

# TEST REPORT

**Product Name** : WIFI&BT Module  
**Brand Mark** : N/A  
**Model No.** : AW65S1-50B1  
**Extension model** : AW65S1-50B2, AW65S1-50B2,  
AW65S1-50B3, AW65S1-50B4,  
AW65S1-50B5, AW65S1-50B6,  
AW65S1-50B7, AW65S1-50B8  
**Report Number** : BLA-EMC-202305-A10901  
**FCC ID** : VYV-AW65S1-50B1  
**Date of Sample Receipt** : 2023/5/31  
**Date of Test** : 2023/6/1 to 2023/7/28  
**Date of Issue** : 2023/7/28  
**Test Standard** : 47 CFR Part 15, Subpart C 15.247  
**Test Result** : Pass

Prepared for:

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Date:

2023/7/25



## REPORT REVISE RECORD

Version No.	Date	Description
00	2023/7/28	Original

BlueAsia

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## 1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5 & Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(1) & 15.247(b)(3)	Pass
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass

## 2 GENERAL INFORMATION

<b>Applicant</b>	Iton Technology Corp.
<b>Address</b>	7 Floor East, Building C, Shenzhen International Innovation Center, No.1006 Shennan Rd. Futian Dist
<b>Manufacturer</b>	Iton Technology Corp.
<b>Address</b>	7th Floor, Building C, Shenzhen International Innovation Center (Futian Science and Technology Plaza), 1006 Shennan Road, Huafu Street, Futian District, Shenzhen City, Guangdong Province, China
<b>Factory</b>	Huizhou Langda Industrial Co.
<b>Address</b>	6/F, No.1 Plant, Langhua Smart New City Project, No.2, Shuiwei 3rd Road, Qingchun Village, Chenjiang Sub-district, Zhongkai High-Tech Industry Development Zone, Huizhou
<b>Product Name</b>	WIFI&BT Module
<b>Test Model No.</b>	AW65S1-50B1
<b>Extension model</b>	AW65S1-50B2, AW65S1-50B2, AW65S1-50B3, AW65S1-50B4, AW65S1-50B5, AW65S1-50B6, AW65S1-50B7, AW65S1-50B8
<b>Note</b>	All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are model name for commercial purpose.

## 3 GENERAL DESCRIPTION OF E.U.T.

<b>Hardware Version</b>	V1.0
<b>Software Version</b>	20230313
<b>Operation Frequency:</b>	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz
<b>Modulation Type:</b>	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11ax: OFDMA
<b>Channel Spacing:</b>	5MHz
<b>Number of Channels:</b>	802.11b/g/n(HT20):11 802.11n(HT40):7
<b>Antenna Type:</b>	External Antenna
<b>Antenna Gain:</b>	3dBi (Provided by the applicant)
<b>Note:</b>	Antenna number : 2 SISO mode: 802.11b/ 802.11g MIMO mode : 802.11n(HT20)/ 802.11n(HT40)/ 802.11ax(HT20)/ 802.11ax(HT40) Directional gain of MIMO mode:3+10log2=6.01dBi
Remark:The Antenna Gain is supplied by the customer.BlueAsia is not responsible for this data	

Note: if transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced.

Because the directional gain = 6.31dB > 6.0 dBi, the limit should be calculated as below:

Power:

$$\begin{aligned}\text{Limit} &= 30 \text{ dBm} - (\text{ANT Gain} + 10 \cdot \log(N=2)) - 6 \text{ dBi} \\ &= 30 \text{ dBm} - (3 + 3.01 - 6) \text{ dBi} = 29.99 \text{ dBm}\end{aligned}$$

P.S.D:

$$\begin{aligned}\text{Limit} &= 8 \text{ dBm} - (\text{ANT Gain} + 10 \cdot \log(N=2)) - 6 \text{ dBi} \\ &= 8 \text{ dBm} - (3 + 3.01 - 6) \text{ dBi} = 7.99 \text{ dBm}\end{aligned}$$

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz	X	

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)
	802.11b/802.11g/802.11n(HT20)
Lowest channel	2412MHz
Middle channel	2437MHz
Highest channel	2462MHz
Test channel	802.11n(HT40)
	2422MHz
Lowest channel	2422MHz
Middle channel	2437MHz
Highest channel	2452MHz



#### 4 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25°C	3.3Vdc

#### 5 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
Transmitting mode	Keep the EUT in continuously transmitting mode with modulation. (The duty cycle is greater than 98%)
Remark: Full battery is used during all test except ac conducted emission, 802.11b/g/n(HT20) and 802.11n(HT40) all have been tested, During the radiated spurious emission test , 802.11b/11g/11nH20/11nH40 modulations all have been tested,only worse case 802.11b is reported.	

#### 6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission(9kHz-30MHz)	±4.34dB
Radiated Emission(30Mz-1000MHz)	±4.24dB
Radiated Emission(1GHz-18GHz)	±4.68dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB

## 7 DESCRIPTION OF SUPPORT UNIT

Device Type	Manufacturer	Model Name	Serial No.	Remark
AC adaptor	From client	RJ35-W120150US	/	/

## 8 LABORATORY LOCATION

All tests were performed at:  
BlueAsia of Technical Services(Shenzhen) Co.,Ltd.  
Building C, No. 107, Shihuan Road, Shiyuan Sub-District, Baoan District, Shenzhen, Guangdong Province,  
China  
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

## 9 TEST INSTRUMENTS LIST

Test Equipment Of RF Conducted Test					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2022/09/15	2023/09/14
Spectrum	Agilent	N9020A	MY49100060	2022/09/07	2023/09/06
Spectrum	KEYSIGHT	N9030A	MY52350152	2022/07/01	2023/06/30
				2023/06/29	2024/06/28
Spectrum	KEYSIGHT	N9010A	MY54330814	2022/07/01	2023/06/30
				2023/06/29	2024/06/28
Signal Generator	Agilent	N5182A	MY47420955	2022/09/07	2023/09/06
Signal Generator	Agilent	E8257D	MY44320250	2022/07/01	2023/06/30
				2023/06/29	2024/06/28
Signal Generator	Agilent	N5181A	MY46240904	2022/08/02	2023/08/01
Signal Generator	R&S	CMW500	132429	2022/09/07	2023/09/06
BluetoothTester	Anritsu	MT8852B	06262047872	2022/09/07	2023/09/06
Power probe	DARE	RPR3006W	14I00889SN042	2022/09/07	2023/09/06
DCPowersupply	zhaoxin	KXN-305D	20K305D1221363	2022/09/14	2023/09/13
DCPowersupply	zhaoxin	RXN-1505D	19R1505D050168	2022/09/14	2023/09/13

Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Shield room	SKET	833	N/A	2020/11/25	2023/11/24
Receiver	R&S	ESPI3	101082	2022/09/14	2023/09/13
LISN	R&S	ENV216	3560.6550.15	2022/09/14	2023/09/13
LISN	AT	AT166-2	AKK1806000003	2022/09/14	2023/09/13
ISN	TESEQ	ISNT8-cat6	53580	2022/09/14	2023/09/13
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01045	2022/08/17	2023/08/16
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01075	2022/08/17	2023/08/16
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A

<b>Test Equipment Of Radiated Spurious Emissions</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>S/N</b>	<b>Cal.Date</b>	<b>Cal.Due</b>
Chamber 1	SKET	966	N/A	2020/11/10	2023/11/9
Chamber 2	SKET	966	N/A	2021/07/20	2024/07/19
Spectrum	R&S	FSP40	100817	2022/09/15	2023/09/14
Receiver	R&S	ESR7	101199	2022/09/15	2023/09/14
Receiver	R&S	ESPI7	101477	2022/07/16	2023/07/15
				2023/07/14	2024/07/13
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2022/09/15	2023/09/14
Horn Antenna	Schwarzbeck	BBHA9120D	01892 P:00331	2022/09/13	2025/09/12
Amplifier	SKET	LNPA_30M01G-30	SK2021060801	2022/07/16	2023/07/15
				2023/07/14	2024/07/13
Amplifier	SKET	PA-000318G-45	N/A	2022/09/13	2023/09/12
Amplifier	SKET	LNPA_18G40G-50	SK2022071301	2022/07/14	2023/07/13
				2023/07/14	2024/07/13
Filter group	SKET	2.4G/5G Filter group r	N/A	2022/07/16	2023/07/15
				2023/07/14	2024/07/13
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2022/9/14	2025/9/13
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

## 10 ANTENNA REQUIREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

### 10.1 CONCLUSION

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The best case gain of the antenna is 3dBi.

## 11 RADIATED SPURIOUS EMISSIONS

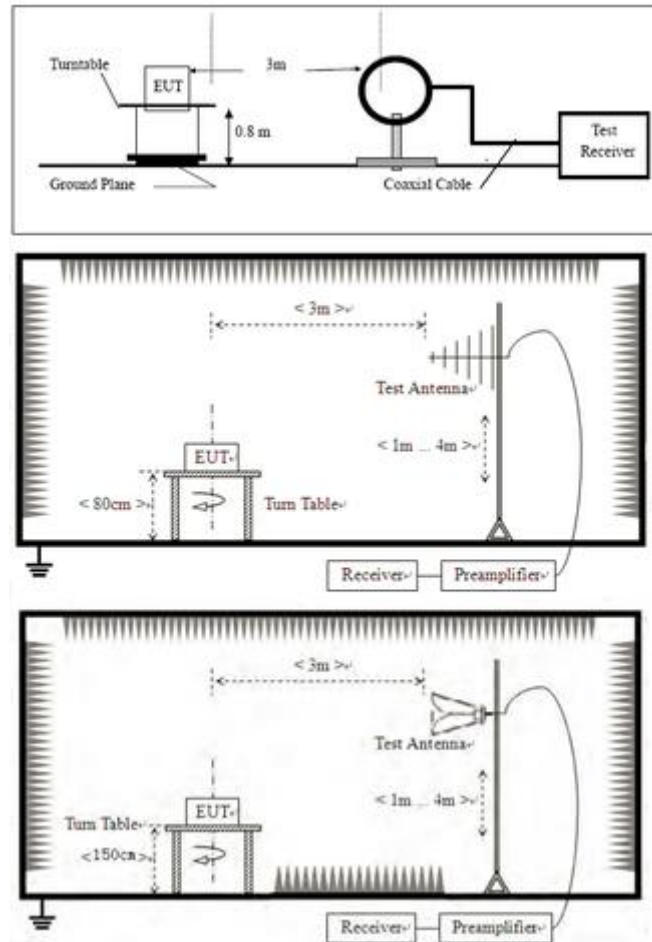
<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.247
<b>Test Method</b>	ANSI C63.10 (2013) Section 6.4,6.5,6.6
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Jozu
<b>Temperature</b>	25°C
<b>Humidity</b>	60%

### 11.1 LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

## 11.2 BLOCK DIAGRAM OF TEST SETUP



## 11.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

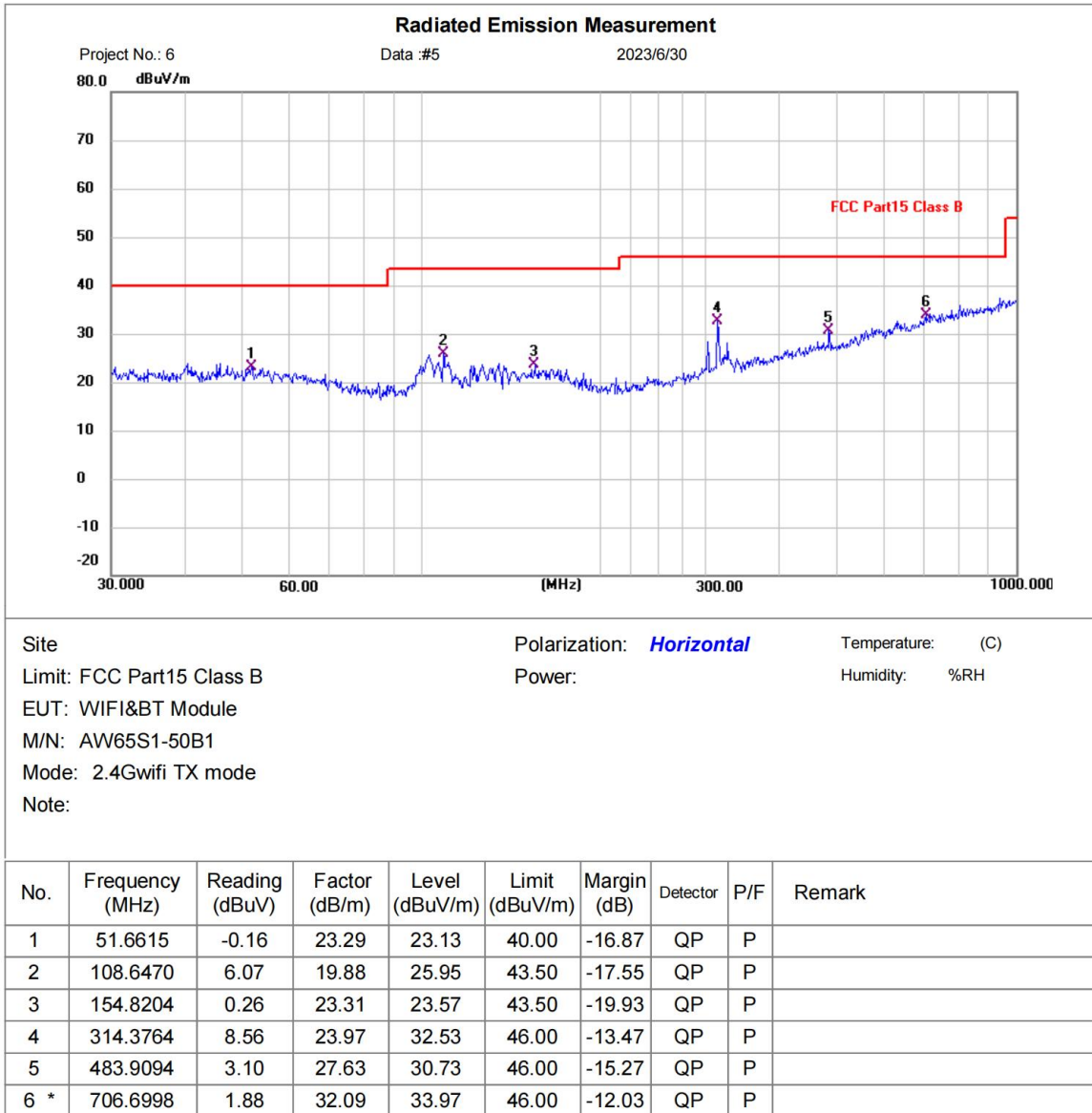
Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



### 11.4 TEST DATA

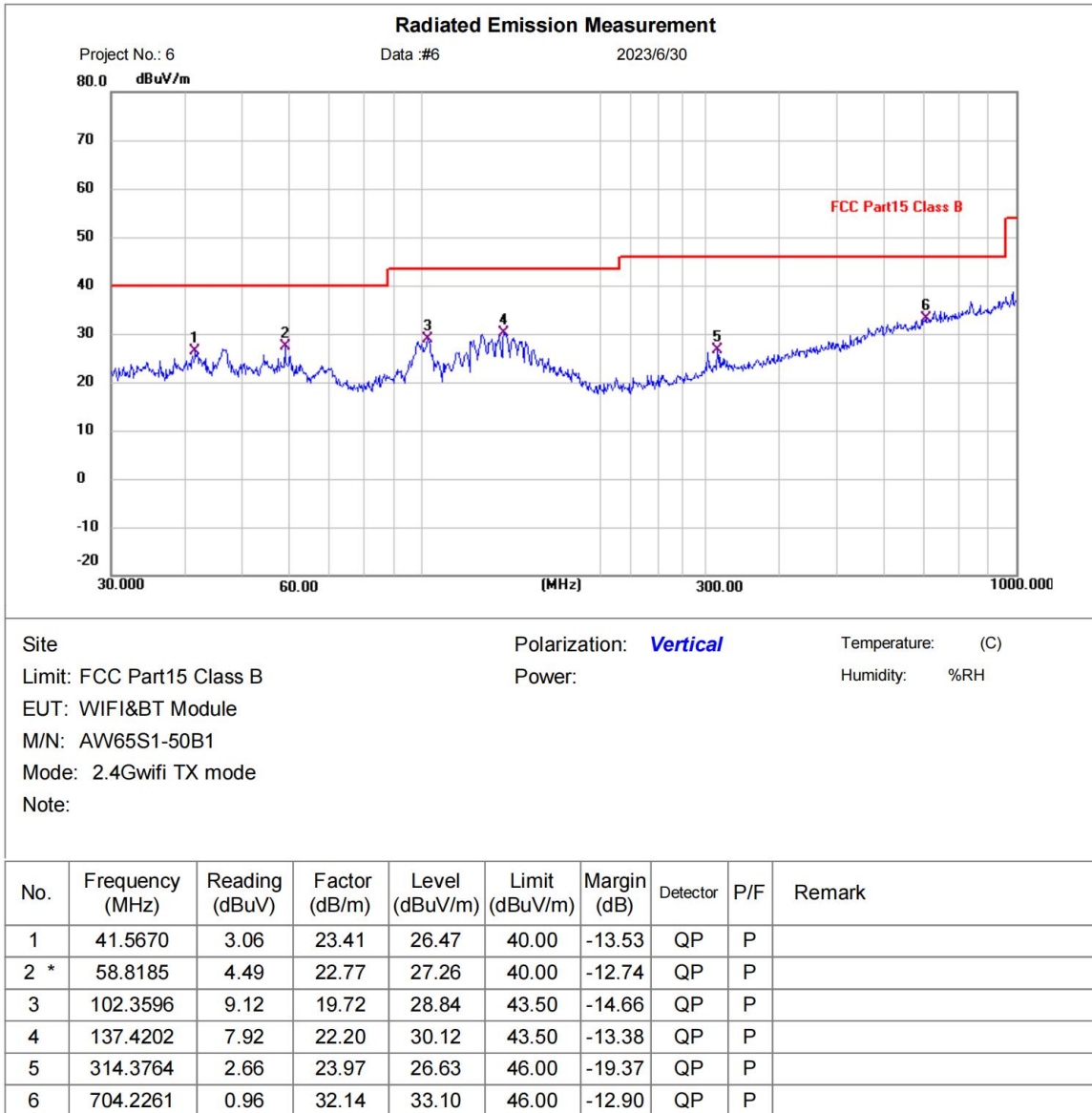
[TestMode: TX below 1G]; [Polarity: Horizontal]



\*:Maximum data    x:Over limit    !:over margin

**Test Result: Pass**

[TestMode: TX below 1G]; [Polarity: Vertical]

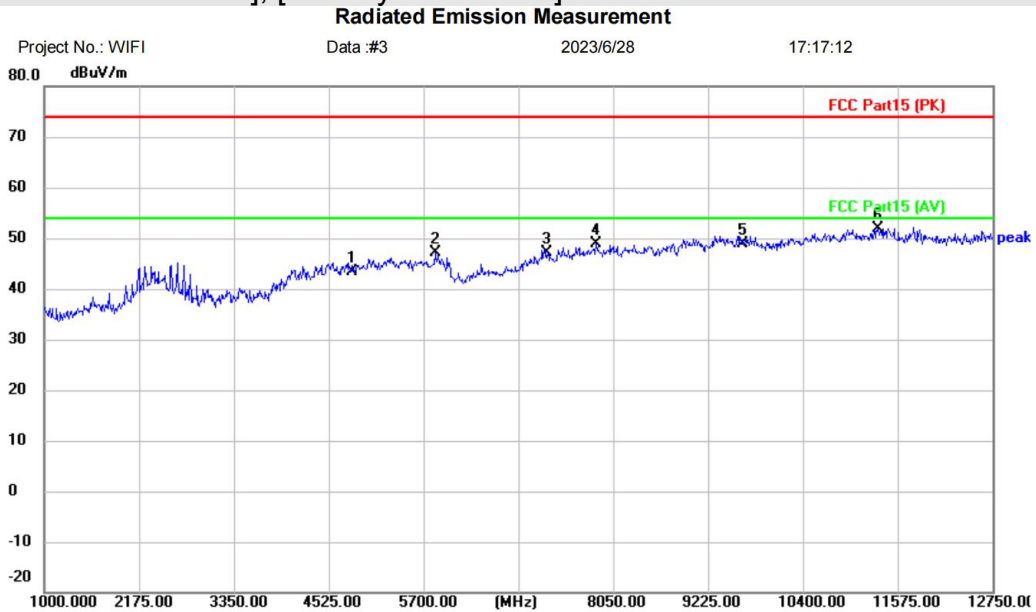


\*:Maximum data    x:Over limit    !:over margin

**Test Result: Pass**

Remark: During the test, pre-scan the 802.11b/g/n mode, and found the 802.11b mode which it is worse case.

[TestMode: TX low channel]; [Polarity: Horizontal]



Site	Polarization: <b>Horizontal</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: WIFI&BT Module		
M/N: AW65S1-50B1		
Mode: 2.4Gwifi-11B-TX-L		
Note:		

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	4824.000	38.86	4.52	43.38	74.00	-30.62	peak	
2	5841.000	40.68	6.49	47.17	74.00	-26.83	peak	
3	7236.000	39.58	7.47	47.05	74.00	-26.95	peak	
4	7838.500	40.29	8.66	48.95	74.00	-25.05	peak	
5	9648.000	37.30	11.63	48.93	74.00	-25.07	peak	
6 *	11328.25	38.37	13.39	51.76	74.00	-22.24	peak	

\*:Maximum data    x:Over limit    !:over margin      (Reference Only)

Receiver:      ESP1\_1      Spectrum Analyzer:      FSP40

**Test Result: Pass**

[TestMode: TX low channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site:      Polarization: **Vertical**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
 EUT: WIFI&BT Module  
 M/N: AW65S1-50B1  
 Mode: 2.4Gwifi-11B-TX-L  
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4824.000	39.26	4.52	43.78	74.00	-30.22	peak	
2		5946.750	39.69	6.73	46.42	74.00	-27.58	peak	
3		7236.000	37.83	7.47	45.30	74.00	-28.70	peak	
4		8672.750	39.33	9.81	49.14	74.00	-24.86	peak	
5		9648.000	38.37	11.63	50.00	74.00	-24.00	peak	
6	*	10999.25	38.94	13.82	52.76	74.00	-21.24	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

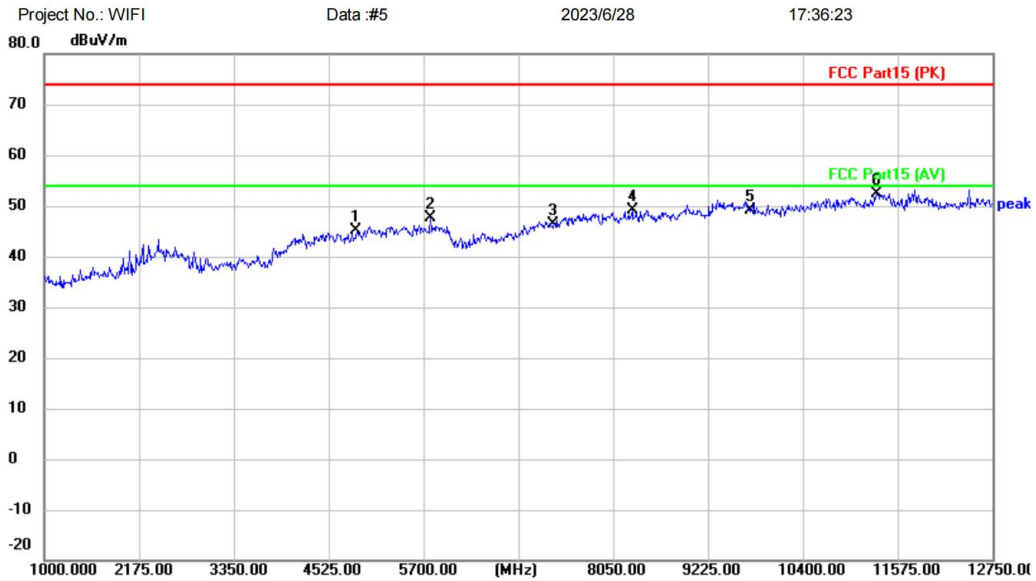
Receiver: ESPI\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX mid channel]; [Polarity: Horizontal]

**Radiated Emission Measurement**



Site:      Polarization: **Horizontal**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
 EUT: WIFI&BT Module  
 M/N: AW65S1-50B1  
 Mode: 2.4Gwifi-11B-TX-M  
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4874.000	40.46	4.58	45.04	74.00	-28.96	peak	
2		5782.250	41.48	6.27	47.75	74.00	-26.25	peak	
3		7311.000	38.51	7.80	46.31	74.00	-27.69	peak	
4		8285.000	40.34	8.79	49.13	74.00	-24.87	peak	
5		9748.000	37.52	11.71	49.23	74.00	-24.77	peak	
6	*	11316.50	38.92	13.39	52.31	74.00	-21.69	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

Receiver: ESPI\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX mid channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site	Polarization: <b>Vertical</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: WIFI&BT Module		
M/N: AW65S1-50B1		
Mode: 2.4Gwifi-11B-TX-M		
Note:		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4874.000	39.07	4.58	43.65	74.00	-30.35	peak	
2		5829.250	40.81	6.40	47.21	74.00	-26.79	peak	
3		7311.000	38.40	7.80	46.20	74.00	-27.80	peak	
4		8473.000	39.82	9.31	49.13	74.00	-24.87	peak	
5		9748.000	36.89	11.71	48.60	74.00	-25.40	peak	
6	*	11363.50	40.04	13.40	53.44	74.00	-20.56	peak	

\*:Maximum data    x:Over limit    !:over margin

< Reference Only

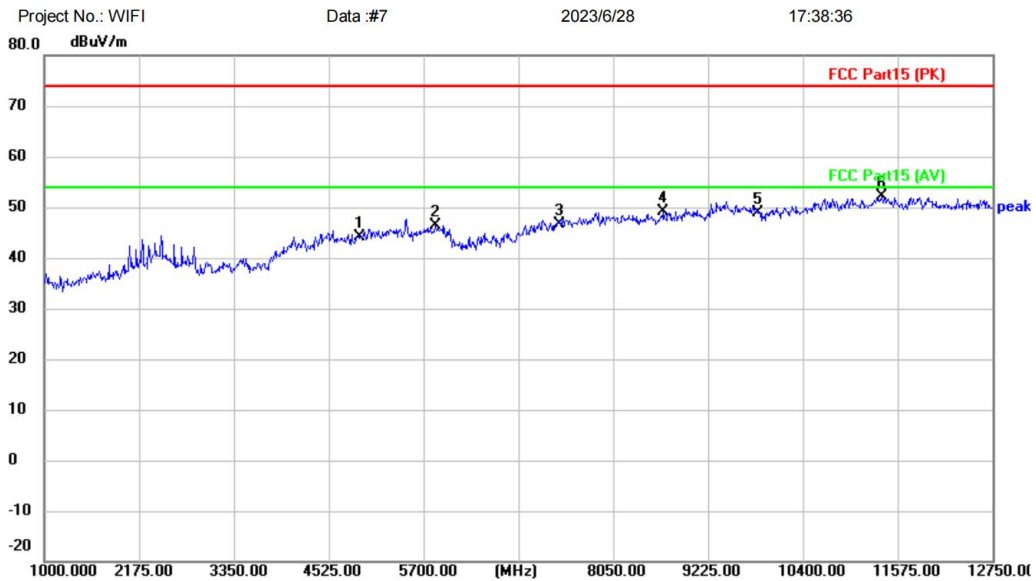
Receiver: ESPI\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Horizontal]

**Radiated Emission Measurement**



Project No.: WIFI      Data :#7      2023/6/28      17:38:36

Site:      Polarization: **Horizontal**      Temperature: (C)

Limit: FCC Part15 (PK)      Power:      Humidity: %RH

EUT: WIFI&BT Module

M/N: AW65S1-50B1

Mode: 2.4Gwifi-11B-TX-H

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4924.000	39.21	4.96	44.17	74.00	-29.83	peak	
2		5841.000	40.01	6.49	46.50	74.00	-27.50	peak	
3		7386.000	38.88	7.87	46.75	74.00	-27.25	peak	
4		8672.750	39.37	9.81	49.18	74.00	-24.82	peak	
5		9848.000	36.93	12.00	48.93	74.00	-25.07	peak	
6	*	11375.25	38.70	13.40	52.10	74.00	-21.90	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

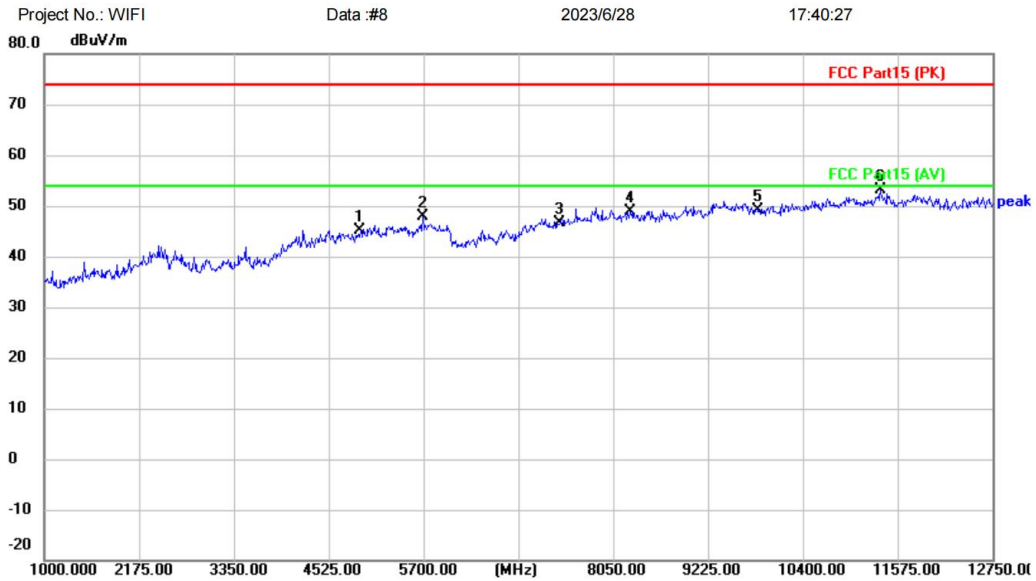
Receiver: ESPI\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Project No.: WIFI      Data :#8      2023/6/28      17:40:27

Site      Polarization: **Vertical**      Temperature: (C)

Limit: FCC Part15 (PK)      Power:      Humidity: %RH

EUT: WIFI&BT Module

M/N: AW65S1-50B1

Mode: 2.4Gwifi-11B-TX-H

Note:

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	4924.000	40.08	4.96	45.04	74.00	-28.96	peak	
2	5688.250	41.44	6.36	47.80	74.00	-26.20	peak	
3	7386.000	38.68	7.87	46.55	74.00	-27.45	peak	
4	8261.500	40.25	8.62	48.87	74.00	-25.13	peak	
5	9848.000	37.01	12.00	49.01	74.00	-24.99	peak	
6 *	11363.50	39.74	13.40	53.14	74.00	-20.86	peak	

\*:Maximum data    x:Over limit    !:over margin      (Reference Only)

Receiver:    ESPI\_1      Spectrum Analyzer:    FSP40

**Test Result: Pass**



Remark:

1. Final Level = Receiver Read level + Correct factor
2. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

BlueAsia

## 12 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

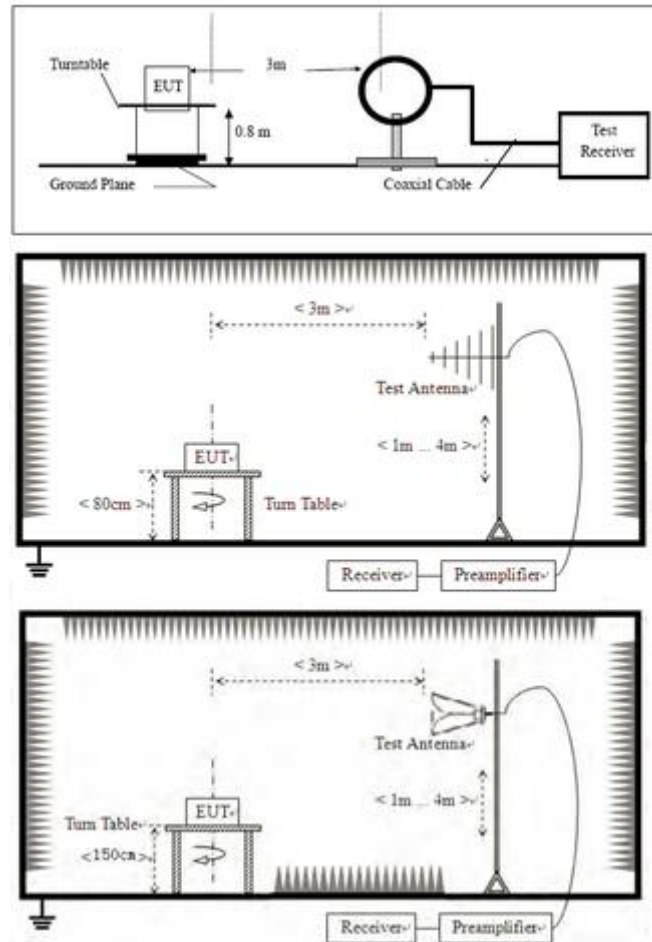
<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.247
<b>Test Method</b>	ANSI C63.10 (2013) Section 6.10.5
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Jozu
<b>Temperature</b>	25°C
<b>Humidity</b>	60%

### 12.1 LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

## 12.2 BLOCK DIAGRAM OF TEST SETUP



## 12.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1:  $Level = Read\ Level + Cable\ Loss + Antenna\ Factor - Preamp\ Factor$

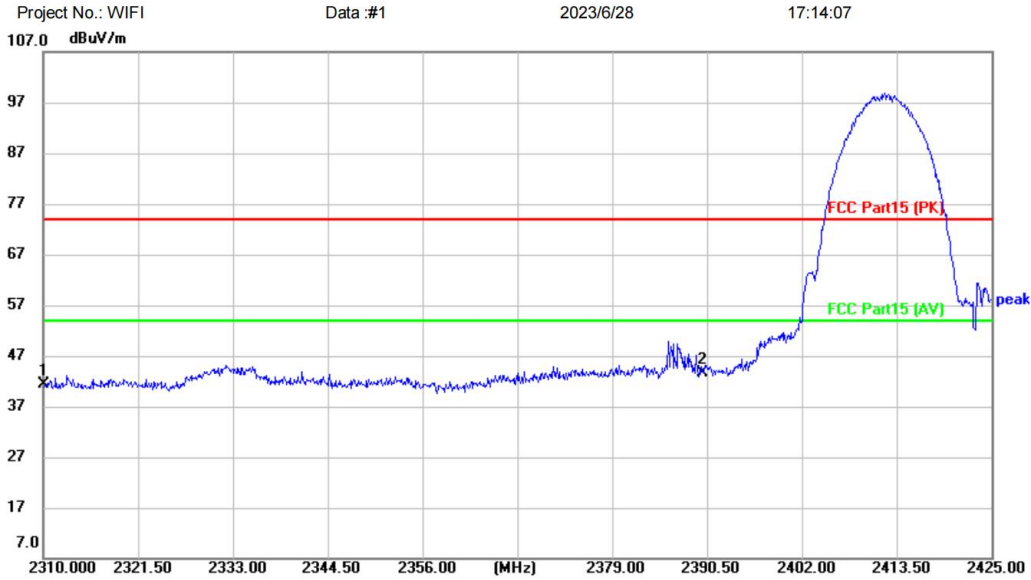
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

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### 12.4 TEST DATA

[TestMode: TX b low channel]; [Polarity: Horizontal]

#### Radiated Emission Measurement



Site	Polarization: <b>Horizontal</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: WIFI&BT Module		
M/N: AW65S1-50B1		
Mode: 2.4Gwifi-11B-TX-L		
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2310.000	45.78	-4.40	41.38	74.00	-32.62	peak	
2	*	2390.000	48.05	-4.31	43.74	74.00	-30.26	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

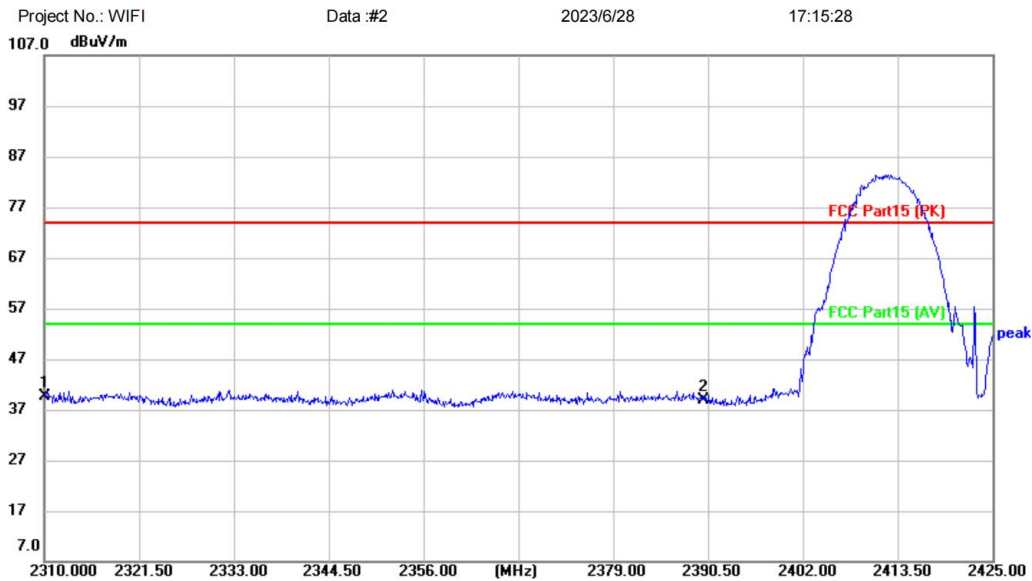
Receiver: ESPI\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX b low channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site	Polarization: <b>Vertical</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: WIFI&BT Module		
M/N: AW65S1-50B1		
Mode: 2.4Gwifi-11B-TX-L		
Note:		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2310.000	44.09	-4.40	39.69	74.00	-34.31	peak	
2		2390.000	43.08	-4.31	38.77	74.00	-35.23	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

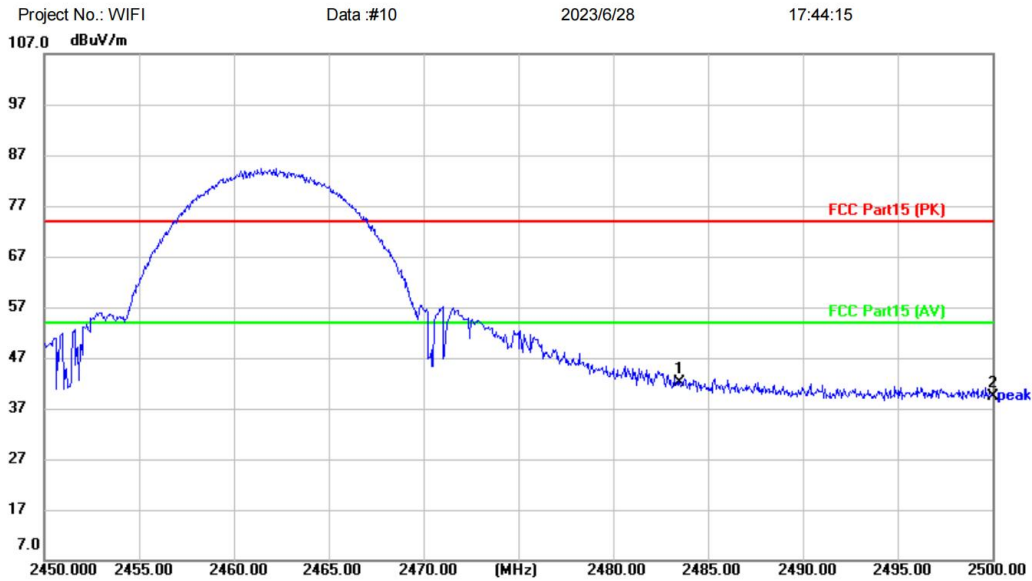
Receiver: ESPI\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX b high channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site:      Polarization: **Vertical**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
 EUT: WIFI&BT Module  
 M/N: AW65S1-50B1  
 Mode: 2.4Gwifi-11B-TX-H  
 Note:

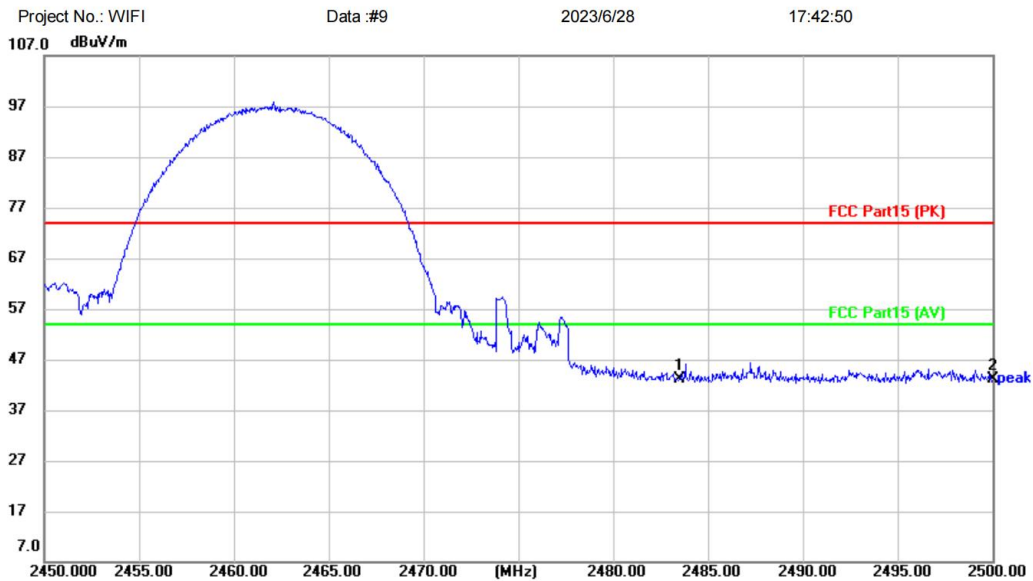
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2483.500	46.74	-4.64	42.10	74.00	-31.90	peak	
2		2500.000	44.09	-4.75	39.34	74.00	-34.66	peak	

\*:Maximum data    x:Over limit    !:over margin      (Reference Only)  
 Receiver:      ESPI\_1      Spectrum Analyzer:      FSP40

**Test Result: Pass**

[TestMode: TX b high channel]; [Polarity: Horizontal]

**Radiated Emission Measurement**



Site	Polarization: <b>Horizontal</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: WIFI&BT Module		
M/N: AW65S1-50B1		
Mode: 2.4Gwifi-11B-TX-H		
Note:		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2483.500	47.83	-4.64	43.19	74.00	-30.81	peak	
2		2500.000	47.87	-4.75	43.12	74.00	-30.88	peak	

\*:Maximum data    x:Over limit    !:over margin    <Reference Only

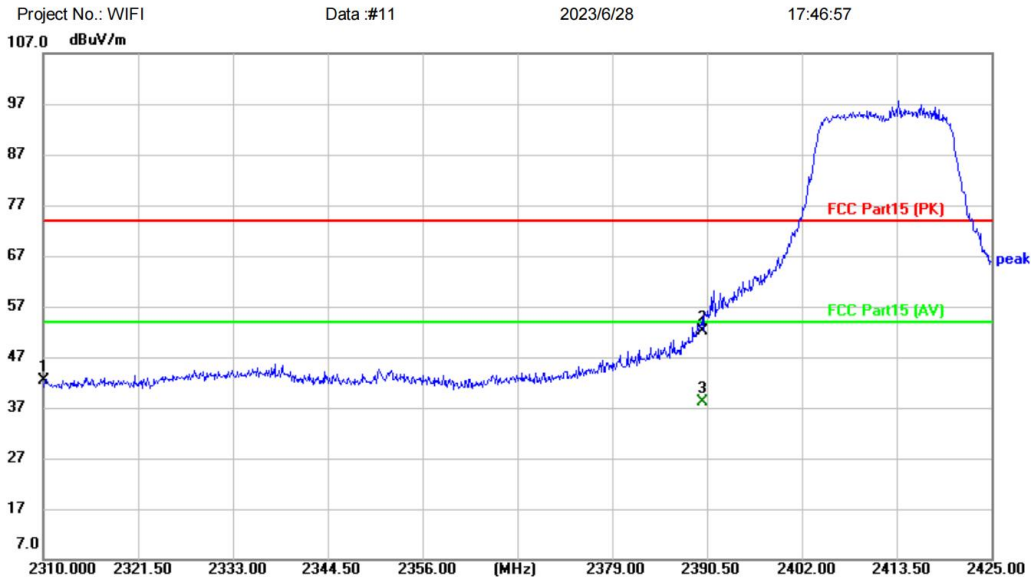
Receiver: ESPI\_1      Spectrum Analyzer: FSP40

**Test Result: Pass**



[TestMode: TX g low channel]; [Polarity: Horizontal]

**Radiated Emission Measurement**



Site:      Polarization: **Horizontal**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
 EUT: WIFI&BT Module  
 M/N: AW65S1-50B1  
 Mode: 2.4Gwifi-11G-TX-L  
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2310.000	46.80	-4.40	42.40	74.00	-31.60	peak	
2		2390.000	56.48	-4.31	52.17	74.00	-21.83	peak	
3	*	2390.000	42.34	-4.31	38.03	54.00	-15.97	AVG	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

Receiver:      ESPI\_1

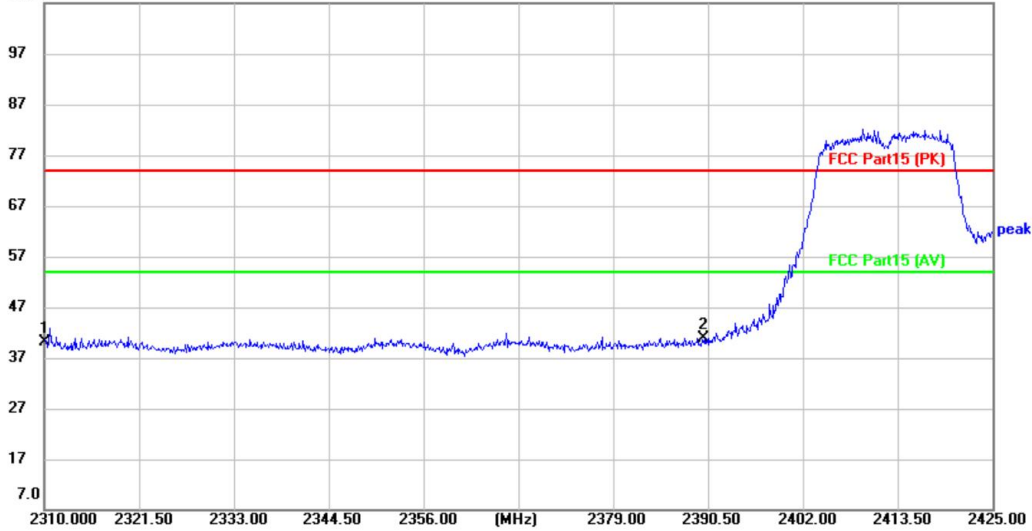
Spectrum Analyzer:      FSP40

**Test Result: Pass**

[TestMode: TX g low channel]; [Polarity: Vertical]

**Radiated Emission Measurement**

Project No.: WIFI      Data #12      2023/6/28      17:50:35  
107.0 dBuV/m



Site	Polarization: <b>Vertical</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: WIFI&BT Module		
M/N: AW65S1-50B1		
Mode: 2.4Gwifi-11G-TX-L		
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2310.000	44.55	-4.40	40.15	74.00	-33.85	peak	
2	*	2390.000	45.16	-4.31	40.85	74.00	-33.15	peak	

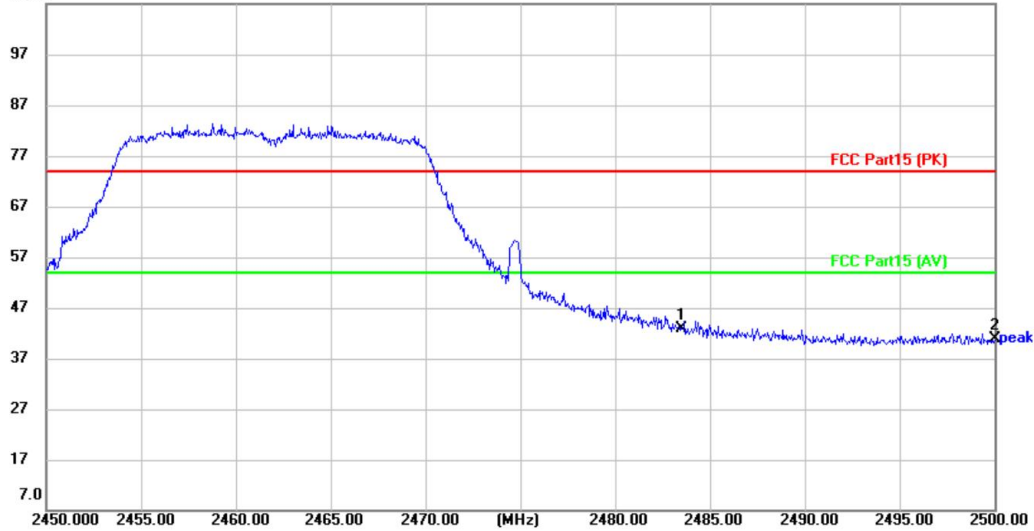
\*:Maximum data    x:Over limit    !:over margin      (Reference Only)  
Receiver:      ESP1\_1      Spectrum Analyzer:      FSP40

**Test Result: Pass**

[TestMode: TX g high channel]; [Polarity: Vertical]

**Radiated Emission Measurement**

Project No.: WIFI      Data #14      2023/6/28      17:57:43  
107.0 dBuV/m



Site:      Polarization: **Vertical**      Temperature: (C)  
Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
EUT: WIFI&BT Module  
M/N: AW65S1-50B1  
Mode: 2.4Gwifi-11G-TX-H  
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2483.500	47.54	-4.64	42.90	74.00	-31.10	peak	
2		2500.000	45.56	-4.75	40.81	74.00	-33.19	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

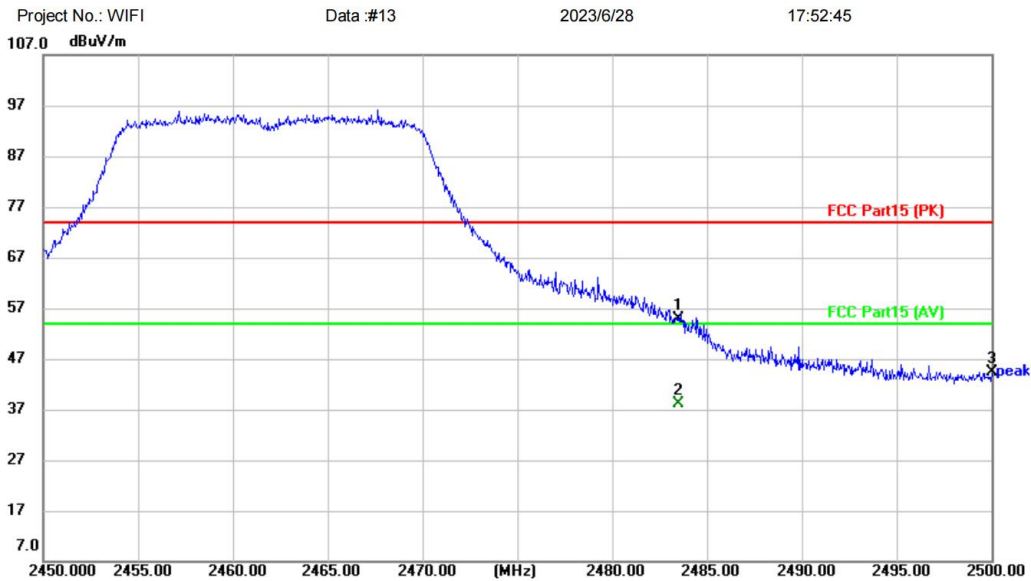
Receiver: ESPI\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX g high channel]; [Polarity: Horizontal]

**Radiated Emission Measurement**



Site:      Polarization: **Horizontal**      Temperature: (C)  
Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
EUT: WIFI&BT Module  
M/N: AW65S1-50B1  
Mode: 2.4Gwifi-11G-TX-H  
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2483.500	59.41	-4.64	54.77	74.00	-19.23	peak	
2	*	2483.500	42.81	-4.64	38.17	54.00	-15.83	AVG	
3		2500.000	49.01	-4.75	44.26	74.00	-29.74	peak	

\*:Maximum data    x:Over limit    !:over margin

<Reference Only

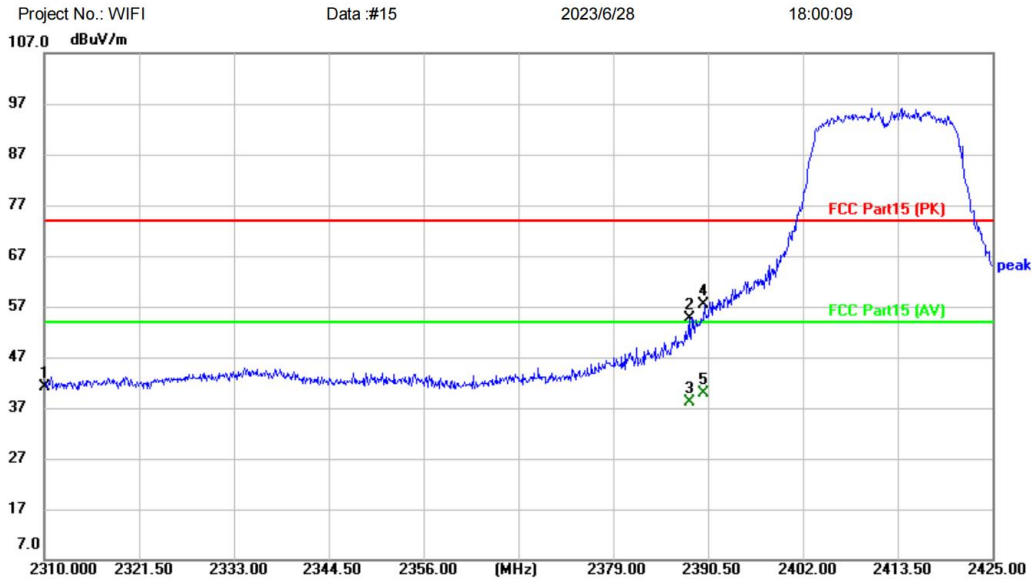
Receiver: ESPI\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX n20 low channel]; [Polarity: Horizontal]

**Radiated Emission Measurement**



Site:      Polarization: **Horizontal**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
 EUT: WIFI&BT Module  
 M/N: AW65S1-50B1  
 Mode: 2.4Gwifi-11N20-TX-L  
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2310.000	45.46	-4.40	41.06	74.00	-32.94	peak	
2		2388.200	59.01	-4.31	54.70	74.00	-19.30	peak	
3		2388.200	42.35	-4.31	38.04	54.00	-15.96	AVG	
4		2390.000	61.58	-4.31	57.27	74.00	-16.73	peak	
5	*	2390.000	44.10	-4.31	39.79	54.00	-14.21	AVG	

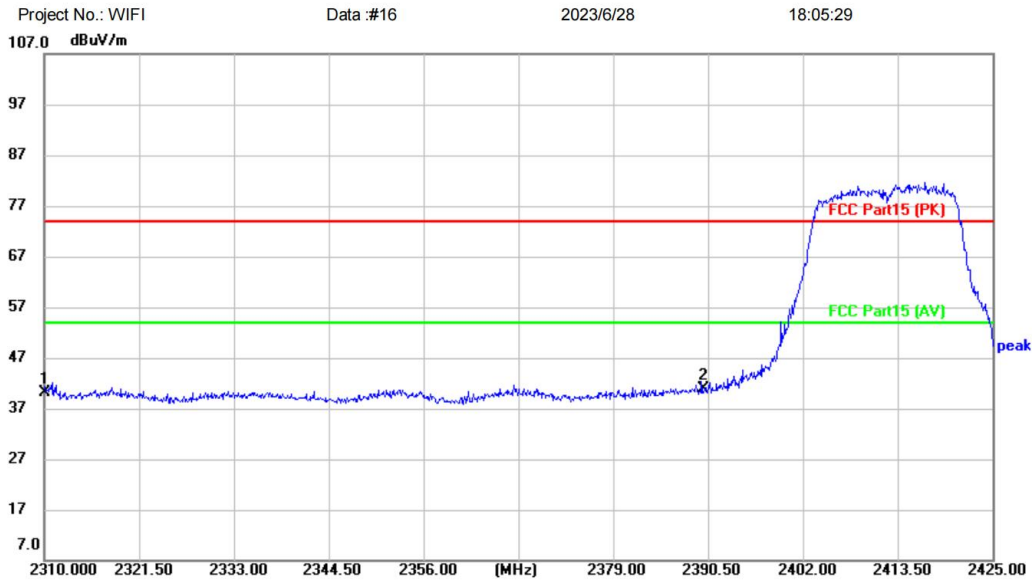
\*:Maximum data    x:Over limit    !:over margin      (Reference Only)

Receiver:      ESPI\_1      Spectrum Analyzer:      FSP40

**Test Result: Pass**

[TestMode: TX n20 low channel ]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site:      Polarization: **Vertical**      Temperature: (C)  
Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
EUT: WIFI&BT Module  
M/N: AW65S1-50B1  
Mode: 2.4Gwifi-11N20-TX-L  
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2310.000	44.52	-4.40	40.12	74.00	-33.88	peak	
2	*	2390.000	45.26	-4.31	40.95	74.00	-33.05	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

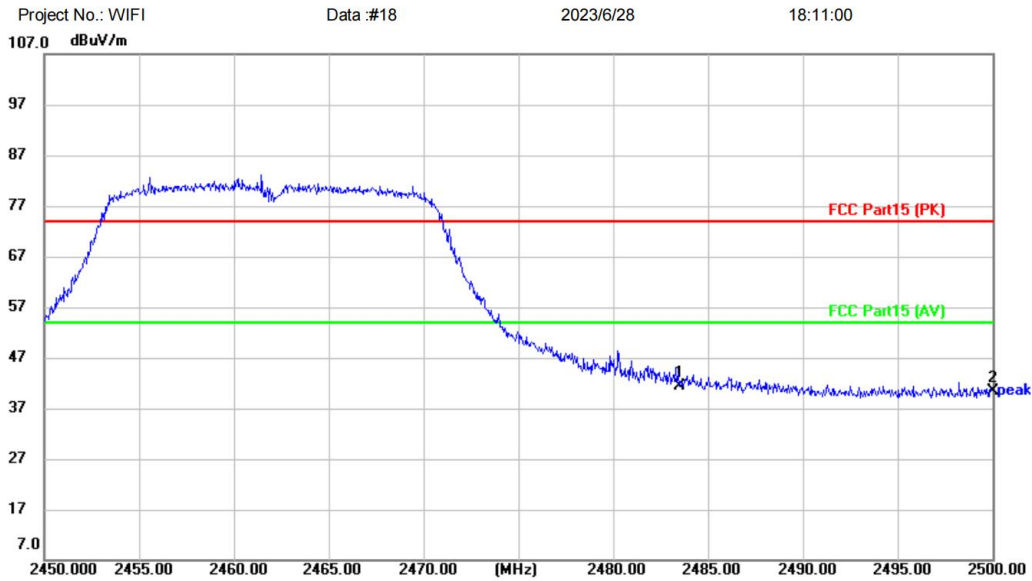
Receiver: ESPI\_1

Spectrum Analyzer: FSP40

**Test Result: Pass**

[TestMode: TX n20 high channel]; [Polarity: Vertical]

**Radiated Emission Measurement**



Site:      Polarization: **Vertical**      Temperature: (C)  
 Limit: FCC Part15 (PK)      Power:      Humidity: %RH  
 EUT: WIFI&BT Module  
 M/N: AW65S1-50B1  
 Mode: 2.4Gwifi-11N20-TX-H  
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	2483.500	46.13	-4.64	41.49	74.00	-32.51	peak	
2		2500.000	45.16	-4.75	40.41	74.00	-33.59	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

Receiver:      ESPI\_1

Spectrum Analyzer:      FSP40

**Test Result: Pass**