AVNET ABACUS

Avnet Abacus sensor solutions

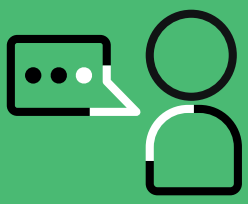
Content

THE OPTIMAL SENSING SOLUTION FOR YOUR DESIGN

Avnet Abacus partners with the market's leading sensor manufacturers to provide you with the solutions and technical expertise you need to select the optimal sensing solution for your application. Our knowledgeable team of technical specialists can guide you through the design process, helping you to reduce your design cycle and decrease your time to market.

To view our full sensor linecard, along with a range of design resources, visit our sensor solutions page at avnet-abacus.eu/sensors

To arrange a visit or discuss your requirements in your local language, get in touch at avnet-abacus.eu/ask-an-expert



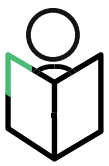
LET'S TALK

Speak to your local sales representative, or get in touch with our sensor specialists in your local language at www.avnet-abacus.eu/ask-an-expert

Visit avnet-abacus.eu/sensors to:

View our linecard

Download technical brochures, white papers and datasheets



Read our guide to European sensor legislation and safety requirements

Avnet Abacus sensor solutions

Advances in sensing technologies are increasing the functionality of devices in many industries including consumer, medical, industrial, automotive and wearables. The functionality can be delivered at various levels of integration in terms of number of diverse sensor types included in either a single package or sensor module. Determining the right types of sensor for your application, selecting the optimal technical characteristics such as precision, range of operation and speed along with ensuring interoperability with the balance of the design is no small task. This brochure details a selection of products available from Avnet Abacus. For further information please visit avnet-abacus.eu/sensors

	Temperature							Pressure		Gas and liquid					Motion													Current	Optical		Sound	Image
	NTC	PTC	RTD	Digital IC	Thermal reed switch	IR thermopile	Thermocouple	Pressure	Force, load, torque and tension	Humidity	VOC and CO_2	Dust	Flow	Water level	Accelerometer, vibration and shock	Inclinometer and gyro	Geomagnetic	GMR, AMR and TMR	Inductive transducer	Capacitive touch	Resistive potentiometers	Optical encoder	Magnetic encoder	Photo interruptor	Ultrasonic	Passive Infrared (PIR)	Light convergent reflective	Magnetic proximity (reed and hall)	Current	Sunlight, ambient light and colour	Pulse oximetry (SpO_2)	Microphone	Human vision
Abracon	•																															
Alps Alpine								•	•	•							•	•			•		•									
Amphenol Advanced Sensors	•	•				•		•		•	•	•																	•			
AVX	•																															
Bourns								•		•											•	•	•									
C&K Components																						•						•				
Grayhill																						•	•									
Harvatek																								•					•			
Hirose			•	•						•			•																			
Innovative Sensor Technology					•																					•		•				
KEMET																															•	
Kingstate	•	•						•			•				•	•		•			•				•	•						
Murata								•													•	•	•					•				
Nidec Copal								•													•	•	•					•				
Omron						•		•		•	•	•	•		•					•				•			•					•
Panasonic Industry	•					•		•							•			•			•											
Panasonic Electric Works																										•						
PUI Audio																									•						•	
Pulse																												•				
Qinlon																									•							
SMI								•																								
TDK	•	•						•		•					•	•	•	•										•			•	
TE Connectivity	•		•	•		•	•	•	•	•	•		•	•	•	•		•	•		•		•		•			•		•		
Vishay	•	•	•																		•		•									

Temperature sensors

Temperature sensors are fundamental for all forms of temperature measurement, control and compensation. Commonly used sensors are Negative Temperature Coefficient (NTC) thermistors, Positive Temperature Coefficient (PTC) thermistors, Resistance Temperature Detectors (RTD), thermocouples and infrared sensing thermopiles.

Factors in consideration when selecting the correct temperature sensor include the required accuracy, responsiveness, temperature range, output type and any environmental demands such as corrosiveness, shock and vibration.

Avnet Abacus offers an extensive range of temperature sensors and thermal sensing solutions for applications across all industries from vendors including Alps Alpine, Amphenol, AVX, Bourns, KEMET, Murata, Omron, Panasonic Industry, TDK, TE Connectivity and

AMPHENOL JRI SENSOR SERIES

Developed by Amphenol the JRI range of EMI-protected ring terminal sensors consists of an NTC chip thermistor mounted in an eyelet tag for surface temperature measurement with a novel RF de-coupling function. These sensors are designed with an integrated bypass capacitor to prevent AC currents, generated from resonant EMI coupled with the wiring harness, from causing nuisance self-heating of the NTC element.

Features and benefits

- Suitable for surface temperature measurement
- Integrated EMI noise immunity
- EMI-protected upgrade for existing applications
- Reduced system cost by eliminating shielded cables and replacing twisted-pair wiring
- Eyelets to fit M3-M10 screw sizes
- Various lead lengths

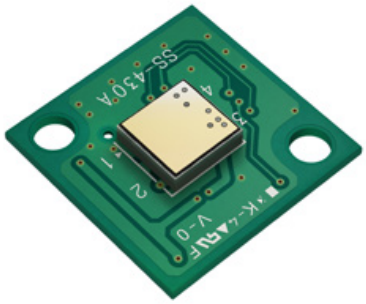
KEMET PL PYROELECTRIC INFRARED SENSORS

KEMET's pyroelectric infrared sensors use the pyroelectric effect of ceramic by absorbing infrared rays emitted from the human body. This detects the natural infrared signature produced by humans. Also, it can detect infrared rays without using lenses.

Due to the absence of a lens, KEMET's pyroelectric sensors are low profile, as it does not protrude, which makes it ideal for gathering visual requirements. With KEMET's proprietary piezoelectric ceramic material and element structure of the pyroelectric infrared sensors, humans can be detected through glass or resin. This allows more freedom in the design of the outer appearance of the end product.

Features and benefits

- Reflow capable SMD configuration
- Lens not required
- Wide view angle up to ±60˚C
- Detection possible through glass or resin
- Low power consumption, down in the µA range
- Excellent radio wave performance in high-frequency band
- Compact and low profile (5mm x 4.8mm x 1.7 mm)



Temperature sensors

OMRON D6T-32L-01A SERIES

Omron D6T series MEMS thermal sensors are super-sensitive infrared temperature sensors that make full use of Omron's proprietary MEMS sensing technology. Unlike typical pyroelectric human presence sensors that rely on motion detection, the D6T thermal sensor is able to detect the presence of stationary humans by detecting body heat, and can therefore be used to automatically switch off unnecessary lighting, air conditioning, etc. when people are not present.

Features and benefits

- Achieves world's highest level of SNR
- Accurate temperature measurements with little impact from outside
- Superior noise immunity with a digital output
- High-precision area temperature detection with low crosstalk field of view characteristics
- RoHS compliant

TDK K525

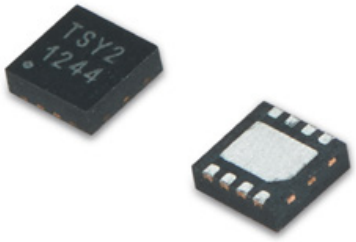
TDK has presented the K525, an EPCOS NTC temperature sensor that is designed for the extended measuring range from -10°C up to +300°C. Thanks to its ceramic sleeve that is filled with a ceramic, the sensor is suitable for applications under harsh operating conditions and is resistant to aggressive media such as acids and bases. The response time is only 1.2s, allowing measurements to be made even with fast temperature changes. The resistance at +25°C is about 48.5kΩ, at 100°C about 3.3kΩ, and the B value (20/100) is nearly 4000K.

Features and benefits

- Wide measurement range from -10°C to +300°C
- Robust ceramic encapsulation and therefore resistant to aggressive media such as acids and bases
- High voltage strength of 4kV AC

TE CONNECTIVITY TSYS02D DIGITAL TEMPERATURE SENSOR

The TSYS02D is a single chip temperature sensor. It provides factory calibrated data corresponding to the measured temperature. The data is provided via I²C interface. The TSYS02D can be interfaced to any microcontroller by an I²C interface. The TDFN8 package provides a small size and fast time response.



Features and benefits

- High accuracy ±0.2°C @ temp. range -5°C to +50°C
- Adjustment of high accuracy temperature range on request
- Low supply current <420µA (standby <0.14µA)
- I²C interface up to 400kHz
- Small IC-package TDFN8 2.5mm x 2.5mm
- Operating temperature range: -40°C to +125°C
- Resolution: +0.01°C

Temperature sensors

TE CONNECTIVITY PTF FAMILY PLATINUM RTD SENSORS

The PTF-sensors are designed to provide precise, stable measurement in extreme temperature applications. These sensors offer high value through proven design, ease-of-use, reliable performance and quick availability.

Precise temperature measurements can be made in extreme environments. Whether you're working on a new engineering design or optimising an existing one, TE Connectivity's platinum temperature sensors are easy to use in many industries and applications. The linear output requires low engineering intervention and TE Connectivity makes these sensors available quickly in most form factors. Sensor components are available as glass encapsulated wire wound types for metrology applications as well as thin film on ceramic types for industrial and general purpose usage. The assemblies include push and screw-in probes for multi-purpose usage including harsh environments. Platinum RTD temperature sensor components and assemblies comply with the DIN EN 60751 to provide international comparability and interchangeability.

Features and benefits

- Precise measurement in extreme environments
- Ease of application and use
- Engineered to withstand extreme temperatures -200°C to +600°C
- International industrial standards (IEC 60751:2008)
- Greater engineering efficiency due to linear output
- Complete range for numerous applications

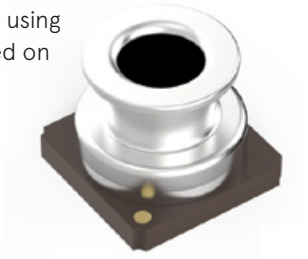
Pressure sensors

A pressure sensor detects and measures the pressure of a medium (liquid or gas) applied to its sensing element and converts it to an electrical signal representing the applied pressure. Criteria for selecting an optimal component include the magnitude of the pressure, nature of the medium, accuracy, range and linearity. Applications exist across a wide variety of end-markets including industrial, transportation, building automation, automotive, medical, aerospace and defence.

Avnet Abacus offers an extensive range of MEMS pressure sensors from market leaders including Alps Alpine, Amphenol, Bourns, Murata, Omron, Panasonic Industry, SMI, TDK and TE Connectivity, with extensive packaging options from SMD and board level to complete pressure transducer modules.

ALPS ALPINE MEMS PRESSURE SENSOR HSPPA SERIES

HSPPAD143A is the 3.1m x 3.1mm footprint and 2.6mm height digital interface pressure sensor designed as waterproof for barometer system and water depth measurement system. Barometric and water pressure is detected by MEMS sensor element using piezo resistive bridge circuit formed on the silicon diaphragm.



Features and benefits

- Pressure range: 300hPa to 2100hPa (9000m in altitude and 10m in depth)
- Supply voltage 1.7V to 3.6V (typical 1.8V)
- Operating temperature: -40°C to +85°C
- Package small LGA package: 3.1mm x 3.1mm x 2.6mm
- Digital interface I^2C
- Current consumption 1.8uA (low power setting)
- Noise RMS 0.026hPa (high resolution setting)
- Sampling rate 200Hz max. (continuous mode)
- Lead free, RoHS instruction, halogen free conforming

AMPHENOL ADVANCED SENSORS NPA 201 DIGITAL BAROMETRIC PRESSURE SENSOR

The NovaSensor NPA 201 is an absolute pressure sensor with digital output for low cost applications. Its low power consumption and compact size (2.0mm × 2.5mm x 1.0mm) make it ideal for battery powered and mobile applications or any application where size is a constraint.

Features and benefits

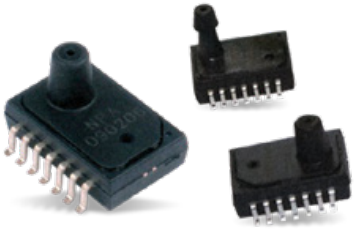
- 260mBar to 1260mBar absolute pressure range
- Temperature measurement included
- Sleep state current: <20nA typ. (+25°C)
- Temperature resolution: <0.003K/LSB
- 16-bit pressure and temperature resolution
- Operation temperature: −40°C to +85°C
- Operating range 1.7V to 3.6V
- 8-HCLGA package
- Fully calibrated and compensated
- Digital compensation via 18-bit internal Digital Signal Processor (DSP) running a correction algorithm
- Absolute accuracy: +/-0.2mbar/relative accuracy: +/-0.1mbar typ
- I^2C interface

AMPHENOL ADVANCED SENSORS NPA SURFACE-MOUNT PRESSURE SENSOR SERIES

The NPA is a family of OEM miniature pressure sensing products offering best-in-class performance for OEM applications in healthcare, industrial and transportation markets. Packaged in an industry standard surface mount SOIC14 pin package, the NPA series is available in gauge, absolute or differential pressure ranges from 0mm to 254mm H2O to 0 to 30PSI. Uncalibrated millivolt outputs, fully calibrated, amplified analogue and 14-bit digital outputs are available.

Features and benefits

- Differential, gauge, absolute and low pressure
- 254mm H2O to 30PSI full scale
- Amplified analogue or digital output
- Digital pressure signal: 14-bit ADC/11-bit DAC
- On chip temperature sensor in digital mode
- Operating temperature range of -40°C to +125°C
- 60X overpressure on ranges <1psi



Pressure sensors

PANASONIC INDUSTRY ADP51B62

Panasonic Industry air pressure sensors are high precision gauge pressure sensors available with or without amplifier. The sensors also come with or without a glass base in a DIP terminal. Pressure ratings range from -100kPa to +1000kPa. Surface mount versions are available for both series.
PS pressure sensors are compact in size and feature a high-level of precision and linearity. The ends of the DIP pins are chamfered for easy insertion into PCBs. PS sensors are ideal for pneumatically operated pressure devices in industrial and medical applications.

Features and benefits

- Pressure sensor built-in amplifier compensation circuit.
  - > Overall accuracy : ±1.25% FS (standard), ±2.5% FS (low-pressure type)
- Pressure type
  - > Standard type (with glass base): rated pressure ±100kPa to 1000kPa
  - > Economy type (without glass base): rated pressure 40kPa
  - > Low pressure type: rated pressure 6kPa
- Compact size, space-saving
  - > Compatible size for PS type (standard/economy, S and M packages)

SMI SM7221, SM7321, SM7421 SERIES GAUGE AND DIFFERENTIAL PRESSURE SENSORS

The SM7221, SM7321 and SM7421 series are digital, low-pressure MEMS sensors offering state-of-the-art pressure transducer and CMOS mixed signal processing technology to produce digital, fully conditioned, multi-order pressure and temperature compensated sensors in a JEDEC standard SOIC-16 package with a dual vertical porting option. They are available in both compound gauge and differential pressure configurations. With the dual porting, a vacuum-gauge measurement is possible to minimise altitude errors due to changes in ambient pressure.
Combining the pressure sensor with a signal-conditioning ASIC in a single package simplifies the use of advanced silicon micro-machined pressure sensors.

Features and benefits

- Pressure ranges from 10cm to 20cm H2O (7.36mm to 14.7mm Hg); gauge, differential and asymmetric outputs
- Accuracy: ±1% full scale
- 14-bit digital, pressure calibrated and temperature compensated output
- I^2C digital interface
- Compensated temperature range: -20°C to +85°C
- Insensitive to mounting orientation
- Robust JEDEC SOIC-16 package for automated assembly
- Manufactured according to ISO9001 and ISO/TS 16949 standards

TE CONNECTIVITY MS5840-02BA

The MS5840 is an ultra-compact micro altimeter. It is optimised for altimeter and barometer applications. The altitude resolution at sea level is 13cm of air.
The sensor module includes a high-linearity pressure sensor and an ultra-low power 24-bit ΔΣ ADC with internal factory-calibrated coefficients. It provides a precise digital 24-bit pressure and temperature value and different operation modes that allow the user to optimize for conversion speed and current consumption.

Features and benefits

- Ceramic - metal package: 3.3mm x 3.3mm x 1.7mm
- High-resolution module: 13cm
- Supply voltage: 1.5V to 3.6V
- Fast conversion down to 0.5ms
- Low power, 0.6µA (standby ≤0.1µA at +25°C)
- Integrated digital pressure sensor (24-bit ΔΣ ADC)
- Operating range: 300mbar to 1200mbar, -20°C to +85°C
- I^2C interface
- No external components (internal oscillator)
- Protected against direct sunlight
- Lid connected to ground option

Pressure sensors

TE CONNECTIVITY M5600 WIRELESS PRESSURE TRANSDUCER

The modular M5600 wireless pressure transducer from the microfused line is enclosed in a stainless steel and polycarbonate housing. This high accuracy wireless transducer eliminates hard wiring and provides remote process control and monitoring.

This series is suitable for measurement of liquid or gas pressure, even for difficult media such as contaminated water, steam, and mildly corrosive fluids. The wetted material of the pressure port is made of 316L stainless steel and the transducer's durability is excellent with no o-rings or organics exposed to the pressure media. The M5600 is weatherproof and exceeds the latest heavy industrial CE requirements.

Features and benefits

- Digital 24-bit ADC output, I^2C protocol
- Wireless Bluetooth® 4.0 connection
- CE compliant with variety of pressure ports
- Compact and battery powered [CR2050]
- Optional stainless steel snubber
- 17PH to 4PH or 316L SS port
- Gauge, sealed, compound
- 10V/m EMI protection
- ±0.25% pressure accuracy
- Pressure down to ±1.0% total error band
- ±3°C temperature output accuracy
- -10°C to +60°C compensating temperature
- -20°C to +85°C operating temperature

TE CONNECTIVITY MSP100 PRESSURE TRANSDUCER

The MSP100 pressure transducer provides stainless steel media compatibility in a low cost, small profile solution. This sensor has no silicone gel or polymeric media isolation methods to fail in contact with water or other harsh chemicals. Pressure connections are provided via an o-ring seal. The device is available in both analogue and 14-bit digital output with a port material of either 316L SS or 17PH to 4PH.

Additional custom port options are available to meet your application needs. The small size vs. performance and media compatibility are provided through solid-state technology.

Features and benefits

- Single piece construction; no welds, no oil
- 100% stainless steel isolation for harsh chemical measurement
- Low cost
- 14-bit digital output or analogue
- Small size
- 316L Stainless Steel (SS) or 17PH to 4PH
- Available in both analogue and 14-bit digital output with a port material of either 316L SS or 17PH to 4PH

Air quality, humidity and dust sensors

Monitoring and controlling air quality is a key factor in building automation, agriculture and horticultural systems where the ability to measure moisture, VOC, carbon dioxide and dust in the air is crucial. Further applications for humidity sensing include humidifiers, dehumidifiers and meteorology.

Alps Alpine, Amphenol, Bourns, Omron and TE Connectivity are world leaders in the development of a range of component and modular solutions for air quality monitoring and control applications.

AMPHENOL ADVANCED SENSORS TELAIRE T6713 CO_2 MODULE

The T6700 series is a miniature NDIR CO_2 sensor that has the accuracy and reliability of many larger sensors. The small size allows OEMs to integrate in to smaller enclosures and equipment and uses significantly less power than many other devices on the market. The Telaire T6713 CO_2 module is ideal for applications where accurate CO_2 levels need to be measured and controlled for indoor air quality and energy saving applications such as demand control ventilation.

Features and benefits

- An affordable gas sensing solution for OEMs
- Eliminates the need for calibration in most applications with Telaire's patented ABC Logic™ software
- Lifetime calibration warranty
- A reliable sensor design based on 20 years of engineering and manufacturing expertise
- Flexible CO_2 sensor platform designed to interact with other microprocessor devices
- Compact design and versatile interface options for simple product integration

AMPHENOL TELAIRE MICS-VZ-89TE INTEGRATED SENSOR BOARD

The MiCS-VZ-89TE combines state-of-the-art MOS sensor technology with intelligent detection algorithms to monitor VOCs (Volatile Organic Compounds) and CO_2 equivalent variations in confined spaces, e.g. meeting rooms or vehicle cabins.

The dual signal output can be used to control ventilation on-demand, saving energy and reducing cost of ownership.

Features and benefits

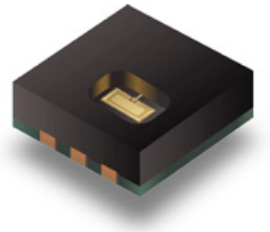
- Calibration free
- Low power
- Wide VOCs detection range
- High sensitivity
- High resistance to shocks and vibrations

BOURNS BPS230

The Bourns BPS230 family offers precision relative humidity sensing in a small (2.0mm x 2.0mm x 0.75mm) surface mount package. Bourns' line of humidity sensors features low current consumption for battery supported applications and low voltage operation compatibility with high reliability over the life of the sensor.

Features and benefits

- Low voltage operation
- Low current consumption
- Miniature SMD package size
- I^2C communication protocol
- Established reliability
- Capacitive technology



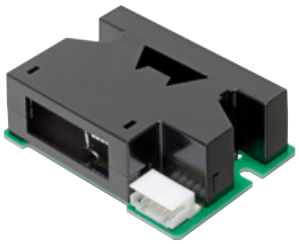
Air quality, humidity and dust sensors

OMRON B5W-LD0101/2 SERIES COMPACT AIR QUALITY SENSORS

The Omron B5W-LD0101-1/2 series compact air quality sensor features an optical design and can detect particles down to 0.5µm utilising its LED light source. Its unique flow path structure efficiently sucks in air, allowing increased particle count accuracy, and it is ideal for air purifier and HVAC systems.

Features and benefits

- Detection of particles down to 0.5µm in diameter is possible while using an LED light source
- Features a unique flow path structure that efficiently sucks in air
- Small in size thanks to its compact optical system



TE CONNECTIVITY HM1500LF

Based on the rugged HS1101LF capacitive humidity sensor, HM1500LF is a dedicated humidity transducer designed for OEM applications where a reliable and accurate measurement is needed. Direct interface with a micro-controller is made possible with the module's linear voltage output.

Features and benefits

- Full interchangeability
- High reliability and long term stability
- Not affected by water immersion
- Very low temperature dependence
- Suitable for 3VDC to 10VDC supply voltage

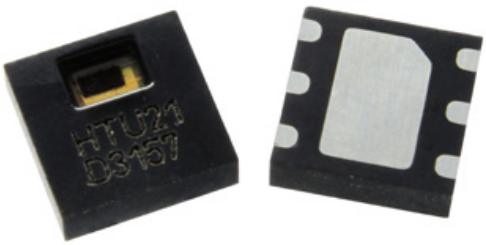
TE CONNECTIVITY HTU21D(F) DIGITAL HUMIDITY TEMPERATURE SENSOR

The HTU21D(F) is a digital humidity sensor with temperature output. Setting standards in terms of size and intelligence, it is embedded in a reflow solderable Dual Flat No leads (DFN) package with a small 3mm x 3mm x 0.9mm footprint. This sensor provides calibrated, linearised signals in digital, I²C format. Every sensor is individually calibrated and tested. Lot identification is printed on the sensor and an electronic identification code is stored on the chip – which can be read out by command. Low battery can be detected and a checksum improves communication reliability.

The resolution of these digital humidity sensors can be changed by command (8/12-bit up to 12/14-bit for RH/T).

Features and benefits

- Relative humidity and temperature digital output, I²C interface
- Fully calibrated
- Lead free sensor, reflow solderable
- Low power consumption
- Full interchangeability with no calibration required in standard conditions
- Instantaneous desaturation after long periods in saturation phase
- Compatible with automatised assembly processes, including Pb free and reflow processes
- Individual marking for compliance to stringent traceability requirements



Motion and position sensors

Encoders and potentiometers are used in a wide range of applications to provide position feedback measurement of objects. Encoders are sensors and transducers that are used to accurately measure linear or angular position. They use optical, magnetic or conductive technologies and are widely employed in applications such as industrial machine controls, indicators and monitors, motion control, robotics, valve position monitors, audio consoles and medical devices. Potentiometers are variable resistors that are commonly used for all applications where manually activated, adjustable settings are designed for long lifetimes. They are found in transportation, industrial and medical equipment.

BOURNS AMS22U NON-CONTACTING ANALOGUE ROTARY POSITION SENSOR

The Bourns model AMS22U non-contacting analogue rotary position sensor is designed to meet the specifications of heavy-duty applications requiring long cycle life and high reliability. This single-turn rotary sensor features a 1/8 inch shaft supported by dual ball bearings and a factory programmable electrical angle from 10° to 360°. Available in a servo mount configuration with a rotational life of up to 100 million cycles, the Bourns model AMS22U sensor is a highly versatile position sensing device ideal for use in a range of industrial, medical and security applications.

Features and benefits

- Non-contacting magnetic technology
- Highly resistant to vibration/shock
- Highly resistant to fluid/dust ingress
- Operating temperature -40°C to +125°C
- Programmable at factory for zero position
- Robust design for industrial applications
- Highly repeatable
- Dual ball bearing
- RoHS compliant

GRAYHILL 68P SERIES

The Grayhill 68P series sensors are non-contact rotary position sensors with a longer operational life than competing technologies. The 68P series uses hall effect technology to produce ratiometric voltage output that allows it to substitute for a potentiometer. With this output and contactless operation. This series is ideal for use in applications that require constantly changing voltage control.

Features and benefits

- Ratiometric analog output
- Debris resistant hall effect sensor technology
- 7 million rotational cycles
- Single or redundant output
- Custom output options
- Optional shaft and panel seal
- Reverse voltage and overvoltage protection

VISHAY RAMS027

The Vishay RAME027 is a rotational absolute magnetic encoder displacement sensor operating with the hall effect principle. Featuring a stainless steel shaft with protected housing, the RAME027 is a plug and play solution for use in a variety of industrial, medical and military applications including joysticks (one and two mechanical axis), electrical actuators and machine tools for position feedback or metrology functions.

Features and benefits

- Hall effect principle
- OTP (One Time Programmable) technology
- Plug-and-play
- Good magnetic immunity
- Ball bearings
- Stainless steel shaft
- Housing protected

MEMS motion sensors - accelerometers and gyroscopes

MEMS sensors are used by several industries to measure the rate and rotational angle of motion. Accelerometers measure linear motion which can be used to determine acceleration, tilt, shock and vibration. Gyroscopes measure the rate of angular motion and can accurately assess complex motion in multiple dimensions.

TDK INVENSENSE 9 AXIS SENSOR ICM-20948

The ICM-20948 is the world's lowest power 9-axis motion tracking device that is ideally suited for smartphones, tablets, wearable sensors, and IoT applications.

Features and benefits

- Lowest power 9-axis device at 2.5mW
- 3-axis gyroscope with programmable FSR of ±250dps, ±500dps, ±1000dps, and ±2000dps
- 3-axis accelerometer with programmable FSR of ±2g, ±4g, ±8g, and ±16g
- 3-axis compass with a wide range to ±4900µT
- Onboard Digital Motion Processor (DMP)
- Android support
- Auxiliary I^2C interface for external sensors
- On-chip 16-bit ADCs and programmable filters
- 7MHz SPI or 400kHz fast mode I^2C
- Digital-output temperature sensor
- VDD operating range of 1.71V to 3.6V
- MEMS structure hermetically sealed and bonded at wafer level
- RoHS and green compliant

MURATA SCC2230-D08 COMBINED GYROSCOPE AND 3-AXIS ACCELEROMETER

The SCC2230-D08 is a combined high performance angular rate and accelerometer sensor component. It consists of a Z-axis angular rate sensor and a 3-axis accelerometer sensor based on Murata's proven capacitive 3D MEMS technology. Signal processing is done in one mixed signal ASIC that provides angular rate and acceleration output via flexible SPI digital interface. The sensor elements and ASIC are packaged in a 24-pin pre-molded plastic housing that guarantees reliable operation over the product's lifetime.

The SCC2230-D08 is designed, manufactured and tested for high stability, reliability and quality requirements. The component has extremely stable output over a wide range of temperature, humidity and vibration. It has several advanced self diagnostics features, is suitable for SMD mounting and is compatible with RoHS and ELV directives.

Features and benefits

- SPI output
- ±6g, ±125deg/s range
- 1962LSB/g or 0.029deg/LSB, 50LSB/(°/s)
- 10Hz to 60Hz amplitude response

Magnetic sensors - AMR, GMR and geomagnetic

Magnetic sensors are used to measure the presence, strength and direction of magnetic fields. Types of magnetic sensors include AMR (anisotropic magnetoresistive), GMR (giant magnetoresistive), geomagnetic, hall effect and reed switch. Different types of magnetic sensors are used for cylinder/axis position detection, tamper detection and the open/close detection for equipment such as industrial control panels and refrigerators. Avnet Abacus offers an extensive range of magnetic sensors for applications across all industries from vendors including Alps Alpine, Murata and TE Connectivity.

ALPS ALPINE HGP*D SERIES

The HGP*D series is built-in 2-phase output in a small sized package. This series contributes to making the encoder system smaller and to increasing the design flexibility.

Features and benefits

- Package specifications: SOT23 type
- Size: 2.9mm x 2.8mm x 1.1mm
- Function: 2-phase alternating output
- Operating magnetic field: -HON: +1mT
  -HOFF: -1mT
- Drive voltage: type 12V (3V min. to 30V max.)
- Current consumption: 3.5mA ave. (at VDD=12V)

MURATA MRMS201A-001 SERIES FOR GENERAL POSITION AND OPEN-CLOSE DETECTION

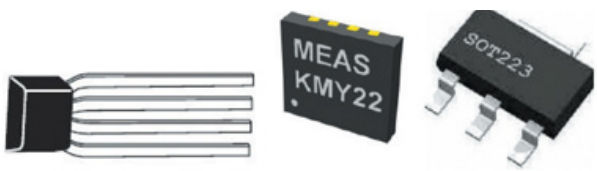
Exploiting the magnetoresistive effect, AMR sensors detect changes in the magnetic resistance of a magnetoresistive element affected by an external magnetic field. This series includes versatile sensors that can detect a broad range of magnet movements for position sensing and rotation detection applications.

Features and benefits

- Operating temperature range: -45°C to +85°C
- Supply voltage range: 1.6V to 3.5V
- Low level output voltage: 0.3V
- High level output voltage: 2.7V
- Current consumption (typ.): 5µA
- Operating magnetic field (HON) max.: 2.5mT
- Operating magnetic field ( ) min.: 0.5mT
- Storage temperature range: -40°C to +125°C

TE CONNECTIVITY KMY/KMZ LINEAR MAGNETIC FIELD SENSOR

Due to their featured properties - high sensitivity and almost no hysteresis – the KMY/KMZ sensors are used in a wide range of applications, for example magnetic field measurement, revolution counters, proximity detecting, and position measurement.



Features and benefits

- Output proportional to magnetic field strength with very high sensitivity
- Very small hysteresis and low noise
- Highly reliable
- Large operating temperature range, from -40°C to +150°C
- With/without internal magnet

Object and proximity sensors

Sensing the presence or movement of objects or humans is important in various applications, particularly in the medical, industrial, building automation and automotive sectors. This is achieved with sensing techniques including optical sensors, detector switches and ultrasonic sensors. Depending on the nature of the object and the application's environment, solutions include choosing a detector switch to mechanically sense the presence or movement of an object, using an ultrasonic sensor to measure the presence or distance to an object or selecting a photomicrosensor which is triggered when an object interrupts its optical beam.

OMRON EE-SX3350/EE-SX4350 PHOTOMICROSENSOR

The photomicrosensor is a compact optical sensor that senses objects or object positions with an optical beam. The transmissive photomicrosensor incorporates an emitter and a transmissive that face each other.

Features and benefits

- Unique 5mm slot width
- PCB surface mounting type
- High resolution with a 0.5mm wide aperture
- Choice of 2 types of Photo-IC output (EE-SX3350: dark ON, EE-SX4350: light ON)

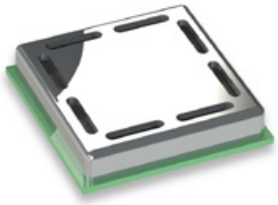
MURATA ULTRASONIC SENSOR MA40H1S-R

Murata's ultrasonic sensors feature a composite oscillating body combining the oscillator - which joins a metal plate and piezoelectric ceramics - with a resonator. This body is elastically fixed to the base and housed in a case.

The resonator is shaped like a funnel to efficiently radiate the ultrasonic waves generated by the oscillating body into the air and to effectively concentrate ultrasonic waves from the air on the center of the oscillator. These sensors can be used for human, gesture and object detection.

Features and benefits

- Small (5.2mm x 5.2mm)
- Thin (t 1.15mm)
- Surface mount available (solder-mount by reflow)
- No water proof (possible by housing component)



TDK CH-101

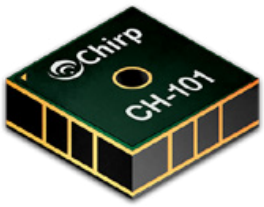
The CH-101 is a miniature, ultra-low-power ultrasonic Time-of-Flight (ToF) range sensor. Based on Chirp's patented MEMS technology, the CH-101 is a system-in-package that integrates a PMUT (Piezoelectric Micromachined Ultrasonic Transducer) together with an ultra-low-power SoC (System on Chip) in a miniature, reflowable package. The SoC runs Chirp's advanced ultrasonic DSP algorithms and includes an integrated microcontroller that provides digital range readings via I^2C.

Features and benefits

- Fast, accurate range-finding
- Easy to integrate
- Miniature integrated module
- Operating temperature range: -40°C to +85°C
- Ultra-low supply current:

  1 sample/s:
  - > 13µA (10cm max. range)
  - > 15µA (1m max. range)

  30 samples/s:
  - > 33µA (10cm max. range)
  - > 130µA (1m max.F2 range)



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