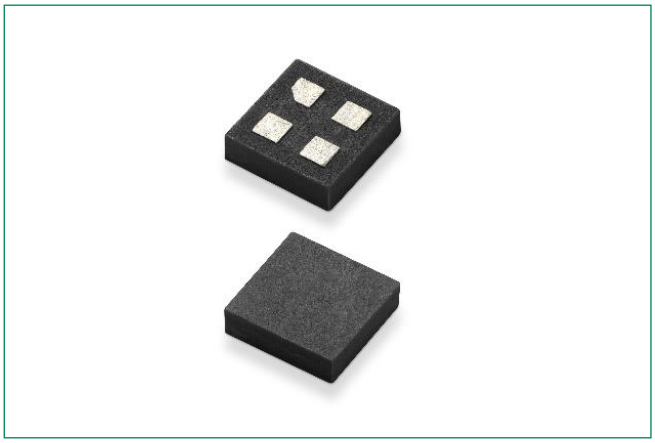
LF2117XTMR Series

TMR Omnipolar Switch 160nA Push Pull Sensor

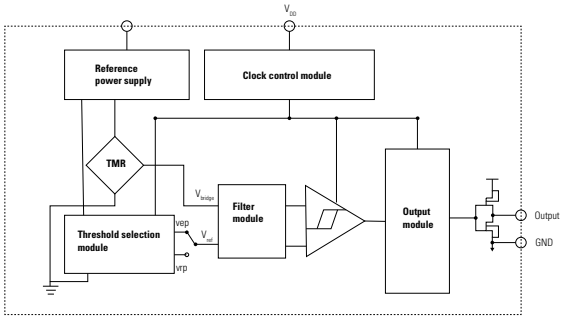
RoHS



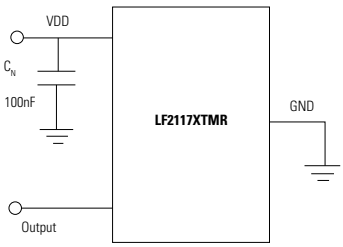
Additional Information

Resources | Accessories | Samples

Functional Block Diagram



TMR Switch Typical Applications Circuit



Notes:
1. It is strongly recommended that an external bypass capacitor be connected in-close-proximity to the VCC pin.

Description

LF2117XTMR is a digital omnipolar magnetic switch that integrates TMR and CMOS technology in order to provide high precision, low power consumption and high sensitivity.

It contains a voltage generator, a comparator, a digital logic control module, a threshold trimming module and a CMOS output circuit. LF2117XTMR has a wide working voltage and temperature range. This series is available in a variety of magnetic field thresholds to suit various applications.

LF2117XTMR can provide omnipolar magnetic response with a low current consumption of 160nA. It detects the magnetic field parallel to the surface of the chip package and operates within a supply voltage range from 1.8V to 5.5V and is available in an LGA4 package.

Features & Benefits

- Tunneling Magnetoresistance technology (TMR)
- Low power consumption at 160nA
- X axis sensing direction
- Low Frequency at 50Hz
- Operation with North and South Pole
- 1.8V to 5.5V Operating Range
- High Tolerance to External Magnetic Field Interference
- Low Switching Points for High Sensitivity
- Excellent Thermal Stability

Applications

- Proximity Switches
- Medical Devices
- Fluid Level Sensing/Detection
- IoT Devices
- Low power applications

Healthcare:
- Continuous Glucose Meter
- Auto-injectors or drug delivery pens

Industrial:
- Automation
- Robotic

Consumer electronics:
- Robotic and portable devices

Transportation:
- Off-Highway Vehicles
- E-Bikes, Two-/Three-Wheelers

Building Automation:
- Smart gas and eater meter
- Door and windows position detection

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Absolute Maximum Ratings (@TA = +25°C, unless otherwise specified)

Symbol	Characteristics	Values	Unit
B	Magnetic Flux Density	3000	Gauss
V_{ESD}	ESD level (HBM)	8	kV
T_A	Operating Temperature	-40 ~ 85	°C
T_{stg}	Storage Temperature	-50 ~150	°C
TJ	Junction Temperature	150	°C
T_R	Reflow Soldering Temperature	260	°C

Notes:
1. Stresses greater than the 'Absolute Maximum Ratings' specified above may cause permanent damage to the device. These are stress ratings only; functional operation of the device at these or any other conditions exceeding those indicated in this specification is not implied. Device reliability may be affected by exposure to absolute maximum rating conditions for extended periods of time.

Electrical Characteristics (@TA= +25°C, Vcc = 3.0V)

Symbol	Characteristics	Min.	Typ.	Max.	Unit	Conditions
V_{CC}	Supply Voltage	1.8	5.0	5.5	V	Operating
V_{OH}	Output High Voltage	Vcc -0.1	Vcc-0.005	V_{CC}	V	Iout at 1mA
V_{OL}	Output Low Voltage	-	0.015	0.1	V	Iout at 1mA
I_{CC}	Average Supply Current	-	160	-	nA	Output Open
Freq	Response Frequency	–	50	-	Hz	–

Magnetic Characteristics (@TA = +25°C, Vcc = 3.0V)

Part Number	Symbol	Characteristics	Min.	Typ.	Max.	Unit
LF21173TMR	B_{OP}	Operation Point	6	9	12	Gauss
	B_{RP}	Release Point	3	6	9	Gauss
	B_H	Hysteresis	-	3	-	Gauss
LF21177TMR	B_{OP}	Operation Point	28	30	36	Gauss
	B_{RP}	Release Point	16	21	26	Gauss
	B_H	Hysteresis	-	9	-	Gauss

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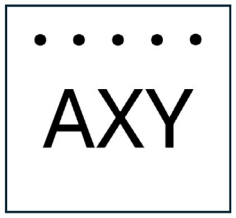
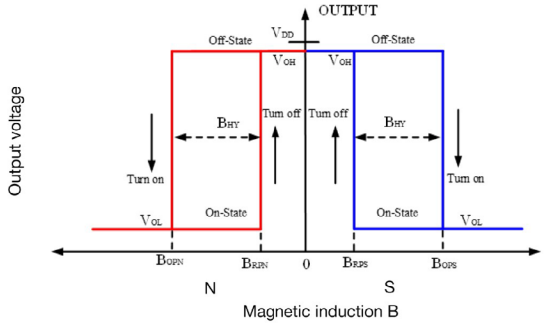
Pin Configuration and Sensing Direction of Magnetic Field



CODE:
A-W: Switch Type
X: 2nd Digit of WW
Y: Last Digit of Year
Dots: 1st Digit of WW



Part Marking Code:
Ixxxy: I = LF21173TMR; xxx = Julian manufactured date; y = manufactured year Moisture Sensitivity Level: Rating is 3
Pick and Place Nozzle: Samsung CN140 or equivalent

Pin Name	Pin No. LGA4	Pin Function
V_{out}	3	Output
GND	4	Ground
V_{cc}	2	Supply Voltage
DNC	1	Do Not Connect

Part Numbering System

LF - x - x - x - x - x TMR

Littelfuse Brand

Switch Type
Type 1 = Linear Sensor
2 = Omnipolar
3 = Unipolar

Output
1 = PushPull
2 = Open Drain

Quiescent Current
1 = 200nA
2 = 1.5uA
3 = 0.6mA

Tunneling Magnetoresistance Technology Sensor

Sensitivity Gauss
1 = 5 Gauss
2 = 7 Gauss
3 = 10 Gauss
4 = 14 Gauss
5 = 17 Gauss
6 = 25 Gauss
7 = 35 Gauss

Sensitivity Axis/Package
1 = X/SOT23
2 = Y/SOT23
3 = Z/SOT23
4 = X/TO92
5 = Y/TO92
6 = Z/TO92
7 = X/LGA
8 = Y/LGA
9 = Z/LGA

Example: LF11115 is Bipolar, Push Pull, 200nA, X axis, 17Gauss
Note: Every combination is NOT offered. Contact Littelfuse for availability.

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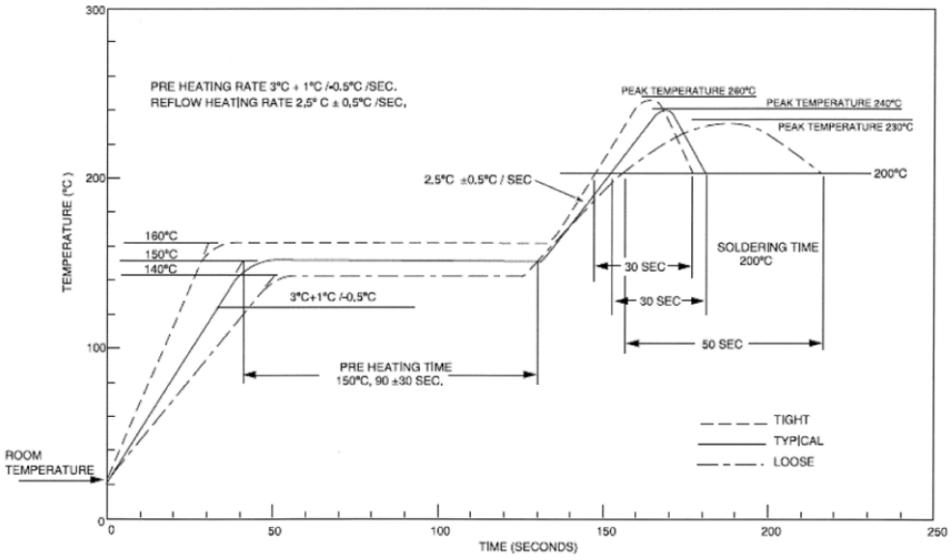
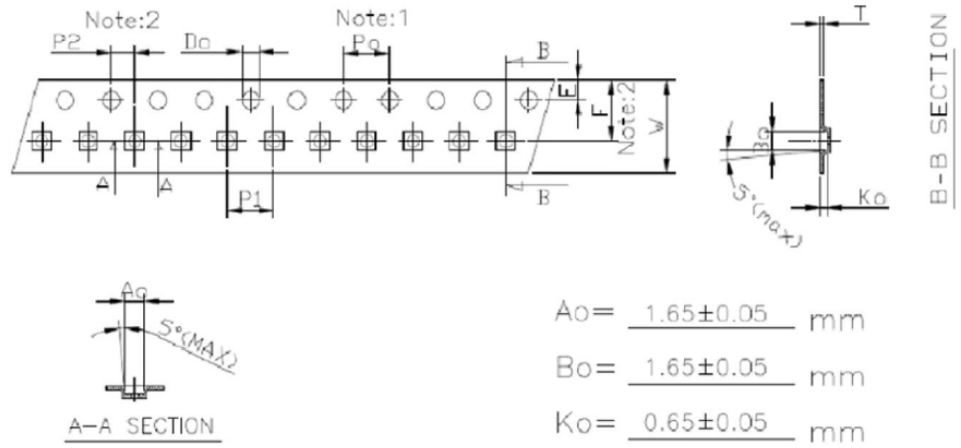
Soldering Profile for Lead-free packages



Tape and Reel



Po	P1	P2	Do	D1	E	F	W	T
4.00 ± 0.10mm	4.00 ± 0.10mm	2.00 ± 0.05mm	1.50 ± 0.10mm	1.10 ± 0.05mm	1.75 ± 0.10mm	3.50 ± 0.05mm	8.00 ± 0.20mm	0.25 ± 0.02mm

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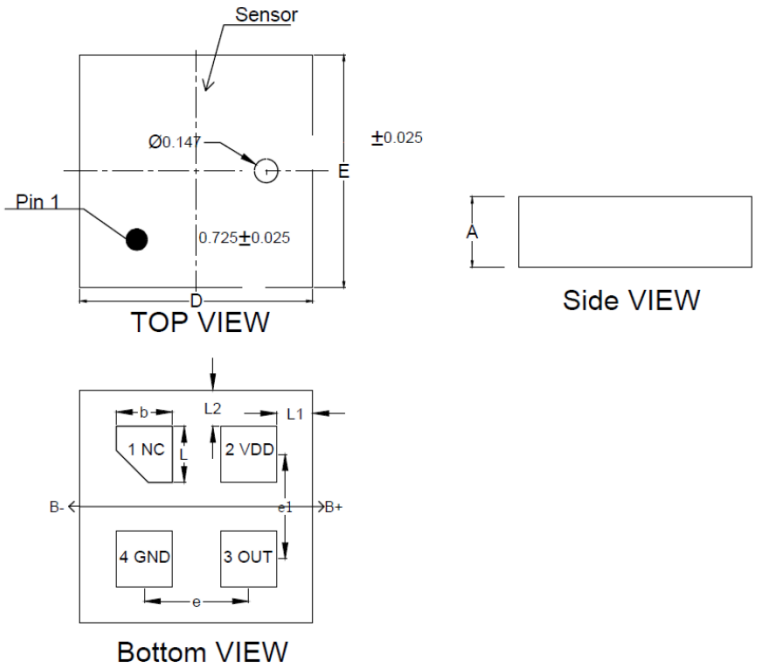
LGA4 Package Information



Remark：Lead Plating thickness >=1um (Pure Tin)

Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.386	-	0.486	0.015	-	.019
D	1.40	-	1.50	.055	-	.059
E	1.40	-	1.50	.055	-	.059
b	0.30	-	0.40	.012	-	.016
L	0.30	-	0.40	.012	-	.016
L1	0.225 REF			.009 REF		
L2	0.225 REF			.009 REF		
e	0.650 BSC			.026 REF		
e1	0.650 BSC			.026 REF		

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