

FCC Radio Test Report

FCC ID: 2BH7FC645D

Report No. : BTL-FCCP-1-2508C413
Equipment : Battery-Powered Dual-Lens Pan/Tilt Security Camera
Model Name : Tapo C645D
Brand Name : tp-link, tapo
Applicant : TP-Link Systems Inc.
Address : 10 Mauchly, Irvine, CA 92618
Manufacturer : TP-Link Systems Inc.
Address : 10 Mauchly, Irvine, CA 92618

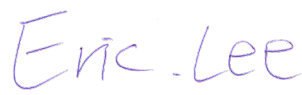
Radio Function : Bluetooth Low Energy

FCC Rule Part(s) : FCC CFR Title 47, Part 15, Subpart C (15.247)
Measurement Procedure(s) : ANSI C63.10-2020

Date of Receipt : 2025/8/29
Date of Test : 2025/8/29 ~ 2025/10/15
Issued Date : 2025/11/5

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

Prepared by : 
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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	13
3 AC POWER LINE CONDUCTED EMISSIONS TEST	14
3.1 LIMIT	14
3.2 TEST PROCEDURE	14
3.3 DEVIATION FROM TEST STANDARD	15
3.4 TEST SETUP	15
3.5 TEST RESULT	15
4 RADIATED EMISSIONS TEST	16
4.1 LIMIT	16
4.2 TEST PROCEDURE	17
4.3 DEVIATION FROM TEST STANDARD	17
4.4 TEST SETUP	18
4.5 EUT OPERATING CONDITIONS	19
4.6 TEST RESULT – 9 KHZ TO 30 MHZ	19
4.7 TEST RESULT – 30 MHZ TO 1 GHZ	19
4.8 TEST RESULT – ABOVE 1 GHZ	19
5 BANDWIDTH TEST	20
5.1 APPLIED PROCEDURES / LIMIT	20
5.2 TEST PROCEDURE	20
5.3 DEVIATION FROM STANDARD	20
5.4 TEST SETUP	20
5.5 EUT OPERATION CONDITIONS	20
5.6 TEST RESULTS	20
6 OUTPUT POWER TEST	21
6.1 APPLIED PROCEDURES / LIMIT	21
6.2 TEST PROCEDURE	21
6.3 DEVIATION FROM STANDARD	21
6.4 TEST SETUP	21
6.5 EUT OPERATION CONDITIONS	21
6.6 TEST RESULTS	21
7 POWER SPECTRAL DENSITY TEST	22
7.1 APPLIED PROCEDURES / LIMIT	22
7.2 TEST PROCEDURE	22
7.3 DEVIATION FROM STANDARD	22
7.4 TEST SETUP	22
7.5 EUT OPERATION CONDITIONS	22
7.6 TEST RESULTS	22

8	ANTENNA CONDUCTED SPURIOUS EMISSION	23
8.1	APPLIED PROCEDURES / LIMIT	23
8.2	TEST PROCEDURE	23
8.3	DEVIATION FROM STANDARD	23
8.4	TEST SETUP	23
8.5	EUT OPERATION CONDITIONS	23
8.6	TEST RESULTS	23
9	LIST OF MEASURING EQUIPMENTS	24
10	EUT TEST PHOTO	26
11	EUT PHOTOS	26
APPENDIX A	AC POWER LINE CONDUCTED EMISSIONS	27
APPENDIX B	RADIATED EMISSIONS - 30 MHZ TO 1 GHZ	30
APPENDIX C	RADIATED EMISSIONS - ABOVE 1 GHZ	33
APPENDIX D	BANDWIDTH	45
APPENDIX E	OUTPUT POWER	48
APPENDIX F	POWER SPECTRAL DENSITY TEST	50
APPENDIX G	ANTENNA CONDUCTED SPURIOUS EMISSION	52

REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-1-2508C413	R00	Original Report.	2025/11/5	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 15.247(d)	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(2)

NOTE:

- (1) "N/A" denotes test is not applicable in this test report.
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.
- (3) The report format version is TP.1.1.1.

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 ☒ TR01

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 %**.

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U (dB)
C01	CISPR	150 kHz ~ 30MHz	3.44

B. Radiated emissions test :

Test Site	Measurement Frequency Range (GHz)	U (dB)
CB20	0.03~0.2	4.01
	0.02~1	4.64
	1 ~ 6	5.91
	6 ~ 18	6.24
	18 ~ 26	3.93
	26 ~ 40	4.06

C. Conducted test :

Test Item	U
Occupied Bandwidth	86 %
Output power	0.8412 dB
Power Spectral Density	0.8602 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 120V	Ken Lan
Radiated emissions below 1 GHz	Refer to data	DC 5V	Benny Cao
Radiated emissions above 1 GHz	Refer to data	DC 5V	Benny Cao
Bandwidth	25 °C, 50 %	DC 5V	Cheng Tsai
Output Power	25 °C, 50 %	DC 5V	Cheng Tsai
Power Spectral Density	25 °C, 50 %	DC 5V	Cheng Tsai
Antenna conducted Spurious Emission	25 °C, 50 %	DC 5V	Cheng Tsai

1.4 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

Test Software Version	IPOP_V4.0		
Frequency (MHz)	2402	2440	2480
1Mbps	0x3f	0x3f	0x3f
2Mbps	0x3f	0x3f	0x3f

2 GENERAL INFORMATION

2.1 DESCRIPTION OF EUT

Equipment	Battery-Powered Dual-Lens Pan/Tilt Security Camera
Model Name	Tapo C645D
Brand Name	tp-link, tapo
Model Difference(s)	N/A
Hardware Version	1.0
Software Version	1.X
Power Source	1) DC voltage supplied from AC adapter (support unit). 2) Supplied from Solar Panel. 3) Supplied from Lithium-ion battery. 1# Model: LR1865HB 2# Model: CMICR18650F9
Power Rating	1) 2) 5V 2A 3) 1#3.6V 3250 mAh 11.7Wh*3 2#3.6V 3350 mAh*3
Operation Band	2400 MHz ~ 2483.5 MHz
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	1Mbps, 2Mbps
Output Power Max.	1Mbps: 9.52 dBm (0.0090 W)
Test Model	Tapo C645D
Sample Status	Engineering Sample

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:

Antenna	Manufacturer	P/N	Type	Connector	Gain (dBi)
1	TP-Link Systems Inc.	Tapo C645D 1.0	Dipole	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)	1Mbps	19	-
Transmitter Radiated Emissions (above 1GHz)	1Mbps 2Mbps	00/39	Bandedge
	1Mbps 2Mbps	00/19/39	Harmonic
Transmitter Radiated Emissions (above 18GHz)	1Mbps	19	-
Bandwidth & Output Power & Power Spectral Density & Antenna conducted Spurious Emission	1Mbps 2Mbps	00/19/39	-

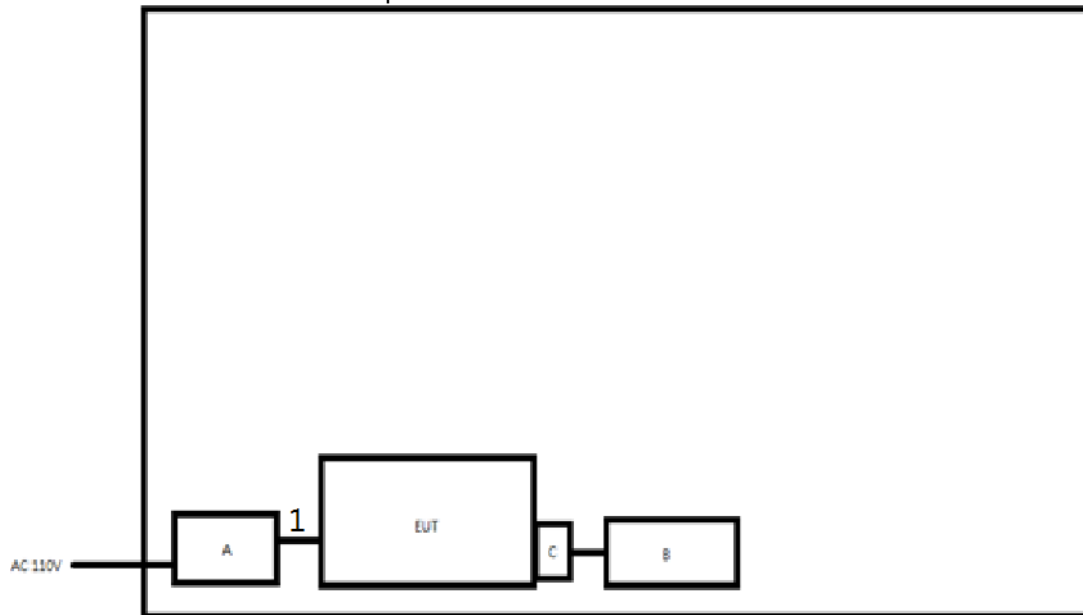
NOTE:

- (1) For radiated emission above 1GHz test, both Vertical and Horizontal are evaluated, but only the worst case (Vertical) is recorded.
- (2) For radiated emission above 18GHz test, only tested and recorded the worst case.
- (3) For radiated emission below 1GHz test, three power supply methods are evaluated, in this report only recorded the worst case.

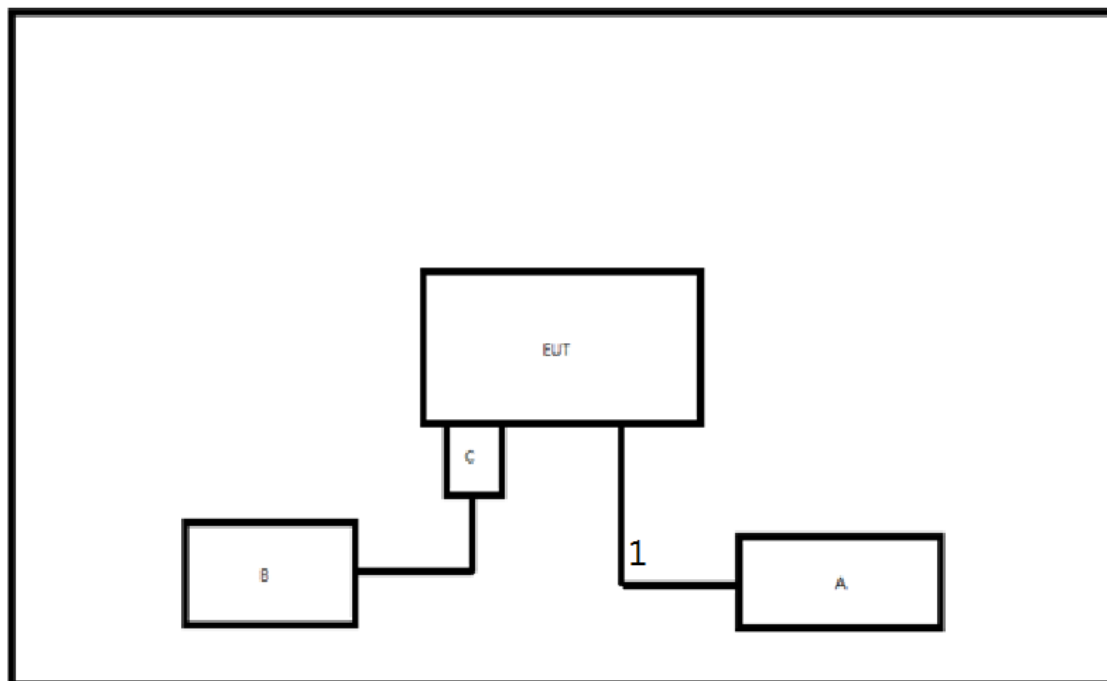
2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

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

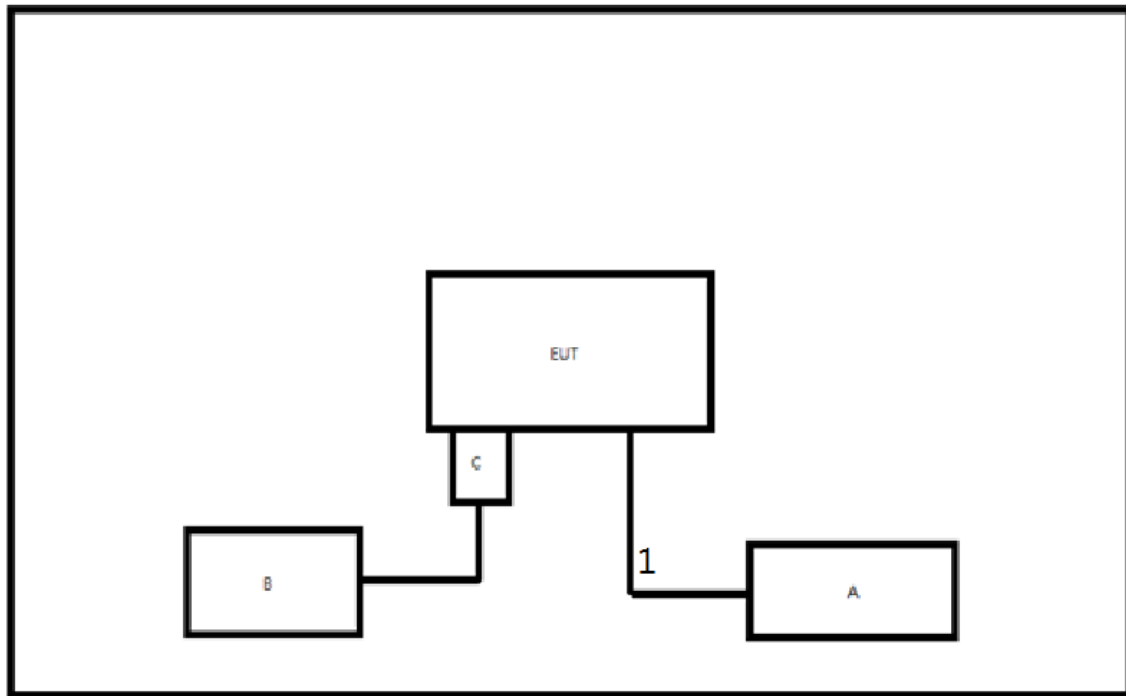
AC power line conducted emissions



Radiated Emissions Below 1GHz



Radiated Emissions Above 1GHz



2.4 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.	Remarks
A	Adapter	DVE	DSA-10PF06-05 FUS 052200	N/A	Supplied by test requester
B	Notebook	Lenovo	ThinkBook 14 G4 IAP	MP28KHAH	Furnished by test lab.
C	Fixture	UART STC	CP2102	N/A	Furnished by test lab.

Item	Cable Type	Shielded	Ferrite Core	Length	Remarks
1	Type-C Cable	NO	NO	0.5m	Supplied by test requester

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 (dBμV)		Correct Factor (dB)		Measurement Value (dBμV)
38.22	+	3.45	=	41.67

Measurement Value (dBμV)		Limit Value (dBμV)		Margin Level (dB)
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.

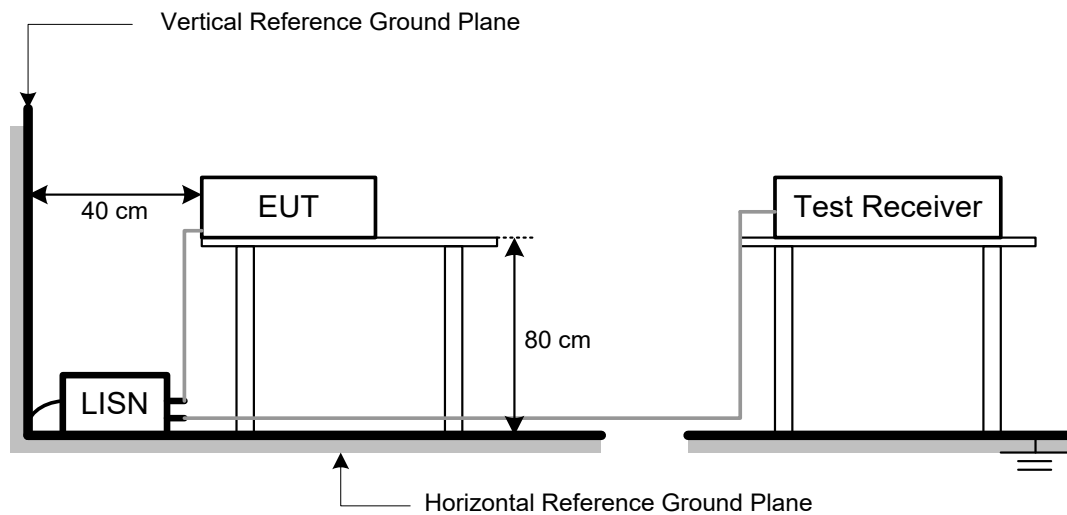
NOTE:

- (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 (dBuV)		Correct Factor (dB/m)		Measurement Value (dBuV/m)
41.91	+	-8.36	=	33.55

Measurement Value (dBuV/m)		Limit Value (dBuV/m)		Margin Level (dB)
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

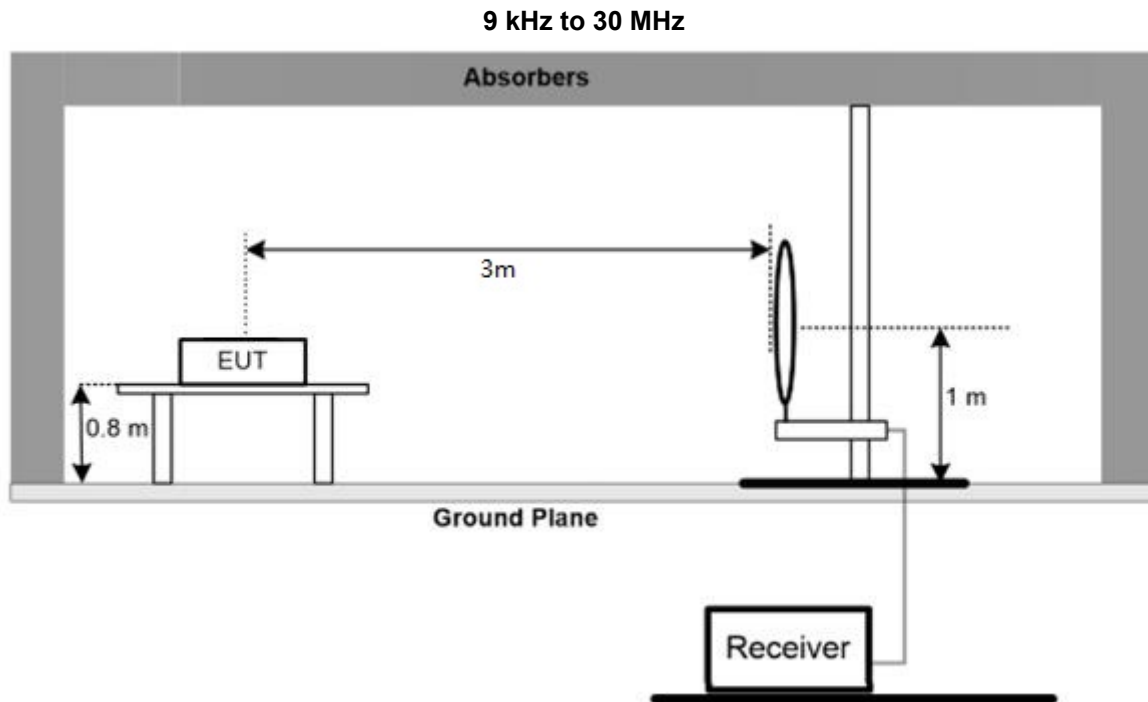
4.2 TEST PROCEDURE

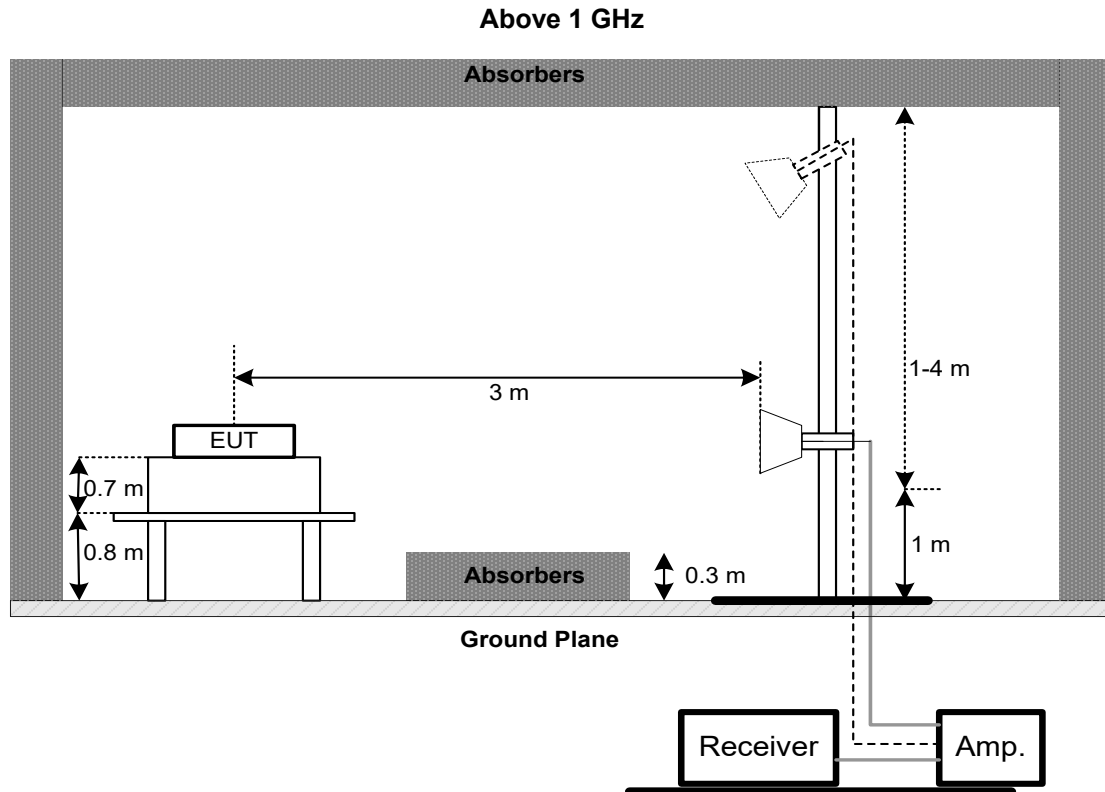
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 30MHz)
- b. The measuring distance 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)
- c. 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)
- d. 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.
- e. 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).
- f. 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.
- g. 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.
- h. 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)
- i. 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)
- j. 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





4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.6 TEST RESULT – 9 KHZ TO 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

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

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

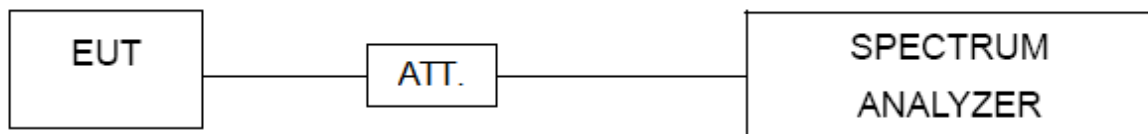
6.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer 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

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 intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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 the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

8.2 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 = 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	2025/6/26	2026/6/25
2	Test Cable	EMCI	EMCRG58-BM-B M-9000	210501	2024/12/10	2025/12/9
3	EMC Receiver	Keysight	N9038A	MY54130009	2025/6/27	2026/6/26
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	2025/6/25	2026/6/24
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	2025/11/23
13	Pre-Amplifier	EMCI	EMC184045SE	980512	2024/12/10	2025/12/9
14	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	340	2025/6/27	2026/6/26
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 & Output Power & Power Spectral Density & 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	2025/6/27	2026/6/26
2	10dbAttenuator	INMET	AHC-10dB	1	2024/11/26	2025/11/25
3	BTL-ConductedTest	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

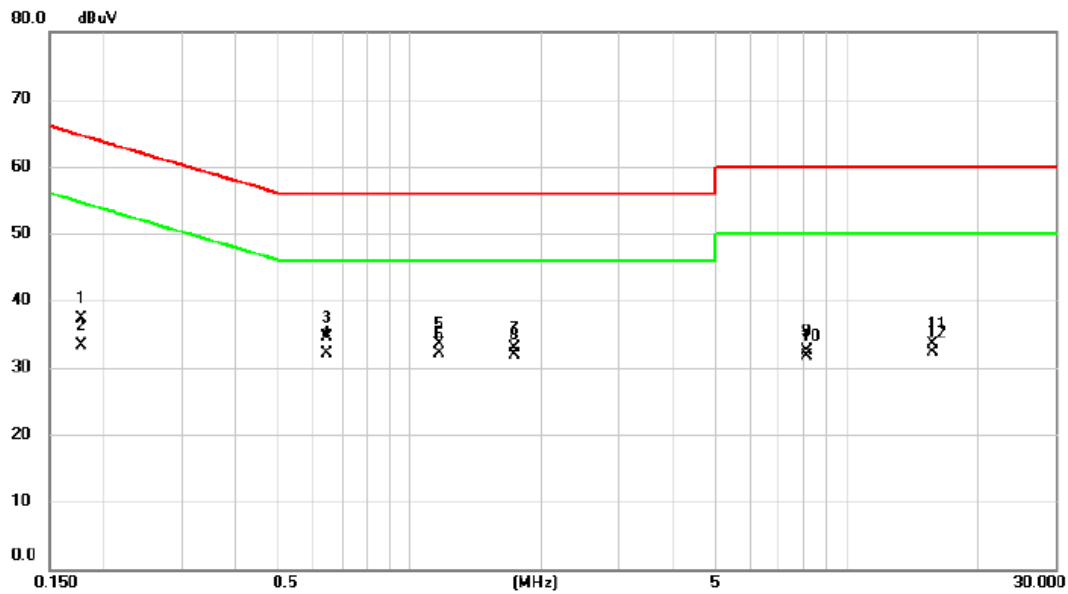
Please refer to document Appendix No.: TP-2508C413-1 (APPENDIX-TEST PHOTOS).

11 EUT PHOTOS

Please refer to document Appendix No.: EP-2508C413-1 (APPENDIX-EUT PHOTOS).

APPENDIX A AC POWER LINE CONDUCTED EMISSIONS

Test Mode	Normal	Tested Date	2025/9/3
Test Frequency	-	Phase	Line

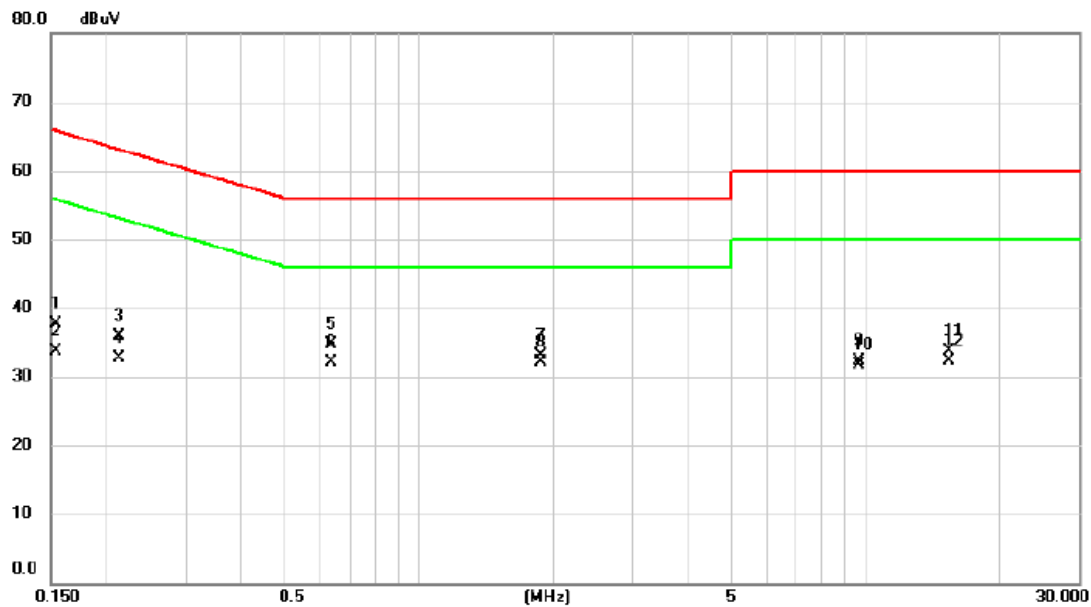


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1768	27.70	9.51	37.21	64.63	-27.42	QP	
2		0.1768	23.73	9.51	33.24	54.63	-21.39	AVG	
3		0.6440	25.07	9.53	34.60	56.00	-21.40	QP	
4	*	0.6440	22.55	9.53	32.08	46.00	-13.92	AVG	
5		1.1705	23.86	9.55	33.41	56.00	-22.59	QP	
6		1.1705	22.47	9.55	32.02	46.00	-13.98	AVG	
7		1.7375	23.25	9.61	32.86	56.00	-23.14	QP	
8		1.7375	22.35	9.61	31.96	46.00	-14.04	AVG	
9		8.1000	22.74	9.79	32.53	60.00	-27.47	QP	
10		8.1000	22.00	9.79	31.79	50.00	-18.21	AVG	
11		15.7250	23.55	10.00	33.55	60.00	-26.45	QP	
12		15.7250	22.26	10.00	32.26	50.00	-17.74	AVG	

REMARKS:

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

Test Mode	Normal	Tested Date	2025/9/3
Test Frequency	-	Phase	Neutral



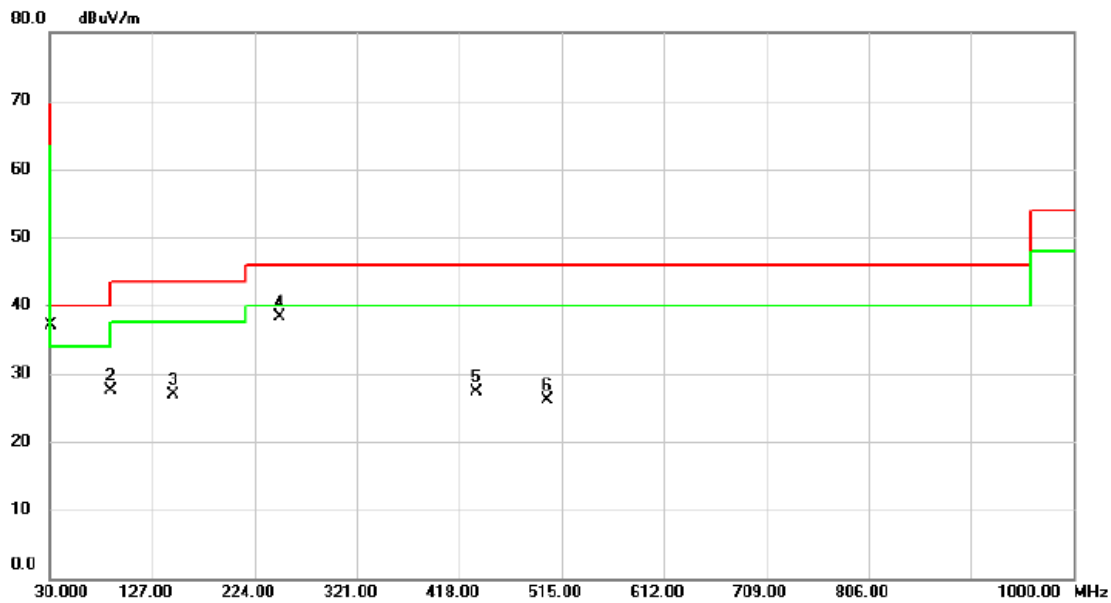
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1535	28.24	9.55	37.79	65.81	-28.02	QP	
2		0.1535	24.23	9.55	33.78	55.81	-22.03	AVG	
3		0.2126	26.28	9.56	35.84	63.10	-27.26	QP	
4		0.2126	23.16	9.56	32.72	53.10	-20.38	AVG	
5		0.6350	25.17	9.57	34.74	56.00	-21.26	QP	
6	*	0.6350	22.47	9.57	32.04	46.00	-13.96	AVG	
7		1.8725	23.44	9.63	33.07	56.00	-22.93	QP	
8		1.8725	22.39	9.63	32.02	46.00	-13.98	AVG	
9		9.6500	22.49	9.88	32.37	60.00	-27.63	QP	
10		9.6500	21.86	9.88	31.74	50.00	-18.26	AVG	
11		15.4000	23.64	10.08	33.72	60.00	-26.28	QP	
12		15.4000	22.27	10.08	32.35	50.00	-17.65	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	BLE 5.0 (1Mbps)	Test Date	2025/9/2
Test Frequency	2440MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

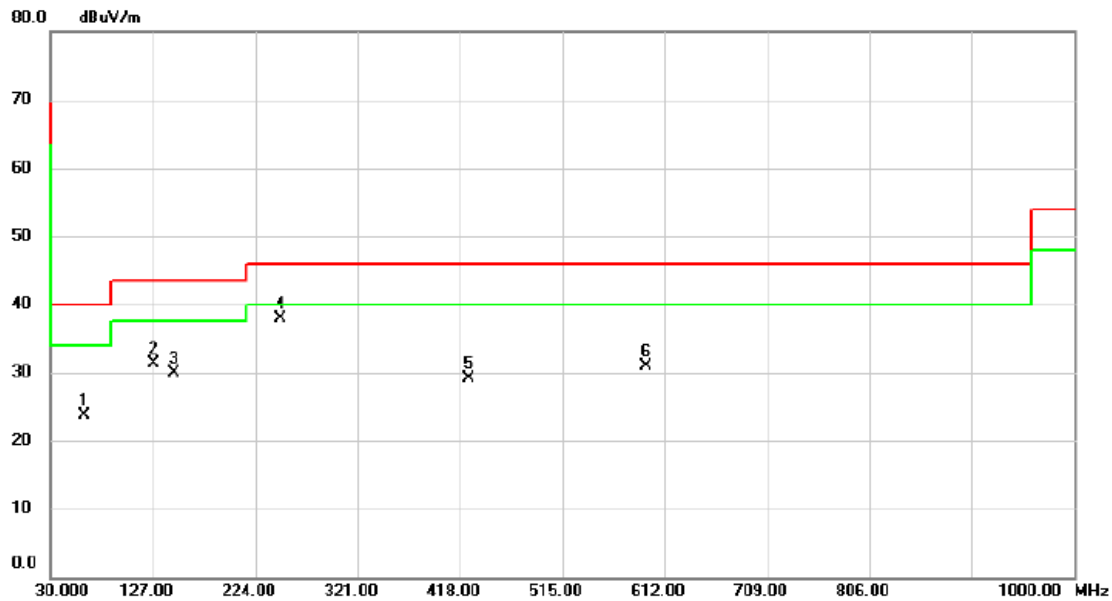


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	30.0000	51.00	-13.93	37.07	40.00	-2.93	peak	
2		87.2300	44.33	-16.78	27.55	40.00	-12.45	peak	
3		146.4000	38.22	-11.31	26.91	43.50	-16.59	peak	
4		248.2500	50.11	-11.83	38.28	46.00	-7.72	peak	
5		433.5200	33.40	-6.09	27.31	46.00	-18.69	peak	
6		501.4200	30.92	-4.91	26.01	46.00	-19.99	peak	

REMARKS:

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

Test Mode	BLE 5.0 (1Mbps)	Test Date	2025/9/2
Test Frequency	2440MHz	Polarization	Horizontal
Temp	25°C	Hum.	65%



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		62.0100	35.72	-12.10	23.62	40.00	-16.38	peak	
2		127.0000	44.52	-13.24	31.28	43.50	-12.22	peak	
3		147.3700	41.22	-11.22	30.00	43.50	-13.50	peak	
4	*	248.2500	49.68	-11.83	37.85	46.00	-8.15	peak	
5		426.7300	35.40	-6.26	29.14	46.00	-16.86	peak	
6		594.5400	33.44	-2.46	30.98	46.00	-15.02	peak	

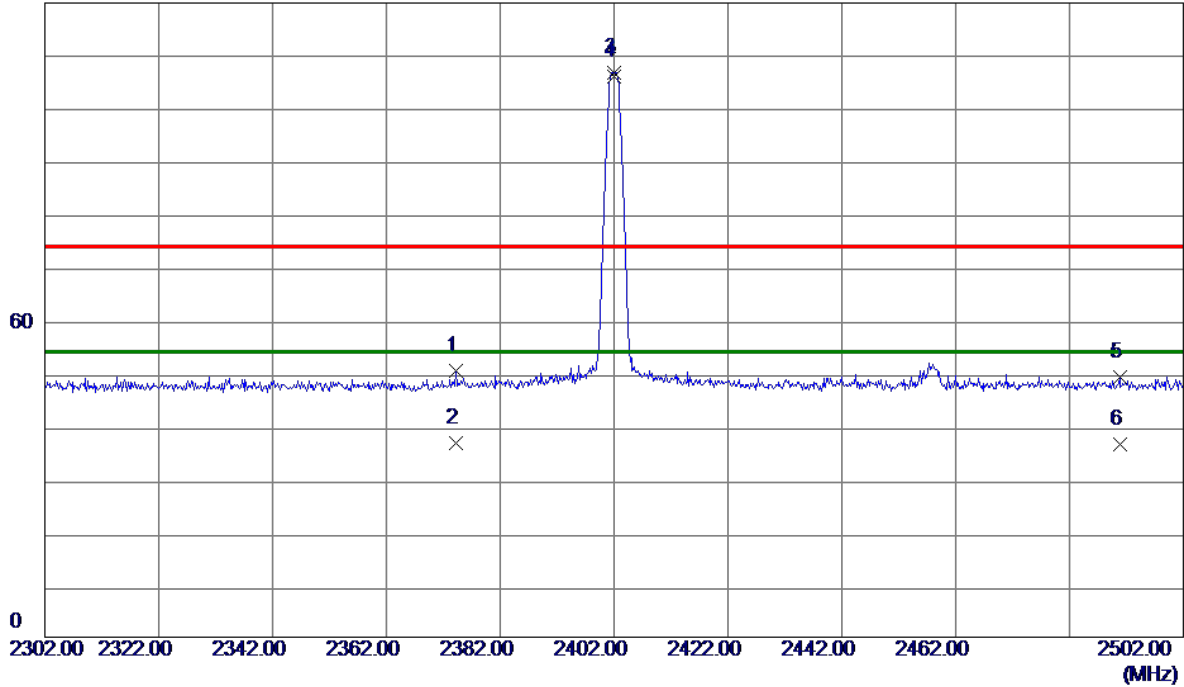
REMARKS:

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

APPENDIX C RADIATED EMISSIONS - ABOVE 1 GHZ

Test Mode	BLE 5.0 (1Mbps)	Test Date	2025/9/2
Test Frequency	2402MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

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	2374.2000	45.24	5.21	50.45	74.00	-23.55	Peak	
2	2374.2000	31.57	5.21	36.78	54.00	-17.22	AVG	
3	2402.0000	101.65	5.26	106.91	74.00	32.91	Peak	No Limit
4 *	2402.0000	100.89	5.26	106.15	54.00	52.15	AVG	No Limit
5	2490.8000	43.83	5.42	49.25	74.00	-24.75	Peak	
6	2490.8000	31.07	5.42	36.49	54.00	-17.51	AVG	

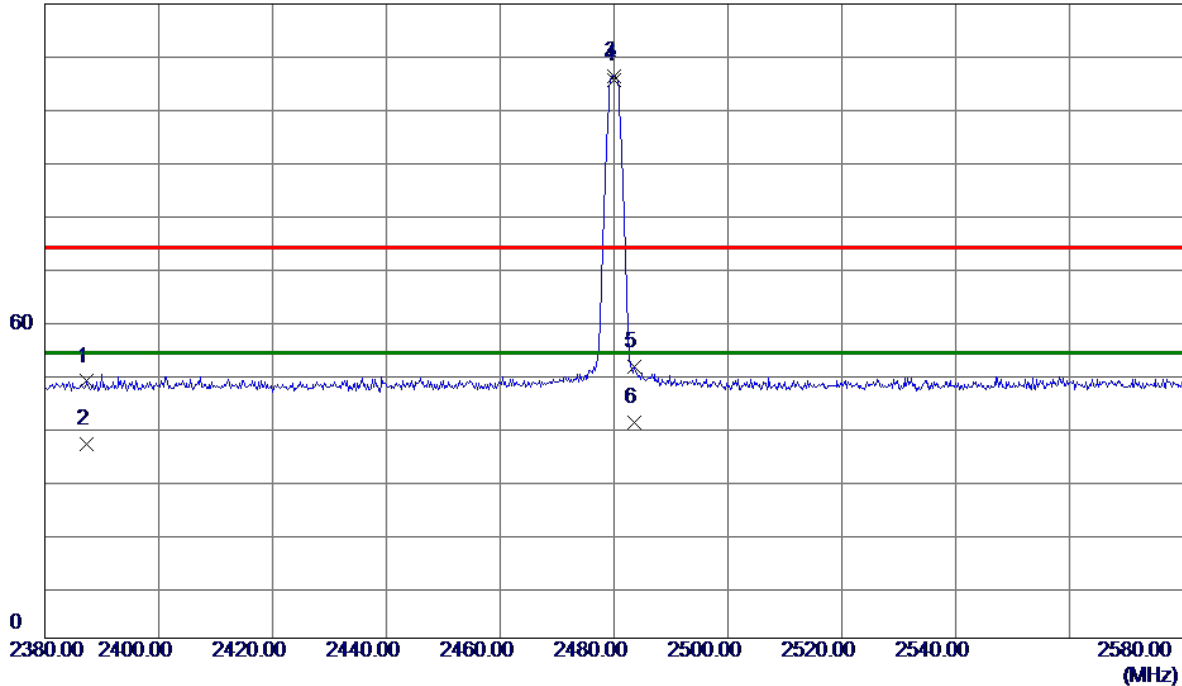
REMARKS:

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE 5.0 (1Mbps)	Test Date	2025/9/2
Test Frequency	2480MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

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	2387.4000	43.36	5.24	48.60	74.00	-25.40	Peak	
2	2387.4000	31.52	5.24	36.76	54.00	-17.24	AVG	
3	2480.0000	100.92	5.40	106.32	74.00	32.32	Peak	No Limit
4 *	2480.0000	100.30	5.40	105.70	54.00	51.70	AVG	No Limit
5	2483.6000	45.88	5.41	51.29	74.00	-22.71	Peak	
6	2483.6000	35.47	5.41	40.88	54.00	-13.12	AVG	

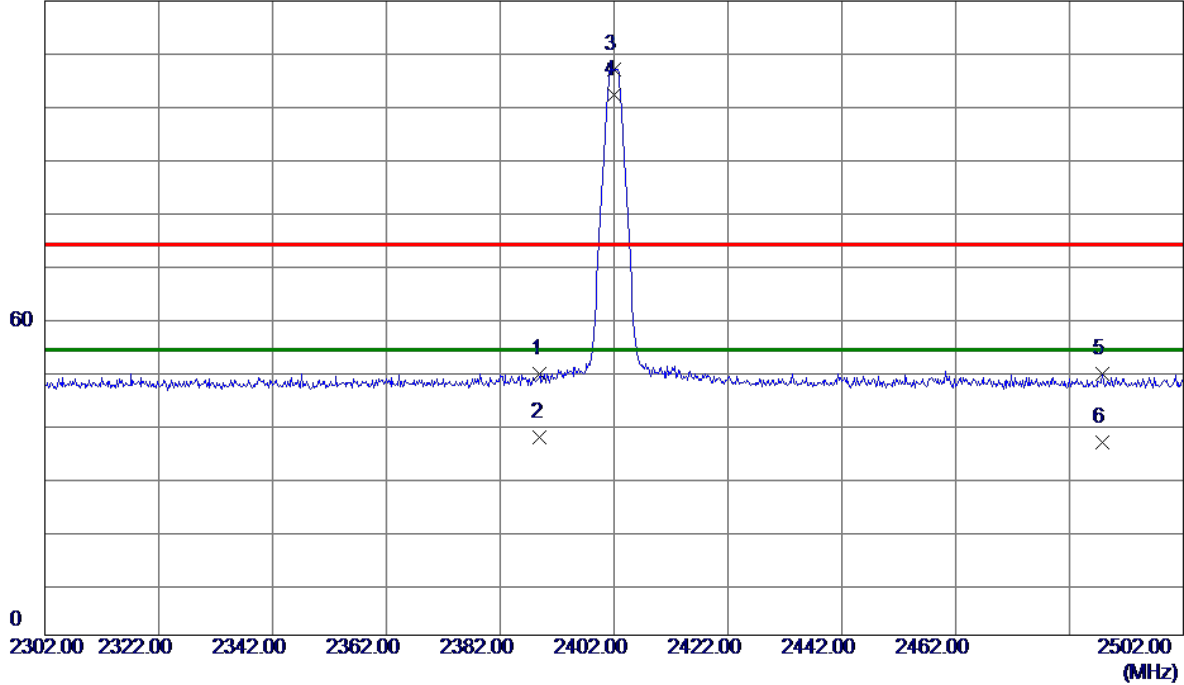
REMARKS:

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE 5.0 (2Mbps)	Test Date	2025/9/2
Test Frequency	2402MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

120 dBuV/m



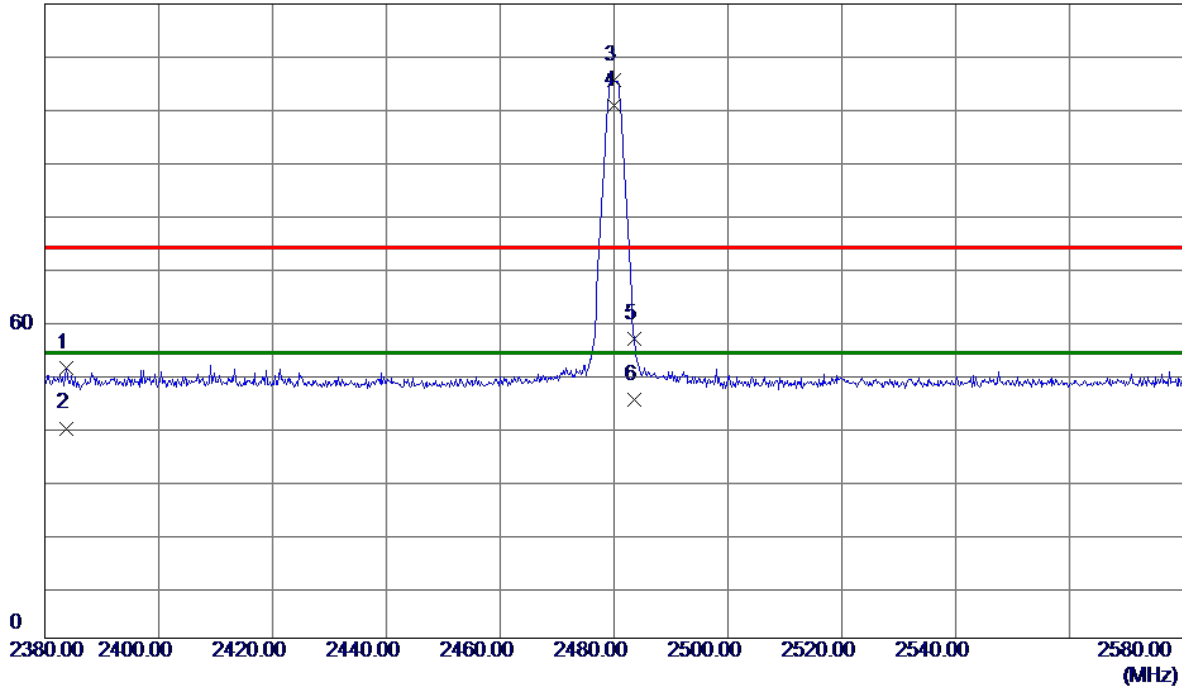
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2389.0000	44.14	5.24	49.38	74.00	-24.62	Peak	
2	2389.0000	32.13	5.24	37.37	54.00	-16.63	AVG	
3	2402.0000	101.88	5.26	107.14	74.00	33.14	Peak	No Limit
4 *	2402.0000	97.06	5.26	102.32	54.00	48.32	AVG	No Limit
5	2487.8000	43.97	5.42	49.39	74.00	-24.61	Peak	
6	2487.8000	31.01	5.42	36.43	54.00	-17.57	AVG	

REMARKS:

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

Test Mode	BLE 5.0 (2Mbps)	Test Date	2025/9/2
Test Frequency	2480MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

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	2383.8000	45.80	5.23	51.03	74.00	-22.97	Peak	
2	2383.8000	34.49	5.23	39.72	54.00	-14.28	AVG	
3	2480.0000	100.13	5.40	105.53	74.00	31.53	Peak	No Limit
4 *	2480.0000	95.35	5.40	100.75	54.00	46.75	AVG	No Limit
5	2483.5000	51.17	5.41	56.58	74.00	-17.42	Peak	
6	2483.5000	39.77	5.41	45.18	54.00	-8.82	AVG	

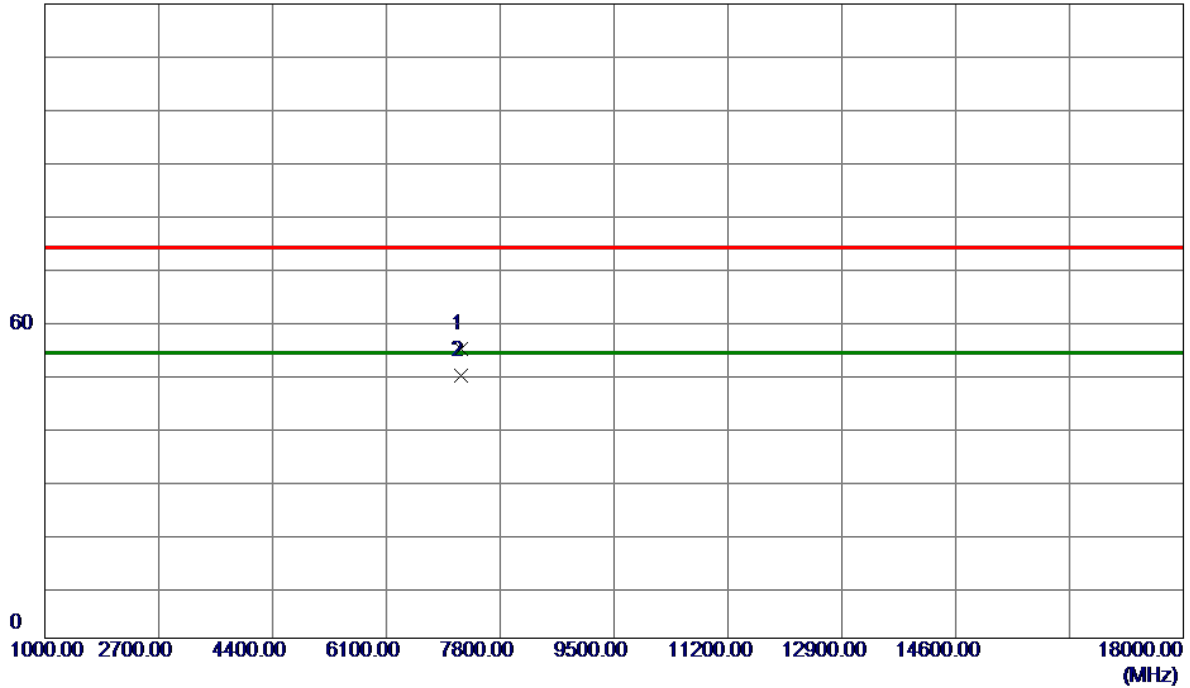
REMARKS:

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode	BLE 5.0 (1Mbps)	Test Date	2025/9/2
Test Frequency	2402MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

120 dBuV/m



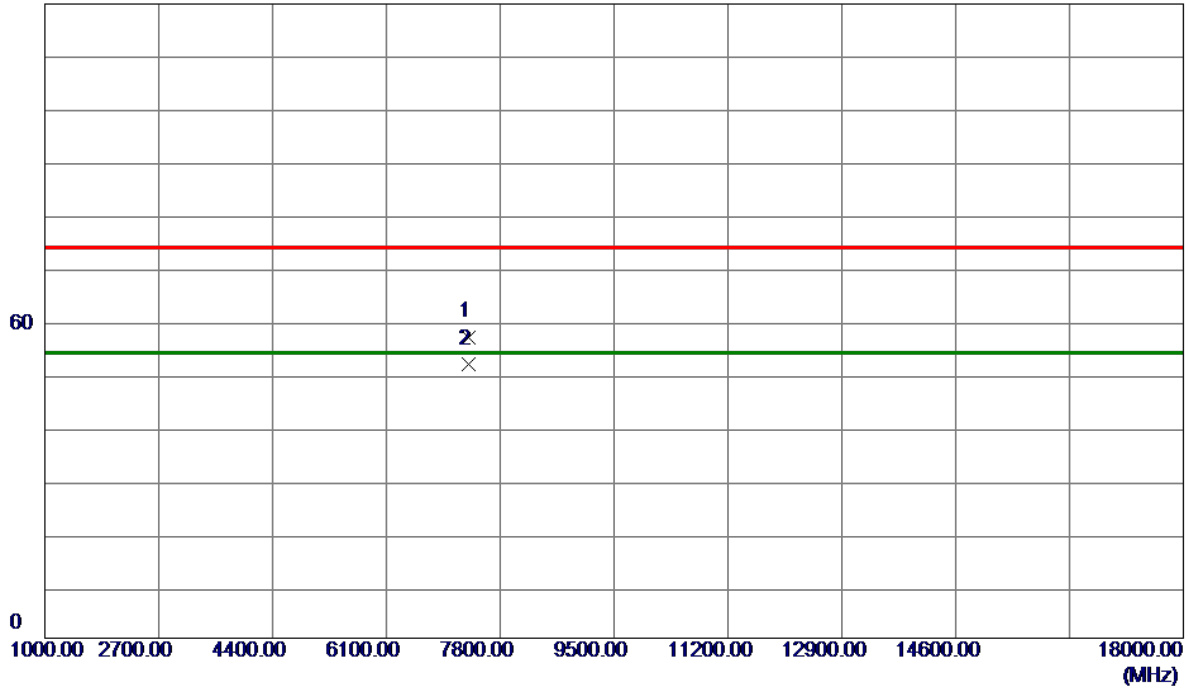
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	7206.0000	48.41	6.39	54.80	74.00	-19.20	Peak	
2 *	7206.0000	43.24	6.39	49.63	54.00	-4.37	AVG	

REMARKS:

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

Test Mode	BLE 5.0 (1Mbps)	Test Date	2025/9/2
Test Frequency	2440MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

120 dBuV/m



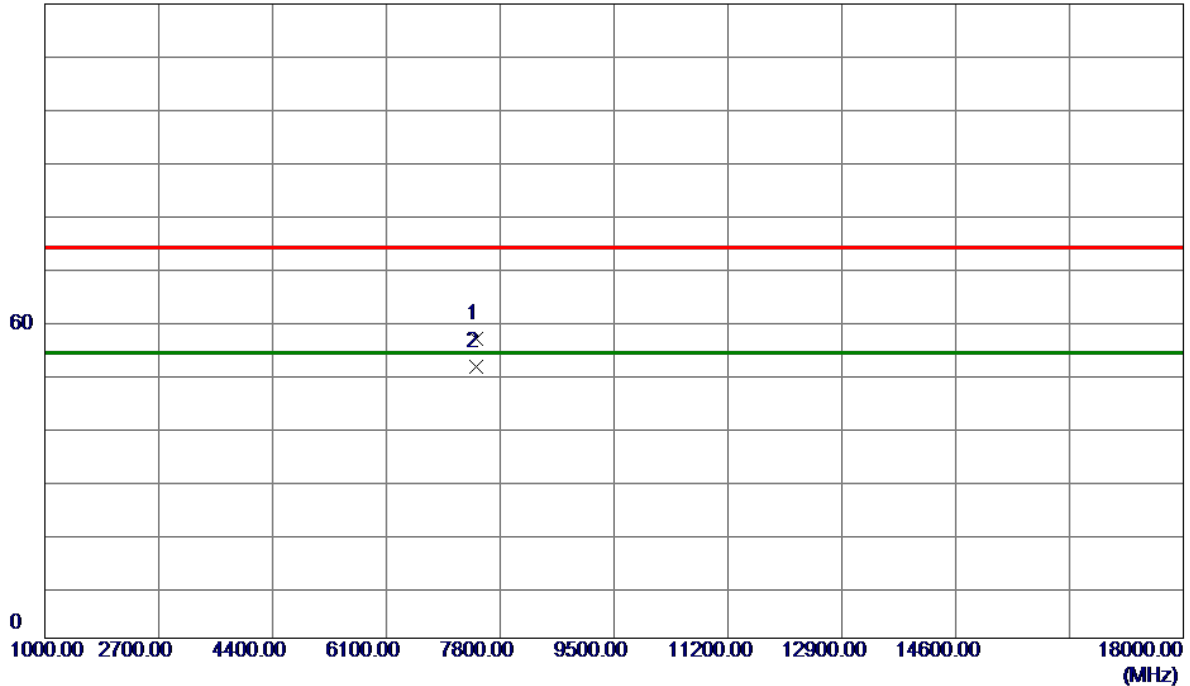
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	7320.0000	50.59	6.41	57.00	74.00	-17.00	Peak	
2 *	7320.0000	45.51	6.41	51.92	54.00	-2.08	AVG	

REMARKS:

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

Test Mode	BLE 5.0 (1Mbps)	Test Date	2025/9/3
Test Frequency	2480MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

120 dBuV/m



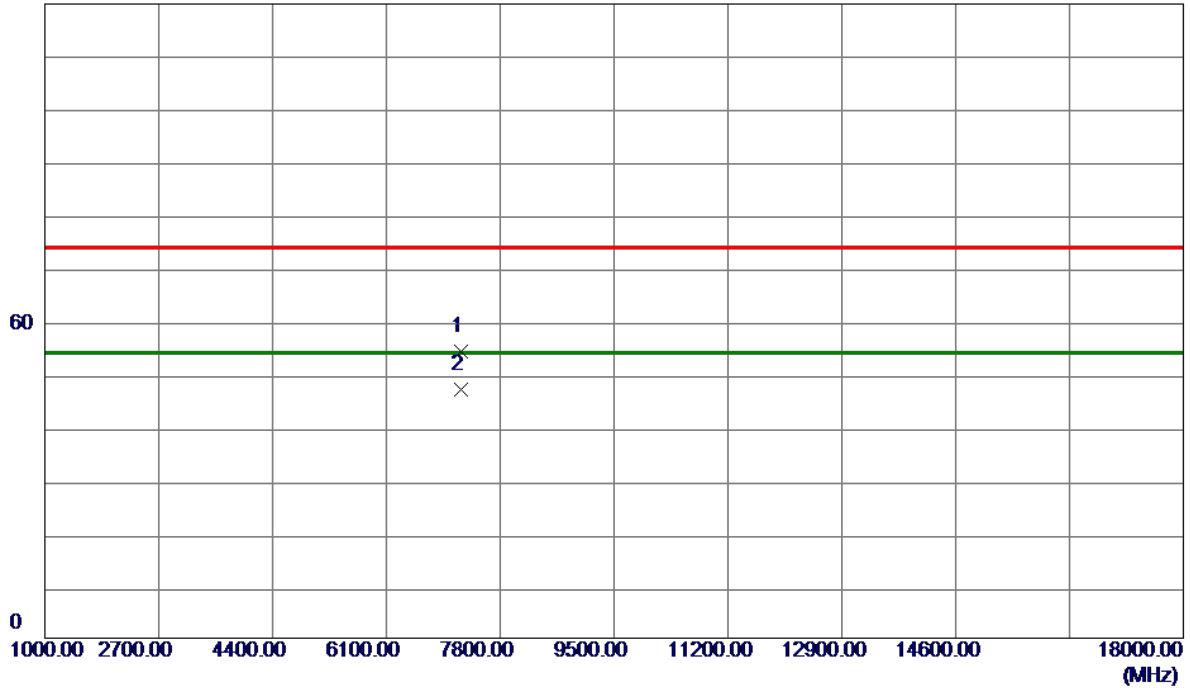
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	7440.0000	50.23	6.42	56.65	74.00	-17.35	Peak	
2 *	7440.0000	45.04	6.42	51.46	54.00	-2.54	AVG	

REMARKS:

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

Test Mode	BLE 5.0 (2Mbps)	Test Date	2025/9/3
Test Frequency	2402MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

120 dBuV/m



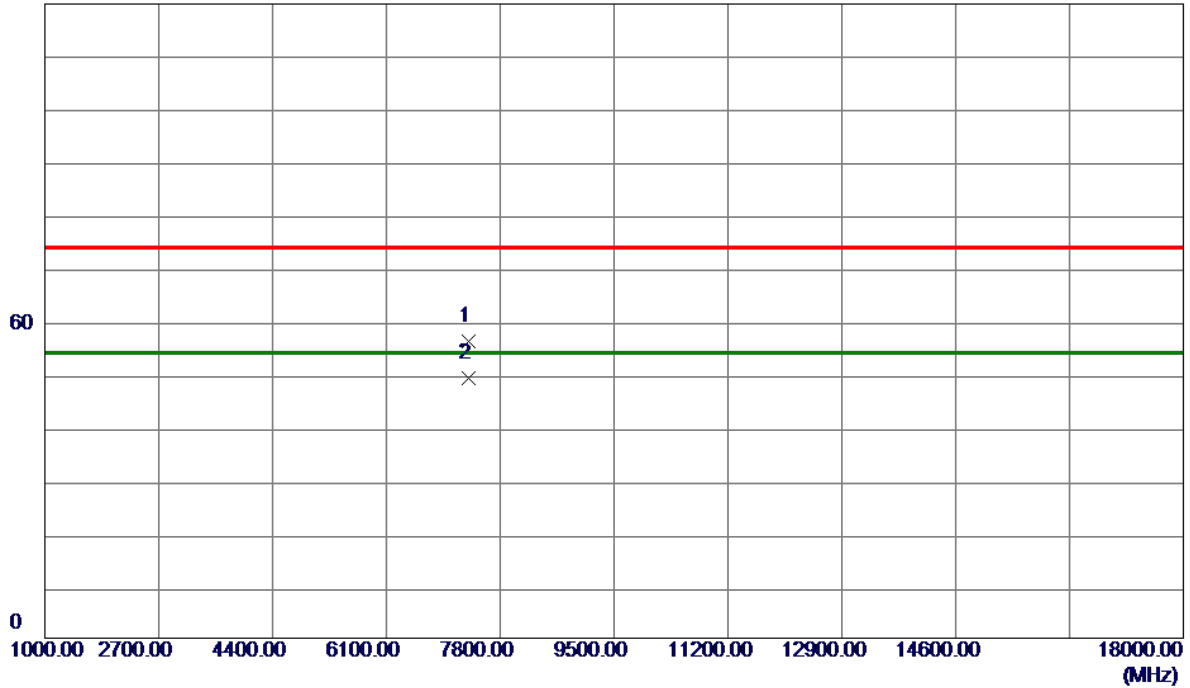
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	7206.0000	47.76	6.39	54.15	74.00	-19.85	Peak	
2 *	7206.0000	40.57	6.39	46.96	54.00	-7.04	AVG	

REMARKS:

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

Test Mode	BLE 5.0 (2Mbps)	Test Date	2025/9/3
Test Frequency	2440MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

120 dBuV/m



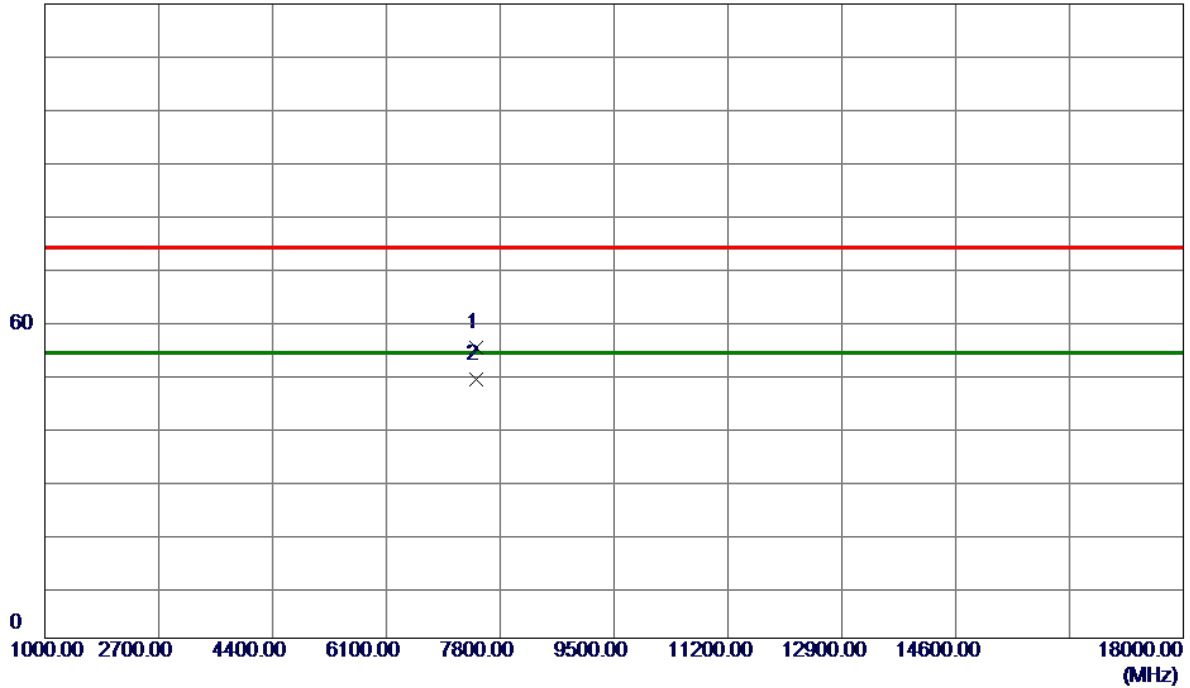
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	7320.0000	49.85	6.41	56.26	74.00	-17.74	Peak	
2 *	7320.0000	42.71	6.41	49.12	54.00	-4.88	AVG	

REMARKS:

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

Test Mode	BLE 5.0 (2Mbps)	Test Date	2025/9/3
Test Frequency	2480MHz	Polarization	Vertical
Temp	25°C	Hum.	65%

120 dBuV/m

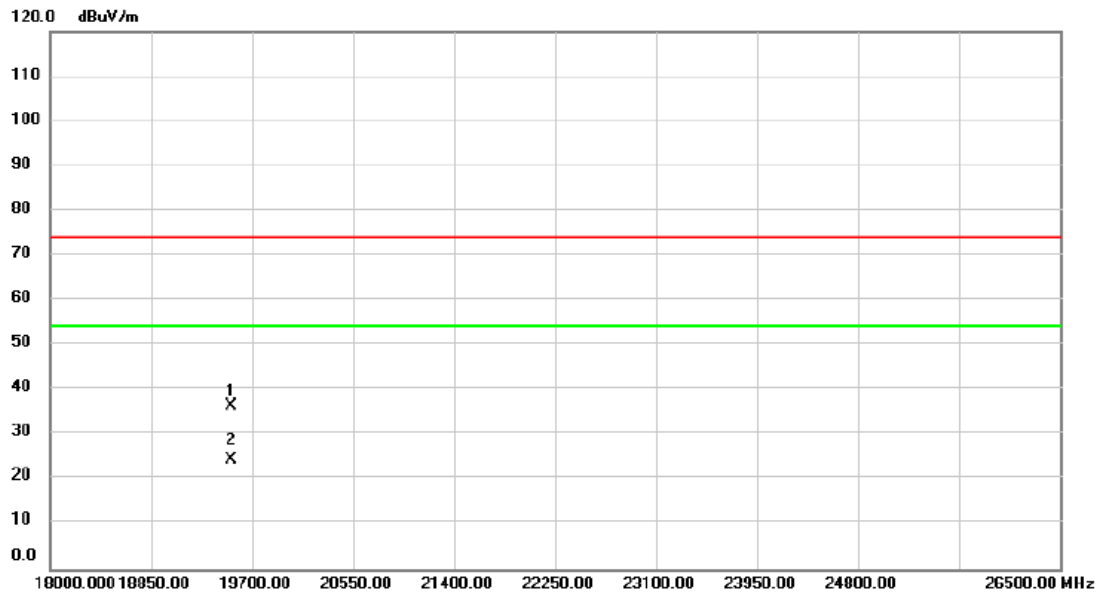


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	7440.0000	48.58	6.42	55.00	74.00	-19.00	Peak	
2 *	7440.0000	42.49	6.42	48.91	54.00	-5.09	AVG	

REMARKS:

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

Test Mode	BLE 5.0 (1Mbps)	Test Date	2025/9/3
Test Frequency	2440MHz	Polarization	Vertical
Temp	25°C	Hum.	65%



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		19520.00	46.29	-9.71	36.58	74.00	-37.42	peak	
2	*	19520.00	34.12	-9.71	24.41	54.00	-29.59	AVG	

REMARKS:

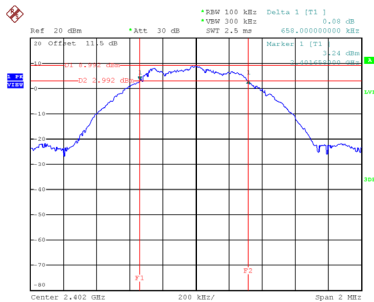
- (1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

APPENDIX D BANDWIDTH

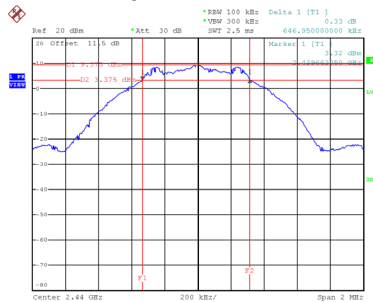
Test Mode: 1Mbps

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	0.658	1.036	0.5	Pass
19	2440	0.647	1.044	0.5	Pass
39	2480	0.646	1.040	0.5	Pass

CH00

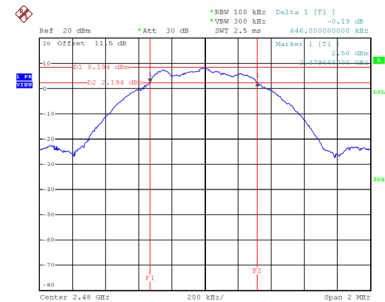


Date: 1.SEP.2025 17:37:20

CH19
6 dB Bandwidth


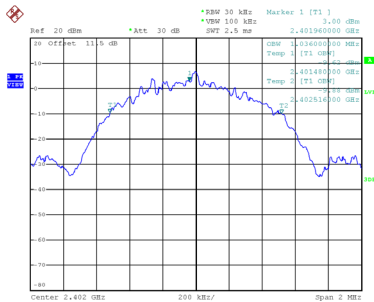
Date: 1.SEP.2025 17:39:02

CH39

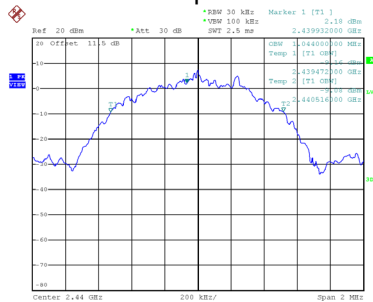


Date: 1.SEP.2025 17:41:14

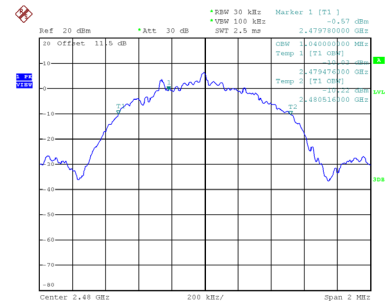
99 % Occupied Bandwidth



Date: 1.SEP.2025 17:36:49



Date: 1.SEP.2025 17:39:09

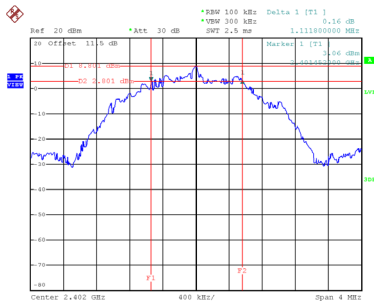


Date: 1.SEP.2025 17:41:22

Test Mode: 2Mbps

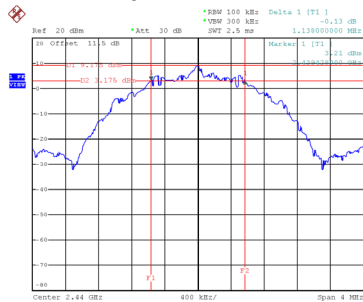
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	1.112	2.056	0.5	Pass
19	2440	1.138	2.072	0.5	Pass
39	2480	0.974	2.056	0.5	Pass

CH00



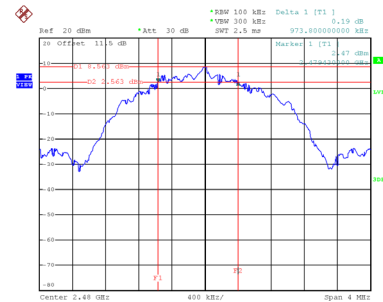
Date: 1.SEP.2025 17:44:12

CH19
6 dB Bandwidth



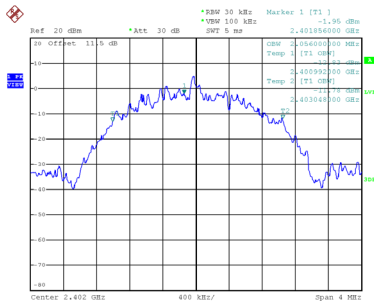
Date: 1.SEP.2025 17:45:53

CH39

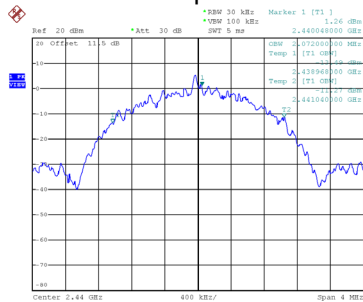


Date: 1.SEP.2025 17:47:44

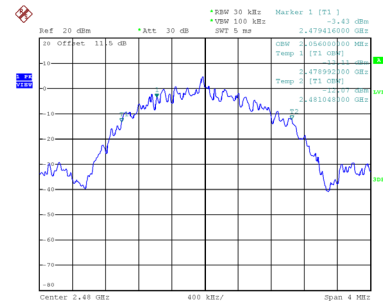
99 % Occupied Bandwidth



Date: 1.SEP.2025 17:43:38



Date: 1.SEP.2025 17:46:01



Date: 1.SEP.2025 17:47:52

APPENDIX E OUTPUT POWER

Test Mode :	1Mbps	Tested Date	2025/9/1
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Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	9.15	0.0082	30.00	1.0000	Pass
2440	9.52	0.0090	30.00	1.0000	Pass
2480	8.89	0.0077	30.00	1.0000	Pass

Note: Output power = Measure result + Cable loss

Test Mode :	2Mbps	Tested Date	2025/9/1
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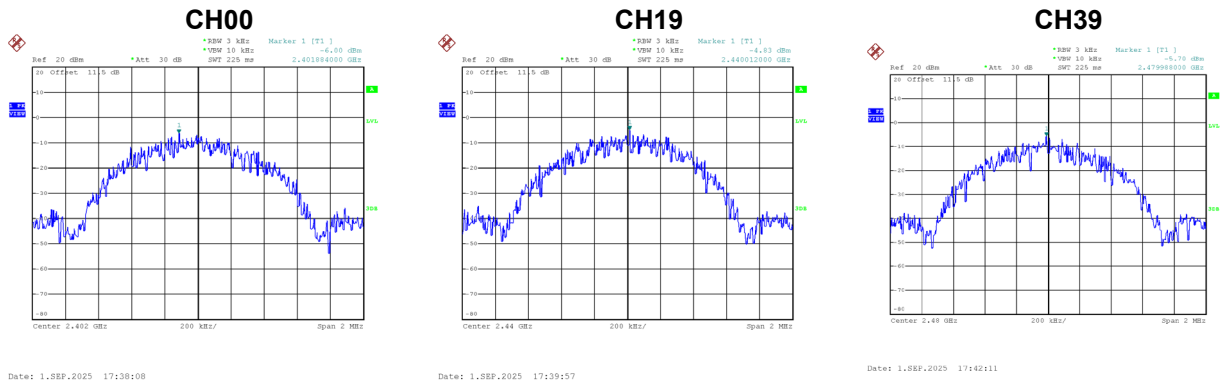
Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	8.82	0.0076	30.00	1.0000	Pass
2440	9.22	0.0084	30.00	1.0000	Pass
2480	9.03	0.0080	30.00	1.0000	Pass

Note: Output power = Measure result + Cable loss

APPENDIX F POWER SPECTRAL DENSITY TEST

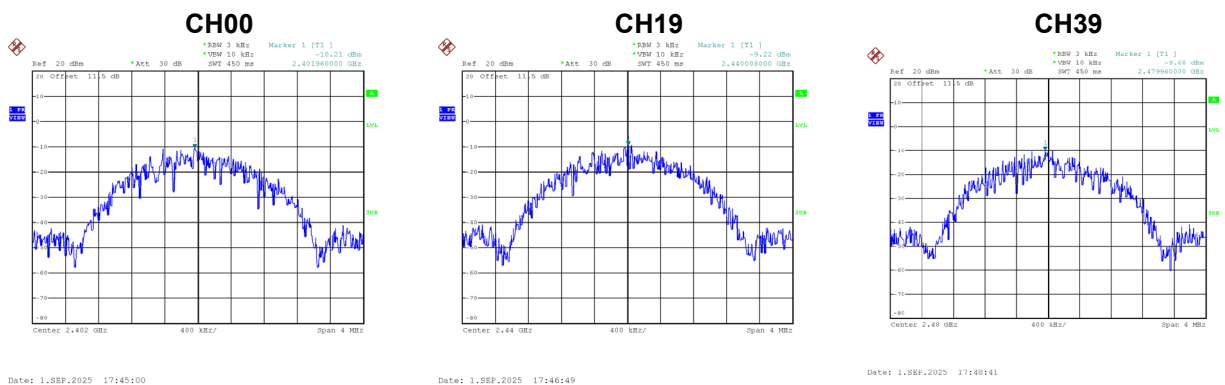
Test Mode :	1Mbps
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Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-6.00	8.00	Pass
19	2440	-4.83	8.00	Pass
39	2480	-5.70	8.00	Pass



Test Mode :	2Mbps
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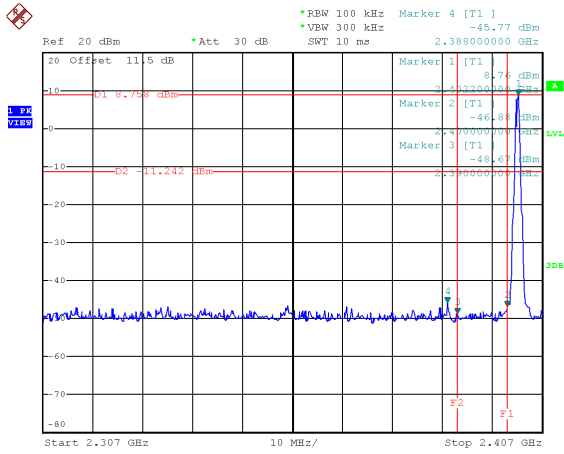
Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-10.21	8.00	Pass
19	2440	-9.22	8.00	Pass
39	2480	-9.68	8.00	Pass



APPENDIX G ANTENNA CONDUCTED SPURIOUS EMISSION

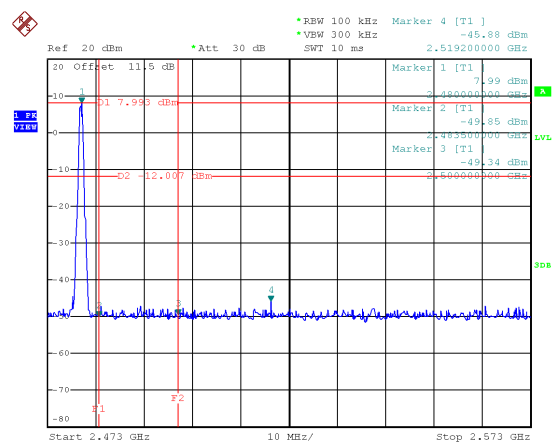
Test Mode : 1Mbps

Bandedge CH00 (Lower)



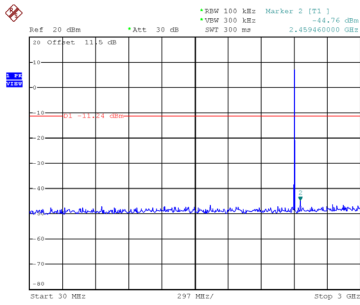
Date: 1.SEP.2025 17:37:28

Bandedge CH39 (Upper)

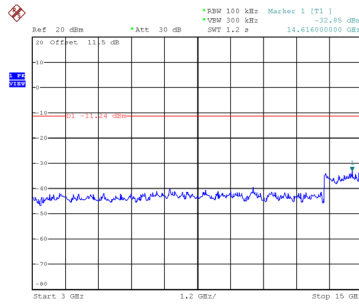


Date: 1.SEP.2025 17:41:31

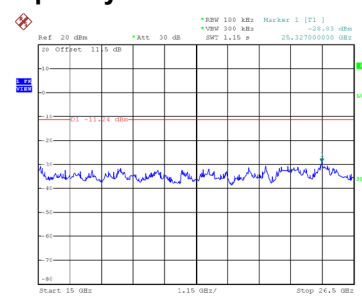
CH00 – 10th Harmonic of the fundamental frequency



Date: 1.SEP.2025 17:37:43

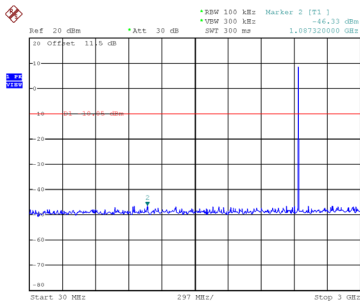


Date: 1.SEP.2025 17:37:52

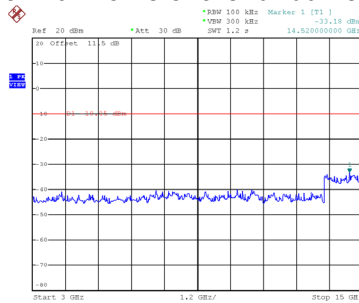


Date: 1.SEP.2025 17:38:01

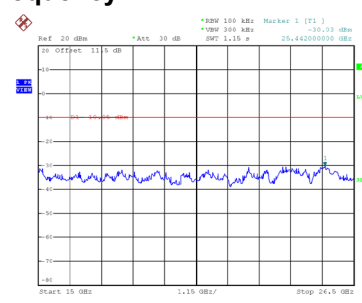
CH19 – 10th Harmonic of the fundamental frequency



Date: 1.SEP.2025 17:39:32

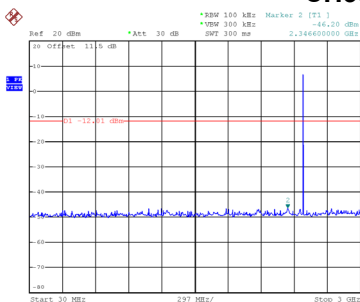


Date: 1.SEP.2025 17:39:41

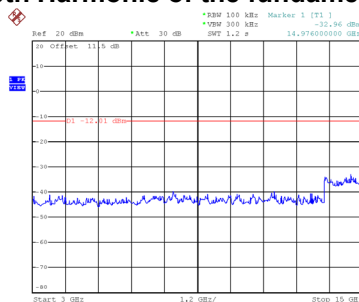


Date: 1.SEP.2025 17:39:50

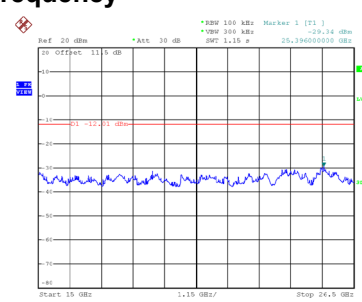
CH39 – 10th Harmonic of the fundamental frequency



Date: 1.SEP.2025 17:41:46



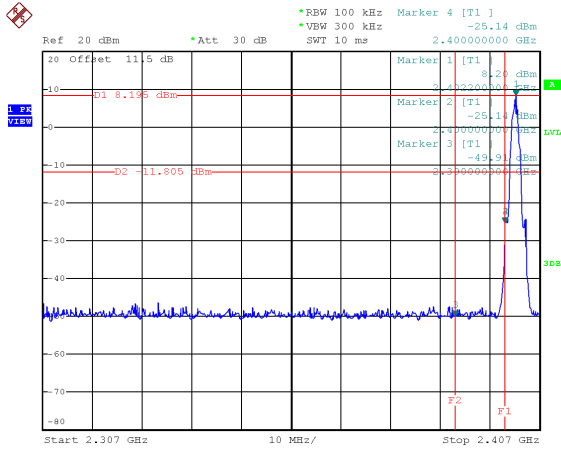
Date: 1.SEP.2025 17:41:55



Date: 1.SEP.2025 17:42:03

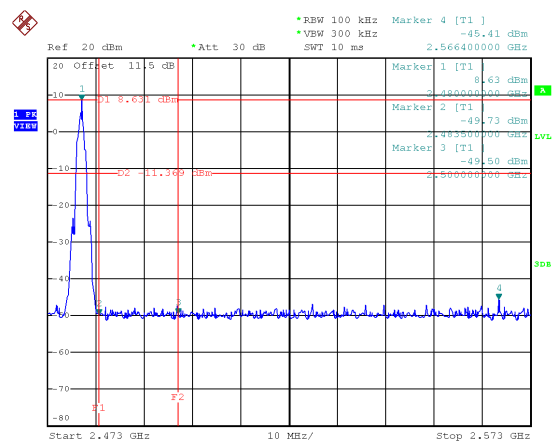
Test Mode : 2Mbps

Bandedge CH00 (Lower)



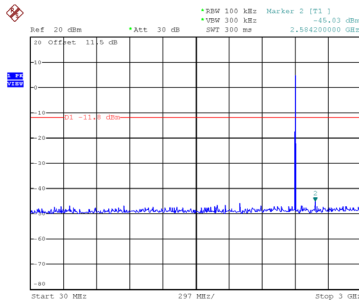
Date: 1.SEP.2025 17:44:20

Bandedge CH39 (Upper)

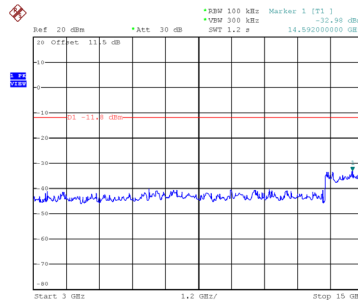


Date: 1.SEP.2025 17:48:01

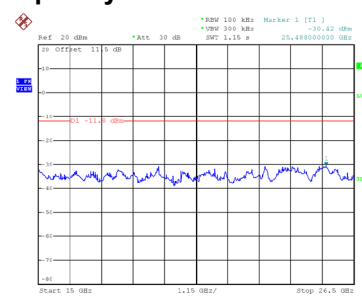
CH00 – 10th Harmonic of the fundamental frequency



Date: 1.SEP.2025 17:44:35

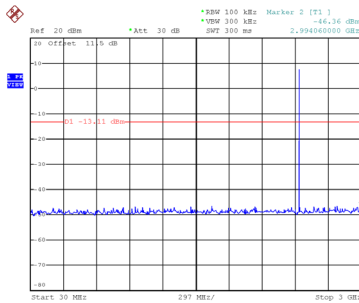


Date: 1.SEP.2025 17:44:44

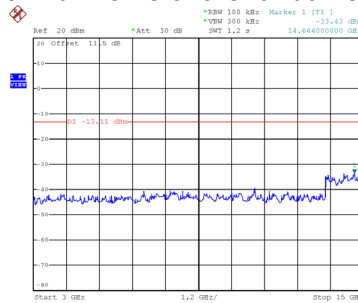


Date: 1.SEP.2025 17:44:53

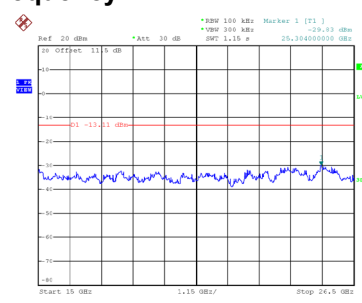
CH19 – 10th Harmonic of the fundamental frequency



Date: 1.SEP.2025 17:44:24

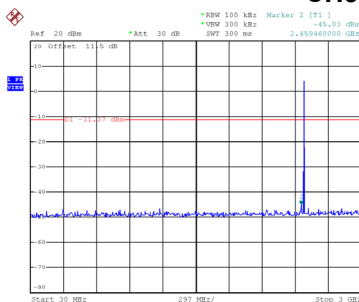


Date: 1.SEP.2025 17:46:33

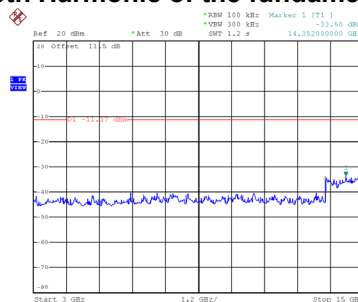


Date: 1.SEP.2025 17:46:42

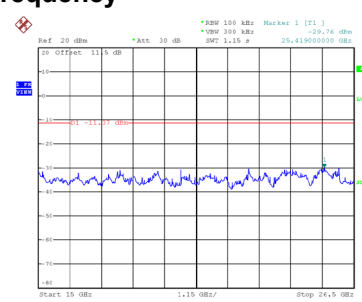
CH39 – 10th Harmonic of the fundamental frequency



Date: 1.SEP.2025 17:48:16



Date: 1.SEP.2025 17:48:25



Date: 1.SEP.2025 17:48:33

End of Test Report