FCC Pretest Report

Report No.:	RF190724C15
FCC ID:	K7SF7U094
Test Model:	F7U094
Received Date:	Jul. 24, 2019
Test Date:	Jul. 25 ~ Jul. 30, 2019
Issued Date:	Aug. 15, 2019
Applicant:	Belkin International, Inc.
Address:	12045 East Waterfront Drive, Playa Vista, CA 90094
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 / Designation Number:	788550 / TW0003

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The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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Release Control Record

Issue No.	Description	Date Issued
RF190724C15	Original release	Aug. 15, 2019

1 Certificate of Conformity

Product:	BOOST↑CHARGE™ Wireless Charging Stand Special Edition
Brand:	belkin
Test Model:	F7U094
Sample Status:	Engineering sample
Applicant:	Belkin International, Inc.
Test Date:	Jul. 25 ~ Jul. 30, 2019
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 : _____ , **Date:** Aug. 15, 2019

Polly Chien / Specialist

Approved by : _____ , **Date:** Aug. 15, 2019

Bruce Chen / Project Engineer

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 -10.24dB at 5.61618MHz.
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -8.2dB at 59.06MHz

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	3.86 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	BOOST↑CHARGE™ Wireless Charging Stand Special Edition
Brand	belkin
Test Model	F7U094
Sample Status	Engineering sample
Rating	15Vdc (Adapter)
Modulation Type	FSK
Operating Frequency	127.8 kHz
Dimension for iPhone charging coil	47.52cm^2 (diameter = 77.8mm)
Antenna Type	Coil antenna
Field Strength	81.1dBuV/m
Accessory Device	Adapter
Data Cable Supplied	NA
Maximum Power Output for Phone charging coil	7.5W

Note:

1. The EUT uses following adapter.

Brand	belkin
Model	2ADH023H NJ
Input Power	100-240Vac, 50/60Hz, 0.7A MAX
Output Power	15Vdc, 1.5A
Power Line	1.5m DC cable without core attached on adapter

2. The EUT has WPC (Wireless Power Consortium) technology.

3.2 Description of Test Modes

1 channel is provided to this EUT

Channel	Freq. (kHz)
1	127.8

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO		DESCRIPTION
	RE<1G	PLC	
A	√	-	Charging Mode (iPhone in the stand-up position)
B	√	√	Charging Mode (iPhone in the lie-down position)
C	√	√	Standby Mode

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

Note:
1. The EUT is designed to be positioned on the **X-plane** only.
2. "-" means no effect.
3. After the pretesting on radiated emission (30MHz to 1GHz) among mode A and B, mode B was found to be the worst case test mode. Therefore, radiated emission (30MHz to 1GHz) and conducted emission among mode B had been chosen for final test.

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, C	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
B, C	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, 75% RH	120Vac, 60Hz	Willy Cheng

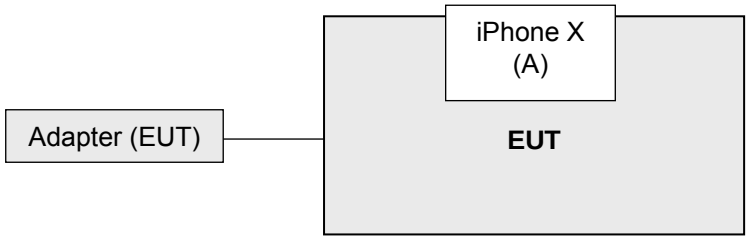
3.3 Description of Support Units

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.

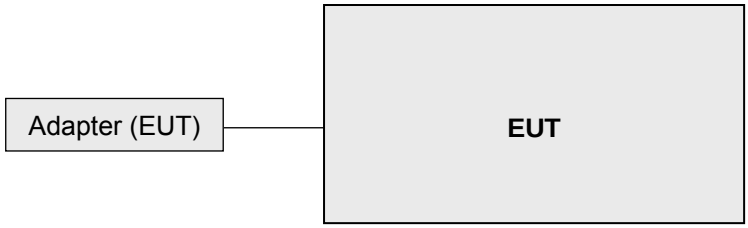
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	iPhone X	APPLE	A1901	NA	NA	-

3.3.1 Configuration of System under Test

Charging Mode:
Test Mode A, B



Standby Mode:
Test Mode C



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	ESIB7	100187	May 30, 2019	May 29, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 22, 2018	Nov. 21, 2019
HORN Antenna SCHWARZBECK	9120D	209	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna TESEQ	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2018	Aug. 20, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 27, 2019	Mar. 26, 2020
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-S M-8000	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.

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:

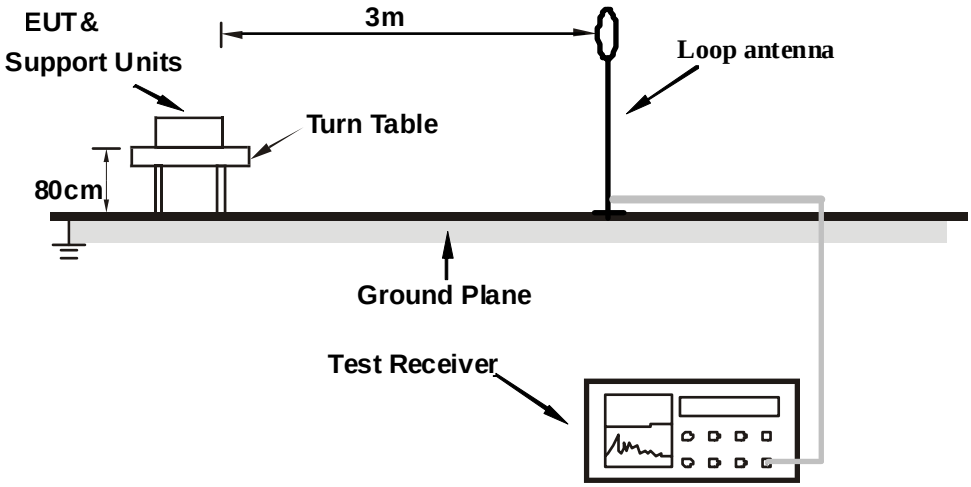
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

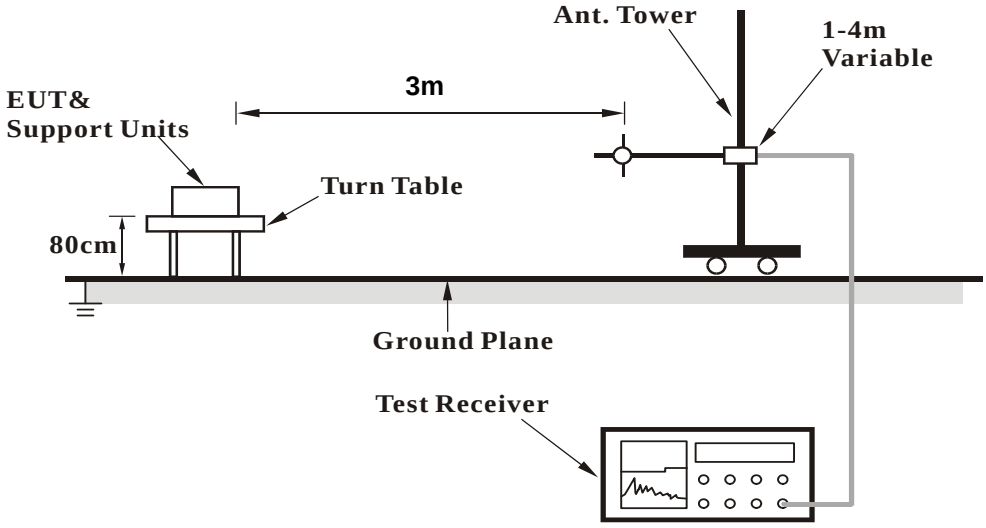
No deviation.

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

Charging Mode:

Test Mode A, B

a. The EUT powered by adapter.

b. Put the iPhone X on the EUT (wireless charging) during the test.

Standby Mode:

Test Mode C

a. The EUT powered by adapter.

4.1.7 Test Results

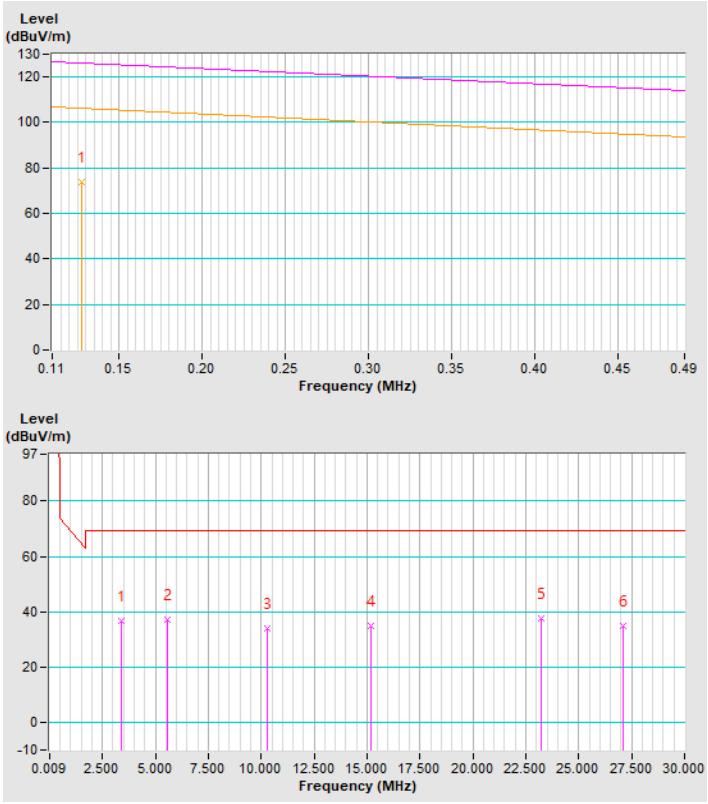
Below 30MHz Data: Charging Mode

Channel	TX Channel 1	Detector Function	Average (AV) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA 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	*0.1278	73.9 AV	105.5	-31.6	1.00	293	54.8	19.1
2	3.3747	36.5 QP	69.5	-33.0	1.00	335	16.5	20.0
3	5.5985	37.0 QP	69.5	-32.5	1.00	319	16.7	20.3
4	10.2865	33.9 QP	69.5	-35.6	1.00	213	12.2	21.7
5	15.2149	34.7 QP	69.5	-34.8	1.00	321	12.8	21.9
6	23.2085	37.4 QP	69.5	-32.1	1.00	13	15.3	22.1
7	27.1151	34.8 QP	69.5	-34.7	1.00	70	12.6	22.2

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.
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

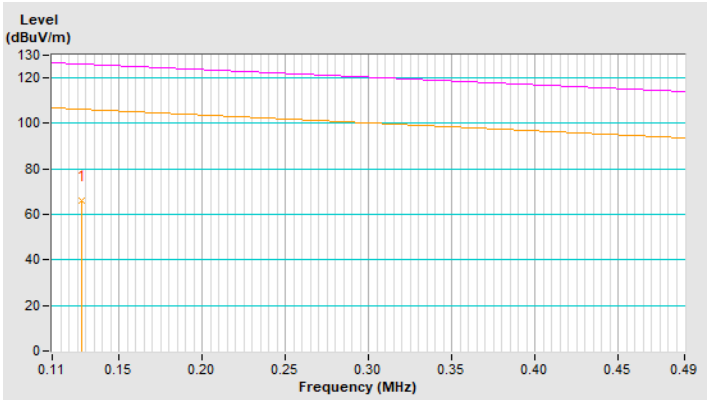


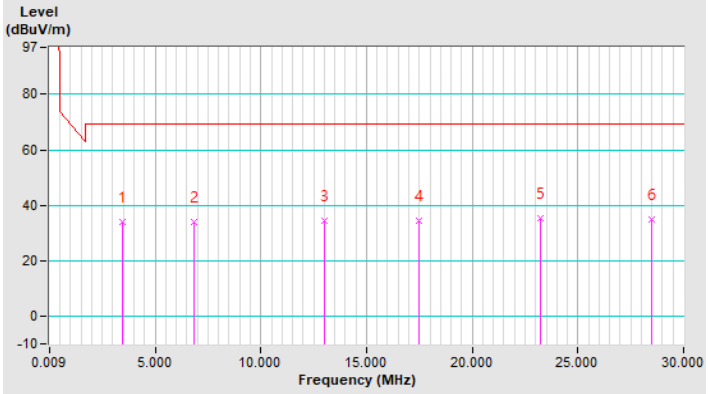
Channel	TX Channel 1	Detector Function	Average (AV) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA PERPENDICULAR 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	*0.1278	66.1 AV	105.5	-39.4	1.00	15	47.0	19.1
2	3.4348	34.1 QP	69.5	-35.4	1.00	332	14.1	20.0
3	6.8607	33.8 QP	69.5	-35.7	1.00	240	13.1	20.7
4	12.9911	34.6 QP	69.5	-34.9	1.00	147	12.8	21.8
5	17.4987	34.3 QP	69.5	-35.2	1.00	30	12.3	22.0
6	23.2085	35.4 QP	69.5	-34.1	1.00	128	13.3	22.1
7	28.4974	34.8 QP	69.5	-34.7	1.00	94	12.6	22.2

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.
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



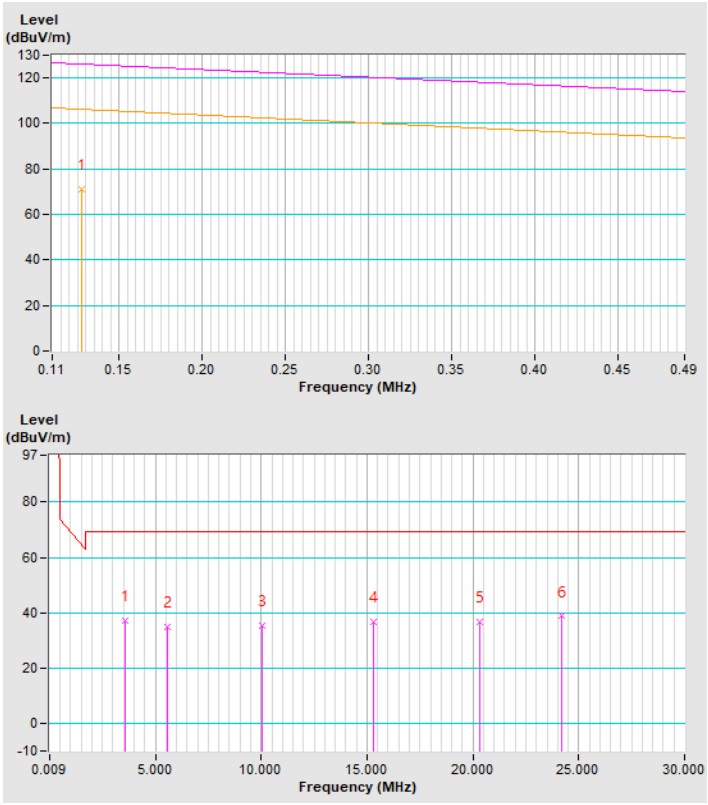


Channel	TX Channel 1	Detector Function	Average (AV) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

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	*0.1278	71.1 AV	105.5	-34.4	1.00	277	52.0	19.1
2	3.550	37.2 QP	69.5	-32.3	1.00	286	17.2	20.0
3	5.5985	35.0 QP	69.5	-34.5	1.00	147	14.7	20.3
4	10.0461	35.4 QP	69.5	-34.1	1.00	123	13.7	21.7
5	15.3351	36.7 QP	69.5	-32.8	1.00	306	14.8	21.9
6	20.3235	36.8 QP	69.5	-32.7	1.00	69	14.7	22.1
7	24.1701	38.7 QP	69.5	-30.8	1.00	243	16.6	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

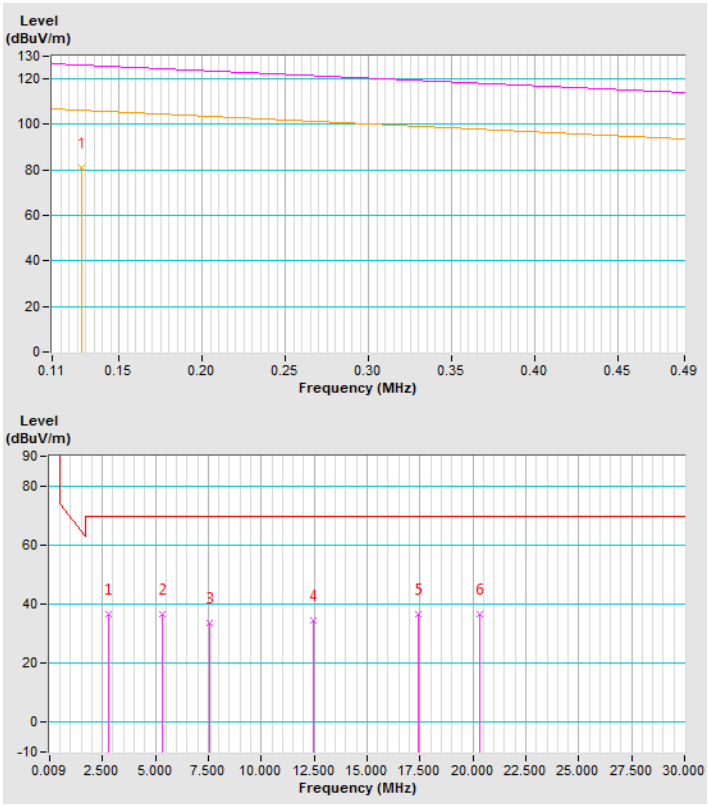


Channel	TX Channel 1	Detector Function	Average (AV) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA 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	*0.1278	81.1 AV	105.5	-24.4	1.00	333	62.0	19.1
2	2.7737	36.7 QP	69.5	-32.8	1.00	302	16.8	19.9
3	5.3581	36.8 QP	69.5	-32.7	1.00	343	16.6	20.2
4	7.5819	33.7 QP	69.5	-35.8	1.00	154	12.8	20.9
5	12.4502	34.7 QP	69.5	-34.8	1.00	336	12.9	21.8
6	17.4386	36.5 QP	69.5	-33.0	1.00	214	14.5	22.0
7	20.3235	36.7 QP	69.5	-32.8	1.00	141	14.6	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

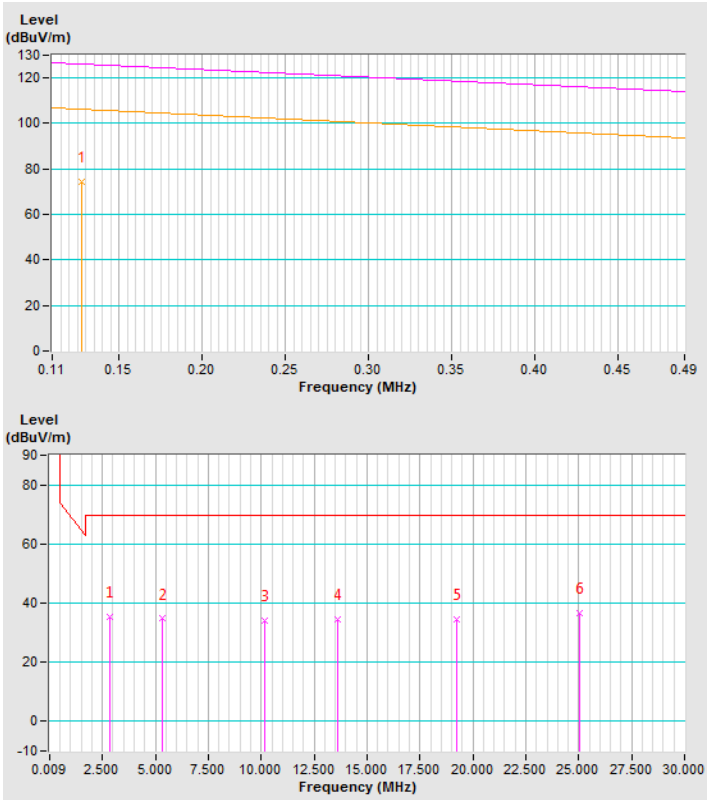


Channel	TX Channel 1	Detector Function	Average (AV) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA PERPENDICULAR 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	*0.1278	74.3 AV	105.5	-31.2	1.00	115	55.2	19.1
2	2.8338	35.4 QP	69.5	-34.1	1.00	27	15.5	19.9
3	5.3581	34.7 QP	69.5	-34.8	1.00	192	14.5	20.2
4	10.1663	34.1 QP	69.5	-35.4	1.00	173	12.4	21.7
5	13.5921	34.4 QP	69.5	-35.1	1.00	337	12.6	21.8
6	19.2417	34.4 QP	69.5	-35.1	1.00	80	12.3	22.1
7	25.0716	36.5 QP	69.5	-33.0	1.00	170	14.4	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

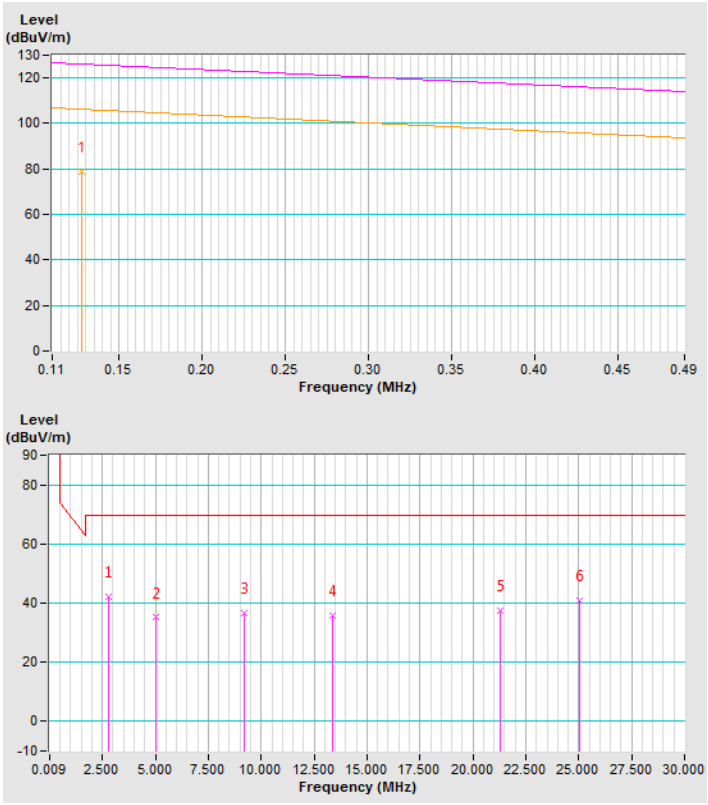


Channel	TX Channel 1	Detector Function	Average (AV) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

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	*0.1278	78.5 AV	105.5	-27.0	1.00	41	59.4	19.1
2	2.7737	42.1 QP	69.5	-27.4	1.00	236	22.2	19.9
3	5.0576	35.1 QP	69.5	-34.4	1.00	287	15.0	20.1
4	9.2046	36.7 QP	69.5	-32.8	1.00	3	15.3	21.4
5	13.3517	35.6 QP	69.5	-33.9	1.00	298	13.8	21.8
6	21.2852	37.4 QP	69.5	-32.1	1.00	300	15.3	22.1
7	25.0716	40.9 QP	69.5	-28.6	1.00	14	18.8	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



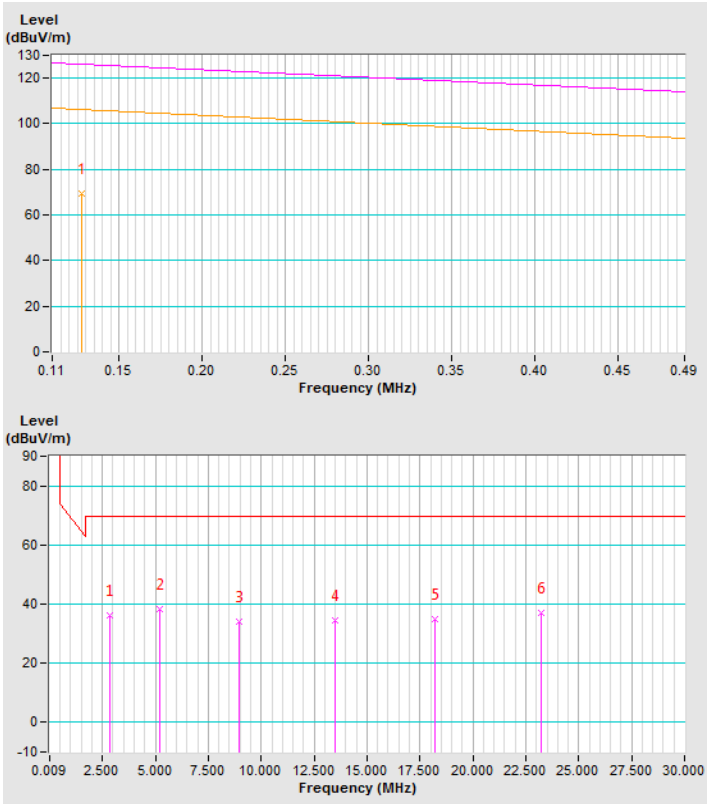
Standby Mode

Channel	TX Channel 1	Detector Function	Average (AV) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	C		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA 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	*0.1278	69.3 AV	105.5	-36.2	1.00	354	50.2	19.1
2	2.8338	36.1 QP	69.5	-33.4	1.00	102	16.2	19.9
3	5.2379	38.3 QP	69.5	-31.2	1.00	10	18.1	20.2
4	8.9642	34.0 QP	69.5	-35.5	1.00	198	12.7	21.3
5	13.4719	34.6 QP	69.5	-34.9	1.00	114	12.8	21.8
6	18.2200	35.1 QP	69.5	-34.4	1.00	23	13.1	22.0
7	23.2085	36.9 QP	69.5	-32.6	1.00	352	14.8	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

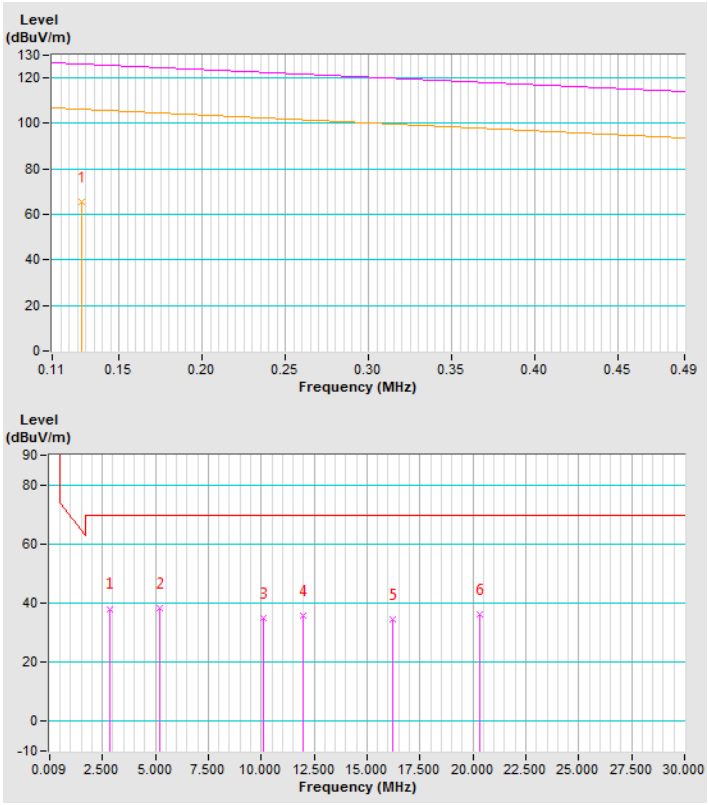


Channel	TX Channel 1	Detector Function	Average (AV) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	C		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA PERPENDICULAR 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	*0.1278	65.5 AV	105.5	-40.0	1.00	273	46.4	19.1
2	2.8338	38.1 QP	69.5	-31.4	1.00	187	18.2	19.9
3	5.2379	38.5 QP	69.5	-31.0	1.00	56	18.3	20.2
4	10.1062	35.0 QP	69.5	-34.5	1.00	322	13.3	21.7
5	11.9693	35.7 QP	69.5	-33.8	1.00	182	13.9	21.8
6	16.2366	34.5 QP	69.5	-35.0	1.00	18	12.6	21.9
7	20.3235	36.0 QP	69.5	-33.5	1.00	12	13.9	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

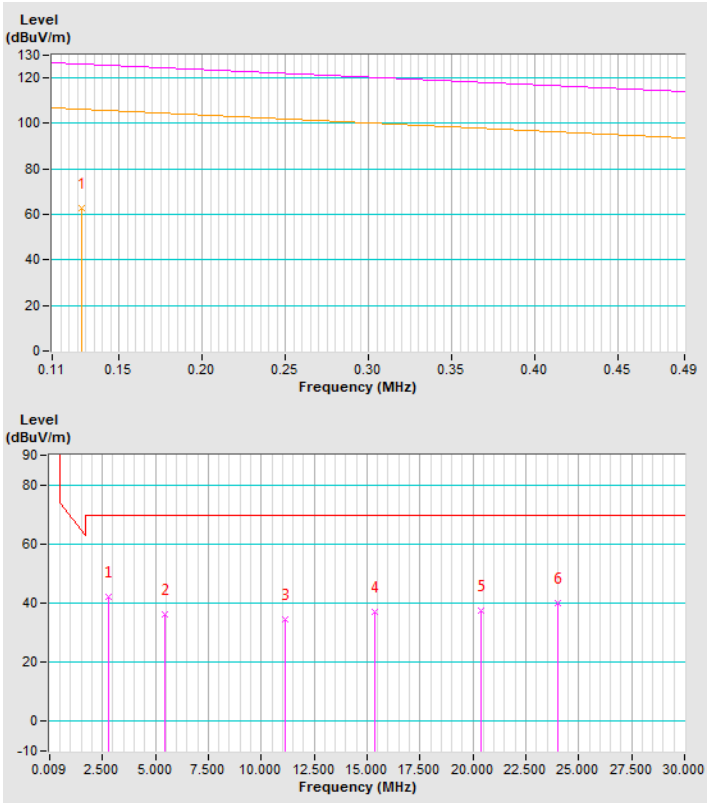


Channel	TX Channel 1	Detector Function	Average (AV) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	C		

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	*0.1278	63.0 AV	105.5	-42.5	1.00	3	43.9	19.1
2	2.7737	42.1 QP	69.5	-27.4	1.00	27	22.2	19.9
3	5.4783	36.0 QP	69.5	-33.5	1.00	175	15.8	20.2
4	11.1279	34.7 QP	69.5	-34.8	1.00	73	13.0	21.7
5	15.3952	37.0 QP	69.5	-32.5	1.00	238	15.1	21.9
6	20.3836	37.6 QP	69.5	-31.9	1.00	9	15.5	22.1
7	23.9898	40.0 QP	69.5	-29.5	1.00	63	17.9	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:

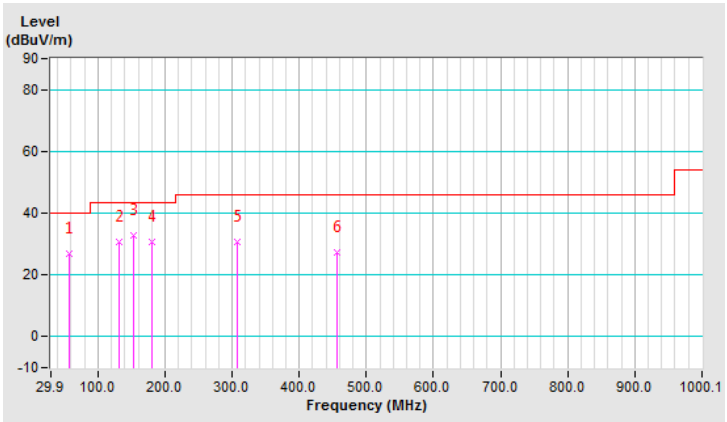
Charging Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
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	26.9 QP	40.0	-13.1	2.00 H	268	37.0	-10.1
2	131.00	30.5 QP	43.5	-13.0	1.50 H	71	41.0	-10.5
3	152.39	32.9 QP	43.5	-10.6	2.00 H	78	42.1	-9.2
4	179.61	30.6 QP	43.5	-12.9	1.50 H	74	40.8	-10.2
5	307.93	30.6 QP	46.0	-15.4	1.01 H	236	37.7	-7.1
6	455.70	27.2 QP	46.0	-18.8	2.00 H	120	31.6	-4.4

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

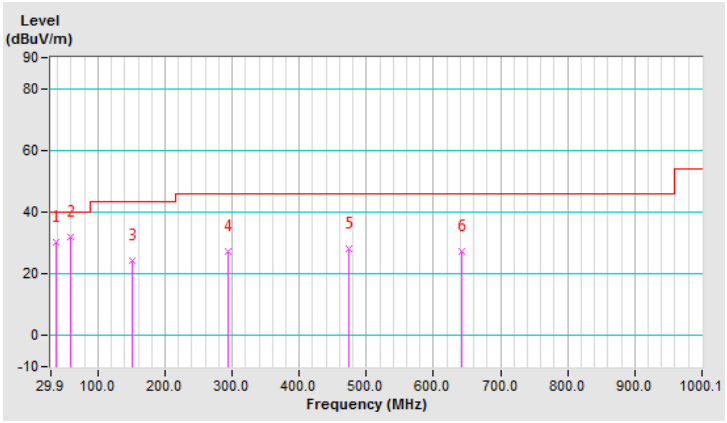


Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		
Test Mode	B		

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	37.68	30.3 QP	40.0	-9.7	1.00 V	329	41.0	-10.7
2	**59.06**	**31.8 QP**	**40.0**	**-8.2**	**1.00 V**	**322**	**41.9**	**-10.1**
3	150.45	24.4 QP	43.5	-19.1	1.00 V	0	33.5	-9.1
4	294.32	27.3 QP	46.0	-18.7	1.50 V	183	34.9	-7.6
5	473.20	28.3 QP	46.0	-17.7	1.00 V	84	32.4	-4.1
6	642.35	27.1 QP	46.0	-18.9	1.50 V	7	27.7	-0.6

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



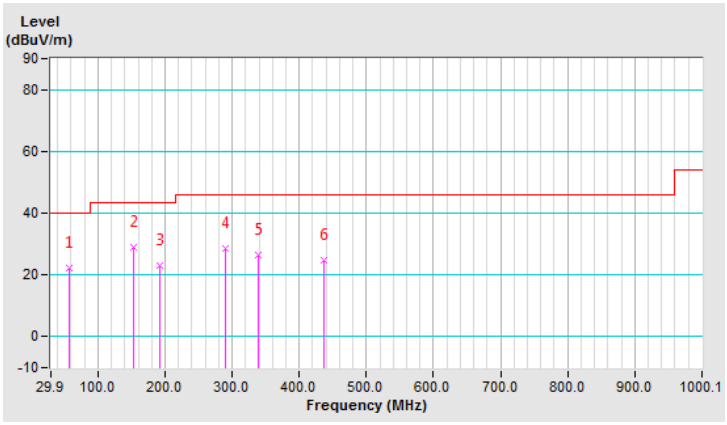
Standby Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		
Test Mode	C		

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	22.3 QP	40.0	-17.7	1.50 H	62	32.4	-10.1
2	152.39	29.1 QP	43.5	-14.4	1.00 H	250	38.3	-9.2
3	193.22	22.9 QP	43.5	-20.6	2.00 H	68	34.1	-11.2
4	290.43	28.6 QP	46.0	-17.4	1.00 H	135	36.3	-7.7
5	339.04	26.4 QP	46.0	-19.6	1.50 H	81	33.2	-6.8
6	436.26	24.6 QP	46.0	-21.4	1.00 H	290	29.1	-4.5

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

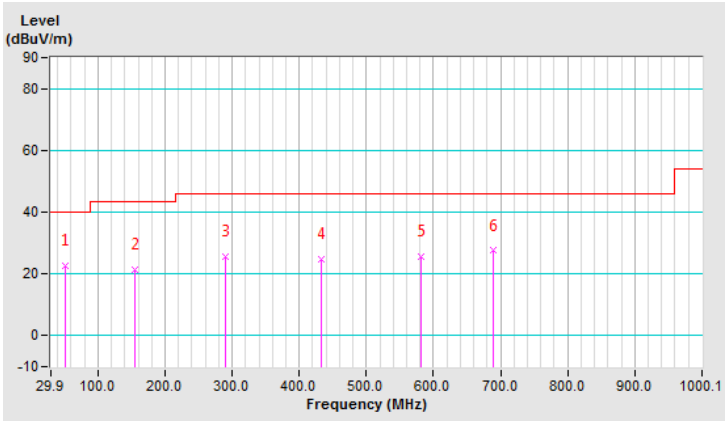


Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		
Test Mode	C		

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	51.29	22.7 QP	40.0	-17.3	1.50 V	5	32.4	-9.7
2	154.33	21.5 QP	43.5	-22.0	1.00 V	120	30.5	-9.0
3	290.43	25.8 QP	46.0	-20.2	1.50 V	169	33.5	-7.7
4	432.37	24.9 QP	46.0	-21.1	1.00 V	247	29.4	-4.5
5	582.08	25.6 QP	46.0	-20.4	2.00 V	240	27.3	-1.7
6	689.01	27.5 QP	46.0	-18.5	1.00 V	117	27.4	0.1

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



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. 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.

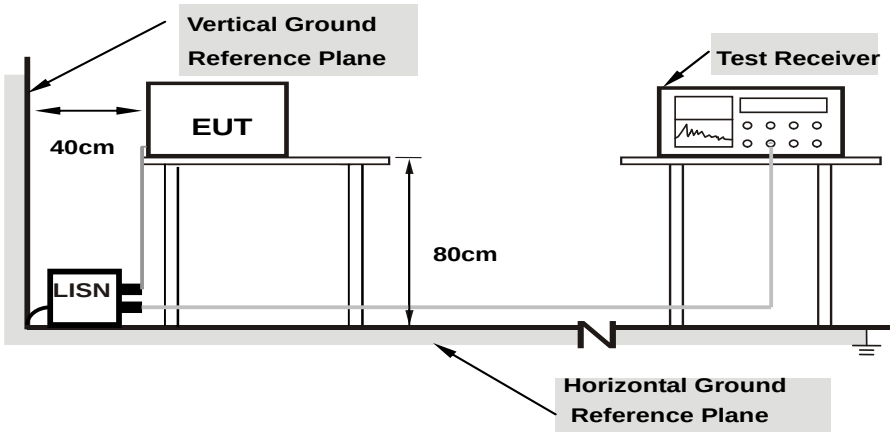
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

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

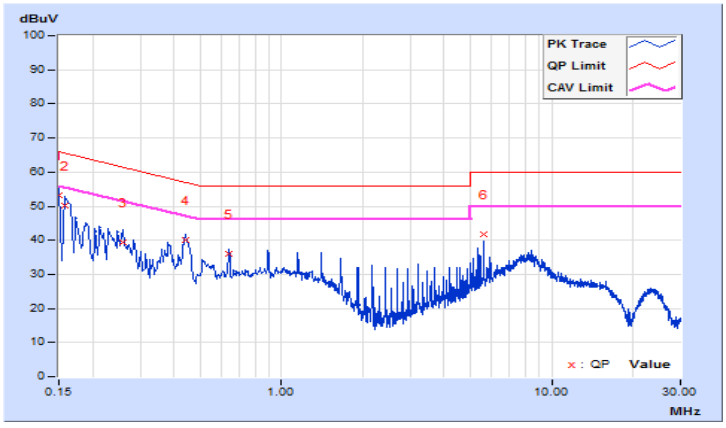
Charging Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	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	9.84	43.45	27.05	53.29	36.89	66.00	56.00	-12.71	-19.11
2	0.15782	9.84	40.35	25.24	50.19	35.08	65.58	55.58	-15.39	-20.50
3	0.25932	9.86	29.58	21.18	39.44	31.04	61.45	51.45	-22.01	-20.41
4	0.44325	9.88	30.35	24.10	40.23	33.98	57.00	47.00	-16.77	-13.02
5	0.63856	9.90	26.17	23.28	36.07	33.18	56.00	46.00	-19.93	-12.82
6	**5.61618**	**10.06**	**31.85**	**29.70**	**41.91**	**39.76**	**60.00**	**50.00**	**-18.09**	**-10.24**

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.

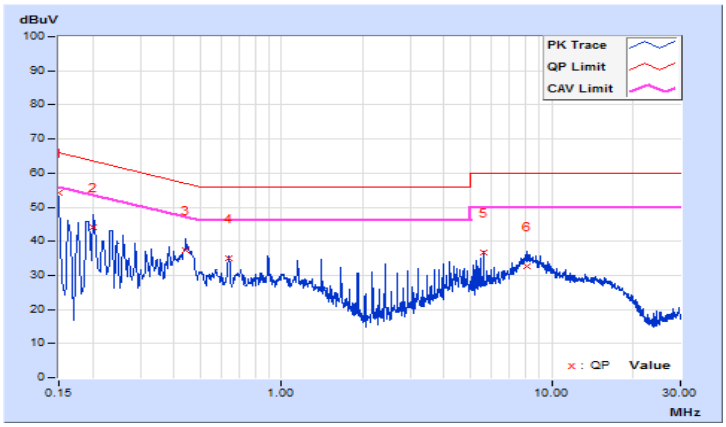


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.15000	9.82	44.30	27.29	54.12	37.11	66.00	56.00	-11.88	-18.89
2	0.20084	9.84	34.38	20.56	44.22	30.40	63.58	53.58	-19.36	-23.18
3	0.44325	9.87	27.42	21.02	37.29	30.89	57.00	47.00	-19.71	-16.11
4	0.63856	9.87	25.16	23.09	35.03	32.96	56.00	46.00	-20.97	-13.04
5	5.62009	10.04	26.53	23.78	36.57	33.82	60.00	50.00	-23.43	-16.18
6	8.05602	10.11	22.45	17.45	32.56	27.56	60.00	50.00	-27.44	-22.44

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.



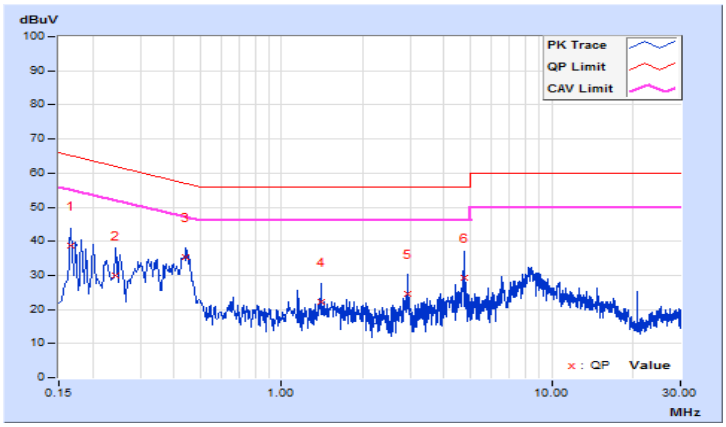
Standby Mode

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16564	9.84	28.93	4.57	38.77	14.41	65.18	55.18	-26.41	-40.77
2	0.24384	9.86	20.12	2.20	29.98	12.06	61.96	51.96	-31.98	-39.90
3	0.44325	9.88	25.51	9.34	35.39	19.22	57.00	47.00	-21.61	-27.78
4	1.40395	9.93	12.24	4.18	22.17	14.11	56.00	46.00	-33.83	-31.89
5	2.93783	9.98	14.53	5.63	24.51	15.61	56.00	46.00	-31.49	-30.39
6	4.72861	10.04	19.32	9.62	29.36	19.66	56.00	46.00	-26.64	-26.34

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.

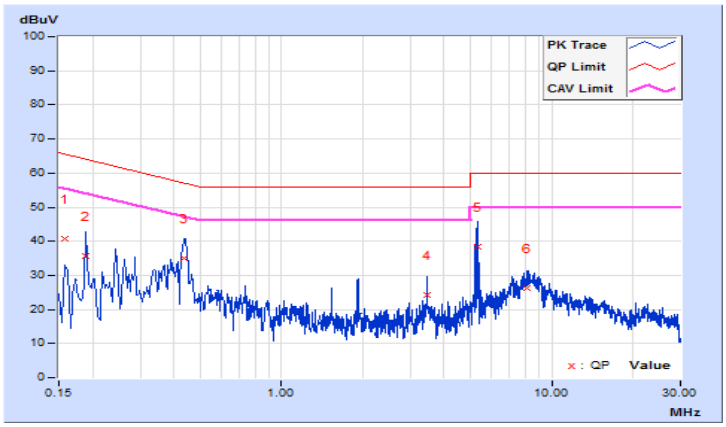


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

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	0.15802	9.82	30.87	9.56	40.69	19.38	65.57	55.57	-24.88	-36.19
2	0.18910	9.84	25.72	6.04	35.56	15.88	64.08	54.08	-28.52	-38.20
3	0.43579	9.87	25.24	8.85	35.11	18.72	57.14	47.14	-22.03	-28.42
4	3.44613	9.98	14.37	5.59	24.35	15.57	56.00	46.00	-31.65	-30.43
5	5.36203	10.04	28.39	20.00	38.43	30.04	60.00	50.00	-21.57	-19.96
6	8.13813	10.11	16.12	0.71	26.23	10.82	60.00	50.00	-33.77	-39.18

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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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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