ANALOG DEVICES
AHEAD OF WHAT'S POSSIBLE™

Product manual

Overview

Our powerful suite of products and solutions adds value across the entire signal chain. In this Summer 2022 edition of the New Products and Solutions guide, you will find select new product innovations including analog-to-digital converters, a digital-to-analog converter, industrial Ethernet, interface and isolation, power, a precision signal chain platform, RF and microwave, security, sensors and MEMS, and voltage references for use across a wide range of markets and applications.

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Contents

Products by Market

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

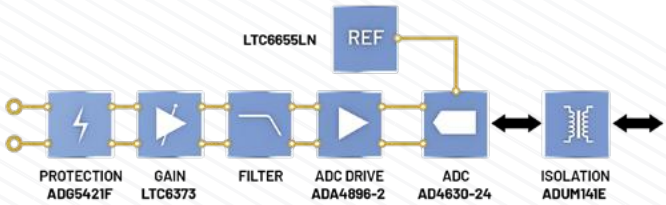
Product Category	Part Number	General-Purpose	ADEF	Automotive	Building and Infrastructure	Comms	Consumer	Energy	Healthcare	Industrial Automation	Instrumentation and Measurement
ADC	AD4134		•					•		•	●
	AD4630-24	•	•		•				•	•	●
	CN0552									•	●
DAC	AD3552R family									•	●
Industrial Ethernet	ADIN2111				●					•	
Interface and Isolation	ADN4680E	•				●		•		•	•
Power	LT4200					●		•		•	•
	LT8722				•	•			•		●
	LTM4658	●	•			•			•	•	•
	LTM4670	●	•			•			•	•	•
	LTM4705	●				•			•	•	•
	MAX16163				•		•		●		•
	MAX16191			●							
	MAX16712	●				•					
	MAX20406			●		•			•	•	
	MAX22200						•		•	●	•
	MAX38912						•		●		•
	MAX77540				•	•	●		•	•	
Precision: Signal Chain Platform	Precision narrow bandwidth signal chain	•	•					•	•	•	●
RF and Microwave	ADMV4540		•			●					
	ADMV8526	•	●			•					•
	CN0534	•				●			•		•
	HMC1126	•	•			•					●
Security	DS28E30						●		•	•	
Sensors and MEMS	MAX30207						•		●		•
	MAX3188								•	●	•
Voltage Reference	ADR1399	•				•			•	•	●

Precision Narrow Bandwidth Signal Chain Platform

By delivering a more complete, optimized signal chain starting point for precision narrow bandwidth needs, this platform offers customized signal chain "flavors" depending on specific application priorities such as stability, noise, power, or density. Along with design-in support, there is no longer a need to sacrifice specific customization needs for the time-to-market benefits of a platform.

Features and Benefits

- Measures DC and low frequency signals providing best-in-class accuracy, stability, and repeatability
- Accelerates development cycles by matching the specific design challenge to configurable signal chain
- ADI domain expertise and design-in support reduces complexity, enabling faster time to market



Parts in Signal Chain

- Switch/Protection: ADG5421F
- Gain: LTC6373
- ADC Driver: ADA4896-2
- Reference: LTC6655LN
- ADC: AD4630-24
- Isolation: ADuM141E

Applications

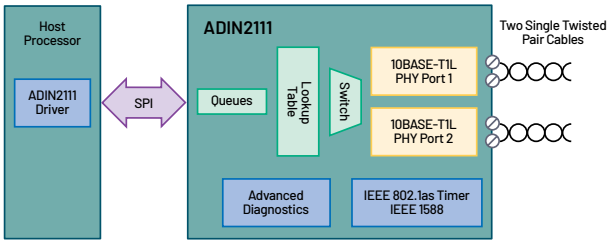
- Instrumentation and Measurement
- Industrial Automation
- Aerospace and Defense
- Energy
- Healthcare
- General-Purpose

Learn more about precision narrow bandwidth signal chain solutions at analog.com/PrecisionNarrowBandwidth

Industrial Ethernet

ADIN2111: Low Complexity, 2-Port Ethernet Switch with Integrated 10BASE-T1L PHYs

ADIN2111 adds Ethernet connectivity to every node in a building using long reach 10BASE-T1L technology, harmonizing the building network with Ethernet to simplify network management. ADIN2111 supports low power edge node designs and interfaces to a wide variety of host controllers via SPI. Coming complete with a suite of diagnostic features it enables real time fault detection and fault location identification with 2% accuracy over 1 km of cables, reducing system downtime and commissioning time. It enables networks of sensors, actuators, controllers, and fire panels to be connected in a line and ring topology while utilizing existing deployed single, twisted pair cabling infrastructure.



Features and Benefits

- 2-port low complexity switch for low power and resource constrained edge devices
- Low power consumption at 77 mW with SPI interface to simplify host processor connectivity
- Included diagnostics suite: monitors link quality in real time and detects faults to reduce system downtime

Applications

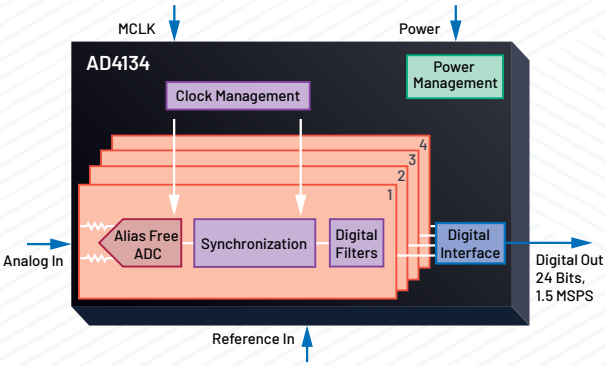
- Building and Infrastructure
- Industrial Automation

Analog-to-Digial Converters

AD4134: 24-Bit, 4-Channel Simultaneous Sampling 1.5 MSPS Precision Alias Free ADC

The AD4134 is a quad-channel, low noise, simultaneous sampling, precision analog-to-digital converter (ADC) that delivers on functionality, performance, and ease of use. It's easy to drive due to its resistive input structure, which eliminates the need for external high speed amplifiers to drive the analog inputs. AD4134's inherent antialiasing filter also eliminates the need for external second-order antialias filter preceding the ADC input. An integrated asynchronous sample rate converter simplifies the handshake between the system clock and modulator clock without limiting interface maximum throughput.

This product is a direct upgrade from the AD7134 because of the expanded temperature range, which is ideal for industrial applications. AD7134 is now marked as 'Not Recommended' for new designs.



Features and Benefits

- Expanded operating temperature range of –40°C to +105°C
- Inherent antialias rejection high performance mode 102.5 dB
- No ADC driver or reference buffer needed with its resistive signal and reference inputs

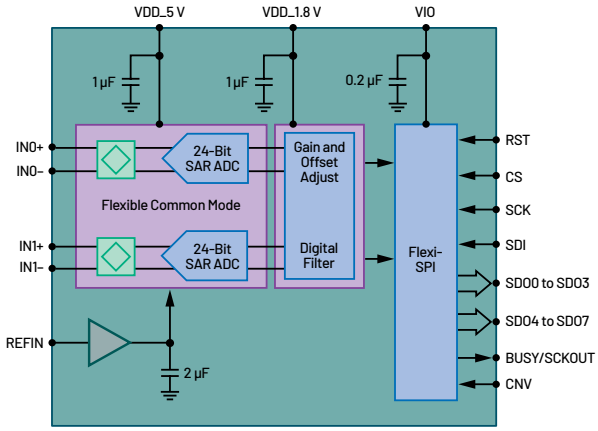
Applications

- Instrumentation and Measurement
- Industrial Automation
- Aerospace and Defense
- Energy

Analog-to-Digital Converters (Continued)

AD4630-24: 24-Bit, 2 MSPS, Dual-Channel SAR ADC

The AD4630-24 is a two-channel, simultaneous sampling, EasyDrive™, 2 MSPS successive approximation register (SAR) analog-to-digital converter. With a guaranteed maximum ±0.9 ppm INL and no missing codes at 24 bits, the AD4630-24 achieves unparalleled precision from −40°C to +125°C.



Features and Benefits

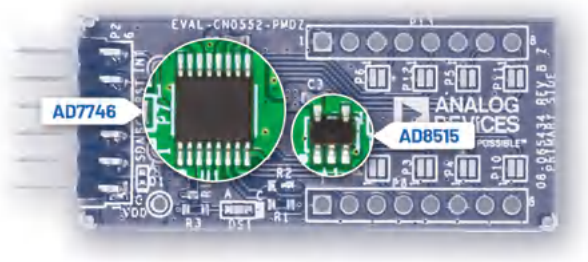
- Linearity is guaranteed at ±0.9 ppm
- EasyDrive inputs improve compatibility with companion circuitry
- Flexi-SPI interface relaxes user interface timing requirements without compromising performance

Applications

- Instrumentation and Measurement
- Industrial Automation
- Healthcare
- General-Purpose
- Aerospace and Defense
- Building and Infrastructure

CN0552 Reference Design: Capacitance-to-Digital Converter with Extended Range

The CN0552 reference design is a 24-bit capacitance-to-digital converter (CDC) with a default full-scale input range of ±4.096 pF and extended input range of ±50 pF. The solution's I²C serial communication interface provides a high resolution, high linearity, and high accuracy capacitance measurement.



Features and Benefits

- Extended input range of ±50 pF suits a wide array of sensors
- Compatible with I²C pmod-compatible platform boards, with an I/O voltage from 2.7 V to 5.5 V

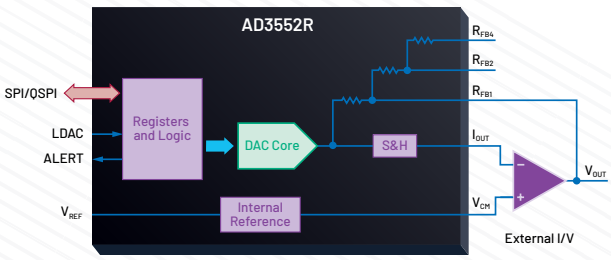
Applications

- Instrumentation and Measurement
- Industrial Automation

Digital-to-Analog Converter

AD3552R Family: 16-Bit, 30 MUPS/20 MUPS, Multispan Output, Multi-IO SPI DAC

AD3552R (and family) is a low drift ultrafast, 16-bit accuracy, current output digital-to-analog converter (DAC) designed to generate multiple output voltage span ranges. It combines high precision performance with reduced latency, reduced settling time, and faster updates. This allows applications to increase their control loop bandwidth, use less system time for control applications, or run more complex algorithms and create faster more precise stimulus signals.



Features and Benefits

- Combines high precision performance (12-/16-bit) with reduced latency
- Waveform generation with improved THD
- Fast process control loops for ATE and instrumentation applications

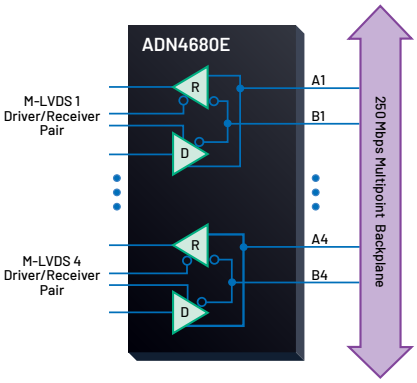
Applications

- Instrumentation and Measurement
- Industrial Automation

Interface and Isolation

ADN4680E: 250 Mbps, Half-Duplex, Quad M-LVDS Transceiver

Providing four M-LVDS (multipoint low voltage differential signaling) transceivers (driver and receiver pairs) at 250 Mbps in a tiny 7 mm × 7 mm LFCSP footprint, the ADN4680E allows for operation at an extended industrial temperature of 105°C with low dynamic power consumption. The low latency, skew, and jitter performance, along with system-level ESD protection and hot swap, enable robust and flexible backplane and cable multipoint data transmission systems, all with ADI's trusted safety and data integrity.



Features and Benefits

- Operation at extended industrial temperature of 105°C
- Provides optimum signal integrity for a multipoint clock or data network at 250 Mbps
- Robust Level 4 IEC ESD protection on the I/O pins

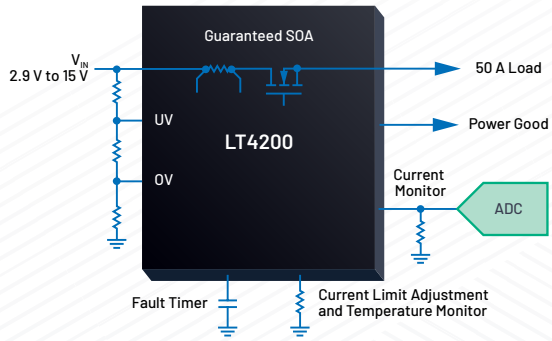
Applications

- Communications
- Industrial Automation
- Instrumentation and Measurement
- Energy
- General-Purpose

Power

LT4200: 50 A Hot Swap E-Fuse with Guaranteed SOA

The LT4200 is an integrated solution for hot swap applications that allows a board to be safely inserted and removed from a live backplane. The part integrates a hot swap controller, power MOSFET, and current sense resistor into a single package for small form factor applications. The MOSFET safe operating area is production tested and guaranteed for the stresses in hot swap applications.

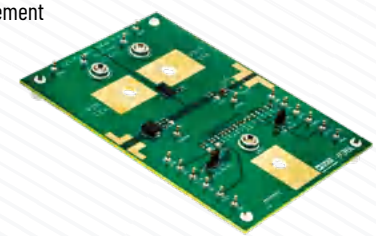


Features and Benefits

- Guarantees protection and reliability during hot swap stresses
- 28 V voltage rating on supply pin for transients beyond 15 V max operating voltage

Applications

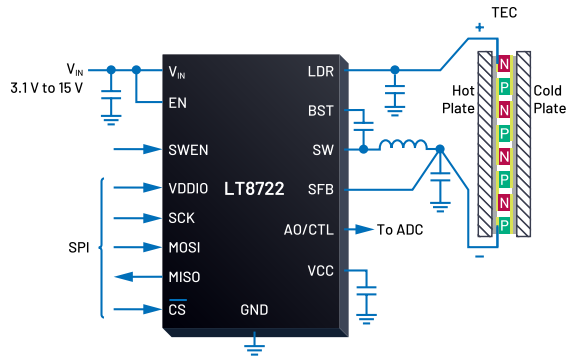
- Communications
- Instrumentation and Measurement
- Industrial Automation
- Energy



Power (Continued)

LT8722: Ultracompact 4 A, 15 V, Full-Bridge Driver with SPI

LT8722 is a high performance, high efficiency, monolithic full bridge DC-to-DC converter. One side of the full bridge is driven by a pulse-width modulation (PWM) buck power stage, while the other side of the full bridge is driven by a linear power stage. The LT8722 can deliver up to 54 W of power to meet the needs of the latest thermoelectric coolers (TEC). An integrated 25-bit digital-to-analog converter (DAC) is used to control the output voltage and minimize temperature variation. Furthermore, Silent Switcher® techniques are used to minimize EMI/EMC emissions while delivering high efficiency at high switching frequencies.



Features and Benefits

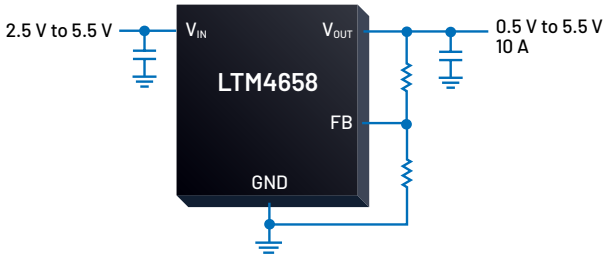
- Integrated 25-bit DAC for accurate output voltage control
- Silent Switcher technology minimizes EMI emissions
- Smallest TEC driver, 3 mm × 3 mm LQFN

Applications

- Instrumentation and Measurement
- Communication
- Building and Infrastructure
- Healthcare

LTM4658: Low V_{IN}, High Efficiency 10 A Step-Down µModule Regulator

LTM4658 provides a 10 A output current with an integrated inductor in a tiny 4 mm × 4 mm package. It has excellent efficiency of 95% at 5 V_{IN} to 3.3 V_{OUT}.



Features and Benefits

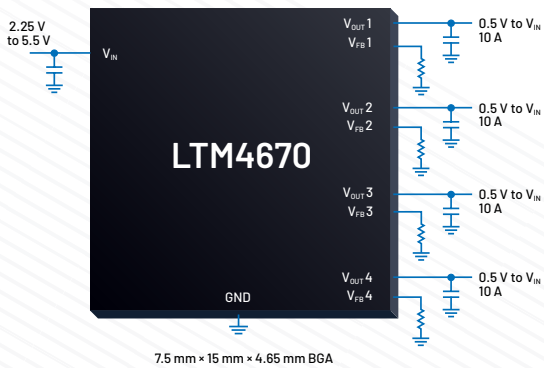
- 95% efficiency at 5 V_{IN} to 3.3 V_{OUT}
- 85% efficiency at 3.3 V_{IN} to 1 V_{OUT}
- Tiny 4 mm × 4 mm packaging for space constrained applications

Applications

- General-Purpose
- Aerospace and Defense
- Communications
- Healthcare
- Industrial Automation
- Instrumentation and Measurement

LTM4670: Low V_{IN}, Quad µModule Regulator with Configurable 10 A Output Array

The LTM4670 has a quad output array configurable as single, dual, triple, or quad output, and can support multiple power rails to simplify the power supply design. It can also support a wide range of current requirements in a compact package size.



Features and Benefits

- Supports up to 40 A currents, or 10 A output current per channel
- Small 7.5 mm × 15 mm BGA package

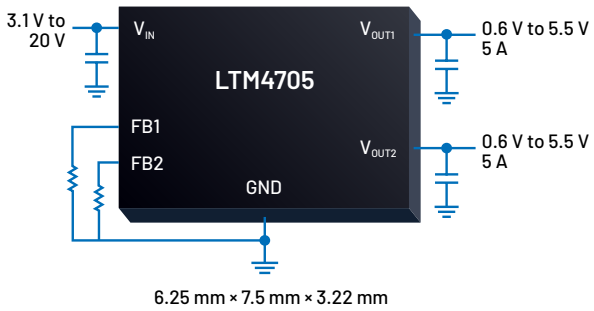
Applications

- General-Purpose
- Aerospace and Defense
- Communications
- Healthcare
- Industrial Automation
- Instrumentation and Measurement

Power (Continued)

LTM4705: 20 V_{IN}, Dual 5 A or Single 10 A, Step-Down DC-to-DC µModule Regulator

The LTM4705 is a complete dual 5 A step-down switching mode µModule regulator in a tiny 6.25 mm × 7.5 mm × 3.22 mm BGA package. Included in the package are the switching controller, power MOSFETs, inductor, and support components. Operating over an input voltage range of 3.1 V to 20 V, the LTM4705 supports an output voltage range of 0.6 V to 5.5 V, set by a single external resistor. Its high efficiency design delivers dual 5 A continuous output current. Only a few ceramic input and output capacitors are needed.



Features and Benefits

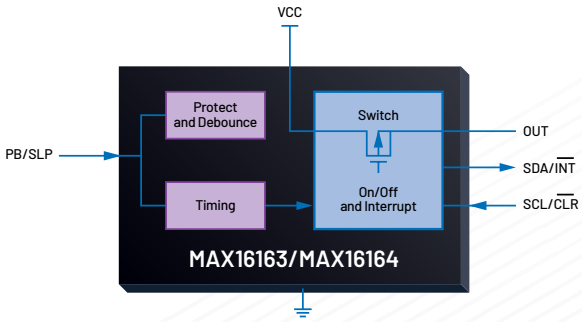
- Tiny 6.25 mm × 7.5 mm package for small area applications
- Configurable dual 5 A or single 10 A supports multiple power rails in a single device
- Wide V_{IN} and V_{OUT} range supports low voltage rails and system bus voltages

Applications

- General-Purpose
- Communications
- Healthcare
- Industrial Automation
- Instrumentation and Measurement

MAX16163: nanoPower On/Off Controller with Programmable Sleep Time

The MAX16163 shuts off battery connection, reducing system current to a minimum. The integrated dynamic sleep timer wakes up the system when appropriate.



Features and Benefits

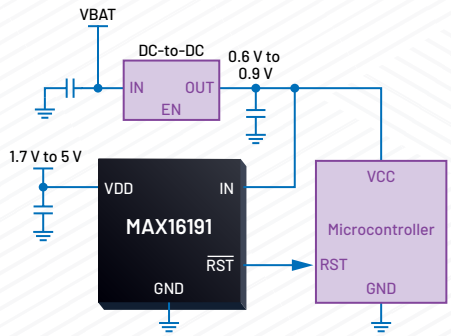
- Extends battery life up to 60%
- Consumes only 30 nA in timer mode and 10 nA in shutdown mode

Applications

- Healthcare
- Instrumentation and Measurement
- Buildings and Infrastructure
- Consumer

MAX16191: Ultrahigh, 0.35% Accuracy Supervisory Circuit

With ±0.35% accuracy over temperature, the MAX16191 window voltage monitor can be used with all ADAS SoCs requiring only a few mVs margin around the recommended core rail voltage for proper operation in all conditions of temperature.



Features and Benefits

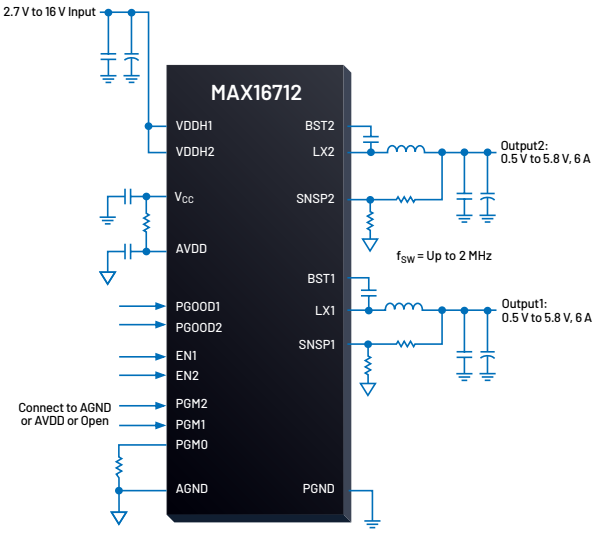
- ±0.35% accuracy over temperature
- Meets tight core rails voltage requirements
- Small 2 mm × 2 mm package

Applications

- Automotive

MAX16712: Dual-Output, 6 A, 2 MHz, 2.7 V to 16 V Step-Down Switching Regulator

The MAX16712 is a dual output, fully integrated, highly efficient, step-down DC-to-DC switching regulator that provides a compact solution with high efficiency and BOM savings. This device integrates multiple protections including positive and negative overcurrent protection, output overvoltage protection, and overtemperature protection to ensure a robust design. The switching frequency of the device can be configured from 500 kHz to 2.0 MHz and provides the capability of optimizing the design in terms of solution size and performance.



Features and Benefits

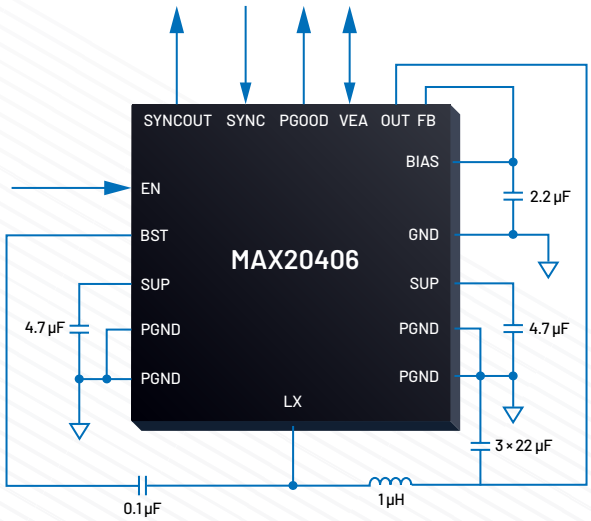
- Design flexibility due to single or dual output design
- Integrated overcurrent and overvoltage protection
- Wide operating input voltage range from 2.7 V to 16 V

Applications

- General-Purpose
- Communicaations

MAX20406: Automotive, 36 V, 4 A/5 A/6 A Fully Integrated Synchronous Buck Converter

MAX20406 is the industry's smallest 42 V_{IN} high efficiency, high power 6 A buck converter. It is capable of 2 MHz operation due to its 33 ns on-time to ensure it stays in 2 MHz operation even during input voltage transients to keep the solution size small and enable low EMI. The quiescent current is only 10 µA to preserve the battery life of always-on automotive systems



Features and Benefits

- 3 V to 42 V operating V_{IN} range
- Symmetrical pinout and 2.1 MHz operation with spread spectrum reduces EMI
- 10 µA quiescent current to preserve battery life

Applications

- Automotive
- Industrial Automation
- Communications
- Healthcare

MAX22200: 36 V, 1 A Octal Integrated Serial-Controlled Solenoid and Motor Driver

The MAX22200 has eight independently controlled half bridges while saving power in the system design due to the programmable current and drive settings. It also has integrated current resistors that eliminates the need for bulky external power resistors to save space.

Features and Benefits

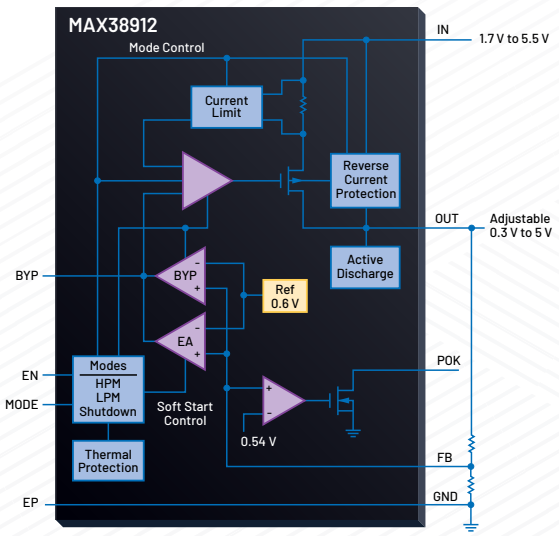
- Eight channels independently controlled creating >50% power savings
- Integrated lossless current sensing for space savings

Applications

- Industrial Automation
- Healthcare
- Consumer
- Instrumentation and Measurement

MAX38912: 11 µV RMS Low Noise, 500 mA LDO Linear Regulator with Low Power Mode

MAX38912 is a high performance LDO regulator with low power mode, low noise, high PSRR, and low dropout voltage. It has a wide input and output voltage range to support multiple types of batteries and a broad range of applications. For battery operated devices, the low power mode can be used when the device is idle, consuming only 19.2 µA quiescent current and sourcing up to 20 mA.

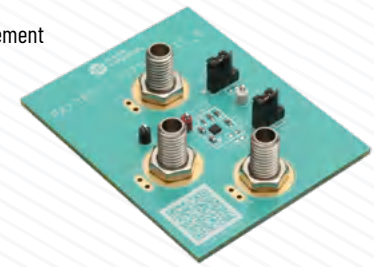


Features and Benefits

- Consumes only 19.2 µA quiescent current when sourcing up to 20 mA in low power mode
- Wide input and adjustable output voltage range
- Reduces noise and improves accuracy

Applications

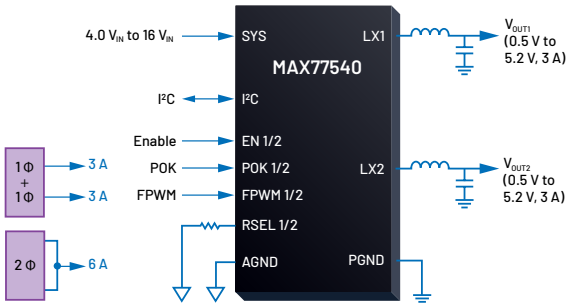
- Healthcare
- Instrumentation and Measurement
- Consumer



Power (Continued)

MAX77540: 16 V_{IN}/6 A, Dual-Phase High-Efficiency Buck Converter

MAX77540 is a high efficiency step-down converter with two 3 A switching phases. It uses an adaptive COT (constant on-time) current-mode control architecture and the two 3 A switching phases can be configured as either one (2 Φ, 6 A) or two (1 Φ, 3 A each) outputs. Its wide input voltage range enables a direct conversion for sub-1 V outputs from 3-cell Li+ batteries, USB PD, and 12 V_{DC} supply rails. The output voltages are preset with resistors and are further adjustable through an I²C-compatible interface. With 94% peak efficiency, low quiescent current, and compact solution size, the MAX77540 is ideal for battery-powered, space-constraint equipment.



Features and Benefits

- Single stage conversion, 4 V to 16 V input voltage
- 94% peak efficiency
- High power density in small 55 mm² solution size

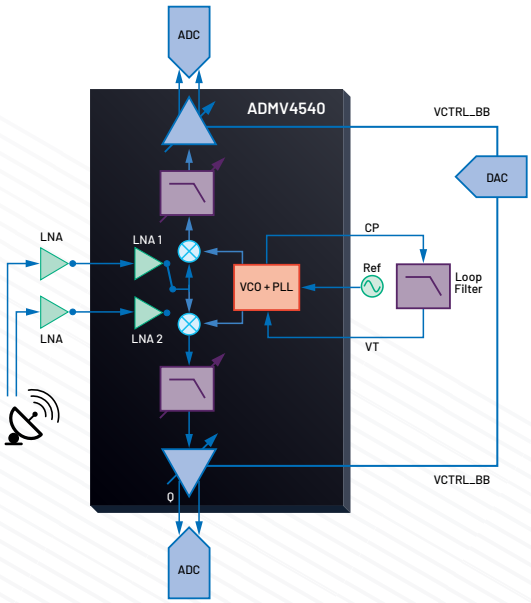
Applications

- Consumer
- Industrial Automation
- Communications
- Building and Infrastructure
- Healthcare

RF and Microwave

ADMV4540: K Band Quadrature Demodulator with Integrated Fractional-N PLL and VCO

The ADMV4540 is a single-chip, cost-effective IC solution with an integrated synthesizer with VCO, downconverter, filtering baseband amplifiers and LNA. It comes with SPI control functionalities to help shrink the overall system's form factor.

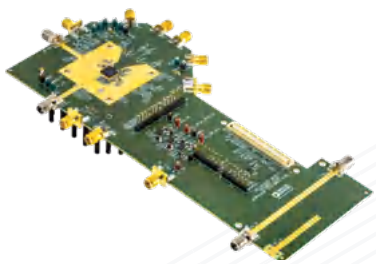


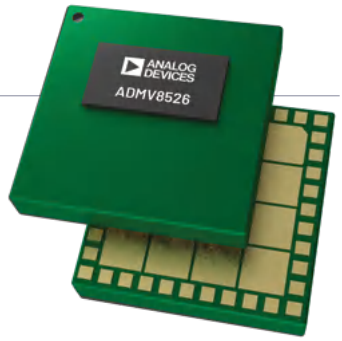
Features and Benefits

- Integrated baseband filtering supports direct-conversion architecture
- Simplifies interface with ADC
- Dual K band RF input provides polarization diversity in newer satellite terminal design

Applications

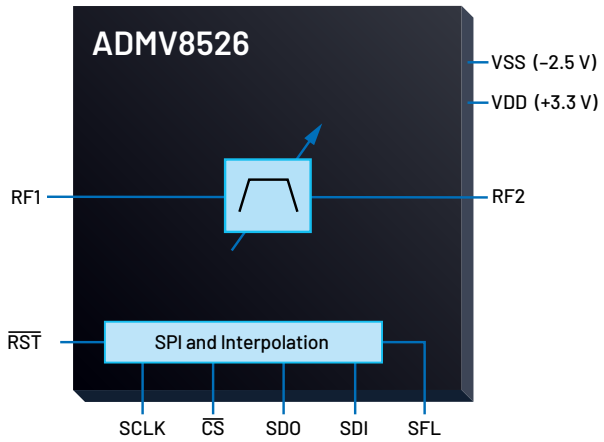
- Communications
- Aerospace and Defense





ADMV8526: 1.25 GHz to 2.6 GHz Digitally Tunable Band-Pass Filter

ADMV8526 is a single tunable filter IC with both center frequencies and passband bandwidth that can be configured through simple SPI command on-the-fly in the system. Its compact form factor and flexible tunability simplifies system design and reduces engineering development time. ADMV8526 provides the benefits of low SWaP-C in various applications.

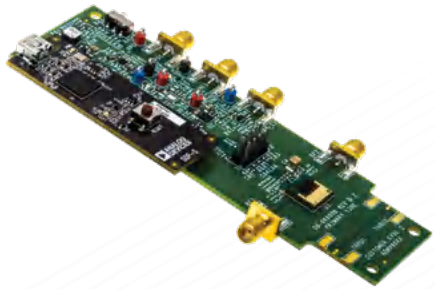


Features and Benefits

- Single-chip tunable band-pass filter replacement for discrete solution
- Enables low SWaP-C solution
- Low insertion loss for RF front-end applications

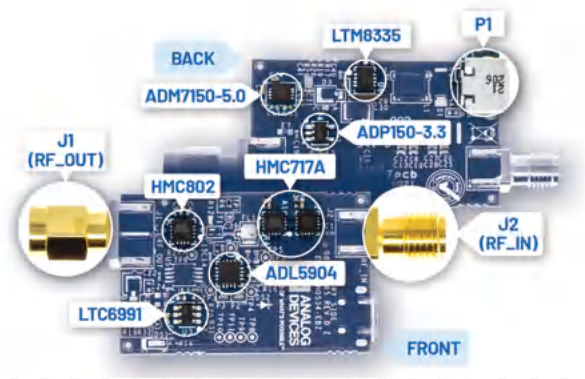
Applications

- Aerospace and Defense
- Instrumentation and Measurement
- Communications
- General-Purpose



CN0534 Reference Design: USB-Powered 5.8 GHz RF LNA Receiver with Output Power Protection

The CN0534 reference design provides a high gain, robust overpower monitoring, and protection all in a small footprint. It provides an immediate solution for an industrial, scientific, and medical (ISM) band application where low signal strength or distance may be a complication. The International Telecommunication Union (ITU) allocates the unlicensed 5.8 GHz ISM radio frequency band for use worldwide. While the range is shorter, it accommodates multiple channels. Advancements in wireless technologies and standards, as well as minimal regulatory compliance requirements, have made this frequency band popular for short range, wireless communication systems (it is an alternative to other digital comms such as Wi-Fi).



Features and Benefits

- Low system noise boosts RF receiver channel for attenuated signals
- Protects sensitive downstream equipment connected to the receiver system
- Automatic on/off when the RF power input is within acceptable ranges

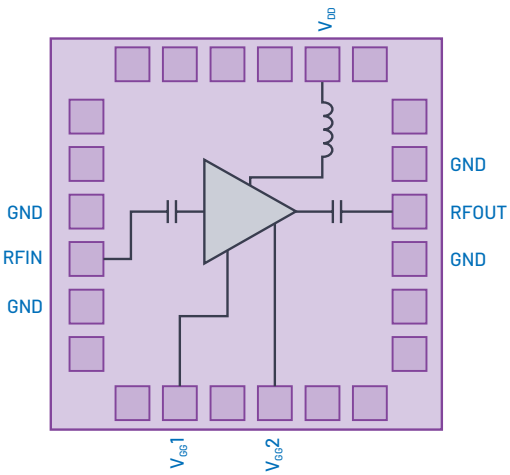
Applications

- Communications
- Instrumentation and Measurement
- General-Purpose
- Healthcare

RF and Microwave (Continued)

HMC1126: GaAs, pHEMT, Low Noise Amplifier, 400 MHz to 52 GHz

The HMC1126ACEZ is a gallium arsenide (GaAs), pseudomorphic high electron mobility transfer (pHEMT), monolithic microwave integrated circuit (MMIC), distributed power amplifier that operates from 0.4 GHz to 52 GHz. The HMC1126ACEZ amplifier inputs/outputs are internally matched to 50 Ω facilitating integration into multichip modules (MCMs). All data is taken with the chip connected via two 0.025 mm (1 mil) wire bonds of minimal length 0.31 mm (12 mils).

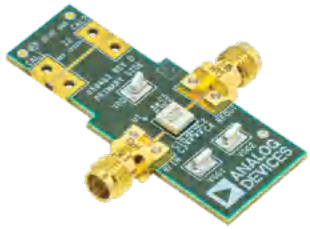


Features and Benefits

- Extends bandwidth of existing LNA
- Improves system noise figure (3.5 dB noise figure)
- Unique and small package format to 52 GHz

Applications

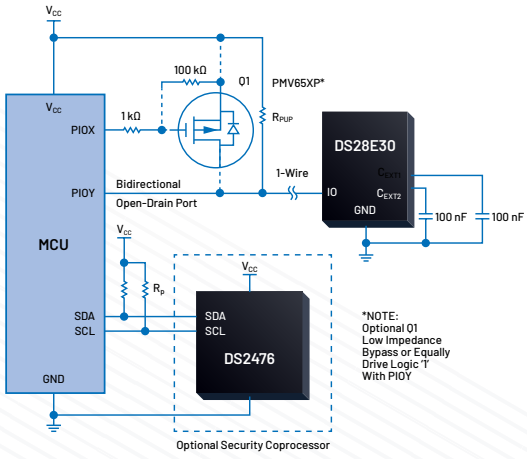
- Aerospace and Defense
- Instrumentation and Measurement
- Communications
- General-Purpose



Security

DS28E30: 1-Wire ECDSA Secure Authenticator

The DS28E30 is a cryptographic-based HW IC solution that provides a root-of-trust to detect and prevent counterfeit products, and to enable secure use management of limited life peripherals. It provides a highly secure and easily deployed turnkey authentication solution based on the FIPS-186 ECDSA standard. Available in a tiny 1.2 mm × 1.4 mm WLP package with 1.62 V to 5 V operating range, it is easily added to existing or new designs.



Features and Benefits

- Easy to use, fixed function, public key cryptography toolbox based on industry standards
- 1-Wire® interface integrates with minimal contact requirements
- 3 kb of secure EEPROM securely stores application information

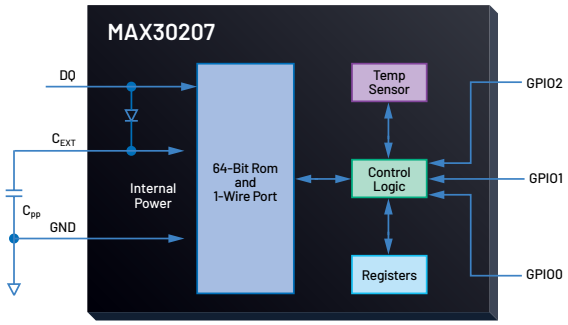
Applications

- Consumer
- Industrial Automation
- Healthcare

Sensors and MEMS

MAX30207: ±0.1°C Accurate, 1-Wire Digital Temperature Sensor

The MAX30207 is a low power, high accuracy digital temperature sensor with ±0.1°C accuracy from 30°C to 50°C and ±0.3°C accuracy from 0°C to 70°C. It provides a 16-bit resolution (0.005°C) in a 2 mm × 2 mm package design that has extremely low thermal mass.



Features and Benefits

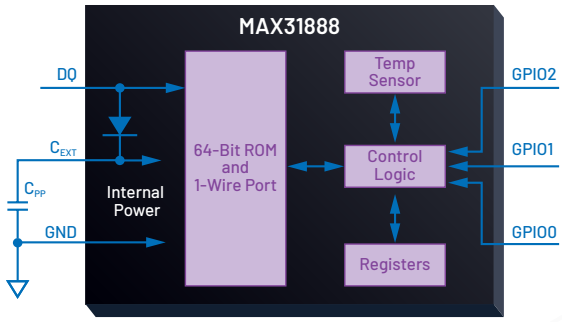
- Accuracy of 0.1°C allows the detection of temperature change
- 1-Wire interface with multiple variants allows connection between temperature sensors
- 2 mm × 2 mm size allows for development of small wearables

Applications

- Healthcare
- Instrumentation and Measurement
- Consumer

MAX31888: ±0.25°C Accurate, 1-Wire Temperature Sensor

MAX31888 provides ±0.25°C accuracy across a wide temperature range at a fraction of the cost of RTDs, as well as at 35% of the power consumed by competitive solid-state solutions.



Features and Benefits

- Precise measurement with ±0.25°C accuracy across a wide temperature range
- Low power consumption for battery powered applications

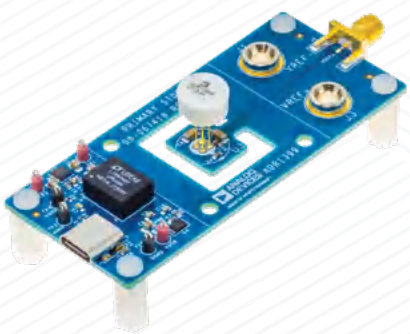
Applications

- Industrial Automation
- Instrumentation and Measurement
- Healthcare

Voltage References

ADR1399: Oven-Compensated, Buried Zener, 7.05 V Voltage Reference

The ADR1399 precision shunt reference features excellent temperature stability over a wide range of voltage, temperature, and quiescent current conditions. A temperature stabilizing loop is incorporated with the active Zener on a monolithic substrate, which nearly eliminates changes in voltage with temperature. The subsurface Zener circuit is fully specified at a quiescent current I_{REF} of 3 mA and offers minimal noise and excellent long-term stability. The ADR1399 offers much lower output dynamic impedance than the LM399, reducing the effects of shunt resistor (R_{SHUNT}) and the supply voltage variation on the reference output.



Features and Benefits

- Ultralow noise and temperature coefficient enables higher bit counts
- Very low dynamic impedance and excellent long-term stability supports high stability requirement
- Pin-compatible LM399 replacement with improved performance

Applications

- Instrumentation and Measurement
- Communications
- Industrial Automation
- General-Purpose
- Healthcare

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