

FCC Test Report

Report No.: RF190130D01

FCC ID: K7SF7U053

Test Model: F7U053

Received Date: Jan. 22, 2019

Test Date: Jan. 22 ~ 23, 2019

Issued Date: Feb. 21, 2019

Applicant: Belkin International., Inc

Address: 12045 East 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.

**FCC Registration /
Designation Number:** 198487 / TW2021



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Report Issue History Record

Issue No.	Description	Date Issued
RF190130D01	Original release	Feb. 21, 2019

Release Control Record

Issue No.	Description	Date Issued
RF190130D01	Original release	Feb. 21, 2019

1 Certificate of Conformity

Product: BOOST↑UP™ Wireless Charging Vent Mount 10W

Brand: belkin

Test Model: F7U053

Sample Status: Engineering sample

Applicant: Belkin International., Inc

Test Date: Jan. 22 ~ 23, 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 : Annie Chang, **Date:** Feb. 21, 2019
Annie Chang / Senior Specialist

Approved by : Rex Lai, **Date:** Feb. 21, 2019
Rex Lai / Associate Technical 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	Not Applicable	Without AC power port of the EUT
15.215	Channel Bandwidth Measurement		
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -11.39 dB at 56.87 MHz

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.38 dB
	30MHz ~ 1000MHz	5.54 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	BOOST↑UP™ Wireless Charging Vent Mount 10W
Brand	belkin
Test Model	F7U053
Sample Status	Engineering sample
Rating	Input: 12Vdc, 2A, Output: 10W
Modulation Type	FSK
Operating Frequency	111-148kHz
Antenna Type	Coil antenna
Field Strength	85.64dBuV/m
Dimensions	14.52cm ² (diameter = 43mm)
Accessory Device	N/A
Data Cable Supplied	1.2m Non-shielded DC cable attached on EUT
Maximum Power Output from the Charging Coil	10W

Note:

1. The EUT is a BOOST↑UP™ Wireless Charging Vent Mount 10W with Qi charging function.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

The following test frequencies are provided to this EUT:

Operating Frequency (kHz)	Tested Frequency (kHz)	Mode
111-148	127.8	Charging Mode with max Load
111-148	127.8	Charging Mode with iPhone
111-148	146.5	Standby Mode

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE<1G	PLC	CBW	
A	√	Note 1	√	Charging Mode with max Load
B	√	Note 1	√	Charging Mode with iPhone
C	√	Note 1	√	Standby Mode

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

Note:

1. No need to concern of Conducted Emission due to the EUT is powered by battery
2. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

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 (kHz)	Tested Frequency (kHz)
A	111-148	127.8
B	111-148	127.8
C	111-148	146.5

Channel Bandwidth 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 (kHz)	Tested Frequency (kHz)
A	111-148	127.8
B	111-148	127.8
C	111-148	146.5

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE<1G	29 deg. C, 75% RH	12Vdc	Ian Chang
CBW	25 deg. C, 76% RH	12Vdc	Saxon Lee

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.	Load	N/A	N/A	N/A	N/A	Supplied by client (10W max load)
B.	iPhone X	Apple	A1901	NA	BCG-E3175A	Supplied by client
C.	Battery	RKSING	SMF NX120-7L	NA	N/A	Provided by Lab

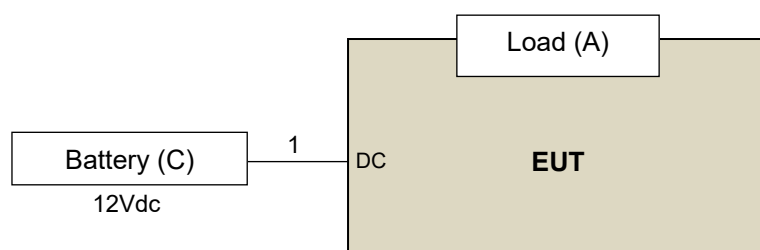
Note: All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC cable	1	1.2	N	0	Supplied by client

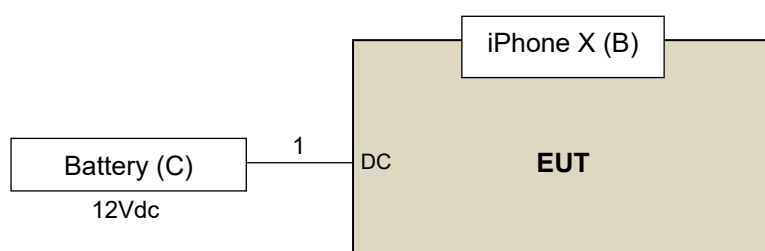
Note: The core(s) is(are) originally attached to the cable(s).

3.3.1 Configuration of System under Test

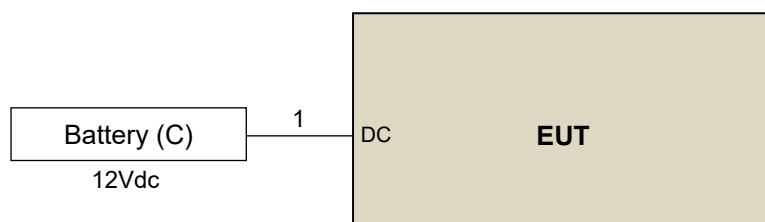
For Mode A:



For Mode B:



For 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.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 21, 2018	Feb. 20, 2019
HP Preamplifier	8449B	3008A01201	Feb. 22, 2018	Feb. 21, 2019
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 21, 2018	Feb. 20, 2019
Agilent TEST RECEIVER	N9038A	MY51210137	Jun. 19, 2018	Jun. 18, 2019
Schwarzbeck Antenna	VULB 9168	139	Nov. 26, 2018	Nov. 25, 2019
Schwarzbeck Antenna	VHBA 9123	480	May 19, 2017	May 18, 2019
Schwarzbeck Horn Antenna	BBHA-9170	212	Nov. 25, 2018	Nov. 24, 2019
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Nov. 25, 2018	Nov. 24, 2019
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF102	Cable-CH6-01	Aug. 13, 2018	Aug. 12, 2019
SUHNER RF cable With 3/4dB PAD	SF102	Cable-CH8-3.6m	Aug. 13, 2018	Aug. 12, 2019
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	Jun. 4, 2018	Jun. 3, 2019
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Aug. 3, 2018	Aug. 2, 2019
Loop Antenna EMCI	LPA600	270	Aug. 11, 2017	Aug. 10, 2019
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 27, 2018	Sep. 26, 2019

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 3. The test was performed in Chamber No. 6.
 4. The Industry Canada Reference No. IC 7450E-6.

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:

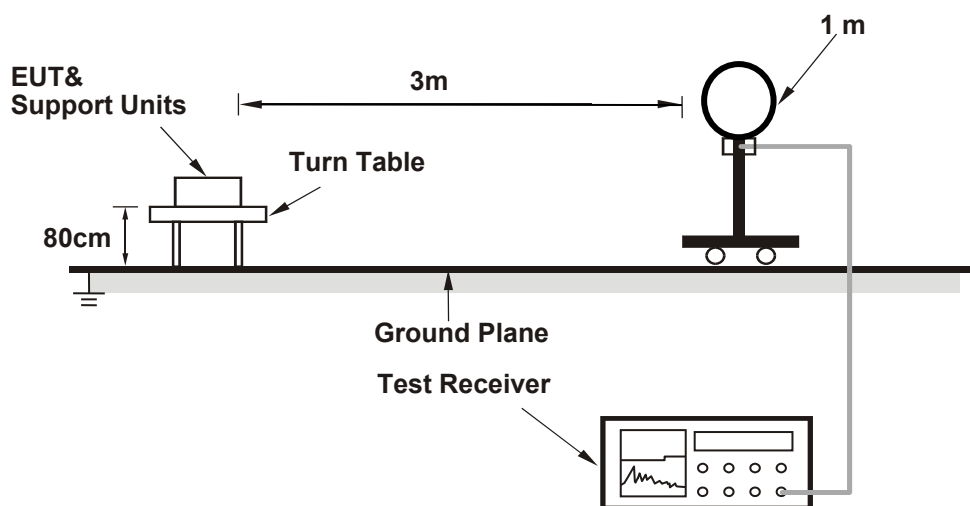
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

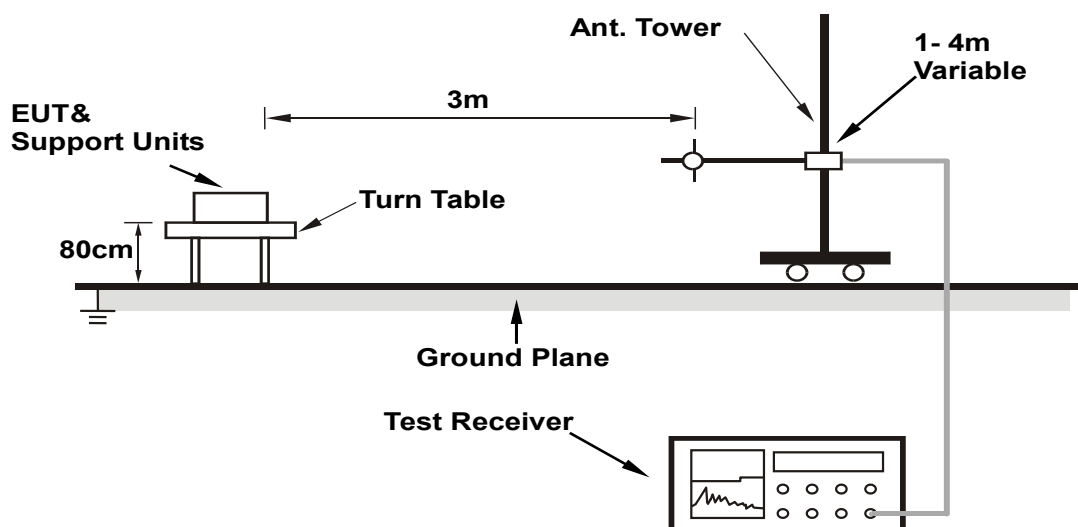
No deviation.

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 Battery.
- Put the Load on the EUT (wireless charging) during the test.

Test Mode B:

- The EUT powered by Battery.
- Put the iPhone X on the EUT (wireless charging) during the test.

Test Mode C:

- The EUT powered Battery.
- Set the EUT under standby condition.

4.1.7 Test Results

Below 30MHz Data:

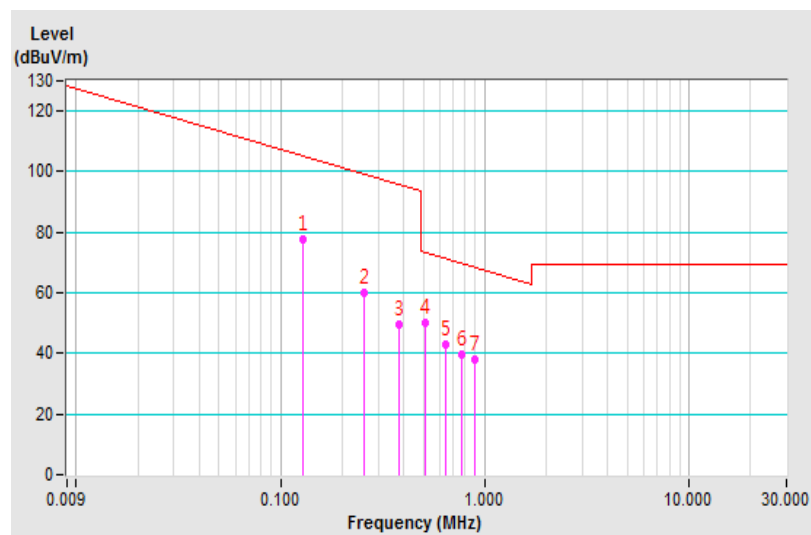
Charging Mode With Load

Test Frequency	127.8kHz	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	*0.1278	77.59 QP	105.47	-27.88	1.00	274	57.90	19.69
2	0.2556	59.84 QP	99.45	-39.61	1.00	175	39.90	19.94
3	0.3834	49.79 QP	95.93	-46.14	1.00	356	29.68	20.11
4	0.5112	49.93 QP	73.43	-23.50	1.00	297	29.71	20.22
5	0.6390	43.19 QP	71.49	-28.30	1.00	247	23.02	20.17
6	0.7668	39.47 QP	69.91	-30.44	1.00	194	19.34	20.13
7	0.8946	38.04 QP	68.57	-30.53	1.00	124	17.95	20.09

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

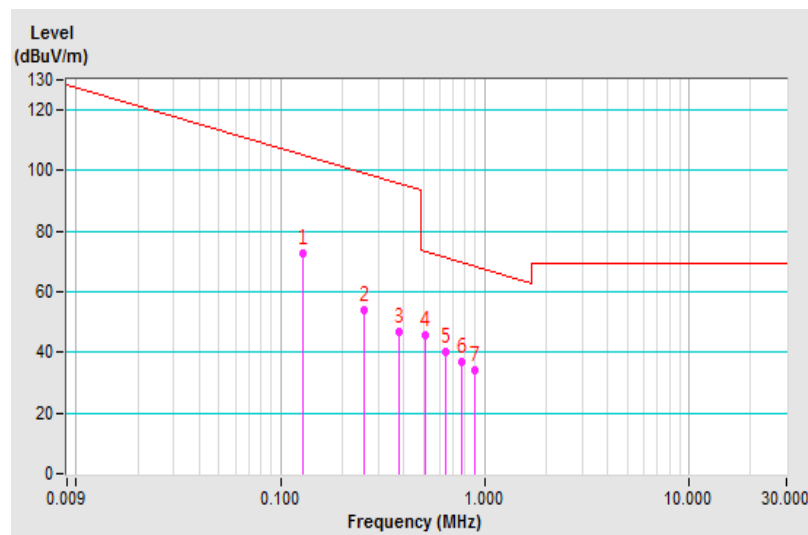


Test Frequency	127.8kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

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	*0.1278	72.70 QP	105.47	-32.77	1.00	113	53.01	19.69
2	0.2556	54.18 QP	99.45	-45.27	1.00	119	34.24	19.94
3	0.3834	46.90 QP	95.93	-49.03	1.00	11	26.79	20.11
4	0.5112	45.78 QP	73.43	-27.65	1.00	0	25.56	20.22
5	0.6390	40.21 QP	71.49	-31.28	1.00	0	20.04	20.17
6	0.7668	37.12 QP	69.91	-32.79	1.00	0	16.99	20.13
7	0.8946	34.04 QP	68.57	-34.53	1.00	0	13.95	20.09

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

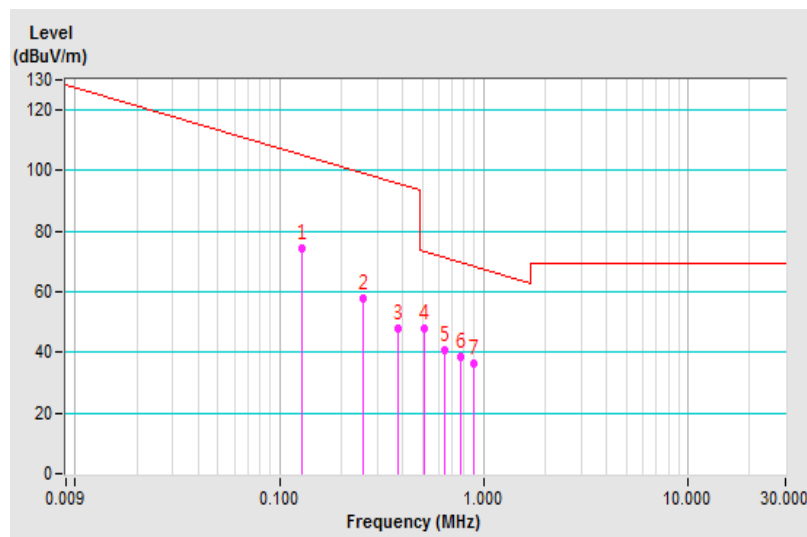


Test Frequency	127.8kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

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	74.55 QP	105.47	-30.92	1.00	356	54.86	19.69
2	0.2556	57.81 QP	99.45	-41.64	1.00	98	37.87	19.94
3	0.3834	48.15 QP	95.93	-47.78	1.00	155	28.04	20.11
4	0.5112	47.66 QP	73.43	-25.77	1.00	189	27.44	20.22
5	0.6390	40.77 QP	71.49	-30.72	1.00	243	20.60	20.17
6	0.7668	38.29 QP	69.91	-31.62	1.00	275	18.16	20.13
7	0.8946	36.31 QP	68.57	-32.26	1.00	327	16.22	20.09

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



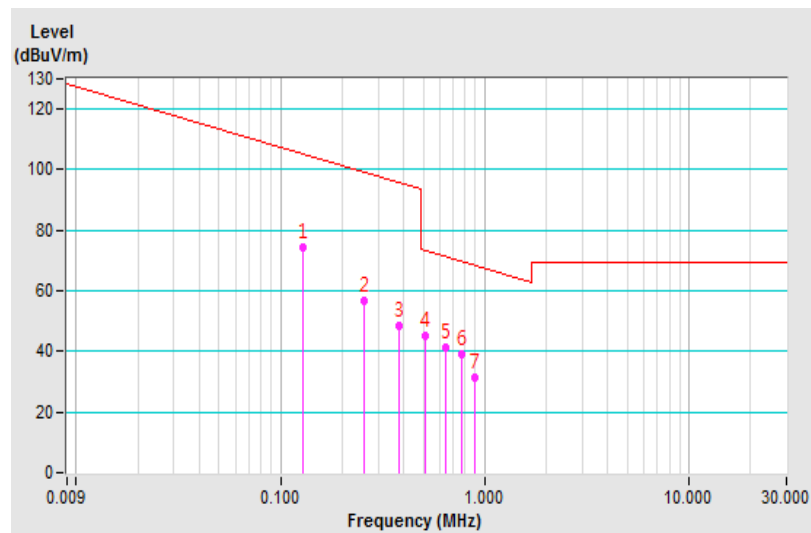
Charging Mode With iPhone

Test Frequency	127.8kHz	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	*0.1278	74.41 QP	105.47	-31.06	1.00	271	54.72	19.69
2	0.2556	56.91 QP	99.45	-42.54	1.00	100	36.97	19.94
3	0.3834	48.38 QP	95.93	-47.55	1.00	132	28.27	20.11
4	0.5112	44.99 QP	73.43	-28.44	1.00	164	24.77	20.22
5	0.6390	41.12 QP	71.49	-30.37	1.00	202	20.95	20.17
6	0.7668	39.11 QP	69.91	-30.80	1.00	253	18.98	20.13
7	0.8946	31.32 QP	68.57	-37.25	1.00	360	11.23	20.09

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

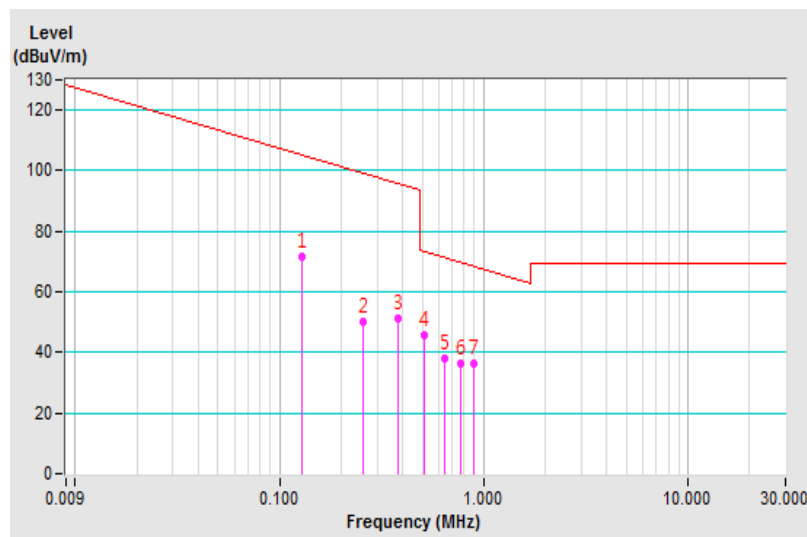


Test Frequency	127.8kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

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	*0.1278	71.59 QP	105.47	-33.88	1.00	152	51.90	19.69
2	0.2556	50.08 QP	99.45	-49.37	1.00	10	30.14	19.94
3	0.3834	51.36 QP	95.93	-44.57	1.00	162	31.25	20.11
4	0.5112	45.45 QP	73.43	-27.98	1.00	88	25.23	20.22
5	0.6390	37.98 QP	71.49	-33.51	1.00	164	17.81	20.17
6	0.7668	36.55 QP	69.91	-33.36	1.00	128	16.42	20.13
7	0.8946	36.18 QP	68.57	-32.39	1.00	177	16.09	20.09

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

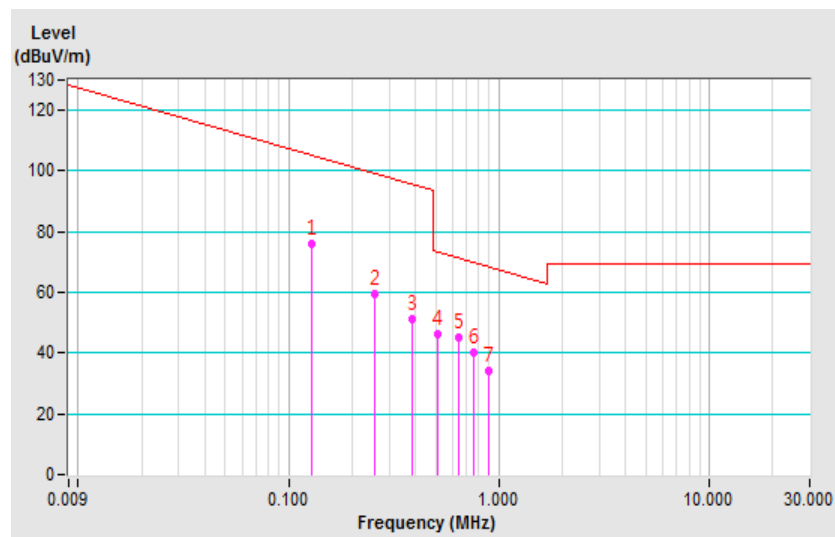


Test Frequency	127.8kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

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	76.12 QP	105.47	-29.35	1.00	360	56.43	19.69
2	0.2556	59.64 QP	99.45	-39.81	1.00	152	39.70	19.94
3	0.3841	51.40 QP	95.92	-44.52	1.00	22	31.29	20.11
4	0.5091	46.10 QP	73.47	-27.37	1.00	222	25.88	20.22
5	0.6391	44.92 QP	71.49	-26.57	1.00	276	24.75	20.17
6	0.7641	40.41 QP	69.94	-29.53	1.00	349	20.28	20.13
7	0.8946	34.01 QP	68.57	-34.56	1.00	292	13.92	20.09

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



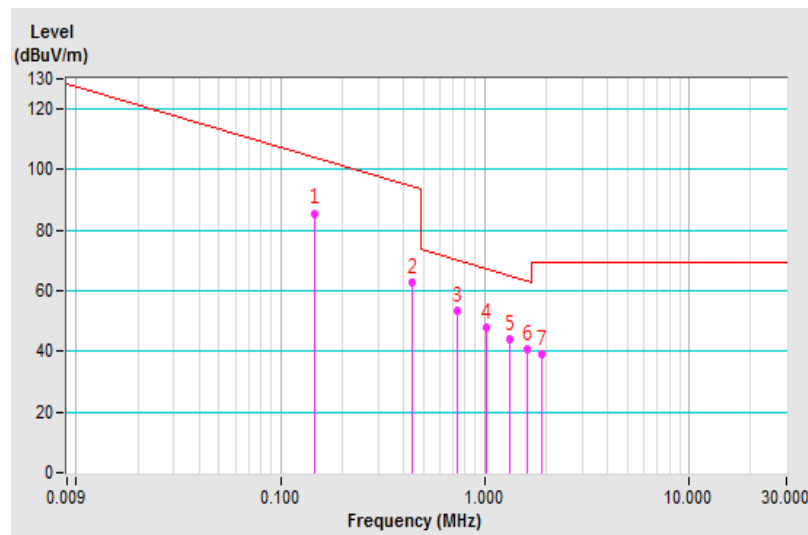
Standby Mode

Test Frequency	146.5kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	C		

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	*0.1465	85.64 QP	104.29	-18.65	1.00	360	65.91	19.73
2	0.4395	62.65 QP	94.74	-32.09	1.00	360	42.49	20.16
3	0.7325	53.56 QP	70.31	-16.75	1.00	360	33.42	20.14
4	1.0255	48.04 QP	67.39	-19.35	1.00	360	28.00	20.04
5	1.3185	44.18 QP	65.20	-21.02	1.00	325	24.22	19.96
6	1.6115	40.66 QP	63.46	-22.80	1.00	302	20.78	19.88
7	1.9045	39.28 QP	69.54	-30.26	1.00	278	19.47	19.81

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

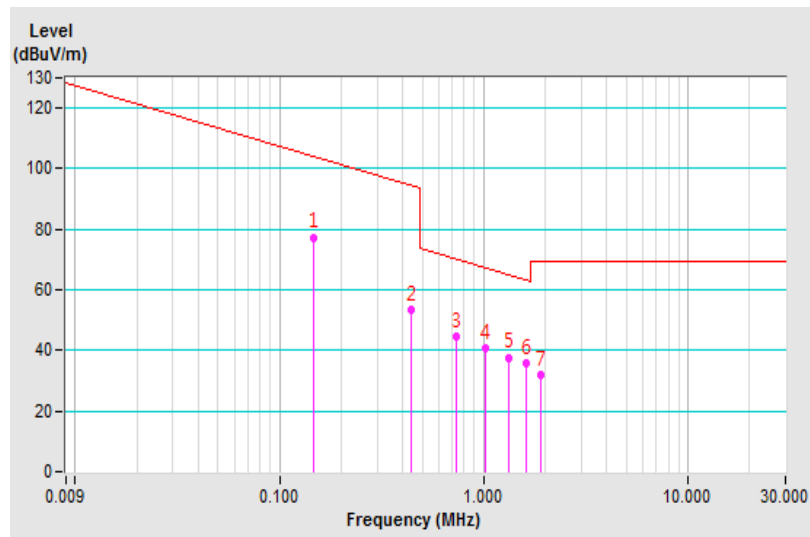


Test Frequency	146.5kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	C		

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	*0.1465	77.39 QP	104.29	-26.90	1.00	104	57.66	19.73
2	0.4395	53.48 QP	94.74	-41.26	1.00	176	33.32	20.16
3	0.7325	44.72 QP	70.31	-25.59	1.00	206	24.58	20.14
4	1.0255	40.99 QP	67.39	-26.40	1.00	229	20.95	20.04
5	1.3185	37.71 QP	65.20	-27.49	1.00	249	17.75	19.96
6	1.6115	35.63 QP	63.46	-27.83	1.00	276	15.75	19.88
7	1.9045	31.96 QP	69.54	-37.58	1.00	319	12.15	19.81

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

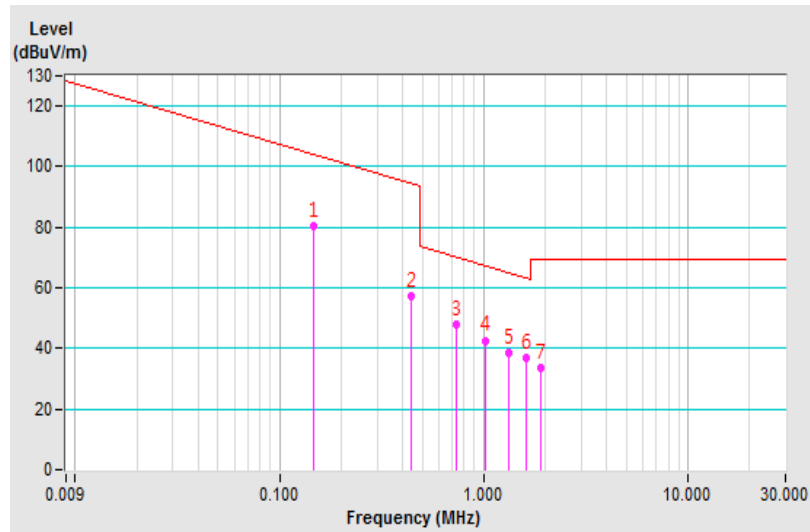


Test Frequency	146.5kHz	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	C		

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	*0.1465	80.51 QP	104.29	-23.78	1.00	158	60.78	19.73
2	0.4395	57.05 QP	94.74	-37.69	1.00	271	36.89	20.16
3	0.7325	48.08 QP	70.31	-22.23	1.00	242	27.94	20.14
4	1.0255	42.66 QP	67.39	-24.73	1.00	221	22.62	20.04
5	1.3185	38.47 QP	65.20	-26.73	1.00	195	18.51	19.96
6	1.6115	36.97 QP	63.46	-26.49	1.00	171	17.09	19.88
7	1.9045	33.78 QP	69.54	-35.76	1.00	141	13.97	19.81

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:

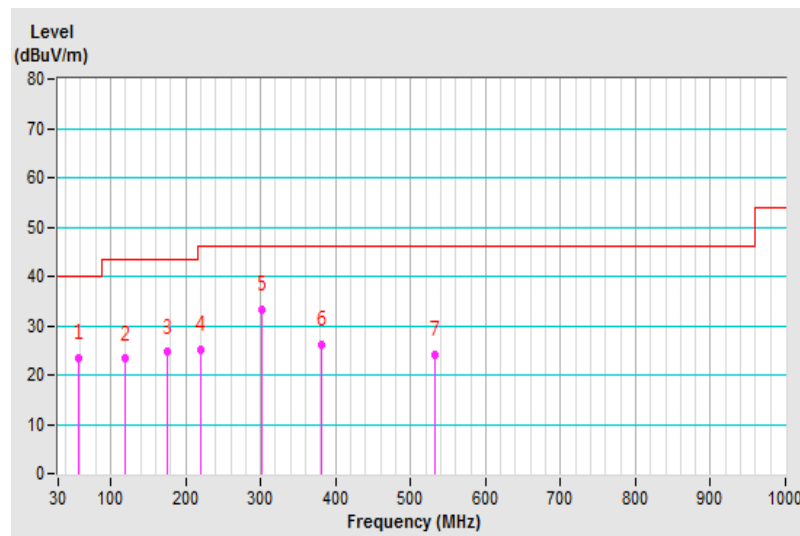
Charging Mode With Load

Test Frequency	127.8kHz	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 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	57.89	23.45 QP	40.00	-16.55	1.88 H	152	31.23	-7.78
2	120.02	23.28 QP	43.50	-20.22	1.46 H	89	32.58	-9.30
3	176.03	24.61 QP	43.50	-18.89	1.58 H	126	32.51	-7.90
4	219.44	25.16 QP	46.00	-20.84	2.08 H	279	34.04	-8.88
5	301.07	33.35 QP	46.00	-12.65	2.15 H	208	38.62	-5.27
6	381.96	26.09 QP	46.00	-19.91	2.61 H	130	29.91	-3.82
7	531.64	23.99 QP	46.00	-22.01	1.00 H	360	24.88	-0.89

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

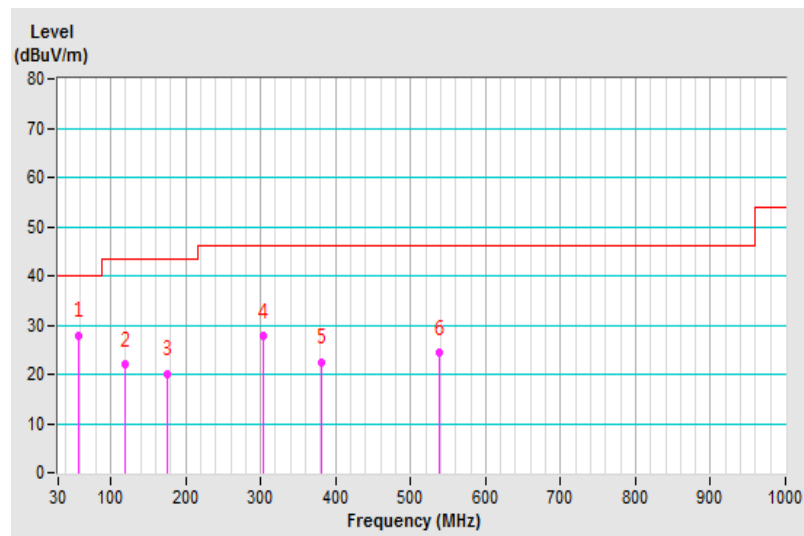


Test Frequency	127.8kHz	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A		

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	57.89	27.74 QP	40.00	-12.26	1.78 V	95	35.52	-7.78
2	120.02	21.87 QP	43.50	-21.63	1.24 V	61	31.17	-9.30
3	176.13	20.07 QP	43.50	-23.43	1.54 V	360	27.99	-7.92
4	302.86	27.64 QP	46.00	-18.36	1.80 V	206	32.85	-5.21
5	382.06	22.50 QP	46.00	-23.50	2.32 V	157	26.31	-3.81
6	537.65	24.26 QP	46.00	-21.74	1.68 V	18	25.13	-0.87

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



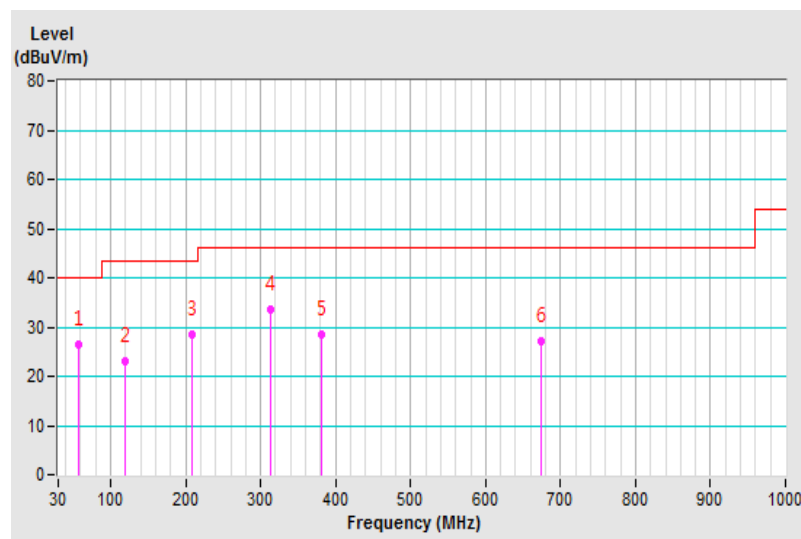
Charging Mode With iPhone

Test Frequency	127.8kHz	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 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	57.26	26.51 QP	40.00	-13.49	1.52 H	176	34.29	-7.78
2	120.02	22.98 QP	43.50	-20.52	1.14 H	62	32.28	-9.30
3	209.35	28.52 QP	43.50	-14.98	1.34 H	109	37.56	-9.04
4	312.61	33.56 QP	46.00	-12.44	1.85 H	198	38.45	-4.89
5	380.36	28.53 QP	46.00	-17.47	1.27 H	138	32.38	-3.85
6	673.60	27.14 QP	46.00	-18.86	1.88 H	42	25.22	1.92

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

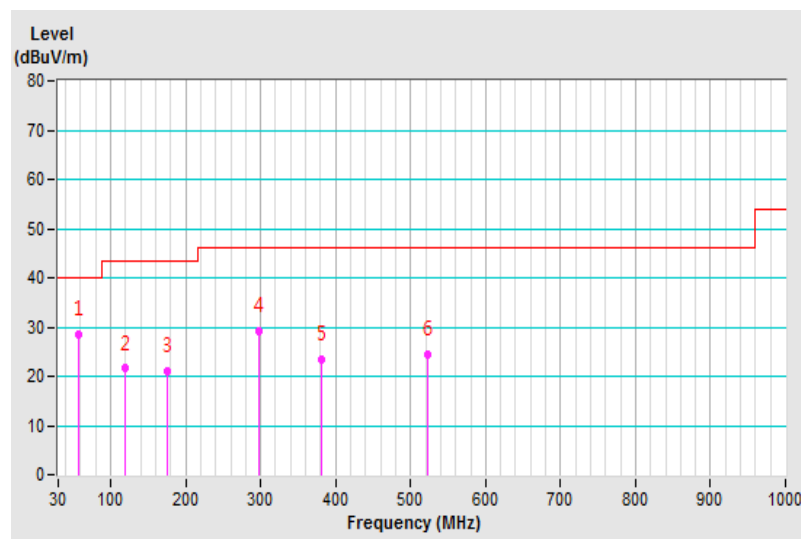


Test Frequency	127.8kHz	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	B		

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	56.87	28.61 QP	40.00	-11.39	1.37 V	86	36.37	-7.76
2	120.02	21.58 QP	43.50	-21.92	1.52 V	146	30.88	-9.30
3	175.99	21.04 QP	43.50	-22.46	1.85 V	352	28.94	-7.90
4	298.01	29.24 QP	46.00	-16.76	1.69 V	191	34.60	-5.36
5	380.70	23.51 QP	46.00	-22.49	1.72 V	176	27.35	-3.84
6	522.57	24.43 QP	46.00	-21.57	1.44 V	218	25.48	-1.05

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



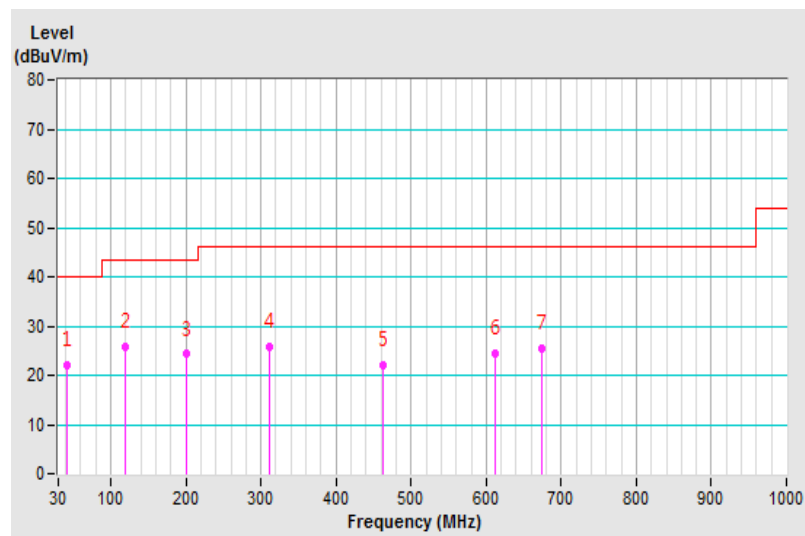
Standby Mode

Test Frequency	146.5kHz	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 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	41.20	21.95 QP	40.00	-18.05	3.21 H	360	29.70	-7.75
2	120.02	25.85 QP	43.50	-17.65	2.15 H	70	35.15	-9.30
3	199.99	24.29 QP	43.50	-19.21	1.64 H	120	33.57	-9.28
4	312.08	25.80 QP	46.00	-20.20	1.84 H	216	30.71	-4.91
5	462.28	22.02 QP	46.00	-23.98	1.75 H	167	24.10	-2.08
6	611.18	24.54 QP	46.00	-21.46	1.25 H	360	23.56	0.98
7	674.37	25.57 QP	46.00	-20.43	1.00 H	332	23.63	1.94

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

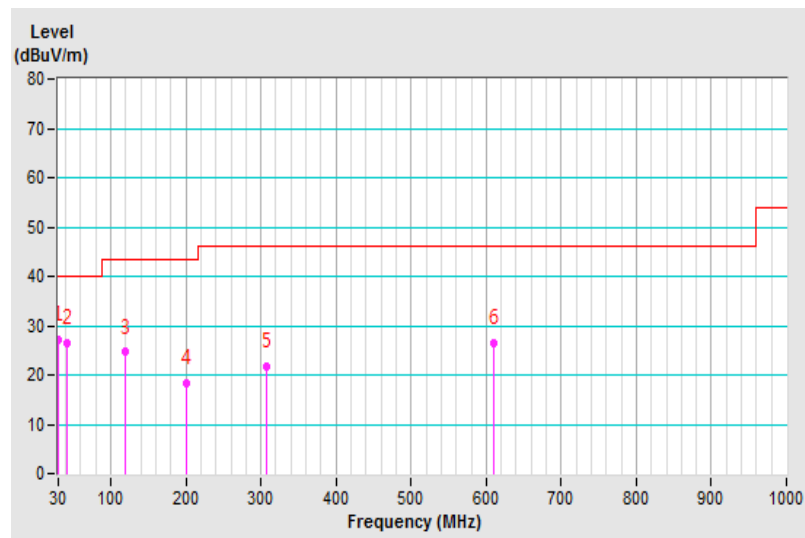


Test Frequency	146.5kHz	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	C		

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	30.58	27.14 QP	40.00	-12.86	1.23 V	360	36.22	-9.08
2	40.72	26.51 QP	40.00	-13.49	1.45 V	277	34.36	-7.85
3	120.02	24.59 QP	43.50	-18.91	1.62 V	360	33.89	-9.30
4	199.99	18.34 QP	43.50	-25.16	1.85 V	0	27.62	-9.28
5	306.50	21.81 QP	46.00	-24.19	1.22 V	195	26.89	-5.08
6	609.91	26.38 QP	46.00	-19.62	1.84 V	162	25.44	0.94

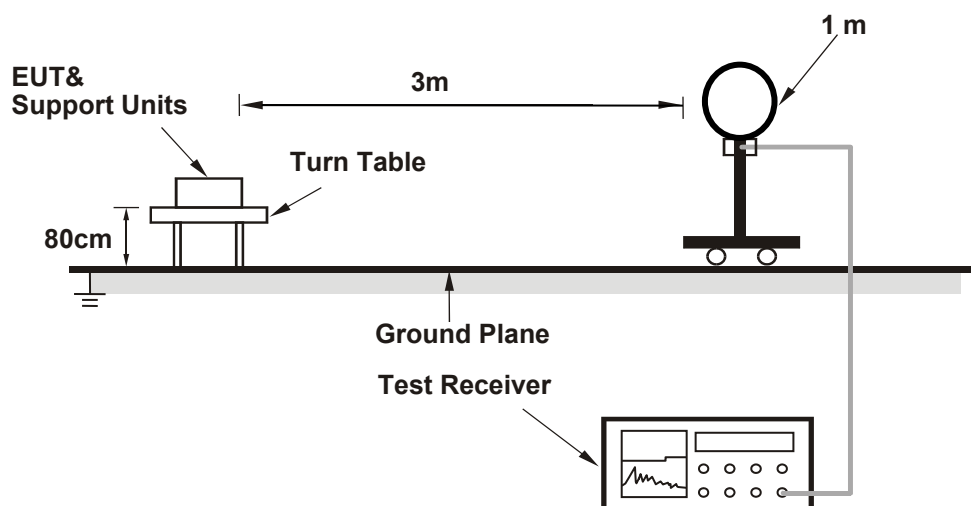
Remarks:

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 Channel Bandwidth

4.2.1 Test SetUp



4.2.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.3 Test Procedure

- 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.
- 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.
- The test-receiver system was set to Quasi-peak detect function and specified bandwidth.

4.2.4 Deviation from Test Standard

No deviation.

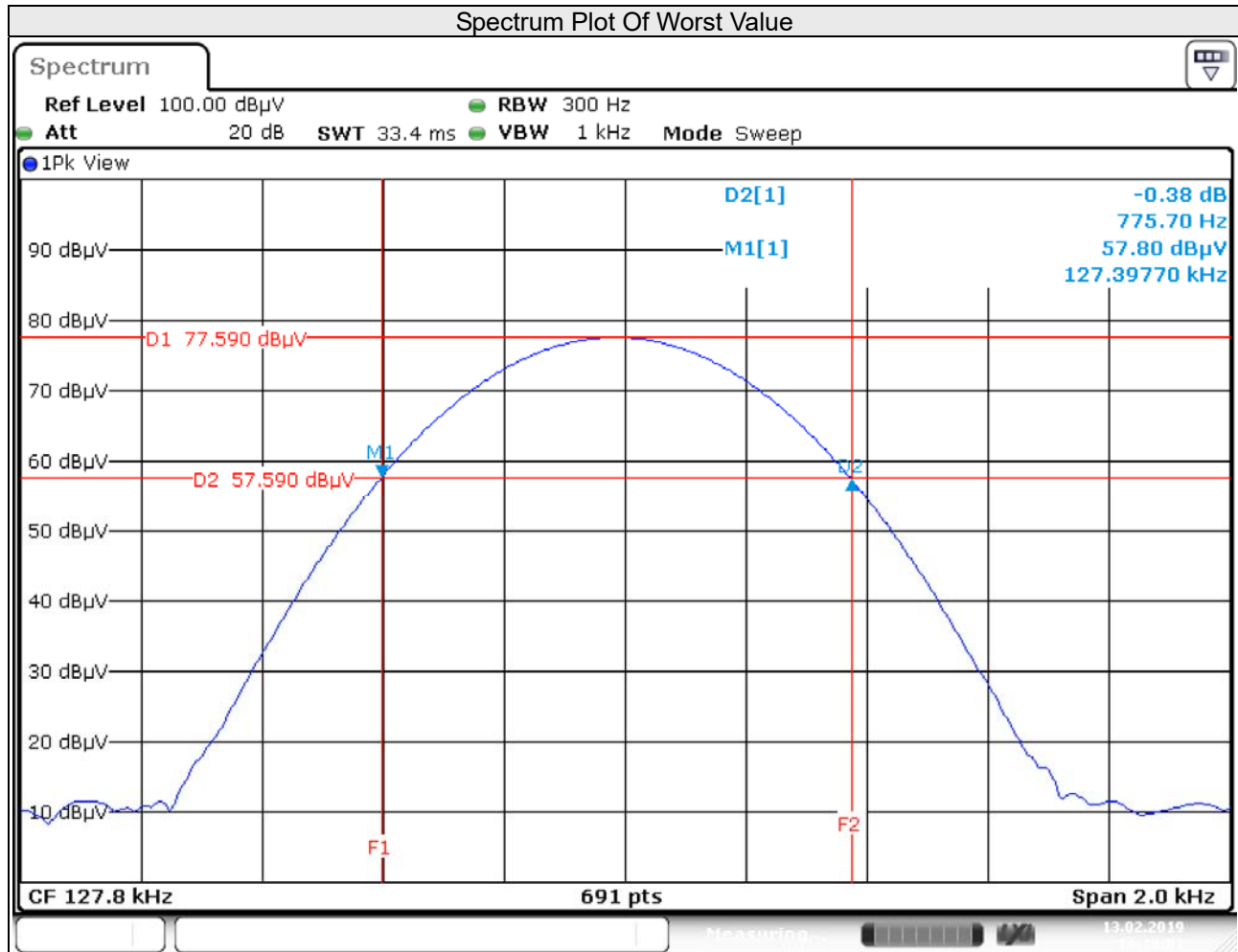
4.2.5 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously.

4.2.6 Test Results

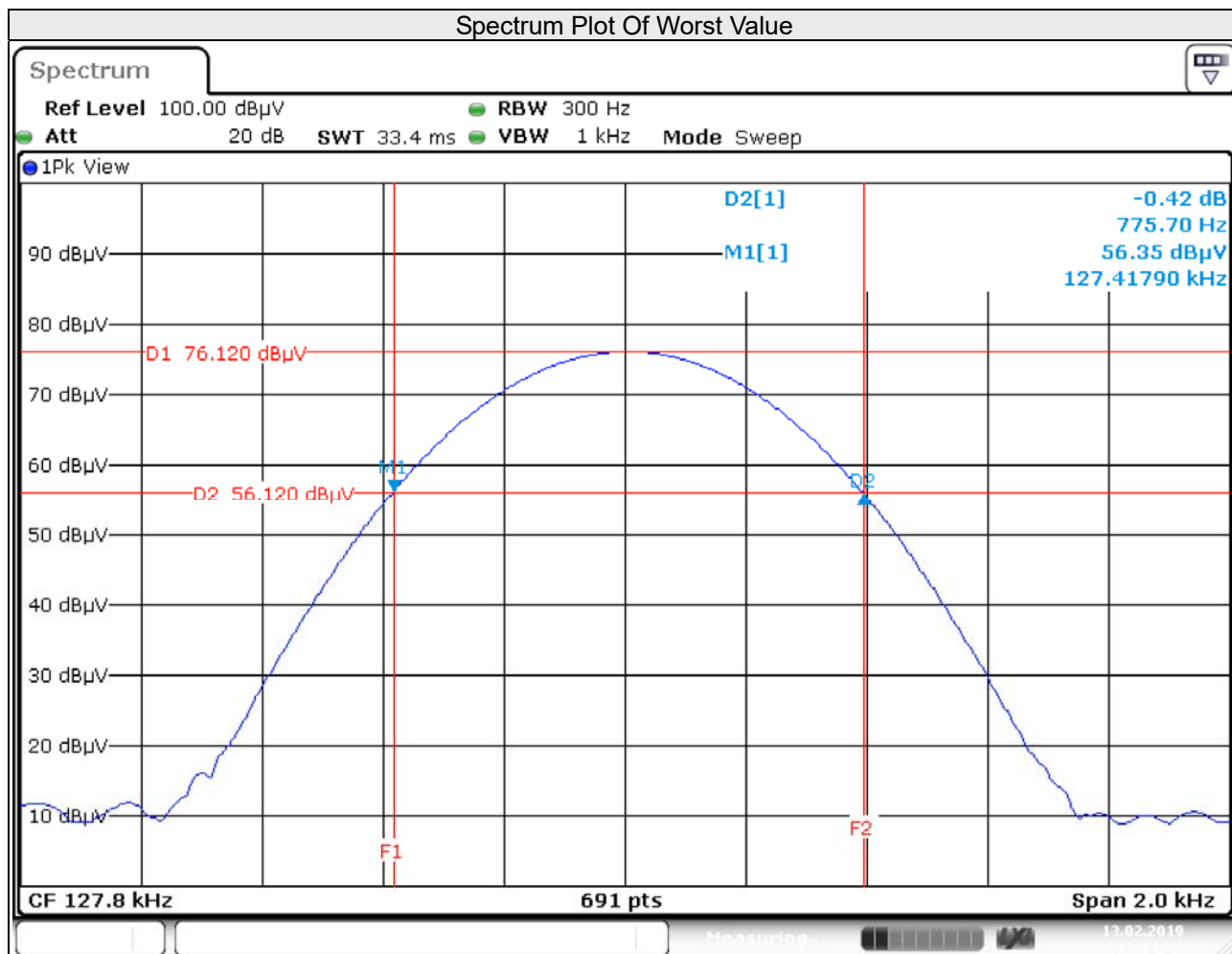
Mode A:

Frequency (kHz)	20dB Bandwidth (kHz)
127.8kHz	0.7757



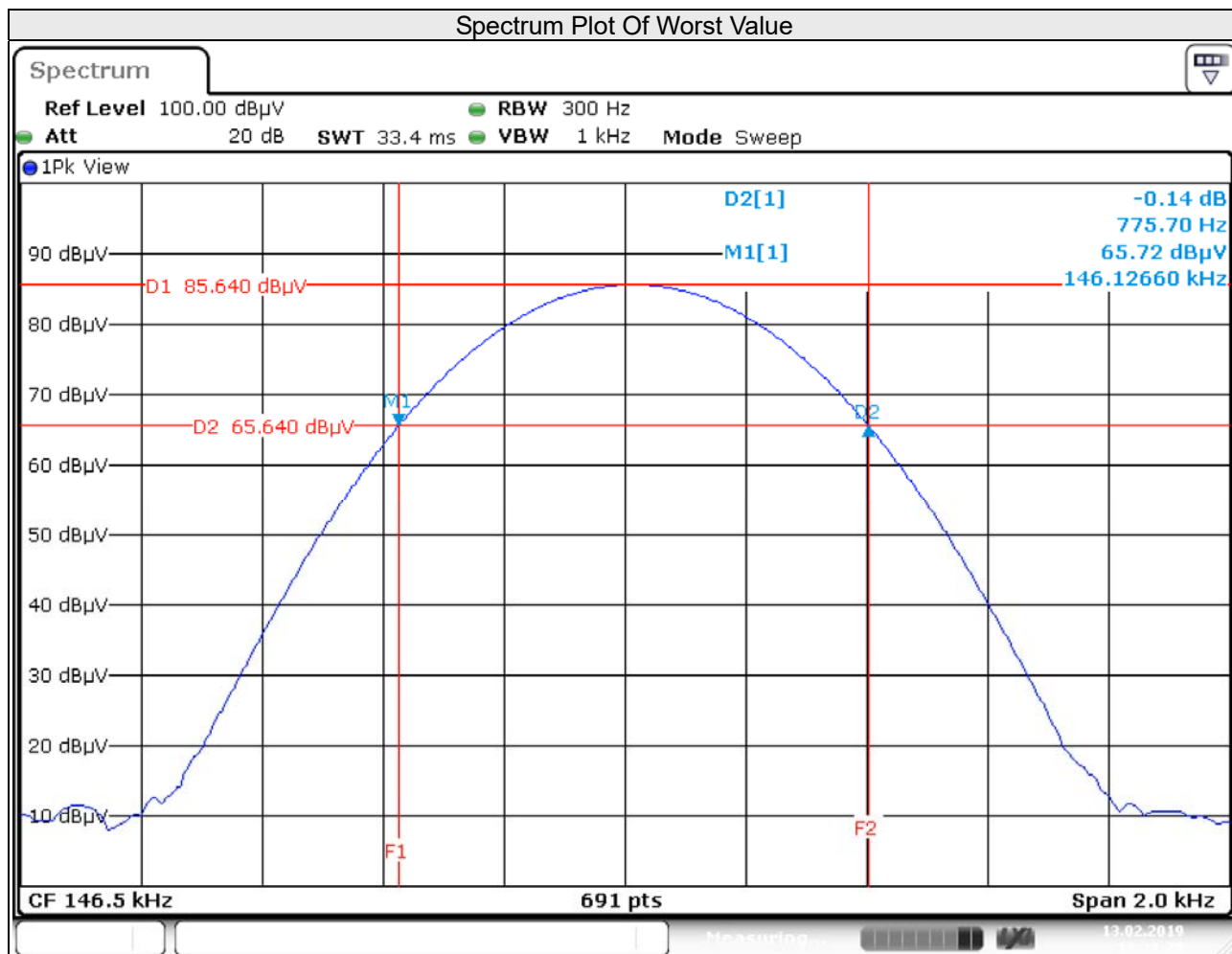
Mode B:

Frequency (kHz)	20dB Bandwidth (kHz)
127.8kHz	0.7757



Mode C:

Frequency (kHz)	20dB Bandwidth (kHz)
146.5	0.7757



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:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

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Email: service.adt@tw.bureauveritas.com

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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