Power Management

Selection Guide 2014

www.infineon.com/powermanagement-selectionguide

Dear Customer,

having been the global market leader in power semiconductors for nine consecutive years, we maximize power savings along the entire energy supply chain – generation, distribution and consumption.

Our Power Management Technologies set the benchmark in energy efficiency and power density in electronic systems. We want to enable you to leapfrog innovation and cost-performance in your applications – including Servers, Telecom Systems, Computers, Game Consoles, Smart Phones, Cellular Infrastructure and Lighting Solutions – by providing core microelectronic systems for a connected world.

On the way from product thinking to system understanding
Being a recognized leader with product families such as CoolMOS™ or OptiMOS™ for over a decade, Infineon has greatly strengthened its system competence. Thus we extend our portfolio of Driver- and Control ICs enabling the next quantum leap in both energy efficiency and power density. Power needs control – and we are changing the game from product thinking to system understanding, preparing building blocks for your application for the growing future markets. Our experts combine Infineon semiconductors and control architecture in a unique way to make your products more efficient, more cost effective and altogether more successful.

I am happy to present you with the new Infineon Power Management Selection Guide 2014 and I am certain that it will aid you in finding the right energy-efficient products and solutions!

We look forward to growing business together with you!

Andreas Urschitz
Division President
Power Management & Multimarket

事业部总裁
电源管理与多元化市场

尊敬的客户朋友们:
英飞凌已连续九年位居全球功率半导体市场领导地位。在整个能源供应链中, 我们竭尽全力在制造、销售、消费等环节中实现节能。我们的电源管理技术为电子系统的高能效和高功率密度设定了标杆。英飞凌的创新效能理论, 秉持着不断改进的精神, 使您的应用系统不仅高效, 更节约成本, 因而在市场上大获成功。我们产品的应用领域包括服务器、通讯系统、计算机、游戏设备、智能手机、射频及照明等。

从关注产品到提供系统解决方案
十多年来英飞凌 CoolMOS™, OptiMOS™ 等产品系列一直是行业中公认的领军者, 凭借这一优势, 英飞凌极大地增强了其整体能力。我们通过扩充驱动及控制芯片产品系列, 实现了能效和功率密度方面新的突破。针对客户的应用, 我们持续创新, 从关注产品到提供系统解决方案, 为未来市场做好准备。我们的专家将英飞凌半导体与系统控制相结合, 使您的产品在效率、成本方面进一步提升,实现更大的成功。
希望全新的《2014英飞凌电源管理产品选型指南》助您找到合适的节能产品和解决方案!
我们期待与您一道拓展业务, 共创更美好的未来!

Content

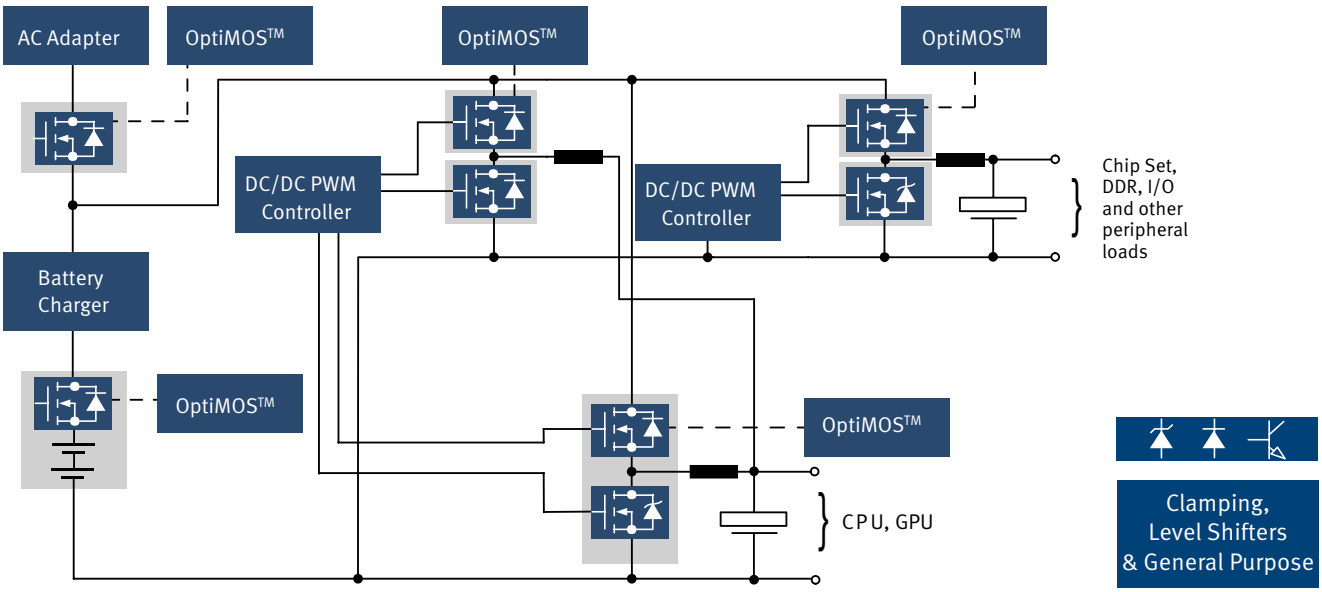
We shape Power Management - We live Energy Efficiency

www.infineon.com/powermanagement

DC/DC Computing

Small and Cool System Power for Notebooks

Benchmark technologies significantly improve switching losses in power stages and drivers and thus improve battery lifetime and system reliability. Highest efficiency at all load conditions enables system designers to overcome thermal challenges to reach a new level of system miniaturization. Our latest portfolio of Notebook products is consequently optimized along the requirements of the next generation Notebook platforms and easy to design in.

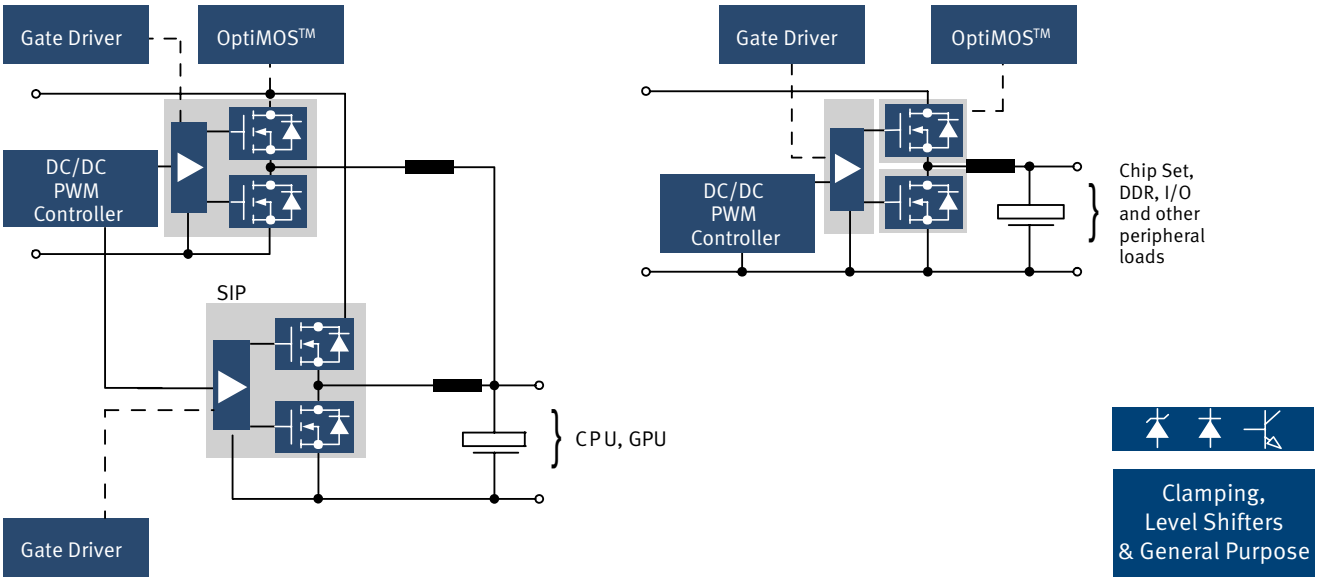


Notebook	Topology	Voltage Class	Technology	Selection
DC/DC	Buck Converter	30V	OptiMOS™	Recommendation

DC/DC Computing

Highest Power Density for Server, Desktop and Graphic Cards

Power management system solutions based on OptiMOS™ technology increase Energy Efficiency in all load conditions, reduce required PCB real estate and are easy to use. Our benchmark solutions demonstrate dramatically increased efficiency even at high currents and high switching frequencies. This supports system designers to achieve their efficiency, power and thermal requirements with a reduced number of phases and thus save overall system cost.

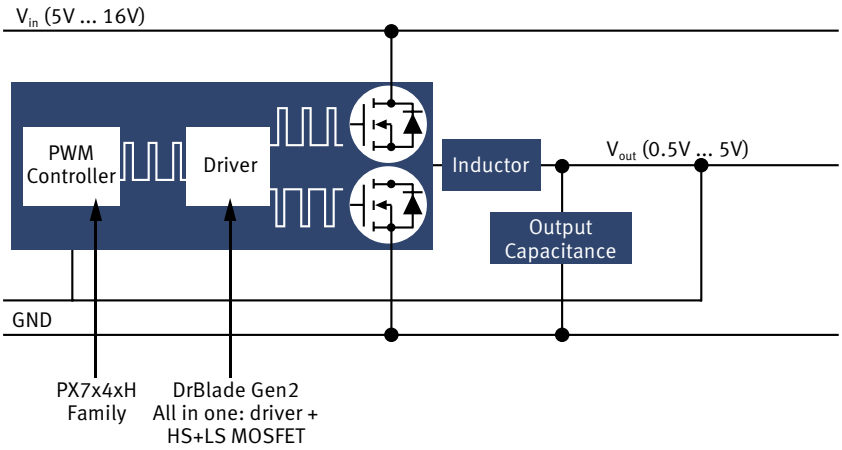


Server, Desktop and Graphic Cards	Topology	Voltage Class	Technology	Selection
DC/DC	Buck Converter	25V	OptiMOS™	Recommendation
	Buck Converter	30V	OptiMOS™	Reference
Driver	Buck Converter	12V	PX 3517	Recommendation
SIP	Buck Converter	16V	TDA21220	Recommendation
Controller	Buck Converter	see page 107 for further information		

DC/DC Computing

Point-of-Load Power Management for Superior Performance

Our power architectures address the need for more accurate and efficient power delivery to support increasingly challenging requirements of today's microprocessors, memories, ASICs and FPGAs. The voltage regulators can be optimized and configured while actively regulating, the final configuration is then permanently stored inside the controller chip non-volatile memory eliminating the need for external configuration components. Combined with DrBlade Gen2 (TDA21320) – the innovative Infineon power stage in Blade package technology - the voltage regulators achieve ›95% efficiency and can support voltage regulator designs with output voltages up to 5.0V. Point of Load is used in Datacom, Computing and Telecom.

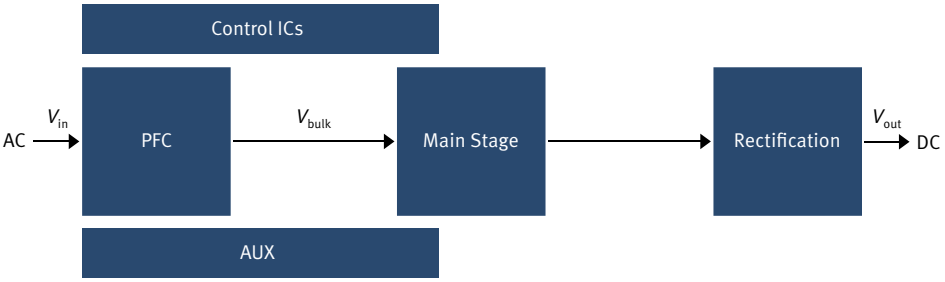


Point-of-Load	Topology	Technology	Selection
Controller	Buck-Converter	Highly parameterized fully digital controller	Recommendation
Power Stage	Buck-Converter	DrBlade Gen2 – SiP (driver and FETs)	Recommendation

SMPS

Cost-Effective Products for Consumer SMPS

We offer a wide range of cost-effective products for consumer Switch Mode Power Supplies (SMPS). This includes high voltage MOSFETs, Control IC´s for PFC and PWM stages, as well as low voltage MOSFETs for synchronous rectification. With these products Infineon supports the trends towards continuously reducing power consumption. Especially versatile are the new CoolMOS™ C6/E6 and P6 families which combine good efficiency with attractive pricing. For synchronous rectification we recommend our OptiMOS™ series offering extremely low on-state resistance and low capacitances. New control ICs support topologies such as quasi-resonant flyback and LLC. For the PFC stage we introduce our new hyperfast Rapid Silicon Diode family.

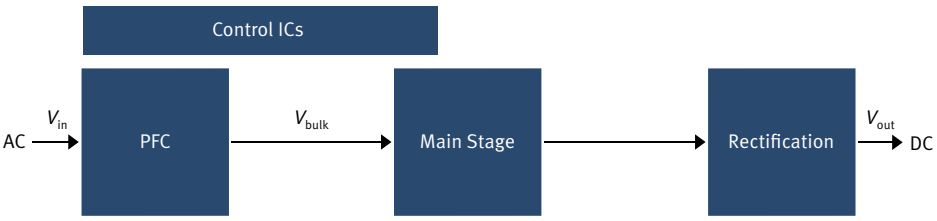


Consumer SMPS	Topology	Voltage Class	Technology	Selection
AC/DC	PFC	600V	CoolMOS™ C6	Ease of Use
	PFC	600V	CoolMOS™ P6	Efficiency
	PFC	650V	Rapid Diode 2	Ease of Use
DC/DC	2 Switch-Forward DC/DC (TTF)	600V	CoolMOS™ C6	Ease of Use
	2 Switch-Forward DC/DC (TTF)	600V	CoolMOS™ P6	Efficiency
	Fixed Frequency Flyback	600V/650V	CoolMOS™ C6	Ease of Use
	Fixed Frequency Flyback	600V/650V	CoolMOS™ E6/P6	Efficiency
	Fixed Frequency Flyback	600V/650V	CoolMOS™ E6/P6	Recommendation
	LLC HB DC/DC	650V	CoolMOS™ CFD2	Recommendation
	LLC HB DC/DC	600V	CoolMOS™ P6	Efficiency
	LLC HB	500V	CoolMOS™ CE	Ease of Use
	Quasi-Resonant Flyback DC/DC	650V/800V/900V	CoolMOS™ C6/C3	Ease of Use
	Quasi-Resonant Flyback DC/DC	600V/800V/900V	CoolMOS™ P6/C3	Efficiency
	Active Clamp Forward	800V	CoolMOS™ C3	Ease of Use
	Active Clamp Forward	800V	CoolMOS™ C3	Efficiency
	Active Clamp Forward	800V	CoolMOS™ C3	Recommendation
	ZVS Asym. Half Bridge DC/DC	650V	CoolMOS™ CFD2	Ease of Use
	ZVS Asym. Half Bridge DC/DC	600V	CoolMOS™ P6	Efficiency
	ITTF	600V	CoolMOS™ C6	Ease of Use
	ITTF	600V/650V	CoolMOS™ P6/C7	Efficiency
Rectification	Synchronous Rectification	150-250 V	OptiMOS™	Recommendation
AUX	CoolSET™	650-800V	CoolSET™	Recommendation

SMPS

Leading-Edge Technologies for Slim Adapters

We offer a wide range of products for slim Adapters including high voltage MOSFETs and control ICs for both PFC and PWM stage, as well as low voltage MOSFETs for synchronous rectification. With these products Infineon supports the trends towards a significantly higher efficiency level, especially in partial load condition, as well as towards miniaturization of the adapter. Especially versatile are the CoolMOS™ C6/E6 and P6 families which combine good efficieny with ease of use. For synchronous rectification we recommend our OptiMOS™ series, offering extremely low on-state resistance and low capacitances. New control ICs support topologies such as quasi-resonant flyback and LLC, which gain market share within the notebook adapter segment. For the PFC stage we introduce our new hyperfast Rapid Silicon Diode family.

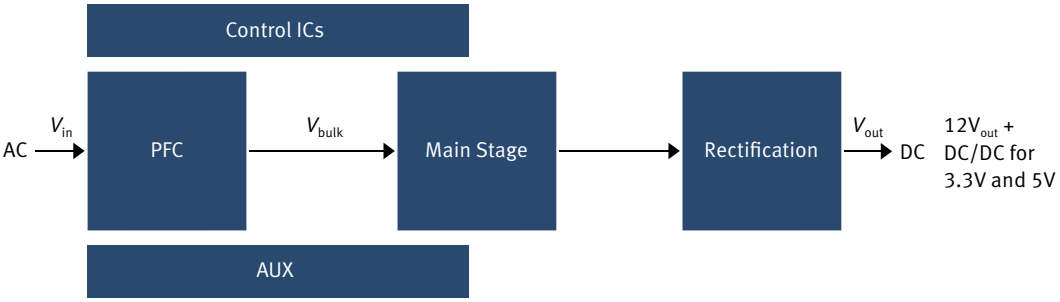


Notebook Adapter	Topology	Voltage Class	Technology	Selection
AC/DC	PFC Boost	600V	CoolMOS™ C6	Ease of Use
	PFC Boost	600V	CoolMOS™ P6	Efficiency
	PFC Boost	650V	Rapid Diode 1/2	Ease of Use
DC/DC	Fixed Frequency Flyback	650V	CoolMOS™ C6	Ease of Use
	Fixed Frequency Flyback	600V/650V	CoolMOS™ E6/P6	Efficiency
	Single Stage	650V	CoolMOS™ C6	Ease of Use
	Single Stage	600V	CoolMOS™ P6	Efficiency
	LLC HB	650V	CoolMOS™ CFD2	Ease of Use
	LLC HB	500V	CoolMOS™ CE	Ease of Use
	LLC HB	600V	CoolMOS™ P6	Efficiency
	Quasi-Resonant Flyback	650V/800V/900V	CoolMOS™ C6/C3	Ease of Use
	Quasi-Resonant Flyback	600V/800V/900V	CoolMOS™ P6/C3	Efficiency
	Active Clamp Flyback	800V	CoolMOS™ C3	Ease of Use
	Active Clamp Flyback	800V	CoolMOS™ C3	Efficiency
Rectification	Synchronous Rectification	100-120V	OptiMOS™	Recommendation
DC/DC	Fixed Frequency/QR Flyback	650-800V	CoolSET™	Recommendation

SMPS

Highest Efficiency with new Topologies for PC Silverbox

The PC Silverbox has seen a tremendous race towards higher efficiency with peak values in the range of 92% and above. Special care is dedicated to the 20% load point. We support these trends with our range of high voltage and low voltage MOSFETs as well as control ICs for Power Factor Correction (PFC) and Pulse-Width Modulation (PWM). Especially versatile are the CoolMOS™ C6/E6 and P6 families, our latest technologies in the superjunction field, which were pioneered by Infineon Technologies. CoolMOS™ C6/E6 and P6 offer easy paralleling and good efficiency even with less ideal PCB layout. The family is specifically recommended for resonant topologies such as LLC due to its high body diode ruggedness, for hard switching topologies such as TTF we recommend the CoolMOS™ C6/E6 and P6. New control ICs support continous current mode PFC and the LLC topology. For the synchronous rectification and the DC/DC we recommend our OptiMOS™ series, which combine extremely low on-state resistance and low capacitances. For the PFC stage we introduce our new hyperfast Rapid Silicon Diode family.

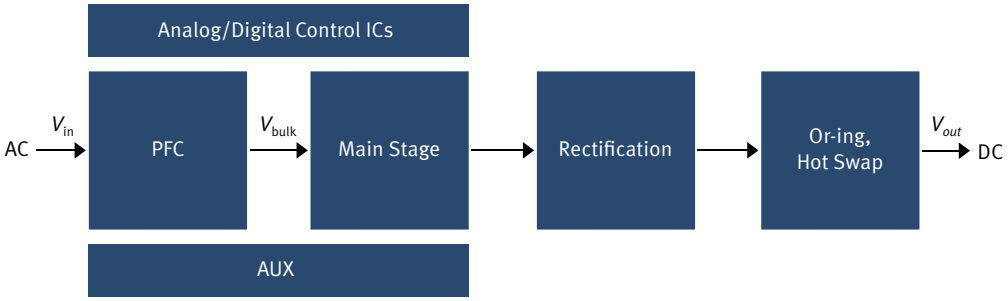


PC Silverbox	Topology	Voltage Class	Technology	Selection
AC/DC	PFC Boost	500V	CoolMOS™ CE	Ease of Use
	PFC Boost	600V	CoolMOS™ C6/E6/P6	Ease of Use
	PFC Boost	600V/650V	CoolMOS™ CP/C7	Efficiency
	PFC Boost	600V	CoolMOS™ C6/E6/P6	Recommendation
	PFC Boost	650V	thinQ!™ Diode Gen 5	Efficiency
	PFC Boost	650V	Rapid Diode 1/2	Ease of Use
DC/DC	2 Switch-Forward (TTF)	500V	CoolMOS™ CE	Ease of Use
	2 Switch-Forward (TTF)	600V	CoolMOS™ C6/E6/P6	Ease of Use
	2 Switch-Forward (TTF)	600V/650V	CoolMOS™ CP/C7	Efficiency
	2 Switch-Forward (TTF)	600V	CoolMOS™ C6/E6/P6	Recommendation
	LLC HB	500V	CoolMOS™ CE	Ease of Use
	LLC HB	650V	CoolMOS™ CFD2	Ease of Use
	LLC HB	600V	CoolMOS™ C6/E6/P6	Efficiency
	LLC HB	600V	CoolMOS™ P6	Recommendation
	Active Clamp Forward	800V	CoolMOS™ C3	Ease of Use
	Active Clamp Forward	800V	CoolMOS™ C3	Efficiency
	Active Clamp Forward	800V	CoolMOS™ C3	Recommendation
	ZVS Asym. Half-Bridge	650V	CoolMOS™ CFD2	Ease of Use
	ZVS Asym. Half-Bridge	600V	CoolMOS™ C6/E6	Efficiency
	ZVS Asym. Half-Bridge	600V	CoolMOS™ P6	Recommendation
Rectification	Synchronous Rectification	40-80V	OptiMOS™	Recommendation
AUX	Fixed Frequency/QR Flyback	650-800V	CoolSET™	Recommendation

SMPS

Server Power Supply

The server market has seen a tremendous shift towards higher efficiency with peak values in the range of 95% and above. We specifically recommend our CoolMOS™ CP/C7 series for hard switching applications such as continuous current mode PFC and interleaved two transistor forward (ITTF). For resonant switching applications such as LLC, we offer a wide range of products from the CoolMOS™ P6 series, our latest technology in the superjunction field. For synchronous rectification we offer various voltage classes of the OptiMOS™ in the range of 40-80V for 12V output. With ultra-low on-state resistance and very low capacitances the OptiMOS™ series will boost your design to best efficiency. Furthermore, we offer control ICs for the CCM PFC and isolated drivers such as the 1ED and 2ED series. For the PFC stage we introduce our new hyperfast Rapid Silicon Diode family.

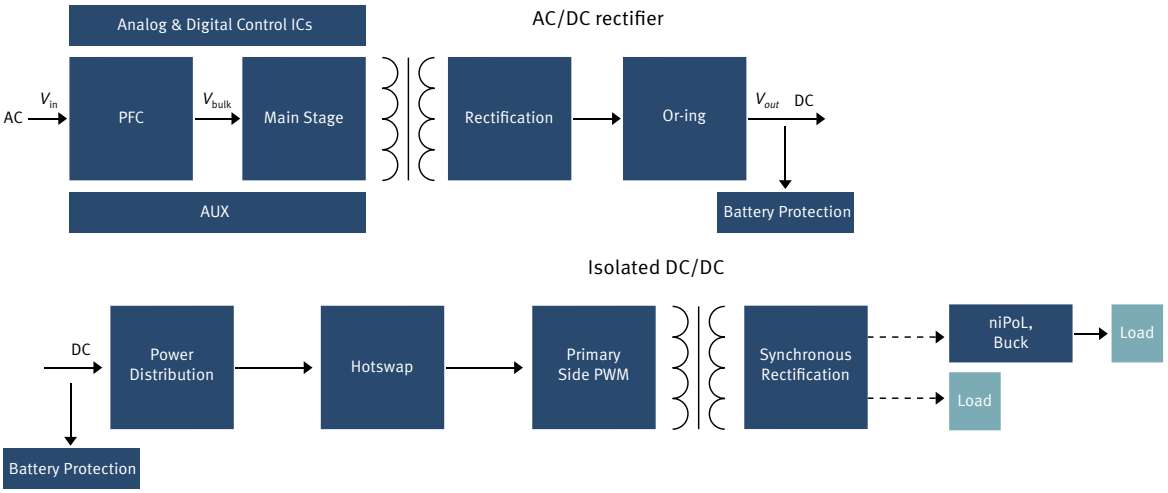


Server Power Supply	Topology	Voltage Class	Technology	Selection
AC/DC	PFC Boost	600V/650V	CoolMOS™ C6/E6/P6	Ease of Use
	PFC Boost	600V/650V	CoolMOS™ CP/C7	Efficiency
	PFC Boost	600V/650V	CoolMOS™ C6/E6/P6	Recommendation
	Bridgless PFC	600V/650V	CoolMOS™ C6/E6/P6	Ease of Use
	Bridgless PFC	600V/650V	CoolMOS™ CP/C7	Efficiency
	Bridgless PFC	600V/650V	CoolMOS™ C6/E6/P6	Recommendation
	PFC Boost	600V/650V	thinQ!™ Diode Gen 5	Efficiency
	PFC Boost	650V	Rapid Diode 2	Ease of Use
DC/DC	LLC HB	650V	CoolMOS™ CFD2	Ease of Use
	LLC HB	600V	CoolMOS™ C6/E6/P6	Efficiency
	LLC HB	600V	CoolMOS™ P6	Recommendation
	ZVS Asym. Half-Bridge	650V	CoolMOS™ CFD2	Ease of Use
	ZVS Asym. Half-Bridge	600V	CoolMOS™ C6/E6/P6	Efficiency
	ZVS Asym. Half-Bridge	600V	CoolMOS™ C6/E6/P6	Recommendation
	ZVS Full Bridge Phase Shift	650V	CoolMOS™ CFD2	Ease of Use
	ZVS Full Bridge Phase Shift	600V	CoolMOS™ C6/E6/P6	Efficiency
	ZVS Full Bridge Phase Shift	650V	CoolMOS™ CFD2	Recommendation
	ITTF	600V	CoolMOS™ C6/E6/P6	Ease of Use
	ITTF	600V/650V	CoolMOS™ CP/C7	Efficiency
	ITTF	600V	CoolMOS™ C6/E6/P6	Recommendation
Rectification	Synchronous Rectification	40-80V	OptiMOS™	Recommendation
Or-ing FET	-	30V	OptiMOS™	Recommendation
AUX	Fixed Frequency/QR Flyback	650-800V	CoolSET™	Recommendation

SMPS

Energy Efficiency for Telecom Power Systems

The Telecom Power Systems market has grown fast within the last years. High efficiency targets are required across the entire load range starting at 20% or even at 10% load. We support these trends with our range of high voltage MOSFETs and SiC Schottky barrier Diodes and Driver ICs as well as our low voltage MOSFET series for synchronous rectification and Or-ing. For the PFC stage we introduce our new hyperfast Rapid Silicon Diode family.



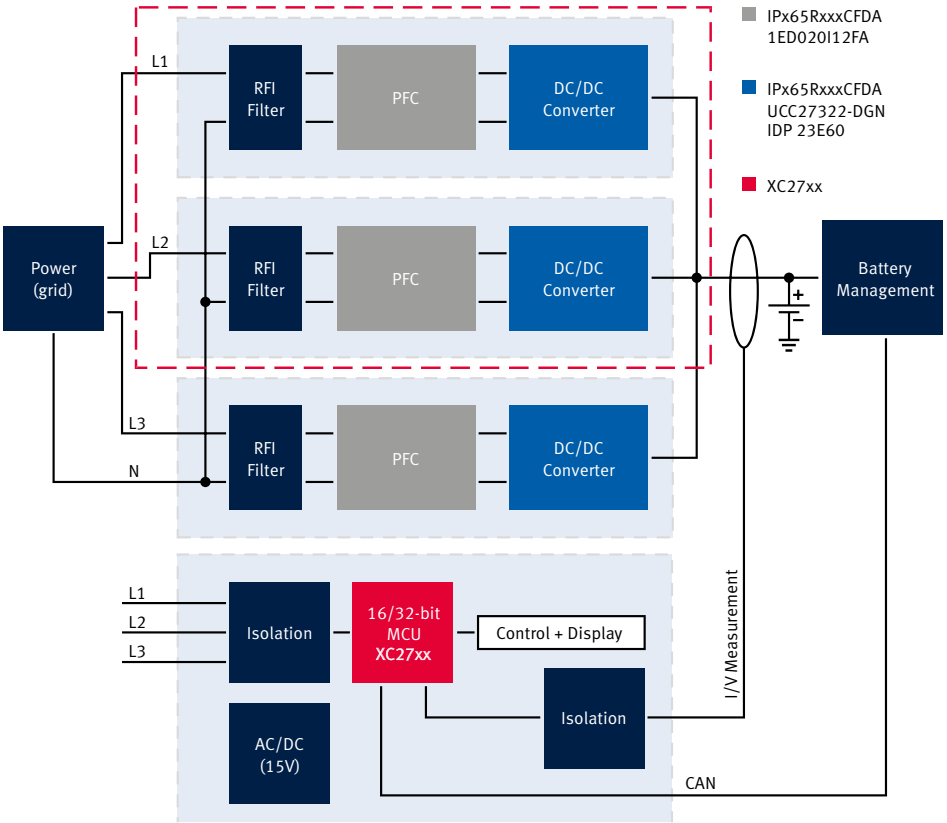
Telecom	Functional Block	Topology	Voltage Class	Technology
AC/DC	PFC	PFC MOSFET	600V, 650V	CoolMOS™ 600V CP, CoolMOS™ 650V C7
		Bridgeless PFC MOSFET	600V, 650V	CoolMOS™ 600V CP, CoolMOS™ 650V C7
		PFC Boost Diode	650V	thinQ™ Gen 5 SiC Diode
		Bridgeless PFC Diode	600V/650V	thinQ™ Gen 5 SiC Diode, Rapid 2 Diode
		CCM PFC IC		ICE3PCS01, IPC3PCS02, IPE3PCS03
	PWM main stage	LLV Half Bridge DC/DC MOSFET	600V, 650V	CoolMOS™ 600V P6, CoolMOS™ 650V CFD2
		ZVS Full Bridge Phase Shift MOSFET	600V, 650V	CoolMOS™ 600V P6, CoolMOS™ 650V CFD2
		ITTF Full Bridge MOSFET	600V, 650V	CoolMOS™ 600V P6, CoolMOS™ 650V CFD2
	Synchronous Rectification	Synchronous Rectification MOSFET	80-200V	OptiMOS™ 80V, 100V, 150V, 200V
	LLC Controller	LLC PWM Half & Full Bridge IC		ICE2HS01G
	Auxilliary Power Supply	AUX Flyback IC	650-800V	CoolSET™ 650V, CoolSET™ 800V
	Or-ing	Or-ing MOSFET	60-150V	OptiMOS™ 60V, 80V, 100V, 150V, 200V
DC/DC	Battery Protection	MOSFET	60-150V	OptiMOS™ 60V, 75V, 80V, 100V, 150V
	Power Distribution	MOSFET	60-150V	OptiMOS™ 60V, 75V, 80V, 100V, 150V Small Signal 60V
	eFuse, hotswap	MOSFET	60-150V	OptiMOS™ 60V, 75V, 80V, 100V, 150V
	Isolated DC/DC	Primary Side PWM MOSFET	60-200V	OptiMOS™ 75V, 80V, 100V, 150V, 200V Small Signal 60V, 100V, 200V
		Synchronous Rectification MOSFET	40-100V	OptiMOS™ 40V, 60V, 75V, 80V, 100V
		Or-ing MOSFET	25-30V	OptiMOS™ 25V, 30V
	non isolated POL, Buck	MOSFET	20-30V	OptiMOS™ 25V, 30V Small Signal 20V, 30V
		Power Stage	25-30V	DrMOS, DrBlade
		Digital DC/DC controller		Primarion™ digital DC/DC controller family

E-Mobility

Best Solutions for Battery Chargers

To recharge the battery of an electric or hybrid/electric car, a charger is needed. In cars with on-board chargers the batteries can be recharged from a standard electric power outlet. Battery charging via the power grid requires a flexible topology to handle different voltage and power ratings in different countries. On-board chargers have to be very efficient so that they are as small and light as possible. A long-term trend may be towards bi-directional charger functions for not only receiving power from the grid but also utilizing the battery system as a short-term energy store which can feed power back into the grid upon demand. Infineon's comprehensive portfolio of semiconductors (sensors, microcontrollers, power semiconductors, power modules, etc.) lends itself perfectly to compact charging units. The products also function at high switching frequencies for use in small and light charger designs. Our products in this sector include MOSFETs like CoolMOS™, the flexible Easy 1B/2B power modules for standard charging and HybridPACK™1 for fast charging. In addition, high-performance 16- and 32-bit microcontroller solutions complete our product portfolio.

AC/DC Battery Charger

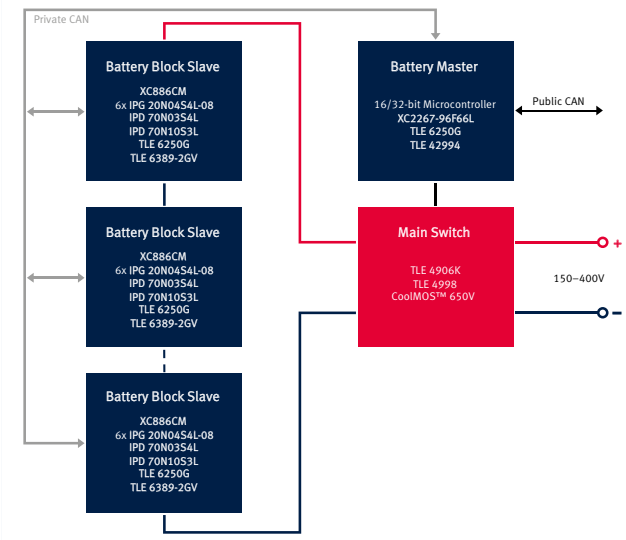


E-car (Battery charger)	Topology	Voltage	Technology	Selection
AC/DC: PFC	Bridgeless converter	650V	CoolMOS™ CFDA	Recommendation
	Totem Pole	650V	CoolMOS™ CFDA	Recommendation
DC/DC	ZVS Phase Shifted Full Bridge	650V	CoolMOS™ CFDA	Recommendation
	LLC Converter	650V	CoolMOS™ CFDA	Recommendation
Control Board	-		Microcontroller XC27xx	Recommendation

Best Solution for Battery Management

An intelligent Battery Management System (BMS) is necessary to sustain battery performance throughout its entire lifetime. The challenge there is to individually optimize the utilization of each battery cell. Infineon's microcontrollers and sensors, in combination with our power devices, enable monitoring of the cells and actively balancing them during charging and discharging. This extends the battery´s lifetime and the effective cruising range by 10 percent and more. In this context we want to mention our 8-bit XC886CM Microcontroller family, the 16/32-bit XC22xx microcontroller family, the OptiMOS™ low-voltage MOSFETs, theTLE 6250/51 CAN transceivers as well as the TLE 6389-2GV and TLE 42994GM linear regulators.

Battery Management



E-car (Battery management)	Topology	Voltage	Technology	Selection
Main Switch	High Power High Current	600V	CoolMOS™	Recommendation
Battery Block Slave	Step Up Step Down	30V	OptiMOS™	Recommendation
		40V	OptiMOS™	Recommendation
		100V	OptiMOS™	Recommendation

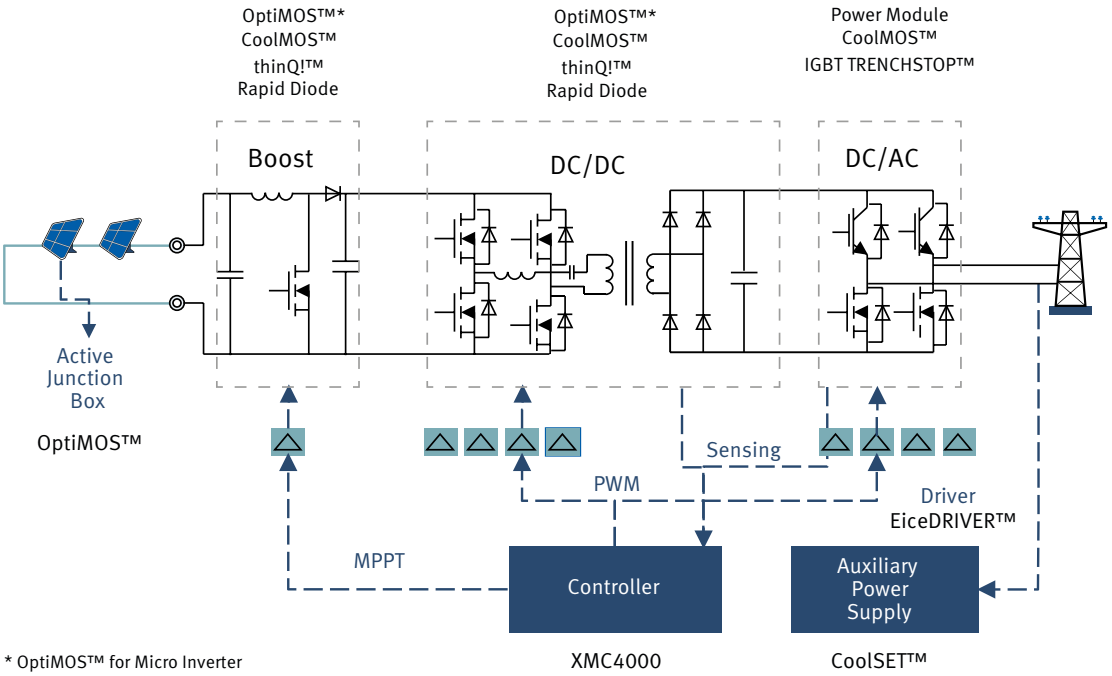
Solar

Leading Products for Solar Power Systems

Infineon provides a comprehensive portfolio to deliver the best efficiency and reliability for Solar Applications. Infineon's leading edge technology like Superjunction MOSFET, Trenchstop and Fieldstop IGBT, Coreless transformer driver etc. combined with rich experience and highest quality, ensured our Number 1 position in Solar Application. The newest add ARM® Cortex™-M4 based MCU enables easy and high efficiency design.

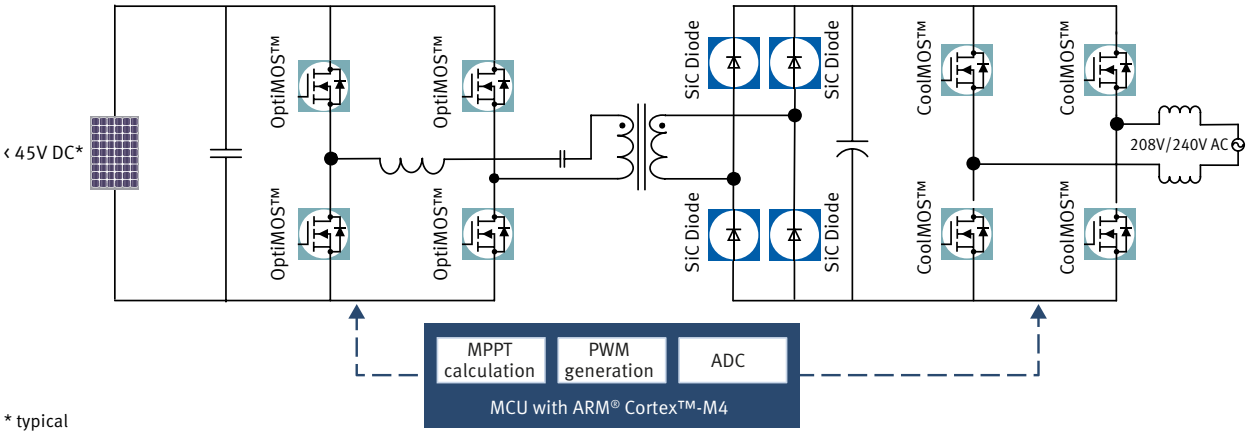
	Optimizer 250W - 400W	Micro Inverter 200W - 300W		String Inverter 1kW - 30kW	Central Inverter 30kW - 500kW
MOSFET	OptiMOS™ SS08/CanPAK | 75V - 150V	OptiMOS™ SS08 | 60V-200V	CoolMOS™ D²PAK/ThinPAK 600V-800V	CoolMOS™ TO247 | 600/650V | 19mΩ-99mΩ	
SiC Diode		thinQ!™ ThinPAK/DPAK | 650V/1200V		thinQ!™ TO-220/TO-247 | 650V/1200V	
IGBT				TRENCHSTOP™/HighSpeed 3 600V/650V/1200V | TO-247 Single/DuoPack	
Power Module & Stack				EasyPACK 1B/2B Press FIT	PrimePACK™/PrimeSTACK™/IHM-B EconoPACK™ 4/EconoDUAL™ 3, 62mm
Driver				IGBT Driver: 1ED020I12-F2, 2ED020I12-F2	
Schottky Diode				BAT165 Schottky Diode	
Auxiliary Power Supply				CoolSET™ 800V	
Microcontroller	MCU: XMC4100/4200	MCU: XMC4100/4200		MCU: XMC4400-XMC4500	MCU: XMC4700

Infineon leading products for Complete Solar System



* OptiMOS™ for Micro Inverter

Micro Inverter



* typical

Infineon OptiMOS™ for Micro Inverter

V_{in}	Topology	Voltage Class	OptiMOS™
Up to 48V	Half-Bridge	60V	BSC016N06NS
Up to 48V	Full-Bridge	60V	BSC028N06NS
Up to 64V	Full-Bridge	80V	BSC047N08NS3 G
Up to 60V	Flyback	150V	BSC190N15NS3 G

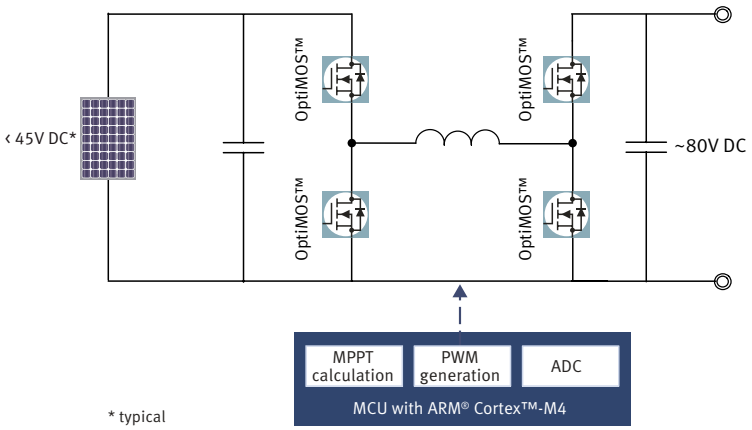
Infineon thinQ!™ SiC Diode for Micro Inverter

Topology	Package	Voltage Class	thinQ!™
Rectification	DPAK	600V	IDD05SG60C

Infineon CoolMOS™ for Micro Inverter

Topology	Package	Voltage Class	CoolMOS™
Current Source	D^2PAK	800V	SPB17N80C3
Current / Voltage Source	D^2PAK	650V	IPB65R190C6
	ThinPAK	600V	IPL60R210P6

Optimizer

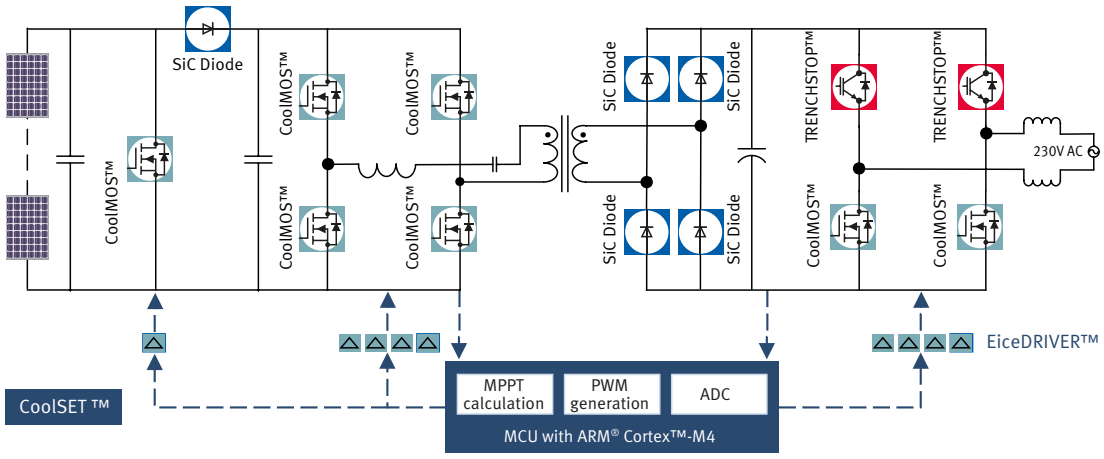


* typical

Infineon OptiMOS™ for Optimizer DC/DC Power Conversion

V_{in}	Topology	Voltage Class	OptiMOS™
up to 48V	Buck-Boost	60V	BSC028N06NS
up to 60V		75V	BSC042NE7NS3 G
up to 64V		80V	BSC047N08NS3 G
			BSC057N08NS3 G
up to 80V		100V	BSC060N10NS3 G

String Inverter



Infineon Discrete Power Device for String Inverter

Inverter Type	Function	Product Series	Typical part number	Voltage Class
Single Phase	Boost	CoolMOS™ CP/C7	IPW65R045C7	650V
		thinQ!™ SiC Diode	IDW20G65C5	650V
	DC/DC	CoolMOS™ C6	IPW65R041C6	650V
		thinQ!™ SiC Diode	IDW20G65C5	650V
		Rapid Diode	IDW15E65D2	650V
	Inverter	TRENCHSTOP™	IKW50N60T	600V
		CoolMOS™ C6	IPW65R041C6	650V
Three Phase	Boost	TRENCHSTOP™	IKW40N120H3	1200V
		thinQ!™ SiC Diode	IDW30S120	1200V
	Inverter	TRENCHSTOP™	IKW40N120H3	1200V

Infineon EiceDRIVER™ for String Inverter

Power Device	Driving Method	Voltage class	Typical part number
IGBT	Single Channel	1200V	1ED020I12-F2/B2
IGBT	Half Bridge	1200V	2ED020I12-FI

Infineon CoolSET™ for String Inverter

Voltage class	Typical part number
800V	ICE3AR2280JZ
650V	ICE3BR1765JZ

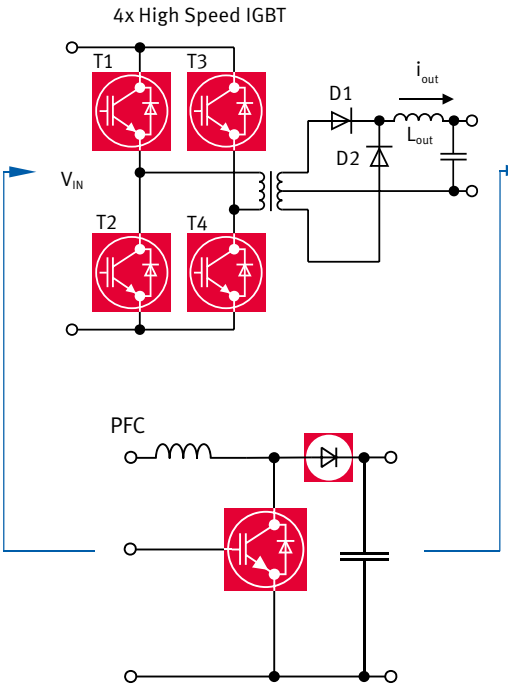
Industrial Welding (MMA ‹ 280A)

Innovative Solutions for Your Applications

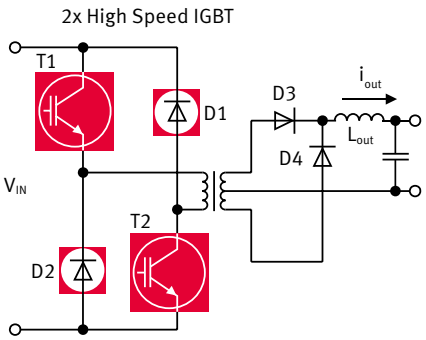
In the field of industrial welding, discretes are used for household and small industrial welders. Infineon's high speed devices are used to reduce the size of active components (25 kHz → 75 kHz), thus enabling to lower the cost and weight of the portable welding machines.

The best fit technologies for welding are HighSpeed3 and TRENCHSTOP™5 providing the highest efficiency at hard switching conditions for switching frequencies from 25 kHz up to 100 kHz. Excellent dynamic response of the IGBTs allows reaching arc current in shorter time contributing to the better quality of welding.

Full Bridge/Half Bridge



Two Transistor Forward



Industrial Welding	Topology	Voltage Class	Technology	Selection
DC/AC	Full Bridge/Half Bridge	600V	HighSpeed 3	Recommendation
	Full Bridge/Half Bridge	650V	TRENCHSTOP™5	Recommendation
	Full Bridge/Half Bridge	1200V	HighSpeed 3	Recommendation
	Two Transistor Forward	600V	HighSpeed 3	Recommendation
	Two Transistor Forward	650V	Rapid 2	Recommendation
	Two Transistor Forward	1200V	HighSpeed 3	Recommendation
AC/DC: PFC	Boost Converter/switch	600V	HighSpeed 3	Reference
	Boost Converter/switch	650V	TRENCHSTOP™5	Recommendation
	Boost Converter/switch	1200V	HighSpeed 3	Reference
	Boost Converter/diode	650V	Rapid 2	Recommendation
IGBT Driver	Half Bridge Single Channel	600V/1200V	EiceDRIVER™ (1ED)	Efficiency
	Half Bridge Dual Channel	600V/1200V	EiceDRIVER™ (2ED)	Recommendation
AUX	Boost Converter	650V	CoolSET F3	Recommendation

Major Home Appliance

Highest Performance and Efficiency for Induction Cooking

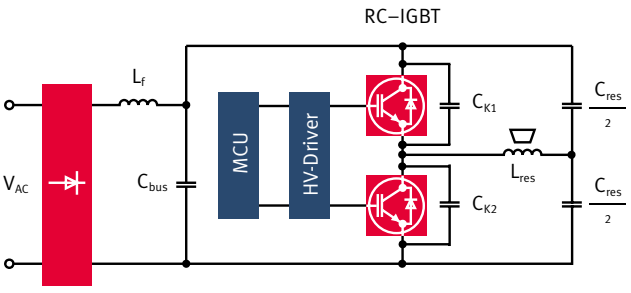
Being the market leader in IGBTs, we offer a comprehensive, high performance portfolio of 600V, 650V, 1100V, 1200V, 1350V, 1600V discrete IGBTs for resonant-switching applications like Induction Cooking. The portfolio has been developed to provide benchmark performance in terms of switching and conduction losses, which ensures Best-in-Class efficiency and fast time to market.

The new RC-H5 technology has been developed to extend the performance leadership for both Half Bridge and Single Ended designs. New 650V devices with higher blocking voltage offer customers higher reliability with improved performance even in designs which require higher frequencies or additionally hard switching conditions.

The updated RC-H5 1350V and 1200V offer the lowest switching losses across a broad range of operating conditions, allowing customers to develop the most efficient and reliable designs.

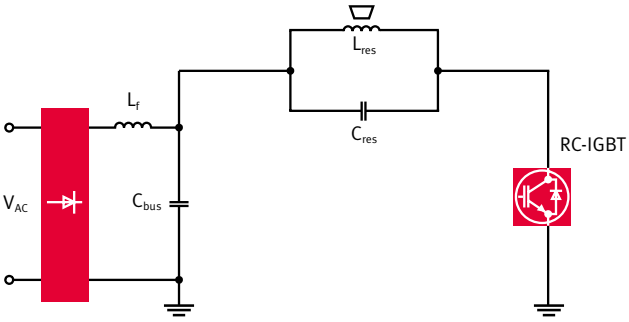
Induction Heating Inverter (Current Resonance)

Half Bridge



Induction Heating Inverter (Voltage Resonance)

Single Switch



Induction Heating	Topology	Voltage Class	Technology	Selection
DC/AC	Series Resonant Half Bridge	600V	RC-H	Recommendation
	Quasi Resonant Single Ended	1100V	RC-H	Recommendation
	Quasi Resonant Single Ended	1200V	RC-H	Recommendation
	Quasi Resonant Single Ended	1350V	RC-H	Recommendation
	Quasi Resonant Single Ended	1600V	RC-H	Recommendation
AUX	Flyback	650V	CoolSET™ QR	Efficiency
	Flyback	800V	CoolSET™ QR	Recommendation
	Boost Converter	800V	CoolSET™ F3	Recommendation

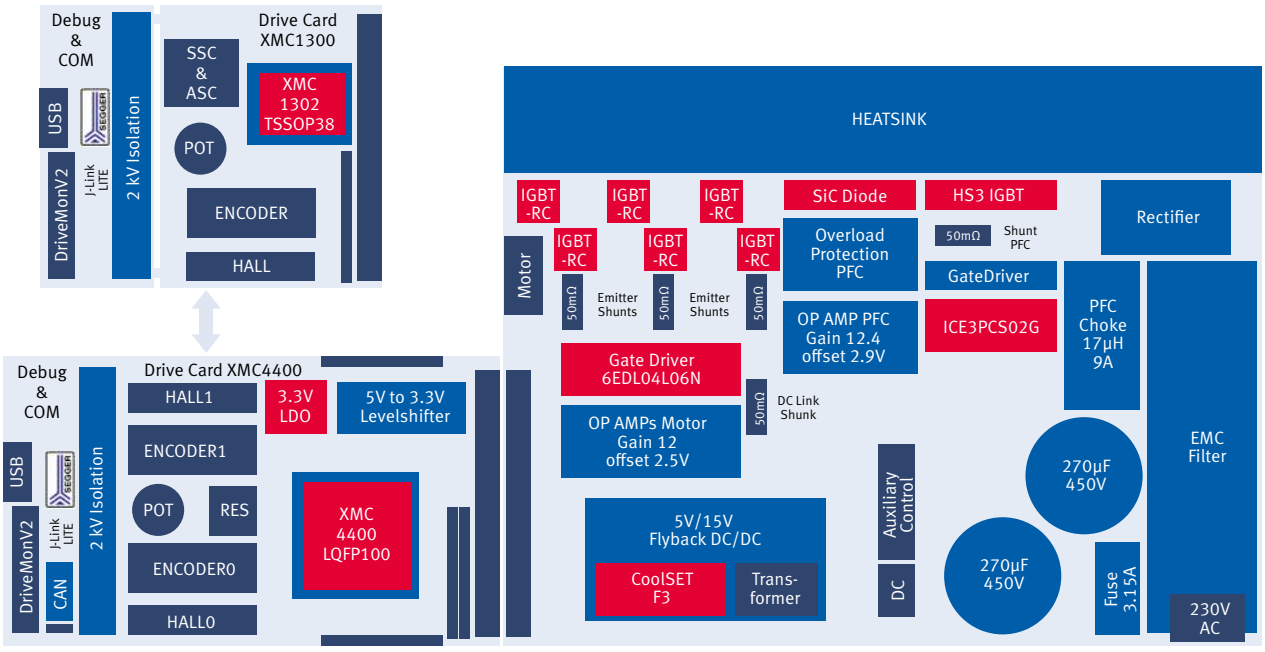
Major Home Appliance

Innovative Approach for Aircon Systems

We offer a wide portfolio of energy saving chips for the whole system chain of power electronic devices for air-conditioning systems. To enable engineers a fast entry in the usage of our devices an Aircon reference board has been developed.

Features

- 1kW compressor inverter stage using 15A RC-Drives IGBT in DPAK (TO-252)
- 200W outdoor fan inverter stage using 4A RC-Drives IGBT in DPAK (TO-252)
- 1.5kW CCM-PFC using 20A HighSpeed 3 IGBT
- 10A SiC-Diode



Aircon	Topology	Voltage Class	Technology	Selection
PFC AC/DC	PFC CCM (low frequency)	600V	TRENCHSTOP™	Recommendation
	PFC CCM (high frequency)	600V	HighSpeed 3	Recommendation
	PFC CCM	600V	CoolMOS™ C6	Reference
	PFC CCM	600V	SiC Diode	Recommendation
DC/AC	B6-VSI	600V	RC-Drives IGBT	Recommendation
	B6-VSI	600V	TRENCHSTOP™	Efficiency
IGBT Driver	Driver for B6 Bridge	600V	EiceDRIVER™ (6ED)	Recommendation
AUX	Boost Converter	650V	CoolSET™ F3	Reference

Lighting

Energy Efficiency for Your Applications

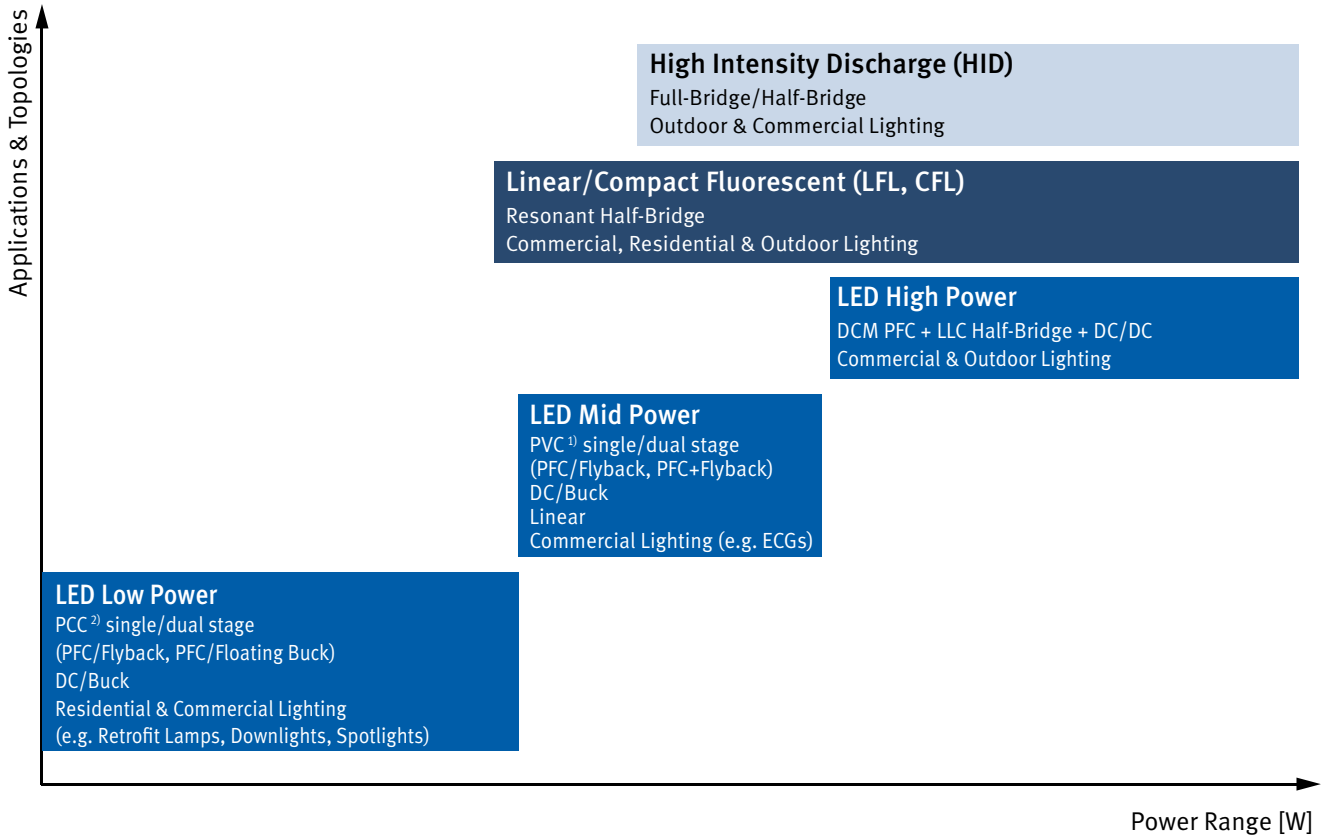
Global concerns over climate changes require using our limited energy resources more efficiently. Approximately 20% of the global electrical energy is consumed by Lighting Applications.

The trend towards energy efficient lighting is apparent and requires both efficient light source technologies and electronics components. Infineon as global number 1 ranking power semiconductor market leader for the last 8 consecutive years, offers an innovative product portfolio for general Lighting Applications, supporting benchmark efficiency improvements, system miniaturization, reliability and overall cost savings.

Infineon delivers innovative, high-performance solutions with Best-in-Class technologies that can be used in a broad range of applications.

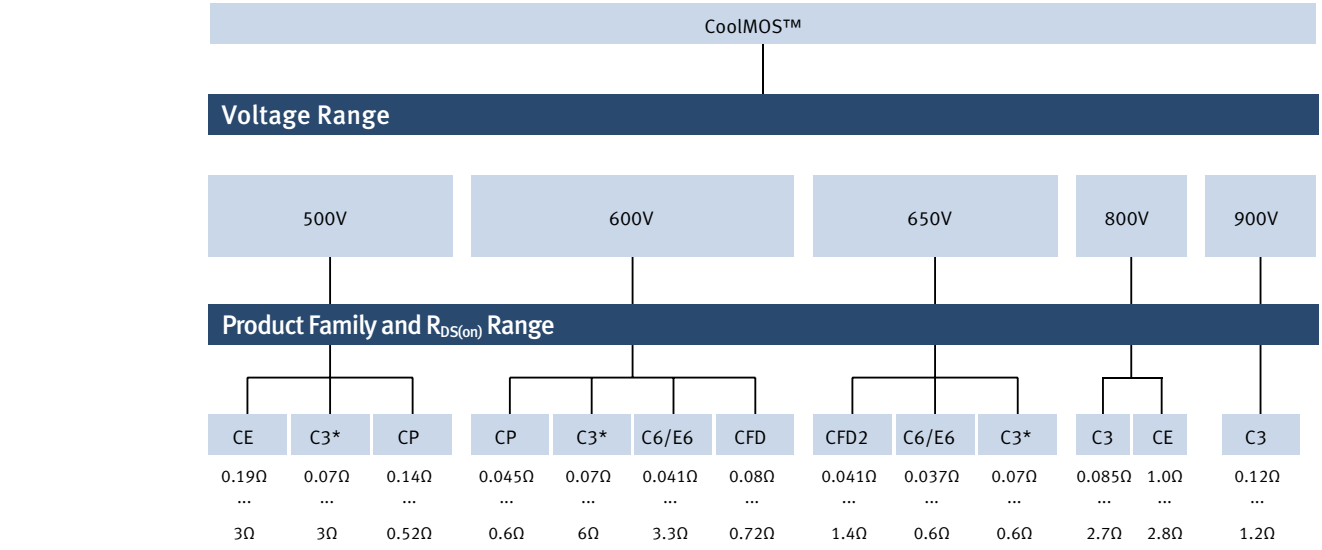
- Fully integrated ballast controllers for fluorescent lamps
- Highly efficient offline LED driver ICs for lamp retrofits and low power LED converters
- DC/DC switched mode and linear LED drivers for single string LED applications
  - High performance power management ICs and microcontrollers for intelligent lighting systems
- Extensive portfolio of leading edge CoolMOS™ and OptiMOS™ Power MOSFETs

Lighting Applications vs. Power Range and Topology



1) Primary Side Voltage Control
2) Primary Side Current Control

CoolMOS™ Selection Table for Lighting Applications



Application & Topologies

PFC/Resonant Half-Bridge	FL				FL	HID	HID					
PFC/Resonant Full-Bridge			HID	HID								
Single Stage PFC/ Flyback								LED low power		LED low power	LED low power	LED low power
Single Stage PFC/ non-isolated Buck	LED low power				LED low power							
PFC/QR Flyback					LED mid power					LED mid power	LED mid power	LED mid power
PFC/LLC Half-Bridge	LED high power		LED high power		LED high power			LED high power				

* Not for new design

Battery Powered Applications

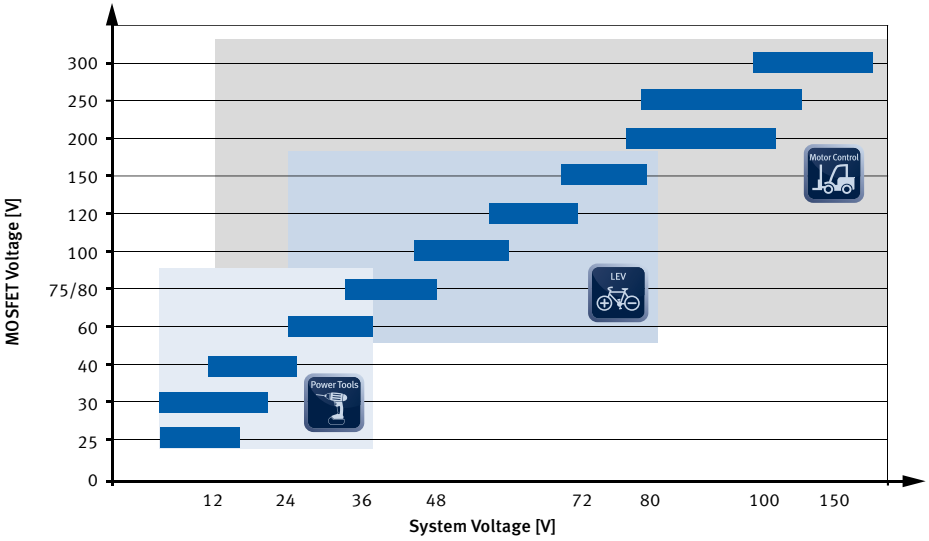
OptiMOS™ for Highest Performance in Your Drives Application

Motor Control – a high current application with a wide range of system power from 1W to 50.000W requires MOSFETs with:

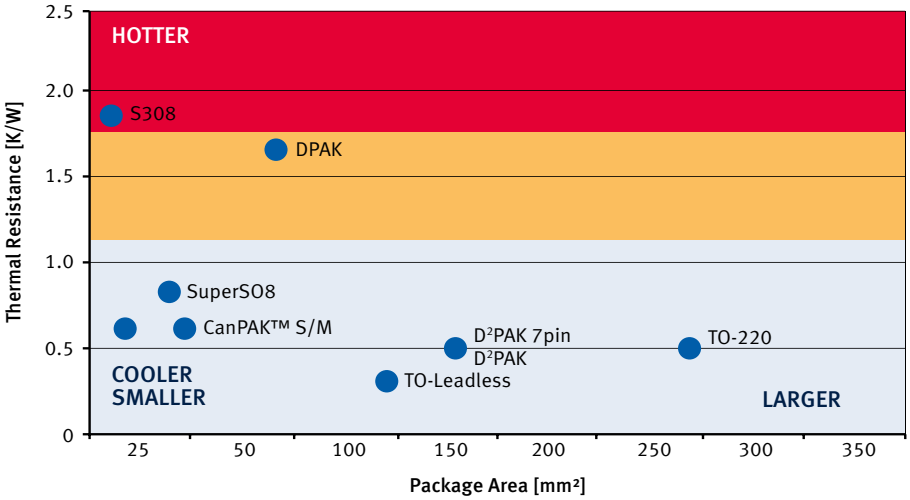
- High current capability
- Lowest on-state resistance ($R_{DS(on)}$)
- Outstanding product performance and quality

With OptiMOS™ 25-300V products we set the benchmark in the industry. With this broad and comprehensive portfolio Infineon supports your application perfectly and offers you the best solution for Motor Control systems up to 110V DC supply voltage.

Infineon offers the right MOSFET for each system



Packages for Battery Powered Applications [1)]



[1)] Further information on the packages available in chapter “Packages”

Your Application – Our Solution

Application		Nominal Battery Voltage	Voltage Class	Packages
Power Tools	Do-it-yourself (DIY)	3.6V-18V	OptiMOS™ 25V, 30V	SuperSO8, D²PAK, TO-220
	Professional	3.6V-36V	OptiMOS™ 25V, 30V, 40V, 60V	CanPAK™ , SuperSO8, D²PAK, D²PAK 7pin, TO-220
Light Electric Vehicles (LEV)	Pedelec	24V-36V	OptiMOS™ 60V, 75V, 80V	SuperSO8, DPAK
	E-scooter	24V-48V	OptiMOS™ 75V, 80V, 100V	SuperSO8, CanPAK™ M, TO-220, D²PAK 7pin
	Low-speed cars	48V – 72V	OptiMOS™ 100 – 150V	D²PAK, D²PAK 7pin, TO-Leadless
RC-toys	Toy-grade	1.2V -24V	OptiMOS™ 25V, 30V , 40V, 60V	S3O8, CanPAK™ S, DPAK
	Hobby-grade	7.2V-48V	OptiMOS™ 25V, 30V , 40V, 60V, 75V, 80V	SuperSO8 and CanPAK™ S and M
Forklift	Small size	‹ 24V	OptiMOS™ 40V, 60V	TO-220, D²PAK, D²PAK 7pin, TO-Leadless
	Medium size	24V - 60V	OptiMOS™ 60V, 75V, 80V, 100V	
	Big size	› 60V	OptiMOS™ 120, 150V, 200, 250V	
Fans		6V-48V	OptiMOS™ 25V -100V	SuperSO8, CanPAK™, S3O8, D²PAK, DPAK

Features and Benefits of OptiMOS™ 25V-300V for Battery Powered Applications

Features

- High current capability
- Lowest on-state resistance ($R_{DS(on)}$)
- Easy to use
- Outstanding product performance and reliability

Benefits

- Enables system cost reduction and overall system minituarization
- Enables optimized thermal management
- Extending battery lifetime
- Reliable operation in harsh environments

OptiMOS™

Leading-Edge Solutions for a Better Future

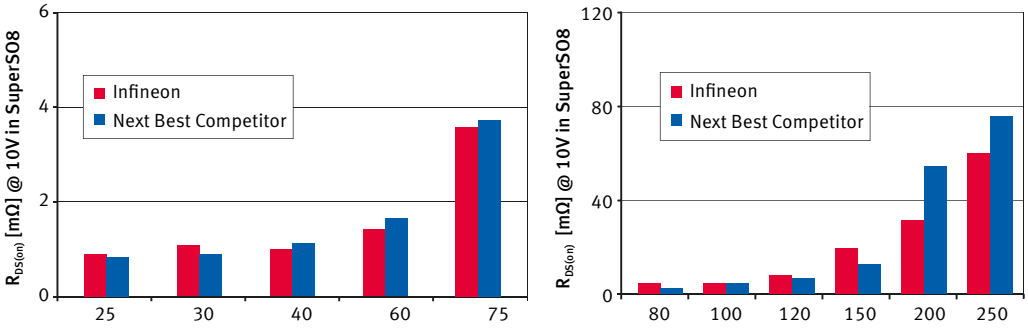
Infineon's innovative products serve the market needs throughout the whole energy supply chain. OptiMOS™ is the market leader in highly efficient solutions for power generation (e.g. Solar micro inverter), Power Supply (e.g. Server and Telecom) and power consumption (e.g. electric vehicle). In all these areas, our customers face the challenge of growing power demand, higher efficiency and lower cost. At the same time, the available space is constantly shrinking, leading to higher power density requirements.

The solution can be found in the low voltage Power MOSFET family, OptiMOS™ 20V up to 300V, which consistently sets the benchmark in key specifications for power system design, including leading on-state resistance and Figure of Merit characteristics which lead to reduced power losses and improved overall efficiency.

Lower power losses enable system cost improvement by reducing the need for device paralleling and allowing smaller heatsinks. The OptiMOS™ family also contributes to customers' goals of providing more compact power supply designs.
Available in innovative space saving packages such as TO-Leadless, CanPAK™, SuperSO8 or S3O8, power stage and Blade, these products reduce the area consumption. For example TO-Leadless provide a 60% space reduction compared to D²PAK 7pin. In addition, they improve switching noise and EMI for SMPS, as well as other industrial applications.

OptiMOS™ products are suitable for a wide range of applications:

- VR-modules for Server
- Synchronous rectification for AC/DC SMPS
- DC/DC converters
- Motor Control 12V-110V system
- Solar micro inverter and Maximum Power Point Tracker (MPPT)
- LED lighting
- Notebook and Desktop



Demonstrating › 93% Efficiency in Voltage Regulation for Power Applications

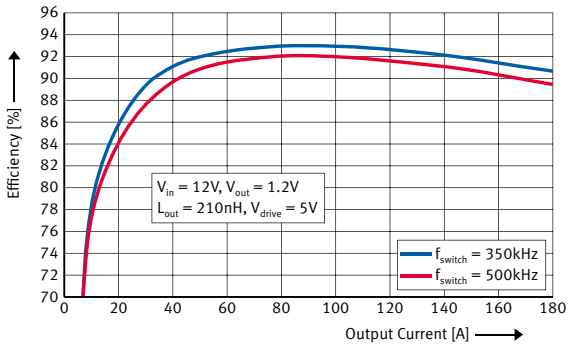
With the new OptiMOS™ 25V and 30V product family, Infineon sets new standards in power density and Energy Efficiency for discrete power MOSFETs and system in package. Ultra low gate and output charge, together with lowest on-state resistance in small footprint packages, make OptiMOS™ 25V the best choice for the demanding requirements of voltage regulator solutions in Servers, Datacom and Telecom applications.

OptiMOS™ 30V products are tailored to the needs of power management in notebook by improved EMI behavior, as well as increased battery life.

With the new OptiMOS™ products, we have the best solution to:

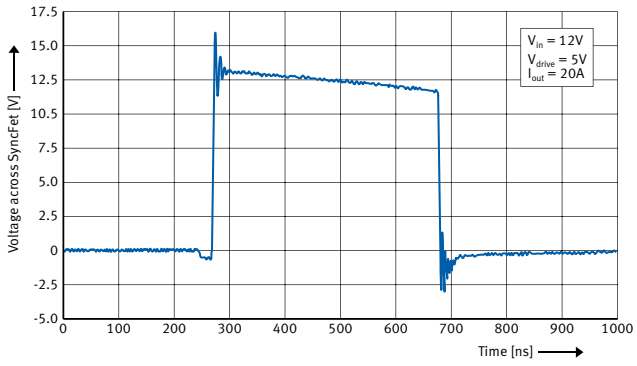
- Save overall system costs by reducing the number of phases in multiphase converters
- Reduce power losses and increase efficiency for all load conditions
- Save space with the smallest packages such as CanPAK™, S3O8 or system-in-package solution
- Minimize EMI in the system making external snubber networks obsolete and the products easy to design-in

Efficiency of OptiMOS™ 25V in a six-phase server VRD



Outstanding performance of the new OptiMOS™ 25V and 30V products is exemplified on a six-phase Server V_{core} VRD. 93% peak efficiency and ›90% full load efficiency is demonstrated with the new OptiMOS™ 25V products in SuperSO8 package. (HighSide: BSC050NE2LS; LowSide: BSC010NE2LS)

Clean waveforms for optimized EMI behavior make new OptiMOS™ 25V/30V products easy to use



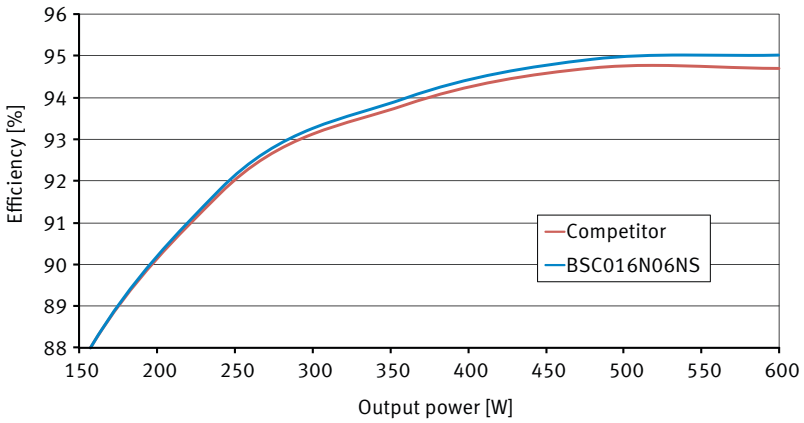
With the new OptiMOS™ 25V/30V products short switching times (rise and fall times ‹5ns) go in hand with excellent EMI behavior. An integrated damping network guarantees low over- and undershoot and minimizes ringing without sacrificing efficiency.

Always a Step Ahead with Infineon

With OptiMOS™ 40V-300V products, we set the benchmark in the industry. The leading on-state resistance ($R_{DS(on)}$) and switching behavior reduce power losses and enable overall efficiency of 96%. With these products Infineon supports the market trend towards Energy Efficiency targets such as Energy Star Titanium Level.

OptiMOS™ technology enables for the first time very low $R_{DS(on)}$ values needed for high current applications in space saving packages such as SuperSO8, S3O8 and CanPAK™ and TO-Leadless, which were previously only possible in bulky packages.

Efficiency



Using Infineon products in synchronous rectification of a 600W server power supply with 12V output brings your peak efficiency 0.3% higher.

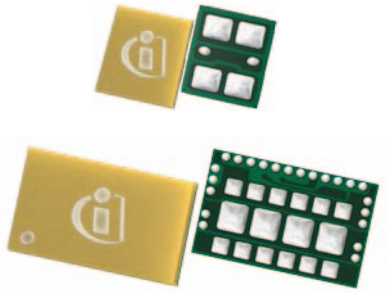
Optimized for High Power Applications

TO-Leadless

TO-Leadless package is especially designed for high current applications with high power and reliability requirements such as Forklift, Light Electric Vehicles, E-fuse, PoL (Point of Load) and Telecom. The outstanding current capability up to 300A is an ideal feature for these applications. Furthermore, TO-Leadless offers benefits in terms of optimized board space. The significant smaller package size, reduced by 60%, enables a very compact design. Compared to D^2PAK 7pin, TO-Leadless shows a 30% reduction in footprint. This allows aboard space reduction in Forklift Applications and the 50% reduced height offers a significant advantage in narrow applications such as rack or blade servers.

Blade/DrBlade

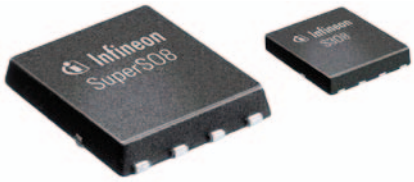
DrBlade, the new ultra-compact integrated MOSFET halfbridge with driver, realized in a revolutionary new packaging technology, is an ideal solution for buck converter applications with highest efficiency and power density requirements. The Blade packaging technology realizes a low package resistance and inductance as well as high current handling capability, replacing standard packaging processes like bonding or molding which provide a 30% package footprint reduction. Additionally, the thermal resistances to the package bottom and top side are optimized, improving its thermal behavior. The new packaging technology is available in discrete products such as Blade 3x3 as well as in the integrated DrBlade configuration including driver and MOSFETs.



The Revolutionary Next Packaging Generation

SuperSO8/S3O8

In applications like synchronous rectification in server and desktop, motor drives and DC/DC converters in telecom, high power density and high efficiency are the major driving factors. The trend set by Infineon to move from TO-220 to SuperSO8 in Server reduces the area consumption drastically. With three times lower resistance parasitic compared to TO-220, SuperSO8 offers highest efficiency and lowest design efforts due to reduced spikes.



The Intelligent Way to Highest Efficiency and Power Density

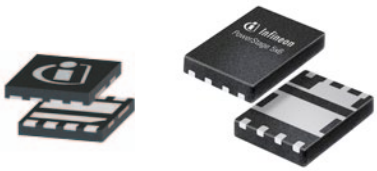
CanPAK™

The CanPAK™ portfolio is the best fit for a broad number of industrial applications such as voltage regulator for servers, DC/DC converters in telecom, solar micro inverters and Maximum Power Point Trackers (MPPT), low voltage drives and synchronous rectification in server and desktop. With only a 31mm² footprint, CanPAK™ M allows 79% space reduction in power components on the board compared to traditional D²PAK. In addition, the metal 'Can' enables double-sided cooling along with almost no package parasitic inductances, leading to a higher systems efficiency.

Best Thermal Behavior in a Tiny Footprint

Power stage 3x3 and power stage 5x6

Dual FET power stages in a single leadless SMD package integrate the low side and high side MOSFET of a synchronous DC/DC converter into a 3x3mm² or 5x6mm² package outline. Designers are able to shrink their designs up to 85% by replacing two seperate discrete packages such as SO-8 or SuperSO8 with this new package. Both, the small outline and the interconnection of the two MOSFETs within the package minimize the loop inductance which boosts efficiency. With the new OptiMOS™ technology power stage 3x3 and power stage 5x6 achieve a peak efficiency of 93,5%. Power stage 3x3 can handle an application current up to 12,5A and power stage 5x6 up to 30A.



Save Space, Minimize Losses, Boost Efficiency

OptiMOS™ 20V Super Logic Level

$R_{DS(on)}$ max @V_{GS}=4.5V [mΩ]	TO-251 / TO-251 SL	TO-252 DPAK	Blade 3x3	CanPAK™ S/M	TO-263 7 Pin	TO-220	TO-220 FullPAK	SuperSO8	SO-8
<2								BSC019N02KS G $R_{DS(on)}$= 1.9mΩ	
2-4								BSC026N02KS G $R_{DS(on)}$=2.6mΩ	
4-10								BSC046N02KS G $R_{DS(on)}$=4.6mΩ	

OptiMOS™ 25V Logic Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-251 / TO-251 SL	TO-252 DPAK	Blade 3x3	CanPAK™ S/M	TO-263 7 Pin	TO-220	TO-220 FullPAK	SuperSO8	S3O8
<1.0				BSB008NE2LX $R_{DS(on)}$= 0.8mΩ				BSC009NE2LS $R_{DS(on)}$=0.9mΩ	
1-2			BSN011NE2LSI $R_{DS(on)}$=1.5mΩ	BSB012NE2LX $R_{DS(on)}$=1.2mΩ				BSC010NE2LS $R_{DS(on)}$=1.0mΩ	
			BSN011NE2LS $R_{DS(on)}$=1.5mΩ	BSB012NE2LXI $R_{DS(on)}$=1.2mΩ				BSC010NE2LSI $R_{DS(on)}$=1.05mΩ	
				BSB013NE2LXI $R_{DS(on)}$=1.3mΩ				BSC014NE2LSI $R_{DS(on)}$=1.4mΩ	
								BSC018NE2LS $R_{DS(on)}$=1.8mΩ	BSZ18NE2LS $R_{DS(on)}$=1.8mΩ
								BSC018NE2LSI $R_{DS(on)}$=1.8mΩ	BSZ018NE2LSI $R_{DS(on)}$=1.8mΩ
2-4								BSC024NE2LS $R_{DS(on)}$=2.4mΩ	
				BSF030NE2LQ[1)] $R_{DS(on)}$=3.0mΩ				BSC032NE2LS $R_{DS(on)}$=3.2mΩ	
				BSF035NE2LQ[1)] $R_{DS(on)}$=3.5mΩ					BSZ036NE2LS $R_{DS(on)}$=3.6mΩ
4-6									
								BSC050NE2LS $R_{DS(on)}$=5.0mΩ	
									BSZ060NE2LS $R_{DS(on)}$=6.0mΩ
6-7			BSN045NE2LS $R_{DS(on)}$=6.5mΩ						

[1)] CanPAK™ S

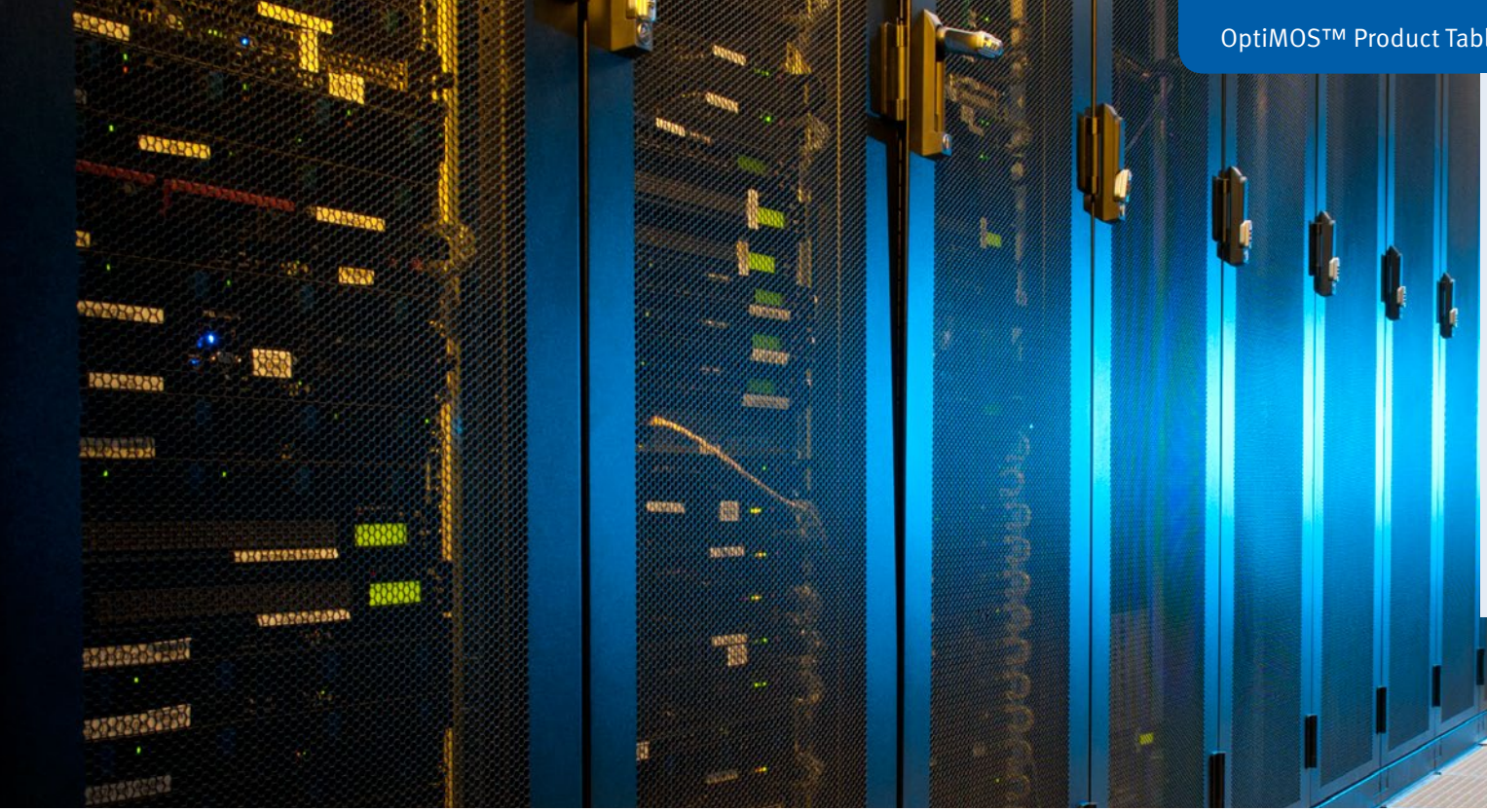
OptiMOS™ 25/30V in power stage 3x3 and 5x6

Part Number	Monolithically integrated Schottky like diode	BV_{DSS} (V)	$R_{DS(on)max.}$ [mΩ] @ V_{GS}=4.5V max		Q_g [nC] @ V_{GS}=4.5V typ	
			High Side	Low Side	High Side	Low Side
BSC0910NDI	✓	25	5.9	1.6	7.7	25.0
BSC0911ND	–	25	4.8	1.7	7.7	25.0
BSC0921NDI	✓	30	7.0	2.1	5.8	21.0
BSC0923NDI	✓	30	7.0	3.7	5.2	12.2
BSC0924NDI	✓	30	7.0	5.2	5.2	8.6
BSC0925ND	–	30	6.4	6.4	5.2	6.7
BSZ0907ND	–	30	13.0	10.0	4.3	5.3
BSZ0908ND	–	30	25.0	13.0	2.0	4.3

OptiMOS™ 30V Logic Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-251 / TO-251 SL	TO-252 DPAK	Blade 3x3	CanPAK™ M	TO-Leadless	TO-263 D²PAK	TO-263 7 Pin	TO-220	SuperSO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
1-2			BSN012N03LSI $R_{DS(on)}$=1.6mΩ	BSB012N03LX3 G $R_{DS(on)}$=1.2mΩ	IPT004N03L [3] $R_{DS(on)}$=0.4mΩ		IPB009N03L G $R_{DS(on)}$=0.95mΩ		BSC011N03LS $R_{DS(on)}$=1.1mΩ		IPC218N03L3 $R_{DS(on)}$=0.5mΩ
			BSN012N03LS $R_{DS(on)}$=1.6mΩ						BSC011N03LSI $R_{DS(on)}$=1.1mΩ		
									BSC014N03LS G $R_{DS(on)}$=1.4mΩ		
				BSB017N03LX3 G $R_{DS(on)}$=1.7mΩ					BSC016N03LS G $R_{DS(on)}$=1.6mΩ	BSZ019N03LS $R_{DS(on)}$=1.9mΩ	IPC055N03L3 $R_{DS(on)}$=1.7mΩ
									BSC0901NS $R_{DS(on)}$=1.9mΩ		
									BSC0901NSI $R_{DS(on)}$=2.0mΩ	BSZ0901NS $R_{DS(on)}$=2.0mΩ	
2-4									BSC020N03LS G $R_{DS(on)}$=2.0mΩ	BSZ0901NSI $R_{DS(on)}$=2.1mΩ	IPC042N03L3 $R_{DS(on)}$=2.3mΩ
									BSC025N03LS G $R_{DS(on)}$=2.5mΩ		
									BSC0902NS $R_{DS(on)}$=2.6mΩ	BSZ0902NS $R_{DS(on)}$=2.6mΩ	
									BSC0902NSI $R_{DS(on)}$=2.8mΩ	BSZ0902NSI $R_{DS(on)}$=2.8mΩ	
	IPS031N03L G $R_{DS(on)}$=3.1mΩ	IPD031N03L G $R_{DS(on)}$=3.1mΩ				IPB034N03L G $R_{DS(on)}$=3.4mΩ		IPP034N03L G $R_{DS(on)}$=3.4mΩ	BSC030N03LS G $R_{DS(on)}$=3.0mΩ	BSZ035N03LS G $R_{DS(on)}$=3.5mΩ	
									BSC034N03LS G $R_{DS(on)}$=3.4mΩ		
									BSC0904NSI $R_{DS(on)}$=3.7mΩ		
4-6	IPS040N03L G $R_{DS(on)}$=4.0mΩ	IPD040N03L G $R_{DS(on)}$=4.0mΩ				IPB042N03L G $R_{DS(on)}$=4.2mΩ		IPP042N03L G $R_{DS(on)}$=4.2mΩ	BSC042N03LS G $R_{DS(on)}$=4.2mΩ	BSZ0904NSI $R_{DS(on)}$=4.0mΩ	
									BSC0906NS $R_{DS(on)}$=4.5mΩ		
	IPS050N03L G $R_{DS(on)}$=5.0mΩ	IPD050N03L G $R_{DS(on)}$=5.0mΩ							BSC050N03LS G $R_{DS(on)}$=5.0mΩ	BSZ050N03LS G $R_{DS(on)}$=5.0mΩ	IPC028N03L3 $R_{DS(on)}$=5.0mΩ
						IPB055N03L G $R_{DS(on)}$=5.5mΩ		IPP055N03L G $R_{DS(on)}$=5.5mΩ	BSC052N03LS $R_{DS(on)}$=5.2mΩ		IPC022N03L3 $R_{DS(on)}$=5.3mΩ
									BSC057N03LS G $R_{DS(on)}$=5.7mΩ	BSZ058N03LS G $R_{DS(on)}$=5.8mΩ	
6-8	IPS060N03L G $R_{DS(on)}$=6.0mΩ	IPD060N03L G $R_{DS(on)}$=6.0mΩ	BSN048N03LS $R_{DS(on)}$=6.6mΩ			IPB065N03L G $R_{DS(on)}$=6.5mΩ				BSZ065N03LS $R_{DS(on)}$=6.5mΩ	
	IPS075N03L G $R_{DS(on)}$=7.5mΩ	IPD075N03L G $R_{DS(on)}$=7.5mΩ				IPB080N03L G $R_{DS(on)}$=8.0mΩ					
8-10									BSC080N03LS G $R_{DS(on)}$=8.0mΩ	BSZ088N03LS G $R_{DS(on)}$=8.8mΩ	
	IPS090N03L G $R_{DS(on)}$=9.0mΩ	IPD090N03L G $R_{DS(on)}$=9.0mΩ							BSC090N03LS G $R_{DS(on)}$=9.0mΩ		
									BSC0909NS $R_{DS(on)}$=9.2mΩ		
10-15										BSZ100N03LS G $R_{DS(on)}$=10.0mΩ	
									BSC120N03LS G $R_{DS(on)}$=12.0mΩ	BSZ0909NS $R_{DS(on)}$=12.0mΩ	
		IPD135N03L G $R_{DS(on)}$=13.5mΩ								BSZ130N03LS G $R_{DS(on)}$=13.0mΩ	
2 x 7.2									BSC072N03LD G $R_{DS(on)}$=7.2mΩ		
2 x 15									BSC150N03LD G $R_{DS(on)}$=15.0mΩ		
50											IPC014N03L3 $R_{DS(on)}$=50.0mΩ

[3] In development



OptiMOS™ 30V Logic Level 5V optimized

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-251 / TO-251 SL	TO-252 DPAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	SuperSO8	S3O8	SO-8
‹2							BSC014N03MS G $R_{DS(on)}$=1.4mΩ		
							BSC016N03MS G $R_{DS(on)}$=1.6mΩ		
2-6							BSC020N03MS G $R_{DS(on)}$=2.0mΩ	BSZ035N03MS G $R_{DS(on)}$=3.5mΩ	BSO033N03MS G $R_{DS(on)}$=3.3mΩ
							BSC025N03MS G $R_{DS(on)}$=2.5mΩ		BSO040N03MS G $R_{DS(on)}$=4.0mΩ
							BSC030N03MS G $R_{DS(on)}$=3.0mΩ		
							BSC042N03MS G $R_{DS(on)}$=4.2mΩ	BSZ050N03MS G $R_{DS(on)}$=5.0mΩ	
							BSC050N03MS G $R_{DS(on)}$=5.0mΩ	BSZ058N03MS G $R_{DS(on)}$=5.8mΩ	
							BSC057N03MS G $R_{DS(on)}$=5.7mΩ		
6-10									
							BSC080N03MS G $R_{DS(on)}$=8.0mΩ	BSZ088N03MS G $R_{DS(on)}$=8.8mΩ	
							BSC090N03MS G $R_{DS(on)}$=9.0mΩ		
10-20							BSC100N03MS G $R_{DS(on)}$=10.0mΩ	BSZ100N03MS G $R_{DS(on)}$=10.0mΩ	BSO110N03MS G $R_{DS(on)}$=11.0mΩ
							BSC120N03MS G $R_{DS(on)}$=12.0mΩ	BSZ130N03MS G $R_{DS(on)}$=13.0mΩ	
›20									
2x15									BSO150N03MD G $R_{DS(on)}$=15.0mΩ
2x22									BSO220N03MD G $R_{DS(on)}$=22.0mΩ

OptiMOS™ 40V Logic Level/Normal Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-252 DPAK	CanPAK™ S/M	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	SuperSO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
<2							BSC010N04LS $R_{DS(on)}$=1.0mΩ		
							BSC010N04LSI $R_{DS(on)}$=1.05mΩ		
							BSC014N04LS $R_{DS(on)}$=1.4mΩ		
							BSC014N04LSI $R_{DS(on)}$=1.45mΩ		
		BSB014N04LX3 G $R_{DS(on)}$=1.4mΩ	IPB015N04N G $R_{DS(on)}$=1.5mΩ	IPB011N04L G $R_{DS(on)}$=1.1mΩ	IPP015N04N G $R_{DS(on)}$=1.5mΩ		BSC016N04LS G $R_{DS(on)}$=1.6mΩ		
		BSB015N04NX3 G $R_{DS(on)}$=1.5mΩ	IPB015N04L G $R_{DS(on)}$=1.5mΩ	IPB011N04N G $R_{DS(on)}$=1.1mΩ			BSC017N04NS G $R_{DS(on)}$=1.7mΩ		
							BSC018N04LS G $R_{DS(on)}$=1.8mΩ		IPC218N04N3 $R_{DS(on)}$=0.5mΩ
							BSC019N04NS G $R_{DS(on)}$=1.9mΩ		IPC171N04N $R_{DS(on)}$=1.1mΩ
							BSC019N04LS $R_{DS(on)}$=1.4mΩ		
2-3				IPB020N04N G $R_{DS(on)}$=2.0mΩ	IPP023N04N G $R_{DS(on)}$=2.3mΩ		BSC022N04LS $R_{DS(on)}$=2.2mΩ	BSZ023N04LS $R_{DS(on)}$=2.3mΩ	
			IPB023N04N G $R_{DS(on)}$=2.3mΩ				BSC026N04LS $R_{DS(on)}$=2.6mΩ	BSZ028N04LS $R_{DS(on)}$=2.8mΩ	
							BSC027N04LS G $R_{DS(on)}$=2.7mΩ		
							BSC030N04NS G $R_{DS(on)}$=3.0mΩ		
3-4	IPD036N04L G $R_{DS(on)}$=3.6mΩ				IPP039N04L G $R_{DS(on)}$=3.9mΩ		BSC032N04LS $R_{DS(on)}$=3.2mΩ	BSZ034N04LS $R_{DS(on)}$=3.4mΩ	
							BSC035N04LS G $R_{DS(on)}$=3.5mΩ	BSZ040N04LS G $R_{DS(on)}$=4.0mΩ	
4-7					IPP041N04N G $R_{DS(on)}$=4.1mΩ		BSC050N04LS G $R_{DS(on)}$=5.0mΩ	BSZ042N04NS G $R_{DS(on)}$=4.2mΩ	
					IPP048N04N G $R_{DS(on)}$=4.8mΩ		BSC054N04NS G $R_{DS(on)}$=5.4mΩ		
					IPP065N04N G $R_{DS(on)}$=6.5mΩ		BSC059N04LS G $R_{DS(on)}$=5.9mΩ		
7-8									
8-10							BSC093N04LS G $R_{DS(on)}$=9.3mΩ	BSZ097N04LS G $R_{DS(on)}$=9.7mΩ	
10-11								BSZ105N04NS G $R_{DS(on)}$=10.5mΩ	
13-17								BSZ165N04NS G $R_{DS(on)}$=16.5mΩ	

OptiMOS™ 60V Logic Level/Normal Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-252 DPAK	CanPAK™ S/M	TO-Leadless	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	SuperSO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
<3	IPD025N06N [2] $R_{DS(on)}$=2.5mΩ	BSB028N06NN3 G $R_{DS(on)}$=2.8mΩ	IPT007N06N [2] $R_{DS(on)}$=0.7mΩ	IPI020N06N [2] $R_{DS(on)}$=2.0mΩ	IPB019N06L3 G $R_{DS(on)}$=1.9mΩ	IPB010N06N [2] $R_{DS(on)}$=1.0mΩ	IPP020N06N [2] $R_{DS(on)}$=2.0mΩ		BSC014N06NS [2] $R_{DS(on)}$=1.4mΩ		
				IPI024N06N3 G $R_{DS(on)}$=2.4mΩ		IPB014N06N [2] $R_{DS(on)}$=1.4mΩ	IPP024N06N3 G $R_{DS(on)}$=2.4mΩ		BSC016N06NS [2] $R_{DS(on)}$=1.6mΩ		IPC218N06L3 $R_{DS(on)}$=1.2mΩ
				IPI029N06N [2] $R_{DS(on)}$=2.9mΩ	IPB026N06N [2] $R_{DS(on)}$=2.6mΩ	IPB016N06L3 G $R_{DS(on)}$=1.6mΩ	IPP029N06N [2] $R_{DS(on)}$=2.9mΩ		BSC028N06NS [2] $R_{DS(on)}$=2.8mΩ		IPC218N06N3 $R_{DS(on)}$=1.3mΩ
					IPB029N06N3 G $R_{DS(on)}$=2.9mΩ	IPB017N06N3 G $R_{DS(on)}$=1.7mΩ			BSC028N06LS3 G $R_{DS(on)}$=2.8mΩ		
3-5	IPD031N06L3 G $R_{DS(on)}$=3.1mΩ			IPI032N06N3 G $R_{DS(on)}$=3.2mΩ	IPB034N06L3 G $R_{DS(on)}$=3.4mΩ		IPP032N06N3 G $R_{DS(on)}$=3.2mΩ	IPA032N06N3 G $R_{DS(on)}$=3.2mΩ	BSC031N06NS3 G $R_{DS(on)}$=3.1mΩ	BSZ042N06NS [2] $R_{DS(on)}$=4.2mΩ	
	IPD034N06N3 G $R_{DS(on)}$=3.4mΩ				IPB037N06N3 G $R_{DS(on)}$=3.7mΩ		IPP037N06L3 G $R_{DS(on)}$=3.7mΩ		BSC034N06NS [2] $R_{DS(on)}$=3.4mΩ		
				IPI040N06N3 G $R_{DS(on)}$=4.0mΩ			IPP040N06N [2] $R_{DS(on)}$=4.0mΩ		BSC039N06NS [2] $R_{DS(on)}$=3.9mΩ		
	IPD038N06N3 G $R_{DS(on)}$=3.8mΩ						IPP040N06N3 G $R_{DS(on)}$=4.0mΩ				
	IPD048N06L3 G $R_{DS(on)}$=4.8mΩ										
5-7	IPD053N06N [2] $R_{DS(on)}$=5.3mΩ						IPP052N06L3 G $R_{DS(on)}$=5.2mΩ	IPA057N06N3 G $R_{DS(on)}$=5.7mΩ	BSC066N06NS [2] $R_{DS(on)}$=6.6mΩ		
					IPB057N06N [2] $R_{DS(on)}$=5.7mΩ		IPP057N06N3 G $R_{DS(on)}$=5.7mΩ		BSC067N06LS3 G $R_{DS(on)}$=6.7mΩ	BSZ067N06LS3 G $R_{DS(on)}$=6.7mΩ	
							IPP060N06N [2] $R_{DS(on)}$=6.0mΩ			BSZ068N06NS [2] $R_{DS(on)}$=6.8mΩ	
7-10	IPD079N06L3 G $R_{DS(on)}$=7.9mΩ			IPI084N06L3 G $R_{DS(on)}$=8.4mΩ	IPB081N06L3 G $R_{DS(on)}$=8.1mΩ		IPP084N06L3 G $R_{DS(on)}$=8.4mΩ	IPA093N06N3 G $R_{DS(on)}$=9.3mΩ	BSC076N06NS3 G $R_{DS(on)}$=7.6mΩ	BSZ076N06NS3 G $R_{DS(on)}$=7.6mΩ	
	IPD088N06N3 G $R_{DS(on)}$=8.8mΩ				IPB090N06N3 G $R_{DS(on)}$=9.0mΩ		IPP093N06N3 G $R_{DS(on)}$=9.3mΩ		BSC097N06NS [2] $R_{DS(on)}$=9.7mΩ	BSZ100N06LS3 G $R_{DS(on)}$=10.0mΩ	
									BSC100N06LS3 G $R_{DS(on)}$=10.0mΩ	BSZ100N06NS [2] $R_{DS(on)}$=10.0mΩ	
11-30		BSF110N06NT3 G [1] $R_{DS(on)}$=11.0mΩ							BSC110N06NS3 G $R_{DS(on)}$=11.0mΩ	BSZ110N06NS3 G $R_{DS(on)}$=11.0mΩ	
30-50	IPD350N06L G $R_{DS(on)}$=35.0mΩ										
	IPD400N06N G $R_{DS(on)}$=40.0mΩ										
	IPD640N06L G $R_{DS(ON}$ = 64.0mΩ										

[1] CanPAK™ S

[2] 6V rated ($R_{DS(on)}$ also specified @ V_{GS}=6V)

OptiMOS™ 75V Normal Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-252 DPAK	CanPAK™ S/M	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	Super SO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
2-4			IPI023NE7N3 G $R_{DS(on)}$=2.3mΩ	IPB020NE7N3 G $R_{DS(on)}$=2.0mΩ		IPP023NE7N3 G $R_{DS(on)}$=2.3mΩ		BSC036NE7NS3 G $R_{DS(on)}$=3.6mΩ		IPC302NE7N3 $R_{DS(on)}$=1.2mΩ
			IPI034NE7N3 G $R_{DS(on)}$=3.4mΩ	IPB031NE7N3 G $R_{DS(on)}$=3.1mΩ		IPP034NE7N3 G $R_{DS(on)}$=3.4mΩ				
4-6			IPI052NE7N3 G $R_{DS(on)}$=5.2mΩ	IPB049NE7N3 G $R_{DS(on)}$=4.9mΩ		IPP052NE7N3 G $R_{DS(on)}$=5.2mΩ		BSC042NE7NS3 G $R_{DS(on)}$=4.2mΩ		
6-12						IPP062NE7N3 G $R_{DS(on)}$=6.2mΩ				
12-45		BSF450NE7NH3 [1] $R_{DS(on)}$=45.0mΩ								

OptiMOS™ 80V Normal Level [2]

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-251 / TO-251 SL	TO-252 DPAK	CanPAK™ S/M	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	Super SO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
1-3					IPB017N08N5 [3] $R_{DS(on)}$=1.7mΩ	IPB019N08N3 G $R_{DS(on)}$=1.9mΩ	IPP020N08N5 [3] $R_{DS(on)}$=2.0mΩ		BSC027N08NS5 [3] $R_{DS(on)}$=2.7mΩ		IPC302N08N3 $R_{DS(on)}$=1.2mΩ
					IPB025N08N3 G $R_{DS(on)}$=2.5mΩ		IPP028N08N3 G $R_{DS(on)}$=2.8mΩ	IPA028N08N3 G $R_{DS(on)}$=2.8mΩ	BSC030N08NS5 [3] $R_{DS(on)}$=3.0mΩ		
3-4				IPI037N08N3 G $R_{DS(on)}$=3.7mΩ	IPB035N08N3 G $R_{DS(on)}$=3.5mΩ	IPB030N08N3 G $R_{DS(on)}$=3.0mΩ	IPP037N08N3 G $R_{DS(on)}$=3.7mΩ	IPA037N08N3 G $R_{DS(on)}$=3.7mΩ	BSC039N08NS5 [3] $R_{DS(on)}$=3.9mΩ		
4-6		IPD053N08N3 G $R_{DS(on)}$=5.3mΩ	BSB044N08NN3 G $R_{DS(on)}$=4.4mΩ		IPB054N08N3 G $R_{DS(on)}$=5.4mΩ		IPP057N08N3 G $R_{DS(on)}$=5.7mΩ	IPA057N08N3 G $R_{DS(on)}$=5.7mΩ	BSC047N08NS3 G $R_{DS(on)}$=4.7mΩ		
									BSC057N08NS3 G $R_{DS(on)}$=5.7mΩ		
6-7					IPB067N08N3 G $R_{DS(on)}$=6.7mΩ		IPP070N08N3 G $R_{DS(on)}$=7.0mΩ				
7-11		IPD096N08N3 G $R_{DS(on)}$=9.6mΩ	BSB104N08NP3 $R_{DS(on)}$=10.4mΩ		IPB097N08N3 G $R_{DS(on)}$=9.7mΩ		IPP100N08N3 G $R_{DS(on)}$=9.7mΩ	IPA100N08N3 G $R_{DS(on)}$=10.0mΩ		BSZ075N08NS5 [3] $R_{DS(on)}$=7.5mΩ	
11-20										BSZ110N08NS5 [3] $R_{DS(on)}$=11.0mΩ	
		IPD135N08N3 G $R_{DS(on)}$=13.5mΩ			IPB136N08N3 G $R_{DS(on)}$=13.6mΩ		IPP139N08N3 G $R_{DS(on)}$=13.9mΩ		BSC123N08NS3 G $R_{DS(on)}$=12.3mΩ	BSZ123N08NS3 G $R_{DS(on)}$=12.3mΩ	
30-40									BSC340N08NS3 G $R_{DS(on)}$=34.0mΩ	BSZ340N08NS3 G $R_{DS(on)}$=34.0mΩ	

[1] CanPAK™ S
[2] 6V rated ($R_{DS(on)}$ also specified @ V_{GS} = 6V)
[3] In development

OptiMOS™ 100V Normal Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-252 DPAK	CanPAK™ S/M	TO-Leadless	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	Super SO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
<3			IPT020N10N3 [2] $R_{DS(on)}$=2.0mΩ		IPB020N10N5 [2] $R_{DS(on)}$=2.0mΩ		IPP023N10N5 [2] $R_{DS(on)}$=3.0mΩ				IPC302N10N3 $R_{DS(on)}$=1.7mΩ
				IPI030N10N3 G $R_{DS(on)}$=3.0mΩ	IPB027N10N3 G $R_{DS(on)}$=2.7mΩ	IPB025N10N3 G $R_{DS(on)}$=2.5mΩ	IPP030N10N3 G $R_{DS(on)}$=3.0mΩ	IPA030N10N3 G $R_{DS(on)}$=3.0mΩ			
3-4									BSC035N10NS5 [2] [3] $R_{DS(on)}$=3.5mΩ		IPC26N10NR $R_{DS(on)}$=3.2mΩ
						IPB039N10N3 G $R_{DS(on)}$=3.9mΩ			BSC041N10NS5 [2] [3] $R_{DS(on)}$=4.1mΩ		IPC173N10N3 $R_{DS(on)}$=3.6mΩ
4-6		BSB056N10NN3 G $R_{DS(on)}$=5.6mΩ		IPI045N10N3 G $R_{DS(on)}$=4.5mΩ	IPB042N10N3 G $R_{DS(on)}$=4.2mΩ		IPP045N10N3 G $R_{DS(on)}$=4.5mΩ	IPA045N10N3 G $R_{DS(on)}$=4.5mΩ	BSC046N10NS3 G $R_{DS(on)}$=4.6mΩ		
6-8	IPD068N10N3 G $R_{DS(on)}$=6.8mΩ			IPI072N10N3 G $R_{DS(on)}$=7.2mΩ					BSC060N10NS3 G $R_{DS(on)}$=6.0mΩ		
							IPP072N10N3 G $R_{DS(on)}$=7.2mΩ		BSC070N10NS3 G $R_{DS(on)}$=7.0mΩ		
8-12	IPD082N10N3 G $R_{DS(on)}$=8.2mΩ			IPI086N10N3 G $R_{DS(on)}$=8.6mΩ	IPB083N10N3 G $R_{DS(on)}$=8.3mΩ			IPA086N10N3 G $R_{DS(on)}$=8.6mΩ			
							IPP086N10N3 G $R_{DS(on)}$=8.6mΩ		BSC109N10NS3 G $R_{DS(on)}$=10.9mΩ	BSZ097N10NS5 [2] [3] $R_{DS(on)}$=9.7mΩ	
									BSC118N10NS G $R_{DS(on)}$=11.8mΩ		
12-18	IPD122N10N3 G $R_{DS(on)}$=12.2mΩ	BSF134N10NJ3 G [1] $R_{DS(on)}$=13.4mΩ		IPI126N10N3 G $R_{DS(on)}$=12.6mΩ	IPB123N10N3 G $R_{DS(on)}$=12.3mΩ		IPP126N10N3 G $R_{DS(on)}$=12.6mΩ	IPA126N10N3 G $R_{DS(on)}$=12.6mΩ		BSZ160N10NS3 G $R_{DS(on)}$=16.0mΩ	
									BSC160N10NS3 G $R_{DS(on)}$=16.0mΩ		
18-20	IPD180N10N3 G $R_{DS(on)}$=18.0mΩ			IPI180N10N3 G $R_{DS(on)}$=18.0mΩ			IPP180N10N3 G $R_{DS(on)}$=18.0mΩ	IPA180N10N3 G $R_{DS(on)}$=18.0mΩ	BSC196N10NS G $R_{DS(on)}$=19.6mΩ		
20-40	IPD25CN10N G [1] $R_{DS(on)}$=25.0mΩ										
	IPD33CN10N G [1] $R_{DS(on)}$=33.0mΩ										
40-80									BSC440N10NS3 G $R_{DS(on)}$=44.0mΩ	BSZ440N10NS3 G $R_{DS(on)}$=44.0mΩ	
	IPD78CN10N G [1] $R_{DS(on)}$=78.0mΩ										
2 x 75									BSC750N10ND G $R_{DS(on)}$=75.0mΩ		

[1] CanPAK™ S
[2] 6V rated ($R_{DS(on)}$ also specified @ V_{GS} = 6V)
[3] In development

OptiMOS™ 100V Logic Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-251 / TO-251 SL	TO-252 DPAK	CanPAK™ M	CanPAK™ S	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	Super SO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
4-6												
6-8												
8-12										BSC082N10LS G $R_{DS(on)}$=8.2mΩ		
										BSC105N10LSF G $R_{DS(on)}$=10.5mΩ		
								IPP12CN10L G $R_{DS(on)}$=12.0mΩ				
12-18										BSC123N10LS G $R_{DS(on)}$=12.3mΩ	BSZ150N10LS3 $R_{DS(on)}$=15.0mΩ	IPC045010N3 $R_{DS(on)}$=15.2mΩ
20-40										BSC205N10LS $R_{DS(on)}$=20.5mΩ		IPC020N10L3 $R_{DS(on)}$=42.0mΩ
										BSC265N10LSF G $R_{DS(on)}$=26.5mΩ		

OptiMOS™ 120V Normal Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-251 / TO-251 SL	TO-252 DPAK	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	Super SO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
<4				IPB038N12N3 G $R_{DS(on)}$=3.8mΩ	IPB036N12N3 G $R_{DS(on)}$=3.6mΩ				IPC302N12N3 $R_{DS(on)}$=2.6mΩ
4-5			IPI041N12N3 G $R_{DS(on)}$=4.1mΩ			IPP041N12N3 G $R_{DS(on)}$=4.1mΩ			IPC26N12N $R_{DS(on)}$=3.0mΩ
						IPP048N12N3 G $R_{DS(on)}$=4.8mΩ			
7-8			IPI076N12N3 G $R_{DS(on)}$=7.6mΩ			IPP076N12N3 G $R_{DS(on)}$=7.6mΩ	BSC077N12NS3 G $R_{DS(on)}$=7.7mΩ		
10-13	IPS110N12N3 G $R_{DS(on)}$=11.0mΩ	IPD110N12N3 G $R_{DS(on)}$=11.0mΩ				IPP114N12N3 G $R_{DS(on)}$=11.4mΩ			
13-20			IPI147N12N3 G $R_{DS(on)}$=14.7mΩ	IPB144N12N3 G $R_{DS(on)}$=14.4mΩ		IPP147N12N3 G $R_{DS(on)}$=14.7mΩ	BSC190N12NS3 G $R_{DS(on)}$=19.0mΩ		
20-25							BSC240N12NS3 G $R_{DS(on)}$=24.0mΩ	BSZ240N12NS3 G $R_{DS(on)}$=24.0mΩ	IPC300N15N3R $R_{DS(on)}$=4.9mΩ

OptiMOS™ 150V Normal Level [4)]

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-252 DPAK	CanPAK™ M	TO-Leadless	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	Super SO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
4-7			IPT059N15N3 $R_{DS(on)}$=5.9mΩ			IPB065N15N3 G $R_{DS(on)}$=6.5mΩ					IPC302N15N3 $R_{DS(on)}$=4.9mΩ
7-12				IPI075N15N3 G $R_{DS(on)}$=7.5mΩ	IPB072N15N3 G $R_{DS(on)}$=7.2mΩ		IPP075N15N3 G $R_{DS(on)}$=7.5mΩ	IPA075N15N3 G $R_{DS(on)}$=6.5mΩ			
				IPI111N15N3 G $R_{DS(on)}$=11.1mΩ	IPB108N15N3 G $R_{DS(on)}$=10.8mΩ		IPP111N15N3 G $R_{DS(on)}$=11.1mΩ	IPA105N15N3 G $R_{DS(on)}$=10.5mΩ			
16-30	IPD200N15N3 G $R_{DS(on)}$=20.0mΩ	BSB165N15NZ3 G $R_{DS(on)}$=16.5mΩ		IPI200N15N3 G $R_{DS(on)}$=20.0mΩ	IPB200N15N3 G $R_{DS(on)}$=20.0mΩ		IPP200N15N3 G $R_{DS(on)}$=20.0mΩ		BSC190N15NS3 G $R_{DS(on)}$=19.0mΩ		
		BSB280N15NZ3 G $R_{DS(on)}$=28.0mΩ									
30-60									BSC360N15NS3 G $R_{DS(on)}$=36.0mΩ		
	IPD530N15N3 G $R_{DS(on)}$=53.0mΩ			IPI530N15N3 G $R_{DS(on)}$=53.0mΩ	IPB530N15N3 G $R_{DS(on)}$=53.0mΩ		IPP530N15N3 G $R_{DS(on)}$=53.0mΩ		BSC520N15NS3 G $R_{DS(on)}$=52.0mΩ	BSZ520N15NS3 G $R_{DS(on)}$=52.0mΩ	
80-90										BSZ900N15NS3 G $R_{DS(on)}$=90.0mΩ	

[4)] 8V rated ($R_{DS(on)}$ also specified @ V_{GS}=8V)

OptiMOS™ 200V Normal Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-252 DPAK	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	Super SO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
10-20									IPC300N20N3 $R_{DS(on)}$=9.2mΩ
		IPI110N20N3 G $R_{DS(on)}$=11.0mΩ	IPB107N20N3 G $R_{DS(on)}$=10.7mΩ		IPP110N20N3 G $R_{DS(on)}$=11.0mΩ				IPC302N20N3 $R_{DS(on)}$=9.2mΩ
			IPB107N20NA [5] $R_{DS(on)}$=10.7mΩ		IPP110N20NA [5] $R_{DS(on)}$=11.0mΩ				
			IPB117N20NFD $R_{DS(on)}$=11.7mΩ		IPP120N20NFD $R_{DS(on)}$=12.0mΩ				
30-40	IPD320N20N3 G $R_{DS(on)}$=32.0mΩ	IPI320N20N3 G $R_{DS(on)}$=32.0mΩ	IPB320N20N3 G $R_{DS(on)}$=32.0mΩ		IPP320N20N3 G $R_{DS(on)}$=32.0mΩ		BSC320N20NS3 G $R_{DS(on)}$=32.0mΩ		
40-50							BSC500N20NS3G $R_{DS(on)}$=50.0mΩ		
80-100							BSC900N20NS3 G $R_{DS(on)}$=90.0mΩ	BSZ900N20NS3 G $R_{DS(on)}$=90.0mΩ	
100-200							BSC12DN20NS3 G $R_{DS(on)}$=125.0mΩ	BSZ12DN20NS3 G $R_{DS(on)}$=125.0mΩ	
200-300							BSC22DN20NS3 G $R_{DS(on)}$=225.0mΩ	BSZ22DN20NS3 G $R_{DS(on)}$=225.0mΩ	
							BSC14DN20NS3 [3]		

OptiMOS™ 250V Normal Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-252 DPAK	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	Super SO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
10-20									IPC302N25N3A [5] $R_{DS(on)}$=16.0mΩ
20-30		IPI200N25N3 G $R_{DS(on)}$=20.0mΩ	IPB200N25N3 G $R_{DS(on)}$=20.0mΩ		IPP200N25N3 G $R_{DS(on)}$=20.0mΩ				IPC045N25N3 $R_{DS(on)}$=25.0mΩ
					IPP220N25NFD $R_{DS(on)}$=22.0mΩ				
60-70	IPD600N25N3 G $R_{DS(on)}$=60.0mΩ	IPI600N25N3 G $R_{DS(on)}$=60.0mΩ	IPB600N25N3 G $R_{DS(on)}$=60.0mΩ		IPP600N25N3 G $R_{DS(on)}$=60.0mΩ		BSC600N25NS3 G $R_{DS(on)}$=60.0mΩ		
100-200							BSC16DN25NS3 G $R_{DS(on)}$=165.0mΩ	BSZ16DN25NS3 G $R_{DS(on)}$=165.0mΩ	
400-500								BSZ42DN25NS3 G $R_{DS(on)}$=425.0mΩ	

[5] Part qualified for Automotive

OptiMOS™ 300V Normal Level

$R_{DS(on)}$ max @V_{GS}=10V [mΩ]	TO-252 DPAK	TO-262 I²PAK	TO-263 D²PAK	TO-263 7 Pin	TO-220	TO-220 FullPAK	Super SO8	S3O8	Bare Die ($R_{DS(on)}$ typ.)
40-50			IPB410N30N [3] $R_{DS(on)}$=40.7mΩ		IPP410N30N [3] $R_{DS(on)}$=41.0mΩ				

[3] In development

Small Signal

Voltage		SOT-223	TSOP6	SOT-89	SC-59	SOT-23	SOT-323	SOT-363
P-Channel MOSFETs	- 250	BSP317P 4Ω, -0.43A, LL						
		BSP92P 12Ω, -0.26A, LL		BSS192P 12Ω, -0.19A, LL	BSR92P 11Ω, -0.14A, LL			
	- 100	BSP321P 900mΩ, -0.98A, NL						
		BSP322P 800mΩ, -1.0A, LL						
		BSP316P 1.8Ω, -0.68A, LL			BSR316P 1.8Ω, -0.36A, LL			
	- 60	BSP612P[1] 120mΩ, 3A, LL						
		BSP613P 130mΩ, 2.9A, NL				BSS83P 2Ω, -0.33A, LL		
		BSP170P 300mΩ, -1.9A, NL				BSS84P 8Ω, -0.17A, LL	BSS84PW 8Ω, -0.15, LL	
		BSP171P 300mΩ, -1.9A, LL						
		BSP315P 800mΩ, -1.17A, LL			BSR315P 800mΩ, -0.62A, LL			
	- 30		BSL303SPE[1] ~30mΩ, ~-6.6A, LL		BSR303PE[3] ~30mΩ, ~-3.3A, LL			
			BSL305SPE[1] ~50mΩ, ~-5.3A, LL		BSR305PE[3] ~50mΩ, ~-2.7A, LL			
			BSL307SP 43mΩ, -5.5A, LL			BSS308PE 80mΩ, -2.1A, LL, ESD		
			BSL308PE 80mΩ, -2.1A, LL, dual, ESD			BSS314PE 140mΩ, -1.5A, LL, ESD		
			BSL314PE 140mΩ, -1.5A, LL, ESD, dual			BSS315P 150mΩ, -1.5A, LL		BSD314SPE 140mΩ, -1.5A, LL, ESD
							BSS356PWE[2] ~560mΩ, ~0.73A, LL	BSD356PE[2] ~560mΩ, ~0.73A, LL
	- 20		BSL207SP 41mΩ, -6A, SLL				BSS209PW 550mΩ, -0.58A, SLL	BSV236SP 175mΩ, -1.5A, SLL
			BSL211SP 67mΩ, -4.7A, SLL				BSS223PW 1.2Ω, -0.39A, SLL	BSD223P 1.2Ω, -0.39A, SLL, dual
						BSS215P 150mΩ, -1.5A, SLL		

[1] Coming Q2 2014
[2] Coming Q3 2014
[3] Coming Q4 2014
All products are qualified to Automotive AEC Q101

Small Signal

Voltage		SOT-223	TSOP6	SOT-89	SC-59	SOT-23	SOT-323	SOT-363
Complementary	-20/20		BSL215C N: 140mΩ, 1.5A, SLL P: 150mΩ, -1.5A, SLL					BSD235C N: 350mΩ, 0.95A, SLL P: 1.2Ω, -0.53A, SLL
	-30/30		BSL316C N: 160mΩ, 1.4A, LL P: 150mΩ, -1.5A, LL					
			BSL308C N: 57mΩ, A, LL P: 80mΩ, A, LL,					BSD356C [2] N: 350mΩ, 0.95A, LL P: ~560mΩ, ~0.73A, LL

[2] Coming Q3 2014
All products are qualified to Automotive AEC Q101

Small Signal

	Voltage	SOT-223	TSOP6	SOT-89	SC-59	SOT-23	SOT-323	SOT-363
N-Channel MOSFETs	20		BSL802SN 22mΩ, 7.5A, ULL		BSR802N 23mΩ, 3.7A, ULL			
			BSL202SN 22mΩ, 7.5A, SLL		BSR202N 21mΩ, 3.8A, SLL	BSS806NE 57mΩ, 2.3A, ULL, ESD		
			BSL806N 57mΩ, 2.3A, ULL, dual			BSS806N 57mΩ, 2.3A, ULL		BSD816SN 160mΩ, 1.4A, ULL
			BSL205N 50mΩ, 2.5A, SLL, dual			BSS205N 50mΩ, 2.5A, SLL		BSD214SN 140mΩ, 1.5A, SLL
			BSL207N 70mΩ, 2.1A, SLL, dual				BSS816NW 160mΩ, 1.4A, ULL	BSD840N 400mΩ, 0.88A, ULL, dual
			BSL214N 140mΩ, 1.5A, SLL, dual			BSS214N 140mΩ, 1.5A, SLL	BSS214NW 140mΩ, 1.5A, SLL	BSD235N 350mΩ, 0.95A, SLL, dual
	30		BSL302SN 25mΩ, 7.1A, LL		BSR302N 23mΩ, 3.7A, LL	BSS306N 57mΩ, 2.3A, LL		
			BSL306N 57mΩ, 2.3A, LL, dual			BSS316N 160mΩ, 1.4A, LL		BSD316SN 160mΩ, 1.4A, LL
	55					BSS670S2L 650mΩ, 0.54A, LL		
	60	BSP318S 90mΩ, 2.6A, LL	BSL606SN 60mΩ, 4.5A, LL	BSS606N 60mΩ, 3.2A, LL	BSR606N 60mΩ, 2.3A, LL	BSS138N 3.5Ω, 0.23A, LL	BSS138W 3.5Ω, 0.28A, LL	
		BSP320S 120mΩ, 2.9A, NL				BSS7728N 5Ω, 0.2A, LL		
		BSP295 300mΩ, 1.8A, LL				SN7002N 5Ω, 0.2A, LL	SN7002W 5Ω, 0.23A, LL	
						2N7002 3Ω, 0.3A, LL		2N7002DW 3Ω, 0.3A, LL, dual
						BSS159N 8Ω, 0.13A, depl.		
	75	BSP716N 160mΩ, 2.3A, LL	BSL716SN[1)] 150mΩ, 2.5A, LL					

[1)] Coming Q2 2014
All products are qualified to Automotive AEC Q101 (except 2N7002)

Small Signal

	Voltage	SOT-223	TSOP6	SOT-89	SC-59	SOT-23	SOT-323	SOT-363
N-Channel MOSFETs	100	BSP373N 240mΩ, 1.8A, NL	BSL373SN [1] 230mΩ, 2.0A, NL			BSS169 12Ω, 0.09A, depl.		
		BSP372N 230mΩ, 1.8A, LL	BSL372SN [1] 220mΩ, 2.0A, LL			BSS119N 6Ω, 0.19A, LL $V_{GS(th)}$ 1.8V to 2.3V		
		BSP296N 600mΩ, 1.2A, LL	BSL296SN [1] 460mΩ, 1.4A, LL					
						BSS123N 6Ω, 0.19A, LL $V_{GS(th)}$ 0.8V to 1.8V		
	200	BSP297 1.8Ω, 0.66A, LL						
		BSP149 3.5Ω,0.14 A, depl.						
	240	BSP88 6Ω, 0.35A, 2.8V rated		BSS87 6Ω, 0.26A, LL		BSS131 14Ω, 0.1A, LL		
		BSP89 6Ω, 0.35A, LL						
		BSP129 6Ω, 0.05A, depl.						
	250					BSS139 30Ω, 0.03A, depl.		
	400	BSP298 3Ω, 0.5A, NL						
		BSP324 25Ω, 0.17A, LL						
	500	BSP299 4Ω, 0.4A, NL						
	600	BSP125 45Ω, 0.12A, LL		BSS225 45Ω, 0.09A, LL		BSS127 500Ω, 0.023A, LL		
		BSP135 60Ω, 0.02A, depl.				BSS126 700Ω, 0.007A, depl.		
	800	BSP300 20Ω, 0.19A, NL						

[1] Coming Q2 2014
All products are qualified to Automotive AEC Q101

Power P-Channel MOSFETs

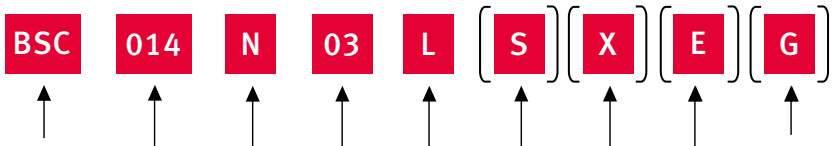
		$R_{DS(on)}$ @ V_{GS}=10V	TO-220	TO-252 (DPAK)	TO-263 (D^2PAK)	SO8	SuperSO8	S3O8
P-Channel MOSFETs	- 20V	7				BSO201SP H		
		21				BSO203SP H BSO203P H (dual)		
		30						
		45				BSO207P H (dual)		
		67				BSO211P H (dual)		
	- 30V	3					BSC030P03NS3 G	
		4,2		IPD042P03L3 G				
		5-7		SPD50P03L G [1] * IPD068P03L3 G			BSC060P03NS3E G	
		~8				BSO080P03NS3 G BSO080P03NS3E G BSO080P03S H BSO301SP H	BSC080P03LS G BSC084P03NS3 G BSC084P03NS3E G	BSZ086P03NS3 G BSZ086P03NS3E G
		12						BSZ120P03NS3 G BSZ120P03NS3E G
		13				BSO130P03S H	BSC130P03LS G	
		18						BSZ180P03NS3 G BSZ180P03NS3E G
		20				BSO200P03S H BSO303SP H		
		21				BSO303P H (dual)		
		1,2 Ω						
	- 60V	23	SPP80P06P H *		SPB80P06P G *			
		75		SPD30P06P G *				
		130	SPP18P06P H *	SPD18P06P G *	SPB18P06P G *	BSO613SPV G *		
		250		SPD09P06PL G *				
		300	SPP08P06P H *	SPD08P06P G *	SPB08P06P G *			
	- 100V	210	SPP15P10PL H *	SPD15P10PL G *				
		240	SPP15P10P H *	SPD15P10P G *				
		850		SPD04P10PL G *				
		1 Ω		SPD04P10P G *				
Comp.	-60/ 60V	11-30				BSO612CV G *		
						BSO615C G *		

[1] 5-leg

* Products are qualified to Automotive AEC Q101

Naming System

OptiMOS™



Package Type
BSB = CanPAK™ (M Can)
BSC = SuperSO8
BSF = CanPAK™ (S Can)
BSO = SO-8
BSZ = S3O8
SPA/IPA = FullPAK
SPB/IPB = D²PAK
SPC/IPC = Chip Product
SPD/IPD = DPAK
SPI/IPI = I²PAK
SPP/IPP = TO-220
SPS/ IPS = IPAK Short Leads
SPT/IPT = TO-Leadless

$R_{DS(on)}$ [mΩ]
Divide by 10 to get $R_{DS(on)}$ value e.g. 014 = 1.4mΩ

However, if the sixth character is a C, the fourth and the fifth character indicate the $R_{DS(on)}$ e.g. 12C=12mΩ
For chip products chip area in mm² multiplied by 10

N = N-Channel
P = P-Channel
C = Complementary

Breakdown Voltage [V]
multiply by 10 to get voltage class e.g. 03 = 30V
E = Extended, +5V, e.g. E2 = 25V

Level

		to be used from V_{GS}
N = Normal Level	(NL)	10.0
M = Logic Level 5V opt.	(LL)	4.5
L = Logic Level	(ELL)	4.5
K = Super Logic Level	(SLL)	2.5
J = Ultra Logic Level	(ULL)	1.8

Package Options
SO-8/SuperSO8/S3O8
S = Single Chip
D = Dual Chip

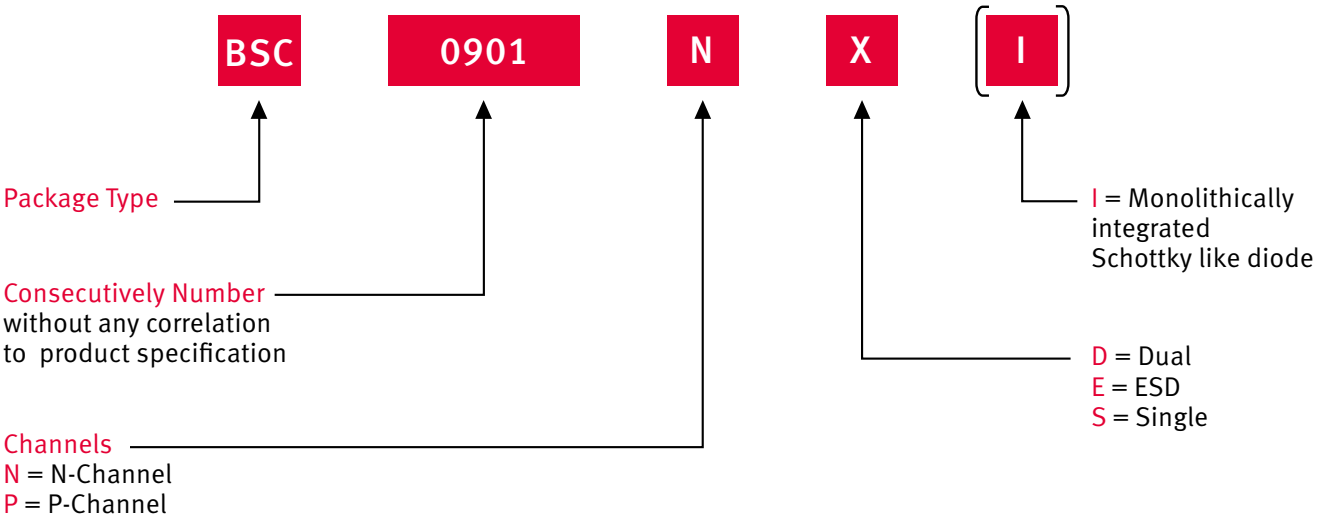
CanPAK™
X = MX footprint
N = MN footprint
Z = MZ footprint
Q = SQ footprint
T = ST footprint
H = SH footprint
J = SJ footprint

3 = Technology Generation
I = Monolithically integrated Schottky like diode
FD = Fast Diode

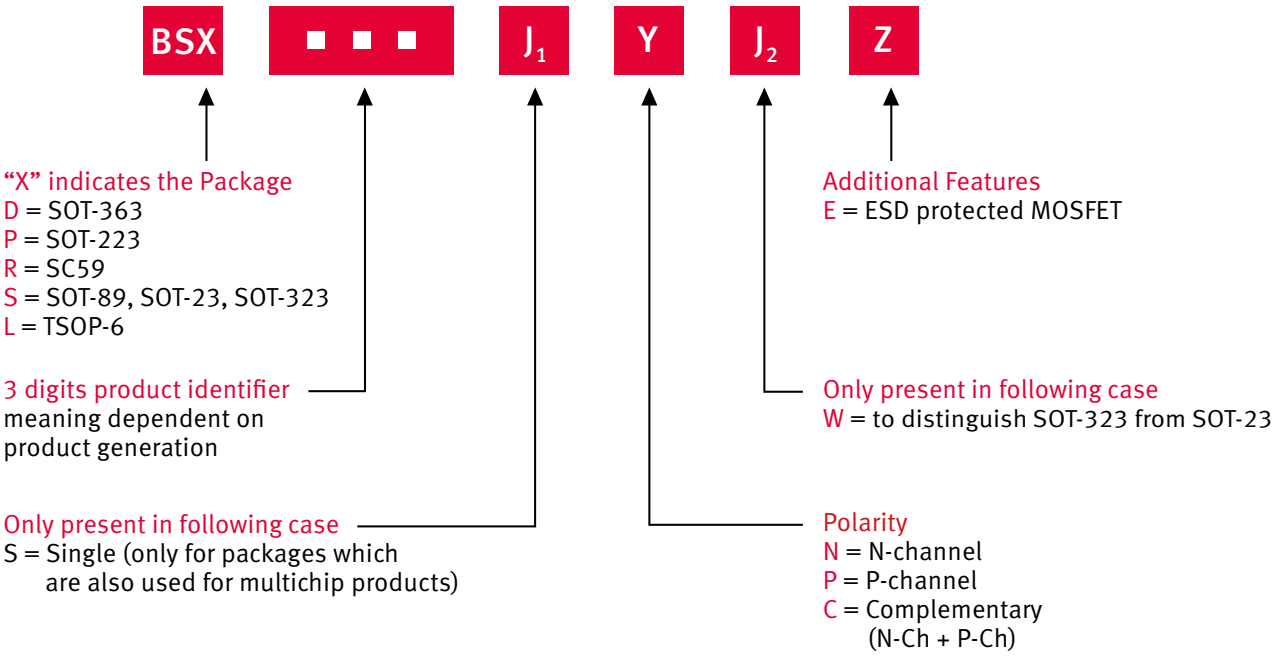
Features
F = fast switching
R = integrated gate resistor
E = ESD protection

RoHS compliant

New OptiMOS™ 30V



Small Signal



Expert Support for OptiMOS™

Easy Access and High Quality

Application Notes, Datasheets & More

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Where to Buy

CoolMOS™

From Price Performance to Best-in-Class

The revolutionary CoolMOS™ power family sets new standards in the field of Energy Efficiency. As technology leader in high voltage MOSFETs, CoolMOS™ offers a significant reduction of conduction and switching losses and enables high power density and efficiency for superior power conversion systems. Especially the latest, state-of-the-art generation of high voltage power MOSFETs makes it possible that AC/DC power supplies are more efficient, more compact, lighter and cooler than ever before. This success was achieved by offering the lowest on-state resistance per package outline, the fastest switching speed and the lowest gate driver requirements of high voltage MOSFETs commercially Available.

Features

- Offers a significant reduction of conduction and switching losses
- Enables high power density and efficiency for superior power conversion systems
- Best-in-Class price/performance ratio

Benefits

- Improved efficiency
- More efficient, more compact, lighter and cooler
- Outstanding reliability with proven CoolMOS™ quality combined with high body diode ruggedness

CoolMOS™ Technology

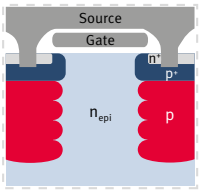
On-state: Reduction of resistance of epitaxial layer by high doped n-columns

- Higher doping level in n-type drift region results in lower $R_{DS(on)}$

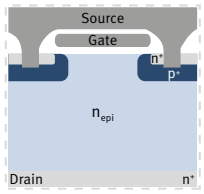
Blocking state: Compensation of additional charge by adjacent p-columns

- Half of active chip area is covered by p-columns
- During blocking state the p-column compensates the charge of the adjacent n-column resulting in high breakdown voltage at an area specific on-resistance below the silicon limit

CoolMOS™



Standard MOSFET



Main Applications

- Adapter
- PC Silverbox
- Server
- Telecom
- Solar
- UPS
- HID Lighting
- Automotive

CoolMOS™ – a History

Since the development of the innovative CoolMOS™ technology we support applications to meet the standby power and Energy Efficiency regulations. CoolMOS™ is used for example in lighting applications where Energy Efficiency is more than ever a pre-condition as well as in solar inverters of market leaders.

S5 series:
- First series of CoolMOS™, market entry in 1998
- Slow switching, close to converter MOSFET, V_{th} 4.5 V, g_{fs} low, R_g high
- Design-in in high power SMPS only

C3 series:
- Third series of CoolMOS™, market entry in 2001
- The "working horse" of the portfolio, fast switching, symmetrical rise/fall time @10 V V_{gs}, V_{th} 3 V, g_{fs} high, R_g very low
- Design-in into all CoolMOS™ segments

CFD series:
- Fourth series of CoolMOS™, market entry in 2004
- Fast Body Diode, Q_{rr} 1/10th of C3 series, V_{th} 4 V, g_{fs} high, R_g low
- Specific for phase-shift ZVS and DC/AC power applications

CE series:
- Cost optimized platform for price sensitive applications such as PC Silverbox, Consumer and Lighting
- Applicable in PFC, in LLC topologies in resonant switching and in TTF topologies in Hard Switching in PWM stage

CP series:
- Fifth series of CoolMOS™, market entry in 2005
- Ultra low $R_{DS(on)}$, ultra low gate charge, very fast switching
- V_{th} 3 V, g_{fs} very high, internal R_g very low

C6 / E6 series:
- Sixth series of CoolMOS™, market entry 2009
- Is the successor of C3

CFD2 series:
- Seventh series of CoolMOS™, market entry 2011
- First 650V superjunction device, with Fast Body Diode
- Is the successor of CFD, suitable for resonant topologies

CFDA series:
- First automotive qualified CoolMOS™ technology with integrated Fast Body Diode
- Optimized for resonant topologies in the automotive field used e.g. for battery charging and DC/DC converters

P6 series:
- New price/performance family suitable for both PFC and PWM topologies

C7 series:
- New Best-in-Class efficiency in hard switching applications such as Power Factor Correction

600V CoolMOS™ P6 Power MOSFET

Optimized Power MOSFETs merging high Energy Efficiency with Easiness to use

CoolMOS™ P6 is Infineon's seventh generation of high voltage power MOSFETs designed according to the revolutionary superjunction (SJ) principle. The new CoolMOS™ P6 series combines our experience as the leading SJ MOSFET supplier with innovation focusing on high efficiency solutions. The resulting P6 technology is tailored to provide high performance in hard & soft switching topologies (e.g. PFC, LLC) while not sacrificing the ease of use.

P6 achieves extremely low conduction and switching losses especially in light load condition enabling switching applications to work more efficient and be designed more compact, lighter and cooler.

Moreover, with its granular portfolio, P6 can address the specific needs of applications such as server, PC power, telecom rectifiers and consumer applications, while additionally offering the best price/performance ratio on the market today.

Features

- Reduced gate charge (Q_g)
- Optimized V_{th} for soft switching
- Good body diode ruggedness
- Optimized integrated R_g
- Improved dv/dt

Benefits

- Improved efficiency especially in light load condition
- Better efficiency in soft switching applications due to earlier turn-off
- Suitable for hard- & soft-switching topologies
- Optimized balance of efficiency and ease of use and good controllability of switching behavior
- High robustness, better efficiency
- Outstanding quality & reliability

Applications

- PFC stages for Server, Telecom Rectifier, PC Silverbox, Gaming Consoles
- PWM stages (TTF, LLC) for Server,Telecom Rectifier, PC Silverbox, Gaming Consoles

New 650V CoolMOS™ C7 Series

Introduction of new market leading Best-in-Class on-resistance per package

With the new 650V CoolMOS™ C7 series Infineon brings a new level of performance in hard switching applications such as Power Factor Correction (PFC). It is the successor to the CP series and provides efficiency benefits across the whole load range through balancing a number of key parameters.

The Best in Class $R_{DS(on)}$ leads to increased full load efficiency and improves on our already BiC CoolMOS™ C6 parts in TO-220 and establishes clear leadership in TO-247. E_{oss} reduction brings efficiency benefits at light load and the low Q_g correlates to faster switching and lower E_{on} and E_{off} which gives efficiency benefits across the whole load range.

As well as balancing the various parameters to give the Best-in-Class performance, measures were taken to even improve implementation/ease of use behavior compared to the CoolMOS™ CP series.

650V was defined to give extra safety margin for designers and make it suitable for both SMPS and Solar inverters. Finally the new CoolMOS™ C7 series benefits from the 12 years manufacturing experience and continues to offer Infineon's outstanding quality.

Features

- 650V voltage
- Revolutionary BiC $R_{DS(on)}$ /package
- Reduced energy stored in output capacitance (E_{oss})
- Lower gate charge (Q_g)
- Space saving through use of smaller packages or reduction of parts

Benefits

- Improved safety margin and suitable for both SMPS and Solar Inverter applications
- Lowest conduction losses/package
- Low switching losses
- Better light load efficiency
- Increasing power density
- Outstanding CoolMOS™ quality

Applications

- Hard switching PFC for Telecom
- Server and UPS Boost for Solar

CoolMOS™ C3 800V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	TO-220 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	TO-247 Halogen-Free	TO-252 STD	TO-252 STD Halogen-Free	TO-262 Halogen-Free	TO-263 Halogen-Free
2.0	2700	9.0	SPP02N80C3	SPA02N80C3			SPD02N80C3	SPD02N80C3		
4.0	1300	20.0	SPP04N80C3	SPA04N80C3			SPD04N80C3	SPD04N80C3		
6.0	900	27.0	SPP06N80C3	SPA06N80C3			SPD06N80C3	SPD06N80C3		
8.0	650	40.0	SPP08N80C3	SPA08N80C3					SPI08N80C3	
11.0	450	50.0	SPP011N80C3	SPA11N80C3		SPW11N80C3				
17.0	290	91.0	SPP17N80C3	SPA17N80C3		SPW17N80C3				SPB17N80C3
54.9	85	288.0				SPW55N80C3				

CoolMOS™ C3A 800V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	TO-220 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	TO-247 Halogen-Free	TO-252 STD	TO-252 STD Halogen-Free	TO-262 Halogen-Free	TO-263 Halogen-Free
t.b.d.	2700	t.b.d.					IPD80R2K7C3A			
t.b.d.	290	t.b.d.			IPW80R290C3A					IPB80R290C3A

CoolMOS™ C3 900V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	TO-220 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	TO-247 Halogen-Free	TO-252 STD	TO-252 STD Halogen-Free	TO-262 Halogen-Free	TO-263 Halogen-Free
3.1	1200	29.0	IPP90R1K2C3	IPA90R1K2C3	IPW90R1K2C3			IPD90R1K2C3	IPI90R1K2C3	
5.7	1000	34.0	IPP90R1K0C3	IPA90R1K0C3	IPW90R1K0C3				IPI90R1K0C3 [3]	
6.9	800	42.0	IPP90R800C3	IPA90R800C3 [3]	IPW90R800C3 [3]				IPI90R800C3 [3]	
11.0	500	68.0	IPP90R500C3	IPA90R500C3	IPW90R500C3				IPI90R500C3	
15.0	340	94.0	IPP90R340C3	IPA90R340C3	IPW90R340C3				IPI90R340C3	IPB90R340C3
t.b.d.	120	t.b.d.			IPW90R120C3					

[3] Will be discontinued

CoolMOS™ C6 600V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 5x6	TO-220	TO-220 FullPAK	TO-247		TO-251 IPAK	TO-251 IPAK SL	TO-252 STD		TO-262	TO-263
			Halogen-Free	Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free	Halogen-Free
t.b.d.	3300	t.b.d.								IPD60R3K3C6			
t.b.d.	2100	t.b.d.	IPL60R2K1C6S [1]					IPU60R2K0C6		IPD60R2K0C6			
t.b.d.	1400/1500	t.b.d.	IPL60R1K5C6S [1]	IPP60R1K4C6				IPU60R1K4C6		IPD60R1K4C6			
4.4	950	13.0		IPP60R950C6	IPA60R950C6			IPU60R950C6		IPD60R950C6	IPD60R950C6 [3]		IPB60R950C6
7.3	600	20.5		IPP60R600C6	IPA60R600C6			IPU60R600C6		IPD60R600C6	IPD60R600C6 [3]		IPB60R600C6 [3]
8.1	520	23.4		IPP60R520C6	IPA60R520C6					IPD60R520C6	IPD60R520C6 [3]		
10.6	380	32.0		IPP60R380C6	IPA60R380C6					IPD60R380C6	IPD60R380C6 [3]	IPI60R380C6	IPB60R380C6
13.8	280	43.0		IPP60R280C6	IPA60R280C6	IPW60R280C6						IPI60R280C6	IPB60R280C6
20.2	190	58.0		IPP60R190C6	IPA60R190C6	IPW60R190C6						IPI60R190C6	IPB60R190C6
23.8	160	75.0		IPP60R160C6	IPA60R160C6	IPW60R160C6							IPB60R160C6
30.0	125	96.0		IPP60R125C6	IPA60R125C6	IPW60R125C6							IPB60R125C6
38.0	99	119.0		IPP60R099C6	IPA60R099C6	IPW60R099C6							IPB60R099C6
t.b.d.	74	t.b.d.		IPP60R074C6									
t.b.d.	70	t.b.d.				IPW60R070C6							
t.b.d.	41	t.b.d.				IPW60R041C6							

CoolMOS™ C6 650V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 5x6	TO-220	TO-220 FullPAK	TO-247		TO-251 IPAK	TO-251 IPAK SL	TO-252 STD		TO-262	TO-263
			Halogen-Free	Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free	Halogen-Free
t.b.d.	1400/1500	t.b.d.	IPL65R1K5C6S [1]						IPS65R1K4C6		IPD65R1K4C6		
t.b.d.	950/1000	t.b.d.	IPL65R1K0C6S [1]						IPS65R950C6		IPD65R950C6		
t.b.d.	600/650	t.b.d.	IPL65R650C6S [1]	IPP65R600C6	IPA65R600C6					IPD65R600C6		IPI65R600C6	IPB65R600C6
10.6	380	39.0		IPP65R380C6	IPA65R380C6					IPD65R380C6	IPD65R380C6 [1]	IPI65R380C6	IPB65R380C6
13.8	280	45.0		IPP65R280C6	IPA65R280C6	IPW65R280C6						IPI65R280C6	IPB65R280C6
t.b.d.	250	t.b.d.									IPD65R250C6		
20.2	190	73.0		IPP65R190C6	IPA65R190C6	IPW65R190C6						IPI65R190C6	IPB65R190C6
38.0	99	127.0		IPP65R099C6	IPA65R099C6	IPW65R099C6						IPI65R099C6	IPB65R099C6
t.b.d.	74	t.b.d.		IPP65R074C6									
t.b.d.	70	t.b.d.				IPW65R070C6							
t.b.d.	37	t.b.d.				IPW65R037C6							

[1] Coming soon
[3] Will be discontinued

CoolMOS™ C7 650V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 8x8	TO-220	TO-220 FullPAK	TO-247		TO-247-4	TO-252 STD		TO-263
			Halogen-Free	Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free
t.b.d.	230	t.b.d.	IPL65R230C7								
11.0	225	20.0		IPP65R225C7	IPA65R225C7					IPD65R225C7	IPB65R225C7
t.b.d.	195	t.b.d.	IPL65R195C7 [1]								
13.0	190	23.0		IPP65R190C7	IPA65R190C7		IPW65R190C7			IPD65R190C7	IPB65R190C7
t.b.d.	130	t.b.d.	IPL65R130C7								
18.0	125	35.0		IPP65R125C7	IPA65R125C7		IPW65R125C7				IPB65R125C7
t.b.d.	99	t.b.d.	IPL65R099C7 [1]								
24.0	95	45.0		IPP65R095C7	IPA65R095C7		IPW65R095C7	IPZ65R095C7			IPB65R095C7
t.b.d.	70	t.b.d.	IPL65R070C7 [1]								
33.0	65	64.0		IPP65R065C7	IPA65R065C7		IPW65R065C7	IPZ65R065C7			IPB65R065C7
46.0	45	93.0		IPP65R045C7	IPA65R045C7	IPW65R045C7		IPZ65R045C7			IPB65R045C7
t.b.d.	42	t.b.d.				IPW65R042C7					
t.b.d.	32	t.b.d.		IPP65R032C7							IPB65R032C7
t.b.d.	19	t.b.d.				IPW65R019C7		IPZ65R019C7			

CoolMOS™ CE 500V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	TO-220	TO-220 FullPAK	TO-247		TO-251 IPAK	TO-252 STD		TO-262
			Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free
t.b.d.	3000	t.b.d.					IPU50R3K0CE	IPD50R3K0CE		
t.b.d.	2000	t.b.d.					IPU50R2K0CE	IPD50R2K0CE		
t.b.d.	1400	t.b.d.					IPU50R1K4CE	IPD50R1K4CE		
4.3	950	10.5		IPA50R950CE			IPU50R950CE	IPD50R950CE		
5.0	800	12.4		IPA50R800CE				IPD50R800CE		
6.1	650	15.0		IPA50R650CE				IPD50R650CE	IPD50R650CE [1]	
7.6	500	18.7	IPP50R500CE	IPA50R500CE				IPD50R500CE	IPD50R500CE [1]	
9.9	380	32.0	IPP50R380CE	IPA50R380CE				IPD50R380CE	IPD50R380CE [1]	IPI50R380CE
13.0	280	32.6	IPP50R280CE	IPA50R280CE	IPW50R280CE			IPD50R280CE	IPD50R280CE [1]	IPI50R280CE
18.5	190	47.2	IPP50R190CE	IPA50R190CE	IPW50R190CE					IPI50R190CE

CoolMOS™ CE 800V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	TO-220	TO-220 FullPAK	TO-220 FP TSHT	TO-247		TO-251 IPAK	TO-252 STD		TO-262
			Halogen-Free	Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free
t.b.d.	2800	t.b.d.						IPU80R2K8CE		IPD80R2K8CE	
t.b.d.	1400	t.b.d.						IPU80R1K4CE		IPD80R1K4CE	
t.b.d.	1000	t.b.d.						IPU80R1K0CE		IPD80R1K0CE	

[1] Coming soon
[2] Available Q3/Q4 2014

CoolMOS™ CFD 600V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	TO-220	TO-220 FullPAK	TO-247		TO-262
			Halogen-Free	Halogen-Free		Halogen-Free	Halogen-Free
6.6	700	35.0	SPP07N60CFD [3]	SPA07N60CFD	SPW07N60CFD		
11.0	440	48.0	SPP11N60CFD	SPA11N60CFD	SPW11N60CFD		SPI11N60CFD [3]
13.4	330	63.0	SPP15N60CFD	SPA15N60CFD	SPW15N60CFD		SPI15N60CFD [3]
20.7	220	95.0	SPP20N60CFD	SPA20N60CFD	SPW20N60CFD		SPI20N60CFD [3]
21.7	185	110.0	SPP24N60CFD [3]		SPW24N60CFD		
34.1	115	163.0			SPW35N60CFD		
46	80	248.0			SPW47N60CFD		

CoolMOS™ CFD2 650V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 8x8	TO-220	TO-220 FullPAK	TO-247		TO-252 STD		TO-262	TO-263
			Halogen-Free	Halogen-Free	Halogen-Free		Halogen-Free		Halogen-Free	Halogen-Free	Halogen-Free
t.b.d.	1400	t.b.d.						IPD65R1K4CFD	IPD65R1K4CFD [1]		
t.b.d.	950	t.b.d.						IPD65R950CFD	IPD65R950CFD [1]		
t.b.d.	725	t.b.d.	IPL65R725CFD								
6.0	660	22.0		IPP65R660CFD	IPA65R660CFD	IPW65R660CFD		IPD65R660CFD	IPD65R660CFD [1]	IPI65R660CFD	IPB65R660CFD
t.b.d.	460	t.b.d.	IPL65R460CFD								
8.7	420	32.0		IPP65R420CFD	IPA65R420CFD	IPW65R420CFD		IPD65R420CFD	IPD65R420CFD [1]	IPI65R420CFD	IPB65R420CFD
t.b.d.	340	t.b.d.	IPL65R340CFD								
11.4	310	41.0		IPP65R310CFD	IPA65R310CFD	IPW65R310CFD				IPI65R310CFD	IPB65R310CFD
t.b.d.	210	t.b.d.	IPL65R210CFD								
17.5	190	68.0		IPP65R190CFD	IPA65R190CFD	IPW65R190CFD				IPI65R190CFD	IPB65R190CFD
t.b.d.	165	t.b.d.	IPL65R165CFD								
22.4	150	86.0		IPP65R150CFD	IPA65R150CFD	IPW65R150CFD				IPI65R150CFD	IPB65R150CFD
31.2	110	118.0		IPP65R110CFD	IPA65R110CFD	IPW65R110CFD				IPI65R110CFD	IPB65R110CFD
t.b.d.	80	t.b.d.				IPW65R080CFD					
t.b.d.	41	t.b.d.				IPW65R041CFD					

CoolMOS™ CFDA 650V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	TO-220	TO-247		TO-252 STD		TO-262	TO-263
			Halogen-Free	Halogen-Free	Halogen-Free	Halogen-Free	Halogen-Free	Halogen-Free	Halogen-Free
t.b.d.	660	t.b.d.	IPP65R660CFDA				IPD65R660CFDA		IPB65R660CFDA
t.b.d.	420	t.b.d.					IPD65R420CFDA		
t.b.d.	310	t.b.d.	IPP65R310CFDA	IPW65R310CFDA					IPB65R310CFDA
t.b.d.	190	t.b.d.	IPP65R190CFDA	IPW65R190CFDA					IPB65R190CFDA
t.b.d.	150	t.b.d.	IPP65R150CFDA	IPW65R150CFDA					IPB65R150CFDA
t.b.d.	110	t.b.d.	IPP65R110CFDA	IPW65R110CFDA					IPB65R110CFDA
t.b.d.	80	t.b.d.		IPW65R080CFDA					
t.b.d.	48	t.b.d.		IPW65R048CFDA					

[1] Coming soon
[3] Will be discontinued

CoolMOS™ CP 500V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 8x8 Halogen-Free	TO-220 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	TO-247 Halogen-Free	TO-251 IPAK SL Halogen-Free	TO-252 STD	TO-252 STD Halogen-Free	TO-262 Halogen-Free	TO-263 Halogen-Free
7.0	520	13.0		IPP50R520CP	IPA50R520CP			IPS50R520CP	IPD50R520CP	IPD50R520CP[1)]		
9.0	399	17.0		IPP50R399CP	IPA50R399CP	IPW50R399CP			IPD50R399CP	IPD50R399CP[1)]	IPI50R399CP	
10.0	350	19.0		IPP50R350CP	IPA50R350CP	IPW50R350CP					IPI50R350CP	
12.0	299	23.0		IPP50R299CP	IPA50R299CP	IPW50R299CP					IPI50R299CP	IPB50R299CP
13.0	250	27.0		IPP50R250CP	IPA50R250CP	IPW50R250CP					IPI50R250CP	IPB50R250CP
17.0	199	34.0		IPP50R199CP	IPA50R199CP	IPW50R199CP					IPI50R199CP	IPB50R199CP
23.0	140	48.0		IPP50R140CP	IPA50R140CP	IPW50R140CP					IPI50R140CP	IPB50R140CP

CoolMOS™ CP 600V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 8x8 Halogen-Free	TO-220 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	TO-247 Halogen-Free	TO-251 IPAK SL Halogen-Free	TO-252 STD	TO-252 STD Halogen-Free	TO-262 Halogen-Free	TO-263 Halogen-Free
6.1	600	21.0		IPP60R600CP	IPA60R600CP				IPD60R600CP	IPD60R600CP[1)]	IPI60R600CP	IPB60R600CP
6.8	520	24.0		IPP60R520CP	IPA60R520CP				IPD60R520CP	IPD60R520CP[1)]	IPI60R520CP	IPB60R520CP
9.0	385	17.0	IPL60R385CP	IPP60R385CP	IPA60R385CP				IPD60R385CP	IPD60R385CP[1)]	IPI60R385CP	IPB60R385CP
11.0	299	22.0	IPL60R299CP	IPP60R299CP	IPA60R299CP	IPW60R299CP					IPI60R299CP	IPB60R299CP
12.0	250	26.0		IPP60R250CP	IPA60R250CP	IPW60R250CP					IPI60R250CP	IPB60R250CP
16.0	199	32.0	IPL60R199CP	IPP60R199CP	IPA60R199CP	IPW60R199CP					IPI60R199CP	IPB60R199CP
21.0	165	39.0		IPP60R165CP	IPA60R165CP	IPW60R165CP					IPI60R165CP	IPB60R165CP
25.0	125	53.0		IPP60R125CP	IPA60R125CP	IPW60R125CP					IPI60R125CP	IPB60R125CP
31.0	99	60.0		IPP60R099CP	IPA60R099CP	IPW60R099CP					IPI60R099CP	IPB60R099CP
t.b.d.	75	t.b.d.				IPW60R075CP						
t.b.d.	45	t.b.d.				IPW60R045CP						

CoolMOS™ CPA 600V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 8x8 Halogen-Free	TO-220 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	TO-247 Halogen-Free	TO-251 IPAK SL Halogen-Free	TO-252 STD	TO-252 STD Halogen-Free	TO-262 Halogen-Free	TO-263 Halogen-Free
t.b.d.	299	t.b.d.										IPB60R299CPA
t.b.d.	199	t.b.d.										IPB60R199CPA
t.b.d.	99	t.b.d.		IPP60R099CPA		IPW60R099CPA						IPB60R099CPA
t.b.d.	75	t.b.d.				IPW60R075CPA						
t.b.d.	45	t.b.d.				IPW60R045CPA						

[1)] Coming soon

CoolMOS™ E6 600V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 8x8 Halogen-Free	TO-220 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	TO-247 Halogen-Free	TO-252 STD	TO-252 STD Halogen-Free	TO-262	TO-263
5.7	750	17.2		IPP60R750E6	IPA60R750E6			IPD60R750E6	IPD60R750E6 [1]		
7.3	600	20.5		IPP60R600E6	IPA60R600E6			IPD60R600E6	IPD60R600E6 [1]		
8.1	520	23.4		IPP60R520E6	IPA60R520E6						
9.2	450	28.0		IPP60R450E6	IPA60R450E6			IPD60R450E6	IPD60R450E6 [1]		
10.6	380	32.0		IPP60R380E6	IPA60R380E6			IPD60R380E6	IPD60R380E6 [1]		
13.8	280	43.0		IPP60R280E6	IPA60R280E6	IPW60R280E6					
20.2	190	63.0		IPP60R190E6	IPA60R190E6	IPW60R190E6					

CoolMOS™ E6 650V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 8x8 Halogen-Free	TO-220 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	TO-247 Halogen-Free	TO-252 STD	TO-252 STD Halogen-Free	TO-262	TO-263
t.b.d.	660	t.b.d.	IPL65R660E6								
7.3	600	23.0		IPP65R600E6	IPA65R600E6			IPD65R600E6	IPD65R600E6		
t.b.d.	420	t.b.d.	IPL65R420E6								
10.6	380	39.0		IPP65R380E6	IPA65R380E6			IPD65R380E6	IPD65R380E6 [1]	IPI65R380E6	IPB65R380E6
t.b.d.	310	t.b.d.	IPL65R310E6								
13.8	280	45.0		IPP65R280E6	IPA65R280E6	IPW65R280E6				IPI65R280E6	IPB65R280E6
t.b.d.	250	t.b.d.							IPD65R250E6		
t.b.d.	210	t.b.d.	IPL65R210E6 [1]								
20.2	190	73.0		IPP65R190E6	IPA65R190E6	IPW65R190E6					

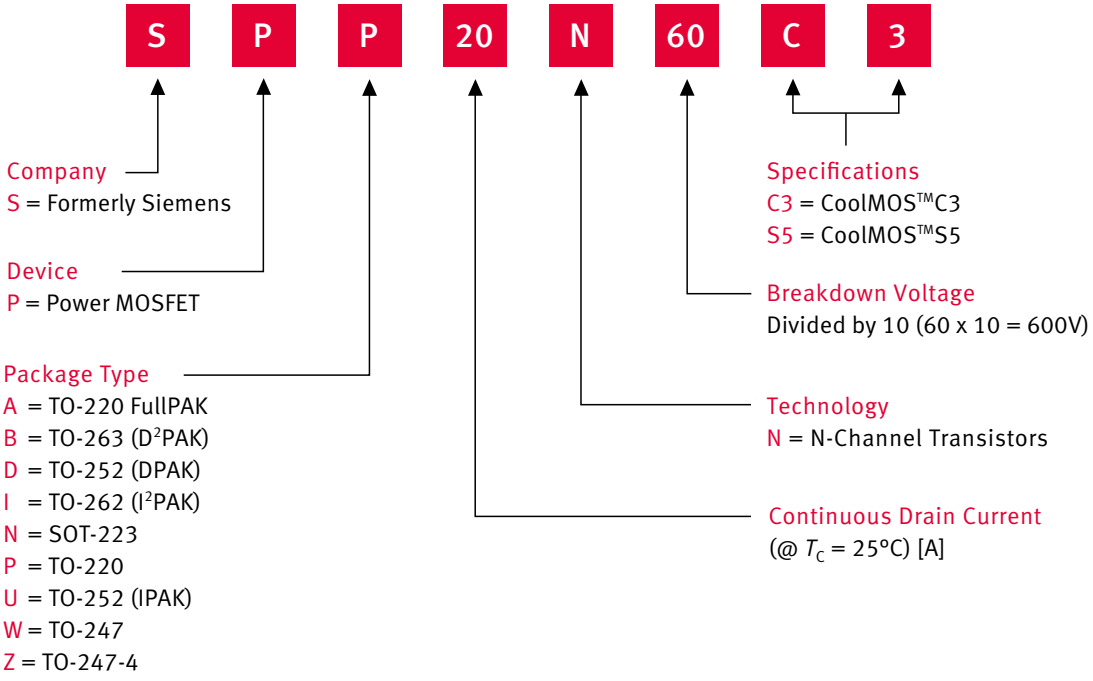
CoolMOS™ P6 600V

I_D [A]	$R_{DS(on)}$ [mΩ]	Q_g [nC]	ThinPAK 5x6 Halogen-Free	ThinPAK 8x8 Halogen-Free	TO-220 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	TO-247 Halogen-Free	TO-252 STD	TO-252 STD Halogen-Free
t.b.d.	600/650	t.b.d.	IPL60R650P6S [1]		IPP60R600P6	IPA60R600P6				IPD60R600P6
t.b.d.	360/380	t.b.d.	IPL60R360P6S [1]		IPP60R380P6	IPA60R380P6				IPD60R380P6
7.0	330	22.0			IPP60R330P6	IPA60R330P6	IPW60R330P6			
7.7	280	25.5			IPP60R280P6	IPA60R280P6	IPW60R280P6			
t.b.d.	255	t.b.d.		IPL60R255P6 [1]						
8.6	230	31.0			IPP60R230P6	IPA60R230P6	IPW60R230P6			
t.b.d.	210	t.b.d.		IPL60R210P6 [1]						
9.5	190	37.0			IPP60R190P6	IPA60R190P6	IPW60R190P6			
t.b.d.	180	t.b.d.		IPL60R180P6 [1]						
10.4	160	44.0			IPP60R160P6 [1]	IPA60R160P6 [1]	IPW60R160P6 [1]			
t.b.d.	125	t.b.d.			IPP60R125P6 [1]	IPA60R125P6 [1]		IPW60R125P6 [1]		
t.b.d.	125	t.b.d.								
t.b.d.	125	t.b.d.								
t.b.d.	99	t.b.d.			IPP60R099P6 [1]	IPA60R099P6 [1]		IPW60R099P6 [1]		
t.b.d.	41	t.b.d.						IPW60R041P6 [1]		

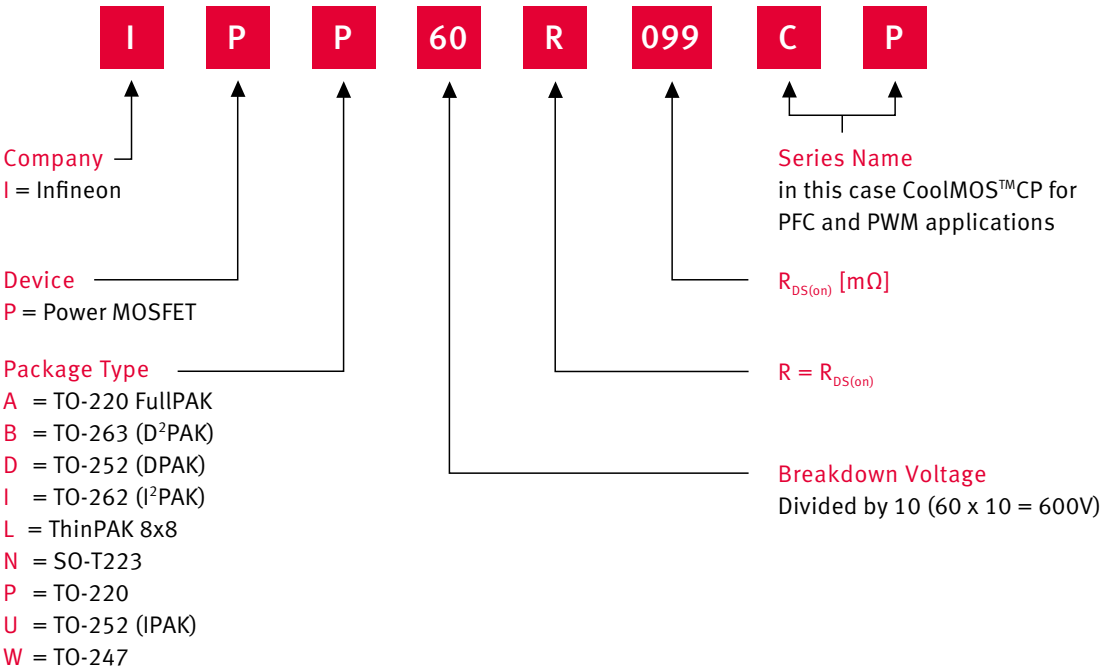
[1] Coming soon

Naming System

Power MOSFETs (naming system until 2005)



Power MOSFETs (naming system from 2005 onwards)



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Where to Buy

Silicon Carbide Diodes

Improve Efficiency and Solution Costs

Silicon Carbide (SiC) devices belong to the so-called wide band gap semiconductor group, which offers a number of attractive characteristics for high voltage power semiconductors when compared to commonly used silicon (Si). In particular, the much higher breakdown field strength and thermal conductivity of SiC allow creating devices which outperform by far the corresponding Si ones, and enable reaching otherwise unattainable efficiency levels.

Silicon Carbide Schottky Diodes

The differences in material properties between SiC and silicon limit the fabrication of practical silicon unipolar diodes (Schottky diodes) to a range up to 100V – 150V, with relatively high on-state resistance and leakage current. On the other hand, SiC Schottky barrier diodes (SBD) can reach a much higher breakdown voltage. Infineon offers products up to 1200V as discrete and up to 1700V in modules.

Features

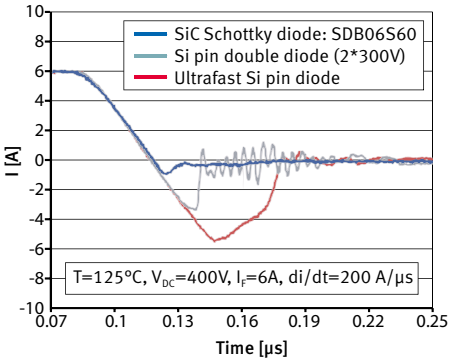
- Benchmark switching behavior
- No reverse recovery charge
- Temperature independent switching behavior
- High operating temperature (T_j max 175°C)

Benefits

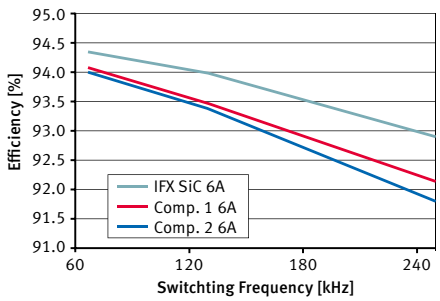
- System efficiency improvement compared to Si diodes
- Reduced cooling requirements
- Enabling higher frequency/increased power density
- Higher system reliability due to lower operating temperature
- Reduced EMI

Applications

- Server
- Telecom
- Solar
- UPS
- PC Silverbox
- Motor Drives
- Lighting



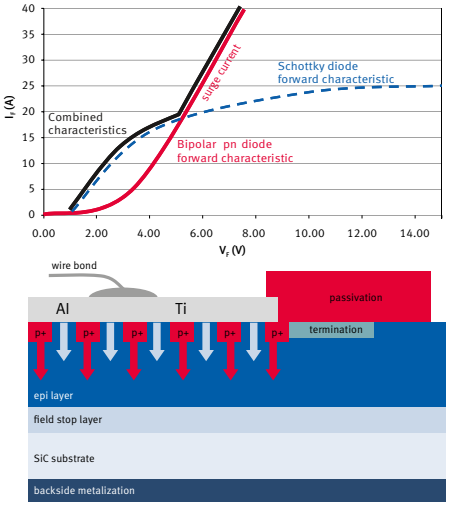
Reverse recovery charge of SiC versus Silicon devices
The majority carrier characteristics of the device imply no reverse recovery charge and the only contribution to the switching losses comes from the tiny displacement charge of capacitive nature. In the same voltage range, silicon devices show a bipolar component resulting in much higher switching losses. Here the comparison between various 600V devices.



Improved system efficiency (PFC in CCM Mode operation, full load, low line)
The fast switching characteristics of the SiC diodes provide clear efficiency improvements at system level.The performance gap between SiC and high-end silicon devices increases with the operating frequency.

thinQ!™ Generation 2 600V

The second generation of Infineon SiC Schottky diodes has emerged over the years as the industry standard. The low V_F values characterizing this family of products, make it particularly suitable for applications requiring high load efficiency. With the Generation 2 Infineon introduced a new design concept consisting in regularly distributed p-doped areas, in conjunction with the pure Schottky ones: the so-called “merged pn-structure” (MPS).



Merged pn-structure and improved surge capability

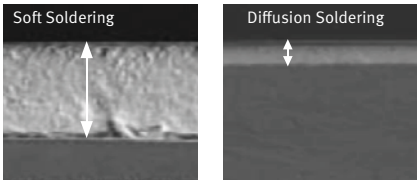
In standard operation the device behaves like a pure SBD, but at high current levels a bipolar component is activated: the much lower voltage drop dramatically reduces the power dissipation at high current peaks and accordingly the risks for thermal runaway.

thinQ!™ Generation 3 600V

The third generation of Infineon SiC Schottky diodes features the industry’s lowest device capacitance for any given current rating, which further enhances overall system efficiency, especially at higher switching frequencies and under low load conditions. The Generation 3 is based on the same technology platform as Generation 2 with the introduction, at package level, of the so called diffusion soldering.

Diffusion soldering and improved thermal performance

Diffusion soldering is a proprietary Infineon process reducing dramatically the thickness of the solder between chip and lead frame with respect to standard soft soldering. It results into ~40% lower $R_{th(j\text{-}c)}$ per same unit area.



thinQ!™ 1200V

The 1200V is the highest voltage family of Infineon SiC Schottky discrete diodes and has been extended into the TO-247 package. The very good thermal characteristics of the TO-247 in combination with the low V_F of the 1200V diodes make it particularly suitable in power applications where relatively high currents are demanded and utmost efficiency is required. With the introduction of this package, Infineon now offers a current capability of up to 30A in the 1200V range.

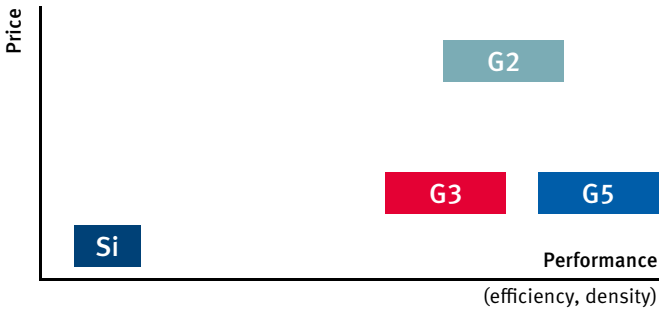
Generation 5 650V: Compact Design and Wafer Thinning Technology for Best Price/Performance Level

Performance comparison

thinQ!™ Generation 5 represents Infineon's leading edge technology for SiC Schottky Barrier diodes. The Infineon proprietary diffusion soldering process, already introduced with Gen3, is now combined with a new, more compact MPS design and thin wafer technology. The result is a new family of products showing improved efficiency over all load conditions, coming from both the improved thermal characteristics and a lower Figure of Merit (Q_c x V_F). The new thinQ!™ Generation 5 has been designed to complement our 650V CoolMOS™ offer: This ensures meeting the most stringent application requirements in this voltage range.

Generation 5 main product characteristics

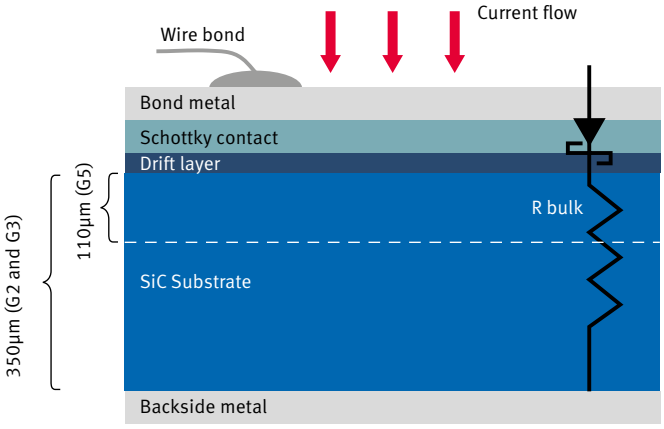
- Improved efficiency with respect to all previous generations
- Surge current capability at Gen2 level
- Increased V_{br} to 650V
- Extension of portfolio up to 40A
- New packages
- Best Price/Performance

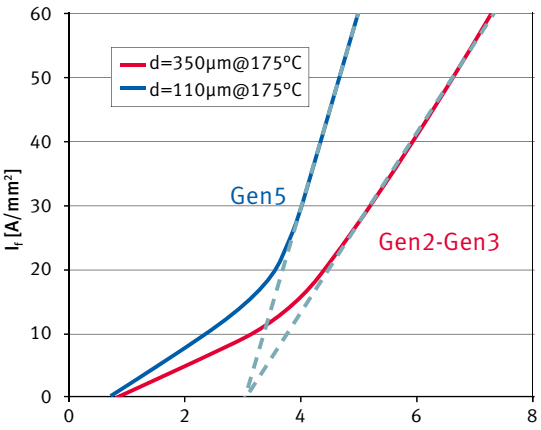


Wafer Thinning

Higher surge current capability

By reducing the wafer thickness to almost 1/3, the resistive contribution of the substrate is considerably reduced and one of its most striking benefits is a consistent improvement of the surge current robustness, now at comparable level or even higher (for I_f <10A) than for Gen2, in spite of a smaller chip size.

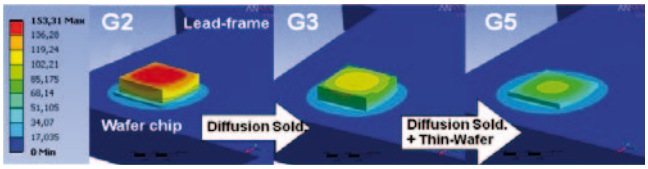




Lower thermal resistance

In combination with our proprietary diffusion soldering, the reduced thickness further contributes to decrease the overall thermal resistance in the package. The picture on the right shows the temperature increase at the junction under given forward current conditions for the same device area:

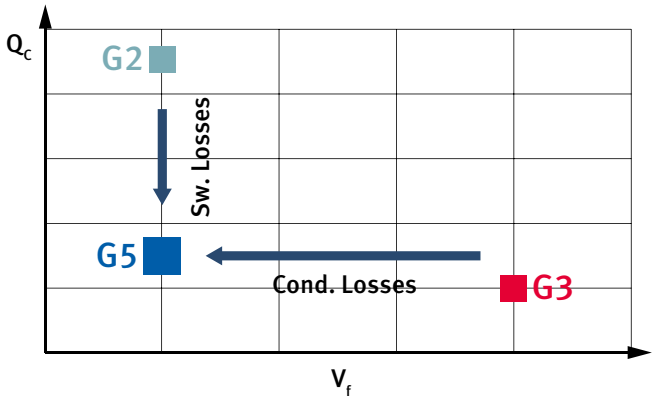
Left: 350µm chip with 60µm soft solder
Middle: 350µm chip with diff. solder
Right: 110µm chip with diff. solder



Generation 5 650V: Best Performance over all Load Conditions

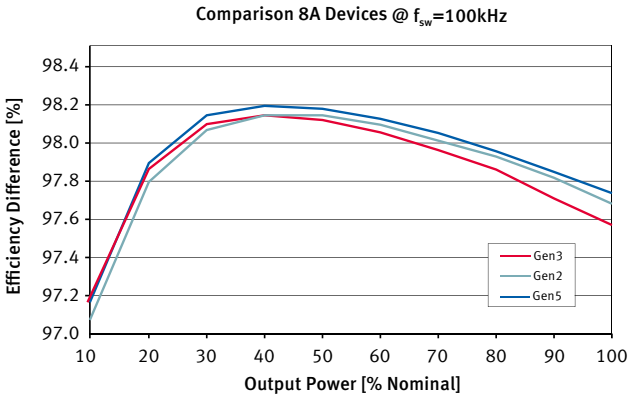
Lower Figure of Merit V_F x Q_c

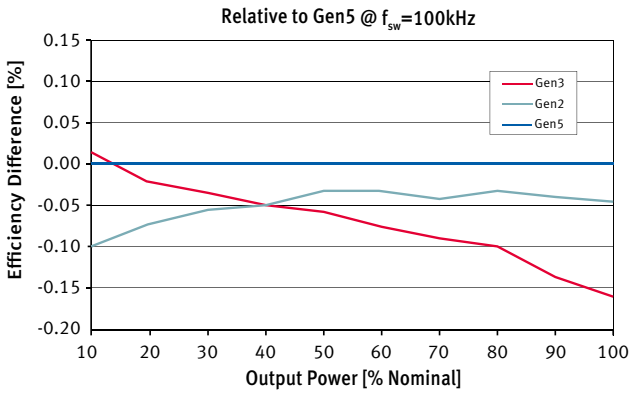
- Gen2 diodes have been optimized with low forward voltage (V_F)
- Gen3 is optimized with low capacitive charge (Q_c)
- Thanks to the technology advance, Gen5 can be optimized to have V_F at Gen2 level and Q_c comparable with Gen3
- On the right picture: device tailoring in Gen5, comparison with Gen2 and Gen3 regarding of Q_c and V_F. Arrows represent the benefit in terms of device lower losses



Performance comparison

Thanks to the similar Q_c values, Gen5 efficiency is comparable to Gen3 at light load, and outperforms it at high load, because of the lower V_F. Gen2 has been optimized for high load performance, and also with respect to this family Gen5 shows clear improvements, mainly at light load; the benefits of Gen5 over Gen2 become even more evident with increasing operating frequency, because of the much lower Q_c values.





CoolSiC™ 1200V SiC JFET & Direct Drive JFET Topology

The new CoolSiC™ 1200V SiC JFET family, in combination with the proposed Direct Drive JFET Topology, represents Infineon's leading edge solution to bring actual designs towards new and so far unattainable efficiency borders. In fact the SiC JFET offers Best in Class switching loss behavior with respect to 1200V IGBT with comparable conduction losses available. Utmost efficiency at highest power density levels can be reached also thanks to Infineon CoolSiC™ monolithically integrated body diode, showing a switching performance comparable with that of an external SiC Schottky barrier diode. The Infineon SiC JFET, with its ultrafast SiC body diode and dedicated driver, represents the best solution in solar, UPS and industrial drives applications by combining best performance, reliability, safety and Ease of Use.

Features

- Extremely low and temperature independent switching losses
- Excellent high load efficiency compared to IGBTs
- Monolithically integrated SiC body diode
- Dedicated driver for direct JFET control
- High reliability due to missing gate oxide
- Structural elements similar to SiC diodes, with 10 year IFX proved experience in manufacturing

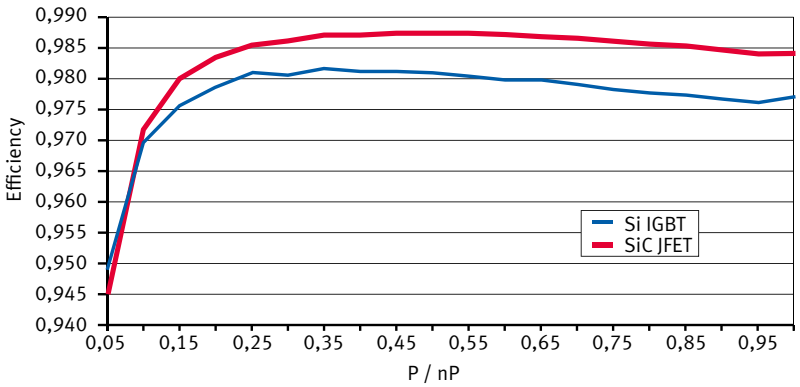
Benefits

- Reduced cooling effort due to reduced losses
- Increase of the operating frequency with consequent shrink of passive components and savings at system level
- Increased power density
- Increase of output power, reduction of specific system cost

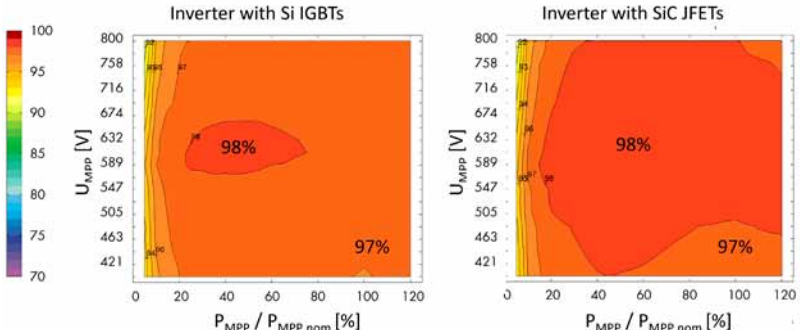
Applications

- Solar
- UPS
- Industrial Drives

Direct measurements in a 3-phase string inverter (Sunny Tripower by SMA) P_{out} max 17kW fsw=16kHz [1)]



System efficiency comparison between SiC JFET and IGBT.



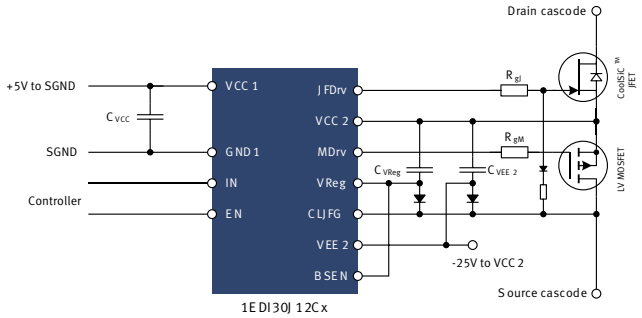
Measured system efficiencies at several DC link voltages (400V up to 800V). The JFET shows the widest high efficiency operating window.

[1)] G. Deboy, H. Ludwig, R. Mallwitz, R. Rupp, „New SiC JFET with Integrated Body Diode Boosts Performance of Photovoltaic Systems" Proc. PCIM, May 2011

Infineon Direct Drive Technology

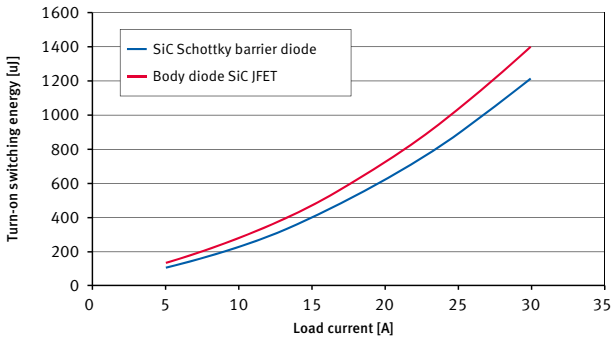
Due to the normally on condition of the JFET, the infineon approach to SiC switches consists of a simple and safe driver circuit design based on a dedicated driver IC that directly drives both the CoolSiC™ JFET and the LV p-channel MOSFET, as indicated in the picture on the right. The main features of the unique SiC direct drive approach are:

- A dedicated driver IC operating both normally-on JFET and p-MOS → enabling a normally-off behavior and best controllability of the JFET
- A low-voltage Si MOSFET is used to ensure safe off-state during start up or system failure. During normal operation, the LV MOSFET is turned-on



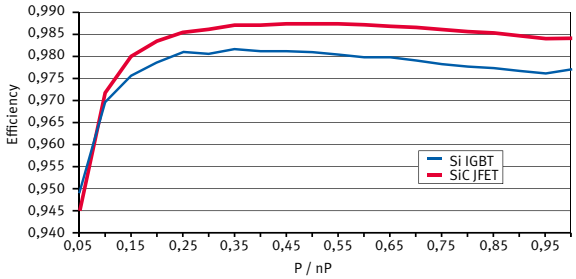
CoolSiC™ JFET Monolithically Integrated Body Diode and Synchronous Rectification

The monolithically integrated body diode has been explicitly optimized to provide a benchmark switching performance. This for the possibility of exploiting the ohmic characteristics of the SiC JFET in reverse operation during synchronous rectification driving scheme: the relatively high voltage drop of the body diode can be in fact significantly reduced by turning-on the JFET channel in parallel. With such a driving scheme the conduction losses of the diode are negligible, as they play a role only within a very short dead time between turn-off of the channel and commutation of the body diode.



CoolSiC™ 1200V JFET portfolio and recommended driver/LV MOS for Direct Drive JFET Topology

Voltage	$R_{DS(on)}$	Sales name	JFET Package	Driver	Driver Package	LV MOS	LV MOS Package
1200	70	IJW120R070T1	TO247	1EDI30J12CL/CP	DSO-16-20/19-4	BSC030P03NS3 G	SuperSO8
	100	IJW120R100T1	TO247	1EDI30J12CL/CP	DSO-16-20/19-4	BSC030P03NS3 G	SuperSO8
1200	70	IJC120R070T1	Bare die	1EDI30J12CL/CP	DSO-16-20/19-4	IPC099P03N	Bare die
	100	IJC120R100T1	Bare die	1EDI30J12CL/CP	DSO-16-20/19-4	IPC099P03N	Bare die



Further information on the JFET driver available on page 119

600V Silicon Carbide High Voltage Schottky Diodes thinQ!™ G2

I_F [A]	TO-252 DPAK	TO-263 D²PAK	TO-220 real2pin	TO-220 FullPAK
2				
3				
4	IDD04S60C [1]		IDH04S60C [1]	
5			IDH05S60C [1]	
6		IDB06S60C [1]	IDH06S60C [1]	
8			IDH08S60C [1]	
10		IDB10S60C [1]	IDH10S60C [1]	
12			IDH12S60C [1]	
16			IDH16S60C [1]	

600V Silicon Carbide High Voltage Schottky Diodes thinQ!™ G3

I_F [A]	TO-252 DPAK	TO-263 D²PAK	TO-220 real2pin	TO-220 FullPAK
3	IDD03SG60C		IDH03SG60C	
4	IDD04SG60C		IDH04SG60C	
5	IDD05SG60C		IDH05SG60C	
6	IDD06SG60C		IDH06SG60C	
8	IDD08SG60C		IDH08SG60C	
9	IDD09SG60C		IDH09SG60C	
10	IDD10SG60C		IDH10SG60C	
12	IDD12SG60C		IDH12SG60C	

650V Silicon Carbide High Voltage Schottky Diodes thinQ!™ G5

I_F [A]	TO-220 R2L	TO-247	D²PAK R2L	ThinPAK 8x8
2	IDH02G65C5		IDK02G65C5	IDL02G65C5
3	IDH03G65C5		IDK03G65C5	
4	IDH04G65C5		IDK04G65C5	IDL04G65C5
5	IDH05G65C5		IDK05G65C5	
6	IDH06G65C5		IDK06G65C5	IDL06G65C5
8	IDH08G65C5		IDK08G65C5	IDL08G65C5
9	IDH09G65C5		IDK09G65C5	
10	IDH10G65C5	IDW10G65C5	IDK10G65C5	IDL10G65C5
12	IDH12G65C5	IDW12G65C5	IDK12G65C5	IDL12G65C5
16	IDH16G65C5	IDW16G65C5		
20	IDH20G65C5	IDW20G65C5		
30		IDW30G65C5		
40		IDW40G65C5		

[1] Not recommended for new designs

1200V Silicon Carbide High Voltage Schottky Diodes thinQ!™

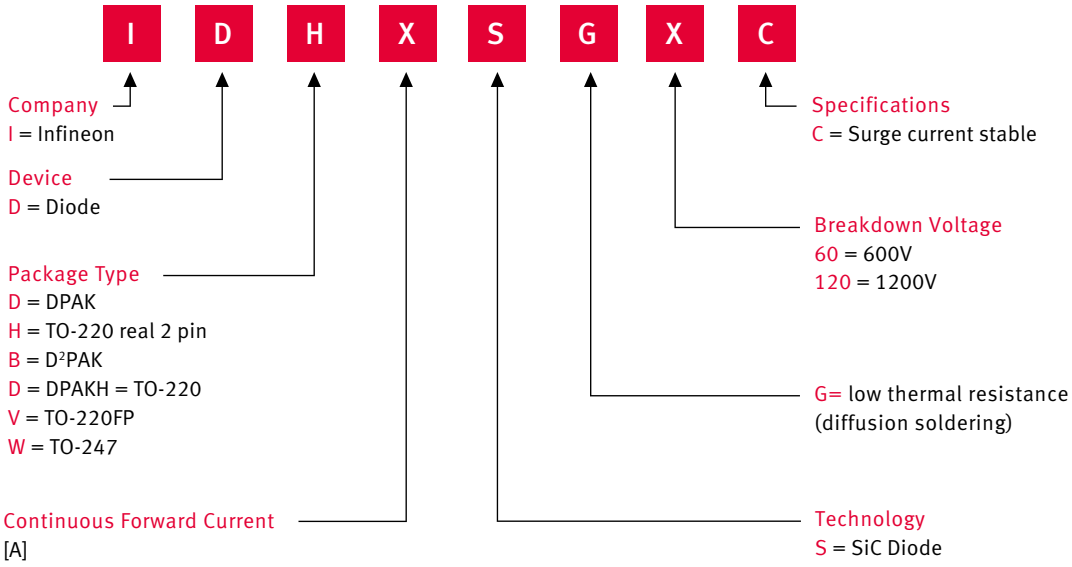
Continous Current [A]	TO-252 DPAK	TO-263 D²PAK	TO-220 real2pin	TO-247
2			IDH02SG120	
5			IDH05S120	
8			IDH08S120	
10			IDH10S120	IDW10S120
15			IDH15S120	IDW15S120
20				IDW20S120
30				IDW30S120

1200V CoolSiC™ JFET

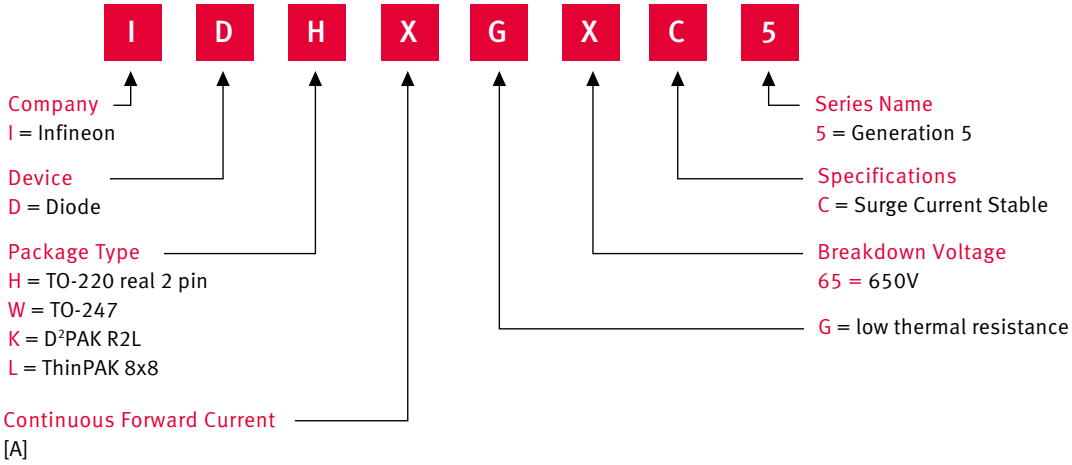
$R_{DS(on)}$ T_c = 25°C	TO-252 DPAK	TO-263 D²PAK	TO-220 real2pin	TO-247
70				IJW120R070T1
100				IJW120R100T1

Naming System

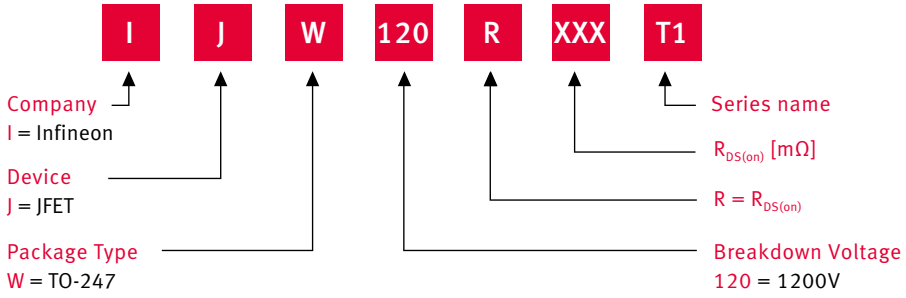
thinQ!™ Silicon Carbide Schottky Diodes Generation 2 and 3



thinQ!™ Silicon Carbide Schottky Diodes Generation 5



CoolSiC™ Silicon Carbide JFET



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Where to Buy

IGBT

Technology Leadership Offering Comprehensive Portfolio

We are famous for IGBT technology leadership and offer a comprehensive portfolio for the General Purpose Inverters, Solar Inverters, UPS, Induction Heating, Microwave Oven, Rice Cookers, Welding and SMPS Segments.

Benefits

- IGBTs offer much higher current density than MOSFET power switches due to bipolar action
- Insulated gate allows bipolar performance with MOSFET gate drive performance
- High efficiency = smaller heat sink which leads to lower overall system cost
- 175°C $T_{j(max)}$ leading to higher reliability

Soft Switching/Resonant and Hard Switching Topologies are Comprehensively Supported

Infineon has a huge portfolio addressing the following two switching techniques:

Soft Switching/resonant

- The world famous IHW series IGBTs – #1 best selling family worldwide
- Available in 600V, 1100V, 1200V, 1350V and 1600V voltage classes
- Best-in-Class efficiency and robustness

Hard Switching

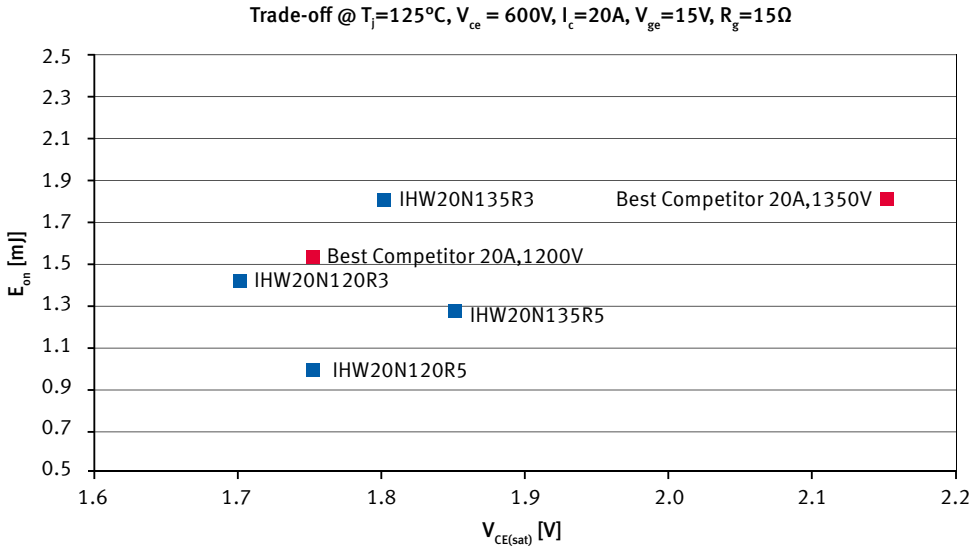
- 600V RC-D IGBTs
- 600V RC-Drives Fast
- 600V TRENCHSTOP™ DuoPack IGBTs
- 600V/1200V HighSpeed 3
- 1200V TRENCHSTOP™2
- 650V TRENCHSTOP™5

Preview

- Low $V_{CE(sat)}$ 650V: Low $V_{CE(sat)}$ optimized IGBT based on TRENCHSTOP™5 platform for mix frequency topologies e.g. 3 level NPC and asymmetrical H4. Meanwhile, characteristics of low switching losses maintained to address requirement of reactive power.

New Generation Reverse Conducting IGBT

The newest generation of reverse conducting IGBTs has been optimized for the rigorous requirements of Induction Cooking applications. The new 20A RC-H5 devices complement the previous RC-H3 generation of reverse conduction IGBTs and extend the performance leadership of the RC-H family, focusing on system efficiency and reliability. RC-H5 offers up to 30% reduction in switching losses, allowing designs to use higher frequencies up to 30kHZ. With this increased switching frequency comes the flexibility of higher efficiency or system cost reductions from smaller coil choices. Improvements in thermal performance and reduced power dissipation, even under higher ambient temperatures and stress condition, result in better reliability. Soft switching capabilities result in better EMI behavior resulting in less filtering requirements and lower system costs. The RC-H5 family is offered in two versions with blocking voltages of 1200V and 1350V.



Features

- Switching losses reduced up to 30%
- Very low conduction losses
- Efficiency improvement up to 0.5%
- $T_{j(max)}$ = 175°C
- Soft current turn-off waveforms for low EMI
- Higher blocking voltage $V_{BR(min)}$ = 1350V

Benefits

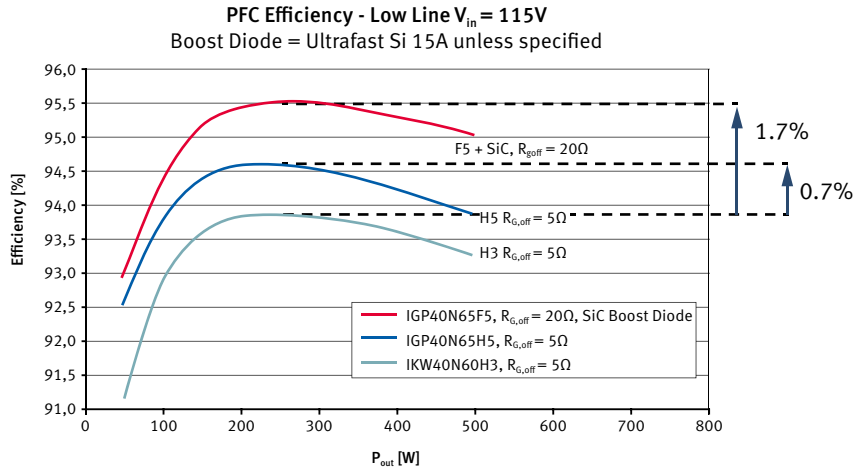
- Increased system switching frequency
- Lowest power dissipation
- Better thermal management for higher reliability
- Lower EMI filtering requirements
- Reduced system costs
- Highest reliability against peak currents

Applications

- Induction cooking stoves
- Inverterized microwave ovens
- Induction rice cookers
- Inverters
- Other soft switching, single ended topology applications

TRENCHSTOP™5

In terms of switching and conduction losses, there is no other IGBT on the market that can match the performance of the TRENCHSTOP™5. TRENCHSTOP™5 is the next generation of thin wafer technology for applications switching ›10kHz. Wafer thickness has been reduced by ›25%, which enables a dramatic improvement in both switching and conduction losses, whilst providing a breakthrough voltage of 650V. Translating this Best-in-Class efficiency application tests show ›25% reduction in package temperature when performing a plug and play approach with Infineon's previous Best-in-Class IGBT, the "HighSpeed 3". Even more revolutionary, when replacing a TO-247 HighSpeed 3 IGBT with the TRENCHSTOP™5 in a TO-220, case temperatures are ›10% lower for the TRENCHSTOP™5. The quantum leap of efficiency improvement provided by the TRENCHSTOP™5 opens up new opportunities for designers to explore.



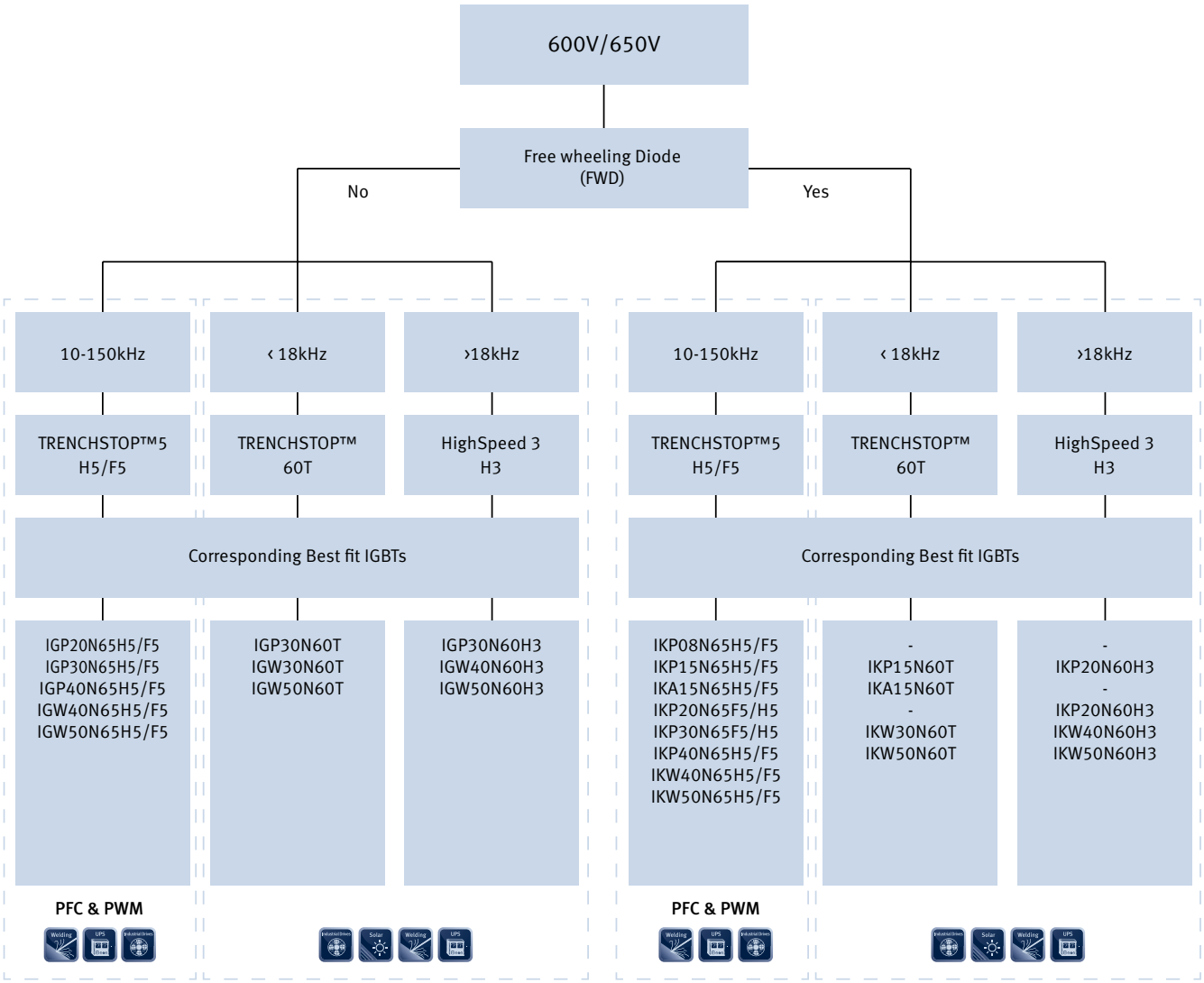
Features

- 650V breakthrough voltage
- Compared to Infineon's Best-in-Class "HighSpeed 3" family
  - Factor 2.5 lower Q_g
  - Factor 2 reduction in switching losses
  - 200mV reduction in $V_{CE(sat)}$
- Co-packed with Infineon's new "Rapid" Si-diode technology
- Low C_{oss}/E_{oss}
- Mild positive temperature coefficient $V_{CE(sat)}$
- Temperature stability of V_F

Benefits

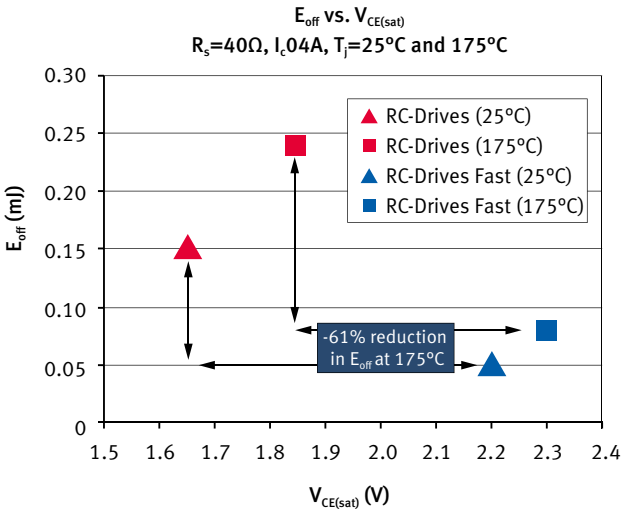
- Best-in-Class efficiency, resulting in lower junction and case temperature leading to higher device reliability
- 50V increase in the bus voltage possible without compromising reliability
- Higher power density designs

TRENCHSTOP™5 Selection Tree



RC-Drives and RC-Drives Fast

The RC-Drives IGBT technology is a cost optimized solution for the price-sensitive consumer drives market that provides outstanding performance for permanent magnet synchronous and brushless DC motor drives. The family of reverse conducting RC-Drives Fast was developed to meet rising demand for the low power motor drives in consumer market. IGBT and diode losses were reoptimized to reduce losses at frequencies of 4 ~ 30kHz. RC-Drives Fast enables high efficiency designs for inverters above 16kHz to reduce the audible noise to absolutely silent level. Furthermore highly precise vector control techniques can be used to provide more torque in operation at low speed and high performance dynamics in the control at high speed. The small size of the components allows high power density designs with less system costs.



Features

- Optimized E_{on}, E_{off} and Q_{rr} for up to 20% lower switching losses
- Operating range of DC to 30kHz
- Max. junction temperature 175°C
- Short circuit capability of 5µs
- Very tight parameter distribution
- Best-in-Class current versus package size performance
- Smooth switching performance leading to low EMI levels
- Complete product portfolio and PSpice Models on the internet

Benefits

- Excellent cost/performance for hard switching applications
- Outstanding temperature stability
- Very good EMI behavior
- Up to 60% space saving on the PCB
- Higher reliability due to monolithically integrated IGBT & diode due to less thermal cycling during switching

Reverse Conducting Drives - Qualified according to AEC Q101

RC-Drives IGBT technology has been developed by Infineon as a cost optimized solution by offering space saving advantages due to monolithically integrated diode. Furthermore the technology provides outstanding performance for smooth switching behavior and low EMI levels even at the maximum junction temperature of 175°C.

Features

- Optimized parameters for up to 20% lower switching losses
- Operating range of DC to 30kHz
- Max. junction temperature 175°C
- Short circuit capability of 5ms
- Very tight parameter distribution
- Best in class current versus package size performance
- Smooth switching performance leading to low EMI levels

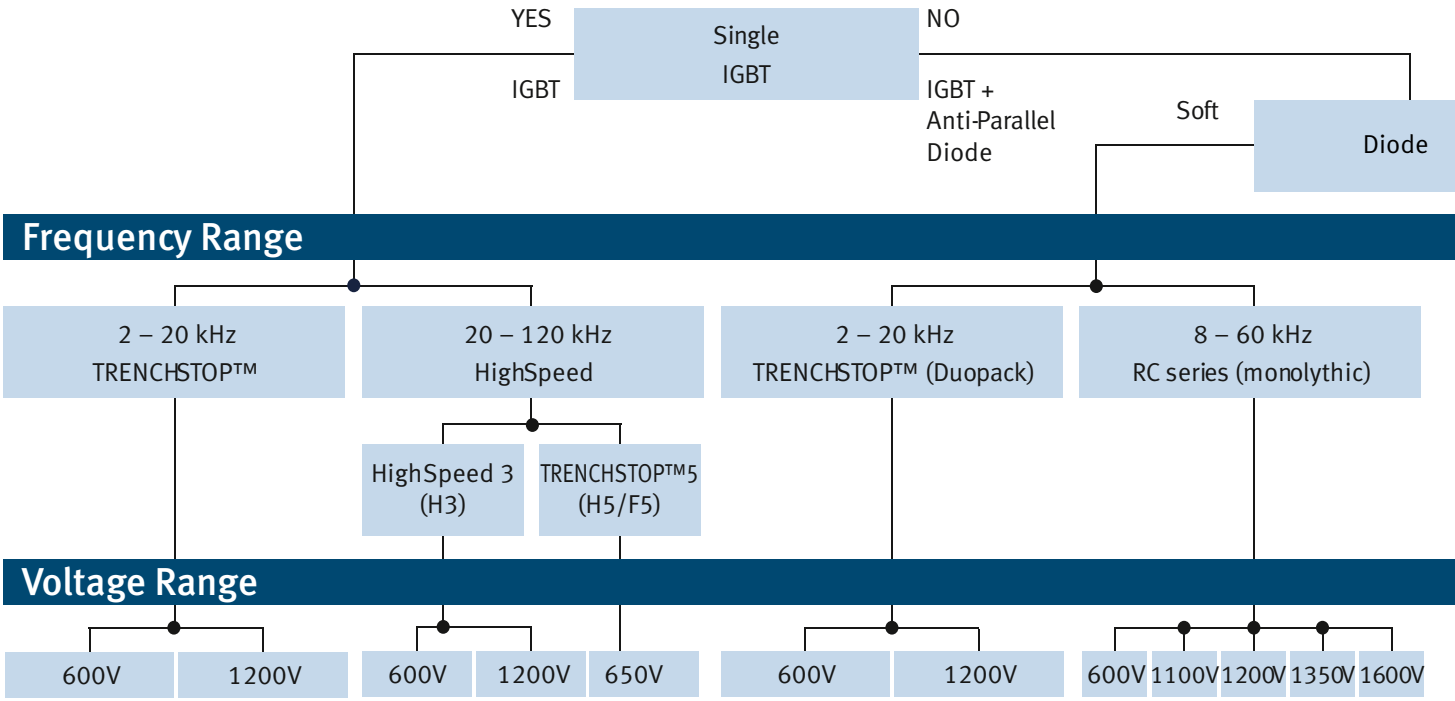
Benefits

- Excellent cost/performance for hard switching applications
- Outstanding temperature stability
- Very good EMI behavior
- Up to 60% space saving on the PCB
- Higher reliability due to monolithically integrated IGBT & diode due toless thermal cycling during switching

Applications

- Piezo Injection
- HID Lighting
- Pumps
- Small Drives

IGBT Selection Tree



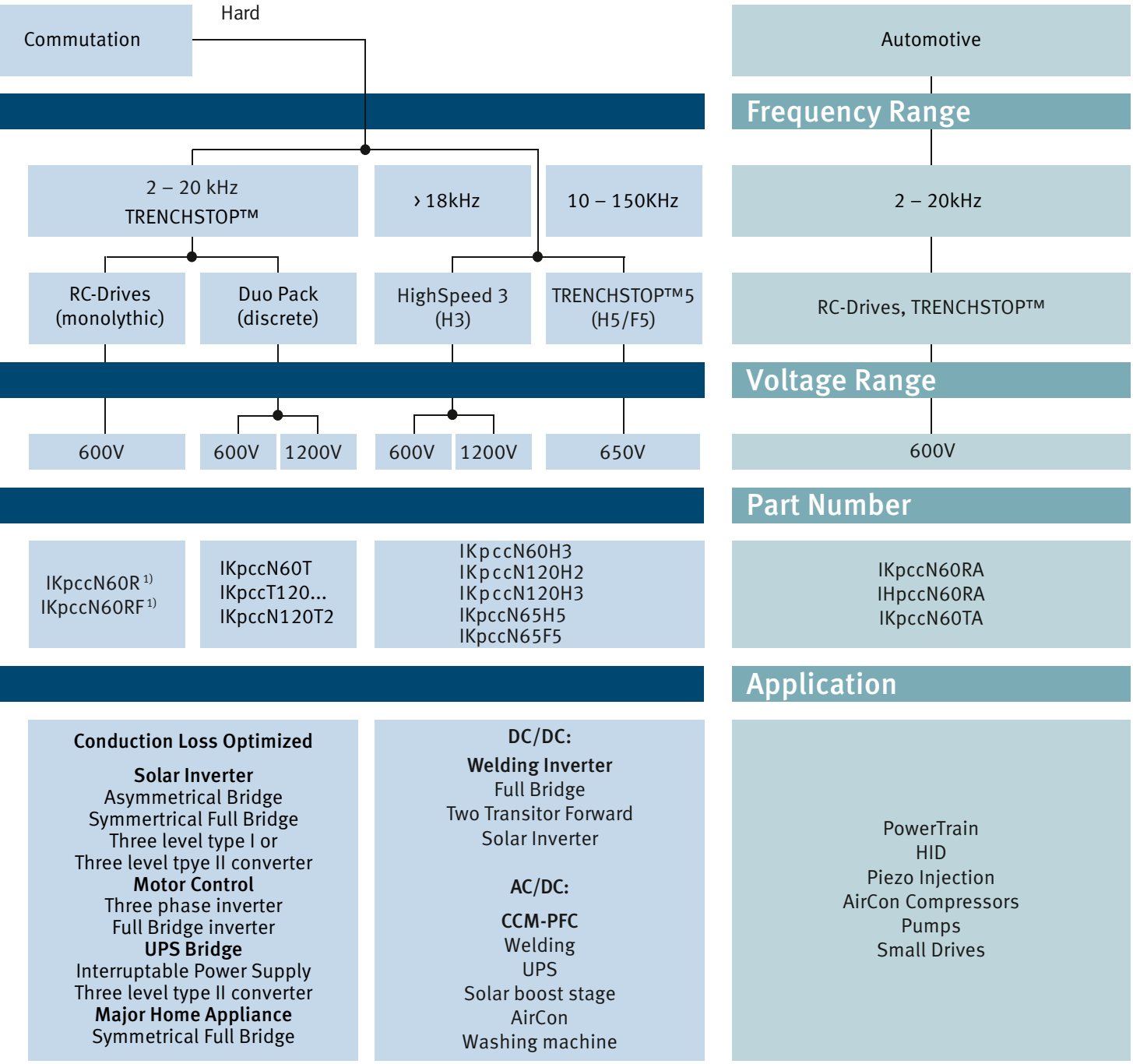
Part Number

IGpccN60T... IGpccT120... IGpccN120T2	IGpccN60H3 IGpccN120H2 IGpccN120H3 IGpccN65H5 IGpccN65F5	IHpccN60T IHpccT60... IHpccT120...	IHpccNvvvR2 IHpccNvvvR3 IHpccNvvvR5 IHpccN60R IHpccN60RF

Application

Conduction Loss Optimized **Hard switching topologies** without anti-parallel diode	**DC/DC:** **Welding Inverter** Full Bridge Two Transitor Forward Solar Inverter **AC/DC:** **CCM-PFC** Welding UPS Solar boost stage AirCon Washing machine	**Induction Heating** **Microwave** **Multifunction Printers** Half Bridge Resonant (Current resonance – 600V parts) Single Switch (Voltage resonance › 600V parts)

[1] part qualified for Automotive


Commutation
Hard
Automotive
Frequency Range
2 – 20 kHz
TRENCHSTOP™
› 18kHz
10 – 150KHz
2 – 20kHz
RC-Drives
(monolythic)
Duo Pack
(discrete)
HighSpeed 3
(H3)
TRENCHSTOP™5
(H5/F5)
RC-Drives, TRENCHSTOP™
Voltage Range
600V
600V
1200V
600V
1200V
650V
600V
Part Number
IKpccN60R 1)
IKpccN60RF 1)
IKpccN60T
IKpccT120...
IKpccN120T2
IKpccN60H3
IKpccN120H2
IKpccN120H3
IKpccN65H5
IKpccN65F5
IKpccN60RA
IHpccN60RA
IKpccN60TA
Application
Conduction Loss Optimized
Solar Inverter
Asymmetrical Bridge
Symmertrical Full Bridge
Three level type I or
Three level tpye II converter
Motor Control
Three phase inverter
Full Bridge inverter
UPS Bridge
Interruptable Power Supply
Three level type II converter
Major Home Appliance
Symmetrical Full Bridge
DC/DC:
Welding Inverter
Full Bridge
Two Transitor Forward
Solar Inverter
AC/DC:
CCM-PFC
Welding
UPS
Solar boost stage
AirCon
Washing machine
PowerTrain
HID
Piezo Injection
AirCon Compressors
Pumps
Small Drives

TRENCHSTOP™ and RC-Drives IGBT

600V Product Family

Continuous collector current @ T_c=100°C		TO-251	TO-252 DPAK Halogen-Free	TO-263 D²PAK Halogen-Free	TO-220 Halogen-Free	TO-262 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247
Single IGBT	4	IGU04N60T						
	6		IGD06N60T		IGP06N60T			
	10			IGB10N60T	IGP10N60T			
	15			IGB15N60T	IGP15N60T			
	30			IGB30N60T				IGW30N60T
	50			IGB50N60T	IGP50N60T			IGW50N60T
	75							IGW75N60T
IGBT and Diode	3		IKD03N60RF					
	4		IKD04N60RF IKD04N60R IKD04N60RA		IKP04N60T			
	6		IKD06N60RF IKD06N60R IKD06N60RA	IKB06N60T	IKP06N60T		IKA06N60T	
	10		IKD10N60RF IKD10N60R IKD10N60RA	IKB10N60T	IKP10N60T		IKA10N60T	
	15		IKD15N60RF IKD15N60R IKD15N60RA	IKB15N60T	IKP15N60T		IKA15N60T	
	20			IKB20N60T	IKP20N60T			IKW20N60T
	30							IKW30N60T
	50							IKW50N60T
	75							IKW75N60T

TRENCHSTOP™ IGBT and DuoPack

1200V Product Family

Continuous collector current @ T_c=100°C		TO-251	TO-252 DPAK Halogen-Free	TO-263 D²PAK Halogen-Free	TO-220 Halogen-Free	TO-262 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247	
								TRENCHSTOP™	TRENCHSTOP™ 2
Single IGBT	8							IGW08T120	
	15							IGW15T120	
	25							IGW25T120	
	40							IGW40T120	
	60							IGW60T120	
DuoPack	8							IKW08T120	
	15							IKW15T120	IKW15N120T2
	25							IKW25T120	IKW25N120T2
	40							IKW40T120	IKW40N120T2

Induction Cooking Series Portfolio

Portfolio for 600V, 1100V, 1200V, 1350V & 1600V

Continuous collector current @T_c=100°C		TO-251	TO-252 DPAK Halogen-Free	TO-263 D²PAK Halogen-Free	TO-220 Halogen-Free	TO-262 Halogen-Free	TO-247 600V	TO-247 1100V	TO-247 1200V	TO-247 1350V	TO-247 1600V
IGBT & Diode	15										
									IHW15N120R3		
	20						IKW20N60H3		IHW20N120R3	IHW20N135R3	
									IHW20N120R5	IHW20N135R5	
	25								IHW25N120R2		
	30							IHW30N110R3	IHW30N120R3	IHW30N135R3	IHW30N160R2
							IKW30N60H3				
	40								IHW40N120R3	IHW40N135R3	
							IHW40N60R				
							IHW40N60RF				
	50						IKW50N60H3				
	60										
	75										

HighSpeed 2 IGBT and DuoPack

1200V Product Family

Continuous collector current @T_c=100°C		TO-251	TO-252 DPAK Halogen-Free	TO-263 D²PAK Halogen-Free	TO-220 Halogen-Free	TO-262 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247
IGBT	1		IGD01N120H2	IGB01N120H2	IGP01N120H2			
	3			IGB03N120H2	IGP03N120H2		IGA03N120H2	IGW03N120H2
DuoPack	3			IKB03N120H2	IKP03N120H2		IKA03N120H2	IKW03N120H2

HighSpeed 3 IGBT and DuoPack

600V Product Family

Continuous collector current @T_c=100°C		TO-251	TO-252 DPAK Halogen-Free	TO-263 D²PAK Halogen-Free	TO-220 Halogen-Free	TO-262 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247
IGBT	20			IGB20N60H3	IGP20N60H3			IGW20N60H3
	30			IGB30N60H3	IGP30N60H3		IGA30N60H3	IGW30N60H3
	40							IGW40N60H3
	50							IGW50N60H3
	60							IGW60N60H3
	75							IGW75N60H3
	100							IGW100N60H3
DuoPack	20			IKB20N60H3	IKP20N60H3			IKW20N60H3
	30							IKW30N60H3
	40							IKW40N60H3
	50							IKW50N60H3
	60							IKW60N60H3
	75							IKW75N60H3

HighSpeed 3 IGBT and DuoPack

1200V Product Family

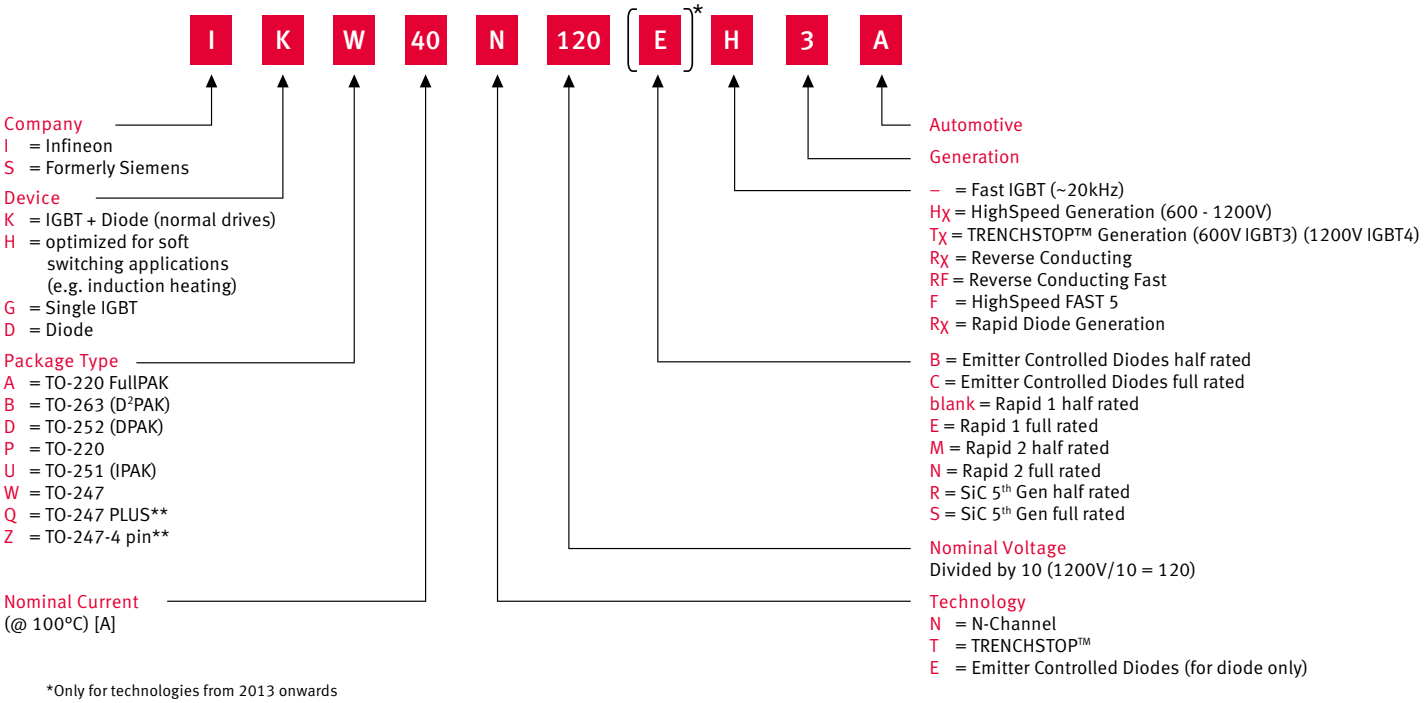
Continuous collector current @ T_c=100°C		TO-251	TO-252 DPAK Halogen-Free	TO-263 D²PAK Halogen-Free	TO-220 Halogen-Free	TO-262 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247
IGBT	15							IGW15N120H3
	25							IGW25N120H3
	40							IGW40N120H3
DuoPack	15							IKW15N120H3
	25							IKW25N120H3
	40							IKW40N120H3

TRENCHSTOP™5 Product Spectrum

Continuous collector current @ T_c=100°C		TO-251	TO-252 DPAK Halogen-Free	TO-263 D²PAK Halogen-Free	TO-220 Halogen-Free	TO-262 Halogen-Free	TO-220 FullPAK Halogen-Free	TO-247
IGBT	20				IGP20N65F5/H5			
	30				IGP30N65F5/H5			
	40				IGP40N65F5/H5			IGW40N65F5/5
	50							IGW50N65F5/5
DuoPack	8				IKP08N65F5/H5		IKA08N65F5/H5	
	15				IKP15N65F5/H5		IKA15N65F5/H5	
	20				IKP20N65H5/F5			
	30				IKP30N65H5/F5			
	40				IKP40N65F5/H5			IKW40N65F5/H5
	50							IKW50N65F5/H5

Naming System

Discrete IGBT



*Only for technologies from 2013 onwards
** Coming Q4 2014

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Where to Buy

High Power Silicon Diodes

Infineon's New Rapid Diode Families

Infineon brings thin wafer technology expertise to offer two brand new 650V hyperfast diode families that offer outstanding efficiency and EMI behavior.

Rapid 1 is forward voltage drop (V_F) optimized to address low switching frequency applications
Optimized for applications switching up to 40kHz, for example air conditioner and welder PFC stages.

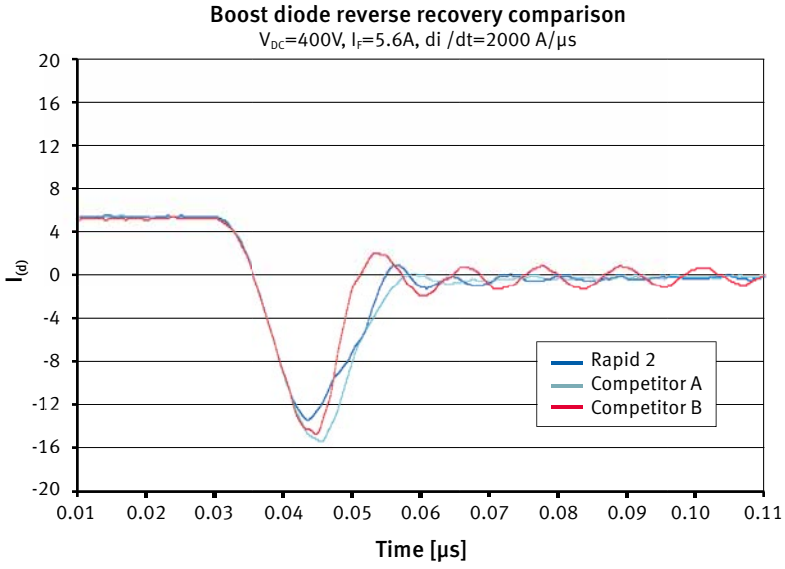
Features

- Temperature stable forward voltage (V_F) of 1.35V
- 650V breakthrough voltage
- Low reverse recovery current (I_{rrm})
- Soft reverse recovery for outstanding EMI behavior
- t_{rr} < 50ns

Rapid 2 is Q_{rr}/t_{rr} optimized hyperfast diode to address high speed switching applications
Optimized for applications switching between 40kHz and 100kHz typically found in PFCs in high efficiency switch mode power supplies (SMPS) and welding machines.

Features

- Temperature stable forward voltage (V_F) of 1.6V
- t_{rr} < 20ns
- Soft reverse recovery for outstanding EMI behavior
- Excellent cost optimized alternative to silicon carbide (SiC) diodes



Rapid 2 combines low I_{rrm} and high softness ratio to achieve a low Q_{rr} and an outstanding EMI behavior. Low Q_{rr} will minimize the power losses of the power switch in a PFC. Here the comparison for 600V/8A devices for an 800W PFC.

Rapid 1 Diodes

650V Product Family

Continous Current I_c T_c=100°C	TO-220 (real 2-leg) Halogen-Free	TO-220 FullPAK (real 2-leg) Halogen-Free	TO-220-3 (Common Cathode, 3-leg) Halogen-Free	TO-247 Halogen-Free	TO-247-3 (Common Cathode, 3-leg) Halogen-Free
8A	IDP08E65D1				
15A	IDP15E65D1				
20A		IDV20E65D1 [1]			IDW20C65D1 [2]
30A	IDP30E65D1			IDW30E65D1	IDW30C65D1
40A				IDW40E65D1	
60A					IDW60C65D1
75A					IDW75D65D1
80A					IDW80C65D1

Rapid 2 Diodes

650V Product Family

Continous Current I_c T_c=100°C	TO-220 (real 2-leg) Halogen-Free	TO-220 FullPAK (real 2-leg) Halogen-Free	TO-220-3 (Common Cathode, 3-leg) Halogen-Free	TO-247 Halogen-Free	TO-247-3 (Common Cathode, 3-leg) Halogen-Free
8A	IDP08E65D2	IDV08E65D2			
15A	IDP15E65D2	IDV15E65D2 [2]		IDW15E65D2	
20A	IDP20E65D2		IDP20C65D2		IDW20C65D2
30A	IDP30E65D2	IDV30E65D2	IDP30C65D2		IDW30C65D2
40A	IDP40E65D2			IDW40E65D2	

[1] Coming Q2 2014
[2] Coming Q4 2014

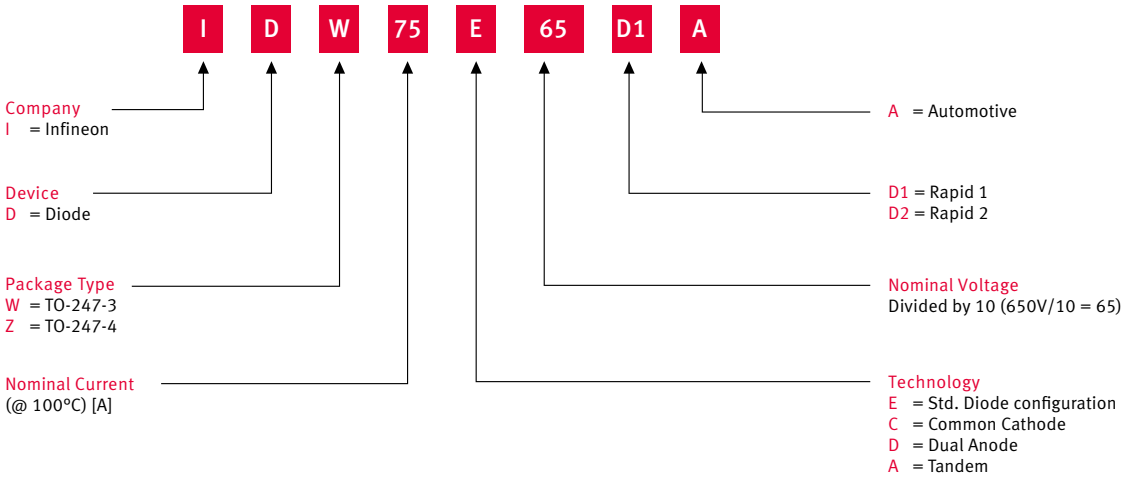
Discrete Emitter Controlled Diodes

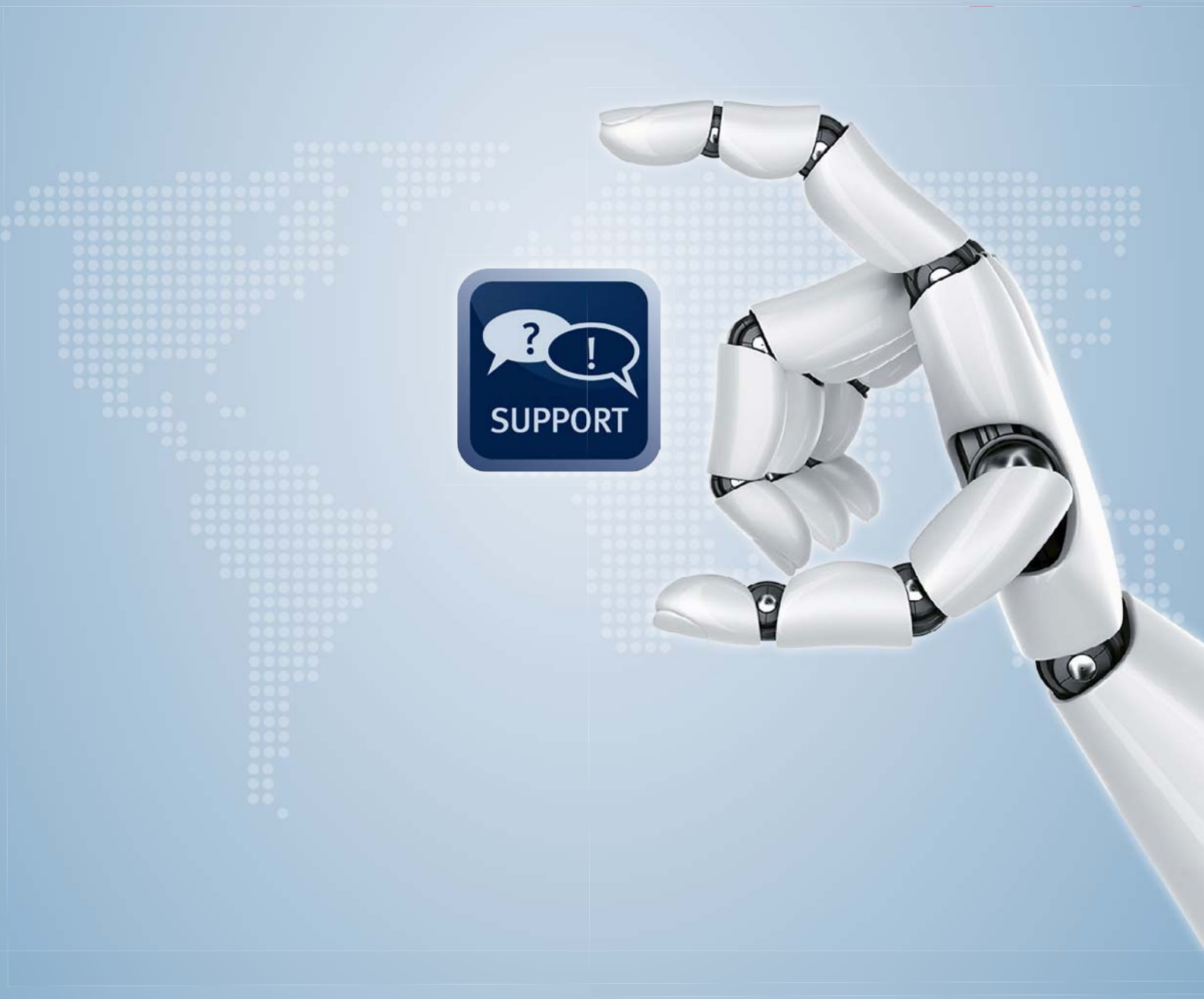
600V and 1200V

Continous Current I_c T_c=100°C		TO-251	TO-252 DPAK Halogen-Free	TO-263 D²PAK Halogen-Free	TO-220 Real 2pin Halogen-Free	TO-220 FullPAK Real 2pin 600V Halogen-Free	TO-247
600V	3		IDD03E60				
	6		IDD06E60	IDB06E60	IDP06E60		
	9		IDD09E60	IDB09E60	IDP09E60		
	15		IDD15E60	IDB15E60	IDP15E60		
	23			IDB23E60	IDP23E60		
	30			IDB30E60	IDP30E60	IDV30E60C	IDW30E60
	45			IDB45E60	IDP45E60		
	50						IDW50E60
	75						IDW75E60
	100						IDW100E60
1200V	4				IDP04E120		
	9				IDP09E120		
	12			IDB12E120	IDP12E120		
	18			IDB18E120	IDP18E120		
	30			IDB30E120	IDP30E120		

Naming System

High Power Silicon Diodes





Expert Support for Si Power Diodes

Easy Access and High Quality

Application Notes, Datasheets & More
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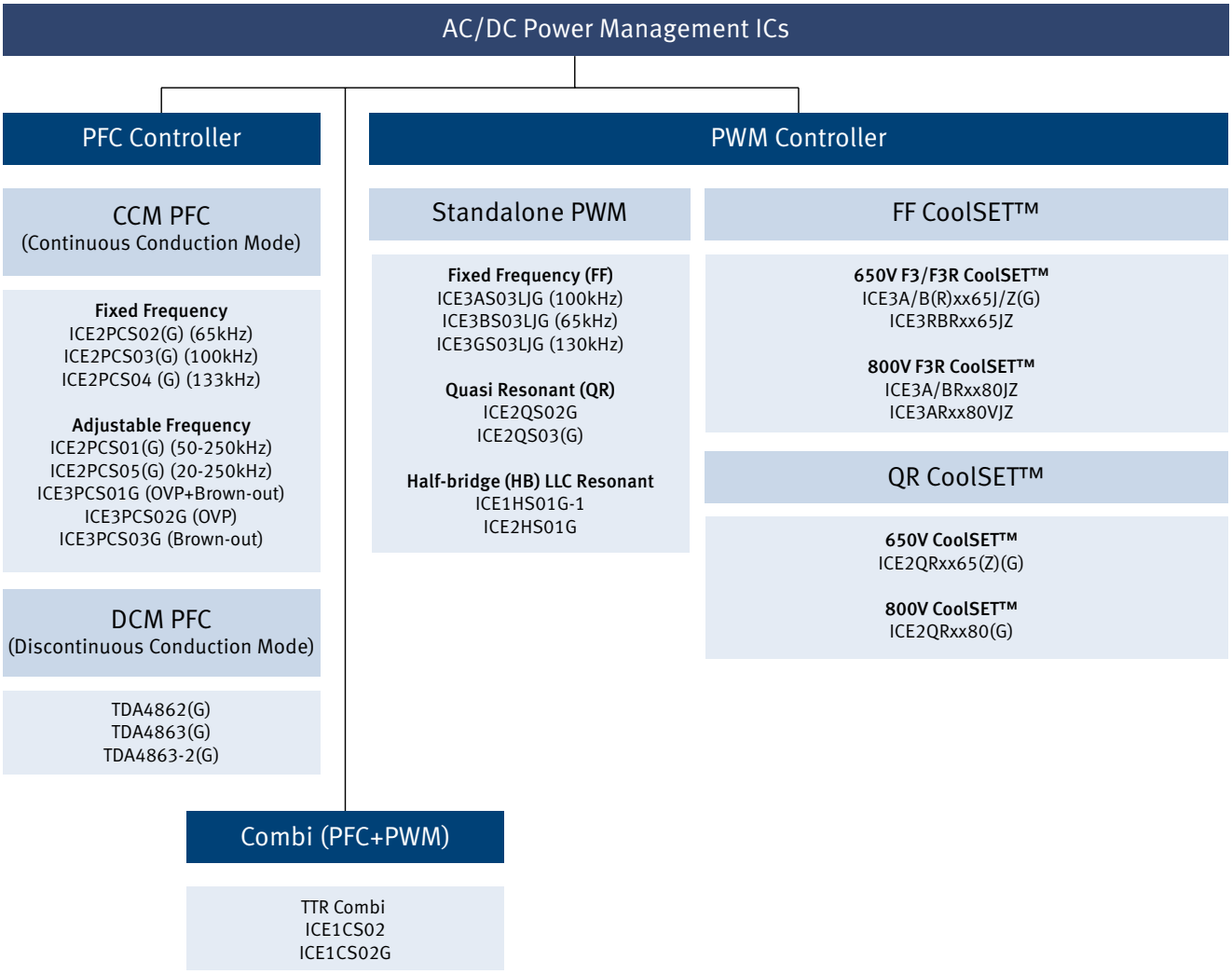
Where to Buy

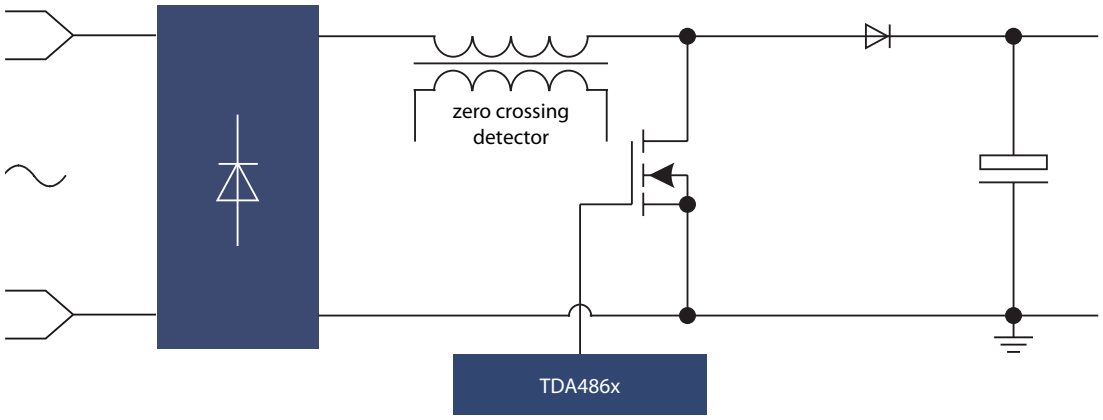
Power Management ICs

Technology Leadership in Power Supply



Power Factor Correction and Combo Controller

Discontinuous Conduction Mode PFC ICs



TDA4862 / TDA4862G

Power Factor Controller (PFC) IC for high-power factor and active harmonic filter

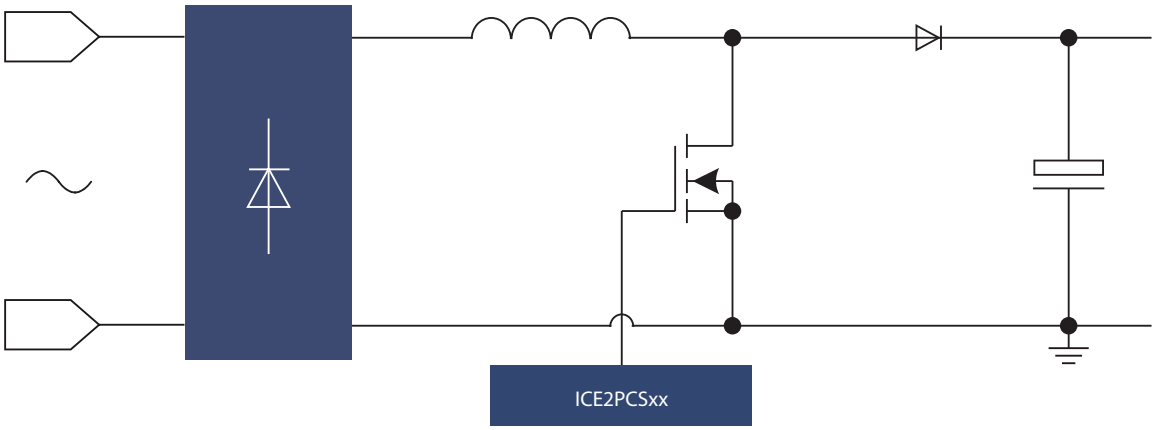
- IC for sinusoidal line-current consumption
- Power factor approaching 1
- Controls boost converter as an active harmonics filter
- Internal start-up with low current consumption
- Zero current detector for discontinuous operation mode
- High current totem pole gate driver
- Trimmed ±1.4% internal reference
- Undervoltage lock out with hysteresis
- Very low start-up current consumption
- Pin compatible with world standard
- Output overvoltage protection
- Current sense input with internal low pass filter
- Totem pole output with active shutdown during UVLO
- Junction temperature range -40°C to +150°C
- Available in DIP-8 and SO-8 packages

TDA4863-2/G

Power Factor Controller IC for high-power factor and low THD additional features to TDA4862

- Reduced tolerance of signal levels
- Improved light load behavior
- Open loop protection
- Current sense input with leading edge blanking LEB
- Undervoltage protection

Continuous Conduction Mode PFC ICs



2nd Generation Continuous Conduction Mode (CCM) Power Factor Correction IC Features

- Fulfills Class D Requirements of IEC 61000-3-2
- Lowest count of external components
- Adjustable and fixed switching frequencies
- Frequency range from 20kHz to 250kHz
- Versions with brown-out protection available
- Wide input range supported
- Enhanced dynamic response during load jumps
- Cycle by Cycle Peak Current Limiting
- Integrated protections OVP, OCP
- DIP8 and DSO8
- Leadfree, RoHS compliant

2nd Generation Continuous Conduction Mode (CCM) Power Factor Correction IC Product Portfolio

Product	$Frequency_{(sw)}$	Current Drives	Package
ICE2PCS01	50kHz-250kHz	2.0A	DIP-8
ICE2PCS02	65kHz	2.0A	
ICE2PCS03	100kHz	2.0A	
ICE2PCS04	133kHz	2.0A	
ICE2PCS05	20kHz-250kHz	2.0A	
ICE2PCS01G	50kHz-250kHz	2.0A	DSO-8
ICE2PCS02G	65kHz	2.0A	
ICE2PCS03G	100kHz	2.0A	
ICE2PCS04G	133kHz	2.0A	
ICE2PCS05G	20kHz-250kHz	2.0A	

3rd Generation Continuous Conduction Mode (CCM) Power Factor Correction IC Features

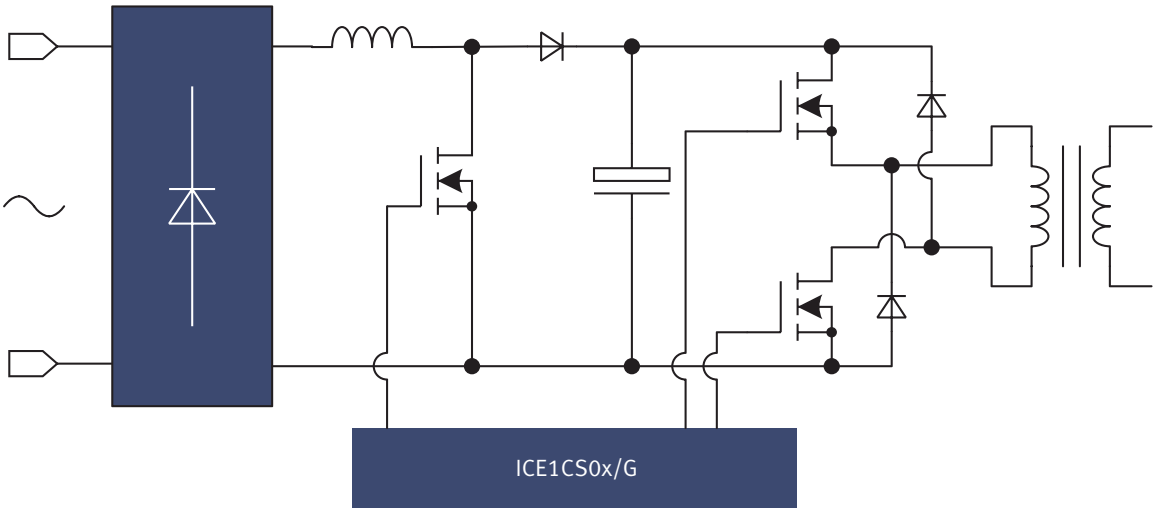
- Fulfills Class D Requirements of IEC 61000-3-2
- Integrated digital voltage loop compensation
- Boost follower function
- Bulk voltage monitoring signals, brown-out
- Multi protections such as Double OVP
- Fast output dynamic response during load jump
- External synchronization
- Extra low peak current limitation threshold
- SO8 and SO14
- Leadfree, RoHS compliant

Fixed Frequency PWM IC and CoolSET™ Product Portfolio

Product	$Frequency_{(SW)}$	Current Drives	Features	Package
ICE3PCS01G	Adjustable	0.75A	OVP+Brown-out	DSO-14
ICE3PCS02G		0.75A	OVP	DSO-8
ICE3PCS03G		0.75A	Brown-out	DSO-8

CCM PFC by feature	ICE2PCS01(G) ICE2PCS05(G)	ICE2PCS02(G) ICE2PCS03(G) ICE2PCS04(G)	ICE3PCS03G	ICE3PCS02G	ICE3PCS01G
Digital control voltage loop	–		✓	✓	✓
Variable frequency	✓	–	✓	✓	✓
Synchronous frequency	–		✓	✓	✓
Open loop protection	✓	✓	✓	✓	✓
Low peak current limit	-1	-1	-0,4	-0,4	-0,2
Brown out protection	–	✓	✓	–	✓
Over voltage protection	✓	✓	✓	✓	✓
Second over voltage protection	–			✓	✓
PFC enable function	–				✓
Boost follower mode	–				✓
5V regulator	–				✓

Combination of Continuous Conduction Mode PFC with Two-Transistor Forward PWM IC



- Pre-short protection
- Trimmed reference voltage ±2.5% (±2% at 25°C)
- BiCMOS technology for wider V_{CC} range

Power Factor Correction Block

- Fulfills Class D Requirements of IEC 61000-3-2
- Fixed switching frequency (sync to half PWM freq.)
- AC brown-out protection
- Average current control
- Max duty cycle of 95%
- Enhanced dynamic response for fast load response
- Unique soft-start to limit start up current
- Over-voltage protection

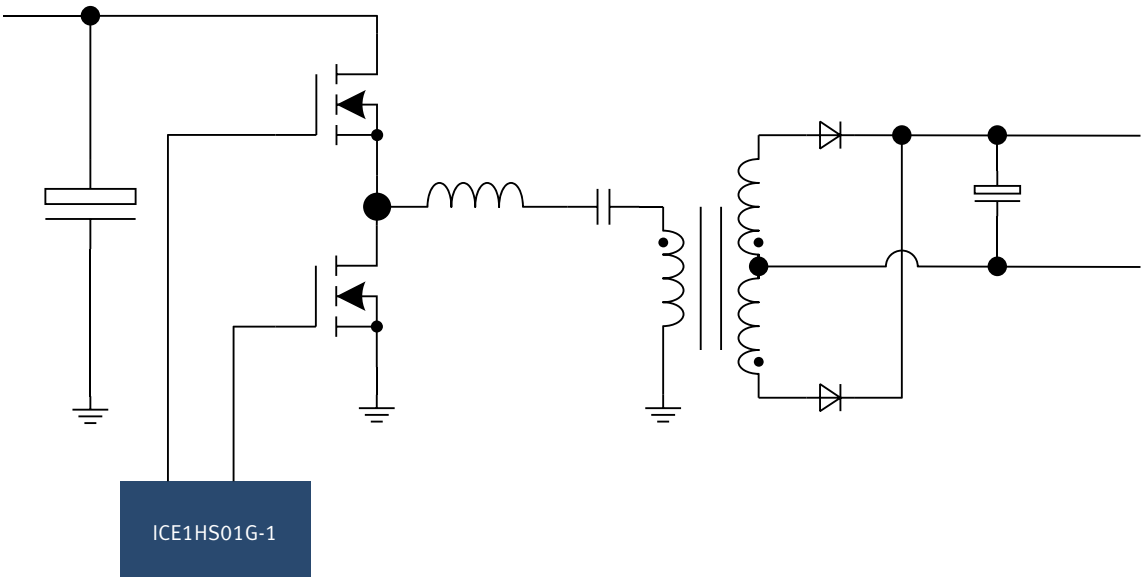
Pulse-Width-Modulation Block

- Fixed switching frequency
- Option for external control synchronization
- Built in soft start for higher reliability
- Max duty cycle 47% or 60%
- Overall tolerance of current limiting ‹±5%
- Internal leading edge blanking
- Slope compensation
- Fast, soft switching totem pole gate drive (2A)
- SO16 and DIP16
- Pb-free lead plating and RoHS compilant
- All protection features available

Product	$Frequency_{(SW)}$	Current Drives	Package
ICE1CS02	PFC=65kHz PWM=130kHz	2.0A	DIP-16
ICE1CS02G		2.0A	DSO-16

Resonant LLC Half-Bridge Controller IC

LLC Resonant (No SR)

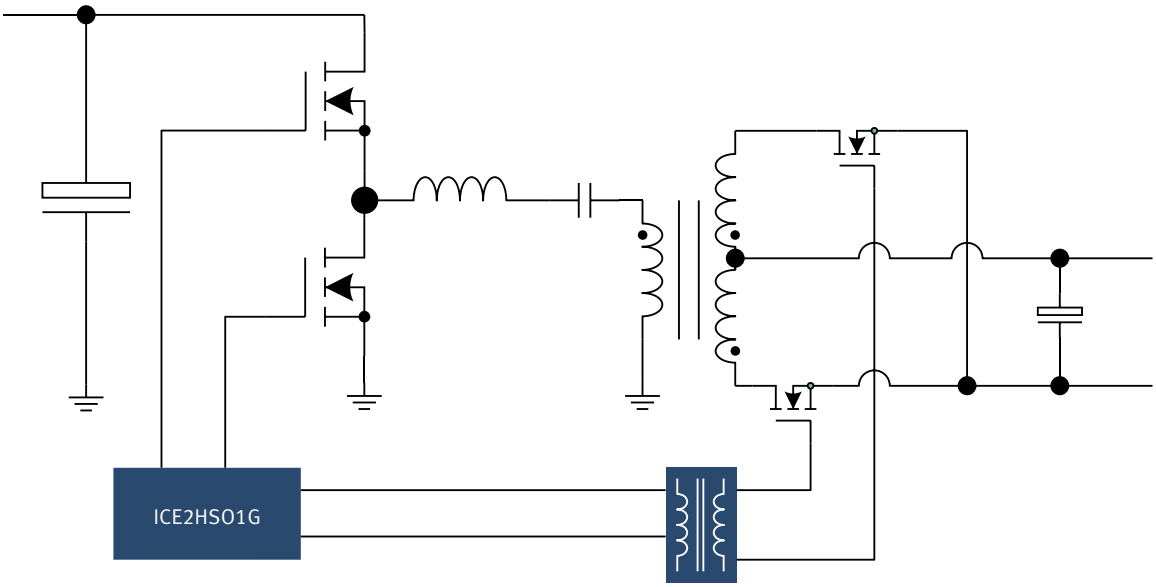


- Novel and simple design (12 components + HB driver)
- Minimum operating frequency is adjustable externally
- Burst mode operation for output voltage regulation during no load and/or bus over-voltage
- Multiple protections in case fault
- Input voltage sense for brown-out protection
- Open loop/over load fault detection by FB pin with auto-restart and adjustable blanking/restart time
- Frequency shift for over-current protection
- Lead Free, RoHS compliant package
- DSO-8 package

Product	Frequency$_{(SW)}$	Dead Time(ns)	Current Drives	Package
ICE1HS01G-1	30kHZ~600kHz	380	1.5A	DSO-8

Resonant LLC Half-Bridge Controller IC with Integrated Sychronised Rectifier Control

LLC Resonant + SR

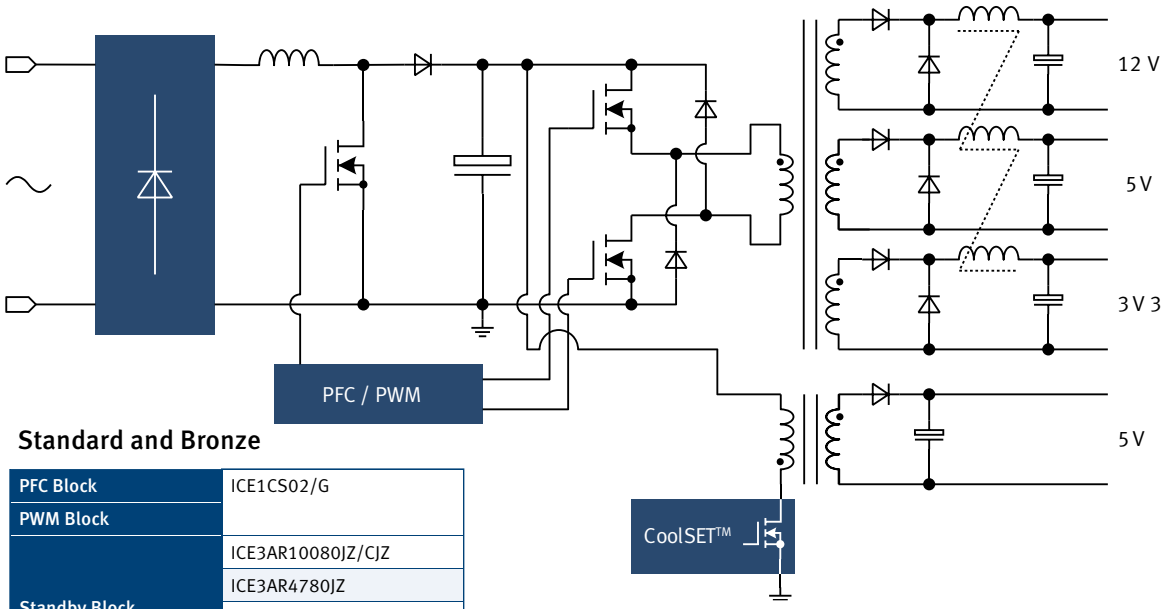


- Novel LLC/SR operation mode and controlled by primary side controller
- Multiple protections for SR operation
- Tight tolerance control
- Accurate setting of switching frequency and dead time
- Simple system design
- Optimized system efficiency
- Multiple converter protections: OTP, OLP, OCP, latch-off enable
- External disable for either SR switching or HB switching
- Lead free, RoHS compliant package
- DSO-20 package

Product	Frequency$_{(SW)}$	Dead Time(ns)	Current Drives	Package
ICE2HS01G	30kHz~1MHz	100~1000	0.3A	DSO-20

LLC Half-Bridge Controller IC	ICE1HS01G-1	ICE2HS01G
Package	DSO-8	DSO-20
Switching frequency range	up to 600kHz	up to 1MHz
LLC softstart	✓	✓
LLC Burst mode	✓	✓
Adjustable minium frequency	✓	✓
Over load/open loop protection	✓	✓
Mains undervoltage protection with hysteresis	✓	✓
Over current protection	2-level	3-level
Drive Signal for Synchro–us Rectification	–	✓
Adjustable Deadtime	–	✓
External latch-off and OTP	–	✓
Target Application	LCD-TV, Audio, etc.	Server, PC, LCD-TV, etc.

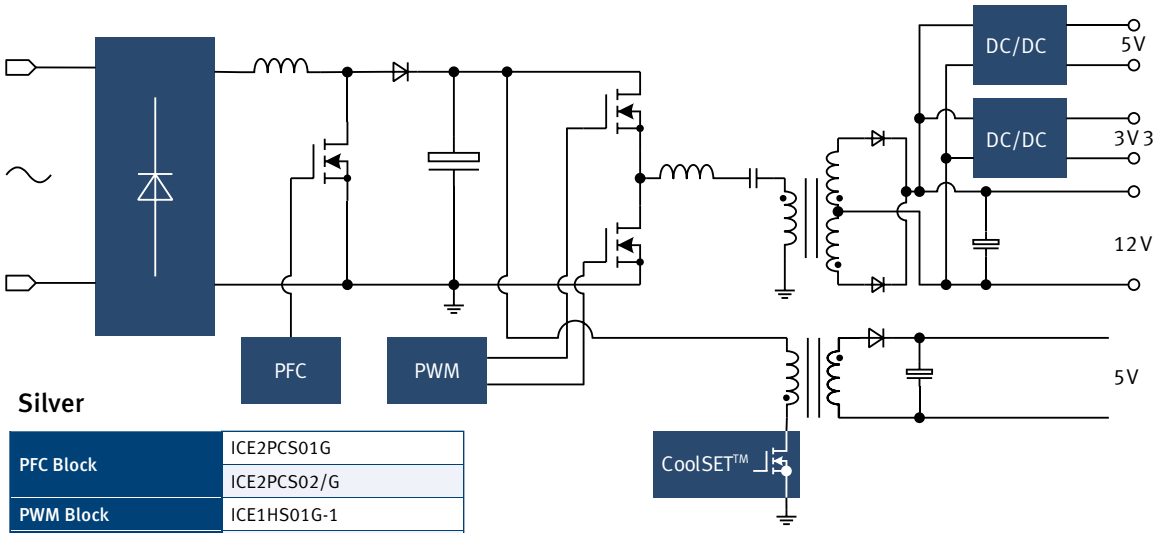
Climate Saver Standard and Bronze



Standard and Bronze

PFC Block	ICE1CS02/G
PWM Block	
Standby Block CoolSET™	ICE3AR10080JZ/CJZ
	ICE3AR4780JZ
	ICE3AR2280JZ/CJZ
	ICE3AR0680JZ
	ICE3AR4780CJZ

Climate Saver Silver



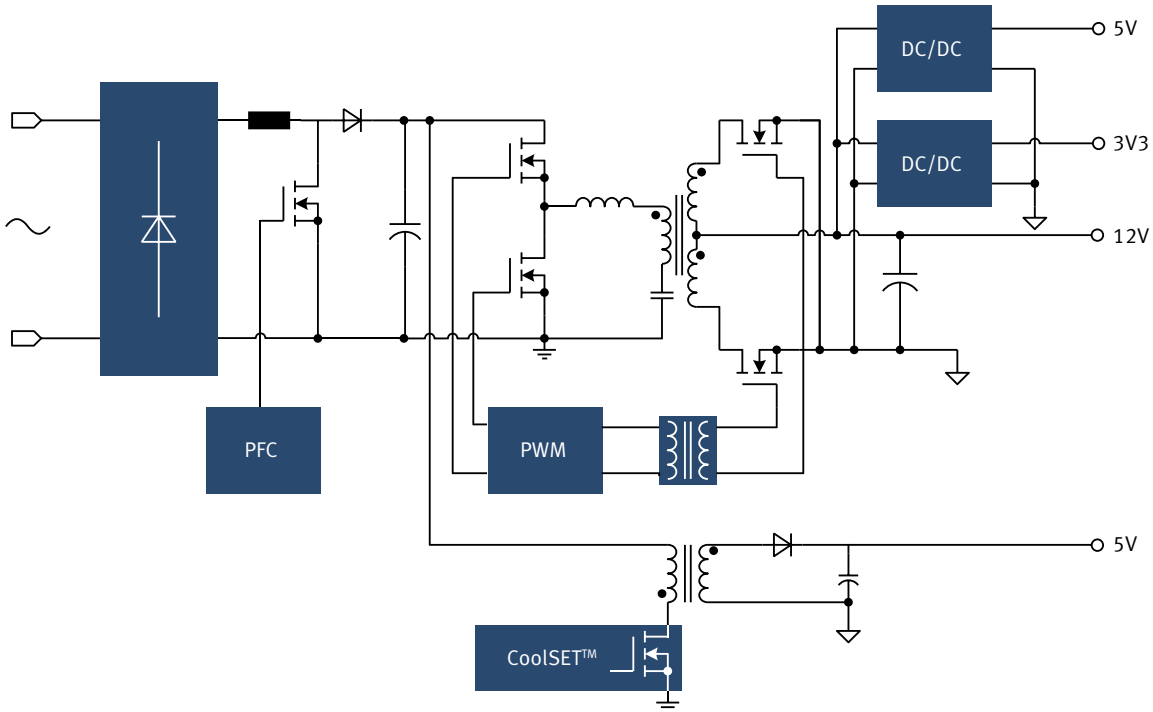
Silver

PFC Block	ICE2PCS01G
	ICE2PCS02/G
PWM Block	ICE1HS01G-1
Standby Block CoolSET™	ICE3AR10080JZ/CJZ
	ICE3AR4780JZ
	ICE3AR2280JZ/CJZ
	ICE3AR0680JZ
	ICE2QR4765
	ICE2QR1765
	ICE2QR0665
	ICE3AR4780CJZ

Climate Saver Gold

Climate Saver 80 PLUS® Platinum

Certification for Infineon's Silverbox reference design



Gold

PFC Block	ICE3PCS01G
	ICE3PCS02G
	ICE3PCS03G
PWM Block	ICE2HS01G
Standby Block CoolSET™	ICE3AR10080JZ/CJZ
	ICE3AR4780JZ
	ICE3AR2280JZ/CJZ
	ICE3AR0680JZ
	ICE3BR2280JZ
	ICE3BR0680JZ
	ICE3AR4780CJZ

80 PLUS® Platinum

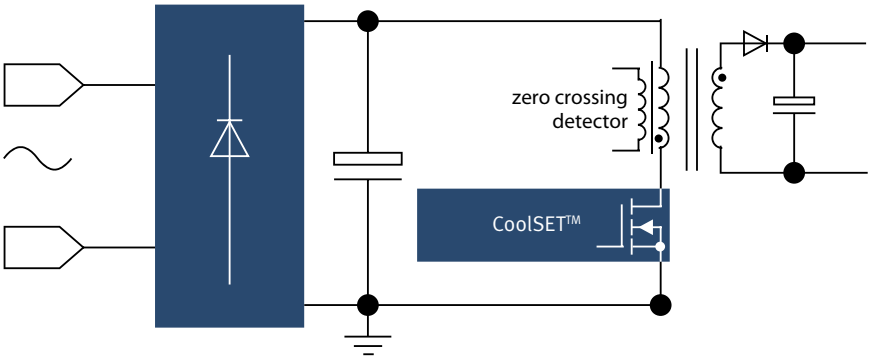
Certification for Infineon's Silverbox reference design

PFC Block	ICE3PCS01G
	ICE3PCS02G
	ICE3PCS03G
PWM Block	ICE2HS01G
Standby Block CoolSET™	ICE2QR4780Z
	ICE2QR2280Z - 1
	ICE2QR0680Z
	ICE2QR2280G-1

For further information visit www.infineon.com/silverbox

Isolated AC/DC

Quasi-resonant PWM IC and CoolSET™ Features



- Integrated CoolMOS™ with startup cell
- Quasi-resonant operation with Digital Frequency Reduction
- High average efficiency over wide load range
- Stable operation without jittering/audible noise problem
- Active burst mode operation for very low stby losses (to achieve standby power ‹50mW)
- Auto restart mode for V_{CC} under-voltage/over-voltage protection
- Auto restart mode for open-loop and output overload protection
- Auto restart mode for over-temperature protection
- Latch-off mode for output over-voltage, short-winding
- BiCMOS technology (controller) for wide V_{CC} operation and low IC power consumption
- Peak power limitation with input voltage compensation
- Minimum switching frequency limitation (no audible noise on power units on/off)
- DIP & DSO package (for controllers and CoolSET™)

Halogen-Free RoHS

Quasi-resonant PWM IC and 650V CoolSET™

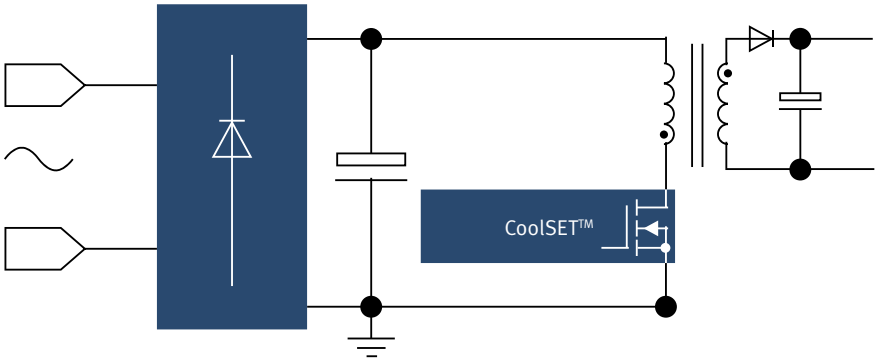
P_{out} [1] (85 … 265V_{AC}) / $R_{DS(on)}$		14~15W	23~26W	34W	38~42W
		4.7Ω	1.7Ω	1.0Ω	0.6Ω
Package	PWM Only	650V Depletion CoolMOS™			
DIP-7		ICE2QR4765Z	ICE2QR1765Z	ICE2QR1065Z	ICE2QR0665Z
DIP-8	ICE2QS03	ICE2QR4765 ICE2QR4765-T	ICE2QR1765		ICE2QR0665
DSO-8	ICE2QS02G ICE2QS03G				
DSO-12		ICE2QR4765G	ICE2QR1765G		ICE2QR0665G

Quasi-resonant CoolSET™ 800V

P_{out} [1] (85 … 265V_{AC}) / $R_{DS(on)}$	18W	24W	47W
	4.7Ω	2.2Ω	0.6Ω
Package	800V Depletion CoolMOS™		
DIP-7	ICE2QR4780Z	ICE2QR2280Z ICE2QR2280Z-1	ICE2QR0680Z
DSO-12		ICE2QR2280G ICE2QR2280G-1	

[1] Output power assume 78~83% efficiency. T_a=50°C, T_j=125°C and no copper area for 650V device and 232mm² copper area for 800V device.

Fixed Frequency PWM IC and CoolSET™ Features



- Active Burst Mode to achieve the lowest standby power requirements < 50mW
- Optional latched off mode (L) to increase robustness and safety of the system
- Adjustable blanking window for high load jumps to increase reliability
- DCM, CCM
- Startup cell switched off after start up
- 65kHz/100kHz/130kHz internally fixed switching frequency
- Over-temperature, over-voltage, short-winding, overload and open-loop, V_{CC} under-voltage, (Brown-out) protections, fast AC reset, input over-voltage protection
- Fixed softstart time
- Overall tolerance of current limiting < ±5%
- Internal leading edge blanking time
- Max duty cycle 72%
- DIP, DSO and FullPAK packages

Halogen-Free RoHS

Fixed Frequency PWM IC and CoolSET™ 650V

P_{out} [1] (85 … 265V_{AC}) / $R_{DS(on)}$		11~12W	13~14W	18W	24~25W	34W	39~40W	61 W ~138W
		6.5Ω	4.7Ω	3.0Ω	1.7Ω	1.0Ω	0.6Ω	2.5Ω/1.4Ω/1.0Ω/0.6Ω
Package	PWM Only	650V Depletion CoolMOS™						
DIP-7			ICE3RBR4765JZ		ICE3RBR1765JZ		ICE3RBR0665JZ	
DIP-8		ICE3B0365J ICE3B0365J-T	ICE3BR4765J	ICE3A1065ELJ	ICE3BR1765J	ICE3A2065ELJ ICE3BR1065J	ICE3BR0665J	
DSO-8	ICE3AS03LJG ICE3BS03LJG ICE3GS03LJG							
DSO-12		ICE3B0365JG	ICE3BR4765JG					
TO-220 FullPAK								ICE3BR2565JF (61W) (2.5Ω) ICE3BR1465JF (77W) (1.4Ω) ICE3BR1065JF (93W) (1.0Ω) ICE3BR0665JF (138W) (0.6Ω)

Fixed Frequency PWM IC and CoolSET™ 800V

P_{out} [1] (85 … 265V_{AC}) / $R_{DS(on)}$	11W	16W	22W	30W	37W	43W
	10.0Ω	4.7Ω	2.2Ω	1.5Ω	1.0Ω	0.6Ω
Package	800V Depletion CoolMOS™					
DIP-7	ICE3AR10080JZ ICE3AR10080JZ-T ICE3AR10080CJZ	ICE3AR4780JZ ICE3AR4780VJZ ICE3AR4780CJZ	ICE3AR2280JZ ICE3AR2280JZ-T ICE3AR2280CJZ ICE3AR2280VJZ ICE3BR2280JZ ICE3BR2280JZ-T	ICE3AR1580VJZ	ICE3AR1080VJZ	ICE3AR0680JZ ICE3AR0680VJZ ICE3BR0680JZ

[1] Output power assume 76~83% efficiency. T_a=50°C, T_j=125°C and no copper area

Fixed Frequency PWM IC

FF PWM IC	ICE3AS03LJG	ICE3BS03LJG	ICE3GS03LJG
Package	DSO-8		
Operating temperature	-25°C ~ 130°C		
Switching frequency	100kHz	65kHz	130kHz
Max V_{CC} voltage	27V		
V_{CC} on/off threshold	18V / 10.5V		
Soft start time	10ms	20ms	10ms
Gate drive capability	-0.17A / 0.39A		
Jitter feature for low EMI	√		
Modulated gate drive	√		
Active burst mode	√		
Over load/Open loop	auto restart		
V_{CC} under voltage/ Short opto-coupler	auto restart		
Short winding/Short diode	latch off		
V_{CC} over voltage	latch off		
Over temperature	latch off		
External protection enable pin	latch off		

Quasi-Resonant PWM IC

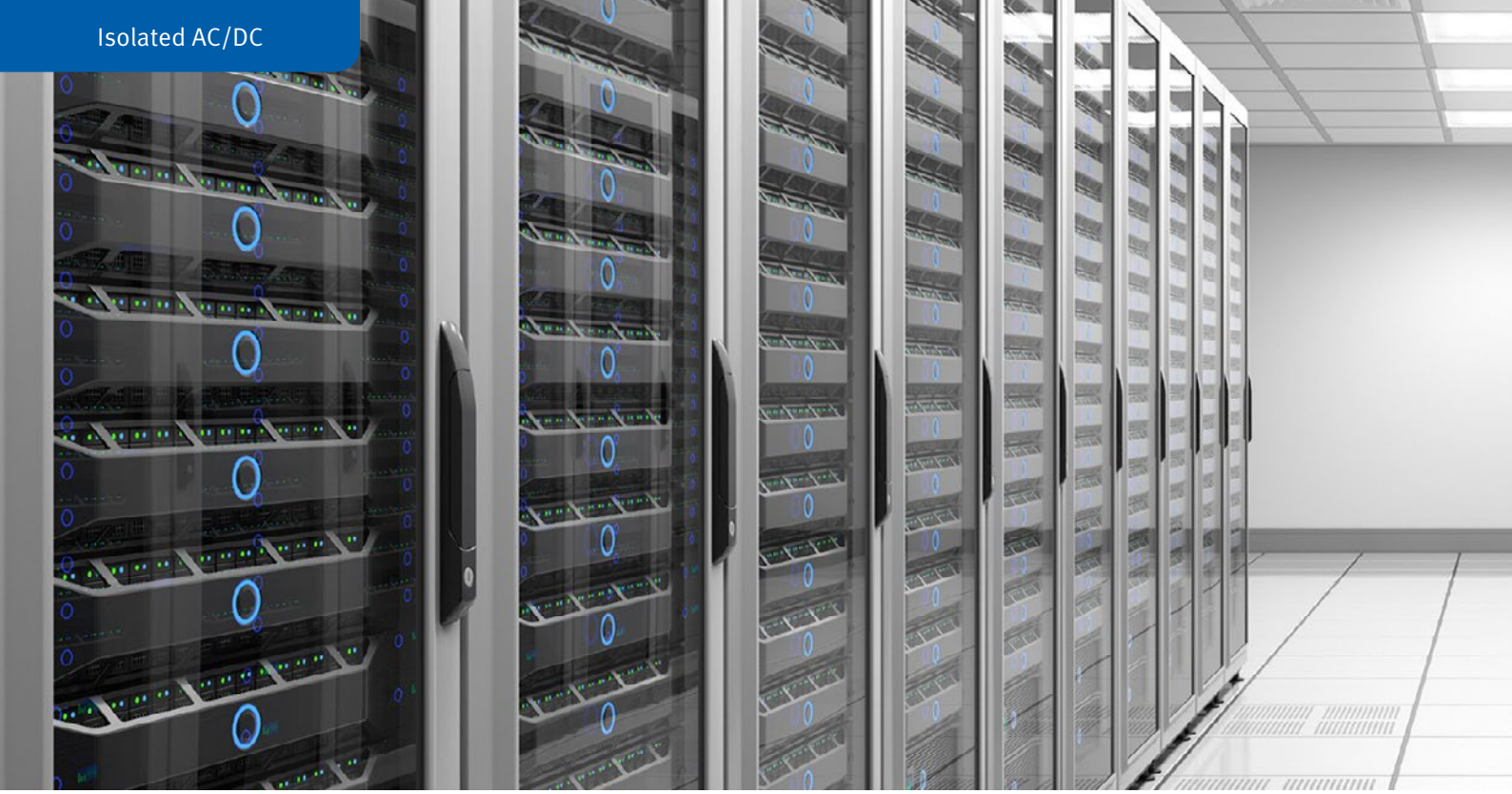
Feature	ICE2QS02G	ICE2QS03	ICE2QS03G
Package	DSO-8	DIP-8	DSO-8
Operating temperature	-25°C ~ 130°C	-25°C ~ 130°C	-40°C ~ 130°C
Startup Cell	–	✓	
V_{CC} on/off	12V / 11V	18V / 10.5V	
Power Saving during standby	–	Yes, ABM 52kHz	
Digital Frequency Reduction for high average efficiency	✓	✓	
OLP blanking time	Adjustable	Fixed	
Auto restart timer	Setting with external components	Through V_{CC} charging/discharging	
Maximum input power limitation	Adjustable through ZC resistor	Adjustable through ZC resistor	
Adjustable output overvoltage protection with Latch mode	Yes with V_{ZCOVP}=4.5V	Yes, with V_{ZCOVP}=3.7V	
Brownout feature	✓	–	
Target Application	Aux-power supply to V_{CC} Eg. LCD TV multi/main, Audio main, PDP TV multi/address	Self-power supply to V_{CC} e.g. Notebook/Netbook Adapters, LCD TV Multi, CRT TV, Audio, DVD	Self-power supply to V_{CC} e.g. Notebook/Tablet Adapters, LCD TV Mulit, CRT TV, Audio, DVD, Smart Meter, Industrial applications

Quasi-resonant CoolSET™

	650V CoolSET™		800V CoolSET™	
	ICE2QRxx65/Z/G	ICE2QRxx65-T	ICE2QRxx80Z/G	ICE2QRxx80Z/G-1
Package	DIP-8/DIP-7/DSO-16/12	DIP-8	DIP-7 / DSO-16/12	DIP-7 / DSO-16/12
CoolMOS™ rating	650V[1]		800V	
$R_{D(on)}$	0.65/1.0/1.7/ 4.7Ω	4.7Ω	0.65/2.2/4.7Ω	2.2Ω
Output power[2]	14 ~ 42W	15W	18 ~ 47W	24W
Operating temperature	-25°C ~ 130°C	-40°C ~ 130°C	-25°C ~ 130°C	
V_{CC} on/off	18V / 10.5V			18V / 9.85V
Power Saving during standby	Yes, ABM 52kHz			
Digital Frequency Reduction for high average efficiency	√			
OLP blanking time	Fixed			
Auto restart timer	Through V_{CC} chg/dischg			
Maximum input power limitation	Adjustable through ZC resistor			
Adjustable output overvoltage protection with Latch mode	Yes, with VZCOVP=3.7V			
Product Available	ICE2QR4765 ICE2QR4765Z ICE2QR4765G ICE2QR1765 ICE2QR1765Z ICE2QR1765G ICE2QR1065Z ICE2QR0665 ICE2QR0665Z ICE2QR0665G	ICE2QR4765-T	ICE2QR4780Z ICE2QR2280Z ICE2QR2280G ICE2QR0680Z	ICE2QR2280Z-1 ICE2QR2280G-1

DFR= digital frequency Reduction, PPR= Peak Power Limitation/Control

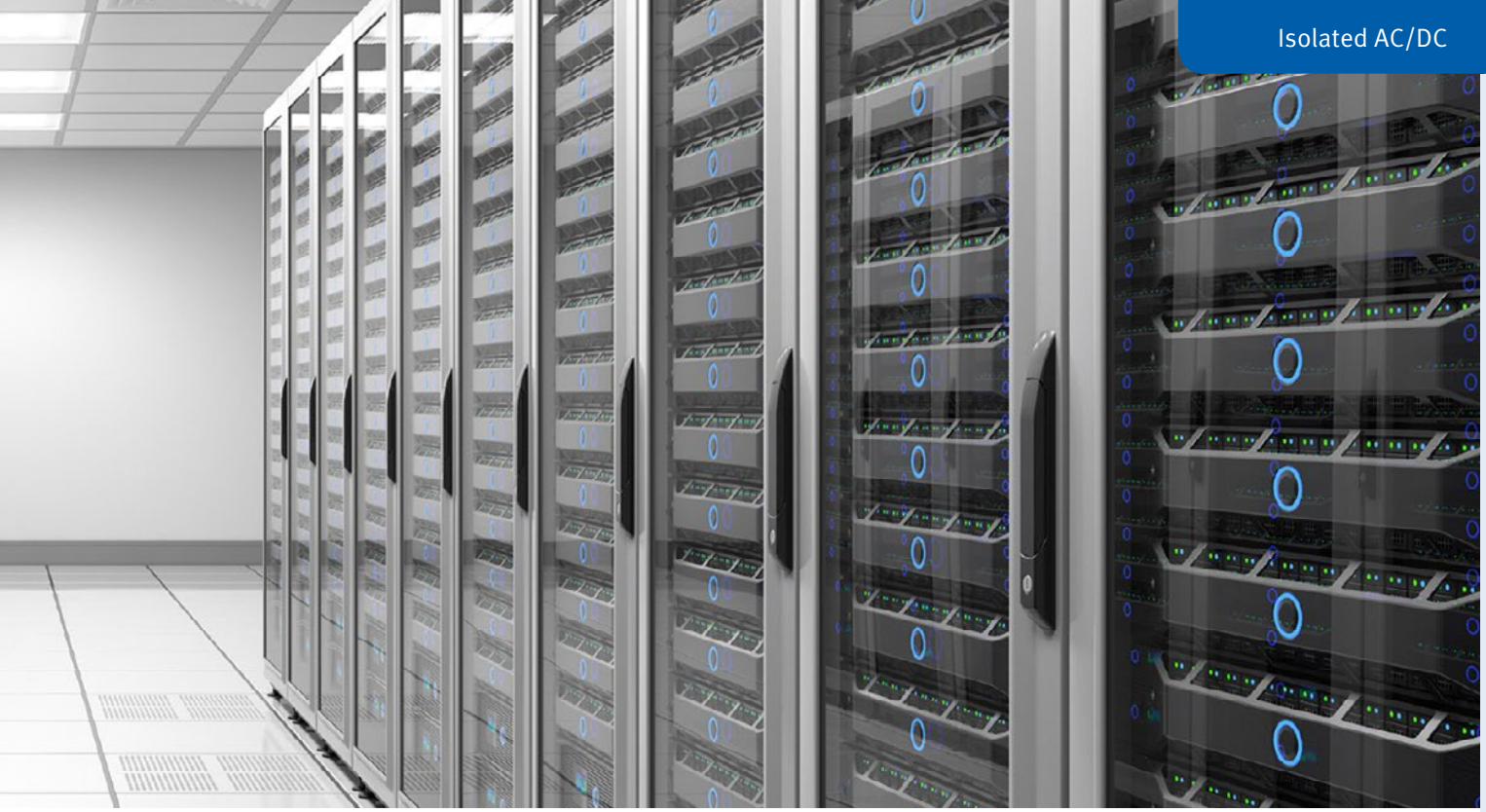
[1] Output power assume 78~83% efficiency. Ta=50°C, Tj=125°C and no copper area for 650V device and 232mm2 copper area for 800V device.



Fixed Frequency CoolSET™

	650V CoolSET™					
	F3(Jitter) ICE3Bxx65J(G)	F3(Latch & Jitter) ICE3Axx65ELJ	F3R ICE3BRxx65J(G)	F3R(FullPAK) ICE3BRxx65JF	F3R ICE3RBRxx65JZ	F3(Jitter) ICE3B0365J-T
Package	DIP-8, DSO-16/12	DIP-8	DIP-8, DSO-16/12	TO220(FullPak)	DIP-7	DIP-8
Output power range [1]	11W ~ 12W	18W~34W	13W ~ 40W	61W ~ 138W	13W ~ 40W	11W
MOSFET (rugged avalanche capability)	650V					
Min. Operating temperature	-25°C				-40°C	
Switching frequency	67kHz	100kHz	65kHz	67kHz	65kHz	67kHz
Max V_{cc} voltage	27V					
V_{cc} on/off threshold	18V / 10.3V	18V / 10.5V				18V / 10.3V
Jitter feature for low EMI	✓ (by CSOFTS)	✓				✓ (by CSOFTS)
Modulated gate drive	–	✓				–
Soft start time	by CSOFTS	20ms				by CSOFTS
Active burst mode selection	1 level					
Over load/Open loop	Auto Restart					
V_{cc} under voltage/ Short opto-coupler	Auto Restart					
V_{cc} over voltage	Auto Restart	Latch	Auto Restart			
Over temperature	Auto Restart	Latch	Auto Restart			
External protection enable pin	–	Latch	Auto Restart			–
Brownout	–					
Input OVP	–					
Fast AC reset	–					
Slope compensation for CCM mode	–					
Product Available	ICE3B0365J ICE3B0365JG	ICE3A1065ELJ ICE3A2065ELJ	ICE3BR4765J ICE3BR1765J ICE3BR1065J ICE3BR0665J ICE3BR4765JG	ICE3BR2565JF ICE3BR1465JF ICE3BR1065JF ICE3BR0665JF	ICE3RBR4765JZ ICE3RBR1765JZ ICE3RBR0665JZ	ICE3B0365J-T

[1] Output power assume 76~83% efficiency. T_a=50°C, T_j=125°C and no copper area



800V CoolSET™					
F3R 800V ICE3ARxx80JZ	F3R 800V ICE3BRxx80JZ	F3R CCM 800V ICE3ARxx80CJZ	F3R 800V ICE3ARxx80JZ-T	F3R 800V ICE3BRxx80JZ-T	F3R 800V ICE3ARxx80VJZ
DIP-7					
11W ~ 43W		11W~22W	11W~22W	11W	11W ~ 43W
800V					
-25°C			-40°C		
100kHz	65kHz	100kHz	100kHz	65kHz	100kHz
27V					
17V / 10.5V					
✓					
YES (with 50Ω gate turn on resistor)					
10ms					
4 levels		3 levels	4 levels		
Auto Restart					
Auto Restart					
Auto Restart					
Auto restart with hysteresis					
Auto Restart		Latch	Auto Restart		–
✓					–
–					✓
–		✓	–		
–		✓	–		
ICE3AR10080JZ ICE3AR4780JZ CE3AR2280JZ ICE3AR0680JZ	ICE3BR2280JZ ICE3BR0680JZ	ICE3AR10080CJZ ICE3AR4780CJZ ICE3AR2280CJZ	ICE3AR10080JZ-T ICE3AR2280JZ-T	ICE3BR2280JZ-T	ICE3AR4780VJZ ICE3AR2280VJZ ICE3AR0680VJZ ICE3AR1080VJZ ICE3AR1580VJZ

Non-Isolated DC/DC

MOSFET GateDriver IC

The new OptiMOS™ Driver products PX3517 and PX3519 are high speed Drivers, designed to drive a wide range of dual high side and low side n-channel power MOSFETs in applications such as Computing and Telecom Point of Load (PoL).

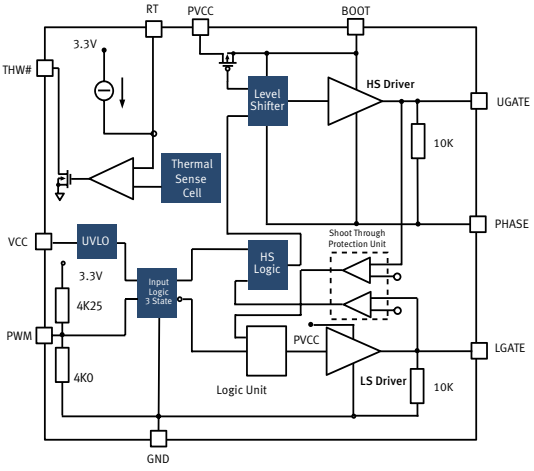
Combining the new devices with the Primarion/Infineon Digital Multi-phase Controllers IC family and Infineon n-channel MOSFETs, the new devices form a complete core-voltage regulator solution for advanced micro and graphic processors as well as point-of-load applications.

To tailor the efficiency of the system based on the customer conditions and needs, the OptiMOS™ Driver devices provide the capability of driving the high-side gate and low-side gate with a variable gate driving voltage ranging from 4.5V up to 8V.

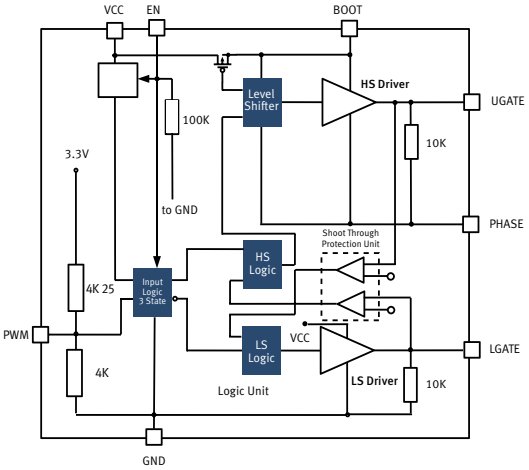
General Features

- High frequency operation up to 1.2MHz
- Wide V_{CC} input voltage range from 4.5V to 8V
- Capability to drive MOSFET at 50A continuous current per phase
- Wide input voltage range: up to 16V
- Low power dissipation
- Includes bootstrap diode
- Adaptive shoot through protection
- Compatible with standard + 3.3V PWM controller ICs
- Tri-state PWM input functionality
- RoHS compliant

PX3517 offers a thermal warning report function.



PX3519 features a Gate disable pin (EN) for low power consumption.



Gate driver	PX3517	PX3519
Package	3mm x 3mm TDSON-10	3mm x 3mm VDSON-8
RoHS compliant	Y	Y
Max. Junction temperature	-25°C to 125°C	-25°C to 125°C
Supply voltage and driving voltage, V_{CC}	+4.5V to 8V	+4.5V to 8V
Boot to gnd	30	30
PWM inputs	tri-state compatibility	tri-state compatibility
Quiescent current iq	660µA	780µA
Features	thermal warning	driver enable pin

6 x 6 IQFN High-Performance DrMOS (Driver+MOS)

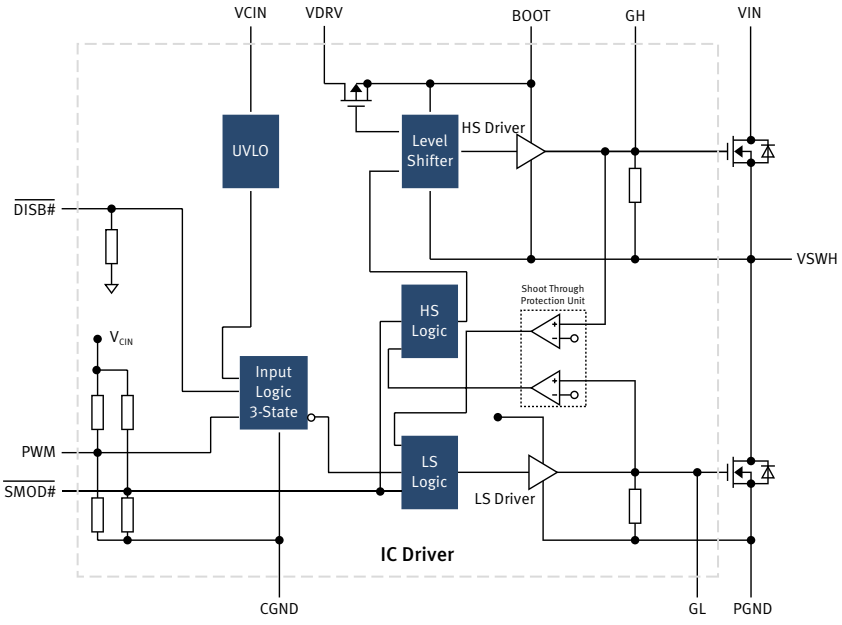
TDA21220

Features

- Intel compliant DrMOS, Power MOSFET and Driver in one package
- For Synchronous Buck - step down voltage applications
- Wide input voltage range 5V ... 16V
- High efficiency
- Extremely fast switching technology for improved performance at high switching frequencies
- Remote driver disable function
- SMOD–switching modulation of low side MOS
- Extremely robust switch node -10 ... 25V in noisy applications
- Includes active PMOS
- Adaptive Gate Drive for shoot through protection
- 5V high and low side driving voltage
- Compatible to standard PWM controller ICs with 3.3V and 5V logic
- Tri-State functionality
- Small package: IQFN-40 (6 x 6 x 0.8 mm³)
- RoHS compliant (Pb Free)

	TDA21220
Input voltage range	5V...16V
SMOD function	supported
Thermal warning/shutdown	-
Max average load current	50A
MOSFET breakdown voltage	25V
PWM levels	compatible +3.3V / +5V (tolerant)
shoot through protection	included

DrMOS application diagram



DrBlade

The Revolutionary Next Packaging Generation

Infineon has launched the revolutionary Blade chip embedding technology. DrBlade contains the latest generation low voltage DC/DC Driver technology and OptiMOS™ MOSFET devices.

Features

- Compatible to Intel® VR12 Driver and MOSFETs Module (DrMOS) functionality
- High current capability 40A
- Capable of operating up to 1.2MHz switching frequency
- Fast switching technology for improved performance (93% peak efficiency at 1.2V)
- Small package size and low profile: 5x5x0.5mm³
- Optimized footprint for DC/DC converter layout and improved cooling to the PCB
- Low thermal resistance to the top side
- RoHS compliant and halogen free
- Compatible to standard +3.3 V PWM controller

Applications

- High performance desktop, notebook and server DCDC converters
- Single Phase and Multiphase DCDC point of load (PoL) converters
- CPU/GPU voltage regulation in Desktop Graphics Cards, DDR Memory, Graphic Memory
- High Power Density Voltage Regulator Modules (VRM)
- Telecom VR

TDA21320/ TDA21321

Features

- Temperature reporting and over temperature protection
- High side short protection
- Over-current protection
- Shoot-through protection
- Under voltage lockout
- Boot switch included
- Low side-off function

	TDA21320[1)]	TDA21321[1)]
Input voltage	16V	16V
SMOD function	included	included
Temperature reporting and overtemperature protection	included	included
Max average load current	60A	30A
Maximum MOSFET BVDSS voltage	25V	25V
PWM levels	+3.3V	+3.3V
Shoot through protection	included	included

[1)] to be released Q3/Q4 2014

Digital Controllers for Point-of-Load Power Management

Infineon's Digital Multi-phase and Multi-rail Controllers provide power for today's medium and high current PoL applications used in Telecom/Datacom and Server & Storage environments. Infineon's Digital Controller family enables OEMs and ODMs to improve efficiency and total cost of ownership while increasing power density and optimizing the total system footprint of the voltage regulator. The PX7247, PX7241, PX7242 and PX7141 are the first products out of our 3rd generation Digital Controller family and support up to 2 rails with up to 3 phases on each rail. The I2C/PMBus interface connects the digital controllers to the application system and provides real time telemetry information, monitoring and control capabilities. The digital controllers are fully configurable through our PowerCode™ graphical user interface that allows for easy to use and simplified design optimization.

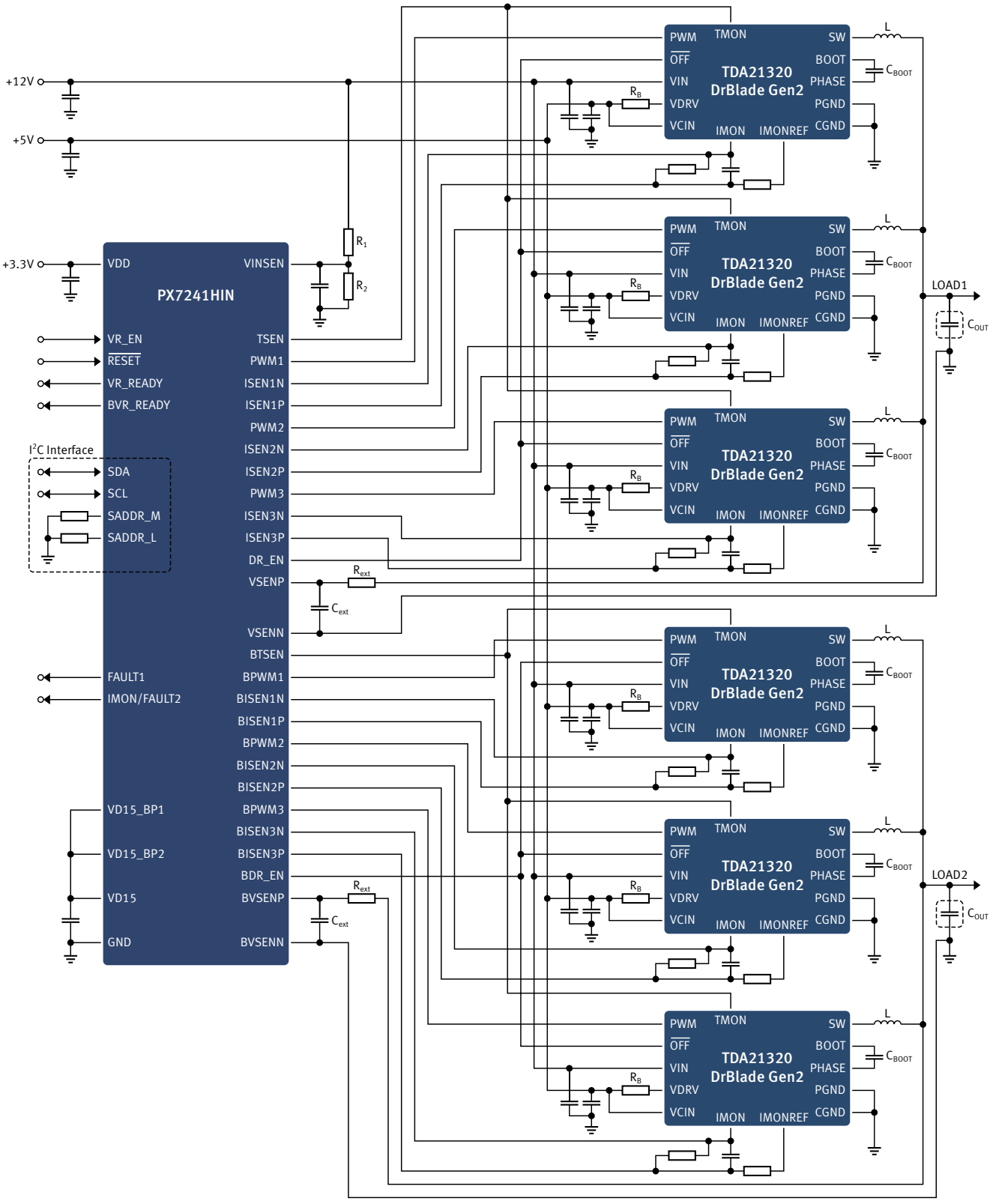
Multiple phase configurations are supported for best power optimization:

Part No.	PMBus	PX7247HIN	PX7241HIN	PX7242HIM	PX7141HIM
Phase Configuration	Single Rail	Up to 6+0	Up to 3+0	1+0	1+0
	Dual Rail	Up to 6+1	Up to 3+3	1+1	n.a.
V_{out_max}	PoL Mode	5V	5V	5V	5V
Temperature range		-40°C...85°C	-40°C...85°C	--40°C...85°C	-40°C...85°C
Switching Frequency		Up to 2 MHz	Up to 2 MHz	Up to 2 MHz	Up to 2 MHz
VQFN Package		48-lead (6mm x 6mm) 0.4mm pitch	48-lead (6mm x 6mm) 0.4mm pitch	40-lead (5mm x 5mm) 0.4mm pitch	40-lead (5mm x 5mm) 0.4mm pitch

Advantages of a Digital Controller

Protection features include a set of sophisticated over-voltage, under-voltage, over-temperature, and over-current protections. PX7247, PX7241, PX7242 and PX7141 also detect and protect against an open circuit on the remote sensing inputs. These attributes provide a complete and advanced protection feature set for microprocessor, DSP, FPGA or ASIC power systems. Accurate current sense telemetry is achieved through internal calibration that measures and corrects current sense offset error sources upon startup. Programmable temperature compensation provides accurate current sense information even when using DCR current sense.

Typical Point-of-Load Application



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Where to Buy

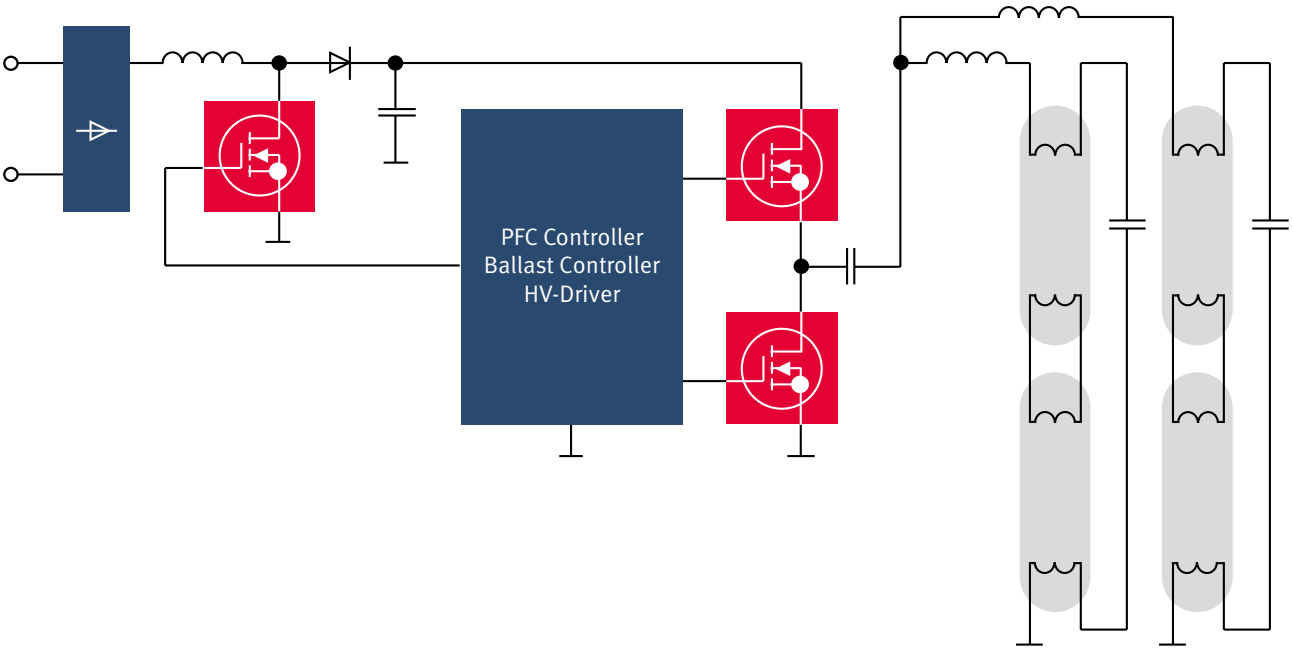
Lighting ICs

LED Driver for General Lighting

Smart FL Ballast Controller

Smart Ballast Control ICs from Infineon integrate all functions required to operate FL lamps such as preheat-, ignition- and run- mode and protection features. Digital mixed-signal power control is employed enabling speedy, cost effective and stable ballast designs with a minimum number of external components. Reliable and robust high voltage isolation is achieved using Infineon's proprietary Coreless Transformer Technology (CLT).

- Integrated high performance PFC Stage
- Intelligent digital/mixed signal power control
- Integrated high voltage half bridge driver
- All parameters set using only resistors
- Highly accurate timing and frequency control over a wide temperature range



ICB2FL01G

Infineon's 2nd Generation Smart Ballast Controller ICB2FL01 G is designed to control a fluorescent lamp ballast including

- Power Factor Correction (PFC)
- Lamp Inverter Control and
- High voltage level-shift half bridge driver with Coreless Transformer Technology

Short Form Data	min.	typ.	max.
Package		SO-19	
Operating voltage range	10V	–	17.5V
Turn-on threshold	–	14V	
Supply current during UVLO and fault mode	–	110µA	170µA
Operating frequency of inverter during RUN mode	20kHz	–	120kHz
Operating frequency of inverter during preheating mode	F_{RFRUN}	–	150kHz
Preheating time	0ms	–	2500ms
Adjustable self-adapting dead time max between LS and HS gate drive	2.25µs	2.50µs	2.75µs
Adjustable self-adapting dead time min between LS and HS gate drive	1.00µs	1.25µs	1.50µs
Operating voltage range of floating HS gate drive	-900V	–	+900V
LS Current limitation threshold: Ignition/start up/soft start/pre run	1.5V	1.6V	1.7V
LS Current protection threshold during RUN mode and preheating	0.75V	0.80V	0.85V
End-of-life detection threshold	-40µA	–	+40µA
Detection of –n-ZVS operation CapMode 1 & 2	–	–	–
PFC preconverter control with critical and discontinuous CM	–	–	–
Maximum controlled on-time	18µs	22.7µs	26µs
Hysteresis of zero current detector	–	1.0V	–
PFC Current limitation threshold	–	1.0V	–
Reference voltage for control of bus voltage	2.47V	2.5V	2.53V
Overvoltage detection threshold	2.68V	2.73V	2.78V
Undervoltage detection threshold	1.835V	1.88V	1.915V
Open loop detection	0.237V	0.31V	0.387V
Junction operating temperature range	-25°C	–	+125°C
Pb-free lead plating RoHS compliant	–	–	–

Smart Ballast Controller

ICB2FL01 G

Features

- Able to handle lamp chokes with higher saturation behavior
- Special in-circuit test mode for faster test time
- Excellent dynamic PFC performance enables very low THD across wide load ranges
- Separate adjustable levels of lamp overload and rectifier effect detection
- Adjustment of the preheat time
- No high voltage capacitor required for detection of lamp removal (capacitive mode operation)
- Automatically restarts by surge and inverter overcurrent events
- Skipped preheating when line interruption ‹ 500ms
- Self adapting dead time adjustment of the half bridge driver
- One single restart at fault mode

Benefits

- Optimized lamp choke size and reduced BOM costs
- Dramatically reduced time for key tests such as end of life detection, preheat/ignition timeout and pre run operation modes
- Suitable for dimming and multi-power ballasts
- Enables ballast compatibility with a wider range of lamp types
- Flexible support of both current and voltage mode preheating
- Reduced BOM costs
- Intelligent discrimination between surge & half bridge overcurrent events
- Meets standards for emergency lighting (according to DIN VDE 0108)
- Eases design of multi-power ballasts and reduces EMI
- Enhanced reliability of ballasts

ICB2FL02 G

The ICB2FL02 G is functionality identical to the ICB2FL01 G with adjustments to certain timings and parameters to further optimize performance in dimming ballasts.

Function	ICB2FL02 G	ICB2FL01 G
Cap load 1 protection	Deactivated	Activated
Suitable for dimming	Optimized	✓
Max adjustable run frequency	max. 140kHz	max. 120kHz
Adjustable dead time	1.05µs	1.05µs to 2.5µs
Dead time detector level	-50mV	-100mV
Capacitive mode 2 detector level 3	-50mV	-100mV

ICB2FL03 G

Infineons's latest Smart Ballast Controller ICB2FL03 G in SO-16 offers very similar performance and feature set compared to the well established SO-19 product ICB2FL01 G.

	ICB2FL03 G	ICB1FL01 G
Package	SO-16 small body	SO-19 wide body
Driver capability	650V	900V
Lamp connection	single and series	single, series and parallel

LED Driver for General Lighting

LED based lighting sources are the best suited candidates to replace inefficient lighting solutions such as incandescent or halogen lamps that are still widely used today. Current LED driver design and system cost are still a challenge to gain major consumer acceptance. Infineon offers benchmark solutions and represent an outstanding choice to overcome this hurdle.

ICL8001G / ICL8002G

are designed for off-line LED lighting applications with high efficiency requirements such as replacement lamps (40/60/100W), LED tubes, luminaires and downlights. Infineon provides a single stage flyback solution with PFC functionality. Innovative primary control techniques combined with accurate PWM generation for phase cut dimming enable solutions with significant reduced component count on a single sided driver PCB for smallest form factor.

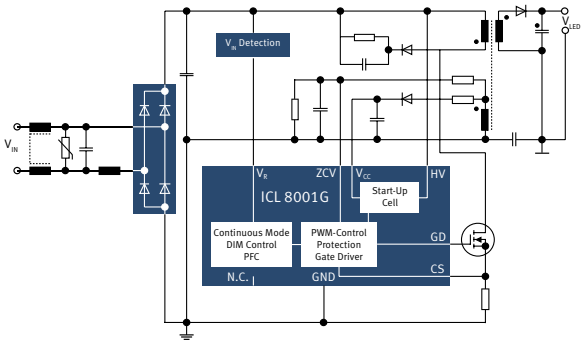
Benefits

- ICL8001G simplifies LED driver implementation
- ICL8002G is optimized for best dimming performance

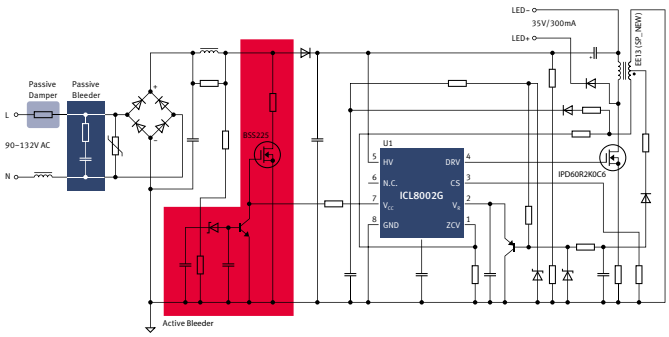
Features

- Primary side flyback or buck control with integrated PFC and phase angle dimming
- Optimized for trailing- and leading-edge dimmers
- Integrated HV startup cell for short time to light
- Best in class BOM for dimmable LED bulbs
- High and stable efficiency over wide dimming range
  - Good line regulation capabilities based on digital foldback correction
  - Low external part count for simplified designs and short-time to market
  - Cycle-by-cycle peak current limitation
- Built-in digital soft-start
- Auto restart mode for short circuit protection
- Adjustable latch-off mode for output overvoltage protection

ICL8001G



ICL8002G



Linear Current Regulators

BCR401W / BCR402W / BCR401U / BCR402U / BCR405U

The BCR40x family is the smallest size and lowest cost series of LED drivers. These products are perfectly suited for driving low power LEDs in general lighting applications. Thanks to AEC-Q101 qualification, it may also be used in automotive applications such as brake lights or interior.

The advantage versus resistor biasing is:

- Long lifetime of LEDs due to constant current in each LED string
- Homogenous LED light output independent of LED forward voltage binning, temperature increase and supply voltage variations
- See Application Note AN182 for details on replacing resistors

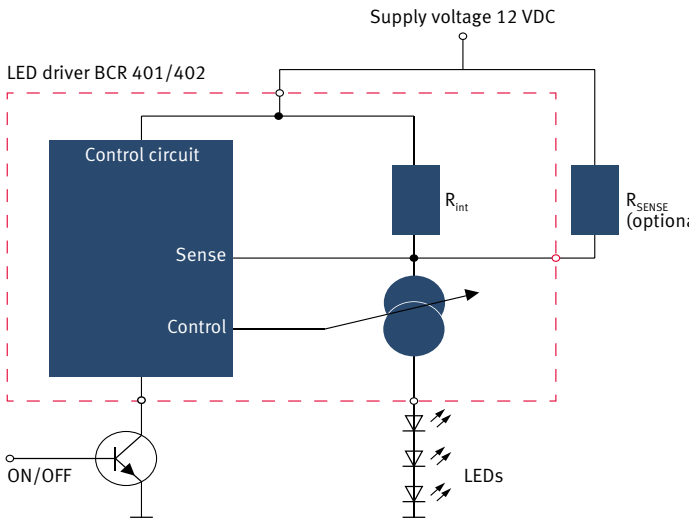
The advantage versus discrete semiconductors is:

- Reduced part count and assembly effort
- Pretested output current
- Defined negative temperature co-efficient protection

Features and benefits

- Output current from 10mA to 65mA (adjustable by external resistor)
- Supply voltage up to 24V (BCR401W, BCR402W) and up to 40V (BCR401U, BCR402U, BCR405U)
- Reduction of output current at high temperature, contributing to long lifetime LED systems
- Easy to use
- Very small form factor packages with up to 750mW max. power handling capability

	V_s (min)	V_s (max)	I_{out} (typ)	I_{out} (max)	Package	P_{tot} (max)	$\Delta(I_{out})/ I_{out}$
BCR 401U	1.4V+U^{fLED}	40V	10mA	65mA	SC74	750mW	1.0%/V
BCR 401W	1.2V+U^{fLED}	18V	10mA	60mA	SOT343	500mW	2.0%/V
BCR 402U	1.4V+U^{fLED}	40V	20mA	60mA	SC74	750mW	1.0%/V
BCR 402W	1.4V+U^{fLED}	18V	20mA	65mA	SC343	500mW	2.0%/V
BCR 405U	1.4V+U^{fLED}	18V	50mA	65mA	SC343	750mW	1.0%/V



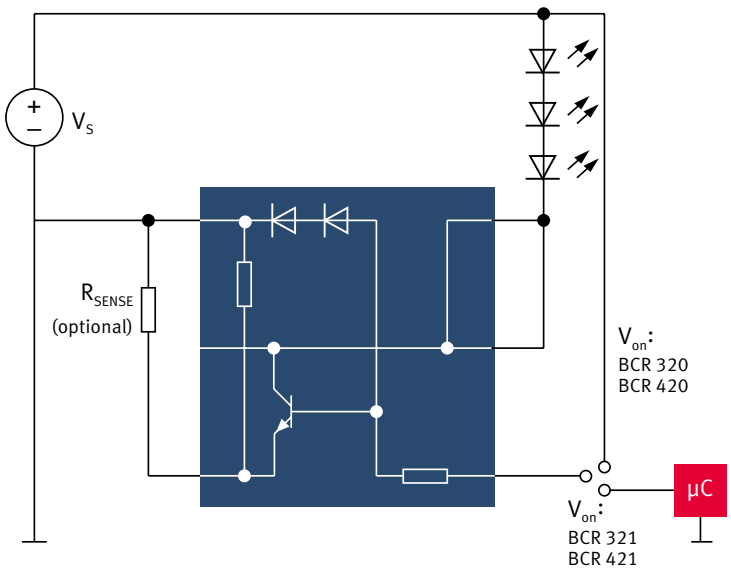
BCR420U / BCR321U / BCR420U / BCR421U

The BCR32x and BCR42x LED drivers are dedicated linear regulators for 0.5W LEDs with a maximum output current of 250mA. They are optimized in terms of cost, size and feature set for medium power LEDs in General Lighting applications. Thanks to AEC-Q101 qualification, it may also be used in automotive applications such as brake lights or interior.

Features and benefits

- Output current from 10mA up to 300mA for BCR32x (200mA for BCR42xU), adjustable by external resistor
- Supply voltage up to 40V for BCR42x (24V for BCR32x)
- Direct microcontroller interface for PWM dimming with BCR321U/BCR421U
- Reduction of output current at high temperature, contributing to long lifetime LED systems
- Easy to use
- Very small form factor packages with up to 1.000mW max. power handling capability

	V_s (min)	V_s (max)	I_{out} (typ)	I_{out} (max)	Package	P_{tot} (max)	$\Delta(I_{out})/ I_{out}$
BCR 320U	1.4V+U^{fLED}	24V+U^{fLED}	250mA	300mA	SC74	1.000mW	1.0%/V
BCR 321U	1.4V+U^{fLED}	24V+U^{fLED}	250mA	300mA	SC74	1.000mW	1.0%/V
BCR 420U	1.4V+U^{fLED}	40V+U^{fLED}	150mA	200mA	SC74	1.000mW	1.0%/V
BCR 421U	1.4V+U^{fLED}	40V+U^{fLED}	150mA	200mA	SC74	1.000mW	1.0%/V



DC/DC Switch Mode LED Drivers

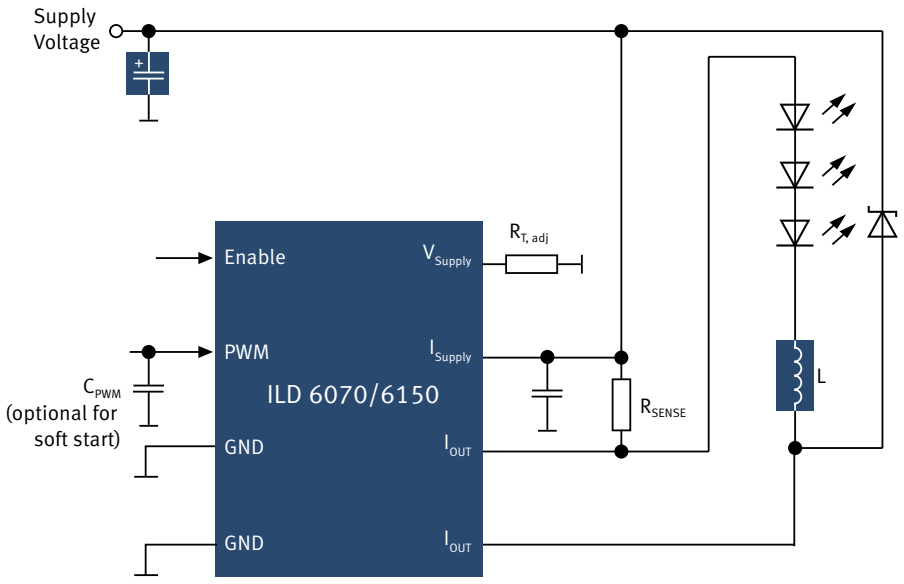
ILD1151 / ILD2035 / ILD4001 / ILD4035 / ILD4120 / ILD4180 / ILD6070 / ILD6150

The ILD series are switch-mode LED drivers for high power LEDs. They combine protection features that contribute to the lifetime of LEDs with the flexibility in output current range from 150mA up to multiple amperes. The new ILD series include LED driver ICs with integrated power stage as well as with external MOSFET achieving up to 98% driver efficiency across a wide range of general lighting applications. ILD4120, ILD4180, ILD6070 and ILD6150 are buck LED regulators. ILD4001 is a buck LED controller and ILD1151 is a multi-topology LED controller.

Features and benefits

- Wide input voltage range
- Scalability in output current from 150mA up to multiple amperes
- Alternative dimming concepts: digital or analog
- Over voltage and over current protection
- Smart thermal protection for ILD2035, ILD4035 and ILD4120 contributing to longer LED lifetime
- ILD1151 supports boost, buck-boost and SEPIC topologies

	V_s (min)	V_s (max)	I_{out} (typ)	I_{out} (max)	Package	Dimming	Topology	f_{sw}	Features
ILD 1151	4.5V	45V	90.0mA	3.000mA	SSOP-14	analog/digital	boost, buckboost SEPIC	adjustable 100-500kHz	multi topology controller, constant current or constant voltage mode, over voltage, over current, short on GND protection
ILD 4001	4.5V	42V	10.0mA	3.000mA	DSO-8-27	analog/digital	hysteretic buck	‹ 500kHz	thermal protection
ILD 2035	8.0V	22V	350mA	400mA	SC74	-	hysteretic buck	‹ 500kHz	smart thermal protection
ILD 4035	4.5V	40V	350mA	400mA	SC74	analog/digital	hysteretic buck	‹ 500kHz	smart thermal protection, over voltage, over current protection
ILD 4120	4.5V	40V	1.200mA	1.200mA	DSO-8-27	analog/digital	hysteretic buck	‹ 500kHz	smart thermal protection, over voltage, over current protection
ILD 4180	4.75V	45V	1.800mA	1.800mA	DSO-8-27	digital	fixed frequency buck	370kHz	over voltage, over current protection, constant current or constant voltage mode
ILD 6070	4.5V	60V	700mA	700mA	DSO-8-27	analog/digital	hysteretic buck	‹1000kHz	integrated switch rated up to 700mA, PWM or analog dimming, adjustable over temperature protection, over current protection
ILD 6150	4.5V	60V	1.500mA	1.500mA	DSO-8-27	analog/digital	hysteretic buck		integrated switch rated up to 1.500mA, PWM or analog dimming, adjustable over temperature protection, over current protection



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Where to Buy

EiceDRIVER™

High Voltage Gate Driver ICs

1ED020I12-B2

Single channel isolated gate driver

- Basic isolation according to EN60747-5-2, recognized under UL1577
- Fully functional at transient +/- 1420V and static voltages of +/-1200V
- High voltage side status feedback
- 2A sink and source rail-to-rail output
- Max. T_j = 150°C
- Package SO16 300mil
- Protection functions:
  - Enhanced desaturation detection
  - Active Miller clamp
  - Under voltage lockout
  - Shut down
  - Watchdog timer
- Evaluation Board available EVAL-1ED020I12-B2

1ED020I12-F2

Single channel isolated gate driver

- Same functions and features as 1ED020I12-B2
- Functional isolation of 1200V

1ED020I12-BT

Single channel isolated gate driver

- Same functions and features as 1ED020I12-B2
- Basic isolation according to EN60747-5-2, recognized under UL1577
- Adjustable two level turn-off function
- Desaturation detection with 500µA
- Evaluation Board available EVAL-1ED020I12-BT

1ED020I12-FT

Single channel isolated gate driver

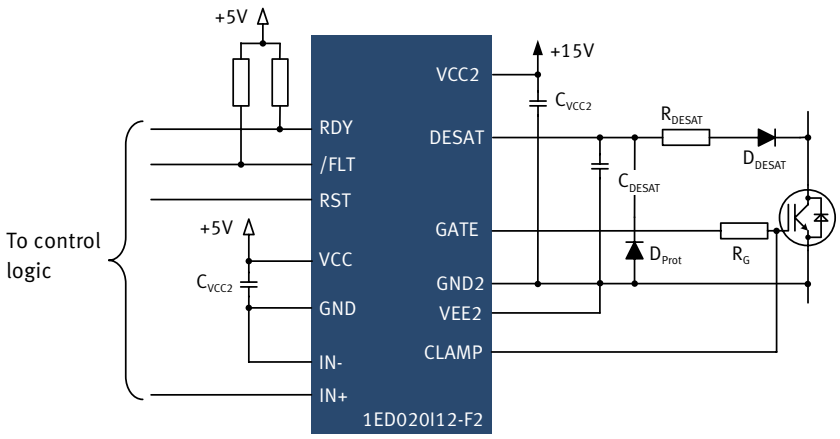
- Same functions and features as 1ED020I12-BT
- Functional isolation of 1200V

2ED020I12-F2

Dual channel isolated gate driver

- Same functions and features as two times 1ED020I12-F2
- Package SO36 300mil
- Evaluation Board available EVAL-2ED020I12-F2

Typical application 1ED020I12-F2

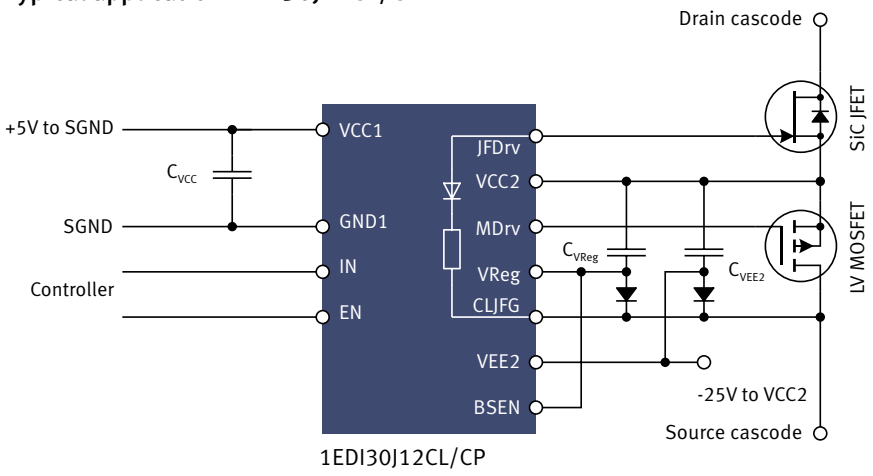


1EDI30J12CL and 1EDI30J12CP

Infineon has developed the Direct Drive JFET Topology to enable normally-on SiC JFETs to be driven at best possible efficiency and as safe as normally-off switches. This isolated EiceDRIVER™ dedicated for normally-on SiC JFETs comes with special features and benefits:

- Single channel driver IC with Coreless Transformer (CT) technology
- Galvanic isolation, ±1200V
- UVLO 16-17V, optimized for Infineon's SiC JFET discretes and power modules
- Bootstrap mode (UVLO 8-9V, logic, MOS driver capability, indicator output)
- Safe turn off during start up and power supply failures
- Minimum 3A rail-to-rail output
- Extremely low propagation delay of typ. 80ns
- Green Packages DSO-16-20 (150mil) and DSO-19-4 (300mil)

Typical application 1EDI30J12CL/CP



1EDI30J12CL/CP

CoolSiC™ 1200V JFET portfolio and recommended driver / LV MOS for Direct Drive Topology

Voltage	$R_{DS(on)}$	Sales name	JFET Package	Driver	Driver Package	LV MOS	LV MOS Package
1200	70	IJW120R070T1	TO-247	1EDI30J12CL/CP	DSO-16-20/19-4	BSC030P03NS3 G	SuperSO8
	100	IJW120R100T1	TO-247	1EDI30J12CL/CP	DSO-16-20/19-4	BSC030P03NS3 G	SuperSO8
1200	70	IJC120R070T1	Bare die	1EDI30J12CL/CP	DSO-16-20/19-4	IPC099P03N	Bare die
	100	IJC120R100T1	Bare die	1EDI30J12CL/CP	DSO-16-20/19-4	IPC099P03N	Bare die

2ED020I12-FI

1200V Isolated high side halfbridge gate driver

- Galvanic isolation of high side driver
- 2A sink current, 1 A source current
- Fully functional at transient and static voltages of +/-1200V
- Integrated operational amplifier and comparator
- Matched delay times of high side and low side
- Max. T_j = 150°C
- Package SO18 300mil
- Protection function:
  - Hardware input interlocking
  - Undervoltage lockout
  - Shut down function

2ED020I06-FI

650V isolated high side halfbridge gate driver

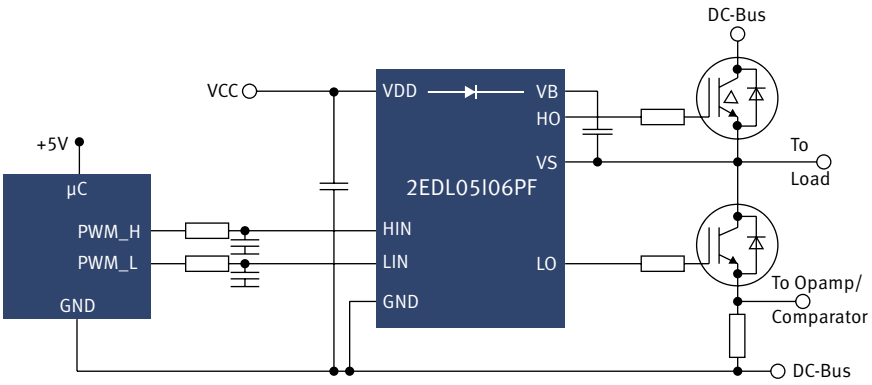
- Galvanic isolation of high side driver
- 2A sink current, 1 A source current
- Fully functional at transient and static voltages of +/-650V
- Matched delay times of high side and low side
- Max. T_j = 150°C
- Package SO18 300mil
- Protection function:
  - Hardware input interlocking
  - Under voltage lockout

2EDL Compact Family

600V levelshift high side halfbridge gate driver

- Ultra fast integrated bootstrap diode
- SO8 and SO14 package
- Enable function (2EDL23x only)
- Fault indication (2EDL23x only)
- Versions with and without Interlock
- Protection functions:
  - Asymmetric undervoltage lockout
  - Active shut down
  - Undervoltage lockout levels for MOSFET and IGBT
  - Over current protection (2EDL23x only)
  - Fixed HW dead time optional
- Evaluation Boards available:
  - EVAL-2EDL05I06PF
  - EVAL-2EDL23I06PJ
  - EVAL-2EDL23N06PJ

Typical application 2EDL05I06PF

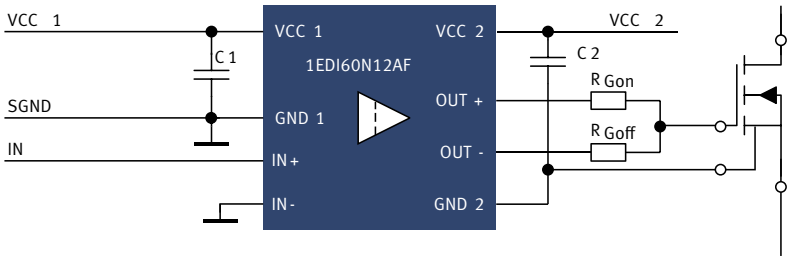


1EDI Compact Family

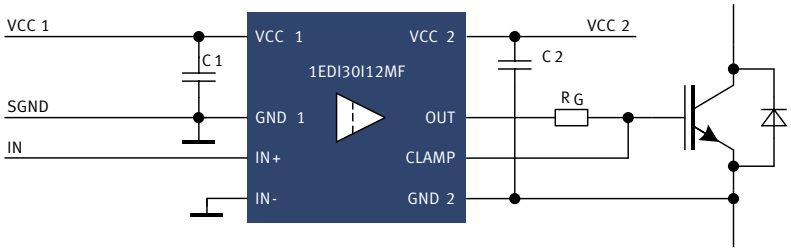
Single Channel isolated gate driver

- Fully functional at static voltages of+/- 1200V
- High CMTI rating dV/dt = 100V/ns
- Up to 6A min. output peak current
- Separated source / sink output or single output with Active Miller clamp
- Short propagation delay of 100ns or 240ns input filter time for noise suppression
- Compact SO8 150mil package

Typical application 1EDI60N12AF



Typical application 1EDI30I12MF

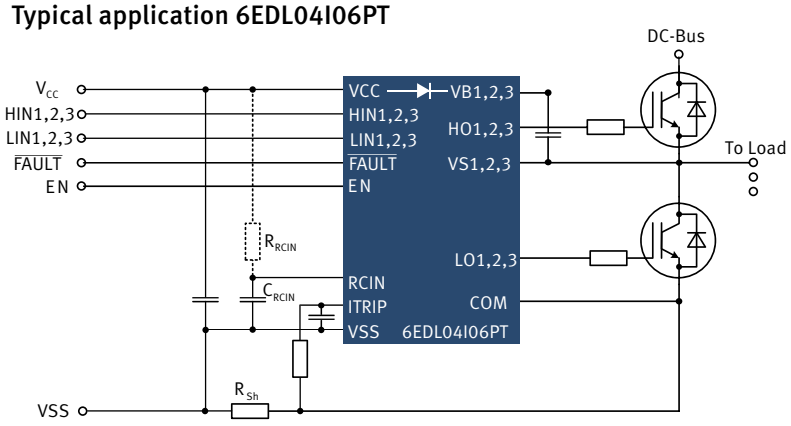


6EDL Compact Family

200V and 600V 3-phase gate driver

- Ultra fast integrated bootstrap diode
- Fully functional at neg. transient voltages down to -50V (500ns)
- Programmable restart after over current protection
- Shut down of all outputs in case of UVLO, OCP
- Package SO28 300mil (600V) and package TSSOP28 (200V)
- Protection functions:
  - Overcurrent protection (OCP)
  - Hardware input interlocking
  - Undervoltage lockout (UVLO)
  - Fixed hardware deadtime of high side and low side
  - Enable function
  - Pin compatible variants of first generation available

Typical application 6EDL04I06PT



High Voltage Gate Driver ICs Product Type

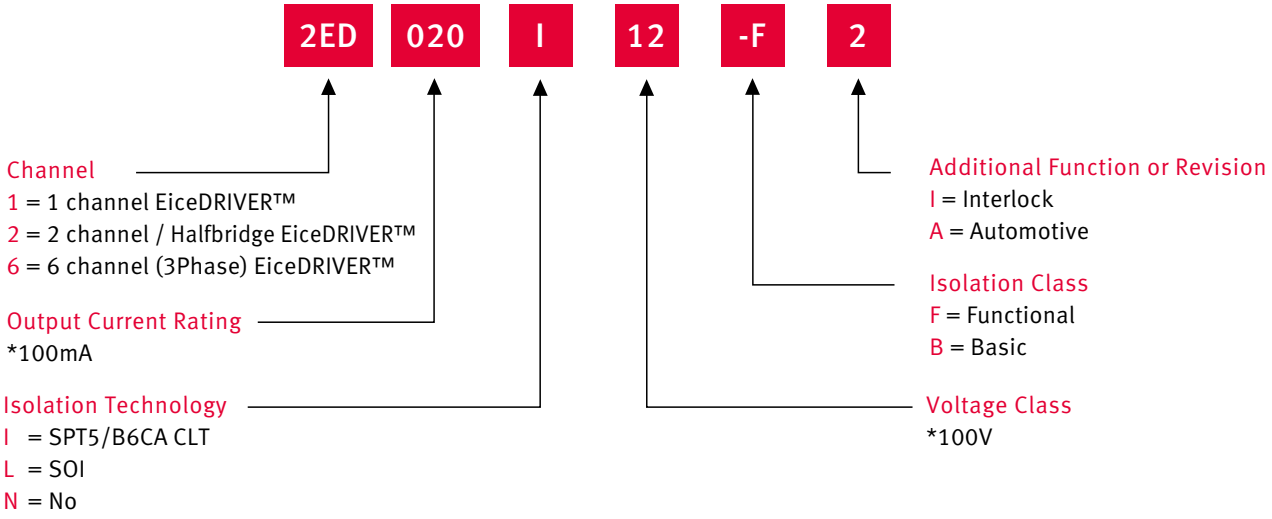
Products		Package	Topology	Voltage Class	Source/Sink Current Io+/-	Turn-On Propagation Delay (max)
ED-C Compact	1EDI05I12AF	PG-DSO-8	Single	1200 V	0.5 / -0.5 A	330 ns
	1EDI10I12MF	PG-DSO-8	Single	1200 V	1.0 / -1.0 A	330 ns
	1EDI20I12AF	PG-DSO-8	Single	1200 V	2.0 / -2.0 A	330 ns
	1EDI20I12MF	PG-DSO-8	Single	1200 V	2.0 / -2.0 A	330 ns
	1EDI30I12MF	PG-DSO-8	Single	1200 V	3.0 / -3.0 A	330 ns
	1EDI40I12AF	PG-DSO-8	Single	1200 V	4.0 / -4.0 A	330 ns
	1EDI60I12AF	PG-DSO-8	Single	1200 V	6.0 / -6.0 A	330 ns
	1EDI60N12AF	PG-DSO-8	Single	1200 V	6.0 / -6.0 A	115 ns
	2EDL05I06BF	PG-DSO-8	Half Bridge	600 V	0.25 / -0.5 A	600.0 ns
	2EDL05I06PF	PG-DSO-8	Half Bridge	600 V	0.25 / -0.5 A	600.0 ns
	2EDL05I06PJ	PG-DSO-14	Half Bridge	600 V	0.25 / -0.5 A	600.0 ns
	2EDL05N06PF	PG-DSO-8	Half Bridge	600 V	0.25 / -0.5 A	450.0 ns
	2EDL23I06PJ	PG-DSO-14	Half Bridge	600 V	1.5 / -2.3 A	600.0 ns
	2EDL23N06PJ	PG-DSO-14	Half Bridge	600 V	1.5 / -2.3 A	450.0 ns
	6ED003L02-F2	PG-TSSOP-28	3-Phase	200V	180 / -380 mA	800.0 ns
	6ED003L06-F2	PG-DSO-28	3-Phase	600 V	180 / -380 mA	800.0 ns
	6EDL04I06NT	PG-DSO-28	3-Phase	600 V	180 / -380 mA	800.0 ns
	6EDL04I06PT	PG-DSO-28	3-Phase	600 V	180 / -380 mA	800.0 ns
	6EDL04N02PR	PG-TSSOP-28	3-Phase	200V	180 / -380 mA	800.0 ns
	6EDL04N06PT	PG-DSO-28	3-Phase	600 V	180 / -380 mA	800.0 ns
ED-E Enhanced	1ED020I12-B2	PG-DSO-16	Single	1200 V	2.0 / -2.0 A	195.0 ns
	1ED020I12-BT	PG-DSO-16	Single	1200 V	2.0 / -2.0 A	2,000.0 ns
	1ED020I12-F2	PG-DSO-16	Single	1200 V	2.0 / -2.0 A	195.0 ns
	1ED020I12-FT	PG-DSO-16	Single	1200 V	2.0 / -2.0 A	2,000.0 ns
	2ED020I06-FI	PG-DSO-18	Half Bridge	650 V	1.0 / -2.0 A	105.0 ns
	2ED020I12-F2	PG-DSO-36	Dual	1200 V	2.0 / -2.0 A	195.0 ns
	2ED020I12-FI	PG-DSO-18	Half Bridge	1200 V	1.0 / -2.0 A	105.0 ns

*Certified according to DIN EN 60747-5-2

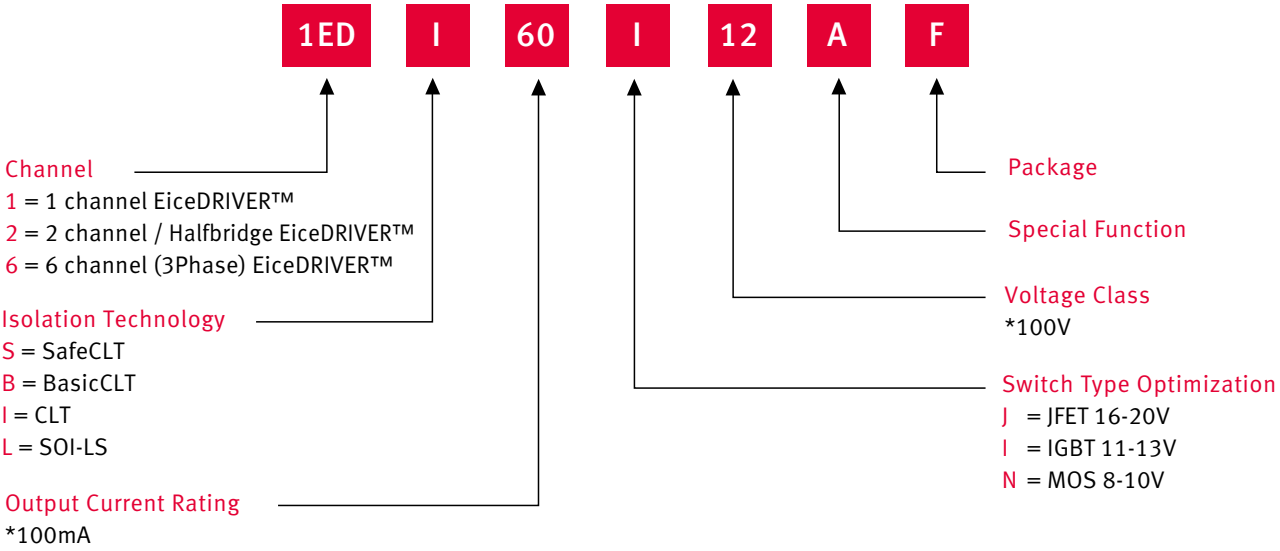
$T_{j(max)}$	Safety Isolation Type*	UVLO ON,max	Fault Reporting	Shutdown / Enable	Input Logic Type	Interlock	Two Level Turn Off
150.0 degC	–	12.7 V	–	–	pos/neg	–	–
150.0 degC	–	12.7 V	–	–	pos/neg	–	–
150.0 degC	–	12.7 V	–	–	pos/neg	–	–
150.0 degC	–	12.7 V	–	–	pos/neg	–	–
150.0 degC	–	12.7 V	–	–	pos/neg	–	–
150.0 degC	–	12.7 V	–	–	pos/neg	–	–
150.0 degC	–	12.7 V	–	–	pos/neg	–	–
150.0 degC	–	10.0 V	–	–	pos/neg	–	–
150.0 degC	–	12.4 V	–	EN	pos	–	–
150.0 degC	–	12.4 V	–	EN	pos	✓	–
150.0 degC	–	12.4 V	–	EN	pos	✓	–
150.0 degC	–	12.4 V	–	EN	pos	✓	–
150.0 degC	–	12.4 V	OCP	EN	pos	✓	–
150.0 degC	–	12.4 V	OCP	EN	pos	✓	–
125.0 degC	–	12.5 V	ITRIP	EN	neg	✓	–
125.0 degC	–	12.5 V	ITRIP	EN	neg	✓	–
125.0 degC	–	12.5 V	ITRIP	EN	neg	✓	–
125.0 degC	–	12.5 V	ITRIP	EN	pos	✓	–
125.0 degC	–	9.8 V	ITRIP	EN	pos	✓	–
125.0 degC	–	9.8 V	ITRIP	EN	pos	✓	–
150.0 degC	Basic	12.6 V	DESAT	/RST	pos/neg	–	–
150.0 degC	Basic	12.6 V	DESAT	/RST	pos/neg	–	✓
150.0 degC	–	12.6 V	DESAT	/RST	pos/neg	–	–
150.0 degC	–	12.6 V	DESAT	/RST	pos/neg	–	✓
150.0 degC	–	13.5 V	–	/SD	pos	✓	–
150.0 degC	–	12.6 V	DESAT	/RST	pos/neg	–	–
150.0 degC	–	13.5 V	OCP	/SD	pos	✓	–

Naming System

EiceDRIVER™ (Driver Boards and existing Gate Driver)



EiceDRIVER™ (Gate Driver ICs since 2012)



Expert Support for EiceDRIVER™

Easy Access and High Quality

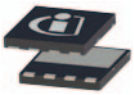
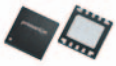
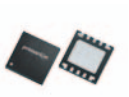
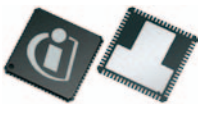
Application Notes, Datasheets & More
www.infineon.com/eicedriver
www.infineon.com/eicedriver-enhanced
www.infineon.com/eicedriver-compact

EiceDRIVER™ Evaluation Boards
www.infineon.com/eicedriver-safe

Where to Buy

Packages

SMD Technology

DPAK (TO-252)		Reverse DPAK (Rev. TO-252)		DPAK 5pin (TO-252 5pin)		D²PAK (TO-263)		D²PAK 2pin (TO-263-2)		D²PAK 7pin (TO-263 7pin)	
3	9.9 x 6.5 x 2.3	3	9.7 x 6.6 x 2.34	5	9.9 x 6.5 x 2.3	3	15.0 x 10.0 x 4.4	2	15.0 x 10.0 x 4.4	7	15.0 x 10.0 x 4.4
											
SO-8/SO-8 dual		SO-16/12		SO-14		SO-16		SO-18		SO-19	
8	5.0 x 6.0 x 1.75	12	10.0 x 6.0 x 1.75	14	8.75 x 6.0 x 1.75	16	10.0 x 6.0 x 1.75	18	12.8 x 10.3 x 2.65	19	12.8 x 10.3 x 2.65
											
SO-20		SC59		SOT-23		SOT-89		SOT-223		SOT-323	
20	12.8 x 10.3 x 2.65	3	3.0 x 2.8 x 1.1	3	2.9 x 2.4 x 1.0	3	4.5 x 4.0 x 1.5	4	6.5 x 7.0 x 1.6	3	2.0 x 2.1 x 0.9
											
SOT-363		TSOP-6		S3O8		TISON (power stage 5x6)		WISON (power stage 3x3)		SuperSO8	
6	2.0 x 2.1 x 0.9	6	2.9 x 2.5 x 1.1	8	3.3 x 3.3 x 1.0	8	5.0 x 6.0 x 1.0	8	3.0 x 3.0 x 0.8	8	5.15 x 6.15 x 1.0
											
SuperSO8 dual		SuperSO8 fused leads		VSON (ThinPAK)		CanPAK™ S-Size		CanPAK™ M-Size		TDSON-10-2	
8	5.15 x 6.15 x 1.0	8	5.15 x 6.15 x 1.0	4	8.0 x 8.0 x 1.0	6	4.8 x 3.8 x 0.65	7	6.3 x 4.9 x 0.65	10	3.0 x 3.0 x 0.9
											
TDSON-10-7		TO-leadless (TOLL)		TSSOP-48		DSO-36		IQFN-40		TSSOP-28	
10	3.0 x 3.0 x 0.9	8	11.68 x 9.9 x 2.3	48	12.5 x 6.1 x 1.1	36	15.9 x 11.0 x 3.5	40	6.0 x 6.0 x 0.8	28	9.7 x 6.4 x 1.2
											
DSO-28		VQFN-68		Blade 3x3		DrBlade 1.0		DrBlade Gen2		Package (JEITA-code)	
28	18.1 x 10.3 x 2.65	68	10.0 x 10.0 x 0.9	6	3.0 x 3.4 x 0.65	32	5.0 x 5.0 x 0.6	38	6.6 x 4.5 x 0.8	X	L x W x H
										PIN-Count All Dimensions in mm	

All products are available in green (RoHS compliant).

THD Technology

IPAK (TO-251)		IPAK SL (TO-251 SL)		I²PAK (TO-262)		TO-220 real 2pin		TO-220 2pin		TO-220 3pin	
3	15.5 x 6.5 x 2.3	3	10.7 x 6.5 x 2.3	3	25.1 x 10 x 4.4	2	29.15 x 10.0 x 4.4	2	29.1 x 9.9 x 4.4	3	29.15 x 10.0 x 4.4
											
TO-220 FullPAK		**TO-220-6-46**		**TO-220-6-47**		**TO-247**		**TO-247 4pin**		**DIP-7**	
3	29.6 x 10.5 x 4.7	6	21.7 x 9.9 x 4.4	6	26.1 x 9.9 x 4.4	3	40.15 x 15.9 x 5.0	3	40.15 x 15.9 x 5.0	7	9.52 x 8.9 x 4.37
											
DIP-8		**DIP-14**		**DIP-20**		**Package (JEITA-code)**					
8	9.52 x 8.9 x 4.37	14	19.5 x 8.9 x 4.37	20	24.6 x 9.9 x 4.2	X	L x W x H				
						PIN-Count All Dimensions in mm					

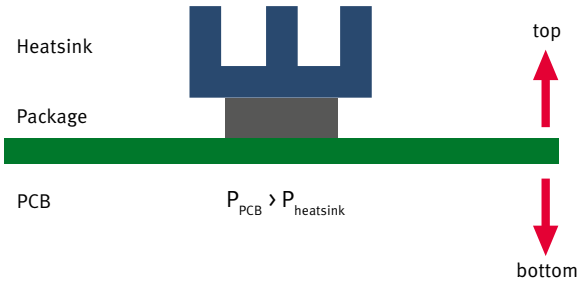
All products are available in green (RoHS compliant).

RoHS

Top and bottom side cooling of SMD devices

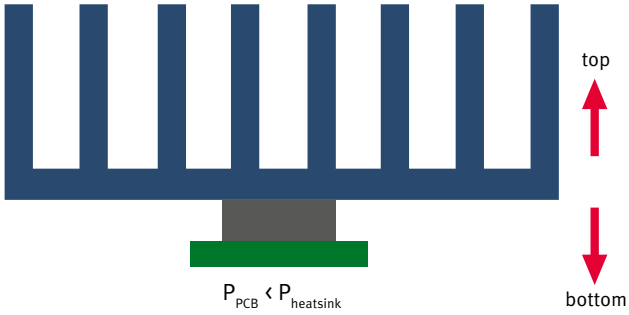
For LV MOSFETs different SMD packages like SuperSO8, CanPAK and Blade are available. If the cooling system is designed for main heatflow to the PCB both packages will show similar thermal performance. If the main heat flow is to the top side the CanPAK™ is the better choice since the thermal resistance to the top side is lower ($R_{th\_top\_CanPAK}$ ~ 1 K/W, $R_{th\_top\_SuperSO8}$ ~ 20 K/W).

Bottom side cooling



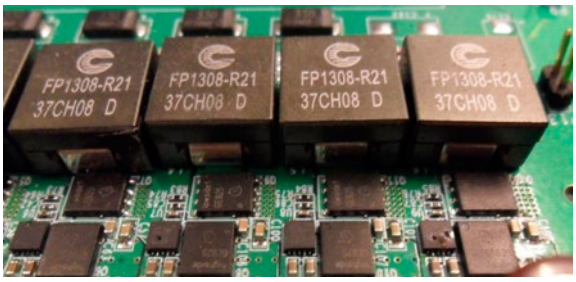
Thermal performance
CanPAK™ ~ SuperSO8

Top side cooling

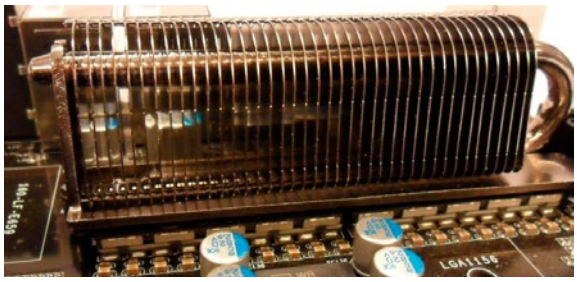


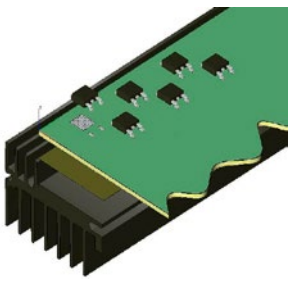
Thermal performance
CanPAK™ > SuperSO8

Example: High performance Server
(PCB: 8 layer, 70 µm)



Example: Motherboard (PCB 4 layer, 35 µm) with high performance heatsink





New IGBT technology RCD allows Highest Power Density with Small SMD Packages

The new IGBT RCD technology in combination with an efficient cooling system allows to use small SMD packages which enable to build compact systems with increased power density. In order to improve the heat dissipation, thermal vias are integrated in the PCB under the device case which results in a low thermal resistance to the opposite side of the PCB. A heatsink complements the cooling system. Isolation to the heatsink is realized with a thermal foil. With this cooling system power dissipation up to 7 to 10 W / IGBT is achievable which corresponds to ~ 2 kW application systems.

OptiMOS™ in TO-Leadless

A Package Optimized For High Current Applications

TO-Leadless has been designed for high currents up to 300A. In addition, latest OptiMOS™ silicon technology in combination with reduced package resistance achieves lowest $R_{DS(on)}$. This enables a reduction in the number of parallel MOSFETs in a forklift application and increases power density.

Further the 60% smaller package size enables a very compact design. Compared to D²PAK 7pin, TO-Leadless shows a substantial reduction in footprint of 30%. The 50% reduced height offers a significant advantage in applications where compact designs are key, such as rack or blade servers.

Moreover low package parasitic inductances result in an improved EMI behavior and a 50% bigger solder contact area avoids electro migration at high current levels, which results in improved reliability.

Applications

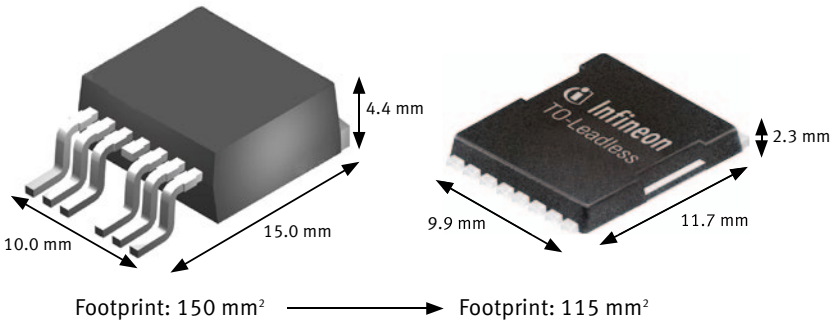
- Forklift
- Light Electric Vehicles
- Point of Load (PoL)
- Telecom
- efuse

Features

- Industry‘s lowest $R_{DS(on)}$
- Highest current capability up to 300A
- Very low package parasitics and inductances

Benefits

- Less paralleling and cooling required
- Highest system reliability
- System cost reduction
- Enabling very compact design



TO-247 4pin

Applications
- Telecom
- Server
- Solar
- PC Power

Package for CoolMOS™ High Voltage Power MOSFETs
Infineon's TO-247 4pin package enables significant efficiency improvements in hard switching topologies for CoolMOS™ high voltage Power MOSFETs. The fourth pin acting as a Kelvin source can be used to reduce the parasitic inductance of the source lead of the power MOSFET.

The benefit will be seen in various hard switching topologies such as Continuous Conduction Mode Power Factor Correction (CCM PFC), Boost and Two Transistor Forward (TTF). The new package offers improved efficiency by reducing switching losses up to 8% which equates to 5W of saved power in a CCM Mode PFC running at 1.2KW, which is equal to 0,4% extra full load efficiency compared to the same MOSFET in the standard 3 pin TO-247 package.

Features
- 650V voltage
- Revolutionary Best-in-Class $R_{DS(on)}$/package
- Reduced energy stored in output capacitance (E_{oss})
- Lower gate charge Q_g
- Space saving through use of smaller packages or reduction of parts
- 12 years manufacturing experience in Superjunction Technology

Benefits
- Improved safety margin and suitable for both SMPS and Solar Inverter applications
- Lowest conduction losses/package
- Low switching losses
- Better light load efficiency
- Increasing power density
- Outstanding CoolMOS™ quality

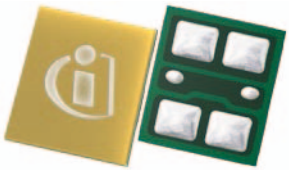
Topologies
- Power Factor Correction (PFC)
- Solar Boost

Blade 3x3

Pushing the Boundaries for Discrete 25V/30V Power MOSFETs

Infineon's new Blade 3x3 is a highly-innovative discrete MOSFET package based on a revolutionary packaging concept, setting a new standard for high performance power packages. Blade 3x3 with 3.0 x 3.4mm² package outline is a source down package with a low thermal resistance to the top side, which allows effective top side cooling. The package footprint with two gate connections and large source and drain pads is optimized for high current handling and easy PCB layout.

Using this technology makes it possible to realize products with lowest on state resistances and highest power density without compromizing in performance and cooling.



Applications

- Notebook core, peripheral
- Motherboard core, peripheral
- Server
- Telecom - Point of load

Features

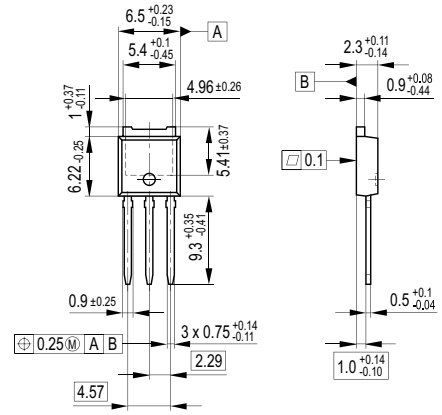
- Best-in-Class on-state resistance
- Low profile (0.55mm)
- Large drain and source connection pads
- Optimized pin-out
- Low thermal resistance to the
- Package top side
- RoHS compliant and halogen free

Benefits

- Compact and simplified layout for DC/DC converters
- Optimized layout with lowest loop inductance
- Highest efficiency
- Environmentally friendly

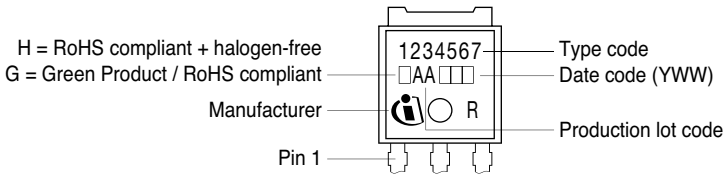
TO-251 (I-PAK)

Package Outline



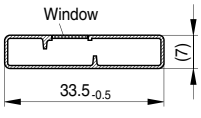
All metal surfaces tin plated, except area of cut.

Marking Layout



Packing

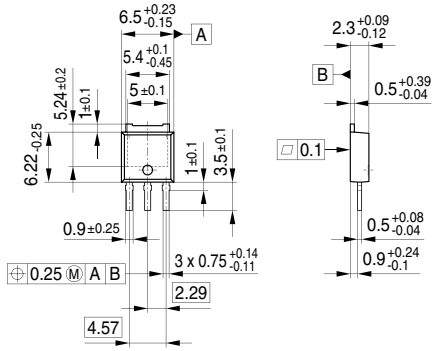
Pieces/Tube: 75



All dimensions in mm

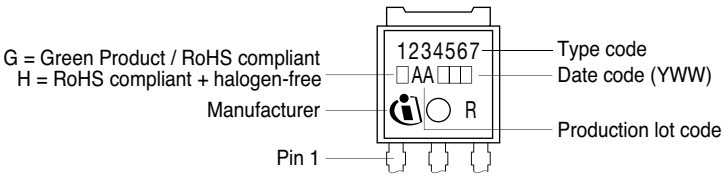
TO-251-3 (I-PAK short leads)

Package Outline



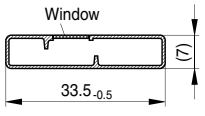
All metal surfaces tin plated, except area of cut.

Marking Layout



Packing

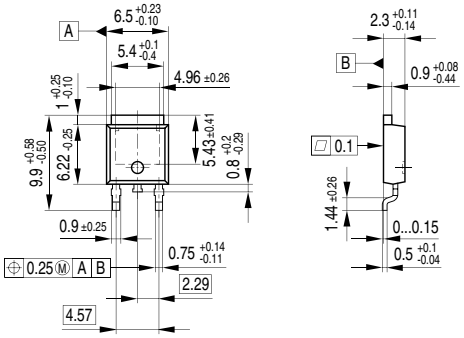
Pieces/Tube: 75



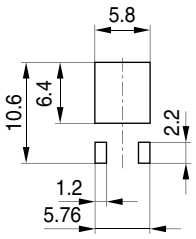
All dimensions in mm

TO-252 (DPAK)

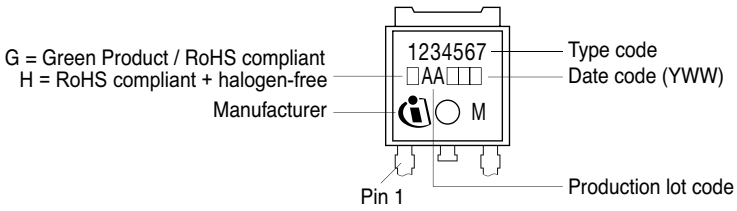
Package Outline



Foot Print

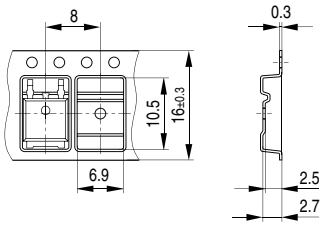


Marking Layout



Packing

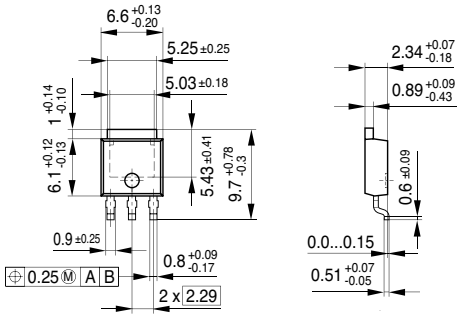
Reel ø330mm = 2.500 Pieces/Reel



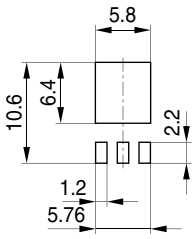
All dimensions in mm

TO-252 R (Reverse DPAK)

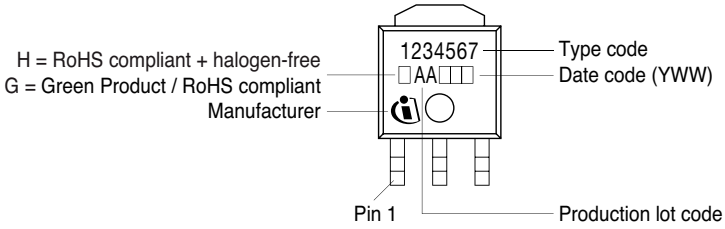
Package Outline



Foot Print

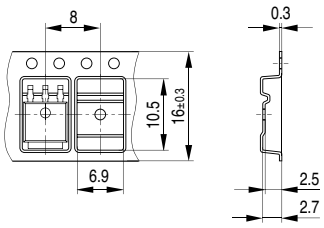


Marking Layout



Packing

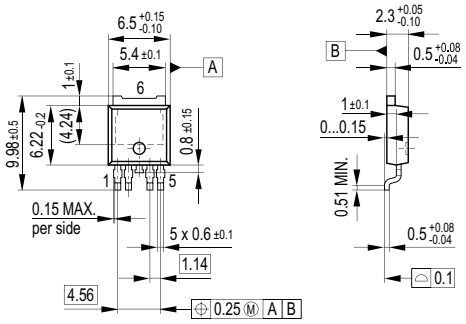
Reel ø330mm = 2.500 Pieces/Reel



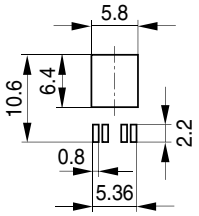
All dimensions in mm

TO-252 (DPAK 5pin)

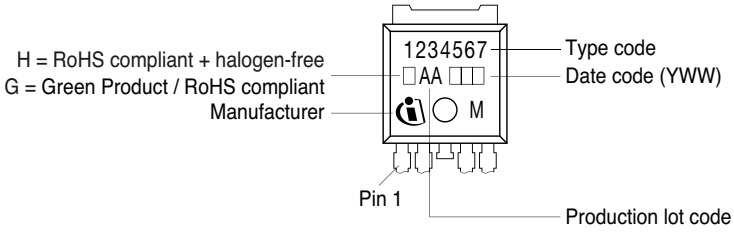
Package Outline



Foot Print

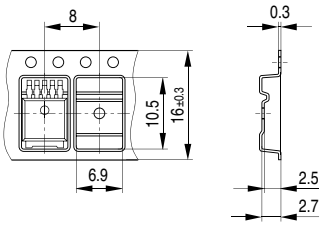


Marking Layout



Packing

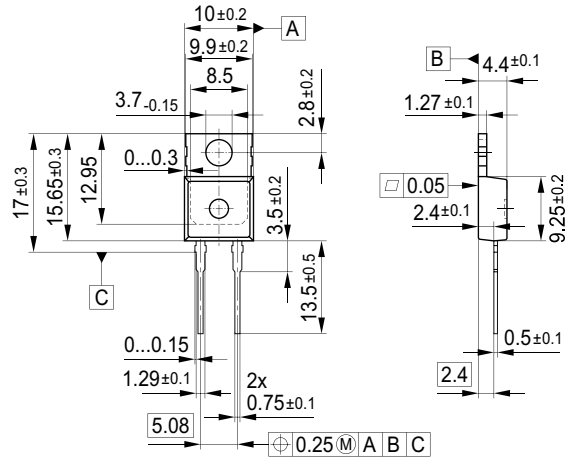
Reel ø330mm = 2.500 Pieces/Reel



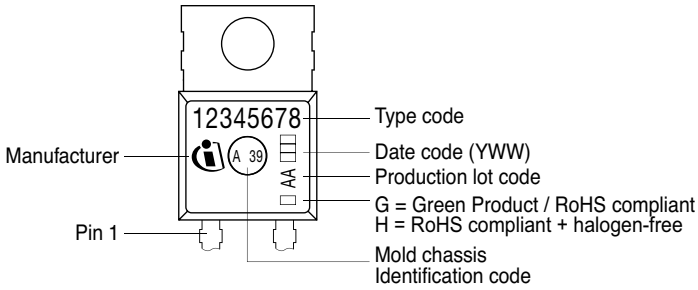
All dimensions in mm

TO-220 2pin

Package Outline

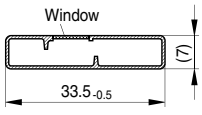


Marking Layout



Packing

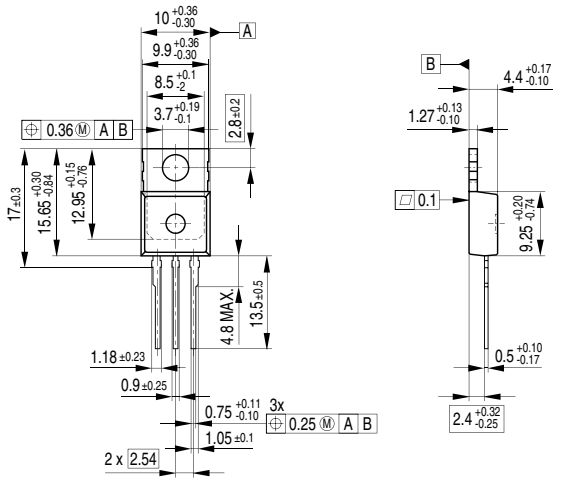
Pieces/Tube: 50



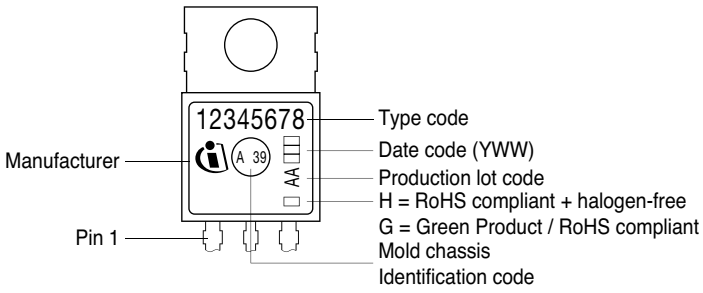
All dimensions in mm

TO-220 3pin

Package Outline

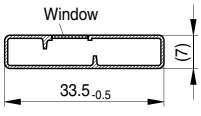


Marking Layout



Packing

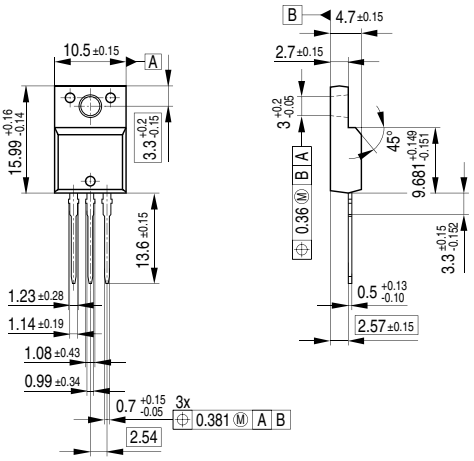
Pieces/Tube: 50



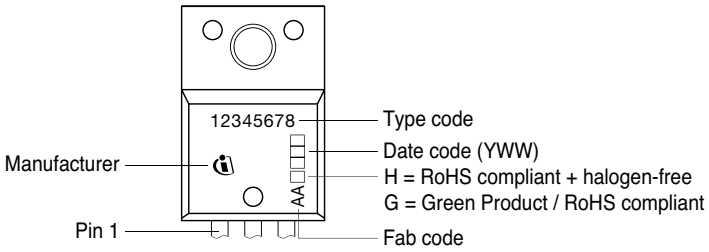
All dimensions in mm

TO-220 FullPAK

Package Outline

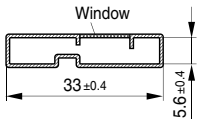


Marking Layout



Packing

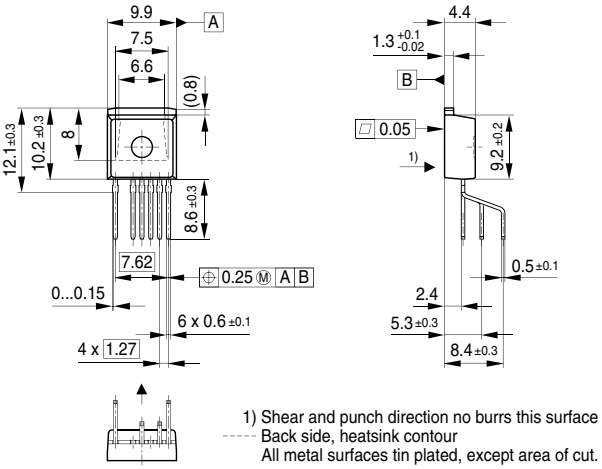
Pieces/Tube: 25



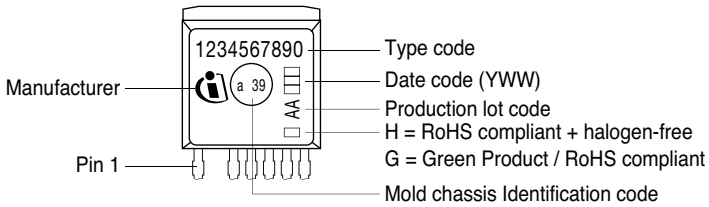
All dimensions in mm

TO-220-6-46

Package Outline

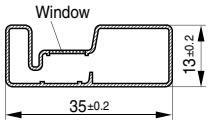


Marking Layout



Packing

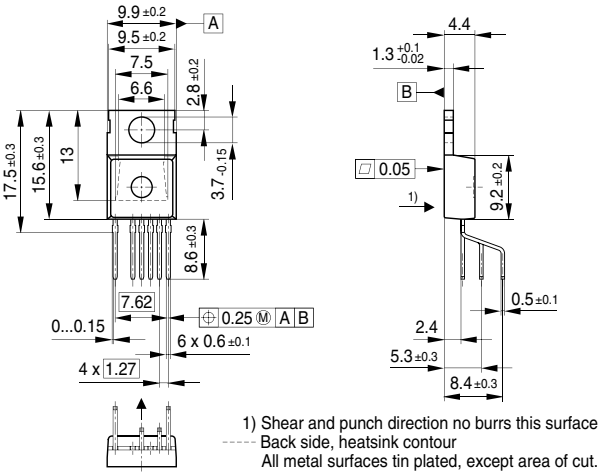
Pieces/Tube: 50



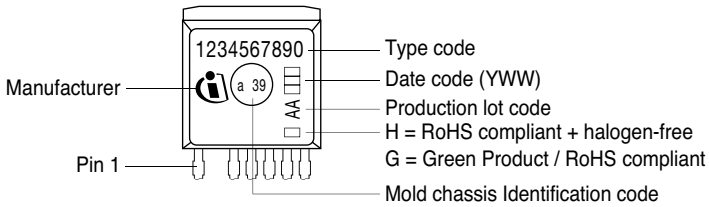
All dimensions in mm

TO-220-6-47

Package Outline

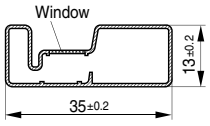


Marking Layout



Packing

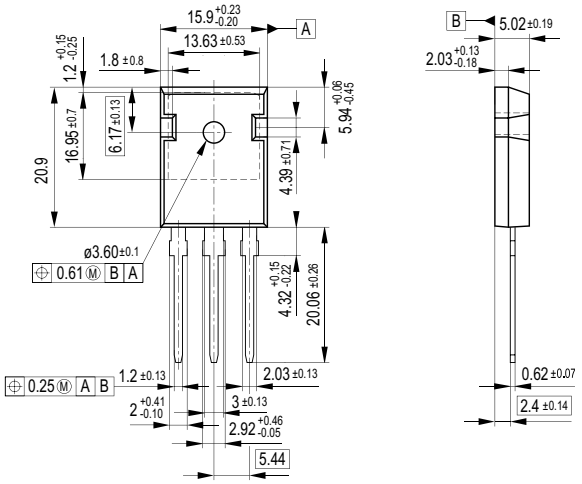
Pieces/Tube: 50



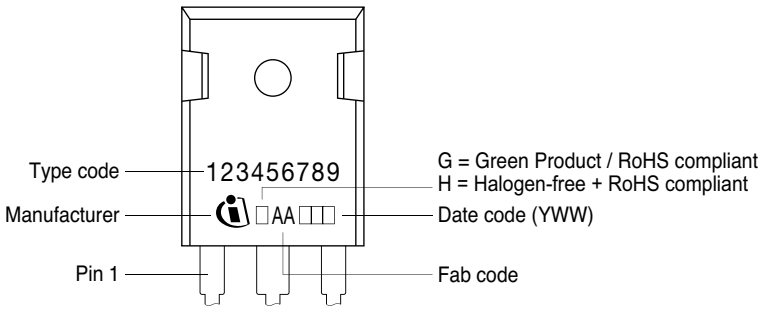
All dimensions in mm

TO-247

Package Outline

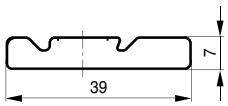


Marking Layout



Packing

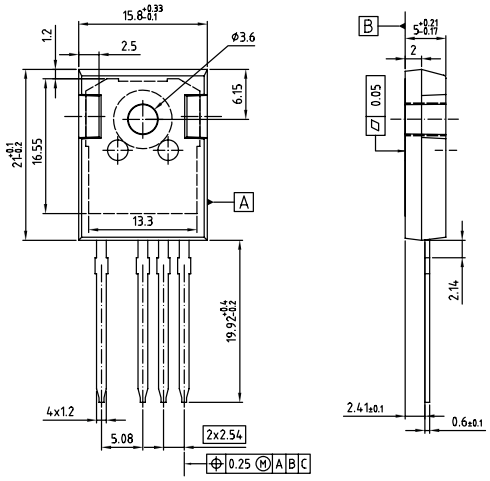
Pieces/Tube: 30



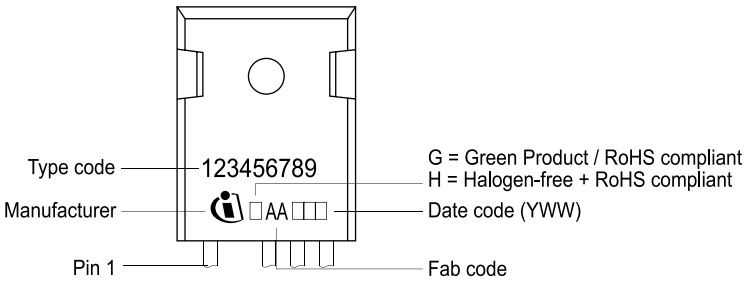
All dimensions in mm

TO-247 4pin

Package Outline

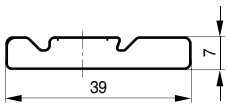


Marking Layout



Packing

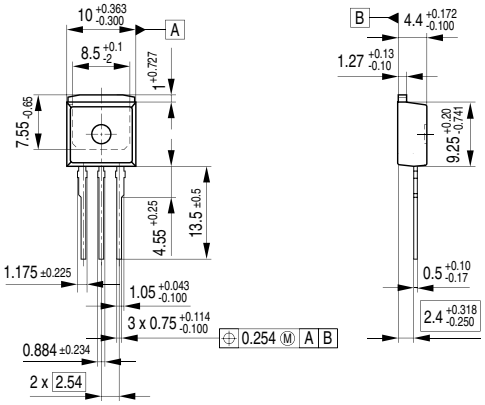
Pieces/Tube: 30



All dimensions in mm

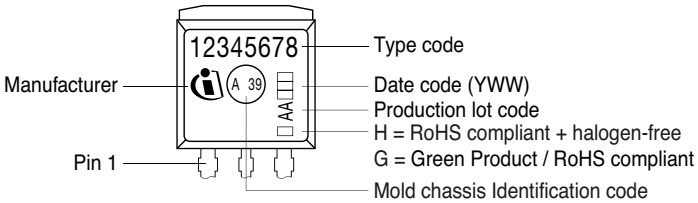
TO-262 (I²PAK)

Package Outline



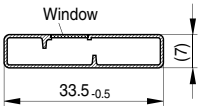
All metal surfaces tin plated, except area of cut.

Marking Layout



Packing

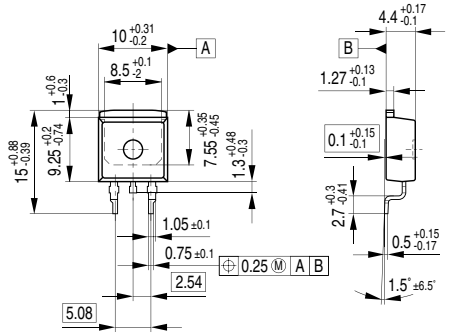
Pieces/Tube: 50



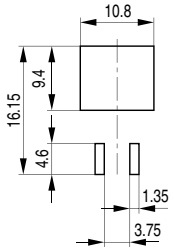
All dimensions in mm

TO-263 (D²PAK)

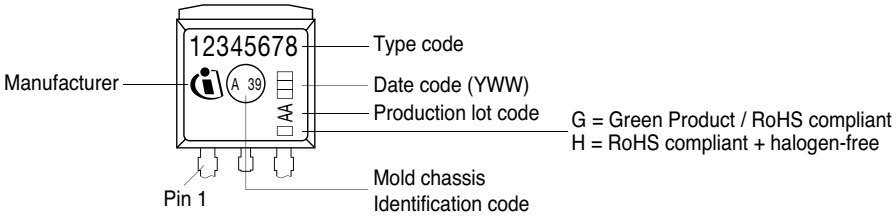
Package Outline



Foot Print

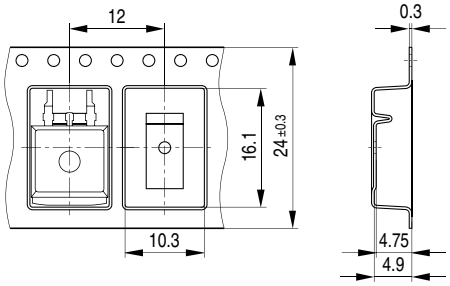


Marking Layout



Packing

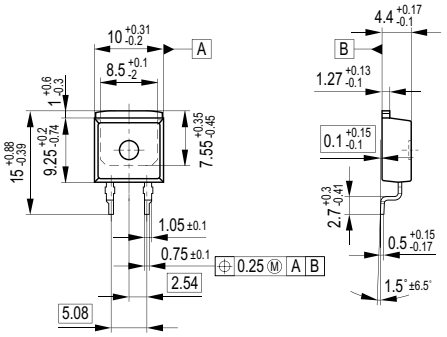
Reel ø330mm = 1.000 Pieces/Reel



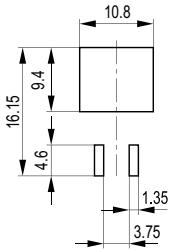
All dimensions in mm

TO-263 (D²PAK 2pin)

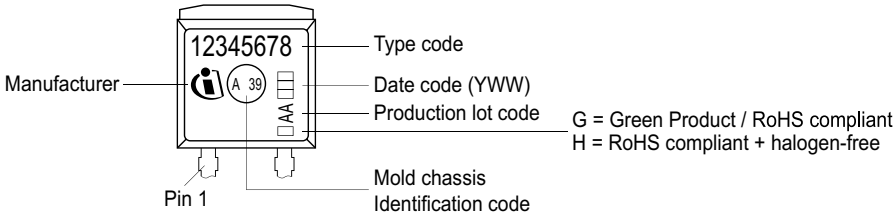
Package Outline



Foot Print

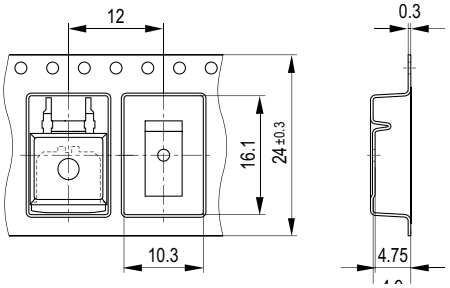


Marking Layout



Packing

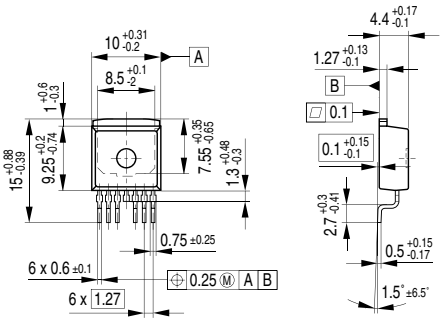
Reel ø330mm = 1.000 Pieces/Reel



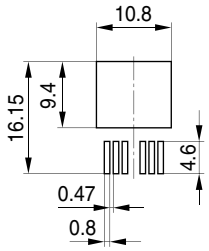
All dimensions in mm

TO-263 (D²PAK 7pin)

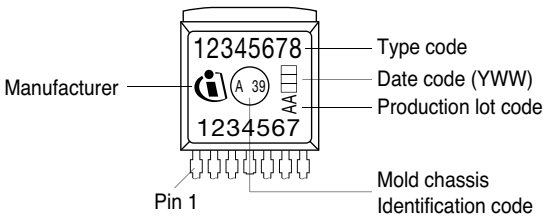
Package Outline



Foot Print

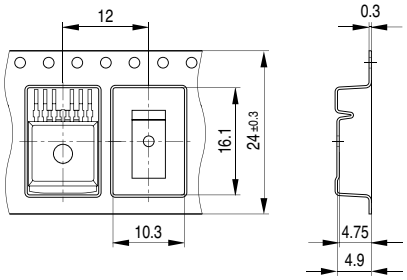


Marking Layout



Packing

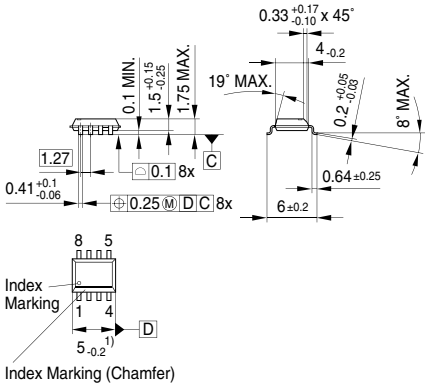
Reel ø330mm = 1.000 Pieces/Reel



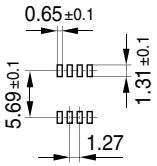
All dimensions in mm

SO-8

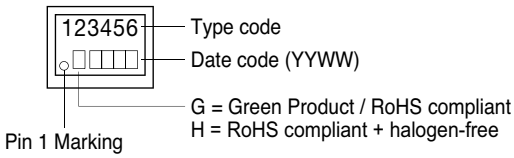
Package Outline



Foot Print



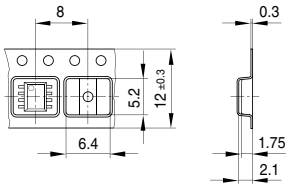
Marking Layout

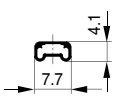


Packing

Reel ø330mm = 2.500 Pieces/Reel

Pieces/Tube: 100

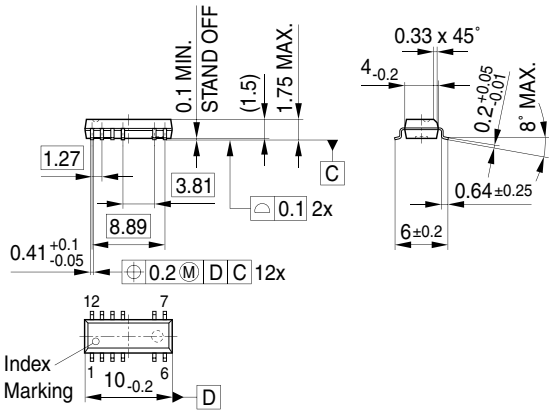




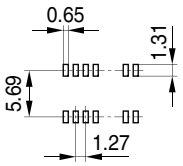
All dimensions in mm

SO-16/12

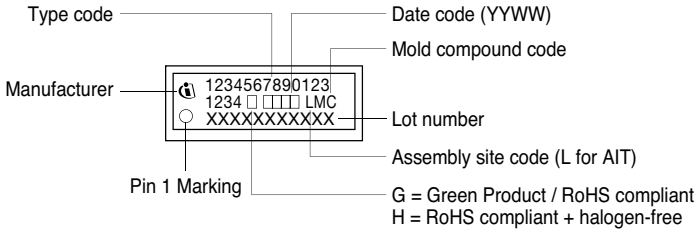
Package Outline



Foot Print



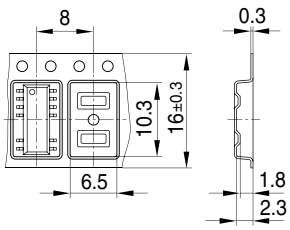
Marking Layout

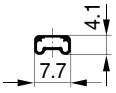


Packing

Reel ø330mm = 2.500 Pieces/Reel

Pieces/Tube: 50

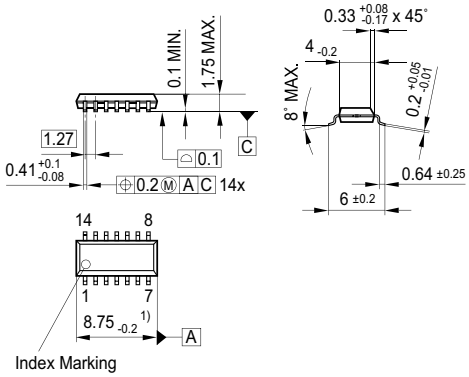




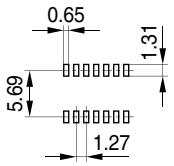
All dimensions in mm

SO-14

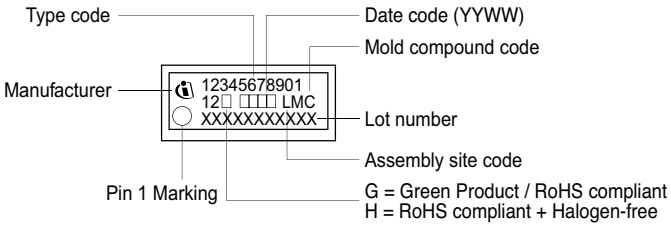
Package Outline



Foot Print



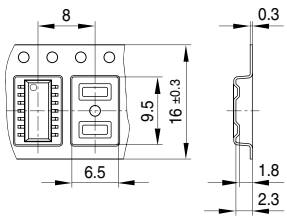
Marking Layout

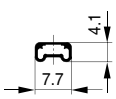


Packing

Reel ø330mm = 2.500 Pieces/Reel

Pieces/Tube: 50

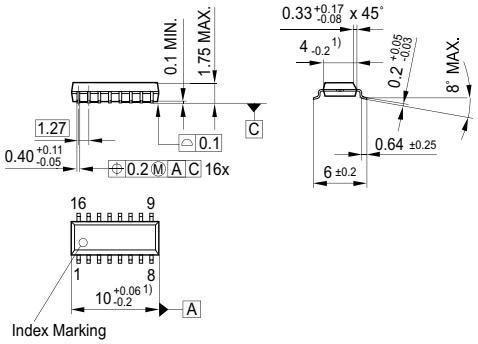




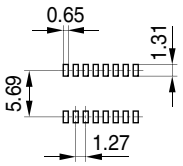
All dimensions in mm

SO-16

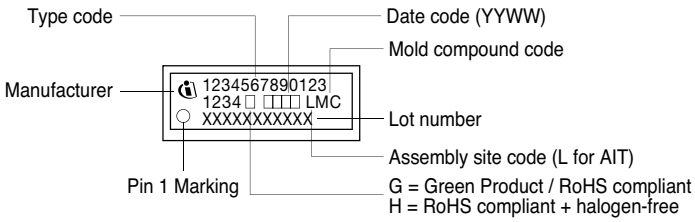
Package Outline



Foot Print

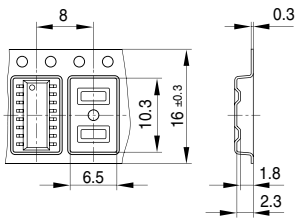


Marking Layout

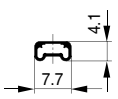


Packing

Reel ø330mm = 2.500 Pieces/Reel



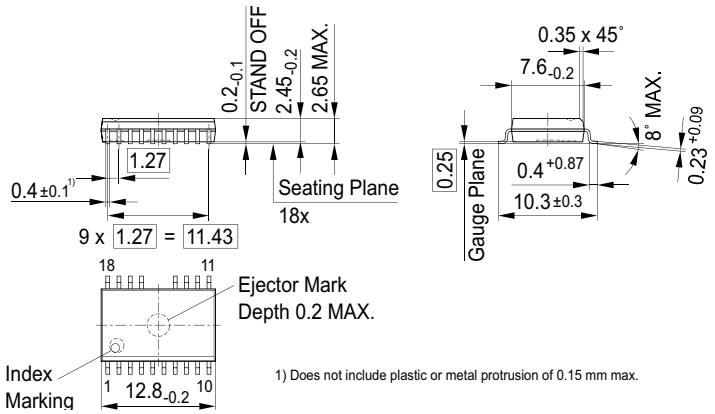
Pieces/Tube: 50



All dimensions in mm

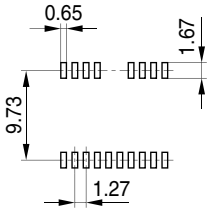
SO-18

Package Outline

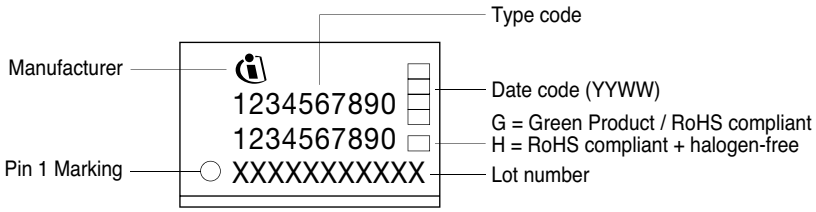


1) Does not include plastic or metal protrusion of 0.15 mm max.

Foot Print

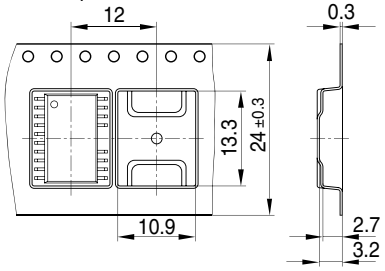


Marking Layout

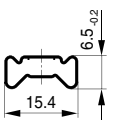


Packing

Reel ø330mm = 1.000 Pieces/Reel



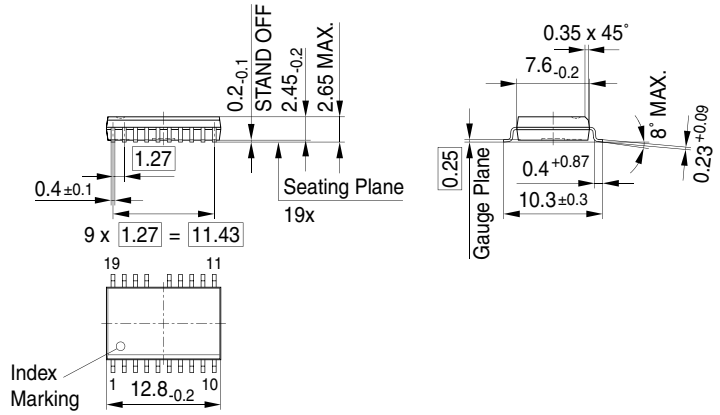
Pieces/Tube: 39



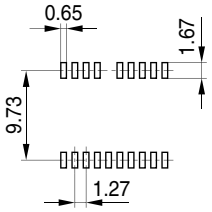
All dimensions in mm

SO-19

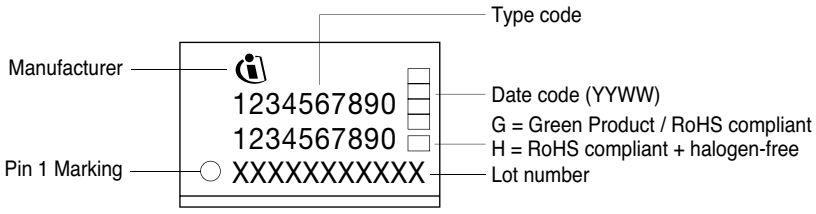
Package Outline



Foot Print

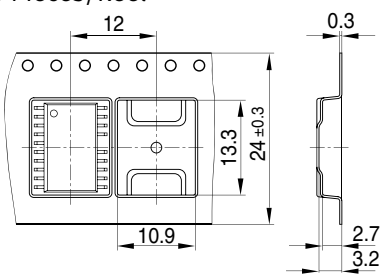


Marking Layout

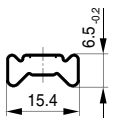


Packing

Reel ø330mm = 1.000 Pieces/Reel



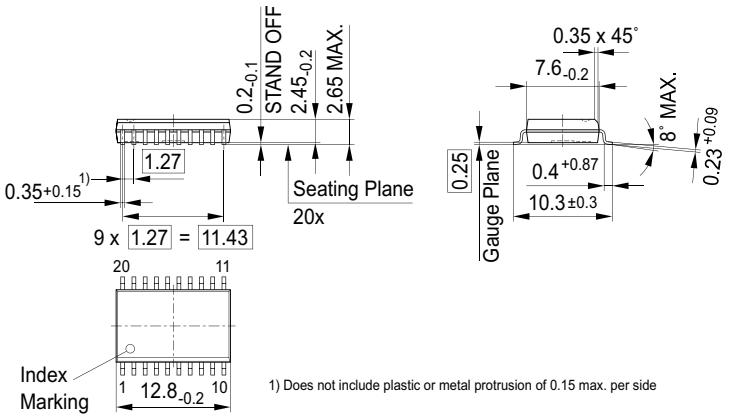
Pieces/Tube: 39



All dimensions in mm

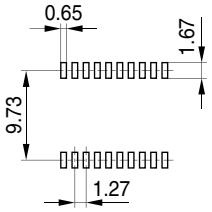
SO-20

Package Outline

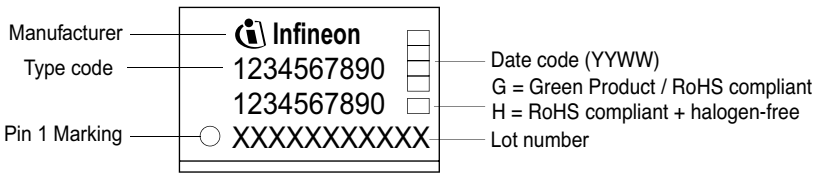


1) Does not include plastic or metal protrusion of 0.15 max. per side

Foot Print

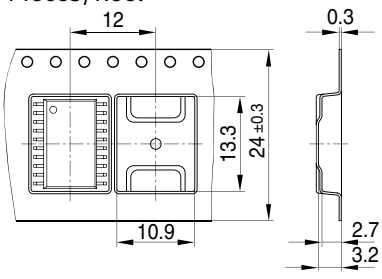


Marking Layout

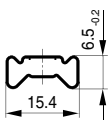


Packing

Reel ø330mm = 1.000 Pieces/Reel



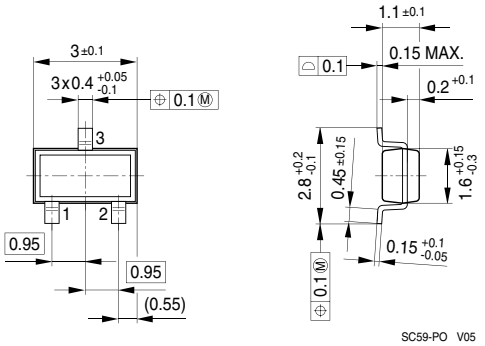
Pieces/Tube: 39



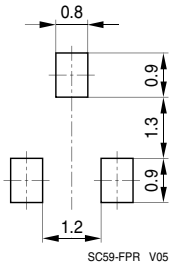
All dimensions in mm

SC59

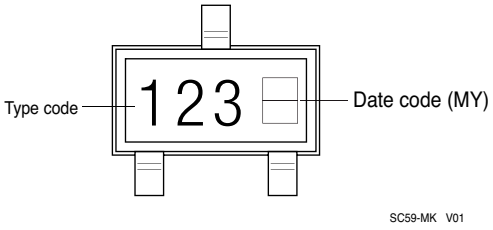
Package Outline



Foot Print



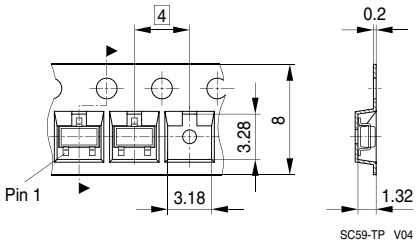
Marking Layout



Packing

Reel ø180mm = 3.000 Pieces/Reel

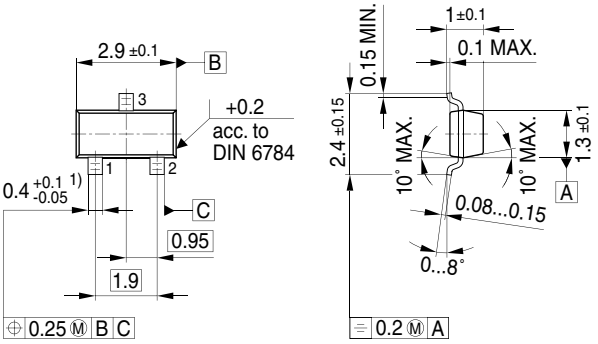
Reel ø330mm = 10.000 Pieces/Reel



All dimensions in mm

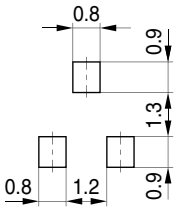
SOT-23

Package Outline

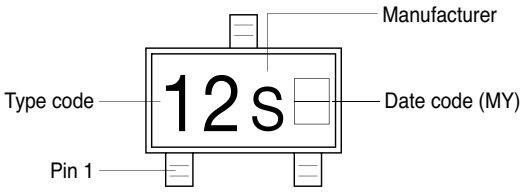


1) Lead width can be 0.6 max. in dambar area

Foot Print



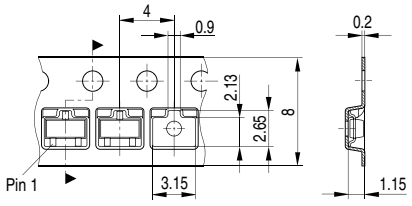
Marking Layout



Packing

Reel ø180mm = 3.000 Pieces/Reel

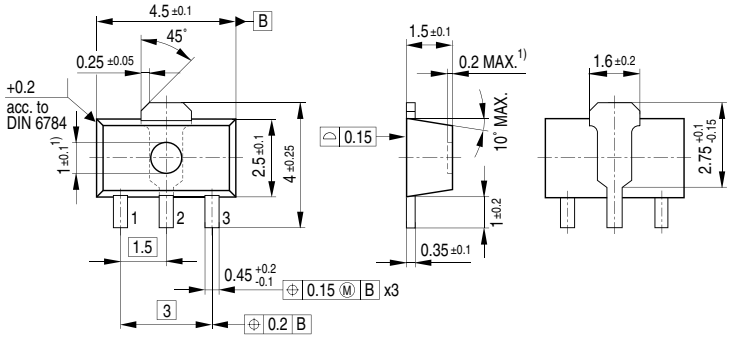
Reel ø330mm = 10.000 Pieces/Reel



All dimensions in mm

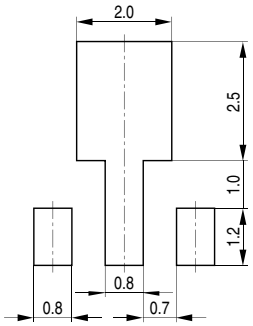
SOT-89

Package Outline

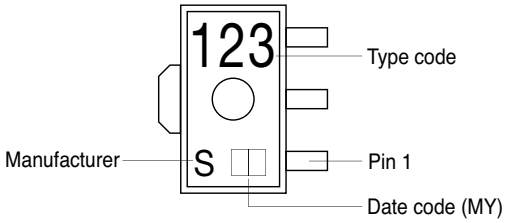


1) Ejector pin markings possible

Foot Print



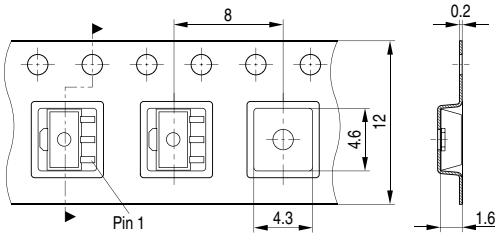
Marking Layout



Packing

Reel ø180mm = 1.000 Pieces/Reel

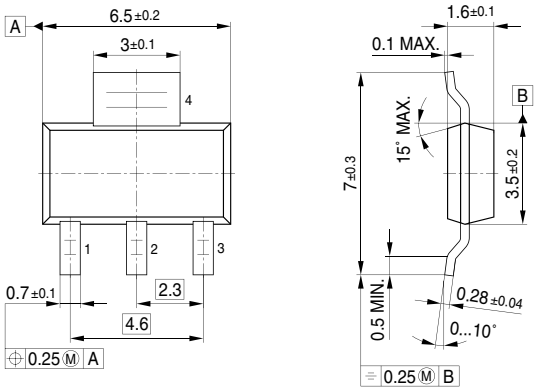
Reel ø330mm = 4.000 Pieces/Reel



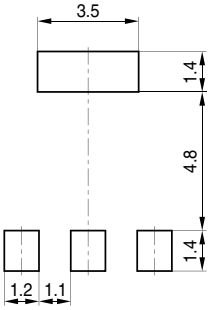
All dimensions in mm

SOT-223

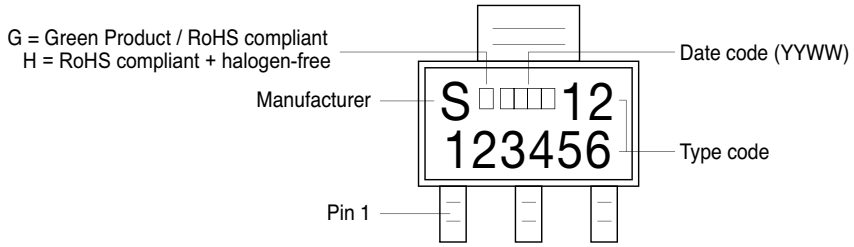
Package Outline



Foot Print



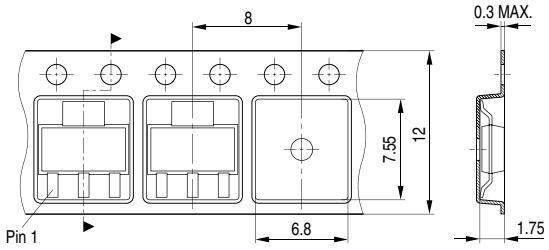
Marking Layout



Packing

Reel ø180mm = 1.000 Pieces/Reel

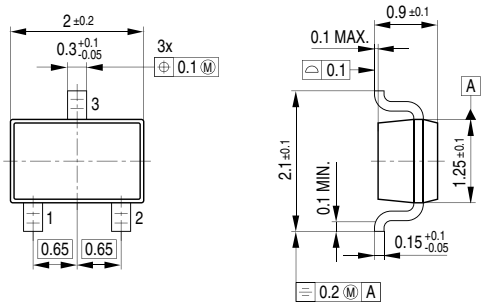
Reel ø330mm = 4.000 Pieces/Reel



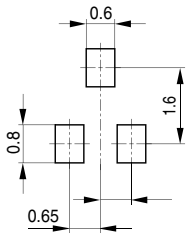
All dimensions in mm

SOT-323

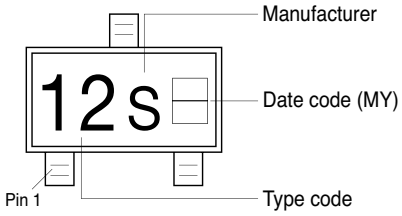
Package Outline



Foot Print



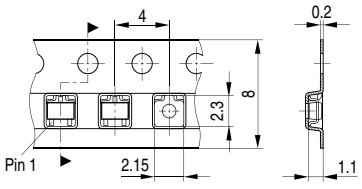
Marking Layout



Packing

Reel ø180mm = 3.000 Pieces/Reel

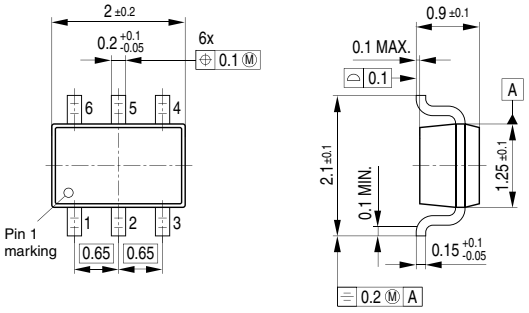
Reel ø330mm = 10.000 Pieces/Reel



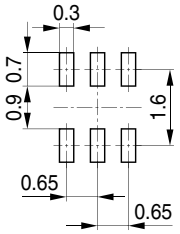
All dimensions in mm

SOT-363

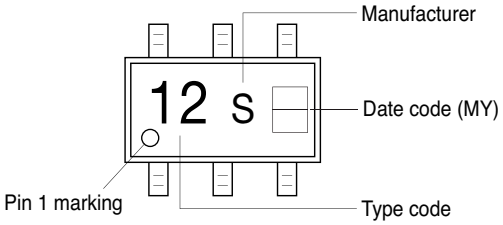
Package Outline



Foot Print



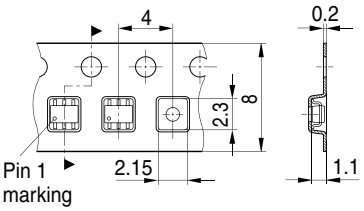
Marking Layout



Packing

Reel ø180mm = 3.000 Pieces/Reel

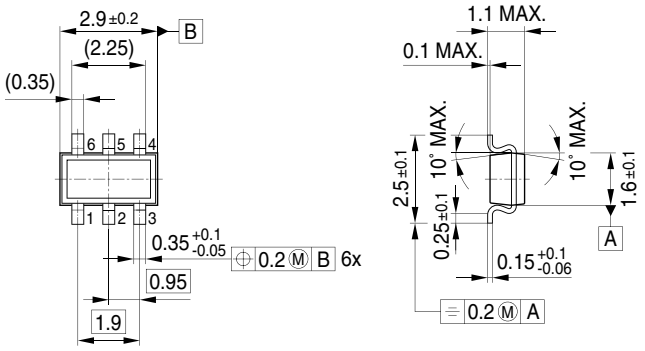
Reel ø330mm = 10.000 Pieces/Reel



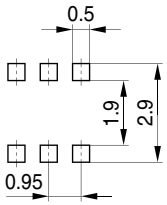
All dimensions in mm

TSOP-6

Package Outline

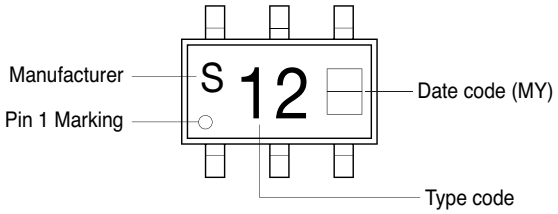


Foot Print



Remark: Wave soldering possible dep.
on customers process conditions

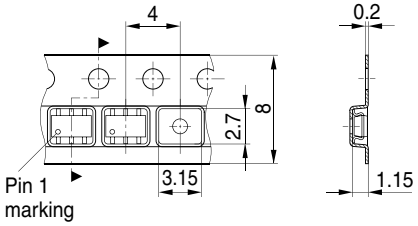
Marking Layout



Packing

Reel ø180mm = 3.000 Pieces/Reel

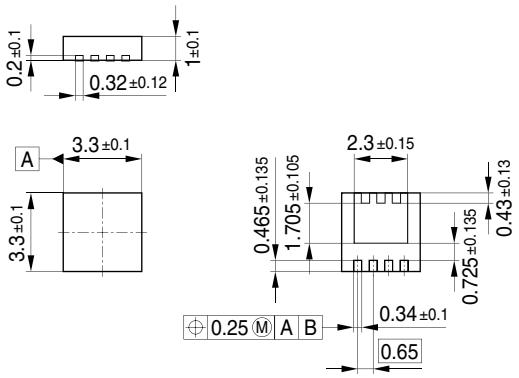
Reel ø330mm = 10.000 Pieces/Reel



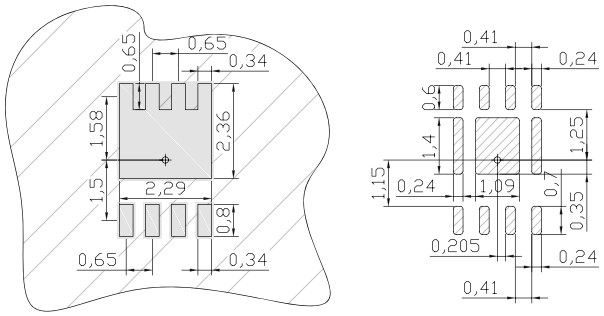
All dimensions in mm

TSDSON-8 (S308)

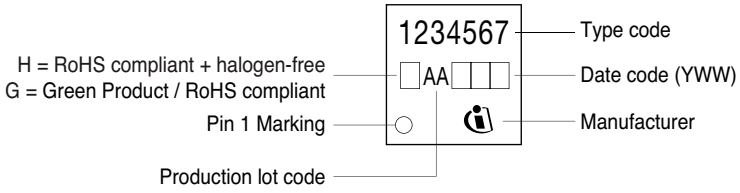
Package Outline



Foot Print

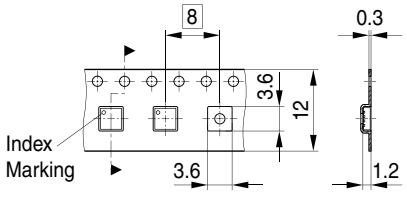


Marking Layout



Packing

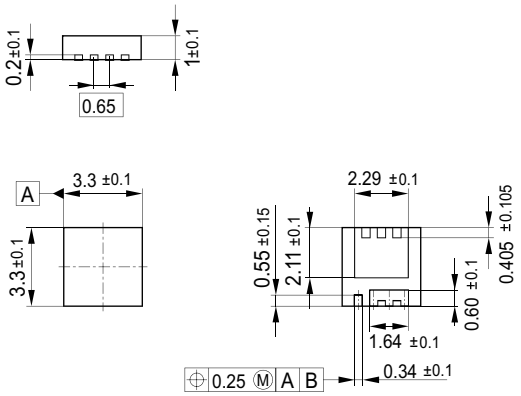
Reel ø330mm = 5.000 Pieces/Reel



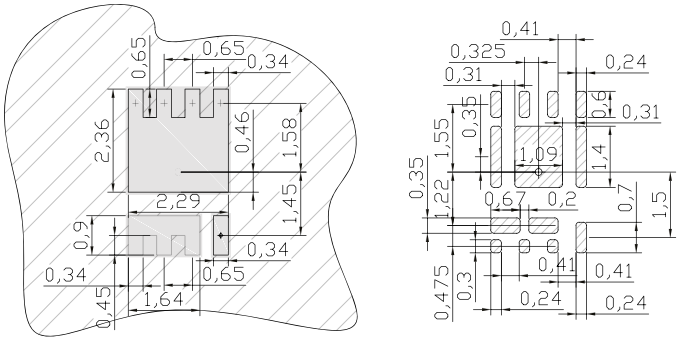
All dimensions in mm

TSDSON-8 FL (S308 fused leads)

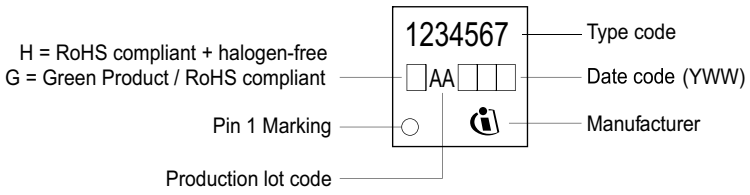
Package Outline



Foot Print

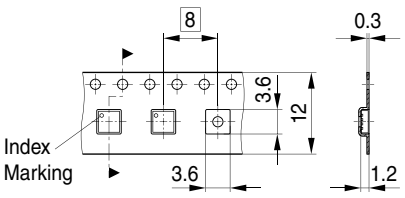


Marking Layout



Packing

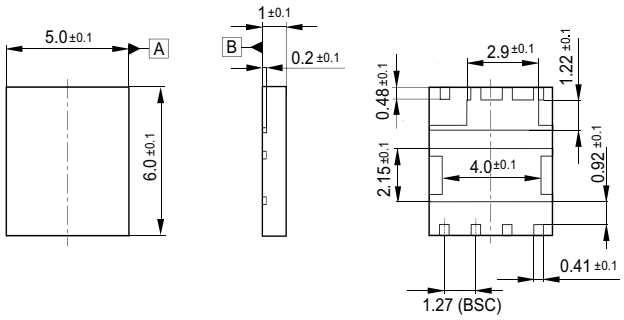
Reel ø330mm = 5.000 Pieces/Reel



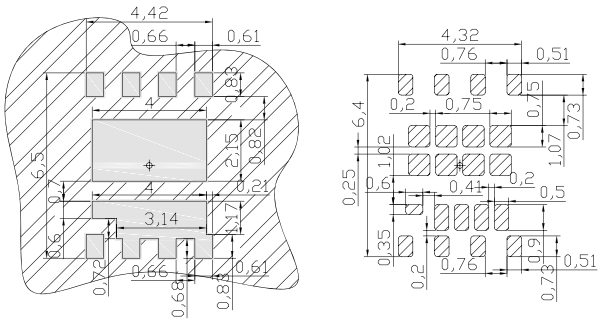
All dimensions in mm

TISON-8 (Power stage 5x6)

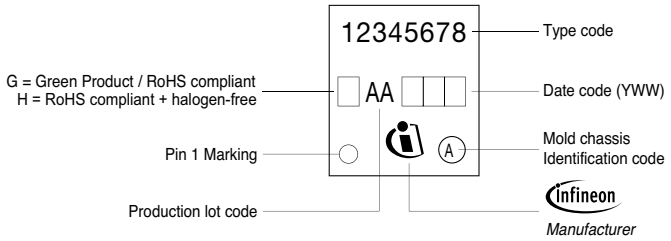
Package Outline



Foot Print

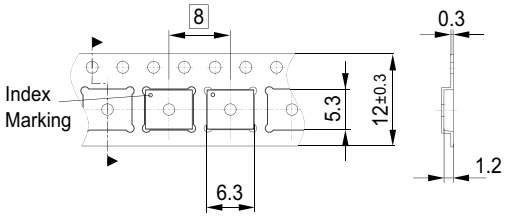


Marking Layout



Packing

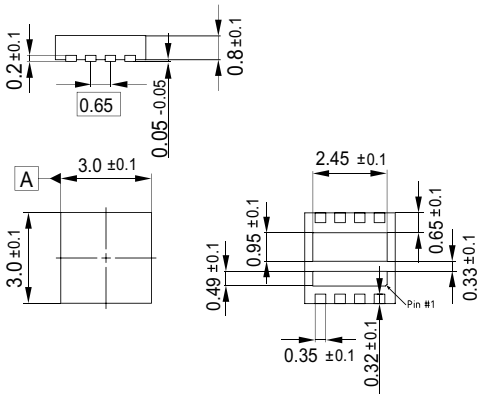
Reel ø330mm = 5.000 Pieces/Reel



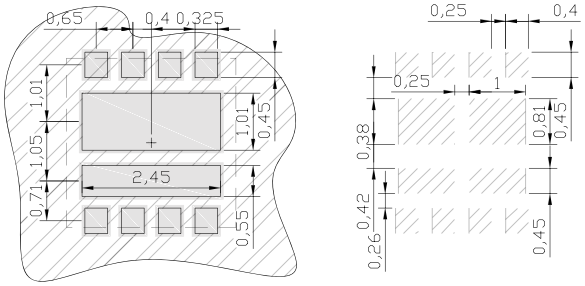
All dimensions in mm

WISON-8 (Power stage 3x3)

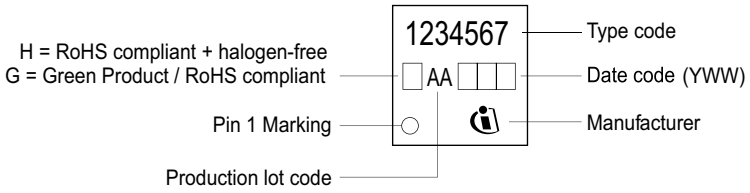
Package Outline



Foot Print

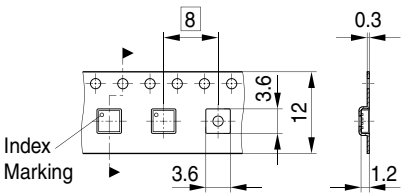


Marking Layout



Packing

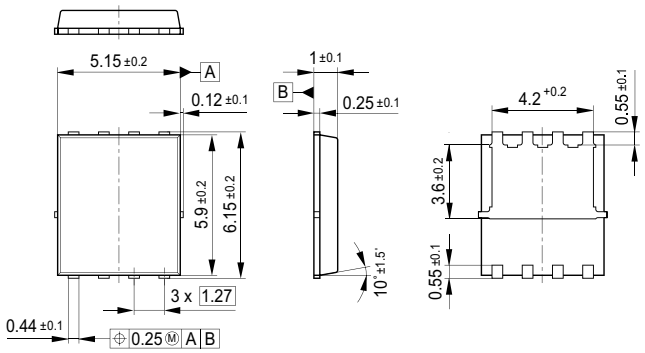
Reel ø330mm = 5.000 Pieces/Reel



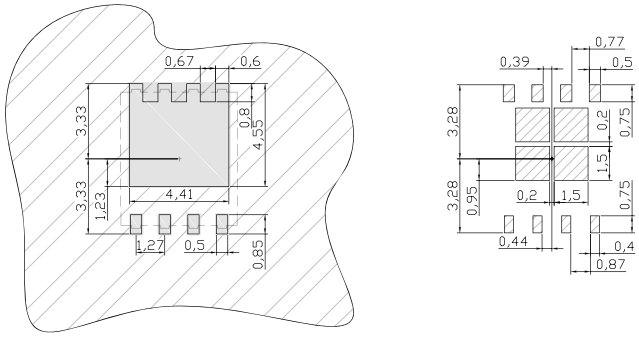
All dimensions in mm

TDSON-8 (SuperS08)

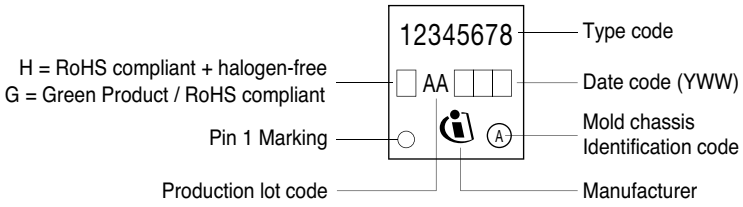
Package Outline



Foot Print

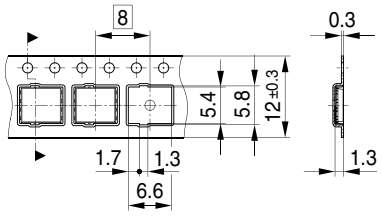


Marking Layout



Packing

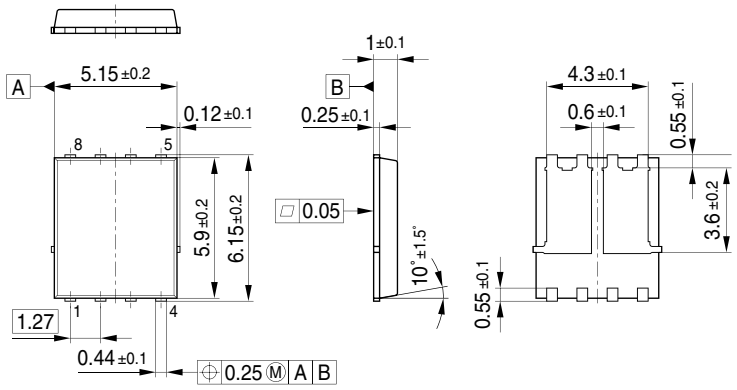
Reel ø330mm = 5.000 Pieces/Reel



All dimensions in mm

TDSON-8 dual (SuperS08 dual)

Package Outline



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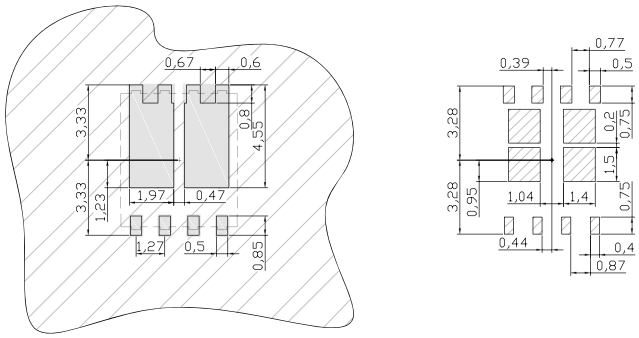
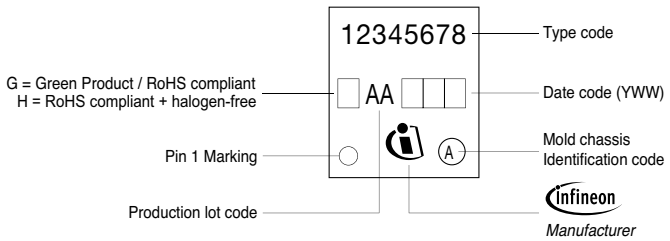
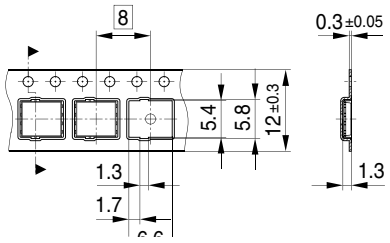


Marking Layout



Packing

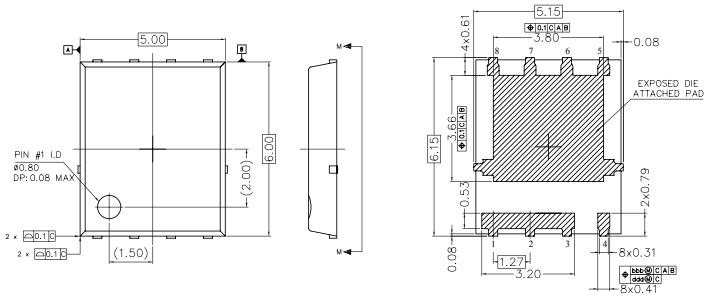
Reel ø330mm = 5.000 Pieces/Reel



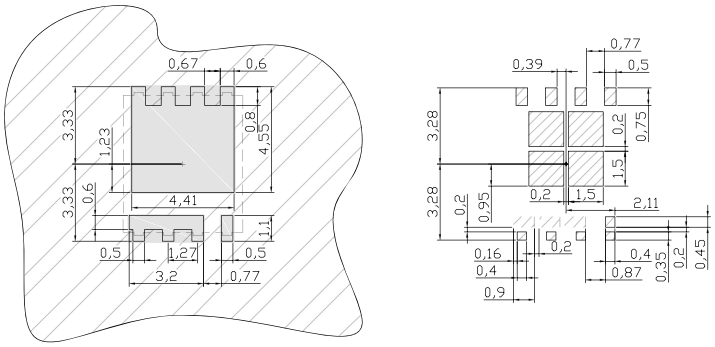
All dimensions in mm

TDSON-8 FL (SuperS08 fused leads)

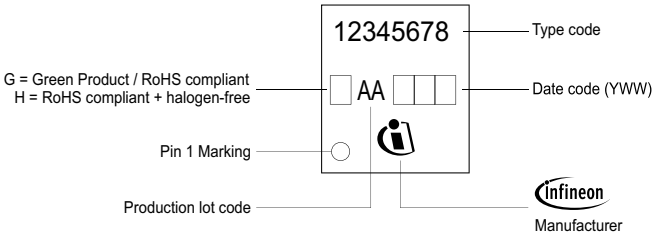
Package Outline



Foot Print

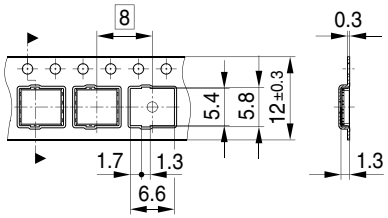


Marking Layout



Packing

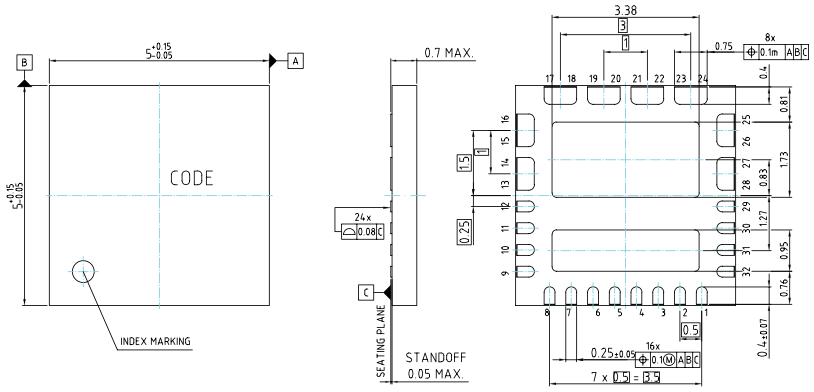
Reel ø330mm = 5.000 Pieces/Reel



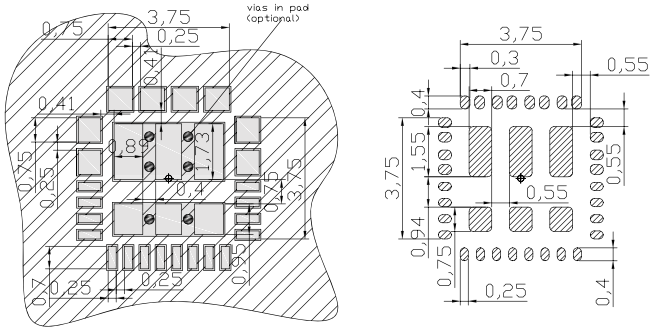
All dimensions in mm

DrBlade 1.0 (UIQFN-32-2)

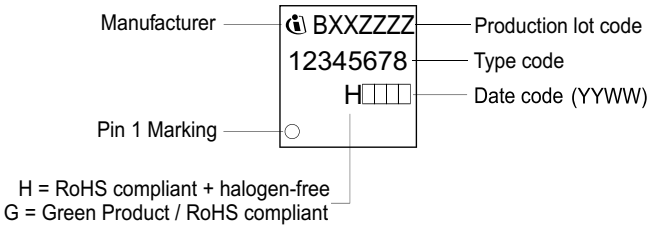
Package Outline



Foot Print

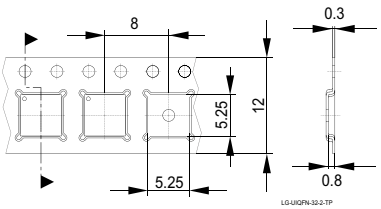


Marking Layout



Packing

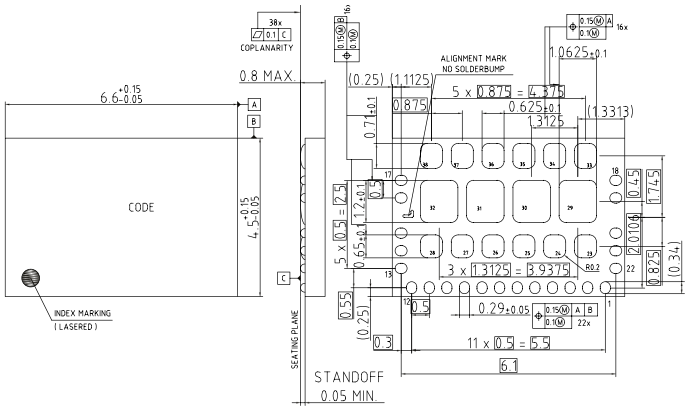
Reel ø330mm = 5.000 Pieces/Reel



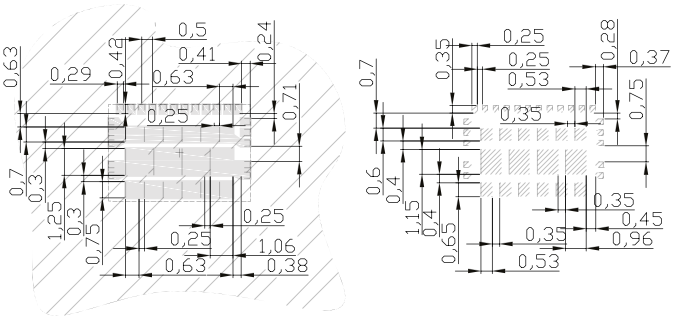
All dimensions in mm

DrBlade Gen2 (WIQFN-38-1)

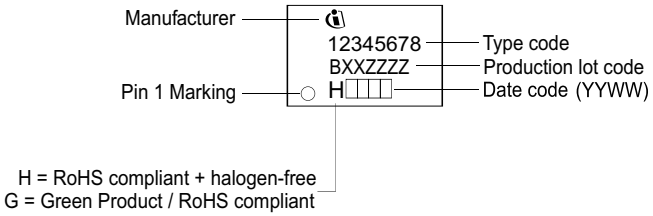
Package Outline



Foot Print

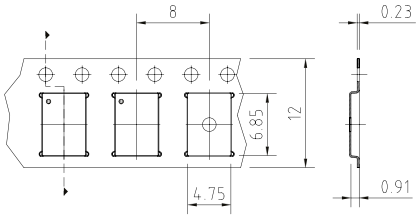


Marking Layout



Packing

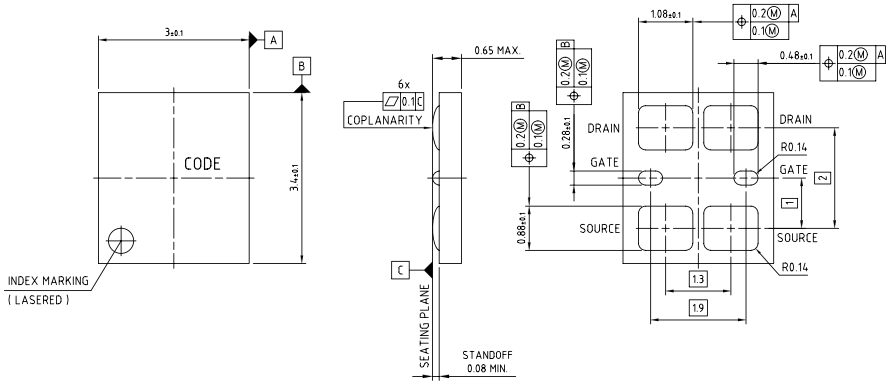
Reel ø330mm = 8.000 Pieces/Reel



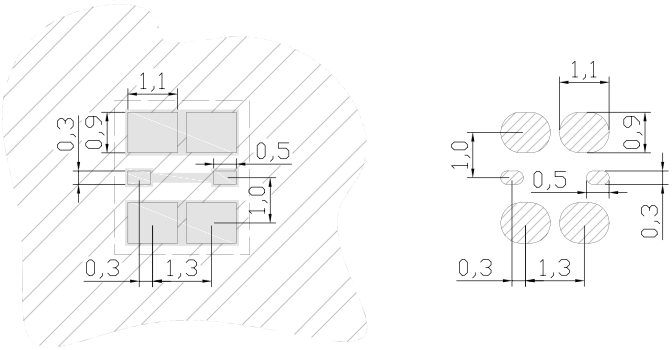
All dimensions in mm

Blade 3x3 (USON-6-1)

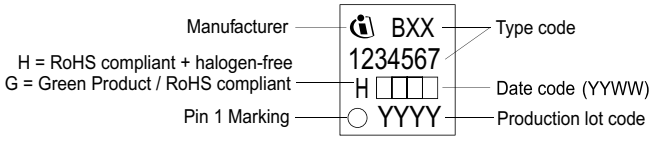
Package Outline



Foot Print

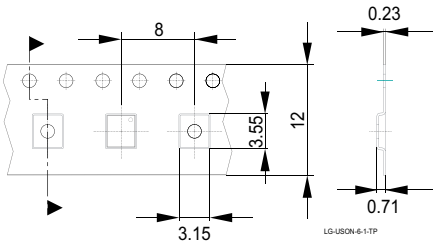


Marking Layout



Packing

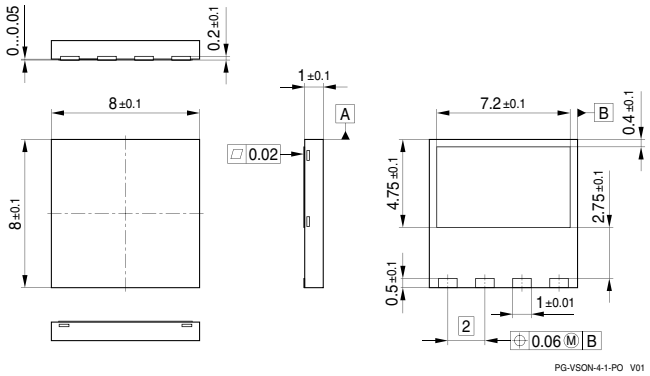
Reel ø330mm = 5.000 Pieces/Reel



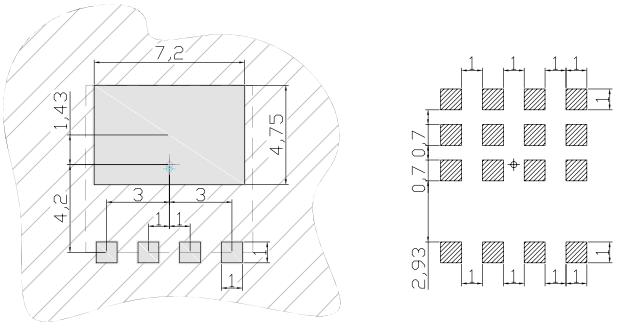
All dimensions in mm

VSON-4 (ThinPAK)

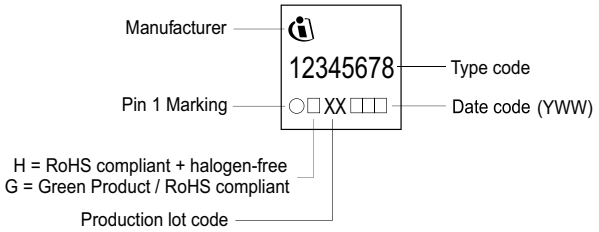
Package Outline



Foot Print

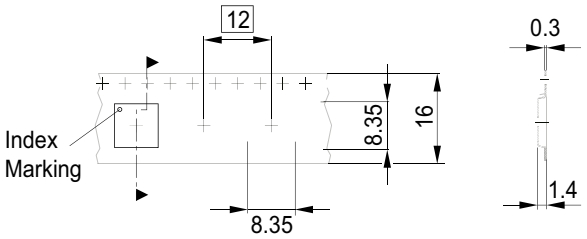


Marking Layout



Packing

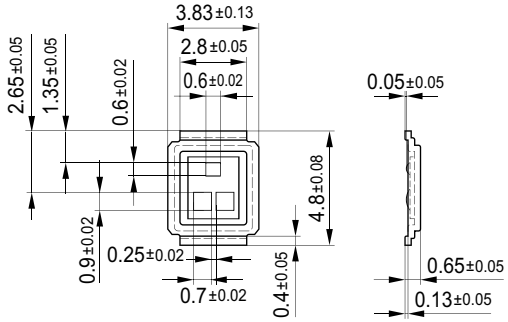
Reel ø330 mm = 3000 pcs/ Reel



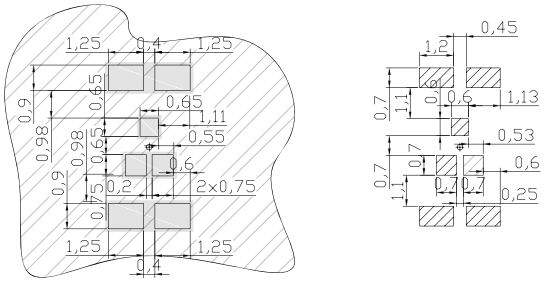
All dimensions in mm

WDSON-2-2 (CanPAK™ SJ)

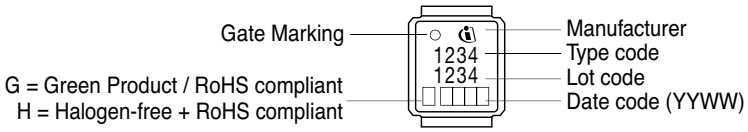
Package Outline



Foot Print

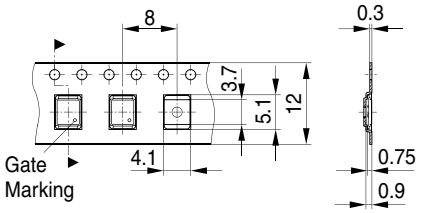


Marking Layout



Packing

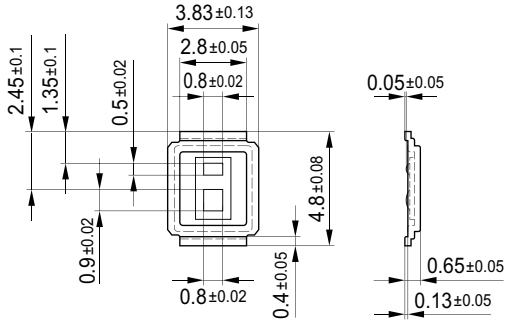
Reel ø177mm = 1.000 Pieces/Reel



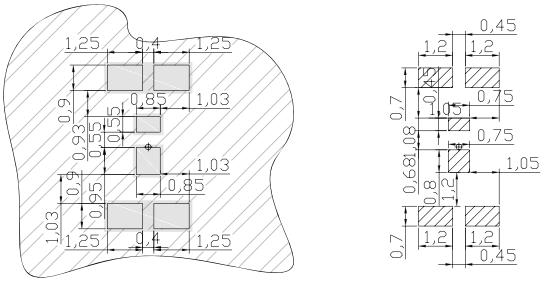
All dimensions in mm

WDSON-2-3 (CanPAK™ SQ)

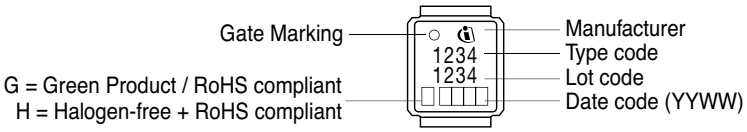
Package Outline



Foot Print

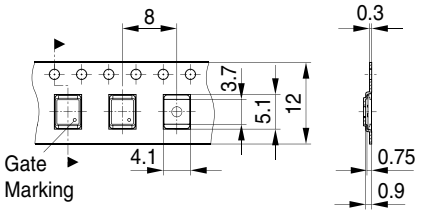


Marking Layout



Packing

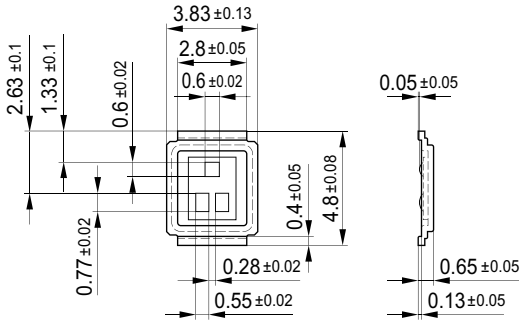
Reel ø177mm = 1.000 Pieces/Reel



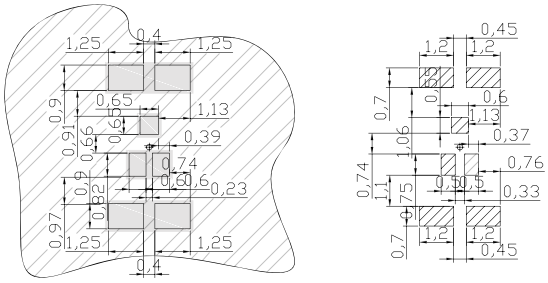
All dimensions in mm

WDSON-2-4 (CanPAK™ ST)

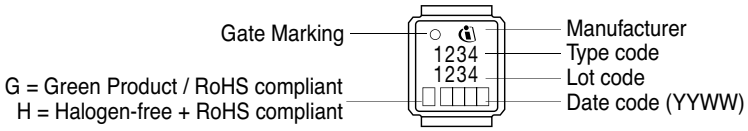
Package Outline



Foot Print

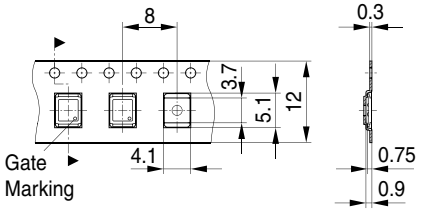


Marking Layout



Packing

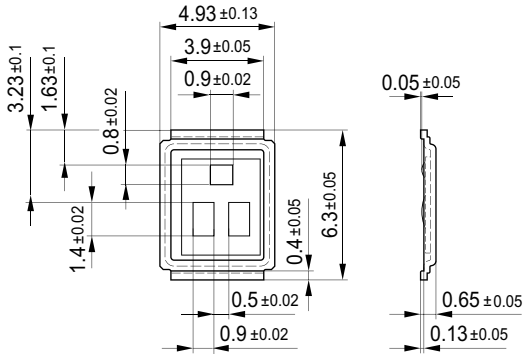
Reel ø177mm = 1.000 Pieces/Reel



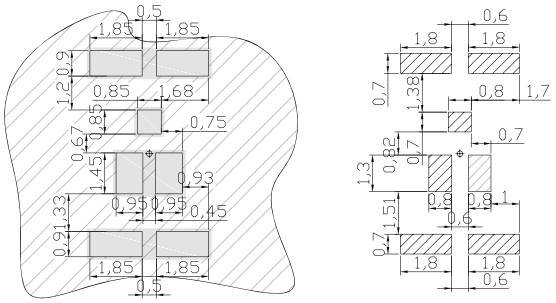
All dimensions in mm

WDSON-2-5 (CanPAK™ MN)

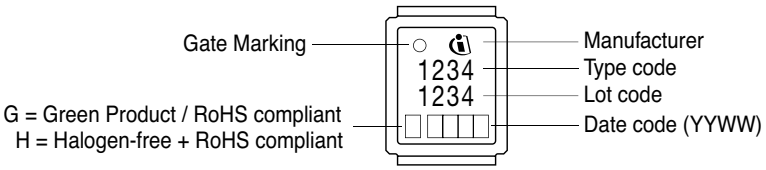
Package Outline



Foot Print

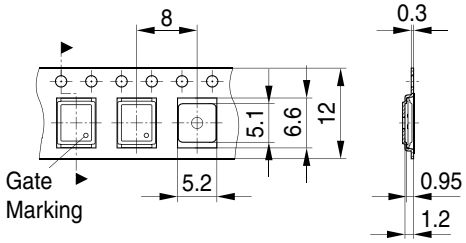


Marking Layout



Packing

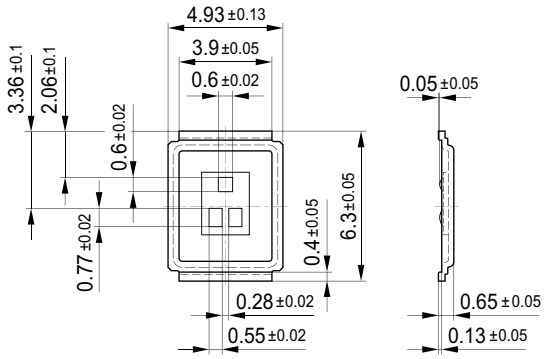
Reel ø177mm = 1.000 Pieces/Reel



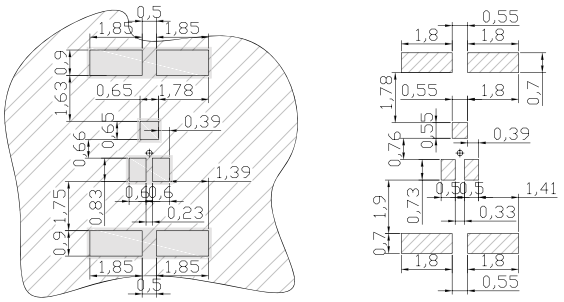
All dimensions in mm

WDSON-2-6 (CanPAK™ MP)

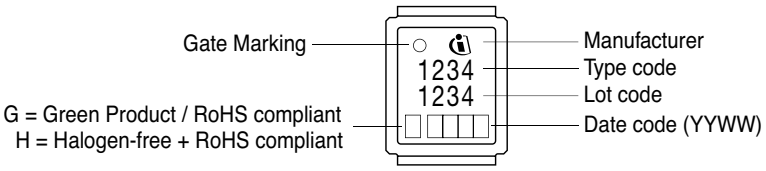
Package Outline



Foot Print

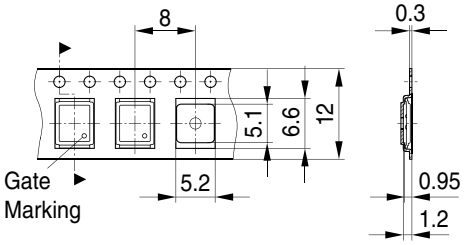


Marking Layout



Packing

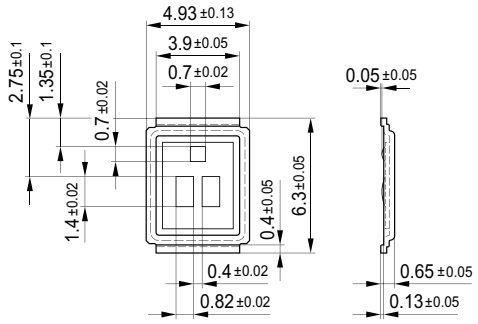
Reel ø177mm = 1.000 Pieces/Reel



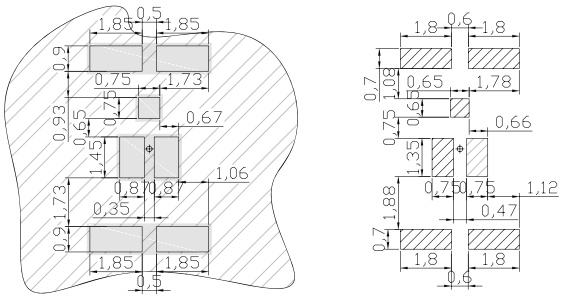
All dimensions in mm

WDSON-2-8 (CanPAK™ MX)

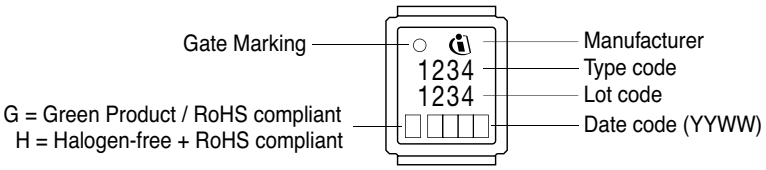
Package Outline



Foot Print

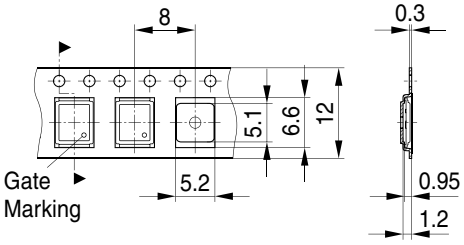


Marking Layout



Packing

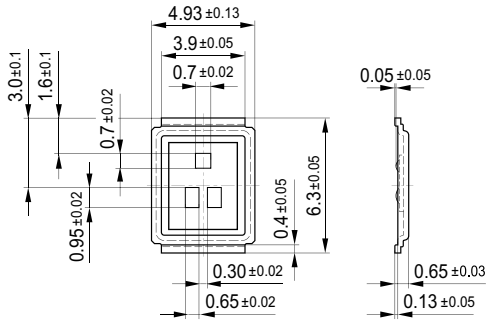
Reel ø177mm = 1.000 Pieces/Reel



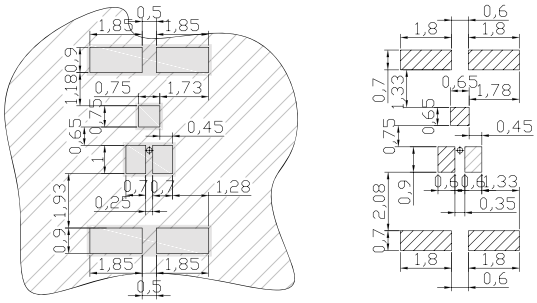
All dimensions in mm

WDSON-2-9 (CanPAK™ MZ)

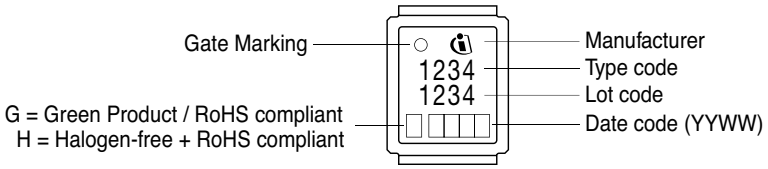
Package Outline



Foot Print

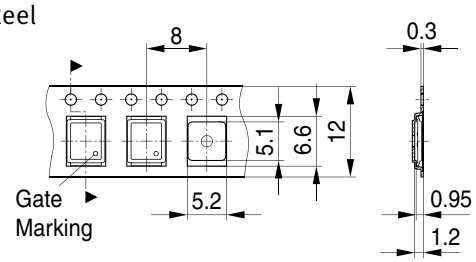


Marking Layout



Packing

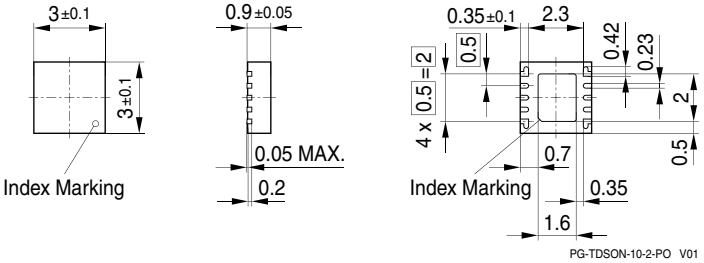
Reel ø177mm = 1.000 Pieces/Reel



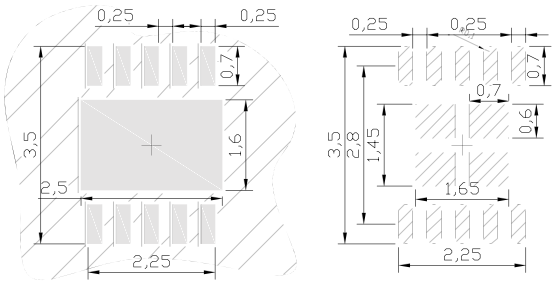
All dimensions in mm

TDSON-10-2

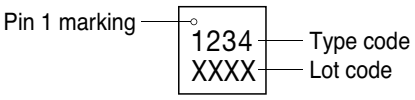
Package Outline



Foot Print

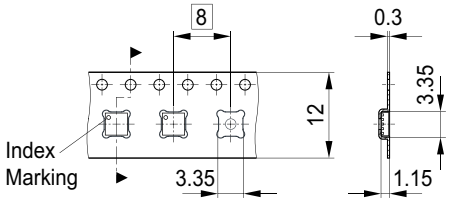


Marking Layout



Packing

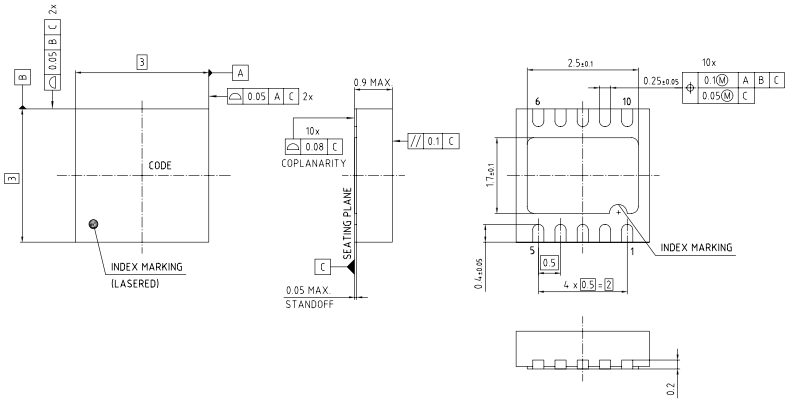
Reel ø330mm = 5.000 Pieces/Reel



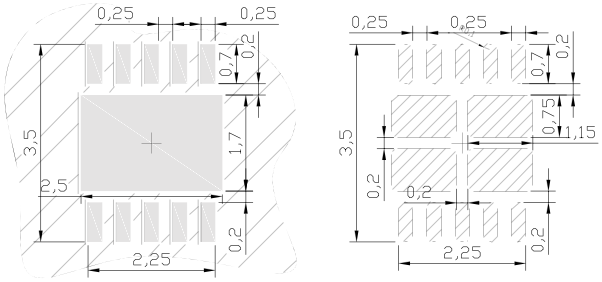
All dimensions in mm

TDSON-10-7

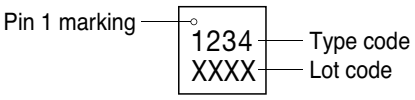
Package Outline



Foot Print

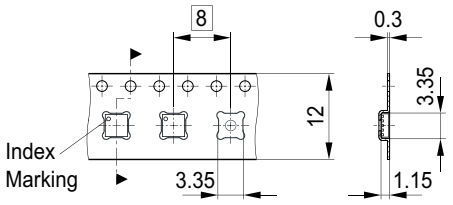


Marking Layout



Packing

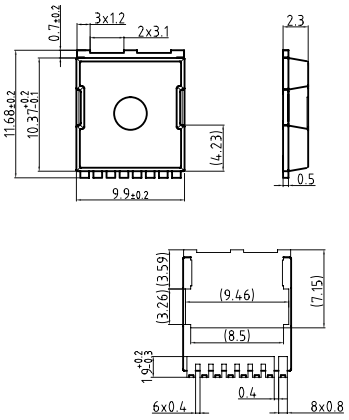
Reel ø330mm = 5.000 Pieces/Reel



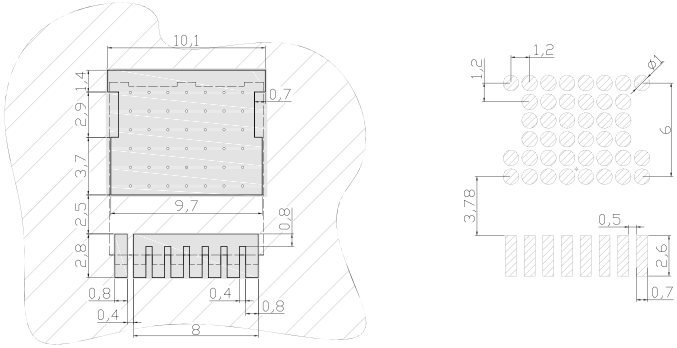
All dimensions in mm

HSOF-8 (TO-Leadless)

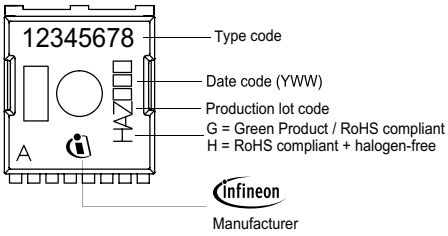
Package Outline



Foot Print

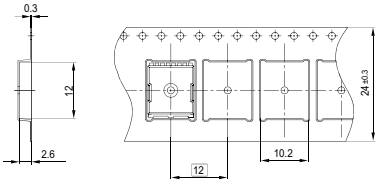


Marking Layout



Packing

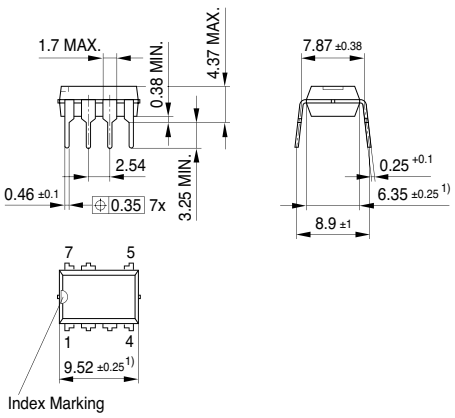
Reel ø330mm = 5.000 Pieces/Reel



All dimensions in mm

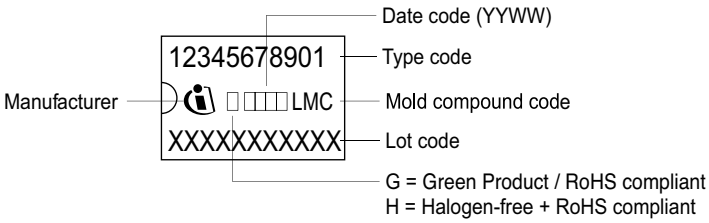
DIP-7

Package Outline



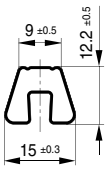
1) Does not include plastic or metal protrusion of 0.25 max. per side

Marking Layout



Packing

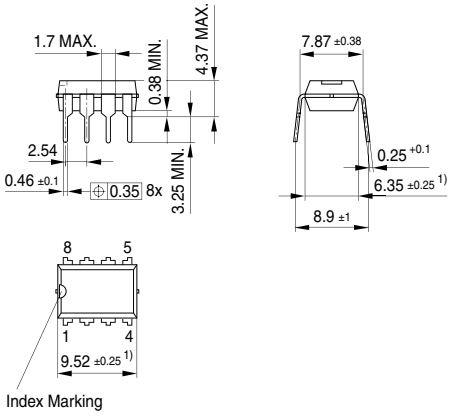
Pieces/Tube: 20



All dimensions in mm

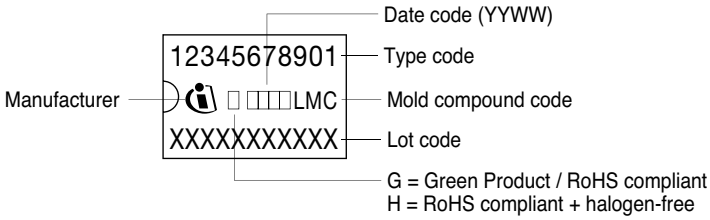
DIP-8

Package Outline



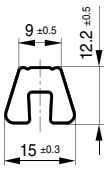
1) Does not include plastic or metal protrusion of 0.25 max. per side

Marking Layout



Packing

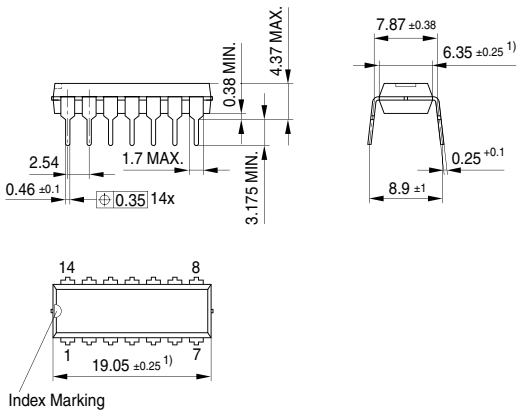
Pieces/Tube: 20



All dimensions in mm

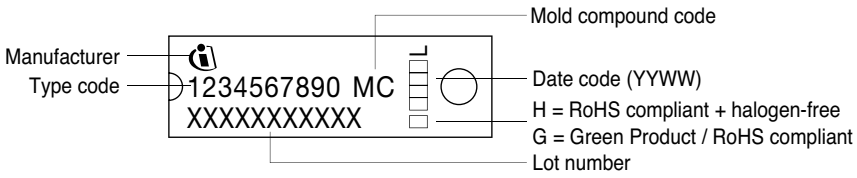
DIP-14

Package Outline



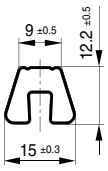
1) Does not include plastic or metal protrusion of 0.25 max. per side

Marking Layout



Packing

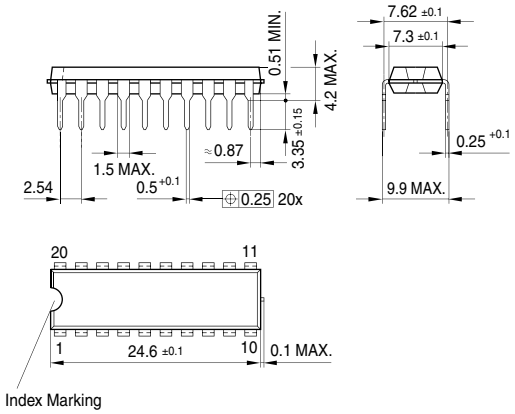
Pieces/Tube: 20



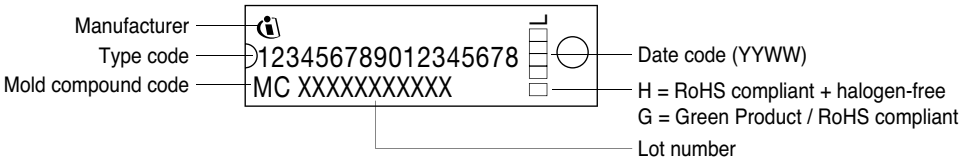
All dimensions in mm

DIP-20

Package Outline

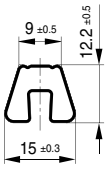


Marking Layout



Packing

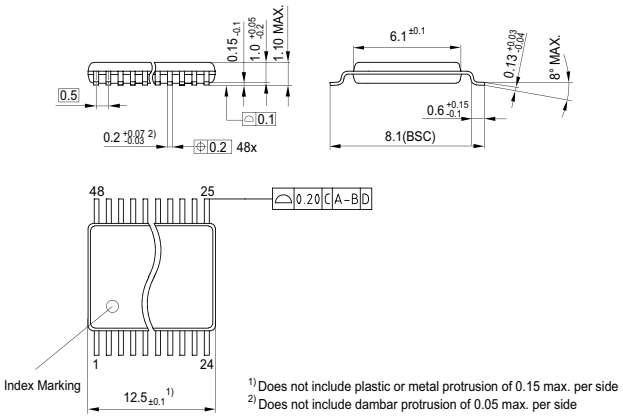
Pieces/Tube: 20



All dimensions in mm

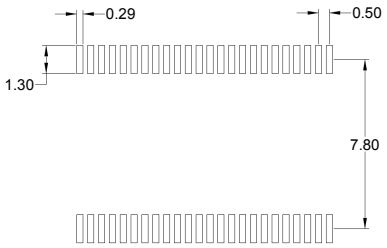
TSSOP-48

Package Outline

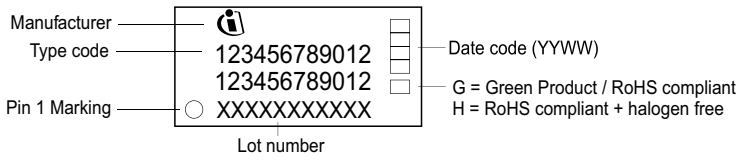


1) Does not include plastic or metal protrusion of 0.15 max. per side
2) Does not include dambar protrusion of 0.05 max. per side

Foot Print

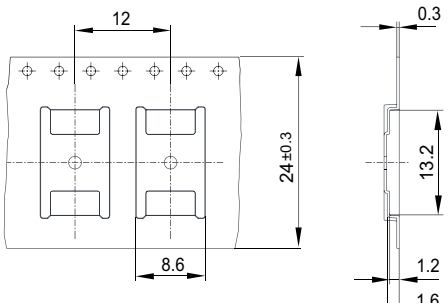


Marking Layout



Packing

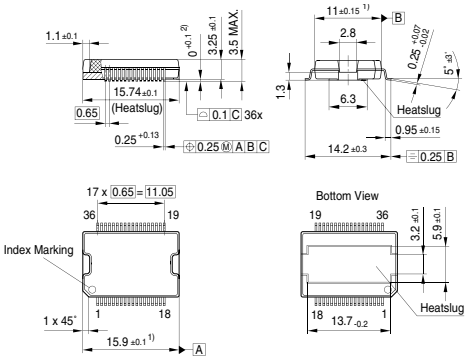
Reel ø330mm = 2.000 Pieces/Reel



All dimensions in mm

DSO-36 (430 mil)

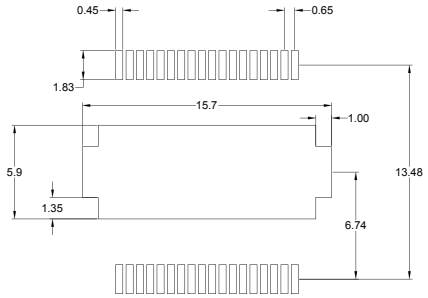
Package Outline



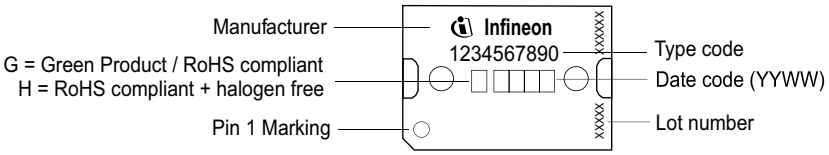
1) Does not include plastic or metal protrusion of 0.15 max. per side
2) Stand off

PG-DSO-36-10 -12 -15 -16 -21 -23 -26 -27 V01

Foot Print

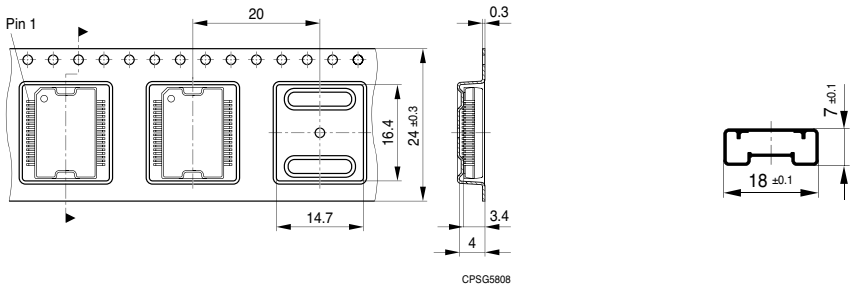


Marking Layout



Packing

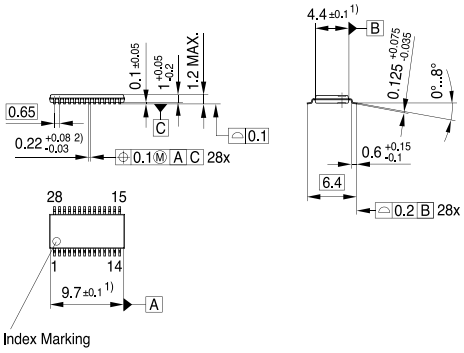
Reel ø330mm = 1.000 Pieces/Reel



All dimensions in mm

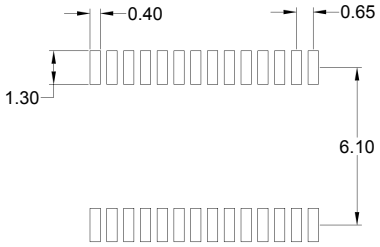
TSSOP-28

Package Outline

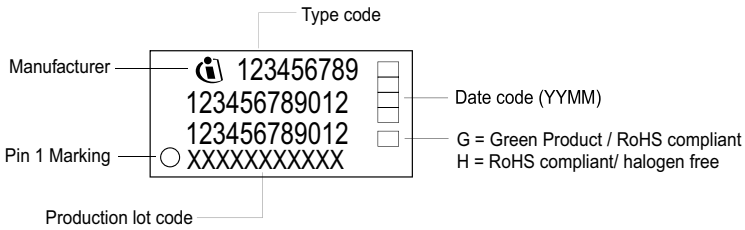


1) Does not include plastic or metal protrusion of 0.15 max. per side
2) Does not include dambar protrusion

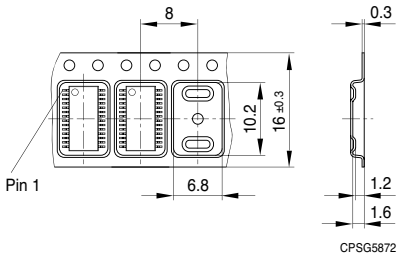
Foot Print



Marking Layout



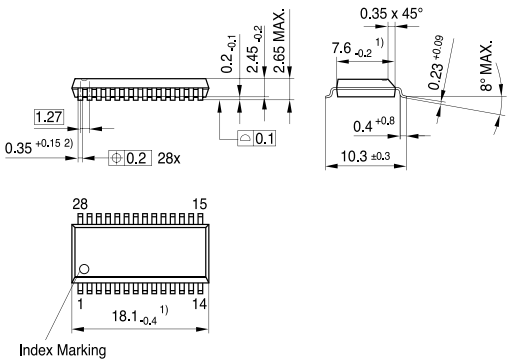
Packing



All dimensions in mm

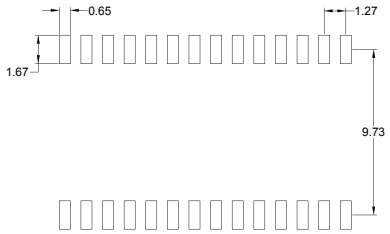
DSO-28

Package Outline

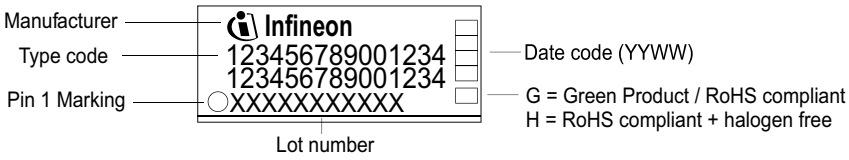


1) Does not include plastic or metal protrusion of 0.15 max. per side
2) Does not include dambar protrusion of 0.05 max. per side

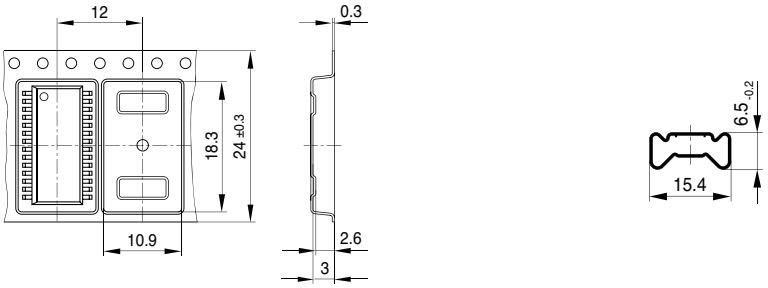
Foot Print



Marking Layout



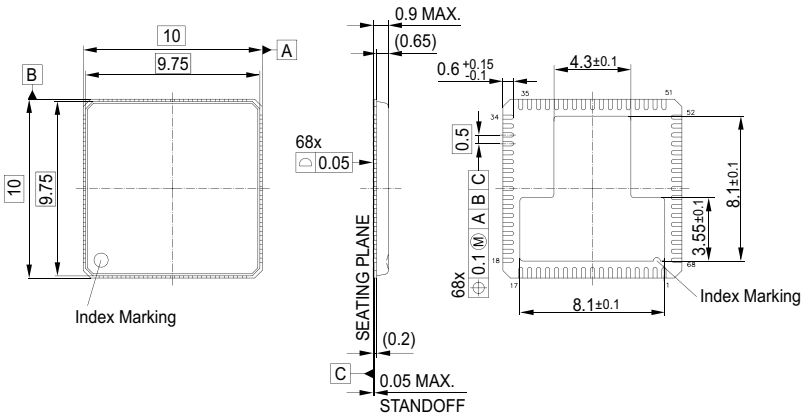
Packing



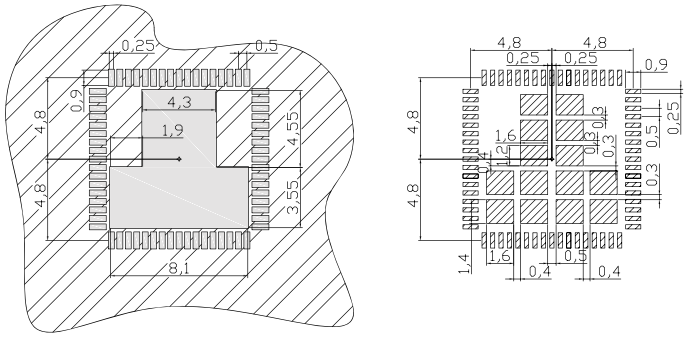
All dimensions in mm

VQFN-68

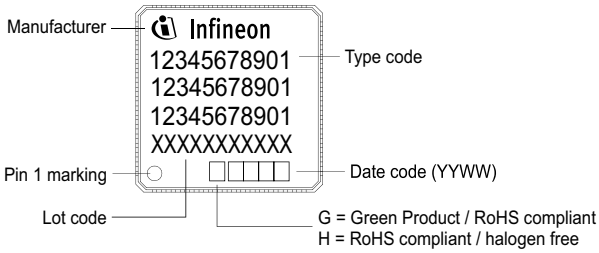
Package Outline



Foot Print

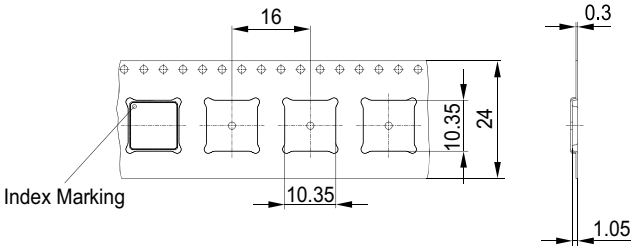


Marking Layout



Packing

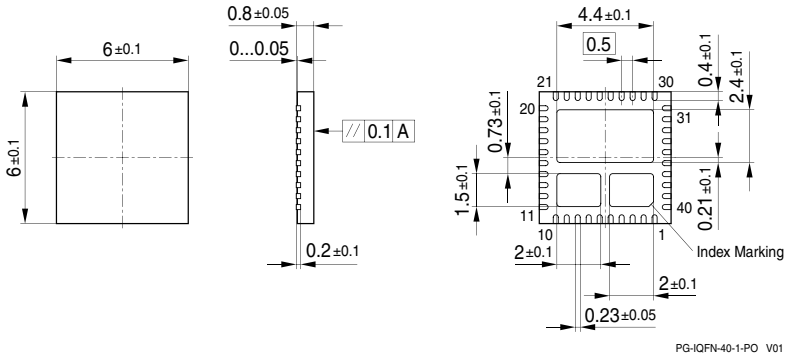
Reel ø330mm = 3.000 Pieces/Reel



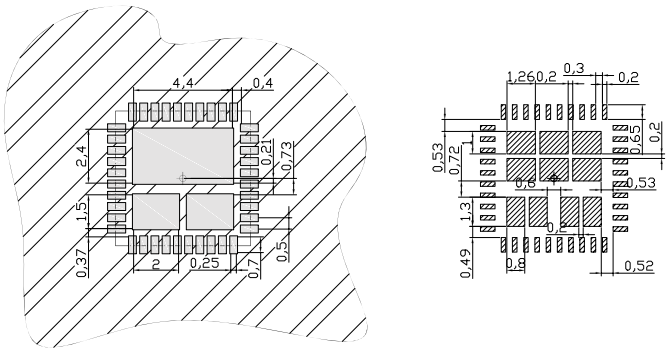
All dimensions in mm

IQFN-40 (DrMOS)

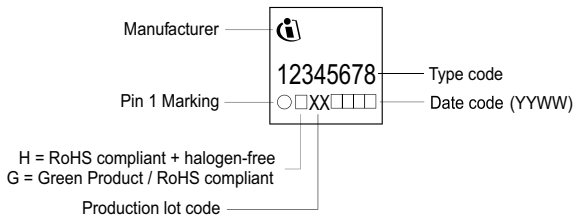
Package Outline



Foot Print

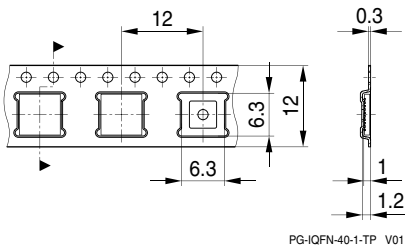


Marking Layout



Packing

Reel ø330mm = 4.000 Pieces/Reel



All dimensions in mm

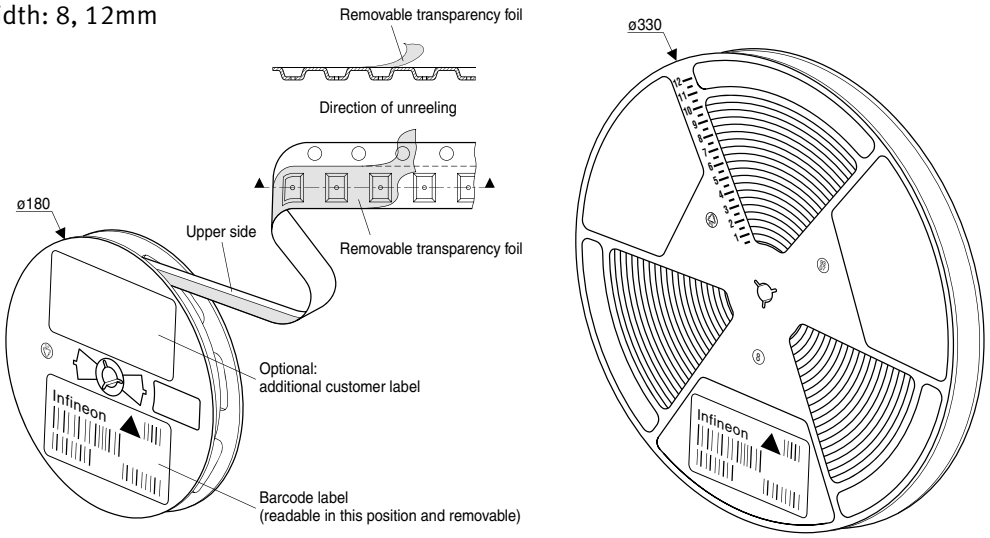
Packaging Information

Tape and Reel

(DIN IEC 60 286-3)
Please consult your nearest Infineon sales offices (www.infineon.com/sales) if you have any queries relating to additional dimensions, dimensional tolerances or variations.

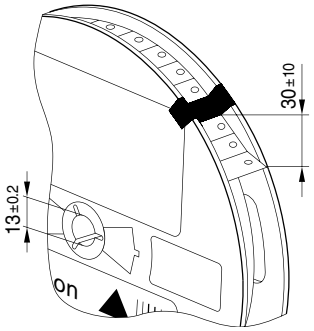
Tape and Reel made of Plastic

ø Reel 180mm and 330mm
Carrier tape width: 8, 12mm

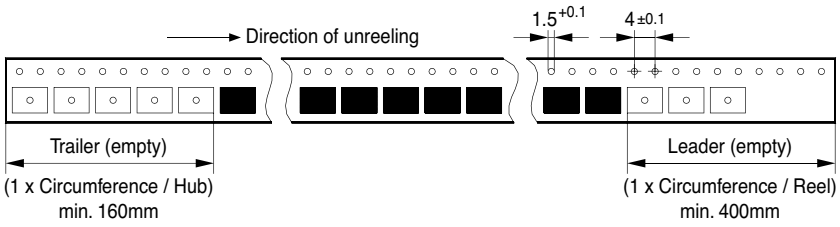


Fixing on the Tape

Carrier tape width: ≤ 12mm



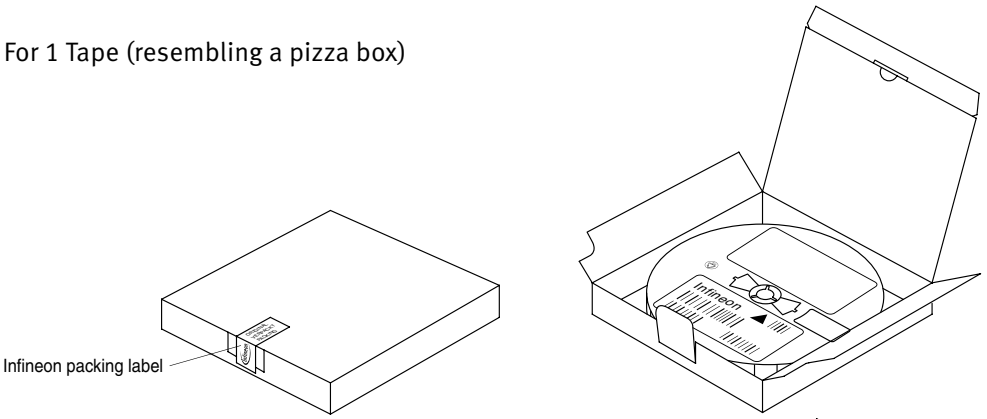
Direction of Unreeling



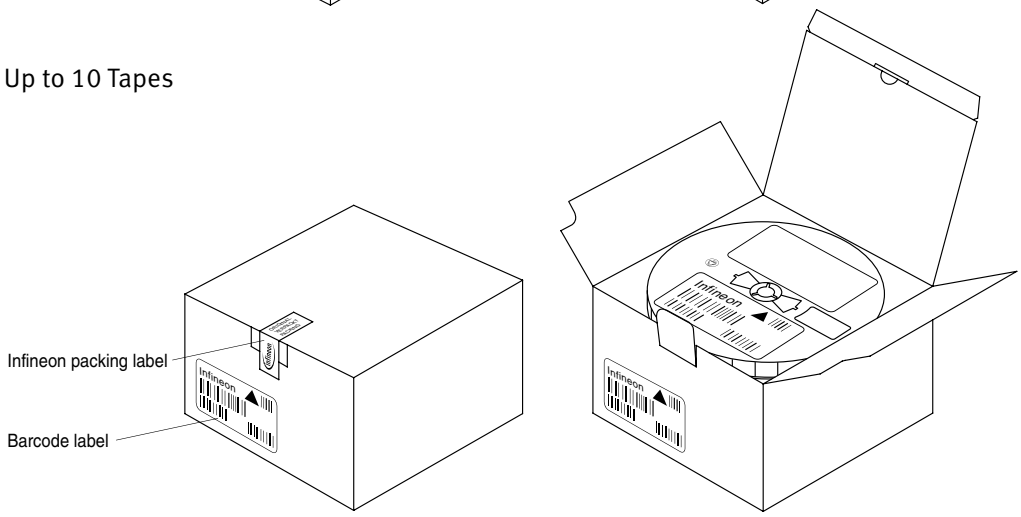
There shall be a leader of 400mm minimum of cover tape, which includes at least 100mm of carrier tape with empty compartments. All the leader may consist of the carrier tape with empty compartments, sealed by cover tape.

Labels and Boxes

For 1 Tape (resembling a pizza box)



Up to 10 Tapes



Tube (DIN IEC60 286-4)

(DIN IEC60 286-4)
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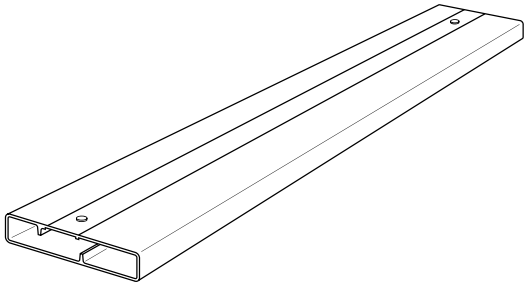
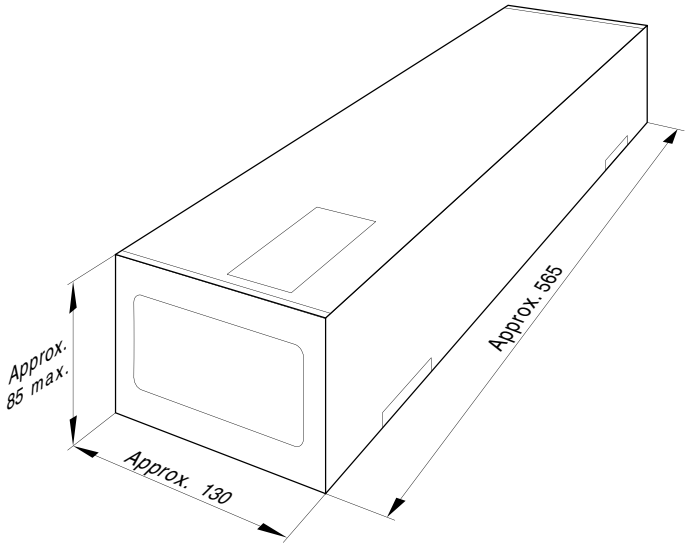
Tube and Packing

Standard Length: 528_{-2}mm;
coated (unless stated to the contrary)





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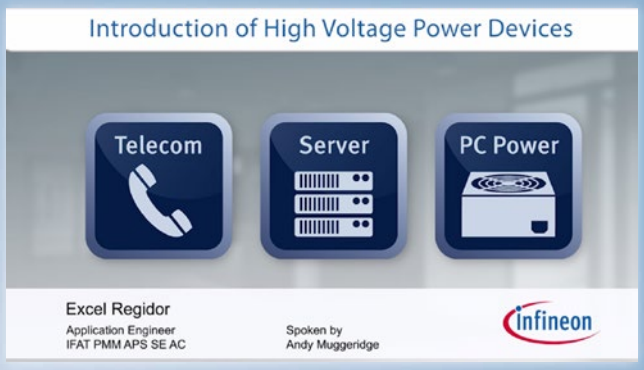

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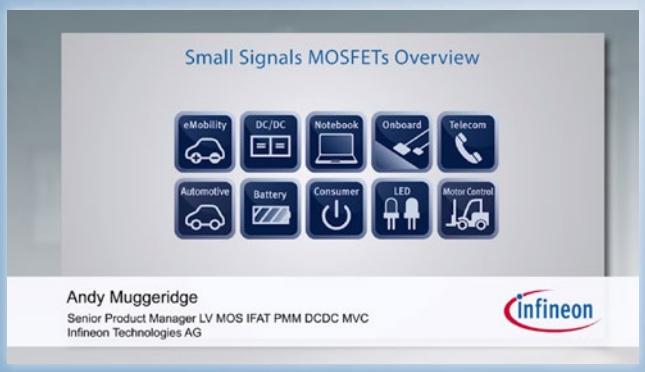

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