

## APPLICATION NOTE

Dear. \_\_\_\_\_.

Item	TMS100
Model	
Rev.	Ver. 01
Date	3/22/2013

March. 22. 2013

Signature : \_\_\_\_\_.

Date : \_\_\_\_\_.

### TELTRON INC.

TELTRON INC. 202 ITplex, 26-41, Gajeongbuk-ro, Yuseong-gu, Daejon, 305-343, Korea

Tel : +82-42-360-2020 Fax : +82-42-360-2010

E-mail : [teltron@teltron.com](mailto:teltron@teltron.com) URL : <http://www.teltron.com>

## Contents

1. Application
2. General characteristics
3. Electrical properties
4. Service environment
5. Physical specification
6. Detecting distance
7. Application schematic diagram
8. Instructions on PCB Artwork
9. Analog output signals of TMS100 Sensor IF output filter and amplifier

## 1. Application

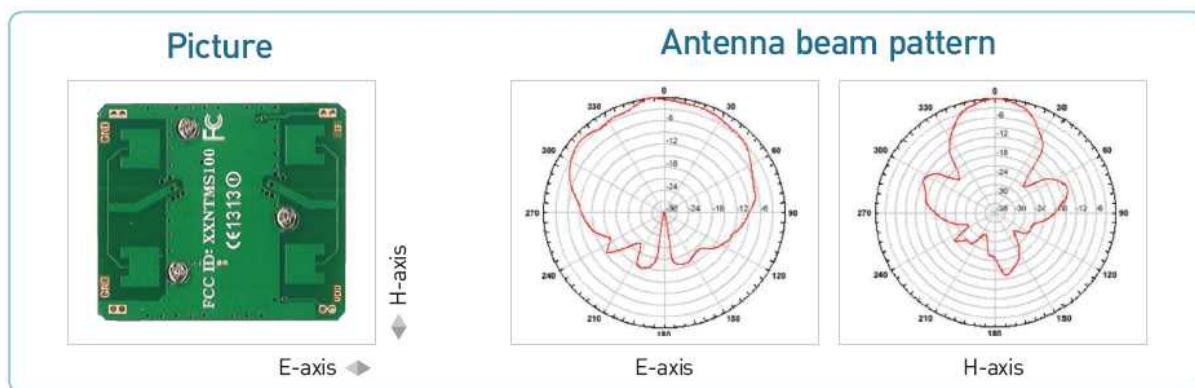
This item is used for the products and systems requiring motion detection as follows.

- 1) Intrusion detection
- 2) Automatic door control
- 3) Lighting control

## 2. General characteristics

TMS100 is a X-band Doppler sensor transmitter & receiver module for motion detection. As this product includes a DR(dielectric resonator) oscillator, a passive diode mixer, and a patch antenna, it provides the most reliable solution in motion detection.

## 3. Electrical properties

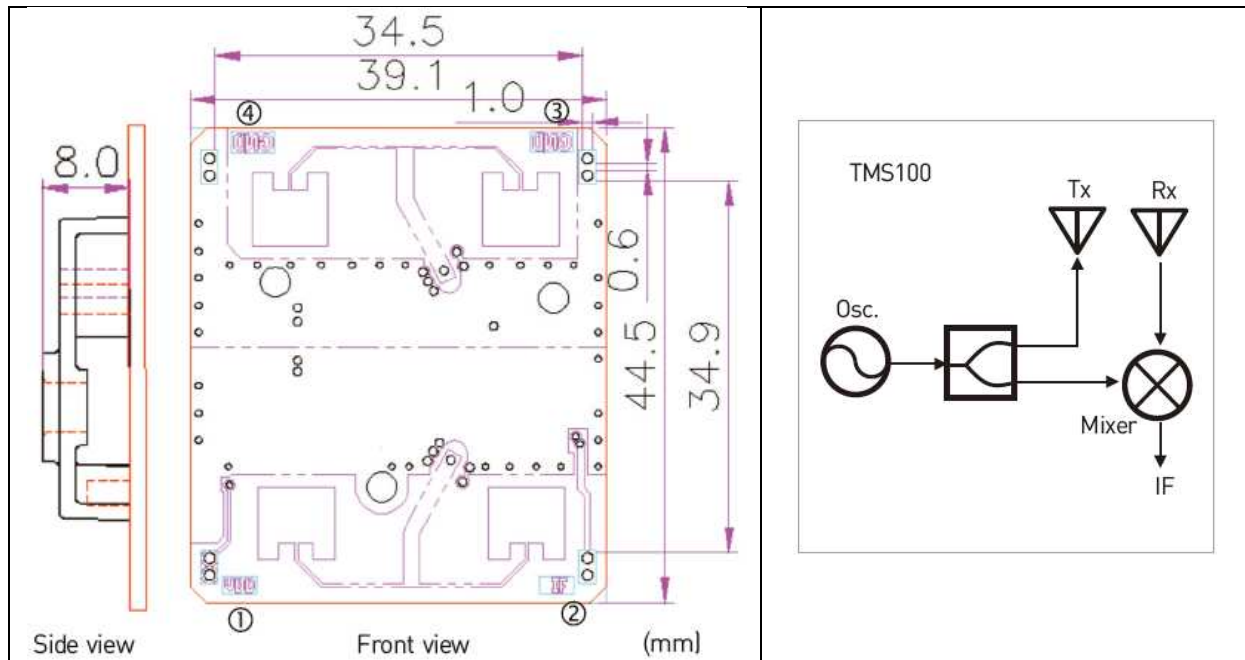


Parameters		Min.	Typ.	Max.	Unit	Condition
CW	Frequency	10,525±12.5			MHz	Over Temp.
	Output Power (EIRP)			15	dBm	
	Power Supply	4.75	5	5.25	V	
	Current Consumption	30		60	mA	CW
	Settling time			6	μs	
	Noise			10	μVrms	3~80 Hz
	Received Signal			20	mVp-p	max
	3dB Antenna Beam Width - E-axis		81		°	
	3dB Antenna Beam Width - H-axis		36		°	
	Operating temp.	-20		+55	°C	
	Storage temp.	-30		+70	°C	
	Size	45 x 40 x 10			mm <sup>3</sup>	
Pulse Operation	Pulse Width	5			μs	
	Duty Cycle	1			%	
	Average Current		2		mA	@5% duty

## 4. Service environment

- 1) Operating temperature: -20 ~ +55 °C
- 2) Storage temperature : -30 ~ +70 °C

## 5. Physical dimension (Unit : mm)

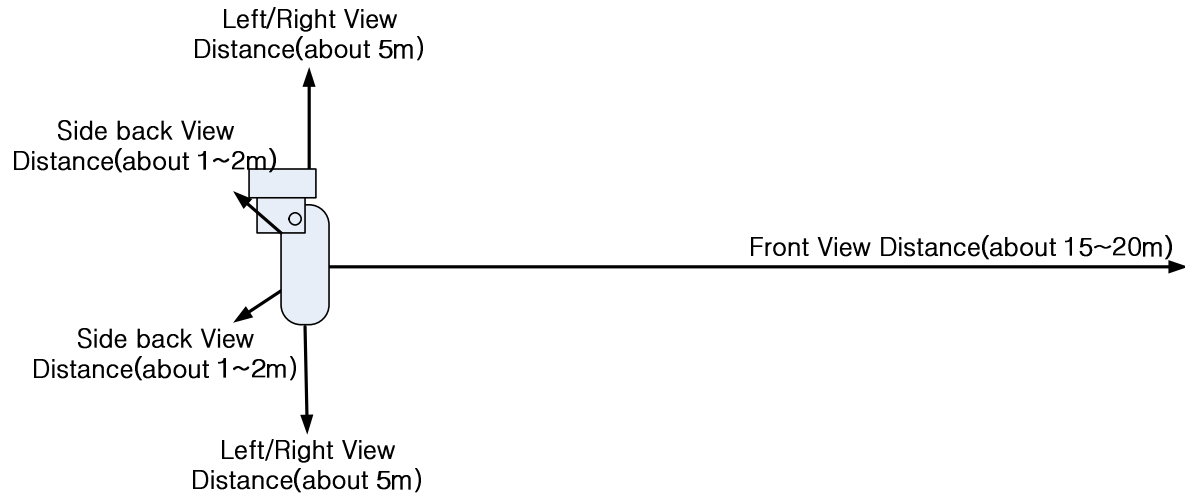


Parameter	Length	Description
W	39.1	Width of the sensor
H	44.5	Length of the sensor
T	10	Height of the sensor

### [I/O Description]

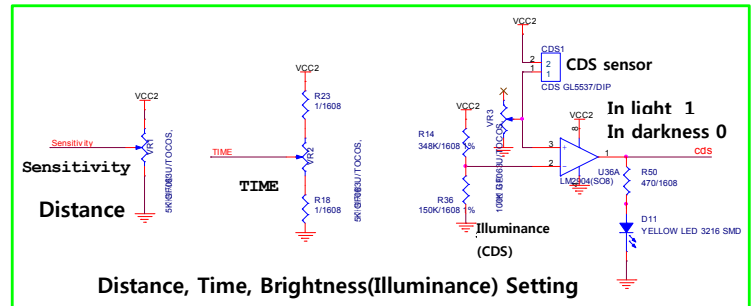
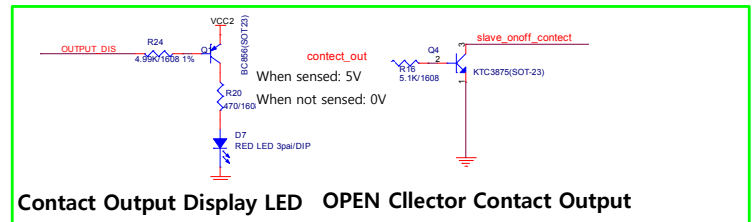
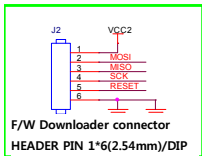
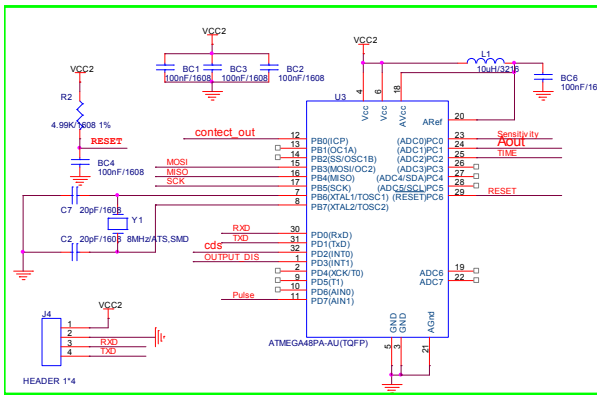
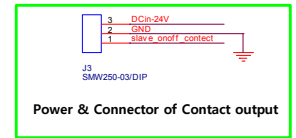
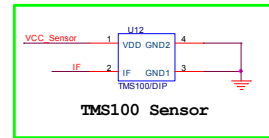
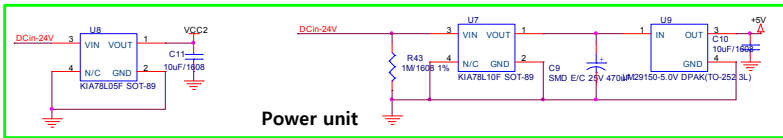
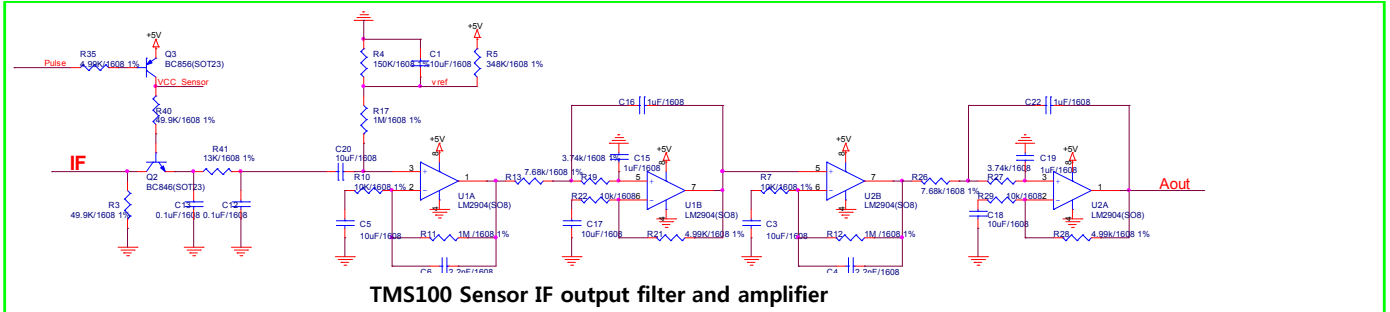
#	Pin name	Description
1	VDD	Bias supply, +5V
2	IF	Output
3	GND	Ground
4	GND	Ground

## 6. Detecting distance



- The sensor can detect up to 20 meters in front of the sensor.
- The sensor can detect about 5 meters above and below the sensor.
- The sensor can detect about 1 ~ 2 meters in the back of the sensor.

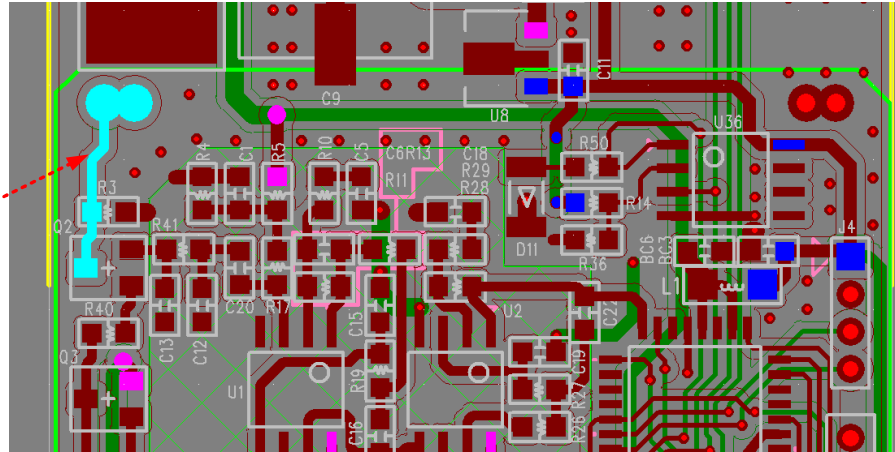
## 7. Application schematic diagram



## 8. Instructions on PCB Artwork

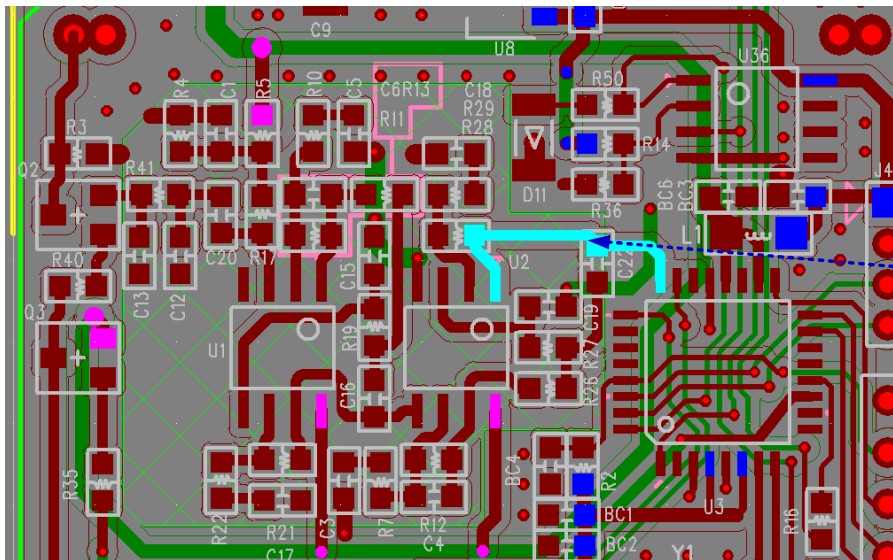
### - IF Net Line(output of TMS100 sensor) Routing

It is essential that the routing should be carried out by making 'IF Net Line' as short as possible and without VCC (power) lines in the surrounding area. VCC lines should not pass through the top and the bottom.



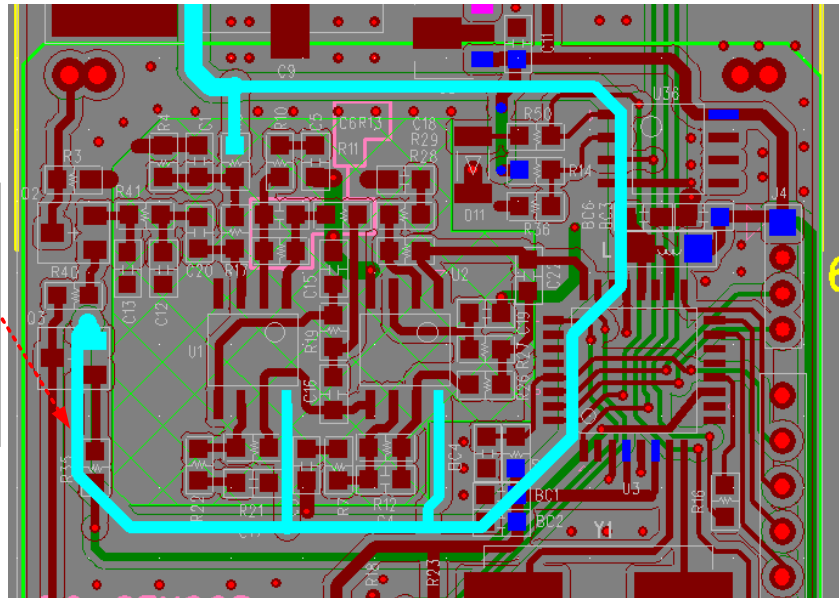
### - Aout Net Line Routing

It is essential that the routing should be carried out by making 'Aout Net Line' as short as possible and without VCC (power) lines in the surrounding area.



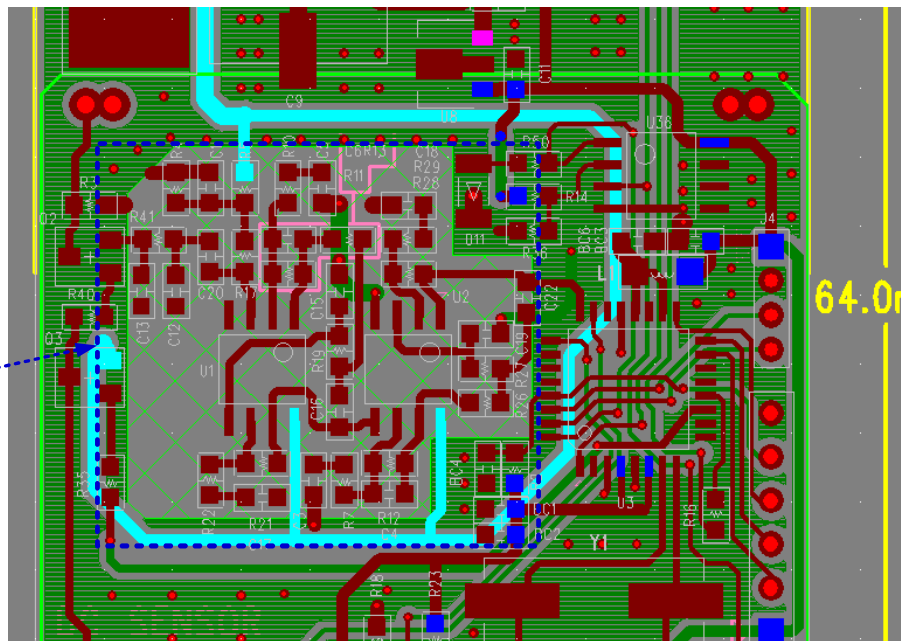
## - TMS100 Sensor IF output filter and amplifier power Line Routing

It is essential that the routing should be carried out by not allowing the power (+5V) lines to pass the TMS100 Sensor IF output filter and amplifier circuit. As shown in the side picture, the Opamp power should be provided.



## - TMS100 Sensor IF output filter and amplifier TOP,BOTTOM Copper

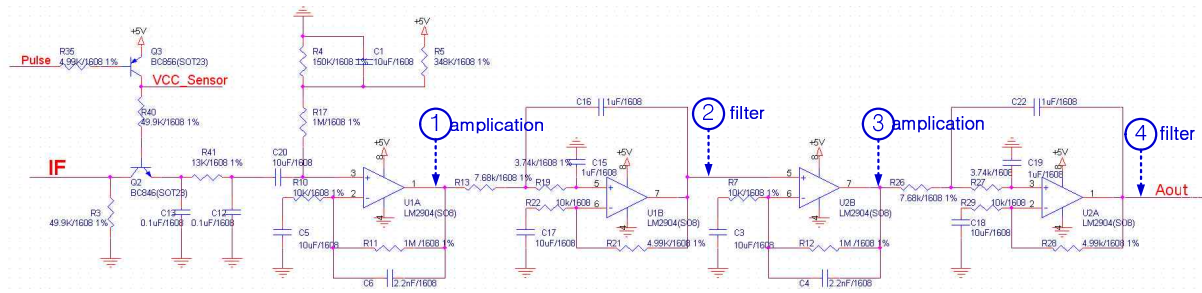
Do not lay the ground copper plate at the top and bottom of TMS100 Sensor IF output filter and amplifier circuit.



\* By designing PCB as described above, you can reduce noise level.(Very important!)

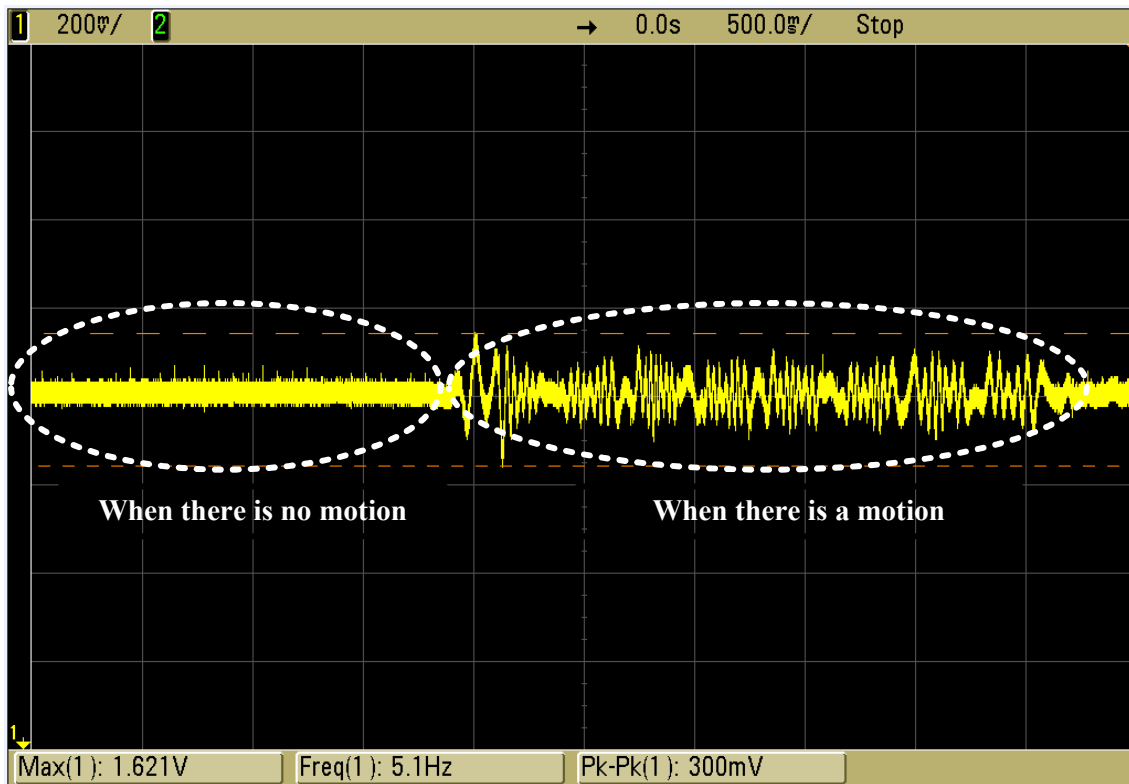


## 9. Analog output signals of TMS100 Sensor IF output filter and amplifier



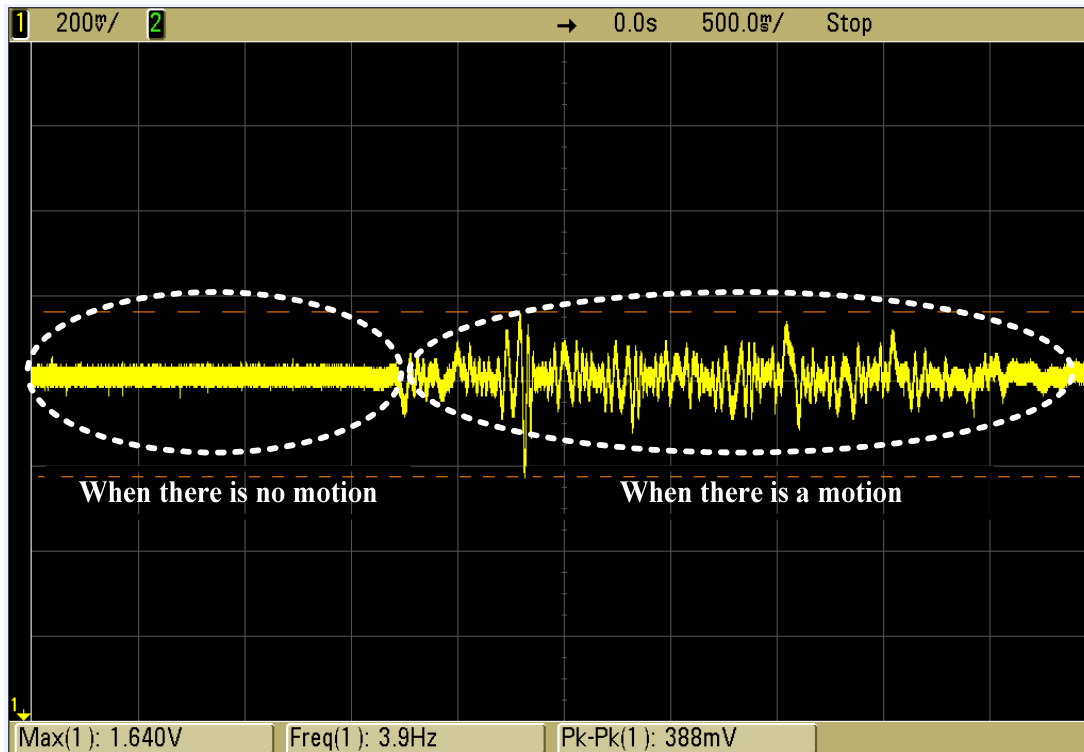
**TMS100 Sensor IF output filter and amplifier**

① Amplified signal (Oscilloscope-Voltage Div.:200mV, Time Div.:500ms)



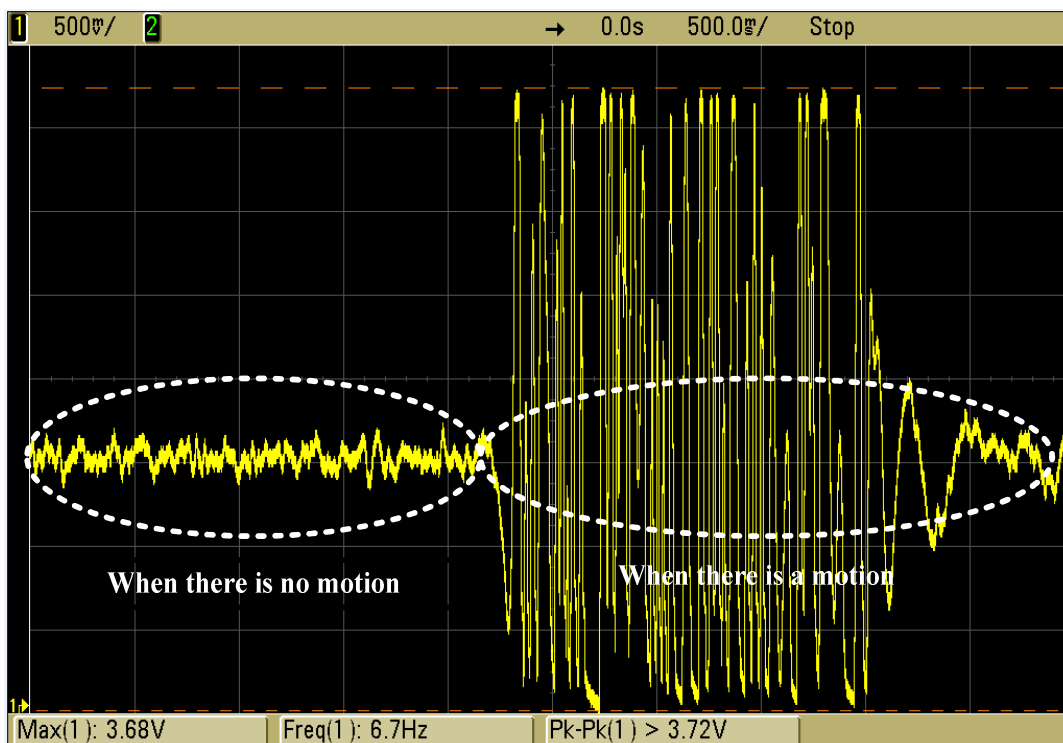
\* Motion condition : Moving a palm back and forth at the distance of 20cm in front of the sensor

② Filter signal(Oscilloscope -Voltage Div.:200mV, Time Div.:500ms)



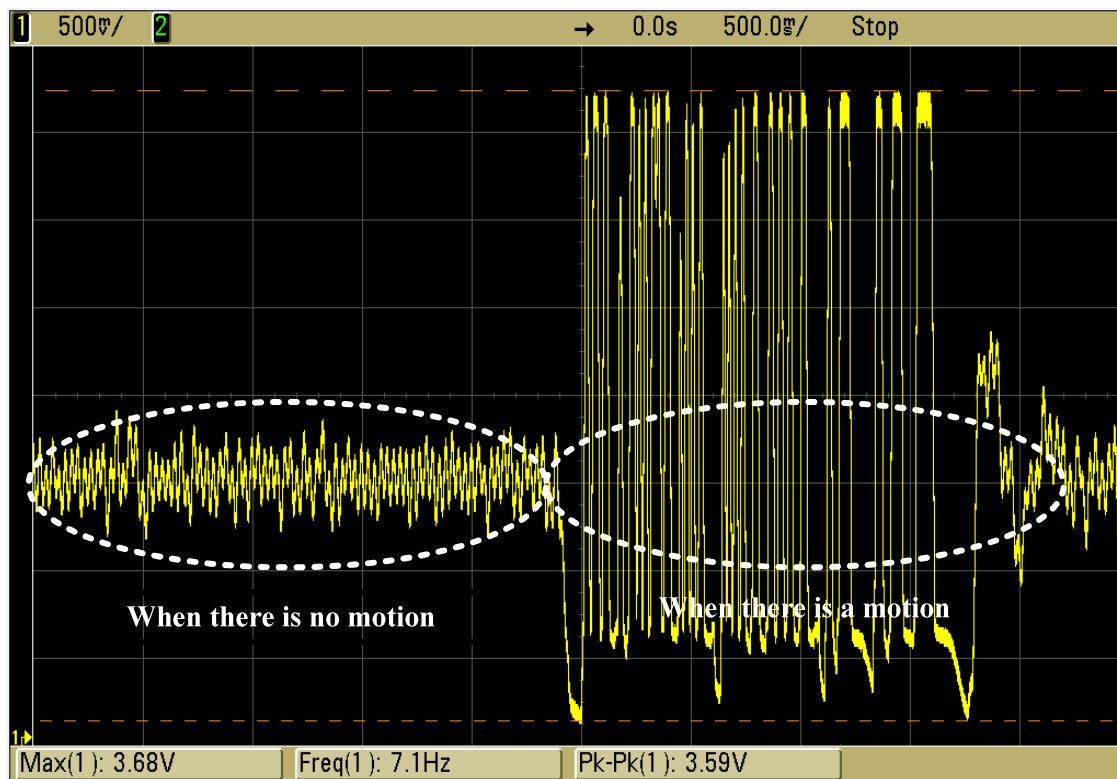
\* Motion condition : Moving a palm back and forth at the distance of 20cm in front of the sensor

③ Amplified signal (Oscilloscope -Voltage Div.:500mV, Time Div.:500ms)



\* Motion condition : Moving a palm back and forth at the distance of 20cm in front of the sensor

④ Filter signal (Oscilloscope -Voltage Div.:500mV, Time Div.:500ms)



\* Motion condition : Moving a palm back and forth at the distance of 20cm in front of the sensor