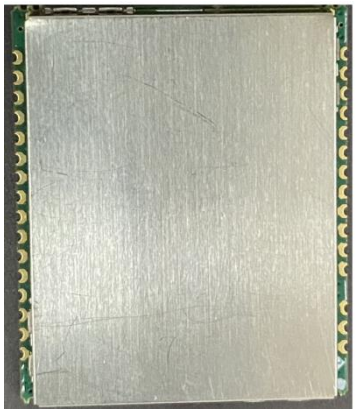
Eastsoft®

Category: Datasheet
Version : V1.1

Wi-SUN Module Datasheet

Product Name: Wi-SUN Module

Model Number: ESMD-WISUN-A0



1 Module Dimension

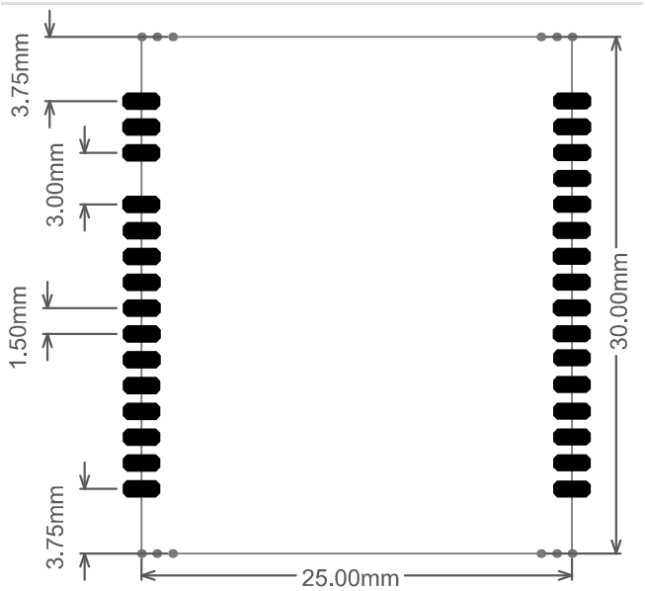


Figure 1 Wi-SUN Module Dimension

2 Features

- Support IEEE 802.15.4g/Wi-SUN
- Frequency Range：902-928MHz
- RF TX：Up to 29dBm , Configurable
- Compact Surface Mount Module：25mm*30mm

3 Block Diagram

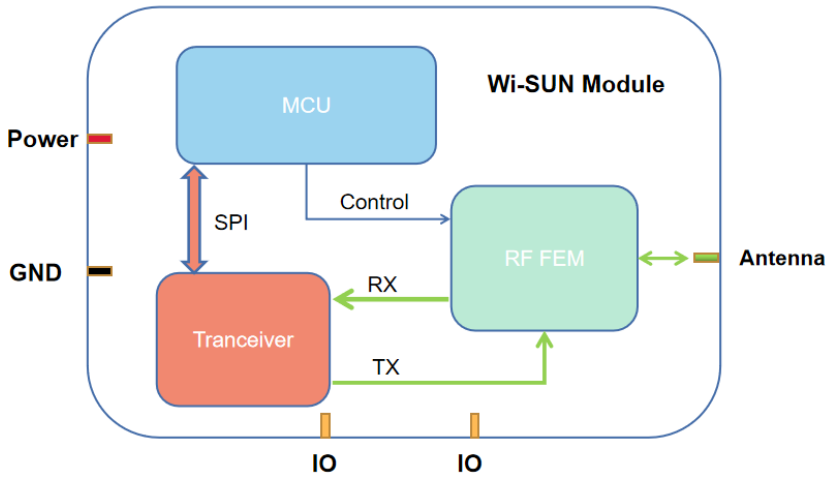


Figure 2 Module Block Diagram

4 Interface Description

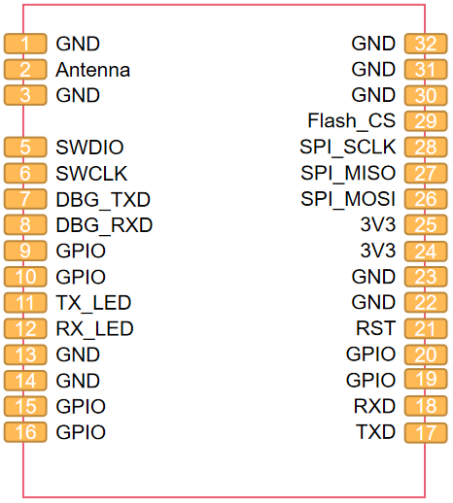


Figure 3 Wi-SUN Module PIN Assignment

PIN No.	PIN Name	Definition
1	GND	GND
2	Antenna	RF output port for the antenna
3	GND	GND
5	SWDIO	Debug pin(SWDIO)
6	SWCLK	Debug pin(SWCLK)
7	DBG_TXD	Debug pin (UART_TX)
8	DBG_RXD	Debug pin (UART_RX)
9	GPIO	GPIO(STA)

10	GPIO	GPIO(EVENTIN)
11	TX_LED	High when transmitting
12	RX_LED	High when receiving
13	GND	GND
14	GND	GND
15	Power_DET	Power down detection input port, High effective.
16	GPIO	GPIO (SET)
17	TXD	UART TX，3.3V Pulled up
18	RXD	UART RX, 3.3V Pulled up
19	GPIO	GPIO
20	GPIO	GPIO
21	RST	Reset pin, low active
22	GND	GND
23	GND	GND
24	3V3	Power supply, 1.3A current at least when RF output>30dBm
25	3V3	
26	SPI_MOSI	Flash MOSI for BR
27	SPI_MISO	Flash MISO for BR
28	SPI_SCLK	Flash CLKI for BR
29	FLASH_CS	Flash CS for BR
30	GND	GND
31	GND	GND
32	GND	GND

Figure 4 Wi-SUN Module PIN Description

5 Antenna Requirements

This wireless module is shipped without an antenna. For the purpose of FCC certification testing, a specific antenna compliant with the relevant regulations was used to verify the module's radio frequency performance and compliance. It is recommended to use our same-model antenna with the purchase of our module or FCC re-certification will be necessary.

6 Operation Condition

Parameters	Symbol	MIN.	Typ.	MAX.	Unit
Supply Voltage	Power	3	3.3	3.6	V
Operating Temperature	TEMP_W	-20	25	80	℃
Storage Temperature	TEMP_S	-45	25	90	℃

Figure 5 Operating Parameter Table

Federal Communication Commission Statement (FCC, U.S.)

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 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.

FCC Caution:

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

FCC Radiation Exposure Statement:

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.

IMPORTANT NOTES

Co-location warning:

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

OEM integration instructions:

This device is intended only for OEM integrators under the following conditions:
The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module.
As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the hostequipment is no longer considered valid and the FCC ID of the module cannot be used on the final

product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End product labeling:

The final end product must be labeled in a visible area with the following: “Contains Transmitter Module FCC ID: 2BP5O-ESWSN0CDF”.

Information that must be placed in the end user manual:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

Integration instructions for host product manufactures according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

FCC Part 15 Subpart C 15.247 & 15.207 & 15.209

2.3 Specific operational use conditions

The host manufacturer installing this module into their product must ensure that the final composit product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operaition. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

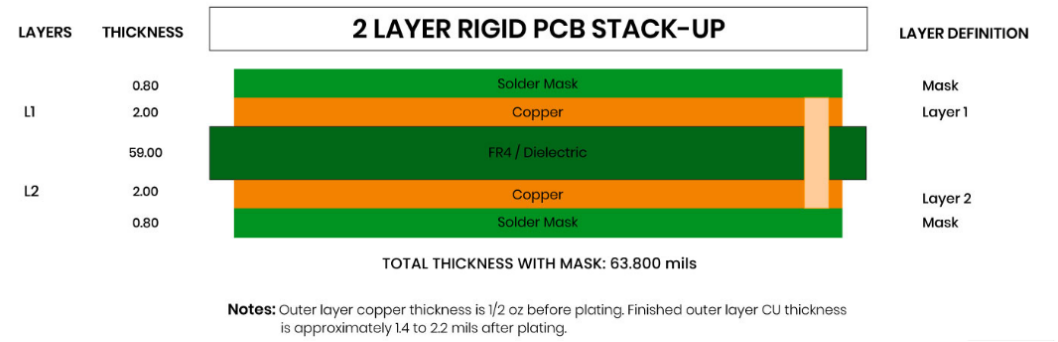
2.4 Limited module procedures

Not applicable.

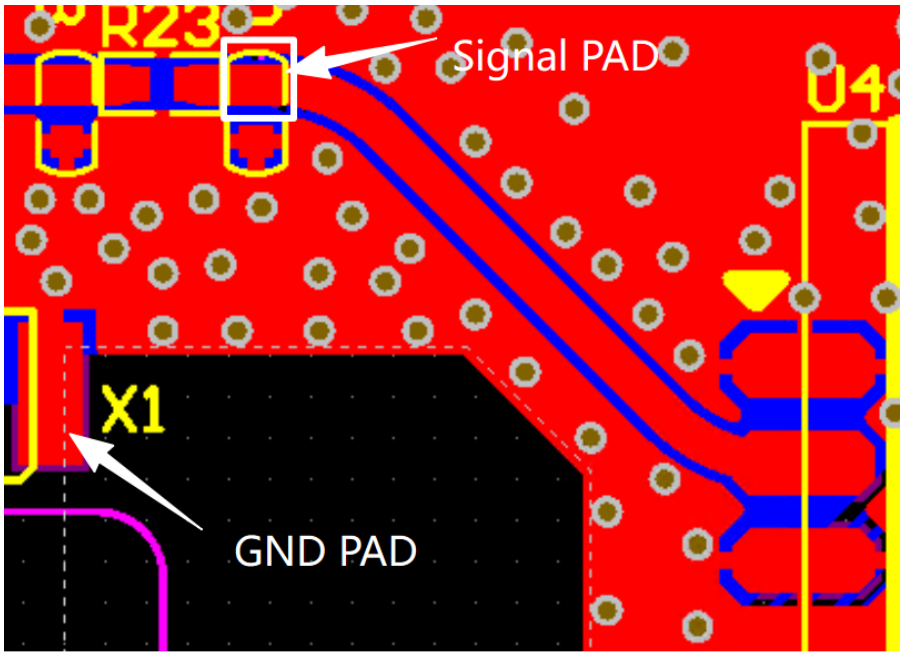
2.5 Trace antenna designs

During FCC certification, a microstrip line and an RP-SMA cable are required to test the performance of the module.

The microstrip line is designed on a two-layer board, with the trace on the TOP layer and the GND on the Bottom layer. The PCB stack-up structure is shown in the figure below, with a dielectric constant of 4.2.

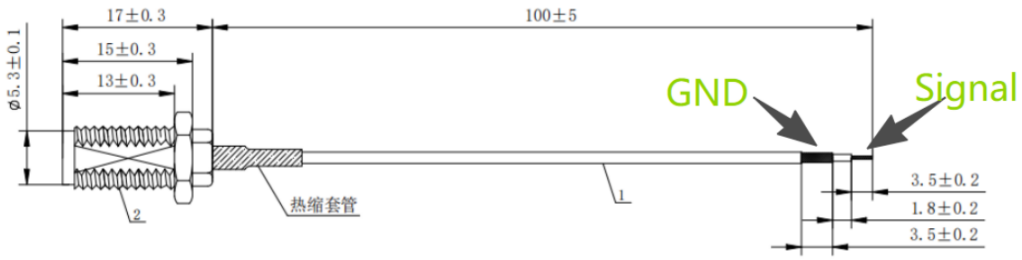


The shape of the microstrip line is as follows. For detailed design parameters of this microstrip line, please refer to the provided Microstrip Gerber file.

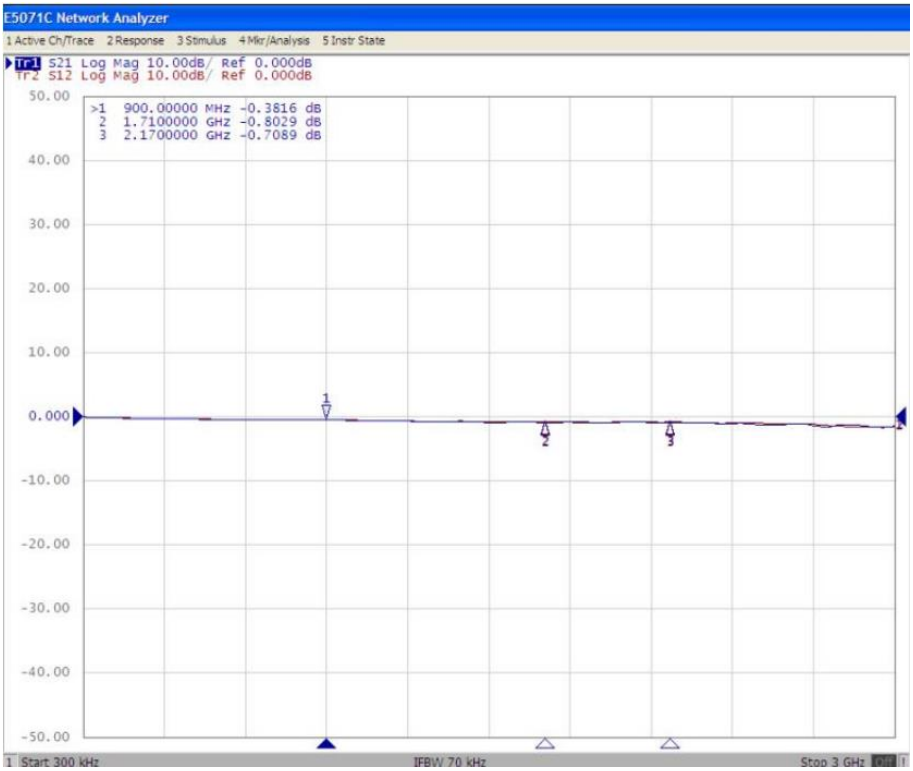


The cable has an RP-SMA connector on one end and exposed metal wires on the other end, including GND and signal wires. Its specifications, model, and physical dimensions are as follows:

Name	Manufacture	Modle	Impedance	Frequency Range	Connector	Cable Type
RP SMA Cable	Top Point Technology Xiangyang Co., Ltd.	DDZ-N/S-1073	50	0.03~6GHz	RP SMA(F)	RG1.13



Unit(mm)



For the purpose of FCC certification, microtrip and RP-SMA cable was used during testing and approval. End users and integrators shall use the same trace antenna design and RP SMA cable for this module.

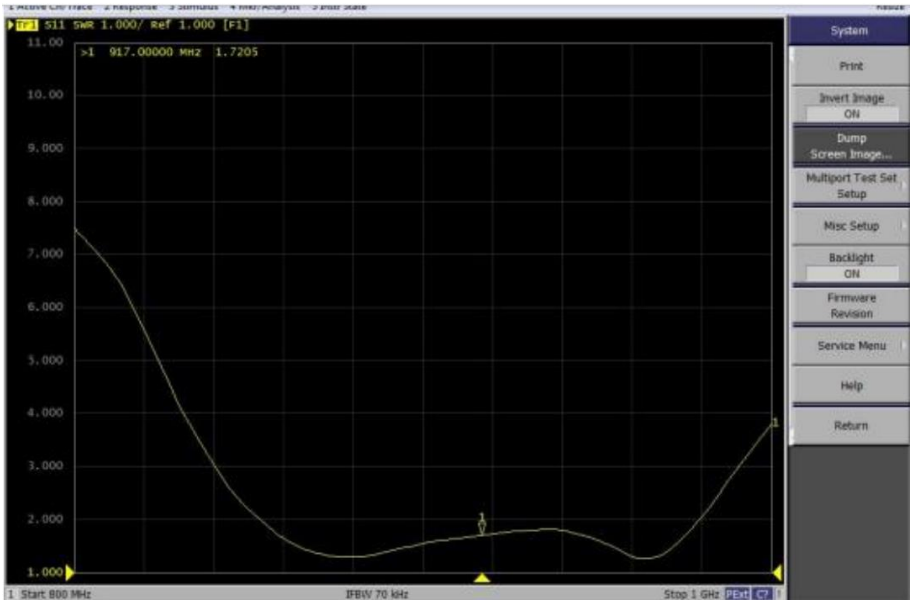
2.6 RF exposure considerations

The module must be installed in the host equipment such that at least 20cm is maintained between the antenna and users ’ body; and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization

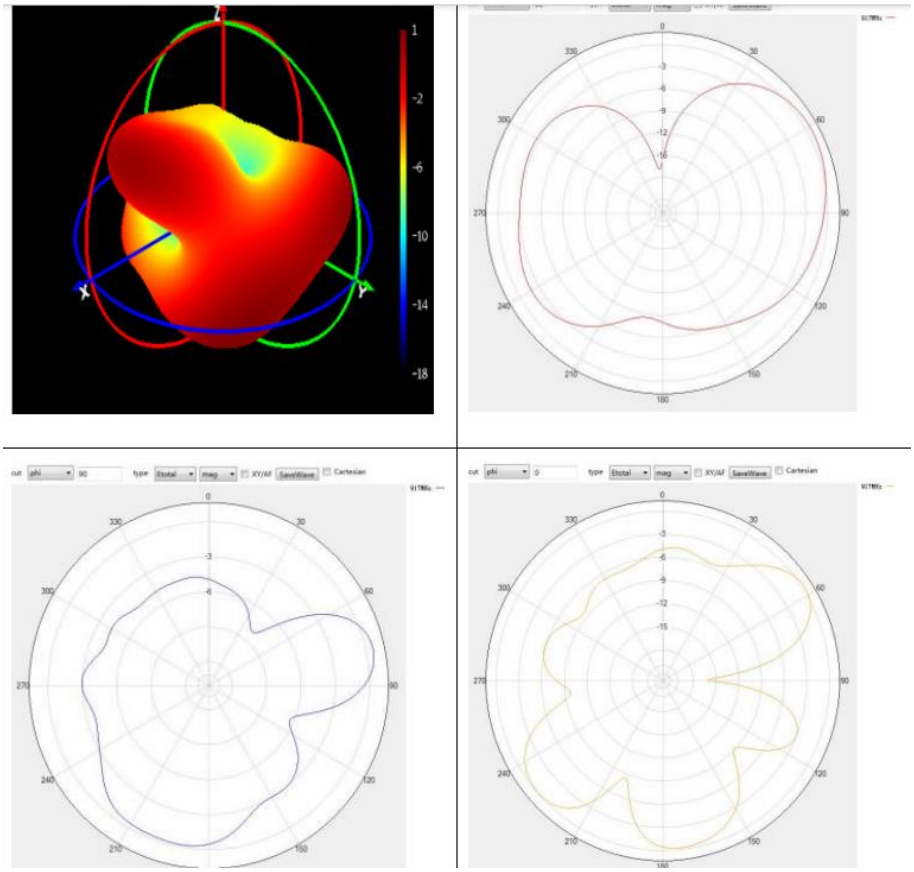
2.7 Antennas

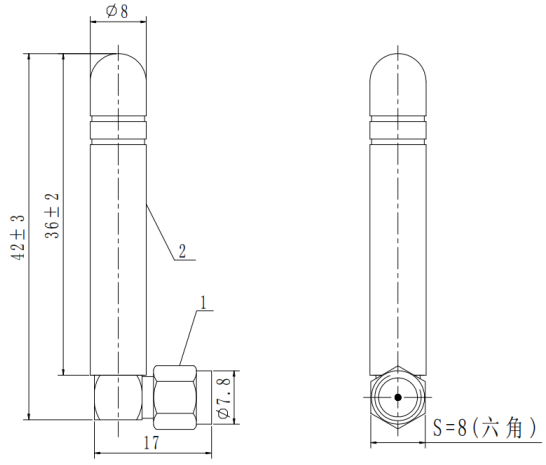
Antenna Type	Manufacturer	Model	Gain (max)	Impedance	Monting	Part No.
Monopole	Top Point Technology Xiangyang Co., Ltd.	DDA-U917-222	1	50Ω	RP-SMA(M)	10307000094

Name :External suction cup antenna(DD3001222)		Model Type	DDA-U917-222
ELECTRICAL SPECTFICATIONS		MECHANICAL SPECTFICATIONS	
Frenquency Range	915±15 MHz	Height	42±3 mm
Band Width	30 MHz	Connector	RP SMA(M)
Impedance	50Ω	Chassis material	ABS
VSWR	≤2	Chassis color	black
Gain	1 dBi	Cable Length	/
Polarization	Horizontal/veVertical	Working Temperature	-40℃～+85℃
Radiation	omnidirectional	Limit Temperature	-40℃～+85℃
Power	50W		



frequency 频率 (MHz)	gain 增益(dBi)	efficiency 效率	frequency 频率 (MHz)	gain 增益(dBi)	efficiency 效率
900	0.79	50.00%	916	0.9	51.26%
901	0.78	50.38%	917	0.92	51.37%
902	0.74	50.51%	918	0.92	51.47%
903	0.72	50.64%	919	0.95	51.91%
904	0.7	50.91%	920	0.98	52.22%
905	0.68	50.93%	921	0.94	51.80%
906	0.66	50.31%	922	0.94	51.85%
907	0.69	50.43%	923	0.95	52.05%
908	0.72	50.63%	924	0.96	52.10%
909	0.77	50.79%	925	0.94	51.82%
910	0.78	50.46%	926	0.97	51.97%
911	0.81	50.69%	927	1	52.26%
912	0.82	50.78%	928	1	52.26%
913	0.84	50.81%	929	0.97	51.99%
914	0.84	50.61%	930	1	52.29%
915	0.89	51.11%			





This device is intended only for host manufacturers under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna; The module shall be only used with the antenna(s) that has been originally tested and certified with this module.

As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.)

2.8 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating “Contains Transmitter Module FCC ID: 2BP5O-ESWSN0CDF” with their finished product.

2.9 Information on test modes and additional testingrequirements

Operation Frequency: 902~928MHz

Number of Channel: 64

Modulation: FSK Host manufacturer must perfom test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 & 15.207 & 15.209 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional radiator digital circuity), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.