

# FCC Radio Test Report

## FCC ID: 2ADQS-107001535

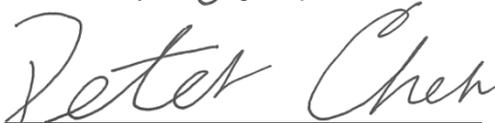
**Report No.** : BTL-FCCP-2-2311T124  
**Equipment** : Portable Bluetooth Speaker  
**Model Name** : Rockster Cross  
**Brand Name** : **Teufel**  
**Applicant** : Lautsprecher Teufel GmbH  
**Address** : Budapester Strasse 44,10787 Berlin, Germany  
**Radio Function** : Bluetooth Low Energy 5.2  
**FCC Rule Part(s)** : FCC CFR Title 47, Part 15, Subpart C (15.247)  
**Measurement Procedure(s)** : ANSI C63.10-2013  
**Date of Receipt** : 2023/11/27  
**Date of Test** : 2023/12/14 ~ 2023/12/18  
**Issued Date** : 2024/1/31

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** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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**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.

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### REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-2-2311T124	R00	Original Report.	2024/1/31	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 APPENDIX D	Pass	-----
15.247(a)(2)	Bandwidth	APPENDIX E	Pass	-----
15.247(b)(3)	Output Power	APPENDIX F	Pass	-----
15.247(e)	Power Spectral Density	APPENDIX G	Pass	-----
15.247(d)	Antenna conducted Spurious Emission	APPENDIX H	Pass	-----
15.203	Antenna Requirement	-----	Pass	-----

**NOTE:**

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) 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. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan  
(FCC DN: TW0659)

C05       CB08       CB11       SR10       SR11

No. 72, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan  
(FCC DN: TW0659)

C06       CB21       CB22

### 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  $U_{\text{cispr}}$  requirement.

#### A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U (dB)
C05	CISPR	150 kHz ~ 30MHz	3.44

#### B. Radiated emissions test:

Test Site	Measurement Frequency Range	U,(dB)
CB21	0.03 GHz ~ 0.2 GHz	4.17
	0.2 GHz ~ 1 GHz	4.72
	1 GHz ~ 6 GHz	5.21
	6 GHz ~ 18 GHz	5.51
	18 GHz ~ 26 GHz	3.69
	26 GHz ~ 40 GHz	4.23

#### C. Conducted test:

Test Item	U,(dB)
Occupied Bandwidth	0.5334
Output Power	0.3669
Power Spectral Density	0.6591
Conducted Spurious emissions	0.5416
Conducted Band edges	0.5348

#### NOTE:

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

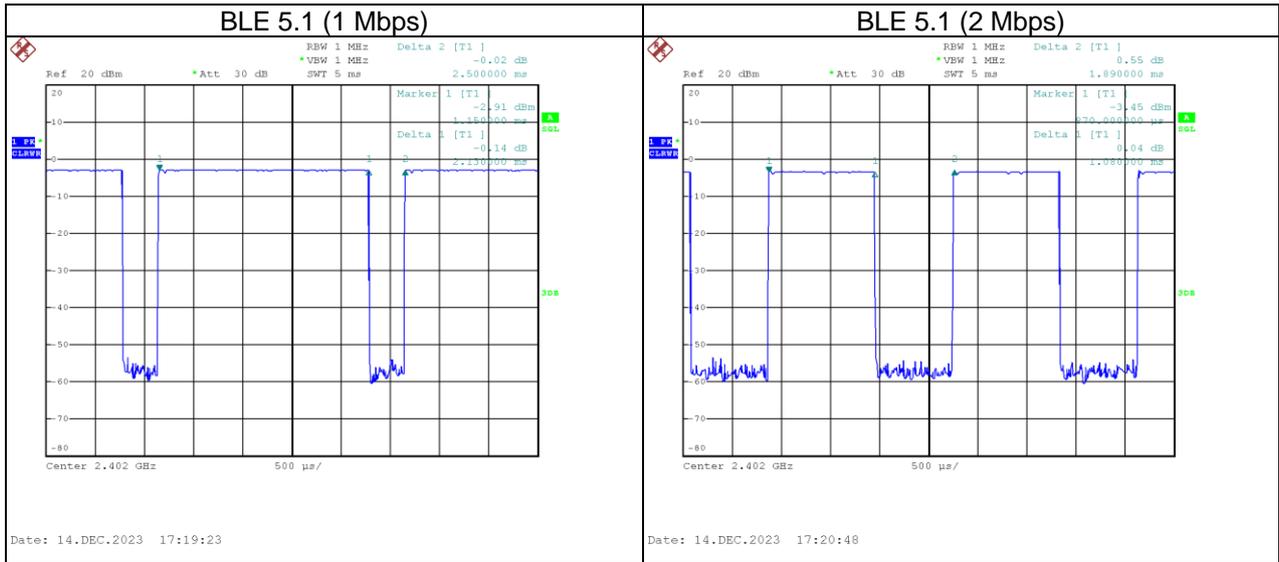
### 1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Environment Condition	Test Voltage	Tested by
AC Power Line Conducted Emissions	18 °C, 44 %	AC 120V	Jerry Chuang
Radiated emissions below 1 GHz	Refer to data	AC 120V	Mark Wang
Radiated emissions above 1 GHz	Refer to data	AC 120V	Mark Wang
Bandwidth	22 °C, 70 %	AC 120V	Jerry Chuang
Output Power	21.1 °C, 66 %	AC 120V	Jerry Chuang
Power Spectral Density	22 °C, 70 %	AC 120V	Jerry Chuang
Antenna conducted Spurious Emission	22 °C, 70 %	AC 120V	Jerry Chuang

## 1.4 DUTY CYCLE

If duty cycle is  $\geq 98\%$ , duty factor is not required.  
 If duty cycle is  $< 98\%$ , duty factor shall be considered.

Remark	Delta 1			Delta 2	On Time/Period	10 log(1/Duty Cycle)
Mode	ON (ms)	Numbers (ON)	On Time (B) (ms)	Period (ON+OFF) (ms)	Duty Cycle (%)	Duty Factor (dB)
BLE 5.1 (1 Mbps)	2.130	1	2.130	2.500	85.20%	0.70
BLE 5.1 (2 Mbps)	1.080	1	1.080	1.890	57.14%	2.43



## 2 GENERAL INFORMATION

### 2.1 DESCRIPTION OF EUT

Equipment	Portable Bluetooth Speaker
Model Name	Rockster Cross
Brand Name	<b>Teufel</b>
Model Difference	N/A
Power Source	#1 DC Voltage supplied from AC/DC adapter. #2 DC Voltage supplied from battery.
Power Rating	#1 I/P: 100-240Vac, 50/60Hz, 1.5A MAX, O/P: 20.0V --- 3.25A, 65.0W #2 DC 7.4V/5510mAh
Products Covered	1 * Battery: Pow-Tech / C0417A1 1 * Adapter: DS / DYS865-200325W 2 * Power Cable (EU Plug and US Plug)
Operation Band	2400 MHz ~ 2483.5 MHz
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Technology	GFSK
Transfer Rate	1/2 Mbps
Maximum Output Power	1 Mbps: 9.32 dBm (0.0086 W) 2 Mbps: 9.33 dBm (0.0086 W)
Test Software Version	BlueTest3
Test Model	Rockster Cross
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:

Antenna	Manufacture	Model Name	Type	Connector	Frequency Range (MHz)	Gain (dBi)
1	FIHONEST COMMUNICA CO.,LTD	Onkyo Ryoma SAS200	PCB printed antenna	N/A	2400-2500	-0.017

(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/Idle	-	-
Transmitter Radiated Emissions (below 1GHz)	2 Mbps	39	-
Transmitter Radiated Emissions (above 1GHz)	1/2 Mbps	00/39	Bandedge
	1/2 Mbps	00/19/39	Harmonic
Transmitter Radiated Emissions (above 18GHz)	2 Mbps	39	-
Bandwidth	1/2 Mbps	00/19/39	-
Output Power	1/2 Mbps	00/19/39	-
Power Spectral Density	1/2 Mbps	00/19/39	-
Antenna conducted Spurious Emission	1/2 Mbps	00/19/39	-

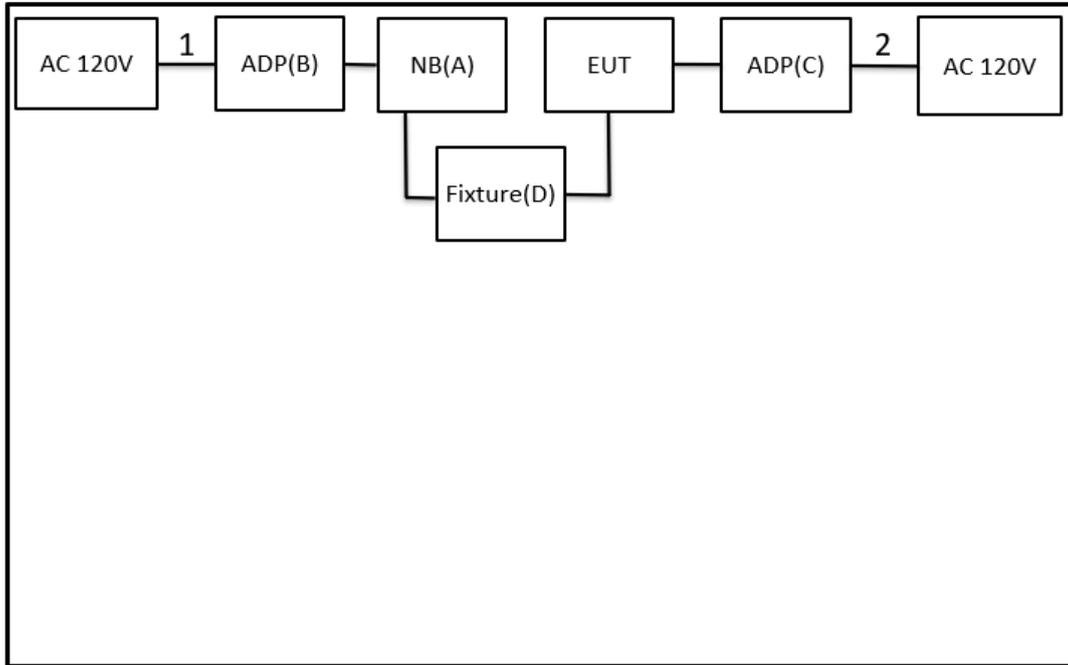
**NOTE:**

- (1) For radiated emission band edge test, both Vertical and Horizontal are evaluated, but only the worst case (Horizontal) is recorded.
- (2) All X, Y and Z axes are evaluated, but only the worst case (X axis) is recorded.

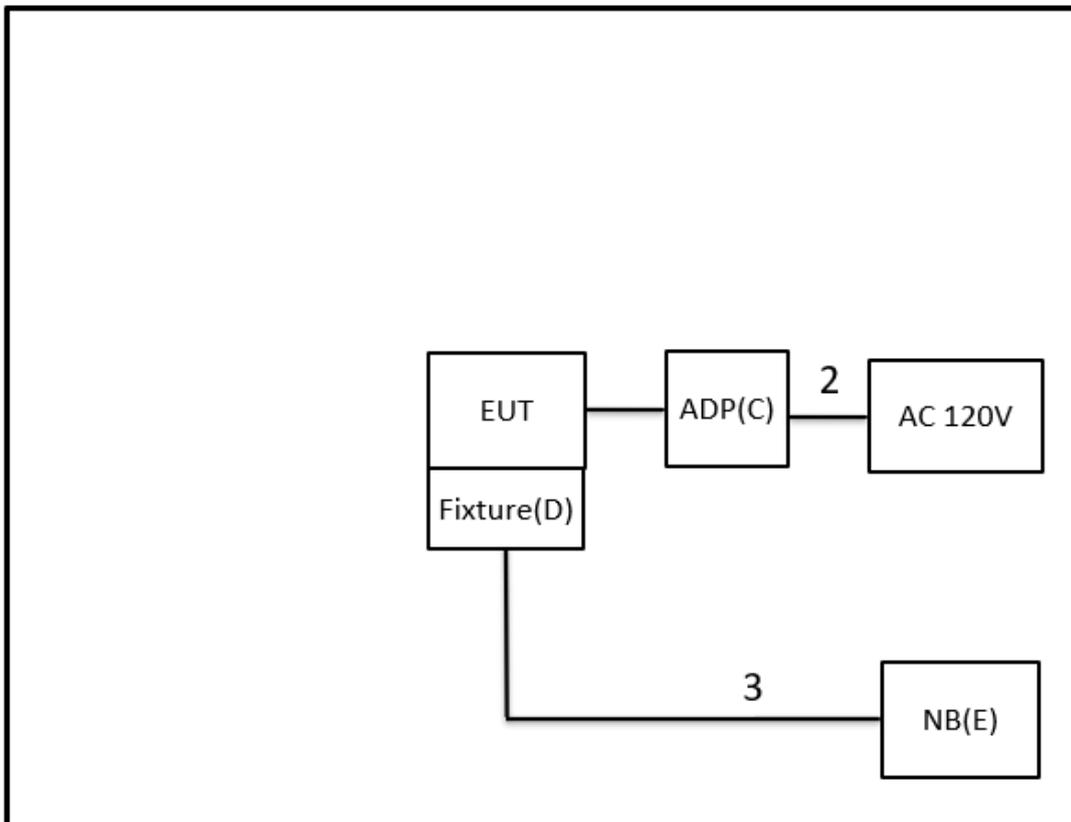
**2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED**

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

AC Power Line Conducted Emissions Test



Radiated Emissions Test



**2.4 SUPPORT UNITS**

Item	Equipment	Brand	Model No.	Series No.	Remarks
A	NB	HP	240 G5	N/A	Furnished by test lab.
B	ADP	HP	HSTNN-CA40	N/A	Furnished by test lab.
C	ADP	DS	DYS865-200325W	N/A	Supplied by test requester.
D	Fixture	N/A	N/A	N/A	Furnished by test lab.
E	NB	HP	TPN-I119	N/A	Furnished by test lab.

Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	N/A	N/A	1m	Power Cord	Furnished by test lab.
2	N/A	N/A	1m	Power Cord	Supplied by test requester.
3	N/A	N/A	1m	USB extension Cable	Furnished by test lab.

### 3 AC POWER LINE CONDUCTED EMISSIONS TEST

#### 3.1 LIMIT

Frequency (MHz)	Limit (dB $\mu$ V)	
	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 (dB $\mu$ V)		Correct Factor (dB)		Measurement Value (dB $\mu$ V)
38.22	+	3.45	=	41.67

Measurement Value (dB $\mu$ V)		Limit Value (dB $\mu$ V)		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/50 $\mu$ H 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.

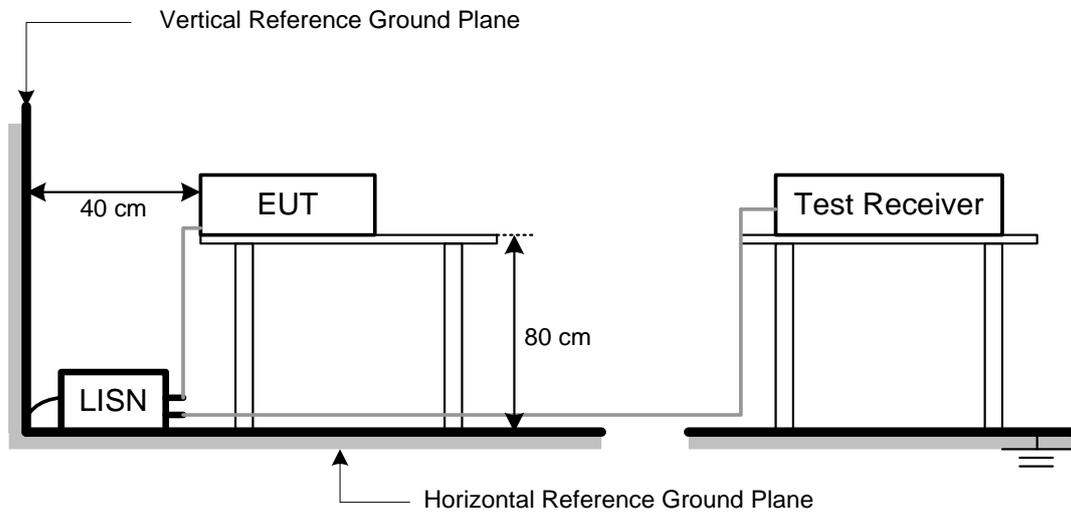
**NOTE:**

- (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 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)		Measurement Value (dBuV/m)
19.11	+	2.11	=	21.22

Measurement Value (dBuV/m)		Limit Value (dBuV/m)		Margin Level (dB)
21.22	-	54	=	-32.78

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

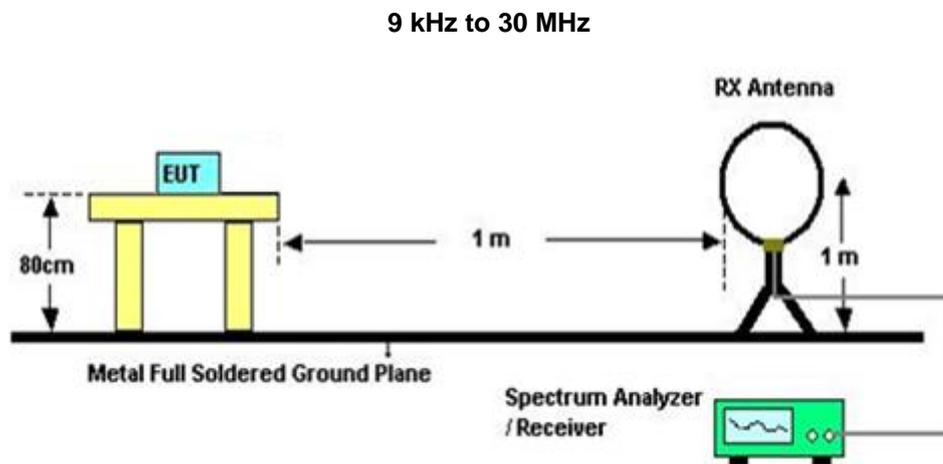
#### 4.2 TEST PROCEDURE

- 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.

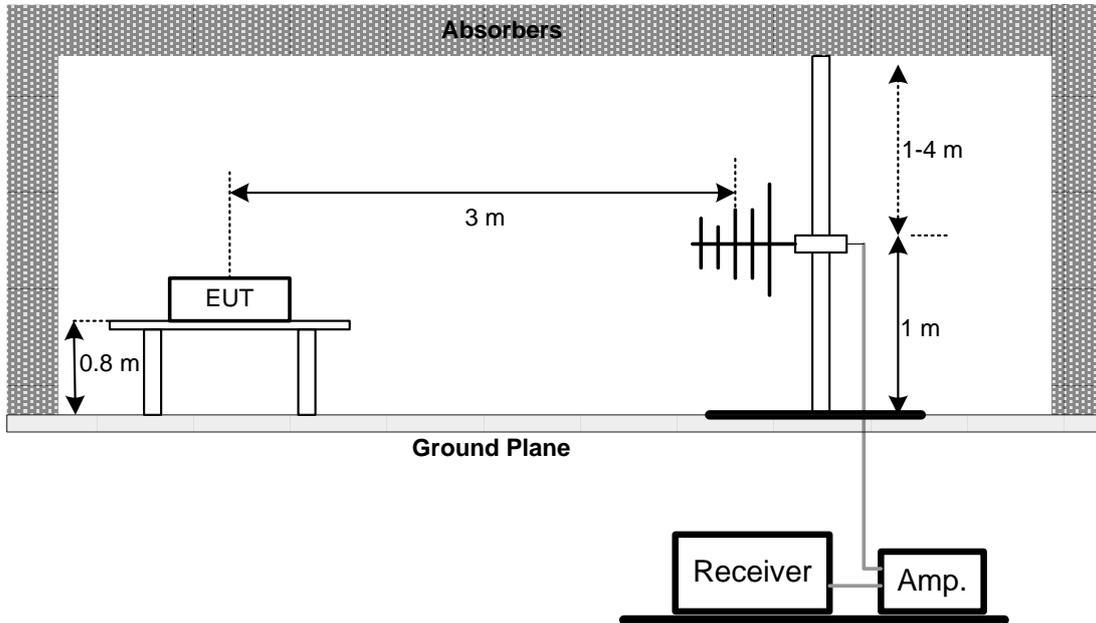
#### 4.3 DEVIATION FROM TEST STANDARD

No deviation.

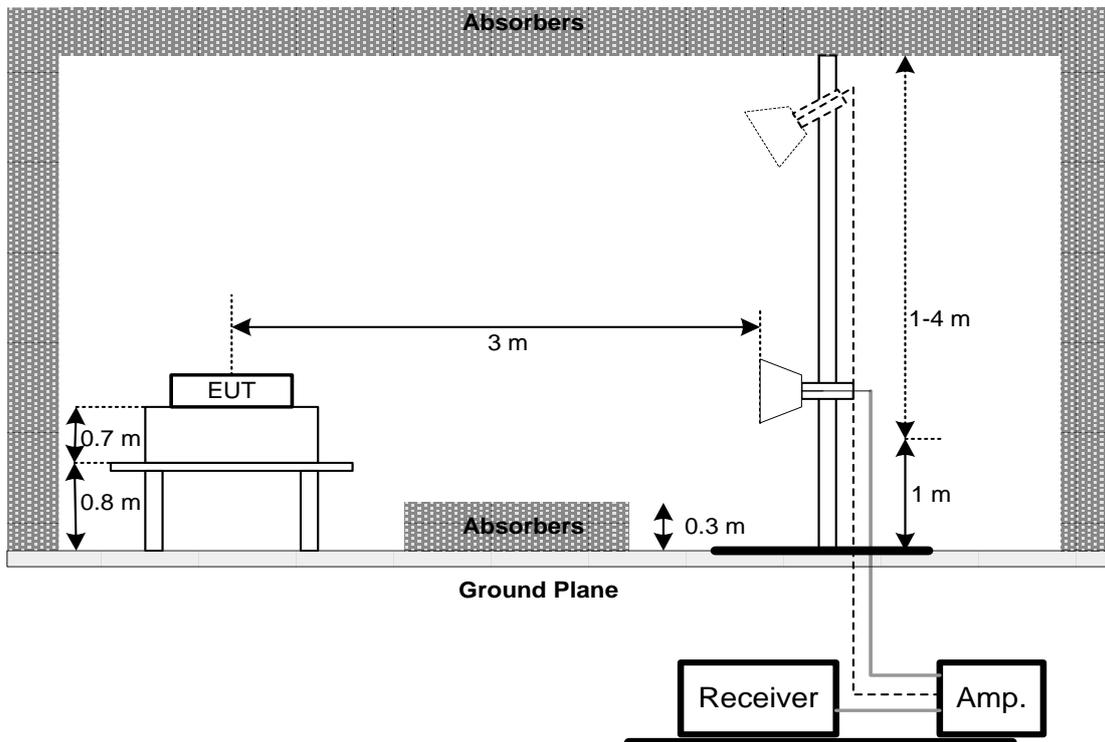
#### 4.4 TEST SETUP



### 30 MHz to 1 GHz



### Above 1 GHz



#### 4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

**4.6 TEST RESULT – BELOW 30 MHZ**

Please refer to the APPENDIX B.

**4.7 TEST RESULT – 30 MHZ TO 1 GHZ**

Please refer to the APPENDIX C.

**4.8 TEST RESULT – ABOVE 1 GHZ**

Please refer to the APPENDIX D.

**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

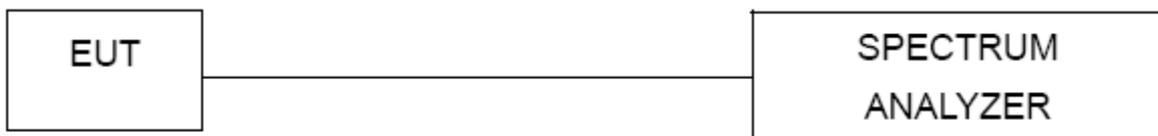
### 5.2 TEST PROCEDURE

- 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 tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 5.6 TEST RESULTS

Please refer to the APPENDIX E.

## 6 OUTPUT POWER TEST

### 6.1 LIMIT

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

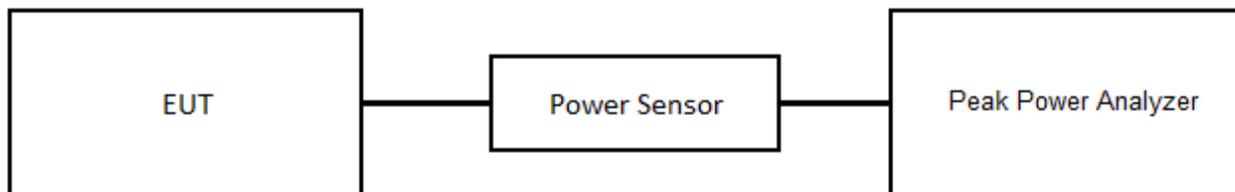
### 6.2 TEST PROCEDURE

- a. The EUT was directly connected to the Peak Power Analyzer and antenna output port as show in the block diagram below.
- b. The maximum peak conducted output power was performed in accordance with method 9 b) of FCC KDB 558074 D01 DTS 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 F.

## 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

- 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=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 tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 7.6 TEST RESULTS

Please refer to the APPENDIX G.

## 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 tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 8.6 TEST RESULTS

Please refer to the APPENDIX H.

## 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	101521	2023/9/13	2024/9/12
2	Test Cable	EMCI	EMCCFD300-BM-BMR-5000	220331	2023/3/30	2024/3/29
3	EMI Test Receiver	R&S	ESR 7	101433	2023/11/10	2024/11/9
4	Measurement Software	EZ	EZ EMC (Version 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	Preamplifier	EMCI	EMC330N	980850	2023/9/6	2024/9/5
2	Preamplifier	EMCI	EMC118A45SE	980819	2023/3/7	2024/3/6
3	Pre-Amplifier	EMCI	EMC184045SE	980907	2023/9/21	2024/9/20
4	Preamplifier	EMCI	EMC001340	980579	2023/9/6	2024/9/5
5	Test Cable	EMCI	EMC104-SM-1000	180809	2023/7/10	2024/7/9
6	Test Cable	EMCI	EMC104-SM-SM-3000	220322	2023/3/14	2024/3/13
7	Test Cable	EMCI	EMC104-SM-SM-7000	220324	2023/3/14	2024/3/13
8	EXA Signal Analyzer	keysight	N9020B	MY57120120	2023/2/24	2024/2/23
9	Loop Ant	Electro-Metrics	EMCI-LPA600	291	2023/9/12	2024/9/11
10	Horn Antenna	RFSPIN	DRH18-E	211202A18EN	2023/5/12	2024/5/11
11	Horn Ant	Schwarzbeck	BBHA 9170D	1136	2023/5/12	2024/5/11
12	Log-bicon Antenna	Schwarzbeck	VULB9168	1369	2023/5/9	2024/5/8
13	6dB Attenuator	EMCI	EMCI-N-6-06	AT-06001	2023/5/9	2024/5/8
14	Test Cable	EMCI	EMC101G-KM-KM-3000	220329	2023/3/14	2024/3/13
15	Test Cable	EMCI	EMC102-KM-KM-1000	220327	2023/3/14	2024/3/13
16	Measurement Software	EZ	EZ EMC (Version 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 40	101139	2023/3/9	2024/3/8

Output Power						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Peak Power Analyzer	Keysight	8990B	MY51000517	2023/3/15	2024/3/14
2	Power Sensor	Keysight	N1923A	MY58310005	2023/3/15	2024/3/14

Power Spectral Density						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 40	101139	2023/3/9	2024/3/8

Antenna conducted Spurious Emission						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 40	101139	2023/3/9	2024/3/8

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**

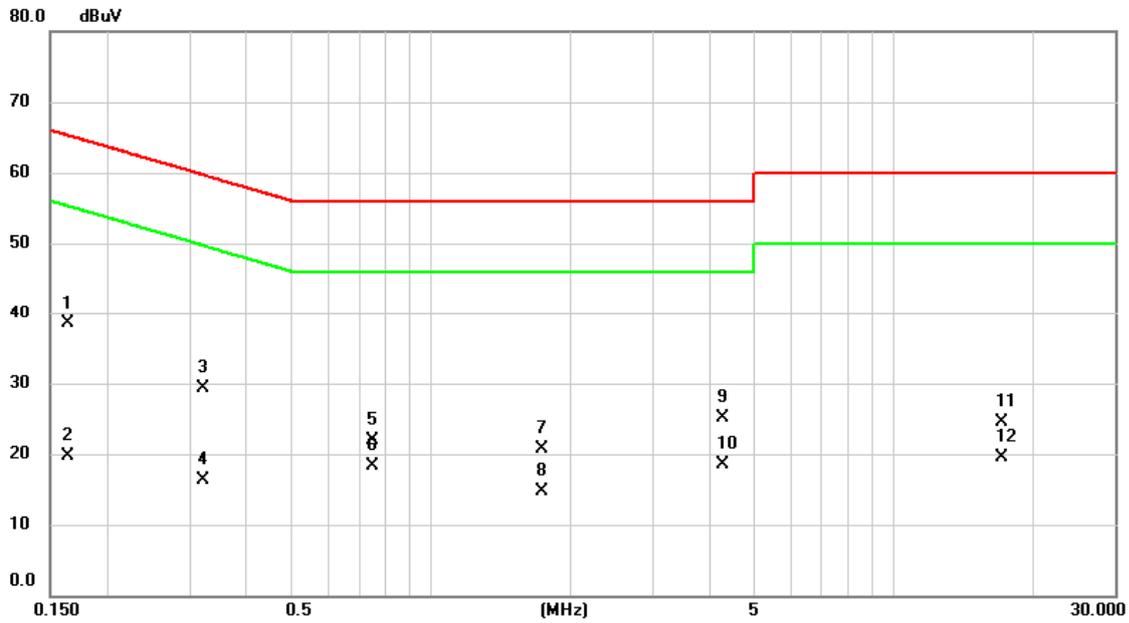
Please refer to document Appendix No.: TP-2311T124-FCCP-1 (APPENDIX-TEST PHOTOS).

## **11 EUT PHOTOS**

Please refer to document Appendix No.: EP-2311T124-1 (APPENDIX-EUT PHOTOS).

## **APPENDIX A AC POWER LINE CONDUCTED EMISSIONS**

Test Mode	Normal	Tested Date	2023/12/15
Test Frequency	-	Phase	Line



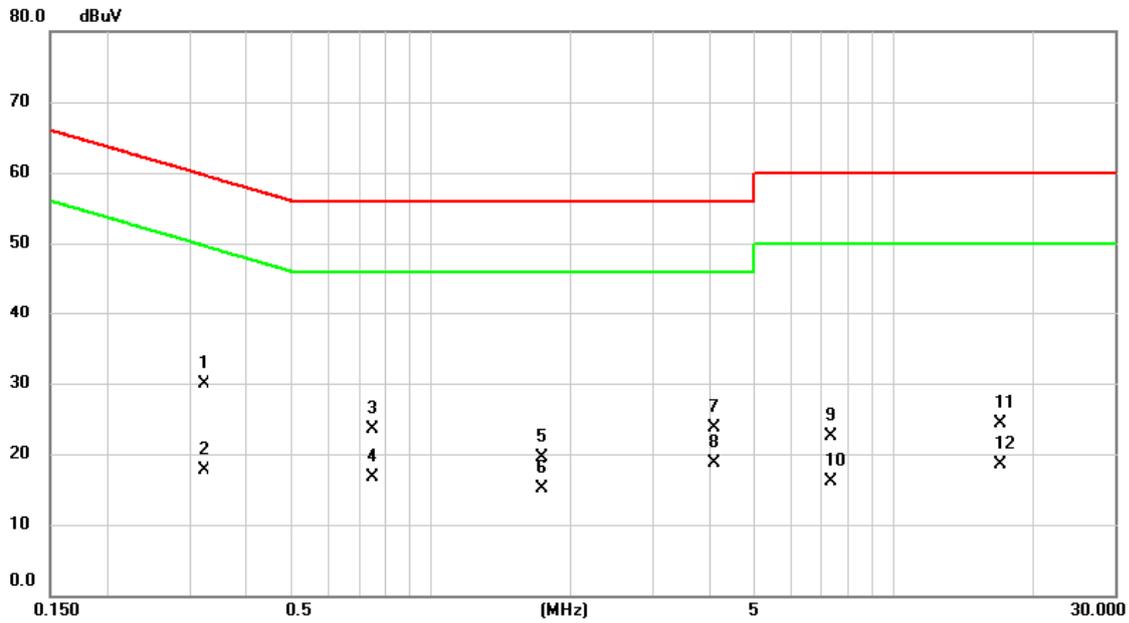
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1635	28.94	9.60	38.54	65.28	-26.74	QP	
2		0.1635	10.18	9.60	19.78	55.28	-35.50	AVG	
3		0.3210	19.63	9.58	29.21	59.68	-30.47	QP	
4		0.3210	6.68	9.58	16.26	49.68	-33.42	AVG	
5		0.7462	12.40	9.59	21.99	56.00	-34.01	QP	
6		0.7462	8.72	9.59	18.31	46.00	-27.69	AVG	
7		1.7295	10.99	9.63	20.62	56.00	-35.38	QP	
8		1.7295	4.99	9.63	14.62	46.00	-31.38	AVG	
9		4.2585	15.50	9.64	25.14	56.00	-30.86	QP	
10		4.2585	8.85	9.64	18.49	46.00	-27.51	AVG	
11		17.0812	14.75	9.71	24.46	60.00	-35.54	QP	
12		17.0812	9.75	9.71	19.46	50.00	-30.54	AVG	

**REMARKS:**

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

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

Test Mode	Normal	Tested Date	2023/12/15
Test Frequency	-	Phase	Neutral

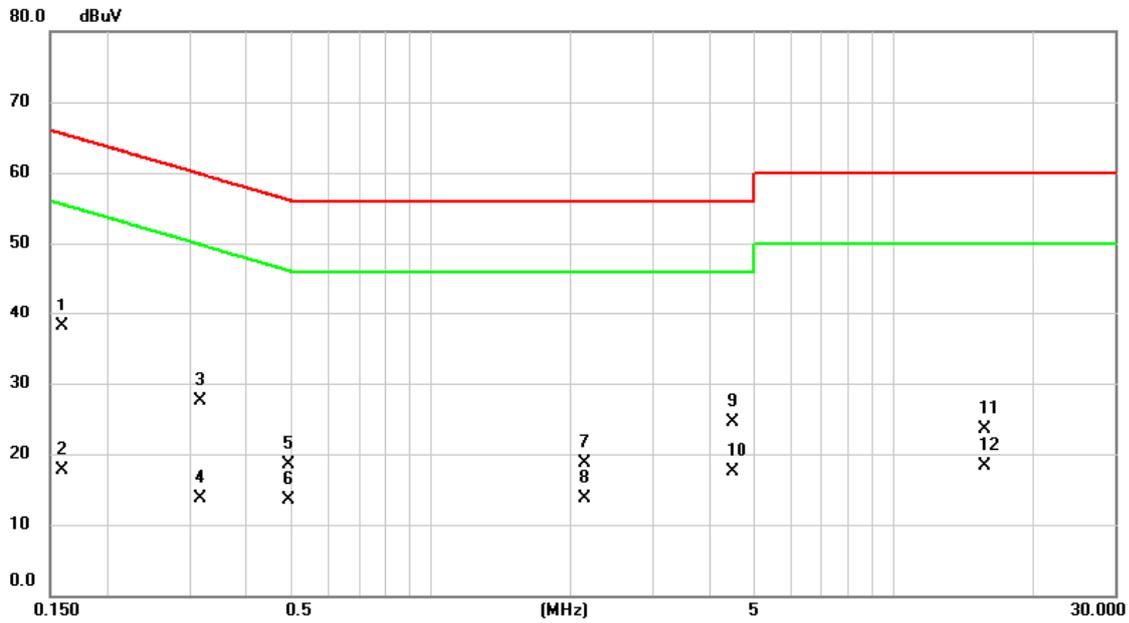


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.3232	20.32	9.57	29.89	59.62	-29.73	QP	
2		0.3232	8.14	9.57	17.71	49.62	-31.91	AVG	
3		0.7462	13.96	9.58	23.54	56.00	-32.46	QP	
4		0.7462	7.06	9.58	16.64	46.00	-29.36	AVG	
5		1.7340	9.85	9.62	19.47	56.00	-36.53	QP	
6		1.7340	5.48	9.62	15.10	46.00	-30.90	AVG	
7		4.0896	14.06	9.63	23.69	56.00	-32.31	QP	
8	*	4.0896	9.05	9.63	18.68	46.00	-27.32	AVG	
9		7.3387	12.90	9.69	22.59	60.00	-37.41	QP	
10		7.3387	6.49	9.69	16.18	50.00	-33.82	AVG	
11		17.0002	14.45	9.80	24.25	60.00	-35.75	QP	
12		17.0002	8.66	9.80	18.46	50.00	-31.54	AVG	

**REMARKS:**

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

Test Mode	Idle	Tested Date	2023/12/15
Test Frequency	-	Phase	Line



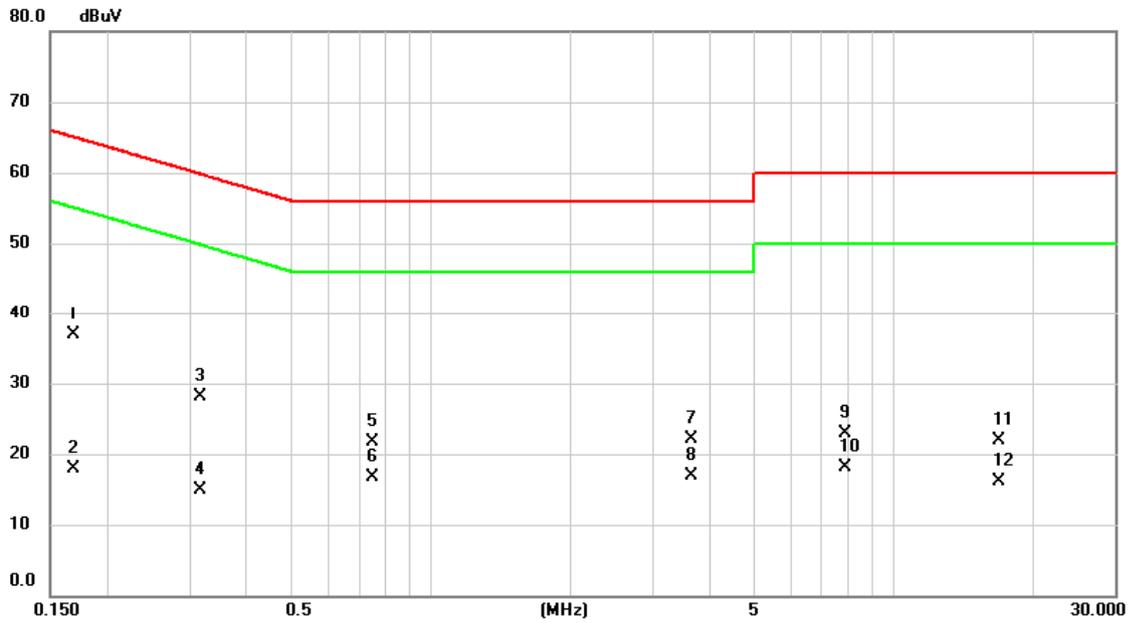
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1590	28.56	9.60	38.16	65.52	-27.36	QP	
2		0.1590	8.05	9.60	17.65	55.52	-37.87	AVG	
3		0.3164	17.95	9.58	27.53	59.80	-32.27	QP	
4		0.3164	4.03	9.58	13.61	49.80	-36.19	AVG	
5		0.4920	8.96	9.58	18.54	56.13	-37.59	QP	
6		0.4920	4.02	9.58	13.60	46.13	-32.53	AVG	
7		2.1435	8.96	9.65	18.61	56.00	-37.39	QP	
8		2.1435	4.10	9.65	13.75	46.00	-32.25	AVG	
9		4.4700	14.88	9.64	24.52	56.00	-31.48	QP	
10		4.4700	7.85	9.64	17.49	46.00	-28.51	AVG	
11		15.7605	13.72	9.71	23.43	60.00	-36.57	QP	
12		15.7605	8.63	9.71	18.34	50.00	-31.66	AVG	

**REMARKS:**

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

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

Test Mode	Idle	Tested Date	2023/12/15
Test Frequency	-	Phase	Neutral



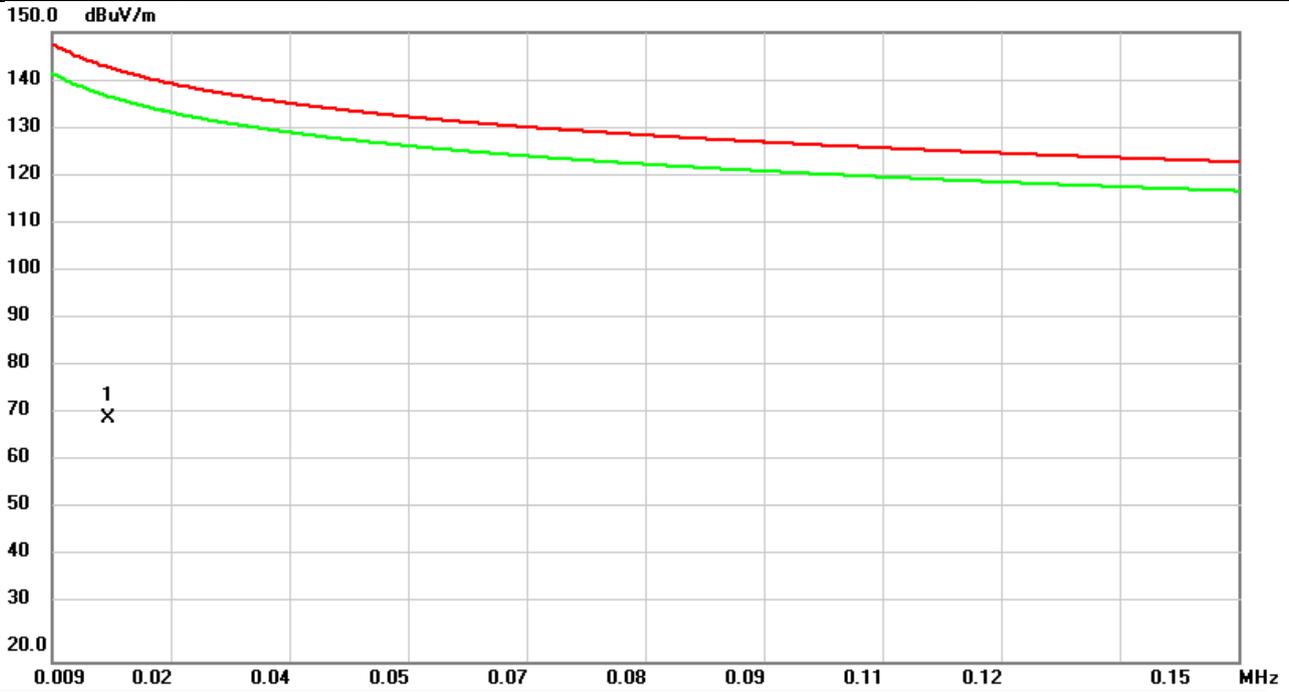
No.	Mk.	Freq. (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1	*	0.1680	27.38	9.59	36.97	65.06	-28.09	QP	
2		0.1680	8.33	9.59	17.92	55.06	-37.14	AVG	
3		0.3164	18.60	9.57	28.17	59.80	-31.63	QP	
4		0.3164	5.33	9.57	14.90	49.80	-34.90	AVG	
5		0.7507	12.09	9.57	21.66	56.00	-34.34	QP	
6		0.7507	7.22	9.57	16.79	46.00	-29.21	AVG	
7		3.6307	12.48	9.63	22.11	56.00	-33.89	QP	
8		3.6307	7.33	9.63	16.96	46.00	-29.04	AVG	
9		7.8742	13.17	9.70	22.87	60.00	-37.13	QP	
10		7.8742	8.45	9.70	18.15	50.00	-31.85	AVG	
11		16.9215	12.19	9.80	21.99	60.00	-38.01	QP	
12		16.9215	6.31	9.80	16.11	50.00	-33.89	AVG	

**REMARKS:**

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

## **APPENDIX B    RADIATED EMISSIONS - 9 KHZ TO 30 MHZ**

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

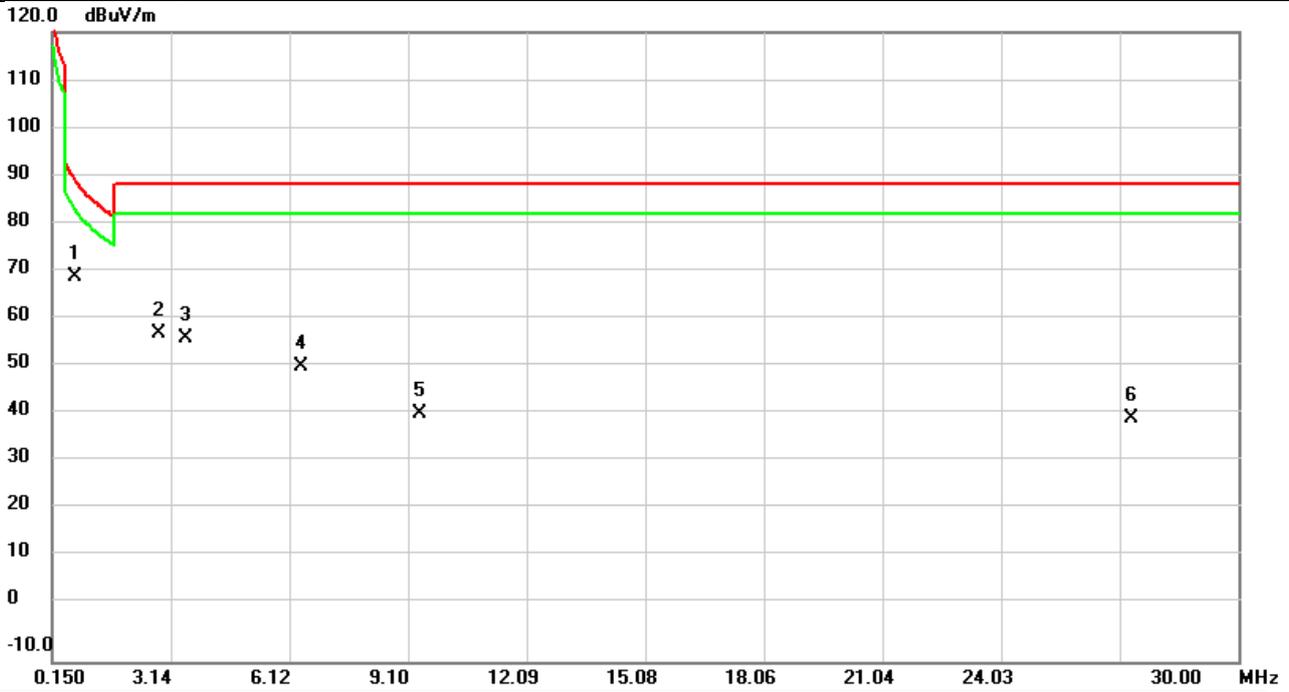


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.0156	36.55	33.71	70.26	142.82	-72.56	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

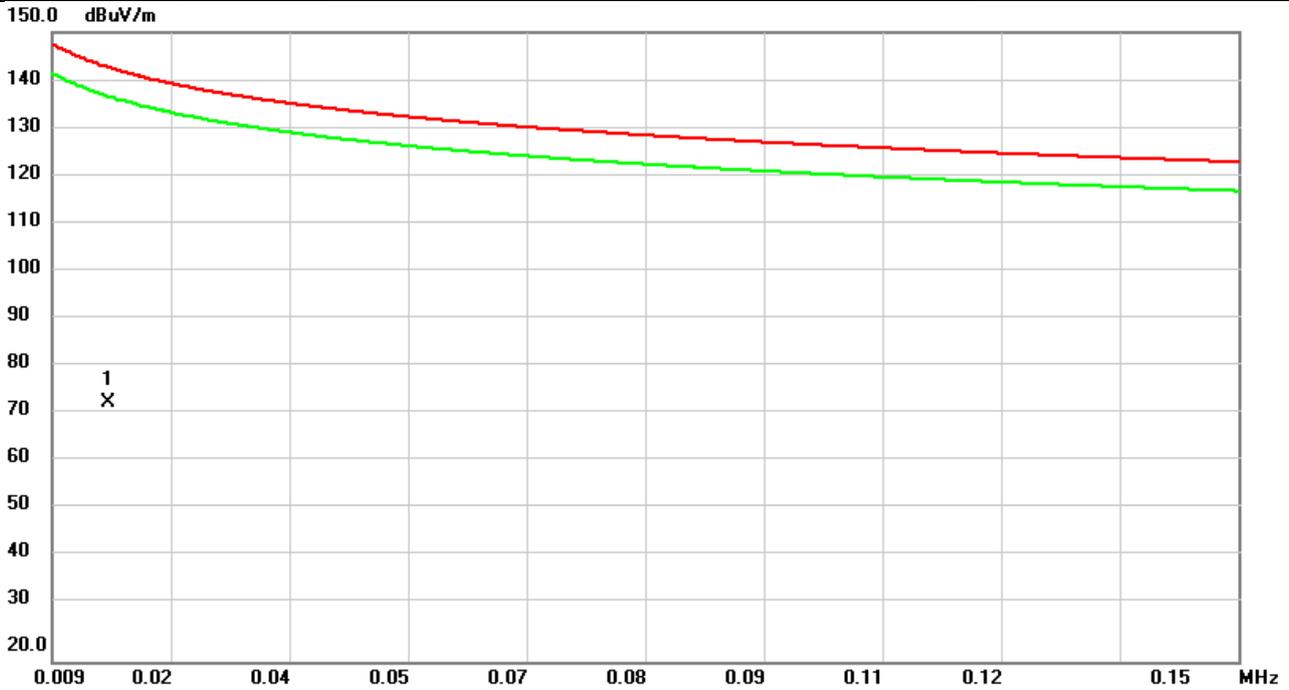


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.7271	66.09	3.22	69.31	89.45	-20.14	QP	
2		2.8295	61.22	-3.45	57.77	88.62	-30.85	QP	
3		3.5300	60.63	-3.97	56.66	88.62	-31.96	QP	
4		6.4046	54.90	-4.10	50.80	88.62	-37.82	QP	
5		9.4065	44.52	-3.36	41.16	88.62	-47.46	QP	
6		27.3225	40.74	-0.63	40.11	88.62	-48.51	QP	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

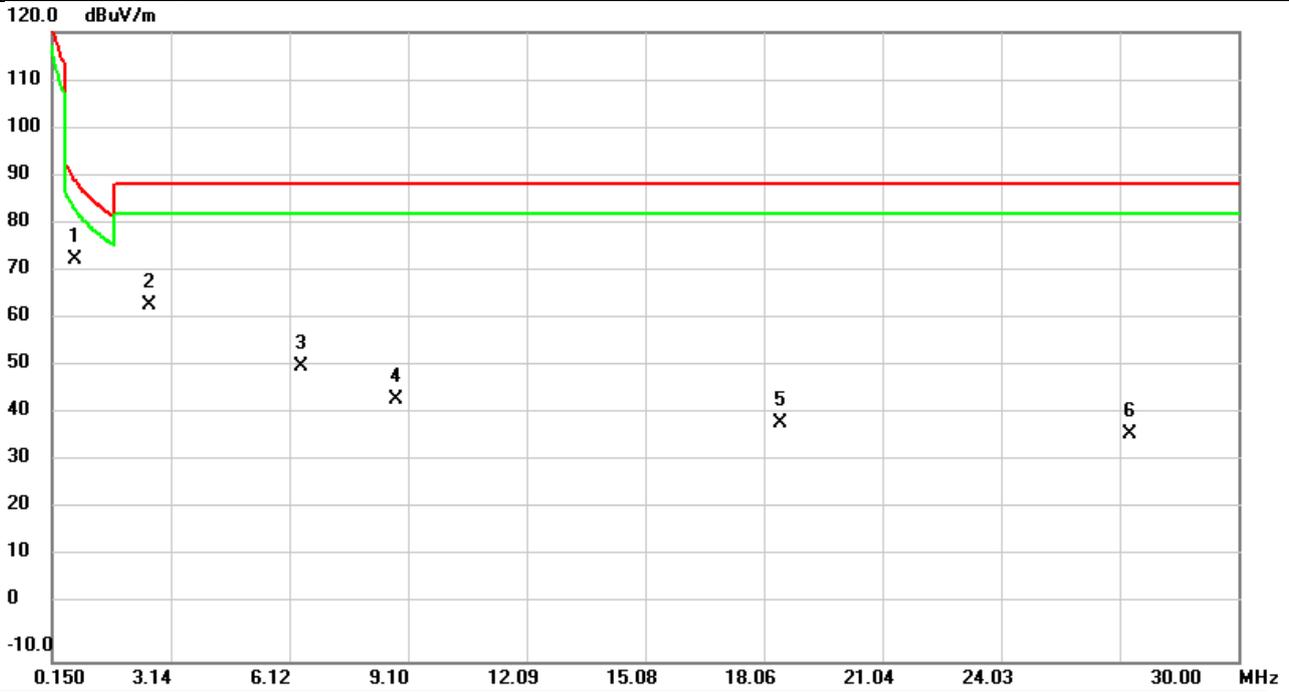


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.0157	39.83	33.67	73.50	142.77	-69.27	AVG	

REMARKS:

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%



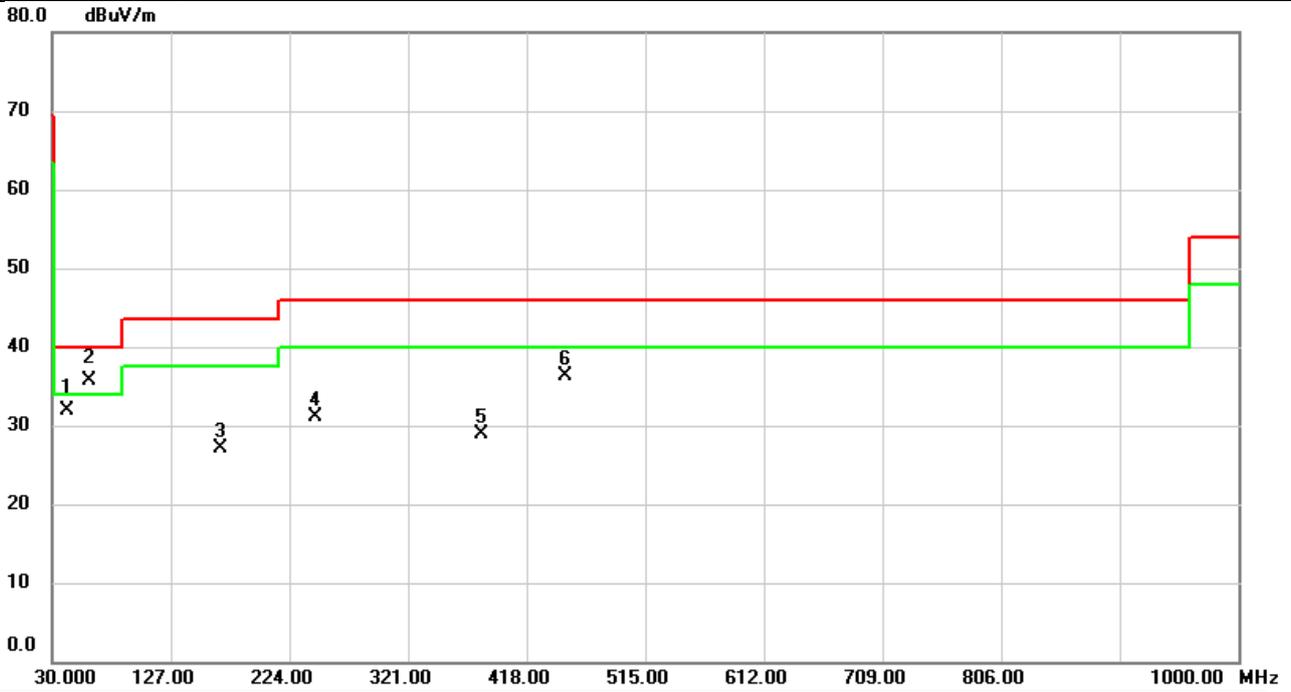
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.7380	70.00	3.13	73.13	89.32	-16.19	QP	
2		2.6116	66.57	-3.02	63.55	88.62	-25.07	QP	
3		6.4235	54.88	-4.09	50.79	88.62	-37.83	QP	
4		8.8204	47.45	-3.50	43.95	88.62	-44.67	QP	
5		18.4968	43.34	-3.97	39.37	88.62	-49.25	QP	
6		27.2697	37.55	-0.65	36.90	88.62	-51.72	QP	

**REMARKS:**

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

## **APPENDIX C    RADIATED EMISSIONS - 30 MHZ TO 1 GHZ**

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

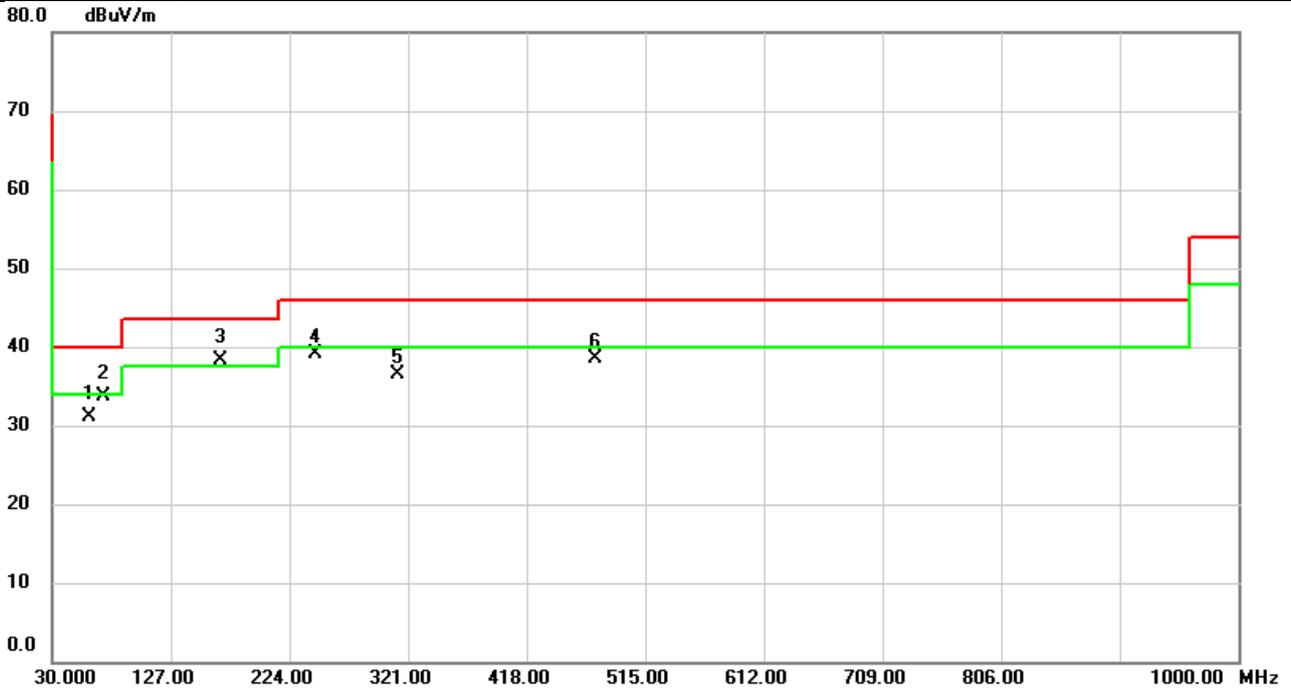


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		42.5453	43.26	-11.38	31.88	40.00	-8.12	QP	
2	*	60.0053	47.46	-11.73	35.73	40.00	-4.27	QP	
3		167.9987	39.32	-12.18	27.14	43.50	-16.36	peak	
4		245.7603	44.25	-13.21	31.04	46.00	-14.96	peak	
5		380.9460	38.16	-9.20	28.96	46.00	-17.04	peak	
6		450.3333	43.51	-7.15	36.36	46.00	-9.64	peak	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%



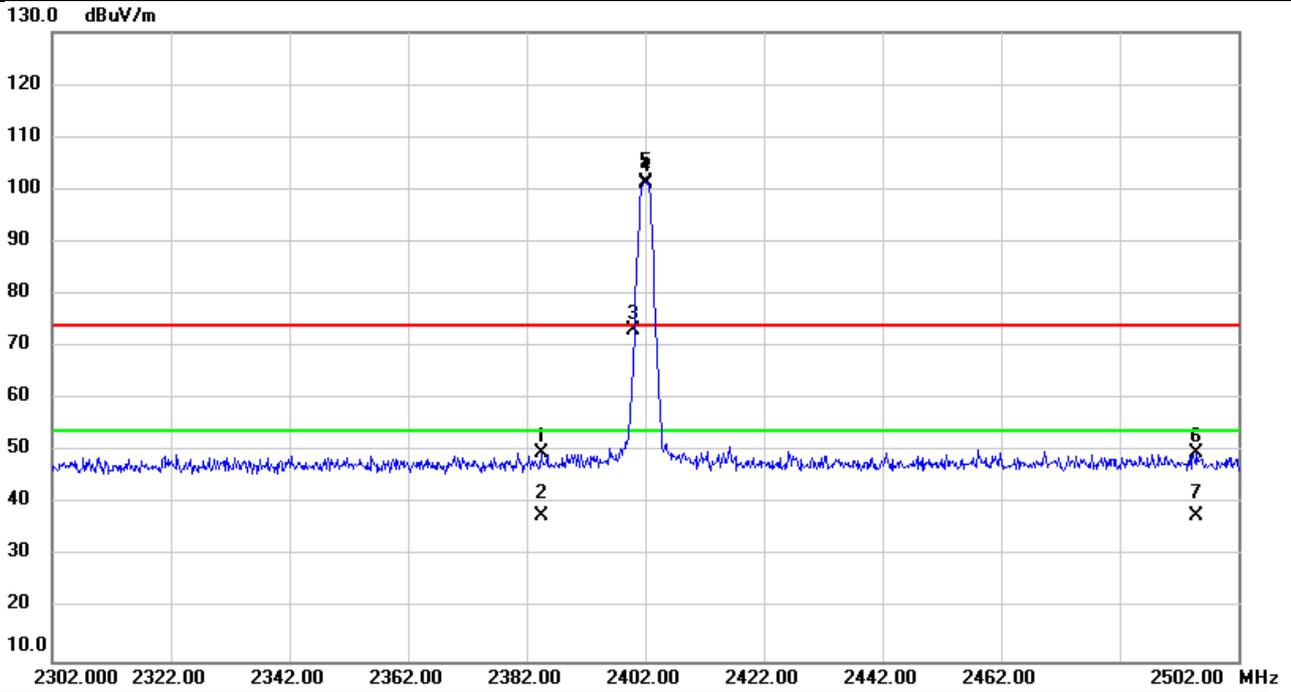
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		60.0053	42.76	-11.73	31.03	40.00	-8.97	QP	
2		71.9363	48.23	-14.49	33.74	40.00	-6.26	QP	
3	*	167.9987	50.45	-12.18	38.27	43.50	-5.23	QP	
4		245.7603	52.34	-13.21	39.13	46.00	-6.87	peak	
5		312.0113	47.55	-11.02	36.53	46.00	-9.47	peak	
6		473.8720	45.33	-6.75	38.58	46.00	-7.42	peak	

**REMARKS:**

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

## **APPENDIX D RADIATED EMISSIONS - ABOVE 1 GHZ**

Test Mode	BLE 5.1 (1 Mbps)	Test Date	2023/12/19
Test Frequency	2402MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

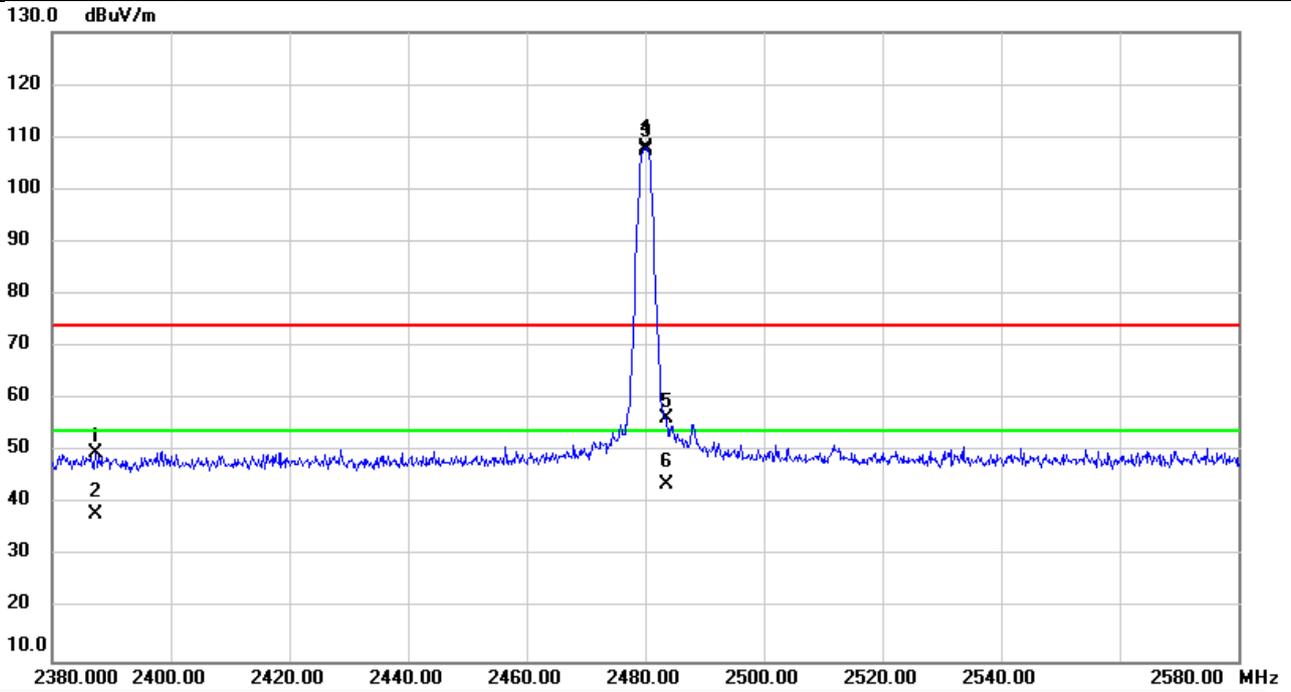


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2384.467	55.27	-5.58	49.69	74.00	-24.31	peak	
2		2384.467	43.40	-5.58	37.82	54.00	-16.18	AVG	
3		2400.000	78.60	-5.56	73.04	74.00	-0.96	peak	NoLimit
4	X	2402.000	107.05	-5.55	101.50	74.00	27.50	peak	NoLimit
5	*	2402.000	106.48	-5.55	100.93	54.00	46.93	AVG	NoLimit
6		2495.053	55.17	-5.39	49.78	74.00	-24.22	peak	
7		2495.053	43.15	-5.39	37.76	54.00	-16.24	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (1 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

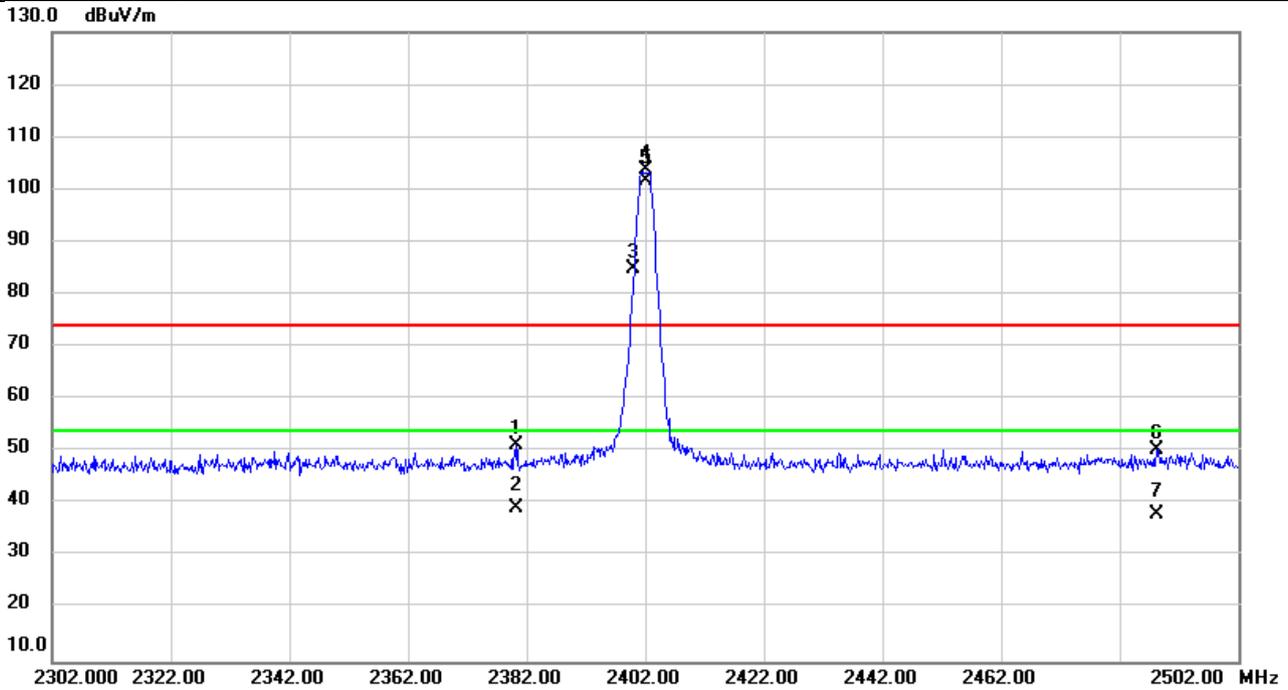


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2387.287	55.35	-5.58	49.77	74.00	-24.23	peak	
2		2387.287	43.70	-5.58	38.12	54.00	-15.88	AVG	
3	X	2480.000	113.37	-5.41	107.96	74.00	33.96	peak	NoLimit
4	*	2480.000	112.72	-5.41	107.31	54.00	53.31	AVG	NoLimit
5		2483.607	61.86	-5.42	56.44	74.00	-17.56	peak	
6		2483.607	49.29	-5.42	43.87	54.00	-10.13	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2402MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

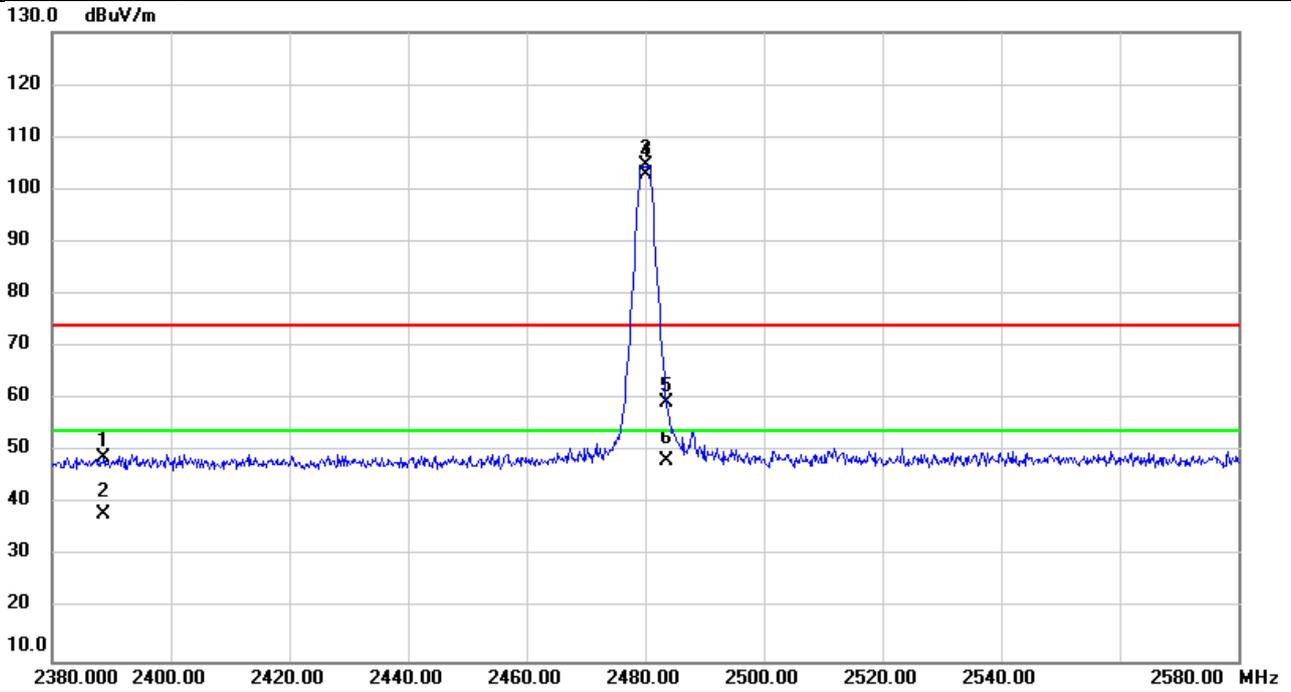


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2380.173	56.72	-5.59	51.13	74.00	-22.87	peak	
2		2380.173	44.99	-5.59	39.40	54.00	-14.60	AVG	
3	X	2400.000	90.48	-5.56	84.92	74.00	10.92	peak	NoLimit
4	X	2402.000	109.16	-5.55	103.61	74.00	29.61	peak	NoLimit
5	*	2402.000	107.12	-5.55	101.57	54.00	47.57	AVG	NoLimit
6		2488.393	55.86	-5.40	50.46	74.00	-23.54	peak	
7		2488.393	43.48	-5.40	38.08	54.00	-15.92	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

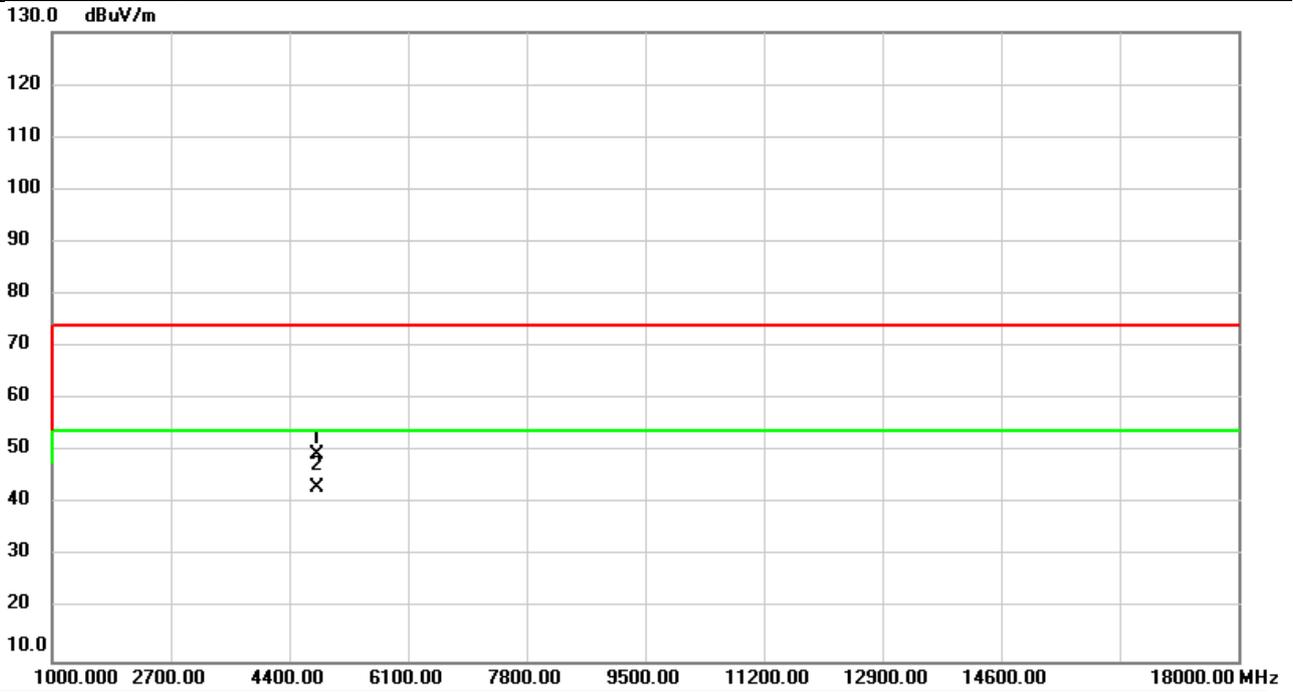


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2388.667	54.48	-5.58	48.90	74.00	-25.10	peak	
2		2388.667	43.67	-5.58	38.09	54.00	-15.91	AVG	
3	X	2480.000	110.03	-5.41	104.62	74.00	30.62	peak	NoLimit
4	*	2480.000	108.27	-5.41	102.86	54.00	48.86	AVG	NoLimit
5		2483.607	64.70	-5.42	59.28	74.00	-14.72	peak	
6		2483.607	53.81	-5.42	48.39	54.00	-5.61	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (1 Mbps)	Test Date	2023/12/19
Test Frequency	2402MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

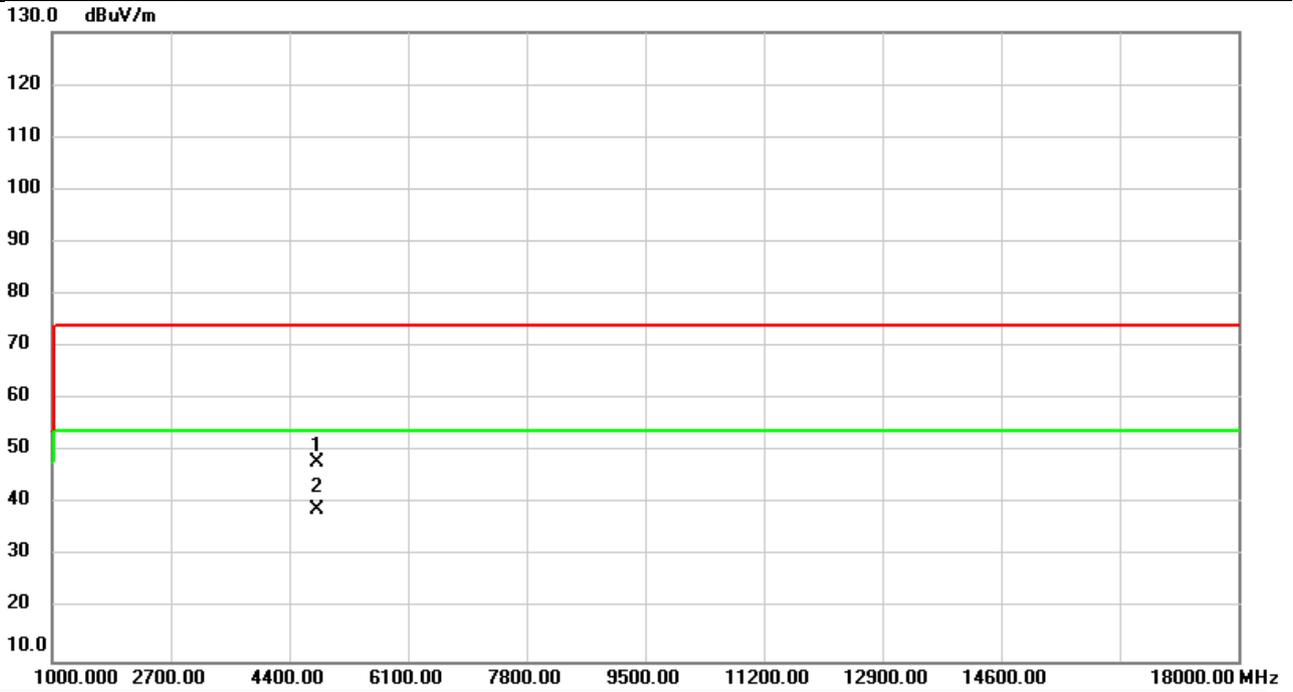


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		4804.000	49.04	0.50	49.54	74.00	-24.46	peak	
2	*	4804.000	42.78	0.50	43.28	54.00	-10.72	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (1 Mbps)	Test Date	2023/12/19
Test Frequency	2402MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

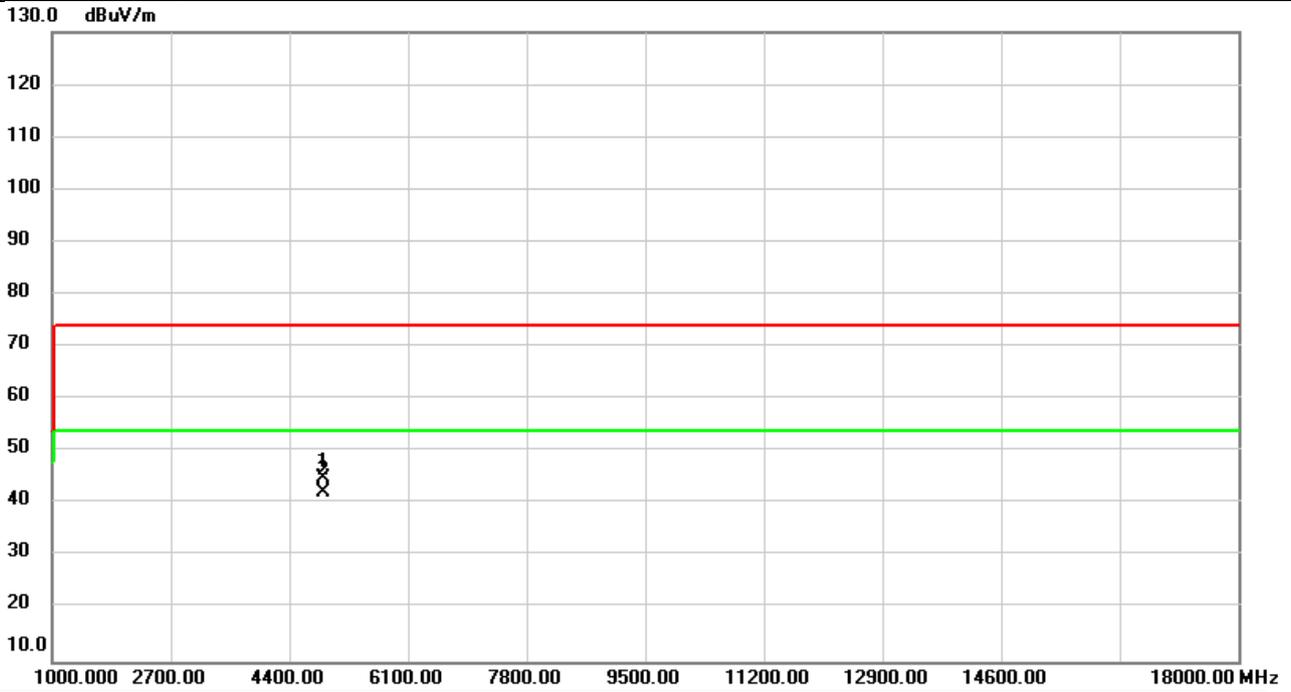


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	47.34	0.50	47.84	74.00	-26.16	peak	
2	*	4804.000	38.34	0.50	38.84	54.00	-15.16	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (1 Mbps)	Test Date	2023/12/19
Test Frequency	2440MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

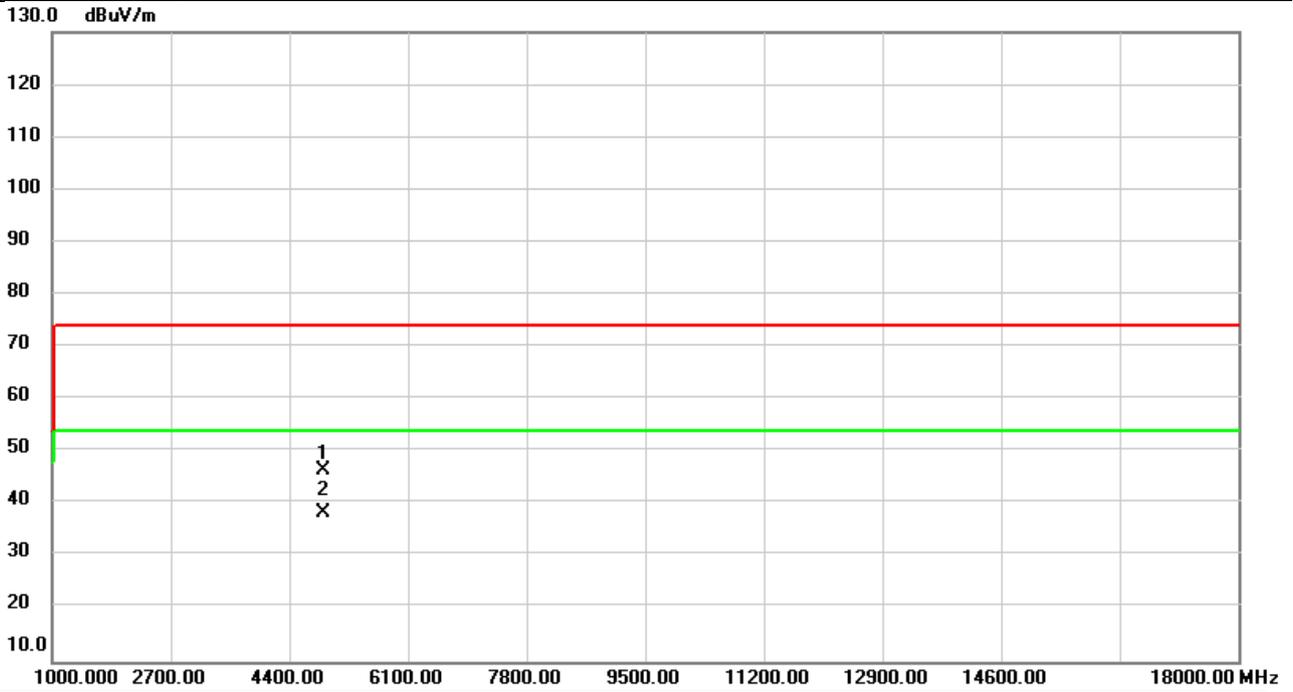


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		4880.000	44.28	0.73	45.01	74.00	-28.99	peak	
2	*	4880.000	41.62	0.73	42.35	54.00	-11.65	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (1 Mbps)	Test Date	2023/12/19
Test Frequency	2440MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

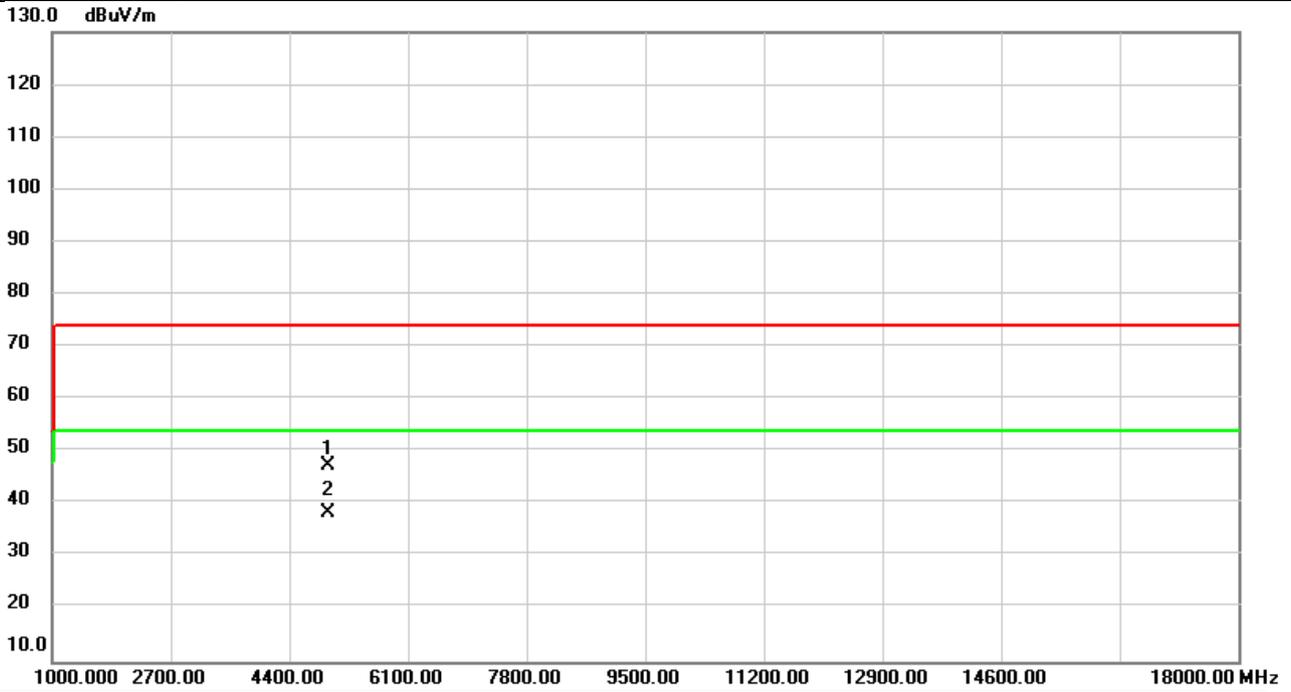


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4880.000	45.65	0.73	46.38	74.00	-27.62	peak	
2	*	4880.000	37.69	0.73	38.42	54.00	-15.58	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (1 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

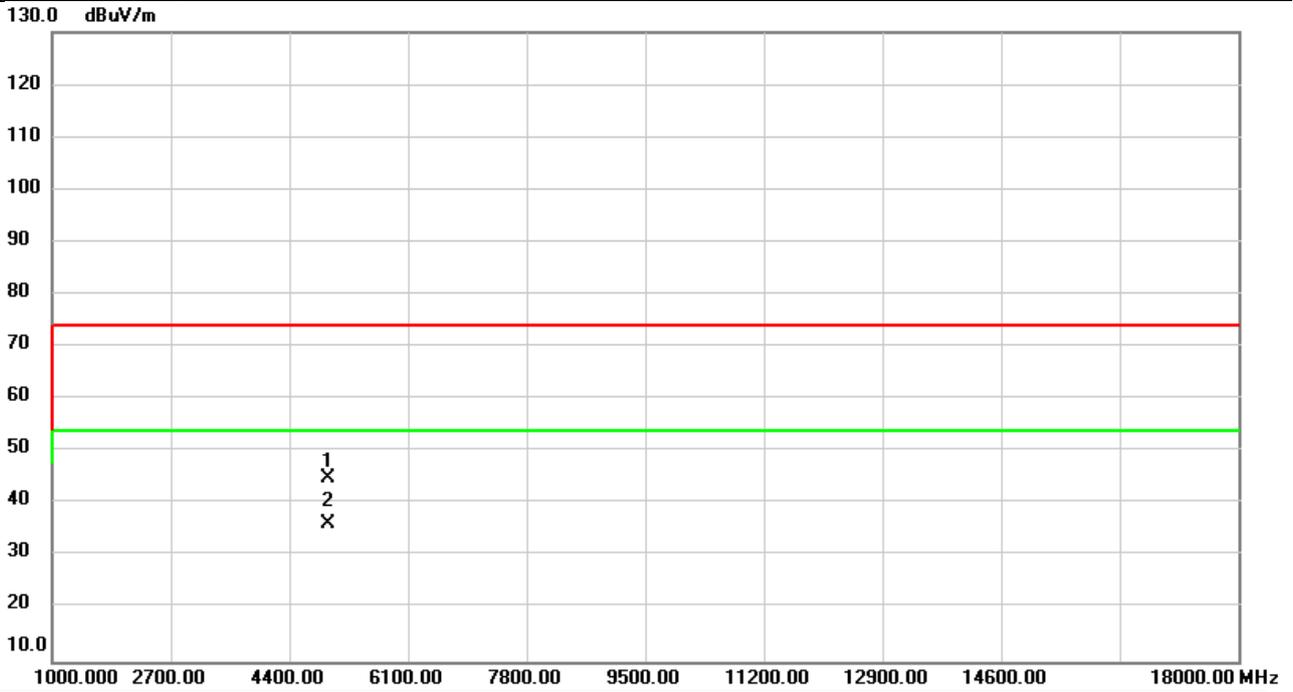


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	46.39	0.99	47.38	74.00	-26.62	peak	
2	*	4960.000	37.22	0.99	38.21	54.00	-15.79	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (1 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

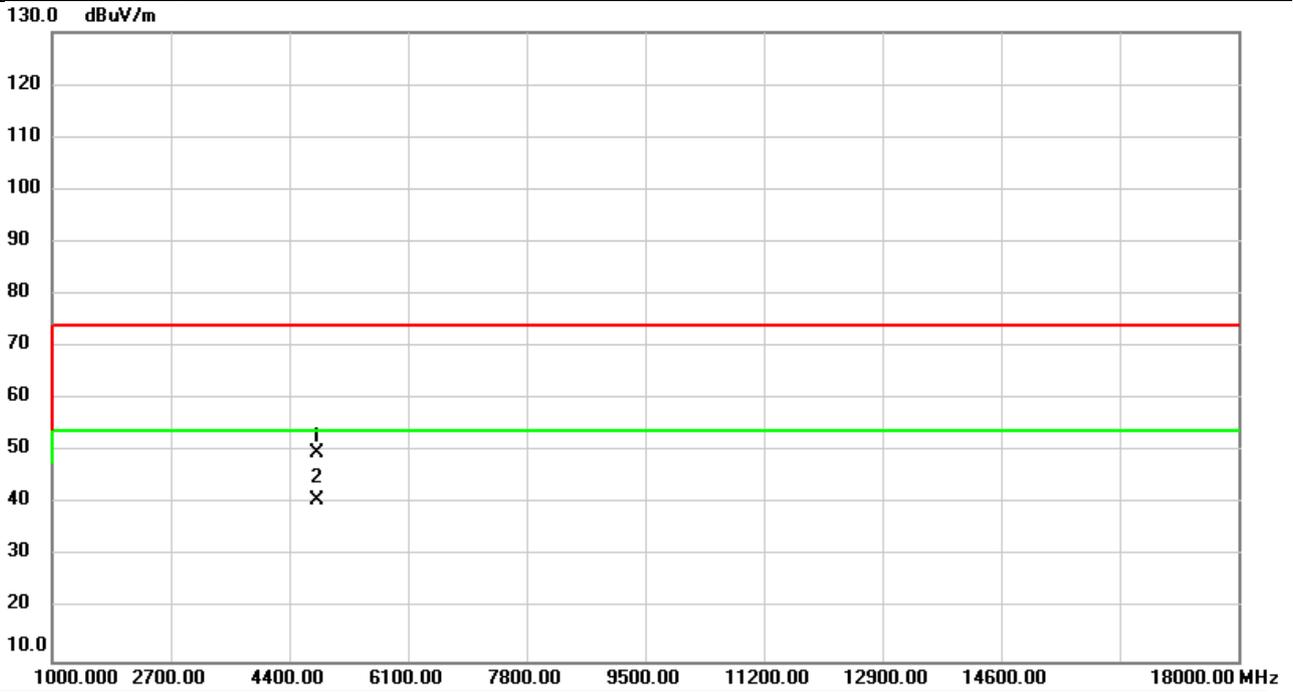


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	44.00	0.99	44.99	74.00	-29.01	peak	
2	*	4960.000	35.11	0.99	36.10	54.00	-17.90	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2402MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

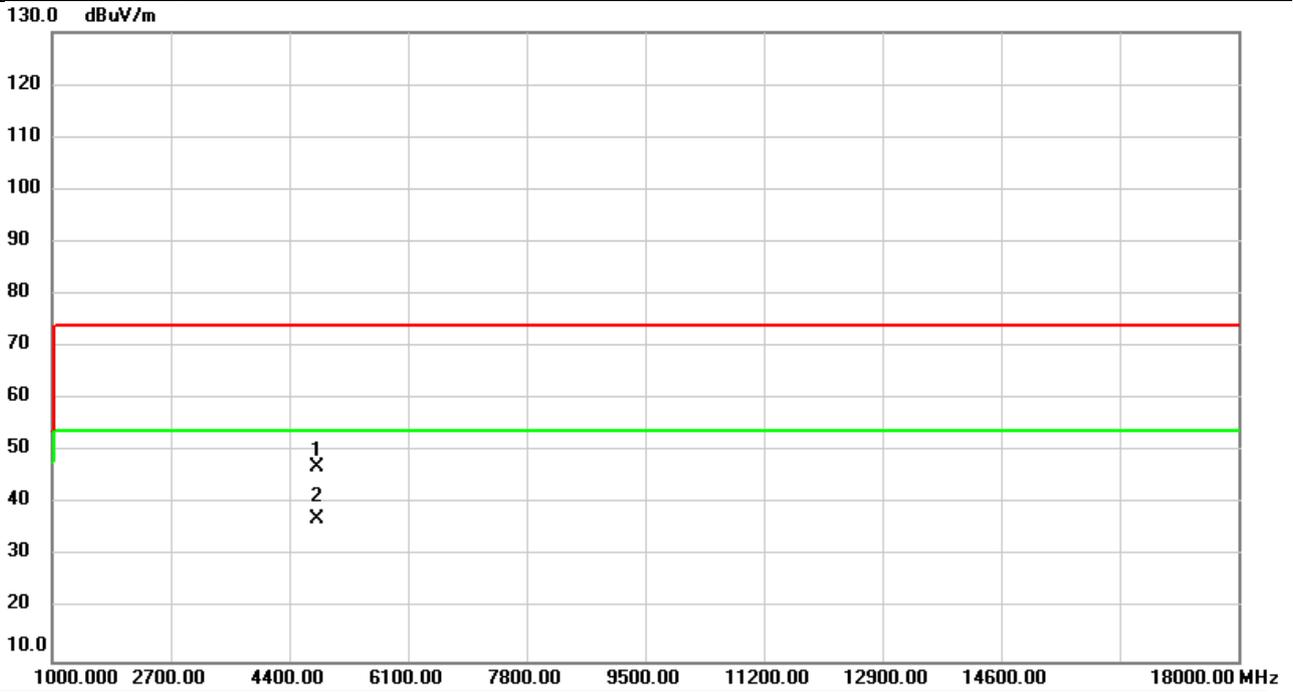


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	49.29	0.50	49.79	74.00	-24.21	peak	
2	*	4804.000	40.27	0.50	40.77	54.00	-13.23	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2402MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

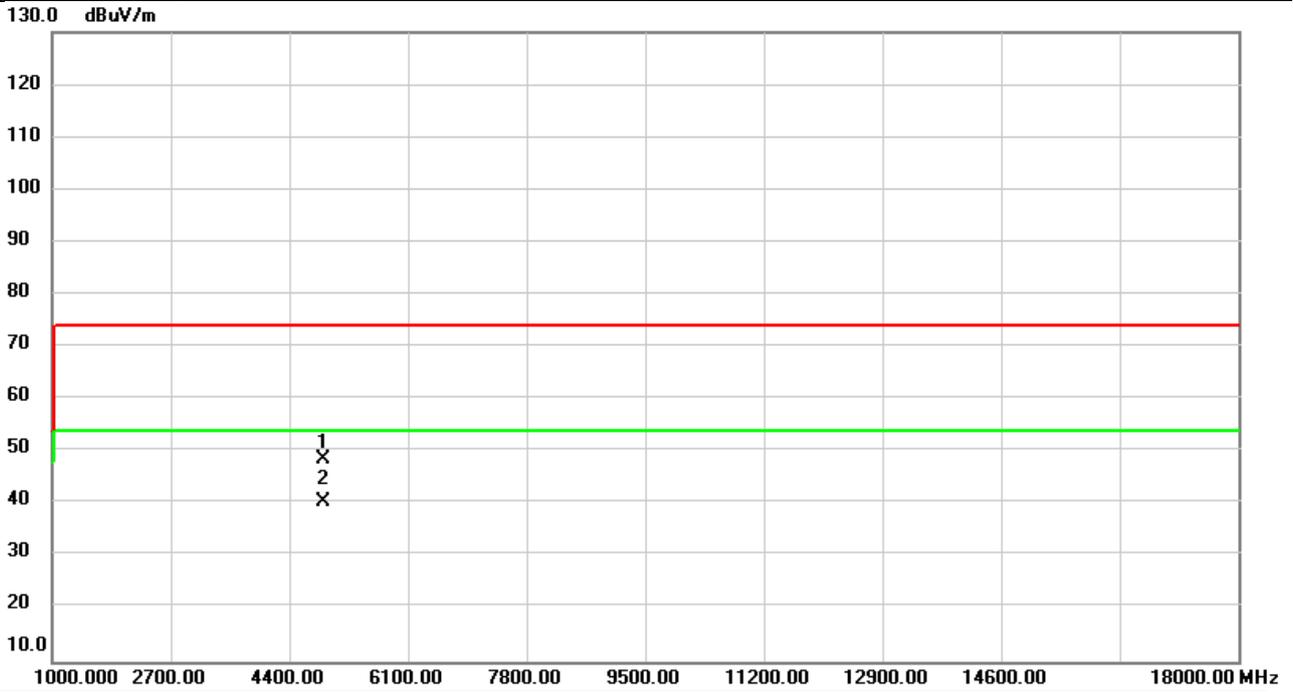


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	46.41	0.50	46.91	74.00	-27.09	peak	
2	*	4804.000	36.72	0.50	37.22	54.00	-16.78	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2440MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

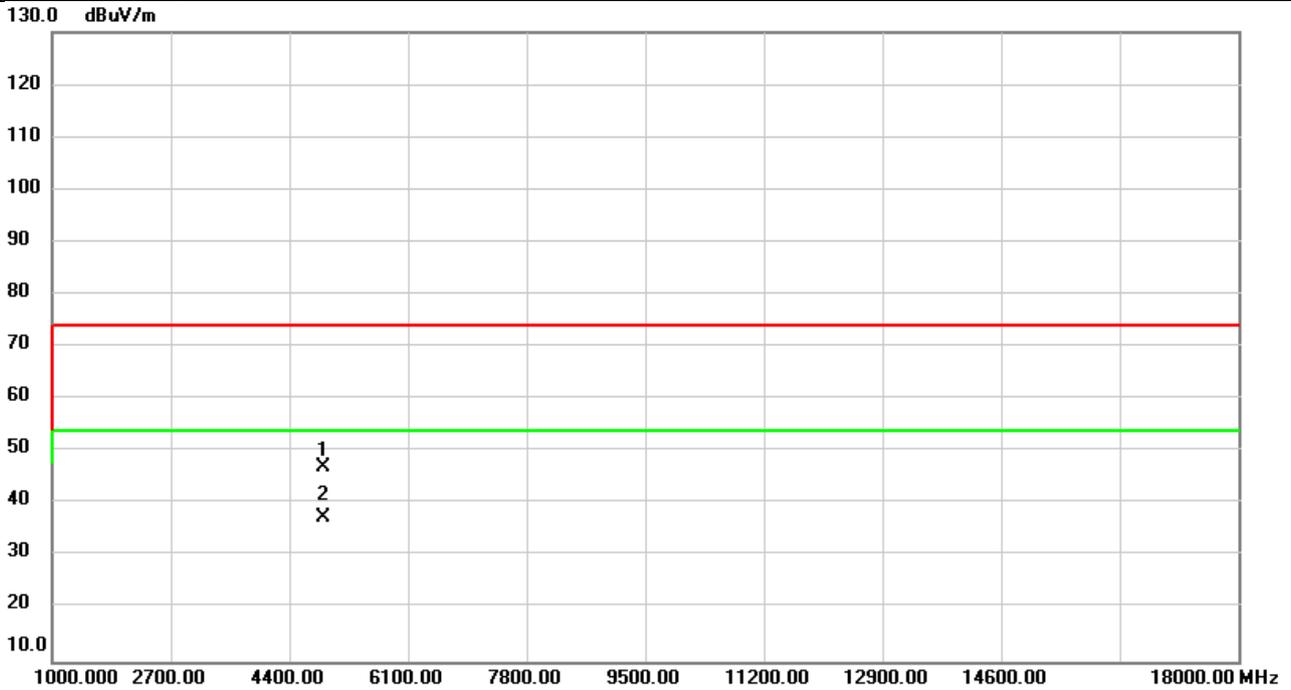


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4880.000	47.92	0.73	48.65	74.00	-25.35	peak	
2	*	4880.000	39.71	0.73	40.44	54.00	-13.56	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2440MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

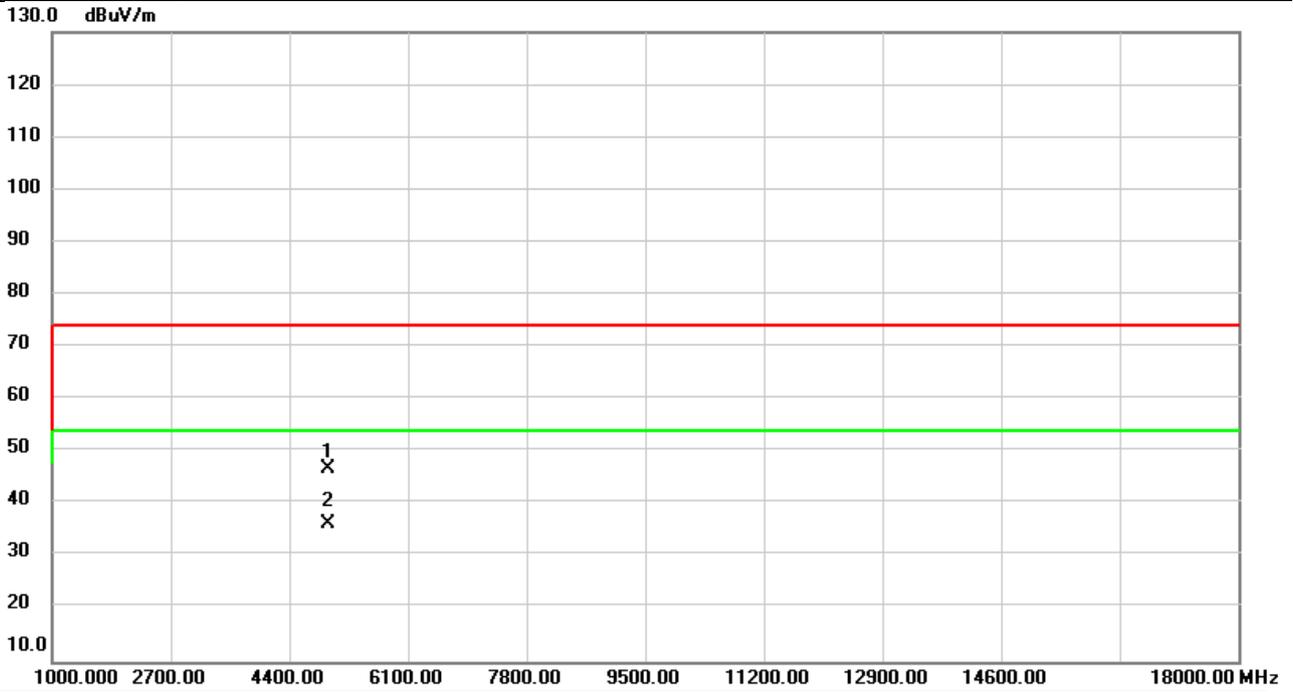


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		4880.000	46.41	0.73	47.14	74.00	-26.86	peak	
2	*	4880.000	36.86	0.73	37.59	54.00	-16.41	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

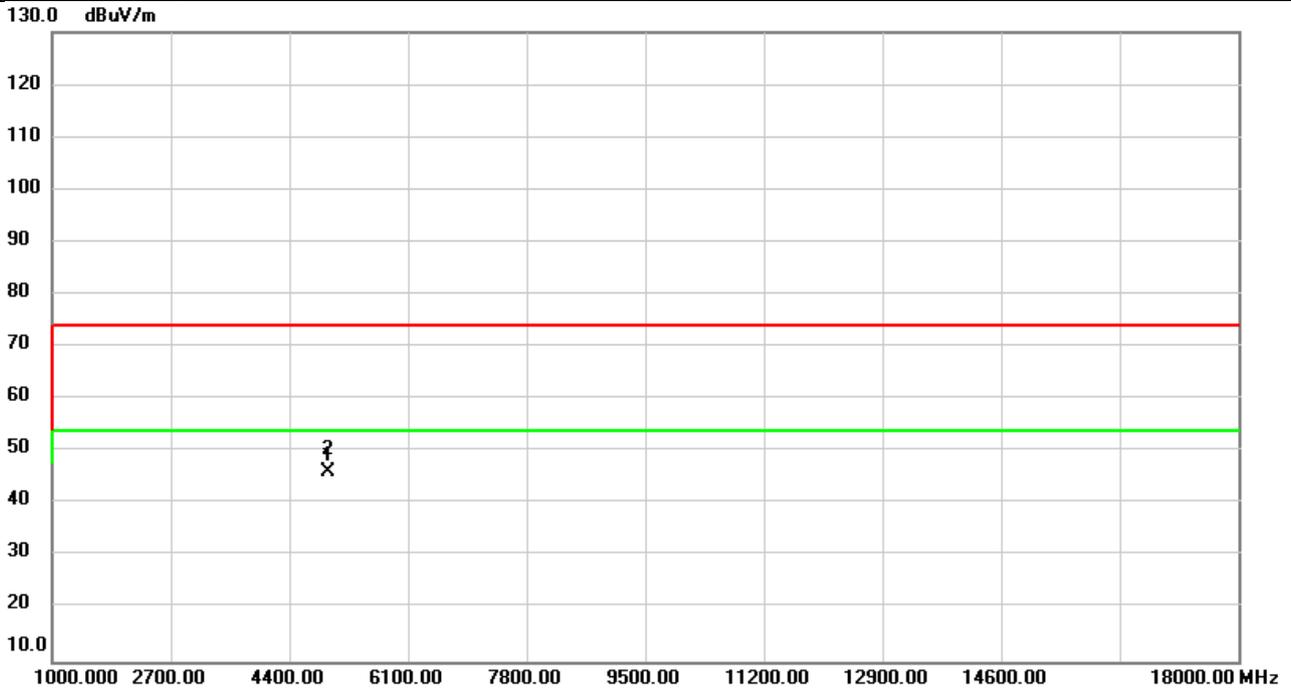


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	45.64	0.99	46.63	74.00	-27.37	peak	
2	*	4960.000	35.11	0.99	36.10	54.00	-17.90	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Horizontal
Temp	23°C	Hum.	57%

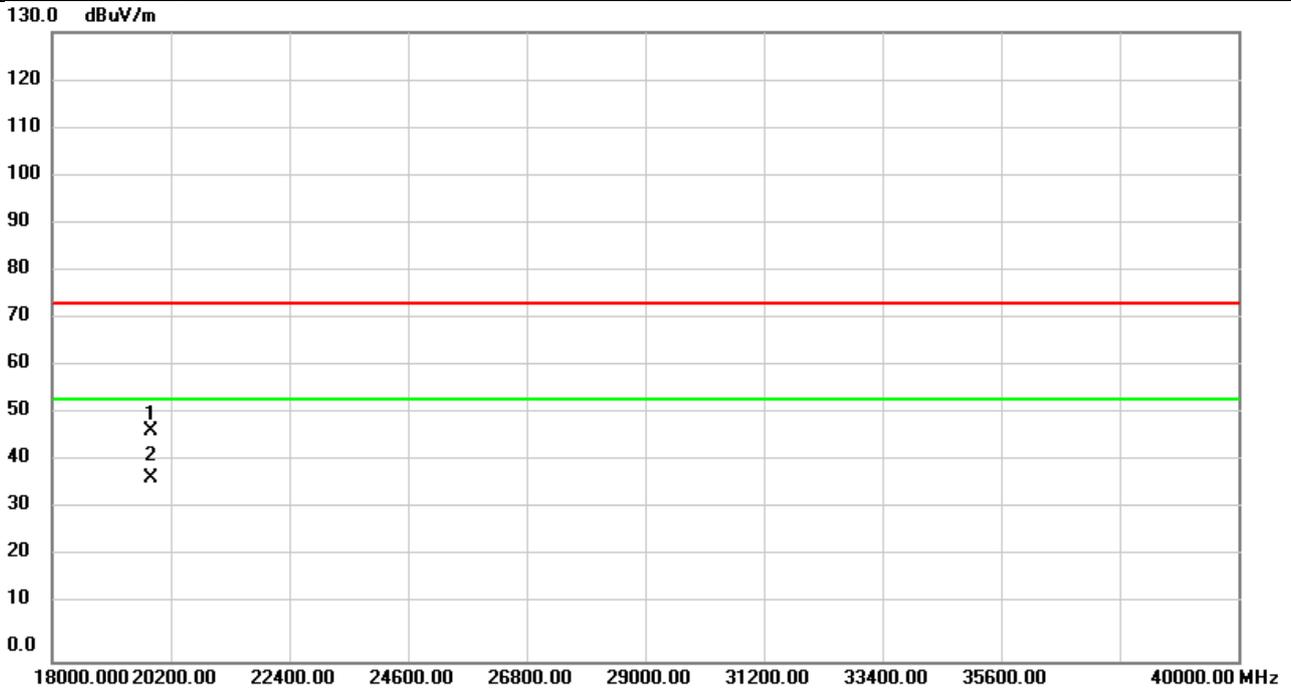


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4959.300	45.09	0.99	46.08	74.00	-27.92	peak	
2	*	4959.300	45.09	0.99	46.08	54.00	-7.92	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Vertical
Temp	23°C	Hum.	57%

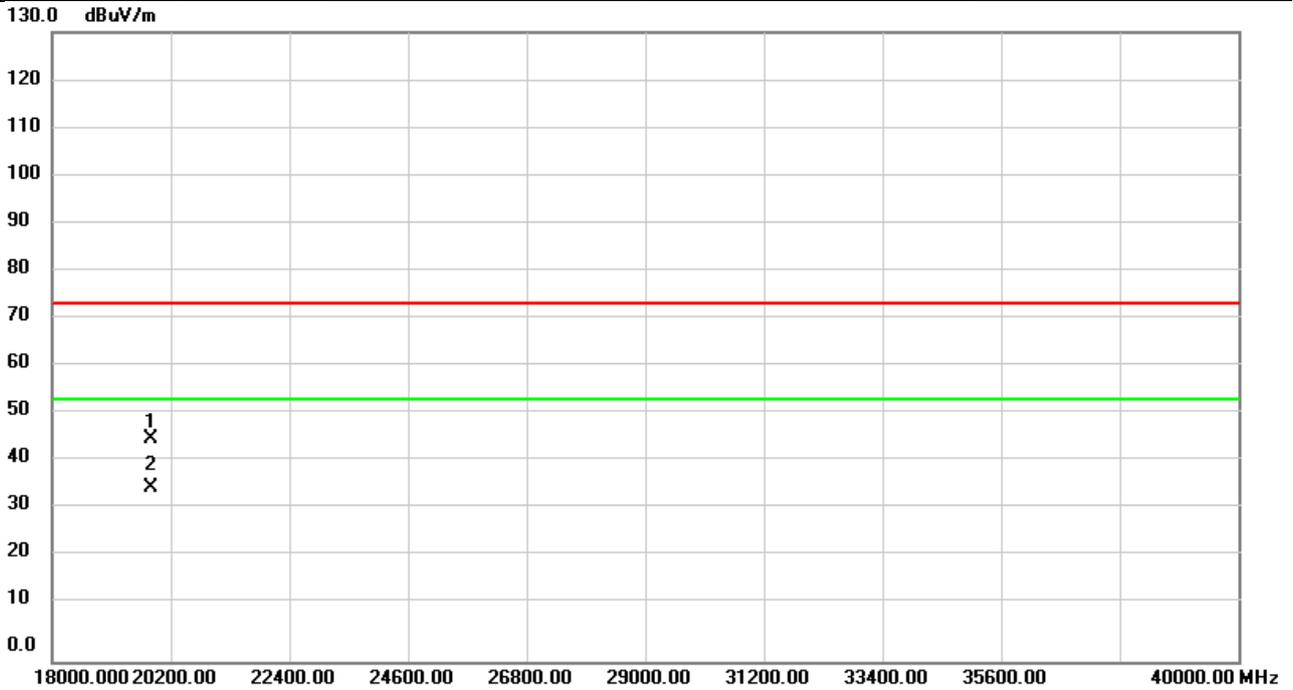


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		19840.00	55.17	-7.47	47.70	74.00	-26.30	peak	
2	*	19840.00	45.29	-7.47	37.82	54.00	-16.18	AVG	

**REMARKS:**

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

Test Mode	BLE 5.1 (2 Mbps)	Test Date	2023/12/19
Test Frequency	2480MHz	Polarization	Vertical
Temp	23°C	Hum.	57%



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		19840.00	53.30	-7.47	45.83	74.00	-28.17	peak	
2	*	19840.00	43.23	-7.47	35.76	54.00	-18.24	AVG	

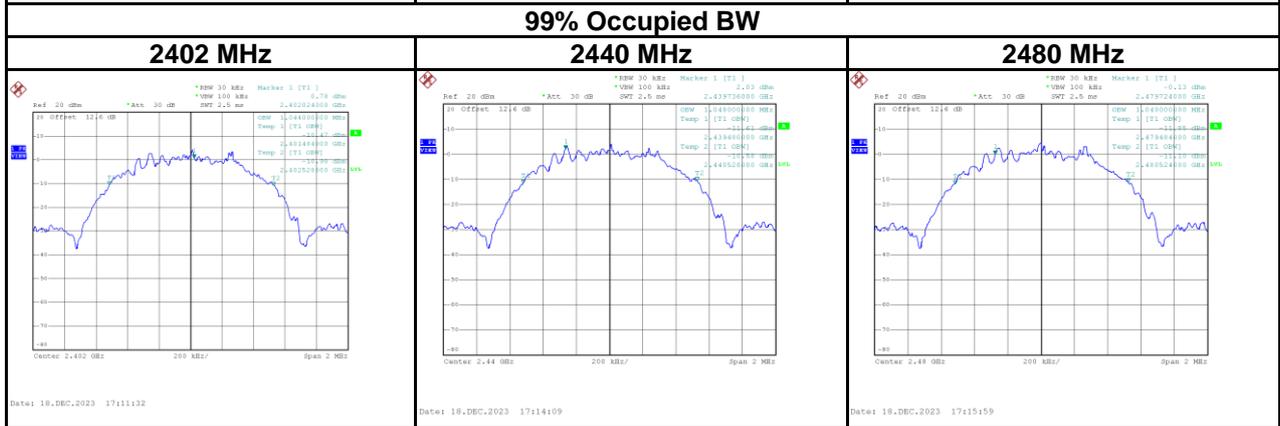
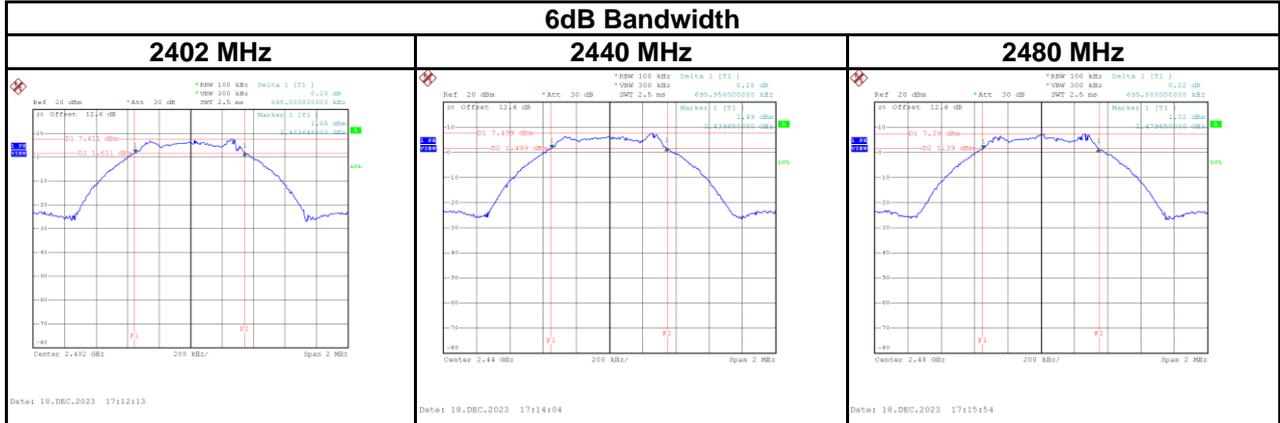
**REMARKS:**

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

# APPENDIX E BANDWIDTH

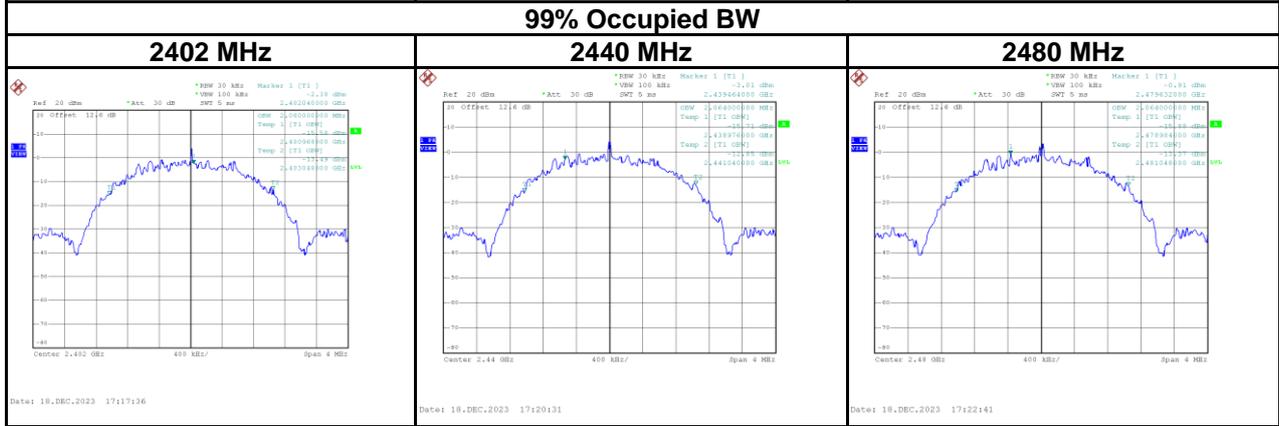
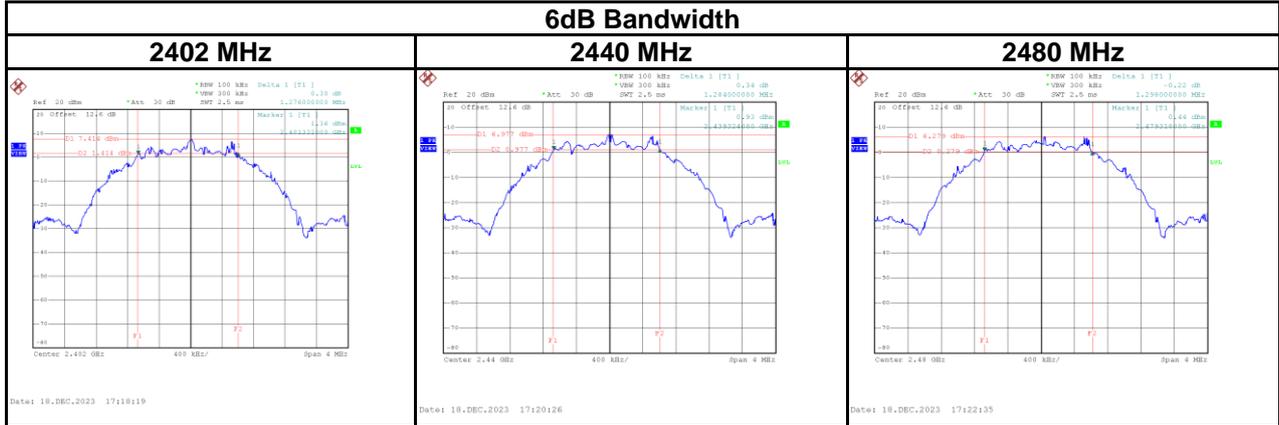
Test Mode: 1Mbps

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2402	0.70	1.04	500	Pass
2440	0.70	1.05	500	Pass
2480	0.70	1.04	500	Pass



Test Mode:	2Mbps
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Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2402	1.28	2.08	500	Pass
2440	1.28	2.06	500	Pass
2480	1.30	2.06	500	Pass



## APPENDIX F OUTPUT POWER

Test Mode :	BLE 5.1 (1Mbps)	Tested Date	2023/12/15
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Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	9.32	0.0086	30.00	1.0000	Pass
2440	9.25	0.0084	30.00	1.0000	Pass
2480	9.09	0.0081	30.00	1.0000	Pass

Test Mode :	BLE 5.1 (2Mbps)	Tested Date	2023/12/15
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Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	9.33	0.0086	30.00	1.0000	Pass
2440	9.28	0.0085	30.00	1.0000	Pass
2480	9.10	0.0081	30.00	1.0000	Pass

## APPENDIX G POWER SPECTRAL DENSITY TEST

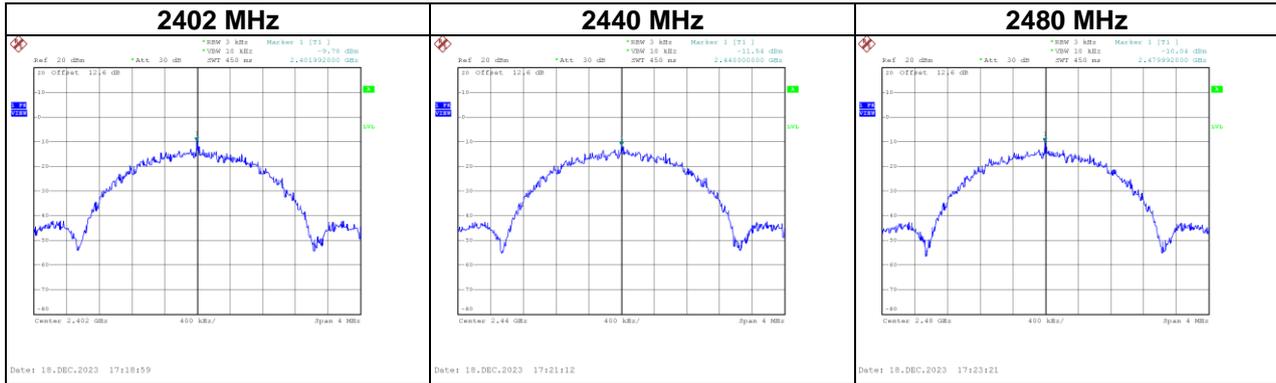
Test Mode : 1Mbps

Frequency (MHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Test Result
2402	-8.61	8	Pass
2440	-9.02	8	Pass
2480	-8.75	8	Pass



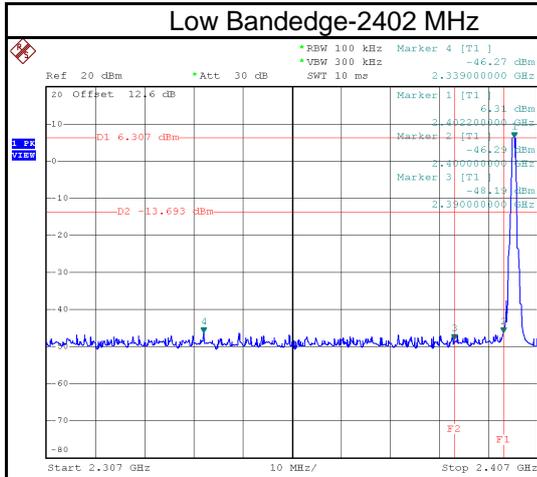
Test Mode :	2Mbps
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Frequency (MHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Test Result
2402	-9.78	8	Pass
2440	-11.54	8	Pass
2480	-10.04	8	Pass

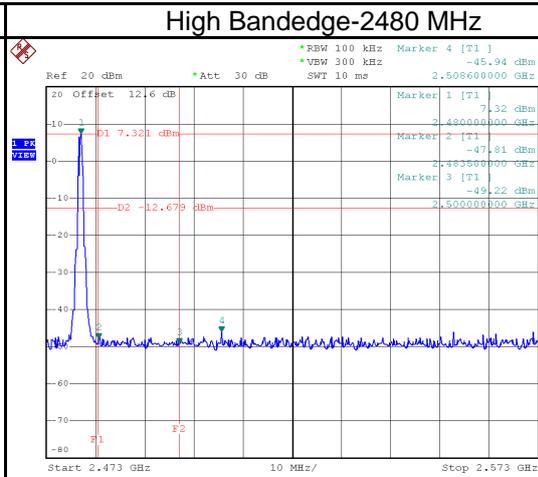


## **APPENDIX H ANTENNA CONDUCTED SPURIOUS EMISSION**

Test Mode : 1Mbps

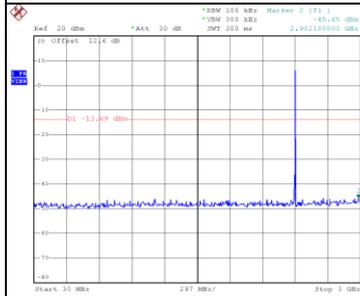


Date: 18.DEC.2023 17:12:20

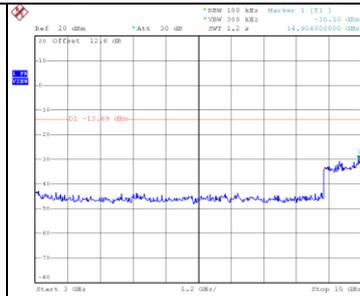


Date: 18.DEC.2023 17:16:07

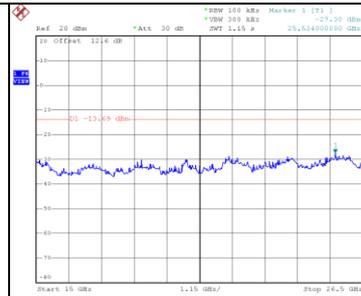
## 2402 MHz – 10th Harmonics



Date: 18.DEC.2023 17:12:33

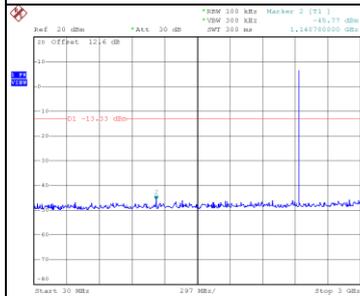


Date: 18.DEC.2023 17:12:40

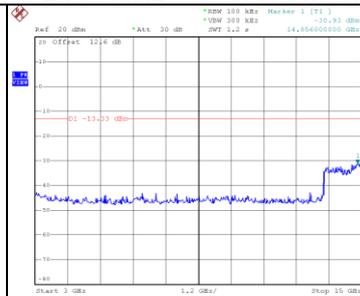


Date: 18.DEC.2023 17:12:47

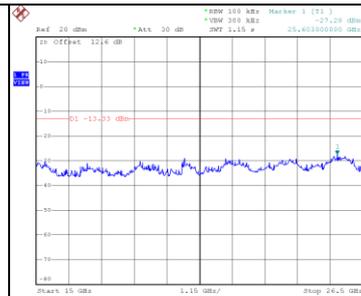
## 2440 MHz – 10th Harmonics



Date: 18.DEC.2023 17:14:30

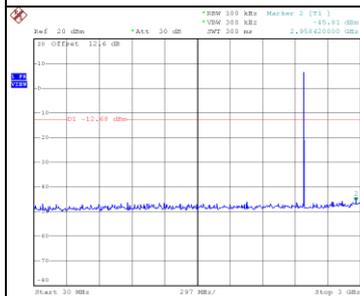


Date: 18.DEC.2023 17:14:37

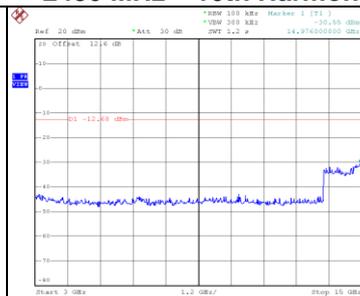


Date: 18.DEC.2023 17:14:44

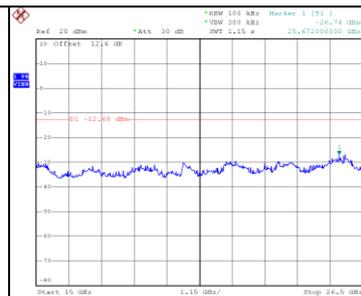
## 2480 MHz – 10th Harmonics



Date: 18.DEC.2023 17:16:20

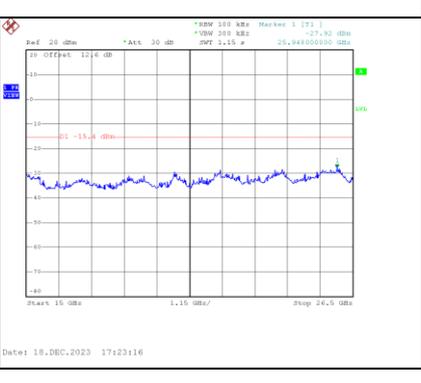
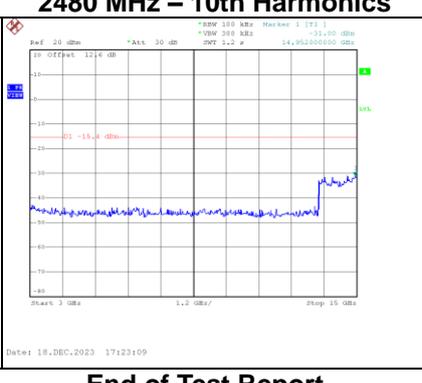
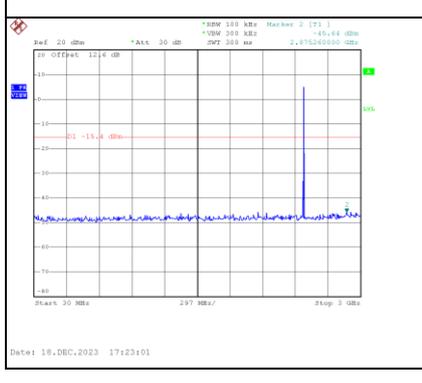
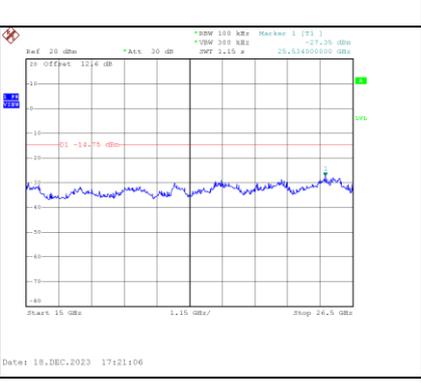
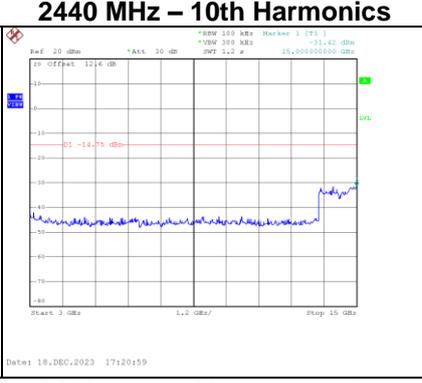
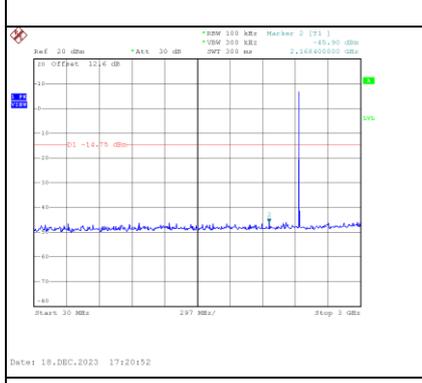
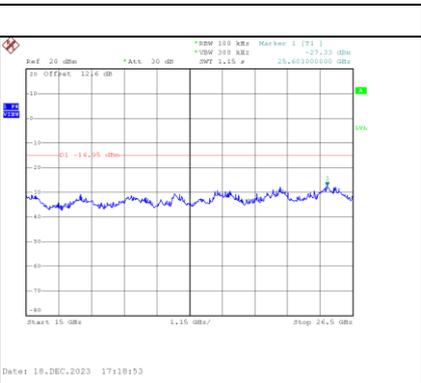
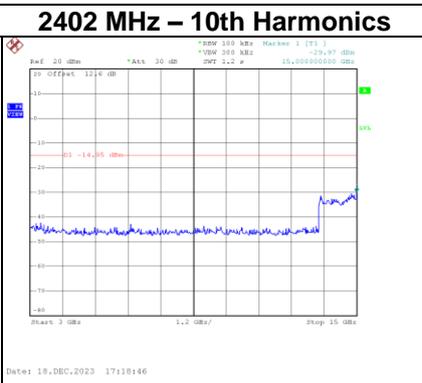
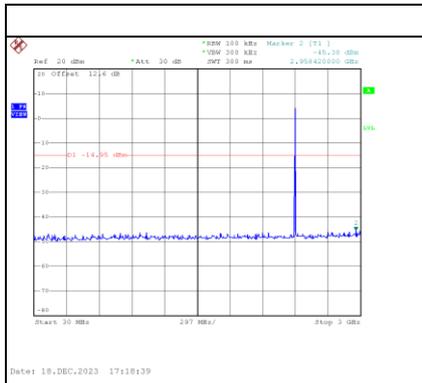
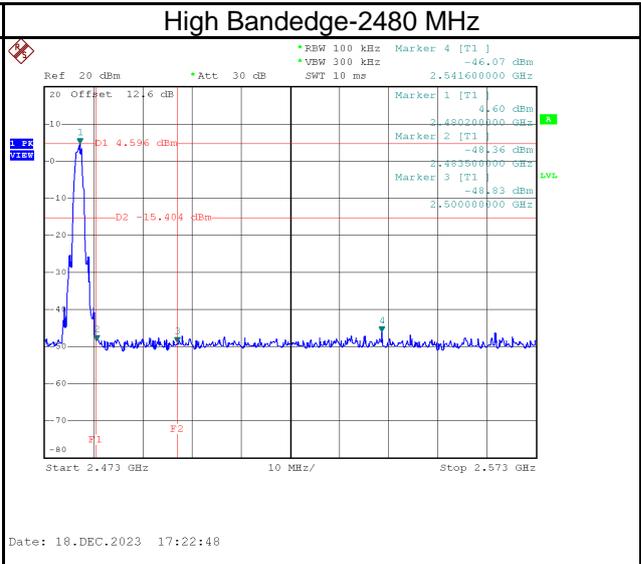
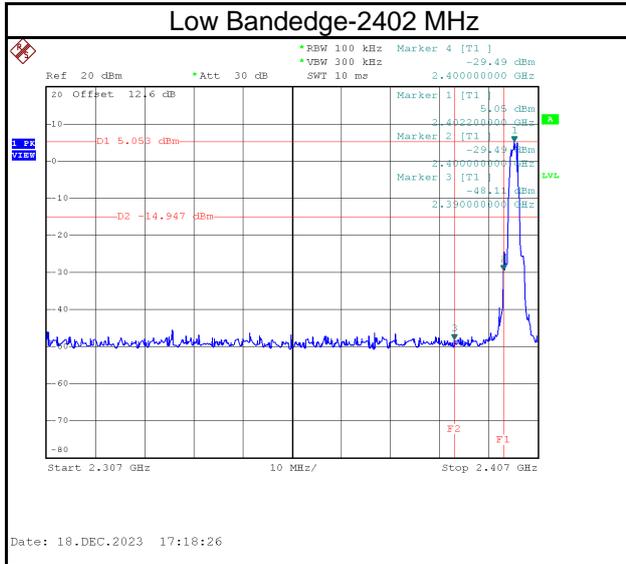


Date: 18.DEC.2023 17:16:27



Date: 18.DEC.2023 17:16:34

Test Mode : 2Mbps



End of Test Report