

User Manual

MODEL No.:AP6330

1. Introduction

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

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

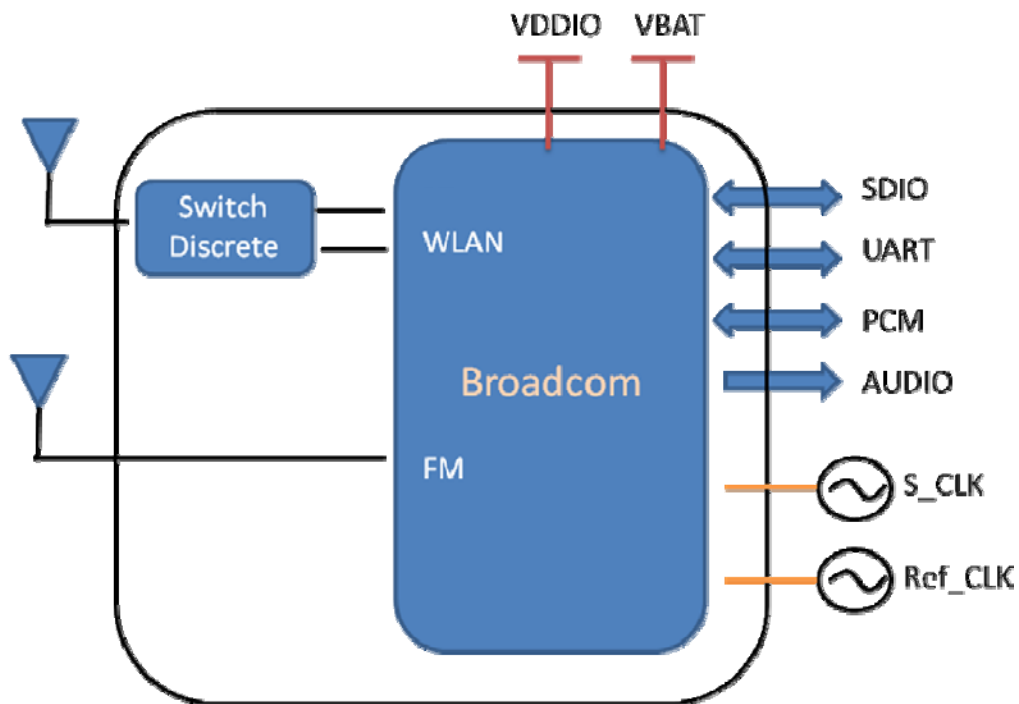
This compact module is a total solution for a combination of WiFi + FM technologies. The module is specifically developed for Smart phones and Portable devices.

The module is limited to being installed in a fixed device and cannot be used in a mobile device. While the module is being installed to the platform, the pertaining rule with regards to 15B must be evaluated. Further to the RF exposure, the device shall be installed to the mobile platform with 20cm, and not collated with other transmitters

2. Features

- 802.11a/b/g/n dual-band radio — non-simultaneous dual-band operation
- Concurrent FM (RX) RDS/RBDS, and WLAN operation
- Simultaneous WLAN receive with single antenna
- WLAN host interface options:
 - SDIO v2.0 — up to 50 MHz clock rate
- FM multiple audio routing options: PCM, eSCO, A2DP
- IEEE Co-existence technologies are integrated die solution
- ECI — enhanced coexistence support, ability to coordinate 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.

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	AP6330
Product Description	Support WiFi/FM functionalities
Dimension	L x W x H: 12 x 12 x 1.5 (typical) mm
WiFi Interface	SDIOV2.0
Humidity	Operating Humidity 10% to 95%Non-Condensing

5. WiFi RF Specification

Characteristics	Description
IEEE 802.11 WLAN Mode Supported	☒ 802.11b ☒ 802.11g ☒ 802.11n(20MHz channel bandwidth)
Data Rate	☒ 802.11 b:1,2,5.5,11Mbps; ☒ 802.11 g:6,9,12,18,24,36,48,54Mbps; ☒ 802.11n(HT20):MCS0-MCS7;
Modulation	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n;
Operating Frequency Range	☒ 2412-2462MHz for 802.11b/g; ☒ 2412-2462MHz for 802.11n(HT20);
Number of Channels	☒ 11 channels for 802.11b/g; ☒ 11 channels for 802.11n(HT20);
Transmit Power Max	21.12 dBm
Antenna Type	Integral antenna via a SMA connector

Characteristics	Description			
IEEE 802.11 WLAN Mode Supported	☒ 802.11a(20MHz channel bandwidth) ☒ 802.11n(20MHz channel bandwidth)			
Data Rate	802.11a:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 600 Mbps			
Modulation	OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n;			
Operating Frequency Range	WIFI 5G Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)	5180-5240	4
	UNII Band III	802.11a/n(HT20)	5745-5825	5
Transmit Power Max	13.86 dBm for UNII Band I 16.27dBm for UNII Band III			
Antenna Type	Integral antenna via a SMA connector			

Frequency and Channel list for 802.11 b/g/n(HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447		

☒ Wifi 5G with UNII Band I

Frequency and Channel list for 802.11a/n(HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220		
40	5200	48	5240		

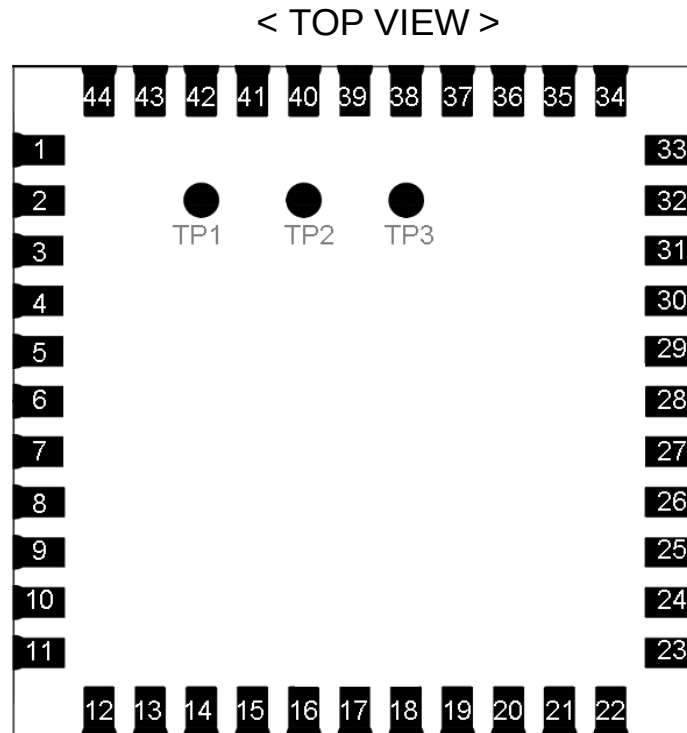
☒ Wifi 5G with UNII Band III

Frequency and Channel list for 802.11a/n(HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825
153	5765	161	5805		

7. Pin Assignments

7.1 Pin Outline



7.2 Pin Definition

NO	Name	Type	Description
1	GND	-	Ground connections
2	_ANT	I/O	RF I/O port
3	GND	-	Ground connections
4	FM_RX	I	FM radio RF input antenna port
5	NC	-	Floating (Don't connected to ground)
6	_WAKE	I	HOST wake-up Bluetooth device
7	_HOST_WAKE	O	wake-up HOST
8	NC	-	Floating (Don't connected to ground)
9	VBAT	P	Main power voltage source input
10	XTAL_IN	I	Crystal input
11	XTAL_OUT	O	Crystal output
12	WL_REG_ON	I	Internal regulators power enable/disable
13	WL_HOST_WAKE	O	WLAN to wake-up HOST

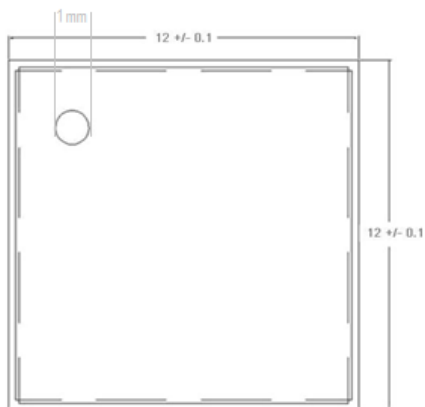
14	SDIO_DATA_2	I/O	SDIO data line 2
15	SDIO_DATA_3	I/O	SDIO data line 3
16	SDIO_DATA_CMD	I/O	SDIO command line
17	SDIO_DATA_CLK	I/O	SDIO clock line
18	SDIO_DATA_0	I/O	SDIO data line 0
19	SDIO_DATA_1	I/O	SDIO data line 1
20	GND	-	Ground connections
21	VIN_LDO_OUT	P	Internal Buck voltage generation pin
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	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	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	FM UART interface
42	UART_TXD	O	FM UART interface
43	UART_RXD	I	FM UART interface
44	UART_CTS_N	I	FM UART interface
45	TP1	O	FM Analog AUDIO left output
46	TP2	O	FM Analog AUDIO right output
47	TP3 (NC)	-	Floating (Don't connected to ground)

8. Dimensions

8.1 Physical Dimensions

(Unit: mm)

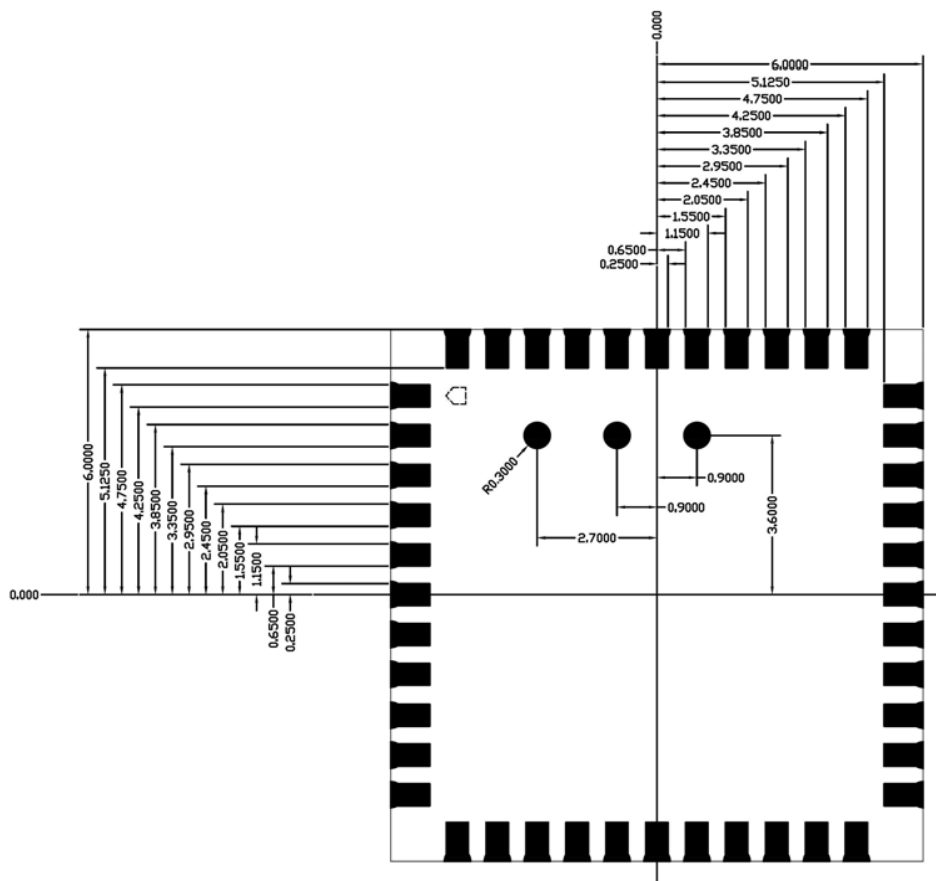
< TOP VIEW >



< Side View >



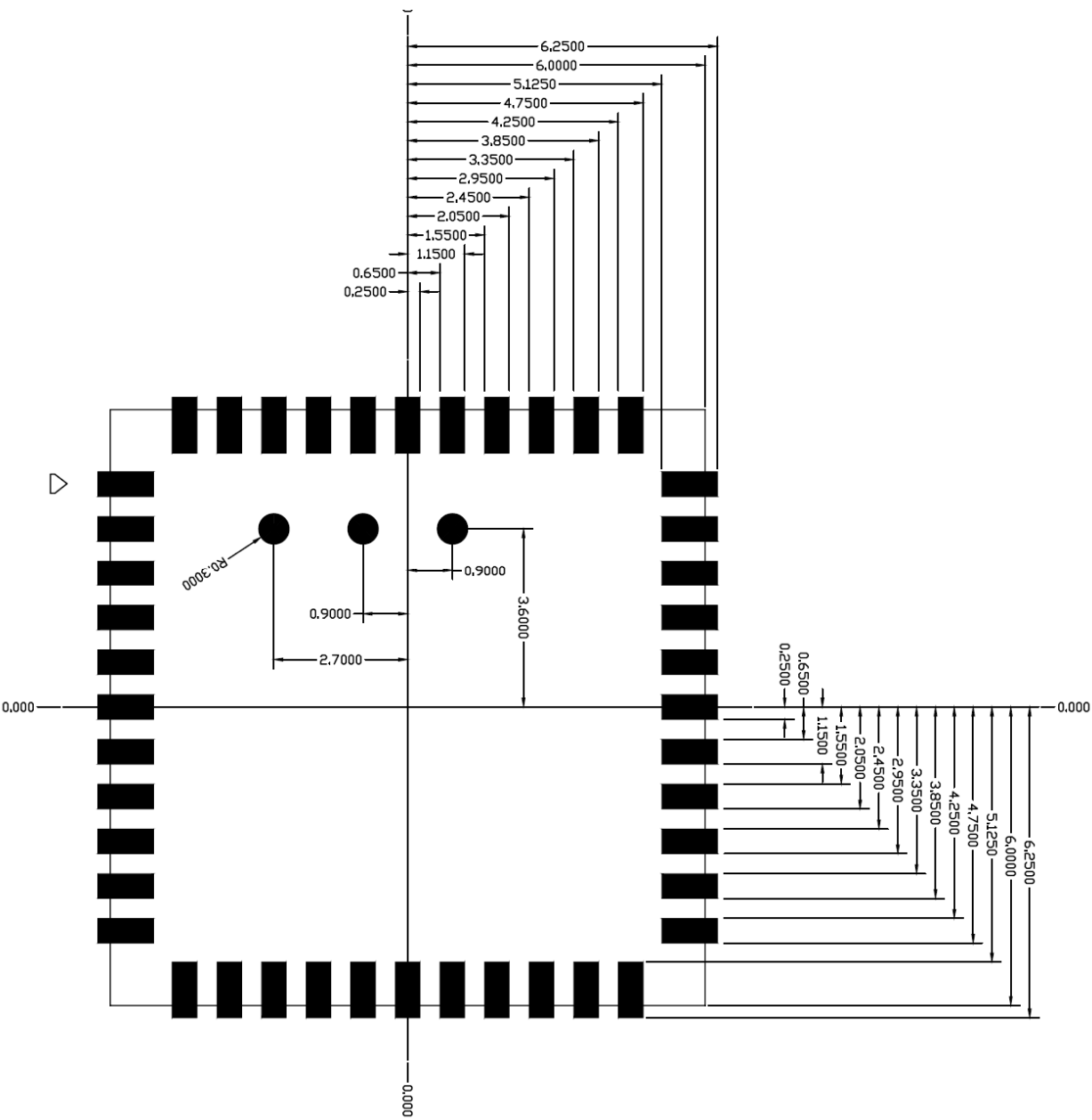
< TOP VIEW >



8.2 Layout Recommendation

(Unit: mm)

< TOP VIEW >



FCC warning:

The modular transmitter have its own RF shielding, but this 1mm of the hole can only ensure 6th harmonic of 2.4G and 3th harmonic of 5G not coupling theoretically. Therefore, this is a limited module. This module only use for the Lighthouse LED Video Display Screen, and the model of the Lighthouse LED Video Display Screen is A2.5-89 , A2.5-118, A2.5-104.

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.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: 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 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.

This module is designed to comply with the FCC statement, FCC ID is: 2ARRD-AP6330. The host system using this module, should have label in a visible area indicated the following texts: "Contains FCC ID: 2ARRD-AP6330".