

Solid State Sensors

Hall Effect Gear Tooth Sensors

GT1 Series



FEATURES

- Senses ferrous metal targets
- Digital current sinking output (open collector)
- Better signal-to-noise ratio than variable reluctance sensors, excellent low speed performance, output amplitude not dependent on RPM
- Sensor electronically *self-adjusts* to slight variations in runout and variations in temperature, simplifying installation and maintenance
- Fast operating speed – over 100 kHz
- EMI resistant
- Reverse polarity protection and transient protection (integrated into Hall I.C.)
- Wide continuous operating temperature range (-40° to 150°C), short term to 160°C

TYPICAL APPLICATIONS

Automotive and Heavy Duty Vehicles:

- Camshaft and crankshaft speed/ position
 - Transmission speed
 - Tachometers
 - Anti-skid/traction control
- Industrial:
- Sprocket speed
 - Chain link conveyor speed and distance
 - Stop motion detector
 - High speed low cost proximity
 - Tachometers, Counters

GT1 ORDER GUIDE

Catalog Listing	Description
1GT101DC	Gear Tooth Sensor

GENERAL INFORMATION

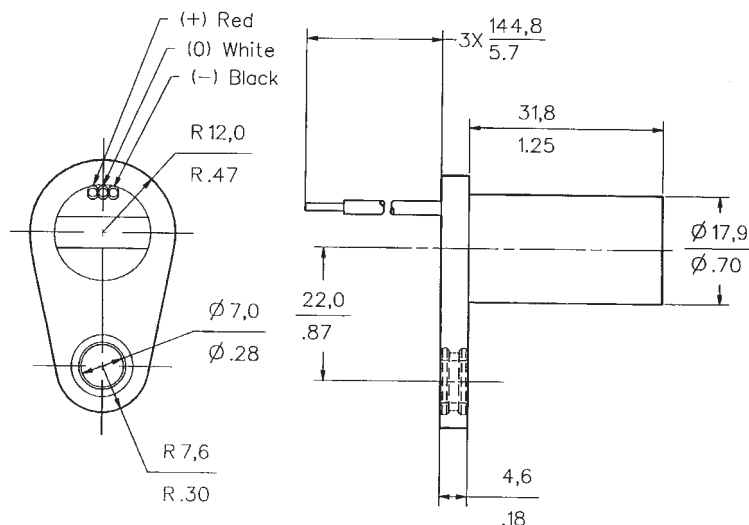
1GT1 Series Gear Tooth Sensors use a magnetically biased Hall effect integrated circuit to accurately sense movement of ferrous metal targets. This specially designed I.C., with discrete capacitor and bias magnet, is sealed in a probe type package for physical protection and cost effective installation.

Units will function from a 4.5 to 24 VDC power supply. Output is digital, current sinking (open collector). Reverse polarity protection is standard. If power is inadvertently wired backwards, the sensor will not be damaged. Built-in protection against pulsed transients to +60V, -40V is also included.

Optimum sensor performance is dependent on the following variables which must be considered in combination:

- Target material, geometry, and speed
- Sensor/target gap
- Ambient temperature
- Magnetic material in close proximity

MOUNTING DIMENSIONS (For reference only)



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SENSOR SPECIFICATIONS

All values were measured using 1 K pull-up resistor.

Electrical Characteristics	Supply Voltage	4.5 to 24 VDC
	Supply Current	10 mA typ., 20 mA max.
	Output Voltage (output low)	0.4 V max.
	Output Current (output high)	10 μ A max. leakage into sensor
	Switching Time	
	Rise (10 to 90%)	15 μ sec. max.
	Fall (90 to 10%)	1.0 μ sec. max.
Absolute Maximum Ratings*	Supply Voltage (Vs)	\pm 30 VDC continuous
	Voltage Externally Applied To Output (output high)	-0.5 to +30 V
	Output Current	40 mA sinking
	Temperature Range	
	Storage	-40 to 150° (-40 to 302°F)
	Operating	-40 to 150° C (-40 to 302°F)
Switching Characteristics**	Operate Point	3.7 \pm 1.25° (3,28 \pm 1,13 mm)
	Release Point	4.7 \pm 2.50° (4,16 \pm 2,21 mm)
	Differential Travel	8.4 \pm 3.70° (7,45 \pm 3,34 mm)

* As with all solid state components, sensor performance can be expected to deteriorate as rating limits are approached; however, sensors will not be damaged unless the limits are exceeded.

** See Reference Target table.

TARGET GUIDELINES

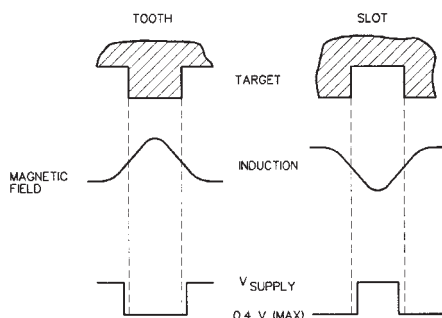
The Target Guidelines table provides basic parameters when an application is not restricted to a specific target.

Any target wheel that exceeds the following minimum specifications can be sensed over the entire temperature range of -40° to 150°C with any sensing gap up to .080 in. (2,0 mm). This data is based on a 4 in. (102 mm) diameter wheel, **rotating 10 to 3600 RPM.**

Reference Target Dimensions

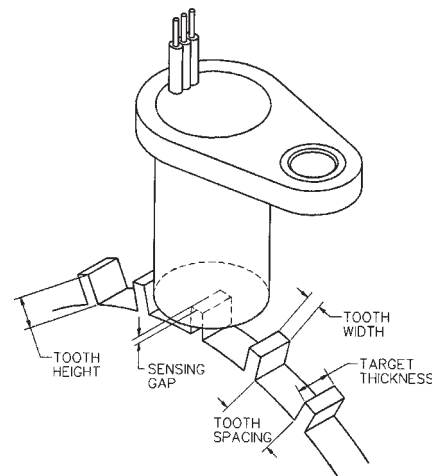
Tooth Height:	.200 in. (5,06 mm) min.
Tooth Width:	.100 in. (2,54 mm) min.
Tooth Spacing:	.400 in. (10,16 mm) min.
Target Thickness:	.250 in. (6,35 mm)

Sensor Output (with pull-up resistor added to output circuit)



REFERENCE TARGET/CONDITIONS

Characteristics will vary due to target size, geometry, location, and material. Sensor specifications were derived using a cold-rolled steel reference target. See table, right, for reference target configuration and evaluation conditions.



Target

Diameter:	4 in. (101,6 mm)
Tooth Width:	.350 in. (8,89 mm)
Thickness:	.250 in. (6,35 mm)

Test Conditions

Air Gap:	.040 to .080 in. (1,02 to 2,03 mm)
V Supply:	4.5 to 24 V
RPM:	10 min., 3600 max.

Integral Magnet