

HCT CO., LTD.

CERTIFICATE OF COMPLIANCE FCC Certification

Applicant Name:
LG Electronics Inc.

Address:
19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si,
Gyeonggi-do 451-713, Korea

Date of Issue:
December 27, 2013

Test Site/Location:
HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-
myeon, Icheon-si, Gyeonggi-do, Korea

Report No.: HCTR1312FR05-3

HCT FRN: 0005866421

FCC ID: BEJLTTTC10

APPLICANT: LG Electronics Inc.

FCC Model(s): GEN10NADNA

EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module

FCC Classification: PCS Licensed Transmitter (PCB)

FCC Rule Part(s): §22, §24, §2

Tx Frequency:
1852.5 MHz – 1907.5 MHz (LTE – Band2 (5MHz))
1855.5 MHz – 1905.0 MHz (LTE – Band2 (10MHz))
826.5 MHz – 846.5 MHz (LTE – Band 5 (5MHz))
829.0 MHz – 844.0 MHz (LTE – Band 5 (10MHz))

Max. RF Output Power:	Band 2 (5 MHz) :	0.220 W (QPSK) (23.42 dBm)	
		0.177 W (16-QAM) (22.47 dBm)	
	Band 2 (10 MHz) :	0.219 W (QPSK) (23.40 dBm)	
		0.180 W (16-QAM) (22.55 dBm)	
	Band 5 (5 MHz) :	0.193 W (QPSK) (22.85 dBm)	
		0.157 W (16-QAM) (21.95 dBm)	
	Band 5 (10 MHz) :	0.193 W (QPSK) (22.85 dBm)	
		0.154 W (16-QAM) (21.87 dBm)	
	Emission Designator(s):	Band 2 (5 MHz) :	4M48G7D (QPSK) / 4M49W7D (16-QAM)
		Band 2 (10 MHz) :	8M96G7D (QPSK) / 8M94W7D (16-QAM)
Band 5 (5 MHz) :		4M49G7D (QPSK) / 4M50W7D (16-QAM)	
Band 5 (10 MHz) :		8M99G7D (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
: Jong Seok Lee
Test engineer of RF Team



Approved by
: Chang Seok Choi
Manager of RF Team

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1312FR05	December 05, 2013	-First Approval Report
HCTR1312FR05-1	December 16, 2013	- Revised the following parts : Test period / Test equipment / Conducted power / Section 7.5 PAPR level
HCTR1312FR05-2	December 19, 2013	- Revised conducted output power
HCTR1312FR05-3	December 27, 2013	- Revised Antenna Gain Value on Page 4.

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name: LG Electronics Inc.

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Emission Designator(s):

Band 2 (5 MHz) :	4M48G7D (QPSK) / 4M49W7D (16-QAM)
Band 2 (10 MHz) :	8M96G7D (QPSK) / 8M94W7D (16-QAM)
Band 5 (5 MHz) :	4M49G7D (QPSK) / 4M50W7D (16-QAM)
Band 5 (10 MHz) :	8M99G7D (QPSK) / 8M94W7D (16-QAM)

Date(s) of Tests: November 06, 2013 ~ December 18, 2013

Antenna Specification

Manufacturer: Laird Technologies

Antenna type: MIMO capable vehicle dome antenna

Peak Gain: Band 2: -0.3 dBi
Band 5: -2.4 dBi

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2. INTRODUCTION

2.1. EUT DESCRIPTION

The LG Electronics Inc. GEN10NADNA CDMA/GSM/WCDMA/LTE Telematics NAD module consists of LTE Band2, 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 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

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3. DESCRIPTION OF TESTS

3.1 CONDUCTED OUTPUT POWER

Test Procedure

Conducted Output Power is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r01, June 7, 2013, Section 5.2.

5.2.1 Procedure for use with a spectrum/signal analyzer when EUT can be configured to transmit continuously or when sweep triggering/signal gating can be properly implemented

The EUT is considered to transmit continuously if it can be configured to transmit at a burst duty cycle of greater than or equal to 98% throughout the duration of the measurement. If this condition can be achieved, then the following procedure can be used to measure the average output power of the EUT.

This procedure can also be used when the EUT cannot be configured to transmit continuously, provided that the measurement instrument can be configured to trigger a sweep at the beginning of each full-power transmission burst, and the sweep time is less than or equal to the minimum transmission time during each burst (*i.e.*, no burst off-time is to be included in the measurement).

- 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) Set number of points in sweep $\geq 2 \times$ span / RBW.
- e) Sweep time = auto-couple.
- f) Detector = RMS (power averaging).
- g) If the EUT can be configured to transmit continuously (*i.e.*, burst duty cycle $\geq 98\%$), then set the trigger to free run.
- h) If the EUT cannot be configured to transmit continuously (*i.e.*, burst duty cycle $< 98\%$), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.
- i) Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode.
- j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

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3.2 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

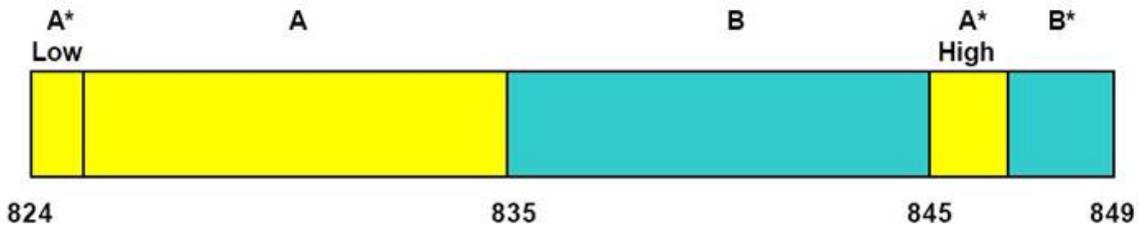
Radiated spurious emissions

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

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3.3 FREQUENCY RANGE

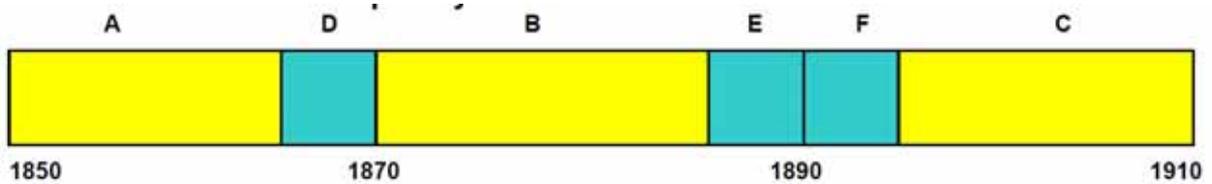
§22.917(a): Cellular – Mobile Frequency Blocks



BLOCK 1: 824 – 835 MHz (A* Low + A)
 BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)
 BLOCK 4: 846.5 – 849 MHz (B*)

§ 24.229: PCS – Mobile Frequency Blocks



BLOCK 1: 1850 – 1865 MHz (A)
 BLOCK 2: 1865 – 1870 MHz (D)
 BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 4: 1885 – 1890 MHz (E)
 BLOCK 5: 1890 – 1895 MHz (F)
 BLOCK 6: 1895 – 1910 MHz (C)



3.4 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:

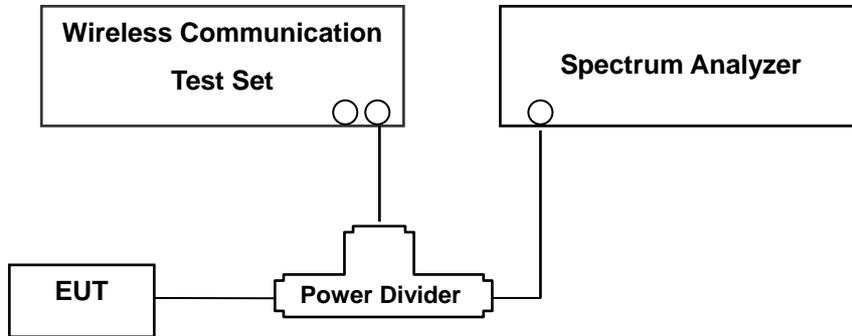
- a) Set span to at least 1.5 times the OBW.
- b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
- c) Set VBW ≥ 3 x RBW.
- d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
- e) Sweep time = auto.
- 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%.

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3.5 OCCUPIED BANDWIDTH.

Test set-up



(Configuration of conducted Emission measurement)

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

Test Procedure

The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels(low, middle and high operational range.)

The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

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3.6 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 10th Harmonics. 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.

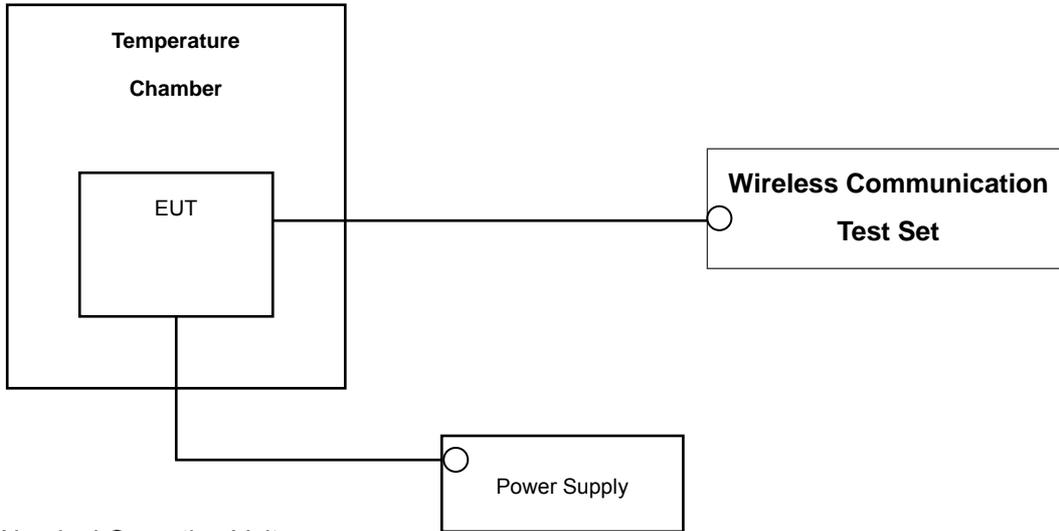
NOTES: The analyzer plot offsets were determined by below conditions.

- For LTE Band 2, total offset 39.0 dBm = 30 dBm attenuator + 6 dBm Divider + 3.0 dBm RF cables.
- For LTE Band 5, total offset 37.4 dBm = 20 dBm attenuator + 6 dBm Divider + 2.4 dBm RF cables.

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3.7 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 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 $\pm 0.00025\%$ (± 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.

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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	E9020A/Spectrum Analyzer	MY51110063	Annual	05/14/2014
Agilent	ATTENUATOR	77640	Annual	07/24/2014
REOHDE&SCHWARZ	FSV40/Spectrum Analyzer	1307.9002K40-100931-NK	Annual	06/10/2014
Anritsu	MT8820C/Radio Communication Analyzer	6200863156	Annual	03/25//2014

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5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049, 22.917(a), 24.238(a)	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 22.917(a), 24.238(a)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	< 43 + 10log ₁₀ (P[Watts]) at Band Edge and for all out-of-band emissions		PASS
2.1046	Conducted Output Power	N/A		PASS
24.232(d)	Peak- to- Average Ratio	< 13 dB		PASS
2.1055, 22.355, 24.235	Frequency stability / variation of ambient temperature	< 2.5 ppm		PASS
22.913(a)(2),	Effective Radiated Power(Band 5)	< 7 Watts max. ERP	RADIATED	PASS
24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS
2.1053, 22.917(a), 24.238(a)	Radiated Spurious and Harmonic Emissions	< 43 + 10log ₁₀ (P[Watts]) for all out-of band emissions		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

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

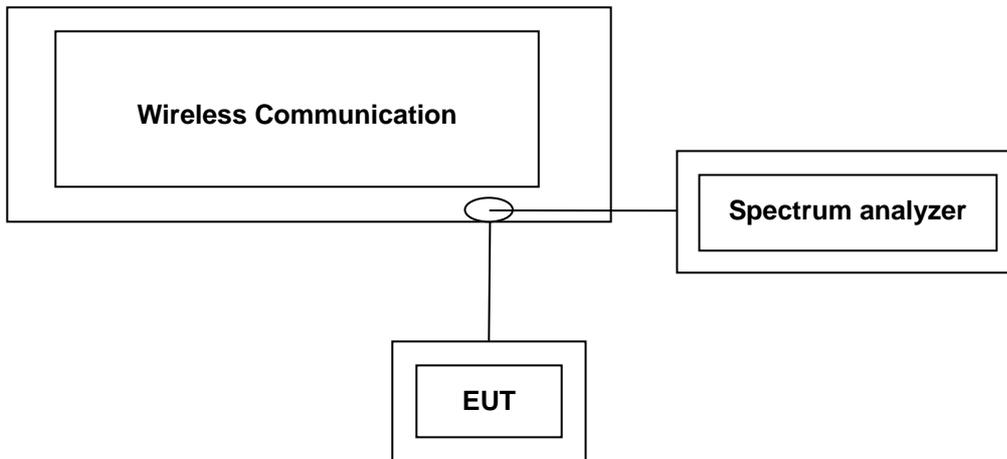
FCC CERTIFICATION REPORT			www.hct.co.kr
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7. TEST DATA

7.1 CONDUCTED OUTPUT POWER

Conducted Output Power was tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r01, June 7, 2013, Section 5.2.

A base station simulator was used to establish communication with the EUT, and Spectrum analyzer was used for test results. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



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Test Result

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 2	5	1852.5	18625	1	0	23.42	22.47
				1	12	23.38	22.40
				1	24	23.29	22.38
				12	0	22.38	21.45
				12	6	22.34	21.40
				12	11	22.39	21.42
				25	0	22.30	21.32
		1880.0	18900	1	0	23.12	22.40
				1	12	23.14	22.33
				1	24	23.19	22.43
				12	0	22.19	21.19
				12	6	22.15	21.18
				12	11	22.10	21.16
				25	0	22.10	21.19
		1907.5	19175	1	0	23.01	22.41
				1	12	23.10	22.42
				1	24	23.21	22.47
				12	0	22.00	21.00
				12	6	22.01	21.09
				12	11	22.10	21.05
				25	0	22.06	21.00

LTE Conducted Average Output Powers (5 MHz Band 2 LTE)

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 2	10	1855.0	18650	1	0	23.38	22.53
				1	24	23.35	22.55
				1	49	23.40	22.55
				25	0	22.10	21.29
				25	12	22.20	21.35
				25	24	22.19	21.29
				50	0	22.23	21.34
		1880.0	18900	1	0	23.35	22.50
				1	24	23.31	22.37
				1	49	23.37	22.50
				25	0	22.17	21.23
				25	12	22.15	21.15
				25	24	22.18	21.20
				50	0	22.10	21.10
		1905.0	19150	1	0	22.95	21.65
				1	24	22.85	21.59
				1	49	23.05	21.70
				25	0	22.10	21.10
				25	12	21.96	21.06
				25	24	21.98	21.14
				50	0	21.98	21.03

LTE Conducted Average Output Powers (10 MHz Band 2 LTE)

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
21Band 5	5	826.5	20425	1	0	22.80	21.95
				1	12	22.85	21.95
				1	24	22.79	21.89
				12	0	21.85	20.80
				12	6	21.83	20.72
				12	11	21.90	20.77
				25	0	21.77	20.62
		836.5	20525	1	0	22.70	21.60
				1	12	22.84	21.78
				1	24	22.75	21.72
				12	0	21.96	20.88
				12	6	21.90	20.82
				12	11	21.91	20.92
				25	0	21.74	20.75
		846.5	20625	1	0	22.85	21.80
				1	12	22.84	21.71
				1	24	22.80	21.70
				12	0	21.80	20.75
				12	6	21.82	20.80
				12	11	21.90	20.85
				25	0	21.80	20.65

LTE Conducted Average Output Powers (5 MHz Band 5 LTE)

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 5	10	829.0	20450	1	0	22.75	21.78
				1	24	22.70	21.65
				1	49	22.85	21.84
				25	0	21.70	20.75
				25	12	21.75	20.72
				25	24	21.70	20.70
				50	0	21.68	20.69
		836.5	20525	1	0	22.70	21.50
				1	24	22.82	21.80
				1	49	22.80	21.65
				25	0	21.68	20.70
				25	12	21.85	20.73
				25	24	21.70	20.70
				50	0	21.46	20.57
		844.0	20600	1	0	22.75	21.69
				1	24	22.85	21.80
				1	49	22.80	21.87
				25	0	21.66	20.82
				25	12	21.75	20.80
				25	24	21.70	20.78
				50	0	21.75	20.74

LTE Conducted Average Output Powers (10 MHz Band 5 LTE)

Note : Detecting mode is average.

- Plots of the EUT's Conducted Output Power are shown Page 37 ~ 38

In order to simplify the report, attached plots were only the center channel. (QPSK, Full RB Size)

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7.2 EQUIVALENT ISOTROPIC RADIATED POWER OUTPUT

Freq (MHz)	Band Width (MHz)	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1852.5	5	QPSK	-15.64	16.51	10.02	1.40	V	0.326	25.13
		16-QAM	-15.62	16.53	10.02	1.40	V	0.327	25.15
1880.0		QPSK	-15.86	16.45	10.04	1.45	V	0.319	25.04
		16-QAM	-15.77	16.54	10.04	1.45	V	0.326	25.13
1907.5		QPSK	-16.75	15.81	10.05	1.48	V	0.274	24.38
		16-QAM	-16.64	15.92	10.05	1.48	V	0.281	24.49

Equivalent Isotropic Radiated Power Output Data (5 MHz Band 2 LTE)

Note: Worst case is 1 resource block.

This device uses 1.5m ~ 6m cables interchangeably. After testing under all configurations, worst case has been determined for the 1.5m cable.

Freq (MHz)	Band Width (MHz)	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1855.0	10	QPSK	-15.89	16.14	10.02	1.41	V	0.299	24.75
		16-QAM	-16.00	16.03	10.02	1.41	V	0.291	24.64
1880.0		QPSK	-15.93	16.38	10.04	1.45	V	0.314	24.97
		16-QAM	-15.88	16.43	10.04	1.45	V	0.318	25.02
1905.0		QPSK	-17.49	15.01	10.05	1.47	V	0.229	23.59
		16-QAM	-17.34	15.16	10.05	1.47	V	0.237	23.74

Equivalent Isotropic Radiated Power Output Data (10 MHz Band 2 LTE)

Note: Worst case is 1 resource block.

This device uses 1.5m ~ 6m cables interchangeably. After testing under all configurations, worst case has been determined for the 1.5m cable.



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. 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 x plane in LTE mode. Also worst case of detecting Antenna is vertical polarization in LTE mode.

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7.3 EFFECTIVE RADIATED POWER OUTPUT

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	ERP	
								W	dBm
826.5	5 MHz	QPSK	-10.38	37.93	-10.59	0.95	H	0.436	26.39
		16-QAM	-10.73	37.58	-10.59	0.95	H	0.402	26.04
836.5		QPSK	-11.95	35.67	-10.54	0.96	H	0.261	24.17
		16-QAM	-12.06	35.56	-10.54	0.96	H	0.255	24.06
846.5		QPSK	-12.98	34.28	-10.48	1.11	H	0.186	22.69
		16-QAM	-13.26	34.00	-10.48	1.11	H	0.174	22.41

Equivalent Isotropic Radiated Power Output Data (5 MHz Band 5 LTE)

Note: Worst case is 1 resource block.

This device uses 1.5m ~ 6m cables interchangeably. After testing under all configurations, worst case has been determined for the 1.5m cable.

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	ERP	
								W	dBm
829.0	10 MHz	QPSK	-11.17	36.98	-10.58	0.95	H	0.351	25.45
		16-QAM	-11.23	36.92	-10.58	0.95	H	0.346	25.39
836.5		QPSK	-11.95	35.67	-10.54	0.96	H	0.261	24.17
		16-QAM	-11.86	35.76	-10.54	0.96	H	0.267	24.26
844.0		QPSK	-12.90	34.59	-10.49	0.96	H	0.206	23.14
		16-QAM	-12.53	34.96	-10.49	0.96	H	0.224	23.51

Equivalent Isotropic Radiated Power Output Data (10 MHz Band 5 LTE)

Note: Worst case is 1 resource block.

This device uses 1.5m ~ 6m cables interchangeably. After testing under all configurations, worst case has been determined for the 1.5m cable.



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. Turntable rotation was adjusted for the highest reading on the receive spectrum analyzer.

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 vertical polarization LTE mode.

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7.4 RADIATED SPURIOUS EMISSIONS

7.4.1 RADIATED SPURIOUS EMISSIONS (5 MHz Band 2 LTE)

OPERATING FREQUENCY : _____ 1880.00 MHz
 MEASURED OUTPUT POWER: _____ 25.15 dBm = 0.327W
 MODULATION SIGNAL: _____ 5 MHz 16-QAM
 DISTANCE: _____ 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ _____ 38.15 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	dBc
18625 (1852.5)	3705.0	-31.84	12.27	-36.58	2.19	V	-26.50	51.65
	5557.5	-36.80	13.40	-36.47	2.88	V	-25.95	51.10
	7410.0	-56.38	11.37	-46.09	3.29	H	-38.01	63.16
18900 (1880.0)	3760.0	-23.44	12.31	-27.99	2.11	V	-17.79	42.94
	5640.0	-33.46	13.41	-32.79	2.92	V	-22.30	47.45
	7520.0	-53.45	11.55	-43.93	3.34	V	-35.72	60.87
19175 (1907.5)	3815.0	-27.50	12.37	-31.98	2.14	V	-21.75	46.90
	5722.5	-36.18	13.42	-34.74	3.02	H	-24.34	49.49
	7630.0	-56.17	11.68	-46.39	3.13	H	-37.84	62.99

- 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.
 5. This device uses 1.5m ~ 6m cables interchangeably. After testing under all configurations, worst case has been determined for the 1.5m cable.

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7.4.2 RADIATED SPURIOUS EMISSIONS (10 MHz Band 2 LTE)

OPERATING FREQUENCY : 1880.00 MHz
 MEASURED OUTPUT POWER: 25.02 dBm = 0.318W
 MODULATION SIGNAL: 10 MHz 16-QAM
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 38.02 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	dBc
18650 (1855.0)	3710.0	-32.32	12.26	-37.17	2.19	V	-27.10	52.12
	5565.0	-36.01	13.40	-35.75	2.88	V	-25.23	50.25
	7420.0	-56.25	11.35	-46.25	3.34	V	-38.24	63.26
18900 (1880.0)	3760.0	-25.83	12.31	-30.38	2.11	H	-20.18	45.20
	5640.0	-33.42	13.41	-32.75	2.92	V	-22.26	47.28
	7520.0	-54.46	11.55	-44.94	3.34	H	-36.73	61.75
19150 (1905.0)	3810.0	-25.26	12.35	-29.12	2.74	V	-19.51	44.53
	5715.0	-34.87	13.42	-33.48	2.97	H	-23.03	48.05
	7620.0	-56.47	11.67	-46.72	3.16	H	-38.21	63.23

- 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.
 5. This device uses 1.5m ~ 6m cables interchangeably. After testing under all configurations, worst case has been determined for the 1.5m cable.

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7.4.3 RADIATED SPURIOUS EMISSIONS (5 MHz Band 5 LTE)

OPERATING FREQUENCY : 836.50 MHz
 MEASURED OUTPUT POWER: 26.39 dBm = 0.436W
 MODULATION SIGNAL: 5 MHz QPSK
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 39.39 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	dBc
20425 (826.5)	1653.0	-45.54	7.11	-52.47	1.20	V	-46.56	72.95
	2479.5	-	-	-	-	-	-	-
	3306.0	-	-	-	-	-	-	-
20525 (836.5)	1673.0	-43.50	7.22	-50.72	0.98	V	-44.48	70.87
	2509.5	-36.15	8.51	-39.94	1.65	V	-33.08	59.47
	3346.0	-	-	-	-	-	-	-
20625 (846.5)	1693.0	-48.02	7.34	-55.36	0.88	V	-48.90	75.29
	2539.5	-	-	-	-	-	-	-
	3386.0	-	-	-	-	-	-	-

- 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.
 5. This device uses 1.5m ~ 6m cables interchangeably. After testing under all configurations, worst case has been determined for the 1.5m cable.

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7.4.4 RADIATED SPURIOUS EMISSIONS (10 MHz Band 5 LTE)

OPERATING FREQUENCY : 836.50 MHz
 MEASURED OUTPUT POWER: 25.45 dBm = 0.351W
 MODULATION SIGNAL: 10 MHz QPSK
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 38.45 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	dBc
20450 (829.0)	1658.0	-45.49	7.11	-52.42	1.20	V	-46.51	71.96
	2487.0	-	-	-	-	-	-	-
	3316.0	-	-	-	-	-	-	-
20525 (836.5)	1673.0	-43.16	7.22	-50.38	0.98	V	-44.14	69.59
	2509.5	-41.00	8.51	-44.79	1.65	V	-37.93	63.38
	3346.0	-	-	-	-	-	-	-
20625 (844.0)	1688.0	-46.22	7.28	-53.28	1.20	V	-47.20	72.65
	2532.0	-	-	-	-	-	-	-
	3376.0	-	-	-	-	-	-	-

- 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.
 5. This device uses 1.5m ~ 6m cables interchangeably. After testing under all configurations, worst case has been determined for the 1.5m cable.

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7.5 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Band 2	5 MHz	1880.0	QPSK	25	0	5.73
			16-QAM	25	0	6.41
	10 MHz	1880.0	QPSK	50	0	5.73
			16-QAM	50	0	6.40

- Plots of the EUT's Peak- to- Average Ratio are shown Page 43 ~ 44

7.6 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 2	5 MHz	1880.0	QPSK	25	0	4.4840
			16-QAM	25	0	4.4911
	10 MHz	1880.0	QPSK	50	0	8.9626
			16-QAM	50	0	8.9361

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 5	5 MHz	836.5	QPSK	25	0	4.4949
			16-QAM	25	0	4.4966
	10 MHz	836.5	QPSK	50	0	8.9876
			16-QAM	50	0	8.9413

- Plots of the EUT's Occupied Bandwidth are shown Page 39 ~ 42.

7.7 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 2	5	1852.5	QPSK	1	0	19.0850	-23.218
		1880.0	QPSK	1	0	19.3955	-23.431
		1907.5	QPSK	1	0	19.9335	-23.678
	10	1855.0	QPSK	1	0	18.9854	-23.266
		1880.0	QPSK	1	0	19.9270	-22.635
		1905.0	QPSK	1	0	19.0710	-22.749

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Frequency of Maximum Harmonic (GHz)	Maximum Data [dBm]
Band 5	5	826.5	QPSK	1	0	3.1704	-29.714
		836.5	QPSK	1	0	2.5033	-28.424
		846.5	QPSK	1	0	3.1395	-28.254
	10	829.0	QPSK	1	0	5.7061	-29.168
		836.5	QPSK	1	0	6.2291	-29.809
		844.0	QPSK	1	0	3.0724	-29.323

- Plots of the EUT's Conducted Spurious Emissions are shown Page 53 ~ 64

7.7.1 BAND EDGE

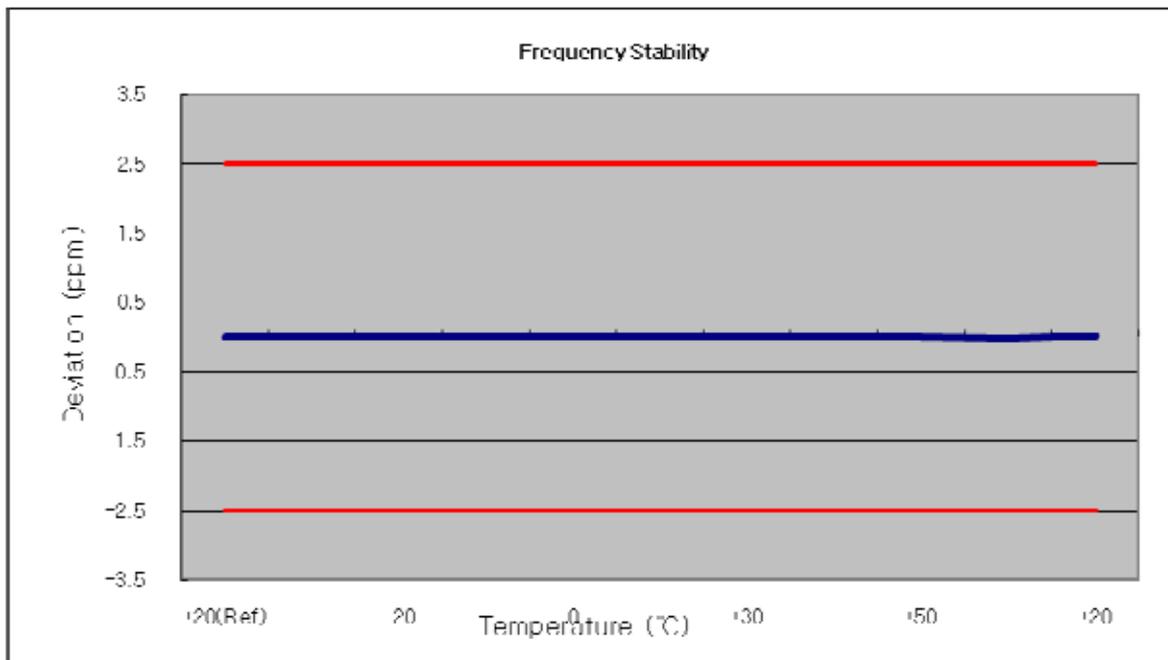
- Plots of the EUT's Band Edge are shown Page 45 ~ 52.

7.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.8.1 FREQUENCY STABILITY (5 MHz Band 2 LTE)

OPERATING FREQUENCY: 1880,000,000 Hz
 CHANNEL: 18900 (5 MHz)
 REFERENCE VOLTAGE: 12.0 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. ()	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	12.0	+20(Ref)	1879 999 991	0	0.000 000	0.000
100%		-30	1879 999 978	-12.10	-0.000 001	-0.006
100%		-20	1879 999 980	-10.10	-0.000 001	-0.005
100%		-10	1879 999 968	-22.80	-0.000 001	-0.012
100%		0	1879 999 980	-10.20	-0.000 001	-0.005
100%		+10	1879 999 973	-17.80	-0.000 001	-0.009
100%		+30	1879 999 999	8.60	0.000 000	0.005
100%		+40	1879 999 970	-20.20	-0.000 001	-0.011
100%		+50	1879 999 979	-11.80	-0.000 001	-0.006
115%		13.8	+20	1879 999 966	-24.70	-0.000 001
85%	10.2	+20	1880 000 002	11.50	0.000 001	0.006



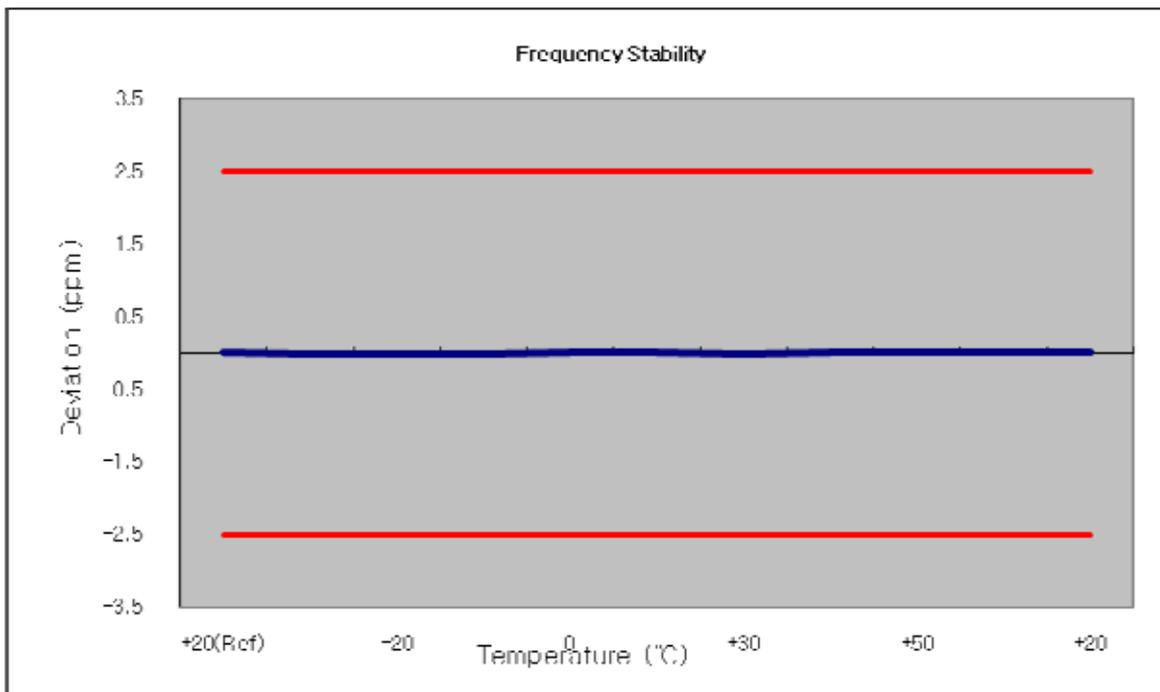
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTTTC10
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7.8.2 FREQUENCY STABILITY (10 MHz Band 2 LTE)

OPERATING FREQUENCY: 1880,000,000 Hz
 CHANNEL: 18900 (10 MHz)
 REFERENCE VOLTAGE: 12.0 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

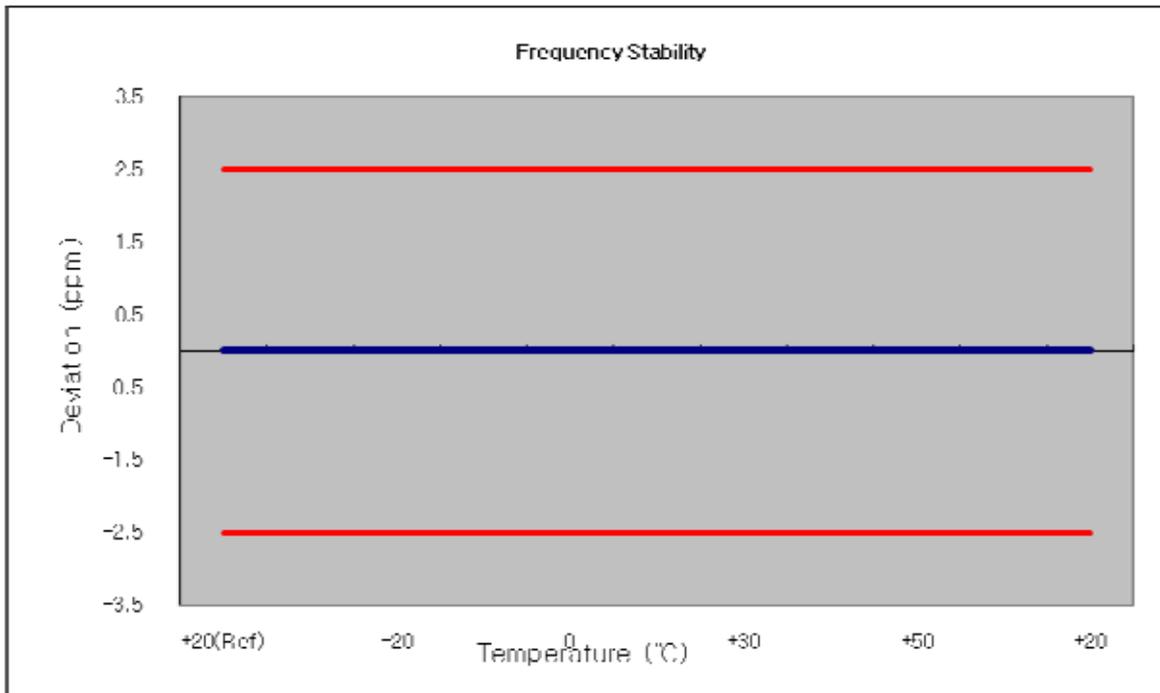
Voltage (%)	Power (VDC)	Temp. ()	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	12.0	+20(Ref)	1879 999 990	0	0.000 000	0.000
100%		-30	1879 999 979	-11.30	-0.000 001	-0.006
100%		-20	1879 999 978	-12.00	-0.000 001	-0.006
100%		-10	1879 999 966	-24.50	-0.000 001	-0.013
100%		0	1879 999 999	8.40	0.000 000	0.004
100%		+10	1880 000 001	10.80	0.000 001	0.006
100%		+30	1879 999 965	-25.70	-0.000 001	-0.014
100%		+40	1879 999 984	-5.90	0.000 000	-0.003
100%		+50	1880 000 002	11.30	0.000 001	0.006
115%		13.8	+20	1879 999 982	-8.70	0.000 000
85%	10.2	+20	1879 999 994	4.20	0.000 000	0.002



7.8.3 FREQUENCY STABILITY (5 MHz Band 5 LTE)

OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 20525 (5 MHz)
 REFERENCE VOLTAGE: 12.0 VDC
 DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

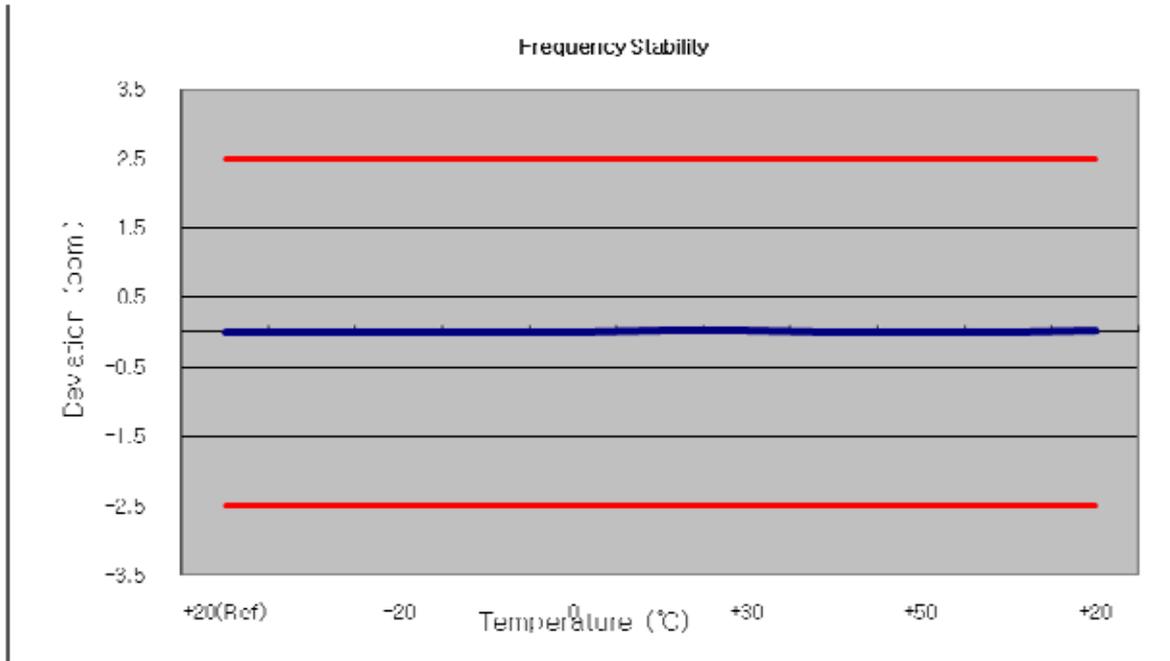
Voltage (%)	Power (VDC)	Temp. ()	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	12.0	+20(Ref)	836 499 996	0	0.000 000	0.000
100%		-30	836 500 000	3.70	0.000 000	0.004
100%		-20	836 499 999	3.50	0.000 000	0.004
100%		-10	836 499 998	2.20	0.000 000	0.003
100%		0	836 499 993	-3.30	0.000 000	-0.004
100%		+10	836 500 002	6.00	0.000 001	0.007
100%		+30	836 500 000	4.50	0.000 001	0.005
100%		+40	836 499 999	3.50	0.000 000	0.004
100%		+50	836 499 999	3.20	0.000 000	0.004
115%	13.8	+20	836 499 994	-2.40	0.000 000	-0.003
85%	10.2	+20	836 499 993	-3.00	0.000 000	-0.004



7.8.4 FREQUENCY STABILITY (10 MHz Band 5 LTE)

OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 20525 (10 MHz)
 REFERENCE VOLTAGE: 12.0 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. ()	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	12.0	+20(Ref)	836 499 995	0	0.000 000	0.000
100%		-30	836 499 991	-4.40	-0.000 001	-0.005
100%		-20	836 499 999	3.70	0.000 000	0.004
100%		-10	836 499 992	-3.20	0.000 000	-0.004
100%		0	836 499 997	1.90	0.000 000	0.002
100%		+10	836 500 000	5.10	0.000 001	0.006
100%		+30	836 500 003	7.40	0.000 001	0.009
100%		+40	836 499 998	2.50	0.000 000	0.003
100%		+50	836 500 000	4.90	0.000 001	0.006
115%		13.8	+20	836 499 992	-3.80	0.000 000
85%	10.2	+20	836 500 001	5.40	0.000 001	0.006





8. TEST PLOTS

FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTTTC10

BAND 2. Conducted Output Power Plot (Ch.18900 QPSK RB 25) 5 MHz



BAND 2. . Conducted Output Power Plot (Ch.18900 QPSK RB 50) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTTTC10
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BAND 5. Conducted Output Power Plot (Ch.20525 QPSK RB 25) 5 MHz



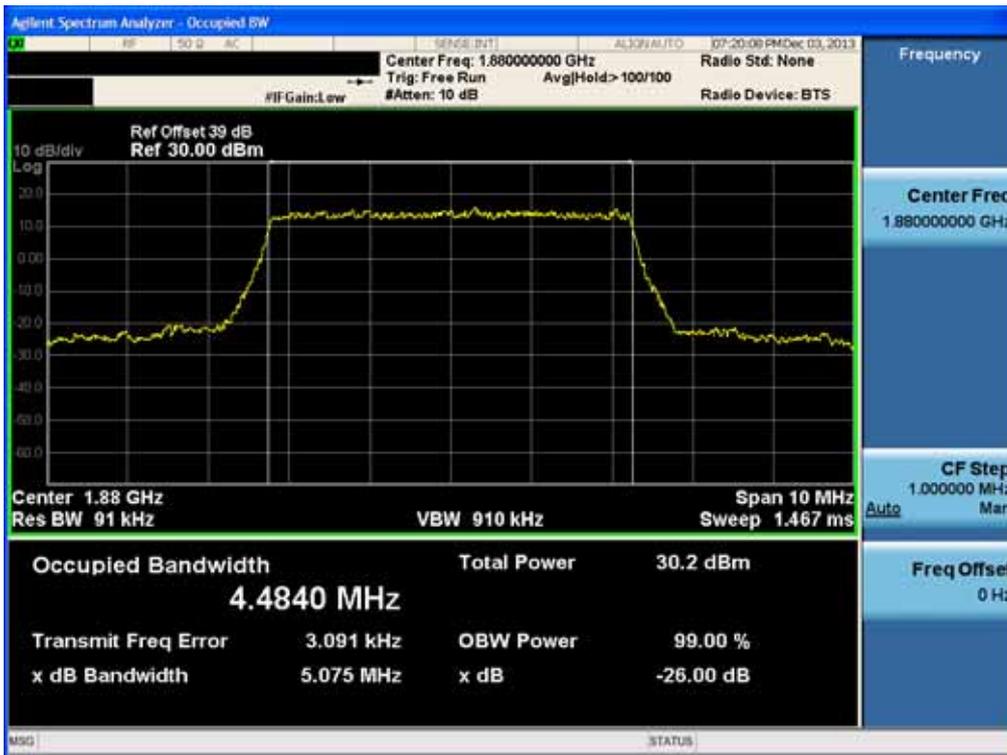
BAND 5. . Conducted Output Power Plot (Ch.20525 QPSK RB 50) 10 MHz



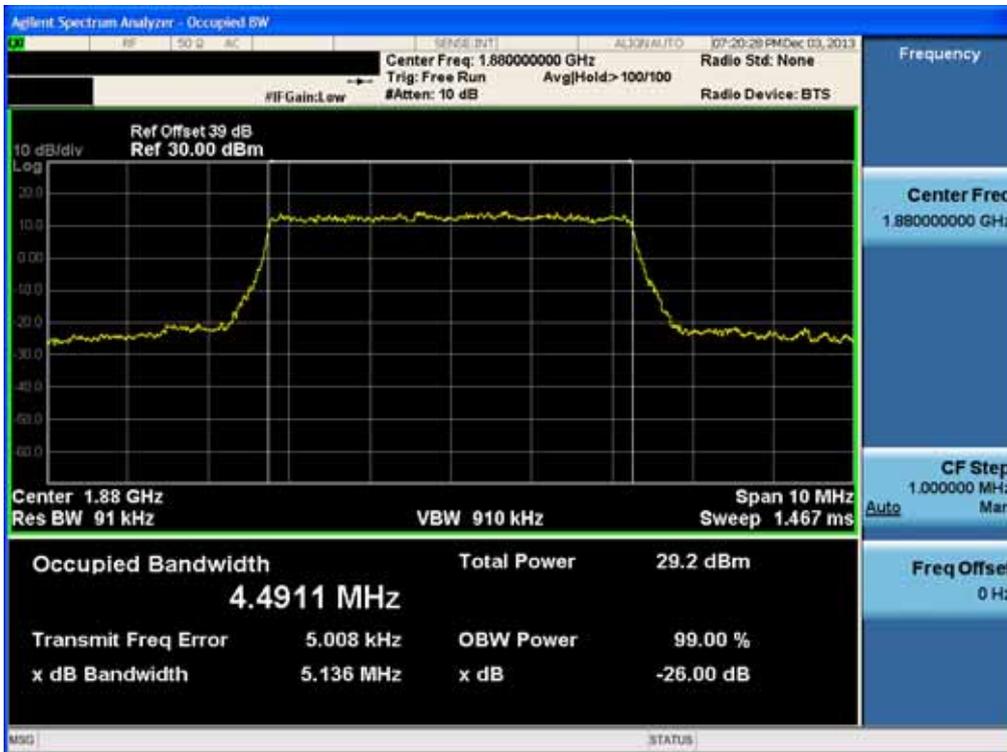
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 2. Occpied Bandwidth Plot (Ch.18900 QPSK RB 25) 5 MHz



BAND 2. Occpied Bandwidth Plot (Ch.18900 16-QAM RB 25) 5 MHz



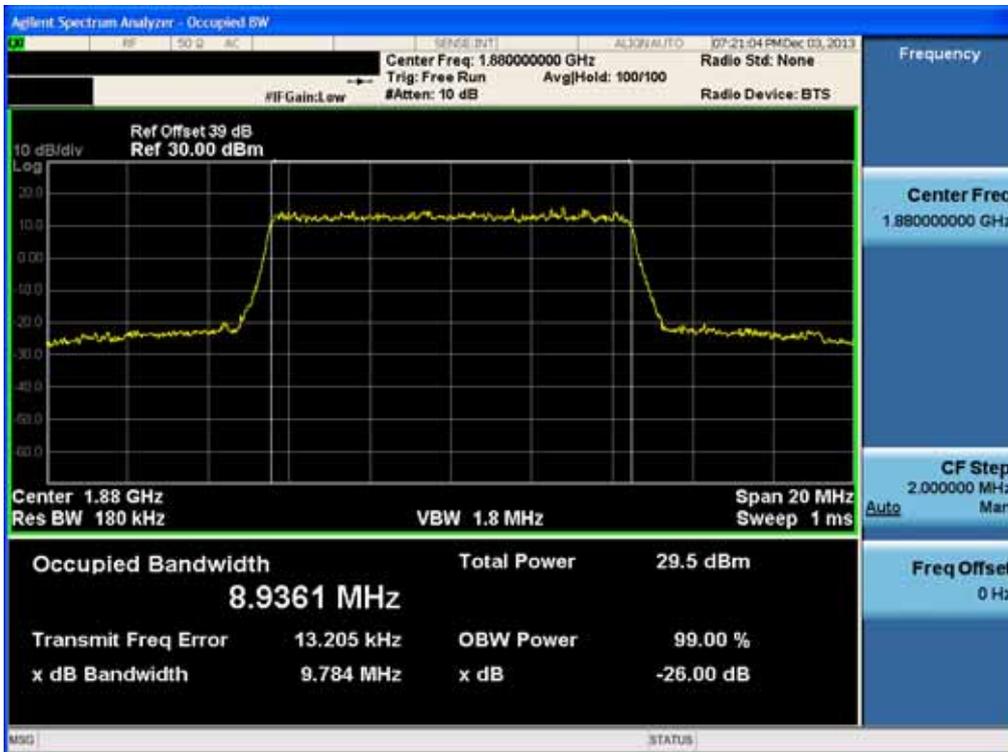
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 2. Occpied Bandwidth Plot (Ch.18900 QPSK RB 50) 10 MHz



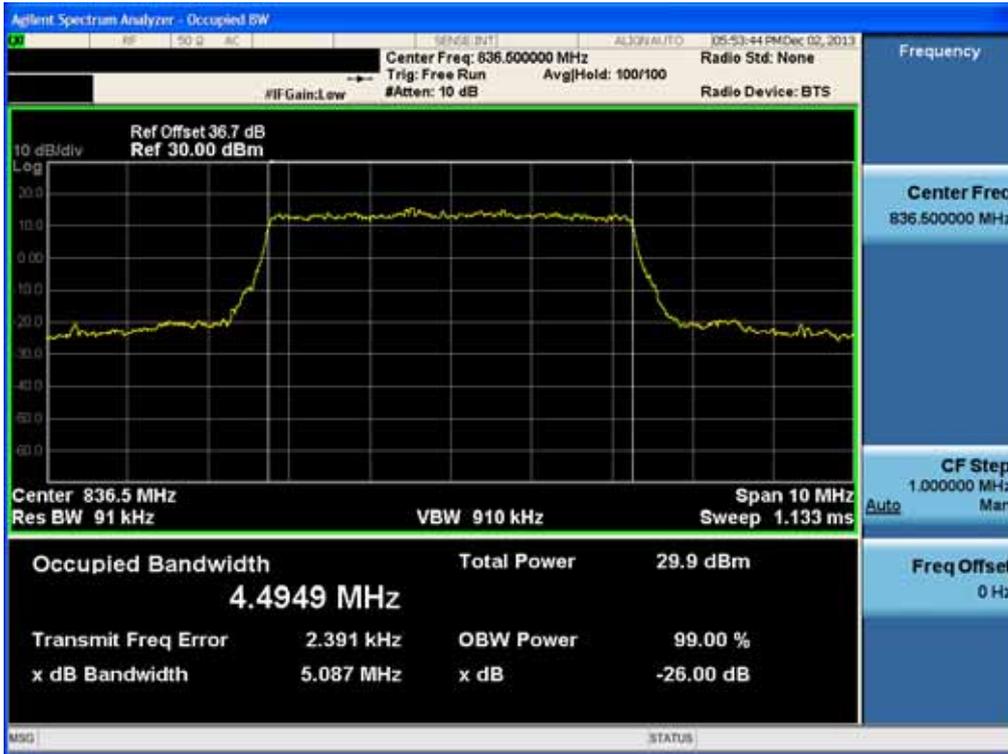
BAND 2. Occpied Bandwidth Plot (Ch.18900 16-QAM RB 50) 10 MHz



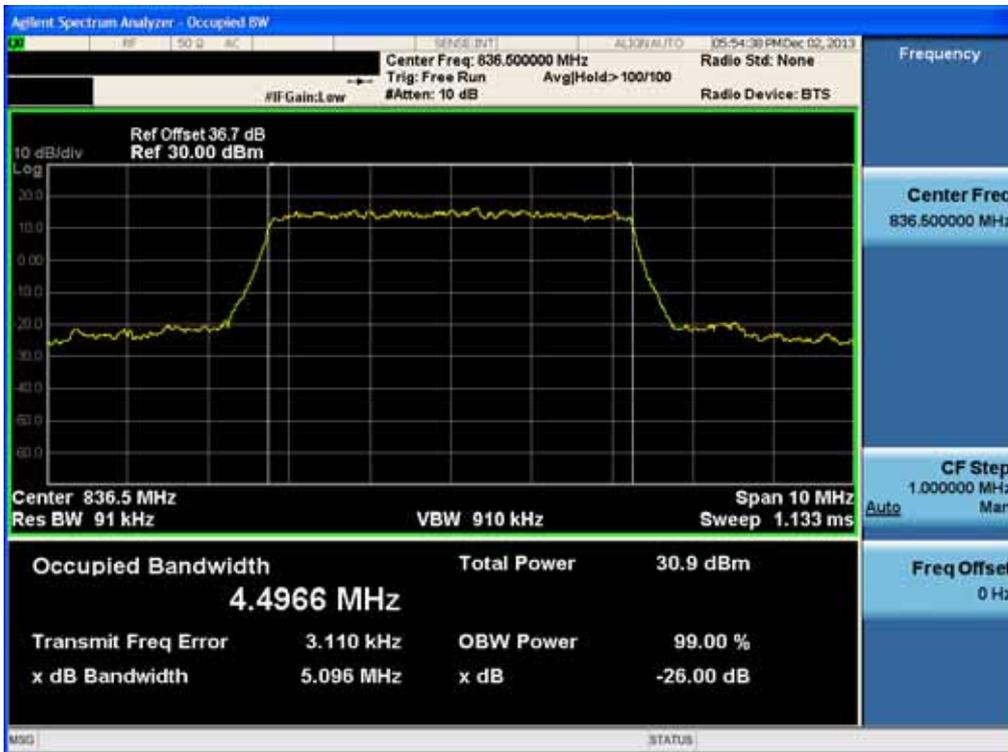
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTTTC10
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BAND 5. Occpied Bandwidth Plot (Ch.20525 QPSK RB 25) 5 MHz



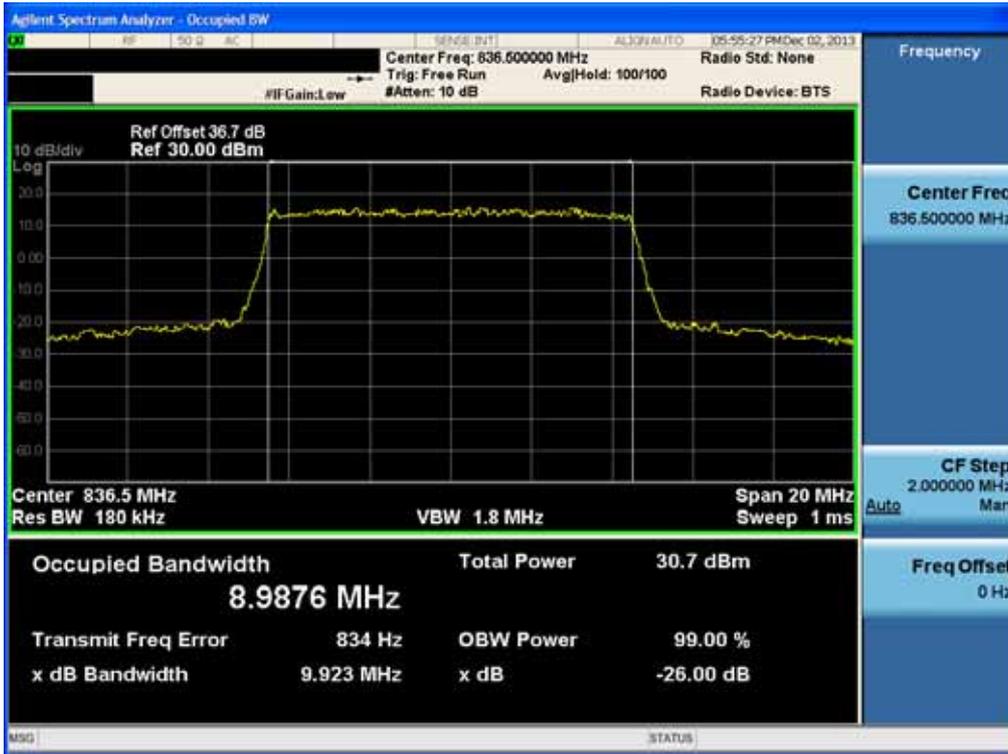
BAND 5. Occpied Bandwidth Plot (Ch.20525 16-QAM RB 25) 5 MHz



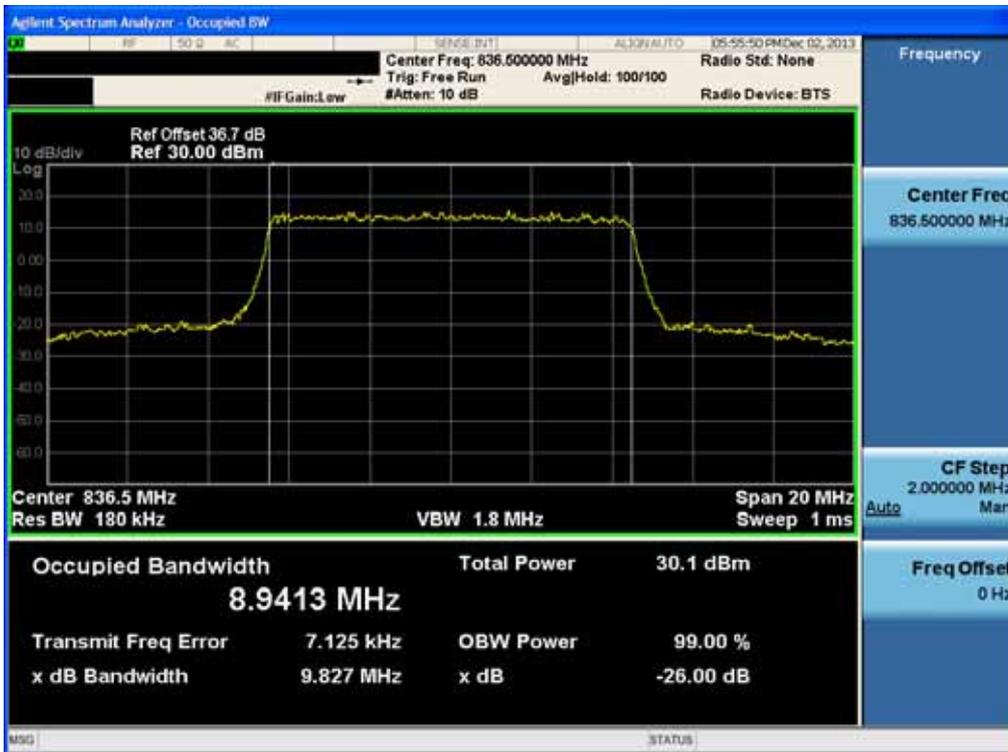
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTTTC10
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BAND 5. Occpied Bandwidth Plot (Ch.20525 QPSK RB 50) 10 MHz



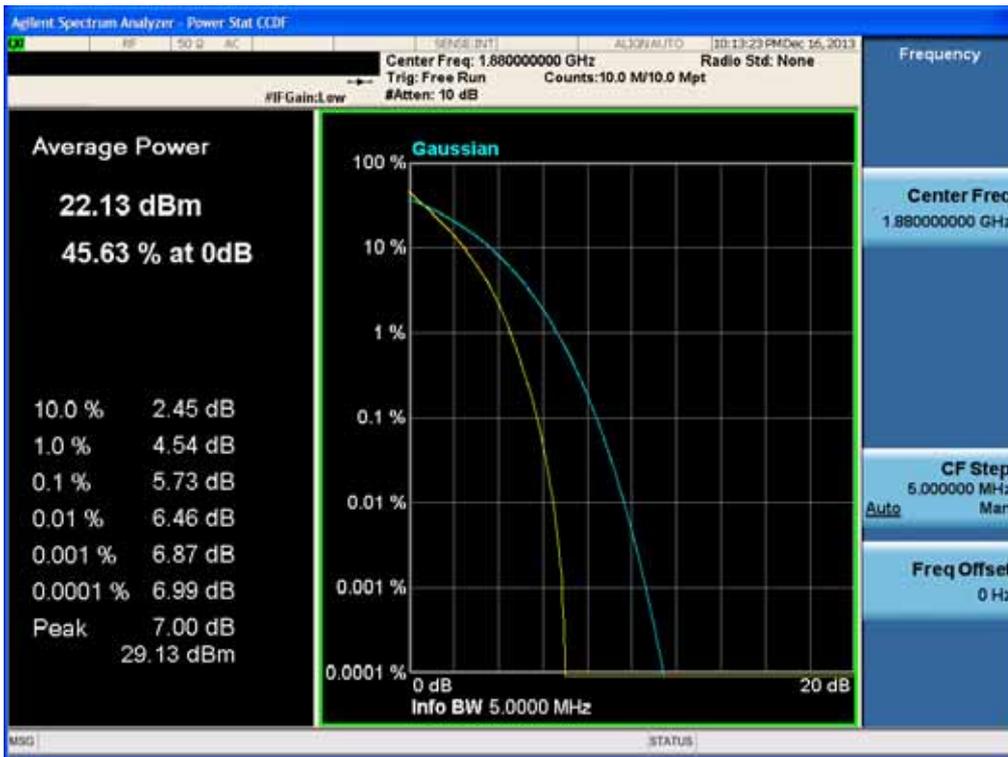
BAND 5. Occpied Bandwidth Plot (Ch.20525 16-QAM RB 50) 10 MHz



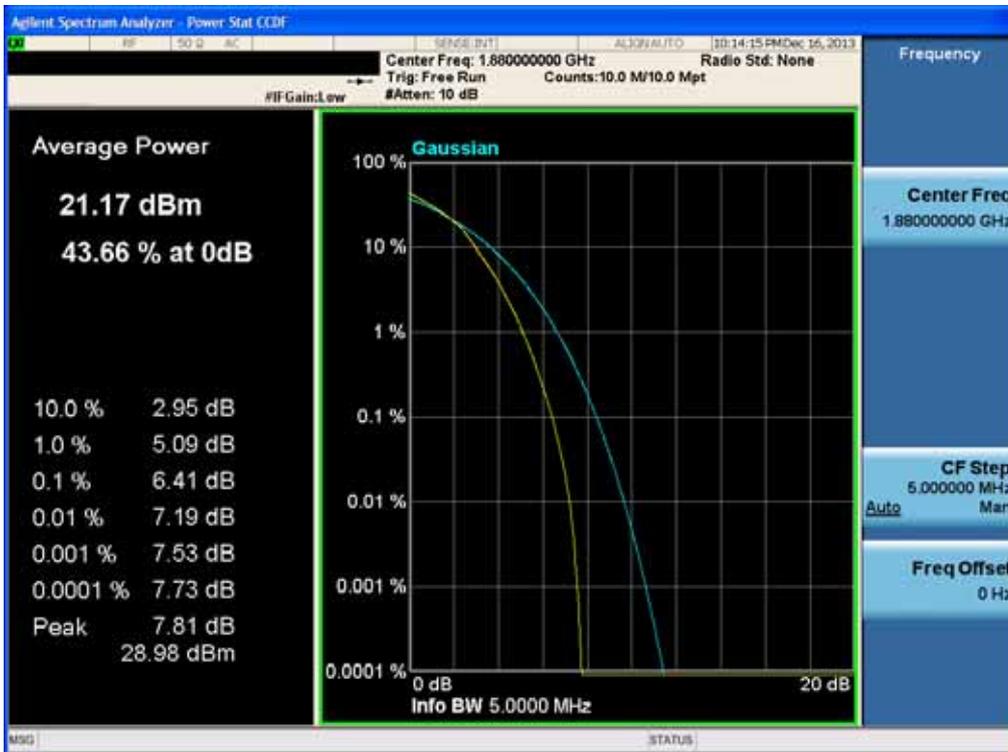
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTTTC10
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BAND 2. Peak to Average Ratio Plot (Ch.18900 QPSK RB 25) 5 MHz



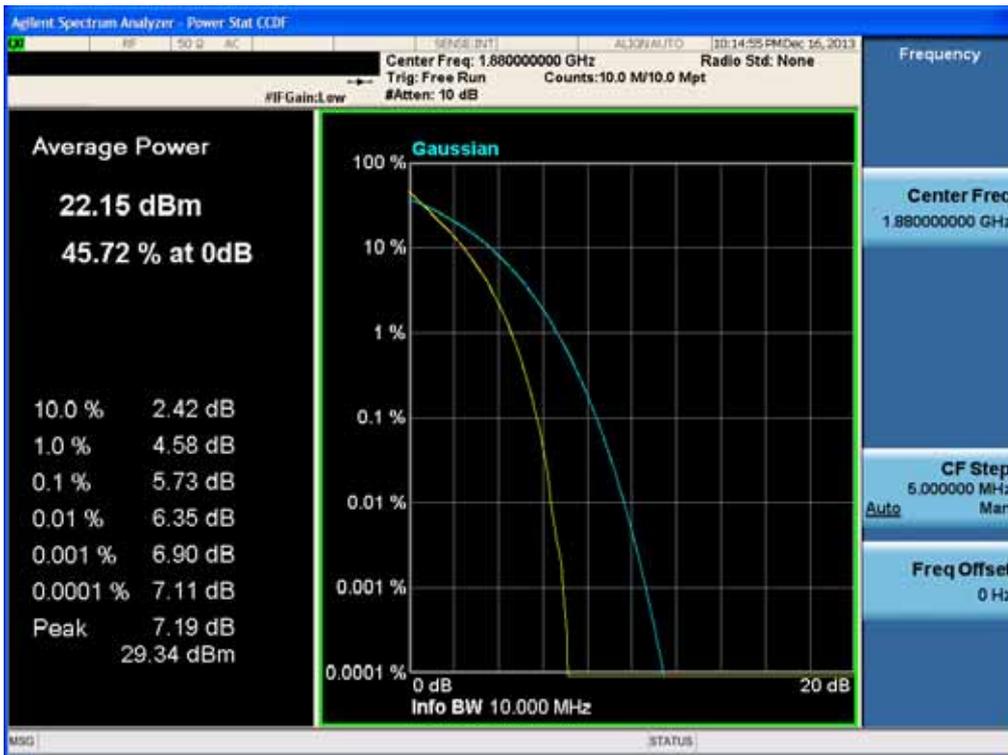
BAND 2. Peak to Average Ratio Plot (Ch.18900 16-QAM RB 25) 5 MHz



FCC CERTIFICATION REPORT

FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTTTC10

BAND 2. Peak to Average Ratio Plot (Ch.18900 QPSK RB 50) 10 MHz



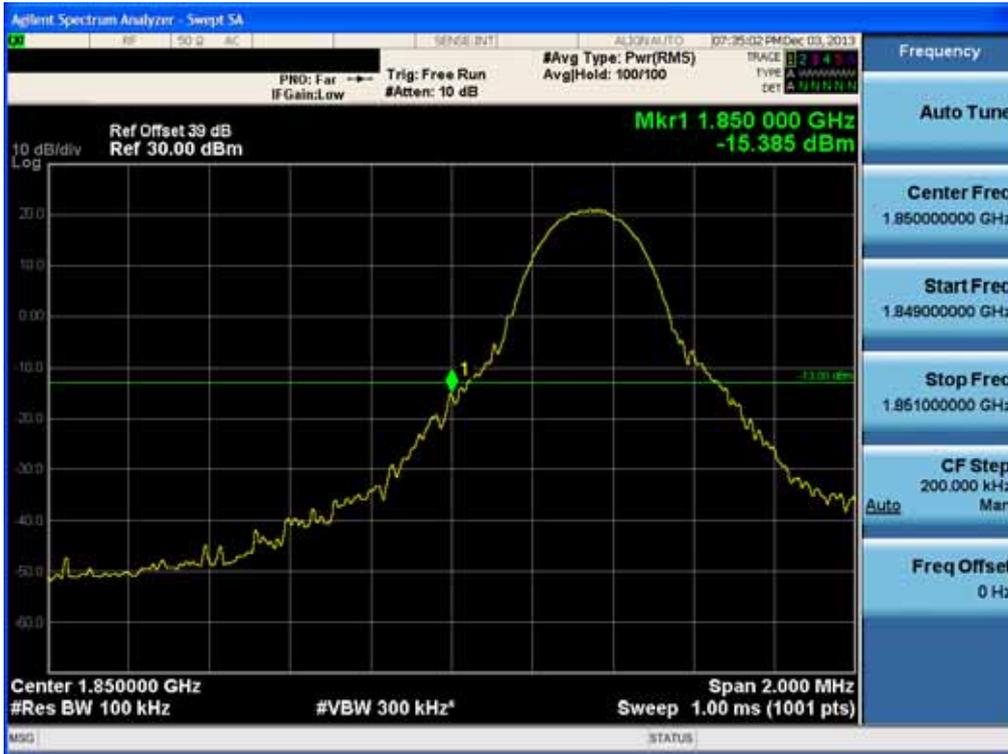
BAND 2. Peak to Average Ratio Plot (Ch.18900 16-QAM RB 50) 10 MHz



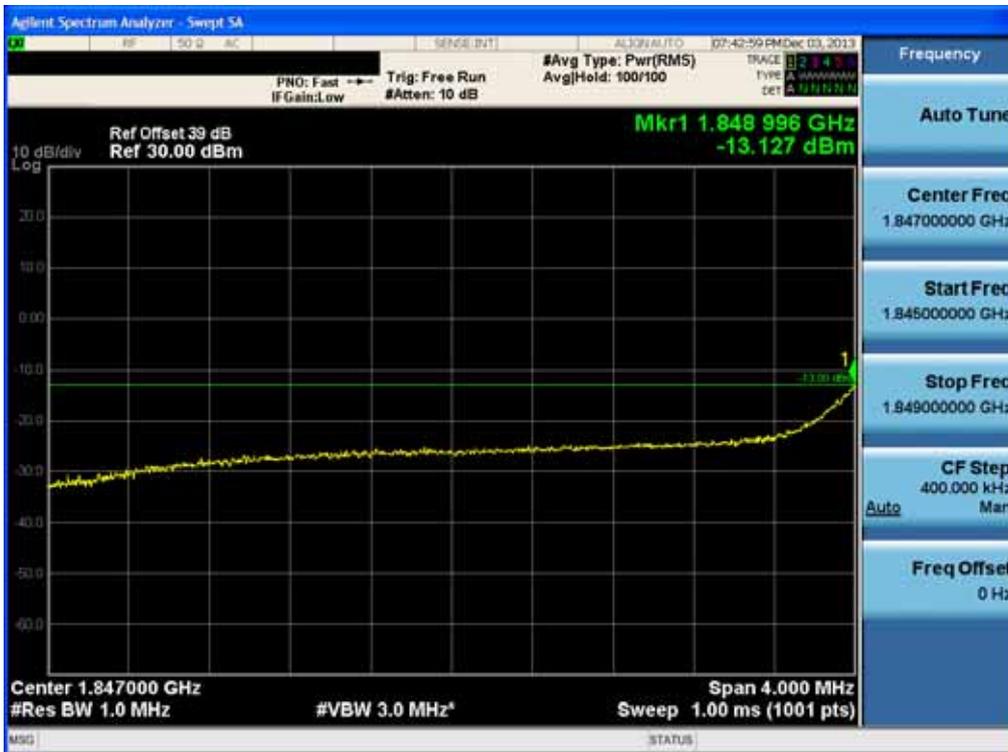
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTTTC10
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BAND 2. Lower Band Edge Plot 1 (Ch.18625 QPSK RB 1, Offset 0) 5 MHz



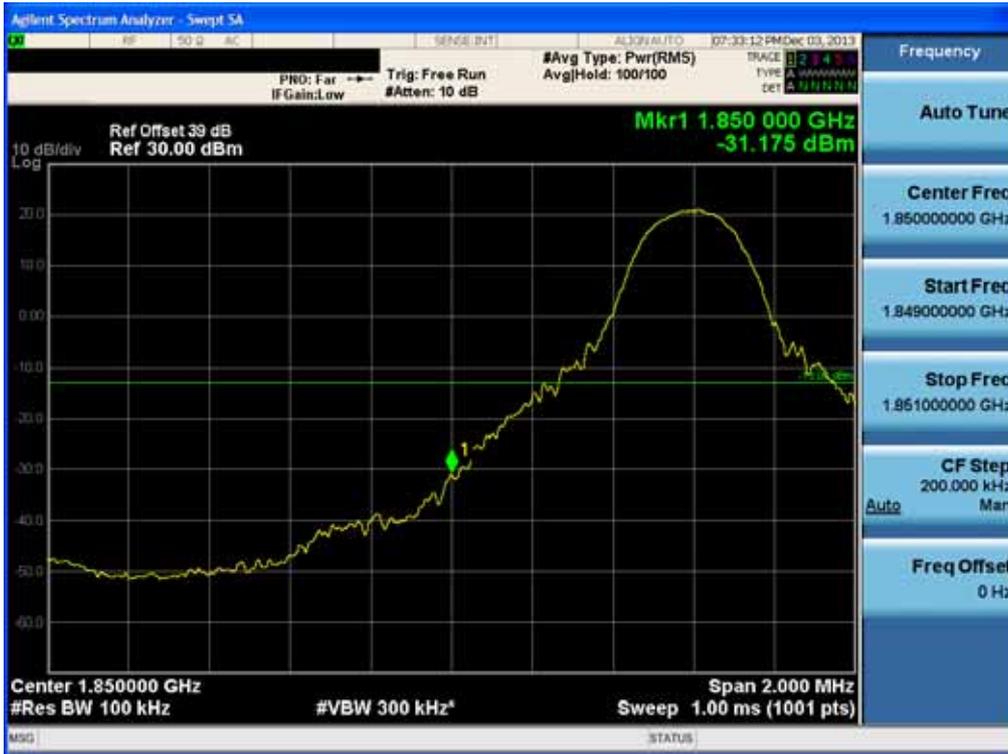
BAND 2. Lower Band Edge Plot 2 (Ch.18625 QPSK RB 25) 5 MHz



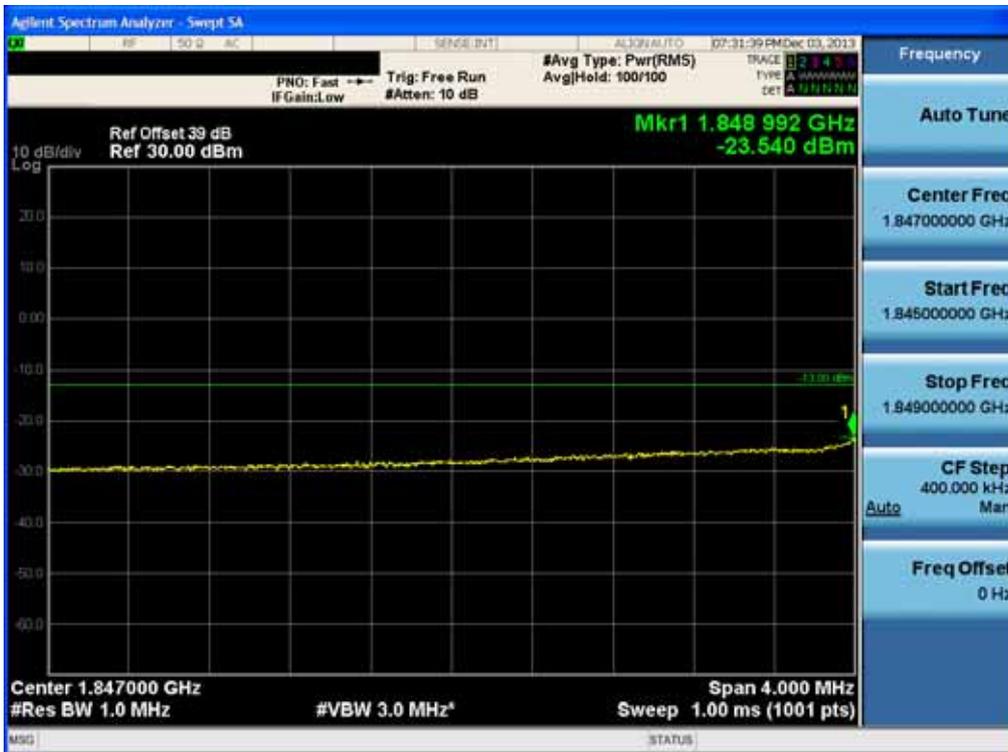
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 2. Lower Band Edge Plot 1 (Ch.18650 QPSK RB 1, Offset 0) 10 MHz



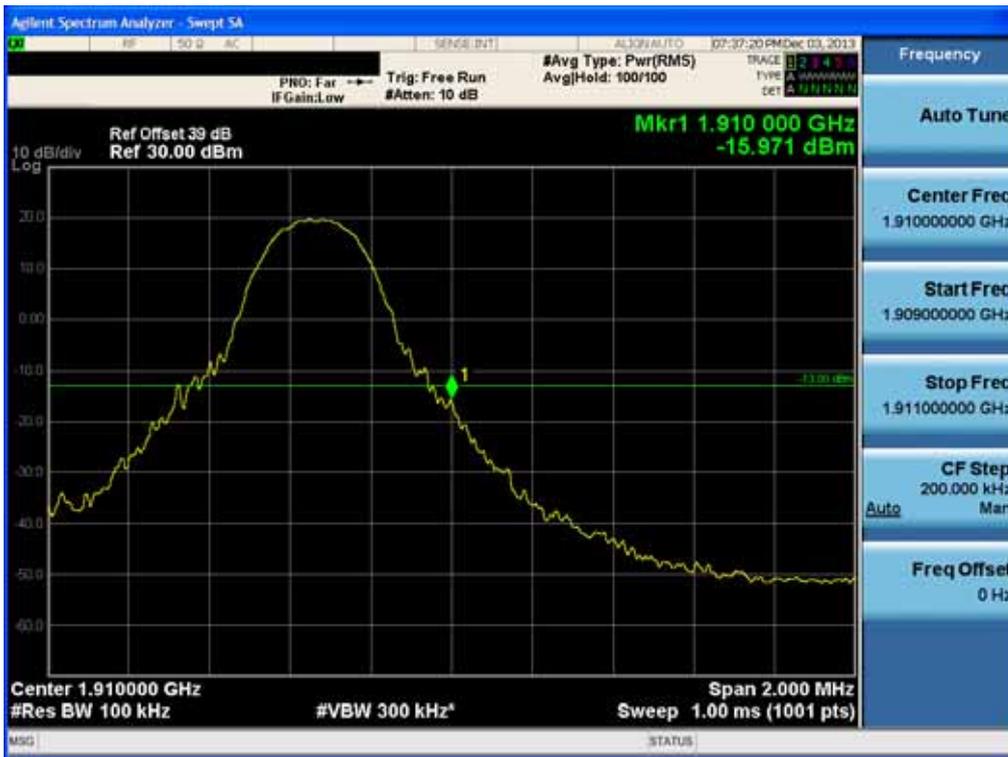
BAND 2. Lower Band Edge Plot 2 (Ch.18650 QPSK RB 50) 10 MHz



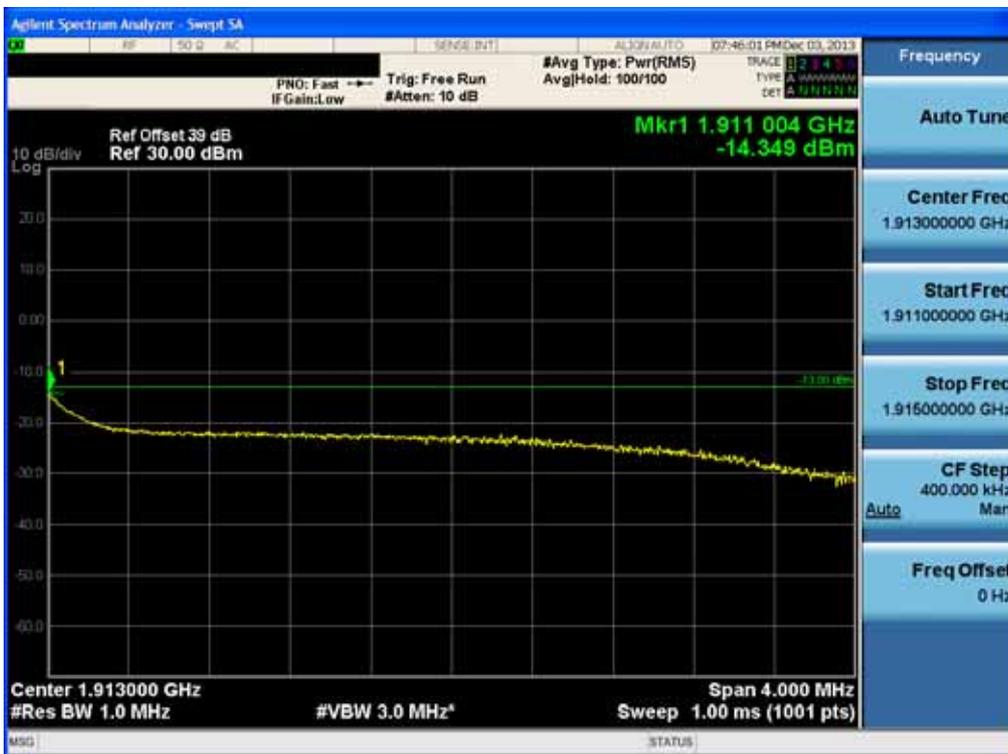
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 2. Upper Band Edge Plot 1 (Ch.19175 QPSK RB 1, Offset 24) 5 MHz



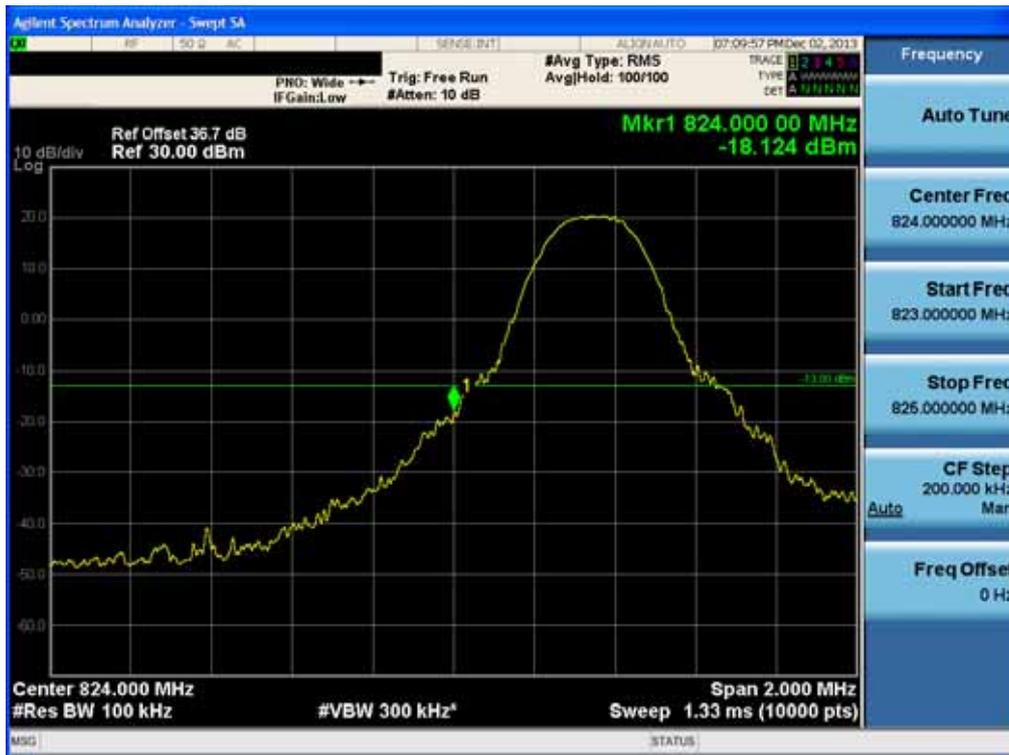
BAND 2. Upper Band Edge Plot 2 (Ch.19175 QPSK RB 25) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 5. Lower Band Edge Plot 1 (Ch.20425 QPSK RB 1, Offset 0) 5 MHz



BAND 5. Lower Band Edge Plot 2 (Ch.20425 QPSK RB 25) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 5. Lower Band Edge Plot 1 (Ch.20450 QPSK RB 50) 10 MHz



BAND 5. Lower Band Edge Plot 2 (Ch.20450 QPSK RB 50) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 5. Upper Band Edge Plot 1 (Ch.20600 QPSK RB 50) 10 MHz



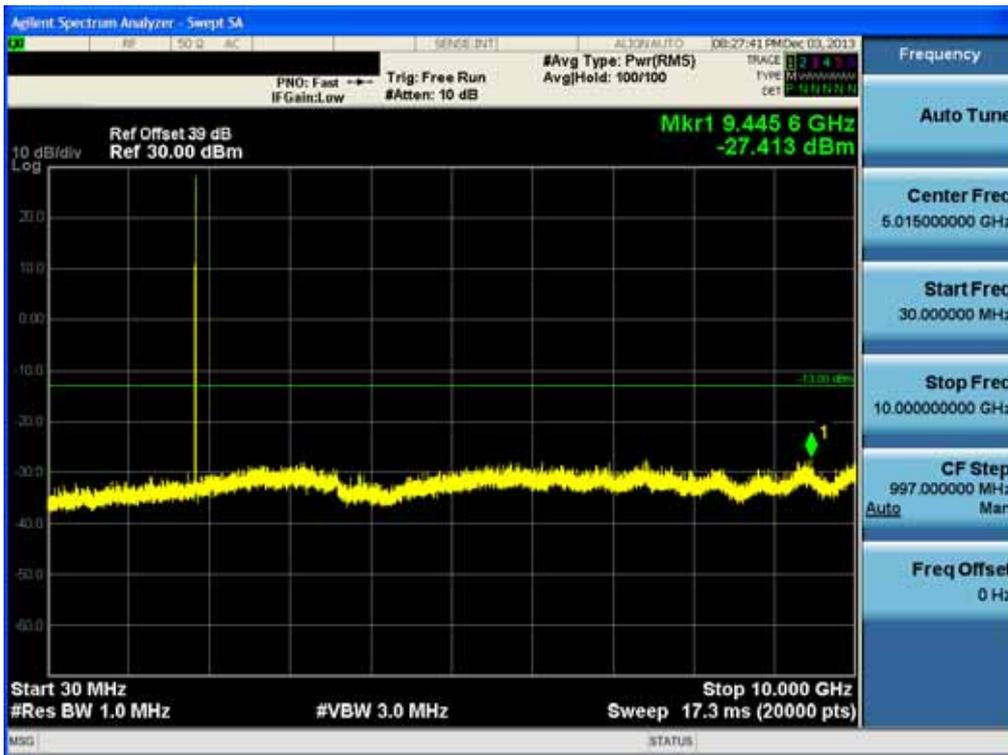
BAND 5. Upper Band Edge Plot 2 (Ch.20600 QPSK RB 50) 10 MHz



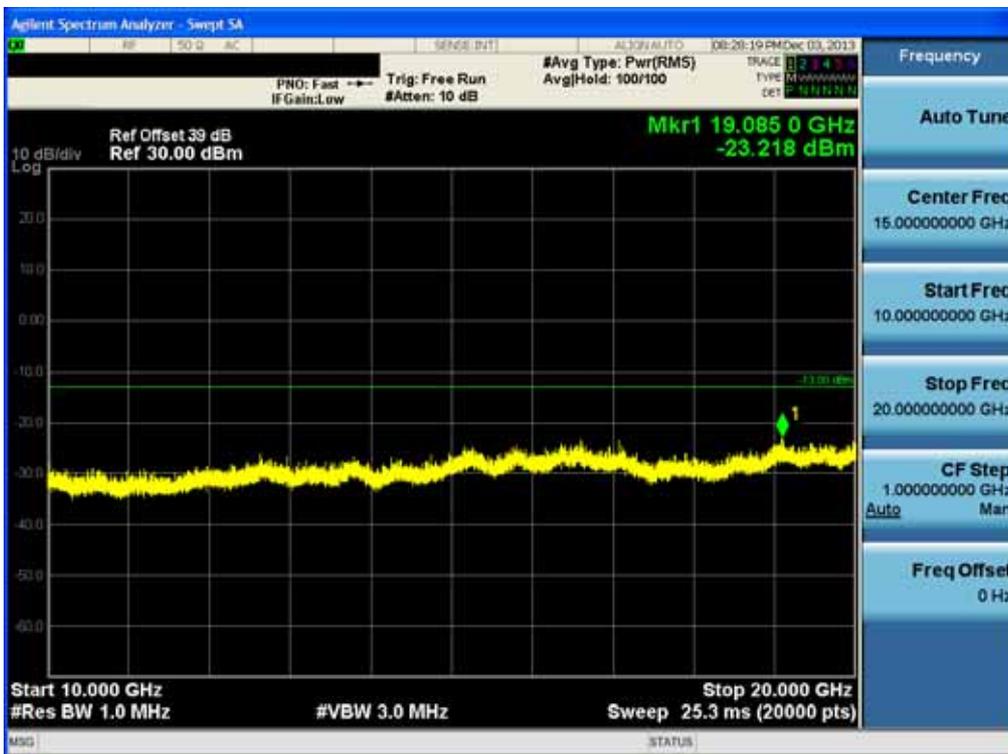
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 2. Conducted Spurious Plot 1 (Ch.18625 QPSK RF 1, Offset 0) 5 MHz



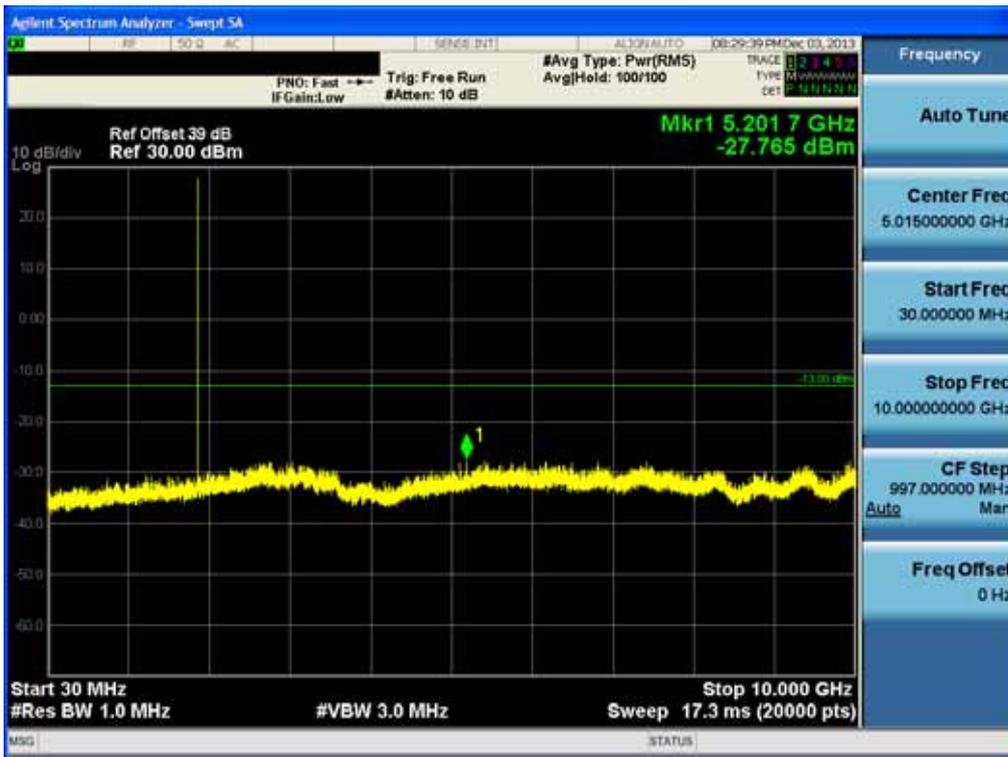
BAND 2. Conducted Spurious Plot 2 (Ch.18625 QPSK RF 1, Offset 0) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 2. Conducted Spurious Plot 1 (Ch.18900 QPSK RF 1, Offset 0) 5 MHz

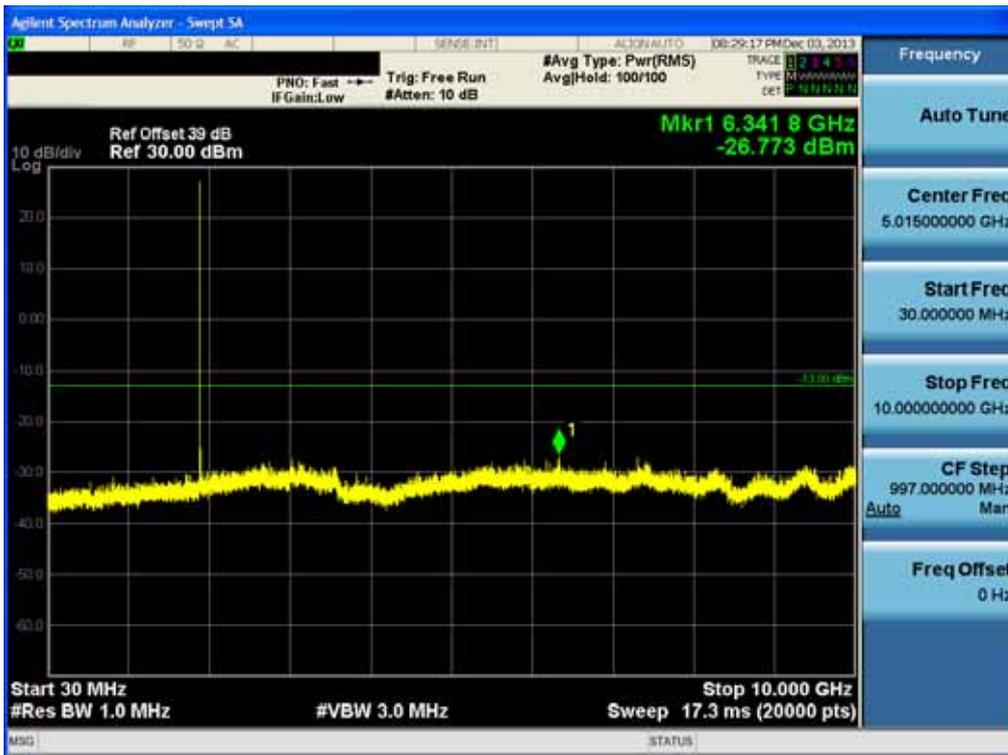


BAND 2. Conducted Spurious Plot 2 (Ch.18900 QPSK RF 1, Offset 0) 5 MHz



FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10

BAND 2. Conducted Spurious Plot 1 (Ch.19175 QPSK RF 1, Offset 0) 5 MHz

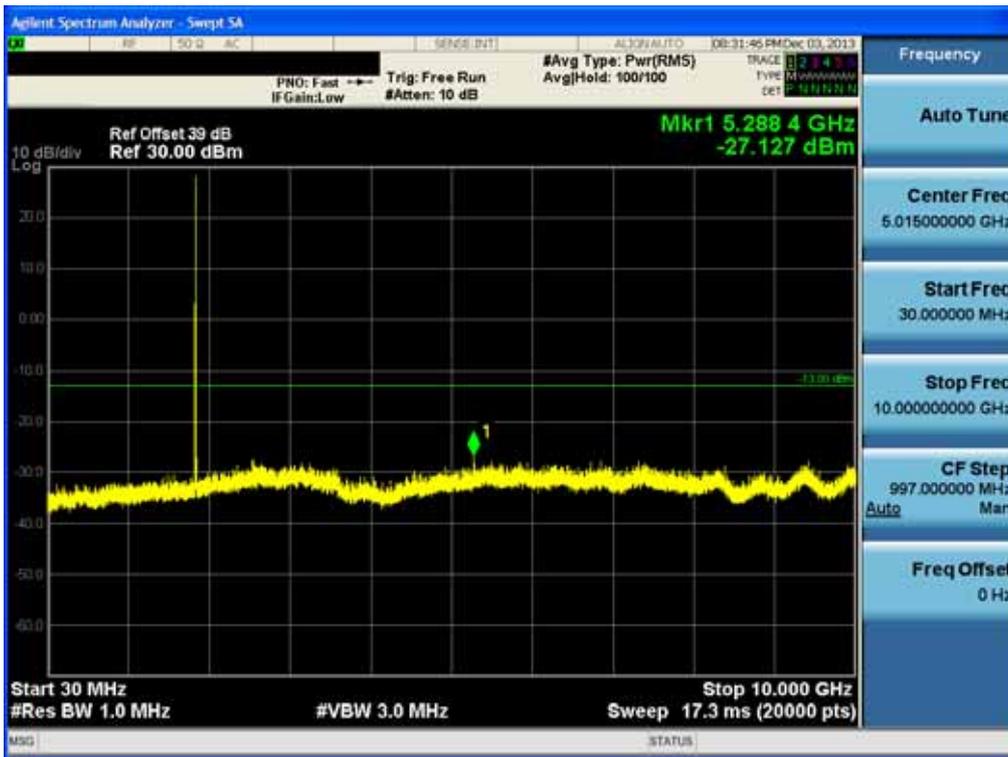


BAND 2. Conducted Spurious Plot 2 (Ch.19175 QPSK RF 1, Offset 0) 5 MHz

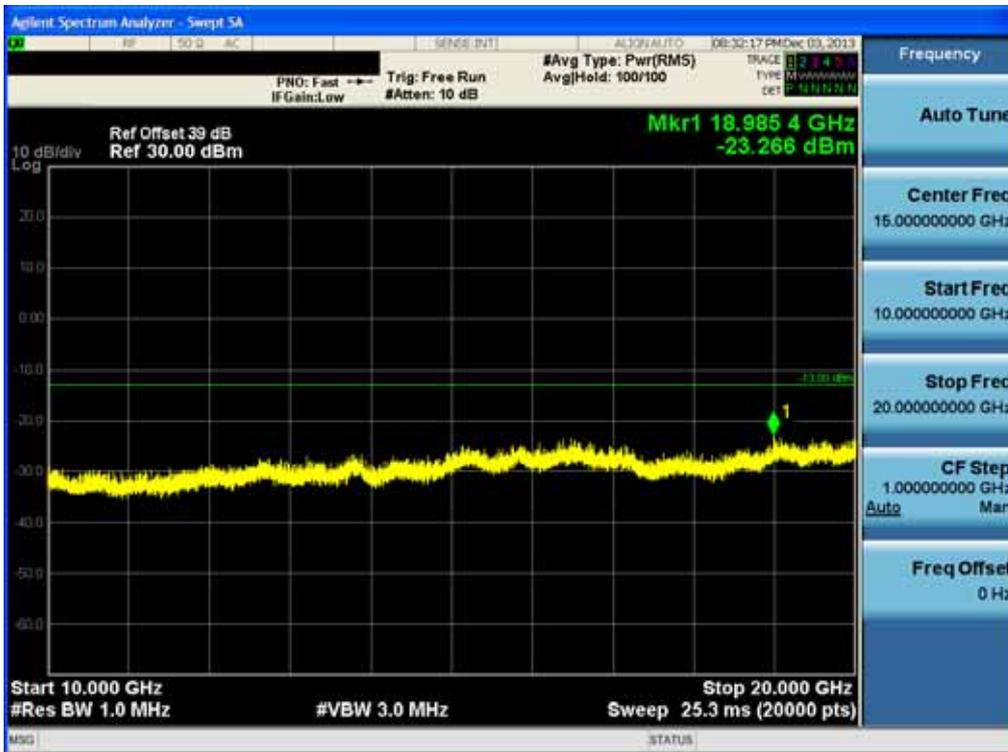


FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10

BAND 2. Conducted Spurious Plot 1 (Ch.18650 QPSK RF 1, Offset 0) 10 MHz

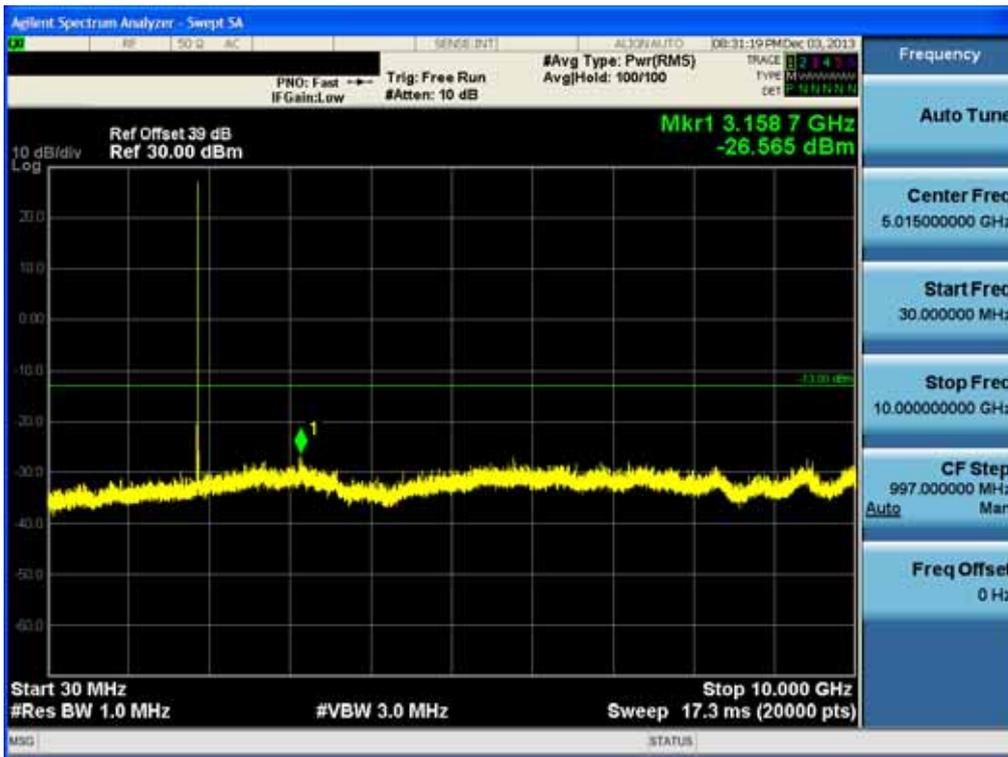


BAND 2. Conducted Spurious Plot 2 (Ch.18650 QPSK RF 1, Offset 0) 10 MHz

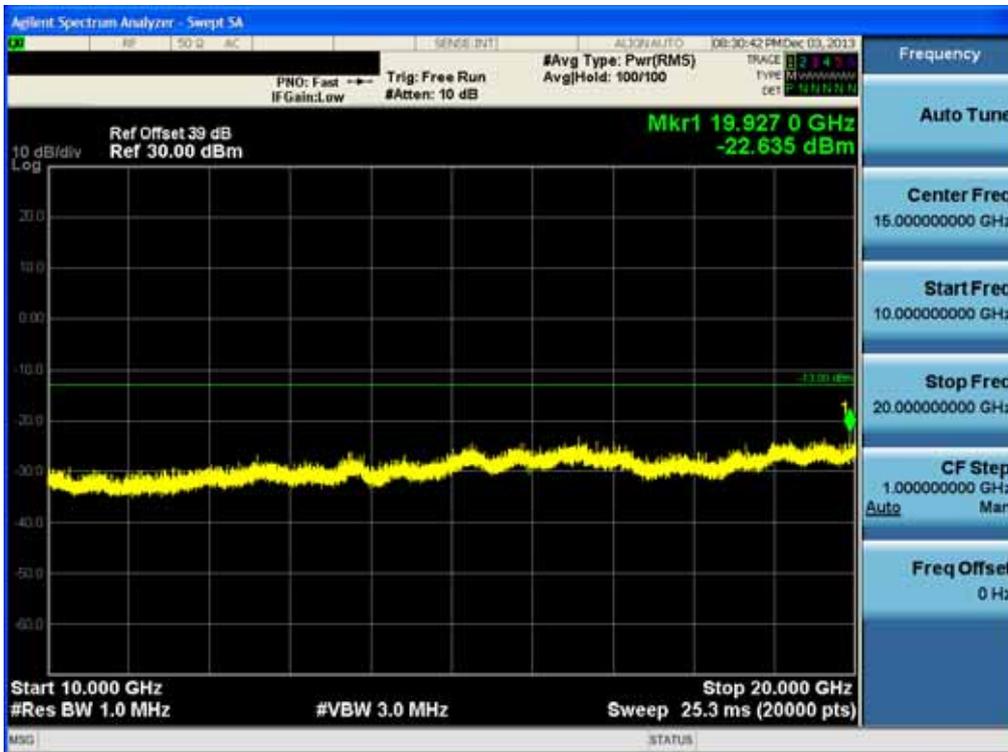


FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10

BAND 2. Conducted Spurious Plot 1 (Ch.18900 QPSK RF 1, Offset 0) 10 MHz



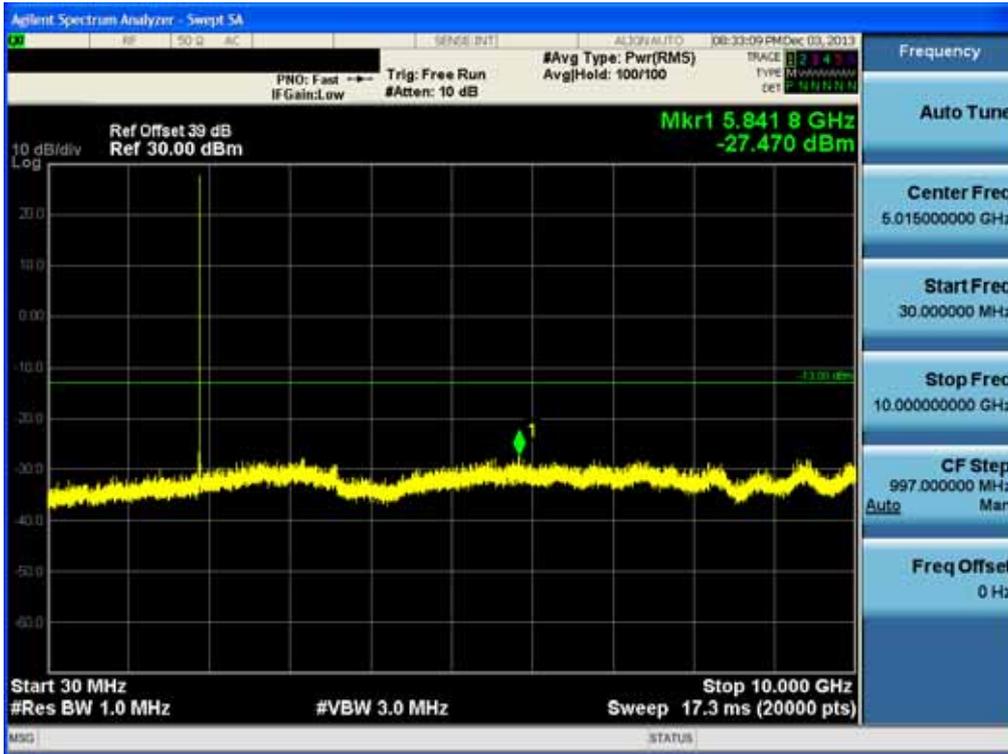
BAND 2. Conducted Spurious Plot 2 (Ch.18900 QPSK RF 1, Offset 0) 10 MHz



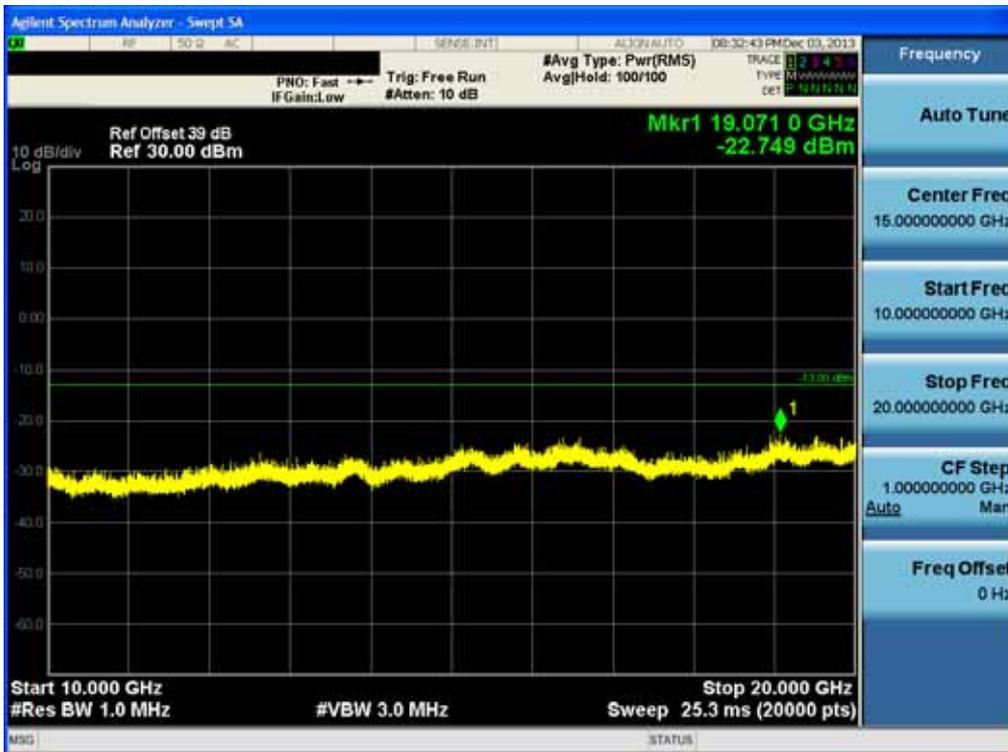
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 2. Conducted Spurious Plot 1 (Ch.19150 QPSK RF 1, Offset 0) 10 MHz



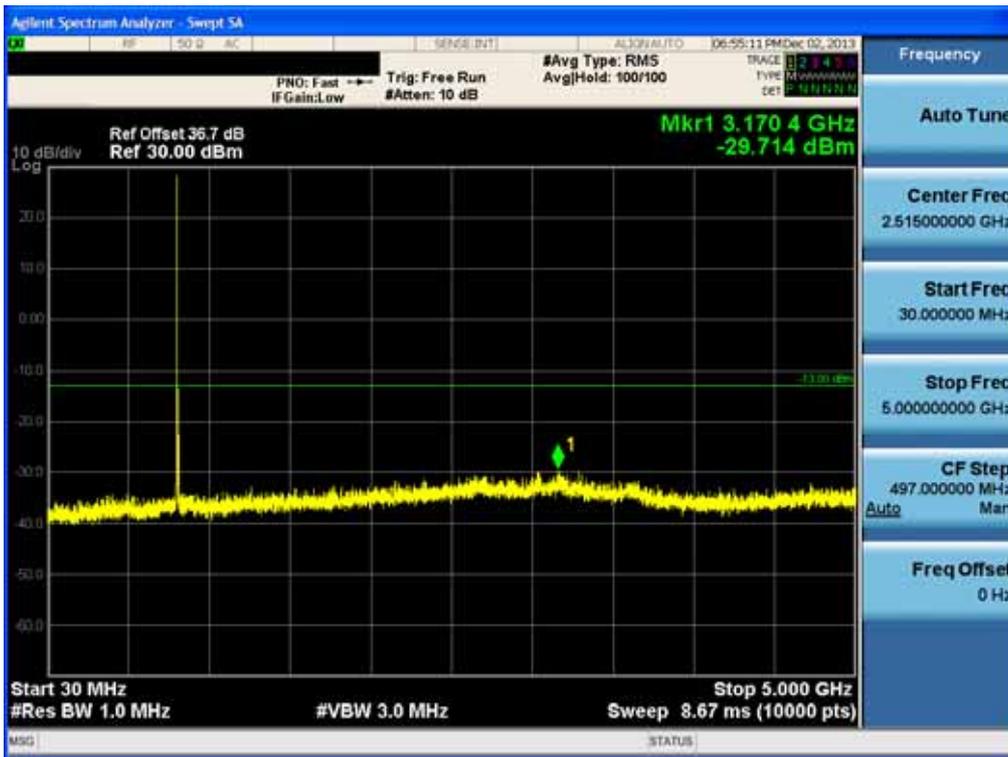
BAND 2. Conducted Spurious Plot 2 (Ch.19150 QPSK RF 1, Offset 0) 10 MHz



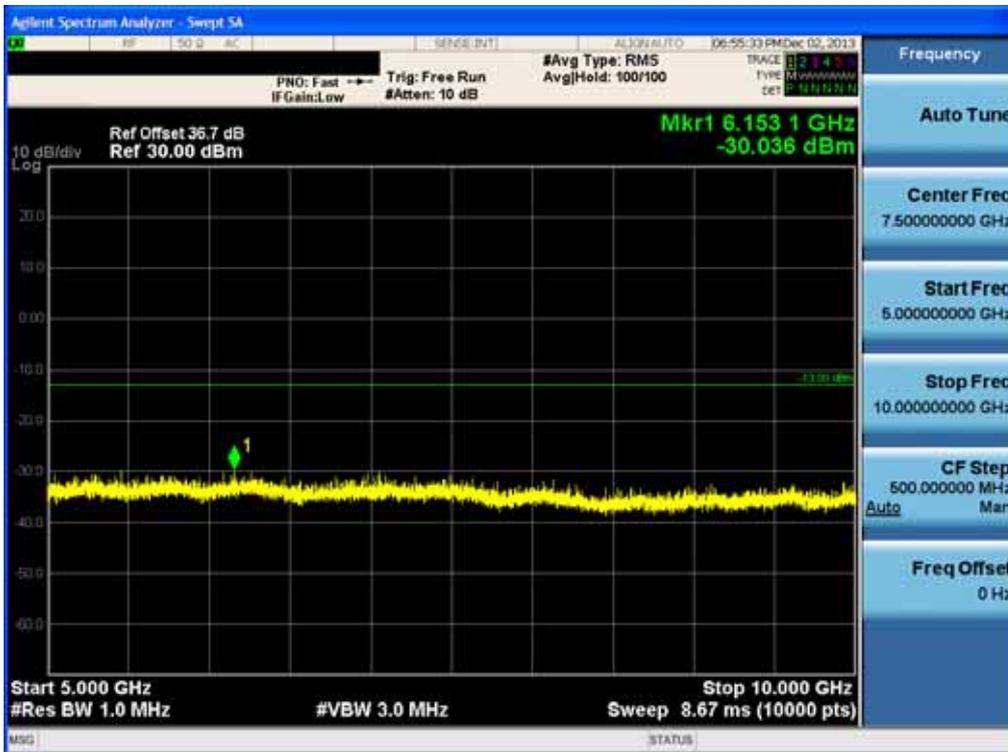
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 5. Conducted Spurious Plot 1 (Ch.20425 QPSK RF 1, Offset 0) 5 MHz



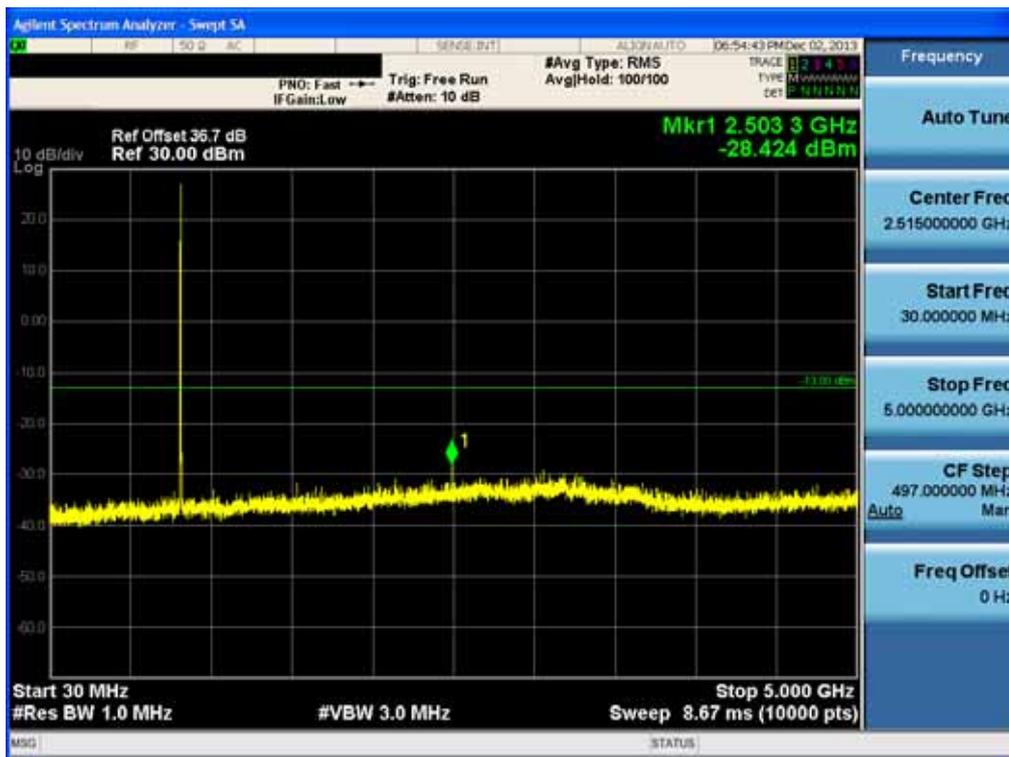
BAND 5. Conducted Spurious Plot 2 (Ch.20425 QPSK RF 1, Offset 0) 5 MHz



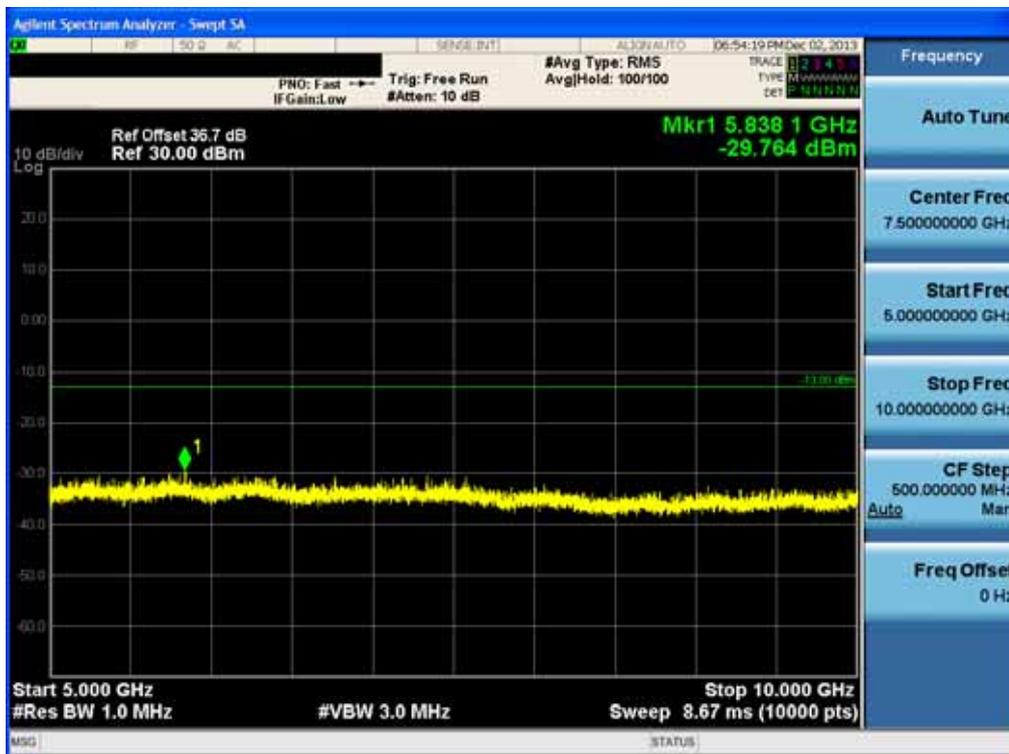
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 5. Conducted Spurious Plot 1 (Ch.20525 QPSK RF 1, Offset 0) 5 MHz



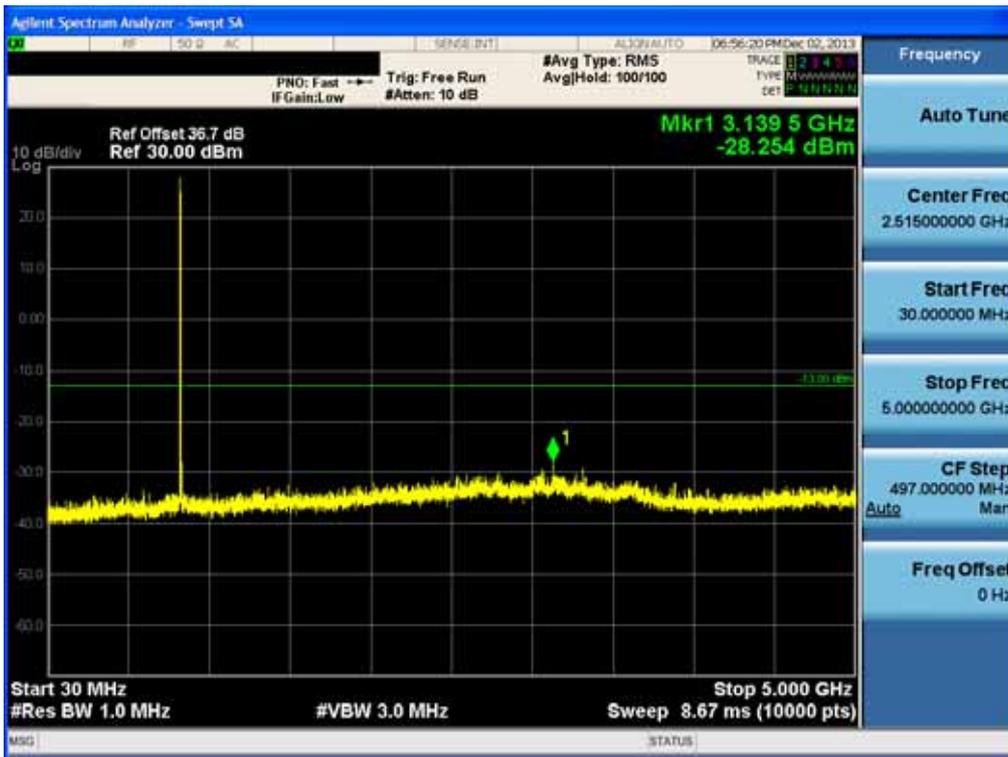
BAND 5. Conducted Spurious Plot 2 (Ch.20525 QPSK RF 1, Offset 0) 5 MHz



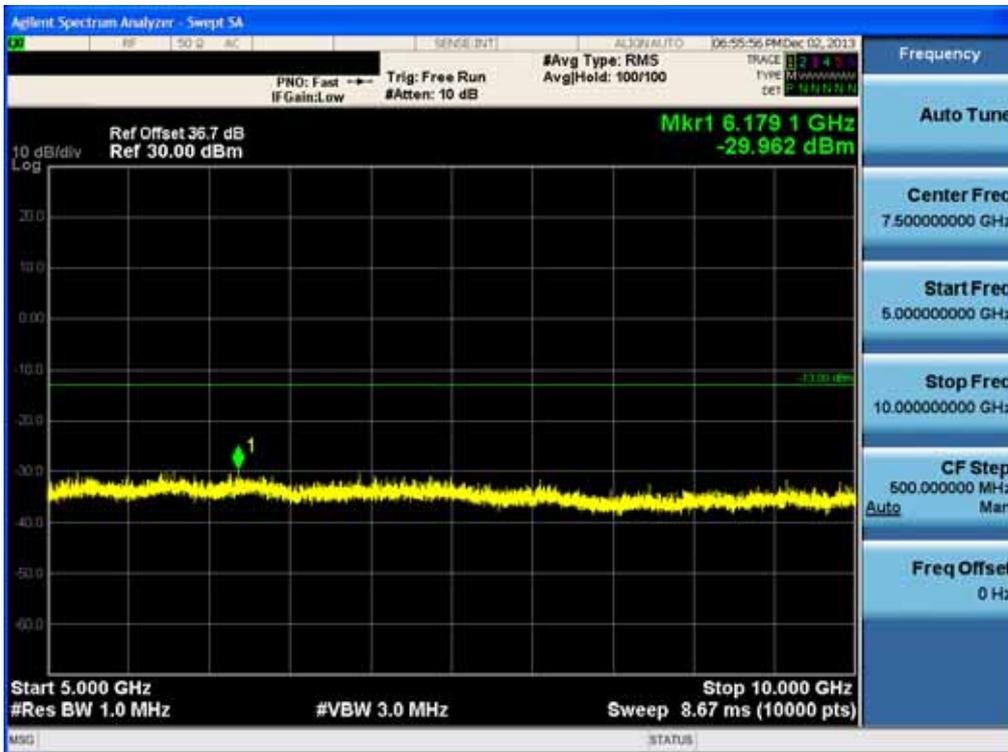
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR05-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	www.hct.co.kr FCC ID: BEJLTC10
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BAND 5. Conducted Spurious Plot 1 (Ch.20625 QPSK RF 1, Offset 0) 5 MHz



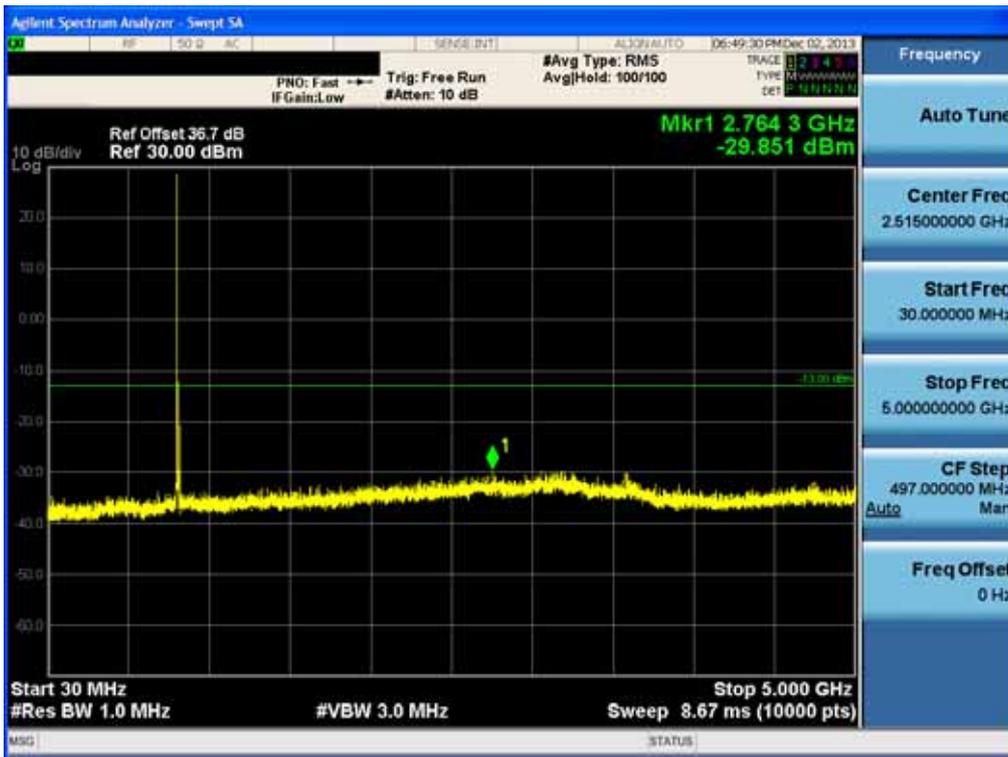
BAND 5. Conducted Spurious Plot 2 (Ch.20625 QPSK RF 1, Offset 0) 5 MHz



FCC CERTIFICATION REPORT

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BAND 5. Conducted Spurious Plot 1 (Ch.20450 QPSK RF 1, Offset 0) 10 MHz



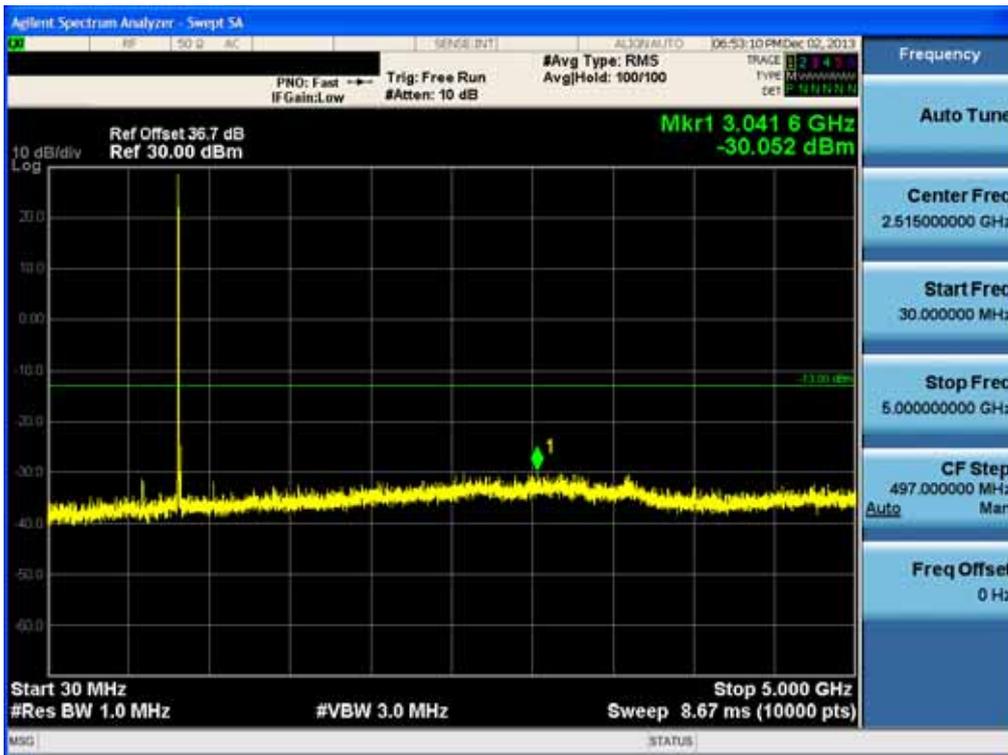
BAND 5. Conducted Spurious Plot 2 (Ch.20450 QPSK RF 1, Offset 0) 10 MHz



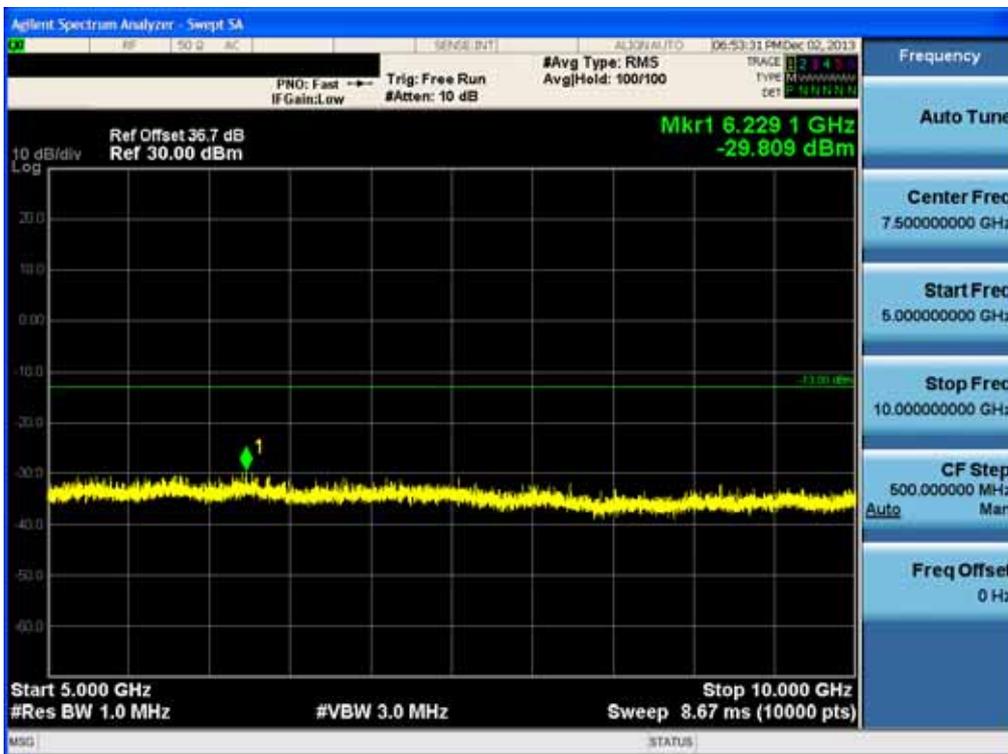
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BAND 5. Conducted Spurious Plot 1 (Ch.20525 QPSK RF 1, Offset 0) 10 MHz



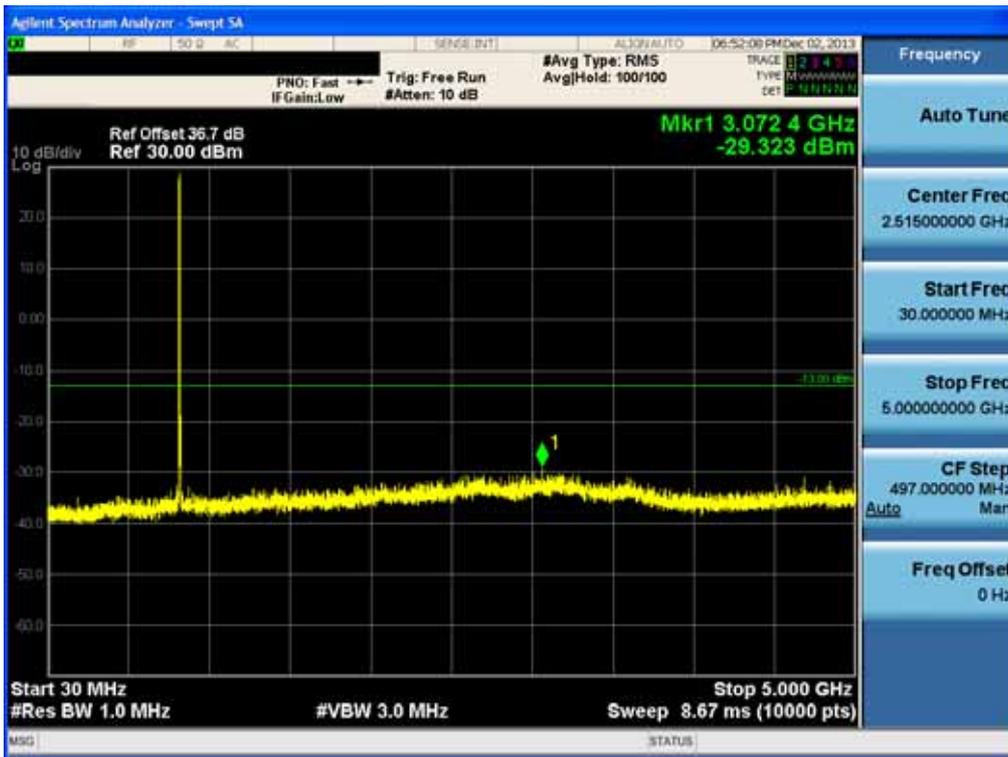
BAND 5. Conducted Spurious Plot 2 (Ch.20525 QPSK RF 1, Offset 0) 10 MHz



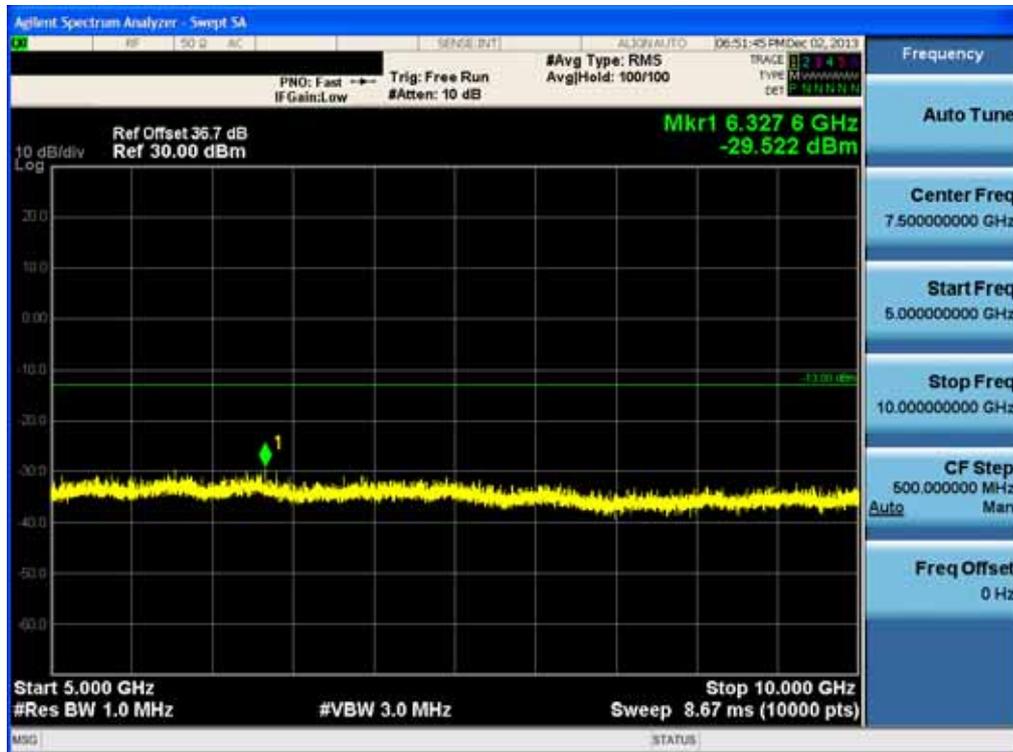
FCC CERTIFICATION REPORT

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BAND 5. Conducted Spurious Plot 1 (Ch.20600 QPSK RF 1, Offset 0) 10 MHz



BAND 5. Conducted Spurious Plot 2 (Ch.20600 QPSK RF 1, Offset 0)10 MHz



FCC CERTIFICATION REPORT

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