HCT CO.,LTD

HCT CO., LTD.

CERTIFICATE OF COMPLIANCE

FCC Certification

Applicant Name:
LG Electronics MobileComm U.S.A., Inc.

Address:
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue:
August 16, 2012

Test Site/Location:
HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea

Report No.: HCTR1208FR21

HCT FRN: 0005866421

FCC ID	**: ZNFP895**
APPLICANT	**: LG Electronics MobileComm U.S.A., Inc.**

FCC Model(s):	LG-P895
Additional FCC Model(s):	P895, LGP895
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Max. RF Output Power:	5.93 dBm (3.92 mW)
Frequency Range:	2402 MHz -2480 MHz(BT 4.0_Low Energy Mode)
Modulation type	GFSK
FCC Classification:	Digital Transmission System(DTS)
FCC Rule Part(s):	Part 15.247

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by
: Jong Seok Lee
Test engineer of RF Team

Approved by
: Chang Seok Choi
Manager of RF Team

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1208FR21	August 16, 2012	HCTR1207FRxx

Table of Contents

1. GENERAL INFORMATION

Applicant:	LG Electronics MobileComm U.S.A., Inc.
Address:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID:	ZNFP895
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Model name(s):	LG-P895
Additional Model name(s):	P895, LGP895
Date(s) of Tests:	July 22, 2012 ~ August 03, 2012
Place of Tests:	HCT Co., Ltd. 105-1, Jangam-ri , Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, KOREA. (IC Recognition No. : 5944A-3)

2. EUT DESCRIPTION

EUT Type	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC	
FCC Model Name	LG-P895	
Additional FCC Model Name	P895, LGP895	
Power Supply	DC 3.7 V	
Battery type	Li-ion Battery(Standard)	
Frequency Range	TX: 2402 MHz ~ 2480 MHz RX: 2402 MHz ~ 2480 MHz	
Max. RF Output Power	Peak	5.93 dBm (3.9174 mW)
	Average	-3.54 dBm (0.4426 mW)
BT Operating Mode	BT 4.0_Low Energy Mode	
Modulation Type	GFSK	
Number of Channels	40 Channels	
Antenna Specification	Manufacturer: LS Mtron Ltd. Antenna type: Internal Antenna Peak Gain : 0.88 dBi	

3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz(ANSI C63.4-2003)

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated March 02, 2011 (Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203

7. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	§15.247(a)(2)	> 500 kHz	CONDUCTED	PASS
Conducted Maximum Peak Output Power	§15.247(b)(3)	< 1 Watt		PASS
Power Spectral Density	§15.247(e)	< 8 dBm / 3 kHz Band		PASS
Band Edge(Out of Band Emissions)	§15.247(d)	Conducted < 20 dBc		PASS
AC Power line Conducted Emissions	§15.207	cf. Section 8.6		PASS
Radiated Spurious Emissions	§15.205, 15.209	cf. Section 8.5.1	RADIATED	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 8.5.2		PASS

8. TEST RESULT

8.1 6dB BANDWIDTH MEASUREMENT

Test Requirements and limit, §15.247(a)(2)

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

The minimum permissible 6dB bandwidth is 500 kHz.

▣ TEST CONFIGURATION

▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

RBW = 1 – 5 % of the EBW

VBW = 3 * RBW

SPAN = 5 MHz

Detector = Peak

Trace mode = max hold

Sweep = auto couple

▣ TEST RESULTS

Conducted 6dB Bandwidth Measurements

LE Mode		Measured Bandwidth [kHz]	Minimum Bandwidth [kHz]	Pass / Fail
Frequency [MHz]	Channel No.			
2402	0	668.4	500	Pass
2440	19	670.3	500	Pass
2480	38	669.8	500	Pass

▣ RESULT PLOTS

6dB Bandwidth plot (Low-CH 0)

6dB Bandwidth plot (Mid-CH 19)

6dB Bandwidth plot (High-CH 38)

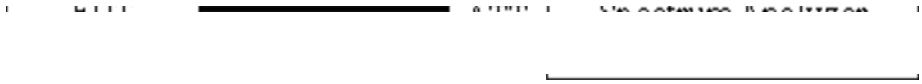
8.2 OUTPUT POWER MEASUREMENT

Test Requirements and limit, §15.247(b)(3)

A transmitter antenna terminal of EUT is connected to the input of a Spectrum Analyzer. Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

The maximum permissible conducted output power is 1 Watt.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We use the spectrum analyzer's integrated band power measurement function. We tested according to 718828 DTS Measurement Guidance DR01.

This EUT TX condition is actual operating mode (not near 100 % duty cycle) by WLAN test program.

The Spectrum Analyzer is set to

- Peak Power(Measurement Procedure PK2 in KDB 558074)

RBW = 1 MHz
VBW = 3 MHz
SPAN = 5 – 30 % greater than the EBW
Detector Mode = Peak
Integrated bandwidth = EBW
Sweep = auto couple
Trace Mode = max hold

- Average Power(Measurement Procedure AVG2 in KDB 558074)

RBW = 1 MHz
VBW = 3 MHz
SPAN = 5 – 30 % greater than the EBW
Detector Mode = power averaging(RMS) or sample
Integrated bandwidth = EBW
Sweep = auto couple
Sweep Point = 1001
Trace average at least 100 traces in power averaging(RMS) mode

▣ Sample Calculation

Output Power = Reading Value + ATT loss + Cable loss(1 ea)

= 10 dBm + 10 dB + 0.8 dB = 20.8 dBm

Note :

1. Spectrum reading values are not plot data. The power results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is 10.11 dB at 2402 MHz and is 10.13 dB at 2480 MHz. So, the offset is 10.1 dB. And the offset gap in the 2.4 GHz range do not affect the conducted output power final result.

▣ TEST RESULTS-Peak

Conducted Output Power Measurements

LE Mode		Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.		
2402	0	4.68	30
2440	19	5.53	30
2480	38	5.93	30

▣ TEST RESULTS-Average

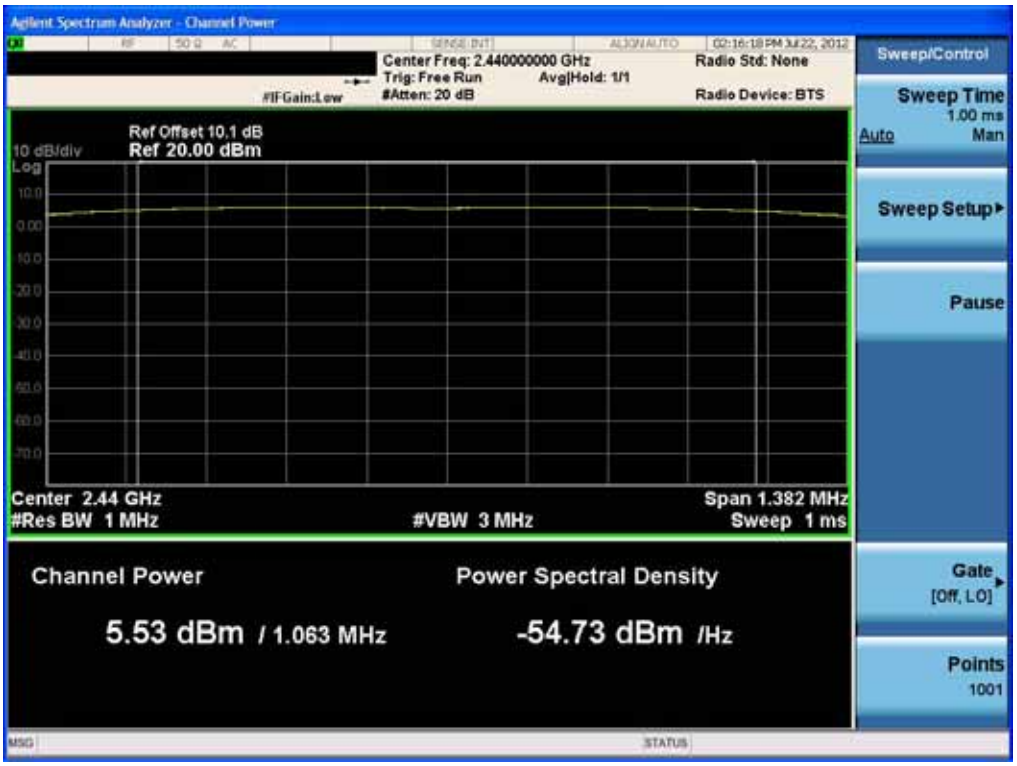
Conducted Output Power Measurements

LE Mode		Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.		
2402	0	-4.70	30
2440	19	-3.86	30
2480	38	-3.54	30

▣ RESULT PLOTS-Peak

Conducted Output Power (Low-CH 0)

Conducted Output Power (Mid-CH 19)



Conducted Output Power (High-CH 38)

▣ RESULT PLOTS-Average

Conducted Output Power (Low-CH 0)

Conducted Output Power (Mid-CH 19)

Conducted Output Power (High-CH 38)

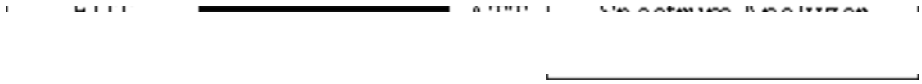
8.3 POWER SPECTRAL DENSITY

Test Requirements and limit, §15.247(e)

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Minimum Standard – The transmitter power density average over 1-second interval shall not be greater than 8dBm in any 3kHz BW.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

We tested according to KDB 558074(issued 1/18/2012).

The spectrum analyzer is set to :

1. Span = 5 – 30 % greater than the EBW
2. RBW = 100 kHz
3. VBW = 300 kHz
4. Sweep = Auto couple
5. Detector Mode = Peak
6. Trace Mode = Max hold
7. Search peak

▣ Sample Calculation

PSD = Reading Value + ATT loss + Cable loss(1 ea) + BWCF

Output Power = -5 dBm + 10 dB + 0.8 dB –15.2 dB= 0.6 dBm

Where: BWCF(Bandwidth Correction Factor) = 10log(3 kHz/100 kHz) = -15.2 dB

Note :

1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is 10.11 dB at 2402 MHz and is 10.13 dB at 2480 MHz. So, the offset is 10.1 dB. And the offset gap in the 2.4 GHz range do not affect the power spectral density final result.

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Spectrum Value(dBm)	BWCF (dB)	PSD (dBm)	Limit (dBm)	Pass/ Fail
2402	0	LE	4.572	-15.2	-10.628	8	Pass
2440	19		5.126	-15.2	-10.074	8	Pass
2480	38		5.591	-15.2	-9.609	8	Pass

Note : PSD = Spectrum Value + BWCF

▣ RESULT PLOTS

Power Spectral Density (Low-CH 0)

Power Spectral Density (Mid-CH 19)

Power Spectral Density (High-CH 38)

8.4 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Requirements and limit, §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit : 20 dBc

▣ TEST CONFIGURATION

▣ TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer.
RBW = 100 kHz(Upon 1 GHz = 1 MHz)
VBW = 300 kHz(Upon 1 GHz = 1 MHz)
Set span to encompass the spectrum to be examined
Detector = Peak
Trace Mode = max hold
Sweep = auto couple

Measurements are made over the 30 MHz to 26 GHz range with the transmitter set to the lowest, middle, and highest channels.

Note :

1. The band edge results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is 10.11 dB at 2402 MHz and is 10.13 dB at 2480 MHz. So, the offset is 10.1 dB. And the offset gap in the 2.4 GHz range do not affect the band edge final result.
5. In case of conducted spurious emissions test, please check factors blow table.

FACTORS FOR FREQUENCY

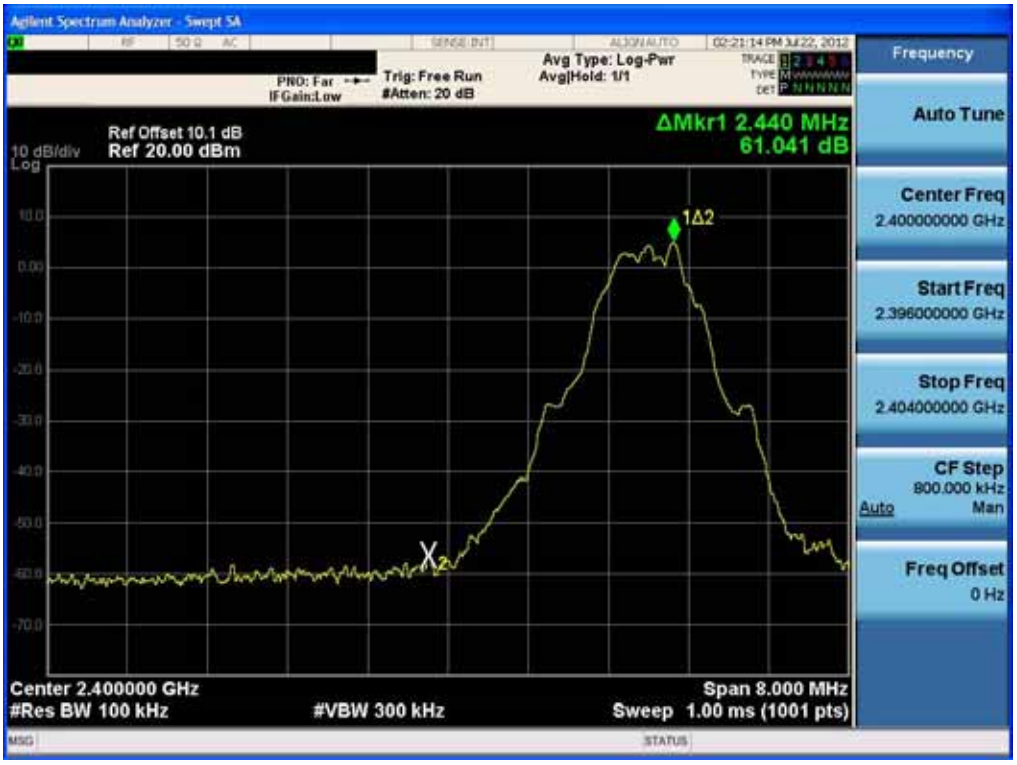
Freq(MHz)	Factor(dB)
30	10.37
100	10.16
200	10.15
300	10.14
400	10.18
500	10.19
600	10.20
700	10.30
800	10.25
900	10.28
1000	10.29
2000	10.17
2402*	10.11
2440*	10.10
2480*	10.13
3000	10.26
4000	10.31
5000	9.85
6000	10.20
7000	10.60
8000	10.53
9000	10.23
10000	10.41
11000	10.65
12000	11.19
13000	10.97
14000	11.42
15000	12.01
16000	11.77
17000	10.78
18000	10.76
19000	11.15
20000	10.75
21000	10.82
22000	10.82
23000	11.26
24000	11.08
25000	11.18
26000	10.90

Note : 1. '*' is fundamental frequency range.

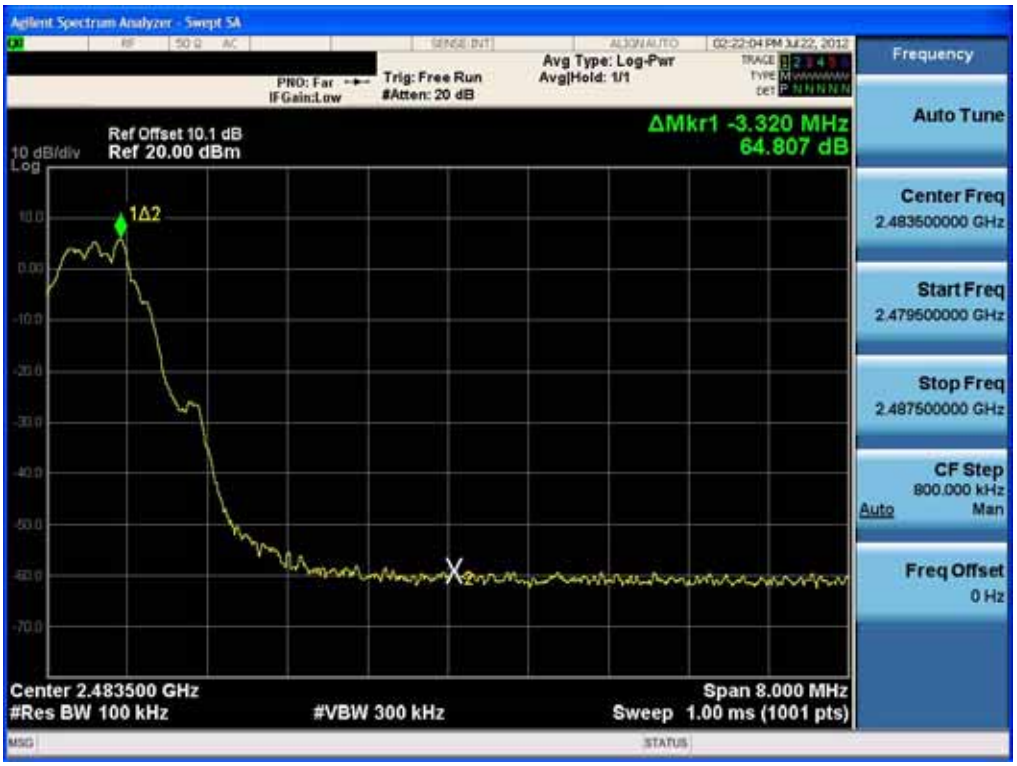
2. Factor = Cable loss + Attenuator loss

▣ RESULT PLOTS

BandEdge (Low-CH 0)

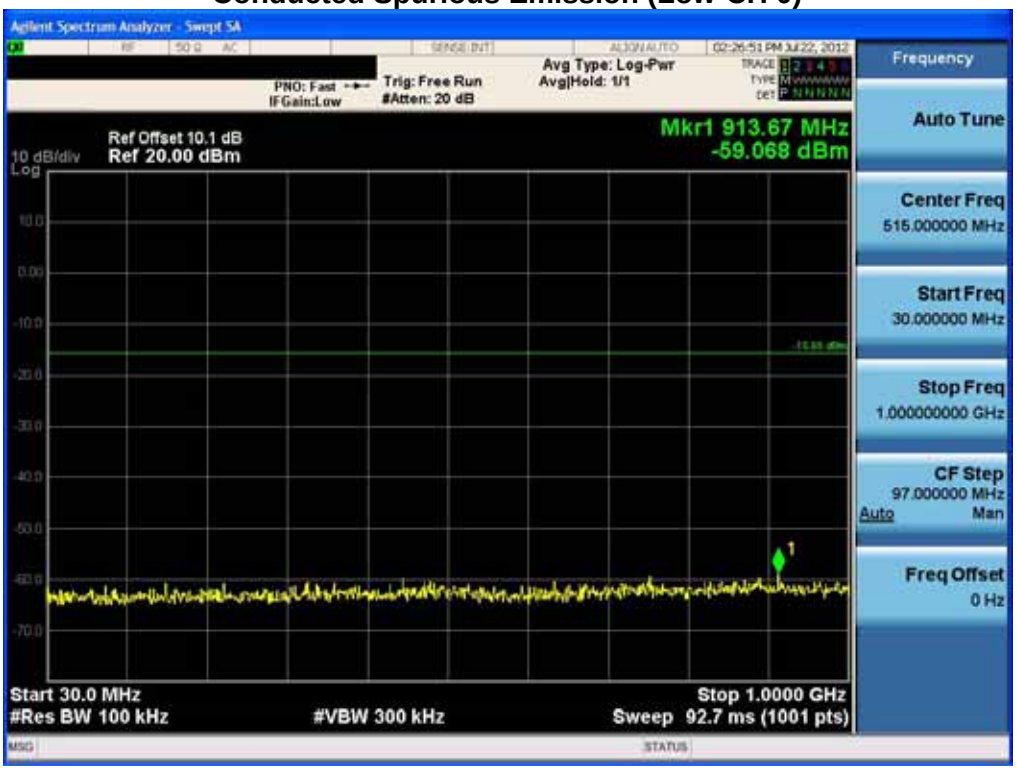


BandEdge (High-CH 38)



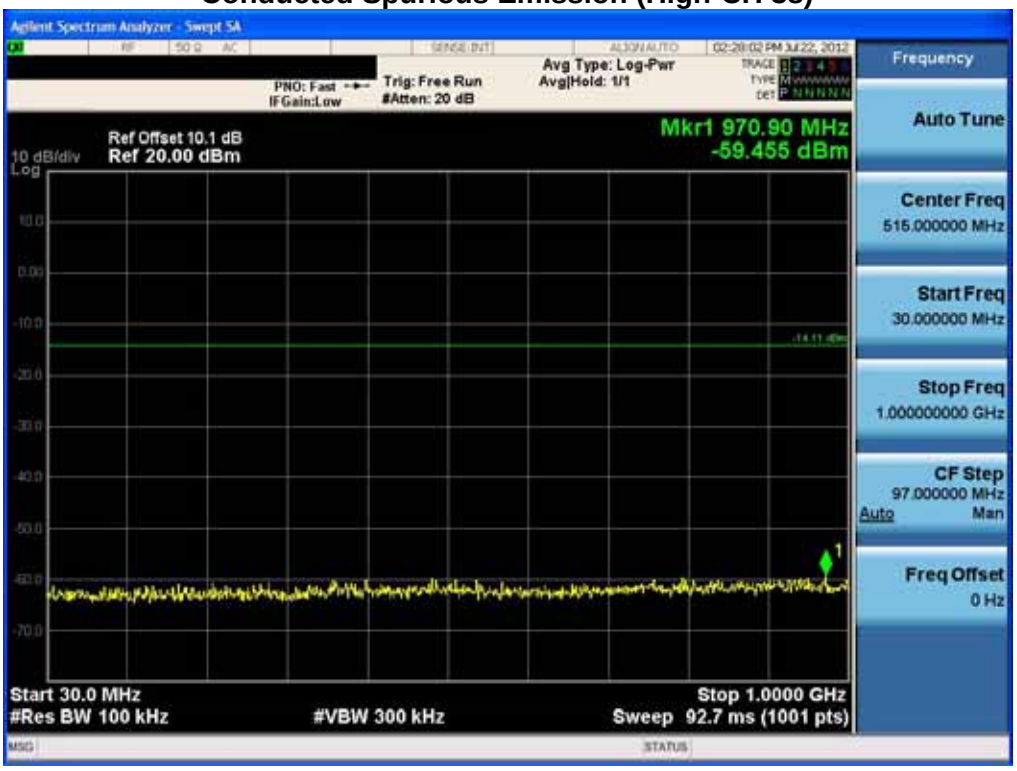
30 MHz ~ 1 GHz

Conducted Spurious Emission (Low-CH 0)



Conducted Spurious Emission (Mid-CH 19)

Conducted Spurious Emission (High-CH 38)



1 GHz ~ 26 GHz

Conducted Spurious Emission (Low-CH 0)

Conducted Spurious Emission (Mid-CH 19)

Conducted Spurious Emission (High-CH 38)

8.5 RADIATED MEASUREMENT.

8.5.1 RADIATED SPURIOUS EMISSIONS.

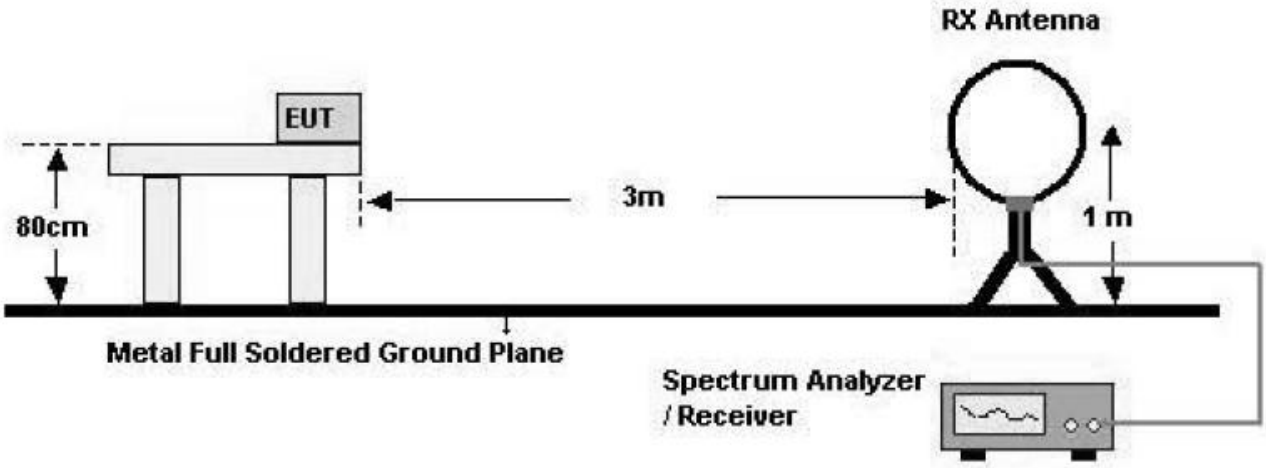
Test Requirements and limit, §15.205, §15.209

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

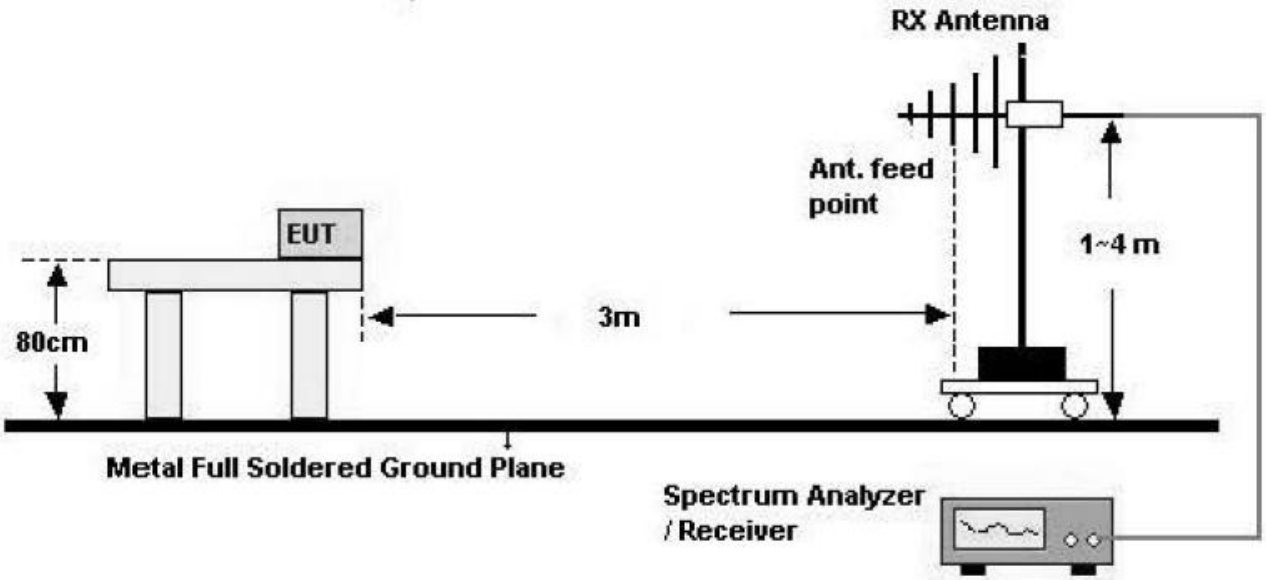
7

Test Configuration

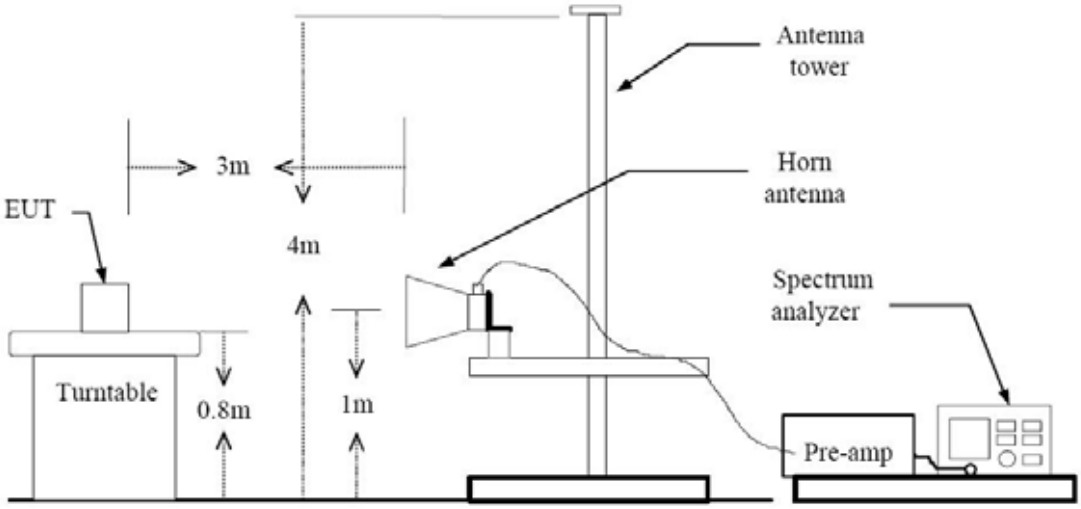
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Above 1 GHz

Operation Mode: CH Low(LE Mode)

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4804	49.46	-0.20	V	49.26	74	24.74	PK
4804	36.16	-0.20	V	35.96	54	18.04	AV
7206	47.44	10.34	V	57.78	74	16.22	PK
7206	33.96	10.34	V	44.30	54	9.70	AV
9608	47.29	13.21	V	60.50	74	13.50	PK
9608	33.86	13.21	V	47.07	54	6.93	AV
4804	48.93	-0.20	H	48.73	74	25.27	PK
4804	35.33	-0.20	H	35.13	54	18.87	AV
7206	47.75	10.34	H	58.09	74	15.91	PK
7206	33.92	10.34	H	44.26	54	9.74	AV
9608	48.22	13.21	H	61.43	74	12.57	PK
9608	34.01	13.21	H	47.22	54	6.78	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
   b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: CH Mid(LE Mode)

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4880	48.59	0.25	V	48.84	74	25.16	PK
4880	35.36	0.25	V	35.61	54	18.39	AV
7320	46.87	10.01	V	56.88	74	17.12	PK
7320	32.95	10.01	V	42.96	54	11.04	AV
9760	47.67	12.93	V	60.60	74	13.40	PK
9760	34.48	12.93	V	47.41	54	6.59	AV
4880	48.81	0.25	H	49.06	74	24.94	PK
4880	35.42	0.25	H	35.67	54	18.33	AV
7320	45.97	10.01	H	55.98	74	18.02	PK
7320	32.91	10.01	H	42.92	54	11.08	AV
9760	48.09	12.93	H	61.02	74	12.98	PK
9760	34.38	12.93	H	47.31	54	6.69	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
   b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: CH High(LE Mode)

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4960	48.26	0.75	V	49.01	74	24.99	PK
4960	35.13	0.75	V	35.88	54	18.12	AV
7440	47.42	10.11	V	57.53	74	16.47	PK
7440	33.90	10.11	V	44.01	54	9.99	AV
9920	48.30	13.37	V	61.67	74	12.33	PK
9920	34.74	13.37	V	48.11	54	5.89	AV
4960	48.80	0.75	H	49.55	74	24.45	PK
4960	35.32	0.75	H	36.07	54	17.93	AV
7440	47.88	10.11	H	57.99	74	16.01	PK
7440	33.88	10.11	H	43.99	54	10.01	AV
9920	49.72	13.37	H	63.09	74	10.91	PK
9920	34.82	13.37	H	48.19	54	5.81	AV

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
   b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.5.2 RADIATED RESTRICTED BAND EDGES

Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

Operation Mode	BT 4.0_LE
Operating Frequency	2402 MHz, 2480 MHz
Channel No	0 Ch, 38 Ch

Frequency [MHz]	*Fund. Reading dBuV	※ A.F.+CL [dB]	Ant. Pol. [H/V]	*Fundamental [dBuV/m]	Delta Value [dBuV/m]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	69.26	33.86	H	103.12	51.05	52.07	74	21.93	PK
2390.0	20.06	33.86	H	53.92	51.05	2.87	54	51.13	AV
2390.0	65.13	33.86	V	98.99	46.86	52.13	74	21.87	PK
2390.0	19.34	33.86	V	53.20	46.86	6.34	54	47.66	AV
2483.5	68.60	34.02	H	102.62	53.21	49.41	74	24.59	PK
2483.5	19.95	34.02	H	53.97	53.21	0.76	54	53.24	AV
2483.5	65.59	34.02	V	99.61	50.14	49.47	74	24.53	PK
2483.5	19.46	34.02	V	53.48	50.14	3.34	54	50.66	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss
2. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
   b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
5. Radiated Restricted Band Edge measures by marker-delta method according to ANSI C63.10(version : 2009)
6. This test is performed with hopping off.
7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
8. Marker-Delta Method

In making radiated band-edge measurements, there can be a problem obtaining meaningful data because a measurement instrument that is tuned to a band-edge frequency may also capture some

in-band signals when using the resolution bandwidth (RBW).In an effort to compensate for this problem, the following technique for determining band-edge compliance shall be used.

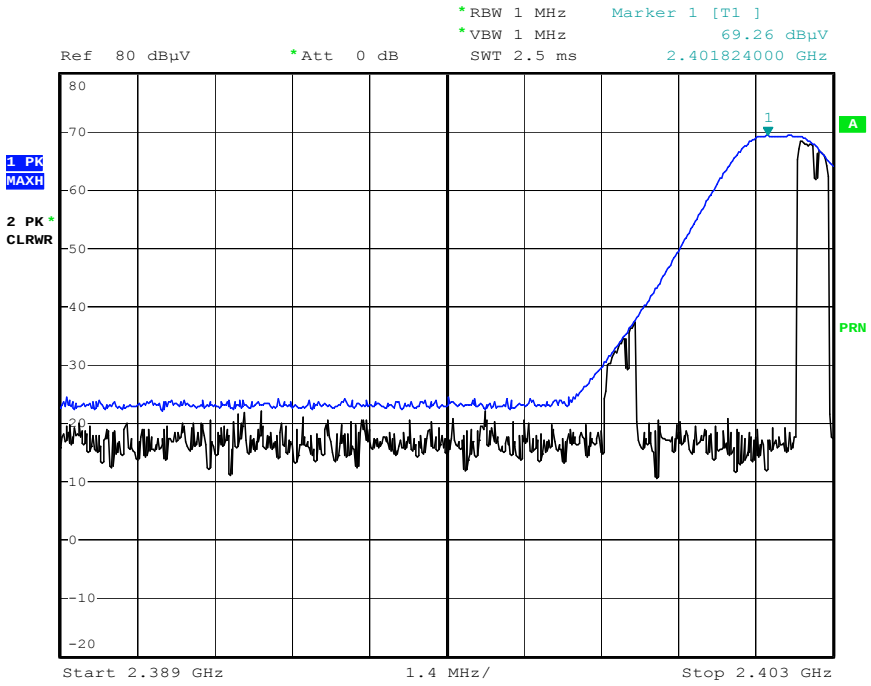
a) Perform an in-band field strength measurement of the fundamental emission using the RBW and detector function specified in 6.3 and 6.4, 6.5, or 6.6, as applicable, and the appropriate regulatory requirements for the frequency being measured. and our Rules for the frequency being measured.
For example, for a device operating in the 902-928 MHz band under 47 CFR 15.249, use a 120 kHz RBW with a CISPR QP detector (a peak detector with 100 kHz RBW may alternatively be used). For unlicensed wireless devices operating above 1 GHz, use a 1 MHz RBW, a 1 MHz VBW, and a peak detector as required by 47 CFR 15.35. Repeat the measurement with an average detector (i.e., 1 MHz RBW with 10 Hz VBW). For pulsed emissions, other factors must be included. For example note that radiated measurements of the fundamental emission of a spread spectrum unlicensed wireless device operating under 47 CFR 15.247 are not normally required, but they are necessary in connection with this procedure.

b) Choose a spectrum analyzer span that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set the analyzer RBW to approximately 1% to 5 % of the total span, unless otherwise specified, with a video bandwidth equal to or greater than the RBW. Record the peak levels of the fundamental emission and the relevant band-edge emission (i.e., run several sweeps in peak hold mode). Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not an abosolute field strength measurement; it is only a relative measurement to determine the amount by which the emission drops at the band-edge relative to the highest fundamental emission level.

c) Subtract the delta measured in b) from the field strengths measured in a). The resultant field strengths (CISPR QP, average, or peak, as appropriate) are then used to determine band-edge compliance of the resricted bands, described in 5.9.

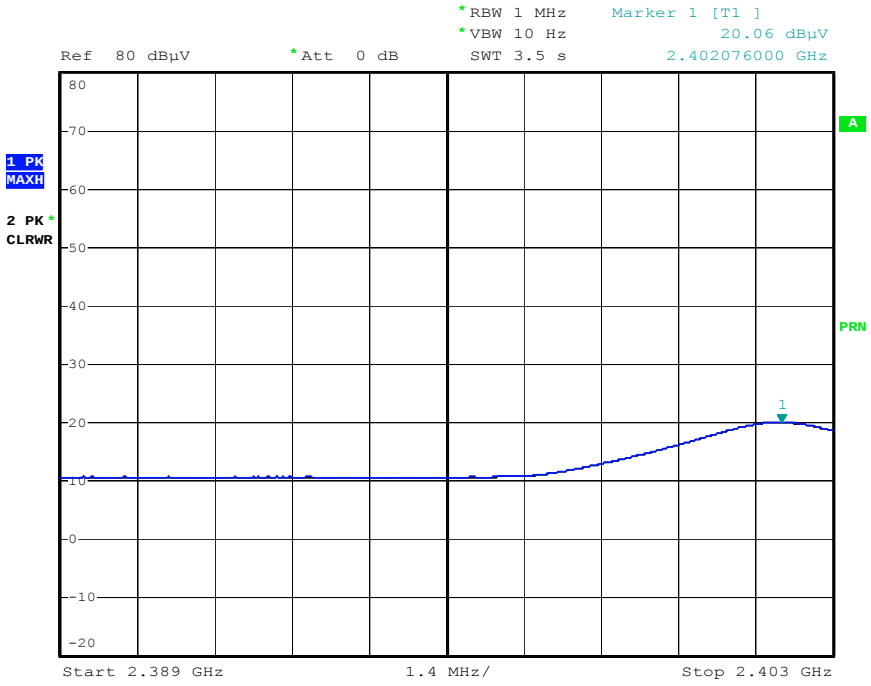
Test Plots (LE)

Fund. (Peak_Horizontal _CH 0)



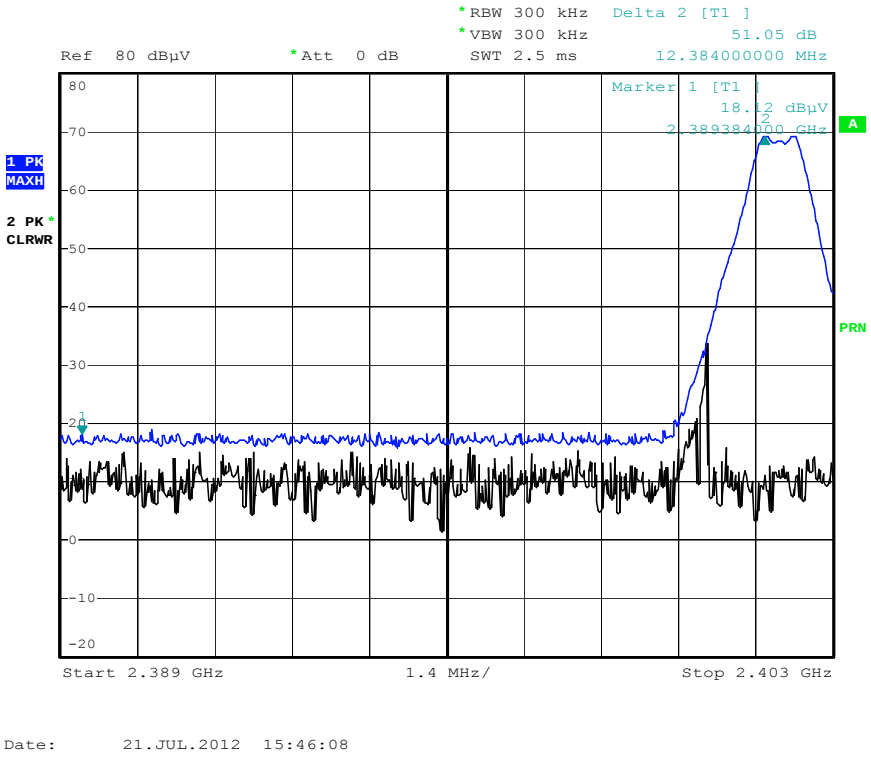
Date: 21.JUL.2012 15:44:49

Fund. (Average_Horizontal _CH 0)

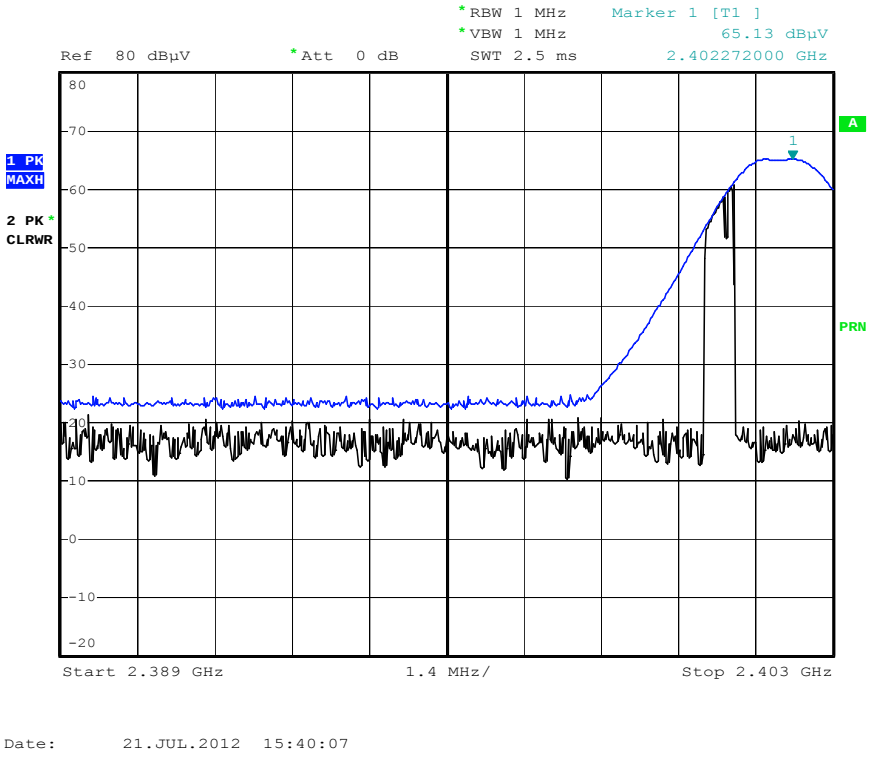


Date: 21.JUL.2012 15:45:13

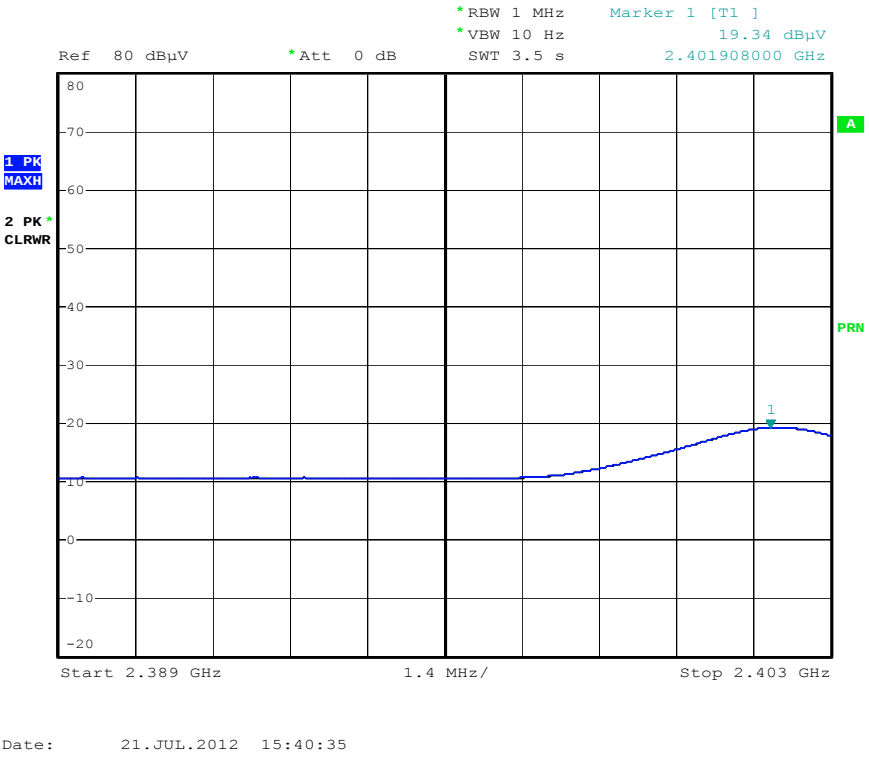
Delta (Horizontal _CH 0)



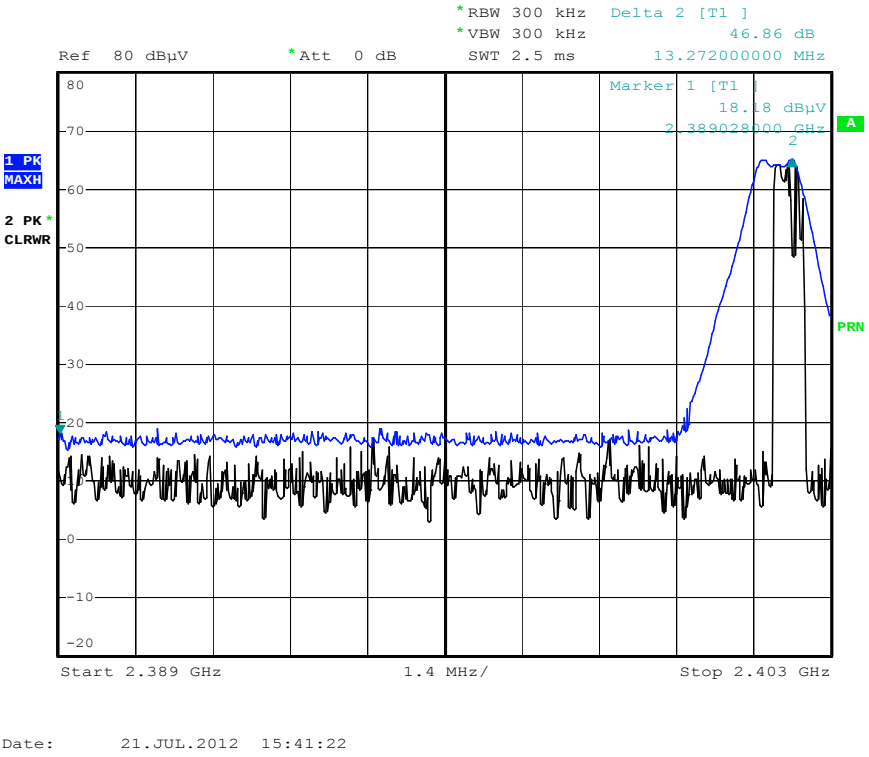
Fund. (Peak_Vertical_CH 0)



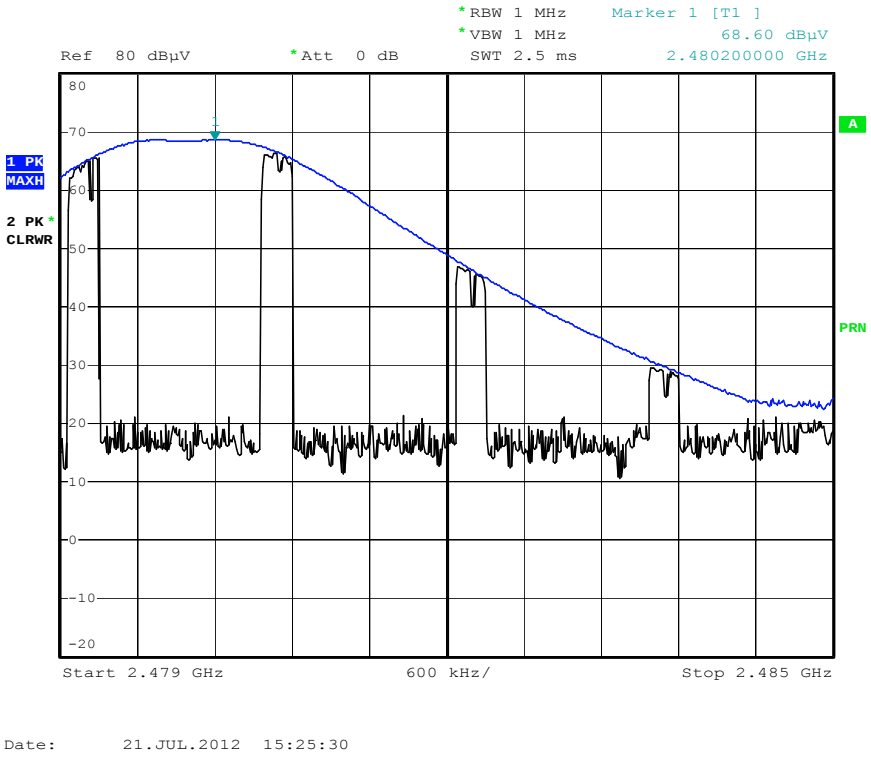
Fund. (Average_Vertical_CH 0)



Delta (Vertical_CH 0)

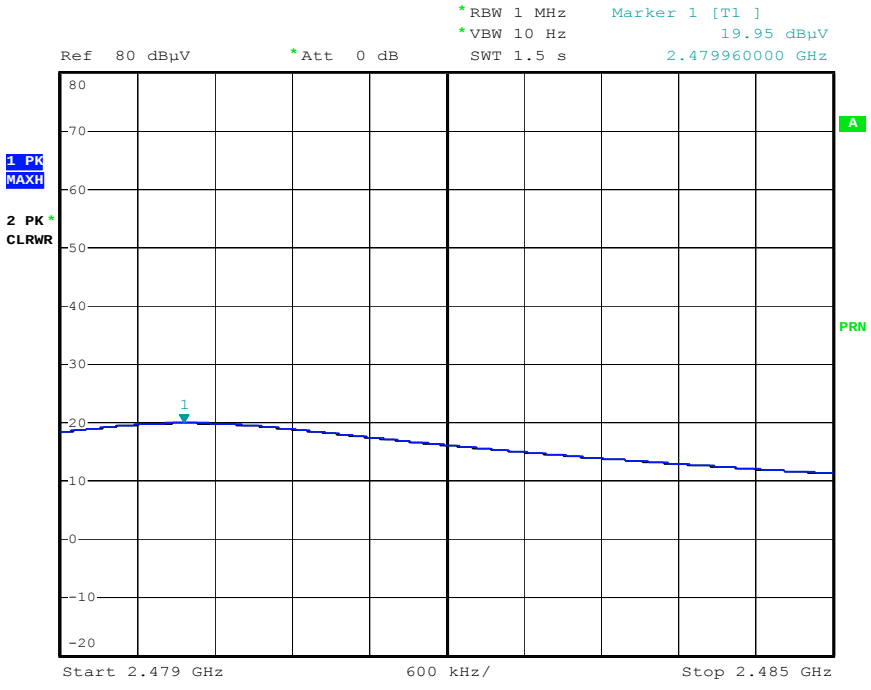


Fund. (Peak_Horizontal_CH 38)



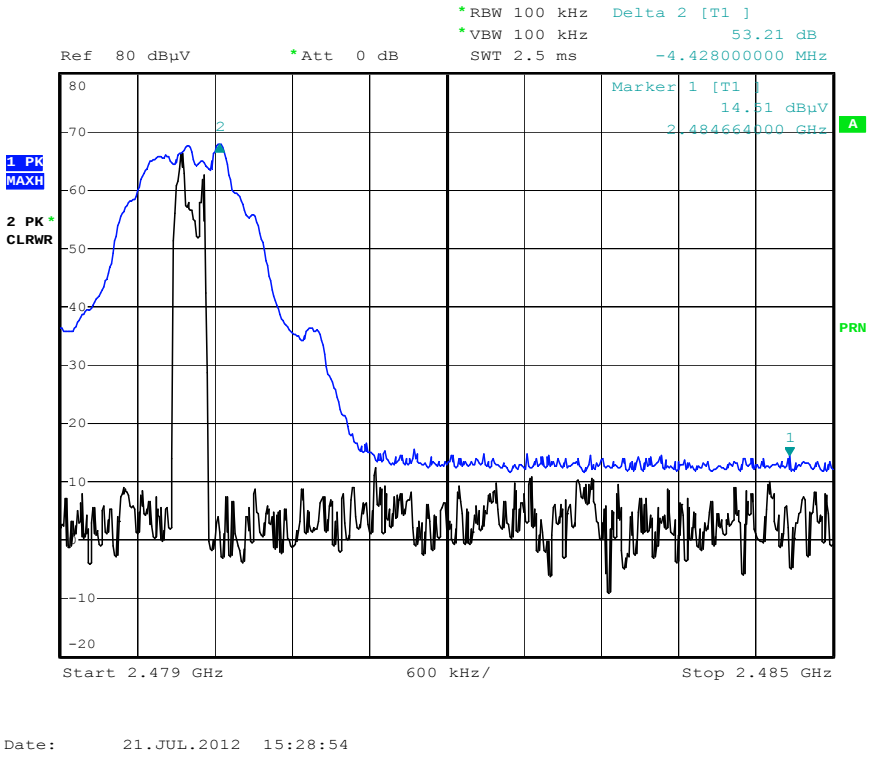
Date: 21.JUL.2012 15:25:30

Fund. (Average_Horizontal_CH 38)

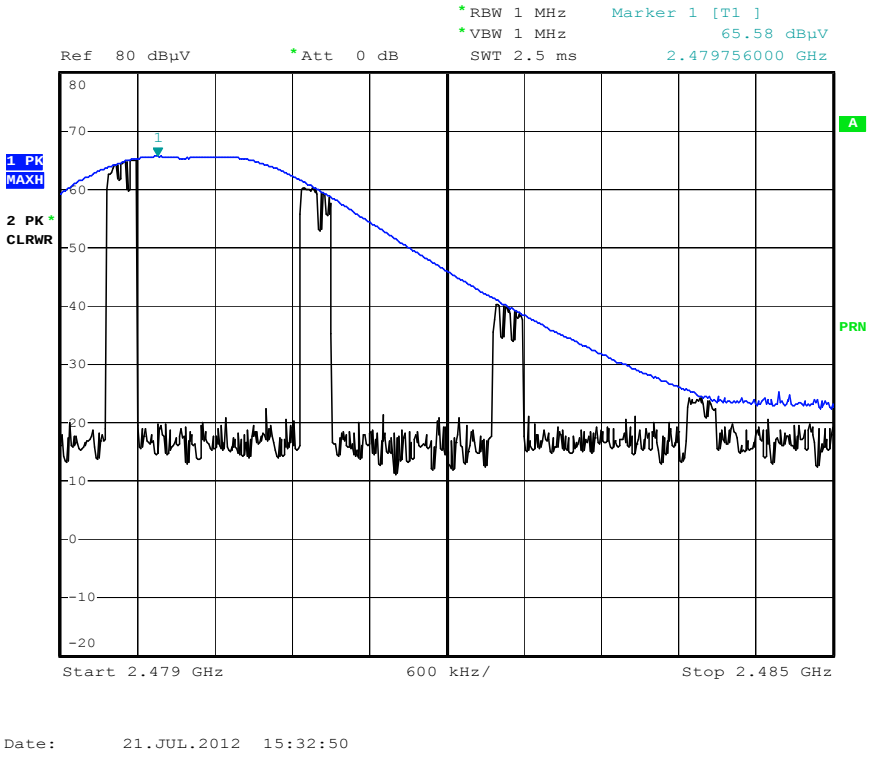


Date: 21.JUL.2012 15:27:33

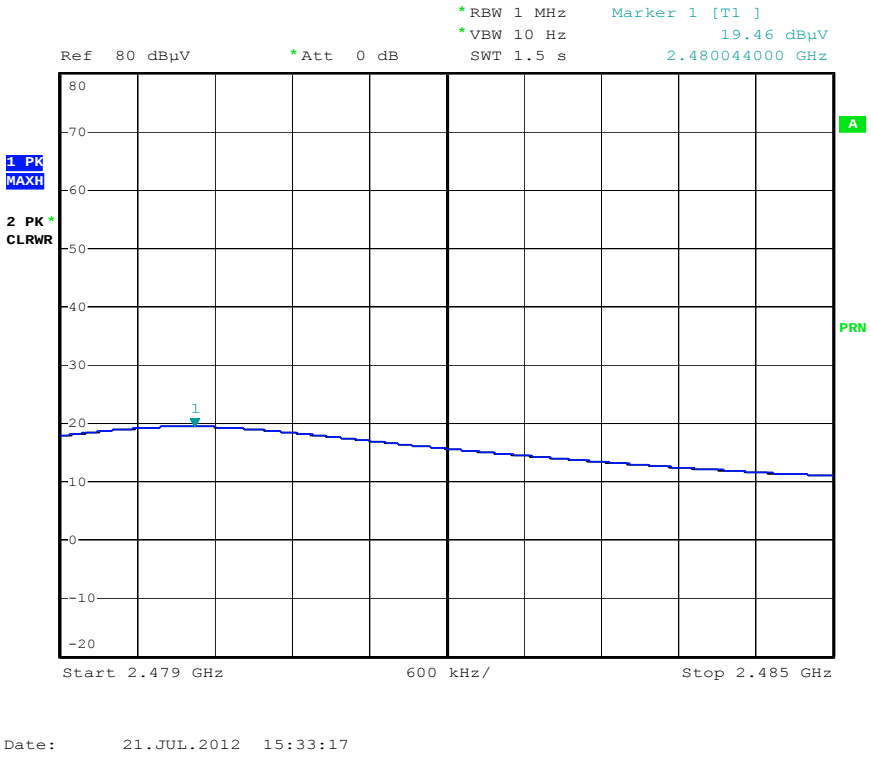
Delta (Horizontal_CH 38)



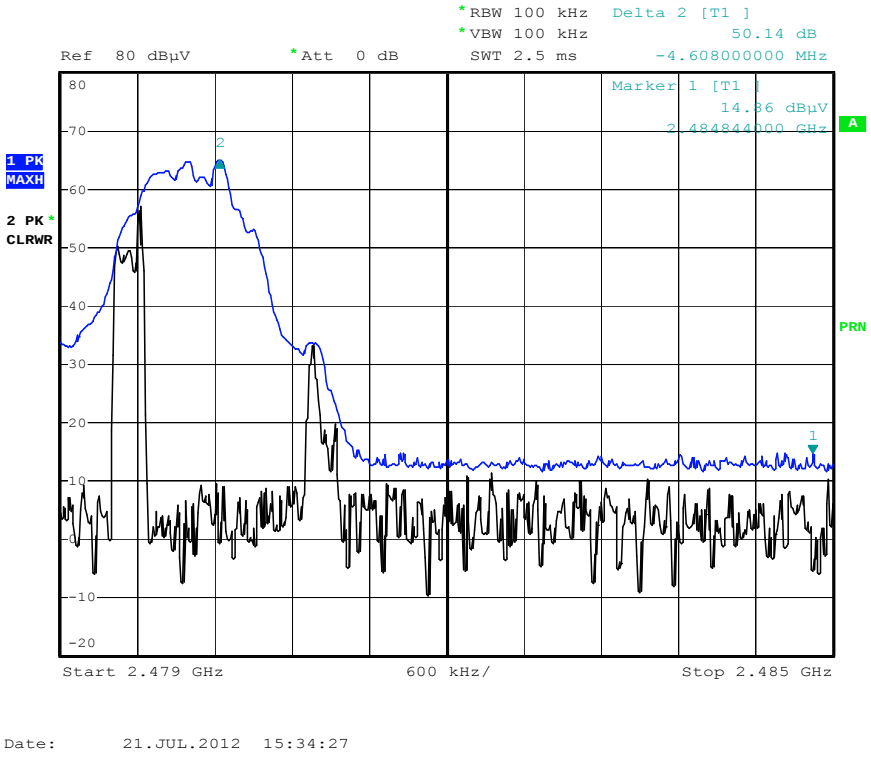
Fund. (Peak_Vertical_CH 38)



Fund. (Average_Vertical_CH 38)



Delta (Vertical_CH 38)



8.6 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207

For an intentional radiator which 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 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	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

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. We are performed the AC Power Line Conducted Emission test for Ch.19 on BT 4.0 LE mode. Because Ch.39 on BT 4.0 LE mode is worst case.

▣ RESULT PLOTS

Conducted Emissions (Line 1)

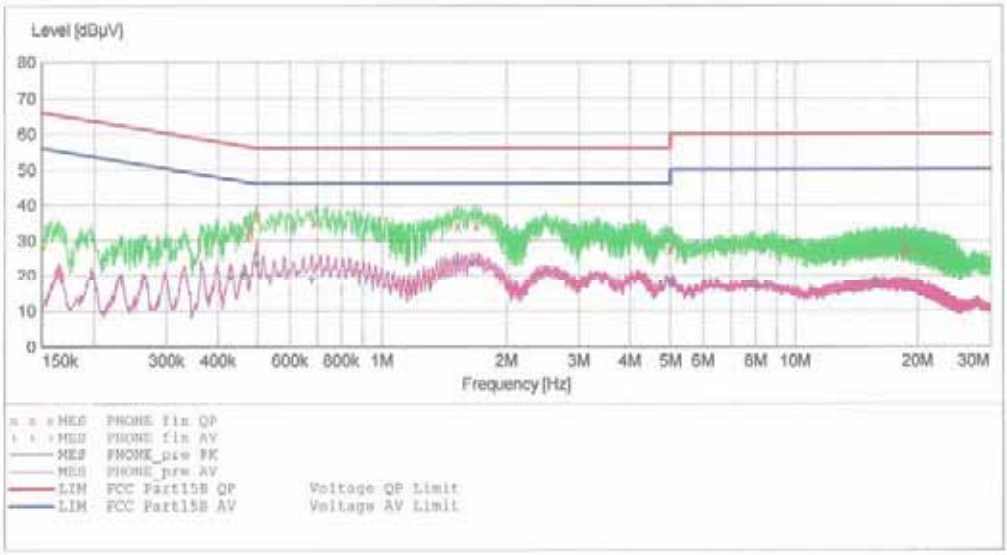
HCT

EMC

```
EUT:                  LG-P895
Manufacturer:         LG
Operating Condition:  BT 4.0 MODE
Test Site:            SHIELD ROOM
Operator:             JS LEE
Test Specification:   FCC PART 15 B
Comment:              H
```

SCAN TABLE: "FCC PART 15 B(H)"

```
Short Description:                    FCC PART 15 CLASS B
Start      Stop       Step       Detector   Meas.     IF       Transducer
Frequency  Frequency  Width                 Time      Bandw.
150.0 kHz  500.0 kHz  1.0 kHz    MaxPeak    10.0 ms   9 kHz    None
                                  Average
500.0 kHz  5.0 MHz    4.0 kHz    MaxPeak    10.0 ms   9 kHz    None
                                  Average
5.0 MHz    30.0 MHz   4.0 kHz    MaxPeak    10.0 ms   9 kHz    None
                                  Average
```



MEASUREMENT RESULT: "PHONE_fin QP"

```
8/3/2012  3:42PM
   Frequency     Level   Transd   Limit   Margin   Line    PE
       MHz       dBµV      dB     dBµV       dB
  0.471010      31.20     9.8       57     25.3   ---     ---
  0.478010      33.30     9.8       56     23.1   ---     ---
  0.497010      37.00     9.8       56     19.1   ---     ---
  0.696000      35.40     9.8       56     20.6   ---     ---
  1.524000      34.20     9.9       56     21.8   ---     ---
  1.692000      34.20     9.9       56     21.8   ---     ---
  5.000000      27.60    10.2       56     28.4   ---     ---
 18.584000      27.30    11.5       60     32.7   ---     ---
 18.712000      27.00    11.6       60     33.0   ---     ---
```

```
Page 1/2   8/3/2012  3:43PM   PHONE
```

MEASUREMENT RESULT: "PHONE_fin AV"

8/3/2012 3:42PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.430010	19.30	9.8	47	28.0	---	---
0.462010	20.40	9.8	47	26.3	---	---
0.497010	23.50	9.8	46	22.6	---	---
0.680000	18.80	9.8	46	27.2	---	---
1.516000	23.90	9.9	46	22.1	---	---
1.648000	23.90	9.9	46	22.1	---	---
5.000000	18.30	10.2	46	27.7	---	---
8.028000	17.20	10.3	50	32.8	---	---
15.648000	17.90	11.1	50	32.1	---	---

Page 2/2 8/3/2012 3:43PM PHONE

Conducted Emissions (Line 2)

HCT

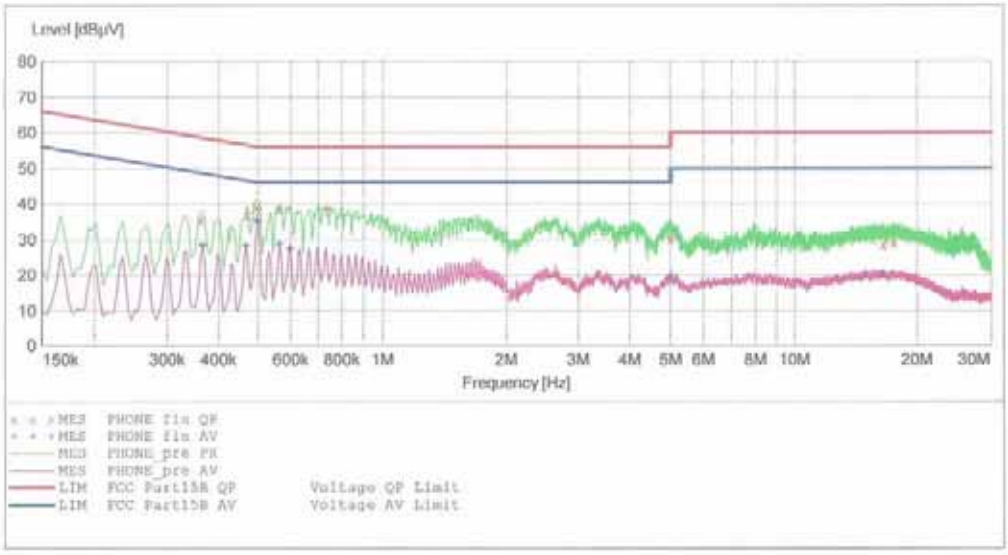
EMC

```
EUT:                  LG-P895
Manufacturer:         LG
Operating Condition:  BT 4.0 MODE
Test Site:            SHIELD ROOM
Operator:             JS LEE
Test Specification:   FCC PART 15 CLASS B
Comment:              N
```

SCAN TABLE: "FCC PART 15 B(N)"

Short Description: FCC PART 15 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

8/3/2012 3:37PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.362010	35.60	10.0	59	23.1	---	---
0.470010	37.00	10.0	57	19.5	---	---
0.494010	39.10	10.0	56	17.0	---	---
0.504000	38.10	10.0	56	17.9	---	---
0.564000	38.60	10.0	56	17.4	---	---
0.736000	38.10	10.0	56	17.9	---	---
5.000000	30.20	10.4	56	25.8	---	---
16.560000	28.70	11.5	60	31.3	---	---
17.536000	29.20	11.7	60	30.8	---	---

Page 1/2 8/3/2012 3:37PM PHONE

MEASUREMENT RESULT: "PHONE_fin AV"

8/3/2012 3:37PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.366010	28.40	10.0	49	20.2	---	---
0.466010	28.20	10.0	47	18.4	---	---
0.498010	35.40	10.0	46	10.7	---	---
0.500000	34.80	10.0	46	11.2	---	---
0.564000	28.80	10.0	46	17.2	---	---
0.600000	27.60	10.0	46	18.4	---	---
5.000000	19.20	10.4	46	26.8	---	---
14.952000	20.30	11.2	50	29.7	---	---
16.560000	20.10	11.5	50	29.9	---	---

Page 2/2 8/3/2012 3:37PM PHONE

9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	Annual	02/09/2013	100073
Schwarzbeck	VULB 9168/ TRILOG Antenna	Biennial	02/09/2013	200
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	05/03/2013	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	05/02/2013	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	07/31/2013	MY51110020
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	Annual	09/19/2012	10094
MITEQ	AMF-6B-180265-35-10P / POWER AMP	Annual	04/16/2013	667624
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2013	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	10/17/2013	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/26/2012	BBHA9170342
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/09/2013	839117/011
Agilent	E4416A /Power Meter	Annual	11/07/2012	GB41291412
Agilent	E9327A /POWER SENSOR	Annual	05/02/2013	MY4442009
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	05/02/2013	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	05/02/2013	1
Hewlett Packard	11636B/Power Divider	Annual	11/07/2012	11377
Hewlett Packard	11667B / Power Splitter	Annual	06/05/2013	05001
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	11/07/2012	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/07/2012	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	11/14/2012	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	05/02/2013	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
MITEQ	AMF-6D-001180-35-20P/ POWER AMP	Annual	07/30/2013	990893
Agilent	8493C / Attenuator(10 dB)	Annual	07/30/2013	76649
WEINSCHEL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617
CERNEX	CBLU1183540 / POWER AMP	Annual	07/27/2013	21691