

55140 Sensor

Miniature Flange Mounting

RoHS



Description

The 55140 is a small flange mounting hall effect sensor occupying only 3.22cm² (0.500"²) board space with a choice of digital, or programmable analog outputs. It is available as three-wire (voltage output) or two-wire (current output) versions. Its case design enables screw or adhesive mounting and the sensor is capable of switching up to 24Vdc and 20mA. It comes with a range of sensitivity and cable length options.

Features & Benefits

- Magnetically operated position sensor
- Digital and programmable analog types available
- Medium, high or programmable sensitivities
- Three-wire (voltage output) or two-wire (current output) versions
- Vibration 50g max. @ 50-2,000Hz
- Shock 150g max. @ 11ms ½ Sine
- Reverse/Over voltage protection
- Built in temperature compensation
- High switching speed up to 12kHz
- Long life; up to 20 billion operations
- Operates in static or dynamic magnetic field
- RoHS Compliant

Additional Information



Resources



Accessories



Samples

Applications

- Position and limit sensing
- RPM measurement
- Commutation of brushless DC motors
- Flow metering
- Angle sensing
- Magnetic encoders

Dimensions

Dimensions in mm (inch)

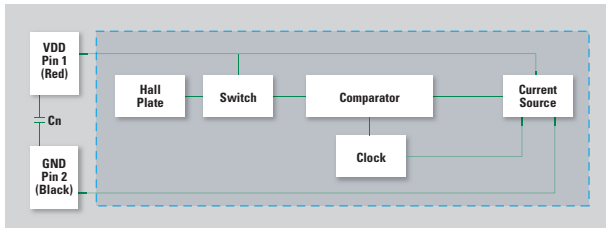


55140 Sensor

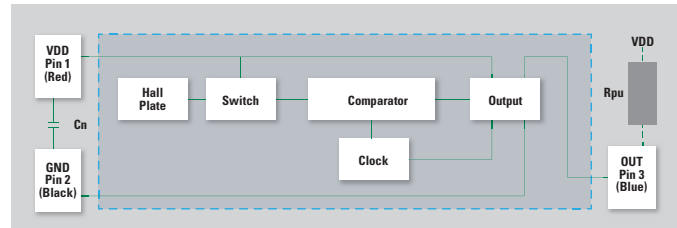
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Block Diagram

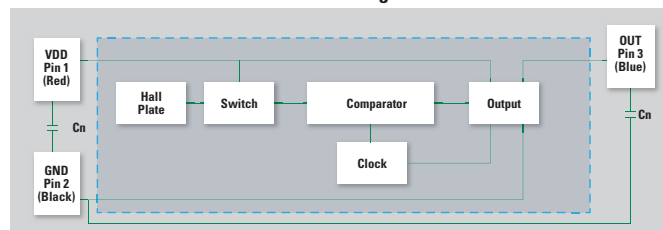
Two-wire Version



Three-wire Version



Three-wire Analog Version



Notes:

1. Add capacitor Cn as shown, close to the sensor, for transient suppression if required.
2. Add pull-up resistor Rpu as shown for sinking output. The Rpu value should be calculated using your supply voltage while keeping the ON state current at a level below the maximum.
 $R_{pu} = V_{DD}/I_o$; $R_{pu} = 12V_{dc}/10mA = 1.2k\Omega$

T1 - Electrical Ratings

2-Wire Hall Switch (2M)

| Hall Type | | Digital Switch 2-Wire (Current Output) | |
|-----------------------------|----------------------|--|--------------|
| Supply Voltage ¹ | Absolute Ratings | Vdc | -18 to +28 |
| | Operate | Vdc | +3 to +24 |
| | Overshoot Protection | Vdc - max | 32 |
| Current Consumption | Hall OFF | mA | 5.0 to 6.9 |
| | Hall ON | mA | 12.0 to 17.0 |
| Switching Speed | - | kHz | 12 |
| Temperature | Operating | C | -40 to +100 |

Notes:

1. It is assumed the product will operate within the normal Supply Voltage of +24Vdc maximum.

T2 - Electrical Ratings

3-Wire Hall Switch & Analog Programmable (3H, 3M, & AP)

| Hall Type | | Digital Switch 3 - Wire (Voltage Output) | | AP - Analog (Programmable Only) ² |
|-----------------------------------|----------------------|--|----------------|--|
| Supply Voltage ¹ | Absolute Ratings | Vdc | -18 to +28 | 8.5 |
| | Operate | Vdc | 2.7 to 24 | 4.5 - 5.5 |
| | Overshoot Protection | Vdc - max | 32 | 16.0 |
| Output High Voltage | Min | Vdc | Sinking Output | 0.2 |
| Output Low Voltage | Max | Vdc | 0.4 @ 20mA | 4.80 |
| Output Current (continuously on) | Max | mA | 25 | -1.0 to +1.0 |
| Current Consumption (from Supply) | - | mA | 1.1 to 2.4 | 5.0 to 10.0 |
| Switching Speed | - | kHz | 12 | 2 |
| Temperature | Operating | C | -40 to +100 | -40 to +100 |

Notes:

1. It is assumed the product will operate within the normal Supply Voltage of +24Vdc maximum.
2. Sensor Voltage Output can be reprogrammed to best fit customer application (see LF Application Note)

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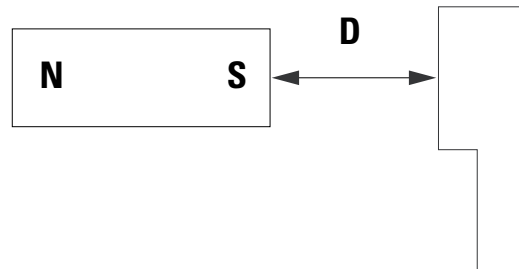
Hall Sensitivity Options

| Select Option | Hall Type | Sensitivity (Gauss) | Activate - D ¹ mm (inch) |
|---------------|---------------|------------------------------------|-------------------------------------|
| 2M | 2-Wire Switch | 94 | 15.0 |
| 3M | 3-Wire Switch | 120 | 13.0 |
| 3H | 3-Wire Switch | 55 | 19.0 |
| AP | Analog | Programmable Response ² | |

Notes:

1. Activation distances are approximate using NeFeB Magnet 21 x 7 x 4.7 (.827 x .276W x .185H) Littelfuse P/N H-58
2. Sensor Voltage Output can be reprogrammed to best fit customer application (see LF Application Note)

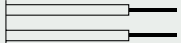
Activation Detail



Cable Length Specification

| Cable 24 AWG 7/32 PVC 105°C UL1430/UL1569 | |
|--|------------------------|
| Select Option | Cable Length mm (inch) |
| 02 | 300 (11.81) |
| 05 | 1000 (39.37) |

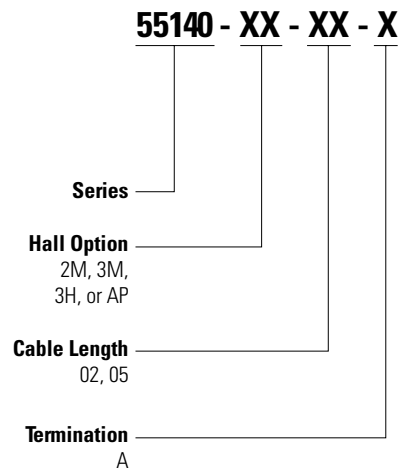
Termination Detail

| Select Option | Description (Two-wire versions illustrated) |
|---------------|---|
| A | Tinned leads (6.4±0.76)mm  |

Packaging Options

| Packaging Option | Packaging Specification | Quantity | Quantity & Packaging Code | Taping Width |
|------------------|-------------------------|----------|---------------------------|--------------|
| Bulk | Bulk | 500 | N/A | N/A |

Part Numbering System



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