THE DATASHEET OF

OHS3120U

Hallogic Hall-Effect Sensors

OH090U, OH180U, OH360U

OHN3000 series, OHS3000 series

OHN3100 series, OHS3100 series

Through Hole

Features:

- Designed for non-contact switching operations
- Operates over broad range of supply voltages (4.5 V to 24 V)
- Operates with excellent temperature stability in harsh environments
- Drive capability up to 7 TTL loads

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 to allow 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 approached the symbolized face of the device (Operating Point) and turns off (logic level “1”) after the magnetic field reached a minimum value. The Bi-Polar latch device turns on (logic level “0”) in the presence of a magnetic south pole and turn 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.

Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

Ordering Information	
Through Hole	**Configuration**
OH090U **OH180U** **OH360U** **OHN3113U** **OHN3019U** **OHS3019U** **OHN3020U** **OHS3020U** **OHN3120U** **OHS3120U** **OHN3030U** **OHS3030U** **OHS3130U** **OHS3131U** **OHN3040U** **OHS3040U** **OHN3140U** **OHS3140U**	Unipolar non-latching

Ordering Information	
Through Hole	**Configuration**
OHN3075U **OHS3075U** **OHN3175U** **OHS3175U** **OHS3177U**	Bi-Polar latching

RoHS

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Electrical Specifications

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

Supply Voltage, Vcc		25 V
Storage Temperature Range, T_S		-65°C to +160°C
Operating Temperature Range, T_A	OHN30_ _U OHS30_ _U OH090/180/360U	-20°C to +85°C -40°C to +125°C -40°C to +150°C
Lead Soldering Temperature (1/8 in. (3.2 mm) from case for 5 sec. 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

Electrical Characteristics (Vcc = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)

OH090U Uni-Polar

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	0	90	180	Gauss	
B_{RP}	Magnetic Release Point	-100	65	100	Gauss	
B_H	Magnetic Hysteresis	10	25	100	Gauss	
Icc	Supply Current	-	6	9	mA	Vcc = 24 V, Output Off
V_{OL}	Output Saturation Voltage	-	100	300	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 180 Gauss
I_{OH}	Output Leakage Current	-	0.5	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ -100 Gauss
t_r	Output Rise Time	-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 14 V
t_f	Output Fall Time	-	0.10	1.00	µs	

OH180U Uni-Polar

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	70	180	290	Gauss	
B_{RP}	Magnetic Release Point	0	140	230	Gauss	
B_H	Magnetic Hysteresis	20	40	120	Gauss	
Icc	Supply Current	-	6	9	mA	Vcc = 24 V, Output Off
V_{OL}	Output Saturation Voltage	-	100	300	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 290 Gauss
I_{OH}	Output Leakage Current	-	0.5	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ 0 Gauss
t_r	Output Rise Time	-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 14 V
t_f	Output Fall Time	-	0.10	1.00	µs	

Notes:
(1) South pole facing symbolized surface.

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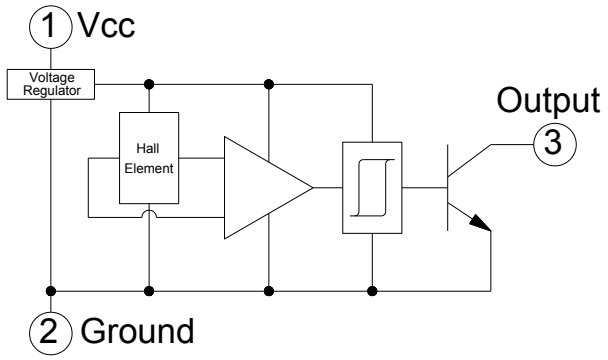
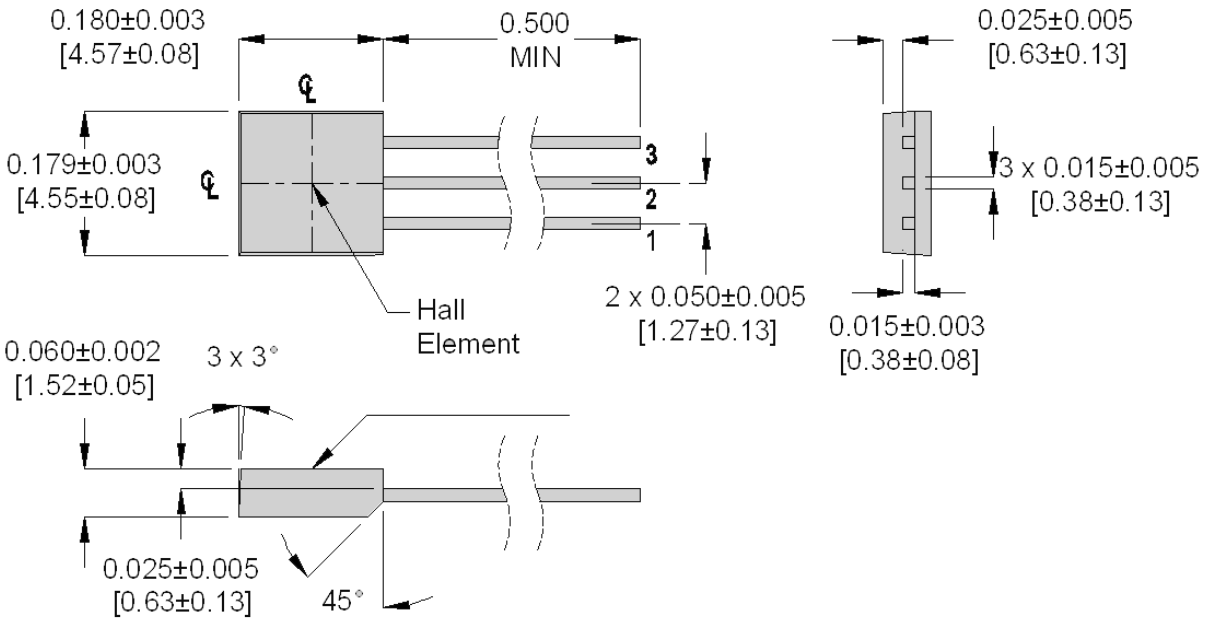


Pin #	Transistor
1	V_{CC}
2	Ground
3	Output



NOTE: The Hall Element is located 0.013" beneath the top surface of the package.
The back of the package is denoted by the 45° angle at the base of the plastic body.

DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

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Electrical Characteristics (Vcc = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)

OH360U Uni-Polar

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	235	300	465	Gauss	
B_{RP}	Magnetic Release Point	120	235	325	Gauss	
B_H	Magnetic Hysteresis	30	65	200	Gauss	
Icc	Supply Current	-	6	9	mA	Vcc = 24 V, Output Off
V_{OL}	Output Saturation Voltage	-	100	300	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 465 Gauss
I_{OH}	Output Leakage Current	-	0.1	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ 120 Gauss
t_r	Output Rise Time	-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 14 V
t_f	Output Fall Time	-	0.10	1.00	µs	

OHN3013U, OHN3113U Uni-Polar

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point(1)	OHN3013 OHN3113	- -	300 -	450 510	Gauss	+25°C -20°C TO 85°C
B_{RP}	Magnetic Release Point	OHN3013 OHN3113	30 20	235 -	- -	Gauss	+25°C -20°C TO 85°C
B_H	Magnetic Hysteresis	OHN3013 OHN3113	20 10	65 -	- -	Gauss	+25°C -20°C TO 85°C
Icc	Supply Current		-	4	7	mA	Vcc = 24 V, Output Off, B ≤ 25 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 450 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ 25 Gauss
t_r	Output Rise Time		-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

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OHN3019U, OHS3019U, OHN3119U, OHS3119U Uni-Polar

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point[(1)]	OH_3019 OHN3119 OHS3119	175 100 45	300 - -	500 545 575	Gauss	+25°C -20°C to +85°C -40°C to +125°C
B_{RP}	Magnetic Release Point	OH_3019 OHN3119 OHS3119	125 50 25	235 - -	450 495 555	Gauss	+25°C -20°C to +85°C -40°C to +125°C
B_H	Magnetic Hysteresis	OH_3019 OHN3119 OHS3119	50 50 20	65 - -	- - -	Gauss	+25°C -20°C to +85°C -40°C to +125°C
Icc	Supply Current		-	4	7	mA	Vcc = 24 V, Output Off, B ≤ 125 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 500 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ 100 Gauss
t_r	Output Rise Time		-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

OHN3020U, OHS3020U, OHN3120U, OHS3120U Uni-Polar

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point[(1)]	OH_3020 OHN3120 OHS3120	70 70 35	230 - -	350 425 450	Gauss	+25°C -20°C to +85°C -40°C to +125°C
B_{RP}	Magnetic Release Point	OH_3020 OHN3120 OHS3120	50 50 25	180 - -	330 405 430	Gauss	+25°C -20°C to +85°C -40°C to +125°C
B_H	Magnetic Hysteresis	OH_3020 OHN3120 OHS3120	20 20 20	50 - -	- - -	Gauss	+25°C -20°C to +85°C -40°C to +125°C
Icc	Supply Current		-	4	7	mA	Vcc = 24 V, Output Off, B ≤ 50 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 350 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ 50 Gauss
t_r	Output Rise Time		-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

Notes:
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Electrical Characteristics (Vcc = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)

OHN3030U, OHS3030U, OHN3130U & OHS3130U Uni-Polar

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point[1]	OH_3030	-	205	250	Gauss	+25°C
		OH_3130	-	-	150		+25°C
		OHN3130	-	-	175		-20°C to +85°C
		OHS3130	-	-	200		-40°C to +125°C
B_{RP}	Magnetic Release Point	OH_3030	0	160	-	Gauss	+25°C
		OH_3130	-150	-	-		+25°C
		OHN3130	-175	-	-		-20°C to +85°C
		OHS3130	-200	-	-		-40°C to +125°C
B_H	Magnetic Hysteresis	OH_3030	20	45	-	Gauss	+25°C
		OH_3130	20	-	-		+25°C
		OHN3130	20	-	-		-20°C to +85°C
		OHS3130	20	-	-		-40°C to +125°C
Icc	Supply Current		-	4	7	mA	Vcc = 24 V, Output Off, B ≤ 0 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 200 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ 50 Gauss
t_r	Output Rise Time		-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

OHN3131U & OHS3131U Uni-Polar

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point[1]	OH_3131	-75	-	95	Gauss	+25°C
		OHN3131	-75	-	95		-20°C to +85°C
		OHS3131	-75	-	135		-40°C to +125°C
B_{RP}	Magnetic Release Point	OH_3031	-95	-	85	Gauss	+25°C
		OHN3131	-59	-	85		-20°C to +85°C
		OHS3131	-135	-	125		-40°C to +125°C
B_H	Magnetic Hysteresis	OH_3031	10	-	-	Gauss	+25°C
		OHN3131	10	-	-		-20°C to +85°C
		OHS3131	10	-	-		-40°C to +125°C
Icc	Supply Current		-	4	7	mA	Vcc = 24 V, Output Off, B ≤ 0 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 200 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ 50 Gauss
t_r	Output Rise Time		-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

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OHN3040U, OHS3040U, OHN3140U, OHS3140U Uni-Polar

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point[1]	OH_3040 OHN3140 OHS3140	70 45 45	150 - -	220 260 270	Gauss	+25°C -20°C to +85°C -40°C to +125°C
B_{RP}	Magnetic Release Point	OH_3040 OHN3140 OHS3140	50 25 25	115 - -	180 240 250	Gauss	+25°C -20°C to +85°C -40°C to +125°C
B_H	Magnetic Hysteresis	OH_3040 OHN3140 OHS3140	20 20 20	35 - -	- - -	Gauss	+25°C -20°C to +85°C -40°C to +125°C
Icc	Supply Current		-	4	7	mA	Vcc = 24 V, Output Off, B ≤ -50 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 200 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ -50 Gauss
t_r	Output Rise Time		-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

OHN3075U, OHS3075U, OHN3175U, OHS3175U Bi-Polar Latch

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point[1]	OH_3075 OH_3175 OHN3175 OHS3175	50 25 15 10	100 - - -	250 170 180 260	Gauss	+25°C +25°C -20°C to +85°C -40°C to +125°C
B_{RP}	Magnetic Release Point	OH_3075 OH_3175 OHN3175 OHS3175	-250 -170 -180 -260	-100 - - -	-50 -25 -15 -10	Gauss	+25°C +25°C -20°C to +85°C -40°C to +125°C
B_H	Magnetic Hysteresis	OH_3075 OH_3175 OHN3175 OHS3175	100 100 80 50	200 - - -	500 - - -	Gauss	+25°C +25°C -20°C to +85°C -40°C to +125°C
Icc	Supply Current		-	4	7	mA	Vcc = 24 V, Output Off, B ≤ -250 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 250 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ -250 Gauss
t_r	Output Rise Time		-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

Notes:
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Electrical Characteristics (Vcc = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)

OHN3177U, OHS3177U Bi-Polar Latch

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP}	Magnetic Operate Point[(1)]	OH_3177	50	-	150	Gauss	+25°C
		OHN3177	25	-	150		-20°C to +85°C
		OHS3177	25	-	200		-40°C to +125°C
B_{RP}	Magnetic Release Point	OH_3177	-150	-	-50	Gauss	+25°C
		OHN3177	-150	-	-25		-20°C to +85°C
		OHS3177	-200	-	-25		-40°C to +125°C
B_H	Magnetic Hysteresis	OH_3177	100	-	-	Gauss	+25°C
		OHN3177	50	-	-		-20°C to +85°C
		OHS3177	50	-	-		-40°C to +125°C
Icc	Supply Current		-	4	7	mA	Vcc = 24 V, Output Off, B ≤ -250 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	Vcc = 4.5 V, I_{OL} = 20 mA, B ≥ 250 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	Vcc = 24 V, V_{OUT} = 24 V, B ≤ -250 Gauss
t_r	Output Rise Time		-	0.21	1.00	µs	R_L = 820 Ω, C_L = 20 pF, Vcc = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

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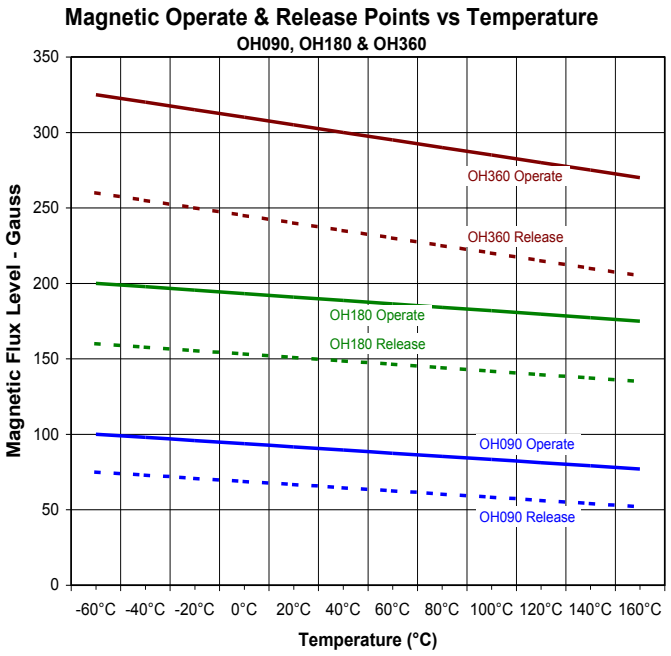
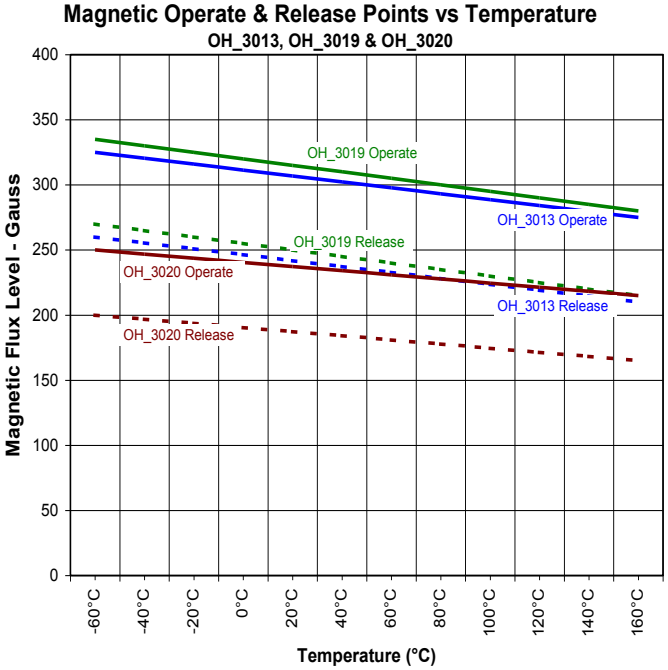
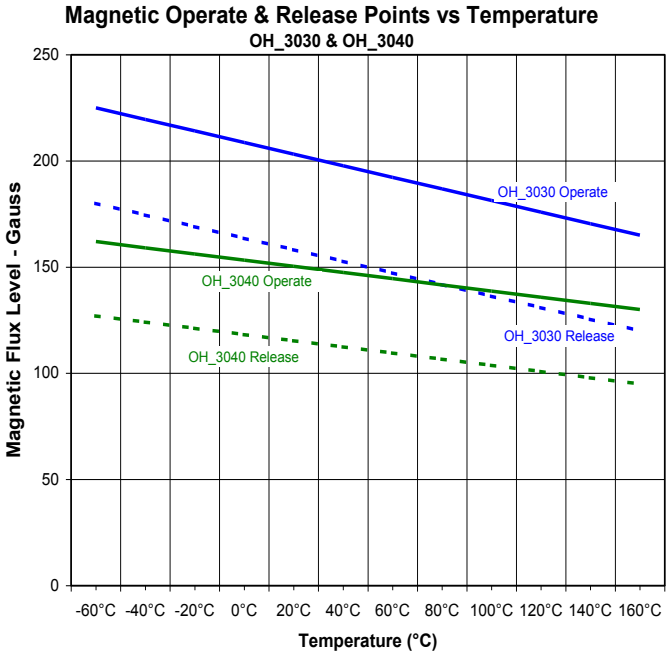
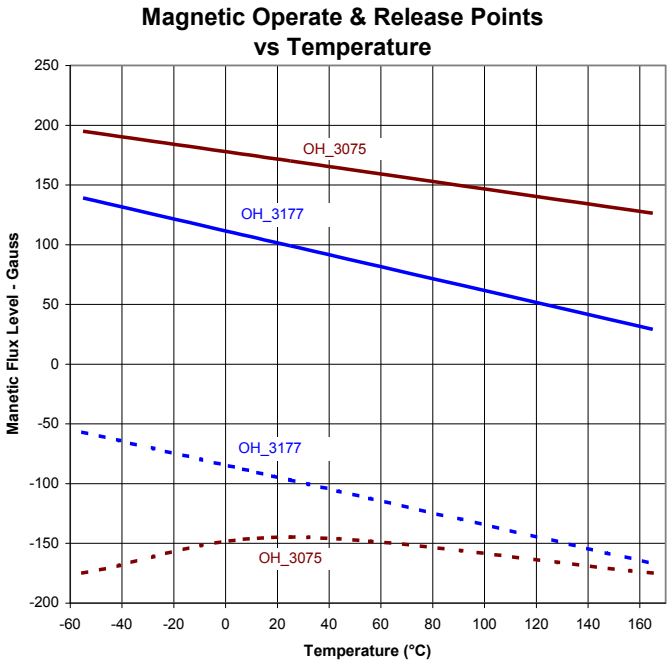
Typical Operate & Release Points









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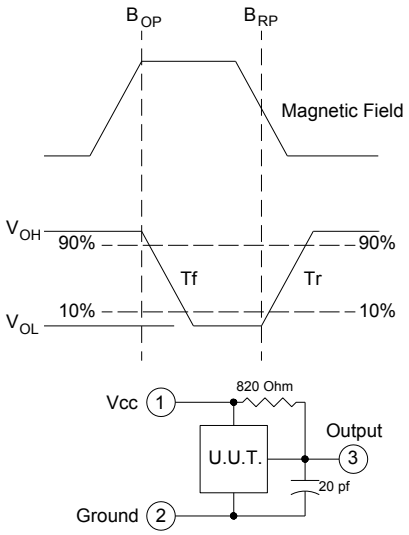

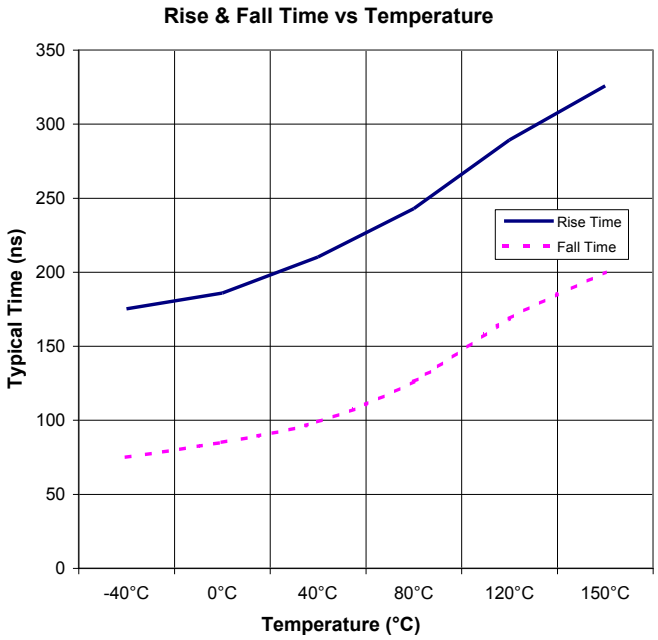

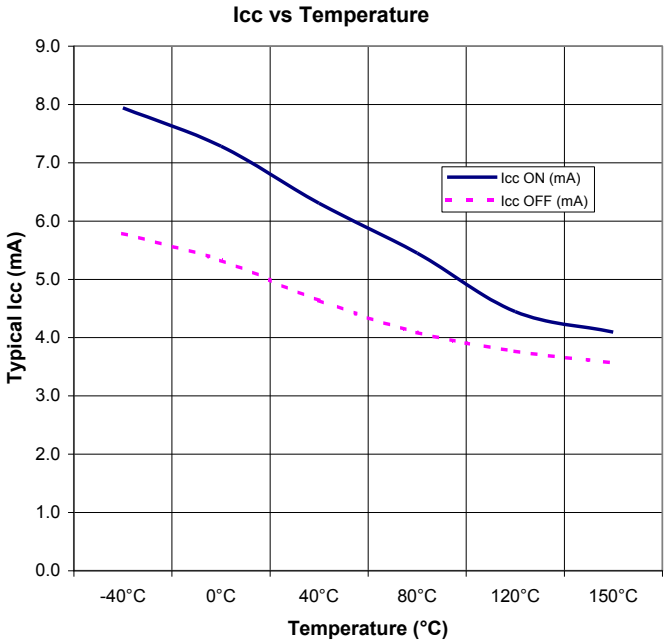

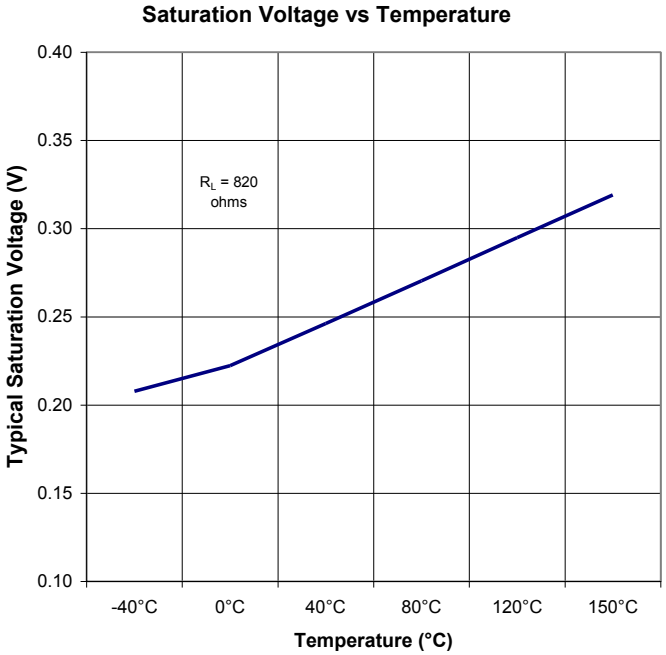

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