

Peloton Interactive Inc.

TEST REPORT

SCOPE OF WORK:

47 CFR FCC Part 15.249 – Radio Spectrum report

Model:

PLTN-RB1VO-2

REPORT NUMBER

210400309THC-001

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Radio Spectrum TEST REPORT

Applicant:	PELTON INTERACTIVE, INC. 125 West 25th street, FL11, New York, NY 10001, USA
Product:	Peloton Console Tablet
Model No.:	PLTN-RB1VO-2
FCC ID:	2AA3N-RB1VO2
Test Method/ Standard:	47 CFR FCC Part 15.249 & ANSI C63.10 2013
Test By:	Intertek Testing Services Taiwan Ltd., Hsinchu Laboratory No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li, Shiang-Shan District, Hsinchu City, Taiwan



Zero chen

Zero Chen
Engineer

Durant Wei

Durant Wei
Reviewer

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Revision History

Report No.	Issue Date	Revision Summary
210400309THC-001	Jun. 23, 2021	Original report

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Summary of Tests

Test	Reference	Results
20dB Bandwidth	15.215(c)	Pass
Radiated Emission test	15.249(c), 15.209	Pass
Emission on the Band Edge	15.249(d)	Pass
Conducted Emission of AC Power	15.207	Pass
Antenna Requirement	15.203	Pass

Note: Please note that the test results with statement of conformity, the decision rules which are based on: Safety Testing: the specification, standard or IEC Guide 115.

Other Testing: the specification, standard and not taking into account the measurement uncertainty.

1. General Information**1.1 Identification of the EUT**

Product:	Peloton Console Tablet
Model No.:	PLTN-RB1VO-2
Operating Frequency:	2402 MHz, 2440 MHz, 2480 MHz
Channel Number:	3 channels
Rated Power:	DC 12V from adapter
Power Cord:	N/A
Sample receiving date:	2021/04/26
Sample condition:	Workable
Test Date(s):	2021/04/26 ~ 2021/05/14

1.2 Antenna description

Antenna Gain : 4.32 dBi

Antenna Type : PCB Antenna

Connector Type : I-PEX

TEST REPORT**1.3 Operation mode**

The EUT connected to Notebook USB port , executing “AMPAK RFTestTool.apk” and select different frequency and modulation.

Mode	Channel	Frequency (MHz)	Signal on time (ms)	Signal on & off time (ms)	Duty cycle	Duty factor (dB)	1/T Minimum VBW (kHz)
ANT+	Mid	2441	0.19	6.10	3.06%	30.28	5.36

1.4 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Data cable
Notebook PC	HP	HP Probook 440 G3	5CD8021S9H	Micro USB shielded cable 1 meter
Adapter	EDAC	EA10681G-120	N/A	N/A

2. 20dB Bandwidth test

2.1 Test setup & procedure

Step 1: The 20dB bandwidth was measured using a 50 ohm spectrum analyzer

Step 2: The span range for the SA display shall be between two times and five times the OBW.

Step 3: The nominal IF filter bandwidth (3 dB RBW) should be approximately 1 % to 5 % of the OBW, unless otherwise specified, depending on the applicable requirement.

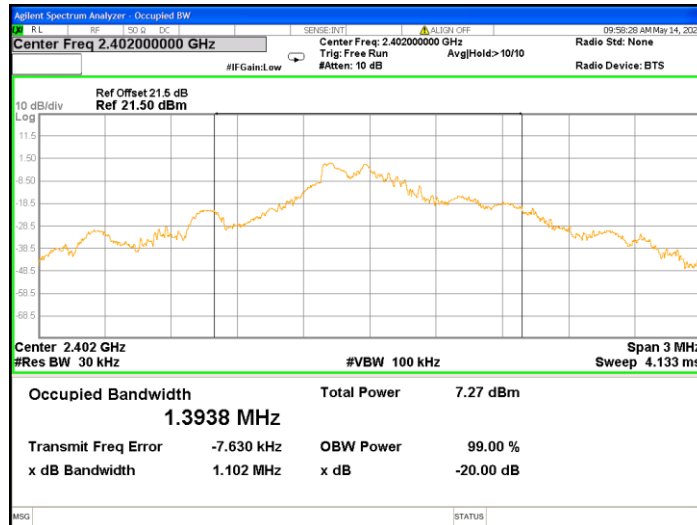
Step 4: The test was performed at 1 channel. The maximum 20dB modulation bandwidth is in the following Table.

2.2 Measured data of modulated bandwidth test results

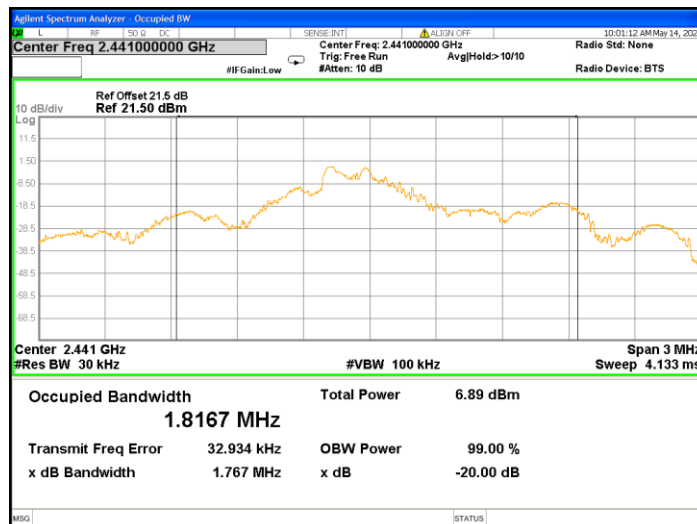
Temperature (°C) :	27
Relative Humidity (%) :	55
Test date :	2021/5/14

Mode	Frequency (MHz)	20dB Occupied Bandwidth (MHz)
ANT+	2402	1.102
	2441	1.767
	2480	1.945

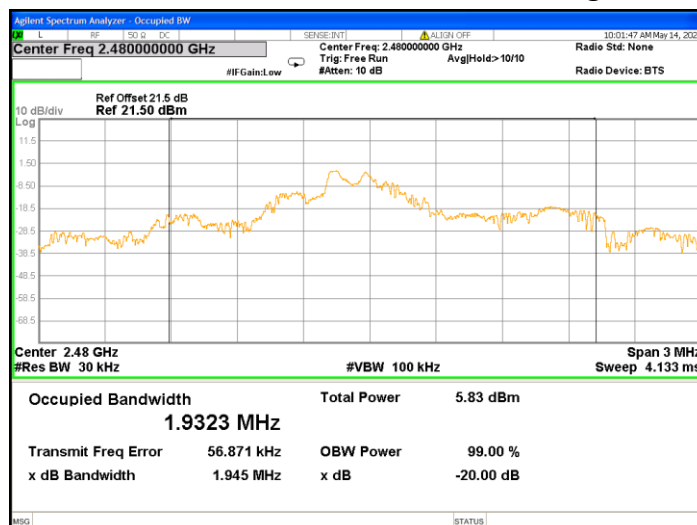
20dB Bandwidth @ ANT+ Channel Low



20dB Bandwidth @ ANT+ Channel Mid



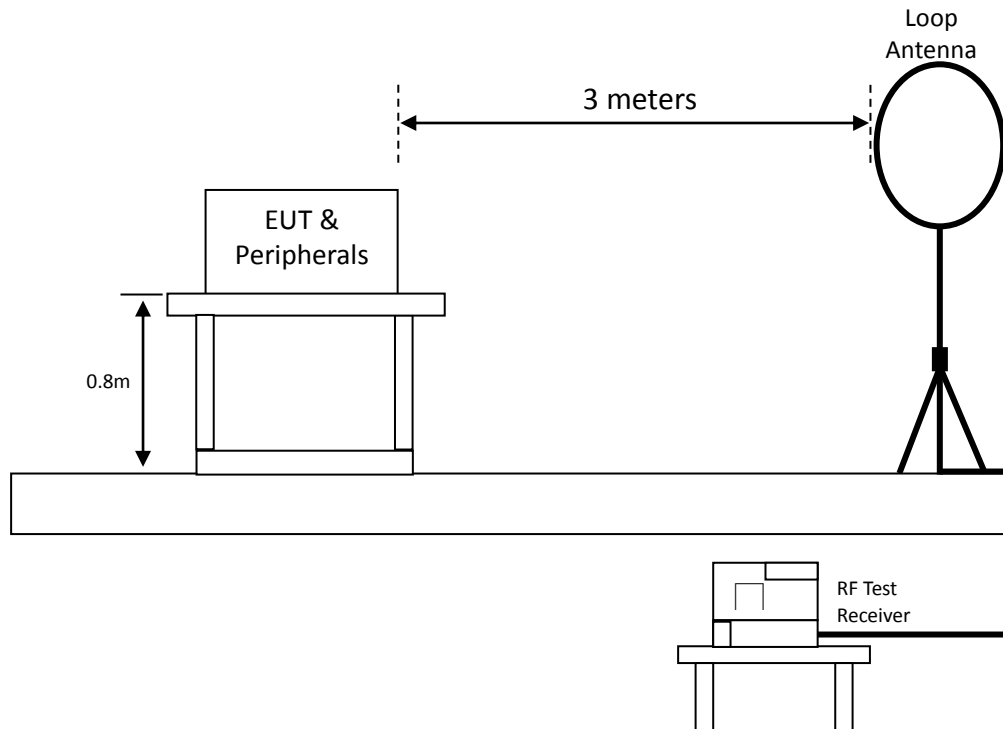
20dB Bandwidth @ ANT+ Channel High



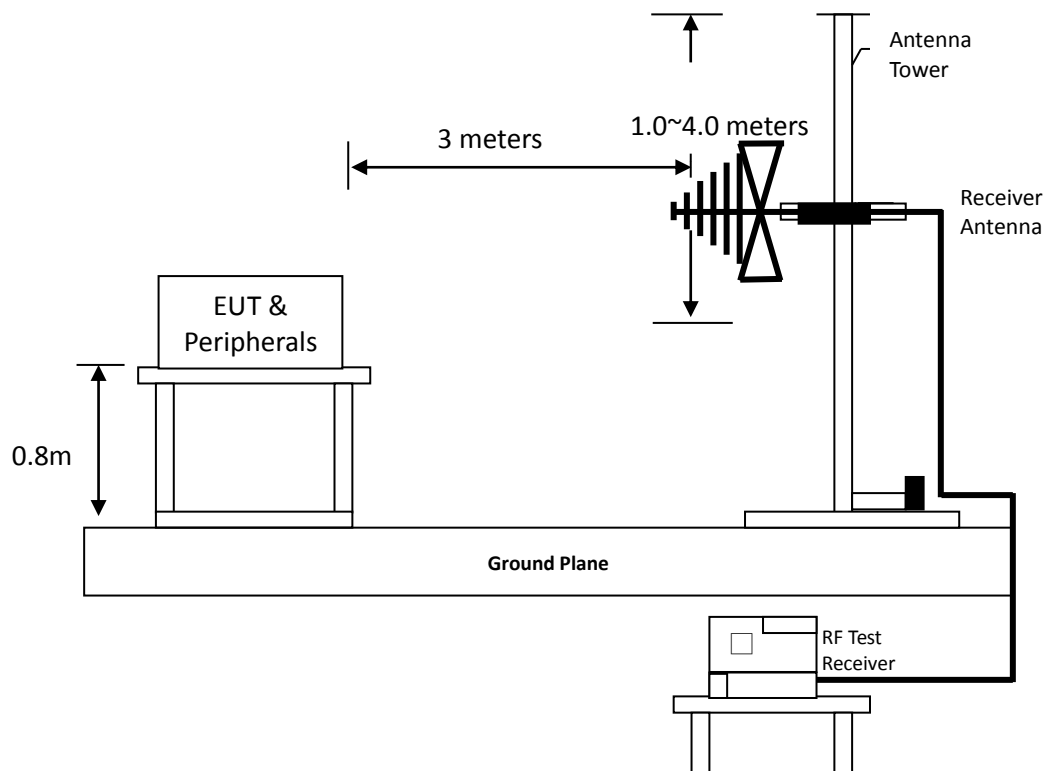
3. Radiated emission test FCC 15.249 (C)

3.1 Test setup & procedure

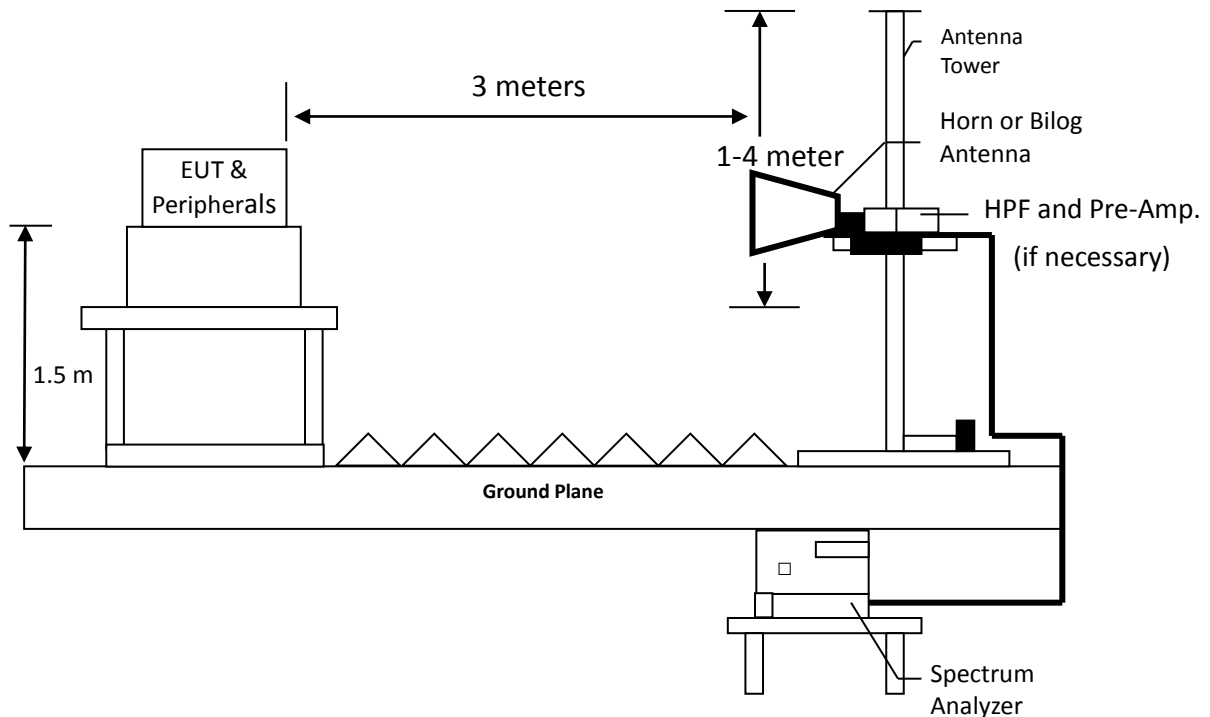
Radiated emission from 9kHz to 30MHz uses Loop Antenna



Radiated emission below 1GHz using Bilog Antenna



Radiated emission above 1GHz using Horn Antenna



Radiated emissions were investigated cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 1/T minimum kHz VBW or add duty factor to record Average reading. (15.209 paragraph), the Peak reading (1 MHz RBW/ 3 MHz VBW) recorded also on the report.

The EUT for testing is arranged on a turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

3.3 Emission limit

3.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m@3m)	(dBuV/m@3m)	(uV/m@3m)	(dBuV/m@3m)
2400-2483.5	50	94	500	54

3.3.2 General radiated emission limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

Frequency MHz	15.209 Limits (dBµV/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

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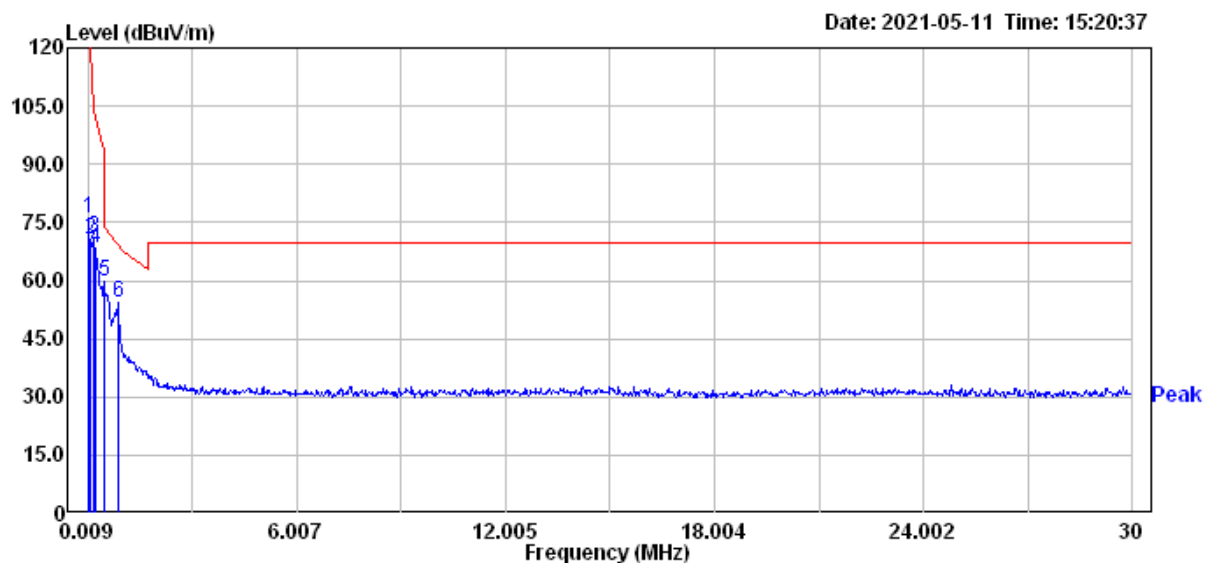
3.4 Radiated spurious emission test data

3.4.1 Measurement results: frequency range from 9 kHz to 30 MHz

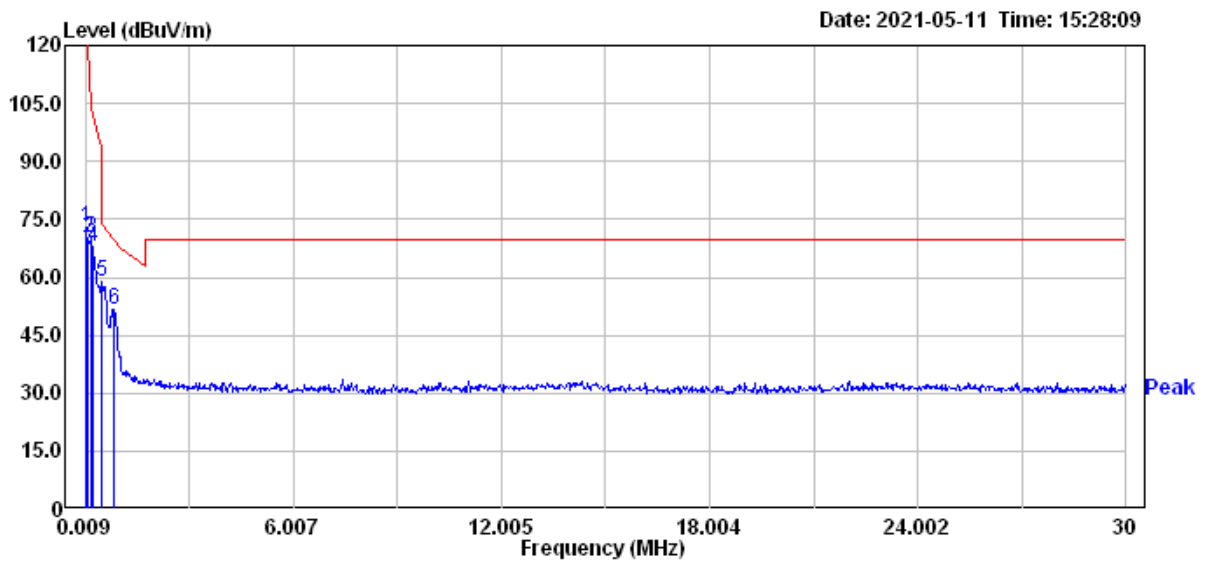
Temperature (°C) :	26
Relative Humidity (%) :	53
Test date :	2021/5/11

The test was performed on EUT under continuously transmitting mode. The worst case occurred at ANT+_Ch Low.

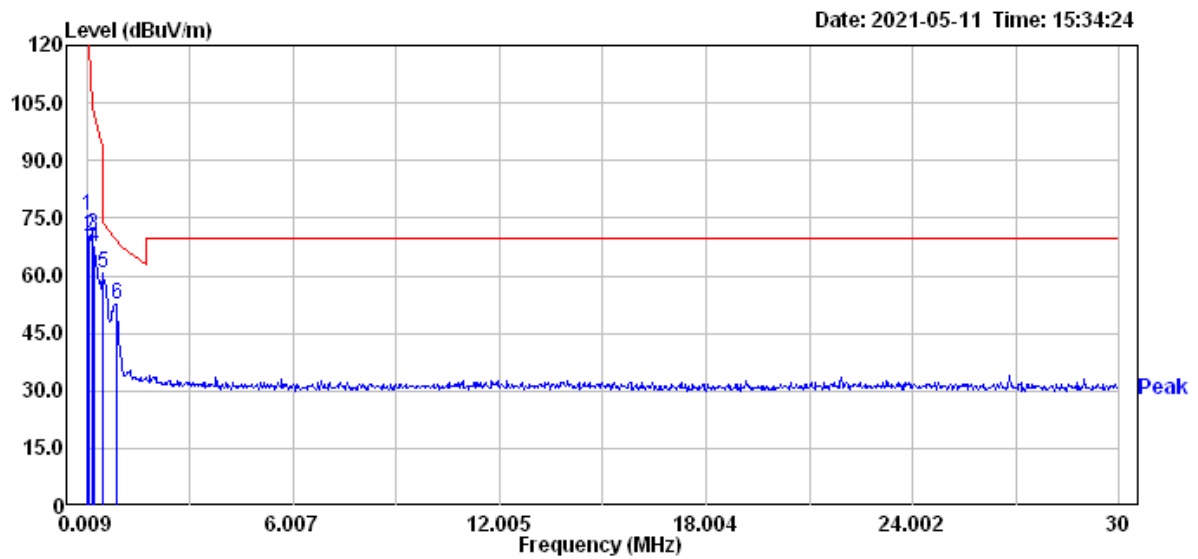
Antenna Polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Perpendicular	0.01	AV	18.20	57.75	75.95	128.52	-52.57
Perpendicular	0.07	AV	19.80	51.44	71.24	110.83	-39.59
Perpendicular	0.16	AV	18.57	52.39	70.96	103.58	-32.62
Perpendicular	0.22	AV	18.75	49.66	68.41	100.80	-32.39
Perpendicular	0.46	AV	19.17	40.45	59.62	94.37	-34.75
Perpendicular	0.85	QP	19.64	34.51	54.15	69.03	-14.88



Antenna Polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dB μ V)	Corrected Reading (dB μ V/m)	Limit @ 3 m (dB μ V/m)	Margin (dB)
Parallel	0.01	AV	18.20	54.86	73.06	128.52	-55.46
Parallel	0.07	AV	19.08	51.03	70.11	110.83	-40.72
Parallel	0.16	AV	18.57	51.71	70.28	103.58	-33.30
Parallel	0.22	AV	18.75	49.33	68.08	100.80	-32.72
Parallel	0.49	AV	19.34	39.32	58.66	93.82	-35.16
Parallel	0.82	QP	19.65	31.87	51.52	69.34	-17.82



Antenna Polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dB μ V)	Corrected Reading (dB μ V/m)	Limit @ 3 m (dB μ V/m)	Margin (dB)
Ground-parallel	0.01	AV	18.20	57.50	75.70	128.52	-52.82
Ground-parallel	0.07	AV	19.08	51.26	70.34	110.83	-40.49
Ground-parallel	0.16	AV	18.57	52.07	70.64	103.58	-32.94
Ground-parallel	0.22	AV	18.75	48.79	67.54	100.80	-33.26
Ground-parallel	0.46	AV	19.17	41.29	60.46	94.37	-33.91
Ground-parallel	0.85	QP	19.64	32.84	52.48	69.03	-16.55



TEST REPORT

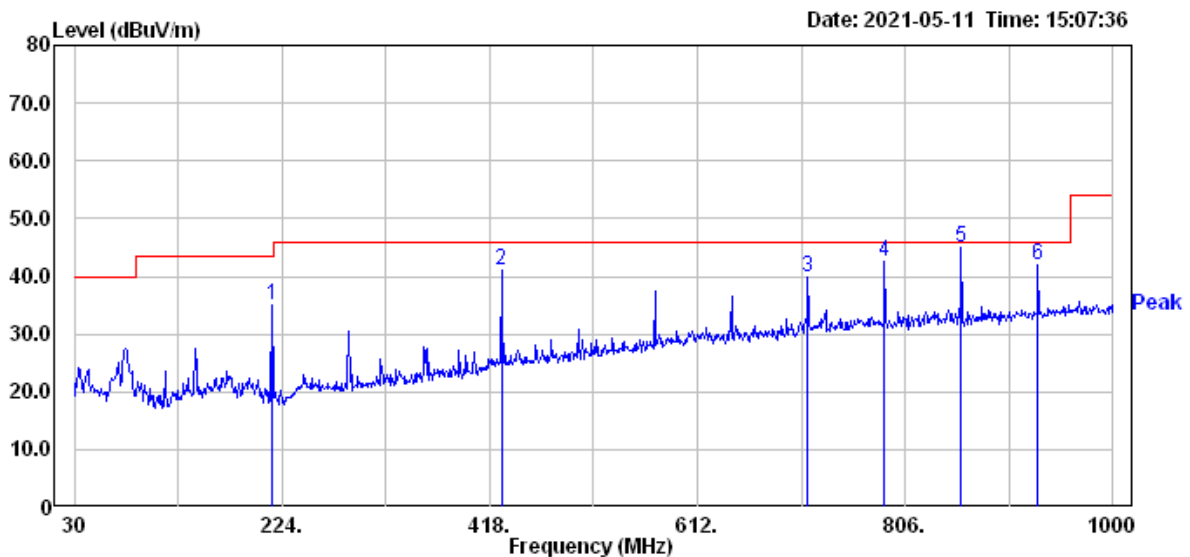
3.4.2 Measurement results: frequencies equal to or less than 1 GHz

Temperature (°C) :	26
Relative Humidity (%) :	53
Test date :	2021/5/11

The test was performed continuously transmitting mode. The worst case occurred at ANT+_Ch Low.

Antenna Polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Vertical	214.30	QP	18.41	16.71	35.12	43.50	-8.38
Vertical	428.67	QP	25.61	15.52	41.13	46.00	-4.87
Vertical	714.82	QP	30.86	9.04	39.90	46.00	-6.10
Vertical	786.60	QP	32.30	10.12	42.42	46.00	-3.58
Vertical	858.38	QP	33.02	11.96	44.98	46.00	-1.02
Vertical	930.16	QP	34.22	7.87	42.09	46.00	-3.91

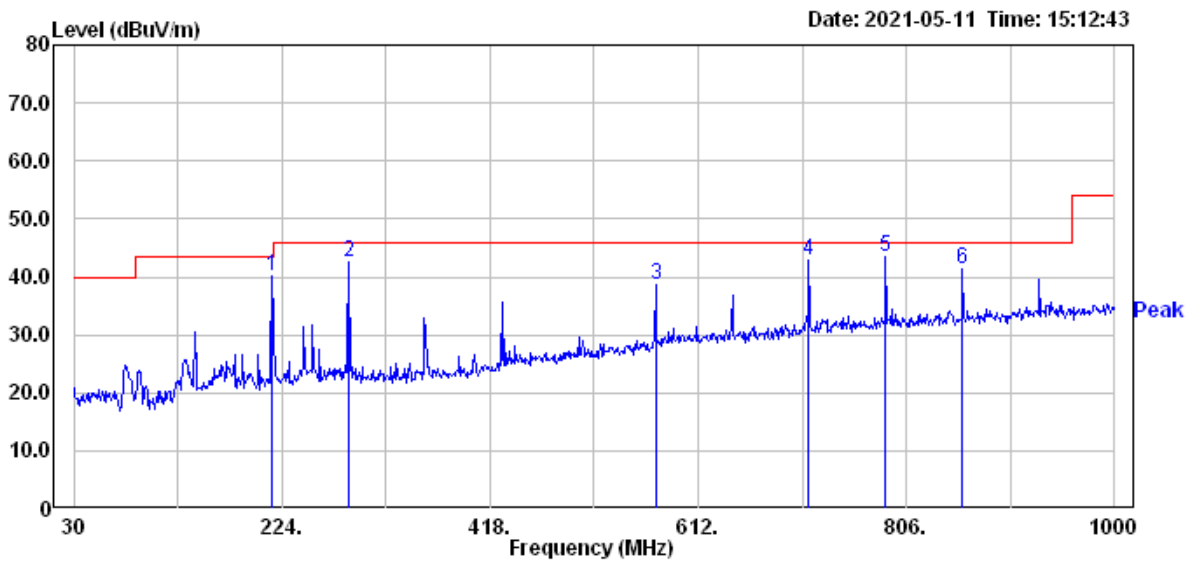
Remark: Corr. Factor = Antenna Factor + Cable Loss



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Antenna Polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Horizontal	214.30	QP	18.41	21.70	40.11	43.50	-3.39
Horizontal	286.08	QP	21.69	20.82	42.51	46.00	-3.49
Horizontal	572.23	QP	28.54	10.14	38.68	46.00	-7.32
Horizontal	714.82	QP	30.86	11.86	42.72	46.00	-3.28
Horizontal	786.60	QP	32.30	11.28	43.58	46.00	-2.42
Horizontal	858.38	QP	33.02	8.49	41.51	46.00	-4.49

Remark: Corr. Factor = Antenna Factor + Cable Loss



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3.4.3 Measurement results: frequency above 1GHz

Temperature (°C) :	26
Relative Humidity (%) :	57
Test date :	2021/5/8

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
ANT+_Ch Low	4804	PK	V	8.91	42.08	50.99	74.00	-23.01
	4804	PK	H	8.91	47.74	56.65	74.00	-17.35
	4804	AV	H	-	-	26.37	54.00	-27.63
ANT+_Ch Mid	4880	PK	V	9.24	40.56	49.80	74.00	-24.20
	4880	PK	V	9.24	44.74	53.98	74.00	-20.02
	4880	AV	H	-	-	23.70	54.00	-30.30
ANT+_Ch High	4960	PK	V	9.61	43.13	52.74	74.00	-21.26
	4960	PK	H	9.61	49.86	59.47	74.00	-14.53
	4960	AV	H	-	-	29.19	54.00	-24.81

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

Note: AV Corrected Reading = PK Corrected Reading + Duty cycle correction factor (-30.28)

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3.4.4 Measurement results: Fundamental

Temperature (°C) :	26
Relative Humidity (%) :	57
Test date :	2021/5/8

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
ANT+_Ch Low	2402	PK	V	34.37	54.01	88.38	114.00	-25.62
	2402	AV	V	-	-	58.10	94.00	-35.90
	2402	PK	H	34.37	56.73	91.10	114.00	-22.90
	2402	AV	H	-	-	60.82	94.00	-33.18
ANT+_Ch Mid	2441	PK	V	34.53	53.62	88.15	114.00	-25.85
	2441	AV	V	-	-	57.87	94.00	-36.13
	2441	PK	H	34.53	55.91	90.44	114.00	-23.56
	2441	AV	H	-	-	60.16	94.00	-33.84
ANT+_Ch High	2480	PK	V	34.71	52.65	87.36	114.00	-26.64
	2480	AV	V	-	-	57.08	94.00	-36.92
	2480	PK	H	34.71	55.49	90.20	114.00	-23.80
	2480	AV	H	-	-	59.92	94.00	-34.08

Remark: Correction Factor = Antenna Factor + Cable Loss

Note: AV Corrected Reading = PK Corrected Reading + Duty cycle correction factor (-30.28)

4. Radiated emission on the band edge FCC 15.249(d)

4.1 Radiated emission on the band edge test data

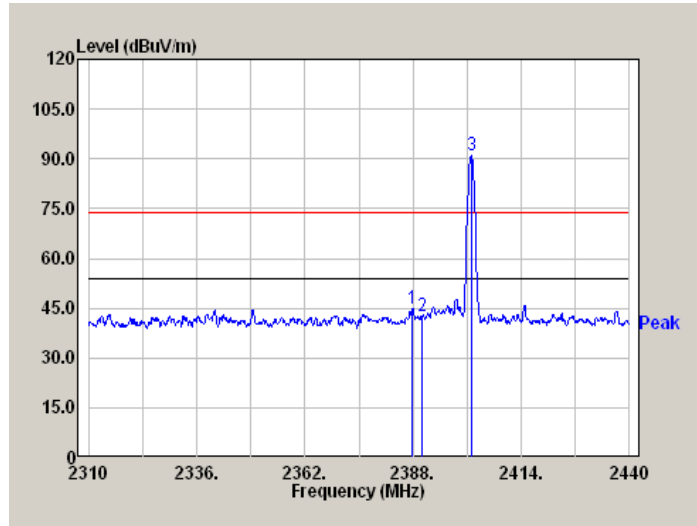
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Temperature (°C) :	26
Relative Humidity (%) :	57
Test date :	2021/5/8

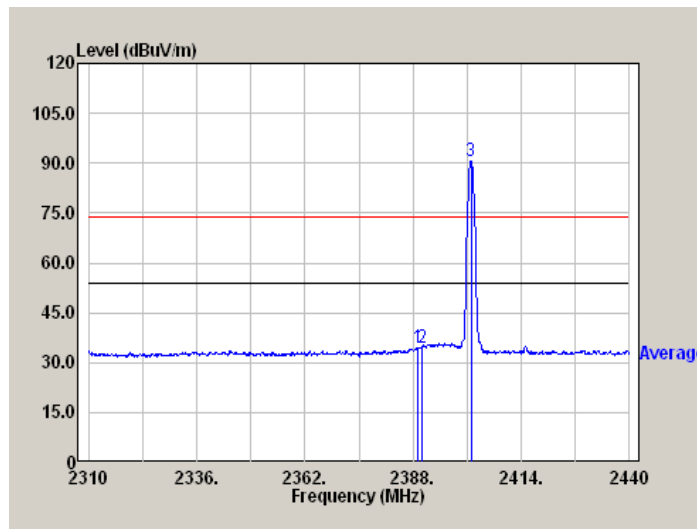
Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)	Restricted band (MHz)
ANT+	2387.87	PK	H	34.30	10.58	44.88	74	-29.12	2310~2390
	2389.30	AV	H	34.31	0.20	34.51	54	-19.49	
	2495.44	PK	H	34.78	8.90	43.68	74	-30.32	2483.5~2500
	2483.50	AV	H	34.72	0.80	35.52	54	-18.48	

Remark: Correction Factor = Antenna Factor + Cable Loss

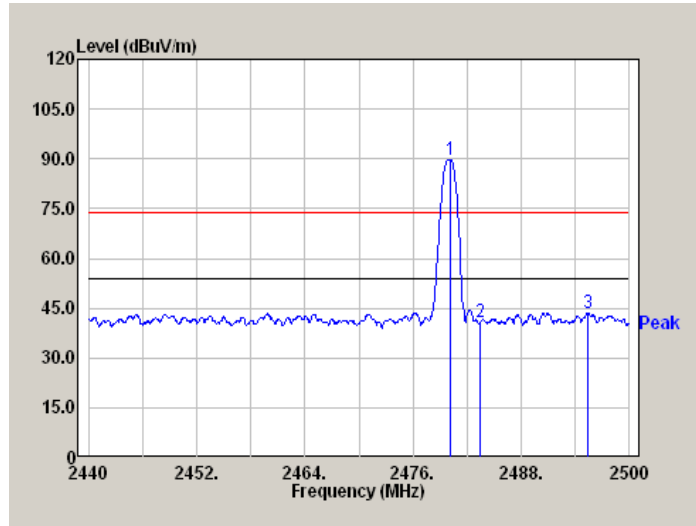
Bandedge @ mode ANT+ Channel Low Peak



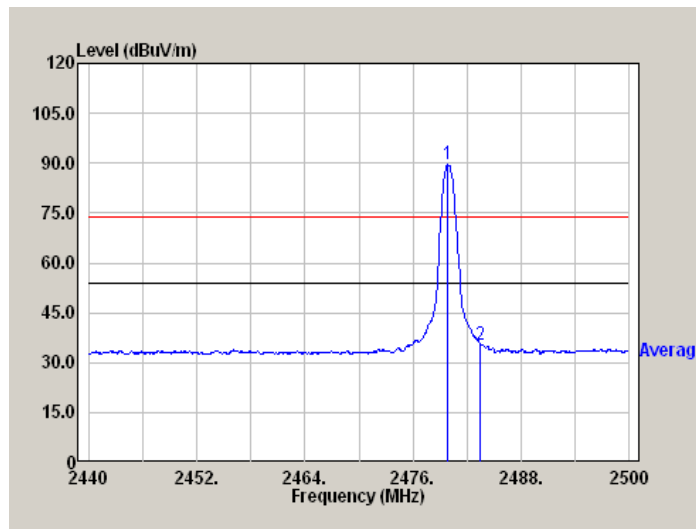
Bandedge @ mode ANT+ Channel Low Average



Bandedge @ mode ANT+ Channel High Peak



Bandedge @ mode ANT+ Channel High Average



5. AC Power Line Conducted Emission

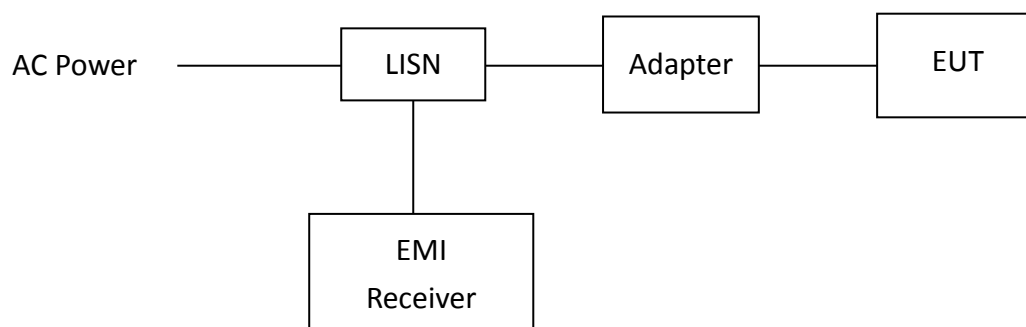
5.1 Measuring instrument setting

Receiver Function	Setting
Detector	QP
Start frequency	0.15MHz
Stop frequency	30MHz
IF bandwidth	9 kHz
Attenuation	10dB

5.2 Test Procedure

Step 1	Configure the EUT according to ANSI C63.10:2013. The EUT or host of EHT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
Step 2	Connect EUT or host of EUT to the power mains through a line impedance stabilization network.
Step 3	All the companion devices are connected to the other LISN. The LISN should provide 50Uh/50ohms coupling impedance.
Step 4	The frequency range from 150 kHz to 30MHz was searched.
Step 5	Set the test-receiver system to peak detector and specified bandwidth with maximum hold mode.
Step 6	The measurement has to be done between each power line and ground at the power terminal.

5.3 Test Diagram



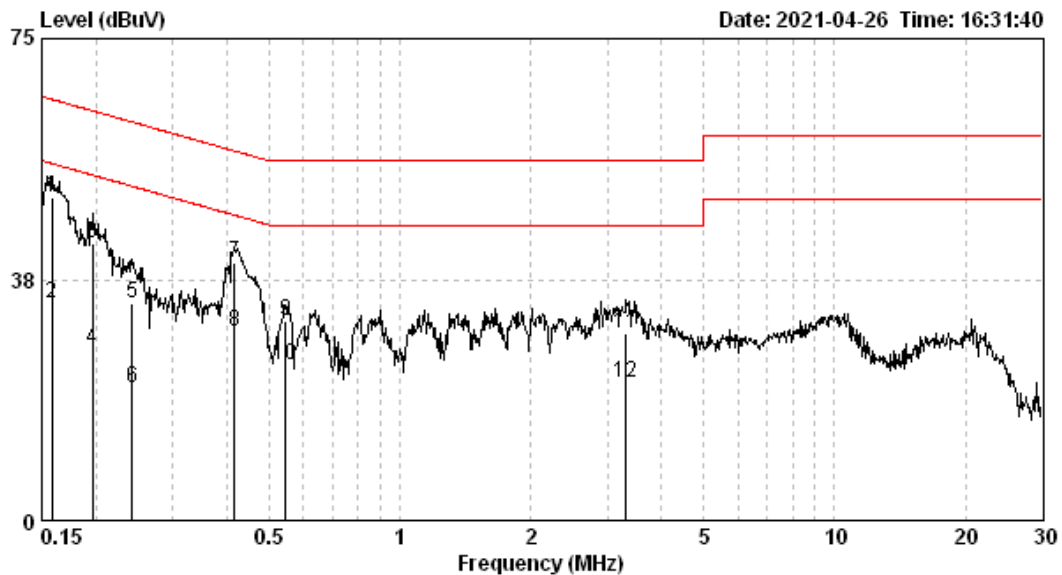
5.4 Limit

Frequency (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56	56 – 46
0.50~5.00	56	46
5.00~30.0	60	50

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5.5 Test Results

Phase: Live Line
 Test Condition: Tx mode



Test voltage :AC 120V / 60Hz
 Temp./ R.H. :26 / 65
 Atmospheric pressure :1009

Phase	Frequency (MHz)	Corr. Factor (dB)	Reading QP (dBuV)	Level QP (dBuV)	Limit QP (dBuV)	Reading AV (dBuV)	Level AV (dBuV)	Limit AV (dBuV)	Margin (dB)	
									QP	AV
LINE	0.158	0.08	50.09	50.17	65.56	33.71	33.79	55.56	-15.39	-21.77
LINE	0.197	0.08	43.06	43.14	63.76	26.46	26.54	53.76	-20.62	-27.22
LINE	0.242	0.08	33.64	33.72	62.04	20.49	20.57	52.04	-28.32	-31.47
LINE	0.417	0.08	39.93	40.01	57.51	29.29	29.37	47.51	-17.50	-18.14
LINE	0.546	0.09	30.99	31.08	56.00	24.21	24.30	46.00	-24.92	-21.70
LINE	3.310	0.17	29.05	29.22	56.00	21.24	21.41	46.00	-26.78	-24.59

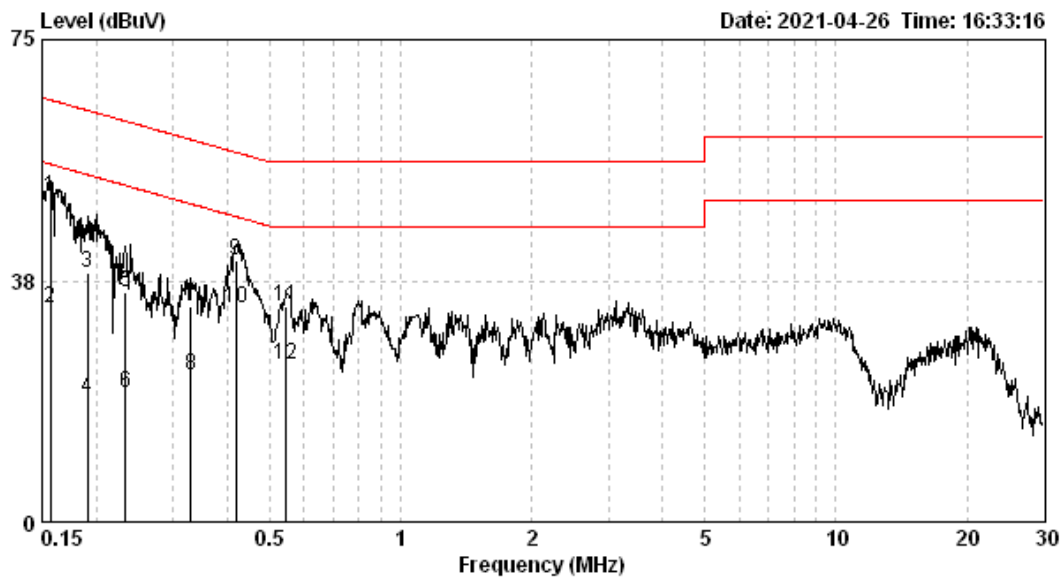
Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBuV) = Corr. Factor (dB) + Reading (dBuV)
3. Margin (dB) = Level (dBuV) – Limit (dBuV)

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Phase: Neutral Line

Test Condition: Tx mode



Test voltage :AC 120V / 60Hz
 Temp. / R.H. :26 / 65
 Atmospheric pressure :1009

Phase	Frequency (MHz)	Corr. Factor (dB)	Reading QP (dBuV)	Level QP (dBuV)	Limit QP (dBuV)	Reading AV (dBuV)	Level AV (dBuV)	Limit AV (dBuV)	Margin (dB)	
									QP	AV
NEUTRAL	0.156	0.08	50.41	50.49	65.65	33.09	33.17	55.65	-15.16	-22.48
NEUTRAL	0.190	0.08	38.61	38.69	64.02	19.05	19.13	54.02	-25.33	-34.89
NEUTRAL	0.233	0.08	35.61	35.69	62.35	19.89	19.97	52.35	-26.66	-32.38
NEUTRAL	0.330	0.08	33.40	33.48	59.44	22.69	22.77	49.44	-25.96	-26.67
NEUTRAL	0.419	0.08	40.70	40.78	57.46	33.04	33.12	47.46	-16.68	-14.34
NEUTRAL	0.546	0.09	33.43	33.52	56.00	24.48	24.57	46.00	-22.48	-21.43

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBuV) = Corr. Factor (dB) + Reading (dBuV)
3. Margin (dB) = Level (dBuV) – Limit (dBuV)

Appendix A: Test equipment list

Test Equipment/ Test site	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	Rohde & Schwarz	ESR7	101822	2020/08/18	2021/08/17
Spectrum Analyzer	Rohde & Schwarz	FSP30	100137	2020/08/25	2021/08/24
Signal Analyzer	Agilent	N9030A	MY51380492	2020/08/17	2021/08/16
Active Loop Antenna	SCHWARZBECK MESS-ELEKTRONIC	FMZB1519	1519-067	2021/04/14	2022/04/13
Broadband Antenna	SHWARZBECK	VULB 9168	9168-172	2021/01/29	2022/01/28
Horn Antenna	SHWARZBECK	BBHA 9120 D	9120D-456	2021/01/11	2022/01/10
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170159	2020/08/20	2023/08/19
Pre-Amplifier	EMC Co.	EMC12635SE	980205	2021/01/13	2022/01/12
Pre-amplifier	SGH	SGH184	20201124-1	2020/12/16	2021/12/15
Power Meter	Anritsu	ML2495A	0844001	2020/10/28	2021/10/27
Power Sensor	Anritsu	MA2411B	0738452	2020/10/28	2021/10/27
966-2(A) Cable	SUHNER	SUCOLEX 104	295105/4	2021/03/08	2022/03/07
966-2(B) Cable	SUHNER	SUCOFLEX 104P	CB0005	2021/03/08	2022/03/07
RF Cable	SUHNER	SUCOFLEX 104P	CB0006	2021/04/29	2022/04/28
966-2_3m Semi-Anechoic Chamber	966_2	CEM-966_2	N/A	2021/01/15	2022/01/14
Hight Pass Filter	Reactel	7HS-3G/18G-S11	N/A	2020/05/27	2021/05/26
20dB Attenuator	Mini-Circuits	BW-S20W5+	N/A	2020/05/27	2021/05/26
Test software	Audix	e3	V9	NCR	NCR

Note: No Calibration Required (NCR).

TEST REPORT

Test Equipment/ Test site	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	R&S	ESCS30	833364/011	2020/05/08	2021/05/07
LISN	R&S	ESH3-Z5	825562/003	2020/08/26	2021/08/25
CON-3 Cable	SUHNER	SUCOFLEX 106	27222 /6	2021/01/13	2022/01/12
Test software	Audix	e3	V4.20040112L	NCR	NCR

Note: No Calibration Required (NCR).

Appendix B: Measurement Uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.

Item	Uncertainty
Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.16 dB
Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.02 dB
Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	5.17 dB
Vertically polarized Radiated disturbances from 18GHz~26.5GHz in a semi-anechoic chamber at a distance of 1m	2.39 dB
Horizontally polarized Radiated disturbances from 18GHz~26.5GHz in a semi-anechoic chamber at a distance of 1m	2.39 dB
Radiated disturbances from 9kHz~30MHz in a semi-anechoic chamber at a distance of 3m	3.70 dB
Emission on the Band Edge Test	4.32 dB
Occupied Bandwidth Test	7.78 %
AC Power Line Conducted Emission	3.08 dB