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

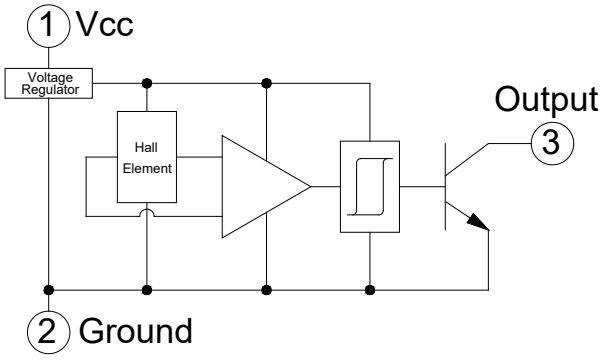
Ordering Information	
Through Hole	**Configuration**
OH090U **OH180U** **OH360U** **OHN3020U** **OHS3020U** **OHN3120U** **OHS3120U** **OHS3030U** **OHS3131U** **OHN3040U** **OHS3040U** **OHN3140U** **OHS3140U**	Uni-Polar non-latching

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

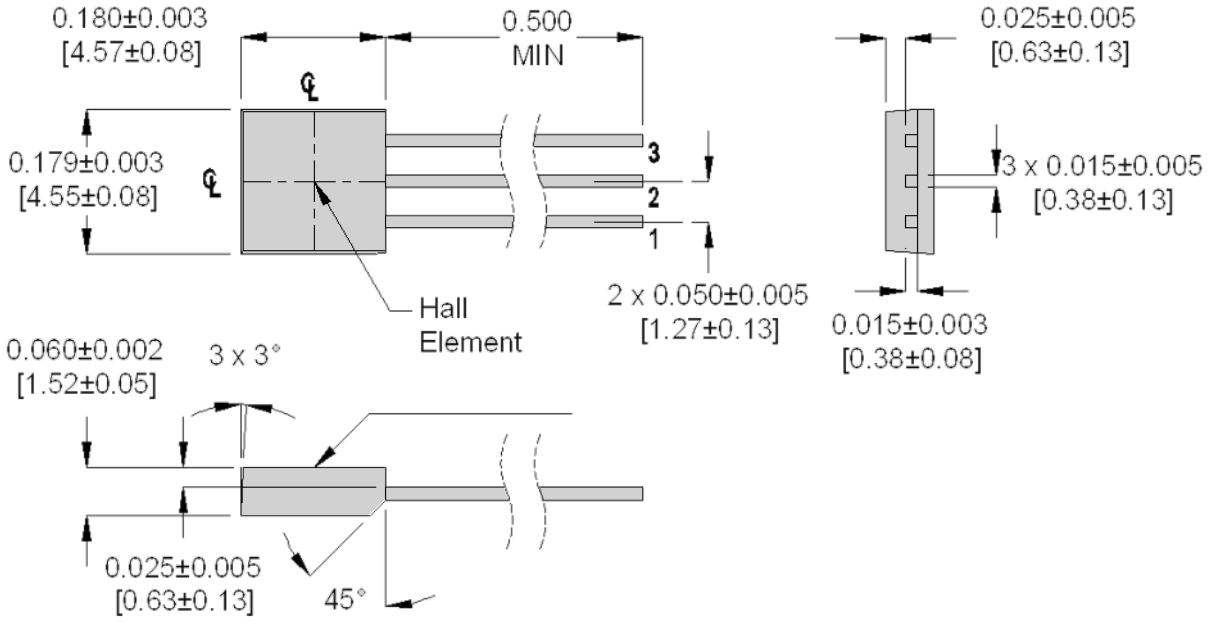
RoHS

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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 Specifications

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

Supply Voltage, V_{CC}		25 V
Storage Temperature Range, T_S		-50° 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) (1)		260° C
Output ON Current, I_{SINK}		25 mA
Output OFF Voltage, V_{OUT}		25 V
Magnetic Flux Density, B		Unlimited

Electrical Characteristics (V_{CC} = 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} (1)	Magnetic Operate Point	0	90	180	Gauss	
B_{RP}	Magnetic Release Point	-100	65	100	Gauss	
B_H	Magnetic Hysteresis	10	25	100	Gauss	
I_{CC}	Supply Current	-	6	9	mA	V_{CC} = 24 V, Output Off
V_{OL}	Output Saturation Voltage	-	100	300	mV	V_{CC} = 4.5 V, I_{OL} = 20 mA, B ≥ 180 Gauss
I_{OH}	Output Leakage Current	-	0.5	10.0	µA	V_{CC} = 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, V_{CC} = 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} (1)	Magnetic Operate Point	70	180	290	Gauss	
B_{RP}	Magnetic Release Point	0	140	230	Gauss	
B_H	Magnetic Hysteresis	20	40	120	Gauss	
I_{CC}	Supply Current	-	6	9	mA	V_{CC} = 24 V, Output Off
V_{OL}	Output Saturation Voltage	-	100	300	mV	V_{CC} = 4.5 V, I_{OL} = 20 mA, B ≥ 290 Gauss
I_{OH}	Output Leakage Current	-	0.5	10.0	µA	V_{CC} = 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, V_{CC} = 14 V
t_f	Output Fall Time	-	0.10	1.00	µs	

Notes:
(1) South pole facing symbolized surface.

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Electrical Specifications

Electrical Characteristics (V_{CC} = 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} (1)	Magnetic Operate Point	235	300	465	Gauss	
B_{RP}	Magnetic Release Point	120	235	325	Gauss	
B_H	Magnetic Hysteresis	30	65	200	Gauss	
I_{CC}	Supply Current	-	6	9	mA	V_{CC} = 24 V, Output Off
V_{OL}	Output Saturation Voltage	-	100	300	mV	V_{CC} = 4.5 V, I_{OL} = 20 mA, B ≥ 465 Gauss
I_{OH}	Output Leakage Current	-	0.1	10.0	µA	V_{CC} = 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, V_{CC} = 14 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} (1)	Magnetic Operate Point	OH_3020	70	230	350	Gauss	+25° C
		OHN3120	70	-	425		-20° C to +85° C
		OHS3120	35	-	450		-40° C to +125° C
B_{RP}	Magnetic Release Point	OH_3020	50	180	330	Gauss	+25° C
		OHN3120	50	-	405		-20° C to +85° C
		OHS3120	25	-	430		-40° C to +125° C
B_H	Magnetic Hysteresis	OH_3020	20	50	-	Gauss	+25° C
		OHN3120	20	-	-		-20° C to +85° C
		OHS3120	20	-	-		-40° C to +125° C
I_{CC}	Supply Current		-	4	7	mA	V_{CC} = 24 V, Output Off, B ≤ 50 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	V_{CC} = 4.5 V, I_{OL} = 20 mA, B ≥ 350 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	V_{CC} = 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, V_{CC} = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

Notes:

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Electrical Specifications

Electrical Characteristics (V_{CC} = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)

OHS3030U Uni-Polar

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP} (1)	Magnetic Operate Point	-	205	250	Gauss	+25° C
B_{RP}	Magnetic Release Point	0	160	-	Gauss	+25° C
B_H	Magnetic Hysteresis	20	45	-	Gauss	+25° C
I_{CC}	Supply Current	-	4	7	mA	V_{CC} = 24 V, Output Off, B ≤ 0 Gauss
V_{OL}	Output Saturation Voltage	-	100	400	mV	V_{CC} = 4.5 V, I_{OL} = 20 mA, B ≥ 200 Gauss
I_{OH}	Output Leakage Current	-	0.1	10.0	µA	V_{CC} = 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, V_{CC} = 12 V
t_f	Output Fall Time	-	0.10	1.00	µs	

OHS3131U Uni-Polar

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP} (1)	Magnetic Operate Point	OHS3131 OHS3131	-75 -75	- -	95 135	Gauss	+25° C -40° C to +125° C
B_{RP}	Magnetic Release Point	OHS3131 OHS3131	-95 -135	- -	85 125	Gauss	+25° C -40° C to +125° C
B_H	Magnetic Hysteresis	OHS3131 OHS3131	10 10	- -	- -	Gauss	+25° C -40° C to +125° C
I_{CC}	Supply Current		-	4	7	mA	V_{CC} = 24 V, Output Off, B ≤ 0 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	V_{CC} = 4.5 V, I_{OL} = 20 mA, B ≥ 200 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	V_{CC} = 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, V_{CC} = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

Notes:

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Electrical Specifications

Electrical Characteristics (V_{CC} = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)

OHN3040U, OHS3040U, OHN3140U, OHS3140U Uni-Polar

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP} (1)	Magnetic Operate Point	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
I_{CC}	Supply Current		-	4	7	mA	V_{CC} = 24 V, Output Off, B ≤ -50 Gauss
V_{OL}	Output Saturation Voltage		-	100	400	mV	V_{CC} = 4.5 V, I_{OL} = 20 mA, B ≥ 200 Gauss
I_{OH}	Output Leakage Current		-	0.1	10.0	µA	V_{CC} = 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, V_{CC} = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

OHS3075U, OHS3175U Bi-Polar Latch

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP} (1)	Magnetic Operate Point	OHS3075 OHS3175 OHS3175	50 25 10	100 - -	250 170 260	Gauss	+25° C +25° C -40° C to +125° C
B_{RP}	Magnetic Release Point	OHS3075 OHS3175 OHS3175	-250 -170 -260	-100 - -	-50 -25 -10	Gauss	+25° C +25° C -40° C to +125° C
B_H	Magnetic Hysteresis	OHS3075 OHS3175 OHS3175	100 100 50	200 - -	500 - -	Gauss	+25° C +25° C -40° C to +125° C
I_{CC}	Supply Current		-	4	7	mA	V_{CC} = 24 V, Output Off, B ≤ -250 Gauss
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		-	0.1	10.0	µA	V_{CC} = 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, V_{CC} = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

Notes:

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Electrical Specifications

Electrical Characteristics (V_{CC} = 4.5 V to 24 V, T_A = 25° C unless otherwise noted)

OHS3177U Bi-Polar Latch

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
B_{OP} (1)	Magnetic Operate Point	OHS3177 OHS3177	50 25	- -	150 200	Gauss	+25° C -40° C to +125° C
B_{RP}	Magnetic Release Point	OHS3177 OHS3177	-150 -200	- -	-50 -25	Gauss	+25° C -40° C to +125° C
B_H	Magnetic Hysteresis	OHS3177 OHS3177	100 50	- -	- -	Gauss	+25° C -40° C to +125° C
I_{CC}	Supply Current		-	4	7	mA	V_{CC} = 24 V, Output Off, B ≤ -250 Gauss
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		-	0.1	10.0	µA	V_{CC} = 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, V_{CC} = 12 V
t_f	Output Fall Time		-	0.10	1.00	µs	

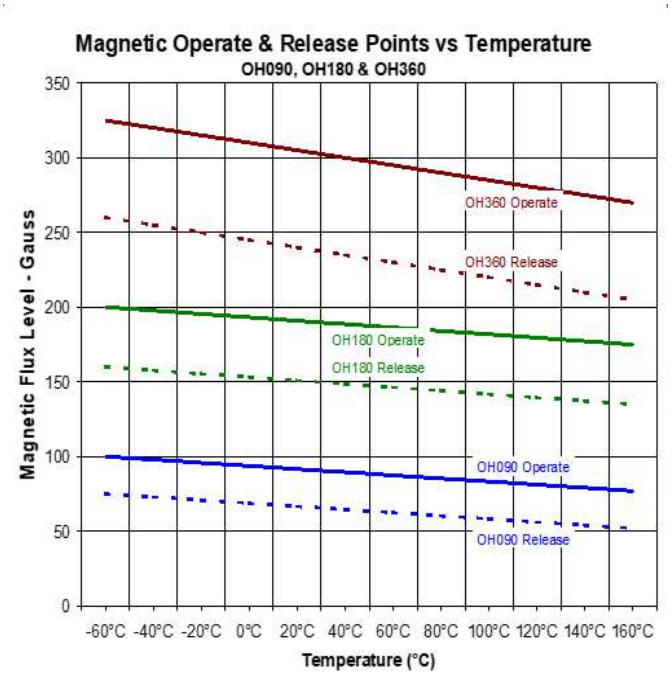
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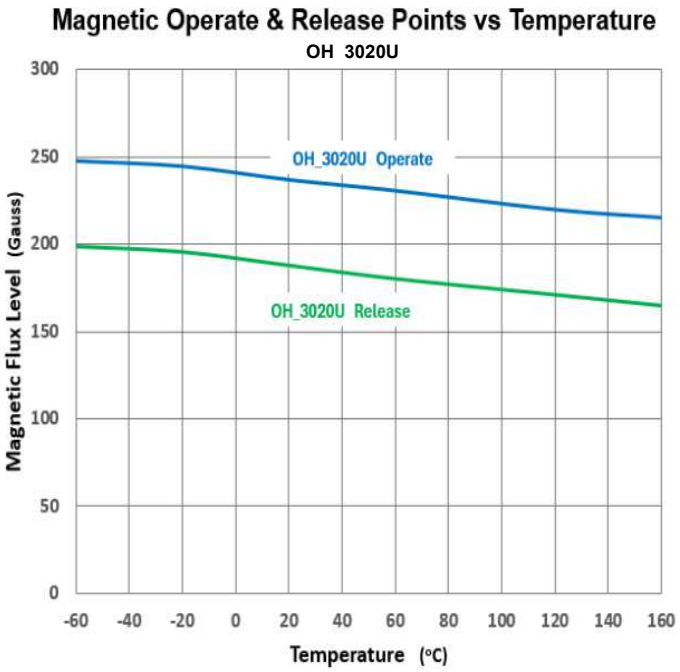
(1) South pole facing symbolized surface.

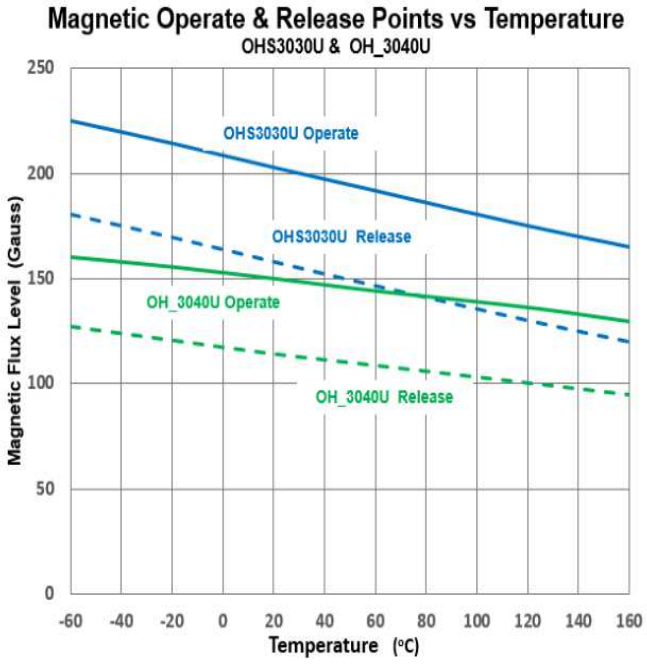
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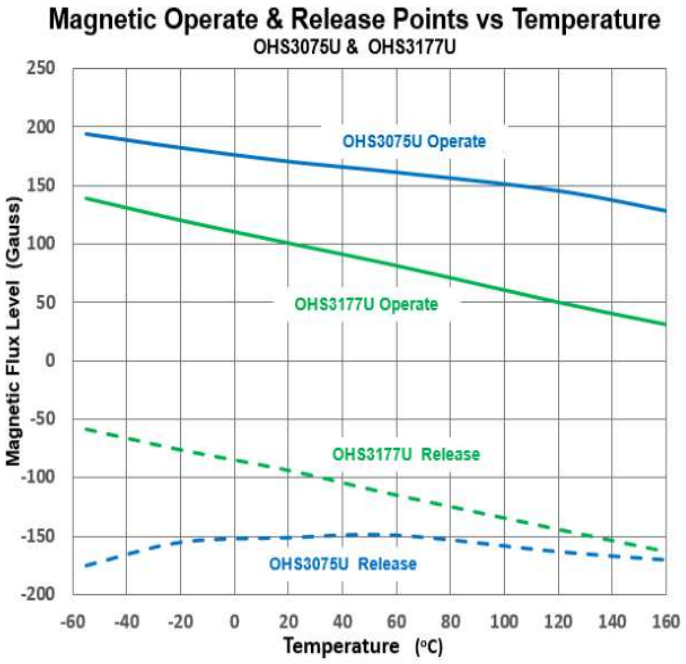
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Typical Operate & Release Points





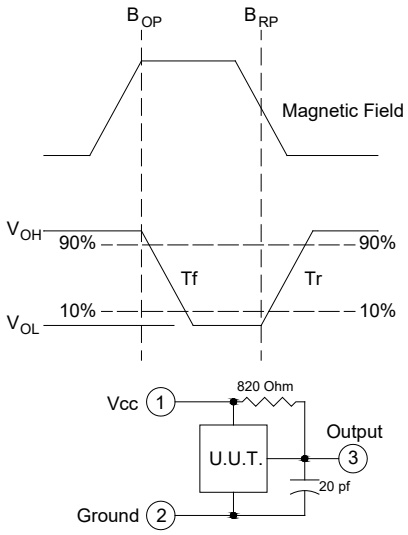


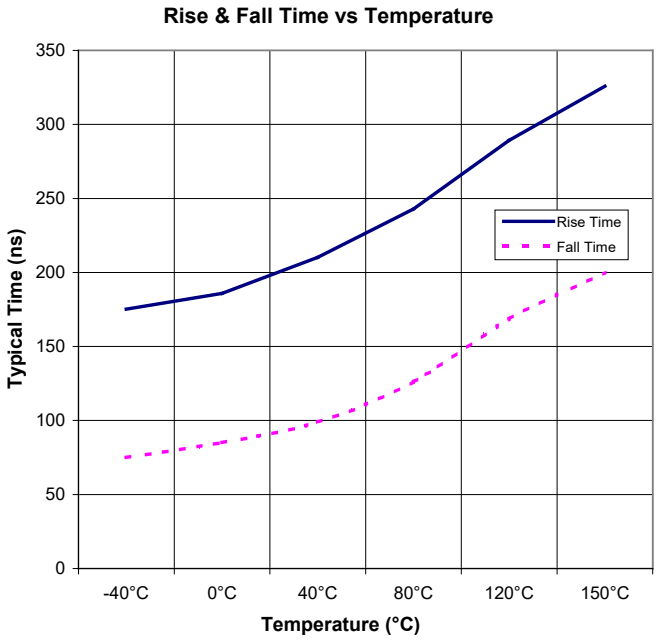


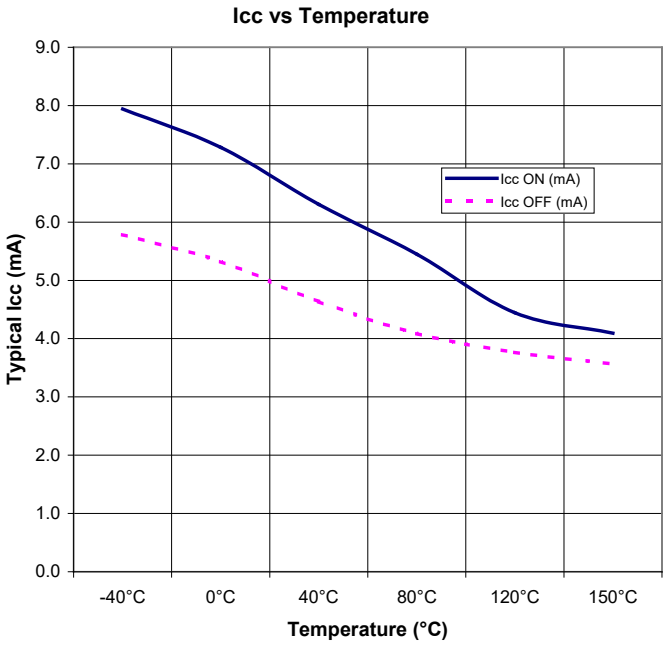
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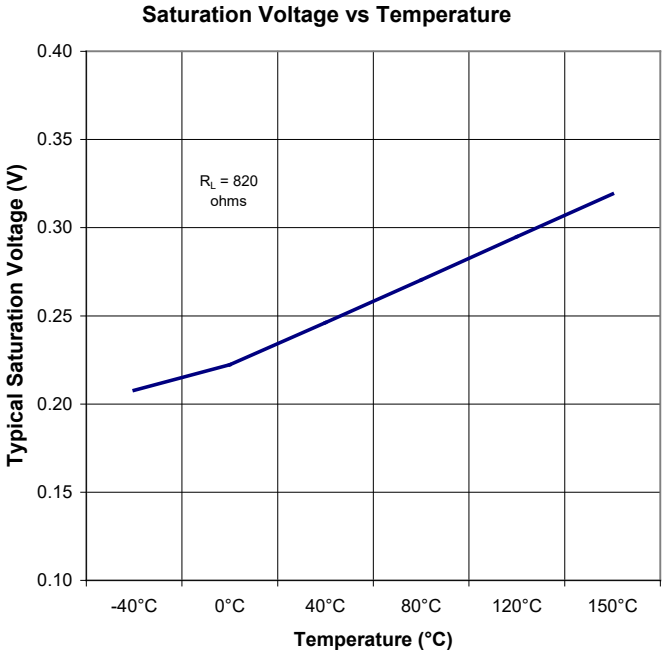
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Typical Performance









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