

Automotive Sensor Products

Linear Position Sensor – Hall



Figure 1: Linear Position Sensor

Features

- ♦ Magnetically operated position sensor
- ♦ Linear PWM outputs
- ♦ Programmable sensor – custom option
- ♦ Separate magnet assembly as actuator
- ♦ Large air gap operating
- ♦ Non-contact measuring

Benefits

- ♦ Robust construction makes this sensor well suited to harsh environments
- ♦ Magnetically operated non-contact sensing gives excellent life and reliability
- ♦ Ability to customize programming output states to customer needs

Applications

- ♦ Transmission fork position
- ♦ Linear stroke

General Description

The Hall Effect Linear Position Sensor detects the position of each fork in a DCT transmission. Each position sensor operates in a pair with one magnet actuator. There are four pairs in total to detect the fork position of gears 1~7 and reverse position.

Operation

Basic Principle

The sensor is a linear PWM output sensor which detects the position of moving parts. After programming, the sensor will output a linear PWM signal to reflect the position of the magnet assembly actuator.



Figure 2: Magnet Actuator



Figure 3: Linear Position Sensor

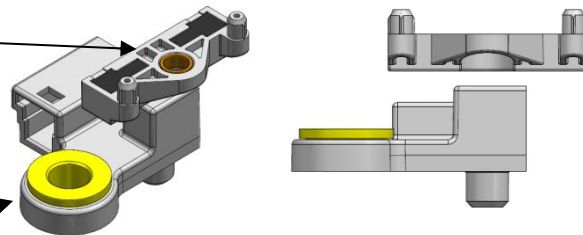


Figure 4: Assembly Relationship

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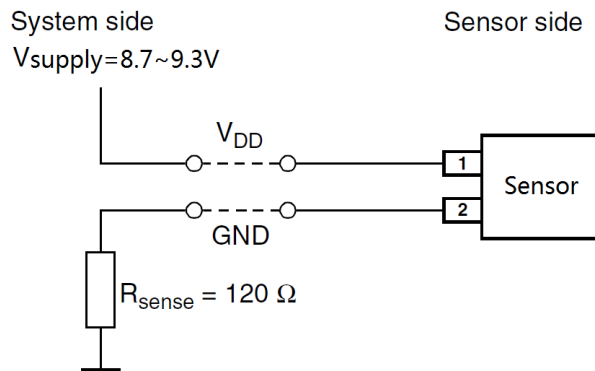


Figure 5: Typical Application Schematic Diagram

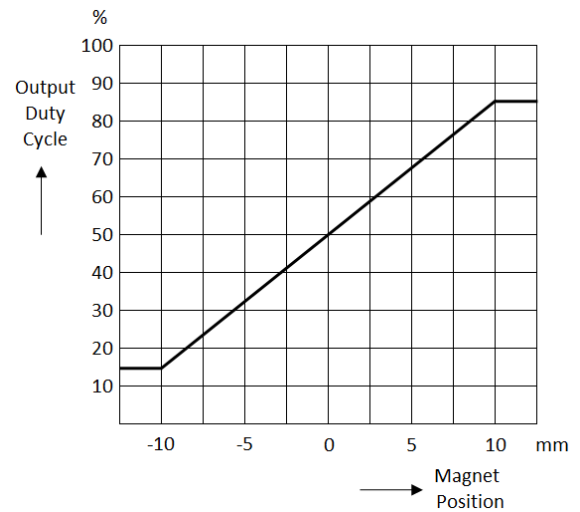


Figure 6: Output Curve

Packaging Options

Custom packaging can be provided to meet any need, please contact Littelfuse Engineering for details.

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Functional Characteristics

Parameter			
Type			
Hall Effect Sensor		Programmable	
Output		Linear PWM Duty Cycle	
Electrical			
Voltage Supply	Max.		9.3Vdc
	Min.		8.7Vdc
PWM Output Signal Current	Low		4.0 ~ 8.0mA
	High		12.0~ 16.5mA
PWM output Frequency		420~540Hz	
Magnet to Sensor Air Gap	Max.		2.3mm
	Min.		4.7mm
Magnet Linear Sensing Range		-10~+10mm	
Repeatability Across Temp Range		0.5%FS	
Sensor Output Performance (typical)	Air Gap		-10.0mm +10.0mm
	2.3mm		15%DC 85%DC
	3.5mm		25%DC 75%DC
	4.7mm		33%DC 67%DC
PWM Output Signal Clamps	Min.		3%DC
	Max.		97%DC
Environmental/Mechanical			
Temperature	Operating	Celsius	-40° C to +140°C
	Storage	Celsius	-55°C to +150°C
Mechanical Shock	15ms ½ Sine	Max.	25g
Random Vibration	12 – 2000Hz	Max.	RMS MAX 4.2g

Littelfuse

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ASP-MKT45-0021-AB