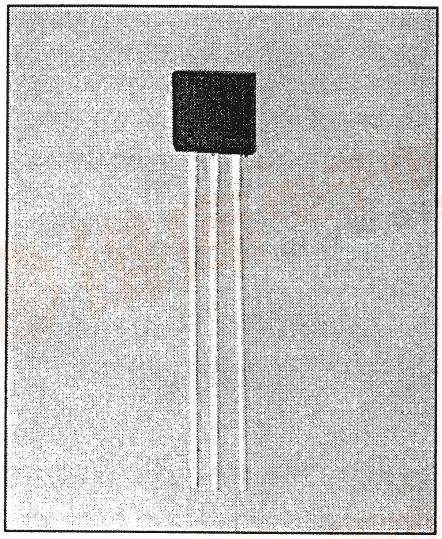
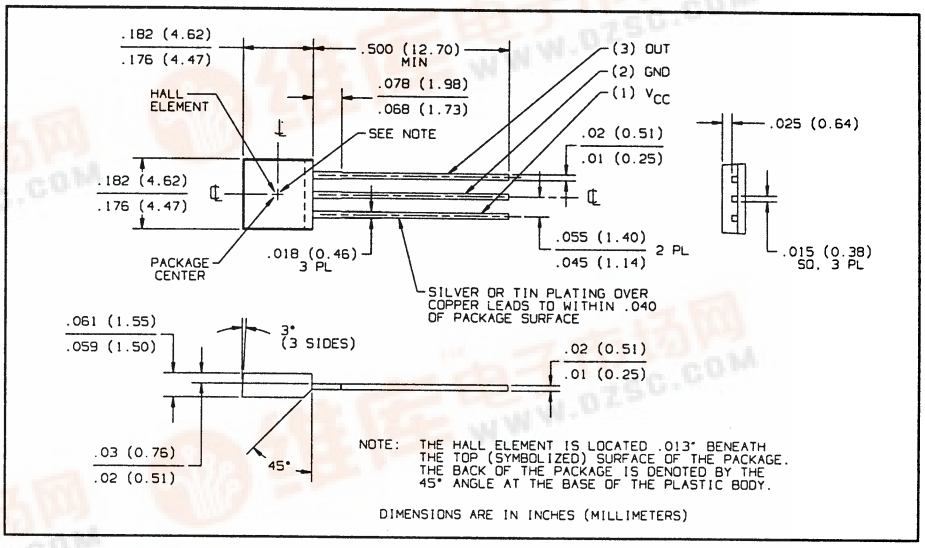
OPTEK

Product Bulletin OHN3140U
May 1996

Hallogic® Hall Effect Sensors
Types OHN3140U, OHS3140U





Features

- Operates over a broad range of supply voltages
- Excellent temperature stability to operate in harsh environments
- Drive capability up to 7 TTL loads
- Hall element, linear amplifier, and Schmitt trigger on a single Hallogic® silicon chip

Description

The OHN3140U and OHS3140U each contain a monolithic integrated circuit which incorporates a Hall element, a linear amplifier, and Schmitt trigger on a single silicon chip. Included on-chip is a bandgap voltage regulator to allow operation with a wide range of supply voltages. The devices feature logic level output and provides 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.

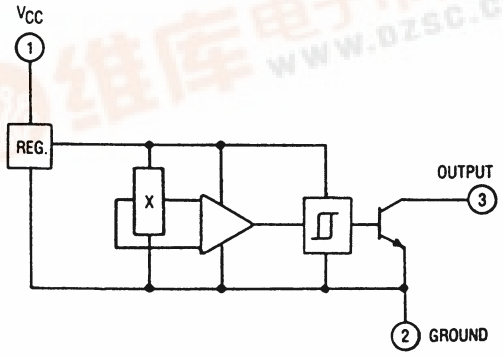
Package size has been kept to minimum, providing an advantage in applications where space is limited.

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

Supply Voltage, V_{CC}	25 V
Storage Temperature Range, T_S	-65° C to +160° C
Operating Temperature Range, T_A OHN3140U	-20° C to +85° C
OHS3140U	-40° C to +125° C
Lead Soldering Temperature [1/8 inch (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

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

Functional Block Diagram



Types OHN3140U, OHS3140U

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
I_{CC}	Supply Current		4	7	mA	V_{CC} = 24 V, Output Off
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} = 4.5 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
t_f	Output Fall Time		0.25	1.00	µs	

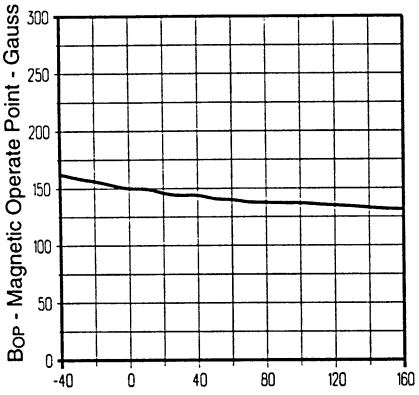
Magnetic Characteristics

		T_A = 25° C		T_A = -20° C to 85° C		T_A = -40° C to 125° C		
CHARACTERISTICS	SYMBOL	MIN	MAX	MIN	MAX	MIN	MAX	UNITS
Operate Point(2)	B_{OP}	70	200	45	260	45	270	G
Release Point	B_{RP}	50	180	25	240	25	250	G
Hysteresis	B_H	20		20		20		G

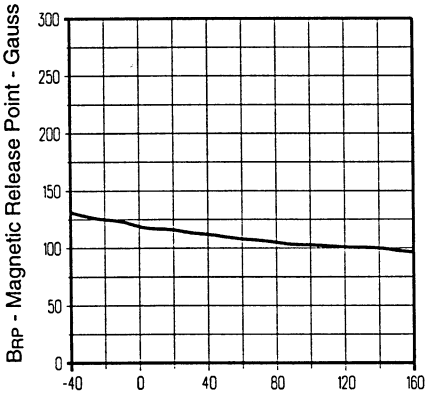
(2) South pole facing symbolized surface.

Typical Performance Curves

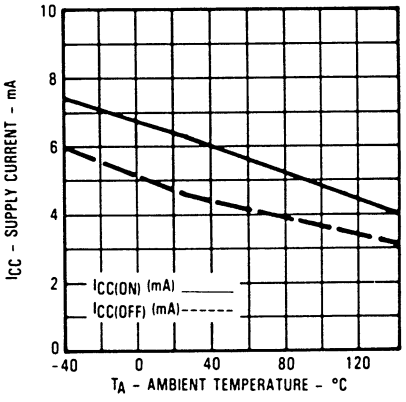
Magnetic Operate Point vs Ambient Temperature



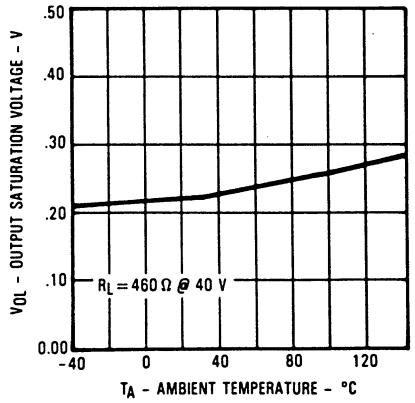
Magnetic Release Point vs Ambient Temperature



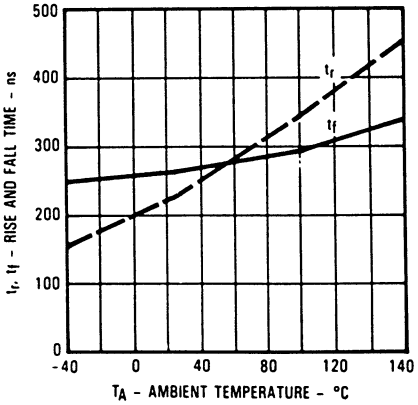
Supply Current vs Ambient Temperature



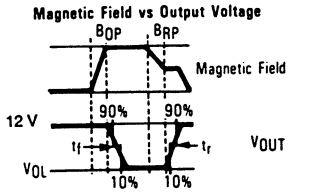
Output Saturation Voltage vs Ambient Temperature



Rise and Fall Time vs Ambient Temperature



Rise and Fall Time Tests



Rise and Fall Time Test Circuit