

Technical Description:

The Equipment Under Test (EUT) is a tablet, equipped with HDMI, WiFi, Bluetooth 3.0/4.0 (BLE), SD and USB Interface. The EUT operates in frequency range 2412MHz to 2462MHz at 802.11b,g,n HT20 (11 channels with 5MHz spacing) and also operates in the frequency range 2402MHz to 2480MHz at Bluetooth 3.0 (79 channels with 1MHz spacing) while 2402MHz to 2480MHz at Bluetooth 4.0 BLE (40 channels with 2MHz spacing). The EUT is powered by an external AC/DC adaptor (5VDC output) or/and 3.7VDC(1x3.7V 3000mAh rechargeable battery). The adaptor accepts 100-120VAC only.

WiFi and Bluetooth portions are in the same module that share a single antenna. The type of antenna in the EUT is internal, integral.

1. WiFi & Bluetooth RF module AP6210 (UW4)

AP6210 is a WLAN USB module which fully supports the features and functional compliance of IEEE 802.11b/g/n(HT20) and Bluetooth 3.0 and Bluetooth 4.0 BLE standards. This module operates in 2.4GHz frequency bands. AP6210 consists of:

- 1) U5 (BCM43362) is a single-chip IEEE802.11b/g/n(HT20) 1T1R WLAN controller. F1 is 2.4GHz bandpass filter and U4 is RF switch.
- 2) U6 (BCM20710) is a single-chip Bluetooth 3.0/4.0 BLE + EDR compliant processor.
- 3) YW6 is 26MHz crystal providing clock for U5 and U6. UW9 is clock buffer.

2. Main Processor Portion

- 1) U1 (ATM7029B) is quad core ARM Cortex-A9 main processor.
- 2) YZ4 is 24MHz crystal oscillator for U1.
- 3) YZ2 is 32.768kHz crystal for Real Time Clock in PMIC (UP1).

3. Memory Portion

- 1) UN1, UN2 (K4B4G1646Q) are 1GB DDR3 memories.
- 2) UF1 (TC58TEG6DCJTA00) is 8GB NAND flash memory.

4. Audio and Power Management Portion

- 1) UP1 (ATC2603A) Power Management Processor and Audio Codec.

5. USB Portion

- 1) UU1 (TCS3348) is USB OTG Power.
- 2) UU4 (TCS9708) is USB Current Switch.

6. Touch Panel

- 1) UT2 (GSL1680) is touch panel controller IC.

The AP6210 module was tested in according with the following power output and in actual application the below limit shall not be exceeded.

WiFi and Bluetooth transmission

Operating mode	Nominal Radiated Field Strength	Production Tolerance	Modulation Type
802.11b	101.6dBμV/m at 3m	+/- 3dB	DSSS
802.11g	101.4dBμV/m at 3m	+/- 3dB	OFDM
802.11n (HT20)	100.8dBμV/m at 3m	+/- 3dB	MCS7
Bluetooth 4.0 BLE	101.2dBμV/m at 3m	+/- 3dB	GFSK
Bluetooth 3.0	90.4dBμV/m at 3m	+/- 3dB	GFSK

Antenna Type: Internal, Integral

Antenna Gain: 0dBi

AP6210 Module Bluetooth 3.0 Channel Table

CH. NO.	FRE.	Hex Value		CH. NO.	FRE.	Hex Value		CH. NO.	FRE.	Hex Value		CH. NO.	FRE.	Hex Value
CH0	2402MHz	0		CH26	2428MHz	1A		CH52	2454MHz	34		CH78	2480MHz	4E
CH1	2403MHz	1		CH27	2429MHz	1B		CH53	2455MHz	35				
CH2	2404MHz	2		CH28	2430MHz	1C		CH54	2456MHz	36				
CH3	2405MHz	3		CH29	2431MHz	1D		CH55	2457MHz	37				
CH4	2406MHz	4		CH30	2432MHz	1E		CH56	2458MHz	38				
CH5	2407MHz	5		CH31	2433MHz	1F		CH57	2459MHz	39				
CH6	2408MHz	6		CH32	2434MHz	20		CH58	2460MHz	3A				
CH7	2409MHz	7		CH33	2435MHz	21		CH59	2461MHz	3B				
CH8	2410MHz	8		CH34	2436MHz	22		CH60	2462MHz	3C				
CH9	2411MHz	9		CH35	2437MHz	23		CH61	2463MHz	3D				
CH10	2412MHz	A		CH36	2438MHz	24		CH62	2464MHz	3E				
CH11	2413MHz	B		CH37	2439MHz	25		CH63	2465MHz	3F				
CH12	2414MHz	C		CH38	2440MHz	26		CH64	2466MHz	40				
CH13	2415MHz	D		CH39	2441MHz	27		CH65	2467MHz	41				
CH14	2416MHz	E		CH40	2442MHz	28		CH66	2468MHz	42				
CH15	2417MHz	F		CH41	2443MHz	29		CH67	2469MHz	43				
CH16	2418MHz	10		CH42	2444MHz	2A		CH68	2470MHz	44				
CH17	2419MHz	11		CH43	2445MHz	2B		CH69	2471MHz	45				
CH18	2420MHz	12		CH44	2446MHz	2C		CH70	2472MHz	46				
CH19	2421MHz	13		CH45	2447MHz	2D		CH71	2473MHz	47				
CH20	2422MHz	14		CH46	2448MHz	2E		CH72	2474MHz	48				
CH21	2423MHz	15		CH47	2449MHz	2F		CH73	2475MHz	49				
CH22	2424MHz	16		CH48	2450MHz	30		CH74	2476MHz	4A				
CH23	2425MHz	17		CH49	2451MHz	31		CH75	2477MHz	4B				
CH24	2426MHz	18		CH50	2452MHz	32		CH76	2478MHz	4C				
CH25	2427MHz	19		CH51	2453MHz	33		CH77	2479MHz	4D				

AP6210 Module Bluetooth 4.0 BLE Channel Table

Channel	Frequency (MHz)
1	2402
2	2404
3	2406
4	2408
5	2410
6	2412
7	2414
8	2416
9	2418
10	2420
11	2422
12	2424
13	2426
14	2428
15	2430
16	2432
17	2434
18	2436
19	2438
20	2440
21	2442
22	2444
23	2446
24	2448
25	2450
26	2452
27	2454
28	2456
29	2458
30	2460
31	2462
32	2464
33	2466
34	2468
35	2470
36	2472
37	2474
38	2476
39	2478
40	2480

Channel Occupation of AP6210 Module in IEEE 802.11b/g/n standard

channel (b/g/n20)	frequency (MHz)	n20 = 802.11n HT20 (20MHz bandwidth)
1	2412	
2	2417	
3	2422	
4	2427	
5	2432	
6	2437	
7	2442	
8	2447	
9	2452	
10	2457	
11	2462	



正基科技股份有限公司

SPECIFICATION

SPEC. NO. : _____ REV : 1.2

DATE : 12. 26.2012

PRODUCT NAME : AP6210

	APPROVED	CHECKED	PREPARED	DCC ISSUE
NAME				

AMPAK

AP6210

WiFi 802.11b/g/n + BT4.0
SIP Module Spec Sheet

Revision History

Date	Revision Content	Revised By	Version
2012/09/18	- Preliminary	Bart	1.0
2012/09/25	- Modify Pin Definition	Bart	1.1
2012/12/26	- Modify Pin name 10,11	Brian	1.2

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1. Introduction

AMPAK Technology would like to announce a low-cost and low-power consumption module which has all of the WiFi and Bluetooth functionalities. The highly integrated tiny module makes the possibilities of web browsing, VoIP, Bluetooth headsets and portable navigation applications. With seamless roaming capabilities and advanced security, also could interact with different vendors' 802.11b/g/n Access Points in the wireless LAN.

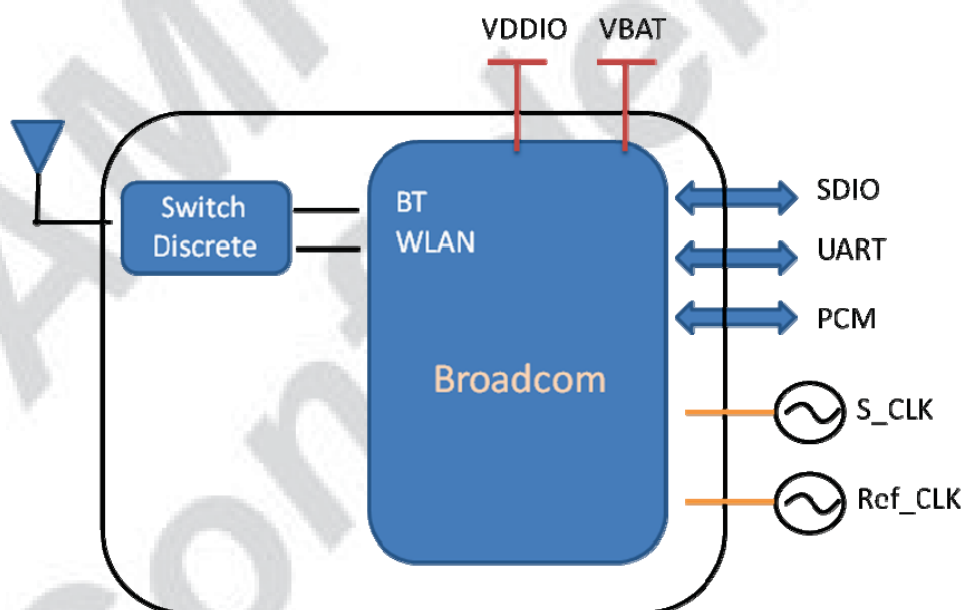
The module complies with IEEE 802.11 b/g/n standard and it could achieve up to a speed of 72.2Mbps with single stream in 802.11n draft, 54Mbps as specified in 802.11g, or 11Mbps for 802.11b to connect to the wireless LAN. The integrated module provides SDIO interface for WiFi, UART / PCM for Bluetooth.

This compact module is a total solution for a combination of WiFi + BT technologies. The module is specifically developed for Tablet, Smart phones and Portable devices.

2. Features

- 802.11b/g/n single-band radio
- Bluetooth V4.0 + EDR with integrated Class 1.5 PA Concurrent Bluetooth and WLAN operation
- Simultaneous BT / WLAN receive with single antenna
- WLAN host interface options:
 - SDIO v2.0 — up to 50 MHz clock rate
- BT host digital interface:
 - UART (up to 4 Mbps)
- IEEE Co-existence technologies are integrated die solution

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	AP6210
Product Description	Support WiFi/Bluetooth functionalities
Dimension	L x W x H: 12.0 x 12.0 x 1.5 (typical) mm
WiFi Interface	SDIO V2.0
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. WiFi RF Specification

5.1 2.4GHz RF Specification

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

Feature	Description
WLAN Standard	IEEE 802.11b/g/n, WiFi compliant
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz : Ch1 ~ Ch14
Modulation	802.11b : DQPSK, DBPSK, CCK 802.11 g/n : OFDM /64-QAM, 16-QAM, QPSK, BPSK

Receive Sensitivity (11n, 20MHz) @10% PER	- MCS=0	PER @ -85 dBm, typical
	- MCS=1	PER @ -84 dBm, typical
	- MCS=2	PER @ -82 dBm, typical
	- MCS=3	PER @ -80 dBm, typical
	- MCS=4	PER @ -77 dBm, typical
	- MCS=5	PER @ -73 dBm, typical
	- MCS=6	PER @ -71 dBm, typical
	- MCS=7	PER @ -69 dBm, typical
Receive Sensitivity (11g) @10% PER	- 6Mbps	PER @ -86 dBm, typical
	- 9Mbps	PER @ -85 dBm, typical
	- 12Mbps	PER @ -85 dBm, typical
	- 18Mbps	PER @ -83 dBm, typical
	- 24Mbps	PER @ -81 dBm, typical
	- 36Mbps	PER @ -78 dBm, typical
	- 48Mbps	PER @ -73 dBm, typical
	- 54Mbps	PER @ -72 dBm, typical
Receive Sensitivity (11b) @8% PER	- 1Mbps	PER @ -90 dBm, typical
	- 2Mbps	PER @ -89 dBm, typical
	- 5.5Mbps	PER @ -88 dBm, typical
	- 11Mbps	PER @ -85 dBm, typical
Data Rate	802.11b : 1, 2, 5.5, 11Mbps	
	802.11g : 6, 9, 12, 18, 24, 36, 48, 54Mbps	

Data Rate (20MHz ,Long GI,800ns)	802.11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65Mbps
Data Rate (20MHz ,short GI,400ns)	802.11n : 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65,72.2Mbps
Maximum Input Level	802.11b : -10 dBm
	802.11g/n : -20 dBm
Antenna Reference	Small antennas with 0~2 dBi peak gain

6. Bluetooth Specification

6.1 Bluetooth Specification

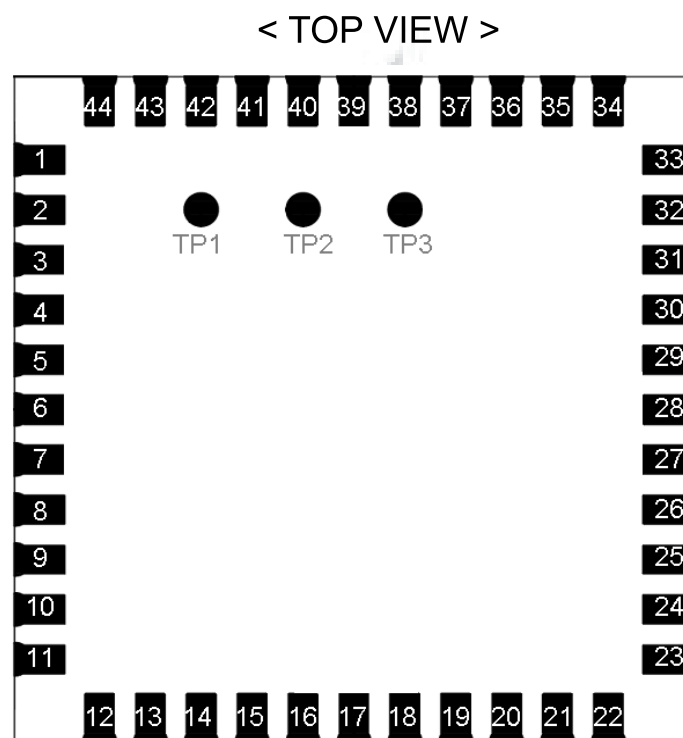
Conditions : VBAT=3.6V ; VDDIO=3.3V ; Temp:25°C

Feature	Description			
General Specification				
Bluetooth Standard	Bluetooth V4.0 of 1, 2 and 3 Mbps.			
Host Interface	UART			
Antenna Reference	Small antennas with 0~2 dBi peak gain			
Frequency Band	2.400 GHz ~ 2483.5 GHz			
Number of Channels	79 channels			
Modulation	FHSS, GFSK, DPSK, DQPSK			
RF Specification				
	<table><tr><th>Min.</th><th>Typical.</th><th>Max.</th></tr></table>	Min.	Typical.	Max.
Min.	Typical.	Max.		

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		

7. Pin Assignments

7.1 Pin Outline



7.2 Pin Definition

NO	Name	Type	Description
1	GND	—	Ground connections
2	WL_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	WL_REG_ON	I	Internal regulators power enable/disable
13	WL_HOST_WAKE	O	WLAN to wake-up HOST
14	SDIO_DATA_2	I/O	SDIO data line 2

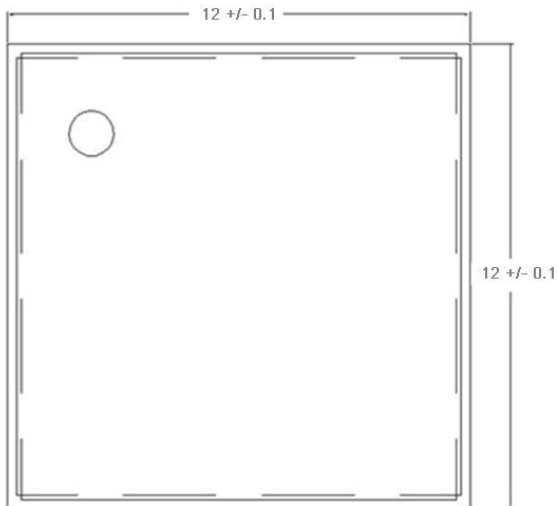
15	SDIO_DATA_3	I/O	SDIO data line 3
16	SDIO_DATA_CMD	I/O	SDIO command line
17	SDIO_DATA_CLK	I/O	SDIO CLK line
18	SDIO_DATA_0	I/O	SDIO data line 0
19	SDIO_DATA_1	I/O	SDIO data line 1
20	GND	—	Ground connections
21	VIN_LDO_OUT	P	Internal Buck voltage generation pin
22	VDDIO	P	I/O Voltage supply input
23	VIN_LDO	P	Internal Buck voltage generation pin
24	LPO	I	External Low Power Clock input (32.768KHz)
25	PCM_OUT	I/O	PCM Data output
26	PCM_CLK	I/O	PCM Clock
27	PCM_IN	I/O	PCM data input
28	PCM_SYNC	I/O	PCM sync signal
29	WL_VDD_TCXO	P	1.7V to 3.3V supply for the TCXO driver
30	TCXO_IN	I	Reference clock input
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	BT_XTAL_IN	I	Crystal input for BT
38	BT_XTAL_OUT	O	Crystal output for BT
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)

8. Dimensions

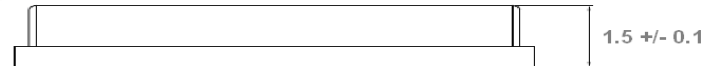
8.1 Physical Dimensions

(Unit: mm)

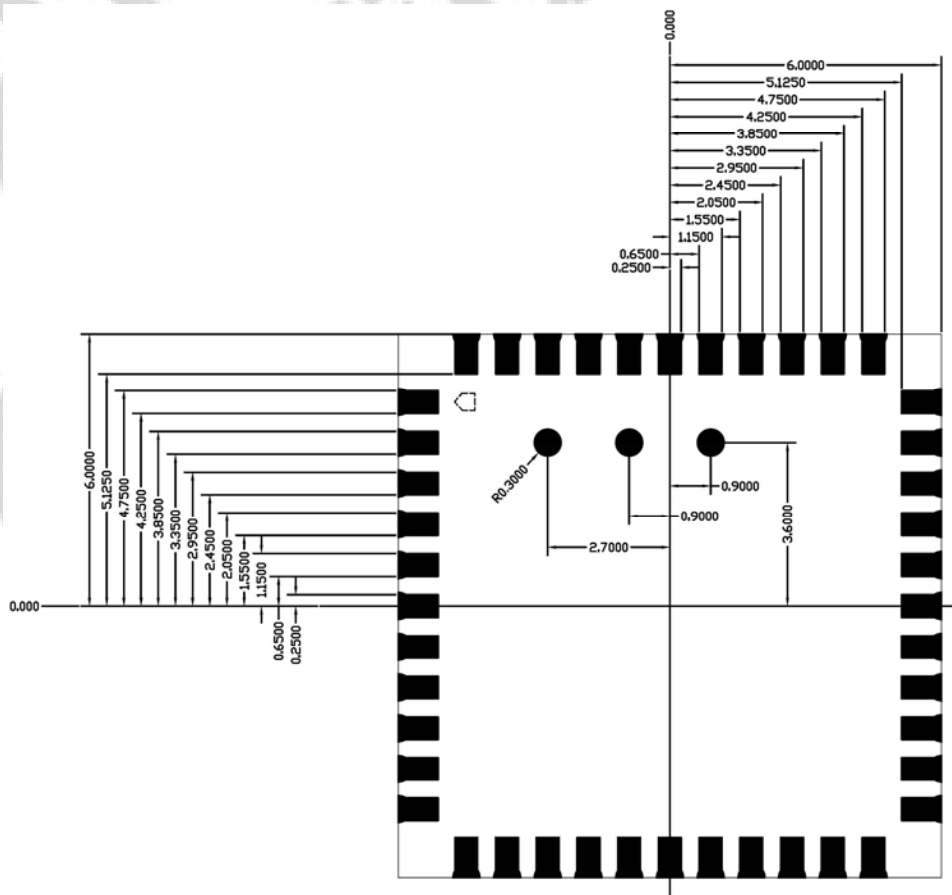
< TOP VIEW >



< Side View >



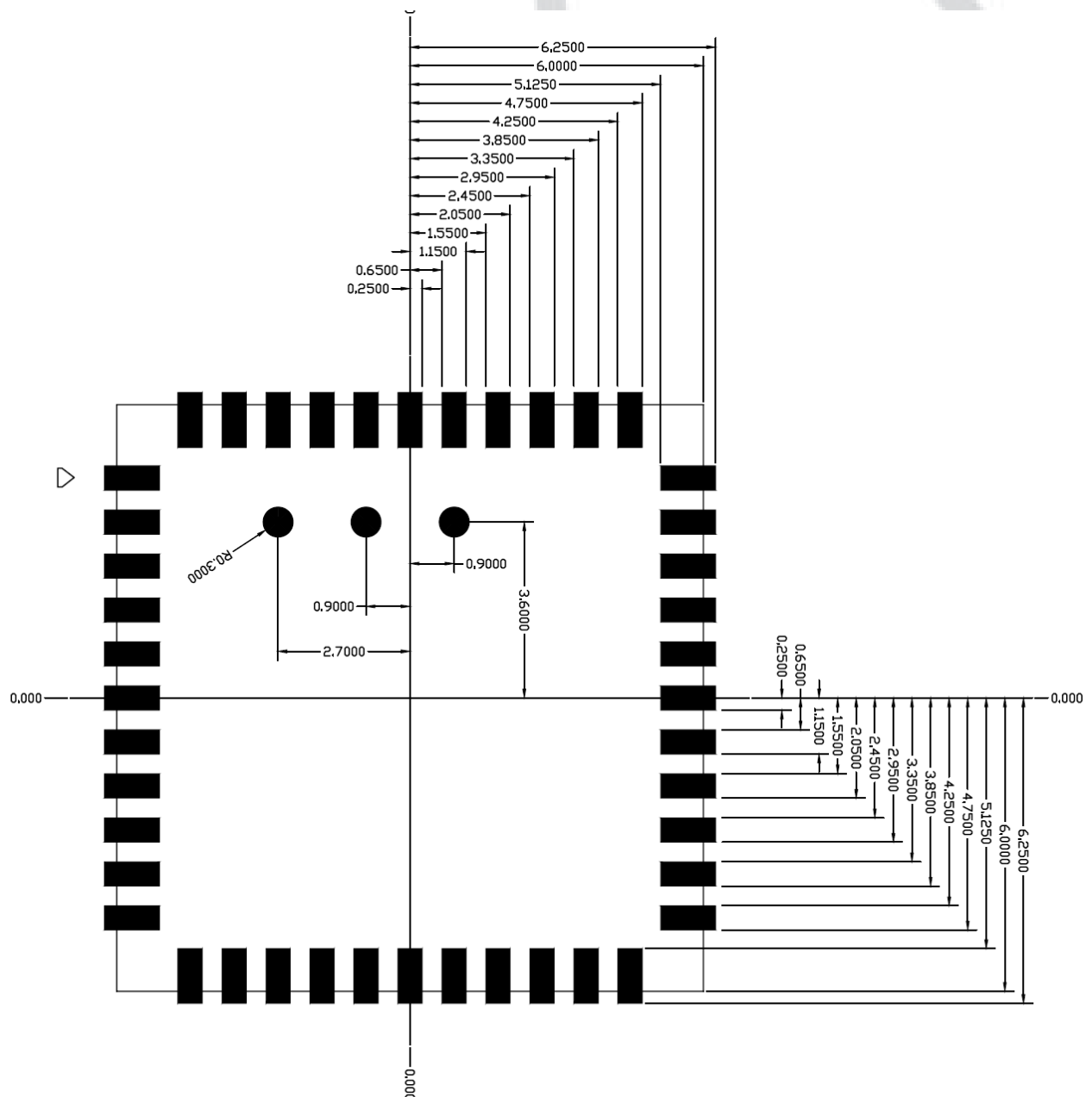
< TOP VIEW >



8.2 Layout Recommendation

(Unit: mm)

< TOP VIEW >



9. 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	Ω
	<5	pF
Clock jitter (integrated over 300Hz – 15KHz)	<1	Hz
Output high voltage	0.7V _{io} - V _{io}	V

External Ref_CLK signal characteristics

No.	Item	Symb.	Electrical Specification				Remark
			Min.	Type	Max.	Units	
1	Nominal Frequency	F ₀	26.00000			MHz	
2	Mode of Vibration		Fundamental				
3	Frequency Tolerance	$\Delta F/F_0$	-10	-	10	ppm	at 25°C ±3°C
4	Operating Temperature Range	T _{OPR}	-30	-	85	°C	
5	Frequency Stability	TC	-10	-	10	ppm	
6	Storage Temperature	T _{STG}	-55	-	125	°C	
7	Load capacitance	CL	-	16		pF	
8	Equivalent Series Resistance	ESR	-	-	50	Ω	
9	Drive Level	DL	-	100	200	μ W	
10	Insulation Resistance	IR	500	-	-	M Ω	At 100V _{DC}
11	Shunt Capacitance	C ₀	-	-	3	pF	
12	Aging Per Year	Fa	-2	-	2	ppm	First Year

9.1 SDIO Pin Description

The module supports SDIO version 2.0 for 4-bit modes. It has the ability to stop the SDIO clock and map the interrupt signal into a GPIO pin. This 'out-of-band' interrupt signal notifies the host when the WLAN device wants to turn on the SDIO interface. The ability to force the control of the gated clocks from within the WLAN chip is also provided.

- ❖ Function 0 Standard SDIO function (Max BlockSize / ByteCount = 32B)
- ❖ Function 1 Backplane Function to access the internal System On Chip (SOC) address space (Max BlockSize / ByteCount = 64B)
- ❖ Function 2 WLAN Function for efficient WLAN packet transfer through DMA (Max BlockSize/ByteCount=512B)

SDIO Pin Description

SDIO 4-Bit Mode	
DATA0	Data Line 0
DATA1	Data Line 1 or Interrupt
DATA2	Data Line 2 or Read Wait
DATA3	Data Line 3
CLK	Clock
CMD	Command Line

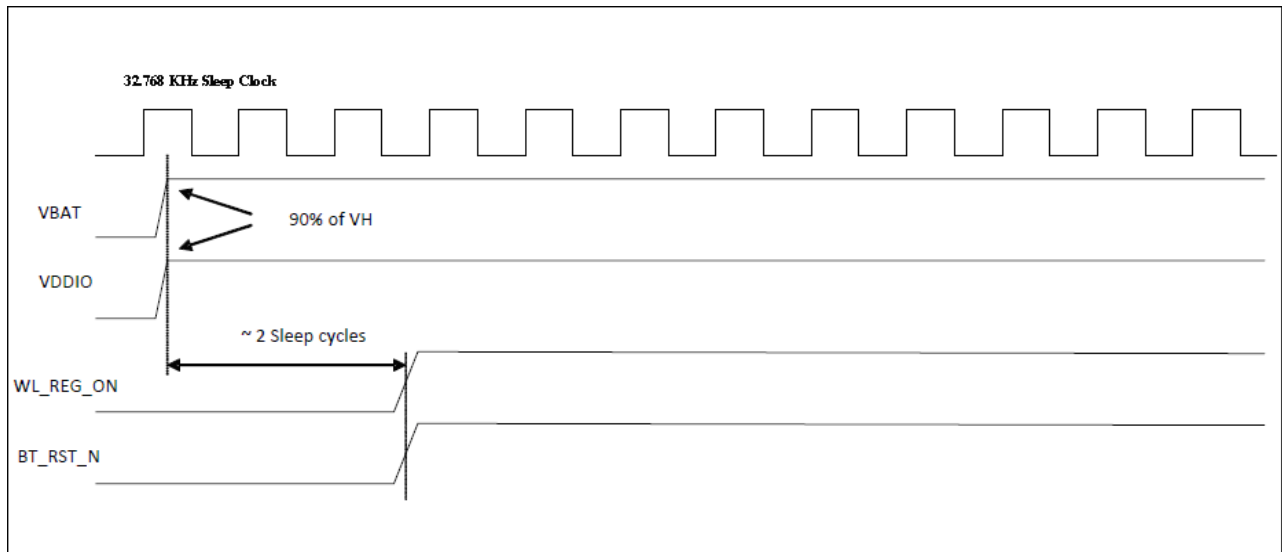
10. Host Interface Timing Diagram

10.1 Power-up Sequence Timing Diagram

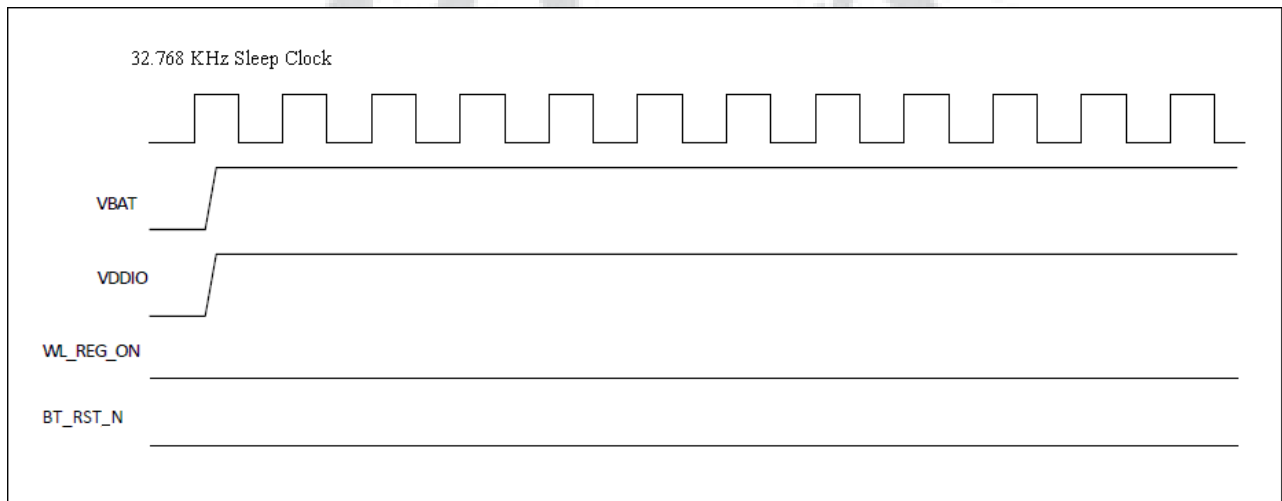
The module has two signals that allow the host to control power consumption by enabling or disabling the Bluetooth, WLAN and internal regulator blocks. These signals are described below.

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.

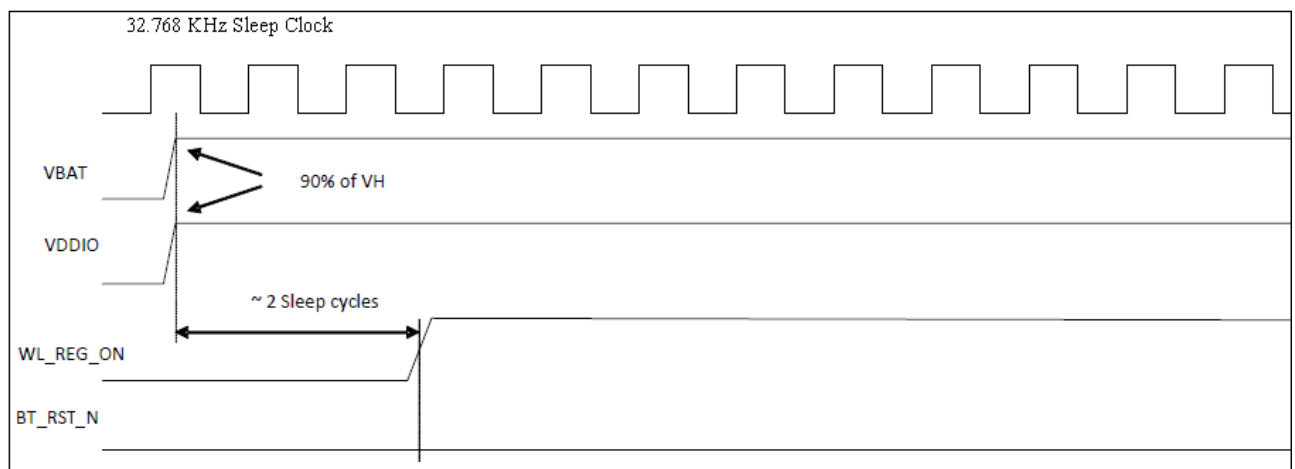
- ※ WL_REG_ON: Used by the PMU to power up the WLAN section. It is input to control the internal WLAN regulators. When this pin is high, the regulators are enabled and the WLAN section is out of reset. When this pin is low the WLAN section is in reset.
- ※ BT_RST_N: Used by the PMU to power up the internal Bluetooth regulators. If the BT_RST_N pins are low, the regulators are disabled.



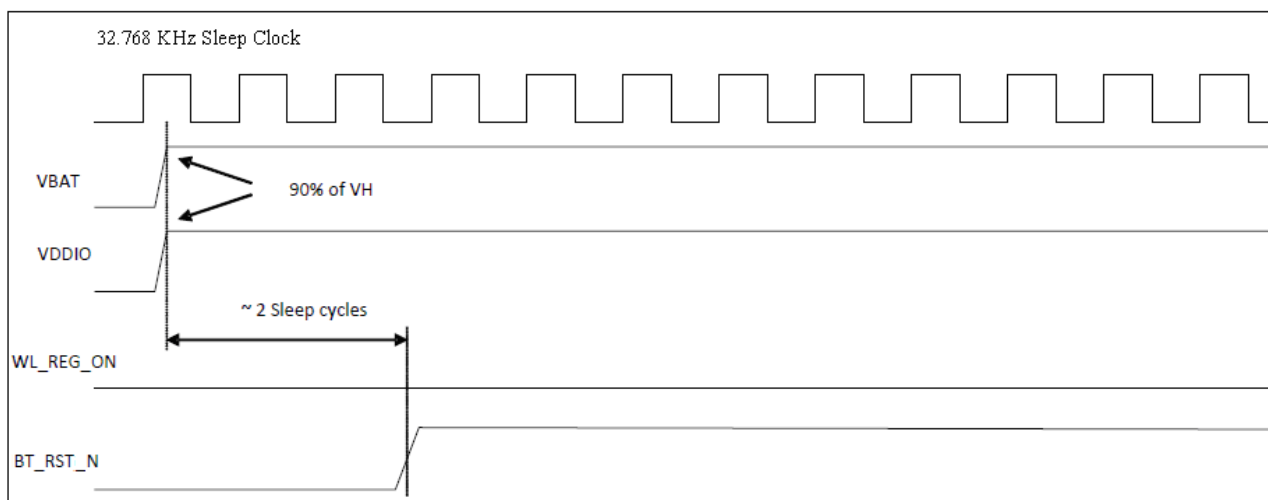
WLAN=ON, Bluetooth =ON



WLAN=OFF, Bluetooth =OFF

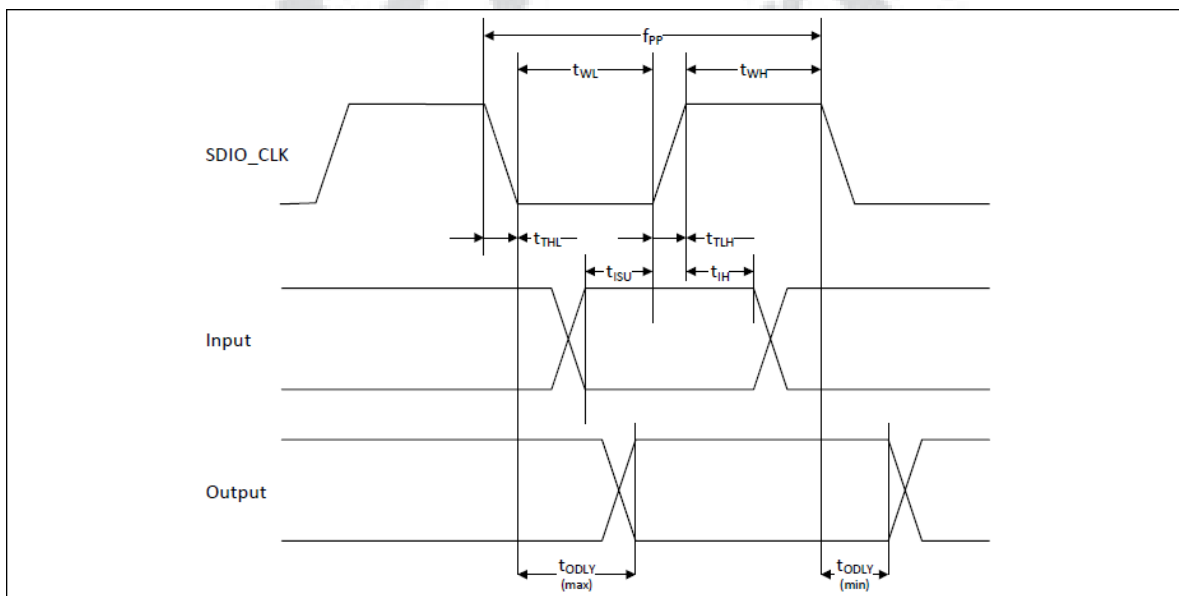


WLAN=ON, Bluetooth =OFF



WLAN=OFF, Bluetooth=ON

10.2 SDIO Default Mode Timing Diagram

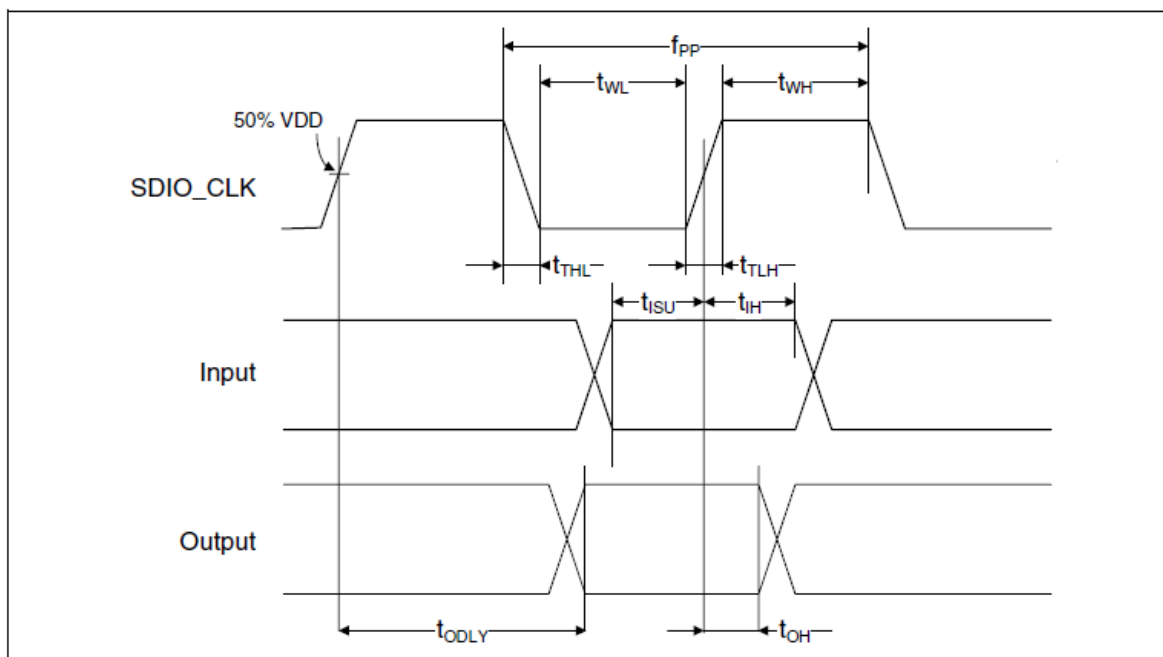


Parameter	Symbol	Minimum	Typical	Maximum	Unit
SDIO CLK (All values are referred to minimum V_{IH} and maximum V_{IL}^b)					
Frequency-Data Transfer mode	f _{PP}	0	-	25	MHz
Frequency-Identification mode	f _{OD}	0	-	400	kHz
Clock low time	t _{WL}	10	-	-	ns
Clock high time	t _{WH}	10	-	-	ns
Clock rise time	t _{TLH}	-	-	10	ns
Clock low time	t _{TTL}	-	-	10	ns
Inputs: CMD, DAT (referenced to CLK)					
Input setup time	t _{ISU}	5	-	-	ns
Input hold time	t _{IH}	5	-	-	ns
Outputs: CMD, DAT (referenced to CLK)					
Output delay time - Data Transfer mode	t _{ODLY}	0	-	14	ns
Output delay time - Identification mode	t _{ODLY}	0	-	50	ns

a. Timing is based on CL ≤ 40pF load on CMD and Data.

b. min(V_{IH}) = 0.7 × VDDIO and max(V_{IL}) = 0.2 × VDDIO.

10.3 SDIO High Speed Mode Timing Diagram



Parameter	Symbol	Minimum	Typical	Maximum	Unit
SDIO CLK (All values are referred to minimum V_{IH} and maximum V_{IL}^b)					
Frequency-Data Transfer mode	f_{PP}	0	-	50	MHz
Frequency-Identification mode	f_{OD}	0	-	400	kHz
Clock low time	t_{WL}	7	-	-	ns
Clock high time	t_{WH}	7	-	-	ns
Clock rise time	t_{TLH}	-	-	3	ns
Clock low time	t_{THL}	-	-	3	ns
Inputs: CMD, DAT (referenced to CLK)					
Input setup time	t_{ISU}	6	-	-	ns
Input hold time	t_{IH}	2	-	-	ns
Outputs: CMD, DAT (referenced to CLK)					
Output delay time – Data Transfer mode	t_{ODLY}	-	-	14	ns
Output hold time	t_{OH}	2.5	-	-	ns
Total system capacitance (each line)	CL	-	-	40	pF

a. Timing is based on $CL \leq 40pF$ load on CMD and Data.

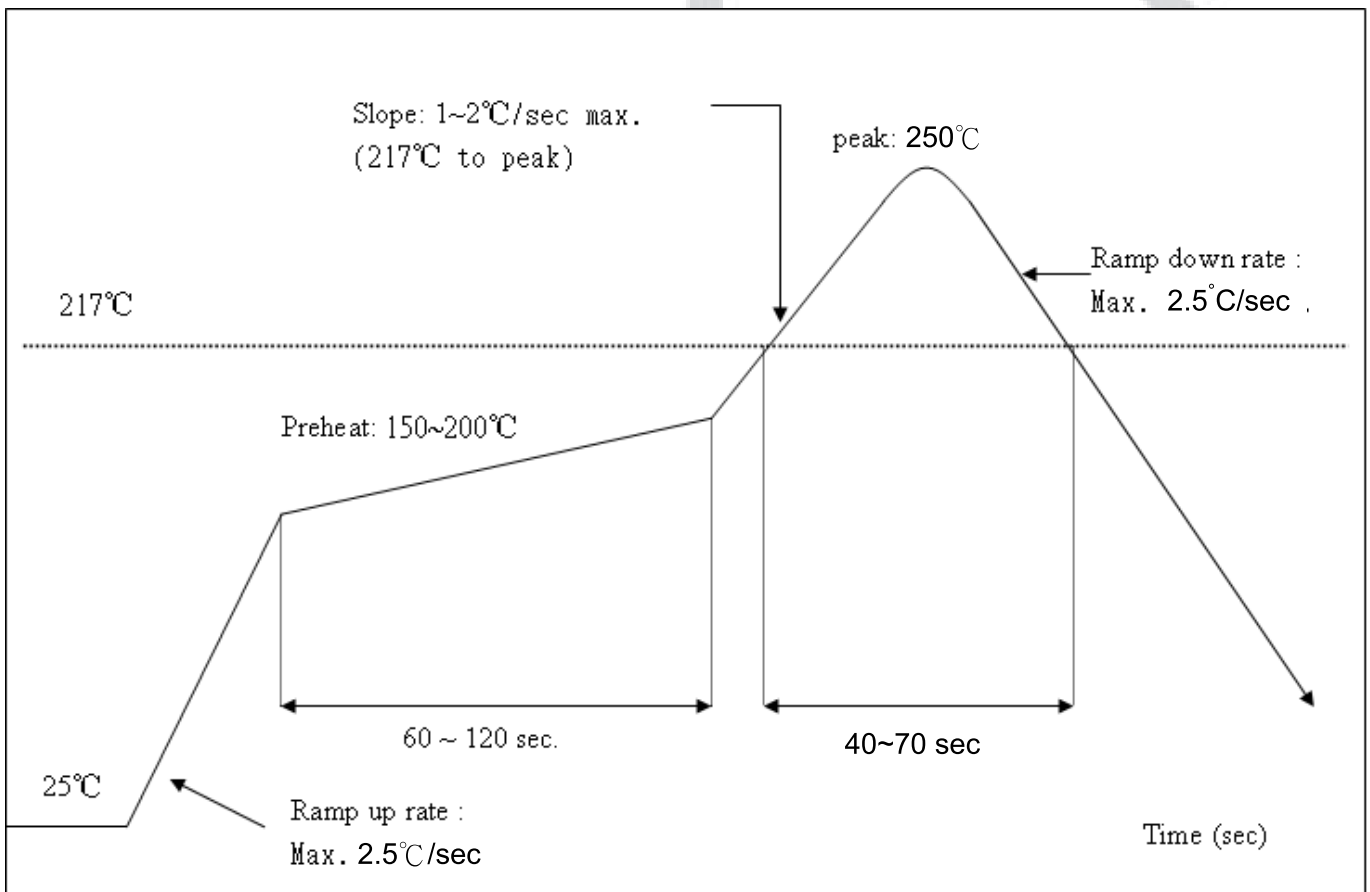
b. $\min(V_{IH}) = 0.7 \times V_{DDIO}$ and $\max(V_{IL}) = 0.2 \times V_{DDIO}$.

11. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : $<250^{\circ}\text{C}$

Number of Times : ≤ 2 times



12. Package Information

12.1 Label

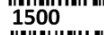
Label A → Anti-static and humidity notice



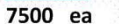
Label B → MSL caution / Storage Condition

Caution		LEVEL
This bag contains MOISTURE-SENSITIVE DEVICES		☐ If blank, see adjacent bar code label
1. Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH) 2. Peak package body temperature: _____ °C If blank, see adjacent bar code label 3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be a) Mounted within: _____ hours of factory conditions If blank, see adjacent bar code label ≤30°C/60% RH, or b) Stored per J-STD-033 4. Devices require bake, before mounting, if: a) Humidity Indicator Card reads >10% for level 2a - 5a devices or >60% for level 2 devices when read at 23 ± 5°C b) 3a or 3b are not met 5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure Bag Seal Date: _____ If blank, see adjacent bar code label Note: Level and body temperature defined by IPC/JEDEC J-STD-020		

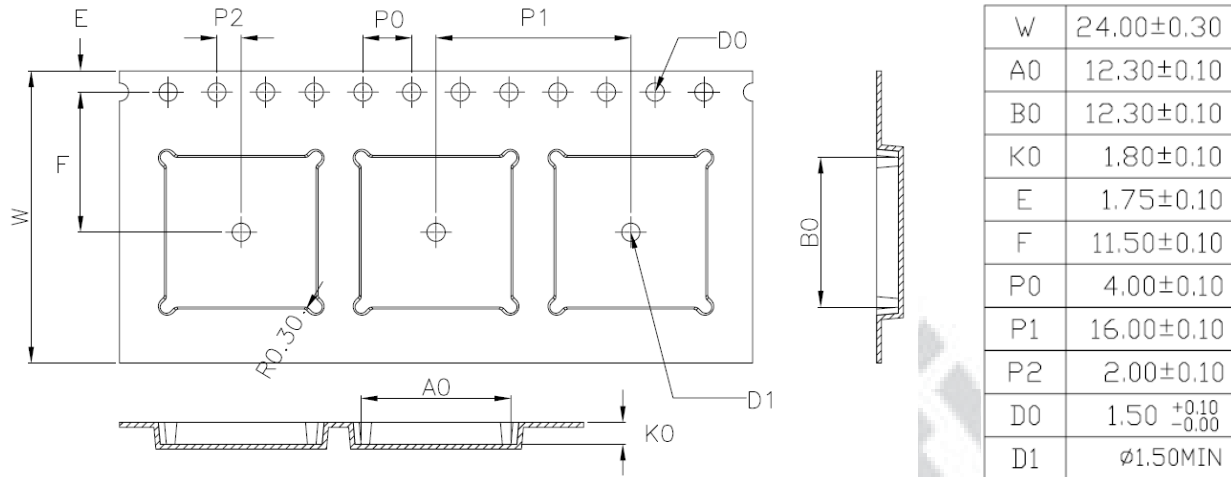
Label C → Inner box label .

PKG S/N :	 9PKG12013100001
Model:	 XXXXXXXXXXXX
P/N :	 99P-W01-0048R
Qty :	 1500
Date Code :	 1205
Lot Code :	 T0C102B

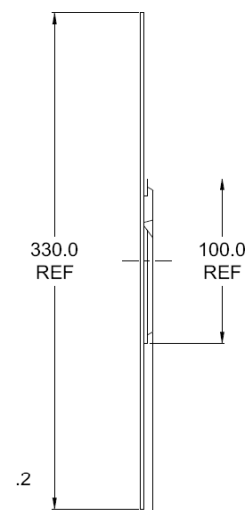
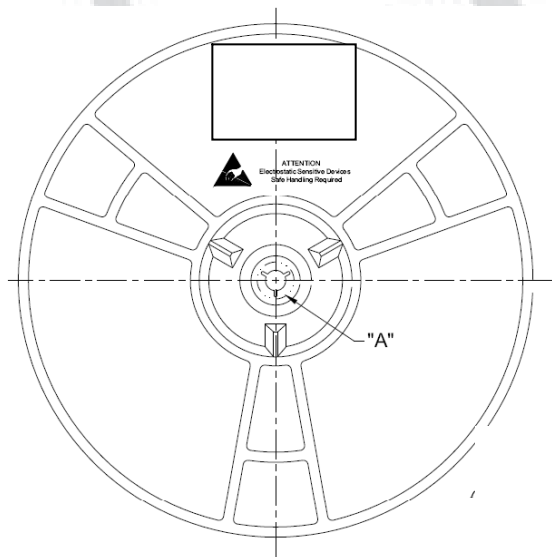
Label D → Carton box label .

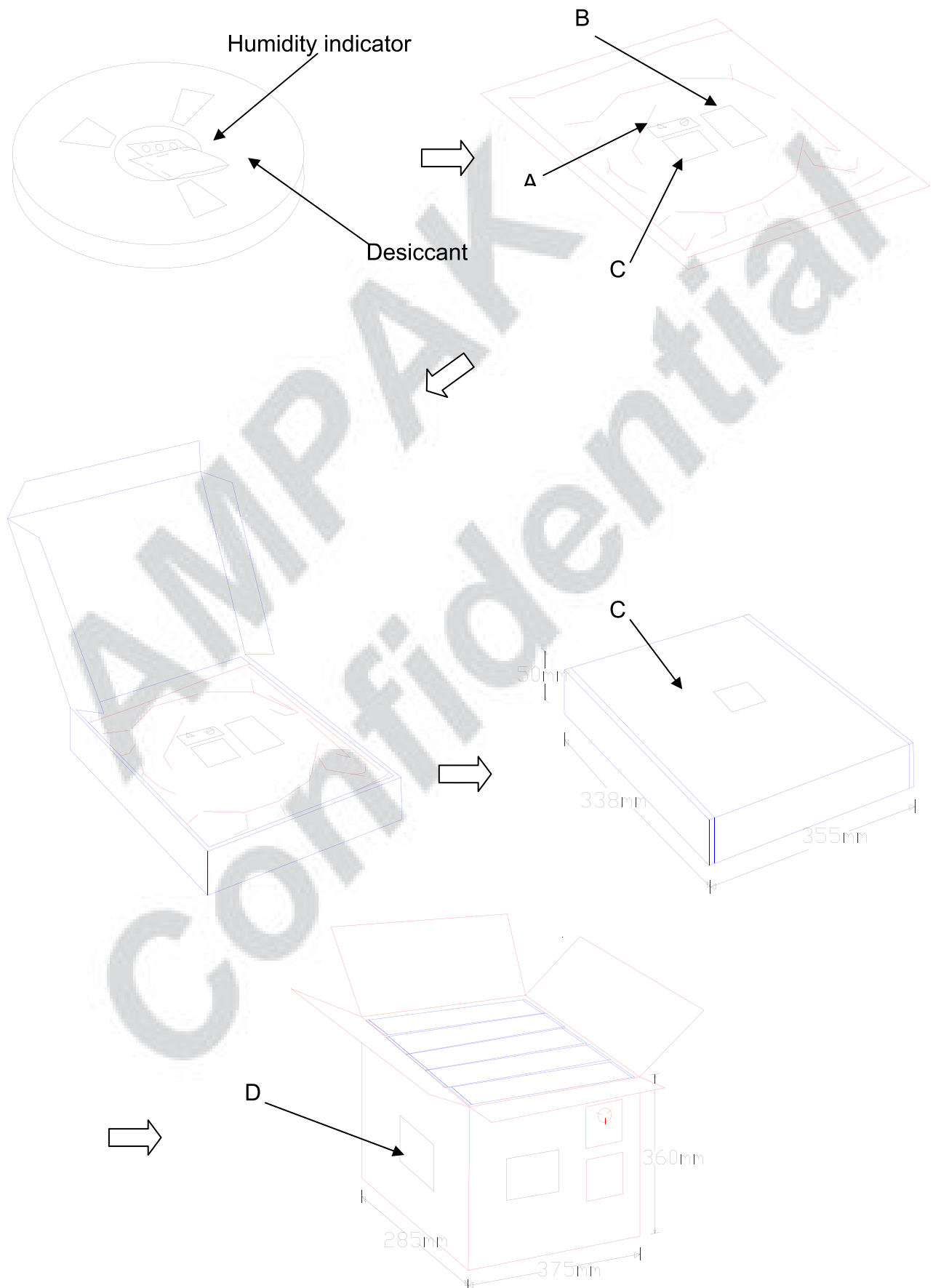
AMPAK Technology	
Model Name :	 XXXXXXXXXXXX
Part No :	 99P-W01-0048R
Quantity :	 7500 ea
Lot D/C :	 20081000033
Manufacture :	 2012/02/22

12.2 Dimension



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 ± 0.05 mm.
6. Packing length per 22" reel : 98.5 Meters.(1:3)
7. Component load per 13" reel : 1500 pcs.





12.3 MSL Level / Storage Condition

	Caution This bag contains MOISTURE-SENSITIVE DEVICES Do not open except under controlled conditions 1. Calculated shelf life in sealed bag: 12 months at $< 40^{\circ}\text{C}$ and $< 90\%$ relative humidity(RH) 2. Peak package body temperature: 225°C 240°C 250°C 260°C ☐ ☐ ☒ ☐ 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 $< 30^{\circ}\text{C} / 60\% \text{ RH}$, OR b) Stored at $< 10\% \text{ RH}$ 4. Devices require bake, before mounting, if: a) Humidity Indicator Card is $> 10\%$ when read at $23 \pm 5^{\circ}\text{C}$ b) 3a or 3b not met 5. If baking is required, devices may be baked for 24 hours at $125 \pm 5^{\circ}\text{C}$ 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: <u> See-SEAL DATE LABEL </u> Note: Level and body temperature defined by IPC/JEDEC J-STD-020	LEVEL 4
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※NOTE : Accumulated baking time should not exceed 96hrs