TEST REPORT

1. Applicant		
Name	:	Shinan Information Communication
Address	:	7-3, Dangsan-ro 148beon-gil, Gunpo-si, Gyeonggi-do, Korea
FCC ID	:	2AG84DOTWACBTX16001
2. Products		
Name	:	Wireless charging battery pack
Model No.	:	DOTWACBTX16001
Variant Model No.	:	N/A
Manufacturer		Shinan Information Communication
Address	:	7-3, Dangsan-ro 148beon-gil, Gunpo-si, Gyeonggi-do, Korea
3. Test Standard	:	CFR 47 FCC PART 15 SUBPART C section 15.207 CFR 47 FCC PART 15 SUBPART C section 15.209
4. Test Result	:	PASS
5. Dates of Test	:	March 01, 2017 to March 10, 2017
6. Date of Issue	:	March 14, 2017
7. Test Laboratory	:	Standard Engineering Co. Ltd. FCC Designation Number : 624439

Tested by	Approved by
SoonHo, Kim / Test Engineer	SeongSeok, Seo / Compliance Engineer

This report may not be reproduced without the full written consent of Standard Engineering Laboratory.

Standard Engineering Co. Ltd.
377-11, Sinjang-ri, Eumam-myeon, Seosan-si, ChoongNam 356-844, South Korea
Tel.: +82-41-663-9436, Fax :+82-41-663-9434
www.stdeng.com

1. Test Summary

ELECTROMAGNETIC INTERFERENCE (EMI)			
Test	**Test Requirement**	**Test method**	**Result**
Radiated Emission (9 kHz to30MHz)	47 CFR Part 15, Subpart C Section 15.209	ANSI C 63.10-2013: Clause 6.4	PASS
Radiated Emission (30MHz to 1GHz)	47 CFR Part 15, Subpart C Section 15.209	ANSI C 63.10-2013: Clause 6.4	PASS
Conducted Emission (150 KHz to 30 MHz)	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10-2013: Clause 6.2	PASS

Remark:

EUT: In this whole report EUT means Equipment Under Test.

N/A: not applicable. Refer to the relative section for the details.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radio Frequency.

2. TABLE OF CONTENTS

1. Test Summary....2

2. Table of Contents....3

3. General Information....4
3.1 Client Information....4
3.2 General Description of E.U.T....4
3.3 Details of E.U.T....4
3.4 Description of Support Units....4
3.5 Abnormalities from Standard Conditions....4
3.6 Other Information Requested by the Customer....4
3.7 Test Location....4

4. Equipment Used during Test....5

5. Emission Test Results....6
5.1 Radiated Emissions....6
5.1.1. Field Strength of Fundamental Test Result....9
5.1.2 Spurious Emission: below 30 MHz....10
5.1.3 Spurious Emission: above 30 MHz....12
5.2 20 dB Bandwidth....20
5.2.1 Test Setup....20
5.2.2 Test Procedure....20
5.2.3 Test Result....20
5.3 Conducted Emissions at Mains Terminals 150 kHz to 30 MHz....23
5.3.1 Measurement Data....25

** APPENDIX....33

3. General Information

3.1. Client Information

Applicant	:	Shinan Information Communication
Address of Applicant	:	7-3, Dangsan-ro 148beon-gil, Gunpo-si, Gyeonggi-do, Korea
Manufacturer	:	Shinan Information Communication
Address of Manufacturer	:	7-3, Dangsan-ro 148beon-gil, Gunpo-si, Gyeonggi-do, Korea

3.2. General Description of E.U.T.

Product Name	:	Wireless charging battery pack
Model No.	:	DOTWACBTX16001
Product Description	:	Low Power Transmitter

3.3. Details of E.U.T.

Power Supply	:	DC 5.1V (supplied by adaptor)
Test Voltage	:	Input: DC 5.1V, 2.1A Wireless Output: DC 5V, 1A USB Output : DC 5V, 2A

3.4. Description of Support Units

The EUT has been tested with simulate receiver, resistor and adapter provided by applicant.

Adapter details Model : A1357 W010A051
Input : AC 100-240 50/60 Hz 0.15A
Wireless Output: DC 5V, 1A
USB Output : DC 5V, 2A

3.5. Abnormalities from Standard Conditions

None.

3.6. Other Information Requested by the Customer

None.

3.7. Test Location

377-11, Sinjang-ri, Eumam-myeon, Seosan-si, ChoongNam 356-844, South Korea (FCC Designation Number : 624439)

This test site is in compliance with ISO/IEC 17025 for general requirements for the competence of testing and calibration laboratories.

4. Equipment Used during Test

No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (MM-DD-YY)	Next Cal. Data (MM-DD-YY)
1	EMI Test Receiver	LIG	ER-265	L1009B016	03/02/2017	03/02/2018
2	EMI Test Receiver	Rhode & Schwarz	ESIB7	3311	09/02/2016	09/02/2017
3	Bi-log Antenna	Schwarzbeck	VULB9163	164	09/22/2016	09/22/2017
4	Loop Antenna	EMCO	6502	9206-2769	01/28/2016	01/28/2018
5	Spectrum Analyzer	Agilent	E4440A	US45303130	01/24/2017	01/24/2018
6	Power Meter	Agilent	E4418B	MY405111655	01/23/2017	01/23/2018
7	Power Sensor	HP	8485A	2347A02746	01/23/2017	01/23/2018
8	Signal Generator	HP	83630A	3420A00728	01/24/2017	01/24/2018
9	Pre Amplifier	Agilent	8449B	3008A02105	01/24/2017	01/24/2018
10	Signal Generator	Rhode & Schwarz	SML03	102330	01/23/2017	01/23/2018
11	POWER DIVIDER	Agilent	11636B	50309	01/23/2017	01/23/2018
12	Power Sensor	Agilent	8482B	3318A05111	01/23/2017	01/23/2018
13	DC Power Supply	HP	6032A	US35420383	01/23/2017	01/23/2018
14	Bandreject Filter	K&L Microwave	50140	555	01/23/2017	01/23/2018
15	Horn Antenna	SCHWARZBECK	BBHA9120A	346	02/05/2016	02/05/2018
16	DC Power Supply	Provice	PWS-5005D	205051	01/23/2017	01/23/2018
17	LISN	Rhode & Schwarz	ESH2-Z5	100204	11/10/2016	11/10/2017
18	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100137	11/10/2016	11/10/2017
19	DIGITAL MULTIMETER	DONG HWA	DM-1010	A323665	01/23/2017	01/23/2018
20	Electric Field Probe	Narda	EP-601	401WX00129	12/15/2016	12/15/2017

5. Emission Test Results

5.1. Radiated Emissions

Standard requirement: 47 CFR Part 15C Section 15.209

Test Requirement: FCC Part15 C

Test Method: ANSI C63.10:2013

Frequency Range: 9 kHz to 1GHz

Measurement Distance: 3 m

Detector: peak and average for pre-scan

Class / Limit:

Frequency (MHz)	Field strength (microvolt/meter)	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	300
0.490MHz-1.705MHz	24000/F(kHz)	30
1.705MHz-30MHz	30	30
30MHz-88MHz	100	3
88MHz-216MHz	150	3
216MHz-960MHz	200	3
960MHz-1GHz	500	3
Above 1GHz	500	3

Correction factor used due to measurement distance of 3m:

Frequency (MHz)	Field strength (dBuV/m)	Measurement distance (m)
0.009MHz-0.490MHz	67.6-20log(f)(kHz)+40	3
0.490MHz-1.705MHz	87.6-20log(f)(kHz)+20	3
1.705MHz-30MHz	49.5	3
30MHz-88MHz	40.0	3
88MHz-216MHz	43.5	3
216MHz-960MHz	46.0	3
960MHz-1GHz	54.0	3
Above 1GHz	54.0	3

Radiated Emissions

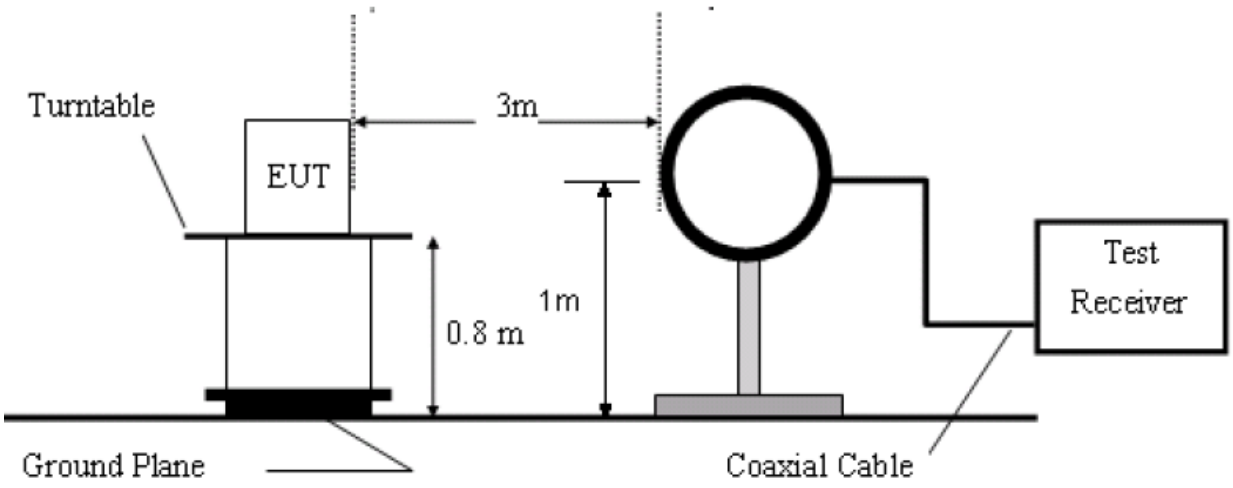
Operating Environment:

Temperature: 15.9 °C Humidity: 41 %RH Atmospheric Pressure: 1105 mbar

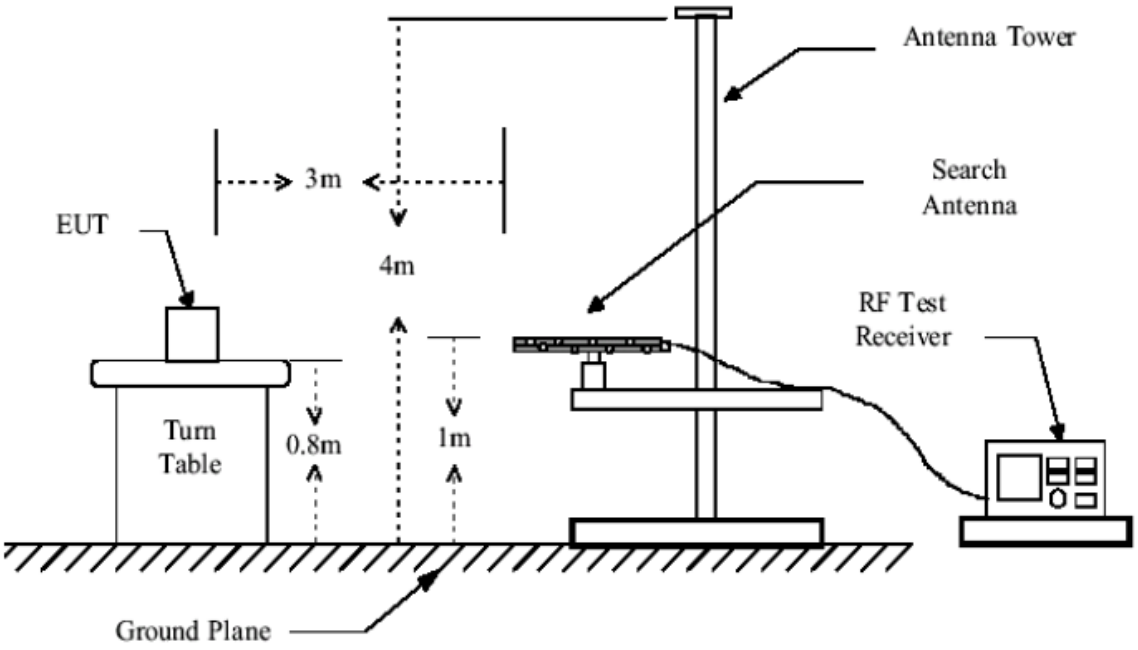
EUT Operation: Test the EUT in operating mode

Test Configuration:

1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



Test Procedure:

1) 9 kHz to 30 MHz emissions:

For testing performed with the loop antenna. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specied distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2) 30 MHz to 1 GHz emissions:

For testing perfomed with the bi-log type antenna. The measurement is performed with the EUT rotated 360°, the antenna height scaned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

Detector Peak for pre-scan

Test Receiver test setup	Detector		
	9 kHz-150 kHz	150 kHz-30 MHz	30 MHz-1000 MHz
RBW	200Hz	9 kHz	120 kHz
VBW	≥ RBW	≥ RBW	≥ RBW
Sweep	auto	auto	auto
Detector function	QP	QP	QP
Trace	max hold	max hold	max hold

5.1.1 Field Strength of Fundamental Test Result

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical. The field strength of spurious emission was measured in all orthogonal EUT position and worst orthogonal position was x-axis.

Frequency (MHz)	Reading (dBuV/m)	Correct (dB)	Actual (dBμV/m) at 3 m	Actual (dBμV/m) at 300 m	FCC Limit		Det. Mode
					Limit (dBμV/m) at 300 m	Margin (dB)	
Charging with max load mode							
0.111	40.39	10.86	51.25	-28.75	25	53.74	AV
0.120	47.21	10.85	58.06	-21.94	25	46.94	AV
0.147	42.90	10.82	53.72	-26.28	25	51.28	AV
0.205	41.41	10.77	52.18	-27.82	25	52.82	AV
Charging with mid load mode							
0.111	41.15	10.86	52.01	-27.99	25	52.97	AV
0.120	46.54	10.85	57.39	-22.61	25	47.61	AV
0.147	42.11	10.82	52.93	-27.07	25	52.07	AV
0.205	42.56	10.77	53.33	-26.67	25	51.67	AV
Charging with min load mode							
0.111	41.76	10.86	52.62	-27.37	25	52.36	AV
0.120	46.25	10.85	57.1	-22.9	25	47.9	AV
0.147	43.19	10.82	54.01	-25.99	25	50.99	AV
0.205	40.54	10.77	51.31	-28.69	25	53.69	AV

Note;

1. According to §15.31 (f)(2) 300 m Result(dBμV/m) = 3 m Result(dBμV/m) – 40log(300/3) (dBμV/m).
2. According to §15.209 (d), the measurements were tested by using Quasi peak detector except for the frequency bands 9 – 90 ㎑, 110 – 490 ㎑and above 1 ㎓in these three bands on measurements employing an average detector.
3. The limit above was calculated based on table of §15.209 (a).

5.1.2 Spurious Emission: below 30 MHz

Frequency (MHz)	Reading (dBuV/m)	Correct (dB)	Actual (dBμV/m) at 3 m	Actual (dBμV/m)	FCC Limit		Det. Mode
					Limit (dBμV/m)	Margin (dB)	
Charging with max load mode							
0.75	31.22	10.67	41.89	-8.78	30.10	39.73	QP
4.43	21.65	10.59	32.24	-18.35	30	48.35	QP
5.60	12.36	10.65	23.01	-27.64	30	57.64	QP
10.31	12.59	10.63	23.22	-27.41	30	57.41	QP
25.61	13.57	8.16	21.73	-26.43	30	56.43	QP
Charging with mid load mode							
0.68	31.12	10.66	59.04	-8.88	30.95	39.83	QP
4.28	21.65	10.63	41.78	-18.35	30	48.35	QP
5.60	12.24	10.65	32.28	-27.76	30	57.76	QP
10.52	13.45	10.55	22.89	-26.55	30	56.55	QP
25.25	13.12	8.16	24	-26.88	30	56.88	QP
Charging with min load mode							
0.75	31.22	10.67	41.89	-8.78	30.103	38.88	QP
4.55	12.36	10.63	22.99	-27.64	30	57.64	QP
5.50	12.24	10.65	22.89	-27.76	30	57.76	QP
8.65	12.59	10.63	23.22	-27.41	30	57.41	QP
25.41	13.57	8.16	21.73	-26.43	30	56.43	QP
Standby mode							
0.91	26.34	10.83	37.17	-13.66	28.42	42.08	QP
4.55	21.21	10.63	31.84	-18.79	30	48.79	QP
8.47	13.32	10.62	23.94	-26.68	30	56.68	QP
10.25	13.45	10.53	23.98	-26.55	30	56.55	QP
25.51	13.62	8.16	21.78	-26.38	30	56.38	QP

Note;

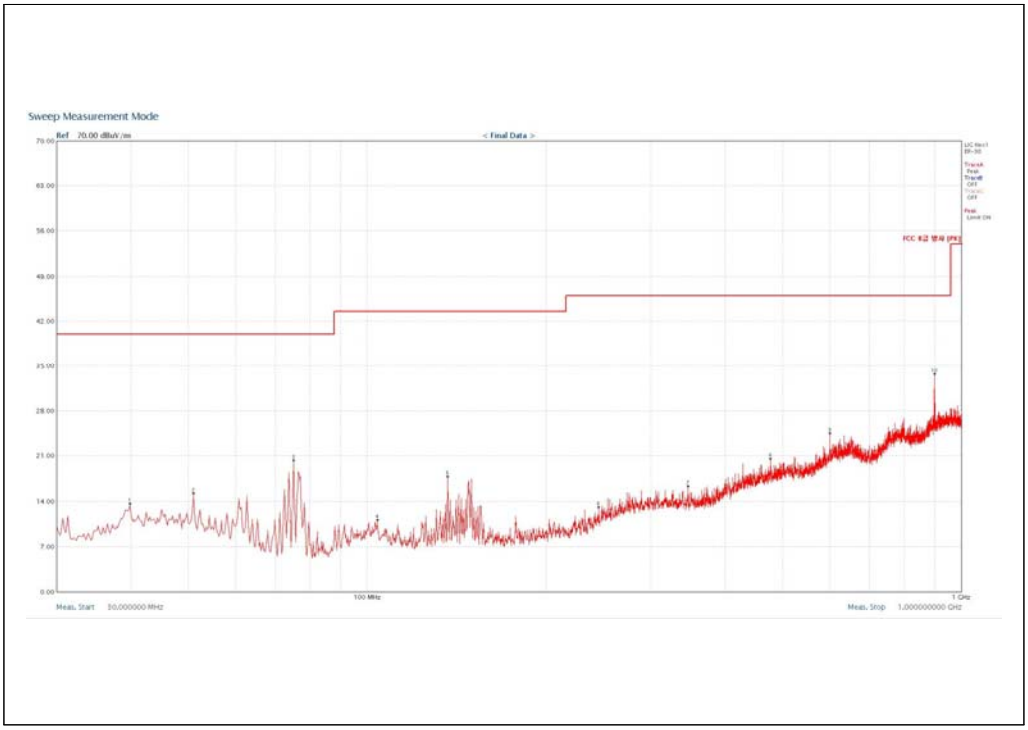
1. According to §15.31 (f)(2),
   - 300 m Result(dBμV/m) = 3 m Result(dBμV/m) – 40log(300/3) (dBμV/m)
   - 30 m Result(dBμV/m) = 3 m Result(dBμV/m) – 40log(30/3) (dBμV/m)
2. According to field strength table of general requirement in §15.209 (a), field strength limits below 1.705 ㎒ were calculated as below.
   - 9 ㎑ to 490 ㎑ : 20log(2 400 / F (㎑)) at 300 m (dBμV/m)
   - 490 ㎑ to 1 705 ㎑ : 20log(24 000 / F (㎑)) at 30 m (dBμV/m)
   - 1.705 ㎒ to 30 ㎒ : 30 at 30 m (dBμV/m)
3. According to §15.209 (d), the measurements were tested by using Quasi peak detector except for the frequency bands 9 – 90 ㎑, 110 – 490 ㎑and above 1 ㎓ in these three bands on measurements employing an average detector.

5.1.3 Spurious Emission: above 30 MHz

Charging with max load mode

Vertical:

Level (dBμV/m)

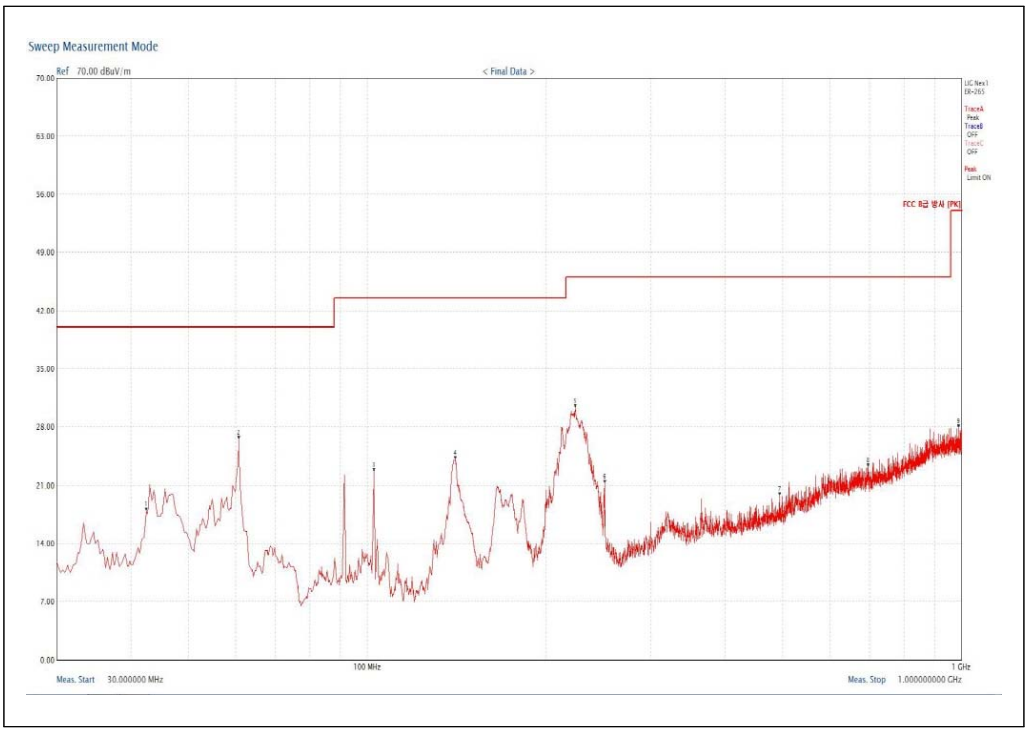


Quasi-peak measurement

Frequency (MHz)	Detect Mode	Polarization (V/H)	Measured Value (dBμV)	Antenna Factor + Cable Loss (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Magin (dB)
39.77	QP	V	10.21	14.64	24.85	40	15.15
51.14	QP	V	11.48	14.27	25.75	40	14.25
75.29	QP	V	23.26	9.06	32.32	40	7.68
137.00	QP	V	9.82	9.51	19.33	43.5	24.17
600.00	QP	V	13.88	22.63	36.51	46	9.49

Horizontal:

Level (dBμV/m)



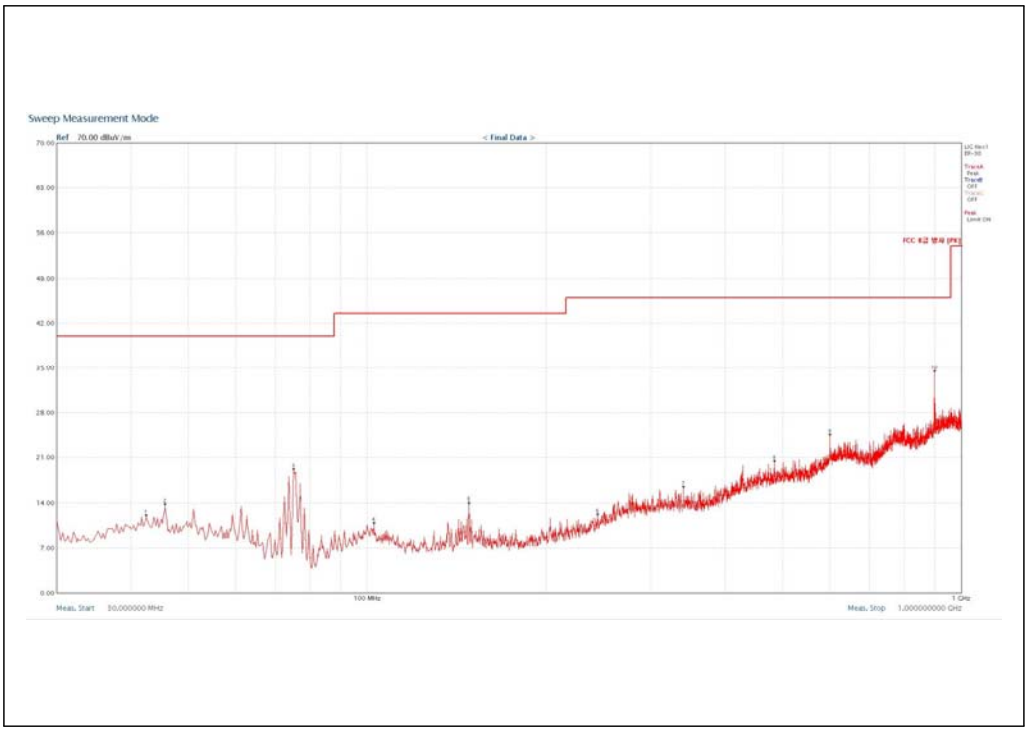
Quasi-peak measurement

Frequency (MHz)	Detect Mode	Polarization (V/H)	Measured Value (dBμV)	Antenna Factor + Cable Loss (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Magin (dB)
43.89	QP	H	8.17	14.67	22.84	40	17.16
71.16	QP	H	15.01	9.75	24.76	40	15.24
142.30	QP	H	16.08	9.45	25.53	43.5	17.97
208.17	QP	H	12.88	12.87	25.75	43.5	17.75
600.00	QP	H	13.91	22.63	36.54	46	9.46

Charging with mid load mode

Vertical:

Level (dBμV/m)

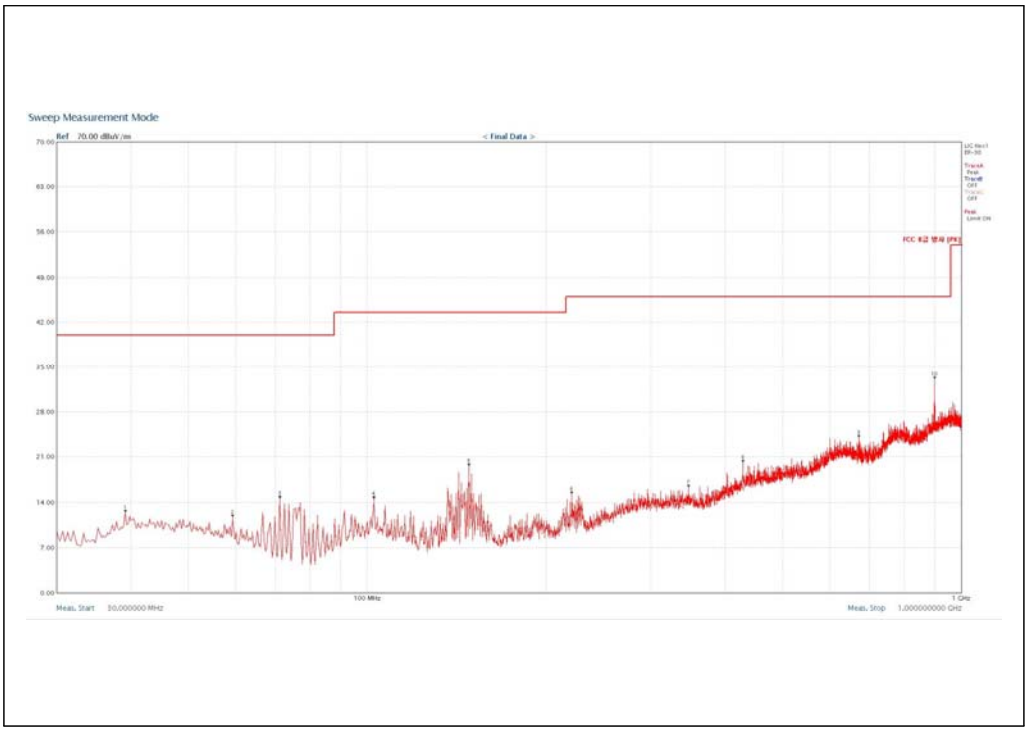


Quasi-peak measurement

Frequency (MHz)	Detect Mode	Polarization (V/H)	Measured Value (dBμV)	Antenna Factor + Cable Loss (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Magin (dB)
39.61	QP	V	10.51	14.57	25.08	40	14.92
75.45	QP	V	21.78	9.03	30.81	40	9.19
148.10	QP	V	12.2	9.62	21.82	43.5	21.68
655.75	QP	V	12.6	23.10	35.70	46	10.3
900.03	QP	V	16.45	26.72	43.17	46	2.83

Horizontal:

Level (dBμV/m)



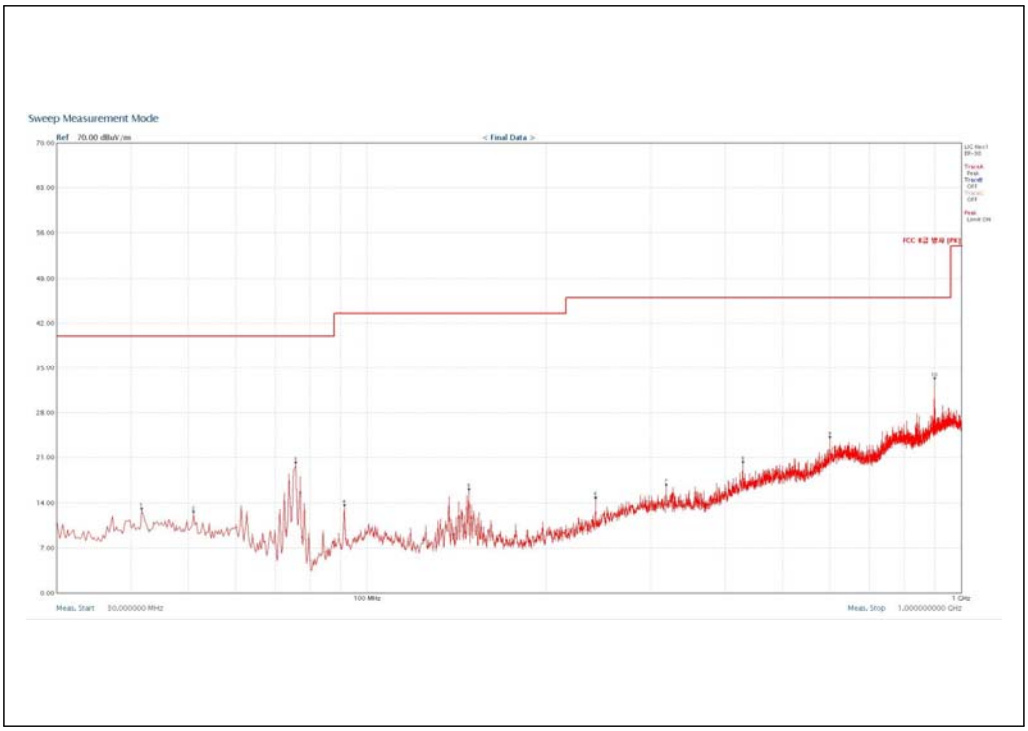
Quasi-peak measurement

Frequency (MHz)	Detect Mode	Polarization (V/H)	Measured Value (dBμV)	Antenna Factor + Cable Loss (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Magin (dB)
45.56	QP	H	9.88	14.62	24.50	40	15.5
76.87	QP	H	17.26	8.79	26.05	40	13.95
102.31	QP	H	12.9	13.31	26.21	43.5	17.29
142.30	QP	H	15.92	9.45	25.37	43.5	18.13

Charging with min load mode

Vertical:

Level (dBμV/m)

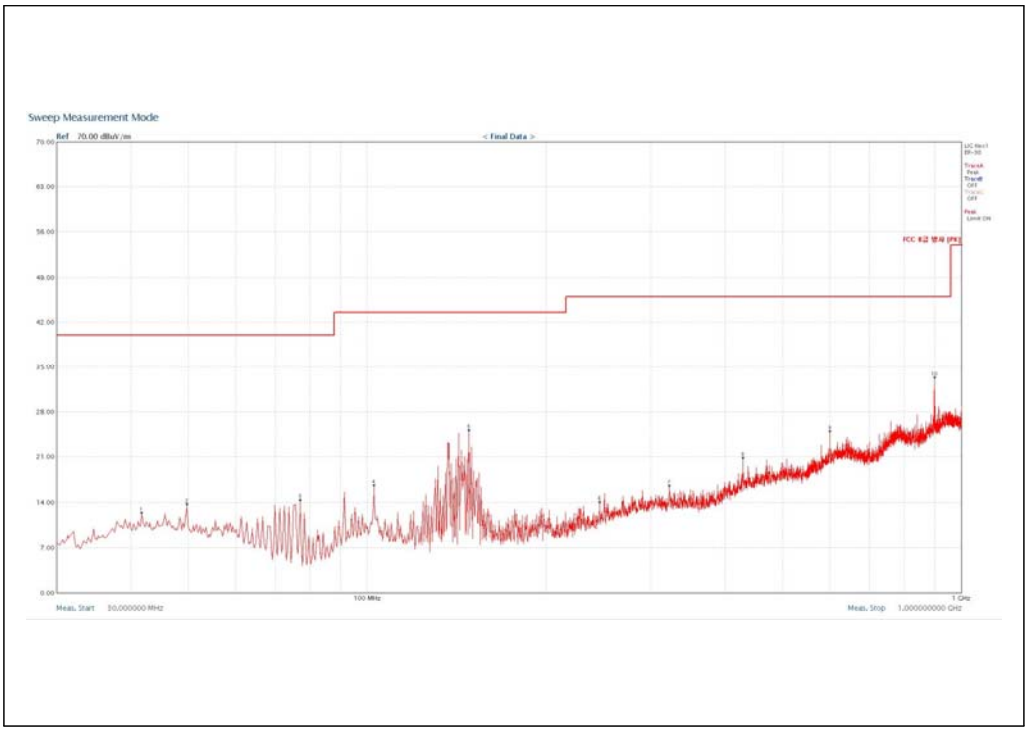


Quasi-peak measurement

Frequency (MHz)	Detect Mode	Polarization (V/H)	Measured Value (dBμV)	Antenna Factor + Cable Loss (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Magin (dB)
45.67	QP	V	8.6	14.61	23.21	40	16.79
75.43	QP	V	21.37	9.04	30.41	40	9.59
148.04	QP	V	14.42	9.62	24.04	43.5	19.46
600.00	QP	V	13.86	22.63	36.49	46	9.51

Horizontal:

Level (dBμV/m)



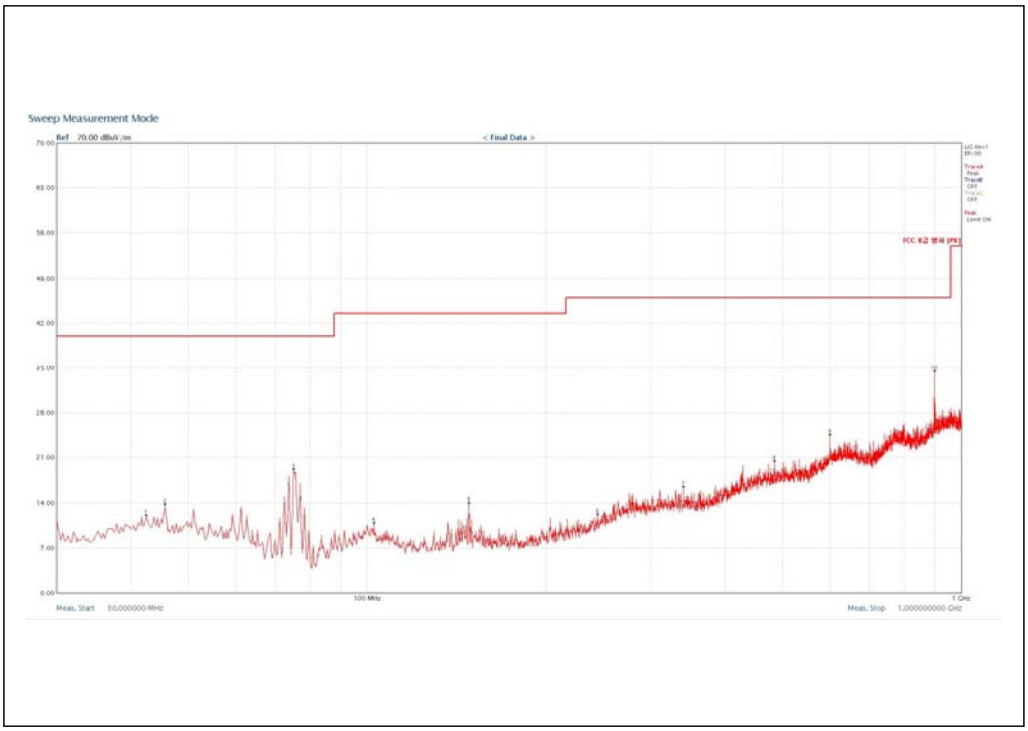
Quasi-peak measurement

Frequency (MHz)	Detect Mode	Polarization (V/H)	Measured Value (dBμV)	Antenna Factor + Cable Loss (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Magin (dB)
38.74	QP	H	8.19	14.20	22.39	40	17.61
59.44	QP	H	7.98	13.77	21.75	40	18.25
71.17	QP	H	14.52	9.75	24.27	40	15.73
102.30	QP	H	13.64	13.31	26.95	43.5	16.55
147.99	QP	H	20.85	9.62	30.47	43.5	13.03

Standby mode:

Vertical:

Level (dBμV/m)

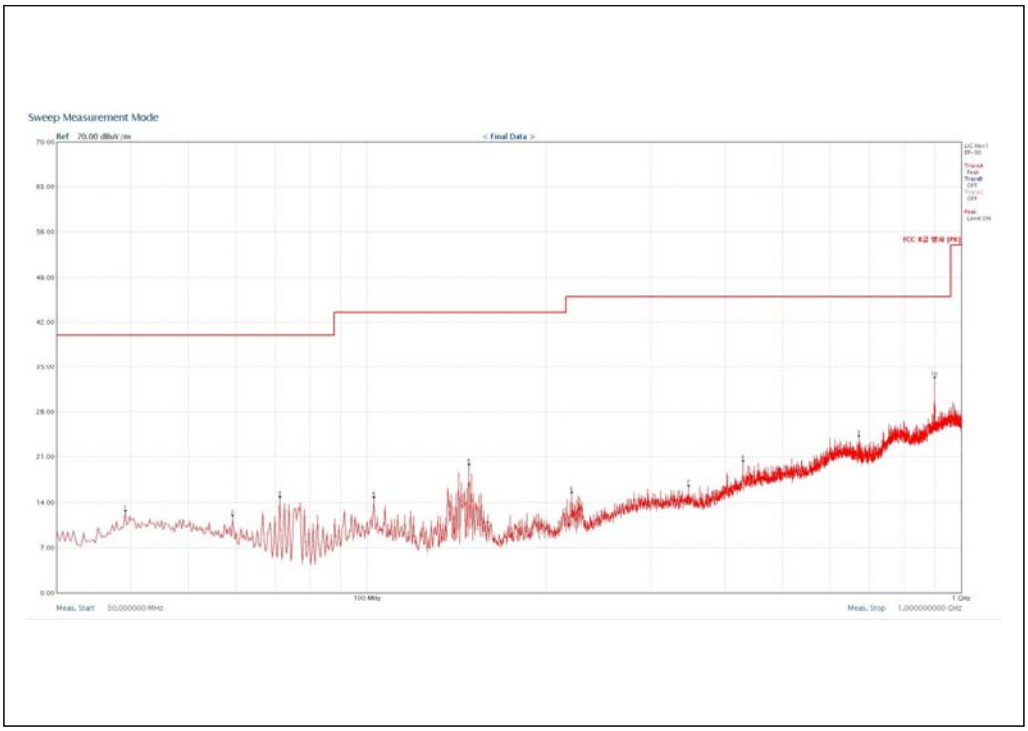


Quasi-peak measurement

Frequency (MHz)	Detect Mode	Polarization (V/H)	Measured Value (dBμV)	Antenna Factor + Cable Loss (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Magin (dB)
75.48	QP	V	22.65	9.03	31.68	40	8.32
91.31	QP	V	12.68	11.93	24.61	43.5	18.89
148.10	QP	V	13.16	9.62	22.78	43.5	20.72
600.00	QP	V	13.86	22.63	36.49	46	9.51
900.00	QP	V	15.38	26.72	42.10	46	3.9

Horizontal:

Level (dBμV/m)



Quasi-peak measurement

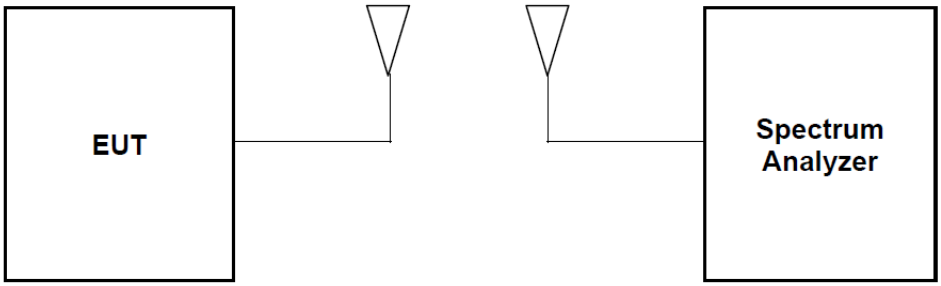
Frequency (MHz)	Detect Mode	Polarization (V/H)	Measured Value (dBμV)	Antenna Factor + Cable Loss (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Magin (dB)
76.87	QP	H	18.75	8.80	27.55	40	12.45
102.28	QP	H	14.55	13.31	27.86	43.5	15.64
148.05	QP	H	22.51	9.62	32.13	43.5	11.37
600.00	QP	H	13.88	22.63	36.51	46	9.49
900.01	QP	H	15.37	26.72	42.09	46	3.91

Note 1. The worst case data were reported. And no other spurious and harmonic emissions were reported greater than listed emissions above table.

Note 2. All measurements were recorded using a spectrum analyzer employing a Qusi-peak detector for above 30MHz.

5.2. 20 dB Bandwidth

5.2.1 Test Setup



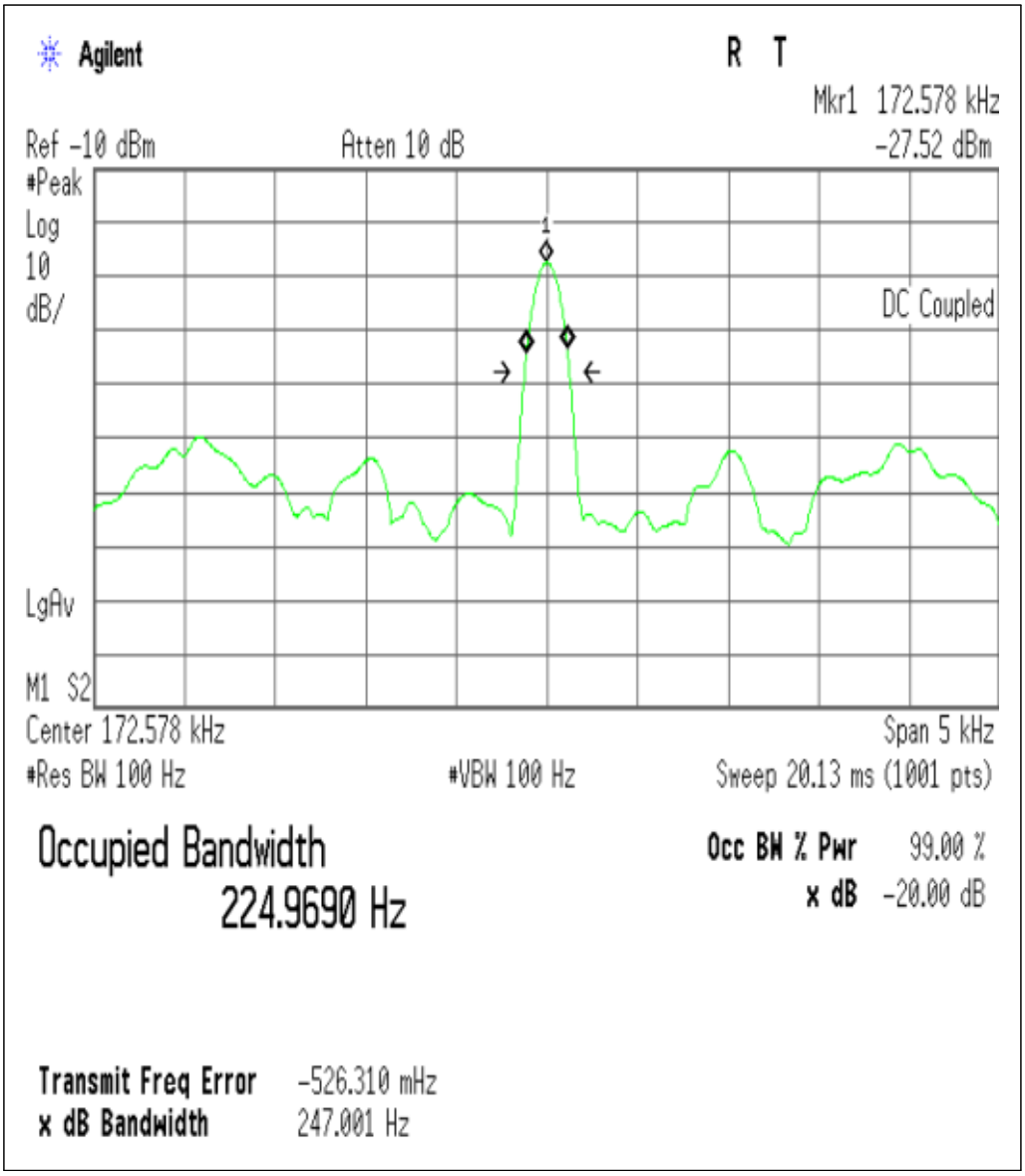
5.2.2 Test Procedure

20 dB Bandwidth a. Span = approximately 2 to 3 times the 20 dB bandwidth, RBW = greater than 1 % of the 20 dB bandwidth, VBW = RBW, Sweep = auto, Detector = peak, Trace = max hold. b. The marker-to-peak function to set the mark to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is 20 dB bandwidth of the emission.

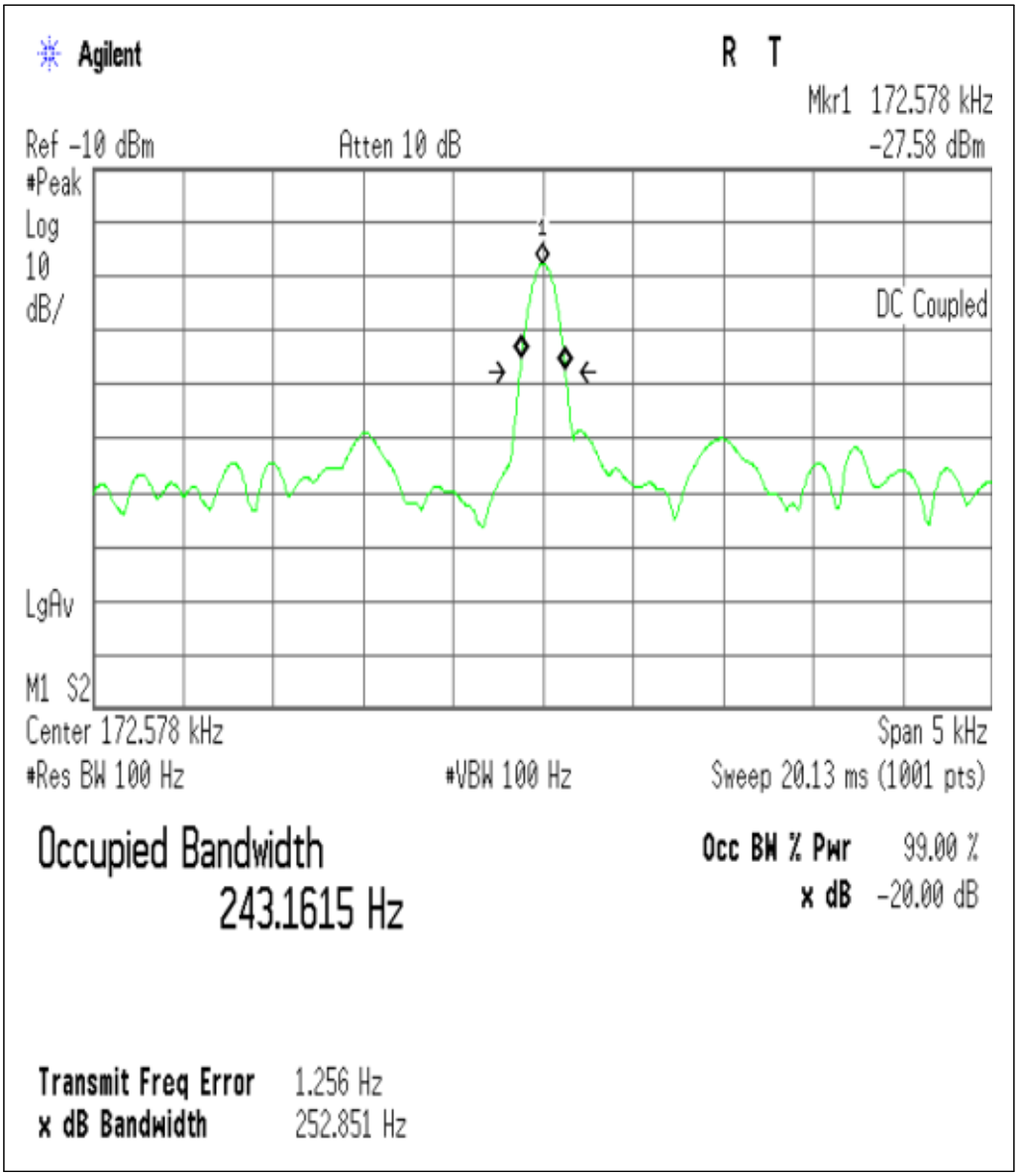
5.2.3 Test Result

EUT status	20 dB Bandwidth (kHz)	Limit
Charging with max load mode	224	Reporting proposed only
Charging with mid load mode	243	
Charging with min load mode	230	

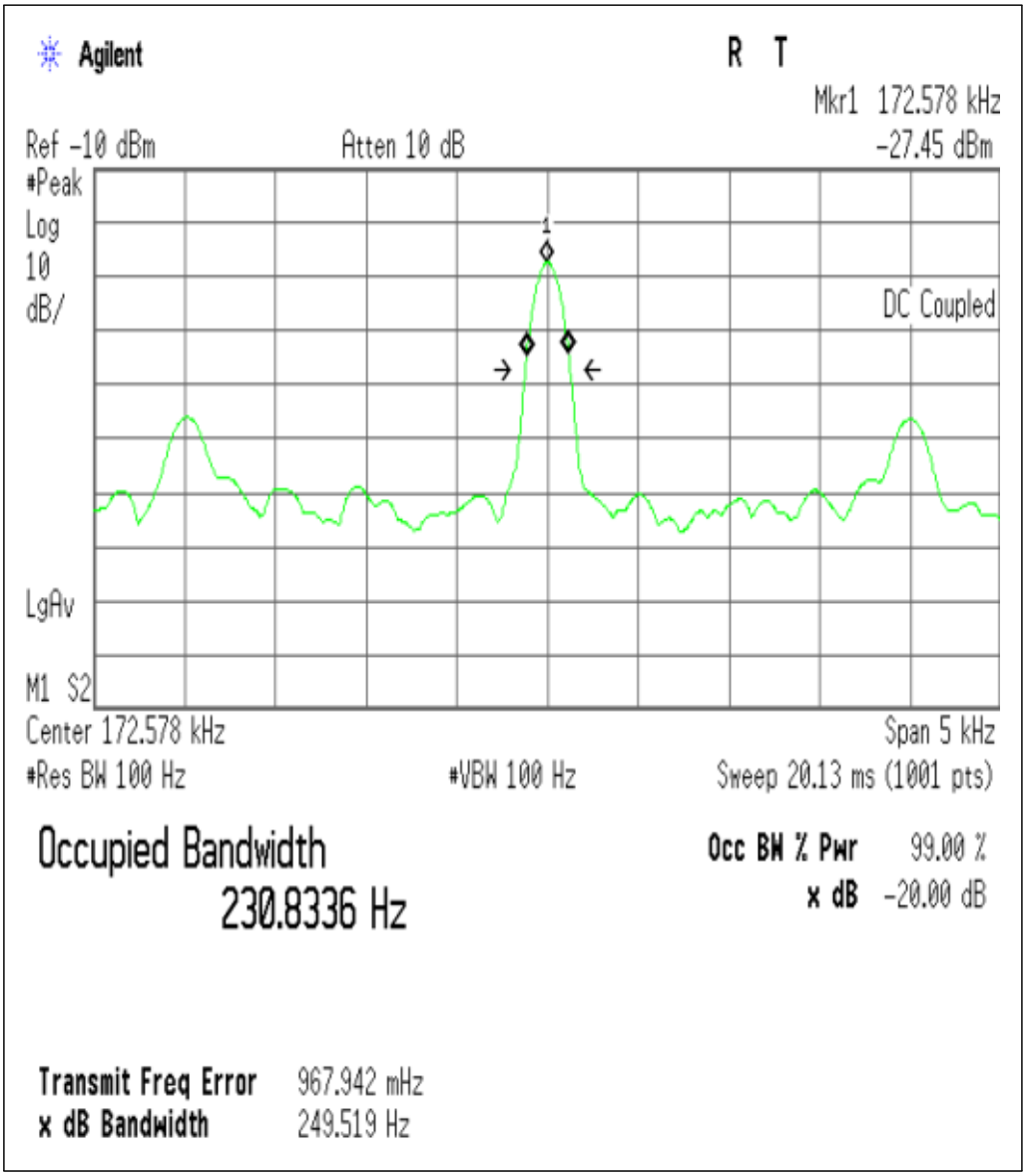
Charging with max load mode



Charging with mid load mode



Charging with min load mode



5.3. Conducted Emissions at Mains Terminals 150 kHz to 30 MHz

Test Requirement: FCC Part 15 C section 15.207
Test Method: ANSI C63.10: ANSI C63.10: 2013
Frequency Range: 150 kHz to 30 MHz
Detector: Peak for pre-scan (9 kHz Resolution Bandwidth)

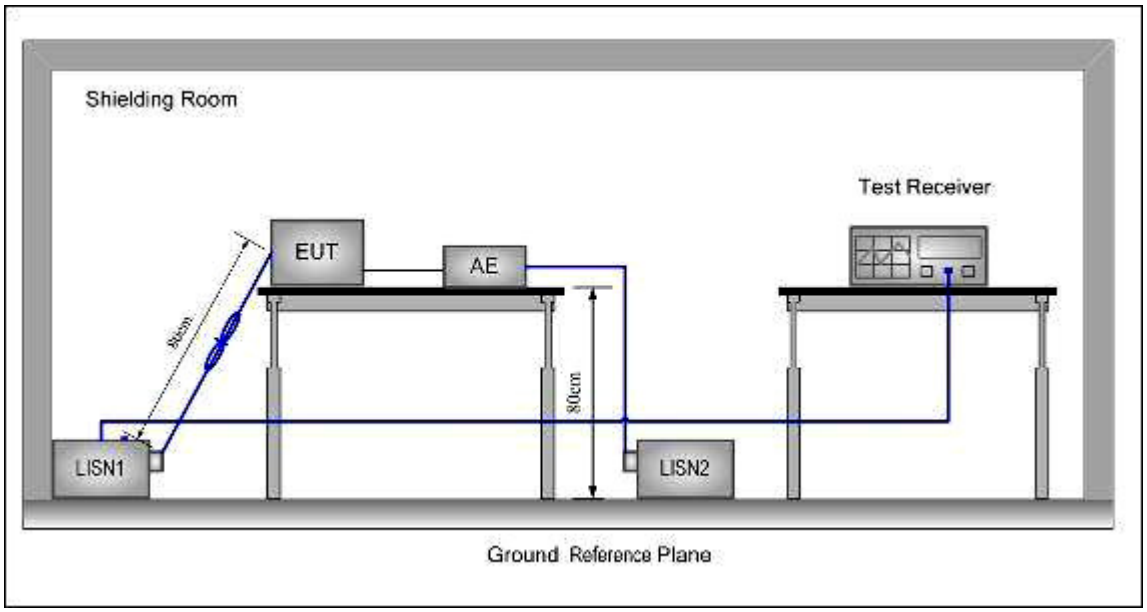
Test Limit

Limits for conducted disturbance at the mains ports of class B

Frequency Range (MHz)	Class B Limit dB(μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

EUT Operation: Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. 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).

Test Configuration:



Test procedure:

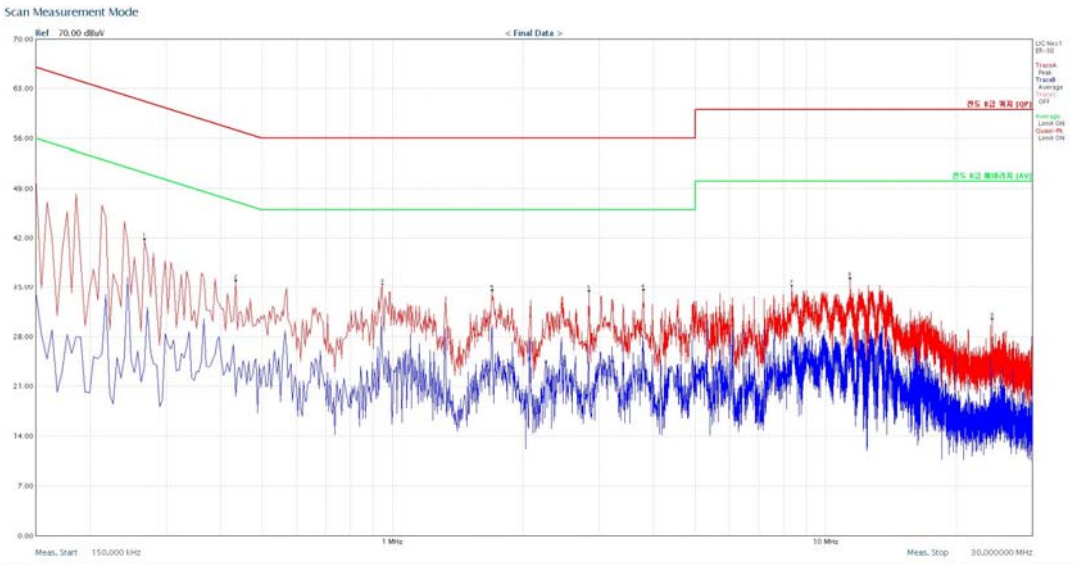
1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50/50μH + 5linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the LISN 2.
5. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.

5.3.1. Measurement Data

Pre-scan was performed with peak detected on all ports, Quasi-peak & average measurements were performed at the frequencies at which maximum peak emission level were detected. Please see the attached Quasi-peak and Average test results.

Charging with max load mode

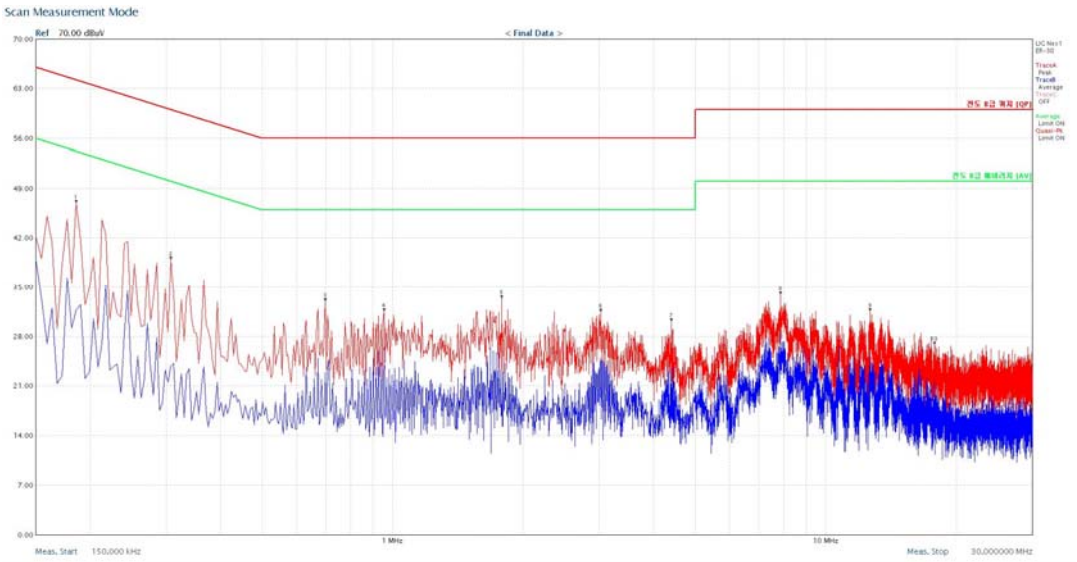
Line - PE(QusiPeak and Average detector used)



REDUCTION TABLE

No	Freq (MHz)	Level (dBuV)	Corr (dB)	Limit (dBuV)	Margin (dB)	State	Reference
1	0.186	39.11	10.11	64.21	25.10	Pass	QP
2	0.276	35.71	10.08	60.94	25.23	Pass	QP
3	0.685	35.19	10.08	56.00	20.81	Pass	QP
4	1.185	32.79	10.09	56.00	23.21	Pass	QP
5	2.625	31.46	10.16	56.00	24.54	Pass	QP
6	7.854	30.53	10.44	60.00	29.47	Pass	QP
7	12.448	27.96	10.67	60.00	32.04	Pass	QP
8	0.186	32.24	10.11	54.21	21.97	Pass	AV
9	0.276	32.39	10.08	50.94	18.55	Pass	AV
10	0.685	29.96	10.08	46.00	16.04	Pass	AV
11	1.185	27.00	10.09	46.00	19.00	Pass	AV
12	2.625	26.05	10.16	46.00	19.95	Pass	AV
13	7.854	25.26	10.44	50.00	24.74	Pass	AV
14	12.448	22.49	10.67	50.00	27.51	Pass	AV

Neutral – PE(QusiPeak and Average detector used)



REDUCTION TABLE

No	Freq (MHz)	Level (dBuV)	Corr (dB)	Limit (dBuV)	Margin (dB)	State	Reference
1	0.154	43.54	10.18	56.00	6.71	Pass	QP
2	0.276	34.85	10.07	56.00	8.55	Pass	QP
3	1.842	29.35	10.11	56.00	14.02	Pass	QP
4	8.025	30.01	10.39	60.00	15.75	Pass	QP
5	0.154	36.96	10.18	46.00	9.53	Pass	AV
6	0.276	26.22	10.07	46.00	9.37	Pass	AV
7	1.842	20.48	10.11	46.00	11.62	Pass	AV
8	8.025	24.69	10.39	50.00	13.89	Pass	AV

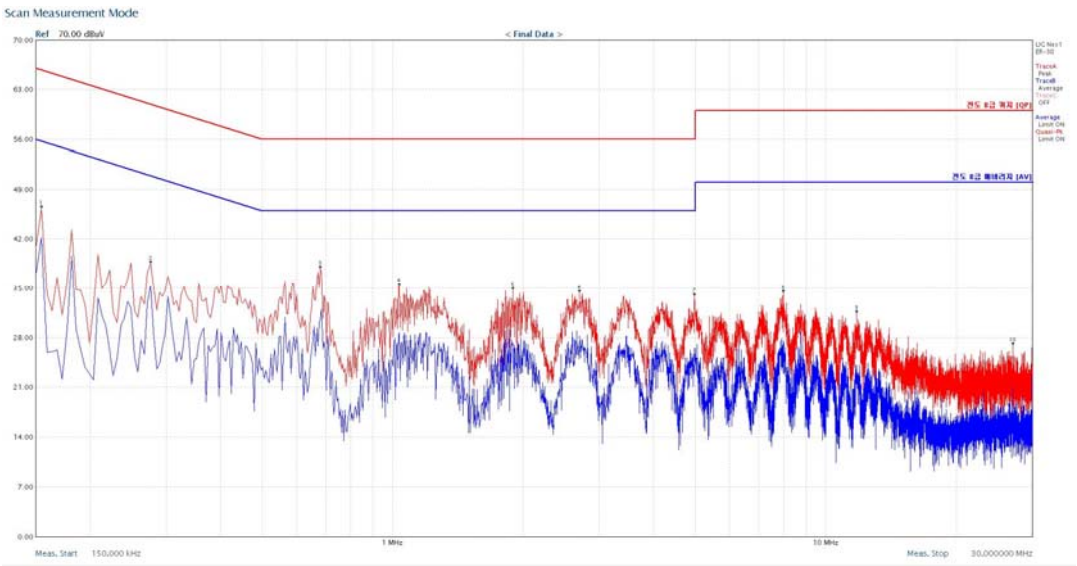
Measurement data:

* Detector function was set into Quasi-peak & Average mode.

* Corr = LISN Factor + Cable loss + Pulse Limiter

Charging with mid load mode

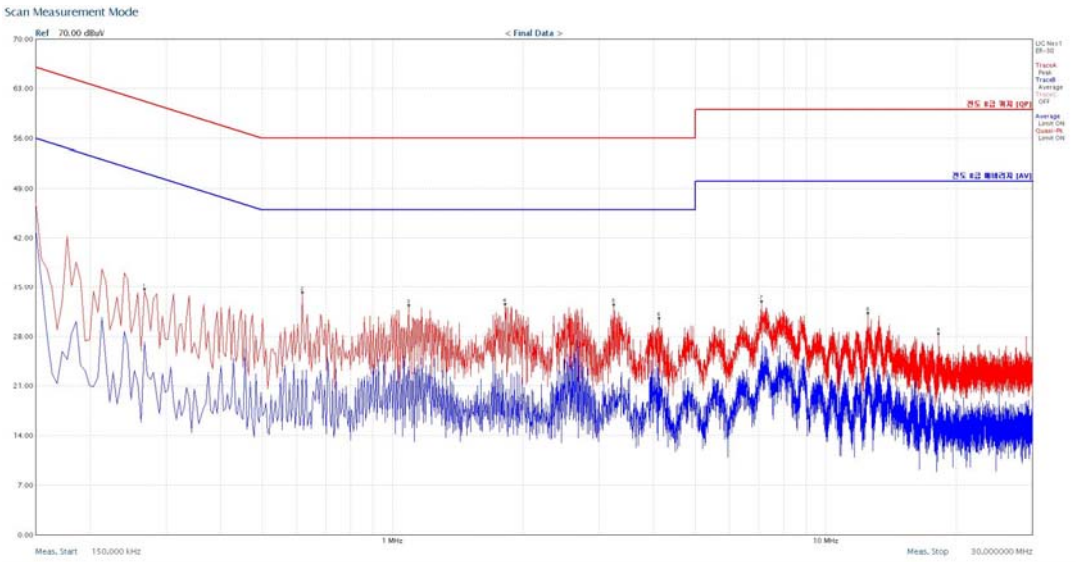
Line - PE(QusiPeak and Average detector used)



REDUCTION TABLE

No	Freq (MHz)	Level (dBuV)	Corr (dB)	Limit (dBuV)	Margin (dB)	State	Reference
1	0.276	36.15	10.08	60.94	24.79	Pass	QP
2	0.685	30.37	10.08	56.00	25.63	Pass	QP
3	1.212	32.4	10.09	56.00	23.60	Pass	QP
4	2.755	33.76	10.17	56.00	22.24	Pass	QP
5	7.948	32.37	10.44	60.00	27.63	Pass	QP
6	0.276	32.71	10.08	60.94	28.23	Pass	AV
7	0.685	35.54	10.08	56.00	20.46	Pass	AV
8	1.212	26.6	10.09	56.00	29.40	Pass	AV
9	2.755	28.63	10.17	56.00	27.37	Pass	AV
10	7.948	27.33	10.44	60.00	32.67	Pass	AV

Neutral – PE(QusiPeak and Average detector used)



REDUCTION TABLE

No	Freq (MHz)	Level (dBuV)	Corr (dB)	Limit (dBuV)	Margin (dB)	State	Reference
1	0.303	36.01	10.07	60.16	24.15	Pass	QP
2	0.465	28.13	10.07	56.61	28.48	Pass	QP
3	1.851	28.52	10.11	56.00	27.48	Pass	QP
4	2.697	28.19	10.16	56.00	27.81	Pass	QP
5	7.525	27.43	10.38	60.00	32.57	Pass	QP
6	0.303	25.13	10.07	60.16	35.03	Pass	AV
7	0.465	18.67	10.07	56.61	37.94	Pass	AV
8	1.851	19.78	10.11	56.00	36.22	Pass	AV
9	2.697	19.6	10.16	56.00	36.40	Pass	AV
10	7.525	22.12	10.38	60.00	37.88	Pass	AV

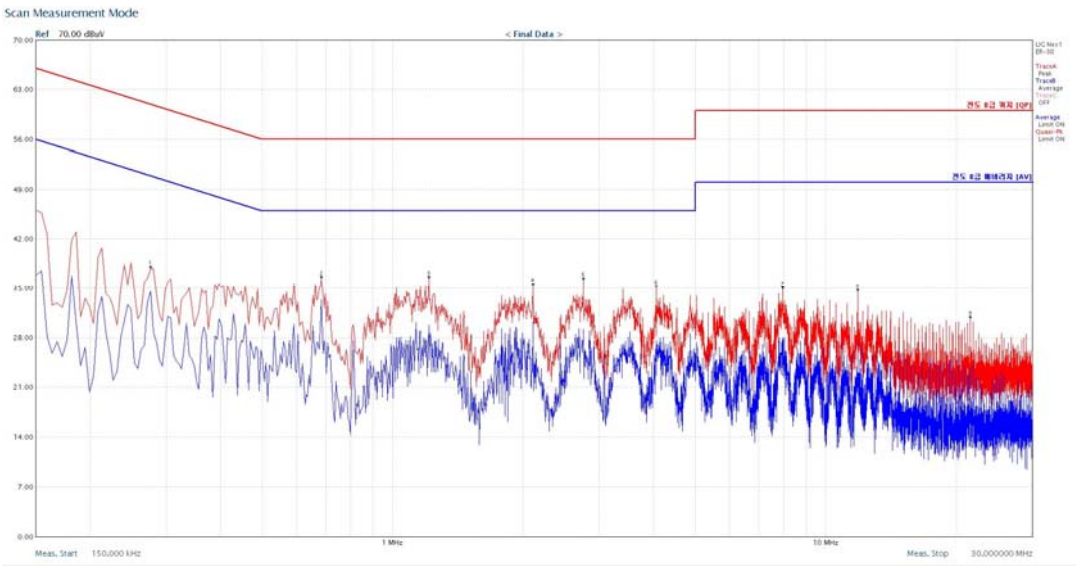
Measurement data:

* Detector function was set into Quasi-peak & Average mode.

* Corr = LISN Factor + Cable loss + Pulse L imiter

Charging with min load mode

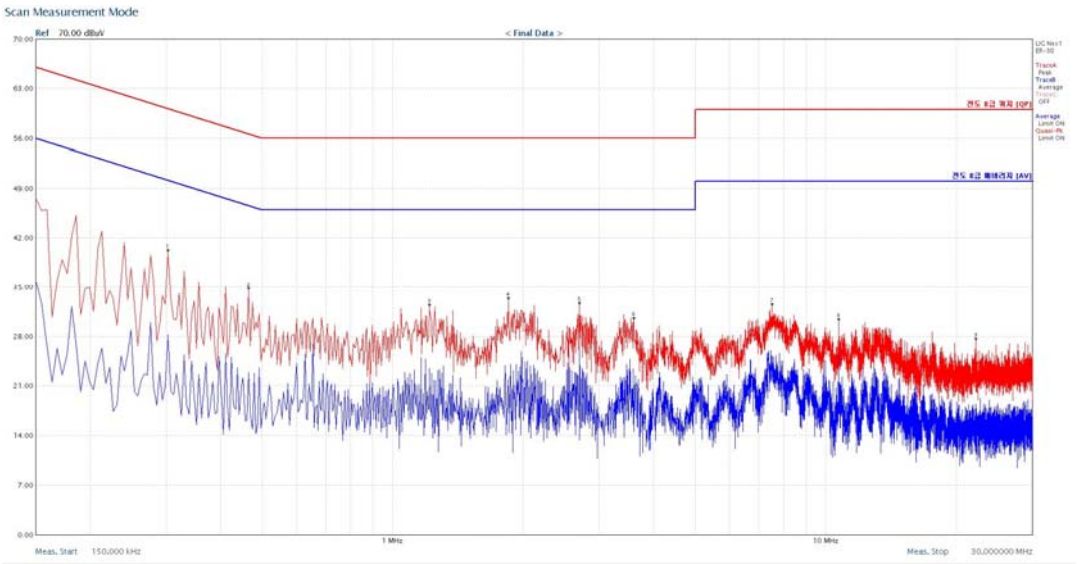
Line - PE(QusiPeak and Average detector used)



REDUCTION TABLE

No	Freq (MHz)	Level (dBuV)	Corr (dB)	Limit (dBuV)	Margin (dB)	State	Reference
1	0.213	38.69	10.08	63.09	24.40	Pass	QP
2	0.681	35.65	10.08	56.00	20.35	Pass	QP
3	1.86	31.77	10.12	56.00	24.23	Pass	QP
4	7.845	30.68	10.44	60.00	29.32	Pass	QP
5	11.008	27.77	10.58	60.00	32.23	Pass	QP
6	0.213	34.29	10.08	63.09	28.80	Pass	AV
7	0.681	30.24	10.08	56.00	25.76	Pass	AV
8	1.86	25.58	10.12	56.00	30.42	Pass	AV
9	7.845	25.5	10.44	60.00	34.50	Pass	AV
10	11.008	22.29	10.58	60.00	37.71	Pass	AV

Neutral – PE(QusiPeak and Average detector used)



REDUCTION TABLE

No	Freq (MHz)	Level (dBuV)	Corr (dB)	Limit (dBuV)	Margin (dB)	State	Reference
1	0.154	43.96	10.18	65.78	21.82	Pass	QP
2	0.276	35.23	10.07	60.94	25.71	Pass	QP
3	0.622	29.72	10.07	56.00	26.28	Pass	QP
4	2.647	28.12	10.15	56.00	27.88	Pass	QP
5	13.119	26.46	10.58	60.00	33.54	Pass	QP
6	0.154	37	10.18	65.78	28.78	Pass	AV
7	0.276	26.26	10.07	60.94	34.68	Pass	AV
8	0.622	19.11	10.07	56.00	36.89	Pass	AV
9	2.647	19.4	10.15	56.00	36.60	Pass	AV
10	13.119	20.65	10.58	60.00	39.35	Pass	AV

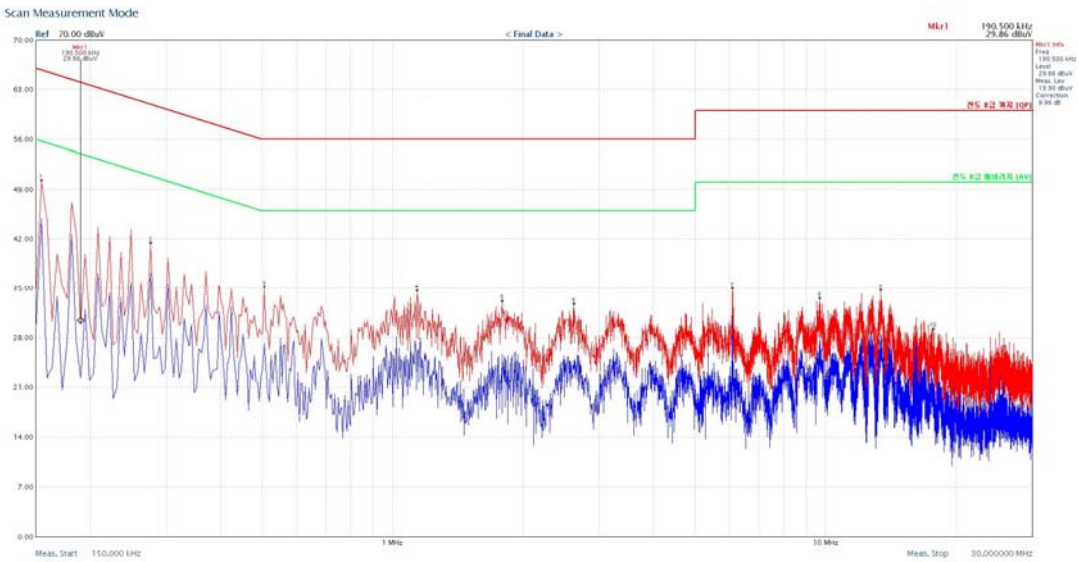
Measurement data:

* Detector function was set into Quasi-peak & Average mode.

* Corr = LISN Factor + Cable loss + Pulse Limiter

Standby mode:

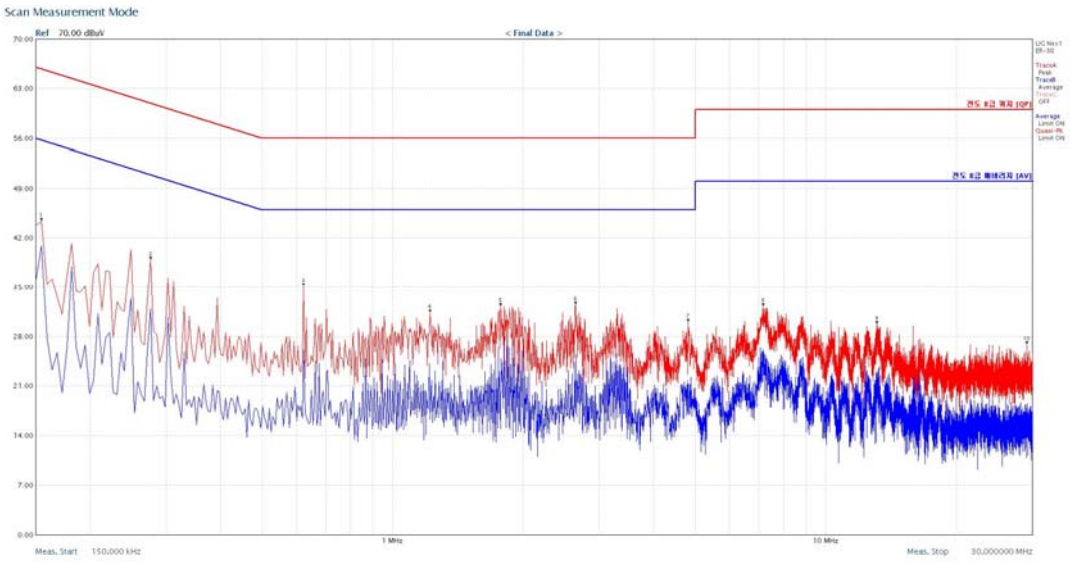
Line - PE(QusiPeak and Average detector used)



REDUCTION TABLE

No	Freq (MHz)	Level (dBuV)	Corr (dB)	Limit (dBuV)	Margin (dB)	State	Reference
1	0.154	44.67	10.19	65.78	21.11	Pass	QP
2	0.276	36.02	10.08	60.94	24.92	Pass	QP
3	0.681	35.73	10.08	56.00	20.27	Pass	QP
4	1.896	31.97	10.12	56.00	24.03	Pass	QP
5	7.971	30.72	10.44	60.00	29.28	Pass	QP
6	0.154	37.86	10.19	65.78	27.92	Pass	AV
7	0.276	32.67	10.08	60.94	28.27	Pass	AV
8	0.681	30.4	10.08	56.00	25.60	Pass	AV
9	1.896	26.08	10.12	56.00	29.92	Pass	AV
10	7.971	24.8	10.44	60.00	35.20	Pass	AV

Neutral – PE(QusiPeak and Average detector used)



REDUCTION TABLE

No	Freq (MHz)	Level (dBuV)	Corr (dB)	Limit (dBuV)	Margin (dB)	State	Reference
1	0.213	38.82	10.07	63.09	24.27	Pass	QP
2	0.618	28.74	10.07	56.00	27.26	Pass	QP
3	1.09	27.64	10.07	56.00	28.36	Pass	QP
4	7.102	28.32	10.37	60.00	31.68	Pass	QP
5	12.52	26.42	10.56	60.00	33.58	Pass	QP
6	0.213	30.53	10.07	63.09	32.56	Pass	AV
7	0.618	19.05	10.07	56.00	36.95	Pass	AV
8	1.09	20.14	10.07	56.00	35.86	Pass	AV
9	7.102	23.47	10.37	60.00	36.53	Pass	AV
10	12.52	20.952	10.56	60.00	39.05	Pass	AV

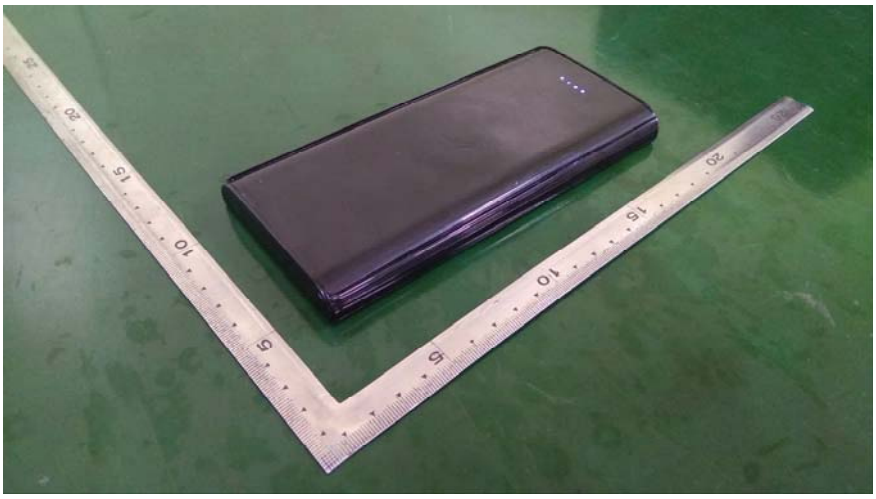
Measurement data:

* Detector function was set into Quasi-peak & Average mode.

* Corr = LISN Factor + Cable loss + Pulse Li

miter

* The worst case data were reported. And no other spurious and harmonic emissions were reported greater than listed emissions above table.

APPENDIX

1. EUT photo