

UGN-3275K THROUGH UGS-3277K HALL EFFECT LATCHES

With Dual Complementary Output

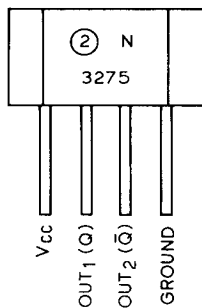
FEATURES

- 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
- Dual Complementary Output

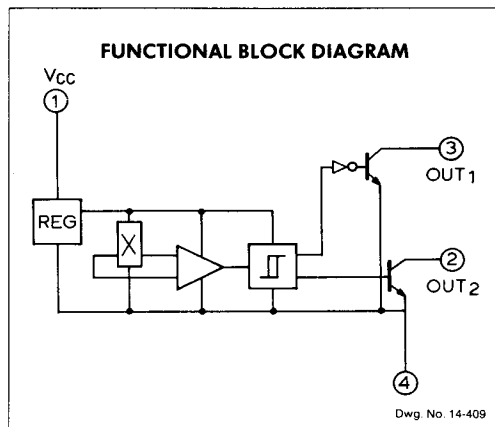
Sprague Type 3275, 3276 and 3277 latching Hall Effect sensors are bipolar integrated circuits designed for electronic commutation in brushless dc motors. All three types feature dual complementary output. The latches are typically used to sense matched magnetic flux densities of alternating polarity 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.

One of the pair of NPN open-collector output stages saturates when the Hall element is exposed to flux density equal to or greater than the operate threshold. The other output transistor is OFF. This ON/OFF operating mode continues until magnetic flux of equal density but opposite polarity crosses the sensor's release threshold. The output pair then



Dwg. No. A-14,407



switches to an OFF/ON configuration. This mode is also latched.

Types UGN-3275K, UGN-3276K and UGN-3277K are rated for operation over the temperature range of -20°C to $+85^{\circ}\text{C}$. UGS-3275K, UGS-3276K and UGS-3277K have an operating range of -40°C to $+125^{\circ}\text{C}$.

The dual 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	25 V
Output ON Current, I_{SINK}	50 mA
Operating Temperature Range, T_A	
(UGN)	-20°C to $+85^{\circ}\text{C}$
(UGS)*	-40°C to $+125^{\circ}\text{C}$
Storage Temperature Range, T_S	-65°C to $+150^{\circ}\text{C}$

*Selected devices are available with a maximum T_A rating of $+150^{\circ}\text{C}$.

ELECTRICAL CHARACTERISTICS at $T_A = +25^\circ\text{C}$, $V_{CC} = 4.5\text{ V to }24\text{ V}$ (unless otherwise noted)

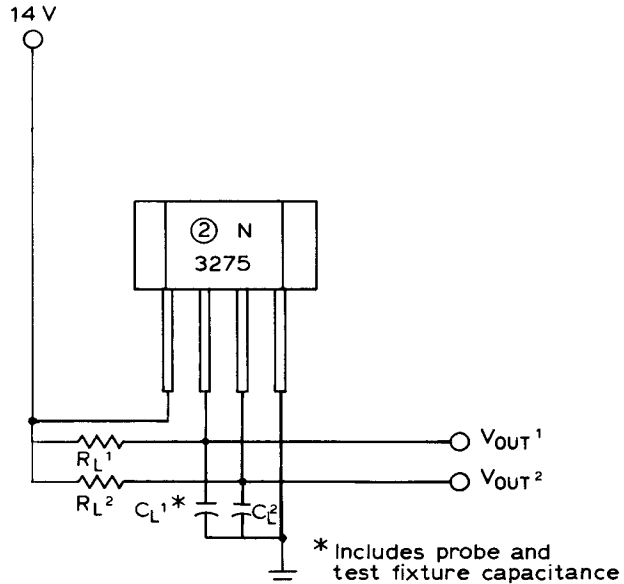
Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Supply Voltage	V_{CC}		4.5	—	24	V
Output Saturation Voltage	$V_{CE(sat)}$	$V_{CC} = 24\text{ V}$, $I_{SINK} = 20\text{ mA}$	—	—	400	mV
Output Leakage Current	I_{OFF}	$V_{OUT} = 24\text{ V}$, $V_{CC} = 24\text{ V}$	—	—	10	μA
Supply Current	I_{CC}	$V_{CC} = 24\text{ V}$, Output Open	—	—	7.0	mA
Output Rise Time	t_r	$V_{CC} = 14\text{ V}$, $R_L = 820\Omega$, $C_L = 20\text{ pF}$	—	0.04	0.4	μs
Output Fall Time	t_f	$V_{CC} = 14\text{ V}$, $R_L = 820\Omega$, $C_L = 20\text{ pF}$	—	0.18	0.4	μs
Switch Time Differential	Δt	$V_{CC} = 14\text{ V}$, $R_L = 820\Omega$, $C_L = 20\text{ pF}$	—	0.685	0.8	μs

MAGNETIC CHARACTERISTICS

Characteristic	Device Type*	$T_A = +25^\circ\text{C}$		$T_A = -20^\circ\text{C to }+85^\circ\text{C}$		$T_A = -40^\circ\text{C to }+125^\circ\text{C}$		Units
		Min.	Max.	Min.	Max.	Min.	Max.	
Operate Point, B_{OP}	3275	50	250	50	250	50	250	G
	3276	50	350	50	350	50	350	G
	3277	50	150	50	175	50	200	G
Release Point, B_{RP}	3275	-250	-50	-250	-50	-250	-50	G
	3276	-350	-50	-350	-50	-350	-50	G
	3277	-150	-50	-175	-50	-200	-50	G
Hysteresis, B_H	All	100	—	100	—	100	—	G

*Complete part number includes a prefix denoting operating temperature range ("UGN-" or "UGS-") and a suffix ("K") denoting package type.

TEST CIRCUIT



Dwg. No. A-14.408