

Project No: TM-2502000081P
Report No.: TMWK2502000509KR

FCC ID: 2AQ8A-KP3D7X1

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Rev.: 01

RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C

Test Standard	FCC Part 15.247
Product name	Kapture Square Deadbolt
Brand Name	Kapture
Model No.	KP3-D7P1, KP3-D791
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

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	March 25, 2025	Initial Issue	ALL	Peggy Tsai
01	April 7, 2025	See the following Note Rev. (01)	P.4	Peggy Tsai

Note:

Rev. (01)

1. Modify Model Discrepancy and Remark in section 1.1.

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Pamex Inc. 4680 Vinita Court, Chino, CA, 91710, United States		
Manufacturer	ALZK Co., Ltd. 9F., No. 36, Sec. 3, Bade Rd., Songshan Dist., Taipei City, Taiwan		
Equipment	Kapture Square Deadbolt		
Model No.	KP3-D7P1, KP3-D791		
Brand Name	Kapture		
Model Discrepancy			
		Main Model	Family Model
	Model No.	KP3-D7P1	KP3-D791
	Difference	Nickel (Color)	Black (Color)
Received Date	February 7, 2025		
Date of Test	February 24 ~ 27, 2025		
Power Operation	Powered from Battery (AA) Energizer Max / E915W4 Rating: DC 6V (DC 1.5V*4)		
EUT Serial #	0000024		
HW Version	V0.0.6		
FW Version	V0.0.1		

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: The variant model numbers / trademarks are assessed as identical in hardware and software to each other, hence all variants are fully covered by the test results in this test report without further verification test.
4. The device supports two colors. The color difference does not affect the RF and EMC characteristics, so the laboratory chooses one color for complete evaluation.

1.2 EUT CHANNEL INFORMATION

Frequency Range	2402MHz-2480MHz
Modulation Type	GFSK for BLE 1 Mbps GFSK for BLE 2 Mbps
Number of channel	40 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
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	☐ PIFA ☒ PCB ☐ Dipole ☐ Coils
Antenna Brand / Model Name	ALZK / ALZK-KP3-D7X1-BLE
Antenna Gain	Gain: 3.3 dBi

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.

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 2.21 dB
Channel Bandwidth	+/- 2.79 dB
RF output power (Power Meter + Power sensor)	+/- 0.24 dB
Power Spectral density	+/- 2.74 dB
Conducted Bandedge	+/- 2.74 dB
Conducted Spurious Emission	+/- 2.74 dB
Radiated Emission_9kHz-30MHz	+/- 3.492 dB
Radiated Emission_30MHz-200MHz	+/- 3.62 dB
Radiated Emission_200MHz-1GHz	+/- 3.899 dB
Radiated Emission_1GHz-6GHz	+/- 5.063 dB
Radiated Emission_6GHz-18GHz	+/- 5.122 dB
Radiated Emission_18GHz-26GHz	+/- 3.032 dB
Radiated Emission_26GHz-40GHz	+/- 3.271 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.

1.5 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
AC Conduction Room	-	Not applicable, because EUT not connect to AC Main Source direct.
Radiation	Ben Yang	-
RF Conducted	David Lee	-

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

1.6 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	1911387	2024-08-30	2025-08-29
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-001	2024-08-08	2025-08-07
Attenuator	Marvelous Microwave Inc	MVE2213-10	08	2024-11-07	2025-11-06
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
Active Loop Antenna	SCHWARZBECK	FMZB 1513-60	1513-60-028	2024-12-11	2025-12-10
Thermo-Hygro Meter	WISEWIND	1206	D07	2024-11-26	2025-11-25
Bi-Log Antenna	Sunol Sciences	JB3	A030105	2024-07-12	2025-07-11
Preamplifier	EMEC	EM330	60609	2025-02-20	2026-02-19
Cable	Huber+Suhner	104PEA	20995+21000+182330	2024-08-07	2025-08-06
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2024-12-20	2025-12-19
Preamplifier	HP	8449B	3008A00965	2024-12-18	2025-12-17
Cable	EMCI	EMC101G	221011+221012+221213	2024-10-11	2025-10-10
Attenuator	Mini-Circuits	BW-S9W5	BWS9W5-09-966A-01	2025-02-06	2026-02-05
Site Validation	CCS	966A	N/A	2024-08-03	2025-08-02
High Pass Filters	Titan Microwave	T04H30001800070S01	22011402-4	2024-06-12	2025-06-11
Pre-Amplifier	EMCI	EMC184045SE	980860	2024-12-02	2025-12-01
Horn Antenna	SCHWARZBECK	BBHA9170	1047	2024-12-06	2025-12-05
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
Software	e3 V9-210616c				

Remark:

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

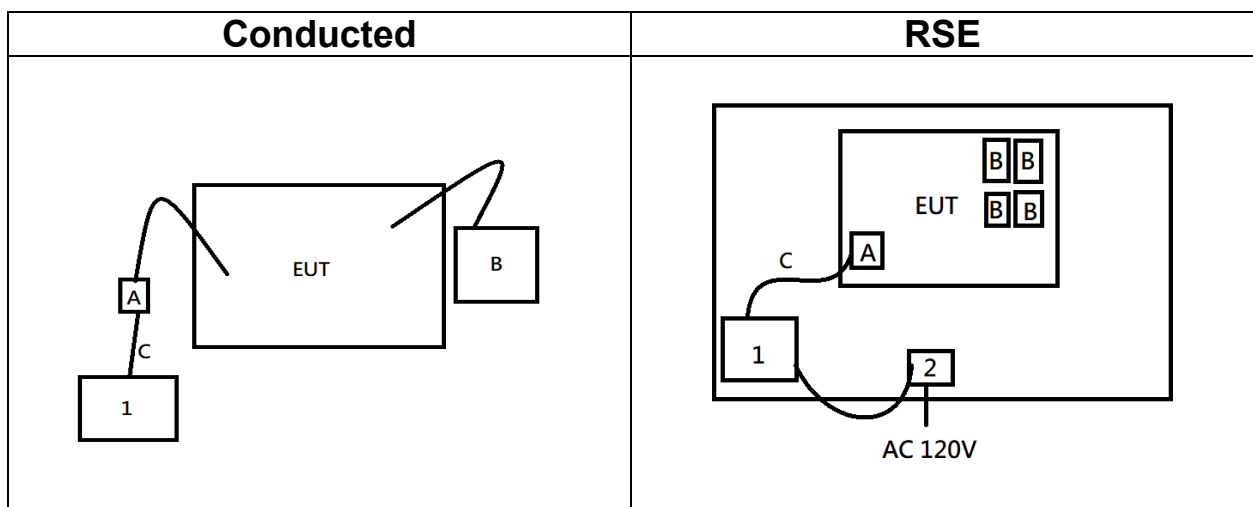
1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

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

Support Equipment (Conducted)					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(I)	Lenovo	X260	N/A	N/A
A	FT232 USB UART	N/A	N/A	N/A	N/A
B	Battery	Energizer Max	E91-LR6-AM3	N/A	N/A
C	Micro to USB	N/A	N/A	N/A	N/A

Support Equipment (RSE)					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(D)	Lenovo	ThinkPad X260	N/A	N/A
2	Adapter	Lenovo	ADLX45DLC3A	N/A	N/A
A	UART to TTL	N/A	N/A	N/A	N/A
B	Battery	Energizer Max	E91-LR6-AM3	N/A	N/A
C	Micro to USB	N/A	N/A	N/A	N/A

1.8 TEST SET UP DIAGRAM



1.9 TEST PROGRAM

The EUT connection corresponds to the surrounding fixture control board.
This EUT uses "Tera Term" software and setup command to set the frequency, modulation, and power to allow the sample to continuously transmit .

1.10 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 SUMMERY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	N/A
15.247(a)(2)	4.2	6 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)(3)	4.3	Output Power Measurement	Pass
15.247(e)	4.4	Power Spectral Density	Pass
15.247(d)	4.5	Conducted Band Edge	Pass
15.247(d)	4.5	Conducted Spurious Emission	Pass
15.247(d) 15.205, 15.209	4.6	Radiation Band Edge	Pass
15.247(d) 15.205, 15.209	4.6	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	BLE Mode (1Mbps) BLE Mode (2Mbps)
Test Channel Frequencies	1.Lowest Channel : 2402MHz 2.Middle Channel : 2442MHz 3.Highest Channel : 2480MHz

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 Battery
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☒ 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 Battery
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

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

3.3 EUT DUTY CYCLE

Temperature: 23.2°C

Test date: February 27, 2025

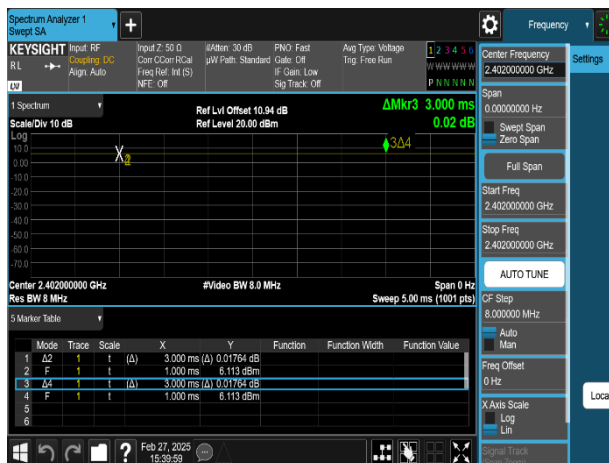
Humidity: 61% RH

Tested by: David Lee

Mode	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
BLE 1M	100.00	0.00	0.00	0.01
BLE 2M	100.00	0.00	0.00	0.01

BLE_1M_LowCH00-2402

BLE_2M_LowCH00-2402



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

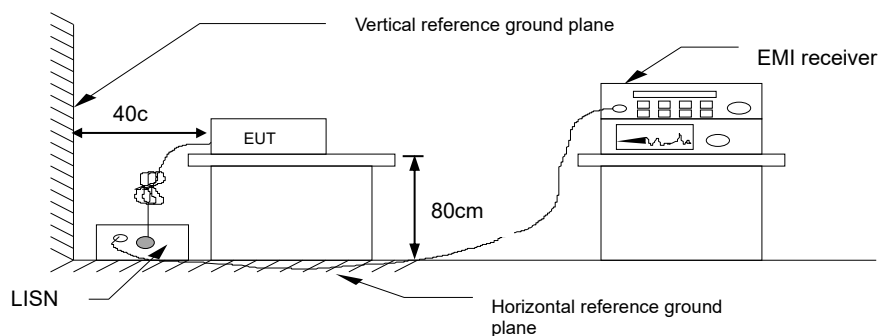
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup



4.1.4 Test Result

Not applicable, because EUT not connect to AC Main Source direct.

4.2 6dB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

According to §15.247(a)(2),

6 dB Bandwidth :

Limit	Shall be at least 500kHz
-------	--------------------------

Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 558074 D01 and ANSI C63.10: 2013 clause 6.9.2.

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 6 dB Bandwidth.
4. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth
5. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup

Refer to section 1.8.

4.2.4 Test Result

Temperature: 23.2°C

Test date: February 27, 2025

Humidity: 61% RH

Tested by: David Lee

6dB BANDWIDTH

BLE 1M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
2402	0.7508	≥ 0.5	PASS
2442	0.7055	≥ 0.5	PASS
2480	0.7311	≥ 0.5	PASS

BLE 2M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
2402	1.245	≥ 0.5	PASS
2442	1.306	≥ 0.5	PASS
2480	1.326	≥ 0.5	PASS

BANDWIDTH 99%

BLE 1M mode

Frequency (MHz)	99%Bandwidth (MHz)
2402	1.0693
2442	1.0644
2480	1.0760

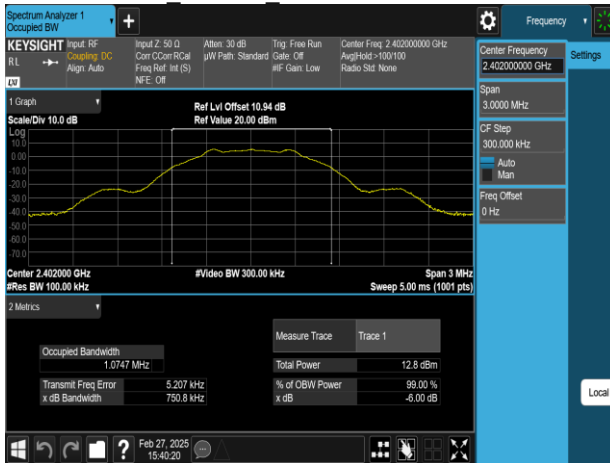
BLE 2M mode

Frequency (MHz)	99%Bandwidth (MHz)
2402	2.0694
2442	2.0744
2480	2.0800

Test Data

6dB BANDWIDTH

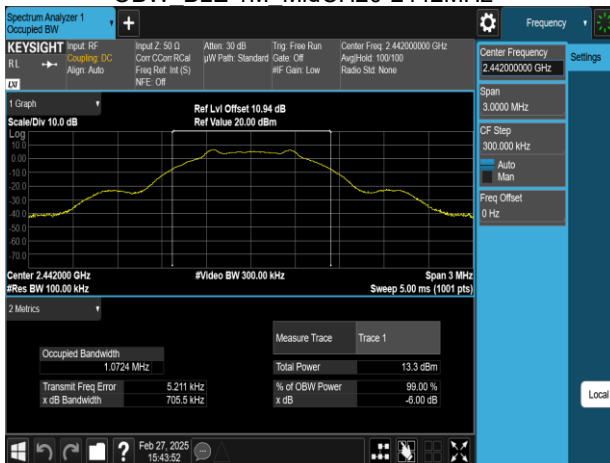
OBW BLE 1M LowCH00-2402MHz



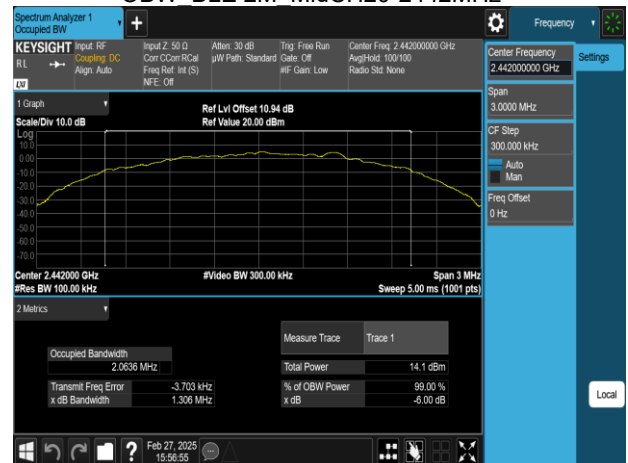
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OBW BLE 1M MidCH20-2442MHz



OBW BLE 2M MidCH20-2442MHz



OBW BLE 1M HighCH39-2480MHz



OBW BLE 2M HighCH39-2480MHz

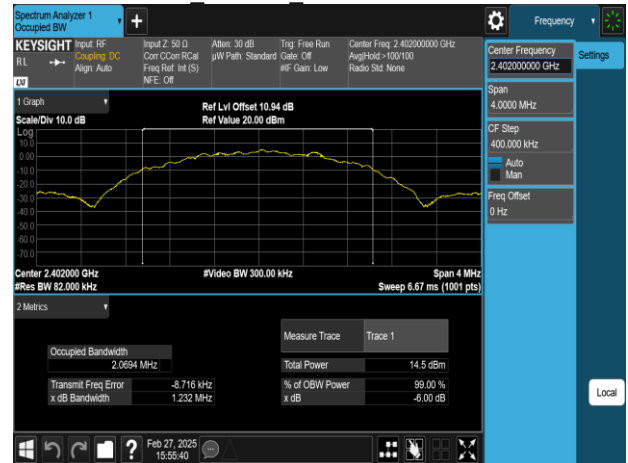


BANDWIDTH 99%

IC OBW BLE 1M LowCH00-2402MHz



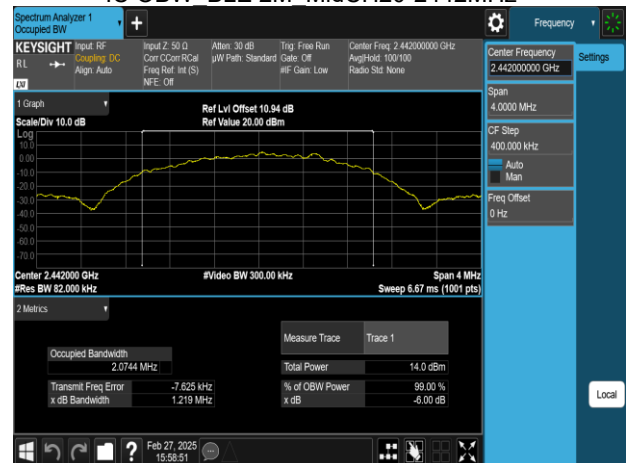
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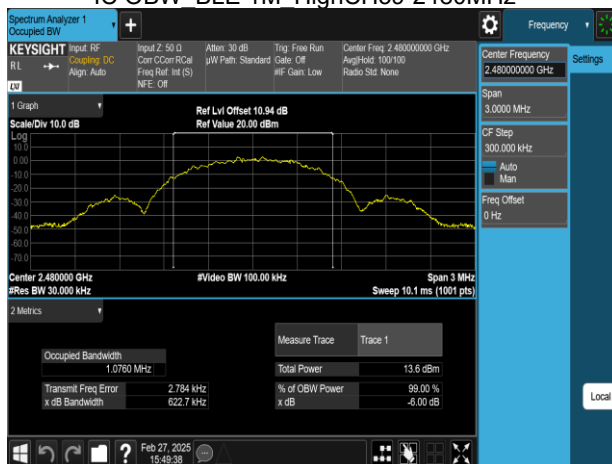
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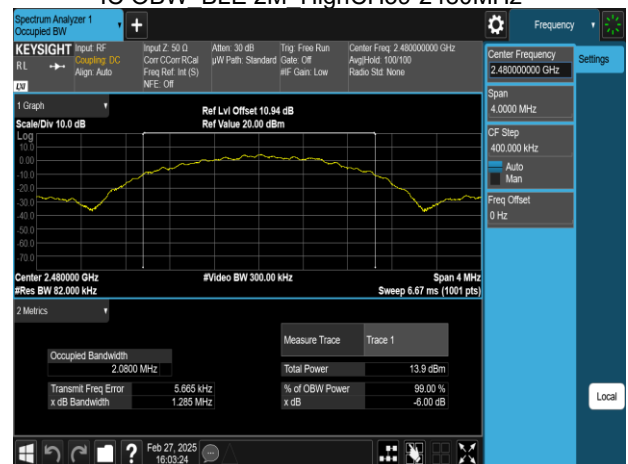
IC OBW BLE 2M MidCH20-2442MHz



IC OBW BLE 1M HighCH39-2480MHz



IC OBW BLE 2M HighCH39-2480MHz



4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b)(3),

Peak output power :

FCC

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

Limit	☒ Antenna not exceed 6 dBi : 30dBm ☐ Antenna with DG greater than 6 dBi [Limit = 30 – (DG – 6)] ☐ Point-to-point operation
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Average output power : For reporting purposes only.

4.3.2 Test Procedure

Test method Refer as KDB 558074 D01

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.

4.3.3 Test Setup

Refer to section 1.8.

4.3.4 Test Result

Temperature: 23.2°C

Test date: February 27, 2025

Humidity: 61% RH

Tested by: David Lee

Peak & Average output power :

BLE 1M mode:

CH	Frequency (MHz)	Power Setting	Peak Output Power (dBm)	Required Limit (dBm)
0	2402	7	6.25	30
20	2442	8	6.65	30
39	2480	8	6.10	30
CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Required Limit (dBm)
0	2402	7	6.11	30
20	2442	8	6.52	30
39	2480	8	5.94	30

***Note:**

1.Measured by power meter, cable loss 10.94 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

BLE 2M mode:

CH	Frequency (MHz)	Power Setting	Peak Output Power (dBm)	Required Limit (dBm)
0	2402	8	7.13	30
20	2442	8	6.65	30
39	2480	8	6.08	30
CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Required Limit (dBm)
0	2402	8	7.02	30
20	2442	8	6.51	30
39	2480	8	5.94	30

***Note:**

1. Measured by power meter, cable loss 10.94 dB + Duty cycle factor has been offsetted to the power meter for Avg. power and cable loss has been offsetted for Peak power measurement.

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.247(e),

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Limit	☒ Antenna not exceed 6 dBi : 8dBm ☐ Antenna with DG greater than 6 dBi [Limit = 8 – (DG – 6)] ☐ Point-to-point operation :
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4.4.2 Test Procedure

Test method Refer as KDB 558074 D01

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 3kHz, VBW = 10kHz, Span = 1.5 times DTS Bandwidth (6 dB BW), Detector = Peak, Sweep Time = Auto and Trace = Max hold.
4. The path loss was compensated to the results for each measurement by SA.
5. Mark the maximum level.
6. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup

Refer to section 1.8.

4.4.4 Test Result

Temperature: 23.2°C
Humidity: 61% RH

Test date: February 27, 2025
Tested by: David Lee

BLE 1M mode

Frequency (MHz)	RF Power Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)	Result
2402	-7.09	8	PASS
2442	-7.74	8	PASS
2480	-7.60	8	PASS

***Note:**

1.cable loss as 10.94dB that offsets in the spectrum

BLE 2M mode

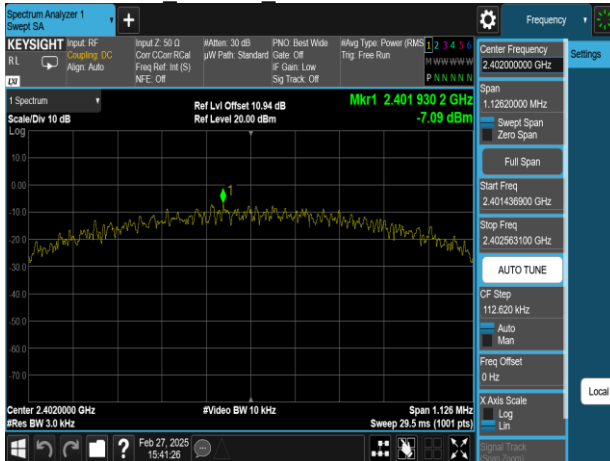
Frequency (MHz)	RF Power Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)	Result
2402	-8.29	8	PASS
2442	-10.09	8	PASS
2480	-9.59	8	PASS

***Note:**

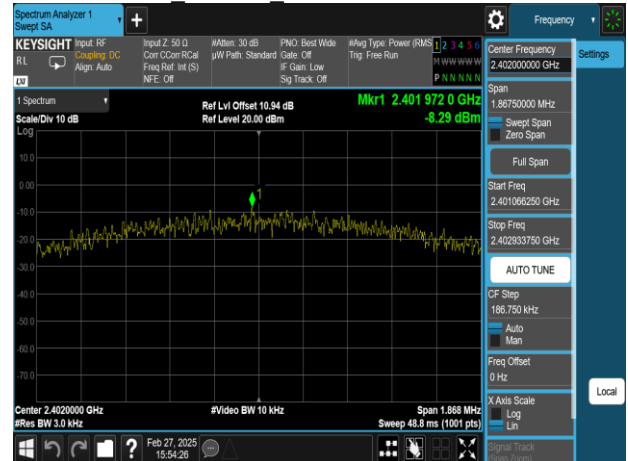
1.cable loss as 10.94dB that offsets in the spectrum

Test Data

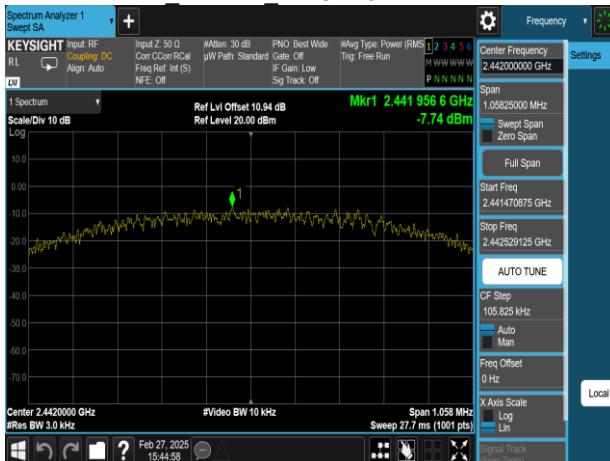
PSD BLE 1M LowCH00-2402MHz



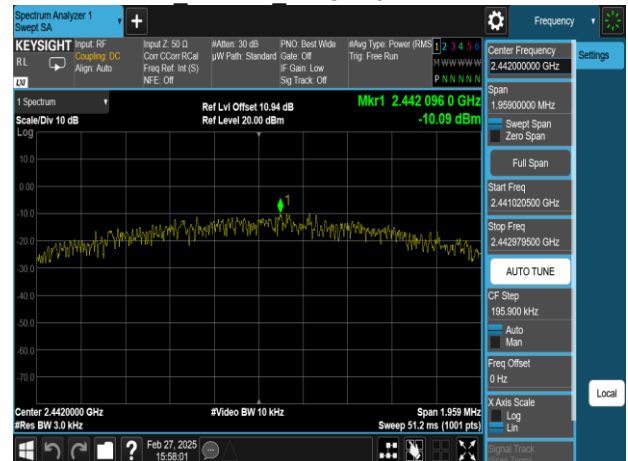
PSD BLE 2M LowCH00-2402MHz



PSD BLE 1M MidCH20-2442MHz



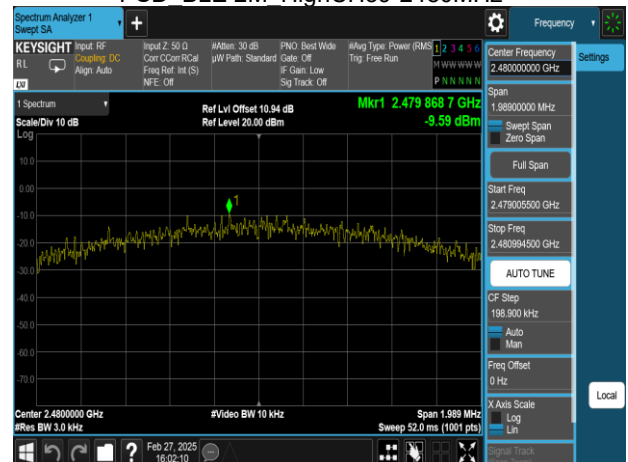
PSD BLE 2M MidCH20-2442MHz



PSD BLE 1M HighCH39-2480MHz



PSD BLE 2M HighCH39-2480MHz



4.5 CONDUCTED BAND EDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

According to §15.247(d),

FCC: In any 100 kHz bandwidth outside the authorized frequency band, Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

4.5.2 Test Procedure

Test method Refer as KDB 558074 D01

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.
2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.
3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

4.5.3 Test Setup

Refer to section 1.8.

4.5.4 Test Result

Temperature: 23.2°C

Test date: February 27, 2025

Humidity: 61% RH

Tested by: David Lee

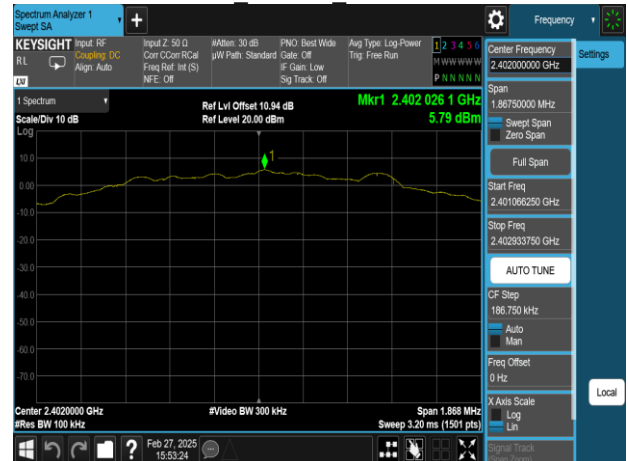
Test Data

Reference Level

Reference Level BLE 1M LowCH00-2402MHz



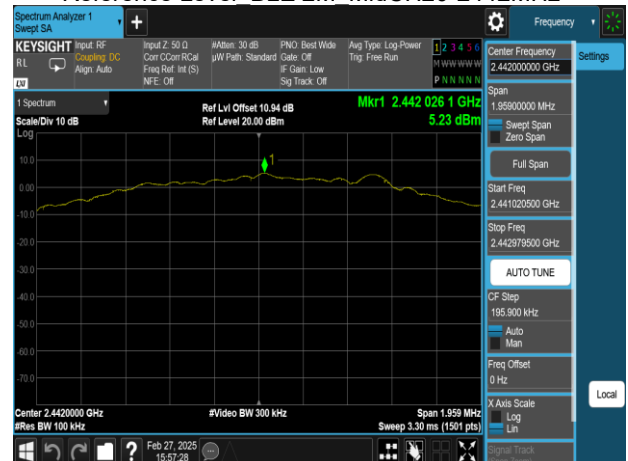
Reference Level BLE 2M LowCH00-2402MHz



Reference Level BLE 1M MidCH20-2442MHz



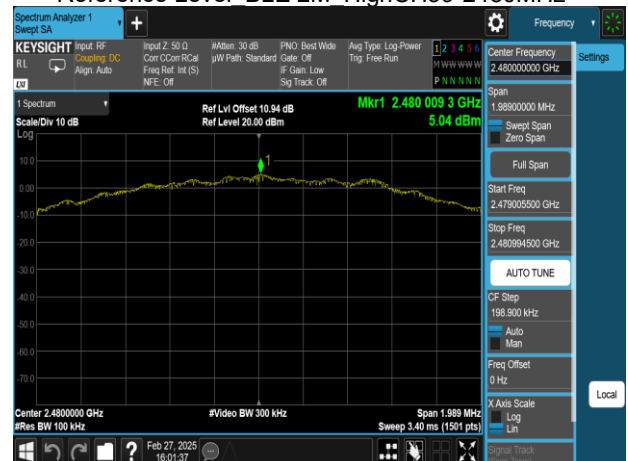
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Reference Level BLE 1M HighCH39-2480MHz



Reference Level BLE 2M HighCH39-2480MHz

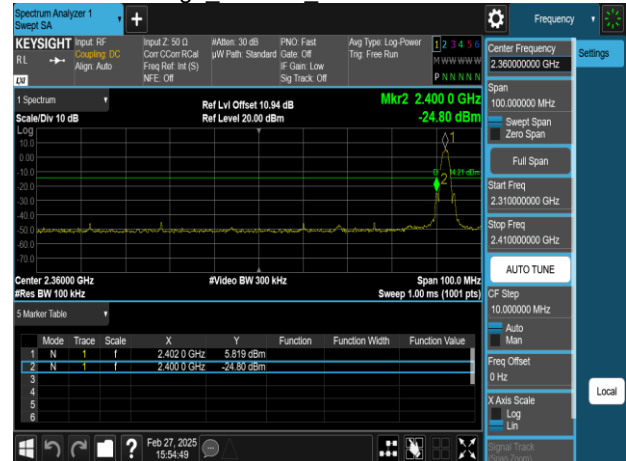


Band Edge

Band Edge BLE 1M LowCH00-2402MHz



Band Edge BLE 2M LowCH00-2402MHz



Band Edge BLE 1M HighCH39-2480MHz

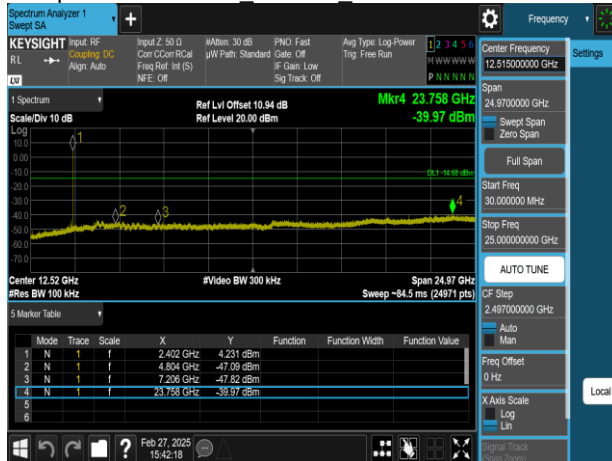


Band Edge BLE 2M HighCH39-2480MHz

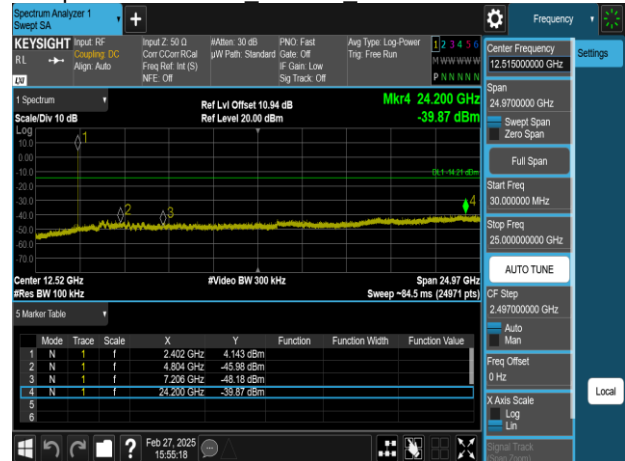


Spurious Emission

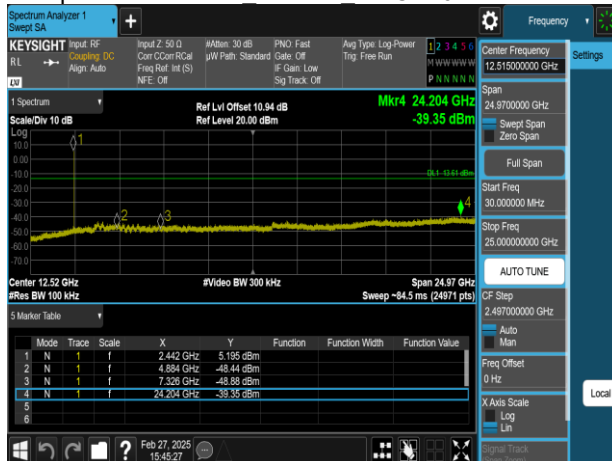
Spurious Emission BLE 1M LowCH00-2402MHz



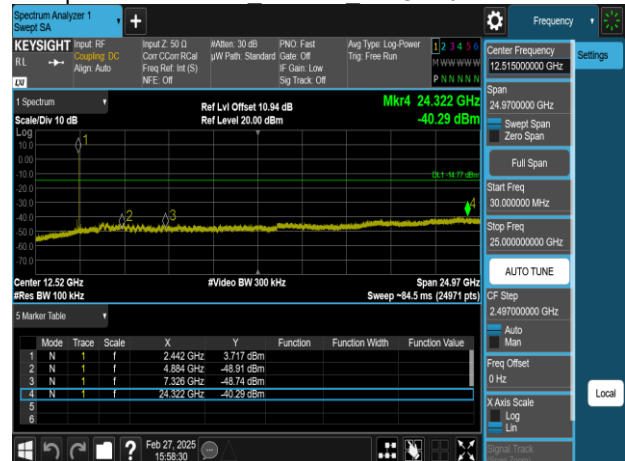
Spurious Emission BLE 2M LowCH00-2402MHz



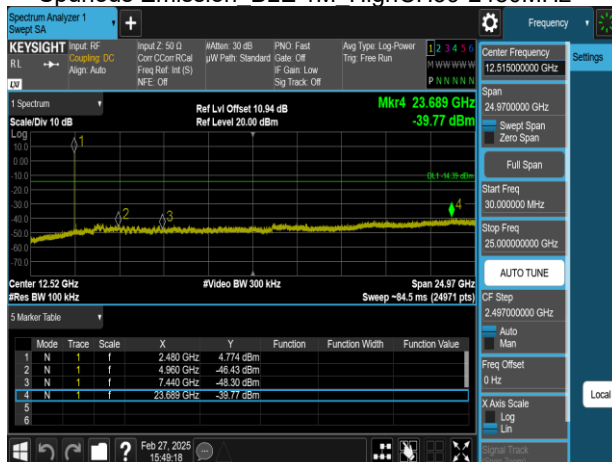
Spurious Emission BLE 1M MidCH20-2442MHz



Spurious Emission BLE 2M MidCH20-2442MHz



Spurious Emission BLE 1M HighCH39-2480MHz



Spurious Emission BLE 2M HighCH39-2480MHz



4.6 RADIATION BANDEGE AND SPURIOUS EMISSION

4.6.1 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.

4.6.2 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 low, Mid and High 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.

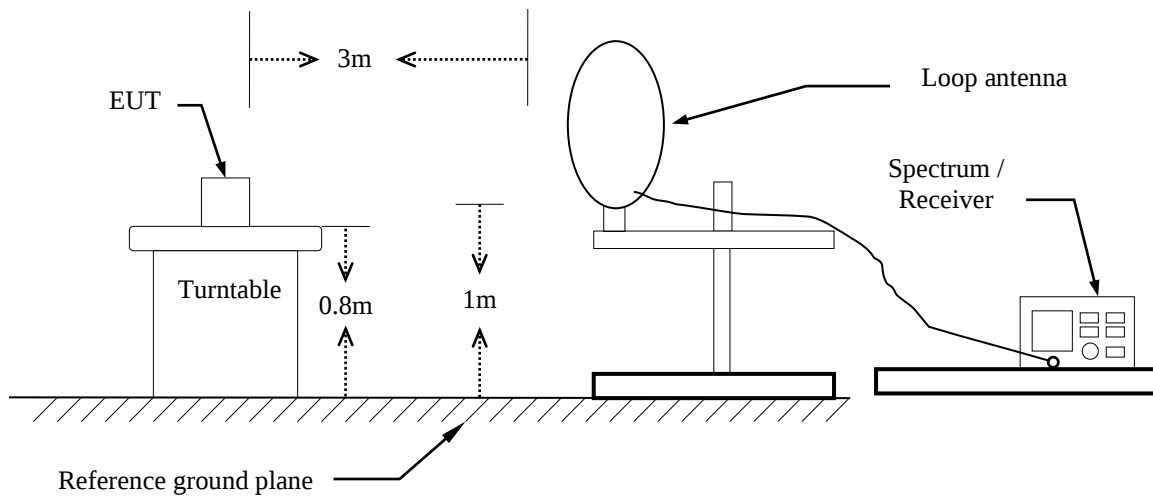
6. Data result :

Actual FS=Spectrum Reading Level + Factor

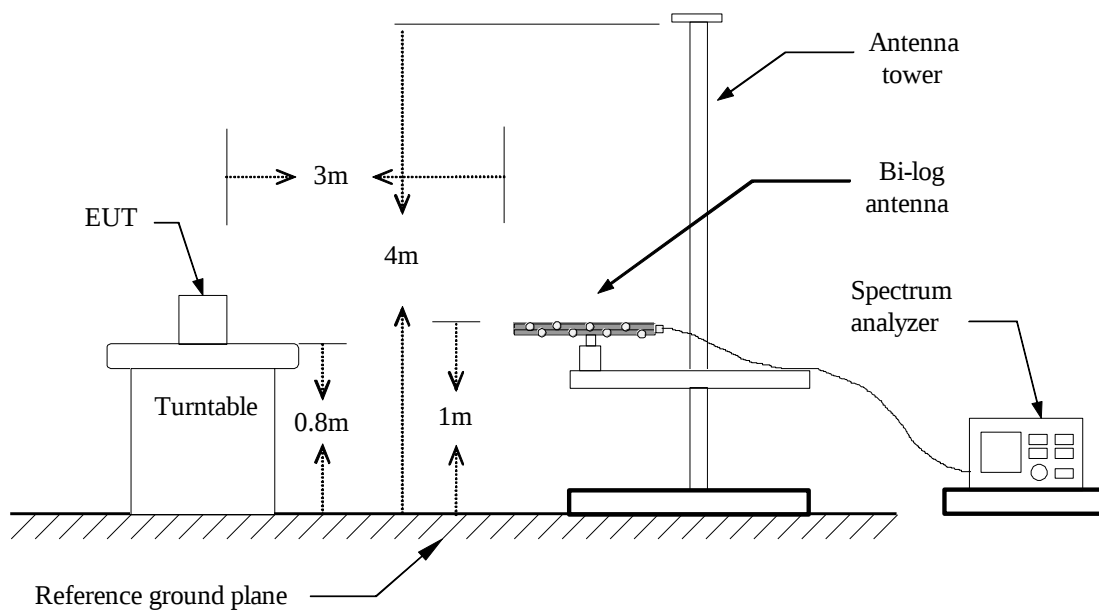
Margin=Actual FS- Limit

4.6.3 Test Setup

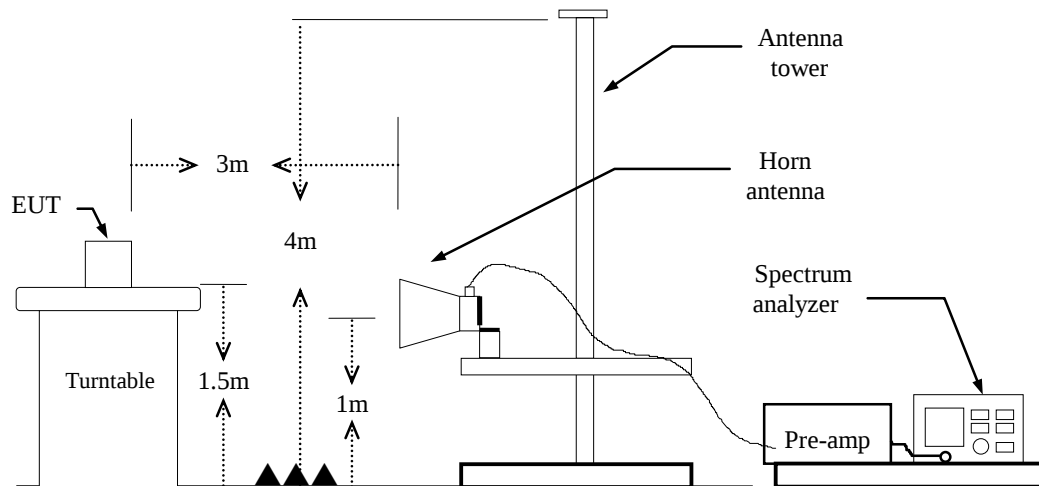
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz

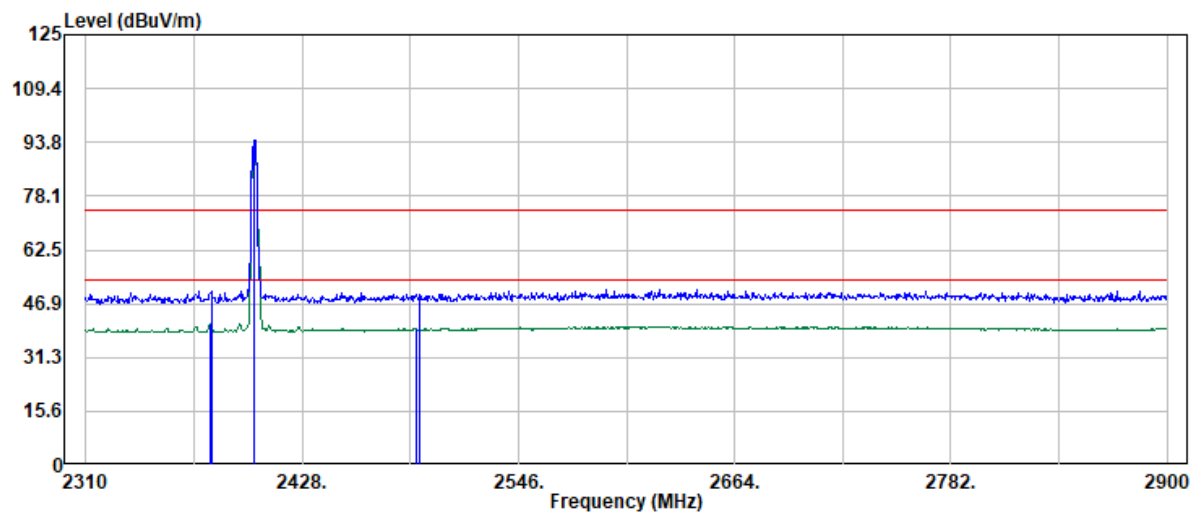


4.6.4 Test Result

Band Edge Test Data

Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2402 MHz
Operation Mode : Bandedge
EUT Pol : H
Setting : 7

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



Trace: 1

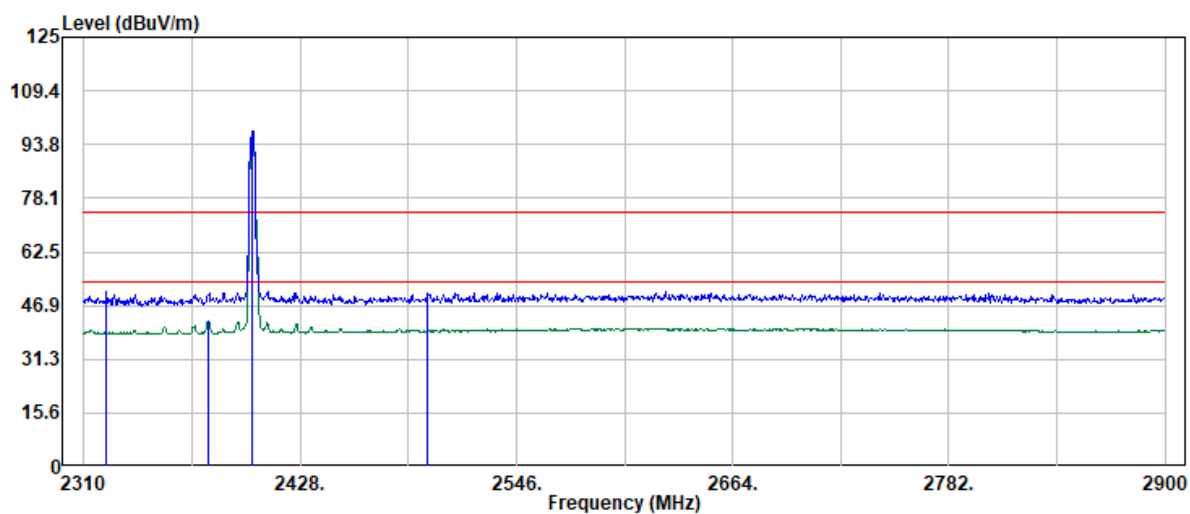
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2377.94	34.61	6.35	40.96	54.00	-13.04	Average
2378.44	44.16	6.36	50.52	74.00	-23.48	Peak
2402.00	87.80	6.49	94.29	--	--	Peak
2402.00	87.58	6.49	94.07	--	--	Average
2490.35	32.83	6.86	39.69	54.00	-14.31	Average
2492.35	42.53	6.86	49.39	74.00	-24.61	Peak

Project No: TM-2502000081P
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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2402 MHz
Operation Mode : Bandedge
EUT Pol : H
Setting : 7

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



Trace: 1

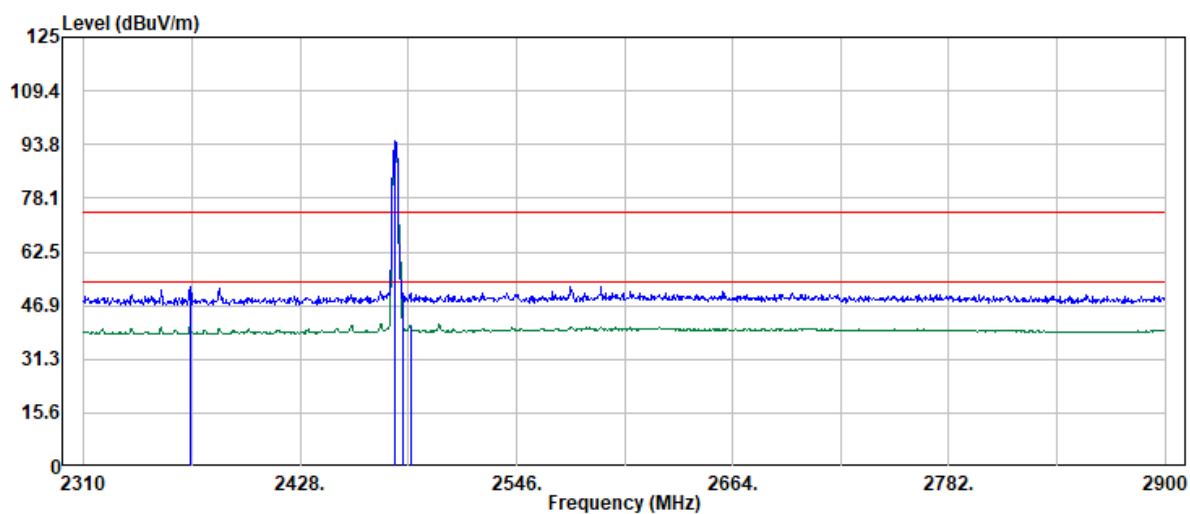
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2322.49	44.79	6.37	51.16	74.00	-22.84	Peak
2377.94	36.21	6.35	42.56	54.00	-11.44	Average
2402.00	91.19	6.49	97.68	--	--	Peak
2402.00	90.98	6.49	97.47	--	--	Average
2497.84	43.79	6.84	50.63	74.00	-23.37	Peak
2497.84	33.50	6.84	40.34	54.00	-13.66	Average

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Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2480 MHz
Operation Mode : Bandedge
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



Trace: 1

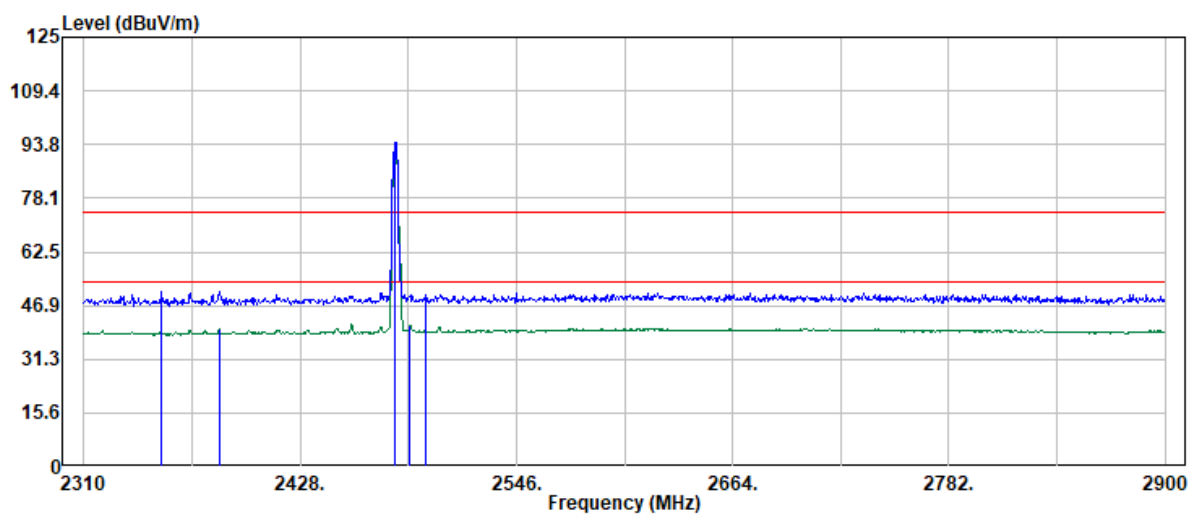
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2367.95	34.33	6.29	40.62	54.00	-13.38	Average
2368.45	46.28	6.29	52.57	74.00	-21.43	Peak
2480.00	87.82	6.78	94.60	--	--	Peak
2480.00	87.56	6.78	94.34	--	--	Average
2483.85	43.67	6.82	50.49	74.00	-23.51	Peak
2488.35	34.05	6.85	40.90	54.00	-13.10	Average

Project No: TM-2502000081P
Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2480 MHz
Operation Mode : Bandedge
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



Trace: 1

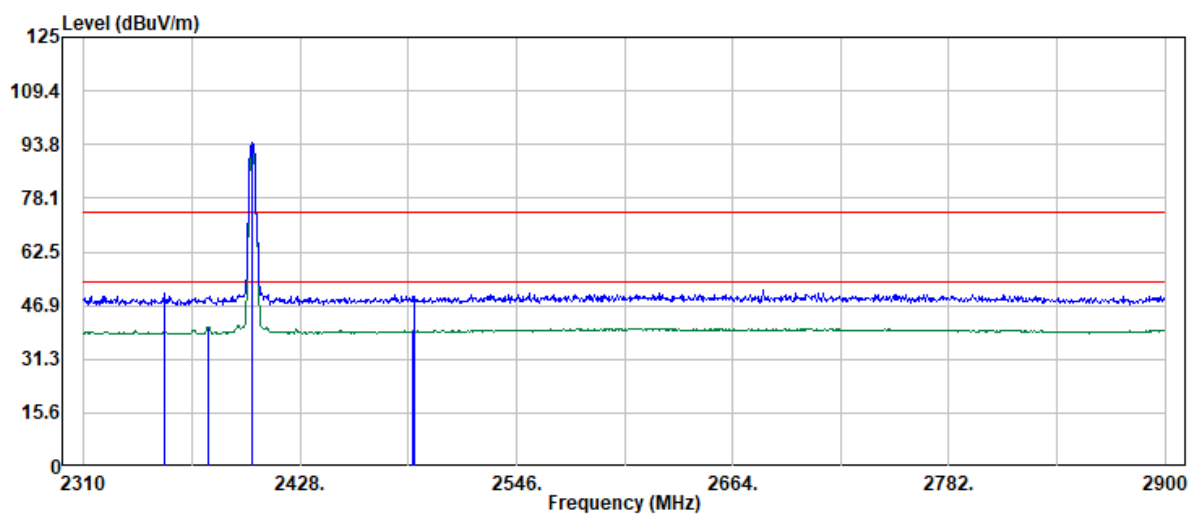
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2352.46	44.67	6.19	50.86	74.00	-23.14	Peak
2383.94	33.57	6.39	39.96	54.00	-14.04	Average
2480.00	87.39	6.78	94.17	--	--	Peak
2480.00	87.04	6.78	93.82	--	--	Average
2487.85	34.23	6.85	41.08	54.00	-12.92	Average
2496.34	43.19	6.85	50.04	74.00	-23.96	Peak

Project No: TM-2502000081P
Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2402 MHz
Operation Mode : Bandedge
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



Trace: 1

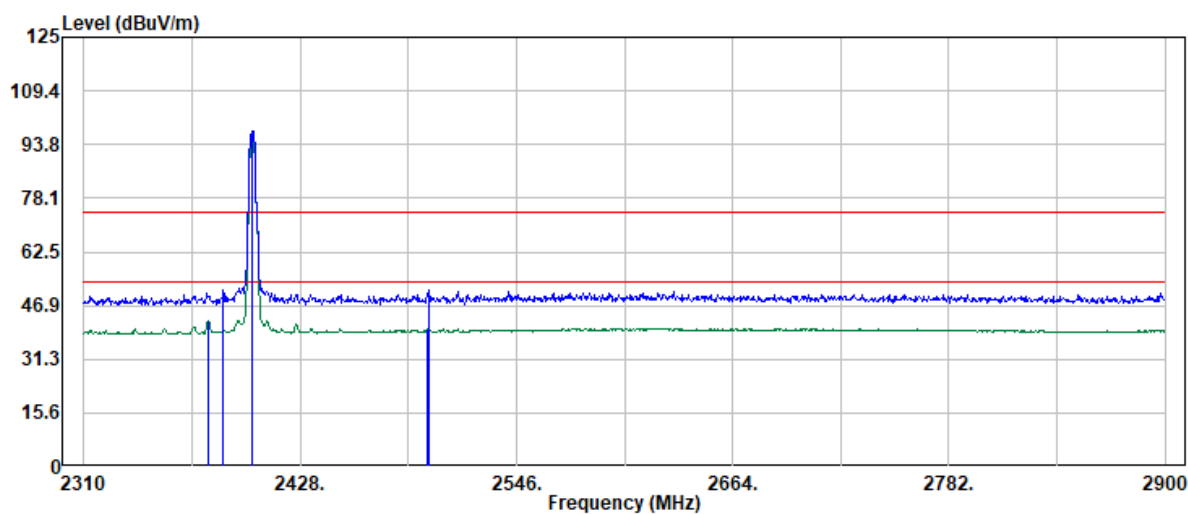
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2353.96	44.04	6.20	50.24	74.00	-23.76	Peak
2377.94	34.37	6.35	40.72	54.00	-13.28	Average
2402.00	87.67	6.49	94.16	--	--	Peak
2402.00	86.62	6.49	93.11	--	--	Average
2489.85	32.63	6.86	39.49	54.00	-14.51	Average
2490.35	42.85	6.86	49.71	74.00	-24.29	Peak

Project No: TM-2502000081P
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Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2402 MHz
Operation Mode : Bandedge
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



Trace: 1

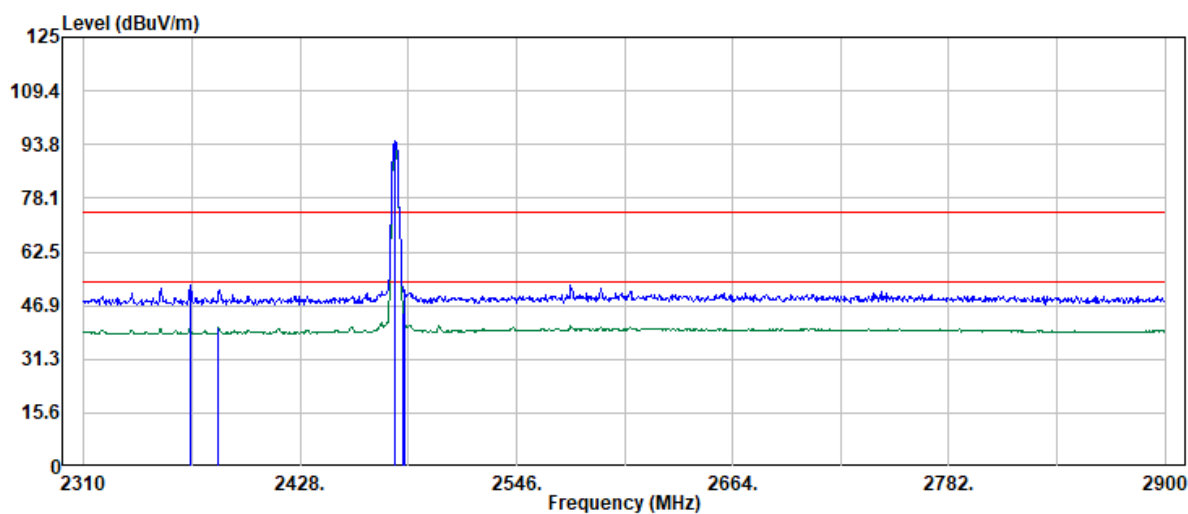
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2377.94	35.99	6.35	42.34	54.00	-11.66	Average
2385.94	45.05	6.40	51.45	74.00	-22.55	Peak
2402.00	91.04	6.49	97.53	--	--	Peak
2402.00	90.05	6.49	96.54	--	--	Average
2497.84	33.29	6.84	40.13	54.00	-13.87	Average
2498.34	44.77	6.84	51.61	74.00	-22.39	Peak

Project No: TM-2502000081P
Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2480 MHz
Operation Mode : Bandedge
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



Trace: 1

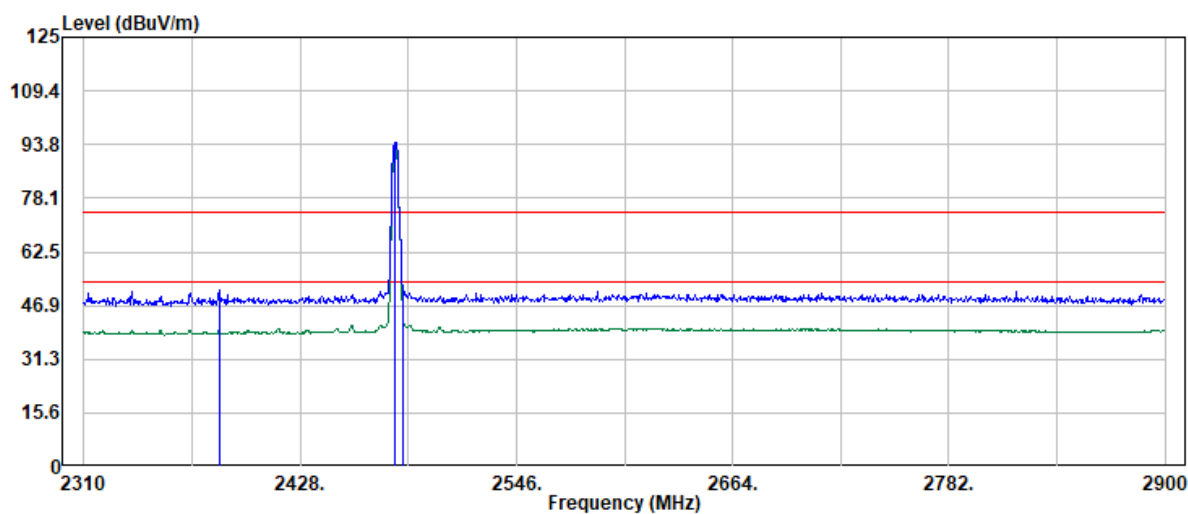
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-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2367.95	46.34	6.29	52.63	74.00	-21.37	Peak
2383.44	34.07	6.39	40.46	54.00	-13.54	Average
2480.00	87.87	6.78	94.65	--	--	Peak
2480.00	86.81	6.78	93.59	--	--	Average
2483.85	38.01	6.82	44.83	54.00	-9.17	Average
2484.85	44.50	6.82	51.32	74.00	-22.68	Peak

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Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2480 MHz
Operation Mode : Bandedge
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



Trace: 1

Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
2383.94	45.06	6.39	51.45	74.00	-22.55	Peak
2383.94	33.84	6.39	40.23	54.00	-13.77	Average
2480.00	87.53	6.78	94.31	--	--	Peak
2480.00	86.53	6.78	93.31	--	--	Average
2483.85	37.96	6.82	44.78	54.00	-9.22	Average
2484.35	45.12	6.81	51.93	74.00	-22.07	Peak

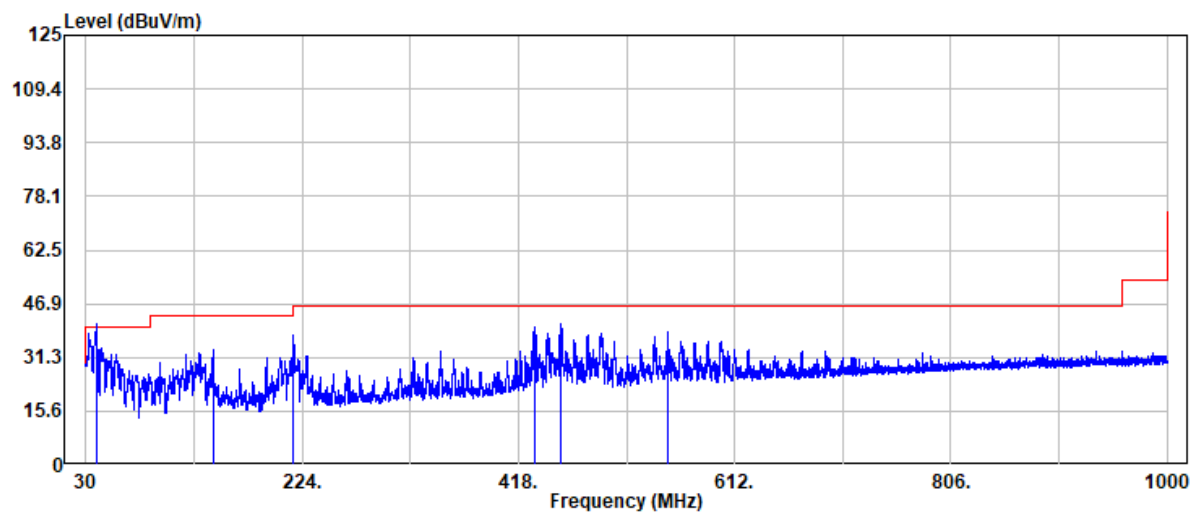
Project No: TM-2502000081P
Report No.: TMWK2502000509KR

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TX Test Data

Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2402 MHz
Operation Mode : TX
EUT Pol : H
Setting :

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



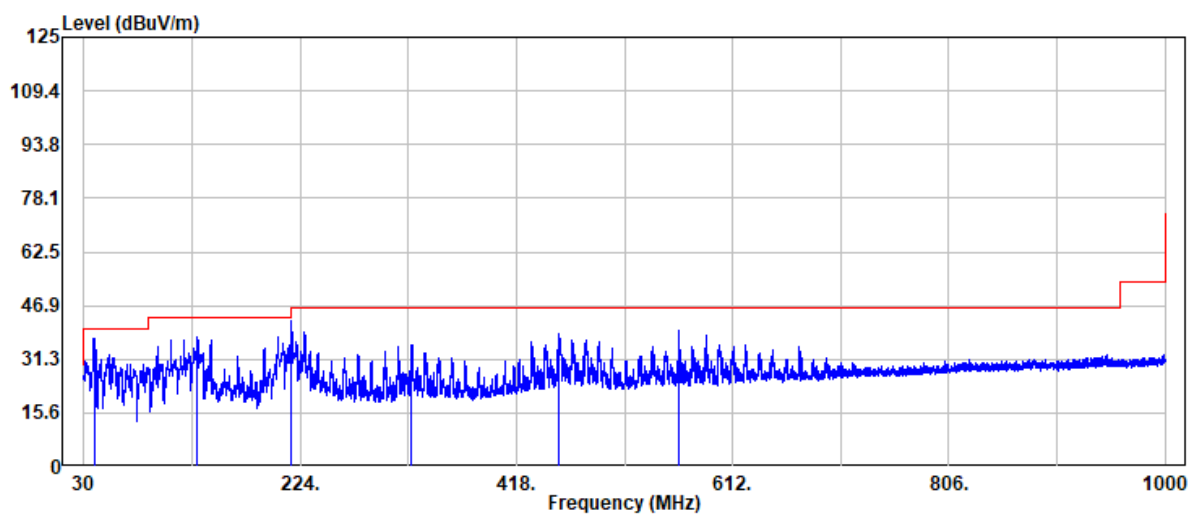
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
39.46	47.06	-9.86	37.20	40.00	-2.80	QP
143.98	44.49	-10.87	33.62	43.50	-9.88	Peak
216.24	50.56	-12.69	37.87	46.00	-8.13	Peak
432.31	45.75	-5.85	39.90	46.00	-6.10	Peak
456.07	46.14	-5.31	40.83	46.00	-5.17	Peak
551.74	42.34	-3.72	38.62	46.00	-7.38	Peak

Project No: TM-2502000081P
Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2402 MHz
Operation Mode : TX
EUT Pol : H
Setting :

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



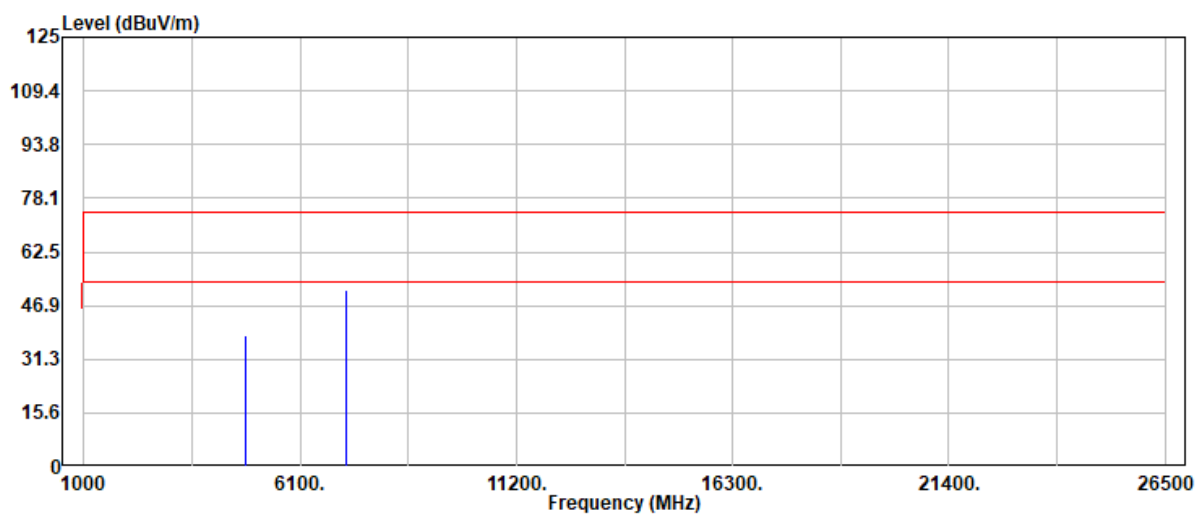
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
39.22	46.81	-9.69	37.12	40.00	-2.88	Peak
131.97	47.63	-10.03	37.60	43.50	-5.90	Peak
216.00	54.95	-12.70	42.25	43.50	-1.25	Peak
324.03	44.46	-8.92	35.54	46.00	-10.46	Peak
456.68	44.15	-5.30	38.85	46.00	-7.15	Peak
564.23	43.24	-3.50	39.74	46.00	-6.26	Peak

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Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2402 MHz
Operation Mode : TX
EUT Pol : H
Setting : 7

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



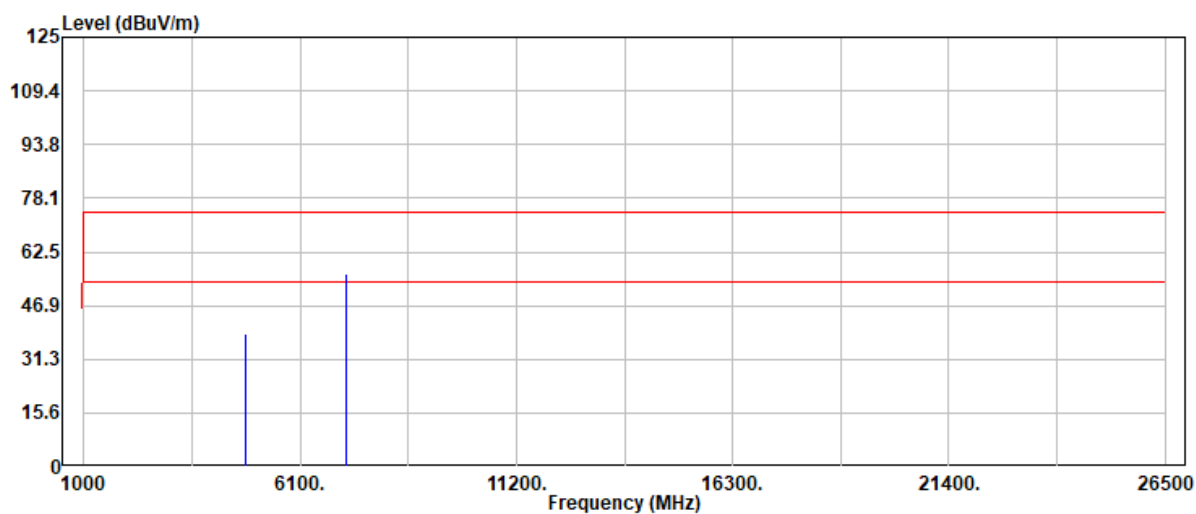
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4804.00	36.15	1.98	38.13	74.00	-35.87	Peak
4804.00	29.80	1.98	31.78	54.00	-22.22	Average
7206.00	42.54	8.82	51.36	74.00	-22.64	Peak
7206.00	39.58	8.82	48.40	54.00	-5.60	Average

Project No: TM-2502000081P
Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2402 MHz
Operation Mode : TX
EUT Pol : H
Setting : 7

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



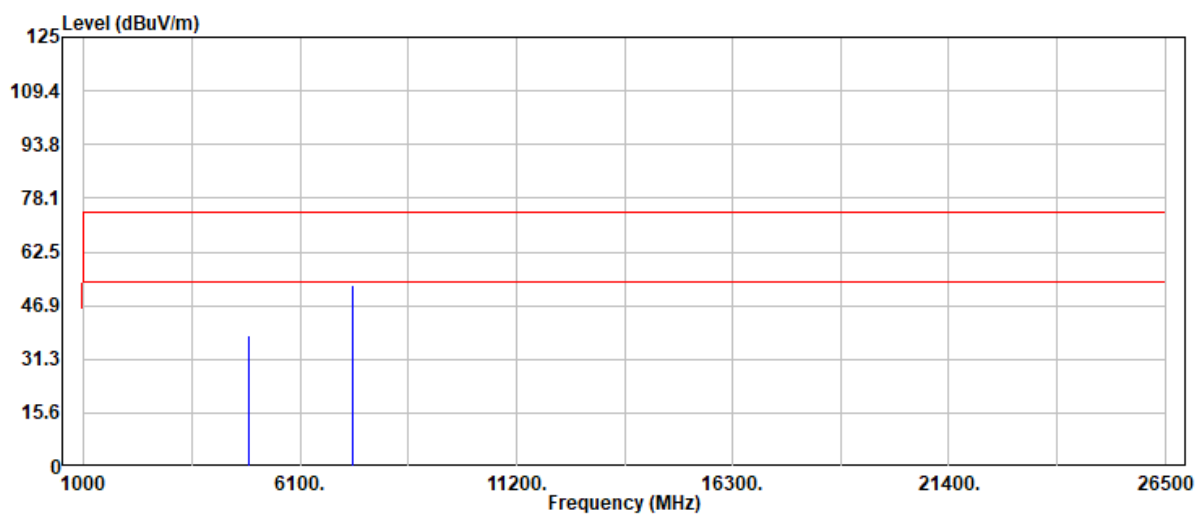
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4804.00	36.47	1.98	38.45	74.00	-35.55	Peak
4804.00	29.68	1.98	31.66	54.00	-22.34	Average
7206.00	47.11	8.82	55.93	74.00	-18.07	Peak
7206.00	44.51	8.82	53.33	54.00	-0.67	Average

Project No: TM-2502000081P
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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2442 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



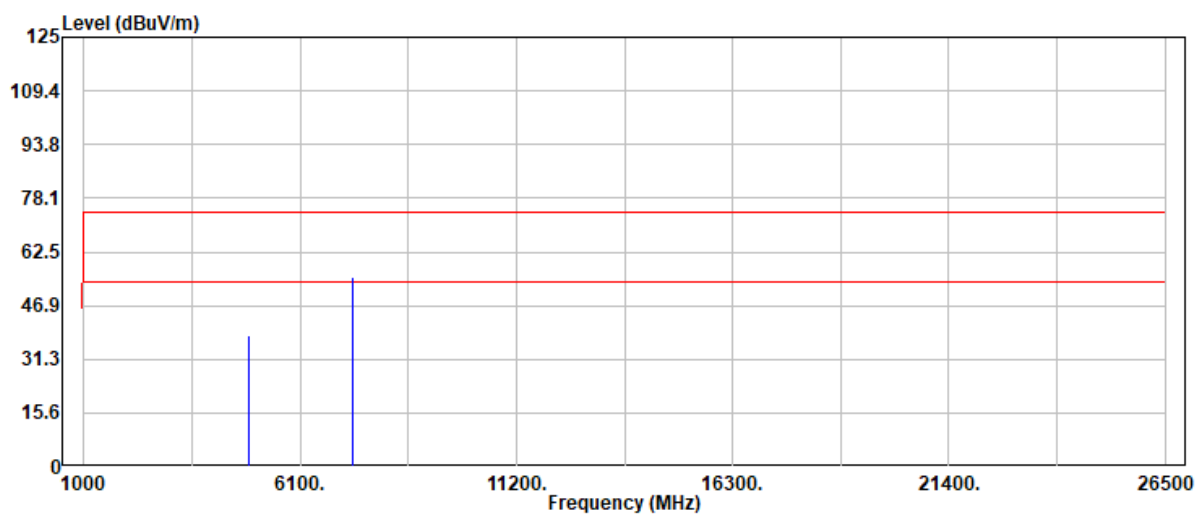
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4884.00	35.41	2.69	38.10	74.00	-35.90	Peak
4884.00	29.58	2.69	32.27	54.00	-21.73	Average
7326.00	43.66	9.27	52.93	74.00	-21.07	Peak
7326.00	40.58	9.27	49.85	54.00	-4.15	Average

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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2442 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



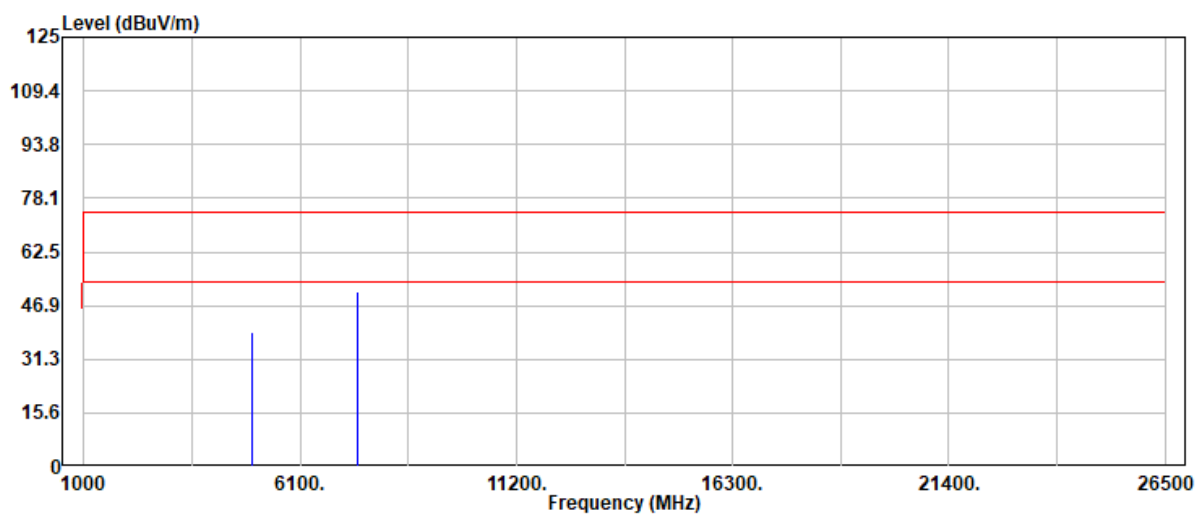
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4884.00	35.67	2.69	38.36	74.00	-35.64	Peak
4884.00	29.65	2.69	32.34	54.00	-21.66	Average
7326.00	46.06	9.27	55.33	74.00	-18.67	Peak
7326.00	43.06	9.27	52.33	54.00	-1.67	Average

Project No: TM-2502000081P
Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2480 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



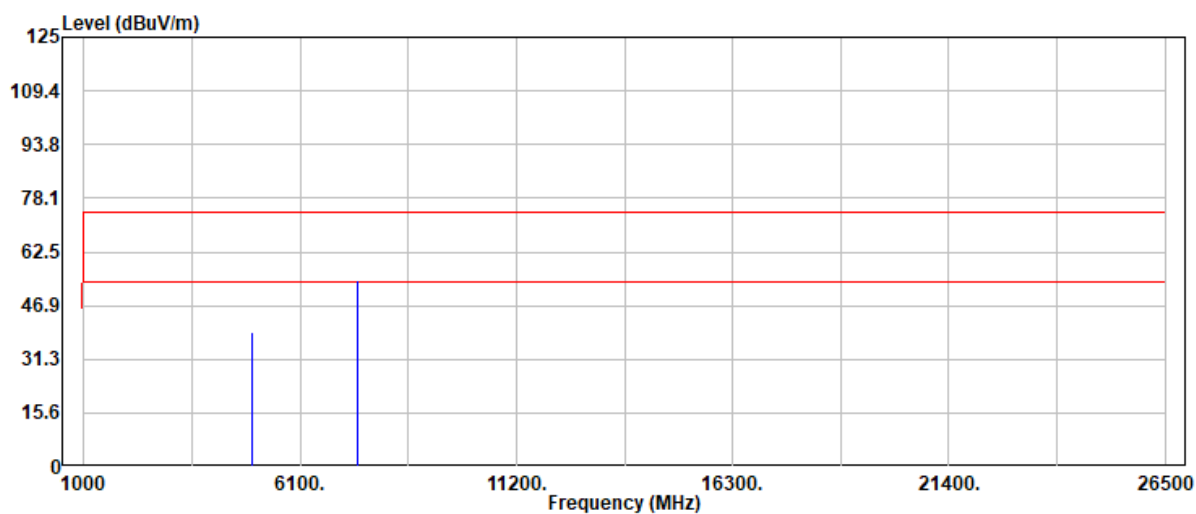
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4960.00	35.42	3.71	39.13	74.00	-34.87	Peak
4960.00	29.47	3.71	33.18	54.00	-20.82	Average
7440.00	41.81	9.27	51.08	74.00	-22.92	Peak
7440.00	37.60	9.27	46.87	54.00	-7.13	Average

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Project No : TM-2502000081P
Operation Band : BLE_1M
Frequency : 2480 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



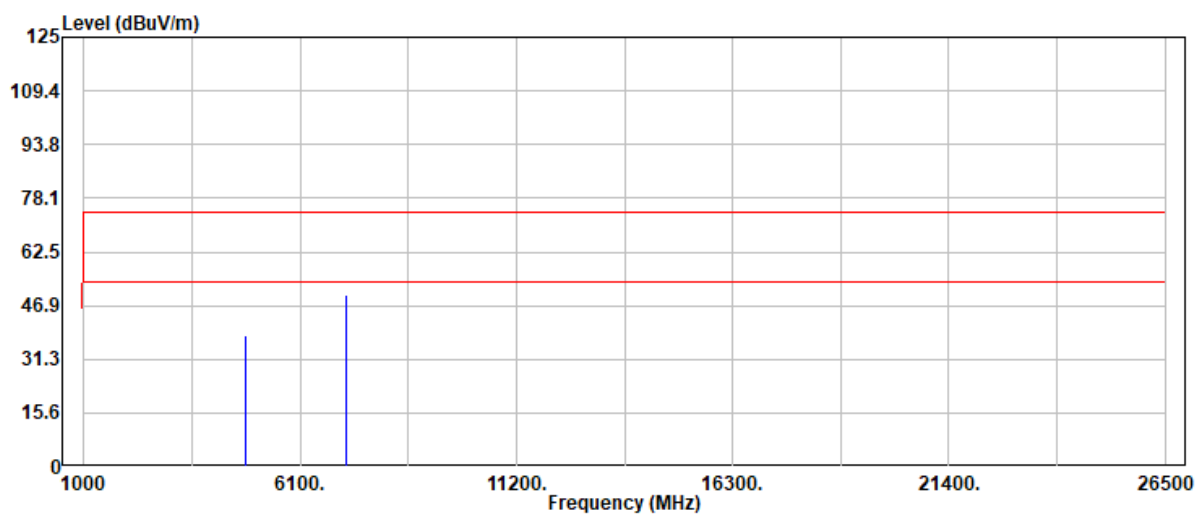
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4960.00	35.25	3.71	38.96	74.00	-35.04	Peak
4960.00	29.75	3.71	33.46	54.00	-20.54	Average
7440.00	45.13	9.27	54.40	74.00	-19.60	Peak
7440.00	42.12	9.27	51.39	54.00	-2.61	Average

Project No: TM-2502000081P
Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2402 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



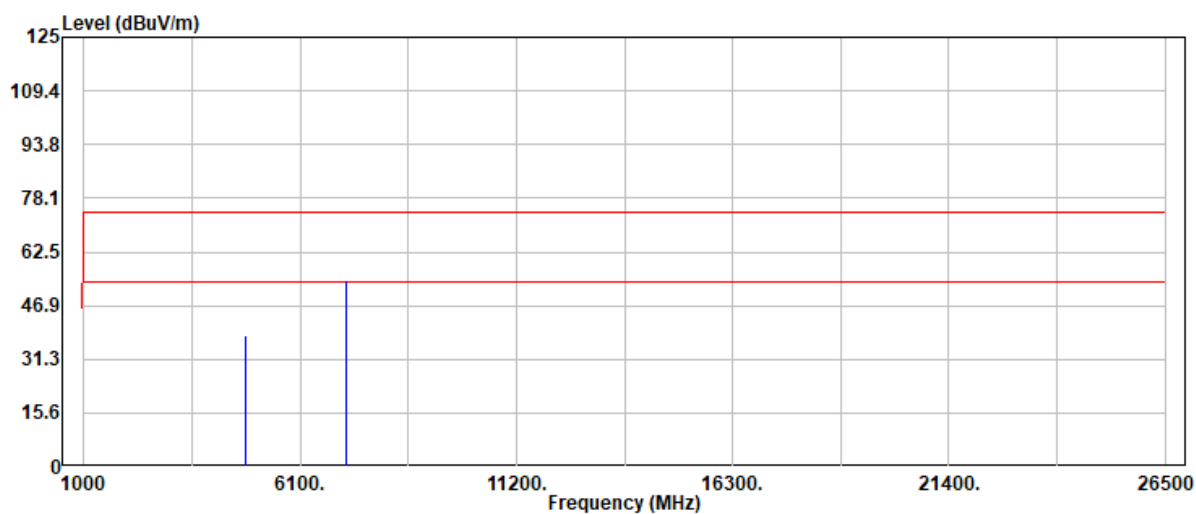
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4804.00	36.08	1.98	38.06	74.00	-35.94	Peak
4804.00	29.49	1.98	31.47	74.00	-42.53	Peak
7206.00	41.40	8.82	50.22	74.00	-23.78	Peak
7206.00	38.60	8.82	47.42	54.00	-6.58	Average

Project No: TM-2502000081P
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Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2402 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



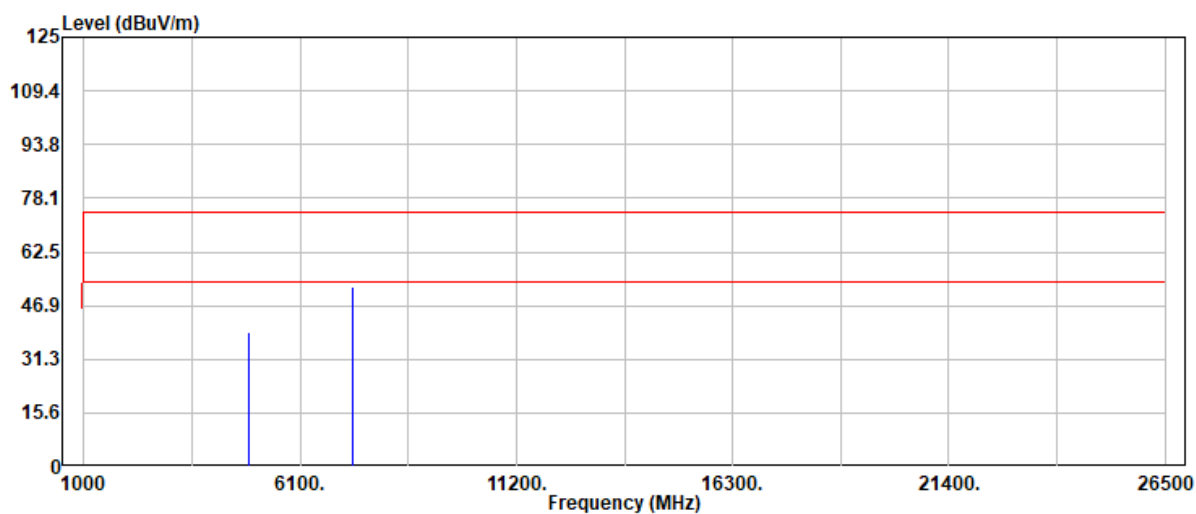
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4804.00	36.01	1.98	37.99	74.00	-36.01	Peak
4804.00	29.70	1.98	31.68	54.00	-22.32	Average
7206.00	45.51	8.82	54.33	74.00	-19.67	Peak
7206.00	43.58	8.82	52.40	54.00	-1.60	Average

Project No: TM-2502000081P
Report No.: TMWK2502000509KR

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Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2442 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



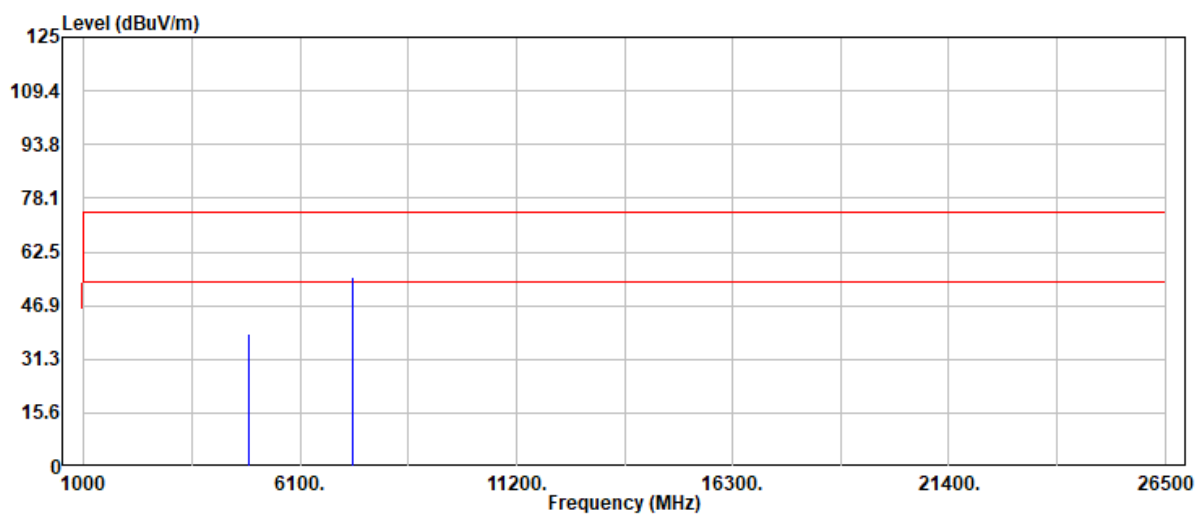
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4884.00	36.33	2.69	39.02	74.00	-34.98	Peak
4884.00	29.28	2.69	31.97	54.00	-22.03	Average
7326.00	43.24	9.27	52.51	74.00	-21.49	Peak
7326.00	39.35	9.27	48.62	54.00	-5.38	Average

Project No: TM-2502000081P
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Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2442 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



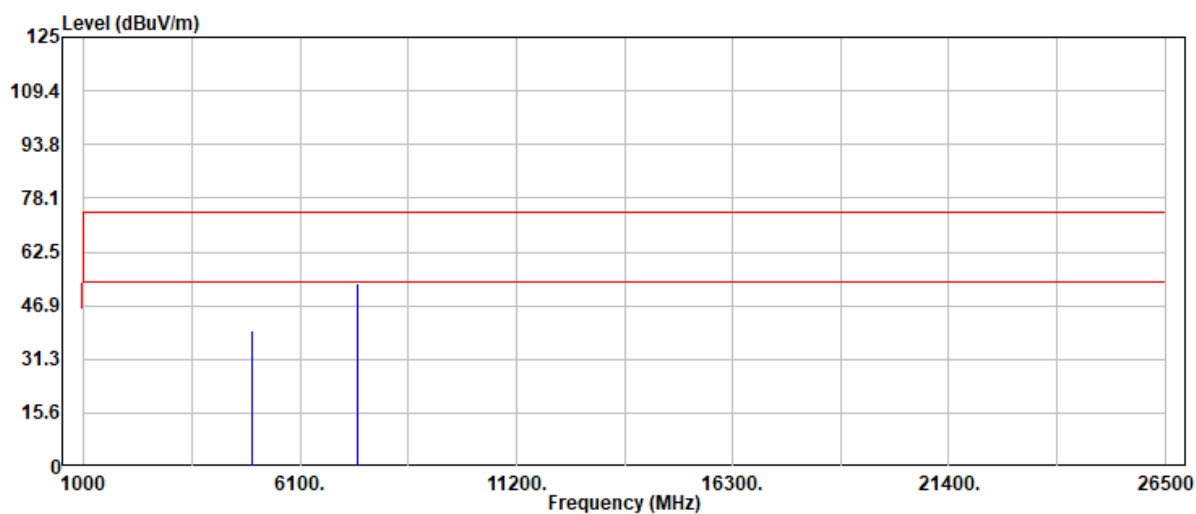
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4884.00	36.04	2.69	38.73	74.00	-35.27	Peak
4884.00	29.50	2.69	32.19	54.00	-21.81	Average
7326.00	45.83	9.27	55.10	74.00	-18.90	Peak
7326.00	41.98	9.27	51.25	54.00	-2.75	Average

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Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2480 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : VERTICAL
Engineer : Ben.Yang
Test Chamber : 966A



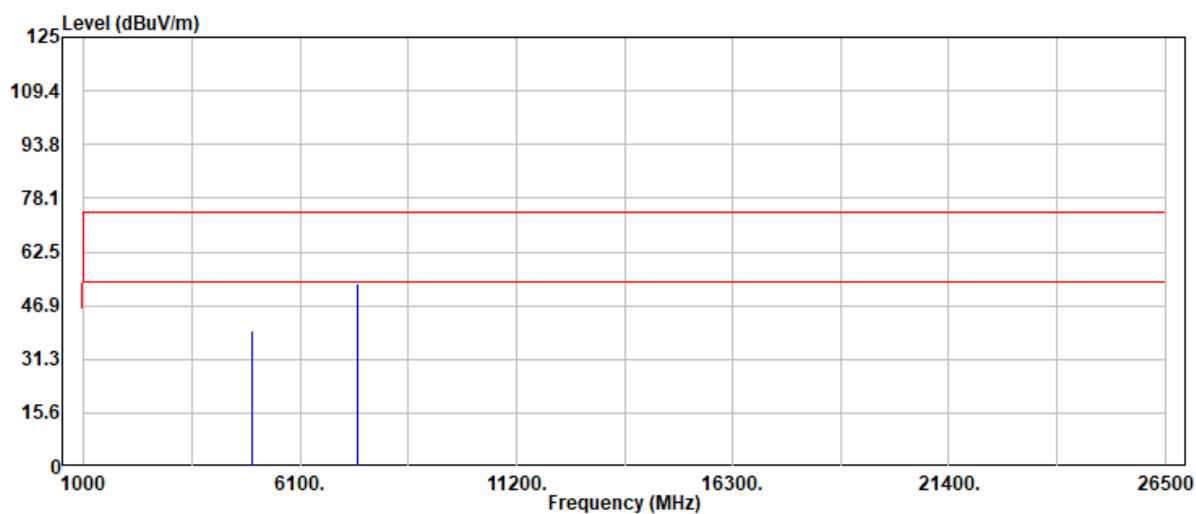
Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4960.00	35.87	3.71	39.58	74.00	-34.42	Peak
4960.00	29.16	3.71	32.87	54.00	-21.13	Average
7440.00	44.07	9.27	53.34	74.00	-20.66	Peak
7440.00	40.10	9.27	49.37	54.00	-4.63	Average

Project No: TM-2502000081P
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Rev.: 01

Project No : TM-2502000081P
Operation Band : BLE_2M
Frequency : 2480 MHz
Operation Mode : TX
EUT Pol : H
Setting : 8

Test Date : 2025-02-24
Temp./Humi. : 24.3/61
Antenna Pol. : HORIZONTAL
Engineer : Ben.Yang
Test Chamber : 966A



Freq	Read Level	Factor	Actual FS	Limit @3m	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	PK/QP/AV
4960.00	35.77	3.71	39.48	74.00	-34.52	Peak
4960.00	29.63	3.71	33.34	54.00	-20.66	Average
7440.00	44.07	9.27	53.34	74.00	-20.66	Peak
7440.00	40.69	9.27	49.96	54.00	-4.04	Average

- End of Test Report -