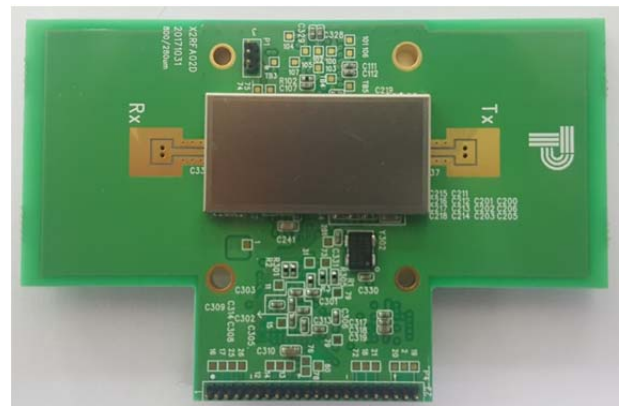


# TSR-M241U

## SERIES

### UWB Smart Radar

# User Manual



## CONTENTS

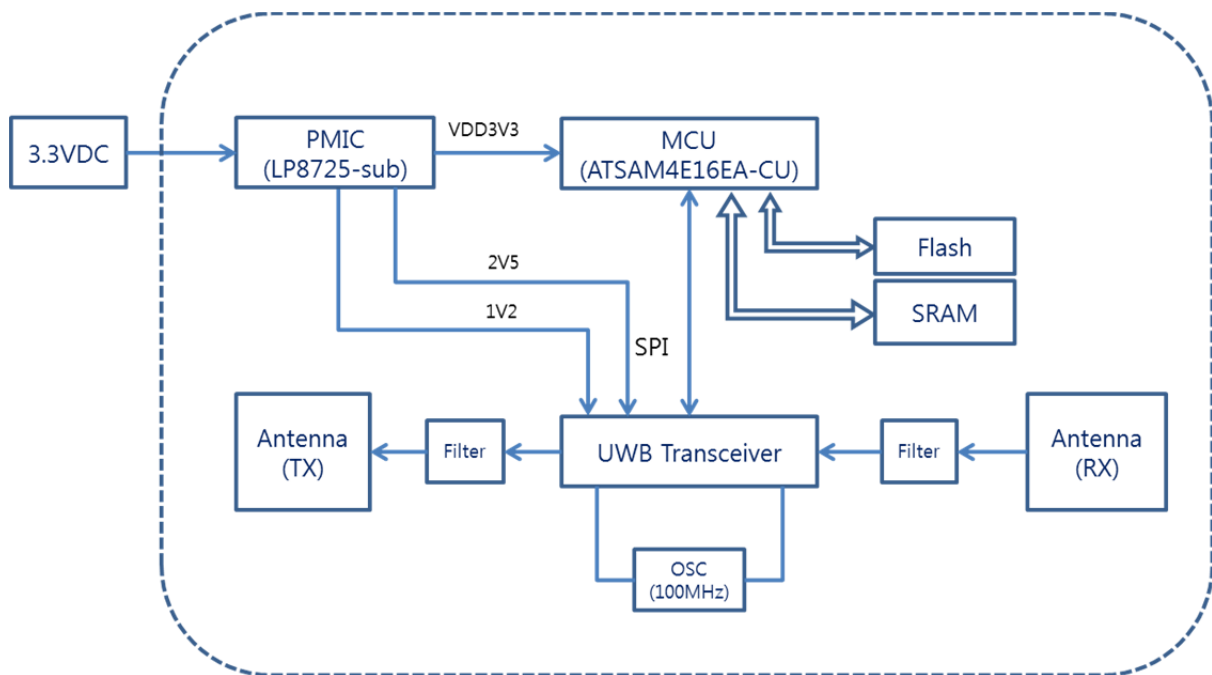
|                                 |   |
|---------------------------------|---|
| 1. Introduction .....           | 3 |
| 2. Block Diagram .....          | 3 |
| 3. Specification .....          | 4 |
| 4. For FCC module caution ..... | 4 |

## 1. Introduction

The UWB Radar has sophisticated motion detection and obstacle penetration characteristics, enabling breathing and heart rate measurements as well as non-contact detection, as well as room and intrusion detection. It is less influenced by the surrounding environment and does not affect the human body because the intensity of radio waves is significantly lower than conventional communication methods such as Wi-Fi. The frequency band of this product is 6~8.5GHz Band and it includes antenna element for UWB.

## 2. Block Diagram

The Block Diagram of UWB Radar is as follows.



UWB Smart Radar Block Diagram

### 3. Specification

|                       |              |                                      |
|-----------------------|--------------|--------------------------------------|
| Model                 |              | TSR-M241U                            |
| Detection Technology  |              | Impulse Radio UWB                    |
| RF parameter          | Output Power | $\leq -41.3\text{dBm}$               |
|                       | Frequency    | 6~8.5GHz                             |
|                       | Bandwidth    | $\geq 1\text{ GHz at } -10\text{dB}$ |
|                       | Antenna Type | Patch Type                           |
| Minimum Range         |              | 6m @ 60° Azimuth                     |
| Maximum Range         |              | 9~10m @ 0° elevation                 |
| Sensitivity           |              | 4mm ~ 40cm/sec                       |
| Power Supply          |              | 3.3 VDC                              |
| Current Consumption   |              | 100mA(Max) at 5VDC                   |
| Weight                |              | Approx. 100g                         |
| Interface             |              | UART                                 |
| Operating Temperature |              | -25°C ~ +85°C                        |
| Operating Humidity    |              | 95% max                              |

### 4. For FCC module caution

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

This equipment has been tested and found to comply with the limits for a Class

digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

UWB devices may not be employed for the operation of toys. Operation onboard an aircraft, a ship or a satellite is prohibited

### Troubleshooting

If this equipment does cause harmful interference to radio reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following instructions.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult dealer or an experienced radio technician.

### Conditions

Operation is subject to the following conditions

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

### FCC Caution

This device complies with Part 15 of the FCC rules. Operation is subject to th

e following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.

RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. For body worn operation, this device has been tested and meets FCC RF exposure guidelines. When used with an accessory that contains metal may not ensure compliance with FCC RF exposure guidelines.

**End Product Labeling**

This transmitter module is authorized only for use in devices where the final end product must be labeled in visible area with the following:

"Contains FCC ID: 2APYW-TSR-M241U" .

**This device is intended only for OEM integrators under the following conditions:**

The TSR-M241U may transmit simultaneously with other collocated radio transmitters within a host device, provided the following conditions are met:

1. Each collocated radio transmitter has been certified by FCC / IC for mobile application.

As long as the above conditions are met, further transmitter test will not be required.

However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

#### **IMPORTANT NOTE:**

In the event that these conditions cannot be met (for example co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product.

In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

As long as a condition above is met, further transmitter test will not be required.

However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.)

## **Manual Information to the End user**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

## **Antenna Restriction**

The antenna is designed as permanent attached and no consideration of replacement.