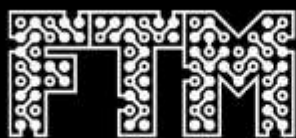




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**NPIs, DESIGN AND
TECHNOLOGY NEWS**



26-vi Intelligent Sensing

Compact MCU simplifies intelligent sensing and control in space-constrained designs

As a Renesas RA0E3 microcontroller, the R7FA0E3034ZSD#VA0 combines 32MHz Arm[®] Cortex[®]-M23 processing with analog, timing, and serial interfaces in a compact MCU for intelligent sensing endpoints.



The R7FA0E3034ZSD#VA0 is a microcontroller aimed at compact intelligent sensing nodes that need low power, simple analog capture, and basic control in a small footprint. With 16KB of code Flash and 2KB of SRAM in a 20-pin TSSOP package, the microcontroller gives designers a practical option for cost-sensitive sensor endpoints and small control boards.

To keep external logic to a minimum, the R7FA0E3034ZSD#VA0 integrates a 10-bit analog-to-digital converter, an on-chip temperature sensor, serial array unit (SAU), and I2C bus interface (IICA). The communications mix includes simplified serial peripheral interface (SPI), simplified inter-integrated circuit (IIC), universal asynchronous receiver or transmitter (UART), and UART with local interconnect network, LIN-bus support, helping one microcontroller to handle sensor reading, local control, and host communications.

Renesas also builds in functions that matter in field nodes. Flash read protection, low-voltage detection, cyclic redundancy check (CRC), an independent watchdog timer (IWDT) and register write protection. There is also GPIO read-back level detection, and illegal memory access detection to help support more robust sensing products. Low-power modes, a data transfer controller (DTC), and internal 32MHz and 32.768kHz oscillators further reduce design overhead.

The R7FA0E3034ZSD#VA0 operates from 1.6V to 5.5V across -40°C to 125°C. The MCU is part of the RA0E3 Group, which shares common Renesas peripherals and helps to ease software and hardware scaling inside the RA family.

RENESAS

FEATURES

- 128-bit unique ID
- Debug and trace support:
 - Data watchpoint and trace (DWT)
 - Flash patch and breakpoint (FPB)
 - CoreSight MTB-M23
- Timer resources:
 - 8 x 16-bit timer array unit channels
 - 32-bit interval timer
- Up to seven PWM outputs
- Up to 17 ports with open-drain and input pull-up support
- Clock trimming for the high-speed on-chip oscillator (HOCO)
- Low-speed on-chip oscillator (LOCO)
- Package: 4.4mm x 6.5mm, 0.65mm pitch

APPLICATIONS

- Consumer electronics
- System control for small appliances
- Industrial system control
- Building automation

FREE DEV BOARD

Fast prototyping board for RA0E3 MCUs.

Orderable Part Number
FPB-RA0E3

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TELECOMS

Precise short-range sensing for automation, detection, and level monitoring

Operating across reflective surfaces and in challenging ambient-light conditions, the STMicroelectronics VL53L4ED Time-of-Flight proximity sensor measures from 1mm to 1.3m.



The VL53L4ED is a Time-of-Flight (ToF) proximity sensor for short-range measurements in demanding environments. It provides linear ranges ranging down to 1 mm, measures up to 1300mm in standard conditions, and can range up to 800mm under 5000lux ambient light. This makes the VL53L4ED well suited to presence detection, system activation, and industrial collision-avoidance functions.

The VL53L4ED also measures absolute distance independently of target reflectance, helping engineers to maintain reliable sensing performance with light, dark, or mixed-surface targets in industrial automation, outdoor smart lighting, security systems, and liquid level monitoring.

STMicroelectronics integrates a single photon avalanche diode (SPAD) array, infrared filters, a 940nm laser emitter, and on-chip processing in one miniature module. The VL53L4ED helps to reduce host processing requirements through embedded firmware and turnkey C drivers, and it is pin-to-pin compatible with the VL53L4CD for easier migration when extended temperature capability is needed.



FEATURES

- Field of view 18°
- Fast ranging frequency up to 100Hz
- Operating voltage from 2.7V to 3.4V
- I2C serial bus up to 1MHz
- Autonomous low-power mode with programmable interrupt threshold
- Reflowable optical LGA12 package
- Can be hidden behind cover glass
- Laser classification Class 1
- Effective temperature ranges from -40°C to 105°C
- Package size: 4.4mm x 2.4mm x 1mm

APPLICATIONS

- Industrial robots
- Occupancy and presence detection
- Outdoor smart lighting control
- Industrial automation and security systems
- Liquid level monitoring in containers and tanks

FREE DEV BOARD

ToF proximity sensor expansion board based on the VL53L4ED for STM32 Nucleo.

Orderable Part Number
X-NUCLEO-53L4A3

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TELECOMS

Ultra-low quiescent current converter extends battery life in always-on designs

The Nexperia NEX30606 step-down converter, with a 1.8V to 5.0V supply, delivers up to 600mA, with a quiescent current low enough to suit continuously powered portable and IoT applications.



nexperia

FEATURES

- Input voltage range: 1.8V to 5.0V
- 600mA maximum output current
- 220nA quiescent current in ultra-low-power mode
- 2% maximum output voltage accuracy
- 1.5MHz pseudo-fixed switching frequency
- MOSFET on-resistance:
 - High-side: 100mΩ
 - Low-side: 80mΩ
- Operating temperature: -40°C to 125°C
- 6-bump WLCSP, 1.09mm x 0.74mm

APPLICATIONS

- Wearable electronics
- Smart meters
- Asset tracking devices
- Medical sensor patches and monitors

Keeping a battery-powered product alive between active events is largely a function of how little current the power supply draws when nothing is happening. The NEX30606 step-down converter addresses this by entering an ultra-low-power mode at light loads, where most internal circuitry is switched off.

When load demand increases, the converter transitions automatically to PWM mode using Constant On Time (COT) control. This provides fast transient response and low output ripple across the full load range without any intervention from the host system. The switching frequency scales linearly with load current in power save mode, keeping efficiency high at the microampere-range loads which are typical of a sleeping IoT node.

Output voltage is configured with a single external resistor connected to the voltage set (VSET) pin, selecting from 16 fixed voltages between 0.7V and 3.3V. The resistor value is read once at start-up before the sensing current is disconnected entirely, so the configuration process has no impact on the steady-state power budget. The wide input voltage range accommodates single-cell Li-ion and Li-MnO₂ cells as well as two- and three-cell alkaline packs, giving designers flexibility in selecting the source without changes to the surrounding circuit.

An internal soft-start limits inrush at power-up, which is particularly useful when operating from high-impedance sources such as coin cells. Cycle-by-cycle overcurrent limiting on both power switches, hiccup-mode short-circuit protection, and thermal shutdown with automatic recovery reduce the need for external protection components, keeping the total solution compact.



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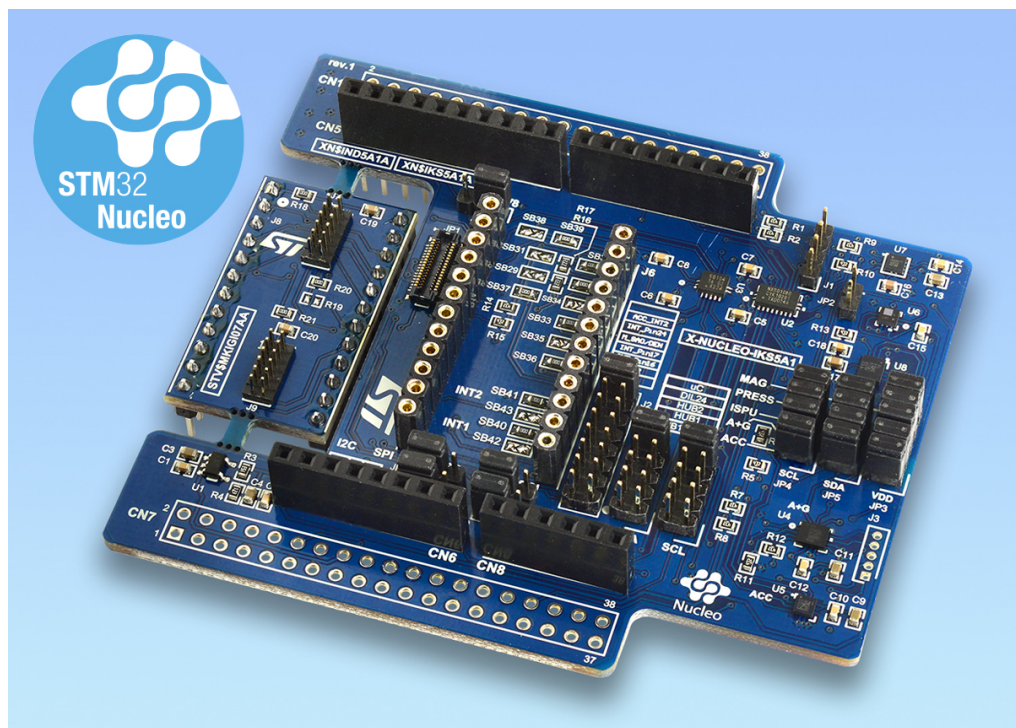
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TELECOMS

Expansion board speeds industrial MEMS prototyping on STM32 Nucleo

Combining five industrial sensors and external sensor support, the STMicroelectronics X-NUCLEO-IKS5A1 evaluation board shortens development of motion and environmental sensing platforms.



FEATURES

- Compatible with STM32 Nucleo boards
- Connectors:
 - Arduino® UNO R3
 - ST morpho
- ST MEMS adapter kits support
- I2C sensor hub support:
 - ISM330IS
 - ISM6HG256X
- Example code and binary provided
- Sample implementation available:
 - NUCLEO-F401RE
 - NUCLEO-L152RE
 - NUCLEO-L073RZ
 - NUCLEO-U575ZI-Q
- RoHS compliant and WEEE compliant

APPLICATIONS

- Industrial sensing nodes
- Condition monitoring equipment
- Predictive maintenance platforms
- Smart factory monitoring systems
- Industrial prototyping

The X-NUCLEO-IKS5A1 is an STM32 Nucleo expansion board which brings together motion and environmental sensing on one industrial platform. By combining five onboard MEMS sensors, the board gives engineers a faster route to evaluating sensor fusion, condition monitoring, and industrial sensing concepts without first building custom hardware.

The sensing set on the X-NUCLEO-IKS5A1 includes the ISM6HG256X intelligent inertial measurement unit (IMU), with simultaneous low-g and high-g acceleration detection, the ISM330IS 6-axis IMU, the IIS2DULPX 3-axis accelerometer, the ILPS22QS barometer, and the IIS2MDC 3-axis magnetometer. This combination allows developers to assess both motion and environmental data on the same board, and explore advanced embedded functions such as finite state machine, machine learning core, intelligent sensor processing unit, and sensor hub operation.

To make the platform more useful in real industrial set-ups, the X-NUCLEO-IKS5A1 supports external sensors through a DIL24 adapter, ribbon flat cable, or flex PCB connection. The main board X-NUCLEO-IND5A1 hosts the motion MEMS and environmental sensors, and the detachable STEVAL-MKGI07A add-on board provides two industrial connectors, allowing remote sensor placement when the measurement point is not close to the host board.

Software support is broad. The X-NUCLEO-IKS5A1 is supported by the ST Edge AI Suite with tools, including [MEMS Studio](#), [X-CUBE-MEMS1](#), [HSDatalog](#), and the wider STM32Cube ecosystem, and sample implementations are available for NUCLEO-F401RE, NUCLEO-L152RE, NUCLEO-L073RZ, and NUCLEO-U575ZI-Q boards. This helps to shorten the path from first evaluation to application firmware.

FREE DEV BOARD

Orderable Part Number
X-NUCLEO-IKS5A1

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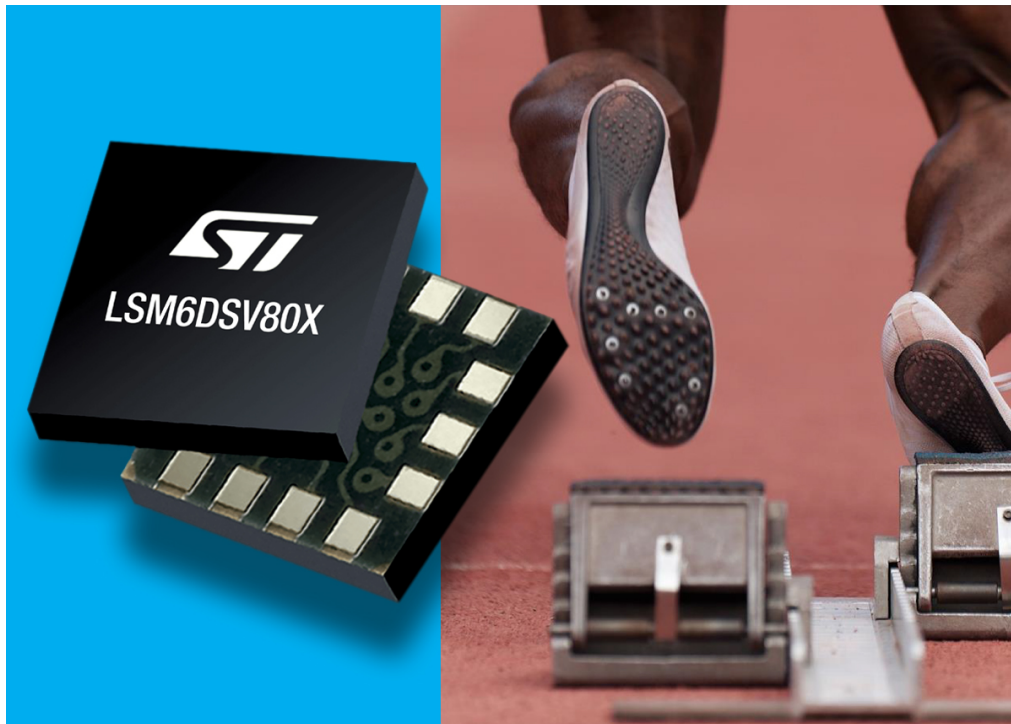
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TELECOMS

6-axis inertial measurement unit boosts wearable motion tracking for high impact sports

The STMicroelectronics LSM6DSV80X is a 6-axis inertial measurement unit which combines 16g and 80g acceleration sensing in one package for sport trackers and other compact wearables.



The LSM6DSV80X 6-axis inertial measurement unit (IMU) is aimed at wearables and sport trackers that need to measure both routine motion and sharp impacts in a single sensor. The LSM6DSV80X integrates a low-g accelerometer, a high-g accelerometer and a gyroscope.

The dual accelerometer architecture lets the LSM6DSV80X track low-g movement up to 16 g and high-g events up to $\pm 80g$, helping designers to avoid saturation during impact events without adding a second sensor. All sensing channels are fully synchronized, supporting cleaner motion capture in smartwatches, smart rings, sport trackers and other compact wearables.

To cut host processor overhead, the LSM6DSV80X performs motion processing at the edge with a machine learning core (MLC), a finite state machine (FSM), adaptive self-configuration, (ASC), and sensor fusion low power (SFLP). This enables context-aware analysis and real-time sensor reconfiguration inside the IMU.



FEATURES

- Gyroscope full-scale from ± 250 dps to ± 4000 dps
- Output data rate up to 7.68kHz
- Smart FIFO buffer up to 4.5KB with compression
- Supply current:
 - 0.67mA in 6-axis high-performance mode
 - 0.80mA in 9-axis high-performance mode
- I/O supply range from 1.08V to 3.6V
- Serial interface with main processor data synchronization
 - SPI
 - I²C
 - MIPI I3C@ v1.1
- Operating temperature range from -40°C to 85°C
- LGA-14L 2.5 x 3.0 x 0.83mm package

APPLICATIONS

- Wearables
- Sport trackers
- High-shock detection
- IoT and connected devices
- Augmented reality (AR)
- Virtual reality (VR)
- Mixed reality (MR)

FREE DEV BOARD

Inertial measurement unit adapter board for a standard DIL24 socket.

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STEVAL-MKI247A

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TELECOMS

This magnetometer strengthens accuracy for smart consumer and industrial systems

By combining tunnel magnetoresistance sensing with field shock recovery, the Bosch Sensortec BMM350 magnetometer offers benefits for AR or VR, indoor navigation, and industrial motion tracking.



The BMM350 from Bosch Sensortec is a 16-bit 3-axis magnetometer for products which need accurate heading information in a very small footprint. Based on tunnel magnetoresistance technology (TMR), the BMM350 is aimed at consumer and industrial systems such as AR and VR headsets, wearables, hearables, robots, vehicles, drones, and GPS-enabled products.

While it is specified as a 16-bit sensor at a system level, the magnetometer internally uses higher-resolution digital representation, with magnetic and temperature data delivered in a 21-bit signed format within 24-bit registers, enabling more precise processing and measurement handling.

Performance is a key strength. The BMM350 measures magnetic fields on the x, y, and z axes across a typical range of $\pm 2000\mu\text{T}$, while combining low current consumption with low noise. Average current consumption of 200 μA at 100Hz in normal mode. The magnetometer is housed in a 1.28mm x 1.28mm x 0.5mm wafer level chip scale package.

The BMM350 supports field shock recovery, enabling it to recover from excessively strong magnetic fields up to 400mT, tolerating fields up to 100 times the measurement range without performance degradation. This helps to maintain stable sensing in products exposed to transient magnetic disturbance.

For intelligent sensing designs, the BMM350 can support far more than a basic digital compass. Bosch Sensortec highlights use such as head orientation for 3D audio, reduced pixel latency in AR and VR, indoor navigation in combination with an accelerometer, and positioning or speed detection in vehicles or industrial machines. Used alongside the BMI270 inertial measurement unit and BMP58x pressure sensors, the BMM350 can form part of a 10 DoF sensing solution for more accurate context awareness and heading estimation.

Bosch Sensortec  **BOSCH**

FEATURES

- Communication interfaces: I2C, I3C
- 400Hz sampling rate in normal mode
- Normal, forced, and suspend operating modes
- Supply-voltage ranges:
 - 1.72V to 1.98V positive supply voltage (VDD)
 - 1.72V to 3.6V input/output voltage (VDDIO)
- Operating-temperature range from -40°C to 85°C

APPLICATIONS

- AR, VR, and MR head tracking
- 3D audio head orientation
- Indoor navigation
- Magnetic compass functions
- High-end gaming systems
- Dead reckoning in robotics
- Positioning and speed detection

FREE DEV BOARD

Magnetometer sensor platform evaluation expansion board.

Orderable Part Number
Shuttle Board 3.0 BMM350

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TELECOMS

Digital vibration sensor captures signals across 6.3kHz bandwidth

The STMicroelectronics IIS3DWBG1 3-axis digital vibration sensor combines low noise, bandwidth to 6.3kHz and stable sensitivity over temperature, to build more accurate condition-monitoring and predictive-maintenance systems.



The IIS3DWBG1 from STMicroelectronics is a 3-axis digital vibration sensor designed for industrial equipment, electric and hybrid vehicles, and test systems that require consistent wideband vibration data. The flat passband response, bandwidth up to 6 kHz, and low noise enable the capture of both subtle and higher-frequency mechanical signatures with a single sensor. The sensor offers an ultrawide, flat frequency response from dc to 6kHz, with a $\pm 3\text{dB}$ limit at the upper end.

Engineers can configure the IIS3DWBG1 for $\pm 2\text{g}$, $\pm 4\text{g}$, $\pm 8\text{g}$ or $\pm 16\text{g}$ full-scale operation. The sensor outputs 16-bit acceleration data at 26.667kHz, and the combination of stable sensitivity over temperature and operation up to 125°C makes the IIS3DWBG1 well suited to condition monitoring and predictive maintenance in demanding environments.

Integration overhead is kept low. The IIS3DWBG1 combines a serial peripheral interface (SPI) selectable low-pass and high-pass filtering, wake-up and activity-inactivity interrupts, a 3KB first-in, first-out buffer, an embedded temperature sensor, and embedded self-test. Power consumption is 1.1mA with all 3 axes active, making the IIS3DWBG1 a strong fit for compact industrial wireless sensor nodes.



FEATURES

- Noise density:
 - $75\mu\text{g}/\sqrt{\text{Hz}}$ in 3-axis mode
 - $60\mu\text{g}/\sqrt{\text{Hz}}$ in single-axis mode
- Supply-voltage range from 2.1V to 3.6V
- Embedded functions:
 - Temperature sensor
 - Self-test
 - Activity and inactivity detection
- Operating temperature range from -40°C to 125°C
- LGA-14L 2.5mm x 3.0mm x 0.83mm package

APPLICATIONS

- Vibration monitoring
- Electric and hybrid vehicles
- Condition monitoring
- Predictive maintenance
- Test and measurements

FREE DEV BOARD

Evaluation kit for the IIS3DWBG1 3-axis digital vibration sensor.

Orderable Part Number
STEVAL-MKI252KA

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TELECOMS

Extends battery life in compact sensor nodes while providing efficiency up to 95%

The Diodes Incorporated AP61040 and AP61041 synchronous buck converters deliver up to 400mA from 2.15V to 5.5V inputs for wearables, health monitors, and Bluetooth® low-energy applications.



FEATURES

- Switching frequency: 1.1MHz
- High-side and low-side MOSFET on-resistance: 321mΩ and 150mΩ
- Soft-start period: 0.8ms
- Operating range from -40°C to 125°C
- AP61040 shutdown supply current: 34nA
- AP61041 shutdown supply current: 440nA
- Thermal hysteresis:
 - 25°C for AP61040
 - 15°C for AP61041
- ESD rating, human body mode: 3000V
- X1-WLB1208-6, 6-ball WLCSP package

APPLICATIONS

- Wearables
- Health monitors
- Action cameras
- Smart glasses
- Ultra-low-power sensor nodes
- Energy-harvesting products

The AP61040 and AP61041 from Diodes Incorporated are synchronous buck converters for portable sensing products that need long battery run-time and a very small power stage footprint. Both buck converters supply up to 400mA across a 2.15V to 5.5V input range, making them suitable for smart watches, fitness bands, health monitors, Bluetooth low-energy products, and energy-harvesting designs.

A key advantage is the low quiescent current, which helps to extend operating life in systems that spend most of their time on standby or light-load operation. The AP61040 draws a typical 930nA quiescent current in pulse-frequency modulation mode (PFM), while the AP61041 typically draws 1.2uA. Both buck converters also provide efficiency up to 95%.

The two parts give designers different ways to simplify rail selection. The AP61040 uses one selection pin to choose from among preset feedback voltages of 0.6V, 2.5V, and 3.3V, and supports pulse-width modulation (PWM) operation regardless of load. The AP61041 uses two three-state selection pins to choose from eight preset feedback voltages between 0.6V and 1.8V, suiting low-voltage digital rails in compact sensing platforms.

Integration is high, helping reduce bill-of-materials size and board area. The AP61040 and AP61041 are optimized for use with a 2.2μH inductor and 10μF input and output capacitors, and both buck converters support seamless transition between buck and 100% duty cycle modes. Protection features include under-voltage lockout (UVLO), over-current protection (OCP), short-circuit protection, and over-temperature protection (OTP).



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TELECOMS

Single-chip MCU combines capacitive sensing with system control for HMI designs

The Infineon Technologies PSoC™ 4100T Plus integrates fifth-generation CAPSENSE™ and Multi-Sense technology with an Arm® Cortex®-M0+ core, allowing designers to consolidate touch sensing and general-purpose control on a single device.



Many human-machine interface (HMI) designs require a dedicated touch controller alongside the main MCU, adding board area, bill of materials cost, and inter-device communication overhead. The PSoC 4100T Plus removes that requirement by combining a 48MHz Arm Cortex-M0+ processor with the Infineon fifth-generation CAPSENSE and Multi-Sense technology on a single die, with up to 32 sensor inputs available simultaneously across all sensing modes.

The CAPSENSE implementation supports both self-capacitive and mutual-capacitive touch detection, covering finger touch and proximity sensing for standard panel applications. Beyond conventional touch, the Multi-Sense subsystem extends capability to inductive sensing, which allows detection over metallic surfaces. A feature that is useful in appliances and industrial panels where a protective metal fascia is required. Liquid level sensing and CAPSENSE hover touch for proximity and gesture detection are also supported, giving designers a broad set of sensing options without adding external components.

Signal integrity in real-world environments is a practical concern for any touch interface. The fifth-generation CAPSENSE architecture delivers a high signal-to-noise ratio and liquid tolerance, allowing panels to remain functional when wet. This is relevant for white goods, outdoor controls, and wearables where condensation or splashing is likely. The PSoC 4100T Plus also offers three times the electrostatic discharge robustness compared to earlier PSoC 4 MCUs, reducing the risk of field failures in consumer and light industrial products.

Power management is addressed at the hardware level. In deep sleep mode, touch sensing continues autonomously, with the processor waking only on a valid touch event. This hardware-based wake-on-touch approach avoids the need for software polling, keeping average current consumption low in battery-operated or mains-powered products where the interface must remain responsive over extended periods.

The 1% internal main oscillator clock accuracy option supports synchronous serial communication without an external crystal, simplifying board design. The peripheral set includes six 16-bit timer/counter/PWM blocks, a 12-bit 1Msample/s ADC with an eight-channel sequencer, two serial communication blocks configurable as I2C, SPI, or UART, and three additional UART blocks. This combination makes the PSoC 4100T Plus capable of acting as a complete system controller, handling both HMI and application logic in a single device. Infineon's ModusToolbox software supports the device with board support packages, a peripheral driver library, and CAPSENSE middleware, reducing firmware development effort.



FEATURES

- Supply voltage: 1.71V to 5.5V
- 48MHz Arm Cortex-M0+ core
- Flash: 128KB
- SRAM: 32KB
- Up to 32 CAPSENSE sensor inputs
- 8µA deep sleep current with active touch sensing
- 300µA autonomous sensing current
- Up to 38 GPIOs
- Operating temperature: -40°C to 105°C
- 48-TQFP package

APPLICATIONS

- White goods
- Touch-controlled screens
- Smart home
- Wearables and hearables
- PC gaming
- Industrial touchscreens

FREE DEV BOARD

Evaluation board for PSoC™ 4100T Plus MCU with CAPSENSE and Multi-Sense.

Orderable Part Number
CY8CPROTO-041TP

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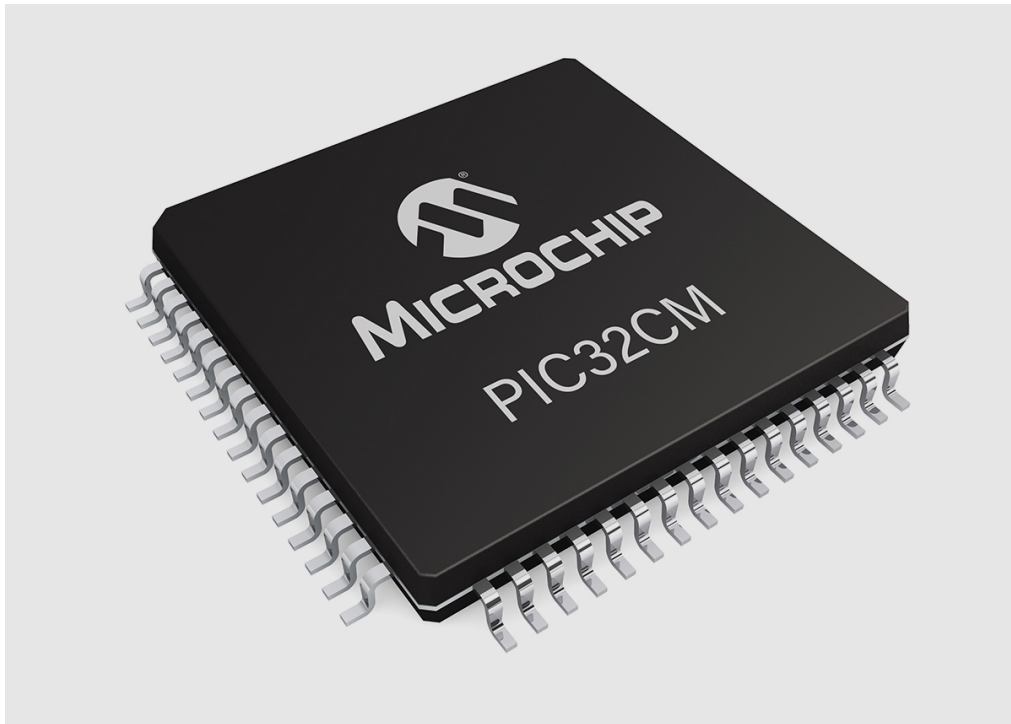
CONSUMER



TELECOMS

Safety-grade MCU targets touch-driven industrial and appliance HMI designs

The Microchip PIC32CM5112GC00 combines functional safety hardware, an enhanced capacitive touch controller, and a broad industrial communications suite in a single Arm® Cortex®-M23 MCU for control panels, appliances, and light industrial nodes.



The central design challenge in touch-driven industrial equipment is maintaining reliable sensing in environments where noise, moisture, and electromagnetic interference are routine conditions. The PIC32CM5112GC00 addresses this through a dedicated peripheral touch controller (PTC) that supports up to 324 mutual-capacitance channels or 36 self-capacitance channels, with Driven Shield+ technology to improve noise immunity and maintain performance on wet surfaces. Wake-on-touch from standby sleep mode allows the sensing subsystem to remain active while the processor core is powered down, which keeps average current low in applications where the panel must remain responsive at all times without draining the supply.

The functional safety architecture is built to ISO 26262:2018, with error correction code (ECC) and fault injection capability on both the 512KB Flash and 128KB SRAM. The memory built-in self-test (MBIST) is accessible in user mode, and there is a fail-safe clock monitor with automatic safe-clock switching, and write protection of peripheral registers through the peripheral access controller. Together these features allow safety requirements to be addressed at the hardware level rather than relying on software workarounds, reducing the certification burden for the wider system.

Communications flexibility is provided by dual CAN-FD modules compliant with ISO 11898-1:2015, a full-speed USB 2.0 interface with on-chip transceiver, and six SERCOM interfaces each configurable as USART, I2C, SPI, RS-485, IrDA, or LIN host/client. This combination allows the MCU to connect simultaneously to a vehicle or industrial network, a local host processor, and lower-level sensors without external bridge components.

The analog front-end includes a 12-bit ADC running at up to 4.5Msample/s across up to 12 channels, supported by two analog comparators with programmable voltage references. SleepWalking allows peripherals including the ADC and event system to continue operating while the core sleeps, enabling autonomous data acquisition without software polling and reducing the frequency of processor wake events.



FEATURES

- Arm Cortex-M2 CPU, up to 72MHz
- 512KB Flash with ECC
- 128KB SRAM with ECC and MBIST
- Supply voltage: 1.71V to 3.63V
- ADC: 12-bit, up to 4.5Msample/s, up to 12 channels
- PTC: up to 324 mutual-capacitance or 36 self-capacitance channels
- Up to 80 GPIO
- Operating temperature: -40°C to 125°C
- Packages: 48-, 64-, 100-pin TQFP and VQFN

APPLICATIONS

- Industrial control panels
- White goods
- Automotive body electronics and UI subsystems
- Touch-controlled building automation
- Battery-assisted sensor nodes
- Motor control with HMI

FREE DEV BOARD

PIC32CM GC00 Curiosity Pro development board.

Orderable Part Number
EV17V75A

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TELECOMS

3D lidar sensor enables high-resolution scans for edge perception

Streaming depth, 2D infrared and ambient maps at up to 100Hz, the STMicroelectronics VL53L9CX 3D direct Time-of-Flight (dToF) lidar sensor offers benefits for robotics, smart building and AR/VR sensing.



The VL53L9CX lidar module is designed for systems that need more scene detail than a conventional range sensor can provide. With 2.3K zones, 1° angular resolution across a 55° x 42° field of view, and accurate ranging to 9m, the VL53L9CX gives a richer basis for perception in robots, occupancy systems and smart building controls.

Speed is another key advantage. The VL53L9CX streams full-resolution processed data at up to 100Hz, and its dual-scan flood illumination approach helps detect small objects and edges while avoiding motion artifacts in fast-moving scenes. This makes the VL53L9CX well suited to simultaneous localization and mapping, obstacle avoidance, people counting and gesture-based interfaces.

Integration is unusually high for this class of sensor. The VL53L9CX combines a single photon avalanche diode (SPAD) array, postprocessing system-on-chip, two vertical-cavity surface-emitting lasers, physical infrared filters, metasurface optics and power management in one module. Depth data are available directly over MIPI or I3C, helping designers to connect the VL53L9CX to a wide range of host processors.

The combination of long range, high zone count and fast streaming broadens the reach of dToF sensing into applications such as content monitoring in tanks or bins, telephoto camera assist, and projector keystone correction. The VL53L9CX also gives product teams a compact route to richer 3D scene awareness in battery-powered and space-constrained designs.



FEATURES

- System power: 150mW
- Package size 12.8mm x 6.1mm x 4.6mm
- Output data:
 - Depth
 - 2D infrared
 - Ambient maps
- Postprocessing map outputs:
 - Reflectance
 - Confidence
- Dual 940nm vertical-cavity surface-emitting lasers
- Laser safety Class 1
- Supply rails:
 - 2.8V to 4.8V battery voltage (V BAT)
 - 2.8V or 3.3V analog voltage (AV DD)
 - 1.2V digital voltage (DVDD)
 - 1.2V or 1.8V input/output voltage (IOVDD)
- Single reflowable mounting module

APPLICATIONS

- Mobile robots
- Autonomous drones
- People-counting systems
- Smart building occupancy sensors
- Smart lighting controllers
- AR/VR headsets
- Industrial tank and bin monitors
- Video projectors



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TELECOMS

FPC connector doubles retention force while keeping a 1.0mm profile height

Offering back-flip top and bottom contact flexibility, the FH34 series of FPC connectors from Hirose Electric features top and bottom contact flexibility with significantly improved FPC/FFC retention in a compact, low-profile package.



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FEATURES

- Contact pitch: 0.5mm
- Connector height: 1.0mm
- Contact count range:
 - Four to 30 positions (FH34D)
 - Four to 50 positions (FH34SRJ)
- Rated voltage: 50V ac-dc
- Operating temperature: -55°C to 105°C
- Transmission rate: Up to 10Gbps
- IEC 61249-2-21 compliant

APPLICATIONS

- Drones and action cameras
- Smart wearables
- IoT modules
- Industrial sensors
- Security cameras

Retention force is where the FH34 stands out. Its back-flip contact design delivers approximately 2.6 times the horizontal, and twice the vertical retention of conventional types, to give a meaningful advantage in vibration-sensitive assemblies.

The series is offered in two options to suit different retention requirements. The FH34SRJ accepts standard FPC/FFC in up to 50 positions, while the FH34D is designed for FPC/FFC with tabs, adding a further 2.5N of horizontal retention force over the FH34SRJ, making it the stronger choice where cable security is critical.

Both variants accept FPC/FFC on either the top or bottom contact, removing a common routing constraint in dense board designs. An overmolding on the lower surface eliminates exposed contacts and removes the need for a pattern-prohibited area beneath the connector, freeing additional PCB routing space. The series ships with the actuator open and features tapered guides on all four inner walls for smooth, repeatable insertion.

With support for transmission rates up to 10Gbps and compliance with eDP v1.3 and MIPI D-PHY standards, the FH34 is well suited to display and camera interfaces in compact consumer and industrial devices.



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