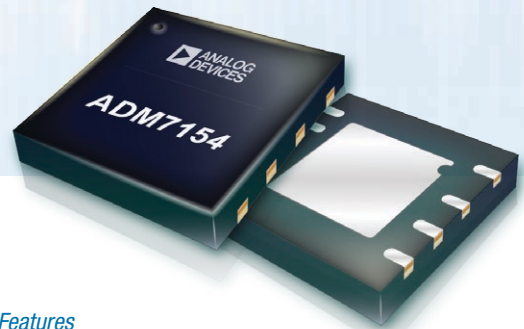


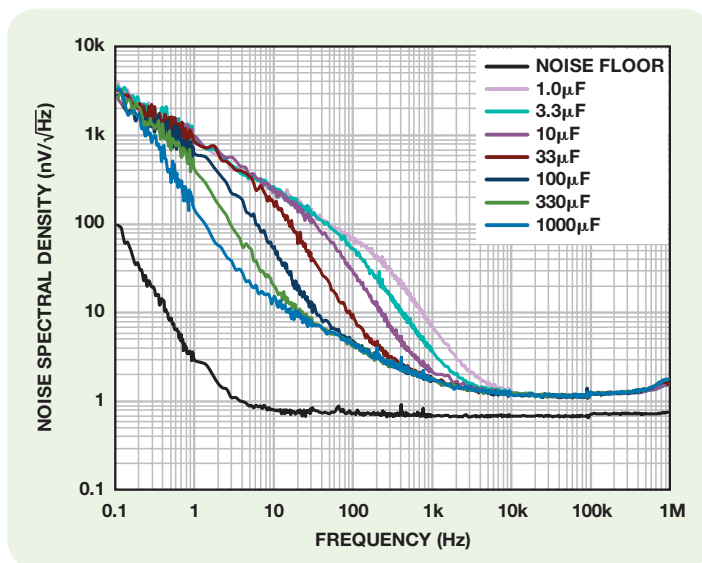


Ultralow Noise, High Rejection Low Dropout Regulators



Analog Devices Introduces the World's Lowest Noise LDO

The ADM7154/ADM7155 are ultralow noise LDO (low dropout) regulators for RF (radio frequency) signal devices. The ADM7154/ADM7155 operate from 2.3 V to 5.5 V, provide up to 600 mA of output current, and support output voltages from 1.2 V to 3.3 V. The LDOs achieve an output NSD (noise spectral density) of 1.5 nV/√Hz above 100 kHz, which significantly reduces VCO (voltage controlled oscillator) phase noise in point-to-point microwave radios, satellite communications, defense electronics, and other wideband applications.



ADM7154 noise spectral density.

Features

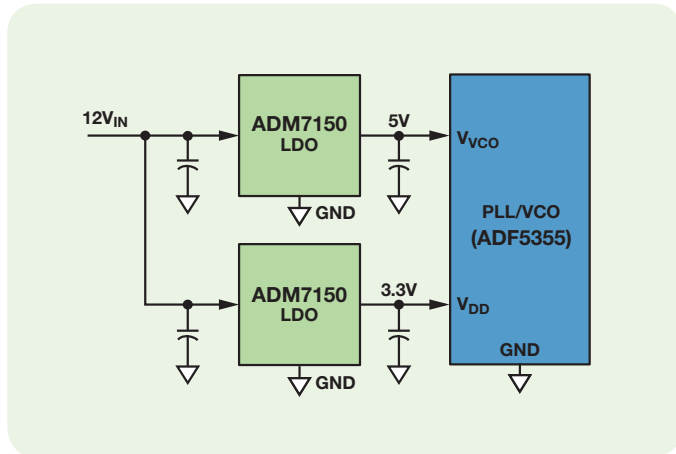
- V_{IN} range: 2.3 V to 5.5 V
- Fixed/adjustable output voltage range: 1.2 V to 3.3 V
- I_{OUT} max: 600 mA
- Low noise ($C_{BYP} = 1 \mu\text{F}$)
 - 0.9 μV rms total integrated noise from 100 Hz to 100 kHz
 - 2 nV/√Hz above 4 kHz
- Power supply rejection ratio (PSRR):
 - 90 dB from 1 kHz to 100 kHz
 - 58 dB at 1 MHz
 - $V_{IN} = 3.8 \text{ V}, V_{OUT} = 3.3 \text{ V @ 600 mA}$
- 8-lead LFCSP and 8-lead SOIC packages

Applications

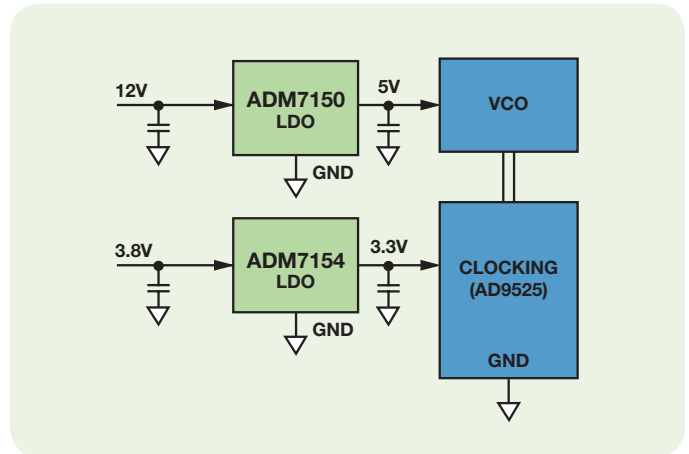
- Regulated power noise sensitive applications
- RF mixers, phase-locked loops (PLLs)
- Voltage controlled oscillators (VCOs)
- PLLs with integrated VCOs
- Communications and infrastructure
- Cable digital-to-analog converter (DAC) drivers
- Backhaul and microwave links

Ultralow Noise LDOs

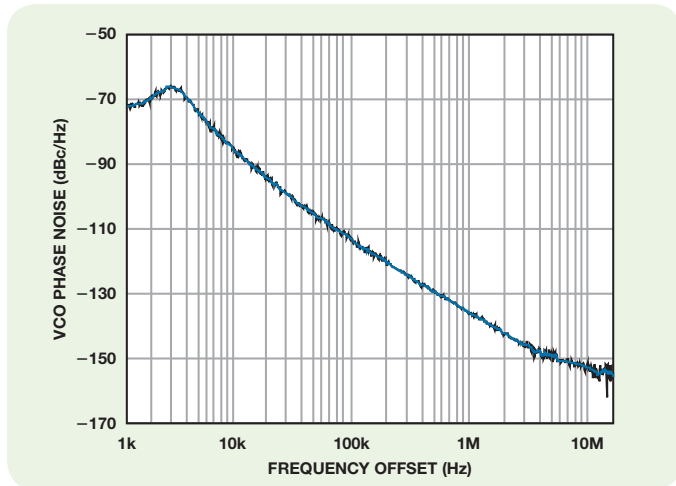
ADM7150, ADM7151, ADM7154, and ADM7155



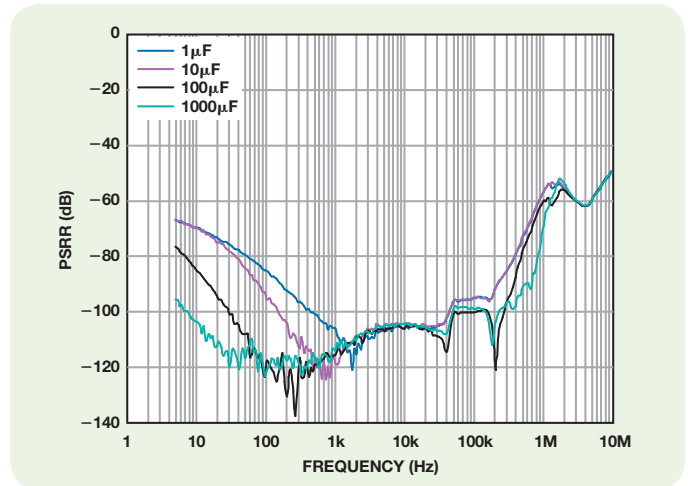
PLL/VCO apps diagram.



Clocking apps diagram.



ADF5355 VCO noise, powered by ADM7150.



ADM7154 PSRR vs. frequency, $V_{OUT} = 3.3\text{ V}$, 400 mA load, 500 mV headroom.

Ultralow Noise LDO Selection Table

Part Number	V_{IN} Min (V)	V_{IN} Max (V)	V_{OUT} Options or Adj Range (V)	I_{OUT} (mA)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	RMS Noise @ 100 Hz to 100 kHz ($\mu\text{V rms}$) ¹	Noise Spectral Density 100 kHz ($\text{nV}/\sqrt{\text{Hz}}$)	Dropout @ Rated I_{OUT} Typ (mV)	Total Accuracy Max ($\pm\%$)	Package
ADM7150	4.5	16	Fixed: 1.5 to 5.0	800	94	62	1	2	600	2	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC
ADM7151	4.5	16	Adjustable: 1.5 to 5.1	800	94	62	1	2	600	2	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC
ADM7154 New	2.3	5.5	Fixed: 1.2 to 3.3	600	90	58	1	1.2	120	2	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC
ADM7155 New	2.3	5.5	Adjustable: 1.2 to 3.3	600	90	58	1	1.2	120	2	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC
HMC976LP3E	3.3	5.5	1.8 to 5.1	400	45	30	1.5	3	300	2	3 mm × 3 mm, 16-lead LFCSP

¹ Noise independent of fixed output voltage.

Ultralow Noise Quad Output LDOs

HMC860LP3E and HMC1060LP3E

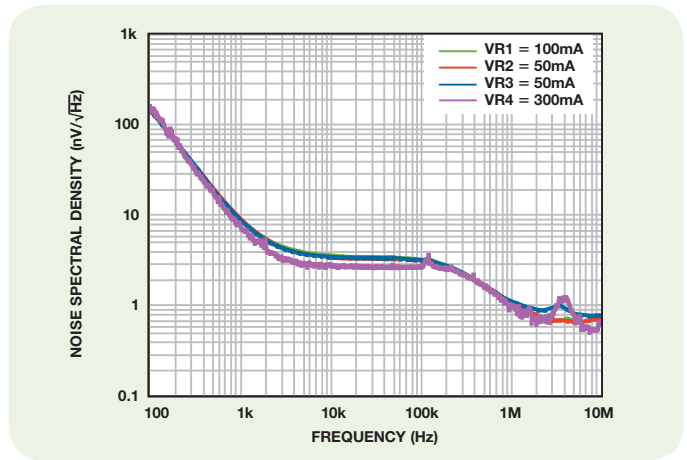
The HMC860LP3E and HMC1060LP3E are ultralow noise, quad-output linear voltage regulators targeted at high performance applications requiring superb power supply isolation. Maximum 240 mA and 500 mA of current, respectively, distributed between four independent outputs, enable the HMC860LP3E and HMC1060LP3E to supply all of the power needs of wideband PLL with integrated VCO products, such as the HMC830LP6GE. An integrated PTAT (proportional to absolute temperature) feature, enabled via an external pin, allows the HMC1060LP3E to scale the supply voltage with temperature in order to maximize phase noise and output power performance of wideband with integrated VCO products, as well as other devices powered by the HMC1060LP3E.

HMC1060LP3E Features

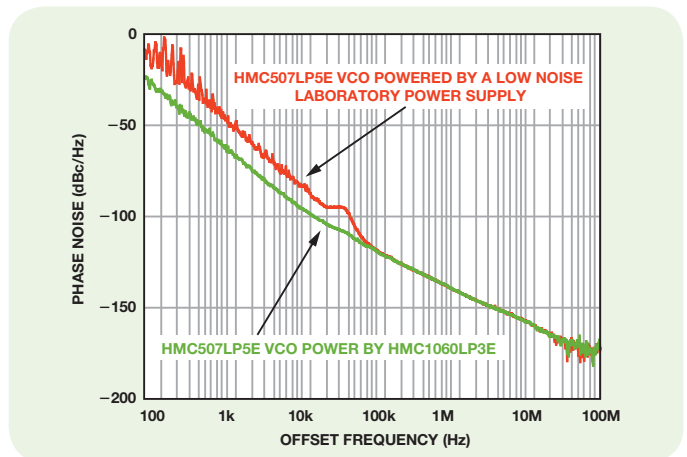
- Ultralow noise density: 3 nV/ $\sqrt{\text{Hz}}$ at 10 kHz, 7 nV/ $\sqrt{\text{Hz}}$ at 1 kHz
- High PSRR: 80 dB at 1 kHz; 60 dB at 1 MHz
- Four adjustable voltage outputs:
 - VR1: 100 mA at 1.8 V to 5.2 V
 - VR2 and VR3: 50 mA at 1.8 V to 5.2 V
 - VR4: 300 mA at 1.8 V to 5.2 V
- Optional proportional to temperature (PTAT) output voltages: 7%/125°C
- Thermal protection
- Low power-down current: <1 μA
- 16-lead, 3 mm \times 3 mm SMT package: 9 mm²

Applications

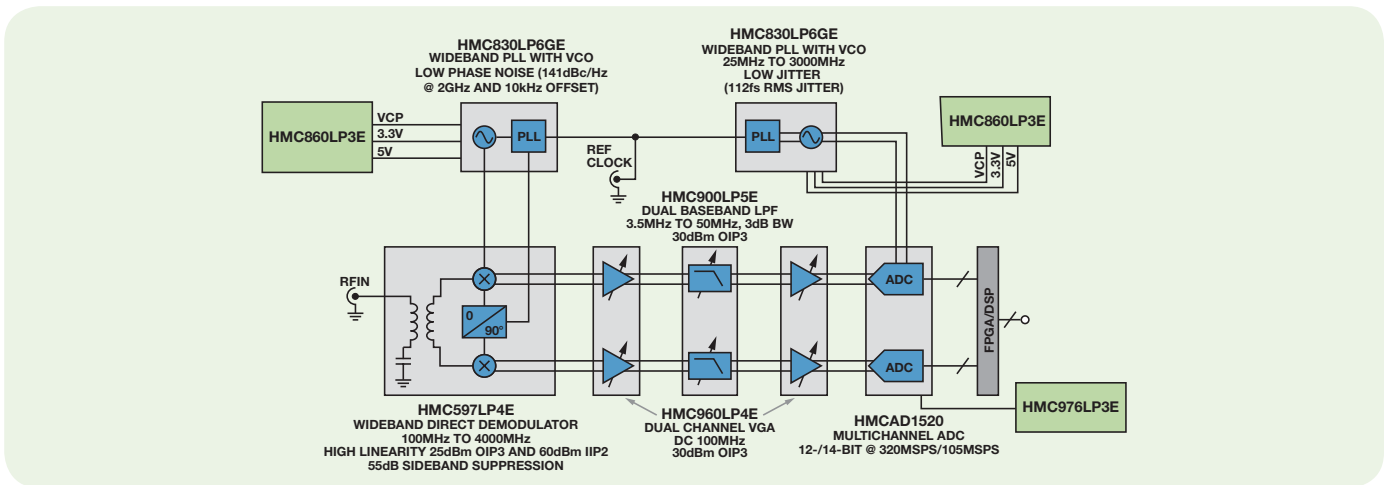
- Ultralow noise frequency generation (PLLs, VCOs, PLLs with integrated VCOs)
- RF and mixed-signal supply



HMC1060LP3E noise spectral density vs. frequency.



HMC1060LP3E vs. typical low noise laboratory power supply.



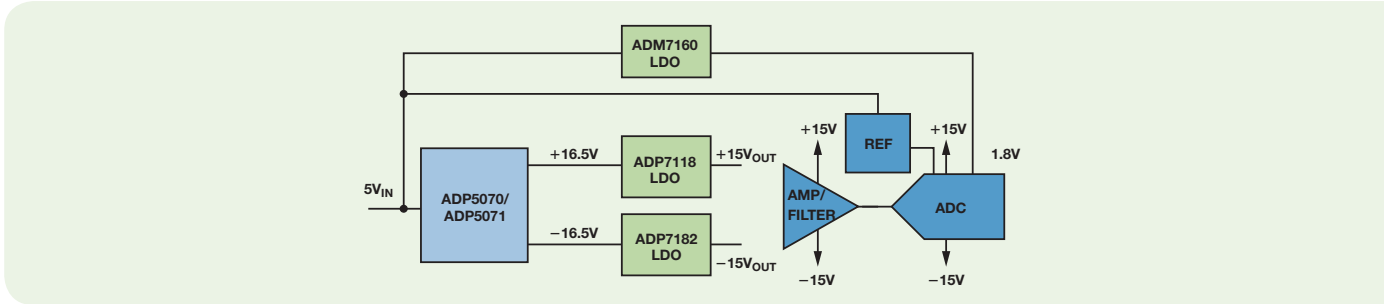
HMC6383 evaluation development kit block diagram.

Ultralow Noise LDO Selection Table

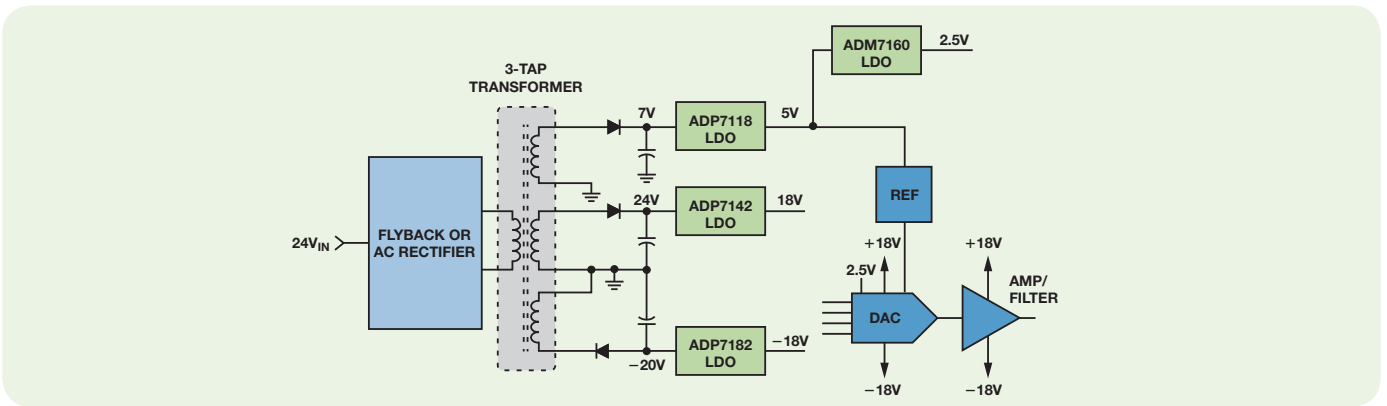
Part Number	V _{IN} Min (V)	V _{IN} Max (V)	V _{OUT} Options or Adj Range (V)	I _{OUT} (mA)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	RMS Noise @ 100 Hz to 100 kHz (μV rms)	Noise Spectral Density 100 kHz (nV/ $\sqrt{\text{Hz}}$)	Total Accuracy Max ($\pm\%$)	Regulated Outputs	Package
HMC860LP3E	3.35	5.6	2.5 to 5.2	240	65	60	1.5	3	2	4	3 mm \times 3 mm, 16-lead LFCSP
HMC1060LP3E	3.35	5.6	1.8 to 5.2	500	71	60	1.5	3	2	4	3 mm \times 3 mm, 16-lead LFCSP

High Voltage LDOs

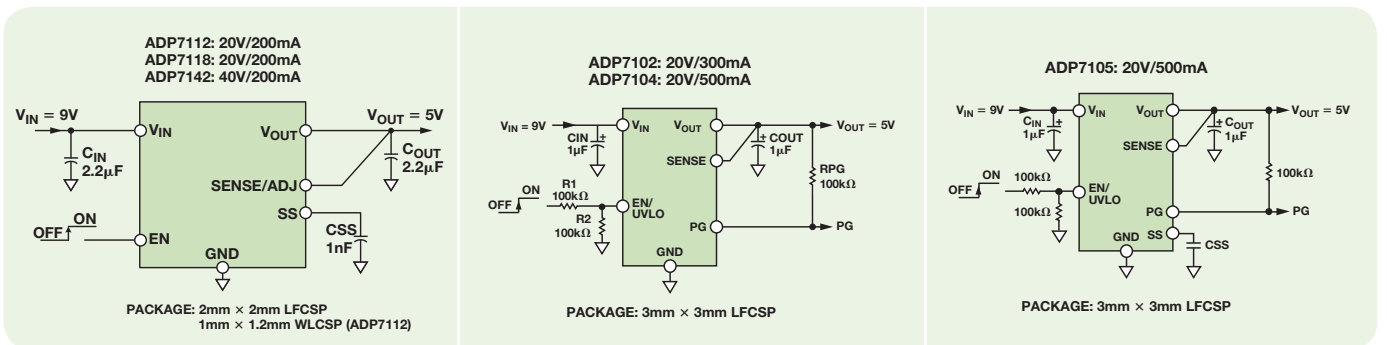
ADP7118, ADP7142, ADP7112, ADP7102, ADP7104, and ADP7105



ADC/AMP applications diagram.



Isolated ADC/AMP applications diagram.



ADP7118/ADP7142/ADP7112*

ADP7102/ADP7104.

ADP7105.

*The ADP7118/ADP7142/ADP7112 architecture allows any fixed output voltage to be set to a higher voltage with an external voltage divider.

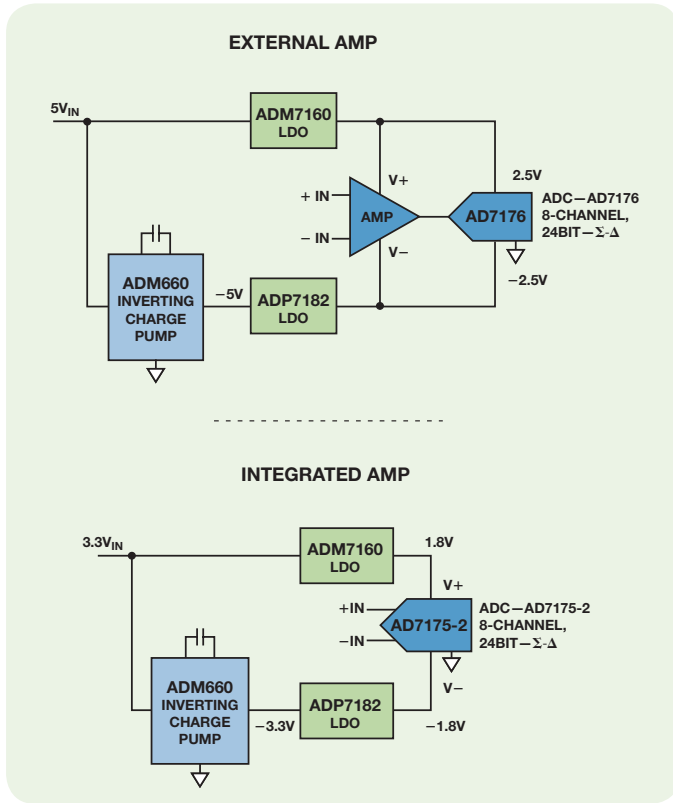
High Voltage LDO Selection Table

Part Number	V _{IN} Range (V)	V _{OUT} Fixed (V)	V _{OUT} Adj Range (V)	I _{OUT} (mA)	Soft Start	Power Good	RMS Noise @ 10 Hz to 100 kHz (µV rms) ¹	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	Package
ADP7118 New	2.7 to 20	1.2 to 5	1.2 to 19	200	Yes	No	11	68	50	2 mm × 2 mm, 6-lead LFCSP, 8-lead SOIC, 5-lead TSOT
ADP7112 New	2.7 to 20	1.2 to 5	1.2 to 19	200	Yes	No	11	68	50	1 mm × 1.2 mm, 6-ball WLCSP
ADP7142 New	2.7 to 40	1.2 to 5	1.2 to 39	200	Yes	No	11	68	50	2 mm × 2 mm, 6-lead LFCSP, 8-lead SOIC, 5-lead TSOT
ADP7102	3.3 to 20	1.5 to 9	1.22 to 19	300	No	Yes	15	60	40	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC
ADP7104	3.3 to 20	1.5 to 9	1.22 to 19	500	No	Yes	15	60	40	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC
ADP7105	3.3 to 20	1.8, 3.3, 5	1.22 to 19	500	Yes	Yes	15	60	40	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC

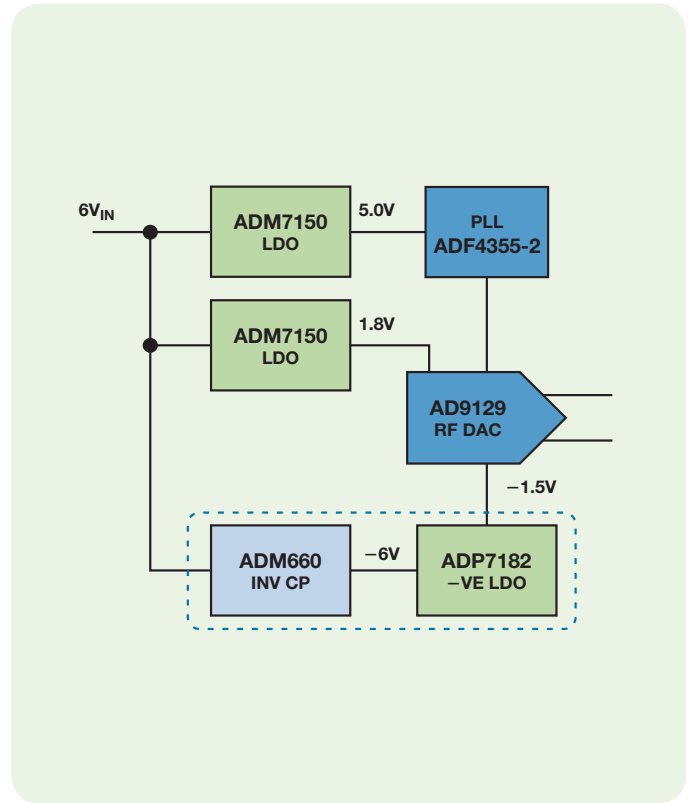
¹ Noise independent of fixed output voltage.

Low Noise LDOs

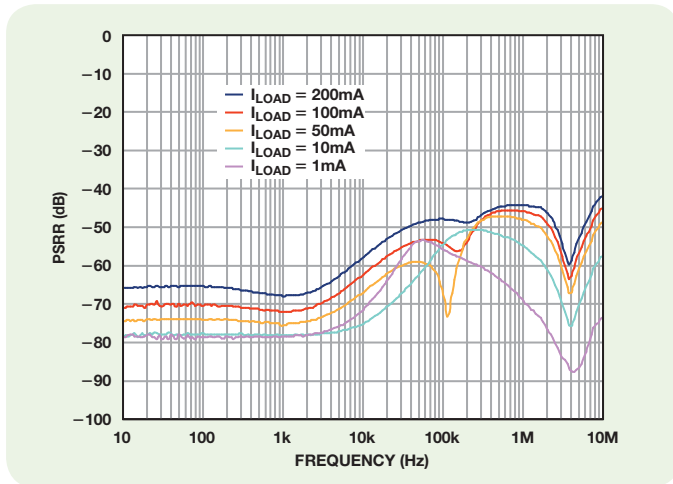
ADM7160 and ADP7182



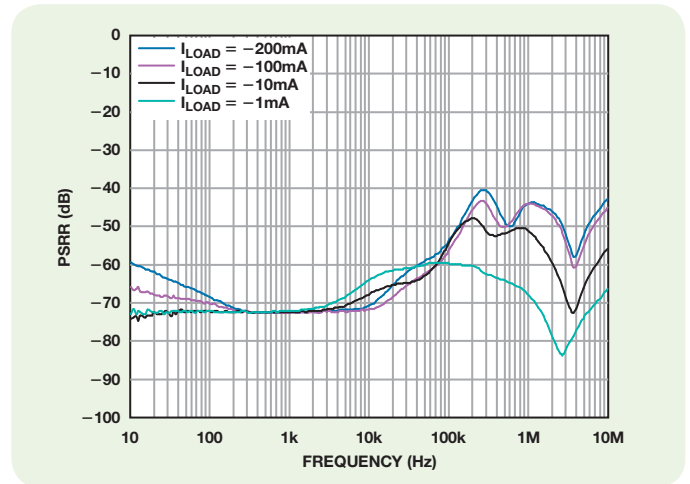
Nonisolated Σ-Δ ADC bipolar applications diagram.



AD9129 RF DAC featuring ADP7182.



ADM7160 PSRR vs. frequency and load current, 1 V headroom, V_{OUT} = 3.3 V.



ADP7182 PSRR vs. frequency, V_{OUT} = -1.22 V vs. different load currents (I_{LOAD}), V_{IN} = -2.7 V.

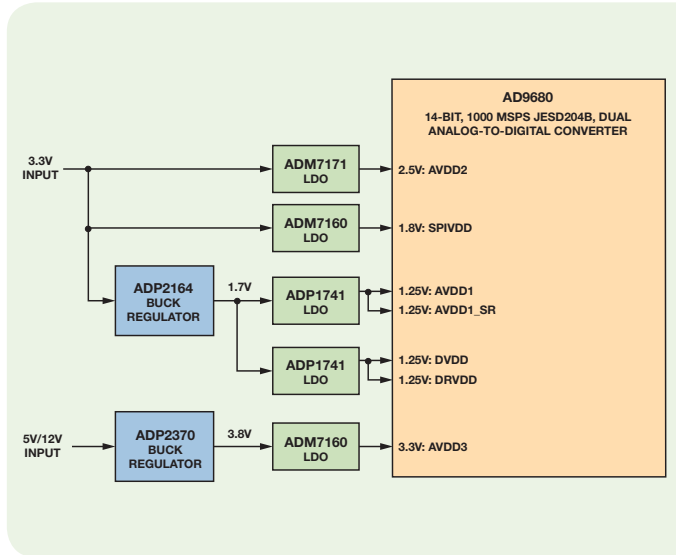
Low Noise LDO Selection Table

Part Number	V _{IN} Min (V)	V _{IN} Max (V)	V _{OUT} Options or Adj Range (V)	I _{OUT} (mA)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	RMS Noise @ 100 kHz to 100 kHz (μV rms) ¹	Noise Spectral Density 100 kHz (nV/√Hz)	Dropout @ Rated I _{OUT} Typ (mV)	Total Accuracy Max (±%)	Package
ADM7160	2.2	5.5	1.1 to 3.3	200	54	46	9	25	150	-2.5/+1.5	2 mm × 2 mm, 6-lead LFCSP, 5-lead TSOT
ADP7182	-2.7	-28	-1.22 to -27	-200	45	32	18	50	185	-3/+2	5-lead TSOT, 2 mm × 2 mm, 6-lead LFCSP, 3 mm × 3 mm, 8-lead LFCSP

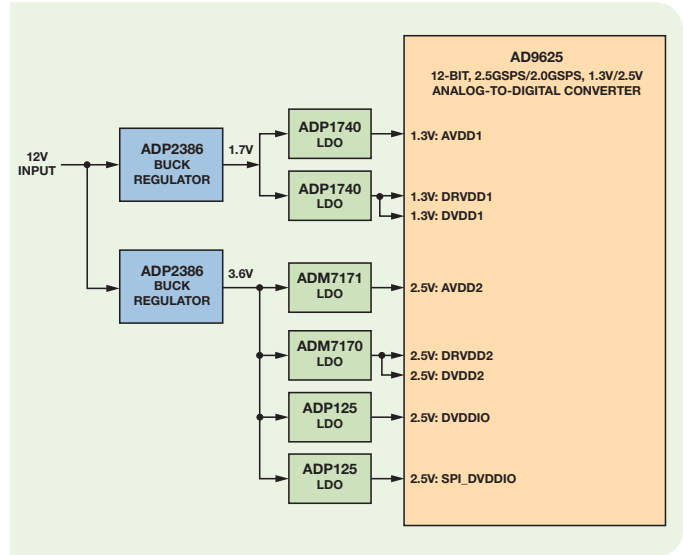
¹ Noise independent of fixed output voltage.

Low V_{IN} , High Current LDOs

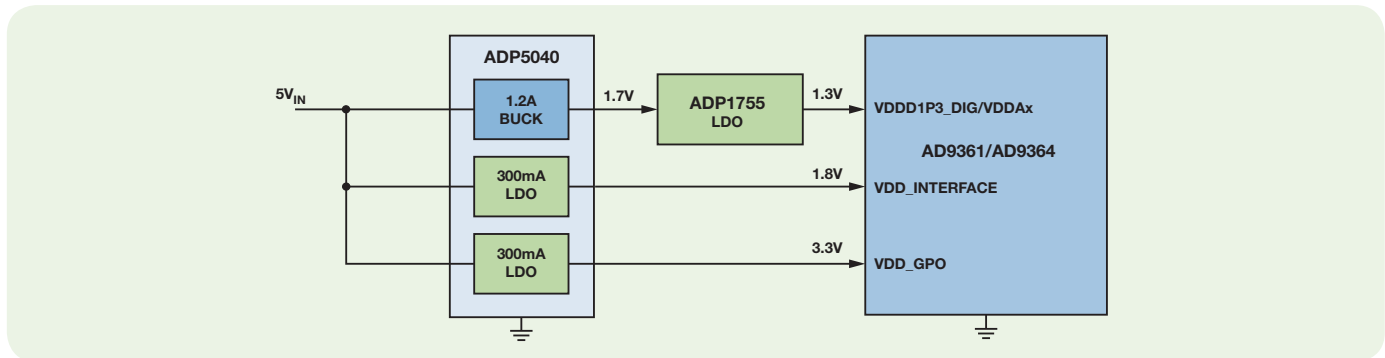
ADP1740, ADP1741, ADP1752, ADP1753, ADP1754, and ADP1755



Powering AD9680 high speed ADC.



Powering AD9625 high speed ADC.



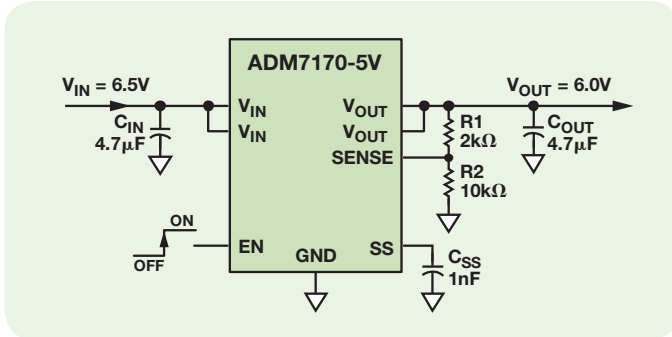
Powering AD9361/AD9364 RF agile transceivers.

Low V_{IN} , High Current LDO Selection Table

Part Number	V_{IN} Range (V)	V_{OUT} Options or Adj Range (V)	I_{OUT} (mA)	Soft Start	Power Good	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	RMS Noise @ 100 Hz to 100 kHz (μ V rms)	Noise Spectral Density 100 kHz (nV/ \sqrt Hz)	Dropout @ Rated I_{OUT} Typ (mV)	Total Accuracy Max (%)	Package
ADP1752	1.6 to 3.6	Fixed: 0.75 to 2.5	800	Yes	Yes	54	40	23	40	70	2	4 mm \times 4 mm, 16-lead LFCSP
ADP1753	1.6 to 3.6	Adjustable: 0.75 to 3.3	800	Yes	Yes	54	40	23	40	70	2	4 mm \times 4 mm, 16-lead LFCSP
ADP1754	1.6 to 3.6	Fixed: 0.75 to 2.5	1200	Yes	Yes	54	40	23	40	105	2	4 mm \times 4 mm, 16-lead LFCSP
ADP1755	1.6 to 3.6	Adjustable: 0.75 to 3.3	1200	Yes	Yes	54	40	23	40	105	2	4 mm \times 4 mm, 16-lead LFCSP
ADP1740	1.6 to 3.6	Fixed: 0.75 to 2.5	2000	Yes	Yes	54	40	23	40	160	2	4 mm \times 4 mm, 16-lead LFCSP
ADP1741	1.6 to 3.6	Adjustable: 0.75 to 3.3	2000	Yes	Yes	54	40	23	40	160	2	4 mm \times 4 mm, 16-lead LFCSP

Ultralow Noise (5 $\mu\text{V rms}$) Fast Transient Response LDOs

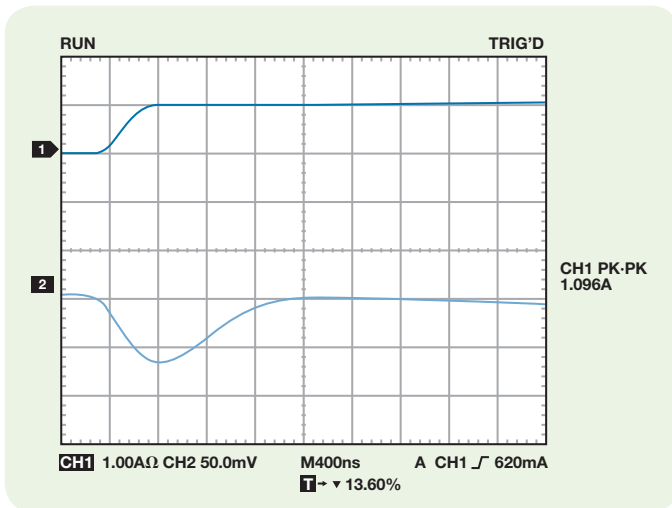
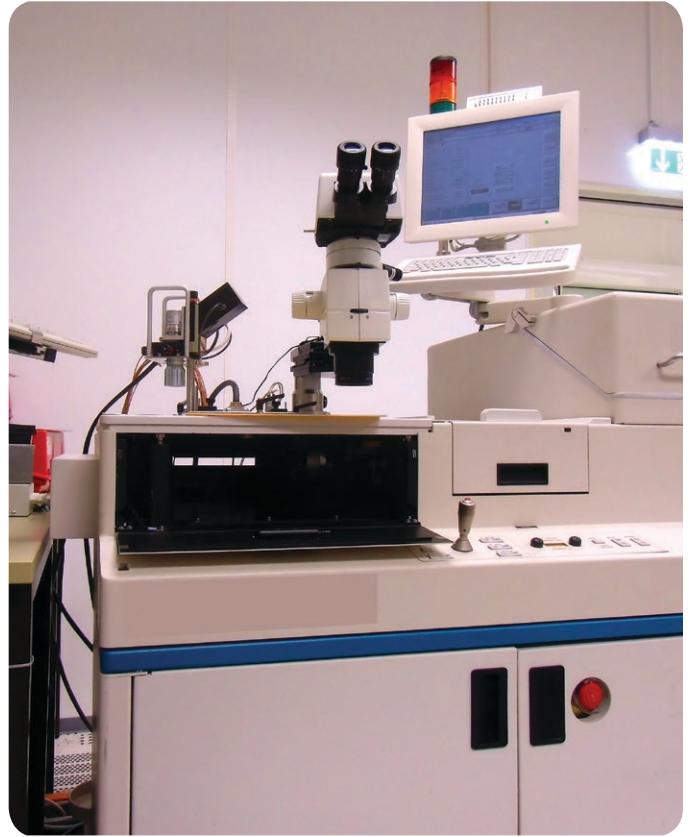
ADM7170, ADM7171, and ADM7172



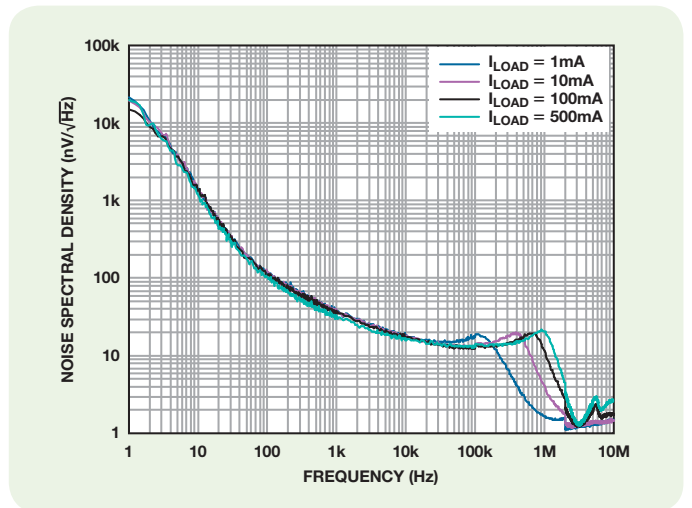
The ADM7170/ADM7171/ADM7172 architecture allows any fixed output voltage to be set to a higher voltage with an external voltage divider.

Features

- Input voltage range: 2.3 V to 6.5 V
- Any fixed voltage part can be adjusted up to give a higher output voltage
- Max current rating:
 - ADM7170: 500 mA
 - ADM7171: 1 A
 - ADM7172: 2 A
- Very low noise: 5 $\mu\text{V rms}$ independent of V_{OUT}
 - BW = 100 Hz to 100 kHz, no bypass cap required
- Fast transient response: < 1.5 μs for 1 mA to 1.5 A load step
- High PSRR: >65 dB at 10 kHz; 60 dB at 100 kHz
- Low dropout voltage of 84 mV at 1 A load, $V_{\text{OUT}} = 3\text{V}$



ADM7171 full load transient response from 1 mA to 1 A for $V_{\text{OUT}} = 3.3\text{V}$.



Output noise spectral density, different output voltages, load current = 100 mA.

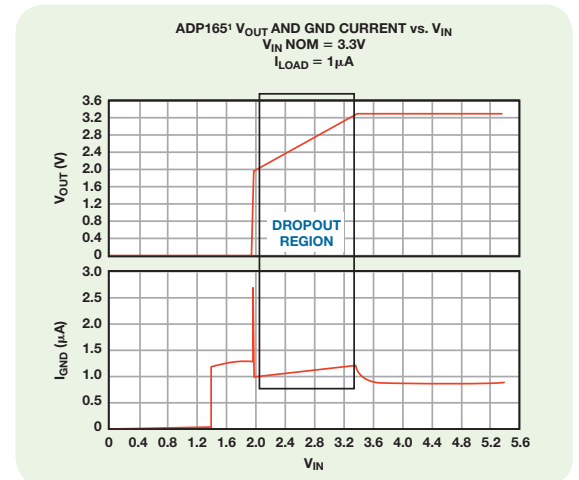
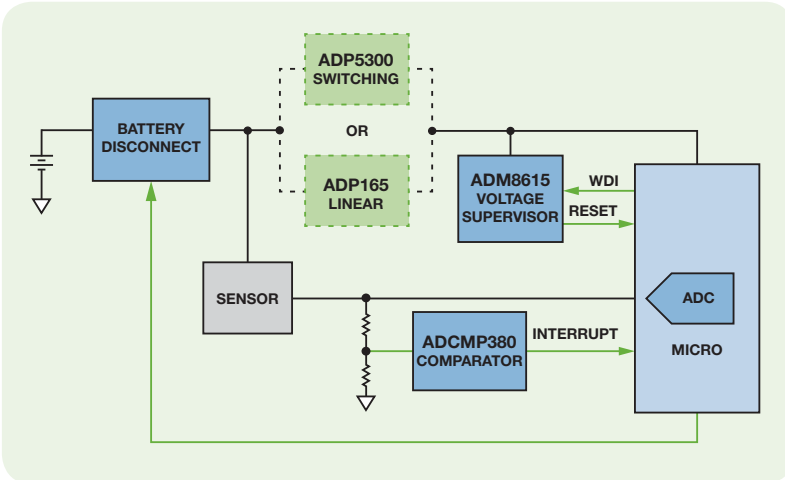
Ultralow Noise, Fast Transient Response LDO Selection Table

Part Number	V_{IN} Range (V)	V_{OUT} Options or Adj Range (V)	I_{OUT} (mA)	Soft Start	Power Good	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	RMS Noise @ 100 Hz to 100 kHz ($\mu\text{V rms}$) ¹	Noise Spectral Density 100 kHz ($\text{nV}/\sqrt{\text{Hz}}$)	Dropout @ Rated I_{OUT} Typ (mV)	Total Accuracy Max ($\pm\%$)	Package
ADM7170	2.3 to 6.5	Fixed: 1.2 to 5.0 Adjustable: 1.2 to 6.4	500	Yes	No	60	31	5.0	12	42	1.25	3 mm \times 3 mm, 8-lead LFCSP
ADM7171	2.3 to 6.5	Fixed: 1.2 to 5.0 Adjustable: 1.2 to 6.4	1000	Yes	No	60	31	5.0	12	84	1.5	3 mm \times 3 mm, 8-lead LFCSP
ADM7172	2.3 to 6.5	Fixed: 1.2 to 5.0 Adjustable: 1.2 to 6.3	2000	Yes	No	60	31	5.0	12	172	1.5	3 mm \times 3 mm, 8-lead LFCSP

¹ Noise independent of fixed output voltage.

Low Quiescent Current LDOs

ADP160, ADP161, ADP162, ADP163, ADP165, and ADP166



Battery-powered sensor.

Low Quiescent Current LDO Selection Table

Part Number	V _{IN} Range (V)	V _{OUT} Options or Adj Range (V)	I _{OUT} (mA)	Supply Current No Load Typical (μA)	Supply Current Full Load Typical (μA)	Quick Output Discharge	Pass Through Mode	RMS Noise @ 10 Hz to 100 kHz (μV rms)	PSRR @ 1 MHz (dB)	Package
ADP160	2.2 to 5.5	Fixed: 1.2 to 4.2	150	0.56	42	Yes	No	80	25	5-lead TSOT, 1 mm × 1 mm, 4-ball WLCSP
ADP161	2.2 to 5.5	Adjustable: 1.2 to 4.2	150	0.56	42	Yes	No	80	25	5-lead TSOT
ADP162	2.2 to 5.5	Fixed: 1.2 to 4.2	150	0.56	42	No	No	80	25	5-lead TSOT, 1 mm × 1 mm, 4-ball WLCSP
ADP163	2.2 to 5.5	Adjustable: 1.2 to 4.2	150	0.56	42	No	No	80	25	5-lead TSOT
ADP165 ¹ New	2.2 to 5.5	Fixed: 1.2 to 4.2 Adjustable: 1.0 to 4.2	150	0.59	42	Yes	Yes	80	25	5-lead TSOT, 2 mm × 2 mm, 6-lead LFCSP, 1 mm × 1 mm, 4-ball WLCSP
ADP166 ¹ New	2.2 to 5.5	Fixed: 1.2 to 4.2 Adjustable: 1.0 to 4.2	150	0.59	42	No	Yes	80	25	5-lead TSOT, 2 mm × 2 mm, 6-lead LFCSP, 1 mm × 1 mm, 4-ball WLCSP

¹ADP165 and ADP166 include pass through mode (very low quiescent current in dropout).

LDO Selection Table

Part Number	V _{in} Range (V Min to V Max)	V _{out} Range (V)	I _{out} (mA)	Supply Current No Load (μA)	Worst-Case Accuracy (±%)	RMS Noise @ 10 Hz to 100 kHz (μV rms)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	PSRR @ Headroom (mV) ¹	Package	Comments
Ultralow Noise, High PSRR											
ADM7150 New	4.5 to 16	1.5 to 5.0	800	4300	2	1.6	90	55	1200	3 mm × 3 mm, 8-lead LFCSP	1.5 nV/√Hz @ 100 kHz
ADM7151 New	4.5 to 16	1.5 to 5.1	800	4300	2	1.6	90	55	1200	3 mm × 3 mm, 8-lead LFCSP	1.5 nV/√Hz @ 100 kHz
ADM7154 New	2.3 to 5.5	1.2 to 3.3	600	4000	2	1.6	90	58	500	3 mm × 3 mm, 8-lead LFCSP	1.2 nV/√Hz @ 100 kHz
ADM7155 New	2.3 to 5.5	1.2 to 3.3	600	4000	2	1.6	90	58	500	3 mm × 3 mm, 8-lead LFCSP	1.2 nV/√Hz @ 100 kHz
HMC976LP3E	3.3 to 5.5	1.8 to 5.1	400	1100	2	9	45	35	500	3 mm × 3 mm, 16-lead LFCSP	3 nV/√Hz @ 100 kHz
HMC860LP3E	3.35 to 5.6	2.5 to 5.2	240	1900	2	5.5	65	60	500	3 mm × 3 mm, 16-lead LFCSP	Quad output
HMC1060LP3E	3.35 to 5.6	1.8 to 5.2	500	2100	2	9	72	35	500	3 mm × 3 mm, 16-lead LFCSP	Quad output
Low Voltage and Low Noise											
ADP150	2.2 to 5.5	1.8 to 3.3	150	10	2.5	9	50	30	500	4-lead WLCSP, 5-lead TSOT	0.8 mm × 0.8 mm WLCSP option
ADP151	2.2 to 5.5	1.1 to 3.3	200	10	3	9	45	25	500	4-lead WLCSP, 5-lead TSOT, 2 mm × 2 mm, 6-lead LFCSP	0.8 mm × 0.8 mm WLCSP option
ADM7160 New	2.2 to 5.5	1.1 to 3.3	200	10	3	9	45	38	500	5-lead TSOT, 2 mm × 2 mm, 6-lead LFCSP	I&I applications, low tempco
ADM7170 New	2.3 to 6.5	1.2 to 6.4	500	700	1.25	6	53	30	500	3 mm × 3 mm, 8-lead LFCSP	Fast transient response
ADM7171 New	2.3 to 6.5	1.2 to 6.4	1000	700	1.5	6	53	30	500	3 mm × 3 mm, 8-lead LFCSP	Fast transient response
ADM7172 New	2.3 to 6.5	1.2 to 6.3	2000	700	1.5	6	53	30	500	3 mm × 3 mm, 8-lead LFCSP	Fast transient response
High Voltage and Low Noise											
ADP7102	3.3 to 20	1.22 to 19	300	400	3	15	60	40	1000	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC	Power good, reverse voltage protected
ADP7104	3.3 to 20	1.22 to 19	500	400	3	15	60	40	1000	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC	Power good, reverse voltage protected
ADP7105 New	3.3 to 20	1.22 to 19	500	400	2	15	60	40	1000	3 mm × 3 mm, 8-lead LFCSP, 8-lead SOIC	Power good, soft start, reverse voltage protected
ADP7112 New	2.7 to 20	1.2 to 19	200	50	1.8	11	68	50	2000	1 mm × 1.2 mm, 6-ball WLCSP	Soft start
ADP7118 New	2.7 to 20	1.2 to 19	200	50	1.8	11	68	50	2000	2 mm × 2 mm, 6-lead LFCSP, 8-lead SOIC, 5-lead TSOT	Soft start
ADP7142 New	2.7 to 40	1.2 to 39	200	50	1.8	11	68	50	2000	2 mm × 2 mm, 6-lead LFCSP, 8-lead SOIC, 5-lead TSOT	Soft start
Negative Voltage											
ADP7182 New	-2.7 to -28	-1.22 to -27	-200	-33	3	18	45	32	1000	2 mm × 2 mm, 6-lead LFCSP, 3 mm × 3 mm, 8-lead LFCSP, 5-lead TSOT	Positive/negative EN logic
Ultralow V_{in}											
ADP170	1.6 to 3.6	0.8 to 3.0	300	23	3	30	50	32	500	5-lead TSOT	Fixed output
ADP171	1.6 to 3.6	0.8 to 3.0	300	23	3	30	50	32	500	5-lead TSOT	Adjustable output
ADP172	1.6 to 3.6	0.8 to 3.0	300	23	3	30	50	32	500	4-lead WLCSP	0.95 mm × 0.95 mm WLCSP option
ADP130	1.2 to 3.6	0.8 to 3.0	350	25	3	29	55	35	500	5-lead TSOT	V _{Bias} voltage required

¹ PSRR specifications are at this headroom voltage (headroom = V_{in} - V_{out}).

Part Number	V _{in} Range (V Min to V Max)	V _{out} Range (V)	I _{out} (mA)	Supply Current No Load (μA)	Worst-Case Accuracy (±%)	RMS Noise @ 10 Hz to 100 kHz (μV rms)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	PSRR @ Headroom ¹ (mV) ¹	Package	Comments
Ultra-low V_{in} (continued)											
ADP1740	1.6 to 3.6	0.75 to 2.5	2000	90	2	23	54	40	1000	4 mm × 4 mm, 16-lead LFCSP	Soft start, power good, reverse voltage protected
ADP1741	1.6 to 3.6	0.75 to 3.3	2000	90	2	23	54	40	1000	4 mm × 4 mm, 16-lead LFCSP	Soft start, power good, reverse voltage protected
ADP1752	1.6 to 3.6	0.75 to 2.5	800	90	2	23	54	40	1000	4 mm × 4 mm, 16-lead LFCSP	Soft start, power good, reverse voltage protected
ADP1753	1.6 to 3.6	0.75 to 3.3	800	90	2	23	54	40	1000	4 mm × 4 mm, 16-lead LFCSP	Soft start, power good, reverse voltage protected
ADP1754	1.6 to 3.6	0.75 to 2.5	1200	90	2	23	54	40	1000	4 mm × 4 mm, 16-lead LFCSP	Soft start, power good, reverse voltage protected
ADP1755	1.6 to 3.6	0.75 to 3.3	1200	90	2	23	54	40	1000	4 mm × 4 mm, 16-lead LFCSP	Soft start, power good, reverse voltage protected
Multitrail											
HMC860LP3E	3.35 to 5.6	2.5 to 5.2	240	1900	2	5.5	65	60	500	3 mm × 3 mm, 16-lead LFCSP	Quad output
HMC1060LP3E	3.35 to 5.6	1.8 to 5.2	500	2100	2	9	72	35	500	3 mm × 3 mm, 16-lead LFCSP	Quad output
ADP220	2.5 to 5.5	0.8 to 3.3	200	60	2	27	60	40	1000	6-lead WL CSP	1 mm × 1.5 mm WL CSP
ADP221	2.5 to 5.5	0.8 to 3.3	200	60	2	27	60	40	1000	6-lead WL CSP	1 mm × 1.5 mm WL CSP; active pull-down
ADP222	2.5 to 5.5	0.8 to 3.3	300	65	2	27	60	40	1000	2 mm × 2 mm, 8-lead LFCSP	Dual LDO, fixed outputs
ADP223	2.5 to 5.5	0.5 to 5.0	300	65	2	27	60	40	1000	2 mm × 2 mm, 8-lead LFCSP	Dual LDO, adjustable outputs
ADP224	2.5 to 5.5	0.8 to 3.3	300	65	2	27	60	40	1000	2 mm × 2 mm, 8-lead LFCSP	Dual LDO, fixed outputs, quick output discharge
ADP225	2.5 to 5.5	0.5 to 5.0	300	65	2	27	60	40	1000	2 mm × 2 mm, 8-lead LFCSP	Dual LDO, adjustable outputs, quick output discharge
ADP320	1.8 to 5.5	0.8 to 3.3	200	85	2	24	55	45	1000	3 mm × 3 mm, 16-lead LFCSP	Triple LDO, 2.5 V _{BIAS} min
ADP322	1.8 to 5.5	0.8 to 3.3	200	85	2	24	55	45	1000	3 mm × 3 mm, 16-lead LFCSP	Triple LDO, 2.5 V _{BIAS} min, fixed outputs
ADP323	1.8 to 5.5	0.5 to 5.0	200	85	2	24	55	45	1000	3 mm × 3 mm, 16-lead LFCSP	Triple LDO, 2.5 V _{BIAS} min, adjustable outputs
High Current											
ADM7172 New	2.3 to 6.5	1.2 to 6.3	2000	700	1.5	6	53	30	500	3 mm × 3 mm, 8-lead LFCSP	Fast transient response
ADP1740	1.6 to 3.6	0.75 to 2.5	2000	90	2	23	54	40	1000	4 mm × 4 mm, 16-lead LFCSP	Soft start, power good, reverse voltage protected
ADP1741	1.6 to 3.6	0.75 to 3.3	2000	90	2	23	54	40	1000	4 mm × 4 mm, 16-lead LFCSP	Soft start, power good, reverse voltage protected
General-Purpose											
ADP121	2.3 to 5.5	1.2 to 3.3	150	11	3	40	50	30	1000	5-lead TSOT, 4-lead WL CSP	0.82 mm × 0.82 mm WL CSP
ADP122	2.3 to 5.5	1.75 to 3.3	300	45	2	25	60	38	500	5-lead TSOT, 2 mm × 2 mm, 6-lead LFCSP	Fixed output
ADP123	2.3 to 5.5	0.8 to 5.0	300	45	2	25	60	38	500	5-lead TSOT, 2 mm × 2 mm, 6-lead LFCSP	Adjustable output
ADP124	2.3 to 5.5	1.75 to 3.3	500	45	2	25	45	33	500	8-lead MSOP, 2 mm × 2 mm, 8-lead LFCSP	Exposed pad package for high thermal conductivity

¹ PSRR specifications are at this headroom voltage (headroom = V_{in} - V_{out}).

Part Number	V _{IN} Range (V Min to V Max)	V _{OUT} Range (V)	I _{OUT} (mA)	Supply Current No Load (μA)	Worst-Case Accuracy (±%)	RMS Noise @ 10 Hz to 100 kHz (μV rms)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	PSRR @ Headroom (mV) ¹	Package	Comments
<i>General-Purpose (continued)</i>											
ADP125	2.3 to 5.5	0.8 to 5.0	500	45	2	25	45	33	500	8-lead MSOP, 2 mm × 2 mm, 8-lead LFCSP	Exposed pad package for high thermal conductivity
<i>Ultralow Iq and Low Noise</i>											
ADP160	2.2 to 5.5	1.2 to 4.2	150	0.56	3.5	80	23	20	500	5-lead TSOT, 4-lead WLCSP	Ultralow Iq, QOD
ADP161	2.2 to 5.5	1.0 to 4.2	150	0.56	3.5	80	23	20	500	5-lead TSOT	Ultralow Iq
ADP162	2.2 to 5.5	1.2 to 4.2	150	0.56	3.5	80	23	20	500	5-lead TSOT, 4-lead WLCSP	Ultralow Iq, QOD, 0.965 mm × 0.965 mm WLCSP
ADP163	2.2 to 5.5	1.0 to 4.2	150	0.56	3.5	80	23	20	500	5-lead TSOT	Ultralow Iq
ADP165 New	2.2 to 5.5	1.0 to 4.2	150	0.59	3.5	80	23	20	500	1 mm × 1 mm, 4-lead WLCSP, 2 mm × 2 mm, 6-lead LFCSP, 5-lead TSOT	Ultralow Iq in dropout (pass through mode), QOD
ADP166 New	2.2 to 5.5	1.0 to 4.2	150	0.59	3.5	80	23	20	500	1 mm × 1 mm, 4-lead WLCSP, 2 mm × 2 mm, 6-lead LFCSP, 5-lead TSOT	Ultralow Iq in dropout (pass through mode)
<i>WLCSP</i>											
ADP121	2.3 to 5.5	1.2 to 3.3	150	11	3	40	50	30	1000	5-lead TSOT, 4-lead WLCSP	0.82 mm × 0.82 mm WLCSP
ADP150	2.2 to 5.5	1.8 to 3.3	150	10	2.5	9	50	30	500	4-lead WLCSP, 5-lead TSOT	0.8 mm × 0.8 mm WLCSP option
ADP151	2.2 to 5.5	1.1 to 3.3	200	10	3	9	45	25	500	4-lead WLCSP, 5-lead TSOT, 2 mm × 2 mm, 6-lead LFCSP	0.8 mm × 0.8 mm WLCSP option
ADP160	2.2 to 5.5	1.2 to 4.2	150	0.56	3.5	80	23	20	500	5-lead TSOT, 4-lead WLCSP	Ultralow Iq, QOD
ADP162	2.2 to 5.5	1.2 to 4.2	150	0.56	3.5	80	23	20	500	5-lead TSOT, 4-lead WLCSP	Ultralow Iq, QOD, 0.965 mm × 0.965 mm WLCSP
ADP165 New	2.2 to 5.5	1.0 to 4.2	150	0.59	3.5	80	23	20	500	1 mm × 1 mm, 4-lead WLCSP, 2 mm × 2 mm, 6-lead LFCSP, 5-lead TSOT	Ultralow Iq in dropout (pass through mode), QOD
ADP166 New	2.2 to 5.5	1.0 to 4.2	150	0.59	3.5	80	23	20	500	1 mm × 1 mm, 4-lead WLCSP, 2 mm × 2 mm, 6-lead LFCSP, 5-lead TSOT	Ultralow Iq in dropout (pass through mode)
ADP172	1.6 to 3.6	0.8 to 3.0	300	23	3	30	50	32	500	4-lead WLCSP	0.95 mm × 0.95 mm WLCSP option
ADP220	2.5 to 5.5	0.8 to 3.3	200	60	2	27	60	40	1000	6-lead WLCSP	1 mm × 1.5 mm WLCSP
ADP221	2.5 to 5.5	0.8 to 3.3	200	60	2	27	60	40	1000	6-lead WLCSP	1 mm × 1.5 mm WLCSP, active pulldown
ADP7112 New	2.7 to 20	1.2 to 19	200	50	2	11	60	40	1000	6-lead WLCSP	Soft start

¹ PSRR specifications are at this headroom voltage (headroom = V_{IN} - V_{OUT}).

Online Tools and Resources

Linear Regulator Parametric Selections and Design Tool

The ADIsimPower™ design center lets you design your power circuits in two easy steps:

- Step 1: Select parts
- Step 2: Design and optimize

The ADIsimPower selector uses your specific application requirements and compares solutions from over 300 power management parts and over 10 different topologies.

Each solution takes into consideration the IC, external components, and operating condition to be able to compare expected performance.



Step 1:

Smart Web selector

Tool Available	Part Number	IC Description and Features	Topology	Solution Cost (USD)	Solution Area (mm²)	Efficiency (%)	Component Count
Download Tool	ADP223	Dual LDO	Linear	\$0.50	15 mm²	60%	
Download Tool	ADP225	Dual LDO	Linear	\$0.60	15 mm²	60%	
Download Tool	ADP124	LDO	Linear	\$0.48	14 mm²	60%	
Download Tool	ADP125	LDO	Linear	\$0.50	15 mm²	60%	
Download Tool	ADP1207	LDO	Linear	\$1.19	14 mm²	60%	
Download Tool	ADP1208	LDO	Linear	\$1.17	15 mm²	60%	
Download Tool	ADP1209	LDO	Linear	\$1.18	15 mm²	60%	
Download Tool	ADP1210	LDO	Linear	\$1.36	24 mm²	60%	
Download Tool	ADP1216	LDO	Linear	\$0.92	24 mm²	60%	
Download Tool	ADP1304	LDO	Linear	\$1.74	14 mm²	60%	
Download Tool	ADP1306	LDO	Linear	\$1.51	14 mm²	60%	
Download Tool	ADMP172	LDO	Linear	\$1.91	18 mm²	60%	
Download Tool	ADMP173	LDO	Linear	\$1.11	18 mm²	60%	
Download Tool	ADMP170	LDO	Linear	\$1.00	18 mm²	59%	
Download Tool	ADP3336	LDO	Linear	\$0.94	12 mm²	59%	
Download Tool	ADP3334	LDO	Linear	\$0.95	13 mm²	59%	
Download Tool	ADP3336	LDO	Linear	\$1.01	28 mm²	59%	
Download Tool	ADP3338	LDO	Linear	\$1.56	50 mm²	58%	
Download Tool	ADP3338	LDO	Linear	\$1.13	50 mm²	58%	

Step 2:

Design and optimize for size, cost, or efficiency

Bill of Materials

Qty	Manufacturer	Part Number	Component Spec	Pkg	Part Qty	Area (mm²)	Height (mm)	Cost (USD)
1	ADI	ADP1207CPZ-3.3R7	Common Linear Regulator	8 Pin EPDIP	1	0	0.8	0.08
1	Murata	GRM188R1A104K	10µF, 16V, 6x6mm	885	1	2.5	1.2	0.242
1	TDK	C1050R009100M	10µF, 6.3V, 12mm	893	1	1.2	0.8	0.061
1	Vishay	±1% 100Ω tolerance	10k, 0.1%	492	1	0.5	0.4	0.01
1	Vishay	1% tolerance	24kΩ	895	8	19.2	0.5	0.08
		Total:			12	32.5	1.2	1.073

Side by side comparison at specified operating point, including expected noise and PSRR

Linear Regulator	Loss (W)	Noise Vrms	PSRR @ 1KHz	Area (mm²)	Parts Count	Solution Cost (USD)	Low Battery	Drop Out Detect
ADP3338ACPZ-3.3R7	1.41	63	70	23.5	8	0.994	-	-
ADP3334ACPZ-REEL7	1.41	65	70	25.1	11	1.024	-	-
ADP3335ACPZ-3.3R7	1.41	63	70	26	9	1.004	-	-
ADP3334ACPZ-REEL7	1.41	65	70	27.5	12	1.034	-	-
ADP104ACPZ-3.3R7	1.36	15	72	30.8	11	1.832	-	-
ADP105ACPZ-3.3R7	1.36	15	72	31.3	10	1.602	-	-
ADP104ACPZ-R7	1.36	24	72	31.8	13	1.852	-	-
ADP105ACPZ-R7	1.36	24	72	32.3	14	1.822	-	-
ADMP170ACPZ-3.3R7	1.381	6	6	32.5	12	1.073	-	-
ADMP171ACPZ-3.3R7	1.373	6	58	32.5	12	1.383	-	-

Design report includes BOM and thermals at operating conditions

Provided Specifications

- Basic Target Settings: Adjustable, Power Good, Low Battery Detect, Drop Out Detect, Tracking, Adjustable Soft Start Enable, 1% tolerance, Smallest Size
- Advanced Target Settings: Don't Care, No, Don't Care, No, Don't Care, No, Don't Care, Yes, Don't Care, Yes, Don't Care, No

Operational Estimates

Parameter	Value	Units	Comment
Shutdown Ground Current	5.2	µA	
No Load Iq	1400.0	µA	
No Load Ioss	0.4	W	
Efficiency	54.4	%	at load max
Total Power Dissipation	1.381	W	at load max
Estimated Die Temperature	120.0	°C	at load max

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