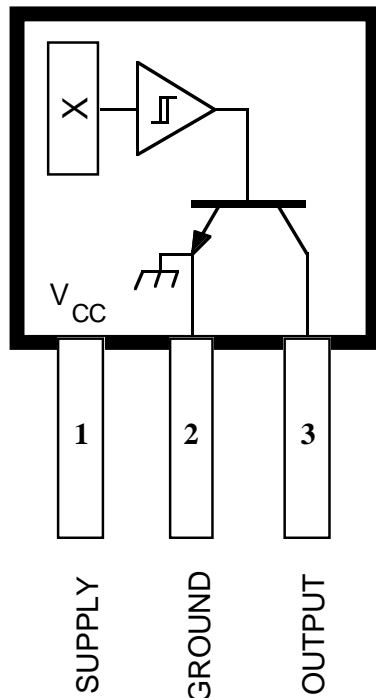


3175 AND 3177

Data Sheet
27609.4B*

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 sensors 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 SOT-89/TO-243AA package; suffixes 'U' and 'UA' feature 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

The UGN3175U is last-time buy. Orders accepted until October 28, 2002.

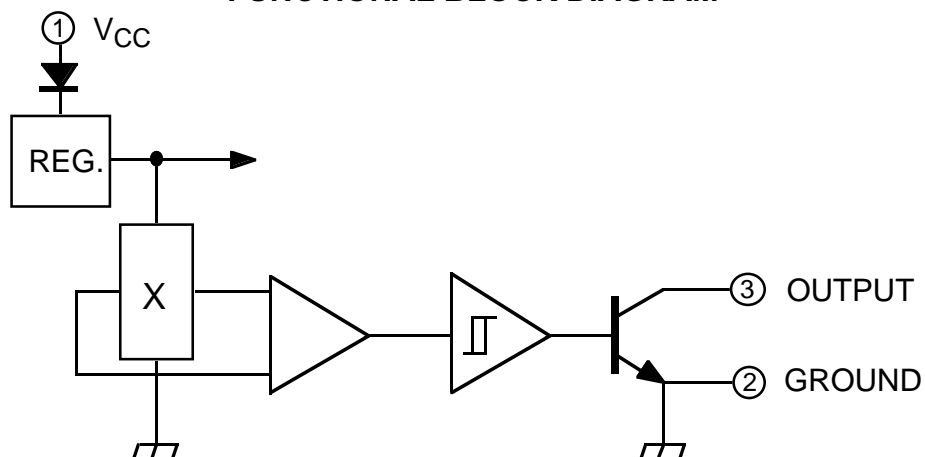
The UGN3177U is discontinued — shown for reference only.

Always order by complete part number, e.g., **UGN3175LT**.

See Magnetic Characteristics table for differences between devices.

3175 AND 3177 HALL-EFFECT LATCHES

FUNCTIONAL BLOCK DIAGRAM



Dwg. FH-005-2

ELECTRICAL CHARACTERISTICS at $T_A = +25^\circ\text{C}$, $V_{CC} = 4.5\text{ V to }18\text{ V}$ (unless otherwise noted).

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

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

Characteristic	Part Number*	$T_A = +25^\circ\text{C}$			$T_A = -20^\circ\text{C to }+85^\circ\text{C}$		
		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, U, or UA).

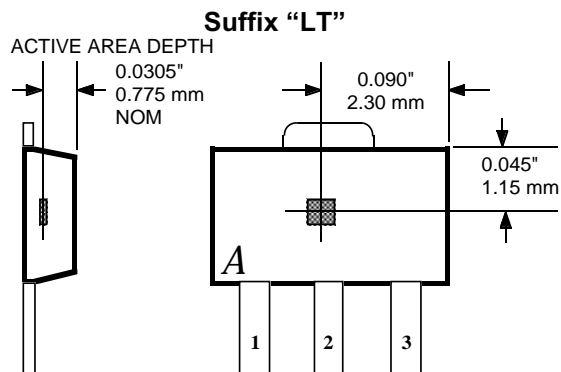


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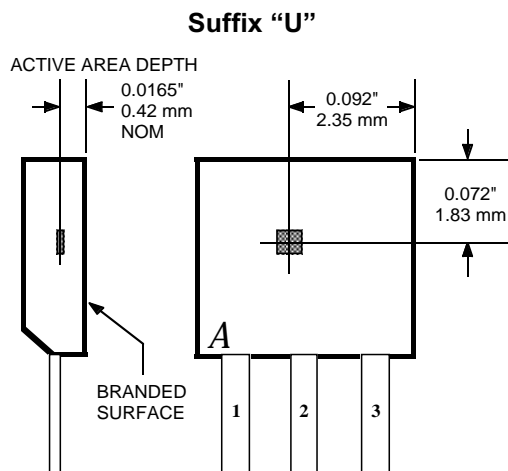
3175 AND 3177 HALL-EFFECT LATCHES

SENSOR LOCATIONS

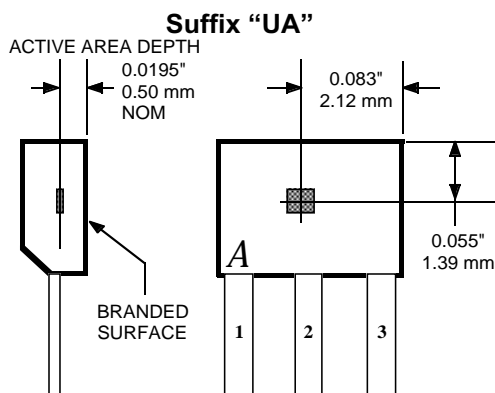
($\pm 0.005"$ [0.13mm] die placement)



Dwg. MH-008-1C

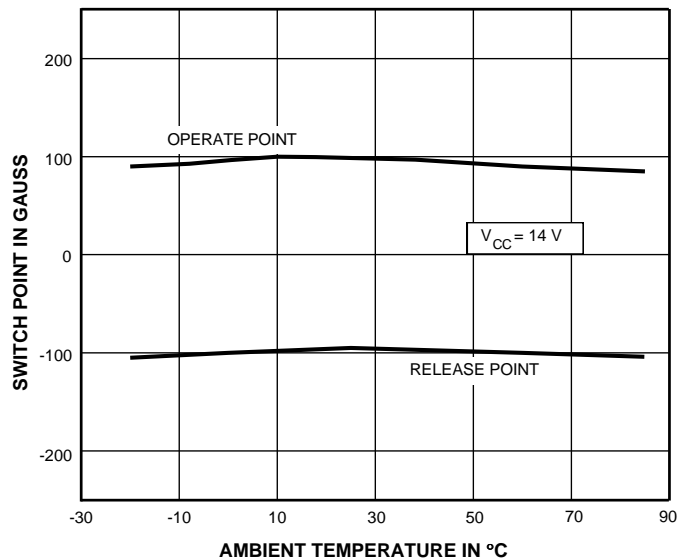


Dwg. MH-002-3C



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.

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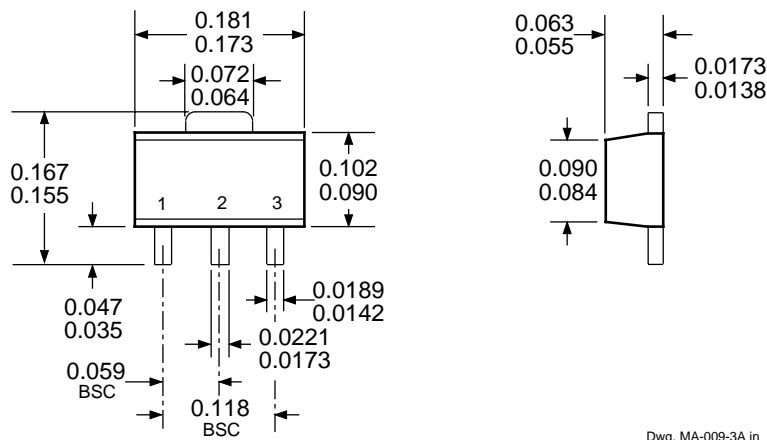
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3175 AND 3177 HALL-EFFECT LATCHES

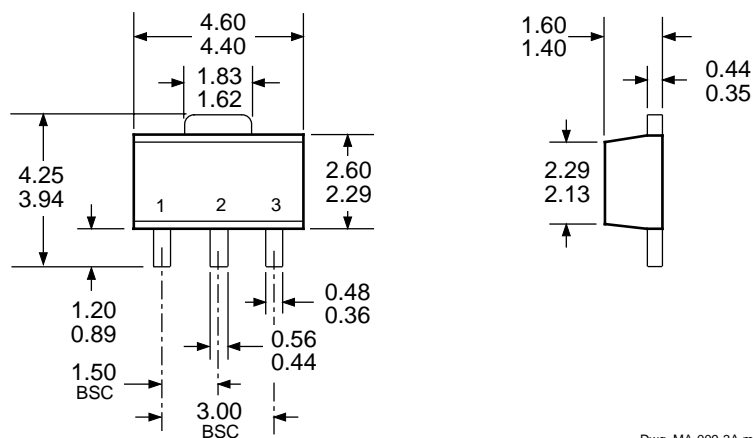
PACKAGE DESIGNATOR 'LT'

Dimensions in Inches
(for reference only)



Dwg. MA-009-3A in

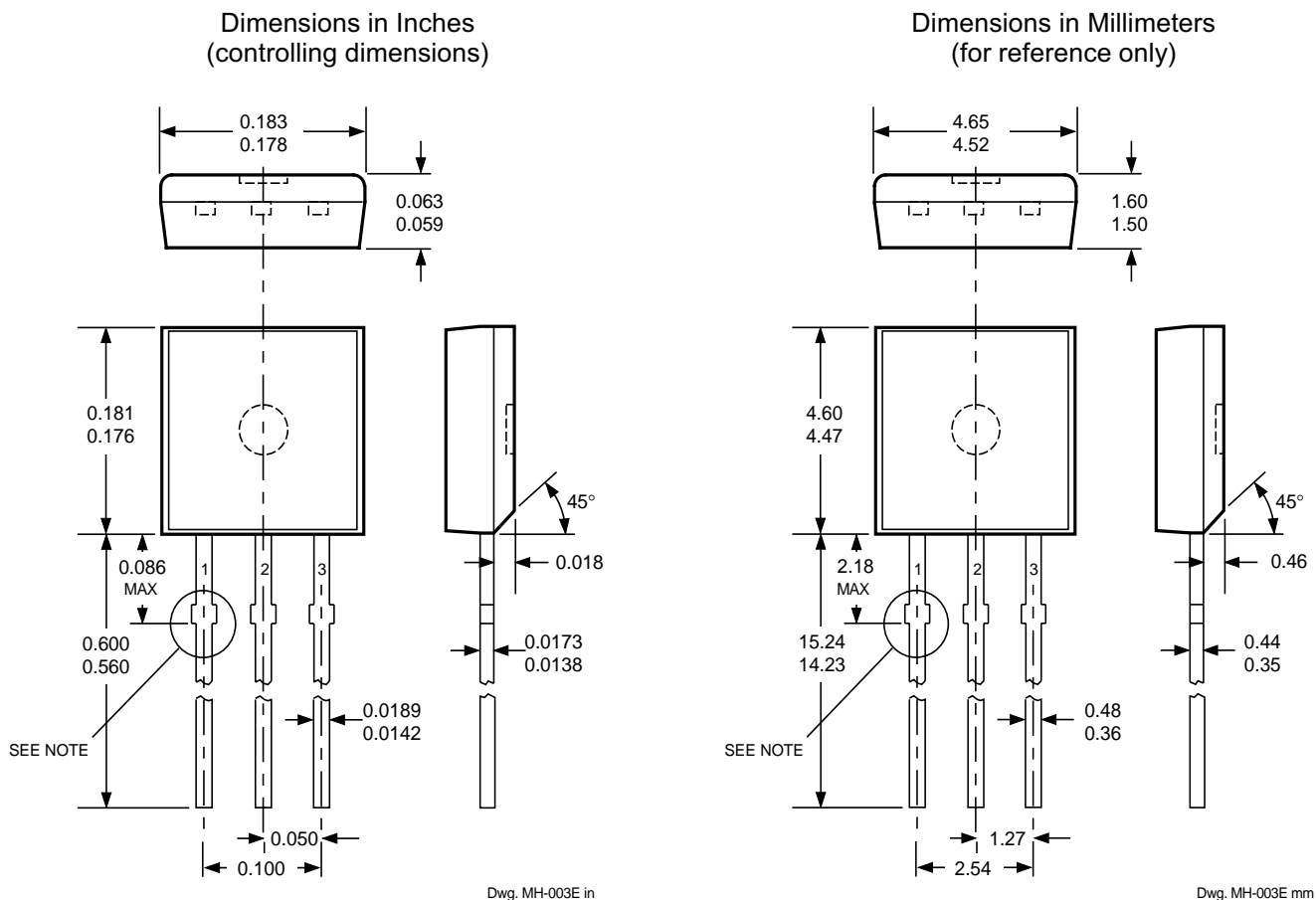
Dimensions in Millimeters
(controlling dimensions)



Dwg. MA-009-3A mm

3175 AND 3177 HALL-EFFECT LATCHES

PACKAGE DESIGNATOR 'U'

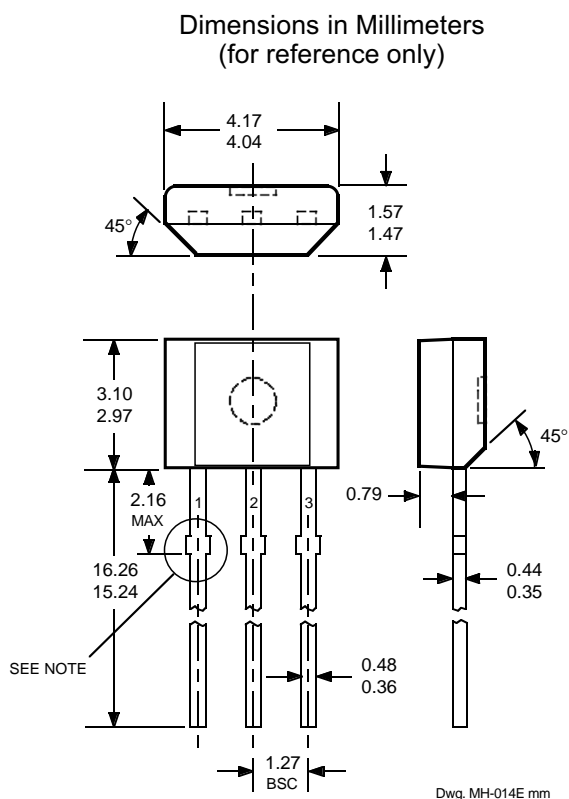
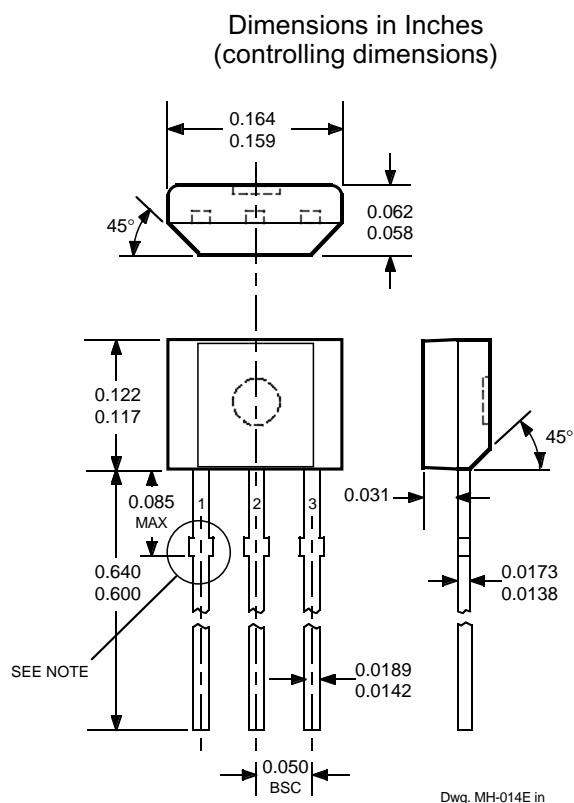


**Devices in the 'U' package are
NOT RECOMMENDED FOR NEW DESIGN**

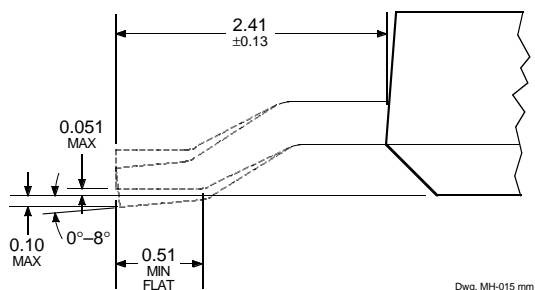
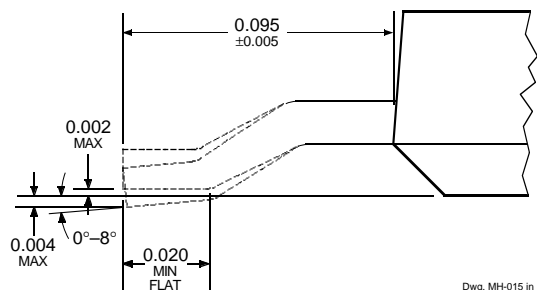
- NOTES:
1. Tolerances on package height and width represent allowable mold offsets. Dimensions given are measured at the widest point (parting line).
 2. Exact body and lead configuration at vendor's option within limits shown.
 3. Height does not include mold gate flash.
 4. Recommended minimum PWB hole diameter to clear transition area is 0.035" (0.89 mm).

3175 AND 3177 HALL-EFFECT LATCHES

PACKAGE DESIGNATOR 'UA'



Surface-Mount Lead Form (add '-TL' or '-TS' to part number).



- 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 (no suffix or suffix '-TL', 500 pieces per bag) or tape and reel (suffix '-TS', 4000 devices per reel).