

FCC Test Report

Report No.: RF170614C22

FCC ID: K7SF8M747

Test Model: F8M741

Series Model: F8M747 (refer to item 3.1 for more details)

Received Date: Jun. 14, 2017

Test Date: Aug. 12 ~ Sep. 14, 2017

Issued Date: Sep. 14, 2017

Applicant: Belkin International, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)



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Release Control Record

Issue No.	Description	Date Issued
RF170614C22	Original release	Sep. 14, 2017

1 Certificate of Conformity

Product: Wireless Charging Pad

Brand: belkin

Model No.: F8M741

Series Model: F8M747 (refer to item 3.1 for more details)

Sample Status: Engineering sample

Applicant: Belkin International, Inc.

Test Date: Aug. 12 ~ Sep. 14, 2017

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.209)
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 EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** Sep. 14, 2017
Suntee Liu / Specialist

Approved by :  , **Date:** Sep. 14, 2017
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.209)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -6.31dB at 0.22422MHz.
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -4.00dB at 49.34MHz.

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) (\pm)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~ 1000MHz	3.87 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless Charging Pad
Test Model	F8M741
Series Model	F8M747
Model Difference	Refer to Note
Sample Status	Engineering sample
Power Supply Rating	5Vdc (adapter / host)
Modulation Type	FSK
Operating Frequency	112~205kHz
Antenna Type	Coil antenna
Accessory Device	Wall charger
Data Cable Supplied	1.8 m shielded USB cable without core

Note:

- All models are listed as below. After the pretest, the model F8M741 is the worst case and representative for final test.

Brand	Model	Difference
belkin	F8M741	Wireless Charging Pad + Wall Charger + USB cable
belkin	F8M747	Wireless Charging Pad + USB cable

- Model F8M741 includes following device.

Item	Brand	Model	Specification
Wall charger	belkin	F8M670 (US)	Input: 100-240Vac, 0.5A, 50-60Hz Output: 5Vdc, 2.1A

- The EUT has WPC (Wireless Power Consortium) technology.
- Sample no. 016-001 & 016-003 are tested in this report. There is no difference between them.

3.1.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to		Description
	RE<1G	PLC	
A	√	√	Charging Mode
B	√	√	Standby Mode

Where **RE<1G**: Radiated Emission below 1GHz **PLC**: Power Line Conducted Emission

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 Configure Mode	Operating Frequency	Tested Frequency
A, B	112~205 kHz	156 kHz

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 Configure Mode	Operating Frequency	Tested Frequency
A, B	112~205 kHz	156 kHz

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE<1G	23 deg. C, 68% RH	120Vac, 60Hz	Willy Cheng
	19 deg. C, 66% RH		Jones Chang
PLC	24 deg. C, 66% RH	120Vac, 60Hz	Willy Cheng

3.2 Description of Support Units

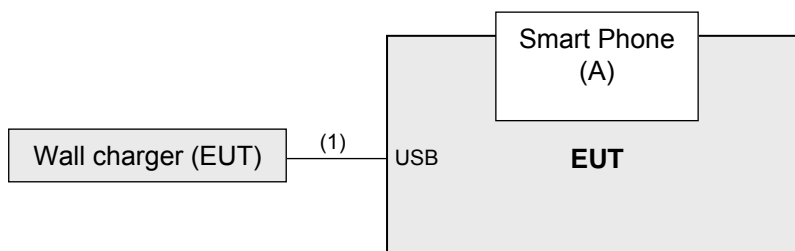
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Smart Phone	Samsung	Galaxy S8	NA	FCC DoC Approved	-

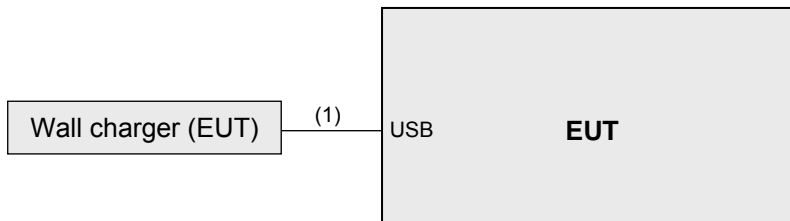
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB	1	1.8	Y	0	Accessory of EUT

3.2.1 Configuration of System under Test

Test Mode A



Test Mode B



3.3 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 (15.209)

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

FOR FREQUENCY BELOW 30MHz

Frequency (MHz)	Field Strength (dBuV/m)		Measurement Distance (meters)
	uV/m	dBuV/m	
0.009 – 0.490	2400 / F (kHz)	48.52-13.80	300
0.490 – 1.705	24000 / F (kHz)	33.80-22.97	30
1.705 – 30.0	30	29.54	30

FOR FREQUENCY BETWEEN 30-1000MHz

Frequency (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
30-88	90	39.1	100	40.0
88-216	150	43.5	150	43.5
216-960	210	46.4	200	46.0
Above 960	300	49.5	500	54.0

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 02, 2017	May 01, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Nov. 16, 2016	Nov. 15, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	9120D	209	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent	8447D	2944A10738	Aug. 22, 2016	Aug. 21, 2017
			Aug. 21, 2017	Aug. 20, 2018
Preamplifier Agilent	8449B	3008A01922	Sep. 18, 2016	Sep. 17, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 22, 2016	Aug. 21, 2017
			Aug. 21, 2017	Aug. 20, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 106	Cable-CH3-03 (309224+12738)	Aug. 22, 2016	Aug. 21, 2017
			Aug. 21, 2017	Aug. 20, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	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 Chamber 3.
 3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
 5. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedures

For Frequency range 9kHz~30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter Semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Then the Loop antenna was rotated 360 degrees to determine the position of the highest radiation.
- b. The antenna is a broadband loop antenna, which is fixed of a 1m height above the ground, and set away from 3m to the EUT to find the disturbance reading on each frequency.
- c. The test-receiver system was set to Quasi-peak detect function and specified bandwidth.

For Frequency range 30~1000MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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:

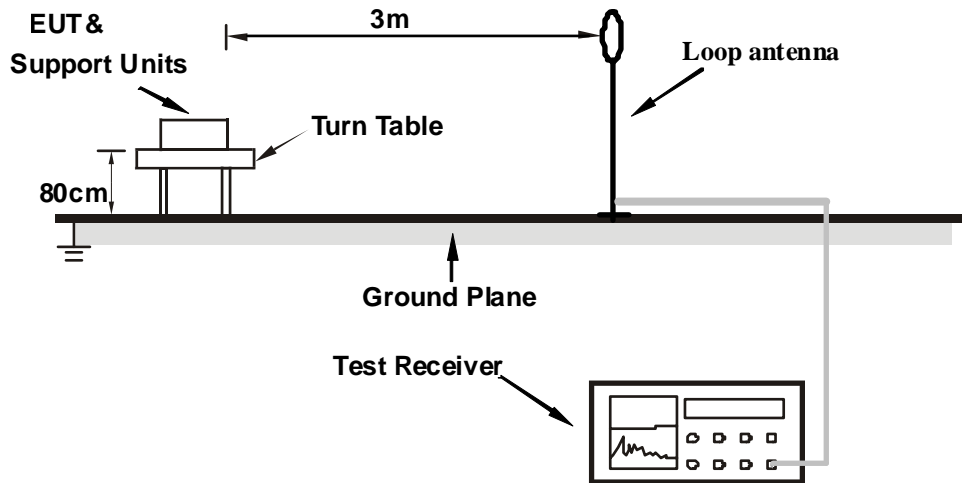
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

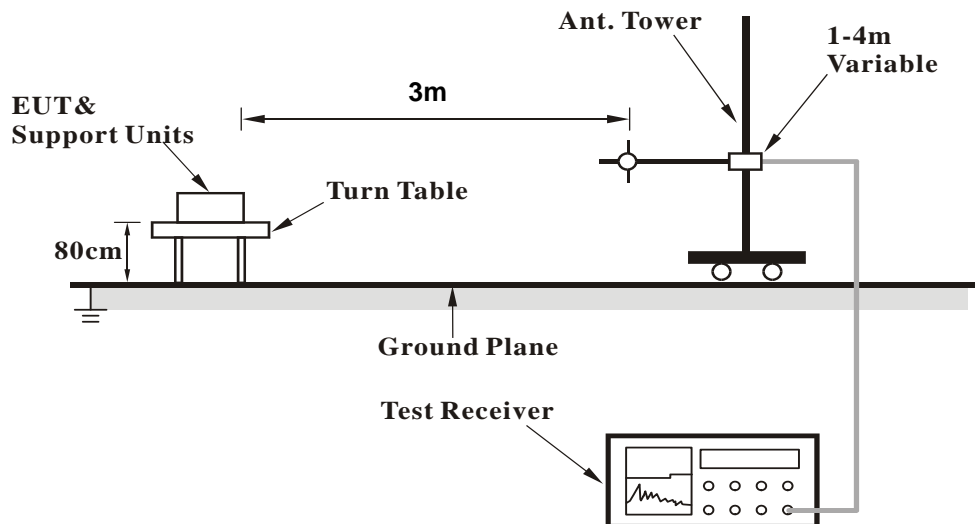
No deviation.

4.1.5 Test Set Up

For Frequency range 9kHz~30MHz



For Frequency range 30~1000MHz



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

4.1.6 EUT Operating Conditions

Test Mode A

- a. EUT was powered by adapter.
- b. Smart phone was charged by EUT through wireless.

Test Mode B

- a. EUT was powered by adapter.

4.1.7 Test Results

Below 30MHz Data:

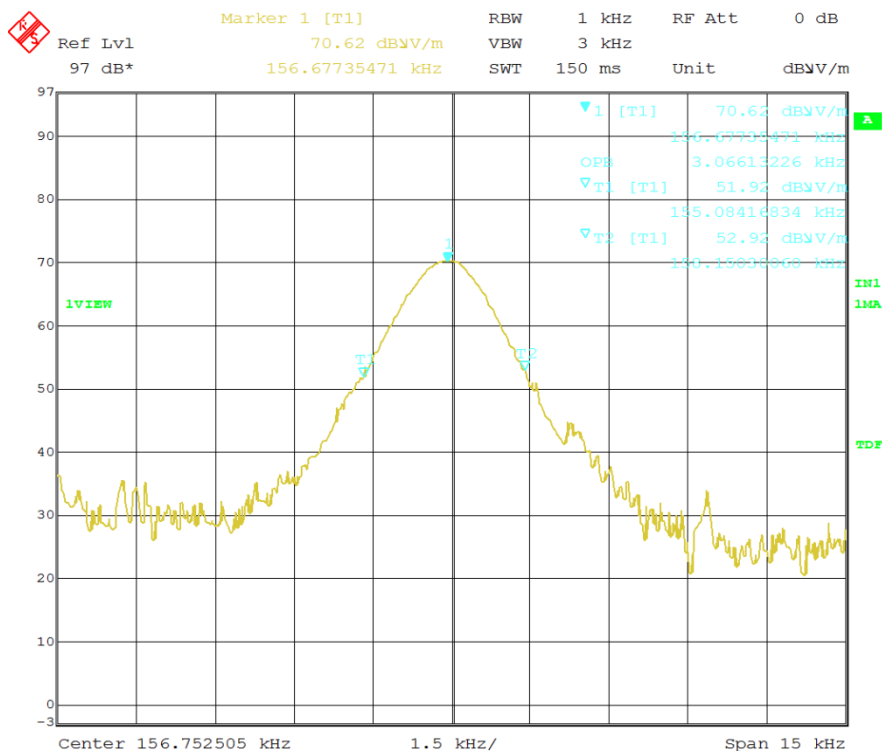
Charging Mode

Frequency	156 kHz	Detector Function	Average
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A, Sample no. 016-001, Charging Mode 10%		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m								
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	*0.156	70.6	103.7	-33.1	1.00	0	50.3	20.3
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m								
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	*0.156	66.1	103.7	-37.6	1.00	88	45.8	20.3

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. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40



Frequency	156 kHz	Detector Function	Average
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A, Sample no. 016-001, Charging Mode 50%		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m

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	*0.156	70.3	103.7	-33.4	1.00	0	50.0	20.3

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m

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	*0.156	65.4	103.7	-38.3	1.00	88	45.1	20.3

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. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

Frequency	156 kHz	Detector Function	Average
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A, Sample no. 016-001, Charging Mode 90%		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m

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	*0.156	70.0	103.7	-33.7	1.00	0	49.7	20.3

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m

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	*0.156	65.1	103.7	-38.6	1.00	88	44.8	20.3

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. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

Frequency	156 kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A, Sample no. 016-001, Charging Mode 10%		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m

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	0.609	57.60	71.90	-14.30	1.00	101	37.30	20.30
2	1.149	54.80	66.40	-11.60	1.00	334	34.50	20.30
3	2.528	49.60	69.50	-19.90	1.00	109	29.30	20.30
4	6.247	45.20	69.50	-24.30	1.00	325	24.70	20.50
5	21.663	45.00	69.50	-24.50	1.00	151	24.60	20.40
6	23.042	44.50	69.50	-25.00	1.00	351	24.00	20.50

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m

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	0.369	62.60	96.30	-33.70	1.00	8	42.30	20.30
2	1.449	55.20	64.40	-9.20	1.00	280	34.90	20.30
3	3.548	49.70	69.50	-19.80	1.00	263	29.30	20.40
4	8.406	44.90	69.50	-24.60	1.00	168	24.50	20.40
5	13.685	44.80	69.50	-24.70	1.00	325	24.30	20.50
6	26.281	43.50	69.50	-26.00	1.00	8	22.80	20.70

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. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40
9. The charging mode 10% is the worst case of 10%, 50% 90%.

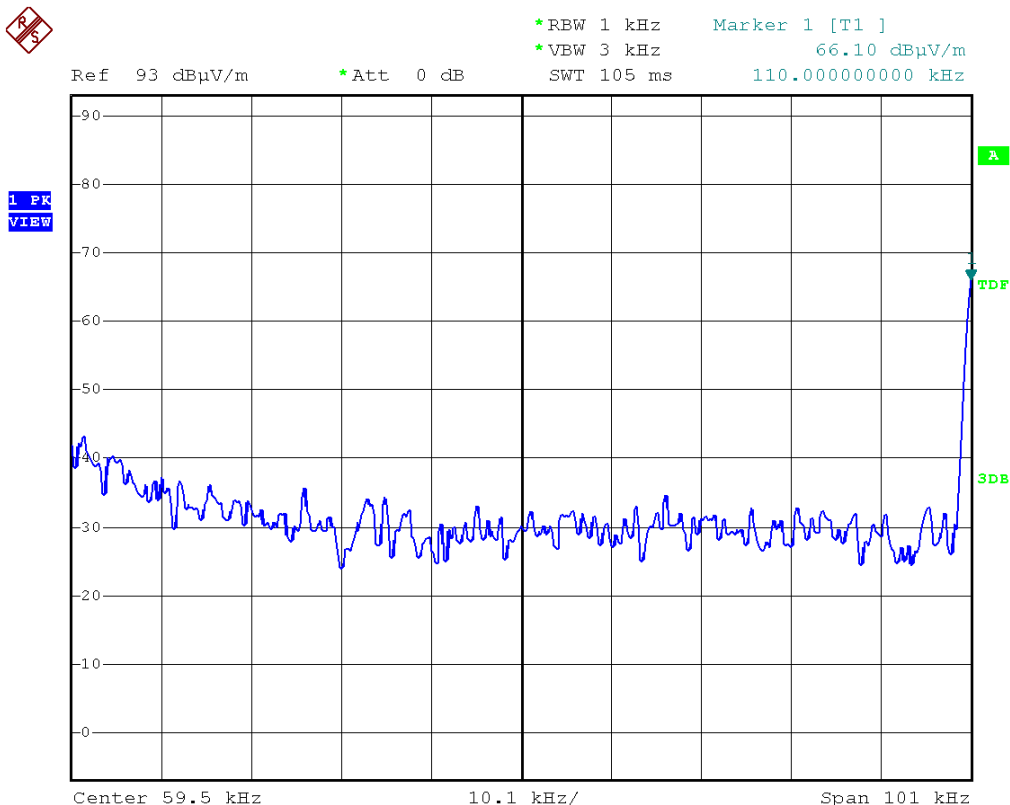
Bandedge from 112 kHz

Frequency	112 kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A, Sample no. 016-001, Charging Mode 10%		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m								
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	0.110	66.1	74.0	-7.9	1.00	288	45.8	20.30
2	0.110	36.3	54.0	-17.7	1.00	288	16.0	20.30
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m								
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	0.110	60.6	74.0	-13.4	1.00	212	40.3	20.30
2	0.110	33.0	54.0	-21.0	1.00	212	12.7	20.30

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. Loop antenna was used for all radiated emission below 30MHz.
7. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40
9. The charging mode 10% is the worst case of 10%, 50% 90%.



Standby Mode

Frequency	175 kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B, Sample no. 016-001		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m

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	0.175	66.00	102.70	-36.70	1.00	177	45.70	20.30
2	0.255	51.90	99.50	-47.60	1.00	152	31.60	20.30
3	1.329	55.30	65.10	-9.80	1.00	230	35.00	20.30
4	2.588	49.70	69.50	-19.80	1.00	305	29.40	20.30
5	3.548	48.80	69.50	-20.70	1.00	104	28.40	20.40
6	11.526	44.40	69.50	-25.10	1.00	345	23.90	20.50
7	21.003	45.90	69.50	-23.60	1.00	126	25.50	20.40

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m

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	0.175	62.00	102.70	-40.70	1.00	222	41.70	20.30
2	0.255	51.20	99.50	-48.30	1.00	305	30.90	20.30
3	1.389	55.40	64.80	-9.40	1.00	173	35.10	20.30
4	3.548	50.40	69.50	-19.10	1.00	265	30.00	20.40
5	8.346	44.80	69.50	-24.70	1.00	118	24.40	20.40
6	23.462	43.30	69.50	-26.20	1.00	291	22.80	20.50
7	29.400	42.70	69.50	-26.80	1.00	290	22.20	20.50

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. Loop antenna was used for all radiated emission below 30MHz.
6. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
7. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

Below 1GHz Data:

Charging Mode

Frequency	156 kHz	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A, Sample no. 016-001, Charging Mode 10%		

Antenna Polarity & Test Distance: Horizontal At 3m

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	26.90 QP	40.00	-13.10	1.99 H	247	41.50	-14.60
2	70.73	24.00 QP	40.00	-16.00	1.99 H	125	40.40	-16.40
3	132.95	26.50 QP	43.50	-17.00	1.99 H	78	41.50	-15.00
4	167.94	27.10 QP	43.50	-16.40	1.49 H	239	41.00	-13.90
5	265.16	26.40 QP	46.00	-19.60	1.00 H	83	39.70	-13.30
6	282.66	25.10 QP	46.00	-20.90	1.00 H	261	37.50	-12.40

Antenna Polarity & Test Distance: Vertical At 3m

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	33.79	31.80 QP	40.00	-8.20	1.49 V	307	47.70	-15.90
2	49.34	36.00 QP	40.00	-4.00	1.00 V	0	50.30	-14.30
3	50.36	35.10 QP	40.00	-4.90	1.00 V	0	49.50	-14.40
4	66.84	26.70 QP	40.00	-13.30	1.00 V	166	42.60	-15.90
5	129.06	26.20 QP	43.50	-17.30	1.00 V	143	41.80	-15.60
6	167.94	27.70 QP	43.50	-15.80	1.00 V	178	41.60	-13.90
7	259.33	21.80 QP	46.00	-24.20	1.99 V	160	35.40	-13.60

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The charging mode 10% is the worst case of 10%, 50% 90%.

Frequency	156 kHz	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A, Sample no. 016-003, Charging Mode 10%		

Antenna Polarity & Test Distance: Horizontal At 3m								
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	27.40 QP	40.00	-12.60	2.00 H	79	42.00	-14.60
2	74.62	29.00 QP	40.00	-11.00	1.50 H	226	46.20	-17.20
3	142.67	28.80 QP	43.50	-14.70	1.50 H	248	42.90	-14.10
4	162.11	27.90 QP	43.50	-15.60	1.50 H	105	41.60	-13.70
5	265.16	28.30 QP	46.00	-17.70	1.00 H	96	41.60	-13.30
6	745.40	32.20 QP	46.00	-13.80	1.00 H	299	34.50	-2.30

Antenna Polarity & Test Distance: Vertical At 3m								
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	33.79	33.00 QP	40.00	-7.00	1.99 V	220	48.90	-15.90
2	51.29	34.40 QP	40.00	-5.60	1.00 V	355	48.80	-14.40
3	131.00	25.60 QP	43.50	-17.90	1.00 V	200	41.00	-15.40
4	167.94	26.20 QP	43.50	-17.30	1.00 V	43	40.10	-13.90
5	263.21	23.10 QP	46.00	-22.90	1.99 V	122	36.50	-13.40
6	747.34	34.00 QP	46.00	-12.00	1.00 V	6	36.30	-2.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The charging mode 10% is the worst case of 10%, 50% 90%.

Standby Mode

Frequency	175 kHz	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	B, Sample no. 016-001		

Antenna Polarity & Test Distance: Horizontal At 3m

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	27.10 QP	40.00	-12.90	1.99 H	221	41.70	-14.60
2	70.73	24.10 QP	40.00	-15.90	1.99 H	13	40.50	-16.40
3	167.94	23.40 QP	43.50	-20.10	1.51 H	104	37.30	-13.90
4	269.05	22.70 QP	46.00	-23.30	1.01 H	109	35.70	-13.00
5	377.93	23.00 QP	46.00	-23.00	1.01 H	23	33.50	-10.50
6	502.36	25.80 QP	46.00	-20.20	1.51 H	10	33.50	-7.70

Antenna Polarity & Test Distance: Vertical At 3m

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	31.84	29.50 QP	40.00	-10.50	1.00 V	254	45.90	-16.40
2	51.29	28.70 QP	40.00	-11.30	1.00 V	14	43.10	-14.40
3	132.95	23.00 QP	43.50	-20.50	1.00 V	200	38.00	-15.00
4	169.89	22.80 QP	43.50	-20.70	1.00 V	200	36.70	-13.90
5	261.27	19.20 QP	46.00	-26.80	1.49 V	194	32.80	-13.60
6	502.36	26.40 QP	46.00	-19.60	1.00 V	154	34.10	-7.70

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

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	ESCS 30	100288	Aug. 18, 2016	Aug. 17, 2017
			Aug. 18, 2017	Aug. 17, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 17, 2017	Jan. 16, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 02, 2017	Aug. 01, 2018
Software ADT	BV ADT_Cond_ V7.3.7.3	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 2.

3. The VCCI Site Registration No. is C-2047.

4.2.3 Test Procedures

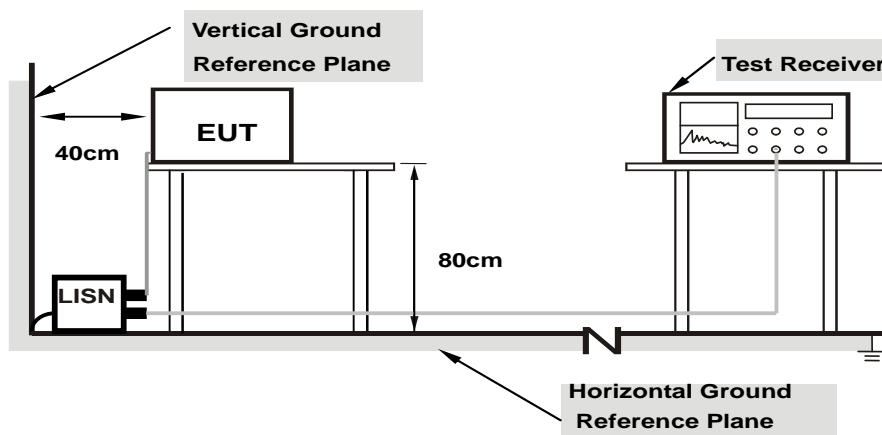
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were 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

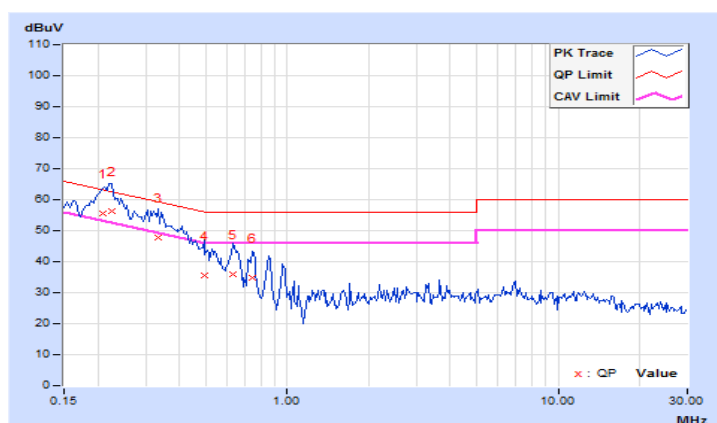
Charging Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A, Sample no. 016-001		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.20859	10.21	45.17	26.76	55.38	36.97	63.26	53.26	-7.88	-16.29
2	0.22422	10.22	46.13	26.47	56.35	36.69	62.66	52.66	-6.31	-15.97
3	0.33359	10.27	37.43	18.72	47.70	28.99	59.36	49.36	-11.66	-20.37
4	0.49375	10.29	25.34	7.91	35.63	18.20	56.10	46.10	-20.47	-27.90
5	0.62656	10.28	25.83	13.74	36.11	24.02	56.00	46.00	-19.89	-21.98
6	0.74375	10.28	24.70	13.08	34.98	23.36	56.00	46.00	-21.02	-22.64

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.

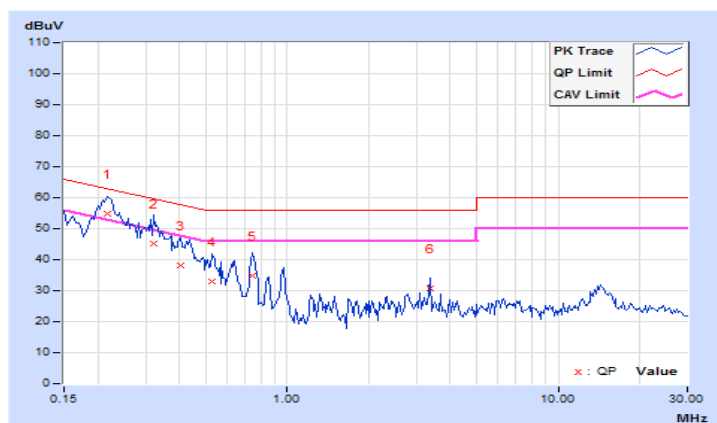


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A, Sample no. 016-001		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.21641	9.98	44.66	25.28	54.64	35.26	62.96
2	0.32188	10.00	35.23	16.21	45.23	26.21	59.66	49.66	-14.43	-23.45
3	0.40391	10.02	28.00	10.66	38.02	20.68	57.77	47.77	-19.75	-27.09
4	0.52891	10.02	22.77	5.86	32.79	15.88	56.00	46.00	-23.21	-30.12
5	0.73984	10.03	24.92	11.52	34.95	21.55	56.00	46.00	-21.05	-24.45
6	3.37109	10.14	20.70	15.75	30.84	25.89	56.00	46.00	-25.16	-20.11

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.



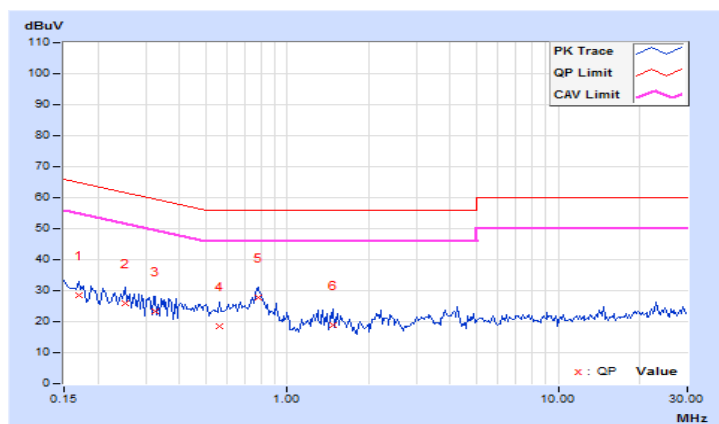
Standby Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B, Sample no. 016-001		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16953	10.21	18.14	2.60	28.35	12.81	64.98
2	0.25156	10.23	15.80	5.98	26.03	16.21	61.71	51.71	-35.68	-35.50
3	0.32578	10.27	13.18	3.02	23.45	13.29	59.56	49.56	-36.11	-36.27
4	0.56016	10.29	8.29	0.19	18.58	10.48	56.00	46.00	-37.42	-35.52
5	0.77891	10.27	17.61	8.21	27.88	18.48	56.00	46.00	-28.12	-27.52
6	1.46875	10.27	8.77	1.41	19.04	11.68	56.00	46.00	-36.96	-34.32

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.

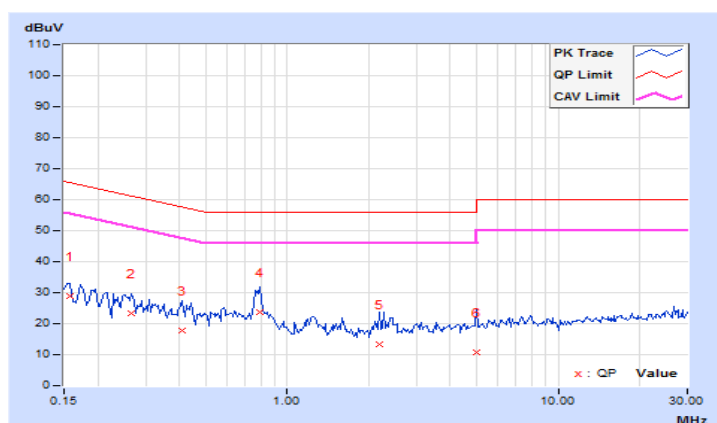


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B, Sample no. 016-001		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.15781	9.96	18.87	5.92	28.83	15.88	65.58
2	0.26719	9.99	13.30	1.04	23.29	11.03	61.20	51.20	-37.91	-40.17
3	0.40781	10.02	7.77	-1.53	17.79	8.49	57.69	47.69	-39.90	-39.20
4	0.79063	10.03	13.85	2.98	23.88	13.01	56.00	46.00	-32.12	-32.99
5	2.20313	10.09	3.25	-4.46	13.34	5.63	56.00	46.00	-42.66	-40.37
6	4.98047	10.21	0.49	-5.75	10.70	4.46	56.00	46.00	-45.30	-41.54

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 on 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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Web Site: www.bureauveritas-adt.com

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

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