



# SUNRISE Technology

## SPECIFICATION

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DATE : 2020.10.02

PRODUCT NAME : FB00000BT

	APPROVED	CHECKED	PREPARED	DCC ISSUE
NAME				

SUNRISE

FB00000BT

Bluetooth 4.1  
Module Spec Sheet

# Revision History

Date	Revision Content	Revised By	Version
2020/10/02	- Bluetooth specification	Eric	1.0

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# 1. Introduction

SUNRISE Technology would like to announce a low-cost and low-power consumption module which has Bluetooth functionalities. The highly integrated module makes the possibilities of Bluetooth headsets applications.

The wireless module complies with Bluetooth V4.0 of 1, 2 and 3 Mbps standard. The module provides host interface UART and PCM interface for data transfer.

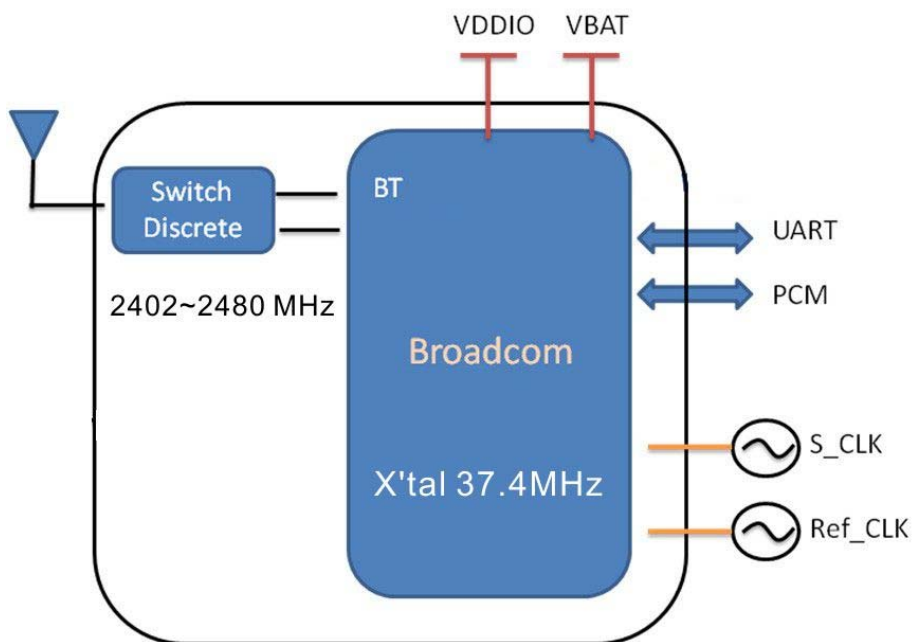
This compact module is a combination of Bluetooth V4.0+EDR with integrated Class 1 PA and Low Energy (BLE) support technologies. The module is specifically developed for Smart console and electronic devices which with IoT function.

*Notice: This module only provide Bluetooth function not support WiFi function.*

## 2. Features

- Bluetooth V4.0+EDR with integrated Class 1 PA and Low Energy (BLE) support
- BT host digital interface:
  - UART (up to 4 Mbps)
- ECI — enhanced coexistence support, ability to coordinate BT SCO transmissions around WLAN receives

A simplified block diagram of the module is depicted in the figure below.



## 3. Deliverables

### 3.1 Deliverables

The following products and software will be part of the product.

- Module with packaging
- Evaluation Kits
- Software utility for integration, performance test.
- Product Datasheet.
- Agency certified pre-tested report with the adapter board.

## 4. General Specification

### 4.1 General Specification

Model Name	FB00000BT
Product Description	Support Bluetooth functionalities
Dimension	L x W x H: 37.6(inc. pin) x 36.6 x 7.3 (typical) mm
BT Interface	UART / PCM
Operating temperature	-30°C to 85°C
Storage temperature	-40°C to 85°C
Humidity	Operating Humidity 10% to 95% Non-Condensing

### 4.2 Voltages

#### 4.2.1 Absolute Maximum Ratings

Symbol	Description	Min.	Max.	Unit
WIFI-VCC	Input supply Voltage	-0.5	6	V
VCC-IO-WIFI	Digital/Bluetooth/SDIO/ I/O Voltage	-0.5	3.9	V

#### 4.2.2 Recommended Operating Rating

The module requires two power supplies: VBAT and VDDIO.

	Min.	Typ.	Max.	Unit
Operating Temperature	-30	25	85	deg.C
WIFI-VCC	3.13	3.6	4.8	V
VCC-IO-WIFI	1.71	1.8	3.63	V



# 5. Bluetooth Specification

## 5.1 Bluetooth Specification

Conditions : VBAT=3.6V ; VDDIO=3.3V ; Temp:25°C

Feature	Description		
<b>General Specification</b>			
Bluetooth Standard	Bluetooth V4.0 of 1, 2 and 3 Mbps.		
Host Interface	UART		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2402 MHz ~ 2480 MHz		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK		
<b>RF Specification</b>			
	<b>Min.</b>	<b>Typical.</b>	<b>Max.</b>
Output Power (Class 1.5)		9 dBm	
Output Power (Class 2)		2 dBm	
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for $\pi/4$ -DQPSK (2Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-80 dBm	
Maximum Input Level	GFSK (1Mbps) :-20dBm		
	$\pi/4$ -DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

# 6. Pin Assignments

## 6.1 Pin Outline

< BOTTOM VIEW >



## 6.2 Pin Definition

NO	Name	Type	Description
1	NC	-	
2	BT-WAKE-AP	O	Bluetooth device to wake-up HOST
3	NC	-	
4	AP-WAKE-BT	I	HOST wake-up Bluetooth device
5	NC	-	
6	BT-UART-CTS	I	Bluetooth UART interface
7	NC	-	
8	BT-UART-RX	I	Bluetooth UART interface
9	NC	-	
10	BT-UART-TX	O	Bluetooth UART interface
11	NC	-	
12	BT-UART-RTS	O	Bluetooth UART interface
13	NC	-	

<b>14</b>	BT-RST	I	Power up/down internal regulators used by BT section
<b>15</b>	NC	-	
<b>16</b>	GND	-	Ground connections
<b>17</b>	DIN	I	PCM data input
<b>18</b>	CLK32K	I	External Low Power Clock input (32.768KHz)
<b>19</b>	CLK	I/O	PCM clock
<b>20</b>	GND	-	Ground connections
<b>21</b>	DOUT	O	PCM Data output
<b>22</b>	WL-VCC	P	Main power voltage source input
<b>23</b>	SYNC	I/O	PCM sync signal
<b>24</b>	IO-VCC	P	I/O Voltage supply input

## 7. External clock reference

External LPO signal characteristics

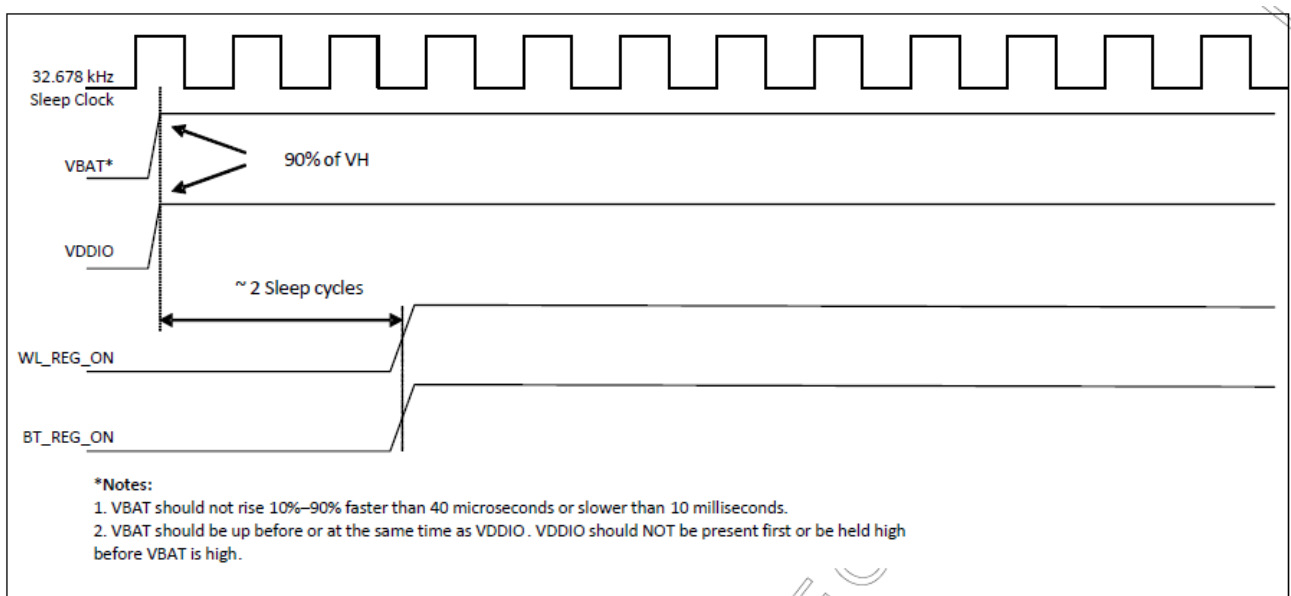
Parameter	Specification	Units
Nominal input frequency	32.768	kHz
Frequency accuracy	$\pm 30$	ppm
Duty cycle	30 - 70	%
Input signal amplitude	400 to 1800	mV, p-p
Signal type	Square-wave	-
Input impedance	>100k <5	$\Omega$ pF
Clock jitter (integrated over 300Hz – 15KHz)	<1	Hz
Output high voltage	0.7V <sub>io</sub> - V <sub>io</sub>	V

# 8. Host Interface Timing Diagram

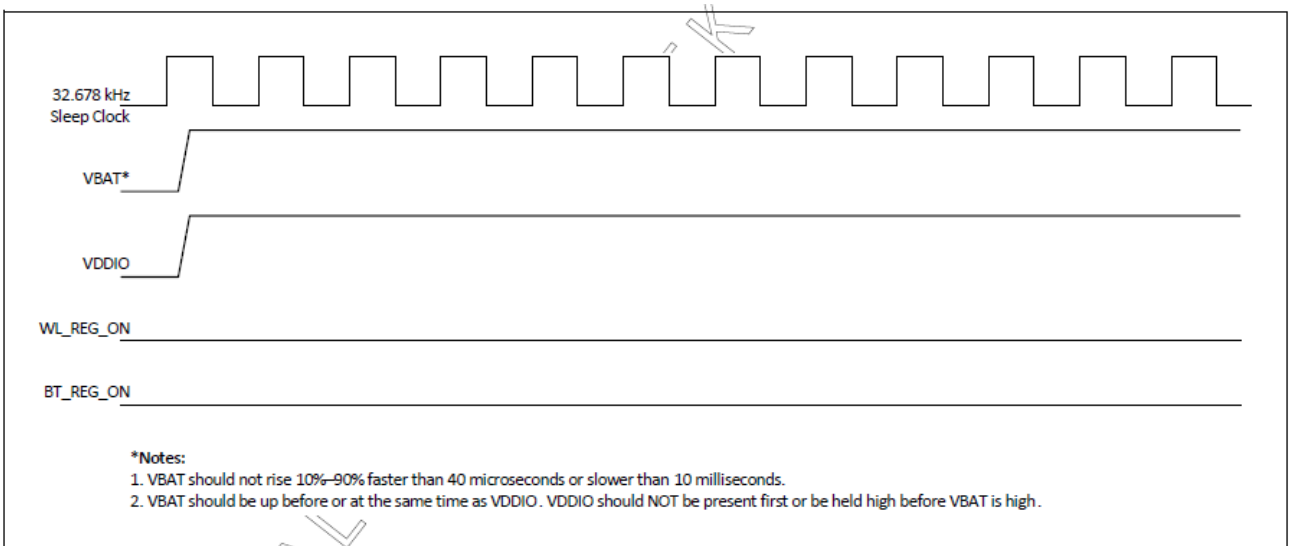
## 8.1 Power-up Sequence Timing Diagram

The module has signals that allow the host to control power consumption by enabling or disabling the Bluetooth and internal regulator blocks. These signals are described below. Additionally, diagrams are provided to indicate proper sequencing of the signals for various operating states. The timing value indicated are minimum required values: longer delays are also acceptable.

- ✧ BT\_REG\_ON: Used by the PMU to power up or power down the internal regulators used by the BT section. Low asserting reset for Bluetooth. This pin has no effect on WLAN and does not control any PMU functions. This pin must be driven high or low (not left floating).



Bluetooth=ON



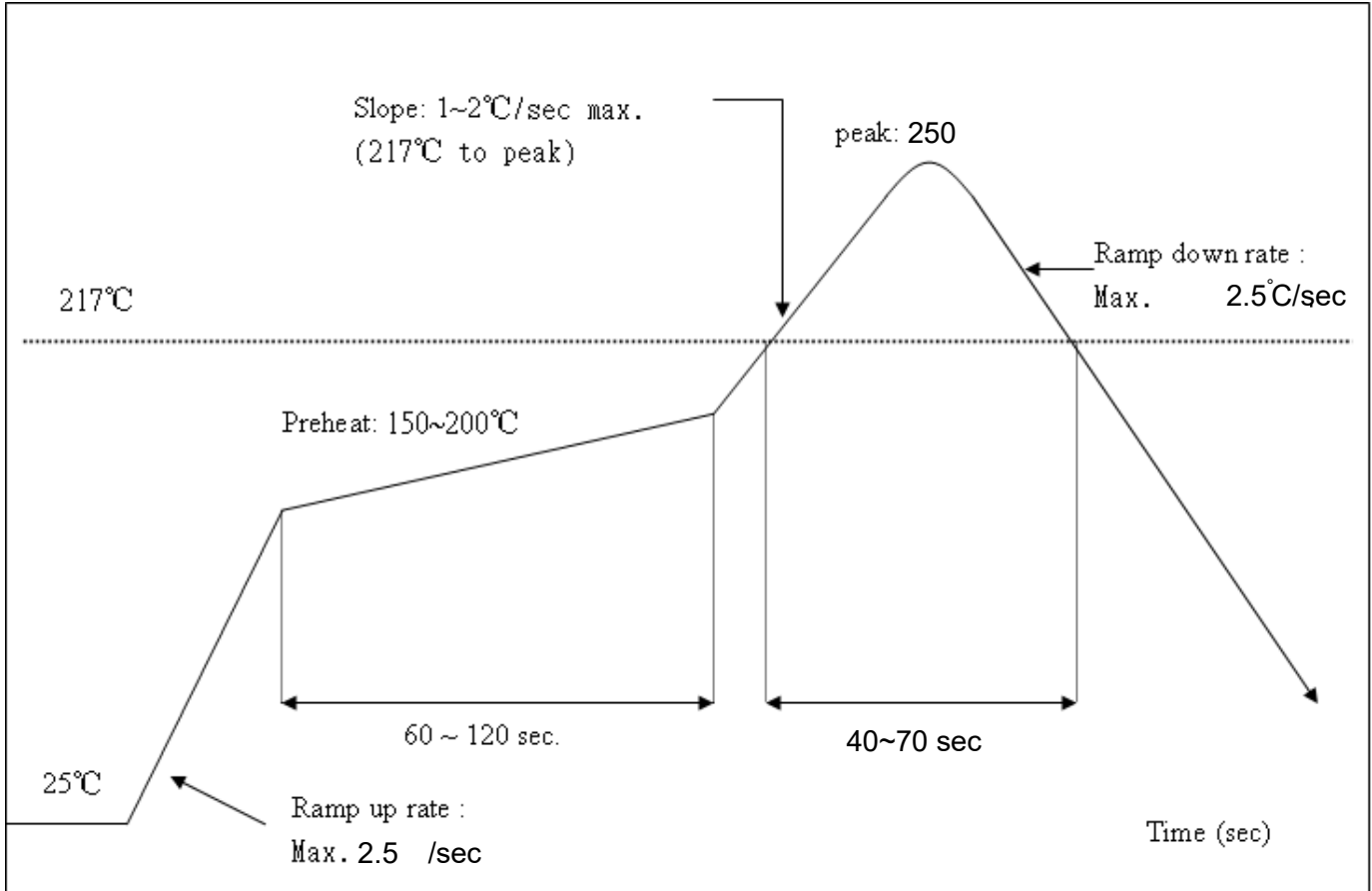
Bluetooth=OFF

# 9. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C Number of

Times : ≤2 times



## APPENDIX A: CERTIFICATION NOTICES

The final end product must be labeled in a visible area with the following: “Contains FCC ID: 2AMPPFB00000BT and IC: 11471A-FB00000BT”

**Notice: The FCC ID and IC ID are only for the FB00000BT Bluetooth module used.**

This module has been granted modular approval for mobile applications. OEM integrators for host products may use the module in their final products without additional FCC / IC (Industry Canada) certification if they meet the following conditions. Otherwise, additional FCC / IC approvals must be obtained.

- The host product with the module installed must be evaluated for simultaneous transmission requirements.
- The users manual for the host product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC / IC RF exposure guidelines.
- To comply with FCC / IC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed 2dBi.

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user’s authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference, and
- 2) this device must accept any interference received, including interference that may cause undesired operation of the device.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body and this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Canada, Industry Canada (IC) Notices

"This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

Canada, avis d'Industry Canada (IC)

"Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

Exposure of humans to RF fields (RSS-102)

The computers employ low gain integral antennas that do not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's Web site at <http://www.hc-sc.gc.ca/>

The radiated energy from the antennas connected to the wireless adapters conforms to the IC limit of the RF exposure requirement regarding IC RSS-102, Issue 4 clause 4.1.

Conformité des appareils de radiocommunication aux limites d'exposition humaine aux radiofréquences (CNR-102)

L'ordinateur utilise des antennes intégrales à faible gain qui n'émettent pas un champ électromagnétique supérieur aux normes imposées par Santé Canada pour la population. Consultez le Code de sécurité 6 sur le site Internet de Santé Canada à l'adresse suivante : <http://www.hc-sc.gc.ca/>

L'énergie émise par les antennes reliées aux cartes sans fil respecte la limite d'exposition aux radiofréquences telle que définie par Industrie Canada dans la clause 4.1 du document CNR-102, version 4.



## APPENDIX B: LABEL FOR FINISHED PRODUCT

Contains Transmitter Module FCC ID: 2AMPPFB00000BT and IC ID: 11471A-FB00000BT

or

Contains FCC ID: 2AMPPFB00000BT and IC ID: 11471A-FB00000BT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference, and
- 2) this device must accept any interference received, including interference that may cause the device.undesired operation of