ALLEGRO
INNOVATION WITH PURPOSE
microsystems

ACCURACY UNDER PRESSURE

A17700: Interface Sensor for Resistive Bridge Pressure Sensing

As the demand for energy-efficient systems continues to rise, so does the need for pressure regulation in liquid and gas carrier systems.

With this mounting demand, pressure sensors used as system monitoring devices need to deliver precise data to ensure accurate pressure regulation for optimized system performance.

Allegro's A17700 is a highly accurate interface IC that incorporates a top-of-the-line signal conditioning algorithm designed for resistive bridge pressure sensors. Automotive-grade qualified, the A17700 is a versatile IC that can be used in many critical motorized applications. From high-pressure sensors for gasoline direct injection (GDI) and braking systems in turbo and hybrid-electric engines to medium and low-pressure sensors used in brake boosters, brake cylinders, HVAC, and automatic transmission oil management, the A17700 offers system confidence and performance.

Pressure sensor high accuracy is achieved with the A17700 by amplifying and offsetting the sensing media's input signal and applying a flexible polynomial compensation of pressure and temperatures. The short configuration time with high accuracy can be achieved by lowering the polynomial order or applying the interpolation to deliver

additional points. Allegro offers a graphical user interface (GUI) and programmer libraries that enable easy use of this flexible algorithm for designers.

Allegro's A17700 can achieve the smallest chip delay of 100μs on the market, input to output, with no output resolution loss. This fast device response time enables faster output sampling, allowing undesired membrane oscillations to be filtered by the system. The IC also implements Fast SENT, allowing six times faster messaging than regular SENT, analog, and PWM outputs for legacy applications.

Systems with safety compliance requirements will benefit from the integrated diagnostics on the A17700. Temporary faults caused by the environmental conditions or internal circuitry changes can be signaled in the output protocol. Reporting of diagnostic status can be enabled or disabled by the user to align with applications' needs. Built-in EEPROM memory offers various device configurations and traceability throughout the IC's lifetime.

The A17700 is available in a small footprint 24-pin 4 mm × 4 mm QFN package with wettable flanks for ensuring reliable soldering and visual inspection of solder joints.
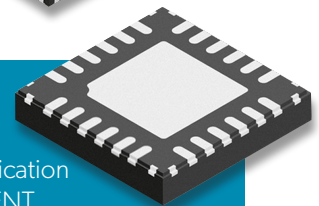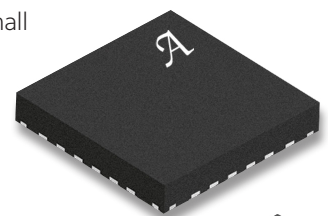
Features and Benefits

- Flexible signal conditioning algorithms including on-chip Poly(4,4) compensation for improved accuracy
- Small output delay with no loss of resolution enables faster response time
- Automotive AEC-Q100 Grade 0 Qualified with 4 kV HBM ratings and robust EMI
- Advanced integrated diagnostics allows for safety-critical systems fault detection

- Multiple output options for wide application use: Analog, PWM, SENT, and Fast SENT
- Integrated EEPROM technology for programming of calibration parameters
- Compact QFN package with exposed pad and wettable flanks enabling reliable soldering and visual inspection of solder joints
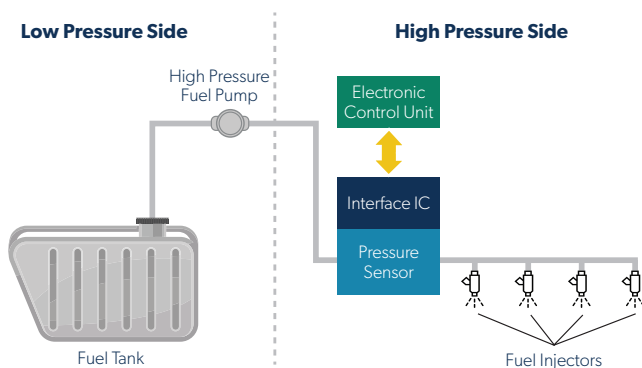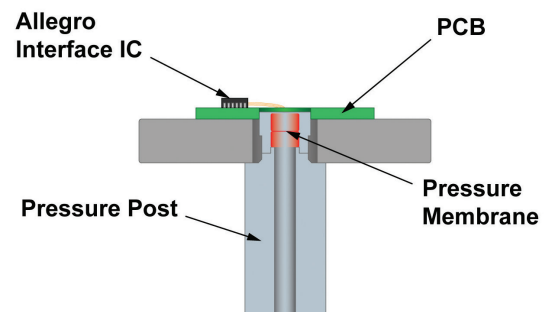
Applications

- High pressure systems in turbo and hybrid vehicles as Gasoline Direct Injection (GDI) and Dynamic Brake System (DBS).

- Medium pressure systems as Brake Boosters, EGR, HVAC, Engine and Automatic Transmission Oil Management.
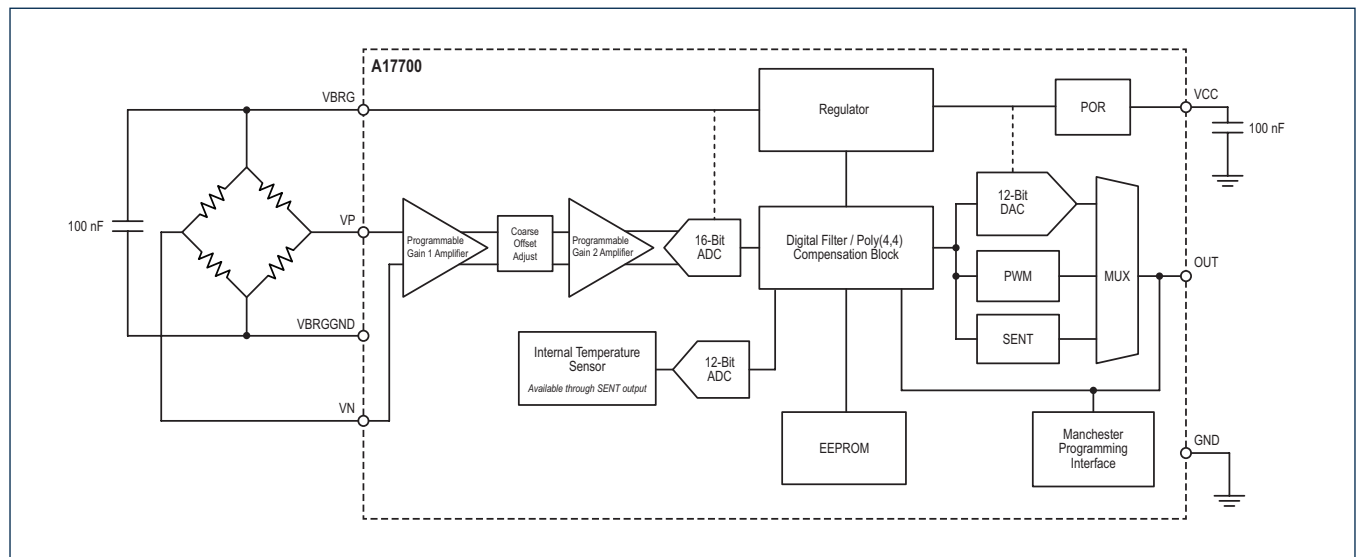
Enabling Highly Efficient Automotive Systems

Save on System Cost & Size

Part Number	Output	Packaging	Packing
A17700LESBTR-AO	Analog Output	24-pin QFN with wettable flank and exposed thermal pad	1500 pieces per 7-inch reel
A17700LESBTR-DO	Digital Output (SENT/PWM)		