TEST REPORT

of

FCC Part 15 Subpart C §15.225

FCC ID: ZNFD855

Equipment Under Test	:	Cellular/PCS GSM/GPRS/EDGE/WCDMA and LTE phone with Bluetooth, WLAN and RFID
Model Name	:	LG-D855
Alternative models	:	LGD855, D855, LG-D855k, LG-D855K, LGD855k, LGD855K, D855k, D855K
Applicant	:	LG Electronics MobileComm U.S.A., Inc.
Manufacturer	:	LG Electronics MobileComm U.S.A., Inc.
Date of Test(s)	:	2014.04.16 ~ 2014.05.30
Date of Issue	:	2014.05.30

In the configuration tested, the EUT complied with the standards specified above.

Tested By: Logan Lee **Date:** 2014.05.30

Approved By: Feel Jeong **Date:** 2014.05.30

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 3FL, 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 435-040

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx.

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1.2. Details of Applicant

Applicant : LG Electronics MobileComm U.S.A., Inc.
Address : 10101 Old Grove Road, San Diego, CA 92131
Contact Person : Lee, Sang-Myung
Phone No. : +82 2 2033 4606

1.3. Description of EUT

Kind of Product	Cellular/PCS GSM/GPRS/EDGE/WCDMA and LTE phone with Bluetooth, WLAN and RFID
Model Name	LG-D855 (Alternative models: LGD855, D855, LG-D855k, LG-D855K, LGD855k, LGD855K, D855k, D855K)
Power Supply	DC 3.8 V
Frequency Range	13.56 ㎒ (NFC) 2 402 ㎒ ~ 2 480 ㎒ (BT, BT LE), 2 412 ㎒ ~ 2 462 ㎒ (11b/g/n_HT20), 5 745 ㎒ ~ 5 825 ㎒ (Band 3: 11a/n_HT20, 11ac_VHT20), 5 755 ㎒ ~ 5 795 ㎒ (Band 3: 11n_HT40, 11ac_VHT40), 5 775 ㎒ (Band 3: 11ac_VHT80), 5 180 ㎒ ~ 5 240 ㎒ (Band 1: 11a/n_HT20, 11ac_VHT20), 5 190 ㎒ ~ 5 230 ㎒ (Band 1: 11n_HT40, 11ac_VHT40), 5 210 ㎒ (Band 1: 11ac_VHT80), 5 260 ㎒ ~ 5 320 ㎒ (Band 2A: 11a/n_HT20, 11ac_VHT20), 5 270 ㎒ ~ 5 310 ㎒ (Band 2A: 11n_HT40, 11ac_VHT40), 5 290 ㎒ (Band 2A: 11ac_VHT80), 5 500 ㎒ ~ 5 700 ㎒ (Band 2C: 11a/n_HT20, 11ac_VHT20), 5 510 ㎒ ~ 5 670 ㎒ (Band 2C: 11n_HT40, 11ac_VHT40), 5 530 ㎒ (Band 2C: 11ac_VHT80)
Modulation Technique	DSSS, OFDM, GFSK, π/4DQPSK, 8DPSK, ASK
Number of Channels	11 channel (11b/g/n_HT20), 5 channel (Band 3: 11a/n_HT20, 11ac_VHT20), 2 channel (Band 3: 11n_HT40, 11ac_VHT40), 1 channel (Band 3: 11ac_VHT80), 4 channel (Band 1: 11a/n_HT20, 11ac_VHT20), 2 channel (Band 1: 11n_HT40, 11ac_VHT40), 1 channel (Band 1: 11ac_VHT80), 4 channel (Band 2A: 11a/n_HT20, 11ac_VHT20), 2 channel (Band 2A: 11n_HT40, 11ac_VHT40), 1 channel (Band 2A: 11ac_VHT80), 8 channel (Band 2C: 11a/n_HT20, 11ac_VHT20), 3 channel (Band 2C: 11n_HT40, 11ac_VHT40), 1 channel (Band 2C: 11ac_VHT80), 79 channel (BT), 40 channel (BT LE), 1 channel (NFC)
Antenna Type	Internal type (SISO)
Antenna Gain	2 402 ㎒ ~ 2 480 ㎒, 2 412 ㎒ ~ 2 462 ㎒: -3.09 ㏈i, 5 180 ㎒ ~ 5 320 ㎒: -1.58 ㏈i, 5 500 ㎒ ~ 5 700 ㎒: -0.13 ㏈i, 5 745 ㎒ ~ 5 825 ㎒: -0.13 ㏈i

1.4. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal Date.	Cal. Interval	Cal Due.
Signal Generator	R&S	SMR40	100540	Jan. 08, 2014	Annual	Jan. 08, 2015
Signal Generator	R&S	SMJ 100A	100882	Jul. 03, 2013	Annual	Jul. 03, 2014
Spectrum Analyzer	Agilent	N9030A	MY53120526	Jul. 30, 2013	Annual	Jul. 30, 2014
Spectrum Analyzer	R&S	FSV30	101004	Jul. 20, 2013	Annual	Jul. 20, 2014
Low Pass Filter	Mini circuits	NLP-1200+	V9500401023-1	Jul. 02, 2013	Annual	Jul. 02, 2014
Attenuator	MCLI	FAS-12-10	1-1	Jul. 03, 2013	Annual	Jul. 03, 2014
DC Power Supply	Agilent	U8002A	MY48490027	Jan. 03, 2014	Annual	Jan. 03, 2015
Temperature Chamber	JEIO TECH	TH-ME-100(1ph)	S040281	Jun. 28, 2013	Annual	Jun. 28, 2014
Preamplifier	H.P.	8447D	1726A01265	Sep. 23, 2013	Annual	Sep. 23, 2014
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	9163-437	Oct. 04, 2013	Biennial	Oct. 04, 2015
Loop Antenna	SCHWARZBECK MESSELEKTRONIK	FMZB 1519	1519-039	Jul. 09, 2013	Biennial	Jul. 09, 2015
Antenna Master	INN-CO	MA4000-EP	N/A	N.C.R.	N/A	N.C.R.
Turn Table	INN-CO	DT-3000S-3T	N/A	N.C.R.	N/A	N.C.R.
Shield Room	SY Corporation	L × W × H (6.5 m × 3.5 m × 3.5 m)	N/A	N.C.R.	N/A	N.C.R.
EMI Test Receiver	R&S	ESU26	100194	Sep. 13, 2013	Annual	Sep. 13, 2014
Two-Line V-Network	R&S	ENV216	101120	Jan. 02, 2014	Annual	Jan. 02, 2015
Anechoic Chamber	SY Corporation	L × W × H (21.5 m × 13.0 m × 9.0 m)	N/A	N.C.R.	N/A	N.C.R.

▶ Support equipment

Description	Manufacturer	Model	Serial Number	FCC ID
Wireless Charger	LG Electronics	WCP-300	306HYNY008023	BEJWCP300

1.5. Summary of Test Results

The EUT has been tested according to the following specifications:

Applied standard : FCC Part15 subpart C		
Standard section	**Test item**	**Result**
15.207	AC Power Line Conducted Emission	Complied
15.225(a)(b)(c)(d) 15.209	Radiated emission	Complied
15.225(e)	Frequency Stability	Complied
15.215(c)	20 dB Bandwidth	-

1.6. Sample calculation

Where relevant, the following sample calculation is provided:

1.6.1. Conducted test

Offset value (dB) = Attenuator (dB) + Cable loss (dB)

1.6.2. Radiation test

Field strength level (dBμV/m) = Measured level (dBμV) + Antenna factor (dB) + Cable loss (dB) - amplifier (dB)

1.7. Test report revision

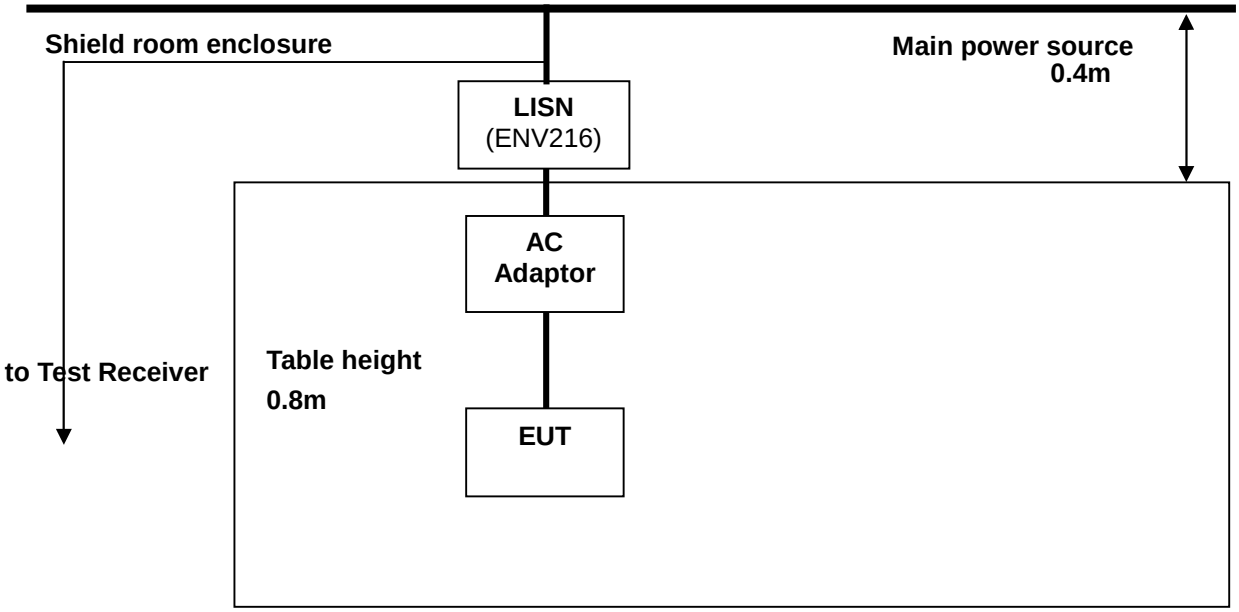
Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL007646	2014.05.12	Initial
1	F690501/RF-RTL007646-1	2014.05.30	- Added actual test equipment list in each test result & DUT axis description on page 12. - Retest the 20 dB Bandwidth. - Added information note 5 on page 18~21.

1.8. Information of Alternative model

Model	Information
LG-D855	Basic model name.
LG-D855k	H/W and S/W are same to basic model. It is only different model name for marketing purpose
LG-D855K	H/W and S/W are same to basic model. It is only different model name for marketing purpose
LGD855k	H/W and S/W are same to basic model. It is only different model name for marketing purpose
LGD855K	H/W and S/W are same to basic model. It is only different model name for marketing purpose
D855k	H/W and S/W are same to basic model. It is only different model name for marketing purpose
D855K	H/W and S/W are same to basic model. It is only different model name for marketing purpose

2. AC power line conducted emission

2.1. Test Setup



2.1.1. Actual equipment used for AC power line conducted emission

Equipment	Manufacturer	Model	S/N	Cal Date	Cal Interval	Cal Due.
EMI Test Receiver	R&S	ESU26	100194	Sep. 13, 2013	Annual	Sep. 13, 2014
Signal Generator	R&S	SMR40	100540	Jan. 08, 2014	Annual	Jan. 08, 2015
Two-Line V-Network	R&S	ENV216	101120	Jan. 02, 2014	Annual	Jan. 02, 2015
Shield Room	SY Corporation	L × W × H (6.5 m × 3.5 m × 3.5 m)	N/A	N.C.R.	N/A	N.C.R.

2.2. Limit

According to §15.207(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).
Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency of Emission (㎒)	Conducted limit (㏈㎶)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

* Decreases with the logarithm of the frequency.

2.3. Test Procedures

All modes were investigated for this test. The full data for the worst case data rate are reported in this section. AC power line conducted emissions from the EUT were measured according to the dictates of ANSI C63.4-2003

1. The test procedure is performed in a 6.5 m × 3.5 m× 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m(W)× 1.5 m(L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. The excess power cable between the EUT and the LISN was bundled. All connecting cables of EUT were moved to find the maximum emission.

2.4. Test Results

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

2.4.1. Battery Cover without charger

Frequency range : 0.15 ㎒ – 30 ㎒
Measured Bandwidth : 9 ㎑

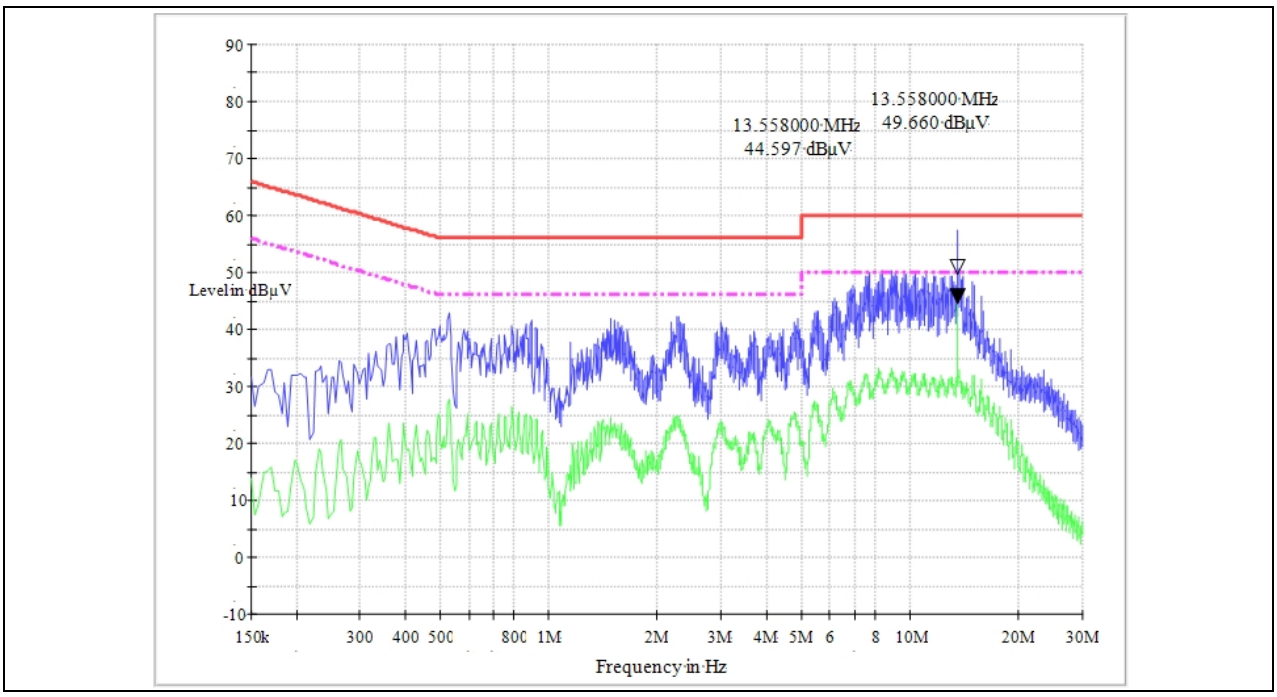
FREQ.	LEVEL(dBμV)		LINE	LIMIT(dBμV)		MARGIN(dB)	
(㎒)	Quasi Peak	Average		Quasi Peak	Average	Quasi Peak	Average
0.53	29.09	21.40	H	56.00	46.00	26.91	24.60
2.25	21.01	12.36	H	56.00	46.00	34.99	33.64
7.68	34.92	28.52	H	60.00	50.00	25.08	21.48
8.31	35.55	29.07	H	60.00	50.00	24.45	20.93
13.56	49.66	44.60	H	60.00	50.00	10.34	5.40
14.94	29.13	23.50	H	60.00	50.00	30.87	26.50
0.15	50.08	47.12	N	66.00	56.00	15.92	8.88
0.18	38.66	19.62	N	64.49	54.49	25.83	34.87
4.43	26.55	16.23	N	56.00	46.00	29.45	29.77
5.05	29.71	21.05	N	60.00	50.00	30.29	28.95
5.50	34.05	26.09	N	60.00	50.00	25.95	23.91
13.56	53.06	45.48	N	60.00	50.00	6.94	4.52

Note ;

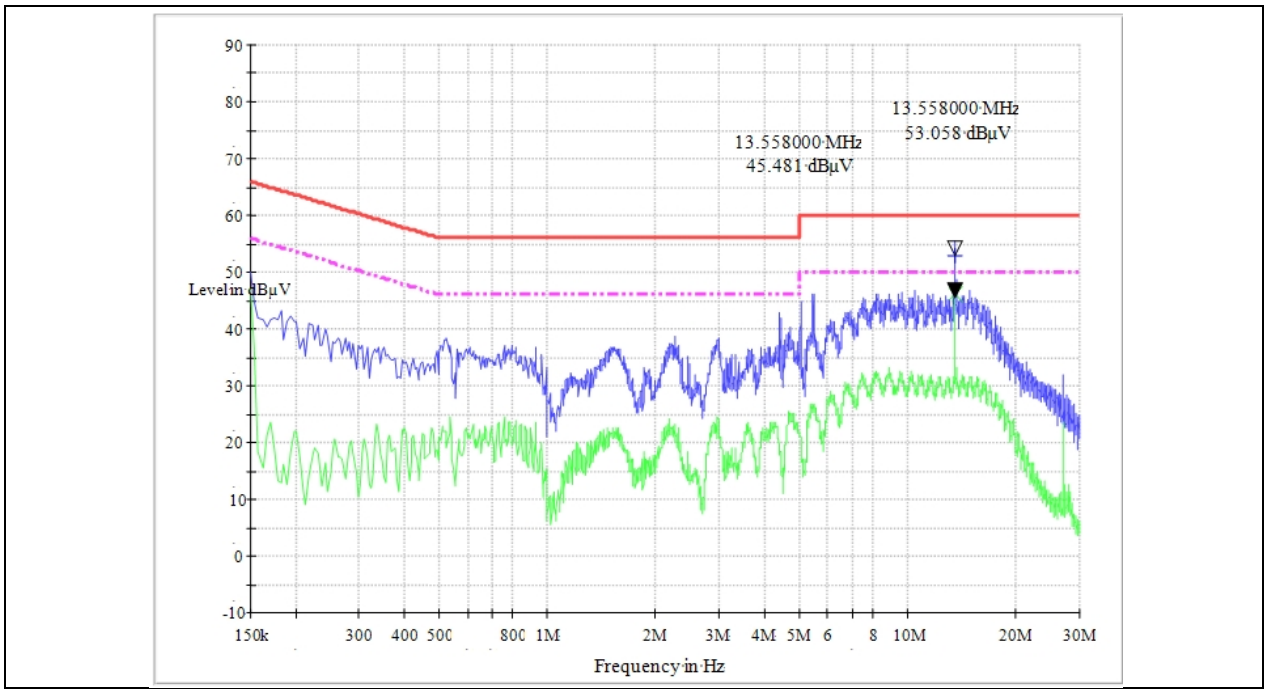
1. Line (H): Hot, Line (N): Neutral
2. All modes of operation were investigated and the worst-case emissions are reported.
3. The limit for Class B device(s) from 150 ㎑ to 30 ㎒ are specified in Section of the Title 47 CFR.
4. Traces shown in plot made using a peak detector and average detector.
5. Deviations to the Specifications: None.
6. ▽ : Final Result in Quasi-peak detector, ▼ : Final Result in Average detector

Plots of Conducted Power line (Battery Cover without charger)

Test mode : (Hot)



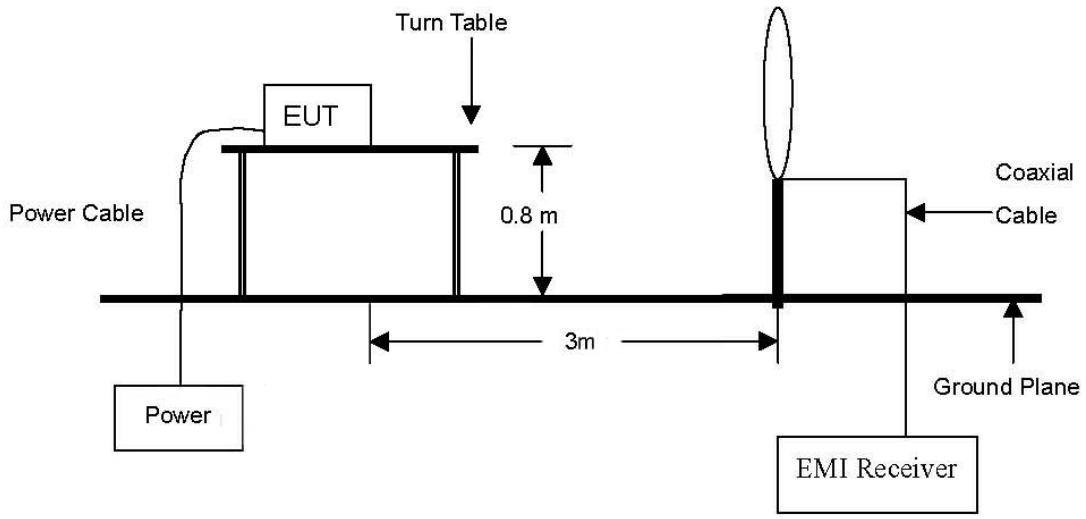
Test mode : (Neutral)



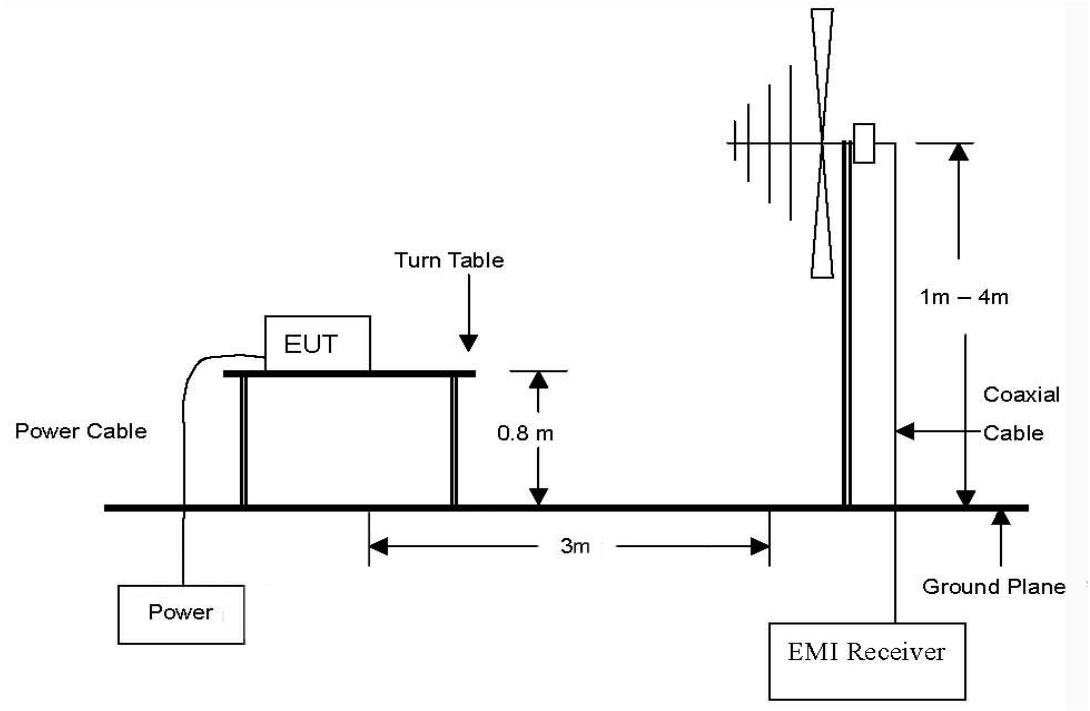
3. Radiated Emissions

3.1. Test Setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission .The spurious emissions were investigated form 1 ㎓ to the 10th harmonic of the highest fundamental frequency or 40 ㎓, whichever is lower.



3.1.1. Actual equipment used for Radiated Emissions

Equipment	Manufacturer	Model	S/N	Cal Date	Cal Interval	Cal Due.
EMI Test Receiver	R&S	ESU26	100194	Sep. 13, 2013	Annual	Sep. 13, 2014
Spectrum Analyzer	R&S	FSV30	101004	Jul. 20, 2013	Annual	Jul. 20, 2014
Signal Generator	R&S	SMR40	100540	Jan. 08, 2014	Annual	Jan. 08, 2015
Signal Generator	R&S	SMJ 100A	100882	Jul. 03, 2013	Annual	Jul. 03, 2014
Low Pass Filter	Mini circuits	NLP-1200+	V9500401023-1	Jul. 02, 2013	Annual	Jul. 02, 2014
Preamplifier	H.P.	8447D	1726A01265	Sep. 23, 2013	Annual	Sep. 23, 2014
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	9163-437	Oct. 04, 2013	Biennial	Oct. 04, 2015
Loop Antenna	SCHWARZBECK MESSELEKTRONIK	FMZB 1519	1519-039	Jul. 09, 2013	Biennial	Jul. 09, 2015
Antenna Master	INN-CO	MA4000-EP	N/A	N.C.R.	N/A	N.C.R.
Turn Table	INN-CO	DT-3000S-3T	N/A	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (21.5 m × 13.0 m × 9.0 m)	N/A	N.C.R.	N/A	N.C.R.

3.1.2. Definition of DUT Axis.

- Definition of DUT three orthogonal planes were described in the test setup photo.

3.2. Limit

According to §15.225,

(a) The field strength of any emissions within the band 13.553 – 13.567 ㎒ shall not exceed 15 848 microvolts / meter at 30 meters.

(b) Within the bands 13.410 – 13.553 ㎒ and 13.567 -13.710 ㎒, the field strength of any emissions shall not exceed 334 microvolts / meter at 30 meters.

(c) Within the bands 13.110 – 13.410 ㎒ and 13.710 – 14.010 ㎒ the field strength of any emissions shall not exceed 106 microvolts / meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110 – 14.010 ㎒ and shall not exceed the general radiated emission limits in §15.209.

3.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4-2003

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.

c. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.

d. The test-receiver system was set to Quasi peak Detect Function with Maximum Hold Mode.

e. To get a maximum emission level from the EUT, the EUT is manipulated through three orthogonal planes.

NOTE;

All modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

Worst orthogonal plan of EUT is **Z – axis** during radiation test.

Battery cover of EUT is supported to battery charging condition with wireless charger.

According to KDB648474 D03 Wireless Chargers Battery Cover v01r02, transmitter spurious emissions measurement had to be adjusted as two kinds of test which are without battery charger and with battery charger during normal charging condition in radiation spurious emission.

3.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

3.4.1. Battery Cover without charger

The following table shows the highest levels of radiated emissions.

-Fundamental within the band 13.553 – 13.567 ㎒

Radiated Emissions			Ant	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 30 m	Limit (dB㎶/m) at 30 m	Margin (dB)
13.560	19.00	Quasi-Peak	H	20.12	0.64	39.76	-0.24	84.00	84.24

-Spurious emission within the bands 13.410 – 13.553 ㎒ and 13.567 -13.710 ㎒

Radiated Emissions			Ant.	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 30 m	Limit (dB㎶/m) at 30 m	Margin (dB)
13.553	8.10	Quasi-Peak	H	20.12	0.64	28.86	-11.14	50.47	61.61
13.567	3.30	Quasi-Peak	H	20.12	0.64	24.06	-15.94	50.47	66.41

- Spurious emission within the bands 13.110 – 13.410 ㎒ and 13.710 – 14.010 ㎒

Radiated Emissions			Ant.	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 30 m	Limit (dB㎶/m) at 30 m	Margin (dB)
13.348	5.70	Quasi-Peak	H	20.11	0.63	26.44	-13.56	40.51	54.07
13.770	5.00	Quasi-Peak	H	20.12	0.64	25.76	-14.24	40.51	54.75

- Spurious emission below 30 ㎒ except for 13.110 – 14.010 ㎒

Radiated Emissions			Ant.	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 30 m	Limit (dB㎶/m) at 30 m	Margin (dB)
27.128	-2.60	Quasi-Peak	H	20.59	0.84	18.83	-21.17	29.54	50.71

- Spurious emission above 30 ㎒

Radiated Emissions			Ant.	Correction Factors		Total	FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss & Amp (dB)	Actual (dB㎶/m) at 3 m	Limit (dB㎶/m) at 3 m	Margin (dB)
40.767	15.02	Quasi-Peak	H	13.58	-24.43	4.17	40.00	35.83
71.613	12.97	Quasi-Peak	V	8.63	-24.23	-2.63	40.00	42.63
97.512	14.66	Quasi-Peak	H	12.85	-23.82	3.69	43.52	39.83
98.773	14.27	Quasi-Peak	V	13.01	-23.81	3.47	43.52	40.05
121.665	12.46	Quasi-Peak	V	10.29	-23.53	-0.78	43.52	44.30
128.940	15.13	Quasi-Peak	H	9.46	-23.47	1.12	43.52	42.40
215.658	15.26	Quasi-Peak	V	10.96	-22.71	3.51	43.52	40.01
Above 300.000	Not detected	-	-	-	-	-	-	-

Note:

1. 30 m Limit (㎶/m) = 20log (15 848) = 84.00 dB㎶/m
2. 3 m distance compensation = 40 log (3/30) = -40 dB㎶/m
3. Other Spurious Emission Frequencies were not detected up to 1 000 ㎒.

3.4.2. Battery Cover with charger

The following table shows the highest levels of radiated emissions.

-Fundamental within the band 13.553 – 13.567 ㎒

Radiated Emissions			Ant	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 30 m	Limit (dB㎶/m) at 30 m	Margin (dB)
13.560	24.70	Quasi-Peak	V	20.12	0.64	45.46	5.46	84.00	78.54

-Spurious emission within the bands 13.410 – 13.553 ㎒ and 13.567 -13.710 ㎒

Radiated Emissions			Ant.	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 30 m	Limit (dB㎶/m) at 30 m	Margin (dB)
13.553	15.10	Quasi-Peak	V	20.12	0.64	35.86	-4.14	50.47	54.61
13.567	10.00	Quasi-Peak	V	20.12	0.64	30.76	-9.24	50.47	59.71

- Spurious emission within the bands 13.110 – 13.410 ㎒ and 13.710 – 14.010 ㎒

Radiated Emissions			Ant.	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 30 m	Limit (dB㎶/m) at 30 m	Margin (dB)
13.347	9.60	Quasi-Peak	V	20.11	0.63	30.34	-9.66	40.51	50.17
13.771	11.90	Quasi-Peak	V	20.12	0.64	32.66	-7.34	40.51	47.85

- Spurious emission below 30 ㎒ except for 13.110 – 14.010 ㎒

Radiated Emissions			Ant.	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 300 m	Limit (dB㎶/m) at 300 m	Margin (dB)
*0.150	43.00	Average	H	19.99	0.04	63.03	-16.97	24.08	41.05

- Spurious emission above 30 ㎒

Radiated Emissions			Ant.	Correction Factors		Total	FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss & Amp (dB)	Actual (dB㎶/m) at 3 m	Limit (dB㎶/m) at 3 m	Margin (dB)
40.670	32.00	Quasi-Peak	V	13.58	-24.44	21.14	40.00	18.86
85.193	26.38	Quasi-Peak	V	10.28	-23.98	12.68	40.00	27.32
193.639	24.46	Quasi-Peak	H	10.29	-22.85	11.90	43.50	31.60
307.905	19.97	Quasi-Peak	V	13.22	-22.13	11.06	46.00	34.94
551.569	24.29	Quasi-Peak	H	17.54	-22.60	19.23	46.00	26.77
544.294	25.31	Quasi-Peak	V	17.41	-22.61	20.11	46.00	25.89
723.453	31.53	Quasi-Peak	V	19.34	-21.81	29.06	46.00	16.94
Above 800.000	Not detected	-	-	-	-	-	-	-

Note:

1. 30 m Limit (㎶/m) = 20log (15 848) = 84.00 dB㎶/m
2. 3 m distance compensation = 40 log (3/30) = -40 dB㎶/m
3. 300 m distance compensation = 40 log (3/300) = -80 dB㎶/m
4. Other Spurious Emission Frequencies were not detected up to 1 000 ㎒.
5. Refer to the next page with respect to " * " mark.

- The spurious at 150 ㎑ exceed the level of the fundamental. So, we had performed additional test as following.

1. Additional test was performed with another device.

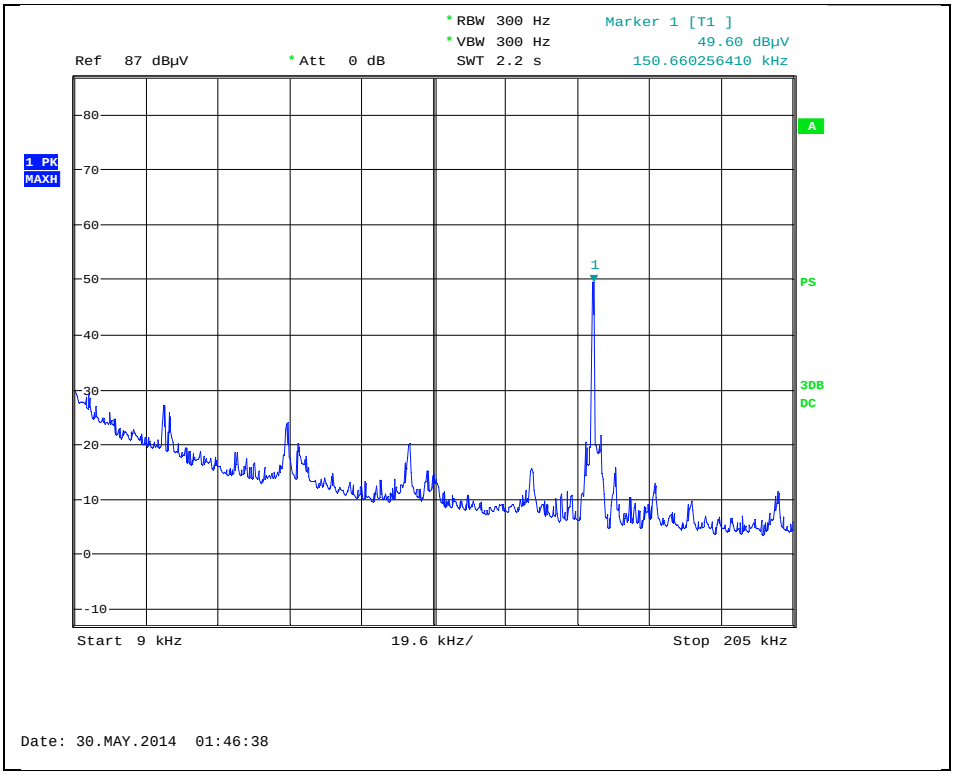
1-1. Information of additional test device.

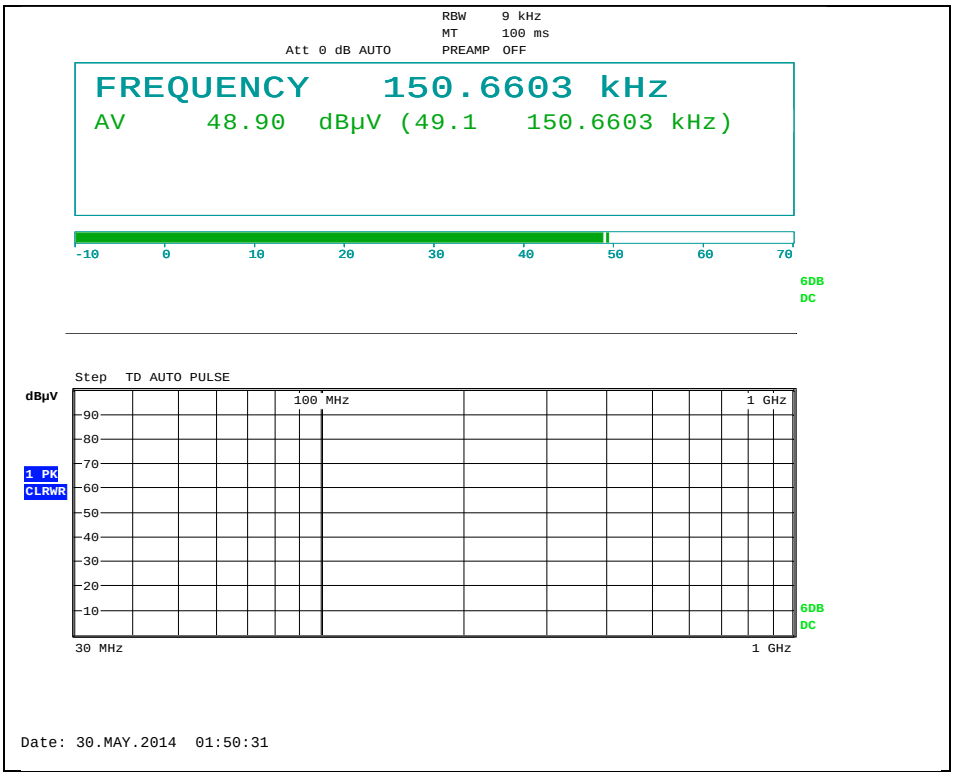
Description	Manufacturer	Model
Mobile phone	Samsung Electronics Co., Ltd.	SM-W750V

1-2. The Charging mode Spurious emission at 150 ㎑ with another device.

Radiated Emissions			Ant.	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 300 m	Limit (dB㎶/m) at 300 m	Margin (dB)
0.151	49.10	Average	H	19.99	0.04	69.13	-10.87	24.02	34.89

- Test Plots





1-3. Conclusion

- The signal has been generated at the same frequency during another device being charged.
- Therefore, the signal at 150 ㎑ is caused by the wireless charger pad.

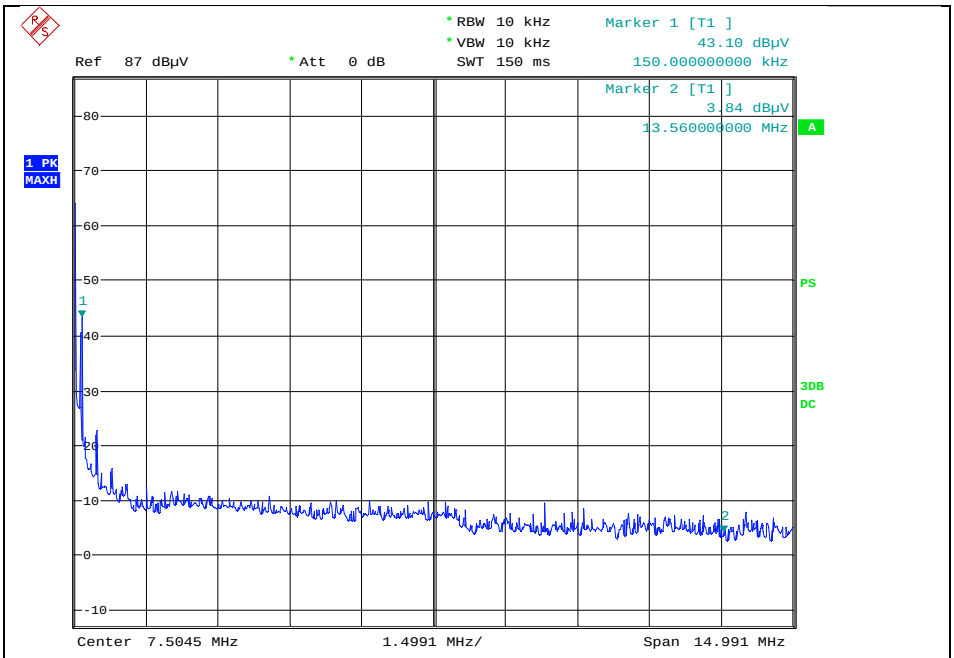
2. Additional test was performed with EUT

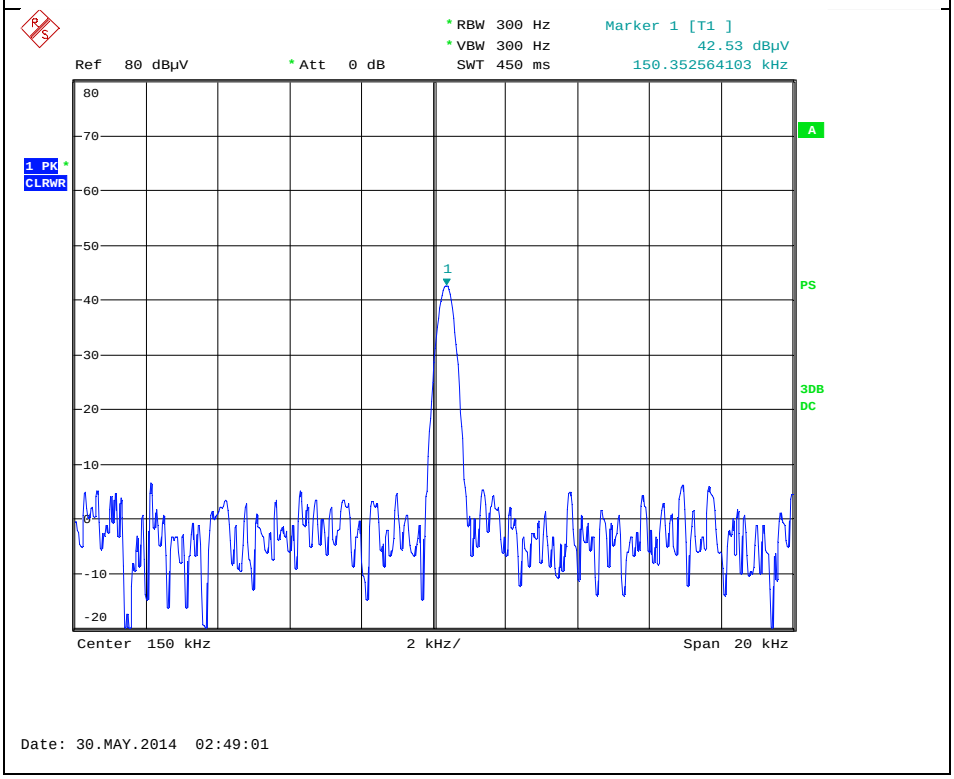
- Test Mode : All transmit function off mode.

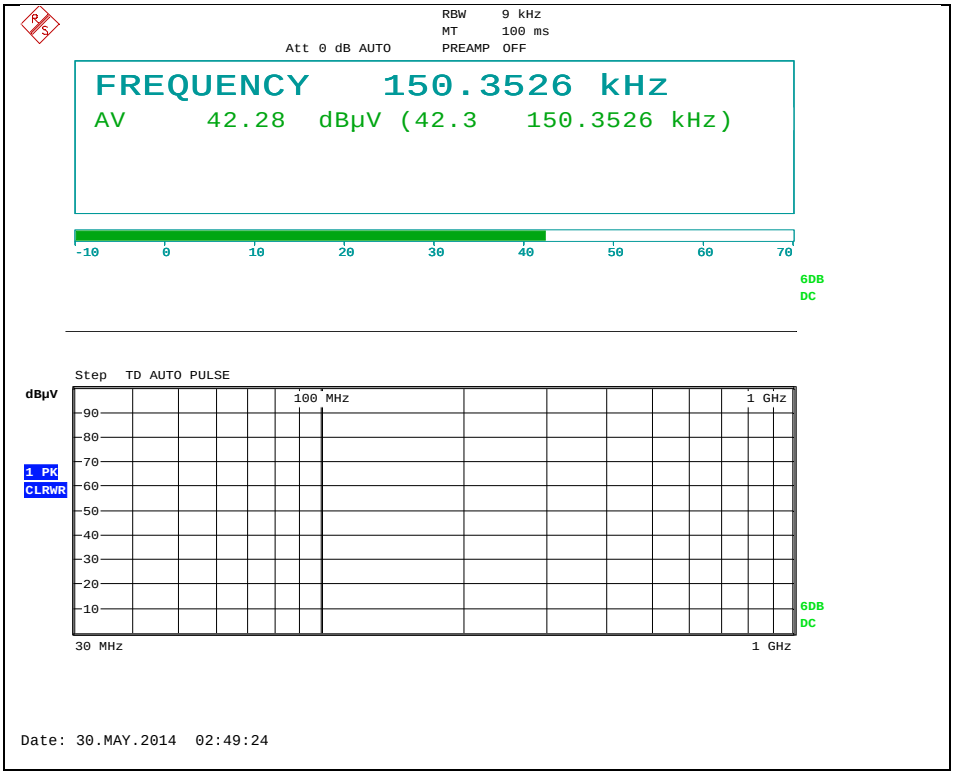
2-2. The Charging mode Spurious emission at 150 ㎑

Radiated Emissions			Ant.	Correction Factors		Total		FCC Limit	
Freq. (㎒)	Reading (dB㎶)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m) at 3 m	Actual (dB㎶/m) at 300 m	Limit (dB㎶/m) at 300 m	Margin (dB)
0.150	42.30	Average	H	19.99	0.04	62.33	-17.67	24.08	41.75

- Test Plots





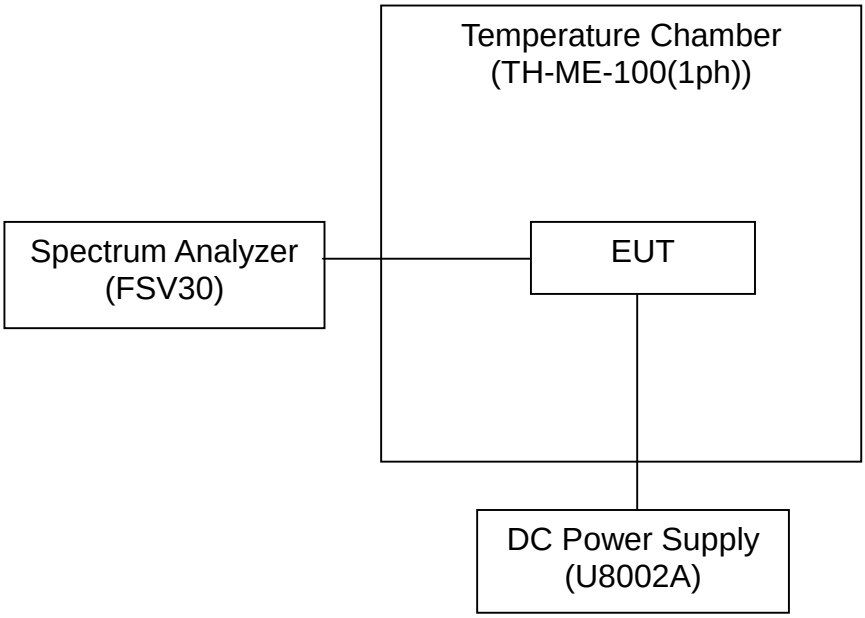


2-3. Conclusion

- The signal has been generated at the same frequency and level during the EUT being charged with all transmit function off mode.
- Therefore, the signal at 150 ㎑ is not caused by the EUT, it comes from wireless charger pad.

4. Frequency Stability

4.1. Test Setup



4.1.1. Actual equipment used for Frequency Stability

Equipment	Manufacturer	Model	S/N	Cal Date	Cal Interval	Cal Due.
Spectrum Analyzer	R&S	FSV30	101004	Jul. 20, 2013	Annual	Jul. 20, 2014
Signal Generator	R&S	SMR40	100540	Jan. 08, 2014	Annual	Jan. 08, 2015
Temperature Chamber	JEIO TECH	TH-ME-100(1ph)	S040281	Jun. 28, 2013	Annual	Jun. 28, 2014
Attenuator	MCLI	FAS-12-10	1-1	Jul. 03, 2013	Annual	Jul. 03, 2014
DC Power Supply	Agilent	U8002A	MY48490027	Jan. 03, 2014	Annual	Jan. 03, 2015

4.2. Limit

According to §15.225(e), the frequency tolerance of the carrier signal shall be maintained within +/- 0.01 % of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85 % to 115 % of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

4.3. Test Procedures

a. Place the EUT on the table and set it in the transmitting mode.
b. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
c. Set the environment into appropriate environment.
d. Set the spectrum analyzer as RBW = 10 ㎑, VBW = 30 ㎑, Span = 1 ㎒, Sweep time = auto.
e. Mark the peak frequency and measure the frequency tolerance using frequency counter function.
f. Repeat until all the results are investigated.

4.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Operating Frequency : 13 560 000 Hz
Reference Voltage : DC 3.80 V
Deviation Limit : ± 0.01 % = ± 1 356 Hz

Temperature Variations

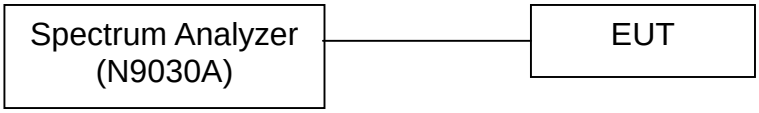
Power (V_{DC})	Temperature (℃)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
3.80	-20	13 559 417	-583	-0.004 299
	-10	13 559 433	-567	-0.004 181
	0	13 559 432	-568	-0.004 189
	+10	13 559 425	-575	-0.004 240
	+20(Ref)	13 559 379	-621	-0.004 580
	+25	13 559 351	-649	-0.004 786
	+30	13 559 344	-656	-0.004 838
	+40	13 559 315	-685	-0.005 052
	+50	13 559 281	-719	-0.005 302

Voltage Variations

Power (V_{DC})	Temperature (℃)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
Battery End Point(3.05)	+20	13 559 311	-689	-0.005 081
115 % (4.37)	+20	13 559 376	-624	-0.004 602

5. 20 dB Bandwidth

5.1. Test Setup



5.1.1. Actual equipment used for Frequency Stability

Equipment	Manufacturer	Model	S/N	Cal Date	Cal Interval	Cal Due.
Spectrum Analyzer	Agilent	N9030A	MY53120526	Jul. 30, 2013	Annual	Jul. 30, 2014
Signal Generator	R&S	SMR40	100540	Jan. 08, 2014	Annual	Jan. 08, 2015
Attenuator	MCLI	FAS-12-10	1-1	Jul. 03, 2013	Annual	Jul. 03, 2014
DC Power Supply	Agilent	U8002A	MY48490027	Jan. 03, 2014	Annual	Jan. 03, 2015

5.2. Limit

None; for reporting purposes only.

5.3. Test Procedures

a. Place the EUT on the table and set it in the transmitting mode.
b. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
c. Set the spectrum analyzer as RBW = 10 ㎑, VBW = 30 ㎑, Span = 2 ㎒, Sweep time = auto.
d. Mark the peak frequency and 20 dB (upper and lower) frequency.
e. Repeat until all the rest channels are investigated.

5.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Frequency (㎒)	20 ㏈ Bandwidth (㎑)
13.56	446