



HCT CO., LTD.

CERTIFICATE OF COMPLIANCE

FCC Certification

Applicant Name: LG Electronics MobileComm U.S.A., Inc.	Date of Issue: March 24 2014
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632	Test Site/Location: HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea
	Report No.: HCT-R-1403-F025-2
	HCT FRN: 0005866421

FCC ID: ZNFD625

APPLICANT: LG Electronics MobileComm U.S.A., Inc.

FCC Model(s):	LG-D625
Additional FCC Model(s):	LGD625, D625
EUT Type:	Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC
FCC Classification:	Licensed Portable Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§2, §27
Tx Frequency:	1712.5 MHz – 1752.5 MHz (LTE – Band 4)
Max. RF Output Power:	Band 4 (1.4 MHz) : 0.587 W (QPSK) (27.69 dBm) 0.582 W (16-QAM) (27.65 dBm) Band 4 (3 MHz) : 0.583 W (QPSK) (27.66 dBm) 0.575 W (16-QAM) (27.60 dBm) Band 4 (5 MHz) : 0.618 W (QPSK) (27.91 dBm) 0.630 W (16-QAM) (27.99 dBm) Band 4 (10 MHz) : 0.541 W (QPSK) (27.33 dBm) 0.569 W (16-QAM) (27.55 dBm) Band 4 (15 MHz) : 0.471 W (QPSK) (26.73 dBm) 0.483 W (16-QAM) (26.84 dBm) Band 4 (20 MHz) : 0.518 W (QPSK) (27.14 dBm) 0.511 W (16-QAM) (27.08 dBm)
Emission Designator(s):	Band 4 (1.4 MHz) : 1M09G7D (QPSK) / 1M09W7D (16-QAM) Band 4 (3 MHz) : 2M69G7D (QPSK) / 2M70W7D (16-QAM) Band 4 (5 MHz) : 4M50G7D (QPSK) / 4M50W7D (16-QAM) Band 4 (10 MHz) : 8M96G7D (QPSK) / 8M95W7D (16-QAM) Band 4 (15 MHz) : 13M5G7D (QPSK) / 13M5W7D (16-QAM) Band 4 (20 MHz) : 17M9G7D (QPSK) / 17M9W7D (16-QAM)

The measurements shown in this report were made in accordance with the procedures specified in §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

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

Report prepared by
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Approved by
: Chang Seok Choi
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FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFD625

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1403-F025	March 14, 2014	-First Approval Report
HCT-R-1403-F025-1	March 21, 2014	-Revised the Emission Designators on page 1, 4 -Revised the EUT Description on section 2.1 -Revised the Battery Endpoint (3.23 V → 3.50 V)
HCT-R-1403-F025-2	March 24, 2014	-Removed the Plots on Page 59

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MEASUREMENT REPORT

1. GENERAL INFORMATION

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

Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632

FCC ID: ZNFD625

Application Type: Certification

FCC Classification: Licensed Portable Transmitter Held to Ear (PCE)

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EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

FCC Model(s): LG-D625

Additional FCC Model(s): LGD625, D625

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Emission Designator(s):

Band 4 (1.4 MHz) :	1M09G7D (QPSK) / 1M09W7D (16-QAM)
Band 4 (3 MHz) :	2M69G7D (QPSK) / 2M70W7D (16-QAM)
Band 4 (5 MHz) :	4M50G7D (QPSK) / 4M50W7D (16-QAM)
Band 4 (10 MHz) :	8M96G7D (QPSK) / 8M95W7D (16-QAM)
Band 4 (15 MHz) :	13M5G7D (QPSK) / 13M5W7D (16-QAM)
Band 4 (20 MHz) :	17M9G7D (QPSK) / 17M9W7D (16-QAM)

Date(s) of Tests: February 15, 2014 ~ March 13, 2014

Antenna Specification

Manufacturer: acetechtechnologyA

Antenna type: Internal antenna

Peak Gain: Band 4: -3.6 dBi

FCC CERTIFICATION REPORT			www.hct.co.kr
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2. INTRODUCTION

2.1. EUT DESCRIPTION

The LG Electronics MobileComm U.S.A., Inc. LG-D625 Cellular/PCS GSM, WCDMA, LTE(Band 4, 7) Phone with Bluetooth/WLAN/NFC consists of GPRS Class12, EDGE 12, GSM850, GSM1900, WCDMA850, WCDMA1900, HSDPA, HSUPA and DC-HSDPA.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

The Fully-anechoic and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea.

3. DESCRIPTION OF TESTS

3.1 ERP/EIRP RADIATED POWER AND RADIATED SPURIOUS EMISSIONS

Note: ERP(Effective Radiated Power), EIRP(Effective Isotropic Radiated Power)

Test Procedure

Radiated emission measurements are performed in the Fully-anechoic chamber. The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-C-2004 Clause 2.2.17. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission. The level and position of the maximized emission is recorded with the spectrum analyzer using a positive peak detector.

A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

The power is calculated by the following formula;

$$P_{d(dBm)} = P_{g(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dB)}$$

Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

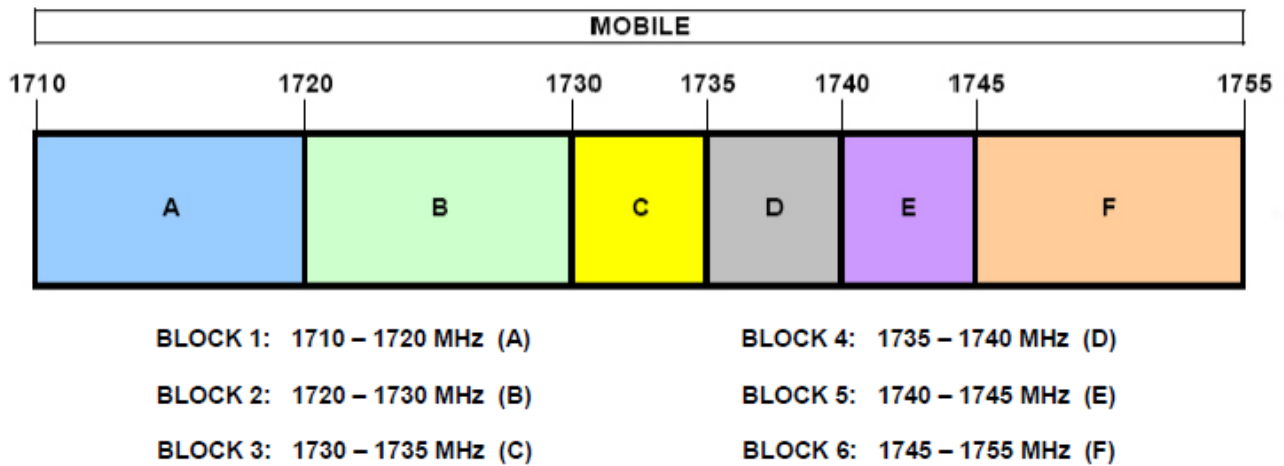
The maximum EIRP is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

Radiated spurious emissions

: Frequency Range : 30 MHz ~ 10th Harmonics of highest channel fundamental frequency.

3.2 AWS – MOBILE FREQUENCY BLOCKS (1710 – 1755 MHz)

§27.5(h)



3.3 PEAK-AVERAGE RATIO.

Test Procedure

Peak to Average Power Ratio is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r01, June 7, 2013, Section 5.7.

- Section 5.7.1 CCDF Procedure

- a) Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
- b) Set the number of counts to a value that stabilizes the measured CCDF curve;
- c) Set the measurement interval as follows:
 - 1) for continuous transmissions, set to 1 ms,
 - 2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
- d) Record the maximum PAPR level associated with a probability of 0.1%.

- Section 5.7.2 Alternate Procedure

Use one of the procedures presented in 5.1 to measure the total peak power and record as P_{Pk} . Use one of the applicable procedures presented 5.2 to measure the total average power and record as P_{Avg} . Determine the P.A.R. from: $P.A.R._{dB} = P_{Pk} \text{ (dBm)} - P_{Avg} \text{ (dBm)}$ (P_{Avg} = Average Power + Duty cycle Factor)

5.1.1 Peak power measurements with a spectrum/signal analyzer or EMI receiver

The following procedure can be used to determine the total peak output power.

- a) Set the RBW $\geq$ OBW.
- b) Set VBW $\geq 3 \times$ RBW.
- c) Set span $\geq 2 \times$ RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Ensure that the number of measurement points $\geq$ span/RBW.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the peak amplitude level.

5.2.2 Procedures for use with a spectrum/signal analyzer when EUT cannot be configured to transmit continuously and sweep triggering/signal gating cannot be properly implemented

If the EUT cannot be configured to transmit continuously (burst duty cycle < 98%), then one of the following procedures can be used. The selection of the applicable procedure will depend on the characteristics of the measured burst duty cycle.

Measure the burst duty cycle with a spectrum/signal analyzer or EMC receiver can be used in zero-span mode if the response time and spacing between bins on the sweep are sufficient to permit accurate measurement of the burst on/off time of the transmitted signal.

5.2.2.2 Constant burst duty cycle

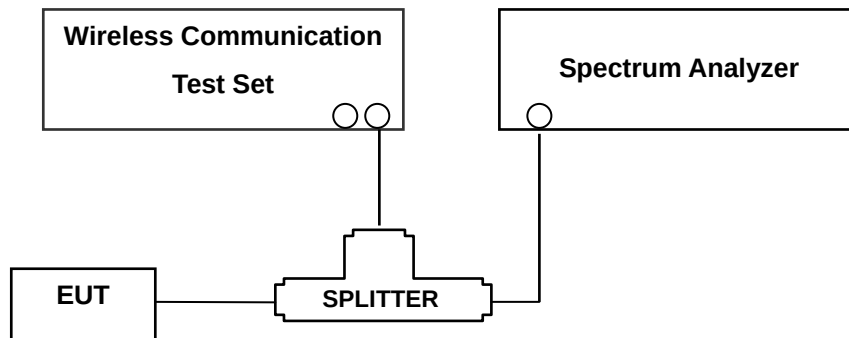
If the measured burst duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent), then:

- a) Set span to at least 1.5 times the OBW.
- b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
- c) Set VBW $\geq 3 \times$ RBW.
- d) Number of points in sweep $\geq 2 \times$ span / RBW. (This gives bin-to-bin spacing $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)
- e) Sweep time = auto.
- f) Detector = RMS (power averaging).
- g) Set sweep trigger to "free run".
- h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
- j) Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).

For example, add $10 \log (1/0.25) = 6$ dB if the duty cycle is a constant 25%.

3.4 OCCUPIED BANDWIDTH.

Test set-up



(Configuration of conducted Emission measurement)

Test Procedure

OBW is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r01, June 7, 2013, Section 4.2..

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Plots of the EUT's occupied bandwidth are shown herein.

3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

Test Procedure

Spurious and harmonic emissions at antenna terminal is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r01, June 7, 2013, Section 6.0.

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer.

The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30kHz bandwidth may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency

Additionally, for operations in the 776-788MHz band, the power of any emission outside the licensee's frequency band of operation shall be attenuated below the transmitted power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 776-788MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43+10\log(P)$ dB.
- (2) On all frequencies between 763-775 and 793-805MHz, by a factor not less than $65+10\log(P)$ dB in a 6.25kHz band segment.

For operations in the 788–793 MHz band, the power of any emission outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

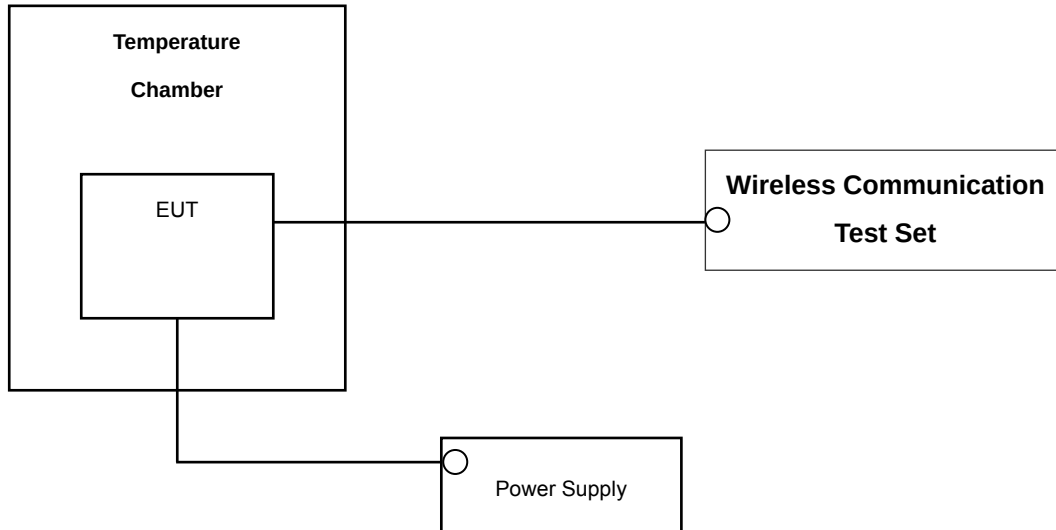
- (1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;
- (2) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log (P)$ dB

NOTES: The analyzer plot offsets were determined by below conditions.

- For LTE Band 4, total offset 27.7 dBm = 30 dBm attenuator + 6 dBm Divider + 1.7 dBm RF cables.

3.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up



Test Procedure

Frequency stability is tested in accordance with ANSI/TIA-603-C-2004 section 2.2.2.

The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from the end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification — the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.000\ 25\ \%$ ($\pm 2.5\ \text{ppm}$) of the center frequency.

Time Period and Procedure:

The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).

1. The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
2. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Interval	Calibration Due
Agilent	E9327A/ Power Sensor	MY4442009	Annual	04/16/2014
MITEQ	AMF-6D-001180-35-20P/AMP	1081666	Annual	09/12/2014
Wainwright	WHK1.2/15G-10EF/H.P.F	2	Annual	04/25/2014
Wainwright	WHK3.3/18G-10EF/H.P.F	1	Annual	04/25/2014
Hewlett Packard	11667B / Power Splitter	11275	Annual	05/13/2014
Digital	EP-3010/ Power Supply	3110117	Annual	10/29/2014
Schwarzbeck	UHAP/ Dipole Antenna	557	Biennial	03/05/2015
Schwarzbeck	UHAP/ Dipole Antenna	558	Biennial	05/03/2015
Korea Engineering	KR-1005L / Chamber	KRAB05063-3CH	Annual	10/30/2014
Schwarzbeck	BBHA 9120D/ Horn Antenna	147	Biennial	05/15/2014
Schwarzbeck	BBHA 9120D/ Horn Antenna	1151	Biennial	10/05/2015
Agilent	E4440A/Spectrum Analyzer	US45303008	Annual	04/25/2014
WEINSCHL	ATTENUATOR	BR0592	Annual	10/28/2014
REOHDE&SCHWARZ	FSV40/Spectrum Analyzer	1307.9002K40-100931-NK	Annual	06/10/2014
Agilent	8960 (E5515C)/ Base Station	GB45070669	Annual	08/31/2014

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049, 27.53	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 27.53(h)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	$< 43 + 10 \log_{10}(P[\text{Watts}])$ at Band Edge and for all-of-band emissions		PASS
27.50(d)(5)	Peak-Average Ratio	$< 13 \text{ dB}$		PASS
2.1046	Conducted Output Power	N/A		PASS
2.1055, 27.54	Frequency stability / variation of ambient temperature	$< 2.5 \text{ ppm}$		PASS
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	$< 1 \text{ Watts max. EIRP}$	RADIATED	PASS
				PASS
2.1053, 27.53(h), 27.53(g)	Undesirable Out-of-Band Emissions	$< 43 + 10 \log_{10}(P[\text{Watts}])$ for all out-of-band emissions		PASS
2.1053, 27.53(f)	Undesirable Emissions in the 1559 – 1610 MHz band	$< -40\text{dBm/MHz EIRP (wideband)}$ $< -50\text{dBm EIRP (narrowband)}$		PASS

6. SAMPLE CALCULATION

A. ERP Sample Calculation

Mode	Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL(dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
	channel	Freq.(MHz)						W	dBm
LTE	23230	782	-10.59	37.59	-10.52	1.53	H	0.358	25.54

$$\text{ERP} = \text{SubstituteLEVEL(dBm)} + \text{Ant. Gain} - \text{CL(Cable Loss)}$$

- 1) The EUT mounted on a wooden tripod is 0.8 meter above test site ground level.
- 2) During the test , the turn table is rotated and the antenna height is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power (ERP).

B. Emission Designator

QPSK Modulation

5MHz Bandwidth

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

10MHz Bandwidth

Emission Designator = 8M95G7D

LTE BW = 8.95 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

16QAM Modulation

5MHz Bandwidth

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = main carrier modulated in a combination of two or more of the following modes;
amplitude, angle, pulse

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

10MHz Bandwidth

Emission Designator = 8M95W7D

LTE BW = 8.95 MHz

W = main carrier modulated in a combination of two or more of the following modes;
amplitude, angle, pulse

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

7. TEST DATA

7.1 EQUIVALENT ISOTROPIC RADIATED POWER OUTPUT

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1710.7	1.4 MHz	QPSK	-13.76	17.82	9.87	1.16	V	0.450	26.53
		16-QAM	-14.01	17.57	9.87	1.16	V	0.425	26.28
1732.5		QPSK	-13.89	17.67	9.90	1.16	V	0.438	26.41
		16-QAM	-14.20	17.36	9.90	1.16	H	0.407	26.10
1754.3		QPSK	-12.50	18.85	10.01	1.17	V	0.587	27.69
		16-QAM	-12.54	18.81	10.01	1.17	H	0.582	27.65

Effective Radiated Power Data (Band 4 – 1.4 MHz)

Note: Worst case is 1 resource block.

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1711.5	3 MHz	QPSK	-13.89	17.68	9.87	1.16	V	0.436	26.39
		16-QAM	-14.04	17.53	9.87	1.16	H	0.421	26.24
1732.5		QPSK	-14.29	17.27	9.90	1.16	H	0.399	26.01
		16-QAM	-14.19	17.37	9.90	1.16	H	0.408	26.11
1753.5		QPSK	-12.48	18.82	10.01	1.17	H	0.583	27.66
		16-QAM	-12.54	18.76	10.01	1.17	H	0.575	27.60

Effective Radiated Power Data (Band 4 – 3 MHz)

Note: Worst case is 1 resource block.

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1712.5	5 MHz	QPSK	-13.82	17.69	9.87	1.16	H	0.437	26.40
		16-QAM	-13.89	17.62	9.87	1.16	H	0.430	26.33
1732.5		QPSK	-13.88	17.68	9.90	1.16	V	0.439	26.42
		16-QAM	-14.01	17.55	9.90	1.16	V	0.426	26.29
1752.5		QPSK	-12.23	19.07	10.01	1.17	H	0.618	27.91
		16-QAM	-12.15	19.15	10.01	1.17	H	0.630	27.99

Effective Radiated Power Data (Band 4 – 5 MHz)

Note: Worst case is 1 resource block.

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1715.0	10 MHz	QPSK	-14.04	17.61	9.87	1.16	V	0.429	26.32
		16-QAM	-14.04	17.61	9.87	1.16	H	0.429	26.32
1732.5		QPSK	-13.88	17.68	9.90	1.16	V	0.439	26.42
		16-QAM	-13.79	17.77	9.90	1.16	V	0.448	26.51
1750.0		QPSK	-12.81	18.49	10.01	1.17	H	0.541	27.33
		16-QAM	-12.59	18.71	10.01	1.17	H	0.569	27.55

Effective Radiated Power Data (Band 4 – 10 MHz)

Note: Worst case is 1 resource block.

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1717.5	15 MHz	QPSK	-13.85	17.81	9.88	1.16	V	0.450	26.53
		16-QAM	-14.18	17.48	9.88	1.16	V	0.417	26.20
1732.5		QPSK	-13.59	17.97	9.90	1.16	V	0.469	26.71
		16-QAM	-13.57	17.99	9.90	1.16	V	0.471	26.73
1747.5		QPSK	-13.46	17.90	9.99	1.16	V	0.471	26.73
		16-QAM	-13.35	18.01	9.99	1.16	V	0.483	26.84

Effective Radiated Power Data (Band 4 – 15 MHz)

Note: Worst case is 1 resource block.

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1720.0	20 MHz	QPSK	-13.87	17.69	9.88	1.16	V	0.438	26.41
		16-QAM	-13.90	17.66	9.88	1.16	V	0.435	26.38
1732.5		QPSK	-13.16	18.40	9.90	1.16	H	0.518	27.14
		16-QAM	-13.22	18.34	9.90	1.16	H	0.511	27.08
1745.0		QPSK	-14.03	17.38	9.96	1.16	V	0.415	26.18
		16-QAM	-14.13	17.28	9.96	1.16	H	0.406	26.08

Effective Radiated Power Data (Band 4 – 20 MHz)

Note: Worst case is 1 resource block.

NOTES:

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer.

A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

Also, we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna. The worst case of the EUT is z plane in LTE mode. Also worst case of detecting Antenna is horizontal polarization in LTE mode.

FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFD625

7.2 RADIATED SPURIOUS EMISSIONS

7.2.1 RADIATED SPURIOUS EMISSIONS (Band 4)

☐ OPERATING FREQUENCY : 1732.50 MHz
☐ MEASURED OUTPUT POWER: 27.69 dBm = 0.587 W
☐ MODULATION SIGNAL: 1.4 MHz QPSK
☐ DISTANCE: 3 meters
☐ LIMIT: $43 + 10 \log_{10}(W) =$ 40.69 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
19957 (1710.7)	3421.4	-53.46	12.36	-60.30	1.64	H	-49.58	77.27
	5132.1	-53.49	12.34	-53.69	2.01	H	-43.36	71.05
	6842.8	-47.02	12.17	-41.41	2.35	V	-31.59	59.28
20175 (1732.5)	3465.0	-54.71	12.27	-61.24	1.63	V	-50.60	78.29
	5197.5	-	-	-	-	-	-	-
	6930.0	-51.67	11.87	-45.52	2.41	V	-36.06	63.75
20393 (1754.3)	3508.6	-	-	-	-	-	-	-
	5262.9	-54.74	12.91	-56.28	2.03	H	-45.40	73.09
	7017.2	-48.84	11.59	-41.97	2.38	V	-32.76	60.45

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:
 2. We are performed all frequency to 10th harmonics from 30 MHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
 4. Worst case is 1 resource block.

■ OPERATING FREQUENCY : 1732.50 MHz
 ■ MEASURED OUTPUT POWER: 27.66 dBm = 0.583 W
 ■ MODULATION SIGNAL: 3 MHz QPSK
 ■ DISTANCE: 3 meters
 ■ LIMIT: $43 + 10 \log_{10}(W) =$ 40.66 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
19965 (1711.5)	3423.0	-53.66	12.36	-60.50	1.64	H	-49.78	77.44
	5134.5	-54.63	12.35	-54.85	2.00	H	-44.50	72.16
	6846.0	-48.19	12.16	-42.56	2.36	H	-32.76	60.42
20175 (1732.5)	3465.0	-55.30	12.27	-61.83	1.63	V	-51.19	78.85
	5197.5	-	-	-	-	-	-	-
	6930.0	-50.35	11.87	-44.20	2.41	V	-34.74	62.40
20385 (1753.5)	3507.0	-55.62	12.15	-61.38	1.67	V	-50.90	78.56
	5260.5	-55.79	12.90	-57.33	2.02	H	-46.45	74.11
	7014.0	-50.19	11.59	-43.37	2.33	H	-34.11	61.77

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:
 2. We are performed all frequency to 10th harmonics from 30 MHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
 4. Worst case is 1 resource block.

■ OPERATING FREQUENCY : 1732.50 MHz
 ■ MEASURED OUTPUT POWER: 27.99 dBm = 0.630 W
 ■ MODULATION SIGNAL: 5 MHz 16-QAM
 ■ DISTANCE: 3 meters
 ■ LIMIT: $43 + 10 \log_{10}(W) =$ 40.99 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
19975 (1712.5)	3425.0	-53.82	12.35	-60.66	1.63	V	-49.94	77.93
	5137.5	-55.11	12.36	-55.35	1.99	H	-44.98	72.97
	6850.0	-49.34	12.15	-43.70	2.36	H	-33.91	61.90
20175 (1732.5)	3465.0	-	-	-	-	-	-	-
	5197.5	-	-	-	-	-	-	-
	6930.0	-50.75	11.87	-44.60	2.41	V	-35.14	63.13
20375 (1752.5)	3505.0	-	-	-	-	-	-	-
	5257.5	-54.97	12.90	-56.42	2.02	H	-45.54	73.53
	7010.0	-50.65	11.61	-44.05	2.36	H	-34.80	62.79

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:
 2. We are performed all frequency to 10th harmonics from 30 MHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
 4. Worst case is 1 resource block.

■ OPERATING FREQUENCY : 1732.50 MHz
 ■ MEASURED OUTPUT POWER: 27.55 dBm = 0.569 W
 ■ MODULATION SIGNAL: 10 MHz 16-QAM
 ■ DISTANCE: 3 meters
 ■ LIMIT: $43 + 10 \log_{10}(W) =$ 40.55 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20000 (1715.0)	3430.0	-53.82	12.34	-60.91	1.63	V	-50.20	77.75
	5145.0	-55.79	12.38	-55.95	1.97	H	-45.54	73.09
	6860.0	-49.33	12.11	-43.89	2.38	V	-34.16	61.71
20175 (1732.5)	3465.0	-55.35	12.27	-61.88	1.63	H	-51.24	78.79
	5197.5	-	-	-	-	-	-	-
	6930.0	-51.00	11.87	-44.85	2.41	V	-35.39	62.94
20350 (1750.0)	3500.0	-	-	-	-	-	-	-
	5250.0	-	-	-	-	-	-	-
	7000.0	-51.11	11.65	-44.43	2.39	V	-35.17	62.72

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:
 2. We are performed all frequency to 10th harmonics from 30 MHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
 4. Worst case is 1 resource block.

■ OPERATING FREQUENCY : 1732.50 MHz
 ■ MEASURED OUTPUT POWER: 26.84 dBm = 0.483 W
 ■ MODULATION SIGNAL: 15 MHz 16-QAM
 ■ DISTANCE: 3 meters
 ■ LIMIT: $43 + 10 \log_{10}(W) =$ 39.84 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20025 (1717.5)	3435.0	-53.36	12.34	-60.17	1.63	H	-49.46	76.30
	5152.5	-54.23	12.40	-54.42	1.96	H	-43.98	70.82
	6870.0	-46.40	12.08	-41.20	2.36	H	-31.48	58.32
20175 (1732.5)	3465.0	-	-	-	-	-	-	-
	5197.5	-	-	-	-	-	-	-
	6930.0	-51.22	11.87	-45.07	2.41	V	-35.61	62.45
20325 (1747.5)	3495.0	-53.81	12.17	-59.85	1.65	H	-49.33	76.17
	5242.5	-	-	-	-	-	-	-
	6990.0	-51.20	11.68	-43.88	2.38	V	-34.58	61.42

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:
 2. We are performed all frequency to 10th harmonics from 30 MHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
 4. Worst case is 1 resource block.

OPERATING FREQUENCY : 1732.50 MHz
 MEASURED OUTPUT POWER: 27.14 dBm = 0.518 W
 MODULATION SIGNAL: 20 MHz QPSK
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) = 40.14 \text{ dBc}$

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20050 (1720.0)	3440.0	-53.36	12.33	-60.15	1.64	H	-49.46	76.60
	5160.0	-55.07	12.44	-55.41	1.98	H	-44.95	72.09
	6880.0	-48.53	12.04	-43.44	2.37	V	-33.77	60.91
20175 (1732.5)	3465.0	-	-	-	-	-	-	-
	5197.5	-	-	-	-	-	-	-
	6930.0	-50.08	11.87	-43.93	2.41	H	-34.47	61.61
20300 (1745.0)	3490.0	-	-	-	-	-	-	-
	5235.0	-	-	-	-	-	-	-
	6980.0	-48.65	11.71	-41.78	2.37	H	-32.44	59.58

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:
 2. We are performed all frequency to 10th harmonics from 30 MHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
 4. Worst case is 1 resource block.

7.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Band 4	1.4 MHz	1732.5	QPSK	6	0	5.55
			16-QAM	6	0	5.55
	3 MHz	1732.5	QPSK	15	0	5.57
			16-QAM	15	0	6.14
	5 MHz	1732.5	QPSK	25	0	5.55
			16-QAM	25	0	5.99
	10 MHz	1732.5	QPSK	50	0	5.59
			16-QAM	50	0	6.07
	15 MHz	1732.5	QPSK	75	0	5.47
			16-QAM	75	0	5.92
	20 MHz	1732.5	QPSK	100	0	5.46
			16-QAM	100	0	6.02

- Plots of the EUT's Peak- to- Average Ratio are shown Page 41 ~ 46

7.4 OCCUPIED BANDWIDTH

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 4	1.4	1732.5	QPSK	6	0	1.0870
			16-QAM	6	0	1.0857
	3	1732.5	QPSK	15	0	2.6899
			16-QAM	15	0	2.6975
	5	1732.5	QPSK	25	0	4.4989
			16-QAM	25	0	4.4979
	10	1732.5	QPSK	50	0	8.9604
			16-QAM	50	0	8.9523
	15	1732.5	QPSK	75	0	13.4870
			16-QAM	75	0	13.4610
	20	1732.5	QPSK	100	0	17.9110
			16-QAM	100	0	17.9260

- Plots of the EUT's Occupied Bandwidth are shown Page 35 ~ 40.

7.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Frequency of Maximum Harmonic (GHz)	Maximum Data [dBm]
Band 4	1.4	1710.7	QPSK	1	0	6.758620	-25.93
		1732.5		1	0	6.997900	-25.79
		1754.3		1	0	6.959380	-25.79
	3	1711.5		1	0	7.849880	-25.78
		1732.5		1	0	6.998350	-24.90
		1753.5		1	0	9.513060	-25.87
	5	1712.5		1	0	5.430340	-25.47
		1732.5		1	0	6.994270	-25.78
		1752.5		1	0	6.999710	-25.48
	10	1715.0		1	0	6.401510	-25.50
		1732.5		1	0	6.566010	-25.14
		1750.0		1	0	6.995630	-25.03
	15	1717.5		1	0	6.972070	-24.87
		1732.5		1	0	6.987020	-24.85
		1747.5		1	0	6.961640	-25.39
	20	1720.0		1	0	6.964360	-24.85
		1732.5		1	0	6.979320	-24.38
		1745.0		1	0	6.986570	-23.87

- Plots of the EUT's Conducted Spurious Emissions are shown Page 59~ 76

7.5.1 BAND EDGE

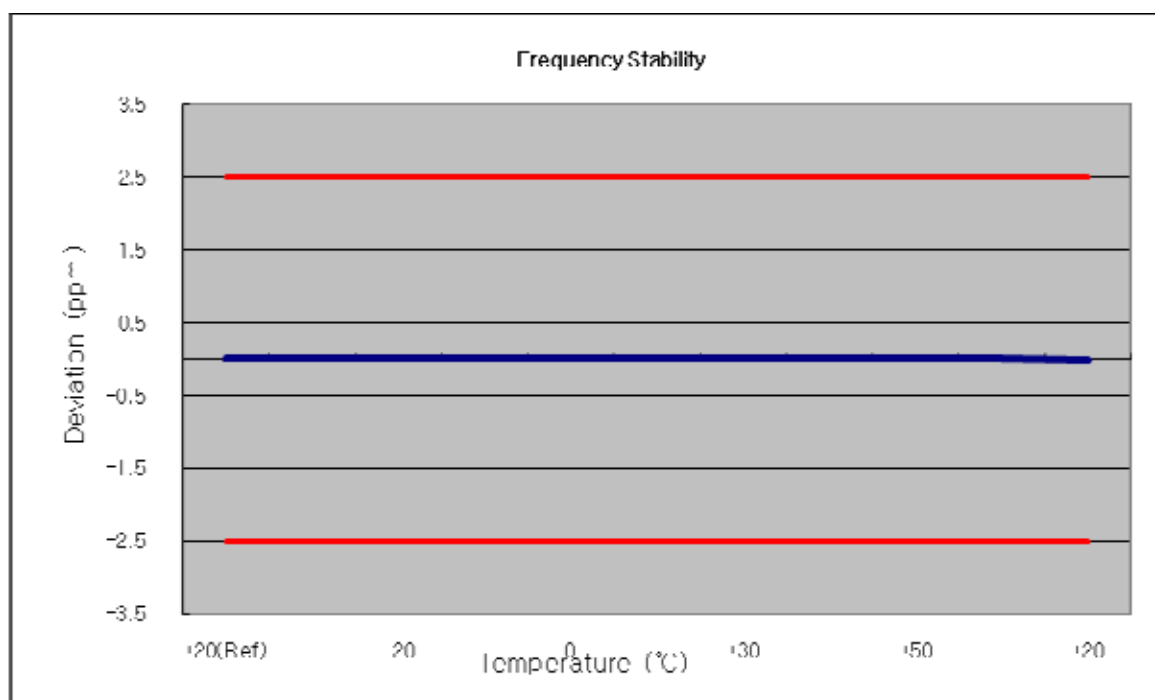
- Plots of the EUT's Band Edge are shown Page 47 ~ 58

7.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.6.1 FREQUENCY STABILITY (LTE Band 4)

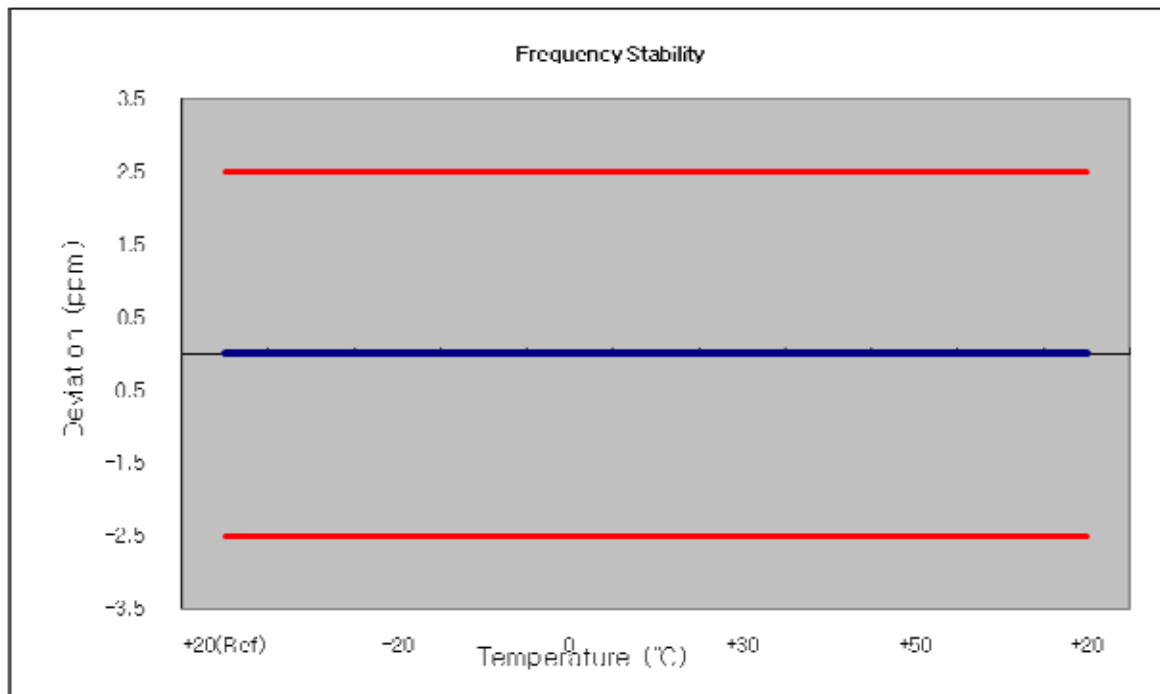
- ☐ OPERATING FREQUENCY: 1732,500,000 Hz
☐ CHANNEL: 20175 (1.4 MHz)
☐ REFERENCE VOLTAGE: 3.8 VDC
☐ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 500 011	0	0.000 000	0.000
100%		-30	1732 500 007	-4.40	0.000 000	-0.003
100%		-20	1732 500 012	1.00	0.000 000	0.001
100%		-10	1732 500 008	-3.40	0.000 000	-0.002
100%		0	1732 500 007	-4.70	0.000 000	-0.003
100%		+10	1732 500 005	-6.40	0.000 000	-0.004
100%		+30	1732 500 008	-3.70	0.000 000	-0.002
100%		+40	1732 500 005	-6.90	0.000 000	-0.004
100%		+50	1732 500 008	-3.30	0.000 000	-0.002
115%	4.37	+20	1732 500 010	-1.30	0.000 000	-0.001
85%	3.50	+20	1732 500 001	-10.30	-0.000 001	-0.006



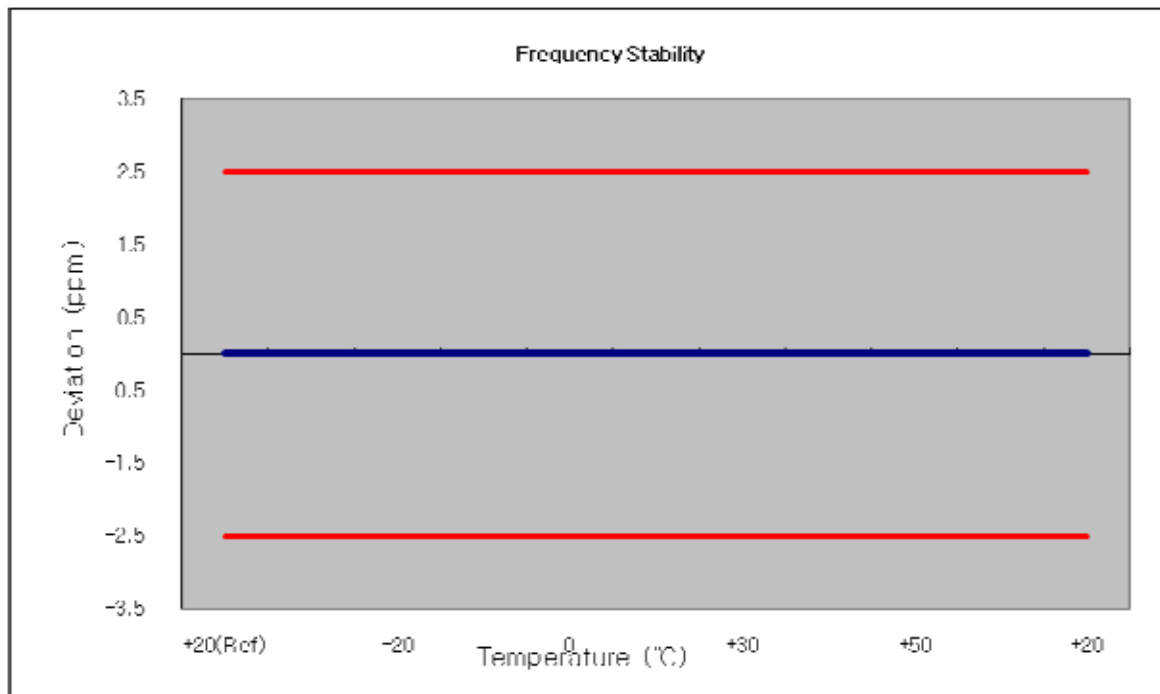
☐ OPERATING FREQUENCY: 1732,500,000 Hz
☐ CHANNEL: 20175 (3 MHz)
☐ REFERENCE VOLTAGE: 3.8 VDC
☐ DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 499 998	0	0.000 000	0.000
100%		-30	1732 500 006	7.10	0.000 000	0.004
100%		-20	1732 500 003	4.20	0.000 000	0.002
100%		-10	1732 499 998	-0.40	0.000 000	0.000
100%		0	1732 499 997	-1.70	0.000 000	-0.001
100%		+10	1732 500 004	5.70	0.000 000	0.003
100%		+30	1732 500 003	4.70	0.000 000	0.003
100%		+40	1732 500 002	3.10	0.000 000	0.002
100%		+50	1732 499 999	1.00	0.000 000	0.001
115%	4.37	+20	1732 500 003	5.00	0.000 000	0.003
85%	3.50	+20	1732 499 997	-1.30	0.000 000	-0.001



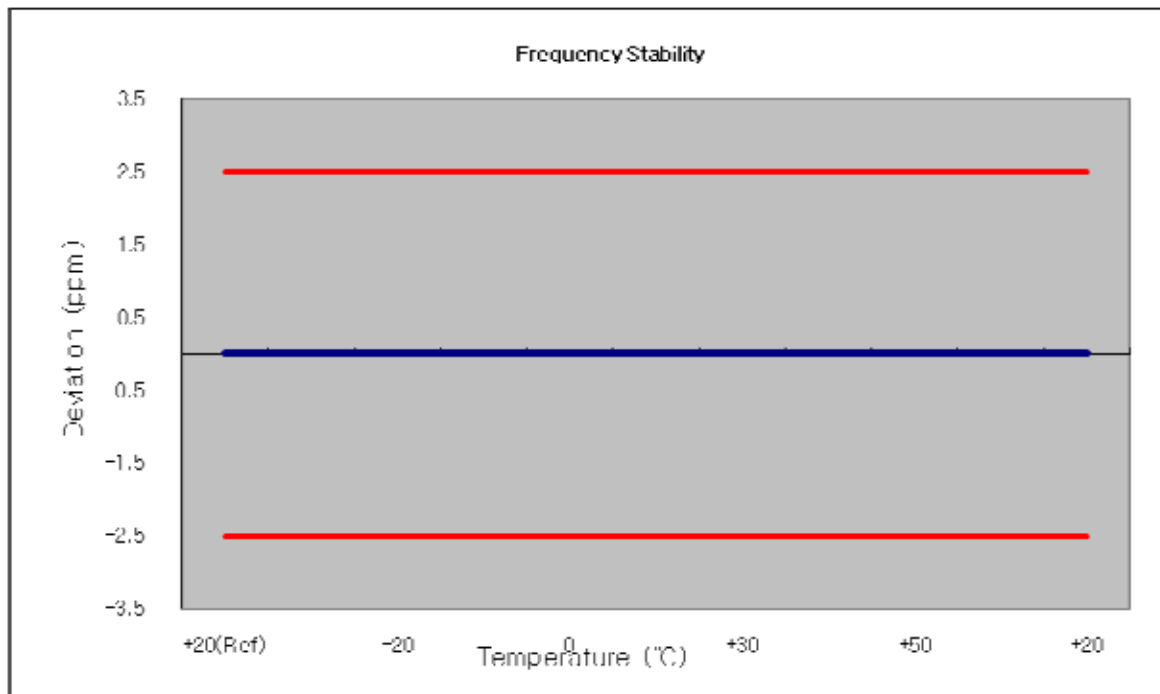
OPERATING FREQUENCY: 1732,500,000 Hz
 CHANNEL: 20175 (5 MHz)
 REFERENCE VOLTAGE: 3.8 VDC
 DEVIATION LIM IT: $\pm 0.000\ 25\ \%$ or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 499 997	0	0.000 000	0.000
100%		-30	1732 499 999	2.50	0.000 000	0.001
100%		-20	1732 499 994	-2.70	0.000 000	-0.002
100%		-10	1732 499 999	2.40	0.000 000	0.001
100%		0	1732 500 006	9.00	0.000 001	0.005
100%		+10	1732 499 989	-7.80	0.000 000	-0.005
100%		+30	1732 500 002	4.80	0.000 000	0.003
100%		+40	1732 500 001	4.40	0.000 000	0.003
100%		+50	1732 499 999	2.20	0.000 000	0.001
115%	4.37	+20	1732 499 992	-5.20	0.000 000	-0.003
85%	3.50	+20	1732 499 994	-2.40	0.000 000	-0.001



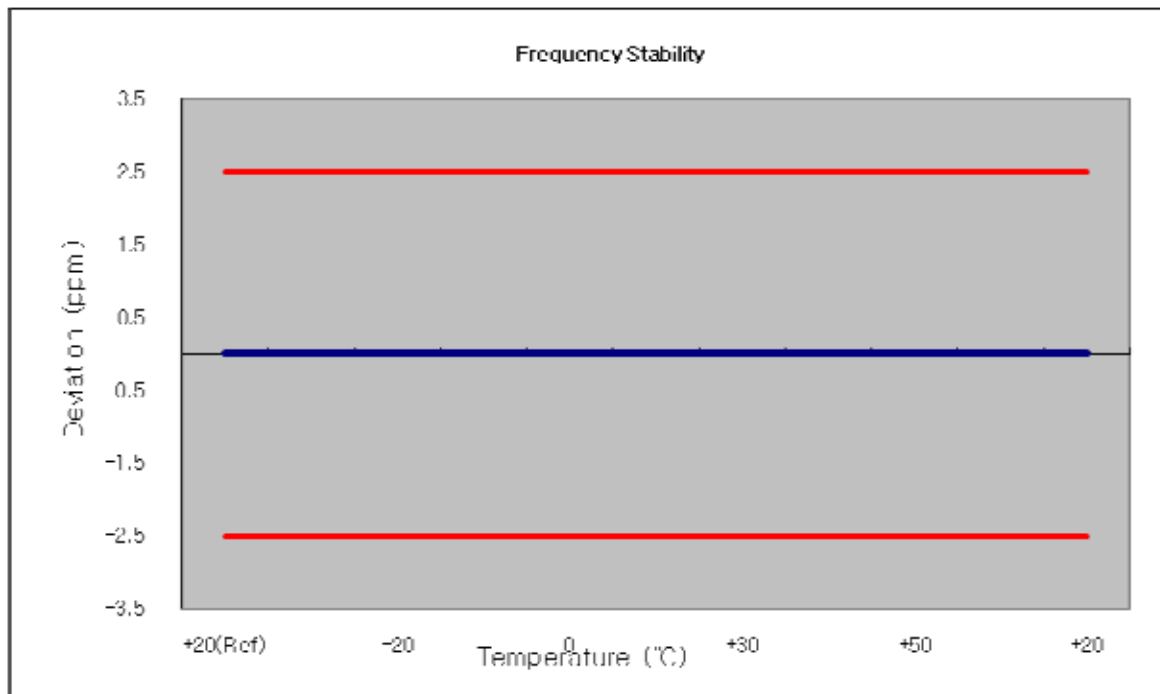
☐ OPERATING FREQUENCY: 1732,500,000 Hz
☐ CHANNEL: 20175 (10 MHz)
☐ REFERENCE VOLTAGE: 3.8 VDC
☐ DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 499 995	0	0.000 000	0.000
100%		-30	1732 499 997	2.40	0.000 000	0.001
100%		-20	1732 499 999	4.60	0.000 000	0.003
100%		-10	1732 499 996	1.70	0.000 000	0.001
100%		0	1732 500 002	7.00	0.000 000	0.004
100%		+10	1732 499 999	3.90	0.000 000	0.002
100%		+30	1732 499 996	0.80	0.000 000	0.000
100%		+40	1732 499 993	-2.20	0.000 000	-0.001
100%		+50	1732 500 000	5.20	0.000 000	0.003
115%	4.37	+20	1732 499 996	1.00	0.000 000	0.001
85%	3.50	+20	1732 500 001	6.20	0.000 000	0.004



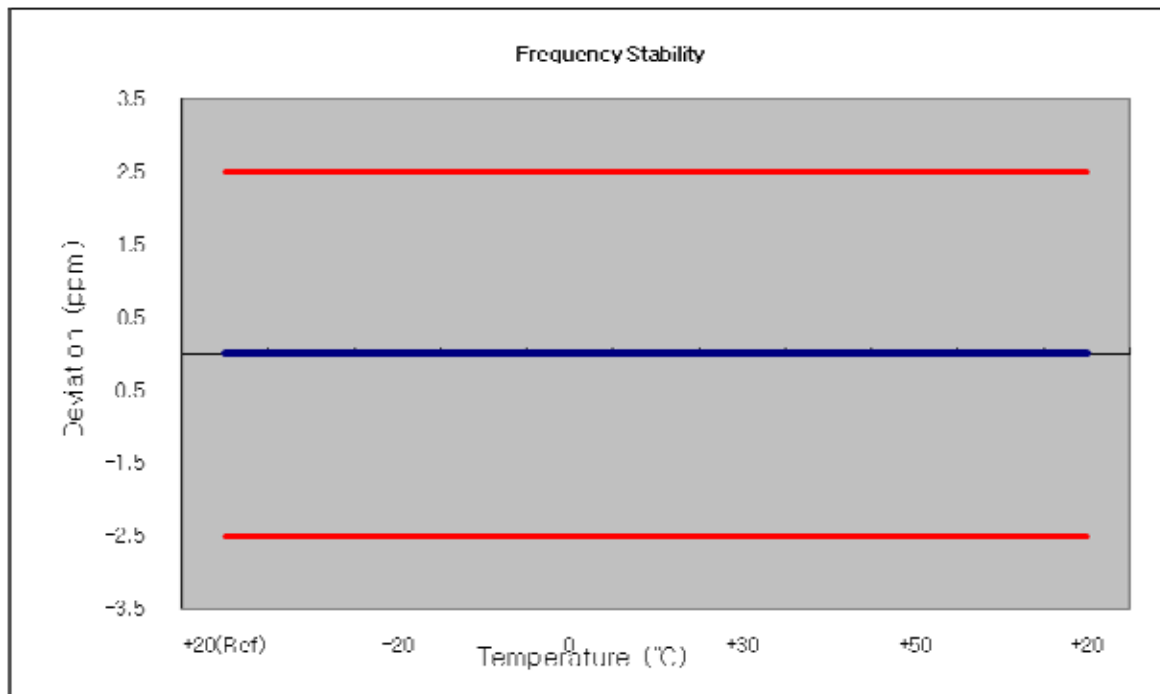
OPERATING FREQUENCY: 1732,500,000 Hz
 CHANNEL: 20175 (15 MHz)
 REFERENCE VOLTAGE: 3.8 VDC
 DEVIATION LIM IT: $\pm 0.000\ 25\ \%$ or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 499 999	0	0.000 000	0.000
100%		-30	1732 499 999	0.10	0.000 000	0.000
100%		-20	1732 500 007	8.70	0.000 001	0.005
100%		-10	1732 499 996	-2.40	0.000 000	-0.001
100%		0	1732 500 006	7.80	0.000 000	0.005
100%		+10	1732 499 998	-0.10	0.000 000	0.000
100%		+30	1732 500 003	4.70	0.000 000	0.003
100%		+40	1732 499 996	-2.50	0.000 000	-0.001
100%		+50	1732 499 997	-1.10	0.000 000	-0.001
115%	4.37	+20	1732 500 004	5.60	0.000 000	0.003
85%	3.50	+20	1732 499 993	-5.80	0.000 000	-0.003



☐ OPERATING FREQUENCY: 1732,500,000 Hz
☐ CHANNEL: 20175 (20 MHz)
☐ REFERENCE VOLTAGE: 3.8 VDC
☐ DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 499 990	0	0.000 000	0.000
100%		-30	1732 499 997	7.70	0.000 000	0.004
100%		-20	1732 499 989	-0.60	0.000 000	0.000
100%		-10	1732 499 990	0.40	0.000 000	0.000
100%		0	1732 499 995	5.20	0.000 000	0.003
100%		+10	1732 499 991	1.30	0.000 000	0.001
100%		+30	1732 499 986	-3.90	0.000 000	-0.002
100%		+40	1732 499 992	2.40	0.000 000	0.001
100%		+50	1732 499 996	6.00	0.000 000	0.003
115%	4.37	+20	1732 499 994	4.50	0.000 000	0.003
85%	3.50	+20	1732 499 991	0.90	0.000 000	0.001

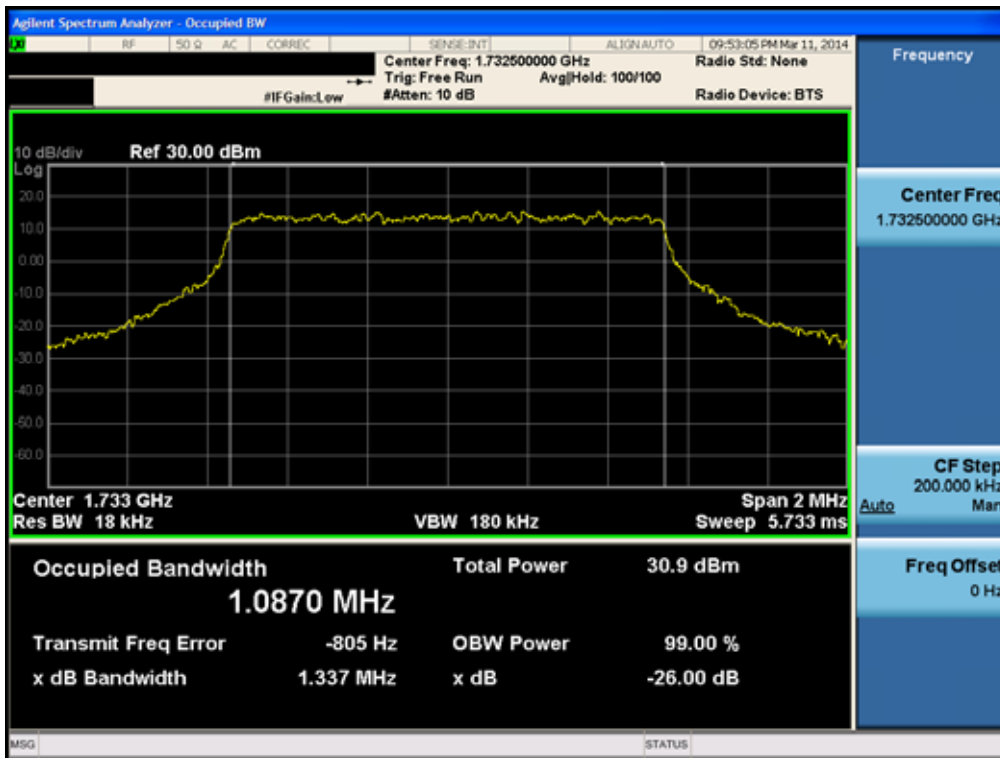




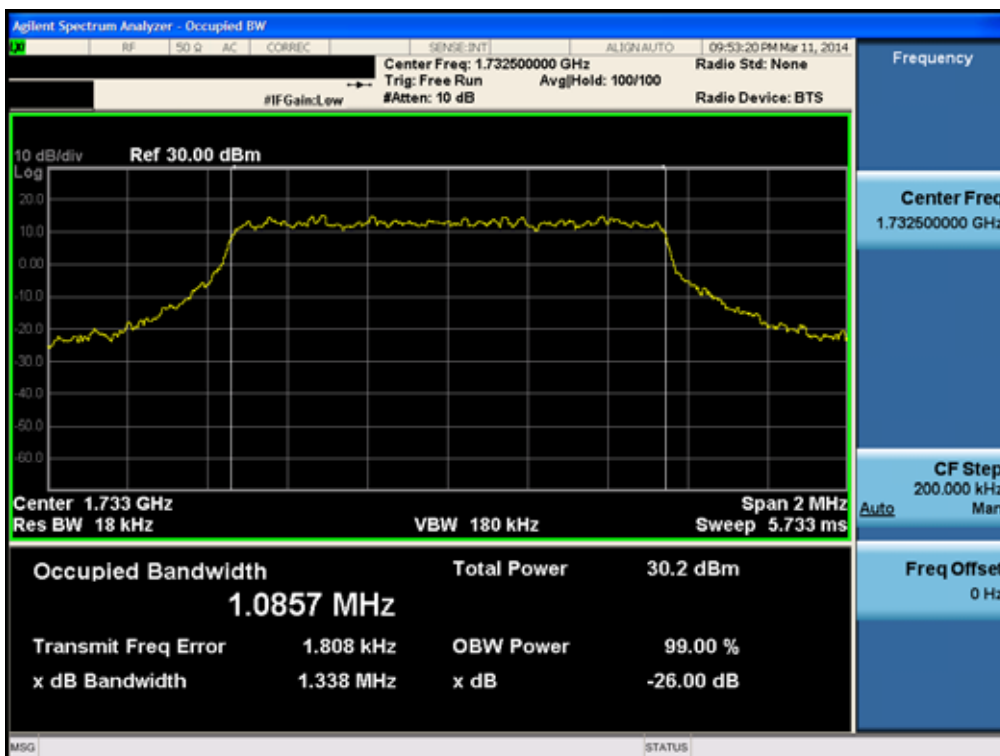
8. TEST PLOTS

FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	FCC ID: ZNFD625

Occupied Bandwidth Plot (1.4M BW Ch.20175 QPSK RB 6)



Occupied Bandwidth Plot (1.4M BW Ch.20175 16QAM RB 6)



FCC CERTIFICATION REPORT

Test Report No.
HCT-R-1403-F025-2

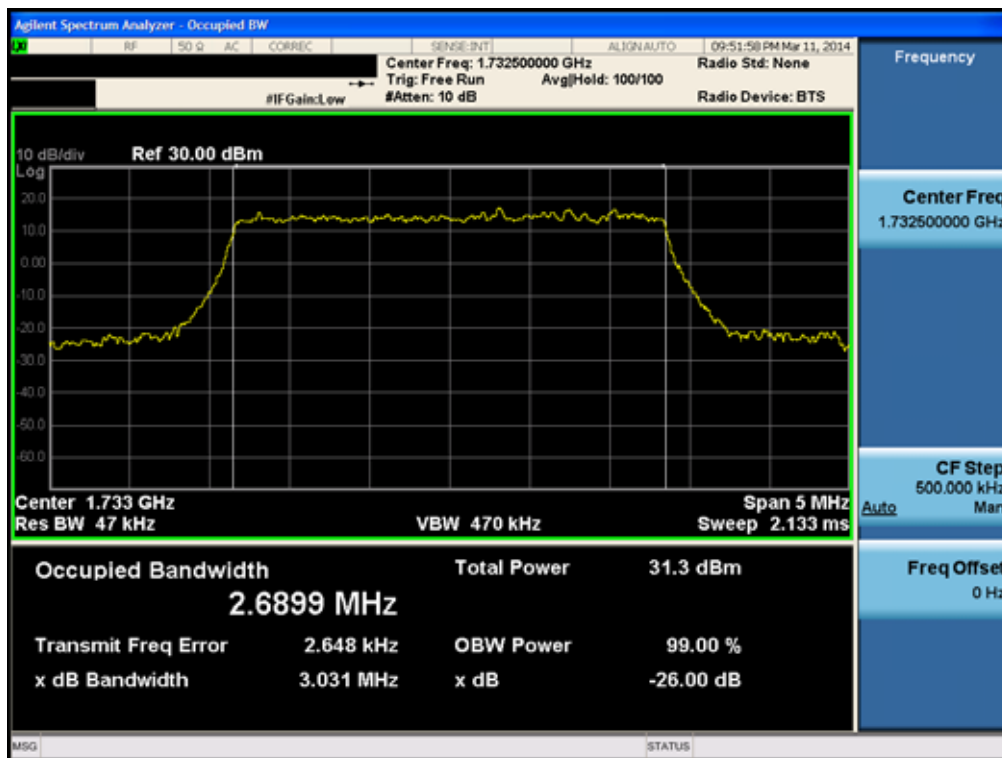
Date of Issue:
March 24, 2014

EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

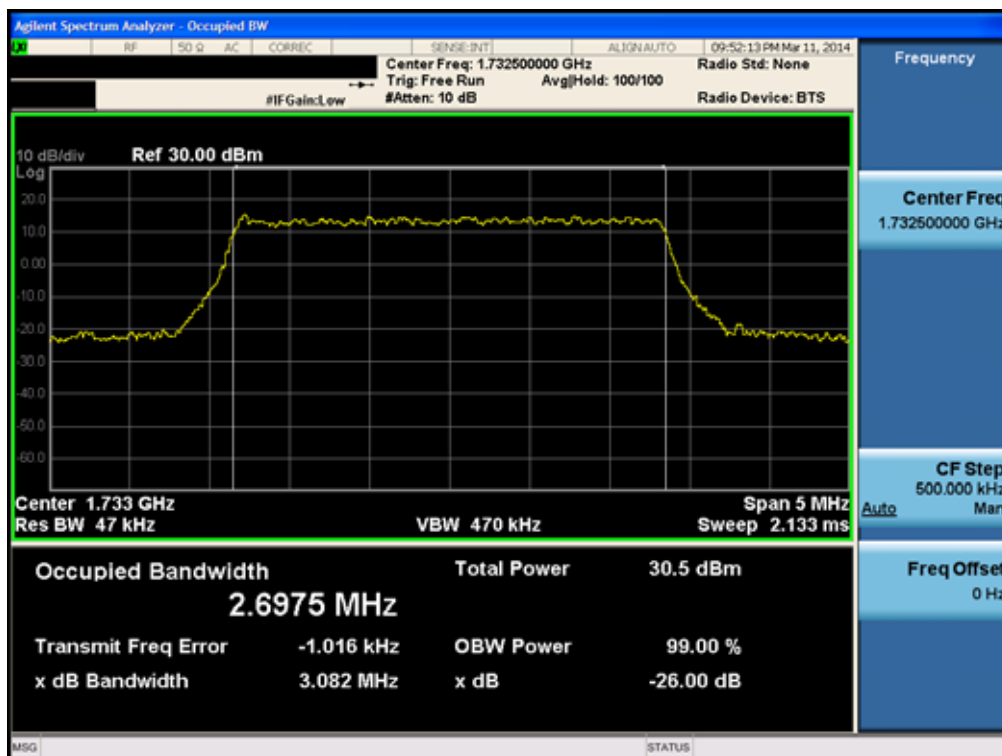
www.hct.co.kr

FCC ID:
ZNFD625

Occupied Bandwidth Plot (3M BW Ch.20175 QPSK RB 15)



Occupied Bandwidth Plot (3M BW Ch.20175 16QAM RB 15)



FCC CERTIFICATION REPORT

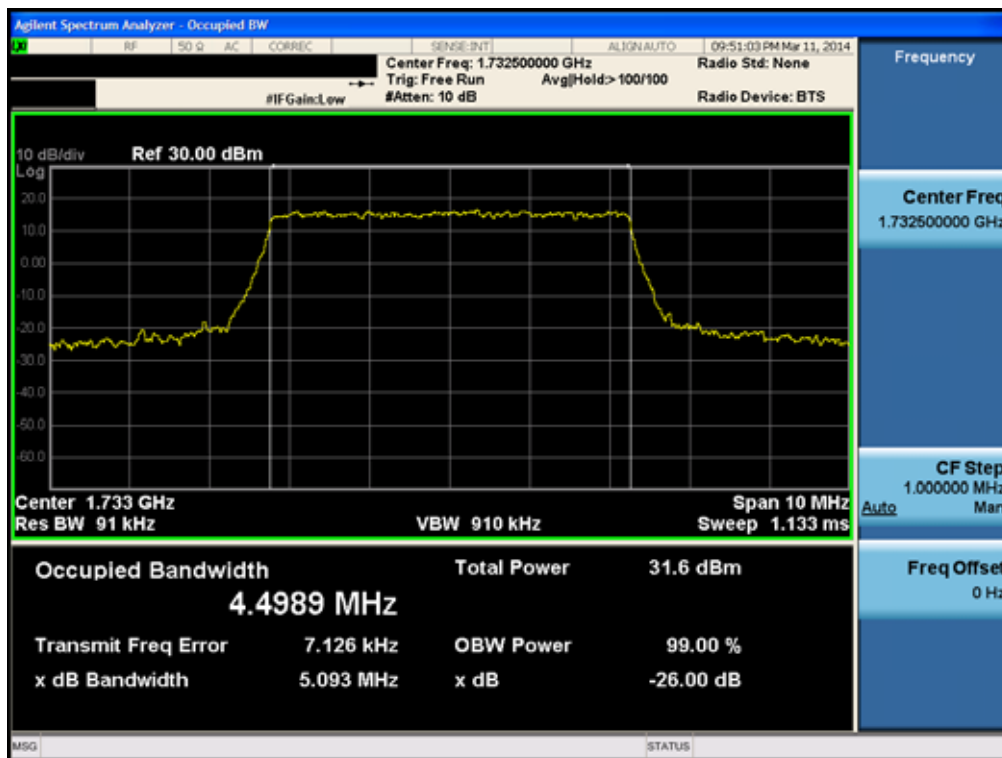
Test Report No.
HCT-R-1403-F025-2

Date of Issue:
March 24, 2014

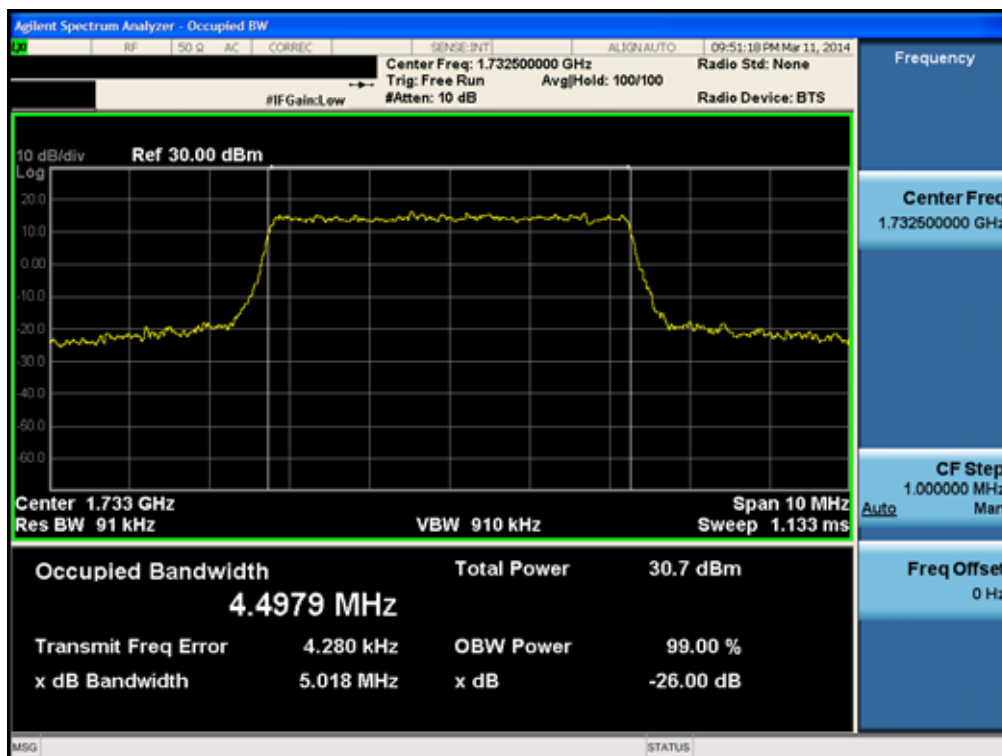
EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

www.hct.co.kr
FCC ID:
ZNFD625

Occupied Bandwidth Plot (5M BW Ch.20175 QPSK RB 25)



Occupied Bandwidth Plot (5M BW Ch.20175 16QAM RB 25)



FCC CERTIFICATION REPORT

Test Report No.
HCT-R-1403-F025-2

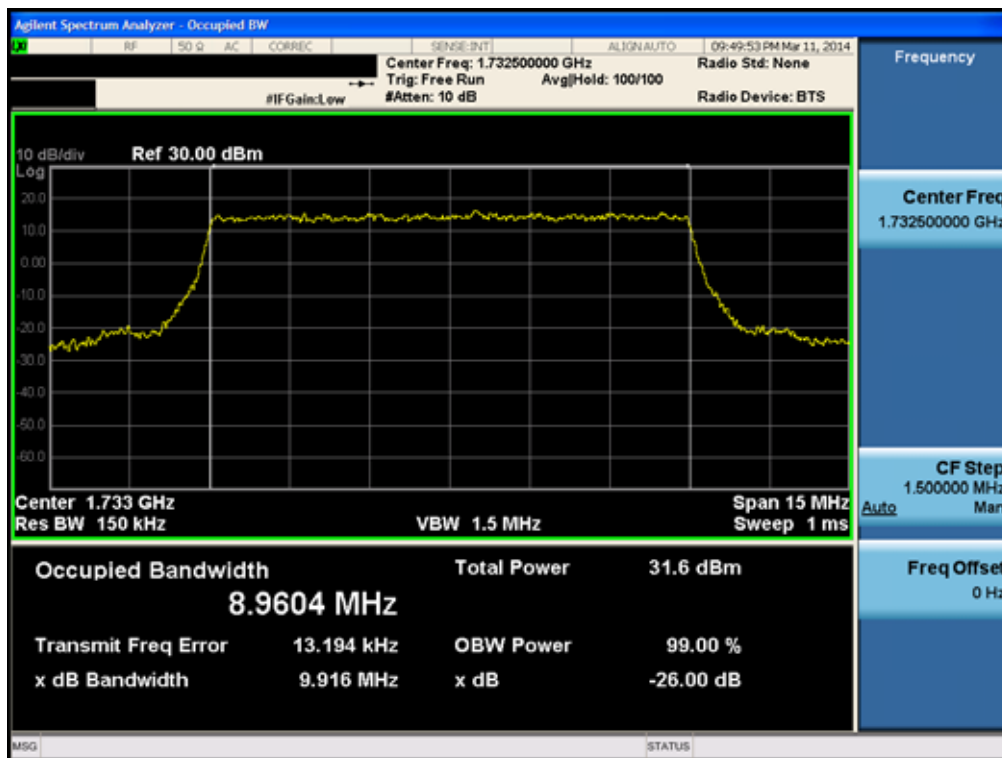
Date of Issue:
March 24, 2014

EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

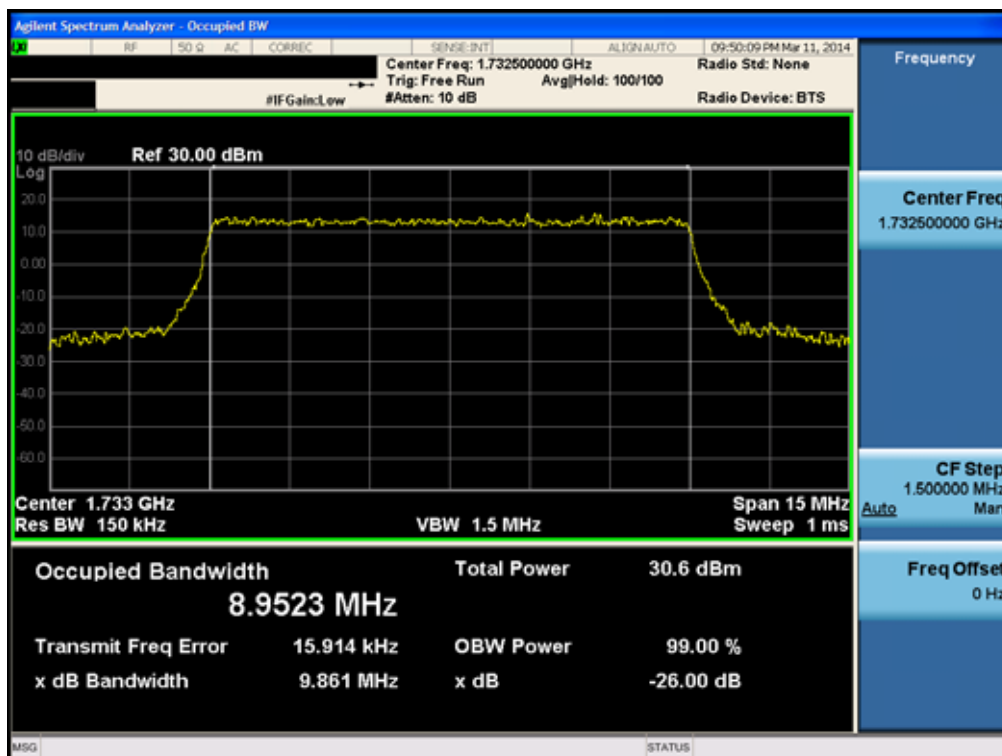
www.hct.co.kr

FCC ID:
ZNFD625

Occupied Bandwidth Plot (10M BW Ch.20175 QPSK RB 50)



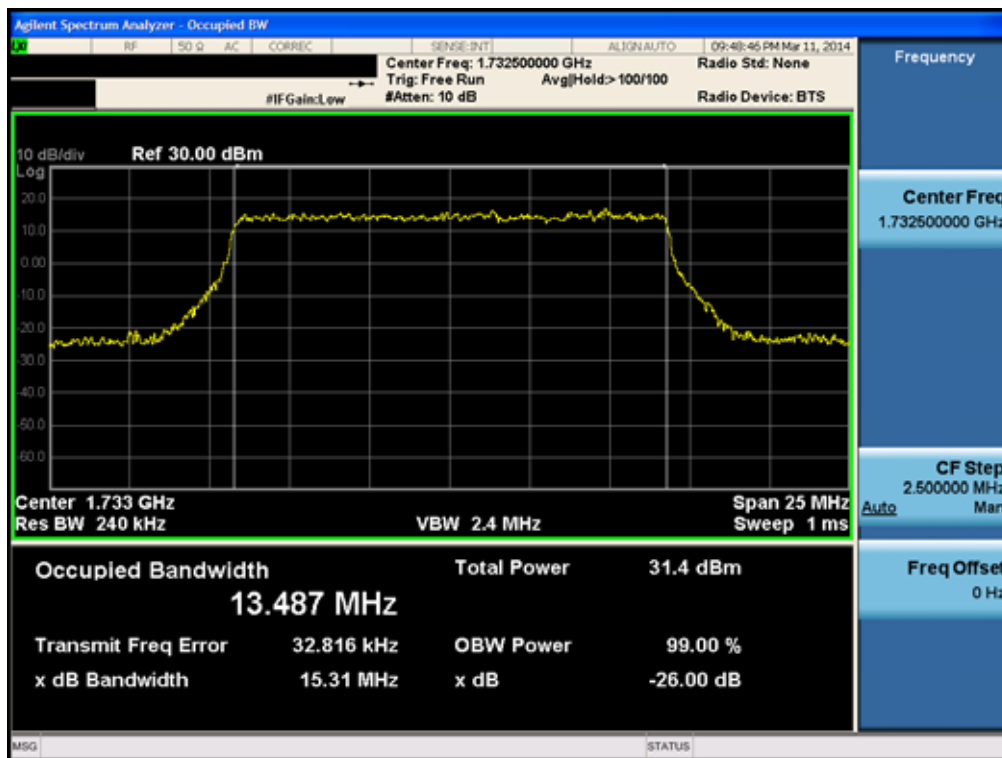
Occupied Bandwidth Plot (10M BW Ch.20175 16QAM RB 50)



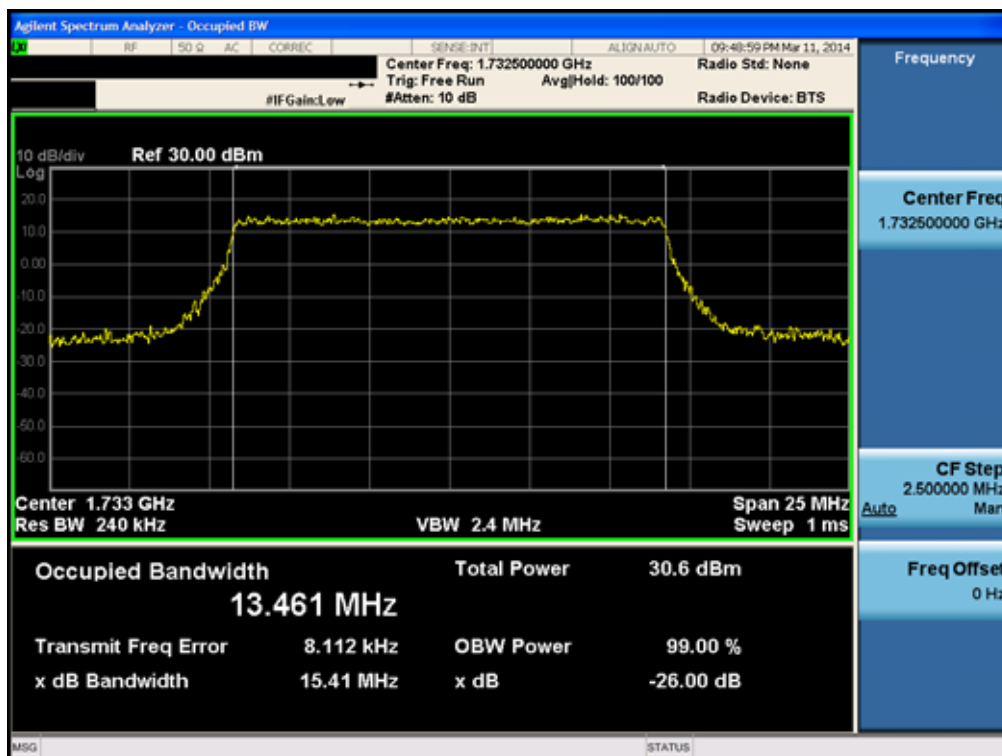
FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Occupied Bandwidth Plot (15M BW Ch.20175 QPSK RB 75)



Occupied Bandwidth Plot (15M BW Ch.20175 16QAM RB 75)



FCC CERTIFICATION REPORT

Test Report No.
HCT-R-1403-F025-2

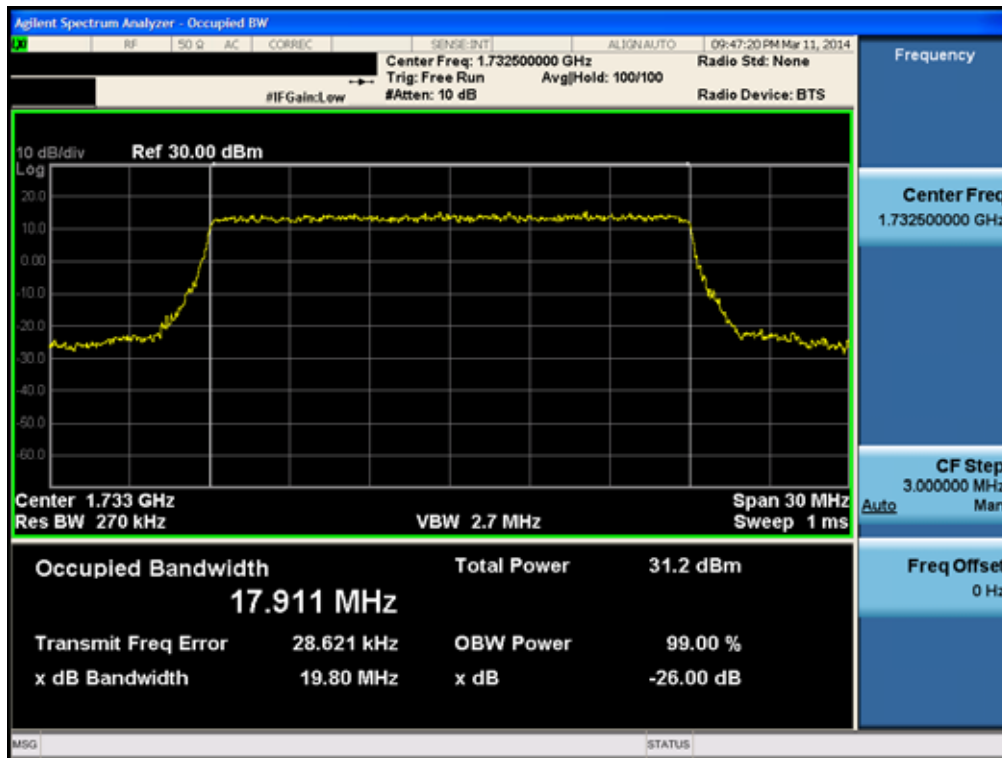
Date of Issue:
March 24, 2014

EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

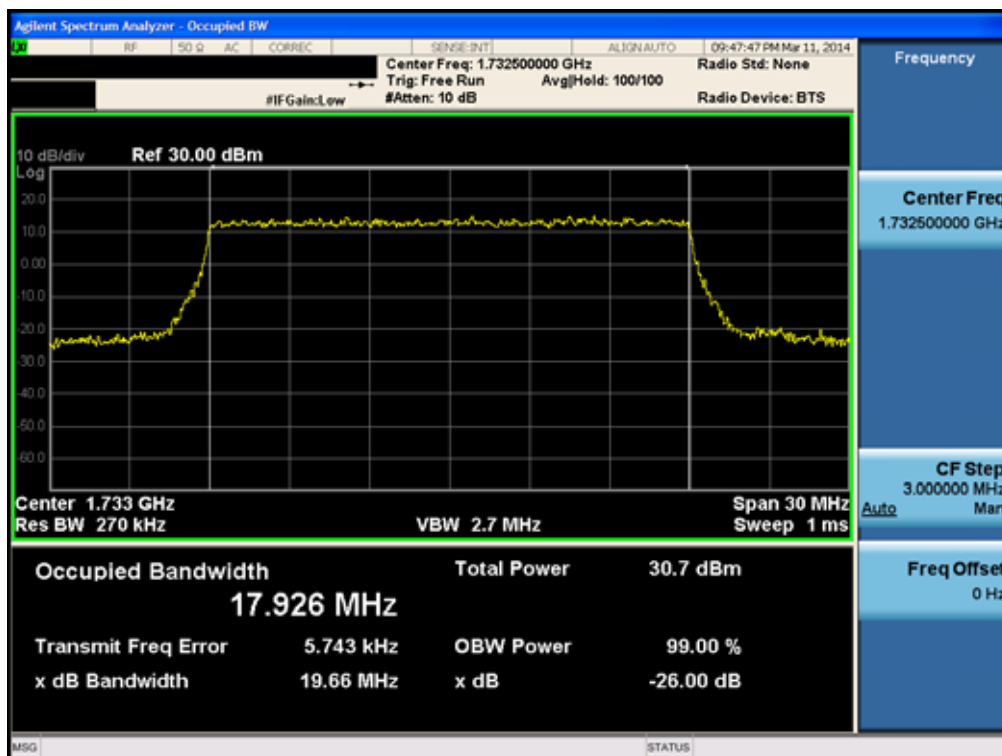
www.hct.co.kr

FCC ID:
ZNFD625

Occupied Bandwidth Plot (20M BW Ch.20175 QPSK RB 100)



Occupied Bandwidth Plot (20M BW Ch.20175 16QAM RB 100)



FCC CERTIFICATION REPORT

Test Report No.
HCT-R-1403-F025-2

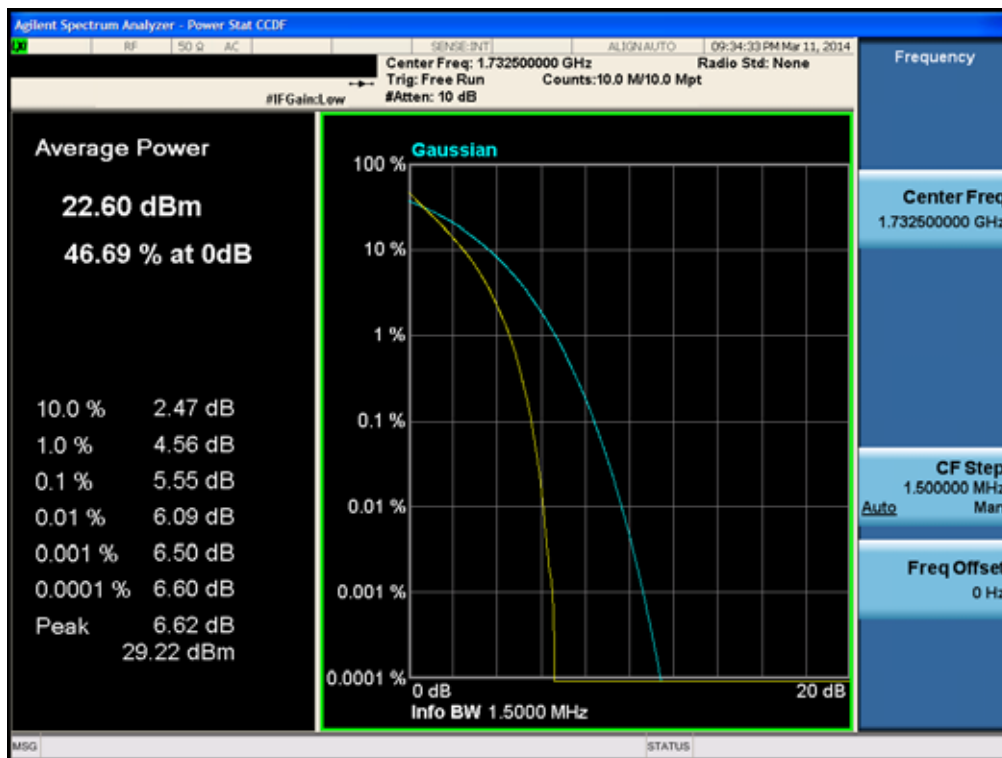
Date of Issue:
March 24, 2014

EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

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FCC ID:
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Peak to Average Ratio Plot (1.4M BW Ch.20175 QPSK RB 6)



Peak to Average Ratio Plot (1.4M BW Ch.20175 16QAM RB 6)



FCC CERTIFICATION REPORT

Test Report No.
HCT-R-1403-F025-2

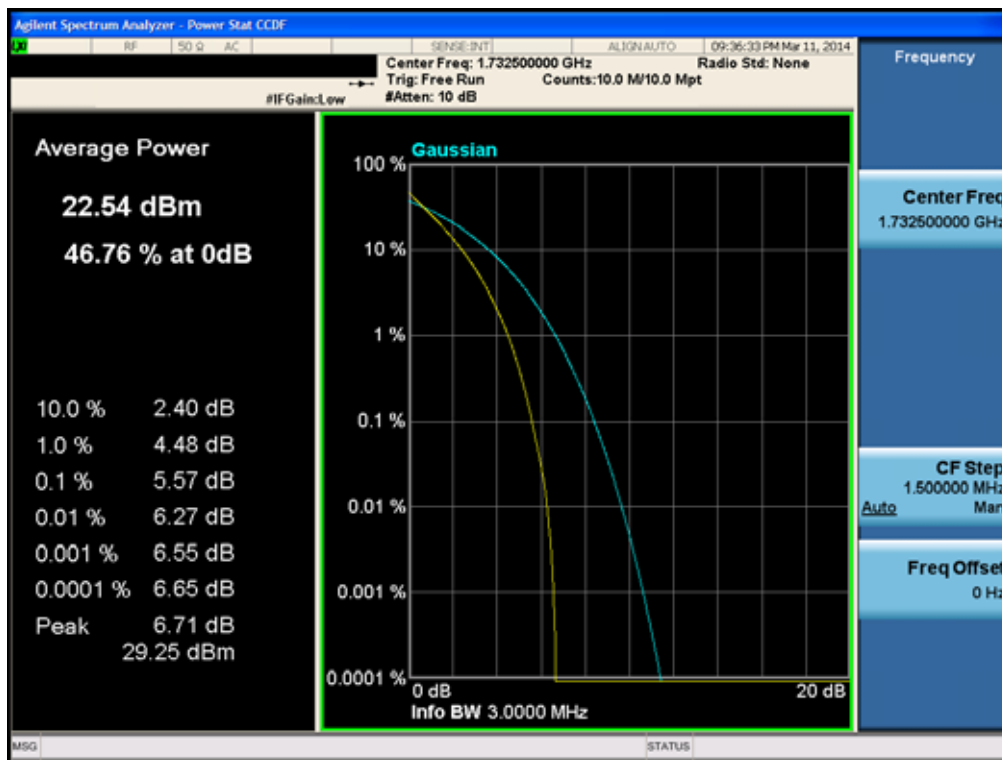
Date of Issue:
March 24, 2014

EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

www.hct.co.kr

FCC ID:
ZNFD625

Peak to Average Ratio Plot (3M BW Ch.20175 QPSK RB 15)



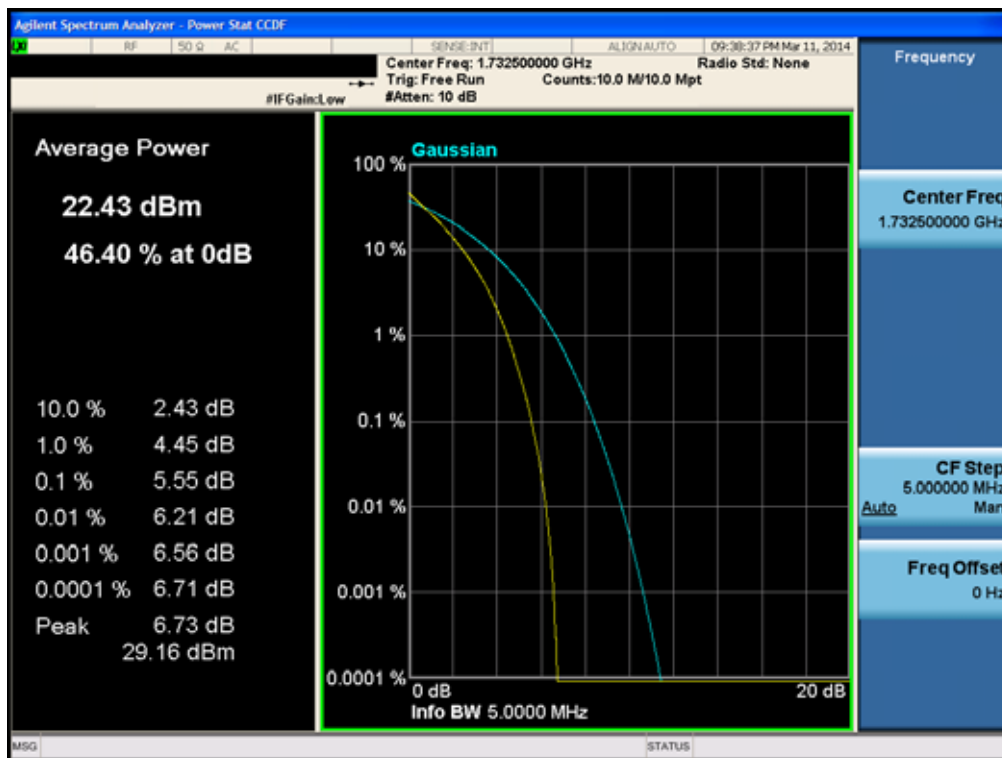
Peak to Average Ratio Plot (3M BW Ch.20175 16QAM RB 15)



FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Peak to Average Ratio Plot (5M BW Ch.20175 QPSK RB 25)



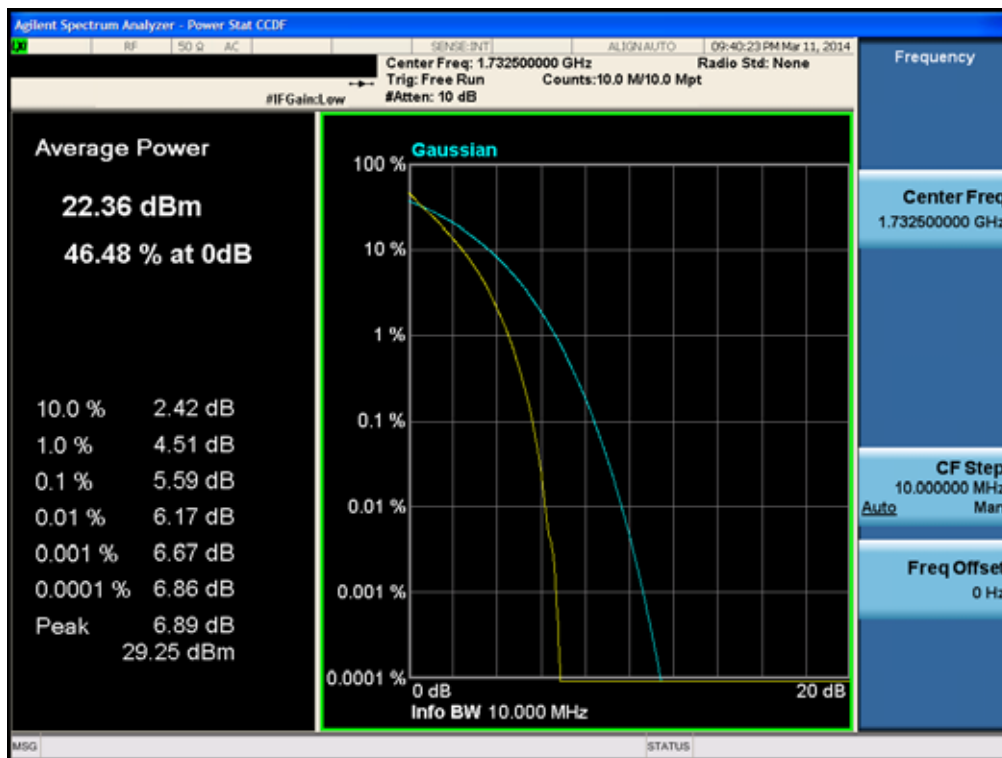
Peak to Average Ratio Plot (5M BW Ch.20175 16QAM RB 25)



FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Peak to Average Ratio Plot (10M BW Ch.20175 QPSK RB 50)



Peak to Average Ratio Plot (10M BW Ch.20175 16QAM RB 50)



FCC CERTIFICATION REPORT

Test Report No.
HCT-R-1403-F025-2

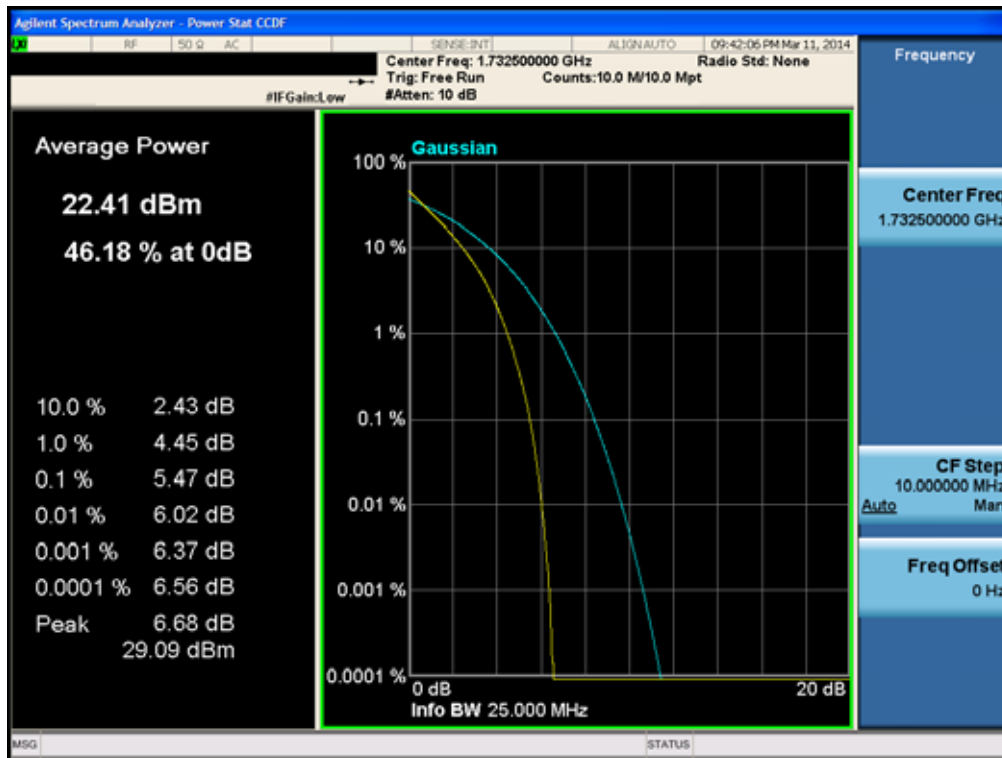
Date of Issue:
March 24, 2014

EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

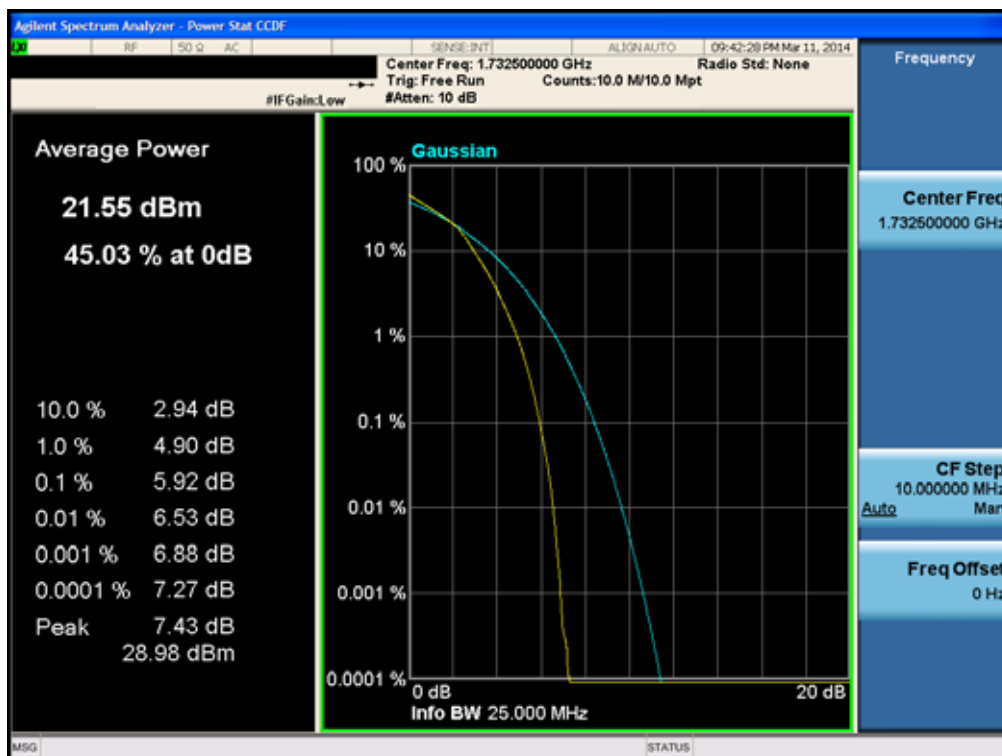
www.hct.co.kr

FCC ID:
ZNFD625

Peak to Average Ratio Plot (15M BW Ch.20175 QPSK RB 75)



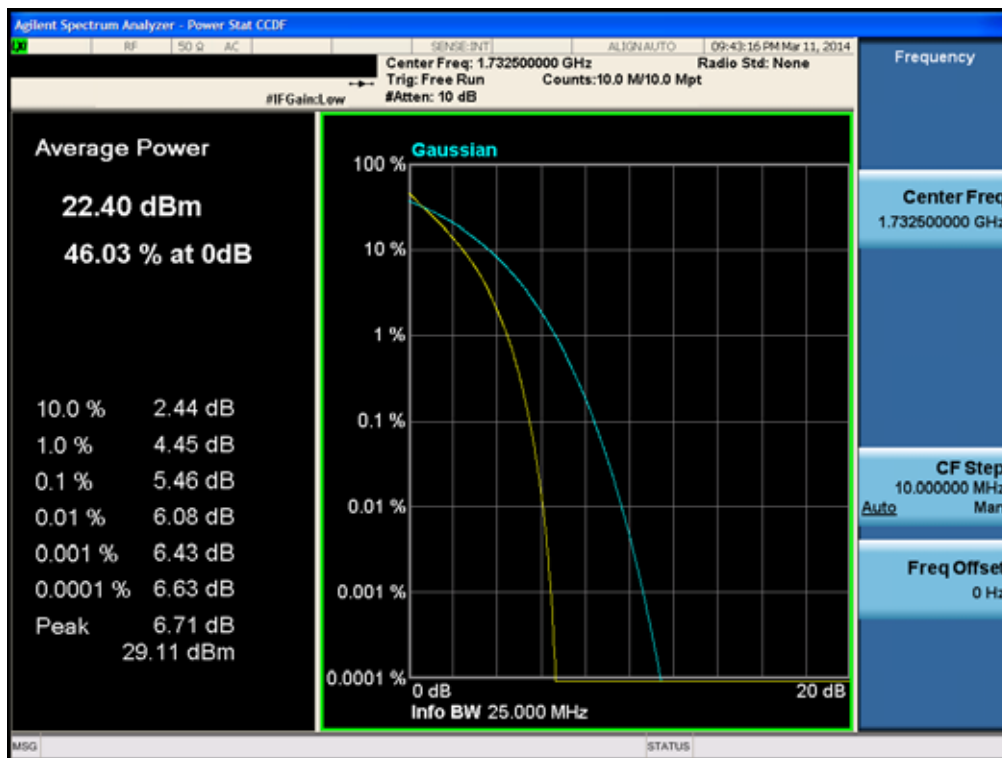
Peak to Average Ratio Plot (15M BW Ch.20175 16QAM RB 75)



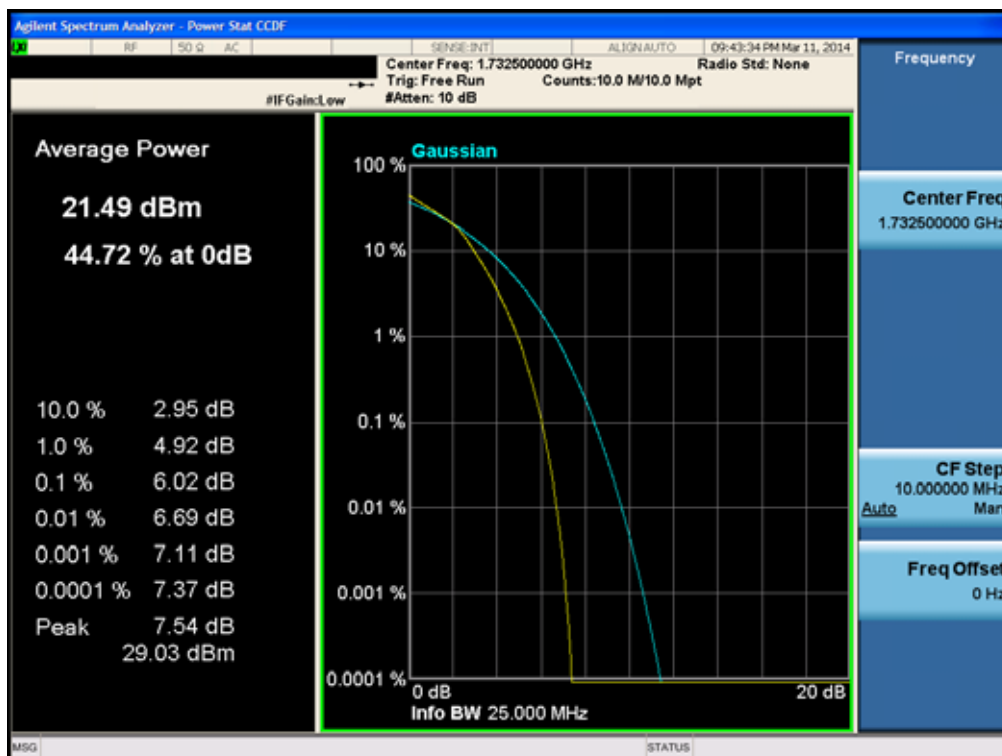
FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Peak to Average Ratio Plot (20M BW Ch.20175 QPSK RB 100)



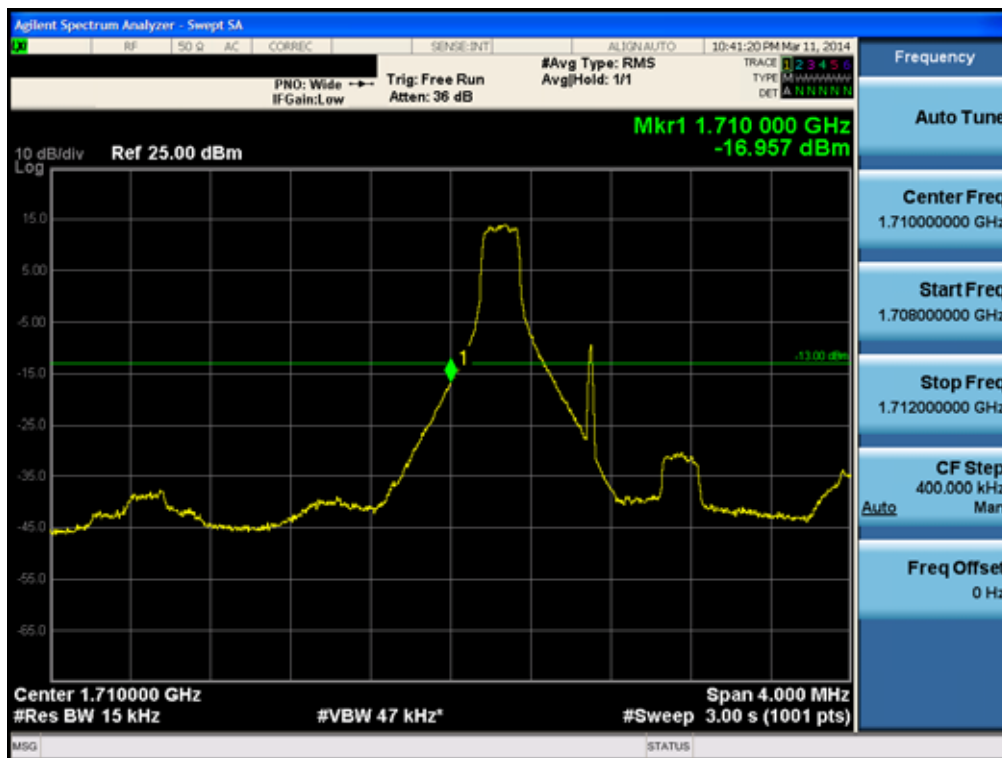
Peak to Average Ratio Plot (20M BW Ch.20175 16QAM RB 100)



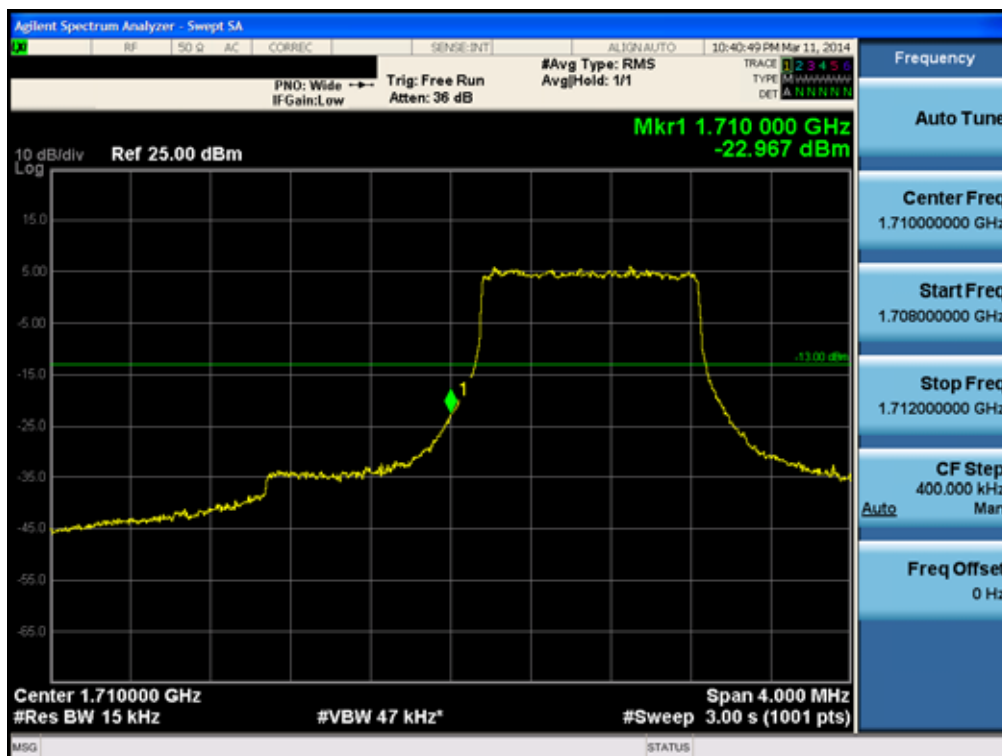
FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Lower Band Edge Plot (1.4M BW Ch.19957 QPSK RB 1, Offset 0) -1



Lower Band Edge Plot (1.4M BW Ch.19957 QPSK RB 6) -2



FCC CERTIFICATION REPORT

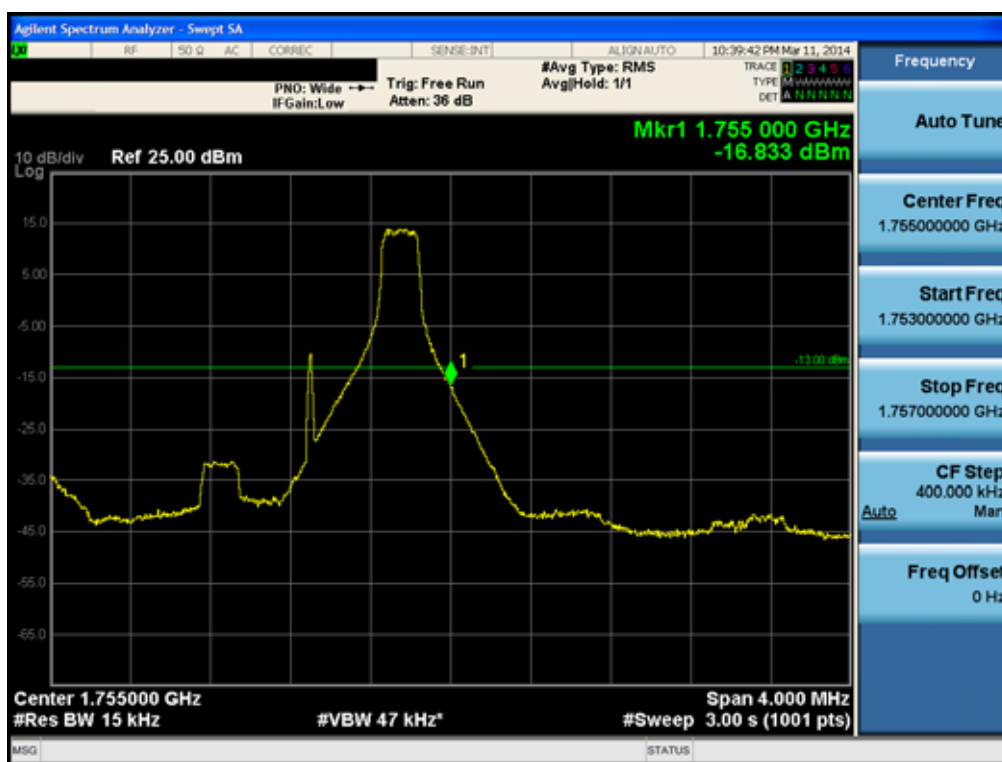
Test Report No.
HCT-R-1403-F025-2

Date of Issue:
March 24, 2014

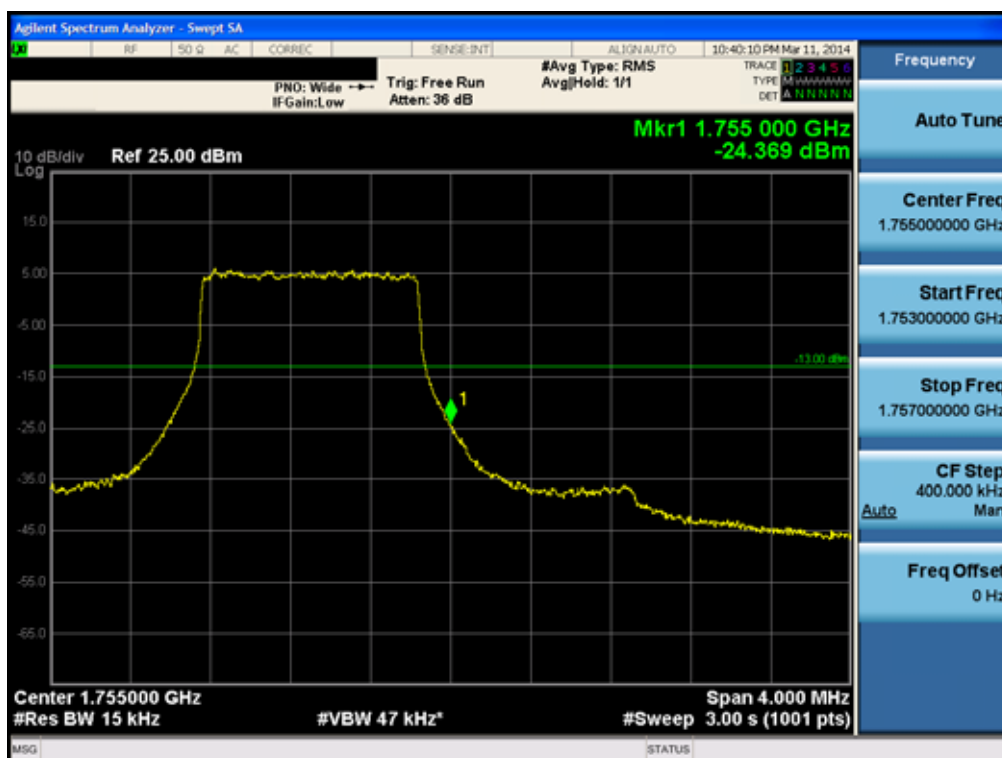
EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

www.hct.co.kr
FCC ID:
ZNFD625

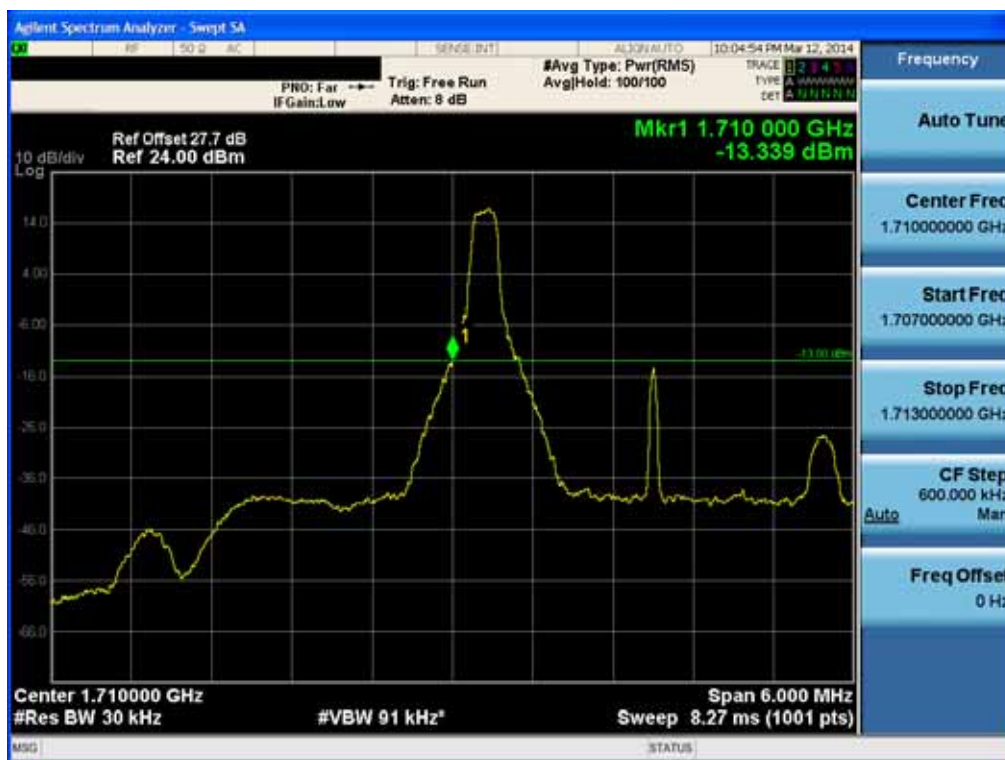
Upper Band Edge Plot (1.4M BW Ch.20393 QPSK RB 1, Offset 5) -1



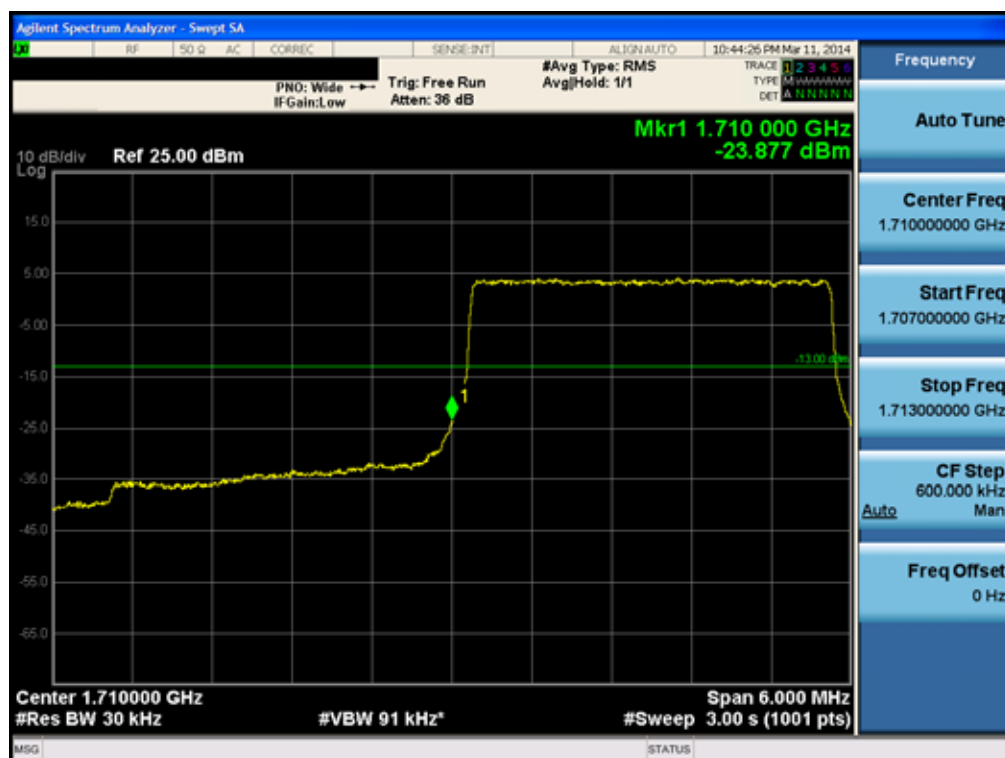
Upper Band Edge Plot (1.4M BW Ch.20393 QPSK RB 6) -2



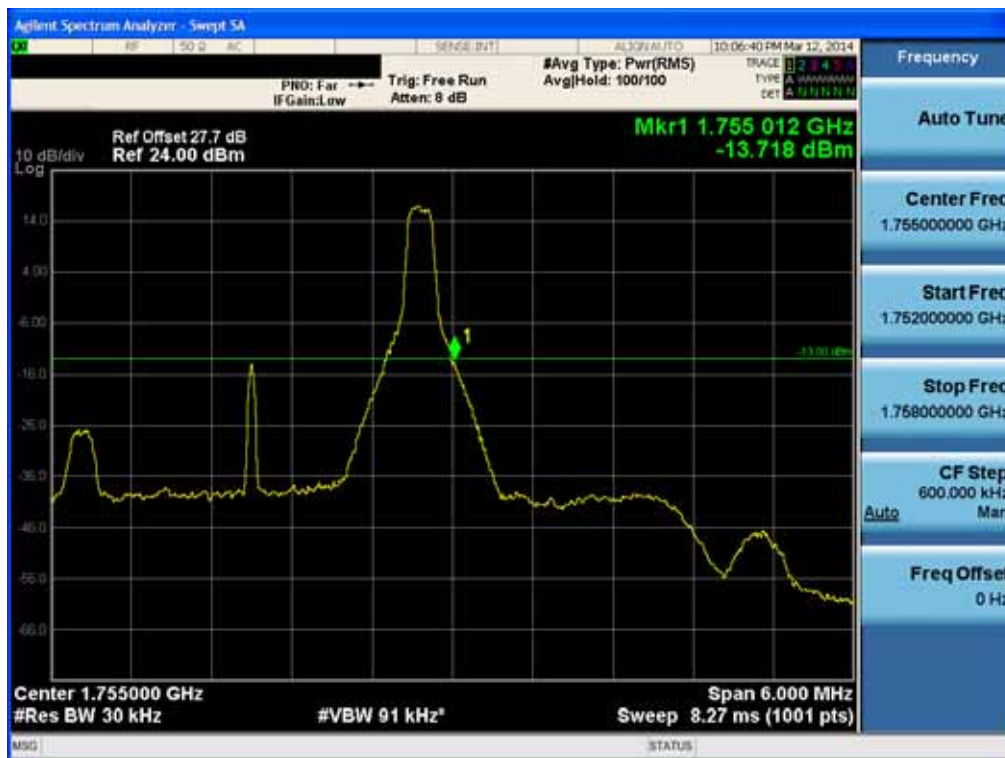
Lower Band Edge Plot (3M BW Ch.19965 QPSK RB 1, Offset 0) -1



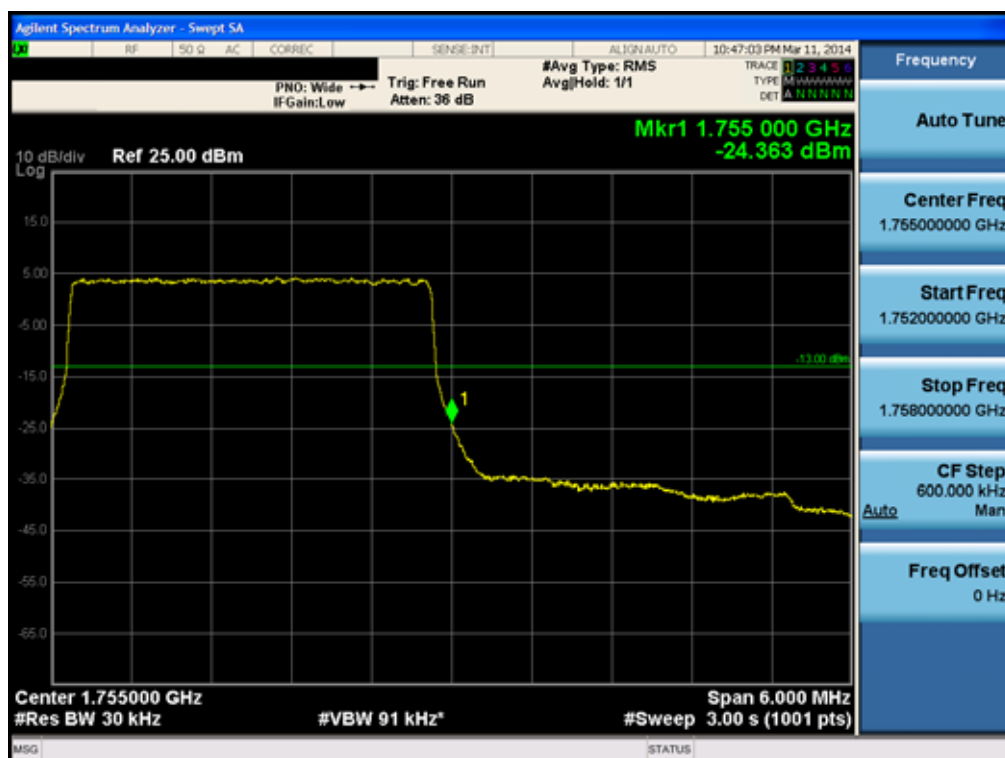
Lower Band Edge Plot (3M BW Ch.19965 QPSK RB 15) -2



Upper Band Edge Plot (3M BW Ch.20385 QPSK RB 1, Offset 14) -1



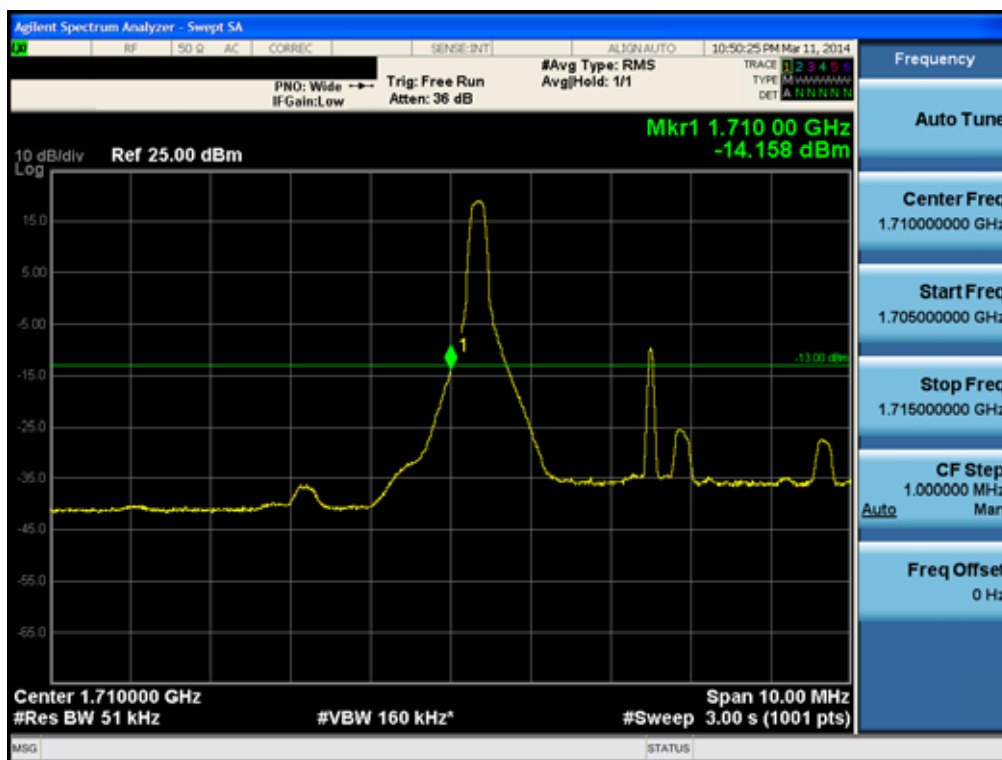
Upper Band Edge Plot (3M BW Ch.20385 QPSK RB 15) -2



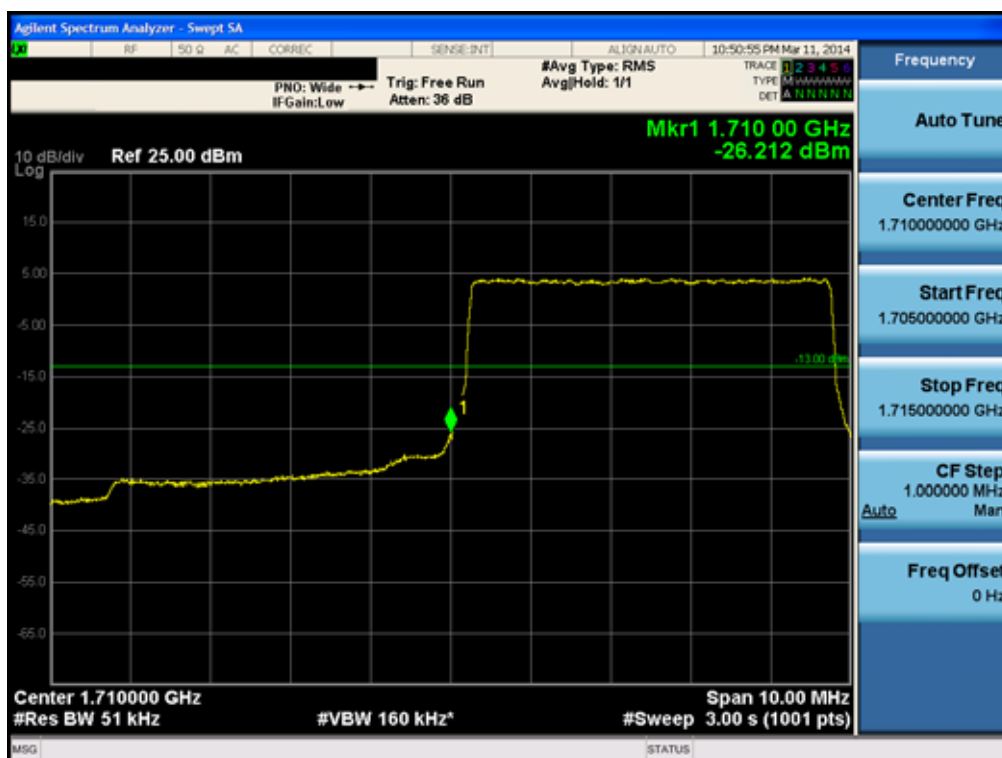
FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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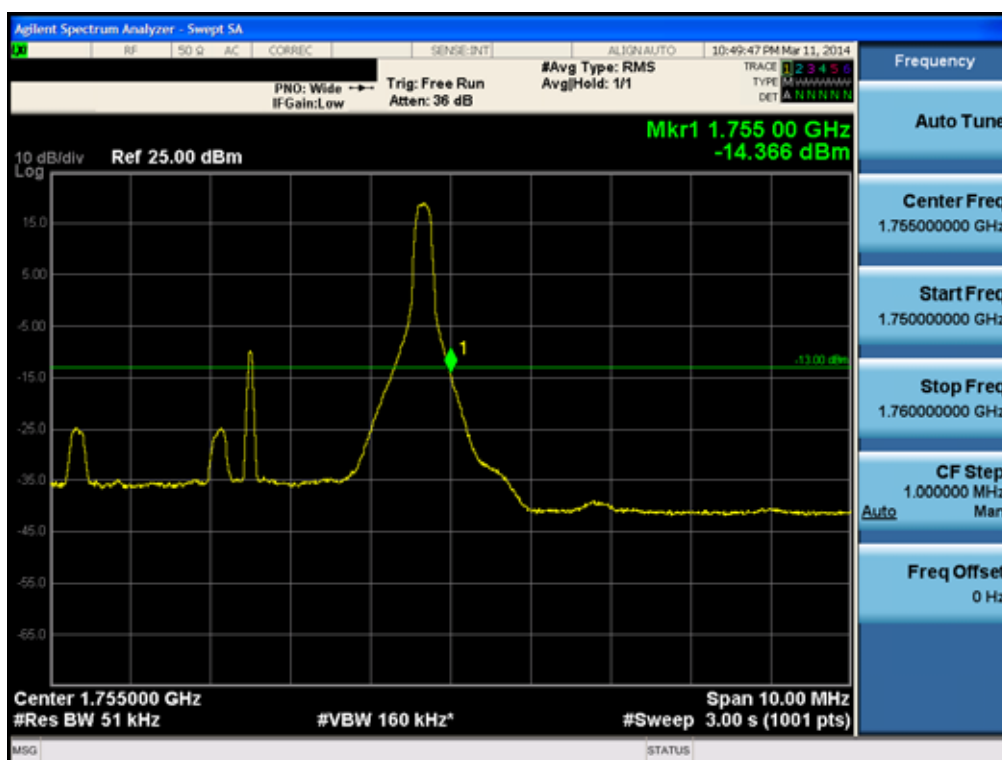
Lower Band Edge Plot (5M BW Ch.19975 QPSK RB 1, Offset 0) -1



Lower Band Edge Plot (5M BW Ch.19975 QPSK RB 25) -2



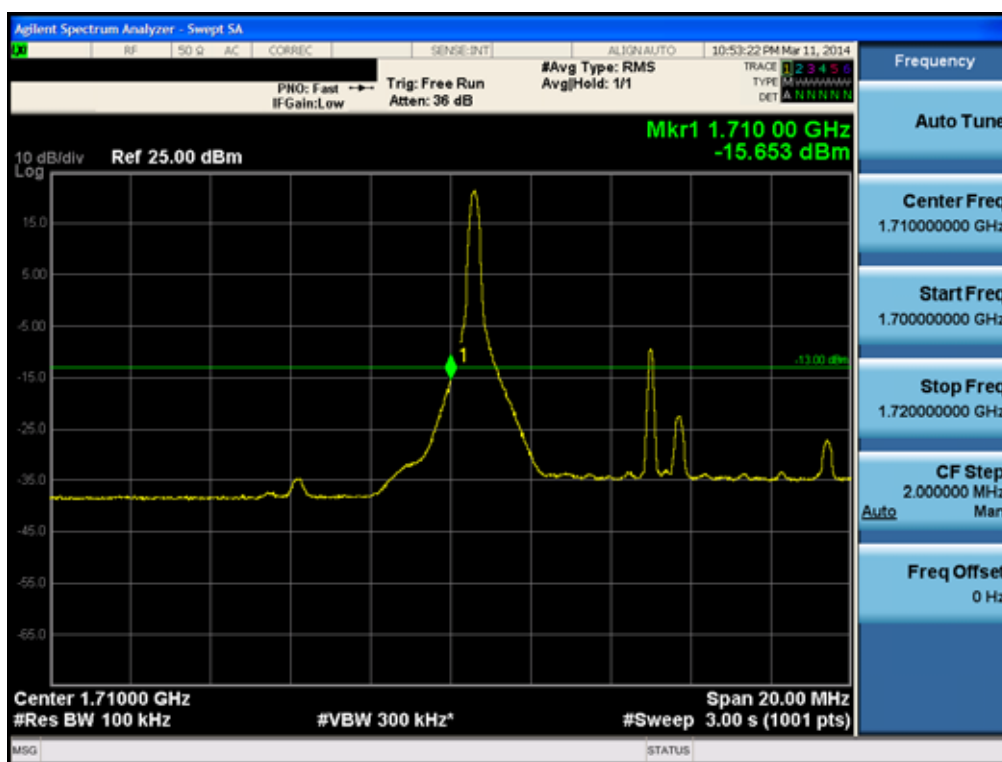
Upper Band Edge Plot (5M BW Ch.20375 QPSK RB 1, Offset 24) -1



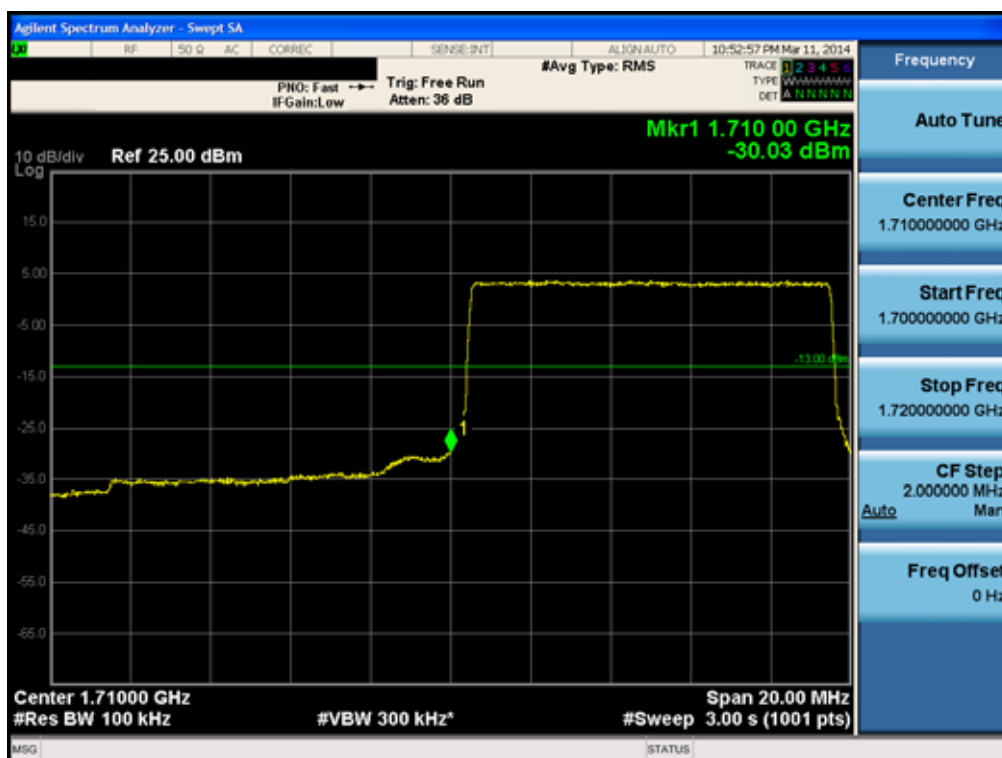
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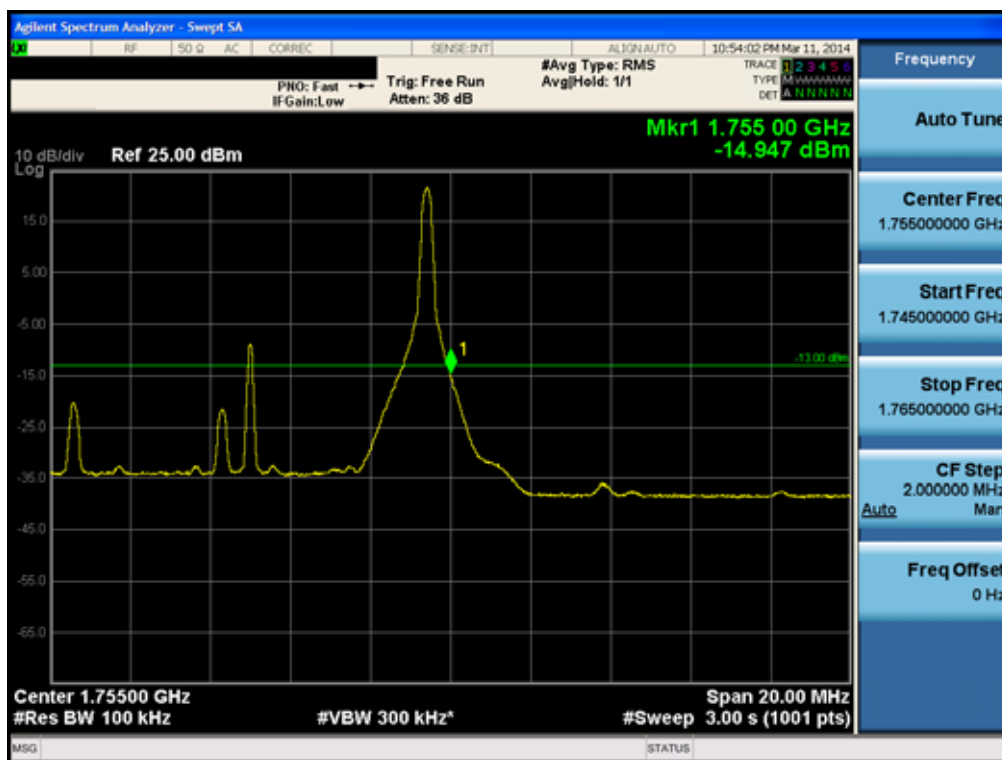
Lower Band Edge Plot (10M BW Ch.20000 QPSK RB 1, Offset 0) -1



Lower Band Edge Plot (10M BW Ch.20000 QPSK RB 50) -2



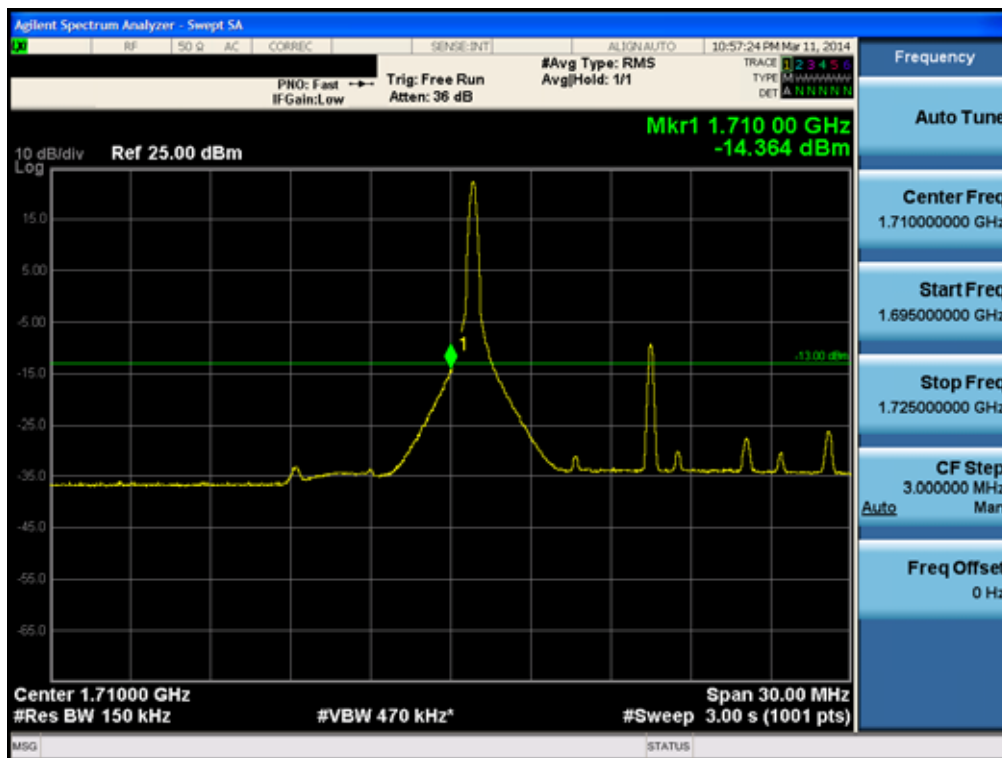
Upper Band Edge Plot (10M BW Ch.20350 QPSK RB 1, Offset 49) -1



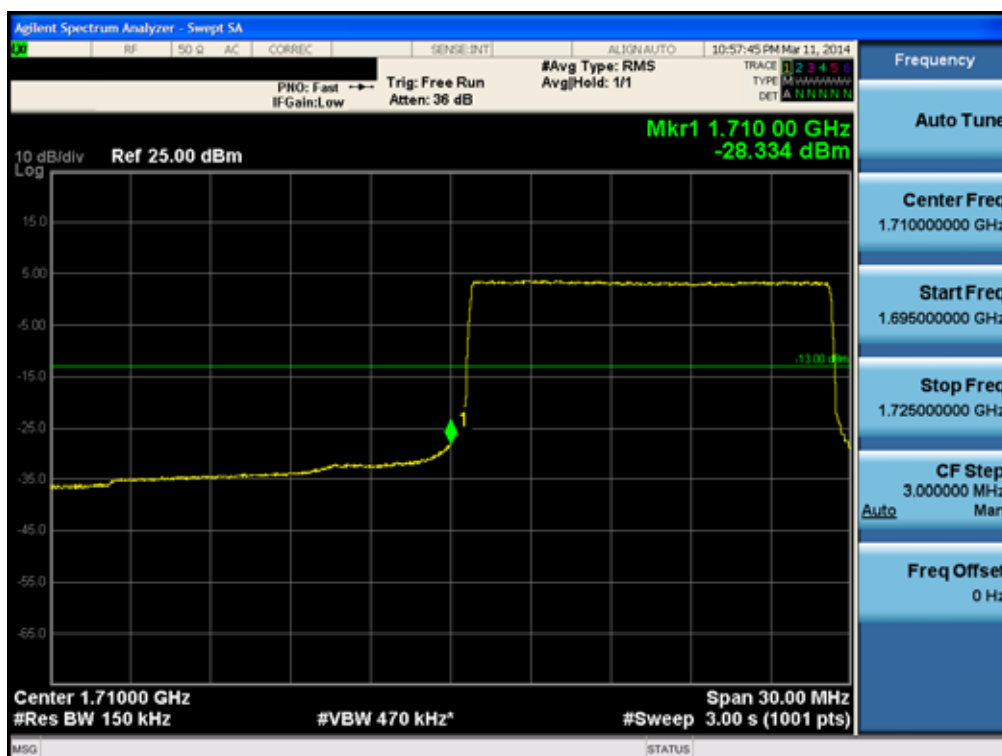
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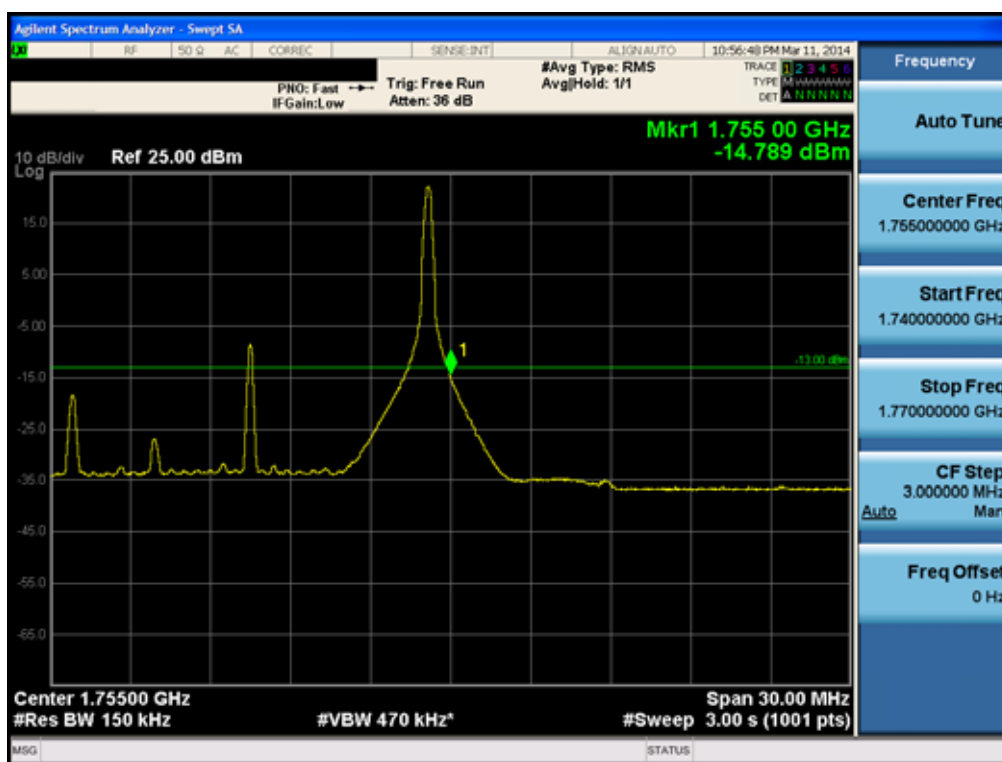
Lower Band Edge Plot (15M BW Ch.20025 QPSK RB 1, Offset 0) -1



Lower Band Edge Plot (15M BW Ch.20025 QPSK RB 75) -2



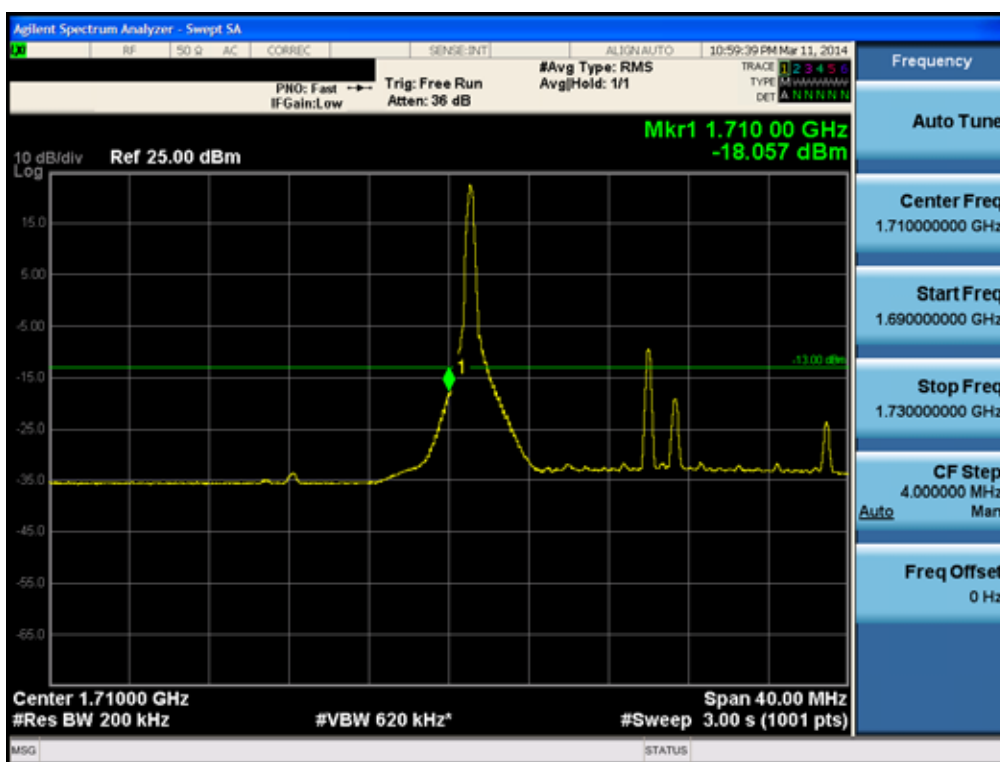
Upper Band Edge Plot (15M BW Ch.20325 QPSK RB 1, Offset 74) -1



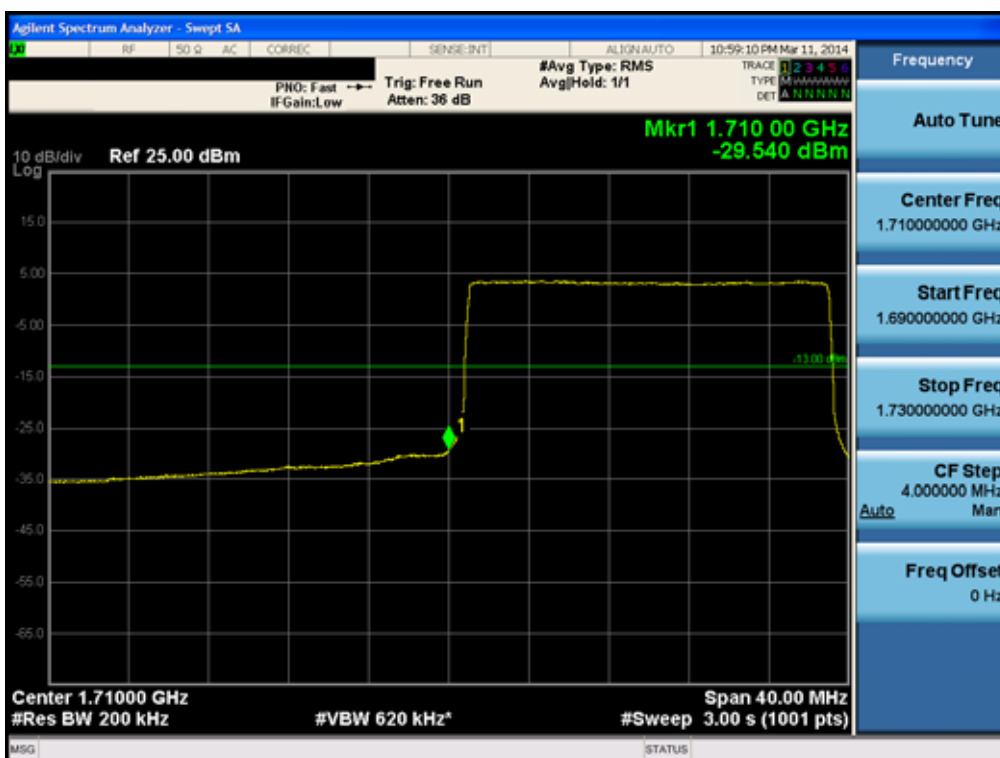
Upper Band Edge Plot (15M BW Ch.20325 QPSK RB 75) -2



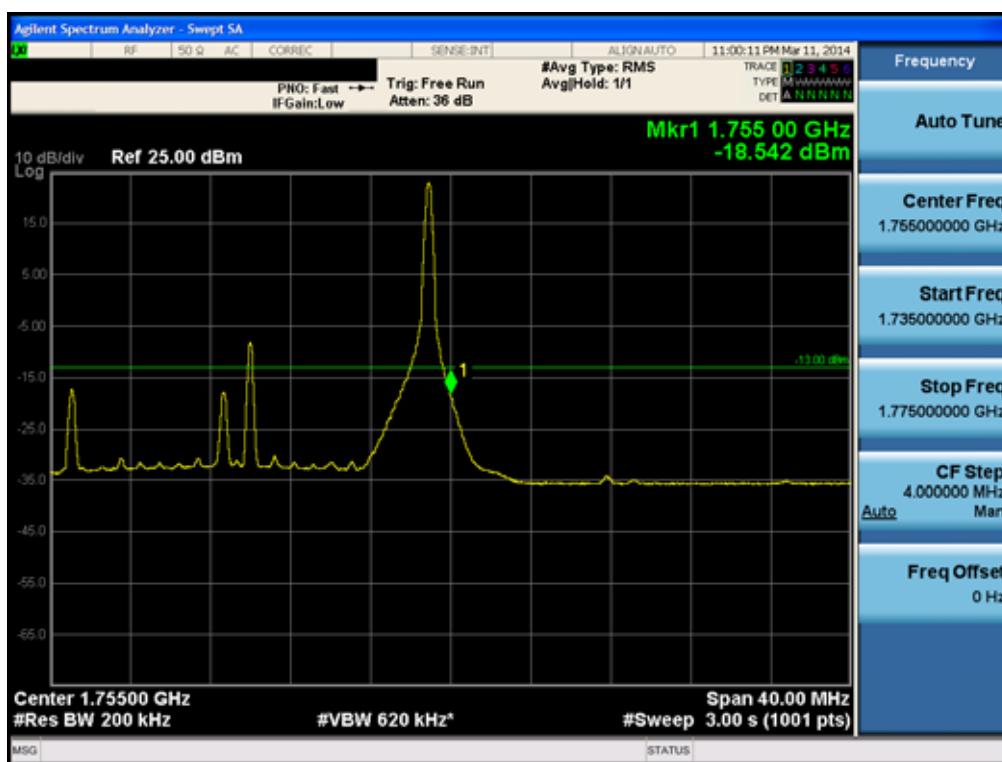
Lower Band Edge Plot (20M BW Ch.20050 QPSK RB 1, Offset 0) -1



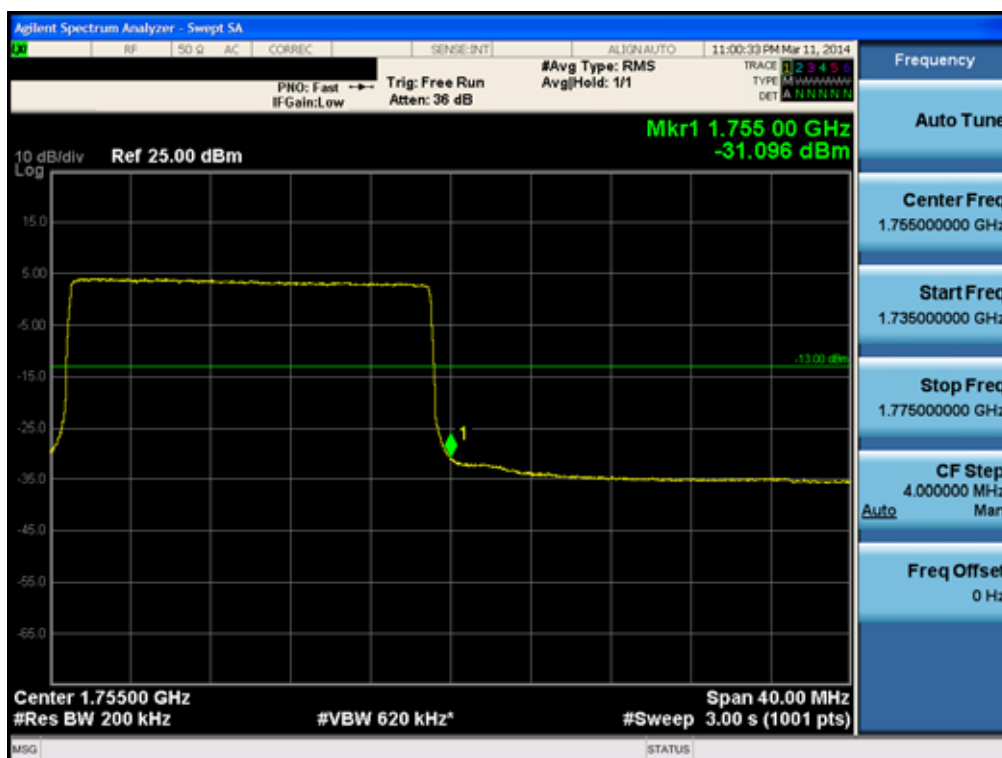
Lower Band Edge Plot (20M BW Ch.20050 QPSK RB 100) -2



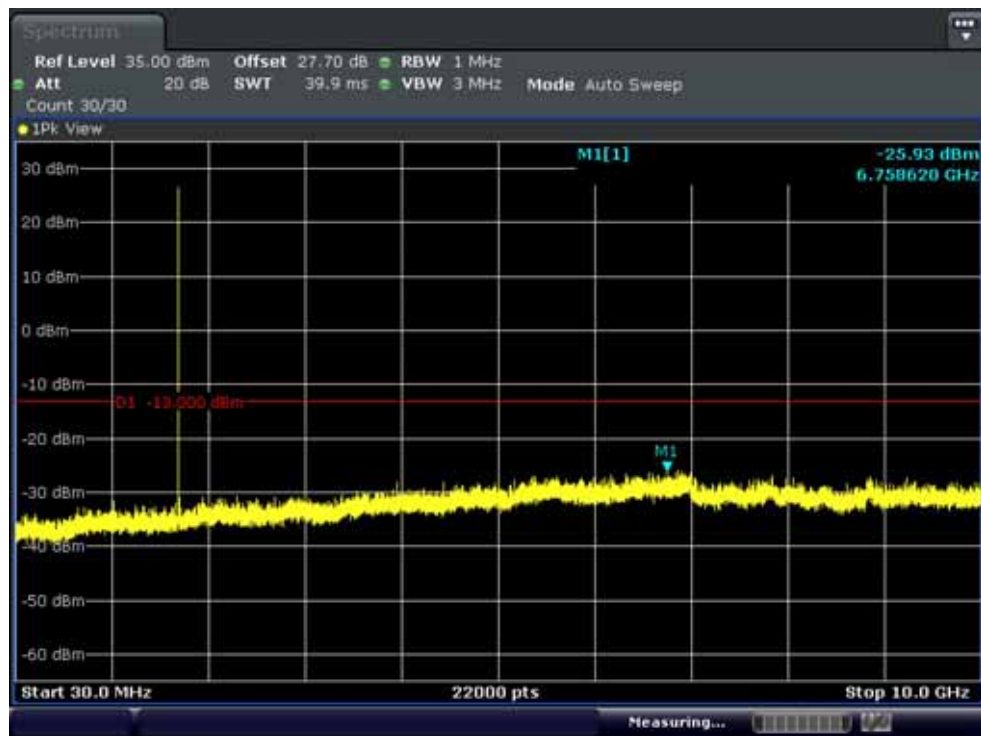
Upper Band Edge Plot (20M BW Ch.20300 QPSK RB 1, Offset 99) -1



Upper Band Edge Plot (20M BW Ch.20300 QPSK RB 100) -2



Band 4: Conducted Spurious Plot 1 (1.4MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



Band 4: Conducted Spurious Plot 2 (1.4MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



FCC CERTIFICATION REPORT

Test Report No.
HCT-R-1403-F025-2

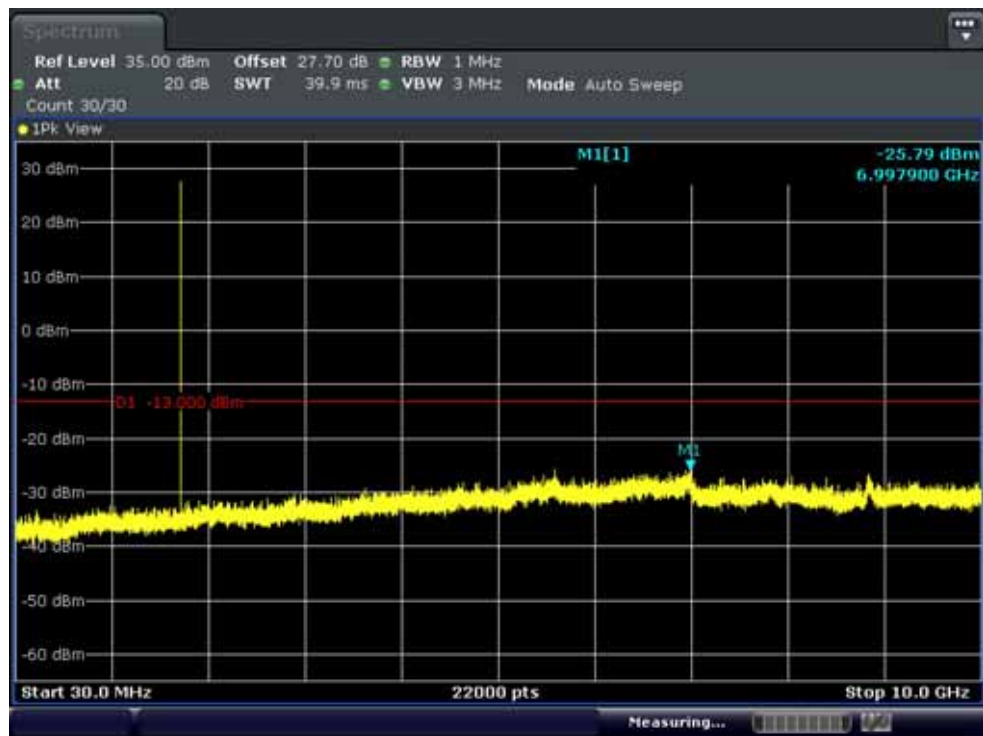
Date of Issue:
March 24, 2014

EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

www.hct.co.kr

FCC ID:
ZNFD625

Band 4: Conducted Spurious Plot 1 (1.4MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



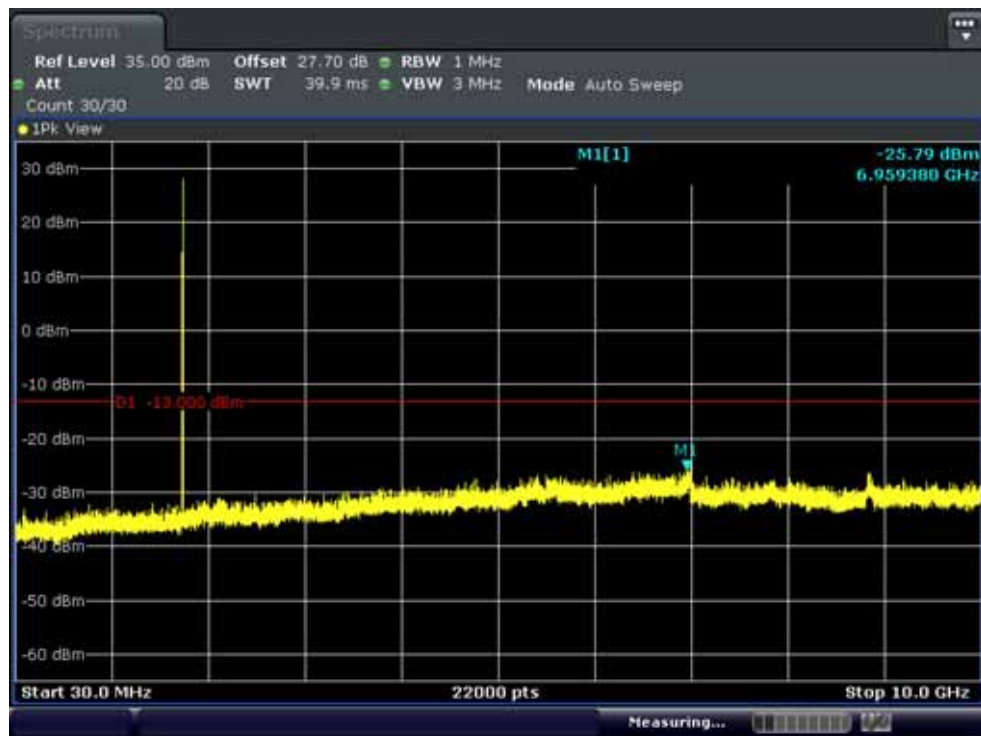
Band 4: Conducted Spurious Plot 2 (1.4MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Band 4: Conducted Spurious Plot 1 (1.4MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



Band 4: Conducted Spurious Plot 2 (1.4MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



FCC CERTIFICATION REPORT

Test Report No.
HCT-R-1403-F025-2

Date of Issue:
March 24, 2014

EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

www.hct.co.kr

FCC ID:
ZNFD625

Band 4: Conducted Spurious Plot 1 (3MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



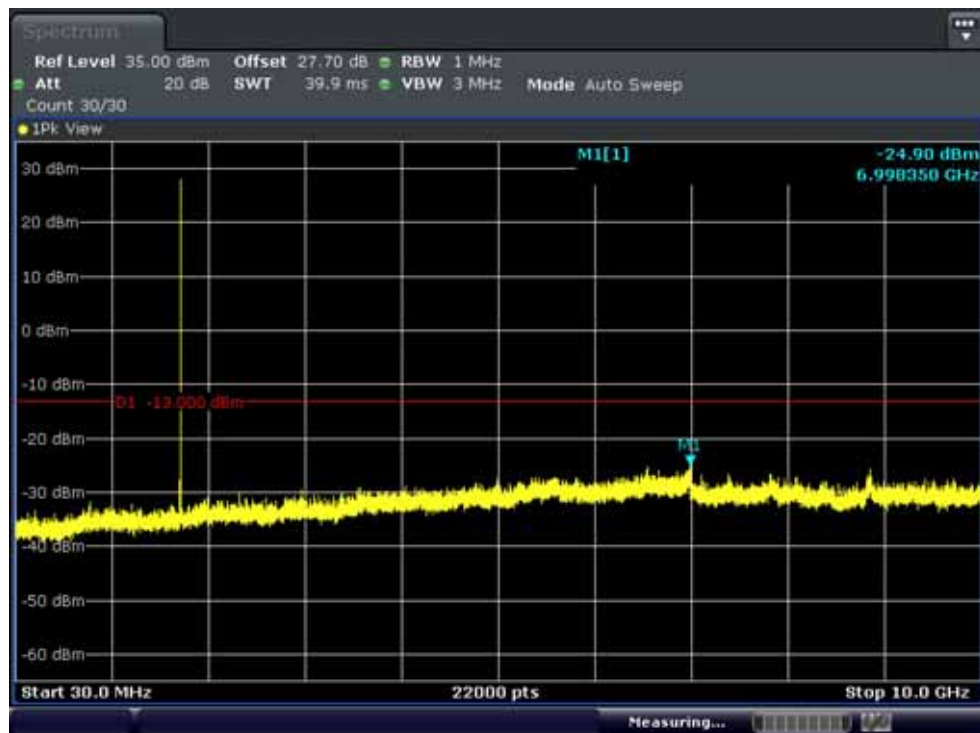
Band 4: Conducted Spurious Plot 2 (3MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Band 4: Conducted Spurious Plot 1 (3MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



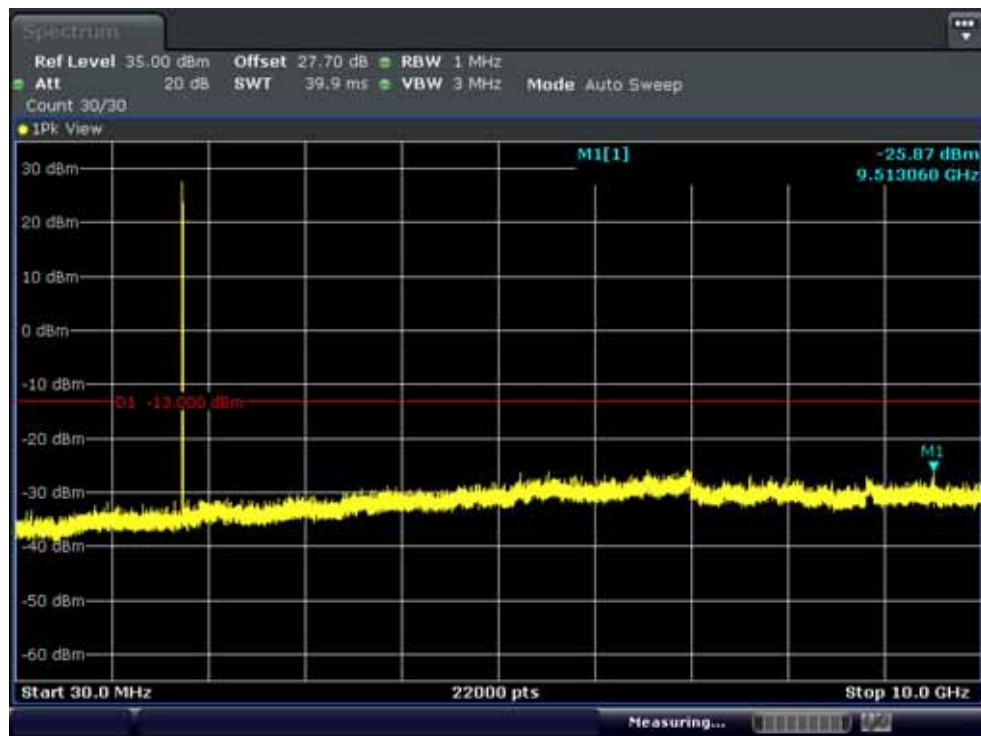
Band 4: Conducted Spurious Plot 2 (3MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Band 4: Conducted Spurious Plot 1 (3MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



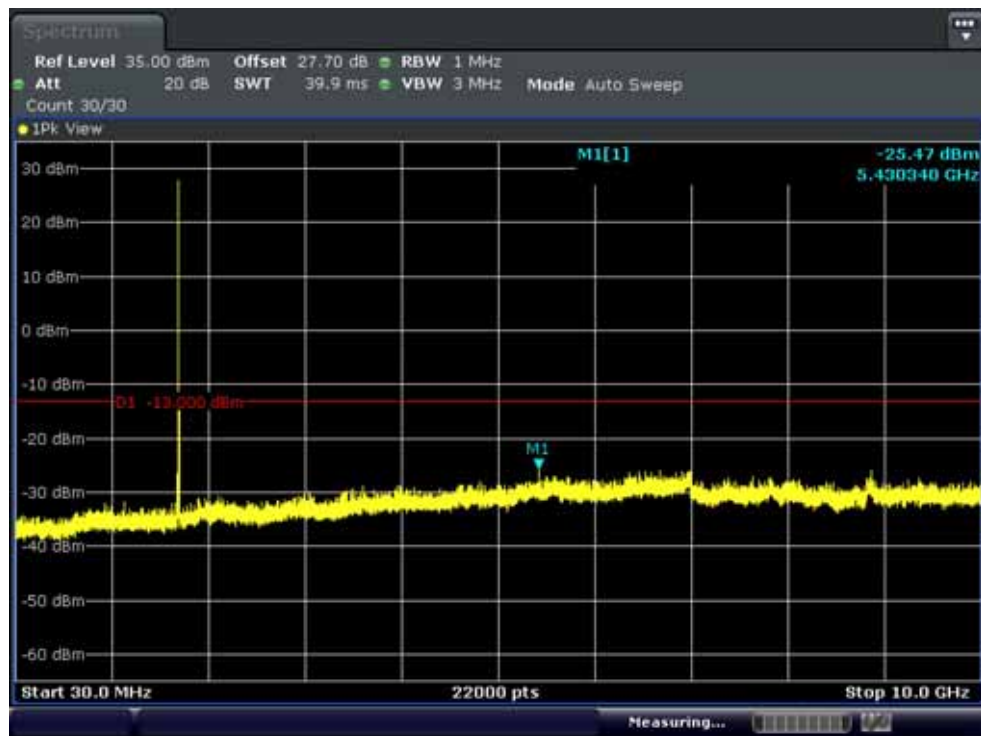
Band 4: Conducted Spurious Plot 2 (3MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Band 4: Conducted Spurious Plot 1 (5MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



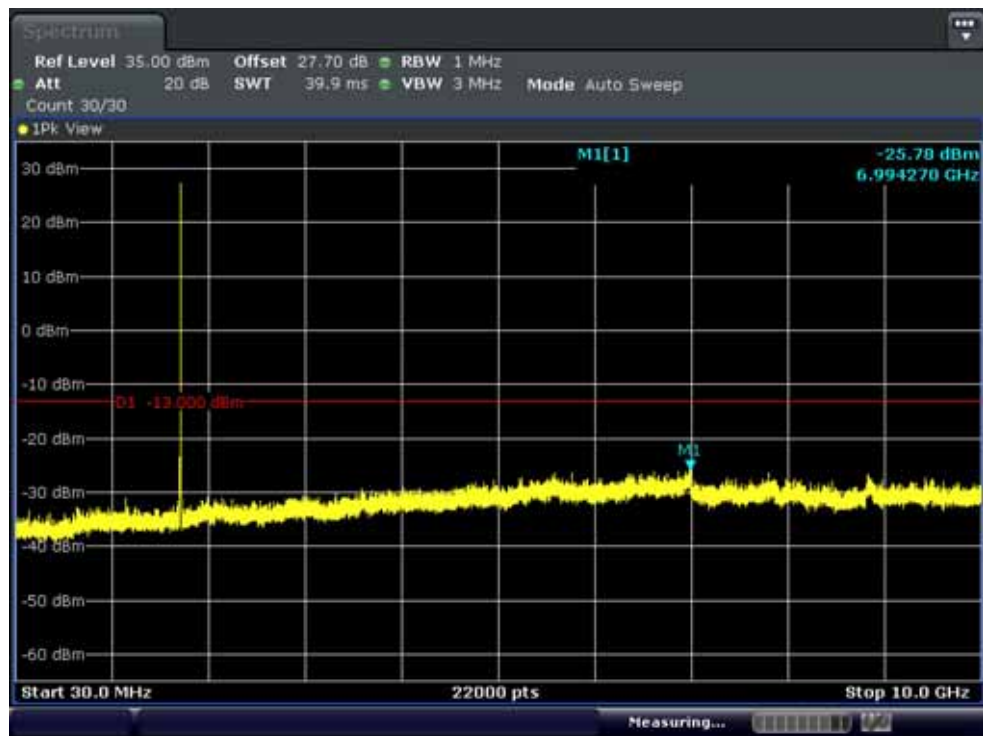
Band 4: Conducted Spurious Plot 2 (5MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



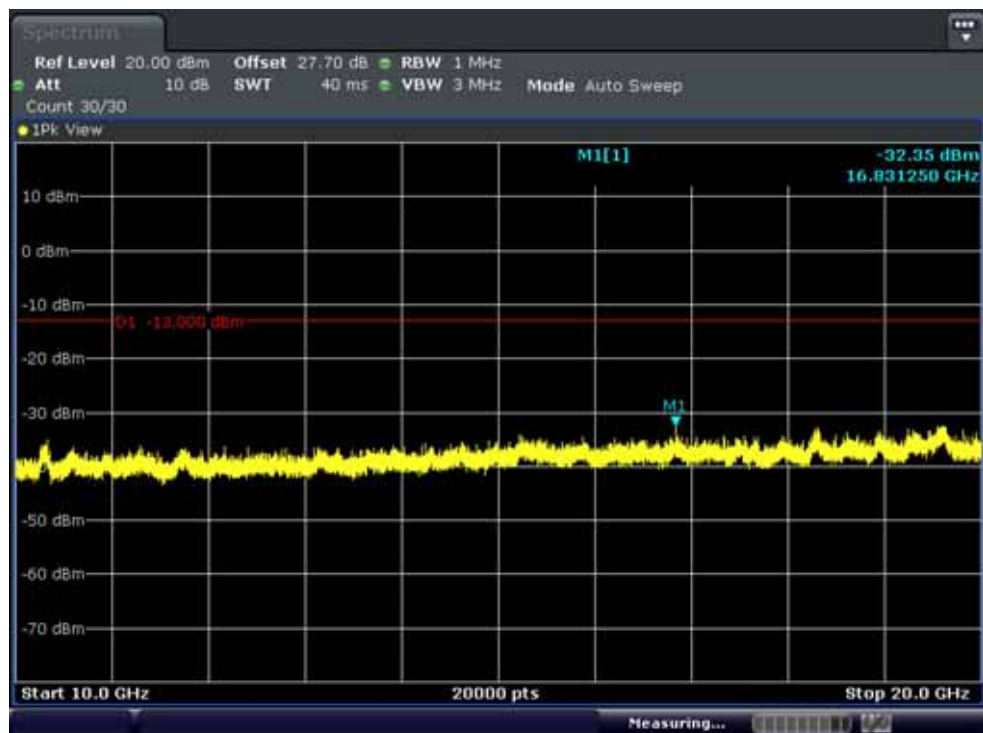
FCC CERTIFICATION REPORT

Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Band 4: Conducted Spurious Plot 1 (5MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



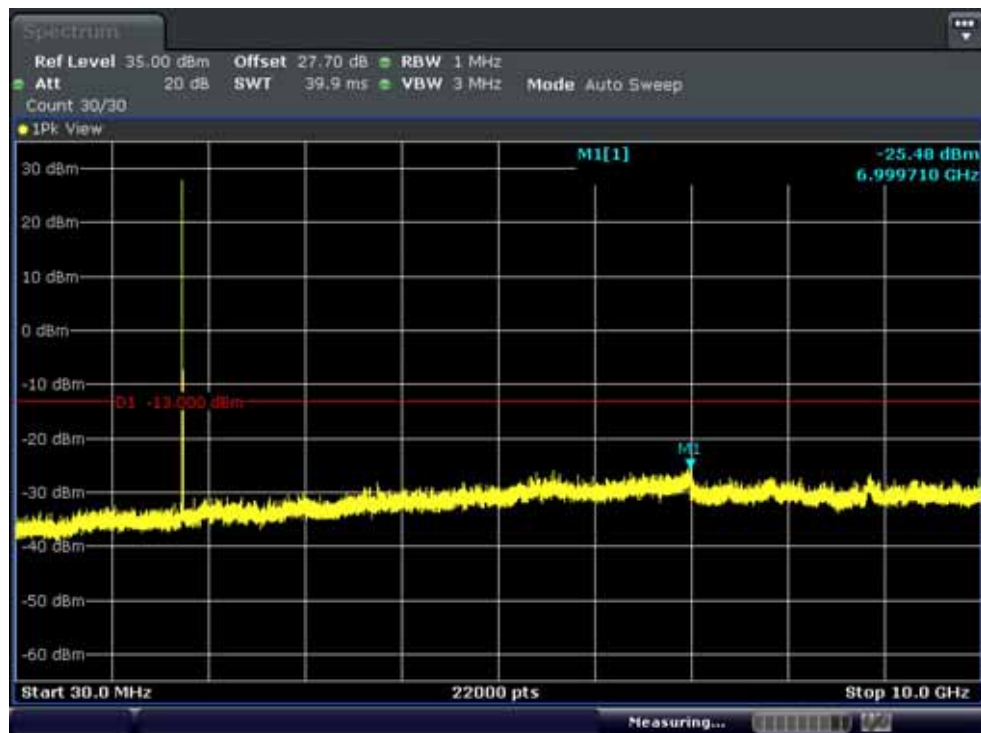
Band 4: Conducted Spurious Plot 2 (5MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



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Band 4: Conducted Spurious Plot 1 (5MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



Band 4: Conducted Spurious Plot 2 (5MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



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Band 4: Conducted Spurious Plot 1 (10MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



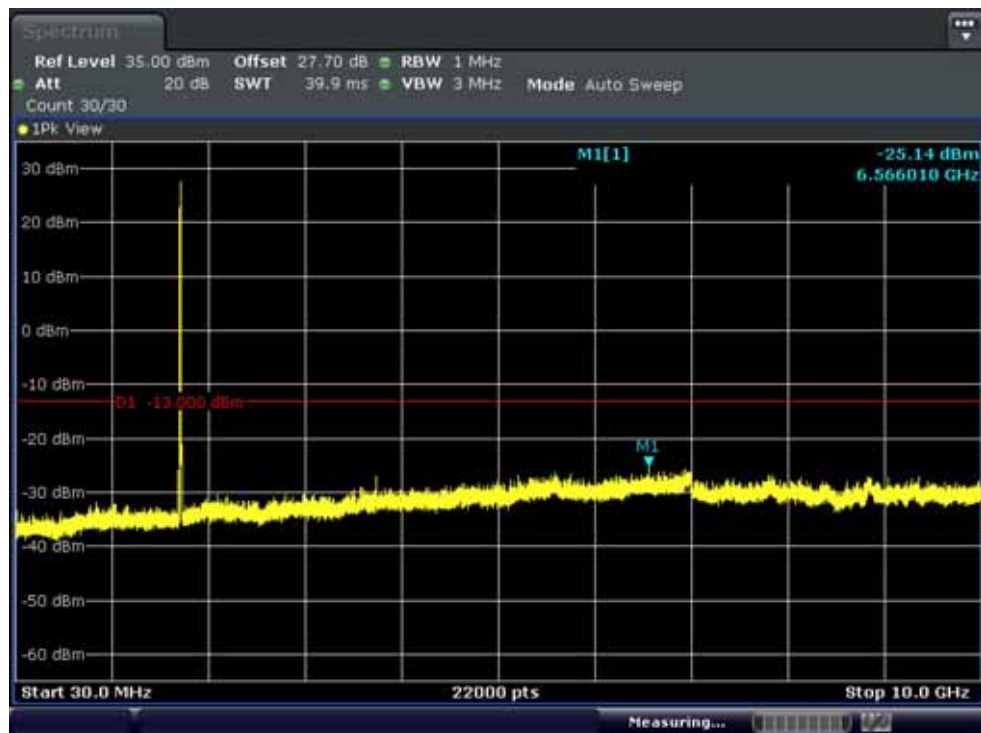
Band 4: Conducted Spurious Plot 2 (10MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



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Band 4: Conducted Spurious Plot 1 (10MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



Band 4: Conducted Spurious Plot 2 (10MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



FCC CERTIFICATION REPORT

Test Report No.
HCT-R-1403-F025-2

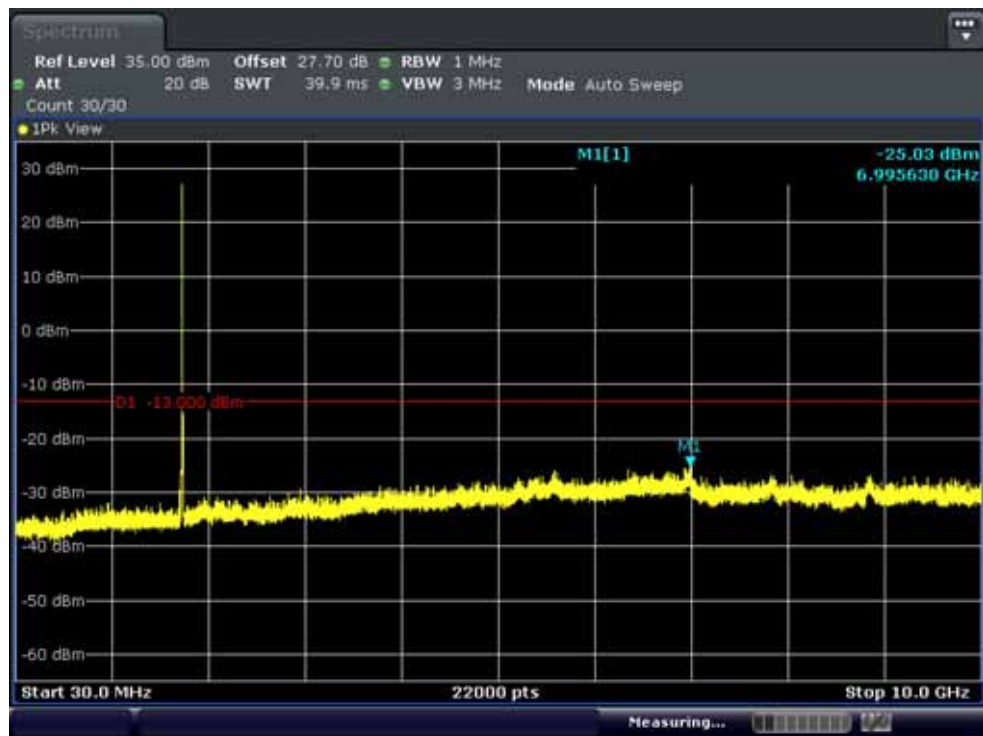
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Band 4: Conducted Spurious Plot 1 (10MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



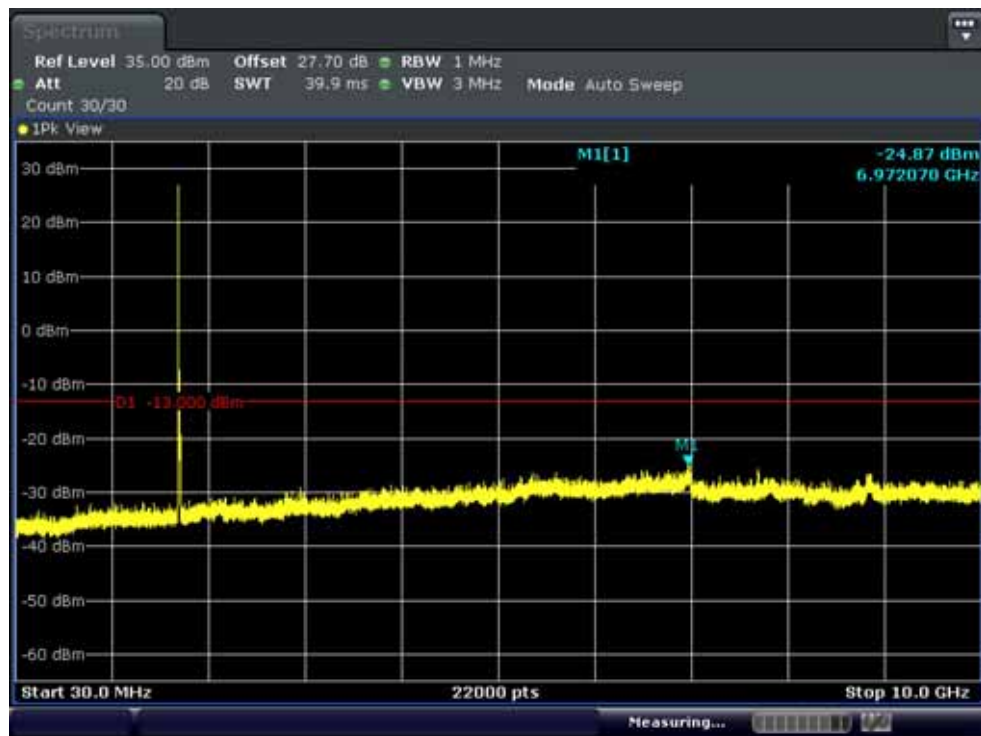
Band 4: Conducted Spurious Plot 2 (10MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



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Band 4: Conducted Spurious Plot 1 (15MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



Band 4: Conducted Spurious Plot 2 (15MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



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Test Report No.
HCT-R-1403-F025-2

Date of Issue:
March 24, 2014

EUT Type:
Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

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FCC ID:
ZNFD625

Band 4: Conducted Spurious Plot 1 (15MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



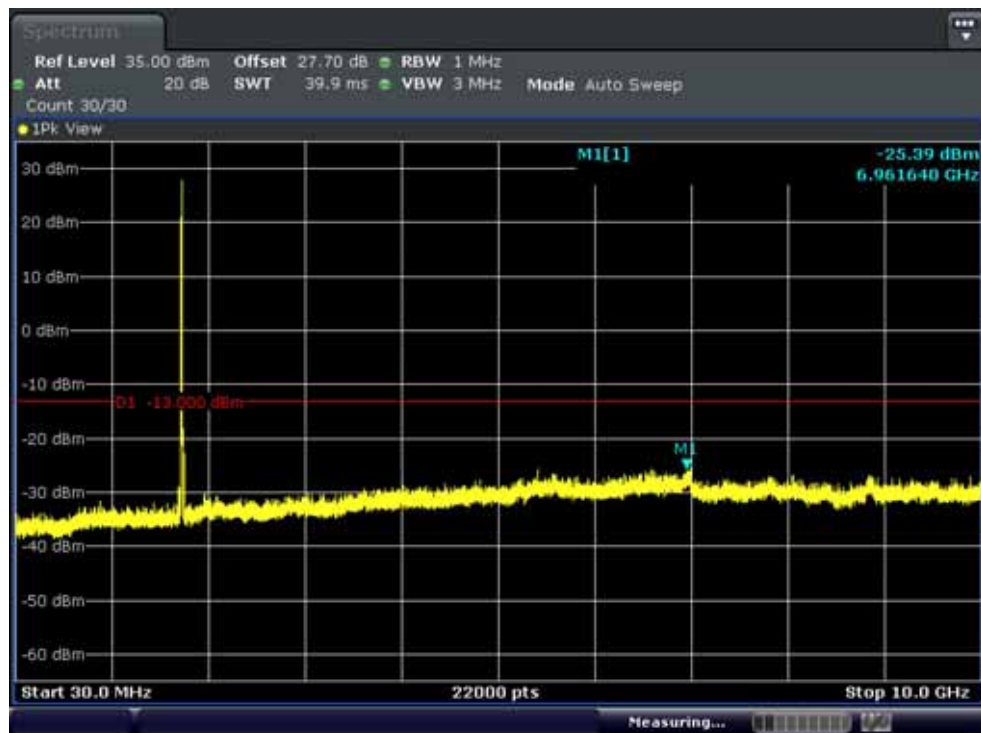
Band 4: Conducted Spurious Plot 2 (15MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



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Test Report No. HCT-R-1403-F025-2	Date of Issue: March 24, 2014	EUT Type: Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC	www.hct.co.kr FCC ID: ZNFD625
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Band 4: Conducted Spurious Plot 1 (15MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



Band 4: Conducted Spurious Plot 2 (15MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



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Test Report No.
HCT-R-1403-F025-2

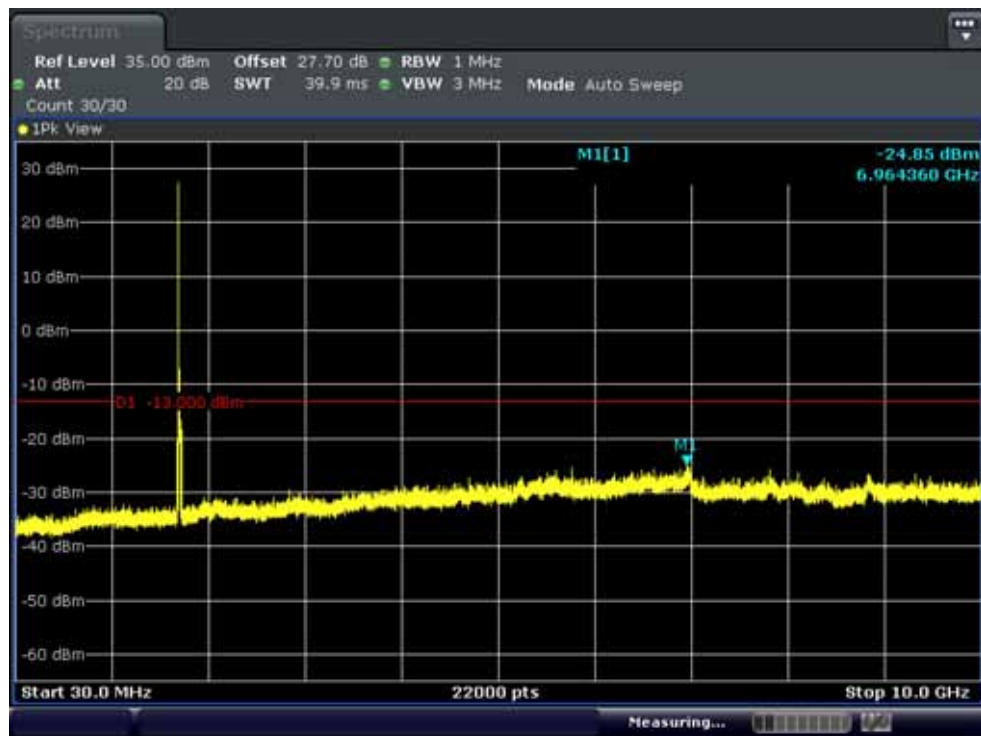
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Cellular/PCS GSM, WCDMA, LTE Phone with Bluetooth/WLAN/NFC

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FCC ID:
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Band 4: Conducted Spurious Plot 1 (20MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



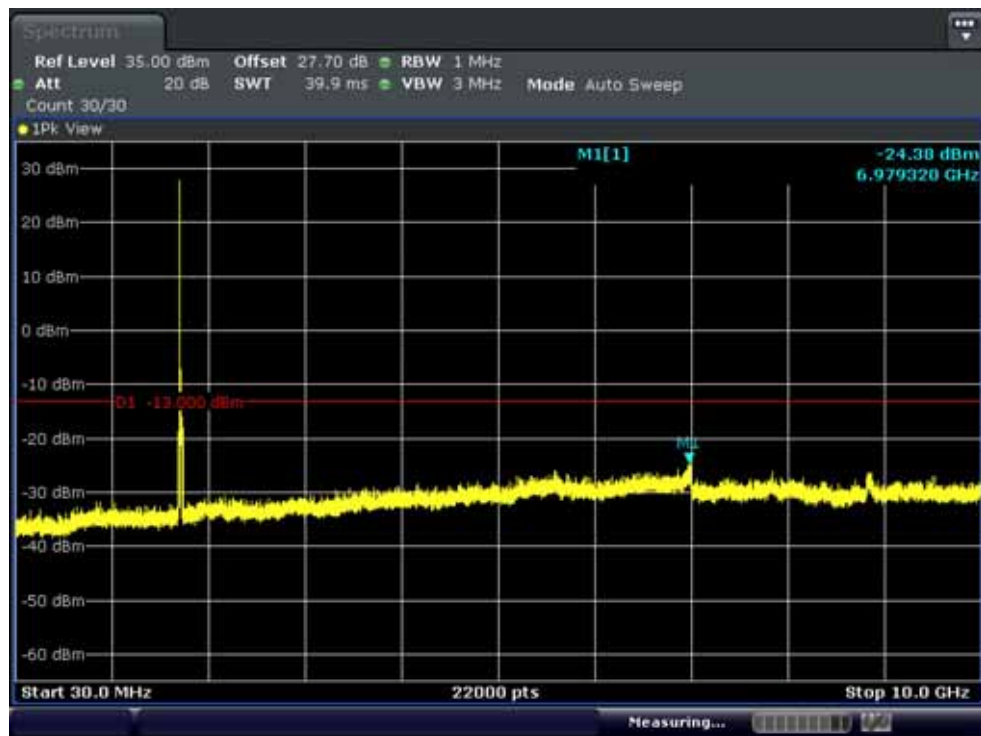
Band 4: Conducted Spurious Plot 2 (20MHz QPSK - RB Size 1, RB Offset 0 - Low Band 4: Channel)



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Band 4: Conducted Spurious Plot 1 (20MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



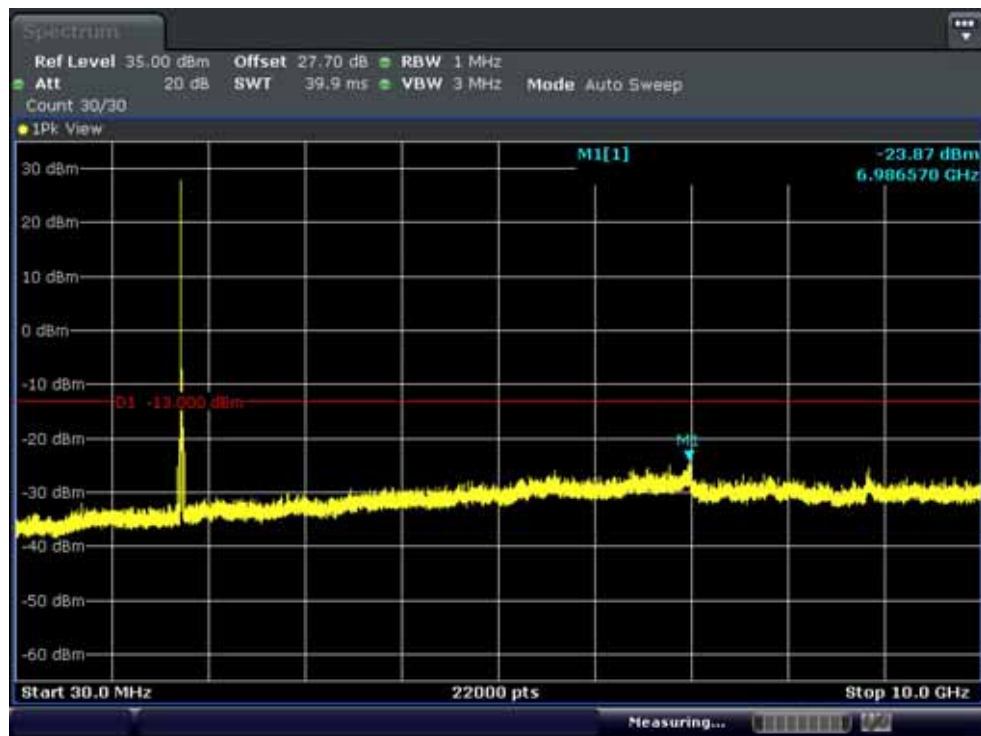
Band 4: Conducted Spurious Plot 2 (20MHz QPSK - RB Size 1, RB Offset 0 - Mid Band 4: Channel)



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Band 4: Conducted Spurious Plot 1 (20MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



Band 4: Conducted Spurious Plot 2 (20MHz QPSK - RB Size 1, RB Offset 0 - High Band 4: Channel)



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