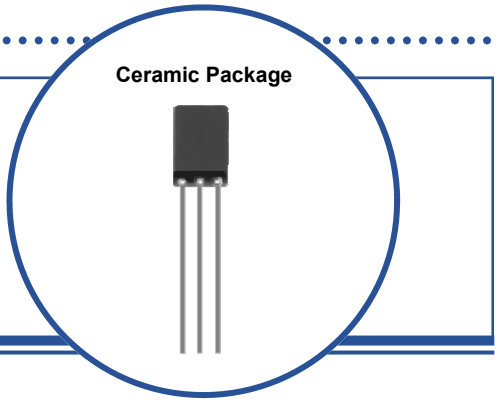
High Reliability Hallogic Hall-Effect Sensors
OMH090 OMH3019, OMH3020, OMH3040, OMH3075, OMH3131 (B, S versions)

TT electronics
OPTEK Technology



Features:

- Designed for non-contact switching operations
- Operates over a broad range of supply voltages
- Excellent temperature stability operates in harsh environments
- Suitable for military and space applications
- Processing patterned after class B or S of MIL-STD-883
- 0.50” (12.700 mm) lead length

Description:

These Hall-effect devices contain a monolithic integrated circuit which incorporates a Hall element, a linear amplifier, a threshold amplifier, and Schmitt trigger on a single Hallogic® silicon chip. Included on-chip is a band-gap voltage regulator that allows operation with a wide range of supply voltages. These devices feature logic level output and provide up to 21 mA of sink current. This allows direct driving of more than 7 TTL loads or any standard logic family using power supplies ranging from 4.5 to 24 volts. Output amplitude is constant at switching frequencies from DC to over 200 kHz.

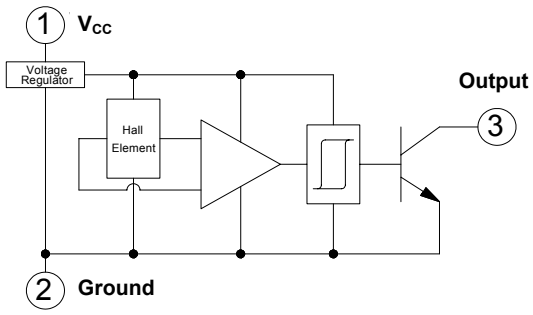
The **Uni-Polar** turns on with a (logic level “0”) after a sufficient magnetic field from the south pole of a magnet approaches the symbolized face of the device (operating point) and turns off (logic level “1”) after the magnetic field reaches a minimum value. The **Bi-Polar** device turns on (logic level “0”) in the presence of a magnetic south pole and turns off (logic level “1”) when subjected to a magnetic north pole. Both magnetic poles are necessary for operation for Bi-Polar devices. This feature makes these sensors ideal for applications in non-contact switching operations, brushless DC motors and for use with multiple pole magnets.

B and S devices are processed to OPTEK’s military screening program patterned after MIL-STD-883. This product is not guaranteed to meet all radiation hardness requirements of MIL-STD-883.

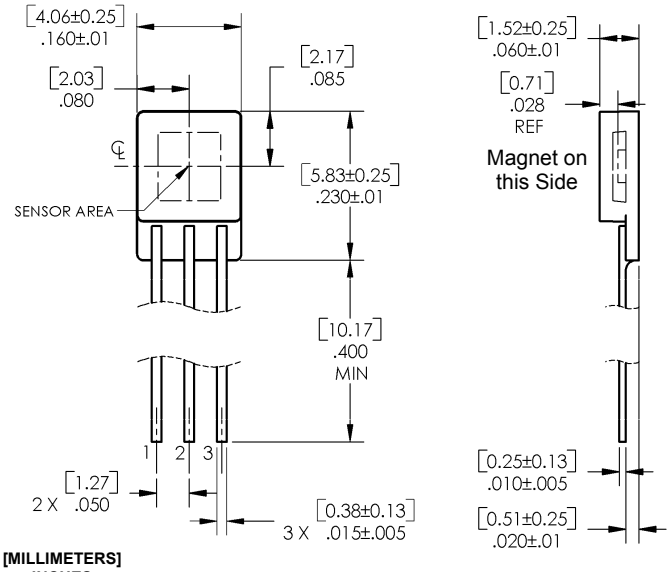
Contact your local representative or OPTEK for more information.

Applications:

- Non-contact switching operations
- Brushless DC motors
- Multiple pole magnets
- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor



Pin #	Description
1	V_{CC}
2	Ground
3	Output



DIMENSIONS ARE IN: [MILLIMETERS] INCHES

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Supply Voltage, V_{CC}	25 V
Storage Temperature Range, T_S	-65°C to +150°C
Operating Temperature Range, T_A	-55°C to +125°C
Lead Soldering Temperature (1/8 in. (3.2 mm) from case for 5 seconds with soldering iron)	260°C(1)
Output ON Current, I_{SINK}	25 mA
Output OFF Voltage, V_{OUT}	25 V
Magnetic Flux Density, B	Unlimited

Notes:
(1) Heat sink leads during hand soldering.

Part Number	Hi-Reliability Hallogic® Sensor	Operate Point Gauss Min / Typ / Max	Release Point Gauss Min / Typ / Max	Hysteresis Gauss Min / Typ / Max	V_{CC} (Volts) Min / Max	Lead Length
OMH090B	Uni-Polar Non-Latching	50/90/180	30 / 60 / 160	5 / 30 / 70	4.5 / 24.0	0.50”
OMH090S						
OMH3019B		175 / 420 / 500	125 / 220 / 420	30 / 100 / 155		
OMH3019S						
OMH3020B		70 / 220 / 350	50 / 165 / 330	15 / 55 / 200		
OMH3020S						
OMH3040B		70 / 150 / 200	50 / 115 / 180	110 / 35 / 60		
OMH3040S						
OMH3075B	Bi-Polar Latching	50 / 150 / 250	-250 / -150 / -50	100 / 300 / 500		
OMH3075S						
OMH3131B		20 / 60 / 95	10 / 45 / 85	5 / 15 / 40		
OMH3131S						

OPTEK Technology Inc. — 1645 Wallace Drive, Carrollton, Texas 75006
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Electrical Characteristics (V_{CC} = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)
OMH090, OMH090B, OMH090S Uni-Polar

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	45 70 20	- 90 -	210 200 180	Gauss	-55°C +25°C +125°C
B_{RP}	Magnetic Release Point	30 25	65 -	180 170	Gauss	-55°C & +25°C +125°C
B_H	Magnetic Hysteresis	5 5	- -	95 70	Gauss	-55°C +25°C & +125°C
I_{CC}	Supply Current	- - -	- 5 -	9 11 5	mA	-55°C,V_{CC} = 24 V, Output On, B≤250 Gauss +25° +125°C
V_{OL}	Output Saturation Voltage	- -	- 125	300 400	mV	-55°C,V_{CC} = 4.5 V, I_{OL} = 30 mA,B≥250 Gauss +25°C & +125°C
I_{OH}	Output Leakage Current	- - -	- 0.50 -	10 11 12	µA	-55°C,V_{CC} = 24 V, V_{OUT} =24 V, B≤250 Gauss +25° +125°C
t_r	Output Rise Time	-	0.13	1.00	µs	R_L = 820 Ω, C_L = 20 pF, V_{CC} = 14 V (guaranteed not tested)
t_f	Output Fall Time	-	0.14	1.00	µs	

Electrical Characteristics (Vcc = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)
OMH3019, OMH3019B, OMH3019S Uni-Polar

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	175 -	300 -	500 575	Gauss	+25°C -55°C & +125°C
B_{RP}	Magnetic Release Point	125 100	235 -	420 -	Gauss	+25°C -55°C & +125°C
B_H	Magnetic Hysteresis	30 20	65 -	155 -	Gauss	+25°C -55°C to +125°C
I_{CC}	Supply Current	-	5	9	mA	V_{CC} = 24 V, Output On, B ≤ 50 Gauss
V_{OL}	Output Saturation Voltage	-	125	300	mV	V_{CC} = 4.5 V, I_{OL} = 15 mA, B ≥ 500 Gauss
I_{OH}	Output Leakage Current	-	0.10	1.0	µA	V_{CC} = 24 V, V_{OUT} = 24 V, B < 50 Gauss
t_r	Output Rise Time	-	0.13	1	µs	R_L = 460 Ω, C_L = 20 pF, V_{CC} = 12 V (guaranteed not tested)
t_f	Output Fall Time	-	0.14	1	µs	

Notes:
(1) South pole facing symbolized surface.

Electrical Characteristics (V_{CC} = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)
OMH3020, OMH3020B, OMH3020S Uni-Polar

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	- -	230 -	350 425	Gauss	+25°C -55°C & +125°C
B_{RP}	Magnetic Release Point	50 25	180 -	- -	Gauss	+25°C -55°C & +125°C
B_H	Magnetic Hysteresis	10 10	50 -	- -	Gauss	+25°C -55°C & +125°C
Icc	Supply Current	-	4	7	mA	V_{CC} = 24 V, Output On, B ≤ 50 Gauss
V_{OL}	Output Saturation Voltage	-	100	400	mV	V_{CC} = 4.5 V, I_{OL} = 15 mA, B ≥ 350 Gauss
I_{OH}	Output Leakage Current	-	0.10	10	µA	V_{CC} = 24 V, V_{OUT} = 24 V, B ≤ 50 Gauss
t_r	Output Rise Time	-	0.21	1	µs	R_L = 820 Ω, C_L = 20 pF, V_{CC} = 12 V (guaranteed not tested)
t_f	Output Fall Time	-	0.10	1	µs	

Electrical Characteristics (V_{CC} = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)
OMH3040, OMH3040B, OMH3040S Uni-Polar

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	70 75	150 -	200 270	Gauss	+25°C -55°C & +125°C
B_{RP}	Magnetic Release Point	50 25	115 -	180 210	Gauss	+25°C -55°C & +125°C
B_H	Magnetic Hysteresis	20 20	35 -	- -	Gauss	+25°C -55°C & +125°C
Icc	Supply Current	- -	4 -	7 8	mA	+25°C, V_{CC} = 24 V, Output On, B ≤ 250 Gauss -55°C & +125°C
V_{OL}	Output Saturation Voltage	-	100	400	mV	V_{CC} = 4.5 V, I_{OL} = 20 mA, B ≥ 250 Gauss
I_{OH}	Output Leakage Current	- - -	- 0.10 -	11 10 12	µA	-55°C +25°C, V_{CC} = 24V, V_{OUT} = 24V, B ≤ 250 Gauss +125°C
t_r	Output Rise Time	-	0.21	1	µs	R_L = 820 Ω, C_L = 20 pF, V_{CC} = 12 V (guaranteed not tested)
t_f	Output Fall Time	-	0.10	1	µs	

Notes:
(1) South pole facing symbolized surface.

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Electrical Characteristics (V_{CC} = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)
OMH3075, OMH3075B, OMH3075S Bi-Polar Latching

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	50 25	150 -	250 275	Gauss	+25°C -55°C & +125°C
B_{RP}	Magnetic Release Point	-250 -275	-150 -	-50 -25	Gauss	+25°C -55°C & +125°C
B_H	Magnetic Hysteresis	100 50	200 -	500 -	Gauss	+25°C -55°C & +125°C
I_{CC}	Supply Current	- -	4 -	7 8	mA	+25°C, V_{CC} = 24 V, Output On, B ≤ 250 Gauss -55°C & +125°C
V_{OL}	Output Saturation Voltage	- - -	- 100 -	500 400 400	mV	-55°C +25°C, V_{CC} = 4.5 V, I_{OL} = 20 mA, B ≥ 250 Gauss +125°C
I_{OH}	Output Leakage Current	-	0.10	1.0	µA	V_{CC}= 24 V, V_{OUT} = 24 V, B ≤ 250 Gauss
t_r	Output Rise Time	-	0.21	1	µs	R_L = 820 Ω, C_L = 20 pF, V_{cc} = 12 V (guaranteed not tested)
t_f	Output Fall Time	-	0.10	1	µs	

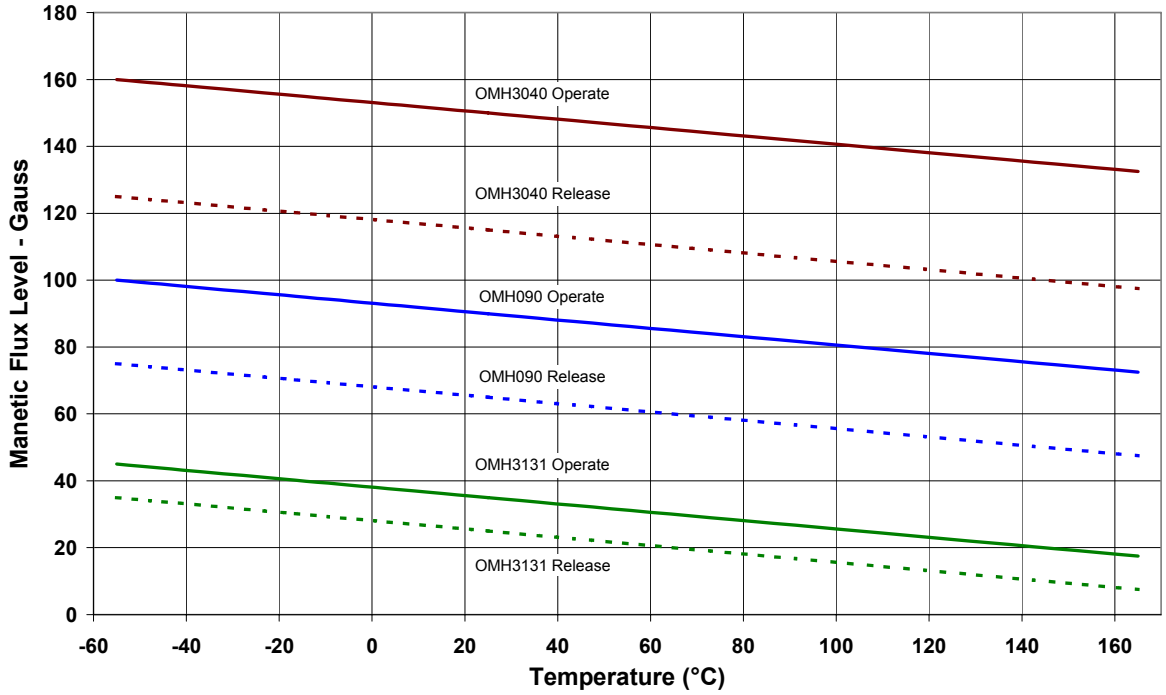
Electrical Characteristics (V_{CC} = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)
OMH3131, OMH3131B & OMS3131S Uni-Polar

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	20 10	- -	95 150	Gauss	+25°C -55°C to +125°C
B_{RP}	Magnetic Release Point	10 5	- -	85 145	Gauss	+25°C -55°C to +125°C
B_H	Magnetic Hysteresis	5 5	- -	40 145	Gauss	+25°C -55°C to +125°C
I_{CC}	Supply Current	-	4	7	mA	V_{CC} = 24 V, Output On, B > 250 Gauss
V_{OL}	Output Saturation Voltage	-	100	400	mV	V_{CC} = 4.5 V, I_{OL} = 15 mA, B ≥ 250 Gauss
I_{OH}	Output Leakage Current	-	0.10	10	µA	V_{CC} = 24 V, V_{OUT} = 24 V, B ≤ 0 Gauss
t_r	Output Rise Time	-	0.21	1	µs	R_L = 820 Ω, C_L = 20 pF, V_{cc} = 12 V (guaranteed not tested)
t_f	Output Fall Time	-	0.10	1	µs	

Notes:
(1) South pole facing symbolized surface.

OMH090, OMH3019, OMH3020, OMH3040, OMH3075, OMH3131 (B, S)

Magnetic Operate & Release Points vs Temperature



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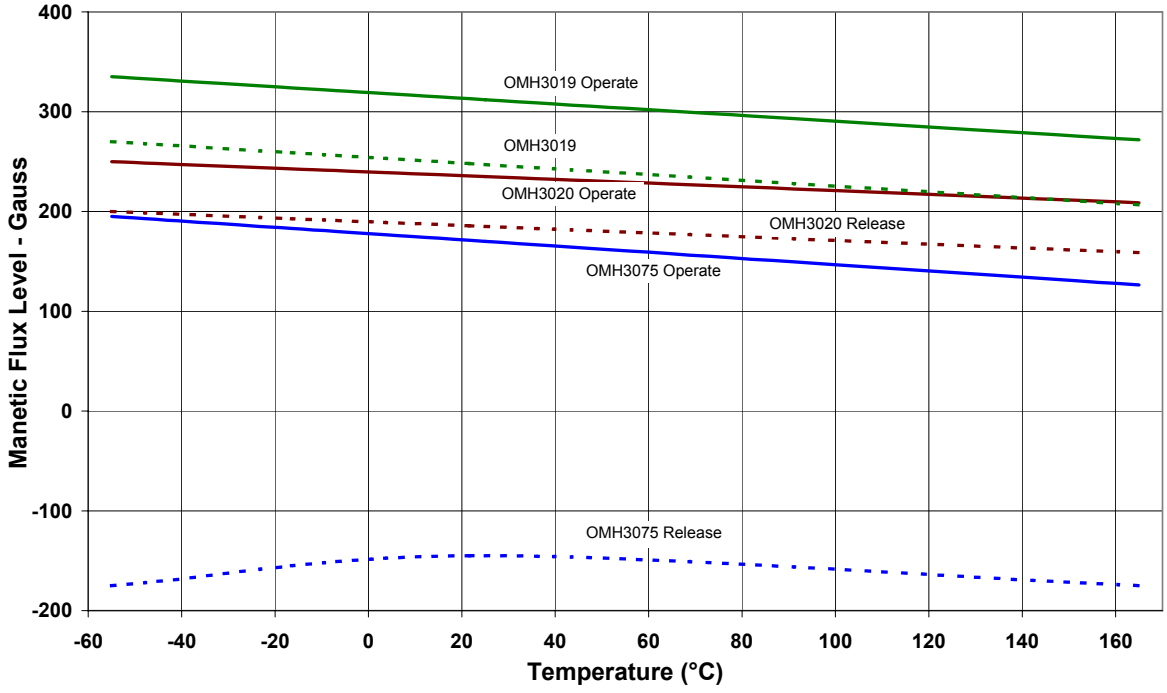

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