

Bulk Indium Arsenide BH-700 Series **Hall Sensors**

Single Axis

Description

Designed to meet the requirements of a wide range of magnetic field measurement applications, the BH-700 Series are small, solid-state devices that provide an output voltage proportional to the product of control current and ambient flux density. Five single-axis models are available to measure axial and transverse magnetic field components with sensitivities from 7.5 to 50mV/kG and input and output resistance of several ohms.



Electrical Specifications

- BH-702**
- a. Air gap: between concentrator and substrate, 0.0025" nominal and 0.003" maximum.
 - b. Sensitivity: Basic sensitivity of Hall element .15 V/A-kG min. With the unit suspended in a free field of 100 oersteds and $I_c=200$ mA, the open circuit Hall voltage is 8.0 mV min. In a closed magnetic circuit with $I_c=200$ mA, V_H is 3.2mV/Ampere turn min.
 - c. Polarity: With the magnetic field vector as shown and I_c entering the red lead, the positive Hall voltage will appear at the blue lead.
- BH-701**
- a. Linearity: V_H vs. B, -10 to +10 kG: $\pm 0.25\%$ of reading, max.
- BH-704**
- V_H vs. B, -30 to +30 kG: $\pm 1.0\%$ of reading, max.
 - V_H vs. I_c , 0 to 100 mA: $\pm 0.1\%$ of reading, max.
 - V_H vs. I_c , 0 to 300 mA: $\pm 1.0\%$ of reading, max.
 - b. Encapsulation: The BH-701 and the BH-704 are encapsulated in a rugged aluminum oxide ceramic and epoxy case for excellent heat transfer and strength.

*approximate

Mechanical Specifications

- a. Color Code: Control Current (I_c): Red (+ I_c) Black (- I_c)
Hall Voltage (V_H): Blue (+ V_H) Yellow (- V_H)
- b. Polarity: With the magnetic field vector (+B) entering the top of the Hall plate and I_c entering the red lead, the positive Hall voltage will appear at the blue lead.

Models

- BH-700 Low cost, Transverse, General Purpose
- BH-701 Rugged, High-Linearity, Transverse, Instrumentation Quality
- BH-702 Low Field (ferrite-embedded), Transverse
- BH-704 Rugged, High Linearity, Axial, Instrumentation Quality
- BH-705 General Purpose, Transverse

SPECIFICATIONS	UNITS	BH-700	BH-701	BH-702	BH-704	BH-705
Input resistance, R_{in}	ohms	5.5 max.	2 max.	3.5 max.	2.5 max.	2.2 max.
Output resistance, R_{out}	ohms	5.5 max.	2 max.	3.5 max.	2.5 max.	2 max.
Open circuit magnetic sensitivity, V_{HOC} (1)	mV/kG	50 min.	7.5 \pm 20% (3)	***	7.5 \pm 20%	10 \pm 25%
Max. resistive residual voltage, V_M @ B=0 (1)	$\pm\mu V$	1500 max.	75 max.	250 max.	75 max.	300 max.
Max. control current @25°C, static air	mA	250	300	300	300	250
Nominal control current	mA	200	100	200	100	100
Max. linearity error, (0 to 10 kG) with R_{lin}	$\pm\%$ of RDG	3	—	—	—	1
Zero field thermal voltage	μV	—	5 max.	—	5 max.	5 max.
Mean temperature coefficient of V_H (-20°C to +80°C) (2)*	%/°C	-0.2	-0.04	-0.18	-0.04	-0.08
Mean temperature coefficient of resistance (-20°C to +80°C) (2)*	%/°C	+0.2	+0.18	+0.18	+0.18	+0.2
Temperature dependence of resistive residual voltage (-20°C to +80°C) (2)*	$\pm\mu V/^\circ C$	6 typical	0.3 typical	2.5 typical	0.5 max.	1 max.
Operating temperature range	°C	-40°C to +100°C	-40°C to +100°C	-55°C to +100°C	-40°C to +100°C	-65°C to +100°C
Storage temperature range	°C	-40°C to +105°C	-40°C to +105°C	-55°C to +105°C	-40°C to +105°C	-65°C to +105°C

Notes

- (1) $I_c = I_{cn}$
- (2) $I_c = 100$ mA
- (3) Loaded Sensitivity

Rev. date 03/2006

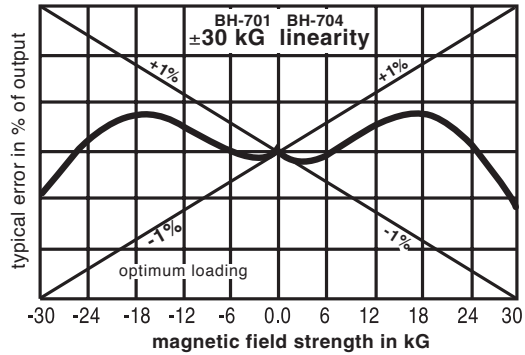


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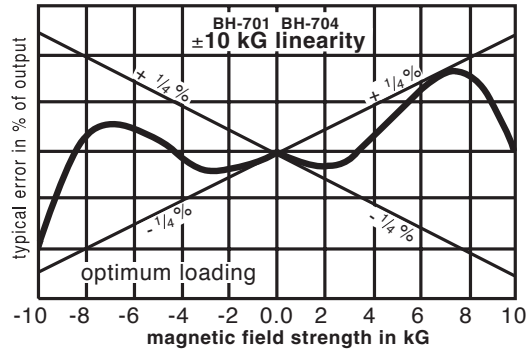
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Mechanical Dimensions

All dimensions are in inches (millimeters)

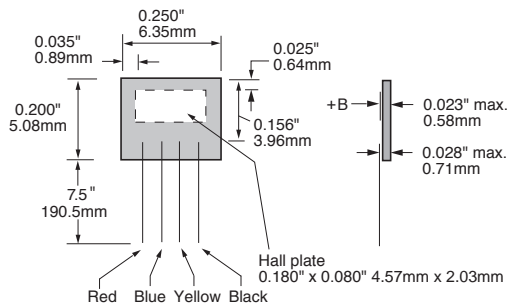


Note: Optimum loading range for ± 30 kG operation is 90-200 Ω

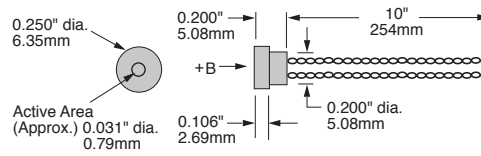


Note: Optimum loading range for ± 10 kG operation is 20-50 Ω

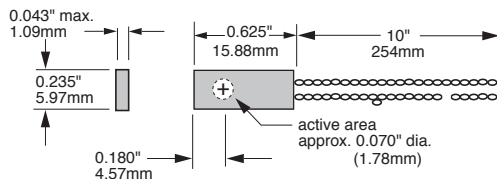
Model BH-700 Low Cost Transverse



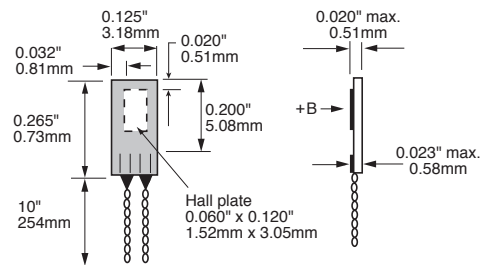
Model BH-704 High Linearity Axial



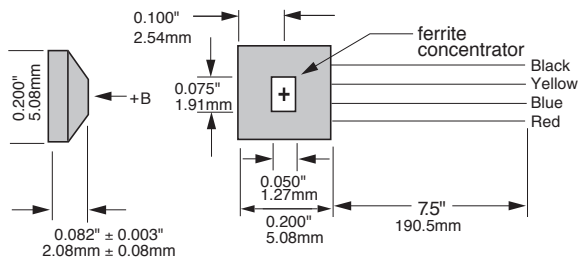
Model BH-701 High Linearity Transverse



Model BH-705 General Purpose Transverse



Model BH-702 Ferrite Imbedded Transverse



Notes

All tolerances unless specified are $\pm 0.10^\circ$



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