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CC2500PATR2.4S

FCC ID:XAO-CC2500PATR

1.Description

CC2500PATR2.4S is a TI transceiver module based on CC2500IC design.It provides extensive hardware support for packet handling ,data buffering ,burst transmissions ,clear channel assessment, link quality indication and wake on radio . It 's data stream can be manchester coded by the modulator and decoded by the demodulator .It has a high performance and easily to design your product.It can be used in 2402-2450MHz ISM/SRD band systems,Consumer Electronics, Wireless game controllers,Wireless audio and others wireless systems.

2. Features

- Low current consumption.
- Easy for application.
- Efficient SPI interface
- Operating temperature range： －40℃～＋85℃
- Operating voltage 1.8~ 3.6 Volts.
- Available frequency at 2402-2450MHz
- Programmable output power and hi sensitivity

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3. BOM list for the modules:

N/A

4. Schematic Diagram

N/A

5. Pin Descriptions

Pin No	Pin Name	Pin Type	Description
1	VCC	Power	1.8V-3.6V power
2	SI	Digital Input	Serial configuration interface, data input
3	SCLK	Digital Input	Serial configuration interface, clock input
4	SO	Digital Output	Serial configuration interface, data output. Optional general output pin when CSn is high
5	GDO2	Digital Output	Digital output pin for general use: • Test signals • FIFO status signals • Clear Channel Indicator • Clock output, down-divided from XOSC • Serial output RX data
6	GND	Ground	GND

7	GDOo	Digital 0/I	Digital output pin for general use: • Test signals • • FIFO status signals • • Clear Channel Indicator • • Clock output, down-divided from XOSC • • Serial output RX data • Serial intput RX data •
8	CSn	Digital Input	Serial configuration interface, chip select
9	PA_EN	Digital Input	When TX status set ”1”, RX set”0”
10	LNA_EN	Digital Input	When RX status set ”1”, TX set”0”

Absolute Maximum Ratings

Parameter	Rating	Units
Supply Voltage	1.8-3.6	V DC
Operating Temperature	-40 to +85	℃

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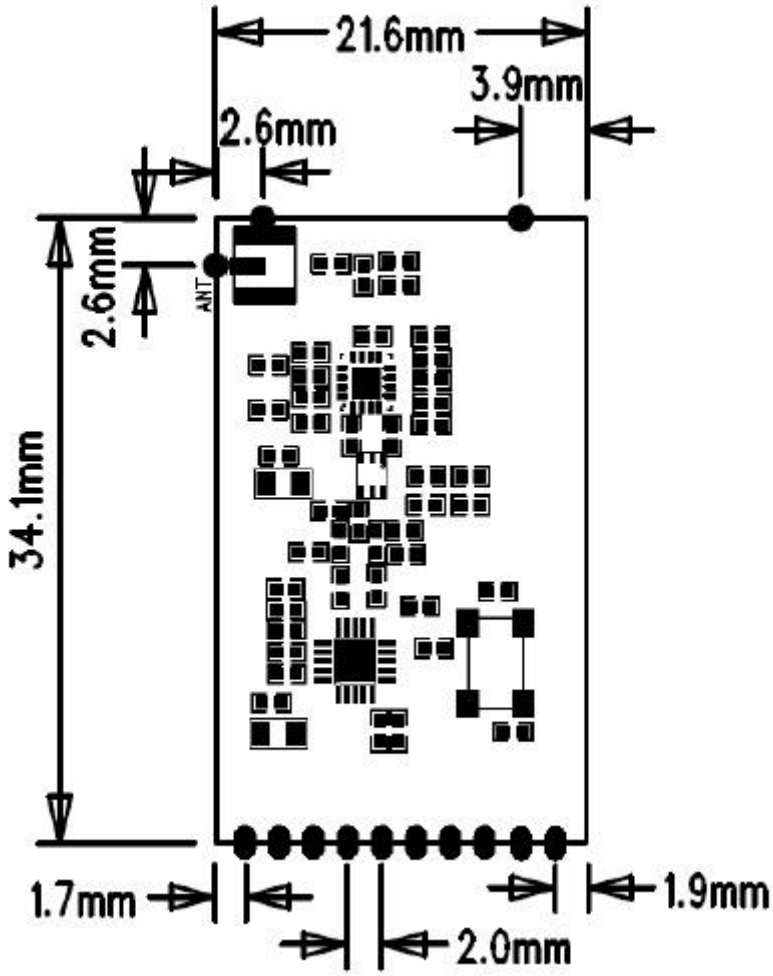
Package Description



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6. Electrical Specifications

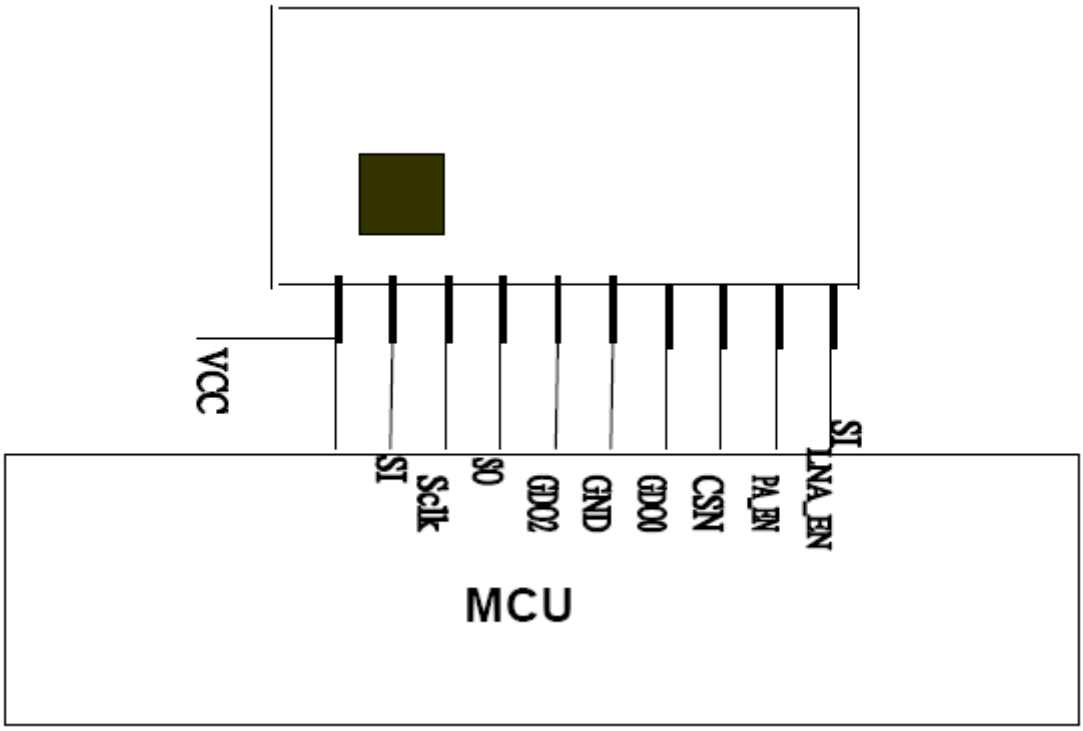
Tc = 25°C, VDD = 3.0V

Parameter	Min	Typ	Max	Unit	Condition
Current consumption,		150		mA	Transmit mode, +17dBm output power

General Characteristics

N/A

Application Circuit



6.1 RF receiver section RF

Tc = 25°C, VDD = 3.0V

Parameter	Min	Typ	Max	Unit	Condition/Note
Receiver sensitivity		–112		dBm	2-FSK, 2.4kbps, 38kHz deviation, , 1% packet error rate, 20 bytes packet length, 203 kHz digital channel filter bandwidth
		–105		dBm	10 kbps data rate, FSK, 1% packet error rate, 20 bytes packet length, 232 kHz digital channel filter bandwidth
		-95		dBm	250kbps, MSK, 1% packet error rate, 20 bytes packet length, 540 kHz digital channel filter bandwidth
		-89		dBm	500Kbps, MSK, 1% packet error rate, 20 bytes packet length, 812 kHz digital channel filter bandwidth
Saturation		–13		dBm	
Digital channel filter bandwidth	58		650	kHz	User programmable. The bandwidth limits are proportional to crystal frequency (given values assume a 26.0MHz crystal).

6.2 RF Transmit Section

Tc = 25°C, VDD = 3.0V

Parameter	Min	Typ	Max	Unit	Condition/Note
Differential load impedance		80 + j74		Ω	Differential impedance as seen from the RF-port (RF_P and RF_N) towards the antenna. Follow the CC2500EM reference design available from the TI and Chipcon websites.
Output power, highest setting		18.5	22	dBm	Output power is programmable, and full range is available in all frequency bands. Delivered to a 50Ωsingle-ended load via Chipcon reference RF matching network.

7. Measurement setup and testing procedures:

The interface for the localized CC2500PATR2.4S module cannot plug directly to SmartRF04EB board so there is an adaptor to convert it to standard EM interface as follows:

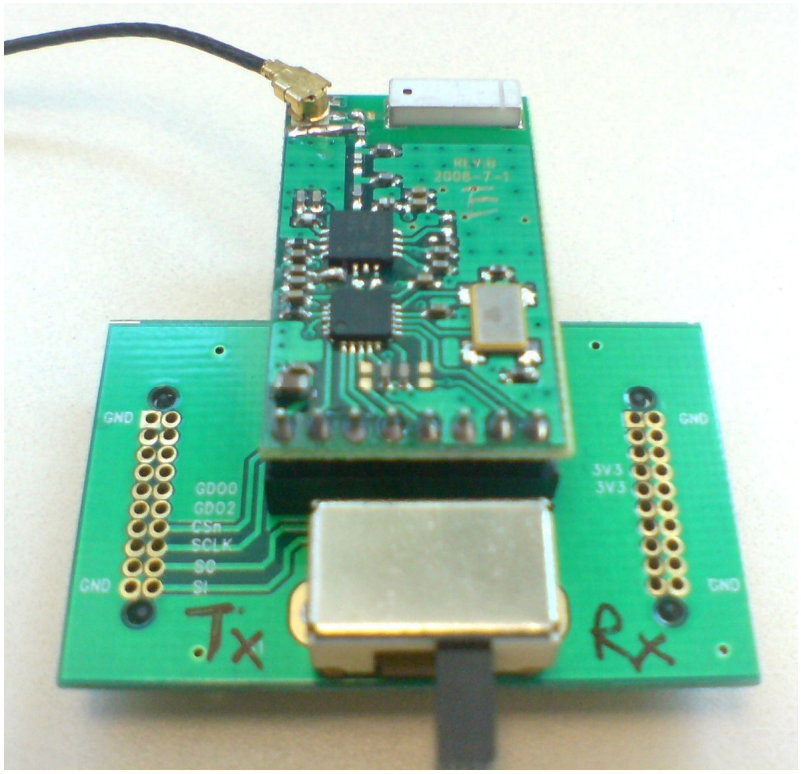


Figure 3.1 Connection for CC2500PATR2.4S module to SmartRF04EB.

7.1 Measurement setup:

Module can then plugged into SmartRF04EB as below and further measurement.

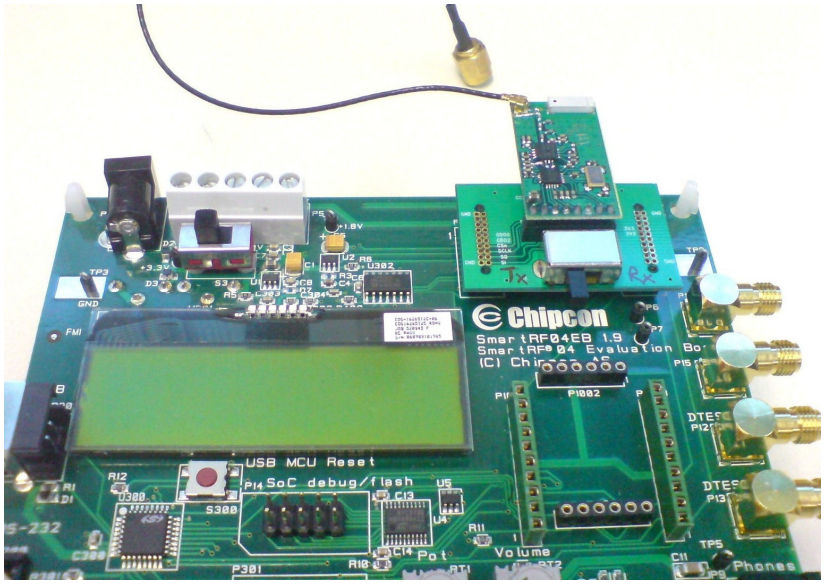
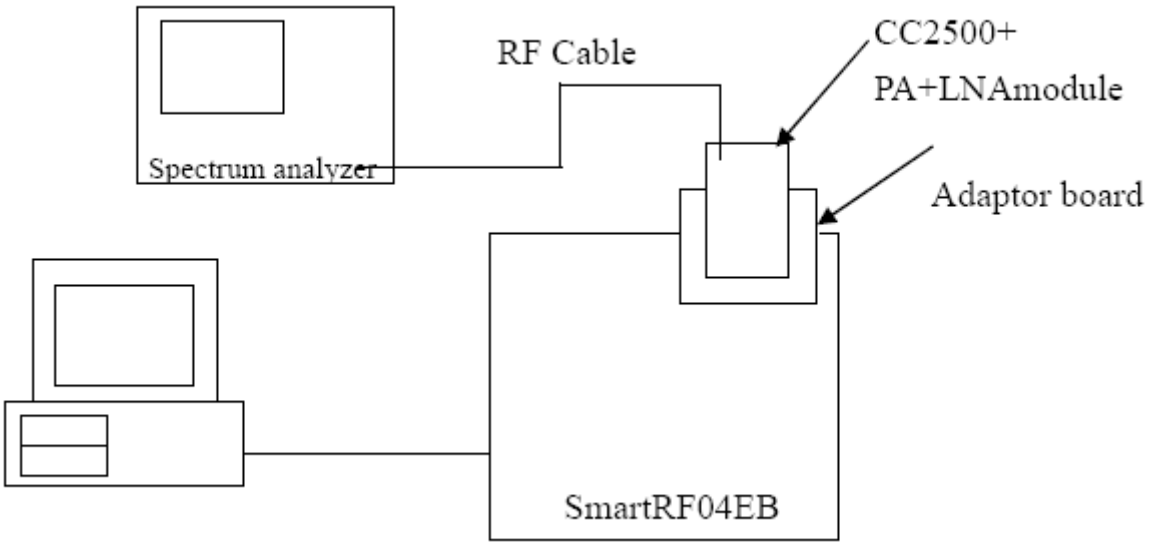


Figure 3.2 Setup for CC2500PATR2.4S module on SmartRF04EB.

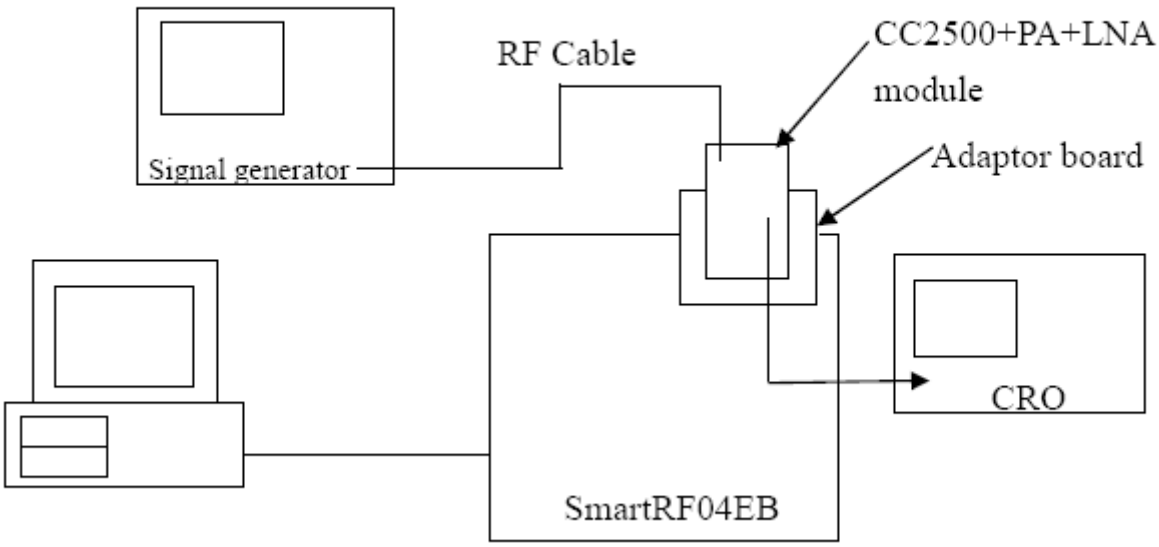
In addition, the module can be operated by SmartRF studio through SmartRF04EB. However, SmartRF studio software cannot control the Tx / Rx switch for PA+LNA; so it
should be done it manual by switch the Tx / Rx on the adaptor board. Tx / Rx control is just simple switching the switch located at adaptor board (see Figure 2.1).

7.2 Parameters measurement:

For transmitted power measurement, it can connect the boards as follows and then set the SmartRF studio to Simple Tx with proper channels (say 2441MHz with 2.4kbps from preferred setting) and then read the Tx power, spectrum and spurious from spectrum analyzer.



7.3For sensitivity measurement, it can connect those boards as follows:



Please set the signal generator to match the modulation setting at SmartRF studio and then set it to Simple Rx for reception.Because the GDO pin of CC2500 does not layout to the SmartRF04EB, it should tie the signal from the following pin.

"Attention - Limited Modular Approval
This RF Module is strictly limited to integration into battery powered host devices.
Integration into devices that are directly or indirectly connected to AC lines may be
added via Class II Permissive Change."

(OEM) Integrator has to assure compliance of the entire end-product
incl. the integrated RF Module. Additional measurements (15B) and/or equipment authorizations
(e.g Verification) may need to be addressed depending on co-location or simultaenous
transmission issues if applicable.

Integrator is reminded to assure that these installation instructions
will not be made available to the end-user of the final host device.

Please be informed,the RF Module is powered by battery,the antenna type is SD2400-3dBi-110 and the antenna gain is 2 dBi

In order to comply with RF exposure requirements, a minimum
distance of 20cm must be maintained between the antenna and all persons

The final host device, into which this RF Module is integrated" has to be labelled
with an auxilliary lable stating the FCC ID of the RF Module, such as
"Contains FCC ID: XAO-CC2500PATR".

"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 to this unit not expressly
approved by the party responsible for compliance could void the user's authority to operate the equipment."