MIP

Marketing Innovative Products

2017/03

SMART CITIES
AUTONOMOUS DRIVING
CONNECTIVITY
INTELLIGENT LIGHTING
POWER EFFICIENCY
SENSORS

EBV Elektronik
An Avnet Company

On land, water, and in the air – a multi-billion market!

There are as yet no statistics on market volumes of autonomous vehicles across all sectors (land, water, air). But prospects for the driverless road vehicles market alone are impressive. Market analyst Boston Consulting Group predicts that global sales of fully autonomous vehicles will have reached 12 million units per year by 2035. And that is despite the fact that manufacturers are not planning to launch self-driving cars onto the market until 2020. The forecast means that cars with autonomous functions will have captured around 25 percent of the total new vehicle market within just 15 years. A study by management consultant Roland Berger forecasts that autonomous driving will generate additional sales of as much as 40 billion US Dollars in hardware components and a further approximately 20 billion in software solutions for driver assistance systems by 2030.

That represents an exciting future growth market for the semiconductor industry especially. The prospects are amply illustrated by the example of driver assistance systems. They need components including DRAM, NAND flash memory, general microprocessors, or analog chips. According to forecasts by IHS, market volumes in those chips alone are set to increase to 2.6 billion US Dollars by 2020. And the market volumes in sensors are predicted to be even bigger: because autonomous cars need lots of different sensor systems to sense their environment and localise their position. MarketsandMarkets forecasts that the market for LiDAR sensors alone will grow by an average of almost 26 percent a year between 2017 and 2022 – totalling 5.2 billion US Dollars by 2022.

Those figures apply only to autonomous road vehicles. Applications in other segments for autonomous vehicles, which need the same electronic systems as autonomous cars in one form or another, will bring additional volumes. According to Tractica, for example, market volumes in driverless farm tractors are set to rise to 30.7 billion US Dollars by 2024. IDTechEx forecasts that the market for unmanned aircraft will be worth more than six billion Dollars in 2027. And even a niche market such as autonomous underwater vehicles is forecast to be worth almost 500 million US Dollars in 2022 according to MarketsandMarkets.

CONTENTS
by Product Groups

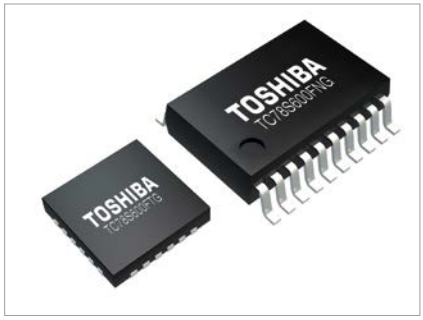
CONTENTS
by Manufacturer

1000-up price
TC78B016FTG(Z,EL)
€ 1.45

TC78B016FTG

40 V/3 A 3-Phase Sine-Wave PWM Driver for BLDC Motors

CLICK OR SCAN



TC78B016FTG

TC78B016FTG contains a new feature called InPAC (Intelligent Phase Control).

Energy saving is increasingly promoted and higher power efficiency is required for home appliances and industrial equipment. Therefore, higher efficiency for built-in fan motor controllers is essential. However, with a motor control system the ideal efficient characteristics can be difficult to obtain and complicated adjustments are required for optimization. This is caused by a phase difference between the motor voltage and motor current due to motor impedance.

To solve this problem, Toshiba has developed "InPAC" technology. InPAC, Toshiba's new control technology, automatically adjusts phases of motor voltage and motor current. Using automatic phase adjustment, the optimal efficiency is achieved simply by initial setting in the used rotation range. The adjustment burden for optimization is reduced, which normally incurs at every rotation speed with the conventional technology.

Accordingly customers' development time can be shortened. TC78B016FTG is the first product containing InPAC for BLDC motor application from 6…30 V supply voltage and up to 3 A output current.

KEY FEATURES

- Auto lead angle (voltage and current: optimized phase control)
- Support for Hall devices and Hall ICs
- Speed control inputs: PWM inputs or analog voltage inputs
- Abnormal detection functions: Thermal shutdown, overcurrent detection, motor lock detection

APPLICATION EXAMPLES

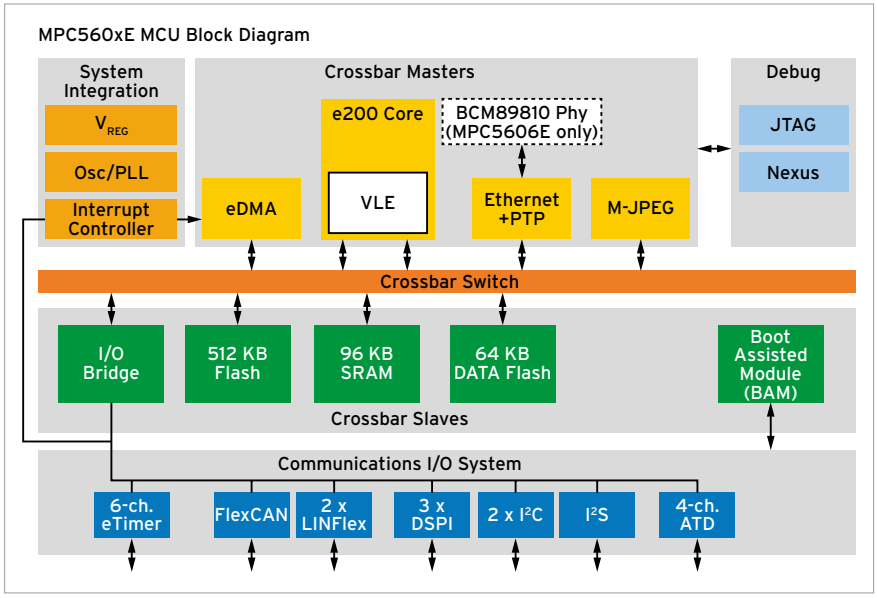
- Industrial like factory automation
  - Cooling fans for servers or industrial motors
- Smart home
  - Cooling ventilation for homes
  - Electrical fans

100-up price	100-up price	1-up price
SPC5604EEF2MLH	PPC5604EEMLL	MPC5604EKIT
€ 11.50	€ 29.-	€ 180.-

MPC5604E

Ultra-Reliable 32-bit MCU for Automotive ADAS and Industrial Ethernet Applications

CLICK OR SCAN



The MPC560xE family of MCUs enables advanced driver assistance, surround view, camera-based systems and industrial applications.

These MCUs are gateway systems, designed to move data from different sources via Ethernet to a receiving system and vice versa.

- Allows for greater levels of system integration
- Enables miniaturization of camera modules
- Helps to reduce system costs and time-to-market

Comprehensive development tools simplify and accelerate system design (MPC5604ES includes a SW license package consisting out of Ethernet Streaming & Camera Application SW as well as Autosar OS).

KEY FEATURES

Key Technical Characteristics

- Automotive AEC-Q100 grade 1 qualified (passed >= 2 × AEC for robustness validation of C90 process) hence suitable for harsh environmental conditions (up to 150 °C junction).
- Core complies with the Power Architecture technology
- Designed to move data from different sources via Ethernet (bandwidth of 10/100 Mb/s) to a receiving system and vice versa. Supported data sources and sinks:
  - Video data (with 8/10/12 bits per data word)
  - Audio data (6 × stereo channels)
  - RADAR data (2 × 12-bit with <1 us per sample, digitized externally and read in via DSPI)
- Other serial communication interfaces, including FlexCAN, LINFlex and DSPI

Highlights

- Enables real-time broadcast of compressed video and audio data over Ethernet with its embedded Motion J-PEG compression engine, precision time stamping hardware (IEEE 1588) and fast Ethernet controller (FEC)
- Low latency MJPEG compressed 1.2 Mpixel, 30 fps video stream fits 100 Mbps Ethernet link
- Camera synchronization via IEEE 1588v2 PTP real-time clock
- Predictive compression control allows high quality factor
- Negligible degradation of object detection rate at high quality factor
- 12-bit per YUV color space component for high dynamic range
- IEEE 1722 Layer 2 AVB transport protocol
- Ethernet simplifies system architectures
- Reduces system costs by moving away from costly cable networks (e.g. LVDS) to less expensive two-wire systems (Unshielded twisted pair).

APPLICATION EXAMPLES

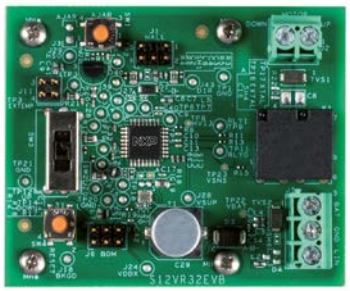
- Gateway systems for video & audio compression and transmission over Ethernet such as:
  - ADAS surround camera
  - Aircraft audio management unit
  - Booster AVB audio
  - Forklift truck rear camera

1000-up price	1-up price
S9S12VR64AF0MLC	S12VR64EVB
€ 2.50	€ 144.-

S12VR (S12VR32)

Mixed-Signal MCU for Automotive & Industrial Relay Based Motor Control

CLICK OR SCAN



S12VR32EVB: S12VR32 Evaluation Board

EBV Elektronik presents the S12VR, one of the smallest, most efficient and scalable relay driven DC motor control solutions for industrial and automotive applications such as window lift and sunroof.

The S12VR integrates the S12 16-bit microcontroller together with LIN Physical Interface, lowside and highside drivers. High Voltage Input pins for 12 V switch interfaces, EVDD for sensor supply that reduce system, qualification and manufacturing cost.

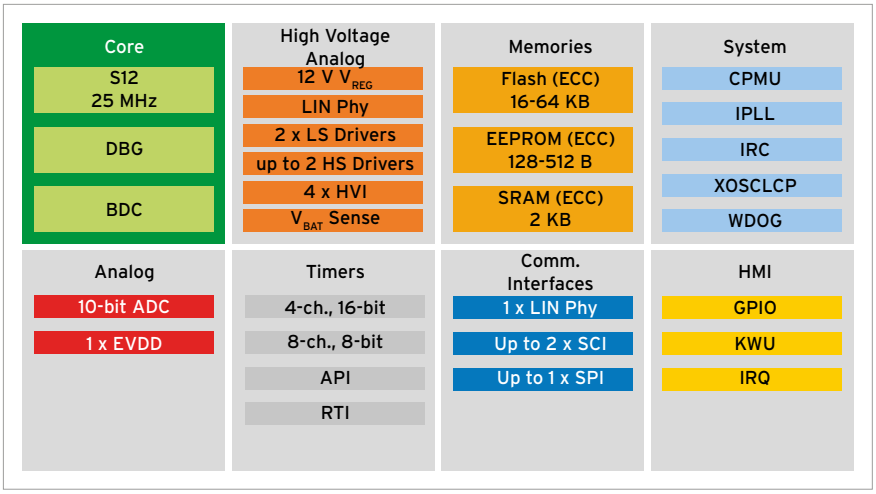
- **System in a package** – Highly integrated part ideal for spaceconstrained relay driven DC motors on LIN Bus
- **Low system cost** – Direct connection with battery, integrated LIN Phy, LS & HS drivers and EVDD reduce system, qualification and manufacturing cost.
- **High reliability** – High immunity to EMI and ESD stresses, LIN 2.x compliant with +/- 8 kV ESD capability.
- **Enablement** – Supported by comprehensive hardware and software solution, which reduces development costs and time-to-market

KEY FEATURES

- S12 (25 MHz max.) 16-bit CPU compatible with the S12G family and MM912 solutions.
- Voltage Regulator operating directly from car battery (no ext regulator needed) capable to drive 20 mA to drive offchip components (e.g. powering Hall sensor)
- LIN Physical Layer: LIN 2.x/J2602 compliant ; +/- 8 kV ESD capability
- Up to 512 B EEPROM with ECC, 4 byte erasable
- 2 Low-Side drivers with active clamps to drive relays (inductive load) for bi-directional brushed DC Motors
- Up to 2 HS drivers: For indicator LED and Switch supply
- 4 High Voltage Inputs: 12 V Inputs for Switch Monitoring, ESD-protected, can be used for wake-up/interrupts or 12 V analog inputs routed to ADC internally through selectable divider ratio
- On chip RC Oscillator; trimmed to +/- 1,3 % tolerance over full temperature range

APPLICATION EXAMPLES

- Anti-Pinch Window Lift
- Sunroof
- Automatic Doors
- Power Lift Gate
- Seat Adjustment
- Seat Heating
- Small LIN Node



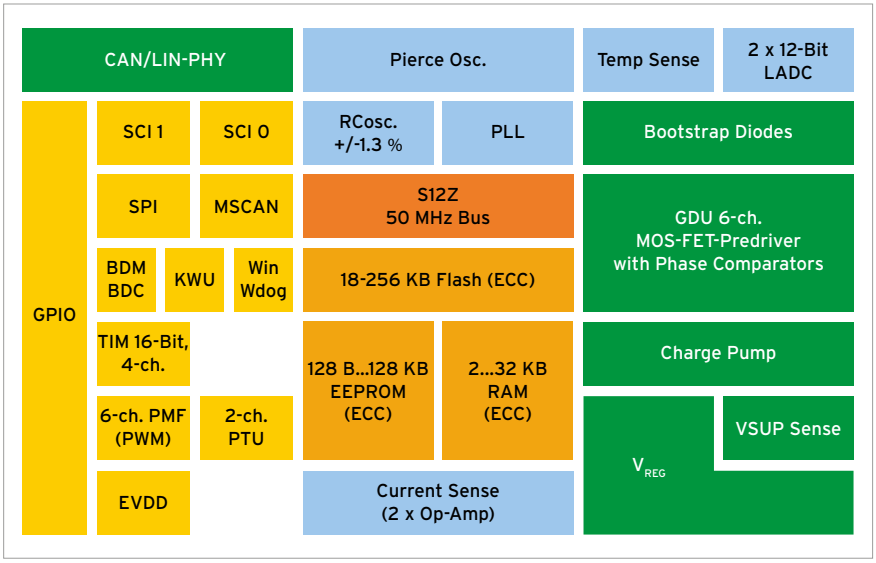
S12VR Microcontroller Block Diagram

100-up price	1-up price	1-up price
S912ZVMC12F1WKH	S12ZVML12EVBLIN	MTRCKTSPNZVM128
€ 4.80	€ 340.-	€ 769.-

S12ZVM (S12ZVM32)

Mixed-Signal MCU for Automotive & Industrial Motor Control Applications

CLICK OR SCAN



S12ZVM Microcontroller Block Diagram

KEY FEATURES

- S12Z CPU @ 50 MHz bus speed
- 6 ch Gate Drive Unit (GDU) with 50…150 nC total Gate Charge drive capability, incl. charge pump for High-Side, Bootstrap diodes for charging external bootstrap capacitors
- Embedded VREG with switchable 5 V/20 mA sensor supply
- LIN PHY, LIN2.1/2.2/J2602 compliant
- CAN-PHY
- Dual 12bit list-based ADC (LADC), synch with PWM through Programmable Trigger Unit (PTU)
- 2 × Op-amp for current sensing

EBV Elektronik presents the S12ZVMB MCU family providing automotive DC-motor control applications with a unique combination of integration and scalability.

With the integrated LIN-PHY, 12 V-V_{REG} and H-Bridge Gatedriver the S12ZVMB allows to build extremely compact solutions in windowlifters, sunroofs or powertrain actuators.

It integrates a sophisticated S12Z 16 bit MCU together with a 12…5 V voltage regulator, LIN physical layer or CAN physical layer and gate driver unit (GDU) in order to control six power MOSFETs for automotive and industrial applications such as blowers, fans or pumps for fuel, oil or water.

- **System in a package** – Highly integrated solution ideal for 3-Phase motors
- **High performance** – S12Z performance supports field-oriented control (FOC) for maximum energy efficiency/lowest audible noise
- **Scalable** – CAN-, LIN-, and HV-PWM-PHY options with memory up to 256 KB
- **High Reliability** – High immunity to EMI and ESD stresses, LIN 2.x compliant with +/-8 kV ESD capability
- **Low System Cost** – Operating straight from car battery, integrated PHY for LIN or CAN, 6 channel motor control MOSFET gate pre-drivers
- **Enablement** – Supported by comprehensive hardware and software solution

APPLICATION EXAMPLES

- Sensorless BLDC or PMSM motor control
- Switched reluctance Motor
- Bidirectional DC motors (H-Bridge)
- Various pumps (oil, fuel, water, vacuum)
- Cooling fan, HVAC blower, Turbocharger

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life.augmented

100-up price	1-up price
STSPIN32F0	STEVAL-SPIN3201
€ 2.29	€ 58.-

STSPIN32F0

Advanced BLDC controller with embedded STM32 MCU

CLICK OR SCAN

STSPIN32F0

Evaluation Board

The STSPIN32F0 is a System-In-Package providing an integrated solution suitable for driving three-phase BLDC motors using different driving modes.

It embeds a triple half-bridge gate driver able to drive power MOSFETs or IGBTs with a current capability of 600 mA (sink and source). The high- and low-side switches of same half-bridge cannot be simultaneously driven high thanks to an integrated interlocking function.

An internal DC/DC buck converter provides the 3.3 V voltage suitable to supply both the MCU and external components. An internal LDO linear regulator provides the supply voltage for gate drivers.

The integrated operational amplifiers are available for the signal conditioning of the analog Hall-effect sensors and the shunt resistor signal.

A comparator with a programmable threshold is integrated to perform the overcurrent protection.

The integrated MCU (STM32F031x6x7) allows performing sensorless and sensored field-oriented control or 6-step and other advanced driving algorithms, including the speed control loop. It has the write-protection and read-protection feature for the embedded Flash memory to protect against unwanted writing and/or reading.

The STSPIN32F0 device also features overtemperature and undervoltage lockout protections and can be put in the standby mode to reduce the power consumption. The device provides 16 general-purpose I/O ports (GPIO) with the 5 V tolerant capability, one 12-bit analog-to-digital converter with up to 9 channels performing conversions in a single-shot or scan modes, 5 synchronizable general-purpose timers and supports an easy to use debugging serial interface (SWD).

KEY FEATURES

- Extended operating voltage from 8…45 V
- Three-phase gate drivers
  - 600 mA sink/source
  - Integrated bootstrap diodes
  - Cross-conduction prevention
- 32-bit ARM® Cortex® -M0 core:
  - Up to 48 MHz clock frequency
  - 4-kByte SRAM with HW parity
  - 32-kByte Flash memory with option bytes used for write/readout protection
- 3.3. V DC/DC buck converter regulator with overcurrent, short-circuit, and thermal protection
- 12 V LDO linear regulator with thermal protection
- 16 general-purpose I/O ports (GPIO)
- 5 general-purpose timers
- 12-bit ADC converter (up to 9 channels)
- I²C, USART and SPI interfaces
- 4 rail-to-rail operation amplifiers for signal conditioning
- Comparator for overcurrent protection with programmable threshold
- 3FG open-drain output providing the decoded result of 3 Hall sensors inputs
- Standby mode for low power consumption
- UVLO protection on each power supply:
  - V_M , V_{DD} , V_{REG} and V_{BOOTx}
- On-chip debug support via SWD
- Extended temperature range: -40…+125 °C

APPLICATION EXAMPLES

- Industrial and educational robots
- Drones and aero modelling
- Portable vacuum cleaners
- Power tools
- Home appliances (dryers, air purifiers) and air-con FANs

BROADCOM
connecting everything®

1000-up price	1000-up price
ACPL-32JT-000E	ACPL-32JT-500E
€ 4.89	€ 4.89

ACPL-32JT

Automotive R²Coupler®
Smart Gate Drive Optocoupler

CLICK OR SCAN

Package ACPL-32JT

ACPL-32JT is a 2.5A Automotive R²Coupler Smart Gate Drive Optocoupler.

The ACPL-32JT features integrated flyback controller for an isolated DC-DC converter, IGBT Desaturation sensing with fault feedback, Under-Voltage LockOut (UVLO) with soft-shutdown and fault feedback and active Miller current clamping.

The fast propagation delay and tight timing skew performance enable excellent timing control and efficiency. This full feature optocoupler comes in a compact, surface-mountable SO-16 package for space-savings, and is suitable for traction power train inverter, power converter, battery charger, air-conditioner and oil pump motor drives in HEV and EV applications.

Broadcom R²Coupler isolation products provide the reinforced insulation and reliability needed for critical automotive and high-temperature industrial applications.

KEY FEATURES

- Qualified to AEC-Q100 Grade 1 Test Guidelines
- Operating temperature range: -40…+125 °C
- Integrated flyback controller for isolated DC-DC converter
- Regulated Output Voltage: 20 V
- Peak output current: 2.5 A (max.)
- Miller Clamp Sinking Current: 1.7 A (max.)
- Wide Input Voltage Range: 8…18 V
- Propagation delay: 250 ns (max.)
- Dead time distortion range: -160…+60 ns
- Common Mode Rejection (CMR): >50 kV/µs @ V_{CM} = 1500 V
- Integrated fail-safe IGBT protection:
  - Desat sensing, "Soft" IGBT turn-off and Fault Feedback
  - Under Voltage Lock-Out (UVLO) protection with Feedback
- High Noise Immunity:
  - Miller Current Clamping
  - Direct LED input with low input impedance and low noise sensitivity
  - Negative Gate Bias
- Compact SO-16 package with 8 mm clearance and creepage
- Regulatory approvals:
  - UL1577, CSA (5000VRMS for 1 min)
  - IEC/EN/DIN EN 60747-5-5 (V_{IORM} = 1230 V_{PEAK})
- Options Available are:
  - 500 = Tape and Reel Packaging Option
  - XXXE = Lead Free Option

APPLICATION EXAMPLES

- Automotive Isolated IGBT/MOSFET Gate Drive
- Hybrid and Plug-in Powertrain Inverter
- Automotive DC-DC Converter
- AC and Brushless DC Motor Drives
- Uninterruptible Power Supplies (UPS)

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1000-up price
ALMD-CY3F-YZ002
€ 0.35

ALMD-CY3F-YZ002 & ALMD-LY3G-12002

High Brightness SMT Round and Oval White LED Lamps

CLICK OR SCAN

The new ALMD-CY3F and ALMD-LY3G series are essentially like a conventional high brightness through holes LED in the form of surface mount device.

It can be assembled using common SMT assembly processes and is compatible with industrial reflow soldering processes.

The LEDs are made with an advanced optical grade epoxy for superior performance in outdoor sign applications. For easy pick and place assembly, the LEDs are shipped in tape and reel. Every reel is shipped from a single intensity and color bin for better uniformity.

KEY FEATURES

- Using high brightness InGaN material
- Support EN12966-1 white class C2 bin
- Typical viewing angle: 30°
- Jedec MSL 3
- Compatible with industrial reflow soldering process

APPLICATION EXAMPLES

- Variable message signs
- Highway signs

Platform	Part No	Color	V-Angle	Min IV	Max IV	Remarks
SMT Lamps	ALMD-LG37-XZ002	Red	40x100	1,66	2,9	
	ALMD-LL37-XZ002	Amber	40x100	1,66	2,9	
	ALMD-LM37-24002	Green	40x100	3,5	6,05	
	ALMD-LM38-24002	Green	40x100	3,5	6,05	
	ALMD-LB37-SU002	Blue	40x100	660	1,15	
	ALMD-LB38-TV002	Blue	40x100	800	1,38	
	ALMD-LY3G-12002	White	90 x 45	2900	4200	New NPI - White
SMT Lamps	ALMD-EG1E-Z2002	Red	15deg	12	27	
	ALMD-EL1E-Z2002	Amber	15deg	12	27	
	ALMD-CM1F-34002	Green	15deg	27	45	
	ALMD-CB1E-VW002	Blue	15deg	4,2	7,2	
	ALMD-EG2E-XZ002	Red	23deg	7,2	16	
	ALMD-EL2E-XZ002	Amber	23deg	7,2	16	
	ALMD-CM2F-12002	Green	23deg	16	27	
	ALMD-CB2E-UV002	Blue	23deg	3,2	5,5	
	ALMD-EG3E-VX002	Red	30deg	4,2	9,3	
	ALMD-EL3E-VX002	Amber	30deg	4,2	9,3	
	ALMD-CM3F-Y1002	Green	30deg	9,3	21	
	ALMD-CB3F-TV002	Blue	30deg	2,5	5,5	
	ALMD-CE3F-XZ002	Cyan	30deg	9,3	21	
	ALMD-CY3F-YZ002	White	30deg	9300	16000	White – clear lens
	ALMD-CY3G-YZ002	White	30deg	9300	16000	White – diffused lens

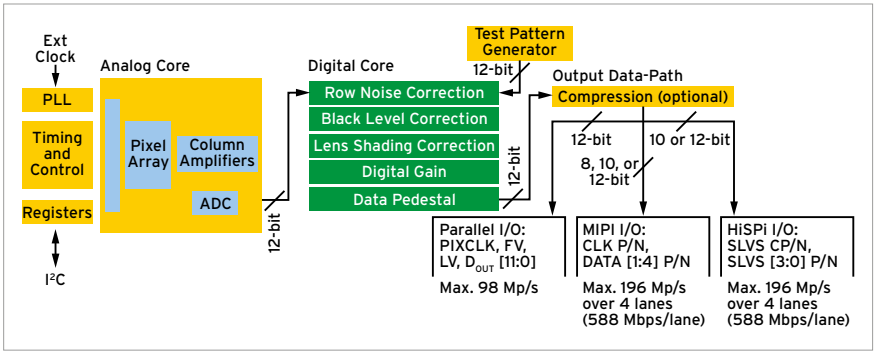
ON Semiconductor®

1000-up price	1000-up price	1000-up price
AR0330CS1C12SPKA0-CR	AR0330CS1C12SPKA0-CP	AR0330CSSC12SPBA0-DR
€ 7.29	€ 7.89	€ 8.79

AR0330CS DIGITAL IMAGE SENSOR

3 MPixels, 1/3-Inch

CLICK OR SCAN



Block diagram AR0330CS

KEY FEATURES

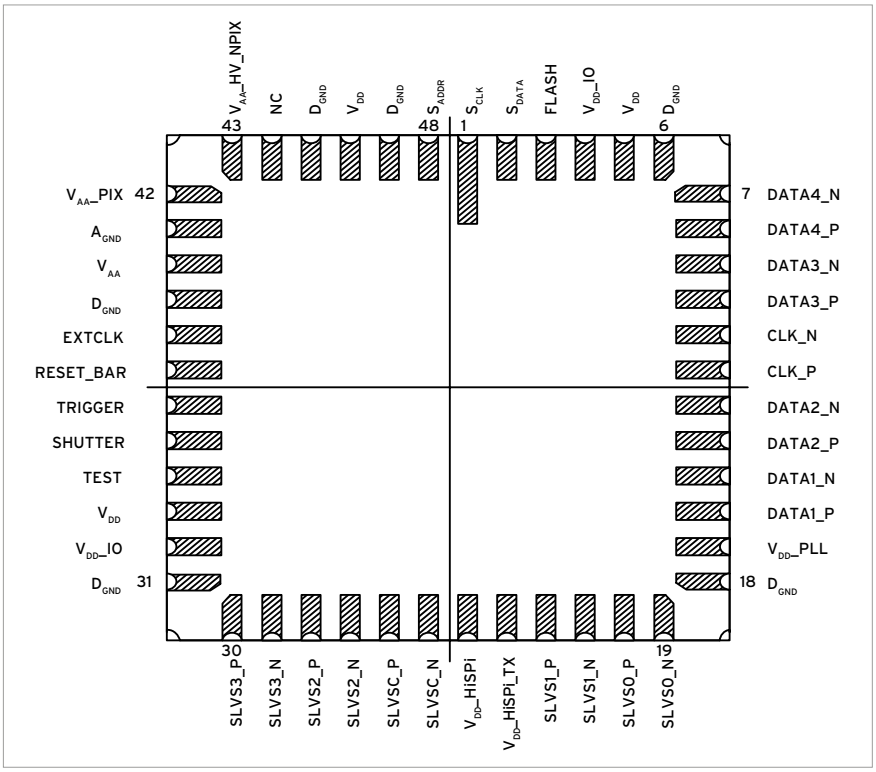
- 2.2 µm pixel with A-Pix™ technology
- Full HD support at 60 fps
- 4 lane MIPI, HiSPi™
- Parallel interface support

APPLICATION EXAMPLES

- Camera
- Security
- Video Camcorders
- Web Cameras
- Video Conference Cameras
- Security Cameras

ON Semiconductor's focus on pixel performance excellence provides the foundation for this sensor's exceptional image quality with superior color accuracy, low-light sensitivity, and low noise level.

This cost-effective CMOS imaging solution enables high speed image capture capabilities, and includes variable functions, including gain, frame rate, and exposure while maintaining low power consumption.



CLCC Package

EBV Elektronik
An Avnet Company

TOSHIBA
Leading Innovation

1000-up price	1000-up price	1000-up price
TLP3547(TP1,F(O	TLP3548(TP1,F(O	TLP3549(TP1,F(O
€ 3.14	€ 3.33	€ 3.65

TLP3547, TLP3548 AND TLP3549

High current Photorelays with up to 5 A Drive Current for Replacing Mechanical Relays

CLICK OR SCAN

Toshiba TLP3547, TLP3548, and TLP3549

New products deliver enhanced reliability and improved safety margins in compact DIP8 packages.

Toshiba Electronics Europe has introduced three new compact, DIP8 package products to its line-up of photorelays that can replace mechanical relays in industrial applications. The new devices - which include a sensational [1] 5 A large drive current – will suit a variety of applications ranging from heating, ventilation and air conditioning (HVAC) systems to inverters, PLCs and automated test equipment (ATE). Unlike mechanical relays, photorelays have no physical contacts that are subject to wear and deterioration. This contributes to greater reliability. Use of photorelays also helps to support the development of smaller and thinner designs. A guaranteed pulsed ON-state current that is three times greater than that of the continuous ON-state current secures a margin for safety design.

The TLP3547 is a 60 V product with an extraordinary [1] 5 A (max.) large drive current. The TLP3548 is a 400 V product with a 0.4 A (max) drive current that offers high-speed switching of 1 ms (max). The 600 V TLP3549 is an excellent photorelay to utilise a super-junction structure 'DTMOS' MOSFET and delivers a 0.6 A (max.) drive current. All of the new photorelays have a minimum isolation voltage rating of 2500 V_{RMS}.

Notes:
[1] For photorelay products in DIP8 packages, as of July 19, 2016. Toshiba survey.

KEY FEATURES

- Normally opened (1-Form-A)
- Isolation Voltage: 2500 V_{RMS} (min.)
- Operating Temperature Range: -40…+85°C
- Off-state output terminal voltages / On-state currents / On-state resistances:
  - TLP3547: 60 V / 5 A / 50 mΩ
  - TLP3548: 400 V / 0,4 A / 5 Ω
  - TLP3549: 600 V / 0,6 A / 2 Ω
- Packages: DIP8 with through hole and SMD leadforming options.

APPLICATION EXAMPLES

- Mechanical Relay Replacement
- Factory Automation (FA)
- Measuring Instruments
- Programmable Logic Controllers (PLCs)
- ATE (Automatic Test Equipment)

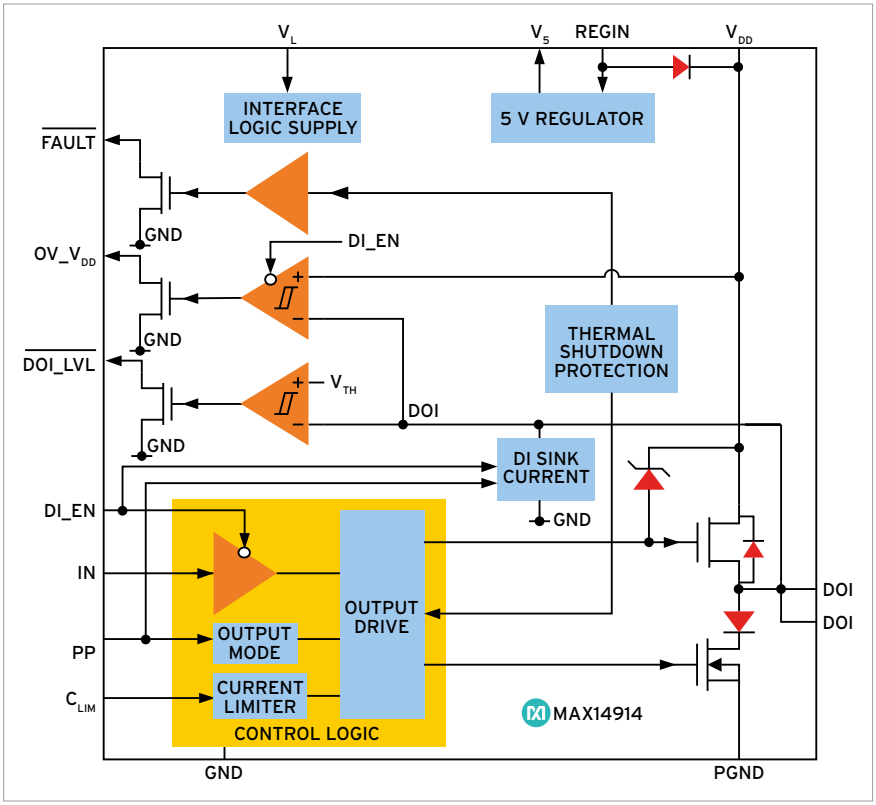
maxim integrated

100-up price
MAX14914ATE+
€ 1.88

MAX14914

High-Side Switch w/ Settable Current-Limiting, Push-Pull Driver Option and Digital Input Config

CLICK OR SCAN



MAX14914 Functional Diagram

The MAX14914 is a high-side/push-pull driver that operates as both an industrial digital output (DO) and an industrial digital input (DI).

The MAX14914 is specified for operation with supplies up to 40 V.

The high-side switch current is resistor settable from 135 mA (min.) to 1.3 A (min.).

The high-side driver's on-resistance is 120 mΩ (typ.) at 125 °C ambient temperature. Optional push-pull operation allows driving of cables and fast discharge of load capacitance.

The output voltage is monitored and indicated through the active-low DOI_LVL pin for safety applications.

The MAX14914 complies with Type 1, Type 2, or Type 3 input characteristics when configured for DI operation.

KEY FEATURES

- Reduces Power and Heat Dissipation
  - 240 mΩ (max.) HS R_{ON} at T_A = 125 °C
  - Accurate Short-Circuit Current Limit
  - Accurate Internal Current Limiter for Types 1, Type 2, and Type 3 Digital Inputs
- Enhances System Robustness
  - "Safe-Demagnetization" for Safe Turn-Off of Unlimited Inductance
  - 60 V Supply Tolerance
  - Loss of GND Protection
  - Thermal Shutdown Protection
  - ±2 kV IEC 61000-4-5 Surge Protection
  - ±20 kV IEC 61000-4-2 Air-Gap ESD Protection
  - ±7 kV IEC 61000-4-2 Contact ESD Protection
  - -40…+125° C Ambient Operating Temperature
- Reduces BOM Count and PCB Space
  - Small 4 × 4 TQFN Package
  - Internal Clamps for Fast Inductive Load Turn-Off
  - On-Chip 5 V Regulator
- Provides Flexibility
  - Configurable as a Digital Input or a High-Side or Push-Pull Digital Output
  - Resistor Settable Current Limiting for the High-Side Switch (135 mA…1.3 A)
  - 10…40 V Operating Supply Range
- Improves System Speed and Throughput
  - Propagation Delay of Less Than 2 µSec

APPLICATION EXAMPLES

- Configurable Digital Input/Output
- Industrial Digital Outputs and Inputs Modules
- Motor Control
- Safety Systems

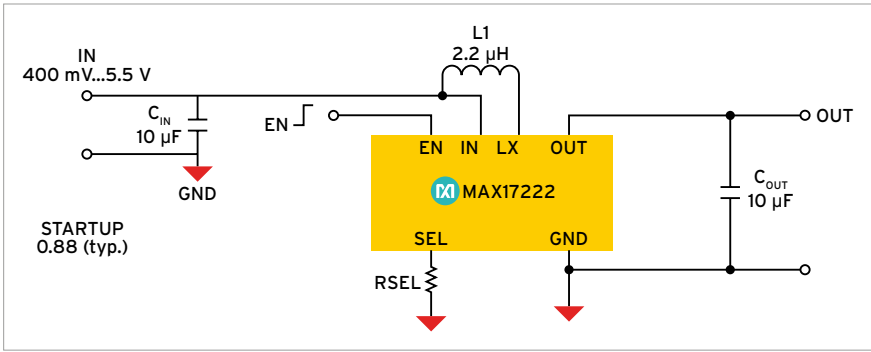
maxim integrated

100-up price
MAX17222ELT
€ 1.30

MAX17222

400 mV…5.5 V Input, nanoPower Synchronous Boost Converter with True Shutdown

CLICK OR SCAN



MAX17222 Typical Operating Circuit

With ultra-high efficiency and very low quiescent current (IQ) of only 300 nA, the MAX17222 nanoPower boost regulator from Maxim Integrated enables long battery life in a tiny form factor for wearable and consumer IoT designs.

The MAX17220…MAX17225 is a family of ultra-low quiescent current boost (step-up) DC-DC converters with a 225 mA/0.5 A/1 A peak inductor current limit and True Shutdown™.

True Shutdown disconnects the output from the input with no forward or reverse current. The output voltage is selectable using a single standard 1 % resistor.

The 225 mA (MAX17220), 500 mA (MAX17221/MAX17222/MAX17223), and 1 A (MAX17224/MAX17225) peak inductor current limits allow flexibility when choosing inductors.

The MAX17220/MAX17222/MAX17224 versions have post-startup enable transient protection (ETP), allowing the output to remain regulated for input voltages down to 400 mV, depending on load current.

The MAX17220…MAX17225 offer ultra-low quiescent current, small total solution size, and high efficiency throughout the entire load range. The MAX17220…MAX17225 are ideal for battery applications where long battery life is a must.

KEY FEATURES

- 300 nA Quiescent Supply Current Into OUT
- True Shutdown Mode
  - 0.5 nA Shutdown Current
  - Output Disconnects from Input
  - No Reverse Current with V_{OUT} 0…5 V
- 95 % Peak Efficiency
- 400 mV…5.5 V Input Range
- 0.88 V Minimum Startup Voltage
- 1.8…5 V Output Voltage Range
  - 100 mV/Step
  - Single 1 % Resistor Selectable Output
- 225 mA, 500 mA, and 1 A Peak Inductor Current Limit
  - MAX17220: 225 mA I_{LIM}
  - MAX17221/MAX17222/MAX17223: 500 mA I_{LIM}
  - MAX17224/MAX17225: 1 A I_{LIM}
- MAX17220/MAX17222/MAX17224 Enable Transient Protection (ETP)
- 2 × 2 mm² 6-Pin µDFN
- 0.8 8 × 1.4 mm² 6-Bump WLP (2 × 3, 0.4 mm Pitch)

APPLICATION EXAMPLES

- Battery-Powered Medical Equipment
- Low-Power Wireless Communication Products
- Optical Heart-Rate Monitoring (OHRM) LED Drivers
- Primary-Cell Portable Systems
- Secondary-Cell Portable Systems
- Supercapacitor Backup for RTC/Alarm Buzzers
- Tiny, Low-Power IoT Sensors
- Wearable Devices

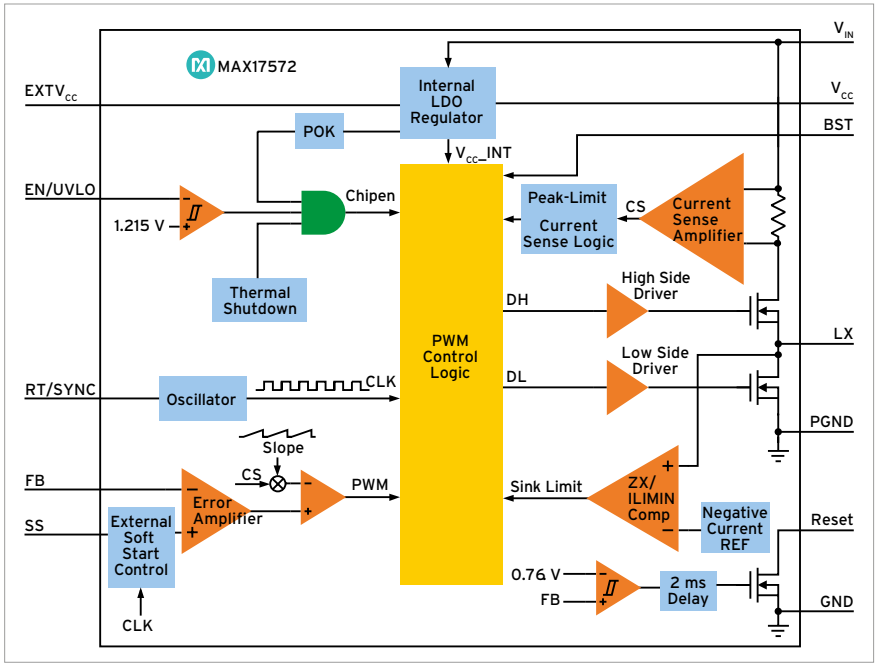
maxim integrated

100-up price
MAX17572ATC+
€ 1.92

MAX17572

4.5...60 V, 1 A, Highly Efficient, Synch. Step-Down DC-DC Converter with Internal Compensation

CLICK OR SCAN



MAX17572 Functional Diagram

The MAX17572 synchronous step-down DC-DC converter operates in a wide voltage input range from 4.5...60 V

The MAX17572 high-efficiency, high-voltage, synchronous step-down DC-DC converter with integrated MOSFETs operates over a 4.5…60 V input. The converter can deliver up to 1 A and generates output voltages from 0.9 V up to 0.9 × V_{IN}. The feedback (FB) voltage is accurate to within ±1.2 % over -40…+125 °C. The MAX17572 uses peak current-mode control.

The device is available in a 12-pin (3 × 3 mm²) TDFN package. Simulation models are available.

KEY FEATURES

- Reduces External Components and Total Cost
  - No Schottky-Synchronous Operation
  - Internal Compensation for Any Output Voltage
  - All-Ceramic Capacitors, Compact Layout
- Reduces Number of DC-DC Regulators to Stock
  - Wide 4.5…60 V Input
  - Adjustable 0.9 V to 0.9 × V_{IN} Output
  - Continuous 1 A Current Over Temperature
  - 400 kHz to 2.2 MHz Adjustable Switching Frequency with External Synchronization
- Reduces Power Dissipation
  - Peak Efficiency >92 %
  - Auxiliary Bootstrap LDO for Improved Efficiency
  - 4.65 µA Shutdown Current
- Operates Reliably in Adverse Industrial Environments
  - Hiccup Mode Overload Protection
  - Adjustable Soft-Start
  - Built-In Output-Voltage Monitoring with Active-Low RESET
  - Programmable EN/UVLO Threshold
  - Monotonic Startup into Prebiased Load
  - Overtemperature Protection
  - High Industrial -40…+125 °C Ambient Operating Temperature Range/-40…+150 °C Junction Temperature Range

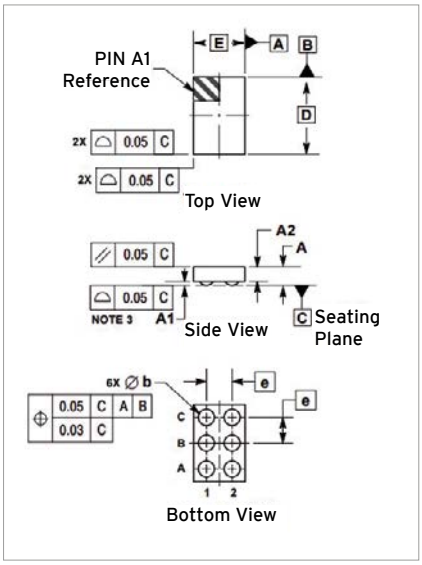
APPLICATION EXAMPLES

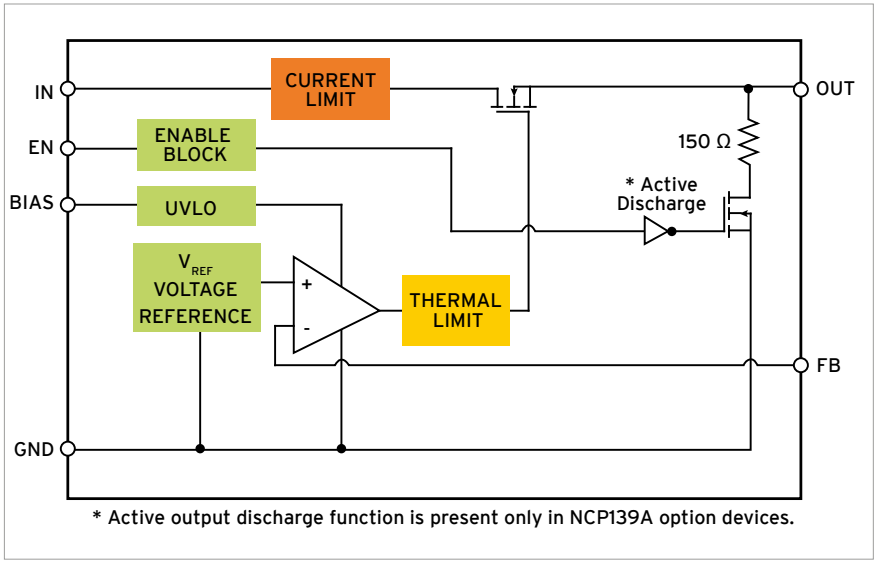
- Base Station Power Supplies
- Distributed Supply Regulation
- General-Purpose Point-of-Load
- High-Voltage, Single-Board Systems
- Industrial Control Power Supplies
- Wall Transformer Regulation

NCP139

CMOS Linear Voltage Regulator (LDO) with Bias Rail, 1 A Very Low Dropout

CLICK OR SCAN





* Active output discharge function is present only in NCP139A option devices.

NCP139 is a 1 A LDO equipped with NMOS pass transistor and a separate bias supply voltage (VBIAS).

The device provides very stable, accurate output voltage with low noise suitable for space constrained, noise sensitive applications.

In order to optimize performance for battery operated portable applications, the NCP139 features low IQ consumption.

The WLCSP6 1.2 × 0.8 mm² package is optimized for use in space constrained applications.

KEY FEATURES

- Ultra-Low Dropout of Typ. 40 mV
- 0.5% Typical Outout Voltage Accuracy
- Guaranteed Output Current from 0 mA to 1 A

APPLICATION EXAMPLES

- Battery - powered and Portable Equipment
- Smartphones, Tablets
- Cameras, DVRs, Camcorders

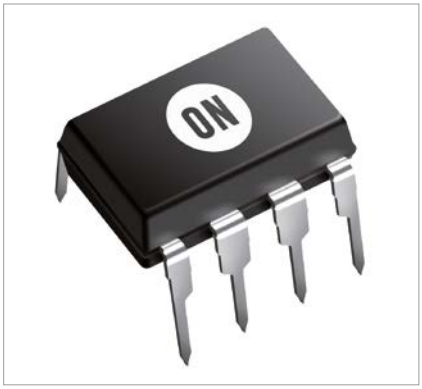
ON Semiconductor®

100-up price	100-up price	100-up price	100-up price
NCP1075AAP065G	NCP1077AAP100G	NCP1076AAP100G	NCP1079AAP100G
€ 0.49	€ 0.49	€ 0.49	€ 0.69

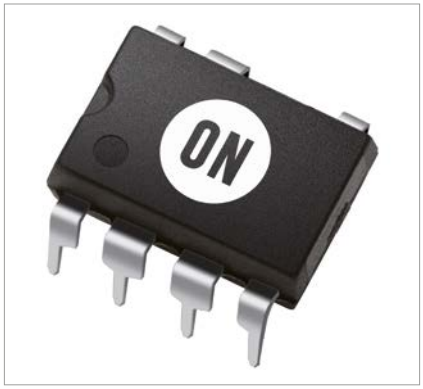
NCP1075, 76-77-79 A & B

Enhanced Off Line Switcher for Robust and Highly Efficient Power Supplies

CLICK OR SCAN



Dip-8 package



Dip-7 package

The NCP1077-76-77-79 A & B products integrate a fixed frequency current mode controller with a 700 V MOSFET.

Available in two different pin-out flavors of the very common PDIP 7 package, the devices offer a high level of integration, including soft start, frequency jittering, short circuit protection, skip cycle, a maximum peak current set point, ramp compensation, and a dynamic self supply (DSS, eliminating the need for an auxiliary winding).

Unlike other monolithic solutions, the NCP1077-76-77-79 A & B is quiet by nature: during nominal load operation, the part switches at one of the available frequencies (65 or 100 kHz). When the output power demand diminishes, the IC automatically enters frequency foldback mode and provides excellent efficiency at light loads. When the power demand reduces further, it enters into a skip mode to reduce the standby consumption down to a no load condition.

Protection features include: a timer to detect an overload or a short circuit event, and Over-voltage Protection with auto recovery.

In addition, AC input line voltage detection prevents lethal runaway in low input voltage conditions (Brown-out) as well as in too high input line conditions (AC line Over voltage Protection). This also allows an over power protection to compensate all internal delays in high input voltage conditions and optimize the maximum output current capability.

For improved standby performance, the connection of an auxiliary winding stops the DSS operation and helps to reduce input power consumption below 50 mW at high line.

KEY FEATURES

- Built-in 700 V MOSFET with $R_{DS(ON)}$ of 13.5 Ω (NCP1075), 4.8 Ω (NCP1076/77) and 2.9 Ω (NCP1079)
- Large creepage distance between high voltage pins
- Current-mode fixed frequency operation – 65/100 kHz
- Fixed slope compensation
- Skip-cycle operation at low peak currents only
- Dynamic Self-Supply: no need for an auxiliary winding
- Internal 10 ms soft-start
- Auto-recovery output short-circuit protection with timer-based detection
- Auto-recovery over-voltage Protection with auxiliary winding operation
- Adjustable brown-out protection and OVP
- 2nd leading edge blanking – current protection
- Over Power Protection
- Frequency jittering for better EMI signature
- No load input consumption <50 mW
- Frequency foldback to improve efficiency at light load
- These are Pb–free devices

APPLICATION EXAMPLES

- Auxiliary & Standby Power Supply
- Major Home Appliances Power Supplies
- Low to medium Power Chargers & Adapters
- White Goods
- E-Meters
- Industrial
- Consumer Equipment Power Supply

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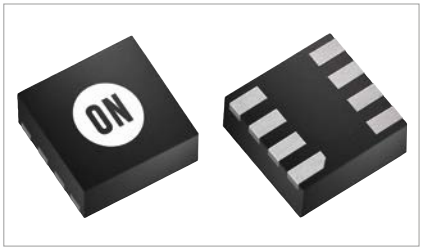
1000-up price	1000-up price	1000-up price	1000-up price
NCP43080DMTTWG	NCP43080ADR2G	NCP43080AMTTWG	NCP43080DMNTWG
€ 0.39	€ 0.39	€ 0.39	€ 0.45

NCP43080

Synchronous Rectifier Controller

CLICK OR SCAN

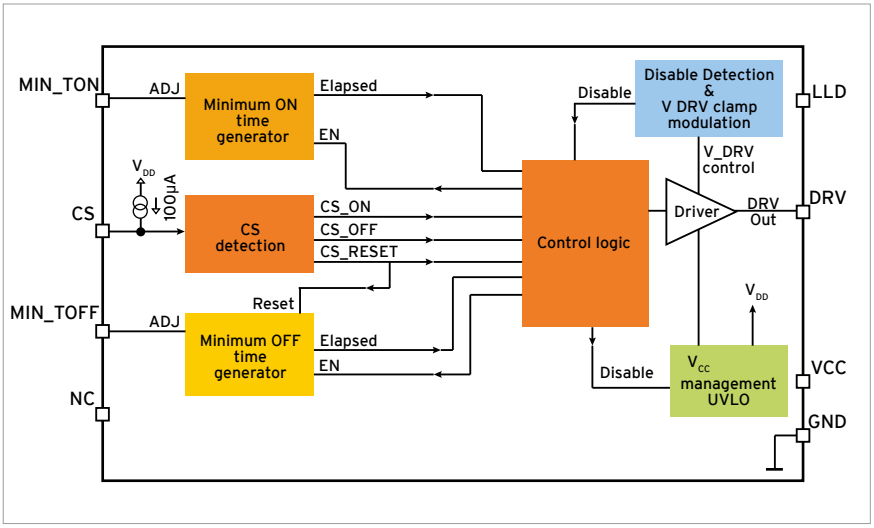


WDFN-8 Package Photo

The NCP43080 is a synchronous rectifier controller for switch mode power supplies. The controller enables high efficiency designs for flyback, quasi resonant flyback and LLC topologies.

Externally adjustable minimum off−time and on−time blanking periods provides flexibility to drive various MOSFET package types and PCB layout. A reliable and noise less operation of the SR system is insured due to the Self Synchronization feature. The NCP4308 also utilizes Kelvin connection of the driver to the MOSFET to achieve high efficiency operation at full load.

The precise turn−off threshold, extremely low turn−off delay time and high sink current capability of the driver allow the maximum synchronous rectification MOSFET conduction time. The high accuracy driver and 5 V gate clamp make it ideally suited for directly driving GaN devices.



Block Diagram NCP43080A, B, C, D

KEY FEATURES

- High efficiency
- Advanced controller parameters
- Self synchronization feature

APPLICATION EXAMPLES

- Notebook Adapters
- High Power Density AC/DC Power Supplies (Cell Phone Chargers)
- LCD TVsAll SMPS with High Efficiency Requirements
- SR for Flyback & LLC
- Notebook Adapters
- Smartphone Chargers
- Tablet Chargers
- AC-DC Power Adapters
- LCD TVs
- Ultra High Density Adapters

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1000-up price	1000-up price	1-up price
L6984ATR	L6984TR	STEVAL-ISA159V1
€ 0.79	€ 0.81	€ 33.-

L6984

36 V 400 mA synchronous step-down switching regulator

CLICK OR SCAN

Evaluation Board

The L6984 is a step-down monolithic switching regulator able to deliver up to 400 mA DC. The output voltage adjustability ranges from 0.9 V.

The fixed 3.3 V V_{OUT} requires no external resistor divider.

The "Low Consumption Mode" (LCM) is designed for applications active during car parking, thus maximizing the efficiency at light load with controlled output voltage ripple.

The "Low Noise Mode" (LNM) keeps the switching frequency almost constant over the load current range, serving low noise application specification like car audio/sensors.

The PGOOD open collector output can implement output voltage sequencing during the power-up phase.

The synchronous rectification, designed for high efficiency at medium - heavy load, and the high switching frequency capability make the size of the application compact.

Pulse-by-pulse current sensing on low-side power element implements an effective constant current protection.

KEY FEATURES

- 400 mA DC output current
- 4.5…36 V operating input voltage
- Synchronous rectification
- Low consumption mode or low noise mode
- 100 µA I_Q at light load (LCM V_{OUT} = 3.3 V)
- 13 µA $I_{Q\text{-}SHTDWN}$
- Adjustable f_{SW} (250…600 kHz)
- Output voltage adjustable from 0.9 V
- No resistor divider required for 3.3 V V_{OUT}
- V_{BIAS} maximizes efficiency at light load
- 350 mA valley current limit
- Constant on-time control scheme
- PGOOD open collector
- Thermal shutdown

APPLICATION EXAMPLES

- Battery powered applications (LCM)
- Car audio and low noise applications (LNM)
- Sensors (LNM)
- E- metering

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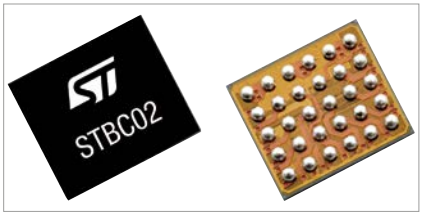
1000-up price	1000-up price	1000-up price
STBC02AJR	STBC02JR	STBC02BJR
€ 1.14	€ 1.14	€ 1.14

STBC02

Li-Ion linear battery charger with LDO, load switches and reset generator

CLICK OR SCAN



STBC02

Eval Board

STBC02 is a highly integrated power management device, embedding a linear battery charger, a 150 mA LDO, 2 SPDT load switches, a smart reset/ watchdog block and a protection circuit module to prevent the battery from being damaged under fault conditions.

The STBC02 uses a CC/CV algorithm to charge the battery; the fast charge and the pre-charge current can be both independently programmed using dedicated resistors. The termination current is set by default, being 5% of the programmed fast charge current, but it can also be fixed to different values.

Likewise, the battery floating voltage value is programmable and can be set to a value up to 4.45 V.

The device also features a charger enable input to stop the charging process at anytime.

STBC02 is automatically powered off from the connected battery when the IN pin is not connected to a valid power source (battery mode).

A battery under/overtemperature condition is detected by using an external circuitry (NTC thermistor).

The STBC02 draws less than 10 nA from the connected battery in shipping mode conditions, so to maximize the battery life during end product shelf life.

The device is available in the Flip Chip 30 package.

KEY FEATURES

- Charges single-cell Li-Ion batteries with CC/CV algorithm and charge termination
- Fast charge current up to 450 mA
- Pre-charge current from 1…450 mA
- Adjustable floating voltage up to 4.45 V
- Integrated low quiescent LDO regulator
- Automatic power path management
- Auto-recharge function
- Embedded protection circuit module (PCM) featuring battery overcharge, battery over-discharge and battery overcurrent protections
- Charging timeout to terminate the charging process for safety reasons
- Shipping mode feature allows battery low leakage when over-discharged
- Very low battery leakage in over-discharge and shutdown mode
- Charge/fault status output
- Battery voltage pin to allow external gauging
- Two 3 Ω SPDT load switches
- Reset generator triggered by USB detection
- SWIRE allows the STBC02 functions to be controlled
- Available in Flip Chip 30, 400 um pitch package
- Rugged ±4 kV HBM, ESD protection on the most critical pins

APPLICATION EXAMPLES

- Smart watches and wearable devices
- Fitness and medical accessories
- Li-Ion and other Li-Poly battery rechargeable equipment

100-up price	100-up price	100-up price
DG411LEDY-GE3	DG412LEDQ-GE3	DG413LEDQ-GE3
€ 0.59	€ 0.69	€ 0.69

DG411LE, DG412LE AND DG413LE

New 3…16 V Enhanced Analog Switches and Multiplexers

CLICK OR SCAN

DG411LE

EBV Elektronik presents DG411LE, DG412LE and DG413LE as part of Vishay's analog switch product families built on advanced silicon process that improves analog circuit performance and reliability.

The DG411LE, DG412LE, and DG413LE are monolithic quad single-pole-single-throw analog switches. The DG411LE and DG412LE differ only in that they respond to opposite logic levels. The DG413LE has two normally open and two normally closed switches. It can be given various configurations, including four SPST (Single Pole - Single Throw), two SPDT (Single Pole - Double Throw), and one DPDT (Dual Pole - Double Throw).

The DG411LE, DG412LE, and DG413LE offer low on resistance of 16 Ω, low parasitic capacitance of 15 pF switch on capacitance, and low charge injection over the signal swing range.

The DG411LE, DG412LE, and DG413LE operate on single and dual supplies. Single supply voltage ranges from 3…16 V while dual supply operation is recommended with ± 3…± 8 V.

Each switch conducts equally well in both directions when on, and blocks input voltages up to the supply levels when off. The DG411LE, DG412LE, and DG413LE are available in 16 lead TSSOP, SOIC, and PDIP packages.

KEY FEATURES

- 3…16 V single supply or ± 3…± 8 V dual supply
- On-resistance $R_{DS(on)}$: 16 Ω
- Low parasitic capacitance:
  - $C_{D(ON)}$: 15 pF
  - $C_{S(OFF)}$: 5 pF
- Less than 8 pC charge injection over the full signal swing range
- Fast switching
  - t_{ON}: 16 ns
  - t_{OFF}: 9 ns
- TTL, CMOS compatible

APPLICATION EXAMPLES

- Automatic test equipment
- Data acquisition systems
- Meters and instruments
- Medical and healthcare systems
- Communication systems
- Audio and video signal routing
- Relay replacement
- Battery powered systems
- Computer peripherals
- Audio and video signal routing

Old base part number	New base part number
DG408L, DG409L	DG408LE, DG409LE
DG411L, DG412L, DG413L	DG411LE, DG412LE, DG413LE
DG441L, DG442L	DG441LE, DG442LE
DG9424, DG9425, DG9426	DG9424E, DG9425E, DG9426E
DG4051, DG4052, DG4053, DG9051, DG9052, DG9053, DG9251, DG9252, DG9253	DG4051E, DG4052E, DG4053E,
DG408,DG9409	DG408E, DG9409E
DG9454	DG9454E

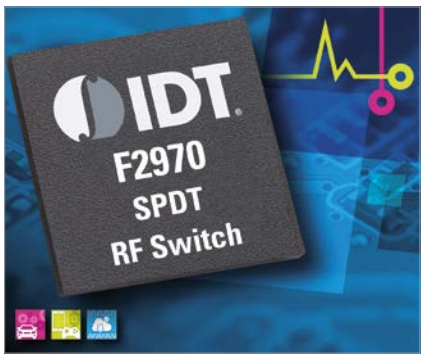
EBV Elektronik
An Avnet Company

100-up price	1-up price
F2970NCGK	F2970EVBI
€ 1.32	€ 104.-

F2970

IDT Introduces an RF Switch Supporting DOCSIS 3.1 Cable Networking Equipment

CLICK OR SCAN



F2970

The F2970 Broadband SPDT absorptive RF Switch is the first in a family of high-linearity 75-Ω switches supporting the next generation of cable standards.

IDT has introduced a new single-pole, double-throw (SPDT) absorptive RF switch optimized for the latest cable networking equipment. The F2970 is a high-linearity 75-Ω broadband switch that supports the DOCSIS 3.1 standard, making it ideal for next-generation cable TV equipment and broadband applications, from the headend to fiber nodes and distribution amplifiers.

The Data Over Cable Service Interface Specification (DOCSIS) is an international standard for the transfer of data via high-bandwidth cable modems. The new 3.1 standard will "fatten" the data pipe to and from the home at a lower cost per bit.

The F2970 delivers high linearity across a wide frequency range of 5…3000 MHz, allowing the switch to be used in both the upstream and downstream signal chains throughout a CATV network. It features composite triple beat (CTB) and composite second order (CSO) of -90 dBc with 77 & 110 channels with output power of 44 dBmV.

The device features a broad operating temperature range of -40…105 °C, low insertion loss of only 0.32 dB at 1200 MHz, and high isolation of 68 dB at 1200 MHz. The F2970 operates with a single positive supply voltage and supports 3.3 V logic.

The device is packaged in a 4 × 4mm² 20L QFN package.

Family Characteristics – High Reliability, High Isolation, Low-Loss Switching

KEY FEATURES

- Freq Range: 5…3000 MHz
- Key RF Performance @ 1.2 GHz
  - IL = 0.32 dB
  - Isolation = 70 dB
  - RL = 18 dB
  - CSO/CTB = -90 dBc
  - P1dB = 31 dBm
- Supply Voltage: 2.7…3.6 V
- Switching Time: 2.7 us
- CMOS compatible control logic
- Op Temp Range: -40…105 °C
- Pin compatible to competitors

APPLICATION EXAMPLES

Applications

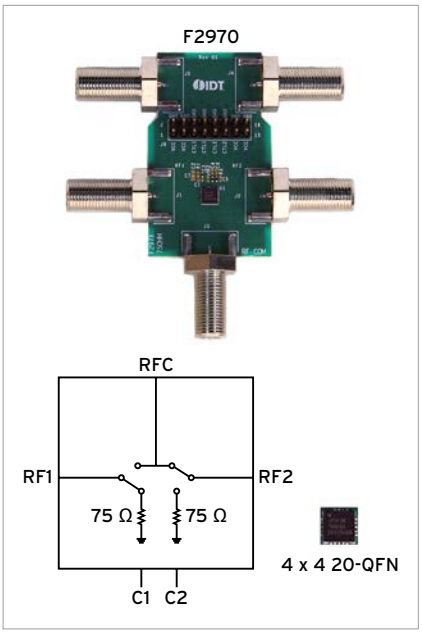
- CATV Infrastructure
- CATV Set-Top Boxes
- CATV Satellite Modems
- Data Network Equipment
- Fiber Networks

Target applications

- CATV/Broadband Applications
- Headend
- Fiber/HFC Distribution Nodes
- Distribution Amplifiers
- Switch Matrix
- DTV Tuner Input Select
- DVR/PVR/Set-top box
- CATV Test Equipment

Application issues solved

- Low insertion loss reduces amplifier requirements
- Highest isolation improves signal integrity
- High linearity across operating freq. range improves system performance
- Higher reliability silicon semiconductor technology



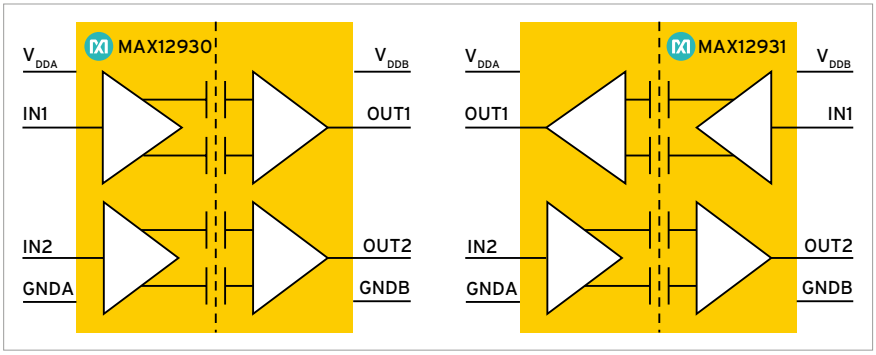
F2970 Board

maxim integrated

100-up price
MAX12931BAWE
€ 1.70

MAX12931
Two-Channel Digital Isolators

CLICK OR SCAN



MAX12931 Functional Diagram

EBV presents the Maxim MAX12930/ MAX12931 family of 2-channel galvanic isolators with ultralow power consumption.

The MAX12930/MAX12931 are a family of 2-channel, 3.75 kV/5 kV_{RMS} digital galvanic isolators using Maxim's proprietary process technology. These devices transfer digital signals between circuits with different power domains while using as little as 0.65 mW per channel at 1 Mbps with 1.8 V.

The two channels of the MAX12931 transfer data in opposite directions, and this makes the MAX12931 ideal for isolating the TX and RX lines of a transceiver. The MAX12930 features two channels transferring data in the same direction.

Both devices are available with a maximum data rate of either 25 Mbps or 150 Mbps and with the default outputs that are either high or low. The default is the state the output assumes when the input is not powered, or if the input is open-circuit. Independent 1.71…5.5 V supplies on each side of the isolator also make the devices suitable for use as level translators.

The MAX12930/MAX12931 are available in an 8-pin, narrow-body SOIC package. In addition, the MAX12931 is available in a 16-pin, wide-body SOIC package. The package material has a minimum comparative tracking index (CTI) of 600 V, which gives it a group 1 rating in creepage tables. All devices are rated for operation at ambient temperatures of -40…+125 °C.

KEY FEATURES

- Robust Galvanic Isolation of Digital Signals
  - Withstands 5 kV_{RMS} for 60 s (VISO) Wide-Body
  - Withstands 3.75 kV_{RMS} for 60 s (VISO) Narrow-Body
  - Continuously Withstands 848 V_{RMS} (VIOWM) Wide-Body
  - Continuously Withstands 445 V_{RMS} (VIOWM) Narrow-Body
  - Withstands ±10 kV Surge between GNDA and GNDB with 1.2/50 µs Waveform
  - High CMTI (50 kV/µs, typ.)
- Options to Support a Broad Range of Applications
  - 2 Data Rates (25 Mbps/150 Mbps)
  - 2 Channel Direction Configurations
  - 2 Output Default States (High or Low)
- Low Power Consumption
  - 1.3 mW per Channel at 1 Mbps with V_{DD} = 3.3 V
  - 3.3 mW per Channel at 100 Mbps with V_{DD} = 1.8 V

APPLICATION EXAMPLES

- Battery Management
- Fieldbus Communications for Industrial Automation
- General Isolation Application
- Isolated RS232, RS-485/RS-422, CAN
- Medical Systems

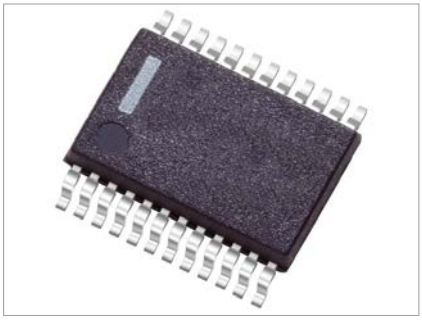
ON Semiconductor®

1000-up price	1000-up price
NCV7240DPR2G	NCV7240ADPR2G
€ 0.99	€ 0.99

NCV7240

8 Channel Low-Side Relay Driver

CLICK OR SCAN



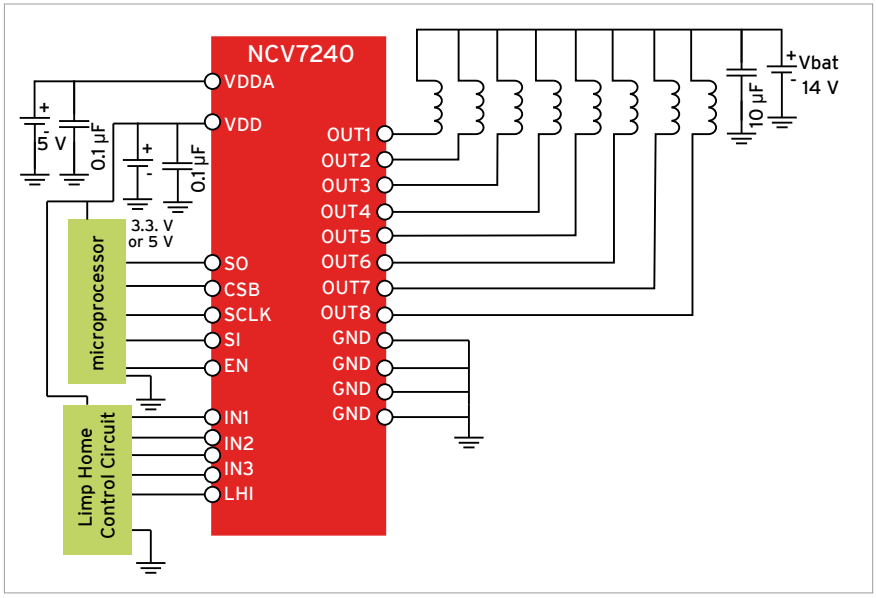
Package photo

NCV7240, an automotive eight channel low side driver, provides drive capability up to 600 mA per channel.

Output control is via an SPI port and offers convenient reporting of faults for open load (or short to ground), over-load, and over-temperature conditions. Additionally, parallel control of the outputs is addressable (in pairs) via the INx pins. A dedicated limp home mode pin (LHI) enables OUT1 thru OUT4 while disabling OUT5 thru OUT8.

Each output driver is protected for over load current and includes an output clamp for inductive loads.

The NCV7240 is available in a SSOP24 fused lead package.



KEY FEATURES

- Microprocessor integration
- Automotive emphasis
- System protection

APPLICATION EXAMPLES

- Relay Driver
- LED Driver
- Stepper Motor Driver
- Automotive Body Control Unit
- Automotive Engine Control Unit

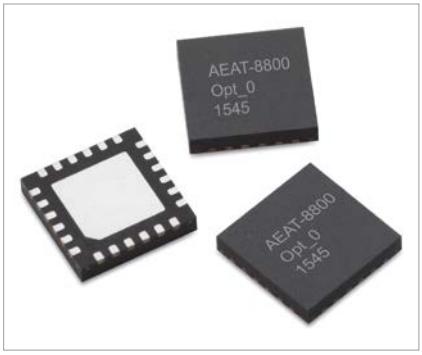
BROADCOM
connecting everything

1000-up price
AEAT-8800-Q24
€ 4.39

AEAT-8800-Q24

10…16-Bit Programmable Angular Magnetic Encoder

CLICK OR SCAN



AEAT-8800-Q24

The Broadcom AEAT-8800-Q24 is an angular magnetic rotary sensor that provides accurate angular measurement over a full 360 degrees of rotation.

It is a sophisticated system that uses integrated Hall sensor elements with complex analog and digital signal processing within a single device.
A simple two-pole magnet generates the necessary magnetic field by rotating it in perpendicular, placed in alignment to the center of the device.

The Broadcom AEAT-8800-Q24 is a versatile solution capable of supporting a broad range of applications with its robust architecture to measure and deliver both absolute and incremental signals. The absolute angle measurement provides an instant indication of the magnet's angular position with a selectable and one-time programmable resolution of 10, 12, 14 or 16 bits. When selected, its positioning data is then represented in its digital form to be assessed through a standard SSI 3 wire communication protocol. Where desired, users may also choose to receive its absolute angle position in PWM-encoded output signals.

The incremental positions are indicated on ABI and UVW signals with user configurable CPR 32, 64, 128, 256, 512, 1024, 2048, and 4096 of ABI signals and pole pairs from 1…8 (2…16 poles) for UVW commutation signals.
An internal voltage regulator allows the AEAT-8800-Q24 to operate at either 3.3 V or 5V supplies.

KEY FEATURES

- 5 V or 3.3 V operation
- Three-wire SSI interface for absolute output
- Selectable 10, 12, 14 or 16 bits of absolute resolution
- Incremental ABI and UVW pins out
- PWM output modes
- User-programmable zero position, direction and index pulse width
- Selectable zero latency mode option to reduce latency to near 0
- Programmable hysteresis
- Easy alignment and calibration mode
- Compact QFN-24 leads (5×5 mm^2) package
- RoHS compliant

APPLICATION EXAMPLES

- Three-phase commutation for a brushless DC motor
- Resolver and potentiometer replacement
- Industrial automation and robotics
- Industrial sewing machine and textiles equipment

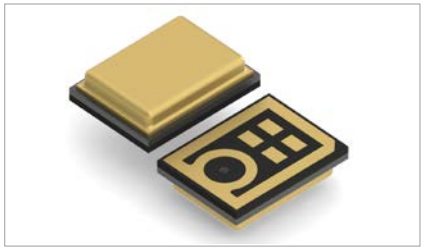
EBV Elektronik
An Avnet Company

1000-up price	1-up price
MP34DB02	STEVAL-MKI155V2
€ 0.59	€ 38.-

MP34DB02

MEMS audio sensor omnidirectional stereo digital microphone

CLICK OR SCAN



MP34DB02

The MP34DB02 is an ultra-compact, low-power, omnidirectional, digital MEMS microphone built with a capacitive sensing element and an IC interface with stereo operation capability.

The sensing element, capable of detecting acoustic waves, is manufactured using a specialized silicon micromachining process dedicated to produce audio sensors.

The IC interface is manufactured using a CMOS process that allows designing a dedicated circuit able to provide a digital signal externally in PDM format.

The MP34DB02 has an acoustic overload point of 120 dBSPL with a high-end 62.6 dB signal-to-noise ratio and -26 dBFS sensitivity.

The device is available in a bottom-port, SMD-compliant, EMI-shielded package and is guaranteed to operate over an extended temperature range from -40…+85 °C.

Associated to MP34DB02, ST is offering a wide range of SW libraries to realize Beamforming, Source Localization, Active Echo Cancellation functions for microphones used in array.

This is added value to final applications which require high quality sound acquisition.

These SW libraries are available in OPEN.Audio integrated in X-CUBE-MEMSMIC1 and can be used with no limitation on STM32 and ST digital microphones.

ST can also provide support on acoustic gasket.

STEVAL-MKI155V2 Evaluation Kit

KEY FEATURES

- Single supply voltage
- Low power consumption
- 120 dBSPL acoustic overload point
- 62.6 dB signal-to-noise ratio
- Omnidirectional sensitivity
- –26 dBFS sensitivity
- PDM single-bit output with option for stereo configuration
- RHLGA package
  - Bottom-port design
  - SMD-compliant
  - EMI-shielded
  - ECOPACK® , RoHS and “Green” compliant

APPLICATION EXAMPLES

- Mobile terminals
- Laptop and notebook computers
- Portable media players
- VoIP

BROADCOM
connecting everything

1000-up price
AFBR-57E6APZ-HT
€ 34.49

AFBR-57E6APZ-HT

Low Power 125 MBd SFP Transceiver for Fast Ethernet & FDDI (-40…+95 °C Temperature)

CLICK OR SCAN

AFBR-57E6APZ-HT

The Broadcom AFBR-57E6APZ-HT is a low power, 125 MBd small form-factor pluggable (SFP) fiber optic transceiver module device designed for Fast Ethernet and fiber distributed data interface (FDDI) applications.

This low power device reduces power consumption by up to 50 % and has an LC duplex connector optical interface and a digital diagnostic monitoring interface (DMI).

The AFBR-57E6APZ-HT is compatible to the SFF-8074i for conventional SFP interface and the SFF-8472 for DMI. By way of 2-wire serial communications as defined in the SFF-8472 MSA, the AFBR-57E6APZ-HT can provide real time information on temperature, LED bias current, LED average output power and receiver average input power. The device also has the ability to monitor the receiver loss of signal (RX_LOS).

The transceiver uses a 1310 nm LED for multimode operation on 50 µ and 62.5 µ fibers with link distances up to 2 km. Data interface for input and output is differential LVPECL.

New Conformal Coating version with LC Connector, DMI for FDDI and Fast Ethernet now available (AFBR-57E6APZC). Conformal coating is a sealing covering of electronic equipment used to protect the PCB and its devices from harsh environments and thus improve FIT and lifetime.

KEY FEATURES

- Low power consumption: 255 mW (typ.), 405 mW (max.)
- Extended operating temperature: -40…+95 °C
- Link distances up to 2 km
- Operates on 50/125 µm and 62.5/125 µm multimode fiber (MMF)
- LC duplex connector optical interface
- Built-in DMI providing real time information on temperature, LED bias current, LED average output power and receiver average input power
- Squelched receiver outputs
- Bail de-latch
- Hot plug capability
- Compatible to SFF-8074i and SFF-8472 MSA specifications
- Compatible with 100BASE-FX version of IEEE 802.3u
- RoHS-compliant and lead-free

APPLICATION EXAMPLES

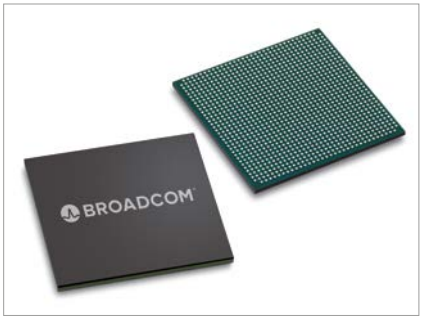
- Industrial / Factory Automation
- Motor Controls
- Fast Ethernet Networking
- FDDI Networking

100-up price	100-up price	100-up price	100-up price
BCM53128KQLEG	BCM53128VKQLEG	BCM53128IQLEG	BCM53128VIQLEG
€ 19.49	€ 21.99	€ 23.39	€ 26.29

BCM53128

Multiport Gigabit Ethernet Switch

CLICK OR SCAN



BCM53128

Highly integrated, cost-effective unmanaged-smart gigabit switch. The switch design is based on the field-proven ROBO architecture.

This device combines all the functions of a high-speed switch system including packet buffers, PHY transceivers, media access controllers (MACs), address management, port-based rate control and a non-blocking switch fabric into a single 65 nm CMOS device. Designed to be fully compliant with the IEEE 802.3™ and IEEE 802.3x specifications, including the MAC-control PAUSE frame, the BCM53128 provides compatibility with all industry-standard Ethernet, Fast Ethernet and Gigabit Ethernet (GbE) devices.

The BCM53128 has a rich feature set suitable for not only standard GbE connectivity for desktop and laptop PCs, but also for next-generation gaming consoles, set-top boxes, networked DVD players and home theater receivers. It is also specifically designed for next-generation Small Office/Home Office and Small/Medium Business routers and gateways.

For documentation and support, visit the Broadcom Community website https://community.broadcom.com

KEY FEATURES

- Nine 10/100/1000 media access controllers
- Eight port 10/100/1000BASE-T/Tx transceivers
- One GMII/RGMII/MII/RvMII/TMII/RvTMII interface for an In-band Management Port (IMP) for connection to a CPU/management entity without PHY
- IEEE 802.1p, MAC, Port, TOS and DiffServ QoS for four queues, plus two time-sensitive queues

APPLICATION EXAMPLES

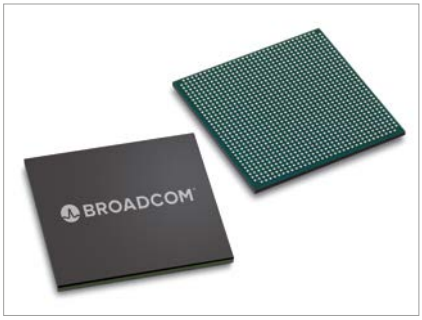
- Home and Small Business Servers (switching)
- Connected Audio + Video

1000-up price	1000-up price	1000-up price	1000-up price
BCM54210EB1KMLG	BCM54210EB1KMLGT	BCM54210EB1IMLG	BCM54210EB1IMLGT
€ 4.89	€ 4.99	€ 5.79	€ 5.89

BCM5421XE FAMILY

10/100/1000BASE-T Gigabit Ethernet Transceiver

CLICK OR SCAN



BCM5421xE

Triple-speed 1000BASE-T/100BASE-TX/10BASE-T Energy Efficient Ethernet (IEEE 802.3az) Gigabit (GbE) transceivers integrated into a single monolithic CMOS chip.

This family of devices performs all physical layer functions for 1000BASE-T, 100BASE-TX and 10BASE-T Ethernet on standard Category 5 Unshielded Twisted-Pair (UTP) cable. 10BASE-T can also run on standard Category 3, 4 and 5 UTP.

The BCM5421xE family is based on the proven digital signal processor technology from Broadcom, combining digital adaptive equalizers, ADCs, phase locked loops, line drivers, encoders, decoders, echo cancellers, crosstalk cancellers, and all other required support circuitry integrated into a single chip.

With full compliance to Energy Efficient Ethernet (IEEE 802.3az) standard, the BCM5421xE substantially lowers power consumption during periods of low-link utilization.

In addition, with Broadcom's AutogrEEEn® technology, the BCM5421xE can be in EEE mode when interfacing with non-EEE enabled MACs, allowing system designers to take advantage of EEE technology and realize power savings today. Optimized for power-intensive Ethernet network applications, the BCM5421xE PHY family is Broadcom's smallest-area, lowest-power single Gigabit PHY.

KEY FEATURES

- Fully compliant to Energy Efficient Ethernet for 1000BASE-T and 100BASE-TX as defined by the IEEE 802.3™-2012 standard
- Broadcom AutoGrEEEn® technology extends EEE power savings to Not Recommended for New Design MACs
- Integrated Wake-on-LAN (WOL) enables remote system activation over the network, reducing system power and complexity
- SyncE+, SyncE, IEEE 1588v2 PTP and ITU-T Y.1731 delay measurement support
- Enhanced cable plant diagnostics that detect cable plant impairments
- The BCM5421xE single-port Gigabit PHY family consists of the following devices:
  - BCM54210E: Single-port RGMII 10/100/1000BASE-T PHY with EEE & WOL
  - BCM54214E: Single-port RGMII 10/100/1000BASE-T PHY with EEE, WOL, SyncE+, SyncE, IEEE 1588v2 PTP & ITU-T Y.1731 delay measurement support
  - BCM54216E: Single-port GMII 10/100/1000BASE-T PHY & WOL
  - BCM54219E: Single-port GMII 10/100/1000BASE-T PHY with EEE, WOL, SyncE+, SyncE, IEEE 1588v2 PTP & ITU-T Y.1731 delay measurement support

APPLICATION EXAMPLES

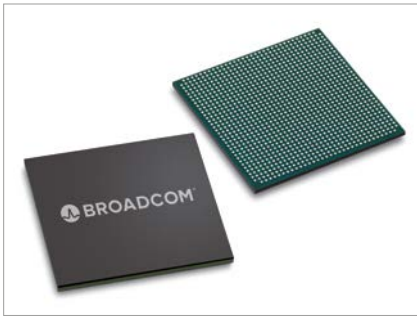
- Ethernet switches and routers for:
  - Carrier
  - Enterprise
  - Small and medium business (SMB)
  - Industrial automation
  - Smart grid markets

100-up price	100-up price	100-up price	100-up price
BCM54220B0KFBG	BCM54220B0IQLEG	BCM54220B0IFBG	BCM54220SB0KFBG
€ 10.39	€ 12.29	€ 12.49	€ 13.79

BCM54220

Dual-Copper Gigabit Ethernet Transceiver

CLICK OR SCAN



BCM54220

The Broadcom® BCM54220 is a fully integrated dual-copper Gigabit Ethernet transceiver with support for Energy Efficient Ethernet (EEE), Synchronous Ethernet (SyncE), and IEEE 1588v2 standards.

The PHY performs all of the physical layer functions for 10BASE-T, 100BASE-TX, 1000BASE-T, on standard Category 5e UTP cable.

The BCM54220 supports both the SGMII and RGMII industry standards. The device is based on the proven digital-signal processor technology of Broadcom, combining digital adaptive equalizers, ADCs, phase locked loops, line drivers, encoders, decoders, echo cancelers, crosstalk cancelers, and all other required support circuitry integrated into a single, monolithic CMOS chip.

Designed for reliable operation over worst-case Category 5e cable plants, the BCM54220 automatically negotiates with any transceiver on the opposite end of the wire to agree on an operating speed. The PHY can also evaluate the condition of the twisted-pair wiring to ensure that the wiring can support operation at Gigabit speeds, and detect and correct most common wiring problems. The device continually monitors both the wiring and the opposing transceiver and alerts the system if it detects potential problems with reliable operation.

KEY FEATURES

- SGMII or RGMII interfaces
- RGMII: 1.8 V HSTL, 2.5 V CMOS, or 3.3 V CMOS
- Support for two power supplies (3.3 V and 1.0 V) or one 3.3 V power supply using the internal voltage regulator.
- Support for IEEE 802.3-compliant copper line interfaces:
  - 1000BASE-T
  - 100BASE-TX
  - 10BASE-T
- IEEE 802.3az Compliant (Energy Efficient Ethernet)
  - Support for native EEE MACs
  - Support for legacy non-EEE MACs using AutogrEEEn® mode
- IEEE 1588v2-compliant
  - One-step or Two-step clock
  - On-chip time-stamping
- ITU-T Y.1731 delay measurement support
  - On-chip time-stamping
  - One-way and Two-way in both directions
- SyncE support
  - Recovered clock and clock lock outputs
- IEEE 802.3bf latency data
- Support for jumbo packets up to 18 KB
- Low-cost 25 MHz crystal option
- Ethernet@Wirespeed™
- Cable plant diagnostics that detect cable plant impairments
- Wake-on-LAN
- Voltage and Temperature Monitors
- Programmable LEDs
- Robust Cable ESD (CESD) tolerance
- Low EMI emissions
- IEEE 1149.1 and IEEE 1149.6 (ACJTAG) boundary scan
- Packages: 128-pin eLQFP and 144-pin FBGA

APPLICATION EXAMPLES

- Ethernet switches and routers for:
  - Carrier
  - Enterprise
  - Small and medium business (SMB)
  - Industrial automation
  - Smart grid markets

ON Semiconductor®

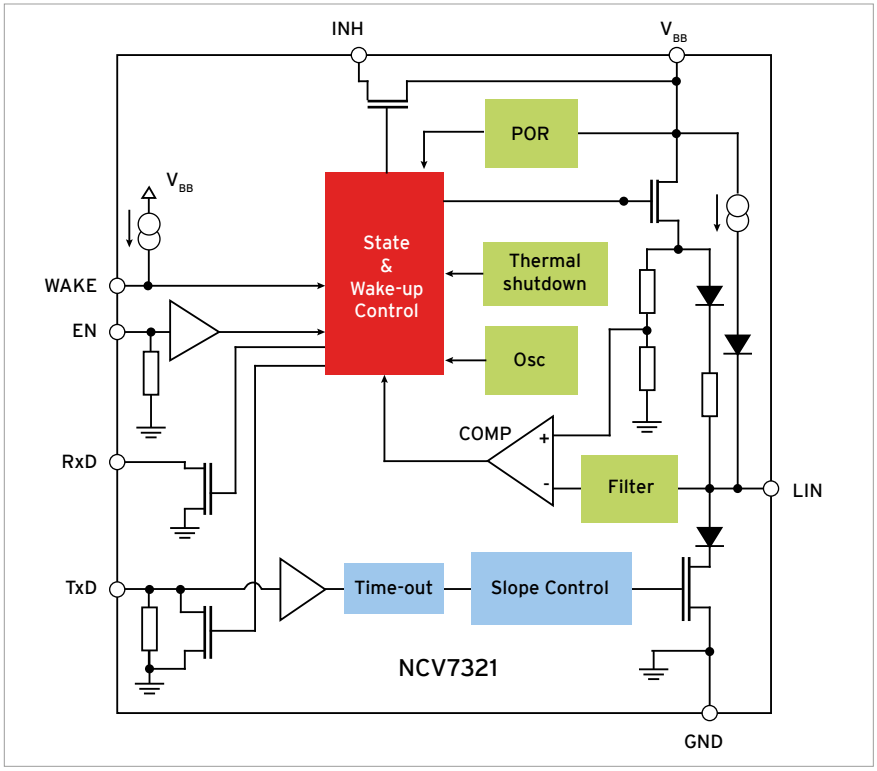
1000-up price	1000-up price	1000-up price
NCV7321D12R2G	NCV7321D11R2G	NCV7321MW2R2G
€ 0.32	€ 0.34	€ 0.35

NCV7321

LIN Transceiver, Stand Alone

CLICK OR SCAN

Product Press Photo



Block Diagram NCV7321

The NCV7321 is a fully featured local interconnect network (LIN) transceiver designed to interface between a LIN protocol controller and the physical bus.

The transceiver is implemented in I3T technology enabling both high-voltage analog circuitry and digital functionality to co-exist on the same chip.

The NCV7321 LIN device is a member of the in-vehicle networking (IVN) transceiver family.

The LIN bus is designed to communicate low rate data from control devices such as door locks, mirrors, car seats, and sunroofs at the lowest possible cost. The bus is designed to eliminate as much wiring as possible and is implemented using a single wire in each node. Each node has a slave MCU-state machine that recognizes and translates the instructions specific to that function. The main attraction of the LIN bus is that all the functions are not time critical and usually relate to passenger comfort.

KEY FEATURES

- Robust ESD performance
- Lower power consumption
- Integrated protection

APPLICATION EXAMPLES

- In-Vehicle Networking
- Automobiles

EBV Elektronik
An Avnet Company

100-up price
AFM906N
€ 1.33

AFM906N RF LDMOS TRANSISTOR

6 Watt, 7.5 V RF Transistor in 4 × 6 mm² DFN Package for VHF and UHF Land Mobile Radios

CLICK OR SCAN

AFM906N 4 × 6 mm² DFN Package

6 W CW over 136-941 MHz, 7.5 V wideband Airfast® RF Power LDMOS transistor.

This is a 6 watt, 7.5 V LDMOS transistor in 4 × 6 mm² DFN SMD package designed for handheld two-way radio applications with frequencies from 136…941 MHz.

The high gain, ruggedness and wideband performance of this device makes it ideal for large-signal, common-source amplifier applications in handheld radio equipment.

KEY FEATURES

- 4 × 6 mm² DFN SMD package
- Characterized for operation from 136…941 MHz
- Unmatched input and output allowing wide frequency range utilisation
- Extreme ruggedness (>65:1 V_{SWR})
- Integrated ESD protection
- Wideband – full power across the band
- High linearity; suitable for TETRA, SSB. etc

APPLICATION EXAMPLES

- Output stage for VHF band handheld LMR radio
- Output stage for UHF band handheld LMR radio
- Output stage for 800…900 MHz handheld LMR radio
- Generic 6 W driver for ISM and broadcast final stage transistors

100-up price MRF1K50GNR5 € 199.-	100-up price MRF1K50NR5 € 199.-

MRF1K50N

1500 W CW over 1.8…500 MHz, 50 V Wideband RF Power LDMOS Transistor

CLICK OR SCAN

Straight lead package

Gull-wing package

Combines very high RF output power with superior ruggedness and thermal performance

This high ruggedness device, MRF1K50N is designed for use in high VSWR industrial, scientific and medical applications, such as laser generation, plasma etching, particle accelerators and MRI scanners, as well as FM radio and VHF broadcast.

Its unmatched input and output design allows for wide frequency range use from 1.8…500 MHz.

KEY FEATURES

- High drain-source avalanche energy absorption capability
- Unmatched input and output allowing wide frequency range utilization
- Device can be used single-ended or in a push-pull configuration
- Characterized from 30…50 V for ease of use
- Suitable for linear application
- Integrated ESD protection with greater negative gate-source voltage range for improved Class C operation
- Recommended driver: MRFE6VS25N (25 W)

APPLICATION EXAMPLES

- Industrial, Scientific, Medical (ISM)
  - Laser generation
  - Plasma etching
  - Particle accelerators
  - MRI and other medical application
  - Industrial heating, welding and drying system
- Broadcast
  - Radio broadcast
  - VHF TV broadcast
- Aerospace
  - VHF omnidirectional range (VOR)
  - HF and VHF communications
  - Weather radar
- Mobile Radio
  - VHF and UHF base stations

1-up price
SIM5300EA S2-106S5
€ 17.99

SIM5300E AND SIM5300EA
WCDMA/HSPA

CLICK OR SCAN

SIM5300EA

The SIM5300EA is a Dual-Band HSPA/WCDMA and Dual-Band GSM/GPRS/EDGE module in a SMT type which supports HSPA up to 7.2 Mbps for downlink and 5.76 Mbps for uplink data transfer.

It has strong extension capability with rich interfaces including UART, USB 2.0, SPI, I²C, etc. With abundant application capability like TCP/UDP/PPP, the module provides much flexibility and ease of integration for customer's application.

Specifications for Data transfer

- HSPA
- Max. 7.2 Mbps(DL), Max.5.76 Mbps(UL)
- WCDMA
- Max.384 Kbps(DL), Max.384 Kbps(UL)
- EDGE Class:Max. 236.8 Kbps(DL),
- GPRSMax. 85.6 Kbps(DL), Max. 85.6 Kbps(UL)
- Specifications for SMS
- Point to point MO and MT
- Text and PDU mode

KEY FEATURES

General features

- Dual-Band WCDMA/HSPA 900/2100 MHz
- Dual-Band GSM/GPRS/EDGE 900/1800 MHz
- GPRS multi-slot class 12
- EDGE downlink only
- Output power
  - UMTS 900/2100: 0.25 W
  - GSM900: 2 W
  - DCS1800: 1 W
- Control via AT Commands
- Supply voltage range: 3.4…4.4 V
- Operation temperature: -40…+85°C
- Dimension: 24 × 24 × 2.4 mm²
- Weight: 3.0 g

Other features

- USB Driver for Microsoft Windows Vista, -7, -8, -10
- USB Driver for Linux/Android
- Firmware update via USB, TCP/IP, PPP

Interfaces

- USB2.0
- UART
- SIM card
- I²C
- GPIO
- RTC
- ADC
- MIC/Receiver (only SIM5300EA)

Certifications

- CE (TBD)
- GCF (TBD)
- ROHS (TBD)
- Reach (TBD)

APPLICATION EXAMPLES

- Tracker
- Health Care
- MID
- PND
- POS

SIMCom
A company of SIM Tech

1-up price
SIM7500E S2-10716
€ 41.99

SIM7500E

LTE cat1 wireless module

CLICK OR SCAN

SIM7500E

The SIM7500E is a Multi-Band LTE-FDD/GSM module solution in an LGA type which supports LTE CAT1 up to 10 Mbps for downlink data transfer.

It has strong extension capability with rich interfaces including UART, USB 2.0, I²C, GPIO etc.

With abundant application capability like TCP/UDP/FTP/FTPS/HTTP/HTTPS/SMTP/POP3 and MMS, the module provides much flexibility and ease of integration for customer's application.

KEY FEATURES

General features

- FDD-LTE B1/B3/B7/B8//B20
- GSM/GPRS/EDGE 900/1800 MHz
- Control Via AT Commands
- Supply voltage range: 3.4…4.2 V
- Operation temperature: -40…+85°C
- Dimension: 24 × 27 × 2.75 mm³
- Weight: 4.0 g
- GNSS gpsOne Gen 8B; standalone, assisted, XTRA

Specifications for Data transfer

- LTE CAT1
  - Uplink up to 5 Mbps
  - Downlink up to 10 Mbps
- EDGE Class
  - Uplink up to 236.8 Kbps
  - Downlink up to 236.8 Kbps
- GPRS
  - Uplink/Downlink up to 85.6 Kbps
- CSDGSM data rate 14.4 Kbps

Other features

- USB Driver for Microsoft Windows 2000/XP/Vista/Win7/Win8
- USB Driver for Windows CE/Mobile
- USB Driver for Linux /Android
- RIL supporting for Android/Windows CE/Mobile
- Automatic installation for windows
- Linux API SDK
- Firmware update via USB
- TCP/IP/IPV4/V6 Multi-PDP,MT PDP
- FTP/FTPS/HTTP/HTTPS/SMTP/POP3/DNS/MMS
- DTMF
- MBIM to Win8Source code of the PC manager of the device for reference

Interfaces

- USB 2.0
- UARTSIM card
- I²C
- GPIO
- ADC
- PCM

Certifications (Plan)

- CE
- ROHS
- REACH

APPLICATION EXAMPLES

- Wearables
- Smart Home
- POS

1000-up price
S2-LPQTR
€ 1.89

S2-LP

Ultra-low power, high performance, sub-1 GHz transceiver

CLICK OR SCAN

S2-LP QFN24 Package

STEVAL-FKI868V1 development kit

The S2-LP is a high performance ultra-low power RF transceiver, intended for RF wireless applications in the sub-1 GHz band.

The device is designed to operate in both the license-free ISM and SRD frequency bands at 433, 868 and 920 MHz, **but can also be programmed** to operate at other additional frequencies in the 430…470 MHz and 860…940 MHz bands.

S2 LP supports **different modulation** schemes: 2(G)FSK, 4(G)FSK, OOK and ASK. The air data rate is programmable from 0.3 to 500 kbps.

It can be used in systems with **channel spacing** of 12.5/25 kHz enabling the narrow band operations.

The S2-LP shows an RF link budget **higher than 140 dB** for long communication ranges and meets the regulatory requirements applicable in territories worldwide, including Europe, Japan, China and the USA.

KEY FEATURES

- Frequency bands:
  - 430…470 MHz
  - 860…940 MHz
- Modulation schemes:
  - 2(G)FSK, 4(G)FSK
  - OOK, ASK
- Air data rate from 0.3…500 kbps
- Ultra-low power consumption:
  - 7 mA RX
  - 10 mA TX @ +10 dBm
- Excellent performance of receiver sensitivity: down to -130 dBm
- Excellent receiver selectivity and blocking
- Programmable RF output power up to +16 dBm
- Bit rate from 0.3…500 kbps
- Programmable RX digital filter
- Programmable channel spacing
- Fast startup and frequency synthesizer settling time
- Automatic frequency offset compensation, AGC and symbol timing recovery
- More than 140 dB RF link budget
- Battery indicator and low battery detector
- RX and TX FIFO buffers
- 4 wires SPI interface
- Automatic packet acknowledgment and retransmission
- Embedded timeout protocol engine
- Antenna diversity algorithm
- Fully integrated ultra-low power RC oscillator
- Wake-up driven by internal timer or external event
- Digital real time RSSI
- Flexible packet length with dynamic payload length
- Programmable preamble and SYNC word quality filtering and detection
- Embedded CSMA/CA engine based on listen-before-talk systems
- IEEE 802.15.4g hardware packet support with whitening, FEC, CRC and dual SYNC word detection
- Wireless M-BUS supported
- Enables operations in the SIGFOX™ networks
- Suitable to build systems targeting:
  - Europe: ETSI EN 300 220, ETSI EN 303 131
  - US: FCC part 15 and part 90
  - Japan: ARIB STD T67, T108
  - China: SRRC
- Operating temperature range: -40…+85 °C

APPLICATION EXAMPLES

- Sensors to Cloud
- Smart metering
- Home energy management systems
- Wireless alarm systems
- Smart home
- Building automation
- Industrial monitoring and control
- Smart lighting systems

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