

FCC Radio Test Report

FCC ID: 2BH7FC400V2


Report No. : BTL-FCCP-1-2503G008
Equipment : Battery-Powered Outdoor Security Camera
Model Name : Tapo C400, Tapo C401
Brand Name : tp-link
Applicant : TP-Link Systems Inc.
Address : 10 Mauchly, Irvine, CA 92618
Manufacturer : TP-Link Systems Inc.
Address : 10 Mauchly, Irvine, CA 92618

Radio Function : Bluetooth Low Energy

FCC Rule Part(s) : FCC CFR Title 47, Part 15, Subpart C (15.247)
Measurement Procedure(s) : ANSI C63.10-2013

Date of Receipt : 2025/6/2
Date of Test : 2025/6/4 ~ 2025/6/10
Issued Date : 2025/6/20

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

Prepared by : 
 Poken Huang, Engineer

Approved by : 
 Peter Chen, Manager



BTL Inc.

No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan

Tel: +886-2-2657-3299 Fax: +886-2-2657-3331 Web: www.newbtl.com Service mail: btl_qa@newbtl.com

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** assumes no responsibility for the data provided by the Customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by **BTL**.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

CONTENTS

REVISION HISTORY	5
1 SUMMARY OF TEST RESULTS	6
1.1 TEST FACILITY	7
1.2 MEASUREMENT UNCERTAINTY	7
1.3 TEST ENVIRONMENT CONDITIONS	7
1.4 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	8
2 GENERAL INFORMATION	9
2.1 DESCRIPTION OF EUT	9
2.2 TEST MODES	11
2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	12
2.4 SUPPORT UNITS	12
3 AC POWER LINE CONDUCTED EMISSIONS TEST	13
3.1 LIMIT	13
3.2 TEST PROCEDURE	13
3.3 DEVIATION FROM TEST STANDARD	13
3.4 TEST SETUP	14
3.5 TEST RESULT	14
4 RADIATED EMISSIONS TEST	15
4.1 LIMIT	15
4.2 TEST PROCEDURE	16
4.3 DEVIATION FROM TEST STANDARD	16
4.4 TEST SETUP	17
4.5 EUT OPERATING CONDITIONS	18
4.6 TEST RESULT – BELOW 30 MHZ	18
4.7 TEST RESULT – 30 MHZ TO 1 GHZ	18
4.8 TEST RESULT – ABOVE 1 GHZ	18
5 BANDWIDTH TEST	19
5.1 APPLIED PROCEDURES / LIMIT	19
5.2 TEST PROCEDURE	19
5.3 DEVIATION FROM STANDARD	19
5.4 TEST SETUP	19
5.5 EUT OPERATION CONDITIONS	19
5.6 TEST RESULTS	19
6 OUTPUT POWER TEST	20
6.1 APPLIED PROCEDURES / LIMIT	20
6.2 TEST PROCEDURE	20
6.3 DEVIATION FROM STANDARD	20
6.4 TEST SETUP	20
6.5 EUT OPERATION CONDITIONS	20
6.6 TEST RESULTS	20
7 POWER SPECTRAL DENSITY TEST	21
7.1 APPLIED PROCEDURES / LIMIT	21
7.2 TEST PROCEDURE	21
7.3 DEVIATION FROM STANDARD	21
7.4 TEST SETUP	21
7.5 EUT OPERATION CONDITIONS	21
7.6 TEST RESULTS	21

8	ANTENNA CONDUCTED SPURIOUS EMISSION	22
8.1	APPLIED PROCEDURES / LIMIT	22
8.2	TEST PROCEDURE	22
8.3	DEVIATION FROM STANDARD	22
8.4	TEST SETUP	22
8.5	EUT OPERATION CONDITIONS	22
8.6	TEST RESULTS	22
9	LIST OF MEASURING EQUIPMENTS	23
10	EUT TEST PHOTO	25
11	EUT PHOTOS	25
APPENDIX A	AC POWER LINE CONDUCTED EMISSIONS	26
APPENDIX B	RADIATED EMISSIONS - 30 MHZ TO 1 GHZ	29
APPENDIX C	RADIATED EMISSIONS - ABOVE 1 GHZ	32
APPENDIX D	BANDWIDTH	44
APPENDIX E	OUTPUT POWER	47
APPENDIX F	POWER SPECTRAL DENSITY TEST	49
APPENDIX G	ANTENNA CONDUCTED SPURIOUS EMISSION	51

REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-1-2503G008	R00	Original Report.	2025/6/20	Valid

1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

Standard(s) Section	Description	Test Result	Judgement	Remark
15.207	AC Power Line Conducted Emissions	APPENDIX A	Pass	-----
15.205 15.209 15.407(b)	Radiated Emissions	APPENDIX B APPENDIX C	Pass	-----
15.247(a)(2)	Bandwidth	APPENDIX D	Pass	-----
15.247(b)(3)	Output Power	APPENDIX E	Pass	-----
15.247(e)	Power Spectral Density	APPENDIX F	Pass	-----
15.247(d)	Antenna conducted Spurious Emission	APPENDIX G	Pass	-----
15.203	Antenna Requirement	-----	Pass	NOTE (3)

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) The report format version is TP.1.1.1.
- (3) The device what use replaceable antennas with non-standard interfaces are considered sufficient to comply with the provisions of 15.203.

1.1 TEST FACILITY

The test locations stated below are under the TAF Accreditation Number 0659.

The test location(s) used to collect the test data in this report are:

No. 64, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (FCC DN: TW0659)

☒ C01 ☒ CB20

No. 68-2, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (FCC DN: TW0659)

☒ SR06

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k = 2$, providing a level of confidence of approximately **95 %**.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{CISPR} requirement.

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U (dB)
C01	CISPR	150 kHz ~ 30MHz	2.4498

B. Radiated emissions test:

Test Site	Measurement Frequency Range	U,(dB)
CB20	0.03 GHz ~ 0.2 GHz	4.17
	0.2 GHz ~ 1 GHz	4.72
	1 GHz ~ 6 GHz	5.20
	6 GHz ~ 18 GHz	5.50
	18 GHz ~ 26 GHz	3.69
	26 GHz ~ 40 GHz	4.23

C. Conducted test:

Test Item	U,(dB)
Occupied Bandwidth	0.83 %
Output power	0.8909 dB
Power Spectral Density	0.8903 dB
Conducted Spurious emissions	1.8304 dB
Conducted Band edges	1.8338 dB

NOTE:

Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Environment Condition	Test Voltage	Tested by
AC Power Line Conducted Emissions	25°C, 45%	AC 120 V	Benny Cao
Radiated emissions below 1 GHz	25°C, 65%	AC 120 V	Benny Cao
Radiated emissions above 1 GHz	25°C, 65%	AC 120 V	Benny Cao
Bandwidth	25°C, 60%	AC 120 V	Cheng Tsai
Output Power	25°C, 60%	AC 120 V	Cheng Tsai
Power Spectral Density	25°C, 60%	AC 120 V	Cheng Tsai
Antenna conducted Spurious Emission	25°C, 60%	AC 120 V	Cheng Tsai

1.4 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

Test Software	Realtek Bluetooth MP Kit Setup Package For Ameba (1)			
Modulation Mode	2402 MHz	2440 MHz	2480 MHz	Data Rate
1 Mbps	0x33	0x33	0x33	1 Mbps
2 Mbps	0x33	0x33	0x33	2 Mbps

2 GENERAL INFORMATION

2.1 DESCRIPTION OF EUT

Equipment	Battery-Powered Outdoor Security Camera
Brand Name	tp-link
Model Name	Tapo C400, Tapo C401
Model Difference(s)	Only differ in model name and appearance color.
Hardware Version	2.0
Software Version	2.X
Power Source	1# Supplied from Type-C port. 2# Battery supplied. Model: CMICR18650F8
Power Rating	1# 5V --- 1A 2# 3.7V, 2600mAh, 9.62Wh
Operation Band	2400 MHz ~ 2483.5 MHz
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Technology	GFSK
Transfer Rate	1Mbps, 2Mbps
Output Power Max.	1Mbps: 4.56 dBm (0.0029 W)
Test Model	Tapo C400
Sample Status	Engineering Sample
EUT Modification(s)	N/A

NOTE:

- (1) The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

(2) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

(3) Table for Filed Antenna:

Ant.	Manufacturer	P/N	Type	Connector	Gain (dBi)
1	TP-Link Systems Inc.	6035500079	PIFA	N/A	0

- (4) The above Antenna information are derived from the antenna data sheet provided by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.2 TEST MODES

Test Items	Test mode	Channel	Note
AC power line conducted emissions	Normal	-	-
Transmitter Radiated Emissions (below 1GHz)	1 Mbps	39	-
Transmitter Radiated Emissions (above 1GHz)	1 Mbps, 2 Mbps	00/39	Bandedge
	1 Mbps, 2 Mbps	00/19/39	Harmonic
Transmitter Radiated Emissions (above 18GHz)	1 Mbps	39	-
Bandwidth	1 Mbps, 2 Mbps	00/19/39	-
Output Power	1 Mbps, 2 Mbps	00/19/39	-
Power Spectral Density	1 Mbps, 2 Mbps	00/19/39	-
Antenna conducted Spurious Emission	1 Mbps, 2 Mbps	00/19/39	-

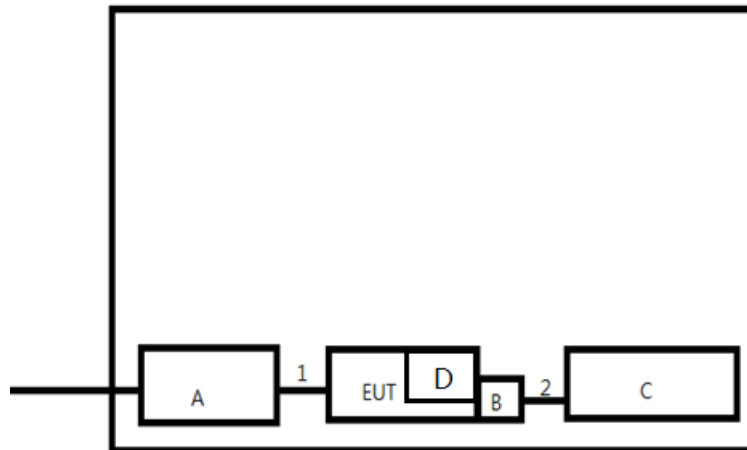
NOTE:

- (1) For radiated emission above 1 GHz test, the polarization of Vertical and Horizontal are evaluated, the worst case is Horizontal for Band edge, Vertical for Harmonic. In this report only recorded the worst case.
- (2) For radiated emission above 1 GHz test, the spurious points of 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.
- (3) For radiated emissions below 1 GHz test, the 1Mbps channel 39 is found to be the worst case and recorded.
- (4) The electric field intensity signal emitted at 9 kHz kHz - 30 MHz is too weak (20 dB below the limit), so the measured value is not recorded in this report.
- (5) For radiated emission Harmonic above 18GHz test, only tested the worst case and recorded.

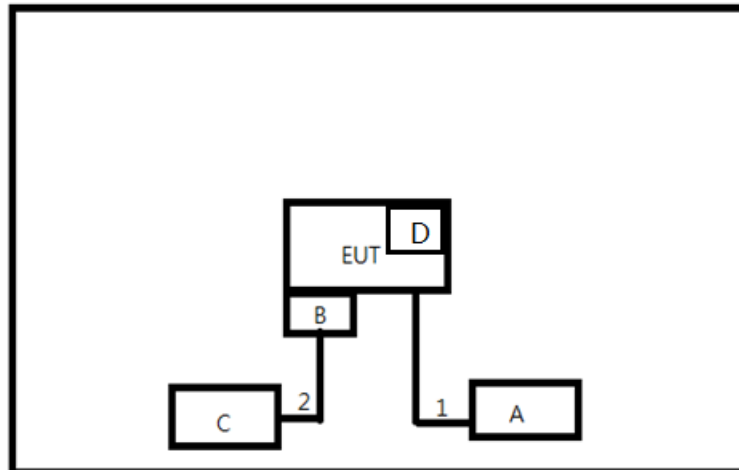
2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Equipment letters and Cable numbers refer to item numbers described in the tables of clause 2.4.

AC power line conducted emissions



Radiated Emissions



2.4 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.	Remarks
A	Adapter	tp-link	T050100-2B3	N/A	Supplied by test requester.
B	Test Fixture	N/A	CH340	N/A	Furnished by test lab.
C	Notebook	Lenovo	ThinkBook 14 G4 IAP	MP28KHAH	Furnished by test lab.
D	SD Card	SanDisk	ZN6MA	N/A	Furnished by test lab.

Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	N	N	1m	USB Cable	Supplied by test requester.
2	N	N	0.8m	Fixture Cable	Furnished by test lab.

3 AC POWER LINE CONDUCTED EMISSIONS TEST

3.1 LIMIT

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56 *	56 - 46 *
0.50 - 5.0	56	46
5.0 - 30.0	60	50

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)
 Margin Level = Measurement Value – Limit Value
 Calculation example:

Reading Level		Correct Factor		Measurement Value
38.22	+	3.45	=	41.67

Measurement Value		Limit Value		Margin Level
41.67	-	60	=	-18.33

The following table is the setting of the receiver.

Receiver Parameter	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

3.2 TEST PROCEDURE

- a. The EUT was placed 0.8 m above the horizontal ground plane with the EUT being connected to the power mains through a line impedance stabilization network (LISN).
 All other support equipment were powered from an additional LISN(s).
 The LISN provides 50 Ohm/50uH of impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle to keep the cable above 40 cm.
- c. Excess I/O cables that are not connected to a peripheral shall be bundled in the center.
 The end of the cable will be terminated, using the correct terminating impedance.
 The overall length shall not exceed 1 m.
- d. The LISN is spaced at least 80 cm from the nearest part of the EUT chassis.
- e. For the actual test configuration, please refer to the related Item – EUT TEST PHOTO.

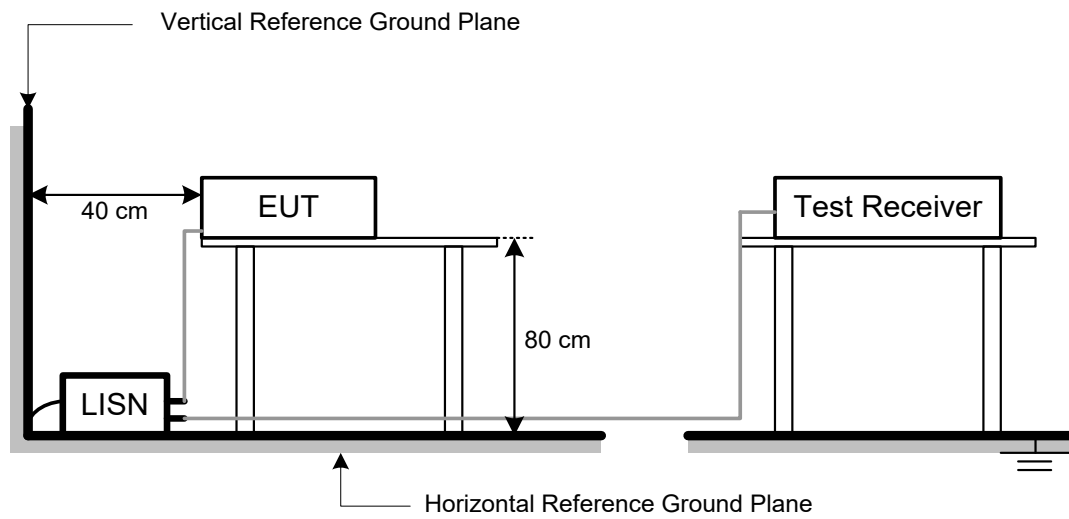
NOTE:

- (1) In the results, each reading is marked as Peak, QP or AVG per the detector used.
 BW=9 kHz (6 dB Bandwidth)
- (2) All readings are Peak unless otherwise stated QP or AVG in column of Note. Both the QP and the AVG readings must be less than the limit for compliance.

3.3 DEVIATION FROM TEST STANDARD

No deviation.

3.4 TEST SETUP



3.5 TEST RESULT

Please refer to the APPENDIX A.

4 RADIATED EMISSIONS TEST

4.1 LIMIT

In case the emission fall within the restricted band specified on 15.205, then the 15.209 limit in the table below has to be followed.

LIMITS OF RADIATED EMISSIONS MEASUREMENT (9 kHz to 1000 MHz)

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
960~1000	500	3

LIMITS OF RADIATED EMISSIONS MEASUREMENT (Above 1000 MHz)

Frequency (MHz)	Radiated Emissions (dBuV/m)		Measurement Distance (meters)
	Peak	Average	
Above 1000	74	54	3

NOTE:

- (1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)

Margin Level = Measurement Value - Limit Value

Calculation example:

Reading Level		Correct Factor		Measurement Value
41.91	+	-8.36	=	33.55

Measurement Value		Limit Value		Margin Level
33.55	-	43.50	=	-9.95

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average

Spectrum Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9KHz~90KHz for PK/AVG detector
Start ~ Stop Frequency	90KHz~110KHz for QP detector
Start ~ Stop Frequency	110KHz~490KHz for PK/AVG detector
Start ~ Stop Frequency	490KHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

4.2 TEST PROCEDURE

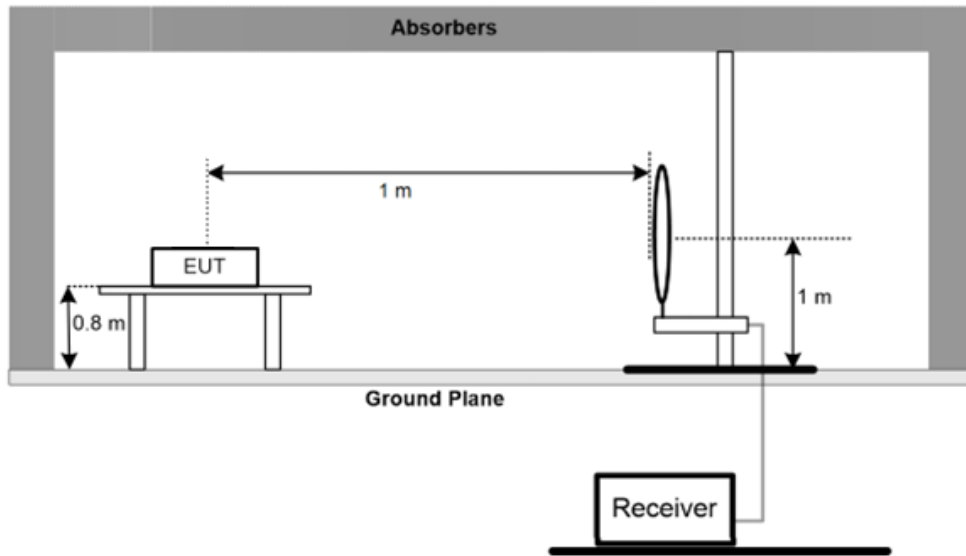
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- i. For the actual test configuration, please refer to the related Item – EUT TEST PHOTO.

4.3 DEVIATION FROM TEST STANDARD

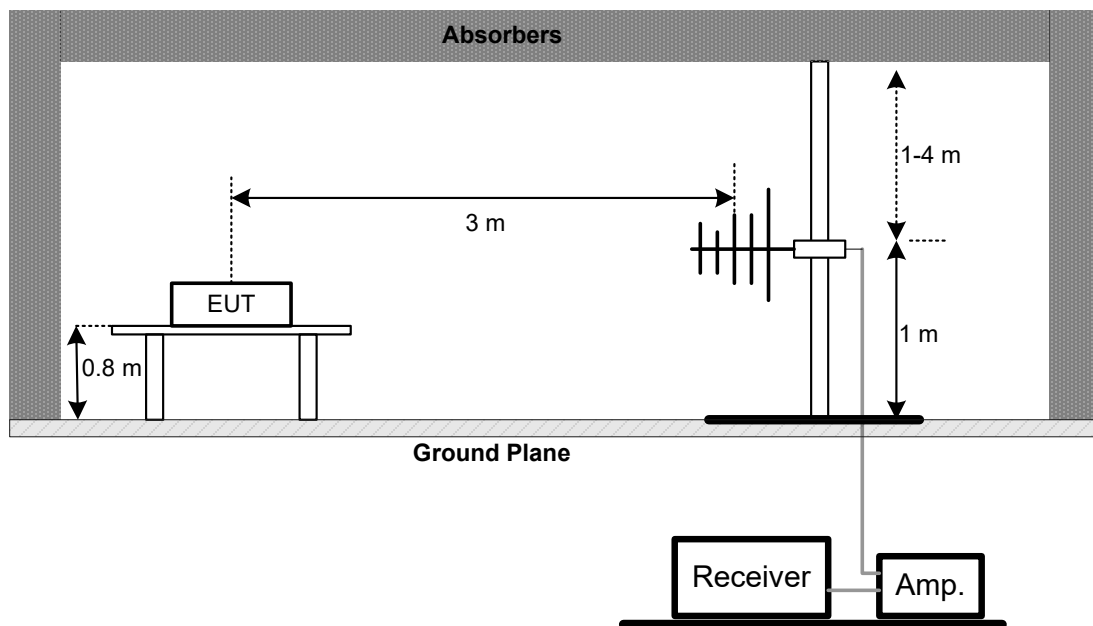
No deviation.

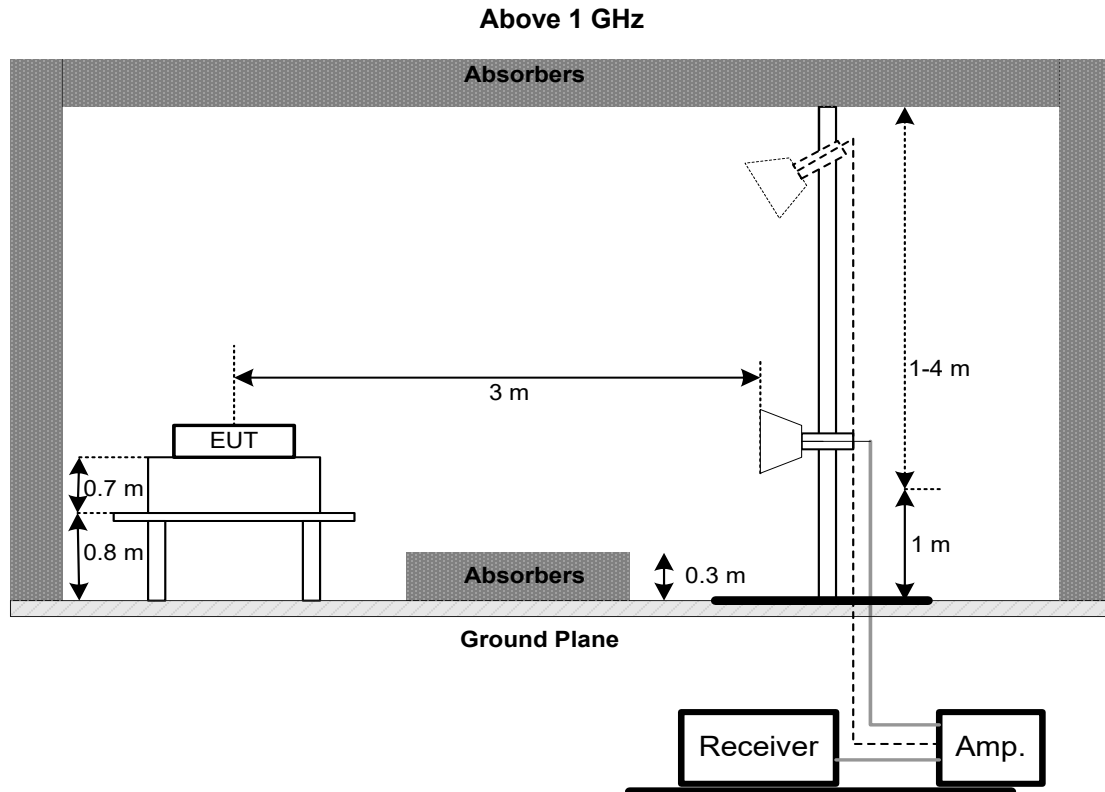
4.4 TEST SETUP

9 kHz to 30 MHz



30 MHz to 1 GHz





4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.6 TEST RESULT – BELOW 30 MHZ

There were no emissions found below 30 MHz within 20 dB of the limit.

4.7 TEST RESULT – 30 MHZ TO 1 GHZ

Please refer to the APPENDIX B.

4.8 TEST RESULT – ABOVE 1 GHZ

Please refer to the APPENDIX C.

NOTE:

- (1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

5 BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

5.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW=300KHz, Sweep time = 2.5 ms.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULTS

Please refer to the APPENDIX D.

6 OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Maximum Output Power	1 watt or 30dBm	2400-2483.5	PASS

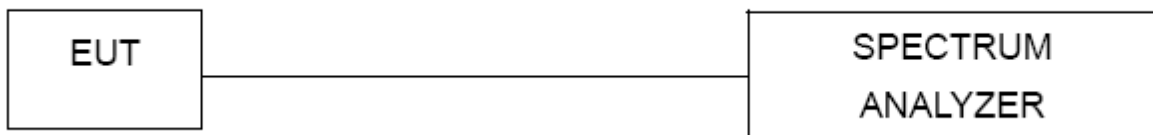
6.2 TEST PROCEDURE

- The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
- The maximum peak conducted output power was performed in accordance with FCC KDB 558074 D01 15.247 Meas Guidance.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.6 TEST RESULTS

Please refer to the APPENDIX E.

7 POWER SPECTRAL DENSITY TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e)	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

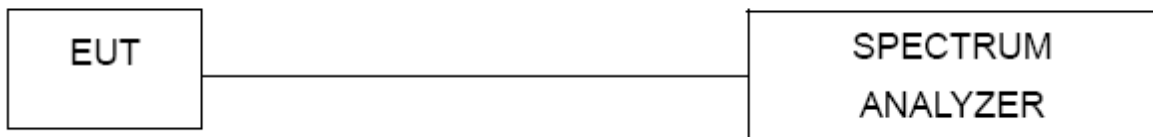
7.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW=3KHz, VBW=10 KHz, Sweep time = auto.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULTS

Please refer to the APPENDIX F.

8 ANTENNA CONDUCTED SPURIOUS EMISSION

8.1 APPLIED PROCEDURES / LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

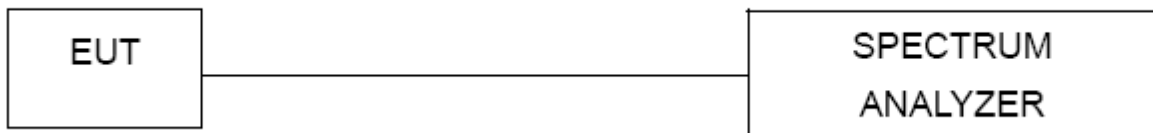
8.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW=300KHz, Sweep time = 10 ms.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

8.6 TEST RESULTS

Please refer to the APPENDIX G.

9 LIST OF MEASURING EQUIPMENTS

AC Power Line Conducted Emissions						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Two-Line V-Network	R&S	ENV216	101051	2024/6/26	2025/6/25
2	Test Cable	EMCI	EMCRG58-BM-B M-9000	210501	2024/12/10	2025/12/9
3	EMC Receiver	Keysight	N9038A	MY54130009	2024/6/27	2025/6/26
4	Measurement Software	Farad	EZ_EMC (Ver. NB-03A1-01)	N/A	N/A	N/A

Radiated Emissions						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	01207	2024/12/4	2025/12/3
2	EMC Receiver	Keysight	N9038A	MY54130009	2024/6/27	2025/6/26
3	Pre-Amplifier	EMCI	EMC001330-202 01222	980807	2024/12/9	2025/12/8
4	Test Cable	EMCI	EMC-8D-NM-NM -5000	150106	2024/12/9	2025/12/8
5	Test Cable	EMCI	EMC-CFD-400-N M-NM-8000	200348	2024/12/9	2025/12/8
6	Test Cable	EMCI	EMC-CFD-400-N M-NM-3300	200343	2024/12/9	2025/12/8
7	Broad-Band Horn Antenna	RFSPIN	DRH18-E	210109A18E	2025/1/14	2026/1/13
8	Pre-Amplifier	EMCI	EMC118A45SE	981030	2024/12/10	2025/12/9
9	Test Cable	EMCI	EMC105-SM-SM-1000	210119	2024/12/10	2025/12/9
10	Test Cable	EMCI	EMC105-SM-SM-3000	210118	2024/12/10	2025/12/9
11	Test Cable	EMCI	EMC105-SM-SM-7000	210117	2024/12/10	2025/12/9
12	EXA Spectrum Analyzer	keysight	N9020B	MY59050137	2024/11/24	2025/11/25
13	Pre-Amplifier	EMCI	EMC184045SE	980512	2024/12/10	2025/12/9
14	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	340	2024/6/27	2025/6/26
15	Test Cable	EMCI	EMC102-KM-KM-1000	220328	2024/12/10	2025/12/9
16	Test Cable	EMCI	EMC101G-KM-K M-3000	220330	2024/12/10	2025/12/9
17	Measurement Software	Farad	EZ_EMC (Ver. NB-03A1-01)	N/A	N/A	N/A

Bandwidth						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 30	100854	2024/6/27	2025/6/26
2	10dbAttenuator	INMET	AHC-10dB	1	2024/11/26	2025/11/25
3	BTL-ConducredTest	BTL	1247788684	N/A	N/A	N/A

Output Power						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	USB Peak Power Sensor	Anritsu	MA24408A	12589	2024/10/25	2025/10/24
2	10dbAttenuator	INMET	AHC-10dB	1	2024/11/26	2025/11/25
3	Measurement Software	Anritsu	MA2440A Peak Power analyzer (Ver1.1.0.0)	N/A	N/A	N/A

Power Spectral Density						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 30	100854	2024/6/27	2025/6/26
2	10dbAttenuator	INMET	AHC-10dB	1	2024/11/26	2025/11/25
3	BTL-ConducredTest	BTL	1247788684	N/A	N/A	N/A

Antenna conducted Spurious Emission						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 30	100854	2024/6/27	2025/6/26
2	10dbAttenuator	INMET	AHC-10dB	1	2024/11/26	2025/11/25
3	BTL-ConducredTest	BTL	1247788684	N/A	N/A	N/A

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.
All calibration period of equipment list is one year.

10 EUT TEST PHOTO

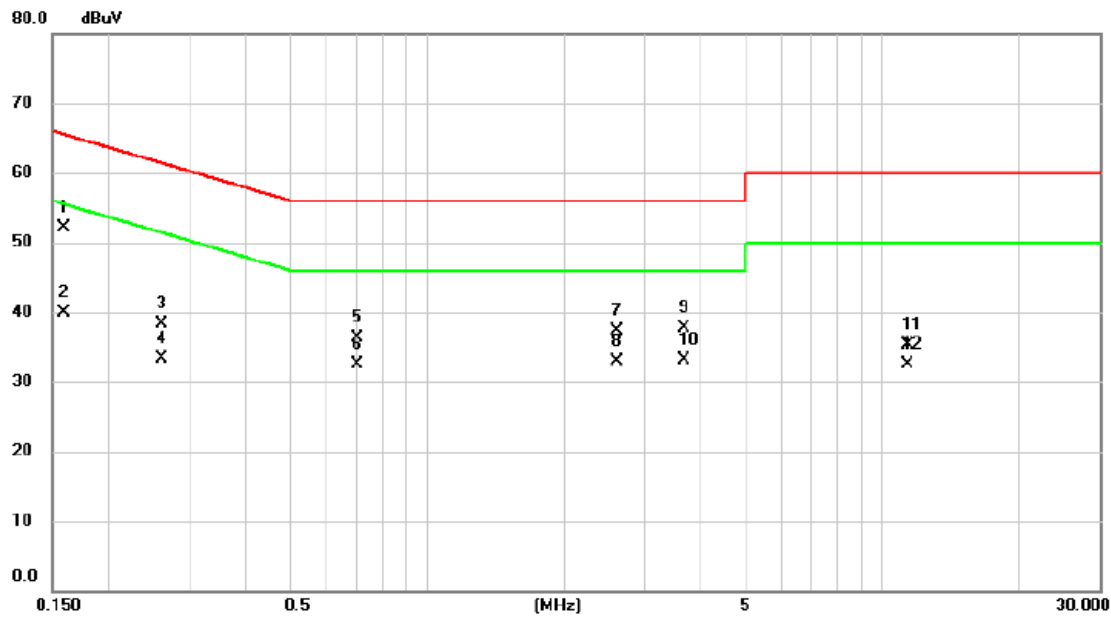
Please refer to document Appendix No.: TP-2503G008-1 (APPENDIX-TEST PHOTOS).

11 EUT PHOTOS

Please refer to document Appendix No.: EP-2503G008-1 (APPENDIX-EUT PHOTOS).

APPENDIX A AC POWER LINE CONDUCTED EMISSIONS

Test Mode	Normal	Test Date	2025/6/10
Test Frequency	-	Phase	Line

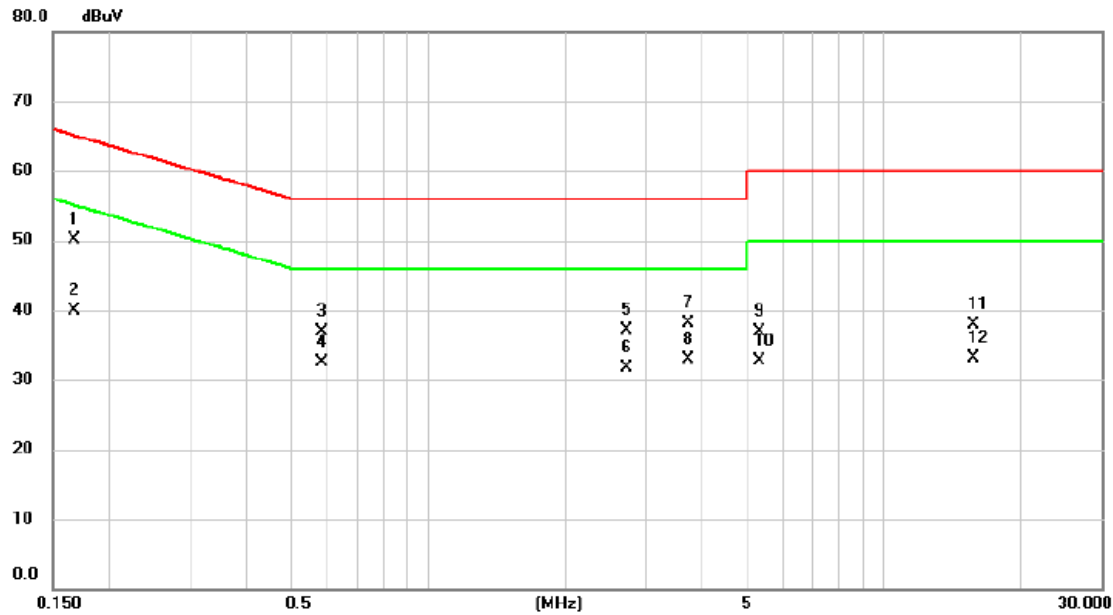


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1598	42.50	9.64	52.14	65.47	-13.33	QP	
2		0.1598	30.26	9.64	39.90	55.47	-15.57	AVG	
3		0.2606	28.68	9.61	38.29	61.41	-23.12	QP	
4		0.2606	23.61	9.61	33.22	51.41	-18.19	AVG	
5		0.7025	26.73	9.62	36.35	56.00	-19.65	QP	
6		0.7025	22.87	9.62	32.49	46.00	-13.51	AVG	
7		2.6105	27.50	9.74	37.24	56.00	-18.76	QP	
8		2.6105	23.12	9.74	32.86	46.00	-13.14	AVG	
9		3.6590	28.00	9.78	37.78	56.00	-18.22	QP	
10	*	3.6590	23.28	9.78	33.06	46.00	-12.94	AVG	
11		11.3750	25.25	10.03	35.28	60.00	-24.72	QP	
12		11.3750	22.44	10.03	32.47	50.00	-17.53	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	Normal	Test Date	2025/6/10
Test Frequency	-	Phase	Neutral



No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1675	40.49	9.62	50.11	65.08	-14.97	QP	
2	0.1675	30.26	9.62	39.88	55.08	-15.20	AVG	
3	0.5855	27.27	9.61	36.88	56.00	-19.12	QP	
4	0.5855	22.89	9.61	32.50	46.00	-13.50	AVG	
5	2.7230	27.40	9.74	37.14	56.00	-18.86	QP	
6	2.7230	22.04	9.74	31.78	46.00	-14.22	AVG	
7	3.7265	28.26	9.78	38.04	56.00	-17.96	QP	
8 *	3.7265	23.16	9.78	32.94	46.00	-13.06	AVG	
9	5.3500	26.97	9.84	36.81	60.00	-23.19	QP	
10	5.3500	22.85	9.84	32.69	50.00	-17.31	AVG	
11	15.7250	27.69	10.19	37.88	60.00	-22.12	QP	
12	15.7250	22.99	10.19	33.18	50.00	-16.82	AVG	

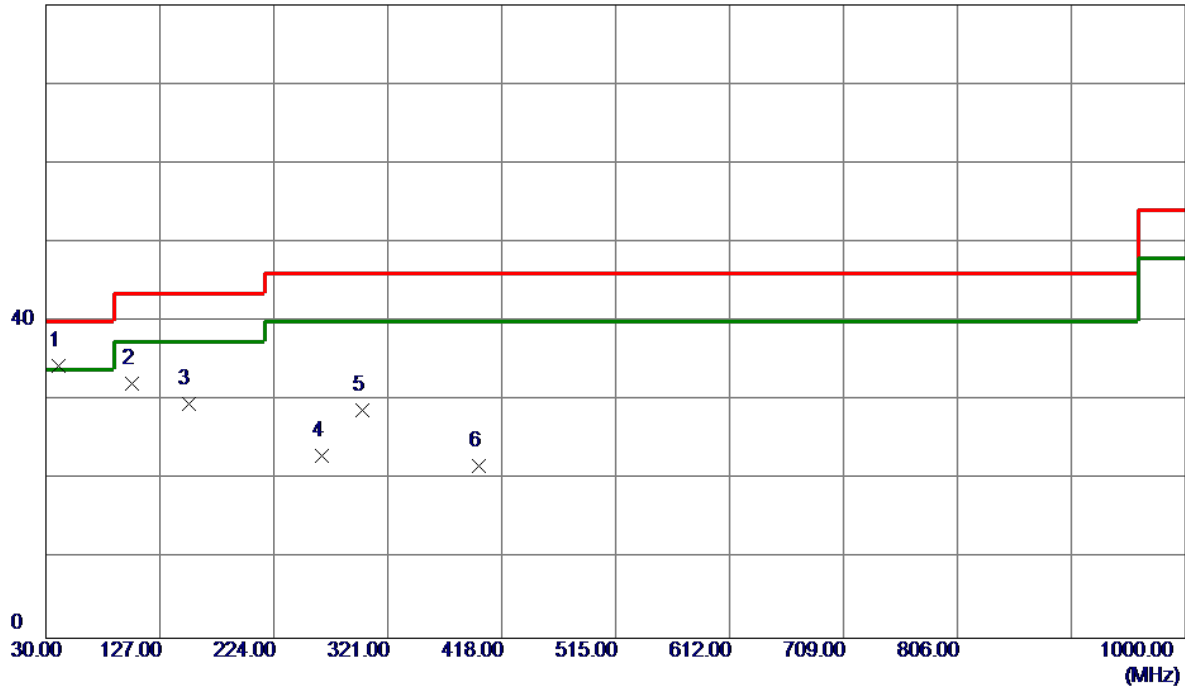
REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

APPENDIX B RADIATED EMISSIONS - 30 MHZ TO 1 GHZ

Test Mode	1Mbps	Test Date	2025/6/9
Test Frequency	2480MHz	Polarization	Vertical

80 dBuV/m



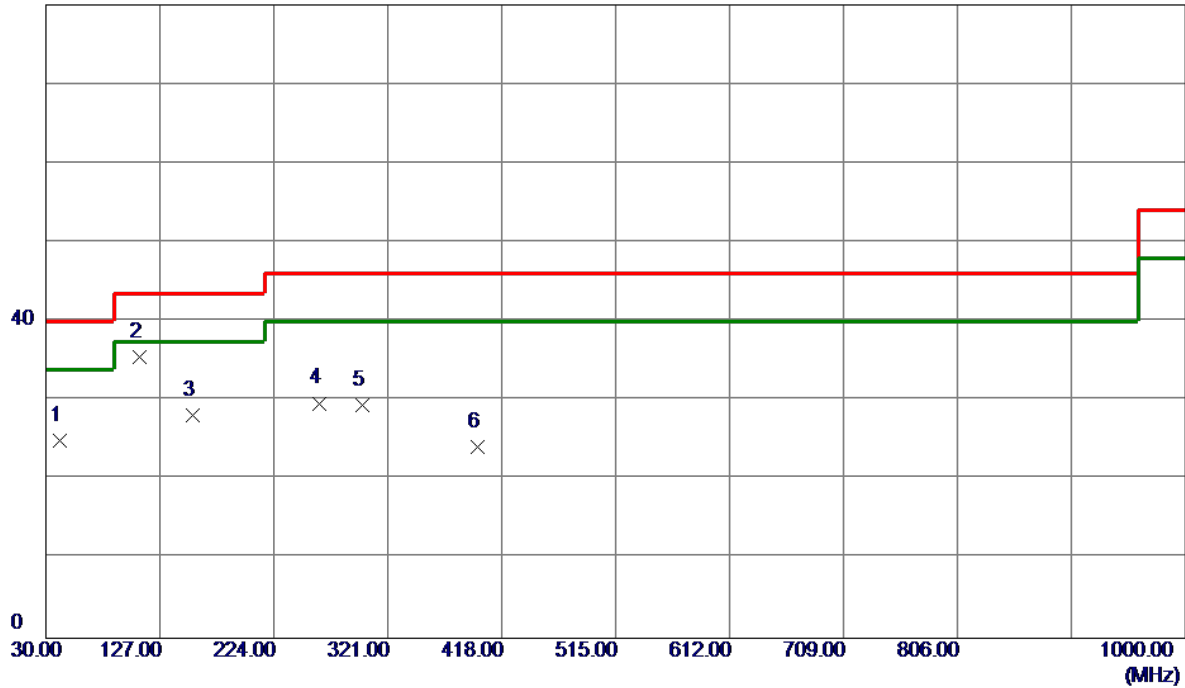
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	40.6699	46.24	-11.83	34.41	40.00	-5.59	Peak	
2	103.7200	47.74	-15.52	32.22	43.50	-11.28	Peak	
3	151.2500	40.53	-10.99	29.54	43.50	-13.96	Peak	
4	264.7400	34.29	-11.18	23.11	46.00	-22.89	Peak	
5	299.6600	38.85	-10.00	28.85	46.00	-17.15	Peak	
6	398.6000	28.74	-7.05	21.69	46.00	-24.31	Peak	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	1Mbps	Test Date	2025/6/9
Test Frequency	2480MHz	Polarization	Horizontal

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	41.6400	36.69	-11.74	24.95	40.00	-15.05	Peak	
2 *	109.5400	50.08	-14.60	35.48	43.50	-8.02	Peak	
3	155.1300	39.22	-11.04	28.18	43.50	-15.32	Peak	
4	262.8000	40.96	-11.28	29.68	46.00	-16.32	Peak	
5	299.6600	39.43	-10.00	29.43	46.00	-16.57	Peak	
6	397.6300	31.24	-7.08	24.16	46.00	-21.84	Peak	

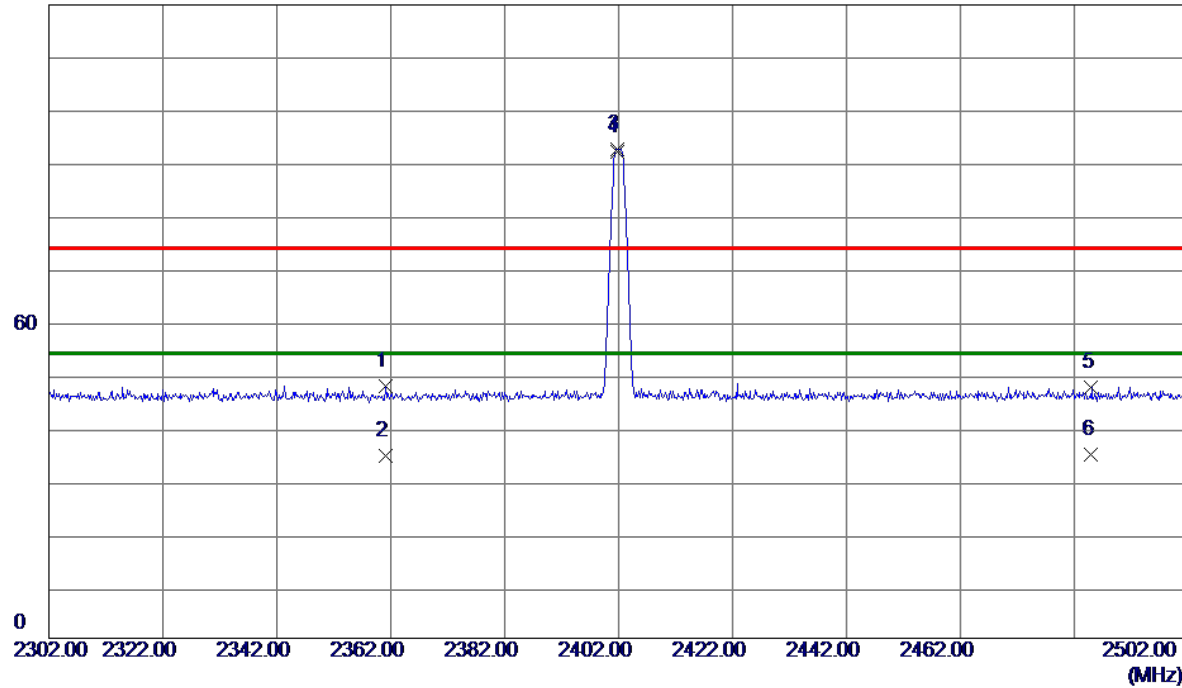
REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

APPENDIX C RADIATED EMISSIONS - ABOVE 1 GHZ

Test Mode	BLE (1 Mbps)	Test Date	2025/6/9
Test Frequency	2402MHz	Polarization	Horizontal

120 dBuV/m



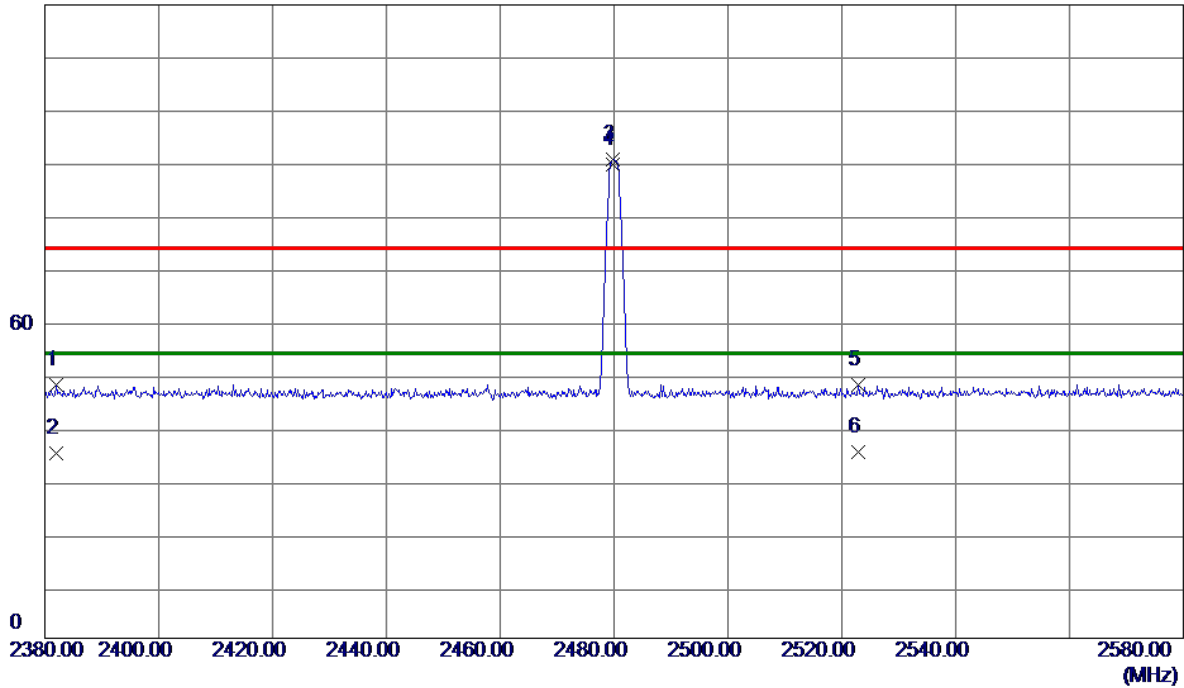
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2361.2000	44.45	3.34	47.79	74.00	-26.21	Peak	
2	2361.2000	31.21	3.34	34.55	54.00	-19.45	AVG	
3	2401.8000	89.33	3.38	92.71	74.00	18.71	Peak	No Limit
4 *	2401.8000	88.76	3.38	92.14	54.00	38.14	AVG	No Limit
5	2485.0000	44.14	3.46	47.60	74.00	-26.40	Peak	
6	2485.0000	31.39	3.46	34.85	54.00	-19.15	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE (1 Mbps)	Test Date	2025/6/9
Test Frequency	2480MHz	Polarization	Horizontal

120 dBuV/m



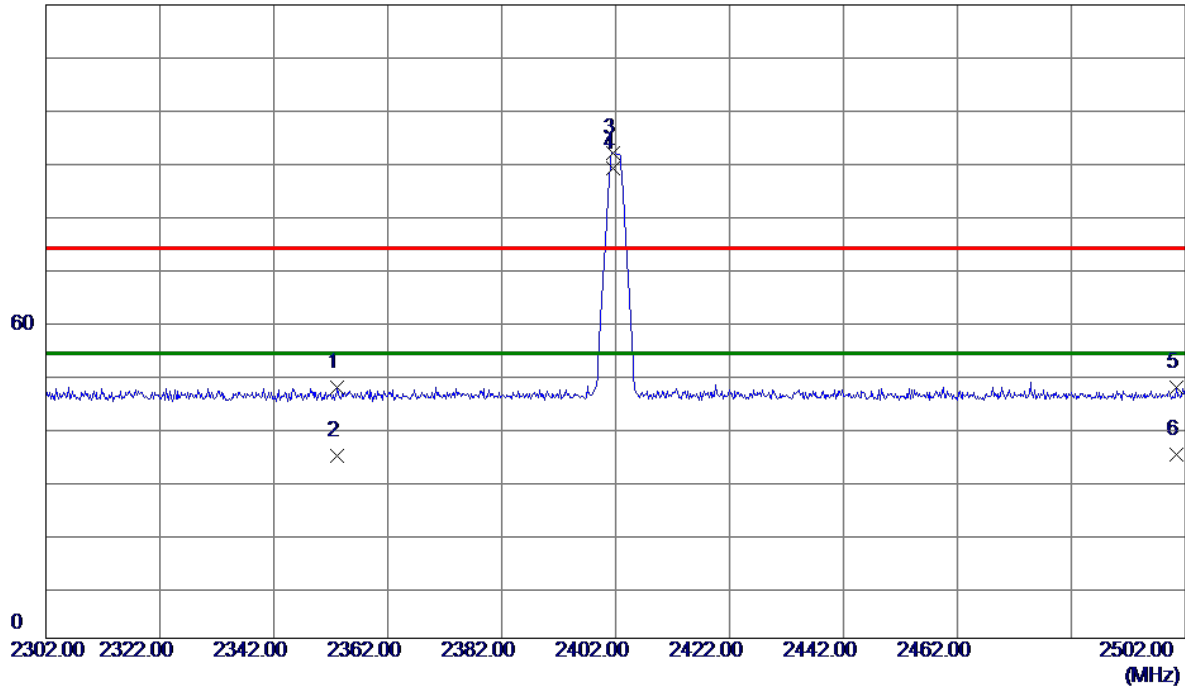
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2382.0000	44.70	3.36	48.06	74.00	-25.94	Peak	
2	2382.0000	31.57	3.36	34.93	54.00	-19.07	AVG	
3	2479.8000	87.16	3.45	90.61	74.00	16.61	Peak	No Limit
4 *	2479.8000	86.40	3.45	89.85	54.00	35.85	AVG	No Limit
5	2522.8000	44.52	3.55	48.07	74.00	-25.93	Peak	
6	2522.8000	31.69	3.55	35.24	54.00	-18.76	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE (2 Mbps)	Test Date	2025/6/9
Test Frequency	2402MHz	Polarization	Horizontal

120 dBuV/m



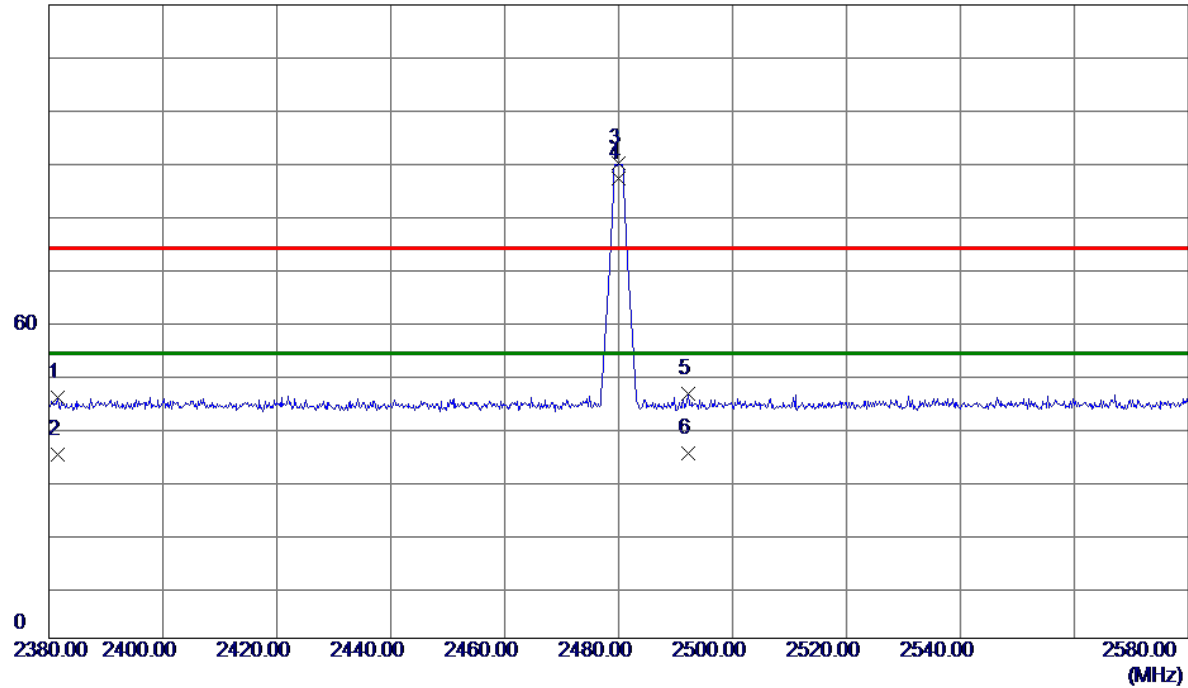
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2353.2000	44.20	3.33	47.53	74.00	-26.47	Peak	
2	2353.2000	31.19	3.33	34.52	54.00	-19.48	AVG	
3	2401.6000	88.48	3.38	91.86	74.00	17.86	Peak	No Limit
4 *	2401.6000	85.65	3.38	89.03	54.00	35.03	AVG	No Limit
5	2500.4000	43.94	3.47	47.41	74.00	-26.59	Peak	
6	2500.4000	31.23	3.47	34.70	54.00	-19.30	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE (2 Mbps)	Test Date	2025/6/9
Test Frequency	2480MHz	Polarization	Horizontal

120 dBuV/m



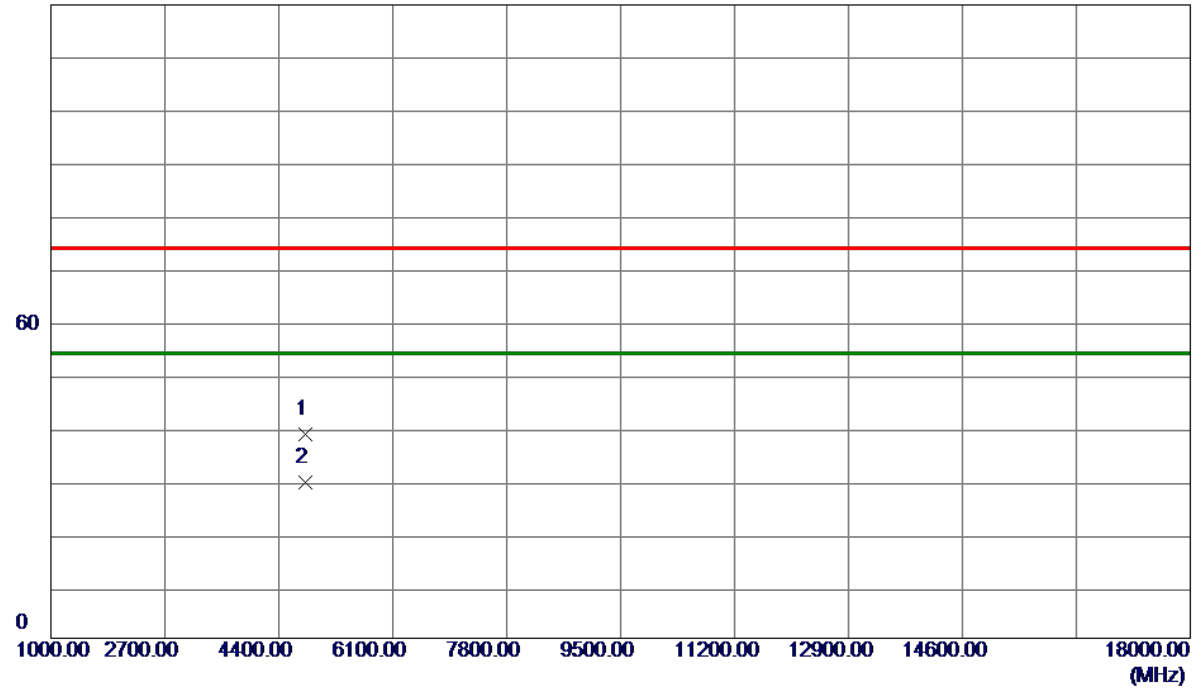
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2381.6000	42.20	3.36	45.56	74.00	-28.44	Peak	
2	2381.6000	31.44	3.36	34.80	54.00	-19.20	AVG	
3	2480.0000	86.45	3.45	89.90	74.00	15.90	Peak	No Limit
4 *	2480.0000	83.72	3.45	87.17	54.00	33.17	AVG	No Limit
5	2492.2000	42.94	3.46	46.40	74.00	-27.60	Peak	
6	2492.2000	31.48	3.46	34.94	54.00	-19.06	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE (1 Mbps)	Test Date	2025/6/9
Test Frequency	2402MHz	Polarization	Vertical

120 dBuV/m



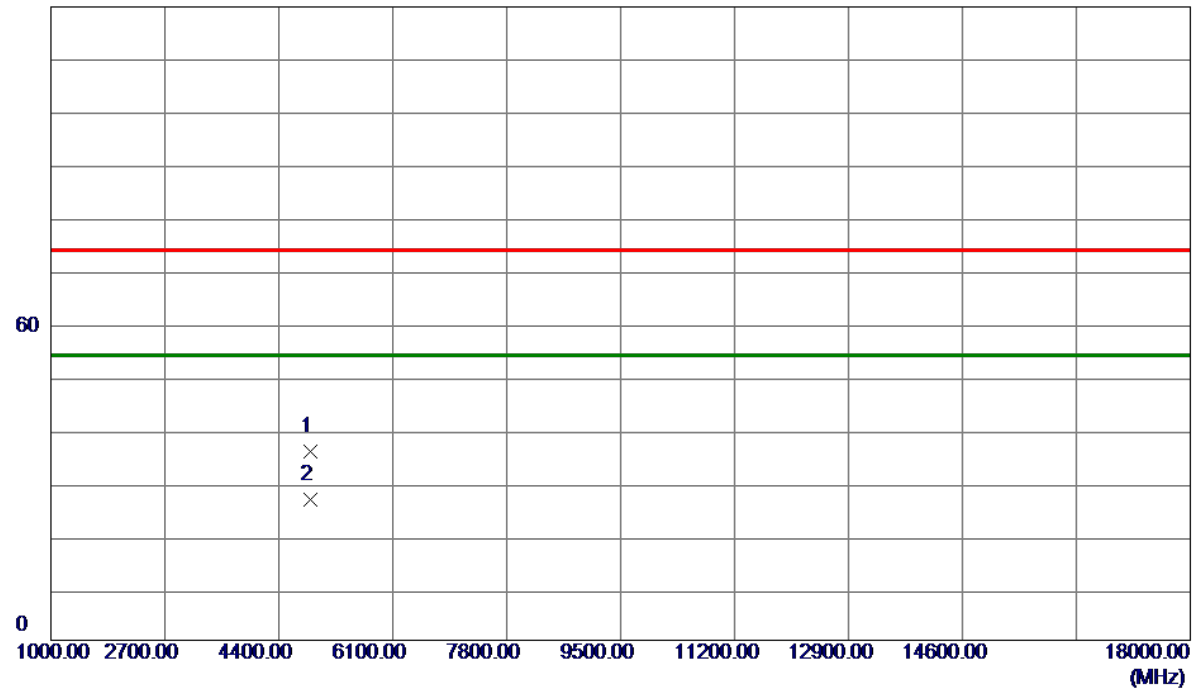
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4804.0000	40.38	-1.72	38.66	74.00	-35.34	Peak	
2 *	4804.0000	31.34	-1.72	29.62	54.00	-24.38	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE (1 Mbps)	Test Date	2025/6/9
Test Frequency	2440MHz	Polarization	Vertical

120 dBuV/m



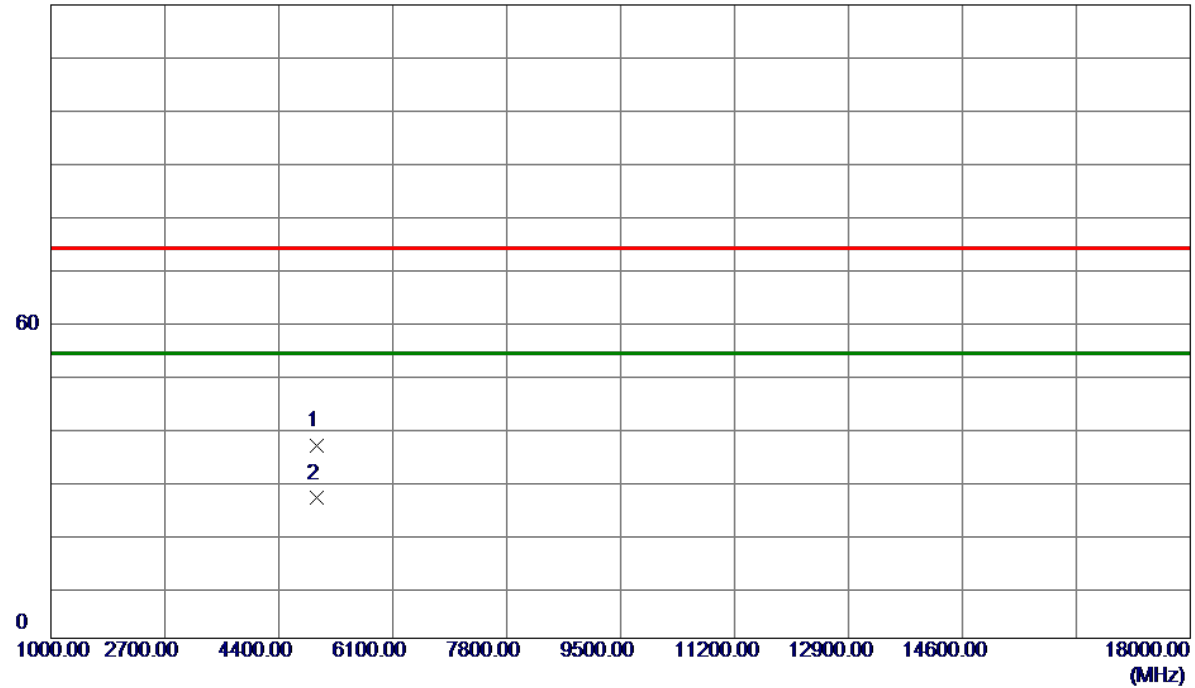
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4880.0000	37.40	-1.62	35.78	74.00	-38.22	Peak	
2 *	4880.0000	28.19	-1.62	26.57	54.00	-27.43	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE (1 Mbps)	Test Date	2025/6/9
Test Frequency	2480MHz	Polarization	Vertical

120 dBuV/m



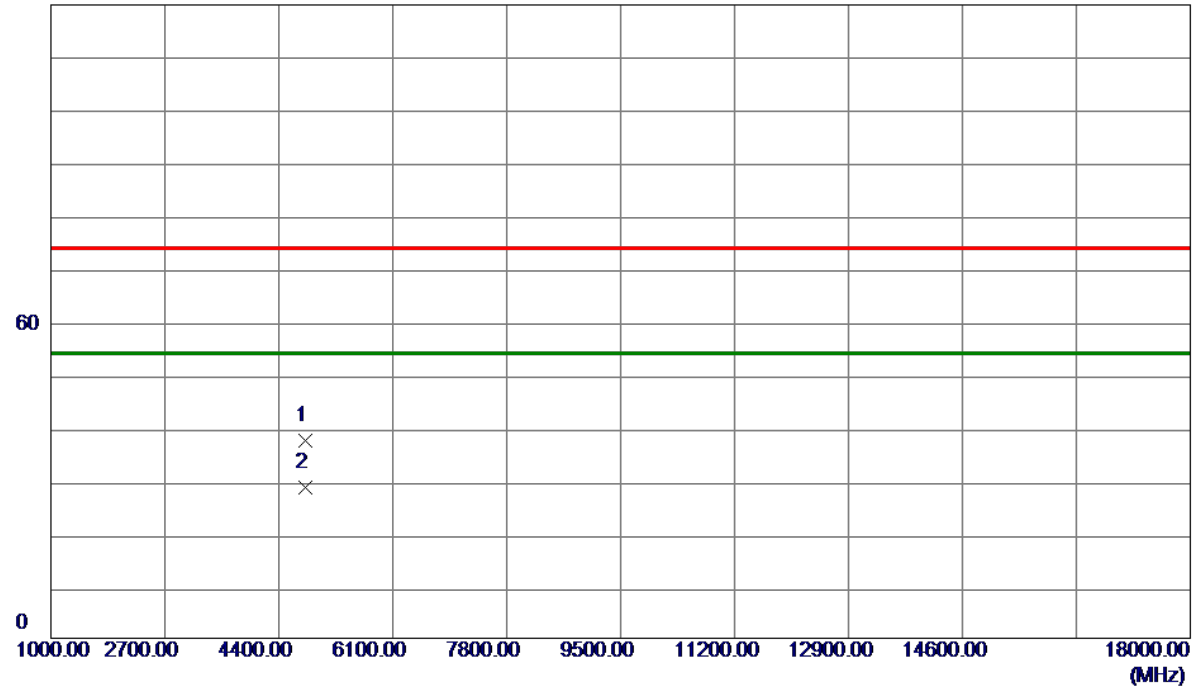
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4960.0000	37.89	-1.52	36.37	74.00	-37.63	Peak	
2 *	4960.0000	28.04	-1.52	26.52	54.00	-27.48	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE (2 Mbps)	Test Date	2025/6/9
Test Frequency	2402MHz	Polarization	Vertical

120 dBuV/m



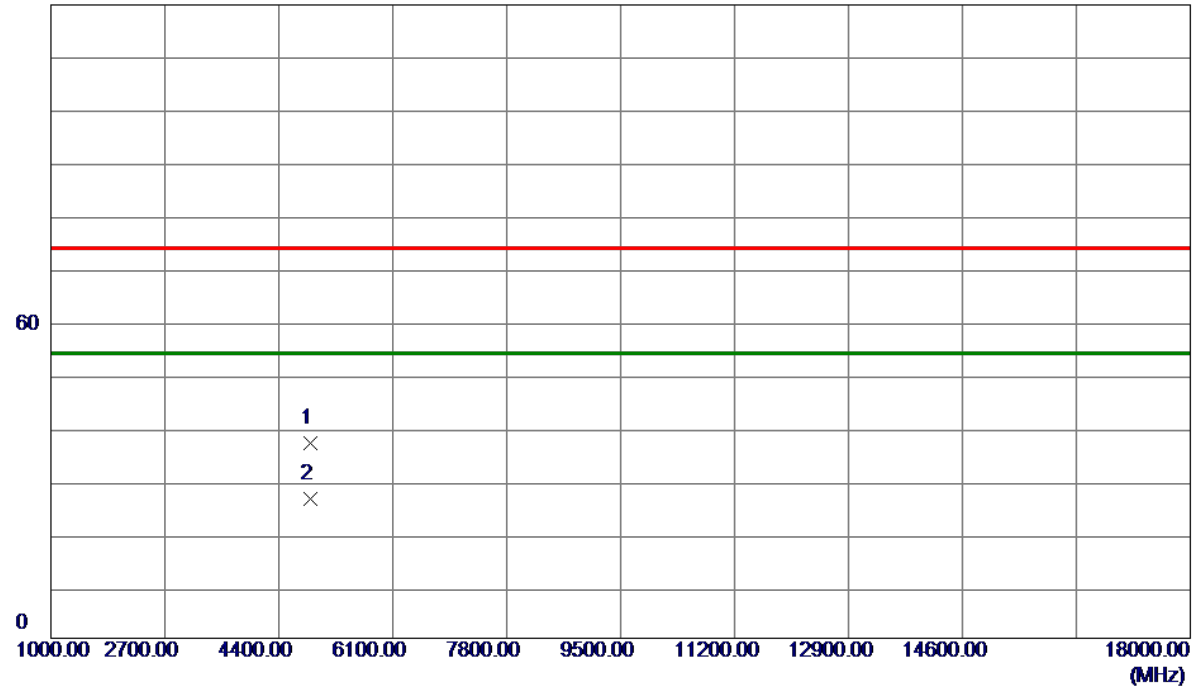
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4804.0000	39.24	-1.72	37.52	74.00	-36.48	Peak	
2 *	4804.0000	30.36	-1.72	28.64	54.00	-25.36	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE (2 Mbps)	Test Date	2025/6/9
Test Frequency	2440MHz	Polarization	Vertical

120 dBuV/m



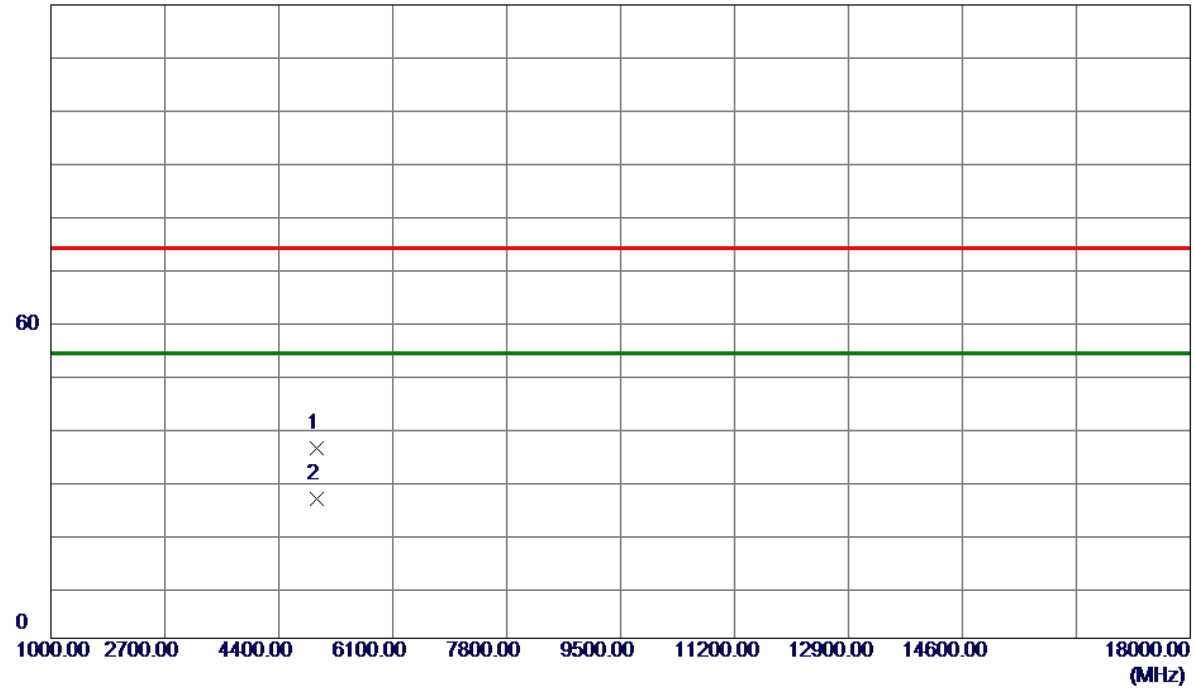
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4880.0000	38.69	-1.62	37.07	74.00	-36.93	Peak	
2 *	4880.0000	27.95	-1.62	26.33	54.00	-27.67	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE (2 Mbps)	Test Date	2025/6/9
Test Frequency	2480MHz	Polarization	Vertical

120 dBuV/m

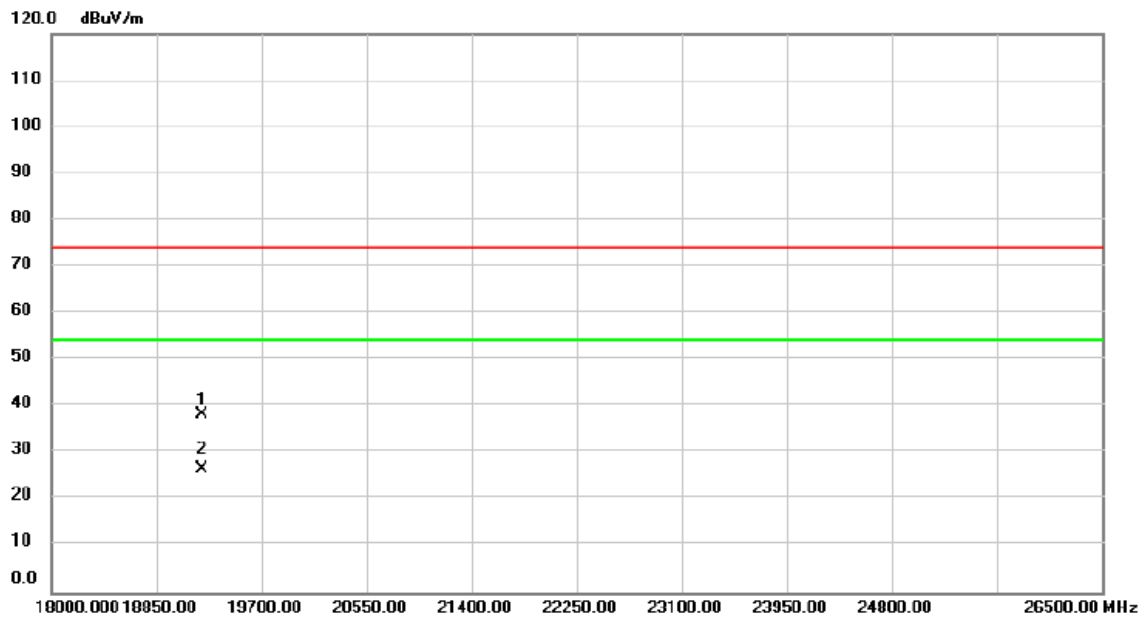


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4960.0000	37.45	-1.52	35.93	74.00	-38.07	Peak	
2 *	4960.0000	28.00	-1.52	26.48	54.00	-27.52	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	1Mbps	Test Date	2025/6/9
Test Frequency	2480MHz	Polarization	Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		19216.00	48.34	-10.05	38.29	74.00	-35.71	peak	
2	*	19216.00	36.57	-10.05	26.52	54.00	-27.48	AVG	

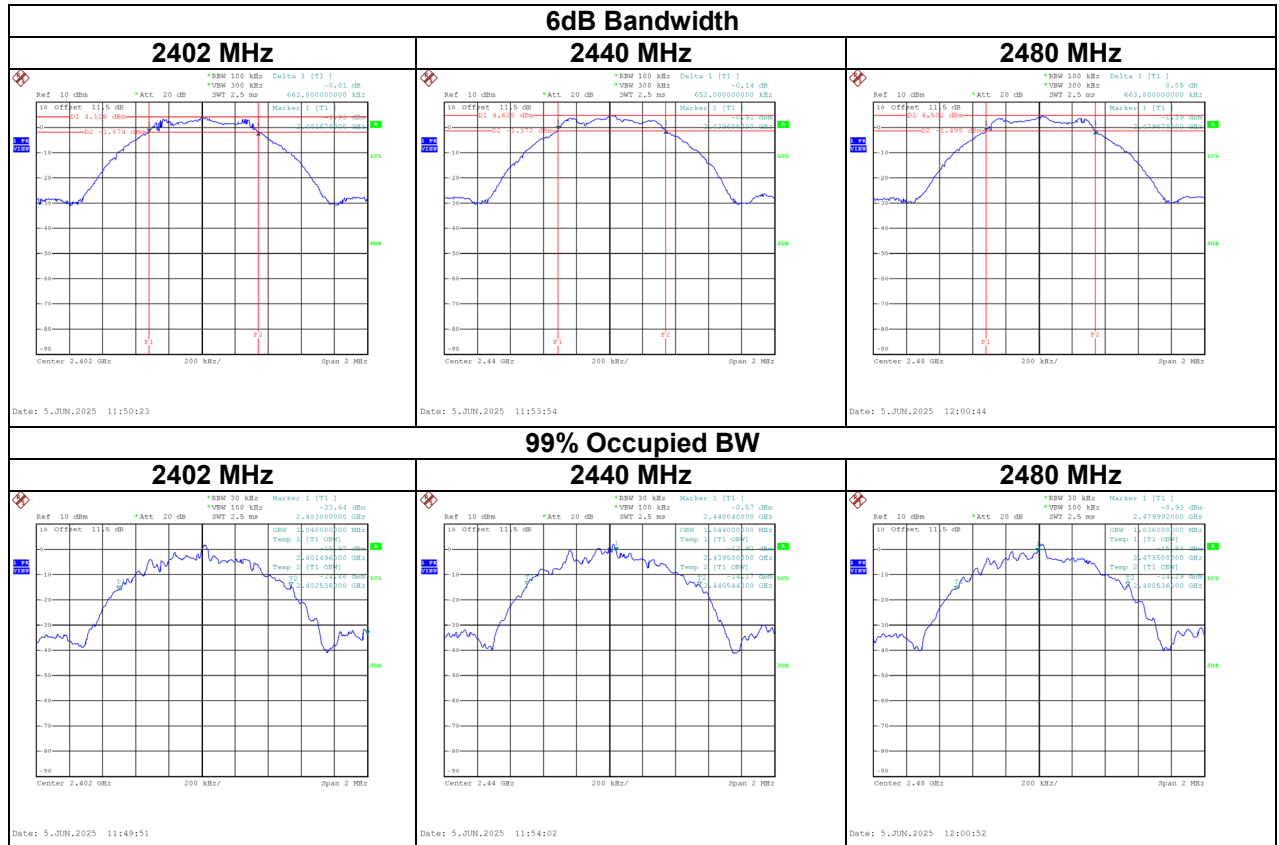
REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

APPENDIX D BANDWIDTH

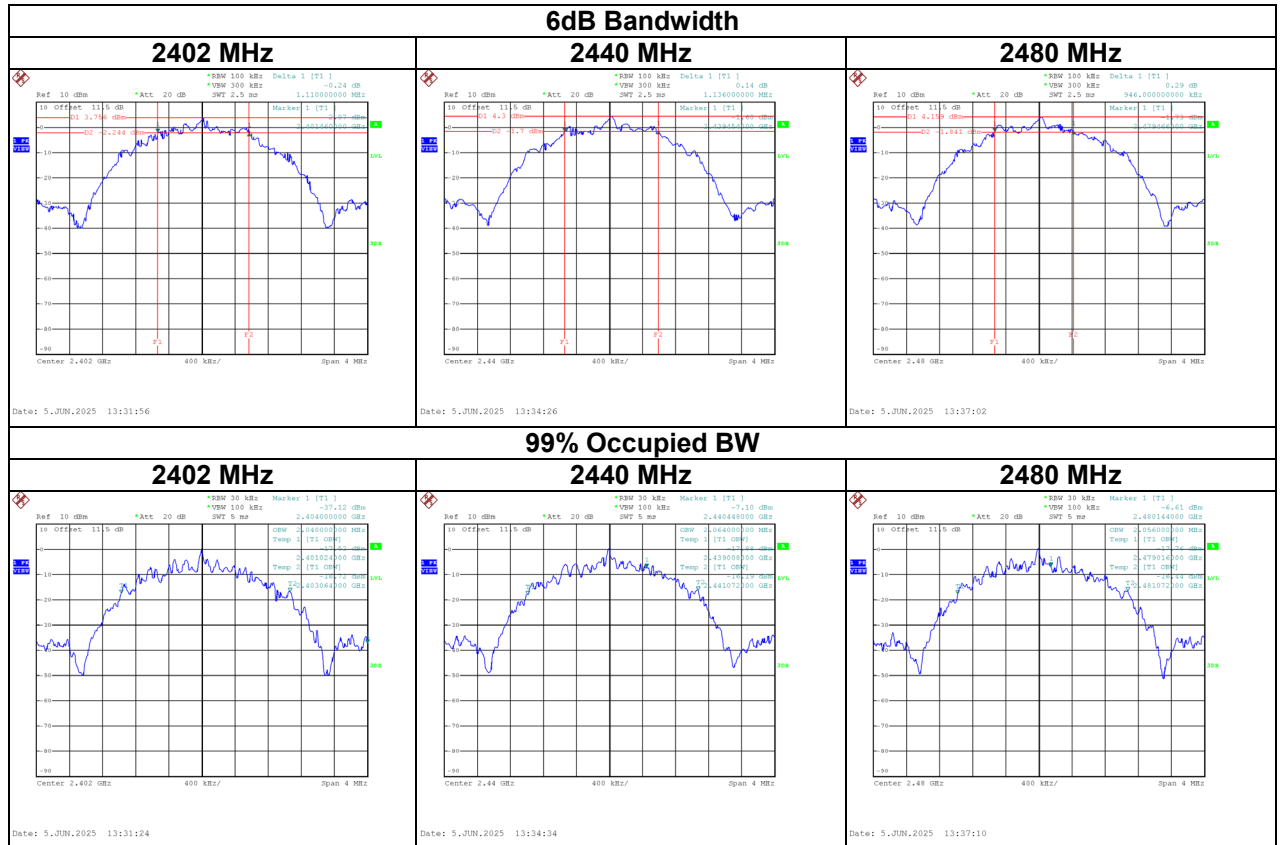
Test Mode: 1Mbps

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2402	0.664	1.040	500	Pass
2440	0.652	1.044	500	Pass
2480	0.664	1.036	500	Pass



Test Mode: 2Mbps

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2402	1.110	2.040	500	Pass
2440	1.136	2.064	500	Pass
2480	0.946	2.056	500	Pass



APPENDIX E OUTPUT POWER

Test Mode :	1Mbps	Tested Date	2025/6/5
-------------	-------	-------------	----------

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	4.22	0.0026	30.00	1.0000	Pass
2440	4.49	0.0029	30.00	1.0000	Pass
2480	4.56	0.0029	30.00	1.0000	Pass

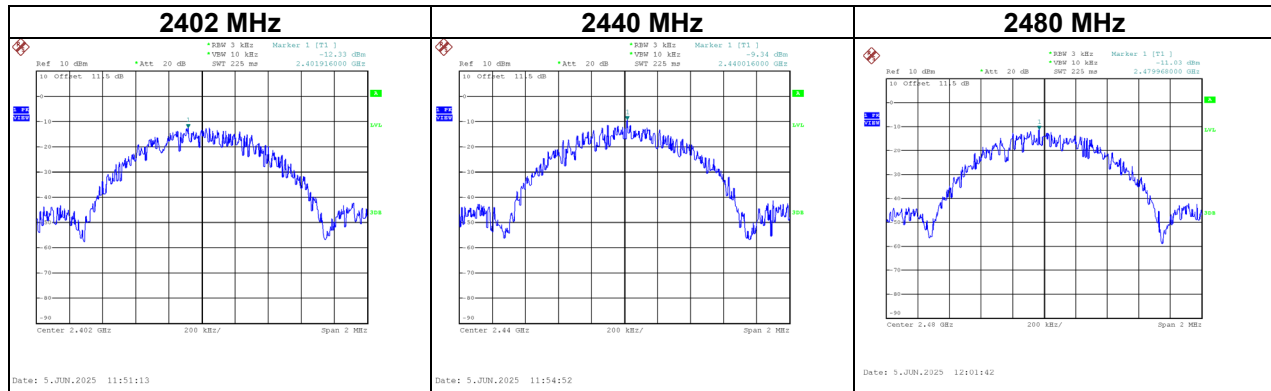
Test Mode :	2Mbps	Tested Date	2025/6/5
-------------	-------	-------------	----------

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	4.11	0.0026	30.00	1.0000	Pass
2440	4.55	0.0029	30.00	1.0000	Pass
2480	4.41	0.0028	30.00	1.0000	Pass

APPENDIX F POWER SPECTRAL DENSITY TEST

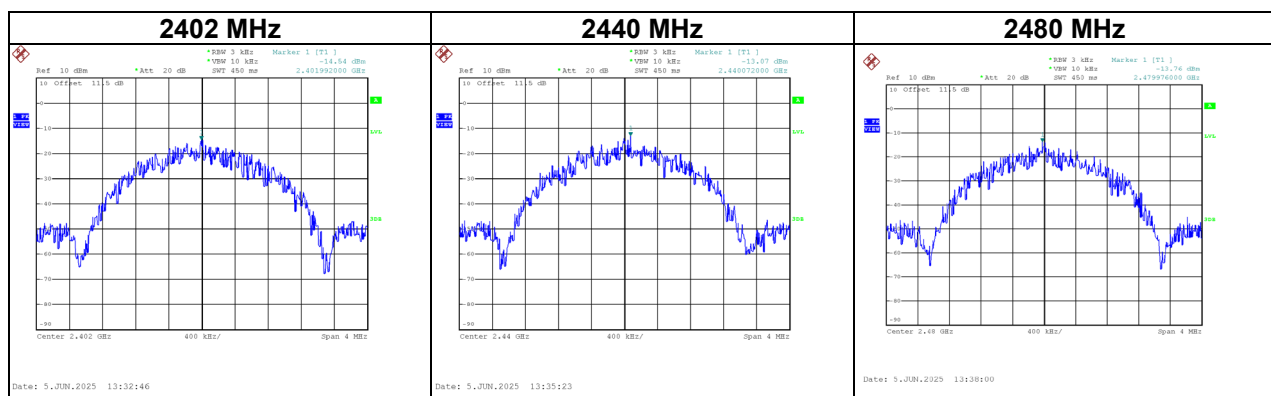
Test Mode :	1Mbps
-------------	-------

Frequency (MHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Test Result
2402	-12.33	8	Pass
2440	-9.34	8	Pass
2480	-11.03	8	Pass



Test Mode :	2Mbps
-------------	-------

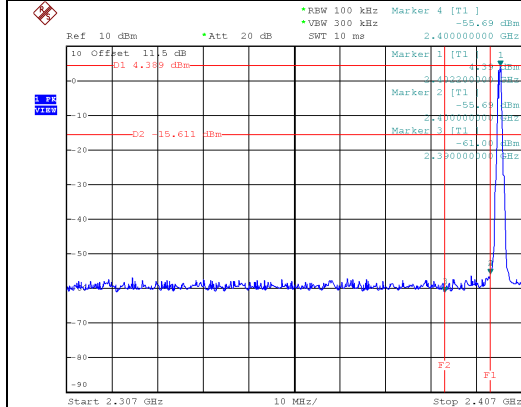
Frequency (MHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Test Result
2402	-14.54	8	Pass
2440	-13.07	8	Pass
2480	-13.76	8	Pass



APPENDIX G ANTENNA CONDUCTED SPURIOUS EMISSION

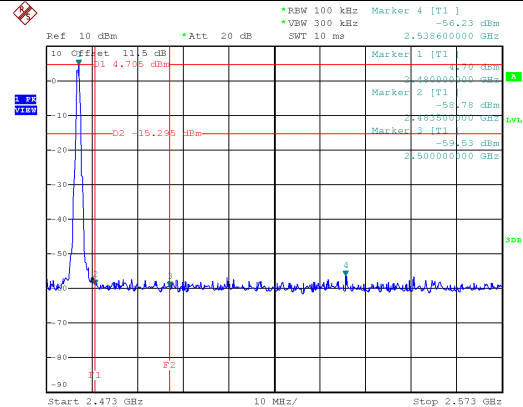
Test Mode : 1Mbps

Low Bandedge-2402 MHz



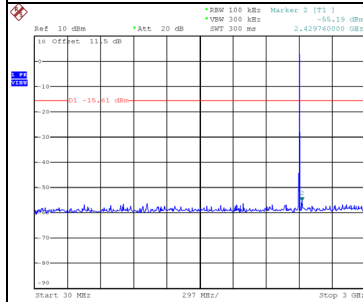
Date: 5.JUN.2025 11:50:32

High Bandedge-2480 MHz

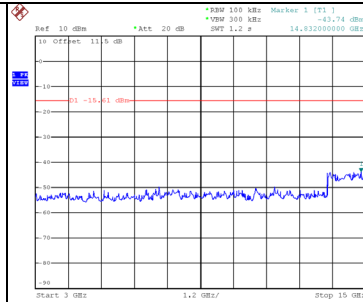


Date: 5.JUN.2025 12:01:01

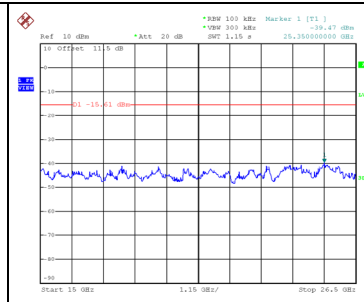
2402 MHz – 10th Harmonics



Date: 5.JUN.2025 11:50:47

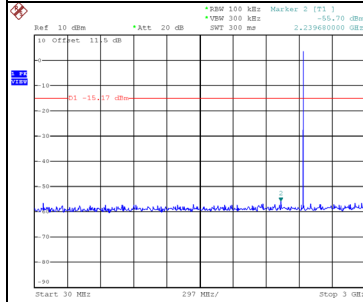


Date: 5.JUN.2025 11:50:56

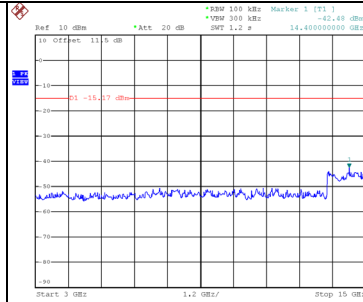


Date: 5.JUN.2025 11:51:05

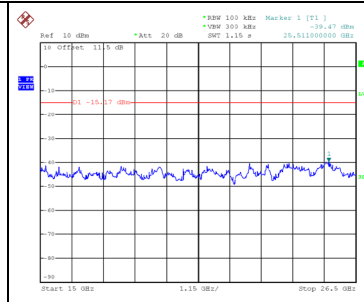
2440 MHz – 10th Harmonics



Date: 5.JUN.2025 11:54:27

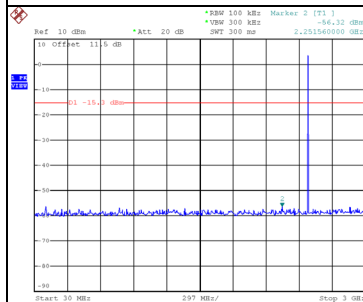


Date: 5.JUN.2025 11:54:36

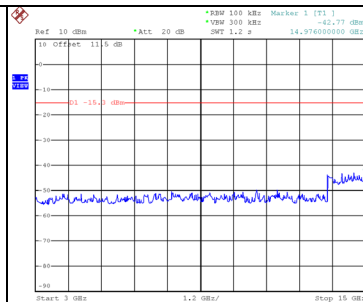


Date: 5.JUN.2025 11:54:45

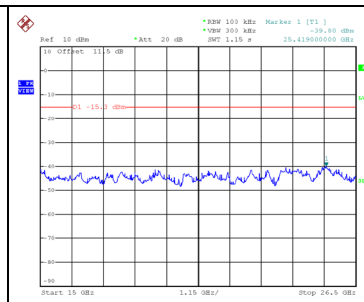
2480 MHz – 10th Harmonics



Date: 5.JUN.2025 12:01:16

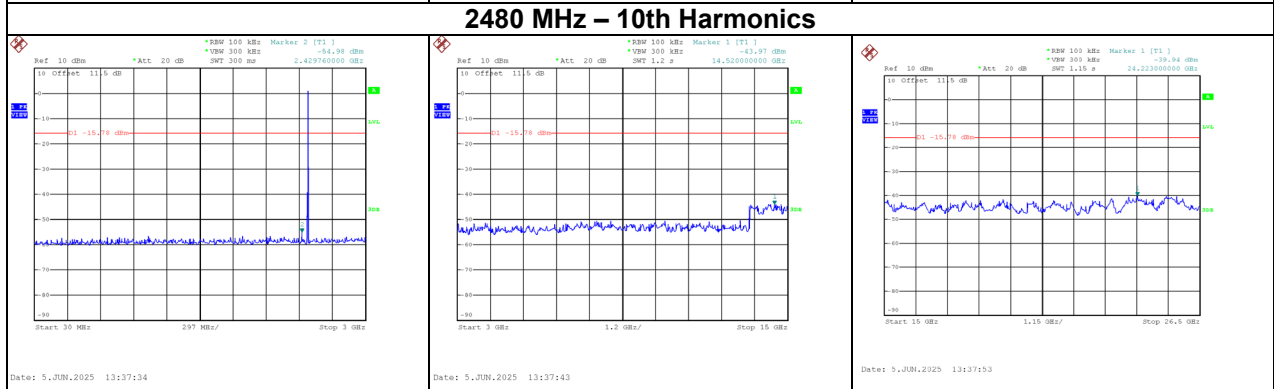
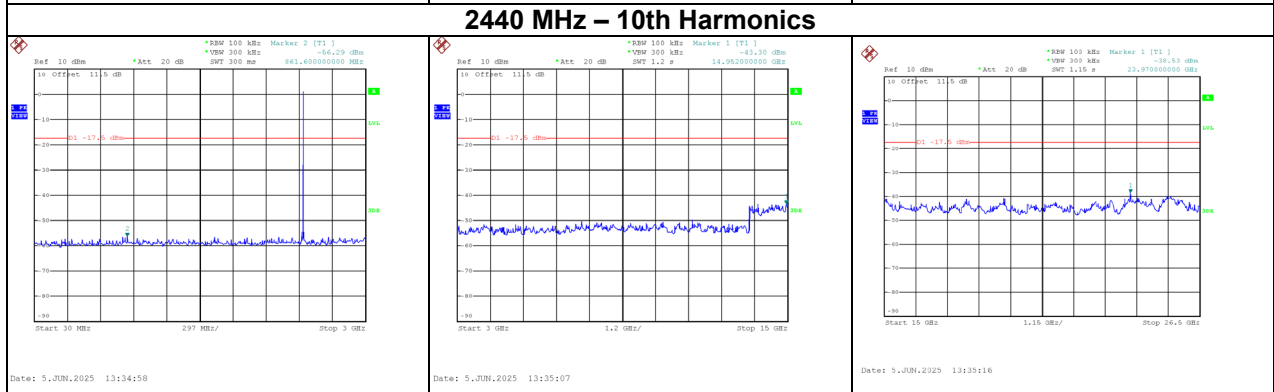
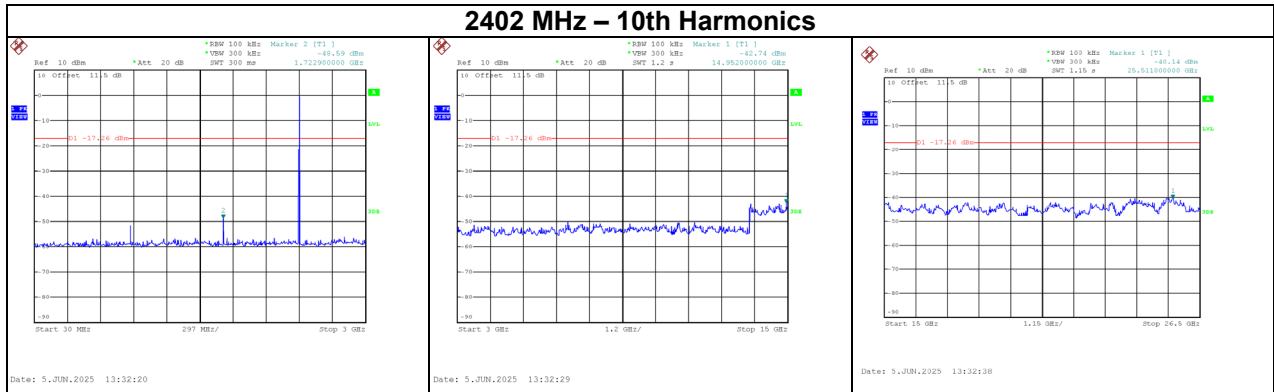
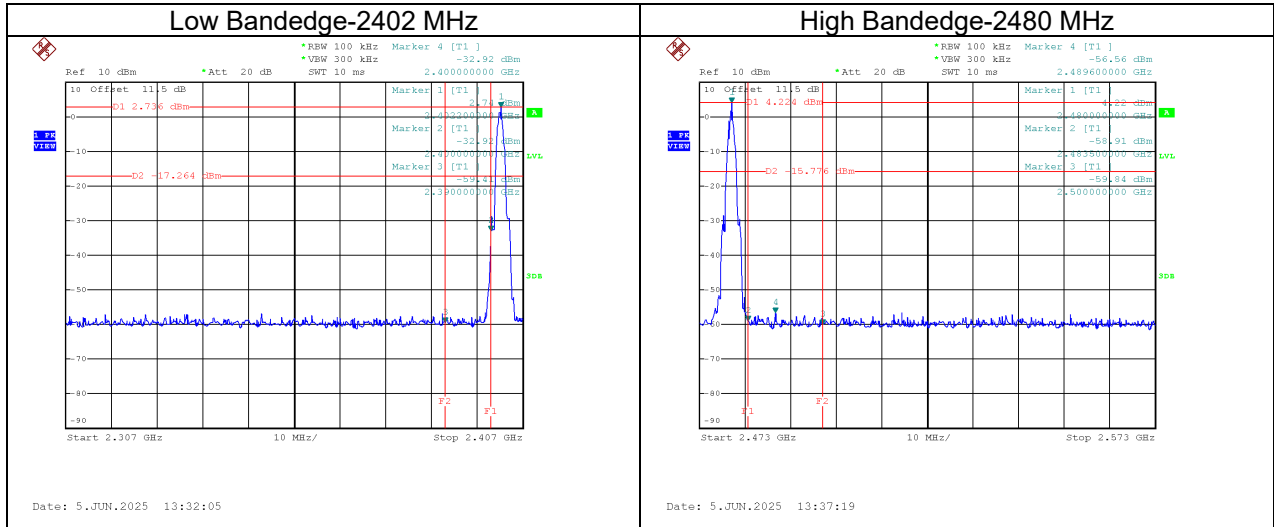


Date: 5.JUN.2025 12:01:25



Date: 5.JUN.2025 12:01:34

Test Mode : 2Mbps



End of Test Report