

# **New Product Introduction**



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BGT60LTR11AIP - completely autonomous radar sensor

XENSIV<sup>™</sup> – IM67D130A high performance MEMS microphone for automotive applications

EasyPACK<sup>™</sup> Automotive IGBT 750V Half Bridge -FF300R08W2P2 B11A

32-bit TriCore<sup>™</sup> AURIX<sup>™</sup> TC3Ex family

BGSX44MU18 - 4P4T MIPI antenna cross switch

PSoC<sup>™</sup> 62S4 Pioneer Kit (CY8CKIT-062S4)

# BGT60LTR11AIP - completely autonomous radar sensor

The BGT60LTR11AIP MMIC is a fully integrated microwave motion sensor including Antennas in Package (AIP) as well as built-in motion and direction of motion detectors. A state machine enables operation of the device autonomously, i.e., without an external microcontroller or further signal processing.

The detection threshold or sensitivity has 16 different levels in order to fulfill a configurable detection range from 0.5 m up to 7 m with a typical human target Radar Cross Section (RCS).

The device can achieve power consumption of less than 2mW with adjustable duty cycling.

#### Features

- > 3.3 x 6.7 x 0.56 mm<sup>3</sup> package size
- > 1Tx 1Rx Antennas in Package (AIP) with 80 ° Half Power Beam Width (HPBW)
- > Integrated motion detector
- > Integrated direction of motion detector
- > Multiple modes of operation including a completely autonomous mode
- Adjustable performance parameters such as detection sensitivity, hold time and frequency of operation
- > Standard FR4 material can be used for PCB design

#### **Target applications**

- > Smart Building and Smart Home devices such as thermostats, smoke detectors, smart speakers and other entertainment systems
- > Smart appliances (small home appliances and major home appliances) such as service robots, vacuum cleaners, lawnmower, washing machine and kitchen appliances
- > Smart home security and alarm systems including IP cameras
- > Displays such as TVs, monitors, laptops or tablets
- > Lighting systems and lighting control (mainly indoor lighting)
- > Air conditioners
- > Automated door openers
- > Contactless switches

# Block diagram



Product overview incl. user guide link

OPN	SP Number	Package
BGT60LTR11AIPE6327XUMA2	SP005537624	PG-UF2BGA-42



## Benefits

Autonomous mode (operation without MCU and signal processing)

- > Up to 7 m detection range for humans
- > Less than 2 mW power consumption possible
- > Requires minimal external circuitry

Adding a M0 MCU extends flexibility:

- > Up to 10 m detection range (SPI mode)
- Advanced functionalities by SPI configuration or further signal processing

# Competitive advantage

Compared to classical PIR motion sensors:

- > Higher sensitivity
- > Ability to sense the direction of motion
- > Sensing through obstacles/materials
- > Smaller size
- > Less prone to environmental influences

Compared to other radar sensors:

- > Small size (3.3 x 6.7 x 0.56 mm package)
- > Integrated antennas & completely autonomous mode
- > Low power consumption
- > Flexibility by hardware preset pins even in the autonomous mode



Product page

Product brief

Evaluation board

# XENSIV<sup>™</sup> – IM67D130A high performance MEMS microphone for automotive applications

Our high-performance digital MEMS microphones are suited to all applications inside and outside the car, where the best audio performance in harsh automotive environments is required. These automotive microphones enable distortion-free audio capturing for all speech-related applications improving speech intelligibility for voice recognition algorithms. In addition, they perfectly support acoustic noise cancellation with its flat frequency and stable phase response. Other highlights include close sensitivity and phase matching, making automotive XENSIV<sup>™</sup> MEMS microphones ideal for beamforming arrays.



We offer two derivatives:

IM67D130A high performance digital MEMS microphone

IM67D120A high performance digital MEMS microphone for 16-bit codecs

### Features

- > High dynamic range of 103dB for best speech performance
- > Signal to noise ratio of 67dBSPL
- > <1% total harmonic distortions up to high SPL levels
- > Acoustic overload point at 130dBSPL / IM67D120A: 120.0 dBSPL
- > Increased operating temperature range:  $T_A = -40^{\circ}C \dots 105^{\circ}C$
- > Digital PDM output
- > Qualification according to AEC-Q103-003

#### Competitive advantage

- > Qualification according to AEC-Q103-003
- > Increased T-range: T<sub>A</sub> = -40°C ... +105°C
- > Long term availability
- > High performance

### Benefits

- > Close sensitivity and phase matching for usage in arrays
- > Extended availability to match long automotive design cycles
- > Flat frequency response with low frequency roll off and very fast analog to digital conversion speed for best ANC performance
- > Enlarged operating temperature range allows flexible use in different application environments

#### Target applications

- > Hands free calling
- > eCall

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- Voice control
- Active noise cancellation (ANC/RNC)
- > Siren detection
- > Road condition detection

#### MEMS **MEMS** bias Voltage regulators charge pump Backplate 1 Ι DATA Membrane **Digital signal** SELECT processing CLOCK <sub>II</sub>, ▼ Backplate 2 [ Power mode detector **Digital core** coefficients ASIC GROUND

Product collaterals / Online support

Product family page

Product brief

<u>eLearning</u>

<u>Video</u>

Product overview incl. data sheet link

OPN	SP Number	Package
IM67D130AXTSA2	SP005582032	PG-LLGA-5
IM67D120AXTSA1	SP005550431	PG-LLGA-5

## System diagram

# EasyPACK™ Automotive IGBT 750V Half Bridge - FF300R08W2P2\_B11A

The EasyPACK<sup>™</sup> 2B is a very compact and flexible halfbridge solution, optimized for inverter applications of hybrid and electric vehicles up to 230Arms. The module uses the benchmark EDT2 IGBT generation allowing 750V blocking voltage and IcN of 300A.The chipset has benchmark current density combined with short circuit ruggedness for reliable inverter operation under harsh environmental conditions. The EDT2 IGBTs also show excellent light load power losses, which helps to improve system efficiency over a real driving cycle. The EasyPACK<sup>™</sup> package is fully qualified for automotive applications and is validated according to AQG 324. Its high power cycling capability as well as the high creepage and clearance distances add to the product reliability. The power module comes with PressFIT Pins for the signal terminals to avoid additional time consuming selective solder processes, which provides cost savings on system level and increases system reliability.

#### Features

- > Blocking voltage 750 V
- > Ic nom 300 A
- > Tvj op = 150°C
- > LowVCEsat
- > Low Switching Losses
- > Low Inductive Design
- > Low Qg and Crss
- > 4.2kV DC 1sec Insulation
- > High Creepage and Clearance Distances
- > PressFIT Contact Technology
- > Integrated NTC temperature sensor
- > RoHS compliant 120 V on-chip bootstrap diode
- > Reduced footprint for PCB design
- > Lead-free RoHS compliant package

#### System diagram



#### Product overview incl. data sheet link

OPN	SP Number	Package
FF300R08W2P2B11ABOMA1	SP005424885	AG-EASY2B-3



# Benefits

- Easy system assembly (PressFIT contact technology for solder-less mounting)
- Easy design (Integrated module solution with optimized thermal management)
- High reliability (high short circuit ruggedness, blocking voltage, power cycling capability, creepage and clearance distances)
- > Flexibility (half bridge concept for flexible inverter design)
- > Fully qualified and validated for automotive (AQG 324)

#### Competitive advantage

- > Product Reliability
- > Performance-based design with EDT2 technology, showing excellent light load power losses. This helps to improve system efficiency over a real driving cycle
- > Low inductive design

# **Target applications**

- > Traction Inverter
- > Electric vehicle (EV) drivetrain system
- > Commercial, Construction, and Agriculture Vehicles

Product collaterals / Online support

- Product page
- Product brief
- Simulation tool
- Application note
- Video

# 32-bit TriCore™ AURIX™ TC3Ex family

Infineon releases its AURIX<sup>™</sup> TC3Ex microcontroller family. It comes back with an increase in performance, memory sizes, connectivity and more scalability to address the new automotive trends and challenges. In terms of performance, T3Ex offers 4 cores running at 300 MHz and up to 1.5 MBytes embedded RAM, and consuming below 2 W. Its mirrored embedded flash banks offers A/B swap capabilities.



#### Features

- > Safety
  - including but not limited to lock-step cores, LBIST, ECC RAM to ensure a safety platform supporting ASIL-D ISO 26262.
- > Security
  - Hardware Security Module (HSM) compliant eVita full, ensuring the implementation of future proofed security measure.
  - extensive connectivity with up to 20 CAN FD, 4 channels FlexRay, 24 LINs, 6 QSPI
- > Scalability
  - The TC3Ex is upward compatible with the higher performance TC39x and downward compatible to TC38x, TC37x, TC36x and TC33x. This product offers as well the capability to be coupled to either and ASIC or another TC3Ex through a dedicated high-speed interface (HSSL) in order to increase the performances of the ECU.

#### Benefits

- > Best-in-class performance enabling ASIL-D designs
- > Upward and downward scalable to the rest of AURIX™ TC3xx family A/B swap software update over the air support
- > Easy migration from AURIX™ TC2xx thanks to high software and hardware compatibility

#### **Target applications**

- > High-performance chassis
- > Powertrain
- > Body and autonomous driving microcontroller



Product collaterals / Online support

 Product family page

 Product brief

 Video

 Training

 User manual vol1

 User manual vol2

 AURIX™ Video Hub

 Preferred Design Houses Rating

 AURIX™ Development Studio

Product overview incl. product page link

OPN	SP Number	Package
TC3E7QF192F300SAAKXUMA1	SP005345769	PG-LFBGA-292
TC3E7QG160F300SAAKXUMA1	SP005345771	PG-LFBGA-292
TC3E7QX192F300SAAKXUMA1	SP005345773	PG-LFBGA-292

#### System diagram: Central gateway

# BGSX44MU18 - 4P4T MIPI antenna cross switch

The BGSX44MU18 RF CMOS switch is specifically designed for LTE and 5G FR1 four-antenna applications. This 4P4T cross-switch offers low insertion loss and low harmonic generation.

The switch is controlled via a MIPI RFFE control interface. The onchip controller allows power-supply voltages from 1.65 to1.95 V. The switch features direct-connect-to-battery functionality and DCfree RF ports.

Unlike GaAs technology, external DC blocking capacitors at the RF ports are only required if DC voltage is applied externally. The device has a very small size of only 2.0 mm x 2.4 mm and a thickness of 0.63 mm.

#### Features

- > High linearity up to 37 dBm peak power
- > Fast switching time (2µs max.)
- > Low insertion loss and high port to port isolation up to 7.125 GHz
- > MIPI RFFE 2.1 control interface
- > Software and hardware programmable USID
- > Ultra low profile lead-less plastic package
- > RoHS and WEEE compliant package

#### **Target applications**

- > Smartphones
- > Notebooks
- > Customer-premises- equipment (CPE), 5G routers

#### System diagram

# Benefits

- > Antenna performance optimization with smart antenna selection and swapping in cellular mobile devices RF Front-end
- > Enable 5G bands device operation with very low system losses
- > Target 4x4 MIMO application; four-antenna RF designs
- > Support your device's SAR reduction
- > Allow 5G SRS application with high switching speed

#### Competitive advantage

- > High power handling (37 dBm peak power) supports 5G bands with Power class 2
- >~ Fast switching speed (2µs max.) allows 5G SRS applications
- > Lowest insertion loss (IL) 0.91 dB at 5G NR band n79 (4.4-5.0 GHz)



#### Product overview incl. data sheet link

OPN	SP Number	Package
BGSX44MU18E6327XUSA1	SP005341854	PG-WLGA-18

Product collaterals / Online support

Product page



# PSoC<sup>™</sup> 62S4 Pioneer Kit (CY8CKIT-062S4)

The PSoC<sup>™</sup> 62S4 Pioneer Kit (CY8CKIT-062S4) is an easy-to-use hardware platform that enables design and debug of the PSoC 62 MCU.

Kit Contents:

PSoC 62S4 Pioneer Board

USB Type-A to Micro-B cable

Six jumper wires (five inches each)

Quick Start Guide

# Features

The PSoC 62S4 Pioneer Kit features the PSoC 62 MCU CY8C62x4 (CY8C6244LQI-S4D92) with: 150-MHz Arm® Cortex®-M4 and 100-MHz Arm Cortex-M0+ cores, 256KB of Flash, 128KB of SRAM, programmable analog blocks including two 12-bit SAR ADCs, programmable digital blocks, Full-Speed USB, a serial memory interface, a CAN-FD interface, and industry-leading capacitive-sensing with CapSense™.

# Target applications

- > Smart home automation
- > Smart building
- > Industrial Control
- > Medical/Healthcare

## Competitive advantage

- Cost-optimized, smaller footprint PSoC 6 with minimized flash: up to 256KB
- PSoC 61x4 (single Cortex-M4), PSoC 62 x4 (Dual Cortex-M4/ M0 core)
- > Enhanced analog vs. other PSoC 6 families
- > CAN-FD Controller, USB 2.0

# Block diagram



Product overview incl. user guide link

MPN	Package
CY8CKIT-062S4	kit



# Benefits

# > External NOR Flash

The PSoC 62S4 Pioneer Kit includes a 512Mbits Quad SPI nonvolatile Flash in a 16-pin SOIC package, that provides a high-performance, safe, and reliable NOR Flash memory solution for local data logging.

### > Low Power Analog

The CY8C62x4 device on PSoC 62S4 Pioneer Kit features rich analog including dual SAR ADCs, DAC, Opamps and Comparators which are capable of operating in system deep sleep mode. An ambient light sensor and an thermistor are connected to CY8C62x4 device on the kit to evaluate the low power analog.

> Industry-Leading CapSense

fineon Devid

Using the 4th generation CapSense provided in the PSoC 62 Line, the PSoC 62S4 Pioneer Board comes with capacitive sensing interfaces including two buttons and a 5-segment slider.

Product collaterals / Online support
Product page
ModusToolbox™ Software Suite
Infineon GitHub Repository
Release notes
Kit schematics
Quick start guide