AD592 Semiconductor Output Table

BAPI Sensor Specifications

Rev. 10/16/12

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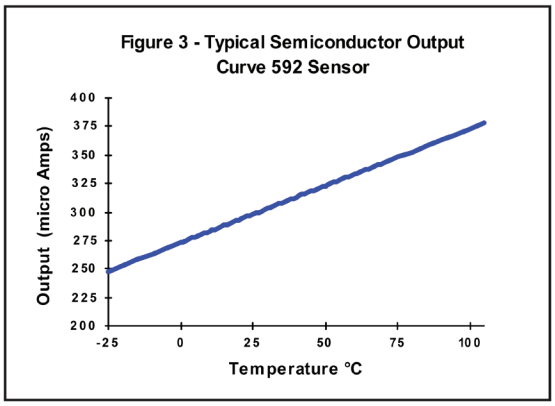
°F	°C	µA
-40.0	-40.00	233.200
-38.0	-38.89	234.310
-36.0	-37.78	235.420
-34.0	-36.67	236.530
-32.0	-35.56	237.640
-30.0	-34.44	238.760
-28.0	-33.33	239.870
-26.0	-32.22	240.980
-24.0	-31.11	242.090
-22.0	-30.00	243.200
-20.0	-28.89	244.310
-18.0	-27.78	245.420
-16.0	-26.67	246.530
-14.0	-25.56	247.640
-12.0	-24.44	248.760
-10.0	-23.33	249.870
-8.0	-22.22	250.980
-6.0	-21.11	252.090
-4.0	-20.00	253.200
-2.0	-18.89	254.310
0.0	-17.78	255.420
2.0	-16.67	256.530
4.0	-15.56	257.640
6.0	-14.44	258.760
8.0	-13.33	259.870
10.0	-12.22	260.980
12.0	-11.11	262.090
14.0	-10.00	263.200
16.0	-8.89	264.310
18.0	-7.78	265.420
20.0	-6.67	266.530
22.0	-5.56	267.640
24.0	-4.44	268.760
26.0	-3.33	269.870
28.0	-2.22	270.980
30.0	-1.11	272.090
32.0	0.00	273.200
34.0	1.11	274.310
36.0	2.22	275.420
38.0	3.33	276.530
40.0	4.44	277.640
42.0	5.56	278.760
44.0	6.67	279.870
46.0	7.78	280.980
48.0	8.89	282.090
50.0	10.00	283.200
52.0	11.11	284.310
54.0	12.22	285.420
56.0	13.33	286.530
58.0	14.44	287.640
60.0	15.56	288.760
62.0	16.67	289.870
64.0	17.78	290.980
66.0	18.89	292.090
68.0	20.00	293.200
70.0	21.11	294.310
72.0	22.22	295.420
74.0	23.33	296.530
76.0	24.44	297.640
78.0	25.56	298.760
80.0	26.67	299.870
82.0	27.78	300.980
84.0	28.89	302.090
86.0	30.00	303.200
88.0	31.11	304.310
90.0	32.22	305.420
92.0	33.33	306.530
94.0	34.44	307.640
96.0	35.56	308.760
98.0	36.67	309.870
100.0	37.78	310.980
102.0	38.89	312.090
104.0	40.00	313.200
106.0	41.11	314.310
108.0	42.22	315.420
110.0	43.33	316.530
112.0	44.44	317.640
114.0	45.56	318.760
116.0	46.67	319.870
118.0	47.78	320.980
120.0	48.89	322.090
122.0	50.00	323.200
124.0	51.11	324.310
126.0	52.22	325.420
128.0	53.33	326.530
130.0	54.44	327.640
132.0	55.56	328.760
134.0	56.67	329.870
136.0	57.78	330.980
138.0	58.89	332.090
140.0	60.00	333.200
142.0	61.11	334.310
144.0	62.22	335.420
146.0	63.33	336.530
148.0	64.44	337.640
150.0	65.56	338.760
152.0	66.67	339.870
154.0	67.78	340.980
156.0	68.89	342.090
158.0	70.00	343.200
160.0	71.11	344.310
162.0	72.22	345.420
164.0	73.33	346.530
166.0	74.44	347.640
168.0	75.56	348.760
170.0	76.67	349.870
172.0	77.78	350.980
174.0	78.89	352.090
176.0	80.00	353.200
178.0	81.11	354.310
180.0	82.22	355.420
182.0	83.33	356.530
184.0	84.44	357.640
186.0	85.56	358.760

Semiconductor Description

BAPI semiconductors are designed to exhibit a defined current output directly proportional to the absolute temperature (°K). This property makes them the most linear of all the common commercial HVAC sensing elements. By putting this current output across a resistor, a proportional output voltage is produced. An example of a semiconductor output curve can be seen in **Figure 3**.



The AD592 semiconductor temperature sensor supplied with BAPI products provides a two wire 248 to 378 micro amp output or a three wire 2.48 to 3.78 volt output over a range of -13 to 221 °F (-25 to 105 °C). These units are offset using equipment traceable to the National Institute of Standards and Technology (NIST). Each unit is then labeled with the actual temperature and the corresponding offset.

Semiconductor Specifications

Interchangeability Tolerance (Accuracy):
Offset to 0.1 °C (0.18 °F) - NIST Traceable

Offset: Required to achieve maximum accuracy. Each sensor includes a custom offset listed on each sensor.

Repeatability: ± 0.10 °C (± 0.18°F)

Linearity: ± 0.15 °C max from 0 to 70 °C
(± 0.27°F max from 32 to 158°F)

Sensor Range: -25 to 105 °C
(-13 to 221 °F) [248 to 378 °K]

Bias Voltage: 5 to 30 VDC

Accuracy Reference: 298.2 mA @ 25°C or 2.982 V @ 25°C

Temperature Output Coefficient:

2 wire:	1 µA/°C	(0.556 µA/°F)	[1 µA/°K]
3 wire	10 mV/°C	(5.556 mV/°F)	[10 mV/°K]

Definition of Specification Terms

Interchangeability Tolerance (Accuracy)
The maximum amount that sensors following the same curve will differ from each other.

Repeatability-
A measure of a sensor's ability to repeat the same output value for a given input value.

Custom Offset Definition and Example

This is how BAPI calculates the offset value provided on the sensor label:

Therm Reading_____
The actual temperature reading according to a thermometer that is certified traceable to recognized standards by the National Institute of Standards and Technology (NIST).

Sensor Reading _____
The temperature reading according to the AD592 sensor, using the output in either µA or mV and converting the output to a Fahrenheit temperature.

Offset_____
The difference between the Thermometer Reading and the Sensor Reading

To maximize the sensor accuracy, simply add the offset value of the sensor reading into the controller.

e.g. Therm Reading 74.6 Sensor Reading 73.0 Offset +1.6
Correction: Add (+1.6) °F to the sensor for an accurate reading: 73 + 1.6 = 74.6°F

e.g. Therm Reading 75.4 Sensor Reading 77.2 Offset -1.8
Correction: Add (-1.6) °F to the sensor for an accurate reading: 77.2 + (-1.8) = 75.4°F