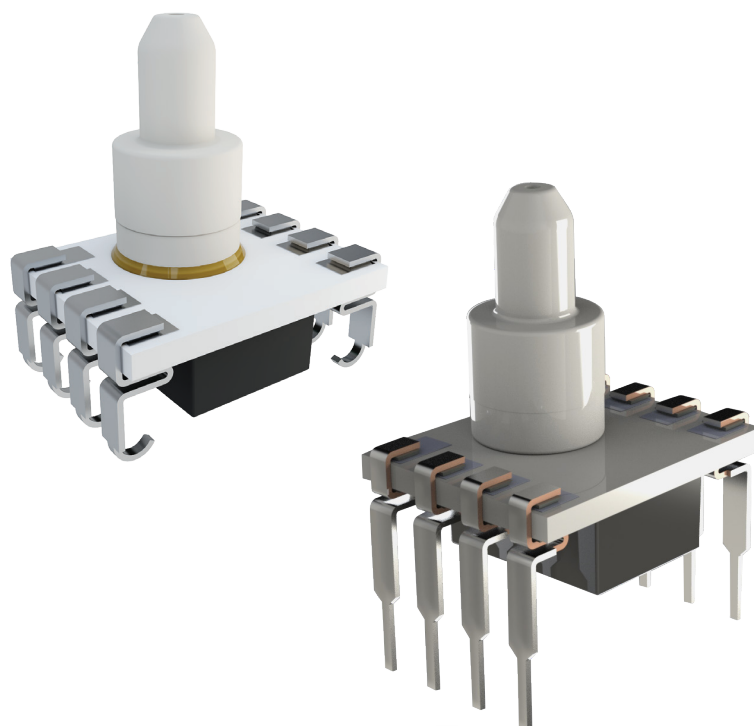


The HTS 1510 Series is a surface or thru-hole mountable package with both digital and analog outputs available. Its backside-pressure measurement provides great compatibility with wet, corrosive media. It is ideal for integration on a control board.



FEATURES

| | |
|----------------|---|
| Pressure Range | 1 to 100 psi / 70 to 7000 mbar / 7 to 700 kPa |
| Temp. | -40 to 125 °C |
| Output | Digital I ² C and Analog 0.5V – 4.5V |
| Type | Absolute or Gage |
| Packaging | Tape and Reel |

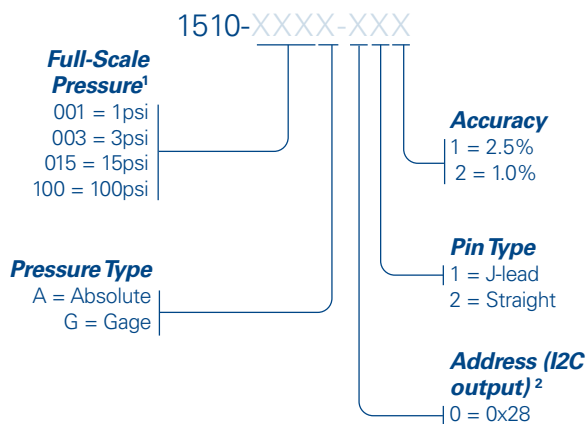
APPLICATIONS

Industrial: To monitor HVAC systems, water levels, water pressure, and processes. It is also used for air-conditioning and other refrigerant systems, portable-measurement and analysis instrumentation, and industrial automation.

Automotive: To monitor the pressure of transmission fluid, fuel systems, oil systems, EGR systems, exhaust gas, etc.

Medical: Used in equipment for diagnosis and analysis.

HTS Series Part Number Configurator



¹ Custom calibration available upon request.

² See note about addresses within the I2C communication section.

SPECIFICATIONS

| Parameter | Minimum | Typical | Maximum | Units | Notes |
|-------------------------------------|---------|---------|---------|-------|---|
| Electrical | | | | | |
| Supply Voltage (Vs) | 4.5 | 5 | 5.5 | Vs | |
| Supply Current | | 6.5 | | mA | @5V input voltage. |
| Performance | | | | | |
| Effective ADC Resolution | | 14 | | Bits | |
| Accuracy | | | | | Applicable if Vs = nominal 5V. Accuracy includes all error for hysteresis and linearity over the entire operating temperature range. It does not include lifetime drift. -40°C to 125°C. High performance accuracy not available for 1 psi parts. |
| Standard | -2.5 | 0 | 2.5 | %FS | |
| High Performance | -1.0 | 0 | 1.0 | %FS | |
| Analog Output Range (Vout) | 10 | | 90 | %Vs | 0 to 100 optional |
| Analog Output Clipping Limit (Vout) | 0 | | 100 | %Vs | Other custom limits available upon request |
| Lifetime Drift | -0.5 | | 0.5 | %FS | |
| Startup Time | | | 10 | ms | |
| Digital Update Time | | 5 | | ms | |
| Proof Pressure | 2X | | | | Full scale pressure |
| Burst Pressure | 5X | | | | Full scale pressure |
| Enviromental | | | | | |
| Operating Temperature | -40 | | 125 | °C | |
| Storage Temperature | -55 | | | °C | |
| Weight | | 1.48 | | Grams | |

Transfer Function Formula - Digital

$$P_{psi} = (P_{max} - P_{min}) \cdot \left(\frac{P_{counts} - 0.1 \cdot Max}{0.8 \cdot Max} \right) + P_{min}$$

Where

P_{psi} = Measured Pressure in PSI
 P_{counts} = Pressure Counts from Merit Sensor Part
 P_{Min} = Minimum Pressure
 P_{Max} = Maximum Pressure
 Max = 32768 = 15 Bits

Transfer Function Formula - Analog

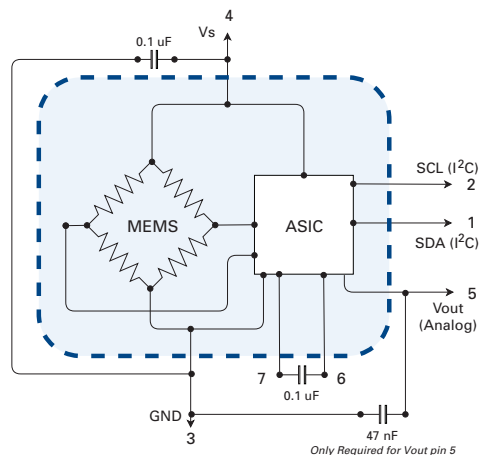
$$P_{psi} = (P_{max} - P_{min}) \cdot \left(\frac{V_{out} - V_{min}}{V_{max} - V_{min}} \right) + P_{min}$$

Where

P_{psi} = Measured Pressure in PSI
 P_{Max} = Maximum Pressure
 P_{Min} = Minimum Pressure
 V_{min} = Minimum Volatage (Usually 0.5V)
 V_{max} = Maximum Volatage (Usually 4.5V)
 V_{out} = Output voltage

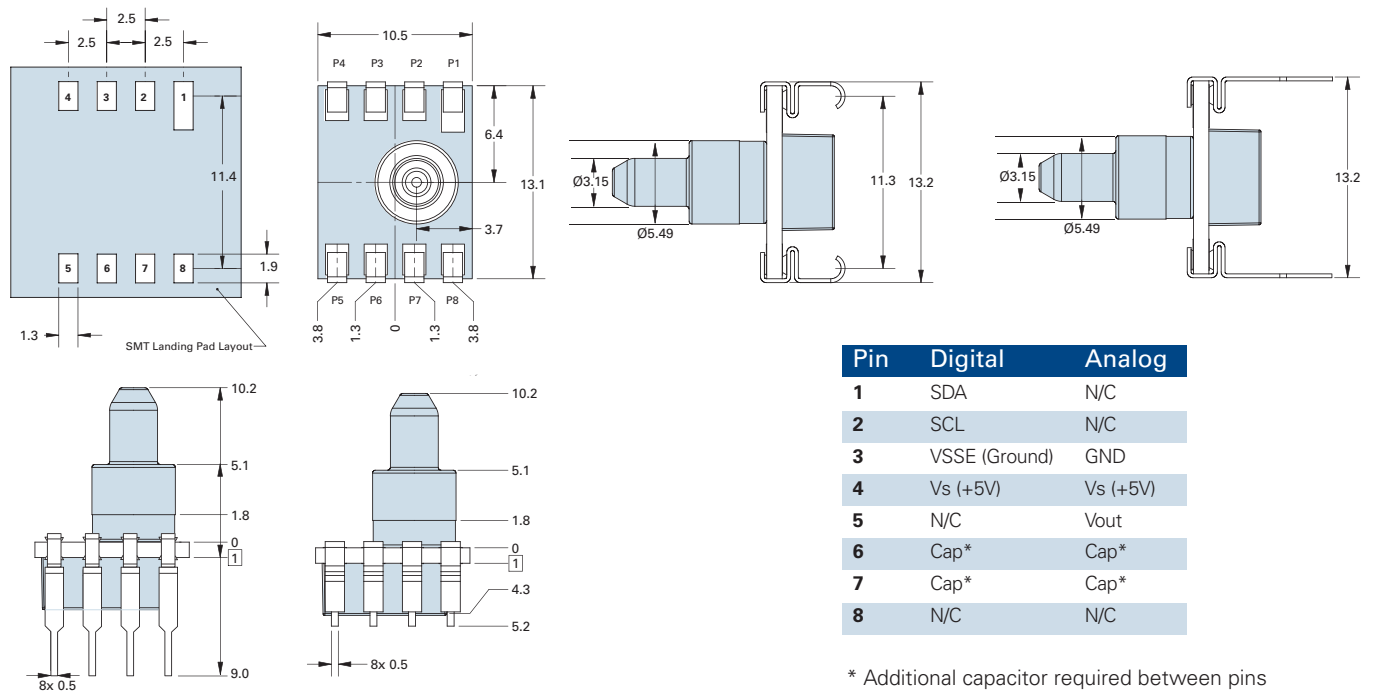
ELECTRICAL

Note: The HTS product is represented by the blue dashed line. The customer needs to include the other capacitors in their circuit.

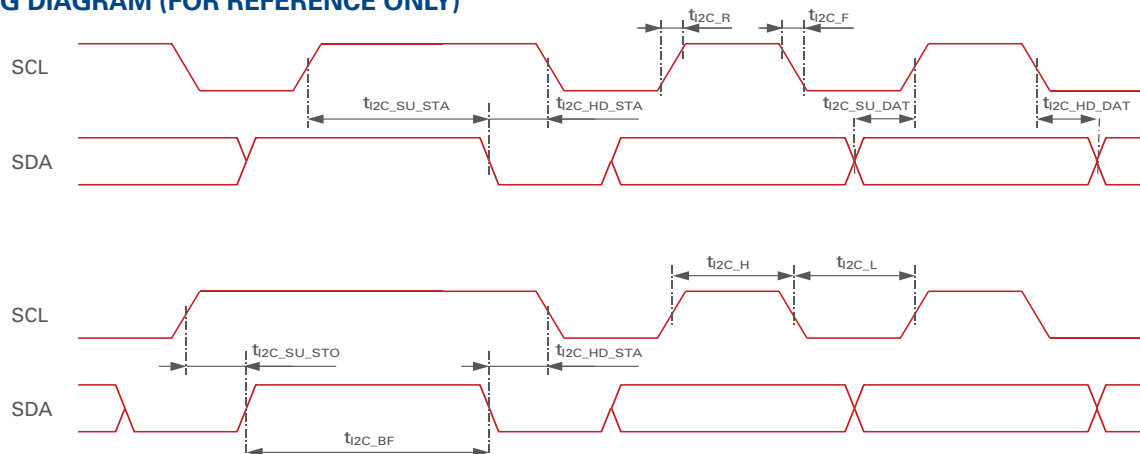


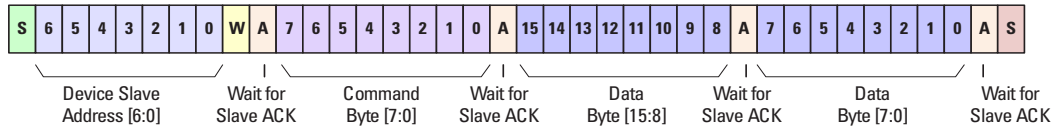
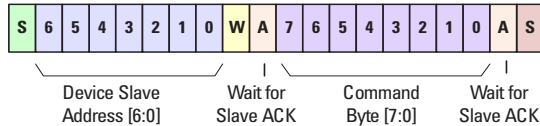
**DIMENSIONS FOR STANDARD OPTIONS (in millimeters)**

Dimensions for reference only. Engineering drawings (with tolerance) available upon order.

**I²C PARAMETERS (FOR REFERENCE ONLY)**

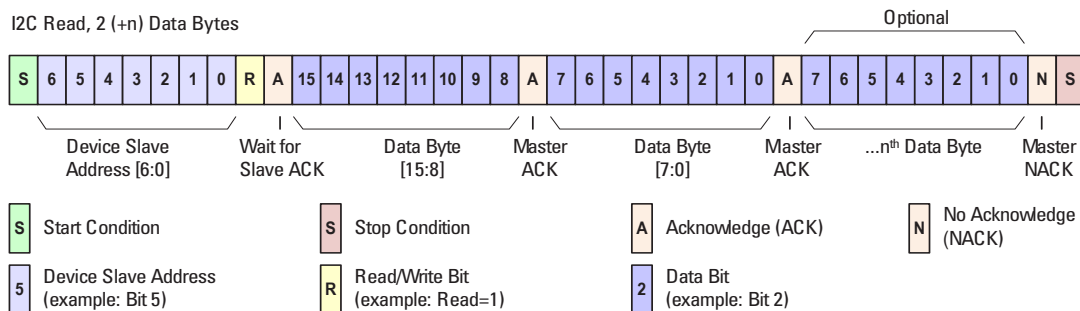
| Nr. | Parameter | Symbol | Condition | Min | Typ | Max | Units |
|-----|--|-------------------------|-------------------|-----|-----|-----|-------|
| 1 | SCL clock frequency | f _{SCL} | | | | 400 | kHz |
| 2 | Bus free time between start and stop condition | t _{I2C_BF} | | 1.3 | | | μs |
| 3 | Hold time start condition | t _{I2C_HD_STA} | | 0.6 | | | μs |
| 4 | Setup time repeated start condition | t _{I2C_SU_STA} | | 0.6 | | | μs |
| 5 | Low period SCL/SDA | t _{I2C_L} | | 1.3 | | | μs |
| 6 | High period SCL/SDA | t _{I2C_H} | | 0.6 | | | μs |
| 7 | Data hold time | t _{I2C_HD_DAT} | | 0.1 | | | μs |
| 8 | Data setup time | t _{I2C_SU_DAT} | | 0.1 | | | μs |
| 9 | Rise time SCL/SDA | t _{I2C_R} | | | | 0.3 | μs |
| 10 | Fall time SCL/SDA | t _{I2C_F} | | | | 0.3 | μs |
| 11 | Setup time stop condition | t _{I2C_SU_STO} | | 0.6 | | 0.3 | μs |
| 12 | Fall time SCL/SDA | t _{I2C_NI} | Spike suppression | | | 50 | μs |

I²C TIMING DIAGRAM (FOR REFERENCE ONLY)

MERIT SENSOR 1510 I²C COMMUNICATIONI²C Write, Command Byte, and 2 Data BytesI²C Write, Command Byte, No Data BytesNOTE REGARDING I²C ADDRESSES:

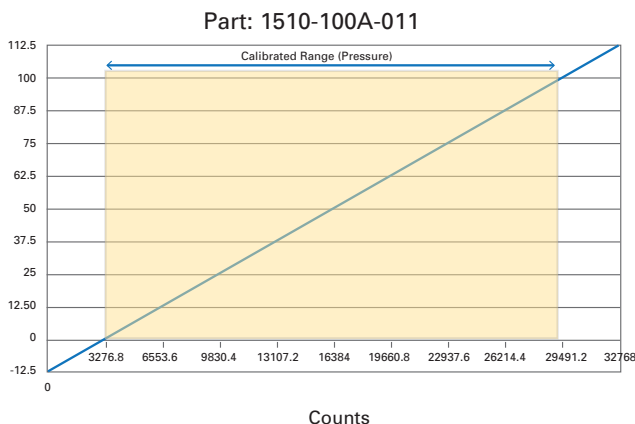
- Address 0x28 is the default
- Other addresses (0x29, 0x2a, 0x2b available upon request,) will respond to both the given address, and 0x28

The correct command to write to the unit for setting up the data read is “0x2E 0x21 0x00”. This write command interrupts the normal operation of the ASIC and should only be used once to “activate” the register that holds the pressure data. Once the register is activated, any subsequent read of the device will return the data from that register.

I²C Read, 2 (+n) Data Bytes

A read command will return the data from the output register. It will not interrupt the normal processing of the ASIC. Three bytes of data should be read... the first byte is the original command (0x2E), the next two bytes are the pressure output in counts.

TRANSFER FUNCTION EXAMPLE

PACKAGING AND SHIPPING
(Tape and Reel)