

FCC Radio Test Report

FCC ID: HBW1595

Report No. : BTL-FCCP-1-2303T057
Equipment : Smart Video Intercom - L
Model Name : CAPXLV2
Brand Name : Liftmaster
Applicant : Chamberlain Group LLC, The
Address : 300 Windsor Dr, Oak Brook, Illinois, United States, 60523


Radio Function : Bluetooth EDR

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

Date of Receipt : 2023/3/20
Date of Test : 2023/6/15 ~ 2023/8/24
Issued Date : 2023/9/28

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

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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-1-2303T057	R00	Original Report.	2023/9/13	Invalid
BTL-FCCP-1-2303T057	R01	Revised report to address TCB's comments.	2023/9/28	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)(1)(iii)	Number of Hopping Frequency	APPENDIX D	Pass	-----
15.247 (a)(1)(iii)	Average Time of Occupancy	APPENDIX E	Pass	-----
15.247 (a)(1)	Hopping Channel Separation	APPENDIX F	Pass	-----
15.247 (a)(1)	Bandwidth	APPENDIX G	Pass	-----
15.247 (b)(1)	Output Power	APPENDIX H	Pass	-----
15.247(d)	Antenna conducted Spurious Emission	APPENDIX I	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_{CISPR} requirement.

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U (dB)
C05	CISPR	150 kHz ~ 30 MHz	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	0.5338
Output power	0.3659
Conducted Spurious emissions	0.5416
Conducted Band edges	0.5348
Dwell time	0.6606
Channel separation	0.6606
Channel numbers	0.6606

NOTE:

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

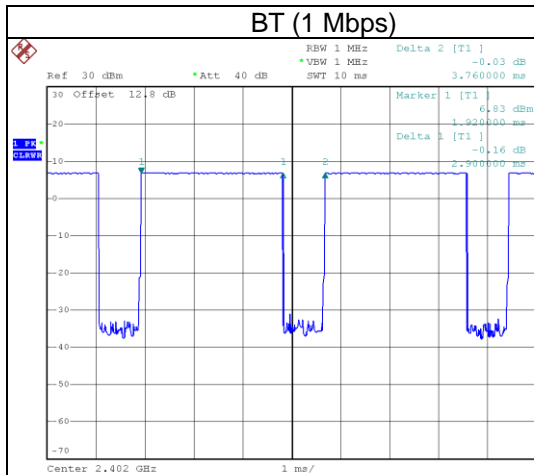
1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Environment Condition	Test Voltage	Tested by
AC Power Line Conducted Emissions	22 °C, 54 %	AC 120V	Cora Lin
Radiated emissions below 1 GHz	Refer to data	AC 120V	Mark Wang
Radiated emissions above 1 GHz	Refer to data	AC 120V	Mark Wang
Number of Hopping Frequency	24.5 °C, 53 %	AC 120V	Jay Tien
Average Time of Occupancy	24.5 °C, 53 %	AC 120V	Jay Tien
Hopping Channel Separation	24.5 °C, 53 %	AC 120V	Jay Tien
Bandwidth	24.5 °C, 53 %	AC 120V	Jay Tien
Output Power	24.5 °C, 53 %	AC 120V	Jay Tien
Antenna conducted Spurious Emission	24.5 °C, 53 %	AC 120V	Jay Tien

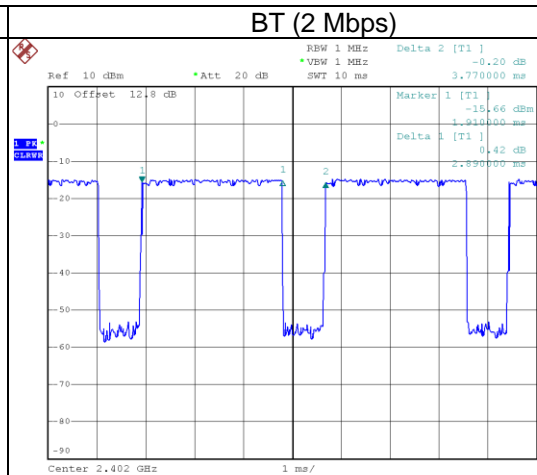
1.4 DUTY CYCLE

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

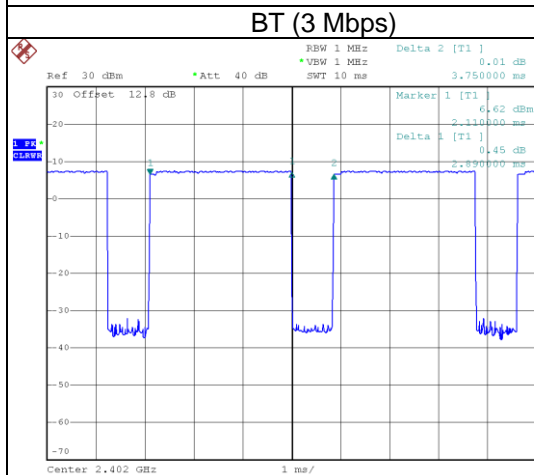
Remark	Delta 1			Delta 2	On Time/Period	10 log(1/Duty Cycle)
Mode	ON (ms)	Numbers (ON)	On Time (B) (ms)	Period (ON+OFF) (ms)	Duty Cycle (%)	Duty Factor (dB)
BT (1 Mbps)	2.900	1	2.900	3.760	77.13%	1.13
BT (2 Mbps)	2.890	1	2.890	3.770	76.66%	1.15
BT (3 Mbps)	2.890	1	2.890	3.750	77.07%	1.13



Date: 19.JUN.2023 19:04:08



Date: 20.JUN.2023 22:17:44



Date: 20.JUN.2023 22:19:27

2 GENERAL INFORMATION

2.1 DESCRIPTION OF EUT

Equipment	Smart Video Intercom - L
Model Name	CAPXLV2
Brand Name	Liftmaster
Model Difference	N/A
Power Source	1. DC voltage supplied from AC/DC adapter. 2. DC voltage supplied from PoE.
Power Rating	1. I/P: 100-240V~ 50/60Hz 1.5A O/P: 24.0V---3.0A, 72.0W 2. DC 48V
Products Covered	1 * Adapter: Shenzhen GEAO Technology Co Ltd / QX72W240300D3
Operation Band	2400 MHz ~ 2483.5 MHz
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK, $\pi/4$ -DQPSK, 8DPSK
Modulation Technology	FHSS
Transfer Rate	1 Mbps, 2 Mbps, 3Mbps
Output Power Max.	1 Mbps: 6.53 dBm (0.0045 W) 2 Mbps: 7.67 dBm (0.0058 W) 3 Mbps: 7.74 dBm (0.0059 W)
Operating Software	PuTTY Release 0.62
Test Model	CAPXLV2
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)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480

25	2427	52	2454		
26	2428	53	2455		

(3) Table for Filed Antenna:

Group I:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)
External antenna	Radiation Technology, Inc.	C0289-ANG0011	Dipole	SMA	2.94

Group II:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)
Built-in antenna	Quectel	YF0011RA	FPC	I-PEX	3.1

NOTE: The EUT includes two groups of antenna, for Radiated External antenna and Built-in antenna are evaluated, for other test items only the worst case Built-in antenna is recorded.

- (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)	3 Mbps	78	-
Transmitter Radiated Emissions (above 1GHz)	1/3 Mbps	00/78	Bandedge
	1/3 Mbps	00/39/78	Harmonic
Number of Hopping Frequency	1/3 Mbps	00~78	-
Average Time of Occupancy	1/3 Mbps	00/39/78	-
Hopping Channel Separation	1/3 Mbps	00/39/78	-
Bandwidth	1/3 Mbps	00/39/78	-
Peak Output Power	1/2/3 Mbps	00/39/78	-
Antenna conducted Spurious Emission	1/3 Mbps	00/39/78	-

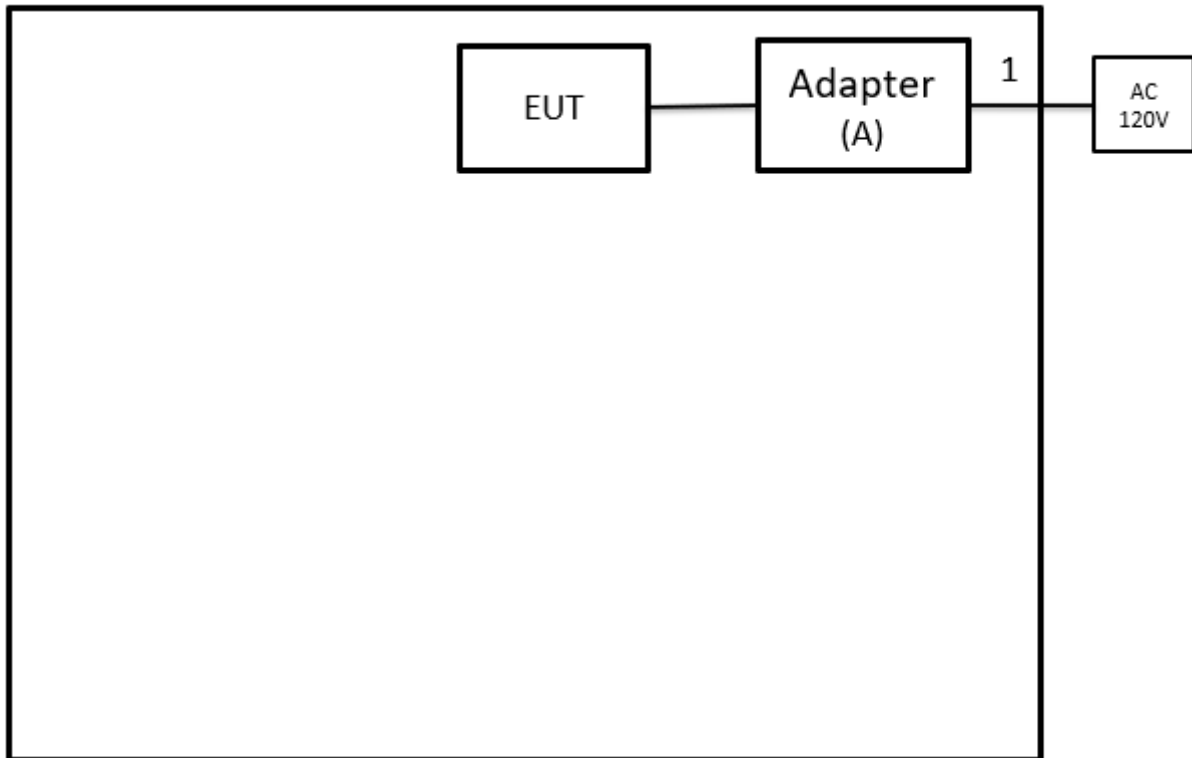
NOTE:

- (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.
- (3) For AC Power line conducted emissions and transmitter radiated emissions (below 1GHz), POE mode and adapter mode are evaluated, adapter mode is found to be the worst case and used for final test.
- (4) For AC Power line conducted emissions and transmitter radiated emissions (below 1GHz), both POE mode and adapter mode are evaluated. For the other test item, only adapter mode is used.

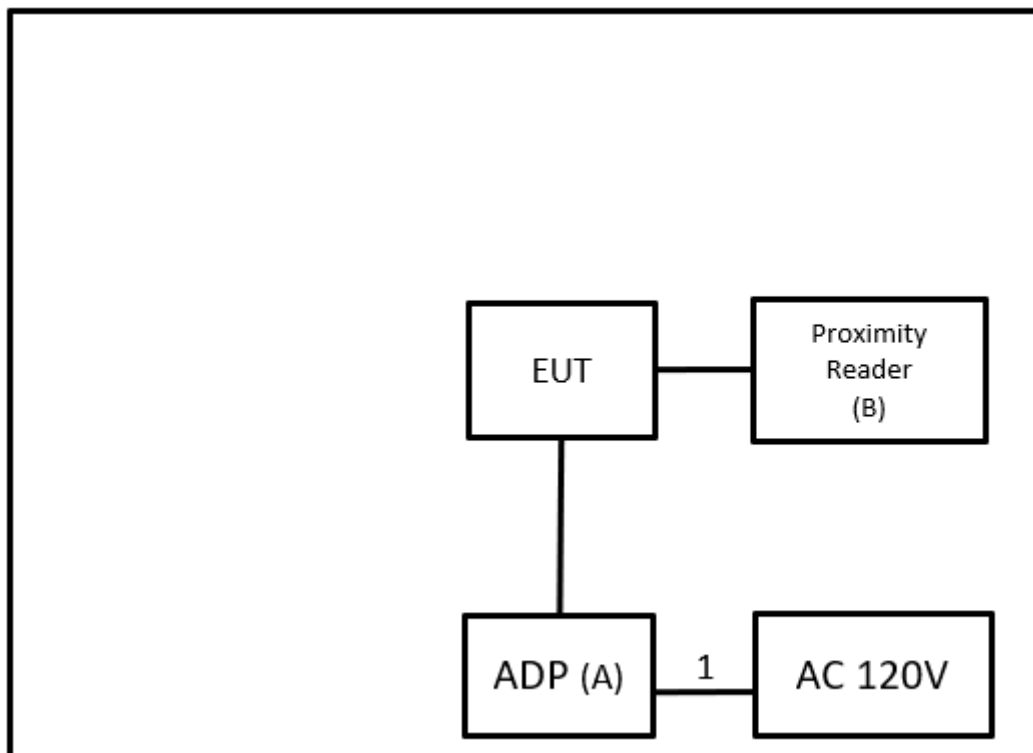
2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

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

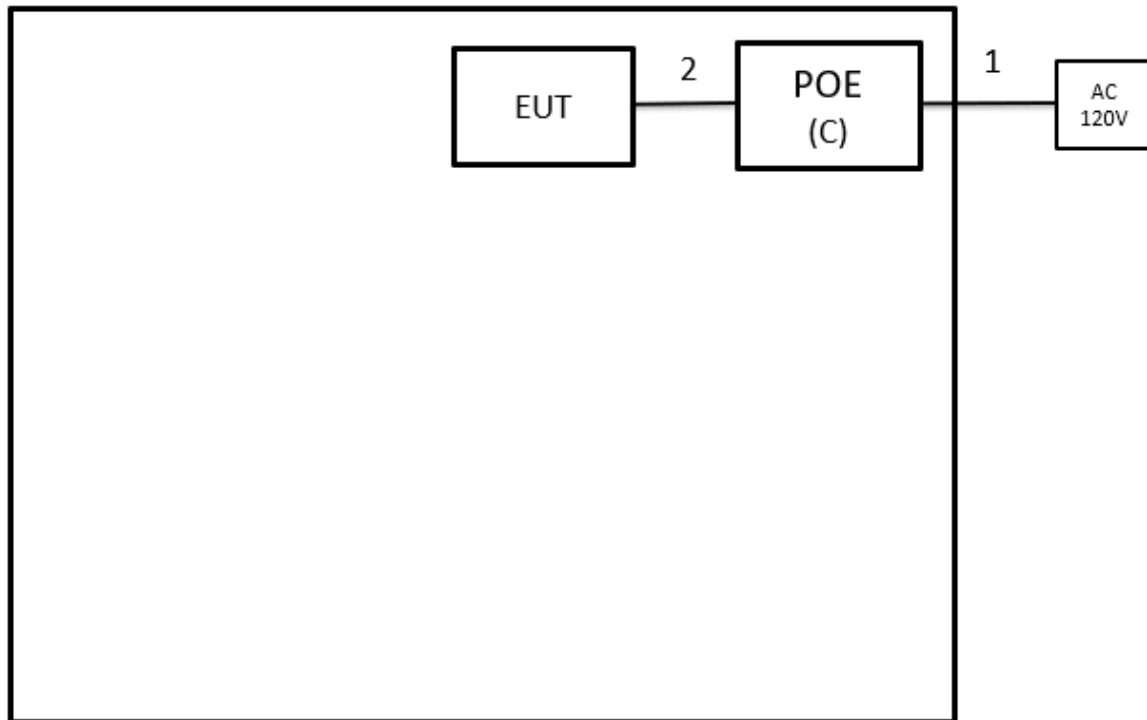
Adapter Mode
AC power line conducted emissions



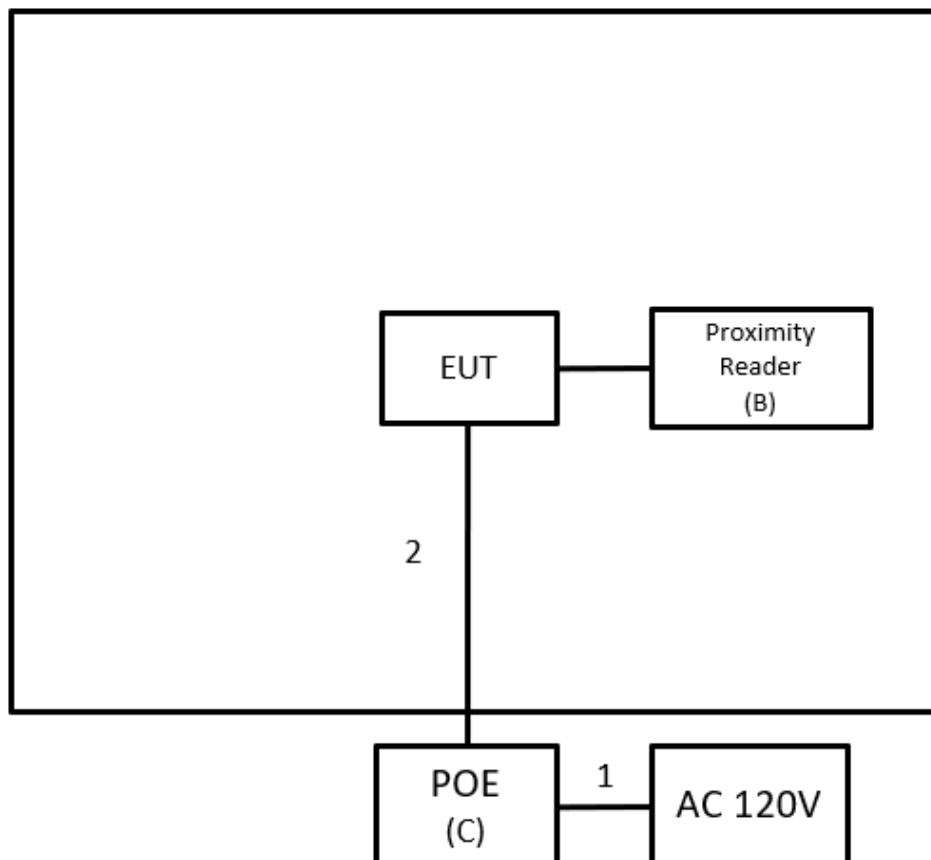
Radiated Emissions



POE Mode
AC power line conducted emissions



Radiated Emissions (below 1GHz)



2.4 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.	Remarks
A	Adapter	Shenzhen GEAO Technology Co Ltd	QX72W240300D3	N/A	Supplied by test requester.
B	Proximity Reader	AWID	SR-2400	N/A	Supplied by test requester.
C	POE	HUAWEI	PoE35-54A	N/A	Furnished by test lab.

Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	No	No	1.1m	Power Cord	Supplied by test requester.
2	No	No	10m	RJ45 Cable	Furnished by test lab.

3 AC POWER LINE CONDUCTED EMISSIONS TEST

3.1 LIMIT

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

NOTE:

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

Reading Level		Correct Factor		Measurement Value
38.22	+	3.45	=	41.67

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

The following table is the setting of the receiver.

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

3.2 TEST PROCEDURE

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

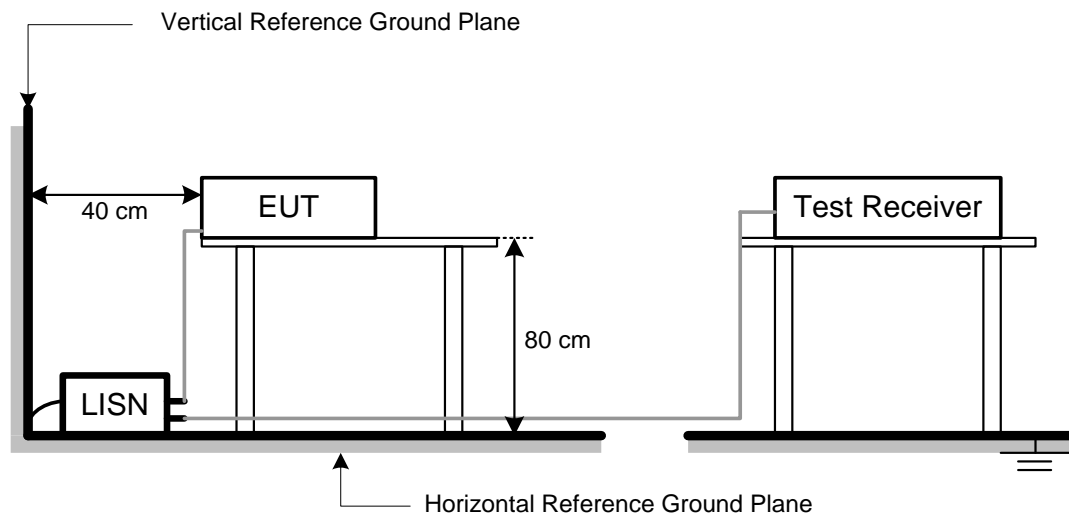
NOTE:

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

3.3 DEVIATION FROM TEST STANDARD

No deviation.

3.4 TEST SETUP



3.5 TEST RESULT

Please refer to the APPENDIX A.

4 RADIATED EMISSIONS TEST

4.1 LIMIT

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

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

LIMITS OF RADIATED EMISSIONS MEASUREMENT (Above 1000 MHz)

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

NOTE:

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

Measurement Value = Reading Level + Correct Factor

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

Margin Level = Measurement Value - Limit Value

Calculation example:

Reading Level		Correct Factor		Measurement Value
35.45	+	-11.37	=	24.08

Measurement Value		Limit Value		Margin Level
24.08	-	40	=	-15.92

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

Mode	VBW(Hz)
BT (1M)	360
BT (2M)	360
BT (3M)	360

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

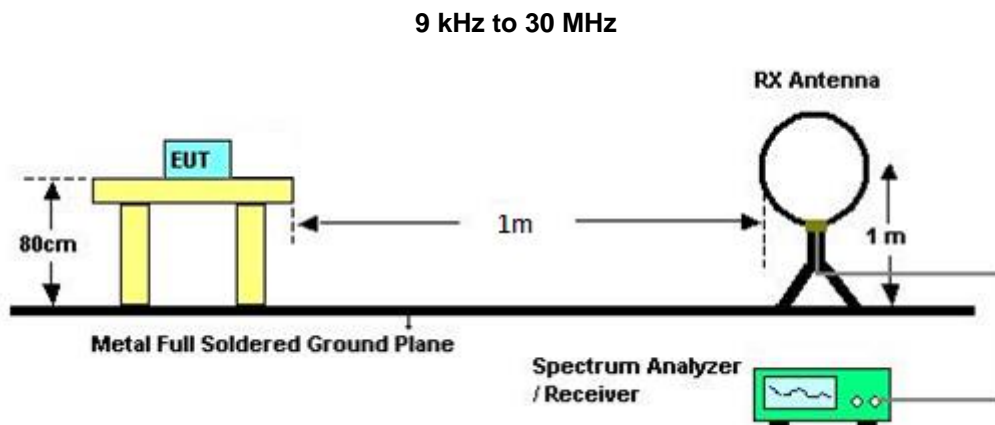
4.2 TEST PROCEDURE

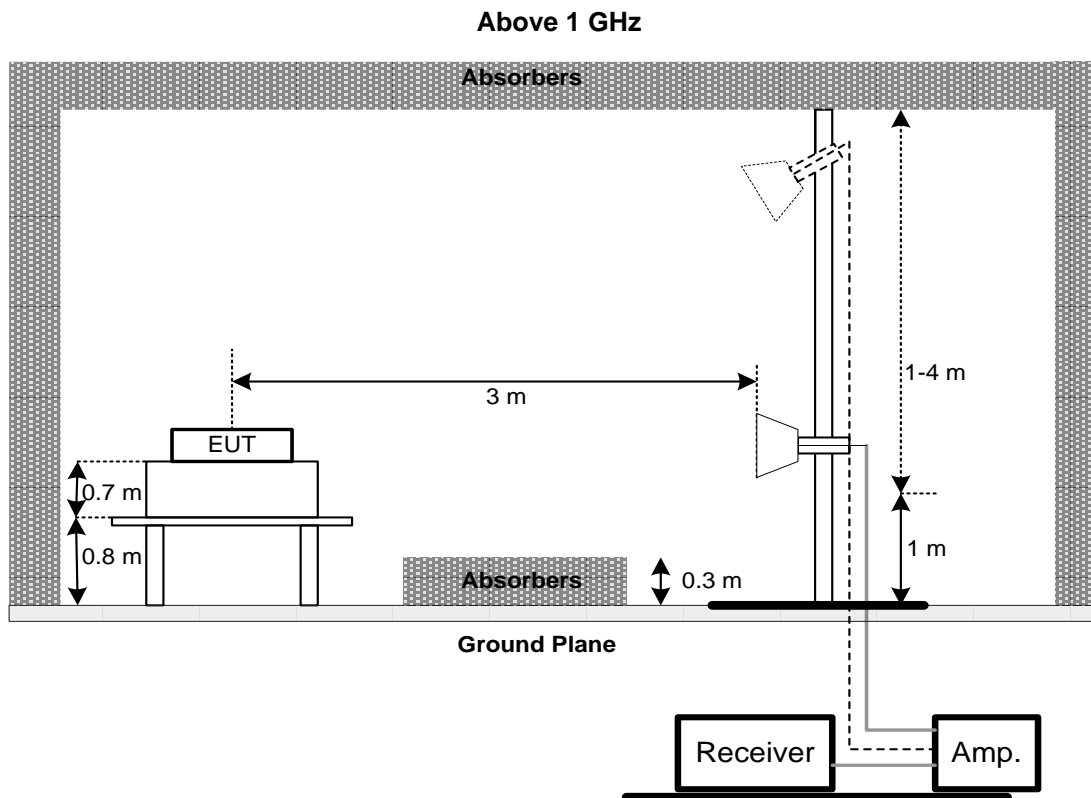
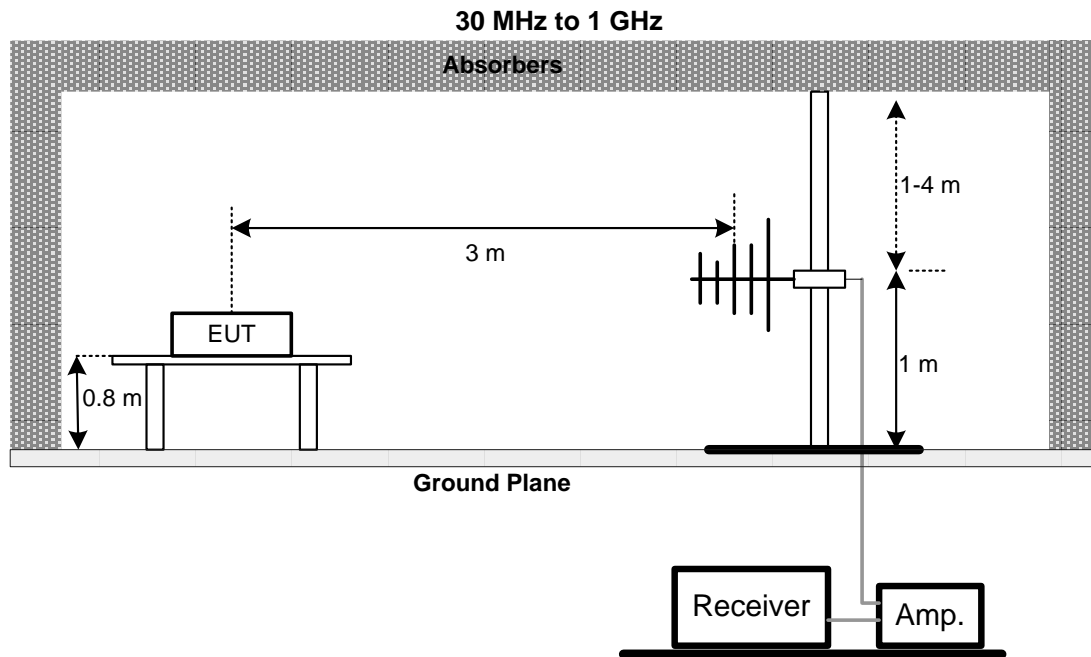
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The measuring distance of 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)
- 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.
- 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).
- 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.
- 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.
- 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)
- 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)
- 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 – BELOW 30 MHZ

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

4.7 TEST RESULT – 30 MHZ TO 1 GHZ

Please refer to the APPENDIX B.

4.8 TEST RESULT – ABOVE 1 GHZ

Please refer to the APPENDIX C.

NOTE:

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

5 NUMBER OF HOPPING CHANNEL

5.1 APPLIED PROCEDURES

Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(1)(iii)	Number of Hopping Channel	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RBW	100 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

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=100KHz, Sweep time = Auto.

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 D.

6 AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

6.2 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyzer
- Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.
- Set the EUT for DH5, DH3 and DH1 packet transmitting.
- Measure the maximum time duration of one single pulse.
- Measure the maximum time duration of one single pulse.

A Period Time = (channel number)*0.4

For Normal Mode (79 Channel):

DH1 Time Solt: Reading * (1600/2)*31.6/(channel number)

DH3 Time Solt: Reading * (1600/2)*31.6/(channel number)

DH5 Time Solt: Reading * (1600/2)*31.6/(channel number)

For AFH Mode (20 Channel):

DH1 Time Solt: Reading * (1600/2)*8/(channel number)

DH3 Time Solt: Reading * (1600/4)*8/(channel number)

DH5 Time Solt: Reading * (1600/6)*8/(channel number)

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 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.

6.6 TEST RESULTS

Please refer to the APPENDIX E.

7 Hopping Channel Separation Measurement

7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 KHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

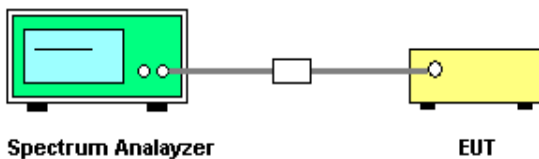
7.2 TEST PROCEDURE

- a. The EUT must have its hopping function enabled
- b. Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) \geq 1% of the span
Video (or Average) Bandwidth (VBW) \geq RBW
Sweep = Auto
Detector function = Peak
Trace = Max Hold

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 TEST RESULTS

Please refer to the APPENDIX F.

8 BANDWIDTH TEST

8.1 APPLIED PROCEDURES

Section	Test Item	Frequency Range (MHz)
15.247(a)(2)	Bandwidth	2400-2483.5

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz (20dB Bandwidth) / 30 KHz (Channel Separation)
VBW	100 KHz (20dB Bandwidth) / 100 KHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

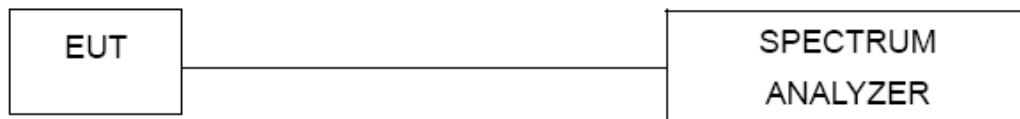
8.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep Time = Auto.

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 G.

9 OUTPUT POWER TEST

9.1 APPLIED PROCEDURES / LIMIT

Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1)	Peak Output Power	0.125Watt or 21dBm	2400-2483.5	PASS

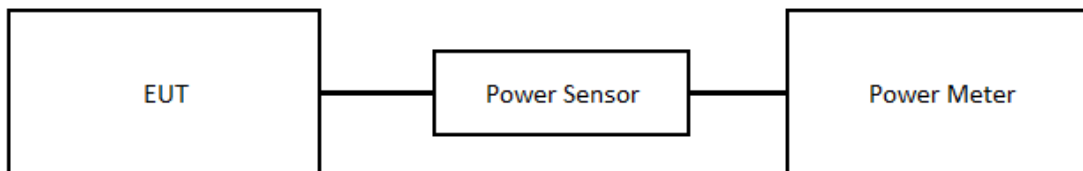
9.2 TEST PROCEDURE

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

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



9.5 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.

9.6 TEST RESULTS

Please refer to the APPENDIX H.

10 ANTENNA CONDUCTED SPURIOUS EMISSION

10.1 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.

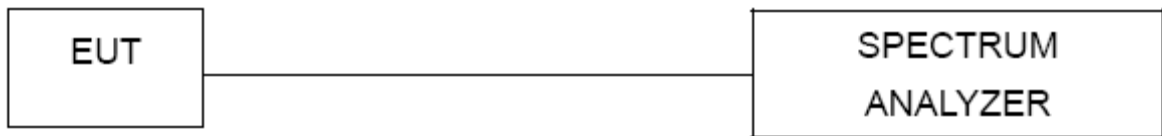
10.2 TEST PROCEDURE

- 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=100KHz, Sweep time = Auto.
- Offset=antenna gain+cable loss

10.3 DEVIATION FROM STANDARD

No deviation.

10.4 TEST SETUP



10.5 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.

10.6 TEST RESULTS

Please refer to the APPENDIX I.

11 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	2022/9/28	2023/9/27
2	Test Cable	EMCI	EMCRG58-BM-B M-9000	220331	2023/3/30	2024/3/29
3	EMI Test Receiver	R&S	ESR 7	101433	2022/11/16	2023/11/15
4	Measurement Software	EZ	EZ EMC (Version NB-03A1-01)	N/A	N/A	N/A

Radiated Emissions - 30 MHz to 1 GHz						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Preamplifier	EMCI	EMC330N	980850	2022/9/19	2023/9/18
2	Test Cable	EMCI	EMC104-SM-SM-1000	180810	2023/7/10	2024/7/9
3	Test Cable	EMCI	EMC104-SM-SM-3000	220322	2023/3/14	2024/3/13
4	Test Cable	EMCI	EMC104-SM-SM-7000	220324	2023/3/14	2024/3/13
5	EXA Signal Analyzer	keysight	N9020B	MY57120120	2023/2/24	2024/2/23
6	Log-bicon Antenna	Schwarzbeck	VULB9168	1369	2023/5/9	2024/5/8
7	6dB Attenuator	EMCI	EMCI-N-6-06	AT-06001	2023/5/9	2024/5/8
8	Measurement Software	EZ	EZ EMC (Version NB-03A1-01)	N/A	N/A	N/A

Radiated Emissions - Above 1 GHz						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Preamplifier	EMCI	EMC330N	980850	2022/9/19	2023/9/18
2	Preamplifier	EMCI	EMC118A45SE	980819	2023/3/7	2024/3/6
3	Pre-Amplifier	EMCI	EMC184045SE	980907	2022/9/28	2023/9/27
4	Preamplifier	EMCI	EMC001340	980579	2022/9/30	2023/9/29
5	Test Cable	EMCI	EMC104-SM-SM-1000	220319	2023/3/14	2024/3/13
6	Test Cable	EMCI	EMC104-SM-SM-1000	180810	2023/7/10	2024/7/9
7	Test Cable	EMCI	EMC104-SM-SM-3000	220322	2023/3/14	2024/3/13
8	Test Cable	EMCI	EMC104-SM-SM-7000	220324	2023/3/14	2024/3/13
9	EXA Signal Analyzer	keysight	N9020B	MY57120120	2023/2/24	2024/2/23
10	Loop Ant	Electro-Metrics	EMCI-LPA600	291	2022/9/19	2023/9/18
11	Horn Antenna	RFSPIN	DRH18-E	211202A18EN	2023/5/12	2024/5/11
12	Horn Ant	Schwarzbeck	BBHA 9170D	1136	2023/5/12	2024/5/11
13	Log-bicon Antenna	Schwarzbeck	VULB9168	1369	2023/5/9	2024/5/8
14	6dB Attenuator	EMCI	EMCI-N-6-06	AT-06001	2023/5/9	2024/5/8
15	Test Cable	EMCI	EMC101G-KM-KM-3000	220329	2023/3/14	2024/3/13
16	Test Cable	EMCI	EMC102-KM-KM-1000	220327	2023/3/14	2024/3/13
17	Measurement Software	EZ	EZ EMC (Version NB-03A1-01)	N/A	N/A	N/A

Number of Hopping Frequency						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 40	100129	2022/10/7	2023/10/7

Average Time of Occupancy						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 40	100129	2022/10/7	2023/10/7

Hopping Channel Separation						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 40	100129	2022/10/7	2023/10/7

Bandwidth						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 40	100129	2022/10/7	2023/10/7

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

Antenna conducted Spurious Emission						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP 40	100129	2022/10/7	2023/10/7

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

12 EUT TEST PHOTO

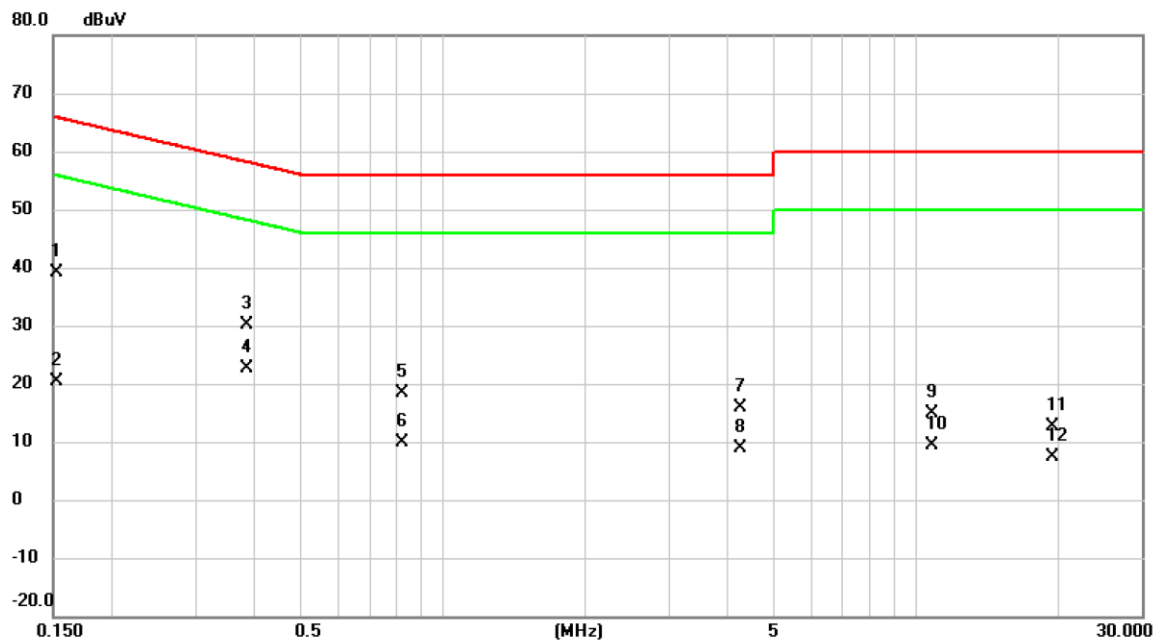
Please refer to document Appendix No.: TP-2303T057-FCCP-1 (APPENDIX-TEST PHOTOS).

13 EUT PHOTOS

Please refer to document Appendix No.: EP-2303T057-2 (APPENDIX-EUT PHOTOS).

APPENDIX A AC POWER LINE CONDUCTED EMISSIONS

Test Mode	Normal	Tested Date	2023/6/15
Test Frequency	-	Phase	Line

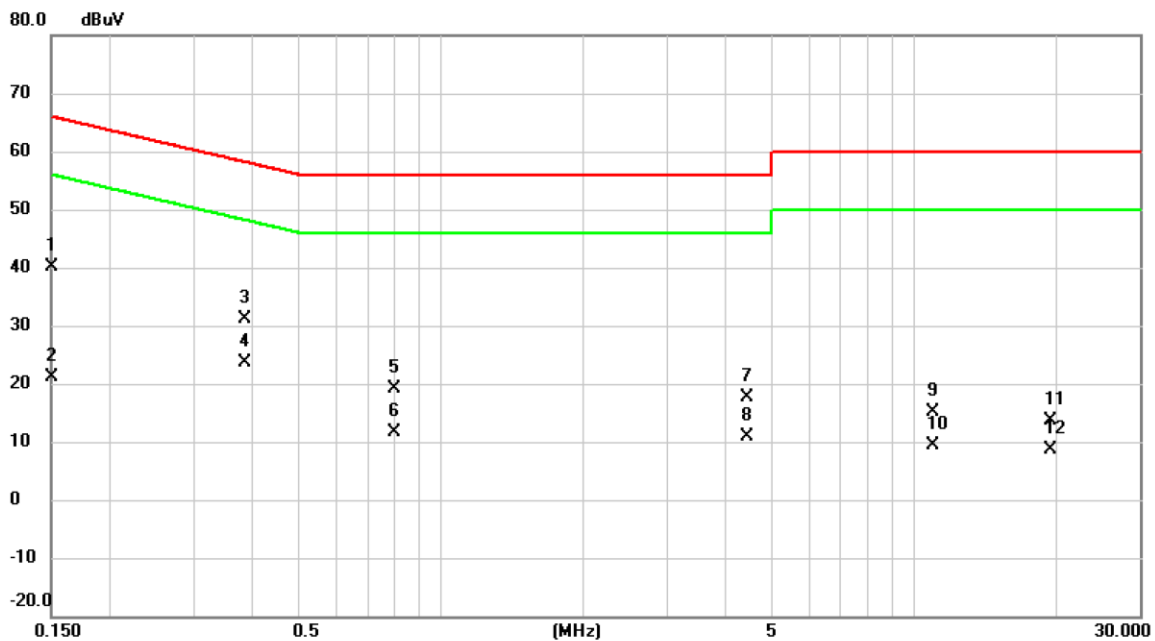


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1522	39.08	0.04	39.12	65.88	-26.76	QP	
2		0.1522	20.30	0.04	20.34	55.88	-35.54	AVG	
3		0.3840	30.19	0.02	30.21	58.19	-27.98	QP	
4	*	0.3840	22.51	0.02	22.53	48.19	-25.66	AVG	
5		0.8205	18.43	0.01	18.44	56.00	-37.56	QP	
6		0.8205	9.86	0.01	9.87	46.00	-36.13	AVG	
7		4.2585	15.94	0.05	15.99	56.00	-40.01	QP	
8		4.2585	8.89	0.05	8.94	46.00	-37.06	AVG	
9		10.8195	14.85	0.12	14.97	60.00	-45.03	QP	
10		10.8195	9.32	0.12	9.44	50.00	-40.56	AVG	
11		19.4888	12.53	0.18	12.71	60.00	-47.29	QP	
12		19.4888	7.17	0.18	7.35	50.00	-42.65	AVG	

REMARKS:

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

Test Mode	Normal	Tested Date	2023/6/15
Test Frequency	-	Phase	Neutral

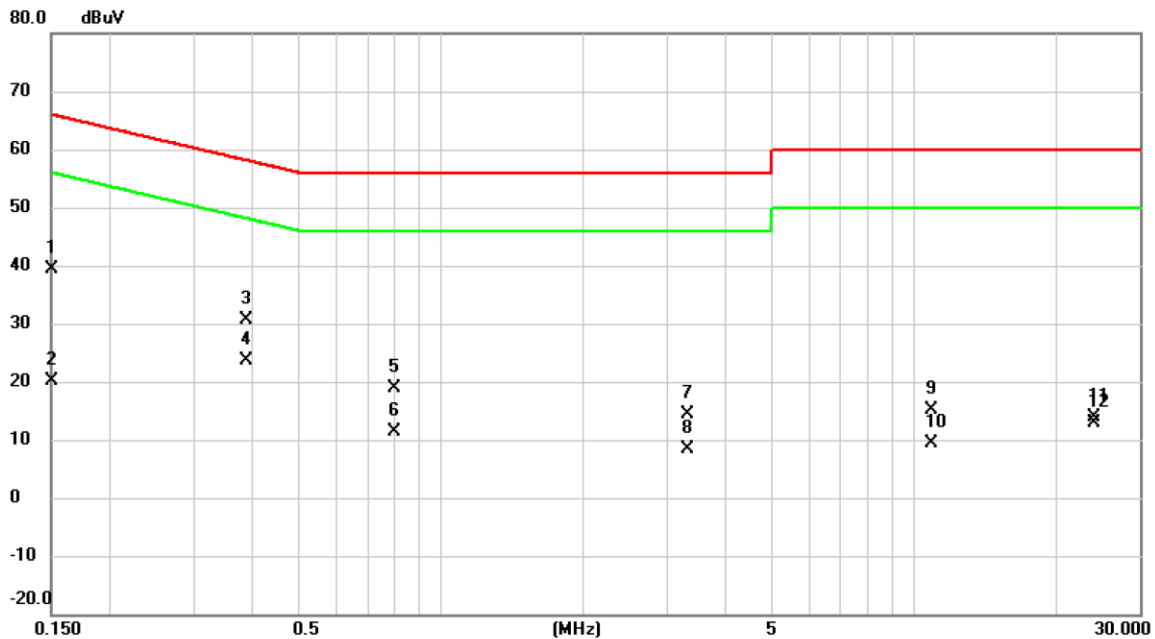


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1500	40.05	0.04	40.09	66.00	-25.91	QP	
2		0.1500	21.16	0.04	21.20	56.00	-34.80	AVG	
3		0.3862	31.07	0.02	31.09	58.15	-27.06	QP	
4	*	0.3862	23.66	0.02	23.68	48.15	-24.47	AVG	
5		0.7980	19.12	0.01	19.13	56.00	-36.87	QP	
6		0.7980	11.53	0.01	11.54	46.00	-34.46	AVG	
7		4.4340	17.69	0.05	17.74	56.00	-38.26	QP	
8		4.4340	10.85	0.05	10.90	46.00	-35.10	AVG	
9		10.9748	15.08	0.13	15.21	60.00	-44.79	QP	
10		10.9748	9.33	0.13	9.46	50.00	-40.54	AVG	
11		19.4190	13.51	0.18	13.69	60.00	-46.31	QP	
12		19.4190	8.54	0.18	8.72	50.00	-41.28	AVG	

REMARKS:

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

Test Mode	Idle	Tested Date	2023/6/15
Test Frequency	-	Phase	Line

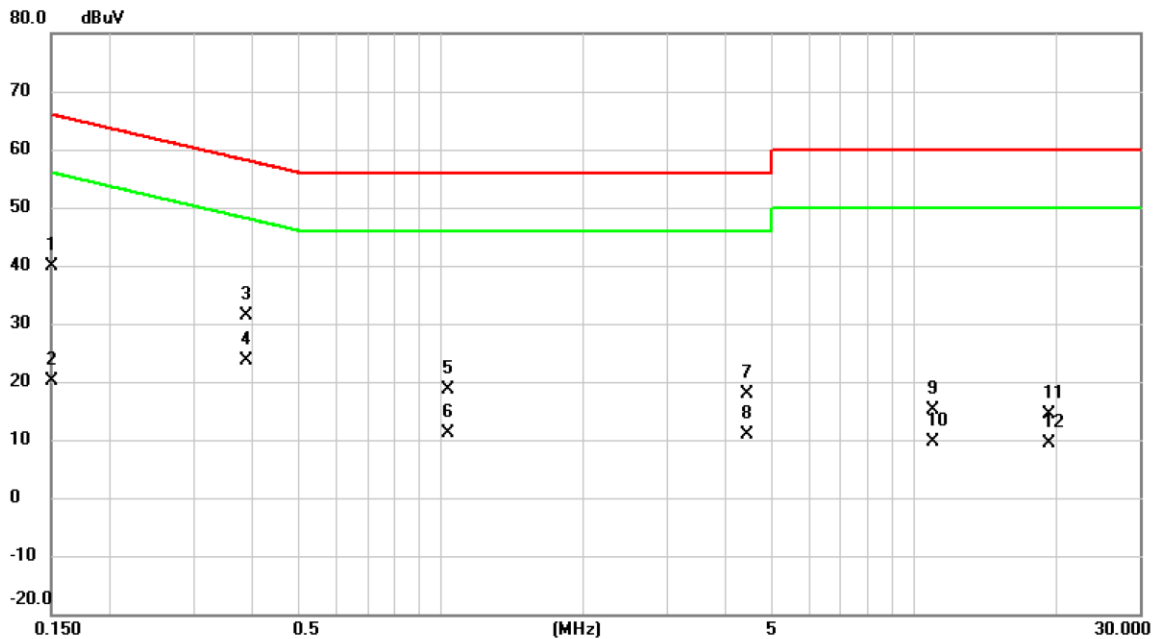


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	39.38	0.04	39.42	66.00	-26.58	QP	
2		0.1500	20.07	0.04	20.11	56.00	-35.89	AVG	
3		0.3885	30.56	0.02	30.58	58.10	-27.52	QP	
4	*	0.3885	23.59	0.02	23.61	48.10	-24.49	AVG	
5		0.7957	18.75	0.01	18.76	56.00	-37.24	QP	
6		0.7957	11.26	0.01	11.27	46.00	-34.73	AVG	
7		3.3203	14.42	0.05	14.47	56.00	-41.53	QP	
8		3.3203	8.35	0.05	8.40	46.00	-37.60	AVG	
9		10.9073	15.07	0.13	15.20	60.00	-44.80	QP	
10		10.9073	9.34	0.13	9.47	50.00	-40.53	AVG	
11		24.0540	13.62	0.23	13.85	60.00	-46.15	QP	
12		24.0540	12.69	0.23	12.92	50.00	-37.08	AVG	

REMARKS:

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

Test Mode	Idle	Tested Date	2023/6/15
Test Frequency	-	Phase	Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1500	39.83	0.04	39.87	66.00	-26.13	QP	
2		0.1500	20.19	0.04	20.23	56.00	-35.77	AVG	
3		0.3885	31.26	0.02	31.28	58.10	-26.82	QP	
4	*	0.3885	23.49	0.02	23.51	48.10	-24.59	AVG	
5		1.0387	18.51	0.01	18.52	56.00	-37.48	QP	
6		1.0387	11.15	0.01	11.16	46.00	-34.84	AVG	
7		4.4385	17.73	0.05	17.78	56.00	-38.22	QP	
8		4.4385	10.87	0.05	10.92	46.00	-35.08	AVG	
9		10.9703	14.89	0.13	15.02	60.00	-44.98	QP	
10		10.9703	9.50	0.13	9.63	50.00	-40.37	AVG	
11		19.2930	14.32	0.18	14.50	60.00	-45.50	QP	
12		19.2930	9.24	0.18	9.42	50.00	-40.58	AVG	

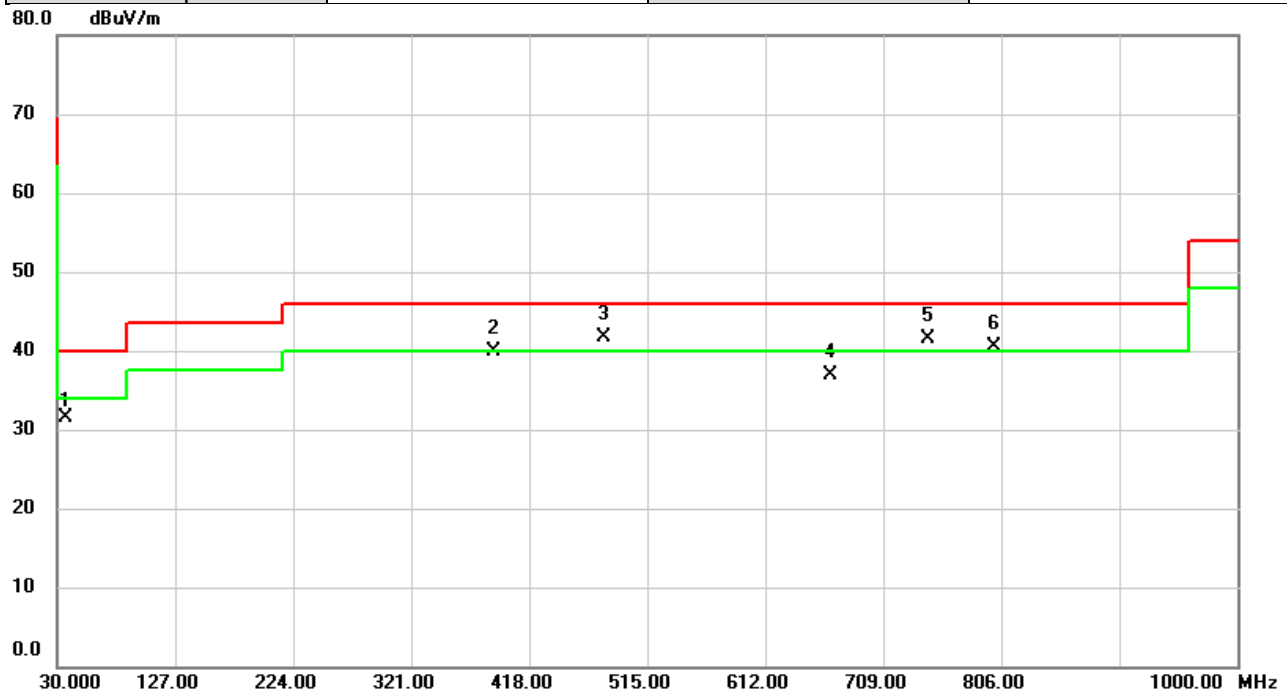
REMARKS:

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

APPENDIX B RADIATED EMISSIONS - 30 MHZ TO 1 GHZ

For External Antenna:

Test Mode	BT (3 Mbps)	Test Date	2023/8/24
Test Frequency	2480MHz	Polarization	Vertical
Temp	25°C	Hum.	57%

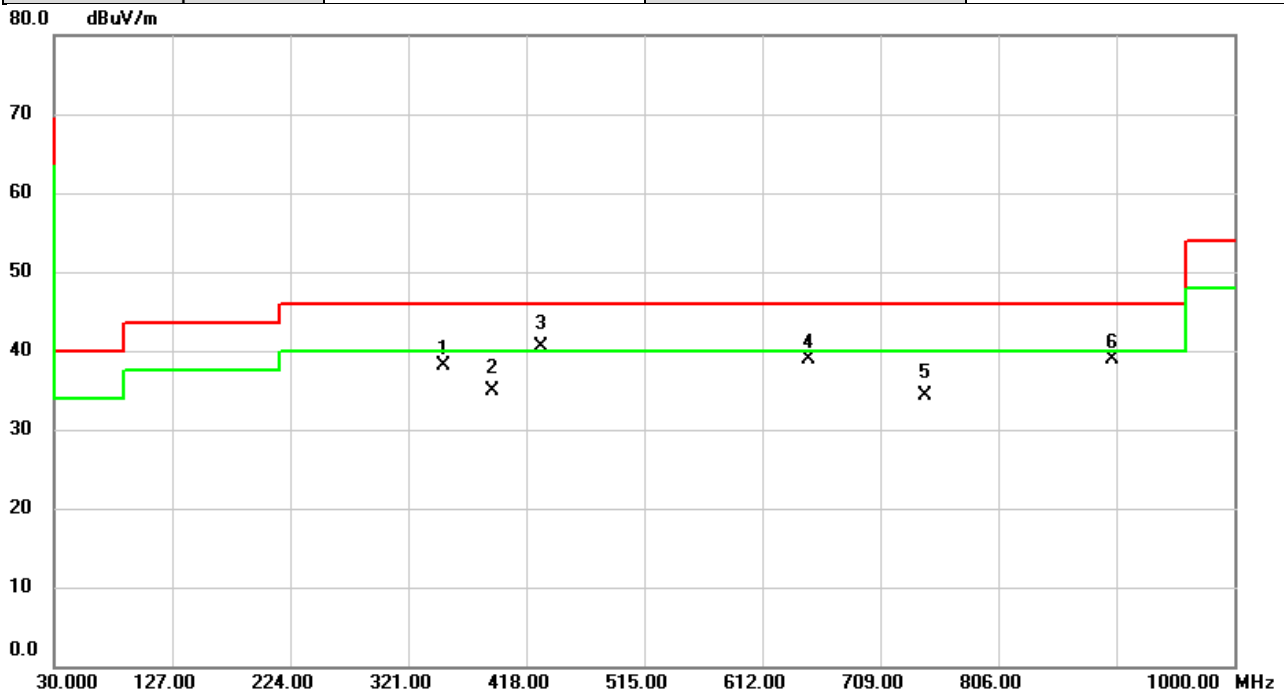


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		37.6953	43.46	-11.99	31.47	40.00	-8.53	peak	
2		388.2857	48.91	-8.92	39.99	46.00	-6.01	QP	
3	*	480.0153	48.24	-6.57	41.67	46.00	-4.33	QP	
4		666.0937	39.83	-2.90	36.93	46.00	-9.07	QP	
5	!	745.6982	42.89	-1.46	41.43	46.00	-4.57	QP	
6	!	799.8567	41.26	-0.79	40.47	46.00	-5.53	QP	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/8/24
Test Frequency	2480MHz	Polarization	Horizontal
Temp	25°C	Hum.	57%



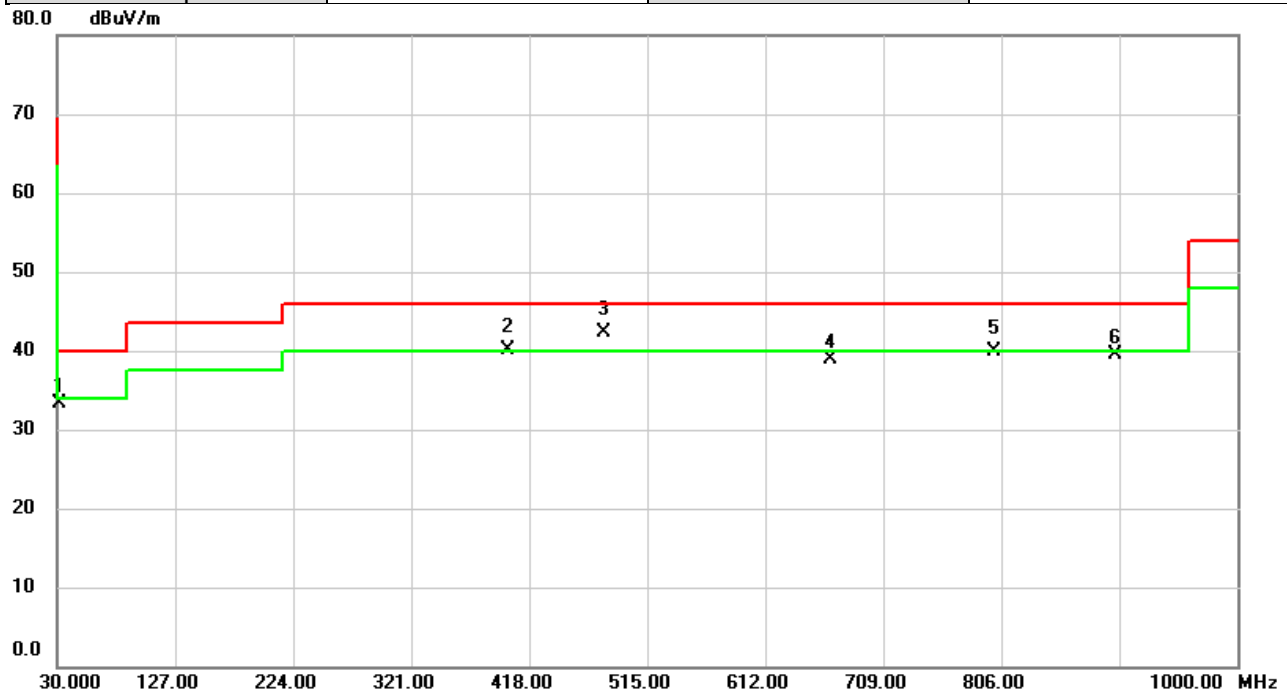
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		350.0030	48.31	-10.12	38.19	46.00	-7.81	peak	
2		390.1610	43.76	-8.87	34.89	46.00	-11.11	QP	
3	*	429.7370	48.24	-7.68	40.56	46.00	-5.44	QP	
4		649.9917	42.02	-3.09	38.93	46.00	-7.07	peak	
5		745.6337	35.76	-1.46	34.30	46.00	-11.70	QP	
6		899.7990	38.42	0.54	38.96	46.00	-7.04	peak	

REMARKS:

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

For Built-in antenna:

Test Mode	BT (3 Mbps)	Test Date	2023/8/24
Test Frequency	2480MHz	Polarization	Vertical
Temp	25°C	Hum.	57%

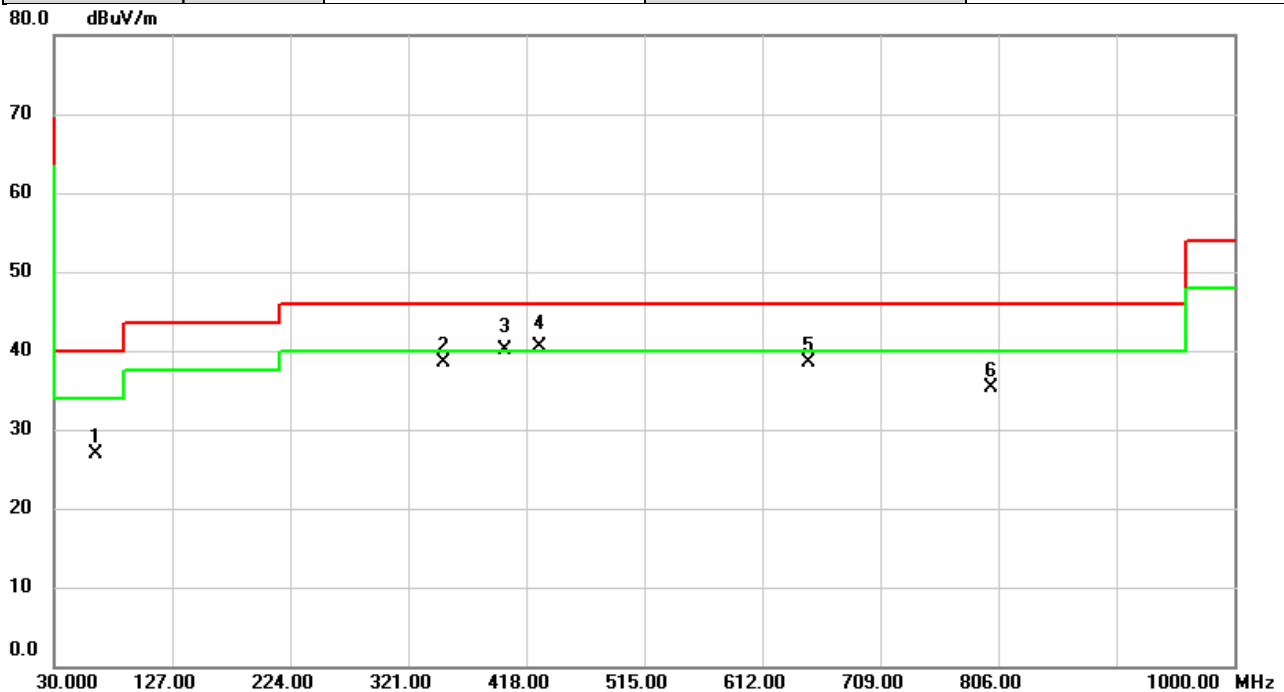


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		32.0693	46.18	-12.95	33.23	40.00	-6.77	peak	
2	!	399.9903	48.60	-8.55	40.05	46.00	-5.95	QP	
3	*	480.0153	48.85	-6.57	42.28	46.00	-3.72	QP	
4		666.0613	41.84	-2.90	38.94	46.00	-7.06	peak	
5		799.8242	40.60	-0.79	39.81	46.00	-6.19	QP	
6		899.8637	38.93	0.54	39.47	46.00	-6.53	peak	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/8/24
Test Frequency	2480MHz	Polarization	Horizontal
Temp	25°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		64.6613	39.77	-12.82	26.95	40.00	-13.05	peak	
2		350.0030	48.56	-10.12	38.44	46.00	-7.56	peak	
3	!	399.9903	48.56	-8.55	40.01	46.00	-5.99	QP	
4	*	428.9610	48.20	-7.69	40.51	46.00	-5.49	QP	
5		649.9917	41.59	-3.09	38.50	46.00	-7.50	peak	
6		799.9213	36.13	-0.79	35.34	46.00	-10.66	peak	

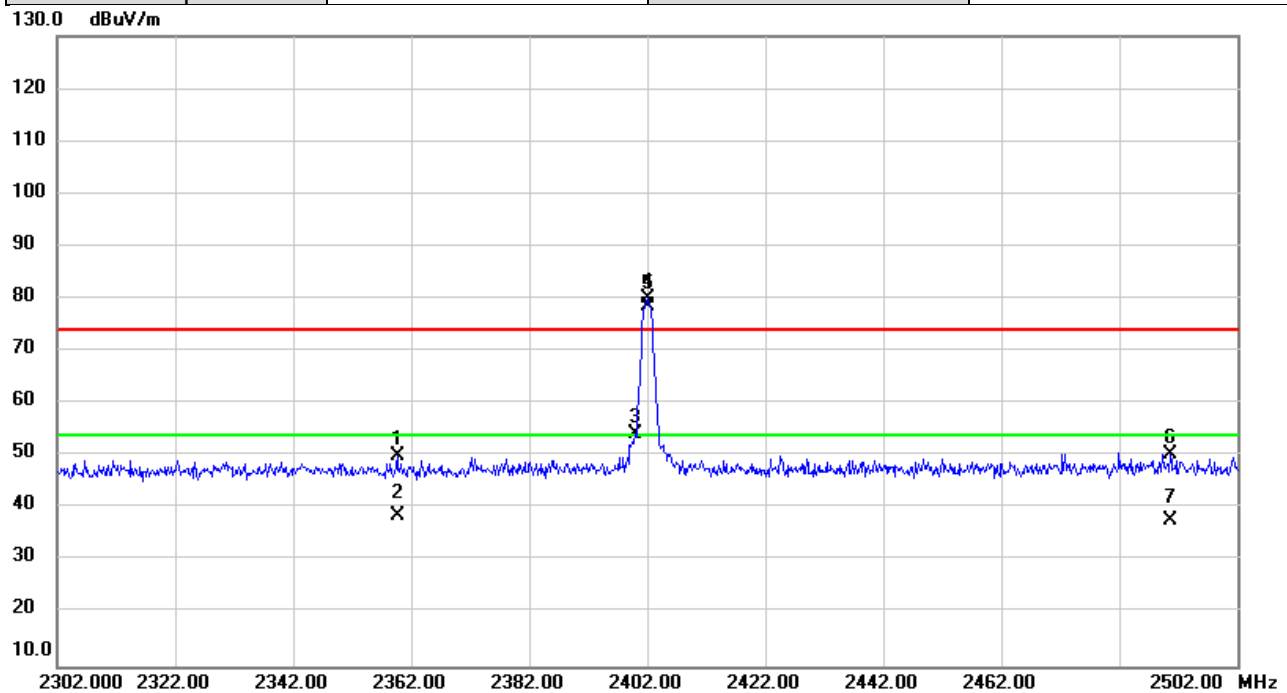
REMARKS:

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

APPENDIX C RADIATED EMISSIONS - ABOVE 1 GHZ

For External Antenna:

Test Mode	BT (1 Mbps)	Test Date	2023/6/27
Test Frequency	2402MHz	Polarization	Horizontal
Temp	25°C	Hum.	50%



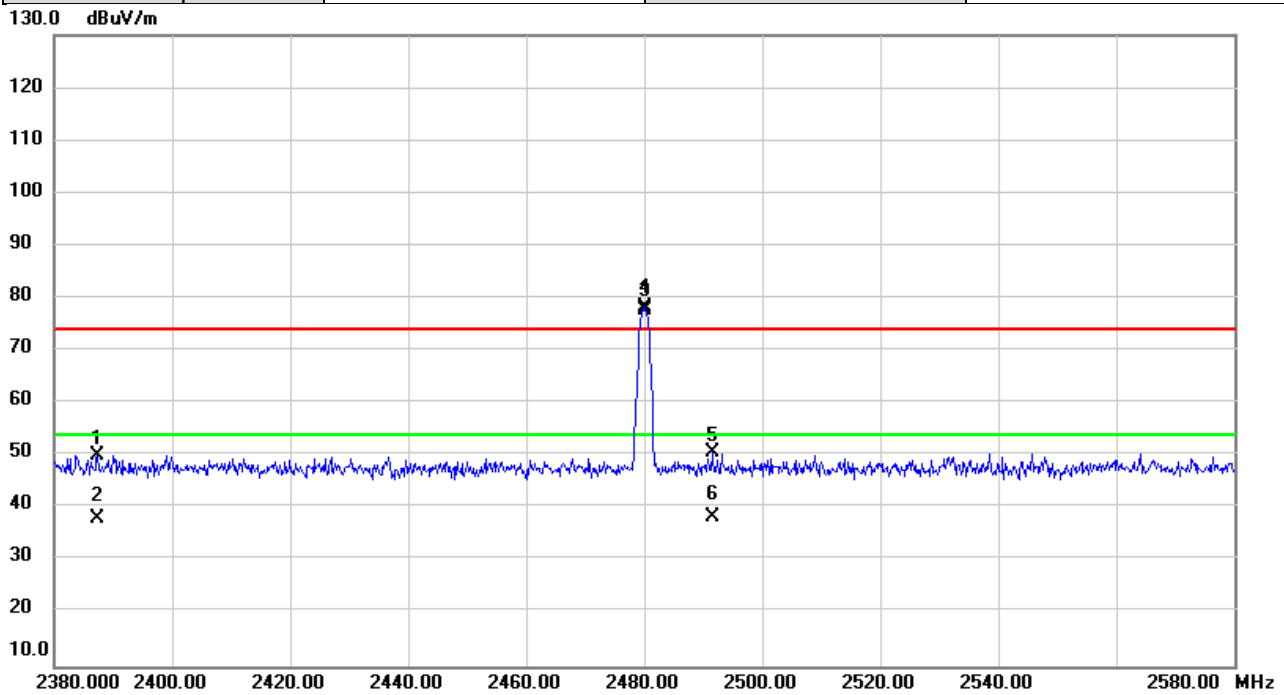
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2359.633	55.33	-5.42	49.91	74.00	-24.09	peak	
2		2359.633	44.17	-5.42	38.75	54.00	-15.25	AVG	
3		2399.987	59.59	-5.37	54.22	74.00	-19.78	peak	No Limit
4	X	2402.000	85.39	-5.36	80.03	74.00	6.03	peak	No Limit
5	*	2402.000	83.87	-5.36	78.51	54.00	24.51	AVG	No Limit
6		2490.780	55.46	-5.20	50.26	74.00	-23.74	peak	
7		2490.780	43.06	-5.20	37.86	54.00	-16.14	AVG	

REMARKS:

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

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/27
Test Frequency	2480MHz	Polarization	Horizontal
Temp	25°C	Hum.	50%

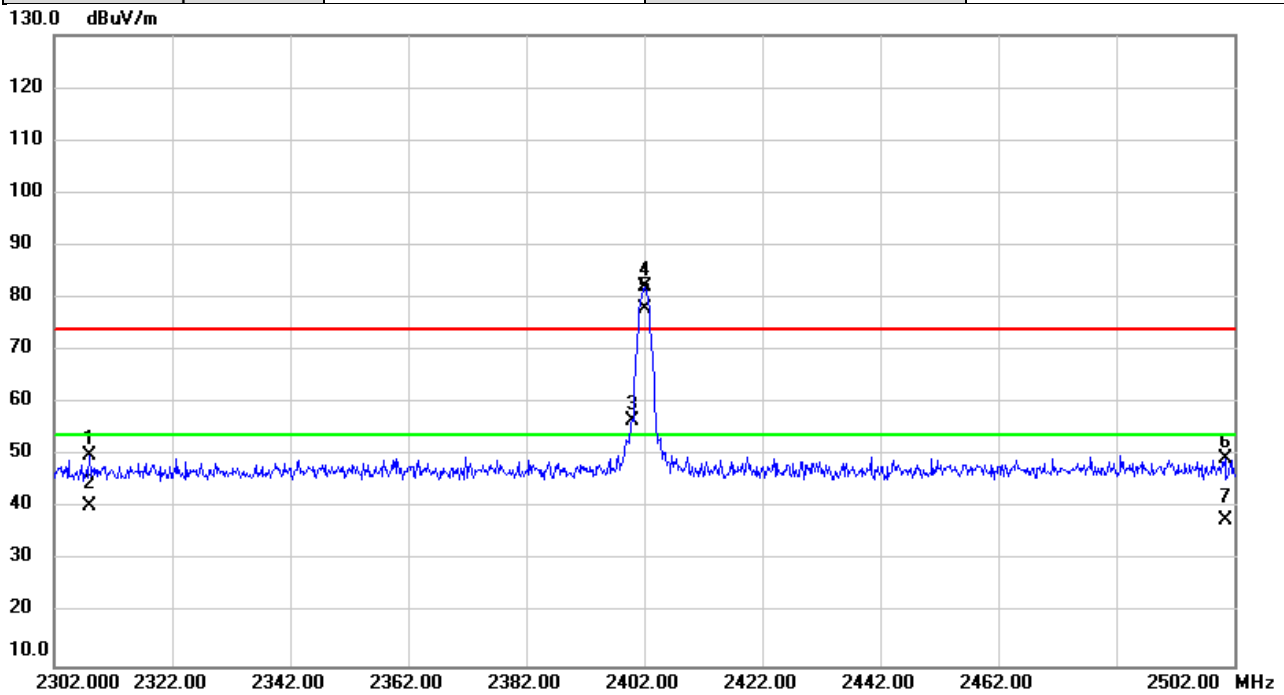


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2387.207	55.40	-5.39	50.01	74.00	-23.99	peak	
2		2387.207	43.34	-5.39	37.95	54.00	-16.05	AVG	
3	X	2480.000	83.42	-5.22	78.20	74.00	4.20	peak	No Limit
4	*	2480.000	82.93	-5.22	77.71	54.00	23.71	AVG	No Limit
5		2491.520	55.93	-5.20	50.73	74.00	-23.27	peak	
6		2491.520	43.44	-5.20	38.24	54.00	-15.76	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/27
Test Frequency	2402MHz	Polarization	Horizontal
Temp	25°C	Hum.	50%

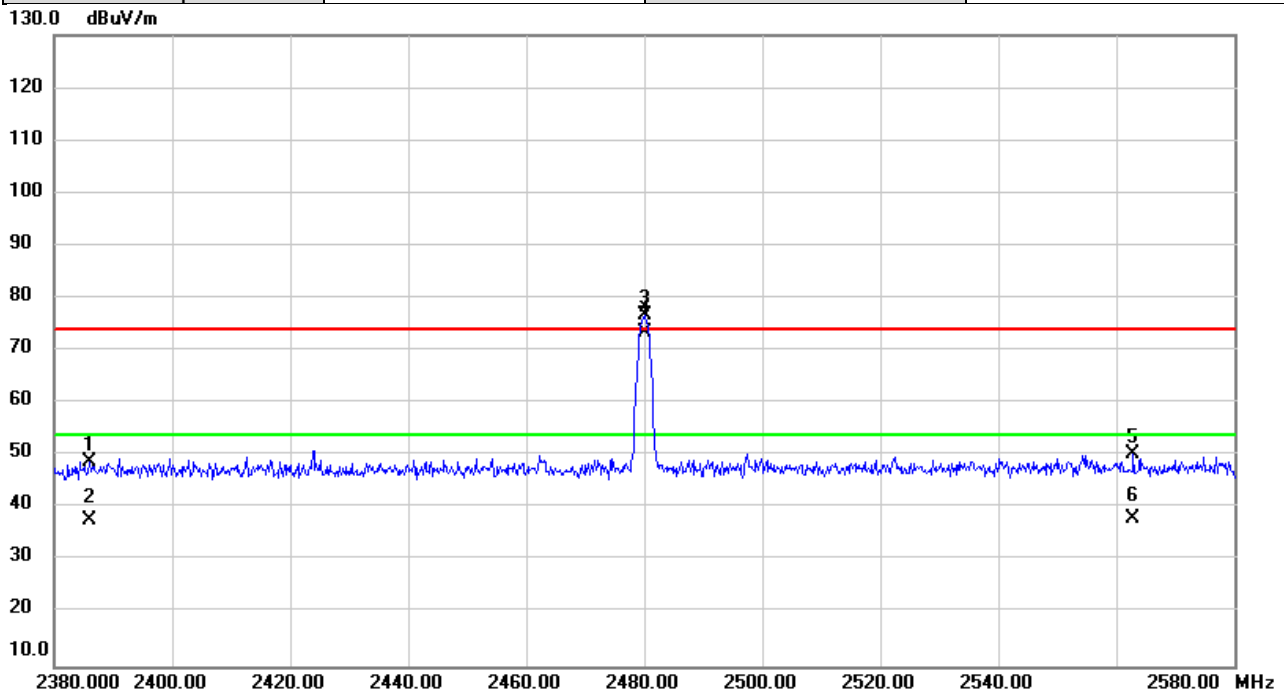


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2308.047	55.50	-5.52	49.98	74.00	-24.02	peak	
2		2308.047	45.89	-5.52	40.37	54.00	-13.63	AVG	
3		2400.000	62.13	-5.37	56.76	74.00	-17.24	peak	No Limit
4	X	2402.000	87.38	-5.36	82.02	74.00	8.02	peak	No Limit
5	*	2402.000	83.43	-5.36	78.07	54.00	24.07	AVG	No Limit
6		2500.447	54.76	-5.19	49.57	74.00	-24.43	peak	
7		2500.447	43.04	-5.19	37.85	54.00	-16.15	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/27
Test Frequency	2480MHz	Polarization	Horizontal
Temp	25°C	Hum.	50%

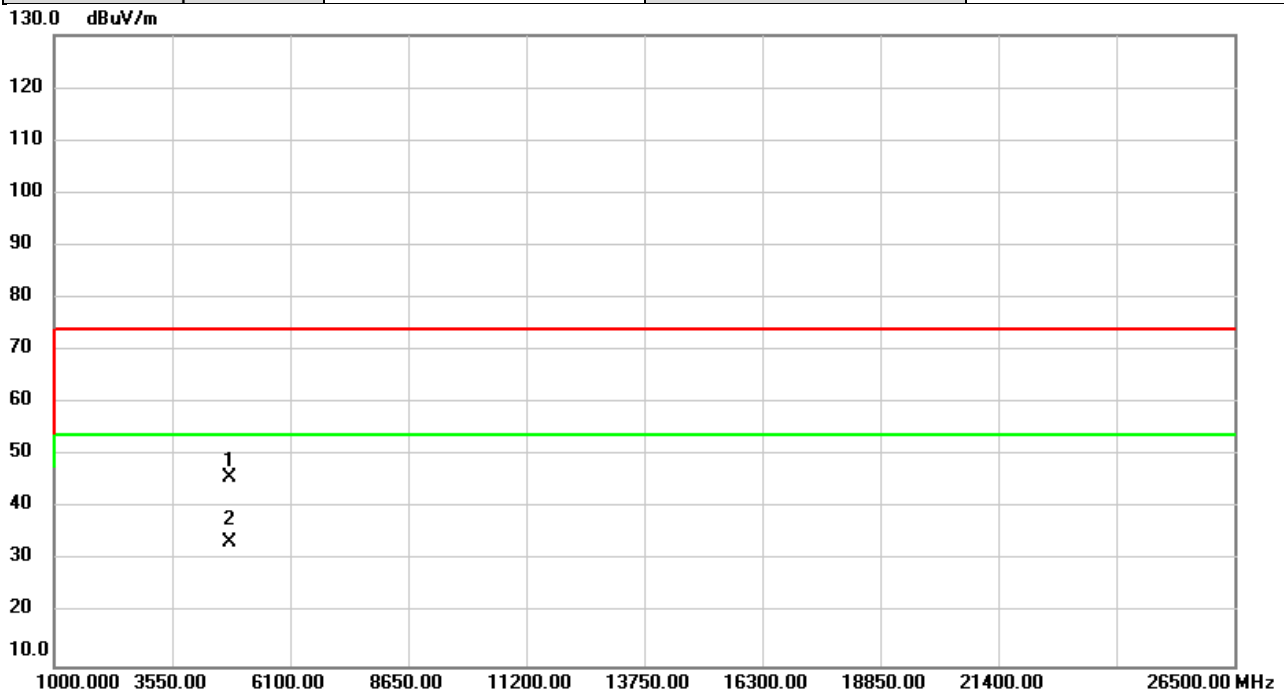


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2385.993	54.16	-5.39	48.77	74.00	-25.23	peak	
2		2385.993	43.22	-5.39	37.83	54.00	-16.17	AVG	
3	X	2480.000	81.98	-5.22	76.76	74.00	2.76	peak	No Limit
4	*	2480.000	78.73	-5.22	73.51	54.00	19.51	AVG	No Limit
5		2562.827	55.39	-4.98	50.41	74.00	-23.59	peak	
6		2562.827	42.93	-4.98	37.95	54.00	-16.05	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/28
Test Frequency	2402MHz	Polarization	Vertical
Temp	25°C	Hum.	51%

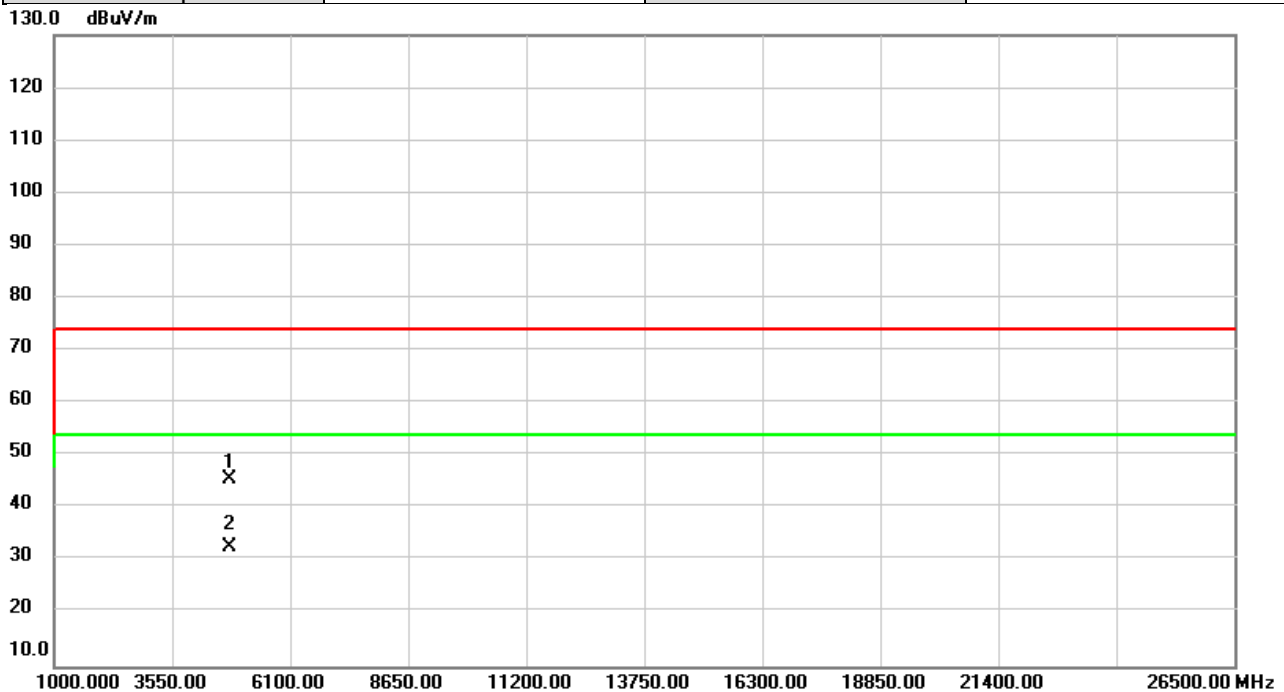


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	45.30	0.53	45.83	74.00	-28.17	peak	
2	*	4804.000	32.91	0.53	33.44	54.00	-20.56	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/28
Test Frequency	2402MHz	Polarization	Horizontal
Temp	25°C	Hum.	51%

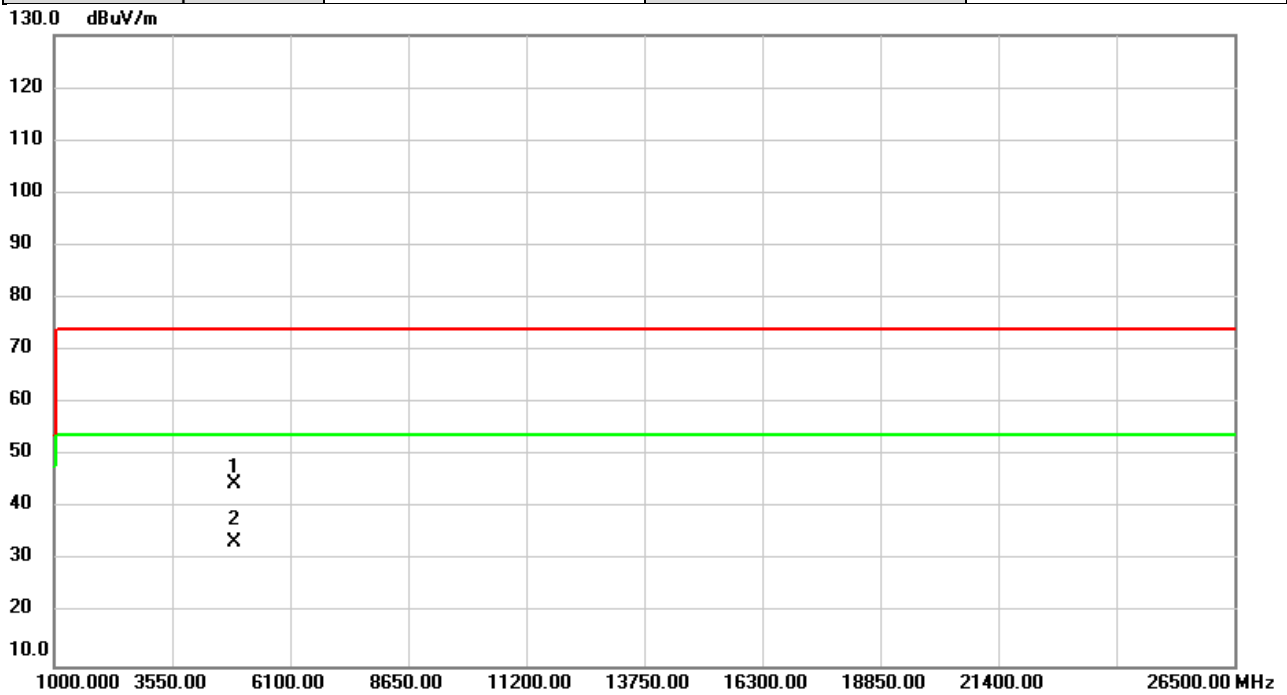


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	44.92	0.53	45.45	74.00	-28.55	peak	
2	*	4804.000	32.19	0.53	32.72	54.00	-21.28	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/28
Test Frequency	2441MHz	Polarization	Vertical
Temp	25°C	Hum.	51%

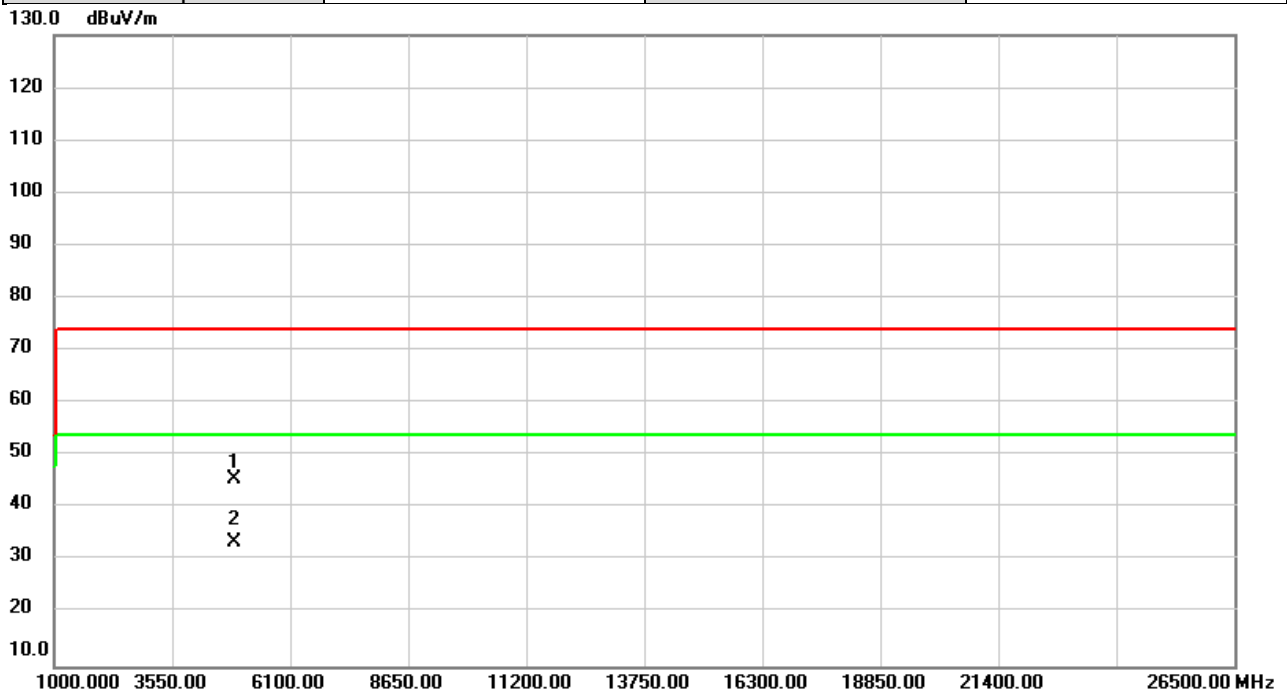


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4882.000	44.03	0.76	44.79	74.00	-29.21	peak	
2	*	4882.000	32.75	0.76	33.51	54.00	-20.49	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/28
Test Frequency	2441MHz	Polarization	Horizontal
Temp	25°C	Hum.	51%

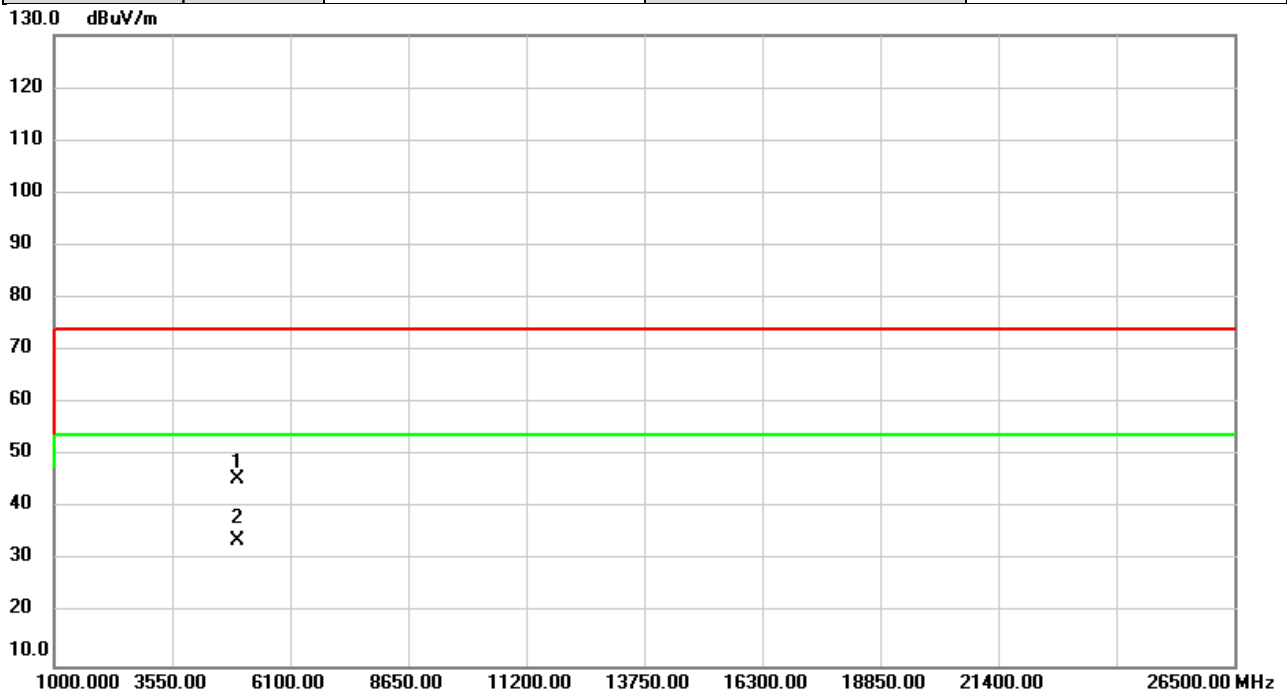


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4882.000	44.82	0.76	45.58	74.00	-28.42	peak	
2	*	4882.000	32.78	0.76	33.54	54.00	-20.46	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/28
Test Frequency	2480MHz	Polarization	Vertical
Temp	25°C	Hum.	51%

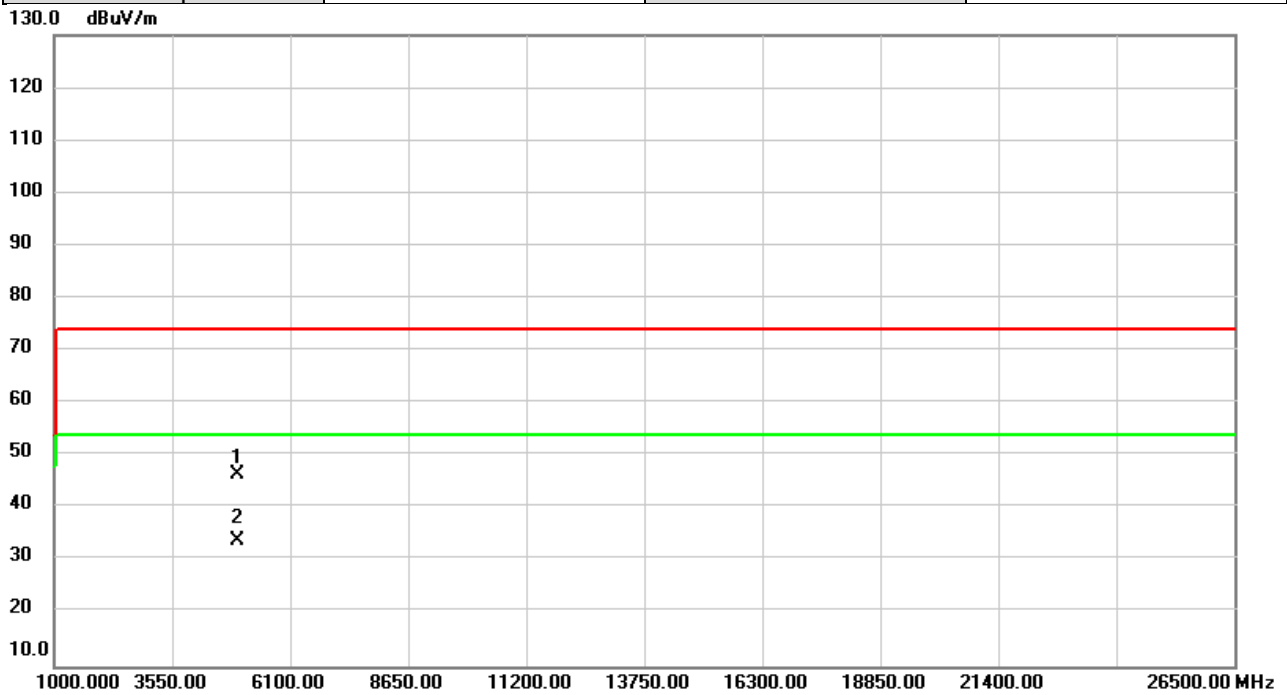


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.000	44.57	1.00	45.57	74.00	-28.43	peak	
2	*	4960.000	32.83	1.00	33.83	54.00	-20.17	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/28
Test Frequency	2480MHz	Polarization	Horizontal
Temp	25°C	Hum.	51%

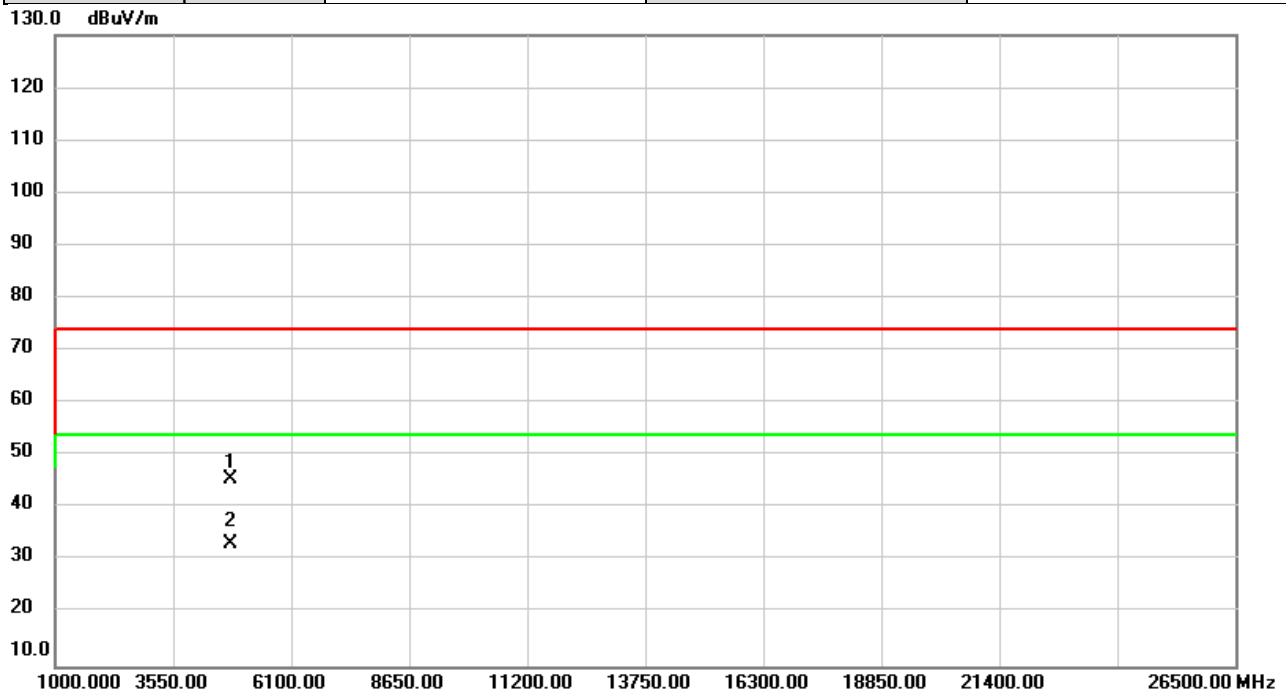


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.000	45.33	1.00	46.33	74.00	-27.67	peak	
2	*	4960.000	32.87	1.00	33.87	54.00	-20.13	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/28
Test Frequency	2402MHz	Polarization	Vertical
Temp	25°C	Hum.	51%

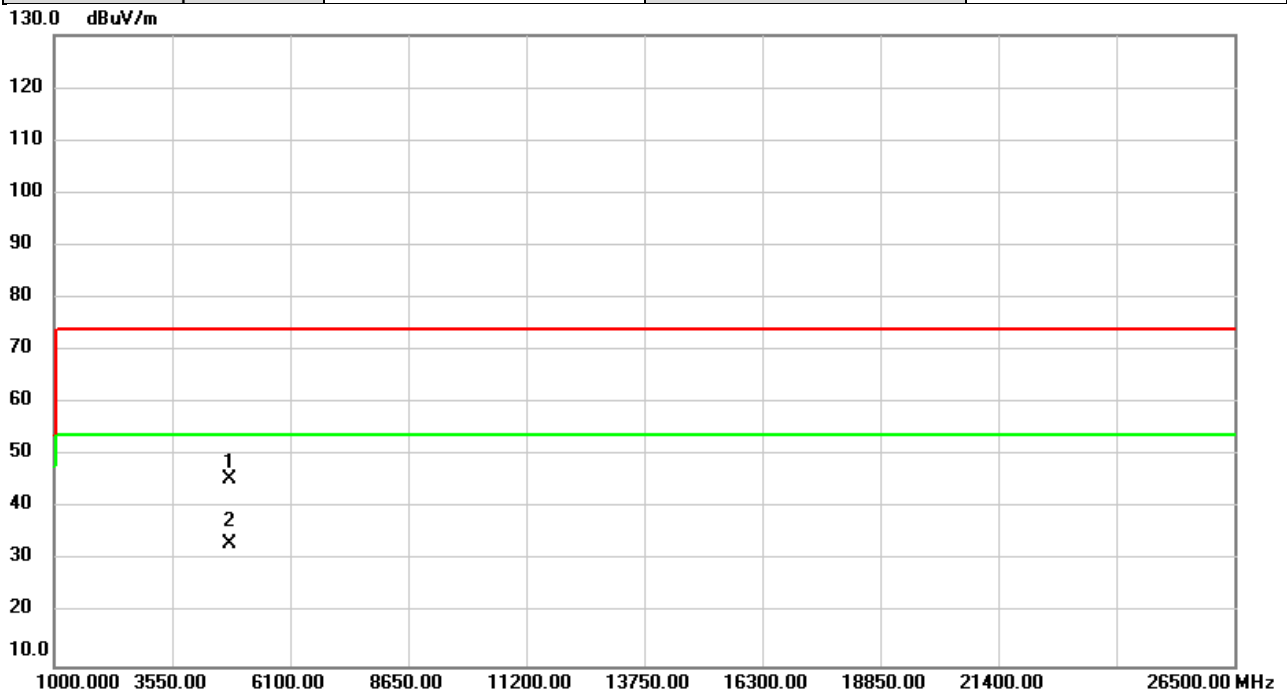


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	45.06	0.53	45.59	74.00	-28.41	peak	
2	*	4804.000	32.64	0.53	33.17	54.00	-20.83	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/28
Test Frequency	2402MHz	Polarization	Horizontal
Temp	25°C	Hum.	51%

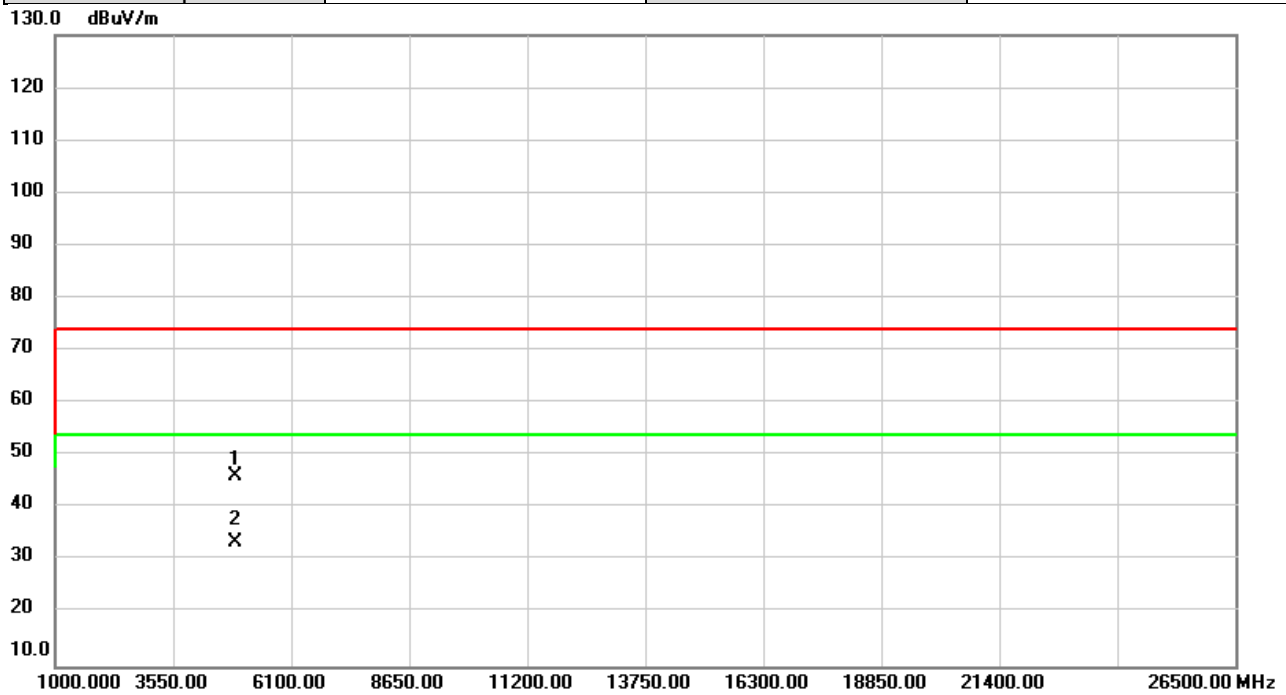


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	44.92	0.53	45.45	74.00	-28.55	peak	
2	*	4804.000	32.64	0.53	33.17	54.00	-20.83	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/28
Test Frequency	2441MHz	Polarization	Vertical
Temp	25°C	Hum.	51%

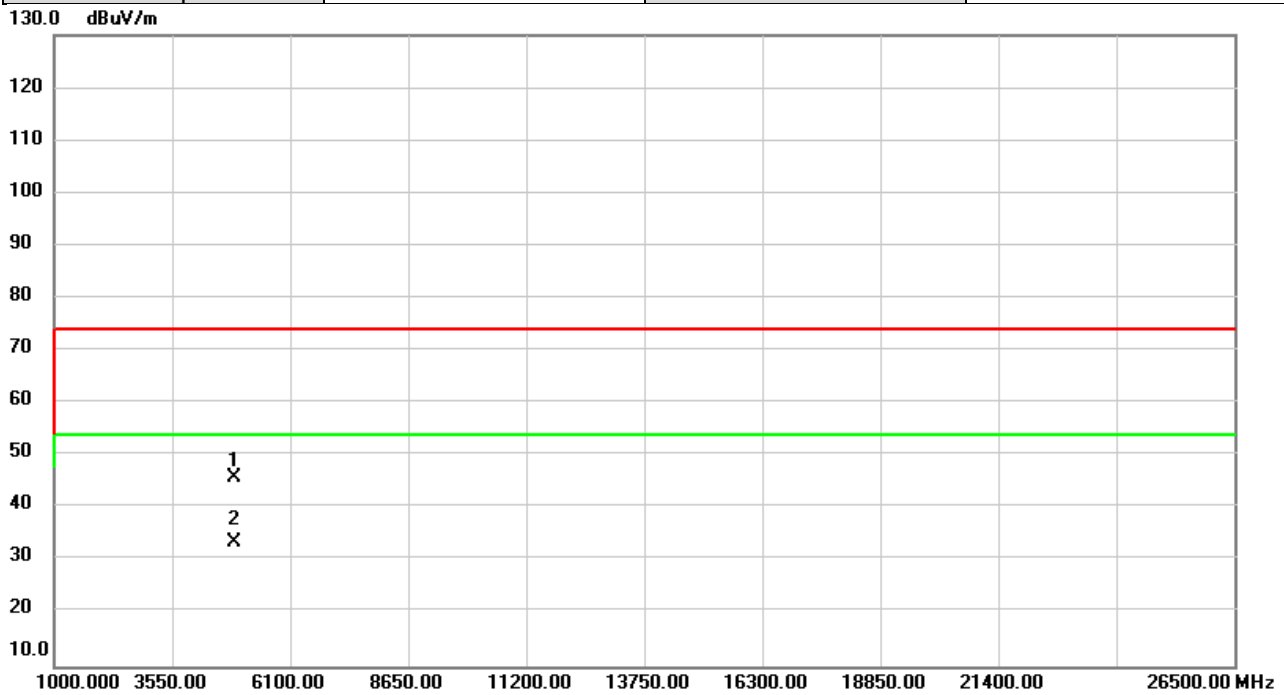


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4882.000	45.31	0.76	46.07	74.00	-27.93	peak	
2	*	4882.000	32.84	0.76	33.60	54.00	-20.40	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/28
Test Frequency	2441MHz	Polarization	Horizontal
Temp	25°C	Hum.	51%

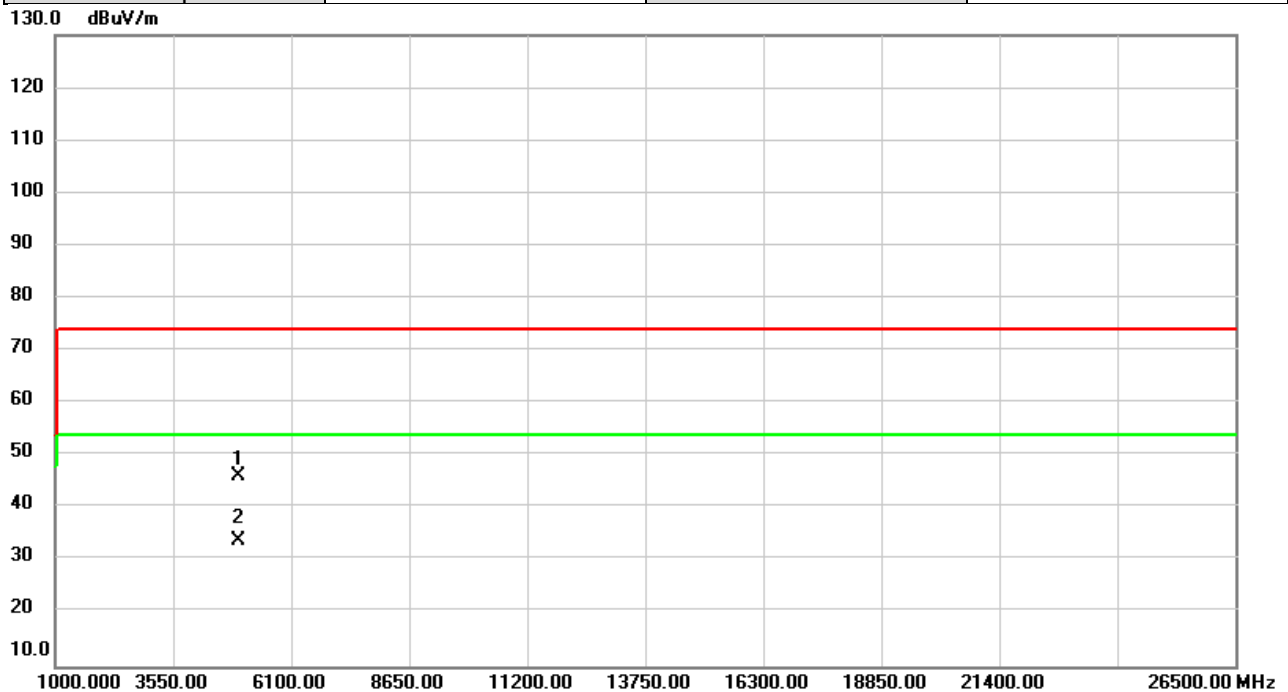


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4882.000	45.11	0.76	45.87	74.00	-28.13	peak	
2	*	4882.000	32.87	0.76	33.63	54.00	-20.37	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/28
Test Frequency	2480MHz	Polarization	Vertical
Temp	25°C	Hum.	51%

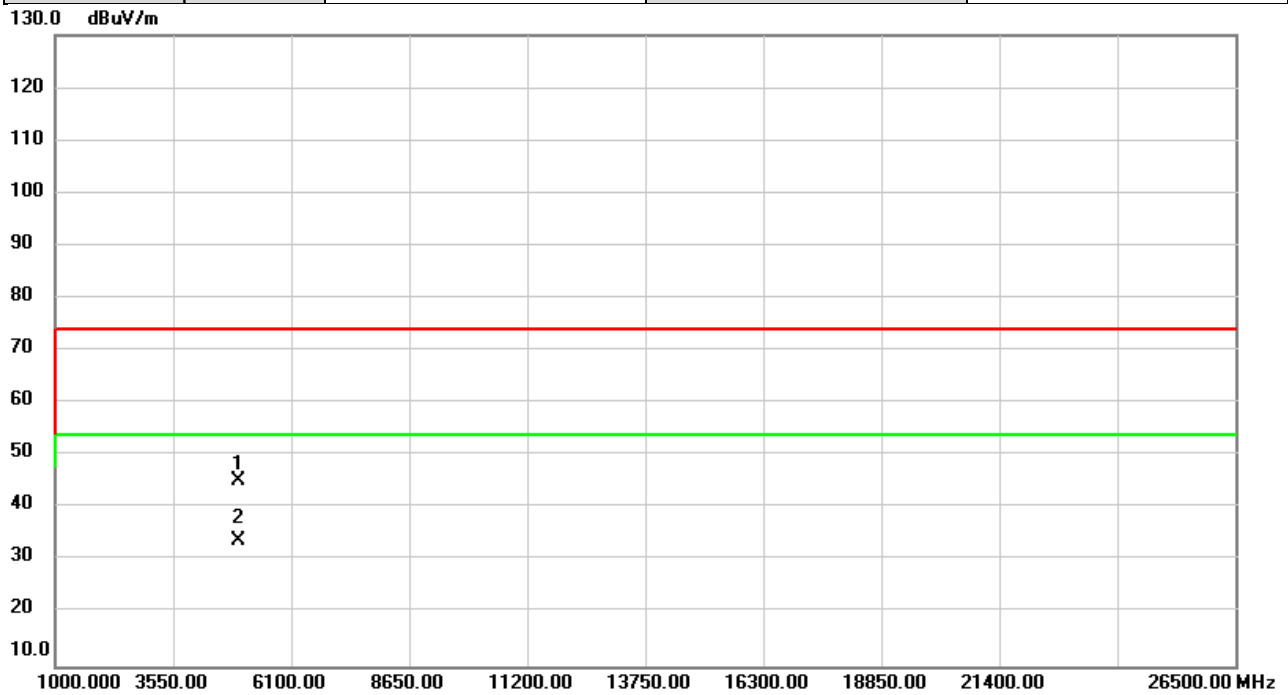


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	45.22	1.00	46.22	74.00	-27.78	peak	
2	*	4960.000	32.91	1.00	33.91	54.00	-20.09	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/28
Test Frequency	2480MHz	Polarization	Horizontal
Temp	25°C	Hum.	51%



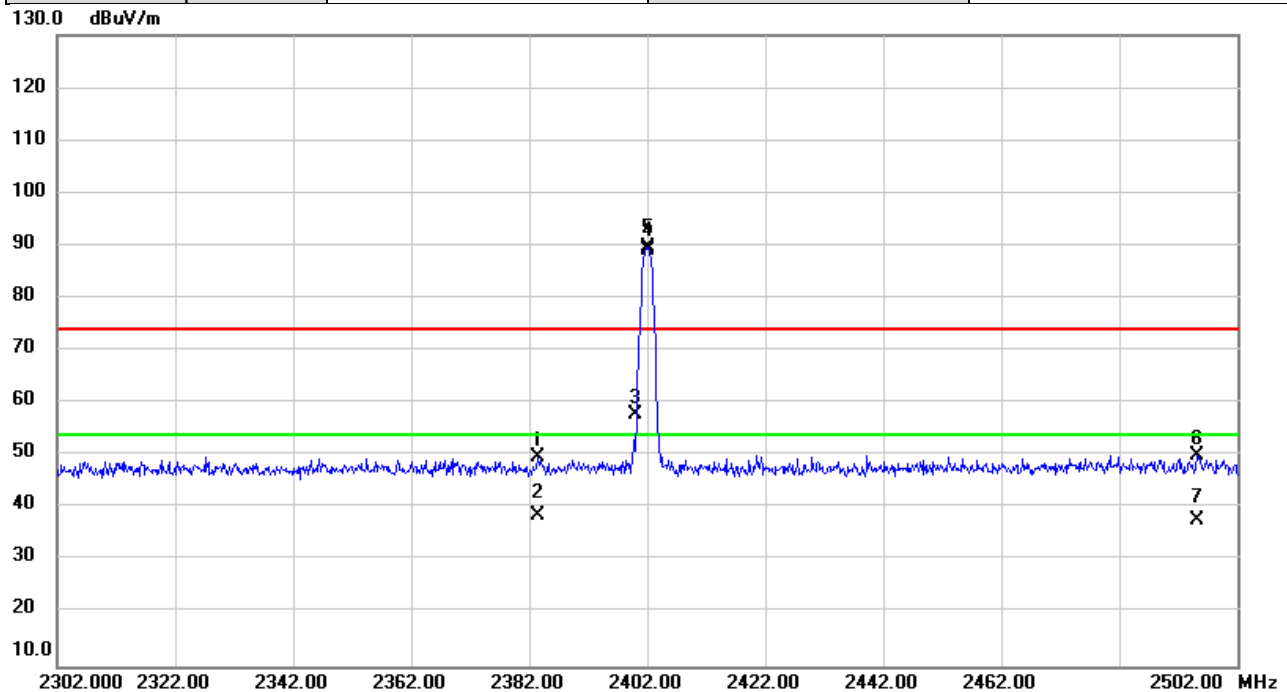
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.000	44.38	1.00	45.38	74.00	-28.62	peak	
2	*	4960.000	32.92	1.00	33.92	54.00	-20.08	AVG	

REMARKS:

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

For Built-in antenna:

Test Mode	BT (1 Mbps)	Test Date	2023/6/26
Test Frequency	2402MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%

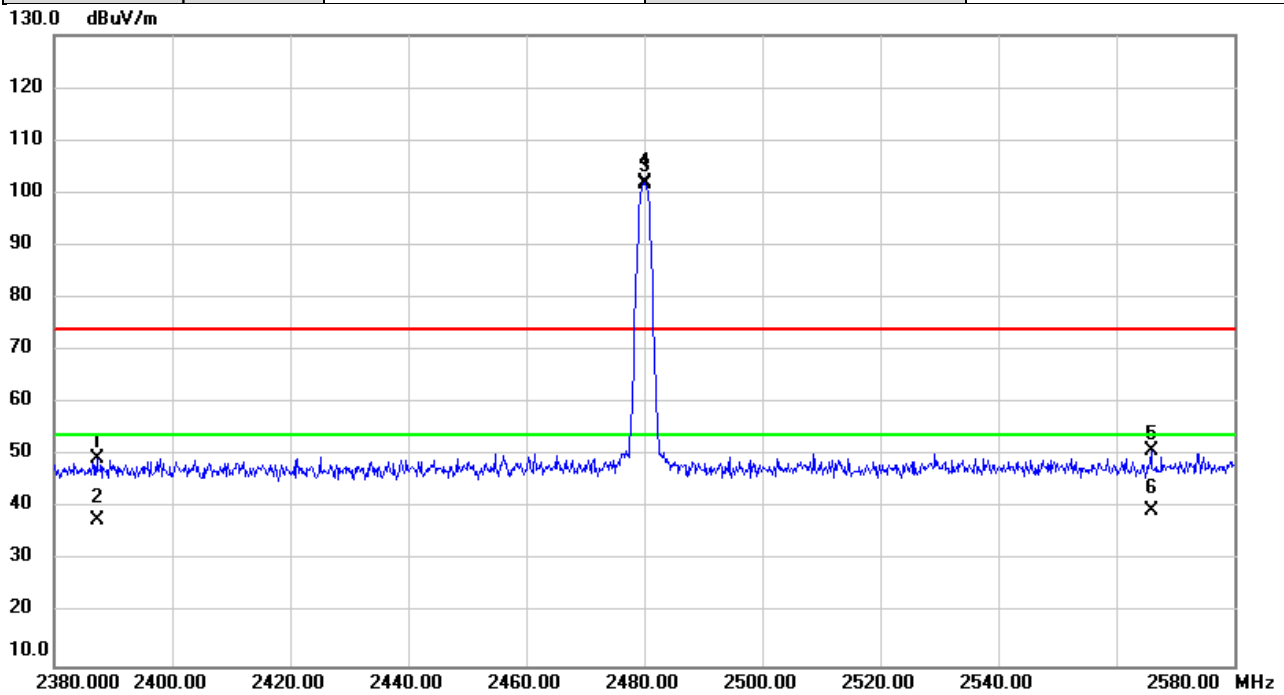


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2383.393	55.22	-5.39	49.83	74.00	-24.17	peak	
2		2383.393	44.02	-5.39	38.63	54.00	-15.37	AVG	
3		2400.000	63.18	-5.37	57.81	74.00	-16.19	peak	No Limit
4	X	2402.000	95.01	-5.36	89.65	74.00	15.65	peak	No Limit
5	*	2402.000	94.44	-5.36	89.08	54.00	35.08	AVG	No Limit
6		2495.233	55.16	-5.20	49.96	74.00	-24.04	peak	
7		2495.233	43.05	-5.20	37.85	54.00	-16.15	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/26
Test Frequency	2480MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%

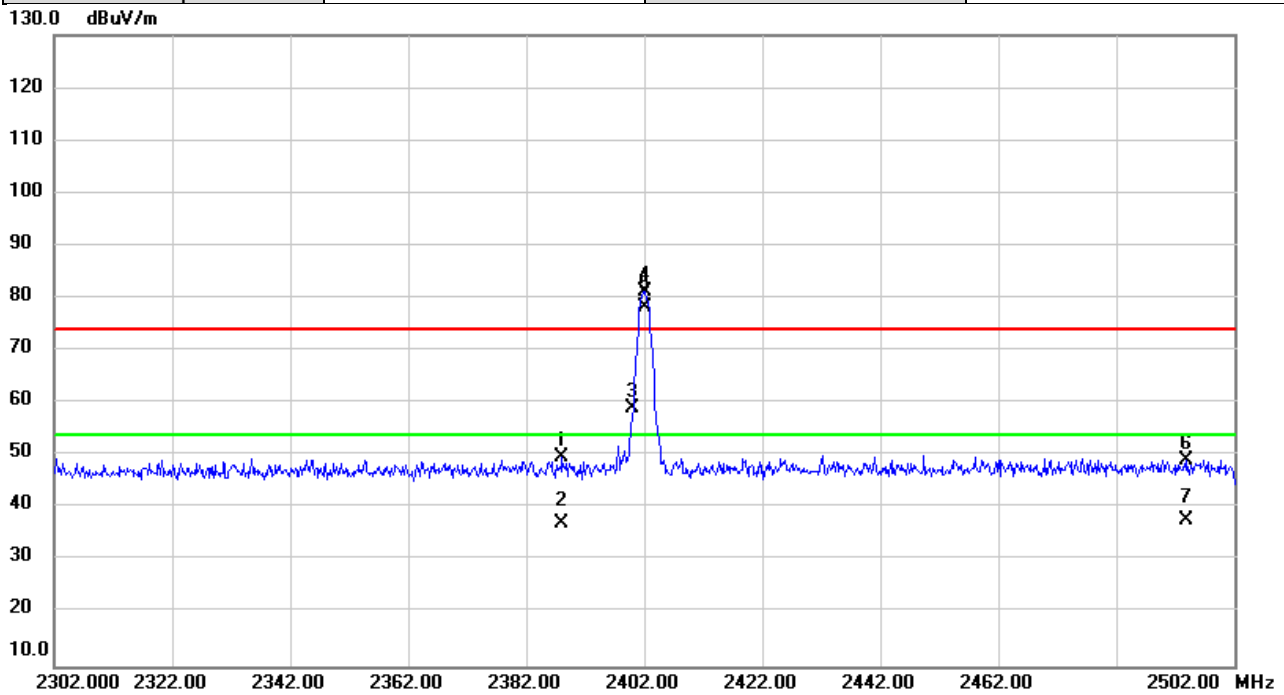


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2387.267	54.98	-5.39	49.59	74.00	-24.41	peak	
2		2387.267	43.05	-5.39	37.66	54.00	-16.34	AVG	
3	X	2480.000	107.23	-5.22	102.01	74.00	28.01	peak	No Limit
4	*	2480.000	106.87	-5.22	101.65	54.00	47.65	AVG	No Limit
5		2565.880	56.04	-4.97	51.07	74.00	-22.93	peak	
6		2565.880	44.60	-4.97	39.63	54.00	-14.37	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/26
Test Frequency	2402MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%

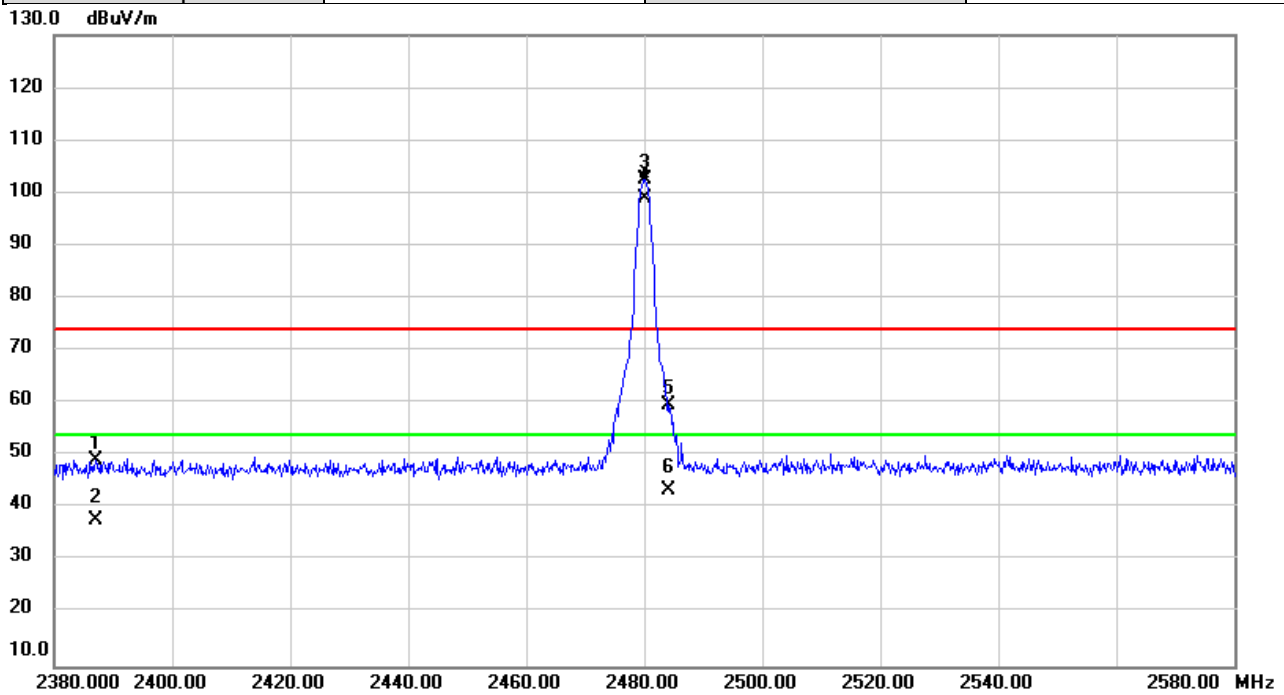


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2388.047	55.09	-5.39	49.70	74.00	-24.30	peak	
2		2388.047	42.68	-5.39	37.29	54.00	-16.71	AVG	
3		2400.000	64.49	-5.37	59.12	74.00	-14.88	peak	No Limit
4	X	2402.000	86.75	-5.36	81.39	74.00	7.39	peak	No Limit
5	*	2402.000	83.50	-5.36	78.14	54.00	24.14	AVG	No Limit
6		2493.933	54.43	-5.21	49.22	74.00	-24.78	peak	
7		2493.933	43.08	-5.21	37.87	54.00	-16.13	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/26
Test Frequency	2480MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%

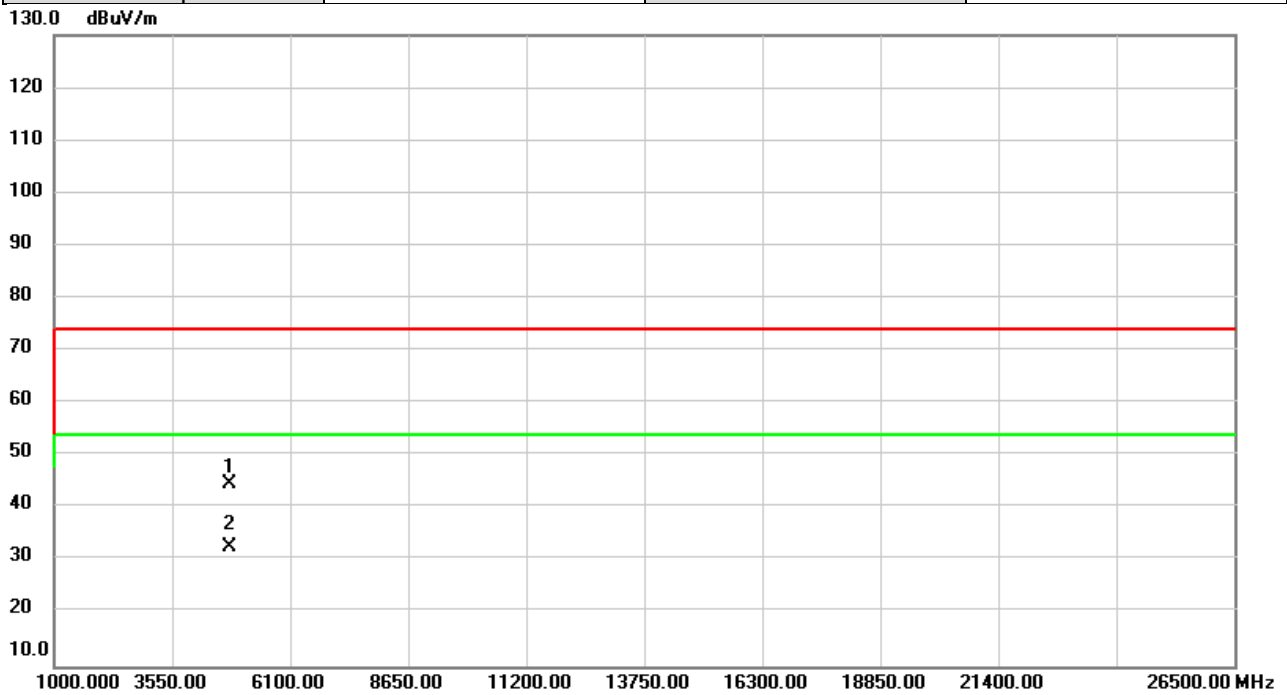


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2387.120	54.67	-5.39	49.28	74.00	-24.72	peak	
2		2387.120	42.99	-5.39	37.60	54.00	-16.40	AVG	
3	X	2480.000	107.77	-5.22	102.55	74.00	28.55	peak	No Limit
4	*	2480.000	104.30	-5.22	99.08	54.00	45.08	AVG	No Limit
5		2484.213	64.92	-5.23	59.69	74.00	-14.31	peak	
6		2484.213	48.82	-5.23	43.59	54.00	-10.41	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/26
Test Frequency	2402MHz	Polarization	Vertical
Temp	24°C	Hum.	58%

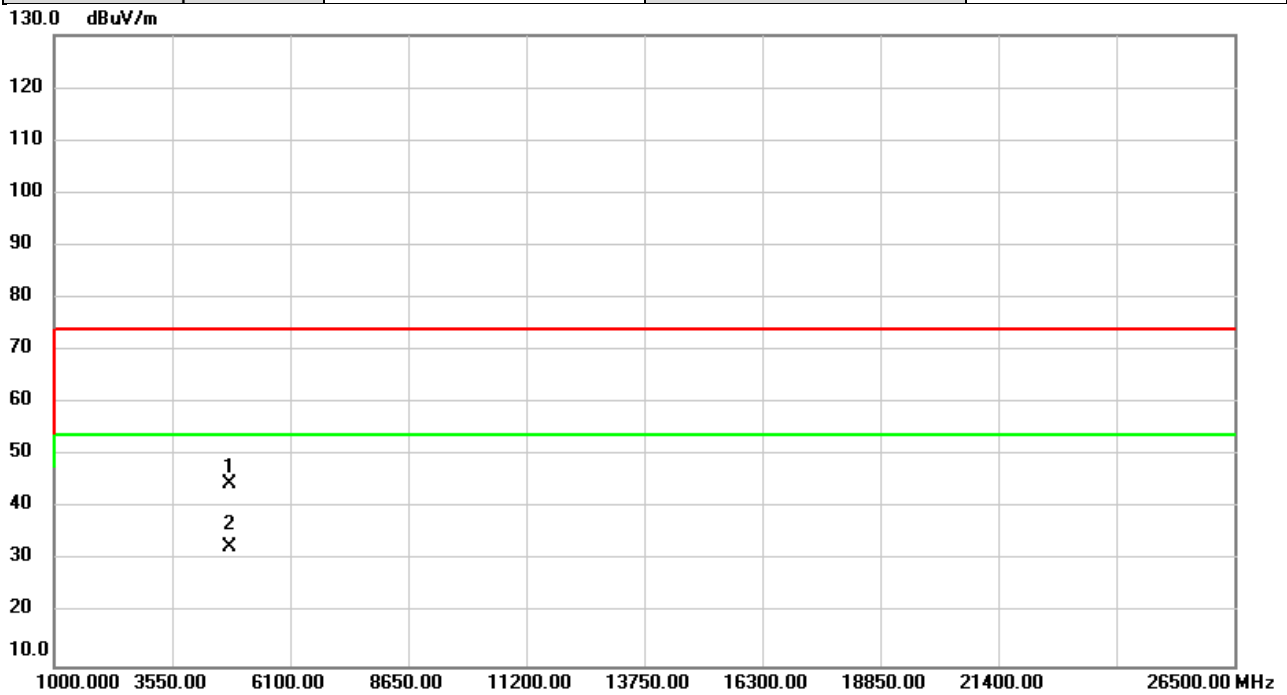


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	44.18	0.53	44.71	74.00	-29.29	peak	
2	*	4804.000	32.08	0.53	32.61	54.00	-21.39	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/26
Test Frequency	2402MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%

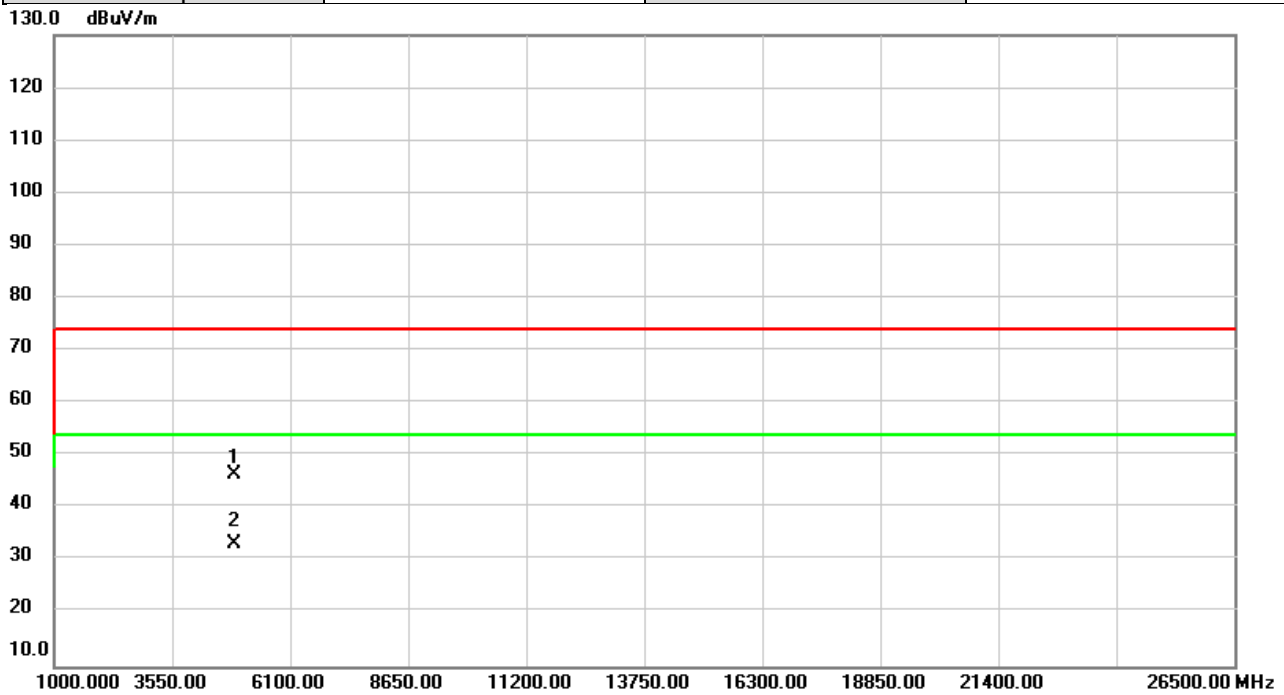


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	44.23	0.53	44.76	74.00	-29.24	peak	
2	*	4804.000	32.16	0.53	32.69	54.00	-21.31	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/26
Test Frequency	2402MHz	Polarization	Vertical
Temp	24°C	Hum.	58%

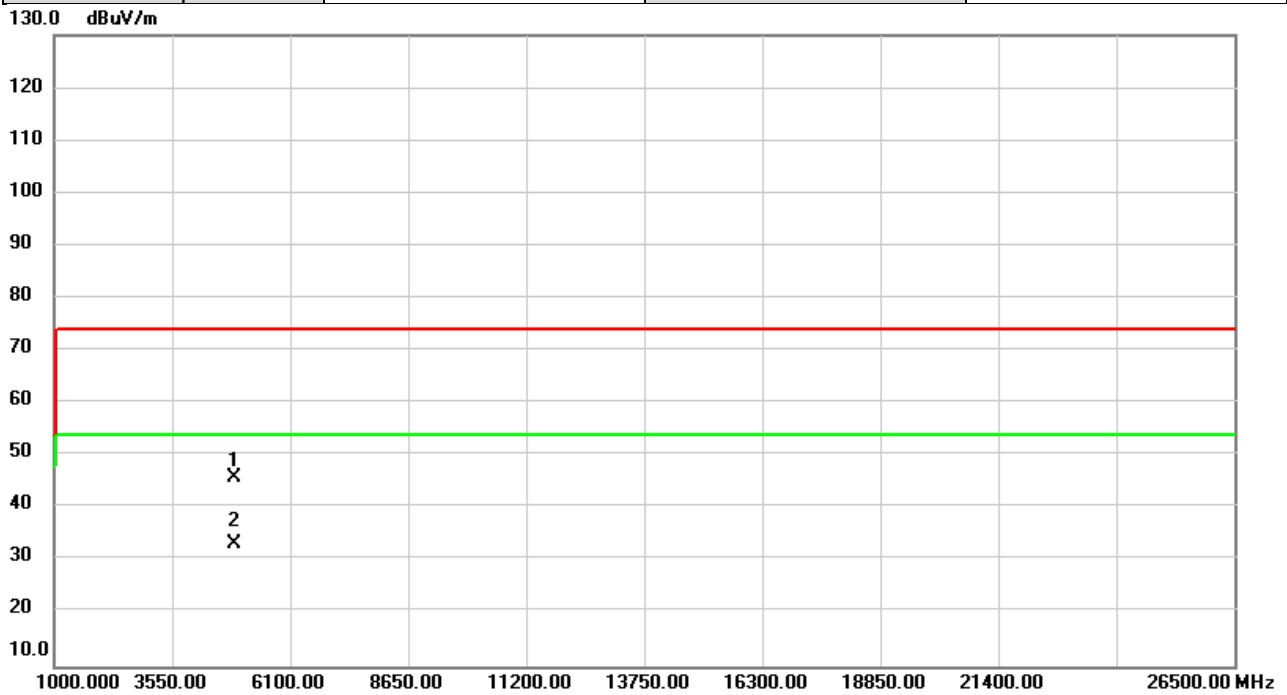


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4882.000	45.57	0.76	46.33	74.00	-27.67	peak	
2	*	4882.000	32.51	0.76	33.27	54.00	-20.73	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/26
Test Frequency	2402MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%

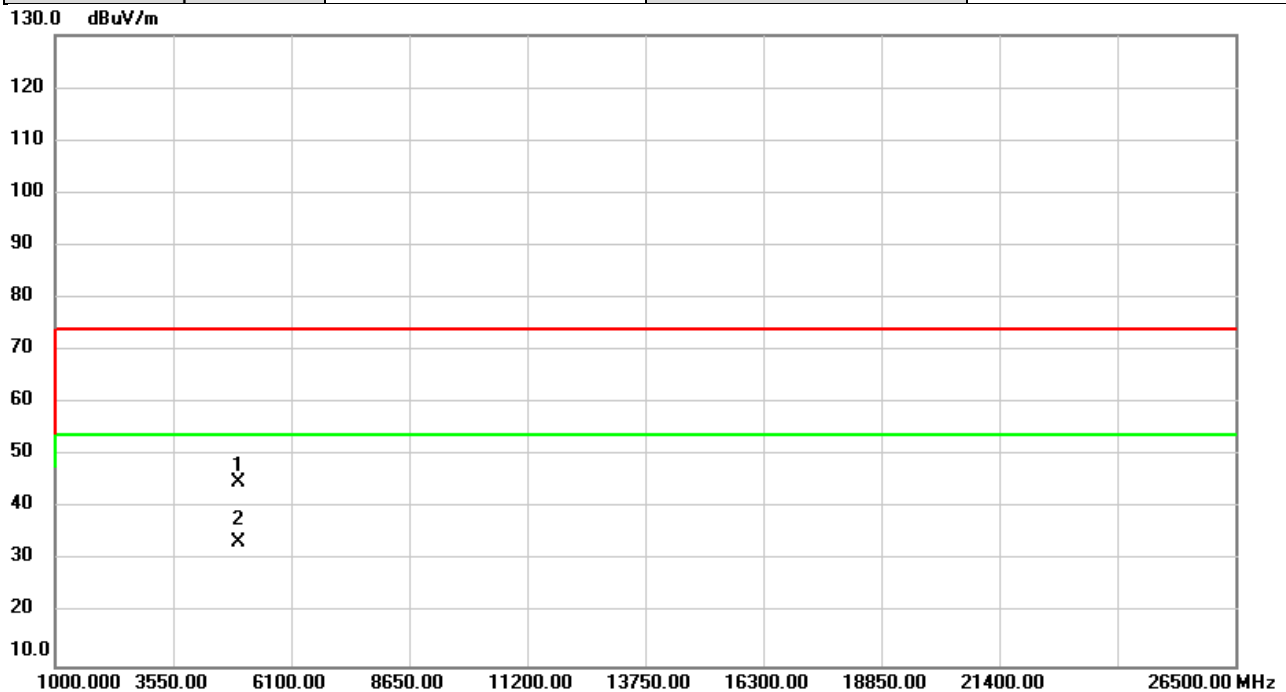


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4882.000	45.19	0.76	45.95	74.00	-28.05	peak	
2	*	4882.000	32.56	0.76	33.32	54.00	-20.68	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/26
Test Frequency	2480MHz	Polarization	Vertical
Temp	24°C	Hum.	58%

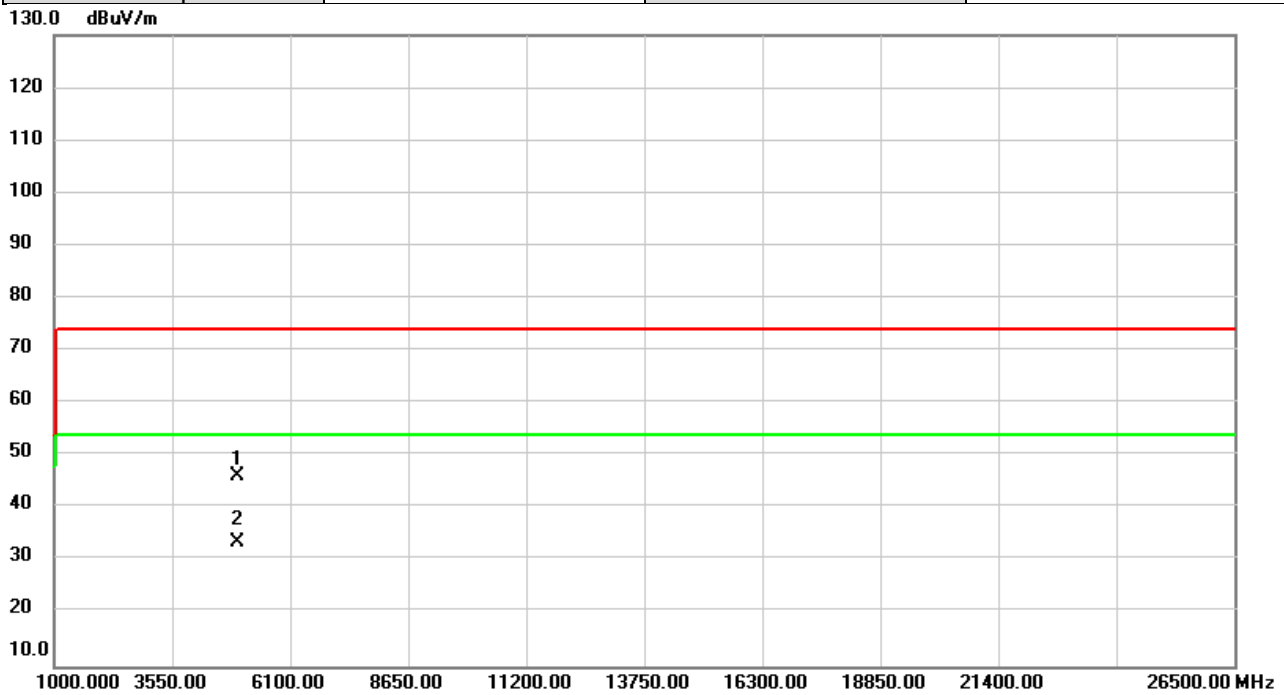


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	43.86	1.00	44.86	74.00	-29.14	peak	
2	*	4960.000	32.62	1.00	33.62	54.00	-20.38	AVG	

REMARKS:

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

Test Mode	BT (1 Mbps)	Test Date	2023/6/26
Test Frequency	2480MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%

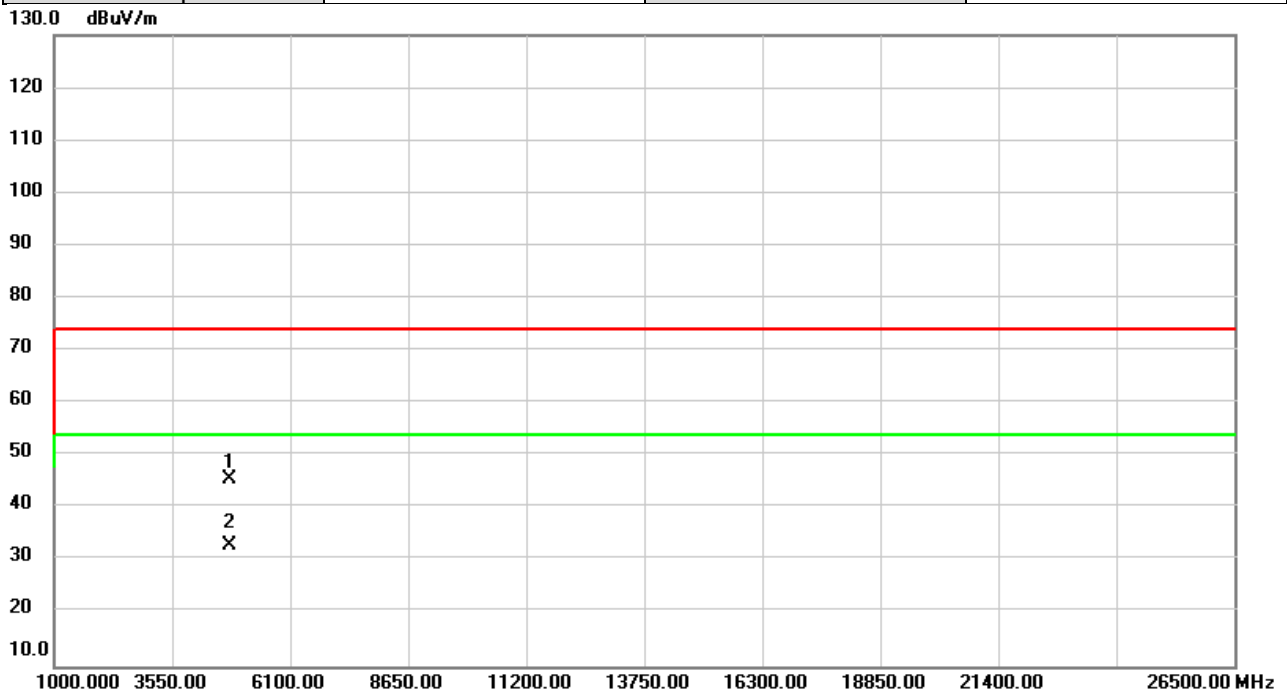


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	45.03	1.00	46.03	74.00	-27.97	peak	
2	*	4960.000	32.65	1.00	33.65	54.00	-20.35	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/26
Test Frequency	2402MHz	Polarization	Vertical
Temp	24°C	Hum.	58%

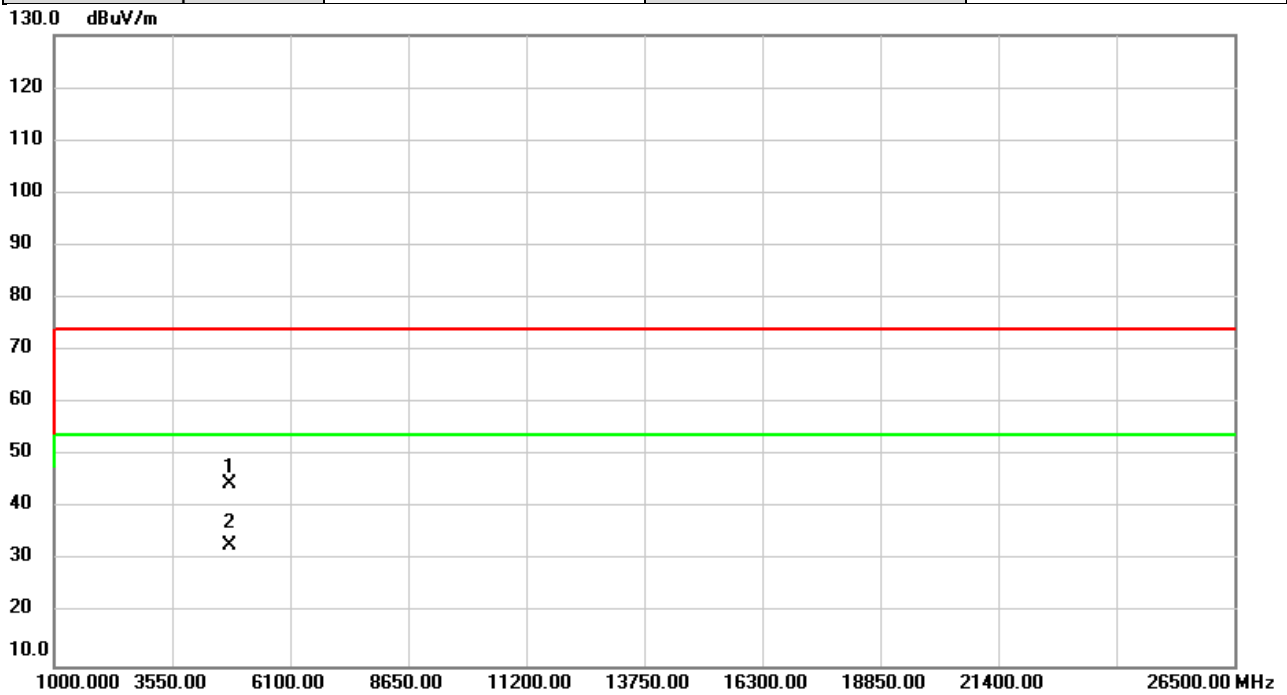


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	44.93	0.53	45.46	74.00	-28.54	peak	
2	*	4804.000	32.35	0.53	32.88	54.00	-21.12	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/26
Test Frequency	2402MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%

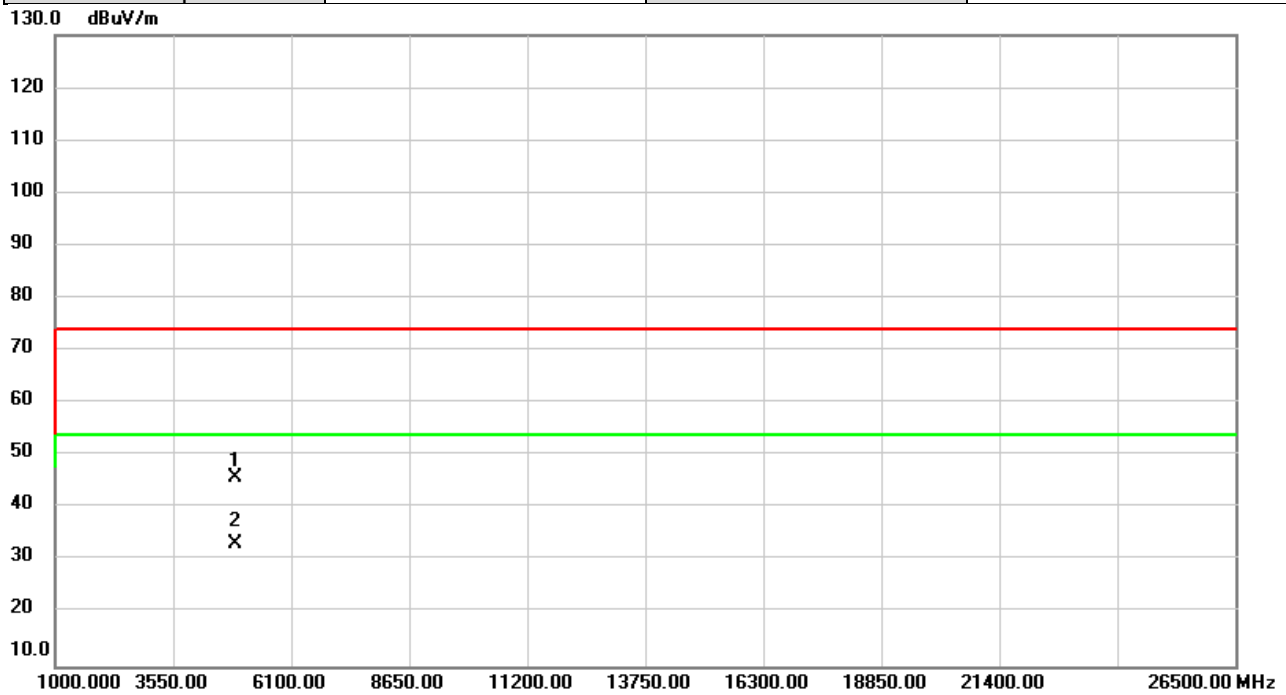


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	44.16	0.53	44.69	74.00	-29.31	peak	
2	*	4804.000	32.42	0.53	32.95	54.00	-21.05	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/26
Test Frequency	2441MHz	Polarization	Vertical
Temp	24°C	Hum.	58%

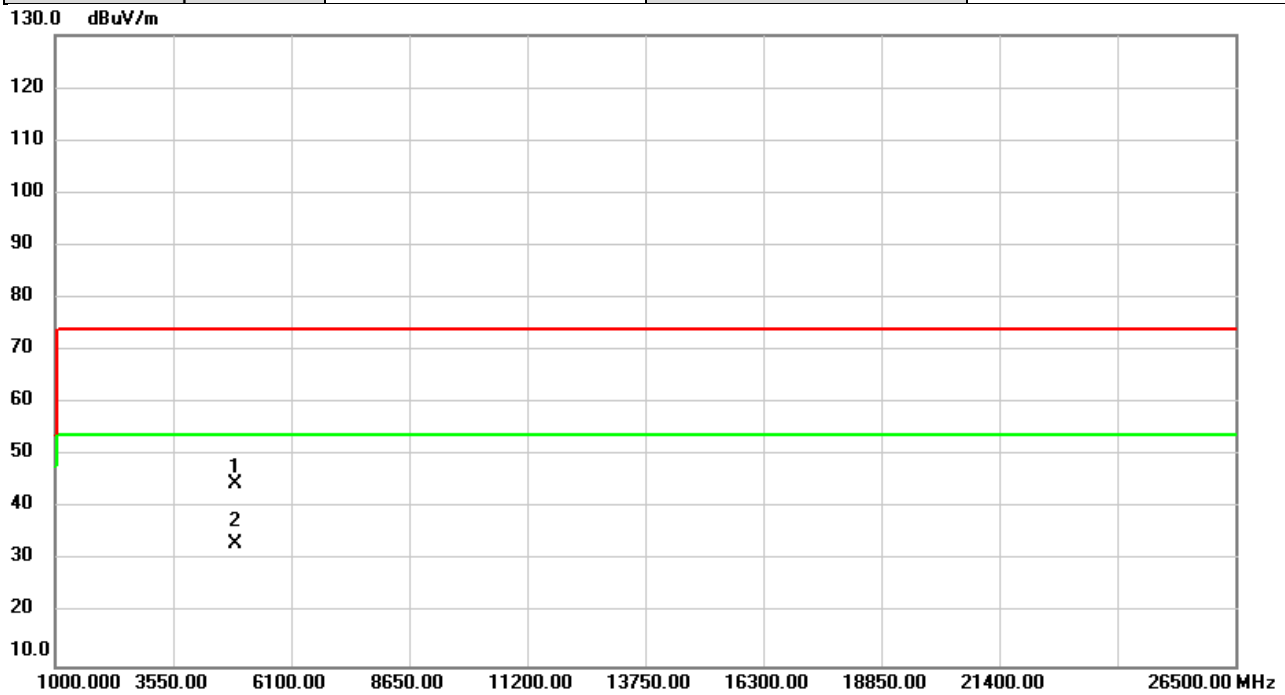


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4882.000	45.22	0.76	45.98	74.00	-28.02	peak	
2	*	4882.000	32.60	0.76	33.36	54.00	-20.64	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/26
Test Frequency	2441MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%

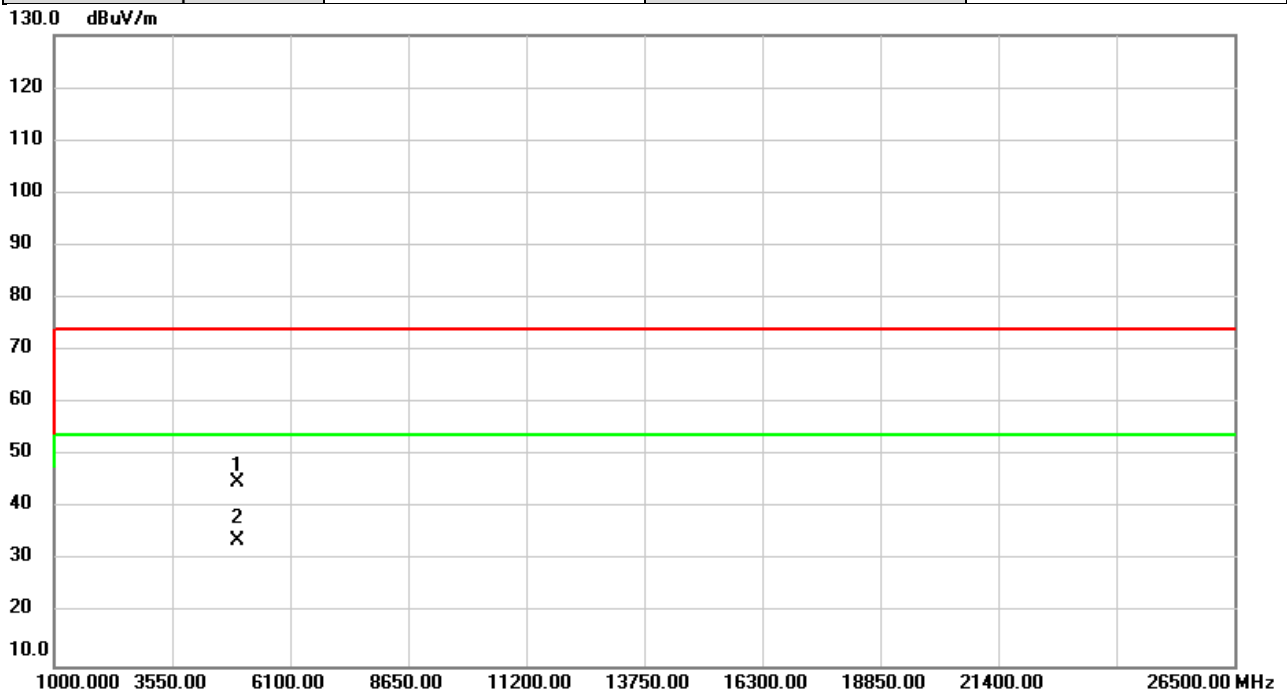


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4882.000	44.01	0.76	44.77	74.00	-29.23	peak	
2	*	4882.000	32.54	0.76	33.30	54.00	-20.70	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/26
Test Frequency	2480MHz	Polarization	Vertical
Temp	24°C	Hum.	58%

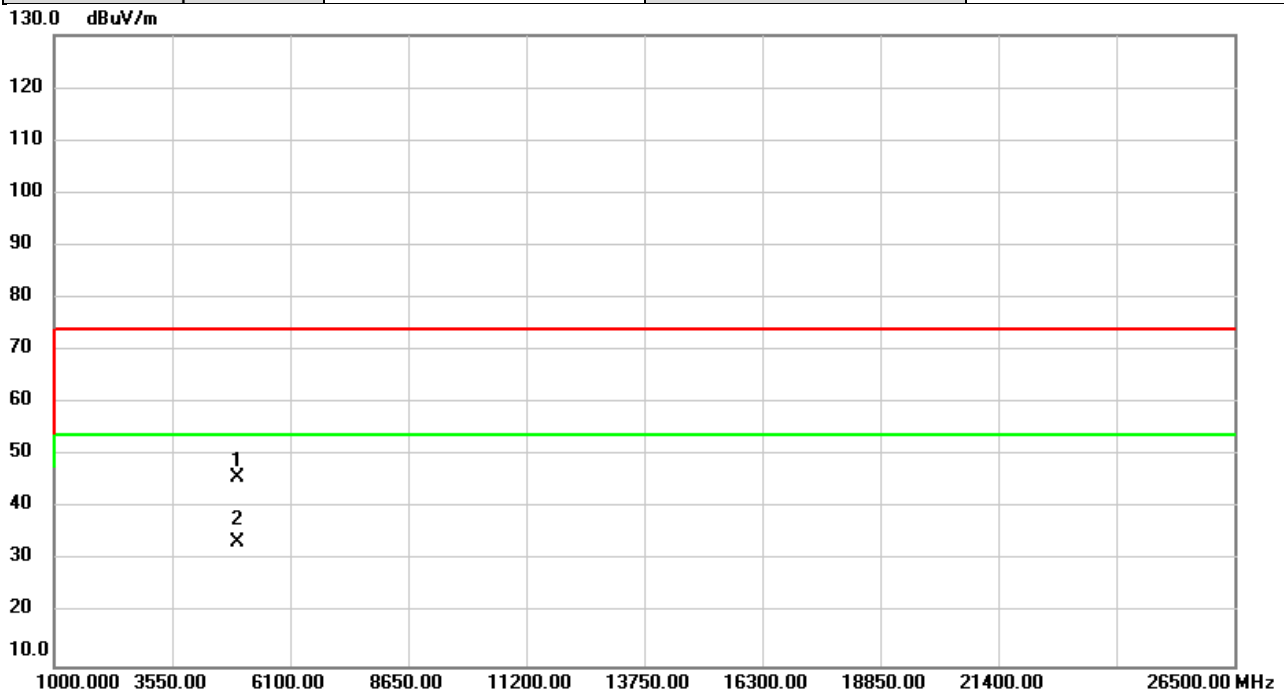


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	44.04	1.00	45.04	74.00	-28.96	peak	
2	*	4960.000	32.70	1.00	33.70	54.00	-20.30	AVG	

REMARKS:

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

Test Mode	BT (3 Mbps)	Test Date	2023/6/26
Test Frequency	2480MHz	Polarization	Horizontal
Temp	24°C	Hum.	58%



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	44.89	1.00	45.89	74.00	-28.11	peak	
2	*	4960.000	32.59	1.00	33.59	54.00	-20.41	AVG	

REMARKS:

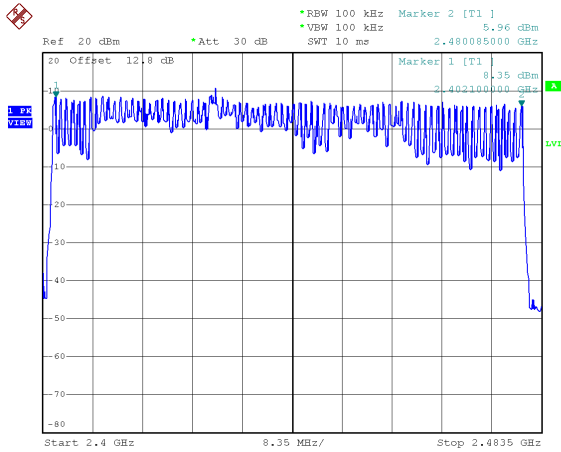
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

APPENDIX D NUMBER OF HOPPING CHANNEL

Test Mode	1/3Mbps
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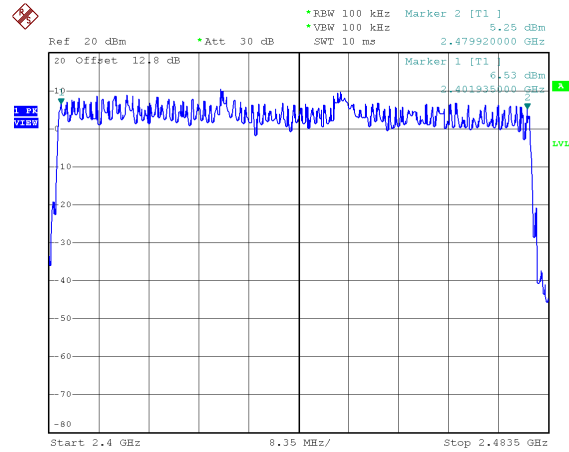
Test Mode	Number of Hopping Channel	≥ Limit	Test Result
1 Mbps	79	15	Pass
3 Mbps	79	15	Pass

1 Mbps



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3 Mbps

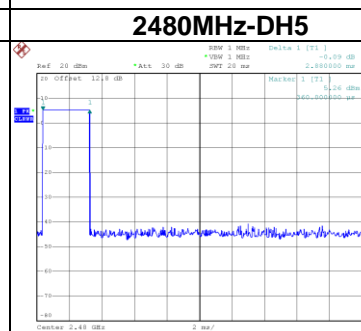
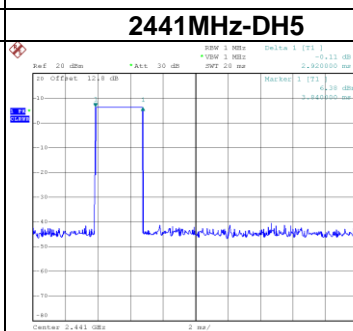
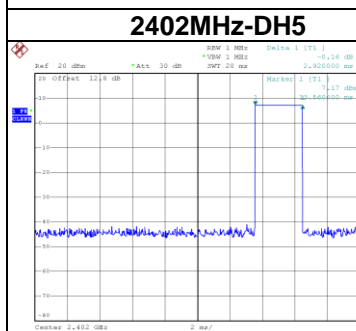
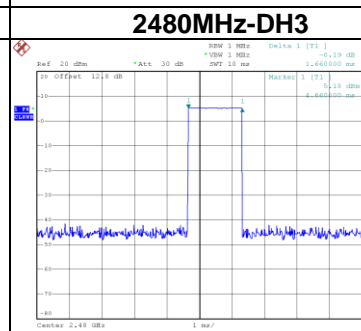
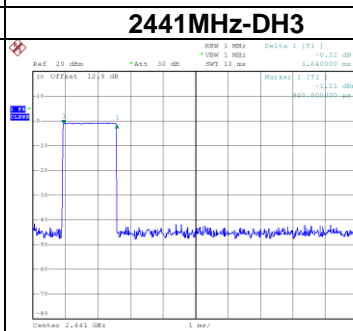
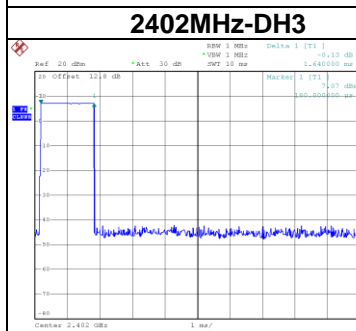
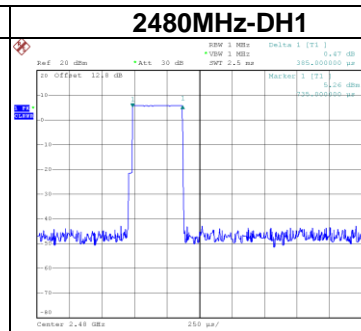
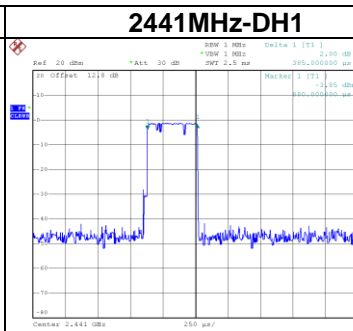
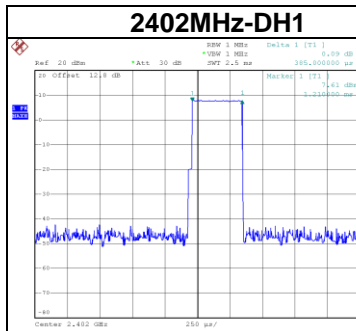


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APPENDIX E AVERAGE TIME OF OCCUPANCY

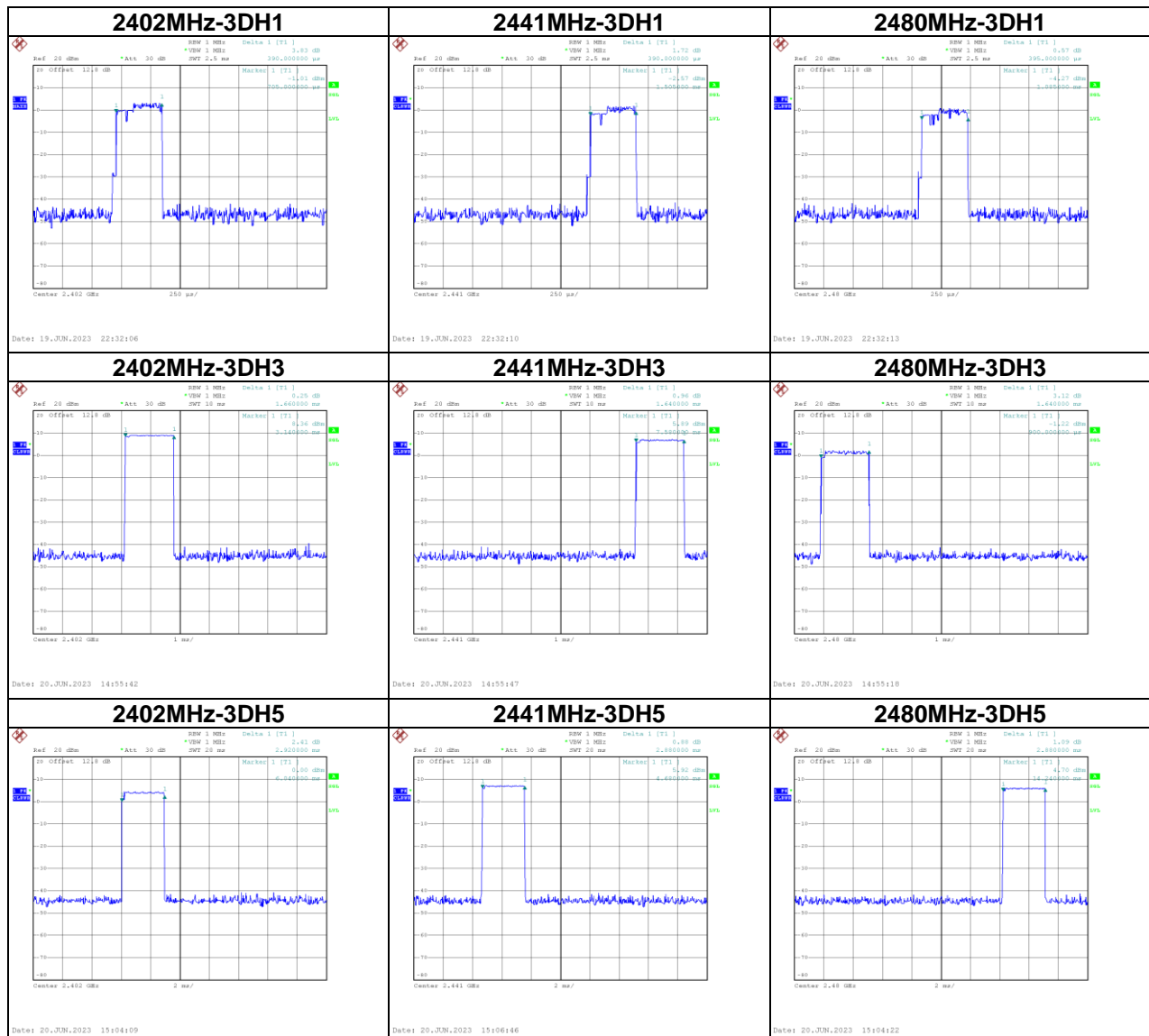
Test Mode : 1Mbps

Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	2.9200	0.3115	0.4000	Pass
DH3	2402	1.6400	0.2624	0.4000	Pass
DH1	2402	0.3850	0.1232	0.4000	Pass
DH5	2441	2.9200	0.3115	0.4000	Pass
DH3	2441	1.6400	0.2624	0.4000	Pass
DH1	2441	0.3850	0.1232	0.4000	Pass
DH5	2480	2.8800	0.3072	0.4000	Pass
DH3	2480	1.6600	0.2656	0.4000	Pass
DH1	2480	0.3850	0.1232	0.4000	Pass



Test Mode :	3Mbps
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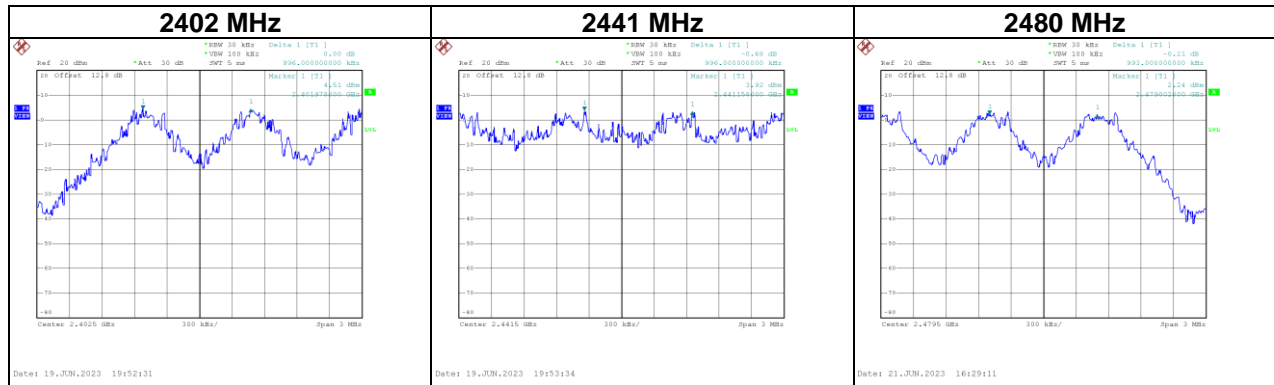
Data Packet	Frequency	Pulse Duration(ms)	Dwell Time(s)	Limits(s)	Test Result
3DH5	2402	2.9200	0.3115	0.4000	Pass
3DH3	2402	1.6600	0.2656	0.4000	Pass
3DH1	2402	0.3900	0.1248	0.4000	Pass
3DH5	2441	2.8800	0.3072	0.4000	Pass
3DH3	2441	1.6400	0.2624	0.4000	Pass
3DH1	2441	0.3900	0.1248	0.4000	Pass
3DH5	2480	2.8800	0.3072	0.4000	Pass
3DH3	2480	1.6400	0.2624	0.4000	Pass
3DH1	2480	0.3950	0.1264	0.4000	Pass



APPENDIX F HOPPING CHANNEL SEPARATION MEASUREMENT

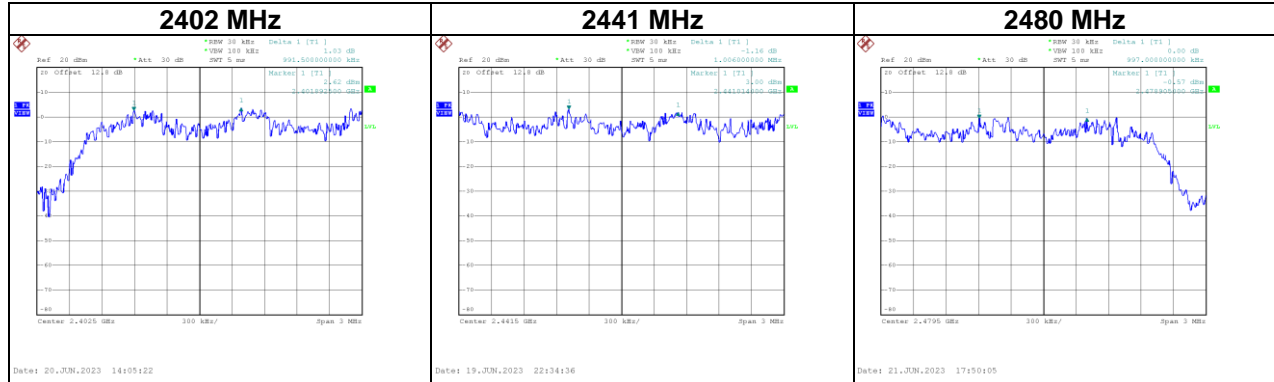
Test Mode :	Hopping on _1Mbps
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Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	0.996	0.701	Pass
2441	0.996	0.667	Pass
2480	0.993	0.707	Pass



Test Mode : Hopping on _3Mbps

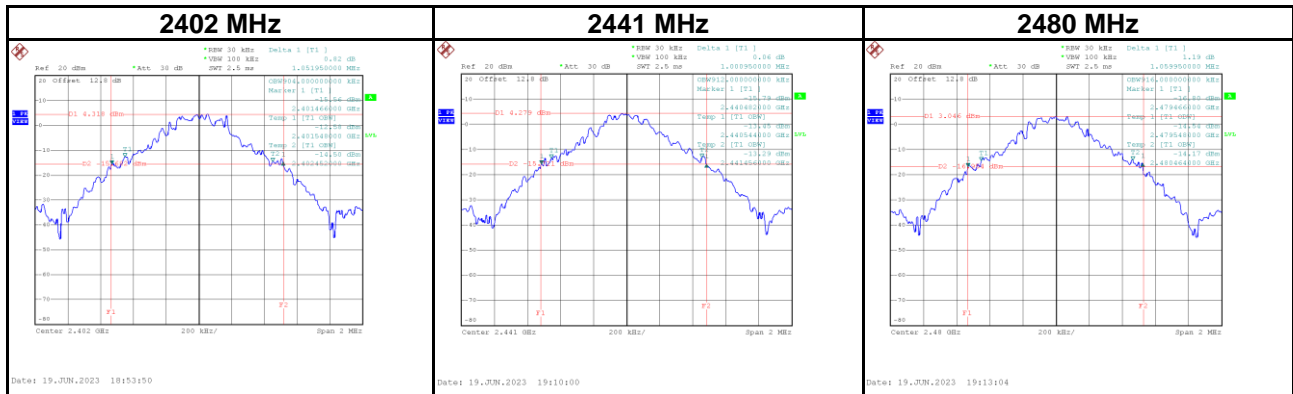
Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	0.992	0.876	Pass
2441	1.006	0.885	Pass
2480	0.997	0.897	Pass



APPENDIX G BANDWIDTH

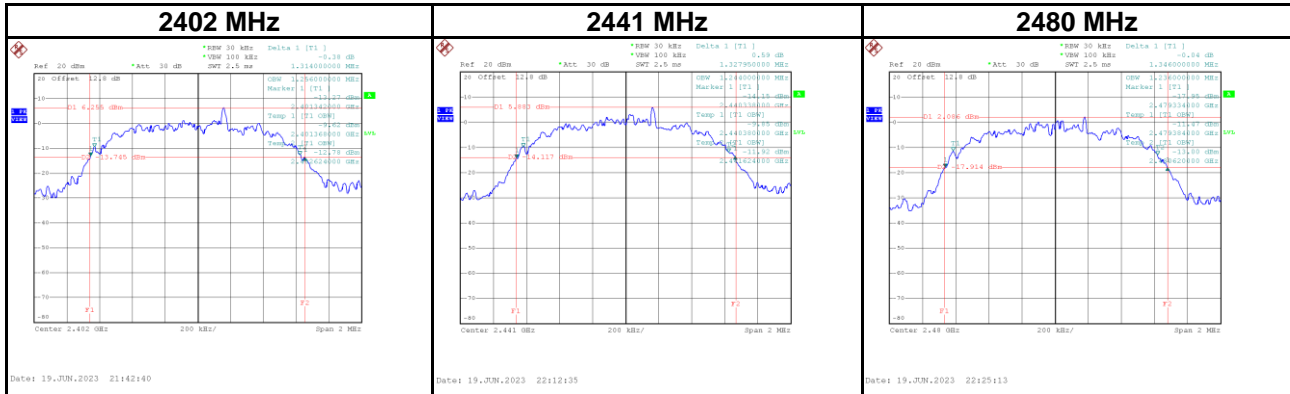
Test Mode :	1Mbps
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Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.052	0.904	Pass
2441	1.001	0.912	Pass
2480	1.060	0.916	Pass



Test Mode : 3Mbps

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.314	1.256	Pass
2441	1.328	1.244	Pass
2480	1.346	1.236	Pass



APPENDIX H OUTPUT POWER

Test Mode :	1Mbps	Tested Date	2023/6/20
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Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	6.53	0.0045	21.00	0.1259	Pass
2441	5.78	0.0038	21.00	0.1259	Pass
2480	4.74	0.0030	21.00	0.1259	Pass

Test Mode :	2Mbps	Tested Date	2023/6/20
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Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	7.67	0.0058	21.00	0.1259	Pass
2441	6.78	0.0048	21.00	0.1259	Pass
2480	5.88	0.0039	21.00	0.1259	Pass

Test Mode :	3Mbps	Tested Date	2023/6/20
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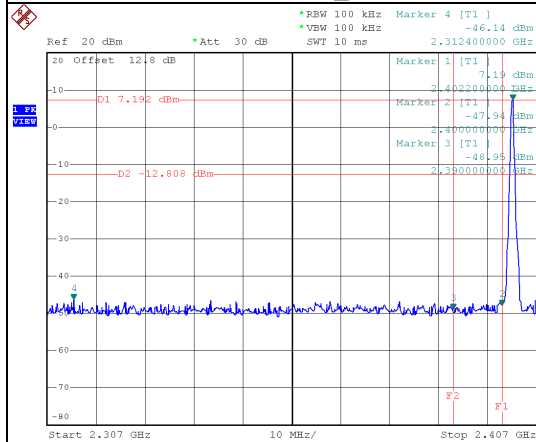
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	7.74	0.0059	21.00	0.1259	Pass
2441	6.97	0.0050	21.00	0.1259	Pass
2480	6.00	0.0040	21.00	0.1259	Pass

APPENDIX I ANTENNA CONDUCTED SPURIOUS EMISSION

Test Mode

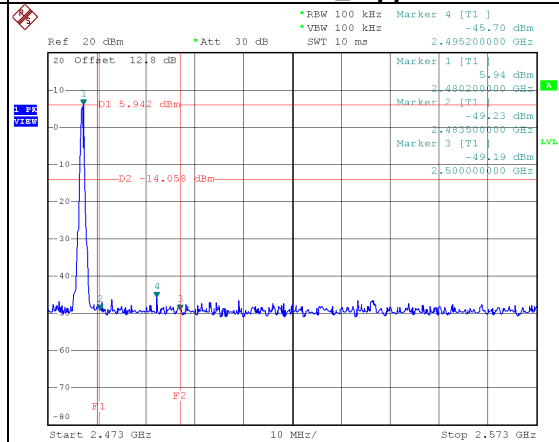
1Mbps

2402 MHz_ Lower



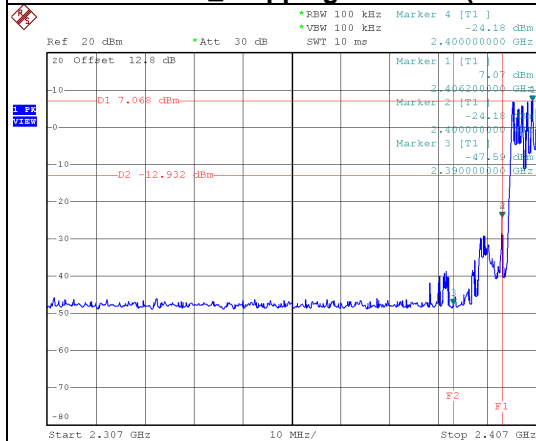
Date: 19.JUN.2023 18:53:10

2480 MHz_ Upper



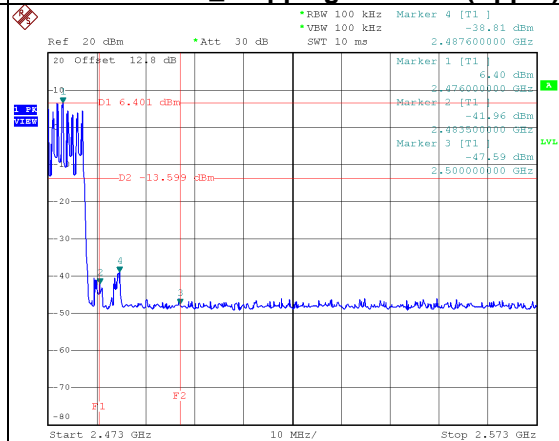
Date: 19.JUN.2023 19:12:20

2402 MHz_ Hopping on mode (Lower)



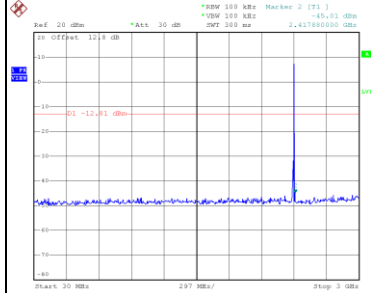
Date: 19.JUN.2023 19:57:10

2480 MHz_ Hopping on mode (Upper)

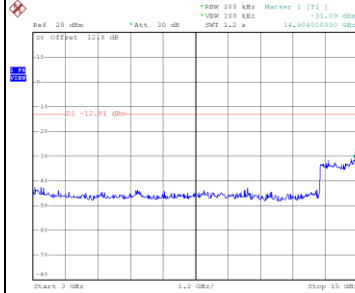


Date: 19.JUN.2023 19:57:44

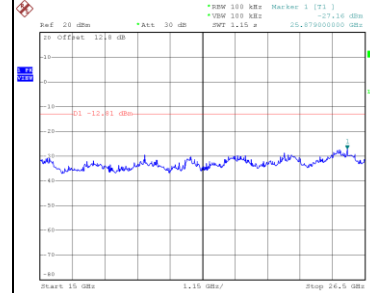
2402 MHz – 10th Harmonics



Date: 19 JUN 2023 18:54:03

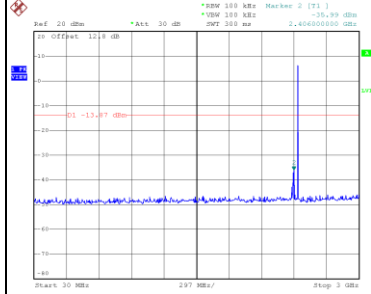


Date: 19 JUN 2023 18:54:10

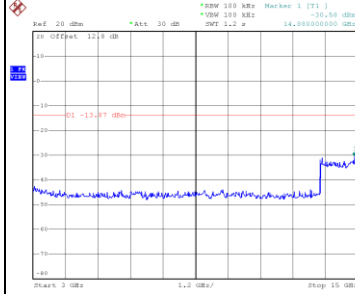


Date: 19 JUN 2023 18:54:16

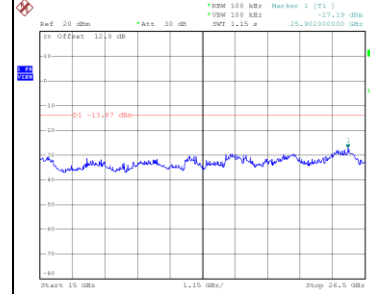
2441 MHz – 10th Harmonics



Date: 19 JUN 2023 19:08:13

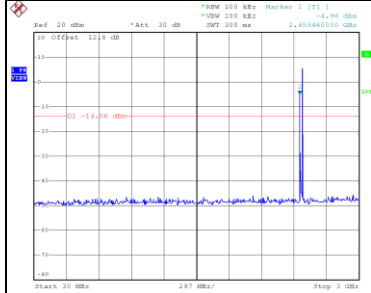


Date: 19 JUN 2023 19:08:20

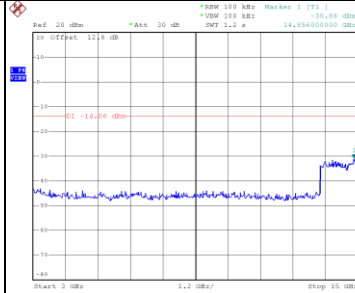


Date: 19 JUN 2023 19:08:27

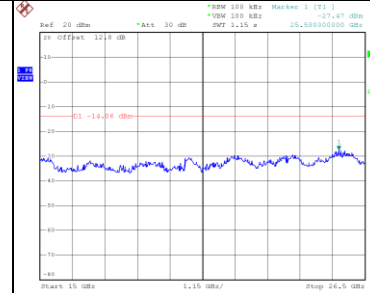
2480 MHz – 10th Harmonics



Date: 19 JUN 2023 19:13:17



Date: 19 JUN 2023 19:13:24

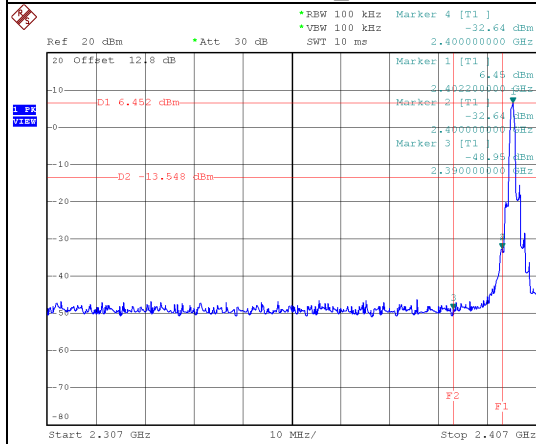


Date: 19 JUN 2023 19:13:31

Test Mode

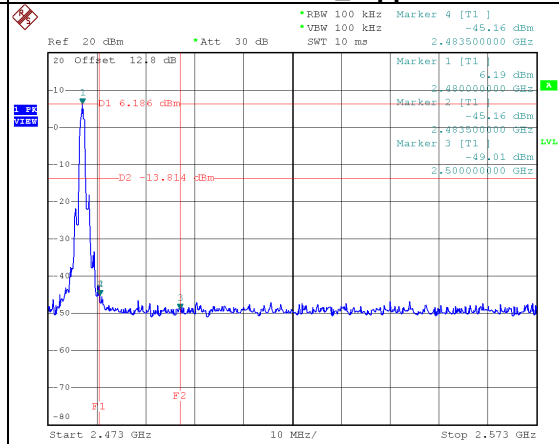
3Mbps

2402 MHz_ Lower



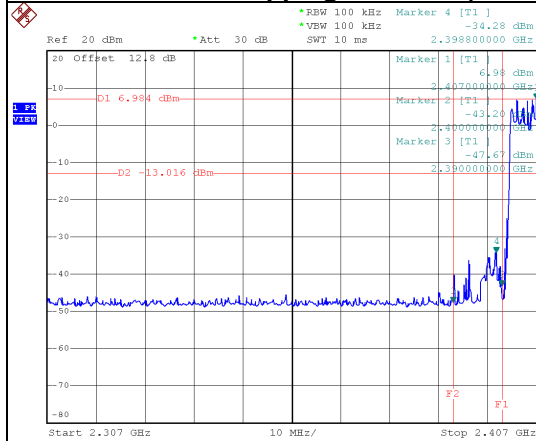
Date: 19.JUN.2023 21:42:12

2480 MHz_ Upper



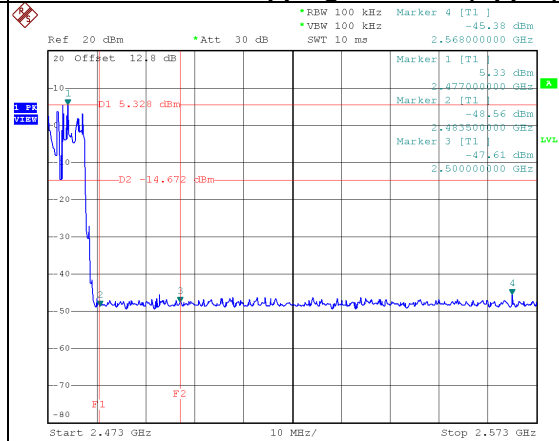
Date: 19.JUN.2023 22:24:40

2402 MHz_ Hopping on mode (Lower)



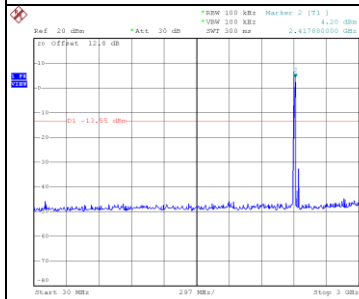
Date: 20.JUN.2023 14:10:56

2480 MHz_ Hopping on mode (Upper)

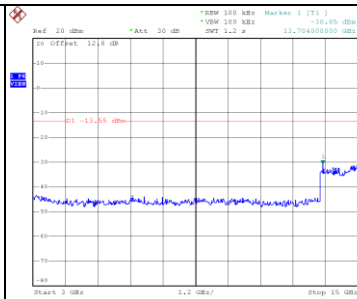


Date: 20.JUN.2023 14:11:30

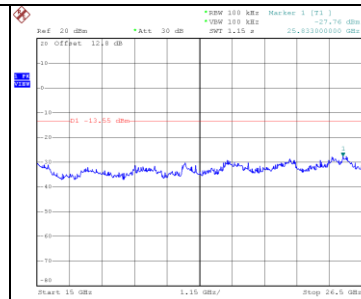
2402 MHz – 10 Harmonics



Date: 19 JUN 2023 21:42:53

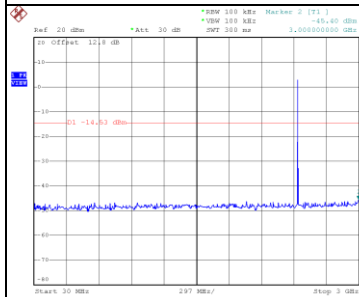


Date: 19 JUN 2023 21:43:00

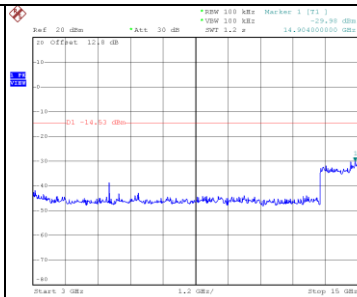


Date: 19 JUN 2023 21:43:07

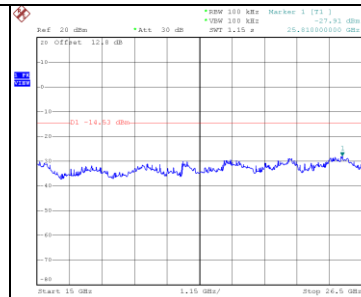
2441 MHz – 10 Harmonics



Date: 19 JUN 2023 22:06:13

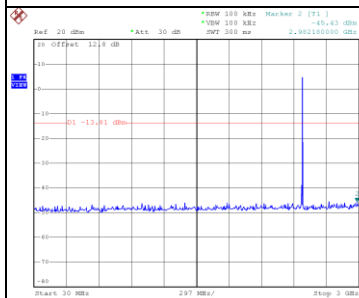


Date: 19 JUN 2023 22:06:20

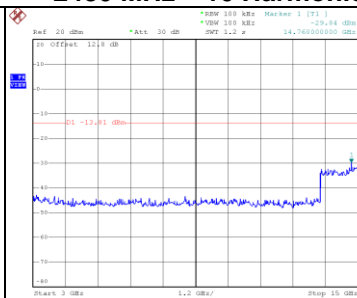


Date: 19 JUN 2023 22:06:27

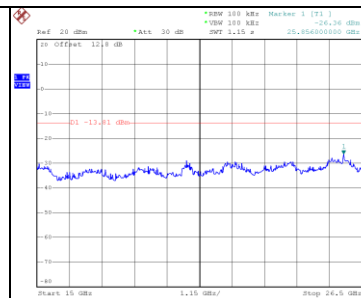
2480 MHz – 10 Harmonics



Date: 19 JUN 2023 22:28:22



Date: 19 JUN 2023 22:28:29



Date: 19 JUN 2023 22:28:36

End of Test Report