# M I P

MARKETING INNOVATIVE PRODUCTS

2019

03

# ARTIFICIAL INTELLIGENCE FOR SMARTER INDUSTRY

FIFTY YEARS
PASSION FOR TECHNOLOGY

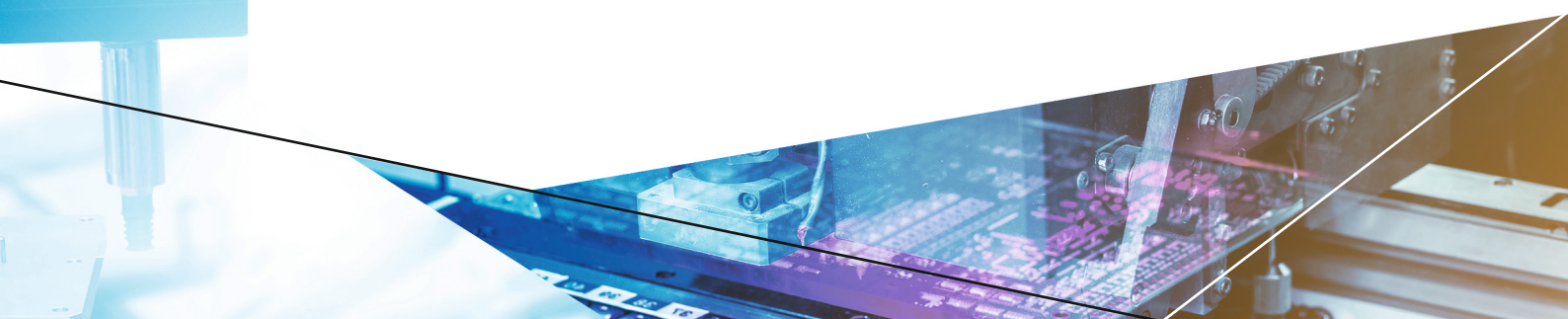
**In the world of fast-paced technological advancement, there is a high demand for reliable and flexible tools and machines capable of adapting to inconsistent working conditions, which are also expected to make decisions based on incomplete inputs from the field. These are tasks that are commonly performed by sentient beings, like humans. But is it possible for a machine or a tool to actually "think" for itself and make some critical decision? For an outsider, this sounds more like a scenario from a science fiction movie, but in reality, these smart machines do exist and have found their place in many modern industries.**

**One good example is the maintenance of an industrial production line. Shutting down the production line for maintenance can be very costly. The more complex the production is, the more costly it can be. In order to reduce unnecessary costs, the production line should have some predictive mechanisms that can help prevent crashes before they even happen. Successful maintenance prediction requires data acquisition from various elements of the production line. By processing and analyzing collected data employing Artificial Neural Networks (ANN), a viable maintenance decision can be made in time - not too early and not too late. The machine itself can decide when exactly the time to act is, without explicit programming. This intelligent approach allows much more flexibility than the conventional approach, allowing for autonomous operation under inconsistent operating conditions.**

**Another example could be an automatic visual inspection of the products on the same production line we discussed above. Scratches, cracks, bubbles and other product imperfections can be very random. By employing the machine learning approach, machine vision processes can be made autonomous and with very low error margins, as the ANNs work really well with the classification and recognition. Applying the correct type of the ANN can be the key to better yield and quality of the modern production line.**

**Inspired by the most ingenious design in the universe - the human brain, we started augmenting our machines with Artificial Intelligence. Armed with tremendous processing capabilities, supported by powerful Artificial Neural Networks, we have managed to combine the best from both worlds: machines which excel at tasks that require precision and strength can now perform intellectually challenging tasks as well. As a result, the industry becomes smarter and revolutionary more efficient.**

**For the last 50 years, EBV Elektronik has been actively participating in the events that led to the latest industrial revolution. Today, our application experts will gladly help you upgrade your industry and push it even further, as they always did in the past: by providing consulting, support, and delivery. Let us build a smarter future together!**



# CONTENTS BY PRODUCT GROUPS

# CONTENTS BY MANUFACTURERS

# MCP6C02

## Zero-Drift, 65 V High-Side Current Sense Amplifier


**MCP6C02 Product Image**

The MCP6C02 is a single high-side current sense amplifier designed specifically to sense the current through a shunt resistor and convert this measurement to a proportional output voltage.

The input pins can support voltages up to 65 V. The output voltage range will be determined by a separate supply pin, which spans 2 V to 5.5 V to make it easy to interface to an ADC or MCU that is operating at 2.5 V, 3.3 V and 5 V.



- **Bidirectional or Unidirectional**
- **High DC Precision**
- **POR Protection**
- **Extended Temperature Range**

### FEATURES

- Zero-drift architecture
- Bidirectional or Unidirectional
- Input (Common-mode) Voltages:
  - +3.0 V to +65 V, specified
  - +2.8 V to +68 V, operating
  - -0.3 V to +70 V, survival
- Power Supply:
  - 2.0 V to 5.5 V
  - Single or Dual (Split) Supplies
- High DC Precision
  - $V_{OS}$: ±1.65 µV (typical)
  - CMRR: 154 dB (typical)
  - PSRR: 138 dB (typical)
  - Gain Error: ±0.1 % (typical)
- Preset Gains: 20, 50 and 100 V/V
- POR Protection
  - HV POR for $V_{IP} – V_{SS}$
  - LV POR for $V_{DD} – V_{SS}$
- Bandwidth: 500 kHz (typical)
- Supply Current: 490 µA (typical)
- Enhanced EMI Protection: EMIRR of 118dB at 2.4 GHz (typical)
- Extended Temperature Range (E-Temp): -40 °C to +125 °C

### KEY APPLICATIONS

- Motor Control
- Analog Level Shifter
- Industrial Computing
- Battery Monitor/Tester

### MARKET SEGMENT

- Industrial
- Healthcare & Wearables

### SUB MARKET

- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Motion Control, Servo Drives
- Robotics
- Embedded Computing & Storage

### TECHNOLOGY SEGMENT

- Analog & Power

# BCM54213PE

## Single Port RGMII Gigabit Ethernet Transceiver


BCM54213

The BCM54213PE is a triple-speed 1000BASE-T/100BASE-TX/10BASE-T Gigabit Ethernet (GbE) transceiver, integrated into a single monolithic CMOS chip. Based on Broadcom®'s proven digital signal processor technology, the BCM54213PE is designed to be fully compliant with RGMII, allowing compatibility with industry-standard Ethernet MACs and switch controllers. Designed for reliable operation over worst-case category 5 cable, the BCM54213PE automatically negotiates with its link partner to determine the highest possible operating speed. The device detects and corrects most common wiring problems.

- **Single-chip integrated triple-speed Ethernet transceiver**
- **1000BASE-T IEEE 802.3ab**
- **100BASE-TX IEEE 802.3u**
- **10BASE-T IEEE 802.3**

### FEATURES

- Supports RGMII MAC interface
- Supports SOFT-RESET
- 10BASE-T can also run on standard category 3, 4, and 5 UTP
- CableChecker™ diagnostics for common cable problems detection
- Ethernet@Wirespeed™
- Integrated voltage regulator
- Trace matched output impedance
- Line-side loopback
- Low EMI emissions
- Robust CESD tolerance
- Support for jumbo packets up to 10 KB
- Detection and correction of pair swaps
- (MDI crossover), pair skew, and pair polarity
- Advanced power management
- Super-isolate mode
- Wake-on-LAN (WOL)
- IEEE 802.3az-compliant support
- Support for native EEE MACs
- Support for legacy non-EEE MAC using AutogrEEEn® mode
- AutogrEEEn+
- 36-pin QFN package

### KEY APPLICATIONS

- GbE switches and uplinks
- Management Port
- Industrial Automation
- Customer Premise Equipment (CPE)
- Video Surveillance
- LED Controller

### MARKET SEGMENT

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

### SUB MARKET

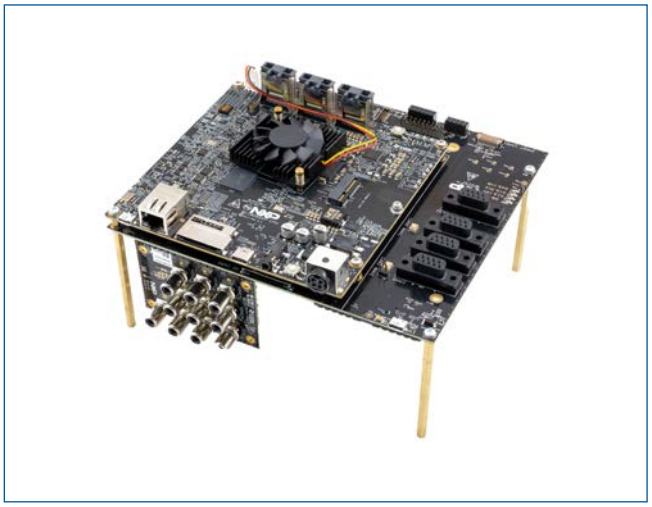
- Broadcast
- Telecom and Networking
- Embedded Vision
- Information Kiosk & Advertising Panels
- Human Machine Interface
- Robotics
- Smart Grid Protection and Control

### TECHNOLOGY SEGMENT

- High End Processing

# MCIMX8QXP-CPU

## i.MX 8QuadXPlus Multisensory Enablement Kit (MEK)



i.MX 8QuadXPlus Multisensory Enablement Kit CPU Board

The NXP i.MX 8QuadXPlus Multisensory Enablement Kit (MEK) provides a platform for evaluation and development of the Arm® Cortex® A35 + Cortex®-M4F based i.MX 8QuadXPlus, i.MX 8DualXPlus and i.MX 8DualX applications processors as well as the NXP PF8100 power management integrated circuit (PMIC) solution and sensors.

The i.MX 8X processor family is built with a high-level integration and is focused on safety-certifiable and efficient performance for industrial and automotive. It has up to four A35 cores, an M4 core, and an integrated DSP.



- **High-level integration to support graphics, video, image processing, audio, and voice**
- **Ideal for safety-certifiable and efficient performance requirements**
- **Supported with highly optimized drivers and software, and accessory boards**
- **Enablement for broad-based applications for the embedded industrial and automotive markets**

### FEATURES

- NXP i.MX 8QuadXPlus
- 4x Cortex®-A35 at up to 1.2 GHz
- 512 MB L2 cache
- Cortex®-M4 at 266 MHz
- NXP MMPF8100 PMIC
- 3 GB LPDDR4 memory, x32
- 32 GB eMMC 5.0
- 64 MB Octal SPI Flash
- 2x MIPI / LVDS connectors
- Camera MIPI-CSI
- Audio Codec
- Microphone and headphone jacks
- 1x full-size SD/MMC card slot
- 10/100/1000 Ethernet port
- 1x USB 3.0 Type-C
- JTAG connector
- Serial to USB connector
- A set of additional features, including accel, gyro, light, and pressure sensors by NXP
- RGB LED
- OS support for Linux, Android, and FreeRTOS
- M.2 Connector (PCIe, USB, UART, I²C, and I²S)
- Support for additional accessory boards (available separately)

### KEY APPLICATIONS

- Robotics
- Human Machine Interface
- Embedded Vision
- Home & Building Control and Automation
- Commercial, Construction and Agricultural Vehicles
- Automotive Power Train and Chassis
- ADAS, Automotive Infotainment & Cluster
- Medical Instruments
- Medical Imaging
- Medical Diagnostic and Therapy
- Surveillance, Parking & Traffic Control

### MARKET SEGMENT

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

### SUB MARKET

- Connected Car, Body Electronics and Automotive Lighting
- Information Kiosk & Advertising Panels
- Motion Control, Servo Drives
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Instrumentation, Test and Measurement
- Home & Building Security (Alarms, Access Control)
- Heating, Ventilation and Air Conditioning
- Audio and Video
- Telecom and Networking

### TECHNOLOGY SEGMENT

- High End Processing

# Xilinx® U200 Alveo™ Card P

## Xilinx® U200 Alveo™ Data Center Accelerator Card Passive Cooling


Xilinx® U200 Alveo™ Data Center accelerator cards are designed to meet the constantly changing needs of the modern Data Center, providing an up to 90X performance increase over CPUs for most common workloads, including machine learning inference, video transcoding, and database search & analytics. Alveo accelerator cards are adaptable to changing acceleration requirements and algorithm standards.

Enabling Alveo is an ecosystem of applications for Data Center workloads. For custom solutions, Xilinx's Application Developer Tool Suite (SDAccel™) and Machine Learning Suite are available.

- **Fast – Highest Performance**
- **Adaptable – Accelerate Any Workload**
- **Accessible – Cloud < > On-Premise Mobility**
- **Internal SRAM Capacity: 35 MB**

### FEATURES

- Computing power:
  - Peak INT8 TOPs: 18.6
- Memory:
  - DDR Memory Capacity: 64 GB
  - DDR Memory Bandwidth: 77 GB/s
  - Internal SRAM Capacity: 35 MB
  - Internal SRAM Bandwidth: 31 TB/s
- Logic Resources:
  - 892,000 Look-up Tables (LUTs)
- Power and Thermal:
  - Maximum Total Power: 225 W
  - Passive Thermal Cooling

### KEY APPLICATIONS

- Data Center
- Machine Learning

### MARKET SEGMENT

- Audio Video Broadcast
- Communication & Infrastructure
- Industrial

### SUB MARKET

- HPC
- Financial Computing
- Data Analytics
- Genomics
- Embedded Computing & Storage
- Video Processing and Transcoding

### TECHNOLOGY SEGMENT

- High End Processing

# LV-A Logic Gates

## With partial power-down feature

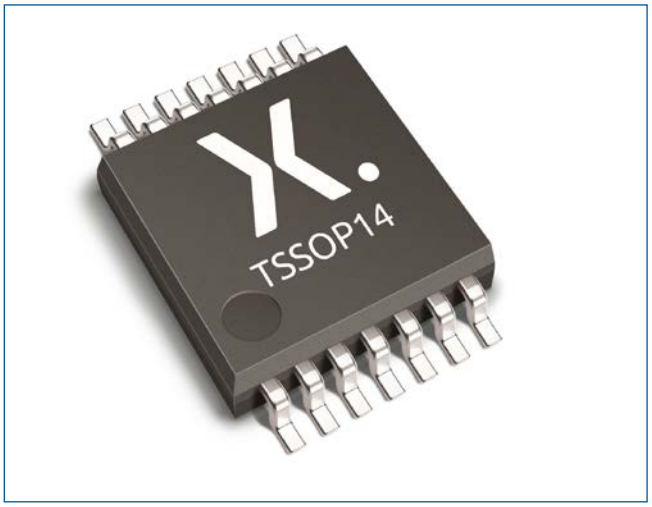



**Image TSSOP14**

LV-A logic solutions from Nexperia feature low leakage $I_{OFF}$ circuitry, for modular standby applications. LV-A technology supports a wide supply voltage range from 2.0 V to 5.5 V and offers low noise characteristics ($V_{OL(P)}$ <0.8 V). Our new AND, NAND, OR & NOR LV-A gates are suitable for computing, printer and smart TV applications and are available in industry-standard TSSOP14 (SOT402-1) packages.



- **Low noise operation: $V_{OL(P)}$ <0.8 V**
- **Over-voltage tolerant inputs**
- **Supply voltage range from 2.0 V to 5.5 V**
- **Partial power down support ($I_{OFF}$ circuitry)**

### FEATURES

- Support of mixed-mode voltage operation on all ports
- $I_{OFF}$ circuitry supports partial Power-down mode operation
- Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times.
- 74LV7032APW with Schmitt-trigger inputs for interfacing slowly transitioning input signals into sharply defined and jitter-free output signals.
- Industry-standard TSSOP14 (SOT402-1) packages
- Temperature Range from -40 °C to +125 °C

### KEY APPLICATIONS

- Medium and low speed applications
- Standby & power-down applications
- Computing peripherals incl. printers
- Home entertainment incl. TV & STB

### MARKET SEGMENT

- Industrial
- Communication & Infrastructure
- Smart Consumer & Building

### SUB MARKET

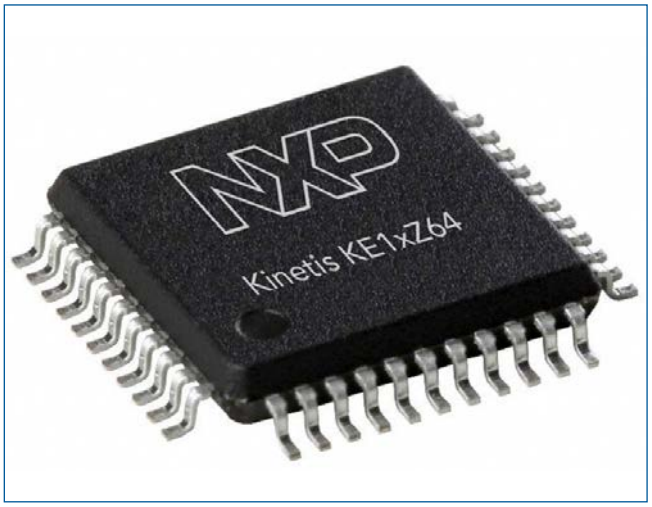
- Embedded Computing & Storage
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Information Kiosk & Advertising Panels
- Professional Gaming, Amusement & Casino Machines
- Broadcast
- Telecom and Networking
- Home & Building Security (Alarms, Access Control)
- Home & Building Control and Automation

### TECHNOLOGY SEGMENT

- High End Processing

# Kinetis KE1xZ64/32

## 5V Robust MCUs with Touch and CAN




**Kinetis KE1xZ64 chip shot**

The Kinetis E Portfolio is a 5V MCU family with MCUs ranging from 8KB up to 512KB Flash, M0+ or M4 cores, and peripherals as CAN, Touch, and ECC to address a variety of applications. The KE1xZ64 MCUs are based on Cortex®-M0+, with up to 48 MHz, up to 64 KB flash and 8 KB RAM with a complete set of analog/digital features, KE1xZ64 extends Kinetis E family with smaller footprint options along with TSI and CAN. The KE14Z MCU offers mixed-signal integration, ADC, ADCMP, Timers, PDB. The KE15Z expands the KE14Z with the additional TSI module, while the KE16Z offers further expansion with the CAN module.

- **Robust for harsh EMC environment**
- **Capacitive Touch Sensing solution that provides a compelling user experience**
- **Rich feature integration for industrial and motor control**
- **Scalable Portfolio**

### FEATURES

- CAN bus
- Flexible PWM and timers
- 1Msps 12-bit ADC, 1Msps
- ACMP
- Support both self-cap and mutual-cap mode
- 25ch, support up to 36 touch pads
- Auto tuning in the performance
- High performance in the liquid tolerance
- Flexible PWM and timers
- 12-bit ADC, 1Msps
- ACMP
- MCUXpresso with GUI touch config tool and SDK
- NXP Touch Library
- Optimized memory and feature set

### KEY APPLICATIONS

- Home Appliance
  - A/C, washer, MWO, induction cooker etc.
  - UI, main board control (touch, non-touch)
- Motor and Power Control
  - Motor, inverter and fan control
  - Low power UPS communication and UI control
- Industrial Control
  - Factory automation, HMI control, alarm monitor
  - Elevator external calling board
  - Circuit breaker, MCCB/ACB
- General 5V Robust Use Cases

### MARKET SEGMENT

- Industrial
- Smart Consumer & Building
- Smart Grid

### SUB MARKET

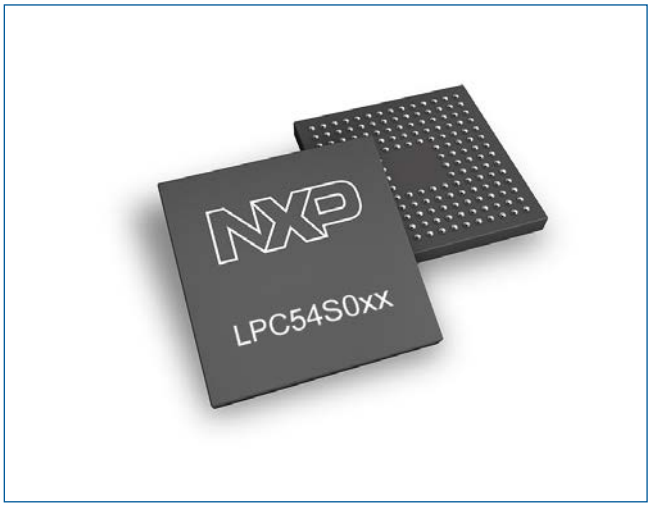
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Human Machine Interface
- Information Kiosk & Advertising Panels
- Point of Sales and Vending machines
- Instrumentation, Test and Measurement
- Robotics
- Surveillance, Parking & Traffic Control
- Home & Building Control and Automation
- Home & Building Security (Alarms, Access Control)
- Home Appliances
- Heating, Ventilation and Air Conditioning
- Power Supplies (UPS, Chargers)
- Power Conversion (Inverters, Welding, Converters)
- Smart Grid Protection and Control
- Motion Control, Servo Drives
- Elevators, Escalators, Moving Walkways

### TECHNOLOGY SEGMENT

- High End Processing

# LPC54S0xx

## Security, HMI and Flexible Communication Interfaces for IoT applications




**LPC54S0xx Chip Shot**

Offering flashless design and security integration, the LPC540xx/LPC54S0xx family of MCUs combines a 180 MHz Cortex®-M4 core with a power-efficient and unique architecture, advanced HMI and flexible communication peripherals for real-time performance in the next-generation IoT. Featuring flexibility with a quad SPI flash interface, CAN, graphic LCD and up to 11 channels for FlexComm, this family provides the ability to adapt as requirements change. Compatibility within the LPC54000 series provide a seamless migration path for increasing processing power and additional advanced peripherals.



- **Real-time Performance and Extremely Low Active Power**
- **Advanced security capabilities including SRAM PUF for Key Generation and Storage**
- **Advanced HMI & Flexible Communication Peripherals**
- **Comprehensive Enablement**

### FEATURES

- Arm® Cortex®-M4 core running up to 180 MHz with active modes of 120 µA/MHz
- Secure Boot
- AES engine, SHA-2
- Up to 21 flexible communication peripherals to interface with memory, connectivity modules, and a variety of sensors
- Numerous wake-up sources, ample timers
- Integrated TFT control allows to keep the overall cost and complexity to a minimum
- Complimentary MCUXpresso IDE and Software Development Kit (SDK)
- Integration of Segger's emWIN Graphics Library into SDK
- Faster time to market with comprehensive development hardware and reference designs

### KEY APPLICATIONS

- Industrial, Building, Energy, General Embedded
- Diagnostic equipment
- Industrial control devices
- PLC
- Data Aggregator & Comms Hub
- Building control & automation
- HVAC control

### MARKET SEGMENT

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

### SUB MARKET

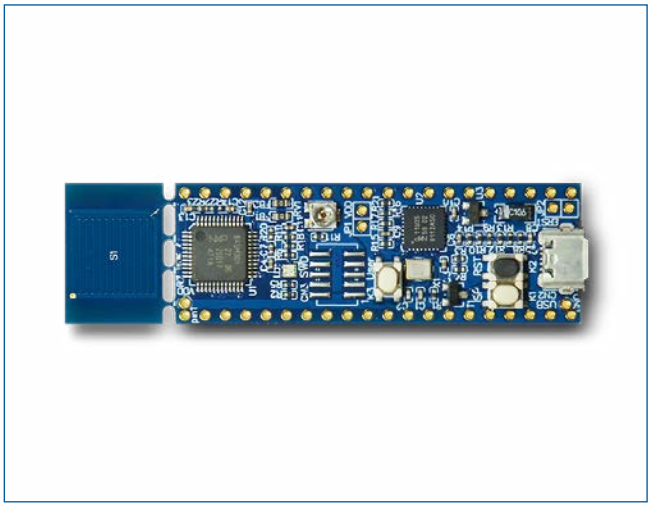
- Connected Car, Body Electronics and Automotive Lighting
- Home Appliances
- Home & Building Security (Alarms, Access Control)
- Home & Building Control and Automation
- Audio and Video
- Asset Tracking
- Heating, Ventilation and Air Conditioning
- Instrumentation, Test and Measurement
- Surveillance,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

### TECHNOLOGY SEGMENT

- High End Processing

# LPC845 Breakout Board

## Ultra Low-Cost Development Board for MCU developers using LPC800 series



LPC845 Breakout Board

The LPC845 breakout board provides a powerful and flexible development system for NXP's low end Arm® Cortex®-M0+ based LPC84x Family of MCUs, delivered in an ultra-low-cost evaluation board. This breakout board can be used with a range of development tools, including the MCUXpresso IDE toolchain. This board is developed by NXP to enable evaluation of and prototyping with the LPC84x family of MCUs and it features an on-board CMSIS-DAP debug and VCOM port, RGB user LEDs, capacitive touch button, user potentiometer and allows an easy prototyping experience with access to 38 LPC845 port pins.

- **Ultra low-Cost Development board for LPC84x Family of MCUs**
- **On-board CMSIS-DAP (debug probe and VCOM port)**
- **Range of development tools supported including MCUXpresso IDE and other popular toolchains**
- **RGB LED, capacitive touch, potentiometer and easy prototyping with access to 38 port pins**

### FEATURES

- LPC845 in QFN48 package
- On-board CMSIS-DAP debug interface
  - Supported by MCUXpresso IDE and popular 3rd party IDEs
  - Includes VCOM support (UART bridged via USB to host)
- External probe
- Easy Prototyping access with 38 port pins
- User-controlled RGB LED
- Capacitive Touch evaluation button
- User Potentiometer
- Target ISP and User buttons
- Target Reset Button
- Options to allow measurement of current consumed by MCU

### KEY APPLICATIONS

- Sensor gateways
- Industrial
- Gaming controller
- 8/16-bit applications
- Consumer
- Climate control
- Simple motor control

### MARKET SEGMENT

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

### SUB MARKET

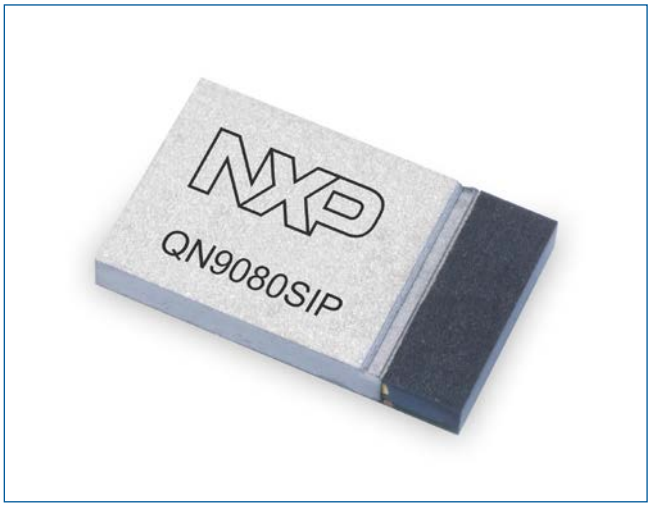
- Portable Personal Electronics & Wearables
- Home & Building Security (Alarms, Access Control)
- Toys, games and entertainment
- Home & Building Control and Automation
- Heating, Ventilation and Air Conditioning
- Lighting Drivers and Electronic Control Gears
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Professional Gaming, Amusement & Casino Machines
- Motion Control, Servo Drives
- Asset Tracking

### TECHNOLOGY SEGMENT

- High End Processing

# QN9080SIP

## Ultra-small module based on the QN9080 Bluetooth® MCU and NT3H2211 NTAG®




**QN9080SIP chip shot**

The QN9080SIP, an ultra-small module based on the QN9080 Bluetooth® MCU and NT3H2211 NTAG®, delivers industry-leading low power consumption along with a rich feature set and FCC/CE/IC/MIC certification making it an ideal solution for wearables and battery powered applications.

Supporting Bluetooth® 5, the QN9080SIP module is designed to power the next generation of ultra-small, portable connected wireless devices, providing easy pairing with NFC NTAG.

NXP also offers a comprehensive enablement of software and tools to help the designs reach the market faster and more robust.

- **System in Package with high integration and small form factor**
- **Bluetooth® LE 5.0 qualified**
- **Certification: FCC (US), IC (Canada), CE (EU), MIC (Japan)**
- **Ready-to-use for applications requiring Bluetooth® and simple pairing with NFC NTAG**

### FEATURES

- Bluetooth specification version 5.0 certified
- 2.4 GHz antenna
- 32 MHz and 32.768 kHz crystals
- NFC NTAG
- Cortex-M4F core at 32 MHz
- 512 KB flash, 128 KB RAM
- TX output power from -20 dBm to +2 dBm
- RX sensitivity: -92.7 dBm in 1 Mb/s mode, and -89 dBm in 2 Mb/s mode
- Support master/slave concurrency
- Support 16 simultaneous links
- Support secure connections
- 48-bit unique BD address
- Single 1.67 V to 3.6 V power supply
- 1 µA power-down mode, to wake up by GPIO
- 2 mA power-down mode, to wake up by 32 kHz sleep timer, RTC and GPIO
- 4 mA RX current at 3 V supply in 1 Mb/s
- 3.5 mA TX current at 0 dBm TX power at 3 V supply in 1 Mb/s mode
- 32 GPIOs
- 8 external 16bit ADC
- 2 Analog Comparator
- UART/SPI/I2C up to 2
- 1 USB 2.0 full speed
- 2 ultra-low power comparators
- SCT/PWM8 CH capacitive touch
- Quad-SPI for XIP
- 6 x9.7x1.11mm LFLGA
- 40 to +85°C

### KEY APPLICATIONS

- Consumer / Wearable
- Health and Medical Devices
- Sports and Fitness
- Gaming / Entertainment
- Home / Building automation and control

### MARKET SEGMENT

- Healthcare & Wearables
- Smart Consumer & Building

### SUB MARKET

- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Medical Diagnostic and Therapy
- Home & Building Control and Automation
- Home & Building Security (Alarms, Access Control)
- Toys, games and entertainment
- Asset Tracking

### TECHNOLOGY SEGMENT

- High End Processing

# STM32G0x1

## ARM® Cortex®-M0+ 32-bit MCU, 128 KB Flash, 36 KB RAM, 4x USART, timers, ADC, DAC


**STM32G0 Series**

STM32G0x1 offers upgraded capabilities towards IoT and integrated functions. STM32G0x1 devices answer the need for higher performance in analog, low-power operations or more control on secure transactions, such as the IoT applications, home-entertainment products, appliances and industrial equipment. It supports a higher temperature range up to 125 °C and a wide set of package types such as WLCSP, UFBGA, TSSOP, QFP and QFN packages.

- **High-performance ARM® Cortex®-M0+ 32-bit**
- **Higher temperature range up to 125 °C**
- **USB Type-C™ Power Delivery controller**
- **HDMI CEC interface**

### FEATURES

- -40 °C to 85 °C/125 °C operating temperature
- Up to 128 Kbytes of Flash memory
- 36 Kbytes of SRAM (32 Kbytes with HW parity check)
- CRC calculation unit
- Reset and power management
- Clock management
- Up to 60 fast I/Os
- 7-channel DMA controller with flexible mapping
- 12-bit, 0.4 µs ADC (up to 16 ext. channels)
- Two 12-bit DACs, low-power sample-and-hold
- Two fast low-power analog comparators, with programmable input and output, rail-to-rail
- 14 timers (two 128 MHz capable)
- Calendar RTC with alarm and periodic wakeup from Stop/Standby/Shutdown
- Communication interfaces
- USB Type-C™ Power Delivery controller
- Development support: serial wire debug (SWD)
- 96-bit unique ID
- All packages ECOPACK 2 compliant

### KEY APPLICATIONS

- Industrial control
- Industrial sensors
- Motor control

### MARKET SEGMENT

- Smart Consumer & Building
- Industrial
- Healthcare & Wearables

### SUB MARKET

- Medical Instruments
- Personal Health, Sport & Fitness
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Instrumentation, Test and Measurement
- Motion Control, Servo Drives
- Home & Building Control and Automation
- Home Appliances

### TECHNOLOGY SEGMENT

- High End Processing

# ACNT-H343

## 5 A Gate Drive Optocoupler in 15 mm SSO-8 Package


ACNT-H343

The ACNT-H343 is a 5 A gate drive optocoupler in a compact SSO-8 package, designed for high voltage (HV), space-constrained industrial applications, including 690 V(AC) motor drives and 1.5 kV(DC) solar inverters. The new package platform provides enhanced high voltage protection and signal isolation in tight spaces. The ACNT-H343 features common mode transient immunity greater than 100 kV/µs, preventing erroneous gate driver failures in noisy environments. Furthermore, it has minimal propagation delay, enabling high-frequency switching and improved efficiency in driving IGBT and SiC/GaN MOSFETs.

- **SSO-8 package, 15 mm creapage, 14.2 mm clearance**
- **5.0 A max. Peak Output Current**
- **UVLO with VE reference for negative power supply**
- **CMR 100 kV/µs at $V_{CM}$ = 1.5 kV**

### FEATURES

- Rail-to-rail output voltage
- 150 ns max propagation delay
- 90 ns max propagation delay difference
- 100-kV/µs minimum common mode rejection (CMR) at $V_{CM}$ = 1500 V
- $I_{CC}$ = 5.0 mA max supply current
- Wide operating $V_{CC}$ range: 15 to 30 V
- Industrial temperature range: -40 °C to +110 °C
- Safety approvals
  - UL recognized: 7500 $V_{RMS}$ for 1 minute.
  - CSA approved
  - IEC/EN/DIN EN 60747-5-5 $V_{IORM}$ = 2,262 $V_{PEAK}$
- Compact package footprint

### KEY APPLICATIONS

- IGBT/MOSFET Gate Drive
- AC and Brushless DC Motor Drives
- Renewable Energy Inverters
- Industrial Inverters
- Switching Power Supplies

### MARKET SEGMENT

- Industrial
- Smart Consumer & Building

### SUB MARKET

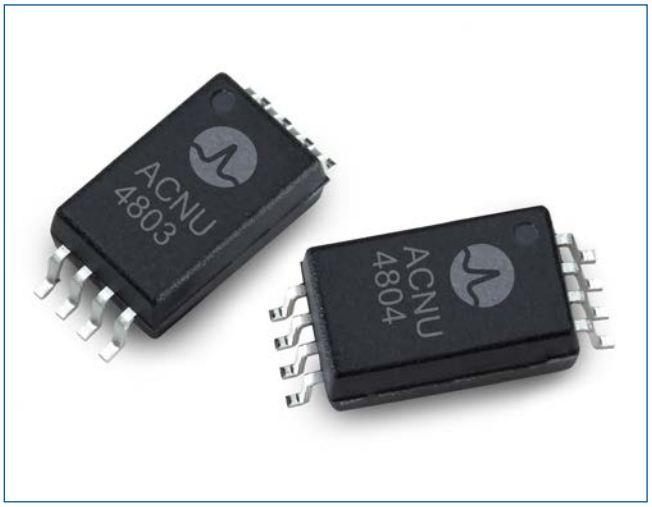
- Elevators, Escalators, Moving Walkways
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Motion Control, Servo Drives
- Robotics
- Instrumentation, Test and Measurement
- Power Supplies (AC/DC, DC/DC)

### TECHNOLOGY SEGMENT

- Analog & Power

# ACNU-4803/-4804 Optocouplers

## High CMR Intelligent Power Module (IPM) and Gate Drive Interface Optocouplers




**ACNU-4803/-4804 Family**

The ACNU-4803 and ACNU-4804 are single-channel fast-speed optocouplers, containing an AlGaAs LED and photodetector with a built-in Schmitt trigger, eliminating the need for additional shaping of logic waveforms. The totem pole output requires no pull-up resistor and allows for direct drive of Intelligent Power Modules. Minimized propagation delay difference between devices makes them an excellent solution for improving inverter efficiency through reduced switching dead time. The ACNU-4803 and ACNU-4804 optocouplers feature an increased common mode transient immunity at high voltages.

- **SSO-8 package, 11 mm creepage, 10.5 mm clearance**
- **Positive output type (totem pole output)**
- **Truth table guaranteed: $V_{cc}$ from 4.5 V to 30 V**
- **Performance specified for common IPM applications over industrial temperature range**

### FEATURES

- LED drive current: 12 mA (min)
- Minimum 30 kV/µs high common-mode rejection at $V_{CM}$ = 1000 V (ACNU-4803)
- Minimum 50 kV/µs high common-mode rejection at $V_{CM}$ = 1500 V (ACNU-4804)
- Low propagation delay, TPLH/TPHL: 120 ns/150 ns (max.)
- Minimized Pulse Width Distortion (PWD)
- Compact, auto-insertable SSO-8 package
- Industrial temperature range: -40 °C to 105 °C
- High speed: 10 MBd typ.
- Hysteresis
- Worldwide safety approval: UL 1577 (5000 $V_{RMS}$/min), IEC/EN/DIN EN 60747-5-5

### KEY APPLICATIONS

- IPM (Intelligent Power Module) interface isolation
- Isolated IGBT/MOSFET gate drive
- AC and brushless DC motor drives
- Industrial inverters
- General-purpose digital isolation

### MARKET SEGMENT

- Industrial

### SUB MARKET

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

### TECHNOLOGY SEGMENT

- Analog & Power

# VCNL36687S

## New VCNL36687S VCSEL-Powered Proximity Sensor

VCNL36687S

Vishay introduces a fully integrated proximity sensor that combines a high power vertical-cavity surface-emitting laser (VCSEL), a photodiode, a signal processing IC, and a 12-bit ADC in a single package.

20 cm detection range greatly simplifies the use and design-in of the proximity sensing capability in consumer and industrial applications



- **VCSEL profile: ±3 °**
- **VCSEL driving current: 20 mA**
- **Operating voltage range: 1.65 V to 1.95 V**
- **I²C bus voltage range: 1.65 V to 3.6 V**

### FEATURES

- No mechanical barriers are required to optically isolate the emitter from the detector
- Small footprint and low height are ideal for space-constrained applications
- Low VCSEL profile is optimized for applications that require narrow angle detection
- Minimizes optical system design concerns
- With only 20 mA pulse current, the VCNL36687S can detect the Kodak Grey Card at a distance of 20 cm, whereas previous VCNL series devices required up to 200 mA
- Programmable interrupt function offers wake-up functionality for the microcontroller when a proximity change occurs
- Reduces processing overhead by eliminating the need for continuous polling

### KEY APPLICATIONS

- Proximity sensing in smartphones, tablets, virtual reality
- Augmented reality (VR/AR) headsets
- Other battery-operated devices

### MARKET SEGMENT

- Communication & Infrastructure
- Healthcare & Wearables
- Smart Consumer & Building
- Industrial

### SUB MARKET

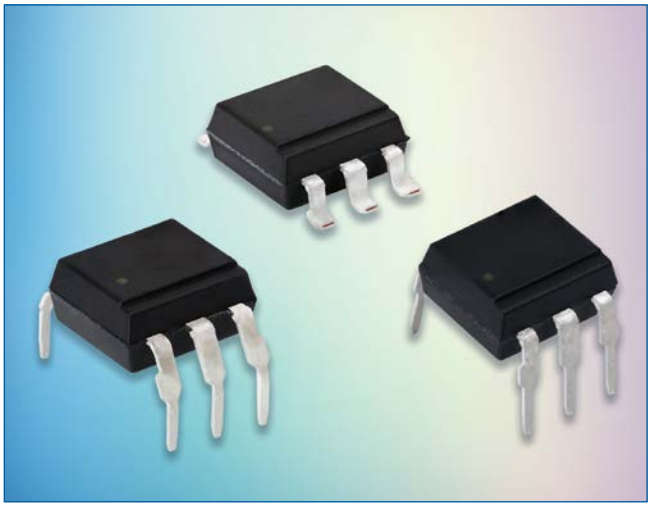
- Toys, games and entertainment
- Home Appliances
- Professional Gaming, Amusement & Casino Machines
- Information Kiosk & Advertising Panels
- Human Machine Interface
- Portable Personal Electronics & Wearables
- Personal Health, Sport & Fitness

### TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity

# VOT8026A

## Optocoupler, Phototriac Output, Zero Crossing, High dV/dt, Low Input Current



VOT8026A Product Image

The VOT8026A consists of a GaAs IRLED optically coupled to a photosensitive zero crossing TRIAC packaged in a DIP-6 package.

VOT8026A isolates low-voltage logic from 120 $V_{AC}$, 240 $V_{AC}$, and 380 $V_{AC}$ lines to control resistive, inductive, or capacitive loads including motors, solenoids, high current thyristors or TRIAC and relays.

- **High isolation distance on output**
- **High static dV/dt 1000 V/µs**
- **High input sensitivity IFT = 5 mA**
- **100 mA on-state current**

### FEATURES

- Zero voltage crossing detector
- 800 V peak off-state blocking voltage
- Isolation rated voltage 5300 $V_{RMS}$

### KEY APPLICATIONS

- Power TRIAC driver in solid-state relays
- 3-phase AC equipment
- Motor control
- Industrial control
- White goods/household equipment

### MARKET SEGMENT

- Industrial
- Smart Consumer & Building

### SUB MARKET

- Human Machine Interface
- Instrumentation, Test and Measurement
- Point of Sales and Vending machines
- Home & Building Control and Automation
- Power Supplies (AC/DC, DC/DC)

### TECHNOLOGY SEGMENT

- Analog & Power

# DSC613 MEMS Clock Generator

## 3-Output Low Power MEMS Clock Generator


The DSC613 family of devices is one of the industry's smallest MEMS clock generator that can replace up to three crystals and oscillators on a board, reducing timing component board space by up to 80 percent.

The clock generator eliminates the need for an external crystal by integrating the low power and high stability Micro-Electro-Mechanical Systems resonator. The family includes two low power fractional PLLs that provide leading frequency flexibility and robust jitter performance. Output frequency, control pin function, package size, PPM accuracy and temperature range can be configuered.



- **Highly configurable device and factory programmed**
- **ClockWorks Configurator to configure the output frequencies and control functions**
- **Integrated MEMS resonator eliminates the need of external crystal**
- **Low power consumption: 5.2 mA active, 1 µA standby current**

### FEATURES

- Supports 3 LVCMOS clock outputs from 2 kHz to 100 MHz
- Wide supply voltage range: 1.71 V – 3.63 V
- Ultra-small package sizes: 1.6 mm × 1.2 mm, 2.0 mm × 1.6 mm, 2.5 mm × 2.0 mm
- High frequency stability: ±20 ppm, ±25 ppm, ±50 ppm
- Supports wide temperature range: -40 °C to +125 °C
- Flexible control functions: Output Enable, Standby, SLEEP, Frequency Select, SpreadSpectrum Enable
- Supports 3 output drive strength and Spread Spectrum clock for EMI reduction
- Excellent shock and vibration immunity
- High reliability
- Lead free and RoHS compliant
- AEC-Q100 automotive grade available

### KEY APPLICATIONS

- Low Power/Portable Applications: IoT
- Embedded/Smart Devices
- Consumer: Home Healthcare, Fitness Devices
- Home Automation
- Building/Factory Automation, Surveillance Cameras

### MARKET SEGMENT

- Industrial
- Hi-Rel
- Communication & Infrastructure
- Healthcare & Wearables

### SUB MARKET

- Broadcast
- Telecom and Networking
- Wireless Infrastructure
- Embedded Computing & Storage
- Embedded Vision
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Instrumentation, Test and Measurement
- Robotics

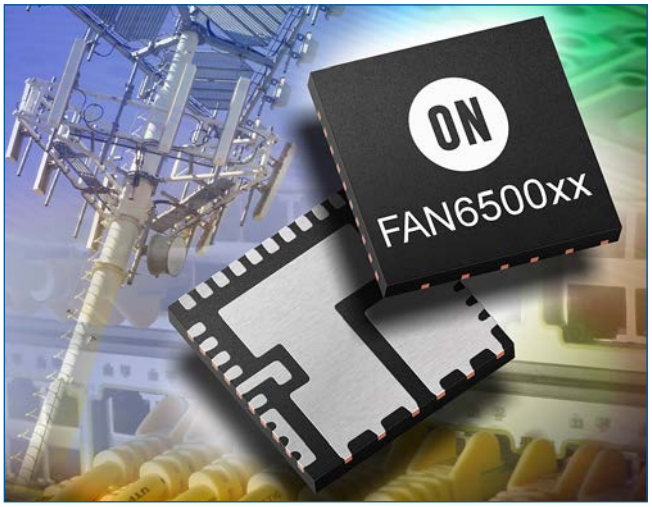
### TECHNOLOGY SEGMENT

- Analog & Power

ON Semiconductor®

# FAN6500

## Wide $V_{IN}$, highly efficient synchronous buck regulator, with integrated power MOSFETs




FAN6500-Hires.jpg

FAN6500xx is a wide $V_{IN}$ highly efficient synchronous buck regulator, with integrated high side and low side power MOSFETs. This single phase buck regulator offers complete protection features including Over current protection, Thermal shutdown, Under-voltage lockout, Over voltage protection, Under voltage protection and Short-circuit protection.

- **Available in a compact 6 × 6 mm PQFN package.**
- **Wide Input Voltage Range: 4.5 V to 65 V**
- **0.67 % accurate reference voltage**
- **Switching frequency can be programmed from 100 kHz to 1 MHz.**

### FEATURES

- Selectable CCM PWM Mode or PFM Mode for Light Loads
- Over Current Protection, Thermal Shutdown, Over Voltage Protection, Under Voltage Protection and Short-circuit Protection
- Dual LDOs for Single Supply Operation and to Reduce Power Loss
- External Compensation for Wide Operation Range
- Adjustable Soft-Start & Pre-Bias Startup
- Enable Function with Adjustable Input Voltage Under-Voltage-Lock-Out (UVLO)
- Power Good Indicator
- Available in a compact 6 × 6 mm PQFN package

### KEY APPLICATIONS

- Industrial automation
- Robotics
- Battery management systems
- High Voltage POL Module
- Telecommunications

### MARKET SEGMENT

- Communication & Infrastructure
- Smart Consumer & Building
- Industrial

### SUB MARKET

- Broadcast
- Telecom and Networking
- Wireless Infrastructure
- Embedded Computing & Storage
- Embedded Vision
- Instrumentation, Test and Measurement
- Motion Control, Servo Drives
- Robotics
- Power Supplies (AC/DC, DC/DC)

### TECHNOLOGY SEGMENT

- Analog & Power

ON Semiconductor®

# FUSB303

## Autonomous USB Type-C Port Controller with I²C and GPIO Control


FUSB303-242-Hires.jpg

The FUSB303 device is a fully autonomous USB Type-C™ controller optimized for 15 W or less applications. The FUSB303 offers CC logic detection for Source Port role, Sink Port role, DRP, and accessory detection support, as well as Dead Battery support as defined in USB-C specifications. The FUSB303 features configurable address I²C access to support multiple ports per system or it can operate autonomously configured by just pins. The FUSB303 features ultra-low power during operation, and an ultra-thin, 12-Lead QFN package.

- **Supports Latest Type-C™ Specification Release 1.3**
- **Source, Sink, and DRP Port role Configuration**
- **Try.SRC and Try.SNK modes**
- **$V_{DD}$ Operating Range, 2.85 V – 5.5 V**

### FEATURES

- Fully Autonomous USB-C™ Port Controller
- Source, Sink, and DRP Port role Configuration with Optional Accessory Support
- Try.SRC and Try.SNK modes for Preferring Source Role or Sink Role Respectively
- Typical Low Power Operation: $I_{CC}$ <10 µA
- GPIO and I²C Configuration
- Max 28 V DC Tolerance on ID, VBUS_DET, CC1 and CC2
- Dead Battery Support (Sink Port role when No Power Applied)
- 4 kV HBM ESD Protection for Connector Pins

### KEY APPLICATIONS

- USB-C Port Controller
- Smartphones
- Tablets
- Laptops
- Accesories
- Industrial
- Power Banks

### MARKET SEGMENT

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

### SUB MARKET

- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Embedded Computing & Storage
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Human Machine Interface
- Professional Gaming, Amusement & Casino Machines
- Robotics
- Surveillance, Parking & Traffic Control
- Power Supplies (UPS, Chargers)
- Smart Grid Protection and Control

### TECHNOLOGY SEGMENT

- Analog & Power

ON Semiconductor®

# NCP1095

## Power Over Ethernet (PoE) Powered Device (PD) Interface Controller IEEE 802.3bt


NCP1095-96-Hires.jpg

The Power Over Ethernet (PoE) Powered Device (PD) Interface Controller NCP1095 contains all features needed to implement an IEEE.3bt, IEEE 802.3af, and/or IEEE 802.3at application. This includes detection, classification, and current limiting. The NCP1095 supports high power applications up to 90 W through an external pass transistor. A power good and auxiliary power supply detection pin guarantee a proper enabling or disabling of the DC/DC converter to comply with type I, II, III and IV operation.

- **IEEE 802.3bt compliant, supporting high power applications up to 90 W**
- **External hot swap transistor & current sense resistor**
- **Auxiliary power supply detection feature and power good pin**
- **Inrush Current Limiting, Current and Temperature Protection Features**

### FEATURES

- 802.3bt UHP 90W compliant PoE PD device
- Classification
  - 5 finger (type 1, 2, 3 and 4 PSE)
  - Auto-classification
- External hot swap transistor & current sense resistor
- Fixed inrush current
- Standard UVLO
- Over current protection/ Over temperature protection
- Interface to microcontroller
  - Classification result
  - LCF for Short maintain power signature
- Interface to external DC/DC, Power Good
- Short MPS (Maintain Power Signature)
- Auxiliary power supply detection, Disable pass switch & back-feed protection
- TSSOP-16 package

### KEY APPLICATIONS

- Video conferencing
- Wireless access points
- IP camera
- Mini base stations
- Point of sales/retail
- Industrial (motor control units)
- LED lighting

### MARKET SEGMENT

- Communication & Infrastructure
- Industrial
- Smart Consumer & Building
- Lighting

### SUB MARKET

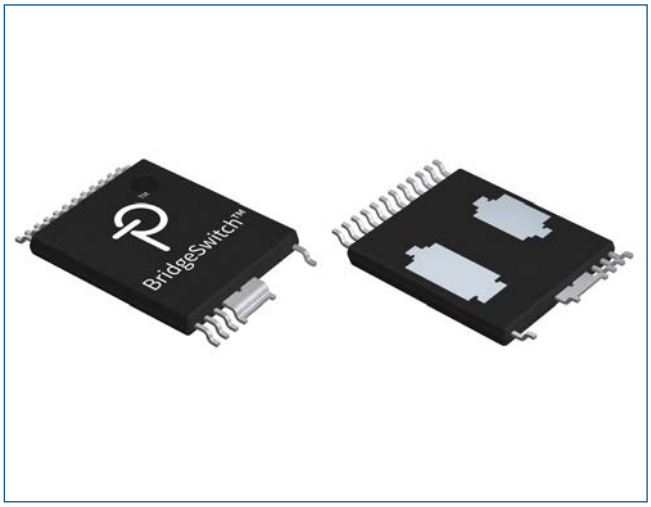
- Telecom and Networking
- Point of Sales and Vending machines
- Surveillance, Parking & Traffic Control
- Embedded Vision
- Wireless Infrastructure
- Home & Building Security (Alarms, Access Control)
- Home & Building Control and Automation
- Audio and Video
- Specialty Lighting (Digital Signage, Signals, Entertainment, Transportation)
- Human Machine Interface
- Information Kiosk & Advertising Panels
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Motion Control, Servo Drives

### TECHNOLOGY SEGMENT

- Analog & Power

# BridgeSwitch™

## HV, Self-Powered, Half-bridge Motor Drive with Device Protection and System Monitoring




**Package**

BridgeSwitch™ feature high- and low-side FREDFETs (Fast Recovery Diode Field Effect Transistors) with integrated lossless current sensing, resulting in inverter conversion efficiency of up to 98.5% in brushless DC (BLDC) motor drive applications to 300 W. Superior efficiency along with the distributed thermal footprint eliminates the need for a heat-sink, reducing both system cost and weight. Integrated lossless current sensing, bus voltage sensing and system-level thermal sensing makes this device family ideal for BLDC motors.



- **Heat-sink-less design up to 300 W**
- **600 V FREDFETs with integrated lossless current sensing, allows up to 98.5%**
- **Simplifies system level safety certification, Class A rated control software possible**
- **Self supplied, no need of external PSU**

### FEATURES

- 600 V Integrated FREDFETs (Fast Recovery Diode Field Effect Transistors) allows up to 98.5% inverter efficiency and low EMI
- No heat-sink required up to 300 W
- Fully self-supplied simplifies system auxiliary power supply
- Low and high-side cycle-by-cycle current limit simplifies system level certification
- High-voltage Gate Drivers- tuned to drive FREDFETs
- Full device and system level monitoring
- Supports trapezoidal, sinusoidal or field oriented control up to 20 kHz PWM
- Simple digital interface to the micro-controller (3.3 V and 5 V CMOS compatible)
- Compact footprint surface mount package

### KEY APPLICATIONS

- HV BLDC Motors, fans, pumps
- Small and Major Appliances, compressors, blowers

### MARKET SEGMENT

- Industrial
- Smart Consumer & Building

### SUB MARKET

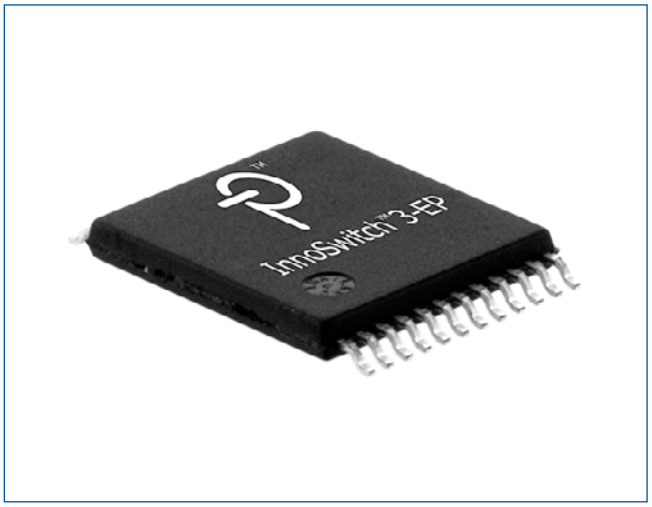
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Motion Control, Servo Drives
- Home Appliances
- Heating, Ventilation and Air Conditioning

### TECHNOLOGY SEGMENT

- Analog & Power

# InnoSwitch™3-EP 900V

## Complete Range of Switcher ICs with Integrated 900V MOSFETs




**InnoSwitch Package**

The new products include 900 V versions of the flagship InnoSwitch™3-EP IC family, which enable extremely high-efficiency isolated flybacks up to 35 W. 900 V product families feature internal control engines optimized for high efficiency across load to easily meet energy-related products (ErP) limits, and a variety of line and load protection mechanisms to further enhance system robustness and reliability. Devices achieve industry-leading efficiencies of up to 90% across line and load conditions, reducing power supply losses and resulting in compact power supplies without heatsinks.

- **Integrated FluxLink™, HIPOT-isolated, feedback link**
- **QR/CCM flyback controller, 725V/900V MOSFET, secondary-side sensing, synch rectification**
- **Up to 90% across line and load conditions for compact SMPS up to 35W without heatsinks**
- **Exceptional CV/CC accuracy, independent of external components**

### FEATURES

- Very high efficiency across full load range
- Excellent multi-output cross regulation with weighted secondary-side regulation (SSR) feedback and synch FETs
- Adjustable accurate output current sense using external output sense resistor EcoSmart™ – Energy Efficient
- Less than 15 mW no-load including line sense
- Easily meets all global energy efficiency regulations
- Low heat dissipation
- Advanced Protection / Safety Features
- Open SR FET-gate detection
- Fast input line UV/OV protection
- Auto-restart fault response for output OVP Optional Features
- Auto-restart output UV protection with option for peak power delivery HV, Self-Powered, Half-bridge Motor Drive with Integrated Device Protection, System Monitoring

### KEY APPLICATIONS

- Three-phase industrial power supplies up to 480 VAC
- High-quality consumer products with unstable mains grids
- Energy meter
- Major Appliances

### MARKET SEGMENT

- Industrial
- Communication & Infrastructure
- Smart Consumer & Building
- Smart Grid

### SUB MARKET

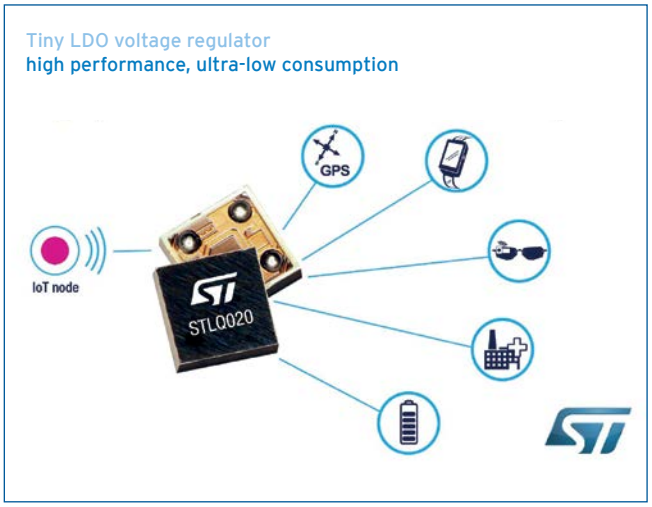
- Telecom and Networking
- Audio and Video
- Heating, Ventilation and Air Conditioning
- Home & Building Control and Automation
- Home & Building Security (Alarms, Access Control)
- Home Appliances
- Power Supplies (AC/DC, DC/DC)
- Toys, games and entertainment
- Metering (Electricity, Flow, Heat)
- Power Conversion (Inverters, Welding, Converters)
- Surveillance, Parking & Traffic Control
- Robotics
- Wireless Infrastructure
- Elevators, Escalators, Moving Walkways
- Embedded Computing & Storage
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Information Kiosk & Advertising Panels
- Instrumentation, Test and Measurement
- Motion Control, Servo Drives
- Point of Sales and Vending machines
- Professional Gaming, Amusement & Casino Machines
- Power Supplies (UPS, Chargers)

### TECHNOLOGY SEGMENT

- Analog & Power

# STLQ020

## 200 mA ultra-low quiescent current LDO




**STLQ020**

The STLQ020 is a 200 mA low-dropout voltage regulator, able to work with an input voltage ranging from 2 V to 5.5 V. The typical dropout voltage at maximum load is 160 mV.

The ultra-low quiescent current, which is just 0.3 µA at no load, extends battery-life of applications requiring very long standby time.

Even though the device intrinsic consumption is ultra-low, STLQ020 is able to provide fast transient response and good PSRR performance, thanks to its adaptive biasing circuit. It also includes short-circuit constant-current limiting and thermal protection.

- **Ultra-low quiescent current**
- **Very low-dropout voltage**
- **Internal overcurrent and thermal protections**
- **Temperature range: from -40 °C to +125 °C**

### FEATURES

- Operating input voltage range: 2 V to 5.5 V
- Output current up to 200 mA
- Output voltage accuracy: 2% at room temperature, 3% in full temperature range
- Output voltage versions: from 0.8 V to 4.5 V, with 50 mV step and adjustable
- Logic-controlled electronic shutdown
- Output discharge feature (optional)
- Internal overcurrent and thermal protections
- Temperature range: from -40 °C to +125 °C
- Packages: DFN6-2x2, SOT323-5L, Flip-Chip4

### KEY APPLICATIONS

- Healthcare devices
- Wearables

### MARKET SEGMENT

- Healthcare & Wearables
- Industrial
- Smart Consumer & Building

### SUB MARKET

- Medical Instruments
- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Instrumentation, Test and Measurement
- Point of Sales and Vending machines
- Professional Gaming, Amusement & Casino Machines
- Robotics
- Surveillance, Parking & Traffic Control
- Home & Building Control and Automation
- Home & Building Security (Alarms, Access Control)
- Toys, games and entertainment

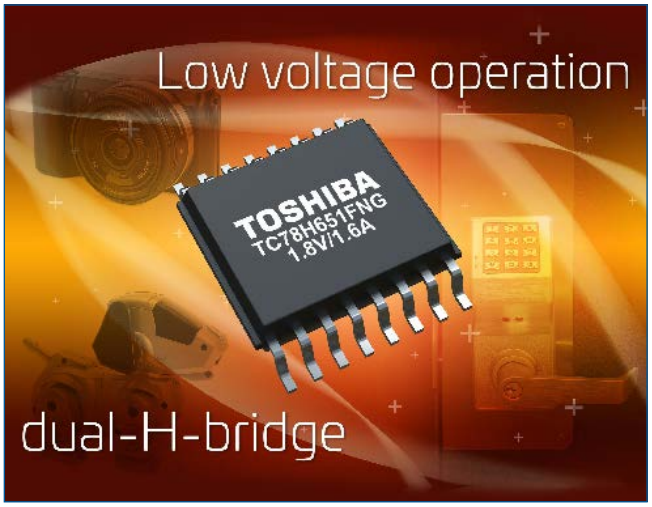
### TECHNOLOGY SEGMENT

- Analog & Power

TOSHIBA

# TC78H651FNG

## H-bridge Driver IC Supporting Low Voltage (1.8 V) and Large Current (1.6 A)




Toshiba_TC78H651FNG

The TC78H651FNG is a new dual H-bridge driver IC for DC brushed motors and stepping motors. It delivers performance at a low voltage down to 1.8 V and high current up to 1.6 A that is essential for equipment powered by dry-cell batteries. The new device is suitable for motor applications such as cameras and compact printers using 3.7 V lithium-ion batteries, toys and home appliances, smart meters, and electronic locks using two 1.5 V dry batteries, and devices using 5 V USB power supplies.

- **Typical voltage range of a dual 1.5 cell or LiPo battery, down to 1.8 V**
- **High current operation up to 1.6 A**
- **Small package, SSOP16**
- **Perfectly suited for space-constrained applications**

### FEATURES
- Battery driven applications supported
- Medium sized DC motors can be driven
- Even when the battery runs low, operation is secured
- No need for external MOSFETs, reduced BOM
- Very small designs are possible

### KEY APPLICATIONS
- Devices using 5 V USB power supply
- Toys using two 1.5 V dry batteries
- Devices using 3.7 V lithium-ion batteries
- Motor applications (1.8 V to 6.0 V)

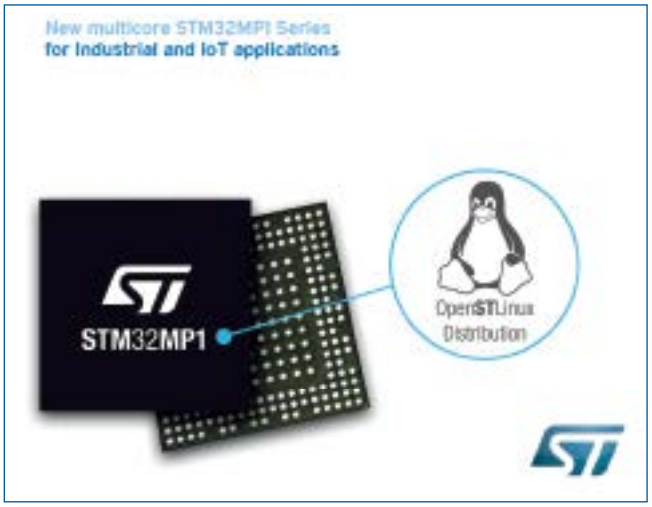
### MARKET SEGMENT
- Industrial
- Smart Consumer & Building
- Healthcare & Wearables

### SUB MARKET
- Surveillance, Parking & Traffic Control
- Home Appliances
- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables

### TECHNOLOGY SEGMENT
- Analog & Power

# STM32MP1 Series

## STM32MP1 microprocessor series with dual Arm® Cortex®-A7 and Cortex®-M4 Cores




**STM32MP1 Series**

A general-purpose microprocessor portfolio enabling easy development for a broad range of applications, the STM32MP1 series is based on a heterogeneous single or dual Arm® Cortex®-A7 and Cortex®-M4 cores architecture, strengthening its ability to support multiple and flexible applications, achieving the best performance and power figures at any time. The Cortex®-A7 core provides access to open-source operating systems (Linux/Android) while the Cortex®-M4 core leverages the STM32 MCU ecosystem.

- **The STM32MP1 comes with many benefits including a rich development ecosystem**
- **Flexible architecture**
- **STM32 ecosystem with support for open-source operating systems**
- **Power efficiency**

### FEATURES

- Mainlined open-source Linux distribution with Android support available via partners
- STM32Cube firmware and embedded software libraries for Cortex®-M4 core
- An optional 3D graphics processing unit (GPU) provides for advanced HMI development
- Rich set of digital and analog peripherals
- Advanced security features
- Optimized bill of materials (BOM) thanks to: High integration, packages compatible with low-cost PCB technologies (down to 4-layer plated-through hole (PTH) PCBs) and dedicated Power Management IC (PMIC)
- Advanced tools from ST and Partners
- Best-in-class local and online support
- Worldwide distribution channels
- Rolling 10-year longevity commitment renewed every year
- STM32MP157: Dual Cortex®-A7 cores at 650 MHz, Cortex®-M4 core at 209 MHz, 3D GPU, DSI display interface and CAN FD
- STM32MP153: Dual Cortex®-A7 cores at 650 MHz, Cortex®-M4 core at 209 MHz and CAN FD
- STM32MP151: Single Cortex®-A7 core at 650 MHz, Cortex®-M4 core at 209 MHz
- Each line comes with a security option (cryptography & secure boot)

### KEY APPLICATIONS

- HMI
- Gateway
- Smart home control

### MARKET SEGMENT

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

### SUB MARKET

- Medical Diagnostic and Therapy
- Medical Imaging
- Wireless Infrastructure
- Telecom and Networking
- Embedded Computing & Storage
- Elevators, Escalators, Moving Walkways
- Embedded Vision
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Instrumentation, Test and Measurement

### TECHNOLOGY SEGMENT

- High End Processing

# RF Energie Series

## Ready-to-use development systems, integrated modules and and transistors for High Power RF


Lab Box

The RFE Series features a multi-level portfolio that addresses each step for building a successful RF Power design:

RFEL Lab Box – A plug-and-play RF generator

RFEM Module – Combines a line-up of RF power transistors with an NXP Kinetis microcontroller

RFEP Pallet – A three-stage power amplifier reference design intended for RF engineers who want to leverage NXP's RF matching know-how to speed up their design cycle

High-performance RF components with associated evaluation boards

- **Precise Control - power can be set to any level while magnetron only work on/off**
- **Ease of use - rapid response, instant on, low voltage power supply**
- **Reliability - transistors lifetime is 100 years while magnetron average is 6000 hours**
- **Comprehensive suite of tools enabling fast prototyping/short design cycle**

### FEATURES

- Plug & play RF generator with reflected power measurement, provided with intuitive PC-based control software with auto-tuning features
- Designed for evaluation and initial prototyping.
- Module subsystem including an MCU and a full RF line-up provided with command interface
- Designed for protoryping, no RF expertise required
- RF PA reference design
- Designed to jump-start RF Power PA development
- LDMOS Transistor
- Designed for high performance

### KEY APPLICATIONS

- RF cooking (drying, sealing), plastics preheating
- Medical (disinfection)

### MARKET SEGMENT

- Smart Consumer & Building
- Industrial

### SUB MARKET

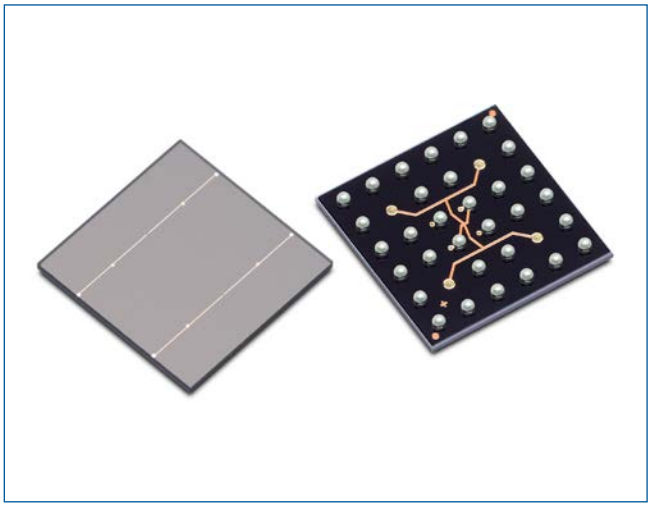
- Home Appliances
- Heating, Ventilation and Air Conditioning

### TECHNOLOGY SEGMENT

- RF & Microwave

# AFBR-S4N66C013

## NUV-HD Single Silicon Photo Multiplier



AFBR-S4N66C013

The Broadcom® AFBR-S4N66C013 is a single silicon photo multiplier (SiPM) used for ultra-sensitive precision measurement of single photons. High packing density of single chips is achieved using through-silicon-via (TSV) technology. Larger areas can be covered by tiling multiple AFBR-S4N66C013 chips to an array, almost without any edge losses. The protective layer is made of glass, highly transparent down to UV wavelengths, resulting in a broad response in the visible light spectrum with high sensitivity towards blue and near-UV regions. The device area is 6.14 × 6.14 $mm^2$.

- **High PDE of more than 55 % at 420 nm**
- **High fill factors**
- **Excellent SPTR and CRT**
- **Excellent uniformity of breakdown voltage**

### FEATURES

- Excellent uniformity of gain
- With TSV technology (4-side tilable)
- Size 6.14 × 6.14 $mm^2$
- Cell pitch 30 × 30 $\mu m^2$
- Highly transparent glass protection layer
- Operating temperature range from -40 °C to +85 °C
- RoHS and REACH compliant

### KEY APPLICATIONS

- X-ray and gamma ray detection
- Gamma ray spectroscopy
- Safety and security
- Nuclear medicine
- Positron emission tomography
- Life sciences
- Flow cytometry
- Fluorescence – luminescence measurements
- Time correlated single photon counting
- High energy physics
- Astrophysics

### MARKET SEGMENT

- Healthcare & Wearables

### SUB MARKET

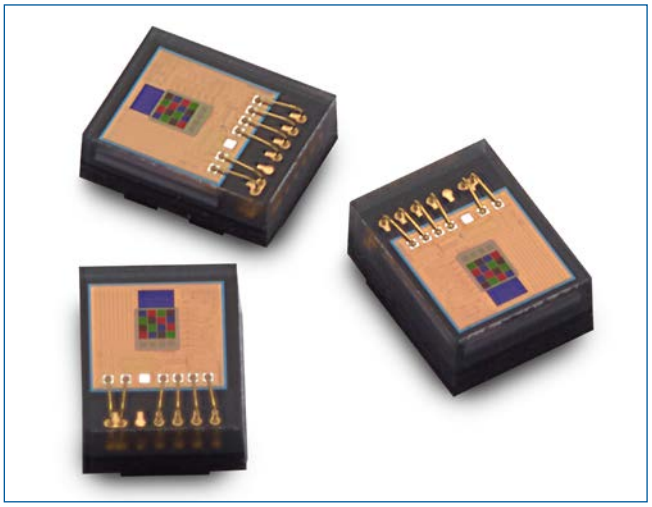
- Medical Diagnostic and Therapy
- Medical Imaging
- Medical Instruments

### TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity

# APDS-9251 and APDS-9253

## Digital RGB, IR and Ambient Light Sensor with I²C Output



APDS-9251-001

The APDS-9251-001 and APDS-9253-001 are low-voltage digital RGB, IR, and ambient light sensor devices, which convert light intensity to digital output signals. These devices use four individual channels of red, green, blue, and IR (RGB+IR), in a specially designed matrix arrangement. This allows having an optimal angular response and accurate RGB spectral response with high lux accuracy over various light sources. These devices support the I²C-bus interface and have a programmable interrupt controller that allows optimization of the microcontroller (MCU) workload.

- **Up to 20-bit resolution**
- **Individual channels for red (R), green (G), blue (B) and infrared (IR)**
- **I²C compatible interface with dedicated interrupt pin**
- **Approximate human eye response with green channel**

### FEATURES

- Miniature package sizes:
  - APDS-9251-001: L 2.00 mm × W 2.00 mm × H 0.65 mm
  - APDS-9253-001: L 1.70 mm × W 1.30 mm × H 0.60 mm
- Precise light intensity measurements under diverse lighting conditions and various attentuation materials including dark glass
- ALS and RGB sensing with integrated IR-blocking filter
- Specially designed matrix arrangement of photodiodes to have optimal angular response
- Low power consumption

### KEY APPLICATIONS

- OLED display control
- Solid-state lighting
- Reflected LED color sampler
- Fluorescent light color temperature detection
- RGB LED backlight control
- Ambient light color temperature sensing
- Light source type detection (by sensing the IR content)

### MARKET SEGMENT

- Lighting

### SUB MARKET

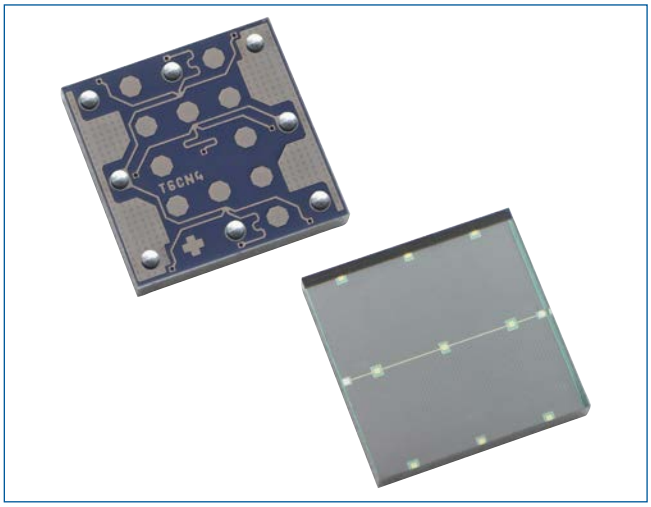
- Specialty Lighting (Digital Signage, Signals, Entertainment, Transportation)

### TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity

# J-SERIES

## Silicon Photomultiplier Sensors, J-Series (SiPM)



MicroFJ-300XX-TSV-Angle

ON Semiconductor's J-Series silicon photomultiplier (SiPM) sensors have been optimized for high-performance timing applications, such as ToF-PET (time of flight positron emission tomography). Due to increased microcell density, J-Series sensors can achieve a photon detection efficiency (PDE) of 50 % and with sensitivity extending down into the UV. They feature industry-leading low dark count rates of 50 kHz/mm$^2$ and because the sensors are created using a high-volume CMOS silicon process they feature an exceptional breakdown voltage uniformity of ±250 mV.

- **Optimized for high-performance timing applications, such as ToF-PET**
- **TSV package results in almost zero deadspace allowing high fill factor arrays**
- **Industry-leading uniformity**
- **3 mm, 4 mm and 6 mm sensor sizes**

### FEATURES

- High-density microcells
- J-Series sensors feature ON Semiconductor's unique 'fast output' terminal
- Temperature stability of 21.5 mV/°C
- Exceptional breakdown voltage uniformity of ±250 mV
- Available in a reflow solder compatible TSV chip-scale package
- Ultra-low dark count rates of 50 kHz/mm$^2$ typical
- Optimized for high-performance timing applications, such as ToF-PET
- 3 mm, 4 mm and 6 mm sensor sizes
- Bias voltage of <30 V
- Results in a 50 % photon detection efficiency (PDE) at 420 nm
- Improved signal rise time and the microcell recovery time
- Negates the need for active voltage control
- Industry-leading uniformity
- TSV package results in almost zero deadspace allowing the creation of high fill factor arrays and is ferrous-metal free

### KEY APPLICATIONS

- Medical Imaging
- Hazard & Threat
- 3D Ranging & Sensing
- Biophotonics & Sciences
- High Energy Physics

### MARKET SEGMENT

- Automotive
- Healthcare & Wearables
- Industrial

### SUB MARKET

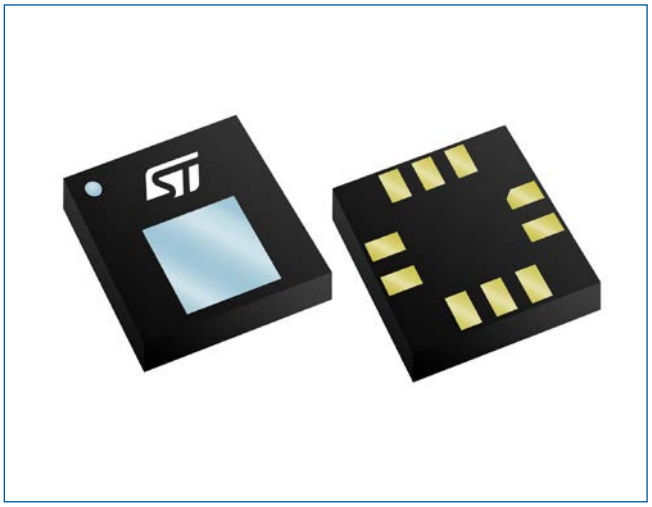
- ADAS, Automotive Infotainment & Cluster
- Commercial, Construction and Agricultural Vehicles
- Medical Diagnostic and Therapy
- Medical Imaging
- Embedded Vision
- Robotics

### TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity

# LPS22HH

## MEMS nano pressure sensor: 260-1260 hPa absolute digital output barometer



LPS22HH Pressure Sensor

The LPS22HH is an ultra-compact piezoresistive absolute pressure sensor which functions as a digital output barometer. The device comprises a sensing element and an IC interface which communicates through I²C, MIPI I3CSM or SPI from the sensing element to the application. The sensing element, which detects absolute pressure, consists of a suspended membrane manufactured using a dedicated process developed by ST. The LPS22HH is available in a full-mold, holed LGA package (HLGA). It is guaranteed to operate over a temperature range extending from -40 °C to +85 °C.

- **260 to 1260 hPa absolute pressure range**
- **Current consumption down to 4 µA**
- **Embedded temperature compensation**
- **High-performance TCO: 0.65 Pa/°C**

### FEATURES

- Absolute pressure accuracy: 0.5 hPa
- Low pressure sensor noise: 0.65 Pa
- 24-bit pressure data output
- ODR from 1 Hz to 200 Hz
- SPI, I²C or MIPI I3CSM interfaces
- Embedded FIFO
- Interrupt functions: Data-Ready, FIFO flags, pressure thresholds
- Supply voltage: 1.7 to 3.6 V
- High shock survivability: 22,000 g
- Small and thin package
- ECOPACK® lead-free compliant

### KEY APPLICATIONS

- Altimeters and barometers for portable devices
- GPS applications
- Weather station equipment
- Sport watches
- e-cigarettes
- Drones
- Gas metering

### MARKET SEGMENT

- Healthcare & Wearables
- Smart Consumer & Building
- Smart Grid

### SUB MARKET

- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Asset Tracking
- Home & Building Control and Automation
- Toys, games and entertainment
- Metering (Electricity, Flow, Heat)

### TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity

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