3275

COMPLEMENTARY-OUTPUTS HALL-EFFECT LATCH

Dwg. PH-002

Pinning is shown viewed from branded side.

Type UGN3275K latching Hall-effect sensor ICs are bipolar integrated circuits designed for electronic commutation of brushless dc motors. They feature dual complementary outputs. The latches are typically used to sense matched magnetic flux densities of alternating polarity from multipole ring magnets.

Each sensor IC includes a Hall voltage generator, operational amplifier, Schmitt trigger, voltage regulator, and dual bipolar output transistors. The regulator allows use of the integrated circuit with supply voltages of 4.5 V to 24 V.

If the Hall cell is exposed to a magnetic flux density greater than the operate threshold (B_{OP}), OUTPUT goes low (turns on) and $\overline{OUTPUT}$ goes high (turns off). The outputs will hold (latch) this state until magnetic field reversal exposes the Hall cell to a magnetic flux density below the release threshold (B_{RP}) when OUTPUT will go high (off) and $\overline{OUTPUT}$ will go low (on). This state is also latched. Under any condition one output is on while the other is off. Because the operating state switches only with magnetic field reversal, and not merely with a change in the strength, these integrated circuits qualify as true Hall-effect latches.

These complementary-output Hall-effect latches are supplied in a four-pin plastic SIP, 0.200" (5.08 mm) wide, 0.130" (3.3 mm) high, and 0.060" (1.54 mm) thick.
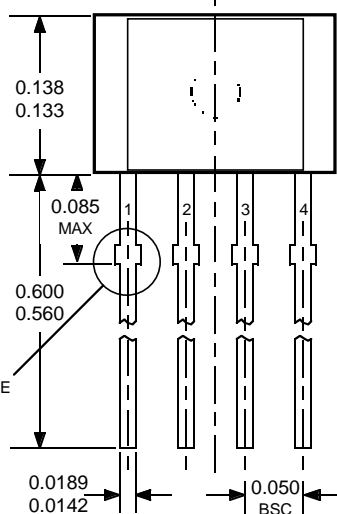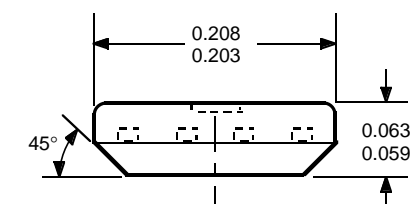
FEATURES

- Operable with Multipole Ring Magnets
- High Reliability
- Small Size
- Output Compatible with All Digital Logic Families
- 4.5 V to 24 V Operation
- High Hysteresis Level Minimizes Stray-Field Problems
- Complementary Outputs

ABSOLUTE MAXIMUM RATINGS

Power Supply, V_{CC} . . . . **25 V**
Magnetic Flux Density, B . . . . . . **Unlimited**
Output OFF Voltage, V_{OUT} . . . . **25 V**
Output ON Current, I_{OUT} . . . . **50 mA**
Operating Temperature Range,
 T_A . . . . **-20°C to +85°C**
Storage Temperature Range,
 T_S . . . . **-65°C to +150°C**

Always order by complete part number: **UGN3275K** .

Allegro® MicroSystems, Inc.

3275
COMPLEMENTARY-OUTPUTS
HALL-EFFECT LATCH

ELEMENT LOCATION

ACTIVE AREA DEPTH
0.0165"
0.42 mm
NOM

0.096"
2.44 mm

0.047"
1.21 mm

A

BRANDED
SURFACE

1   2   3   4

Dwg. MH-001-2B

FUNCTIONAL BLOCK DIAGRAM

① V_{CC}

REG.

X

② OUTPUT

③ $\overline{OUTPUT}$

④ GROUND

Dwg. FH-002

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

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Supply Voltage	V_{CC}	Operating	4.5	—	24	V
Output Saturation Voltage	$V_{OUT(SAT)}$	V_{CC} = 4.5 V, I_{OUT} = 20 mA, B > B_{OP}	—	—	400	mV
Output Leakage Current	I_{OFF}	V_{OUT} = 24 V, V_{CC} = 24 V, B < B_{RP}	—	—	10	μA
Supply Current	I_{CC}	V_{CC} = 24 V, B < B_{RP}	—	—	7.0	mA
Output Rise Time	t_r	V_{CC} = 12 V, R_L = 820 Ω, C_L = 20 pF	—	0.04	0.4	μs
Output Fall Time	t_f	V_{CC} = 12 V, R_L = 820 Ω, C_L = 20 pF	—	0.18	0.4	μs

MAGNETIC CHARACTERISTICS

Characteristic	Symbol	T_A = +25°C		T_A = -20°C to +85°C		Units
		Min.	Max.	Min.	Max.	
Operate Point	B_{OP}	25	250	15	250	G
Release Point	B_{RP}	-250	-25	-250	-15	G
Hysteresis	B_{hys}	100	—	100	—	G

NOTES: 1. As used here, negative flux densities are defined as less than zero (algebraic convention).
2. 1 gauss (G) is exactly equal to 0.1 millitesla (mT).

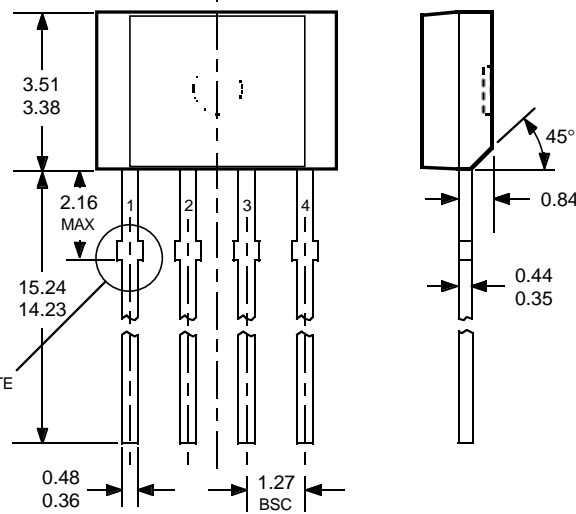**Dimensions in Inches**
(controlling dimensions)

Dimensions in Millimeters
(for reference only)

0.208
0.203

45°

0.063
0.059

0.138
0.133

45°

0.085
MAX

1 2 3 4

0.033

0.600
0.560

SEE NOTE

0.0173
0.0138

0.0189
0.0142

0.050
BSC

Dwg. MH-009D in

5.28
5.16

45°

1.60
1.50

3.51
3.38

45°

2.16
MAX

1 2 3 4

0.84

15.24
14.23

SEE NOTE

0.44
0.35

0.48
0.36

1.27
BSC
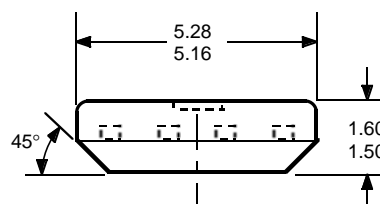
Dwg. MH-009D mm

Surface-Mount Lead Form (Suffix -TL)

0.095
±0.005

0.002
MAX

0.004
MAX

0°–8°

0.020
MIN
FLAT

Dwg. MH-015 in

2.41
±0.13

0.051
MAX

0.10
MAX

0°–8°

0.51
MIN
FLAT
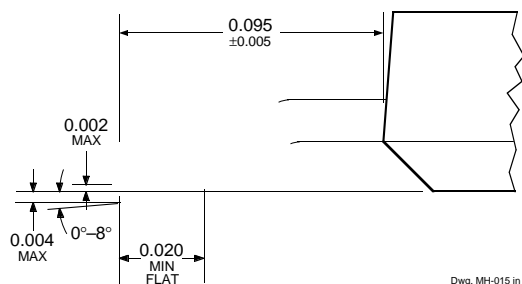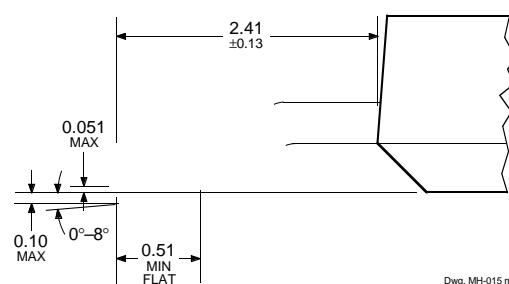
Dwg. MH-015 mm

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 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).

3275
COMPLEMENTARY-OUTPUTS
HALL-EFFECT LATCH

HALL-EFFECT SENSOR ICS

LATCHING HALL-EFFECT DIGITAL SWITCHES						
Partial Part Number	**Operate Point (G)**	**Release Point (G)**	**Hysteresis (G)**	**Oper. Temp.**	**Packages**	**Replaces and Comments**
	Over Oper. Voltage & Temp. Range					
UGN3175	15 to 180	-180 to -15	>80 (Typ 180)	S	LT, UA	
UGN3177	25 to 150	-150 to -25	>50 (Typ 180)	S	LT, UA	
A3185x	140 to 300	-300 to -140	280 to 600	E/L	LT, UA	
A3187x	50 to 175	-175 to -50	100 to 350	E/L	LT, UA	3077, 3175, 3177
A3188x	80 to 200	-200 to -80	160 to 400	E/L	LT, UA	
A3189x	50 to 250	-250 to -50	100 to 500	E/L	LT, UA	3075, 3076
A3280x	5 to 40	-40 to -5	10 to 80	E/L	LH, LT, UA	chopper stabilized
A3281x	15 to 90	-90 to -15	30 to 180	E/L	LH, LT, UA	chopper stabilized
A3283x	100 to 180	-180 to -100	<400 (Typ 300)	E/L	LH, LT, UA	chopper stabilized

"PROTECTED" LATCHING HALL-EFFECT DIGITAL SWITCHES						
Partial Part Number	**Operate Point (G)**	**Release Point (G)**	**Hysteresis (G)**	**Oper. Temp.**	**Packages**	**Comments**
	Over Oper. Voltage & Temp. Range					
A3195x	40 to 200	-200 to -40	>110 (Typ 220)	E, L	U, LT	active pulldown
A3197x	40 to 200	-200 to -40	>110 (Typ 230)	E, L	U, LT	open-collector output

Notes: 1) Typical data is at T_A = +25°C and nominal operating voltage.

2) "x" = Operating Temperature Range [suffix letter or (prefix)]: S (UGN) = -20°C to +85°C, E = -40°C to +85°C, J = -40°C to +115°C, K (UGS) = -40°C to +125°C, L (UGL) = -40°C to +150°C.