

LF2117XTMR Series

TMR Omnipolar Switch 160nA Push Pull Sensor

RoHS



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.

Additional Information



Resources

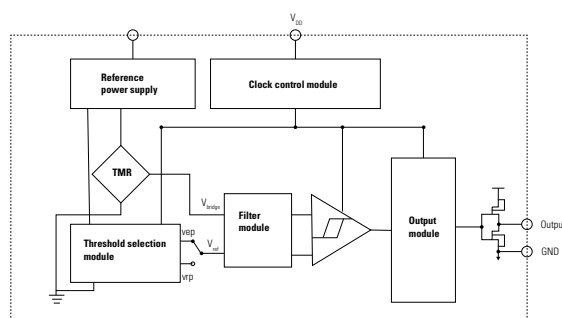


Accessories

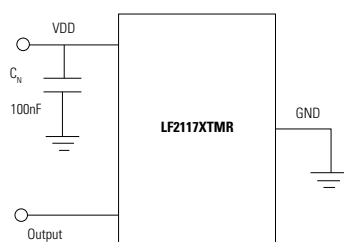


Samples

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.

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
T _J	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	V _{CC} - 0.1	V _{CC} - 0.005	V _{CC}	V	I _{out} at 1mA
V _{OL}	Output Low Voltage	-	0.015	0.1	V	I _{out} 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

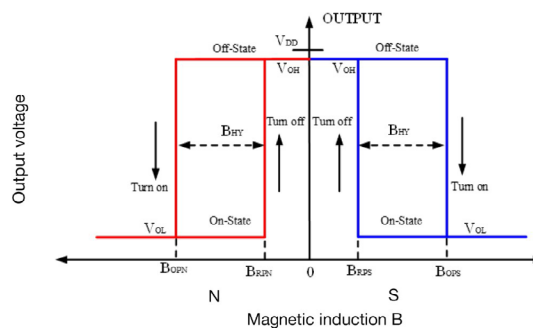
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Pin Configuration and Sensing Direction of Magnetic Field



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

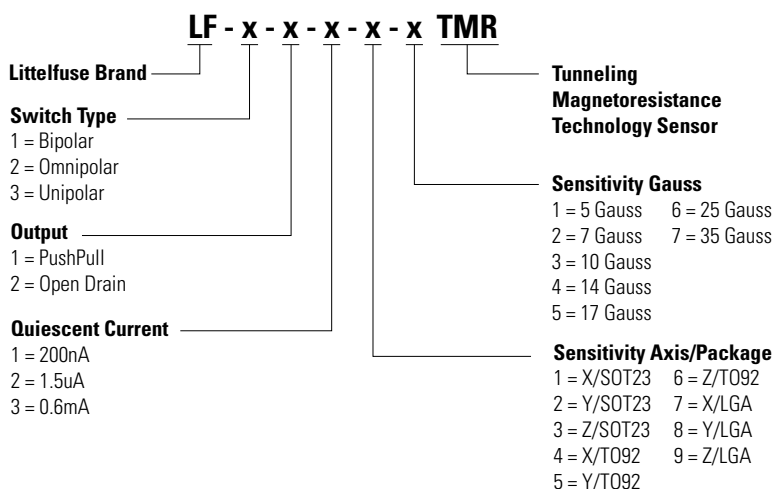


Part Marking Code:

lxxx: l = 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



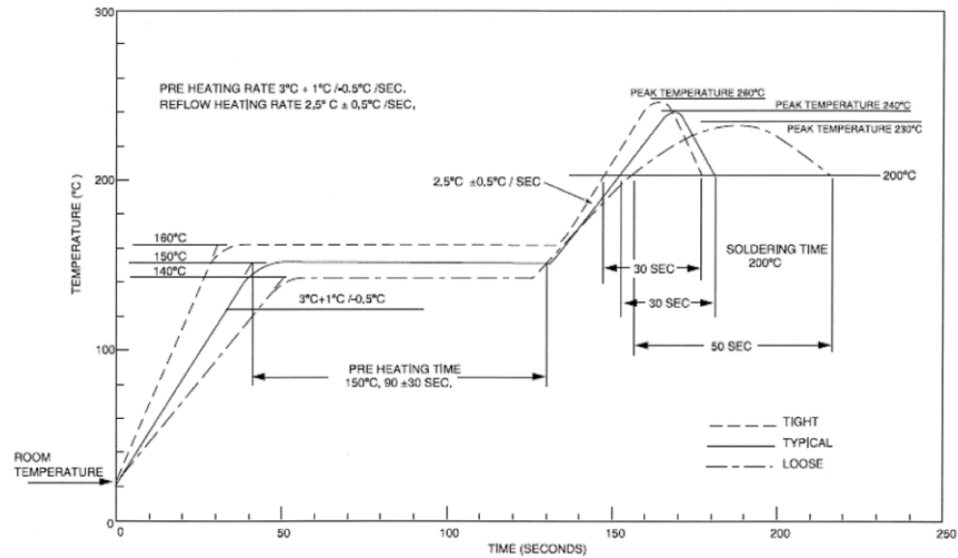
Example: LF11115 is Bipolar, Push Pull, 200nA, X axis, 17Gauss

Note: Every combination is NOT offered. Contact Littelfuse for availability.

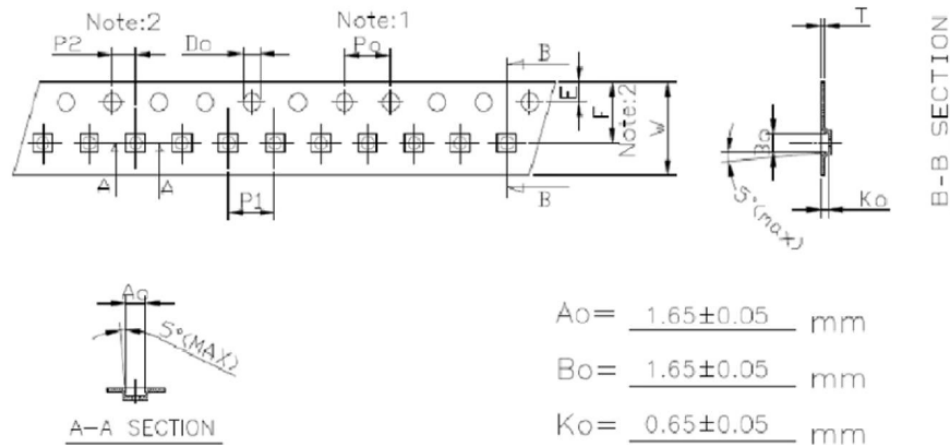
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Soldering Profile for Lead-free packages



Tape and Reel

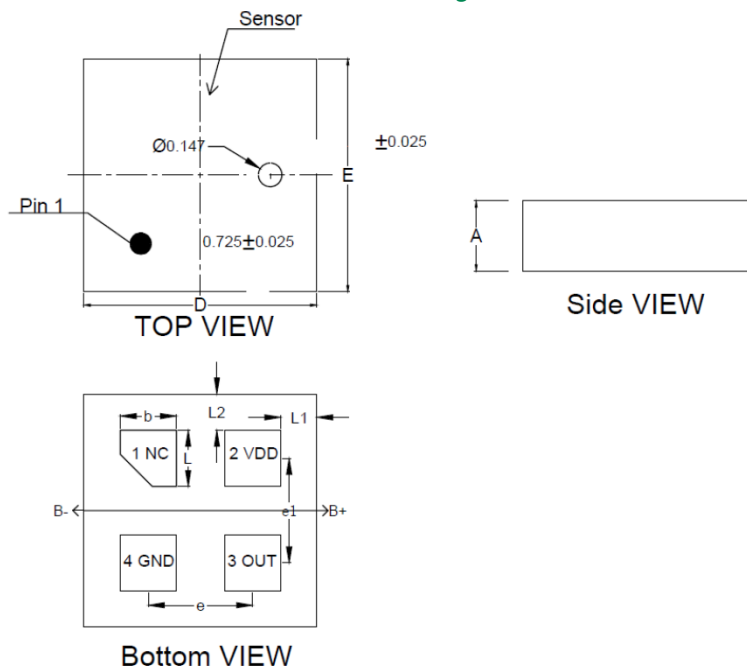


Po	P1	P2	Do	D1	E	F	W	T
4.00 $\pm$ 0.10mm	4.00 $\pm$ 0.10mm	2.00 $\pm$ 0.05mm	1.50 $\pm$ 0.10mm	1.10 $\pm$ 0.05mm	1.75 $\pm$ 0.10mm	3.50 $\pm$ 0.05mm	8.00 $\pm$ 0.20mm	0.25 $\pm$ 0.02mm

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LGA4 Package Information



Remark: Lead Plating thickness $\geq 1\mu\text{m}$ (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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