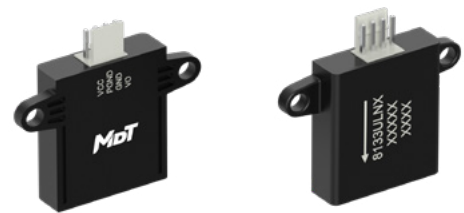


TMR-FMD8133ULNx

Single-axis, Low-noise, High-Transient-Response Magnetic Sensor

Description

The TMR-FMD8133ULNx single-axis, low-noise, high-transient-response magnetic sensor uses a miniaturized, ultra-low-noise TMR sensor chip—independently developed and manufactured by Multi-Dimension Technology—as its sensing element. It employs magnetic modulation technology to suppress 1/f noise, dual-T detection technology to improve the detection of very low-frequency weak magnetic signals, effectively suppressing high-frequency noise and improving the signal-to-noise ratio of weak magnetic signals, thereby achieving high transient response and high-resolution detection of weak magnetic signals. The passive detection range for a non-magnetized paper clip (Comix B3500) can reach up to 25 cm.



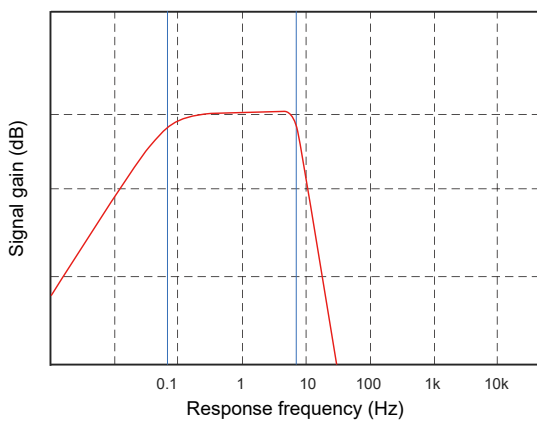
TMR-FMD8133ULNx

Features and Benefits

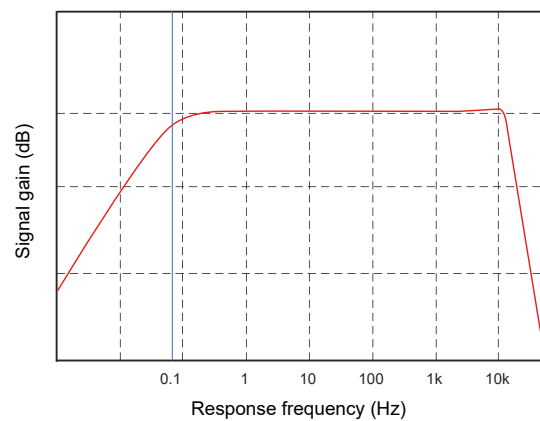
- Strong low-frequency dynamic weak magnetic field detection capability
- High-resolution measurements
- Maximum saturation field: $\sim \pm 600 \mu\text{T}$
- Broad background magnetic field: $\sim \pm 300 \mu\text{T}$
- Highly integrated design, easy secondary integration

Applications

- Security system
- Magnetic material detection
- Traffic flow control



Default frequency response curve



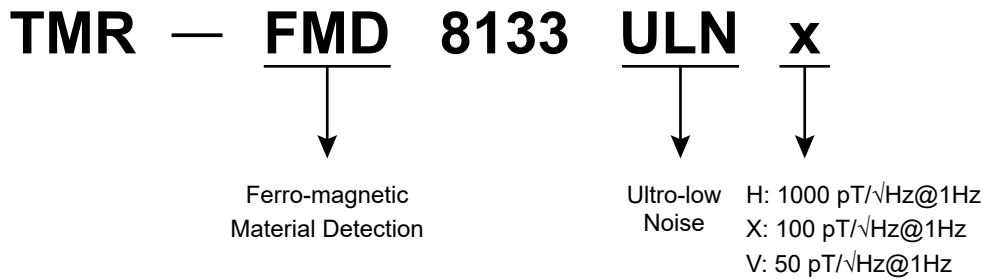
Maximum frequency response chart

Selection Guide

Part Number	Sensing Direction	Frequency Response (-3dB)	Magnetic Field Spectral Noise Density	Supply Voltage	Dimension (mm)
TMR-FMD8133ULNH	Single axis	0.1 to 10 kHz	1000 pT/√Hz@1Hz	3 V to 5 V	48.5 × 52 × 9.5
TMR-FMD8133ULNX	Single axis	0.1 to 10 kHz	100 pT/√Hz@1Hz	3 V to 5 V	48.5 × 52 × 9.5
TMR-FMD8133ULNV	Single axis	0.1 to 10 kHz	50 pT/√Hz@1Hz	3 V to 5 V	48.5 × 52 × 9.5

Note: The Default response frequency is 7Hz.

Product Part Number Description



Catalogue

1. Specification Parameters.....	03
2. Electrical Characteristics Parameters.....	03
3. Interface Definition.....	04
4. Mechanical / Interface Specifications	04
5. Storage and Operating Environment Parameters	04
6. Recommend Interface Circuits	05
7. Dimensions.....	06

1. Specification Parameters

Specification	Typical Value	Unit	Applicable Model
Number of axes	1	-	All models
Saturation field ¹⁾	±1000	μT	TMR-FMD8133ULNH
	±600		TMR-FMD8133ULNX
	±200		TMR-FMD8133ULNV
Measuring range ¹⁾	±500	μT	TMR-FMD8133ULNH
	±300		TMR-FMD8133ULNX
	±100		TMR-FMD8133ULNV
Magnetic field spectral noise density	1000	pT/√Hz@1Hz	TMR-FMD8133ULNH
	100		TMR-FMD8133ULNX
	50		TMR-FMD8133ULNV
Sensitivity	20	mV/nT@1Hz	TMR-FMD8133ULNH
	40		TMR-FMD8133ULNX
	50		TMR-FMD8133ULNV
Frequency response (-3dB) ²⁾	0.1 ~ 10000	Hz	All models
Start up time	100	ms	All models
Electrical balance time	1	min	All models

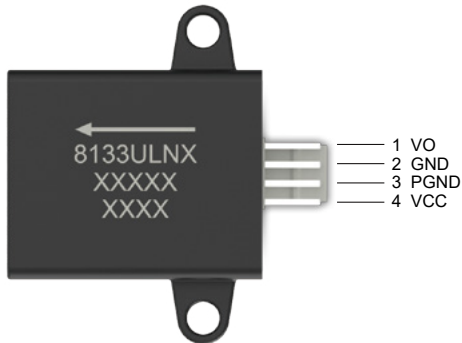
1) TMR chip specification

2) Customizable, up to 10 kHz (default: 7 Hz)

2. Electrical Characteristics Parameters

Specification	Condition	Min.	Typ.	Max.	Unit
Supply voltage	-	3.0	3.3	5.0	V
Supply current	3.3 V Supply	-	33	-	mA
	5 V Supply	-	23	-	mA
Starting current	-	-	-	60	mA
Analog voltage output	3.3 V Supply	0	-	3.3	V
	5 V Supply	0	-	5	V
Quiescent output	-	-	1.6	-	V
Input protection	-	Reverse-polarity protection			-

3. Interface Definition



Number	Name	Function
1	VO	Signal
2	GND	Singal ground
3	PGND	Power ground
4	V _{CC}	Power supply

4. Mechanical / Interface Specifications

Specification	Parameter	Unit
Dimensions (length × width × height)	48.5 × 52 × 9.5	mm
Weight	< 20	g
Electrical interface	4PIN, 2.5 mm pitch	mm
Mounting interface	2 × Φ5, hole-center distance 44	mm
Sensitive axis direction	Isotropic (> 3 times the maximum size of the target to be measured)	-

5. Storage and Operating Environment Parameters

Subject	Parameter	Unit
Operating temperature range	-20 to +70	°C
Storage temperature range	-40 to +85	°C
Environmental protection	Potted / encapsulated	-

6. Recommend Interface Circuits

The module output impedance is related to the magnetic field intensity to be detected and the back-end circuit, and power-frequency interference may also be present. The following interface circuits are therefore recommended:

- 1) When the module output signal meets the requirements, add an isolation circuit before AD sampling, as shown in Figure 1.
- 2) If further amplification of the module output signal is required, use one or more stages of the circuit shown in Figure 2.
- 3) If the signal contains obvious power-frequency interference, use the notch filter circuit shown in Figure 3.

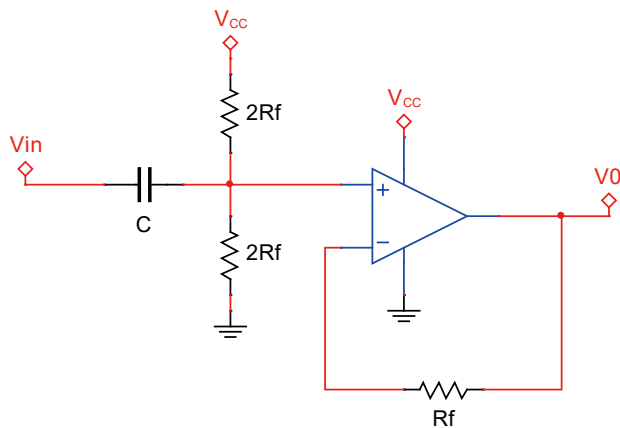


Figure 1. Isolation Circuit

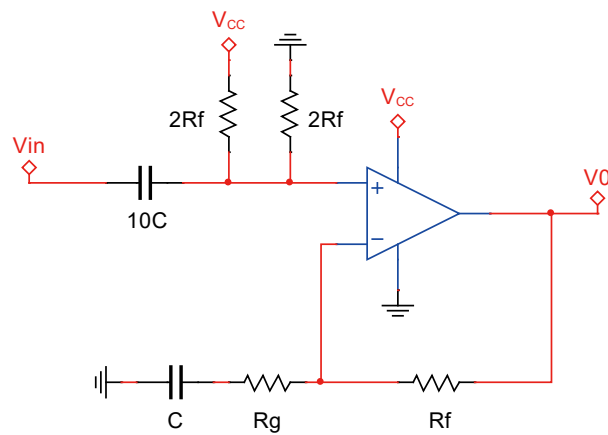


Figure 2. Isolation Amplifier Circuit

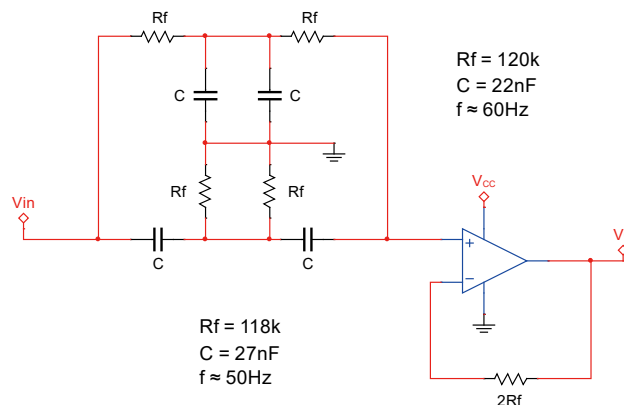


Figure 3. Notch Filter Circuit

7. Dimensions

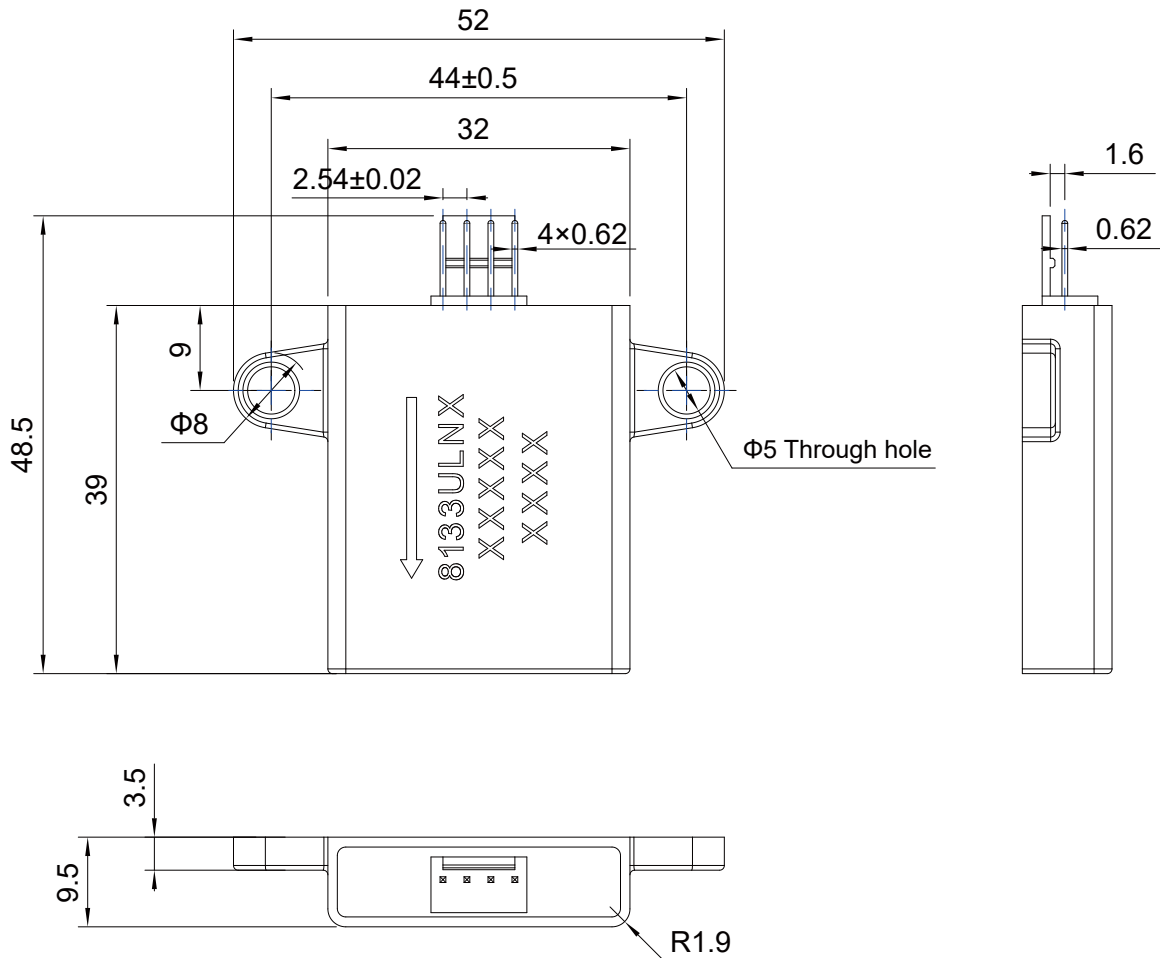


Figure 4. TMR-FMD8133ULN Outline Dimensions (Unit: mm)

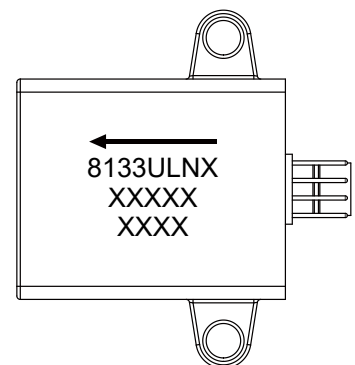
Package Marking Description

Line 1: Arrow, indicating the sensitive-axis direction.

Line 2: Product number.

Line 3: Production date. The first two digits indicate the year, the middle character is the English initial of the month, and the last two digits indicate the day. For example, “25N06” indicates production on November 6, 2025.

Line 4: Product attribute. “3V10” indicates a bandwidth of 7 Hz, and “3V10k” indicates a bandwidth of 10 kHz.



Copyright © 2026 by MultiDimension Technology Co., Ltd.

Information furnished herein by MultiDimension Technology Co., Ltd. (hereinafter MDT) is believed to be accurate and reliable. However, MDT disclaims any and all warranties and liabilities of any kind, with respect to any examples, hints or any performance or use of technical data as described herein and/or any information regarding the application of the product, including without limitation warranties of non-infringement of intellectual property rights of any third party. This document neither conveys nor implies any license under patent or other industrial or intellectual property rights. Customer or any third-party must further determine the suitability of the MDT products for its applications to avoid the applications default of customer or third-party. MDT accept no liability in this respect.

MDT does not assume any liabilities of any indirect, incidental, punitive, special or consequential damages (including without limitation of lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory. Notwithstanding any damages that customer might incur for any reason whatsoever, MDT's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the terms and conditions of commercial sale of MDT.

Absolute maximum ratings are the extreme limits the device will withstand without damage to the MDT product. However, the electrical and mechanical characteristics are not guaranteed as the maximum limits (above recommended operating conditions) are approached. MDT disclaims any and all warranties and liabilities of the MDT product will operate at absolute maximum ratings.

Specifications may change without notice.

Please download latest document from our official website www.dowaytech.com/en.

Recycling

The product(s) in this document need to be handed over to a qualified solid waste management services company for recycling in accordance with relevant regulations on waste classification after the end of the product(s) life.



No.2 Guangdong Road, Zhangjiagang Free Trade Zone, Jiangsu, China

Web: www.dowaytech.com/en E-mail: info@dowaytech.com

