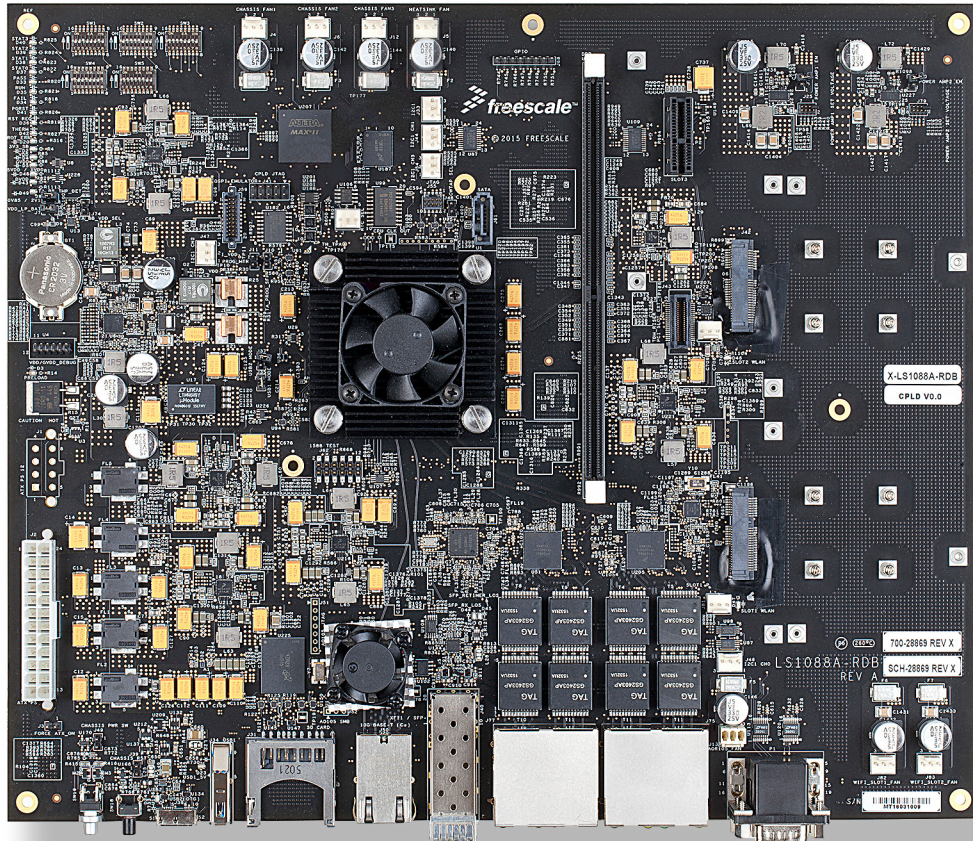


POWER MANAGEMENT SOLUTIONS FOR NXP PROCESSORS

Tested and Verified

QorIQ LS1088A Reference Design (LS1088A-RDB)



- ▶ www.linear.com/nxp
- ▶ Schematics
- ▶ Bill-of-Materials
- ▶ Power Circuit Simulation & Design Tools

Introduction

Power management solutions presented here have been assembled and verified by NXP or third-party development board providers. For more information and technical documentation, visit www.linear.com/nxp.

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Power Circuit Simulation & Design Tool	10-11

Development Boards in this Brochure Can Be Found at www.linear.com/nxp

Processor	Board Supplier	Product Name	Part Number for Core Rail	Page
QorIQ LS1088A	NXP	LS1088A-RDB	LTC®3882	3
QorIQ LS1043A	NXP	LS1043A-RDB	LTM®4649	4
QorIQ T1023A	NXP	T1023RDB	LT®8612	5
i.MX 7	Arrow	i.MX7 96Board	LTC3589-2	6
i.MX 6	Novtech	NOVPEK i.MX6Q/D	LTC3676-1	7

Contact board supplier to purchase the board

NXP: www.nxp.com



Novtech: www.novtech.com

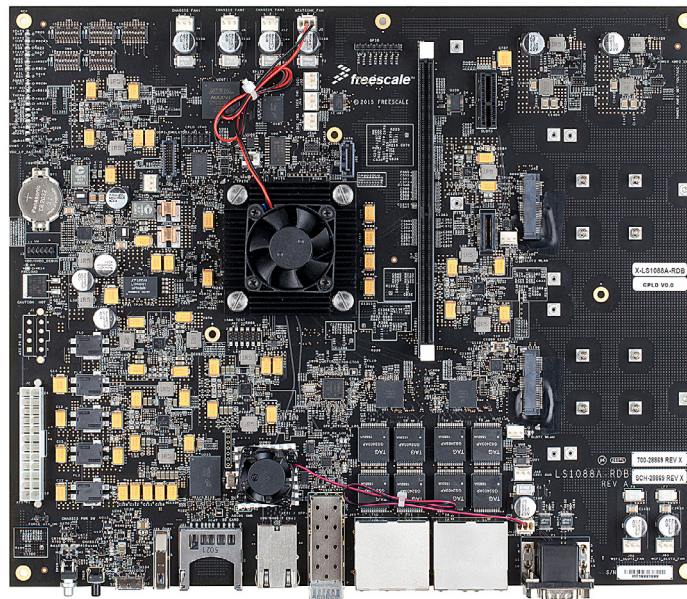


Arrow: www.arrow.com

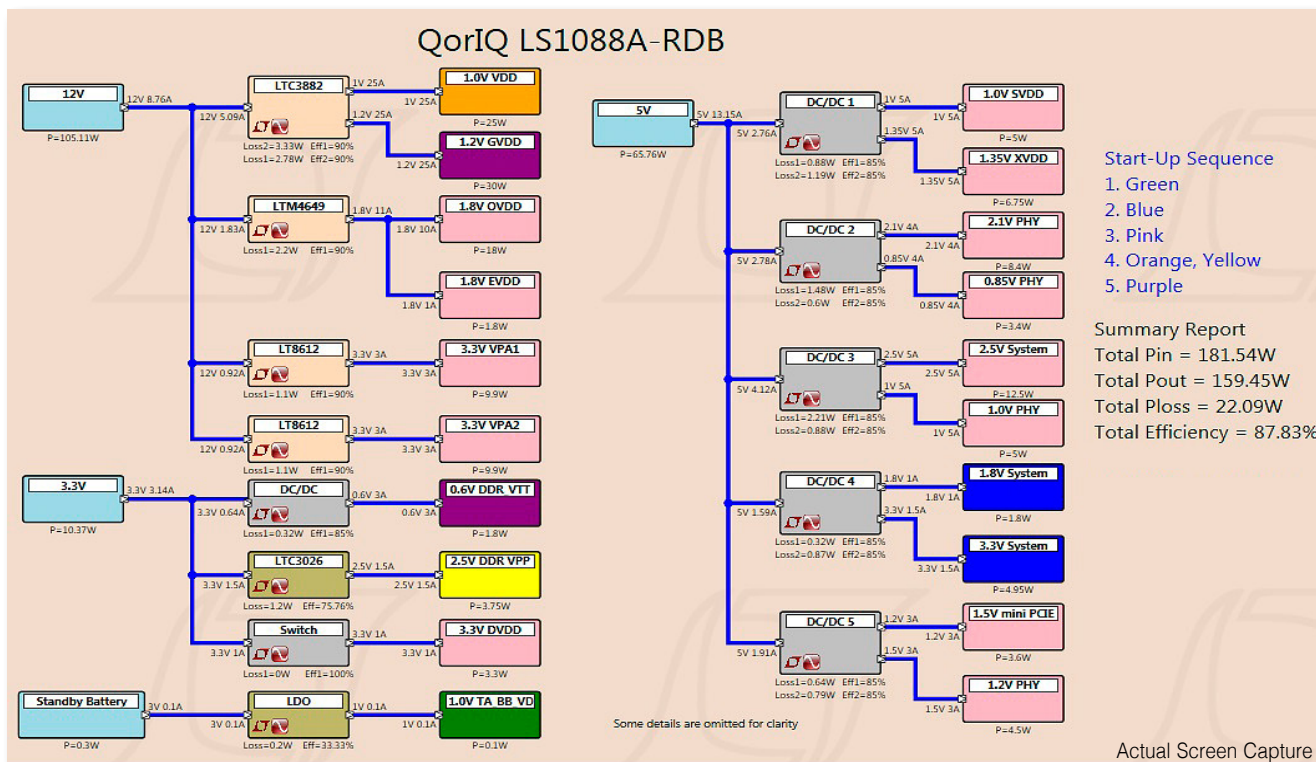


QorIQ LS1088A-RDB

The QorIQ LS1088A reference design board (LS1088A-RDB) is designed to exercise the capabilities of the LS1088A device. It has up to eight ARM® Cortex®-A53 cores with the advanced, high performance data-path and network peripheral interfaces required for wireless access points, networking infrastructure, intelligent edge access, including virtual customer premise equipment (vCPE) and high performance industrial applications.



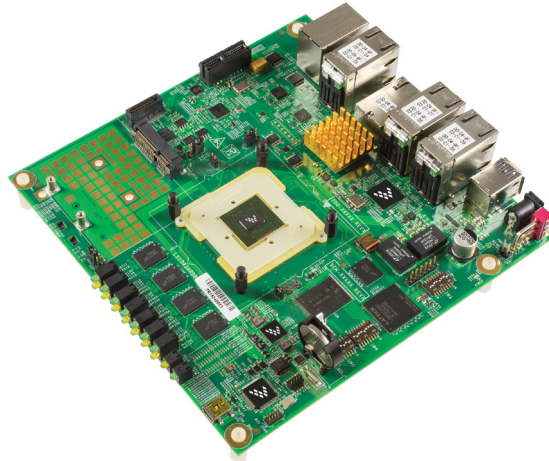
Rail/Function	Part Number	General Description
1.0V: VDD 1.2V: GVDD	LTC3882	Dual Output PolyPhase® Step-Down DC/DC Voltage Mode Controller with Digital Power System Management. Using LTpowerPlay® for Design
1.8V: OVDD, EVDD	LTM4649	10A Step-Down DC/DC μModule® Regulator
3.3V: VPA	LT8612	42V, 6A Synchronous Step-Down Regulator with 3μA Quiescent Current
2.5V: DDR VPP	LTC3026	1.5A Low Input Voltage VLDO™ Linear Regulator



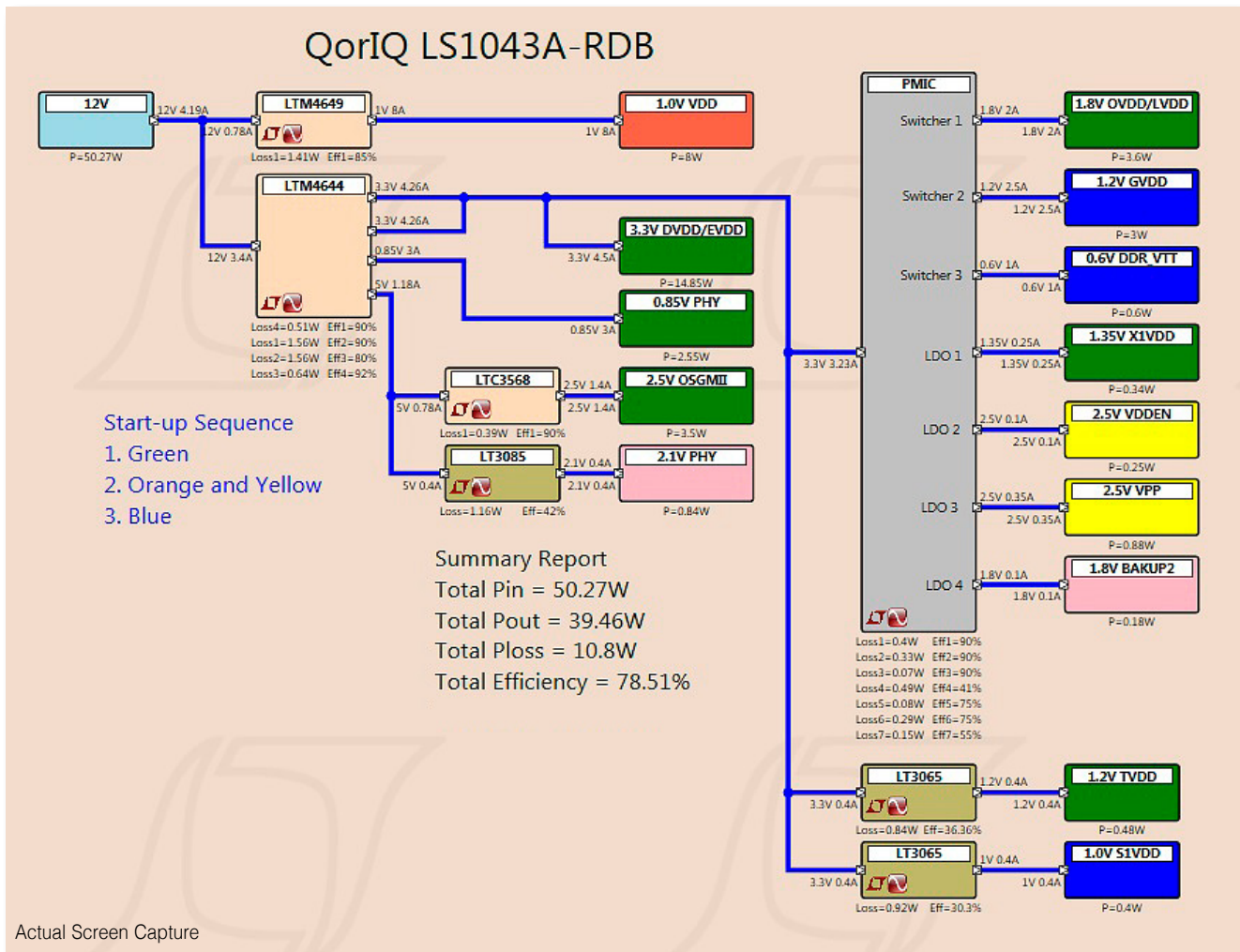
Power Tree designed in [LTPowerPlanner®](http://LTPowerPlanner.com)

QorIQ LS1043A-RDB

The QorIQ LS1043A reference design board (LS1043A-RDB) is designed to exercise most capabilities of the LS1043A device, NXP's first quad-core, 64-bit ARM-based processor for embedded networking and industrial infrastructure.



Rail/Function	Part Number	General Description
1.0V: VDD	LTM4649	10A Step-Down DC/DC μ Module Regulator
3.3V: DVDD/EVDD, System Power	LTM4644	Quad DC/DC μ Module Regulator with Configurable 4A Output Array
0.85V: PHY	LTC3568	1.8A, 4MHz, Synchronous Step-Down DC/DC Converter
5V: System Power	LT3085	Adjustable 500mA Single Resistor Low Dropout Regulator
2.5V: OSGMII	LT3065	45V V_{IN} , 500mA Low Noise, Linear Regulator with Programmable Current Limit and Power Good
2.1V: PHY		
1.2V: TVDD		
1.0V: S1VDD		



Actual Screen Capture

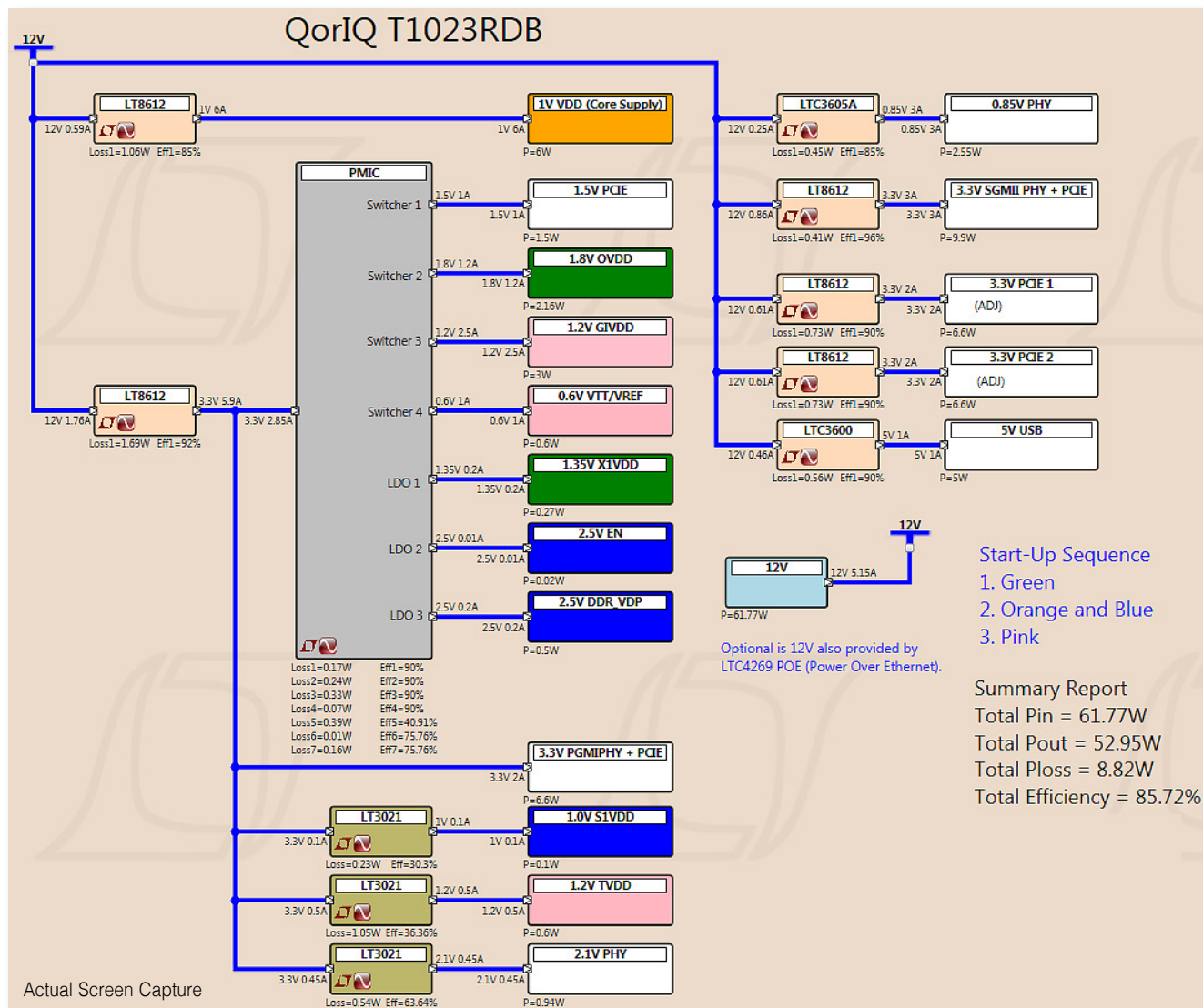
Power Tree designed in LTpowerPlanner

QorIQ T1023RDB

The QorIQ T1023 Reference Design Board (T1023RDB) is a high performance evaluation, development and test platform supporting the QorIQ T1023 communications processor. The board will support the evaluation and development of the dual core T1023 and the single core T1013 communications processors built on Power Architecture® technology.



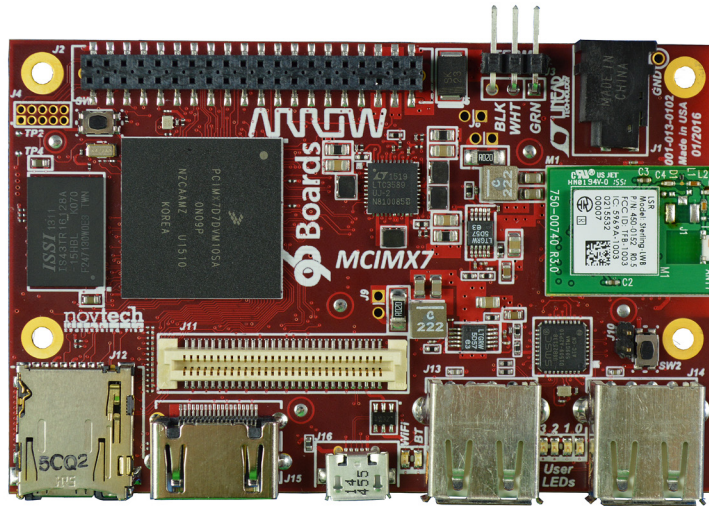
Rail/Function	Part Number	General Description
1.0V: VDD 3.3V: System Power, PHY, PCIE	LT8612	42V, 6A Synchronous Step-Down Regulator with 3µA Quiescent Current
1.0V: S1VDD 1.2V: TVDD 2.1V: PHY	LT3021	500mA, Low Voltage, Very Low Dropout Linear Regulator
0.85V: PHY	LTC3605A	20V, 5A Synchronous Step-Down Regulator
5V: USB	LTC3600	15V, 1.5A Synchronous Rail-to-Rail Single Resistor Step-Down Regulator



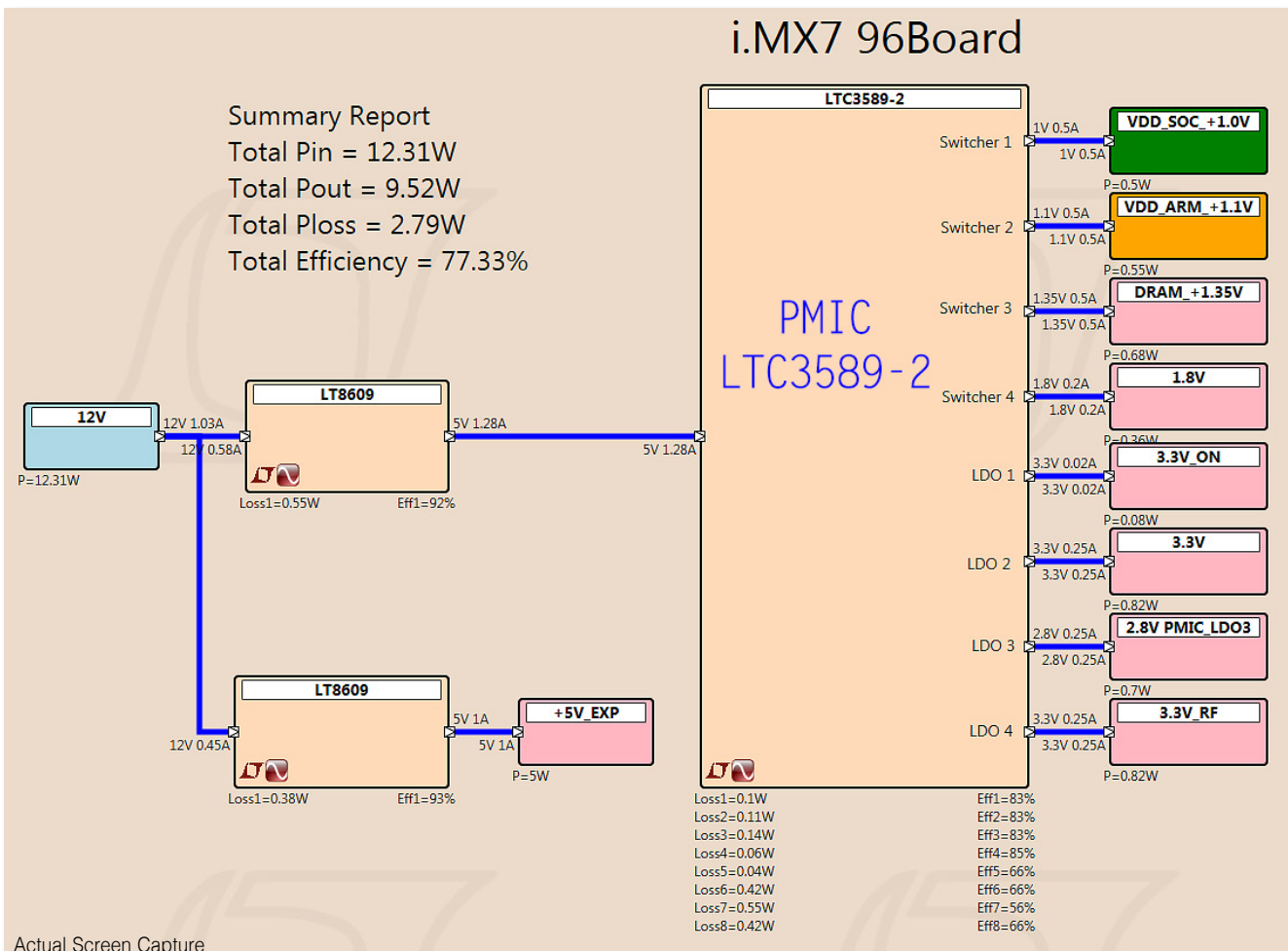
i.MX7 96Board



The i.MX 7 series-based, open-source board provided by Arrow enables secure, power-efficient systems with drastically reduced time to market. The i.MX 7 series is a highly integrated multi-market applications processor designed to enable secure and portable applications within the Internet of Things. The i.MX 7 series utilizes both the ARM Cortex-A7 and Cortex-M4 cores for general purpose programmable processing.



Rail/Function	Part Number	General Description
1.0V: VDD_SoC 1.1V: VDD_ARM 1.35V: DRAM 1.8V 3.3V 2.8V	LTC3589-2	8-Output Regulator with Sequencing and I ² C for ARM and ARM Based Processors
5V: System Power	LT8609	42V, 2A/3A Peak Synchronous Step-Down Regulator with 2.5µA Quiescent Current

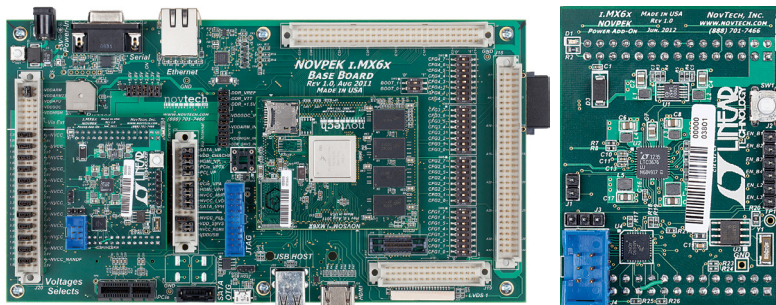


Actual Screen Capture

Power Tree designed in LTpowerPlanner

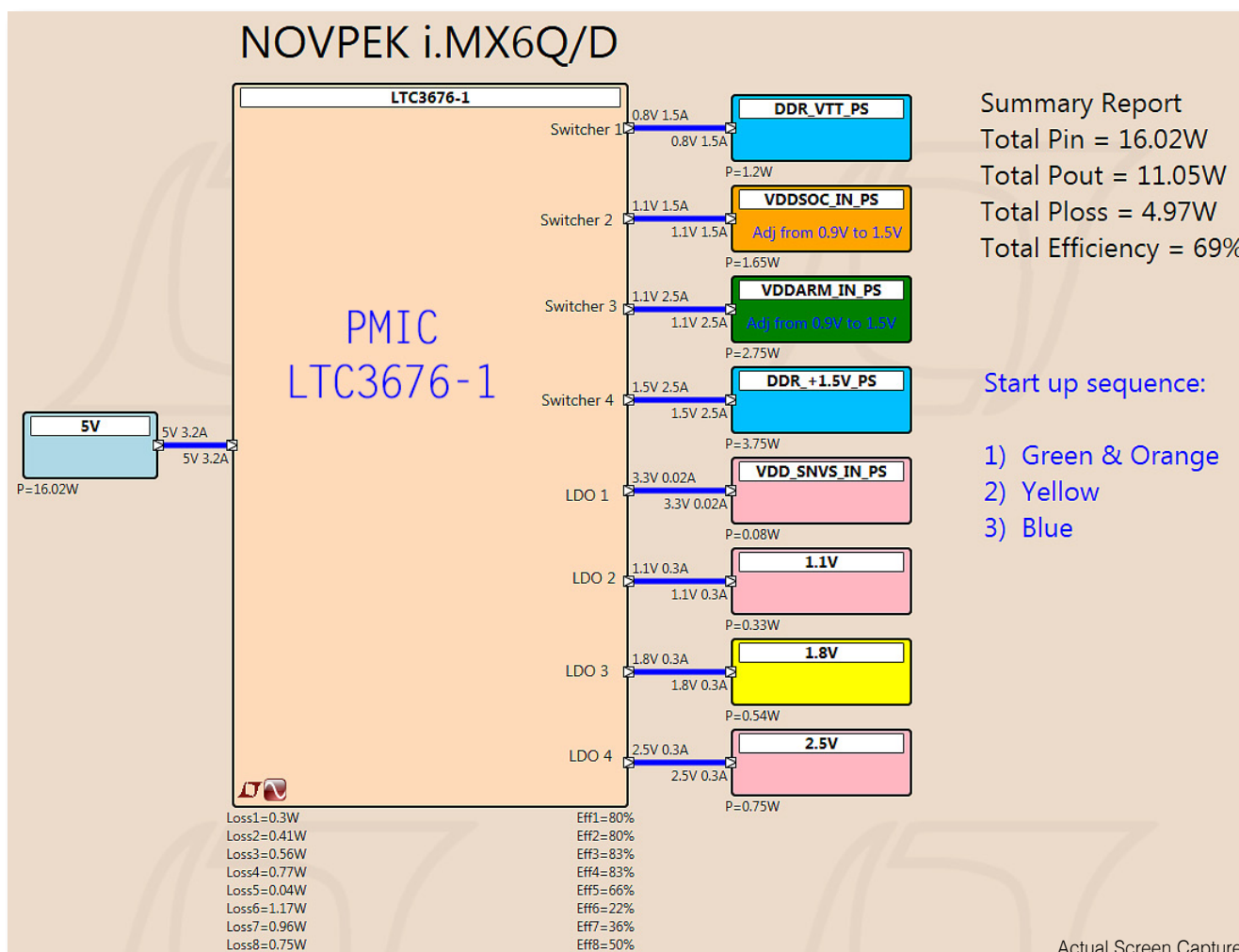
NOVPEK i.MX 6Q/D

The NOVPEK i.MX 6 Platform Evaluation Kit provided by Novtech™ was developed to give OEMs a flexible platform to evaluate i.MX 6 processors by giving access to all the available I/Os on the device and a robust power supply system using the LTC3676-1 PMIC from Analog Devices.



The i.MX 6 series of applications processors is a scalable multicore platform that includes single-, dual- and quad-core families based on the ARM Cortex architecture, including Cortex-A9, combined Cortex-A9 + Cortex-M4 and Cortex-A7 based solutions.

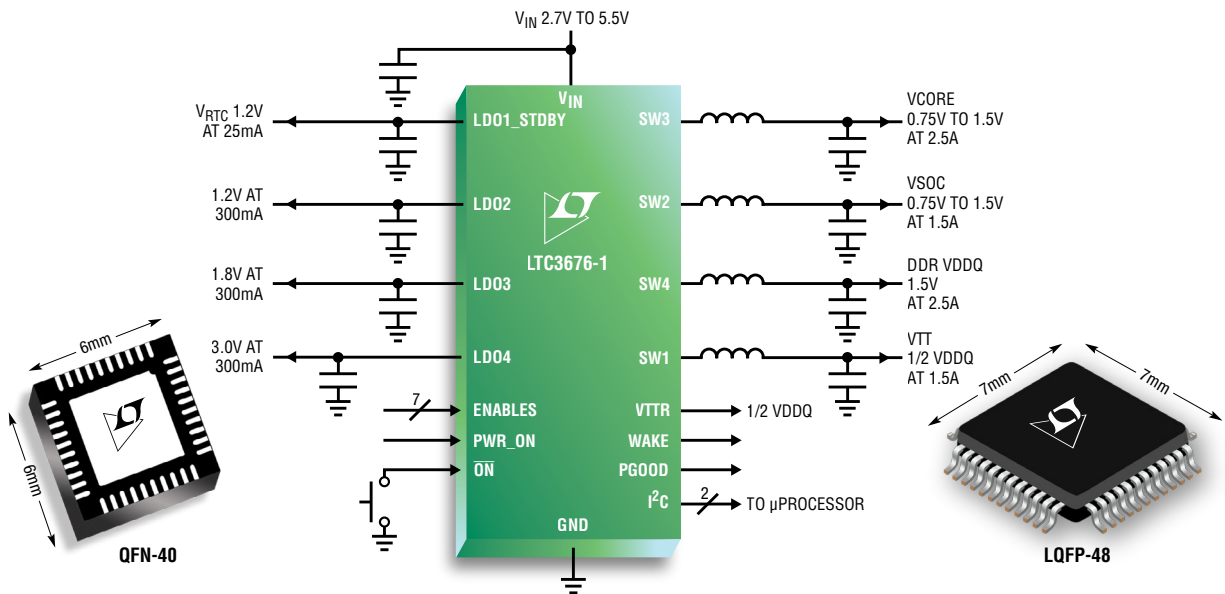
Rail/Function	Part Number	General Description
0.8V: DDR_VTT 1.1V: VDDSOC, VDDARM 1.5V: DDR 3.3V: VDD_SNVS 1.1V 1.8V 2.5V	LTC3676-1	8-Output Power Management Solution with I ² C Interface for Application Processors



Actual Screen Capture

Power Tree designed in [LTpowerPlanner](#)

New PMIC for Advanced Application Processors



4 High Current High Efficiency Bucks + 4 LDOs + DDR Solution with VTTR + I²C Control + Sequencing + Dynamic Voltage Scaling = Complete Power Management Solution for Advanced Application Processor-Based Systems

The LTC3676 and LTC3676-1 are complete power management solutions for NXP i.MX 6 series, ARM Cortex and other advanced portable application processor systems. The LTC3676/LTC3676-1 feature eight independent resistor-programmable voltage rails, with dynamic voltage scaling and sequencing, in compact QFN and thermally enhanced QFP packages. These rails supply power to the processor core, SDRAM, I/O, system memory, PC cards, always-on real-time clock (RTC) and a variety of other functions.

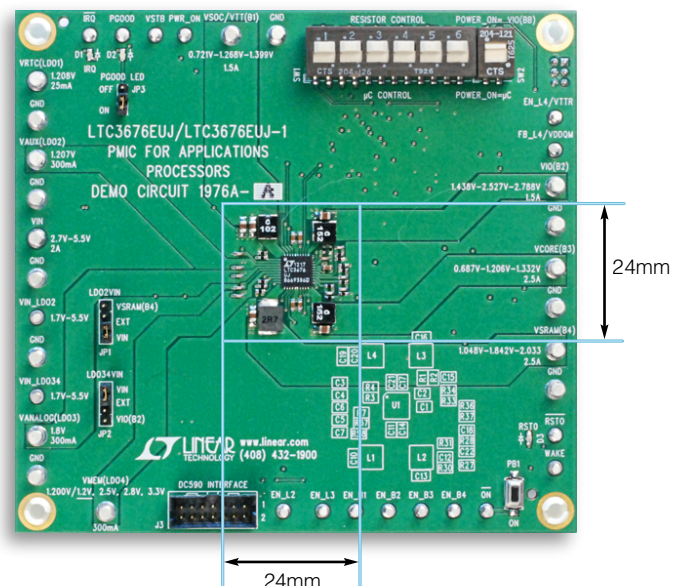
Features

- ▶ Quad I²C Adjustable High Efficiency Step-Down DC/DC Converters: 2.5A, 2.5A, 1.5A, 1.5A
- ▶ Triple 300mA LDO Regulators (2 Adjustable)
- ▶ DDR Power Solution with VTT and VTTR Reference (LTC3676-1 Version)
- ▶ Pushbutton On/Off Control with System Reset
- ▶ Independent Enable Pin-Strap or I²C Sequencing
- ▶ Programmable Autonomous Power-Down Control
- ▶ Power Good and Reset Functions
- ▶ Dynamic Voltage Scaling
- ▶ Selectable 2.25MHz or 1.12MHz Switching Frequency
- ▶ Always Alive 25mA LDO Regulator
- ▶ 12µA Standby Current
- ▶ 40-Pin 6mm × 6mm × 0.75mm QFN Package
- ▶ 48-Pin 7mm × 7mm LQFP Package

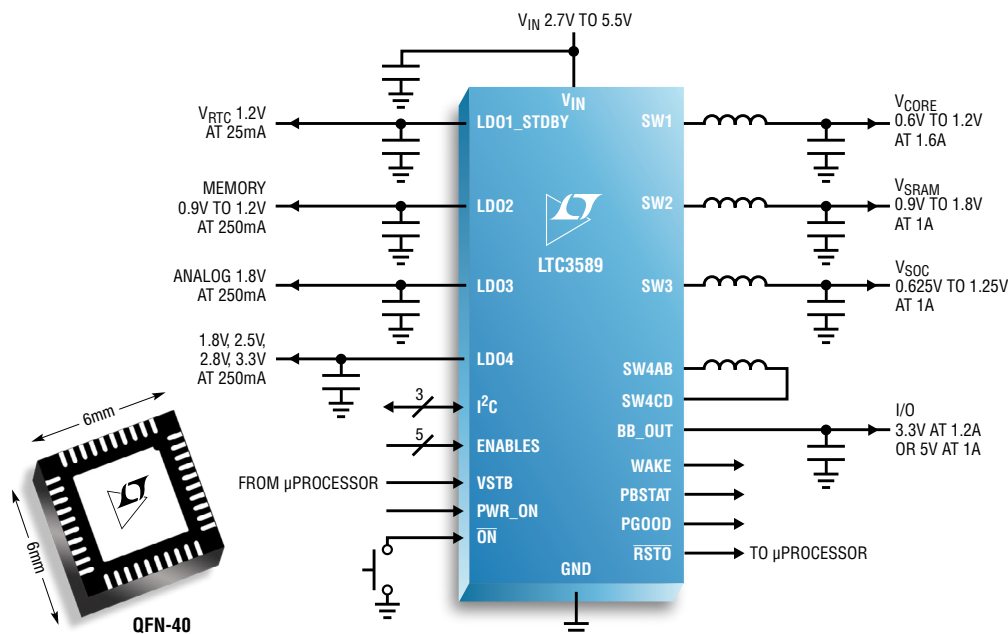
Applications

- ▶ Supports NXP i.MX 6, Altera ARM-Based SoC FPGAs, ARM Cortex and other Application Processors
- ▶ Handheld Instruments and Scanners
- ▶ Portable Industrial and Medical Devices
- ▶ Automotive Infotainment
- ▶ High End Consumer Devices
- ▶ Multirail Systems

LTC3676 Demo Board



A PMIC for Modern Application Processors



3 Bucks + Buck-Boost + 4 LDOs + I²C Control + Sequencing + Dynamic Voltage Scaling = A Complete Power Management Solution for Advanced Application Processor-Based Systems

The LTC3589-1/-2 is a complete power management solution for portable processors such as NXP i.MX, PXA, ARM, OMAP and other advanced portable microprocessor systems. The device features eight independent rails, with dynamic control and sequencing, in a compact QFN package. These rails supply power to the processor core, SDRAM, system memory, PC cards, always-on real-time clock (RTC) and a variety of other functions.

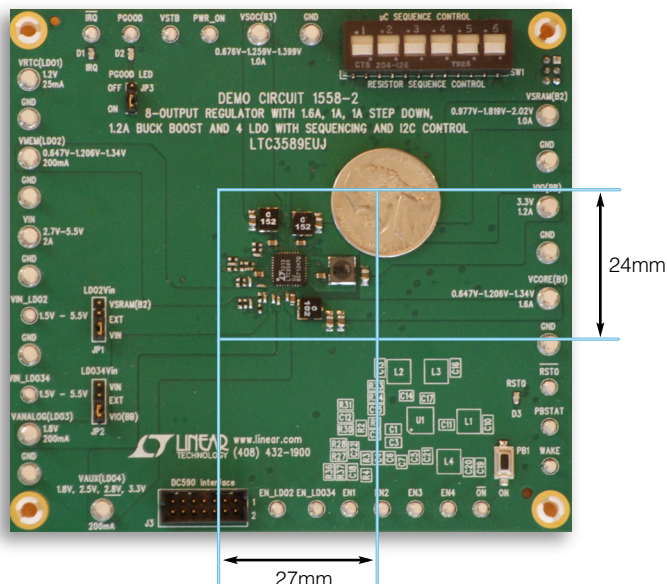
Features

- ▶ Triple I²C Adjustable High Efficiency Step-Down DC/DC Converters: 1.6A, 1A, 1A (1.6A, 1.2A, 1.2A on LTC3589-1/-2)
- ▶ High Efficiency 1.2A Buck-Boost DC/DC Converter
- ▶ Triple 250mA LDO Regulators
- ▶ Pushbutton On/Off Control with System Reset
- ▶ Flexible Pin-Strap Sequencing Operation
- ▶ I²C and Independent Enable Control Pins
- ▶ Power Good and Power-On Reset Outputs
- ▶ Dynamic Voltage Scaling and Slew Rate Control
- ▶ Selectable 2.25MHz or 1.12MHz Switching Frequency
- ▶ Always Alive 25mA LDO Regulator
- ▶ 8μA Standby Current
- ▶ 40-Pin 6mm × 6mm × 0.75mm QFN Package

Applications

- ▶ Supports NXP i.MX, Marvell PXA and Other Application Processors
- ▶ Handheld Instruments and Scanners
- ▶ Portable Industrial and Medical Devices
- ▶ Automotive Infotainment
- ▶ High End Consumer Devices
- ▶ Multirail Systems

LTC3589 Demo Board



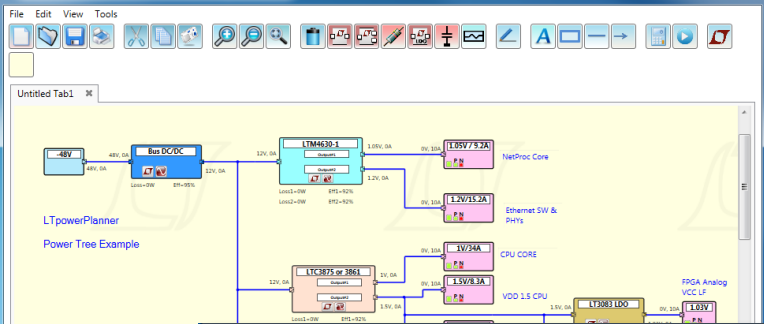
Design Support

Analog Devices provides design support tools that help you select, design and simulate Analog Devices's products. These tools shorten your design time and optimize your power supply solution before you build your prototype board.

LTpowerCAD

LTpowerCAD® is a free download and easy-to-use power supply design tool with a user-friendly graphical user interface (GUI) and powerful design features. It helps power supply designers select a solution for given supply specifications, design power stage components, estimate regulator efficiency and power loss, and optimize supply loop stability and load transient performance. It is a fast off-line tool that runs on Windows PCs, and includes a sync-release feature to ensure your program and its solution libraries are up-to-date. Once a circuit design is completed, it is easily exported to the LTspice® simulation platform. Inside the LTpowerCAD toolbox, there is also an LTpowerPlanner system architecture tool for system-level power management design and optimization.

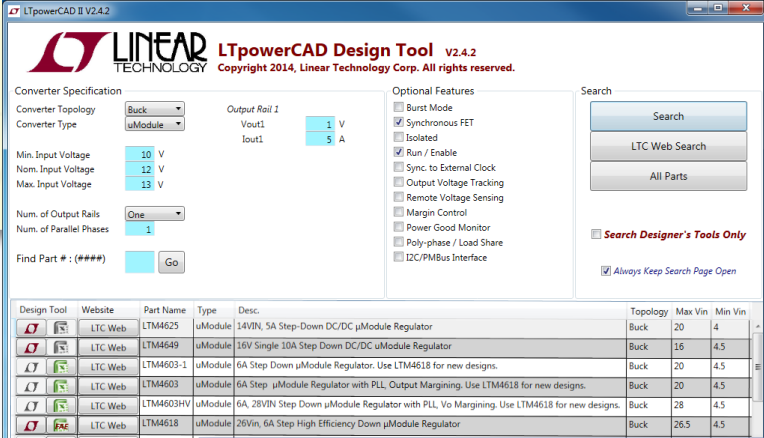
LTpowerPlanner



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System Architecture and Plan

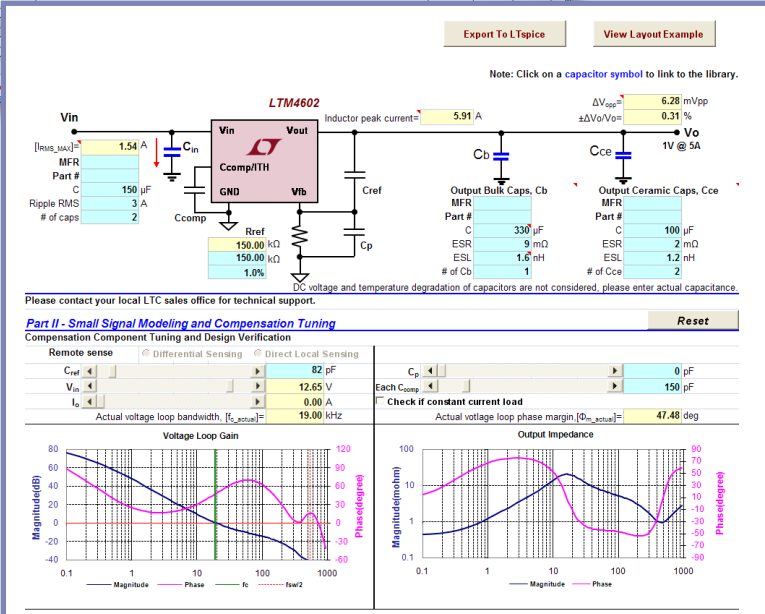
LTpowerCAD



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Search and Selection

Download
LTpowerCAD



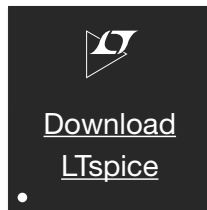
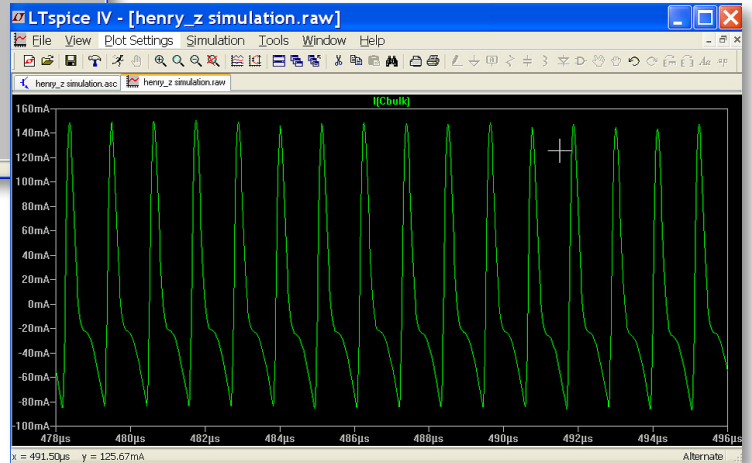
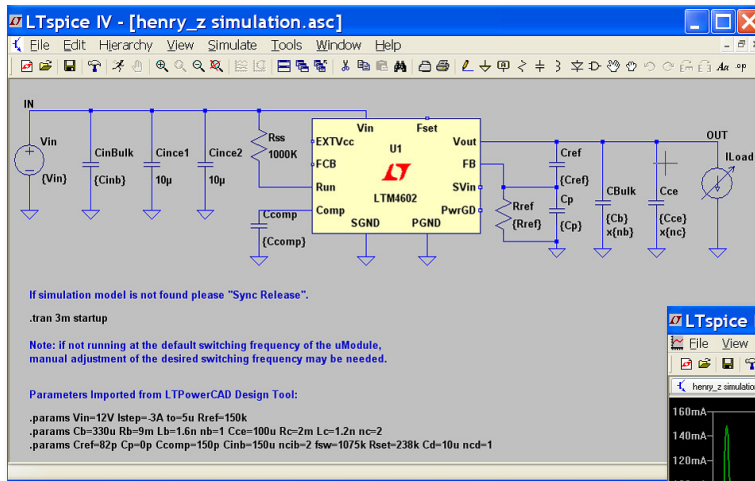
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Circuit Parameter Design



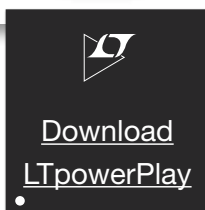
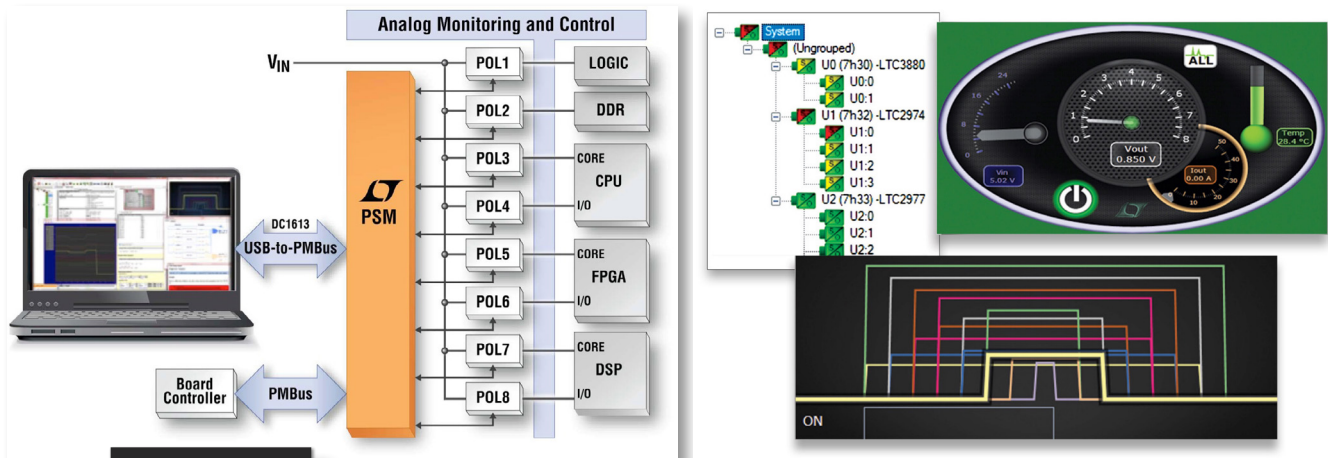
LTspice

LTspice is a free, simple and powerful circuit simulation tool with a library containing Analog Devices products, as well as commonly used discrete passive and transistor components.



LTpowerPlay

LTpowerPlay® is a powerful and intuitive Windows-based development environment used to configure and interrogate power system management (PSM) devices. It can also be used in an offline mode (with no hardware present) in order to build a multichip configuration file that can be saved and reloaded at a later time.



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**POWER BY
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Proven Power Solutions for NXP Processors

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NXP
QorIQ

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