



**FUTURE
ELECTRONICS**

A WT Microelectronics Company



**NPIs, DESIGN AND
TECHNOLOGY NEWS**



25-viii Connectivity

Wireless chipsets combine Wi-Fi 6/6E and Bluetooth Low Energy connectivity

The AIROC™ CYW5551x series chipsets from Infineon, which offer superior coverage thanks to a large link budget and various range-extending features, support smart control functions in lighting, building automation, and consumer devices.



The reliable, high-performance AIROC CYW5551x chipsets from Infineon combine Wi-Fi® 6/6E and Bluetooth® 6.0 wireless connectivity and a capable controller system.

Offering best-in-class Wi-Fi performance, the AIROC CYW55513 also allows for sensors and lights to be connected over a Bluetooth Low Energy link at very long range. This enables, for instance, intelligent sensors to provide for smart control of lights when the host system senses the presence or absence of people in a conference room, alongside conference bridge functionality.

The CYW5551x series chipsets provide up to 24 dBm of transmit power, and sensitivity down to -101.5 dBm, while supporting Wi-Fi 6/6E range-improving features including long guard intervals, a long OFDM symbol, and dual-carrier modulation.

The CYW5551x chipsets are available for ordering by distribution customers as part of integrated Wi-Fi/Bluetooth modules from Murata, Embedded Artists, Ezurio and u-blox.

The high-performance LBEE5HY2FY-922 Type 2FY module from Murata is supplied in a very small package which facilitates integration into size- and power-sensitive applications, including industrial applications operating at temperatures up to 85°C. The Type 2FY module is also available in an M.2 form factor from Embedded Artists, in the part numbers EAR00511 or EAR00512.

The Ezurio Sona™ IF513 module integrates a power amplifier and low-noise amplifier with a 1 x 1 MU-SISO antenna for reliable connectivity in harsh RF environments. The module is supplied with a Linux Backports package for excellent compatibility with the Linux® operating system.

The u-blox MAYA-W3 module is available in versions with a PCB antenna, a u.fl connector, or antenna pins. The surface-mount package has a footprint of just 10.4 mm x 14.3 mm.

Three members of the CYW5551x family

This AIROC family of single-stream wireless transceivers consists of the tri-band 2.4 GHz/5 GHz/6 GHz CYW55513, the dual-band CYW55512, and the single-band CYW55511. All three chips provide an IEEE 802.11ax-compliant Wi-Fi 6/6E media access controller, baseband and radio, alongside a Bluetooth/Bluetooth Low Energy (LE) 6.0 radio sub-system.

Bluetooth system control is performed by a 192 MHz Arm® Cortex®-M33 processor. The chips support Bluetooth Classic and Bluetooth LE functions running in hosted/controller mode, or in the embedded mode in which the chip relieves the host processor of the burden of running Bluetooth control functions.

The CYW5551x supports various Bluetooth features including LE Audio, LE2 data transfers at 2 Mbits/s, LE1 at 1 Mbit/s, Bluetooth Low Energy long-range (LR) mode, and periodic advertising extensions.



FEATURES

- Network offload power saving features
- WPA2 and WPA3 security
- SDIO and GSPI Wi-Fi host interfaces
- UART and SDIO Bluetooth host interfaces
- 39 GPIOs
- Security features:
 - Secure boot
 - Encryption
 - Authentication

APPLICATIONS

- Smart home equipment
- IoT and industrial IoT devices
- IP cameras and video doorbells
- Smart door locks
- Appliances
- Smart watches
- Smart glasses
- Sensors
- Smart speakers
- Smart lighting



10110 INFORMATION



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TELECOMS

Wireless module offers easy way to implement Bluetooth connectivity

The STMicroelectronics STM32WBA5MMG, a complete multi-protocol system including crystals and antenna, is supplied pre-certified, and is backed by a software package including radio protocol stacks.



The STMicroelectronics STM32WBA5MMG is a complete 2.4 GHz wireless module which supports the implementation of Bluetooth® Low Energy v5.4, Zigbee® 3.0 and OpenThread connectivity in an embedded system design.

Based on the STM32WBA55UG wireless microcontroller, the module is supplied with royalty-free RF protocol software, and is suitable for use by any developer, no matter the level of their RF expertise and knowledge. The module incorporates the external components required to implement a short-range wireless transceiver, including 32 MHz and 32 kHz crystals and an integrated antenna. An external antenna option is also available.

The use of a module provides for accelerated time to market as the device can be implemented in a simple, low-cost 2-layer PCB design. It is supplied with a comprehensive set of certifications, including CE, FCC, ISED, MIC, RoHS and REACH.

The module is suitable for low-power applications requiring Bluetooth Low Energy connectivity. It also supports IEEE 802.15.4 radio signaling for Thread and Zigbee networking, including in concurrent communication mode.

The STM32WBA5MMG provides best-in-class RF performance thanks to its good receiver sensitivity and high output signal power. Advanced security features protect both the module and its data.

Developers working with the STM32WBA5MMG can benefit from the STM32CubeWBA, a free software package which includes a hardware abstraction layer, low-level application programming interfaces, Arm® CMSIS support, a file system, real-time operating system, RF protocol stacks, and code examples.

The STM32WBA5MMG is supplied in a SiP-LGA76 package with a 12.5 mm x 8.0 mm footprint.



FEATURES

- Arm Cortex®-M33 CPU with TrustZone execution environment
- 1 Mbyte Flash memory with error correction code
- 128 kbytes of SRAM
 - Includes 64 kbytes with parity check
- 512 bytes of one-time programmable memory
- Power-supply range: 1.71 V to 3.6 V
- SMPS and ultra-low power modes for longer battery run-time
- Output power up to +10 dBm programmable in 1 dB steps
- Receive sensitivity:
 - -96 dBm for Bluetooth Low Energy networking at 1 Mbit/s
 - -97.5 dBm for IEEE 802.15.4 at 250 kbits/s
- Security features:
 - Supports secure firmware installation
 - AES cryptographic accelerators
 - True random number generator
 - Flash read-out and hide protection
 - Tamper detection

APPLICATIONS

- Smart thermostats
- Tracking devices
- Smart chargers
- Headsets
- Power tools
- Smart meters
- Building automation
- Smart city equipment

FREE DEV BOARD

Connectivity expansion board for Bluetooth wireless module.

Orderable Part Number
B-WBA5M-WPAN

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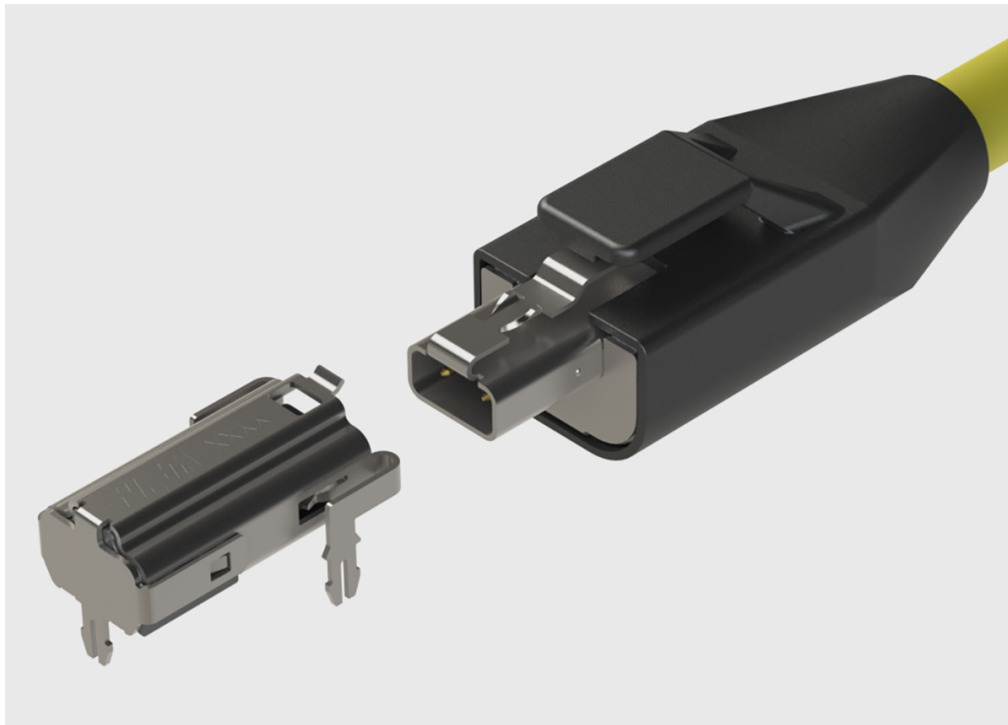
CONSUMER



TELECOMS

New connector range supports space-saving single-pair Ethernet installations

The 6780 series of connectors from KYOCERA AVX provides a standards-compliant way to produce single-pair Ethernet equipment, simplifying network architectures and lowering bill-of-materials and installation costs.



FEATURES

- Mounting styles:
 - IP20 plug: 2P-K
 - IP20 jack: 2J-L
- Operating temperature up to 85°C
- Cable sizes from 18 AWG to 26 AWG

APPLICATIONS

- Robots
- Industrial automation
- Sensor and actuator networks
- Control and monitoring cameras
- Smart grid equipment
- Traffic control systems
- Transportation smart monitoring equipment

The 6780 series of connectors from KYOCERA AVX helps industrial equipment manufacturers to take advantage of the space- and cost-saving benefits of single-pair Ethernet (SPE) equipment.

In SPE, signals are transmitted over only one pair of twisted copper wires. In addition to data transmission via Ethernet, SPE also enables the simultaneous supply of terminal devices via the power over data line (PoDL) protocol. Previously, this required two pairs for Fast Ethernet, with a maximum 100 Mbytes/s data rate, and four pairs for Gigabit Ethernet.

SPE equipment connected via the 6780 series connectors gives OEMs the benefits of space and weight savings using less wire, and offers end users lower installation costs. The simplified Ethernet connection also enables a continuous communications link from the control computer to the sensor at data rates from 10 Mbits/s to 1 Gbit/s, and over a range up to 1 km. By facilitating a transition to an all-Ethernet infrastructure, SPE equipment enables the replacement of analog interfaces, bus systems and other proprietary field-level systems.

The 6780 series connectors comply with the IEC 63171-6 and IEEE 802.3 standards governing SPE equipment.



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TELECOMS

New MPU ideal for HMI systems performing AI acceleration and edge computing

The 64-bit RZ/G3E microprocessor, which integrates a quad-core CPU, a neural processing unit (NPU), high-speed connectivity and advanced graphics, is capable of running a human-machine interface (HMI) with a full HD display.



Renesas has announced the launch of its 64-bit RZ/G3E microprocessor, which provides the computing, AI and graphics capabilities required in high-performance HMI applications.

Featuring a quad-core Arm® Cortex®-A55 CPU running at up to 1.8 GHz as well as a Cortex-M33 microcontroller core, the RZ/G3E combines high-performance edge computing with an Arm Ethos™-U55 NPU for fast local AI inferencing. This architecture efficiently runs AI applications such as image classification, object recognition, voice recognition and anomaly detection while minimizing the load on the CPU.

The MPU's graphics capabilities include rendering smooth Full HD video at 60 frames/s on two independent displays, via output interfaces including dual-link LVDS, MIPI-DSI, and parallel RGB. A MIPI-CSI camera interface is also available for video input and sensing applications.

The RZ/G3E is equipped with a range of high-speed communication interfaces which are useful in edge devices. These include 2-lane PCI Express 3.0 at data rates up to 8 Gbits/s, USB 3.2 Gen2 for fast 10 Gbits/s data transfers, and dual-channel Gigabit Ethernet for seamless connectivity with cloud services, storage, and 5G modules.

Low power consumption in standby mode

The MPU includes advanced power management features. The RZ/G3E maintains sub-CPU operation and peripheral functions while consuming only around 50 mW, and around 1 mW in deep standby mode. The device supports DRAM self-refresh mode to retain memory data, enabling quick wake-up from deep standby for applications running on a Linux® operating system.

Renesas also offers Verified Linux Package software based on the reliable Civil Infrastructure Platform, with over 10 years of maintenance support. In addition, Linux BSP Plus includes support for the latest LTS Linux kernel and the Yocto Project build environment.

RENESAS

FEATURES

- H.264/H.265 video codecs
- 1-channel memory controller for LPDDR4-3200 or LPDDR4X-3200 DRAM with a 32-bit bus width
- Operating-temperature range: -40°C to 125°C
- Package options:
 - 15mm2 529-pin FCBGA
 - 21mm2 625-pin FCBGA
- 15 years product longevity

APPLICATIONS

- Industrial HMIs
- Industrial PCs
- Multi-function printers
- Medical HMIs
- Smart retail equipment
- Home security equipment
- Smart doorbells
- Smart thermostats
- EV chargers

FREE DEV BOARD

Evaluation board kit for 64-bit MPU with AI accelerator.

Orderable Part Number
RZ/G3E-EVKIT

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TELECOMS

Lithium battery charger IC enables faster and more efficient cell balancing

The MPQ2645 from Monolithic Power Systems is a battery charger IC which provides superior charge distribution across a battery of up to five cells. It supports various lithium battery chemistries, as well as supercapacitors.



MPS

FEATURES

- 40 V maximum stack voltage
- Directly powered from battery cells
- AEC-Q100 Grade 1 qualified
- Pack over-voltage protection
- Thermal shutdown protection
- 4 mm x 4 mm QFN-19 package

APPLICATIONS

- Electric vehicle batteries
- Battery energy storage systems:
 - Industrial
 - Residential
 - Grid-level
- General-purpose battery stacks

Monolithic Power Systems has launched the MPQ2645, a battery charger IC which provides a complete system for controlling the charge current to up to five lithium battery cells, while actively balancing the charge across the cells to maximize the battery's energy capacity and extend its lifetime.

A single MPQ2645 can redistribute charge between five series cells in a lithium-ion, lithium polymer, or lithium iron phosphate battery, or a supercapacitor power supply. The charger IC, a bidirectional buck-boost active balancer, can be configured to supply up to 3.75 A of charge redistribution. Its proprietary active cell balancing technology efficiently moves charge between cells to provide for much faster balancing and less heat generation than in conventional passive cell balancing systems. The MPQ2645 can also compensate for cell capacity mismatch.

The MPQ2645 is easily controlled via a robust single-wire interface. Up to eight MPQ2645 can be connected in a cascade topology to enable charging and cell balancing of battery packs with up to 33 cells in series.



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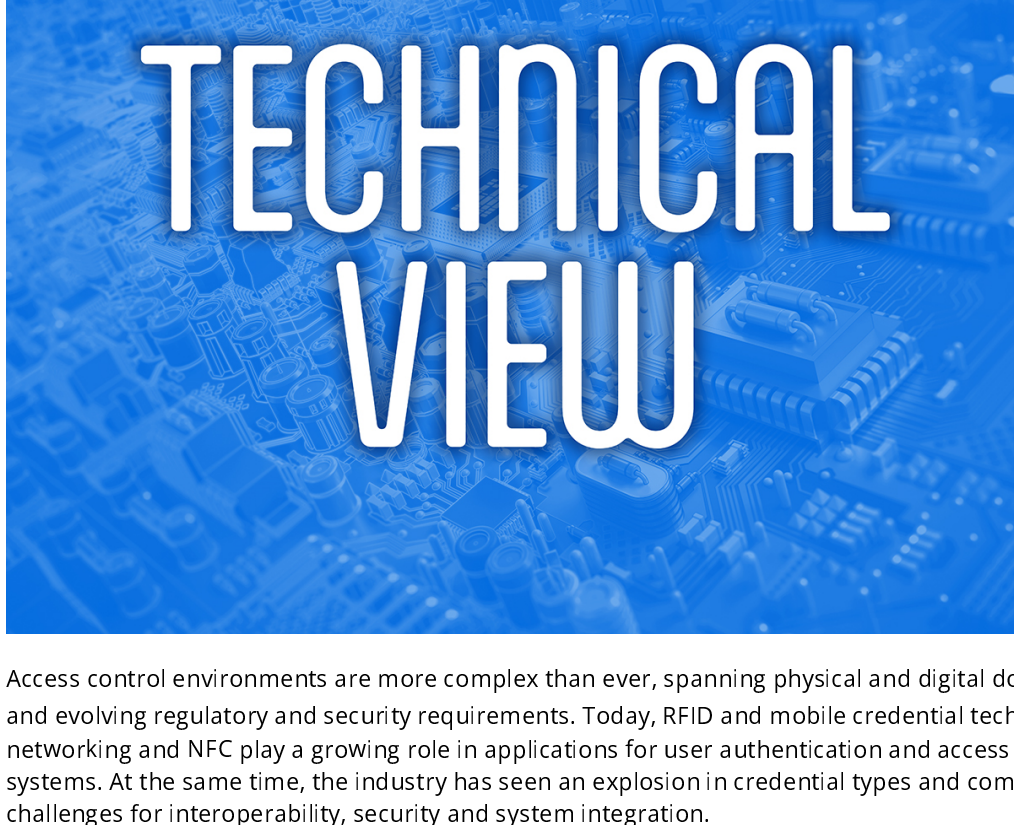
CONSUMER



TELECOMS

Design insight: how to choose the right RFID reader

Across applications as varied as electric vehicle (EV) charging, secure print management, and physical access control, the right RFID reader can play a valuable role in the system's functionality and security while promoting compliance with relevant standards.



ELATEC
RFID Systems

Access control environments are more complex than ever, spanning physical and digital domains, multiple credential technologies, and evolving regulatory and security requirements. Today, RFID and mobile credential technologies such as Bluetooth® Low Energy networking and NFC play a growing role in applications for user authentication and access control for both physical spaces and digital systems. At the same time, the industry has seen an explosion in credential types and communication protocols, creating new challenges for interoperability, security and system integration.



This means that the choice of RFID reader has a big impact on the system's flexibility and future-readiness. This six-step guide shows how to choose the best type of RFID reader for any given application.

1: Define the use case and security requirements

The first step in choosing the right RFID reader is understanding exactly how and where it will be used. Start by identifying the application: EV chargers, secure print managers, vending machines, physical access control and single sign-on systems each present different technical and security problems. In some cases, it might be necessary to integrate multiple use cases across departments or facilities, or even to merge physical and logical access into a unified solution. The reader must be flexible enough to support a range of credentials and systems through a single device, ensuring consistent security and a seamless user experience across access points.

The operating environment and the level of access control needed also have an impact. A reader used for basic office entry will have different requirements from one deployed in a healthcare facility, research laboratory or military base. Sensitive environments may require support for advanced encryption, secure communication protocols or multi-factor authentication.

2: Consider existing infrastructure and legacy systems

The next step is to assess the current infrastructure. In many cases, the RFID reader needs to fit into an existing ecosystem of ID cards, back-end software, physical devices and communication protocols. The need for compatibility with this legacy equipment can substantially affect both cost and implementation speed.

Legacy systems may use protocols such as Wiegand or RS-232, while newer systems rely on modern interfaces such as Open Supervised Device Protocol (OSDP) or USB. The right RFID reader should be able to interface with all, especially in mixed environments or during phased upgrades. Choosing a reader which bridges old and new ensures a smoother upgrade path and reduces the total cost of ownership.

The engineer should also consider the question of physical integration: will the reader need to match a specific size or housing? Does it need to be retrofitted into an existing device or panel?

3: Choose the right technologies

Credential technology is evolving quickly: readers must be able to support a wide range of formats to meet current needs and to adapt to what comes next.

A universal, technology-agnostic RFID reader gives the flexibility to bridge legacy systems, meet today's security standards, and embrace future innovations such as mobile credentials.

There are various ways in which reader technology has evolved:

- From LF to HF RFID: legacy 125 kHz low-frequency (LF) credentials are still sometimes used in access applications, but they do not support strong encryption, and are vulnerable to cloning. Most organizations have moved to modern 13.56 MHz high-frequency (HF) card formats such as the MIFARE® DESFire® standard, which offer stronger security features and better support for regulatory compliance.
- From physical badges to mobile credentials: more organizations are moving to mobile access solutions using smartphones and wearables. Bluetooth Low Energy networking and NFC technologies enable fast, contactless authentication which enhances user convenience without sacrificing security.
- From generic mobile support to platform-native integrations: advanced mobile credentialing platforms, such as Employee Badge in Apple Wallet and Google Wallet, are rapidly being adopted in enterprise and institutional settings. These require RFID readers that can support mobile wallets natively, across devices for both iOS and Android™ operating environments.
- Standards-based credentials: highly secure, standards-based credentials, such as Public Key Open Credential (PKOC), are gaining traction. These credentials support both cards and mobile devices over NFC or Bluetooth networks, and use asymmetric cryptography to provide stronger security and future-proofing.

A universal reader supports all of the above, helping users to manage hybrid environments today while paving the way for a secure, streamlined mobile-first future. A technology-agnostic, universal reader ensures broad compatibility across both legacy and modern formats, including encrypted HF cards and advanced mobile credentials. This allows organizations to maintain continuity while planning for a secure and seamless upgrade to mobile access in the future.

4: Ensure global readiness and regulatory compliance

If a system is to be deployed across multiple regions or in regulated environments, the reader must meet all required certification requirements and security standards. Different countries have different regulations and certification schemes, and industries such as healthcare, education and government often have strict data privacy and cybersecurity requirements.

Choosing a globally certified, security-conscious reader reduces deployment friction and helps to ensure compliance wherever the system is deployed.

This means that there is great value in RFID readers which are pre-certified for key markets. CE marking for Europe and FCC approval for the US help to streamline international deployment.

It is also important to be aware of the cybersecurity and data privacy standards which apply locally, such as GDPR and NIS2 in the European Union and FERPA, HIPAA and NIST in the US. These standards affect the way that access data is collected, transmitted and stored, making secure credential handling and encrypted communication essential.

5: Evaluate total cost of ownership

When selecting an RFID reader, it is prudent to look beyond the advertised purchase price. The total cost of ownership includes not just the upfront hardware cost, but also the costs of installation, integration, and maintenance, as well as the scope to adapt the reader over time.

It is also important to take account of the cost of the credentials themselves: cost calculations must include both the reader and the associated credential technology, such as LEGIC, LEAF, or MIFARE, which can vary greatly in price and licensing structure. Choosing a reader designed for longevity and flexibility can save considerable time and money in the future.

A reader which cannot be updated or reconfigured may require full replacement or expensive on-site technician time when credential types, regulations or integration need to change. By contrast, a reader with remote update capabilities and flexible software settings can extend its useful life, reducing long-term costs and minimizing disruption.

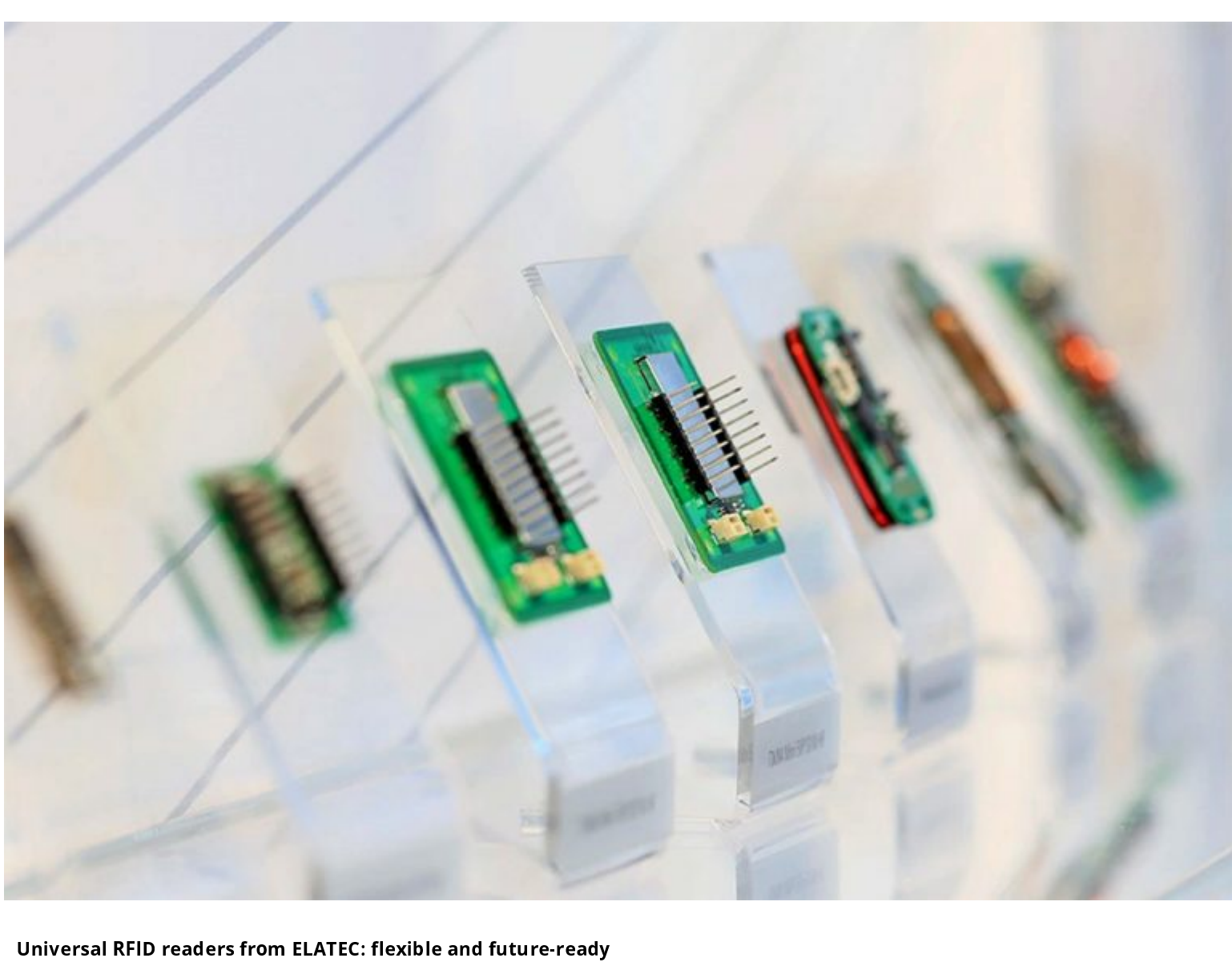
6: Plan for scalability and future flexibility

The ideal RFID reader should be able to grow over time as the needs of the application change. Flexibility is useful as much for a phased roll-out across multiple locations, as for expansion of a unified access system, or the implementation of new infrastructure, credential types or security requirements.

Readers should be capable of being reconfigured to support new credential technologies, such as mobile access via Bluetooth or NFC, without requiring hardware replacement. Scalable readers reduce long-term costs, support evolving access strategies, and ensure that an access control solution stays up to date in a rapidly changing environment.

Future-ready readers should offer:

- Robust software support: a full-featured software development kit enables integration into diverse systems and supports the addition of new functionality over time, from credential recognition to device behavior.
- Configurable firmware: readers with flexible firmware can be adapted for new use cases, security requirements, or credential types, without the need for custom hardware.
- Remote update capabilities: remote management allows the deployment of firmware updates, reconfigured settings, or the roll-out of new features across distributed devices without manual intervention, saving time and reducing downtime.
- Credential flexibility: readers which can change or add new credential types can evolve with a changing ecosystem, cyber requirements and modernization.



Universal RFID readers from ELATEC: flexible and future-ready

The latest universal RFID readers from ELATEC simplify access control while expanding the potential to add new security and convenience features. A universal RFID reader enables broad compatibility across technologies, systems, and geographies rather than locking the operator into narrow use cases or single-credential ecosystems. This results in easier integration, fewer part numbers to manage, and a clear path forward as credential standards and security needs evolve.

It also enables a unified access environment which brings physical and digital access together for better security, a smoother user experience, and easier system management.

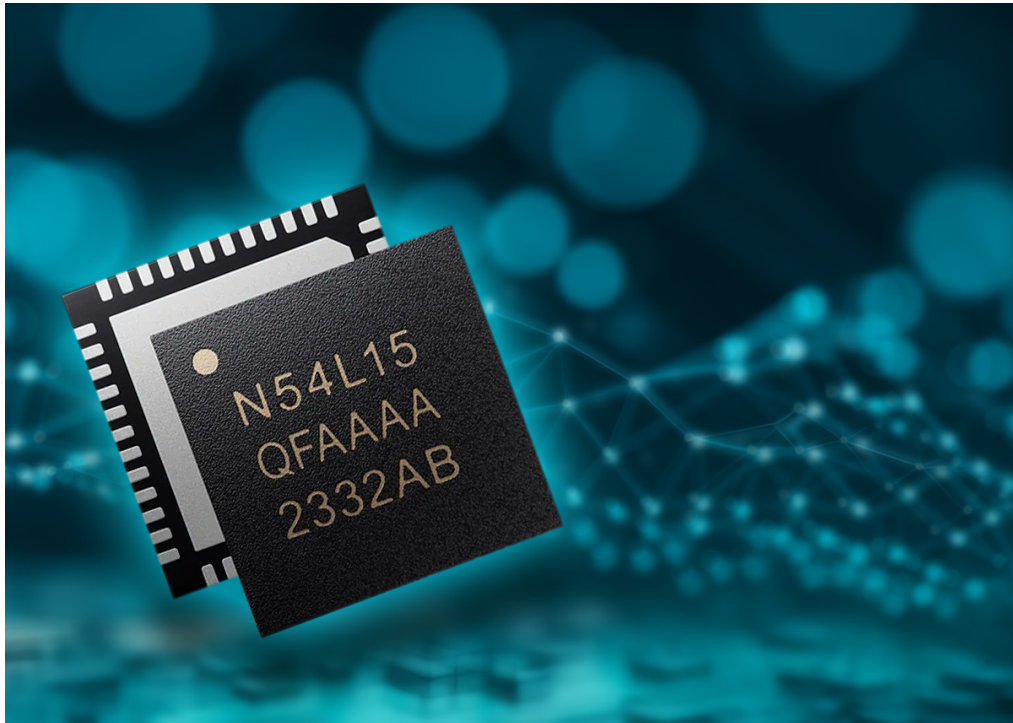
The TWN4 family of RFID readers from ELATEC offers a wide selection of universal, technology-agnostic readers for almost any access application, backed by excellent software and service. The ELATEC universal TWN4 readers are:

- Technology-agnostic
- Mobile-ready
- Globally certified
- Easy to integrate
- Secure
- Configurable
- Future-ready

ELATEC technologies are designed for interoperability, and are not bound by a single credential platform or vendor ecosystem. That means more freedom, more flexibility, and fewer limitations as the system evolves.

New 2.4 GHz SoCs for Bluetooth and other protocols operate at ultra low-power

Nordic Semiconductor has launched the nRF54L series of wireless systems-on-chip (SoCs), offering even lower power consumption, faster processing and longer battery run-time than its earlier nRF52 series.



The new nRF54L series from Nordic Semiconductor are ultra low-power wireless SoCs which support multiple communications protocols operating in the 2.4 GHz band. The SoCs in the nRF54L series are suitable for products using Bluetooth® Low Energy, Bluetooth Mesh, Zigbee, Thread, Matter, Amazon Sidewalk, and proprietary 2.4 GHz protocols.

The nRF54L series consists of the nRF54L15, nRF54L10 and nRF54L05. All the wireless SoCs in the series integrate a multi-protocol 2.4 GHz radio and microcontroller functionality based on a 128 MHz Arm® Cortex®-M33 processor. The ultra low-power consumption is enabled by a new fourth-generation radio, three times better processing efficiency thanks to the Cortex-M33 CPU, and the use of proprietary fabrication technologies implemented on a 22 nm process node.

All SoCs in the series are equipped with the same set of standard peripherals and high-speed serial interfaces. The series features a 14-bit ADC for high-resolution analog sensor measurements, and a global real-time clock capable of running in System OFF mode, drawing just 0.8 µA at 3.0 V.

An integrated RISC-V co-processor is available to offload time-critical tasks from the main Cortex-M33 processor when it is occupied by protocol stack operations. In some cases, the co-processor can even eliminate the need for an external MCU for real-time functions.

The nRF54L series offers a selection of memory size options in devices supplied in pin-compatible QFN packages. The nRF54L15 offers the largest memory capacity in the nRF54L series: 1.5 Mbytes of non-volatile memory and 256 kbytes of RAM, making it suitable for the most demanding applications. In addition, the nRF54L15, which is also available in a 2.4 mm x 2.2 mm CSP package, can run a Wi-Fi® networking protocol stack for the nRF70 series companion ICs.

Memory capacity is lower in the nRF54L10 and nRF54L05: 1.0 Mbyte of non-volatile memory with 192 kbytes of RAM in the nRF54L10, and 0.5 Mbytes of non-volatile memory and 96 kbytes of RAM in the nRF54L05.



NORDIC
SEMICONDUCTOR

FEATURES

- Cortex-M33 MCU core:
 - 500 CoreMark® score running from non-volatile memory
 - Single-precision floating-point unit
 - Memory protection unit
 - Digital signal processing instructions
- Advanced security functions:
 - Secure boot
 - Secure firmware update
 - Secure storage
 - Cryptographic accelerator
 - Side-channel leakage protection
 - Integrated tamper detector
- Five SPI/two-wire/UART interfaces including one high-speed SPI/UART
- I2S interface
- PWM interface
- Pulse density modulation interface
- NFC interface
- Up to two quadrature decoders
- Comparator and low-power comparator
- Temperature sensor

APPLICATIONS

- Consumer electronics
- Portable devices
- IoT devices

FREE DEV BOARD

Dev kit enables rapid evaluation of 2.4 GHz wireless SoCs.

Orderable Part Number
nRF54L15 DK

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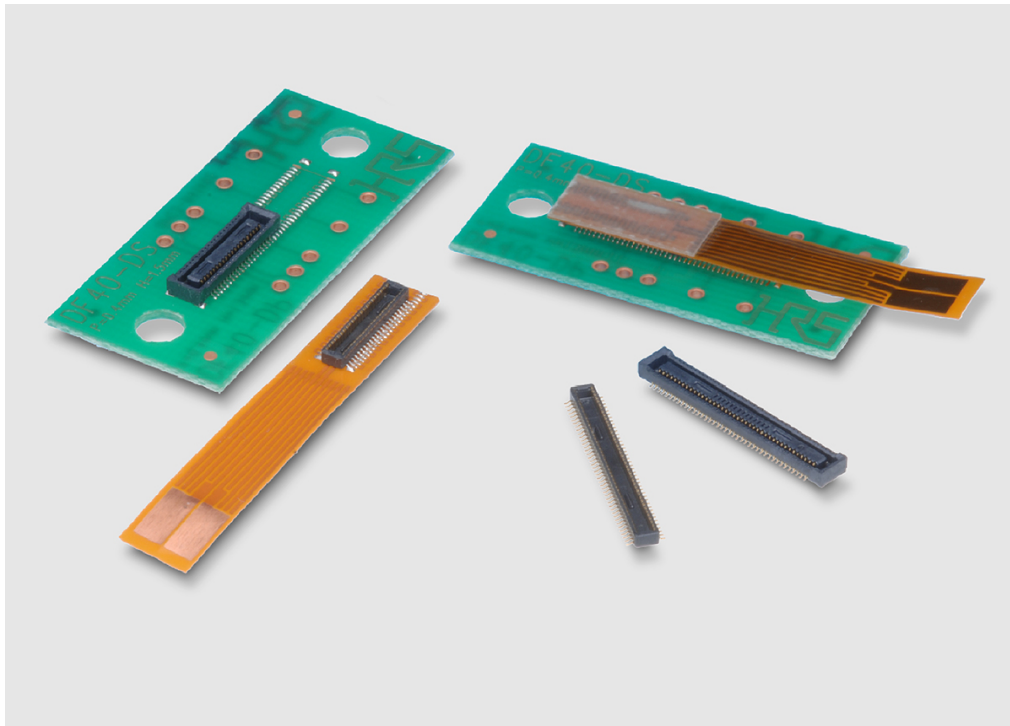
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TELECOMS

Compact connectors offer secure connection and easy unmating

The Hirose DF40 series of connectors, available in board-to-board and FPC-to-board configurations, supports high-speed applications with a 10 Gbits/s data rate and conformity to USB4[®] v2.0 specifications.



HRS HIROSE
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FEATURES

- 0.4 mm contact pitch
- Between 10 and 120 contacts
- 0.3 A rated current
- 50 V ac/dc rated voltage
- Operating-temperature range: -55°C to 85°C
- 30 mating cycles

APPLICATIONS

- Digital cameras
- Home appliances
- Audio devices
- Gaming devices
- Small industrial equipment
- Portable consumer devices

The DF40 series of shielded flexible printed circuit FPC-to-board and board-to-board connectors from Hirose supports high-speed signal transmission at rates up to 10 Gbits/s, making it suitable for use in products conforming to the specifications of the USB4 specification v2.0 standard. At just 3.38 mm deep, the DF40 series connectors occupy a small board mounting area.

The connectors' robust, metal-blade lock has a sliding mechanism to provide a secure connection. This is ideal for applications that must be able to withstand drop impacts. A positive tactile click can be felt when mating to confirm correct engagement. A vacuum pick-and-place area is available for automatic placement.

Guide ribs provide a wide self-alignment range of ± 0.33 mm in the x and y directions to simplify mating. The user-friendly connector offers an effective mating length of 0.45 mm, providing high contact reliability.

In addition to the standard DF40 series, Hirose also offers:

- DF40T, DF40GT, DF40F series of heat-resistant and/or floating versions for automotive applications
- DF40GL, a shielded version



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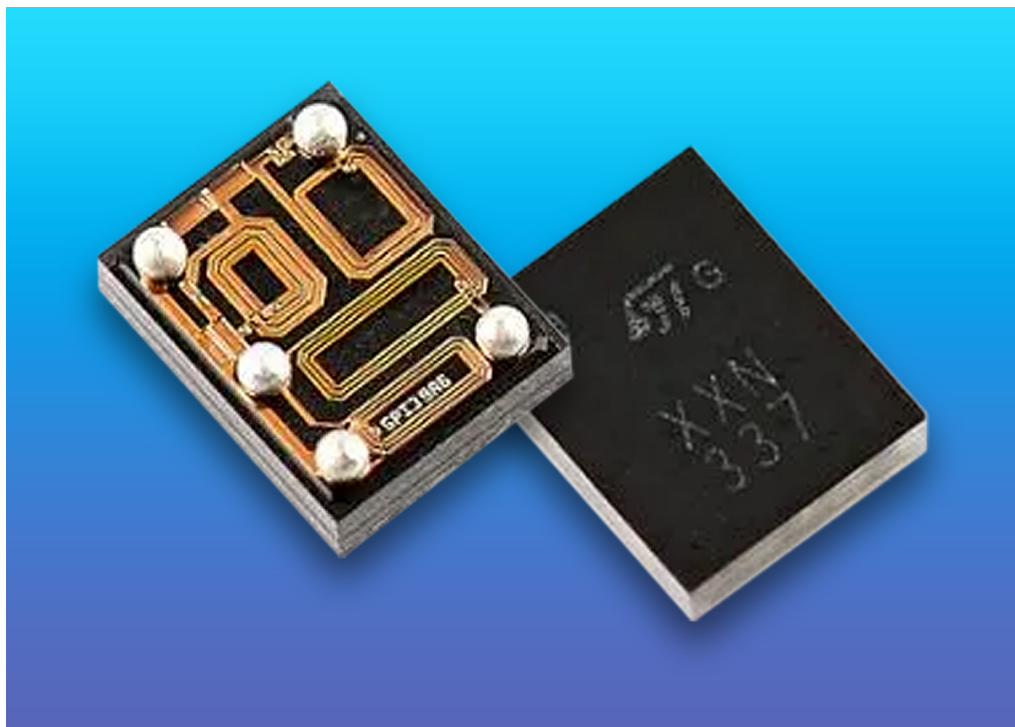
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TELECOMS

Integrated matching network and filter optimized for STM32WL3 wireless MCUs

The STMicroelectronics MLPF-WL-xxD3 family integrates the multiple passive components required for matching and filter circuits for a sub-1 GHz radio into a single compact chip.



FEATURES

- 50 Ω nominal impedance on antenna side
- Deep-rejection harmonic filter
- Low insertion loss
- 630 μm maximum profile after reflow

APPLICATIONS

- Asset tracking
- Wireless sensors
- Industrial monitoring and control
- Home energy management systems
- Smart home and alarm systems
- Building automation
- Heat cost allocators
- Remote metering

The STMicroelectronics MLPF-WL-xxD3 products, which integrate an impedance matching network and harmonics filter in a single chip, saves board space and improves performance in RF circuits based on the STM32WL3 series of wireless microcontrollers. The family consists of several variants, including the MLPF-WL-01D3, MLPF-WL-02D3, and MLPF-WL-03D3.

The matching impedance network has been tailored to get the best radio performance from the STM32WL3xxx ultra-low power, multi-protocol wireless MCUs. The MLPF-WL-xxD3 products use STMicroelectronics integrated passive device (IPD) technology on a non-conductive glass substrate, which provides for excellent RF transmission and reception.

The STM32WL3x line of MCUs, based on an Arm[®] Cortex[®]-M0+ CPU core, operate in two frequency bands: 413 to 479 MHz, and 826 to 958 MHz. The MLPF-WL-xxD3 family includes dedicated filters for these different bands and power modes:

- MLPF-WL-01D3: low-pass filter matched to the low-power 16 dBm mode in the 826 to 958 MHz frequency band
- MLPF-WL-02D3: low-pass filter matched to the high-power 20 dBm mode in the 826 to 958 MHz frequency band
- MLPF-WL-03D3: low-pass filter matched to the low-power 10 dBm mode in the 413 to 479 MHz frequency band

By integrating the matching network and filter into a single device, the MLPF-WL-xxD3 family enables RF designers to eliminate the use of discrete network and filtering components, reducing the circuit's board footprint.

The MLPF-WL-xxD3 products are supplied in a chip-scale package on glass with five bumps, and has a footprint of 1.47 mm x 1.87 mm.



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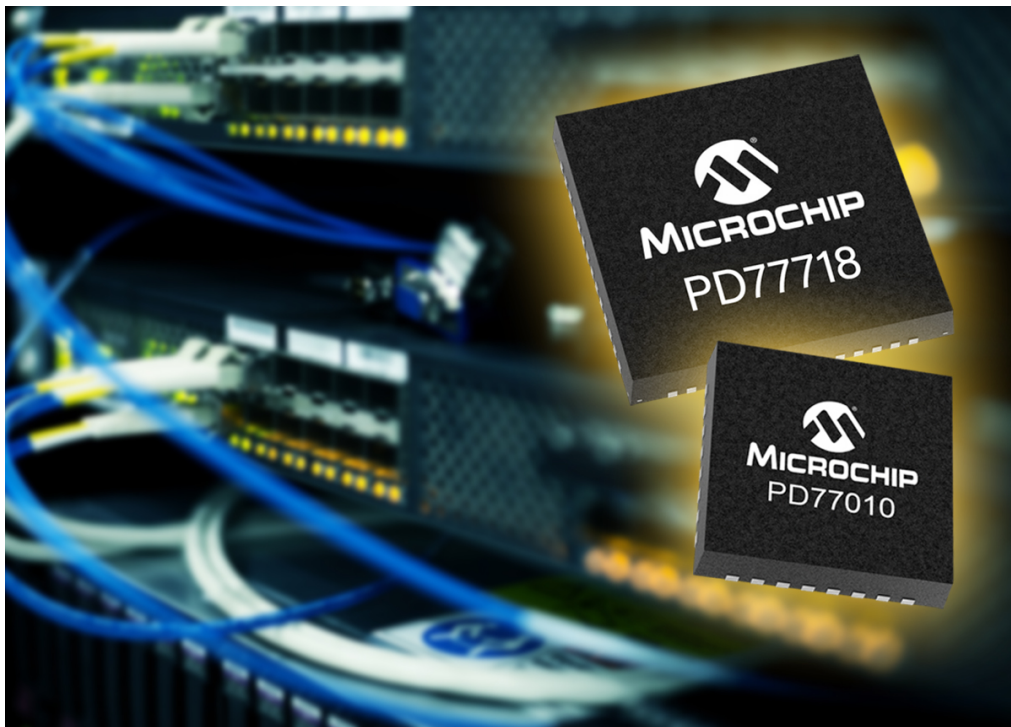
CONSUMER



TELECOMS

Power management ICs provide single-chip solutions for PoE

The PD77718 power manager and PD77010 power controller from Microchip provide highly integrated solutions for power-over-Ethernet (PoE), giving designers an easy way to implement the technology and comply with IEEE 802.3 standards.



FEATURES

- 160 mΩ total port resistance
- 2 W maximum power dissipation at full load
- Twin 55 V and 3.3 V power rails
- Over supply signal (OSS) support
- AutoClass support
- Supports Fast and Perpetual PoE

APPLICATIONS

- Switches
- Routers
- Gateways
- Digital video recorders
- PoE midspans/injectors

Microchip has introduced its seventh generation of power-sourcing equipment (PSE) technology for PoE applications which conform to an IEEE 802.3af/at/bt industry standard. The PD77718 is a PSE manager, and the PD77010 is a PSE controller.

These products are highly integrated, energy-efficient and surge-protected designs supplied in a compact form factor. The only external component required is a capacitor, helping PoE system designers to save board space and reduce bill-of-materials costs.

PSE managers and controllers are widely implemented in various Ethernet networking devices, including switches, routers and gateways, as well as in specialized equipment such as digital video recorders and PoE midspans/injectors. Additionally, Microchip offers powered device (PD) controllers which conform to the specifications of the IEEE 802.3 standard.

PoE enables the transmission of both power and data over a single Ethernet cable. Networking devices such as Ethernet switches, routers and gateways supply power through a PSE chip embedded within the unit. Devices powered by PoE, such as wireless access points, incorporate a PD IC to receive this power. These two components work together to deliver power to connected devices via the Ethernet cable.

Power delivery does not commence until the PD requests it. There are eight power classes, as defined by the IEEE 802.3af/at/bt standards. The PD specifies the exact amount of power required, ranging from as little as 4 W up to 90 W at the source.

On receiving a valid power request, the PSE acknowledges and classifies the requested power before initiating delivery. Both the PSE and PD continuously monitor for faults to protect the devices. If a fault is detected, or if the device no longer requires power, the PSE will terminate power delivery.

A PoE-powered device requires three essential components:

- Diode bridge
- PD IC
- Dc-dc converter

Microchip offers the PD70288 PoE ideal diode bridge, which cuts power dissipation by more than 90% compared to standard diode bridges.

FREE DEV BOARD

Orderable Part Number
EV99F34A

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CONSUMER



TELECOMS

10 Mbits/s optocoupler provides simple solution for isolated signaling

The DPC6137 optocoupler series from Diodes Incorporated, which features a high isolation rating, has various safety approvals certifying its suitability for use in industrial and computing equipment.



FEATURES

- Safety approvals:
 - UL 1577
 - CQC 4943.1-2022
 - VDE EN IEC 60747-5-5
- 1 kV/ μ s minimum common-mode rejection at 10 V
- Operating-temperature range: -40°C to 85°C

APPLICATIONS

- Isolated line receivers
- Computer peripheral interfaces
- Microprocessor system interfaces
- Local area networking equipment
- Smart e-meters
- Robots

Diodes Incorporated has released the DPC6137 series of optocouplers, providing a robust and easy solution to implement for isolated data transfers at rates up to 10 Mbits/s in industrial, consumer, and computer applications.

The phototransistors in the DPC6137 offer low capacitive coupling, which enables them to support high-speed isolated data transmission. The optocoupler features two chips, an infrared diode emitter and an open-collector Schottky-clamped phototransistor with a high current transfer ratio. This circuit provides 5 kV of isolation between the two dies.

The DPC6137 series is available in three industry-standard 8-pin package types: two through-hole and one surface-mount.



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10110 DATASHEET



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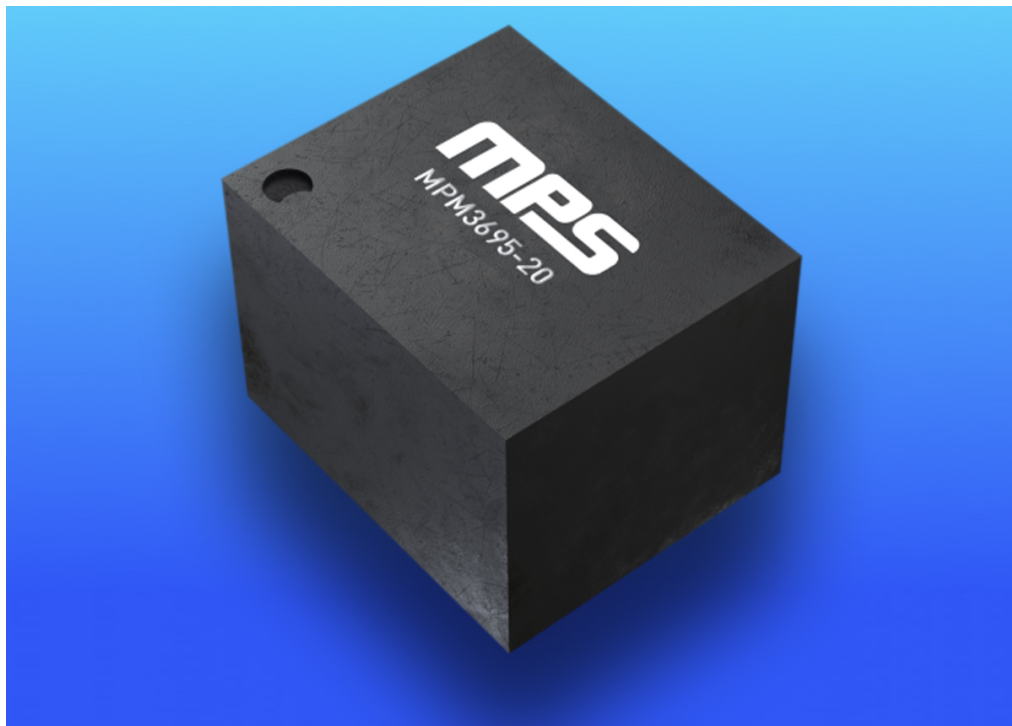
CONSUMER



TELECOMS

Integrated power module provides continuous output of up to 25 A

The MPM3695-20 from Monolithic Power Systems is a compact module which can step down a nominal 12 V input to provide a point-of-load power supply to an FPGA, ASIC or other board-level component.



MPS

FEATURES

- $\pm 1\%$ accurate reference voltage
- Pre-biased output
- Protection features:
 - Over-current protection
 - Over-voltage protection
 - Under-voltage protection
 - Over-temperature protection

APPLICATIONS

- Telecoms and network equipment
- Industrial equipment
- Servers
- Computing equipment
- FPGA/ASIC power supplies

The MPM3695-20 from Monolithic Power Systems is a fully integrated power module which provides an output of up to 25 A and operates across a wide input-voltage range of 3 V to 16 V.

The module, which has an output-voltage range of 0.5 V to 5.5 V, provides excellent load and line regulation. It operates with high efficiency across a wide load range. Multiple MPM3695-20 power modules can be connected in parallel to support load currents higher than 25 A.

The MPM3695-20 implements multi-phase constant-on-time control, which produces ultra-fast transient responses and enables simple loop compensation.

The module's digital interface provides power-system developers with the ability to configure various operating parameters:

- Current limit
- Pulse-skip mode or continuous conduction mode
- Soft-start time
- Switching frequency, choosing between 400 kHz, 600 kHz, 800 kHz, or 1 MHz
- Fault limits
- Ramp compensation

Telemetry read-outs enable monitoring of the input and output voltage, output current, temperature, and fault status.

The MPM3695-20, which is supplied in a 29-lead ECLGA package measuring 5 mm x 6 mm x 4.4 mm, requires few external components.

FREE DEV BOARD

Eval board demonstrates capabilities of 25 A step-down power module.

Orderable Part Number
EVM3695-20-PJ-00A

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CONSUMER



TELECOMS

Wireless IoT modules enable Wi-Fi, Bluetooth and 802.15.4 networking

The 2.4GHz ST67W611M1 wireless module from STMicroelectronics integrates all the RF circuitry and protocol firmware to implement Wi-Fi or Bluetooth networking, to simplify adding wireless capability to embedded system designs.



STMicroelectronics has gone into volume production with a wireless system-on-chip (SoC) module which provides a ready-to-use board-mount implementation of Wi-Fi® and Bluetooth® networking.

The ST67W611M1 is based on a Qualcomm® QCC743 multi-protocol 2.4GHz radio SoC, and is supplied pre-loaded with Wi-Fi 6 and Bluetooth 5.4 protocol firmware. It provides an easy way for users of any STM32 microcontroller or microprocessor to add wireless network capability to their product designs, and requires no RF design expertise on the part of the developer to create a working solution.

ST is expected to provide software updates for the ST67W611M1 by the end of 2025 which will add support for the Matter protocol over Wi-Fi networks, as well as Thread networking. The module supports concurrent Wi-Fi and Bluetooth Low Energy communication.

All RF front-end circuitry is built-in, including power and low-noise amplifiers, an RF switch, balun, plus 4Mbytes of Flash memory for code and data storage, and a 40MHz crystal. The ST67W611M1 can be specified with a PCB antenna, an RF connector for an external antenna, or a dedicated RF pin, which is valuable in multi-antenna implementations with an external RF switch.

The module, which is certified to PSA Level 1, features advanced hardware security features, including hardware cryptographic accelerators, as well as secure boot and secure debug.

The module is supplied in a 32-lead LGA package, and can be used in simple, low-cost PCB designs with as few as two layers, many competing products require a four-layer PCB. A reference design, the STDES-67W61BU-U5, provides a recommended layout and associated bill-of-materials for applications based on the ST67W611M1 and an STM32 MCU.

<https://youtu.be/raWrF1LTVcl>



FEATURES

- PSA certified to Level 1
- Regulatory certificates:
 - CE/RED
 - UKCA
 - FCC
 - IC
 - JRF/ARIB
 - ACMA/RCM
 - RSM
 - BIS/WPC
 - NBTC
- SPI and UART interfaces
- 3.3 V supply voltage
- Operating-temperature range: -40°C to 85°C

APPLICATIONS

- Smart home equipment:
 - Door locks and door bells
 - Cameras
 - Smart hubs
- Industrial IoT equipment:
 - Industrial control hubs/gateways
 - Smart utility metering
 - EV chargers
- Smart appliances:
 - White goods
 - Kitchen appliances
- Healthcare:
 - Portable patient monitors

FREE DEV BOARD

Board enables evaluation of Wi-Fi/Bluetooth module with STM32 MCUs.

Orderable Part Number
X-NUCLEO-67W61M1

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CONSUMER



TELECOMS

Whip antennas enhance RF performance of Wi-Fi networks and GNSS systems

The NANE-W series from NIC Components provide a ready-made solution for systems requiring an external antenna. These whip antennas can be rotated to provide mechanical flexibility in assembly and installation.



FEATURES

NANE24X136WTMG1R561G1F

- 1.6dBi peak gain
- 2.0 maximum voltage standing-wave ratio
- Omnidirectional radiation
- 50Ω impedance
- Linear polarization
- Operating-temperature range: -30°C to 70°C

APPLICATIONS

- Routers
- Gateways
- Mobile devices
- IoT devices

NIC Components supplies the NANE-W series of external whip antennas which provide excellent RF performance in systems operating at frequencies used by Wi-Fi® network or GNSS satellite navigation signals.

The antennas offer up to 90° of mechanical flexibility, and are supplied with SMA male or RP-SMA male connectors.

The NANE24X136WTMG1R561G1F is suitable for GPS L1 and Glonass G1 satellite navigation equipment operating in the 1,561MHz to 1,602MHz frequency band. It features a hinged design with detents for straight, 45° and 90° positioning.

The NANE10X84WTMW2R45G3F for Wi-Fi or Bluetooth® networking applications is suited for frequencies from 2.4GHz to 7.125GHz.

NIC also offers the NANF series of flexible printed circuit (FPC) antennas supplied with an RF1.13 cable and IPEX 1 connector. The NANF30X10AMW2R45G3F is for Wi-Fi 6E/7 applications, and the NANF15X15AMW2R45G1F is for 2.4GHz Wi-Fi systems.



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CONSUMER



TELECOMS

Accurate TMR current sensor offers high bandwidth

The CT455 from Allegro MicroSystems is suitable for use in measuring current in power-conversion applications that use wide bandgap semiconductors, and handles fast-switching behavior while maintaining high measurement accuracy.



FEATURES

- 1 MHz bandwidth
- Low noise
- Supply-voltage range: 3.3 V to 5.0 V
- AEC-Q100 Grade 1 qualified

APPLICATIONS

- Solar inverters
- Power inverters
- Battery management systems
- Industrial equipment
- Electricity meters
- Power conditioners
- Dc-dc converters

Allegro MicroSystems has added the CT455 to its XtremeSense™ family of tunnel magnetoresistance (TMR) current sensors. The new sensor provides superior noise performance and performs precise current measurements in high-voltage, power-dense consumer and industrial applications.

The XtremeSense TMR technology is characterized by higher magnetic sensitivity, lower power consumption, and a smaller footprint than other magnetic current-sensing technologies such as Hall effect, anisotropic magnetoresistance (AMR), and giant magnetoresistance (GMR).

The CT455 operates across two standard magnetic field ranges, translating the magnetic field strength measurement into a linear analog output voltage. The CT455 is also available in a user-programmable variant, which enables end-of-line calibration of gain and offset. While the sensor is pre-programmed to compensate for gain and offset temperature drift, the ability to adjust offset and gain relaxes mechanical tolerances during sensor mounting. The device's output response time is less than 300 ns, while operating current is around 6 mA.

The CT455 is supplied in two package options:

- 8-lead SOIC package
- Low-profile, industry-standard 8-lead TSSOP

FREE DEV BOARD

Evaluation board for high-bandwidth TMR current sensor.

Orderable Part Number
CTD455-BB-48B5

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TELECOMS

New 30W ac-dc power supply supplies outputs up to 54V dc

The RECOM RACM30-K series ac-dc converters operate on mains-voltage inputs, offer enclosed and open-frame formats, and may be used as power supplies in medical equipment and other safety-conscious applications.



RECOM

FEATURES

- Conforms to EN 55022 class B EMC standard
- Up to 90% efficiency
- Floating or grounded outputs
- Multiple safety certificates
- OVCIII rating up to 5,000m altitude
- Three-year warranty

APPLICATIONS

- Industrial equipment
- Medical equipment
- Home appliances
- Test and measurement equipment

RECOM has expanded its cost-effective RACM30-K series of 30W ac-dc converter modules to include options for 36V, 48V, or 54V dc outputs, making them suitable for a wider variety of applications. The series already included parts offering 5V, 12V, 15V, 24V, $\pm 12V$ and $\pm 15V$ outputs.

The new converters are certified according to the UL 60601-1 BF medical standard for outputs higher than 24V dc, making them suitable for home healthcare use. The RACM30-K converters now also support power-over-Ethernet (PoE+) applications. The 54V output converter is suitable for power injection with high isolation to ground.

The RACM30-K series operates from a universal mains input-voltage range of 88V to 305V ac. It is supplied in wired, open-frame or encapsulated PCB options, and in a chassis-mount format with industry-standard pin-outs. A DIN rail fixing option is also available with push-in wire terminations.

Additionally, a fully encapsulated version in an IP65-rated housing and with a diameter of just 59mm is supplied with flying wires for incorporation into flush-mount wall boxes.

The footprint of the converters supplied in an enclosure is just 1.5" x 2": they are rated for the full 30W power output at ambient temperatures of between -40°C and 60°C, and up to 90°C with derating.



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TELECOMS

Stepper motor driver IC provides multiple monitoring and protection functions

The MP6602 from Monolithic Power Systems provides a small and integrated solution for bipolar or unipolar microstepping motors which draw up to 4A per phase.



The Monolithic Power Systems MP6602 is a highly integrated solution for stepper motor driving which is supplied in a 4mm x 5mm 25-lead QFN package.

Featuring two internal full-bridge drivers, a built-in indexer/translator, and internal current regulation, the MP6602 requires no external current-sense resistors. Operating over a 4.5V to 35V input-voltage range, the MP6602 can supply an output current to the motor of up to 4A per phase, depending on the ambient temperature and board layout. The MP6602 can operate a stepper motor in full-, half-, quarter-, eighth-, 1/16-, or 1/32-step modes.

An automatic hold-current mode can lower the winding current to automatically save power when full current is not required, such as when the motor is stopped or lightly loaded.

Diagnostic capabilities enabled by the MP6602 include:

- Rotor stall detection
- Back EMF measurement
- Thermal warning and shutdown
- Fault indication output

A serial control interface enables the developer to set control functions such as the step mode, direction, and output current. The serial interface can also read diagnostic registers.

MPS

FEATURES

- 3.3V- and 5V-compatible logic inputs
- Automatic current decay
- Protection functions:
 - Over-current protection
 - Open-load detection
 - Over-voltage protection
 - Under-voltage protection

APPLICATIONS

- 3D printers
- Laser printers and copiers
- Textile manufacturing equipment

FREE DEV BOARD

USB-to-serial interface board enables PC control of motor driver IC.

Orderable Part Number
EVKT-MOTOR-00A

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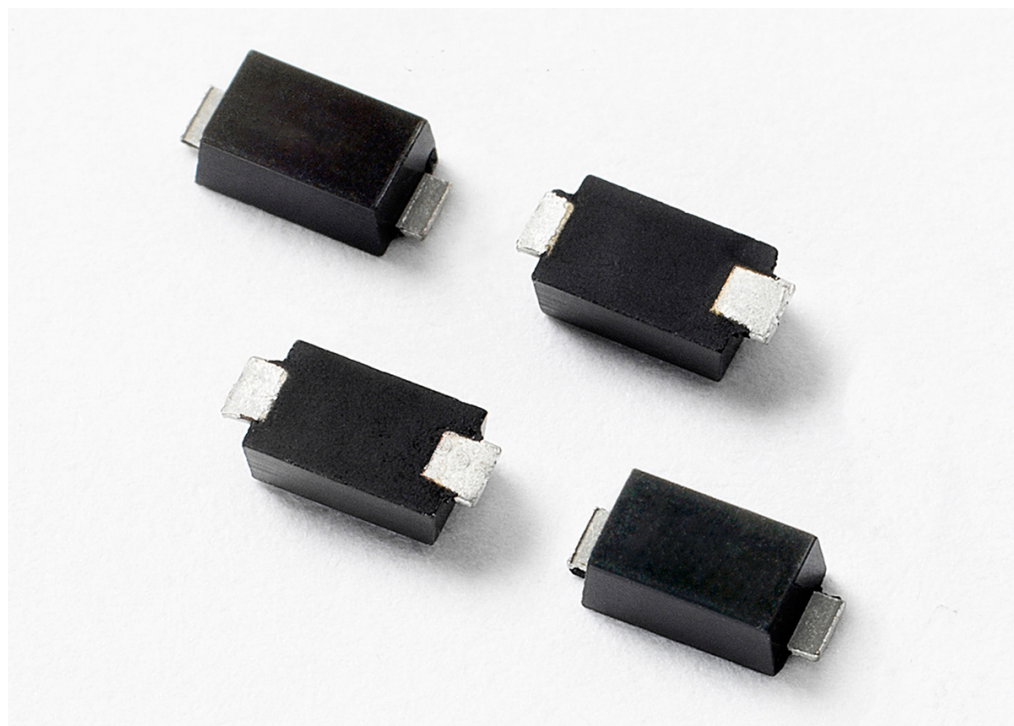
CONSUMER



TELECOMS

Compact 600W TVS diodes save space in automotive applications

The SZSMF6L series from Littelfuse provides excellent clamping characteristics to give protection against voltage surges in a wide range of vehicle systems, from lighting to power distribution to electric motors.



The Littelfuse SZSMF6L series of 600W-rated automotive transient voltage suppression (TVS) diodes protects sensitive systems or components from high-voltage and high-energy surges. Notable for the fast response time and low Zener impedance, these TVS diodes offer excellent clamping capabilities.

Supplied in a SOD-123FL package with a footprint of just 2.35mm x 3.35mm, the SZSMF6L TVS diodes are ideal for use in densely populated automotive electronics designs. The planar chip architecture features low leakage current.

These TVS diodes are available in unidirectional and bi-directional versions. The working peak reverse-voltage range for the unidirectional diodes is -5V to 75V, and 10V to 75V for the bi-directional diodes.



FEATURES

- AEC-Q101 qualified
- PPAP capable
- Less than 1 ns response time
- 16kV minimum ESD rating on the human body model
- Operating temperature up to 175°C

APPLICATIONS

- Automotive systems:
 - EV power train
 - EV inverters
 - Body control modules
 - Domain and zone controllers
 - Car lighting protection circuits
 - Onboard chargers
 - Battery management systems
 - Power distribution units



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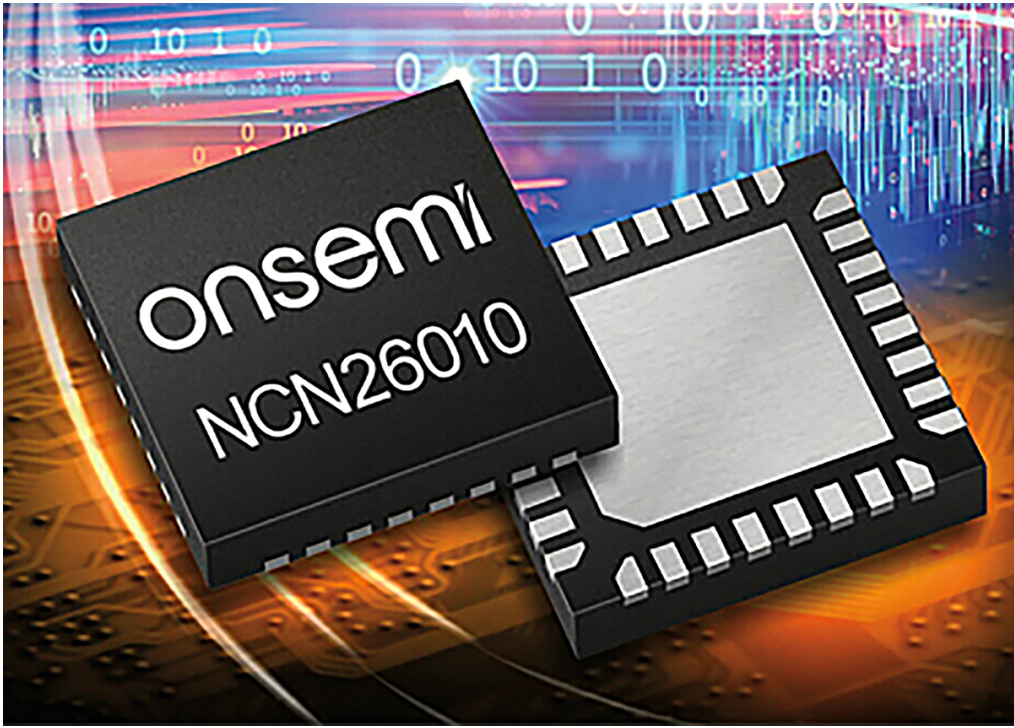
CONSUMER



TELECOMS

IEEE 802.3cg-compliant ICs bring Ethernet to edge of factory networks

The NCN26000 multi-drop Ethernet transceiver and NCN26010 controller from onsemi offer high noise immunity, maintaining reliable connectivity over a long range even in noisy industrial environments.



Factories today commonly use Ethernet networks for supervisory control and station management, but still rely on legacy fieldbus solutions to communicate with field instrumentation. Such legacy protocols need to be replaced and modernized with low-cost, single unshielded-pair Ethernet solutions which will allow factories to run data over Ethernet seamlessly from the cloud to the edge.

The IEEE 802.3cg standard provides a specification for the technology to overcome the gap in industrial Ethernet systems, offering low-cost communication to field devices at a data rate of 10 Mbps/s using two physical layers:

- 10BASE-T1L for long-range, point-to-point communication over a range of up to 1,000m
- 10BASE-T1S for multi-point communication over a range up to 25m

Now onsemi has introduced dedicated IEEE 802.3cg-compliant components which provide a robust, off-the-shelf solution for unshielded-pair Ethernet.

The NCN26000 is an Ethernet transceiver (PHY) which provides all the physical layer functions needed to transmit and receive data over a single unshielded twisted-pair cable. The transceiver communicates to half-duplex 10Mbps/s-capable Ethernet controllers via a standard MII interface.

The NCN26010 Ethernet incorporates both an Ethernet media access controller (MAC) and a 10BASE-T1S PHY for data communication over a single unshielded twisted-pair cable. The NCN26010 communicates to a host microcontroller via an Open Alliance MACPHY SPI protocol.

The noise immunity of the NCN26000 and NCN26010 is far higher than is specified in the 10BASE-T1S standard: a proprietary enhanced noise immunity feature provides robust signal detection in noisy industrial environments, and can extend the network range to up to 50m. The NCN26000 and NCN26010 also offer very low line capacitance, enabling them to support five times the node requirement of the IEEE 802.3cg standard, up to 40 nodes on a 25m segment. This helps factory operators to save more on the cost of wiring and installation.

Multi-drop Ethernet offers a way to reduce the wiring and installation costs which dominate the networking budget in many factories: a network can be completed with up to 70% fewer cables while reducing installation costs by as much as 80%. 10BASE-T1S also offers the flexibility to repurpose nodes after the initial installation.

Additional benefits include:

- Eliminates the need for large switches, gateways, or protocol translators, and the additional wiring and power that are required
- Lowers software maintenance costs as multiple networking technologies no longer need to be maintained, as legacy point-to-point and multi-point standards, such as RS-485, CAN, FlexRay, RS-232, or HART may be replaced by 10BASE-T1S Ethernet
- Enables greater data throughput over existing cables, eliminating the need to run new cables, which is often the highest contributor to costs in a networking installation

onsemi

FEATURES

NCN26000

- Collision detection masking
- Physical layer collision avoidance (PLCA)
- Unique PLCA precedence mode
- Connects to any CSMA/CD half-duplex capable MAC
- Configuration and monitoring via standard MII management interface
- Two configurable digital I/Os with programmable pull-up/-down
- Supports deterministic real-time performance

APPLICATIONS

- Industrial automation
- Sensor and control interfaces
- Home and building control systems
- Security equipment
- Field instrumentation
- Human-machine interfaces
- Data center management
- EV charging stations

FREE DEV BOARD

Development platform for IEEE 802.3cg-compliant industrial networking applications.

Orderable Part Number
NCN26000XMNEVB

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FREE DEV BOARD

Development platform for IEEE 802.3cg-compliant industrial networking applications.

Orderable Part Number
NCN26010XMNEVK

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TELECOMS

Standard-compliant RS-485 transceivers offer reliability in noisy industrial environments

The robust STMicroelectronics ST4E1240 and ST4E1216 transceiver ICs are ideal for factory automation equipment, industrial robots and telecoms infrastructure thanks to the high signal integrity and integrated ESD protection.



The ST4E1240 and ST4E1216 from STMicroelectronics are low-power, differential line transceivers for half-duplex RS-485 transmissions.

With the ST4E1240, STMicroelectronics has extended the capability of its portfolio of RS-485 transceivers to cover data-transfer requirements up to a high maximum speed of 40Mbps/s. A high-speed transceiver is typically used for shorter cable runs in applications calling for high data rates.

The data rate of the ST4E1216 is up to 16Mbps/s. It is better suited to extended cable runs due to its lower speed and higher signal integrity over long distances.

Both transceivers are tolerant of high transient ESD voltages: the bus pins withstand contact discharges of up to ± 12 kV.

Using the ST4E1240 or ST4E1216, equipment designers can configure a bus network with more than 64 transceivers, and up to 100 nodes. Compatible with PROFIBUS network requirements, the differential output voltage exceeds 2.1V at a 5V supply. The ST4E1240 and ST4E1216 also meet or exceed the requirements of the TIA/EIA-485A standard.

Both transceivers are supplied in a standard SO-8 package with a 4.9mm x 3.9mm footprint, or a DFN8 package measuring 3mm x 3mm. The ST4E1216 operates over a temperature range of -40°C to 125°C . The ST4E1240 has a -40°C to 85°C temperature range in the SO-8 package, and -40°C to 125°C in the DFN8.



FEATURES

- Supply-voltage range: 3V to 5.5V
- Protection functions:
 - Fail-safe receiver
 - Thermal shutdown protection
 - Hot-swap with parasitic capacitance up to 100pF
 - ± 30 kV ESD protection according to IEC61000-4-2 for contact discharge
- Low quiescent current in shutdown mode

APPLICATIONS

- Factory automation and control
- Motion control
- Building automation and safety
- Video surveillance
- Backplane busses
- Grid infrastructure
- Smart meters
- Telecoms infrastructure



INFORMATION



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TELECOMS

Low-power 16-bit MCU ideal for smart home appliances

The RL78/L23 microcontroller from Renesas offers display and touch-sensing control capabilities. The MCU features various power-saving innovations which make it suitable for use in battery-powered systems.



Renesas has extended its RL78 family of 16-bit microcontrollers with the RL78/L23, which combines segment LCD and capacitive touch-sensing control to provide a highly integrated option for human-machine interface (HMI) applications.

The RL78/L23 offers very low power consumption, and is ideal for battery-powered applications that spend the majority of the time in standby mode. Active current is just 109µA/MHz, and standby current is as low as 0.365µA. Wake-up time from sleep is just 1µs.

The MCU includes features for reducing display system power consumption, including SNOOZE Mode Sequencer (SMS), which enables dynamic LCD segment display control without calling on the CPU. By offloading tasks to the SMS, the RL78/L23 minimizes the number of CPU wake-up events, thus reducing system-level power consumption.

Featuring a wide supply-voltage range of 1.6V to 5.5V, the MCU can operate directly from the 5V power supplies commonly used in home appliances and industrial systems. This capability reduces the need for external voltage regulators. The MCU also integrates valuable functions such as a temperature sensor and internal oscillator, reducing the OEM bill-of-materials cost and PCB footprint.

The RL78/L23 is backed by an easy-to-use development environment. Developers can use robust support tools such as Smart Configurator and QE for Capacitive Touch to streamline system design.

RENESAS

FEATURES

- Up to 512kbytes of dual-bank Flash memory
- Up to 32kbytes of SRAM
- Up to 8kbytes of data Flash
- Operating temperature range: -40°C to 105°C
- UART, I2C and CSI interfaces
- IEC 60730-compliant self-test library

APPLICATIONS

- Smart home appliances
- Consumer electronics
- IoT devices
- Induction cooktops
- HVAC systems
- Metering equipment



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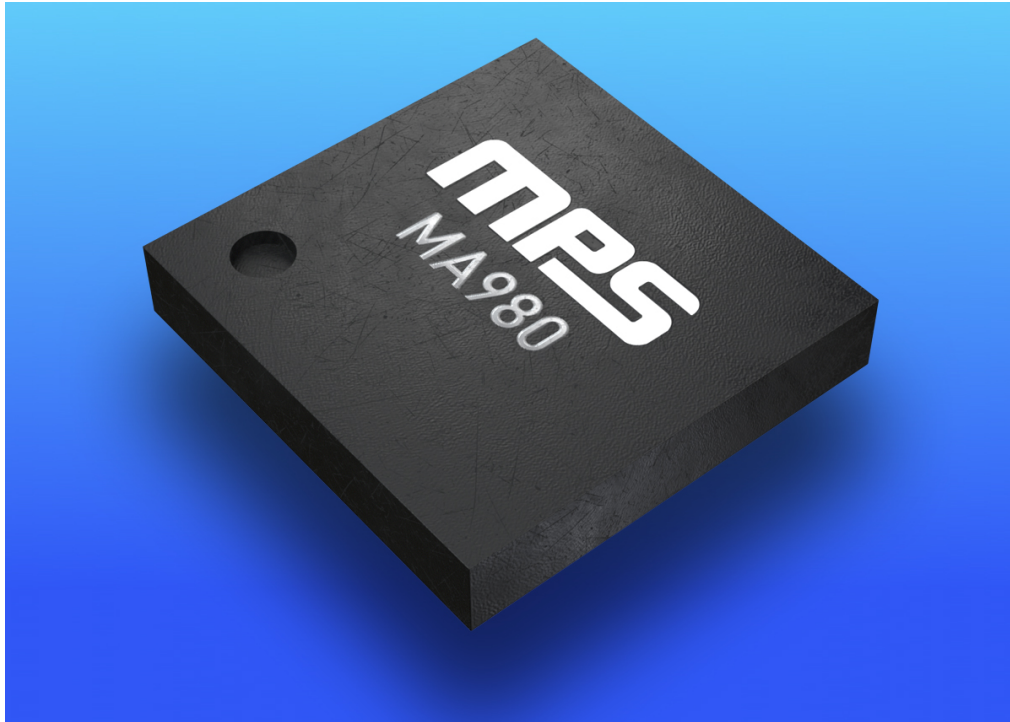
CONSUMER



TELECOMS

Magnetic rotary position sensor works with simple target magnet

The differential sensing technology in the MA980 from Monolithic Power Systems provides high immunity to interference from stray magnetic fields, to produce stable performance in magnetically noisy environments.



MPS

FEATURES

- Absolute resolution range: 9 bits to 13 bits
- Serial peripheral interface:
 - Supports digital angle readout
 - Supports chip configuration
- Magnetic field strength alarm
- Operating-temperature range: -40°C to 125°C

APPLICATIONS

- Portable devices
- Foldable phones
- Laptop computers

The MA980 from Monolithic Power Systems is a miniature angle position sensor based on a differential magnetic field measurement technology which is ideal for sensors operating with a simple, low-cost target magnet.

The sensor detects the absolute angular position of a permanent magnet, typically a diametrically magnetized cylinder mounted at the end of a rotating shaft. The sensor's differential method of magnetic flux measurement eliminates the effect of parasitic magnetic fields induced by high-voltage cabling, electric motors, and other sources.

The MA980 is suitable for use in battery-powered applications that require low average power consumption thanks to its ability to perform duty cycling. The timing of the power cycles can be controlled by an on-chip clock or by an external controller. Flags are available for detecting a definable amount of angle change.

On-chip non-volatile memory provides storage for configuration parameters, including the reference zero angle position, the power cycling parameters, the filter window affecting the output resolution, and magnetic field detection thresholds.



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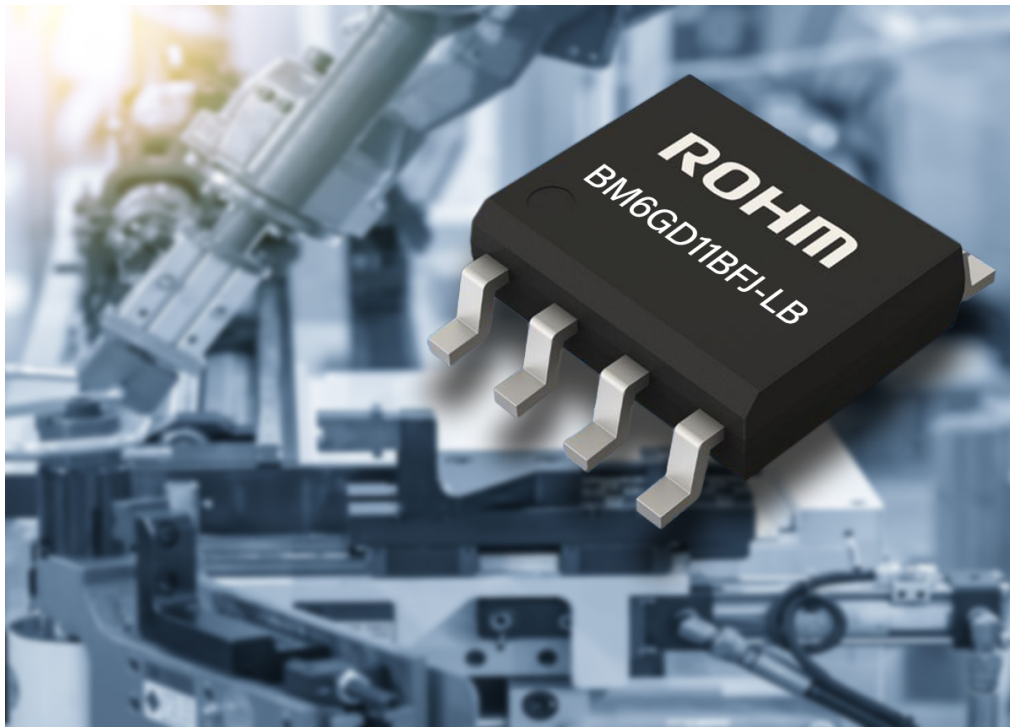
CONSUMER



TELECOMS

New isolated gate driver optimized for GaN power switches

The BM6GD11BFJ-LB from ROHM provides high isolation to protect the control circuit from the high voltages handled by the latest gallium nitride (GaN) power switches in applications such as server power supplies and industrial motors.



ROHM Semiconductor has launched the BM6GD11BFJ-LB, an isolated gate driver IC which offers the high-speed operation required to drive today's fast-switching GaN high electron-mobility transistors (HEMTs).

The BM6GD11BFJ-LB is based on on-chip isolation technology developed by ROHM Semiconductor which reduces parasitic capacitance, enabling stable high-frequency operation at up to 2MHz. Fast-switching operation not only contributes to greater energy efficiency, but also reduces the power circuit's mounting area by enabling the use of smaller inductors and capacitors.

Safe signal transmission is achieved by isolating the gate driver IC from the control circuitry during switching operations that involve rapid cycles of voltage rises and falls. The BM6GD11BFJ-LB provides 2.5kVrms of isolation.

The BM6GD11BFJ-LB also provides high common-mode transient immunity of 150V/ns, 1.5 times higher than that of competing products, which helps to prevent malfunctions caused by the high slew rates typical of GaN HEMT switching. The minimum pulse width has also been reduced to just 65ns, 33% less than that of conventional products.



FEATURES

- Input-voltage range: 4.5V to 5.5V
- Gate-drive voltage range: 4.5V to 6.0V
- 0.5mA output-side operating current
- 60ns maximum I/O delay time
- Under-voltage lockout protection
- Operating-temperature range: -40°C to 125°C

APPLICATIONS

- Industrial equipment:
 - Solar inverters
 - Energy storage systems
 - Motors
 - Air conditioning units
- Telecoms equipment:
 - Base stations
 - Servers
- Consumer devices:
 - White goods
 - USB chargers
 - PCs
 - TVs
 - Refrigerators



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CONSUMER



TELECOMS

Wireless MCU supports Bluetooth, Zigbee, Thread and Matter in a single chip

The new **STM32WBA6** series from STMicroelectronics with embedded 2.4GHz radio provides a convenient, low-power way to implement wireless applications for smart home, health, factory, and agriculture equipment.



STMicroelectronics has extended the STM32 family of power-efficient, short-range wireless microcontrollers, introducing the multi-protocol STM32WBA6 series for consumer and industrial equipment.

Featuring more Flash and RAM memory on-chip than the previous STM32WBA5 series, the new MCUs provide generous storage capacity for application code and data. The STM32WBA6 also offers more digital interfaces, including USB High Speed alongside three SPI ports, 14 GPIOs, four I2C ports, three USART interfaces, and one LPUART interface.

The wireless subsystem in the top-of-the-range STM32WBA64/65 MCUs supports Bluetooth® Low Energy, Zigbee, Thread, Matter and other protocols operating in the 2.4GHz frequency band, and allows communication using multiple protocols concurrently. A typical use case is a smart home bridge which can communicate with a resident's mobile app over a Bluetooth® link and simultaneously manage lights or thermostats through a Zigbee mesh network. The MCUs are supported by the X-CUBE-MATTER software package, which provides a Matter software development kit and application examples to ease development.

The STM32WBA6 series also contains single-protocol variants for simpler and more cost-conscious applications.

All the STM32WBA6 MCUs are based on an Arm® Cortex®-M33 CPU core, with floating-point unit and DSP extensions, running at up to 100MHz.

The MCUs feature hardware security features which enable host systems to be certified to SESIP Level 3 and PSA Level 3. These include cryptographic accelerators, TrustZone® isolation, and a random number generator. These features also enable both the STM32WBA5 and STM32WBA6 series MCUs to meet the requirements of the latest EU Radio Equipment Directive (RED) cybersecurity regulation.



FEATURES

- Memory provision:
 - Up to 2Mbytes of dual-bank Flash memory with error correction code
 - Up to 512kbytes of RAM
 - Include 64kbytes with parity check
- -100dBm Receive sensitivity for IEEE 802.15.4 signals at 250kbits/s
- Security features:
 - Supports secure firmware installation
 - Secure data storage with hardware unique key
 - Two AES co-processors, including one with DPA resistance
 - Public key accelerator
 - HASH hardware accelerator
- Low power consumption:
 - 120nA operating current in standby mode
 - 1.33µA in standby mode with real-time clock running
 - 29µA/MHz in run mode
 - 4.26mA Receive current
 - 5.94mA Transmit current at 0dBm
- Analog peripherals
 - 12-bit ADC operating at up to 2.5Msamples/s
 - Two ultra-low-power comparators
- Touch-sensing controller for up to 24 sensors

APPLICATIONS

- Wearable healthcare and wellness monitors
- Animal collars
- Electronic locks
- Remote weather sensors
- IoT devices

FREE DEV BOARD

Evaluation board for multi-protocol wireless MCU.

Orderable Part Number
NUCLEO-WBA65RI

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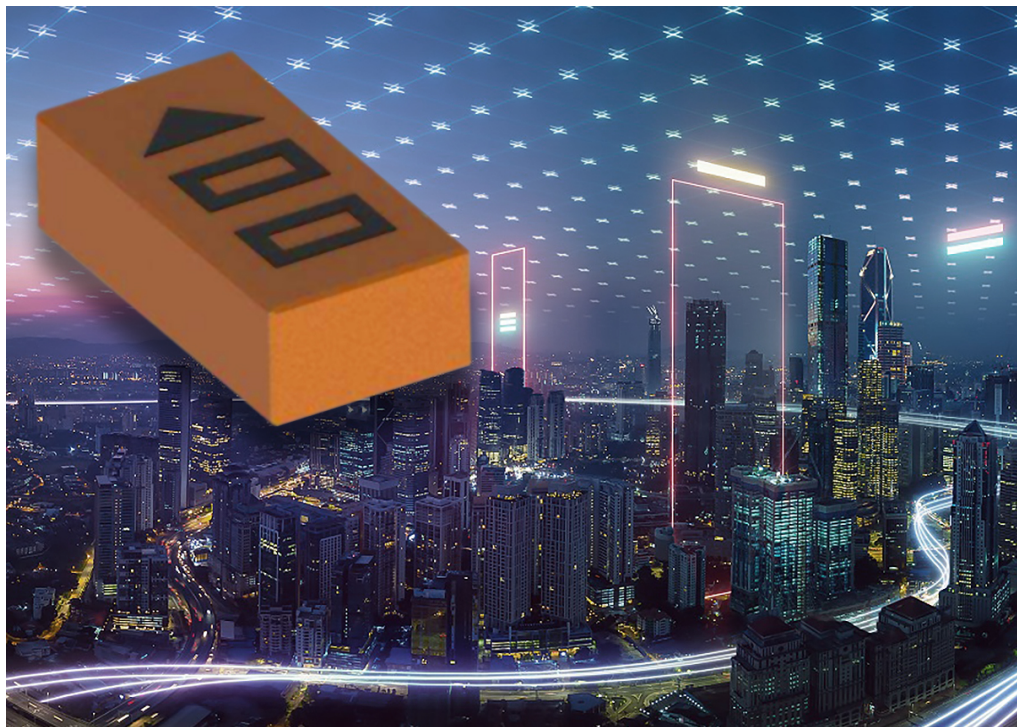
CONSUMER



TELECOMS

Antenna provides high efficiency in compact form factor

The wide range of antennas from TE Connectivity includes the 2108851-1, a small chip antenna which provides broad coverage across the frequency band used for ultra-wideband (UWB) radio equipment for positioning and range-finding.



AUTHORIZED DISTRIBUTOR

FEATURES

- 4.1dBi peak gain
- -1.3dBi average gain
- 50 impedance
- Linear polarization
- Operating-temperature range: -40°C to 85°C

APPLICATIONS

- Asset tracking
- Location-based services
- Positioning and location-finding
- Security equipment
- Aids for daily living

TE Connectivity (TE) supplies a broad portfolio of antennas which includes products to support Wi-Fi®, Bluetooth®, Zigbee or cellular networks, GNSS satellite navigation, RFID, DAS and other radio technologies. These antennas are suitable for use in various product types and applications, including cars, heavy-duty trucks, railway equipment, and personal electronics equipment including mobile devices and wearable technology.

An example of the TE antenna range is the 2108851-1, an embedded ceramic chip antenna which is suitable for use in ultra-wideband (UWB) radio applications in channels 5 to 9 across a frequency range of 5.9GHz to 8.3GHz. Offering excellent average efficiency of 74% across the rated frequency band, the 2108851-1 has a maximum voltage standing-wave ratio of 2.1:1.

This chip antenna has a board footprint of 4.0mm x 2.0mm, and is 1.2mm high.

Adhesive-mount UWB antennas from TE offer an independent ultra-thin ground plane alternative to ceramic chip antennas such as the 2108851-1. These products increase design flexibility by enabling the OEM to mount the antenna on the enclosure of the host device. UWB products in this ultra-thin range include the 2108965-x and 2108971-x series.

TE Connectivity, TE Connectivity (logo) are trademarks.



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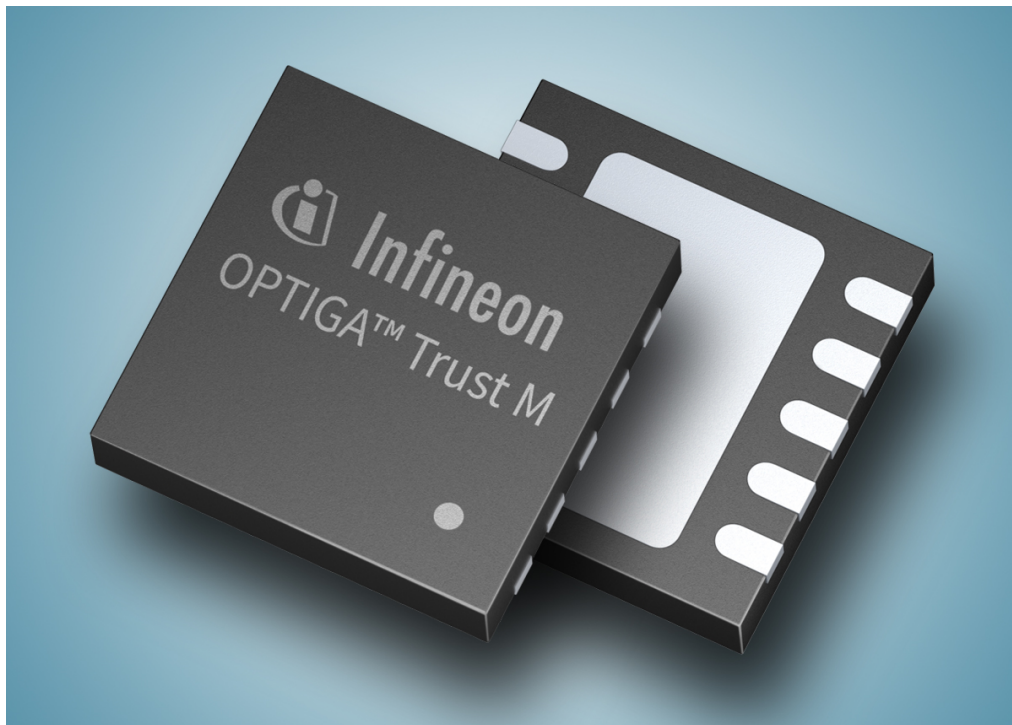
CONSUMER



TELECOMS

Complete cloud security solution protects IoT devices from cyber-attack

The **OPTIGA™ Trust M** tamper-resistant security solution from Infineon is based on **Common Criteria EAL6+ certified hardware**, and can be used with any MCU or application processor to enhance the security of IoT designs.



The OPTIGA Trust M from Infineon is a high-end security solution which provides an anchor of trust for connecting IoT devices to the cloud, giving every IoT device its own unique identity. This individual, turnkey solution offers secure, zero-touch onboarding and the high performance needed for quick cloud access.

OPTIGA™ Trust M is offered with a variety of supporting services:

- Basic: for OEMs which choose to take care of provisioning on their own
- Express: pre-provisioned with public certificates. The Infineon cloud service also automates IoT device certificate registration and device provisioning in the product cloud
- MTR: pre-provisioned with Matter certificates
- Fit: customized with the OEM's key and certificates

The OPTIGA Trust M chips and supporting software offer a wide range of security features. In particular, there is support for common asymmetric cryptography algorithms including:

- RSA® up to 2048
- AES key up to 256, HMAC up to SHA512
- TLS v1.2 PRF and HKDF up to SHA512

The turnkey set-up with full system integration minimizes the design, integration and deployment effort required from product manufacturers. The OPTIGA Trust M development process is certified according to the IEC 62443-4-1 security standard for industrial automation and control systems, acting as an enabler to achieve component-level certification according to IEC 62443-4-2.

The OPTIGA Trust M is specified in two operating-temperature ranges:

- SLS32AIA010MK at a standard temperature range of -25°C to 85°C for most commercial implementations
- SLS32AIA010ML at an extended temperature range of -40°C to 105°C for harsh industrial environments

The OPTIGA Trust M chip is supplied in a USON-10 package which has a footprint of 3mm x 3mm.



FEATURES

- ECC cryptography:
 - NIST curves up to P-521
 - Brainpool r1 curve up to 512
- Hibernate mode for zero power consumption
- Open-source host code available on GitHub under MIT license
- Up to 10kbytes of memory:
 - Protected updates
 - Usage counters
 - Dynamic object locking
- Configurable device security monitor
- 20-year lifetime for industrial and infrastructure applications

APPLICATIONS

- Smart lighting
- Smart home
- Building automation
- Industrial robotics
- Programmable logic controllers
- Motor drives
- Drones

FREE DEV BOARD

OPTIGA Trust M IoT security evaluation board.

Orderable Part Number
TRUSTMV3SHIELDTOBO1

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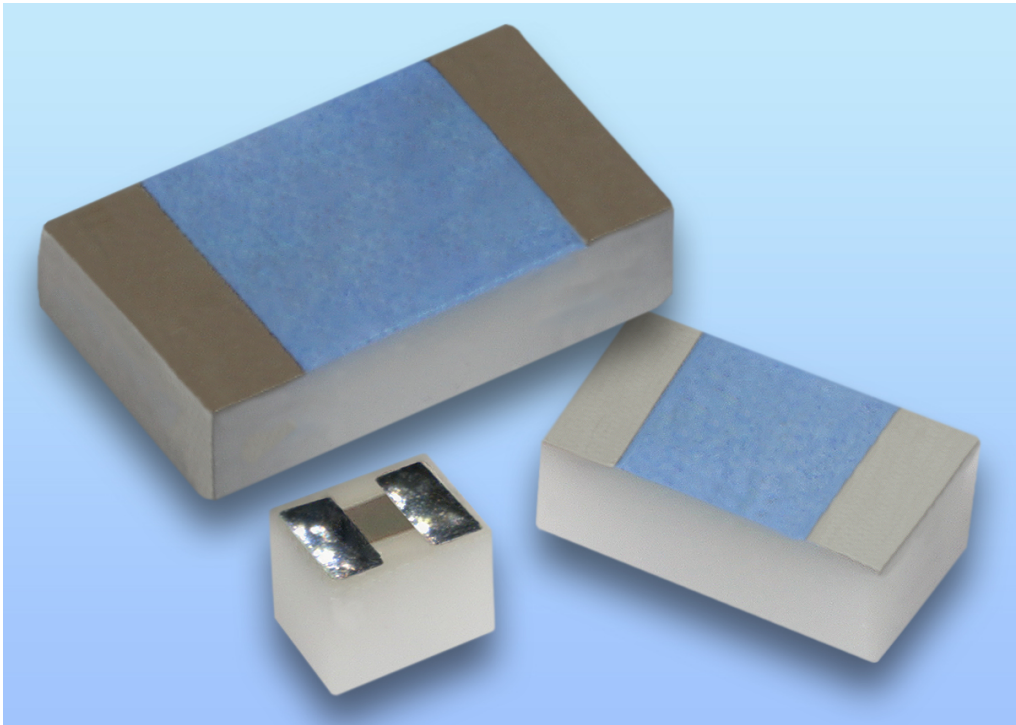
CONSUMER



TELECOMS

Thin-film chip resistors provide high performance at frequencies up to 70GHz

The Vishay CH series of resistors benefits from proprietary design features and a high-quality assembly process to produce stable operation even in demanding automotive operating conditions.



The DNA of tech.®

FEATURES

- Design kits available
- Supports Modelithics® library

APPLICATIONS

- High-frequency electronics circuits
- 5G mobile base stations
- Small cell base stations

Vishay supplies the CH series of thin-film chip resistors which provide stable and precise resistance when operating in high-frequency circuits at up to 70GHz.

Available in case sizes as small as 02016, at 0.48mm x 0.42mm, these thin-film chip resistors are notable for their very low internal reactance. When mounted and configured according to the datasheet specifications, the CH series products function as almost pure resistors over a very wide frequency range: up to 50GHz in the larger CH0402 and CH0603 case sizes, and up to 70GHz for the smallest CH02016.

These resistors are available with a choice of termination styles: flip-chip, wrap-around, or one-face termination. The resistors are also available as the automotive-grade CHA series with AEC-Q200 qualification.

Model Number	Size	Resistance Range	Power Rating	Voltage Rating	Tolerance of Resistance Options
CH02016	02016	10 Ω to <50 Ω	0.1 W	30 V	±5%
CH02016	02016	50 Ω to ≤500 Ω	0.1 W	30 V	±2%, ±5%
CH02016	02016	50 Ω, 100 Ω	0.1 W	30 V	±1%, ±2%, ±5%
CH0402	0402	10 Ω to <50 Ω	0.3 W	37 V	±2%, ±5%
CH0402	0402	50 Ω to ≤500 Ω	0.3 W	37 V	±1%, ±2%, ±5%
CH0603	0603	10 Ω to <50 Ω	0.4 W	50 V	±2%, ±5%
CH0603	0603	50 Ω to ≤500 Ω	0.4 W	50 V	±1%, ±2%, ±5%



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TELECOMS

GaN-based high-voltage flyback regulator offers high power density

The MPXG2100 regulator from Monolithic Power Systems integrates a primary-side gallium nitride (GaN) switch with a secondary-side controller, and allows for optocoupler-less feedback.



The MPXG2100 NovoOne series from Monolithic Power Systems are integrated flyback regulators which use GaN semiconductor technology to achieve high efficiency and to reduce the size of the power system.

The MPXG2100 consists of a primary-side driver circuit driving a 700V GaN high electron-mobility transistor (HEMT), a secondary controller, secondary ideal diode, and safety rules-compliant feedback circuit. The regulator uses capacitive insulation technology which enables it to eliminate the optocoupler that is normally required for communication between the primary and secondary sides, thus reducing bill-of-materials cost and simplifying the power circuit. The regulator works particularly well with a PFC controller.

This NovoOne flyback regulator performs adaptive zero-voltage switching in discontinuous conduction mode, drawing on a patented synchronous rectifier (SR) FET control scheme developed by MPS. The SR can match the primary-side driving signal, which means that it can operate safely in continuous conduction mode with a low-line ac input. This allows for the use of a small input bulk capacitor, helping to increase power density. In addition, the regulator's peak power function enables the use of a smaller transformer and input bulk capacitor than is possible with conventional regulators based on a quasi-resonant control scheme.

The NovoOne family regulators provide a comprehensive set of circuit protection features.

MPS

FEATURES

- 5.7kV ac minimum isolation voltage
- Multiple operating modes:
 - Valley-locked zero-voltage switching
 - Burst mode
 - Optional peak power mode
 - Optional continuous conduction mode
- Integrated 650V primary-side current source
- Integrated 150V secondary-side current source
- X-capacitor discharge
- Less than 20mW power consumption in standby mode

APPLICATIONS

- USB power adapters
- Battery chargers
- High-voltage power supplies



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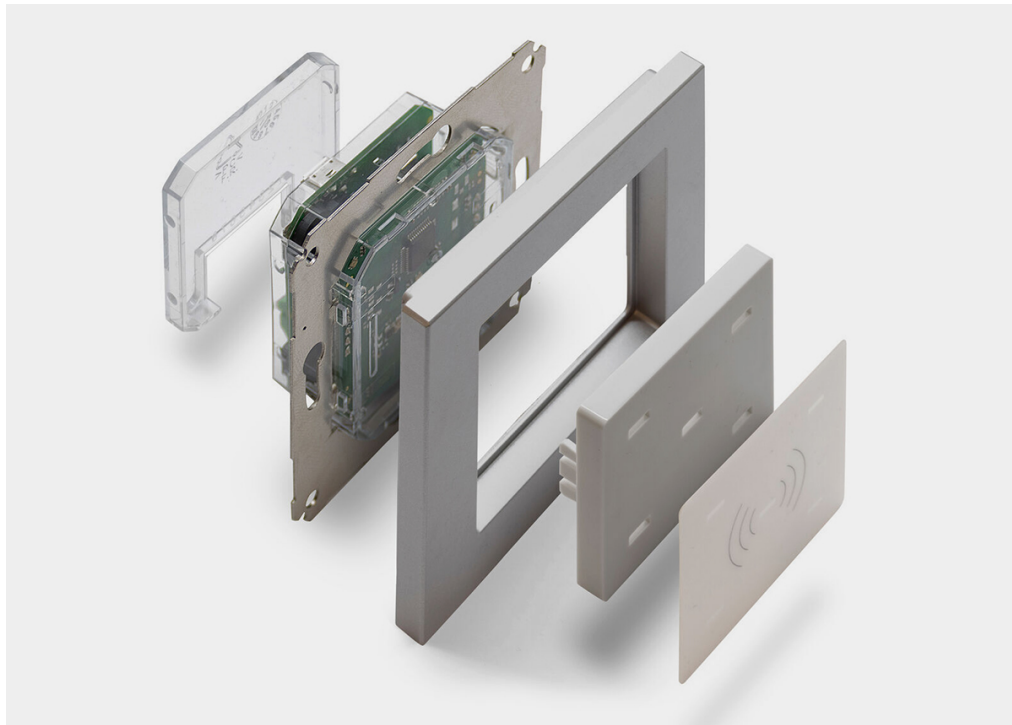
CONSUMER



TELECOMS

Compact RFID readers provide for easy integration into security equipment

The TWN4 Palon Compact series from ELATEC provides various ways for OEMs to build multi-frequency RFID reader functionality into equipment, including with a board-mount module or panel-mount device.



ELATEC

RFID Systems

FEATURES

- Secure Access Module (SAM) socket
- Supported by software development kit
- Supports over-the-air firmware updating
- Wired or wireless reconfiguration via TWN4 CONFIG card
- 18kbytes Flash data storage

APPLICATIONS

- Access control systems
- Time and attendance logging equipment
- Authentication of industrial machines

ELATEC supplies the TWN4 Palon Compact series of integrated RFID readers and modules which offers broad support for communications protocols, and low installation and maintenance costs.

The readers are ideal for applications requiring security and a convenient user experience. Typical use cases include access control, time and attendance logging, and machine authentication in industrial settings.

The TWN4 Palon Compact products are multi-technology readers/writers which support almost all 125kHz and 13.56MHz contactless technologies, including NFC, and standard interfaces including RS-485, RS-232, Wiegand, Clock/Data, USB, and Open Supervised Device Protocol (OSDP). On-board antennas for high-frequency (HF) and low-frequency (LF) RFID provide excellent contactless performance. The TWN4 Palon Compact readers can also be configured to support Bluetooth® Low Energy networking, for use in a broad range of mobile ID and authentication applications.

The TWN4 Palon Compact series consists of three RFID readers and modules which all save space in access control and security systems.

The **TWN4 Palon Compact M** is a versatile OEM PCB module for integration into third-party products and devices. A general-purpose device, the TWN4 Palon Compact M is particularly well suited to time and attendance and access control applications.

The **TWN4 Palon Compact Panel** is a versatile panel-mount reader for integration into third-party products and devices. The IP65 protected housing is easy to install.

The **TWN4 Palon Compact Wall** is a versatile wall-mount reader for integration into flush-mount installation boxes. The IP54 protected housing is easy to install. The standard electric frame design elements give the TWN4 Palon Compact Wall a unique look and feel.



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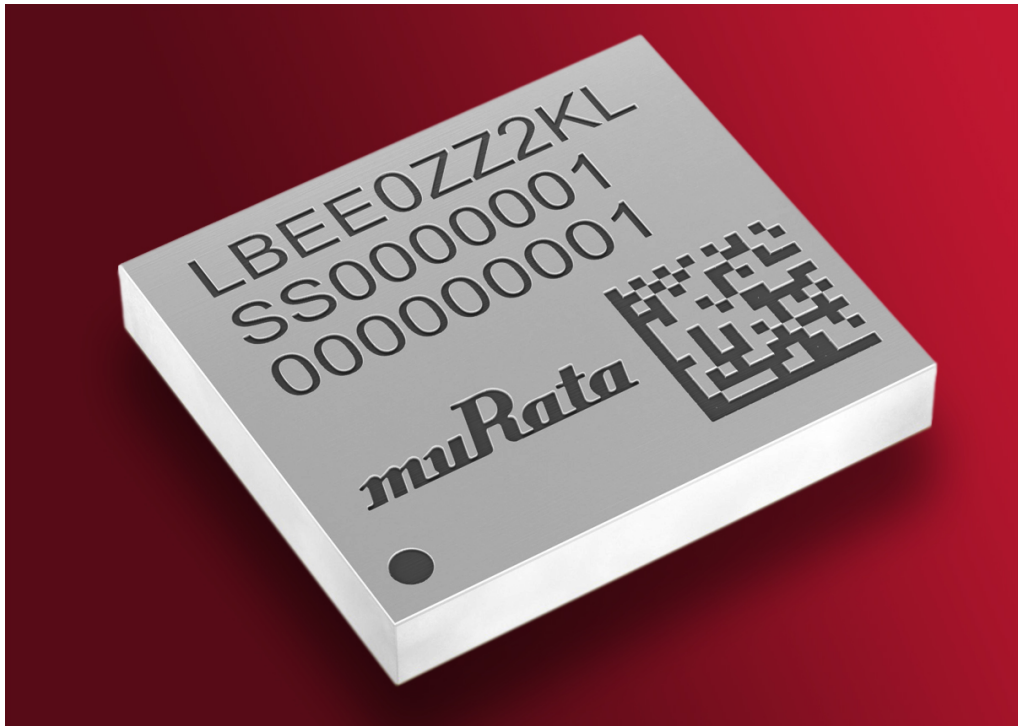
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TELECOMS

Combined Wi-Fi and Bluetooth module saves space in high-speed RF devices

The Type 2LL from Murata is a dual-band Wi-Fi® 802.11a/b/g/n/ac/ax, Bluetooth® 5.4 and IEEE 802.15.4 wireless module which provides strong security protection for data transmitted over the air.



muRata
INNOVATOR IN ELECTRONICS

FEATURES

- SISO radio interface with 20MHz channels
- SDIO 3.0 interface
- Operating-temperature range: -40°C to 85°C
- 0.223 g weight

APPLICATIONS

- Smart home devices
- Sensor networks
- Multimedia systems
- Gateways

The Murata Type 2LL is a small wireless module which is based on an NXP Semiconductors IW610G dual-band 2.4GHz and 5GHz chipset.

Supplied in a shielded surface-mount package measuring just 7.7mm x 8.8mm x 1.3mm, the Type 2LL facilitates integration into size- and power-sensitive applications such as IoT devices, handheld wireless systems, and gateways.

The Type 2LL module is notable for the strong security protection that it provides to data transmitted over Wi-Fi or Bluetooth networks. The IW610G chipset is supplied with NXP EdgeLock™ security technology, and is suitable for security-critical equipment which has to meet the requirements of the SESIP Level 3, IEC 62443 or EU RED article 3(3) security standards and regulations.

The IW610G chipset implements hardware mechanisms and algorithms for enhanced collaborative coexistence, which ensure that the Wi-Fi, Bluetooth and 802.15.4 radios avoid interfering with each other.

Murata also supplies the similar Type 2KL module: this is based on the NXP IW610F dual-band chipset, which supports Wi-Fi 6 and Bluetooth 5.4 networking.



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TELECOMS

Microchip has launched the MPLAB® AI Coding Assistant, which provides code writing and debugging tools, and a chatbot for personalized support and advice for developers of embedded systems running on Microchip products.



Microchip has also partnered with Cartesiam, Edge Impulse, and Motion Gestures to simplify in the MPLAB X integrated development environment the implementation of machine learning applications at the edge running on Microchip Arm[®] Cortex[®]-based microcontrollers and microprocessors.



- Simple user interface for project settings
- Generate CMake files for building
- Supports MPLAB XC8, XC32 and XC-DSC compilers
- Supports MPLAB Data Visualizer
- Added views to assist with embedded target debugging functions:
 - Memory view
 - I/O view
 - Development kit/evaluation board views
 - Disassembly view

- Embedded systems

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Low-side current sense amplifier offers high accuracy and bandwidth

The TSC1801 from STMicroelectronics provides guaranteed low measurement error, enabling designers to build power or battery management systems without elaborate compensation algorithms.



FEATURES

- Automotive AEC-Q100 qualified
- 20V/V fixed gain
- 2.1MHz bandwidth
- Supply voltage range: 2.0V to 5.5V
- Operating-temperature range: -40°C to 125°C

APPLICATIONS

- Motor control systems
- Solar power systems
- Automotive power management
- Solenoid control

The TSC1801 is a low-side current sense amplifier which enables designers to produce accurate current measurements with a simple and low-cost analog circuit.

Low-side current sensing, which is widely used in power management, motor control, battery monitoring, and other types of circuit, is a simple, cost-effective method for current measurement. The circuit requires few additional components, and because the measurement has a ground reference, it is highly immune to noise and EMI.

When using the TSC1801 for low-side current measurement, designers benefit from high accuracy and bi-directional operation. Specified at 25°C, gain error is guaranteed to be 0.1% or less, and the maximum offset voltage is $\pm 200\mu\text{V}$. Total output error is a maximum of 0.5%.

The device is supplied in a 6-lead SOT23 package with a footprint of 3mm x 3mm.



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TELECOMS

Resistive push-button switch offers long life and reliable operation

The MSS-IO switch from SCHURTER differs from conventional push-button switches in having no mechanical actuator. Its sealed surface is easy to clean, making the switch ideal for use in hygiene-conscious applications.



SCHURTER
ELECTRONIC COMPONENTS

FEATURES

- IP67/IP69K sealing
- IK06 impact protection rating
- Standard M12 connection
- Multi-color illumination
- Momentary or latching switch options
- 24Vdc supply voltage
- Operating-temperature range: -40°C to 85°C

APPLICATIONS

- Food processing equipment
- Laboratory equipment
- Automation technology
- Robotics
- IoT devices

SCHURTER has built on its existing MSS push-button switch, launching a new version which includes an IO-Link module to enable bidirectional communication.

The MSS-IO, which operates on a wear-free resistance measurement principle, completely eliminates the use of mechanical switching components. Responding to changes in electrical resistance to detect switch actuation, the MSS-IO is sensitive enough to detect the smallest changes in pressure from the user's finger, but robust enough to withstand the rigors of industrial processes. The absence of moving parts helps to give the MSS-IO long service life.

The switch's resistive sensing operation allows SCHURTER to make a sealed surface which is unaffected by water, dirt or cleaning substances. This is a valuable feature for applications in areas which have to maintain hygiene, such as food processing or laboratory equipment.

The IO-Link interface in the MSS-IO switch allows not only for bidirectional communication, but also for configuration and real-time diagnostics, making the product ready for integration into Industry 4.0 equipment.



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