

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

FCC ID: COF-WMBACBM25

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RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C (CLASS II PERMISSIVE CHANGE)

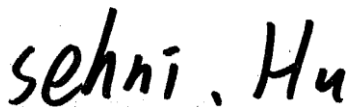
Test Standard	FCC Part 15.247
Product name	802.11a/b/g/n/ac 1x1 + BT 5.0 Module
Brand Name	USI
Model No.	WM-BAC-BM-25-FF4, WM-BAC-BM-25, WM-BAC-BM-25_FF2, WM-BAC-BM-25-FF3
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory)

Approved by:



Sehni Hu
Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 24, 2024	Initial Issue	ALL	Peggy Tsai

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Universal Global Scientific Industrial Co., Ltd. No. 141, Lane 351, Sec. 1, Taiping Road, Tsaotuen, Nantou County 542007, Taiwan
Manufacturer	Universal Global Scientific Industrial Co., Ltd. No. 141, Lane 351, Sec. 1, Taiping Road, Tsaotuen, Nantou County 542007, Taiwan
Equipment	802.11a/b/g/n/ac 1x1 + BT 5.0 Module
Brand Name	USI
Test model	WM-BAC-BM-25-FF4
Series model	WM-BAC-BM-25, WM-BAC-BM-25_FF2, WM-BAC-BM-25-FF3
Model Discrepancy	WM-BAC-BM-25-FF4, Change Antenna matching.
Received Date	November 15, 2024
Date of Test	November 22 ~ 27, 2024
Power Supply	Power from Power Supply. (DC 3.6V)
HW Version	V30
FW Version	dhd-100.10.65.0
Class II Permissive Change	1. Modify Product Name: 802.11a/b/g/n/ac 1x1 + BT 5.0 Module 2. Add one Model Name: WM-BAC-BM-25-FF4 3. Change Antenna Matching. 4. Update Firmware.

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
3. Disclaimer: Variant information between/among trademarks is provided by the applicant, test results of this report are applicable to the sample EUT received of main test model name.

1.2 INFORMATION ABOUT THE FHSS CHARACTERISTICS

1.2.1 Pseudorandom Frequency Hopping Sequence

The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master; the phase in the hopping sequence is determined by the Bluetooth clock of the master. The channel is divided into time slots where each slot corresponds to an RF hop frequency. Consecutive hops correspond to different RF hop frequencies. The nominal hop rate is 1 600 hops/s.

1.2.2 Equal Hopping Frequency Use

The channels of this system will be used equally over the long-term distribution of the hopsets.

1.2.3 Example of a 79 hopping sequence in data mode:

02, 05, 31, 24, 20, 10, 43, 36, 30, 23, 40, 06, 21, 50, 44, 09, 71, 78, 01, 13, 73, 07, 70, 72, 35, 62, 42, 11, 41, 08, 16, 29, 60, 15, 34, 61, 58, 04, 67, 12, 22, 53, 57, 18, 27, 76, 39, 32, 17, 77, 52, 33, 56, 46, 37, 47, 64, 49, 45, 38, 69, 14, 51, 26, 79, 19, 28, 65, 75, 54, 48, 03, 25, 66, 05, 16, 68, 74, 59, 63, 55

1.2.4 System Receiver Input Bandwidth

Each channel bandwidth is 1MHz.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

1.2.5 Equipment Description

15.247(a)(1) that the Rx input bandwidths shift frequencies in synchronization with the transmitted signals.

15.247(g): In accordance with the Bluetooth Industry Standard, the system is designed to comply with all of the regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) system.

15.247(h): In accordance with the Bluetooth Industry Standard, the system does not coordinate its channels selection/ hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

1.3 EUT CHANNEL INFORMATION

Frequency Range	2402MHz-2480MHz
Modulation Type	1. GFSK for BDR-1Mbps 2. $\pi/4$ -DQPSK for EDR-2Mbps 3. 8DPSK for EDR-3Mbps
Number of channel	79 Channels

Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
<input type="checkbox"/> 1 MHz or less	1	Middle
<input type="checkbox"/> 1 MHz to 10 MHz	2	1 near top and 1 near bottom
<input checked="" type="checkbox"/> More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.4 ANTENNA INFORMATION

Antenna Specification	<input type="checkbox"/> PIFA <input type="checkbox"/> PCB <input type="checkbox"/> Dipole <input checked="" type="checkbox"/> Ceramic Chip Antenna
Antenna Gain	Gain: 1.59 dBi
Brand / Model	YAGEO / ANT3216A063R2455A

Notes:

1. The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203.

1.5 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
RF output power (Power Meter + Power sensor)	± 0.243 dB
Radiated Emission_9kHz-30MHz	± 3.761 dB
Radiated Emission_30MHz-200MHz	± 3.473 dB
Radiated Emission_200MHz-1GHz	± 3.946 dB
Radiated Emission_1GHz-6GHz	± 4.797 dB
Radiated Emission_6GHz-18GHz	± 4.803 dB
Radiated Emission_18GHz-26GHz	± 3.459 dB
Radiated Emission_26GHz-40GHz	± 3.297 dB

Remark:

- 1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.6 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

CAB identifier: TW1309

Test site	Test Engineer	Remark
Radiation	Tony Chao 、 Ray Li	-
RF Conducted	Jerry Chang	-

Remark: The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC public Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

1.7 INSTRUMENT CALIBRATION

Conducted_FCC/IC/NCC (All)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
PXA Signal Analyzer	Keysight	N9030B	MY62291089	2024-10-04	2025-10-03
Power Sensor	Anritsu	MA2411B	1911386	2024-07-19	2025-07-18
Power Meter	Anritsu	ML2496A	2136002	2024-07-19	2025-07-18
DC Blocks	Marvelous Microwave	MVE6411	MVE-002	2024-08-08	2025-08-07
DC Power Source	GWINSTEK	SPS-3610	GPE880163	2024-11-06	2025-11-05
Software	Radio Test Software Ver. 21				

966A_Radiated					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Analyzer	KEYSIGHT	N9010A	MY52220817	2024-03-15	2025-03-14
Thermo-Hygro Meter	WISEWIND	1206	D07	2023-12-08	2024-12-07
Active Loop Antenna	SCHWARZBECK	FMZB 1513-60	1513-60-028	2023-12-13	2024-12-12
Bi-Log Antenna	Sunol Sciences	JB3	A030105	2024-07-12	2025-07-11
Preamplifier	EMEC	EM330	060609	2024-02-21	2025-02-20
Cable	Huber+Suhner	104PEA	20995+21000+182330	2024-08-07	2025-08-06
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2023-12-28	2024-12-27
Preamplifier	HP	8449B	3008A00965	2023-12-22	2024-12-21
Cable	EMCI	EMC101G	221011+221012+221213	2024-10-11	2025-10-10
Attenuator	Mini-Circuits	BW-S9W5	BWS9W5-09-966A-01	2024-02-07	2025-02-06
High Pass Filters	Titan Microwave	T04H30001800070S01	22011402-4	2024-06-12	2025-06-11
Horn Antenna	SCHWARZBECK	BBHA9170	1047	2023-12-13	2024-12-12
Pre-Amplifier	EMCI	EMC184045SE	980860	2023-12-12	2024-12-11
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Site Validation	CCS	966A	N/A	2024-08-03	2025-08-02
Software	e3 V9-210616c				

Remark:

1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Required.

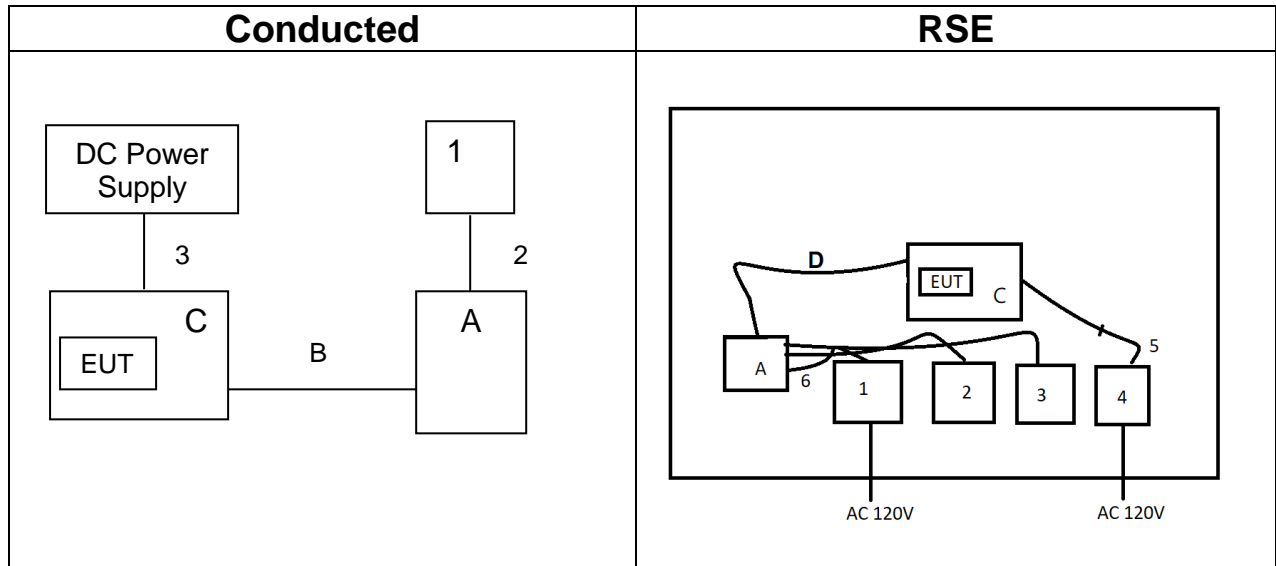
1.8 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment						
No.	Equipment	Brand	Model	Series No.	FCC ID	IC
C	Test Kit	N/A	N/A	N/A	N/A	N/A

Support Equipment (Conducted)						
No.	Equipment	Brand	Model	Series No.	FCC ID	IC
1	LCD Monitor	Lenovo	A20238FT0	N/A	N/A	N/A
2	HDMI Cable	High Speed	E342987	N/A	N/A	N/A
3	DC Power Cable	MISUMI	MCR3S-RE	N/A	N/A	N/A
A	PC	ASUS	WM-BAC-BM25-FF3	N/A	N/A	N/A
B	Mini to USB Cable	N/A	N/A	N/A	N/A	N/A

Support Equipment (RSE)						
No.	Equipment	Brand	Model	Series No.	FCC ID	IC
1	Monitor	View sonic	VS16263	N/A	N/A	N/A
2	MOUSE	Lenovo	300 USB	N/A	N/A	N/A
3	KeyBoard	Logitech	K120	N/A	N/A	N/A
4	DC Power Source	GWINSTEK	SPS-3610	GPE880163	N/A	N/A
5	DC Cable	MISUMI	MCR3S-RE	N/A	N/A	N/A
6	HDMI Cable	UGREEN	HD104	N/A	N/A	N/A
A	PC	ASUS	D320MT	N/A	N/A	N/A
B	Test Kit	N/A	N/A	N/A	N/A	N/A
D	Mini Usb Cable	N/A	N/A	N/A	N/A	N/A

1.9 TEST SETUP DIAGRAM



1.10 TEST PROGRAM

The EUT connection corresponds to the surrounding fixture control board.
This EUT uses setup command to set the frequency, modulation, and power to allow the sample to continuously transmit (including frequency hopping mode and Co-Location).

1.11 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247, KDB 558074.

2. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.247(b)(1)	4.1	Output Power Measurement	Verify
15.247(d) 15.209 15.205	4.2	Radiation Band Edge	Pass
15.247(d) 15.209 15.205	4.2	Radiation Spurious Emission	Pass

Note:

Modified antenna path matching and update FW, but do not modify any RF related parameters. Therefore, the Conducted performance is the same as the quoted modular certification [FCC ID: COF-WMBACBM25, Date of Grant:07/10/2023]. However, worst case model harmonic and band edge radiation performance will be evaluated and will be evaluated to ensure product compliance.

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	GFSK for BDR-1Mbps (DH5) $\pi/4$ -DQPSK for 2Mbps (2DH5) 8DPSK for EDR-3Mbps (3DH5)
Test Channel Frequencies	<p>GFSK for BDR-1Mbps: 1.Lowest Channel: 2402MHz 2.Middle Channel: 2441MHz 3.Highest Channel: 2480MHz</p> <p>$\pi/4$-DQPSK for 2Mbps: 1.Lowest Channel: 2402MHz 2.Middle Channel: 2441MHz 3.Highest Channel: 2480MHz</p> <p>8DPSK for EDR-3Mbps: 1.Lowest Channel: 2402MHz 2.Middle Channel: 2441MHz 3.Highest Channel: 2480MHz</p>

Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.

3.2 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Power Supply
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4
Worst Position	<input type="checkbox"/> Placed in fixed position. <input type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane) <input type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane) <input checked="" type="checkbox"/> Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Power Supply
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

Radiated Emission Measurement [Co-Location]	
Test Condition	Radiated Emission [Co-Location]
Power supply Mode	Mode 1: EUT Power by Wi-Fi 2.4G+BT BR Mode 2: EUT Power by Wi-Fi 5G+BT BR
Worst Mode	<input type="checkbox"/> Mode 1 <input checked="" type="checkbox"/> Mode 2

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(Z -Plane) were recorded in this report
3. Radiation emission was performed the EUT transmit at the highest output power channel as worse case. The worst case was recorded in this report.

4. TEST RESULT

4.1 OUTPUT POWER MEASUREMENT

4.1.1 Test Limit

According to §15.247(a)(1) ,

Peak output power :

FCC

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

Average output power : For reporting purposes only.

4.1.2 Test Procedure

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power. in the test report.

4.1.3 Test Setup

Refer to section 1.9.

4.1.4 Test Result

Temperature: 21.2 ~ 23.7°C

Test date: November 22 ~ 25, 2024

Humidity: 54 ~ 58% RH

Tested by: Jerry Chang

Peak & Average output power :

1M BR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0	9.03	7.998	1000
39	2441	0	9.20	8.318	1000
78	2480	0	9.41	8.730	1000

1M BR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0	8.97	7.896	1000
39	2441	0	9.13	8.192	1000
78	2480	0	9.34	8.598	1000

3M EDR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0	8.19	6.592	125
39	2441	0	7.59	5.741	125
78	2480	0	6.90	4.898	125

3M EDR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0	5.78	3.788	125
39	2441	0	5.05	3.202	125
78	2480	0	4.30	2.694	125

Note:

1. Avg. output power has been calculated with duty factor.
2. The Conducted performance is the same as the quoted modular certification [FCC ID: COF-WMBACBM25, Date of Grant: 07/10/2023].

4.2 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.2.1 Test Limit

FCC according to §15.247(d), §15.209 and §15.205,

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Remark:

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

4.2.2 Test Procedure

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10: 2013, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 9kHz to 26.5GHz set to the high power channels with the EUT transmit.

4. No emission found between lowest internal used/generated frequency to 30MHz (9KHz~30MHz).

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-ane choic chamber, the measurements correspond to those obtained at an open-field test site. There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

5. The SA setting following :

(1) Below 30MHz :

(1.1) 9KHz-490KHz : RBW=200Hz / VBW=1kHz / Sweep=AUTO

(1.2) 490KHz-30MHz : RBW=10kHz / VBW=30kHz / Sweep=AUTO

(2) 30MHz to 1GHz : RBW = 100kHz, VBW $\geq 3 \times$ RBW, Sweep = Auto,

Detector = Peak, Trace = Max hold.

(3) Above 1GHz :

(3.1) For Peak measurement : RBW = 1MHz, VBW $\geq 3 \times$ RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(3.2) For Average measurement : RBW = 1MHz, VBW

·If Duty Cycle $\geq 98\%$, VBW=10Hz.

·If Duty Cycle $< 98\%$, VBW=1/T.

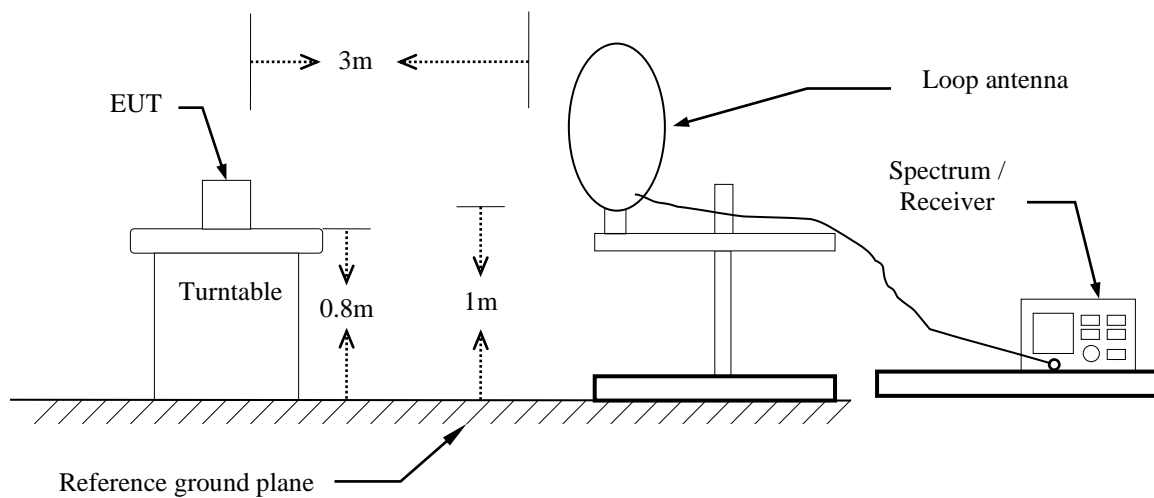
6. Data result

Actual FS=Spectrum Reading Level + Factor

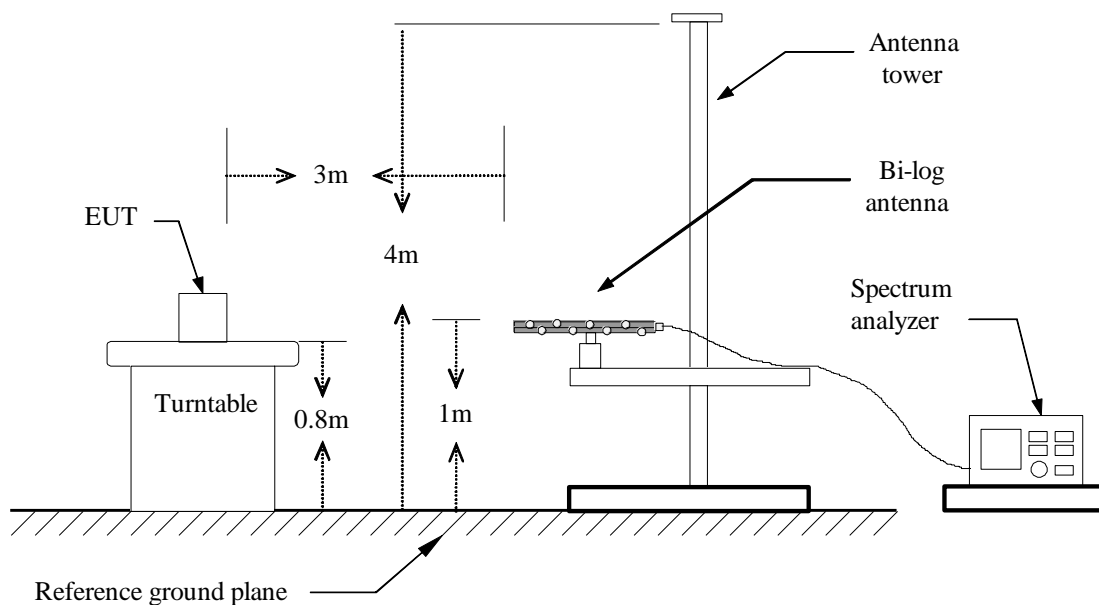
Margin=Actual FS- Limit

4.2.3 Test Setup

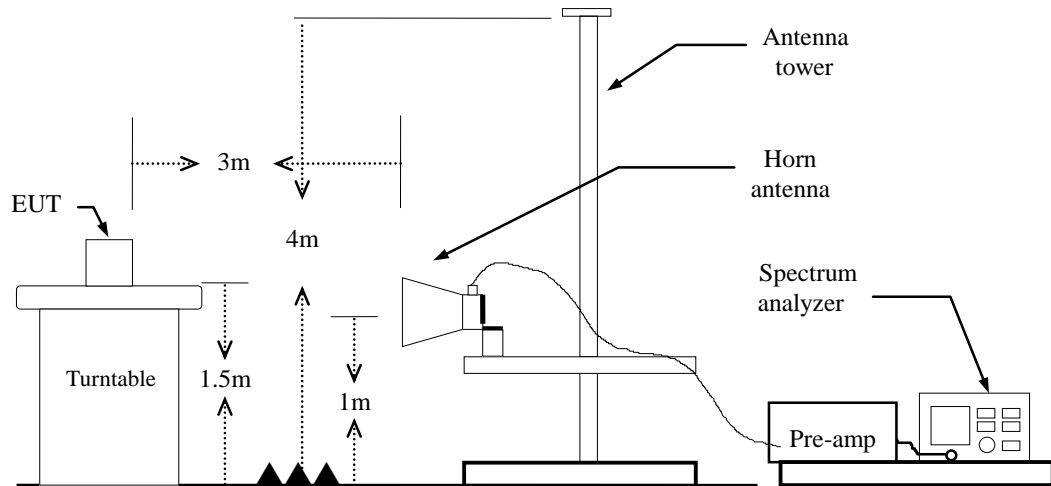
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz



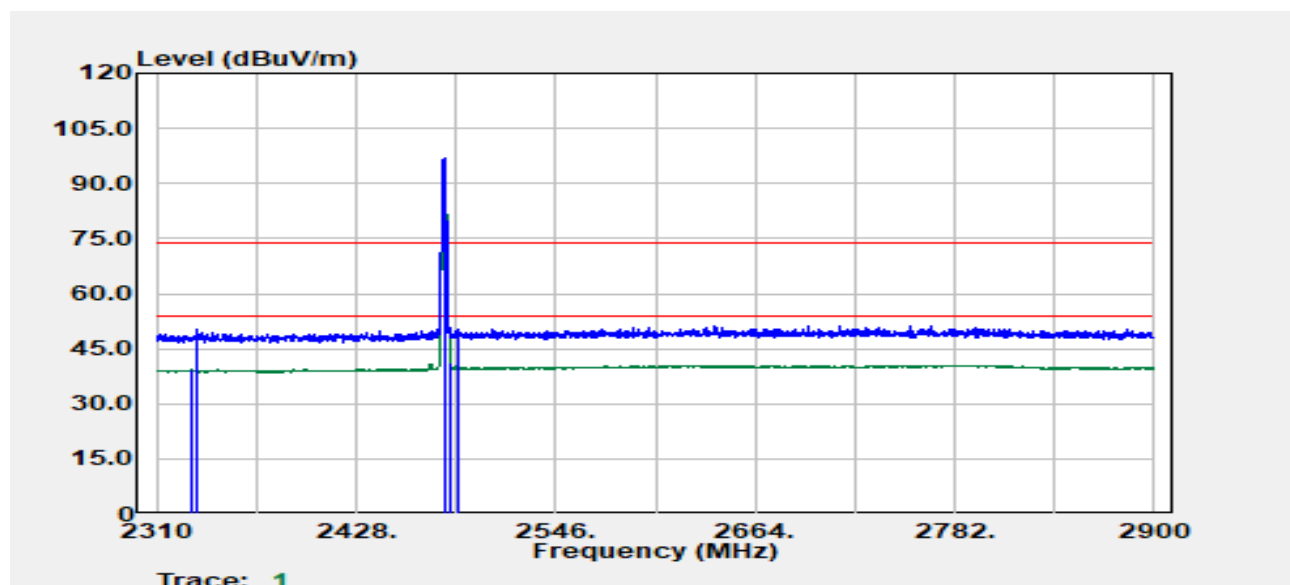
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4.2.4 Test Result

Band Edge Test Data

Project No	:TM-2411000242P	Test Date	:2024-11-26
Operation Band	:BT BR	Temp./Humi.	:24.6/60
Frequency	:2480 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:Bandedge	Engineer	:Ray Li
EUT Pol	:H	Test Chamber	: 966A
Setting	:0		



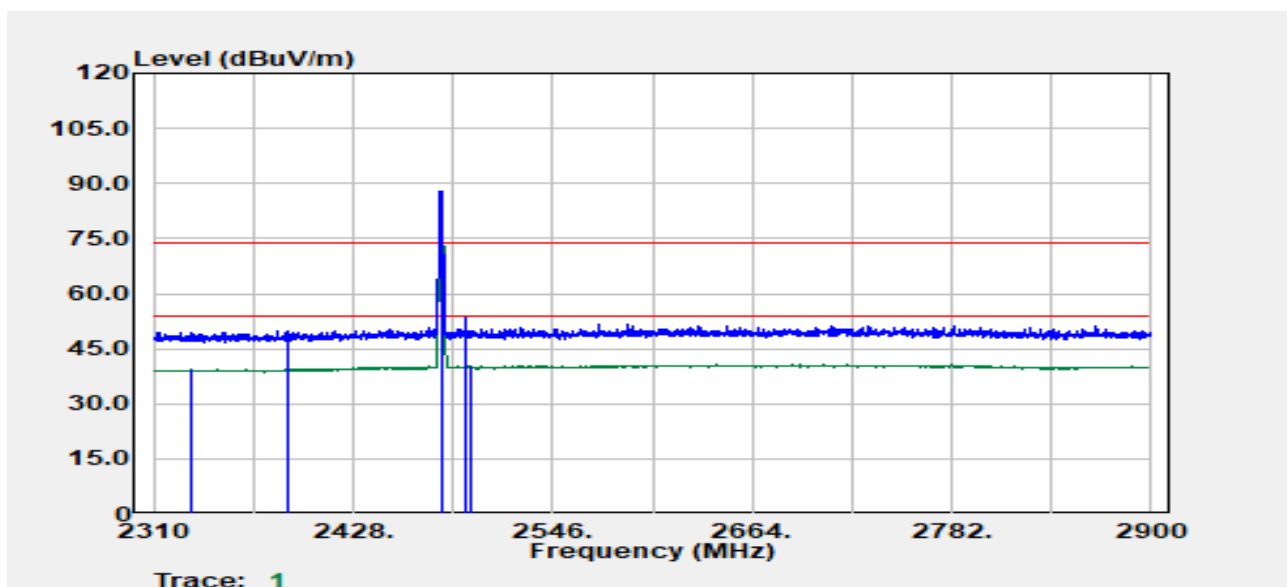
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
2330.26	Average	33.15	6.03	39.18	54.00	-14.82
2334.51	Peak	44.20	6.00	50.20	74.00	-23.80
2480.00	Peak	90.21	6.51	96.73	--	--
2480.00	Average	90.15	6.51	96.66	--	--
2483.57	Average	34.82	6.56	41.38	54.00	-12.62
2488.33	Peak	43.75	6.63	50.38	74.00	-23.62

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Project No :TM-2411000242P
Operation Band :BT BR
Frequency :2480 MHz
Operation Mode :Bandedge
EUT Pol :H
Setting :0

Test Date :2024-11-26
Temp./Humi. :24.6/60
Antenna Pol. :HORIZONTAL
Engineer :Ray Li
Test Chamber : 966A



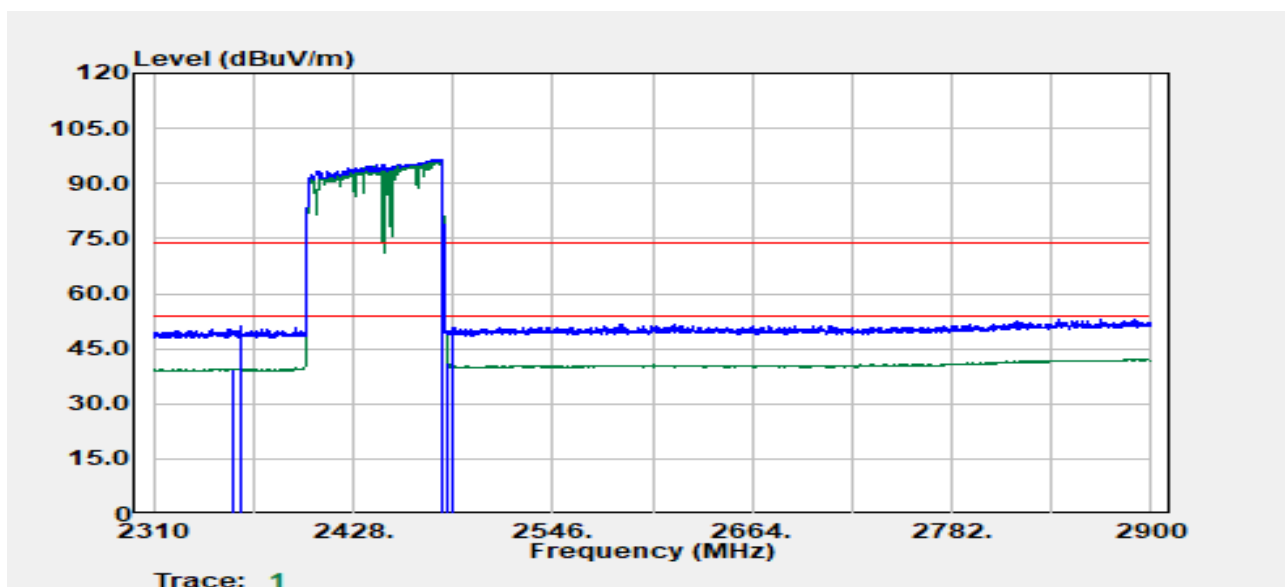
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
2331.76	Average	33.36	6.02	39.38	54.00	-14.62
2388.78	Peak	43.75	6.10	49.85	74.00	-24.15
2480.00	Peak	81.39	6.51	87.90	- -	- -
2480.00	Average	81.33	6.51	87.84	- -	- -
2494.08	Peak	46.80	6.67	53.47	74.00	-20.53
2496.83	Average	33.55	6.68	40.23	54.00	-13.77

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Project No :TM-2411000242P
Operation Band :BT BR
Frequency :2402~2480 MHz
Operation Mode :Hopping
EUT Pol :H
Setting :0

Test Date :2024-11-26
Temp./Humi. :24.6/60
Antenna Pol. :VERTICAL
Engineer :Ray Li
Test Chamber : 966A



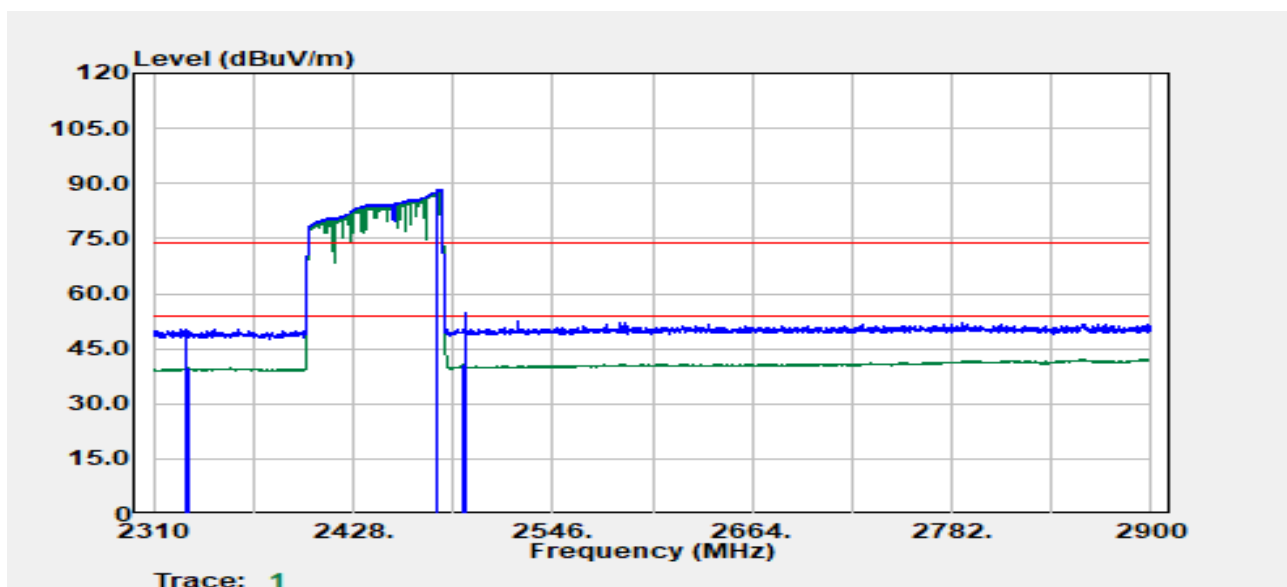
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
2357.52	Average	33.41	6.09	39.51	54.00	-14.49
2361.02	Peak	45.19	6.08	51.28	74.00	-22.72
2479.82	Peak	89.97	6.51	96.48	-	-
2479.82	Average	89.88	6.51	96.38	-	-
2483.57	Average	34.80	6.56	41.36	54.00	-12.64
2486.83	Peak	44.25	6.61	50.86	74.00	-23.14

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Rev.: 00

Project No :TM-2411000242P
Operation Band :BT BR
Frequency :2402~2480 MHz
Operation Mode :Hopping
EUT Pol :H
Setting :0

Test Date :2024-11-26
Temp./Humi. :24.6/60
Antenna Pol. :HORIZONTAL
Engineer :Ray Li
Test Chamber : 966A



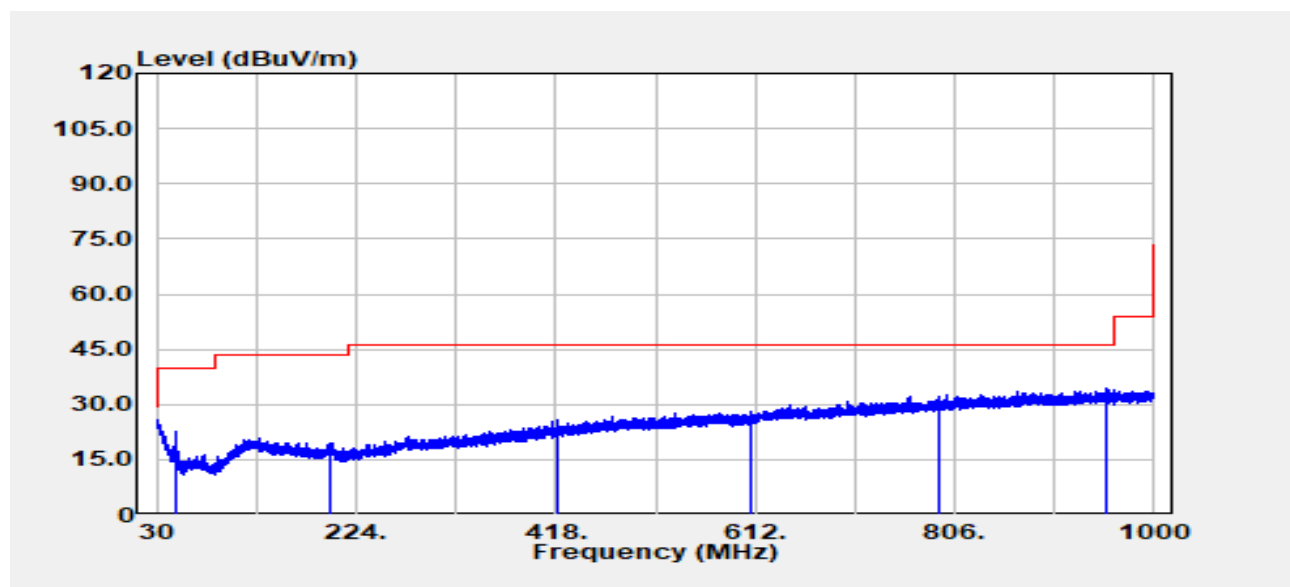
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
2328.51	Peak	44.30	6.03	50.33	74.00	-23.67
2331.26	Average	33.63	6.02	39.65	54.00	-14.35
2478.07	Peak	81.89	6.47	88.36	-	-
2478.07	Average	81.61	6.47	88.08	-	-
2493.33	Average	34.05	6.66	40.71	54.00	-13.29
2494.58	Peak	47.99	6.67	54.66	74.00	-19.34

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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TX Test Data

Project No	:TM-2411000242P	Test Date	:2024-11-27
Operation Band	:BT BR	Temp./Humi.	:24.8/57
Frequency	:2480 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:TX	Engineer	:Tony Chao
EUT Pol	:H	Test Chamber	: 966A
Setting	:		



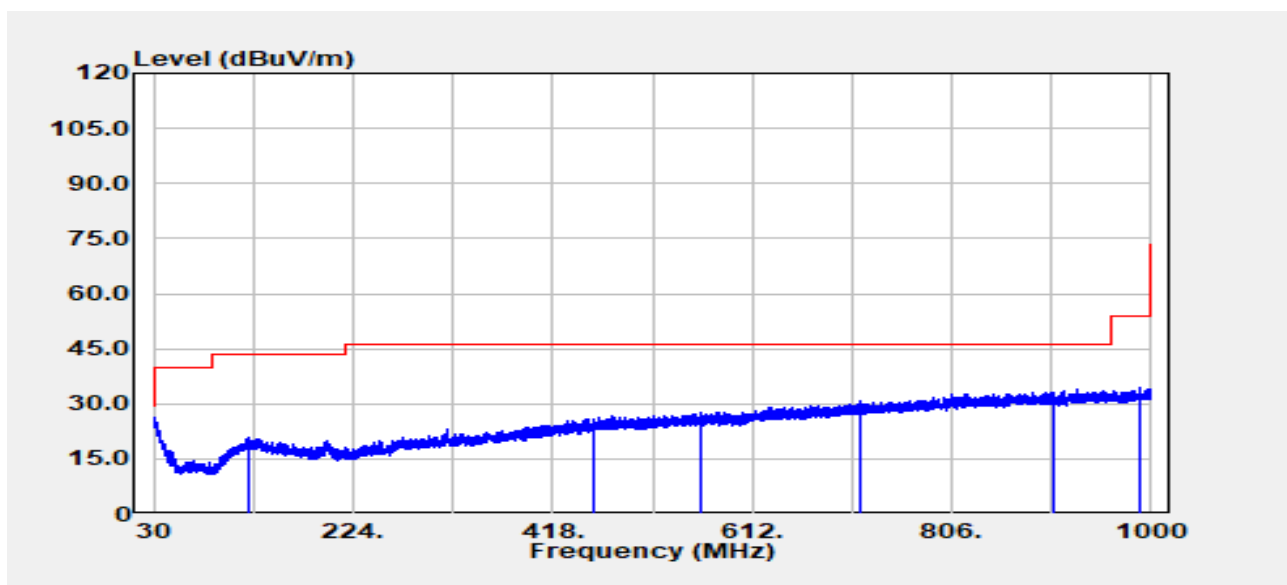
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
49.30	Peak	37.90	-15.18	22.71	40.00	-17.29
198.20	Peak	29.15	-9.79	19.35	43.50	-24.15
419.20	Peak	30.74	-5.11	25.63	46.00	-20.37
606.50	Peak	29.77	-1.81	27.96	46.00	-18.04
790.00	Peak	30.38	1.77	32.15	46.00	-13.85
952.50	Peak	30.30	4.05	34.35	46.00	-11.65

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Rev.: 00

Project No :TM-2411000242P
Operation Band :BT BR
Frequency :2480 MHz
Operation Mode :TX
EUT Pol :H
Setting :

Test Date :2024-11-27
Temp./Humi. :24.8/57
Antenna Pol. :HORIZONTAL
Engineer :Tony Chao
Test Chamber : 966A



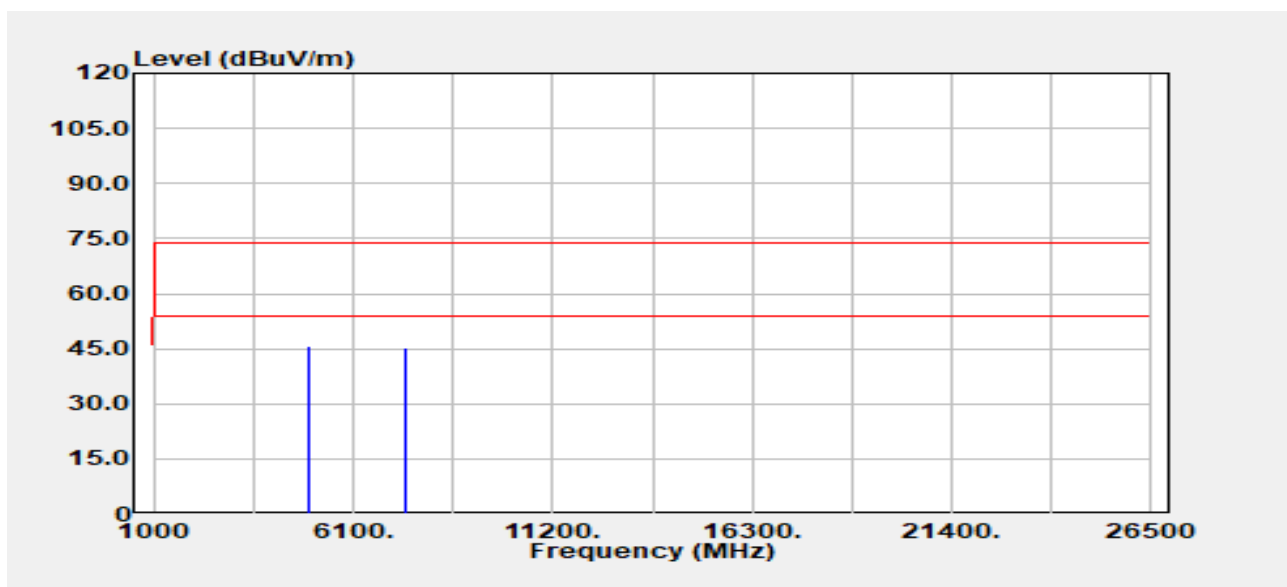
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
123.30	Peak	29.90	-9.13	20.77	43.50	-22.73
458.70	Peak	30.01	-4.16	25.85	46.00	-20.15
561.40	Peak	29.95	-2.31	27.65	46.00	-18.35
717.00	Peak	30.48	0.51	30.99	46.00	-15.01
905.20	Peak	29.91	3.09	33.00	46.00	-13.00
988.90	Peak	29.93	4.46	34.39	54.00	-19.61

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Rev.: 00

Project No :TM-2411000242P
Operation Band :BT BR
Frequency :2480 MHz
Operation Mode :TX
EUT Pol :H
Setting :0

Test Date :2024-11-27
Temp./Humi. :24.6/60
Antenna Pol. :Vertical
Engineer :Ray Li
Test Chamber : 966A



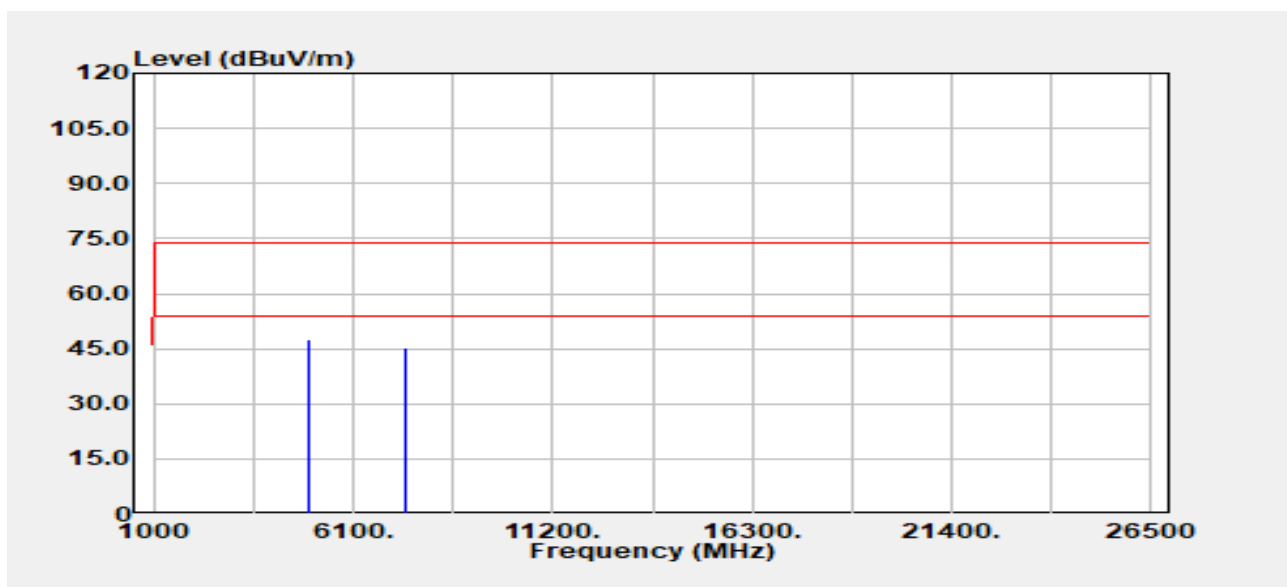
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
4960.00	Peak	42.96	2.94	45.90	74.00	-28.10
4960.00	Average	41.70	2.94	44.64	54.00	-9.36
7440.00	Peak	36.55	8.71	45.26	74.00	-28.74
7440.00	Average	29.27	8.71	37.98	54.00	-16.02

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Rev.: 00

Project No :TM-2411000242P
Operation Band :BT BR
Frequency :2480 MHz
Operation Mode :TX
EUT Pol :H
Setting :0

Test Date :2024-11-27
Temp./Humi. :24.6/60
Antenna Pol. :Horizontal
Engineer :Ray Li
Test Chamber : 966A



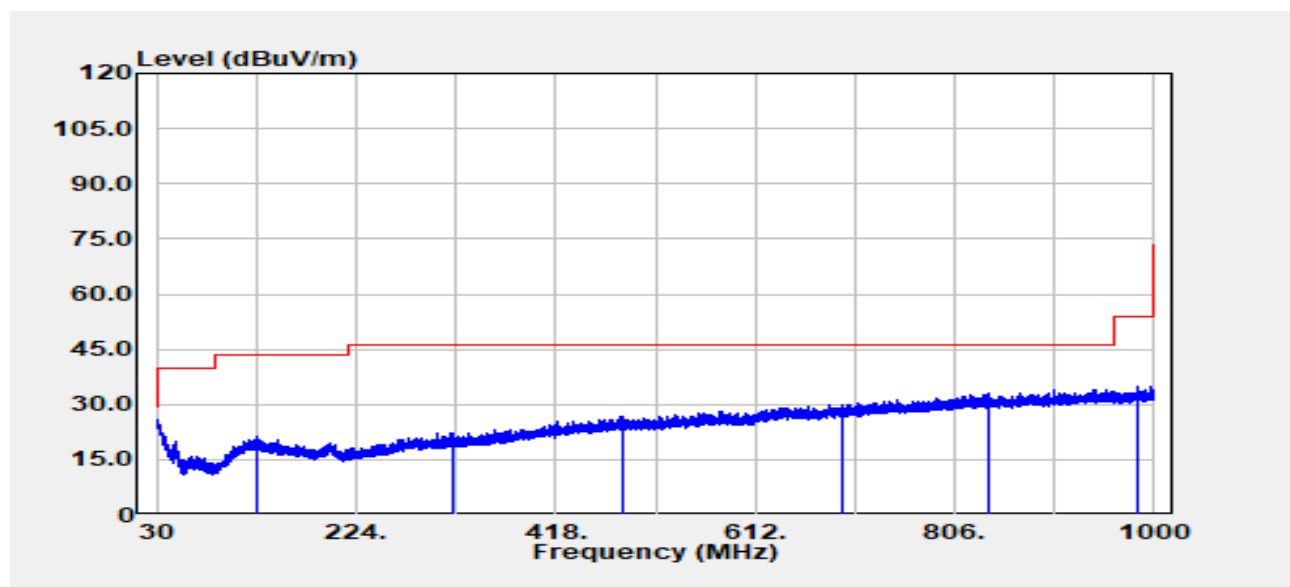
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
4960.00	Peak	44.66	2.94	47.60	74.00	-26.40
4960.00	Average	43.21	2.94	46.15	54.00	-7.85
7440.00	Peak	36.52	8.71	45.23	74.00	-28.77
7440.00	Average	29.49	8.71	38.20	54.00	-15.80

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Co-location

Project No	:TM-2411000242P	Test Date	:2024-11-27
Operation Band	:802.11a/Band4_BT BR	Temp./Humi.	:24.8/57
Frequency	:5825+2480 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:TX	Engineer	:Tony Chao
EUT Pol	:E1	Test Chamber	: 966A
Setting	:		



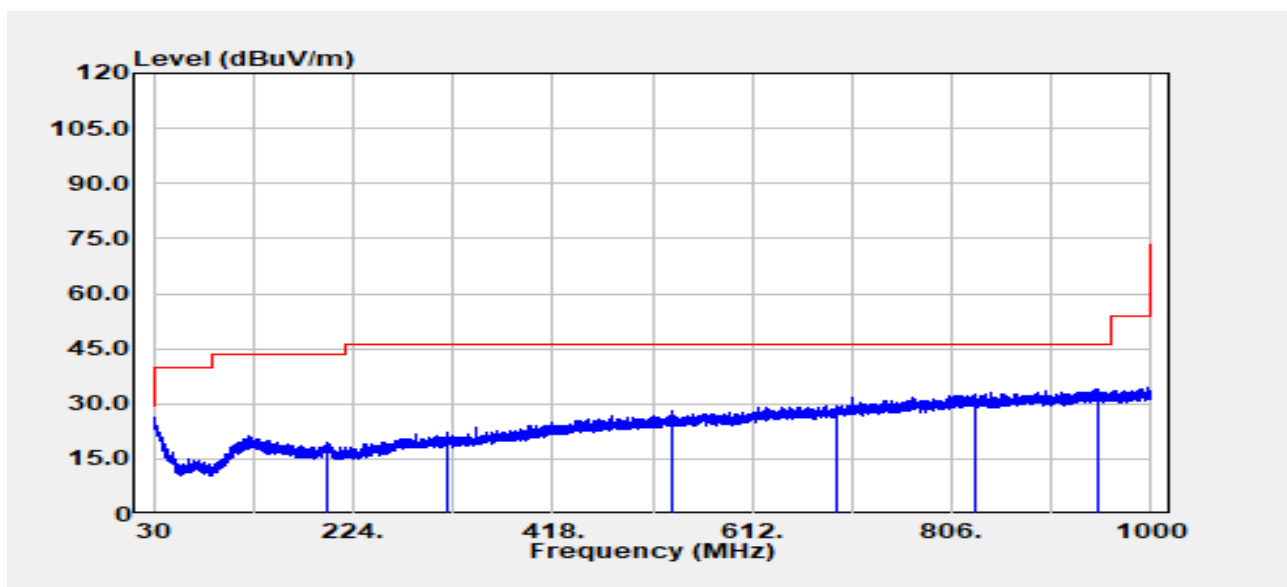
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
126.50	Peak	30.46	-9.01	21.45	43.50	-22.05
319.10	Peak	30.44	-8.09	22.35	46.00	-23.65
483.70	Peak	30.26	-3.43	26.83	46.00	-19.17
697.60	Peak	29.63	0.19	29.82	46.00	-16.18
840.10	Peak	30.39	2.57	32.96	46.00	-13.04
984.60	Peak	30.62	4.38	35.01	54.00	-18.99

Project No: TM-2411000242P
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Project No :TM-2411000242P
Operation Band :802.11a/Band4_BT BR
Frequency :5825+2480 MHz
Operation Mode :TX
EUT Pol :E1
Setting :

Test Date :2024-11-27
Temp./Humi. :24.8/57
Antenna Pol. :HORIZONTAL
Engineer :Tony Chao
Test Chamber : 966A



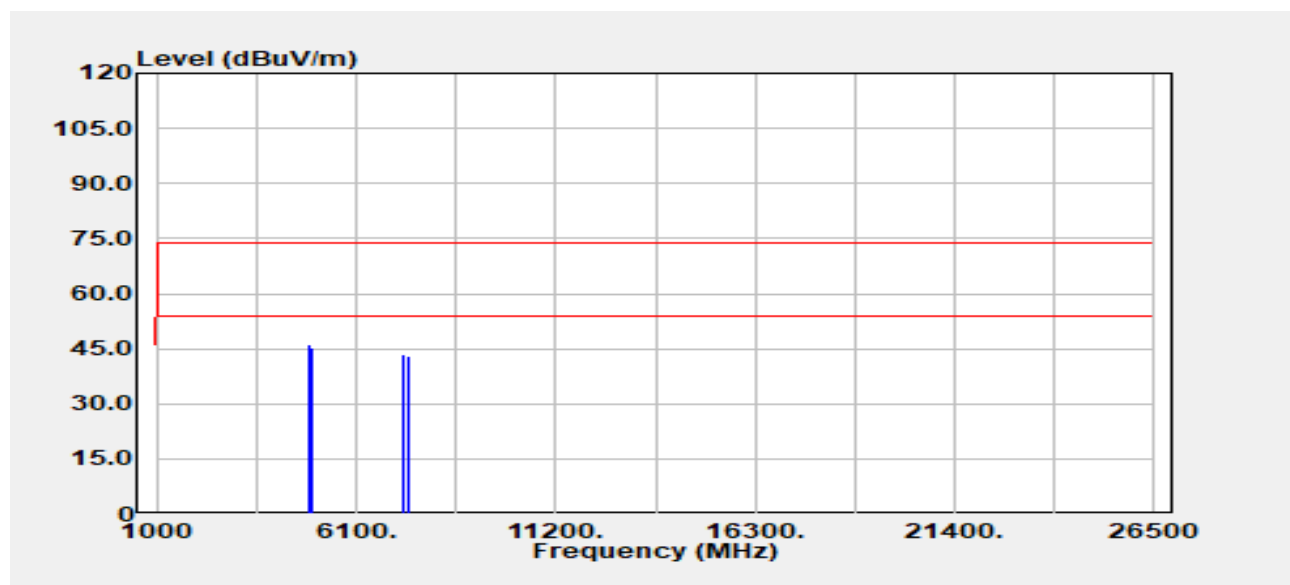
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
198.70	Peak	29.09	-9.69	19.40	43.50	-24.10
315.00	Peak	30.18	-8.03	22.15	46.00	-23.85
533.40	Peak	30.72	-2.75	27.96	46.00	-18.04
694.50	Peak	29.29	0.12	29.41	46.00	-16.59
828.90	Peak	29.90	2.55	32.45	46.00	-13.55
949.10	Peak	29.87	4.08	33.96	46.00	-12.04

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Project No :TM-2411000242P
Operation Band :802.11n20_BT BR
Frequency :2437+2480 MHz
Operation Mode :TX
EUT Pol :H
Setting :85_0

Test Date :2024-11-27
Temp./Humi. :24.8/57
Antenna Pol. :VERTICAL
Engineer :Tony Chao
Test Chamber : 966A



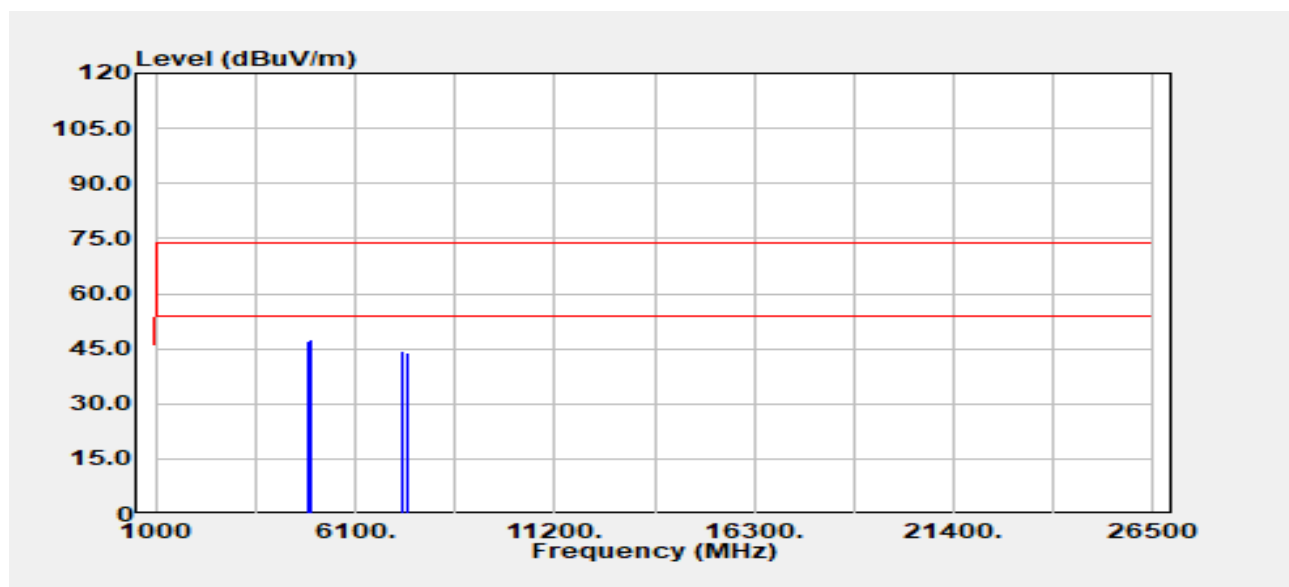
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
4874.00	Peak	43.97	2.23	46.20	74.00	-27.80
4874.00	Average	36.74	2.23	38.97	54.00	-15.03
4960.00	Peak	42.28	2.94	45.23	74.00	-28.77
4960.00	Average	38.33	2.94	41.27	54.00	-12.73
7311.00	Peak	35.00	8.70	43.69	74.00	-30.31
7311.00	Average	27.47	8.70	36.16	54.00	-17.84
7440.00	Peak	34.35	8.71	43.06	74.00	-30.94
7440.00	Average	27.60	8.71	36.31	54.00	-17.69

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Rev.: 00

Project No :TM-2411000242P
Operation Band :802.11n20_BT BR
Frequency :2437+2480 MHz
Operation Mode :TX
EUT Pol :H
Setting :85_0

Test Date :2024-11-27
Temp./Humi. :24.8/57
Antenna Pol. :HORIZONTAL
Engineer :Tony Chao
Test Chamber : 966A



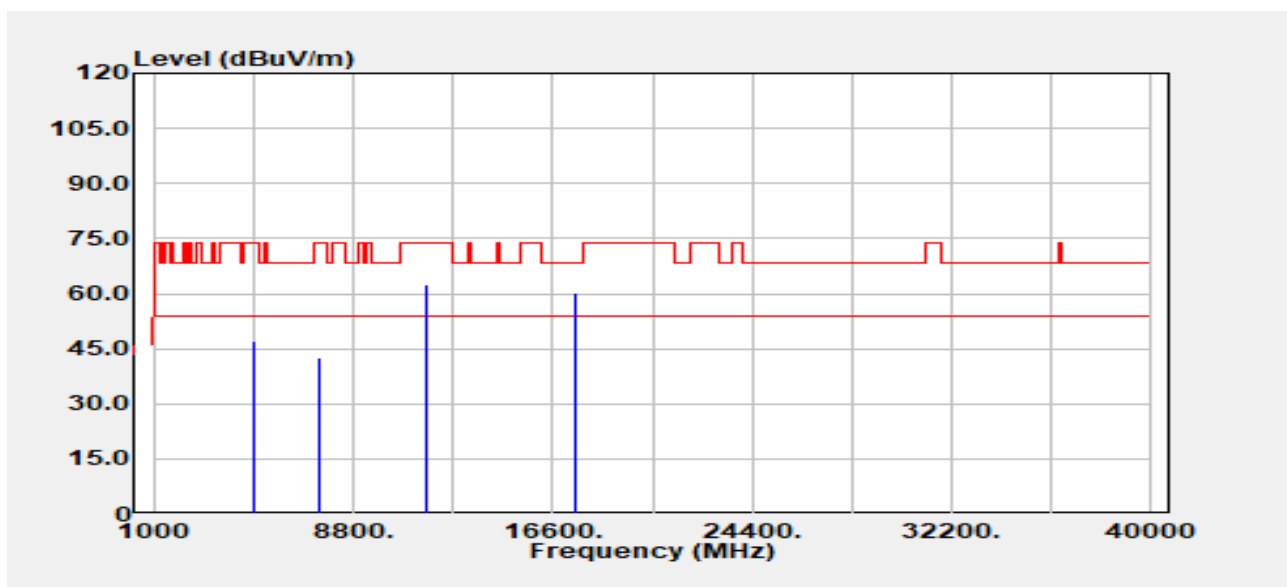
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
4874.00	Peak	44.69	2.23	46.92	74.00	-27.08
4874.00	Average	37.77	2.23	40.00	54.00	-14.00
4960.00	Peak	44.79	2.94	47.73	74.00	-26.27
4960.00	Average	41.48	2.94	44.42	54.00	-9.58
7311.00	Peak	35.69	8.70	44.39	74.00	-29.61
7311.00	Average	27.87	8.70	36.57	54.00	-17.43
7440.00	Peak	35.28	8.71	43.99	74.00	-30.01
7440.00	Average	27.94	8.71	36.65	54.00	-17.35

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Rev.: 00

Project No :TM-2411000242P
Operation Band :802.11a/Band4_BT BR
Frequency :5825+2480 MHz
Operation Mode :TX
EUT Pol :E1
Setting :93_0

Test Date :2024-11-27
Temp./Humi. :24.8/57
Antenna Pol. :VERTICAL
Engineer :Tony Chao
Test Chamber : 966A



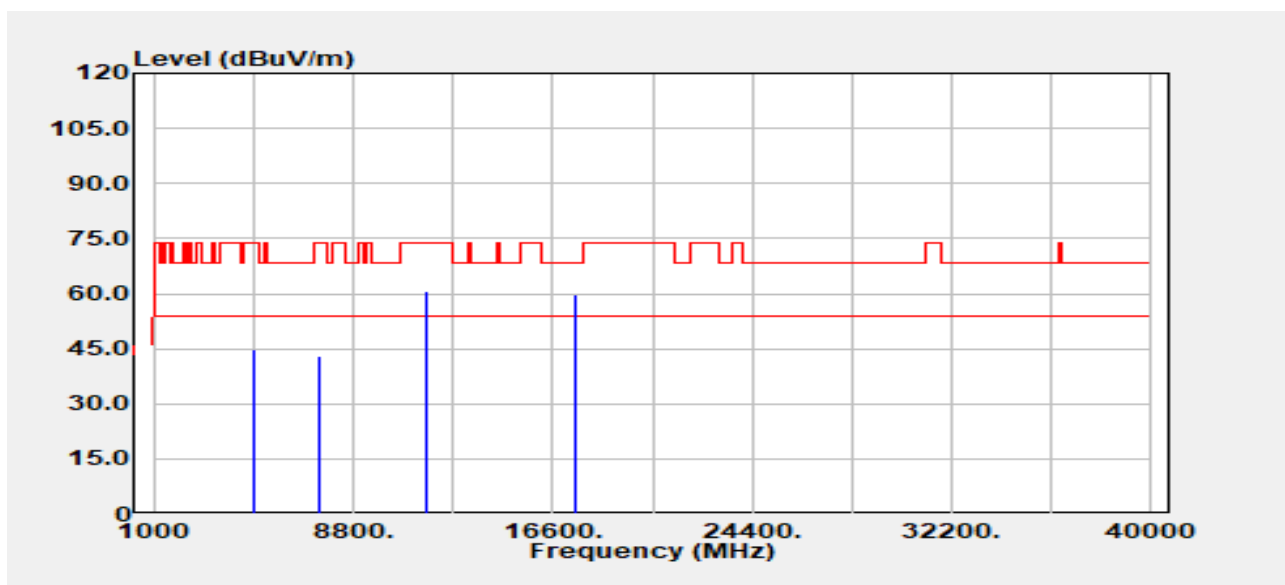
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
4960.00	Peak	44.00	2.94	46.94	74.00	-27.06
4960.00	Average	42.16	2.94	45.10	54.00	-8.90
7440.00	Peak	33.70	8.71	42.41	74.00	-31.59
7440.00	Average	27.48	8.71	36.19	54.00	-17.81
11650.00	Peak	48.85	13.59	62.44	74.00	-11.56
11650.00	Average	39.93	13.59	53.52	54.00	-0.48
17475.00	Peak	33.18	26.83	60.01	68.20	-8.19

Project No: TM-2411000242P
Report No.: TMWK2412004343KR

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Rev.: 00

Project No :TM-2411000242P
Operation Band :802.11a/Band4_BT BR
Frequency :5825+2480 MHz
Operation Mode :TX
EUT Pol :E1
Setting :93_0

Test Date :2024-11-27
Temp./Humi. :24.8/57
Antenna Pol. :HORIZONTAL
Engineer :Tony Chao
Test Chamber : 966A



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
4960.00	Peak	41.83	2.94	44.77	74.00	-29.23
4960.00	Average	38.27	2.94	41.21	54.00	-12.79
7440.00	Peak	34.32	8.71	43.03	74.00	-30.97
7440.00	Average	28.06	8.71	36.77	54.00	-17.23
11650.00	Peak	47.30	13.59	60.89	74.00	-13.11
11650.00	Average	39.65	13.59	53.24	54.00	-0.76
17475.00	Peak	32.91	26.83	59.74	68.20	-8.46

- End of Test Report -