



Conducted Output Power (802.11g-CH 1) 24Mbps

Conducted Output Power (802.11g-CH 1) 36Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:		FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V
		Page 6 1 of 119		





Conducted Output Power (802.11g-CH 1) 48Mbps

Conducted Output Power (802.11g-CH 1) 54Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 6 2 of 119	





Conducted Output Power (802.11g-CH 6) 6Mbps

Conducted Output Power (802.11g-CH 6) 9Mbps



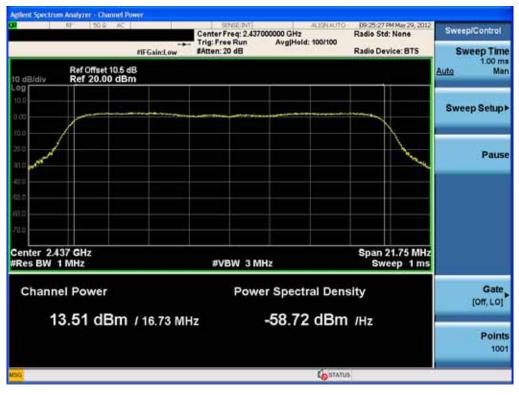
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	
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HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 6 3 of 119	





Conducted Output Power (802.11g-CH 6) 12Mbps

Conducted Output Power (802.11g-CH 6) 18Mbps



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 6 4 of 119	





Conducted Output Power (802.11g-CH 6) 24Mbps

Conducted Output Power (802.11g-CH 6) 36Mbps



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	
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HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 6 5 of 119	





Conducted Output Power (802.11g-CH 6) 48Mbps

Conducted Output Power (802.11g-CH 6) 54Mbps



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 6 6 of 119	





Conducted Output Power (802.11g-CH 11) 6Mbps

Conducted Output Power (802.11g-CH 11) 9Mbps



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 6 7 of 119	





Conducted Output Power (802.11g-CH 11) 12Mbps

Conducted Output Power (802.11g-CH 11) 18Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 6 8 of 119	





Conducted Output Power (802.11g-CH 11) 24Mbps

Conducted Output Power (802.11g-CH 11) 36Mbps



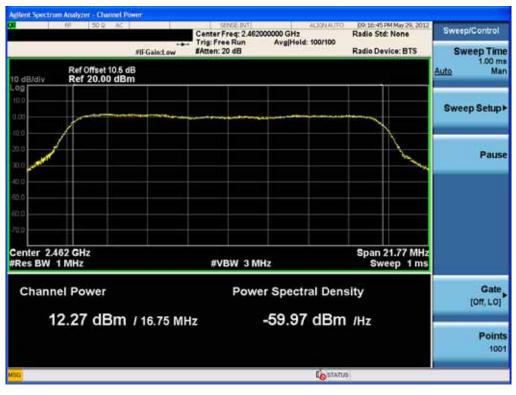
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 6 9 of 119	





Conducted Output Power (802.11g-CH 11) 48Mbps

Conducted Output Power (802.11g-CH 11) 54Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 7 0 of 119	



m Analyzer - Channel Power 10:00:07 AM May 30, 2012 Radio Std: None Sweep/Control Center Freq: 2.412000000 GHz Trig: Free Run Avg|Hold: 100/100 #IFGain:Low Trig: Free Run #Atten: 20 dB Radio Device: BTS Sweep Time 1.00 ms Man Ref Offset 10.5 dB Ref 20.00 dBm Auto 0 dB/div .00 Sweep Setup> Pause Center 2.412 GHz #Res BW 1 MHz Span 22.95 MHz Sweep 1 ms #VBW 3 MHz Gate **Channel Power Power Spectral Density** [Off, LO] 11.73 dBm / 17.65 MHz -60.73 dBm /Hz Points 1001 Lo STATUS

Conducted Output Power (802.11n-CH 1) 6.5Mbps

Conducted Output Power (802.11n-CH 1) 13Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 7 1 of 119	





Conducted Output Power (802.11n-CH 1) 19.5Mbps

Conducted Output Power (802.11n-CH 1) 26Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 7 2 of 119	





Conducted Output Power (802.11n-CH 1) 39Mbps

Conducted Output Power (802.11n-CH 1) 52Mbps



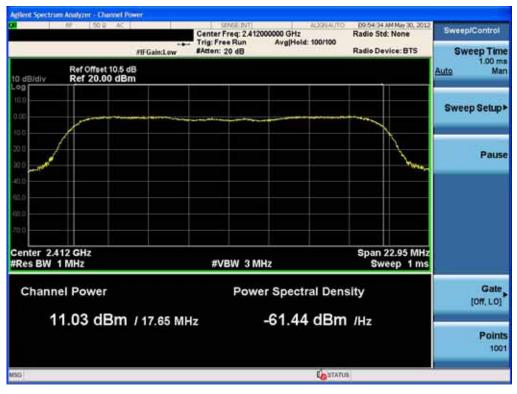
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		w	ww.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FC	CC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZN	NFE610V
		Page 7 3 of 119		





Conducted Output Power (802.11n-CH 1) 58.5Mbps

Conducted Output Power (802.11n-CH 1) 65Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 7 4 of 119	





Conducted Output Power (802.11n-CH 6) 6.5Mbps

Conducted Output Power (802.11n-CH 6) 13Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www	v.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC I	D:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE	610V
		Page 7 5 of 119		





Conducted Output Power (802.11n-CH 6) 19.5Mbps

Conducted Output Power (802.11n-CH 6) 26Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 7 6 of 119	





Conducted Output Power (802.11n-CH 6) 39Mbps

Conducted Output Power (802.11n-CH 6) 52Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 7 7 of 119	





Conducted Output Power (802.11n-CH 6) 58.5Mbps

Conducted Output Power (802.11n-CH 6) 65Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		v	www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	F	CC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	Z	INFE610V
		Page 7 8 of 119		





Conducted Output Power (802.11n-CH 11) 6.5Mbps

Conducted Output Power (802.11n-CH 11) 13Mbps



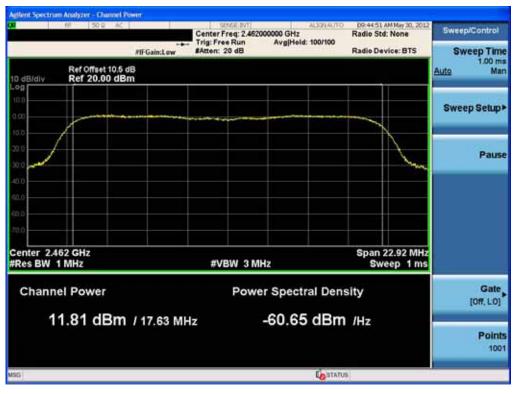
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 7 9 of 119	



lyzer - Channel Po 09:45:22 AM May 30, 2012 Radio Std: None Sweep/Control Center Freq: 2.462000000 GHz Trig: Free Run Avg|Hold: 100/100 FIFGain:Low #Atten: 20 dB Radio Device: BTS Sweep Time 1.00 ms Man Ref Offset 10.5 dB Ref 20.00 dBm Auto 0 dB/div .00 Sweep Setup> Pause Center 2.462 GHz #Res BW 1 MHz Span 22.92 MHz Sweep 1 ms #VBW 3 MHz Gate **Channel Power Power Spectral Density** [Off, LO] 12.10 dBm / 17.63 MHz -60.36 dBm /Hz Points 1001 Costatus .

Conducted Output Power (802.11n-CH 11) 19.5Mbps

Conducted Output Power (802.11n-CH 11) 26Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.k	<u>kr</u>
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V	
		Page 8 0 of 119		



n Analyzer - Channel Power 09:44:13 AM May 30, 2012 Radio Std: None Sweep/Control Center Freq: 2.462000000 GHz Trig: Free Run Avg|Hold: 100/100 Trig: Free Run #IFGain:Low #Atten: 20 dB Radio Device: BTS Sweep Time 1.00 ms Man Ref Offset 10.5 dB Ref 20.00 dBm Auto 0 dB/div .00 Sweep Setup> Pause Center 2.462 GHz #Res BW 1 MHz Span 22.92 MHz Sweep 1 ms #VBW 3 MHz Gate **Channel Power Power Spectral Density** [Off, LO] 11.63 dBm / 17.63 MHz -60.83 dBm /Hz Points 1001 Costatus .

Conducted Output Power (802.11n-CH 11) 39Mbps

Conducted Output Power (802.11n-CH 11) 52Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 8 1 of 119	





Conducted Output Power (802.11n-CH 11) 58.5Mbps

Conducted Output Power (802.11n-CH 11) 65Mbps



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 8 2 of 119	



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

A 11/11/1 Concernance Reporterion

TEST PROCEDURE

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

The spectrum analyzer is set to :

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

Sample Calculation

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

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

Note :

- 1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
- 2. Spectrum offset = Attenuator loss + Cable loss
- 3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is 10.49 dB at 2412 MHz and is 10.52 dB at 2462 MHz. So, the offset is 10.5 dB. And the offset gab in the 2.4 GHz range do not affect the power spectral density final result.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT				
Test Report No.	Date of Issue:	EUT Type:	FCC ID:			
HCTR1206FR03	June 05, 2012	lune 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC				
-	Page 8.3 of 119					



TEST RESULTS

				•	Result		
Frequency (MHz)	Channel No.	Mode	Spectrum Value(dBm)	BWCF (dB)	PSD (dBm)	Limit (dBm)	Pass/ Fail
2412	1		10.665	-15.2	-4.54	8	Pass
2437	6	802.11b	10.290	-15.2	-4.91	8	Pass
2462	11		10.705	-15.2	-4.50	8	Pass
2412	1		3.903	-15.2	-11.30	8	Pass
2437	6	802.11g	4.000	-15.2	-11.20	8	Pass
2462	11		4.235	-15.2	-10.97	8	Pass
2412	1		2.822	-15.2	-12.38	8	Pass
2437	6	802.11n	2.876	-15.2	-12.32	8	Pass
2462	11		3.145	-15.2	-12.06	8	Pass

Conducted Power Density Measurements

Note : PSD = Spectrum Value + BWCF

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V	





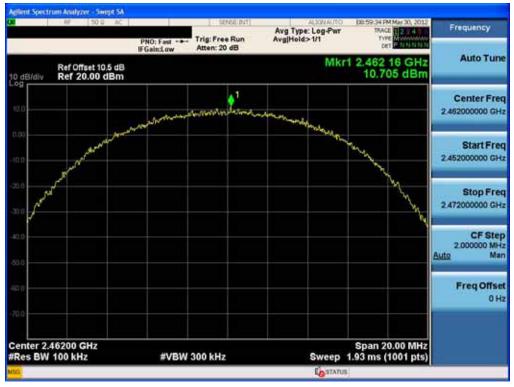
Power Spectral Density (802.11b-CH 1)

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:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V
		Page 8 5 of 119		





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:	
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V	
Page 8 6 of 119				





Power Spectral Density (802.11g-CH 6)

Power Spectral Density (802.11g-CH11)



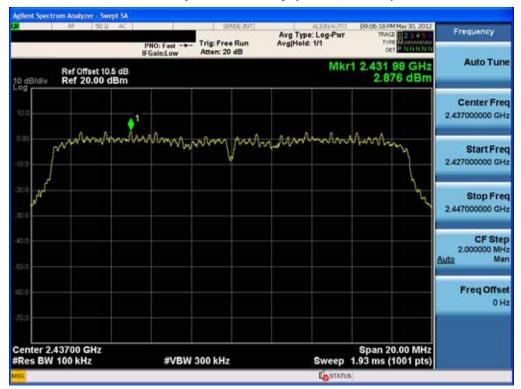
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V	
Page 8 7 of 119				





Power Spectral Density (802.11n-CH 1)

Power Spectral Density (802.11n-CH 6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT www.h		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 8 8 of 119	





Power Spectral Density (802.11n-CH11)

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr		
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1206FR03	June 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V		
	Page 8 9 of 119				



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)).

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Limit : 20 dBc TEST CONFIGURATION

TEST PROCEDURE

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

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

Note :

- 1. The band edge results in plot is already including the actual values of loss for the attenuator and cable combination.
- 2. Spectrum offset = Attenuator loss + Cable loss
- 3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is 10.49 dB at 2412 MHz and is 10.52 dB at 2462 MHz. So, the offset is 10.5 dB. And the offset gab in the 2.4 GHz range do not affect the band edge final result.
- 4. In case of conducted spurious emissions test, please check factors blow table.

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V	
Page 9 0 of 119				



FACTORS FOR FREQUENCY

Freq(MHz)	Factor(dB)
30	9.96
100	10.00
100	10.06
200	10.12
300	10.16
400	10.12
500	10.14
600	10.19
700	10.34
800	10.25
900	10.29
1000	10.26
1000	10.31
2000	10.53
2400*	10.49
2500*	10.53
3000	10.66
4000	10.77
5000	10.73
6000	10.99
7000	11.18
8000	11.33
9000	11.48
10000	11.61
11000	12.09
12000	14.96
13000	12.55
14000	11.88
15000	11.83
16000	11.81
17000	11.98
18000	11.84
19000	12.14
20000	12.29
21000	12.33
22000	12.82
23000	12.86
24000	12.98
25000	13.08
26000	12.80

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

2. Factor = Cable loss + Attenuator loss

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 9 1 of 119	



it Spectrum Analyzer - Swept 5A 10:30:08 AM May 30, 2012 Frequency Avg Type: Log-Pwr Avg|Hold: 1/1 Type Det Trig: Free Run Atten: 20 dB PNO: Fast Auto Tune ΔMkr1 16.20 MHz 47.141 dB Ref Offset 10.5 dB Ref 20.00 dBm 0 dB/di 142 Center Freq 2.40000000 GHz Links 1.1 Start Freq 2.38000000 GHz Stop Freq 2.42000000 GHz Xam CF Step 4.000000 MHz Man and and all and a start of the Auto Freq Offset 0 Hz Center 2.40000 GHz #Res BW 100 kHz Span 40.00 MHz Sweep 3.87 ms (1001 pts) #VBW 300 kHz **Lo**STATUS

BandEdge (802.11b-CH1)

BandEdge (802.11b-CH11)



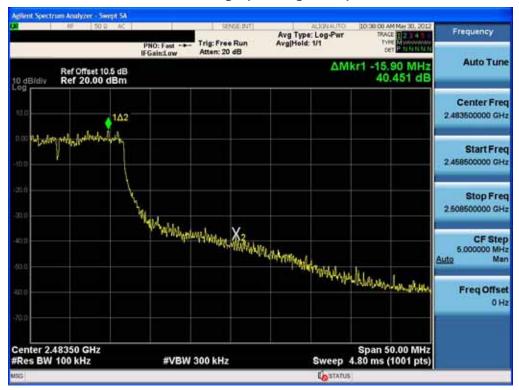
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V	
Page 9 2 of 119				



ectrum Analyzer - Swept SA w 30, 201 Frequency Avg Type: Log-Par Avg|Hold: 1/1 PNO: Fast ++- Trig: Free Run IFGain:Low Atten: 20 dB DET THE R L Auto Tune ΔMkr1 19.68 MHz 36.244 dB Ref Offset 10.5 dB Ref 20.00 dBm 10 dB/div Center Freq 2.400000000 GHz 147 he had not well of a partie for the book and the Start Freq 2.380000000 GHz Stop Freq and the second plans of the 2.42000000 GHz CF Step 4.000000 MHz Man Auto which Freq Offset and the 0 Hz Span 40.00 MHz Sweep 3.87 ms (1001 pts) Center 2.40000 GHz #Res BW 100 kHz #VBW 300 kHz Co STATUS

BandEdge (802.11g-CH1)

BandEdge (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:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 9 3 of 119	



ectrum Analyzer - Swept 5A ay 30, 201 Frequency Avg Type: Log-Par Avg|Hold: 1/1 PNO: Fast ---- Trig: Free Run IFGain:Low Atten: 20 dB DET THE REPORT Auto Tune ΔMkr1 21.28 MHz 36.058 dB Ref Offset 10.5 dB Ref 20.00 dBm 10 dB/div Center Freq 2.400000000 GHz 102 instruction when with the properties when Start Freq 2.380000000 GHz Stop Freq 2.42000000 GHz Marthadrow Martin Martin 10 CF Step 4.000000 MHz Man 1 Auto Freq Offset 0 Hz Center 2.40000 GHz #Res BW 100 kHz Span 40.00 MHz Sweep 3.87 ms (1001 pts) #VBW 300 kHz Co STATUS

BandEdge (802.11n-CH1)

BandEdge (802.11n-CH11)



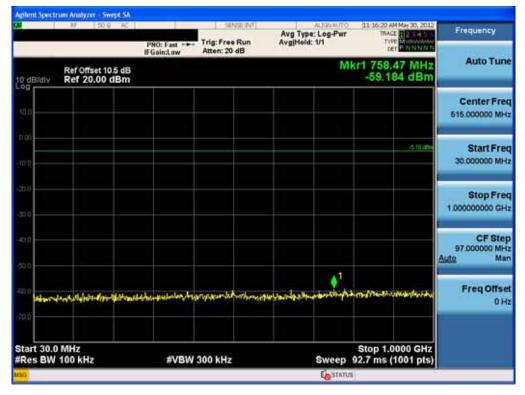
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V	
Page 9 4 of 119				



NF 50.2 AC	PNO: Fast	Trig: Free Run Atten: 20 dB	Avg Type: Log-Pwr Avg Hold: 1/1		Frequency
Ref Offset 10.5 dB dB/div Ref 20.00 dBm			N.	/kr1 931.13 MHz -59.136 dBm	Auto Tune
00					Center Freq 515.000000 MHz
00				4.57.664	Start Freq 30.000000 MHz
άδ					Stop Freq 1.00000000 GHz
on					CF Step 97.000000 MHz Auto Man
an waanaanaanaanaanaanaanaanaanaanaanaanaan	المعاوم والمعروم والمعا	angustantingtofodger	ياروندو ويوني وروندون ويوندون ويوندون ويوندون ويونونو	performant and provided and pro	Freq Offset 0 Hz
tart 30.0 MHz Res BW 100 kHz	#VBW :	300 kHz	Sweep	Stop 1.0000 GHz 92.7 ms (1001 pts)	

Conducted Spurious Emission (802.11b-CH1)

Conducted Spurious Emission (802.11b-CH6)



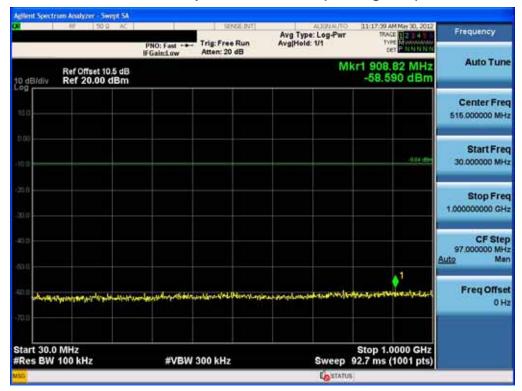
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:		FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V
Page 9 5 of 119				



NE 50 Q AC		SENSE DVT	AUGVIAITO Avg Type: Log-Pwr	11-16-58 AM May 30, 2012 TRACE 22 C	Frequency
	PNO: Fast ++-	Trig: Free Run Atten: 20 dB	Avg Hold: 1/1		
Ref Offset 10.5 dB	B/dly Ref 20.00 dBm -58.899 dBm			Auto Tur	
					Center Fre 515.000000 MH
0.00				.551.004	Start Fre 30.000000 MH
30.0					Stop Fre 1.000000000 GH
10 n					CF Ste 97.000000 Mi- Auto Ma
·····	ing an all and	aniterrortettique	لسمجه والمتحدث	1 134-14-14-14-14-14-14-14-14-14-14-14-14-14	Freq Offse 0 H
Start 30.0 MHz		000 LU-		Stop 1.0000 GHz	
Res BW 100 kHz	#VBW	300 kHz	Sweep	92.7 ms (1001 pts)	

Conducted Spurious Emission (802.11b-CH11)

Conducted Spurious Emission (802.11g-CH1)



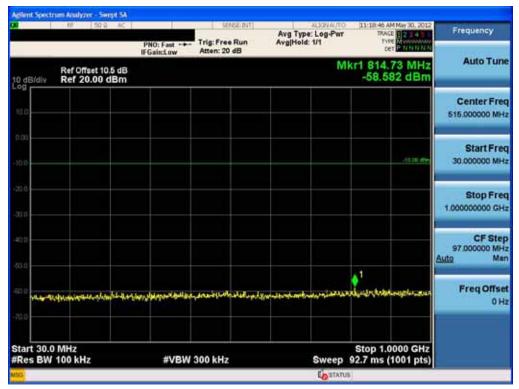
FCC PT.15.247 TEST REPORT		www.hct.co.kr		
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V	
Page 9 6 of 119				



Gain:Low	Atten: 20 dB	M	cr1 915.61 MHz -58.893 dBm	Auto Tune
				Center Fre 515.000000 MH
			-id m der	Start Fre 30.000000 MH
				Stop Fre 1.000000000 GH
				CF Ste 97.000000 MH Auto Mi
ge an internet	ang	all a fail and the second s	spectroshowskipsholo	Freq Offse 0 F
#VBW 3	00 kHz	Sweep	Stop 1.0000 GHz	
		مريد بالمراجع من المراجع من المراجع #VBW 300 kHz		ر این اور این می اور این اور ای مرابع این اور ای #VBW 300 kHz Sweep 92.7 ms (1001 pts)

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:		
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V		
		Page 9 7 of 119			



RF 50.0 MC		SENSE DVT	AUGHAITO Avg Type: Log-Pwr	11:19:34 AM May 30, 2012 TRACE	Frequency
	PNO: Fast ++-	Trig: Free Run Atten: 20 dB	Avg Hold: 1/1	DET PINNNNN	-
Ref Offset 10.5 dB			Mk	r1 898.15 MHz -59.123 dBm	Auto Tun
10.0					Center Fre 515.000000 MH
0.0				.10.01 (D e	Start Fre 30.000000 MH
					Stop Fre 1.000000000 GP
0.0					CF Ste 97.000000 Mi Auto Ma
	where a start where	whomeser article and an article	personal second s	ayungayahan ayaya ang karan	Freq Offs 0 F
tart 30.0 MHz				Stop 1.0000 GHz	
Res BW 100 kHz	#VBW	300 kHz	Sweep 9	92.7 ms (1001 pts)	

Conducted Spurious Emission (802.11n-CH1)

Conducted Spurious Emission (802.11n-CH6)



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V		
		Page 9 8 of 119			



	SENSE DVT	AUGUALITO Ava Type: Log-Par	11:20-45 AM May 30, 2012 TRACE 02:001	Frequency
PNO: Fast IFGain:Low	Trig: Free Run Atten: 20 dB	Avg Hold: 1/1	DET P TAN N N N	10000
		M	-58.490 dBm	Auto Tun
				Center Fre 515.000000 MH
				Start Fre 30.000000 MH
				Stop Fre 1.000000000 GF
				CF Ste 97.000000 MH Auto Ma
eronaginasiptin	alanga Malanga Malandan Silanga Salah S	angang magalapakin-Kalapanakinakan	whatermathemeter	Freq Offse 0 H
#VBW	300 kHz	Sweep	Stop 1.0000 GHz	
	PNO: Fast	PNO: Fast ++ Trig: Free Run IFGain:Low Atten: 20 dB	PNO: Fast Trig: Free Run Avg Type: Log-Pwr Atten: 20 dB Miter	PNO: Fast

Conducted Spurious Emission (802.11n-CH11)

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V	
		Page 9 9 of 119		



1 GHz ~ 26 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:		
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V		
		Page 1 0 0 of 119			





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:		
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V		
		Page 1 0 1 of 119			





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:		
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V		
		Page 1 0 2 of 119			



Conducted Spurious Emission (802.11n-CH1)



Conducted Spurious Emission (802.11n-CH6)



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V		
		Page 1 0 3 of 119			



	HF 50.0 AC		SENSE INT	Aug Type: Log		May 30, 2012	Frequency
		PNO: Fast +++	Trig: Free Run Atten: 20 dB	Avg Hold: 1/1	TYPE DET	PNNNN	1010-12111
0 dB/div	Ref Offset 10.5 dB Ref 20.00 dBm				∆Mkr1 -22.9 49.	50 GHz 216 dB	Auto Tune
	162						Center Free 13 50000000 GH
10:0)						1171.00	Start Free 1.00000000 GH
200							Stop Fre 26.00000000 GH
40.0 50.0	enter work of the ball	Waynesternet	^{مىرى} مەنبەيىرىندەندە ال ىرىملى	ashartha Yanahasarina	when have	yan Ker	CF Step 2.500000000 GH Auto Ma
70.0							Freq Offse 0 H
Start 1.00 #Res BW		#VBW	1.0 MHz	Sw	Stop 26 eep 62.5 ms (1	.00 GHz 001 pts)	

Conducted Spurious Emission (802.11n-CH11)

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT					
Test Report No.	Date of Issue:	EUT Type:	FCC ID:				
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V				
	Page 1.0.4 of 110						



8.5 RADIATED MEASUREMENT. 8.5.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

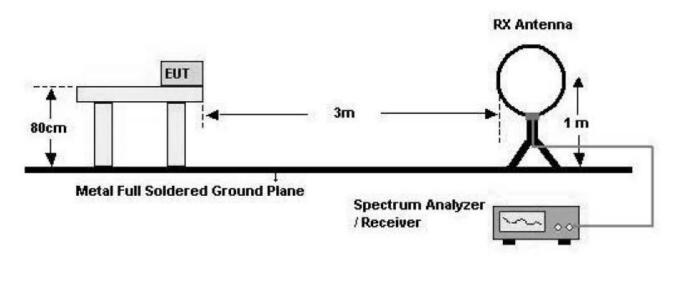
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

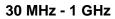
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V	
Page 1.0.5 of 119				

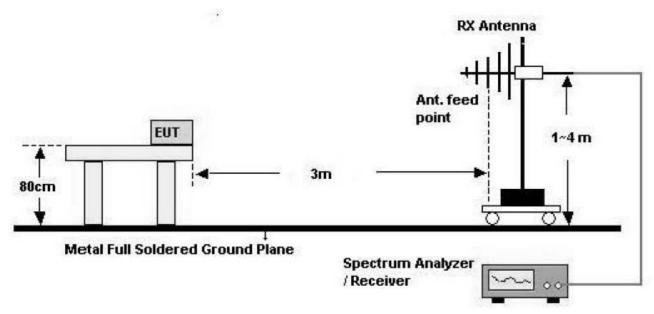


Test Configuration

Below 30 MHz

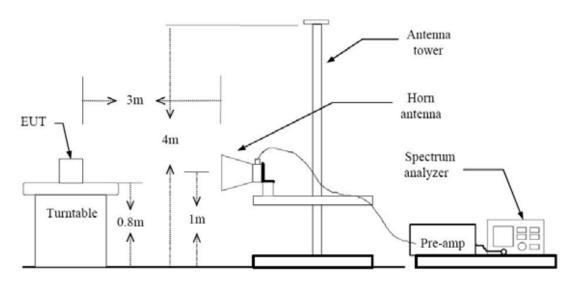






FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		Page 1 0 6 of 119	





TEST PROCEDURE

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

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC ZNFE		ZNFE610V	



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.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V	



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.

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V	



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	52.34	-0.10	V	52.24	74	21.76	PK
4824	42.17	-0.10	V	42.07	54	11.93	AV
7236	48.34	10.13	V	58.47	74	15.53	PK
7236	34.17	10.13	V	44.30	54	9.70	AV
4824	53.65	-0.10	Н	53.55	74	20.45	PK
4824	45.49	-0.10	Н	45.39	54	8.61	AV
7236	48.14	10.13	Н	58.27	74	15.73	PK
7236	34.19	10.13	Н	44.32	54	9.68	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. Spectrum setting:
 - a. Peak Setting 1 GHz 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
 - b. AV Setting 1 GHz 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
- 6. We have done 802.11b/g/n mode test. Worst case of EUT is 1 Mbps in 802.11b.
- 7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT	www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:	
HCTR1206FR03	June 05, 2012 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC		ZNFE610V	



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	51.51	0.13	V	51.64	74	22.36	PK
4874	40.46	0.13	V	40.59	54	13.41	AV
7311	47.75	10.01	V	57.76	74	16.24	PK
7311	34.03	10.01	V	44.04	54	9.96	AV
4874	52.74	0.13	Н	52.87	74	21.13	PK
4874	43.03	0.13	Н	43.16	54	10.84	AV
7311	47.75	10.01	Н	57.76	74	16.24	PK
7311	34.19	10.01	Н	44.20	54	9.80	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. Spectrum setting:
 - a. Peak Setting 1 GHz 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
 - b. AV Setting 1 GHz 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
- 6. We have done 802.11b/g/n mode test. Worst case of EUT is 1 Mbps in 802.11b.
- 7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
•		Dege 1 1 1 ef 110	



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	50.77	0.45	V	51.22	74	22.78	PK
4924	38.79	0.45	V	39.24	54	14.76	AV
7386	48.72	10.17	V	58.89	74	15.11	PK
7386	34.70	10.17	V	44.87	54	9.13	AV
4924	51.54	0.45	Н	51.99	74	22.01	PK
4924	42.13	0.45	Н	42.58	54	11.42	AV
7386	48.28	10.17	Н	58.45	74	15.55	PK
7386	34.72	10.17	Н	44.89	54	9.11	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. Spectrum setting:
 - a. Peak Setting 1 GHz 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
 - b. AV Setting 1 GHz 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
- 6. We have done 802.11b/g/n mode test. Worst case of EUT is 1 Mbps in 802.11b.
- 7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT		www.hct.co.kr	
Test Report No.	Date of Issue:	EUT Type:	FCC ID:
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V
		D 1 1 0 (110	



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	30.56	33.86	Н	64.42	74	9.58	PK
2390.0	13.65	33.86	Н	47.51	54	6.49	AV
2390.0	30.30	33.86	V	64.16	74	9.84	PK
2390.0	13.50	33.86	V	47.36	54	6.64	AV
2483.5	35.63	34.02	Н	69.65	74	4.35	PK
2483.5	16.32	34.02	Н	50.34	54	3.66	AV
2483.5	36.37	34.02	V	70.39	74	3.61	PK
2483.5	15.54	34.02	V	49.56	54	4.44	AV

- 1. Total = Reading Value + Antenna Factor + Cable Loss
- 2. Spectrum setting:
 - a. Peak Setting 1 GHz 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
 - b. AV Setting 1 GHz 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
- 3. We have done 802.11b/g/n mode test. . Worst case of EUT is 1 Mbps in 802.11b
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT		www.hct.co.kr			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V		
Page 1 1 3 of 110					



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 54 Mbps, Ch.11 and 802.11g. Because 802.11g mode is worst case.

FCC PT.15.247 TEST REPORT		www.hct.co.kr			
Test Report No.	Date of Issue:	EUT Type:	FCC ID:		
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V		



RESULT PLOTS **Conducted Emissions (Line 1)**

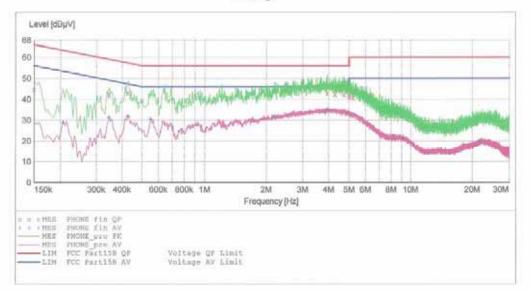
HCT

EMC

EUT:	LG-E610v
Manufacturer:	LGE
Operating Condition:	WLAN MODE
Test Site:	SHIELD ROOM
Operator:	JS LEE
Test Specification:	FCC PART15 CLASS B
Comment:	N

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

Shor	t Desc	ription:		FCC PART 15	CLASS B		
		Stop	Step	Detector		IF	Transducer
Ereq	nuency	Frequency	Width		Time	Bandw.	
150.	0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
	0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms		None
5.0	MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

					8PM	5/30/2012 3:3
PE	Line	Margin dB	Limit dBµV	Transd dB	Level dBµV	Frequency MHz
		21.2	66	10.0	44.80	0.150010
		16.9	59	10.1	42.10	0.346010
		14.2	57	10.1	43.10	0.426010
		13.1	56	10.3	42.90	3.944000
		13.6	56	10.4	42.40	4.292000
		13.6	56	10.4	42.40	4.732000
		15.0	56	10.5	41.00	5.000000
		18.3	60	10.5	41.70	5.048000
		19.3	60	10.5	40.70	5.228000

Page 1/2 5/30/2012 3:38FM PHONE

FCC PT.15.247 FCC CERTIFICATION REPORT www.hct.co.kr TEST REPORT Test Report No. Date of Issue: EUT Type: FCC ID: June 05, 2012 HCTR1206FR03 Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC ZNFE610V Page 1 1 5 of 119



MEASUREMENT RESULT: "PHONE_fin AV"

5/30/2012 3:3						
Frequency MHz	Level dBpV	Transd dB	Limit dBpV	Margin dB	Line	PE
0.206010	28.80	10.1	53	24.5		
0.346010	31.10	10.1	49	17.9		
0.426010	31.70	10.1	47	15.6		
0.552000	30.40	10.1	4.6	15.6		
2.192000	31.50	10.2	46	14.5		
3.956000	34.80	10.3	4.6	11.2	1000	
5.000000	33.40	10.5	46	12.6		
9.168000	21.40	10.8	50	28.6		
21,872000	19,50	11.5	50	30.5		444

Page 2/2 5/30/2012 3:38PM PHONE

FCC PT.15.247 TEST REPORT		www.hct.co.kr				
Test Report No.	Date of Issue:	EUT Type:	FCC ID:			
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V			
Page 1 1 6 of 119						

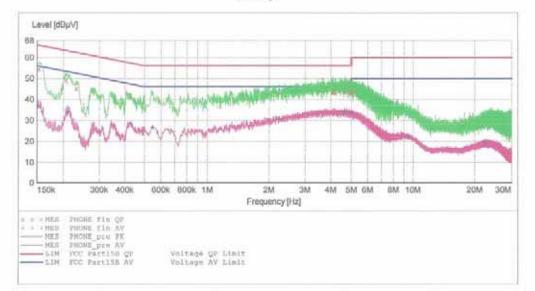


HCT

EMC	
EUT: Manufacturer: Operating Condition: Test Site: Operator: Test Specification: Comment:	SHIELD ROOM JS LEE

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

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



MEASUREMENT RESULT: "PHONE fin QP"

5/30/2012 3:22PM Level Transd Limit Margin Line PE Frequency dBµV dB MHZ dBµV dB 0.153010 0.206010 0.231010 54.50 10.0 66 11.4 49.20 45.10 10.1 63 62 14.1 17.3 12.8 ____ -------------43.20 43.70 43.40 43.40 43.10 43.20 10.4 10.4 10.5 10.5 10.5 4.096000 4.184000 56 56 56 12.3 ---12.6 ---12.6 ---____ 4.656000 ---5.020000 5.032000 56 ----16.9 -------60 16.8 43.20 60 ____ ----

Page 1/2 5/30/2012 3:22PM PHONE

FCC PT.15.247 TEST REPORT		www.hct.co.kr					
Test Report No.	Date of Issue:	EUT Type:	FCC ID:				
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V				
Dogo 1 1 7 of 110							



MEASUREMENT RESULT: "PHONE_fin AV"

Frequency MHz	dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.152010	36.90	10.0	56	19.0		
0.210010	34.00	10.1	53	19.2	-	
0.428010	28.30	10.1	4.7	19.0		1110.00
0.548000	26.80	10.1	46	19.2		
2.248000	30.80	10.2	46	15.2		
4.656000	34.10	10.4	46	11.9		
5.000000	33.40	10.5	4.6	12.6	-	
9.400000	22,10	10.0	50	27.9		
22.364000	19.20	11.7	50	30.8	-	-

Page 2/2 5/30/2012 3:22PM PHONE

FCC PT.15.247 TEST REPORT		www.hct.co.kr					
Test Report No.	Date of Issue:	EUT Type:	FCC ID:				
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V				
	Page 1 1 8 of 119						



Manufacturer	Model / Equipment	Calibration	Calibration	Serial No.
Manufacturer	Model / Equipment	Interval	Due	Senar No.
Rohde & Schwarz	ESH2-Z5/ LISN	Annual	02/03/2013	861741/013
Schwarzbeck	VULB 9168/ TRILOG Antenna	Biennial	02/09/2013	200
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	05/03/2013	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	05/02/2013	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	09/23/2012	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	ESH3-Z2/ PULSE LIMITER	Annual	08/01/2012	375.8810.352
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	Annual	09/19/2012	10094
MITEQ	AMF-6B-180265-35-10P / POWER AMP	Annual	04/16/2013	667624
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2013	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	10/17/2013	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/26/2012	BBHA9170342
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/09/2013	839117/011
Agilent	E4416A /Power Meter	Annual	11/07/2012	GB41291412
Agilent	E9327A /POWER SENSOR	Annual	05/02/2013	MY4442009
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	05/02/2013	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	05/02/2013	1
Hewlett Packard	11636B/Power Divider	Annual	11/07/2012	11377
Hewlett Packard	11667B / Power Splitter	Annual	11/04/2012	10126
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	11/07/2012	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/07/2012	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	11/14/2012	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	05/02/2013	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
MITEQ	AMF-6D-001180-35-20P/ POWER AMP	Annual	12/26/2012	990893
Agilent	8493C / Attenuator(10 dB)	Annual	09/23/2012	76649
WEINSCHEL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617

FCC PT.15.247 TEST REPORT		www.hct.co.kr				
Test Report No.	Date of Issue:	EUT Type:	FCC ID:			
HCTR1206FR03	June 05, 2012	Cellular/PCS GSM/GPRS Phone with Bluetooth/WLAN/NFC	ZNFE610V			