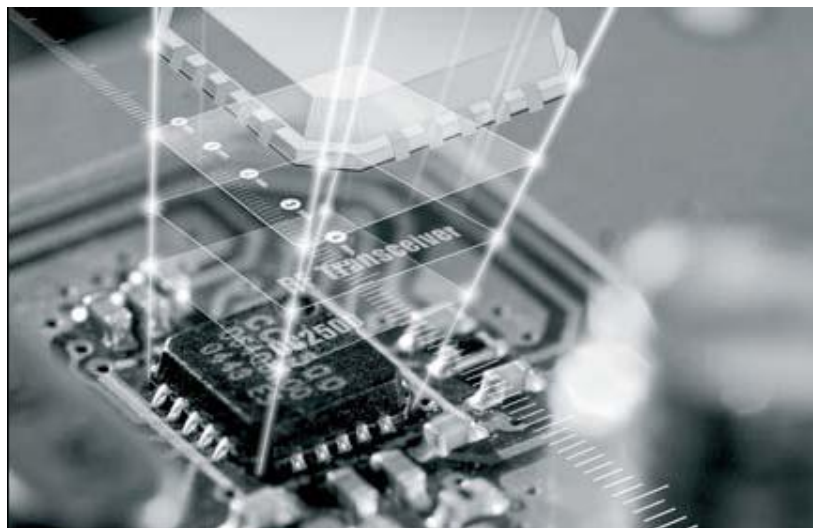




SPECIFICATION

High Power Module for BLE Solution



Model : **2.4GHz RF Module**
Part No : TC2541-PAFxxx
Version : V1.0
Date : 2014.4.22

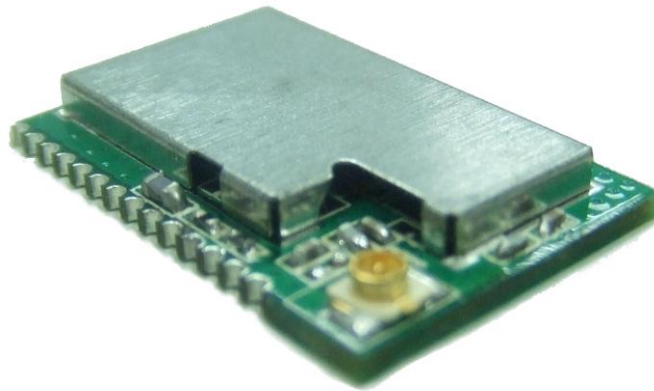
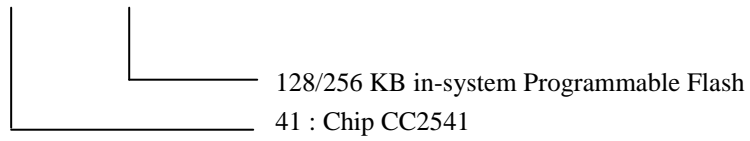
■ Applications

- *2.4-GHz Bluetooth low energy Systems*
- *Proprietary 2.4-GHz Systems*
- *Human-Interface Devices (Keyboard, Mouse ,Remote Control)*
- *Sports and Leisure Equipment*
- *Mobile Phone Accessories*
- *Consumer Electronics*

■ Selection Guide

Denomination : 2.4-GHz Bluetooth Low Energy Applications

Part No. : TC2541- PAFxxx



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			1M		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
Cl Crystal load capacitor			12	16	pF

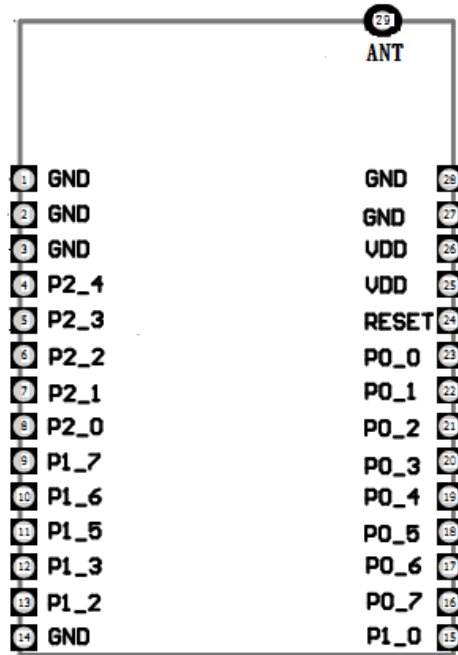
■ Electrical Specifications

● Current Consumption

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

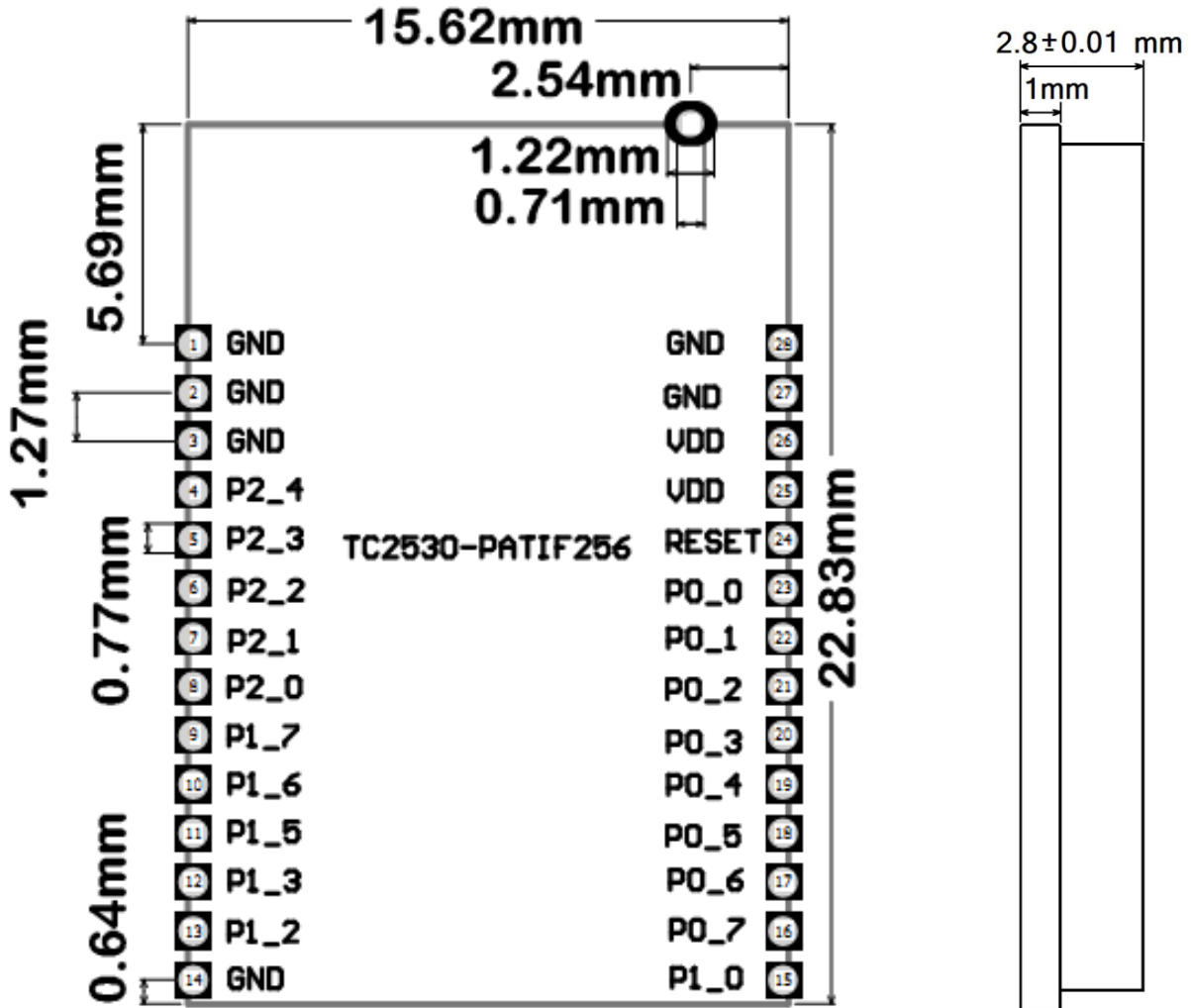
PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
I_{core}	TX Power : 18dBm / BLE Channel= 37	151		161	mA
	TX Power : 11dBm/ BLE Channel=37	76		78	mA
	TX Power : 0dBm/ BLE Channel=37		50		mA
	Continuous RX Mode/ BLE Channel=37		33.8		mA

TC2541-PAFxxx RF Module Pin Configuration

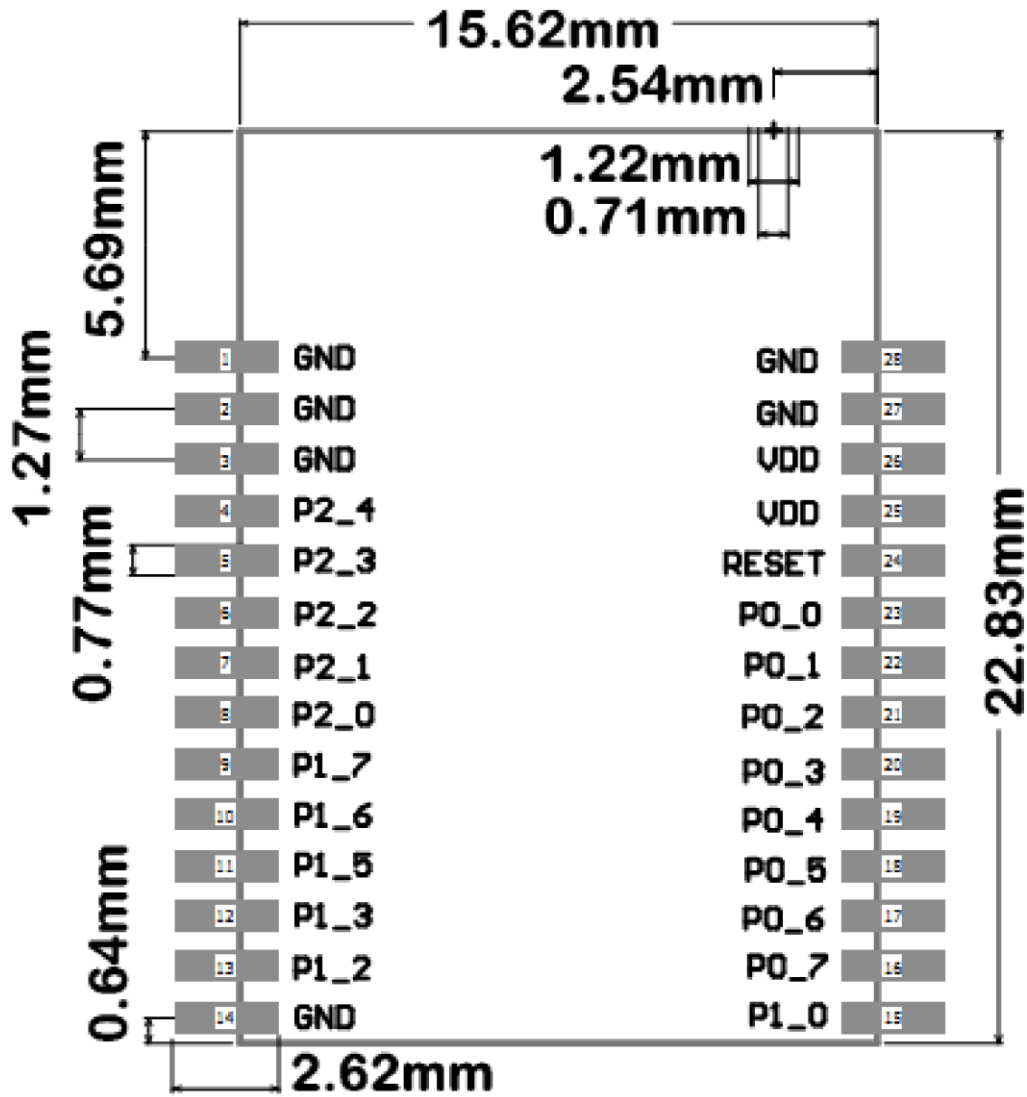


Pin #.	Pin Name	Pin Type	Description
1	GND	GND	Ground
2	GND	GND	Ground
3	GND	GND	Ground
4	P2.4	Digital IO	Port 2.4
5	P2.3	Digital IO	Port 2.3
6	P2.2	Digital IO	Port 2.2
7	P2.1	Digital IO	Port 2.1
8	P2.0	Digital IO	Port 2.0
9	P1.7	Digital IO	Port 1.7
10	P1.6	Digital IO	Port 1.6
11	P1.5	Digital IO	Port 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-PAFxxx Module Demension



■ TC2530-PAFxxx Module layout Suggestion



■ Document History

Revision	Date	Description/Changes
1.0	2014.04.22	First release

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