HALL-EFFECT SWITCHES

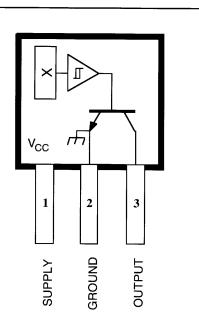
These Hall-effect switches are highly temperature stable and stressresistant sensors best utilized in applications that provide steep magnetic slopes and low residual levels of magnetic flux density.

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 four package styles available provide a magnetically optimized package for most applications. Suffix LT is a surface-mount SOT-89 (TO-243AA) package; suffixes LL, U, and UA feature wire leads for through-hole mounting.

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 Stess
- Directly Replace ServiceN and UGS 300 /U Switches



Dwg. PH-003

Pinning is shown viewed from branded side.

ABSOLUTE MAXIMUM RATINGS

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

Always order by complete part number, e.g., **UGN3113UA**. See Magnetic Characteristics table for differences between devices.



3113, 3120, 3130, and 3140 HALL-EFFECT SWITCHES

ELECTRICAL CHARACTERISTICS at T $_{\rm A}$ + +25°C, V $_{\rm CC}$ = 4.5 V to 24 V (unless otherwise noted).

			Limits			
Characteristic	Symbol	Test Conditions	Min.	Тур.	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	μА
Supply Current	I _{cc}	V _{CC} = 4.5 V, Output Open	_	4.7	8.0	mA
Output Rise Time	t _r	$V_{CC} = 12 \text{ V}, R_L = 820 \Omega, C_L = 20 \text{ pF}$		0.04	2.0	μs
Output Fall Time	t _f	$V_{CC} = 12 \text{ V}, R_L = 820 \Omega, C_L = 20 \text{ pF}$	-	0.18	2.0	μs

MAGNETIC CHARACTERISTICS in gauss

Characteristic	Part Number*	T _A = ·	+25°C Max.	T _A = -20°0 Min.	C to +85°C Max.	T _A = -40°C Min.	to +125°C [†] Max.
Operate Point, B _{OP}	3113	<u> </u>	450	_	510	_	
OP OP	3120	70	350	70	425	35	450
	3130	_	150		175	_	200
	3140	70	200	45	260	45	270
Release Point, B _{RP}	3113	30		20	_		_
	3120	50	330	50	405	25	430
	3130	-150	_	-175	_	-200	_
	3140	50	180	25	240	25	250
Hysteresis, B _{hys}	3113	20	_	10	_	_	_
	3120	20		20	_	20	_
	3130	20	_	20	_	20	
	3140	20		20	_	20	_

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

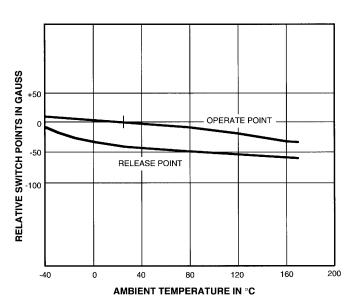


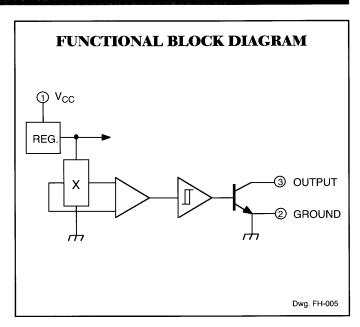
^{*} Complete part number includes a prefix denoting operating temperature range (UGN or UGS) and a suffix denoting package type (LL, LT, U, or UA).

[†] Applicable to prefix UGS devices only (available with all devices except 3113).

3113, 3120, 3130, and 3140 HALL-EFFECT SWITCHES

TYPICAL CHARACTERISTICS AS FUNCTIONS OF TEMPERATURE

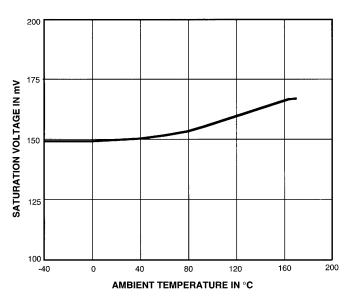




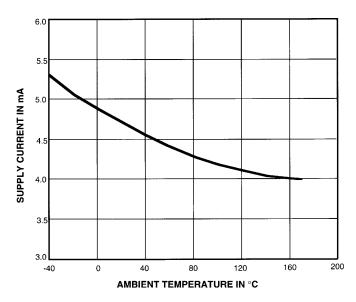
Dwg. GH-018

TYPICAL CHARACTERISTICS AS FUNCTIONS OF TEMPERATURE

OUTPUT SATURATION VOLTAGE



SUPPLY CURRENT



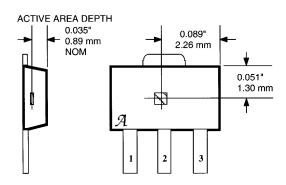
Dwg. GH-013

Dwg. GH-014

SENSOR LOCATIONS

(±0.005" [0.13mm] die placement)

SUFFIX "LL" AND "LT"

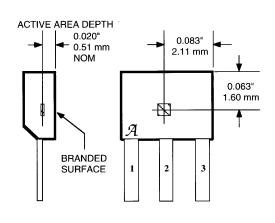


Dwg. MH-008A

SUFFIX "U"

ACTIVE AREA DEPTH 0.017" 0.43 mm NOM 2.34 mm 0.080" 2.03 mm BRANDED SURFACE 1 2 3

SUFFIX "UA"



Dwg. MH-002-1A

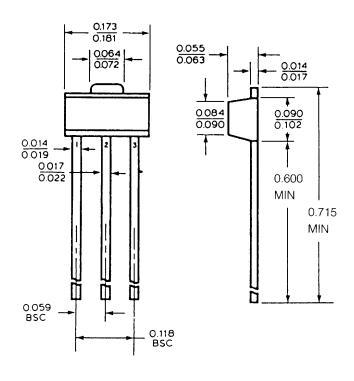
Dwg. MH-011-1A

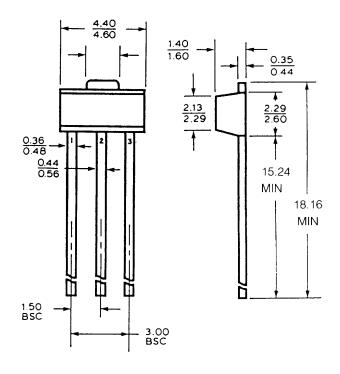


PACKAGE DESIGNATOR LL

Dimensions in Inches (Based on 1 mm = 0.394")

Dimensions in Millimeters





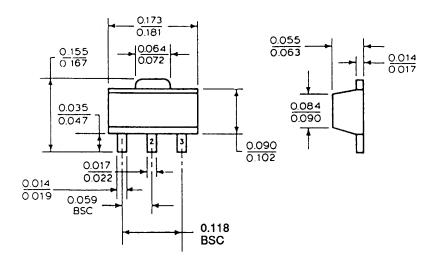
Dwg. No. A-12,657A in

Dwg. No. A-12,657A mm

3113, 3120, 3130, and 3140 HALL-EFFECT SWITCHES

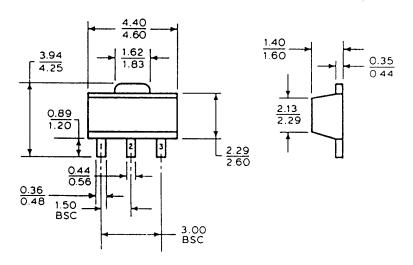
PACKAGE DESIGNATOR LT

Dimensions in Inches (Based on 1 mm = 0.394")



Dwg. No. A-12,608A in

Dimensions in Millimeters



Dwg. No. A-12,608A mm



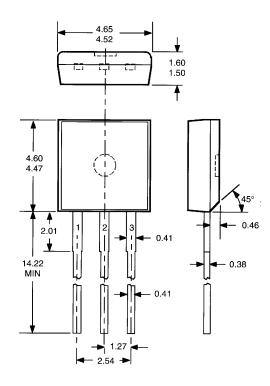
3113, 3120, 3130, and 3140 *HALL-EFFECT SWITCHES*

PACKAGE DESIGNATOR U

Dimensions in Inches

0.183 0.178 0.063 0.059 0.181 0.176 0.018 0.079 0.016 ᆂ 0.560 0.015 0.016 0.100

Dimensions in Millimeters (Based on 1" = 2.54 mm)



Dwg. MH-003A in

Dwg. MH-003A mm

- NOTES: 1. Tolerances on package height and width represent allowable mold offsets. Dimensions given are measured at the widest point (parting line).
 - 2. Exact body and lead configuration at vendor's option within limits shown.
 - 3. Height does not include mold gate flush.
 - 4. Minimum lead length was 0.500" (12.70 mm). If existing product to the original specifications is not acceptable, contact sales office before ordering.

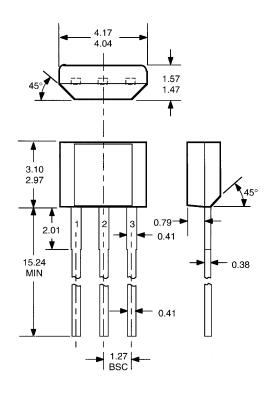
3113, 3120, 3130, and 3140 HALL-EFFECT SWITCHES

PACKAGE DESIGNATOR UA

Dimensions in Inches

0.164 0.159 0.062 0.058 0.122 0.117 0.031 0.079 0.016 0.600 0.015 MIN 0.016 0.050 BSC

Dimensions in Millimeters (Based on 1" = 2.54 mm)



Dwg. MH-014A in

Dwg. MH-014A mm

Allegro MicroSystems, Inc. reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the design of its products. Components made under military approvals will be in accordance with the approval requirements.

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