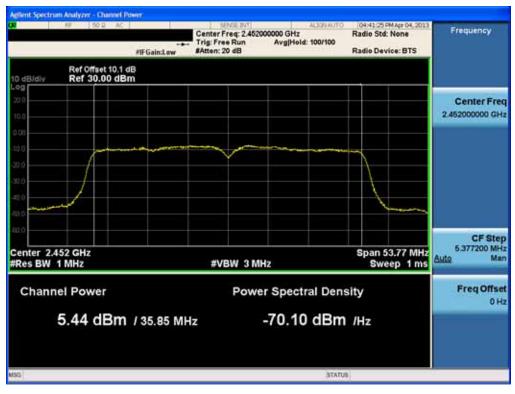




#### Conducted Output Power (802.11n-CH 9) 121.5 Mbps

#### Conducted Output Power (802.11n-CH 9) 135 Mbps



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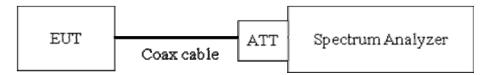
## 8.3 POWER SPECTRAL DENSITY (802.11b/g/n)

#### Test Requirements and limit, §15.247(e)

The peak power spectral 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 power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

#### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

We tested according to Procedure 9.1 Option1 in KDB 558074, issued 10/04/2012

The spectrum analyzer is set to :

Set analyzer center frequency to DTS channel center frequency.

Span = 1.5 times the DTS channel bandwidth

 $\mathsf{RBW}\,\geq\,\mathsf{3\,kHz}$ 

 $VBW \ge 9 kHz$ 

Sweep = Auto couple

Detector Mode = Peak

Trace Mode = Max hold

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

#### **Sample Calculation**

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

= -5 dBm + 10 dB + 0.8 dB = 5.8 dBm

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 below table.

So, 10.1 dB is offset. And the offset gap in the 2.4 GHz range do not affect the power spectral density final result.

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Band	Frequency(MHz)	Loss(dB)
	2412	10.11
2.4 GHz	2437	10.10
	2462	10.12

(Actual value of loss for the attenuator and cable combination)

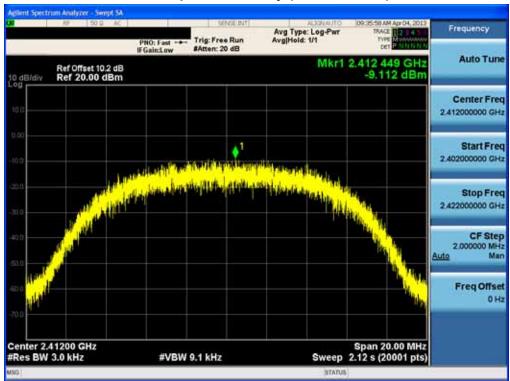
#### **TEST RESULTS**

#### **Conducted Power Density Measurements**

Frequency	Test Result		est Result		
Frequency (MHz)	Channel No.	Mode	PSD	Limit	Pass/Fail
()			(dBm)	(dBm)	
2412	1		-9.112	8	Pass
2437	6	802.11b	-7.427	8	Pass
2462	11	1	-8.828	8	Pass
2412	1		-15.931	8	Pass
2437	6	802.11g	-14.731	8	Pass
2462	11		-15.520	8	Pass
2412	1	802.11n	-18.621	8	Pass
2437	6	(20 MHz	-16.655	8	Pass
2462	11	BW)	-17.875	8	Pass
2422	3	802.11n	-23.354	8	Pass
2437	6	(40 MHz	-21.289	8	Pass
2452	9	BW)	-20.373	8	Pass

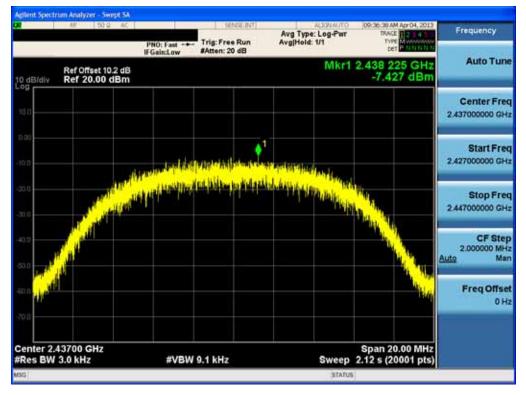
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr	
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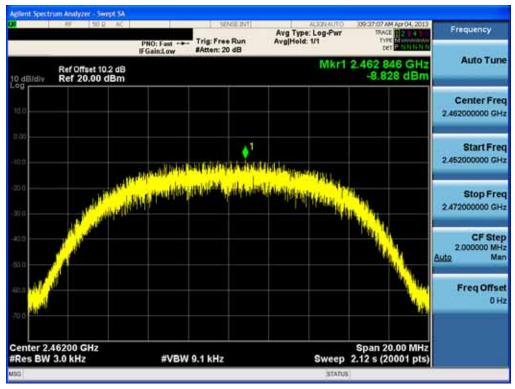
#### Power Spectral Density (802.11b-CH 1)

#### Power Spectral Density (802.11b-CH 6)



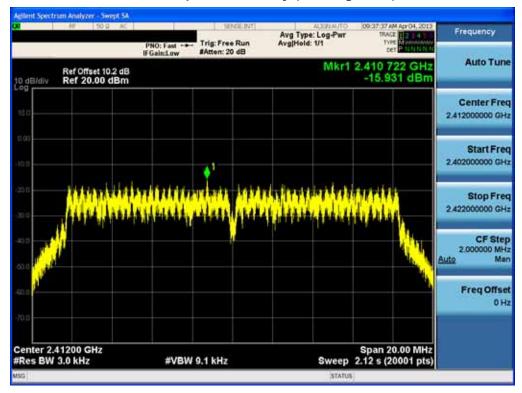
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
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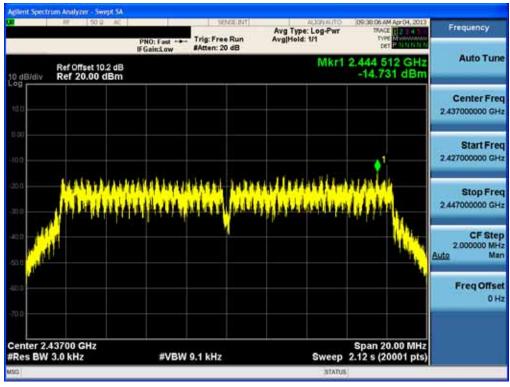
#### Power Spectral Density (802.11b-CH 11)

#### Power Spectral Density (802.11g-CH 1)



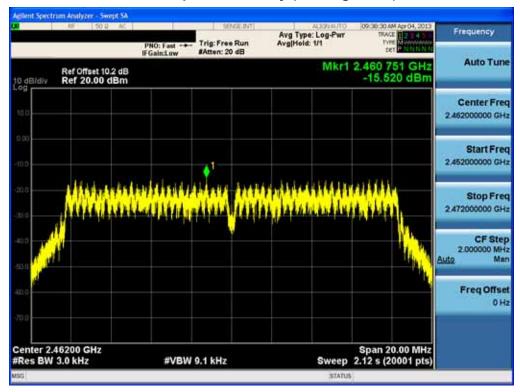
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr		
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
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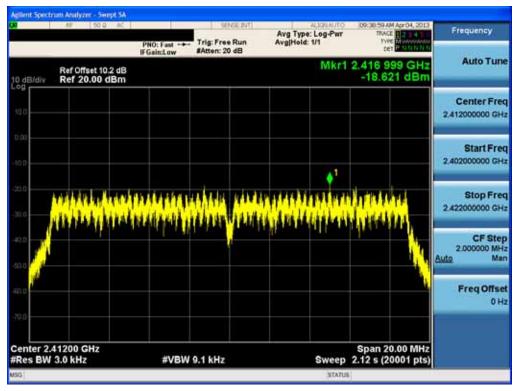
#### Power Spectral Density (802.11g-CH 6)

#### Power Spectral Density (802.11g-CH11)



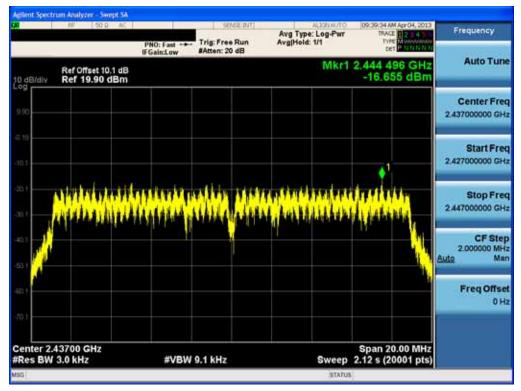
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
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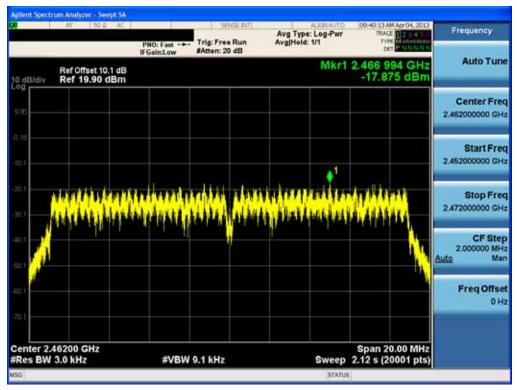
#### Power Spectral Density (802.11n-CH 1) \_ 20 MHz BW

Power Spectral Density (802.11n-CH 6) \_ 20 MHz BW



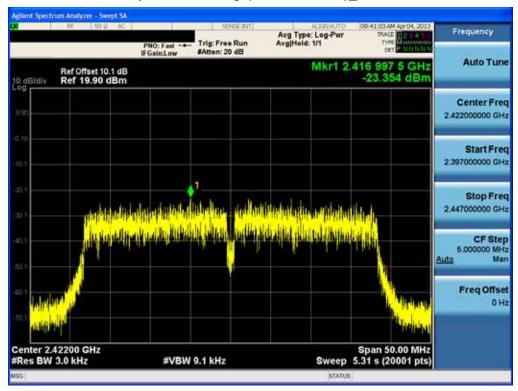
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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#### Power Spectral Density (802.11n-CH11) \_ 20 MHz BW

#### Power Spectral Density (802.11n-CH 3)\_ 40 MHz BW



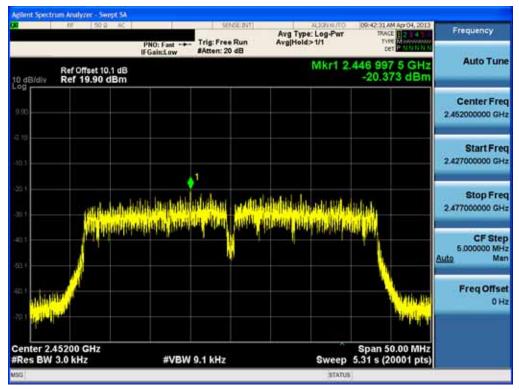
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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RF 50.0 AC SENSURT	ALIONALTO 09:41:49 AM Apr04, 201	Frequency
PNO: Fast Trig: Free Run IFGain:Low #Atten: 20 dB	Avg Type: Log-Pwr Avg Hold: 1/1 ter P there	
Ref Offset 10.1 dB Ref 19.90 dBm	Mkr1 2.445 747 5 GH -21.289 dBn	z Auto Tune
		Center Fred 2.437000000 GHz
		Start Free 2.412000000 GHz
		Stop Fred 2.462000000 GH:
Will Hausson and Aussian Aussian	reinalti ismaaluppatala nii	CF Step 5.000000 MH: Auto Mar
		Freq Offset 0 Hz
700 GHz 0 kHz #VBW 9.1 kHz	Span 50.00 MH Sweep 5.31 s (20001 pts	z 5)
	STATUS	

#### Power Spectral Density (802.11n-CH 6) \_ 40 MHz BW

#### Power Spectral Density (802.11n-CH9) \_ 40 MHz BW



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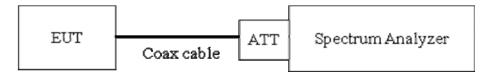


# 8.4 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS Test Requirements and limit, §15.247(d)

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 § 15.205(c)).

#### Limit : 20 dBc

#### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

The transmitter output is connected to the spectrum analyzer. (Procedure 10.1.2 in KDB 558074, issued 10/04/2012)

RBW = 100 kHz(Upon 1 GHz = 1 MHz)

VBW  $\geq$  300 kHz(Upon 1 GHz = 3 MHz)

Set span to encompass the spectrum to be examined

Detector = Peak

Trace Mode = max hold

Sweep = auto couple

Allow the trace to stabilize (this may take some time, depending on the extent of the span).

Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Measurements are made over the 30 MHz to 40 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

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loss for the attenuator and cable combination is below table.

So, 10.1 dB is offset. And the offset gap in the 2.4 GHz range do not affect the band edge final result.

Band	Frequency(MHz)	Loss(dB)
	2412	10.11
2.4 GHz	2437	10.10
	2462	10.12

(Actual value of loss for the attenuator and cable combination)

4. 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				
2412*	10.11				
2437*	10.10				
2462*	10.12				
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				
20000	10.00				

Note : 1. "" is fundamental frequency range.

2. Factor = Cable loss + Attenuator loss

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#### t Spectrum Analyzer - Swept 5A 23 AM Apr 04, 2013 ANCE P Frequency Avg Type: Log-Pwr Avg|Hold: 1/1 Trig: Free Run #Atten: 20 dB PNO: Fast ++-10 ΔMkr1 17.05 MHz 40.538 dB Auto Tune Ref Offset 10.1 dB Ref 19.90 dBm 0 dB/di Center Freq 142 2.40000000 GHz Start Freq 2.375000000 GHz Stop Freq 2.425000000 GHz Xa CF Step 5.000000 MHz Man abierty. Marshar Mady Martha Auto Freq Offset 0 Hz Center 2.40000 GHz #Res BW 100 kHz Span 50.00 MHz Sweep 4.80 ms (1001 pts) #VBW 300 kHz

#### BandEdge (802.11b-CH1)

BandEdge (802.11b-CH11)



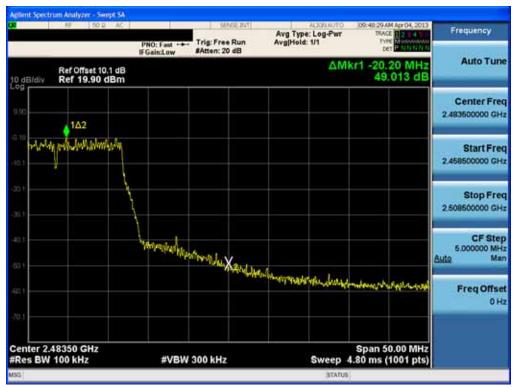
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT				
Test Report No.	Date of Issue:	EUT Type:	FCC ID:			
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#### ctrum Analyzer - Swept SA 04.2Frequency Avg Type: Log-Pwr Avg|Hold: 1/1 PNO: Fast ---- Trig: Free Run IFGain:Low #Atten: 20 dB DET Auto Tune ΔMkr1 16.30 MHz 37.564 dB Ref Offset 10.1 dB Ref 19.90 dBm t0 dB/div Center Freq 2.40000000 GHz 142 ¢ where the the stand where where the the stand and Start Freq 2.375000000 GHz Stop Freq 2.425000000 GHz CF Step 5.000000 MHz Man X2. non the server but for the optimized with a Auto Freq Offset 0 Hz Span 50.00 MHz Sweep 4.80 ms (1001 pts) Center 2.40000 GHz #Res BW 100 kHz #VBW 300 kHz

#### BandEdge (802.11g-CH1)

#### BandEdge (802.11g-CH11)



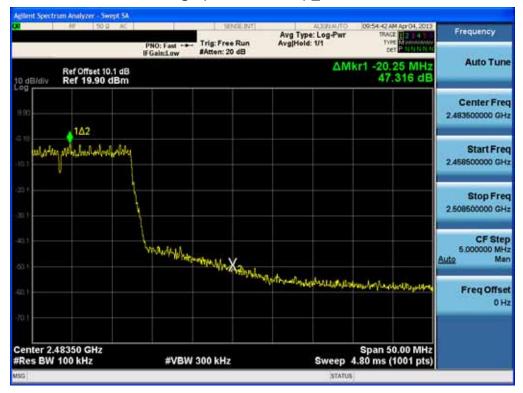
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		
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#### Band Edge (802.11n-CH1) \_ 20 MHz BW

#### Band Edge (802.11n-CH11) \_ 20 MHz BW



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#### Band Edge (802.11n-CH3)\_40 MHz BW

#### Band Edge (802.11n-CH9) \_40 MHz BW



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<b>10</b> 16 50 2	PNO: Fast +++ IFGain:Low	Trig: Free Run Atten: 20 dB	Avg Type: Log-Pwr Avg Hold: 1/1	06:04:44 PM Apr 04, 2013 19/46E 2 4 1 19/4E 12 4 1 19/4E 12 4 1 19/4E 12 4 1	Frequency
Ref Offset 10.1			M	kr1 43.77 MHz -43.942 dBm	Auto Tune
100					Center Freq 515.000000 MHz
-10.9				1175 albe	Start Freq 30.000000 MHz
0.02 					Stop Fred 1.000000000 GH3
42.2 1					CF Step 97.000000 MHa Auto Mar
Æ.a					Freq Offset 0 Hb
Start 30.0 MHz #Res BW 1.0 MHz	#VBW	3.0 MHz	#Sweep 2	Stop 1.0000 GHz 0.0 ms (30001 pts)	

#### Conducted Spurious Emission (802.11b-CH1)

#### Conducted Spurious Emission (802.11b-CH6)



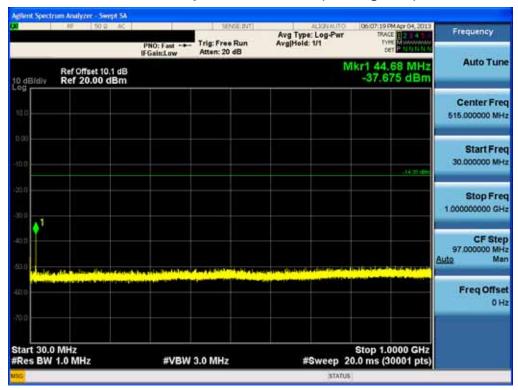
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
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<b>8</b> ₩ 50 0 MC	PNO: Fast ++-	SENCE 201 Trig: Free Run Atten: 20 dB	Avg Type: Log-Pwr Avg Hold: 1/1	06:06:21 PMApr 04, 2013 TRACE 2 14 TRACE TYPE MUNICIPAL N DET P 11 11 21 11	Frequency Auto Tune
Ref Offset 10.1 dB		N	Mkr1 42.55 MHz -46.457 dBm		
10.0					Center Free 515.000000 MH
10.0				.40.23 die	Start Fre 30.000000 MH
310					Stop Fre 1.000000000 GH
	a to and the second statistics of			special lines for physical line investigation	CF Ste 97.000000 MH Auto Ma
					Freq Offse 0 H
Start 30.0 MHz #Res BW 1.0 MHz	#VBW	3.0 MHz	#Sweep 2	Stop 1.0000 GHz 0.0 ms (30001 pts)	

#### Conducted Spurious Emission (802.11b-CH11)

#### Conducted Spurious Emission (802.11g-CH1)



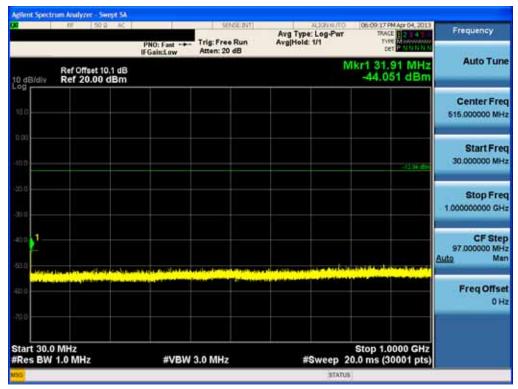
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
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PNO: Fast	Trig: Free Run Atten: 20 dB	Avg Type: Log-Pwr Avg Hold: 1/1	06-00-28 PM Apr 04, 2013 TRACE 2 4 P TYPE MONITORING	Frequency
I Game ow		N	lkr1 42.00 MHz -45.457 dBm	Auto Tune
				Center Fre 515.000000 MH
			72 KJ 40-4	Start Fre 30.000000 MH
				Stop Fre 1.000000000 GH
				CF Ste 97.000000 MH <u>Auto</u> Ma
				Freq Offse 0 H
	2.0.00		Stop 1.0000 GHz	
	IF Gain:Low	PNO: Fast IFGain:Low Atten: 20 dB	PNO: Fast Trig: Free Run IFGain:Low Atten: 20 dB Avg Type: Log-Pwr Avg[Hold: 1/1 M	PNO: Fast

#### Conducted Spurious Emission (802.11g-CH6)

#### Conducted Spurious Emission (802.11g-CH11)



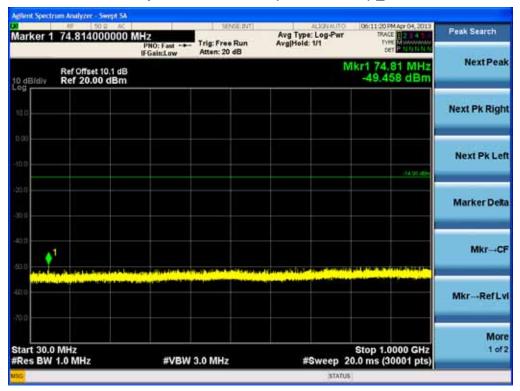
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
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86 50 Q AC	PNO: Fast ++-	SENSE INT Trig: Free Run Atten: 20 dB	Avg Type: Log-Pwr Avg Hold: 1/1	06:10:05 PM Apr 04, 2013 TRACE 22.14 TYPE Non-1000 pet P 11112211	Frequency
Ref Offset 10.1 dB			M	r1 825.17 MHz -49.012 dBm	Auto Tune
100					Center Free 515.000000 MH
B 00 10 0				1111.4	Start Free 30.000000 MH
20.0 Ξε σ					Stop Fre 1.000000000 GH
40.0 50.0	and the second	la la mbitati an santa			CF Step 97.000000 MH <u>Auto</u> Ma
		in all the first second			Freq Offse 0 H
Start 30.0 MHz Res BW 1.0 MHz	#VBW	3.0 MHz	#Sweep 2	Stop 1.0000 GHz ).0 ms (30001 pts)	

#### Conducted Spurious Emission (802.11n-CH1)\_20 MHz BW

#### Conducted Spurious Emission (802.11n-CH6) \_20 MHz BW



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16 50.2 M	PNO: Fast	Trig: Free Run Atten: 20 dB	Avg Type: Log-Pwr Avg Hold: 1/1	06:14:05 PM Apr 04, 2013 TRACE 2 14 1 TYPE TYPE TYPE TYPE TYPE TYPE TYPE TYPE	Frequency
Ref Offset 10.1 dB			M	r1 824.46 MHz -49.702 dBm	Auto Tune
100					Center Free 515.000000 MH
10.0				-H 18 des	Start Fre 30.000000 MH
317					Stop Free 1.000000000 GH
40.0		and a cost of the trans		↓1 A principal de la factoria de la fac	CF Step 97.000000 MH Auto Mar
		and the second			Freq Offse 0 H
70.0 Start 30.0 MHz				Stop 1 0000 CH	
Res BW 1.0 MHz	#VBW	3.0 MHz	#Sweep 2	Stop 1.0000 GHz 0.0 ms (30001 pts)	

### Conducted Spurious Emission (802.11n-CH11) \_20 MHz BW

#### Conducted Spurious Emission (802.11n-CH3)\_40 MHz BW

NF 50.2 MC	PNO: Fast	Trig: Free Run Atten: 20 dB	Avg Type: Log-Pwr Avg Hold: 1/1	06:15:22 PM Apr 04, 2013 TRACE 2 2 4 9 TYPE 10 1011 PM 10	Frequency
Ref Offset 10.1 dB	ir dantatow		M	kr1 79.24 MHz -47.452 dBm	Auto Tune
100					Center Fre 515.000000 MH
10.0					Start Fre 30.000000 MH
200				- (3.53) dbs	Stop Fre 1.00000000 GH
40.0 50.0	a la Propilia de la				CF Ste 97.000000 MH <u>Auto</u> Ma
en o					Freq Offse 0 H
Start 30.0 MHz #Res BW 1.0 MHz	#VBW	3.0 MHz	#Sweep 2	Stop 1.0000 GHz 0.0 ms (30001 pts)	

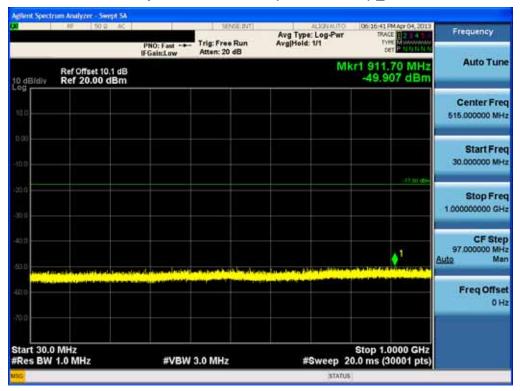
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
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85 50.2 AC	PNO: Fast +++	Trig: Free Run Atten: 20 dB	Avg Type: Log-Pwr Avg Hold: 1/1	06:16:05 PM Apr 04, 2013 TRACE 22:14 T type Noncommunication pet P 11112211	Frequency
Ref Offset 10.1 dB 0 dB/div Ref 20.00 dBm			MI	r1 936.24 MHz -49.456 dBm	Auto Tune
10.0					Center Free 515.000000 MH
10.0					Start Free 30.000000 MH
30.0				A the second sec	Stop Free 1.000000000 GH
40.0					CF Stej 97.000000 MH <u>Auto</u> Ma
E2.9				فتتناك التقع	Freq Offse 0 H
70.0 Start 30.0 MHz				Stop 1.0000 GHz	
Res BW 1.0 MHz	#VBW	3.0 MHz	#Sweep 2	0.0 ms (30001 pts)	

#### Conducted Spurious Emission (802.11n-CH6)\_40 MHz BW

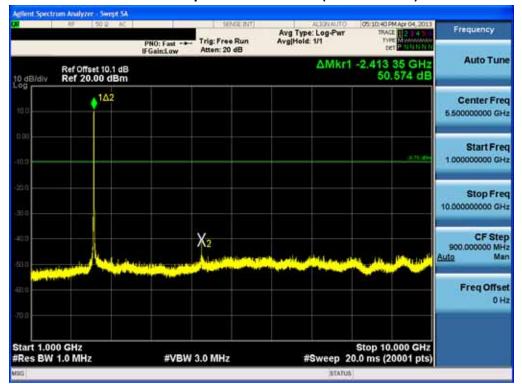
#### Conducted Spurious Emission (802.11n-CH9) \_40 MHz BW



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
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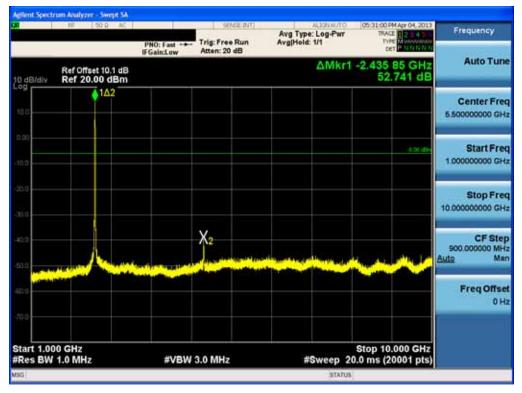


1 GHz ~ 10 GHz



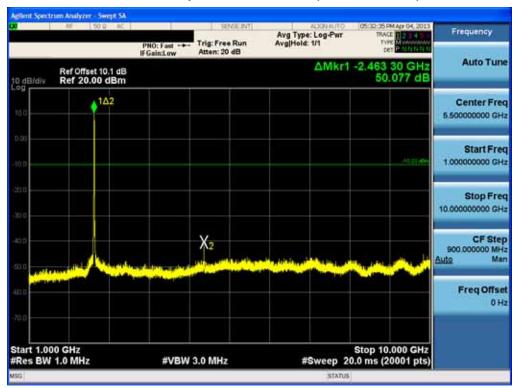
#### Conducted Spurious Emission (802.11b-CH1)

#### Conducted Spurious Emission (802.11b-CH6)



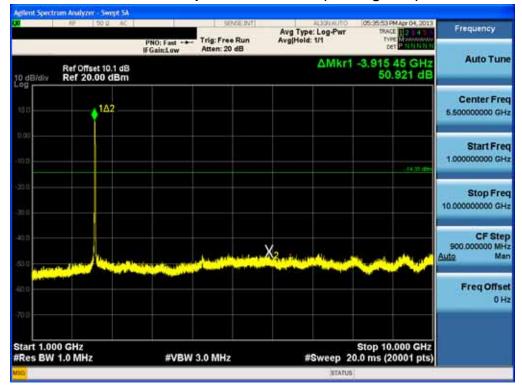
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
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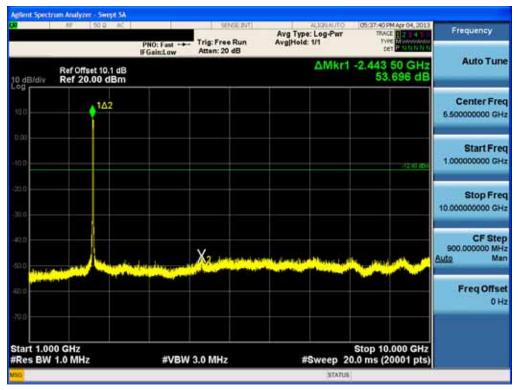
#### Conducted Spurious Emission (802.11b-CH11)

Conducted Spurious Emission (802.11g-CH1)



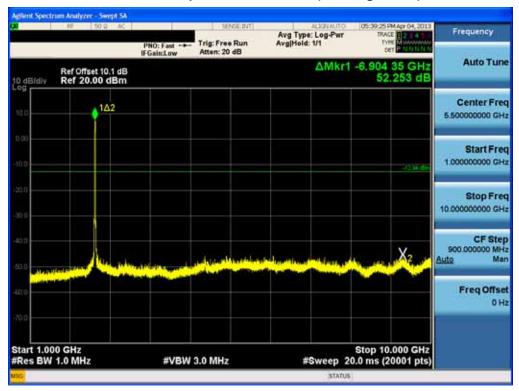
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1304FR05	April 05,2013	GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n	ZNFE440G		
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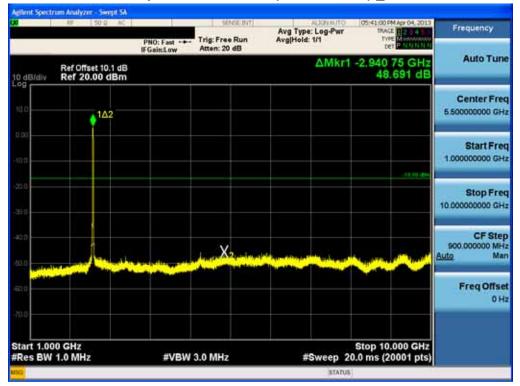
#### Conducted Spurious Emission (802.11g-CH6)

#### Conducted Spurious Emission (802.11g-CH11)



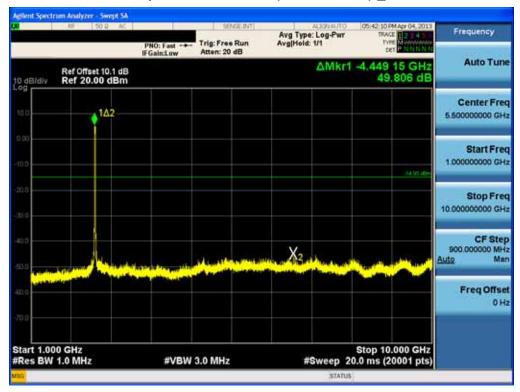
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1304FR05	April 05,2013	GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n	ZNFE440G		
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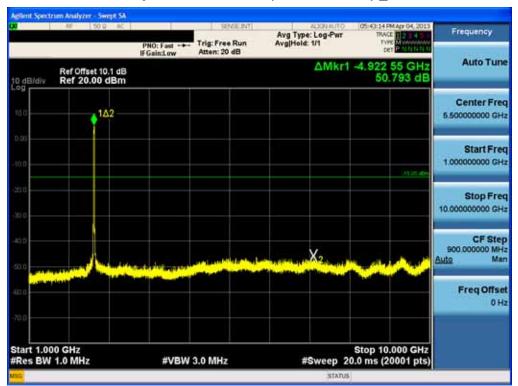
#### Conducted Spurious Emission (802.11n-CH1) \_20 MHz BW

#### Conducted Spurious Emission (802.11n-CH6) \_20 MHz BW



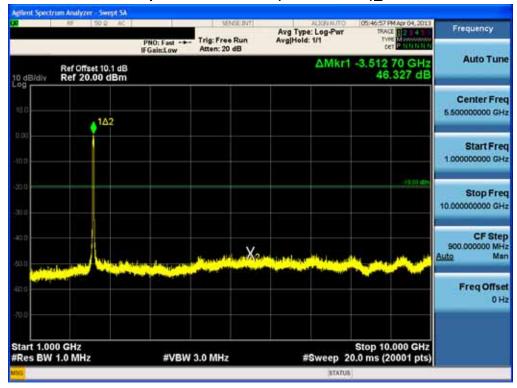
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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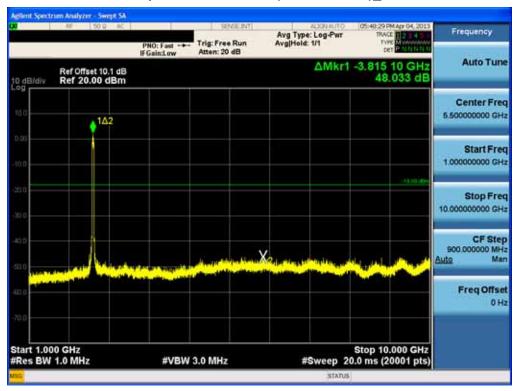
#### Conducted Spurious Emission (802.11n-CH11) \_20 MHz BW

#### Conducted Spurious Emission (802.11n-CH3)\_40 MHz BW



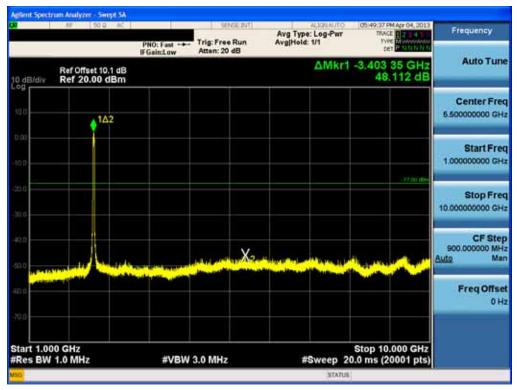
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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#### Conducted Spurious Emission (802.11n-CH6)\_40 MHz BW

#### Conducted Spurious Emission (802.11n-CH9) \_40 MHz BW



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10 GHz ~ 25 GHz



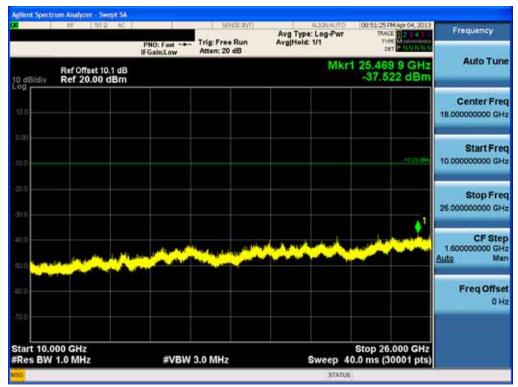
#### Conducted Spurious Emission (802.11b-CH1)

#### Conducted Spurious Emission (802.11b-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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#### Conducted Spurious Emission (802.11b-CH11)

Conducted Spurious Emission (802.11g-CH1)



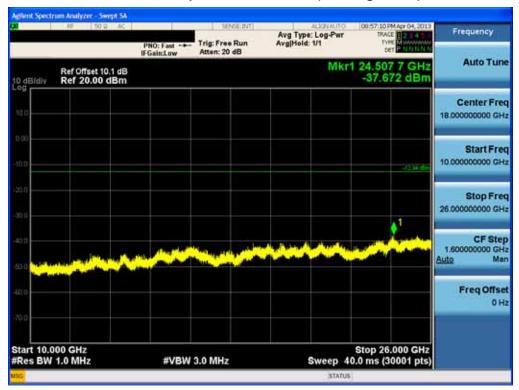
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
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#### Conducted Spurious Emission (802.11g-CH6)

#### Conducted Spurious Emission (802.11g-CH11)



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#### Conducted Spurious Emission (802.11n-CH1) \_20 MHz BW

Conducted Spurious Emission (802.11n-CH6) \_20 MHz BW



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#### Conducted Spurious Emission (802.11n-CH11) \_20 MHz BW

Conducted Spurious Emission (802.11n-CH3) \_40 MHz BW



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Test Report No.	Date of Issue:	EUT Type:	FCC ID:
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#### Conducted Spurious Emission (802.11n-CH6) \_40 MHz BW

#### Conducted Spurious Emission (802.11n-CH9) \_40 MHz BW



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# 8.5 RADIATED MEASUREMENT. 8.5.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

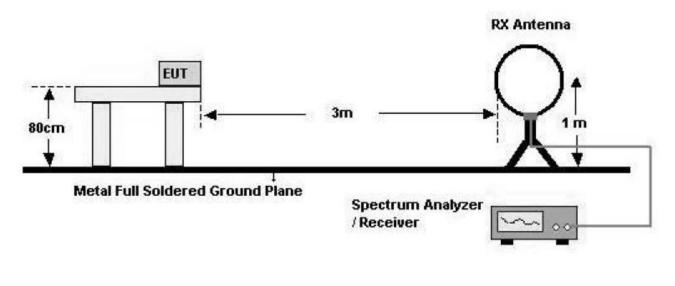
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

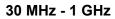
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:		FCC ID:
HCTR1304FR05	April 05,2013	GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n		ZNFE440G

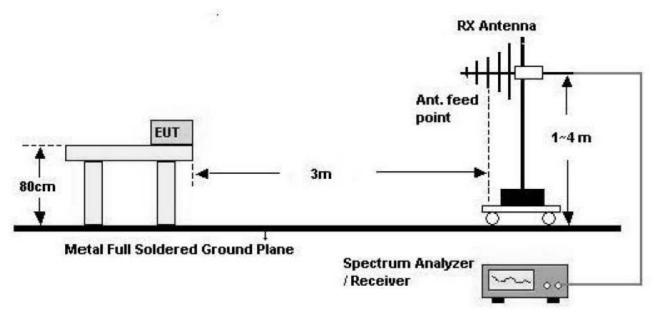


#### **Test Configuration**

#### Below 30 MHz

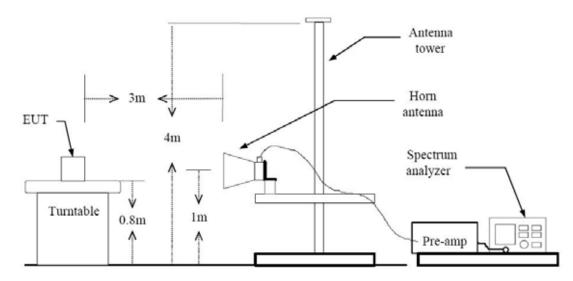






FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:			
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#### **TEST PROCEDURE USED**

ANSI C63.4(2003)

Method 10.2.3.2 in KDB 558074, issued 10/04/2012 (Peak) Method 10.2.3.3 in KDB 558074, issued 10/04/2012(Average)

#### Spectrum Setting

- Peak (Method 10.2.3.2 in KDB 558074, issued 10/04/2012)
  - RBW = 1 MHz

VBW 3 x RBW

Detector = Peak

Trace = Max hold

Sweep = auto couple

- Average (Method 10.2.3.3 in KDB 558074, issued 10/04/2012)
  - RBW = 1 MH
  - VBW 3 x RBW
  - Span = least 1MHz
  - Detector Mode = Power average (RMS) or sample detector when RMS not available
  - Trace average at least 100 traces in power averaging(RMS) mode

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#### 9 kHz – 30MHz

#### Operation Mode: Normal Mode

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

- 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.

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Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
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HCTR1304FR05	April 05,2013	GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n	ZNFE440G		



# Below 1 GHz

# Operation Mode: Normal Mode

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

- 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.

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Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1304FR05	April 05,2013	GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n	ZNFE440G	



Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4824	54.60	-0.79	V	53.81	74	20.19	PK
4824	47.83	-0.79	V	47.04	54	6.96	AV
7236	49.45	9.08	V	58.53	74	15.47	PK
7236	38.55	9.08	V	47.63	54	6.37	AV
4824	53.34	-0.79	Н	52.55	74	21.45	PK
4824	45.89	-0.79	Н	45.1	54	8.90	AV
7236	49.88	9.08	Н	58.96	74	15.04	PK
7236	38.56	9.08	Н	47.64	54	6.36	AV

Operation Mode: Transfer Rate: Operating Frequency

Channel No.

802.11 g	
6 Mbps	
2412	
01 Ch	

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4824	51.02	-0.79	V	50.23	74	23.77	PK
4824	39.55	-0.79	V	38.76	54	15.24	AV
7236	49.45	9.08	V	58.53	74	15.47	PK
7236	38.54	9.08	V	47.62	54	6.38	AV
4824	50.42	-0.79	Н	49.63	74	24.37	PK
4824	39.41	-0.79	Н	38.62	54	15.38	AV
7236	49.76	9.08	Н	58.84	74	15.16	PK
7236	38.55	9.08	Н	47.63	54	6.37	AV

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Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4824	50.02	-0.79	V	49.23	74	24.77	PK
4824	39.41	-0.79	V	38.62	54	15.38	AV
7236	48.79	9.08	V	57.87	74	16.13	PK
7236	38.53	9.08	V	47.61	54	6.39	AV
4824	50.29	-0.79	Н	49.5	74	24.50	PK
4824	39.35	-0.79	Н	38.56	54	15.44	AV
7236	49.85	9.08	Н	58.93	74	15.07	PK
7236	38.57	9.08	Н	47.65	54	6.35	AV

- 11. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 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.
- 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. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
- 6. We have done 20 MHz BW and 40 MHz BW of 802.11n. The results of 20 MHz BW is higher than 40 MHz BW.
- 7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4874	56.38	-0.37	V	56.01	74	17.99	PK
4874	51.25	-0.37	V	50.88	54	3.12	AV
7311	49.61	8.64	V	58.25	74	15.75	PK
7311	37.95	8.64	V	46.59	54	7.41	AV
4874	54.64	-0.37	Н	54.27	74	19.73	PK
4874	48.72	-0.37	Н	48.35	54	5.65	AV
7311	49.78	8.64	Н	58.42	74	15.58	PK
7311	37.97	8.64	Н	46.61	54	7.39	AV

Operation Mode:	802.11 g
Transfer Rate:	6 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4874	51.69	-0.37	V	51.32	74	22.68	PK
4874	40.59	-0.37	V	40.22	54	13.78	AV
7311	49.77	8.64	V	58.41	74	15.59	PK
7311	37.93	8.64	V	46.57	54	7.43	AV
4874	50.78	-0.37	Н	50.41	74	23.59	PK
4874	39.75	-0.37	Н	39.38	54	14.62	AV
7311	49.68	8.64	Н	58.32	74	15.68	PK
7311	37.87	8.64	Н	46.51	54	7.49	AV

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Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4874	51.18	-0.37	V	50.81	74	23.19	PK
4874	39.73	-0.37	V	39.36	54	14.64	AV
7311	49.82	8.64	V	58.46	74	15.54	PK
7311	37.92	8.64	V	46.56	54	7.44	AV
4874	50.20	-0.37	Н	49.83	74	24.17	PK
4874	39.49	-0.37	Н	39.12	54	14.88	AV
7311	49.15	8.64	Н	57.79	74	16.21	PK
7311	37.90	8.64	Н	46.54	54	7.46	AV

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 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.
- 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. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
- 6. We have done 20 MHz BW and 40 MHz BW of 802.11n. The results of 20 MHz BW is higher than 40 MHz BW.
- 7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4924	55.43	-0.15	V	55.28	74	18.72	PK
4924	49.55	-0.15	V	49.40	54	4.60	AV
7386	49.26	9.06	V	58.32	74	15.68	PK
7386	38.22	9.06	V	47.28	54	6.72	AV
4924	54.11	-0.15	Н	53.96	74	20.04	PK
4924	47.14	-0.15	Н	46.99	54	7.01	AV
7386	49.41	9.06	Н	58.47	74	15.53	PK
7386	38.29	9.06	Н	47.35	54	6.65	AV

Operation Mode:	802.11 g
Transfer Rate:	6 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4924	51.19	-0.15	V	51.04	74	22.96	PK
4924	39.93	-0.15	V	39.78	54	14.22	AV
7386	49.63	9.06	V	58.69	74	15.31	PK
7386	38.24	9.06	V	47.3	54	6.7	AV
4924	50.43	-0.15	Н	50.28	74	23.72	PK
4924	39.47	-0.15	Н	39.32	54	14.68	AV
7386	48.97	9.06	Н	58.03	74	15.97	PK
7386	38.23	9.06	Н	47.29	54	6.71	AV

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Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency	Reading	AN.+CL-AMP G	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
4924	50.95	-0.15	V	50.80	74	23.20	PK
4924	39.87	-0.15	V	39.72	54	14.28	AV
7386	48.80	9.06	V	57.86	74	16.14	PK
7386	38.23	9.06	V	47.29	54	6.71	AV
4924	50.24	-0.15	Н	50.09	74	23.91	PK
4924	39.23	-0.15	Н	39.08	54	14.92	AV
7386	49.43	9.06	Н	58.49	74	15.51	PK
7386	38.19	9.06	Н	47.25	54	6.75	AV

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

- 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.
- 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. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
- 6. We have done 20 MHz BW and 40 MHz BW of 802.11n. The results of 20 MHz BW is higher than 40 MHz BW.
- 7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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## 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:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency	Reading	AN.+CL	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
2390.0	30.12	33.90	Н	64.02	74	9.98	PK
2390.0	17.07	33.90	Н	50.97	54	3.03	AV
2390.0	31.05	33.90	V	64.95	74	9.05	PK
2390.0	17.07	33.90	V	50.97	54	3.03	AV
2483.5	29.77	33.99	Н	63.76	74	10.24	PK
2483.5	16.76	33.99	Н	50.75	54	3.25	AV
2483.5	28.06	33.99	V	62.05	74	11.95	PK
2483.5	15.72	33.99	V	49.71	54	4.29	AV

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Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency	Reading	AN.+CL	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
2390.0	27.39	33.90	Н	61.29	74	12.71	PK
2390.0	16.34	33.90	Н	50.24	54	3.76	AV
2390.0	27.62	33.90	V	61.52	74	12.48	PK
2390.0	16.30	33.90	V	50.20	54	3.80	AV
2483.5	26.15	33.99	Н	60.14	74	13.86	PK
2483.5	15.45	33.99	Н	49.44	54	4.56	AV
2483.5	25.63	33.99	V	59.62	74	14.38	PK
2483.5	14.80	33.99	V	48.79	54	5.21	AV

Operation Mode:

Transfer Rate:

Operating Frequency

Channel No.

802.11n\_20 MHz 6.5 Mbps 2412 MHz, 2462 MHz 01 Ch, 11 Ch

Frequency	Reading	AN.+CL	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
2390.0	29.67	33.90	Н	63.57	74	10.43	PK
2390.0	16.80	33.90	Н	50.70	54	3.30	AV
2390.0	29.83	33.90	V	63.73	74	10.27	PK
2390.0	16.70	33.90	V	50.60	54	3.40	AV
2483.5	29.84	33.99	Н	63.83	74	10.17	PK
2483.5	16.57	33.99	Н	50.56	54	3.44	AV
2483.5	28.68	33.99	V	62.67	74	11.33	PK
2483.5	15.76	33.99	V	49.75	54	4.25	AV

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Operation Mode:	802.11n_40 MHz		
Transfer Rate:	13.5 Mbps		
Operating Frequency	2422 MHz, 2452 MHz		
Channel No.	03 Ch, 09 Ch		

Frequency	Reading	AN.+CL	ANT. POL	Total	Limit	Margin	
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Detect
2390.0	30.06	33.90	Н	63.96	74	10.04	PK
2390.0	17.10	33.90	Н	51.00	54	3.00	AV
2390.0	29.70	33.90	V	63.60	74	10.40	PK
2390.0	17.01	33.90	V	50.91	54	3.09	AV
2483.5	28.60	33.99	Н	62.59	74	11.41	PK
2483.5	16.55	33.99	Н	50.54	54	3.46	AV
2483.5	27.74	33.99	V	61.73	74	12.27	PK
2483.5	15.77	33.99	V	49.76	54	4.24	AV

- 1. Total = Reading Value + Antenna Factor + Cable Loss
- 2. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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# **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:

	Limits (dBµV)			
Frequency Range (MHz)	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 6 Mbps, Ch.6 and 802.11g. Because 802.11g mode is worst case.

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# Conducted Emissions (Line 1)

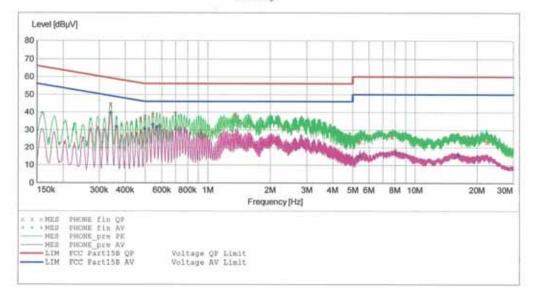
## HCT

#### EMC

EUT:	LG-E440g
Manufacturer:	LG
Operating Condition:	WLAN MODE
Test Site:	SHIELD ROOM
Operator:	JS LEE
Test Specification:	FCC PART 15 B
Comment:	H

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

Short Desc		F	CC PART 15	CLASS B		
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
		1.0 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"

and the property of the second s	52PM	140200-646	10100	100000300000	1.1.1.1.1.1.1	10.00
Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.340010	44.20	9.7	59	15.0		
0.476010	35.90	9.8	56	20.5		
0.498010	37.30	9.8	56	18.7	-	
0.544000	38.40	9.8	56	17.6		
0.700000	39.20	9.8	56	16.8		
1.356000	38.40	9.8	56	17.6		
5.432000	23.80	10.2	60	36.2		
7.776000	26.20	10.3	60	33.8		
22,264000	23.50	11.9	60	36.5		

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#### MEASUREMENT RESULT: "PHONE\_fin AV"

29/	2013	10:5	2PM					
Fr	equenc MH		Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
C	.34001	0	39.40	9.7	49	9.8		
0	.36201	0	31.70	9.8	49	17.0	-	
0	.49701	0	30.70	9.8	46	15.4		
0	.54400	0	33.00	9.8	46	13.0		
0	.56800	0	31.40	9.8	46	14.6	$(-1) = (-1)^{-1}$	-
0	.58800	0	32,10	9.8	4.6	13.9		
5	.43200	0	14.70	10.2	50	35.3		
8	.12400	0	16.60	10.3	50	33.4		
16	.12000	0	15.50	11.1	50	34.5		

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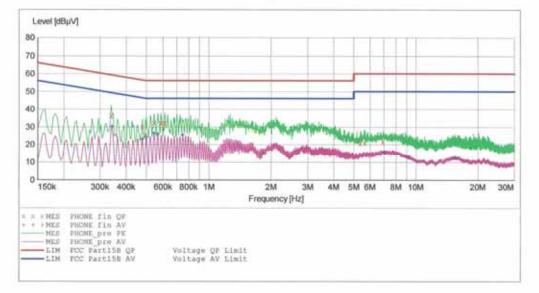
#### **Conducted Emissions (Line 2)**

#### HCT EMC

EUT:	LG-E440g
Manufacturer:	LG
Operating Condition:	WLAN 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 Desc			CC PART 15	CLASS B		
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz		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"

	46PM					
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.338010	36.20	9.9	59	23.0		
0.478010	30.10	10.0	56	26.3		
0.494010	25.60	10.0	56	30.5		(-1) = (-1) =
0.544000	32.40	10.0	56	23.6		
0.588000	32.30	10.0	56	23.7		
0.612000	32.10	10.0	56	23.9		
5.392000	20,90	10.4	60	39.1		
5.644000	21.10	10.4	60	38.9	-	
6.920000	21.90	10.5	60	38.1		

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#### MEASUREMENT RESULT: "PHONE\_fin AV"

3/29/2013 10:	46PM					
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.342010	30.10	9.9	49	19.1		
0.478010	22.90	10.0	46	23.5		
0.498010	24.20	10.0	46	21.8		
0.544000	26.30	10.0	46	19.7		
0.568000	25.80	10.0	46	20.2		
0.748000	25.50	10.0	46	20.5		
7.004000	15.80	10.5	50	34.2		
9,180000	12,90	10.6	50	37.1		
15.492000	12.40	11.3	50	37.6		

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		Calibration	Calibration	Control No.	
Manufacturer	Model / Equipment	Interval	Due	Serial No.	
Rohde & Schwarz	ENV216/ LISN	Annual	02/06/2014	100073	
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	05/03/2015	3125	
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	09/11/2013	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	10/30/2014	BBHA9170124	
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/08/2014	839117/011	
Agilent	E4416A /Power Meter	Annual	11/07/2013	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	11/07/2013	11377	
Hewlett Packard	11667B / Power Splitter	Annual	06/05/2013	05001	
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	11/07/2013	3110117	
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/07/2013	010002156287001199	
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	11/07/2013	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	

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