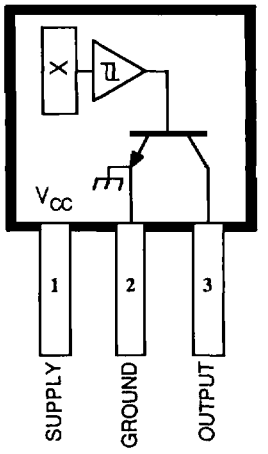
SERIES 3100

HALL EFFECT SWITCHES



Dwg PH-003

Pinning is shown viewed from branded side.

These Hall effect switches are highly temperature-stable and stress-resistant sensors best utilized in applications that provide steep magnetic slopes and low residual levels of magnetic flux density.

Each device includes a voltage regulator, quadratic Hall voltage generator, temperature stability circuit, signal amplifier, Schmitt trigger, and open-collector output on a single silicon chip. The on-board regulator permits operation with supply voltages of 4.5 to 24 volts. The switch output can sink up to 20 mA. With suitable output pull up, they can be used directly with bipolar or MOS logic circuits.

The 'HH' package (TO-260AA) provides a magnetically optimized hermetic package for military and similar applications. Selected devices, for operation to +170°C, are available on special order.

FEATURES

- 4.5 V to 24 V Operation
- Activate With Small, Commercially Available Permanent Magnets
- Solid-State Reliability... No Moving Parts
- Small Size
- Constant Output Amplitude
- Superior Temperature Stability
- Resistant to Physical Stress

ABSOLUTE MAXIMUM RATINGS

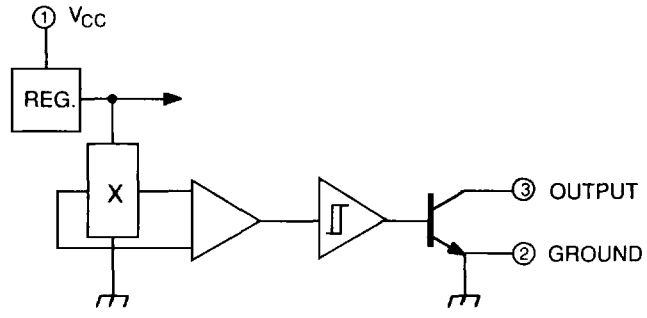
Supply Voltage, V_{CC} . . . . . **25 V**
Magnetic Flux Density, B . . . . . **Unlimited**
Output OFF Voltage, V_{OUT} . . . . . **25 V**
Continuous Output Current, I_{OUT} . . . . **25 mA**
Operating Temperature Range,
T_A . . . . . **-40°C to +125°C**
Storage Temperature Range,
T_S . . . . . **-65°C to +150°C***

* Devices can be stored at +200°C for short periods of time.

These devices are NON-COMPLIANT regarding MIL-STD-883C because of moisture resistance test method.

Always order by complete part number including prefix and suffix, e.g., **UGS3119HHMIL**. See Magnetic Characteristics table for differences between devices.

FUNCTIONAL BLOCK DIAGRAM



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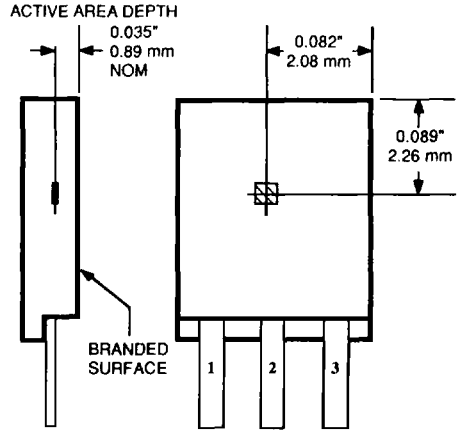
SENSOR LOCATION



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ELECTRICAL CHARACTERISTICS at T_A = +25°C, V_{CC} = 4.5 V to 24 V (unless otherwise noted).

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Supply Voltage	V_{CC}	Operating	4.5	—	24	V
Output Saturation Voltage	$V_{OUT(SAT)}$	I_{OUT} = 20 mA, B > B_{OP}	—	150	400	mV
Output Leakage Current	I_{OFF}	V_{OUT} = 24 V, B < B_{RP}	—	<1.0	10	µA
Supply Current	I_{CC}	V_{CC} = 4.5 V, Output Open	—	4.7	8.0	mA
Output Rise Time	t_r	V_{CC} = 12 V, R_L = 820 Ω, C_L = 20 pF	—	0.04	2.0	µs
Output Fall Time	t_f	V_{CC} = 12 V, R_L = 820 Ω, C_L = 20 pF	—	0.18	2.0	µs

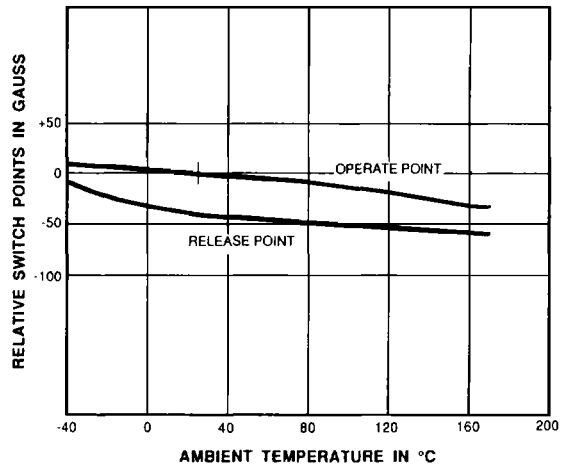
MAGNETIC CHARACTERISTICS in gauss

Characteristic	Part Number	T_A = +25°C		T_A = -20°C to +85°C*		T_A = -40°C to +125°C	
		Min.	Max.	Min.	Max.	Min.	Max.
Operate Point, B_{OP}	UGS3119HH	175	500	100	545	45	575
	UGS3120HH	70	350	70	425	35	450
	UGS3130HH	—	150	—	175	—	200
	UGS3140HH	70	200	45	260	45	270
Release Point, B_{RP}	UGS3119HH	125	450	50	495	25	555
	UGS3120HH	50	330	50	405	25	430
	UGS3130HH	-150	—	-175	—	-200	—
	UGS3140HH	50	180	25	240	25	250
Hysteresis, B_{hys}	UGS3119HH	50	—	50	—	20	—
	UGS3120HH	20	—	20	—	20	—
	UGS3130HH	20	—	20	—	20	—
	UGS3140HH	20	—	20	—	20	—

NOTE: As used here, negative flux densities are defined as less than zero (algebraic convention).

* These characteristics, although guaranteed, are not tested.

TYPICAL CHARACTERISTICS AS FUNCTIONS OF TEMPERATURE



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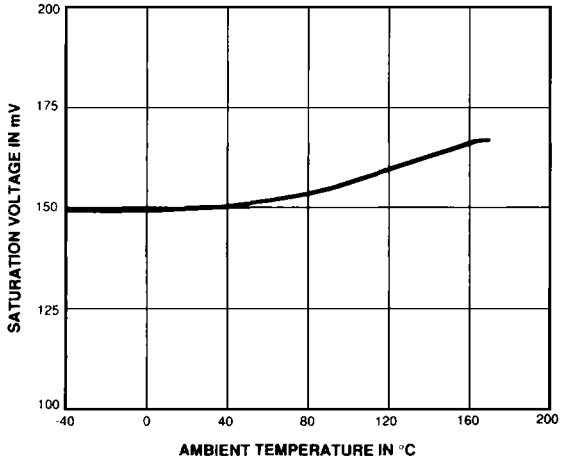
OUTPUT SATURATION VOLTAGE



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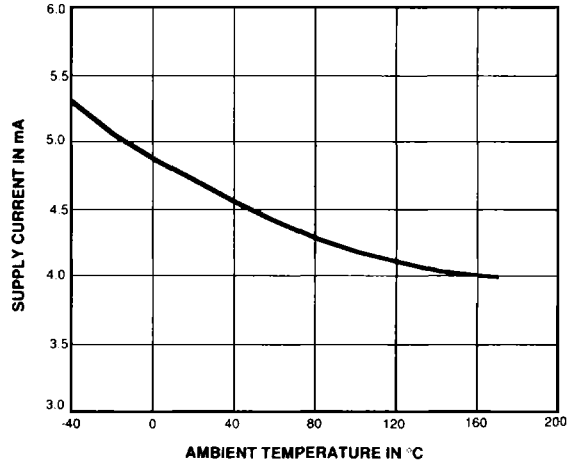
SUPPLY CURRENT



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