Bluetooth® 4.0 Low Energy Single Mode Power-Optimized SoC Module

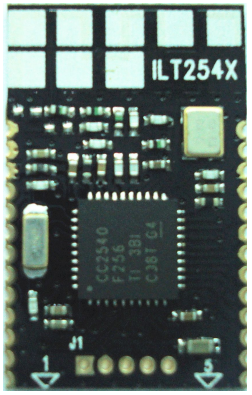
RL-CC2540-A1

Overview

RL-CC2540-A1 module is a 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 CC2540 combines an excellent RF transceiver with an industry-standard enhanced 8051 MCU, in-system programmable flash memory, 8-KB RAM, and many other powerful supporting features and peripherals. The CC2540 is suitable for systems where very low power consumption is required. Very low-power sleep modes are available. Short transition times between operating modes further enable low power consumption.

Feature

- Bluetooth low energy technology Compatible
- Excellent Link Budget
- Enabling Long-Range Applications
- Accurate Digital RSSI
- Compliance With FCC & CE standard
- High-Performance and Low-Power 8051 MCU core
- Battery Monitor and Temperature Sensor
- Sample Applications and Profiles
- I2C Interface
- AES Security Coprocessor



Applications

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

Electrical Characteristics

ITEM	TEST REQUIREMENT	REMARKS
Voltage supply	2.0－3.6V	DC
Center frequency	2400－2483.5MHz	Programmable
Frequency error	±50KHz	
Modulation	O-QPSK	
MaxOutput power	4dBm	Programmable
Receiving sensitivity	-97dBm	High gain Mode
Receiving current	19.6mA	
Transmitting current	32mA	TX Power 4dBm
Sleep consumption At power mode2	0.9uA	Sleep Timer ON
Sleep consumption At power mode3	0.4uA	External interrupts
Transmit distance	>50M	BER<0.1%
Antenna	50ohm	
Module size	15mm*24mm*1.54mm	

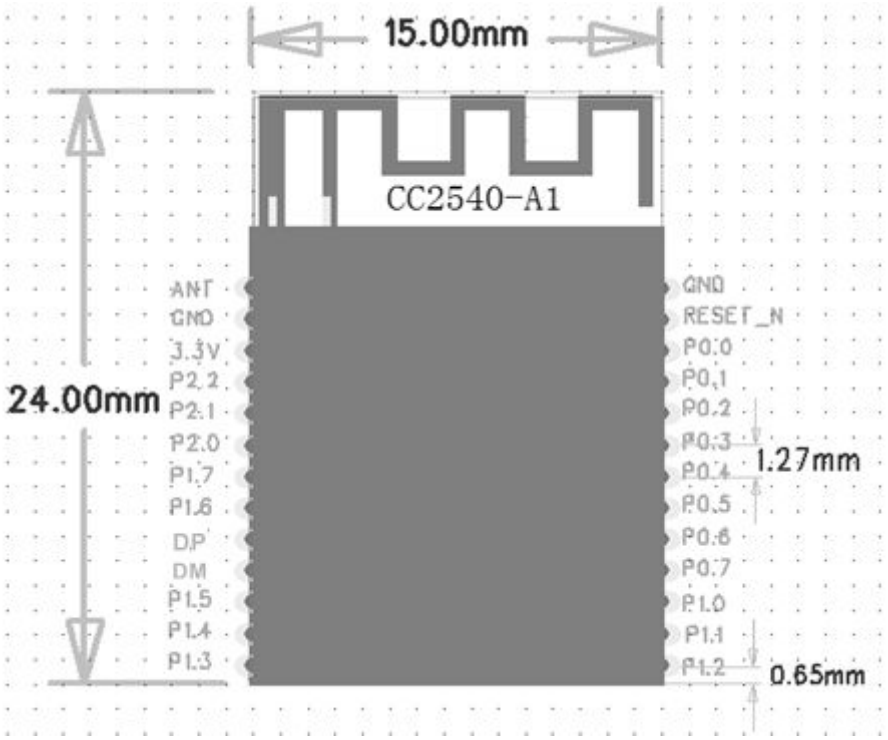
RECOMMENDED OPERATING CONDITIONS

	MIN	MAX	UNIT
Operating ambient temperature range, TA	-30	85	°C
Operating supply voltage	2	3.6	V

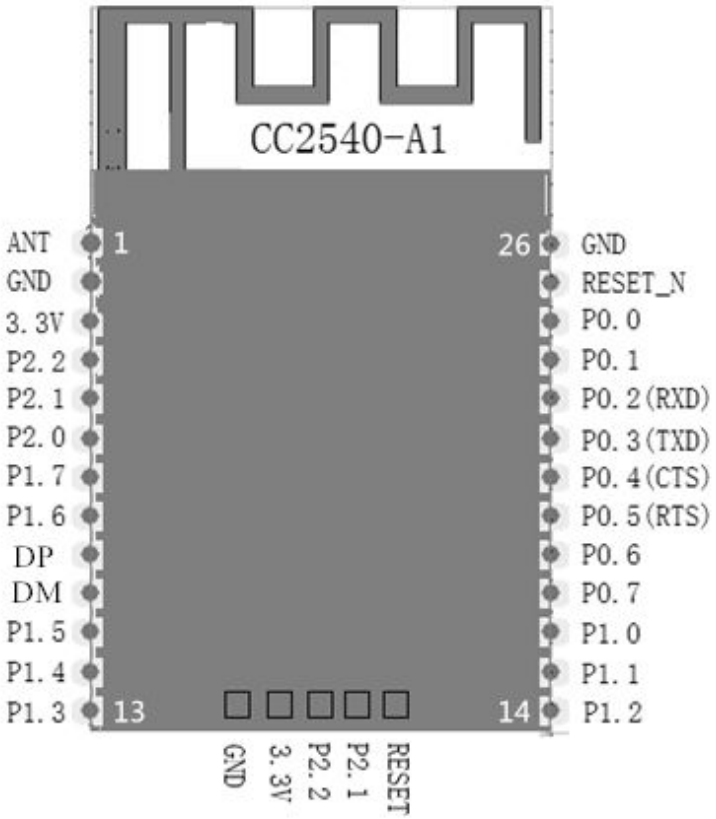
CAUTION:

ESD sensitive device. Precautions should be used when handing the device in order to prevent permanent damage.

Dimensions

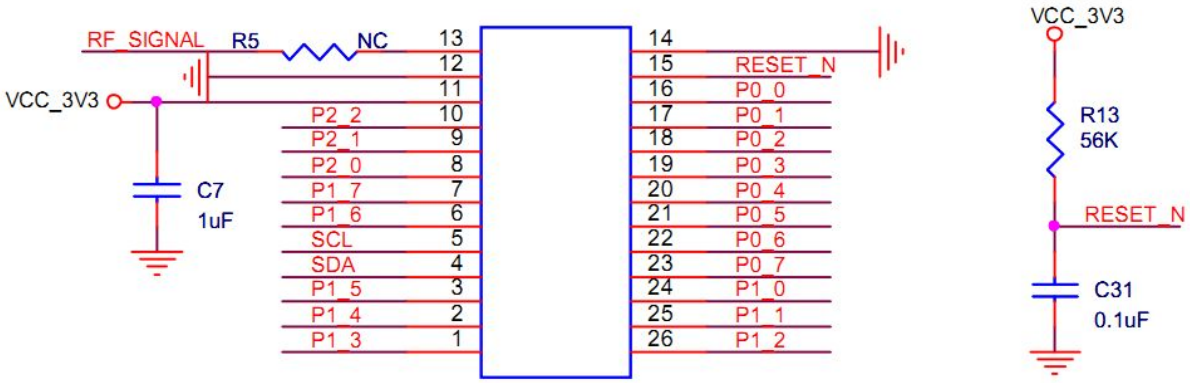


Pin Assignment



Pin Num.	Pin Name	Description
1	ANT	External Antenna
2	GND	Ground
3	3.3V	2-3.6V power-supply
4	P2.2	Digital IO/Jtag DC
5	P2.1	Digital IO/Jtag DD
6	P2.0	Digital IO/TIMER4
7	P1.7	Digital IO/TIMER3
8	P1.6	Digital IO/TIMER3
9	DP	USB D+
10	DM	USB D-
11	P1.5	Digital IO
12	P1.4	Digital IO/TIMER3
13	P1.3	Digital IO/TIMER3
14	P1.2	Digital IO/TIMER1
15	P1.1	Digital IO/TIMER1/TIMER4
16	P1.0	Digital IO/TIMER1/TIMER4
17	P0.7	Digital IO/AD/TIMER1
18	P0.6	Digital IO/AD/TIMER1
19	P0.5	Digital IO /RTS
20	P0.4	Digital IO /CTS
21	P0.3	Digital IO /TXD
22	P0.2	Digital IO /RXD
23	P0.1	Digital IO
24	P0.0	Digital IO
25	RESET_N	RESET active-low
26	GND	Ground

Peripheral Circuit



Layout Suggestion

- **R**L-CC2540-A1 bluetooth module serial level should be 3.3 V, if the connection and 5V level system need to increase the level conversion chip.
- **B**luetooth signal is highly affected by the surrounding,such as trees, metal, wall can have certain absorption on the bluetooth signal or block, so the installation is not recommended in the metal case.
- **D**ue to metal will weaken the function of antenna, it is suggested that Lay in the module board,don't lay GND and a line under the antenna module, it is best to hollow out.

NOTE:

Additional information on the Texas Instruments CC2540 device can be found in the company's latest datasheet release at http:// www.ti.com/product/CC2540