

BASIC BOARD MOUNT PRESSURE SENSORS, ABP2 SERIES

TABLE 1. ABSOLUTE MAXIMUM SPECIFICATIONS¹

CHARACTERISTIC	MINIMUM	MAXIMUM	UNIT
Supply voltage (V_{supply})	-0.3	3.6	Vdc
Voltage on any pin	-0.3	$V_{\text{supply}} + 0.3$	Vdc
Digital clock frequency:			
I ² C	100	400	kHz
SPI	50	800	
ESD susceptibility (human body model)	—	4	kV
Storage temperature range	-40 [-40]	125 [257]	°C [°F]
Soldering time and temperature, peak reflow temperature (Leadless SMT)	15 s max. at 250 °C [482 °F]		

¹Absolute maximum ratings are the extreme limits the device will withstand without damage.

TABLE 2. OPERATING SPECIFICATIONS

CHARACTERISTIC	MINIMUM	TYPICAL	MAXIMUM	UNIT
Supply voltage (V_{supply}) ¹	1.8	3.3	3.6	Vdc
Current consumption:				
I ² C sleep/standby mode	3.0	33.8	211.0	nA
SPI sleep/standby mode	13.0	43.8	221.0	
Power consumption	—	3.1	—	mW
Operating temperature range ²	-40 [-40]	—	110 [230]	°C [°F]
Compensated temperature range ³	-40 [-40]	—	110 [230]	°C [°F]
Startup time (power up to data ready) ⁴	—	7.5	—	ms
Data rate (assumes command AA _{HEX})	161	204	—	samples/s
SPI/I ² C voltage level:				
low	—	—	20	% V_{supply}
high	80	—	—	
Pull up on SDA, SCL	1	—	—	kOhm
Total Error Band ⁵ :				
0°C to 50°C	—	—	±1.5	%FSS ⁶
-20°C to 85°C	—	—	±3.0	%FSS ⁶
-40°C to 110°C	—	—	±4.5	%FSS ⁶
Accuracy ⁷	—	—	±0.25	%FSS BFSL
Resolution	14	—	—	bits
Temperature output error ⁸	—	±5	—	°C

¹Sensors are not reverse polarity protected. Incorrect application of supply voltage or ground to the wrong pin may cause electrical failure.

²**Operating temperature range:** The temperature range over which the sensor will produce an output proportional to pressure.

³**Compensated temperature range:** The temperature range over which the sensor will produce an output proportional to pressure within the specified performance limits (see Total Error Band).

⁴**Startup time:** Based on 2.5 ms for power up to receive the first measurement command and average measurement time of 5 ms (data rate of 204 samples per second). Refer to Section 3.0, Tables 13, 14 and 17 for further details of communication timing.

⁵**Total Error Band:** The maximum deviation from the ideal transfer function over the entire compensated temperature and pressure range. Includes all errors due to offset, full scale span, pressure non-linearity, pressure hysteresis, repeatability, thermal effect on offset, thermal effect on span and thermal hysteresis.

⁶**Full Scale Span (FSS):** The algebraic difference between the output signal measured at the maximum (P_{max.}) and minimum (P_{min.}) limits of the pressure range. (See Figure 2.)

⁷**Accuracy:** The maximum deviation in output from a Best Fit Straight Line (BFSL) fitted to the output measured over the pressure range at 25°C [77°F]. Includes all errors due to pressure non-linearity, pressure hysteresis and non-repeatability.

⁸**Temperature Output Error:** The error in Temperature Output reading relative to a thermal reference standard over a temperature range of -40°C to 125°C.

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TABLE 3. ENVIRONMENTAL SPECIFICATIONS

CHARACTERISTIC	PARAMETER
Humidity: all external surfaces	0 %RH to 95 %RH, non-condensing
internal surfaces of liquid media option "T"	0 %RH to 100 %RH, condensing
Vibration	15 g, 10 Hz to 2 kHz
Shock	75 g, 6 ms duration
Life ¹	1 million full scale pressure cycles minimum
Solder reflow	J-STD-020-E Moisture Sensitivity Level 1 (unlimited shelf life when stored at <30°C/85 %RH)

¹Life may vary depending on specific application in which the sensor is utilized.

TABLE 4. WETTED MATERIALS¹

COMPONENT	MATERIAL ¹
Ports and covers	high temperature polyamide, 304 SST
Substrate	—
Adhesives	epoxy, silicone gel
Electronic components	—

¹Contact Honeywell customer service for detailed material information.

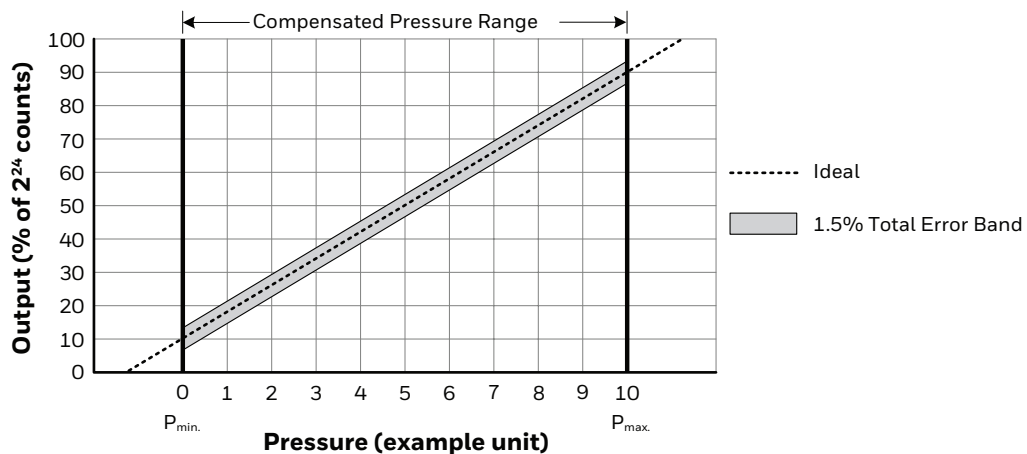
TABLE 5. SENSOR PRESSURE TYPES

PRESSURE TYPE	DESCRIPTION
Gage	Output is proportional to the difference between applied pressure and atmospheric (ambient) pressure.

TABLE 6. SENSOR OUTPUT AT SIGNIFICANT PERCENTAGES

%OUTPUT	DIGITAL COUNTS	
	DECIMAL	HEX
0	0	0X000000
10	1677722	0X199999
50	8388608	0X800000
90	15099494	0XE66666
100	16777215	0XFFFFFF

FIGURE 2. TRANSFER FUNCTION LIMITS



$$\text{Output (\% of } 2^{24} \text{ counts)} = \frac{80\%}{P_{\text{max.}} - P_{\text{min.}}} \times (\text{Pressure}_{\text{applied}} - P_{\text{min.}}) + 10\%$$