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M A R K E T I N G

I N N O V A T I V E

P R O D U C T S



2019

ARTIFICIAL INTELLIGENCE

01

FACE RECOGNITION



EBVElektronik
| An Avnet Company |

FACE TO FACE WITH ARTIFICIAL INTELLIGENCE

What was once science fiction is increasingly becoming reality. Artificial intelligence (AI) is continuing its onward march into multiple aspects of our lives. Furthermore, AI is a flourishing market – the management consulting firm McKinsey predicts that it will grow by 25 per cent per year until 2025, when it will be worth US\$ 130 billion. Still, not all AI technologies are created equal and some deliver more value than others. Good examples are face scanning and recognition, where there are three main application areas.

The first is an AI-based entry control system, used as a pass key in airports, military establishments and critical environments like nuclear plants. These systems are also utilised for the surveillance of public spaces like car parks.

Mimicry is another key application area for AI-based facial recognition. The technology simulates human thought processes by reaching a conclusion based on the analysis of a number of data points. AI-based mimicry is used in medical diagnostics, military anti-terror operations and even in the cosmetics industry.

The third major face recognition segment is machine learning, where it can be used to generate ideas for new products based on certain features in existing ones. It can also optimise algorithms on the code level or boost power, efficiency and speed.

However, choosing all the hardware, software and services to develop AI applications requires some human intelligence as well as the artificial sort! For 50 years, EBV Elektronik has been a one-stop source for support, consulting and delivery services. If you have a facial recognition or another AI project in mind, come and talk to our application experts – they'll be happy to help.




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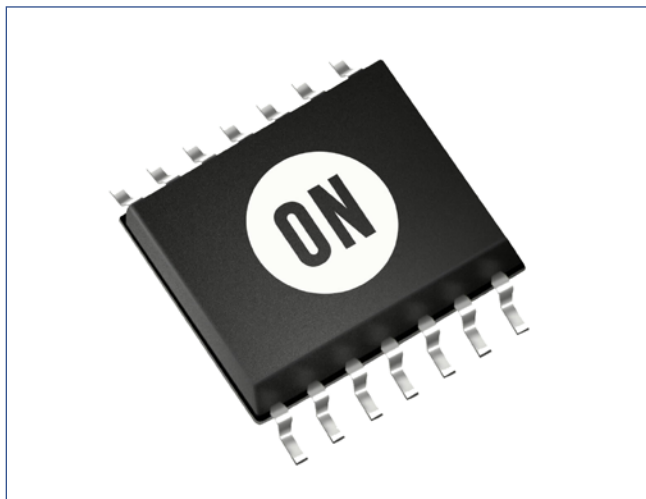


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NCS2007x

Operational Amplifiers



TSSOP-14 WB Package

The NCS2007x series of operational amplifiers provide rail-to-rail output operation, 3 MHz bandwidth, and are available in single, dual, and quad config. Rail-to-rail operation enables the user to make optimal use of the entire supply voltage range. NCS2007x is available in industry standard pinouts in SOT553, TSOP-5, Micro8, SOIC-8, TSSOP-8, TSSOP-14 and SOIC-14 packages.

It is also available as AEC-Q100 qualified and PPAP capable with NCV prefix (NCV2007x).

- **Rail-To-Rail Output**
- **Wide Supply Range: 2.7 V to 36 V**

- **High Slew Rate: 2.8 V/ μ s typical at $V_S = 2.7$ V**
- **Wide Temperature Range: -40 °C to 125 °C**

FEATURES

- Rail to rail Output
- Wide Supply Range: 2.7 V-36 V
- Wide Bandwidth: 3 MHz at $V_S = 2.7$ V
- High Slew Rate: 2.8 V/ μ s at $V_S = 2.7$ V
- Low Supply Current: 405uA/channel at $V_S = 2.7$ V
- Low Input Bias Current: Typically 5pA
- Wide Temperature Range

KEY APPLICATIONS

- Economical low side current sensing solution
- Sensor signal conditioning including high impedance sensors
- Rail to Rail output swing applications
- Active Filters

MARKET SEGMENT

- Industrial
- Smart Consumer & Building
- Smart Grid

SUB MARKET

- Metering (Electricity, Flow, Heat)
- Motion Control, Servo Drives
- Home Appliances

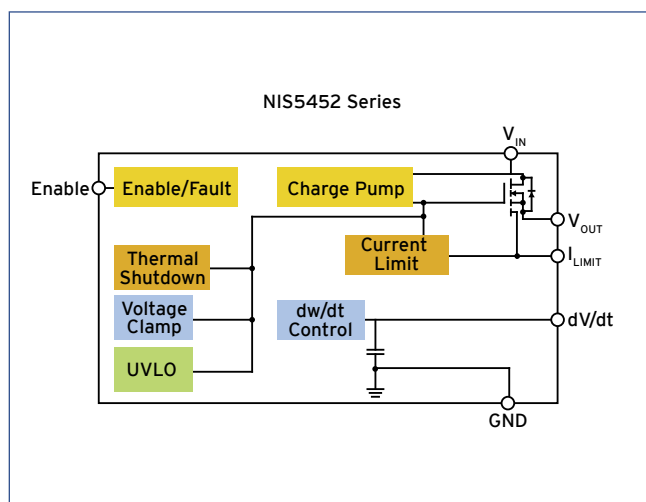
TECHNOLOGY SEGMENT

- Analog & Power



NIS5452

Low $R_{DS(ON)}$ Electronic fuse for 3.3 and 5.0 V Applications



Application Example

The NIS5452 series is a cost-effective, resettable fuse which can greatly enhance the reliability of a hard drive or other circuit from both catastrophic and shutdown failures.

It is designed to buffer the load device from excessive input voltage which can damage sensitive circuits. The NIS5452 series also includes an overvoltage clamp circuit that limits the output voltage during transients but does not shut the unit down, thereby allowing the load circuit to continue operation. Two thermal options are available, latching and auto-retry.

- High Voltage Startup
- Primary Side Feedback

- CC / CV Control
- Tight LED Constant Current Regulation

FEATURES

- Integrated Power Device
- Power Device Thermally Protected
- No External Current Shunt Required
- Low $R_{DS(ON)}$ 33 mΩ Typical
- Internal Charge Pump
- Internal Undervoltage Lockout Circuit
- Internal Overvoltage Clamp
- These are Pb-Free Devices and are RoHS Compliant

KEY APPLICATIONS

- Mother Board
- Hard Drives
- Fan Drives

MARKET SEGMENT

- Communication & Infrastructure
- Smart Consumer & Building
- Industrial

SUB MARKET

- Telecom and Networking
- Surveillance, Parking & Traffic Control
- Audio and Video
- Home & Building Control and Automation
- Home & Building Security (Alarms, Access Control)



STEF01

8 V to 48 V fully programmable universal electronic fuse



HTSSOP14 package

The STEF01 is a universal integrated electronic fuse optimized for monitoring output current and the input voltage on DC power lines.

When connected in series to the main power rail, it is able to detect and react to overcurrent and overvoltage conditions. When an overload condition occurs, the device limits the output current to a safe value defined by the user. If the anomalous overload condition persists, the device goes into an open state, disconnecting the load from the power supply.

The device is fully programmable.

- **Operating input voltage range: 8 V to 48 V**
- **Absolute maximum input voltage: 55 V**

- **Continuous current typ.: 4 A**
- **N-channel on-resistance typ.: 30 mΩ**

FEATURES

- Operating input voltage range: 8 V to 48 V
- Absolute maximum input voltage: 55 V
- Continuous current typ.: 4 A
- N-channel on-resistance typ.: 30 mΩ_i
- Enable/fault functions
- Output clamp voltage: adjustable from 10 V to 52 V
- Programmable undervoltage lockout
- Short-circuit current limit
- Programmable overload current limit
- Adjustable soft-start time
- Latch or auto-retry thermal protection
- Maximum allowable power protection
- Power Good
- Drives an optional external reverse current protection MOSFET
- Operating junction temperature -40 °C to 125 °C
- HTSSOP14 package

KEY APPLICATIONS

- Hot board insertion
- Electronic circuit breaker/power busing
- Industrial/alarm/lighting systems
- Distributed power systems
- Telecom power modules

MARKET SEGMENT

- Industrial

SUB MARKET

- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Human Machine Interface
- Instrumentation, Test and Measurement
- Robotics
- Embedded Computing & Storage

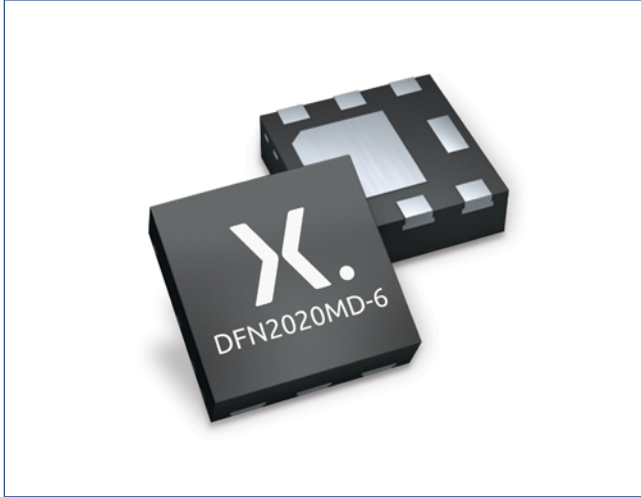
TECHNOLOGY SEGMENT

- Analog & Power



MOSFETs in DFN2020MD-6

Medium power AEC-Q101 MOSFETs in leadless DFN2020 packages



Product image

Our portfolio of medium power automotive-qualified MOSFETs in leadless DFN2020 packages comprises N- & P-channel MOSFETs in the 20V-80V voltage range. The DFN2020 package comes with side-wettable flanks that enable automatic optical inspection (AOI). Our portfolio partly qualifies to 175 °C junction temperature.

- 40 V & 60 V N-ch & P-ch portfolio
- AEC-Q101 qualified

- $T_j = 175\text{ °C}$
- Side wettable flanks for Automatic Optical Inspection

FEATURES

- $R_{DS(ON)}$ down to 18 mΩ (@ 4.5 V) for 40 V N-ch
- $R_{DS(ON)}$ down to 45 mΩ (@ 4.5 V) for 40 V P-ch

KEY APPLICATIONS

- Low-side load switch
- High-speed line drives
- LED driver switch
- DC-DC conversion

MARKET SEGMENT

- Automotive
- Lighting
- Industrial

SUB MARKET

- Connected Car, Body Electronics and Automotive Lighting
- ADAS, Automotive Infotainment & Cluster
- Specialty Lighting (Digital Signage, Signals, Entertainment, Transportation)
- Lighting Drivers and Electronic Control Gears

TECHNOLOGY SEGMENT

- Analog & Power



Xilinx® U250 Alveo™ Card

Xilinx® U250 Alveo™ Data Center Accelerator Card Passive Cooling



Xilinx® U250 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 54 MB**

KEY APPLICATIONS

- Machine Learning

MARKET SEGMENT

- Communication & Infrastructure
- Industrial

SUB MARKET

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

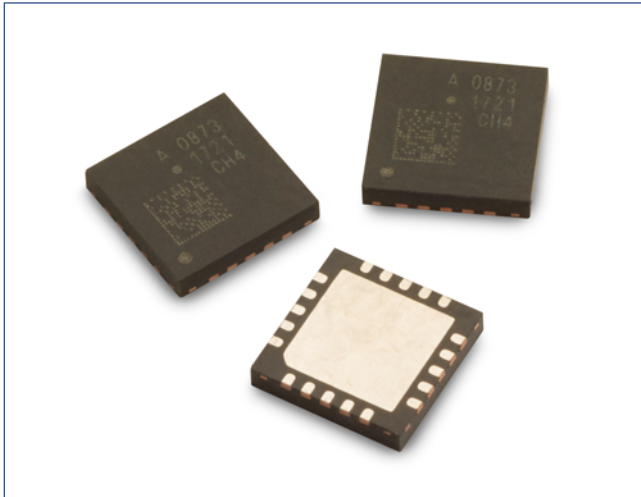
TECHNOLOGY SEGMENT

- High End Processing



ACPL-0873

3-Channel Digital Filter for Second Order Sigma Delta Modulators



ACPL-0873

A 3-channel digital filter designed specifically for Second Order Sigma Delta Modulators in voltage and current sensing. Each input channel can receive an independent Sigma-Delta ($\Sigma\Delta$) modulator bit stream. The bit streams are processed by 3 individual digital decimation filters. Features of the digital filter include 4 decimation ratios for Sinc2 mode and 3 decimation ratios for Sinc3 mode, offset calibration and fast over-range detection. Synchronization of inputs from 3 channels is done internally by the filter alignment.

- **3 Independent Digital Filters**
- **Direct Interface between Isolated Sigma-Delta Modulator and MCU/DSP**

- **Offset Calibration**
- **SPI-compatible Interface**

FEATURES

- Fast Over-range Detection
- Channel 1 MCLK clock detection
- Programmable Input Configuration
- Compact surface mount QFN-20 5 mm × 5 mm
- Operating Temperature -40 °C to 125 °C
- SPI clock frequency up to 17 MHz
- Modulator clock frequency MCLK up to 25 MHz

KEY APPLICATIONS

- Electric motor phase and rail current sensing
- DC/DC converter current sensing
- AC-DC charger current sensing
- Battery current sensing
- General voltage or current sensing

MARKET SEGMENT

- Industrial

SUB MARKET

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

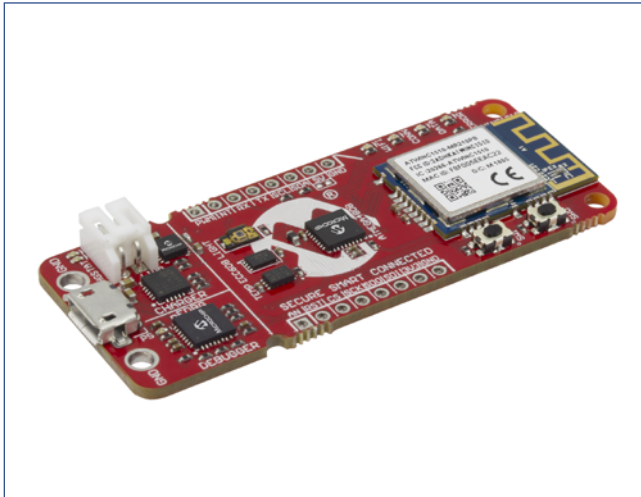
TECHNOLOGY SEGMENT

- Analog & Power



The AVR®-IoT WG

AVR® based IoT Evaluation Board with WiFi Connectivity to the Google Cloud



The AVR® IoT-WG

The AVR-IOT WG board is a small and easily expandable demonstration and evaluation platform for IoT solutions based on the AVR microcontroller architecture using Wi-Fi technology. This board comes pre-programmed and configured for demonstrating connectivity to the Google Cloud.

Supported by Atmel® Studio 7.0 and MPLAB(R) X Integrated Development Environments, the kit provides easy access to the features of the MCU and explains how to integrate the device into a custom design.

Expandability is provided by the mikroBUS connector, with +500 click boards offered by MikroElektronika (www.mikroe.com)

- **Direct connection to the Google Cloud, pre-provisioned with free sandbox account**
- **The ATECC608A Secure Element provide secure key generation/storage**
- **Light and precision temperature sensor are provided for convenience/demonstration**
- **USB serial port bridge is provided for diagnostics**

FEATURES

- mikroBUSTM connector provides access to 500+ additional sensors and actuators
- A Li-Po battery can be connected to power the device and can be charged via a USB interface
- USB serial port bridge is provided for diagnostic and to support a command line interface
- USB Mass Storage interface allows easy (drag 'n drop) update of the microcontroller Flash memory and (re) configuration of WiFi credentials
- Compact and inexpensive evaluation and development board
- Supported by Atmel® Studio and MPLAB X Integrated Development Environments
- The kit includes an on-board nEDBG, no external tools are necessary to program and debug the ATmega4808

KEY APPLICATIONS

- Smart sensors
- Intelligent lighting
- Access control
- Climate control
- Air quality control
- Traffic forecasts
- Traffic modulation

MARKET SEGMENT

- Smart Consumer & Building
- Healthcare & Wearables
- Lighting

SUB MARKET

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



Kinetis KW36/35

Industry's First Automotive-Qualified Bluetooth 5 Microcontrollers with integrated CAN FD



Kinetis KW35/36 Chip

The ultra-low power Kinetis KW36/35 Wireless MCUs enable Bluetooth V5 and Generic FSK RF connectivity. Supporting up to 8 simultaneous Bluetooth connections, focused on applications bridging the embedded world to smartphones to enhance the human interface experience, share embedded data to the cloud, or enable wireless firmware updates.

Based on ARM® Cortex®-M0+ at 48 MHz, with up to 512 kB flash with ECC, 64 kB SRAM and highly-integrated connectivity, security and analog capabilities; The Kinetis KW36/35 also integrate FlexCAN with CAN FD and LIN to enable automotive and industrial networks.

- **Automotive and industrial qualified wireless MCUs**
- **Simplified integration of Bluetooth connectivity**
- **Includes Flex CAN FD and LIN**
- **Four independently programmable DMA controller channels**

FEATURES

- AEC Q100-Grade 2 qualified (KW36A/KW35A only)
- Industrial qualified (KW36Z/35Z only)
- Operating Range (Ambient): -40 °C to +105 °C
- Bluetooth 5 and Generic FSK, 8 simultaneous connections
- Wi-Fi co-existence
- 3rd generation radio from NXP providing performance enhancements to Kinetis KW31Z
- CAN FD and two UARTs with LIN support
- Easy integration into automotive in-vehicle and industrial communication networks
- CAN FD for increased bandwidth and lower latency (automotive)
- ARM® Cortex®-M0+ at up to 48 MHz
- KW36: 256 kB Program Flash +256 kB FlexNVM w. EEPROM emulation both with ECC
- KW35: 512 kB (2 × 256 kB, swappable) Program Flash with ECC
- 64 kB SRAM

- KW36: 8 KB of user-segment defined byte write/erase EEPROM
- 4 programmable DMA controller channels
- Support for Bluetooth 5 and Generic FSK
- Rx Sensitivity, -95 dBm BLE
- -30 to +3.5 dBm programmable output power
- 6.3 mA Rx & 5.7 mA Tx (0 dBm) current target (DC-DC enabled)
- Integrated balun (~9 % board area savings)
- AES Accelerator and True Random Number Generator
- Advanced flash security
- 80-bit device ID
- 40-bit unique number

KEY APPLICATIONS

- Smart Car Access
- Tire-Pressure Monitoring Systems (TPMS)
- Industrial connectivity

MARKET SEGMENT

- Automotive
- Industrial

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

SUB MARKET

- Connected Car, Body Electronics and Automotive Lighting
- ADAS, Automotive Infotainment & Cluster
- Instrumentation, Test and Measurement
- Elevators, Escalators, Moving Walkways
- Information Kiosk & Advertising Panels
- Point of Sales and Vending machines
- Surveillance, Parking & Traffic Control
- Asset Tracking
- Heating, Ventilation and Air Conditioning
- Home & Building Control, Automation and Security
- Home & Building Security (Alarms, Access Control)
- Medical Instruments
- Wireless Infrastructure

TECHNOLOGY SEGMENT

- High End Processing



STM32F750

**High-performance, ARM® Cortex®-M7 MCU
with 64 Kbyte of Flash 216 MHz CPU**



The STM32F750x8 devices are based on the high-performance ARM® Cortex®-M7 32-bit RISC core operating at up to 216 MHz frequency. The Cortex®-M7 core features a single floating point unit (SFPU) precision which supports all ARM® single-precision data-processing instructions and data types. It also implements a full set of DSP instructions and a memory protection unit (MPU) which enhances the application security.

13

MICROCONTROLLERS

• Performance

• Security

• 3 ADCs

• Graphics

FEATURES

- 64 Kbytes of Flash memory
- 1024 bytes of OTP memory
- SRAM: 320 Kbytes (64 KB of data TCM RAM for critical real-time data) + 16 Kbytes of instruction TCM RAM (real-time routines) + 4 Kbytes of backup SRAM (incl lowest power modes)
- Flexible external memory controller with up to 32-bit data bus: SRAM, PSRAM, SDRAM/LPSDR SDRAM, NOR/NAND memories
- Dual mode Quad-SPI
- LCD parallel interface, 8080/6800 modes
- LCD-TFT controller up to XGA resolution with dedicated Chrom-ART Accelerator™ for enhanced graphic content creation (DMA2D)
- Clock, reset and supply management 1.7 V to 3.6 V application supply and I/Os

- POR, PDR, PVD and BOR
- Dedicated USB power
- 4 MHz to 26 MHz crystal oscillator
- 32 kHz oscillator for RTC with calibration
- Internal 32 kHz RC with calibration
- Low-power Sleep, Stop and Standby modes
- VBAT supply for RTC, 32 × 32-bit backup registers + 4 Kbytes of backup SRAM
- 3 × 12-bit, 2.4 MSPS ADC: channels and 7.2 MSPS in triple interleaved mode
- 2 × 12-bit D/A converters
- Up to 18 timers: up to thirteen 16-bit (1 × low- power 16-bit timer available in Stop mode) and two 32-bit timers, each with up to 4 IC/OC/PWM or pulse counter and quadrature (incremental) encoder input. All 15 timers running up to 216 MHz. 2 × watchdogs, SysTick timer

KEY APPLICATIONS

- Graphics
- Audio
- DSP
- Industrial drives

MARKET SEGMENT

- Healthcare & Wearables
- Industrial
- Communication & Infrastructure

SUB MARKET

- Surveillance, Parking & Traffic Control
- Portable Personal Electronics & Wearables
- Medical Instruments

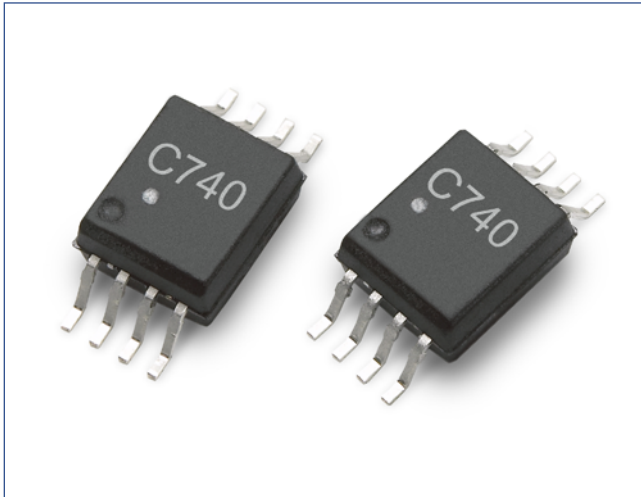
TECHNOLOGY SEGMENT

- High End Processing



ACPL-C740

Optically Isolated Sigma-Delta Modulator



ACPL-C740

The ACPL-C740 is a 1-bit, second-order sigma-delta (Σ - Δ) modulator that converts an analog input signal into a high-speed data stream with galvanic isolation based on optical coupling technology. The ACPL-C740 operates from a 5 V power supply with a dynamic range of 83 dB with an appropriate digital filter. The differential inputs of ± 200 mV (full scale ± 320 mV) are ideal for direct connection to shunt resistors or other low-level signal sources in applications such as motor phase current measurement.

- **Superior Optical Isolation and Insulation**
- **20 MHz internal clock**

- **1-bit, second-order sigma-delta modulator**
- **16 bits resolution no missing codes (12 bits ENOB)**

FEATURES

- 83 dB SNR
- 2 $\mu\text{V}/^\circ\text{C}$ maximum offset drift
- $\pm 1\%$ gain error
- Internal reference voltage
- ± 200 mV linear range with single 5 V supply (± 320 mV full scale)
- 3 V to 5.5 V wide supply range for digital interface
- -40°C to $+110^\circ\text{C}$ operating temperature range
- SSO-8 package
- 25 kV/ μs common-mode transient immunity
- Safety and regulatory approval:
 - IEC/EN/DIN EN 60747-5-5: 1414 V_{peak} working insulation voltage
 - UL 1577: 5000 V_{RMS}/1 min isolation voltage
 - CSA: Component Acceptance Notice #5

KEY APPLICATIONS

- Motor phase and rail current sensing
- Power Inverter current and voltage sensing
- Industrial process control
- Data acquisition systems
- General purpose current and voltage sensing
- Traditional current transducer replacements

MARKET SEGMENT

- Industrial

SUB MARKET

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

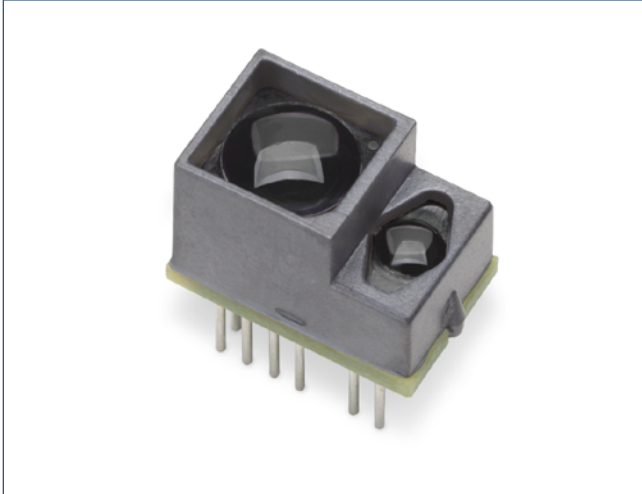
TECHNOLOGY SEGMENT

- Analog & Power



AFBR-S50 Family

Time of Flight Sensor for Multi-Pixel Distance Measurement



AFBR-S50 Family

Broadcom's multi-pixel distance and motion measurement sensor based on the optical Time of Flight principle excels by supporting up to 3000 frames per second with up to 32 illuminated pixels.

The sensor has been developed with a special focus on precise distance sensing and gesture sensing applications with the need for highest speed, small size, and very low power consumption. Through its excellent ambient light suppression of up to 200 k Lux, there is no problem to use it in outside environments.

- Up to 3000 frames p/s
- For precise distance sensing and gesture sensing
- Highest speed, small size and very low power consumption
- Up to 32 illuminated pixels

FEATURES

- Optimized to measure distances of up to 30 m (black target) on a wide variety of surfaces
- Works equally well on white, black, colored as well as on metallic reflective surfaces
- The module has an integrated 680 nm/850 nm laser light source and uses a single voltage supply of 5 V, the data is transferred via a digital SPI interface
- Integrated Laser light source
- Very fast measurement rates of up to 3 kHz

- Variable distance range up to 30 m
- Operation up to 200 k Lux ambient light
- Works well on all surface conditions
- SPI digital interface (up to 25 MHz)
- Single voltage supply 5 V
- Integrated clock source
- Laser Class 1 – eye safe ready
- Drop in compatible within the AFBR-S50 Sensor Platform

KEY APPLICATIONS

- Industrial sensors
- Gesture sensing
- Distance measurement
- Robotics
- Automation and control

MARKET SEGMENT

- Industrial

SUB MARKET

- Robotics
- Elevators, Escalators, Moving Walkways
- Motion Control, Servo Drives

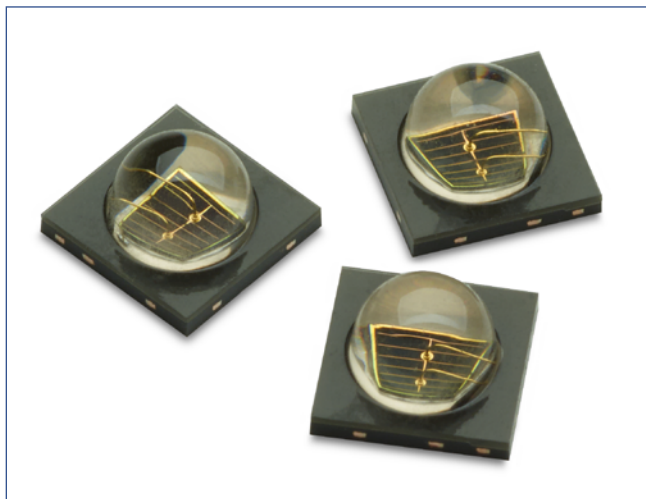
TECHNOLOGY SEGMENT

- Analog & Power



ARE1-xxxx-00000 Family

High Power Infrared Emitting Diodes



ARE1-8930

Broadcom's ARE1-xxxx-00000 product family of high power Infrared emitting diodes targets various IR applications within the Industrial, Automotive, Medical, Security, Telecommunication and Consumer market segments.

The ARE1-xxxx-00000 product series comes in multiple options:

- 1) wavelength (850 nm & 940 nm),
- 2) viewing angle (90 deg & 150 deg)
- 3) single & double stack junctions.

It is being packaged in an industrial standard DFN footprint and surface mount platform, hence makes it manufacturing friendly.

- **MSL Level**
- **Non-ESD Sensitive**

- **Available in peak wavelength 850 nm & 940 nm**
- **Viewing angle 90 deg & 150 deg**

KEY APPLICATIONS

- Night vision, drowsiness Detection
- CCTV Surveillance
- Machine Illumination
- Machine Safety Light Curtain
- Iris/Facial Recognition
- Biometrics
- Touch Screen Panel

MARKET SEGMENT

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

SUB MARKET

- ADAS, Automotive Infotainment & Cluster
- Connected Car, Body Electronics and Automotive Lighting
- Telecom and Networking
- Embedded Vision
- Instrumentation, Test and Measurement
- Specialty Lighting (Digital Signage, Signals, Entertainment, Transportation)
- Home Appliances
- Home & Building Security (Alarms, Access Control)

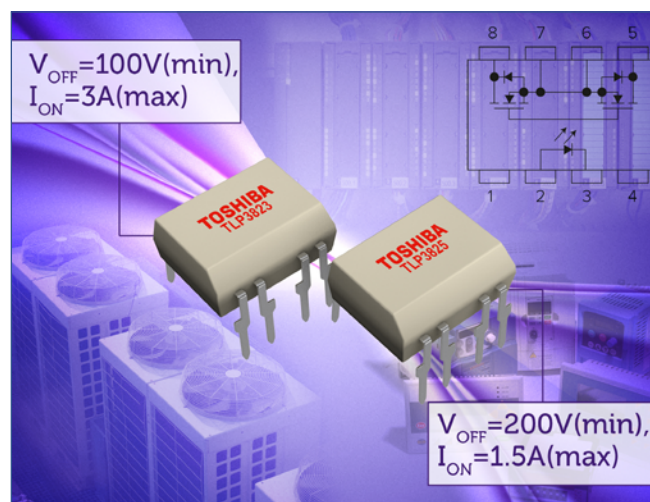
TECHNOLOGY SEGMENT

- Analog & Power



TLP3823 / TLP3825

Mid-voltage range devices will replace mechanical relays



Toshiba_TLP3823 and TLP3825

Toshiba's 100 V TLP3823 with 3 A drive current and the 200 V TLP3825 with 1.5 A drive current – represent two new members of mid-voltage, high-current photorelays. The new products will extend the range of high-current photorelays to replace mechanical relays, alongside Toshiba's existing 60 V, 5 A TLP3547. Toshiba is supporting and promoting the accelerated replacement of mechanical relays by applying its latest trench MOSFET structure, 8th generation UMOS, to realize output currents exceeding 1 A. Photorelays have no physical contacts that incur wear and tear, thus contributing to significantly increased reliability.

- **High operating temperature rating:**
Topr(max.) = 110 °C
- **Normally opened (1-Form-A)**

- **OFF-state output terminal voltage: 100 V (min.)**
- **Trigger LED current: 5.0 mA (max.)**

FEATURES

- High OFF-state output terminal voltage rating: $V_{OFF} = 200\text{ V}$ (TLP3825)
- Large current control: $I_{ON}=1.5\text{ A}$ (TLP3825)
- ON-state resistance (A connection): 500 mΩ (max) (TLP3825)
- High OFF-state output terminal voltage rating: $V_{OFF} = 100\text{ V}$ (TLP3823)
- Large current control: $I_{ON} = 3\text{ A}$ (TLP3823)
- ON-state resistance (A connection): 150 mΩ (max.) (TLP3823)

KEY APPLICATIONS

- Industrial equipment
- General purpose inverters
- HVAC
- Thermostats
- Building automation systems
- Semiconductor testers (memory, SoC and LSI)
- Various test instruments

MARKET SEGMENT

- Industrial

SUB MARKET

- Instrumentation, Test and Measurement

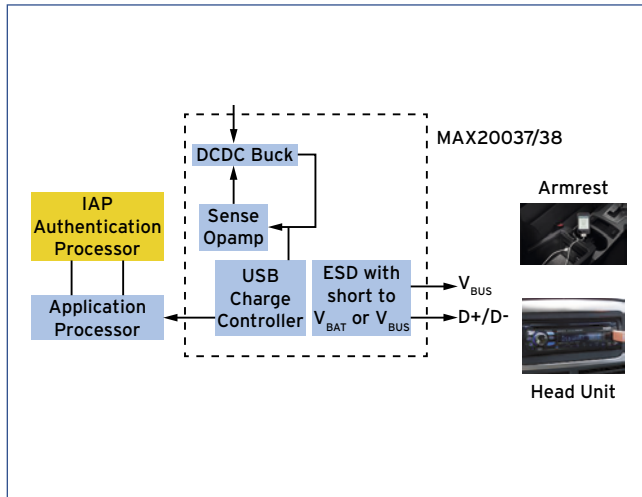
TECHNOLOGY SEGMENT

- Analog & Power



MAX20038

Automotive 3.5 A Buck Converter with I²C, USB Protection/Host Charge Emulator



Sub System Block Diagram

Synchronous USB Buck Converter with I²C, Short to V_{BAT} and Protection/Host Charge Emulator

The MAX20037/MAX20038 ICs combine a 3.5 A automotive-grade step-down converter, USB host charger adapter emulator, and USB protection switches for automotive USB host applications. The device family also includes an USB load current-sense amplifier and configurable feedback-adjustment circuit, designed to provide automatic USB voltage compensation for voltage drops in captive cables often found in automotive applications.

- 3.5 A Synchronous buck converter
- 2.2 MHz switching frequency

- I²C for cable compensation and diagno
- Spread spectrum

FEATURES

- One-Chip Solution Directly from Car Battery to Portable Device
- 4.5 V to 28 V (40 V Load Dump) Input Voltage
- 5 V, 3.5 A Output Current Capability
- Device-Attach Detection Output
- Low-Q Current Skip and Shutdown Modes
- Low-Noise Features Prevent Interference with AM Band and Portable Devices
- Fixed-Frequency 275 kHz to 2.2 MHz Operation
- Fixed-PWM Option at No Load
- Spread Spectrum for EMI Reduction
- SYNC Input/Output for Frequency Parking
- Optimal USB Power and Communication for Portable Devices
- User-Programmable Voltage Gain Adjusts Output for Up to 600 mΩ Cable Resistance
- User-Programmable USB Current Limit

- USB 480 Mbps/12 Mbps/1.5 Mbps Data Switches
- Integrated iPod®/iPhone®/iPad® and Samsung® Charge-Detection Termination Resistors
- Supports USB BC1.2 CDP and DCP Modes
- Supports China YD/T 1591-2009
- Compatible with USB On-the-Go Specification
- Robust Design Keeps Vehicle System and Portable Devices Safe in Automotive Environment
- Short-to-Battery Protection on DC-DC Converter Pins
- Short-to- V_{BUS} Protection on USB Pins (MAX20037)
- Short-to-Battery Protection on USB Pins (MAX20038)

- ±15 kV Air/±8 kV Contact ISO 10605*
- ±15 kV Air/±8 kV Contact IEC 61000-4-2*
- Reduced Inrush Current with Soft-Start
- Overtemperature Protection
- -40 °C to +125 °C Operating Temperature Range

KEY APPLICATIONS

- Telematics

MARKET SEGMENT

- Automotive

SUB MARKET

- ADAS, Automotive Infotainment & Cluster

TECHNOLOGY SEGMENT

- Analog & Power



STPW12

Programmable electronic power breaker for 12 V bus



STPW12 – disconnection for protection

The STPW12 is an integrated electronic power breaker, optimized to monitor the input power.

Connected in series to the power rail, it is able to disconnect the electronic circuitry on its output if the power consumption overcomes the programmed limit. Due to this, the device automatically opens the integrated power switch and disconnects the load.

The intervention of the protection is communicated to the board monitoring circuits through a signal on the fault pin.

After a certain delay time, the device automatically tries again to close the internal switch and re-connect the load.

- Adjustable power limitation
- Continuous current typ.: 1.5 A

- Input voltage range: from 10.5 V to 18 V
- Real-time input power sensing

FEATURES

- P-channel on resistance typ.: 50 mΩ
- Power limit accuracy typ.: 3 %
- PWM mode
- Programmable power limit masking time
- Programmable auto-retry delay
- Thermal shutdown
- Enable function
- Short-circuit current limit
- Operative junction temp. - 40 °C to 125 °C
- Available in power SO8 package
- Simplifies UL compliance and certification

KEY APPLICATIONS

- White goods
- Consumer electronics
- Industrial applications
- Air conditioner
- User interface
- Fan motor control

MARKET SEGMENT

- Industrial

SUB MARKET

- Home and professional appliances
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Robotics
- Instrumentation, Test and Measurement

TECHNOLOGY SEGMENT

- Analog & Power



TB67S128FTG

Motor Driver IC with High-Definition Micro Stepping



Toshiba_TB67S128

Motor Driver IC with High-Definition Micro Stepping TB67S128FTG, a bipolar stepping motor driver with 128 micro steps, is released for high-precision 3D printers, surveillance cameras, electric actuators, and others where higher accuracy and quieter operation are required. It supports high power drive with a 50V/5A rating and is excellent in space-saving. At the heart of the new device is Toshiba's Active Gain Control (AGC) that optimizes the drive current to suit the required torque, thereby preventing stalling and realizing power savings.

- Supporting up to 128 micro steps
- Powerful 5A driver integrated

- Integrates AGC and Selectable Mixed Decay circuitry
- Current detection resistors implemented

FEATURES

- Noise reduced and vibration-free operation
- No need for an external driver IC
- Optimizes drive current to suit the required torque
- No need for external current detection resistors
- Ideal use in applications where a silent and exact operation is mandatory
- Reduced BOM cost. Smaller PCB size.
- Prevents from stalling and realizing optimum power savings

KEY APPLICATIONS

- 3D printers
- Surveillance cameras
- Electric actuators
- Industrial equipment
- Banking terminals such as ATMs
- Office equipment, facsimile machines
- Game machines such as slot machines

MARKET SEGMENT

- Industrial

SUB MARKET

- Professional Gaming, Amusement & Casino Machines
- Surveillance, Parking & Traffic Control

TECHNOLOGY SEGMENT

- Analog & Power



i.MX 6ULZ

**A high performance and ultra-low cost
i.MX 6 family member**



i.MX 6ULZ Chip

The i.MX 6ULZ is a high-performance, ultra-cost-efficient consumer Linux processor featuring an advanced implementation of a single ARM® Cortex®-A7, operating at 900 MHz. The i.MX 6ULZ processor includes full audio suite: ESAI, I²S × 3, S/PDIF, and an integrated power management module that reduces the complexity of an external power supply and power sequencing. This family provides various memory interfaces, including 16-bit LPDDR2, DDR3, DDR3L, raw and managed NAND flash, NOR flash, eMMC, Quad SPI and a wide range of interfaces for connecting peripherals such as WLAN, Bluetooth® and GPS.

- **Lowest Cost i.MX 6 Member**
- **High Performance**

- **Connectivity Optimized for Cost Sensitive Consumer Applications**
- **Ease of Use, Compatibility and Scalability**

FEATURES

- Price at \$ 1.99 RS @ 10 k
- The 14 × 14 289 MAPBGA with 0.8 mm pitch for simple and low-cost PCB design
- Integrated power management module that reduces the complexity of external power supply and simplifies power sequencing
- 900 MHz ARM® Cortex®-A7 with Neon
- 32 KB L1 I-Cache and 32 KB L1 D-Cache
- 128 KB L2 Cache
- Advanced High Assurance Boot
- Full Audio suite: ESAI, I²S × 3, S/PDIF
- 2 × High-speed USB on-the-go with PHY
- Multiple Serial Communication ports: 2 × I²C, 2 × SPI, 4 × UART, 2 × Smartcard interfaces
- Flexible external memory controller: Parallel NAND, Parallel NOR, dual channel QSPI, eMMC, SD

- Linux BSP
- SW and Pin to pin compatible with corresponding i.MX 6UltraLite and i.MX 6ULL
- SW compatible to broad i.MX 6 series

KEY APPLICATIONS

- Computing Engine, Consumer Electronics, Audio/Voice control
- ESAI, 3 × I²S and S/PDIF, Smart Audio for Voice products

MARKET SEGMENT

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

SUB MARKET

- Personal Health, Sport & Fitness
- Toys, games and entertainment
- Home Appliances
- Home & Building Security (Alarms, Access Control)
- Heating, Ventilation and Air Conditioning
- Home & Building Control and Automation
- Audio and Video
- Asset Tracking
- Surveillance, Parking & Traffic Control
- Human Machine Interface
- Embedded Computing & Storage
- Robotics

TECHNOLOGY SEGMENT

- High End Processing



i.MX RT1060

Expanding Crossover processors with more memory



i.MX RT1060

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

The i.MX RT1060 doubles the On-Chip SRAM to 1 MB while keeping pin-to-pin compatibility with i.MX RT1050. This new series introduces additional features ideal for real-time applications such as High-Speed GPIO, CAN-FD, and synchronous parallel NAND/NOR/PSRAM controller. The i.MX RT1060 runs on the ARM® Cortex®-M7 core at 600 MHz.

- **High-Performance, Real-Time Processing**
- **High Levels of Integration**
- **Low BOM Cost**
- **Easy to Use**

FEATURES

- Highest performing ARM® Cortex®-M7
- 3020 CoreMark/1284 DMIPS @ 600 MHz
- 1 MB On-Chip SRAM – up to 512 KB configurable as Tightly Coupled Memory (TCM)
- Real-time, low-latency response as low as 20 ns
- Industry's lowest dynamic power with an integrated DC-DC converter
- Low-power run modes at 24 MHz
- Advanced multimedia for GUI and enhanced HMI
 - 2D graphics acceleration engine
 - Parallel camera sensor interface
 - LCD display controller (up to WXGA 1366 × 768)
 - 3 × I²S for high-performance, multi-channel audio
- Extensive external memory interface options
 - NAND, eMMC, Quad/Octal/Hyper SPI NOR Flash, and Parallel NOR Flash

- Wireless connectivity interface for
 - Wi-Fi®, Bluetooth®, BLE, ZigBee® and Thread™

KEY APPLICATIONS

- Audio Subsystem: High-end, consumer audio devices, etc.
- Industrial Computing: EBS, PLCs, Factory automation, etc.
- Home and Building Automation: HVAC, Security, Lighting, etc
- Industrial Computing: EBS, PLCs, Factory automation, etc.
- Motor Control and Power Conversion: printers, cleaners, etc

MARKET SEGMENT

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

SUB MARKET

- Medical Instruments
- Personal Health, Sport & Fitness
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Human Machine Interface
- Instrumentation, Test and Measurement
- Information Kiosk & Advertising Panels
- Motion Control, Servo Drives
- Robotics
- Audio and Video
- Home & Building Control and Automation
- Heating, Ventilation and Air Conditioning
- Home & Building Security (Alarms, Access Control)
- Wireless Infrastructure
- Medical Diagnostic and Therapy
- Point of Sales and Vending machines

TECHNOLOGY SEGMENT

- High End Processing



i.MX RT1064

Industry's first crossover processor with on-chip Flash memory



i.MX RT1064

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

The i.MX RT1064 is the latest addition to the industry's first crossover processor series and expands the i.MX RT series to four scalable families.

The i.MX RT1064 has 1MB On-Chip SRAM and 4 MB Flash memory, while keeping pin-to-pin compatibility with i.MX RT1050 and i.MX RT1060. The i.MX RT1064 runs on the ARM® Cortex®-M7 core at 600 MHz.

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PROCESSOR

- **High-Performance, Real-Time Processing**
- **High Levels of Integration**
- **Low BOM Cost**
- **Easy to Use**

FEATURES

- The i.MX RT1064
 - core speed of up to 600 MHz.
 - ultra-fast real-time responsiveness thanks to a high density of 512 KB TCM SRAM. Interrupt latency is as low as 20 nanoseconds (NXP: "shortest interrupt latency of any ARM® Cortex®-based product in the world") thanks to high performance and ARM® Cortex®-M7 core.
- i.MX RT crossover processors compete in the market on highest levels.
- Applications processor performance and critical usability features from the MCU-based product design space allow ease of use, low cost, and compatibility with existing realtime infrastructure and work with existing tool chains
- They support product designs that include advanced multimedia for GUI and enhanced human machine interface (HMI) experience. 2D graphics accel. engine, LCD

controllers, camera sensor- and audio interfaces allow high-performance, multi-channel audio streaming.

- offers great design flexibility through extensive external memory interface options: NAND, eMMC, QuadSPI NOR and Parallel NOR Flash. High speed interfaces between external memory plus on-the-fly decryption enable secure external data storage. No need for embedded flash.
- has 4 MB On-Chip Flash, thus is the first crossover processor with embedded Flash.
- i.MX RT1064 crossover processors offer support for both wired (Ethernet, USB, CAN FD, etc.) and wireless standards such as Wi-Fi®, Bluetooth®, BLE, Zigbee®, Thread™, and other options.

KEY APPLICATIONS

- High-end, consumer audio devices
- Smart appliances, LCDs, mobile patient care

- HVAC climate control, lighting control panels, IoT gateways
- PLCs, factory automation, HMI control assembly line robotics
- 3D/Thermal printers, autonomous vehicles, robotic cleaners

MARKET SEGMENT

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

SUB MARKET

- Medical Instruments
- Personal Health, Sport & Fitness
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Instrumentation, Test and Measurement
- Human Machine Interface

TECHNOLOGY SEGMENT

- High End Processing



QorIQ® Layerscape LX2160A

Multicore Communications Processor



LX2160A

The highest performance member of the Layerscape family, the LX2160 has the low power of FinFET process technology, 16 high-performance ARM® Cortex®-A72 cores, large caches, accelerators to 100 Gbps, 100 Gigabit Ethernet, and PCIe Gen4, to enable machine learning, cloud-like computing, NFV at the network edge for greater application responsiveness, mobile edge computing, 5 G packet processing, storage, and industrial applications.

- **16 x ARM® Cortex®-A72 cores at 2.2 GHz at 0.8 V**
- **18 Ethernet controllers with support for 1, 2.5, 10, 25, 40, 50 and 100 Gbps**

- **Hardware acceleration using DPAA2 with 100 Gbps of decompression/compression and 50 Gbps SEC**
- **6 x PCIe Gen4.0 controllers (2 x supporting SR-IOV) and 4 x SATA3.0 controllers**

FEATURES

- ARM® Cortex®-v8 A72 (64 bit) with the following capabilities:
 - Speeds up to 2.2 GHz at 0.8 V
 - 48 KB L1 Instruction Cache and 32 KB Data Cache for each core (ECC protection)
- 8 MB Level 3 cache with ECC and on-chip memory module
- Two 72-bit (64-bit + ECC) DDR4 SDRAM memory controllers
 - ECC and interleaving support
 - Up to 3.2 GT/s
- Datapath acceleration architecture 2.0 (DPAA2)
- 24 SerDes lanes at up to 25 Gbps
- Ethernet interfaces supporting IEEE 1588
 - Up to 18 Ethernet MACs
 - Support for 10G-SXGMII (USXGMII)
 - Support for SGMII (and 1000Base-KX)
 - Support for XFI (and 10GBase-KR)
 - Support for CAUI4 (100G), CAUI2 (50G), 25G-AUI (25G)
- Support for XLAUI4 (and 40GBase-KR4) for 40G
- Support for two RGMII parallel interfaces
- Energy-efficient support (802.3az)
- High-speed peripheral interfaces
 - Two PCIe Gen 4.0 8-lane controllers supporting SR-IOV
 - Four PCIe Gen 4.0 4-lane controllers
 - Four serial ATA (SATA 3.0) controllers
- Additional peripheral interfaces
 - Two USB 3.0 controllers with integrated PHY
 - Two enhanced secure digital host controllers
 - Two Controller Area Network (CAN) modules, optionally supporting Flexible Datarate
 - Flexible Serial Peripheral Interface (FlexSPI) and three Serial Peripheral Interface (SPI) controllers
 - Eight I²C controllers
 - Four UARTs
 - General Purpose IO (GPIO)

KEY APPLICATIONS

- 5G packet processing, network function virtualization
- Smart NIC and storage controller
- Industrial PCs, aerospace, measurement, industrial control

MARKET SEGMENT

- Communication & Infrastructure
- Industrial

SUB MARKET

- Telecom and Networking
- Embedded Computing & Storage
- Instrumentation, Test and Measurement

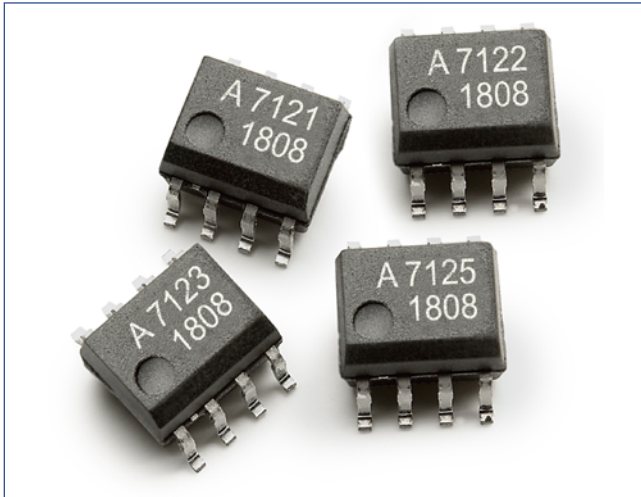
TECHNOLOGY SEGMENT

- High End Processing



ACHS-712x Hall Effect Sensors

From ACHS-7121 to ACHS-7125



With the Broadcom ACHS-712x family, we expand its capabilities in the current sensing low end application range.

The Broadcom® ACHS-712x product series is a fully integrated Hall Effect-based isolated linear current sensor device family designed for AC or DC current sensing in industrial, commercial, and communications systems.

Each of the ACHS-712x consists of a precise, low-offset, linear Hall circuit with a copper conduction path located near the surface of the die.

- **Drop in replacement for Allegro ACS712 (obsolete part)**
- **Small footprint, low-profile SOIC8 package**
- **Wide Operating Temperature: -40 °C to +110 °C (125 °C storage)**
- **80 kHz bandwidth**

FEATURES

- Wide Operating Temperature: -40 °C to +110 °C (125 °C storage)
- 80 kHz bandwidth
- 5 µs output rise time in response to step input current
- Device bandwidth is settable via FILTER pin capacitance
- Total output error $\pm 1.5\%$ at $T_A = 25\text{ °C}$
- 5 V, single supply operation
- Small footprint, low-profile SOIC8 package
- Isolation Voltage: 3 kV_{RMS}/1 minute
- Creepage & clearance of $\geq 4\text{ mm}$

KEY APPLICATIONS

- Chargers and Converters
- Switching Power Supplies
- Solar inverters
- Motor phase and rail current sensing
- Low-power inverter current sensing

MARKET SEGMENT

- Industrial
- Smart Grid

TECHNOLOGY SEGMENT

- Analog & Power
- Smart Sensing & Connectivity



AR18 + AR35 SERIES, UPGRADED

Miniature, 17-25 bits Programmable Absolute Encoders



AR18 + AR35 decoder series are miniature Absolute Encoders ASIC designed to cater for the growing demand on the space constraint application. New: High resolution is possible up to 23/25 Bit. Ask EBV ELEKTRONIK for information!

The decoders are designed for an overall diameter of 18 mm (AR35: 35 mm) and offer user-programmable resolution range from 17, 21 bit and 19 (AR35 only) Single-Turn Absolute Output (STAO).

Both series provide the incremental ABI and UVW in differential mode and come with a recommended high temperature range of $-40...+115\text{ }^{\circ}\text{C}$ suitable for most industrial applications.

- **High Resolution NOW POSSIBLE UP TO 23/25 BIT! – Contact sales for information**
- **Differential output for ABI and UVW**

- **Selectable RS485 mode communication protocol**
- **Selectable SSI mode communication protocol**

FEATURES

- Miniature absolute encoder ASIC surface mount DFN package: 10.9 mm (L) x 9.1 mm (W) x 1.5 mm (H)
- User-programmable resolution ranging from:
 - 17, 19, and 21 bit single turn (OD18)
 - 17 and 21 bit single turn (OD35)
- User-programmable incremental output (ABI) resolution ranging from 128 to 8192 CPR
- User-programmable commutation signal (UVW) ranging from 2, 3, 4, 5, 12, 30, 32 pole pair
- High temperature range of $-40\text{ }^{\circ}\text{C}$ to $115\text{ }^{\circ}\text{C}$ suitable for most of the industrial operation
- Dual-mode operating voltage of 3.3 V and 5V, enabling handheld and portable device applications
- RoHS compliance

KEY APPLICATIONS

- Robotic automation and engineering
- Factory automation and drone
- Medical and dentistry, devices and equipment
- High-accuracy portable and handheld devices
- Miniature motor, servo motor, linear actuator

MARKET SEGMENT

- Industrial
- Communication & Infrastructure

TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity

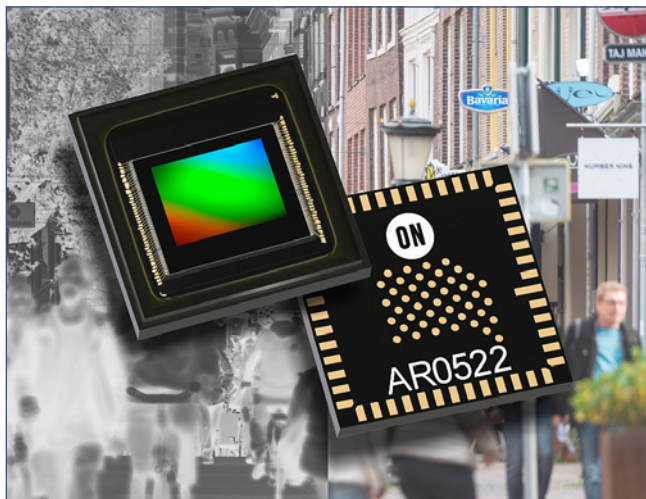
Broadcom will be introducing two new proliferations of AR35 – coming soon.

- 1) Absolute and Incremental Linear with resolution of 318LPI, perfectly suited for linear applications – AR35-Lxx-PBx1
- 2) Absolute Radial for applications requiring through hole mounting, perfectly suited for robotics joints – AR35-T21S-P1xT



AR0522

Image Sensor, CMOS, 1/2.5" 5.1 MP High Performance, Near Infra-Red Enhancement



AR0522-Hires.jpg

The AR0522 is a 1/2.5-inch CMOS digital image sensor with an active-pixel array of 2592 x 1944. It captures images in linear or high dynamic range modes with a rolling-shutter readout, and includes sophisticated camera functions such as binning, windowing and both video and single frame modes. It is designed for both low light and high dynamic range performance, with line interleaved T1/T2 read out to support off chip HDR. The AR0522 produces clear, sharp digital pictures, and its ability to capture continuous video and single frames makes it the perfect choice for wide range of applications.

- 5 Mp at 60 fps for Excellent Video Performance
- Small Optical Format (1/2.5-inch)

- Superior Low-light Performance
- Near Infra-Red Enhancement

FEATURES

- 5 Mp at 60 fps for Excellent Video Performance
- Small Optical Format (1/2.5-inch)
- Color Filter Array : RGB and Monochrome
- 1440p Mode for 16:9 Video
- Superior Low-light Performance
- 2.2 μm Back Side Illuminated Pixel Technology
- Supports Line Interleaved T1/T2 Readout to Enable HDR Processing in ISP Chip
- Support for External Mechanical Shutter
- On-chip Phase-locked Loop (PLL) Oscillator
- Integrated Color and Lens Shading Correction

- Slave Mode for Precise Frame-rate Control
- Data Interfaces:
 - HiSPi (SLVS) – 4 Lanes
 - MIPI CSI-2 – 4 Lanes
- Auto Black Level Calibration
- High-speed Configurable Context Switching
- Temperature Sensor
- Fast Mode Plus Compatible 2 Wire Interface
- Near Infra-Red Enhancement

KEY APPLICATIONS

- Security Camera
- Action Camera
- Body Camera
- Industrial Camera
- Hunting Camera
- Car DVR

MARKET SEGMENT

- Healthcare & Wearables
- Industrial
- Smart Consumer & Building

SUB MARKET

- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Embedded Vision
- Robotics
- Surveillance, Parking & Traffic Control
- Home & Building Security (Alarms, Access Control)
- Toys, games and entertainment

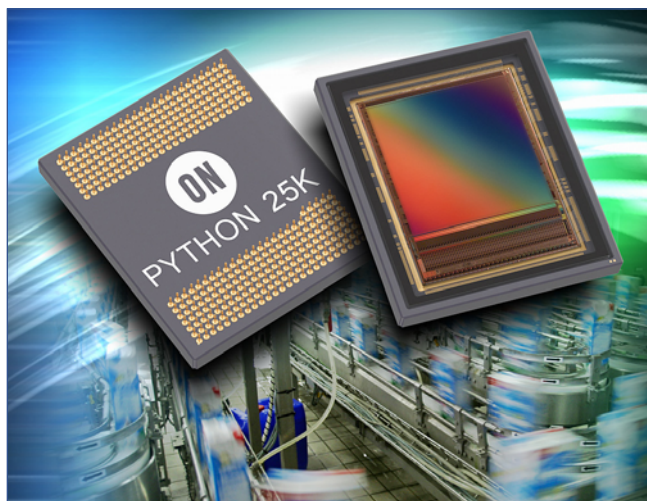
TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



PYTHON CMOS Image Sensors

VGA - 25 MP CMOS Image Sensors



PYTHON Product Photo

The new PYTHON 10K, PYTHON 12K, PYTHON 16K, and PYTHON 25K image sensors combine excellent imaging performance with high speed output architectures. They provide high resolution with very high bandwidth (up to 80 frame per second readout for 25 megapixel readout) in a pin-compatible family of devices. The high sensitivity 4.5 μm pixels support both pipelined and triggered global shutter readout modes. The sensor also supports correlated double sampling (CDS) readout in global shutter mode, reducing noise and increasing dynamic range. It is programmed using a four-wire serial peripheral interface.

- **On-chip 10-bit Analog-to-Digital Converter (ADC)**
- **Random Programmable Region of Interest (ROI) Readout**
- **Serial Peripheral Interface (SPI)**
- **Automatic Exposure Control (AEC)**

FEATURES

- IP-CDS global shutter technology
- HW scalable family
- High configurability
- Fast adaptability
- Multiple windowing
- High frame rate

KEY APPLICATIONS

- Machine Vision
- Motion Monitoring
- Security
- Barcode Scanning (2D)

MARKET SEGMENT

- Healthcare & Wearables
- Smart Consumer & Building
- Industrial

SUB MARKET

- Information Kiosk & Advertising Panels
- Human Machine Interface
- Professional Gaming, Amusement & Casino Machines
- Surveillance, Parking & Traffic Control

TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



IIS2DLPC

MEMS digital output motion sensor: High-performance ultra-low-power 3-axis accelerometer



Product Picture

The IIS2DLPC is an ultra-low-power high-performance three-axis linear accelerometer with digital I²C/SPI output interface which leverages on the robust and mature manufacturing processes already used for the production of micromachined accelerometers.

The IIS2DLPC has user-selectable full scales of ± 2 g/ ± 4 g/ ± 8 g/ ± 16 g and is capable of measuring accelerations with output data rates from 1.6 Hz to 1600 Hz.

The IIS2DLPC has one high-performance mode and 4 low-power modes which can be changed on the fly, providing outstanding versatility and adaptability to the requirements of the application.

- ± 2 g/ ± 4 g/ ± 8 g/ ± 16 g full scale
- Output data rates from 1.6 Hz to 1600 Hz; bandwidth up to 800 Hz
- Multiple operating modes reconfigurable on the fly
- Ultra-low power consumption

FEATURES

- ± 2 g/ ± 4 g/ ± 8 g/ ± 16 g full scale
- Multiple operating modes reconfigurable on the fly: from ultra-low-power to high-performance highresolution mode
- Ultra-low power consumption: 50 nA in power-down mode, below 1 μ A in active low-power mode, 120 μ A in high-performance mode
- Output data rates from 1.6 Hz to 1600 Hz; bandwidth up to 800 Hz
- Single data conversion on demand
- Very low noise: down to 90 μ g/ $\sqrt{\text{Hz}}$
- 32-level FIFO and 2 independent programmable interrupts
- High-speed I²C/SPI digital output interface
- Supply voltage, 1.62 V to 3.6 V
- Embedded temperature sensor
- Self-test
- 10000 g high shock survivability
- ECOPACK®, RoHS and "Green" compliant

KEY APPLICATIONS

- Industrial IoT and connected devices
- Anti-tampering devices
- Appliances and robotics
- Industrial tools and factory equipment
- Portable healthcare devices and hearing aids
- Vibration monitoring
- Tilt/inclination measurements
- Smart power saving & motion-activated functions
- Impact recognition and logging

MARKET SEGMENT

- Industrial

SUB MARKET

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

TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



ISM330DLC

iNEMO inertial module: 3D accelerometer and 3D gyroscope



Product Picture

The ISM330DLC is a system-in-package featuring a high-performance 3D digital accelerometer and 3D digital gyroscope tailored for Industry 4.0 applications. The sensing element of the accelerometer and of the gyro are implemented on the same silicon die, thus guaranteeing superior stability and robustness. It is part of ST's 10 year Longevity program for industrial sensors.

- **3D accelerometer with selectable full scale:**
 $\pm 2 \text{ g}/\pm 4 \text{ g}/\pm 8 \text{ g}/\pm 16 \text{ g}$
- **3D gyroscope, selectable:**
 $\pm 125 \text{ dps}/\pm 245 \text{ dps}/\pm 500 \text{ dps}/\pm 1000 \text{ dps}/\pm 2000 \text{ dps}$
- **Extended operating temperature range**
(-40 °C to +85 °C)
- **10 Years Longevity**

FEATURES

- Analog supply voltage: 1.71 V to 3.6 V
- SPI & I²C serial interface with main processor data synchronization
- Dedicated gyroscope output chain with low latency, low noise and dedicated low-pass filters for stabilization control loop (OIS and other stabilization applications)
- Auxiliary SPI serial interface for independent, low-noise low-latency data output for gyroscope and accelerometer
- Ultra-low power consumption for both accelerometer and gyroscope enabling long-lasting battery-operated applications: 0.5 mA in combo normal mode and 0.75 mA in combo high-performance mode

- Smart FIFO up to 4 kbyte
- Smart embedded functions and interrupts: tilt detection, free-fall, wakeup, 6D/4D orientation, click and double-click
- Sensor hub feature to efficiently collect data from additional external sensors
- Embedded hard, soft ironing for external magnetic sensor corrections
- Embedded temperature sensor
- Embedded self-test both for gyroscope and accelerometer
- High shock survivability

KEY APPLICATIONS

- Predictive maintenance
- Industry 4.0 Sensors

MARKET SEGMENT

- Industrial

SUB MARKET

- Elevators, Escalators, Moving Walkways
- Factory Automation (PLCs, I/O, Sensors & Actuators)
- Human Machine Interface
- Information Kiosk & Advertising Panels
- Instrumentation, Test and Measurement
- Motion Control, Servo Drives
- Point of Sales and Vending machines
- Robotics
- Surveillance, Parking & Traffic Control

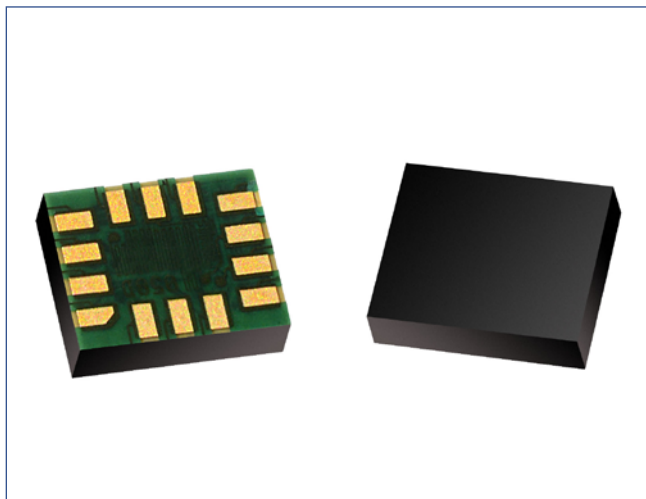
TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



LSM6DSO

iNEMO inertial measurement unit (IMU): 3D accelerometer and 3D gyroscope



Product Picture

The LSM6DSO is a system-in-package featuring a 3D digital accelerometer and a 3D digital gyroscope boosting performance at 0.55 mA in high-performance mode and enabling always-on low-power features for an optimal motion experience for the consumer.

The LSM6DSO supports main OS requirements, offering real, virtual and batch sensors with 9 kbytes for dynamic data batching. ST's family of MEMS sensor modules leverages the robust and mature manufacturing processes already used for the production of micromachined accelerometers and gyroscopes.

- **Power consumption: 0.55 mA in combo high-performance mode**
- **Android compliant**

- **"Always-on" experience with low power consumption for accelerometer and gyroscope**
- **Smart FIFO up to 9 kbyte**

FEATURES

- $\pm 2/\pm 4/\pm 8/\pm 16$ g full scale
- $\pm 125/\pm 250/\pm 500/\pm 1000/\pm 2000$ dps full scale
- Analog supply voltage: 1.71 V to 3.6 V
- Independent IO supply (1.62 V)
- Compact footprint: 2.5 mm \times 3 mm \times 0.83 mm
- SPI/I²C & MIPI I3CSM serial interface with main processor data synchronization
- Auxiliary SPI for OIS data output for gyroscope and accelerometer
- Advanced pedometer, step detector and step counter
- Significant Motion Detection, Tilt detection
- Standard interrupts: free-fall, wakeup, 6D/4D orientation, click and double-click
- Programmable finite state machine: accelerometer, gyroscope and external sensors
- Embedded temperature sensor
- ECOPACK®, RoHS and "Green" compliant

KEY APPLICATIONS

- Motion tracking and gesture detection
- Sensor hub
- Indoor navigation
- IoT and connected devices
- Smart power saving for handheld devices
- EIS and OIS for camera applications
- Vibration monitoring and compensation

MARKET SEGMENT

- Healthcare & Wearables
- Smart Consumer & Building

SUB MARKET

- Personal Health, Sport & Fitness
- Portable Personal Electronics & Wearables
- Asset Tracking
- Home & Building Control and Automation

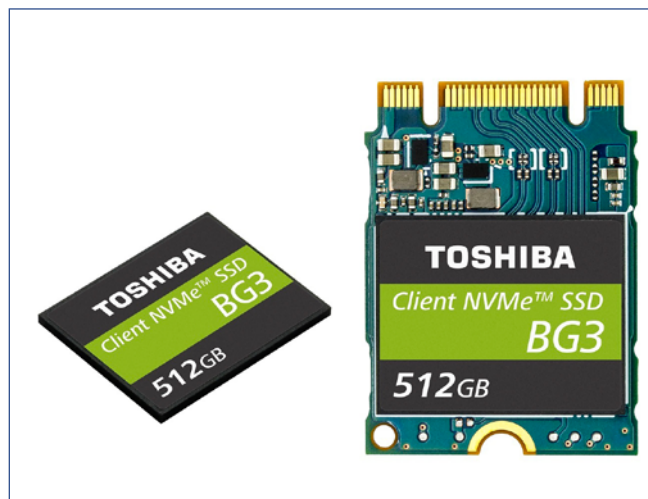
TECHNOLOGY SEGMENT

- Smart Sensing & Connectivity



BG3 Series

Client NVMe™ SSD



BG3 M.2 2230 & 1620

The BG3 series leverages 64-layer, 3-bit-per-cell (TLC) BiCS FLASH™ and features NVMe™ Revision 1.2.1. With Host Memory Buffer (HMB) technology, this SSD series retains high performance in a DRAM-less architecture, while enabling reduced power and a smaller footprint.

- Toshiba 64-Layer BiCS FLASH™
- PCIe® Gen3*2L NVMe™

- Capacities up to 512GB
- M.2 1620 single package and M.2 2230 single-sided form factor

KEY APPLICATIONS

- Ultra-mobile PCs
- 2-in-1 notebook PCs
- IoT/embedded devices
- Server and storage array boot drives

MARKET SEGMENT

- Industrial

SUB MARKET

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

TECHNOLOGY SEGMENT

- High End Processing

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