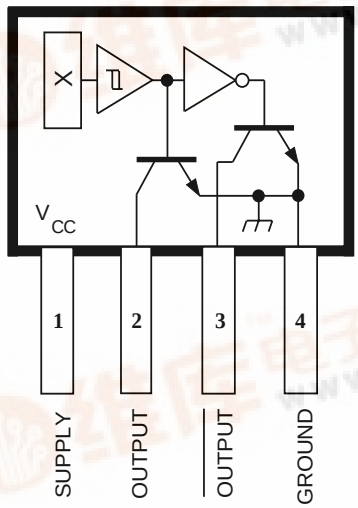
3275

Data Sheet
27632.2

COMPLEMENTARY-OUTPUT HALL-EFFECT LATCH



Dwg. PH-002

Pinning is shown viewed from branded side.

Type UGN3275K latching Hall-effect sensors 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 $\overline{\text{OUTPUT}}$ 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 $\overline{\text{OUTPUT}}$ 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.

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**

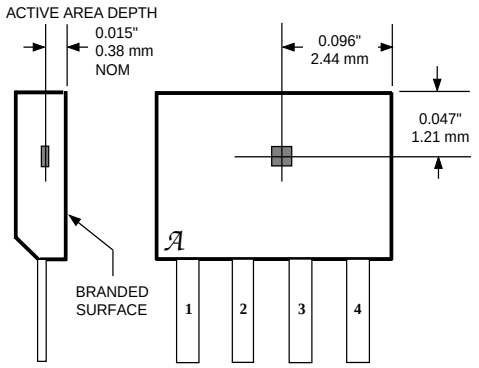
FEATURES

- 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

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

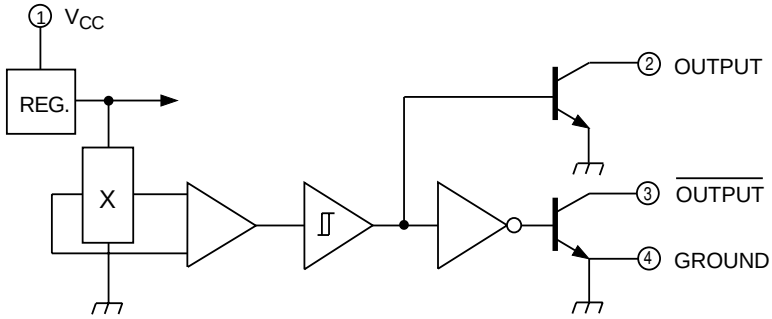
3275
COMPLEMENTARY-OUTPUT HALL-EFFECT LATCH

SENSOR LOCATION



Dwg. MH-001-2A

FUNCTIONAL BLOCK DIAGRAM



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

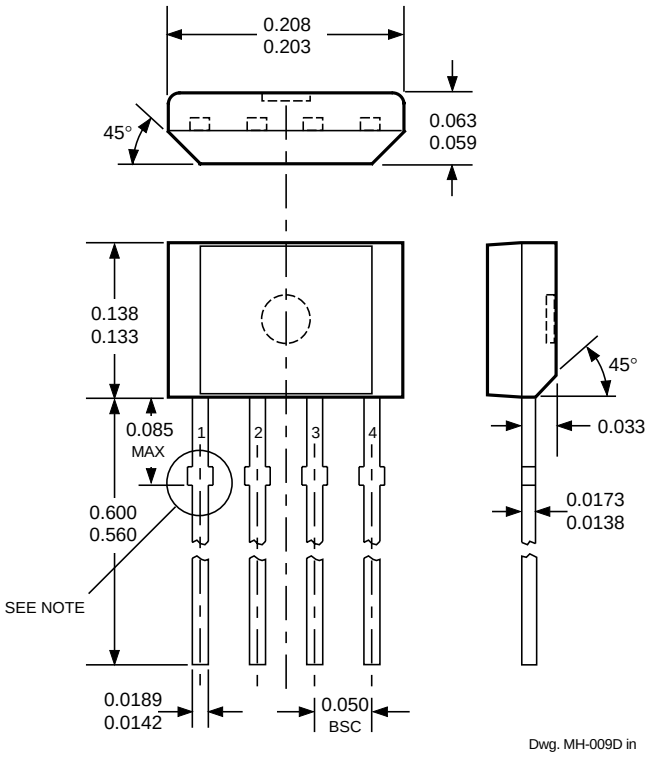
MAGNETIC CHARACTERISTICS

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

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

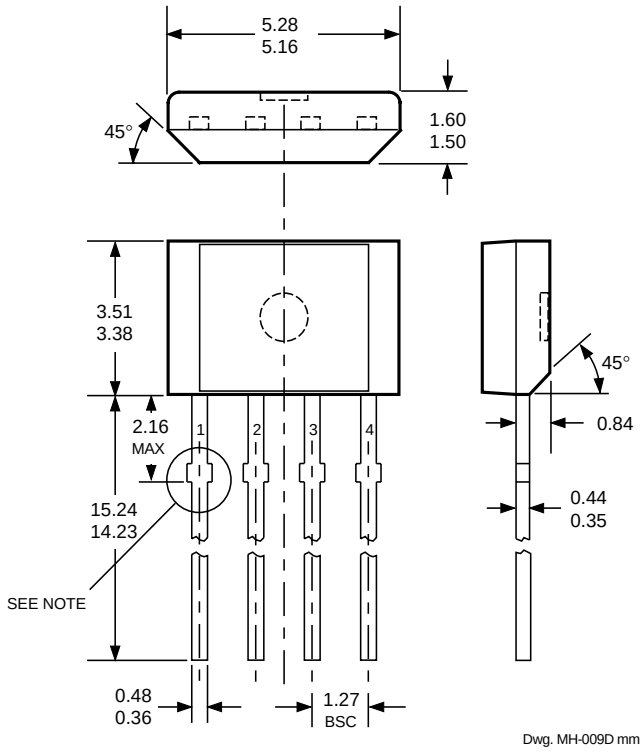
3275
COMPLEMENTARY-OUTPUT HALL-EFFECT LATCH

Dimensions in Inches
(controlling dimensions)



Dwg. MH-009D in

Dimensions in Millimeters
(for reference only)



Dwg. MH-009D 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.

3275
COMPLEMENTARY-OUTPUT HALL-EFFECT LATCH

HALL-EFFECT SENSORS

Partial Part Number	Avail. Oper. Temp.	Characteristics at T_A = +25°C $B_{OP(max)}$	$B_{RP(min)}$	$B_{hys(typ)}$	Features	Notes
HALL-EFFECT UNIPOLAR SWITCHES in order of B_{OP} and B_{hys}						
3240	E/L	+50	+5.0	10	chopper stabilized	1
3210	E	±60	±5.0	7.7	micropower, chopper stabilized	
3361	E	+55*	+110‡	5.0*	2-wire, chopper stabilized	
3362	E	+110	+55	5.0*	2-wire, chopper stabilized	
3161	E	+160	+30	20	2-wire	
3141	E/L	+160	+10	55		
3235	S	+175	+25	15*	output 1	2
		-25	-175	15*	output 2	2
5140	E	+200	+50	55	300 mA output	1, 3
3142	E/L	+230	+75	55		
3143	E/L	+340	+165	55		
3144	E/L	+350	+50	55		
3122	E/L	+400	+140	105		
3123	E/L	+440	+180	105		
3121	E/L	+450	+125	105		
3150	J	+40 to +850	–	20	programmable, chopper stabilized	1
HALL-EFFECT LATCHES & BIPOLAR SWITCHES† in order of B_{OP} and B_{hys}						
3260	E/L	+30	-30	20	bipolar, chopper stabilized	
3280	E/L	+40	-40	45	chopper stabilized	
3134	E/L	+50	-50	27	bipolar switch	
3133	K/L/S	+75	-75	52	bipolar switch	
3281	E/L	+90	-90	100	chopper stabilized	
3132	K/L/S	+95	-95	52	bipolar switch	
3187	E/L	+150	-150	100*		
3177	S	+150	-150	200		
3625	S	+150	-150	200	900 mA outputs	1, 3, 5
3626	S	+150	-150	200	400 mA outputs	1, 3, 5
3195	E/L	+160	-160	220		1, 4
3197	L	+160	-160	230		1
3175	S	+170	-170	200		
3188	E/L	+180	-180	200*		
3283	E/L	+180	-180	300	chopper stabilized	
3189	E/L	+230	-230	100*		
3275	S	+250	-250	100*		5
3185	E/L	+270	-270	340*		

Operating Temperature Ranges:
S = -20°C to +85°C, E = -40°C to +85°C, J = -40°C to +115°C, K = -40°C to +125°C, L = -40°C to +150°C

Notes 1. Protected.
2. Output 1 switches on south pole, output 2 switches on north pole for 2-phase, bifilar-wound, unipolar-driven brushless dc motor control.
3. Power driver output.
4. Active pull down.
5. Complementary outputs for 2-phase bifilar-wound, unipolar-driven brushless dc motor control.

* Minimum. ‡ Maximum

† Latches will not switch on removal of magnetic field; bipolar switches may switch on removal of field but require field reversal for reliable operation over operating temperature range.