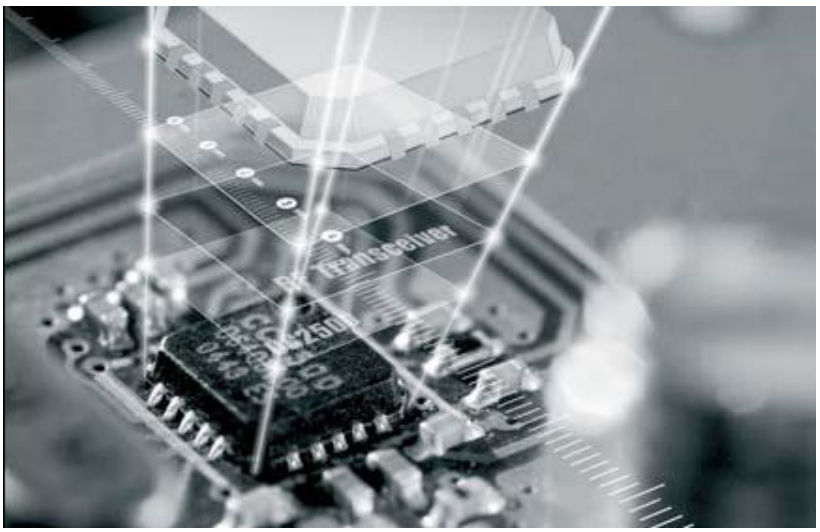
SPECIFICATION

High Power Module for System-on-Chip Solution

2.4-GHz IEEE 802.15.4 / ZigBee



Model : **2.4GHz RF Module**
Part No : TC2530-PATIFxxx
Version : V1.2
Date : 2014.1.24

■ Applications

- ***2.4-GHz IEEE 802.15.4 Systems***
- ***RF4CE Remote Control Systems (64-KB Flash and Higher)***
- ***ZigBee Systems (256-KB Flash)***
- ***Home/Building Automation***
- ***Lighting Systems***
- ***Industrial Control and Monitoring***
- ***Low-Power Wireless Sensor Networks***
- ***Consumer Electronics***
- ***Health Care***

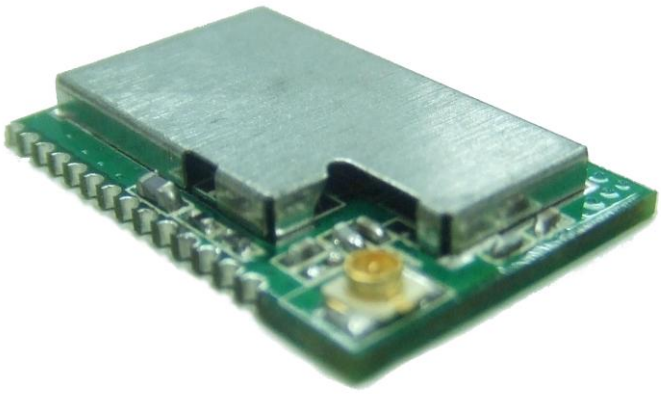
■ Selection Guide

Denomination ：2.4-GHz IEEE 802.15.4 and ZigBee Applications

Part No. ：TC2530- PATIF**xxx**

32/64/128/256 KB in-system Programmable Flash

30 : Chip CC2530



■ Absolute Maximum Ratings

Caution! ESD sensitive device. Precaution should be used when handling the device in order to prevent permanent damage.

		MIN	MAX	UNIT
Supply voltage	All supply pins must have the same voltage	-0.3	3.9	V
Voltage on any digital pin		-0.3	VDD+0.3 ≦3.9	V
Input RF level			10	dBm
Storage temperature range		-40	80	
ESD(2)	All pads, according to human-body model, JEDEC STD 22, method A114		2	kV
	According to charged-device model, JEDEC STD 22, method C101		500	V

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only,and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

(2) CAUTION: ESD sensitive device. Precaution should be used when handling the device in order to prevent permanent damage.

■ General Characteristics

Parameter	TEST CONDITIONS	Min	Typ	Max	Units
RADIO PART					
Frequency range	Programmable in 1-MHz steps	2400		2500	MHz
Data rate and modulation format			250k		Bps
Transmit power(Connect SMA antenna)	TXPOWER=F5		+20		dBm
Receiver sensitivity	1% PER		-105		dBm

■ Module interface

Interface	Description
Antenna	External Antenna 50 Ω
UART Interface	TX, RX ,RTS, CTS
SPI Interface	Synchronous Serial Interface
PIO Interface	19 terminals

■ 32.768KHz crystal

Parameter	TEST CONDITIONS	Min	Typ	Max	Units
Crystal Frequency			32.768		KHz
Crystal frequency accuracy requirement		-40		+40	ppm
ESR Equivalent series resistance			40	130	Kohm
Co Crystal shunt capacitor			0.9	2	pF
C_L Crystal load capacitor			12	16	pF

■ Electrical Specifications

● Current Consumption

Measured with TA = 25°C and VDD = 3 V, unless otherwise noted.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Icore Core current consumption	TX Power : 18dBm / IEEE 802.15.4 Channel= 0x13	151		161	mA
	TX Power : 11dBm/ IEEE 802.15.4 Channel= 0x13	76		78	mA
	TX Power : 0dBm/ IEEE 802.15.4 Channel= 0x13		50		mA
	Continuous RX Mode/ IEEE 802.15.4 Channel: 0x0B		33.8		mA
	HW RESET CC2530/TX Power 20dBm / IEEE 802.15.4 Channel: 0x13		24		mA
	ISRXON&ISTXON/TX Power 20dBm / IEEE 802.15.4 Channel: 0x13		43.6		mA
	ISRFOFF Mode command / TX Power 20dBm / IEEE 802.15.4 Channel: 0x13		24		μA

● RF Parameter

Measured with TA = 25°C and VDD = 3 V, unless otherwise noted.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
EVM	TX Power : 21dBm / IEEE 802.15.4 Channel= 0x0B (Figure 1)		18		%rms
	TX Power : 19dBm/ IEEE 802.15.4 Channel= 0x0B (Figure 2)		14		%rms
	TX Power : 21dBm / IEEE 802.15.4 Channel= 0x11 (Figure 3)		17.9		%rms
	TX Power : 19dBm/ IEEE 802.15.4 Channel= 0x11 (Figure 4)		13.1		%rms
	TX Power : 21dBm / IEEE 802.15.4 Channel= 0x19 (Figure 5)		15.1		%rms
	TX Power : 19dBm/ IEEE 802.15.4 Channel= 0x19 (Figure 6)		11.2		%rms

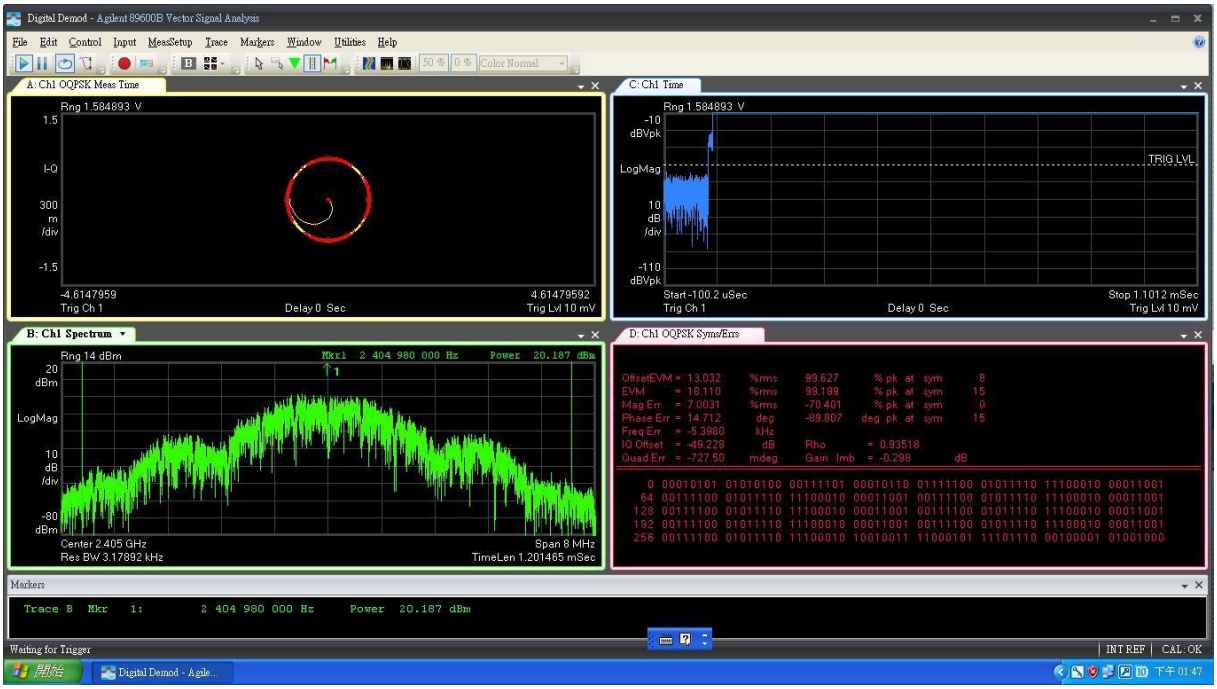


Figure 1

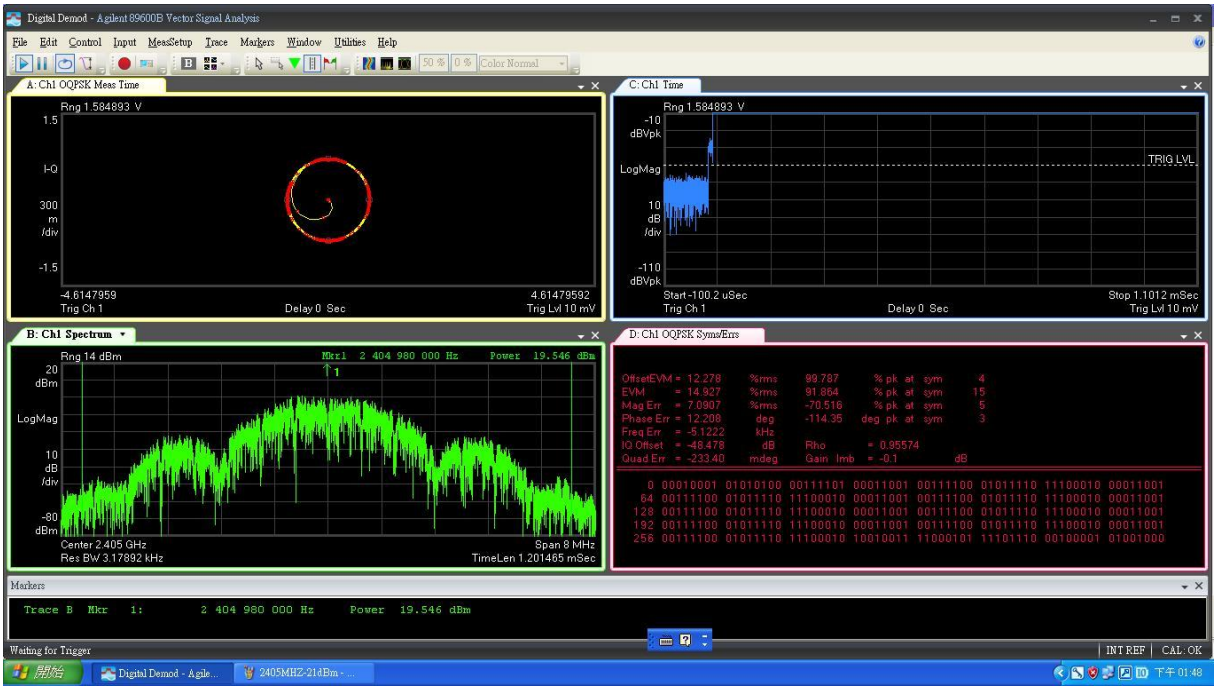


Figure 2

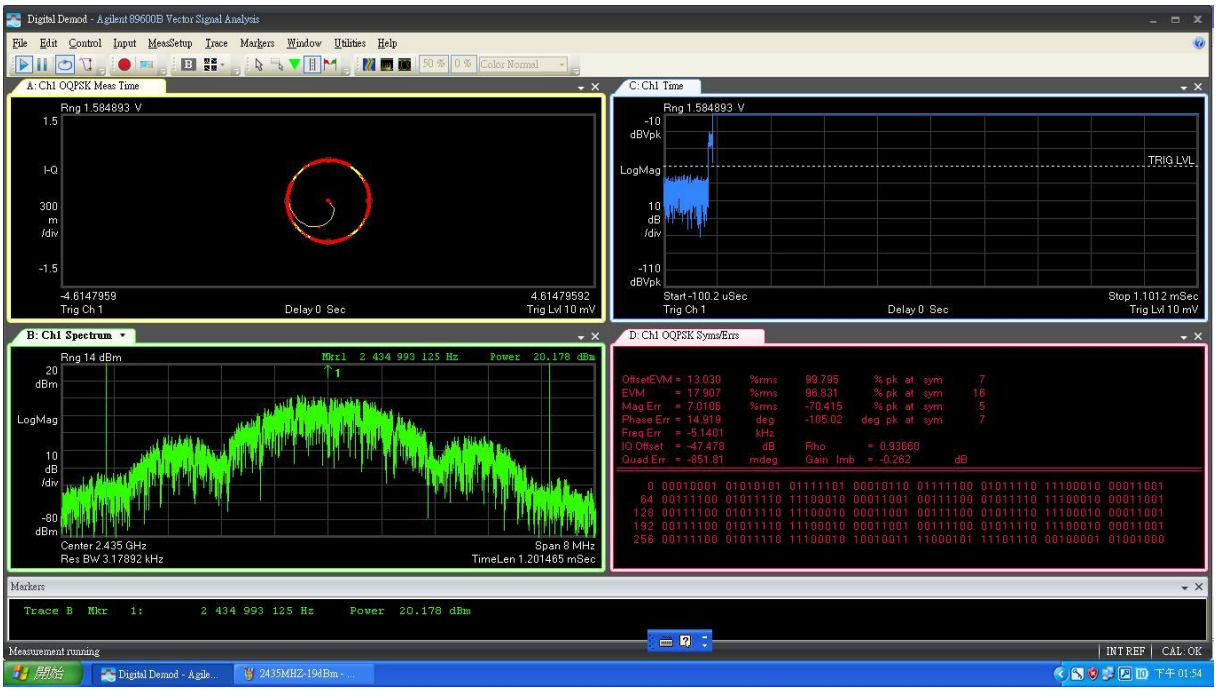


Figure 3

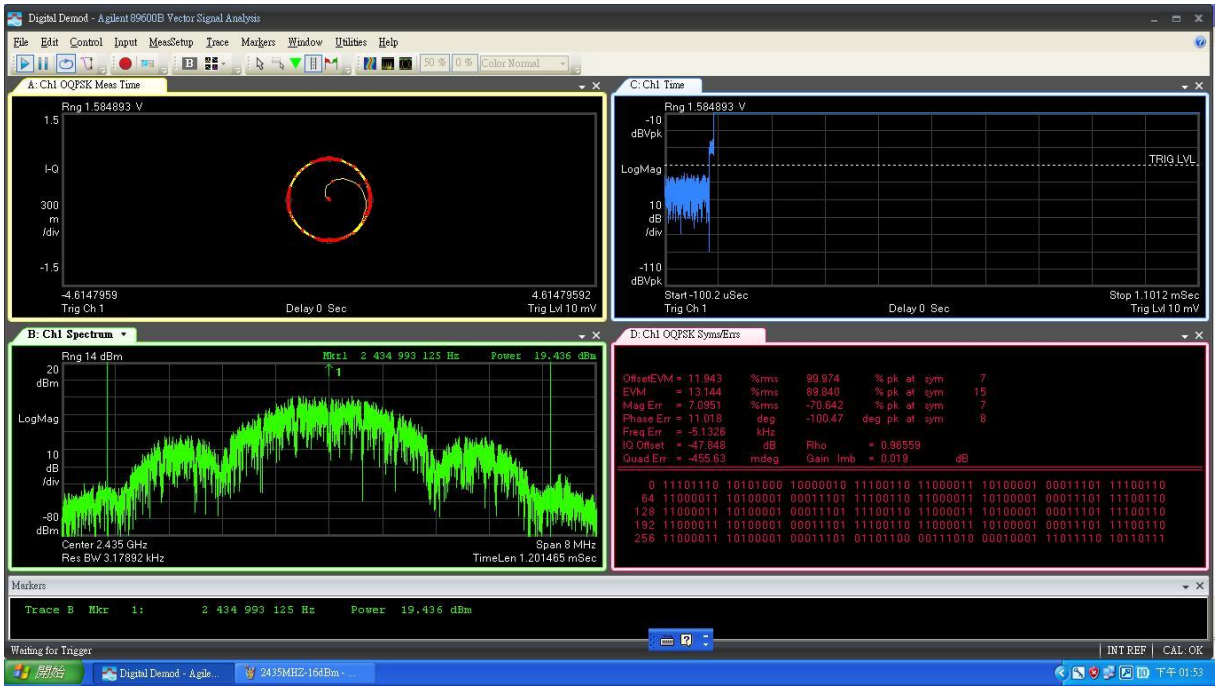


Figure 4

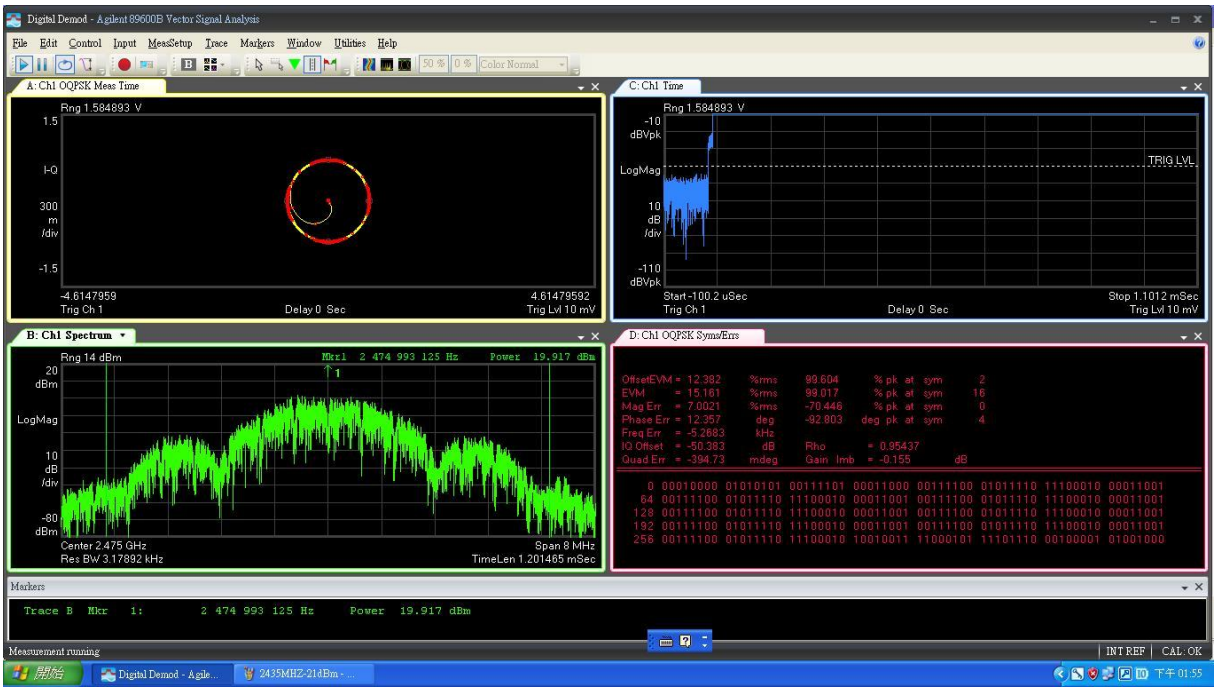


Figure 5

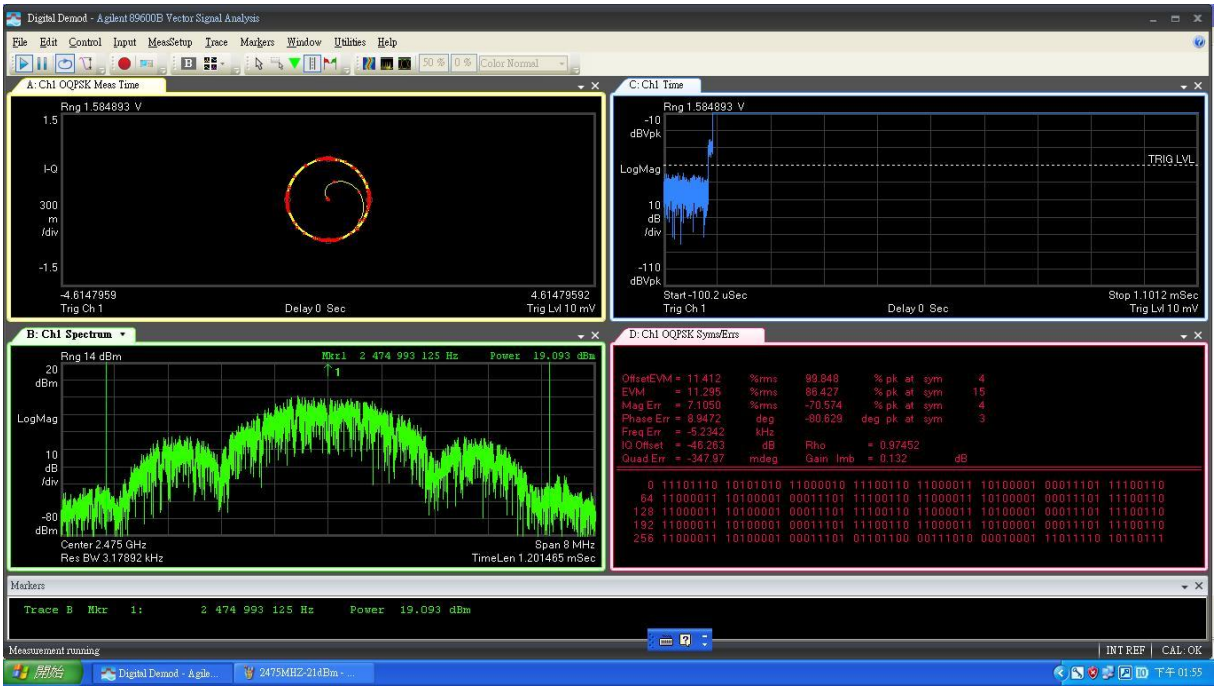
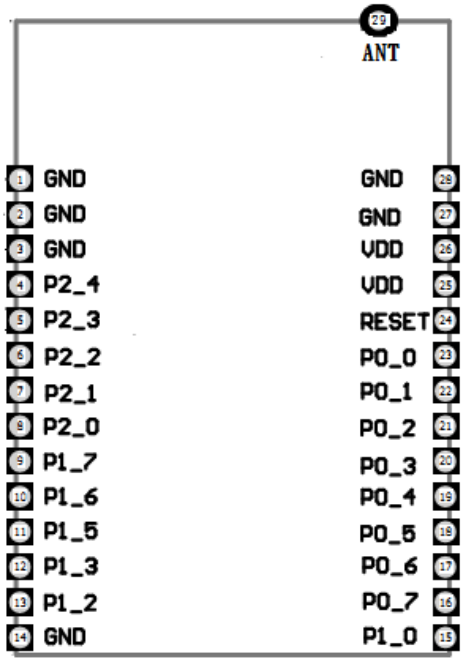


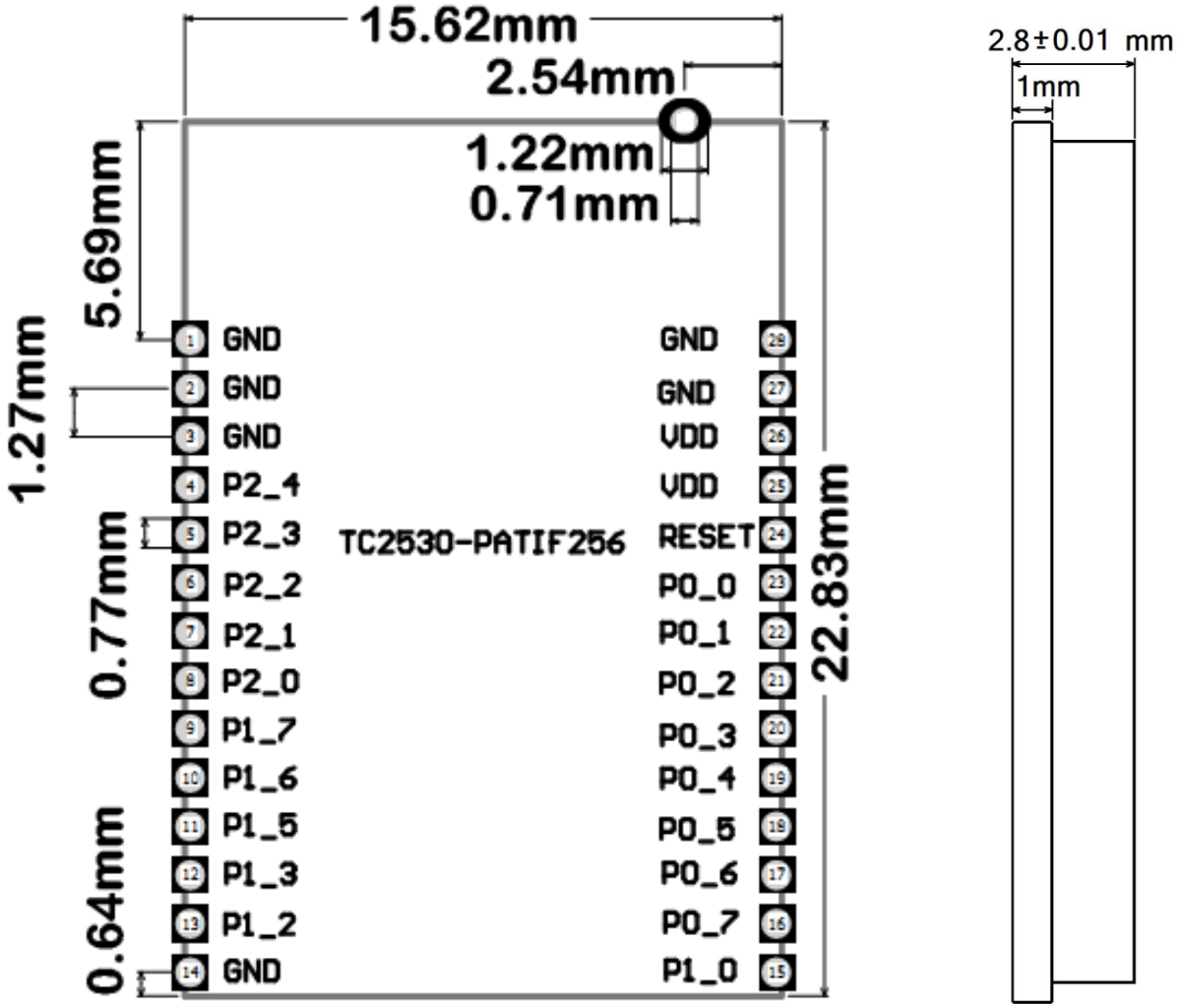
Figure 6

TC2530-PATIFxxx RF Module Pin Configuration

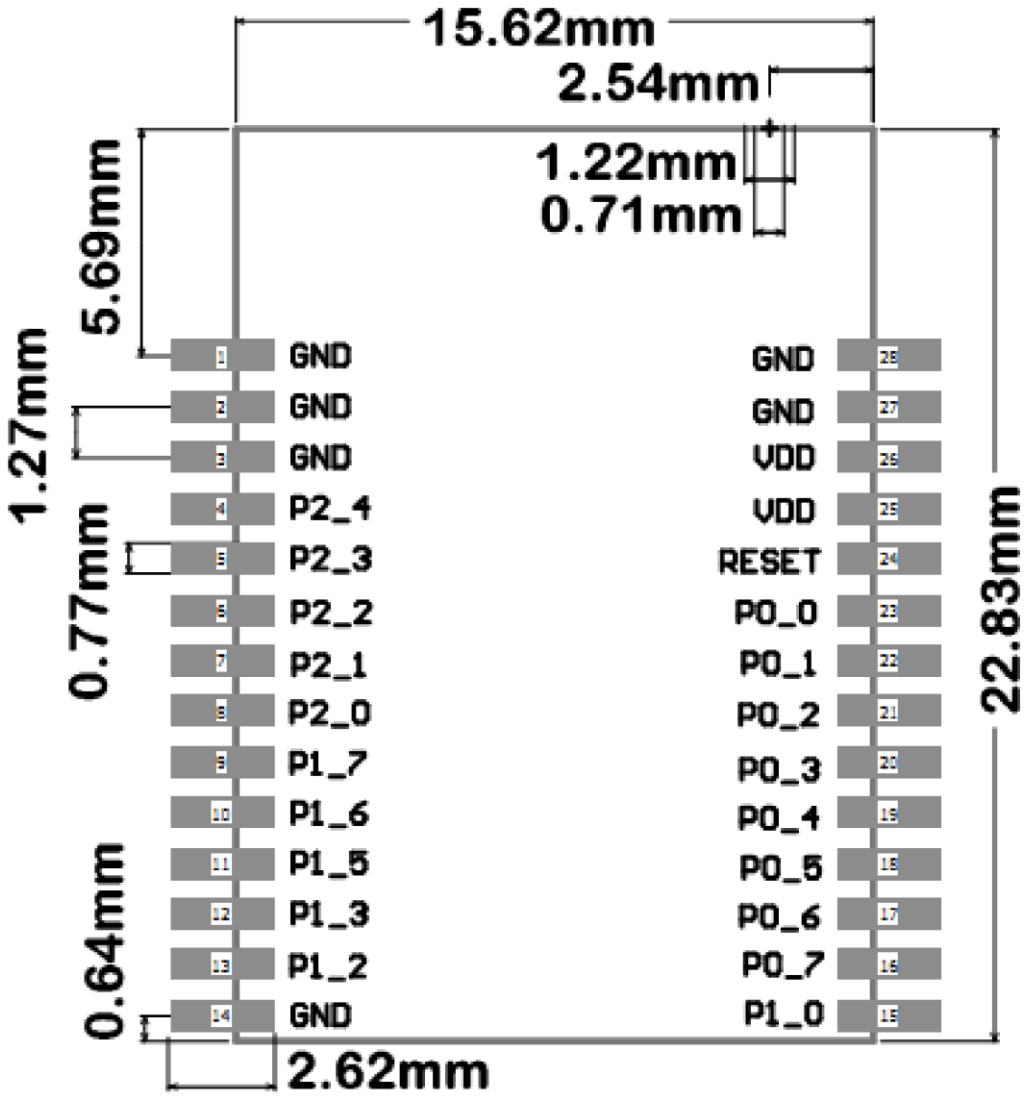


Pin #.	Pin Name	Pin Type	Description
1	GND	GND	Ground
2	GND	GND	Ground
3	GND	GND	Ground
4	P2.4	Digital IO	Port 2.4
5	P2.3	Digital IO	Port 2.3
6	P2.2	Digital IO	Port 2.2
7	P2.1	Digital IO	Port 2.1
8	P2.0	Digital IO	Port 2.0
9	P1.7	Digital IO	Port 1.7
10	P1.6	Digital IO	Port 1.6
11	P1.5	Digital IO	Port 1.5
12	P1.3	Digital IO	Port 1.3
13	P1.2	Digital IO	Port 1.2
14	GND	GND	Ground
15	P1.0	Digital IO	Port 1.0
16	P0.7	Analog / Digital IO	Port 0.7
17	P0.6	Analog / Digital IO	Port 0.6
18	P0.5	Analog / Digital IO	Port 0.5
19	P0.4	Analog / Digital IO	Port 0.4
20	P0.3	Analog / Digital IO	Port 0.3
21	P0.2	Analog / Digital IO	Port 0.2
22	P0.1	Analog / Digital IO	Port 0.1
23	P0.0	Analog / Digital IO	Port 0.0
4	RESET	Digital Input	Reset, Active Low
25	VDD	Power	2.0V ~ 3.7V Power Supply
26	VDD	Power	2.0V ~ 3.7V Power Supply
27	GND	GND	Ground
28	GND	GND	Ground
29	ANT	ANT	Reserve for chip antenna on board

■ TC2530-PATIFxxx Module Demension



■ TC2530-PATIFxxx Module layout Suggestion



Document History

Revision	Date	Description/Changes
1.0	2013.11.22	First release
1.1	2013.12.15	Update EVM test result/ layout suggestion
1.2	2014.01.24	Update 32.768K crystal information

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