UGN-3501T AND UGN-3501U
LINEAR OUTPUT HALL EFFECT SENSORS

FEATURES

- Excellent Sensitivity
- Flat Response to 25 kHz (typ.)
- Internal Voltage Regulation
- Excellent Temperature Stability

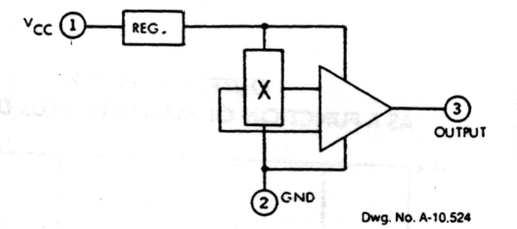
Utilizing the Hall Effect for sensing a magnetic field, UGN-3501T and UGN-3501U integrated circuits provide a linear single-ended output that is a function of magnetic field intensity.

These devices can sense relatively small changes in a magnetic field—changes that are too small to operate a Hall effect switch. They can be capacitively coupled to an amplifier, to boost the output to a higher level.

UGN-3501T and UGN-3501U each include a Hall cell, linear amplifier, emitter-follower output, and a voltage regulator. Integrating the Hall cell and the amplifier into one monolithic device minimizes problems related to the handling of millivolt analog signals

Both devices are rated for continuous operation over the temperature range of 0°C to +70°C and over a supply voltage range of 8 V to 12 V.

FUNCTIONAL BLOCK DIAGRAM



Packaging options include two three-pin SIPs: the "T" package (UGN-3501T), which is 80 mils (2.03 mm) thick, and the magnetically optimized "U" package, which is 60 mils (1.52 mm) thick.

ABSOLUTE MAXIMUM RATINGS

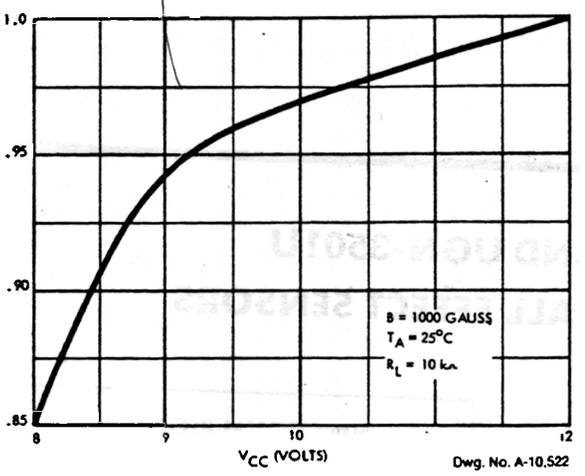
Supply Voltage, V_{CC} . . . . . 16 V
Output Current, I_{OUT} . . . . . 4 mA
Magnetic Flux Density, B . . . . . Unlimited
Operating Temperature Range, T_A . . . . . 0°C to +70°C
Storage Temperature Range, T_S . . . . . −65°C to +150°C

ELECTRICAL CHARACTERISTICS at T_A = +25°C, V_{CC} = 12 VDC

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Operating Voltage	V_{CC}		8.0	—	12	V
Supply Current	I_{CC}	V_{CC} = 12 V	—	10	20	mA
Quiescent Output Voltage	V_{OUT}	B = 0 Gauss, Note 1	2.5	3.6	5.0	V
Sensitivity	ΔV_{OUT}	B = 1000 Gauss, Notes 1, 2	0.35	0.7	—	mV/G
Frequency Response	BW	$f_H - f_L$ at −3 dB	—	25	—	kHz
Broadband Output Noise	e_n	f = 10 Hz to 10 kHz	—	0.1	—	mV
Output Resistance	R_0		—	100	—	Ω

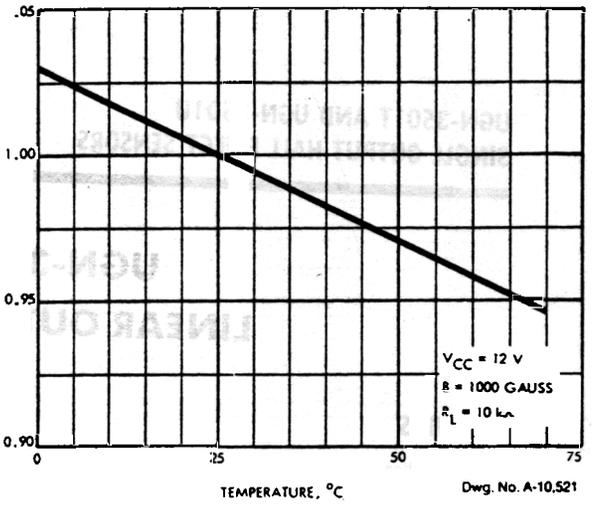
NOTE 1. All output voltage measurements are made with a voltmeter having an input impedance of 10 kΩ or greater.
NOTE 2. Magnetic flux density is measured at the most sensitive area of the device, which is centered on the branded side of the T package, 0.037 ± 0.001" (0.94 ± 0.03 mm) below the surface and 0.017" ± 0.001" (0.43 ± 0.03 mm) below the branded side of the U package.

NORMALIZED SENSITIVITY AS A FUNCTION OF V_{CC}



Dwg. No. A-10,522

NORMALIZED SENSITIVITY AS A FUNCTION OF TEMPERATURE



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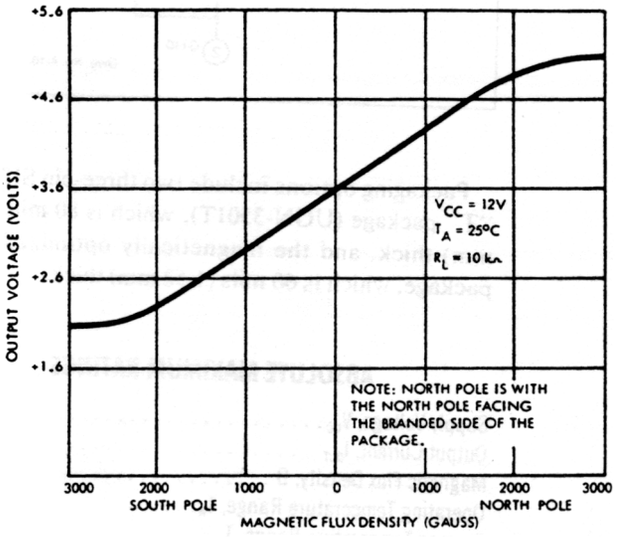
OUTPUT VOLTAGE AS A FUNCTION OF MAGNETIC FLUX DENSITY



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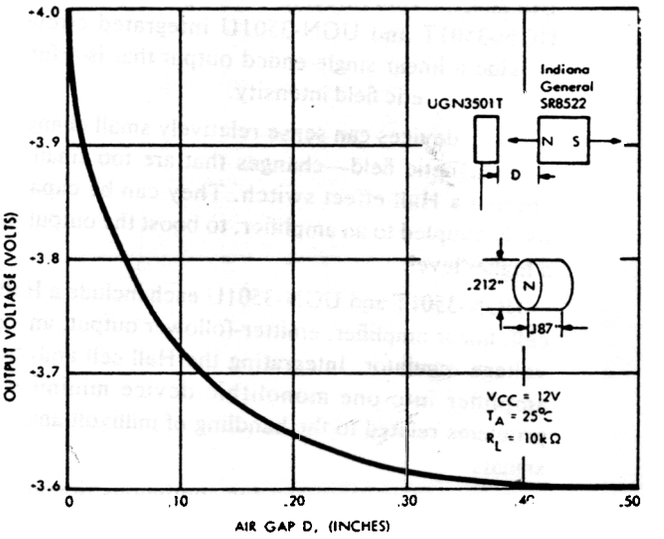
OUTPUT VOLTAGE AS A FUNCTION OF AIR GAP



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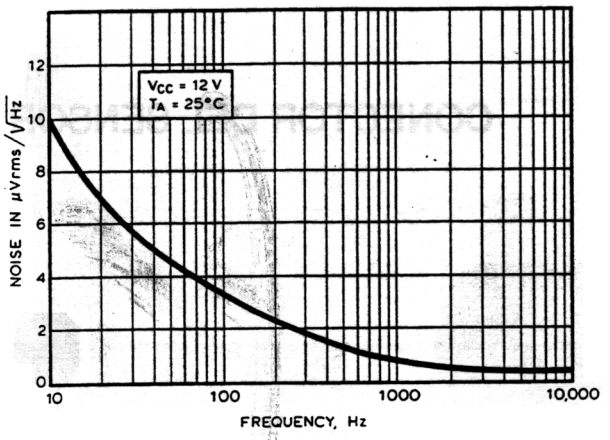
These Hall Effect sensors are also supplied in a low profile "U" package. The low profile "U" is specified by substituting a "UA" for the last character of the part number.

NOISE SPECTRAL DENSITY
AS A FUNCTION OF FREQUENCY



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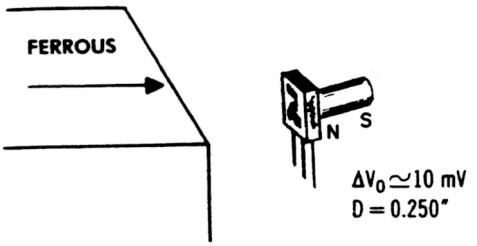
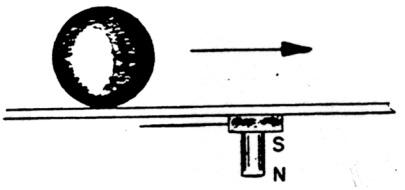
TYPICAL APPLICATIONS

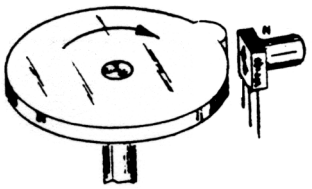
SENSITIVE PROXIMITY DETECTOR



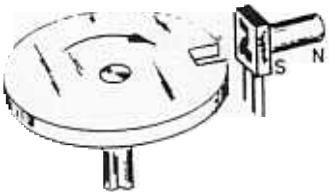
FERROUS METAL SENSOR



LOBE OR COG SENSOR



NOTCH OR HOLE SENSOR



For reference only—an Alnico VIII permanent magnet, 0.212" (5.38 mm) in diameter and 0.187" (4.75 mm) long is approximately 800 gauss at the surface. A samarium cobalt permanent magnet, 0.100" (2.54 mm) square and 0.040" (1.02 mm) thick is approximately 1200 gauss at its surface.

CONECTOR DEL SENSOR - DISTRIBUCION DE TERMINALES