

## Description

The MS47SF2 smart module is a SMD package module basis of CC2540 chip, it is a smart module with cost-effective, low power, true system-on-chip (SoC) for Bluetooth low energy applications. It enables robust BLE master or slave nodes to be built with very low total bill of material costs.

The MS47SF2 smart module combines an excellent RF transceiver with an industry-standard enhanced 8051 MCU, in-system programmable 256KB flash memory, 8KB RAM, and many powerful supporting features and peripherals. It is suitable for systems where very low power consumption is required. Very low-power sleep modes are available. Short transmission times between operating modes further enable low power consumption.

## Features

- Bluetooth low energy technology compatible
- Excellent link budget (up to 97dB)
- Enable long range applications
- Accurate digital RSSI
- Compatible with CE and FCC regulation
- High performance and low power 8051 core MCU
- Battery monitor and temperature sensor
- Samples application and profiles
- Full speed USB interface
- AES security coprocessor

## Application

- 2.4GHz Bluetooth low energy systems
- The Modular only can be used in the host powered by battery.

## Images

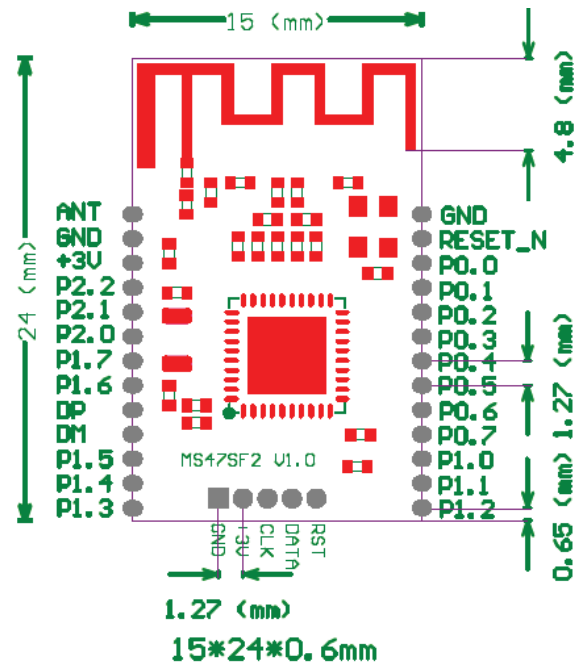


Top view



Bottom view

**Mechanical Footprint (Unit: mm)**



**Pin Description**

Pin Symbol	Pin Type	Definition
ANT	Null	External antenna
GND	Ground	The ground pin should be connected to the cathode of power supply
3.3V	Power	The 3.3V pin should be connected to the positive of power supply
P2.2	Digital I/O	Port 2.2
P2.1	Digital I/O	Port 2.1
P2.0	Digital I/O	Port 2.0
P1.7	Digital I/O	Port 1.7
P1.6	Digital I/O	Port 1.6
DP	Digital I/O	UART
DM	Digital I/O	UART
P1.5	Digital I/O	Port 1.5
P1.4	Digital I/O	Port 1.4
P1.3	Digital I/O	Port 1.3
RESET-N	Digital I/O	Reset, active low
P0.0 – P0.7	Digital I/O	Port 0.0 – Port 0.7
P1.0	Digital I/O	Port 1.0 – 20mA drive capability
P1.1	Digital I/O	Port 1.1 – 20mA drive capability

**Electronic Parameters**

Item	Test Data	Remarks
Operation Voltage	3.3V	DC
Operation Frequency	2402-2483.5MHz	Programmable
Frequency Error	+/- 20KHz	Null
Modulation	Q-QPSK	Null
Receiving Sensitivity	-93dBm	High gain mode
Receiving Current	17.9mA	High gain mode
Transmission Current	24mA	Transmission power +4dBm
Sleep consumption	0.4uA	Power mode 3, connection-less state
Transmission distance	50 meters	BER<0.1%, Open space
Antenna	50ohm	Null
Dimension	24*15*1.7mm	Null

**Debugger / UART Interface**

MS47SF2 smart module

TI JTAG Definition

The Modular must be used in the host powered by battery only.

This device complies with part 15 of the FCC Rules. Operation is subject to the 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2ABU6-MS47SF2 or Contains FCC ID: 2ABU6-MS47SF2".

When the module is installed inside another device, the user manual of this device must contain below warning statements;

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.