

Bluetooth® Low Energy Module RN4871-TR100

Features

- Qualified for Bluetooth SIG v5.0 Core Specification
- Certified to KCC, FCC, CE
- On-Board Bluetooth Low Energy (BLE) Stack
- ASCII Command Interface API over UART
- Scripting Engine for Hostless Operation
- Compact Form Factor - 9 mm x 11.5 mm
- Beacon Private Service for Beacon Services
- UART Transparent Service for Serial Data Applications
- Remote Configuration Over-the-Air



Operational

- Operating Voltage: 1.9V to 3.6V (3.3V typical)
- Temperature Range: -40°C to +85°C (Industrial)
- Supports UART

RF/Analog Features

- ISM Band 2.402 to 2.480 GHz Operation
- Channels: 0-39
- RX Sensitivity: -90 dBm
- TX Power: 0 dBm
- RSSI Monitor

Applications

- Health/Medical Devices
- Sports Activity/Fitness Meters
- Beacon Applications
- Internet of Things (IoT) Sensor Tag
- Remote Control
- Wearable Smart Devices and Accessories
- Smart Energy/Smart Home
- Industrial Control

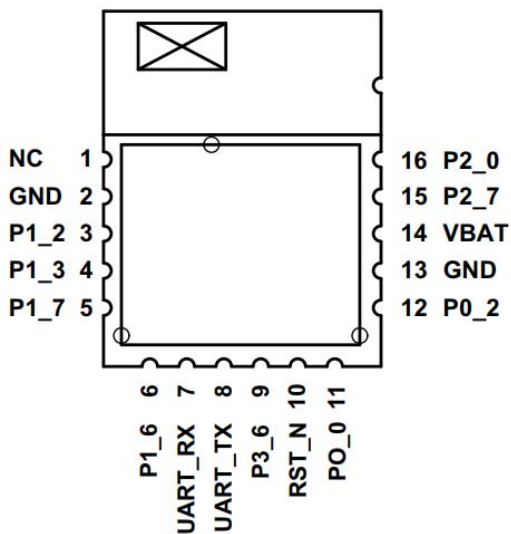
1.1 DEVICE OVERVIEW

The RN4871-TR100 BLE module integrates Bluetooth 5.0 baseband controller, on-board Bluetooth stack, serial communications, and RF power amplifier into one solution.

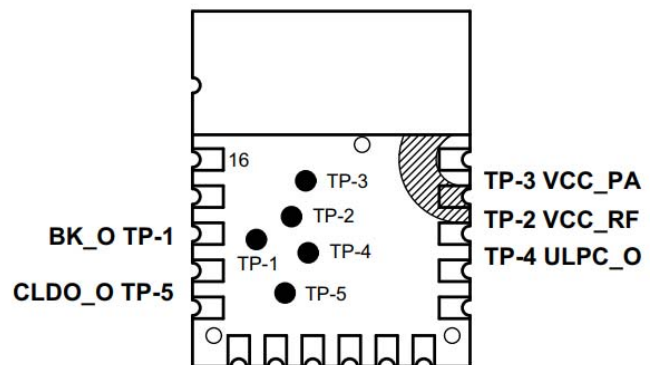
Part Number	Antenna On-Board	Shielding	Number of Pins	Dimensions	Operating Temperature Range
RN4871-TR100	Yes	Yes	16	9 mm x 11.5 mm	-40°C to +85°C

1.2 PIN DIAGRAM

Top View



Bottom View



1.3 PIN DESCRIPTION

PIN No.	Name	Type	Description
2	GND	Power	Ground reference
13	GND	Power	Ground reference
14	VBAT	Power	Positive supply input. Range: 1.9V~3.6V
10	RST_N	D, I/p	Module Reset; active-low; Internally pulled-high
16	P2_0	D, I/p	System configuration input; 1: Application mode 0: Test mode/Flash update/EEPROM configuration
12	P0_2	D, I/O	LED0: Provides indication whether the module is in ON/OFF mode
7	UART_RX	D, I/p	UART Data input
8	UART_TX	D, O/p	UART Data output
1	NC	-	-
3	P1_2	-	-
4	P1_3	-	-
5	P1_7	-	-
6	P1_6	-	-
9	P3_6	-	-
11	P0_0	-	-
15	P2_7	-	-

Legend: Pin Type Abbreviations:

A = Analog D = Digital I/O = Input/Output I/p = Input O/p = Output

2.1 GENERAL SPECIFICATIONS

Specification	Description
Standard Compliance	Bluetooth 5.0
Frequency Band	2.402 to 2.480 GHz
Modulation Method	GFSK
Maximum Data Rate (Transparent UART)	10 kbps (iOS®9)
Antenna	Ceramic
Interface	UART, PIO
Operating Range	1.9V to 3.6V
Sensitivity	-90 dBm
RF TX Power	0 dBm
Operating Temperature Range	-40°C to +85°C
Storage Temperature Range	-40°C to +125°C
Operating Relative Humidity Range	10% to 90%
Storage Relative Humidity Range	10% to 90%
Moisture Sensitivity Level	2

2.2 ELECTRICAL CHARACTERISTICS

Parameter	Min.	Typ.	Max.	Units
Supply Voltage (VDD)	1.9	-	3.6	V
I/O Voltage Levels				
VIL Input Logic Levels Low	Vss	-	0.3 VDD	V
VIH Input Logic Levels High	0.7 VDD	-	VDD	V
VOL Output Logic Levels Low	Vss	-	0.2 VDD	V
VOH Output Logic Levels High	0.8 VDD	-	VDD	V
RESET				
Reset Low Duration	63	-	-	ns
Input and Tri-State Current with				
Pull-Up Resistance	34	48	74	kΩ
Pull-Down Resistance	29	47	86	kΩ

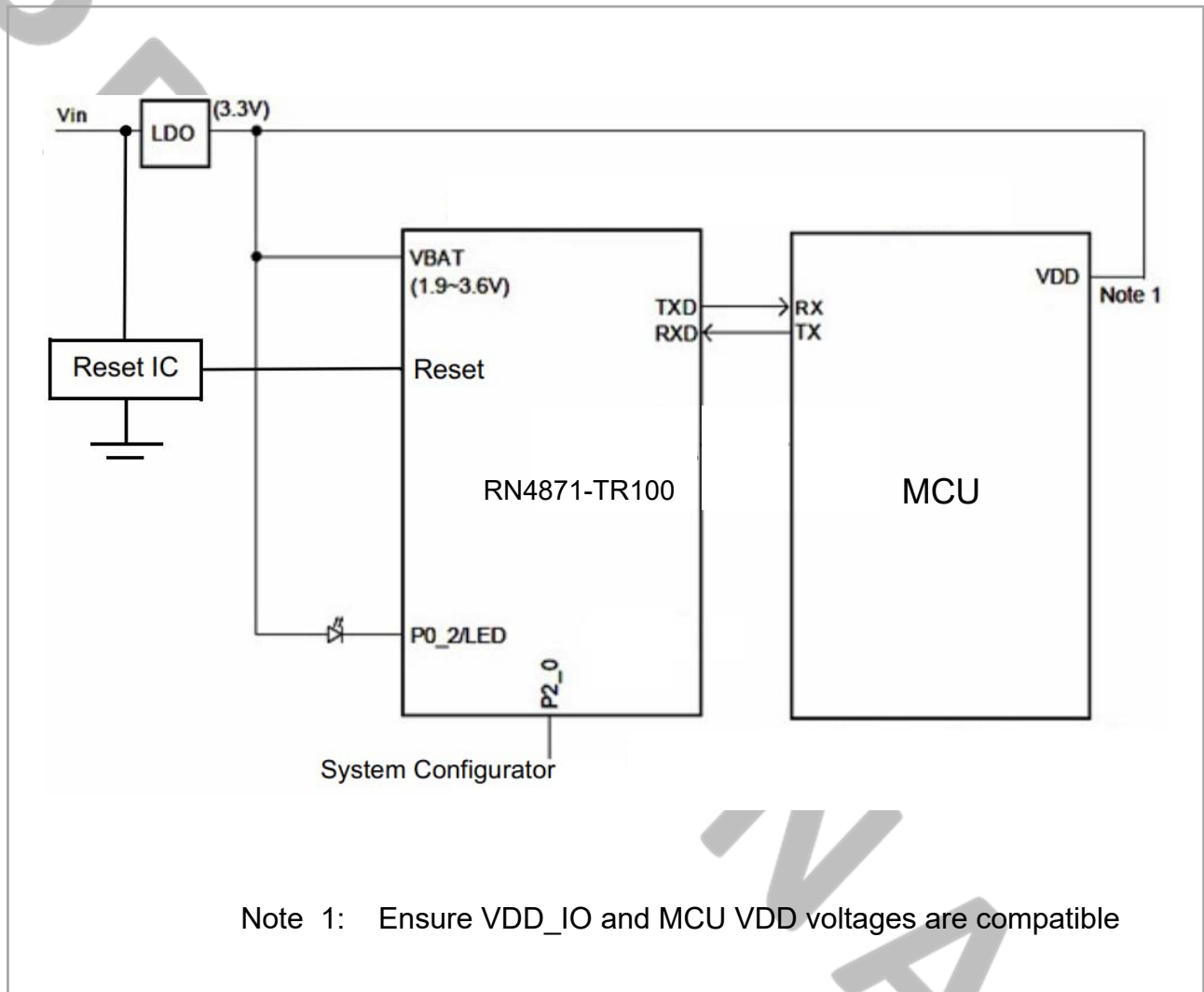
2.3 CURRENT CONSUMPTION

TBD

2.4 CURRENT CONSUMPTION DURING APPLICATION MODE

TBD

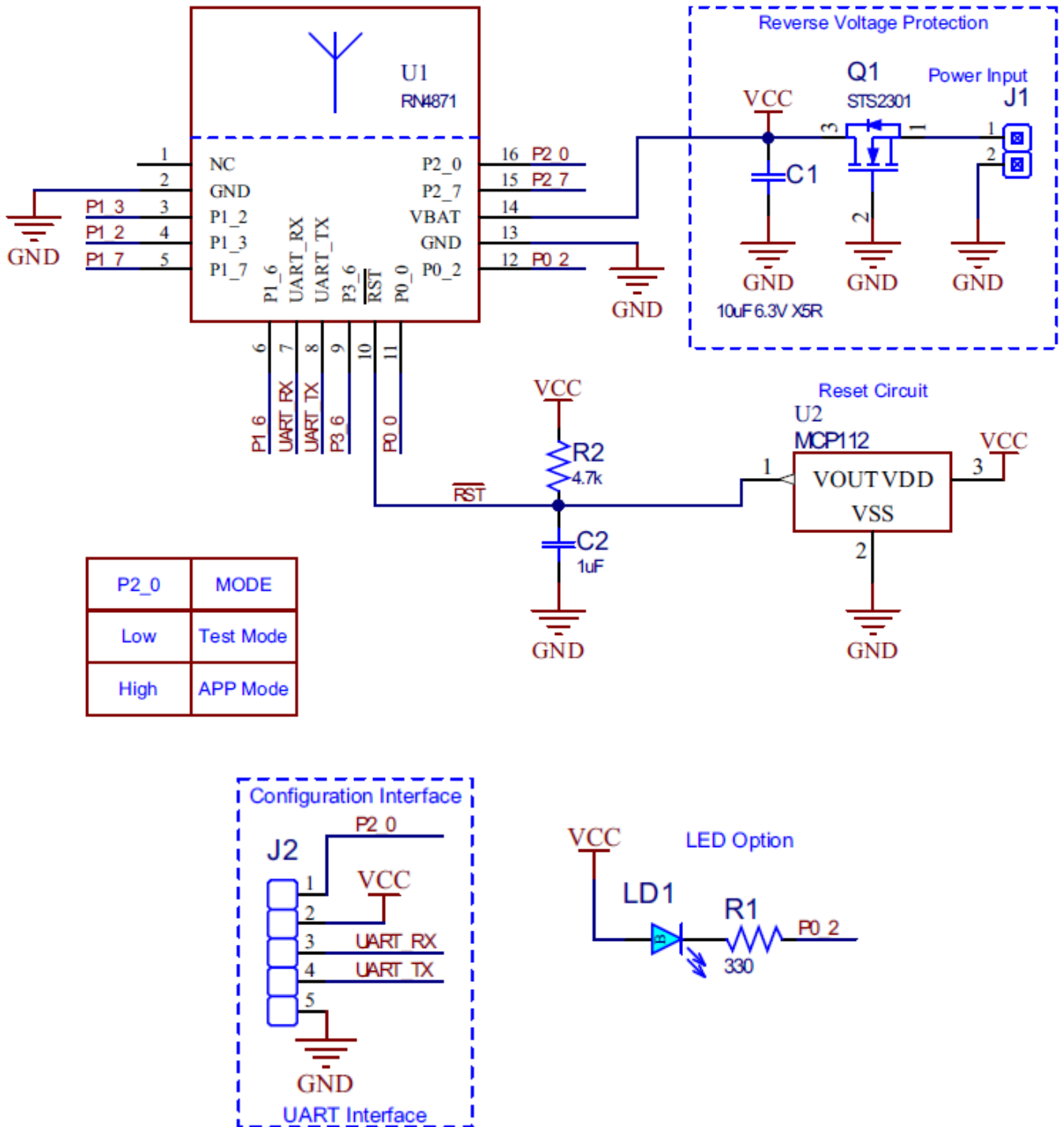
3.1 INTERFACE PINS



Power Drop Protection

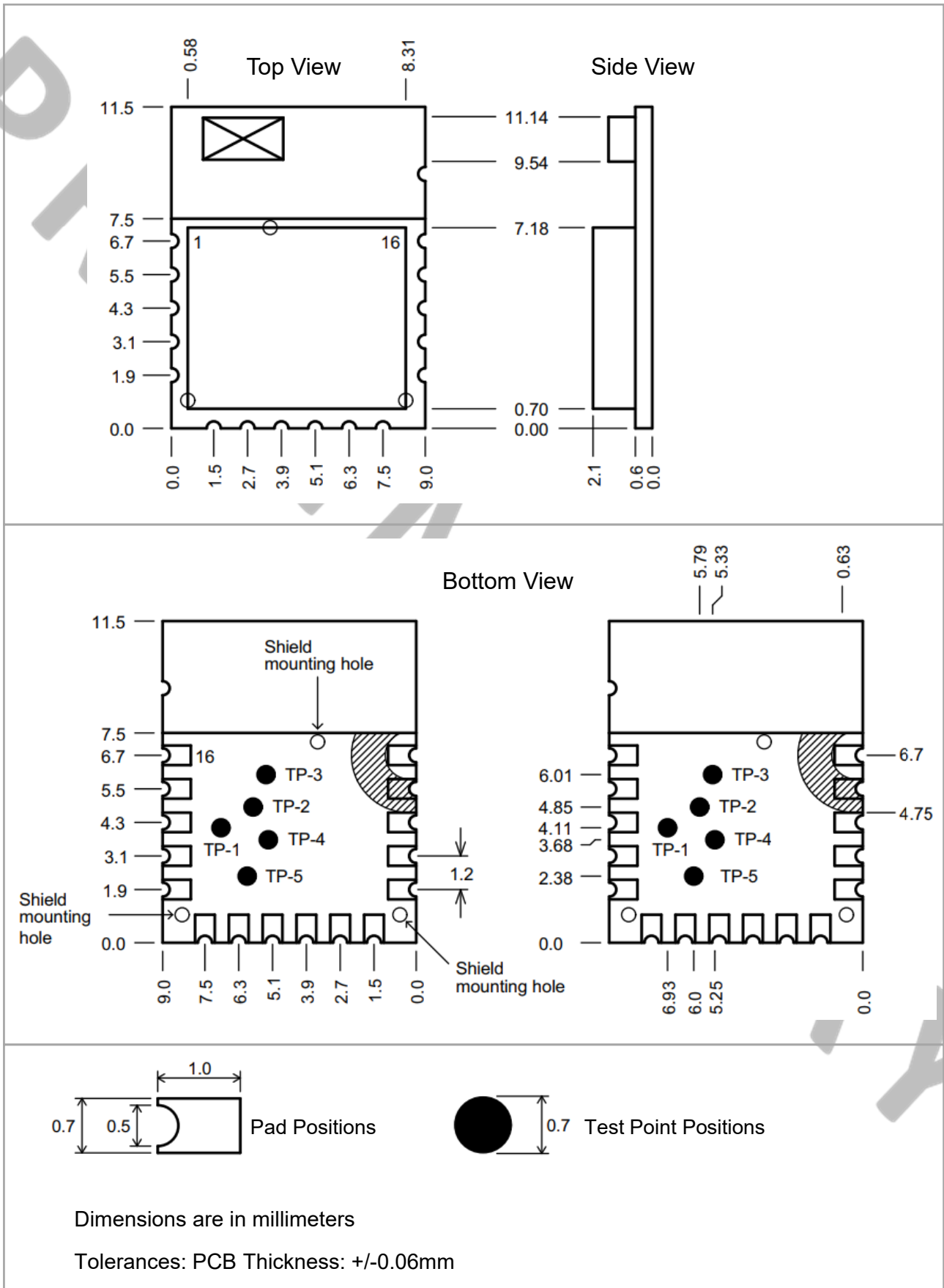
To prevent any problems that may arise when the power supply goes below 1.9V, a power-supply drop-protection circuit is recommended. Essentially, this circuit consists of a Reset IC which acts as an *Open Drain* with a Delay ≤ 10 ms, and is triggered at 1.8V power supply.

3.2 REFERENCE CIRCUIT

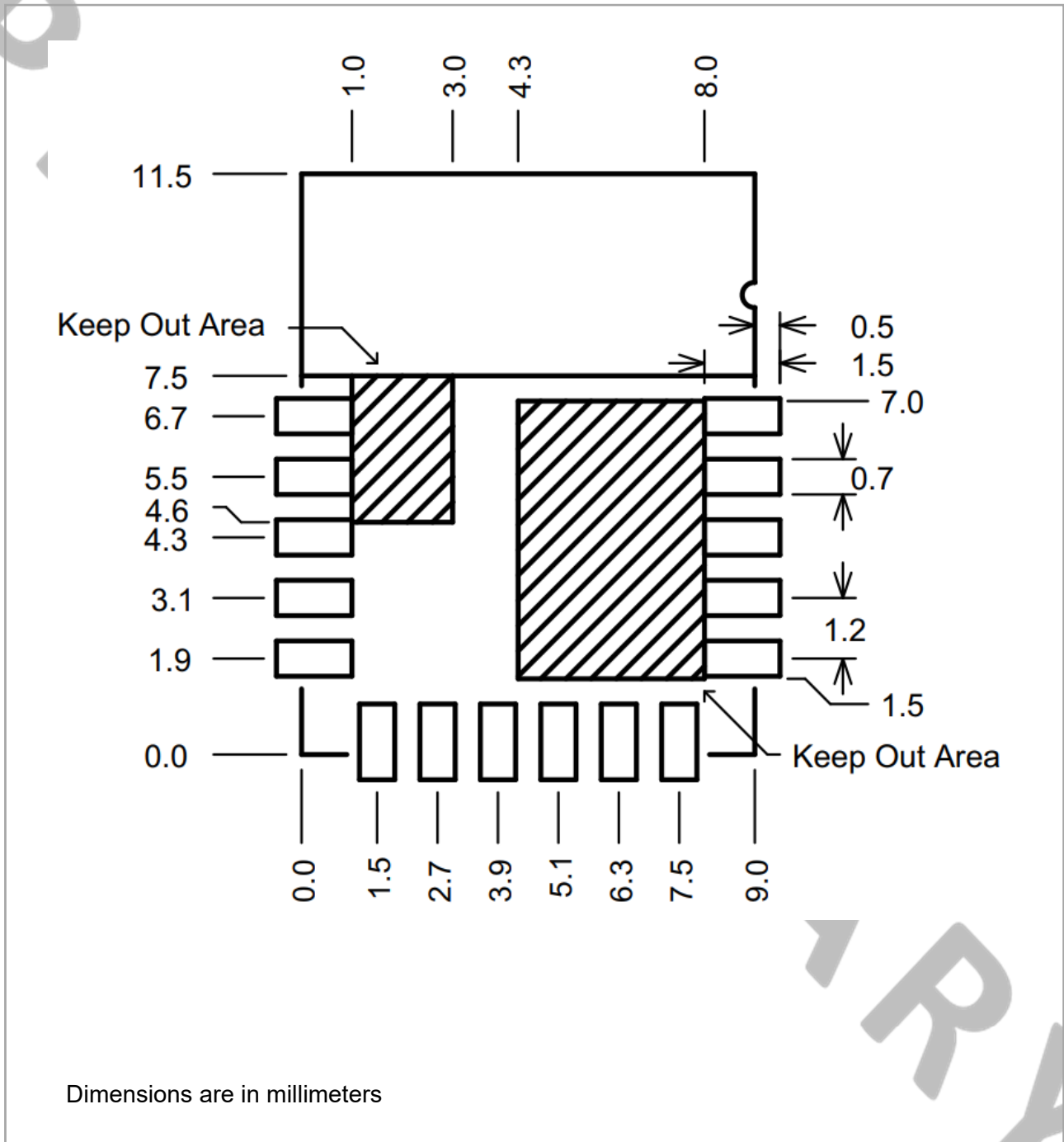


P2_0	MODE
Low	Test Mode
High	APP Mode

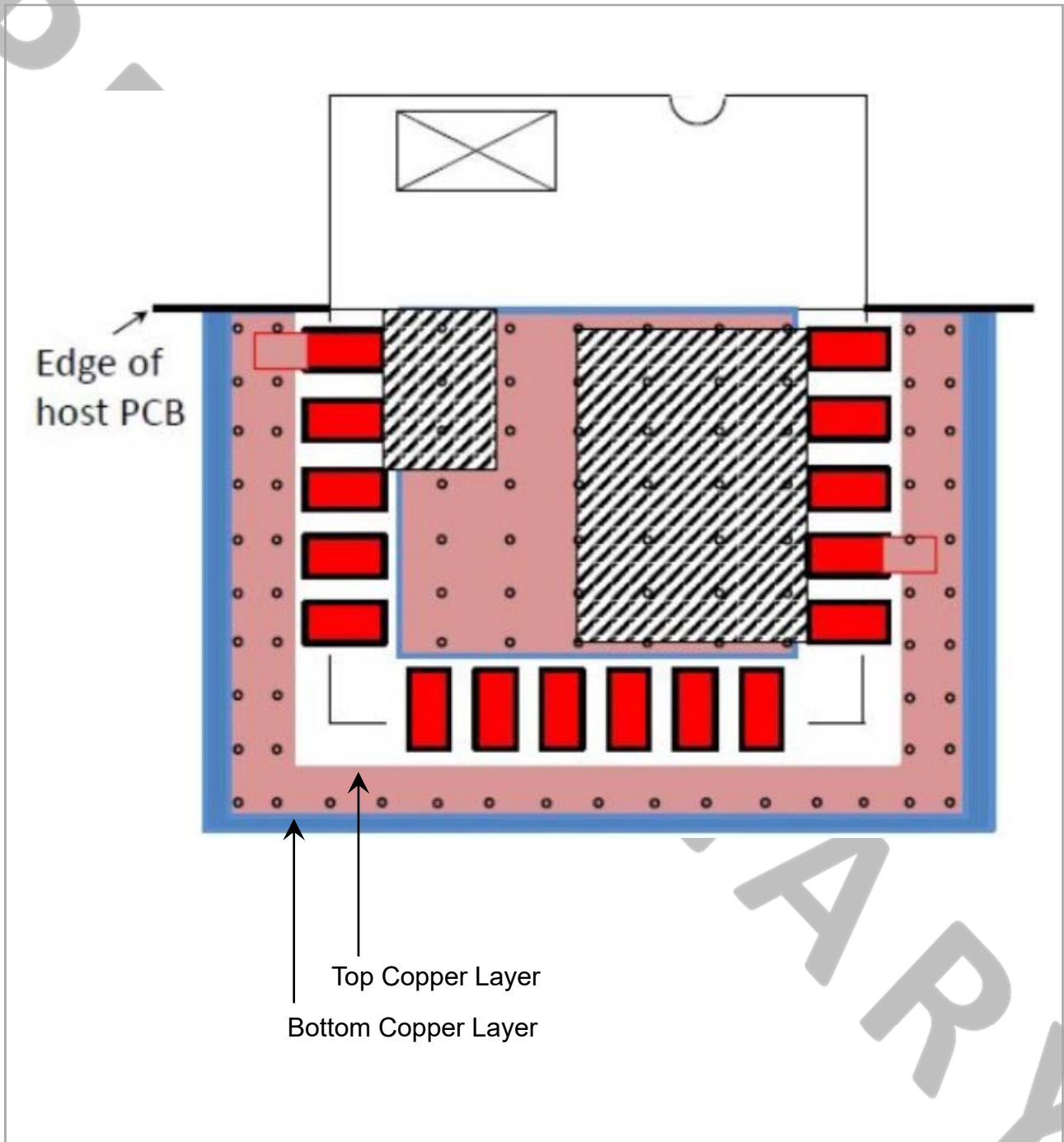
4.1 PHYSICAL DIMENSIONS



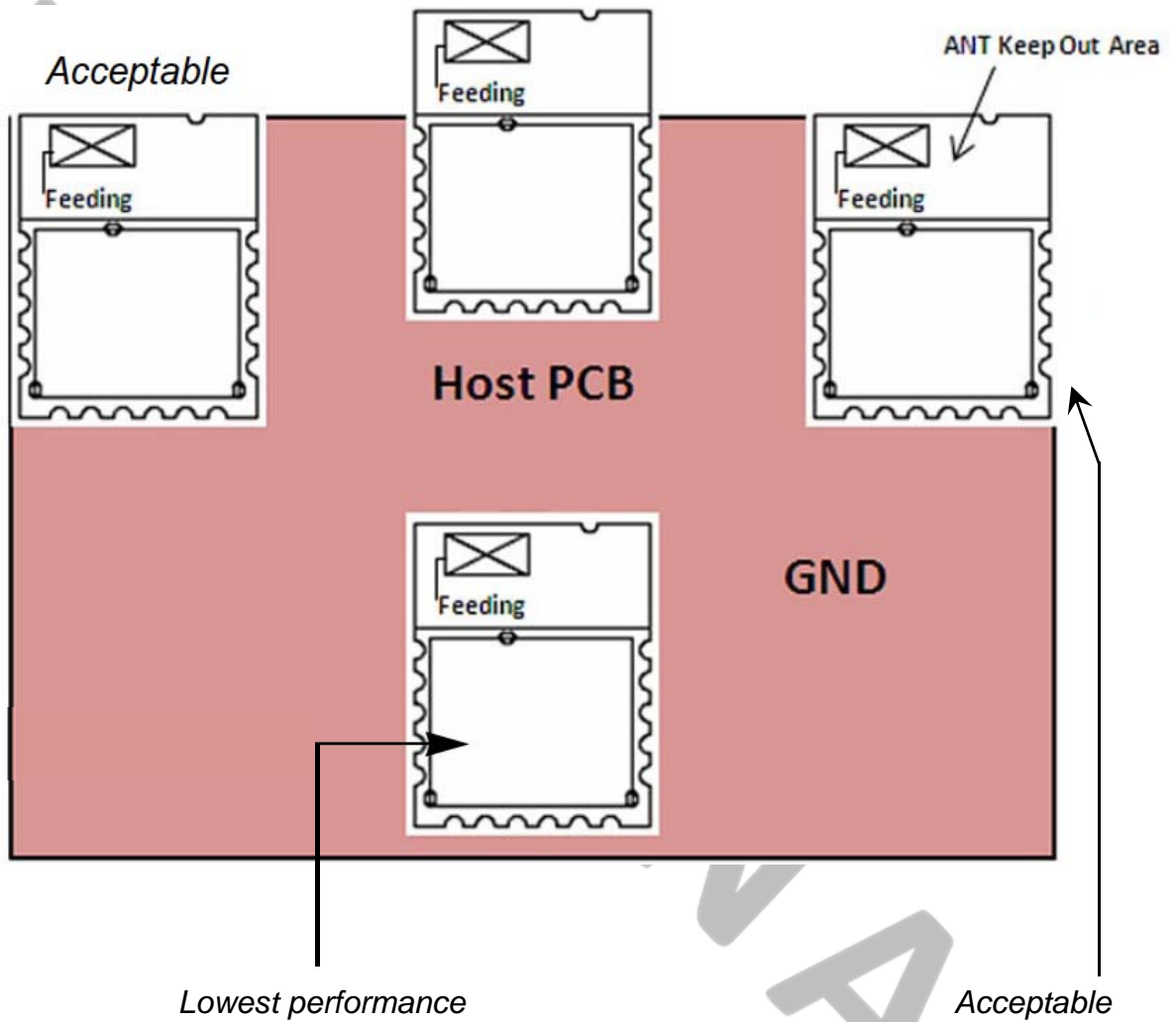
4.2 RECOMMENDED PCB FOOTPRINT



4.3 RECOMMENDED PCB MOUNTING SUGGESTION



4.4 RECOMMENDATIONS FOR THE PLACEMENT OF THE MODULE ON THE HOST PCB BOARD



4.5 Soldering Recommendations

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The RN4871-TR100 Bluetooth module is assembled using standard lead-free reflow profile IPC/JEDEC J-STD-020.

The module can be soldered to the host PCB using standard leaded and lead-free solder reflow profiles.

To avoid damaging the module, the following recommendations are given:

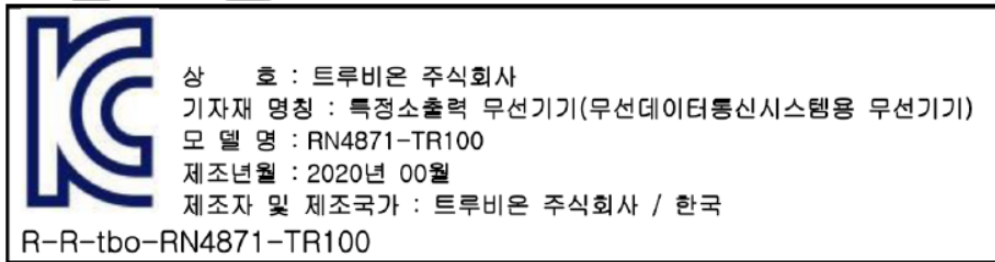
- Microchip Technology Application Note, “AN233 Solder Reflow Recommendation” (DS00233) provides solder reflow recommendations
- Do *not* exceed peak temperature (TP) of 250°C
- Refer to the solder paste data sheet for specific reflow profile recommendations
- Use no-clean flux solder paste
- Do *not* wash as moisture can be trapped under the shield
- Use only one flow. If the PCB requires multiple flows, apply the module on the final flow.

5.1 REGULATORY APPROVAL

The RN4871-TR100 Bluetooth module has received the regulatory approval for the following countries:

- **Korea/KCC** : R-R-tbo-RN4871-TR100

- Label on Packing



- **United States/FCC** ID : 2AYPF-RN4871-TR100

FCC IDENTIFIER:	2AYPF-RN4871-TR100
Name of Grantee:	Truebeyond Co., Ltd.
Equipment Class:	Digital Transmission System
Notes:	TACTOSY
Modular Type:	Single Modular

<u>FCC Rule Parts</u>	<u>Frequency Range (MHZ)</u>	<u>Output Watts</u>	<u>Frequency Tolerance</u>
15C	2402.0 - 2480.0	0.0004	

- **Europe/CE**

Mark\Brand: Truebeyond Co., Ltd.
Product Description: BLE Module
Station Model: RN4871-TR100

satisfies all the technical regulations applicable to the product within the scope of Council Directives 2014/35/EU, 2014/30/EU and 2014/53/EU:

	Harmonized Standards
Safety	EN 62368-1: 2018 EN 62368-1: 2020+A11:2020
EMC	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.2.2 (2019-12)
Radio	ETSI EN 300 328 V2.2.2(2019-07) EN 62479: 2010

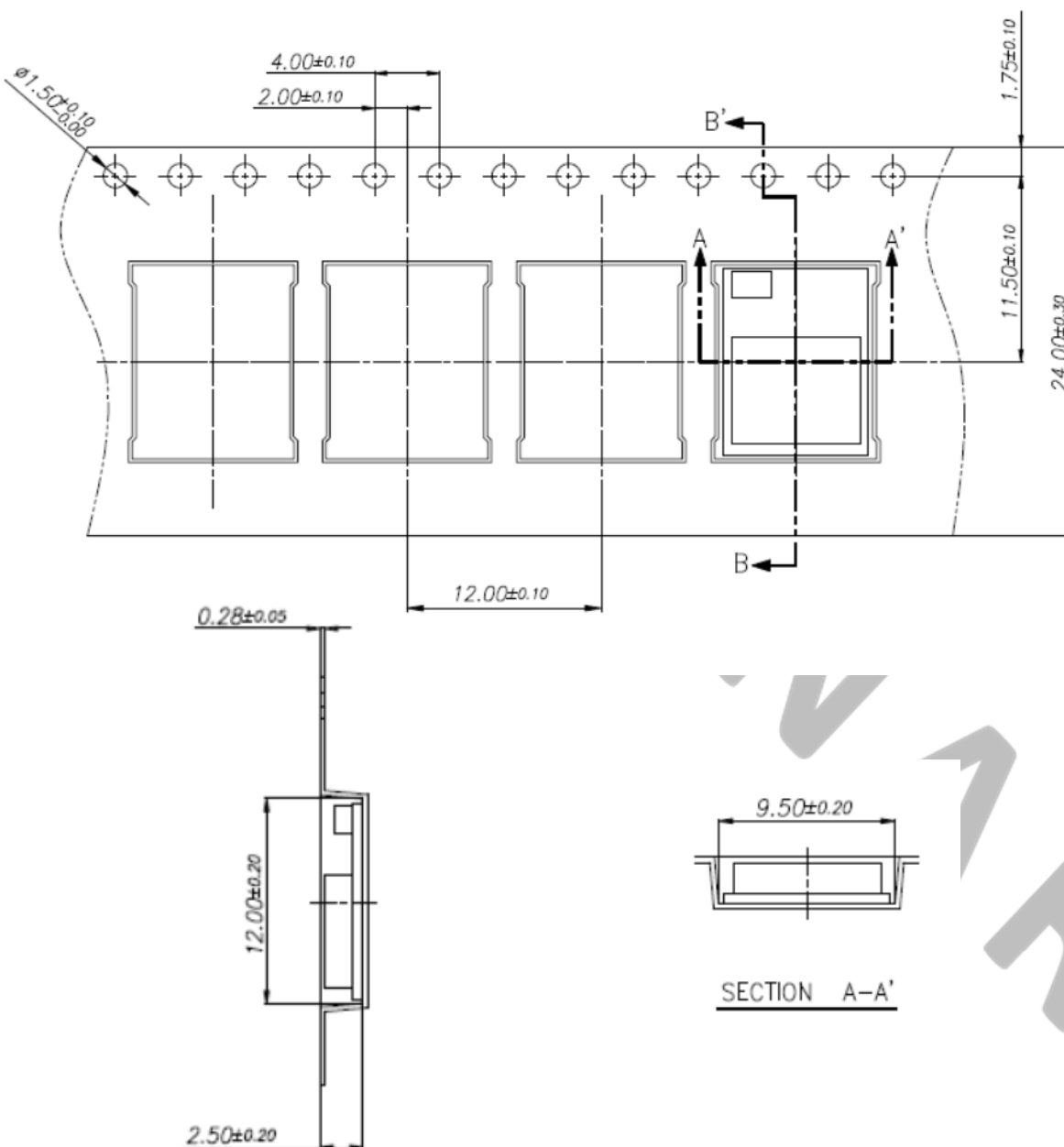
6.1 ASCII COMMAND API

[Refer to the “RN4870/71 Bluetooth® Low Energy Module User’s Guide” \(DS50002466\).](#)

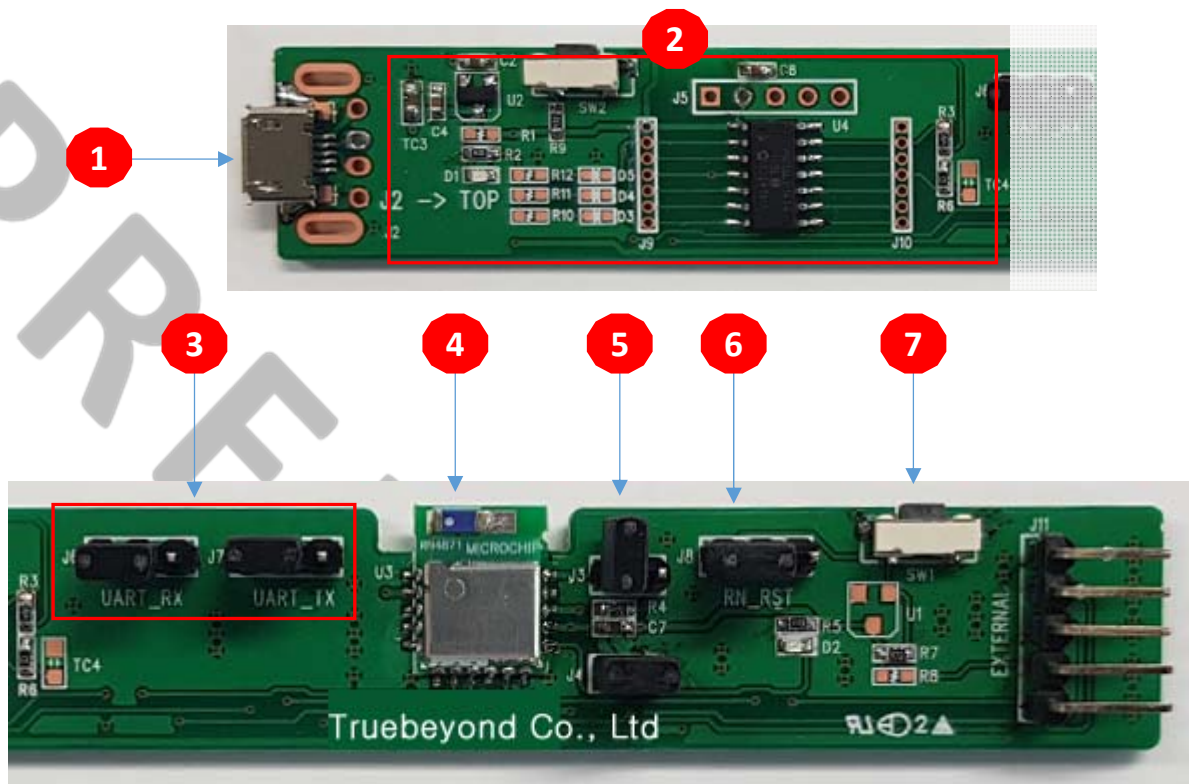
PRELIMINARY

7.1 PACKING DETAILS

Sheet	PET 0.28*50* ~
Bobbin & Box	330*80*24(BS/Black)
Packing Q'ty	2,000/Reel



EVK Interface Description



1. USB micro-b female connector
2. Interface to PIC16LF1454 USB/UART bridge
3. UART select jumper (J6, 7)
4. RN4871-TR100 module
5. Operating mode select (J3)
ON: Programming or Configuration mode
6. RESET select jumper (J8)
7. RESET Button (SW1)
8. Connection to external MCU (J11)
9. Status indicator LED (D2)
10. Power consumption check point (J4)

EVK Video Link _ How to use

<https://www.youtube.com/watch?v=4bPH9uBGJTs&t=10s>