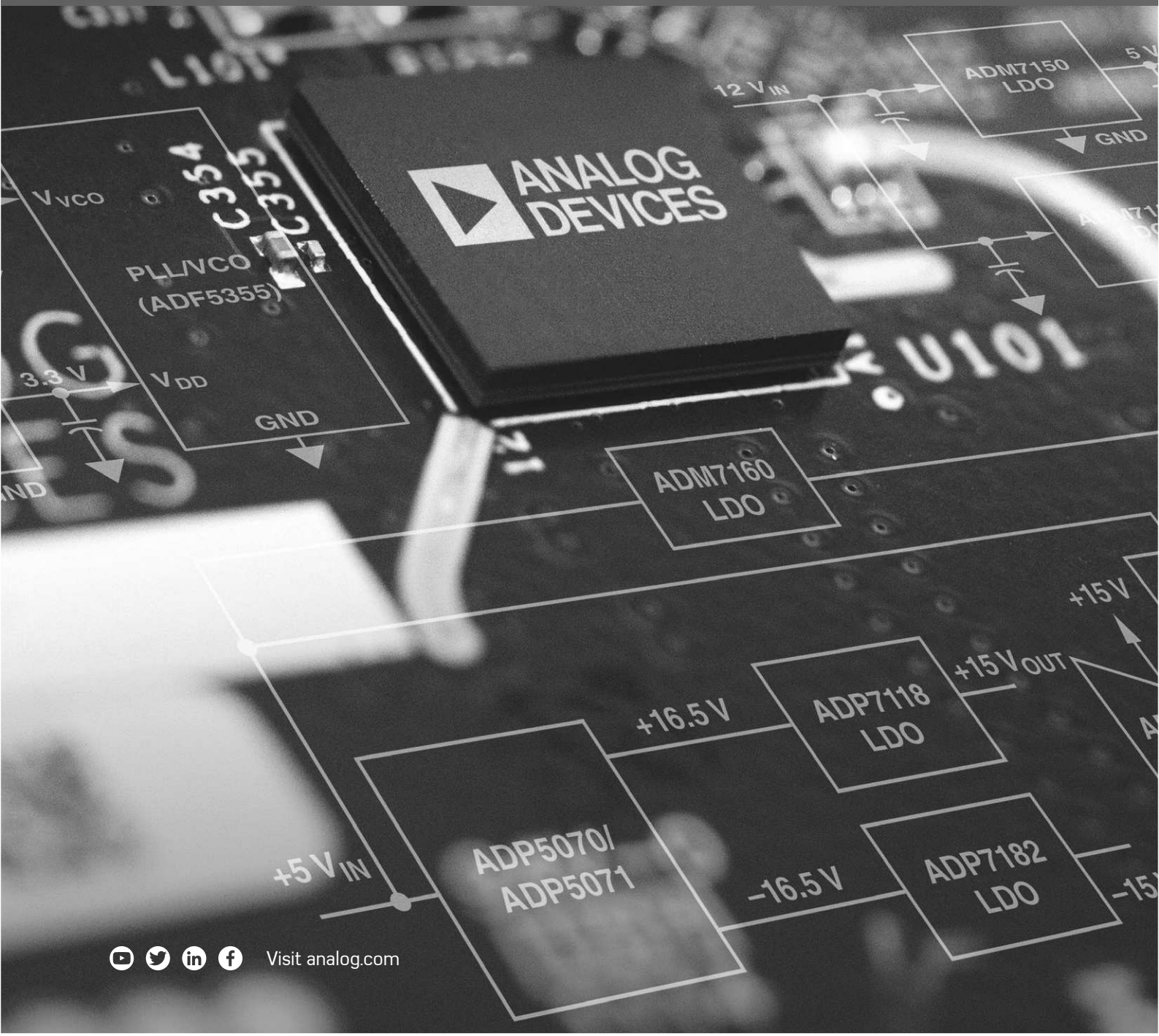
ANALOG DEVICES

AHEAD OF WHAT'S POSSIBLE™

POWERING ADI COMPONENTS

In Industrial and Instrumentation Applications



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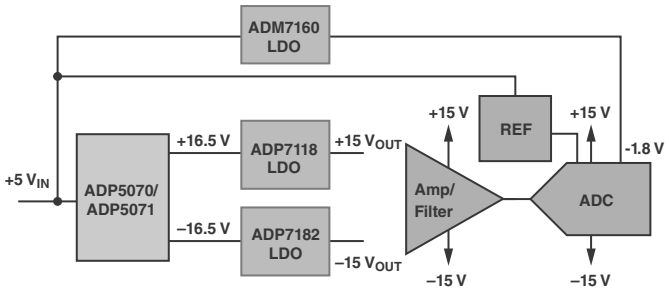
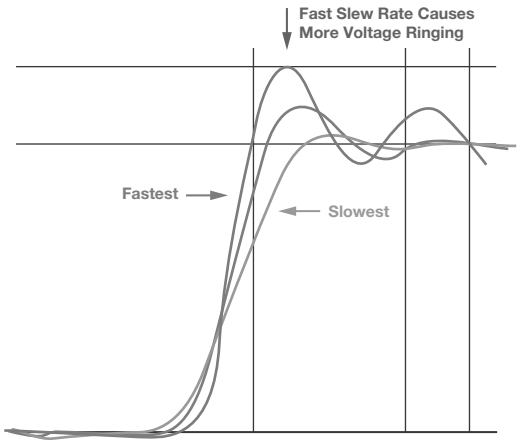
Powering Bipolar Components

Analog Devices offers complete power management solutions to power devices requiring bipolar supplies such as amplifiers, ADCs, and DACs in precision signal chains. ADI offers solutions both for supply generation and low noise point of loads with PSRRs specified at modern switcher frequencies.



ADC/amplifier applications diagram.

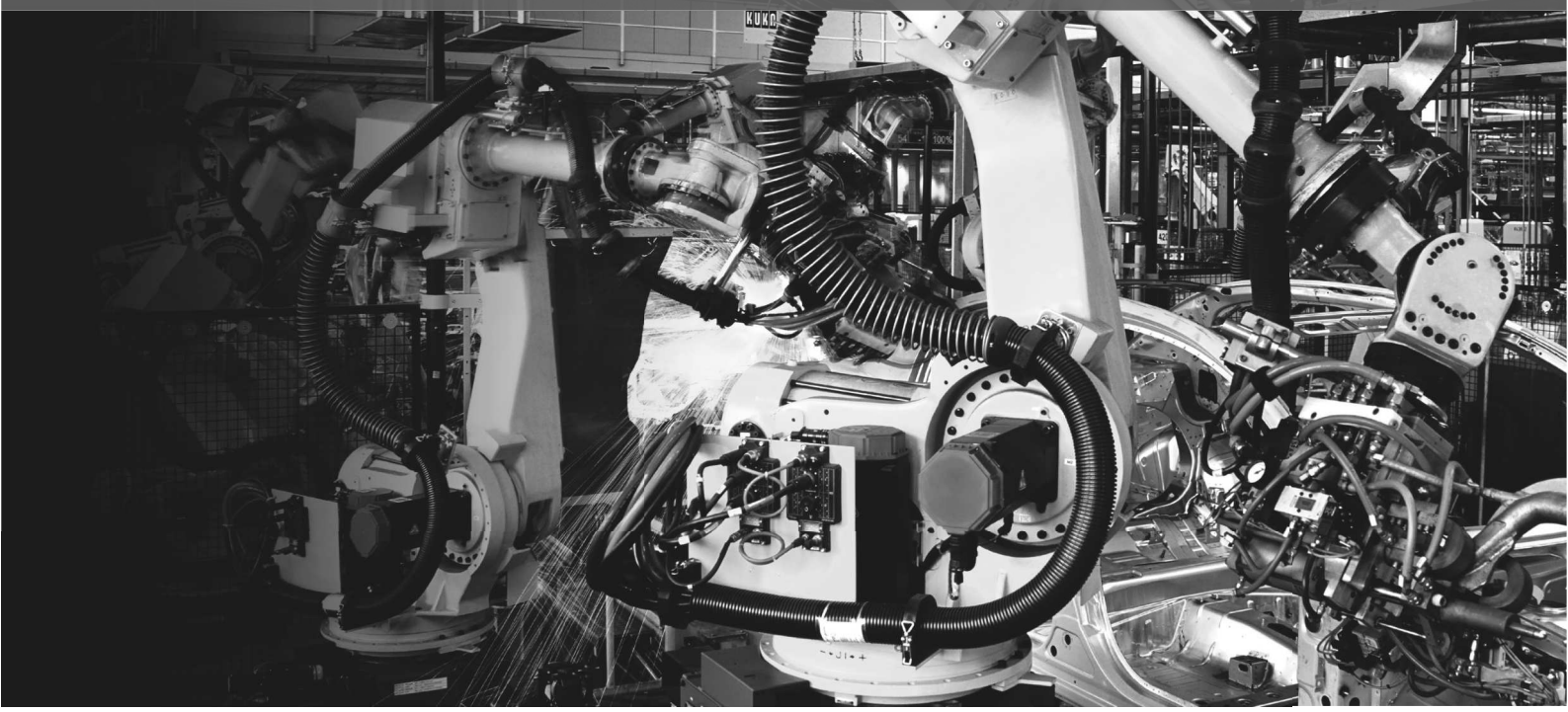
ADP5070/ADP5071/ADP5073/ADP5074/ADP5075 Enable Lower EMI/EMC Power Solutions Through Resistor Programmable Slew Rate Control

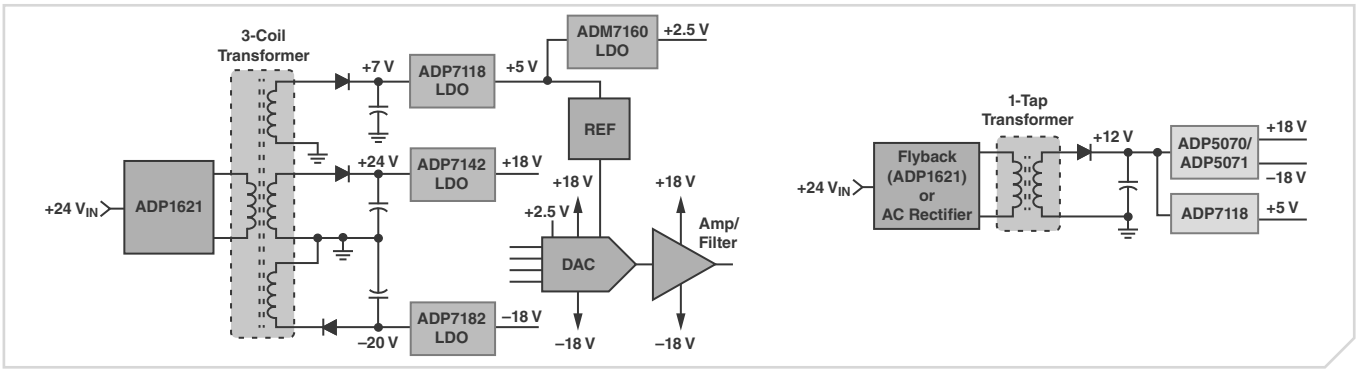


Reduced dV/dt of the Switching Node Results in a Significant Reduction of the Supply and Ground Ringing, as well as Lower Radiated EMI/EMC

DC-to-DC for Bipolar Applications

Part Number	Product Description	V (V_{IN})	V (V_{OUT})	Number of Outputs	Input Current Limt (A)	Key Features	Package
ADP5070	Dual dc-to-dc with boost and inverter outputs for generating independent positive and negative outputs	Boost/ inverter: 2.85 to 15	Boost: V_{IN} to 39 V, inverter: –0.5 V to –39 V below V_{IN}	1 × boost 1 × inverter	Boost: 1, inverter: 0.6	Individual enable pin, adjustable outputs, sequence control, sync sequence, soft start, and slew rate control	20-lead LFCSP, 20-lead TSSOP
ADP5071	Dual dc-to-dc with boost and inverter outputs for generating independent positive and negative outputs	Boost/ inverter: 2.85 to 15	Boost: V_{IN} to 39 V, inverter: –0.5 V to –39 V below V_{IN}	1 × boost 1 × inverter	Boost: 2, inverter: 1.2	Individual enable pin, adjustable outputs, sequence control, sync sequence, soft start, and slew rate control	20-lead LFCSP, 20-lead TSSOP
ADP5073	Inverting switching regulator for generating negative output	Inverter: 2.85 to 15	Inverter: –0.5 V to –39 V below V_{IN}	1 × inverter	Inverter: 1.2	Enable pin, adjustable output, soft start, and slew rate control	16-lead LFCSP
ADP5074	Inverting switching regulator for generating negative output	Inverter: 2.85 to 15	Inverter: –0.5 V to –39 V below V_{IN}	1 × inverter	Inverter: 2.4	Enable pin, adjustable output, soft start, and slew rate control	16-lead LFCSP
ADP5075	Inverting switching regulator for generating negative output	Inverter: 2.85 to 15	Inverter: –0.5 V to –39 V below V_{IN}	1 × inverter	Inverter: 0.8	Enable pin, adjustable output, soft start, and slew rate control	12-ball WLCSP





Powering bipolar output applications diagram.

High Voltage LDOs

Part Number	V_{IN} Range (V)	V_{OUT} Fixed (V)	V_{OUT} Range (V)	I_{OUT} (mA)	Soft Start	Power Good	RMS Noise @ 10 Hz to 100 kHz (µV rms)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	Package
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
ADP7112	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
ADP7118	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
ADP7142	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

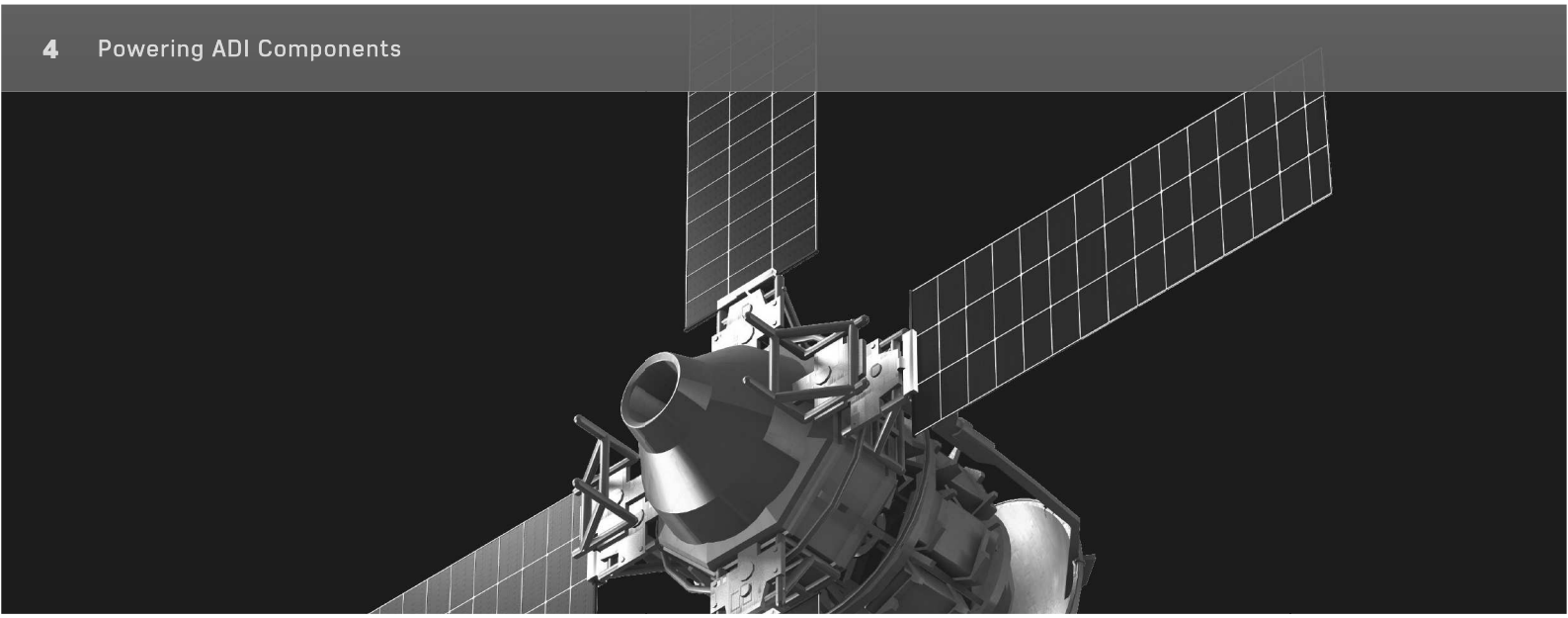
Negative Voltage LDOs

Part Number	V_{IN} Min (V)	V_{IN} Max (V)	I_{OUT} (mA)	V_{OUT} Options or Adj Range (V)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	RMS Noise @ 100 kHz to 100 kHz (µV rms)	Noise Spectral Density 100 kHz (nV√Hz)	Dropout @ Rated I_{OUT} Typ (mV)	Total Accuracy Max (±%)	Package
ADP7182	–2.7	–28	–200	–1.22 to –27	45	32	18	50	185	–3/+2	3 mm × 3 mm, 10-lead MSOP
ADP7183	–2	–5.5	–300	–0.5 to –5.4	>50	40	5	18	100	±1	2 mm × 2 mm, 8-lead MSOP

Switching Controller

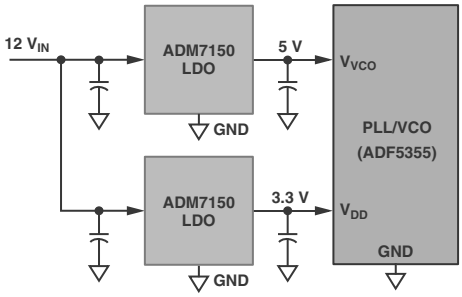
Part Number	V_{IN} Range (V)	V_{OUT} Range (V)	I_{OUT} (A)	Device Topology	Minimum Switching Frequency (kHz)	Maximum Switching Frequency (MHz)	Package
ADP1621	2.9 to 5.5[1]	1.22 to 100	—	Step-up	100	1.5	3 mm × 3 mm, 10-lead MSOP

[1] Input voltage range extended with external components.

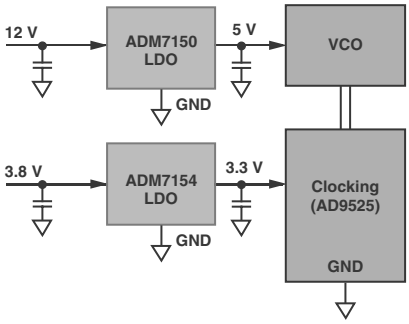


Powering RF Loads

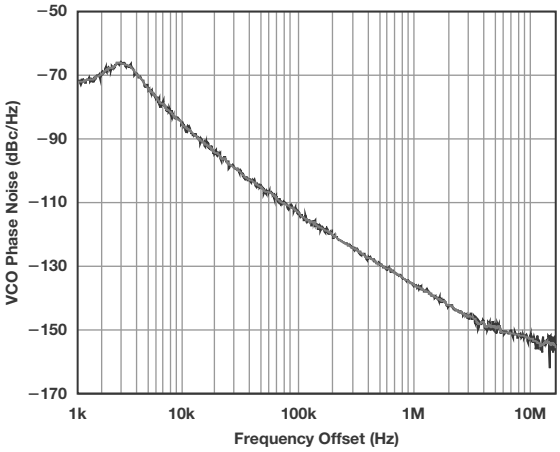
When powering RF circuits, power supplies need to be as quiet as possible to avoid the injection of noise into the RF spectrum. ADI offers the industry's largest portfolio of lowest noise linear regulators specifically designed for powering RF loads.



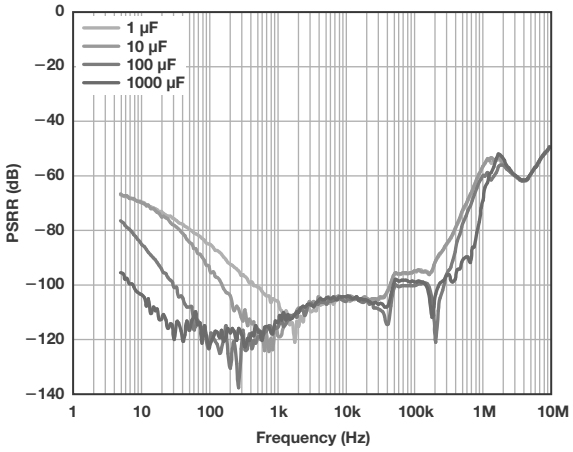
PLL/VCO applications diagram.



Clocking applications diagram.



ADF5355 VCO noise, powered by ADM7150.



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

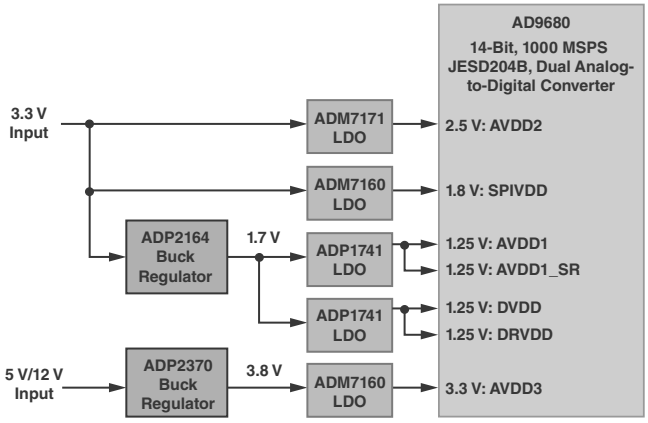
Switching Regulators

Part Number	V_{IN} Range (V)	V_{OUT} Range (V)	I_{OUT} (A)	Device Topology	Minimum Switching Frequency (kHz)	Maximum Switching Frequency (MHz)	Package
ADP2164	2.7 to 6.5	0.6 to V_{IN}	4	Step-down	500	1.4	4 mm × 4 mm, 16-lead LFCSP
ADP2360	4.5 to 60	0.8 to V_{IN}	0.05	Step-down	Variable frequency control		3 mm × 3 mm, 8-lead LFCSP
ADP2370	3.2 to 15	0.8 to 14	0.8	Step-down	600	1.2	3 mm × 3 mm, 8-lead LFCSP
ADP5073	2.85 to 15	–0.5 to V_{IN}–39	0.7	Inverting	1000	2.6	3 mm × 3 mm, 16-lead LFCSP

High Speed Converters

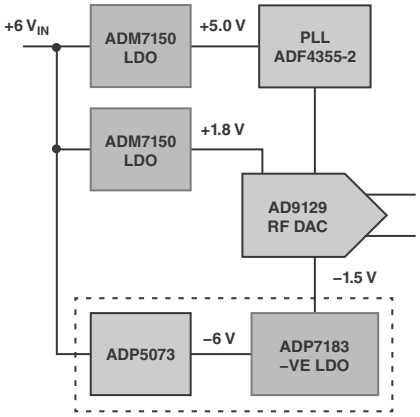
Powering High Speed ADCs

High speed converters need low noise analog core rails, and ADI offers both LDO and switching regulators to solve these problems.



Powering High Speed DACs

RF DACs require very low noise power supplies in order to achieve spectral purity at the outputs and Analog Devices offers low noise, positive and negative power supply solutions.



Ultralow Noise LDOs

Part Number	V_{IN} Range (V)	V_{OUT} Range (V)	I_{OUT} (mA)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	RMS Noise @ 10 Hz to 100 kHz (µV rms)	Noise Spectral Density 100 kHz (nV√Hz)	Dropout @ Rated I_{OUT} Typ (mV)	Total Accuracy Max (±%)	Package
ADM7150	4.5 to 16	1.5 to 5.0	800	94	62	1.6	1	600	2	3 mm × 3 mm, 8-lead LFCSP
ADM7151	4.5 to 16	1.5 to 5.1	800	94	62	1.6	1	600	2	3 mm × 3 mm, 8-lead LFCSP
ADM7154	2.3 to 5.5	1.2 to 3.3	600	90	58	1.6	1.2	120	2	3 mm × 3 mm, 8-lead LFCSP
ADM7155	2.3 to 5.5	1.2 to 3.3	600	90	58	1.6	1.2	120	2	3 mm × 3 mm, 8-lead LFCSP
ADM7160	2.2 to 5.5	1.8 to 3.3	200	54	47	9	20	150	3	2 mm × 2 mm, 6-lead LFCSP
ADM7170	2.3 to 6.5	1.2 to 6.4	500	60	31	6	12	42	1.25	3 mm x 3 mm, 8-lead LFCSP
ADM7171	2.3 to 6.5	1.2 to 6.4	1000	60	31	6	12	84	1.5	3 mm × 3 mm, 8-lead LFCSP
ADM7172	2.3 to 6.5	1.2 to 6.4	2000	60	31	6	12	172	1.5	3 mm x 3 mm, 8-lead LFCSP
ADP1741	1.6 to 3.6	0.75 to 3.3	2000	54	40	23	<60	160	2	4 mm × 4 mm, 16-lead LFCSP
HMC860LP3E	3.35 to 5.6	2.5 to 5.2	240	65	60	1.5	3	—	2	3 mm × 3 mm, 16-lead LFCSP
HMC976LP3E	3.3 to 5.5	1.8 to 5.1	400	45	30	9	3	300	2	3 mm × 3 mm, 16-lead LFCSP
HMC1060LP3E	3.35 to 5.6	1.8 to 5.2	500	71	60	1.5	3	—	2	3 mm × 3 mm, 16-lead LFCSP

Negative Ultralow Noise LDO

Part Number	V_{IN} Min (V)	V_{IN} Max (V)	I_{OUT} (mA)	V_{OUT} Options or Adj Range (V)	PSRR @ 100 kHz (dB)	PSRR @ 1 MHz (dB)	RMS Noise @ 100 kHz to 100 kHz (µV rms)	Noise Spectral Density 100 kHz (nV√Hz)	Dropout @ Rated I_{OUT} Typ (mV)	Total Accuracy Max (±%)	Package
ADP7183	–2	–5.5	–300	–0.5 to –5.4	>50	40	5	18	100	±1	2 mm × 2 mm, 8-lead MSOP

Upcoming Solutions for Powering High Speed Converters

ADP1761/ADP1762/ADP1763

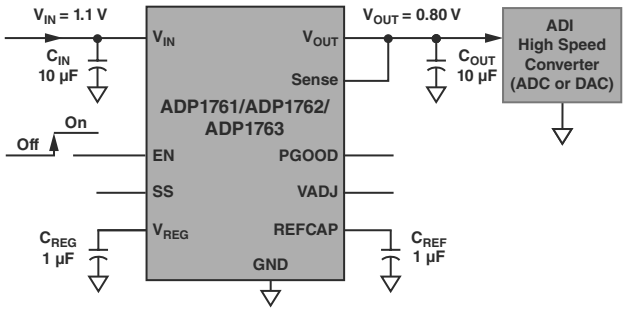
- 1 A, 2 A, and 3 A versions available

Ultralow Dropout Voltage

- 80 mV @ 2 A load
- ±1.5% accuracy over line, load, and temperature

Excellent PSRR Performance

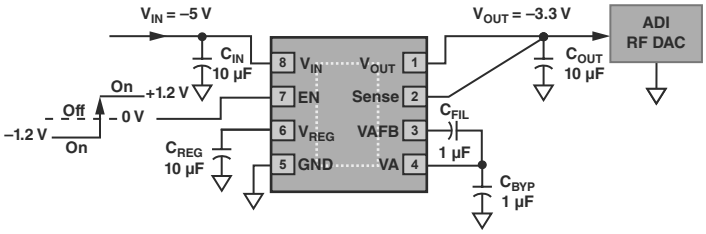
- 55 dB @ 100 kHz @ 2 A load
- 40 dB @ 1 MHz @ 2 A load
- 16-lead, 3 mm × 3 mm LFCSP package



Typical application circuits.

ADP7183

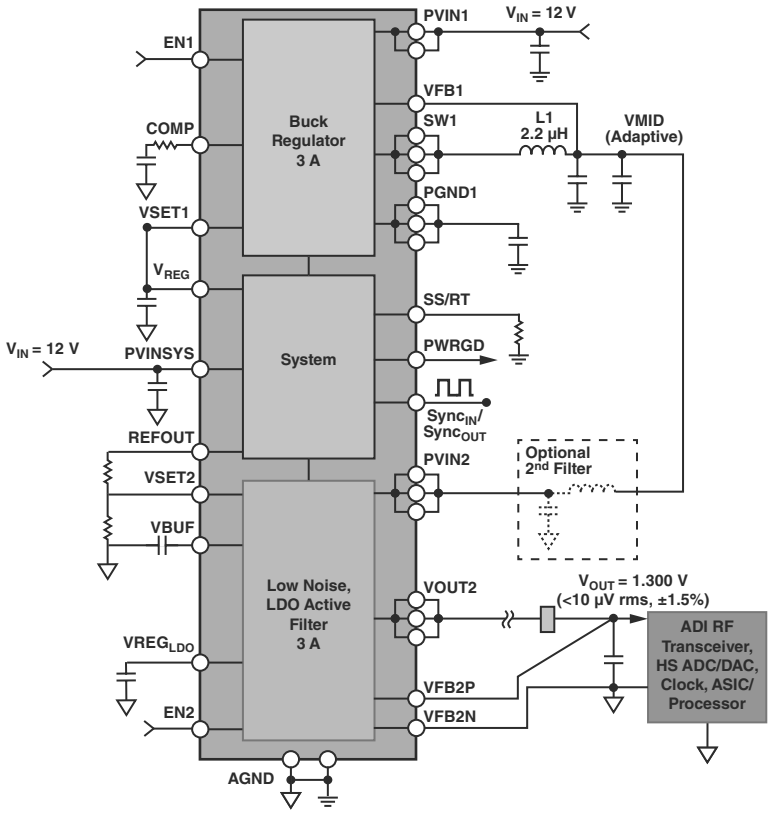
- Input voltage range: –2 V to –5.5 V
- Max current rating: –300 mA
- Very low noise 5 µV rms independent of V_{OUT}
- PSRR at 1 MHz 40 dB, 100 kHz >50 dB
- Fixed output voltage options: –0.5 V to –4.5 V
- Initial accuracy: ±0.5%
- Precision enable at –1.2 V
- Positive enable control
- 8-lead, 2 mm × 2 mm LFCSP



ADP5003

Low Noise Buck and LDO

- 3 A low noise buck regulator
- Buck wide input range: 4.2 V to 15 V
- Buck programmable output range: 0.6 V to 5 V
- <40 µV rms buck output noise (independent of V_{OUT} setting)
- Internal 3 A, low noise NFET LDO acts as an active filter for sensitive analog supplies
- LDO wide input range: 0.65 V to 5 V
- LDO fixed/programmable output range: 0.6 V to 3.3 V
- True differential remote sensing
- Below 10 µV rms LDO output noise (independent of V_{OUT})
- PSRR >50 dB (up to 100 kHz) @ 200 mV headroom at 2 A
- Power-good output



Design Tools

Online Tools and Resources

Linear Regulator Parametric Selections and Design Tool

The ADIsimPower™ design center lets you design your power circuits in three easy steps.

Step 1. Select parts

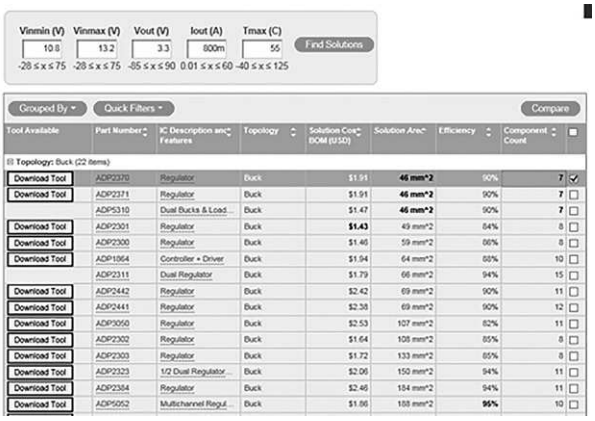
Step 2. Design and optimize

Step 3. Simulate

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

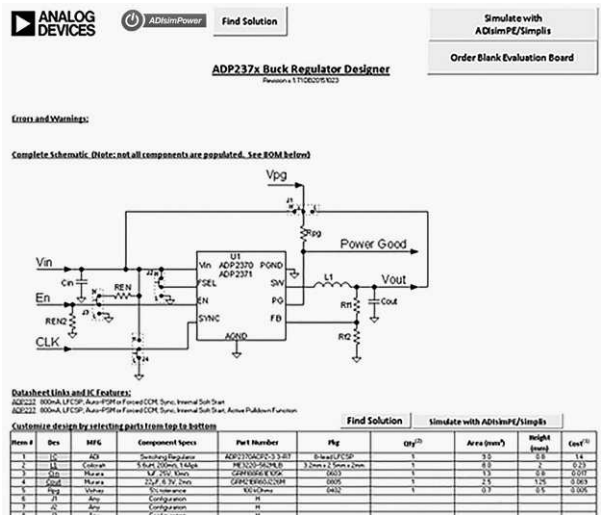
Each solution takes into consideration the IC, external components, and operating condition to be able to compare expected performance. For more infromation, visit *http://www.analog.com/adisimpower*.

Step 1



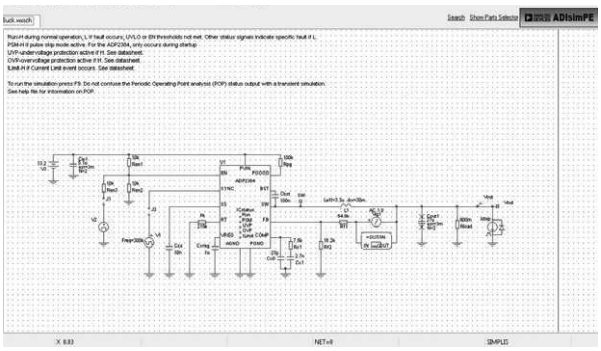
Smart Web selector.

Step 2

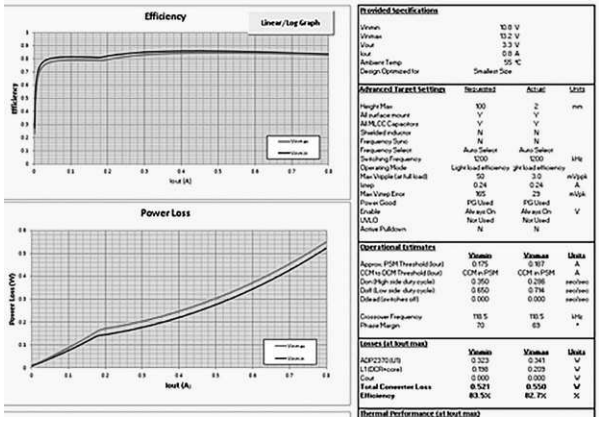


Design and optimize for size, cost, or efficiency.

Step 3



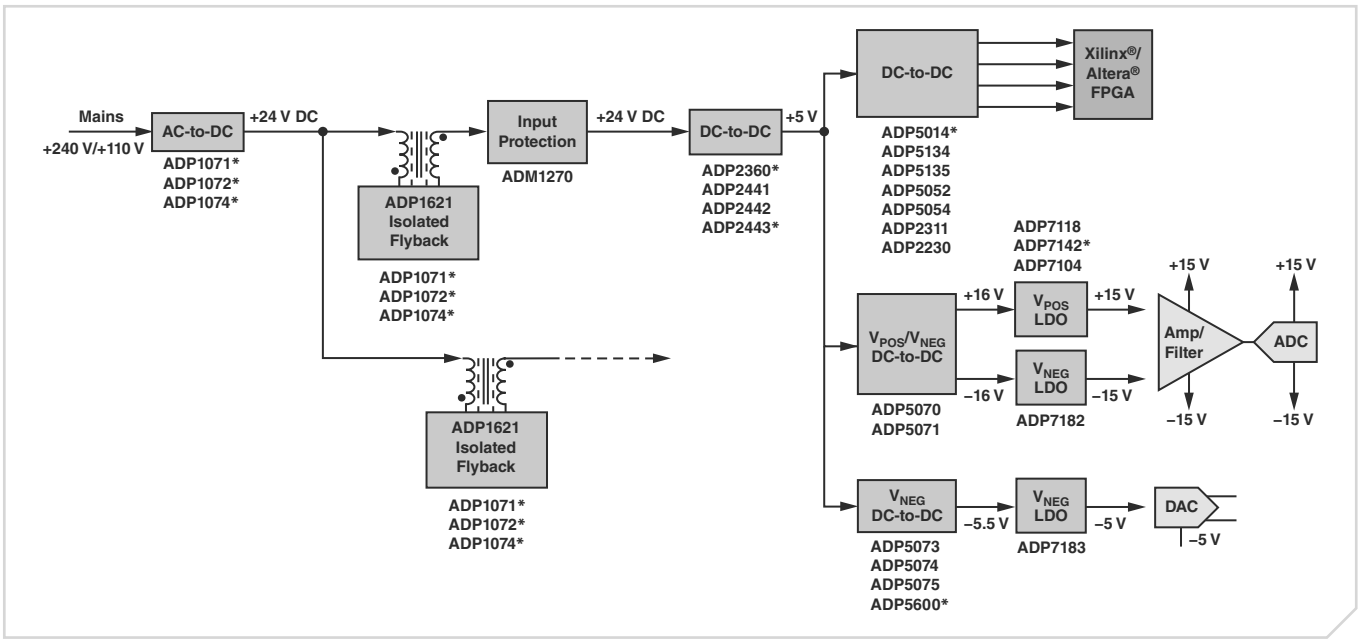
Simulation.



The design report includes BOM and thermals at operating conditions.

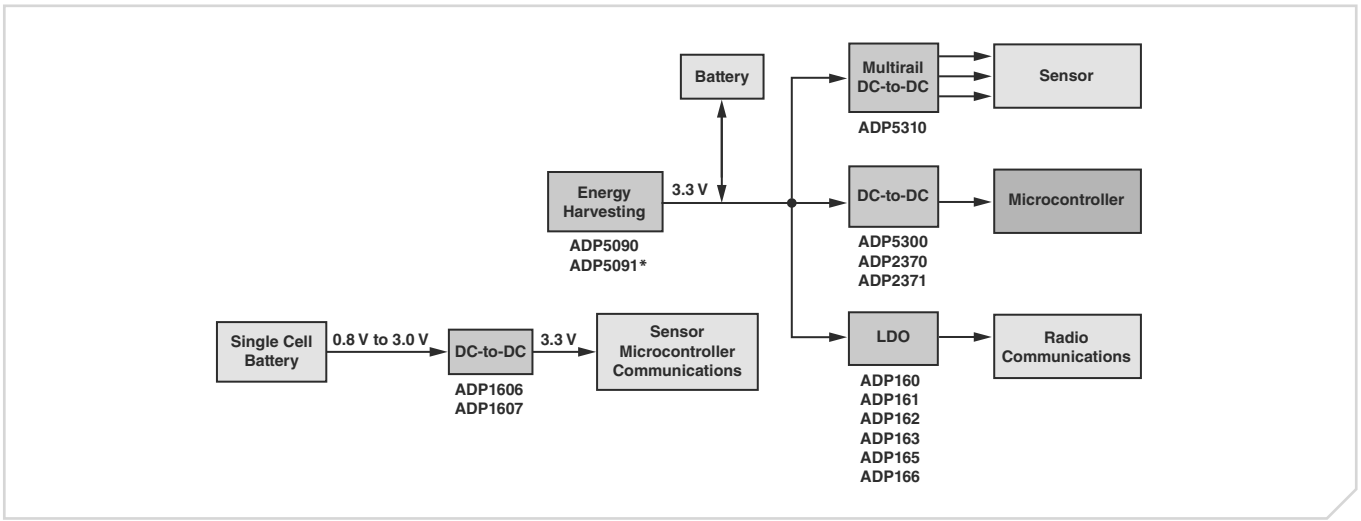
Industrial Applications Diagrams

Typical Block Diagram Showing an Isolated 24 V Power Chain for Industrial Applications



**New products.*

Typical Block Diagram for a Low Power, Battery-Operated System



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Analog Devices, Inc.
Worldwide Headquarters

Analog Devices, Inc.
One Technology Way
P.O. Box 9106
Norwood, MA 02062-9106
U.S.A.
Tel: 781.329.4700
(800.262.5643, U.S.A. only)
Fax: 781.461.3113

Analog Devices, Inc.
Europe Headquarters

Analog Devices, Inc.
Wilhelm-Wagenfeld-Str. 6
80807 Munich
Germany
Tel: 49.89.76903.0
Fax: 49.89.76903.157

Analog Devices, Inc.
Japan Headquarters

Analog Devices, KK
New Pier Takeshiba
South Tower Building
1-16-1 Kaigan, Minato-ku,
Tokyo, 105-6891
Japan
Tel: 813.5402.8200
Fax: 813.5402.1064

Analog Devices, Inc.
Asia Pacific Headquarters

Analog Devices
5F, Sandhill Plaza
2290 Zuchongzhi Road
Zhangjiang Hi-Tech Park
Pudong New District
Shanghai, China 201203
Tel: 86.21.2320.8000
Fax: 86.21.2320.8222

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