

BM-8762EMF Bluetooth 5.2 BLE module

Description

The RTL8762E are ultra-low-power system on-chip solutions for Bluetooth 5.2 low energy and 2.4GHz proprietary multi-application that combine the excellent performance of a leading RF transceiver with a low-power ARM Cortex-M0+, power management unit, ADC, and smart I/O distribution controller.

In addition, RTL8762E supports an analog MIC interface that integrates a sigma-delta ADC, programmable gain amplifier, and microphone bias circuit for voice command application. The RTL8762E also embeds an IR transceiver, hardware key-scan, and Quad-decoder on a single IC within a QFN package.

Features

- Supports Bluetooth 5.2 core specification and 2.4GHz proprietary feature multi-protocol independently
- Supports 2Mbps LE
- Integrated MCU to execute Bluetooth protocol stack
- Supports multiple level Low Energy states
- Supports LE L2CAP Connection Oriented Channel Support
- Supports LE low duty directed advertising
- Supports LE data length extension feature
- Supports OTA (Over-the-Air) programming mechanism for firmware upgrade
- Supports Bluetooth Low Energy PHY
- Supports GAP, ATT/GATT, SMP, L2CAP
- ARM Cortex-M0+ CPU (Maximum 40MHz)

- Total 104kB SRAM, 272kB ROM

Application

- TV Remote Controller
- LE HID
- Beacon
- Home Automation
- Key Fob
- Toy

Revision History

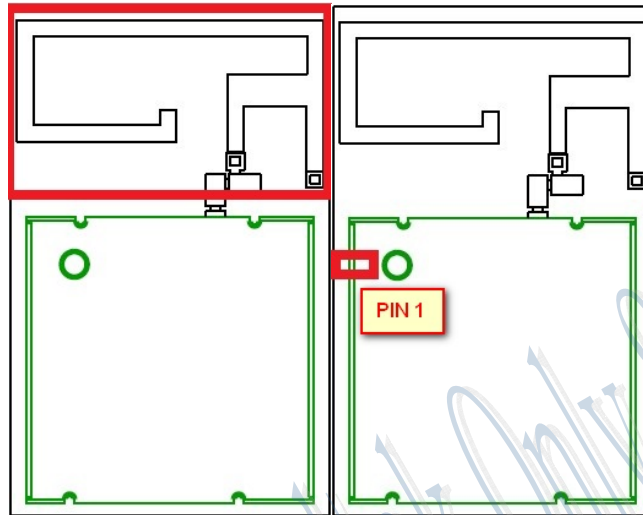
Version	Date	Change Description
1.0	09/21/2023	Initial release

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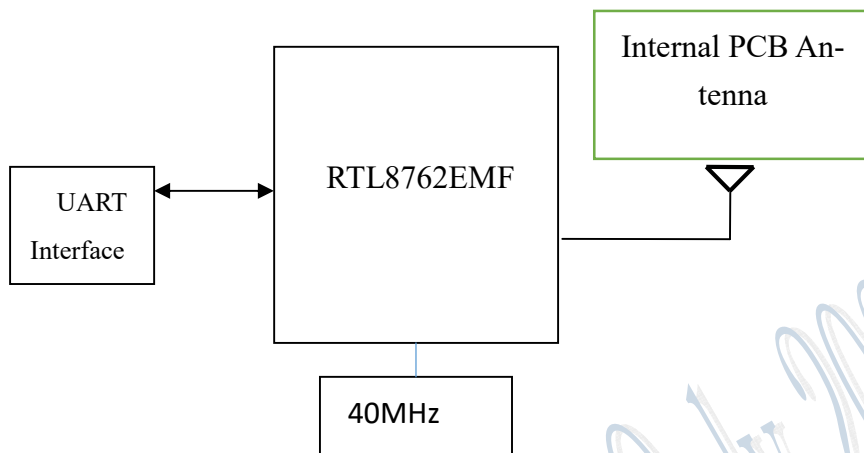
Note : All electrical and mechanical specifications may be changed by CC&C Technologies, Inc. without notice.

Factory options

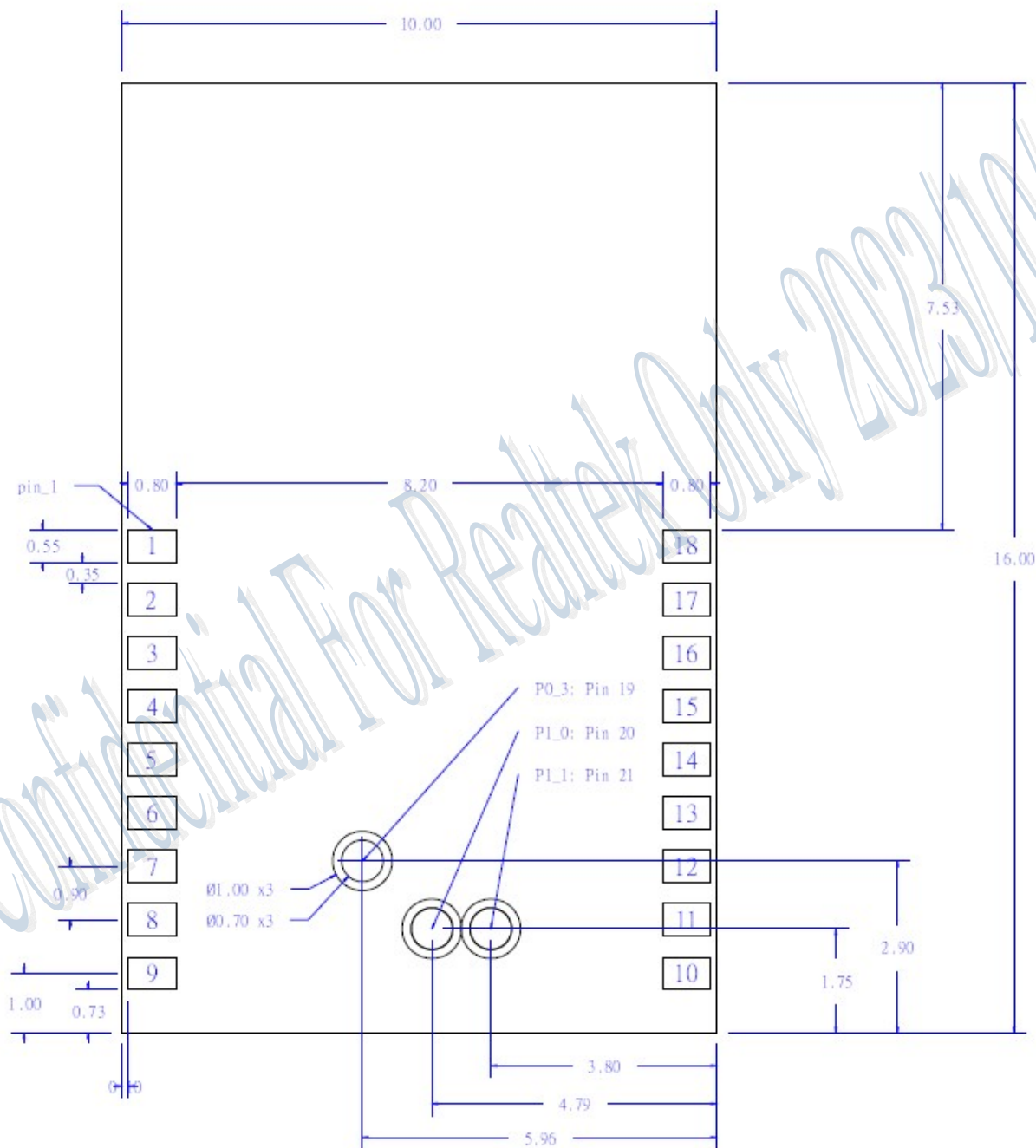
- RF output by PCB Antenna(RF type-1), DFN Pads(RF type-2)



Block Diagram



Pin Assignment (Top view)



Pin Definition

Pin	Pin Name	Pad Type	Description
1	RF_OUT	RF	RF output external Antenna
2	GND	Ground	
3	P4_3	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down.
4	P4_2	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down.
5	P4_1	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down.
6	P4_0	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down.
7	P0_6	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down.
8	P0_5	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down.
9	GND	Ground	
10	VDDIO	PI	Supply input 3.3V power
11	P3_3	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down.
12	P3_2	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability.

			With wakeup function. With internal strong/weak pull-up and pull-down.
13	P3_1	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down. HCI_UART_RX (default).
14	P3_0	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down. HCI_UART_TX (default).
15	P2_6	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down. AUXADC input 2.
16	P2_7	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down. AUXADC input 3.
17	P5_0	IO	Microphone bias. Pin share as GPIO when microphone bias is not used.
18	GND	Ground	
19	P0_3	IO	LOG_UART_TX. Power on trap: Pull-up for normal operation Pull-down to bypass executing program code in flash (PAD internal pull-up by default)
20	P1_0	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability. With wakeup function. With internal strong/weak pull-up and pull-down SWDIO(default)
21	P1_1	IO	General purpose IO, refer Pin Multiplexer table. 8mA driving capability.

			With wakeup function. With internal strong/weak pull-up and pull-down. SWDCLK (default). With wakeup function. With internal strong/weak pull-up and pull-down SWDCLK(default)
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I: Input
 O: Output
 P: Power
 PI: Power input
 RF: RF OUT

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SPECIFICATION

Product Name	Bluetooth 5.2 BLE Module
Model Number	E62
Frequency Range	2402~2480 MHz
Tx power	+7.5dBm(max)
Receiver sensitivity	-97dBm BLE(min)

Power Voltage Range

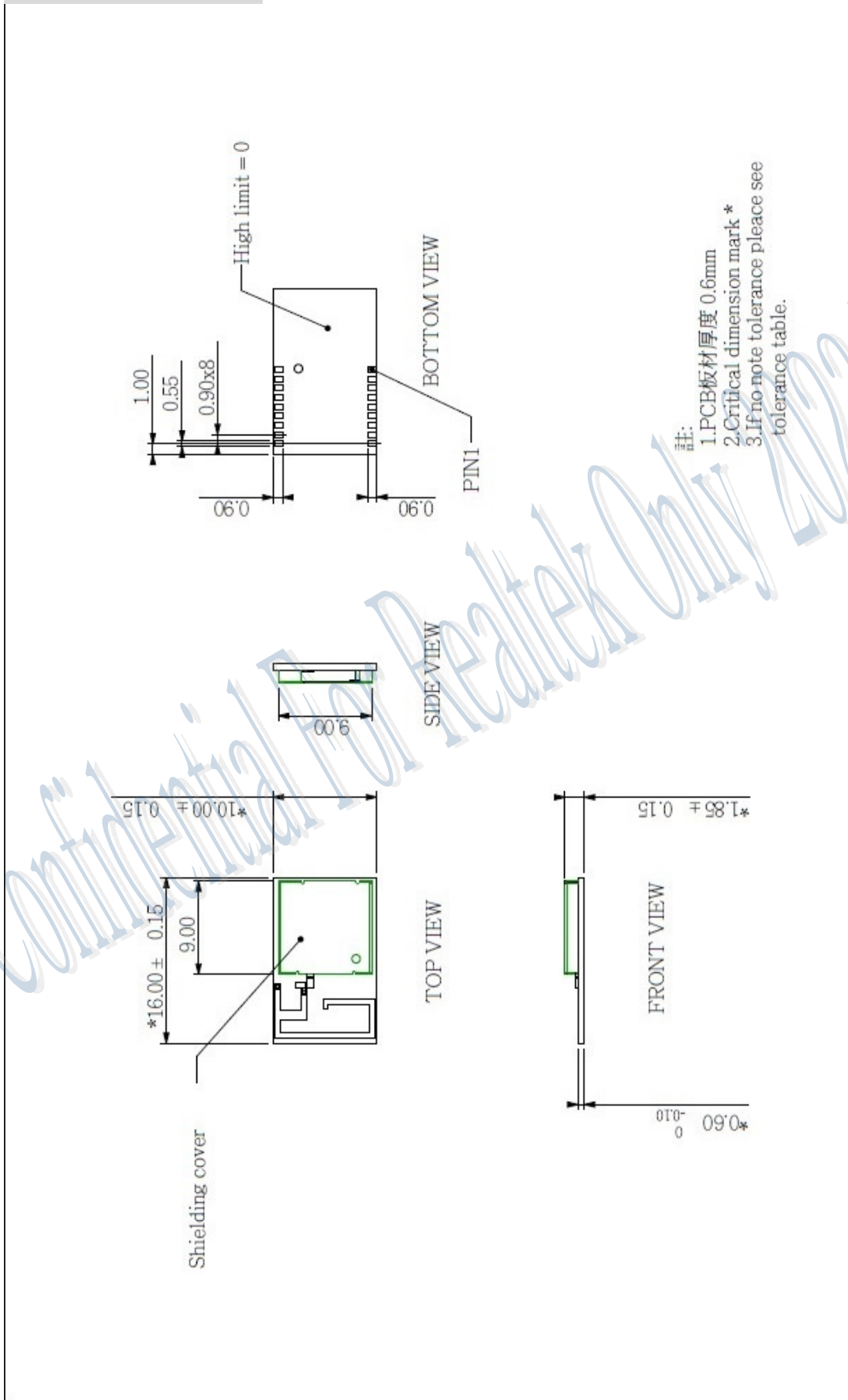
Symbol	Description	Min.	Typ.	Max.	Units
VDDIO	3.3V Supply Voltage	3.0	3.3	3.6	V
	Operating Temperature	-40	25	+85	°C

Note : +85 °C, Relative Humidity 95%
-40 °C, Relative Humidity 0%, non-condensing

Digital logic characteristics (3.3V I/O operation)

parameter	Condition	Min.	Typ.	Max.	Unit
High level input voltage	VDDIO=3.3V	2.0	3.3	3.6	V
Low level input voltage	VDDIO=3.3V	-	0	0.9	V
High level output voltage	VDDIO=3.3V	2.97	-	3.3	V
Low level output voltage	VDDIO=3.3V	0	-	0.33	V
Pull high and pull low resistor	VDDIO=3.3V Strong pull/weak pull	-	10/100	-	KOhm

Module dimension

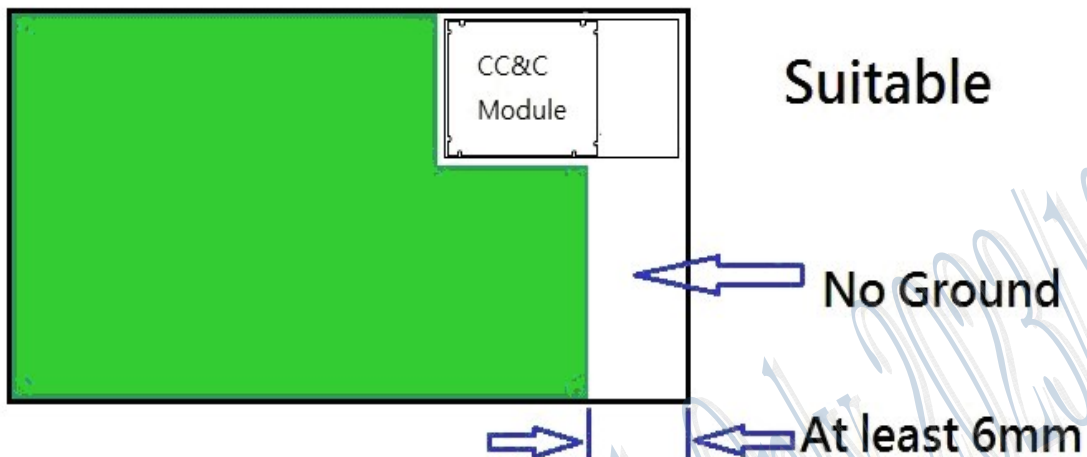


ITEM	DESCRIPTION	DATE	TOL	DIM.	CC&C TECHNOLOGIES, INC.			SCALE	DESCRIPTION		APPROVAL		
					DIM.	TOL	DATE		Q'TY	MATERIAL	FINISH	MODEL NO.	DWG NO.
				0-4	6-30	80-180	180-315	315-800	PCSBRT				
				0.05	0.08	0.12	0.20	0.25	0.30	MM			

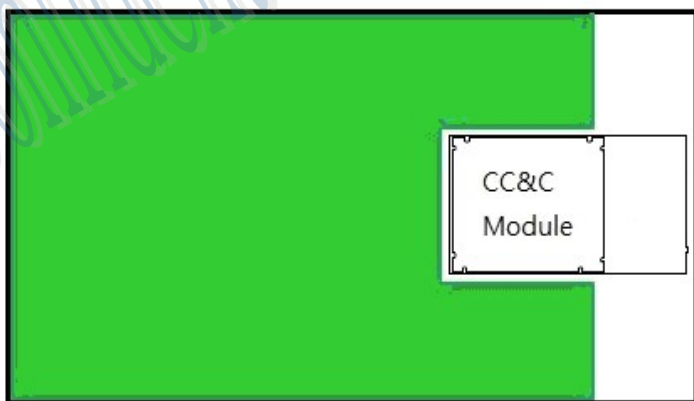
Placement Guideline

RF type-1

It is recommended that BM-8762EMF be placed on the corner of the main board or near the edge as shown below.

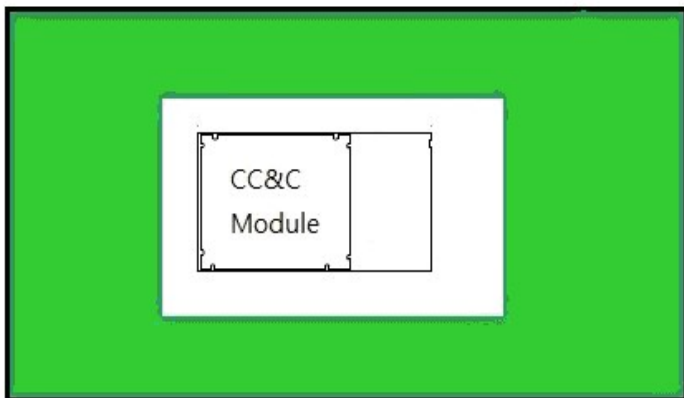


On the corner



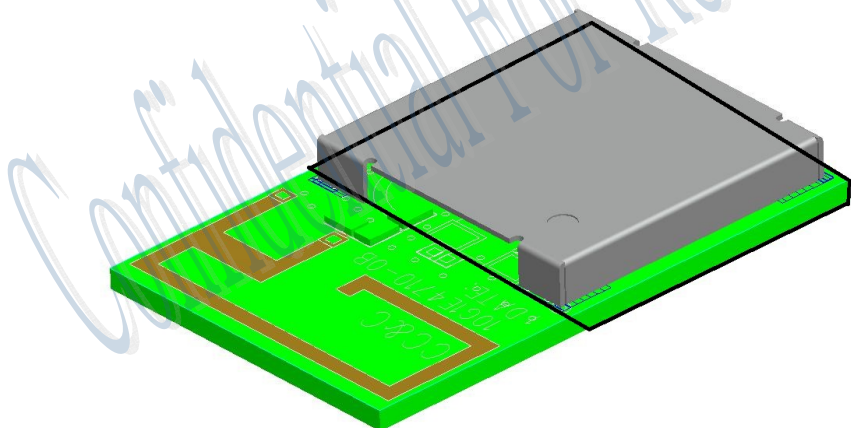
Near the edge

However, placing BM-8762EMF inside the main board affects the RF performance and may reduce the RF range significantly.



Unsuitable

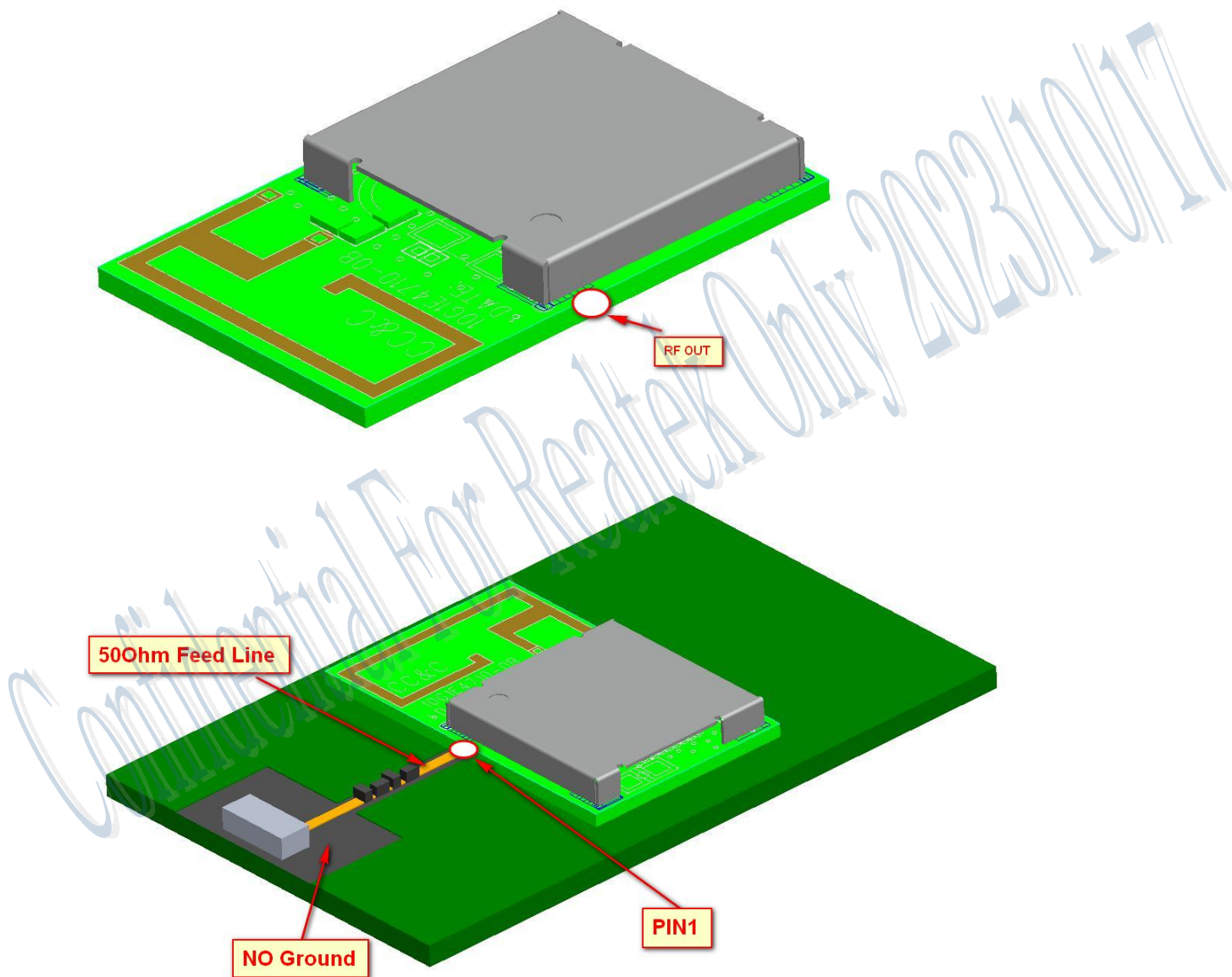
- In order to get a better RF performance, please don't put any trace or copper plane under Black frame of the module.



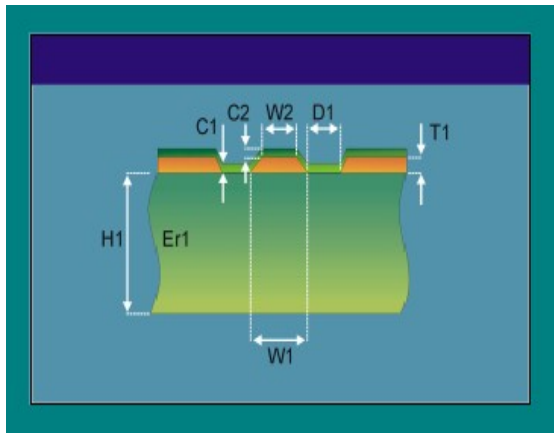
RF type-2

- **RF out**

Please have the impedance of feed lines to be 50 ohms from RF output pin to Antenna.



50 Ohm Feed Line:

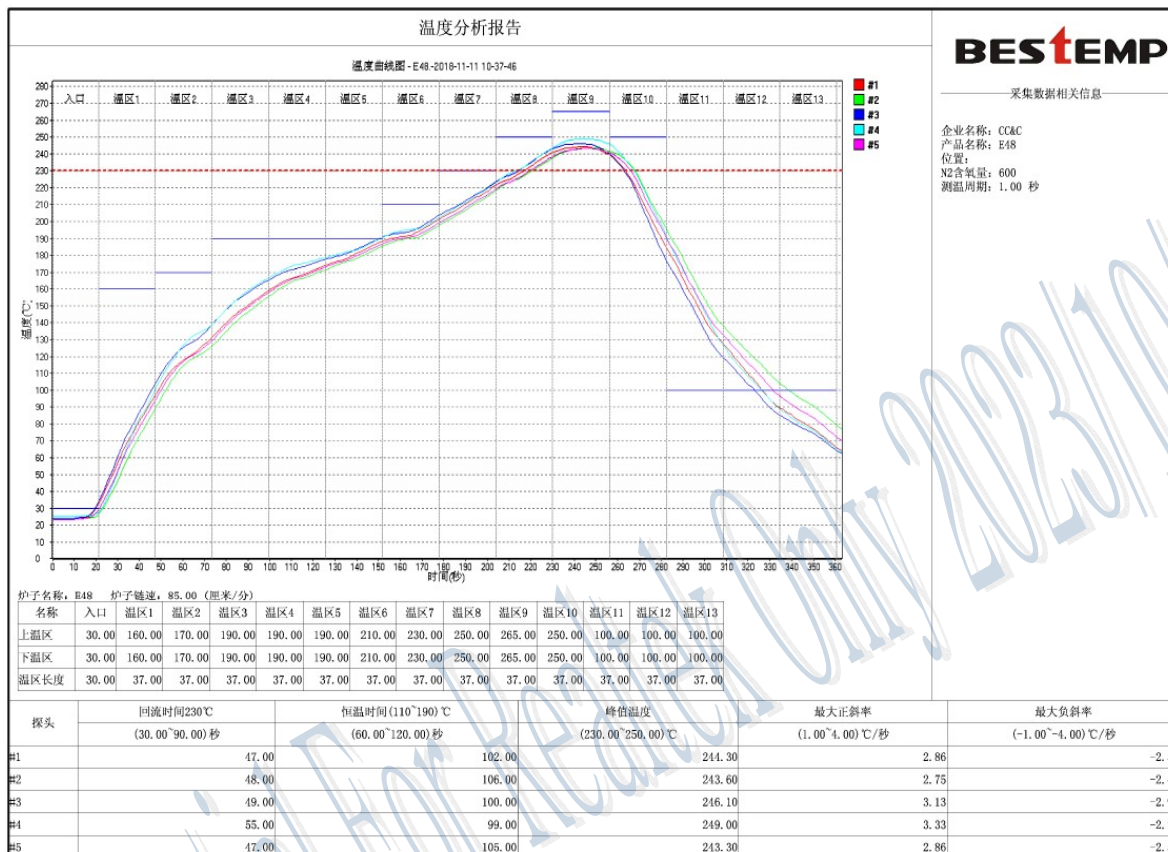


- H1: 30 ~ 60 mil
- Er1: 4.2
- W1: 20 mil
- W2: 20 mil
- D1: 5 mil
- C1: 0.7 mil
- C2: 0.7 mil
- T1: 1.4 mil (1 oz)

Impedance: 51 ~ 53 Ohm

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Reference – Temperature Reflow Chart



Reflow Notice:

1. If the system PCBA is double side design, please reflow the side without this module first.
2. Don't let the solder machine temperature over 250 °C or follow solder paste vendors's recommended temperature.
3. The Ramp-up temperature speed is 1-4 °C per second, the Ramp-down temperature speed is 1-4 °C per second.
4. This temperature reflow chart is for reference only, it depends on the manufacturing machine's characters requirement.

This module is surface mount device; please refer below conditions for drying before solder reflow processes. (extracted from IPC/JEDEC J-STD-033B.1)

Bake @ 125 °C		Bake @ 90 °C		Bake @ 40 °C	
Exceeding floor Life By > 72h	Exceeding floor Life By ≤ 72h	Exceeding floor Life By > 72h	Exceeding floor Life By ≤ 72h	Exceeding floor Life By > 72h	Exceeding floor Life By ≤ 72h
9 hours	7 hours	33 hours	23 hours	13 days	9 days