正基科技股份有限公司

SPECIFICATION

SPEC. NO.： _____ REV： 1.2

DATE： 1. 2. 2013

PRODUCT NAME： AP6210B

	APPROVED	CHECKED	PREPARED	DCC ISSUE
NAME				

AMPAK

AP6210B

BlueTooth 4.0 /BLE
Module Spec Sheet

Revision History

Date	Revision Content	Revised By	Version
2013/11/06	- Preliminary	Brian	1.0
2013/12/12	- Pin Out Definition Modification	Brian	1.1
2014/1/2	- Pin Out Definition/Block Diagram Modification	Brian	1.2

Contents

1. Introduction

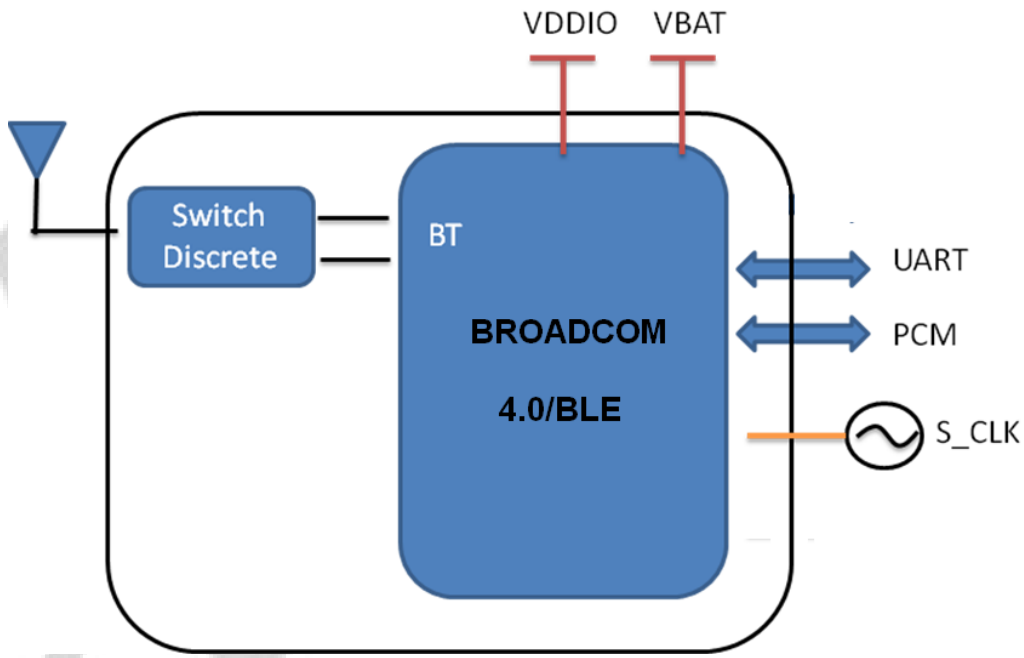
AMPAK Technology would like to announce a low-cost and low-power consumption module which has all of the Bluetooth functionalities. The highly integrated tiny module makes the possibilities of Bluetooth headsets and portable navigation applications.

This compact module is a total solution for Bluetooth technologies. The module is specifically developed for Tablet, Smart phones and Portable devices. The integrated module provides UART for Bluetooth data line and PCM interface for Audio codec communication.

2. Features

- Bluetooth V4.0 + V2.1EDR with integrated Class 1.5 PA Concurrent Bluetooth operation
- Support PCM interface for audio codec communication.
- BT host digital interface:
  - UART (up to 4 Mbps)

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.

3.2 Regulatory certifications

The product delivery is a pre-tested module, without the module level certification. For module approval, the platform's antennas are required for the certification.

4. General Specification

4.1 General Specification

Model Name	AP6210B
Product Description	Support Bluetooth4.0/BLE functionalities
Dimension	L x W x H: 12.0 x 12.0 x 1.5 (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
VBAT	Input supply Voltage	-0.5	5.5	V
VDDIO	Digital/Bluetooth/SDIO/SPI I/O Voltage	-0.5	3.6	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
VBAT	3.0	3.6	4.8	V
VDDIO	1.71	3.3	3.6	V

5. Bluetooth Specification

5.1 Bluetooth Specification

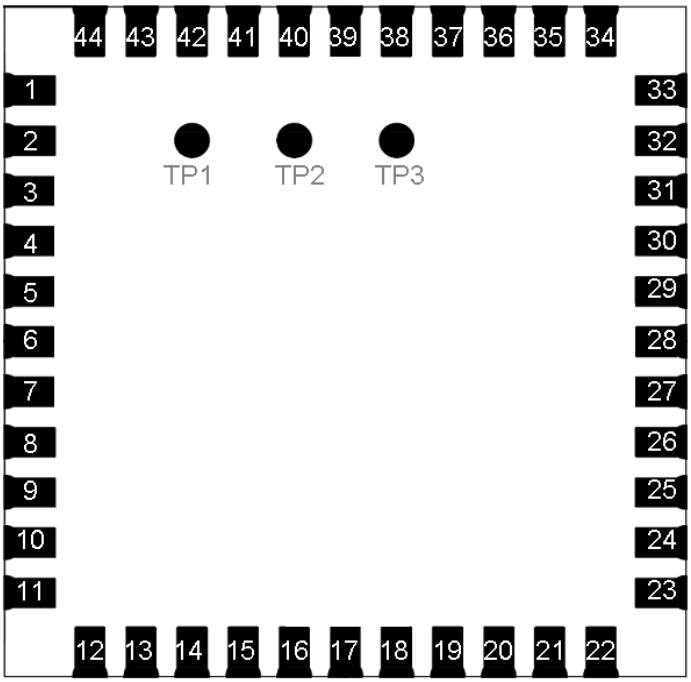
Conditions : VBAT=3.6V ; VDDIO=3.3V ; Temp:25°C

Feature	**Description**		
General Specification			
Bluetooth Standard	Bluetooth V4.0 of 1, 2 and 3 Mbps.		
Host Interface	UART / PCM		
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		
RF Specification			
	Min.	**Typical.**	**Max.**
Output Power (Class 1.5)		9dBm	
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-80 dBm	
Maximum Input Level	GFSK (1Mbps):-20dBm		
	π/4-DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

6. Pin Assignments

6.1 Pin Outline

< TOP VIEW >



6.2 Pin Definition

NO	Name	Type	Description
1	GND	—	Ground connections
2	BT_ANT	I/O	RF I/O port
3	GND	—	Ground connections
4	NC	—	Floating (Don't connected to ground)
5	NC	—	Floating (Don't connected to ground)
6	BT_WAKE	I	HOST wake-up Bluetooth device
7	BT_HOST_WAKE	O	Bluetooth device to wake-up HOST
8	NC	—	Floating (Don't connected to ground)
9	VBAT	P	Main power voltage source input
10	NC	—	Floating (Don't connected to ground)
11	NC	—	Floating (Don't connected to ground)
12	NC	—	Floating (Don't connected to ground)
13	NC	—	Floating (Don't connected to ground)
14	NC	—	Floating (Don't connected to ground)

15	NC	—	Floating (Don't connected to ground)
16	NC	—	Floating (Don't connected to ground)
17	NC	—	Floating (Don't connected to ground)
18	NC	—	Floating (Don't connected to ground)
19	NC	—	Floating (Don't connected to ground)
20	GND	—	Ground connections
21	NC	—	Floating (Don't connected to ground)
22	VDDIO	P	I/O Voltage supply input
23	NC	—	Floating (Don't connected to ground)
24	LPO	I	External Low Power Clock input (32.768KHz)
25	PCM_OUT	O	PCM Data output
26	PCM_CLK	I/O	PCM Clock
27	PCM_IN	I	PCM data input
28	PCM_SYNC	I/O	PCM sync signal
29	NC	—	Floating (Don't connected to ground)
30	NC	—	Floating (Don't connected to ground)
31	GND	—	Ground connections
32	NC	—	Floating (Don't connected to ground)
33	GND	—	Ground connections
34	BT_RST_N	I	Low asserting reset for Bluetooth core
35	NC	—	Floating (Don't connected to ground)
36	GND	—	Ground connections
37	NC	—	Floating (Don't connected to ground)
38	NC	—	Floating (Don't connected to ground)
39	NC	—	Floating (Don't connected to ground)
40	NC	—	Floating (Don't connected to ground)
41	UART_RTS_N	O	Bluetooth UART interface
42	UART_TXD	O	Bluetooth UART interface
43	UART_RXD	I	Bluetooth UART interface
44	UART_CTS_N	I	Bluetooth UART interface
45	TP1 (NC)	—	Floating (Don't connected to ground)
46	TP2 (NC)	—	Floating (Don't connected to ground)
47	TP3 (NC)	—	Floating (Don't connected to ground)

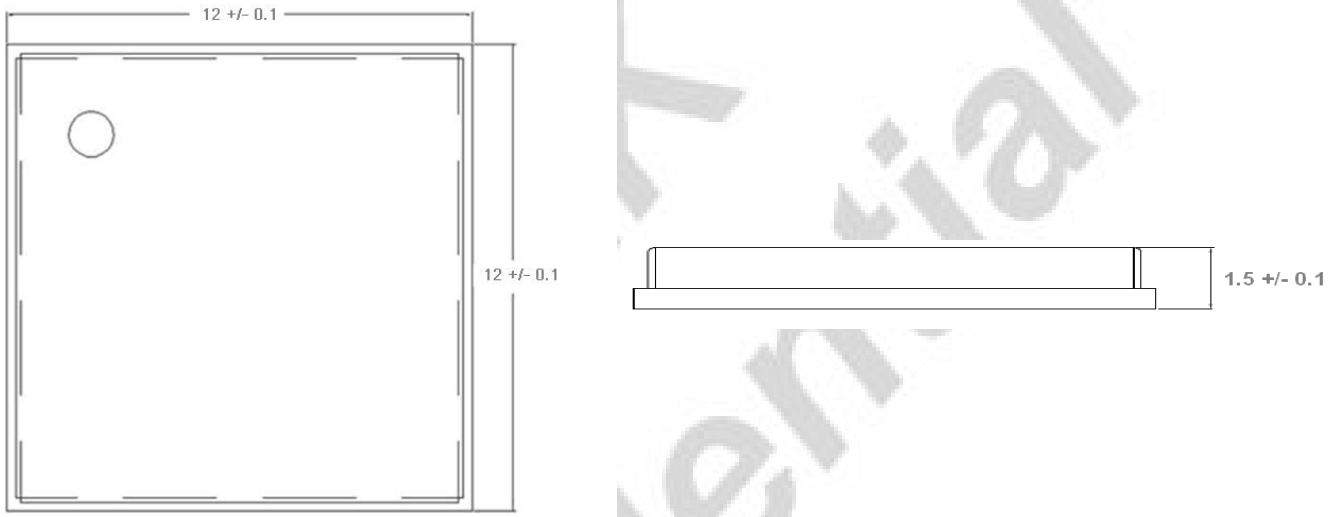
7. Dimensions

7.1 Physical Dimensions

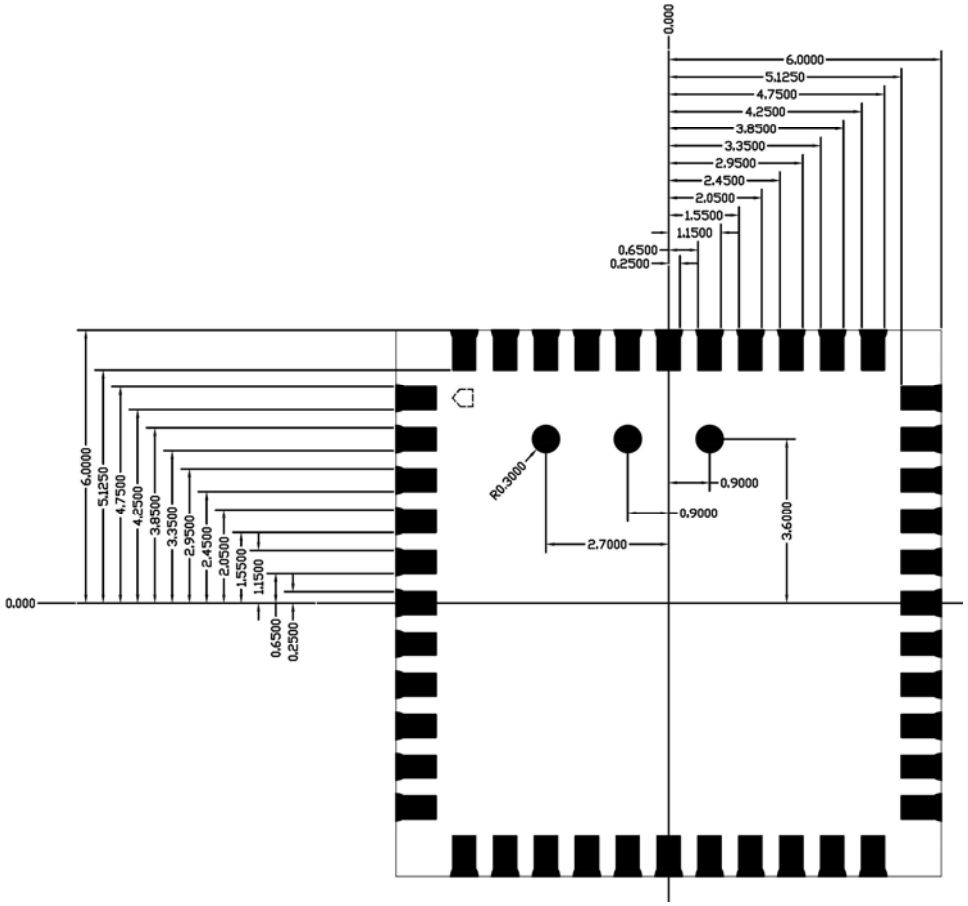
(Unit: mm)

< TOP VIEW >

< Side View >



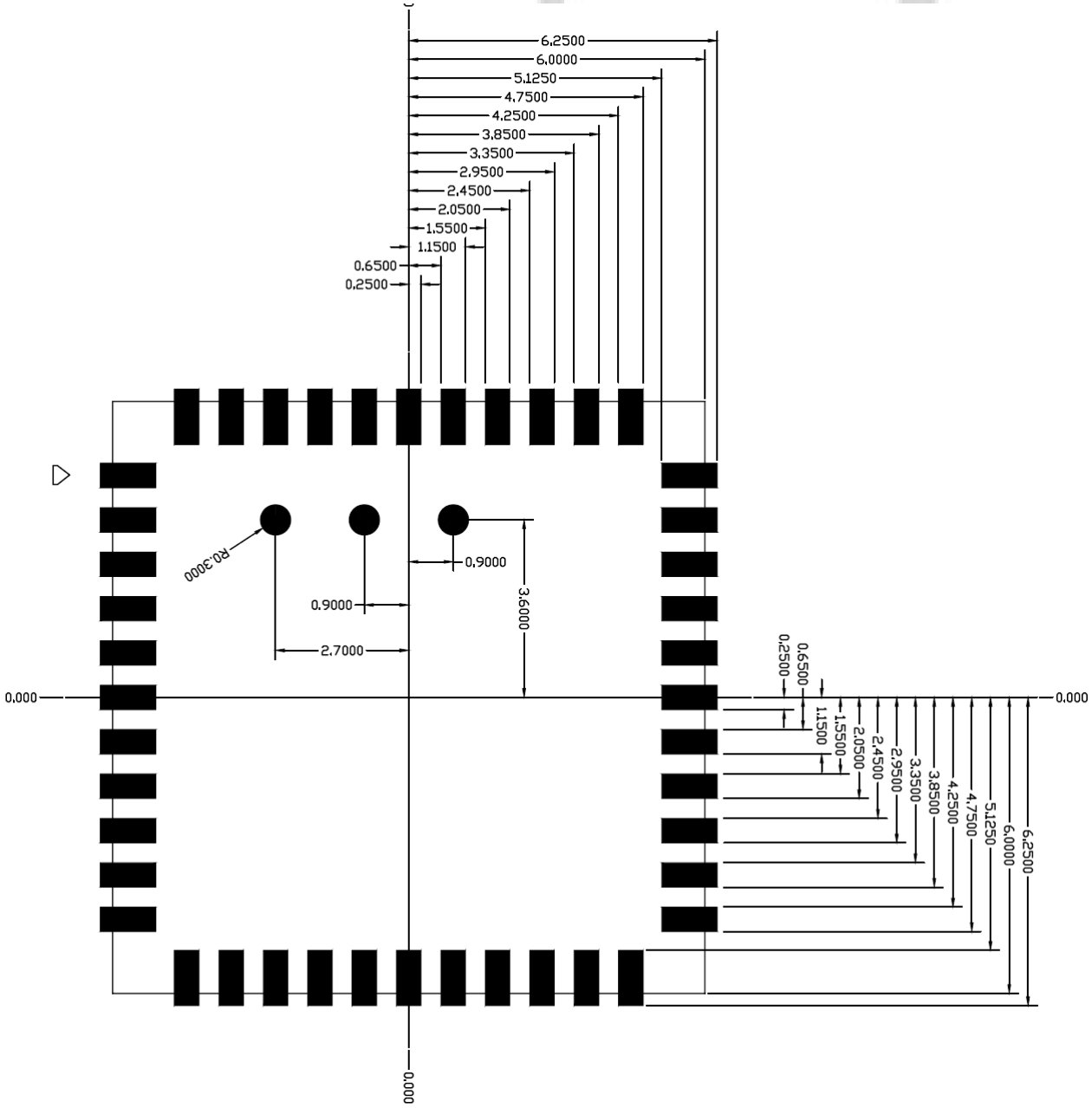
< TOP VIEW >



7.2 Layout Recommendation

(Unit: mm)

< TOP VIEW >



8. External clock reference

External LPO signal characteristics

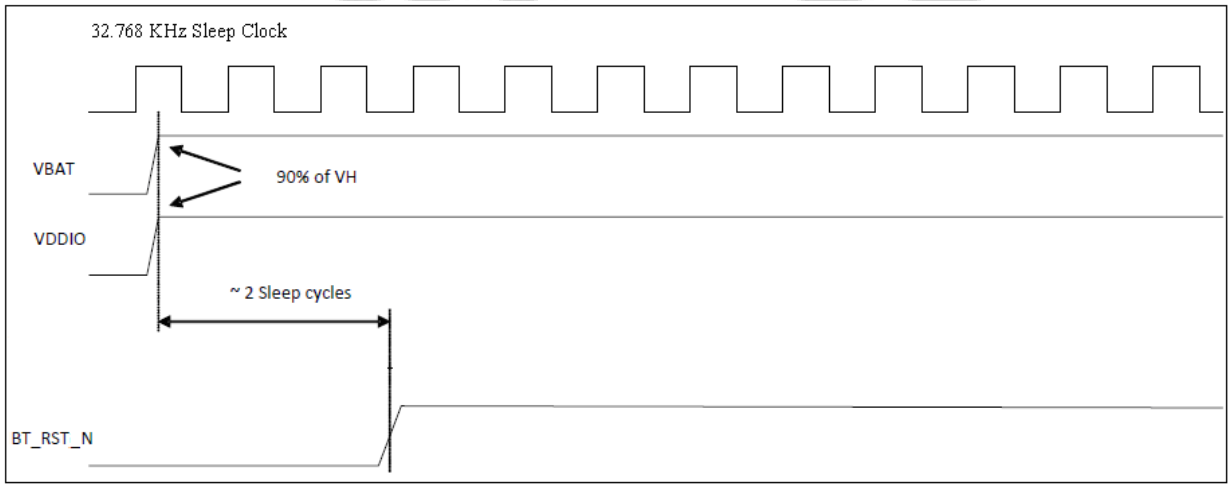
Parameter	Specification	Units
Nominal input frequency	32.768	kHz
Frequency accuracy	±30	ppm
Duty cycle	30 - 70	%
Input signal amplitude	1600 to 3300	mV, p-p
Signal type	Square-wave or sine-wave	-
Input impedance	>100k <5	Ω pF
Clock jitter (integrated over 300Hz – 15KHz)	<1	Hz
Output high voltage	0.7Vio - Vio	V

9. Host Interface Timing Diagram

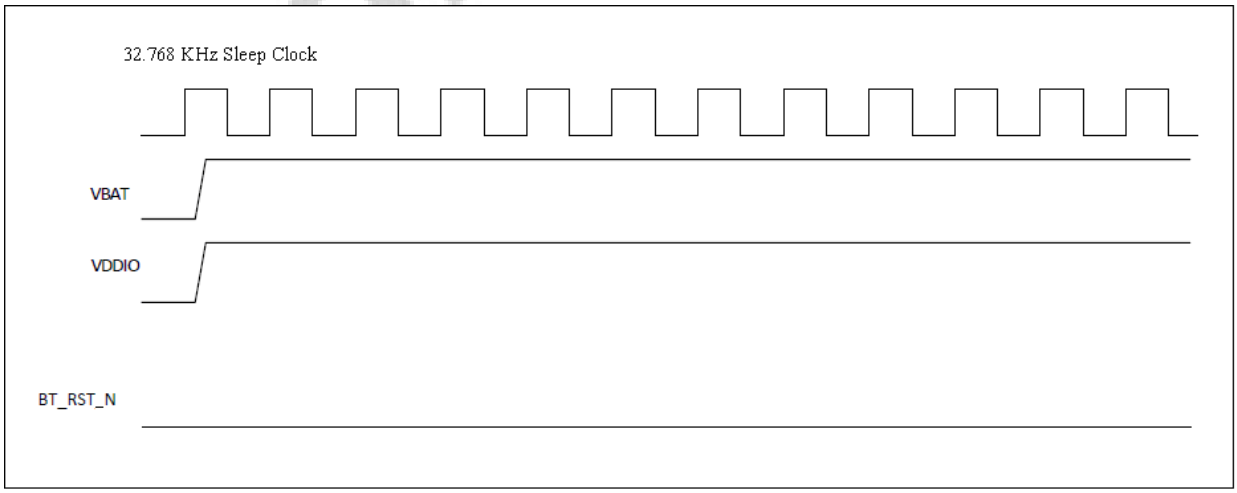
9.1 Power-up Sequence Timing Diagram

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

※ BT_RST_N: Used by the PMU to power up the internal Bluetooth regulators. If the BT_RST_N pins are low, the regulators are disabled.



Bluetooth =ON



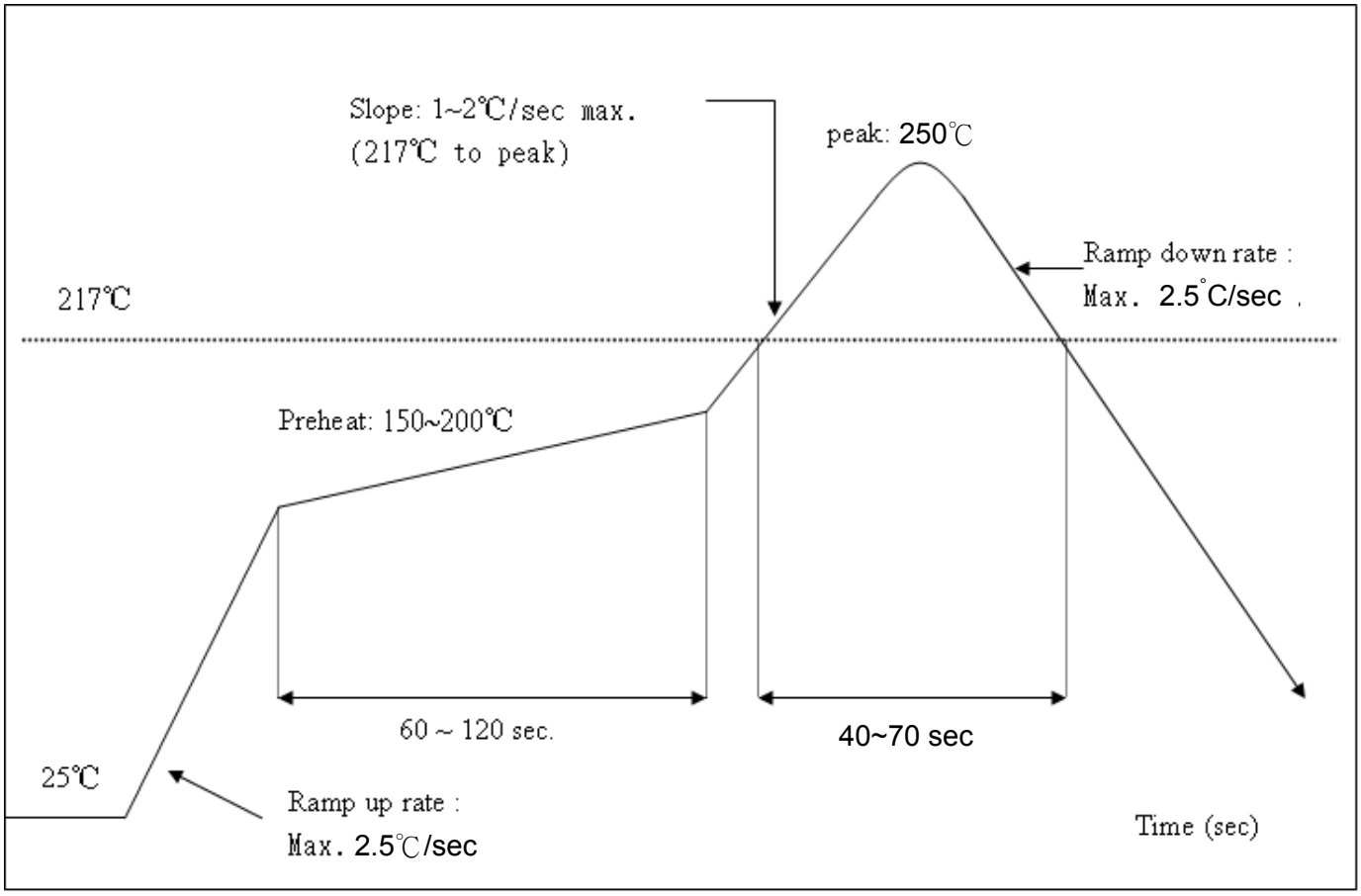
Bluetooth =OFF

10. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : ≤2 times

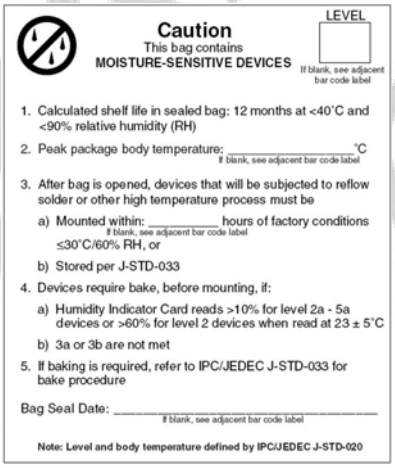


11. Package Information

11.1Label

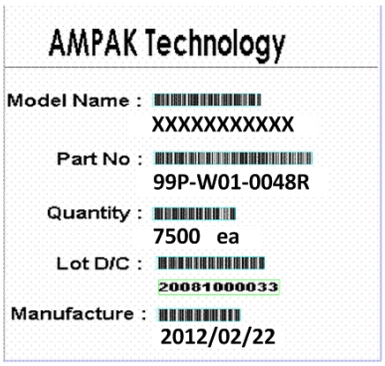
Label A→ Anti-static and humidity notice

Label B→ MSL caution / Storage Condition

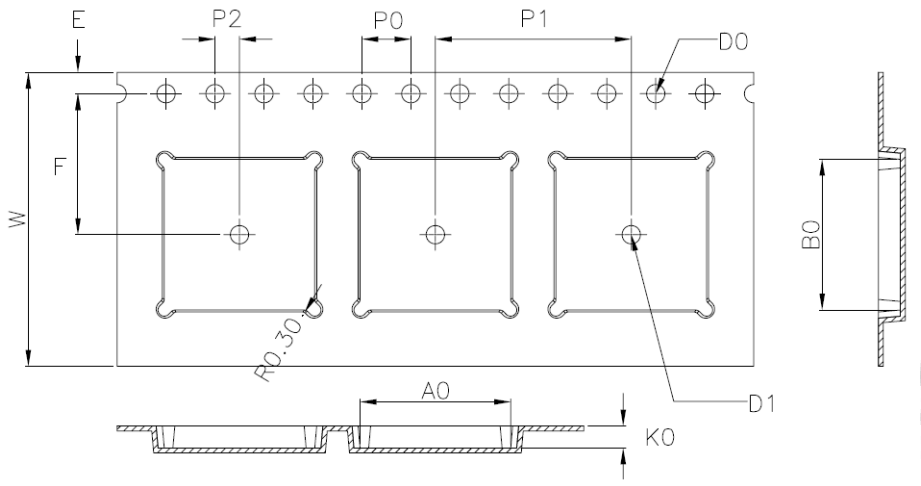


Label C→ Inner box label .

Label D→ Carton box label .

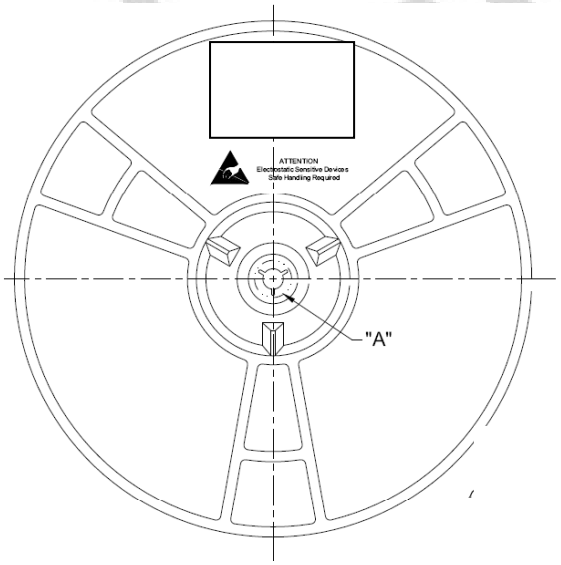


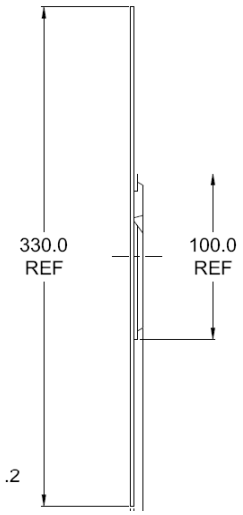
11.2 Dimension

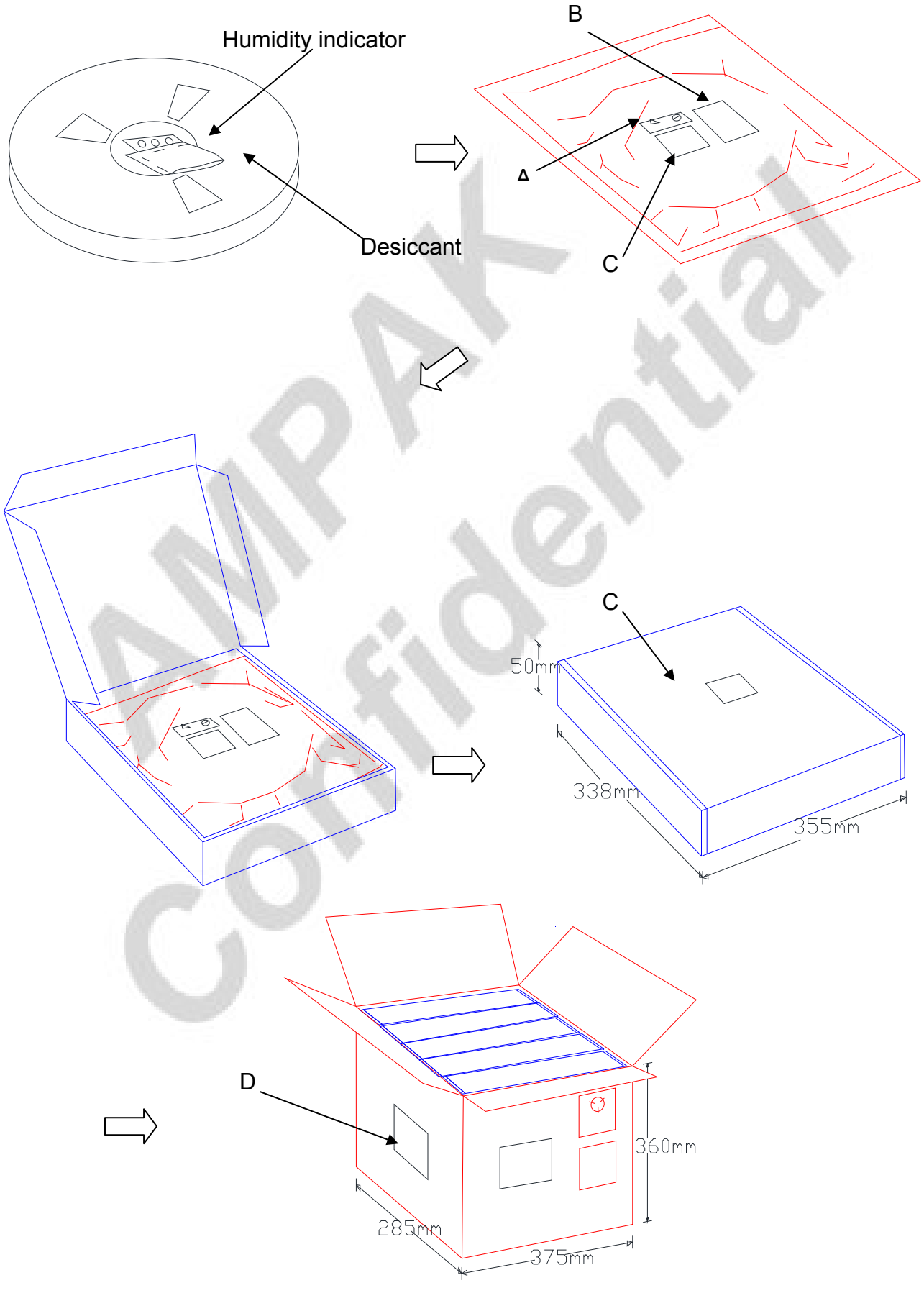


W	24.00±0.30
A0	12.30±0.10
B0	12.30±0.10
K0	1.80±0.10
E	1.75±0.10
F	11.50±0.10
P0	4.00±0.10
P1	16.00±0.10
P2	2.00±0.10
D0	1.50 $^{+0.10}_{-0.00}$
D1	ø1.50MIN

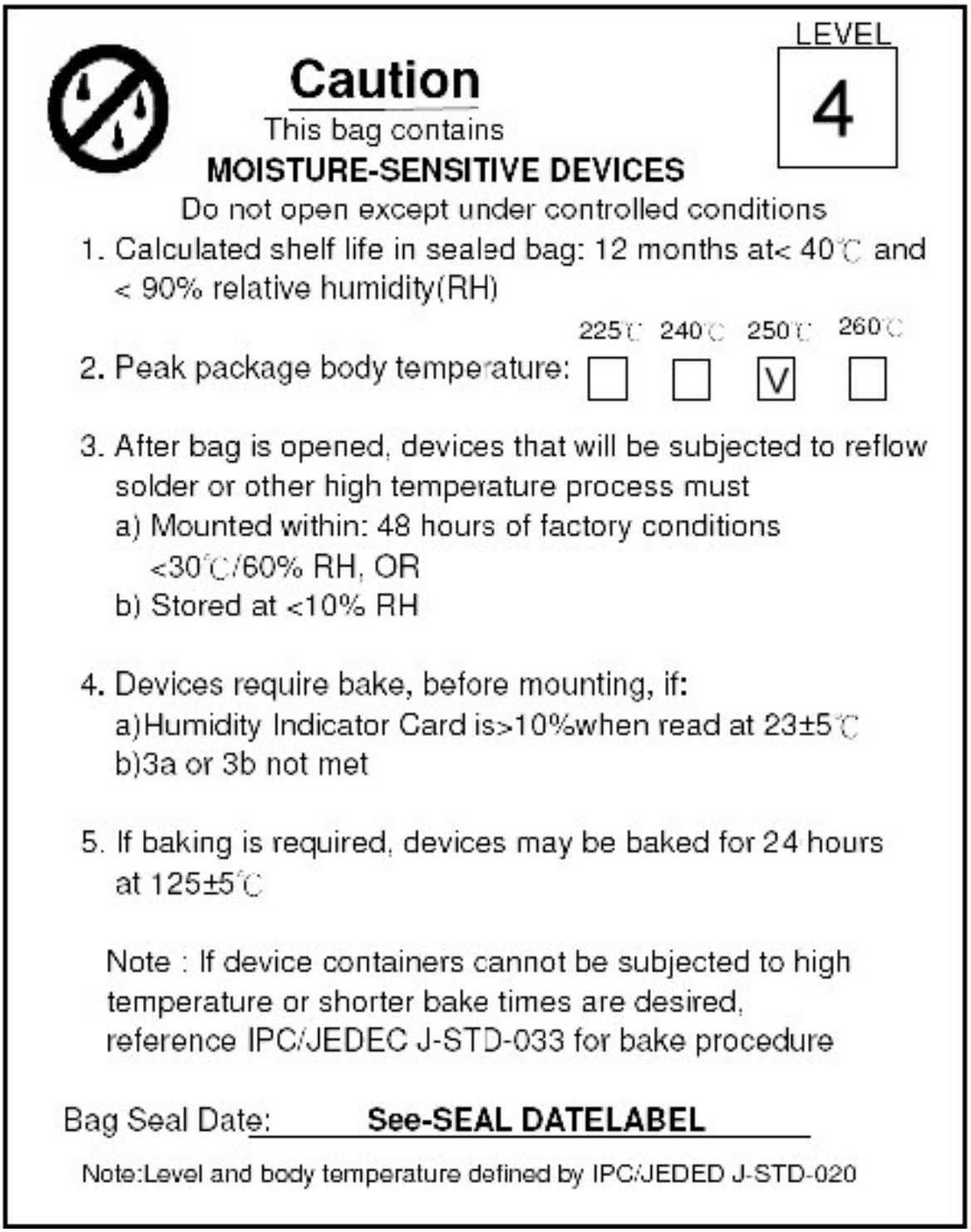
1. 10 sprocket hole pitch cumulative tolerance ±0.20.
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness : 0.30±0.05mm.
6. Packing length per 22" reel : 98.5 Meters.(1:3)
7. Component load per 13" reel : 1500 pcs.







11.3 MSL Level / Storage Condition



LEVEL 4

Caution

This bag contains

MOISTURE-SENSITIVE DEVICES

Do not open except under controlled conditions

1. Calculated shelf life in sealed bag: 12 months at< 40℃ and < 90% relative humidity(RH)
2. Peak package body temperature: 225℃ ☐ 240℃ ☐ 250℃ ☑ 260℃ ☐
3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must
   a) Mounted within: 48 hours of factory conditions <30℃/60% RH, OR
   b) Stored at <10% RH
4. Devices require bake, before mounting, if:
   a) Humidity Indicator Card is>10%when read at 23±5℃
   b) 3a or 3b not met
5. If baking is required, devices may be baked for 24 hours at 125±5℃

Note : If device containers cannot be subjected to high temperature or shorter bake times are desired, reference IPC/JEDEC J-STD-033 for bake procedure

Bag Seal Date: **See-SEAL DATELABEL**

Note:Level and body temperature defined by IPC/JEDED J-STD-020

※NOTE : Accumulated baking time should not exceed 96hrs