

## TMR6206 TMR Magnetic Pattern Recognition Sensor

### **General Description**

The TMR6206 is a type of 6 channels magnetic pattern recognition sensor with high consistency, high sensitivity and high signal-to-noise ratio performance, it is used for detecting the paper bills, bank notes and security documents with magnetic anti-counterfeiting consists. The TMR6206 consist of TMR magneto-resistance sensor, high-quality magnet, high-strength plastic base and durable non-magnetic stainless steel cover. The appearance is shown in Figure. 1.

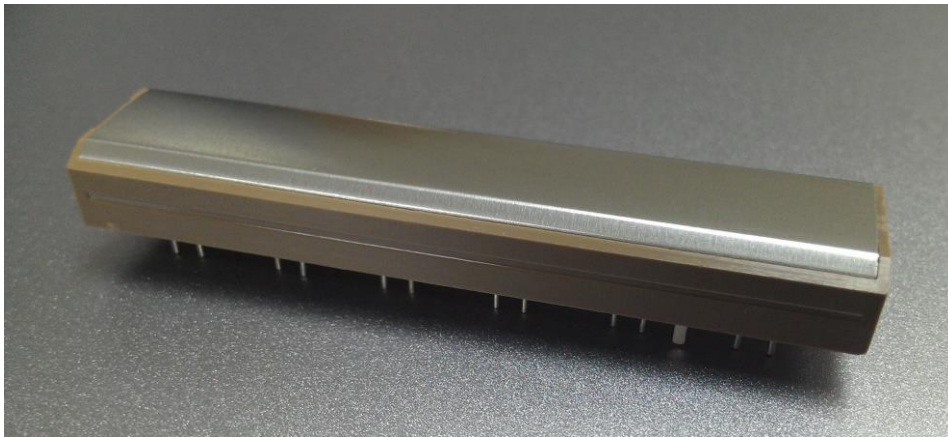


Figure 1. TMR6206 Magnetic Pattern Recognition Sensor Appearance

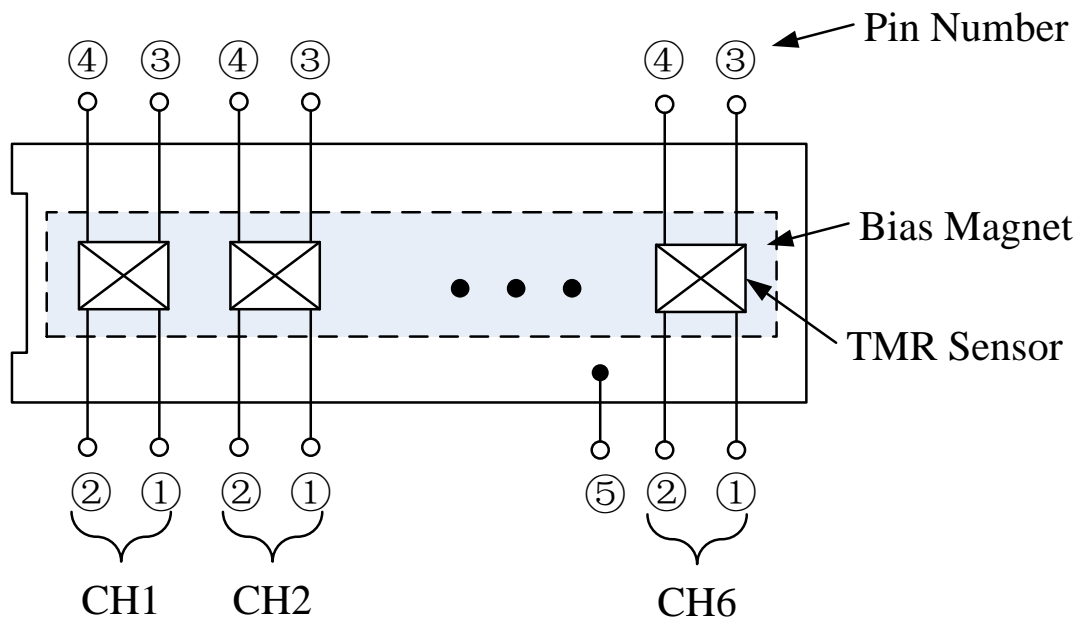
### **Features and Benefits**

- High sensitivity and excellent gap performances
- Sensitivity matching of each channel
- Output voltage is independent of scanning speed
- Differential output, high CMRR performance
- Durable metal case, suitable for long time and heavy load situations
- 60mm detection width, no non-detection area
- 6 channels, 10mm detection width per channel

### **Typical Applications**

- Bill and banknote counter and validator
- Bill and banknote sorter
- ATM
- Bill reader and validator in automated vending machines

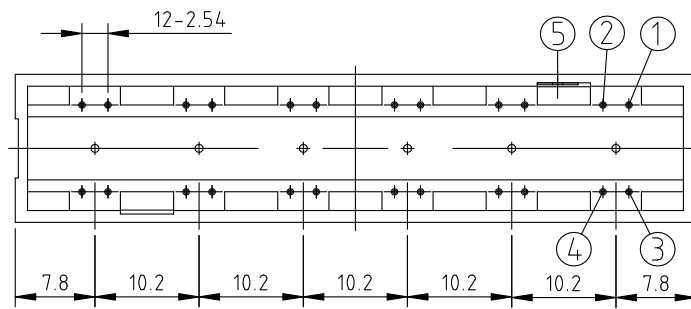
## Schematic and Pin Configuration



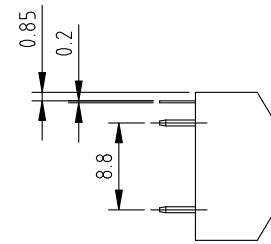
**Block Diagram (Top View)**

Pin No.	Symbol	Description
1	V+	Differential Positive output
2	V <sub>CC</sub>	Power supply
3	V-	Differential Negative output
4	GND	Ground
5	Shell GND	Shell ground

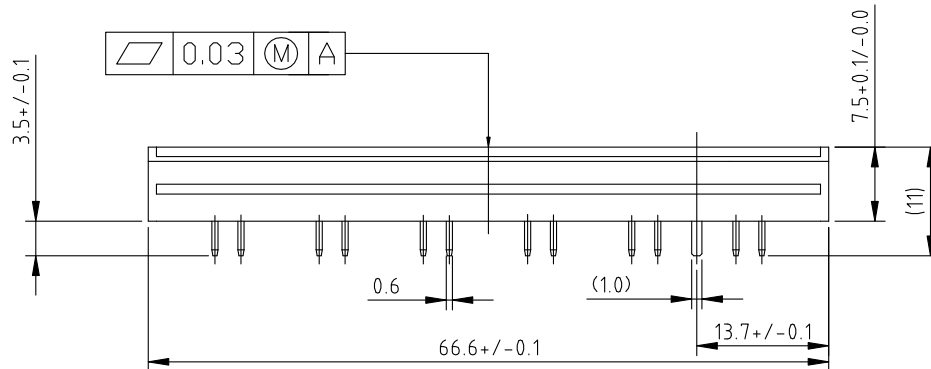
## Outline Drawing and Dimensions



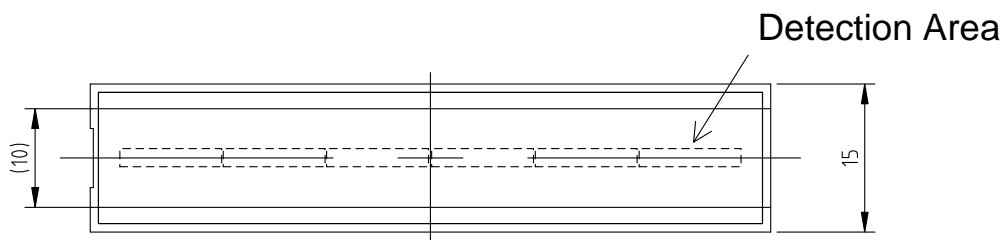
### Bottom View



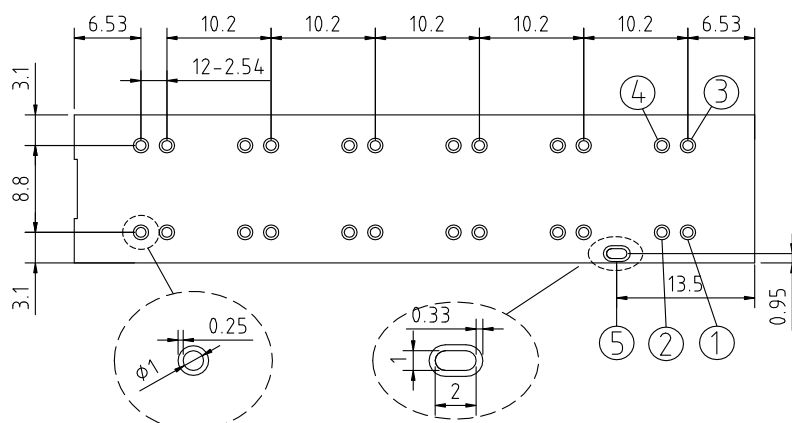
### Side View



### Front View



### Top View



## Recommended Pad Layout

Unit: mm

## **Absolute Maximum Ratings**

Parameter	Symbol	Rating	Unit
Maximum Supply Voltage	$V_{CC}$	5.5	V
Operating Temperature	$T_A$	-20 ~ 65	℃
Storage Temperature	$T_{stg}$	-30 ~ 85	℃
Operating Humidity	HMD	10 ~ 90 (no dew)	%RH
ESD (HBM)	$V_{HBM}$	2000	V

## **Electrical Property (T<sub>A</sub>=25℃)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Sensitivity	$S^{(1)}$	$V_{CC}=5V$	0.4		1.3	$V_{PP}$
Resistance	R	No external magnetic field	0.5		3	kOhm
Output Offset Voltage	$V_{OS}$	$V_{CC}=5V$	-75		75	mV/V
Noise	$V_N^{(2)}$	$V_{CC}=5V$		50		$\mu V_{PP}$
Surface Magnetic Field	B	On sensing surface (S pole)		800		G
Sensitivity Deviation	$\Delta S$	$(S_{MAX} - S_{MIN}) / S_{MEAN}$	0		0.67	V/V
Number of Channels	C			6		
Detection Width per Channel	W			10		mm
Resolution	T			0.475		mm

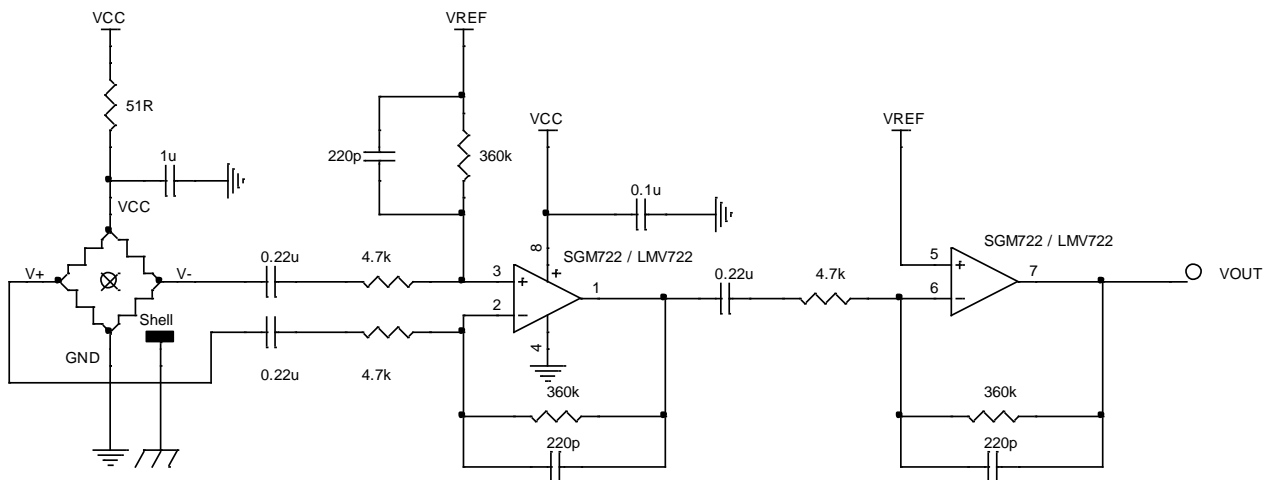
### **Notes:**

- (1) It is tested with 0.4mm x 0.4mm size dots magnetic ink printed paper moving on the surface of the sensor with 0.03mm gap, measure the peak-peak output voltage with the “Recommended Application Circuit”.
- (2) The amplifier’s gain is 10000V/V@1kHz, no external magnetic field applied, measure the peak-to-peak voltage  $V_{PP}$ , then  $V_N = V_{PP}/10000$ .

## Caution for Use

- The sensor contains a permanent magnet, it will cause the recordable magnetic media damaged, such as cassette tapes, floppy disks, credit cards, hard drives, keep it away from such types of magnetic media.
- To avoid the ferromagnetic particles being collected from a dirty environment.
- Magnets tend to snap to each other or the magnetic metals, be careful when handling the sensor not to apply mechanical shock, otherwise the sensors might be abnormal or break.
- Do not place the sensor near the person who has an electronic medical device. It is very dangerous and may cause malfunction of an electronic medical device.
- Magnetic devices may be subject to special transport regulations.
- To avoid the abrasion of the sensor's metal case or stuck the banknote, about 0.1mm gap between the sensor and the opposite side such as rollers is recommended to reduce the pressure of the sensor's metal case.
- To avoid excessive force on terminals, please mount the sensor's base firmly on the PCB and solder all the terminals.
- Hand soldering should be applied, the soldering temperature should be  $350 \pm 10^{\circ}\text{C}$  less than 3 seconds or  $260 \pm 5^{\circ}\text{C}$  less than 10 seconds

## Recommended Application Circuit



### Notes:

Shell GND pin should be connected to the shielding ground.

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