

Multiprotocol 2.4GHz Wireless with power amplifier



The **RC-CC2652PA** module is designed based on **CC2652R** and **CC2592** of Texas Instruments.

The RC-CC2652PA module is designed based on CC2652R and CC2592 of Texas Instruments. The CC2652R device is a multiprotocol wireless 2.4GHz MCU targeting Thread, Zigbee, Bluetooth 5 low energy, IEEE 802.15.4g, IPv6-enabled smart object (6LoWPAN), Wi-SUN, and proprietary systems.

The CC2592 device is a cost effective and high performance RF front end low-power and low-voltage 2.4- GHz wireless applications. To increase the link budget, the CC2592 device provides a power amplifier for increased output power and an LNA with a low-noise figure for improved receiver sensitivity.

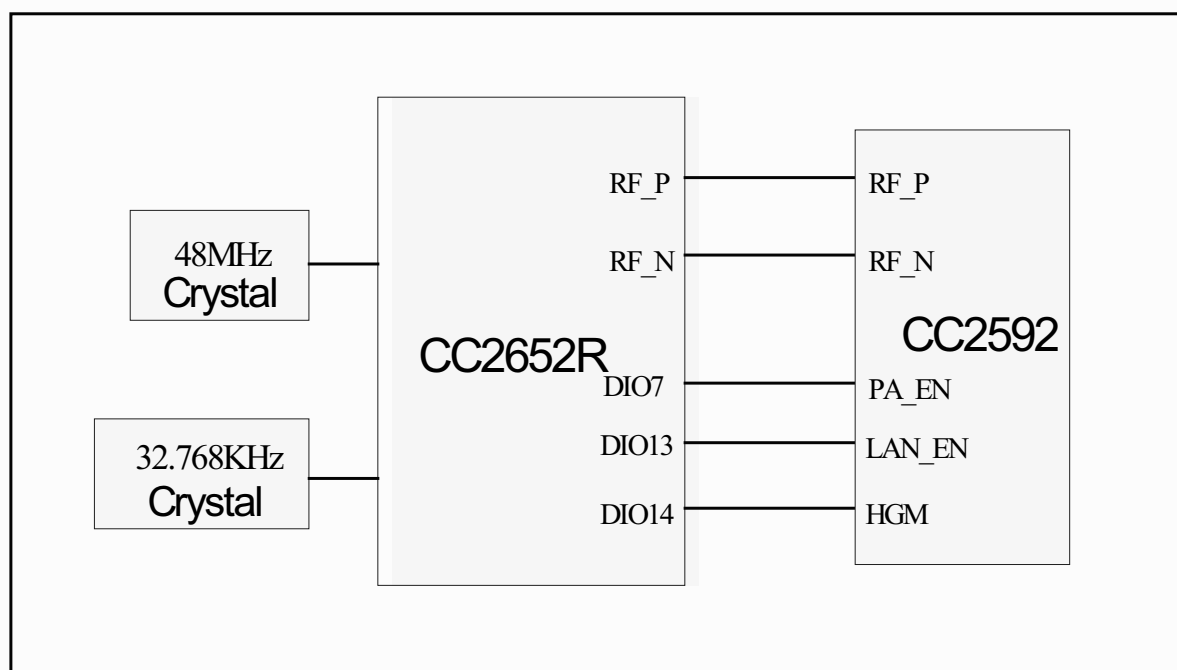
Features

- Microcontroller
 - Powerful Arm®Cortex®M4F Processor
 - Clock Speed Up to 48 MHz
 - 352KB of In-System Programmable Flash
 - 256KB of ROM for Protocols and Firmware
 - 8KB of Cache SRAM (Available as General-Purpose RAM)
 - 80KB of Ultra-Low Leakage SRAM
 - 2-Pin cJTAG and JTAG Debugging
 - Supports Over-the-Air Upgrade (OTA)
- Ultra-Low Power Sensor Controller With 4KB of SRAM
 - Sample, Store, and Process Sensor Data
 - Operation Independent From System CPU
 - Fast Wake-Up for Low-Power Operation
- Peripherals
 - Digital Peripherals Can be Routed to Any GPIO
 - 4× 32-Bit or 8× 16-Bit General-Purpose Timers
 - 12-Bit ADC, 200 kSamples/s, 8 Channels
 - 2× Comparators With Internal Reference DAC (1× Continuous Time, 1× Ultra-Low Power)
 - Programmable Current Source
 - 2× UART
 - I2C
 - I2S
 - Real-Time Clock (RTC)
 - AES 128- and 256-bit Crypto Accelerator
 - ECC and RSA Public Key Hardware Accelerator
 - SHA2 Accelerator (Full Suite Up to SHA-512)
 - True Random Number Generator (TRNG)
 - Capacitive Sensing, Up to 8 Channels
 - Integrated Temperature and Battery Monitor
- Low Power
 - Wide Supply Voltage Range: 2 V to 3.6 V
 - Active-Mode RX: 15 mA
 - Active-Mode TX: 180 mA
 - Standby: 3µA
- Radio Section
 - 2.4-GHz RF Transceiver Compatible With Bluetooth 5 low energy and IEEE 802.15.4 PHY and MAC
 - Excellent Receiver Sensitivity:
 - 100 dBm for 802.15.4 (2.4 GHz),
 - 103 dBm for Bluetooth 5 low energy Coded
 - Output Power Up to +20dBm
 - 2× SSI (SPI, MICROWIRE, TI)

Applications :

- Smart Grid and Automatic Meter Reading
- Wireless Sensor Network
- Industrial
- Wireless Healthcare Applications
- 6LoWPAN systems
- Energy Harvesting Applications
- Electronic Shelf Label (ESL)
- Home and Building Automation
- Wireless Alarm and Security Systems

Functional Block Diagram



Control Logic for connecting the CC2652R to a CC2592 device.

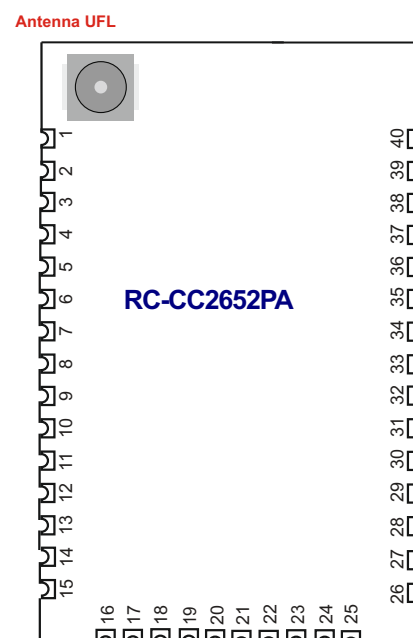
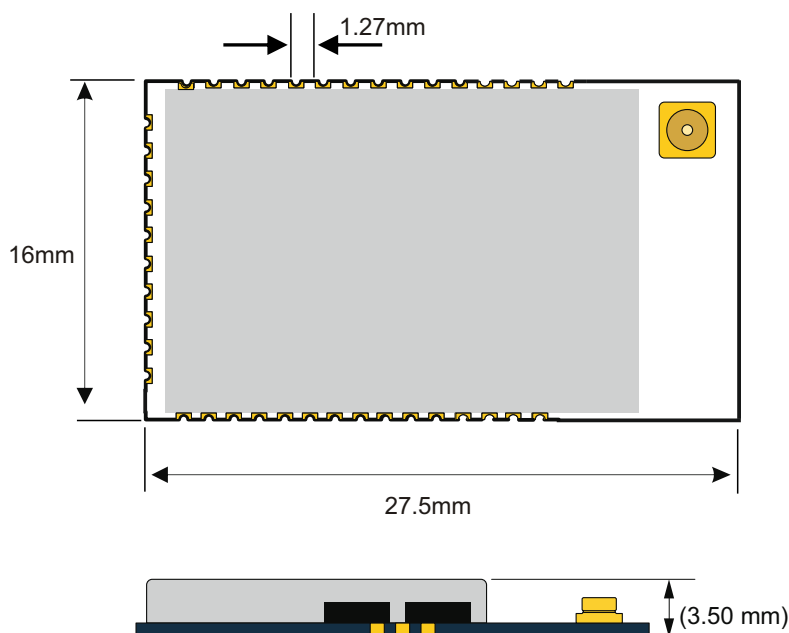
There are three digital controls pins (PA_EN, LNA_EN and HGM) on the Cc2592 that control the state of the chip. The table below shows the control logic when connecting the Cc2592 to a CC2652R device.

PA_EN	LAN_EN	HGM	Mode of Operation
0	0	X	Power Down
X	1	0	RX Low Gain Mode
X	1	1	RX High Gain Mode
1	0	X	TX

Specifications

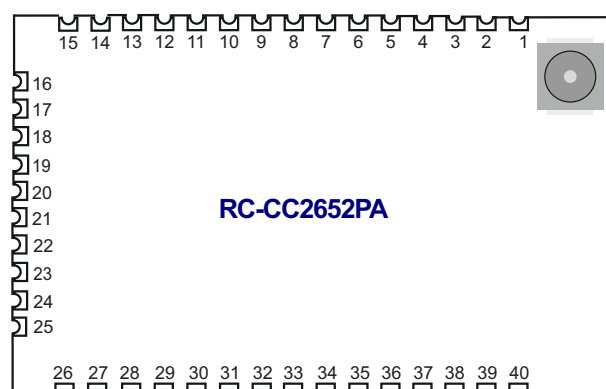
RC-CC2652PA					
Parameter	Symbol	Min.	Typ.	Max.	Units
Operating Voltage	V_{CC}	2.0	3.3	3.6	VDC
Supply Current RX Mode (MCU Active)	I_{CRX}		15		mA
Supply Current TX Mode CW (+18dBm / 3.3V)	I_{CTX1}		180		mA
Supply Current Sleep Mode	I_{CTX2}		3		μ A
TX Power (CW)	P		18	20	dBm
RX Sensitivity	S		-103		dBm
Operative Temperature	T	-30		+75	$^{\circ}$ C

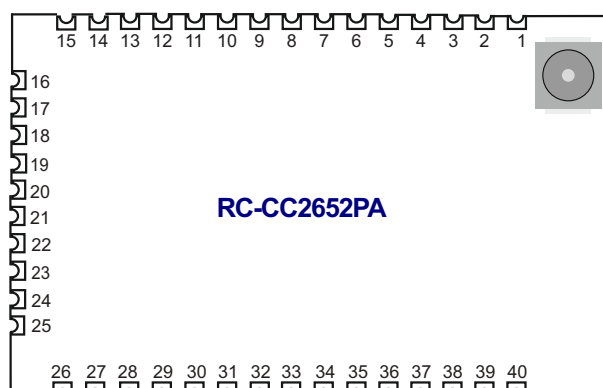
Mechanical Dimension



Terminal description RC-CC2652PA

Pad Number	Name	Pin Type	Description	CC3235 Pkg pin number
1	+3V3	Power	Chip Supply Voltage (VBAT)	
2	+3V3	Power		
3	DIO0	I/O	GPIO, Sensor Controller	5
4	DIO1	I/O	GPIO, Sensor Controller	6
5	DIO2	I/O	GPIO, Sensor Controller	7
6	DIO3	I/O	GPIO, Sensor Controller	8
7	DIO4	I/O	GPIO, Sensor Controller	9
8	DIO5	I/O	GPIO, Sensor Controller, high-drive capability	10
9	DIO6	I/O	GPIO, Sensor Controller, high-drive capability	11
10	NC	-	NO Connect	
11	GND	-	Connect to GND	
12	+3V3	-	Chip Supply Voltage (VBAT)	
13	DIO8	I/O	GPIO	14
14	DIO9	I/O	GPIO	15
15	DIO10	I/O	GPIO	16
16	DIO11	I/O	GPIO	17
17	DIO12	I/O	GPIO	18
18	NC	-	NO Connect	
19	NC	-	NO Connect	





20	DIO15	I/O	GPIO	21
21	JT_AM	I/O	JTAG TMS, high-drive capability	24
22	JT_TC	I	JTAG TCK	25
23	DIO16	I/O	GPIO, JTAG_TDO, high-drive capability	26
24	DIO17	I/O	GPIO, JTAG_TDI, high-drive capability	27
25	DIO18	I/O	GPIO	28
26	DIO19	I/O	GPIO	29
27	DIO20	I/O	GPIO	30
28	DIO21	I/O	GPIO	31
29	DIO22	I/O	GPIO	32
30	REST_N	I	Reset, active low. No internal pullup resistor	35
31	DIO23	I/O	GPIO, Sensor Controller, analog	36
32	DIO24	I/O	GPIO, Sensor Controller, analog	38
33	DIO25	I/O	GPIO, Sensor Controller, analog	38
34	DIO26	I/O	GPIO, Sensor Controller, analog	39
35	DIO27	I/O	GPIO, Sensor Controller, analog	40
36	DIO28	I/O	GPIO, Sensor Controller, analog	41
37	DIO29	I/O	GPIO, Sensor Controller, analog	42
38	DIO30	I/O	GPIO, Sensor Controller, analog	43
39	GND		Connect to GND	
40	GND		Connect to GND	

NOTE: about the proper pin multiplexing options, please reference CC2652 datasheet from www.ti.com for more details

TopOverlay 12,8X17,1mm

27.5mm

16mm

2.28001mm

7.93mm

1.27mm

1.72mm

2X0.7mmx40

Temperature

222°C

180°C

150°C

A

Pre-heating Zone

Ramp up rate (to preheat) < 5°C/sec

Recommend: 80s
Time range (60~100sec)

B

Ramp up rate (to reflow) < 4°C/sec

C

Peak temp 232~255°C

D

Time above 222°C

Recommend: 40s
Time Range (30~90sec)

Soldering Zone

Time (MAX: 400S)