

HCT CO., LTD.

CERTIFICATE OF COMPLIANCE FCC Certification

Applicant Name: LG Electronics MobileComm U.S.A., Inc.	Date of Issue: September 06, 2013
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632	Test Site/Location: HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea
	Report No.: HCTR1308FR36
	HCT FRN: 0005866421

FCC ID: ZNFD821

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

FCC Model(s):	D821
Additional FCC Model(s):	LG-D821, LGD821
EUT Type:	GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC
FCC Classification:	Licensed Portable Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§2 , §22
Tx Frequency:	824.7 MHz – 848.3 MHz (LTE – Band 5): 1.4 MHz 825.5 MHz – 847.5 MHz (LTE – Band 5): 3 MHz 826.5 MHz – 846.5 MHz (LTE – Band 5): 5 MHz 829.0 MHz – 844.0 MHz (LTE – Band 5): 10 MHz
Max. RF Output Power:	Band 5 (1.4 MHz) : 0.240 W (QPSK) (23.81 dBm) / 0.249 W (16-QAM) (23.96 dBm) Band 5 (3 MHz) : 0.228 W (QPSK) (23.57 dBm)/ 0.211 W (16-QAM) (23.24 dBm) Band 5 (5 MHz) : 0.227 W (QPSK) (23.56 dBm)/ 0.235 W (16-QAM) (23.71 dBm) Band 5 (10 MHz) : 0.233 W (QPSK) (23.67 dBm)/ 0.241 W (16-QAM) (23.82 dBm)
Emission Designator(s):	Band 5 (1.4 MHz) : 1M09G7D (QPSK) / 1M09W7D (16-QAM) Band 5 (3 MHz) : 2M68G7D (QPSK) / 2M69W7D (16-QAM) Band 5 (5 MHz) : 4M49G7D (QPSK) / 4M49W7D (16-QAM) Band 5 (10 MHz) : 8M94G7D (QPSK) / 8M94W7D (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
: Kyung Soo Kang
Test engineer of RF Team



Approved by
: Chang Seok Choi
Manager of RF Team

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Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	FCC ID: ZNFD821

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1308FR36	September 06, 2013	First Approval Report

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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: ZNFD821

Application Type: Certification

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

FCC Rule Part(s): §2 , §22

EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC

FCC Model(s): D821

Additional FCC Model(s): LG-D821, LGD821

Tx Frequency: 824.7 MHz – 848.3 MHz (LTE – Band 5): 1.4 MHz
825.5 MHz – 847.5 MHz (LTE – Band 5): 3 MHz
826.5 MHz – 846.5 MHz (LTE – Band 5): 5 MHz
829.0 MHz – 844.0 MHz (LTE – Band 5): 10 MHz

Max. RF Output Power: Band 5 (1.4 MHz) : 0.240 W (QPSK) (23.81 dBm) / 0.249 W (16-QAM) (23.96 dBm)
Band 5 (3 MHz) : 0.228 W (QPSK) (23.57 dBm)/ 0.211 W (16-QAM) (23.24 dBm)
Band 5 (5 MHz) : 0.227 W (QPSK) (23.56 dBm)/ 0.235 W (16-QAM) (23.71 dBm)
Band 5 (10 MHz) : 0.233 W (QPSK) (23.67 dBm)/ 0.241 W (16-QAM) (23.82 dBm)

Emission Designator(s): Band 5 (1.4 MHz) : 1M09G7D (QPSK) / 1M09W7D (16-QAM)
Band 5 (3 MHz) : 2M68G7D (QPSK) / 2M69W7D (16-QAM)
Band 5 (5 MHz) : 4M49G7D (QPSK) / 4M49W7D (16-QAM)
Band 5 (10 MHz) : 8M94G7D (QPSK) / 8M94W7D (16-QAM)

Date(s) of Tests: August 01, 2013 ~ September 04, 2013

Antenna Specification Manufacturer: Shanghai Amphenol Airwave Communication Electronics Co., LTD.
Antenna type: Internal Antenna
Peak Gain: LTE Band 5 : -3.02 dBi

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2. INTRODUCTION

2.1. EUT DESCRIPTION

The LG Electronics MobileComm U.S.A., Inc. D821 GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC consists of LTE 5.

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 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, Korea.

The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated March 02, 2011 (Registration Number: 90661)

3. DESCRIPTION OF TESTS

3.1 ERP/EIRP RADIATED POWER AND RADIATED SPURIOUS EMISSIONS

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

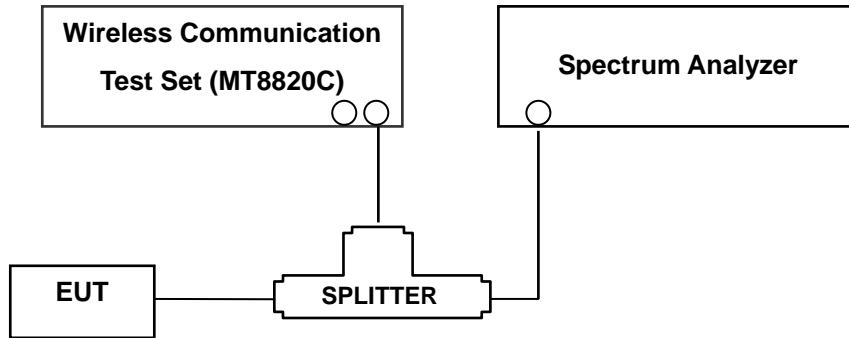
Radiated spurious emissions

1. Frequency Range : 30 MHz ~ 10th Harmonics of highest channel fundamental frequency.
2. Measured distance : 30 MHz ~ 10 GHz at 3 m
3. The EUT was setup to maximum output power. The 100 kHz RBW was used to scan from 30 MHz to 1 GHz. Also, the 1 MHz RBW was used to scan from 1 GHz to 10 GHz. The high, low and a middle channel were tested for out of band measurements.

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3.2 OCCUPIED BANDWIDTH.

Test set-up



(Configuration of conducted Emission measurement)
Test Procedure

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.

3.3 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: $P.A.R_{(dB)} = P_{Pk (dBm)} - P_{Avg (dBm)}$ (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.

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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 ≥ 3 x RBW.
- d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ 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 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

Test Procedure

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

The EUT was setup to maximum output power at its lowest channel. The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with the – 13 dBm limit, in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block. The 1 MHz RBW was used to scan from 30 MHz to 26.5 GHz. A display line was placed at – 13 dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

- Band Edge Requirement : In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

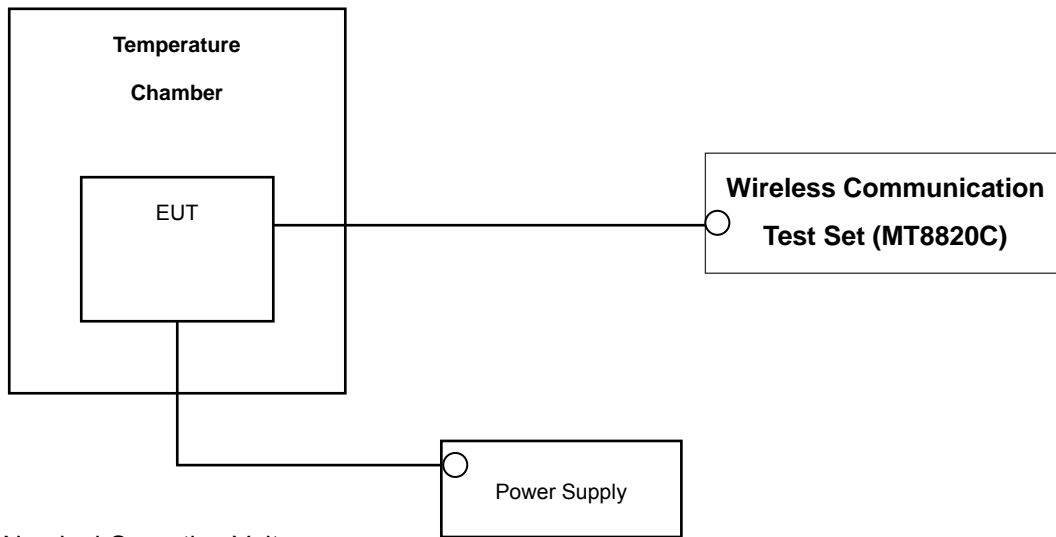
NOTES: The analyzer plot offsets were determined by below conditions.

- For LTE Band 5, total offset 27.7 dBm = 20 dBm attenuator + 6 dBm Divider + 1.7 dBm RF cables.

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3.5 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up



* Nominal Operating Voltage

Test Procedure

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 battery 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 $\pm 0.00025\%$ (± 2.5 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	09/11/2013
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	10126	Annual	11/07/2013
Digital	EP-3010/ Power Supply	3110117	Annual	11/07/2013
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	11/07/2013
Schwarzbeck	BBHA 9120D/ Horn Antenna	147	Biennial	05/15/2014
Schwarzbeck	BBHA 9120D/ Horn Antenna	937	Biennial	10/17/2013
WEINSCHTEL	ATTENUATOR	BR0592	Annual	11/07/2013
REOHDE&SCHWARZ	FSV40/Spectrum Analyzer	1307.9002K40-100931-NK	Annual	06/10/2014
Agilent	8960 (E5515C)/ Base Station	GB44400269	Annual	02/14/2014

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049, 22.917(a)	RSS- Gen(4.6.1)	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 22.917(a)	RSS-132(4.5.1)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions		PASS
2.1046	RSS-132(4.4)	Conducted Output Power	N/A		PASS
2.1055, 22.355	RSS-132(4.3)	Frequency stability / variation of ambient temperature	< 2.5 ppm		PASS
22.913(a)(2)	RSS-132(4.4) [SRSP- 503(5.1.3)]	Effective Radiated Power	< 7 Watts max. ERP	RADIATED	PASS
2.1053, 22.917(a)	RSS-132(4.5.1)	Radiated Spurious and Harmonic Emissions	< 43 + 10log10 (P[Watts]) for all out-of band emissions		PASS
	RSS-Gen,6	Receiver Spurious Emissions	Cf.)Section 7.3.2		PASS

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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 Band5	20525	836.60	-6.73	40.89	-10.54	0.96	V	0.869	29.39

ERP = SubstituteLEVEL(dBm) + Ant. Gain – 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 until the maximum signal 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

1.4MHz Bandwidth

Emission Designator = 1M08G7D

LTE BW = 1.08 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

3MHz Bandwidth

Emission Designator = 2M68G7D

LTE BW = 2.68 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

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

1.4MHz Bandwidth

Emission Designator = 1M08W7D

LTE BW = 1.08 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

3MHz Bandwidth

Emission Designator = 2M68W7D

LTE BW = 2.68 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

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

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7. TEST DATA

7.1 EFFECTIVE RADIATED POWER OUTPUT

Effective Radiated Power Data (Band 5 – 1.4 MHz)

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
824.7	1.4 MHz	QPSK	-12.96	35.35	-10.59	0.95	V	0.240	23.81
		16-QAM	-12.81	35.50	-10.59	0.95	V	0.249	23.96
836.5		QPSK	-12.86	34.76	-10.54	0.96	V	0.212	23.26
		16-QAM	-12.80	34.82	-10.54	0.96	V	0.215	23.32
848.3		QPSK	-14.12	33.14	-10.48	1.11	V	0.143	21.55
		16-QAM	-14.00	33.26	-10.48	1.11	V	0.147	21.67

Note: Worst case is 1 resource block.

Effective Radiated Power Data (Band 5 – 3 MHz)

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
825.5	3 MHz	QPSK	-13.05	35.10	-10.58	0.95	V	0.228	23.57
		16-QAM	-12.88	34.74	-10.54	0.96	V	0.211	23.24
836.5		QPSK	-13.19	34.43	-10.54	0.96	V	0.196	22.93
		16-QAM	-12.99	34.50	-10.49	0.96	V	0.202	23.05
847.5		QPSK	-14.03	34.12	-10.58	0.95	V	0.182	22.59
		16-QAM	-13.76	33.73	-10.49	0.96	V	0.169	22.28

Note: Worst case is 1 resource block.

Effective Radiated Power Data (Band 5 – 5 MHz)

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
826.50	5 MHz	QPSK	-13.21	35.10	-10.59	0.95	V	0.227	23.56
		16-QAM	-13.06	35.25	-10.59	0.95	V	0.235	23.71
836.60		QPSK	-13.30	34.32	-10.54	0.96	V	0.191	22.82
		16-QAM	-13.07	34.55	-10.54	0.96	V	0.202	23.05
846.50		QPSK	-13.49	33.77	-10.48	1.11	V	0.165	22.18
		16-QAM	-13.24	34.02	-10.48	1.11	V	0.175	22.43

Note: Worst case is 1 resource block.

Effective Radiated Power Data (Band 5 – 10 MHz)

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
829.0	10 MHz	QPSK	-12.95	35.20	-10.58	0.95	V	0.233	23.67
		16-QAM	-12.80	35.35	-10.58	0.95	V	0.241	23.82
836.5		QPSK	-12.65	34.97	-10.54	0.96	V	0.222	23.47
		16-QAM	-12.54	35.08	-10.54	0.96	V	0.228	23.58
844.0		QPSK	-13.88	33.61	-10.49	0.96	V	0.164	22.16
		16-QAM	-13.75	33.74	-10.49	0.96	V	0.169	22.29

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. For 1 MHz BW signals, a peak detector is used, with RBW = VBW = 1 MHz. For 10 MHz BW signals, a peak detector is used, with RBW = VBW = 10 MHz. A half-wave dipole was substituted in place of the EUT. This dipole 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 x plane in LTE mode. Also worst case of detecting Antenna is horizontal polarization in LTE mode.

FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNF821
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7.2 RADIATED SPURIOUS EMISSIONS

7.2.1 EUT ONLY

7.2.1.1 RADIATED SPURIOUS EMISSIONS (Band 5_1.4M)

OPERATING FREQUENCY : 836.5 MHz
 MEASURED OUTPUT POWER: 23.96 dBm = 0.249W
 MODULATION SIGNAL: 1.4 MHz 16-QAM
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 36.96 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20407 (824.7)	1649.4	-54.99	7.11	-61.92	1.20	H	-56.01	79.97
	2474.1	-56.15	8.40	-60.04	1.62	H	-53.26	77.22
	3298.8	-	-	-	-	-	-	-
20525 (836.5)	1673.0	-54.64	7.22	-61.86	0.98	H	-55.62	79.58
	2509.5	-55.74	8.51	-59.53	1.65	V	-52.67	76.63
	3346.0	-	-	-	-	-	-	-
20643 (848.3)	1696.6	-54.73	7.34	-62.07	0.88	V	-55.61	79.57
	2544.9	-51.73	8.58	-55.65	1.65	V	-48.72	72.68
	3393.2	-	-	-	-	-	-	-

- NOTES:**
1. Radiated Spurious Emission Measurements at 1 meter and 3 meter 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.

FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	FCC ID: ZNF821



7.2.1.2 RADIATED SPURIOUS EMISSIONS (Band 5_3M)

OPERATING FREQUENCY : 836.50 MHz
 MEASURED OUTPUT POWER: 23.57 dBm = 0.228W
 MODULATION SIGNAL: 3 MHz QPSK
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 36.57 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20415 (825.5)	1651.0	-55.98	7.11	-62.91	1.20	H	-57.00	80.57
	2476.5	-56.13	8.44	-60.23	1.63	H	-53.42	76.99
	3302.0	-	-	-	-	-	-	-
20525 (836.5)	1673.0	-53.33	7.22	-60.55	0.98	H	-54.31	77.88
	2509.5	-55.09	8.51	-58.88	1.65	H	-52.02	75.59
	3346.0	-	-	-	-	-	-	-
20635 (847.5)	1695.0	-53.97	7.28	-61.03	1.20	H	-54.95	78.52
	2542.5	-53.69	8.58	-57.61	1.65	H	-50.68	74.25
	3390.0	-	-	-	-	-	-	-

- NOTES:**
1. Radiated Spurious Emission Measurements at 1 meter and 3 meter 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.



7.2.1.3 RADIATED SPURIOUS EMISSIONS (Band 5_5M)

OPERATING FREQUENCY : 836.50 MHz
 MEASURED OUTPUT POWER: 23.71 dBm = 0.235W
 MODULATION SIGNAL: 5 MHz 16-QAM
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 36.71 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20425 (826.5)	1653.0	-56.11	7.11	-63.04	1.20	H	-57.13	80.84
	2479.5	-55.43	8.40	-59.32	1.62	H	-52.54	76.25
	3306.0	-56.59	9.95	-60.77	1.99	H	-52.81	76.52
20525 (836.5)	1673.0	-54.01	7.22	-61.23	0.98	V	-54.99	78.70
	2509.5	-53.11	8.51	-56.90	1.65	H	-50.04	73.75
	3346.0	-56.83	10.09	-61.22	2.00	H	-53.13	76.84
20625 (846.5)	1693.0	-54.07	7.34	-61.41	0.88	V	-54.95	78.66
	2539.5	-53.98	8.58	-57.90	1.65	H	-50.97	74.68
	3386.0	-	-	-	-	-	-	-

- NOTES:**
1. Radiated Spurious Emission Measurements at 1 meter and 3 meter 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.



7.2.1.4 RADIATED SPURIOUS EMISSIONS (Band 5_10M)

OPERATING FREQUENCY : 836.50 MHz
 MEASURED OUTPUT POWER: 23.82 dBm = 0.241 W
 MODULATION SIGNAL: 10 MHz 16-QAM
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 36.82 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20450 (829.0)	1658.0	-54.84	7.11	-61.77	1.20	H	-55.86	79.68
	2487.0	-55.73	8.44	-59.83	1.63	H	-53.02	76.84
	3316.0	-	-	-	-	-	-	-
20525 (836.5)	1673.0	-54.60	7.22	-61.82	0.98	H	-55.58	79.40
	2509.5	-50.63	8.51	-54.42	1.65	V	-47.56	71.38
	3346.0	-56.72	10.09	-61.11	2.00	H	-53.02	76.84
20600 (844.0)	1688.0	-55.67	7.28	-62.73	1.20	V	-56.65	80.47
	2532.0	-51.85	8.58	-55.77	1.65	H	-48.84	72.66
	3376.0	-57.01	10.17	-61.42	1.98	V	-53.23	77.05

- NOTES:**
1. Radiated Spurious Emission Measurements at 1 meter and 3 meter 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.

7.2.2 EUT ON THE CHARGING PAD

7.2.2.1 RADIATED SPURIOUS EMISSIONS (Band 5_1.4M)

MODULATION SIGNAL: 1.4 MHz 16-QAM
 DISTANCE: 3 meters
 LIMIT: - 13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)
20407 (824.7)	1649.4	-56.94	7.11	-63.87	1.20	H	-57.96
	2474.1	-55.23	8.40	-59.12	1.62	H	-52.34
	3298.8	-	-	-	-	-	3.78
20525 (836.5)	1673.0	-56.17	7.22	-63.39	0.98	H	-57.15
	2509.5	-56.86	8.51	-60.65	1.65	H	-53.79
	3346.0	-	-	-	-	-	3.70
20643 (848.3)	1696.6	-55.42	7.34	-62.76	0.88	H	-56.30
	2544.9	-51.38	8.58	-55.30	1.65	H	-48.37
	3393.2	-	-	-	-	-	3.78

- NOTES:**
1. Radiated Spurious Emission Measurements at 1 meter and 3 meter 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.



7.2.2.2 RADIATED SPURIOUS EMISSIONS (Band 5_3M)

MODULATION SIGNAL: _____ 3 MHz QPSK

DISTANCE: _____ 3 meters

LIMIT: _____ - 13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)
20415 (825.5)	1651.0	-56.97	7.11	-63.90	1.20	H	-57.99
	2476.5	-54.58	8.44	-58.68	1.63	H	-51.87
	3302.0	-	-	-	-	-	4.05
20525 (836.5)	1673.0	-54.97	7.22	-62.19	0.98	H	-55.95
	2509.5	-54.98	8.51	-58.77	1.65	H	-51.91
	3346.0	-	-	-	-	-	3.70
20635 (847.5)	1695.0	-52.37	7.28	-59.43	1.20	H	-53.35
	2542.5	-52.81	8.58	-56.73	1.65	H	-49.80
	3390.0	-	-	-	-	-	3.78

- NOTES:**
1. Radiated Spurious Emission Measurements at 1 meter and 3 meter 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.

FCC CERTIFICATION REPORT			www.hct.co.kr
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7.2.2.3 RADIATED SPURIOUS EMISSIONS (Band 5_5M)

MODULATION SIGNAL: 5 MHz 16-QAM
 DISTANCE: 3 meters
 LIMIT: - 13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)
20425 (826.5)	1653.0	-55.29	7.11	-62.22	1.20	H	-56.31
	2479.5	-55.24	8.40	-59.13	1.62	H	-52.35
	3306.0	-	-	-	-	-	3.78
20525 (836.5)	1673.0	-55.68	7.22	-62.90	0.98	H	-56.66
	2509.5	-54.40	8.51	-58.19	1.65	H	-51.33
	3346.0	-	-	-	-	-	3.70
20625 (846.5)	1693.0	-52.76	7.34	-60.10	0.88	H	-53.64
	2539.5	-55.68	8.58	-59.60	1.65	H	-52.67
	3386.0	-	-	-	-	-	3.78

- NOTES:**
1. Radiated Spurious Emission Measurements at 1 meter and 3 meter 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.



7.2.2.4 RADIATED SPURIOUS EMISSIONS (Band 5_10M)

MODULATION SIGNAL: _____ 10 MHz 16-QAM

DISTANCE: _____ 3 meters

LIMIT: _____ - 13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)
20450 (829.0)	1658.0	-54.32	7.11	-61.25	1.20	H	-55.34
	2487.0	-	-	-	-	-	2.71
	3316.0	-	-	-	-	-	4.05
20525 (836.5)	1673.0	-56.48	7.22	-63.70	0.98	H	-57.46
	2509.5	-52.05	8.51	-55.84	1.65	H	-48.98
	3346.0	-	-	-	-	-	3.70
20600 (844.0)	1688.0	-	-	-	-	-	-0.98
	2532.0	-53.40	8.58	-57.32	1.65	H	-50.39
	3376.0	-	-	-	-	-	-

- NOTES:**
1. Radiated Spurious Emission Measurements at 1 meter and 3 meter 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.

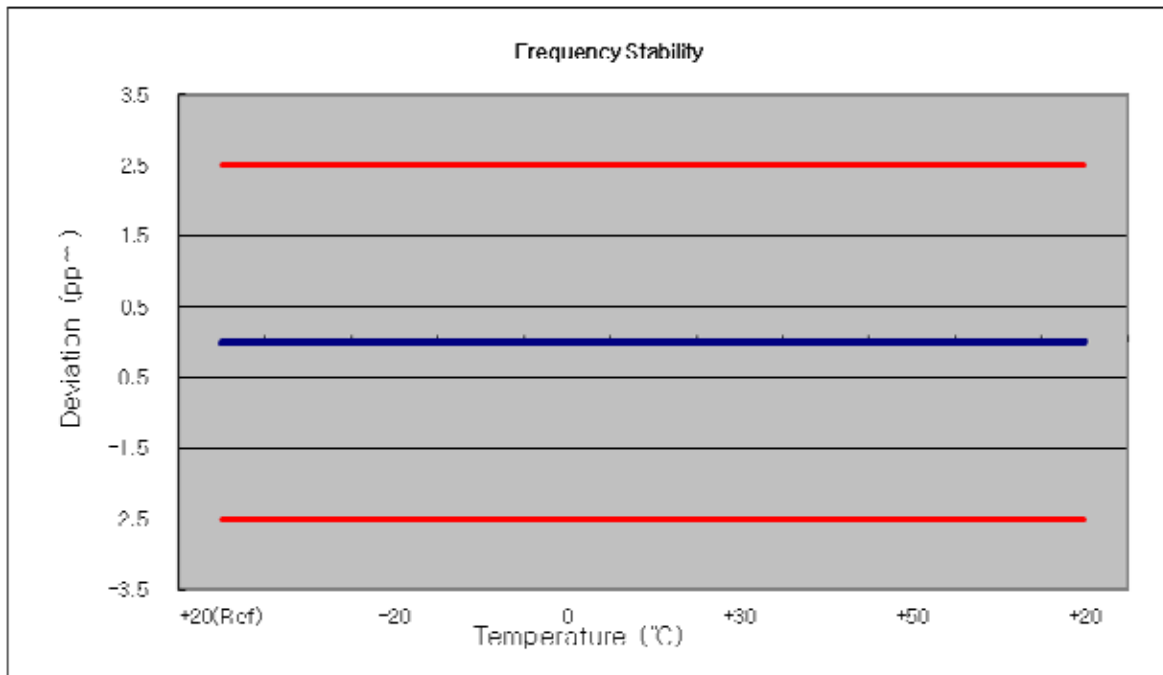
FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	FCC ID: ZNF821

7.3 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.3.1 FREQUENCY STABILITY (LTE Band 5_1.4M)

OPERATING FREQUENCY: 836.500.000 Hz
 CHANNEL: 20525 (1.4 MHz)
 REFERENCE VOLTAGE: 3.8 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

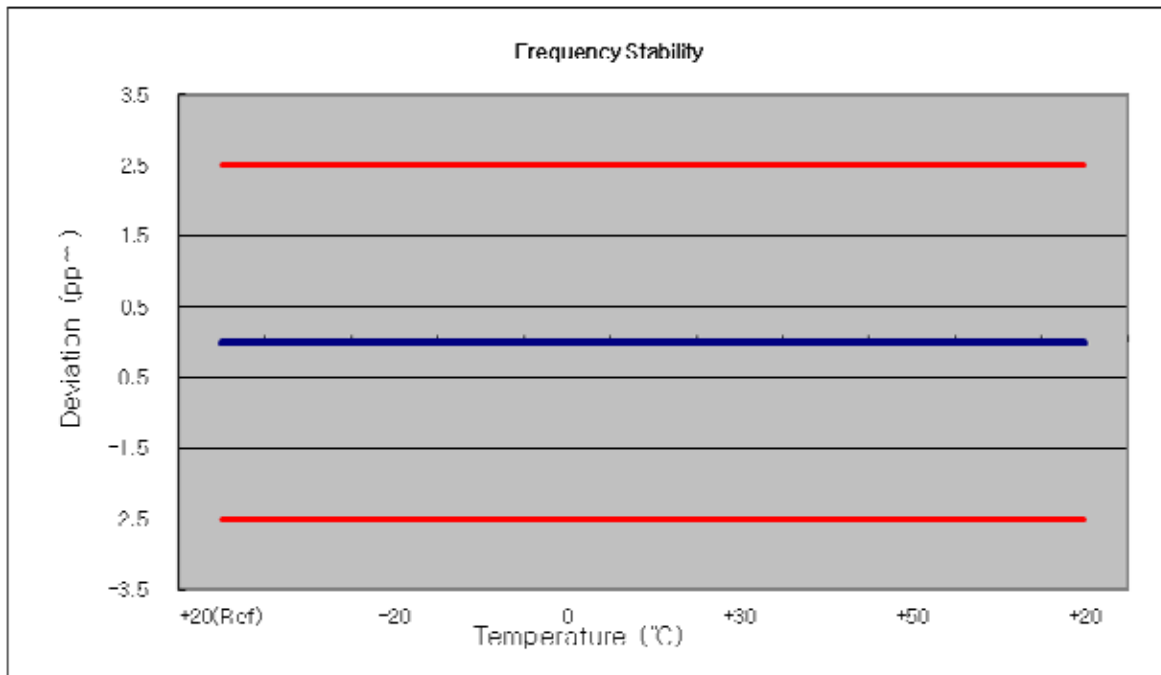
Voltage (%)	Power (VDC)	Temp. ()	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.800	+20(Ref)	836 499 998	0.0	0.000 000	0.000
100%		-30	836 500 001	3.0	0.000 000	0.004
100%		-20	836 500 001	2.5	0.000 000	0.003
100%		-10	836 499 998	0.2	0.000 000	0.000
100%		0	836 499 996	-2.5	0.000 000	-0.003
100%		+10	836 500 004	5.3	0.000 001	0.006
100%		+30	836 499 995	-2.8	0.000 000	-0.003
100%		+40	836 499 998	0.1	0.000 000	0.000
100%		+50	836 499 997	-1.1	0.000 000	-0.001
115%		4.370	+20	836 499 994	-4.3	-0.000 001
Batt. Endpoint	3.500	+20	836 500 002	4.2	0.000 001	0.005



7.3.2 FREQUENCY STABILITY (LTE Band 5_3M)

OPERATING FREQUENCY: 836.500.000 Hz
 CHANNEL: 20525 (3 MHz)
 REFERENCE VOLTAGE: 3.8 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. ()	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.800	+20(Ref)	836 499 999	0.0	0.000 000	0.000
100%		-30	836 500 003	3.6	0.000 000	0.004
100%		-20	836 500 003	3.8	0.000 000	0.005
100%		-10	836 500 004	5.1	0.000 001	0.006
100%		0	836 499 997	-2.2	0.000 000	-0.003
100%		+10	836 499 998	-1.0	0.000 000	-0.001
100%		+30	836 500 000	1.0	0.000 000	0.001
100%		+40	836 500 000	0.7	0.000 000	0.001
100%		+50	836 500 004	4.9	0.000 001	0.006
115%	4.370	+20	836 499 995	-4.2	-0.000 001	-0.005
Batt. Endpoint	3.500	+20	836 499 998	-0.8	0.000 000	-0.001



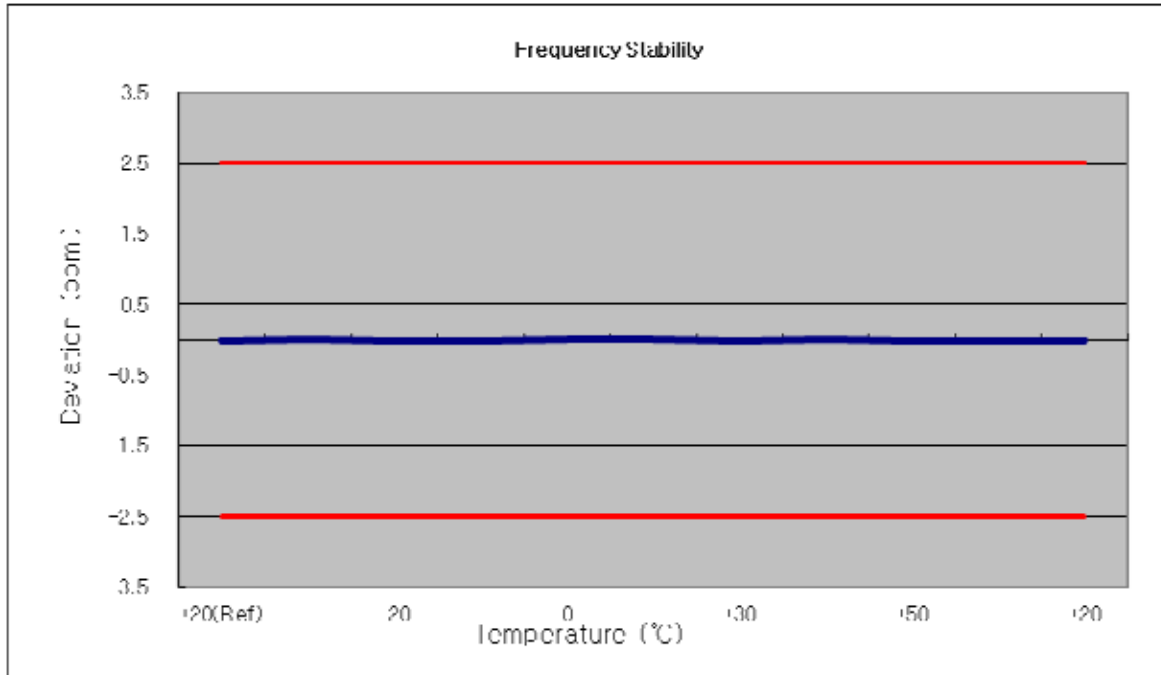
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNF0821
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7.3.3 FREQUENCY STABILITY (LTE Band 5_5M)

OPERATING FREQUENCY: 836.500.000 Hz
 CHANNEL: 20525 (5 MHz)
 REFERENCE VOLTAGE: 3.8 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. ()	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.800	+20(Ref)	836 500 005	0.0	0.000 000	0.000
100%		-30	836 500 008	2.9	0.000 000	0.003
100%		-20	836 500 002	-2.9	0.000 000	-0.003
100%		-10	836 499 996	-8.2	-0.000 001	-0.010
100%		0	836 500 005	0.3	0.000 000	0.000
100%		+10	836 500 006	0.9	0.000 000	0.001
100%		+30	836 500 001	-3.7	0.000 000	-0.004
100%		+40	836 500 008	3.4	0.000 000	0.004
100%		+50	836 500 002	-2.4	0.000 000	-0.003
115%	4.370	+20	836 500 004	-0.8	0.000 000	-0.001
Batt. Endpoint	3.500	+20	836 500 002	-2.2	0.000 000	-0.003



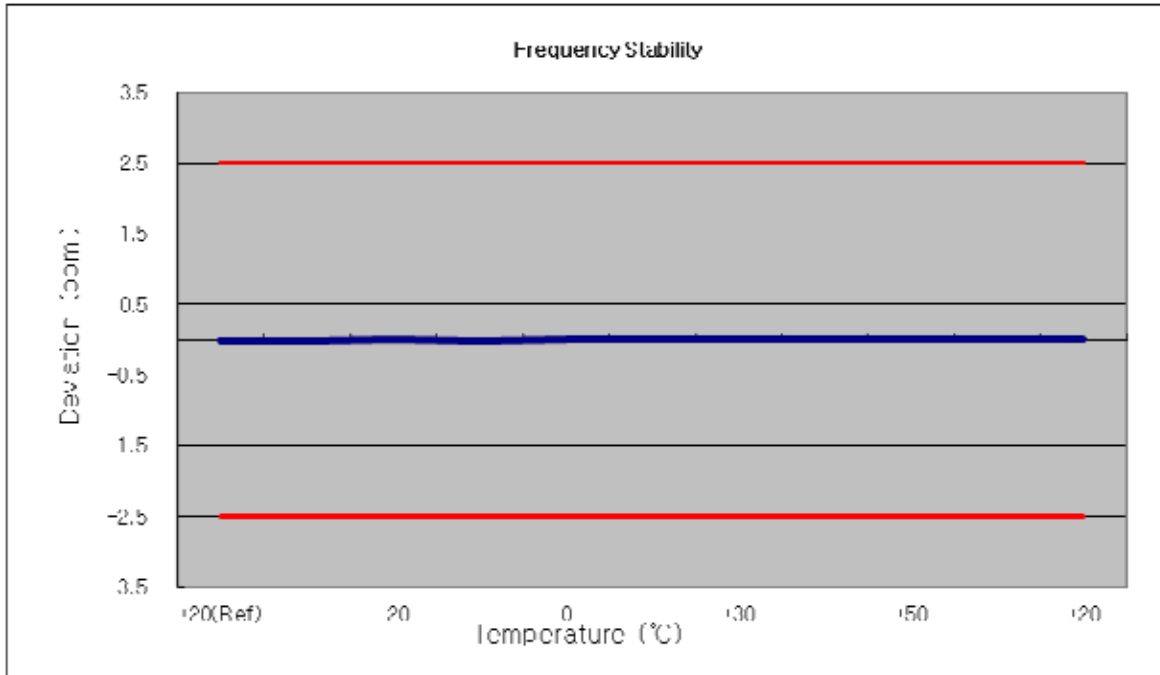
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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7.3.4 FREQUENCY STABILITY (LTE Band 5_10M)

OPERATING FREQUENCY: 836.500.000 Hz
 CHANNEL: 20525 (10 MHz)
 REFERENCE VOLTAGE: 3.8 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. ()	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.800	+20(Ref)	836 499 999	0	0.000 000	0.000
100%		-30	836 499 993	-5.2	-0.000 001	-0.006
100%		-20	836 499 999	0.4	0.000 000	0.000
100%		-10	836 499 998	-0.1	0.000 000	0.000
100%		0	836 499 999	0.2	0.000 000	0.000
100%		+10	836 500 001	2.0	0.000 000	0.002
100%		+30	836 500 002	3.5	0.000 000	0.004
100%		+40	836 500 000	1.0	0.000 000	0.001
100%		+50	836 500 001	2.9	0.000 000	0.003
115%	4.370	+20	836 500 003	4.0	0.000 000	0.005
Batt. Endpoint	3.500	+20	836 500 002	3.3	0.000 000	0.004



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNF821
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7.4 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Band 5	1.4 MHz	836.5	QPSK	6	0	5.67
			16-QAM	6	0	6.82
	3 MHz	836.5	QPSK	15	0	5.78
			16-QAM	15	0	6.88
	5 MHz	836.5	QPSK	25	0	5.78
			16-QAM	25	0	6.65
	10 MHz	836.5	QPSK	50	0	6.02
			16-QAM	50	0	6.84

- Plots of the EUT's Peak- to- Average Ratio are shown Page 37 ~ 40

7.5 OCCUPIED BANDWIDTH

Band	Band Width (MHz)	Frequency (Mhz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 5	1.4 MHz	836.5	QPSK	6	0	1.08538
			16-QAM	6	0	1.08538
	3 MHz	836.5	QPSK	15	0	2.68452
			16-QAM	15	0	2.69175
	5 MHz	836.5	QPSK	25	0	4.48625
			16-QAM	25	0	4.48625
	10 MHz	836.5	QPSK	50	0	8.94356
			16-QAM	50	0	8.94356

- Plots of the EUT's Occupied Bandwidth are shown Page 33 ~ 36

7.6 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 5	1.4	824.7	QPSK	1	0	6.999750	-24.98
		836.5		1	0	6.967750	-24.58
		848.3		1	0	5.600750	-25.68
	3	825.5		1	0	6.993750	-25.03
		836.5		1	0	6.967750	-25.56
		847.5		1	0	6.969750	-25.55
	5	826.5		1	0	6.986250	-24.95
		836.5		1	0	5.798250	-25.69
		846.5		1	0	6.952750	-25.95
	10	829.0		1	0	6.719750	-25.41
		836.5		1	0	6.991250	-26.02
		844.0		1	0	6.971750	-25.05

- Plots of the EUT's Conducted Spurious Emissions are shown Page 45 ~ 56

7.6.1 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 41 ~ 44



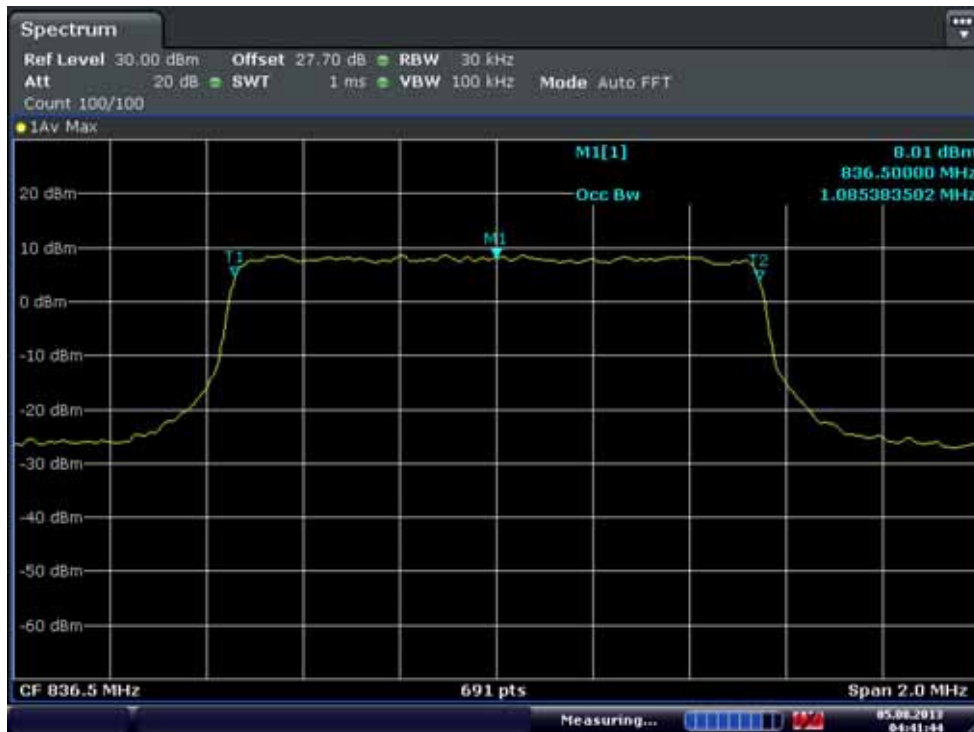
8. TEST PLOTS

FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	FCC ID: ZNFD821

Occupied Bandwidth Plot (20525 ch_1.4 MHz_QPSK_RB Size 6)



Occupied Bandwidth Plot (20525 ch_1.4 MHz_16-QAM_RB 6)



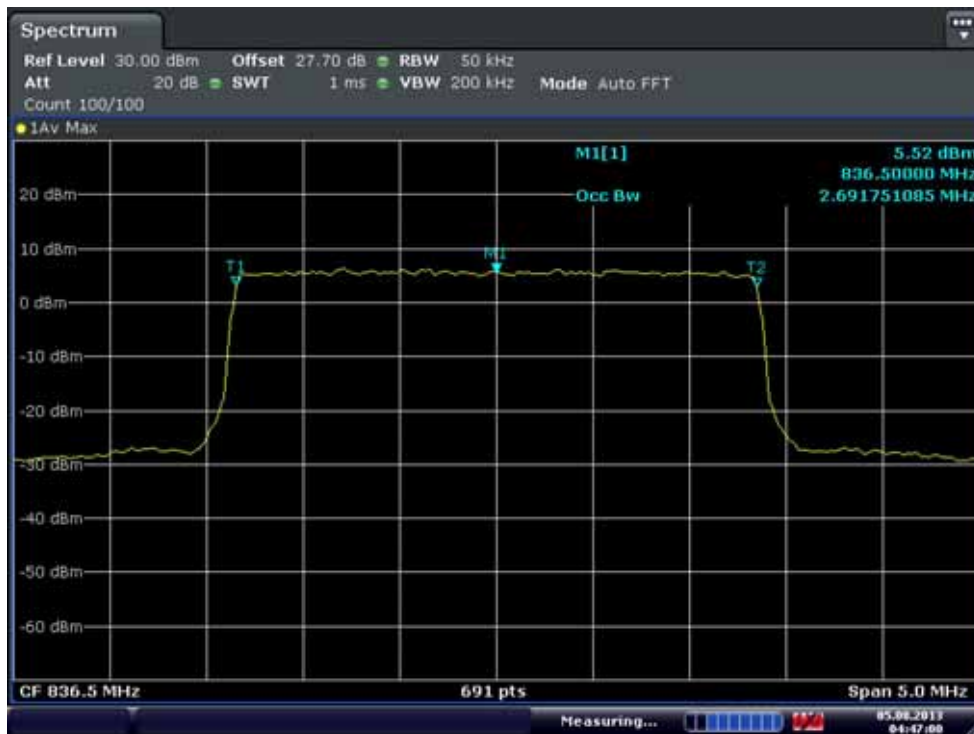
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Occupied Bandwidth Plot (20525 ch_3 MHz_QPSK_RB 15)



Occupied Bandwidth Plot (20525 ch_3 MHz_16-QAM_RB 15)



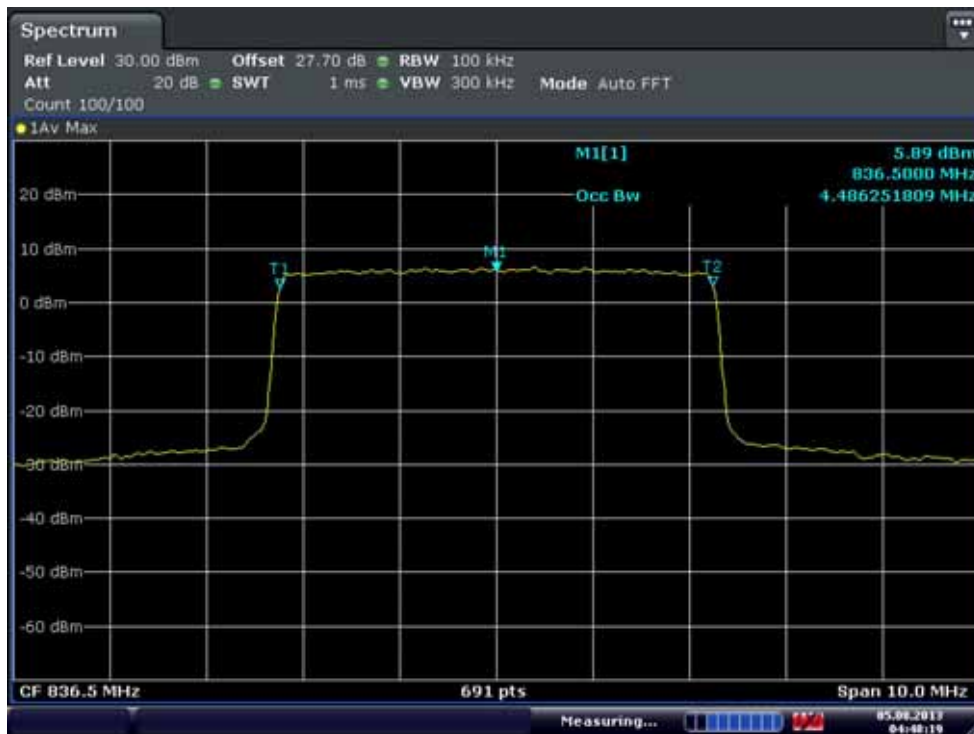
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNF821
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Occupied Bandwidth Plot (20525 ch_5 MHz_QPSK_RB Size 25)



Occupied Bandwidth Plot (20525 ch_5 MHz_16-QAM_RB 25)



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNF821
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Occupied Bandwidth Plot (20525 ch_10 MHz_QPSK_RB 50)



Occupied Bandwidth Plot (20525 ch_10 MHz_16-Q`AM_RB 50)



FCC CERTIFICATION REPORT

FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	FCC ID: ZNF0821

PAR Plot (20525 ch_1.4 MHz_QPSK_RB 15)



PAR Plot (20525 ch_1.4 MHz_16-QAM_RB 15)



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNF0821
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PAR Plot (20525 ch_3 MHz_QPSK_RB 15)



PAR Plot (20525 ch_3 MHz_16-QAM_RB 15)



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNF0821
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PAR Plot (20525 ch_5 MHz_QPSK_RB 25)



PAR Plot (20525 ch_5 MHz_16-QAM_RB 25)



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNF0821
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PAR Plot (20525 ch_10 MHz_QPSK_RB 50)



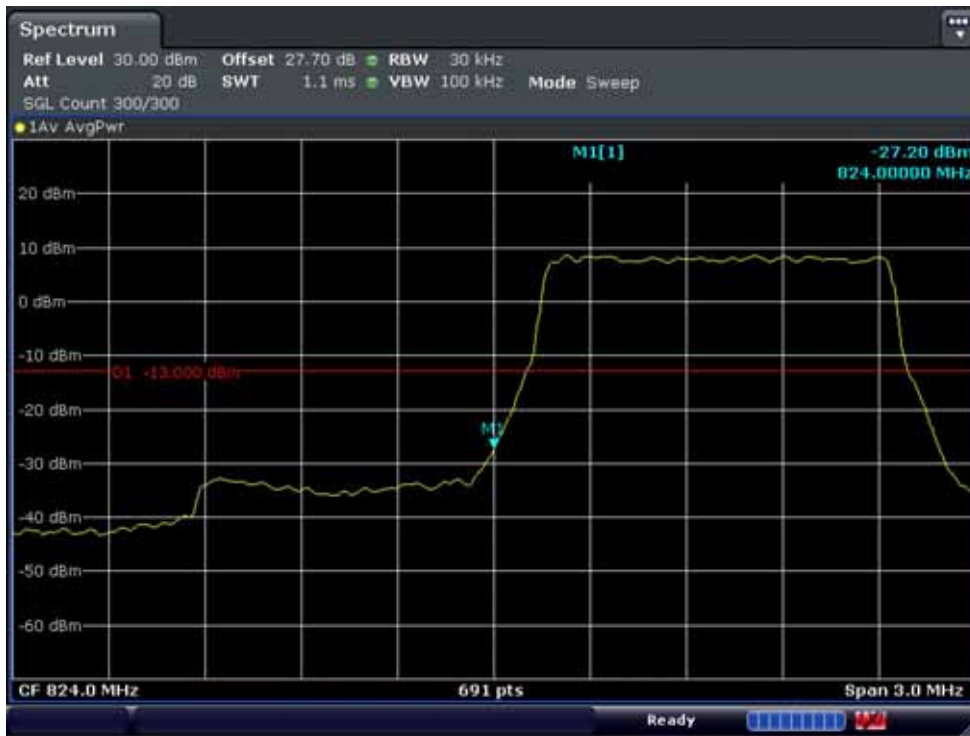
PAR Plot (20525 ch_10 MHz_16-QAM_RB 50)



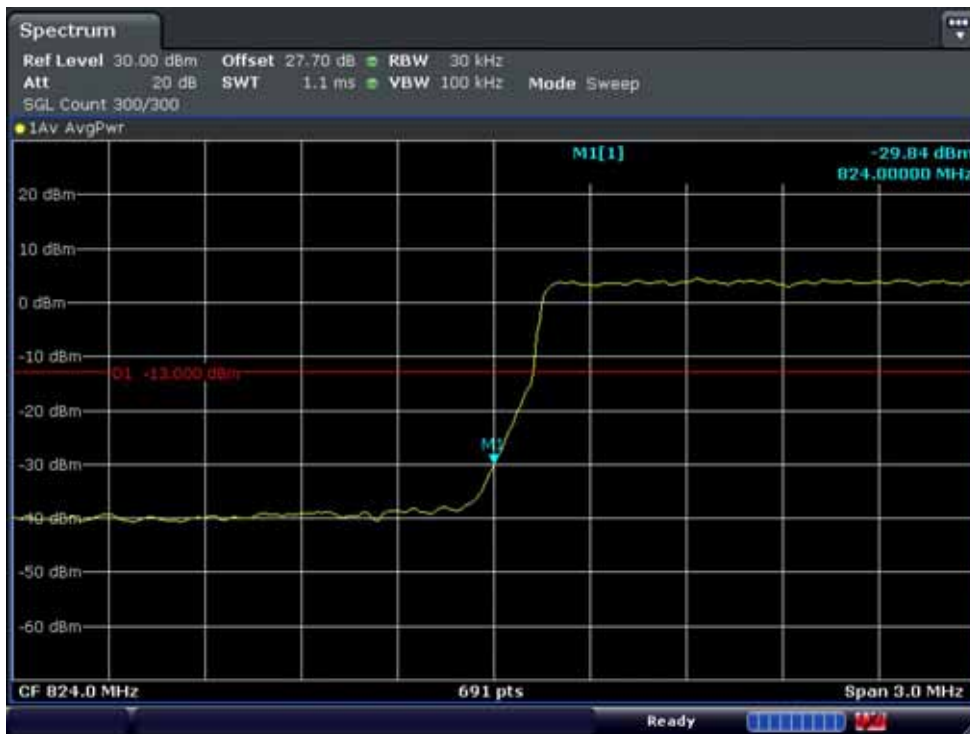
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNF0821
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Low Band Edge Plot (20407 ch_1.4 MHz_QPSK_RB 6_0)



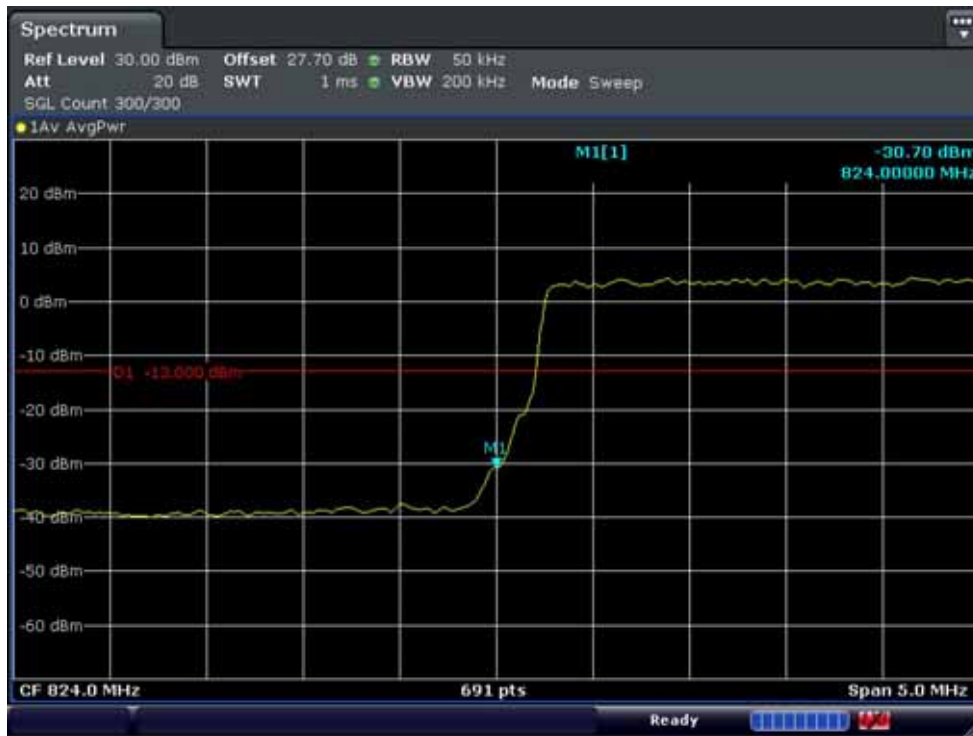
Low Band Edge Plot (20415 ch_3 MHz_QPSK_RB 15_0)



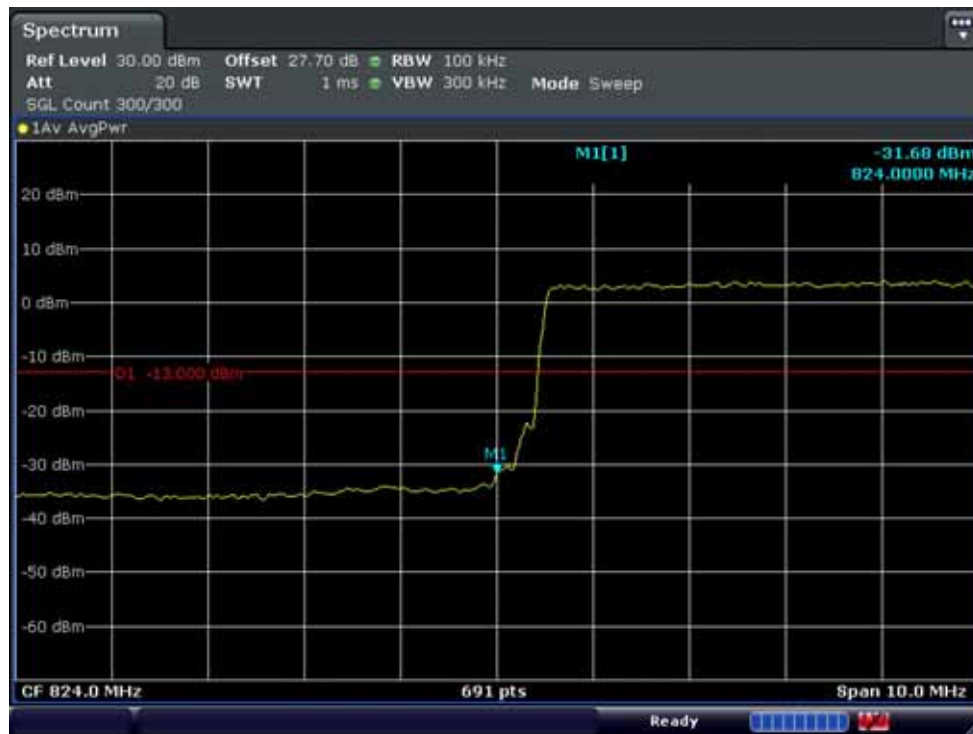
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Low Band Edge Plot (20425 ch_5 MHz_QPSK_RB 25_0)



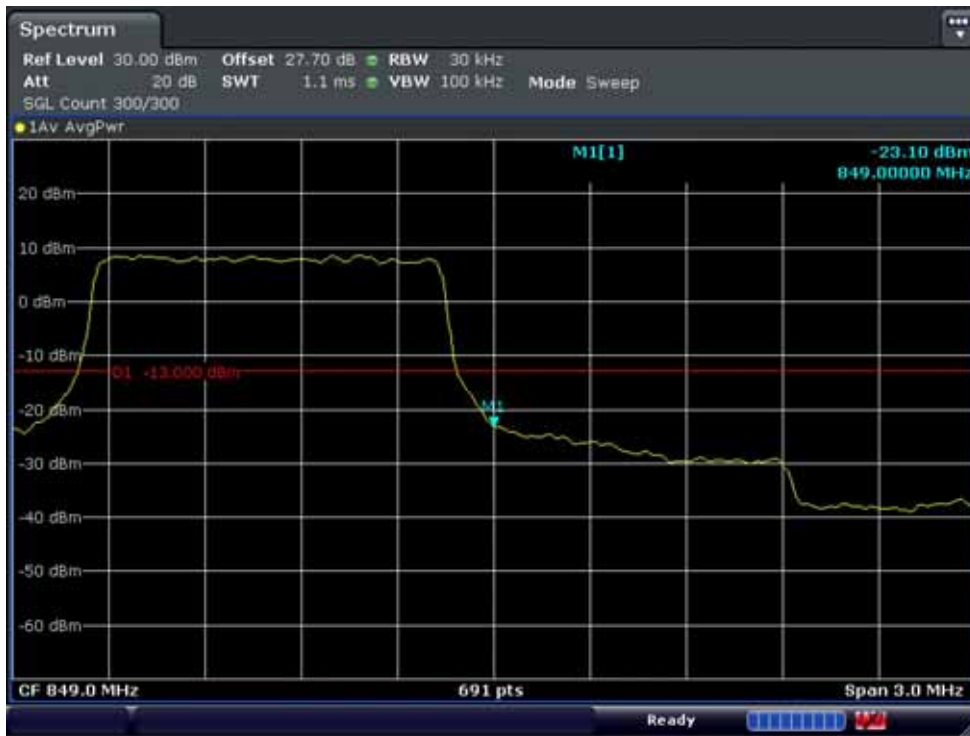
Low Band Edge Plot (20450 ch_10 MHz_QPSK_RB 50_0)



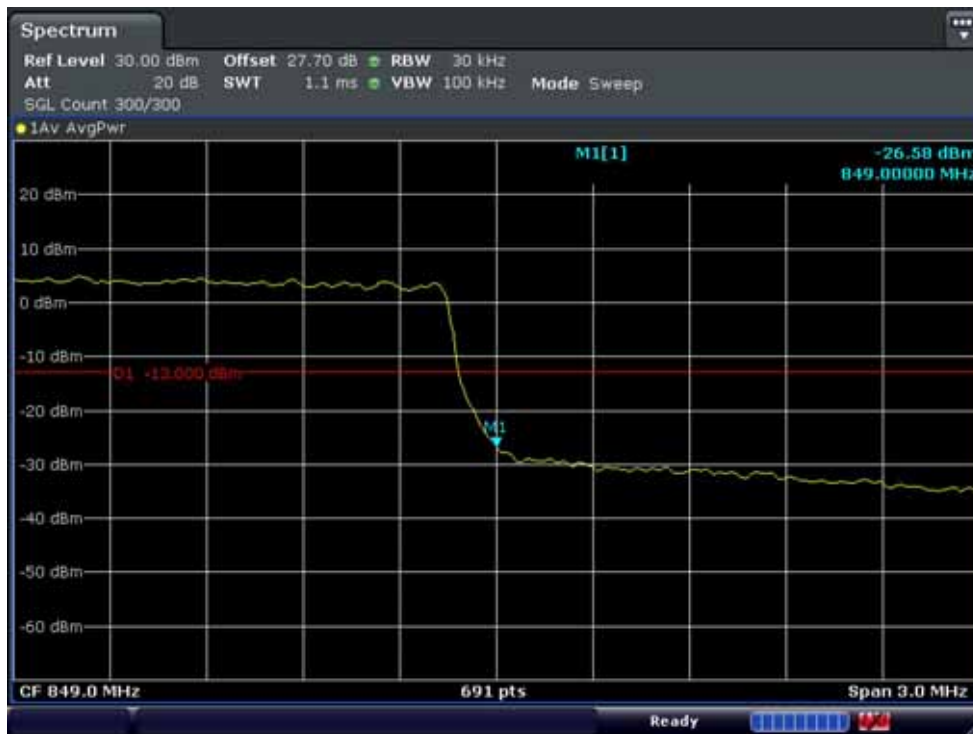
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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High Band Edge Plot (20643 ch_1.4 MHz_QPSK_RB 6_0)



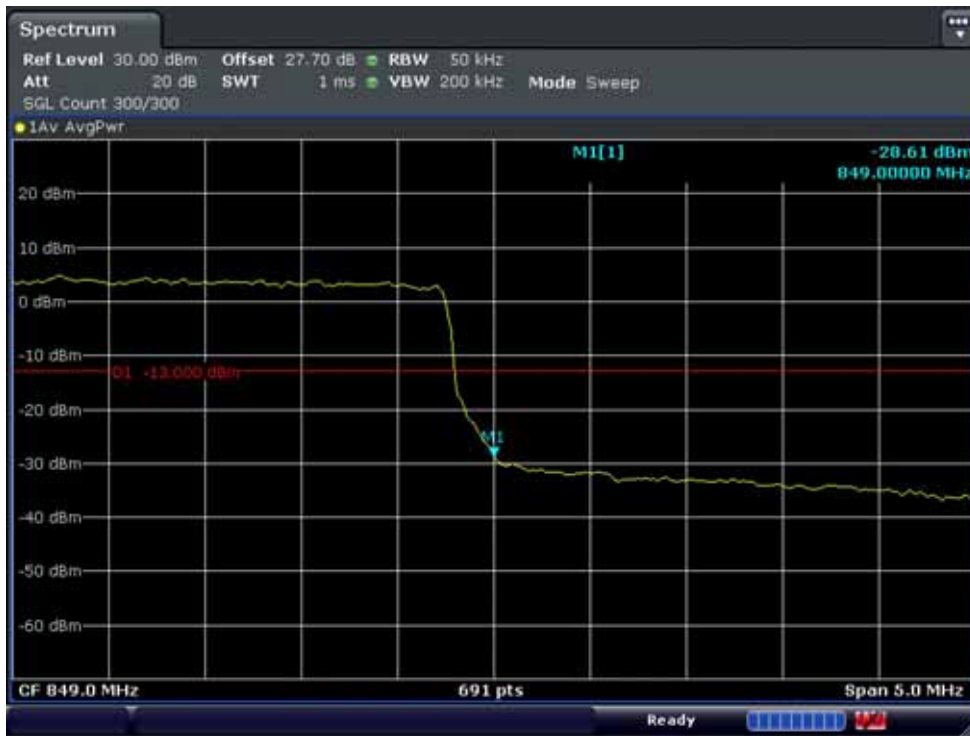
High Band Edge Plot (20635 ch_3 MHz_QPSK_RB 15_0)



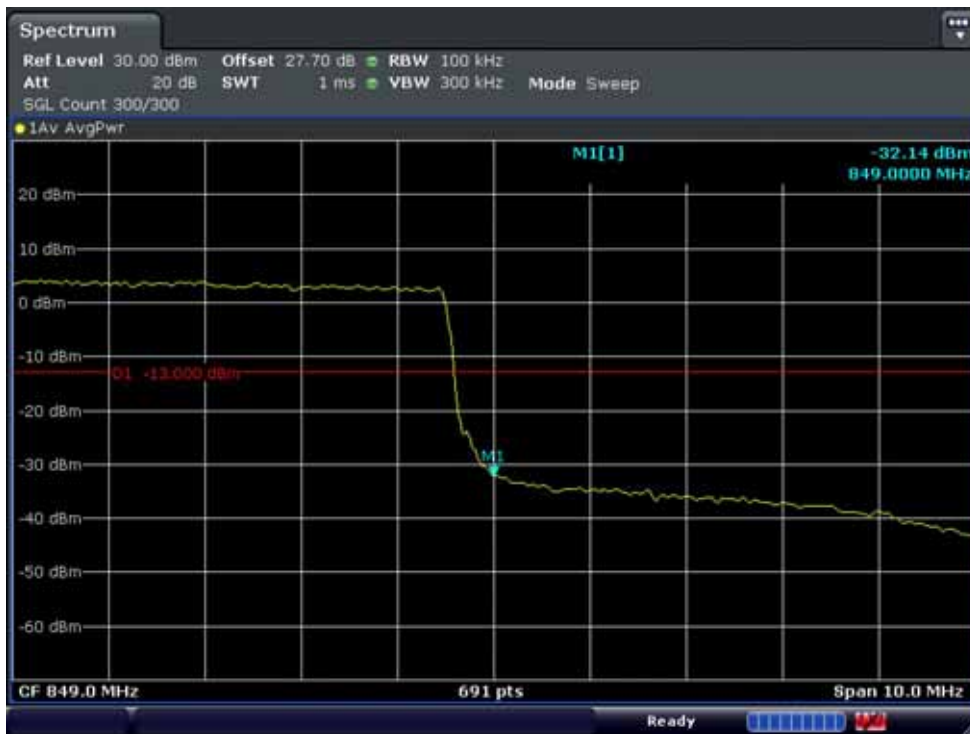
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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High Band Edge Plot (20625 ch_5 MHz_QPSK_RB 25_0)



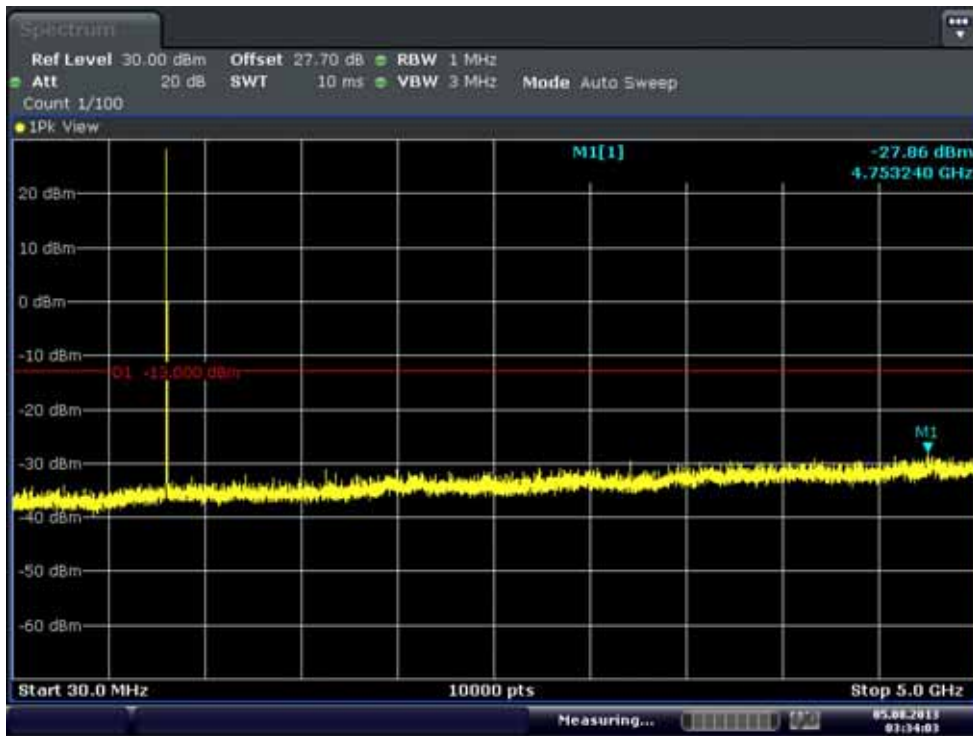
High Band Edge Plot (20450 ch_10 MHz_QPSK_RB 50_0)



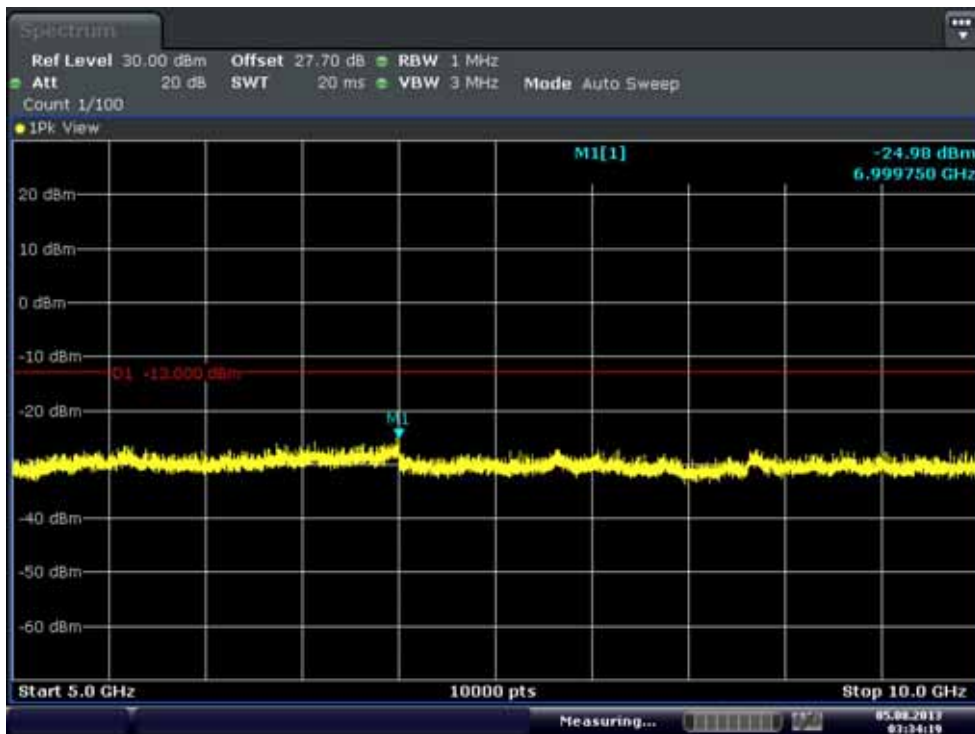
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20407 ch_1.4 MHz_QPSK_RB 6_0) -1



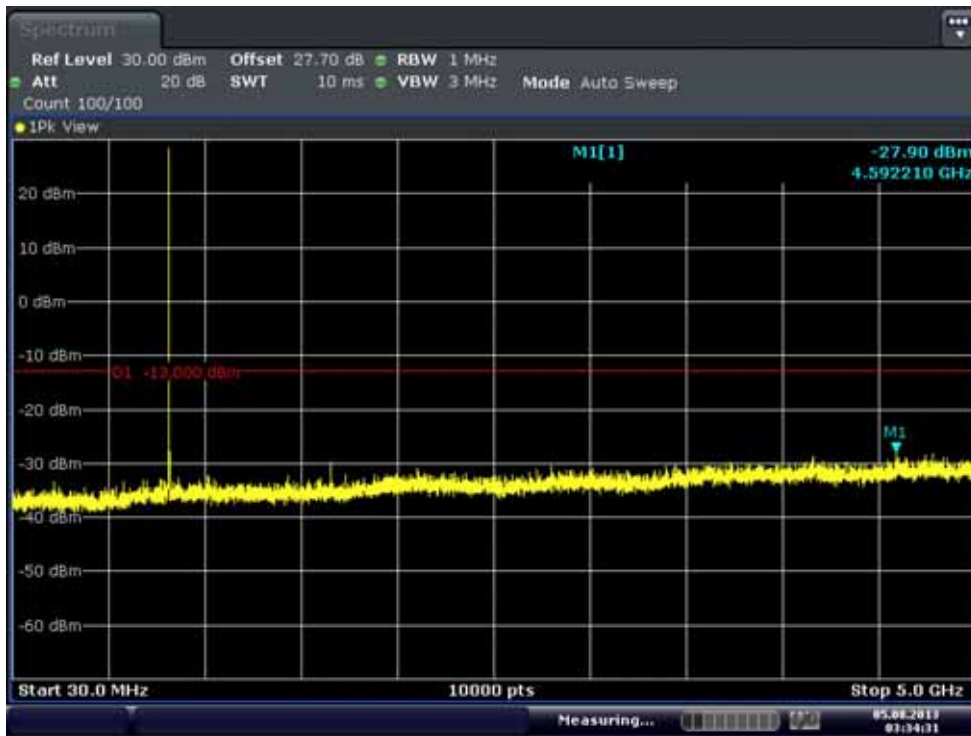
Conducted Spurious Plot_2 (20407 ch_1.4 MHz_QPSK_RB 6_0) -2



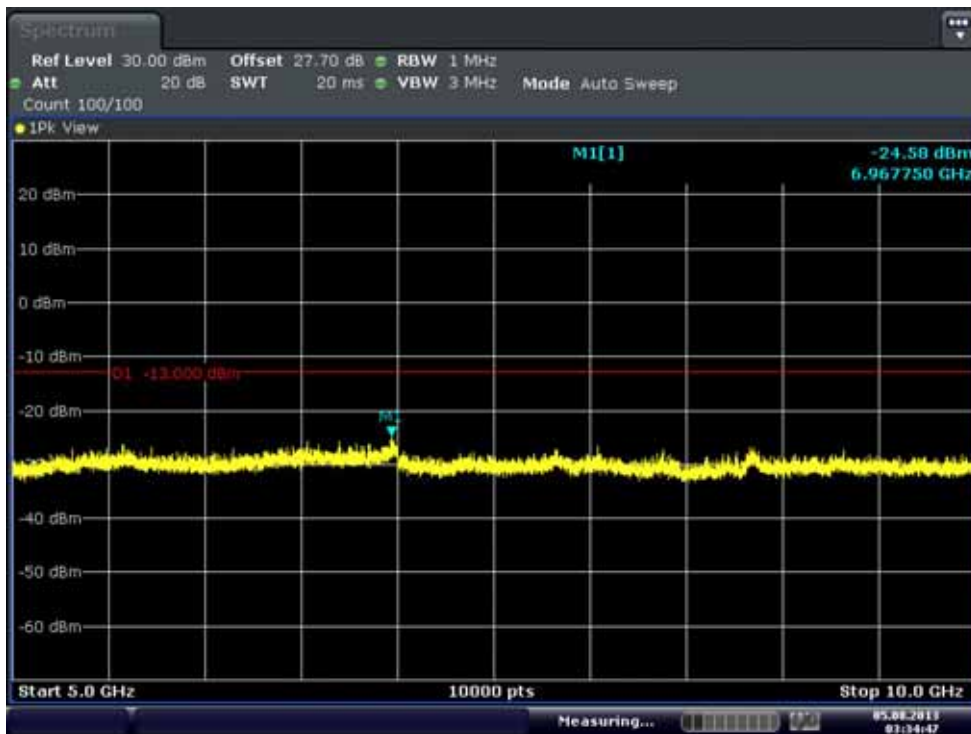
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20525 ch_1.4 MHz_QPSK_RB 6_0) -1



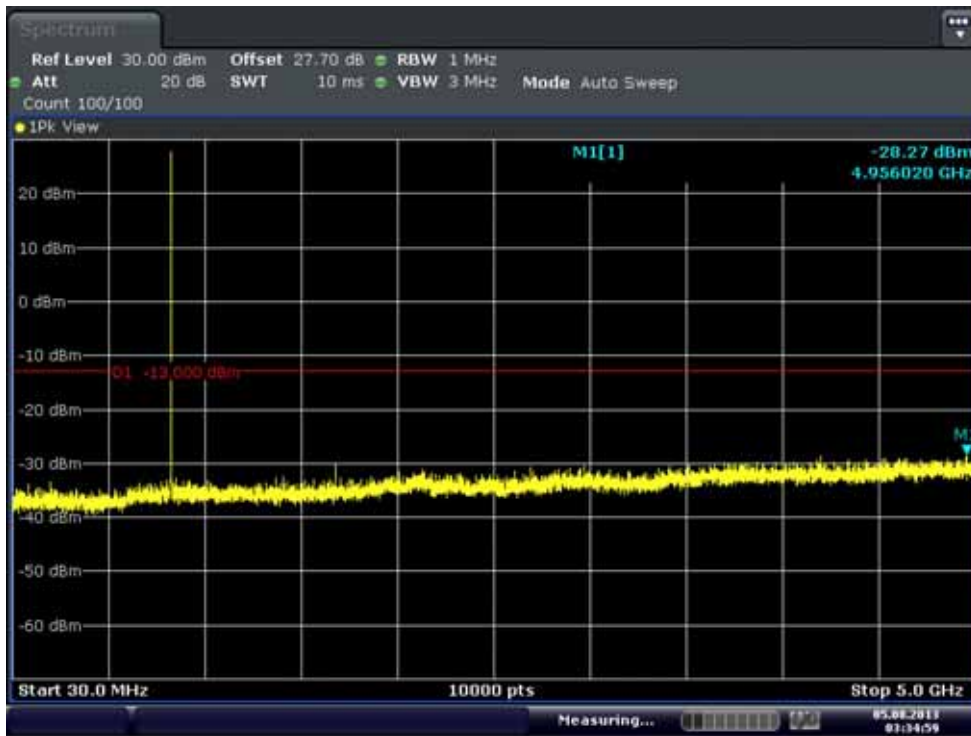
Conducted Spurious Plot_2 (20525 ch_1.4 MHz_QPSK_RB 6_0) -2



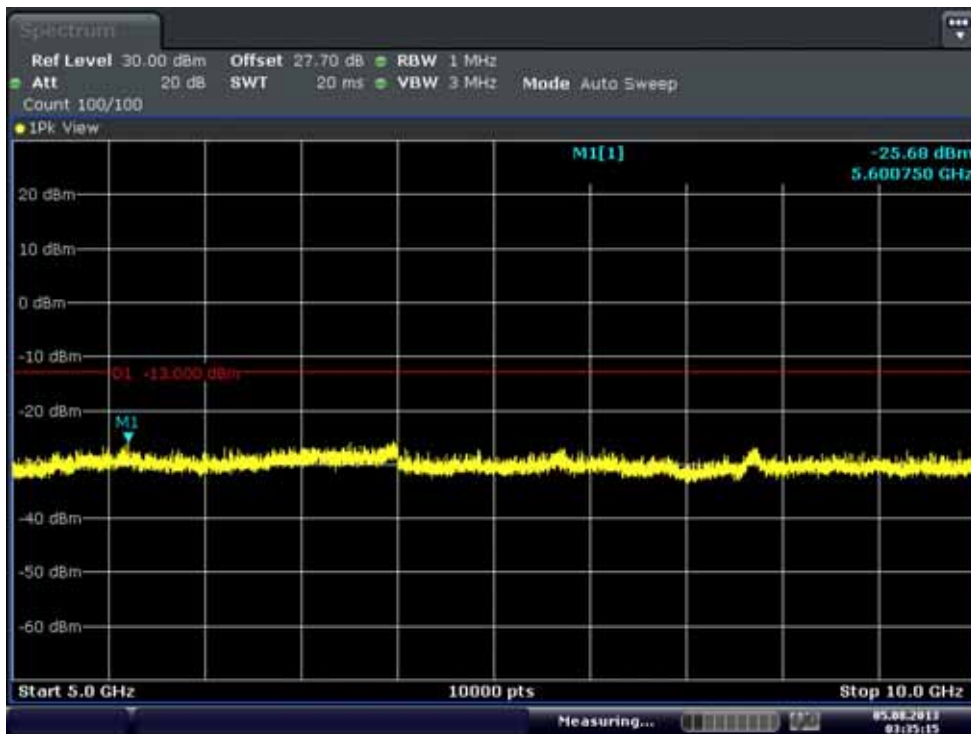
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20643 ch_1.4 MHz_QPSK_RB 6_0) -1



Conducted Spurious Plot_2 (20643 ch_1.4 MHz_QPSK_RB 6_0) -2



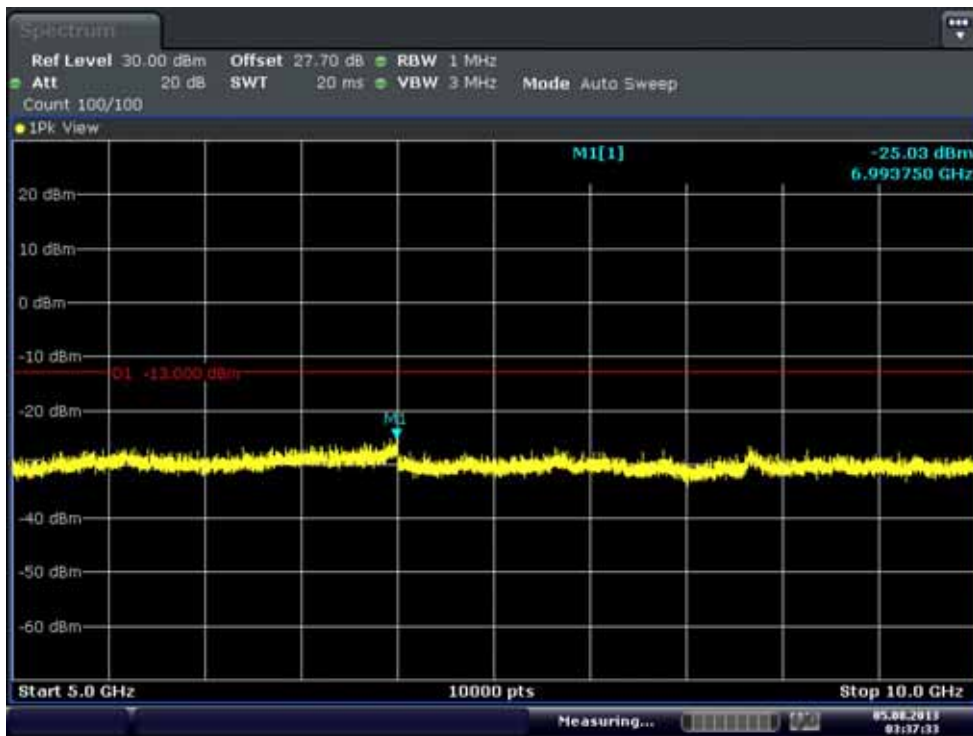
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20415 ch_3 MHz_QPSK_RB 15_0) -1



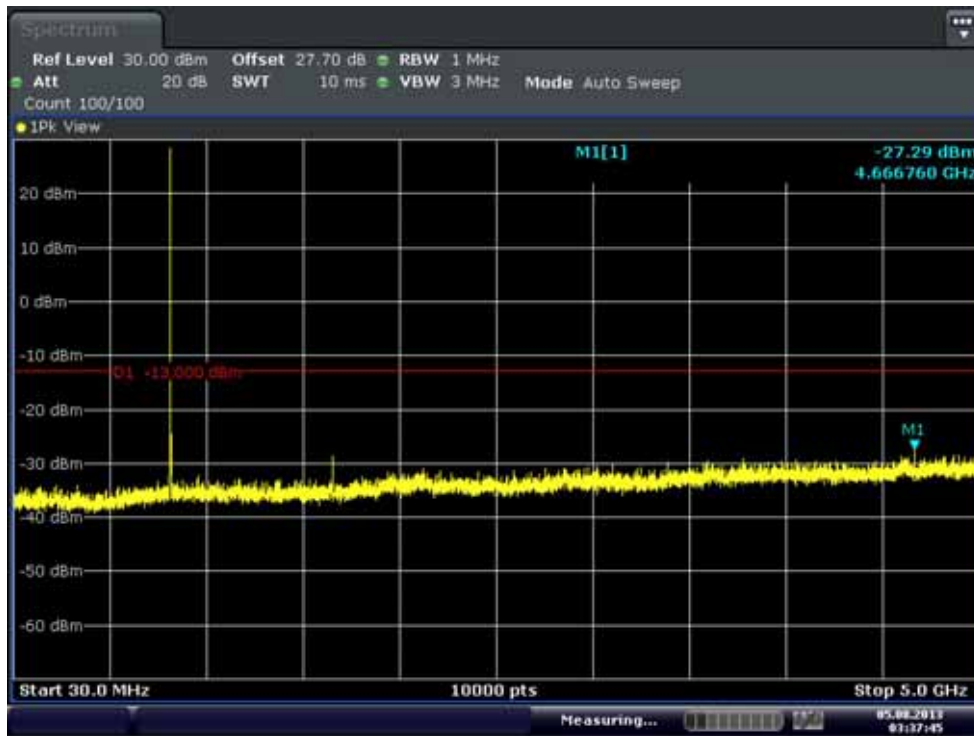
Conducted Spurious Plot_2 (20415 ch_3 MHz_QPSK_RB 15_0) -2



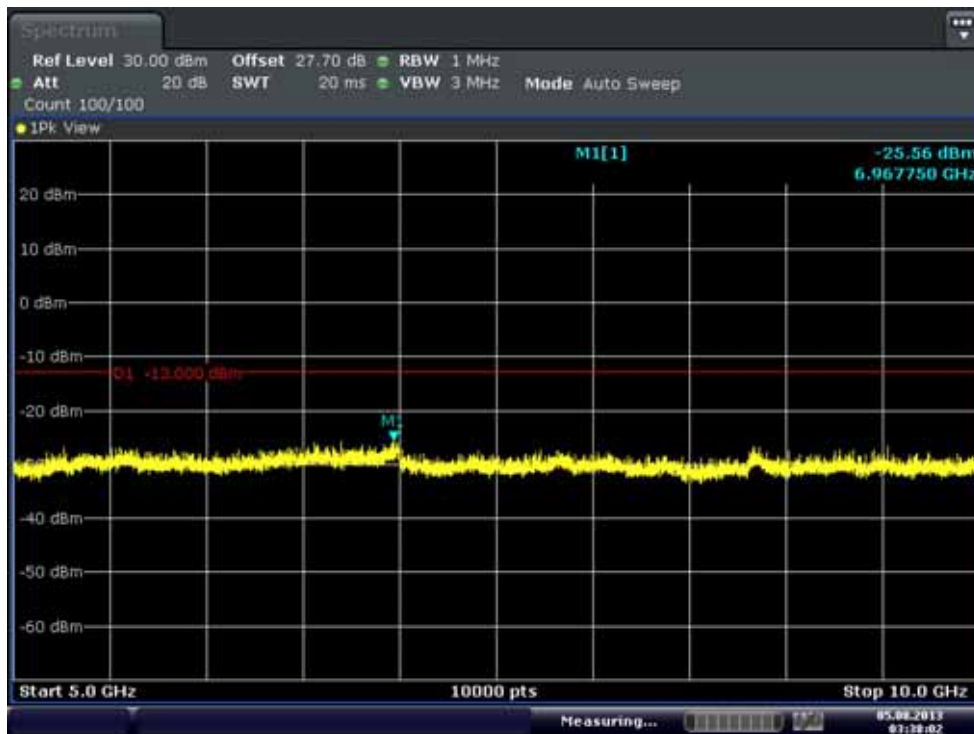
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20525 ch_3 MHz_QPSK_RB 15_0) -1



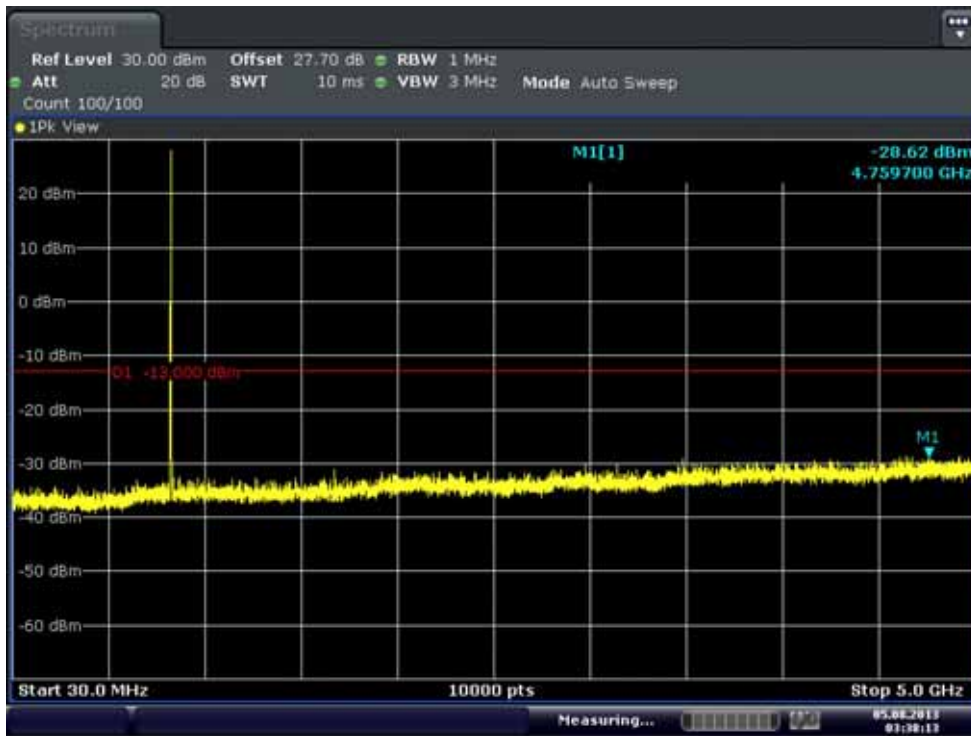
Conducted Spurious Plot_2 (20525 ch_3 MHz_QPSK_RB 15_0) -2



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20635 ch_3 MHz_QPSK_RB 15_0) -1



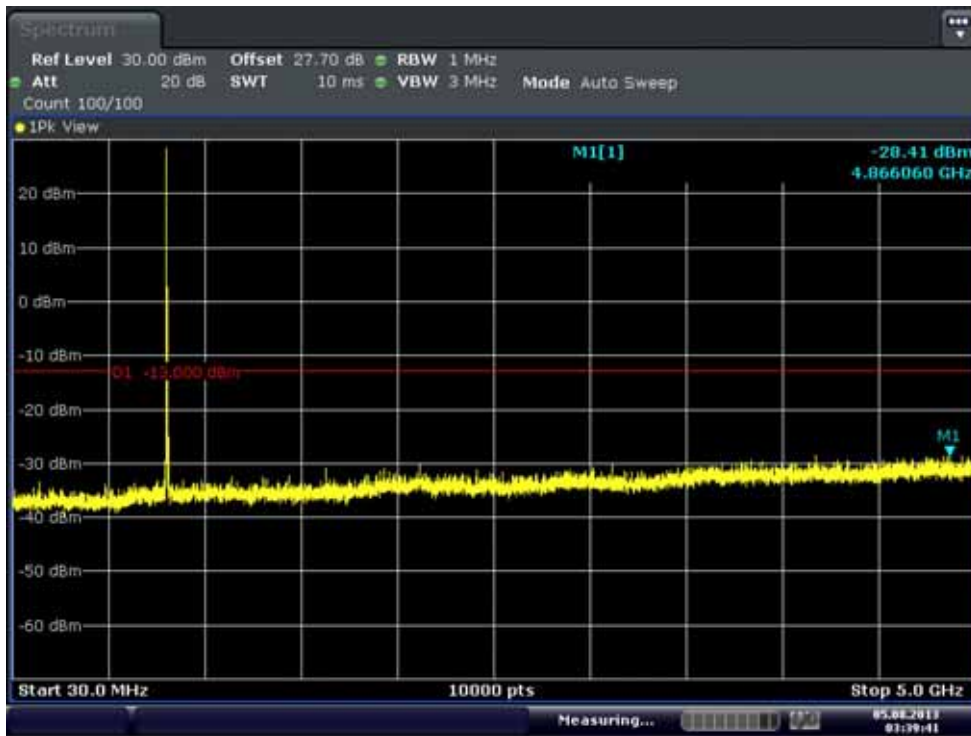
Conducted Spurious Plot_2 (20635 ch_3 MHz_QPSK_RB 15_0) -2



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20425 ch_5 MHz_QPSK_RB 25_0) -1



Conducted Spurious Plot_2 (20425 ch_5 MHz_QPSK_RB 25_0) -2



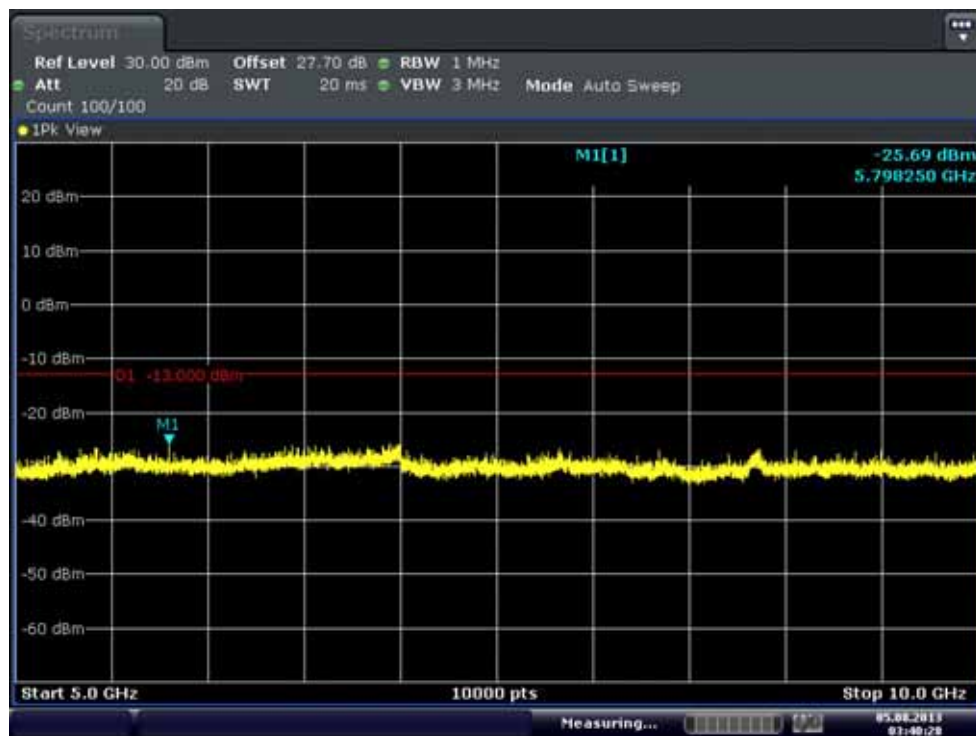
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20525 ch_5 MHz_QPSK_RB 25_0) -1



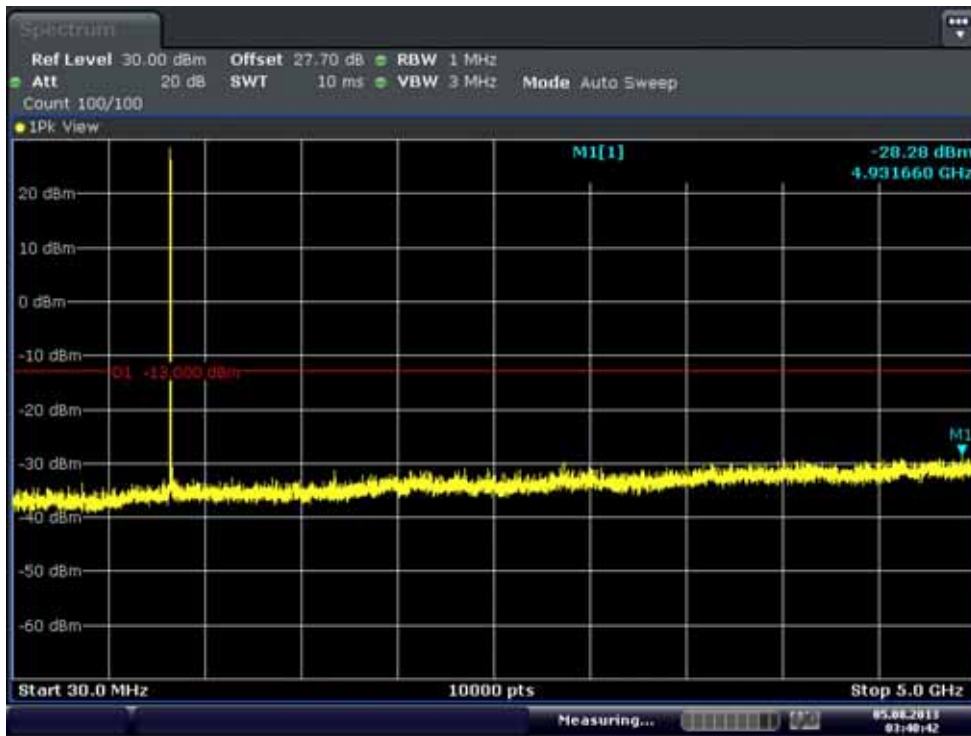
Conducted Spurious Plot_2 (20525 ch_5 MHz_QPSK_RB 25_0) -2



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20625 ch_5 MHz_QPSK_RB 25_0) -1



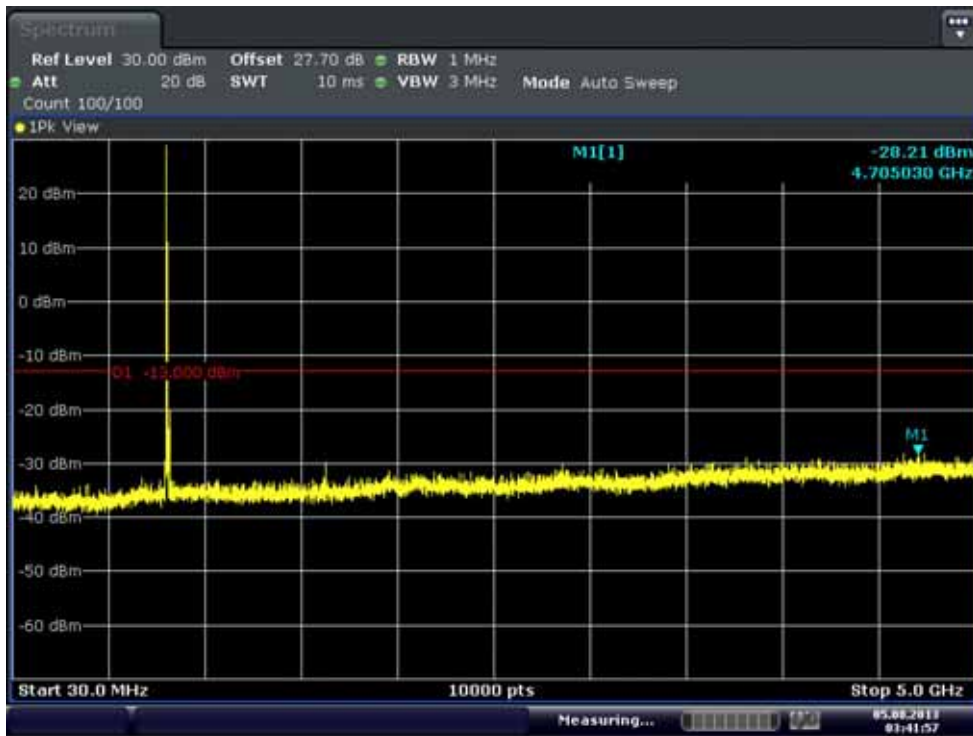
Conducted Spurious Plot_2 (20625 ch_5 MHz_QPSK_RB 25_0) -2



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20450 ch_10 MHz_QPSK_RB 50_0) -1



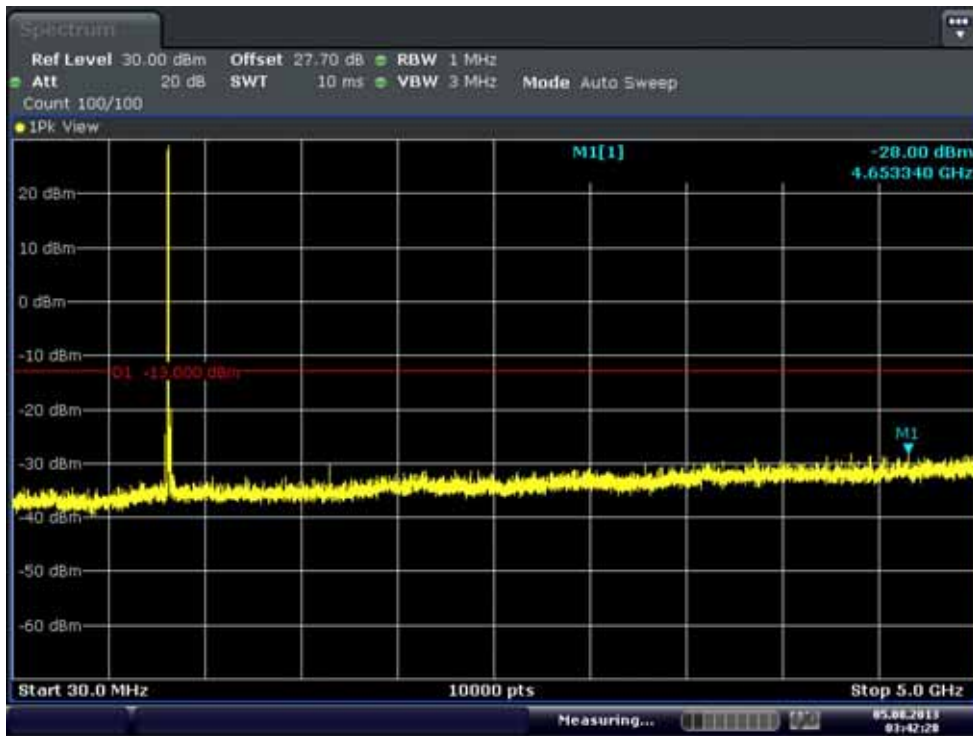
Conducted Spurious Plot_2 (20450 ch_10 MHz_QPSK_RB 50_0) -2



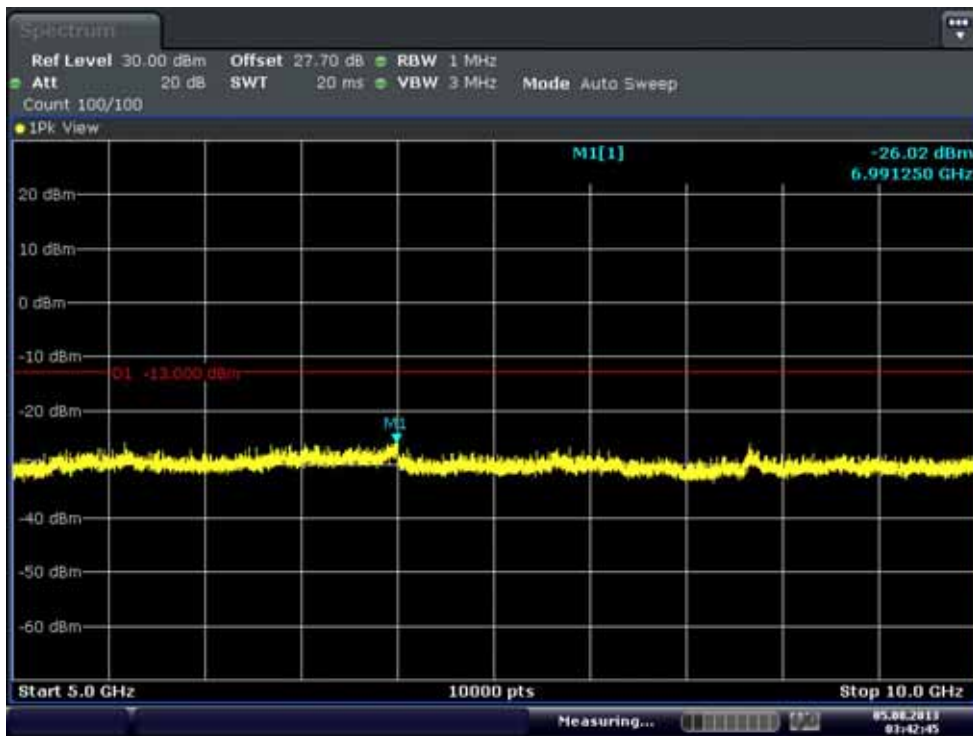
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20525 ch_10 MHz_QPSK_RB 50_0) -1



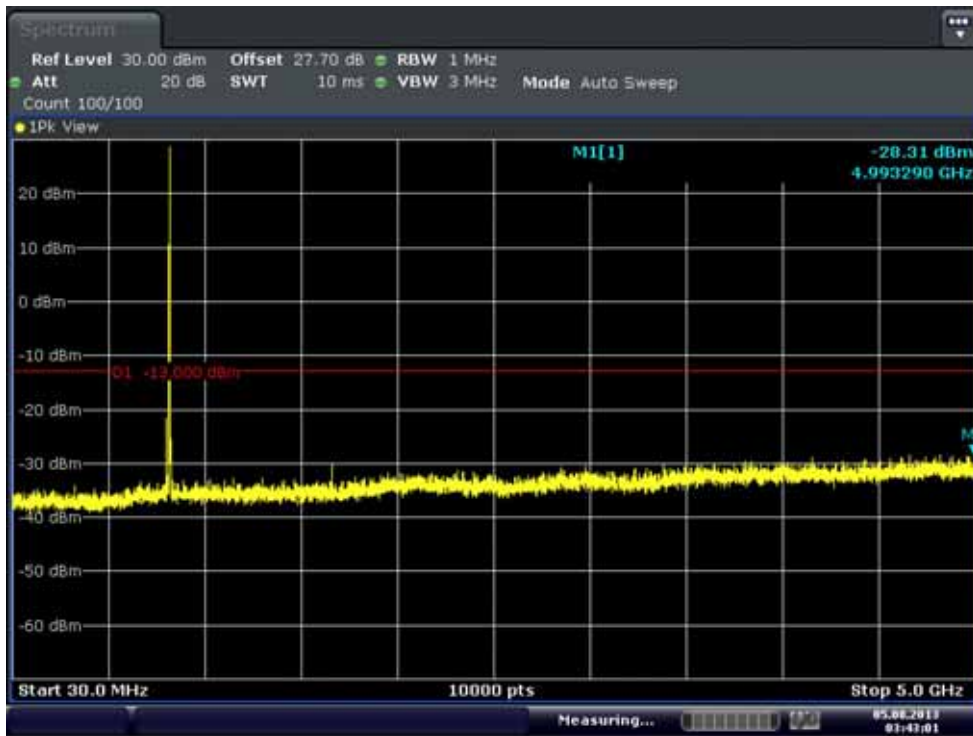
Conducted Spurious Plot_2 (20525 ch_10 MHz_QPSK_RB 50_0) -2



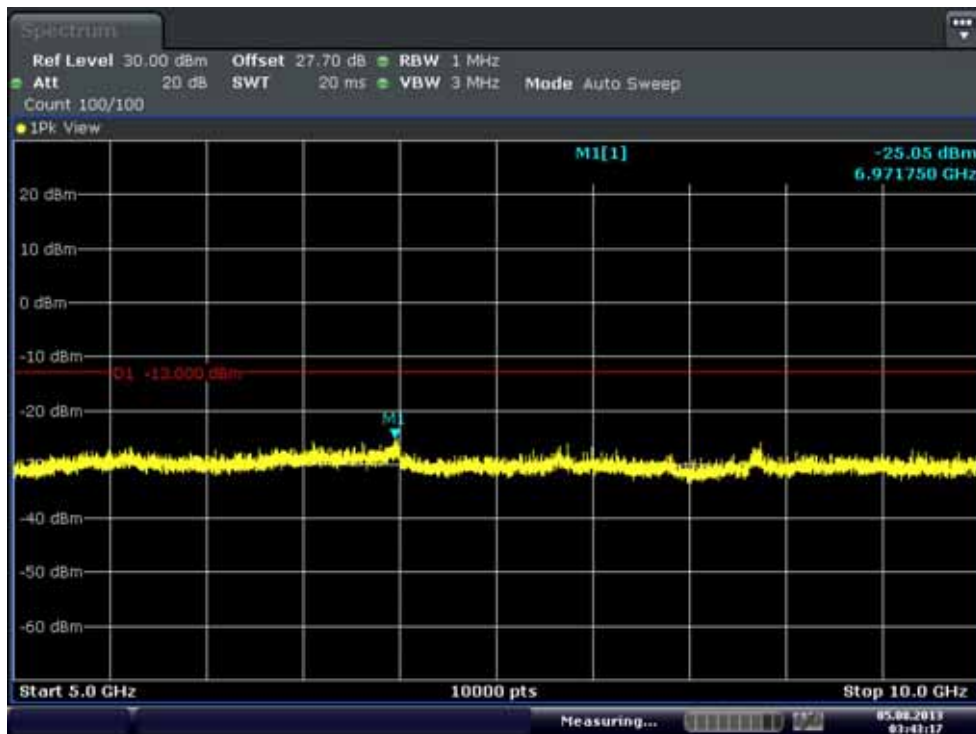
FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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Conducted Spurious Plot_1 (20600 ch_10 MHz_QPSK_RB 50_0) -1



Conducted Spurious Plot_2 (20600 ch_10 MHz_QPSK_RB 50_0) -2



FCC CERTIFICATION REPORT

Test Report No. HCTR1308FR36	Date of Issue: September 06, 2013	EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC	www.hct.co.kr FCC ID: ZNFD821
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