

## FCC Test Report

**Report No.:** RF180910C18

**FCC ID:** K7SF8J237

**Test Model:** F8J237

**Received Date:** Sep. 10, 2018

**Test Date:** Oct. 03 ~ Oct. 04, 2018

**Issued Date:** Oct. 05, 2018

**Applicant:** Belkin International, Inc.

**Address:** 12045 E. Waterfront Drive, Playa Vista, CA 90094 USA

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

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

**FCC Registration /** 788550 / TW0003  
**Designation Number:**



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## Table of Contents

<b>Release Control Record</b>	<b>3</b>
<b>1 Certificate of Conformity</b>	<b>4</b>
<b>2 Summary of Test Results</b>	<b>5</b>
2.1 Measurement Uncertainty	5
2.2 Modification Record	5
<b>3 General Information</b>	<b>6</b>
3.1 General Description of EUT	6
3.2 Description of Test Modes	6
3.2.1 Test Mode Applicability and Tested Channel Detail	7
3.3 Description of Support Units	8
3.3.1 Configuration of System under Test	8
3.4 General Description of Applied Standards	8
<b>4 Test Types and Results</b>	<b>9</b>
4.1 Radiated Emission and Bandedge Measurement	9
4.1.1 Limits of Radiated Emission and Bandedge Measurement	9
4.1.2 Test Instruments	10
4.1.3 Test Procedures	11
4.1.4 Deviation from Test Standard	11
4.1.5 Test Set Up	12
4.1.6 EUT Operating Conditions	12
4.1.7 Test Results	13
4.2 Conducted Emission Measurement	17
4.2.1 Limits of Conducted Emission Measurement	17
4.2.2 Test Instruments	17
4.2.3 Test Procedures	18
4.2.4 Deviation from Test Standard	18
4.2.5 Test Setup	18
4.2.6 EUT Operating Conditions	18
4.2.7 Test Results	19
<b>5 Pictures of Test Arrangements</b>	<b>23</b>
<b>Appendix – Information on the Testing Laboratories</b>	<b>24</b>

### Release Control Record

Issue No.	Description	Date Issued
RF180910C18	Original release	Oct. 05, 2018

## 1 Certificate of Conformity

**Product:** PowerHouse™ Charger Dock for Apple Watch + iPhone

**Brand:** belkin

**Model No.:** F8J237

**Sample Status:** Engineering sample

**Applicant:** Belkin International, Inc.

**Test Date:** Oct. 03 ~ Oct. 04, 2018

**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 RF characteristics under the conditions specified in this report.

**Prepared by :**

  
Polly Chien / Specialist

**Date:**

Oct. 05, 2018

**Approved by :**



Bruce Chen / Project Engineer

**Date:**

Oct. 05, 2018

## 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 -11.68dB at 0.15000MHz.
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -6.1dB at 68.79MHz.

### 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	PowerHouse™ Charger Dock for Apple Watch + iPhone
Test Model	F8J237
Sample Status	Engineering sample
Power Supply Rating	12Vdc (adapter)
Modulation Type	FSK
Operating Frequency	326.5 kHz
Antenna Type	Coil antenna
Field Strength	55.4dBuV/m
Dimension for Apple watch inductive coil	7.95cm <sup>2</sup> (diameter = 31.82mm)
Accessory Device	Adapter
Data Cable Supplied	NA
Maximum Power Output for Apple watch inductive coil	Less than 5W

Note:

1. The EUT uses following adapter.

Brand	HONOTO/belkin
Model	ADS-25SGP-12 12019E
Input Power	100-240Vac, 50/60Hz, Max 0.7A
Output Power	12Vdc, 1.6A
Power Line	1.5m non-shielded DC cable without core attached on adapter

2. The EUT has a wireless inductive charging coil for charging Apple watch.

3. Plastic band is the worst case for final tests after pretesting plastic band and metal band.

#### 3.2 Description of Test Modes

1 channel is provided to this EUT

Channel	Freq. (kHz)
1	326.5

### 3.2.1 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

Note: The EUT is designed to be positioned on the X-plane only.

#### **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	Available Channel	Tested Channel
A, B	1	1

#### **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	Available Channel	Tested Channel
A, B	1	1

#### **Test Condition:**

Applicable To	Environmental Conditions	Input Power	Tested by
RE<1G	22 deg. C, 66% RH	120Vac, 60Hz	Adair Peng
PLC	25 deg. C, 66% RH	120Vac, 60Hz	Jones Chang

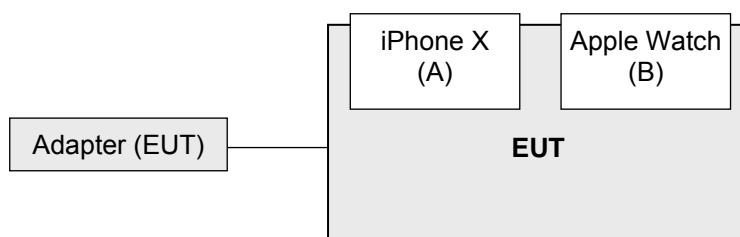
### 3.3 Description of Support Units

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.

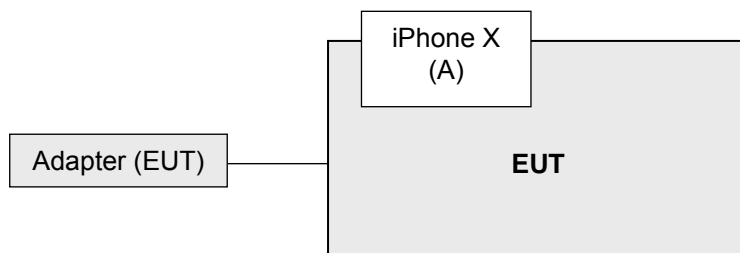
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	iPhone X	Apple	A1901	NA	NA	-
B.	Apple Watch	APPLE	A1553	NA	NA	-

#### 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 (15.209)**

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	ESCI	100424	Oct. 17, 2017	Oct. 16, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	9120D	209	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Loop Antenna TESEQ	HLA 6121	45745	Jun. 14, 2018	Jun. 13, 2019
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2018	Aug. 20, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Apr. 03, 2018	Apr. 02, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 21, 2018	Aug. 20, 2019
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM-8 000	Cable-CH3-03 (309224+170907)	Aug. 21, 2018	Aug. 20, 2019
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	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
Boresight Antenna Fixture	FBA-01	FBA-SIP01	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 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 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:

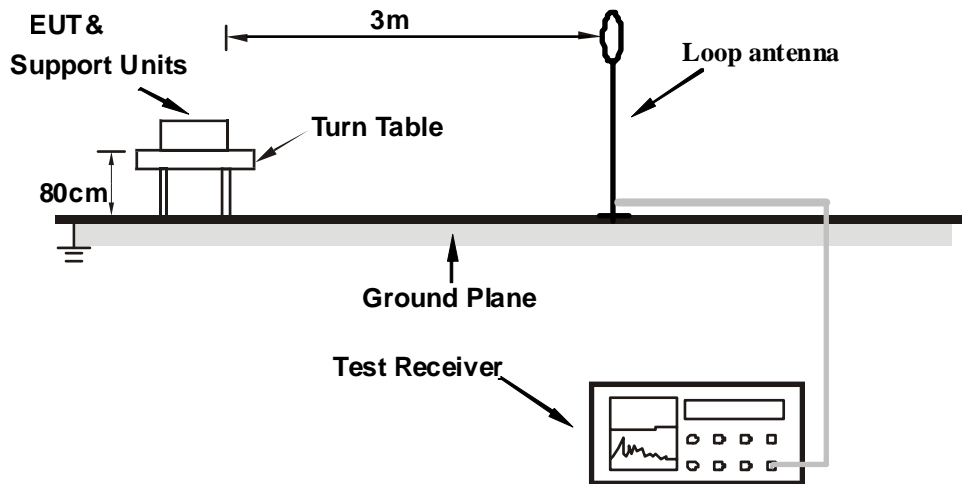
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle  $< 98\%$ ) or 10Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) 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

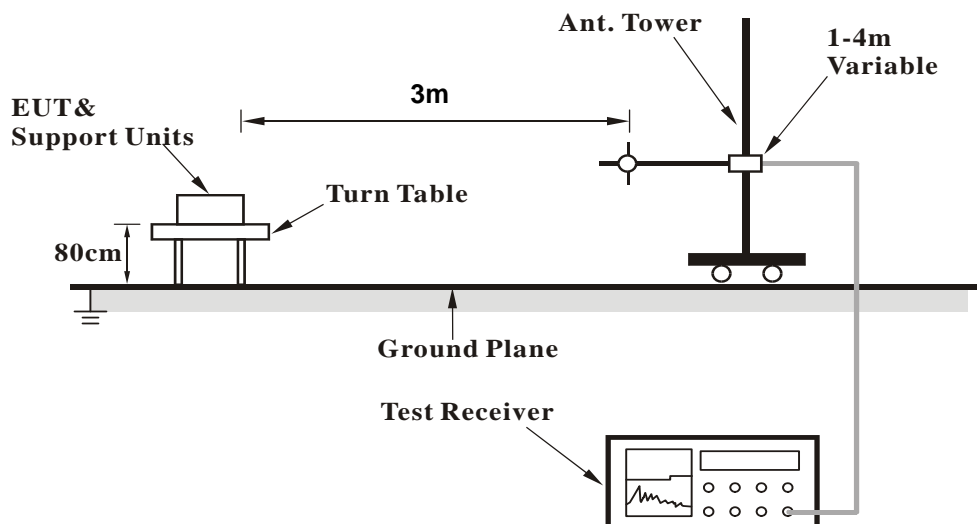
No deviation.

#### 4.1.5 Test Set Up

##### For Radiated emission below 30MHz



##### For Radiated emission 30MHz to 1GHz



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

#### 4.1.6 EUT Operating Conditions

##### Test Mode A

- The EUT powered by adapter.
- Put the iPhone & Apple watch on the EUT (wireless charging) during the test.

##### Test Mode B

- The EUT powered by adapter.

#### 4.1.7 Test Results

Below 30MHz Data:

Charging Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

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	*0.3265	55.4	97.3	-41.9	1.00	113	35.3	20.1
2	1.259	34.8	65.6	-30.8	1.00	358	14.8	20.0
3	3.229	42.6	69.5	-26.9	1.00	217	23.0	19.6
4	8.708	36.0	69.5	-33.5	1.00	303	14.5	21.5
5	11.832	35.4	69.5	-34.1	1.00	16	13.6	21.8
6	15.149	36.4	69.5	-33.1	1.00	356	14.6	21.8
7	22.214	39.2	69.5	-30.3	1.00	258	17.3	21.9
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	*0.3265	51.4	97.3	-45.9	1.00	12	31.3	20.1
2	0.970	35.8	67.9	-32.1	1.00	67	15.7	20.1
3	3.229	42.1	69.5	-27.4	1.00	122	22.5	19.6
4	9.045	34.9	69.5	-34.6	1.00	289	13.3	21.6
5	11.496	35.3	69.5	-34.2	1.00	204	13.5	21.8
6	14.524	34.7	69.5	-34.8	1.00	92	12.9	21.8
7	21.637	36.2	69.5	-33.3	1.00	154	14.3	21.9
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA GROUND-PARALLEL 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	*0.3265	51.1	97.3	-46.2	1.00	173	31.0	20.1
2	0.730	36.3	70.3	-34.0	1.00	49	16.2	20.1
3	3.566	43.3	69.5	-26.2	1.00	0	23.5	19.8
4	8.852	34.8	69.5	-34.7	1.00	265	13.3	21.5
5	12.986	39.1	69.5	-30.4	1.00	39	17.3	21.8
6	17.311	39.5	69.5	-30.0	1.00	66	17.7	21.8
7	22.502	41.8	69.5	-27.7	1.00	14	19.9	21.9

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

### Standby Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

#### 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	*0.3265	47.1	97.3	-50.2	1.00	109	27.0	20.1
2	0.653	43.0	71.3	-28.3	1.00	8	22.8	20.2
3	3.229	43.4	69.5	-26.1	1.00	53	23.8	19.6
4	8.324	34.8	69.5	-34.7	1.00	71	13.4	21.4
5	13.515	35.5	69.5	-34.0	1.00	216	13.7	21.8
6	18.369	44.3	69.5	-25.2	1.00	331	22.5	21.8
7	24.040	41.7	69.5	-27.8	1.00	59	19.7	22.0

#### 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	*0.3265	45.6	97.3	-51.7	1.00	66	25.5	20.1
2	0.653	37.9	71.3	-33.4	1.00	204	17.7	20.2
3	3.229	43.9	69.5	-25.6	1.00	36	24.3	19.6
4	6.642	34.9	69.5	-34.6	1.00	66	13.9	21.0
5	10.679	35.7	69.5	-33.8	1.00	190	13.9	21.8
6	15.149	39.4	69.5	-30.1	1.00	306	17.6	21.8
7	22.214	44.4	69.5	-25.1	1.00	76	22.5	21.9

#### ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA GROUND-PARALLEL 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	*0.3265	44.3	97.3	-53.0	1.00	144	24.2	20.1
2	0.653	41.3	71.3	-30.0	1.00	270	21.1	20.2
3	4.431	34.5	69.5	-35.0	1.00	58	14.3	20.2
4	9.958	35.3	69.5	-34.2	1.00	80	13.5	21.8
5	15.918	35.4	69.5	-34.1	1.00	159	13.6	21.8
6	20.003	40.6	69.5	-28.9	1.00	134	18.7	21.9
7	25.963	40.4	69.5	-29.1	1.00	187	18.3	22.1

#### 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.
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

Below 1GHz Data:

Charging Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30MHz ~ 1GHz		
Test Mode	A		

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	27.3 QP	40.0	-12.7	2.00 H	0	36.90	-9.60
2	127.11	29.9 QP	43.5	-13.6	1.50 H	62	40.80	-10.90
3	191.28	32.4 QP	43.5	-11.1	1.50 H	62	43.90	-11.50
4	311.82	31.8 QP	46.0	-14.2	1.00 H	231	38.80	-7.00
5	440.14	28.3 QP	46.0	-17.7	2.00 H	211	32.60	-4.30
6	619.02	28.8 QP	46.0	-17.2	1.50 H	115	29.50	-0.70
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	<b>68.79</b>	<b>33.9 QP</b>	<b>40.0</b>	<b>-6.1</b>	<b>1.49 V</b>	<b>173</b>	<b>44.80</b>	<b>-10.90</b>
2	125.17	28.0 QP	43.5	-15.5	1.00 V	56	39.10	-11.10
3	169.89	30.8 QP	43.5	-12.7	1.00 V	158	40.00	-9.20
4	286.55	29.3 QP	46.0	-16.7	1.49 V	129	36.90	-7.60
5	348.76	32.0 QP	46.0	-14.0	1.49 V	198	38.60	-6.60
6	620.96	29.4 QP	46.0	-16.6	1.00 V	97	30.10	-0.70

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

### Standby Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30MHz ~ 1GHz		
Test Mode	B		

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	27.2 QP	40.0	-12.8	2.00 H	146	36.80	-9.60
2	127.11	28.5 QP	43.5	-15.0	1.50 H	63	39.40	-10.90
3	193.22	32.4 QP	43.5	-11.1	1.50 H	40	44.00	-11.60
4	296.27	30.8 QP	46.0	-15.2	1.00 H	57	38.30	-7.50
5	442.09	28.4 QP	46.0	-17.6	2.00 H	227	32.70	-4.30
6	624.85	28.0 QP	46.0	-18.0	1.50 H	104	28.50	-0.50
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	55.18	28.3 QP	40.0	-11.7	1.49 V	15	37.80	-9.50
2	127.11	27.0 QP	43.5	-16.5	1.00 V	19	37.90	-10.90
3	169.89	30.4 QP	43.5	-13.1	1.00 V	148	39.60	-9.20
4	350.71	31.0 QP	46.0	-15.0	1.00 V	208	37.50	-6.50
5	436.26	28.3 QP	46.0	-17.7	1.00 V	260	32.70	-4.40
6	646.24	27.8 QP	46.0	-18.2	1.00 V	121	28.20	-0.40

### 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



## 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	Nov. 23, 2017	Nov. 22, 2018
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
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-2040.

#### 4.2.3 Test Procedures

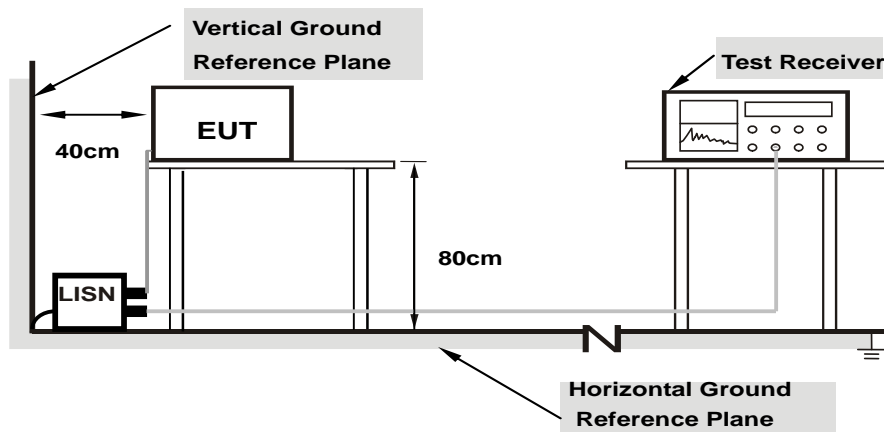
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

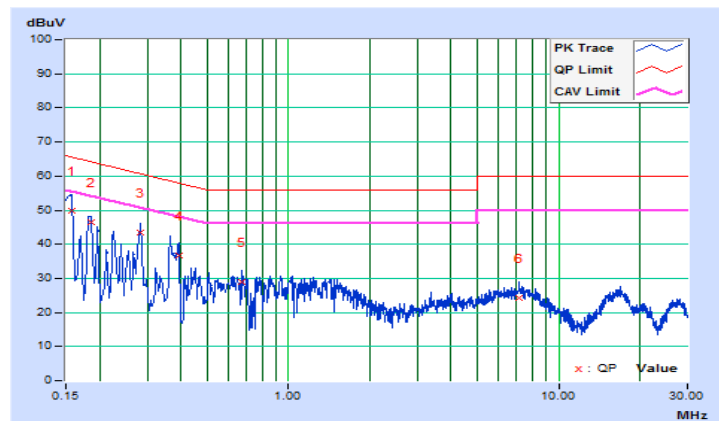
##### Charging Mode

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15719	9.73	40.01	24.82	49.74	34.55	65.61	55.61	-15.87	-21.06
2	0.18508	9.72	36.90	25.02	46.62	34.74	64.25	54.25	-17.63	-19.51
3	0.28288	9.73	33.82	28.44	43.55	38.17	60.73	50.73	-17.18	-12.56
4	0.39219	9.75	26.93	13.25	36.68	23.00	58.02	48.02	-21.34	-25.02
5	0.67394	9.72	19.14	9.90	28.86	19.62	56.00	46.00	-27.14	-26.38
6	7.17236	9.84	14.30	9.28	24.14	19.12	60.00	50.00	-35.86	-30.88

##### 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.

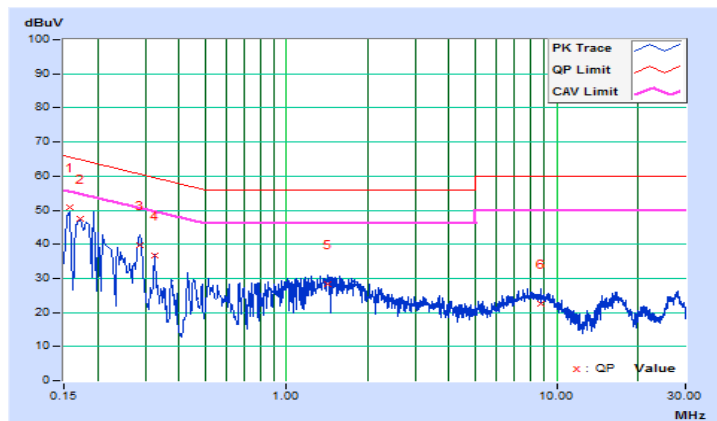


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq. [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	0.15782	9.72	41.12	25.61	50.84	35.33	65.58	55.58	-14.74	-20.25
2	0.17283	9.72	37.73	22.83	47.45	32.55	64.82	54.82	-17.37	-22.27
3	0.28663	9.74	30.15	21.90	39.89	31.64	60.62	50.62	-20.73	-18.98
4	0.32595	9.74	26.87	17.64	36.61	27.38	59.55	49.55	-22.94	-22.17
5	1.41684	9.72	18.54	9.27	28.26	18.99	56.00	46.00	-27.74	-27.01
6	8.73245	9.89	12.53	7.59	22.42	17.48	60.00	50.00	-37.58	-32.52

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.



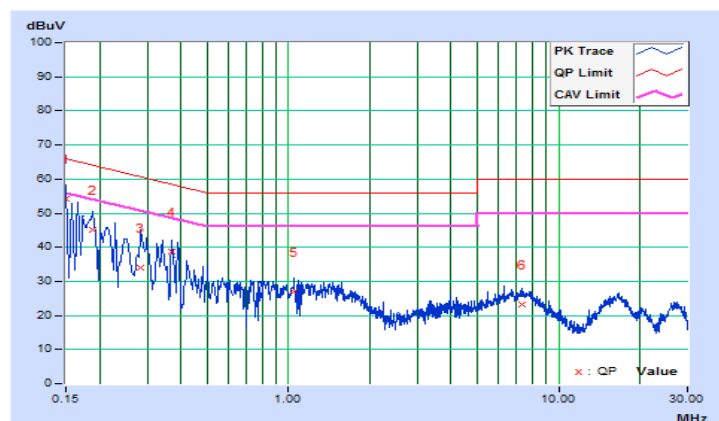
### Standby Mode

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

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	0.15000	9.73	44.59	27.73	54.32	37.46	66.00	56.00	-11.68	-18.54
2	0.18903	9.72	35.27	21.24	44.99	30.96	64.08	54.08	-19.09	-23.12
3	0.28288	9.73	24.27	15.13	34.00	24.86	60.73	50.73	-26.73	-25.87
4	0.36896	9.75	29.11	17.09	38.86	26.84	58.52	48.52	-19.66	-21.68
5	1.05321	9.68	17.34	7.85	27.02	17.53	56.00	46.00	-28.98	-28.47
6	7.30921	9.84	13.27	8.44	23.11	18.28	60.00	50.00	-36.89	-31.72

### 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.

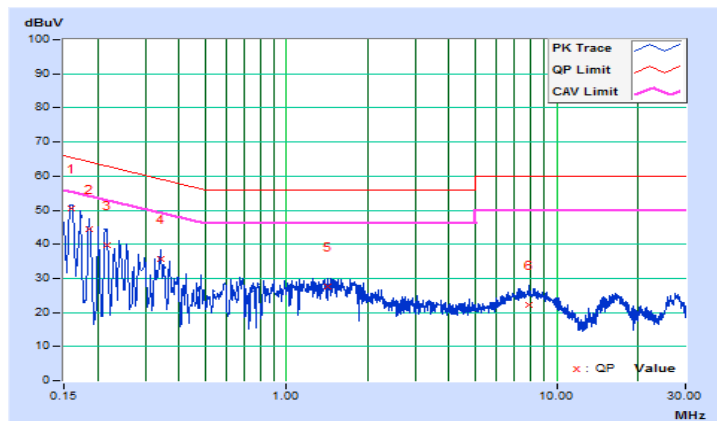


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [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	0.15885	9.72	40.81	27.42	50.53	37.14	65.52	55.52	-14.99	-18.38
2	0.18519	9.73	34.63	19.53	44.36	29.26	64.25	54.25	-19.89	-24.99
3	0.21647	9.73	30.12	15.97	39.85	25.70	62.95	52.95	-23.10	-27.25
4	0.34159	9.74	25.96	16.66	35.70	26.40	59.16	49.16	-23.46	-22.76
5	1.41684	9.72	17.95	9.00	27.67	18.72	56.00	46.00	-28.33	-27.28
6	7.94900	9.88	12.45	7.49	22.33	17.37	60.00	50.00	-37.67	-32.63

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.

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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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