A3175 and A3177

Hall Effect Latches

Discontinued Product

These parts are no longer in production The device should not be purchased for new design applications. Samples are no longer available.

Date of status change: October 31, 2005

Recommended Substitutions:

For new customers and applications:

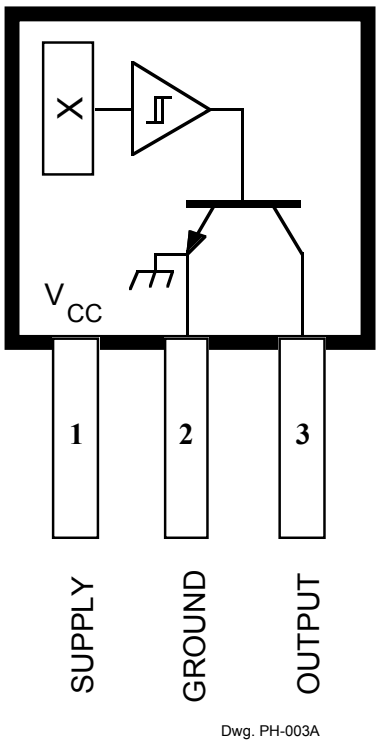
- *for the A3175, refer to the A1211*
- *for the A3177, refer to the A1210*

NOTE: For detailed information on purchasing options, contact your local Allegro field applications engineer or sales representative.

3175 AND 3177

Data Sheet 27609.4d

HALL-EFFECT LATCHES



Dwg. PH-003A

Pinning is shown viewed from branded side.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V_{CC} . . . . . **18 V**
Reverse Battery Voltage, V_{RCC} . . . . **-18 V**
Magnetic Flux Density, B . . . . **Unlimited**
Output OFF Voltage, V_{OUT} . . . . . **18 V**
Continuous Output Current, I_{OUT} . **15 mA**
Operating Temperature Range,
T_A . . . . . **-20°C to +85°C**
Storage Temperature Range,
T_S . . . . . **-65°C to +150°C**

These Hall-effect latches are temperature-stable and stress-resistant sensor ICs especially suited for electronic commutation in brushless dc motors using multipole ring magnets. Each device includes a voltage regulator, quadratic Hall voltage generator, temperature compensation circuit, signal amplifier, Schmitt trigger, and an open-collector output on a single silicon chip. The on-board regulator permits operation with supply voltages of 4.5 volts to 18 volts. The switch output can sink 10 mA. With suitable output pull up, they can be used directly with bipolar or MOS logic circuits.

The three package styles available provide a magnetically optimized package for most applications. Suffix 'LT' is a surface-mount SOT89/ TO-243AA package; suffixe 'UA' features wire leads for through-hole mounting.

FEATURES

- Symmetrical Response
- 4.5 V to 18 V Operation
- Open-Collector Output
- Reverse Battery Protection
- Activate With Small, Commercially Available Permanent Magnets
- Solid-State Reliability
- Small Size
- Superior Temperature Stability
- Resistant to Physical Stress

Always order by complete part number, e.g., **UGN3175LT** .
See Magnetic Characteristics table for differences between devices.

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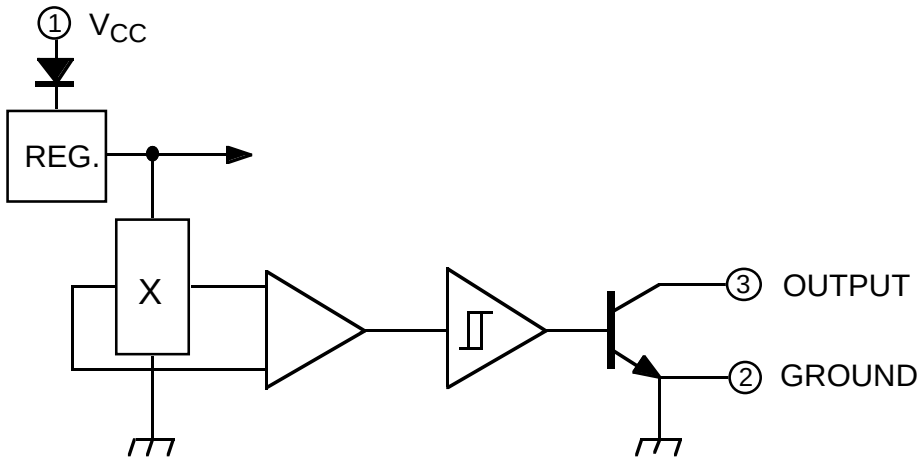
3175 AND 3177 *HALL-EFFECT LATCHES*

FUNCTIONAL BLOCK DIAGRAM



Dwg. FH-005-2

ELECTRICAL CHARACTERISTICS at T_A = +25°C, V_{CC} = 4.5 V to 18 V (unless otherwise noted).

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Supply Voltage	V_{CC}	Operating	4.5	—	18	V
Output Saturation Voltage	$V_{OUT(SAT)}$	V_{CC} = 18 V, I_{OUT} = 10 mA, B > B_{OP}	—	200	300	mV
Output Leakage Current	I_{OFF}	V_{OUT} = 18 V, B < B_{RP}	—	0.05	5.0	µA
Supply Current	I_{CC}	V_{CC} = 4.5 V, B < B_{RP} (Output OFF)	—	5.0	10	mA
Output Rise Time	t_r	V_{CC} = 12 V, R_L = 1.1 kΩ, C_L = 20 pF	—	0.04	2.0	µs
Output Fall Time	t_f	V_{CC} = 12 V, R_L = 1.1 kΩ, C_L = 20 pF	—	0.18	2.0	µs

MAGNETIC CHARACTERISTICS in gauss; V_{CC} = 4.5 V to 18 V.

Characteristic	Part Number*	T_A = +25°C			T_A = -20°C to +85°C		
		Min.	Typ.	Max.	Min.	Typ.	Max.
Operate Point, B_{OP}	UGN3175	25	—	170	15	—	180
	UGN3177	50	—	150	25	—	150
Release Point, B_{RP}	UGN3175	-170	—	-25	-180	—	-15
	UGN3177	-150	—	-50	-150	—	-25
Hysteresis, B_{hys}	UGN3175	100	200	—	80	180	—
	UGN3177	100	200	—	50	180	—

NOTE: As used here, negative flux densities are defined as less than zero (algebraic convention).
Complete part number includes a suffix denoting package type (LT or UA).

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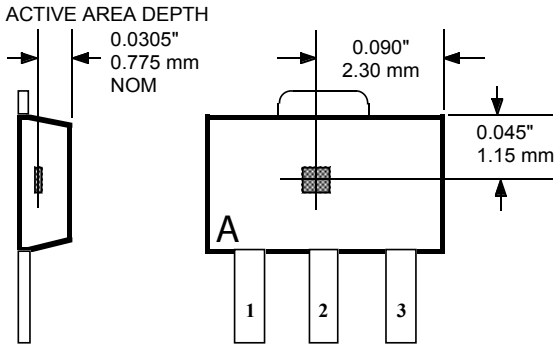
ELEMENT LOCATIONS

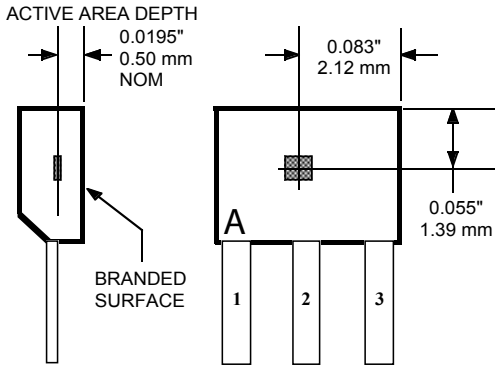
(±0.005” [0.13mm] die placement)

Suffix “LT”



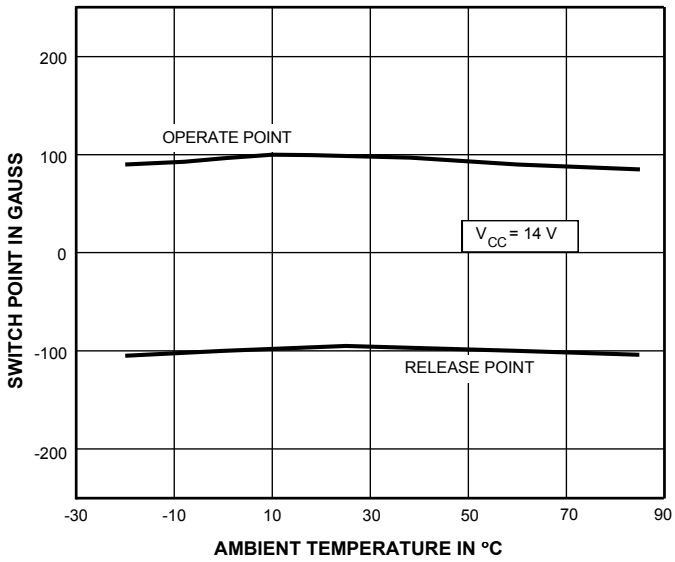
Dwg. MH-008-1C

Suffix “UA”



Dwg. MH-011C

TYPICAL OPERATING CHARACTERISTICS



Dwg. GH-020

The products described herein are manufactured under one or more of the following U.S. patents: 5,045,920; 5,264,783; 5,442,283; 5,389,889; 5,581,179; 5,517,112; 5,619,137; 5,621,319; 5,650,719; 5,686,894; 5,694,038; 5,729,130; 5,917,320; and other patents pending.

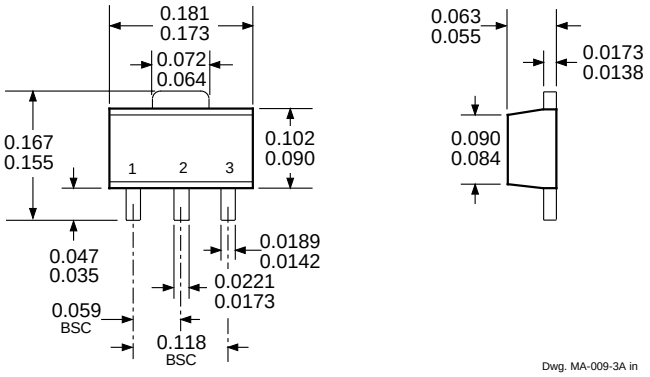
Allegro MicroSystems, Inc. reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the performance, reliability, or manufacturability of its products. Before placing an order, the user is cautioned to verify that the information being relied upon is current.

Allegro products are not authorized for use as critical components in life-support appliances, devices, or systems without express written approval.

The information included herein is believed to be accurate and reliable. However, Allegro MicroSystems, Inc. assumes no responsibility for its use; nor for any infringements of patents or other rights of third parties that may result from its use.

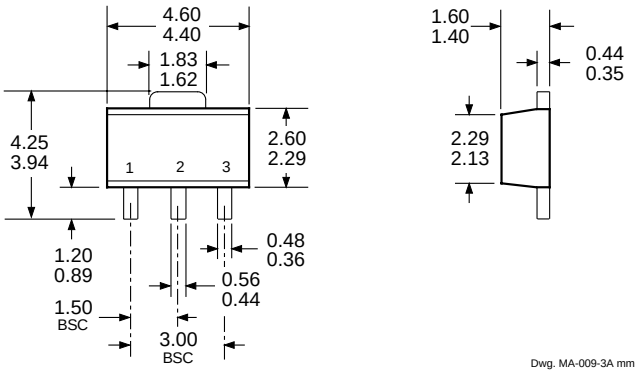
PACKAGE DESIGNATOR 'LT'
(SOT89/TO-243AA)

Dimensions in Inches
(for reference only)

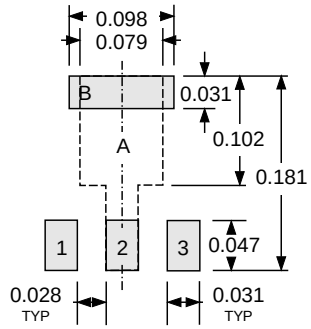


Dwg. MA-009-3A in

Dimensions in Millimeters
(controlling dimensions)

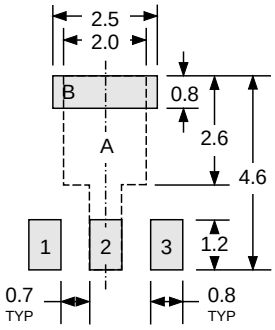


Dwg. MA-009-3A mm



Pads 1, 2, 3, and A — Standard SOT89 Layout
Pads 1, 2, 3, and B — Low-Stress Version
Pads 1, 2, and 3 only — Lowest Stress, But Not Self Aligning

Dwg. MA-012-3 in



Pads 1, 2, 3, and A — Standard SOT89 Layout
Pads 1, 2, 3, and B — Low-Stress Version
Pads 1, 2, and 3 only — Lowest Stress, But Not Self Aligning

Dwg. MA-012-3 mm

NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.
2. Supplied in bulk pack (500 pieces per bag) or add "TR" to part number for tape and reel.
3. Only low-temperature (≤240°C) reflow-soldering techniques are recommended for SOT89 devices.

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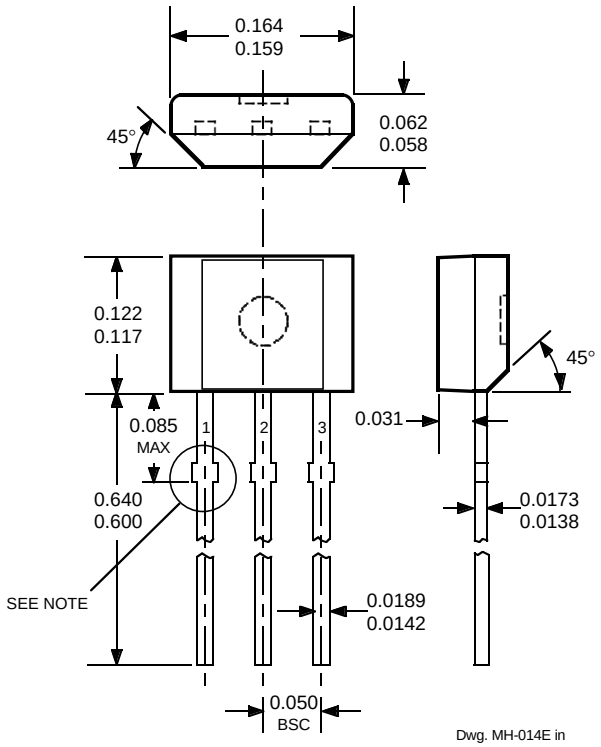
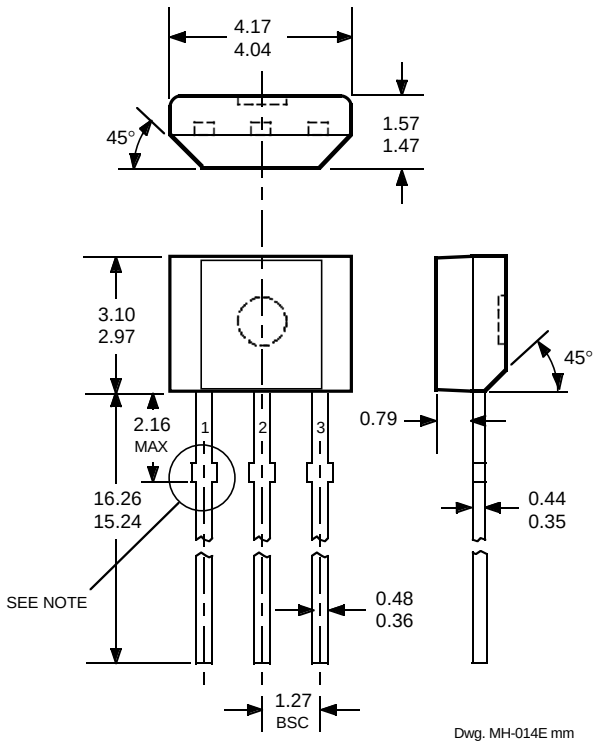
PACKAGE DESIGNATOR 'UA'

Dimensions in Inches
(controlling dimensions)

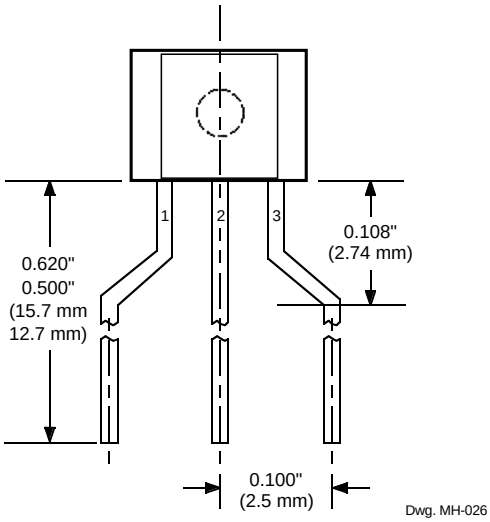


Dimensions in Millimeters
(for reference only)



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 flash.
4. Recommended minimum PWB hole diameter to clear transition area is 0.035" (0.89 mm).
5. Where no tolerance is specified, dimension is nominal.
6. Supplied in bulk pack (500 pieces per bag).

Radial Lead Form (order A317xxUA-LC)



NOTE: Lead-form dimensions are the nominals produced on the forming equipment. No dimensional tolerance is implied or guaranteed for bulk packaging (500 pieces per bag).