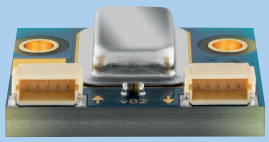
EPCOS Product Brief 2020

NTC Thermistors and Pressure Sensors

For Medical Appliances

The medical electronics sector features a broad range of appliances for inpatient, outpatient and even home care. The growing requirements for high sensitivity, accuracy and long-term stability of temperature and pressure sensors for use in medical devices were taken into account during development. The company's products have long been standard issue in the context of hospital treatment.

- Low resistance tolerance and individual calibration options ensure that our temperature sensors meet all requirements for reliable and accurate measurement.
- Its miniaturized pressure sensor transmitters for anesthesia and respiratory equipment are particularly robust and resistant to aggressive media.
- The pressure sensor elements combine a low-pressure range with high sensitivity and long-term stability.



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Pressure Sensors for Medical Appliances

EPCOS temperature and pressure sensors can also be used to monitor device functionality – e.g. in the context of battery management. Especially when small mobile medical appliances are charging up, it is important to constantly monitor the operating temperature of (rechargeable) batteries. (The electrochemical reactions used during monitoring are mostly temperature-dependent, which is why the temperature factor is so vital to fast, accurate analysis.) Additionally, both our pressure sensor elements and pressure transmitters are qualified for a very broad temperature range that by far exceeds industry standards.

Examples of key medical device applications for EPCOS temperature and pressure sensors:

- Anesthesia and respiration apparatus
- Body temperature control
- Respiratory care and sleep apnea
- Infusion pumps
- Blood pressure monitoring
- Cleaning equipment
- General patient monitoring
- Battery and power management for medical devices

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Pressure sensors dies and transmitters

Pressure sensor dies C33/ C39

Description

- Miniaturized design
- Absolute, gauge pressure measurements
- Media-protected pressure dies for harsh environments

Technical data

- Typical output: 120 mV

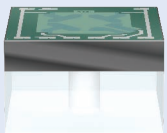
C33

- Pressure range: 0 … 1.2 bar to 0 … 10 bar, absolute
- Dimensions: 1.0 x 1.0 x 0.4 mm^3

C39

- Pressure range: 0 … 1.2 bar, absolute
- Dimensions: 0.65 x 0.65 x 0.24 mm^3

Pressure sensor die C35



Description

- Outstanding long-term stability
- Low pressure measurements at small footprint
- Various wire bond options (surrounded wire bonding and direct die to die wire bonding)

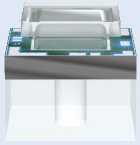
Technical data

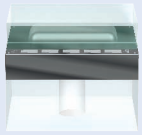
- 0 … 0.1 bar, gauge
- Operating temperature: –40 °C up to +150 °C
- Non-linearity typ. 0.20% FS
- Defined signal stability of ±0.2% FS
- Narrow tolerance of sensitivity ±100 mV
- Size 2.05 x 2.05 mm^2

Pressure Sensors for Medical Appliances

Pressure sensors dies and transmitters

Pressure sensor dies C32/ C38





Description

- All around bond pad layout (C32)
- Layout for direct die to die wire bonding (C38)
- Flat piezo structures
- Thin passivation layer system
- No need for metal layer passivation
- Optimized piezo-structure for high signal stability
- Media-protected pressure dies for harsh environments

Technical data

- Operating temperatures: –40 °C to +135 °C
- Temperature hysteresis of offset typ. 0.1% FS
- Size 1.65 x 1.65 mm^2

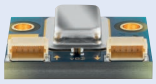
C32

- Pressure range: 0.4 … 40 bar, absolute, gauge

C38

- Pressure range: 10 … 40 bar, absolute, gauge

Pressure transmitter, low-profile pressure transmitter with digital interface



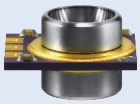
Description

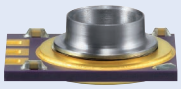
- High mechanical robustness
- High accuracy at low pressures
- Excellent “absolute pressure” accuracy
- No tubes required
- Easy screw-on mounting
- With digital or analogue interface

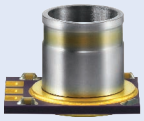
Technical data

- Accuracy: ±1% FS
- Max. rated pressures: 16 mbar to 7 bar
- Operating temperature: –25 °C ≤ TOP ≤ +85 °C
- Miniaturized and low profile (24 x 26 x 6 mm^3)

Pressure transmitter, MiniCell







Description

- Pressure element and signal conditioner mounted in a ceramic housing filled with oil
- High media resistance due to high-alloy steel
- Absolute, relative or differential pressure measurements
- Various flange geometries possible

Technical data

- Radiometric analog output signal: 0.5 … 4.5 V
- Operating temperature: –40 °C ≤ TOP ≤ +140 °C
- High accuracy (< 1.5% FS) over full temperature range and lifetime
- Small dimensions < 3 cm^3

NTC Thermistors for Medical Appliances

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NTC thermistor temperature sensors

G15*1 glass-encapsulated NTC thermistors with insulation

Description

- Thermistor for precise and fast temperature measurement
- Excellent long-term stability
- Temperature measurement with media contact
- Simplified handling due to insulation of glass body and leads
- Dumet wires (copper-clad FeNi)
- Easy and flexible mounting: crimping, soldering or welding
- Packaging in bulk or stripe

Technical data

- Temperature range: –55 °C up to +260 °C
- High insulation strength: Test voltage 500 V DC (1 s)
- Very small dimensions, head diameter: 1.4 mm

L862 epoxy-encapsulated NTC thermistors

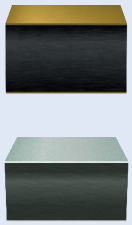
Description

- Lead-free
- Tight temperature tolerances
- High long-term stability
- High thermal shock resistance
- Easy and flexible mounting: crimping, soldering or welding
- Packaging in bulk or stripe

Technical data

- Temperature range: –55 °C up to +155 °C
- High accuracy over a wide temperature range
- Insulated silver plated nickel wire

L860 bondable NTC thermistor chips



Description

- Lead-free
- Low total surface demand on DCB (0.15 mm^2)
- Planar chip mounting (bonding, sintering, soldering, gluing)
- High accuracy and sensitivity
- UL recognised and tested according to AEC-Q200
- Packaging: on tape (within 8-inch frame)

Technical data

- Temperature range: –40 °C up to +150 °C
- Top and bottom surface metallized (metallization depending on type in gold or silver)
- Very small dimensions (smallest: 0.39 x 0.39 x 0.20 mm^3)

Edition 02/2020 · Ordering No. EPC:69019-7600 · Printed in Germany · PB 02201.