TEST REPORT

Reference No.	:	WTX25X04102032W
FCC ID	:	2BPEM-MP1
Applicant	:	Lumos Health Inc.
Address	:	544 Brookhaven Crescent, Waterloo, Ontario N2L4R7, Canada
Manufacturer	:	The same as Applicant
Address	:	The same as Applicant
Product Name	:	Lumos Glasses
Model No.	:	MP1
Standards	:	FCC Part 15.247
Date of Receipt sample	:	2025-04-22
Date of Test	:	2025-04-22 to 2025-04-29
Date of Issue	:	2025-04-29
Test Report Form No.	:	WTX_Part 15_247W
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:
Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road,
Block 70 Bao'an District, Shenzhen, Guangdong, China
Tel.: +86-755-33663308 Fax.: +86-755-33663309 Email: sem@waltek.com.cn

Tested by:

Mike Shi/Project Engineer

Approved by:

Jason Su/Manager

TABLE OF CONTENTS

1. GENERAL INFORMATION **4**
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 4
1.2 TEST STANDARDS 5
1.3 TEST METHODOLOGY 5
1.4 TEST FACILITY 5
1.5 EUT SETUP AND TEST MODE 6
1.6 MEASUREMENT UNCERTAINTY 7
1.7 TEST EQUIPMENT LIST AND DETAILS 8
2. SUMMARY OF TEST RESULTS **12**
3. ANTENNA REQUIREMENT **13**
3.1 STANDARD APPLICABLE 13
3.2 EVALUATION INFORMATION 13
4. POWER SPECTRAL DENSITY **14**
4.1 STANDARD APPLICABLE 14
4.2 TEST SETUP BLOCK DIAGRAM 14
4.3 TEST PROCEDURE 14
4.4 SUMMARY OF TEST RESULTS/PLOTS 14
5. DTS BANDWIDTH **15**
5.1 STANDARD APPLICABLE 15
5.2 TEST SETUP BLOCK DIAGRAM 15
5.3 TEST PROCEDURE 15
5.4 SUMMARY OF TEST RESULTS/PLOTS 15
6. RF OUTPUT POWER **16**
6.1 STANDARD APPLICABLE 16
6.2 TEST SETUP BLOCK DIAGRAM 16
6.3 TEST PROCEDURE 16
6.4 SUMMARY OF TEST RESULTS/PLOTS 16
7. FIELD STRENGTH OF SPURIOUS EMISSIONS **17**
7.1 STANDARD APPLICABLE 17
7.2 TEST PROCEDURE 17
7.3 CORRECTED AMPLITUDE & MARGIN CALCULATION 19
7.4 SUMMARY OF TEST RESULTS/PLOTS 19
8. OUT OF BAND EMISSIONS **26**
8.1 STANDARD APPLICABLE 26
8.2 TEST PROCEDURE 26
8.3 SUMMARY OF TEST RESULTS/PLOTS 27
9. CONDUCTED EMISSIONS **36**
9.1 TEST PROCEDURE 36
9.2 BASIC TEST SETUP BLOCK DIAGRAM 36
9.3 TEST RECEIVER SETUP 36
9.4 SUMMARY OF TEST RESULTS/PLOTS 36
APPENDIX PHOTOGRAPHS **39**

Report version

Version No.	Date of issue	Description
Rev.00	2025-04-29	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Lumos Glasses
Trade Name	/
Model No.:	MP1
Adding Model(s):	/
Rated Voltage:	Charging port:DC5V Battery:DC3.7 V
Battery Capacity:	130mAh
Power Adapter:	/
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Bluetooth Version:	V5.0
Frequency Range:	2402-2480MHz
RF Output Power:	Left Ear: 1Mbps: -2.68dBm (Conducted) 2Mbps: -2.74dBm (Conducted) Right Ear: 1Mbps: -2.07dBm (Conducted) 2Mbps: -2.19dBm (Conducted)
Data Rate:	1Mbps, 2Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	Ceramic antenna
Antenna Gain:	0.5dBi
Note The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.
558074 D01 15.247 Meas Guidance v05r02: Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under section 15.247 of the Fcc rules.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02.
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990
Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is mai ntained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

1.5 EUT Setup and Test Mode

The RF sample was used for the purpose of the measurements. All testing was performed under the maximum output power condition, with a duty cycle equal to 100%, and measured its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	Low	2402MHz
TM2	Middle	2440MHz
TM3	High	2480MHz

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	45~75 %
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	0.68	Unshielded	Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Computer	Lenovo	L13 Yoga	/
Adapter	/	XY18W-1375-QC3.0	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	0.57dB
Occupied Bandwidth	Conducted	0.015MHz
Power Spectral Density	Conducted	1.8dB
Conducted Spurious Emission	Conducted	2.17dB
Conducted Emissions	Conducted	9-150kHz, 3.74dB
		0.15-30MHz, 3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz, 4.52dB
		0.2-1GHz 5.56dB
		1-6GHz, 3.84dB
		6-18GHz, 3.92dB

1.7 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A 1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2025-02-23	2026-02-22
WTXE1005A 1005	Spectrum Analyzer	Agilent	N9020A	US47140102	2025-02-23	2026-02-22
WTXE1084A 1001	Spectrum Analyzer	Agilent	N9020A	MY54320548	2025-02-23	2026-02-22
WTXE1004A 1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2025-02-23	2026-02-22
WTXW1105A 1010	Spectrum Analyzer	KEYSIGHT	N9020A	MY51285677	2025-02-23	2026-02-22
WTXE1105A 1008	RF Control Unit	Tonscend	JS0806-2	24F80620870	2025-02-23	2026-02-22
WTXE1103A 1003	Attenuator	Pasternack	PE4007-4	/	2025-02-23	2026-02-22
WTXE1003A 1-005	Coaxial Cable	/	0M4RFC	/	2025-02-23	2026-02-22
☐Chamber A: Below 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2025-02-23	2026-02-22
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2025-02-23	2026-02-22
WTXE1007A 1001	Amplifier	HP	8447F	2805A03475	2025-02-23	2026-02-22
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2026-02-25
WTXE1010A 1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2025-02-23	2026-02-22
WTXE1104A 1032-1	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1032-2	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1032-3	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
☐Chamber A: Above 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2025-02-23	2026-02-22
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2025-02-23	2026-02-22

WTXE1065A 1001	Amplifier	C&D	PAP-1G18	2002	2025-02-23	2026-02-22
WTXE1010A 1005	Horn Antenna	ETS	3117	00086197	2025-02-23	2026-02-22
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2026-03-16
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2025-02-23	2026-02-22
WTXE1104A 1033-1	Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
WTXE1104A 1033-2	Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
WTXE1104A 1033-3	Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
☐Chamber B:Below 1GHz						
WTXE1010A 1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2024-03-17	2027-03-16
WTXE1038A 1001	Amplifier	Agilent	8447D	2944A104 57	2025-02-23	2026-02-22
WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2025-02-23	2026-02-22
WTXE1104A 1031-1	Coaxial Cable	/	1.5MRFC-LWB3	/	2025-02-23	2026-02-22
WTXE1104A 1031-2	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
WTXE1104A 1031-3	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
☒Chamber C:Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2025-02-23	2026-02-22
WTXE1010A 1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2024-04-18	2027-04-17
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2026-02-25
WTXE1007A 1002	Amplifier	HP	8447F	2944A038 69	2025-02-23	2026-02-22
WTXE1104A 1034-1	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1034-2	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22

WTXE1104A 1034-3	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
☒Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2025-02-23	2026-02-22
WTXE1103A 1005	Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2025-02-23	2026-02-22
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2026-03-16
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2025-02-23	2026-02-22
WTXE1104A 1035-1	Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1035-2	Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1035-3	Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
☐Conducted Room 1#						
WTXE1104A 1029	EMI Test Receiver	Rohde & Schwarz	ESCI	100525	2024-12-08	2025-12-07
WTXE1002A 1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2025-02-23	2026-02-22
WTXE1003A 1001	AC LISN	Schwarz beck	NSLK8126	8126-279	2025-02-23	2026-02-22
WTXE1104A 1036	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
WTXE1104A 1038	Coaxial Cable	/	6MRFC-DP	/	2025-02-23	2026-02-22
☒Conducted Room 2#						
WTXE1001A 1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2025-02-23	2026-02-22
WTXE1003A 1003	LISN	Rohde & Schwarz	ENV 216	100097	2025-02-23	2026-02-22
WTXE1104A 1037	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission A)	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission B)	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission C)	Farad	EZ-EMC	RA-03A1-2 (1.1.4.2)
EMI Test Software (Conducted Emission Room 1#)	Farad	EZ-EMC	3A1*CE-RE 1.1.4.3
EMI Test Software (Conducted Emission Room 2#)	Farad	EZ-EMC	3A1*CE-RE 1.1.4.3
RF Test System	Tonscend	JS1120-3	V3.5.39

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203; §15.247(b)(4)(i)	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§15.207(a)	Conducted Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.247(a)(2)	DTS Bandwidth	Compliant
§15.247(b)(3)	RF Output Power	Compliant
§15.209(a)	Radiated Emission	Compliant
§15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: Not applicable.

3. Antenna Requirement

3.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Evaluation Information

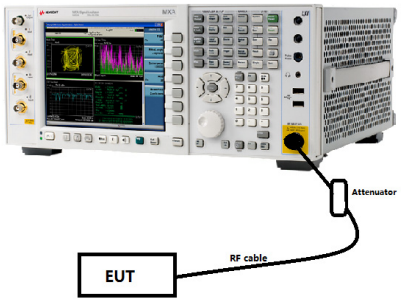
This product has a Ceramic antenna, fulfill the requirement of this section.

4. Power Spectral Density

4.1 Standard Applicable

According to 15.247(a)(1)(iii), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

4.2 Test Setup Block Diagram



4.3 Test Procedure

According to the KDB 558074 D01 v05r02 Subclause 8.4 and ANSI C63.10-2013 Subclause 11.10.2, the test method of power spectral density as below:

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: 3kHz ≤ RBW ≤ 100kHz.
d) Set the VBW ≥ 3 × RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds limit, reduce RBW (no less than 3kHz) and repeat.

4.4 Summary of Test Results/Plots

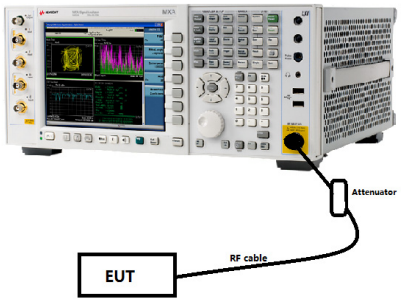
Please refer to Appendix C

5. DTS Bandwidth

5.1 Standard Applicable

According to 15.247(a)(2), systems using digital modulation techniques may operate in the 902–928MHz, 2400–2483.5MHz, and 5725–5850 MHz bands. The minimum 6dB bandwidth shall be at least 500kHz.

5.2 Test Setup Block Diagram



5.3 Test Procedure

According to the KDB 558074 D01 v05r02 Subclause 8.2 and ANSI C63.10-2013 Subclause 11.8.1, the test method of DTS Bandwidth as below:

a) Set RBW = 100kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

5.4 Summary of Test Results/Plots

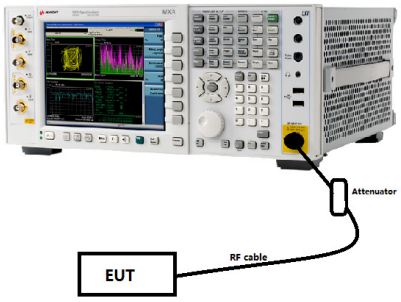
Please refer to Appendix A

6. RF Output Power

6.1 Standard Applicable

According to 15.247(b)(3), for systems using digital modulation in the 902–928MHz, 2400–2483.5MHz, and 5725–5850MHz bands: 1 Watt.

6.2 Test Setup Block Diagram



6.3 Test Procedure

According to the KDB-558074 D01 v05r02 Subclause 8.3.1.1 and ANSI C63.10-2013 Subclause 11.9.1.1, this procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ 3 × RBW.
c) Set span ≥ 3 x RBW
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

6.4 Summary of Test Results/Plots

Please refer to Appendix B

7. Field Strength of Spurious Emissions

7.1 Standard Applicable

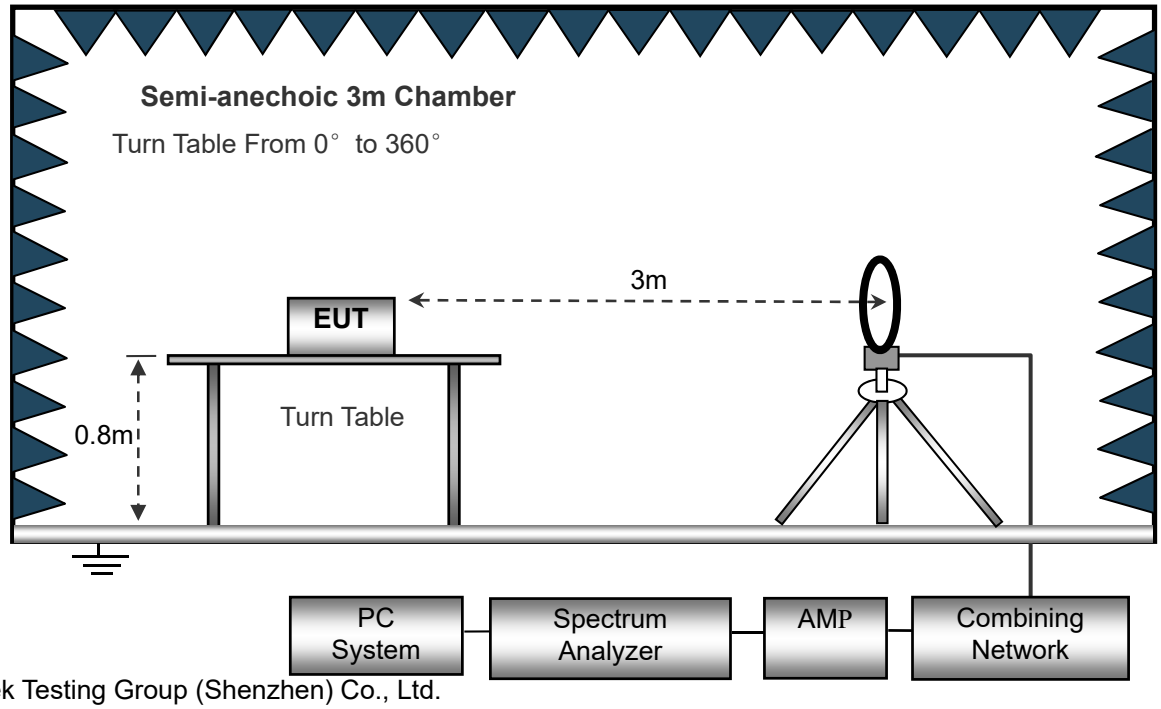
According to §15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

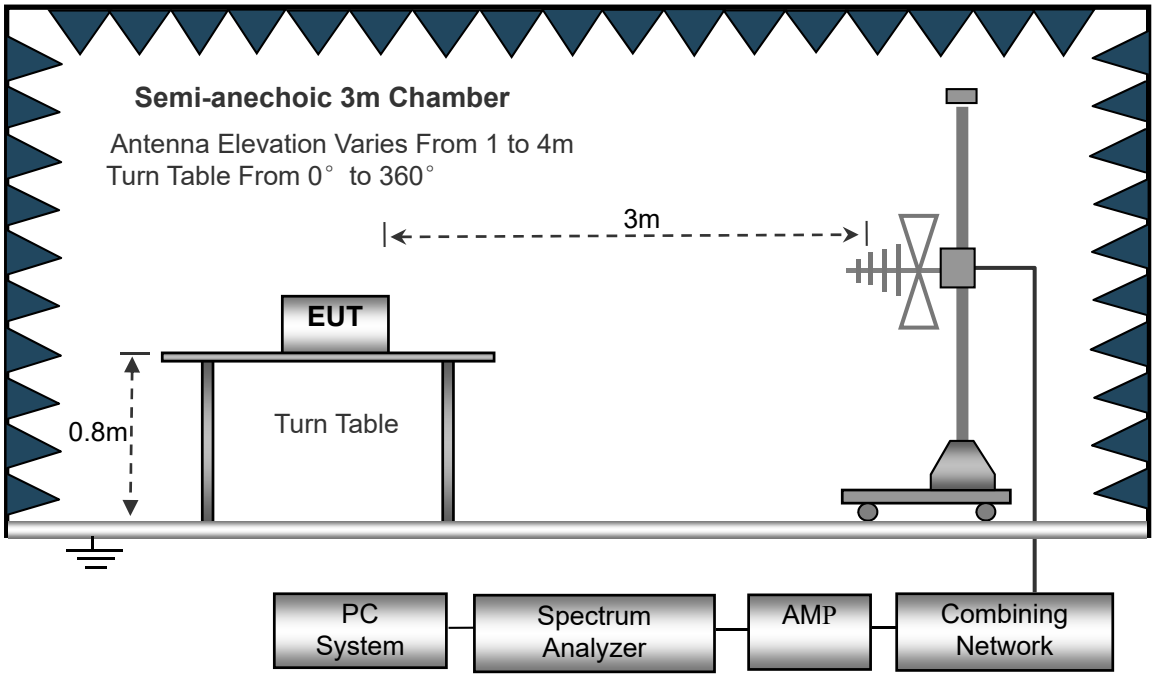
7.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

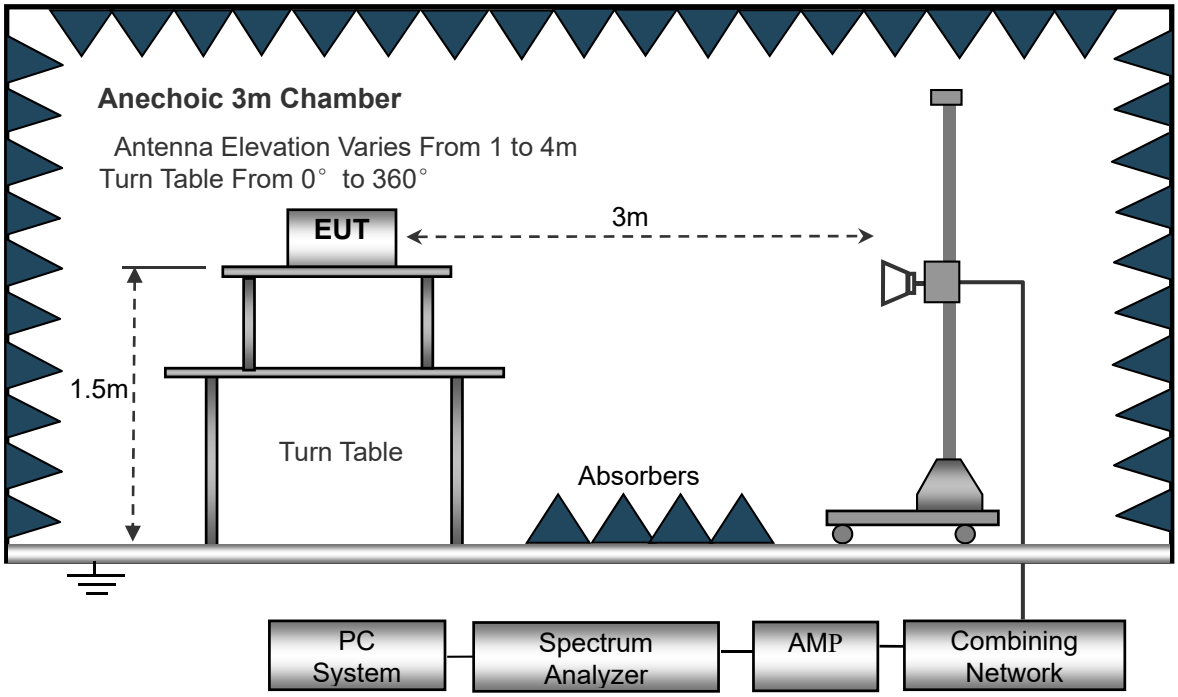
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1GHz.



Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10kHz,	RBW=120kHz,	RBW=1MHz,
VBW =30kHz	VBW=300kHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold

Detector function = peak Detector function = peak, QP Detector function = peak, AV

7.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit. The equation for margin calculation is as follows:

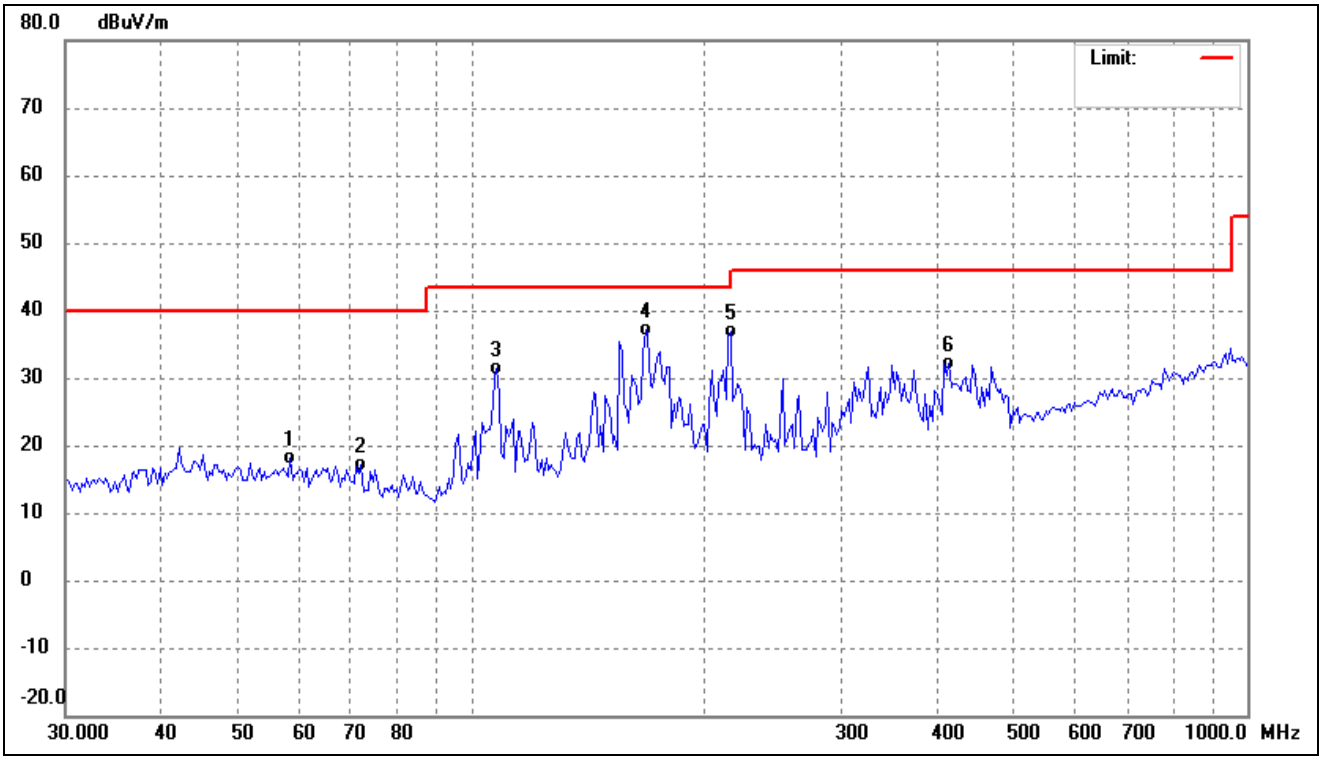
Margin = Corr. Ampl. – FCC Part 15 Limit

7.4 Summary of Test Results/Plots

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

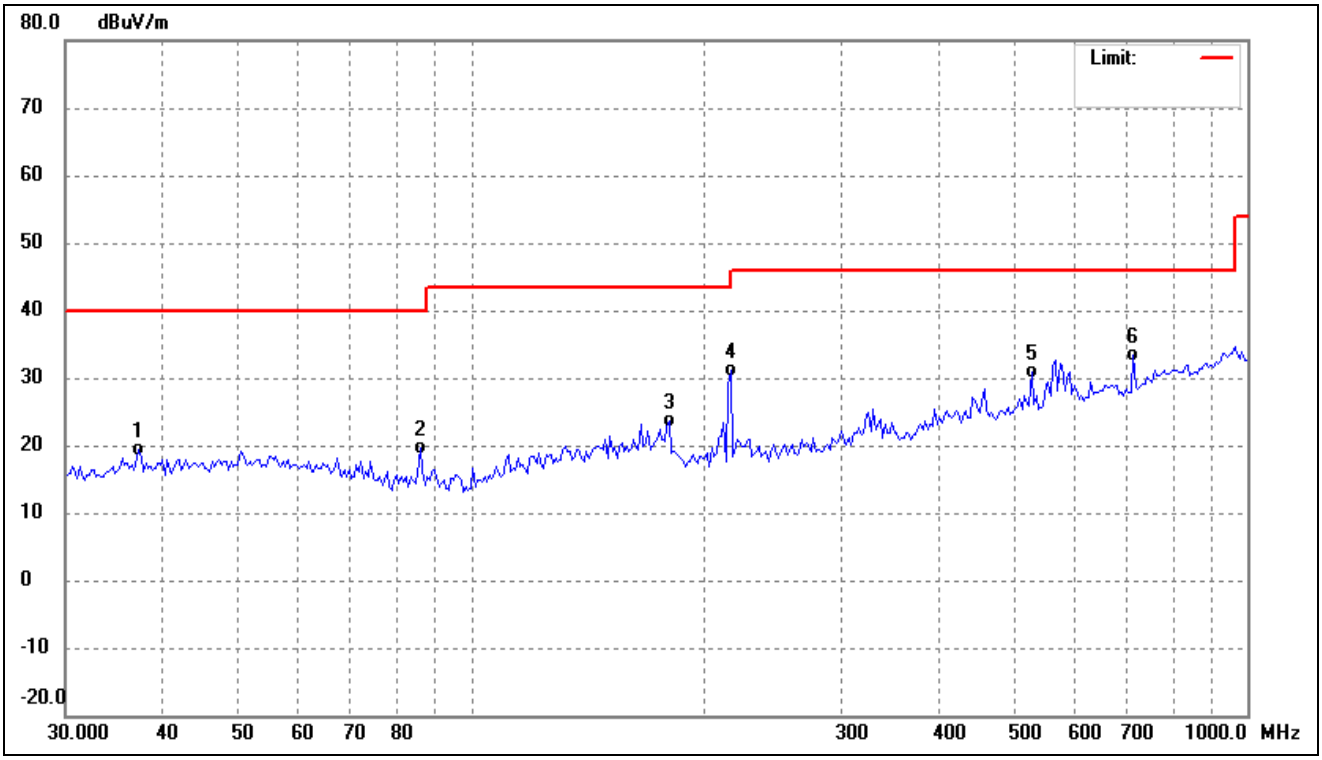
- Spurious Emissions Below 1GHz
- BLE 1Mbps(worst case)
- Left Temple

Test Channel	Low(wort case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	58.4855	27.55	-9.41	18.14	40.00	-21.86	-	-	QP
2	72.2111	28.69	-11.51	17.18	40.00	-22.82	-	-	QP
3	107.7854	43.63	-12.28	31.35	43.50	-12.15	-	-	QP
4	167.8136	45.86	-8.76	37.10	43.50	-6.40	-	-	QP
5	216.1197	48.59	-11.66	36.93	46.00	-9.07	-	-	QP
6	412.5395	38.18	-5.94	32.24	46.00	-13.76	-	-	QP

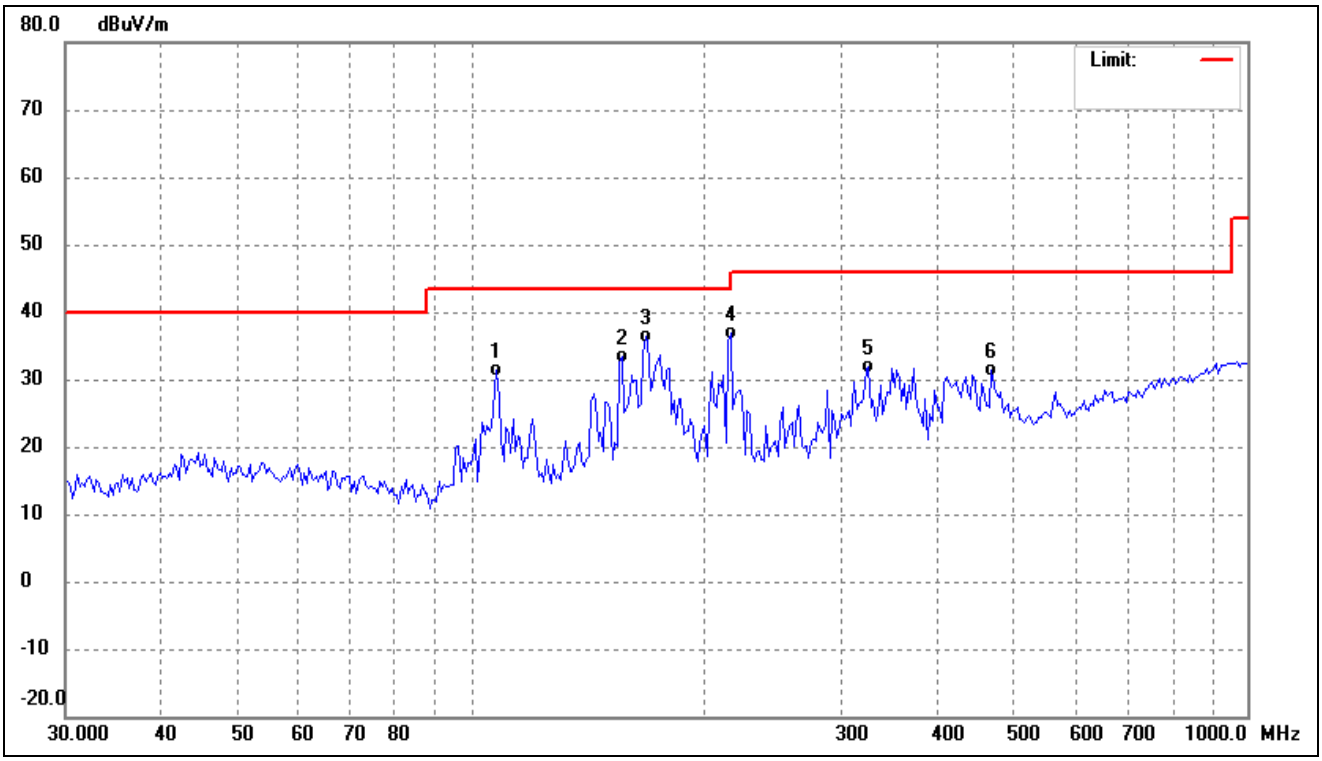
Test Channel	Low(wort case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	37.3017	29.35	-9.90	19.45	40.00	-20.55	-	-	QP
2	86.0796	33.71	-14.07	19.64	40.00	-20.36	-	-	QP
3	180.0304	33.58	-9.87	23.71	43.50	-19.79	-	-	QP
4	216.1197	42.75	-11.66	31.09	46.00	-14.91	-	-	QP
5	527.5707	34.72	-3.81	30.91	46.00	-15.09	-	-	QP
6	713.6917	33.96	-0.66	33.30	46.00	-12.70	-	-	QP

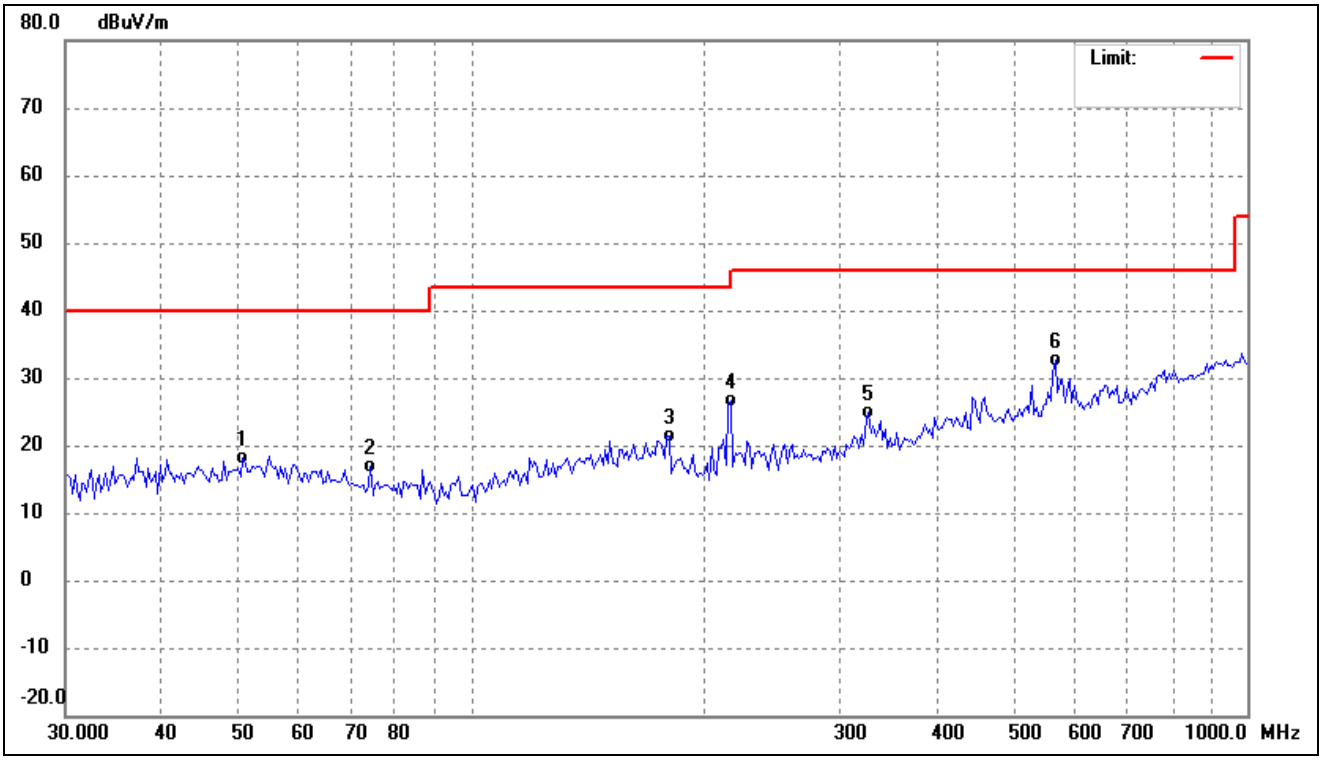
➢ Right Temple

Test Channel	Low(wort case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	107.7854	43.75	-12.28	31.47	43.50	-12.03	-	-	QP
2	156.4259	41.90	-8.58	33.32	43.50	-10.18	-	-	QP
3	167.8136	45.03	-8.76	36.27	43.50	-7.23	-	-	QP
4	216.1197	48.50	-11.66	36.84	46.00	-9.16	-	-	QP
5	324.8645	39.01	-7.18	31.83	46.00	-14.17	-	-	QP
6	468.1651	36.29	-4.89	31.40	46.00	-14.60	-	-	QP

Test Channel	Low(wort case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	50.8172	27.10	-8.98	18.12	40.00	-21.88	-	-	QP
2	74.2696	28.85	-11.92	16.93	40.00	-23.07	-	-	QP
3	180.0304	31.33	-9.87	21.46	43.50	-22.04	-	-	QP
4	216.1197	38.26	-11.66	26.60	46.00	-19.40	-	-	QP
5	324.8645	32.12	-7.18	24.94	46.00	-21.06	-	-	QP
6	565.9776	35.79	-3.20	32.59	46.00	-13.41	-	-	QP

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

➢ Spurious Emissions Above 1GHz

Left Temple: BLE 1Mbps(worst case)

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2402MHz							
4804	60.33	-13.23	47.10	74	-26.90	H	PK
4804	56.15	-13.23	42.92	54	-11.08	H	AV
7206	50.49	-6.85	43.64	74	-30.36	H	PK
7206	42.56	-6.85	35.71	54	-18.29	H	AV
4804	62.49	-13.23	49.26	74	-24.74	V	PK
4804	58.56	-13.23	45.33	54	-8.67	V	AV
7206	51.08	-6.85	44.23	74	-29.77	V	PK
7206	42.97	-6.85	36.12	54	-17.88	V	AV
Middle Channel-2440MHz							
4880	60.02	-13.13	46.89	74	-27.11	H	PK
4880	56.31	-13.13	43.18	54	-10.82	H	AV
7320	49.10	-7.18	41.92	74	-32.08	H	PK
7320	41.87	-7.18	34.69	54	-19.31	H	AV
4880	63.35	-13.13	50.22	74	-23.78	V	PK
4880	59.01	-13.13	45.88	54	-8.12	V	AV
7320	50.86	-7.18	43.68	74	-30.32	V	PK
7320	41.76	-7.18	34.58	54	-19.42	V	AV
High Channel-2480MHz							
4960	59.34	-13.03	46.31	74	-27.69	H	PK
4960	56.72	-13.03	43.69	54	-10.31	H	AV
7440	50.05	-7.52	42.53	74	-31.47	H	PK
7440	42.05	-7.52	34.53	54	-19.47	H	AV
4960	61.99	-13.03	48.96	74	-25.04	V	PK
4960	58.38	-13.03	45.35	54	-8.65	V	AV
7440	50.49	-7.52	42.97	74	-31.03	V	PK
7440	42.70	-7.52	35.18	54	-18.82	V	AV

Right Temple: BLE 1Mbps(worst case)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2402MHz							
4804	61.01	-13.23	47.78	74	-26.22	H	PK
4804	57.14	-13.23	43.91	54	-10.09	H	AV
7206	60.76	-6.85	53.91	74	-20.09	H	PK
7206	57.79	-6.85	50.94	54	-3.06	H	AV
4804	59.31	-13.23	46.08	74	-27.92	V	PK
4804	57.43	-13.23	44.20	54	-9.80	V	AV
7206	57.05	-6.85	50.20	74	-23.80	V	PK
7206	55.63	-6.85	48.78	54	-5.22	V	AV
Middle Channel-2440MHz							
4880	60.90	-13.13	47.77	74	-26.23	H	PK
4880	59.52	-13.13	46.39	54	-7.61	H	AV
7320	61.32	-7.18	54.14	74	-19.86	H	PK
7320	58.15	-7.18	50.97	54	-3.03	H	AV
4880	59.57	-13.13	46.44	74	-27.56	V	PK
4880	57.23	-13.13	44.10	54	-9.90	V	AV
7320	58.00	-7.18	50.82	74	-23.18	V	PK
7320	56.39	-7.18	49.21	54	-4.79	V	AV
High Channel-2480MHz							
4960	61.38	-13.03	48.35	74	-25.65	H	PK
4960	58.75	-13.03	45.72	54	-8.28	H	AV
7440	61.71	-7.52	54.19	74	-19.81	H	PK
7440	58.37	-7.52	50.85	54	-3.15	H	AV
4960	59.83	-13.03	46.80	74	-27.20	V	PK
4960	56.39	-13.03	43.36	54	-10.64	V	AV
7440	57.76	-7.52	50.24	74	-23.76	V	PK
7440	56.13	-7.52	48.61	54	-5.39	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Conducted Spurious Emission Please refer to Appendix F

8. Out of Band Emissions

8.1 Standard Applicable

According to §15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

8.2 Test Procedure

According to the KDB 558074 D01 v05r02 Subclause 8.4 and ANSI C63.10-2013 Subclause 11.11, the Emissions in nonrestricted frequency bands test method as follows:

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.

According to the KDB 558074 D01 v05r02 Subclause 8.5 and ANSI C63.10-2013 Subclause 11.12, the Emissions in restricted frequency bands test method as follows:

A. Radiated emission measurements:
Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)
RBW = 1MHz, VBW = 1MHz for peak value measured
RBW = 1MHz, VBW = 10Hz for average value measured
Sweep = auto; Detector function = peak/average; Trace = max hold
All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission

must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

B. Antenna-port conducted measurements

Peak emission levels are measured by setting the instrument as follows:

a) RBW = as specified in Table 9.

b) VBW ≥ [3 × RBW].

c) Detector = peak.

d) Sweep time = auto.

e) Trace mode = max hold.

f) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be lengthened for low-duty-cycle applications.)

RBW as a function of frequency

Frequency	RBW
9kHz to 150kHz	200Hz to 300Hz
0.15MHz to 30MHz	9kHz to 10kHz
30MHz to 1000MHz	100kHz to 120kHz
>1000MHz	1MHz

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

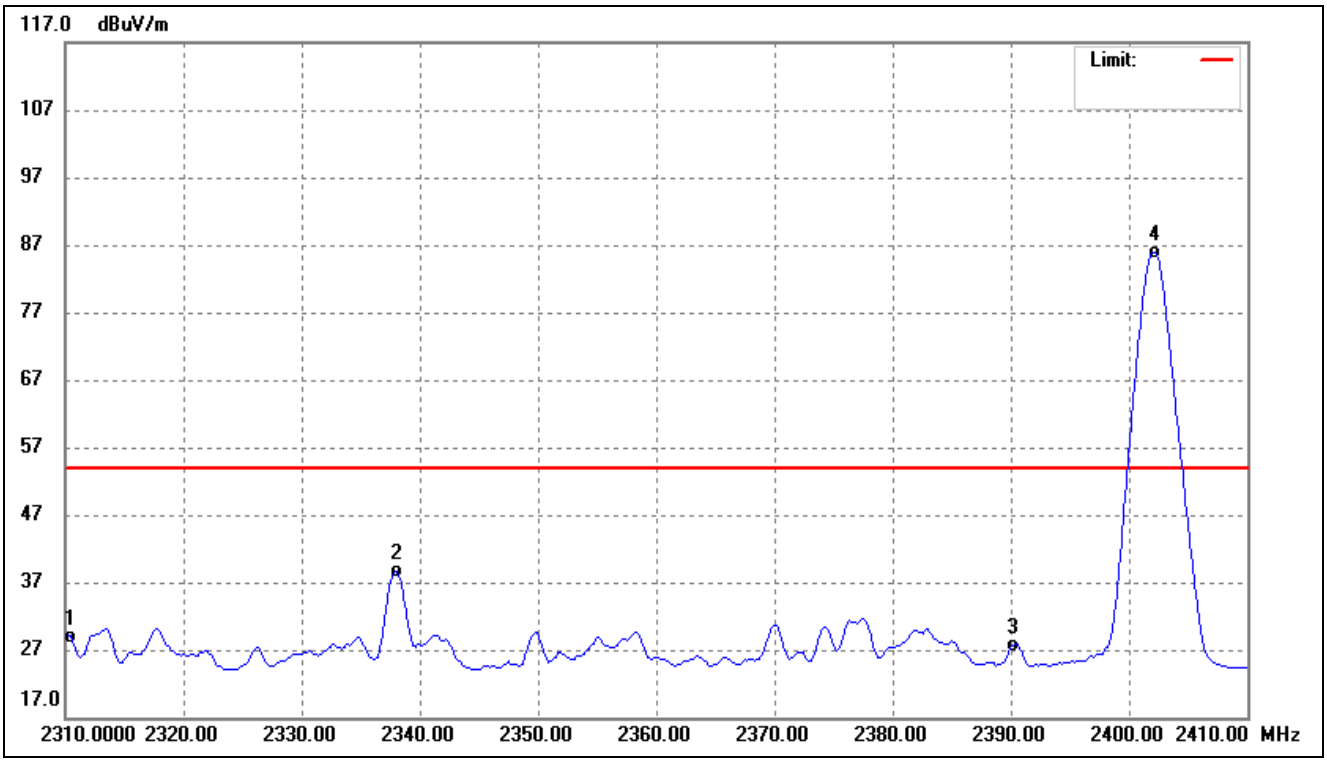
8.3 Summary of Test Results/Plots

➢ Radiated test

Left Temple

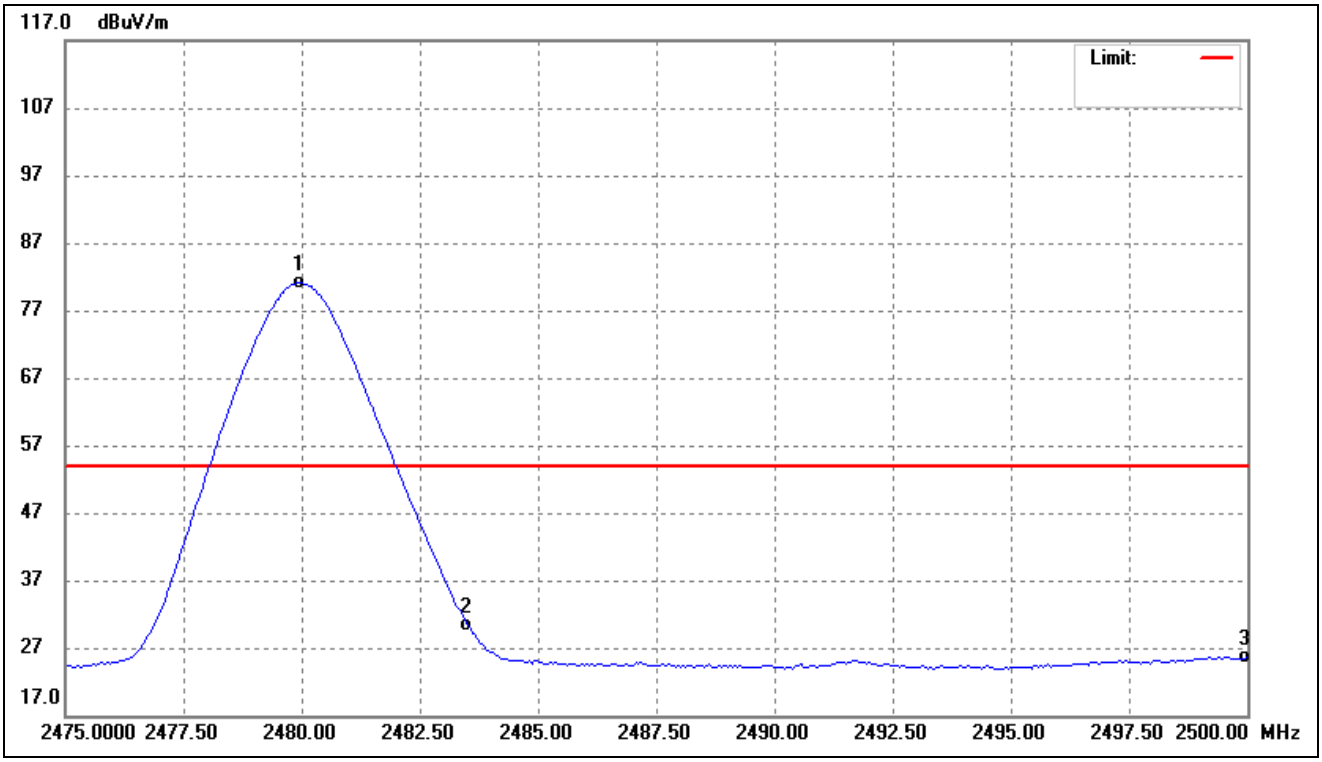
1Mbps

Test Channel	Low	Polarity:	Horizontal(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	48.49	-19.50	28.99	54.00	-25.01	Average Detector
	2310.000	57.78	-19.50	38.28	74.00	-35.72	Peak Detector
2	2338.056	57.98	-19.44	38.54	54.00	-15.46	Average Detector
3	2390.000	47.02	-19.31	27.71	54.00	-26.29	Average Detector
	2390.000	59.08	-19.31	39.77	74.00	-34.23	Peak Detector
4	2402.184	105.27	-19.29	85.98	/	/	Average Detector
	2401.784	105.96	-19.29	86.67	/	/	Peak Detector

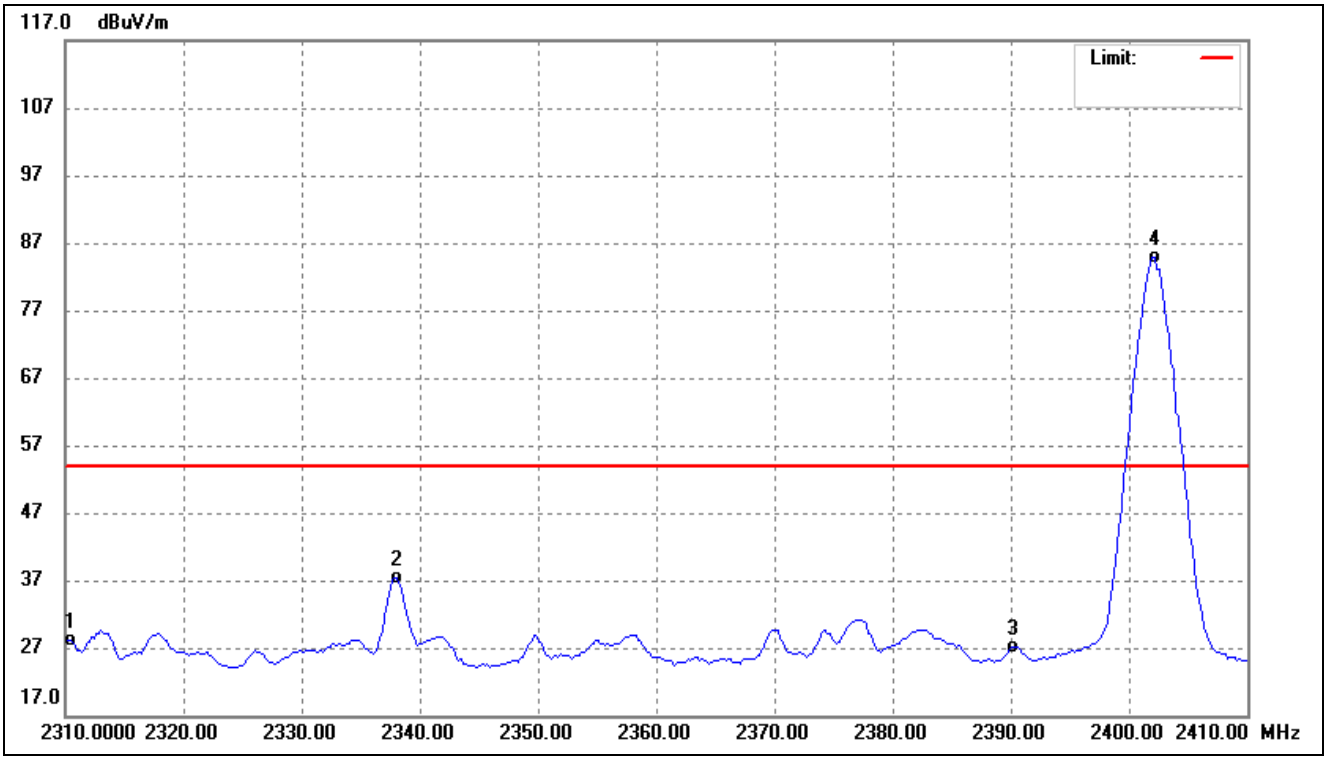
Test Channel	High	Polarity:	Horizontal(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2479.960	100.12	-19.09	81.03	/	/	Average Detector
	2480.261	101.12	-19.09	82.03	/	/	Peak Detector
2	2483.500	49.45	-19.09	30.36	54.00	-23.64	Average Detector
	2483.500	66.34	-19.09	47.25	74.00	-26.75	Peak Detector
3	2500.000	44.66	-19.05	25.61	54.00	-28.39	Average Detector
	2500.000	56.02	-19.05	36.97	74.00	-37.03	Peak Detector

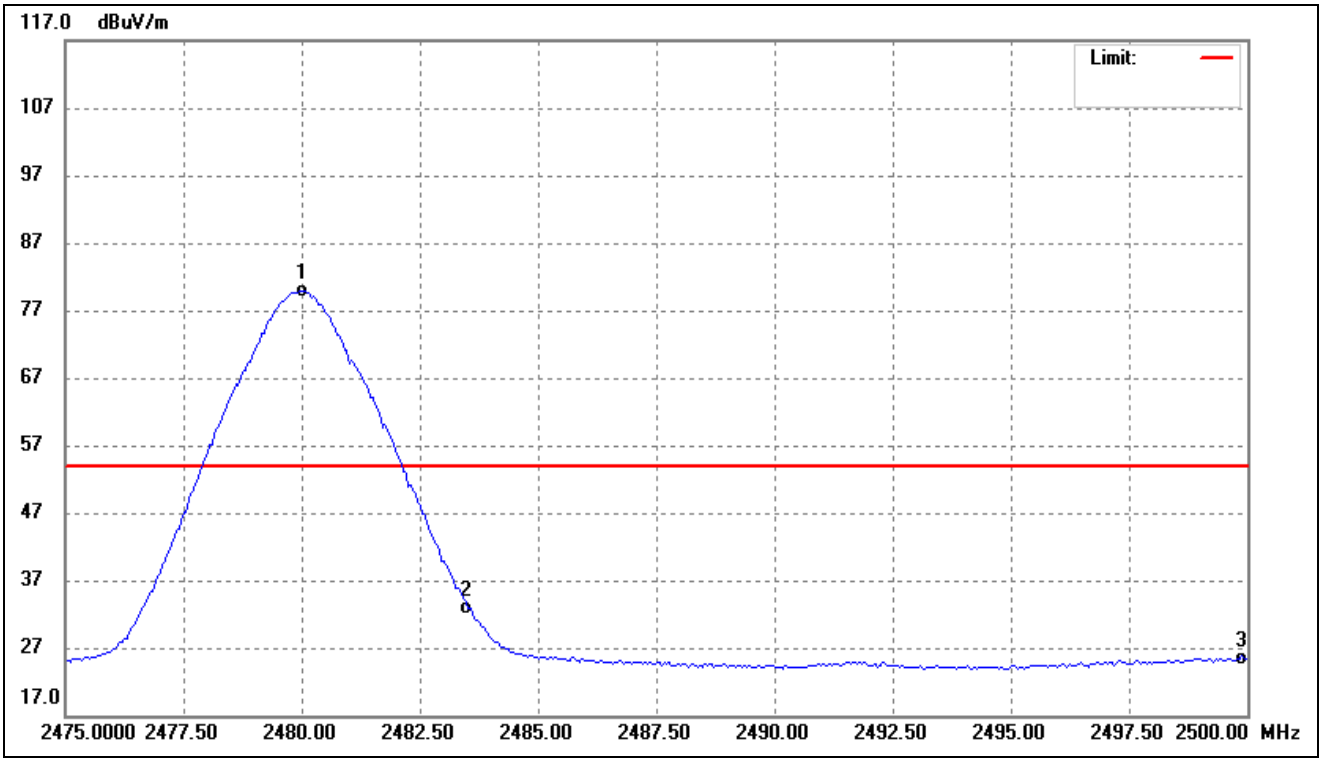
2Mbps

Test Channel	Low	Polarity:	Horizontal(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	47.70	-19.50	28.20	54.00	-25.80	Average Detector
	2310.000	57.03	-19.50	37.53	74.00	-36.47	Peak Detector
2	2338.056	56.94	-19.44	37.50	54.00	-16.50	Average Detector
3	2390.000	46.44	-19.31	27.13	54.00	-26.87	Average Detector
	2390.000	58.71	-19.31	39.40	74.00	-34.60	Peak Detector
4	2402.184	104.07	-19.29	84.78	/	/	Average Detector
	2401.583	106.11	-19.29	86.82	/	/	Peak Detector

Test Channel	High	Polarity:	Horizontal(worst case)

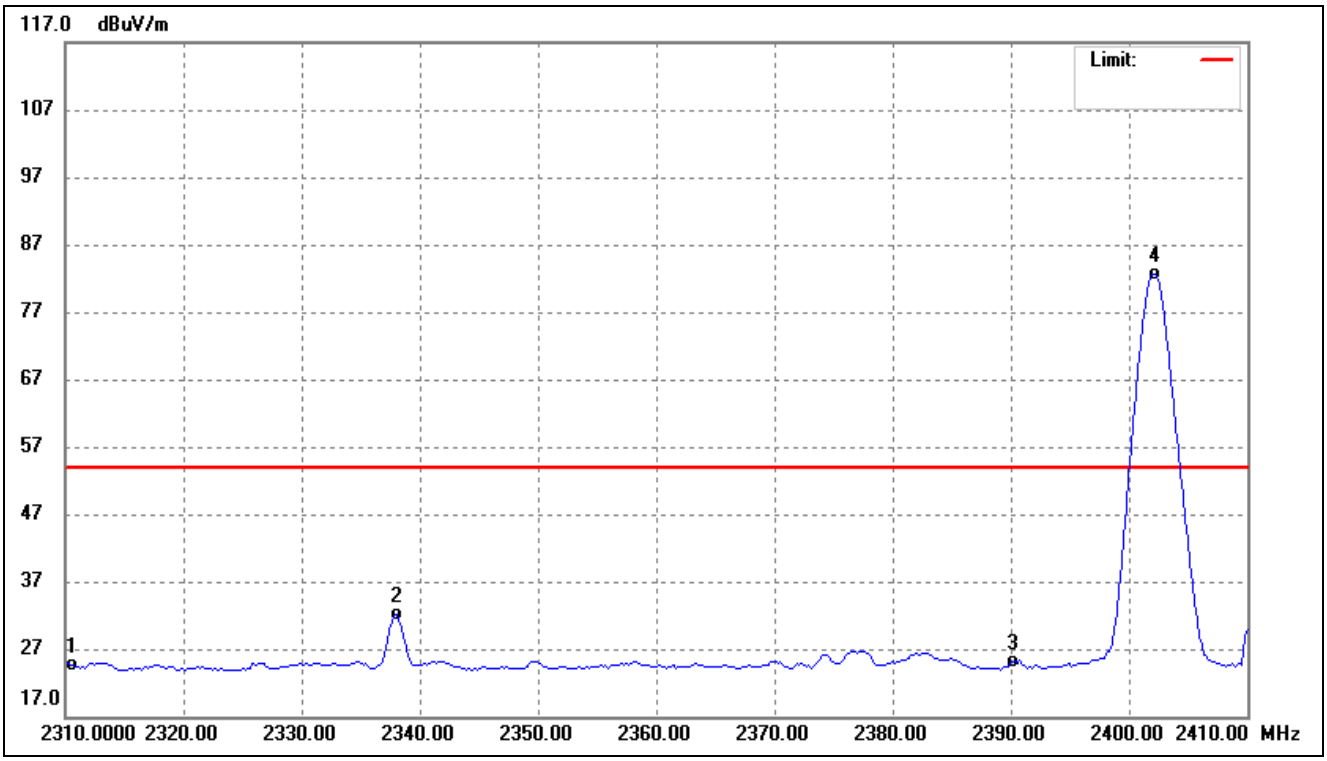


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2479.960	98.88	-19.09	79.79	/	/	Average Detector
	2480.411	100.91	-19.09	81.82	/	/	Peak Detector
2	2483.500	51.85	-19.09	32.76	54.00	-21.24	Average Detector
	2483.500	66.74	-19.09	47.65	74.00	-26.35	Peak Detector
3	2500.000	44.43	-19.05	25.38	54.00	-28.62	Average Detector
	2500.000	55.49	-19.05	36.44	74.00	-37.56	Peak Detector

Right Temple

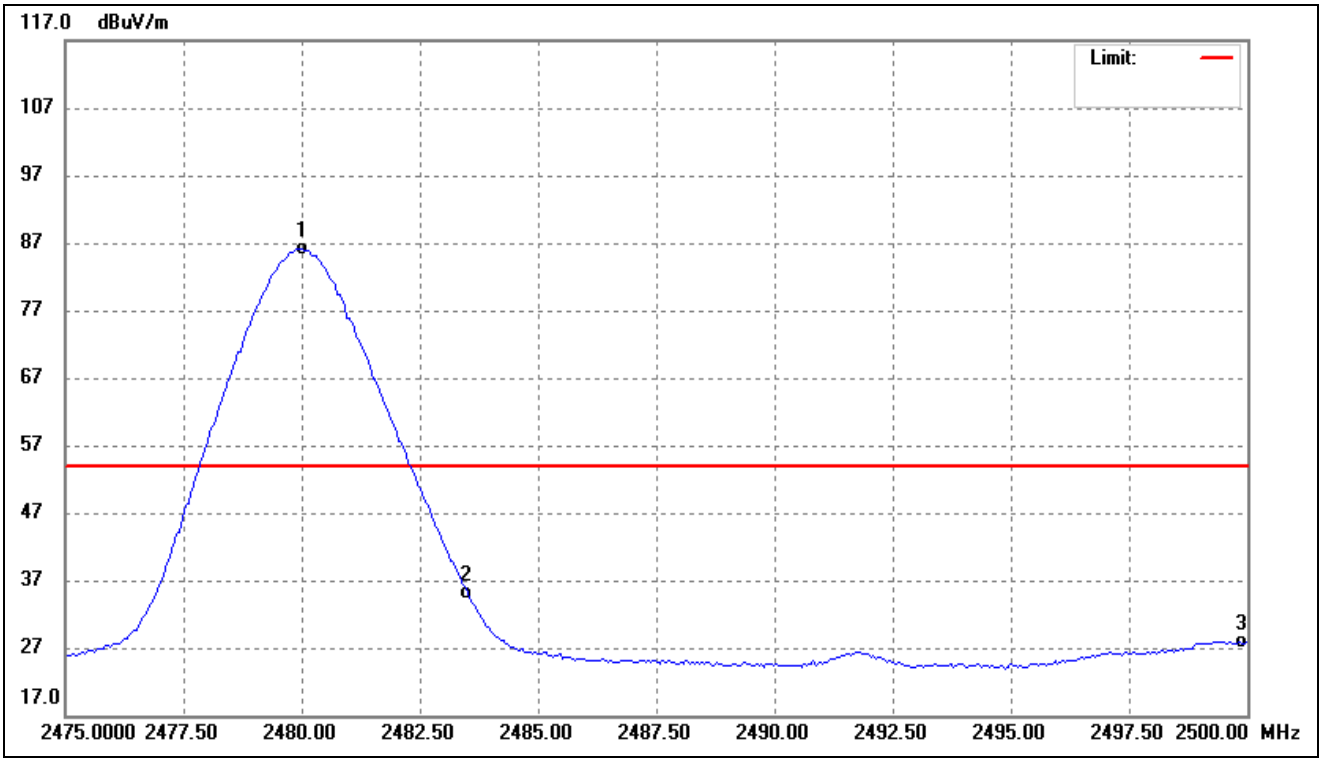
1Mbps

Test Channel	Low	Polarity:	Horizontal(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	44.03	-19.50	24.53	54.00	-29.47	Average Detector
	2310.000	57.39	-19.50	37.89	74.00	-36.11	Peak Detector
2	2338.056	51.46	-19.44	32.02	54.00	-21.98	Average Detector
3	2390.000	44.37	-19.31	25.06	54.00	-28.94	Average Detector
	2390.000	55.85	-19.31	36.54	74.00	-37.46	Peak Detector
4	2402.184	102.03	-19.29	82.74	/	/	Average Detector
	2401.984	103.01	-19.29	83.72	/	/	Peak Detector

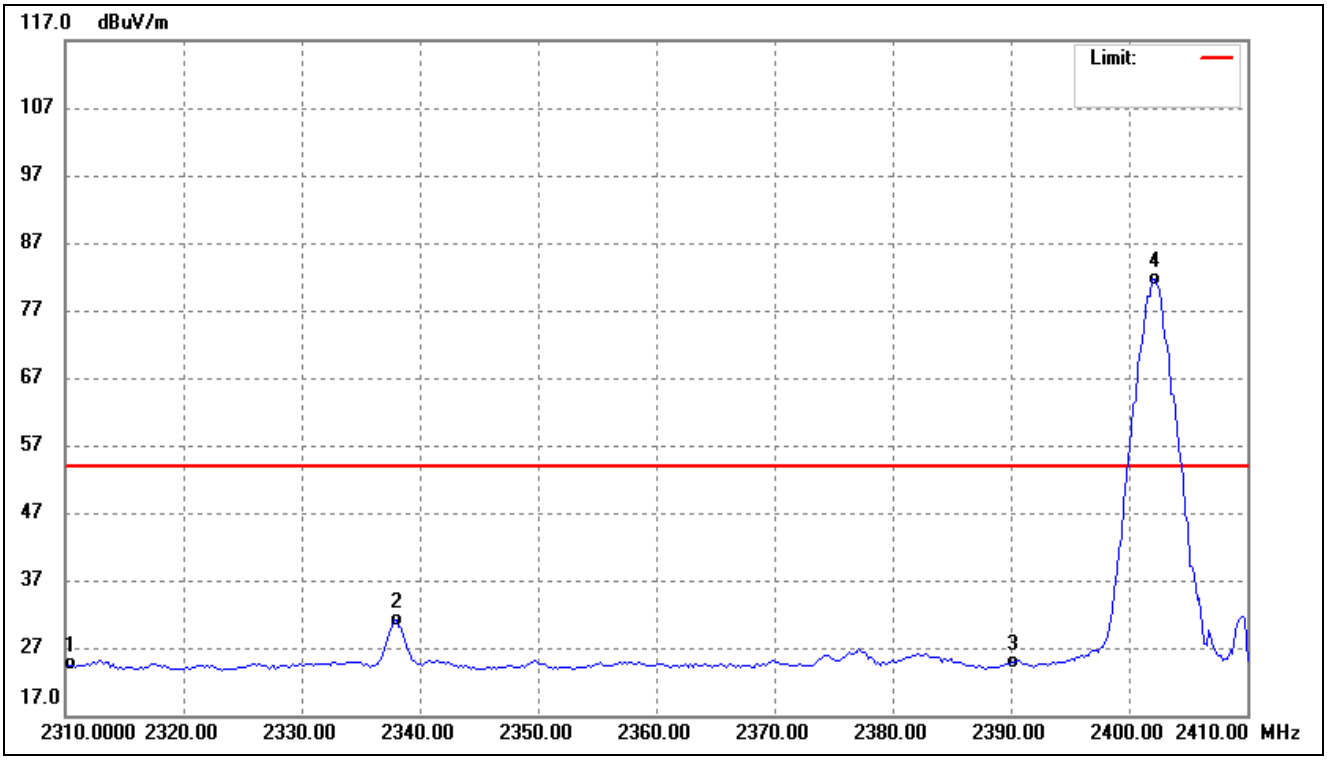
Test Channel	High	Polarity:	Horizontal(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2480.010	105.15	-19.09	86.06	/	/	Average Detector
	2480.210	105.46	-19.09	86.37	/	/	Peak Detector
2	2483.500	54.14	-19.09	35.05	54.00	-18.95	Average Detector
	2483.500	69.59	-19.09	50.50	74.00	-23.50	Peak Detector
3	2500.000	46.85	-19.05	27.80	54.00	-26.20	Average Detector
	2500.000	58.30	-19.05	39.25	74.00	-34.75	Peak Detector

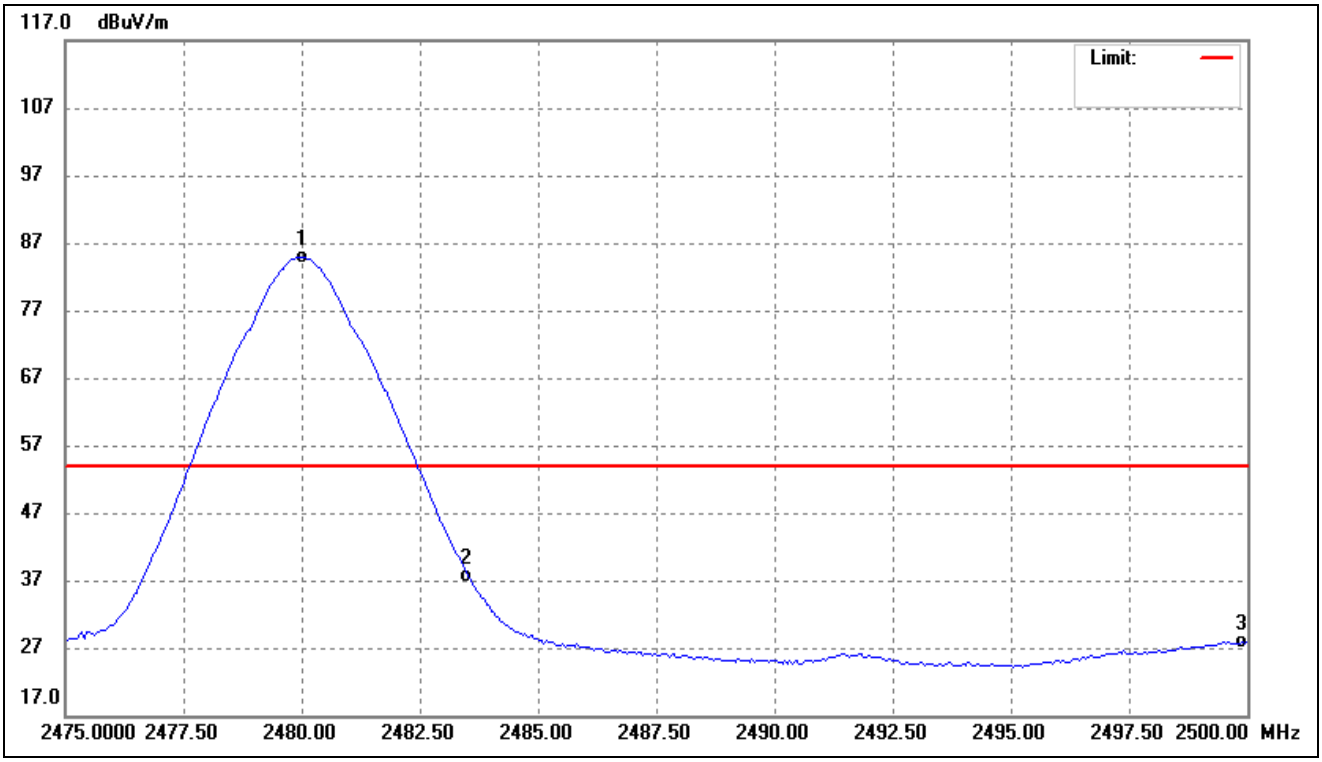
2Mbps

Test Channel	Low	Polarity:	Horizontal(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	44.03	-19.50	24.53	54.00	-29.47	Average Detector
	2310.000	55.43	-19.50	35.93	74.00	-38.07	Peak Detector
2	2337.856	50.58	-19.44	31.14	54.00	-22.86	Average Detector
3	2390.000	44.23	-19.31	24.92	54.00	-29.08	Average Detector
	2390.000	54.83	-19.31	35.52	74.00	-38.48	Peak Detector
4	2402.184	100.96	-19.29	81.67	/	/	Average Detector
	2401.583	102.85	-19.29	83.56	/	/	Peak Detector

Test Channel	High	Polarity:	Horizontal(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2480.010	103.94	-19.09	84.85	/	/	Average Detector
	2479.509	105.82	-19.10	86.72	/	/	Peak Detector
2	2483.500	56.78	-19.09	37.69	54.00	-16.31	Average Detector
	2483.500	70.67	-19.09	51.58	74.00	-22.42	Peak Detector
3	2500.000	46.81	-19.05	27.76	54.00	-26.24	Average Detector
	2500.000	56.76	-19.05	37.71	74.00	-36.29	Peak Detector

- Conducted test

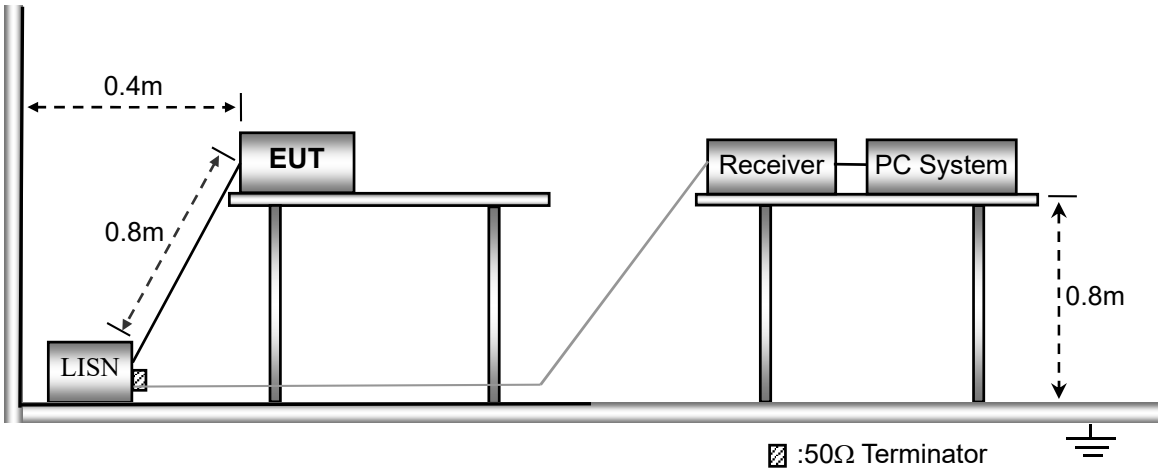
Please refer to Appendix D&E

9. Conducted Emissions

9.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

9.2 Basic Test Setup Block Diagram



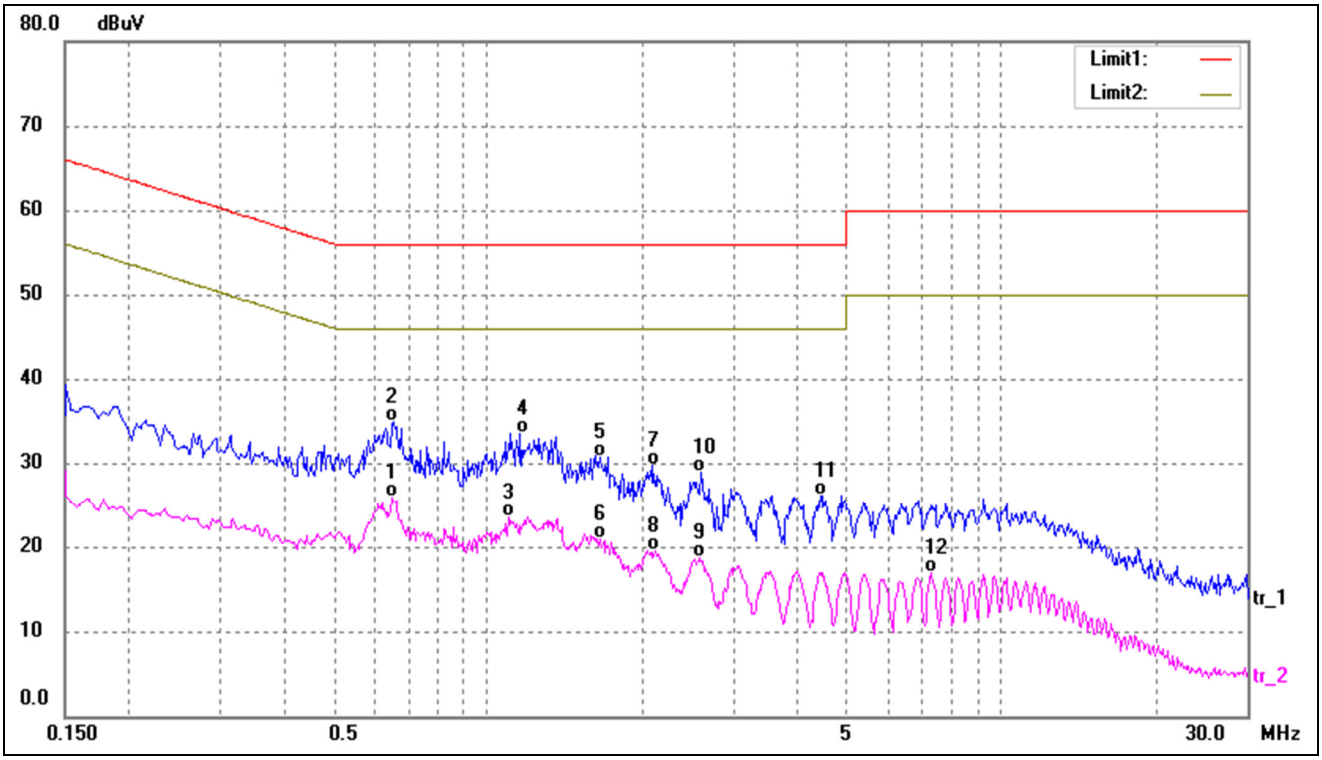
9.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 150kHz
Stop Frequency 30MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Quasi-Peak Adapter Bandwidth 9kHz
Quasi-Peak Adapter Mode ..... Normal

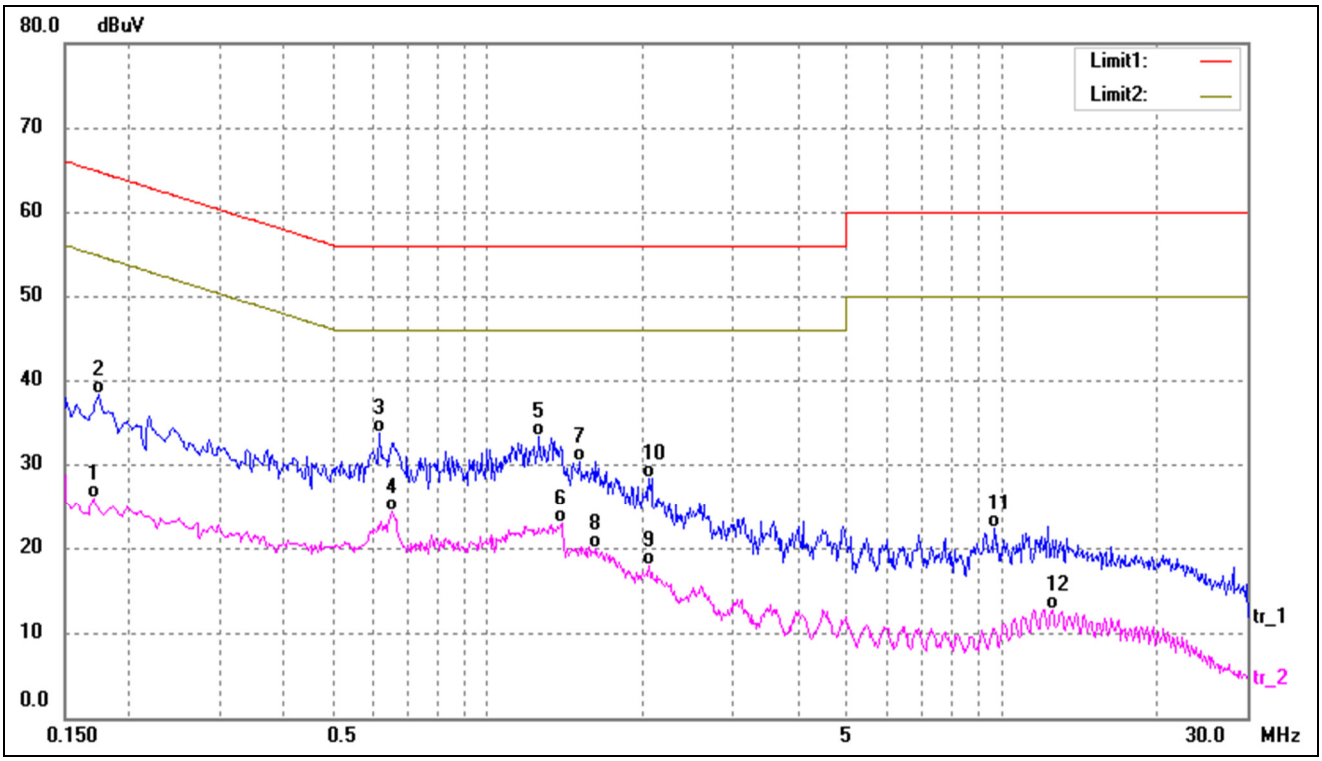
9.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1*	0.6500	16.16	9.71	25.87	46.00	-20.13	AVG
2	0.6540	25.19	9.72	34.91	56.00	-21.09	QP
3	1.0980	13.86	9.72	23.58	46.00	-22.42	AVG
4	1.1580	23.77	9.70	33.47	56.00	-22.53	QP
5	1.6460	21.26	9.50	30.76	56.00	-25.24	QP
6	1.6460	11.34	9.50	20.84	46.00	-25.16	AVG
7	2.0900	20.26	9.36	29.62	56.00	-26.38	QP
8	2.1140	10.07	9.37	19.44	46.00	-26.56	AVG
9	2.5900	9.32	9.38	18.70	46.00	-27.30	AVG
10	2.6060	19.45	9.38	28.83	56.00	-27.17	QP
11	4.4380	16.68	9.50	26.18	56.00	-29.82	QP
12	7.2780	7.11	9.79	16.90	50.00	-33.10	AVG

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1700	16.43	9.51	25.94	54.96	-29.02	AVG
2	0.1739	28.69	9.53	38.22	64.77	-26.55	QP
3	0.6139	24.06	9.70	33.76	56.00	-22.24	QP
4*	0.6500	14.57	9.71	24.28	46.00	-21.72	AVG
5	1.2579	23.70	9.66	33.36	56.00	-22.64	QP
6	1.3939	13.21	9.60	22.81	46.00	-23.19	AVG
7	1.5100	20.70	9.56	30.26	56.00	-25.74	QP
8	1.6259	10.33	9.51	19.84	46.00	-26.16	AVG
9	2.0579	8.45	9.36	17.81	46.00	-28.19	AVG
10	2.0819	19.02	9.36	28.38	56.00	-27.62	QP
11	9.7019	12.44	9.81	22.25	60.00	-37.75	QP
12	12.5299	3.07	9.66	12.73	50.00	-37.27	AVG

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

******* END OF REPORT *******