

FCC 47 CFR PART 15 SUBPART C INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

LTE PHONE BLUETOOTH, WLAN (2.4GHZ & 5GHZ) AND NFC

MODEL NUMBER: LG-D500, LGD500, D500, LGMS500, LG-MS500, MS500

FCC ID: ZNFD500

REPORT NUMBER: 13U14980-2

ISSUE DATE: MAY 16, 2013

Prepared for LG ELECTRONICS MOBILECOMM U.S.A., INC. 1000 SYLVAN AVE. ENGLEWOODS CLIFFS, NJ 07632

> Prepared by UL VERIFICATION SERVICES INC. 47173 BENICIA STREET FREMONT, CA 94538, U.S.A. TEL: (510) 771-1000 FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC. 1000 SYLVAN AVE. ENGLEWOODS CLIFFS, NJ 07632

EUT DESCRIPTION: LTE Phone Bluetooth, WLAN(2.4GHz & 5GHz) and NFC

MODEL: LG-D500, LGD500, D500, LGMS500, LG-MS500, MS500

SERIAL NUMBER: 303KPHG337169

DATE TESTED: APRIL 22 ~ MAY 14, 2013

APPLICABLE STANDARDS						
STANDARD	TEST RESULTS					
CFR 47 Part 15 Subpart C	Pass					
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass					
INDUSTRY CANADA RSS-GEN Issue 3	Pass					

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL Verification Services Inc. By:

This he

PHILIP KIM WISE PROGRAM MANAGER UL Verification Services Inc. Tested By:

MENGISTU MEKURIA WISE ENGINEER UL Verification Services Inc.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <u>http://www.ccsemc.com</u>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is LTE phone supports BLUETOOTH, WLAN (2.4GHZ & 5GHZ) AND NFC

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range	Mode	Output Power	Output Power
(MHz)		(dBm)	(mW)
2402 - 2480	Basic GFSK	11.56	14.32
2402 - 2480	Enhanced 8PSK	10.96	12.47

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Planar Inverted F Antenna, with a maximum gain of 1.04 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 4.1.2 The test utility software used during testing was D500_LAP8930JR130328

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5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List							
Description Manufacturer Model Serial Number FCC ID							
AC Adapter	LG	MCS-01WR	RB320071516	DoC			
arphone Cresyn EAB62410801 N/A N/A							

I/O CABLES

Cable No		# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1m	N/A

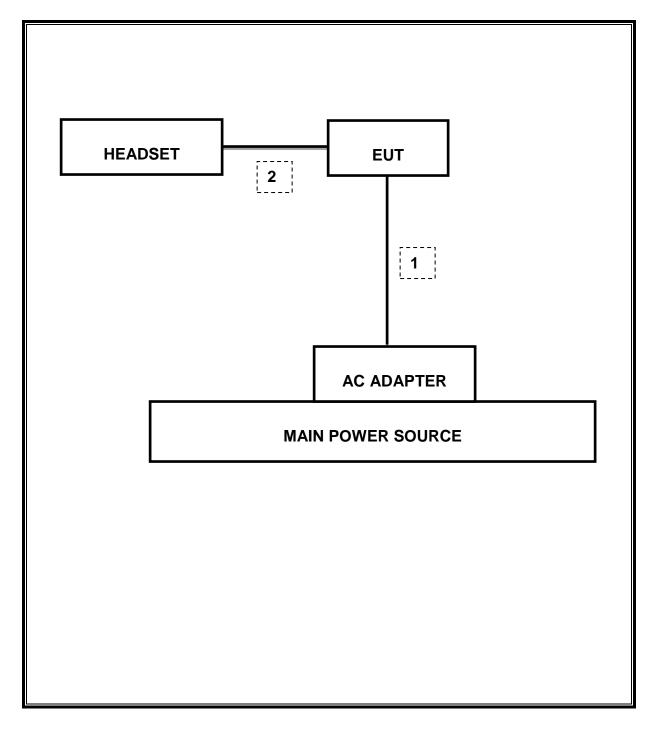
TEST SETUP

The EUT is continuously communicating to the Bluetooth tester during the tests. EUT was set in the Hidden menu mode to enable BT communications.

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SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List								
Description	Manufacturer	Model	Asset	Cal Due				
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/14				
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/13				
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/13				
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	01/28/14				
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/13				
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/13				
CBT Bluetooth Tester	R & S	CBT	None	05/15/13				
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/13				
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/13				
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/14				
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR				

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7. ANTENNA PORT TEST RESULTS

7.1. BASIC DATA RATE GFSK MODULATION

7.1.1. 20 dB AND 99% BANDWIDTH

<u>LIMIT</u>

None; for reporting purposes only.

TEST PROCEDURE

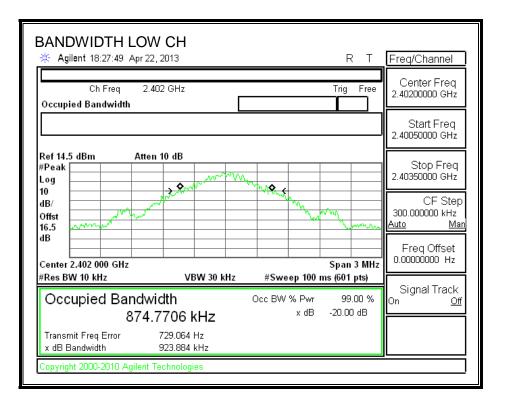
The transmitter output is connected to a spectrum analyzer. The RBW is set to \geq 1% of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

RESULTS

Channel	Frequency	20 dB Bandwidth
	(MHz)	(kHz)
Low	2402	923.884
Middle	2441	922.836
High	2480	923.39

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20 dB BANDWIDTH



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BANDWIDTH MID * Agilent 18:29:34 Apr 22,	-			RT	Freq/Channel
Ch Freq 2.44 Occupied Bandwidth	1 GHz			Trig Free	Center Freq 2.44100000 GHz
					Start Freq 2.43950000 GHz
Ref 14.5 dBm Atten #Peak	10 dB	WWWWWW K	Why	A-1	Stop Freq 2.44250000 GHz
Offst 16.5 dB				- Marina Ana	300.000000 kHz <u>Auto Man</u> Freq Offset
Center 2.441 000 GHz #Res BW 10 kHz	VBW 30 I	Hz #Swe	ep 100 n	Span 3 MHz ns (601 pts)	0.00000000 Hz
Occupied Bandwi 877.0	dth)054 kHz	Occ BW	% Pwr x dB		Signal Track On <u>Off</u>
	-5.545 kHz 922.836 kHz				
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BANDWIDTH HIGH	-		RТ	Freq/Channel
Ch Freq 2.48 (Occupied Bandwidth	GHz		Trig Free	Center Freq 2.48000000 GHz
				Start Freq 2.47850000 GHz
Ref 14.5 dBm Atten 1 #Peak Log 10	0 dB			Stop Freq 2.48150000 GHz
dB/ Offst 16.5 dB			Vhy haven has	CF Step 300.000000 kHz <u>Auto Man</u>
Center 2.480 000 GHz #Res BW 10 kHz	VBW 30 kHz	#Sweep 100 r	Span 3 MHz ns (601 pts)	Freq Offset 0.00000000 Hz
Occupied Bandwid		Occ BW % Pwr x dB	99.00 %	Signal Track On <u>Off</u>
x dB Bandwidth 9	12.058 kHz 23.390 kHz			
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7.1.2. HOPPING FREQUENCY SEPARATION

<u>LIMIT</u>

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

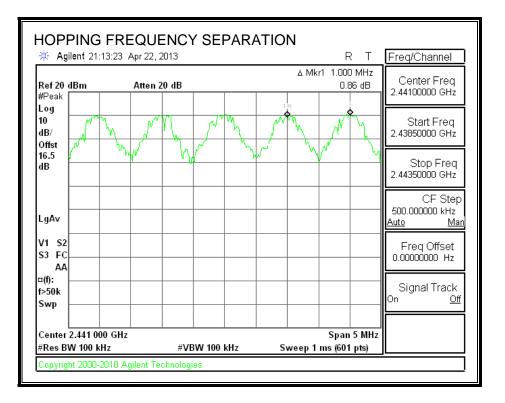
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

RESULTS

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HOPPING FREQUENCY SEPARATION



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7.1.3. NUMBER OF HOPPING CHANNELS

<u>LIMIT</u>

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 nonoverlapping channels.

TEST PROCEDURE

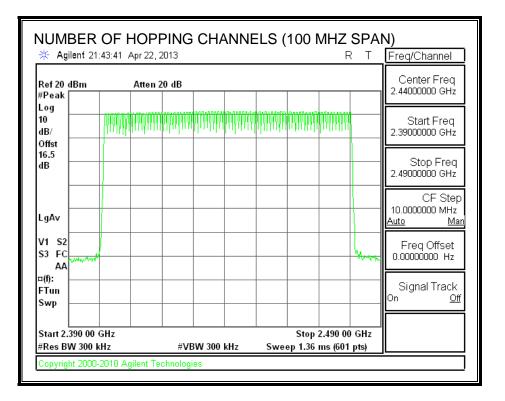
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

<u>RESULTS</u>

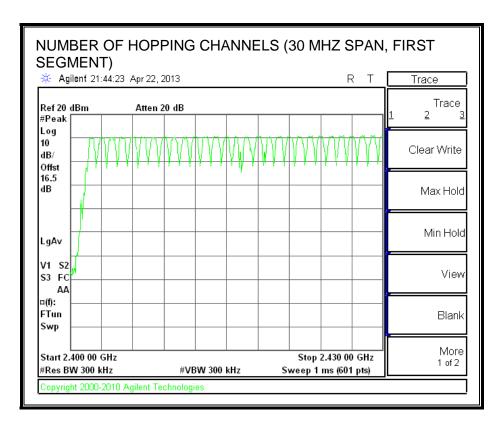
Normal Mode: 79 Channels observed.

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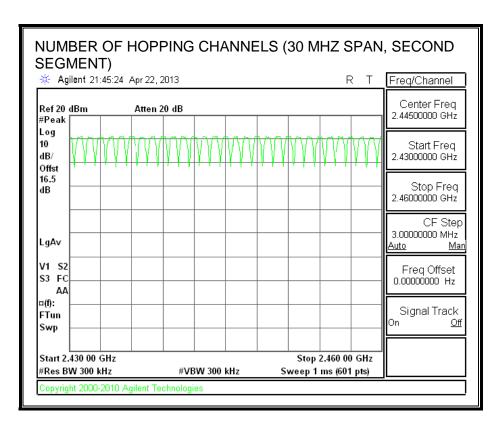
NUMBER OF HOPPING CHANNELS



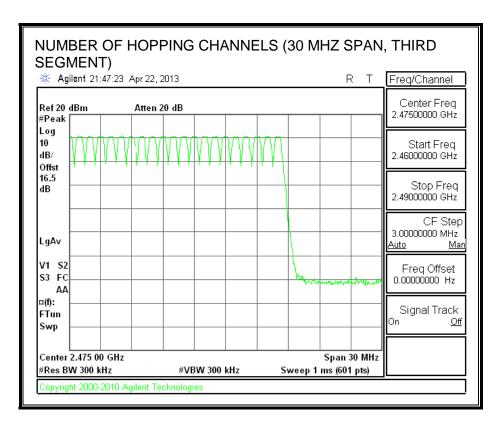
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7.1.4. AVERAGE TIME OF OCCUPANCY

<u>LIMIT</u>

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to 10 * (# of pulses in 0.8 s) * pulse width.

DH Packet	Pulse	Number of	Average Time	Limit	Margin	
	Width	Pulses in	of Occupancy			
	(msec)	3.16	(sec)	(sec)	(sec)	
		seconds				
GFSK Norma	I Mode					
DH1	0.42	31	0.130	0.4	-0.270	
DH3	1.668	13	0.217	0.4	-0.183	
DH5	2.905	9	0.261	0.4	-0.139	
DH Packet	Pulse	Number of	Average Time	Limit	Margin	
	Width	Pulses in	of Occupancy			
	(msec)	0.8	(sec)	(sec)	(sec)	
		seconds				
GFSK AFH Mode						
DH1	0.42	64	0.269	0.4	-0.131	
DH3	1.668	21	0.350	0.4	-0.050	
DH5	2.905	13	0.378	0.4	-0.022	

RESULTS

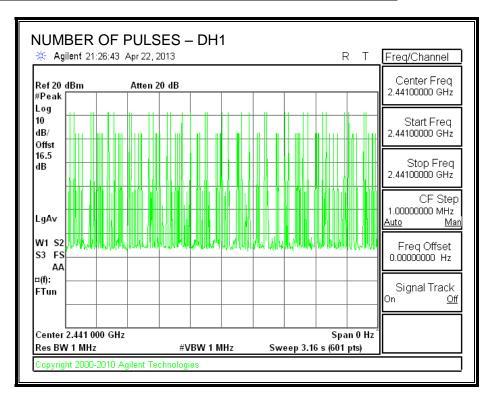
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PULSE WIDTH - DH1

PULSE WIDT			RТ	Freq/Channel
Ref 20 dBm #Peak	Atten 20 dB	۵. М		Center Freq 2.44100000 GHz
Log 10 dB/ Offst				Start Freq 2.44100000 GHz
16.5 dB	1			Stop Freq 2.44100000 GHz
LgAv	Y III			CF Step 1.00000000 MHz <u>Auto Man</u>
W1 S2 S3 FS	way way and and and and an and	and the state of t	un the the the	Freq Offset 0.00000000 Hz
¤(f): FTun				Signal Track On <u>Off</u>
Center 2.441 000 GH Res BW 1 MHz	z #VBW 1	MHz Sweep 7	Span 0 Hz 7 ms (601 pts)	
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NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH1



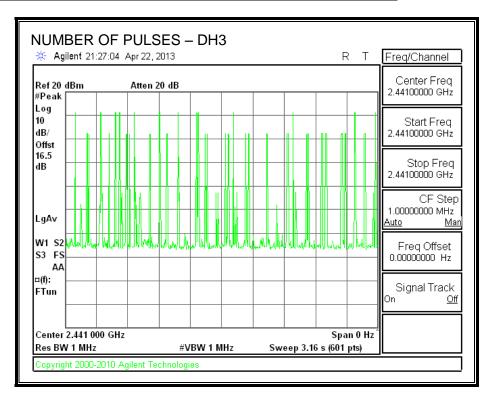
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PULSE WIDTH – DH3

PULSE WIDTH	– DH3				
🔆 🔆 Agilent 21:25:32 Ap	r 22, 2013		R	Т	Freq/Channel
#Peak	utten 20 dB			18 m s 16 d B	Center Freq 2.44100000 GHz
Log 10 dB/ Offst					Start Freq 2.44100000 GHz
16.5 dB					Stop Freq 2.44100000 GHz
LgAv	1.R Ø				CF Step 1.00000000 MHz <u>Auto Man</u>
W1 S2 S3 FS AND	Mynuur -	Wat Arriver	upanga panga	- Vortelland	Freq Offset 0.00000000 Hz
¤(f): FTun					Signal Track ^{On <u>Off</u>}
Center 2.441 000 GHz Res BW 1 MHz	#VBW 1	MHz Sv	Spa veep 7 ms (601	n0Hz pts)	
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NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH3



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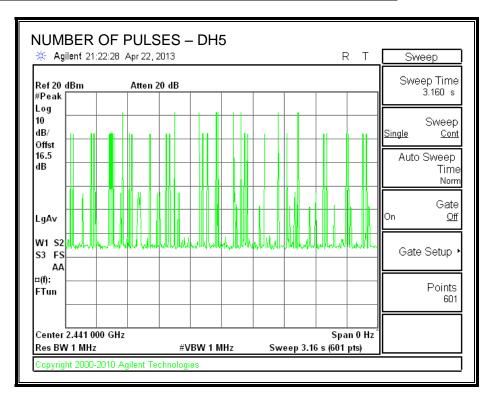
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PULSE WIDTH - DH5

PULSE WIDTH	-				
🔆 Agilent 21:24:20 /	Apr 22, 2013		F	к т	Freq/Channel
Ref 20 dBm #Peak	Atten 20 dB			05 ms)2 dB	Center Freq 2.44100000 GHz
Log 10 dB/	·····				Start Freq 2.44100000 GHz
16.5 dB					Stop Freq 2.44100000 GHz
LgAv					CF Step 1.0000000 MHz <u>Auto Man</u>
W1 S2 S3 FS		Angree to a	edulupopertentistorio	hunder of	Freq Offset 0.00000000 Hz
¤(f): FTun					Signal Track ^{On <u>Off</u>}
Center 2.441 000 GHz Res BW 1 MHz	#VBW 1 N	AHz Sv	Spa veep 7 ms (601	an 0 Hz 1 pts)	
Copyright 2000-2010 Ag	gilent Technologies				

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NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH5



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7.1.5. OUTPUT POWER

<u>LIMIT</u>

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

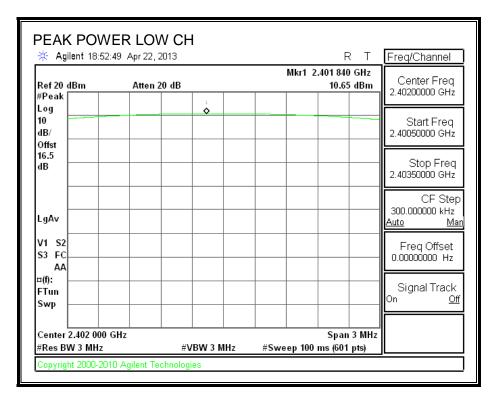
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

Channel	Frequency	Output Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2402	10.65	30	-19.35
Middle	2441	11.56	30	-18.44
High	2480	11.17	30	-18.83

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OUTPUT POWER



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🔆 Agilent 18:53	.20 Api 22, 2013		R 1	riegrenanner
Ref 20 dBm	Atten 20 dB		Mkr1 2.440 800 GH 11.56 dBi	E II Contor Eroa
#Peak Log				
10 dB/				Start Freq 2.43950000 GHz
Offst 16.5 dB				Stop Freq 2.44250000 GHz
LgAv				CF Step 300.000000 kHz <u>Auto Mar</u>
V1 S2 S3 FC AA				Freq Offset 0.00000000 Hz
¤(f): FTun Swp				Signal Track
Center 2.441 000 #Res BW 3 MHz		/BW 3 MHz	Span 3 M #Sweep 100 ms (601 pts)	Hz

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👾 Ayilent to.a	64:02 Apr 22, 2013			R T	Freq/Channel
Ref 20 dBm	Atten 20 dB		Mkr1 2	2.479 775 GHz 11.17 dBm	Center Freq 2.48000000 GHz
#Peak Log					2.40000000 0112
10 dB/					Start Freq 2.47850000 GHz
Offst 16.5 dB					Stop Fred 2.48150000 GHz
LgAv					CF Ste 300.000000 kHz <u>Auto M</u>
V1 S2 S3 FC AA					Freq Offset 0.00000000 Hz
r(f): FTun Swp					Signal Track On <u>C</u>
Center 2.480 000 #Res BW 3 MHz		VBW 3 MHz	#Sweep 100	Span 3 MHz	

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7.1.6. AVERAGE POWER

<u>LIMIT</u>

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 16.5 dB (including 16 dB pad and .5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Average Power		
	(MHz)	(dBm)		
Low	2402	10.80		
Middle	2441	11.10		
High	2480	11.10		

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7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

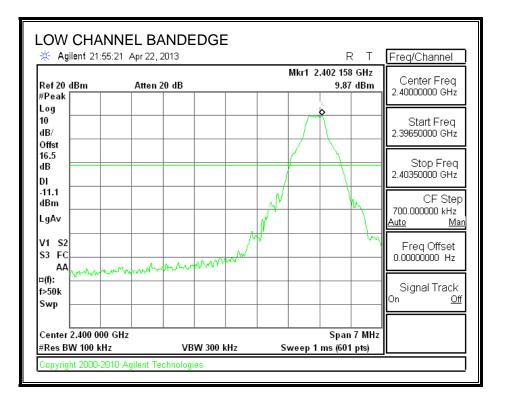
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

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SPURIOUS EMISSIONS, LOW CHANNEL

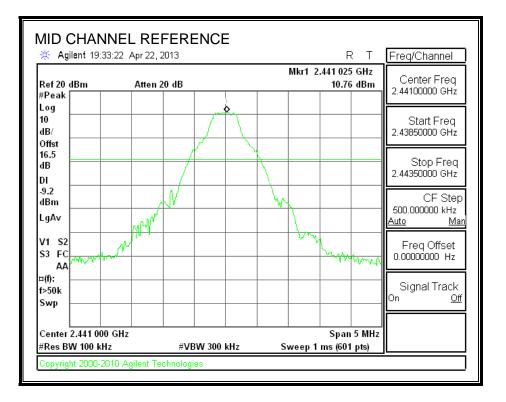


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Ref 20 dBi	m	Atten 20	dB			Μ	lkr1 2.4 9.60	8 GHz dBm	Center	
#Peak	Å								12.9500750	J GHZ
Log 10 dB/									Start 30.0000000	
Offst 16.5 dB									Stop 25.870150	Freq
DI -11.1 dBm	and when	the and the second	un an	a popper and	46447.2004_2008184	1621427 4 414746	anthay the way	<u>م</u>	CF	- Step
LgAv —									2.5840150 <u>Auto</u>	JGHz <u>Mar</u>
Start 30 M #Res BW 1 Marker		Туре	VBW 300	kHz X Axis	Swe	St eep 2.47	op 25.8 / s (601 Amplitu	pts)	Freq C 0.0000000	
1	(1)	Freq	:	2.48 GHz			9.60 dB		Signal ⁻ On	Track <u>Off</u>

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SPURIOUS EMISSIONS, MID CHANNEL

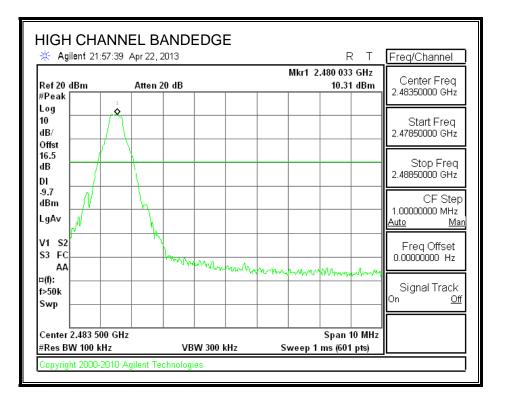


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Arread O Image: Constraint of the second se	150000 GHz Start Freq 100000 MHz
10 dB/ Offst 16.5	
dB/ Offst 16.5	
Offst	
16.5	00000 1011 12
	~. <u>-</u>
	Stop Freq 100000 GHz
	JUUUUU GHZ
9.2 dBm berny Warsen and the state were the state of the	CF Step
2.597	700000 GHz
LgAv Auto	<u>Ma</u>
Start 30 MHz Stop 26.00 GHz	
#D == DW 400 LU= #V/DW 200 LU= Surger 2 492 - (004 pts)	eq Offset 000000 Hz
Marker Trace Type X Axis Amplitude	JUUUUU HZ
1 (1) Freq 2.45 GHz 10.85 dBm	
	gnal Track
On	<u>Of</u>

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SPURIOUS EMISSIONS, HIGH CHANNEL

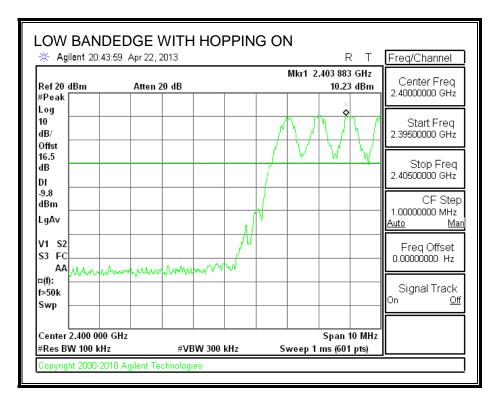


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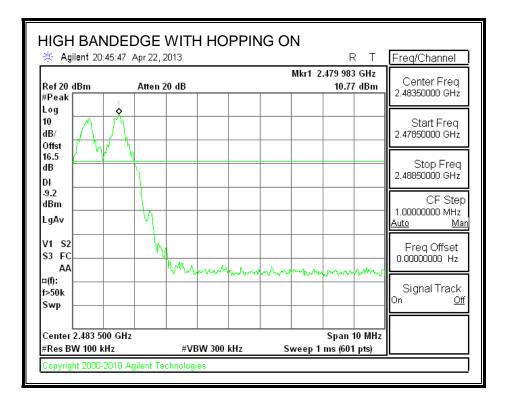
🔆 Agilent 21:58:2	27 Apr 22, 2013		RT	Marker
Ref 20 dBm	Atten 20 dB		Mkr1 2.50 GHz 9.55 dBm	Select Marker
#Peak				
10 dB/				Marker Trace <u>Auto 1 2 3</u>
dB				Readout
DI				Frequency
9.7 dBm				Marker Table On Off
LgAv				<u> </u>
V1 S2 S3 FC		In balance in a constant shift be as	Lind at a difference	Marker All Off
AA	alman Martinana and	M. Landard and the stand of the stand of the stand		
⊐(f): /////////// FTun				
Swp				
				L htem
Start 30 MHz #Res BW 100 kHz	VBW 300		top 26.00 GHz 2 s (601 pts)	More 2 of 2

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SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



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7.2. ENHANCED DATA RATE 8PSK MODULATION

7.2.1. 20 dB AND 99% BANDWIDTH

<u>LIMIT</u>

None; for reporting purposes only.

TEST PROCEDURE

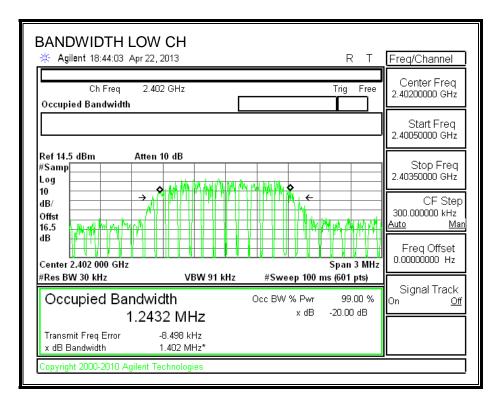
The transmitter output is connected to a spectrum analyzer. The RBW is set to \geq 1% of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

RESULTS

Channel	Frequency	20 dB Bandwidth
	(MHz)	(MHz)
Low	2402	1.402
Middle	2441	1.296
High	2480	1.319

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20 dB BANDWIDTH



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BANDWIDTH MID CH	RT	Freq/Channel
Ch Freq 2.441 GHz Occupied Bandwidth	Trig Free	Center Freq 2.44100000 GHz
		Start Freq 2.43950000 GHz
Ref 14.5 dBm Atten 10 dB #Samp		Stop Freq 2.44250000 GHz
10 dB/ Offst 16.5 dB		Freq Offset
Center 2.441 000 GHz #Res BW 30 kHz VBW 9	Span 3 MHz 1 kHz #Sweep 100 ms (601 pts)	0.00000000 Hz
Occupied Bandwidth 1.1981 MHz	Occ BW % Pwr 99.00 % x dB -20.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error-6.793 kHzx dB Bandwidth1.286 MHz*		
Copyright 2000-2010 Agilent Technologies		

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BANDWIDTH HIGH CH	Freq/Channel
Ch Freq 2.48 GHz Trig Free Occupied Bandwidth	Center Freq 2.48000000 GHz
	Start Freq 2.47850000 GHz
dB Center 2.480 000 GHz Span 3 MHz	Stop Freq 2.48150000 GHz CF Step 300.000000 kHz <u>Auto</u> <u>Man</u> Freq Offset 0.0000000 Hz
#Res BW 30 kHz VBW 91 kHz #Sweep 100 ms (601 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 1.2187 MHz × dB -20.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error -12.850 kHz x dB Bandwidth 1.319 MHz* Copyright 2000-2010 Agilent Technologies	

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7.2.2. OUTPUT POWER

<u>LIMIT</u>

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

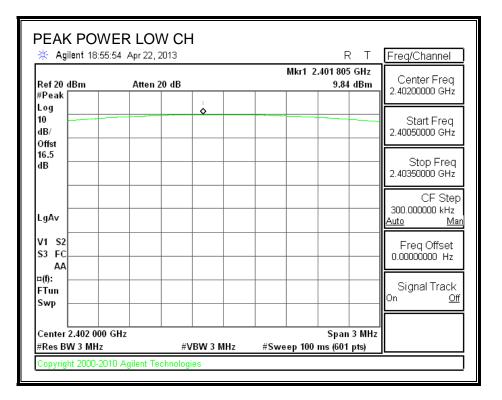
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

Channel	Frequency	Output Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2402	9.84	30	-20.16
Middle	2441	10.96	30	-19.04
High	2480	10.39	30	-19.61

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OUTPUT POWER



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Ref 20 dBm	Atten 20 dB		Mkr1 2.	441 245 GHz 10.96 dBm	Center Freq
#Peak	Allen 20 db	1		10.96 abm	2.44100000 GHz
Log 10		×			Charle English
dB/					Start Freq 2.43950000 GHz
Offst 16.5					
dB					Stop Freq
					2.44250000 GHz
					CF Step
LgAv					300.000000 kHz <u>Auto Mar</u>
V1 S2 S3 FC					Freq Offset 0.00000000 Hz
AA					0.00000000 Hz
¤(f): FTun					Signal Track
Swp					On <u>Off</u>
	GHz			Span 3 MHz	1

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🔆 Agilent 18:57	:09 Apr 22, 2013				Freq/Channel
Ref 20 dBm #Peak	Atten 20 dB	1	Mkr1 2.479 850 10.39	GHz dBm	Center Freq 2.48000000 GHz
Log 10 dB/		`			Start Freq 2.47850000 GHz
Offst 16.5 dB					Stop Freq 2.48150000 GHz
LgAv					CF Step 300.000000 kHz <u>Auto Mar</u>
V1 S2 S3 FC AA					Freq Offset 0.00000000 Hz
¤(f): FTun Swp					Signal Track On <u>Off</u>
Center 2.480 000 #Res BW 3 MHz		/BW 3 MHz	Span #Sweep 100 ms (601	3 MHz pts)	

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7.2.3. AVERAGE POWER

<u>LIMIT</u>

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 16.5 dB (including 16 dB pad and .05 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency	Average Power
	(MHz)	(dBm)
Low	2402	7.50
Middle	2441	7.90
High	2480	7.60

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7.2.4. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

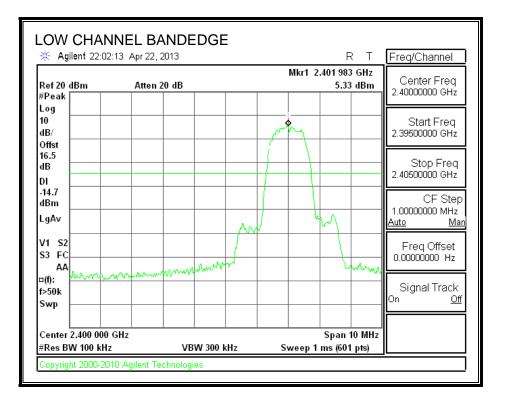
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

<u>RESULTS</u>

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SPURIOUS EMISSIONS, LOW CHANNEL

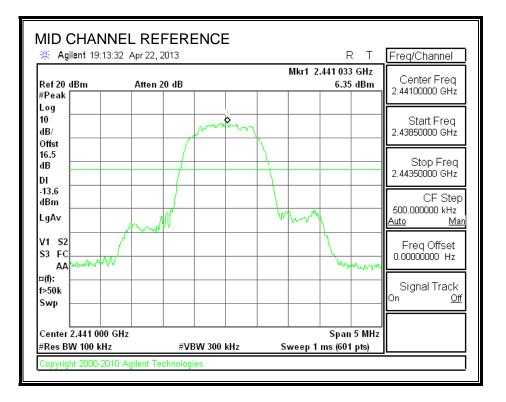


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Ref 20 dBr	n	Atten 20	dB		M	4.28 Ikr1	41 GHz 3 dBm	Center Freq 13.0150000 GHz
#Peak	1							13.0130000 0112
Log	^							Start Freq
dB/								30.0000000 MHz
Offst								
16.5 dB				_				Stop Freq
								26.000000 GHz
.14.7	ب سف	- mark	mundar and the second	materian	and and the second	national term		
dBm 📥	to a far	- Contraction of the						CF Step 2.59700000 GHz
LgAv —								Auto Ma
Start 30 M	Hz				St	op 26.0	0 GHz	
#Res BW 1			VBW 300 kHz	Swe	ep 2.482			Freq Offset
Marker	Trace	Туре	X Axis			Amplit		0.00000000 Hz
1	(1)	Freq	2.41 GHz			4.28 dE	θm	Cianal Track
								Signal Track On <u>Of</u>

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SPURIOUS EMISSIONS, MID CHANNEL

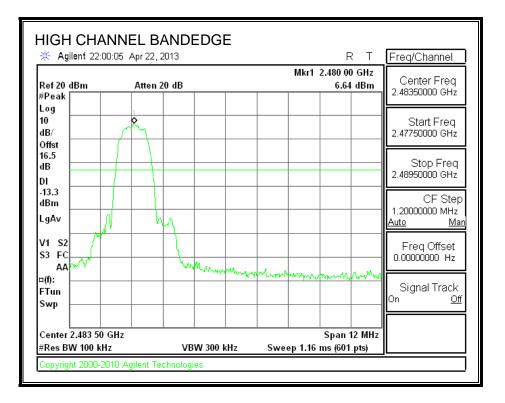


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Ref 20 dBi	n	Atten 20 d	В		M	lkr1 2.4 5.56	45 GHz 5 dBm	Center Freq 13.0150000 GHz
#Peak Log								13.0130000 0112
10 dB/								Start Freq 30.0000000 MHz
Offst 16.5 dB								Stop Freq 26.000000 GHz
DI								26.000000 GHZ
-13.6 dBm 📥	m	manan	n	- and the second filling and	- and the state of			CF Step
LgAv –								2.59700000 GHz Auto Ma
Start 30 M						op 26.0		
#Res BW 1			#VBW 300 kHz	. Swe	эт ер 2.482	•		Freq Offset
Marker	Trace	Туре	X Axi	s		Amplitu	ude	0.00000000 Hz
1	(1)	Freq	2.45	GHz		5.56 dE	^{am}	Signal Track
								On <u>Of</u>

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SPURIOUS EMISSIONS, HIGH CHANNEL

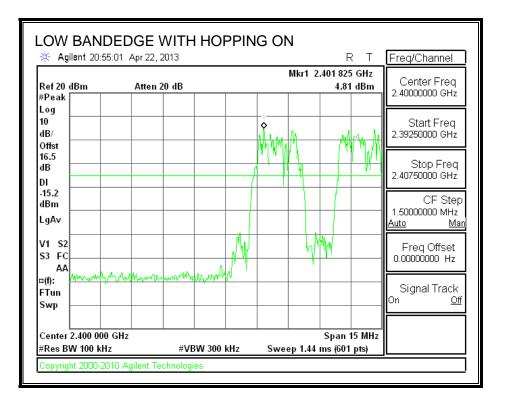


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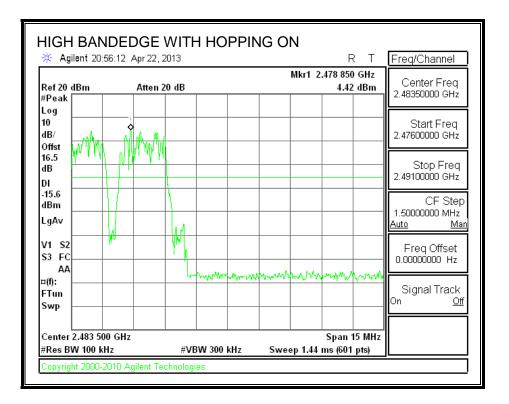
🔆 Agilei	11 22:05:12	Apr 22, 2013			R 1 Mkr1 2.50 Gł	Hz
Ref20dB #Peak	<u>m</u>	Atten 20 d	B		4.83 dBr	Center Fred 13.0150000 GH:
Log 10 dB/ Offst	*					Start Freq 30.0000000 MH
16.5 dB DI						Stop Free 26.000000 GH
-13.4 dBm	ment some	mar and the second	man why we want	a un ma la galga antina di com	er weger Die Arren ein gesten wegen ein der ander a	CF Ste
LgAv					Ct	<u>Auto M</u>
#Res BW			VBW 300 kHz	Sweep 2.	Stop 26.00 GH 482 s (601 pts)	Freq Offset
Marker 1	Trace (1)	Type Freq	X Axis 2.50 GHz		Amplitude 4.83 dBm	Signal Tracl

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SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



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8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

<u>LIMITS</u>

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

		Mkr1 2.312 00 GHz	Freq/Channe
06.2 dBµ∨	#Atten 0 dB	51.12 dBµ∨	Center Frei 2.35000000 GH
			Start Free 2.31000000 GH
			Stop Fre 2.39000000 GH
g 1		unne anter and a second	CF St 8.0000000 MH <u>Auto</u>
v2 =c			Freq Offse 0.00000000 H
			Signal Trac
2.310 00 GHz BW 1 MHz	#VBW 1 MHz	Stop 2.390 00 GHz z Sweep 1 ms (601 pts)	

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🔆 Agilent 18:28:2	29 Apr 23, 2013	R T	1 oak ooaren
Ref 106.2 dB µ∨	#Atten 0 dB	Mkr1 2.389 60 GHz 40.87 dBµ∨	
Log 10 dB/			Next Pk Right
Offst 9.2 dB DI			Next Pk Left
54.0 dBµ∨ #PAvg			Min Search
S1 V2	· · · · · · · · · · · · · · · · · · ·		Pk-Pk Search
«(f): FTun Swp			Mkr © Cl
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10 F	Stop 2.390 00 GHz Hz Sweep 6.238 s (601 pts)	More 1 of 2

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

	IEL RESTRICT	ſED, PEAK,		
🔆 Agilent 18:22:18	3 Apr 23, 2013		RT	Freq/Channel
Ref 106.2 dBµ∨ #Peak	#Atten 0 dB		Mkr1 2.343 47 GHz 50.48 dBµ∨	Center Freq 2.35000000 GHz
Log 10 dB/ Offst				Start Freq 2.31000000 GHz
9.2 dB				Stop Freq 2.39000000 GHz
74.0 dBµ∨ #PAvg			. 1. Alexin and a diministra of the	CF Step 8.0000000 MHz <u>Auto Man</u>
S1 V2 S3 FC				Freq Offset 0.00000000 Hz
×(f): FTun Swp				Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 1	MHz Sv	Stop 2.390 00 GHz veep 1 ms (601 pts)	
Copyright 2000-2012	Agilent Technologies			

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🔆 Agilent 18:23:0	32 Apr 23, 2013		RT	Freq/Channel
Ref 106.2 dB µ∨	#Atten 0 dB	Mkr1	2.389 47 GHz 40.720 dBµ∨	Center Freq 2.35000000 GHz
Log 10 dB/ Offst				Start Freq 2.31000000 GHz
dB DI				Stop Freq 2.39000000 GHz
54.0 dBµ∨ #PAvg				CF Step 8.00000000 MHz <u>Auto Mar</u>
7 S1 V2 S3 FC				Freq Offset 0.00000000 Hz
≈(f): FTun Swp				Signal Track ^{On <u>Off</u>}
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10	•	2.390 00 GHz	

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RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

Start 2.483 500 0 GHz #Res BW 1 MHz	#VBW 1 MHz	Stop 2.500 000 0 GHz Sweep 1 ms (601 pts)	
*(f): FTun Swp			Signal Track On <u>Off</u>
S1 V2 S3 FC			Freq Offset 0.00000000 Hz
74.0 dBµ∨ #PAvg	Mound Marine Marcal Agendance	and the second	CF Step 1.6500000 MHz <u>Auto Man</u>
9.4 dB DI			Stop Freq 2.50000000 GHz
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
#Peak	tten 0 dB	Mkr1 2.485 535 0 GHz 51.29 dBµ∨	Center Freq 2.49175000 GHz
Agilent 18:11:51 Apr	RESTRICTED, F	R T	Freq/Channel

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🔆 Agilent 18:11:0	3 Apr 23, 2013	R T	Freq/Channel
Ref 106.4 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.483 500 0 GHz 41.61 dBµ∨	Center Freq 2.49175000 GHz
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
dB			Stop Freq 2.50000000 GHz
54.0 dBµ∀ #PAvg			CF Step 1.65000000 MHz <u>Auto Mar</u>
S1 V20			Freq Offset
≈(f): FTun Swp			Signal Track
Start 2.483 500 0 G #Res BW 1 MHz	Hz #VBW 10 H	Stop 2.500 000 0 GHz Iz Sweep 1.287 s (601 pts)	_

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

HIGH CHANNE		ED, PEAK, VE	RT	
i 🔆 Agilent 17:52:37 A	Apr 23, 2013		RT	Freq/Channel
Ref 106.4 dBµ∨ #Peak	#Atten 0 dB	Mkr1 2.48	84 050 0 GHz 54.07 dBµ∀	Center Freq 2.49175000 GHz
Log 10 dB/ Offst				Start Freq 2.48350000 GHz
9.4 dB DI				Stop Freq 2.5000000 GHz
74.0 dBµ∨ 1 #PAvg	en in die en in die en in die en	ald marked and a second and a second	As is an an eller	CF Step 1.65000000 MHz <u>Auto Man</u>
S1 V2 S3 FC				Freq Offset 0.00000000 Hz
≈(f): FTun Swp				Signal Track On <u>Off</u>
Start 2.483 500 0 GHz #Res BW 1 MHz	#VBW 1 M	•	00 000 0 GHz ms (601 pts)	
Copyright 2000-2012 Ag	jilent Technologies			

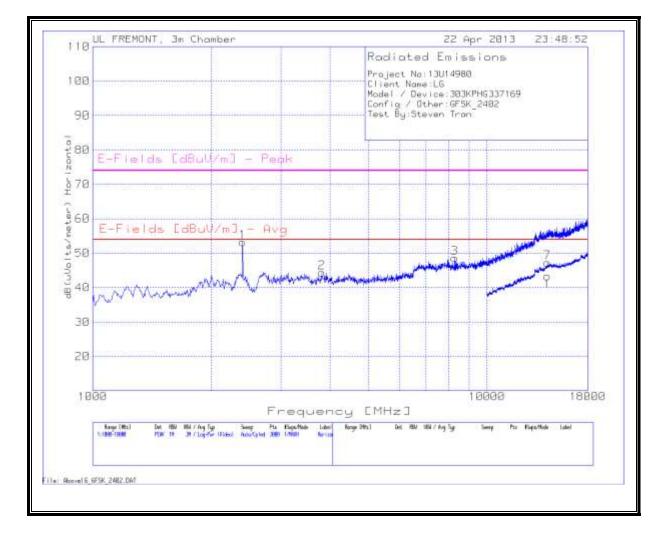
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🔆 Agilent 17:53:3	33 Apr 23, 2013	R T	Freq/Channel
Ref 106.4 dBµ∨	#Atten 0 dB	Mkr1 2.483 527 5 GHz 40.364 dBµ∨	Center Freq 2.49175000 GHz
Log			
10 dB/			Start Freq 2.48350000 GHz
Offst 9.4 dB			Stop Freq
DI			2.50000000 GHz
54.0 dBµ∀			CF Step
#PAvg			1.65000000 MHz <u>Auto Ma</u>
S1 V2 S3 FC			Freq Offset 0.00000000 Hz
×(f):			
FTun Swp			Signal Track
Start 2.483 500 0 G #Res BW 1 MHz	Hz #VBW 10 H	Stop 2.500 000 0 GHz Iz Sweep 1.287 s (601 pts)	*

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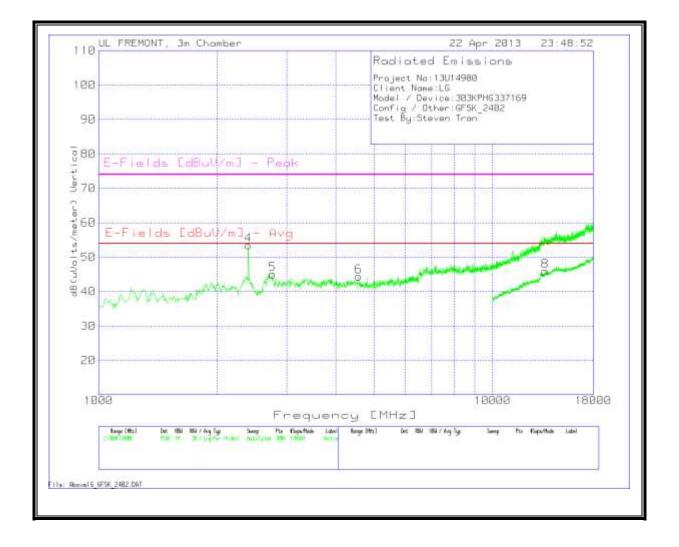
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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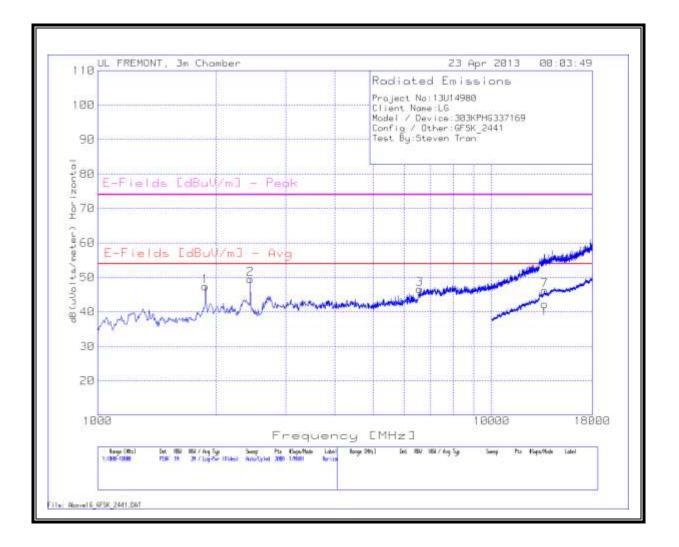
VERTICAL

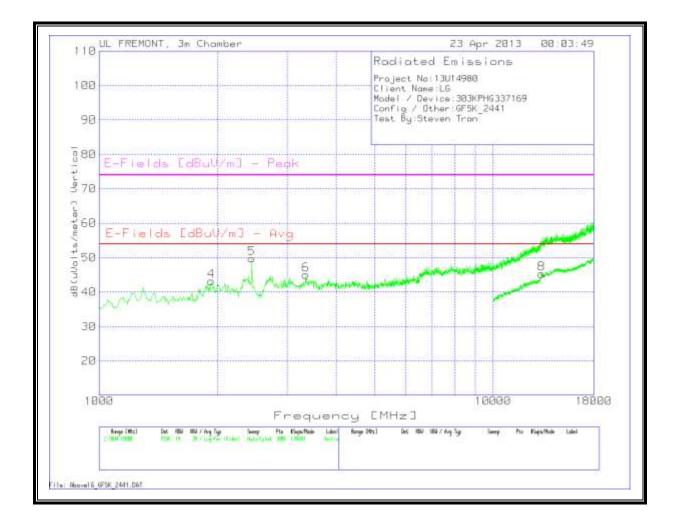


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	b:13U14980										
Client Nar											
•	evice:303KPH										
	ther:GFSK_24	402									
Test By:St	even Tran										
Marker No.	Test Frequency	Meter Reading	Detector	T119 Ant Factor [dB/m]	T34 Preamp/ Cable Loss [dB]	T160 BRF [dB]	dB(uVolts /meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)
Horizonta	I 1000 - 18000	MHz									
1	2398.734	49.94	РК	32.1	-29.7	0.9	53.24	53.97	-0.73	74	-20.76
2	3808.794	37.23	РК	33.2	-26.5	0.5	44.43	53.97	-9.54	74	-29.57
3	8282.478	34.75	PK	35.8	-22.2	0.3	48.65	53.97	-5.32	74	-25.35
Vertical 10	000 - 18000M	Hz									
4	2398.734	50.14	РК	32.1	-29.7	0.9	53.44	53.97	-0.53	74	-20.56
5	2761.159	40.29	РК	32.7	-28.9	0.9	44.99	53.97	-8.98	74	-29.01
6	4561.959	35.67	РК	34	-25.5	0.2	44.37	53.97	-9.6	74	-29.63
Horizonta	10000 - 1800	0MHz									
7	14225.887	23.43	РК	39.2	-15.8	0.4	47.23	53.97	-6.74	74	-26.77
Vertical 1() 2000 - 18000N	<u>лн</u> ,									
8	13590.205	22.87	РК	38.9	-16.2	0.4	45.97	53.97	-8	74	-28.03
PK - Peak											
Av - Avera	age detector										

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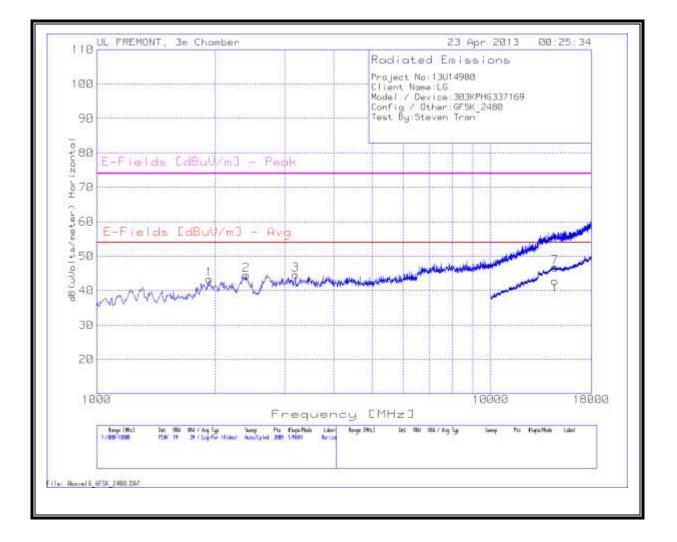


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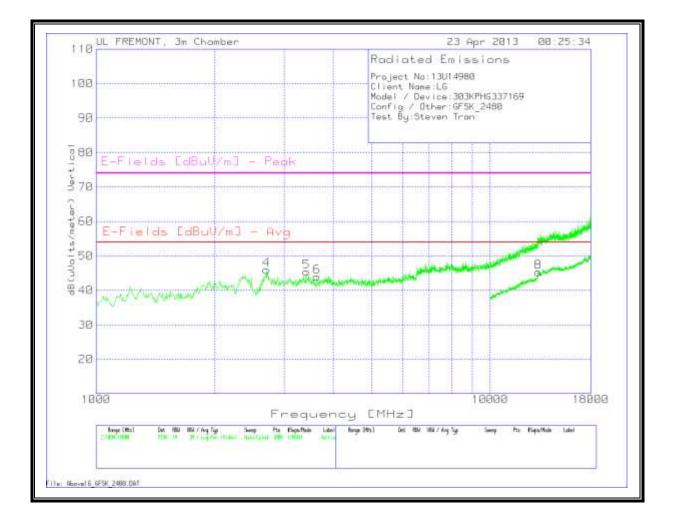
REPORT NO: 13U14980-2
EUT: LTE PHONE BLUETOOTH, WLAN (2.4GHZ & 5GHZ) AND NFC
MID CHANNEL DATA

60 BRF [dB] dB(uV(s/meta) 0.8 47.36 0.9 49.55 0.3 46.63	[dBuV/m] - Avg 36 53.97 55 53.97	Margin (dB) -6.61 -4.42 -7.34	E-Fields [dBuV/m] - Peak 74 74 74 74	Margin (dB) -26.64 -24.45 -27.37
[dB] s/mete 0.8 47.36 0.9 49.55	Volt eter) Image: Constraint of the second sec	(dB) -6.61 -4.42	[dBuV/m] - Peak 74 74	(dB) -26.64 -24.45
[dB] s/mete 0.8 47.36 0.9 49.55	Volt eter) Image: Constraint of the second sec	(dB) -6.61 -4.42	[dBuV/m] - Peak 74 74	(dB) -26.64 -24.45
[dB] s/mete 0.8 47.36 0.9 49.55	Volt eter) Image: Constraint of the second sec	(dB) -6.61 -4.42	[dBuV/m] - Peak 74 74	(dB) -26.64 -24.45
0.9 49.55	55 53.97	-4.42	74	-24.45
0.9 49.55	55 53.97	-4.42	74	-24.45
				-
0.3 46.63	.63 53.97	-7.34	74	-27.37
		1		
0.9 43.22	22 53.97	-10.75	74	-30.78
0.9 49.85	.85 53.97	-4.12	74	-24.15
0.5 45	5 53.97	-8.97	74	-29
I				
0.4 46.18	18 53.97	-7.79	74	-27.82
		1		
0.4 45.25	25 53.97	-8.72	74	-28.75
(0.5 4 0.4 46.	0.5 45 53.97 0.4 46.18 53.97	0.5 45 53.97 -8.97 0.4 46.18 53.97 -7.79	0.5 45 53.97 -8.97 74 0.4 46.18 53.97 -7.79 74

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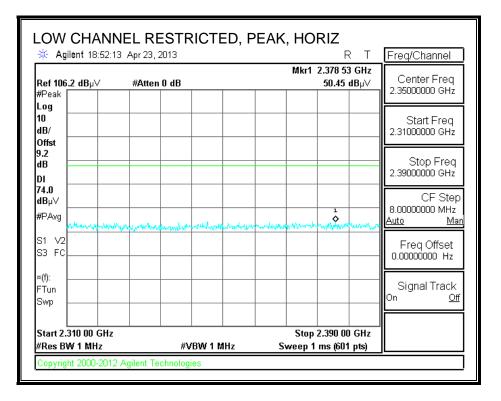
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Project No	o:13U14980										
Client Nar	ne:LG										
Model / D	evice:303KPH	IG337169									
Config / C	ther:GFSK_24	180									
Test By:St	even Tran										
Marker No.	Test Frequency	Meter Reading	Detector	T119 Ant Factor [dB/m]	T34 Preamp/ Cable Loss [dB]	T160 BRF [dB]	dB(uVolt s/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)
	1000 - 18000										
1	1934.377	41.85	РК	31.4	-30.8	0.9	43.35	53.97	-10.62	74	-30.65
2	2393.071	41.15	РК	32.1	-29.7	0.9	44.45	53.97	-9.52	74	-29.55
3	3197.202	39.39	РК	32.9	-28.1	0.4	44.59	53.97	-9.38	74	-29.41
Vertical 10	000 - 18000M	Hz									
4	2704.53	41.4	РК	32.6	-29	0.9	45.9	53.97	-8.07	74	-28.1
5	3418.055	39.56	РК	32.9	-27.4	0.4	45.46	53.97	-8.51	74	-28.54
6	3638.907	37.36	РК	33.1	-26.9	0.4	43.96	53.97	-10.01	74	-30.04
Horizonta	10000 - 1800	0MHz									
7	14561.719	22.77	РК	39.7	-16.1	0.4	46.77	53.97	-7.2	74	-27.23
Vertical 10) 000 - 18000N	ЛНz									
8	13246.377	22.49	РК	39.1	-16.7	0.4	45.29	53.97	-8.68	74	-28.71
PK - Peak	letector										

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8.2.2. ENHANCED DATA RATE 8PSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



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🔆 Agilent 18:53	3:10 Apr 23, 20	13		RT	Freq/Channel
Ref 106.2 dBµ∀ #Peak □	#Atten 0	dB		389 73 GHz 10.80 dBµ∀	Center Freq 2.35000000 GHz
Log 10 dB/					Start Freq
Offst 9.2 dB					Stop Freq
DI					2.39000000 GHz CF Step
#PAvg					8.00000000 MHz <u>Auto Mar</u>
S1 V2 S3 FC					Freq Offset 0.00000000 Hz
×(f): FTun Swp					Signal Track
Start 2.310 00 GH #Res BW 1 MHz	lz	#VBW 10 Hz	Stop 2.3 Sweep 6.238 s	390 00 GHz	

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RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

		ED, PEAK, V	VERT	
Image: Weight with the second sec	#Atten 0 dB	M	K I Ikr1 2.317 87 GHz 51.01 dBµ∨	Freq/Channel Center Freq 2.35000000 GHz
Log 10 dB/ Offst				Start Freq 2.31000000 GHz
9.2 dB DI				Stop Freq 2.39000000 GHz
74.0 dBµ∨ #PAvg φ	when many here and the second	and a start of the	lite wat the second second	CF Step 8.0000000 MHz <u>Auto Man</u>
S1 V2 S3 FC				Freq Offset 0.00000000 Hz
*(f): FTun Swp				Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 1		Stop 2.390 00 GHz ep 1 ms (601 pts)	
Copyright 2000-2012 A	gilent Technologies			

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🔆 Agilent 18:58:5	8 Apr 23, 2013		RT	Freq/Channel
Ref 106.2 dB µ∨	#Atten 0 dB	Mkr1 :	2.312 27 GHz 40.57 dBµ∨	Center Freq 2.3500000 GHz
Log 10 dB/ Offst				Start Freq 2.31000000 GHz
dB				Stop Freq 2.39000000 GHz
54.0 dBµ∨ #PAvg				CF Step 8.00000000 MHz <u>Auto Mar</u>
S1 V2 👌 S3 FC				Freq Offset 0.00000000 Hz
×(f): FTun Swp				Signal Track On <u>Off</u>
Start 2.310 00 GHz #Res BW 1 MHz	#VBW 10	•	2.390 00 GHz 3 s (601 pts)	

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RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

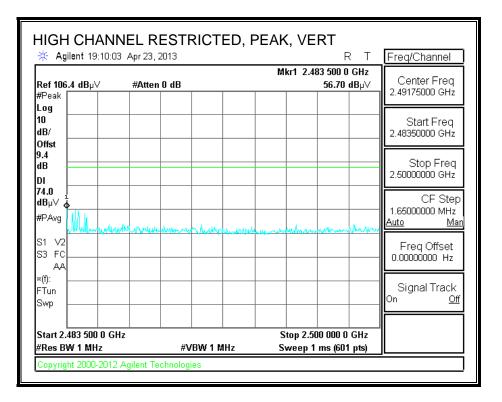
🔆 Agilent 19:15:42	Apr 23, 2013		R T Freq/Channel
Ref 106.4 dB µ∨	#Atten 0 dB	Mkr1 2.485 7 51	82 5 GHz .07 dBµ∀ Center Freq 2.49175000 GHz
Log 10 dB/ Offst			Start Freq 2.48350000 GHz
9.4 dB DI			Stop Freq 2.5000000 GHz
74.0 dBµ∨ #PAvg		ปแกษสสกฎหมายความสาย	CF Step 1.6500000 MHz <u>Auto Mar</u>
S1 V2 S3 FC AA		Anticideal of Automatic francation interest	Freq Offset 0.00000000 Hz
×(f): FTun Swp			Signal Track On <u>Off</u>
Start 2.483 500 0 GH #Res BW 1 MHz	z #VBW 1 I	Stop 2.500 00 AHz Sweep 1 ms	

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🔆 Agilent 19:16:4	0 Apr 23, 2013		RT	Freq/Channel
Ref 106.4 dBµ∨	#Atten 0 dB	Mkr1 2.	483 500 0 GHz 41.08 dBµ∨	Center Freq 2.49175000 GHz
Log 10 dB/ Offst				Start Freq 2.48350000 GHz
dB				Stop Freq 2.50000000 GHz
54.0 dBµ∨ #PAvg				CF Step 1.6500000 MHz <u>Auto Mar</u>
S1 V20 S3 FC				Freq Offset 0.00000000 Hz
×(f): FTun Swp				Signal Track On <u>Off</u>
Start 2.483 500 0 G #Res BW 1 MHz	Hz #VBW 10		500 000 0 GHz 87 s (601 pts)	

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RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



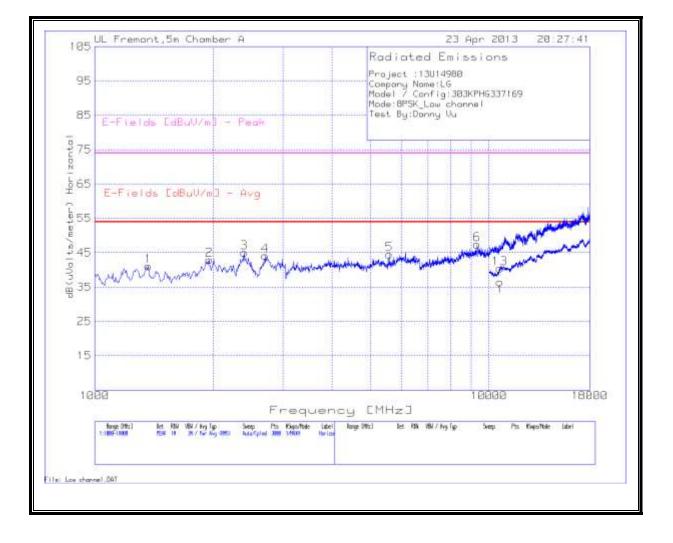
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🔆 Agilent 19:08	:24 Apr 23, 2013			RT	Freq/Channel
Ref 106.4 dB µ∀	#Atten 0 dB		Mkr1 2	2.499 395 0 GHz 40.19 dBµ∨	Center Freq 2.49175000 GHz
Log					
10 dB/					Start Freq 2.48350000 GHz
Offst 9.4 dB					Stop Freq
					2.50000000 GHz
54.0 dBµ∨					CF Step
#PAvg					Auto Mar
S1 V2 S3 FC				1 ♦	Freq Offset
×(f):					<u> </u>
FTun Swp					Signal Track On <u>Off</u>
Start 2.483 500 0 (BW 10 Hz	Stop 2 Sweep 1.	2.500 000 0 GHz	·

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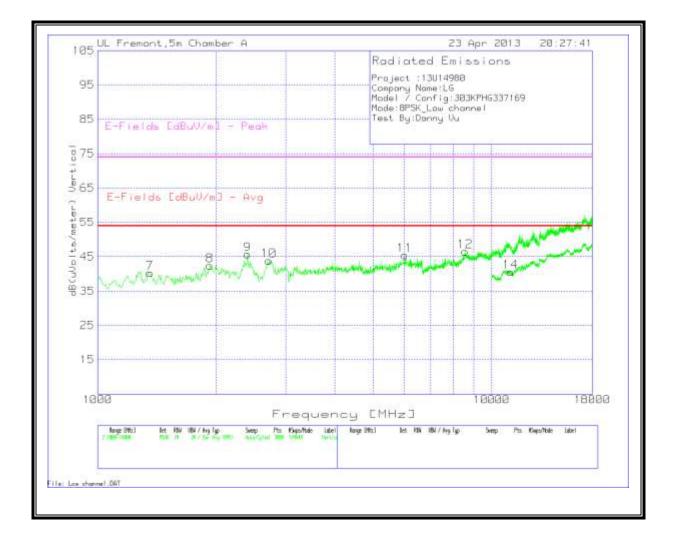
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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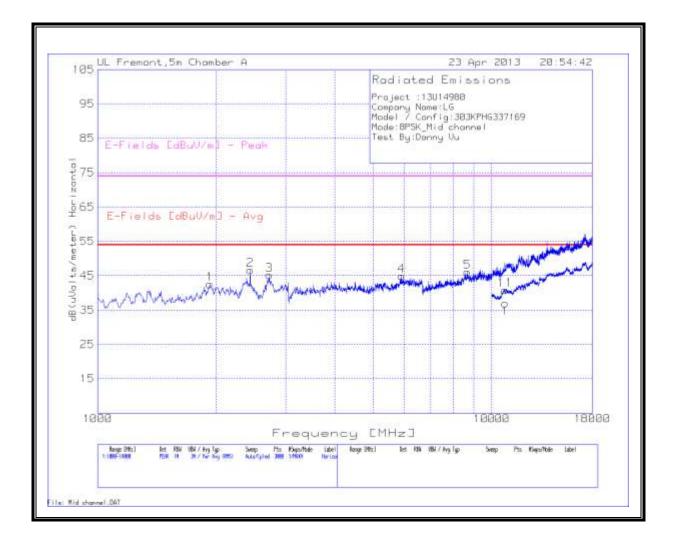
VERTICAL



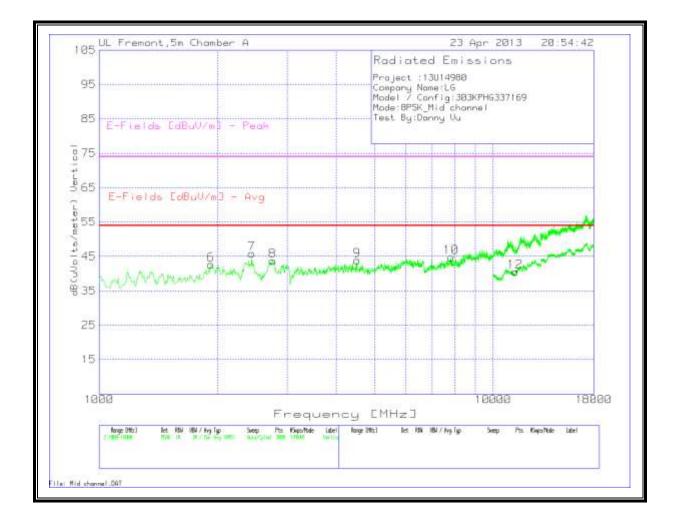
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Project :13	3U14980													
Company	Name:LG													
Model / C	onfig:303KPH	IG337169												
Mode:8PS	K_Low chan	nel												
Test By:Da	inny Vu													
Marker No.	Test Frequency	Meter Reading	Detector	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	dB(uVolt s/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height [cm]	Polarity
Horizontal	1000 - 18000	MHz							-					
1	1368.088	45.24	PK	30	-38	3.4	0.4	41.04	53.97	-12.93	74	-32.96	200	Horz
2	1951.366	43.29	PK	31.8	-37.1	4	0.9	42.89	53.97	-11.08	74	-31.11	200	Horz
3	2398.734	44.57	PK	32.1	-36.9	4.4	0.9	45.07	53.97	-8.9	74	-28.93	200	Horz
4	2710.193	42.49	PK	32.7	-36.8	4.8	0.9	44.09	53.97	-9.88	74	-29.91	200	Horz
5	5581.279	38.05	PK	34.4	-35.5	7.4	0.2	44.55	53.97	-9.42	74	-29.45	200	Horz
6	9335.776	36.8	PK	36.3	-36.2	10	0.5	47.4	53.97	-6.57	74	-26.6	100	Horz
Vertical 10	00 - 18000M	Hz												
7	1356.762	44.6	PK	30	-38.1	3.4	0.4	40.3	53.97	-13.67	74	-33.7	100	Vert
8	1928.714	42.86	PK	31.8	-37.2	4	0.9	42.36	53.97	-11.61	74	-31.64	100	Vert
9	2404.397	45.15	PK	32.1	-36.9	4.4	0.9	45.65	53.97	-8.32	74	-28.35	200	Vert
10	2721.519	42.29	PK	32.7	-36.8	4.8	0.9	43.89	53.97	-10.08	74	-30.11	200	Vert
11	6022.985	37.91	PK	35.2	-35.6	7.7	0.2	45.41	53.97	-8.56	74	-28.59	200	Vert
12	8576.949	36.91	PK	35.7	-36	9.5	0.4	46.51	53.97	-7.46	74	-27.49	200	Vert
Horizontal	10000 - 1800	DOM Hz												
13	10659.67	26.9	РК	37.9	-35.8	10.7	0.7	40.4	53.97	-13.57	74	-33.6	100	Horz
Vertical 10	000 - 180001	//H7												
14	11171.414	26.71	РК	37.9	-35.6	11	0.5	40.51	53.97	-13.46	74	-33.49	100	Vert
14	111/1.714	20.71		57.5	- 55.0	**	0.5	40.51	55.57	13.40	74	55.45	100	vert
PK - Peak d	detector													
Av - Avera	ge detector													

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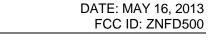


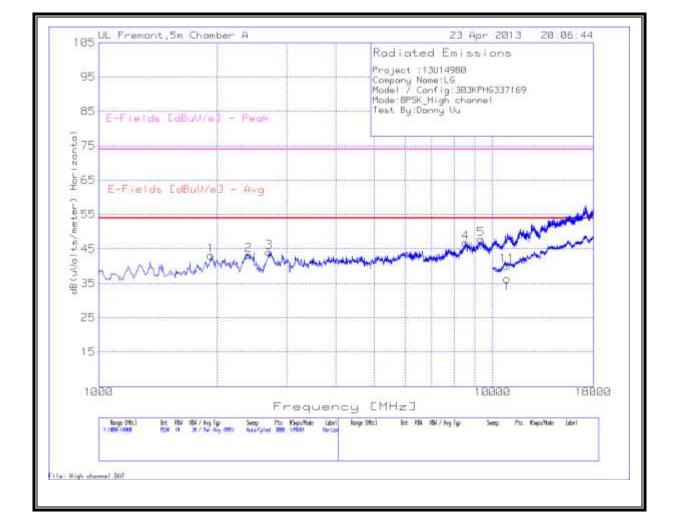
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REPORT NO: 13U14980-2
EUT: LTE PHONE BLUETOOTH, WLAN (2.4GHZ & 5GHZ) AND NFC
MID CHANNEL DATA

Project :1														
Company														
	onfig:303KPI													
	K_Mid chan	nel												
Test By:Da	anny Vu													
Marker No.	Test Frequency	Meter Reading	Detector	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	dB(uVolt s/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height [cm]	Polarity
Horizonta	1000 - 1800	OMHz												
1	1928.714	42.99	PK	31.8	-37.2	4	0.9	42.49	53.97	-11.48	74	-31.51	100	Horz
2	2438.374	45.85	PK	32.3	-36.9	4.5	0.9	46.65	53.97	-7.32	74	-27.35	200	Horz
3	2727.182	43.55	PK	32.7	-36.8	4.8	0.9	45.15	53.97	-8.82	74	-28.85	100	Horz
4	5909.727	37.58	PK	35.1	-35.6	7.6	0.2	44.88	53.97	-9.09	74	-29.12	100	Horz
5	8690.207	36.3	PK	35.8	-36	9.6	0.4	46.1	53.97	-7.87	74	-27.9	200	Horz
Vertical 10	000 - 18000M	Hz												
6	1923.051	43.32	PK	31.7	-37.2	3.9	0.9	42.62	53.97	-11.35	74	-31.38	100	Vert
7	2438.374	45.03	PK	32.3	-36.9	4.5	0.9	45.83	53.97	-8.14	74	-28.17	200	Vert
8	2761.159	42.2	PK	32.6	-36.8	4.8	0.9	43.7	53.97	-10.27	74	-30.3	200	Vert
9	4516.656	39.19	PK	33.8	-35.8	6.5	0.2	43.89	53.97	-10.08	74	-30.11	200	Vert
10	7829.447	35.94	PK	35.5	-35.9	9	0.2	44.74	53.97	-9.23	74	-29.26	200	Vert
Horizonta	10000 - 1800	00MHz												
11	10811.594	27.17	PK	38	-35.7	10.8	0.6	40.87	53.97	-13.1	74	-33.13	200	Horz
Vertical 10	000 - 18000	ИHz												
12	11395.302	26.22	PK	38.2	-35.6	11.1	0.6	40.52	53.97	-13.45	74	-33.48	100	Vert
PK - Peak	detector													
	ige detector													

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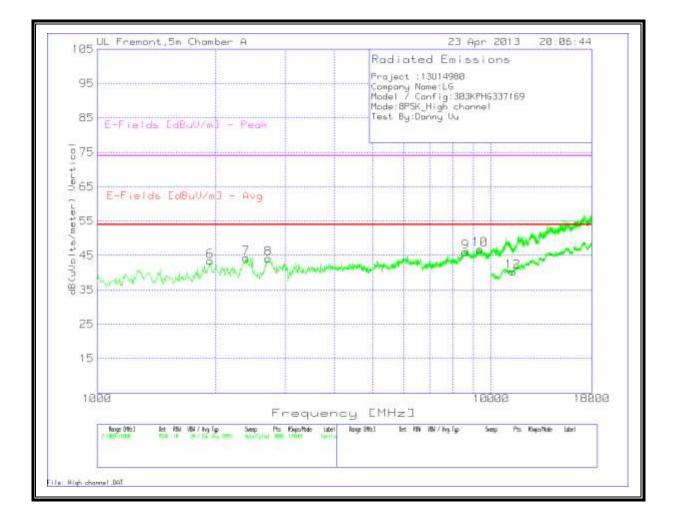




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VERTICAL

REPORT NO: 13U14980-2



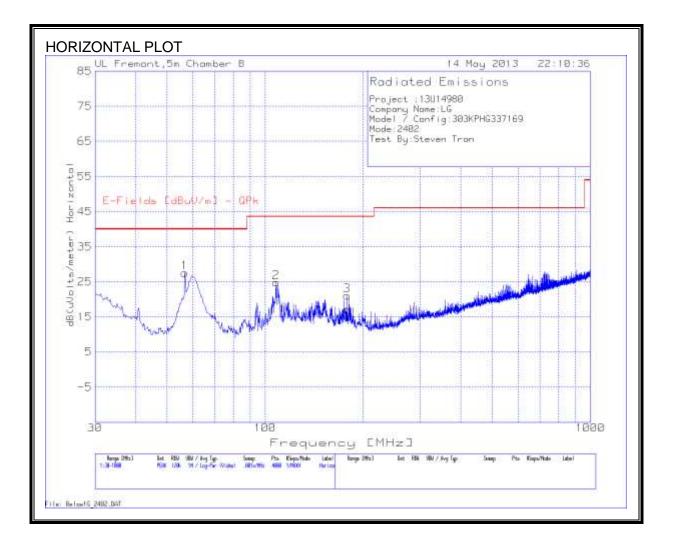
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Project :1	3U14980													
Company	Name:LG													
Model / C	Config:303KP	HG337169												
Mode:8P	SK_High chai	nnel												
Test By:Da	anny Vu													
Marker No.	Test Frequency	Meter Reading	Detector	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	dB(uVolt s/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height [cm]	Polarity
Horizonta	l 1000 - 1800	0MHz												
1	1928.714	43.53	PK	31.8	-37.2	4	0.9	43.03	53.97	-10.94	74	-30.97	200	Horz
2	2404.397	42.72	PK	32.1	-36.9	4.4	0.9	43.22	53.97	-10.75	74	-30.78	200	Horz
3	2704.53	42.59	PK	32.7	-36.8	4.7	0.9	44.09	53.97	-9.88	74	-29.91	200	Horz
4	8542.971	37.16	PK	35.7	-36	9.5	0.4	46.76	53.97	-7.21	74	-27.24	200	Horz
5	9347.102	37.18	PK	36.3	-36.2	10	0.5	47.78	53.97	-6.19	74	-26.22	138	Horz
Vertical 1	000 - 18000N	1Hz												
6	1940.04	43.89	PK	31.8	-37.2	4	0.9	43.39	53.97	-10.58	74	-30.61	200	Vert
7	2387.408	43.83	PK	32	-36.9	4.4	0.9	44.23	53.97	-9.74	74	-29.77	200	Vert
8	2721.519	42.51	PK	32.7	-36.8	4.8	0.9	44.11	53.97	-9.86	74	-29.89	100	Vert
9	8605.263	36.33	PK	35.7	-36	9.6	0.4	46.03	53.97	-7.94	74	-27.97	200	Vert
10	9369.753	36.12	РК	36.4	-36.2	10	0.4	46.72	53.97	-7.25	74	-27.28	100	Vert
Horizonta	l 10000 - 180	00MHz												
11	10867.566	26.61	PK	37.9	-35.7	10.8	0.6	40.21	53.97	-13.76	74	-33.79	100	Horz
Vertical 1	0000 - 18000	MHz												
12	11347.326	26.04	РК	38.1	-35.6	11.1	0.7	40.34	53.97	-13.63	74	-33.66	100	Vert
PK - Peak	detector													

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8.3. WORST-CASE BELOW 1 GHz

GFSK SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

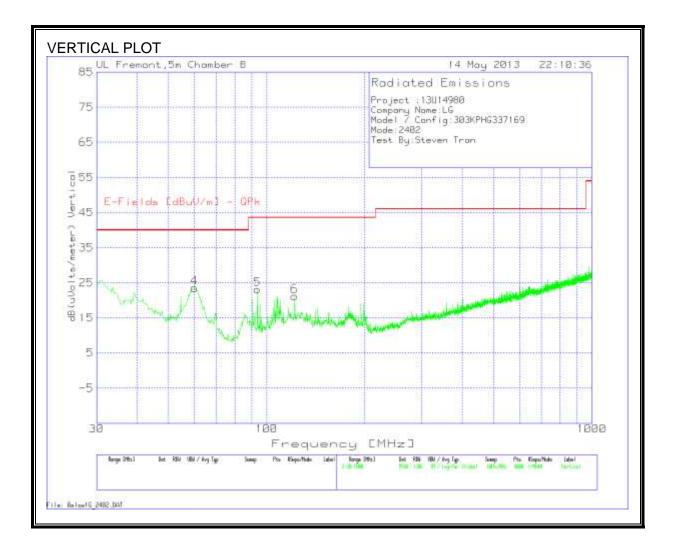


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Project :13	3U14980									
Company	Name:LG									
Model / C	onfig:303KPH	G337169								
Mode:240	2									
Test By:St	even Tran									
Marker No.	Test Frequency	Meter Reading	Detector	T243 Antenna Factor dB/m	T10 preamp/ Cable loss [dB]	dB(uVolt s/meter)	E-Fields [dBuV/m] - QPk	Margin (dB)	Height [cm]	Polarity
Horizontal	1 30 - 1000MH	2								
1	56.655	49.47	PK	6.9	-28.8	27.57	40	-12.43	400	Horz
2	108.0265	40.9	PK	12.2	-28.3	24.8	43.52	-18.72	200	Horz
3	179.0257	37.6	РК	11	-27.5	21.1	43.52	-22.42	200	Horz
PK - Peak o	detector									
$\Delta v - \Delta v era$	ige detector									

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GFSK SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



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VERTICAL DATA

Project :1	3U14980									
Company Name:LG										
Model / C	onfig:303KPH	G337169								
Mode:240)2									
Test By:St	even Tran									
Marker No.	Test Frequency	Meter Reading	Detector	T243 Antenna Factor dB/m	T10 preamp/ Cable loss [dB]	dB(uVolt s/meter)	E-Fields [dBuV/m] - QPk	Margin (dB)	Height [cm]	Polarity
Vertical 30	0 - 1000MHz									
4	60.0475	45.18	PK	7.1	-28.8	23.48	40	-16.52	300	Vert
5	93.7297	43.17	PK	8.3	-28.4	23.07	43.52	-20.45	200	Vert
6	121.8386	35.33	РК	14	-28.1	21.23	43.52	-22.29	200	Vert
PK - Peak d	detector									
	age detector									

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9. AC POWER LINE CONDUCTED EMISSIONS

<u>LIMITS</u>

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)				
	Quasi-peak	Average			
0.15-0.5	66 to 56 *	56 to 46 *			
0.5-5	56	46			
5-30	60	50			

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

<u>RESULTS</u>

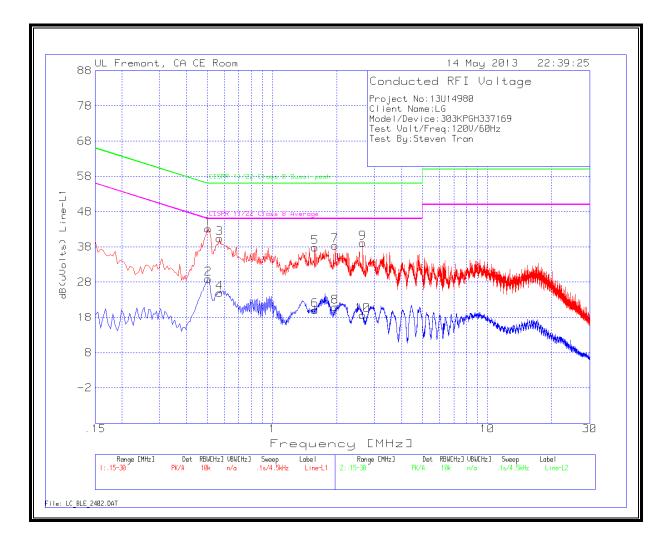
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<u>6 WORST EMISSIONS</u>

roject No:13	J14980								
Client Name:L									
Model/Device	:303KPGH3	37169							
Test Volt/Freq									
Test By:Steven									
Test Frequency	Meter Reading	Detector	T24 IL L1.TXT (dB)	LC Cables 1&3.TXT (dB)	dB(uVolts)	CISPR 11/22 Class B Quasi- peak	Margin	CISPR 11/22 Class B Average	Margin
Line-L1 .15 - 30	OMHz								
0.5055	43.09	РК	0.1	0	43.19	56	-12.81	-	-
0.5055	28.81		0.1	0	28.91	-	-	46	-17.09
0.5685	40.28		0.1	0	40.38	56	-15.62	-	-
0.5685	24.81		0.1	0	24.91		-	46	-21.0
1.581	37.67		0.1	0.1	37.87	56	-18.13	-	-
1.581	19.81		0.1	0.1	20.01	-	-	46	-25.9
1.9635	38.12		0.1	0.1	38.32	56	-17.68		-
1.9635	20.8		0.1	0.1	21	-	-	46	-2
2.643	38.97		0.1	0.1	39.17	56	-16.83	-	-
2.643	18.49		0.1	0.1	18.69		-	46	-27.3
Test Frequency	Meter Reading	Detector	T24 IL L2.TXT (dB)	LC Cables 2&3.TXT (dB)	dB(uVolts)	CISPR 11/22 Class B Quasi- peak	Margin	CISPR 11/22 Class B Average	Margin
Line-L2 .15 - 30									
0.51	38.77		0.1	0	38.87	56	-17.13		-
0.51	25.88		0.1	0	25.98		-	46	-20.02
0.6315	37.46		0.1	0	37.56	56	-18.44	-	-
0.6315	19.75		0.1	0	19.85	-	-	46	-26.15
0.8025	36.39		0.1	0	36.49	56	-19.51	-	-
0.8025	17.39		0.1		17.49		-	46	-28.5
1.41	34.51		0.1	0	34.61	56	-21.39	-	-
1.41	16.13		0.1	0	16.23		-	46	-29.77
1.707	35.22		0.1	0.1	35.42	56	-20.58		- 20 1
1.707	17.63	AV	0.1	0.1	17.83	-	-	46	-28.1
PK - Peak deteo Av - Average d									

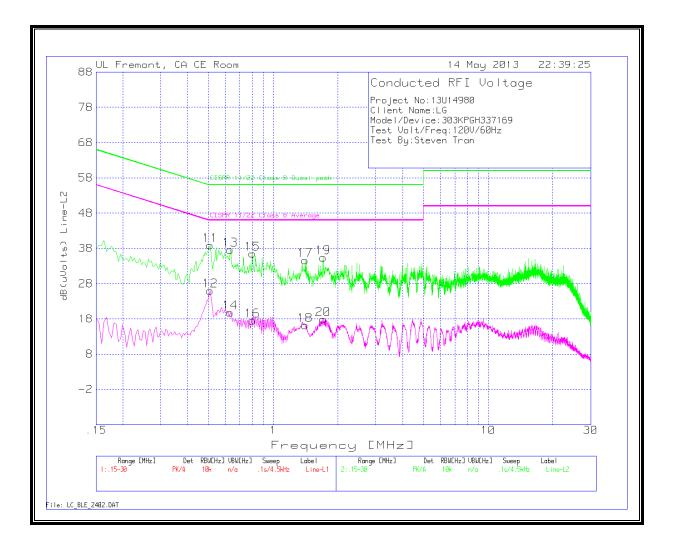
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LINE 1 RESULTS



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LINE 2 RESULTS



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