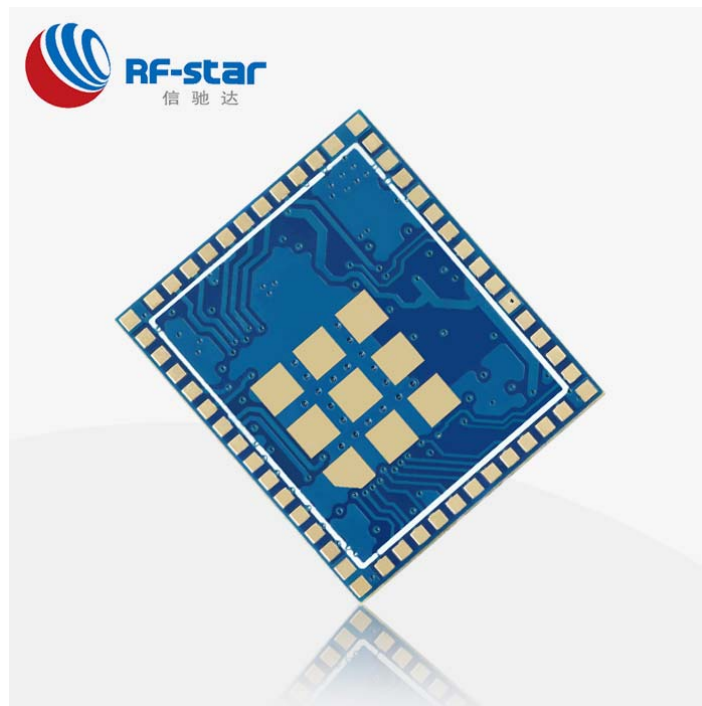


RF-WM-3220B1

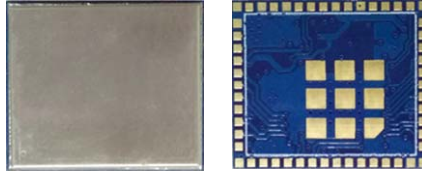
User's Hardware Manual



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Module Function



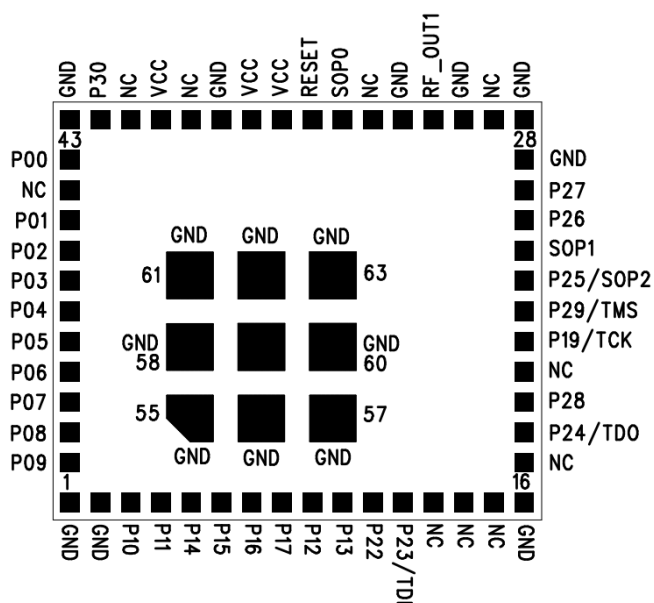
Picture1 RF-WM-3220B3 module

1. Function Introduction

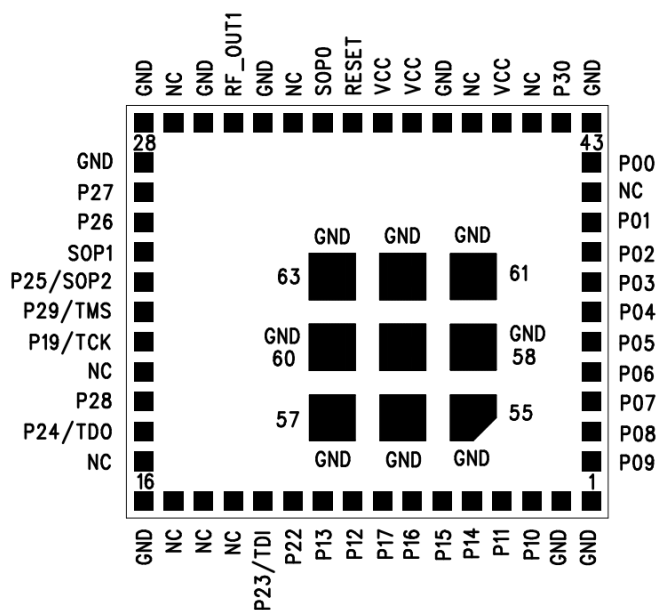
RF-WM-3220B3 module is one of RF-Star's embedded Wi-Fi module which is pin to pin compatible with TI official CC3220MOD. It has the industry's lowest standby power consumption. This module adopts the latest Simple-Link Wi-Fi CC3220R/S/SF chip design embedded with high performance ARM Cortex-M4 MCU, and contain a variety of peripherals, such as parallel camera interface, I2S, SD/MMC, UART, SPI, I2C, ADC and GPIO. This module supports 802.11 b/g/n wireless standards, and can work in Station, AP and Wi-Fi direct connection modes.

RF-WM-3220 module, which is integrated with TCP/IP protocols and applications, can be widely used in IOT applications, such as home automation, home appliance control, security systems, smart energy, internet gateway, industrial control, smart plug, smart metering, wireless audio, wireless doorbell & sensor networking node etc.

2. Pin Assignment



Picture 2 RF-WM-3220B3 Pin Assignment (Top View)



Picture 3 RF-WM-3220B3 Pin Assignment (Bottom View)

3. Pin Assignment Multiplex Table

Pin Assignment Form

MOD PIN NO.	MOD PIN NAME	TYPE	IC PIN NO.	DESCRIPTION
-------------	--------------	------	------------	-------------

1	GND	-		Ground
2	GND	-		Ground
3	GPIO10	I/O	1	GPIO
4	GPIO11	I/O	2	GPIO
5	GPIO14	I/O	5	GPIO
6	GPIO15	I/O	6	GPIO
7	GPIO16	I/O	7	GPIO
8	GPIO17	I/O	8	GPIO
9	GPIO12	I/O	3	GPIO
10	GPIO13	I/O	4	GPIO
11	GPIO22	I/O	15	GPIO
12	JTAG_TDI/P23	I/O	16	GPIO
13	NC	-	13	Reserved
14	NC	-	14	Reserved
15	NC	-	11	Reserved
16	GND	-		Ground
17	NC	-	12	Reserved
18	JTAG_TDO/P24	I/O	17	GPIO
19	GPIO28	I/O	18	GPIO
20	NC	-	23	Unused
21	JTAG_TCK/P19	I/O	19	JTAG TCK input
22	JTAG_TMS/P29	I/O	20	JTAG TMS input
23	SOP2/P25	I/O	21	Add pull-down resistor to ground needed for functional mode. Add option to pull-up required for entering the UART load mode for flashing.
24	SOP1	-	34	Reserved. Do not connect.
25	ANTSEL1/P26	I/O	29	Antenna selection control.
26	ANTSEL2/P27	I/O	30	Antenna selection control.
27	GND	-		Ground
28	GND	-		Ground
29	NC	-	27,28	Reserved
30	GND	-		Ground
31	RF_OUT1	I/O	31	2.4GHz RF input/output.
32	GND	-		Ground
33	NC	-	38	Reserved
34	SOP0	-	35	Optional 1-k Ω pull-up if user chooses to use SWD debug mode instead of 4-wire JTAG.
35	RESET	I	32	Power on reset. Does not require external RC circuit.
36	VCC	-	37	Power supply for the device, can be connected to battery (2.3V to 3.6V).

37	VCC	-	39	Power supply for the device, can be connected to battery (2.3V to 3.6V).
38	GND	-		Ground
39	NC	-	47	Not connected
40	VCC	-	10,44, 54	Power supply for the device, can be connected to battery (2.3V to 3.6V).
41	NC	-	25,36, 48	Reserved
42	GPIO30	I/O	53	GPIO
43	GND	-		Ground
44	GPIO0	I/O	50	GPIO
45	NC	-	51	Reserved
46	GPIO1	I/O	55	GPIO
47	GPIO2	I/O	57	GPIO
48	GPIO3	I/O	58	GPIO
49	GPIO4	I/O	59	GPIO
50	GPIO5	I/O	60	GPIO
51	GPIO6	I/O	61	GPIO
52	GPIO7	I/O	62	GPIO
53	GPIO8	I/O	63	GPIO
54	GPIO9	I/O	64	GPIO
55	GND	-		Thermal Ground
56	GND	-		Thermal Ground
57	GND	-		Thermal Ground
58	GND	-		Thermal Ground
59	GND	-		Thermal Ground
60	GND	-		Thermal Ground
61	GND	-		Thermal Ground
62	GND	-		Thermal Ground
63	GND	-		Thermal Ground

Form 1 Pin Assignment Form

Pin Multiplex Table

PIN NAME	I/O	Select as Wakeup Source	Function	Description
GPIO10	I/O	NO	GPIO10	General-Purpose I/O
			I2C_SCL	I2C Clock
			GT_PWM06	Pulse-Width Modulated O/P
			UART1_TX	UART TX Data
			SDCARD_CLK	SD Card Clock

			GT_CCP01	Timer Capture Port
GPIO11	I/O	Wake-Up Source	GPIO11	General-Purpose I/O
			I2C_SDA	I2C Data
			GT_PWM07	Pulse-Width Modulated O/P
			pXCLK(XVCLK)	Free Clock To Parallel Camera
			SDCARD_CMD	SD Card Command Line
			UART1_RX	UART RX Data
			GT_CCP02	Timer Capture Port
			McAFSX	I2S Audio Port Frame Sync
GPIO12	I/O	NO	GPIO12	General-Purpose I/O
			McACLK	I2S Audio Port Clock
			pVS(VSYNC)	Parallel Camera Vertical Sync
			I2C_SCL	I2C Clock
			UART0_TX	UART0 TX Data
			GT_CCP03	Timer Capture Port
GPIO13	I/O	Wake-Up Source	GPIO13	General-Purpose I/O
			I2C_SDA	I2C Data
			pHS(HSYNC)	Parallel Camera Horizontal Sync
			UART0_RX	UART0 RX Data
			GT_CCP04	Timer Capture Port
GPIO14	I/O	NO	GPIO14	General-Purpose I/O
			I2C_SCL	I2C Clock
			GSPI_CLK	General SPI Clock
			pDATA8(CAM_D4)	Parallel Camera Data Bit 4
			GT_CCP05	Timer Capture Port
GPIO15	I/O	NO	GPIO15	General-Purpose I/O
			I2C_SDA	I2C Data
			GSPI_MISO	General SPI MISO
			pDATA9(CAM_D5)	Parallel Camera Data Bit 5
			GT_CCP06	Timer Capture Port
			SDCARD_DATA0	SD Card Data
GPIO16	I/O	NO	GPIO16	General-Purpose I/O
			GSPI_MOSI	General SPI MOSI
			pDATA10(CAM_D6)	Parallel Camera Data Bit 6
			UART1_TX	UART1 TX Data
			GT_CCP07	Timer Capture Port
			SDCARD_CLK	SD Card Clock
GPIO17	I/O	Wake-Up Source	GPIO17	General-Purpose I/O
			UART1_RX	UART1 RX Data
			GSPI_CS	General SPI Chip Select
			pDATA11(CAM_D7)	Parallel Camera Data Bit 7

			SDCARD_CMD	SD Card Command Line
GPIO22	I/O	NO	GPIO22	General-Purpose I/O
			McAFSX	I2S Audio Port Frame Sync
			GT_CCP04	Timer Capture Port
TDI	I/O	NO	TDI	JTAG TDI. Reset Default PinOut.
			GPIO23	General-Purpose I/O
			UART1_TX	UART1 TX Data
			I2C_SCL	I2C Clock
TDO	I/O	Wake-Up Source	TDO	JTAG TDO. Reset Default Pinout.
			GPIO24	General-Purpose I/O
			PWM0	Pulse Width Modulated O/P
			UART1_RX	UART1 RX Data
			I2C_SDA	I2C Data
			GT_CCP06	Timer Capture Port
			McAFSX	I2S Audio Port Frame Sync
GPIO28	I/O	NO	GPIO28	General-Purpose I/O
TCK	I/O	NO	TCK	JTAG/SWD TCK Reset Default Pinout
			GT_PWM03	Pulse Width Modulated O/P
TMS	I/O	NO	TMS	JTAG/SWD TMS Reset Default Pinout
			GPIO29	General-Purpose I/O
SOP2	O	NO	GPIO25	General-Purpose I/O
			GT_PWM02	Pulse Width Modulated O/P
			McAFSX	I2S Audio Port Frame Sync
			TCXO_EN	Enable to Optional External 40MHz TCXO
			SOP2	Sense-On-Power 2
ANTSEL1	O	NO	ANTSEL1	Antenna Selection Control
ANTSEL2	O	NO	ANTSEL2	Antenna Selection Control
SOP1	Config Sense	N/A	SOP1	Sense On Power 1
SOP0	Config Sense	N/A	SOP0	Sense On Power 0
GPIO0	I/O	NO	GPIO0	General-Purpose I/O
			UART0_CTS	UART0 Clear To Send Input(Active Low)
			McAXR1	I2S Audio Port Data 1(RX/TX)
			GT_CCP00	Timer Capture Port
			GSPI_CS	General SPI Chip Select
			UART1_RTS	UART1 Request To Send O(Active Low)
			UART0_RTS	UART0 Request To Send O(Active Low)
			McAXR0	I2S Audio Port Data 0(RX/TX)
GPIO30	I/O	NO	GPIO30	General-Purpose I/O
			UART0_TX	UART0 TX Data

			McACLK	I2S Audio Port Clock O
			McAFSX	I2S Audio Port Frame Sync
			GT_CCPO5	Timer Capture Port
			GSPI_MISO	General SPI MISO
GPIO1	I/O	NO	GPIO1	General-Purpose I/O
			UART0_TX	UART0 TX Data
			pCLK(PIXCLK)	Pixel Clock From Parallel Camera Sensor
			UART1_TX	UART1 TX Data
			GT_CCPO1	Timer Capture Port
GPIO2	I/O	Wake-Up Source	ADC_CH0	ADC Channel 0 Input(1.5V max)
			GPIO2	General-Purpose I/O
			UART0_RX	UART0 RX Data
			UART1_RX	UART1 RX Data
			GT_CCPO2	Timer Capture Port
GPIO3	I/O	NO	ADC_CH1	ADC Channel 1 Input(1.5V max)
			GPIO3	General-Purpose I/O
			UART1_TX	UART1 TX Data
			pDATA7(CAM_D3)	Parallel Camera Data Bit 3
GPIO4	I/O	Wake-Up Source	ADC_CH2	ADC Channel 2 Input(1.5V max)
			GPIO4	General-Purpose I/O
			UART1_RX	UART1 RX Data
			pDATA6(CAM_D2)	Parallel Camera Data Bit 2
GPIO5	I/O	NO	ADC_CH3	ADC Channel 3 Input(1.5V max)
			GPIO5	General-Purpose I/O
			pDATA5(CAM_D1)	Parallel Camera Data Bit 1
			McAXR1	I2S Audio Port Data 1(RX/TX)
			GT_CCPO5	Timer Capture Port
GPIO6	I/O	NO	GPIO6	General-Purpose I/O
			UART0_RTS	UART0 Request To Send O(Active Low)
			pDATA4(CAM_D0)	Parallel Camera Data Bit 0
			UART1_CTS	UART1 Clear To Send Input(Active Low)
			UART0_CTS	UART0 Clear To Send Input(Active Low)
			GT_CCPO6	Timer Capture Port
GPIO7	I/O	NO	GPIO7	General-Purpose I/O
			McACLKX	I2S Audio Port Clock O
			UART1_RTS	UART1 Request To Send O(Active Low)
			UART0_RTS	UART0 Request To Send O(Active Low)
			UART0_TX	UART0 TX Data
GPIO8	I/O	NO	GPIO8	General-Purpose I/O
			SDCARD_IRQ	Interrupt from SD Card(Future support)
			McAFSX	I2S Audio Port Frame Sync

TEL: 0755-86329829 FAX: 0755-86329413

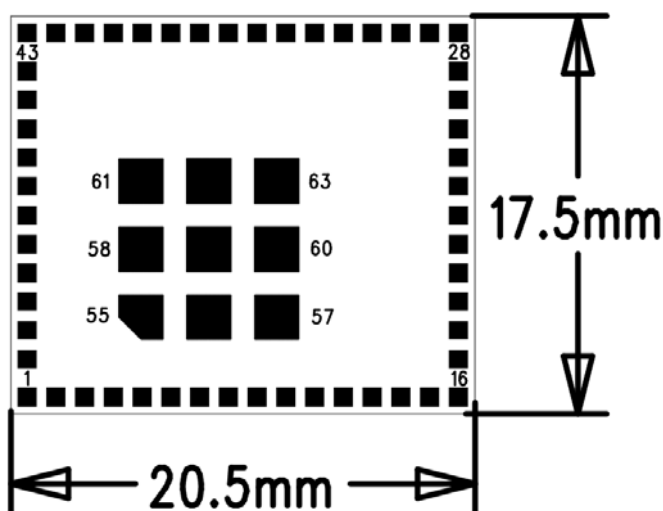
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WEB: www.szrfstar.com

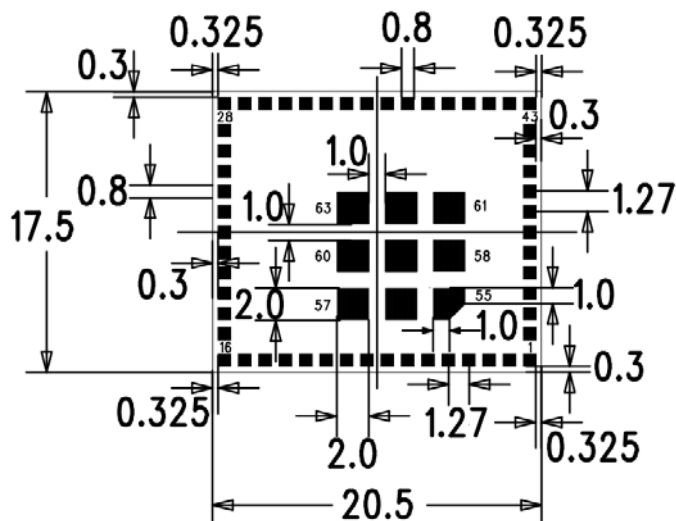
			GT_CCP06	Timer Capture Port
			GPIO9	General-Purpose I/O
			GT_PWM05	Pulse Width Modulated O/P
GPIO9	I/O	NO	SDCARD_DATA0	SD Card Data
			McAXR0	I2S Audio Port Data(RX/TX)
			GT_CCP00	Timer Capture Port

Form2 Pin Multiplex Table

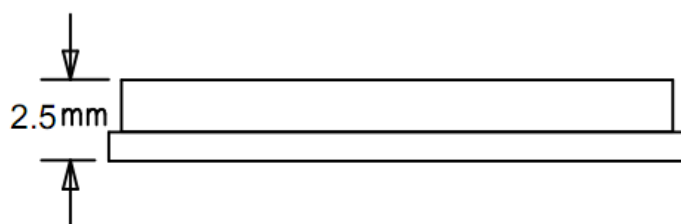
4. Package Size Picture



Picture 4 RF-WM-3220B3 Package Size Picture (Top View)



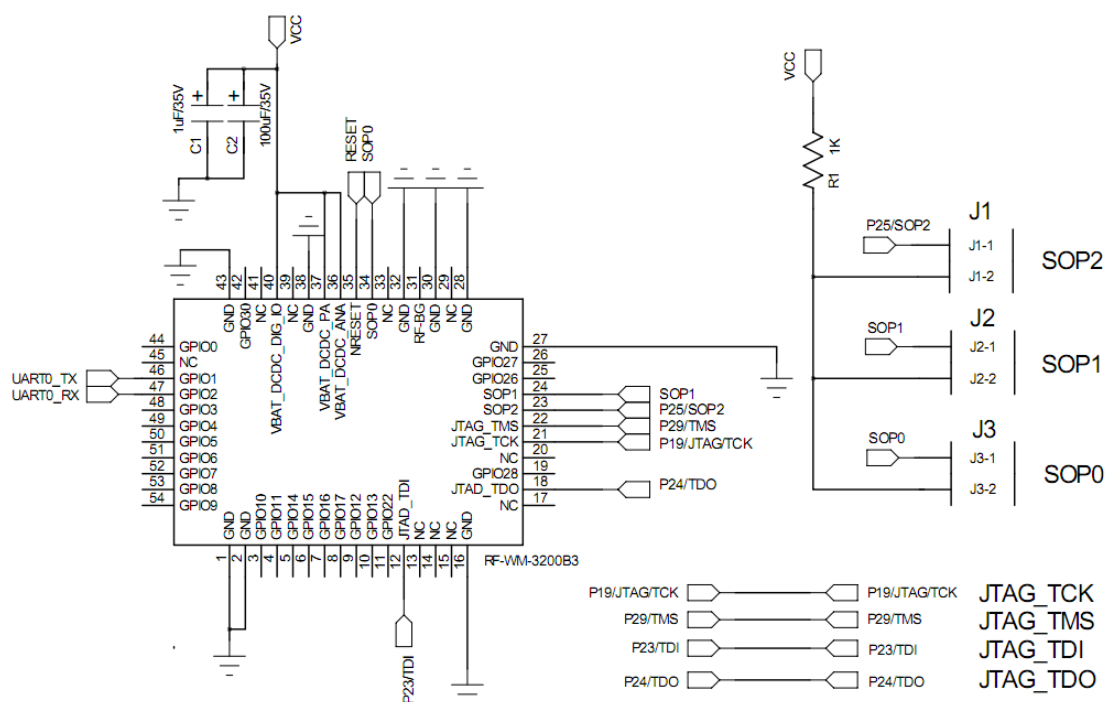
Picture 5 RF-WM-3220B3 Package Size Picture (unit: mm) (Bottom View)



Picture 6 RF-WM-3220B3 Package Size Picture (Side View)

Module Operations

1. SOP Assignment



Picture 7 RF-WM-3220B3 Connection Picture

Remarks:

- When J2 of SOP1 is short connected, J1 of SOP2 & J3 of SOP0 are disconnected (SOP[2,1,0]=010), the module is in flash programming mode. Firmware could be burned into flash via UART0_TX and UART0_RX.
- When J1 of SOP2, J2 of SOP1 and J3 of SOP0 are disconnected (SOP [2,1,0]=000), the module is in the functional module+ 4 Wire JTAG mode.
- When J3 of SOP0 is short connected, J2 of SOP1 and J1 of SOP2 are disconnected (SOP [2,1,0]=001), the module is in the functional module+ 2 Wire JTAG mode.

2. Pin Assignment

Configure the module IO function and generate the corresponding configuration code by using the online PinMux tool (<https://dev.ti.com/>).

Technical Parameters

1. Voltage Range

	Minimum	Typical Value	Maximum
Voltage range	2.3V	3.3V	3.6V

2. Temperature Range

Condition	Temperature Range
Storage temperature	-55 ~ +125 °C
Operating temperature	-20 ~ +70 °C

Remark 1: The operating temperature range of CC3220 chip is -40 ~ +85°C , but the current crystal temperature range is -20 ~ +70 °C .Kindly advise us if higher temperature range is needed,we'll change crystal to improve storage and operating temperature of module accordingly.

3. RF Performance

Wireless mode	Communication rate (modulation)	Transmit power	Receiving sensitivity
IEEE802.11 B	11Mbps@CCK	17.0dBm	-83dBm
IEEE802.11 G	54Mbps@OFDM	13.5dBm	-72dBm
IEEE802.11 N	HT20@MCS7	12.0dBm	-69dBm

Appendix: Version History

version	time	announcer	instructions
1.0.0	2017-10-22	Eaton	First Pre-Release

FCC Statement

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.

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

If the FCC identification number is not visible when the module is installed inside the host, then the outside of the device into which the module is installed must also display a label referring to the enclosed module.

This exterior label can use wording such as the following:

"Contains Transmitter Module Contains FCC ID:2ABN2-RS3220B1" or
"Contains FCC ID: 2ABN2-RS3220B1 Any similar wording that expresses the same meaning may be used.

RF warning statement:

The device has been evaluated to meet general RF exposure requirement.

The device can be used in public exposure condition without restriction.

This device should be installed and operated with minimum distance 20cm between the radiator and your body.