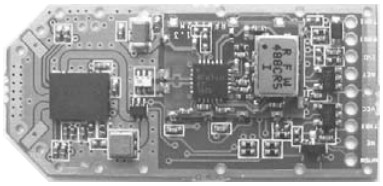
RFW122-M-PA ISM Transceiver Module with Power Amplifier



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DESCRIPTION

The RFW122-M-PA is a small PCB module which includes the RFW122-M module, besed on Vishay RFWaves* RFW122 transceiver chipset, and a Power Amplifier module. This module was created in order to provide a solution for applications that have a need of longer range than provided by the basic RFW122-M module.

The company's products are covered by one or more of the following:
Taiwan Patent No. 155994, Taiwan Patent No. 176767, USA Patent No. 6,535,545. Other patents pending

The module consists of 2 main parts:

1. RFW122-M module - Based on Vishay RFWaves RFW122 transceiver chipset
2. Carrier board which includes:
   - PA chip - A half-duplex RF power amplifier module on chip with internal antenna diversity support
   - A 9 pin application header for main board connection
   - Tx/Rx switch
   - 2 RF output ports
   - RF SAW filter

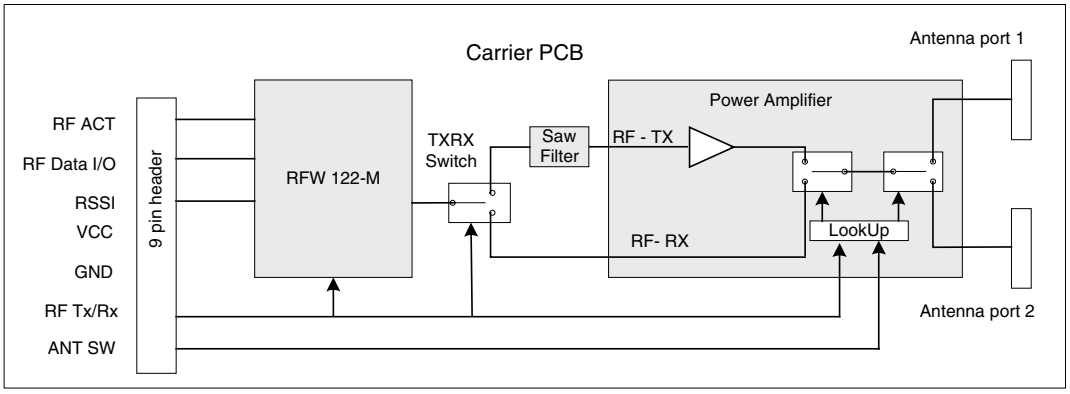
* Vishay Advanced Technologies ltd. - RFWaves division

CHARACTERISTICS

Parameter	Value
Basic transceiver	RFW122-M, 1 mbps, DSSS.
Typical output power	25 dBm peak
Typical receive sensitivity	- 73 dBm peak
Typical total link budget	97 db
Typical current consumption in transmit (Tx) mode (*)	210 mA
Typical current consumption in receive (Rx) mode	35 mA
Averange current consumption	Depending on application (usually much lower than peak due to time sharing between Tx, Rx and standby)
Typical standby current consumption	< 100 uA
Antenna diversity	Two antenna ports and an externally controlled switch, allowing the application to decide which antenna is active (space diversity implementation)
Antenna switch time	Typical < 1 usec
Antenna impedance	50 ohm unbalanced
Antenna mechanical interface	Pads for soldering MMCX connectors or mechanical holes for direct soldering of coaxial cable. **Note**: no cable or connector is provided with the module.
Main board interface	9 pin, 2 mm pitch, 1.2 mm diameter.
Module dimensions (without antenna)	45 x 21 mm
Carrier PCB thickness	0.6 mm
Total module thickness	5 mm

(*) This power consumption is under 1 Mbps, 50 % '1' and 50 % '0'

BLOCK DIAGRAM:



The following table describes the pin out of the RFW122-M-PA. The module has a 9-pin interface towards the main board. See drawing at 'mechanical dimensions' section to identify pin 1 and antenna ports.

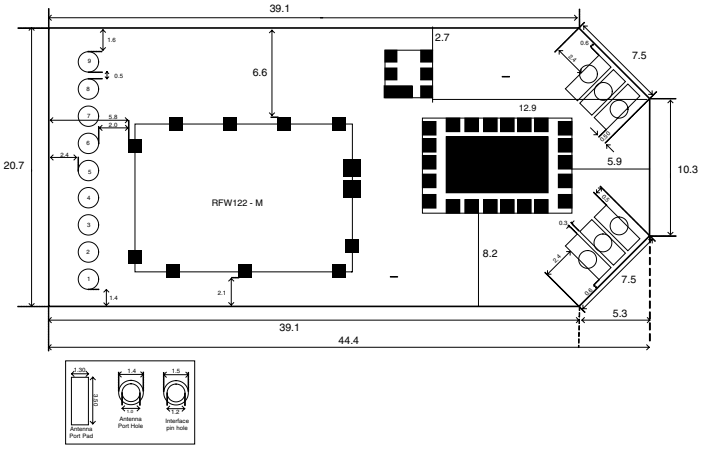
PINOUT		
1	RF Tx/Rx	Transmit receive control. High = Tx; Low = Rx See RFW122-M datasheet for more details. **Note**: RF Tx/Rx controls also the PA state. For low current standby mode this control should be pulled Low.
2	RSSI	RF RSSI indication See RFW122-M datasheet for more details. Max source and sinc current = 50 nA
3	Data I/O	RF Input / Output data. See RFW122-M datasheet for more details.
4	RF ACT	RF Activate module control. High = Active; Low = Non active See RFW122-M datasheet for more details.
5	GND	Ground signal
6	VCC3	Feed Input voltage, 3 - 3.6 V; peak current 200 mA. Recommended 3.4 V for optimal performance. **Note**: Voltage should be regulated - recommended that ripple in peak current will not exceed 50 mV peak/peak.
7	NC	Not connected
8	NC	Not connected
9	Ant SW	RF switch control Ant SW / TX / Rx High ≥ VCC - 0.6 V / Antenna port 1 / Antenna port 2 Low ≤ 0.6 V / Antenna port 2 / Antenna port 1 Note: For low current standby mode this control should be pulled Low.

DESIGN CONSIDERATIONS

RFW122-M-PA carrier board has been designed especially in order to accommodate the RFW122-M Module and the PA module, and provide optimal RF performance and minimal size. The layout has been carefully designed in order to prevent oscillaltion and RF leakage phenomena.
When connecting this Module to the main board, it is recommended to follow these guidelines:

1. When connecting the antenna/s using a coaxial cable, make sure the cable has 50 ohm impedance with low loss at 2.44 Ghz (loss < 2 db/m). In addition, the soldering quality is critical for optimal power transmission. Make sure the cable ground is well soldered in at least two points. Also, make sure that the coaxial cable exposure length is lower than 3 mm.
2. The antenna/s should be placed in a distance of least 3 cm from the module.
3. The antenna should be tuned to 50 ohm at 2.44 Ghz.
4. For antenna diversity implementation, the optimal distance between the two antennas depends on the antenna type and orientation.
5. DC system should be able to support high current bursts of up to 250 mA for switched TX mode. The VCC and ground should remain stable (ripple < 50 mV) or else the module sensitivity can be reduced, and interference can be caused to the rest of the system. It is advised to use a separate regulator for the RF section connected directly to the voltage source and ground, and to avoid using the same voltage supply and ground connection that is used by the rest of the system.
6. Shielding - the module is designed to support a metal shield can. The can is not provided with the module.

MECHANICAL DIMENSIONS in millimeters



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Footprint

*Note: pins are numbered 1 - 9. Please refer to the pin out table on page 2 for pin description.

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