FCC Test Report

Report No.:	RF190119C10-5 R1
FCC ID:	2AA3N-TTR01
Test Model:	PLTN-TTR01
Received Date:	Jan. 19, 2019
Test Date:	Feb. 18 ~ Mar. 11, 2019
Issued Date:	Jun. 09, 2020
Applicant:	Peloton Interactive Inc.
Address:	125 W 25th Street, 11th Floor, New York, NY, 10001, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF190119C10-5	Original release	Mar. 18, 2019
RF190119C10-5 R1	Revised item 3.3 description of Support Units	Jun. 09, 2020

1 Certificate of Conformity

Product:	Peloton Console
Brand:	PELOTON
Test Model:	PLTN-TTR01
Series Model:	Engineering sample
Applicant:	Peloton Interactive Inc.
Test Date:	Feb. 18 ~ Mar. 11, 2019
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.249) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Celine Chou , **Date:** Jun. 09, 2020

Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Jun. 09, 2020

Bruce Chen / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.249)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -8.60dB at 2.27625MHz.
15.209 15.249 15.249 (d)	Radiated Emission Test Band Edge Measurement Limit: 50dB less than the peak value of fundamental frequency or meet radiated emission limit in section 15.209	Pass	Meet the requirement of limit. Minimum passing margin is -4.3dB at 62.95MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Peloton Console
Brand	PELOTON
Test Model	PLTN-TTR01
Sample Status	Engineering sample
Power Supply Rating	20Vdc from adapter
Modulation Type	GFSK
Transfer Rate	1Mbps
Operating Frequency	2402 ~ 2480MHz
Number of Channel	79
Field Strength	96.7dBuV/m (3m)
Antenna Type	PIFA antenna with -0.19dBi gain
Antenna Connector	i-pex(MHF)
Accessory Device	Adapter, Exercise Bike
Cable Supplied	NA

Note:

1. The EUT consumes power from the following Adapter.

Adapter	
Brand	PELOTON
Model	FSP065-APDC8R01
Input Power	100-240Vac, 50-60Hz, 1.7A
Output Power	5Vdc, 3A or 9Vdc, 3A or 20Vdc, 3.25A, 65W Max.
Power Line	AC: 1.7m non-shielded power cable without core DC: 1.5m non-shielded power cable without core attached on adapter

2. Spurious emission of the simultaneous operation mode as below and the test data please refer to report no.: RF190119C10-7.

No	Mode
1	WLAN 2.4GHz + WLAN 5GHz
2	BT + WLAN 5GHz
3	ANT+ + WLAN 5GHz

3.2 Description of Test Modes

79 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE≥1G	RE<1G	PLC	
A	√	√	√	EUT + Adapter
B	-	√	√	EUT + Exercise Bike + Adapter

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configuure Mode	Available Channel	Tested Channel	Modulation Type
A	0 to 78	0, 38, 78	GFSK

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configuure Mode	Available Channel	Tested Channel	Modulation Type
A, B	0 to 78	0	GFSK

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configuure Mode	Available Channel	Tested Channel	Modulation Type
A, B	0 to 78	0	GFSK

Test Condition:

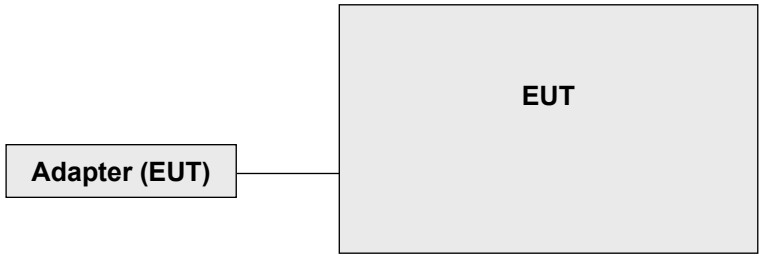
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	22 deg. C, 66% RH	120Vac, 60Hz	Han Wu
RE<1G	21 deg. C, 68% RH 22 deg. C, 66% RH	120Vac, 60Hz	Willy Cheng Greg Lin
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Willy Cheng Jones Chang

3.3 Description of Support Units

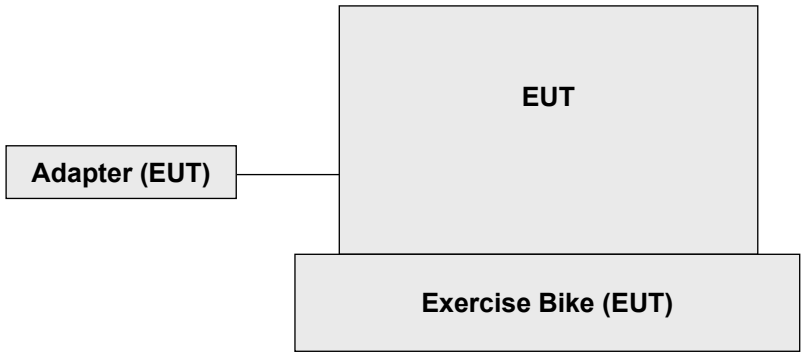
The EUT has been tested as an independent unit.
Exercise Bike and adapter included as representative accessories.

3.3.1 Configuration of System under Test

Test Mode A



Test Mode B



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.249)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

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 as below table, whichever is the lesser attenuation

Frequencies (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
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 11, 2018	Apr. 10, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	May 29, 2018	May 28, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 21, 2018	Nov. 20, 2019
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna TESEQ	HLA 6121	45745	Jun. 14, 2018	Jun. 13, 2019
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Aug. 08, 2018	Aug. 07, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Mar. 16, 2018	Mar. 15, 2019
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 19, 2019	Jan. 18, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Aug. 08, 2018	Aug. 07, 2019
RF signal cable Woken	8D-FB	Cable-CH9-01	Jul. 31, 2018	Jul. 30, 2019
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Nov. 14, 2018	Nov. 13, 2019
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55190007/MY55210005	Jul. 17, 2018	Jul. 16, 2019

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.
3. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
4. The IC Site Registration No. is 7450F-9.

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

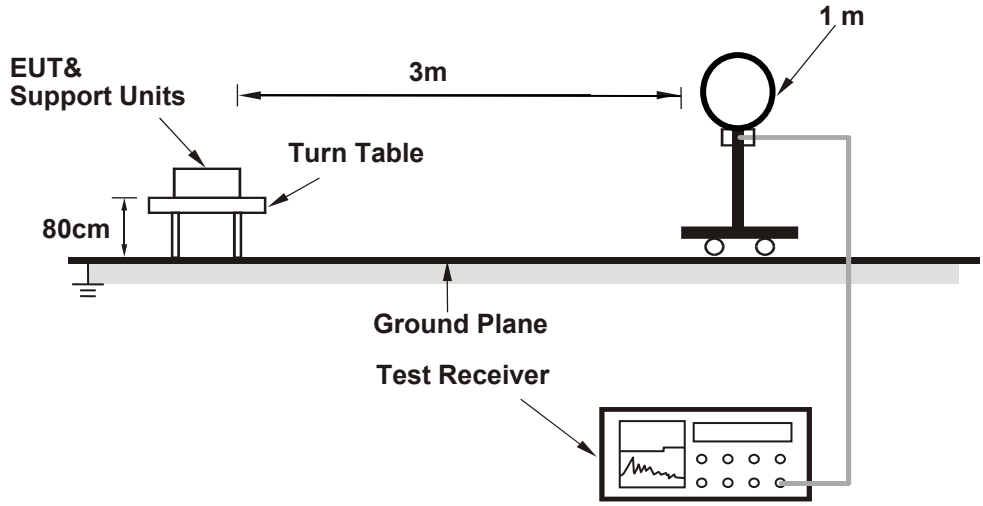
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10 Hz (Duty cycle ≥ 98%) for Peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

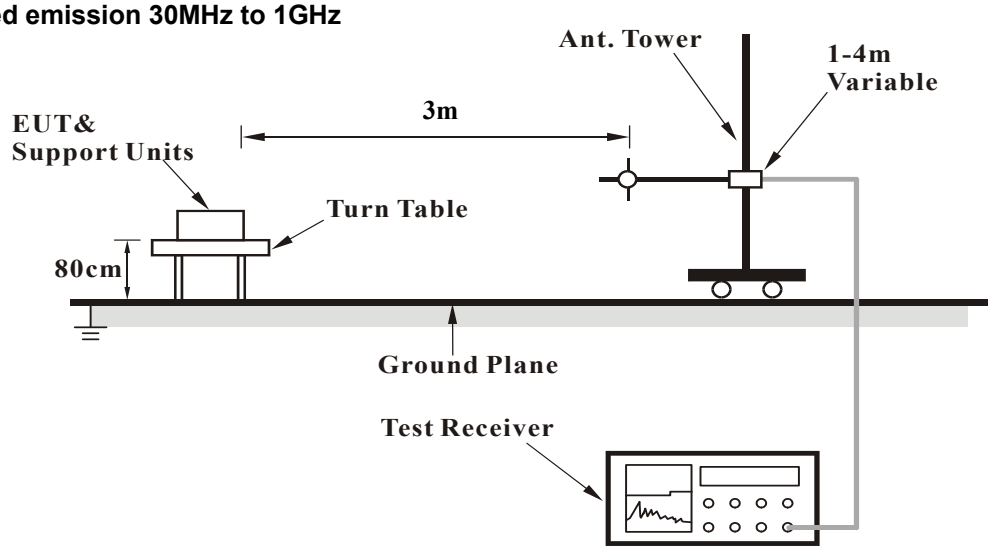
No deviation.

4.1.5 Test Set Up

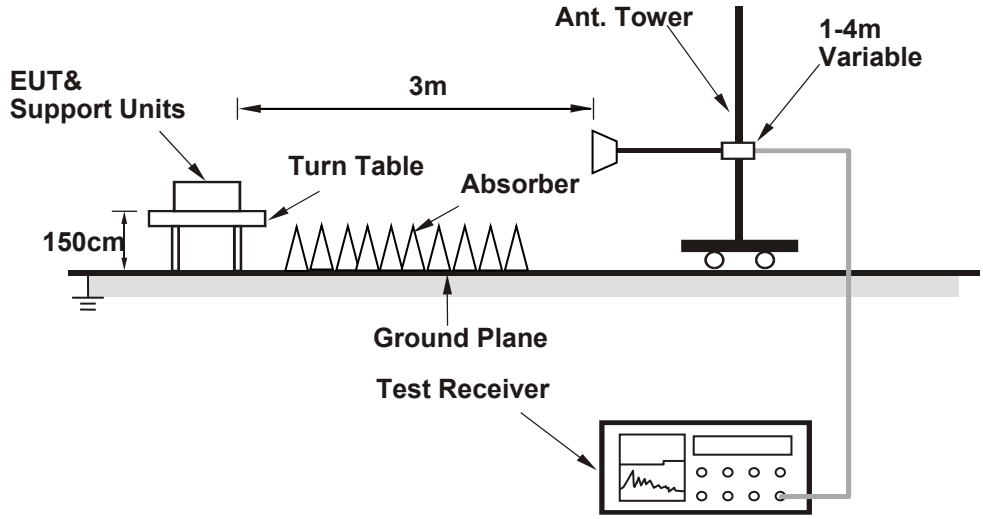
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

a. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.9 PK	74.0	-18.1	1.99 H	286	24.1	31.8
2	2390.00	45.5 AV	54.0	-8.5	1.99 H	286	13.7	31.8
3	*2402.00	95.0 PK	114.0	-19.0	1.99 H	296	63.2	31.8
4	*2402.00	61.2 AV	94.0	-32.8	1.99 H	296	29.4	31.8
5	4804.00	39.0 PK	74.0	-35.0	3.03 H	195	35.3	3.7
6	4804.00	5.2 AV	54.0	-48.8	3.03 H	195	1.5	3.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.7 PK	74.0	-18.3	2.53 V	227	23.9	31.8
2	2390.00	45.3 AV	54.0	-8.7	2.53 V	227	13.5	31.8
3	*2402.00	96.6 PK	114.0	-17.4	2.50 V	225	64.8	31.8
4	*2402.00	62.8 AV	94.0	-31.2	2.50 V	225	31.0	31.8
5	4804.00	39.8 PK	74.0	-34.2	2.99 V	199	36.1	3.7
6	4804.00	6.0 AV	54.0	-48.0	2.99 V	199	2.3	3.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
   Where the duty factor is calculated from following formula:
   20 log (Duty cycle) = 20 log (0.205 * 10 / 100 ms) = -33.8dB
   Please see page 18 for plotted duty.

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	94.3 PK	114.0	-19.7	2.06 H	297	62.5	31.8
2	*2440.00	60.5 AV	94.0	-33.5	2.06 H	297	28.7	31.8
3	4880.00	40.3 PK	74.0	-33.7	3.00 H	200	36.8	3.5
4	4880.00	6.5 AV	54.0	-47.5	3.00 H	200	3.0	3.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	95.9 PK	114.0	-18.1	2.40 V	211	64.1	31.8
2	*2440.00	62.1 AV	94.0	-31.9	2.40 V	211	30.3	31.8
3	4880.00	39.2 PK	74.0	-34.8	2.98 V	198	35.7	3.5
4	4880.00	5.4 AV	54.0	-48.6	2.98 V	198	1.9	3.5

Remarks:

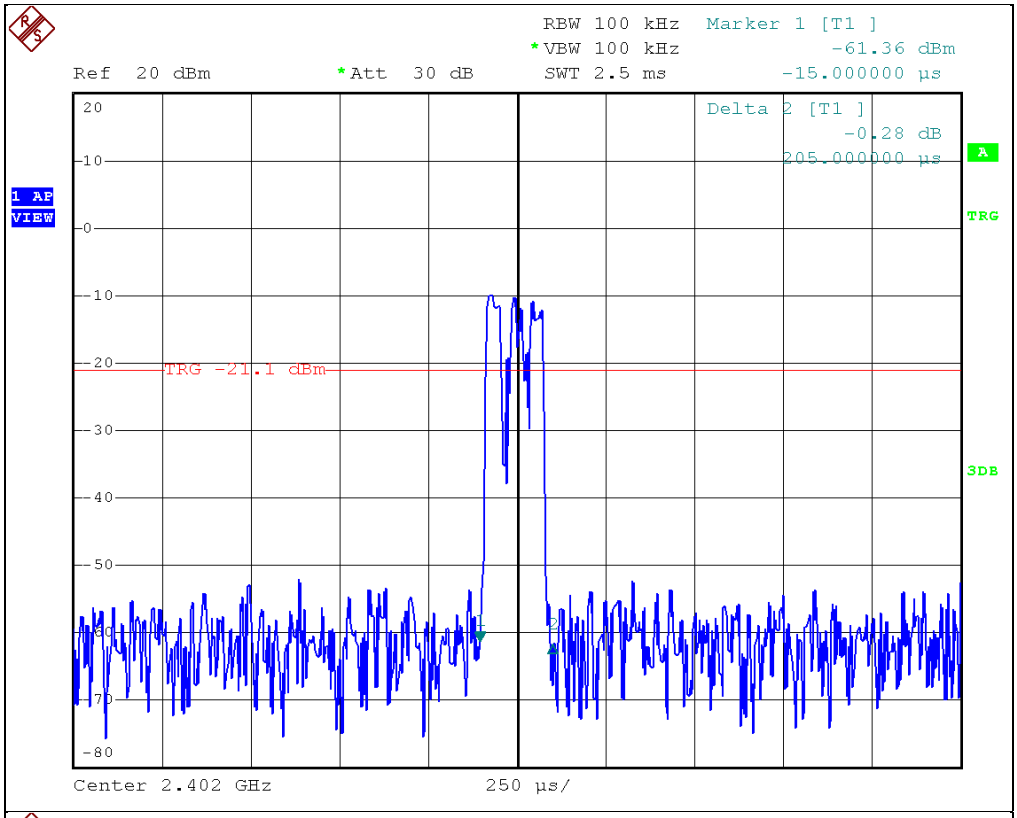
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
   Where the duty factor is calculated from following formula:
   20 log (Duty cycle) = 20 log (0.205 * 10 / 100 ms) = -33.8dB
   Please see page 18 for plotted duty.

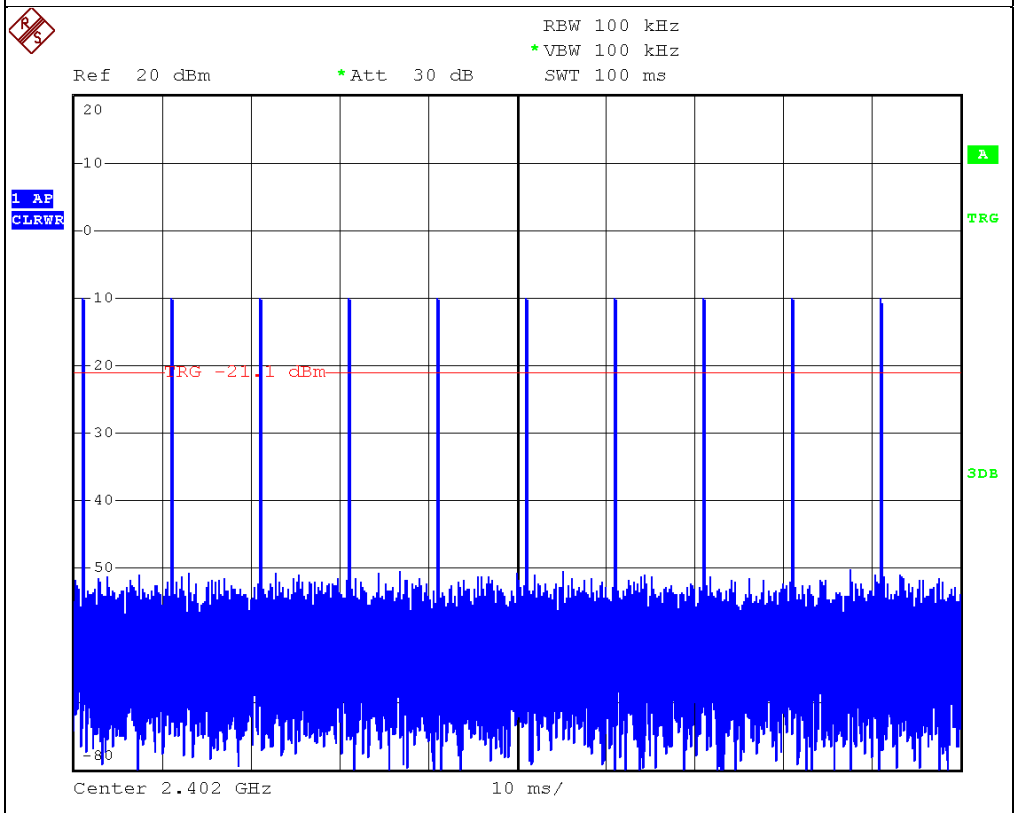
CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	95.5 PK	114.0	-18.5	2.07 H	299	63.7	31.8
2	*2480.00	61.7 AV	94.0	-32.3	2.07 H	299	29.9	31.8
3	2483.50	55.8 PK	74.0	-18.2	2.12 H	297	24.0	31.8
4	2483.50	45.3 AV	54.0	-8.7	2.12 H	297	13.5	31.8
5	4960.00	40.6 PK	74.0	-33.4	2.95 H	201	36.8	3.8
6	4960.00	6.9 AV	54.0	-47.1	2.95 H	201	3.1	3.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	96.7 PK	114.0	-17.3	2.35 V	209	64.9	31.8
2	*2480.00	62.9 AV	94.0	-31.1	2.35 V	209	31.1	31.8
3	2483.50	55.6 PK	74.0	-18.4	4.00 V	210	23.8	31.8
4	2483.50	45.3 AV	54.0	-8.7	4.00 V	210	13.5	31.8
5	4960.00	40.2 PK	74.0	-33.8	3.04 V	197	36.4	3.8
6	4960.00	6.4 AV	54.0	-47.6	3.04 V	197	2.6	3.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
   Where the duty factor is calculated from following formula:
   20 log (Duty cycle) = 20 log (0.205 * 10 / 100 ms) = -33.8dB
   Please see page 18 for plotted duty.





20 log (Duty cycle) = 20 log (0.205 * 10 / 100 ms) = -33.8dB

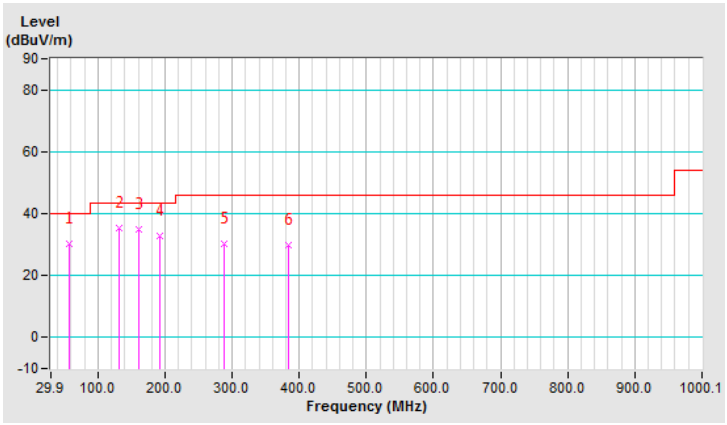
Below 1GHz worst-case data

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	30.1 QP	40.0	-9.9	1.99 H	122	40.2	-10.1
2	131.00	35.3 QP	43.5	-8.2	1.99 H	76	45.8	-10.5
3	160.17	35.1 QP	43.5	-8.4	1.50 H	329	44.1	-9.0
4	191.28	33.0 QP	43.5	-10.5	1.50 H	171	44.1	-11.1
5	288.49	30.3 QP	46.0	-15.7	1.00 H	91	37.9	-7.6
6	383.76	29.9 QP	46.0	-16.1	1.99 H	201	35.7	-5.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report

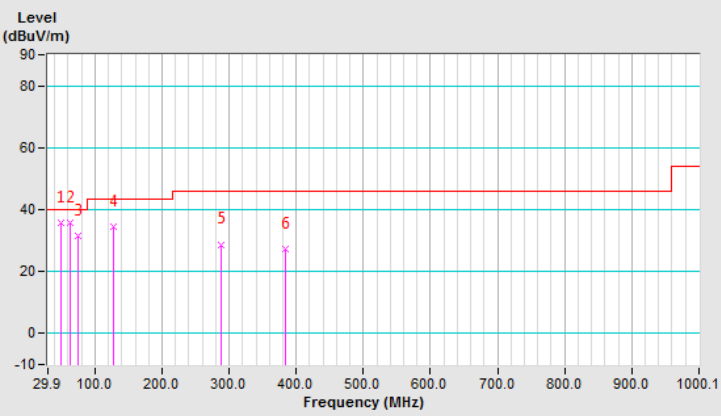


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	49.34	35.6 QP	40.0	-4.4	1.00 V	16	45.3	-9.7
2	**62.95**	**35.7 QP**	**40.0**	**-4.3**	**1.00 V**	**16**	**46.0**	**-10.3**
3	74.62	31.5 QP	40.0	-8.5	1.00 V	226	44.3	-12.8
4	127.11	34.4 QP	43.5	-9.1	1.00 V	16	45.3	-10.9
5	288.49	28.8 QP	46.0	-17.2	2.00 V	331	36.4	-7.6
6	383.76	27.2 QP	46.0	-18.8	1.00 V	93	33.0	-5.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report

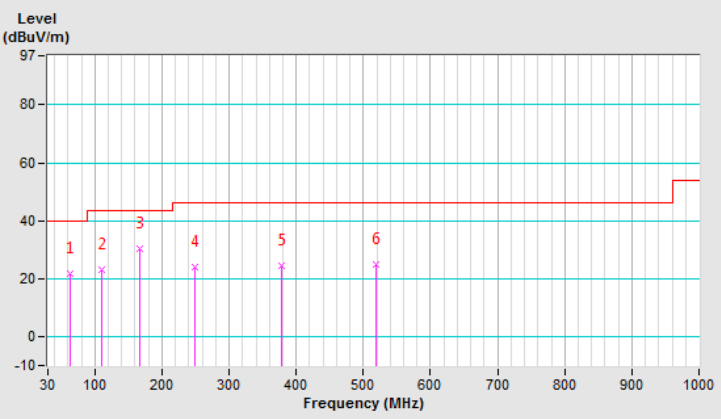


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	62.98	21.9 QP	40.0	-18.1	1.00 H	334	32.4	-10.5
2	110.51	23.1 QP	43.5	-20.4	1.00 H	313	35.5	-12.4
3	167.74	30.4 QP	43.5	-13.1	1.00 H	83	39.8	-9.4
4	248.25	24.2 QP	46.0	-21.8	1.00 H	30	34.0	-9.8
5	378.23	24.4 QP	46.0	-21.6	1.00 H	228	31.0	-6.6
6	519.85	25.0 QP	46.0	-21.0	1.00 H	311	29.2	-4.2

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report

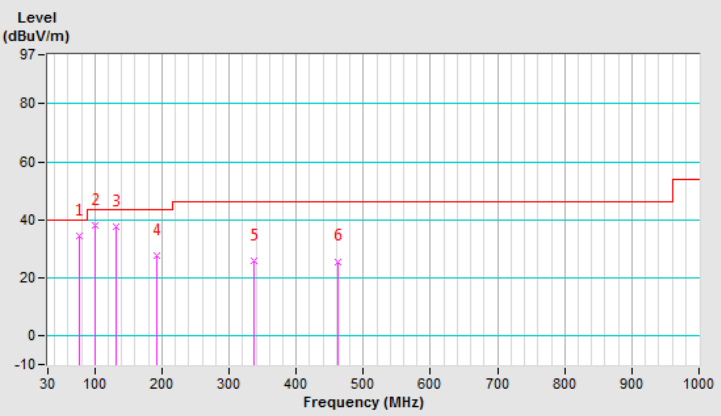


CHANNEL	TX Channel 0	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	76.56	34.6 QP	40.0	-5.4	1.00 V	335	47.9	-13.3
2	100.81	38.2 QP	43.5	-5.3	1.00 V	14	51.7	-13.5
3	130.88	37.6 QP	43.5	-5.9	1.00 V	351	48.3	-10.7
4	192.96	27.8 QP	43.5	-15.7	1.00 V	25	39.3	-11.5
5	336.52	25.8 QP	46.0	-20.2	1.00 V	14	33.0	-7.2
6	461.65	25.6 QP	46.0	-20.4	1.00 V	102	30.7	-5.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	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 lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 10, 2018	Dec. 09, 2019
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 26, 2018	Feb. 25, 2019
			Feb. 21, 2019	Feb. 20, 2020
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

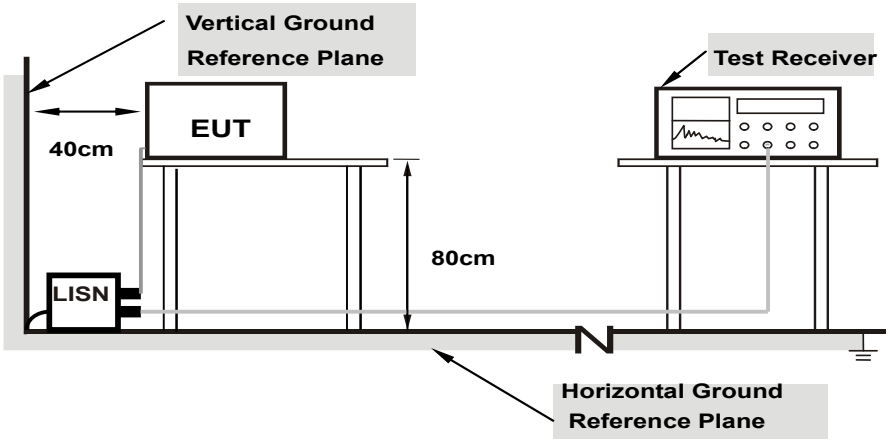
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

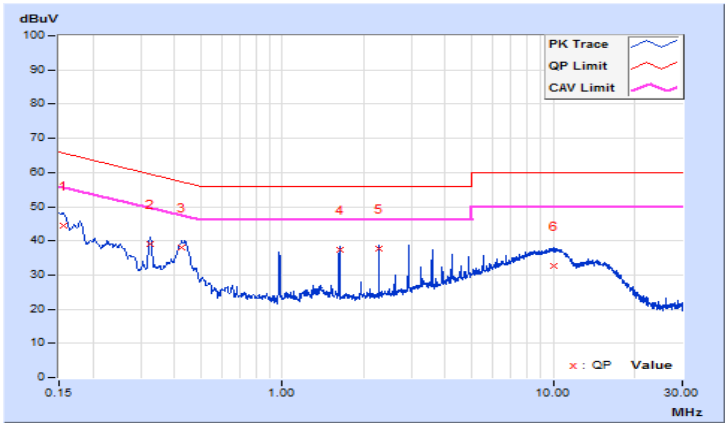
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15675	10.07	34.43	16.58	44.50	26.65	65.63	55.63	-21.13	-28.98
2	0.32569	10.07	28.94	28.03	39.01	38.10	59.56	49.56	-20.55	-11.46
3	0.42635	10.07	27.90	20.43	37.97	30.50	57.32	47.32	-19.35	-16.82
4	1.62604	10.09	27.19	26.94	37.28	37.03	56.00	46.00	-18.72	-8.97
5	**2.27625**	**10.10**	**27.58**	**27.30**	**37.68**	**37.40**	**56.00**	**46.00**	**-18.32**	**-8.60**
6	10.00725	10.27	22.46	15.91	32.73	26.18	60.00	50.00	-27.27	-23.82

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

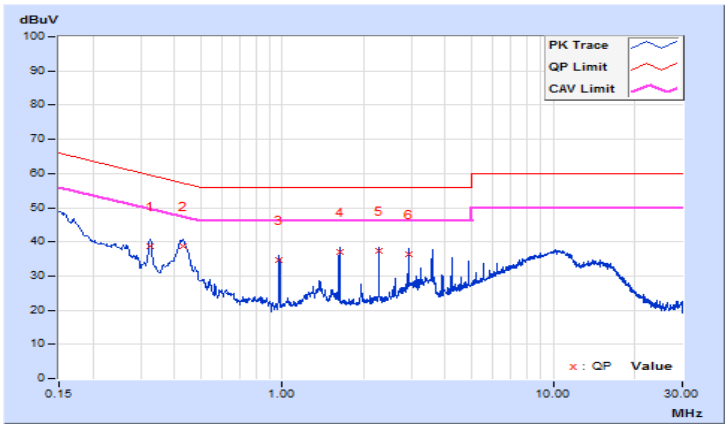


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.32483	10.13	28.55	27.81	38.68	37.94	59.58	49.58	-20.90	-11.64
2	0.42860	10.13	28.47	20.75	38.60	30.88	57.28	47.28	-18.68	-16.40
3	0.97575	10.14	24.65	24.53	34.79	34.67	56.00	46.00	-21.21	-11.33
4	1.62604	10.15	26.77	26.63	36.92	36.78	56.00	46.00	-19.08	-9.22
5	2.27625	10.16	27.19	27.01	37.35	37.17	56.00	46.00	-18.65	-8.83
6	2.92650	10.18	26.29	25.83	36.47	36.01	56.00	46.00	-19.53	-9.99

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

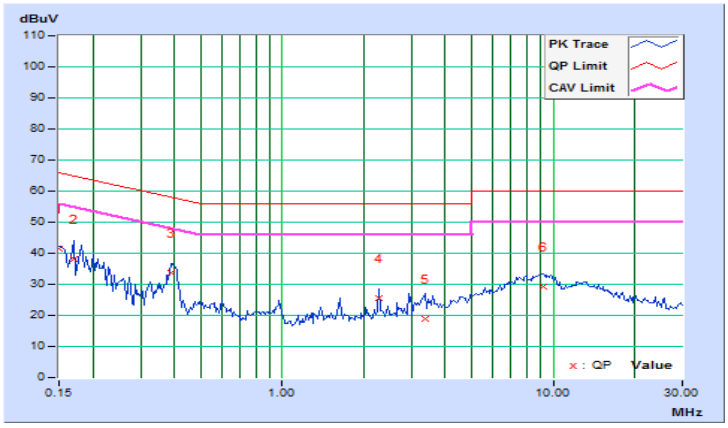


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.69	31.71	18.82	41.40	28.51	66.00	56.00	-24.60	-27.49
2	0.16953	9.69	28.53	16.40	38.22	26.09	64.98	54.98	-26.76	-28.89
3	0.38828	9.68	23.84	16.62	33.52	26.30	58.10	48.10	-24.58	-21.80
4	2.27734	9.71	15.92	15.27	25.63	24.98	56.00	46.00	-30.37	-21.02
5	3.36719	9.73	9.22	2.39	18.95	12.12	56.00	46.00	-37.05	-33.88
6	9.16406	9.85	19.26	13.88	29.11	23.73	60.00	50.00	-30.89	-26.27

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

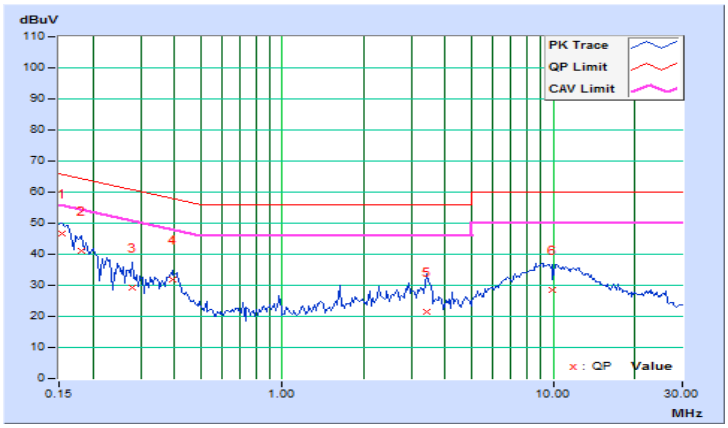


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.66	36.92	20.88	46.58	30.54	65.79	55.79	-19.21	-25.25
2	0.18125	9.66	31.62	16.76	41.28	26.42	64.43	54.43	-23.15	-28.01
3	0.27891	9.66	19.51	7.97	29.17	17.63	60.85	50.85	-31.68	-33.22
4	0.39219	9.65	22.25	15.87	31.90	25.52	58.02	48.02	-26.12	-22.50
5	3.41016	9.71	11.93	2.16	21.64	11.87	56.00	46.00	-34.36	-34.13
6	9.97656	9.85	18.79	13.20	28.64	23.05	60.00	50.00	-31.36	-26.95

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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