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MARKETING INNOVATIVE PRODUCTS

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EBV Elektronik
| An Avnet Company |

CONNECTED CARS

GET THE SHOW ON THE ROAD

FIFTY
YEARS**
PASSION FOR
TECHNOLOGY

When EBV was founded 50 years ago, the staff and managers at that time would have laughed if anyone had told them that they were laying the technological foundations for autonomous cars. Fast forward to today – and most car manufacturers say they plan to launch their first commercial self-driving vehicles within the next couple of years. Furthermore, the research firm Gartner says that today's automated driver assistance systems (ADAS) will evolve into widespread, fully-autonomous driving by 2025. It's clearly set to become the norm.

A good indicator of how accurate these predictions are is the level of "connectedness" of cars today. Housing a plethora of sensors for everything from road quality and speed detection to distance control and surround views – along with fast and powerful processing technologies to turn all that data into knowledge – cars have already become mobile computers. Especially when you add advanced communications, actuator technology, connectivity and IT security systems to the mix.

Against that backdrop, EBV is well positioned in the connected car segment. The major carmakers know how to make cars – they aren't usually computing or communication experts. They work closely with – and sometimes acquire – innovative start-ups who are developing the mobility technologies of tomorrow, often based on the Internet of Things (IoT) and Artificial Intelligence. And EBV has been working with both these types of company for many years, bringing them together and providing the building blocks and expertise they need.

It's an exciting time to be working with the automotive industry – helping its actors to get to grips with the paradigm shift that IoT and AI represent.



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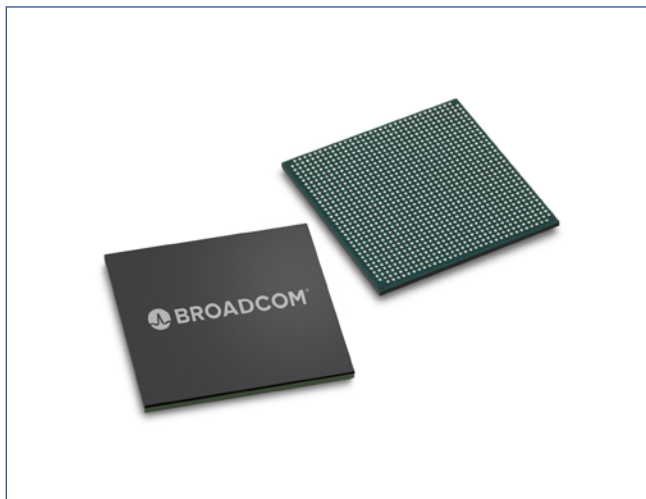


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BCM53112

Low-power Fast-Ethernet RoboSwitch™-2 with High-Speed 1GbE/2.5GbE Uplink Interfaces



BCM53112 is a highly integrated Fast-Ethernet switch designed for high-end FE applications. It is designed for Industrial applications that demand advanced Time Sensitive Networking (TSN) and Audio-Video-Bridging (AVB) support. The device can also be used for next-generation 100 Mbps hybrid-speed SMB solutions that require combinations of 100M/1GE/2.5GE ports and are either unmanaged or lightly managed from GUI or from the cloud. The switch integrates a powerful ARM® Cortex®-M7 CPU that enables customers to design complete SMB and Industrial switches without relying on external processors.

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COMMUNICATION

- **100 Mbps hybrid-speed SMB solutions**
- **Embedded 400 MHz ARM® Cortex®**
- **Support of Time Sensitive Networking (TSN)**
- **Support of Audio-Video-Bridging (AVB)**

FEATURES

- 8 × 10/100Base-T ports with integrated ultra- low-power EPHYs
- 4 × 100FX/1000FX SGMII ports
- 2 × 1G/2.5G SGMII+ ports
- 1 × RGMII
- Switch cascading that enables construction of a large switch with up to 26 ports
- Embedded 400 MHz ARM® Cortex®-M7
- Jumbo frame support: up to 9728 bytes
- 16 K entry MAC address table (also-known-as ARL)
- 1 K multicast group support
- 1 MB packet buffer
- SrTCM and TrTCM meters (support color aware and color blind modes)
- Eight CoS queues per-port with priority flow-control
- IEEE 802.1p, MAC, and DSCP packet classification
- Per-queue and per-port shaper
- 4 K VLANs (IEEE 802.1Q) with Virtual Switching Instance (VSI) support

- 1 K CFP rules support (up to 192b key)
- Ingress and Egress Mirroring
- sFlow sampling
- Loop detection
- 1 K packets and bytes counters
- 16 LAG trunks (32 supported across cascaded switches) VLAN mapping and translation
- Protection and security mechanisms: port authentication (802.1x), isolation groups, BUM flood limitation, Traffic metering, DOS filtering
- IEEE802.3az Energy Efficient Ethernet (EEE)
- Time Sensitive Networking (TSN) support: 802.1Qav, 802.1Qbv, 802.1AS
- IEEE 1588v2 and SyncE support
- 802.1BR standards-based port extender
- JTAG support
- 19 × 19 mm FBGA package support
- Available with various software packages for Unmanaged, Web-Managed and Fully-Managed applications (see datasheets for further information.)

KEY APPLICATIONS

- Industrial Ethernet Switches with or without TSN support
- Unmanaged and Web-Managed SMB devices
- 100 Mbps Port-Extender (802.1BR) solutions

MARKET SEGMENT

- Communication & Infrastructure
- Industrial

SUB MARKET

- Broadcast
- Telecom and Networking
- Embedded Computing & Storage

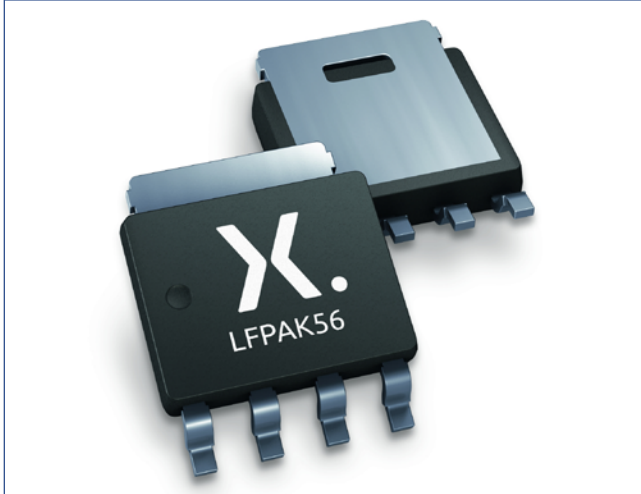
TECHNOLOGY SEGMENT

- High End Processing



High-power in LFPAK56

High-power Transistors: PHPT6xx series in LFPAK56 – full power in half the footprint



LFPAK56 package

Nexperia's high-power bipolar transistors, housed in LFPAK56 (Power-SO8) packages, deliver DPAK-like thermal and electrical performance in just half the footprint. Offering reliable, energy-efficient performance, they are AEC-Q101 qualified and support high-temperature operation (175 °C).

- High current capability I_C up to 15 A
- T_j up to 175 °C

- High power capability due to clip bond & heatsink
- Very thin package with 1 mm height only

FEATURES

- $V_{CE0} = 40\text{ V}, 60\text{ V}, 100\text{ V}$
- $I_C = 2\text{ A}, 3\text{ A}, 6\text{ A}, 10\text{ A}, 15\text{ A}$
- Power dissipation $\leq 3.7\text{ W @ }6\text{ cm}^2$
- High performance and small size
- High reliability due to robust construction
- AEC-Q101 qualified

KEY APPLICATIONS

- Power Management
- Motor drives
- Loadswitches
- Linear mode voltage regulators
- LED backlighting applications
- LED lighting
- Relay Replacement

MARKET SEGMENT

- Automotive
- Communication & Infrastructure
- Healthcare & Wearables
- Industrial
- Lighting
- Smart Grid

SUB MARKET

- Smart Grid Protection and Control
- Heating, Ventilation and Air Conditioning
- Audio and Video
- Asset Tracking
- Specialty Lighting (Digital Signage, Signals, Entertainment, Transportation)
- Lighting Fixtures
- Lighting Drivers and Electronic Control Gears
- Surveillance, Parking & Traffic Control
- Robotics
- Home & Building Control and Automation
- Home & Building Security (Alarms, Access Control)
- Renewable Energy Generation
- Railway (Traction, Control, etc...)
- Power Supplies (UPS, Chargers)
- Power Conversion (Inverters, Welding, Converters)
- Metering (Electricity, Flow, Heat)
- Toys, games and entertainment
- Power Supplies (AC/DC, DC/DC)
- Point of Sales and Vending machines

- Motion Control, Servo Drives
- Medical Imaging
- Medical Diagnostic and Therapy
- Wireless Infrastructure
- Telecom and Networking
- Broadcast
- Connected Car, Body Electronics and Automotive Lighting
- Commercial, Construction and Agricultural Vehicles
- Automotive Power Train and Chassis
- Medical Instruments
- Personal Health, Sport & Fitness
- Instrumentation, Test and Measurement
- Information Kiosk & Advertising Panels
- Human Machine Interface
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Embedded Vision
- Embedded Computing & Storage
- Elevators, Escalators, Moving Walkways

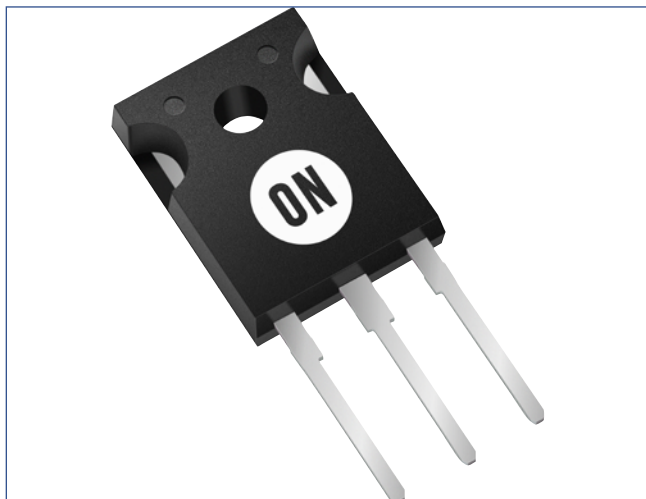
TECHNOLOGY SEGMENT

- Analog & Power



NTHL080N120SC1

N-Channel Silicon Carbide MOSFET
1200 V, 80 mΩ, TO247-3L



TO247-3-340CH

Silicon Carbide (SiC) MOSFET uses a completely new technology that provide superior switching performance and higher reliability compared to Silicon. In addition, the low ON resistance and compact chip size ensure low capacitance and gate charge. Consequently, system benefits include highest efficiency, faster operation frequency, increased power density, reduced EMI, and reduced system size.

Two different part numbers for industrial grade (NTHL080N120SC1) and automotive grade (NVHL080N120SC1) are available.

- **1200 V rated**
- **High Speed Switching and Low Capacitance**

- **Max $R_{DS(ON)} = 110 \text{ m}\Omega$ at $V_{GS} = 20\text{V}$, $I_D = 20 \text{ A}$**
- **Qualified for Automotive According to AEC-Q101 available**

FEATURES

- 100 % UIL Tested
- Pb-Free, RoHS Compliant

KEY APPLICATIONS

- PFC
- Boost Inverter
- PV Charging
- Automotive grade version:
- Automotive DC/DC converter for EV/PHEV
- Automotive On Board Charger
- Automotive Auxiliary Motor Drive

MARKET SEGMENT

- Smart Grid

SUB MARKET

- Power Conversion (Inverters, Welding, Converters)
- Power Supplies (UPS, Chargers)
- Renewable Energy Generation

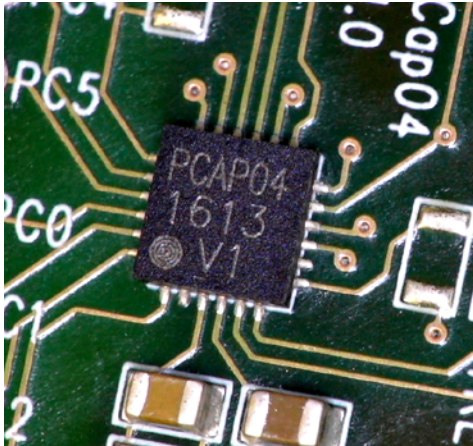
TECHNOLOGY SEGMENT

- Analog & Power



PCap04

Capacitance-to-Digital Converter



PCap04 is a capacitance-to-digital converter with integrated digital signal processor (DSP) for on-chip data post-processing. Its front end is based on ams PICOCAP principle.

This conversion principle offers outstanding flexibility with respect to power consumption, resolution and speed. PCap04 covers a wide capacitance input range.

It is easy to configure the PCap04 for different capacitance measurement tasks. The on-chip DSP allows to implement sensor algorithms like linearization and temperature compensation, with data output in a digital or analog way.

- Up to 6 capacitors in grounded mode
- Up to 3 capacitors in floating mode

- Internal reference 1 to 31 pF
- Integrated guarding operational amplifier

FEATURES

- Up to 8 aF at 2.5 Hz and 10 pF base capacitance
- Up to 50 kHz sample rate
- 32-bit DSP
- SPI/IIC interface
- PDM/PWM outputs, GPIO
- Supply voltage 2.1/3.0 to 3.6 V (integrated 1.8 V regulator)
- QFN-24, WLCSP or dice

KEY APPLICATIONS

- Humidity sensors
- MEMS
- Motion sensors
- Proximity switches and sensors
- Bio-medical sensors

MARKET SEGMENT

- Healthcare & Wearables
- Industrial
- Smart Consumer & Building

SUB MARKET

- Portable Personal Electronics & Wearables

TECHNOLOGY SEGMENT

- Analog & Power



STEVAL-BFA001V1B

Predictive maintenance kit with sensors and IO-Link capability



STEVAL-BFA001V1B

The STEVAL-BFA001V1B is an industrial reference design kit designed for condition monitoring (CM) and predictive maintenance (PdM).

The hardware development kit consists of an industrial sensor board (STEVAL-IDP005V1), an adapter for the ST-LINK/V2-1 programming and debugging tool (STEVAL-UKI001V1), a 0.050" 10-pin flat cable, a 4-pole cable mount connector plug with male contacts and an M12 female connector with a 2 m cable.

- Expansion connector with GPIO, ADC, I²C bus
- SWD connector for debugging and programming capability

- IO-Link PHY using the L6362A Device transceiver for data communication
- M12 industrial connector

FEATURES

- 32-bit ARM® Cortex®-M4 core for signal processing and analysis (STM32F469AI)
- iNEMO 6DoF (ISM330DLC)
- Absolute digital pressure sensor (LPS22HB)
- Relative humidity and temperature sensors (HTS221)
- Digital microphone sensors (MP34DT05-A)
- IO-Link PHY device (L6362A)
- Complete set of firmware demo examples based on 3D accelerometer library with advanced frequency and time domain signal processing for predictive maintenance, including:
 - Programmable FFT size (512, 1024, 2048)
 - Programmable FFT averaging

- Microphone algorithms for:
 - PDM to PCM
 - Sound pressure
 - Audio FFT
- IO-Link PHY using the L6362A Device transceiver for data communication with host unit

KEY APPLICATIONS

- Predictive Maintenance
- Condition monitoring

MARKET SEGMENT

- Industrial

SUB MARKET

- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Motion Control, Servo Drives
- Robotics

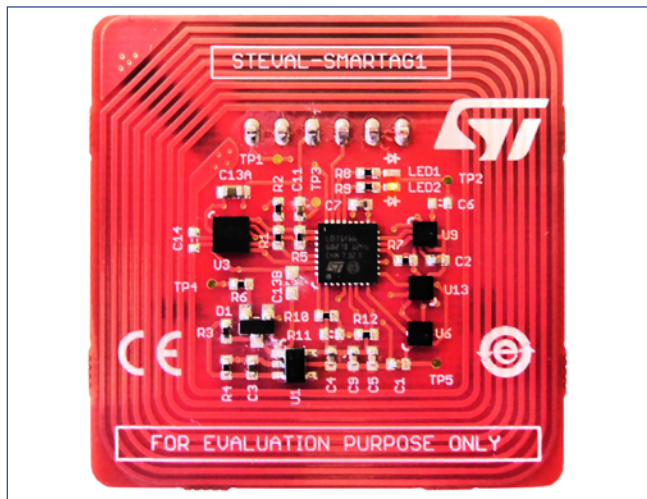
TECHNOLOGY SEGMENT

- TOOL



STEVAL-SMARTAG1

NFC Dynamic Tag sensor node evaluation board



STEVAL-SMARTAG1

This smart and flexible NFC Tracker evaluation board with sensors includes a comprehensive software library and a sample application to monitor and log sensor data over NFC from an Android or iOS device.

The ultra-low power sensor node evaluation board mounts an ST25DV NFC Tag, an STM32L0 ARM® Cortex® M0+, environment sensors (temperature, humidity and pressure) and motion (accelerometer) sensor.

The evaluation board features NFC harvesting to supply power and a battery cradle for a CR2032 battery.

- **Dynamic NFC tag solution based on 64K-bit (8K-Byte) EEPROM**
- **Ultra-low-power ARM® Cortex®-M0+ MCU running at 32 MHz**
- **Ultra-low-power high-performance three-axis linear accelero**
- **Ultra-compact piezo-resistive absolute pressure sensor**

FEATURES

- ST25DV64K dynamic NFC tag solution based on 64K-bit (8K-Byte) EEPROM and with I²C interface, Fast Transfer Mode and Energy Harvesting features
- STM32L031K6 ultra-low-power ARM® Cortex®-M0+ MCU running at 32 MHz with 32-Kbytes Flash and 8-Kbytes RAM
- LIS2DW12 ultra-low-power high-performance three-axis linear accelerometer
- LPS22HB ultra-compact piezo-resistive absolute pressure sensor which functions as a digital output barometer: 260-1260 hPa
- HTS221 capacitive digital sensor for relative humidity and temperature
- STLQ015 low drop linear regulator power management

- CR2032 Battery powered (not included)
- STM32Cube function pack (FP-SNS-SMARTAG1)
- Android (Google Play) and iOS demo apps (ST SmarTag)

KEY APPLICATIONS

- Internet of Things
- Supply Chain and Cold-Chain Management
- Smart building, home and city
- Retail and apparel
- Smart packaging
- Medical and pharmaceutical
- Batteryless sensing
- Smart agriculture (soil control, animal tracking, etc.)

MARKET SEGMENT

- Smart Consumer & Building

SUB MARKET

- Asset Tracking

TECHNOLOGY SEGMENT

- TOOL



ZCU111 RFSoc Evaluation Board

**Application Development kit for Zynq®
UltraScale+ RFSoc based products**



ZCU111 Kit Contents

The Zynq® UltraScale+™ RFSoc ZCU111 Evaluation Kit enables designers to jumpstart RF-Class analog designs for wireless, cable access, early-warning (EW)/radar and other high-performance RF applications. This kit features a Zynq UltraScale+ RFSoc supporting 8×4.096 GSPS 12-bit ADCs, 8×6.554 GSPS 14-bit DAC, and 8 soft-decision forward error correction (SD-FECs). Complete with ARM® Cortex®-A53 and ARM Cortex-R5 subsystems, UltraScale+ programmable logic, and the highest signal processing bandwidth in a Zynq® UltraScale+ device, this kit provides a rapid, comprehensive RF Analog-to-Digital signal chain prototyping platform.

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KITS AND TOOLS

- **XCZU28DR-2FFVG1517E RFSoc**
- **XM500 RFMC balun transformer add-on card**
- **FPGA Mezzanine Card (FMC+) interface for I/O expansion**
- **Ganged SFP28 cage to support up to 4 SFP/SFP+/zSFP+/SFP28 modules**

FEATURES

- Zynq UltraScale+ RFSoc ZCU111 Evaluation Board with XCZU28DR-2FFVG1517E RFSoc
- DDR4 Component – 4 GB, 64-bit, 2666 MT/s, attached to Programmable Logic (PL)
- DDR4 SODIMM – 4 GB 64-bit, 2400 MT/s, attached to Processor Subsystem (PS)
- USB3, DisplayPort, and SATA
- FPGA Mezzanine Card (FMC+) interface for I/O expansion including 12×32.75 Gb/s GTY transceivers and 34 user defined differential I/O signals
- XM500 RFMC balun transformer add-on card with 4 DACs/ 4 ADCs to baluns 4 DACs/ 4 ADCs to SMAs

KEY APPLICATIONS

- Wireless Backhaul

MARKET SEGMENT

- Hi-Rel
- Communication & Infrastructure

SUB MARKET

- Broadcast
- Telecom and Networking
- Wireless Infrastructure
- Aerospace, Defense and High Temp Electronics

TECHNOLOGY SEGMENT

- TOOL

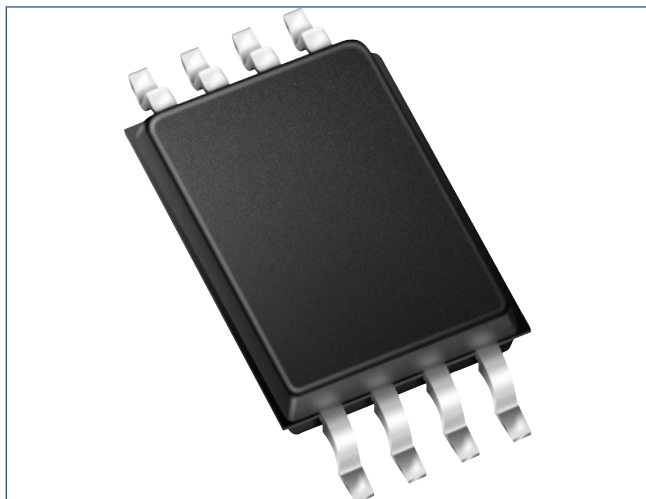


N24RF64DTPT3G

Dual Interface RFID 64 Kb EEPROM Tag ISO 15693 RF and I²C Bus Compliant

12

MEMORY



N24RF TSSOP 8-lead package option

The N24RF64 is a RFID/NFC tag with a 64 Kb EEPROM device, offering both contactless and contact interface. In addition to the ISO/IEC 15693 radio frequency identification (RFID) interface protocol, the device features an I²C interface to communicate with a microcontroller. The I²C contact interface requires an external power supply. The 64 Kb EEPROM array is internally organized as 2048 x 32 bits in RF mode and as 8192 x 8 bits when accessed from the I²C interface.

- **Contactless Transmission of Data**
- **ISO 15693 / ISO 18000-3 Mode1 Compliant**
- **Vicinity Range Communication (up to 150 cm)**
- **Air Interface Communication at 13.56 MHz (HF)**

FEATURES

- Contactless Transmission of Data
- ISO 15693 / ISO 18000-3 Mode1 Compliant
- Vicinity Range Communication (up to 150 cm)
- Air Interface Communication at 13.56 MHz (HF)
- To tag: ASK Modulation with 1.65 Kbit/s or 26.48 Kbit/s Data Rate
- From Tag: Load Modulation Using Manchester Coding with 423 kHz and 484 kHz Subcarriers in Low (6.6 Kbit/s) or high (26 Kbit/s) Data Rate Mode. Supports the 53 Kbit/s Data Rate with Fast Commands
- Read & Write 32-bit Block Mode
- Anti-collision Support
- 64-bit Unique Identifier (UID)
- Multiple 32-bit Passwords and Lock Feature for Each User Memory Sector
- Supports Fast (400 kHz) and Fast-Plus (1 MHz) I²C Protocol

- 1.8 V to 5.5 V Supply Voltage Range
- 4-Byte Page Write Buffer
- I²C Timeout
- Schmitt Triggers and Noise Suppression Filters on I²C Bus Inputs (SCL and SDA)
- 2048 Blocks x 32 Bits (64 Sectors of 32 Blocks Each): RF Mode
- 8192 x 8 Bits I²C Mode
- 2,000,000 Program/Erase Cycles
- 200 Year Data Retention
- -40 °C to +105 °C Temperature Range
- SOIC, TSSOP 8-lead Packages
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

KEY APPLICATIONS

- NFC Tag
- RF Tag
- EEPROM

MARKET SEGMENT

- Healthcare & Wearables
- Smart Consumer & Building

SUB MARKET

- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Audio and Video
- Home & Building Security (Alarms, Access Control)
- Home & Building Control and Automation
- Home Appliances

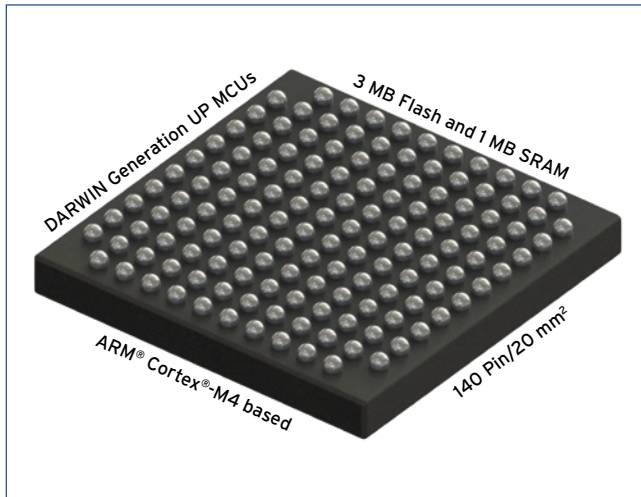
TECHNOLOGY SEGMENT

- High End Processing



MAX32652

ARM® Cortex®-M4 with a floating-point unit MCU for Applications with Large Processing Needs



MAX32652 – a new DARWIN-MCU family member

Ultra-Low Power ARM® Cortex®-M4 with FPU-Based Microcontroller for Battery-Powered Applications.

Max3265x is a new family of low-power microcontrollers built to thrive in the rapidly evolving Internet of Things (IoT).

They are smart, with the biggest memories in their class and a massively scalable memory architecture.

They run extremely long times, thanks to wearable-grade power technology. They are also tough enough to withstand the most advanced cyberattacks.

- 120 MHz ARM® Cortex®
- 3 MB Internal Flash
- 1 MB Internal SRAM
- 16-Channel DMA

FEATURES

- Ultra Efficient Microcontroller for Battery Powered Applications
 - ARM® Cortex®-M4 with FPU
- SmartDMA Provides Background Memory Transfers with Programmable Data Processing
- 120 MHz High-Speed and 7.3728 / 40 MHz Low-Power Oscillators
- 32.768 kHz and RTC (Ext. Crystal)
- 8 kHz Always-on Ultra-Low Power Oscillator
- Internal: 3 MB Flash, 1 MB SRAM
- 104 µW/MHz Executing from Cache at 1.1 V
- Five Low Power Modes
- 1.8 V and 3.3 V I/O with No Level Translators
- Scalable Cached External Memory Interfaces
 - 120 MB/s HyperBus/Xccela DDR Interface
 - SPIXF/SPIXR for External Flash/RAM Expansion
- 240 Mbps SDHC/eMMC/SDIO/microSD Interface
- Optimal Peripheral Mix Provides Platform Scalability
 - 16-Channel DMA
 - Three SPI Master (60 MHz)/Slave (48 MHz)
 - One QuadSPI Master (60 MHz)/Slave (48 MHz)
 - Three 4 Mbd UARTs with Flow Control
 - Two 1 MHz I²C Master/Slave, I²S Slave
 - 4-Channel 7.8 ksp/s 10-BIT $\Delta\Sigma$ ADC
 - USB 2.0 Hi-Speed Device Interface
 - 16 Pulse Train Generators
 - 1-Wire Master
- Trust Protection Unit (TPU) for IP/Data and Security
 - Modular Arithmetic Accelerator (MAA), True Random Number Generator (TRNG)
 - Secure Nonvolatile Key Storage, SHA-256, AES-128/192/256
 - Memory Decryption Integrity Unit, Secure Boot ROM

KEY APPLICATIONS

- Wearables

MARKET SEGMENT

- Healthcare & Wearables
- Industrial

SUB MARKET

- Medical Diagnostic and Therapy
- Robotics
- Point of Sales and Vending machines
- Instrumentation, Test and Measurement
- Information Kiosk & Advertising Panels
- Human Machine Interface
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- ... plus Embedded Vision, Computing, Storage, Wearables, Personal Health, Medical Instruments, Surveillance, Parking, Traffic Control

TECHNOLOGY SEGMENT

- High End Processing



LPC55S6x

Performance Efficient ARM® Cortex®-M33-based MCU with Advanced Security and Integration



LPC5500 chip shot

The LPC55S6x MCU family builds on the ARM® Cortex®-M33 introduced with the LPC5500 series. This family leverages the ARMv8-M to introduce new levels of performance and advanced security, bringing significant signal processing efficiency gains from a DSP accelerator offering a 10 x clock cycle reduction. An optional second core offers balance in performance and power efficiency.

In addition, the 40 nm NVM based process technology brings cost advantages, broad scalable packages, and memory options; as well as a robust enablement including MCUXpresso and Tools ecosystem, and low-cost development boards.

- 32 μ A/MHz for leading performance efficiency
- 10 x improvement in signal processing

- Rich integration to secure, sense and connect
- MCUXpresso Ecosystem with HW & SW scalability

FEATURES

- TrustZone-M for asset protection
- Secure boot and SRAM PUF based key storage for root of trust and provisioning
- Execution from encrypted images (internal flash)
- Integrated power management unit with buck DC-DC
- Dedicated co-processors for signal processing & cryptographic acceleration
- First of next gen LPC5500 MCU Series
- Scalable package and memory options
- Low-cost development board with expansion options
- Robust enablement including MCUXpresso Software/Tools ecosystem
- Up to 100 MHz ARM® Cortex®-M33
 - TrustZone, MPU, FPU, SIMD
- Coprocessors
 - DSP Accelerator
 - Crypto Engine
- Up to 640 KB FLASH
- Up to 320 KB RAM
- 128 KB ROM
- USB HS
- USB FS
- SDIO
- High-Speed SPI
- Flexcomms SPI, I²C, UART, I²S
- Protected Flash Region (PFR)
- AES-256
- SHA-2
- SRAM PUF for Key Generation support
- PRINCE – On-The-Fly Encrypt/Decrypt for flash data
- RNG
- ADC
- Analog Comparator
- Temp Sensor
- LQFP100
- VFBGA98
- LQFP64 or QFN64

KEY APPLICATIONS

- Building control and automation
- Consumer electronics
- Diagnostic equipment
- Industrial IoT

- Machine Learning
- Secure applications

MARKET SEGMENT

- Industrial
- Smart Consumer & Building
- Healthcare & Wearables

SUB MARKET

- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Human Machine Interface
- Information Kiosk & Advertising Panels
- Point of Sales and Vending machines
- Robotics
- Home & Building Control and Automation
- Home & Building Security (Alarms, Access Control)
- Home Appliances
- Instrumentation, Test and Measurement
- Portable Personal Electronics & Wearables

TECHNOLOGY SEGMENT

- High End Processing



AXM0F243

Ultra-Low Power Sub GHz ARM® Cortex®-M0+ Wireless Microcontroller



AXM0F243 Wireless

The AXM0F243 is a System on Chip (SoC) for true single chip wireless applications, containing the field proven narrow-band AX5043 RF transceiver core and a high performance ARM® Cortex®-M0+ microcontroller (MCU) core.

The AX50243 RF core is extremely powerful and software programmable. With a wide array of modulation schemes and data rates, nearly any Sub GHz protocol (proprietary or standard) can be implemented.

The ARM® Cortex®-M0+ microcontroller runs at up to 48 MHz, has 64 kB of FLASH and 8 kB of RAM and includes analog functionality, serial communication, timers and 19 GPIO pins.

- **Ultra-low Power ARM® Cortex®-M0+ 48 MHz MCU**
64 kB FLASH, 8 KB RAM
- **High Performance Narrow-band RF-Transceiver,**
based on field proven AX5043

- **QFN40 package, 5 mm x 7 mm**
- **Ultra-low Power and Programmable Analog Blocks**

FEATURES

- Frequency Range of 27 MHz to 1050 MHz
- Supply Range 1.8 V - 3.6 V
- 19 General Purpose I/O

KEY APPLICATIONS

- Automatic Meter Reading (AMR)
- Security Applications
- Home and Building Automation
- Industrial IoT and Sensor Networks
- Lighting and Remote Control
- Wireless Applications
- Smart Retail and Asset Management

MARKET SEGMENT

- Industrial
- Lighting
- Smart Consumer & Building
- Smart Grid

SUB MARKET

- Information Kiosk & Advertising Panels
- Point of Sales and Vending machines
- Specialty Lighting (Digital Signage, Signals, Entertainment, Transportation)
- Home & Building Control and Automation
- Home & Building Security (Alarms, Access Control)
- Metering (Electricity, Flow, Heat)

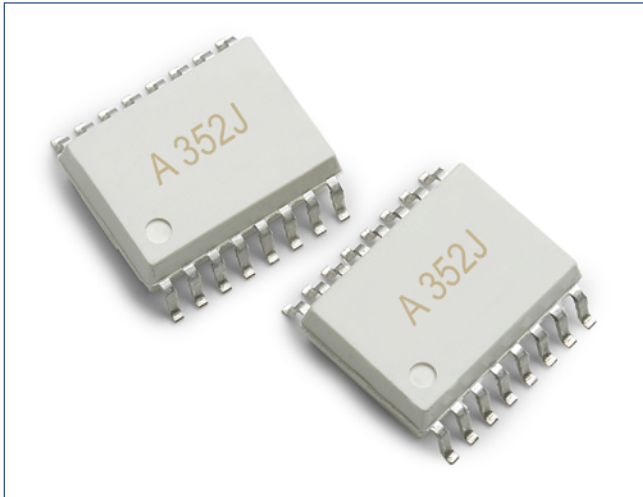
TECHNOLOGY SEGMENT

- High End Processing



5 A Gate Drive – ACPL-352J

with Excellent Noise Immunity for Motor Drives and Power Inverters



Gate Drive Optocoupler – ACPL-352J

This 5 A gate drive optocoupler is a device with integrated fail-safe IGBT and MOSFET diagnostics, protection and fault reporting. These features have become an integral part of ensuring system reliability and high availability. The device also features common mode transient immunity (CMTI) greater than 100 kV/μs and provides minimal propagation delay with excellent timing skew - this enables high frequency switching to improve efficiency in driving IGBT and SiC/GaN MOSFETs. The high peak output current and wide operating voltage range eliminate the need of an output buffer circuit.

- **5 A Maximum Peak Output Current**
- **High CMTI > 100 kV/μs**
- **Functional Safety Protection and Reporting**
- **Active Miller Clamping, Gate Status Check**

FEATURES

- 5 A Maximum Peak Output Current
- High CMTI > 100 kV/μs
- Functional Safety Protection and Reporting
- UVLO with Feedback, Over Current Sensing, Soft Turn-Off, Fault Feedback
- Active Miller Clamping, Gate Status Check
- Propagation Delay 100 ns typical
- Worldwide Safety Approvals: UL1577, CSA and IEC/EN/DIN EN 60747-5-5 (Note these important safety standards are not relevant to non-optical isolators such as magnetic and capacitor-based isolators)

KEY APPLICATIONS

- IGBT and SiC/GaN MOSFET gate drives
- Industrial drives and inverters
- Renewable energy inverters
- Switching power supplies

MARKET SEGMENT

- Smart Grid
- Industrial

SUB MARKET

- Power Conversion (Inverters, Welding, Converters)
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Robotics
- Renewable Energy Generation
- Switching Power Supplies

TECHNOLOGY SEGMENT

- Analog & Power



Horticulture 3535 Surface Mount 3W LEDs

ASM3-SxDx-xxxxH Family



ASM3-SxDx-xxxxH Family

Broadcom Horticulture LEDs are energy-efficient options, which can be used at high driving current and can dissipate heat efficiently resulting in a better performance in reliability. Its low profile package design addresses a wide variety of applications where superior robustness and high efficiency are required.

In addition to being compatible to reflow soldering process, the silicone encapsulation ensures product superiority and longevity.

- Available in Deep Red, Far Red, Royal Blue and Cool White
- High reliability package with enhanced silicone resin materials in ceramic platform

- Wide viewing angle at 130°
- Compatible with reflow soldering process and JEDEC MSL 3

FEATURES

- The LEDs' low profile package design addresses a wide variety of applications where superior robustness and high efficiency are required. In addition to being compatible to reflow soldering process, the silicone encapsulation ensures product superiority and longevity.
- To facilitate easy pick and place assembly, the LEDs are packed in tape and reel. Every reel is shipped in single flux and color bin, to provide close uniformity.

KEY APPLICATIONS

- Horticulture lighting
- General lighting
- Commercial lighting
- Architecture lighting

MARKET SEGMENT

- Lighting

SUB MARKET

- Specialty Lighting (Digital Signage, Signals, Entertainment, Transportation)

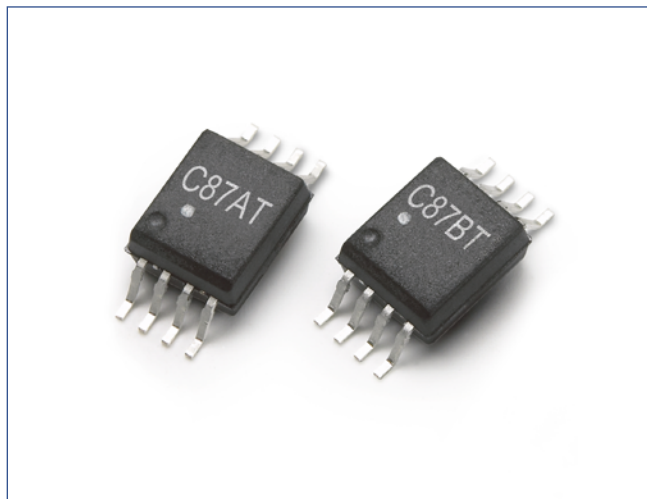
TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



DC Voltage Isolation Sensors

Automotive-Grade, High Precision ACPL-C87AT/ACPL-C87BT Family



ACPL-C87AT/ACPL-C87BT

These automotive-grade isolation amplifiers provide unequalled isolation-mode noise rejection, low offset, high gain accuracy and stability.

They utilize superior optical coupling technology, with sigma-delta ($\Sigma-\Delta$) analog-to-digital converter, chopper stabilized amplifiers, and a fully differential circuit topology to provide unequalled isolation-mode noise rejection, low offset, high gain accuracy and stability

- **Unity Gain**
- **$\pm 0.5\%$ (ACPL-C87BT) and $\pm 1\%$ (ACPL-C87AT) Gain Tolerance @25 °C**
- **25 ppm/°C Gain Drift vs Temperature**
- **-0.3 mV Input Offset Voltage**

FEATURES

- 0.05 % Nonlinearity
- 0 to 2 V Nominal Input Range
- 100 kHz Bandwidth
- Qualified to AEC-Q100 Grade 1 Test Guidelines
- Automotive Operating Temperature -40 to +125 °C
- Shutdown Feature (Active High)
- 15 kV/ μ s Common-Mode Rejection at $V_{CM} = 1000$ V
- Compact, Surface-Mount Stretched SO-8 Package
- Worldwide Safety Approval: UL 1577 (5000 V_{RMS} /1 min.) and CSA
- IEC/EN/DIN EN 60747-5-5 (pending)

KEY APPLICATIONS

- Automotive Motor Inverter DC Bus Voltage Sensing
- Automotive DC/DC Converter Voltage Sensing

- Automotive AC/DC (Charger) DC Output Voltage Sensing
- Automotive Battery Pack Voltage Sensing
- Isolation Interface for Temperature Sensing
- General Purpose Voltage Sensing and Monitoring
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Human Machine Interface
- Instrumentation, Test and Measurement
- Motion Control, Servo Drives

TECHNOLOGY SEGMENT

- Analog & Power

MARKET SEGMENT

- Automotive
- Hi-Rel
- Industrial

SUB MARKET

- Automotive Power Train and Chassis
- Aerospace, Defense and High Temp Electronics
- Robotics
- Surveillance, Parking & Traffic Control
- Elevators, Escalators, Moving Walkways



VOH1016A Series

New VOH1016A Series 1 MBd High Speed Optocouplers



VOH1016A package

The VOH1016A is a single channel 1 MBd optocoupler utilizing a high efficient input LED coupled with an integrated optical photodiode IC detector. The detector has an open collector transistor output with Schmitt-Trigger functionality. The low turn-on threshold and low supply current together with a guaranteed common mode transient immunity of 10 kV/μs makes the VOH1016A to a perfect solution for galvanic noise isolation or to break up ground loops in digital applications. The wide power supply range up to 15 V enables isolated level shifting in applications using different voltage domains.

- **Open collector transistor output with Schmitt-Trigger functionality**
- **Guaranteed minimum common mode transient immunity (CMTI) of 10 kV/μs**

- **Low typical turn-on threshold current of 0.65 mA**
- **Maximum supply current of 1.0 mA**

FEATURES

- Wide power supply range from 3 V to 15 V
- RoHS-compliant
- Latch up and oscillation free
- Feature guaranteed on / off threshold hysteresis
- Maximum rated withstand isolation voltage of 5000 V_{RMS}
- High data rate 2 MHz (NRZ)
- Low turn-on threshold current 2 mA
- Logic compatible output
- Guaranteed on / off threshold hysteresis

KEY APPLICATIONS

- Microprocessor system interface
- Ground loop elimination
- Galvanic noise isolation
- Serial bus systems
- Digital control power supply
- Signal level translation
- PLC, ATE input/output isolation
- Computer peripheral interface

MARKET SEGMENT

- Communication & Infrastructure
- Industrial
- Smart Consumer & Building

SUB MARKET

- Telecom and Networking
- Human Machine Interface
- Power Supplies (AC/DC, DC/DC)

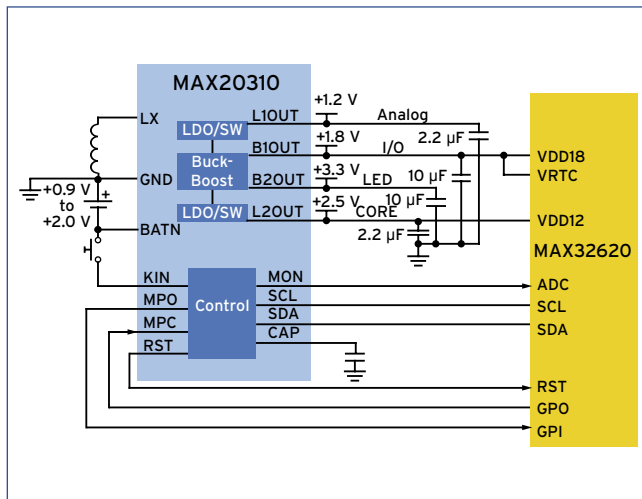
TECHNOLOGY SEGMENT

- Analog & Power



MAX20310

Ultra-Low Quiescent Current PMIC with SIMO Buck-Boost for Wearable Applications



The MAX20310 is a compact power management integrated circuit (PMIC) for space-constrained, battery-powered applications where size and efficiency are critical. The device includes a SIMO buck-boost switching regulator that provides two programmable voltage rails using a single inductor, minimizing solution footprint. The MAX20310 operates with battery voltages down to 0.7 V for use with Zinc Air, Silver Oxide, or Alkaline batteries.

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POWER MANAGEMENT

- **Extend System Battery Use Time**
- **Dual Micro-IQ 50 mA LDO**
- **Extend Product Shelf-Life**
- **Minimize Board Area**

FEATURES

- Extend System Battery Use Time
 - Single Inductor, Multiple Output (SIMO) Ultra-Low IQ Buck-Boost Regulator
 - Battery Input Voltage from 0.7 V to 2.0 V
 - Output Voltage Programmable From 0.9 V to 4.05 V
 - 250 mW Maximum Total Input Power
 - Incremental CAP Quiescent Current 1 µA per channel
 - 84 % Efficiency for 1.8 V, 10 mA Output
 - Input Current Limited
- Dual Micro-IQ 50mA LDO
 - Inputs Supplied by Dual Buck-Boost Outputs
 - Output Programmable from 0.5 V to 3.65 V
 - Quiescent Current 1.1 µA per LDO / 600 nA per Load Switch

- Configurable as Load Switch
- Extend Product Shelf-Life
- Battery Seal Mode
 - 10 nA Battery Current (typ)
- Minimize Board Area
 - 1.63 mm x 1.63 mm WLP
- Easy-to-Implement System Control
 - Voltage Monitor Multiplexer
 - 1% Accurate Battery Inverter (±10 mV at 1.0 V)
- Power Button Monitor
 - Buffered Output
- Power Sequencing
- Reset Output
- I²C Control Interface

KEY APPLICATIONS

- Wearable Medical Devices

MARKET SEGMENT

- Healthcare & Wearables

SUB MARKET

- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables

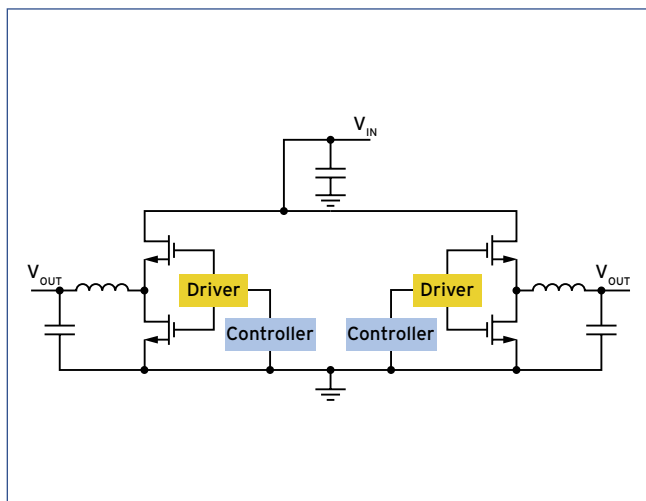
TECHNOLOGY SEGMENT

- Analog & Power



STPMIC1

14 Output Rails PMIC Power Supply, STM32MP1 companion device



Scheme Multi-Output Regulator

14 Output Rails PMIC, 4 Adjustable Constant ON Time (COT) Buck SMPS converters BOOST with Bypass, LDO for Memory Power Supply.

The STPMIC1 is a fully integrated power management IC designed for products based on high integrated application processor designs requiring low power and high efficiency. The device integrates advanced low power features controlled by a host processor via I²C and IO interface.

The STPMIC1 regulators are designed to supply power to the application processor as well as to the external system peripherals such as: DDR, Flash memories and other system devices.

- Large input voltage range from 2.8 V to 5.5 V
- 1 LDO for USB PHY supply with automatic power source detect

- 4 adjustable general purpose LDOs
- 1 reference voltage LDO for DDR memory

FEATURES

- 1 LDO for DDR3 termination (sink-source) or bypass mode for IpDDR or general purpose
- 4 adjustable adaptive constant on-time (COT) buck SMPS converters
- 5.2 V/1.1 A boost SMPS with bypass mode for 5 V input or battery input
- 1 power switch 500 mA USB OTG compliant
- 1 power switch 500 mA/1000 mA general purpose
- User programmable non-volatile memory (NVM), enabling scalability to support a wide range of applications
- I²C and digital IO control interface
- WQFN 5 × 6 × 0.8 44 leads

KEY APPLICATIONS

- Integrated PMU for complete MPU applications
- eReaders, weareable, IoT
- Portable devices
- Man-machine interfaces
- Home automation
- System on-module

MARKET SEGMENT

- Industrial

SUB MARKET

- Embedded Vision
- Embedded Computing & Storage
- Human Machine Interface
- Robotics

TECHNOLOGY SEGMENT

- Analog & Power



STUSB4700

**Stand-alone USB PD controller
(with short-to- V_{BUS} protection)**



STUSB4700 Package view

The STUSB4700 is a new family of USB power delivery controllers communicating over Type-C™ configuration channel pin (CC) to negotiate a given amount of power to be sourced to an inquiring consumer device.

The STUSB4700 addresses provider/DFP devices such as notebooks, tablets and AC adapters. The device can handle any connections to a sink or DRP without any MCU control, from the device attachment to power negotiation, including V_{BUS} discharge and protections.

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POWER MANAGEMENT

- **USB power delivery (PD) controller**
- **Type-C attach and cable orientation detection**
- **Single role: provider**
- **Full hardware solution – no software**

FEATURES

- I²C interface + interrupt (optional connection to MCU)
- Supports up to 5 power data objects (PDO)
- Configurable start-up profiles
- Integrated V_{BUS} voltage monitoring
- Internal and/or external V_{BUS} discharge path
- Short-to- V_{BUS} protections on CC pins (22 V)
- High voltage protections on V_{BUS} pins (28 V)
- High and/or low voltage power supply:
 - V_{SYS} = [3.0 V; 5.5 V]
 - V_{DD} = [4.1 V; 22 V]

- Automotive grade available
- Fully compatible with:
 - USB Type-C™ rev 1.2
 - USB PD rev 2.0
 - Certification test ID 1030023

KEY APPLICATIONS

- AC adapters and power supplies
- Smart plugs and wall adapters
- Power hubs and docking stations
- Displays
- Any Type-C source device

MARKET SEGMENT

- Healthcare & Wearables
- Industrial

SUB MARKET

- Medical Instruments
- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Embedded Computing & Storage
- Human Machine Interface

TECHNOLOGY SEGMENT

- Analog & Power



TB67B054FTG

Three-phase brushless fan motor controller IC



Toshiba_TB67B054FTG

The TB67B054FTG is a new three-phase brushless fan motor controller IC for home appliances such as air conditioners and air purifiers that realizes high efficient drive and noise reduction. During startup, the motor is driven by square-wave commutation signals that are generated according to the hall signals. When the hall signals indicate a rotational speed (f) of 5.7 Hz or more, the B67B054FTG estimates the rotor positions from the hall signals and modulate them. The TB67B054FTG then generates sine-wave by comparing the modulated signals against a triangular waveform.

- Realizes low vibration and noise with a sine-wave PWM drive
- High efficient drive

- Controls the rotation speed
- Small mounting area

FEATURES

- When a motor is upgraded from existing 8-pole rotor to 12-pole rotor type, the new product can control the rotation speed with a current microcontroller. The MC uses a rotation-control signal that outputs 2 pulses in one cycle.
- A small 32-pin QFN package (mounting area: 5 mm × 5 mm) is adopted. The mounting area is 68 % smaller than for current products in 30-pin SSOP type packages (mounting area: 32.8 mm × 13.5 mm), contributing to space-saving in mounting and board layout.

KEY APPLICATIONS

- Fans for home appliances
- Air conditioners, air purifiers, hot-water supply machines
- Fans for industrial equipment
- Refrigeration showcases and others

MARKET SEGMENT

- Smart Consumer & Building
- Industrial

SUB MARKET

- Home Appliances

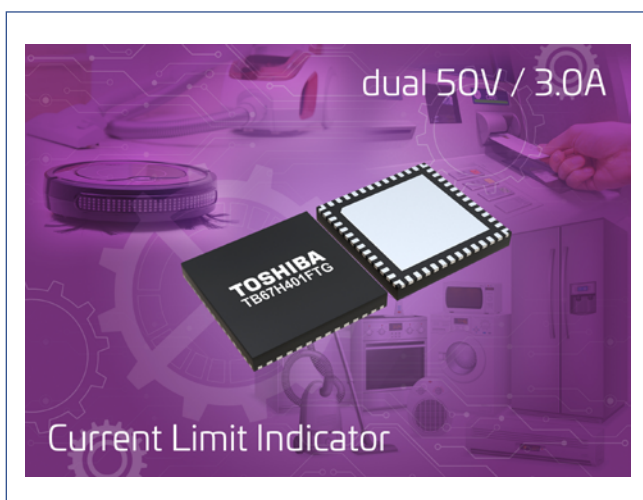
TECHNOLOGY SEGMENT

- Analog & Power



TB67H401FTG

DC brushed motor IC with current limit detection



Toshiba_TB67H401FTG

TB67H401FTG – a dual DC brushed motor driver IC equipped with an output function, which outputs a flag signal in detecting the over current.

The product is suitable for applications that need to monitor the motor driving state and feedback its result, such as industrial equipment including office equipment and ATMs and robotic cleaners.

It supports the motor drive with a rating of 50 V and 3.0 A, and contributes to space saving.

- Integrated current threshold detection circuit
- Single or Dual bridge mode
- Small package

- Low $R_{DS(ON)}$ MOSFETs
(High side + Low side = 0.49 Ω (typ.), in the dual H-bridge mode)

FEATURES

- The flag signal output function is implemented, outputting the result of the current limiter detection to the external device. It contributes to the reduction of the number of external components such as amplifiers and comparators.
- Single H-bridge mode supports the high load drive (large current drive).
- Dual H-bridge mode supports the dual motor drive (space saving/BOM cost reduction)
- Reduced external components

- Flexible for medium and high current applications
- Small footprint
- Lower BOM
- Single device for different configurations
- Smaller PCB

KEY APPLICATIONS

- Home appliances, robotic cleaners, etc.
- Industrial equipment (e.g office equipment)
- Factory automation equipment
- Banking terminals such as ATMs

MARKET SEGMENT

- Smart Consumer & Building
- Industrial

SUB MARKET

- Home Appliances
- Power Supplies (AC/DC, DC/DC)
- Factory Automation (PLCs, I/O, Sensors & Actuators)

TECHNOLOGY SEGMENT

- Analog & Power



i.MX 8M Mini

Bringing performance, power efficiency and cost-effectiveness to industrial applications



i.MX 8M Mini chip shot

The i.MX 8M Mini is a multi-core heterogeneous applications processors built using advanced 14LPC FinFET process technology. And brings together high-performance computing, power efficiency, enhanced system reliability and embedded security. At the heart is a scalable core complex of up to four ARM® Cortex®-A53 running up to 1.8GHz plus ARM® Cortex®-M4 based real-time domain at 400+ MHz. i.MX 8M Mini core options are optimized for low-power but offer the breadth of processing power necessary for consumer, audio, industrial, machine learning training and inferencing across a range of cloud providers.

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PROCESSOR

- **Power Efficient and Scalable Performance**
- **Size- and Cost-optimized System Design**

- **Media-rich: Video, Graphics, Audio, User Interface**
- **Industrial and Commercial, Longevity of Supply**

FEATURES

- Low power 14LPC delivers much lower leakage than standard technology
- Single-, dual- or quad-core ARM® Cortex®-A53 cores up to 1.8 GHz; scalable performance in a pin-compatible package
- ARM® Cortex®-M4 up to 400 MHz for HMP (task offload, power optimizations)
- Full-featured packages with 6-8 layer board design and no microvias
- DDR3L, DDR4, LPDDR4
- Direct connection of PDM microphones (no CODEC) enables low system-cost
- Linux/Android/FreeRTOS BSP and solutions software
- 1080p60 video decoding (H.265, H.264, VP8/9)
- 1080p60 video encoding (H.264, VP8)
- 2D and 3D GPU to enable 1080p media UI via MIPI-DSI display interface
- Advanced audio supports 12 Tx + 16 Rx external I²S lanes with support for 384 KHz and 768 KHz audio, with DSD512 support

- -40 °C to 105 °C junction temperature and qualification for industrial operation
- Up to 10 year continuous operation
- 0 °C to 95 °C junction temperature and qualification for consumer applications needing more performance
- Minimum 10 year supply longevity on commercial and industrial devices

KEY APPLICATIONS

- Embedded Industrial IoT
- Security and surveillance system
- Building access control
- HVAC climate control
- Home gateway
- Human Machine Interface
- Printers

MARKET SEGMENT

- Automotive
- Industrial
- Smart Consumer & Building
- Lighting
- Healthcare & Wearables

SUB MARKET

- Surveillance, Parking & Traffic Control
- Audio and Video
- Home Appliances
- Personal Health, Sport & Fitness
- Medical Imaging
- Medical Diagnostic and Therapy
- Embedded Vision
- Human Machine Interface
- Instrumentation, Test and Measurement
- Robotics
- Home & Building Security (Alarms, Access Control)
- Home & Building Control and Automation
- Heating, Ventilation and Air Conditioning
- Medical Instruments

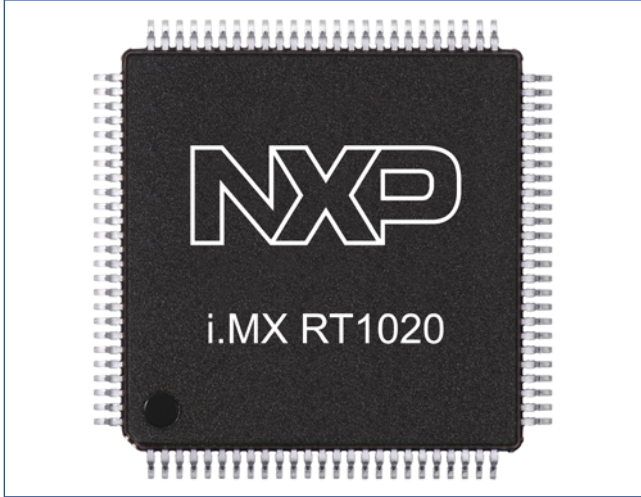
TECHNOLOGY SEGMENT

- High End Processing



i.MX RT1020

High-performance features set in low-cost LQFP package



i.MX RT1020 in 100LQFP package

Building upon decades of leadership in providing both MCUs and applications processors, NXP has developed a new series of embedded processors that fully embodies the best of two worlds: Application processor and Microcontrollers.

The i.MX RT1020 is the latest product to launch within NXP i.MX RT Series, offering a lower price, being the lowest cost of all i.MX products; it also adds LQFP packages, enabling real 2-layer PCB designs; All while maintaining the high performance, based on Arm® Cortex®-M7 core.

- **High-Performance, Real-Time Processing**
- **Low Cost, Lowest cost i.MX of the complete portfolio**
- **Rich Integration, extensive external memory interfaces**
- **Easy for MCU-based developers to use**

FEATURES

- NXP Semiconductors MIMXRT1021, 500 MHz ARM® Cortex®-M7, 144 LQFP M
- Memory 256 Mbit SDRAM memory 512 Mbit Hyper Flash
- Footprint for QSPI Flash
- TF socket for SD card
- Audio Codec
- 4-pole Audio Headphone Jack
- External speaker connection
- Microphone
- Micro USB OTG connector
- Ethernet (10/100T) connector
- CAN transceivers

- ARDUINO interface
- 6-axis ecompass (3-axis Mag, 3-axis Accel) sensor (FXOS8700CQ)
- JTAG connector
- On-board DAP-Link debugger
- 2 layer through hole PCB

KEY APPLICATIONS

- home & building automation

MARKET SEGMENT

- Industrial
- Smart Consumer & Building
- Lighting

SUB MARKET

- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Lighting Drivers and Electronic Control Gears
- Instrumentation, Test and Measurement
- Motion Control, Servo Drives
- Home Appliances
- Robotics
- Heating, Ventilation and Air Conditioning
- Home & Building Security (Alarms, Access Control)
- Home & Building Control and Automation

TECHNOLOGY SEGMENT

- High End Processing



LS1028ARDB

LS1028A Reference Design Board



LS1028ARDB

The Layerscape® LS1028A reference design board (LS1028ARDB) is designed to exercise most of the capabilities of the LS1028A SoC. The LS1028A is dual-core 64-bit ARM® Cortex®-A72 based processor for industrial IoT applications, human machine interface solutions, and industrial networking.

The LS1028ARDB can help reduce time to market. The board serves as a reference for HW development, is also used as a debug tool to check behaviors seen on a custom board. Developers use the reference design board for SW development and performance evaluation prior to the completion of a system design.

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PROCESSOR

- **Reference for custom board development**
- **Debug tool to check behavior on the board compared to custom board designs**

- **Pre-loaded emb. Linux® Software Development Kit (SDK) for Layerscape processors**
- **Overall development time and cost reduction**

FEATURES

- Layerscape LS1028A dual-core processor based on ARM® Cortex®-A72 at 1.3 GHz
- ECC on internal L1, L2 caches for high-reliability applications
- 4 GB DDR4 SDRAM w/ECC
- 32-bit DDR4 bus at data rates up to 1600 MT/s
- 256 MB QSPI NOR flash
- 512 MB QSPI NAND flash
- 8 GB eMMC
- SDHC port connected to full-size SD slot
- x1 RJ45 connector for 1 Gbps Ethernet support w/TSN, 1588
- x4 RJ45 connector for 1Gbps Ethernet switch support w/TSN, 1588 (QSGMII)
- 2 x M.2 Type E slots with PCIe Gen 3.0 x1

- 1 x M.2 Type B slot with SATA 3.0 (resistor mux with 1 Type E slot)
- 1 x Type A USB 3.0 super-speed port
- 1 x Type C USB 3.0 super-speed port
- DisplayPort interface
- 2 x DB9 RS232 serial ports
- 2 x DB9 CAN interfaces
- 1 x 3.5 mm audio out
- 2 x MikroBUS™ sockets

KEY APPLICATIONS

- Robotics Control
- CNC
- Motion Control
- Programmable Logic Controller (PLC)
- Industrial PC
- Industrial HMI

MARKET SEGMENT

- Communication & Infrastructure
- Industrial
- Smart Grid

SUB MARKET

- Telecom and Networking
- Embedded Computing & Storage
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Human Machine Interface
- Motion Control, Servo Drives
- Robotics
- Smart Grid Protection and Control
- Railway (Traction, Control, etc.)
- Power Supplies (UPS, Chargers)

TECHNOLOGY SEGMENT

- High End Processing



STM32MP157

**MPU with ARM® Dual Cortex®-A7 650 MHz,
ARM® Cortex®-M4, 3D GPU, TFT/MIPI DSI**



Product Image

STM32MP157 microprocessors are based on the flexible architecture of a Dual ARM® Cortex®-A7 core running at 650 MHz and ARM® Cortex®-M4 at 209 MHz combined with a dedicated 3D graphics processing unit (GPU) and MIPI-DSI display interface and a CAN FD interface.

The STM32MP157 3D OpenGL ES 2.0 graphics engine works together with an optimized software stack design for industry-standard APIs with support for Android™ and Linux® embedded development platforms.

The security option includes Secure Boot, TrustZone® peripherals and an active tamper-detect feature.

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PROCESSOR

- **32-bit dual-core ARM® Cortex®-A7, 650 MHz and 32-bit ARM® Cortex®-M4, 209 MHz**
- **Secure boot, TrustZone® peripherals, active tamper**

- **ARM® Cortex®-M4 resources isolation**
- **3D GPU: Vivante® – OpenGL® ES 2.0**

FEATURES

- 256-Kbyte unified level 2 cache
- ARM® NEON™ and ARM® TrustZone®
- ARM® Cortex®-M4 with FPU/MPU (Up to 703 CoreMark®)
- External DDR memory up to 1 Gbyte
- up to LPDDR2/LPDDR3-1066 16/32-bit
- up to DDR3/DDR3L-1066 16/32-bit
- 708 Kbytes of internal SRAM: 256 KB of AXI SYSRAM + 384 KB of AHB SRAM + 64 KB of AHB SRAM in backup domain and 4 KB of SRAM in backup domain
- Dual mode Quad-SPI memory interface
- Flexible external memory controller with up to 16-bit data bus: parallel interface to connect external ICs and SLC NAND memories with up to 8-bit ECC
- 1.71 V to 3.6 V I/Os supply (5 V-tolerant I/Os)
- POR, PDR, PVD and BOR
- On-chip LDOs (RETRAM, BKPSRAM, DSI 1.2 V, USB 1.8 V, 1.1 V)
- Backup regulator (~0.9 V)
- LPDDR2/3 retention in Standby mode

- Low-power modes: Sleep, Stop and Standby
- Controls for PMIC companion chip
- Total current consumption down to 6 µA
- Up to 37 communication peripherals
- 2 × CAN controllers supporting CAN FD protocol, out of which one supports time-triggered CAN (TTCAN)
- 3 × SDMMC up to 8-bit (SD/eMMC™/SDIO)
- 10/100M or Gigabit Ethernet GMAC
- LCD-TFT controller, up to 24-bit // RGB888
- MIPI® DSI 2 data lanes up to 1 GHz each
- AES 128, 192, 256, TDES
- HASH (MD5, SHA-1, SHA224, SHA256), HMAC
- 3072-bit fuses including 96-bit unique ID, up to 1184-bit available for user

KEY APPLICATIONS

- Industrial control
- Human Machine Interface
- IoT gateway
- Embedded computing

MARKET SEGMENT

- Industrial
- Healthcare & Wearables
- Smart Consumer & Building

SUB MARKET

- Medical Imaging
- Home & Building Security (Alarms, Access Control)
- Home & Building Control and Automation
- Robotics
- Professional Gaming, Amusement & Casino Machines
- Point of Sales and Vending machines
- Information Kiosk & Advertising Panels
- Human Machine Interface
- Embedded Vision
- Embedded Computing & Storage
- Home Appliances

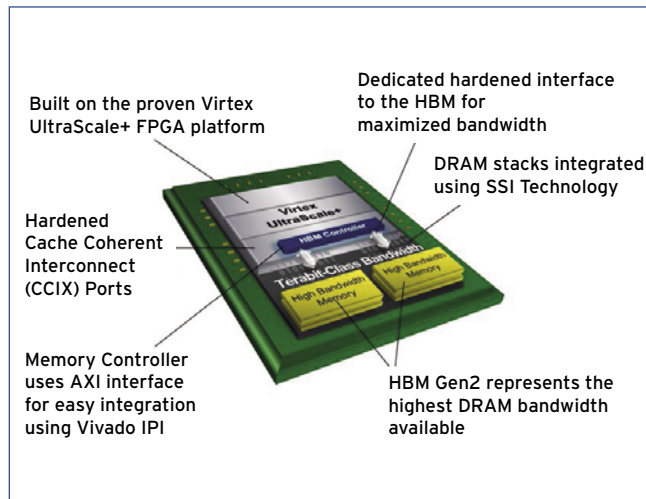
TECHNOLOGY SEGMENT

- High End Processing



Virtex UltraScale+ HBM FPGA®

High Performance FPGA with on-board High Bandwidth Memory



Virtex HBM

Based on the UltraScale architecture, the latest Virtex® UltraScale+ devices provide the highest performance, including the highest signal processing bandwidth at more than 20 TeraMACs of DSP compute performance. They also deliver the highest on-chip memory density with up to 378 Mb of total on-chip integrated memory, plus up to 8 GB of HBM Gen2 integrated in-package for 460 GB/s of memory bandwidth. Virtex UltraScale+ devices deliver significant capabilities with integrated IP for PCI Express, Interlaken, 100 G Ethernet with FEC, and Cache Coherent Interconnect for Accelerators (CCIX).

- **Internal SRAM Bandwidth = 30 TB/s**
- **HBM2 Memory Bandwidth = 460 GB/s and DDR Memory Bandwidth = 38 GB/s**
- **24.5 Tera OP/s DSP compute performance**
- **Look-Up Tables = 1,079 K PCI Express Gen4 × 8 with CCIX**

FEATURES

- Integrated 100 G Ethernet MAC with KR4-FEC and 150G Interlaken cores
- Over 2× system-level performance per watt over Virtex-7 FPGAs
- Up to four speed-grade improvement with high utilization
- Up to 128-33 G transceivers deliver 8.4 Tb of serial bandwidth
- 58 G PAM4 transceivers with KP4-FEC enable data transmission at 50 G+ line rates
- 460 GB/s HBM bandwidth, and 2,666 Mb/s DDR4 in a mid-speed grade
- A 5:1 card reduction for 1 Tb MuxSAR transponder
- UltraRAM for on-chip memory integration
- VCXO and fractional PLL integration reduces clocking component cost

- Up to 60 % lower power vs. 7 series FPGAs
- Voltage scaling options for performance and power
- Tighter logic cell packing reduces dynamic power
- Seamless footprint migration from 20 nm planar to 16 nm FinFET+
- Co-optimized with Vivado Design Suite for rapid design closure
- SmartConnect technology for intelligent IP integration
- Of very high value are the IPs:
 - TCAM SmartCore™, a ternary, content-addressable memory
 - Random Forest, provides acceleration, e.g. for implementing machine learning algorithms

KEY APPLICATIONS

- AI
- Wired Comms HBM as a packet buffer (400 G+)
- Data Center Storage Acceleration
- Smart NIC
- Machine Learning
- A&D Any number of radar and electronic warfare applications
- Algorithmic TCAM Random Forest

MARKET SEGMENT

- Communication & Infrastructure

SUB MARKET

- Wireless Infrastructure
- Telecom and Networking
- Broadcast

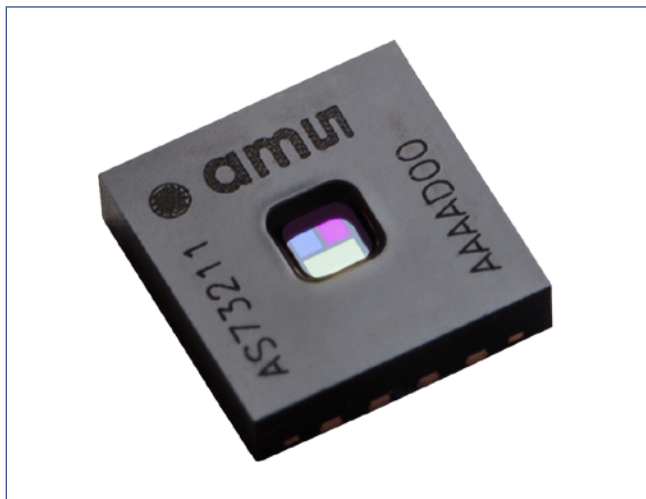
TECHNOLOGY SEGMENT

- High End Processing



AS73211

JENCOLOR® Digital XYZ Sensor



AS73211 is a digital XYZ sensor with I²C interface for relative & absolute color measurement and control. The combination of True Color XYZ sensitized photodiodes with a filter function based on the standard CIE 1931/DIN 5033 (human eye perception) and used interference filter technology of three-range sensors makes the AS73211 more accurate than RGB sensors and guarantee this function without spectral changings over lifetime. AS73211 is designed with a high dynamic range to measure any light in the visible range in environments from sunlight to dark rooms, dimmed LEDs or dark colored monitors

- **JENCOLOR® interference filter technology based on CIE 1931, DIN 5033**
- **Sensitivity up to 2.1 M counts/(μW/cm²)**

- **Dynamic range 250 M : 1 (16 to 24 Bit ADC)**
- **Conversion time 125 μs to 16 s**

FEATURES

- Temperature range -40 °C up to 125 °C
- On-chip temperature sensor

KEY APPLICATIONS

- LED feedback control
- Display calibration
- Fluid or reagent analysis
- Color detection
- Light metering

MARKET SEGMENT

- Industrial
- Smart Consumer & Building
- Healthcare & Wearables

SUB MARKET

- Medical Imaging
- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Embedded Vision

- Point of Sales and Vending machines
- Robotics
- Surveillance, Parking & Traffic Control
- Home & Building Control and Automation
- Home Appliances
- Toys, games and entertainment

TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



QRed Spectrometer AFBR-S20R15R

Ultra-Compact NIR Spectrometer with Cooled High-Performance Image Sensor



QRed AFBR-S20R15R

The QRed is the world's first truly portable near-infrared spectrometer. On a footprint smaller than a credit card, it includes high-throughput CzernyTurner optics with a TEC-cooled InGaAs image sensor.

- Wavelengths range from 900-1700 nm
- Spectral resolution of 4 nm

- Compact size
- Cooled InGaAs sensor

FEATURES

- Powerful on-board electronics with processing and evaluation
- High thermal stability and heat transfer without fan
- Full processing of spectra in the device (offset, nonlinearity, dark spectrum, and spectral sensitivity)
- Stable measurement conditions due to active cooled sensor
- AUX connector for analog and digital I/O, communication interfaces and power supply

KEY APPLICATIONS

- Food safety
- Agricultural measurements
- Color measurements
- Counterfeit detection

- Environmental analysis
- Forensic analysis
- Health and life science
- Light measurements
- Process control and monitoring
- Quality control

MARKET SEGMENT

- Lighting
- Industrial
- Healthcare & Wearables

SUB MARKET

- Medical Diagnostic and Therapy
- Instrumentation, Test and Measurement
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Lighting Drivers and Electronic Control Gears

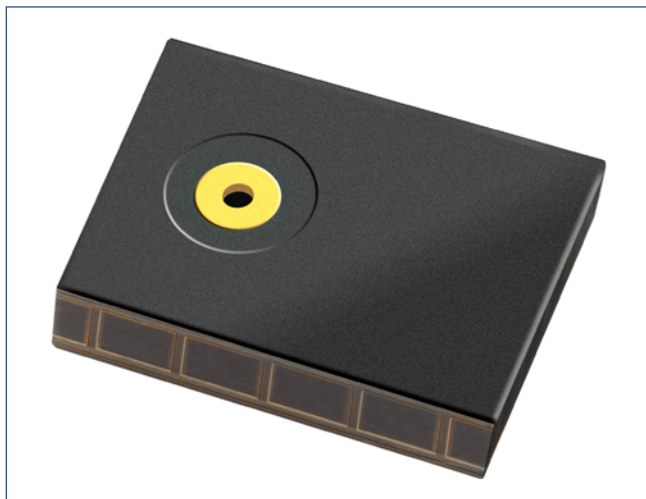
TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



IMP34DT05

MEMS audio sensor omnidirectional digital microphone for industrial applications



IMP34DT05 – a low-distortion digital microphone

The IMP34DT05 is an ultra-compact, low-power, omnidirectional, digital MEMS microphone built with a capacitive sensing element and an IC interface.

The sensing element, capable of detecting acoustic waves, is manufactured using a specialized silicon micromachining process dedicated to producing 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 IMP34DT05 is a low-distortion digital microphone with a 64 dB signal-to-noise ratio and -26 dBFS ± 3 dB sensitivity.

- **Single supply voltage**
- **Low power consumption**
- **AOP = 122.5 dBSPL**
- **64 dB signal-to-noise ratio**

FEATURES

- Omnidirectional sensitivity
- 26 dBFS ± 3 dB sensitivity
- PDM output
- HCLGA package
 - Top-port design
 - SMD-compliant
 - EMI-shielded
 - ECOPACK®, RoHS, and “Green” compliant

KEY APPLICATIONS

- Anti-tampering devices
- Vibration monitoring
- Audio-activated functions
- Predictive maintenance
- Noise cancelling
- Sound detection for alarm systems
- Human/machine voice interface
- Anti-theft systems

MARKET SEGMENT

- Industrial

SUB MARKET

- Elevators, Escalators, Moving Walkways
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Motion Control, Servo Drives
- Robotics

TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



VCNL4030X01

AECQ Proximity Sensor with Four I²C Address Options for Multi-Sensor Applications



VCNL4030X01 image

VCNL4030X01 integrates a PS, ALS and a high power IRED into one small package. It incorporates photodiodes, amplifiers, and analog to digital converting circuits into a single chip by CMOS process. The 16-bit high resolution ALS for excellent sensing capabilities with sufficient selections to fulfill applications whether dark or high transparency lens design. ALS and PS offer a programmable interrupt with individual high and low thresholds offers the power savings on the microcontroller and features an intelligent cancellation scheme - cross talk is eliminated effectively.

- **Integrated modules: IRED, ALS, PS and signal conditioning IC**
- **Operates ALS and PS in parallel structure**
- **Filtron™ technology adoption for robust background light cancellation**
- **Ambient light photo diode offers detection from 0.004 lx to 4.2 klx**

FEATURES

- Offers four different slave address options
- Features Filtron™ technology
 - Enables ambient light spectral sensitivity close to that of the human eye
 - Offers excellent background light cancellation capabilities
- Compact 4 mm by 2.36 mm by 0.75 mm 8-pin QFN package
- Combines photo detectors for proximity and ambient light and a high power IRED
- Integrated signal conditioning IC and a 16-bit ADC
- AEC-Q101 qualified
- Interrupt function
- Supports I²C bus communication interface
- Ambient light photo diode offers detection from 0.004 lx to 4.2 klx
- High accuracy of $\pm 10\%$

- Fluorescent light flicker immunity
- Excellent temperature compensation from -40 °C to +105 °C
- Proximity sensor uses intelligent cancellation to eliminate cross-talk
- Smart persistence scheme ensures fast response time and accuracy when an object is detected
- High object detection distances up to 300 mm
- Emitter wavelength peaks at 940 nm and has no visible "red-tail"
- Supply voltage range of 2.5 V to 3.6 V
- I²C bus voltage range from 1.8 V to 5 V
- RoHS-compliant, halogen-free, and Vishay Green

KEY APPLICATIONS

- Sensing for touchscreen
- detection for display activation
- sensing for dimming control in displays, keypads
- Collision avoidance in toys and robots

MARKET SEGMENT

- Automotive

SUB MARKET

- Commercial, Construction and Agricultural Vehicles
- Connected Car, Body Electronics and Automotive Lighting
- ADAS, Automotive Infotainment & Cluster

TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



XG6 Series

Client NVMe™ SSD



XG6 M.2 2280

The XG6 series utilizes Toshiba Memory's latest 96-layer, 3D TLC (3-bit-per-cell) flash memory.

With 4th generation BiCS FLASH™ and SLC cache features, XG6 SSDs reach up to sequential read/write speeds of 3180 MB/s and 2960 MB/s respectively and deliver up to 355,000 random read and 365,000 random write IOPS.

In addition to high performance, XG6 carries on the low power design of the XG family, consuming 4.7 W or less in active mode and less than 3 mW in stand-by mode.

- Toshiba Memory 96-Layer BiCS FLASH™
- PCIe® Gen3x4L NVMe™

- Capacities up to 1024 GB
- M.2 2280 Single-sided

KEY APPLICATIONS

- Server-boot, caching & logging use in data center
- High-performance desktop PCs
- Gaming PCs
- Thin performance notebook PCs

MARKET SEGMENT

- Industrial

SUB MARKET

- Embedded Computing & Storage
- Embedded Vision
- Human Machine Interface
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Information Kiosk & Advertising Panels
- Instrumentation, Test and Measurement
- Point of Sales and Vending machines
- Professional Gaming, Amusement & Casino Machines
- Robotics
- Surveillance, Parking & Traffic Control

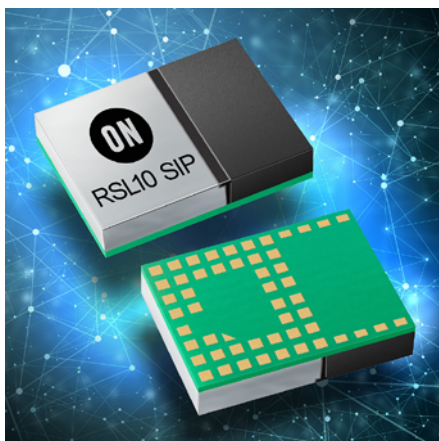
TECHNOLOGY SEGMENT

- High End Processing



RSL10 SIP

RSL10 System-in-Package offers one of lowest power Bluetooth® 5 low energy solutions



RSL10SIP package

The RSL10 SIP offers the easiest way to bring the industry's lowest power Bluetooth® low energy technology to wireless applications.

Already fully certified to worldwide wireless standards (FCC, CE, IC, KCC, MIC), the RSL10 SIP significantly reduces time to market by removing the need for any additional antenna design considerations.

With an integrated antenna, RSL10 Radio SoC, and all passive components built into a single, miniature package, the RSL10 SIP is a compact, ready-to-use solution.

- **Fully-integrated antenna, passive components and Radio SoC**
- **One of industry's lowest power consumptions**

- **Fully-Certified to Worldwide Regulatory Standards**
- **Up-Link and Down-Link**

FEATURES

- Ultra-Low-Power:
 - Very low power consumption in Deep Sleep Mode (62.5 nW) and Rx in Receive Mode (7 mW)
 - Extraordinary EEMBC® ULPMark™ scores (1090 ULPMark CP @ 3 V; 1260 @ 2.1 V)
- Complete Solution
 - Fully-integrated antenna
 - RSL10 Radio SoC
 - All passive components
- Advanced Multi-Protocol Wireless Functionality
 - Supports Bluetooth Low Energy and 2.4 GHz proprietary/custom protocols
 - Rx Sensitivity: -94 dBm
 - Transmitting Power: -17 to +6 dBm
 - Supports Firmware Over The Air (FOTA)
- Other Key Technical Features
 - Built-in power management
 - Advanced dual-core architecture
 - 1.1 to 3.3 Voltage Supply Range

- 384 kB Flash, 76 kB Program Memory, 88 kB Data Memory
- IP protection feature to secure flash contents
- Configurable analog and digital sensor interfaces (GPIOs, LSADs, I²C, SPI, PCM)

KEY APPLICATIONS

- IoT Edge Node Applications
- Energy Harvesting Applications
- Wearables
- Fitness Trackers/Wellness Monitors
- Smart Locks
- Appliances (e.g. A/C, fans etc).
- Lighting Applications

MARKET SEGMENT

- Automotive
- Healthcare & Wearables
- Smart Consumer & Building
- Industrial

SUB MARKET

- Connected Car, Body Electronics and Automotive Lighting
- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Information Kiosk & Advertising Panels
- Point of Sales and Vending machines
- Professional Gaming, Amusement & Casino Machines
- Asset Tracking
- Audio and Video
- Heating, Ventilation and Air Conditioning
- Home & Building Control and Automation
- Home & Building Security (Alarms, Access Control)
- Home Appliances
- Toys, games and entertainment

TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity

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