

New Products and Solutions

Spring 2020 Edition

Overview

Analog Devices is a leading global, high performance analog technology company dedicated to solving the toughest engineering challenges. We enable our customers to interpret the world around us by intelligently bridging the physical and digital with unmatched technologies that sense, measure, power, connect, and interpret. Our powerful suite of products and solutions adds value across the entire signal chain. In this Spring 2020 edition of the New Products and Solutions guide, you will find select new product innovations including isolation, power management, precision, RF and microwave, sensors and MEMS, and reference designs for use across a wide range of markets and applications. You can also stay up-to-date on the latest news from ADI by subscribing to one of our email newsletters.



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Products by Market

Large blue circles indicate the primary markets and the small blue circles indicate the secondary markets.

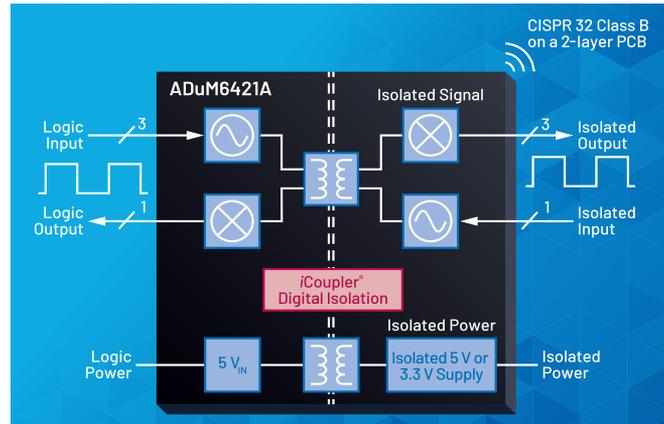
Product Category	Part Number	General-Purpose*	Aerospace and Defense	Automotive	Building and Infrastructure	Communications	Consumer	Energy	Healthcare	Industrial Automation	Instrumentation and Measurement
Isolation	ADuM6420A/ADuM6421A/ADuM6422A			●					●	●	●
Power	LT3040	●									●
	LT8365			●					●	●	●
	LT8652S/LT8653S	●				●				●	
Precision	ADT7422						●		●		●
RF and Microwave	ADMV4530		●			●					
Sensors and MEMS	ADIS16500/ADIS16505/ADIS16507		●							●	
Reference Design	CN-0435									●	
	CN-0510										●

*Intended for use in a broad range of markets.

Isolation

ADuM6420A/ADuM6421A/ADuM6422A: Quad-Channel Isolators with Integrated DC-to-DC Converter

These devices are quad-channel digital isolators with an isoPower[®], integrated, isolated dc-to-dc converter. Based on iCoupler[®] technology, the dc-to-dc converter provides regulated, isolated power that meets CISPR 32/EN 55032 Class B limits at a full load on a 2-layer printed circuit board (PCB) with ferrites. They eliminate the need for a separate, isolated dc-to-dc converter in 500 mW, isolated designs. The iCoupler chip scale transformer technology is used for isolated logic signals and for the magnetic components of the dc-to-dc converter. The result is a small form factor, total isolation solution.



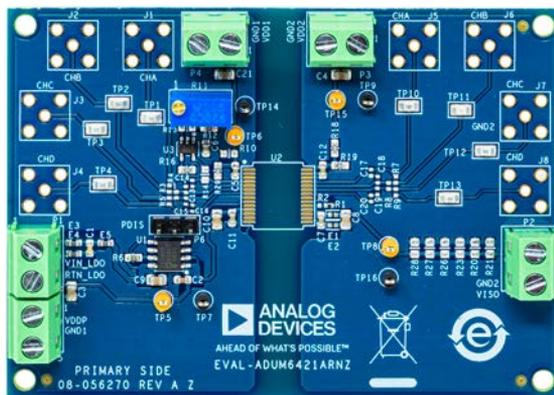
- ▶ **ADuM6420A:** 4:0 directionality
- ▶ **ADuM6421A:** 3:1 directionality
- ▶ **ADuM6422A:** 2:2 directionality

Features and Benefits

- ▶ Class B radiated emissions on a 2-layer PCB
- ▶ Four high speed data channels with high common-mode transient immunity (CMTI)
- ▶ Wide logic side input voltage range and high temperature operation of 125°C

Applications

- ▶ Automotive
- ▶ Industrial automation
- ▶ Instrumentation
- ▶ Healthcare



ADuM6421A evaluation board

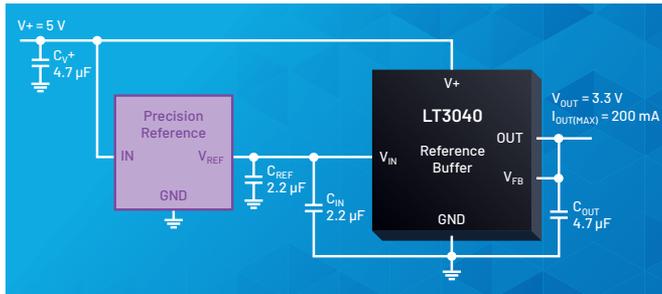


28-lead, fine pitch SOIC

Power

LT3040: 20 V, 200 mA, Ultralow Noise, Ultrahigh PSRR Precision DAC/Reference Buffer

The **LT3040** is a high performance, robust voltage output reference/DAC buffer that employs a unique architecture that seeks to maintain the precision and accuracy of the reference or DAC while sourcing up to 200 mA. It features ADI's ultralow noise and ultrahigh PSRR architecture for powering noise sensitive, high accuracy systems. Designed as an advanced voltage buffer for voltage output references/DACs, the LT3040 features extremely low 1/f noise, very low wideband noise, excellent PSRR over a wide frequency range and low dropout performance—a typical 350 mV dropout at 200 mA of source current.



Features and Benefits

- ▶ Excellent wideband noise filtering, ideal for postregulating high speed switching supplies
- ▶ Retains the noise performance of front-end, high precision references
- ▶ More headroom and higher efficiency

Applications

- ▶ Instrumentation: high precision voltage references or very low noise instrument
- ▶ General-purpose: powering or buffering high speed/high precision data converters



LT3040 evaluation board



12-lead MSOP

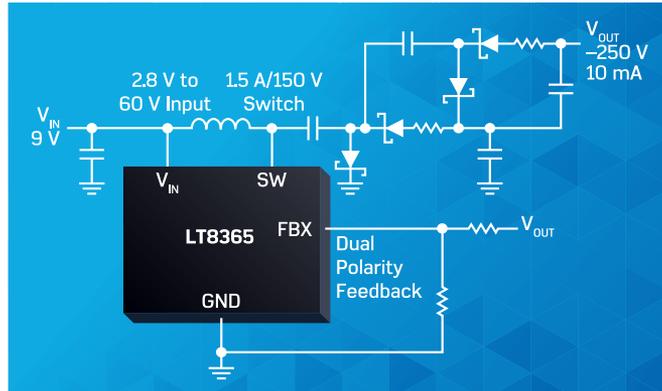


10-lead DFN

Power

LT8365: Low I_o Boost/SEPIC/Inverting Converter With 1.5 A, 150 V Switch

The **LT8365** is a current-mode dc-to-dc converter with a 1.5 A, 150 V switch operating from a 2.8 V to 60 V input. With a unique single feedback pin architecture, it is capable of boost, SEPIC, or inverting configurations. Burst Mode[®] operation consumes as low as 9 μ A quiescent current to maintain high efficiency at very low output currents, while keeping typical output ripple below 15 mV. An external compensation pin allows optimization of loop bandwidth over a wide range of input and output voltages and programmable switching frequencies between 100 kHz and 500 kHz. The LT8365 is available in a thermally enhanced 16-lead MSOP package with four pins removed for high voltage pin spacings.



Features and Benefits

- ▶ 150 V, 1.5 A internal switch delivers high boost, SEPIC, and inverted voltages
- ▶ Positive or negative output voltage programming with a single feedback pin minimizes the application circuit footprint and complexity
- ▶ Spread spectrum frequency modulation reduces EMI

Applications

- ▶ Automotive: ± 250 V APD bias supply for LIDAR
- ▶ Instrumentation: high voltage DAC or high voltage op amp bias supplies
- ▶ Healthcare: vascular imaging
- ▶ Industrial automation: laser bias and light analysis, laser monitors



LT8365 evaluation board

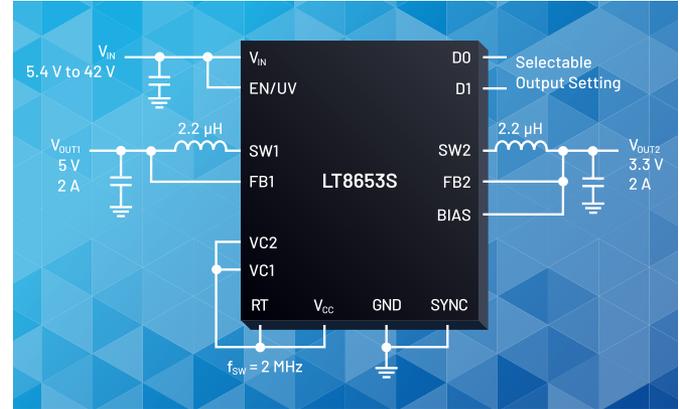
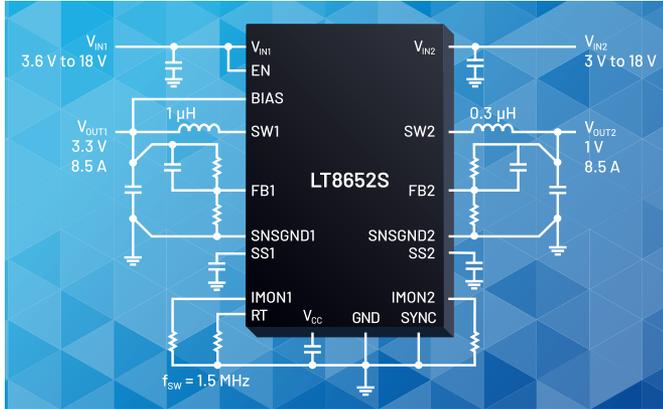


Thermally enhanced, 16-lead MSOP

Power

LT8652S/LT8653S: Dual-Channel, Synchronous Step-Down Silent Switcher² Devices

These devices feature the second generation Silent Switcher architecture to minimize EMI emissions while delivering high efficiency at high switching frequencies. This architecture includes integration of bypass capacitors to optimize high frequency current loops and make it easy to achieve advertised EMI performance by eliminating layout sensitivity. The fast, clean, low overshoot switching edges enable high efficiency operation even at high switching frequencies, which enables a wide control loop bandwidth for fast transient response.



▶ **LT8652S:** 8.5 A, 18 V, 16 μ A I_0

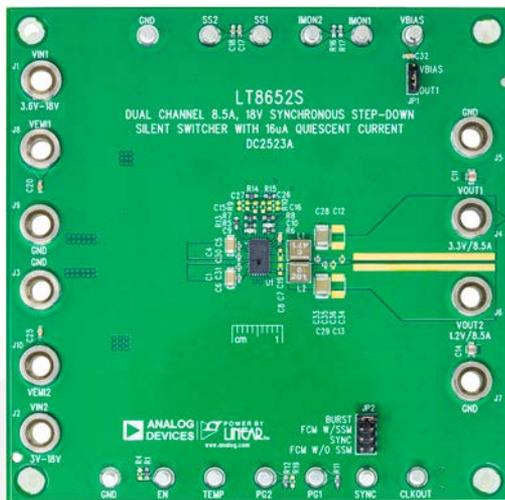
▶ **LT8653S:** 2 A, 42 V, 6.2 μ A I_0

Features and Benefits

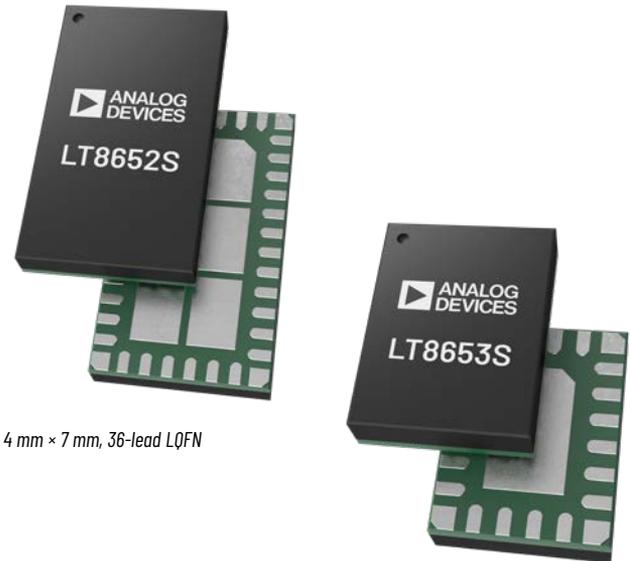
- ▶ Silent Switcher² architecture: internal bypass capacitors reduce radiated EMI
- ▶ Ultralow quiescent current Burst operation: high efficiency at light load and minimize low output ripple voltage (10 mV p-p)
- ▶ Small 4 mm \times 7 mm, 36-lead LQFN with dual 8.5 A output or 17 A combined (LT8652S)
- ▶ Small 4 mm \times 3 mm, 20-lead LQFN with dual 2 A output or 4 A combined (LT8653S)

Applications

- ▶ Communications: communication infrastructure applications
- ▶ General-purpose: point of load for server and core power
- ▶ Industrial automation: building and machine automation



LT8652S evaluation board



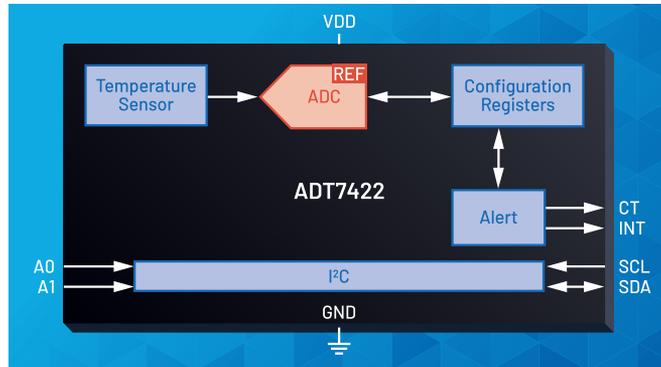
4 mm \times 7 mm, 36-lead LQFN

4 mm \times 3 mm, 20-lead LQFN

Precision

ADT7422: $\pm 0.1^\circ\text{C}$ Accuracy, 16-Bit, Digital $I^2\text{C}$ Temperature Sensor

The **ADT7422** contains an internal band gap reference, a temperature sensor, and a precision analog-to-digital converter (ADC). The device provides a 16-bit temperature result with a resolution of 0.0078°C and an accuracy of up to $\pm 0.1^\circ\text{C}$ across the temperature range of 25°C to 50°C without the need for calibration after the PCB soldering process. Operating at 3.0 V, the average supply current is typically $210\ \mu\text{A}$. The ADT7422 has a shutdown mode that powers down the device and offers a shutdown current of typically $2.0\ \mu\text{A}$ at 3.0 V.



Features and Benefits

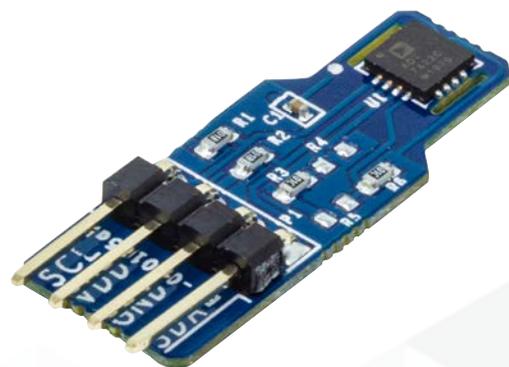
- ▶ 0.1°C accuracy specification enables end product to measure temperature with accuracy that was only possible for thermistors and RTDs
- ▶ Doesn't require external circuitry: smaller, lower power, and lower cost than older sensing technologies
- ▶ Fully tested and calibrated solution: doesn't require system calibration to achieve desired 0.1°C measurement precision

Applications

- ▶ Healthcare: vital signs monitoring, glucose meters, incubators
- ▶ Consumer: vital signs monitoring
- ▶ Instrumentation: CJC, cold junction compensation for thermocouples, temperature control of cooling systems or industrial ovens, environmental sensing, water quality measurements



4 mm × 4 mm, 16-lead LFCSP

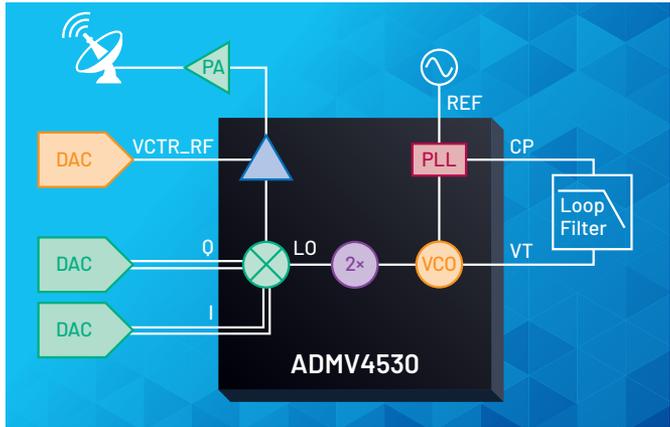


ADT7422 evaluation board

RF and Microwave

ADMV4530: Dual-Mode, Ka-Band Upconverter with Integrated Fractional-N PLL and VCO

The **ADMV4530** is a highly integrated upconverter with an in phase/quadrature (I/Q) mixer. An integrated low phase noise, fractional-N phase-locked loop (PLL) with a voltage controlled oscillator (VCO) and internal 2× multiplier generate the necessary on-chip local oscillator (LO) signal for the I/Q mixer, eliminating the need for external frequency synthesis. The VCO uses an internal autocalibration routine that allows the PLL to select the necessary settings and locks in approximately 100 μs. The single-ended reference input to the PLL operates up to 500 MHz and features internal reference dividers and a multiplier for added flexibility.



Features and Benefits

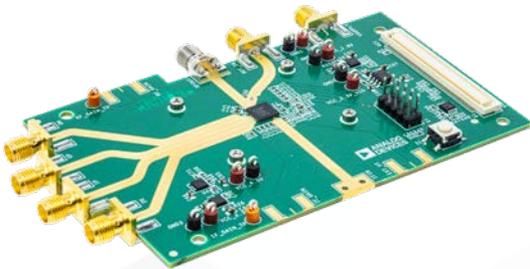
- ▶ High performance integrated fractional-N PLL gives excellent EVM
- ▶ Supports both IF mode and I/Q mode
- ▶ High output power eliminates the need of an external driver amplifier

Applications

- ▶ Satellite communications: commercial, aerospace and defense VSAT
- ▶ Point-to-point microwave communication



6 mm × 6 mm, 40-terminal LGA



ADMV4530IQ evaluation board

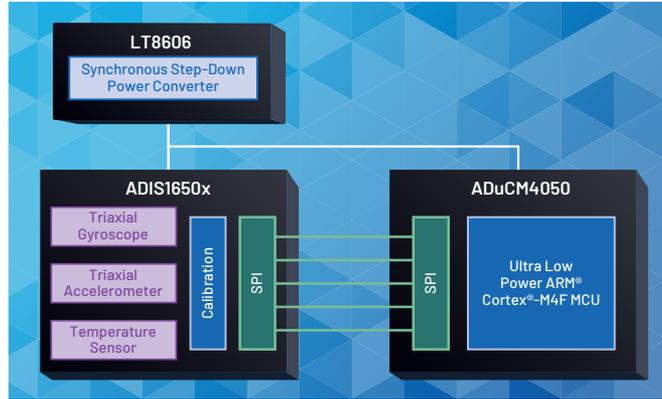


ADMV4530IF evaluation board

Sensors and MEMS

ADIS16500/ADIS16505/ADIS16507: Family of Precision, Miniature MEMS IMUs

The ADIS1650x are precision, miniature microelectromechanical system (MEMS) inertial measurement units (IMUs) that include a triaxial gyroscope and a triaxial accelerometer. Each inertial sensor in the ADIS1650x family combines with signal conditioning that optimizes dynamic performance. The factory calibration characterizes each sensor for sensitivity, bias, alignment, linear acceleration (gyroscope bias), and point of percussion (accelerometer location). As a result, each sensor has dynamic compensation formulas that provide accurate sensor measurements over a broad set of conditions.



- ▶ **ADIS16500:** cost-optimized, $\pm 40\text{ g}$, $\pm 2000\text{ DPS}$
- ▶ **ADIS16505:** $\pm 8\text{ g}$, three DPS options
- ▶ **ADIS16507:** $\pm 40\text{ g}$, three DPS options

Features and Benefits

- ▶ Fully calibrated bias, sensitivity, and alignment over industrial temperature range simplify customer integration, calibration, and inertial frame alignment
- ▶ Excellent vibration rejection in z-axis gyroscope: vibration-proof primary steering axis in ground-based autonomous vehicles
- ▶ 63% reduction in headroom requirement for customer system boards at height of 5.6 mm

Applications

- ▶ Aerospace and defense
- ▶ Industrial automation: autonomous vehicles, drones, robots, guidance, navigation, control, GNC, stabilization



15 mm × 15 mm × 5 mm BGA



ADIS16507 evaluation board

Reference Designs

CN-0435: Analog I/O System with HART and Modbus Connectivity

This solution demonstrates a PLC/DCS system controlled by Modbus, an open industrial protocol, that enables rapid development. Analog inputs and outputs support common analog industrial ranges (0 V to 10 V, ± 10 V, 4 mA to 20 mA). Each node can control or measure up to 16 analog field devices, sensors, or actuators, with either HART-compatible or analog-only interfaces. Channels are group isolated for safety, noise immunity, and robustness, while enabling scalable and customizable PLC/DCS system requirements for your application.



▶ PLC/DCS Systems

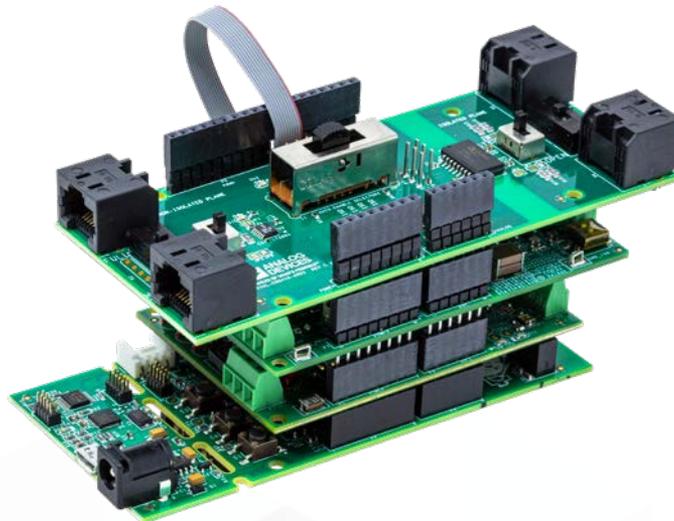
▶ PLC/DCS Systems

Features and Benefits

- ▶ PLC/DCS prototyping system, complete with open-source software stack
- ▶ Each node supports up to 16 channels of input or output sensors/actuators
- ▶ Open wire detection and HART compatible for diagnostics and error checking

Applications

- ▶ Industrial automation, factory automation—PLC/DCS systems



CN-0435 reference design boards

Reference Designs

CN-0510: Electrochemical Impedance Spectroscopy (EIS) for Batteries

This is an EIS measurement system for characterizing lithium ion (Li-Ion) and other types of batteries. EIS is a safe perturbation technique used to examine processes occurring inside electrochemical systems. The system measures the impedance of a battery cell over a range of frequencies. The data, once analyzed and paired with a proper algorithm, can be used to determine the state of health and state of charge of a battery.



▶ Electric Vehicles

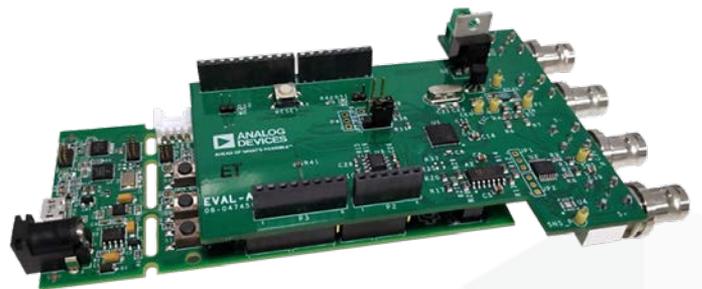
▶ Instrumentation/Alternative Energy

Features and Benefits

- ▶ Measures the impedance of battery cell from mHz to kHz
- ▶ Arduino shield compatible

Applications

- ▶ Instrumentation, test equipment—battery testing



CN-0510 reference design board

Additional New Products

Product Category	Part Number	Description
ADC	AD7387 (14-bit)/AD7388 (12-bit)	4-channel, 4 MSPS, dual, simultaneous sampling SAR ADC
	ADE1201 (single)/ADE1202 (dual)	Channel, configurable, isolated digital input
Amplifier	ADCA3992	45 MHz to 1218 MHz, CATV power doubler hybrid
	ADL6316	500 MHz to 1000 MHz transmit VGA for use with RF DACs and transceivers
	LTC6226 (single)/LTC6227 (dual)	1 nV/√Hz 420 MHz GBW, 180 V/μs, low distortion rail-to-rail output op amp
Analog Functions	LT5401	Matched resistor network for precision amplifiers
DAC	AD5600	High temperature, 16-bit, unbuffered voltage output DAC, SPI interface
Interface and Isolation	ADP1032	2-channel, isolated micropower management unit with seven digital isolators
Power Management	LT3093 (200 mA)/LT3094 (500 mA)	-20 V, ultralow noise, ultrahigh PSRR negative linear regulator
	LT8491	High voltage buck-boost battery charge controller with MPPT and I ² C
	LTC2949	Current, voltage, and charge monitor for high voltage battery packs
	LTC7818	40 V, low I _Q , 3 MHz, triple output buck/buck/boost synchronous controller
	LT8648S	42 V, 15 A synchronous step-down Silent Switcher 2 device
RF and Microwave	ADTR107	6 GHz to 18 GHz, front-end IC
Sensors and MEMS	ADCMXL1021-1	Wide bandwidth, low noise, vibration sensor
	ADXL317	3-axis, ±16 g, I ² S digital accelerometer

Design Resources

EngineerZone® Online Support Community

Engage with the Analog Devices technology experts in our online support community. Ask your toughest design questions, browse our rich knowledge base, or read about new technologies in one of our blogs.

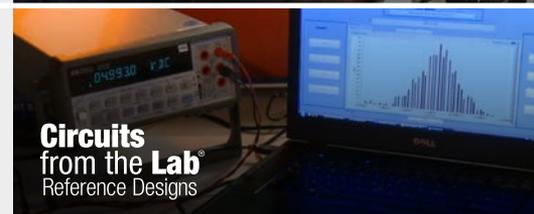
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Circuits from the Lab Reference Designs

Circuits from the Lab® reference designs are built and tested by ADI engineers with comprehensive documentation and factory-tested hardware.

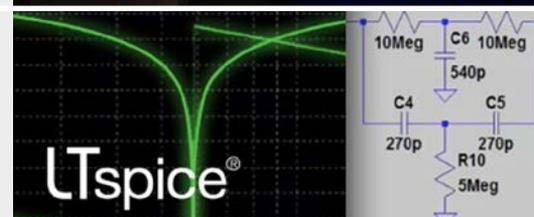
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