

# HCT CO., LTD.

## CERTIFICATE OF COMPLIANCE FCC Certification

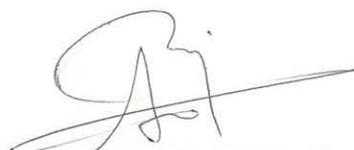
<b>Applicant Name:</b> LG Electronics Inc.	<b>Date of Issue:</b> December 27, 2013
<b>Address:</b> 19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-713, Korea	<b>Test Site/Location:</b> HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea
	<b>Report No.:</b> HCTR1312FR06-3
	<b>HCT FRN:</b> 0005866421

<b>FCC ID:</b>	<b>BEJLTTTC10</b>
<b>APPLICANT:</b>	<b>LG Electronics Inc.</b>

<b>FCC Model(s):</b>	GEN10NADNA																				
<b>EUT Type:</b>	CDMA/GSM/WCDMA/LTE Telematics NAD module																				
<b>FCC Classification:</b>	PCS Licensed Transmitter (PCB)																				
<b>FCC Rule Part(s):</b>	§2, §27																				
<b>Tx Frequency:</b>	706.5 MHz – 713.5 MHz (LTE – Band 17), 1712.5 MHz – 1752.5 MHz (LTE – Band 4) 782 MHz (LTE–Band 13)																				
<b>Max. RF Output Power:</b>	<table border="0"> <tr> <td>Band 4 (5 MHz) :</td> <td>0.219 W (QPSK) (23.40 dBm)</td> </tr> <tr> <td></td> <td>0.170 W (16-QAM) (22.30 dBm)</td> </tr> <tr> <td>Band 4 (10 MHz) :</td> <td>0.215 W (QPSK) (23.33 dBm)</td> </tr> <tr> <td></td> <td>0.172 W (16-QAM) (22.35 dBm)</td> </tr> <tr> <td>Band 17 (5 MHz) :</td> <td>0.202 W (QPSK) (23.05 dBm)</td> </tr> <tr> <td></td> <td>0.161 W (16-QAM) (22.06 dBm)</td> </tr> <tr> <td>Band 17 (10 MHz) :</td> <td>0.200 W (QPSK) (23.02 dBm)</td> </tr> <tr> <td></td> <td>0.159 W (16-QAM) (22.01 dBm)</td> </tr> <tr> <td>Band 13 (10MHz) :</td> <td>0.206 W (QPSK) (23.14 dBm)</td> </tr> <tr> <td></td> <td>0.162 W (16-QAM) (22.10 dBm)</td> </tr> </table>	Band 4 (5 MHz) :	0.219 W (QPSK) (23.40 dBm)		0.170 W (16-QAM) (22.30 dBm)	Band 4 (10 MHz) :	0.215 W (QPSK) (23.33 dBm)		0.172 W (16-QAM) (22.35 dBm)	Band 17 (5 MHz) :	0.202 W (QPSK) (23.05 dBm)		0.161 W (16-QAM) (22.06 dBm)	Band 17 (10 MHz) :	0.200 W (QPSK) (23.02 dBm)		0.159 W (16-QAM) (22.01 dBm)	Band 13 (10MHz) :	0.206 W (QPSK) (23.14 dBm)		0.162 W (16-QAM) (22.10 dBm)
Band 4 (5 MHz) :	0.219 W (QPSK) (23.40 dBm)																				
	0.170 W (16-QAM) (22.30 dBm)																				
Band 4 (10 MHz) :	0.215 W (QPSK) (23.33 dBm)																				
	0.172 W (16-QAM) (22.35 dBm)																				
Band 17 (5 MHz) :	0.202 W (QPSK) (23.05 dBm)																				
	0.161 W (16-QAM) (22.06 dBm)																				
Band 17 (10 MHz) :	0.200 W (QPSK) (23.02 dBm)																				
	0.159 W (16-QAM) (22.01 dBm)																				
Band 13 (10MHz) :	0.206 W (QPSK) (23.14 dBm)																				
	0.162 W (16-QAM) (22.10 dBm)																				
<b>Emission Designator(s):</b>	<table border="0"> <tr> <td>Band 4 (5 MHz) :</td> <td>4M49G7D (QPSK) / 4M49W7D (16-QAM)</td> </tr> <tr> <td>Band 4 (10 MHz) :</td> <td>8M98G7D (QPSK) / 8M94W7D (16-QAM)</td> </tr> <tr> <td>Band 17 (5 MHz) :</td> <td>4M51G7D (QPSK) / 4M51W7D (16-QAM)</td> </tr> <tr> <td>Band 17 (10 MHz) :</td> <td>8M99G7D (QPSK) / 8M97W7D (16-QAM)</td> </tr> <tr> <td>Band 13 (10MHz) :</td> <td>8M99G7D (QPSK) / 8M95W7D (16-QAM)</td> </tr> </table>	Band 4 (5 MHz) :	4M49G7D (QPSK) / 4M49W7D (16-QAM)	Band 4 (10 MHz) :	8M98G7D (QPSK) / 8M94W7D (16-QAM)	Band 17 (5 MHz) :	4M51G7D (QPSK) / 4M51W7D (16-QAM)	Band 17 (10 MHz) :	8M99G7D (QPSK) / 8M97W7D (16-QAM)	Band 13 (10MHz) :	8M99G7D (QPSK) / 8M95W7D (16-QAM)										
Band 4 (5 MHz) :	4M49G7D (QPSK) / 4M49W7D (16-QAM)																				
Band 4 (10 MHz) :	8M98G7D (QPSK) / 8M94W7D (16-QAM)																				
Band 17 (5 MHz) :	4M51G7D (QPSK) / 4M51W7D (16-QAM)																				
Band 17 (10 MHz) :	8M99G7D (QPSK) / 8M97W7D (16-QAM)																				
Band 13 (10MHz) :	8M99G7D (QPSK) / 8M95W7D (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**

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTTTC10

# Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1312FR06	December 05, 2013	-First Approval Report
HCTR1312FR06-1	December 16, 2013	- Revised the following parts : Test period / Test equipment / Conducted power / Section 7.5 PAPR level / Band-edges plots
HCTR1312FR06-2	December 19, 2013	- Revised conducted output power and band-edges plots
HCTR1312FR06-3	December 27, 2013	- Revised Antenna Gain Value on Page 4.

# Table of Contents

1. GENERAL INFORMATION .....		4
2. INTRODUCTION .....		5
2.1. EUT DESCRIPTION.....		5
2.2. MEASURING INSTRUMENT CALIBRATION.....		5
2.3. TEST FACILITY .....		5
3. DESCRIPTION OF TESTS .....		6
3.1 CONDUCTED OUTPUT POWER .....		6
3.2 ERP/EIRP RADIATED POWER AND RADIATED SPURIOUS EMISSIONS.....		7
3.3 PEAK-AVERAGE RATIO. ....		8
3.4 OCCUPIED BANDWIDTH. ....		10
3.5 BLOCK B FREQUENCY RANGE (704 – 710 and 734 – 740 MHz, 777 – 792 MHz) .....		11
3.6 AWS – MOBILE FREQUENCY BLOCKS (1710 – 1755 MHz).....		11
3.7 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.....		12
3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE .....		13
4. LIST OF TEST EQUIPMENT .....		14
5. SUMMARY OF TEST RESULTS .....		15
6. SAMPLE CALCULATION .....		16
7. TEST DATA .....		17
7.1 CONDUCTED OUTPUT POWER .....		17
7.2 EFFECTIVE RADIATED POWER OUTPUT .....		23
7.3 EQUIVALENT ISOTROPIC RADIATED POWER OUTPUT .....		25
7.4 RADIATED SPURIOUS EMISSIONS .....		27
7.4.1 RADIATED SPURIOUS EMISSIONS (Band 4).....		27
7.4.2 RADIATED SPURIOUS EMISSIONS (Band 17).....		29
7.4.3 RADIATED SPURIOUS EMISSIONS (Band 13).....		31
7.4.3.1 RADIATED SPURIOUS EMISSIONS (1559 ~ 1610 MHz Band) .....		31
7.5 PEAK-TO-AVERAGE RATIO .....		32
7.6 OCCUPIED BANDWIDTH .....		33
7.7 CONDUCTED SPURIOUS EMISSIONS .....		34
7.7.1 BAND EDGE.....		34
7.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE .....		35
7.8.1 FREQUENCY STABILITY (LTE Band 4).....		35
7.8.2 FREQUENCY STABILITY (LTE Band 17).....		37
7.8.3 FREQUENCY STABILITY (LTE Band 13).....		39
8. TEST PLOTS.....		40



# MEASUREMENT REPORT

## 1. GENERAL INFORMATION

**Applicant Name:** LG Electronics Inc.

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

**FCC ID:** BEJLTTTC10

**Application Type:** Certification

**FCC Classification:** PCS Licensed Transmitter (PCB)

**FCC Rule Part(s):** §2 , §27

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

**FCC Model(s):** GEN10NADNA

**Tx Frequency:** 706.5 MHz – 713.5 MHz (LTE – Band 17),  
1712.5 MHz – 1752.5 MHz (LTE – Band 4),  
782 MHz (LTE–Band 13)

**Max. RF Output Power:**

Band 4 (5 MHz) :	0.219 W (QPSK) (23.40 dBm)
	0.170 W (16-QAM) (22.30 dBm)
Band 4 (10 MHz) :	0.215 W (QPSK) (23.33 dBm)
	0.172 W (16-QAM) (22.35 dBm)
Band 17 (5 MHz) :	0.202 W (QPSK) (23.05 dBm)
	0.161 W (16-QAM) (22.06 dBm)
Band 17 (10 MHz) :	0.200 W (QPSK) (23.02 dBm)
	0.159 W (16-QAM) (22.01 dBm)
Band 13 (10MHz) :	0.206 W (QPSK) (23.14 dBm)
	0.162 W (16-QAM) (22.10 dBm)

**Emission Designator(s):**

Band 4 (5 MHz) :	4M49G7D (QPSK) / 4M49W7D (16-QAM)
Band 4 (10 MHz) :	8M98G7D (QPSK) / 8M94W7D (16-QAM)
Band 17 (5 MHz) :	4M51G7D (QPSK) / 4M51W7D (16-QAM)
Band 17 (10 MHz) :	8M99G7D (QPSK) / 8M97W7D (16-QAM)
Band 13 (10MHz) :	8M99G7D (QPSK) / 8M95W7D (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 4: -1.6 dBi  
Band 17: -0.3 dBi  
Band 13: -1.5 dBi

### FCC CERTIFICATION REPORT

<b>Test Report No.</b> HCTR1312FR06-3	<b>Date of Issue:</b> December 27, 2013	<b>EUT Type:</b> CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> <b>FCC ID:</b> BEJLTTTC10
--	--	--	--



## 2. INTRODUCTION

### **2.1. EUT DESCRIPTION**

The LG Electronics Inc. GEN10NADNA CDMA/GSM/WCDMA/LTE Telematics NAD module consists of LTE 4, 13 and 17.

### **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.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTTTC10

### 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.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTTTC10



### 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 ~ 10<sup>th</sup> Harmonics of highest channel fundamental frequency.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10



### 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.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTTTC10

**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:

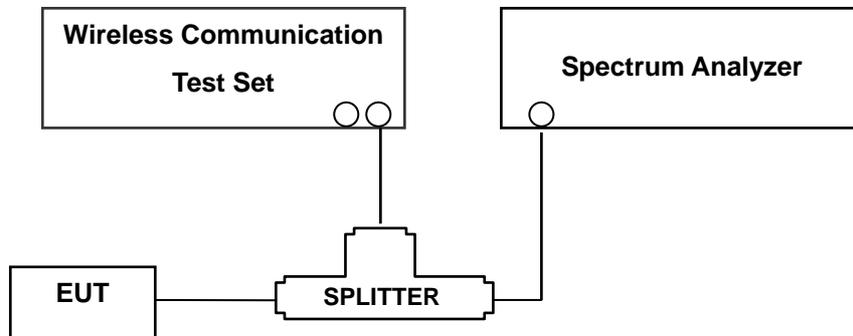
- a) Set span to at least 1.5 times the OBW.
- b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
- c) Set VBW ≥ 3 x RBW.
- d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
- e) Sweep time = auto.
-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

<b>FCC CERTIFICATION REPORT</b>			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
<b>Test Report No.</b> HCTR1312FR06-3	<b>Date of Issue:</b> December 27, 2013	<b>EUT Type:</b> CDMA/GSM/WCDMA/LTE Telematics NAD module	<b>FCC ID:</b> BEJLTC10

### 3.4 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.



### 3.5 BLOCK B FREQUENCY RANGE (704 – 710 and 734 – 740 MHz, 777 – 792 MHz)

§27.5(c)

698-746 MHz Band. The following frequencies are available for licensing pursuant to this part in the 698–746 MHz band: (1) Three paired channel blocks of 12 MHz each are available for assignment as follows :

Block A : 698 – 704 MHz and 728 – 734 MHz ;

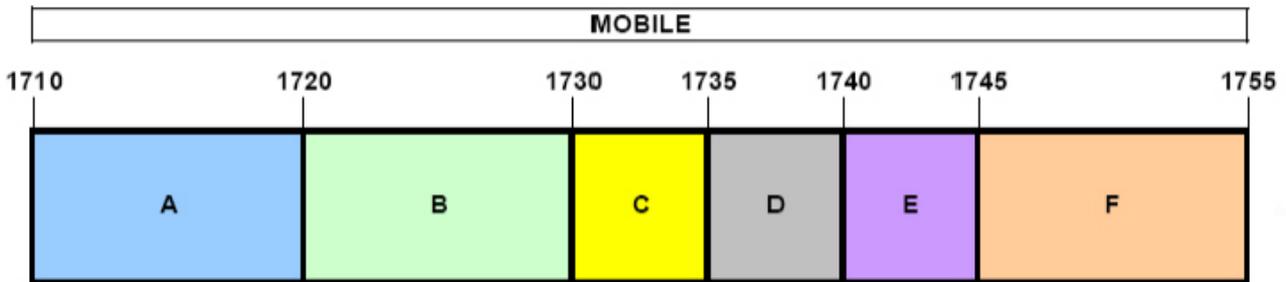
Block B : 704 – 710 MHz and 734 – 740 MHz ; and

Block C : 710 – 716 MHz and 740 – 746 MHz.

The EUT is only being authorized for operation in Blocks B and C.

### 3.6 AWS – MOBILE FREQUENCY BLOCKS (1710 – 1755 MHz)

§27.5(h)



BLOCK 1: 1710 – 1720 MHz (A)

BLOCK 4: 1735 – 1740 MHz (D)

BLOCK 2: 1720 – 1730 MHz (B)

BLOCK 5: 1740 – 1745 MHz (E)

BLOCK 3: 1730 – 1735 MHz (C)

BLOCK 6: 1745 – 1755 MHz (F)



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

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

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

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

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

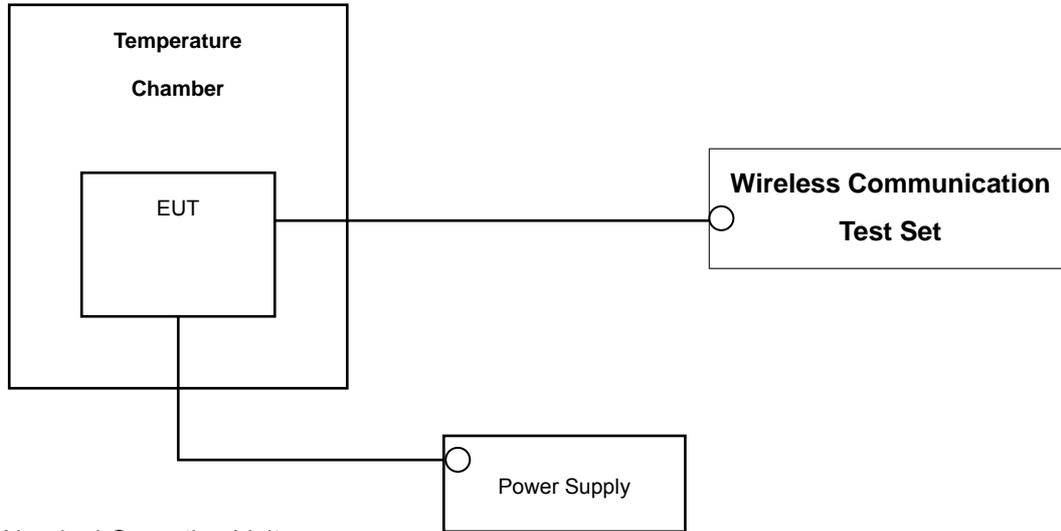
**NOTES:** The analyzer plot offsets were determined by below conditions.

- For LTE Band 4, total offset 37.4 dBm = 30 dBm attenuator + 6 dBm Divider + 1.4 dBm RF cables.
- For LTE Band 13, total offset 36.7 dBm = 30 dBm attenuator + 6 dBm Divider + 0.7 dBm RF cables.
- For LTE Band 17, total offset 36.7 dBm = 20 dBm attenuator + 6 dBm Divider + 0.7 dBm RF cables.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10

### 3.8 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  $\pm 0.00025\%$  ( $\pm 2.5$  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.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTTTC10

## 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

FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

## 5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049, 27.53	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 27.53(c), 27.53(h)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	< 43 +10 log <sub>10</sub> (P[Watts]) at Band Edge and for all-of-band emissions <65 + 10 log (P[Watts]) in a 6.25kHz bandwidth for emissions in the 776–788 MHz bands		PASS
27.50(d)(5)	Peak-Average Ratio	< 13 dB		PASS
2.1046	Conducted Output Power	N/A		PASS
2.1055, 27.54	Frequency stability / variation of ambient temperature	< 2.5 ppm		PASS
27.50(b)(10),(c)(10)	Effective Radiated Power (Band 13, 17)	< 3 Watts max. ERP	RADIATED	PASS
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP		PASS
2.1053, 27.53(c), 27.53(h), 27.53(g)	Undesirable Out-of-Band Emissions	< 43 +10 log <sub>10</sub> (P[Watts]) for all out-of-band emissions		PASS
2.1053,27.53(f)	Undesirable Emissions in the 1559 – 1610 MHz band	< -40dBm/MHz EIRP (wideband) < -50dBm EIRP (narrowband)		PASS

### Note regarding all Emission Mask test plots:

The FCC limit is  $65 + 10\log_{10}(P_{\text{Watts}}) = -35\text{dBm}$  in a 6.25kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25kHz with the available equipment, a bandwidth of 10kHz was used instead to show compliance. By using a 10kHz bandwidth, the limit was adjusted by  $10\log_{10}(10\text{kHz}/6.25\text{kHz}) = 2.04\text{dB}$ . Thus, the limit shown in all emission mask plots for all available modulation types was  $-35\text{dBm} + 2.04\text{dB} = -32.96\text{dBm}$ .

## 6. SAMPLE CALCULATION

### A. ERP Sample Calculation

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

**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 and the antenna height is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power (ERP).

## B. Emission Designator

### QPSK Modulation

#### 5MHz Bandwidth

**Emission Designator = 4M48G7D**

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

#### 10MHz Bandwidth

**Emission Designator = 8M95G7D**

LTE BW = 8.95 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

### 16QAM Modulation

#### 5MHz Bandwidth

**Emission Designator = 4M48W7D**

LTE BW = 4.48 MHz

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

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

#### 10MHz Bandwidth

**Emission Designator = 8M95W7D**

LTE BW = 8.95 MHz

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

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

#### FCC CERTIFICATION REPORT

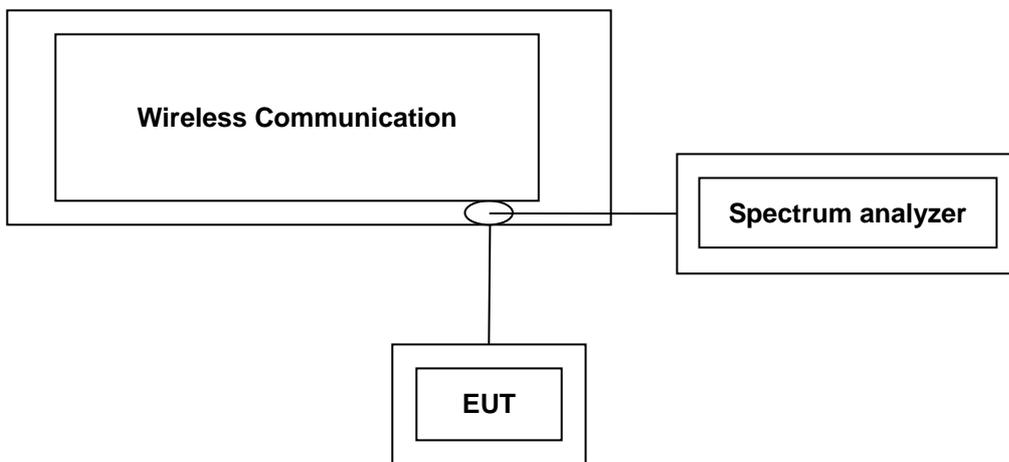
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

## 7. TEST DATA

### 7.1 CONDUCTED OUTPUT POWER

Conducted Output Power is 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.



Test Result

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 4	5	1712.5	19975	1	0	23.40	22.30
				1	12	23.32	22.29
				1	24	23.25	22.07
				12	0	22.20	21.22
				12	6	22.25	21.25
				12	11	22.17	21.15
				25	0	22.15	21.10
		1732.5	20175	1	0	23.11	22.04
				1	12	23.00	21.98
				1	24	23.07	22.00
				12	0	22.00	20.95
				12	6	21.98	20.92
				12	11	22.03	20.96
				25	0	21.95	20.90
		1752.5	20375	1	0	23.20	22.19
				1	12	23.15	22.15
				1	24	23.11	22.14
				12	0	22.18	21.20
				12	6	22.17	21.17
				12	11	22.12	21.15
				25	0	22.12	21.07

LTE Conducted Average Output Powers (5 MHz Band 4 LTE)

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 4	10	1715.0	20000	1	0	23.33	22.30
				1	24	23.10	22.08
				1	49	23.06	21.98
				25	0	22.25	21.21
				25	12	22.15	21.10
				25	24	22.14	21.09
				50	0	22.05	21.05
		1732.5	20175	1	0	23.10	22.26
				1	24	22.98	22.22
				1	49	22.90	22.24
				25	0	22.10	20.86
				25	12	21.95	20.85
				25	24	21.93	20.77
				50	0	21.91	20.76
		1750.0	20350	1	0	23.14	22.35
				1	24	23.19	22.31
				1	49	23.09	22.26
				25	0	22.19	21.25
				25	12	22.05	21.11
				25	24	22.00	21.02
				50	0	21.99	20.98

LTE Conducted Average Output Powers (10 MHz Band 4 LTE)

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 17	5	706.5	23755	1	0	23.05	22.06
				1	12	22.96	21.91
				1	24	23.02	21.99
				12	0	21.91	20.92
				12	6	21.98	20.98
				12	11	21.96	21.02
				25	0	21.90	20.79
		710.0	23790	1	0	23.01	21.99
				1	12	23.01	22.04
				1	24	22.90	21.86
				12	0	21.99	20.88
				12	6	22.00	20.93
				12	11	22.07	21.05
				25	0	21.84	20.80
		713.5	23825	1	0	22.83	21.92
				1	12	22.98	21.84
				1	24	22.72	21.70
				12	0	21.87	20.85
				12	6	21.95	20.93
				12	11	21.80	20.82
				25	0	21.65	20.70

LTE Conducted Average Output Powers (5 MHz Band 17 LTE)

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 17	10	709.0	23780	1	0	22.94	21.93
				1	24	23.02	22.01
				1	49	22.90	21.80
				25	0	21.85	20.75
				25	12	21.75	20.80
				25	24	21.79	20.73
				50	0	21.71	20.65
		710.0	23790	1	0	22.83	21.94
				1	24	23.00	21.99
				1	49	23.01	21.91
				25	0	21.90	20.80
				25	12	21.75	20.74
				25	24	21.79	20.80
				50	0	21.71	20.69
		711.0	23800	1	0	22.80	21.82
				1	24	22.93	22.00
				1	49	22.72	21.78
				25	0	21.72	20.77
				25	12	21.77	20.78
				25	24	21.83	20.77
				50	0	21.69	20.60

LTE Conducted Average Output Powers (10 MHz Band 17 LTE)

Band	Band Width (MHz)	Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
						QPSK	16-QAM
Band 13	10	782.0	23230	1	0	23.14	22.10
				1	24	23.00	21.99
				1	49	22.94	21.83
				25	0	21.82	20.75
				25	12	21.92	20.85
				25	24	21.89	20.77
				50	0	21.67	20.73

LTE Conducted Average Output Powers (10 MHz Band 13 LTE)

Note : Detecting mode is average.

- Plots of the EUT's Conducted Output Power are shown Page 41 ~ 43

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



## 7.2 EFFECTIVE RADIATED POWER OUTPUT

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	ERP	
								W	dBm
706.5	5 MHz	QPSK	-10.40	39.88	-10.09	0.79	H	0.794	29.00
		16-QAM	-10.11	40.17	-10.09	0.79	H	0.849	29.29
710.0		QPSK	-9.88	39.59	-10.12	0.81	H	0.735	28.66
		16-QAM	-9.48	39.99	-10.12	0.81	H	0.805	29.06
713.5		QPSK	-9.56	40.87	-10.14	0.98	H	0.944	29.75
		16-QAM	-9.18	41.25	-10.14	0.98	H	1.030	30.13

**Effective Radiated Power Data (Band 17 – 5 MHz)**

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
709.0	10 MHz	QPSK	-10.50	38.89	-10.11	0.79	H	0.630	27.99
		16-QAM	-10.10	39.29	-10.11	0.79	H	0.690	28.39
710.0		QPSK	-10.21	39.26	-10.12	0.81	H	0.681	28.33
		16-QAM	-9.72	39.75	-10.12	0.81	H	0.762	28.82
711.0		QPSK	-10.12	39.78	-10.13	1.00	H	0.733	28.65
		16-QAM	-9.63	40.27	-10.13	1.00	H	0.820	29.14

**Effective Radiated Power Data (Band 17 – 10 MHz)**

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. The receive antenna height and 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 dipole is measured. The ERP is recorded.

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

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	ERP	
								W	dBm
782.0	10 MHz	QPSK	-19.25	40.59	-10.62	0.83	H	0.820	29.14
		16-QAM	-19.02	40.82	-10.62	0.83	H	0.865	29.37

**Effective Radiated Power Data (Band 13 – 10 MHz)**

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. The receive antenna height and 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 dipole is measured. The ERP 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 y plane in LTE mode. Also worst case of detecting Antenna is vertical polarization in LTE mode.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10

### 7.3 EQUIVALENT ISOTROPIC RADIATED POWER OUTPUT

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1712.5	5 MHz	QPSK	-14.45	17.40	9.56	1.36	V	0.363	25.60
		16-QAM	-14.10	17.75	9.56	1.36	V	0.394	25.95
1732.5		QPSK	-15.25	16.62	9.65	1.34	V	0.311	24.93
		16-QAM	-14.77	17.10	9.65	1.34	V	0.348	25.41
1752.5		QPSK	-14.49	17.25	9.75	1.40	V	0.363	25.60
		16-QAM	-14.07	17.67	9.75	1.40	V	0.400	26.02

**Effective Radiated Power Data (Band 4 – 5 MHz)**

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(dBi)	C.L	Pol	EIRP	
								W	dBm
1715.0	10 MHz	QPSK	-14.51	17.51	9.57	1.32	V	0.377	25.76
		16-QAM	-14.25	17.77	9.57	1.32	V	0.400	26.02
1732.5		QPSK	-15.35	16.52	9.65	1.34	V	0.304	24.83
		16-QAM	-15.00	16.87	9.65	1.34	V	0.330	25.18
1750.0		QPSK	-15.00	16.53	9.74	1.40	V	0.307	24.87
		16-QAM	-14.65	16.88	9.74	1.40	V	0.333	25.22

**Effective Radiated Power Data (Band 4 – 10 MHz)**

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. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer.

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

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

**FCC CERTIFICATION REPORT**

<b>Test Report No.</b> HCTR1312FR06-3	<b>Date of Issue:</b> December 27, 2013	<b>EUT Type:</b> CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> <b>FCC ID:</b> BEJLTC10
--	--	--	--



## 7.4 RADIATED SPURIOUS EMISSIONS

### 7.4.1 RADIATED SPURIOUS EMISSIONS (Band 4)

OPERATING FREQUENCY : \_\_\_\_\_ 1732.50 MHz  
 MEASURED OUTPUT POWER: \_\_\_\_\_ 26.02 dBm = 0.400W  
 MODULATION SIGNAL: \_\_\_\_\_ 5 MHz 16-QAM  
 DISTANCE: \_\_\_\_\_ 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  \_\_\_\_\_ 39.02 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20000 (1712.50)	3425.0	-24.47	12.38	-30.97	2.04	H	-20.63	46.65
	5137.5	-32.70	12.86	-32.37	2.71	H	-22.22	48.24
	6850.0	-48.29	12.35	-42.02	3.22	V	-32.89	58.91
20175 (1732.50)	3465.0	-26.13	12.38	-32.34	1.97	H	-21.93	47.95
	5197.5	-39.57	12.97	-39.35	2.70	H	-29.08	55.10
	6930.0	-53.61	12.15	-46.52	3.27	H	-37.64	63.66
20350 (1752.50)	3505.0	-21.89	12.32	-27.59	2.11	V	-17.38	43.40
	5257.5	-36.73	13.11	-37.11	2.80	V	-26.80	52.82
	7010.0	-53.48	11.89	-45.82	3.14	H	-37.07	63.09

- 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 10<sup>th</sup> 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.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10



OPERATING FREQUENCY : 1732.50 MHz  
 MEASURED OUTPUT POWER: 26.02 dBm = 0.400W  
 MODULATION SIGNAL: 10 MHz 16-QAM  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  39.02 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20000 (1715.00)	3430.00	-23.60	12.38	-30.10	2.04	V	-19.76	45.78
	5145.00	-34.13	12.87	-33.69	2.71	H	-23.53	49.55
	6860.00	-49.71	12.32	-43.52	3.24	H	-34.44	60.46
20175 (1732.50)	3465.00	-26.57	12.38	-32.78	1.97	V	-22.37	48.39
	5197.50	-38.79	12.97	-38.57	2.70	H	-28.30	54.32
	6930.00	-52.55	12.15	-45.46	3.27	V	-36.58	62.60
20350 (1750.00)	3500.00	-25.54	12.32	-31.29	2.11	V	-21.08	47.10
	5250.00	-38.87	13.08	-39.20	2.82	V	-28.94	54.96
	7000.00	-53.63	11.92	-46.66	2.99	H	-37.73	63.75

- 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 10<sup>th</sup> 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.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTTTC10



## 7.4.2 RADIATED SPURIOUS EMISSIONS (Band 17)

OPERATING FREQUENCY : 706.50 MHz  
 MEASURED OUTPUT POWER: 30.13 dBm = 1.030W  
 MODULATION SIGNAL: 5 MHz 16-QAM  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  43.13 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	dBc
23755 (706.50)	1413.00	-50.02	5.25	-54.01	1.08	V	-49.84	79.97
	2119.50	-	-	-	-	-	-	-
	2826.00	-	-	-	-	-	-	-
23790 (710.00)	1420.00	-45.85	5.25	-51.10	0.50	V	-46.35	76.48
	2130.00	-	-	-	-	-	-	-
	2840.00	-	-	-	-	-	-	-
23825 (713.50)	1427.00	-45.99	5.33	-50.71	1.09	V	-46.47	76.60
	2140.50	-	-	-	-	-	-	-
	2854.00	-	-	-	-	-	-	-

- 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 10<sup>th</sup> 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.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10



OPERATING FREQUENCY : 710.00 MHz  
 MEASURED OUTPUT POWER: 29.14 dBm = 0.820W  
 MODULATION SIGNAL: 10 MHz -16QAM  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  42.14 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	dBc
23780 (709.00)	1418.00	-49.32	5.25	-53.31	1.08	V	-49.14	78.28
	2127.00	-	-	-	-	-	-	-
	2836.00	-	-	-	-	-	-	-
23790 (710.00)	1420.00	-51.54	5.25	-56.79	0.50	V	-52.04	81.18
	2130.00	-	-	-	-	-	-	-
	2840.00	-	-	-	-	-	-	-
23800 (711.00)	1422.00	-47.81	5.33	-52.53	1.09	V	-48.29	77.43
	2133.00	-	-	-	-	-	-	-
	2844.00	-	-	-	-	-	-	-

- 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 10<sup>th</sup> 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.

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10



### 7.4.3 RADIATED SPURIOUS EMISSIONS (Band 13)

OPERATING FREQUENCY : 782.00 MHz  
 MEASURED OUTPUT POWER: 29.37 dBm = 0.865 W  
 MODULATION SIGNAL: 10 MHz 16-QAM  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  42.37 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	dBc
23230 (782.00)	2346.00	-55.87	7.75	-59.07	1.68	H	-53.00	82.37
	3128.00	-	-	-	-	-	-	-
	3910.00	-	-	-	-	-	-	-

- 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 10<sup>th</sup> 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.

#### 7.4.3.1 RADIATED SPURIOUS EMISSIONS (1559 ~ 1610 MHz Band)

OPERATING FREQUENCY : 782.00 MHz  
 MODULATION SIGNAL: 10 MHz QPSK  
 DISTANCE: 3 meters  
 WIDEBAND EMISSION LIMIT: 40 dBm/MHz

FREQUENCY (MHz)	EMISSION TYPE	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	MARGIN (dB)
1585.5	WIDEBAND	-56.09	6.81	-62.52	1.11	H	-56.82	86.19

#### FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a>
			FCC ID: BEJLTC10

### 7.5 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB )
Band 4	5 MHz	1732.5	QPSK	25	0	5.78
			16-QAM	25	0	6.42
	10 MHz	1732.5	QPSK	50	0	5.77
			16-QAM	50	0	6.39

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB )
Band 17	5 MHz	710.0	QPSK	25	0	6.26
			16-QAM	25	0	6.91
	10 MHz	710.0	QPSK	50	0	6.26
			16-QAM	50	0	6.86

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB )
Band 13	10 MHz	782.0	QPSK	50	0	5.95
			16-QAM	50	0	6.65

- Plots of the EUT's Peak- to- Average Ratio are shown Page 49 ~ 53

## 7.6 OCCUPIED BANDWIDTH

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( MHz )
Band 4	5	1732.5	QPSK	25	0	4.4940
			16-QAM	25	0	4.4936
	10	1732.5	QPSK	50	0	8.9845
			16-QAM	50	0	8.9438

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( MHz )
Band 17	5	710.0	QPSK	25	0	4.5052
			16-QAM	25	0	4.5089
	10	710.0	QPSK	50	0	8.9906
			16-QAM	50	0	8.9653

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( MHz )
Band 13	10	782	QPSK	50	0	8.9938
			16-QAM	50	0	8.9548

- Plots of the EUT's Occupied Bandwidth are shown Page 44 ~ 48.

## 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 4	5	1712.5	QPSK	1	0	19.1660	-24.746
		1732.5		1	24	19.9670	-24.861
		1752.5		1	24	19.9805	-24.231
	10	1715.0		1	0	19.9960	-23.295
		1732.5		1	0	19.4875	-24.475
		1750.0		1	0	19.0420	-25.070

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Frequency of Maximum Harmonic (GHz)	Maximum Data [dBm]
Band 17	5	706.5	QPSK	1	0	5.6706	-29.160
		710.0		1	0	3.0053	-29.524
		713.5		1	24	3.0496	-29.035
	10	709.0		1	0	2.6842	-29.336
		710.0		1	0	5.7201	-30.003
		711.0		1	0	6.3231	-29.699

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Frequency of Maximum Harmonic (GHz)	Maximum Data [dBm]
Band 13	10	782	QPSK	1	0	3.2360	-30.999

- Plots of the EUT's Conducted Spurious Emissions are shown Page 66~ 78

### 7.7.1 BAND EDGE

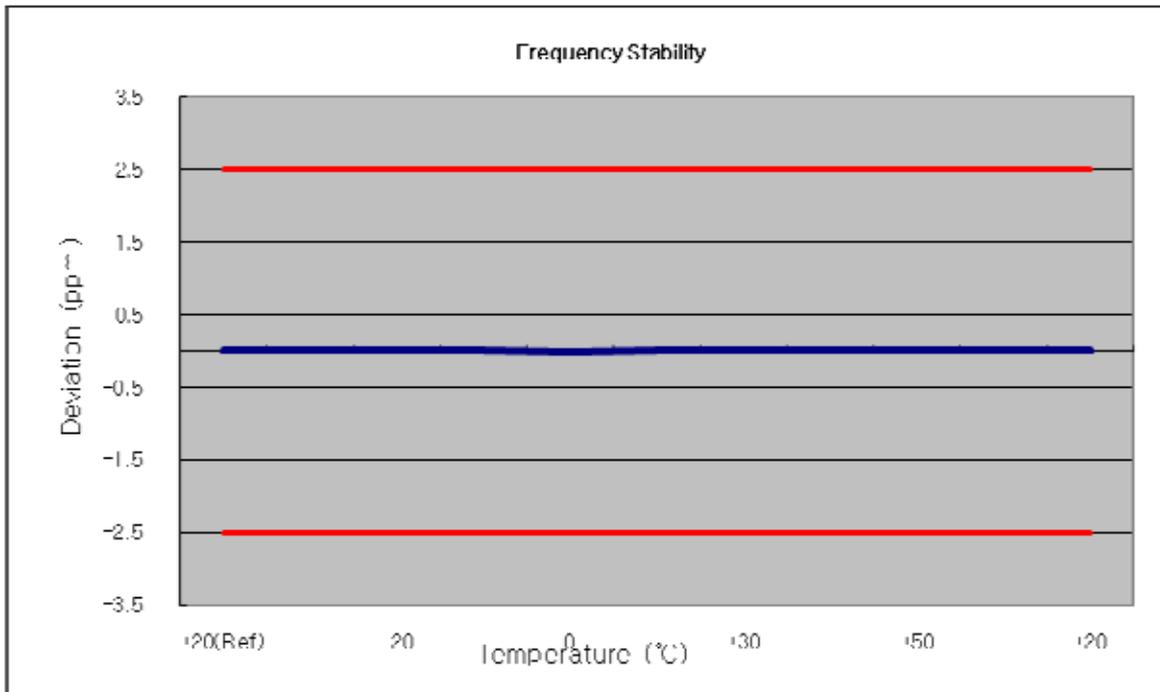
- Plots of the EUT's Band Edge are shown Page 54 ~ 65

## 7.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

### 7.8.1 FREQUENCY STABILITY (LTE Band 4)

OPERATING FREQUENCY: 1732,500,000 Hz  
 CHANNEL: 20175 (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)	1732 499 995	0	0.000 000	0.000
100%		-30	1732 500 001	5.80	0.000 000	0.003
100%		-20	1732 499 991	-3.70	0.000 000	-0.002
100%		-10	1732 499 990	-4.80	0.000 000	-0.003
100%		0	1732 499 984	-11.40	-0.000 001	-0.007
100%		+10	1732 499 988	-7.10	0.000 000	-0.004
100%		+30	1732 499 999	3.60	0.000 000	0.002
100%		+40	1732 500 005	10.20	0.000 001	0.006
100%		+50	1732 500 005	9.90	0.000 001	0.006
115%	13.8	+20	1732 499 989	-5.90	0.000 000	-0.003
85%	10.2	+20	1732 499 990	-4.90	0.000 000	-0.003

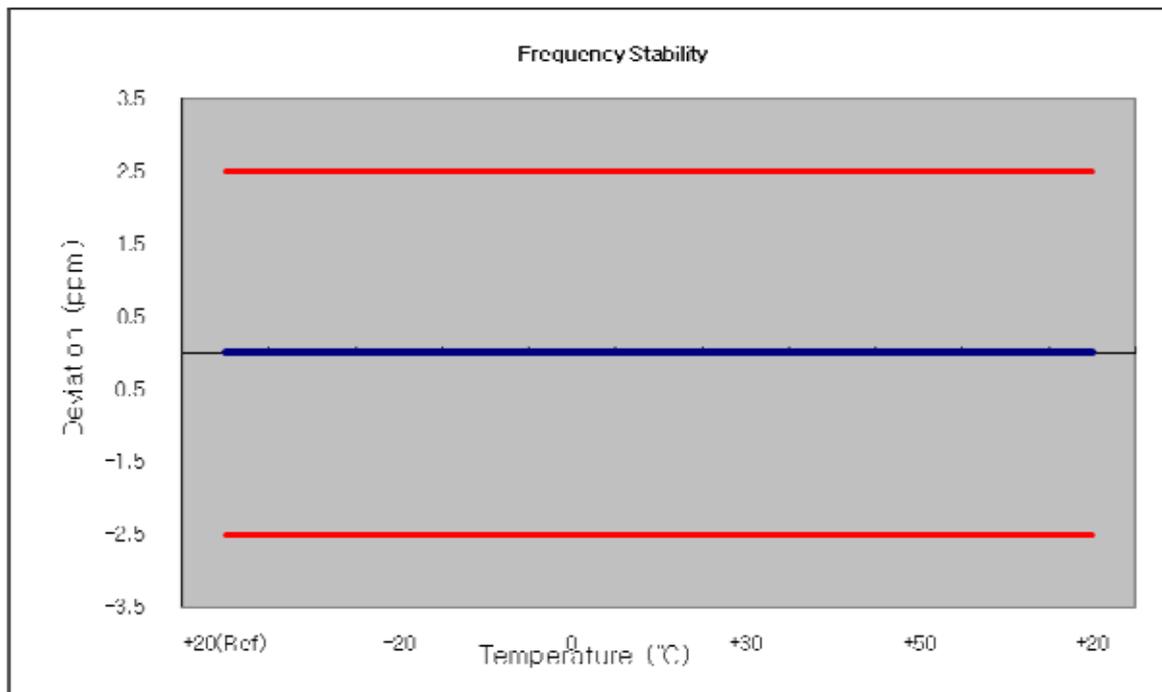


#### FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

OPERATING FREQUENCY: 1732,500,000 Hz  
 CHANNEL: 20175 (10 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)	1732 500 007	0	0.000 000	0.000
100%		-30	1732 499 999	-7.50	0.000 000	-0.004
100%		-20	1732 500 003	-3.50	0.000 000	-0.002
100%		-10	1732 500 003	-3.80	0.000 000	-0.002
100%		0	1732 500 002	-4.50	0.000 000	-0.003
100%		+10	1732 500 013	6.60	0.000 000	0.004
100%		+30	1732 500 015	8.70	0.000 001	0.005
100%		+40	1732 500 015	8.10	0.000 000	0.005
100%		+50	1732 500 015	8.60	0.000 000	0.005
115%		13.8	+20	1732 500 018	11.00	0.000 001
85%	10.2	+20	1732 500 016	9.70	0.000 001	0.006



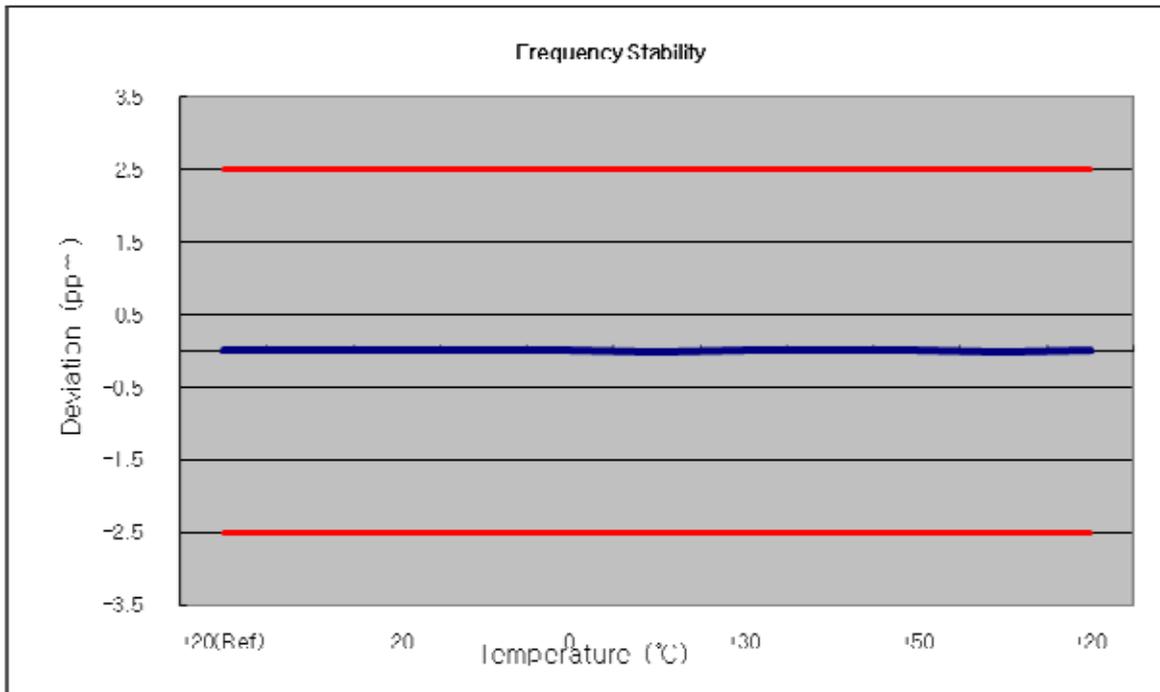
**FCC CERTIFICATION REPORT**

<b>FCC CERTIFICATION REPORT</b>			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTTTC10

### 7.8.2 FREQUENCY STABILITY (LTE Band 17)

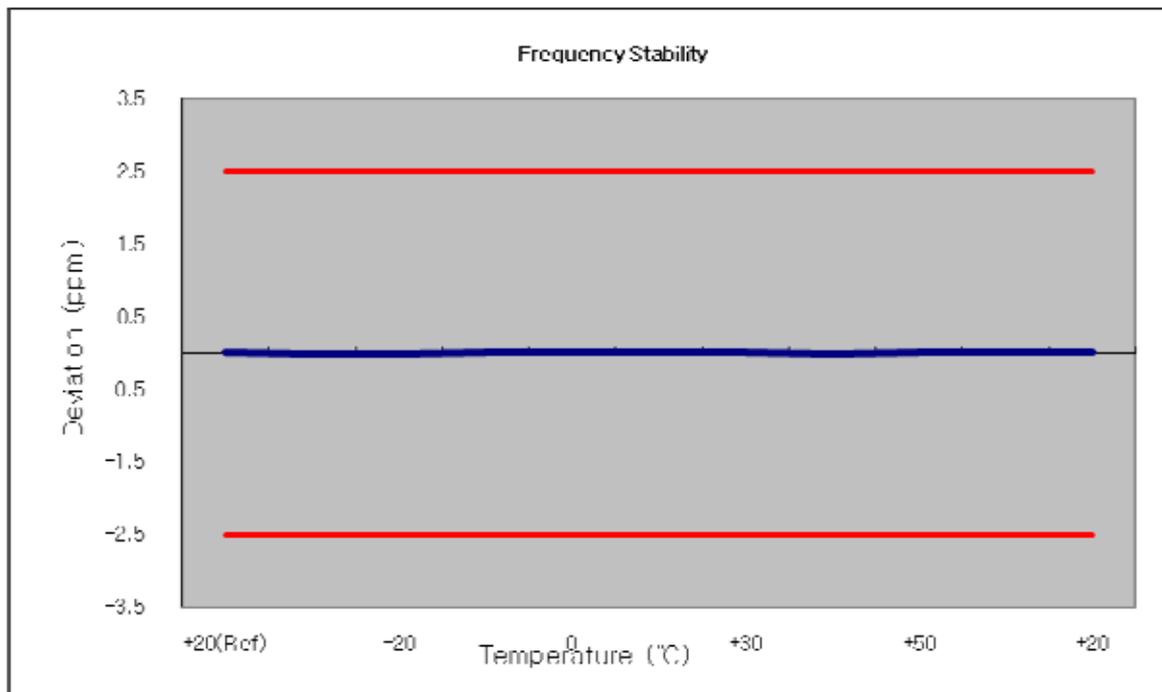
OPERATING FREQUENCY: 710,000,000 Hz  
 CHANNEL: 23790 (5 MHz)  
 REFERENCE VOLTAGE: 12.0 VDC  
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. ( )	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	12.0	+20(Ref)	710 000 005	0	0.000 000	0.000
100%		-30	710 000 009	4.40	0.000 001	0.006
100%		-20	710 000 009	4.00	0.000 001	0.006
100%		-10	710 000 002	-2.70	0.000 000	-0.004
100%		0	710 000 009	3.60	0.000 001	0.005
100%		+10	710 000 001	-4.40	-0.000 001	-0.006
100%		+30	710 000 009	3.90	0.000 001	0.005
100%		+40	710 000 002	-2.70	0.000 000	-0.004
100%		+50	710 000 002	-3.40	0.000 000	-0.005
115%	13.8	+20	710 000 000	-4.90	-0.000 001	-0.007
85%	10.2	+20	710 000 008	2.80	0.000 000	0.004



OPERATING FREQUENCY: 710,000,000 Hz  
 CHANNEL: 23790 (10 MHz)  
 REFERENCE VOLTAGE: 12.0 VDC  
 DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

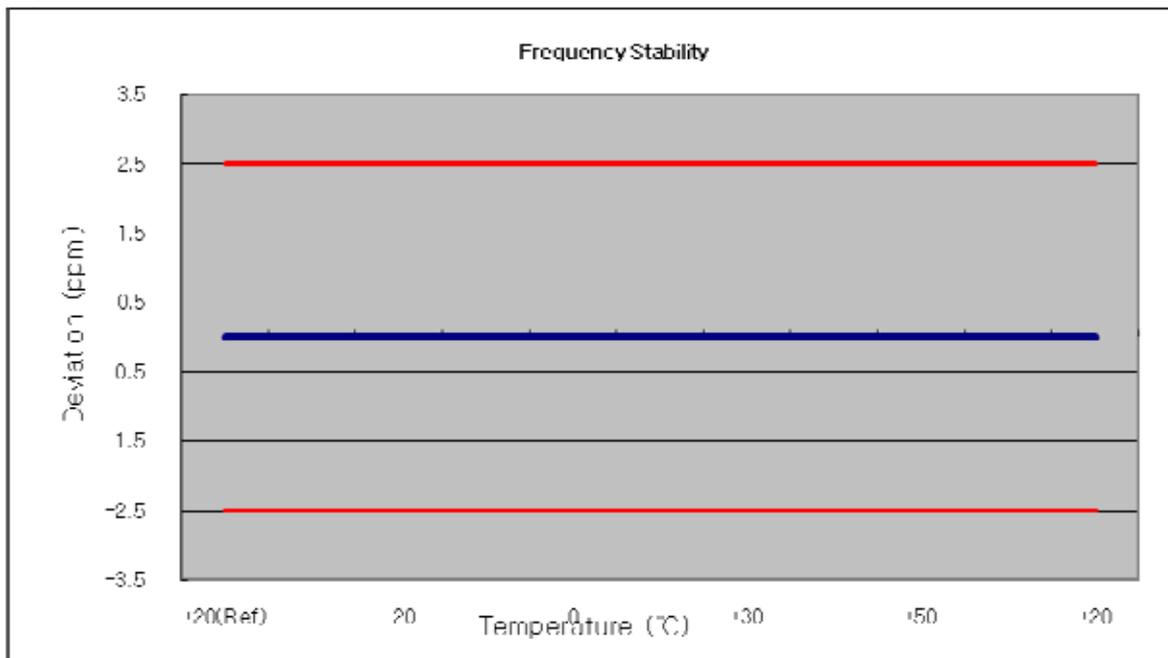
Voltage (%)	Power (VDC)	Temp. ( )	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	12.0	+20(Ref)	710 000 005	0	0.000 000	0.000
100%		-30	710 000 001	-4.00	-0.000 001	-0.006
100%		-20	710 000 000	-5.40	-0.000 001	-0.008
100%		-10	710 000 003	-2.20	0.000 000	-0.003
100%		0	710 000 009	3.90	0.000 001	0.005
100%		+10	710 000 002	-2.70	0.000 000	-0.004
100%		+30	710 000 008	2.80	0.000 000	0.004
100%		+40	709 999 999	-5.80	-0.000 001	-0.008
100%		+50	710 000 010	4.50	0.000 001	0.006
115%		13.8	+20	710 000 007	2.30	0.000 000
85%	10.2	+20	710 000 008	3.00	0.000 000	0.004



### 7.8.3 FREQUENCY STABILITY (LTE Band 13)

OPERATING FREQUENCY: 782,000,000 Hz  
 CHANNEL: 23230 (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)	782 000 004	0	0.000 000	0.000
100%		-30	782 000 008	4.10	0.000 001	0.005
100%		-20	782 000 000	-4.00	-0.000 001	-0.005
100%		-10	782 000 007	3.60	0.000 000	0.005
100%		0	782 000 007	3.50	0.000 000	0.004
100%		+10	781 999 998	-5.30	-0.000 001	-0.007
100%		+30	782 000 008	3.90	0.000 000	0.005
100%		+40	782 000 000	-4.00	-0.000 001	-0.005
100%		+50	782 000 008	4.60	0.000 001	0.006
115%	13.8	+20	782 000 001	-3.00	0.000 000	-0.004
85%	10.2	+20	782 000 006	2.40	0.000 000	0.003



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---



## 8. TEST PLOTS

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10

BAND 4. Conducted Output Power Plot (Ch.20175 QPSK RB 25) 5 MHz



BAND 4. Conducted Output Power Plot (Ch.20175 QPSK RB 50) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Conducted Output Power Plot (Ch.20175 QPSK RB 25) 5 MHz



BAND 17. Conducted Output Power Plot (Ch.20175 16-QAM RB 25) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 13. Conducted Output Power Plot (Ch.23230 QPSK RB 50) 10 MHz



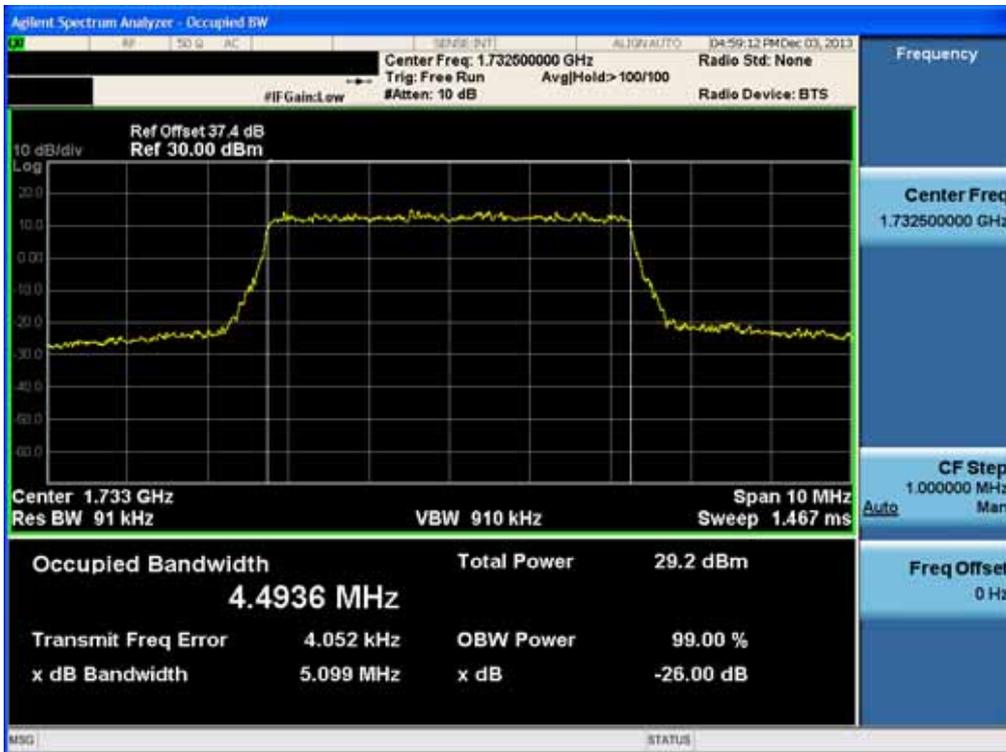
FCC CERTIFICATION REPORT

FCC CERTIFICATION REPORT			<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	FCC ID: BEJLTC10

BAND 4. Occpied Bandwidth Plot (Ch.20175 QPSK RB 25) 5 MHz



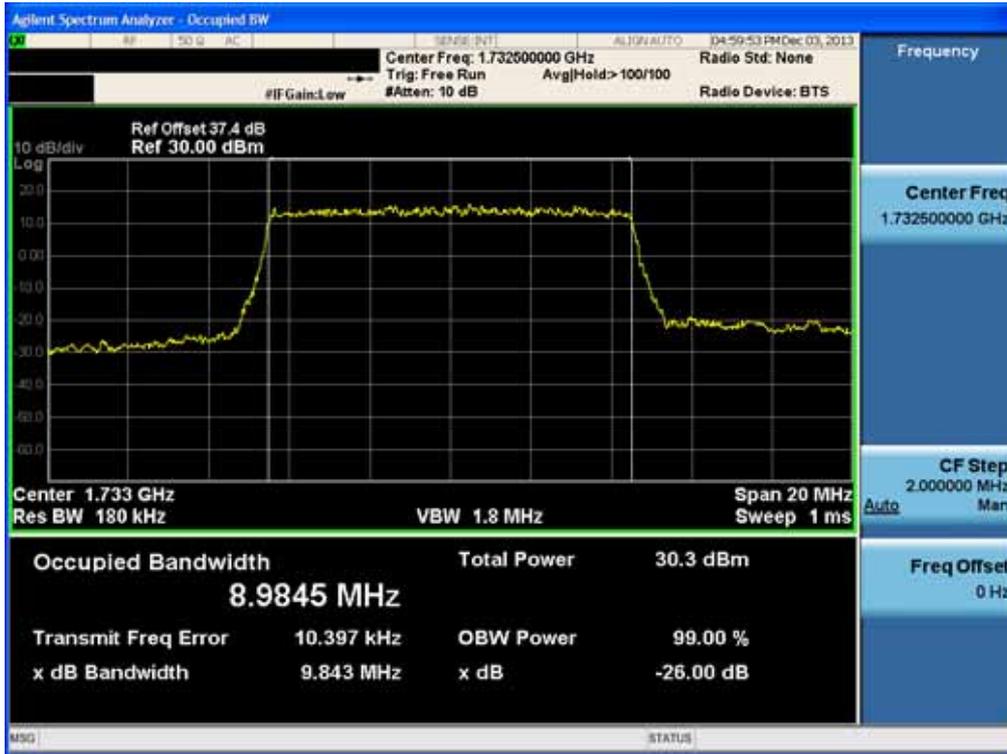
BAND 4. Occpied Bandwidth Plot (Ch.20175 16-QAM RB 25) 5 MHz



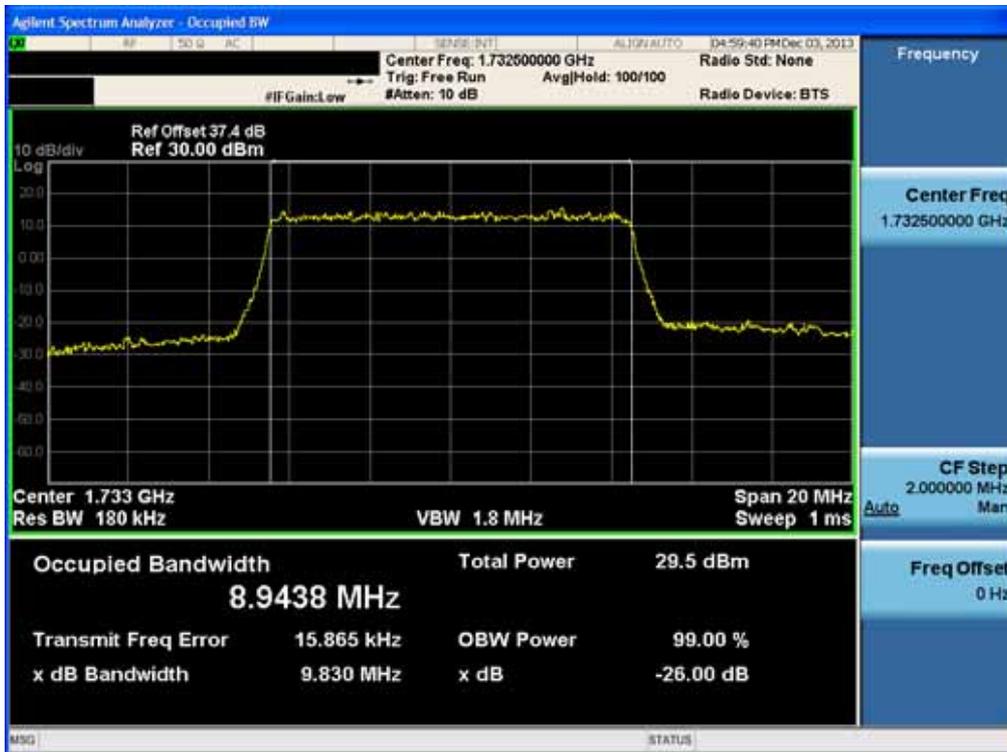
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Occpied Bandwidth Plot (Ch.19975 QPSK RB 50) 10 MHz



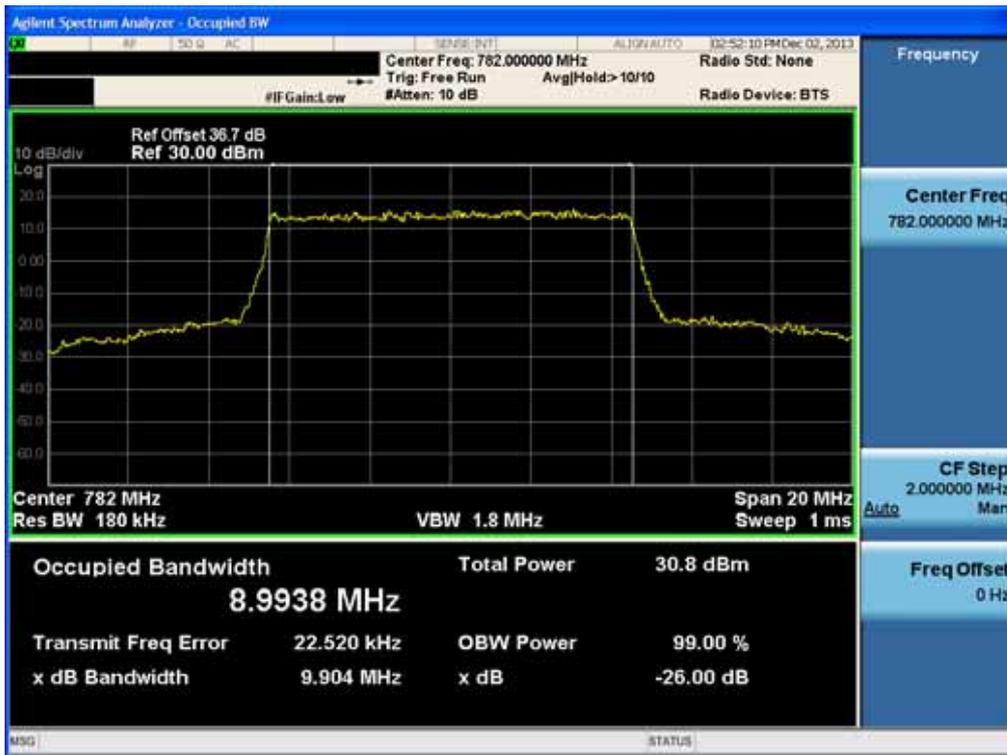
BAND 4. Occpied Bandwidth Plot (Ch.19975 16-QAM RB 50) 10 MHz



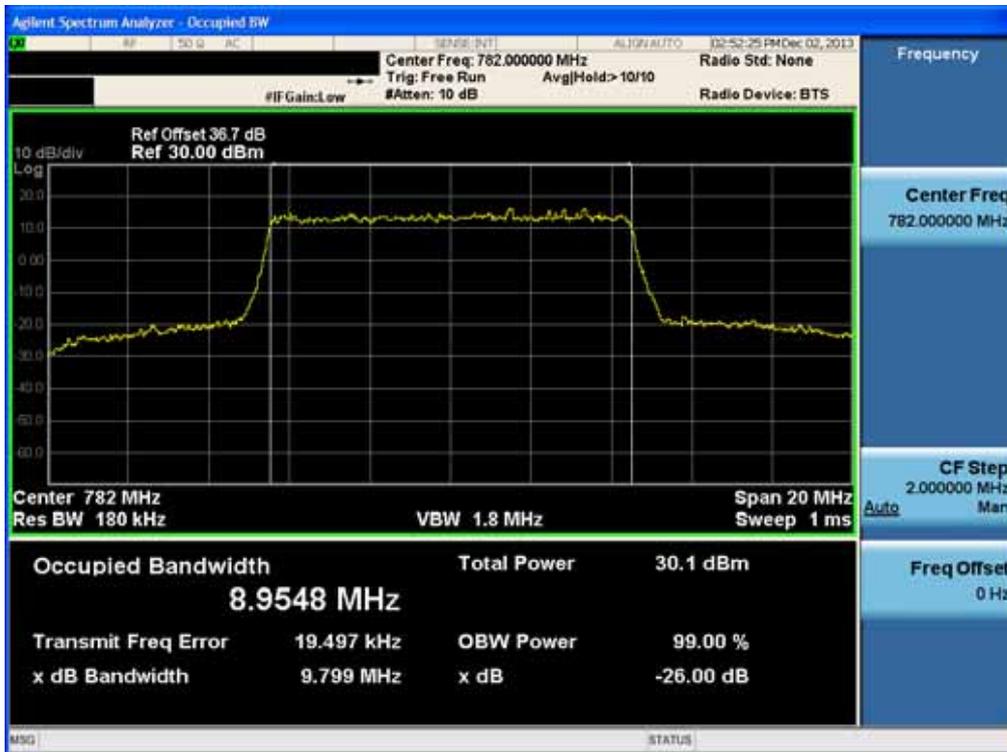
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 13. Occupied Bandwidth Plot (Ch.23230 QPSK RB 50)



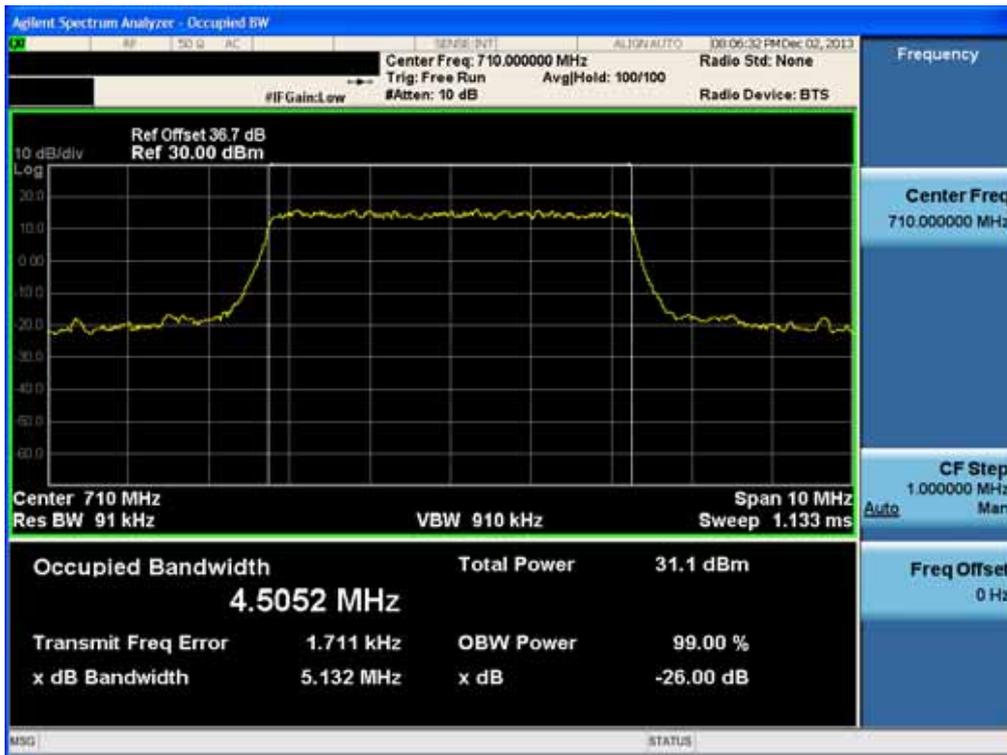
BAND 13. Occupied Bandwidth Plot (Ch.23230 16-QAM RB 50)



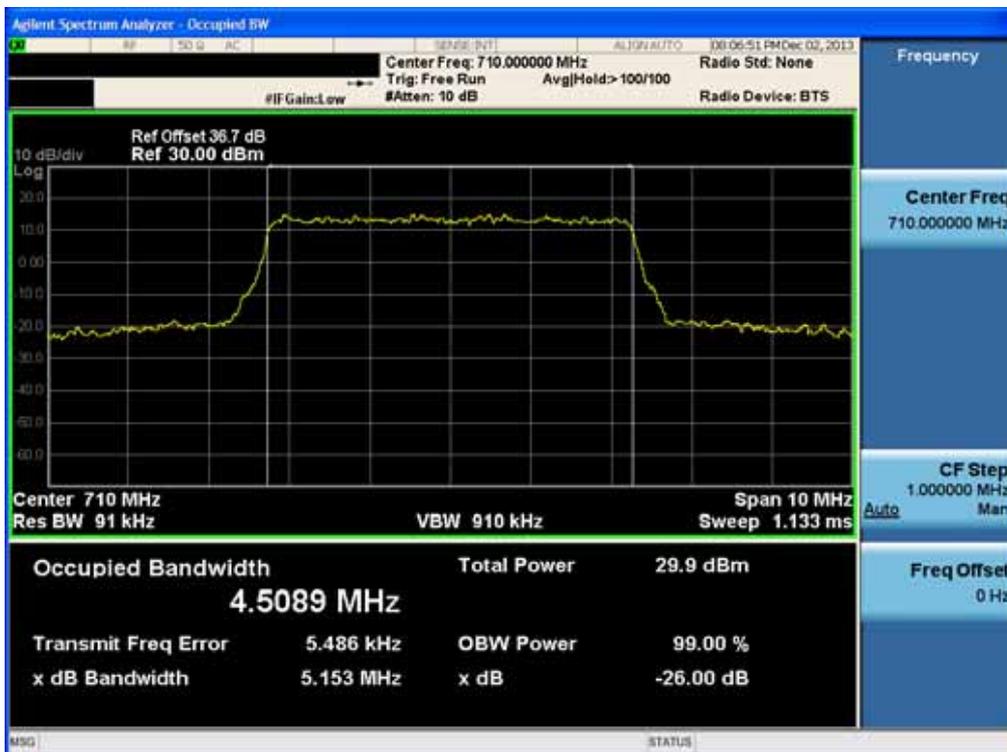
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Occpied Bandwidth Plot (Ch.23790 QPSK RB 25) 5 MHz



BAND 17. Occpied Bandwidth Plot (Ch.23790 16-QAM RB 25) 5 MHz



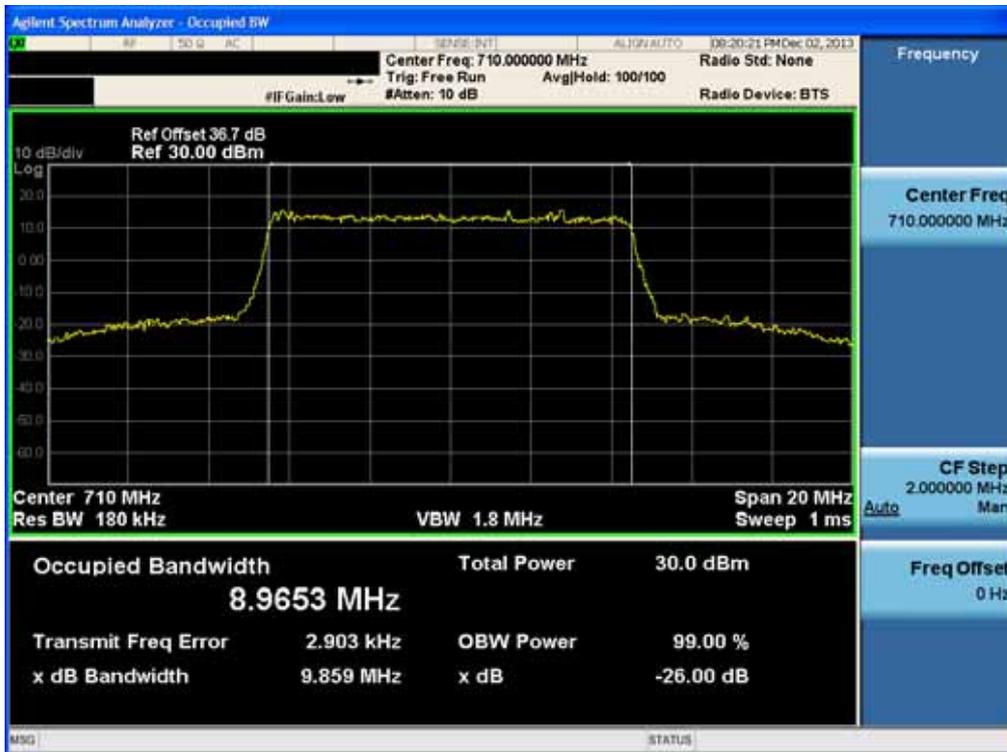
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Occpied Bandwidth Plot (Ch.23790 QPSK RB 50) 10 MHz



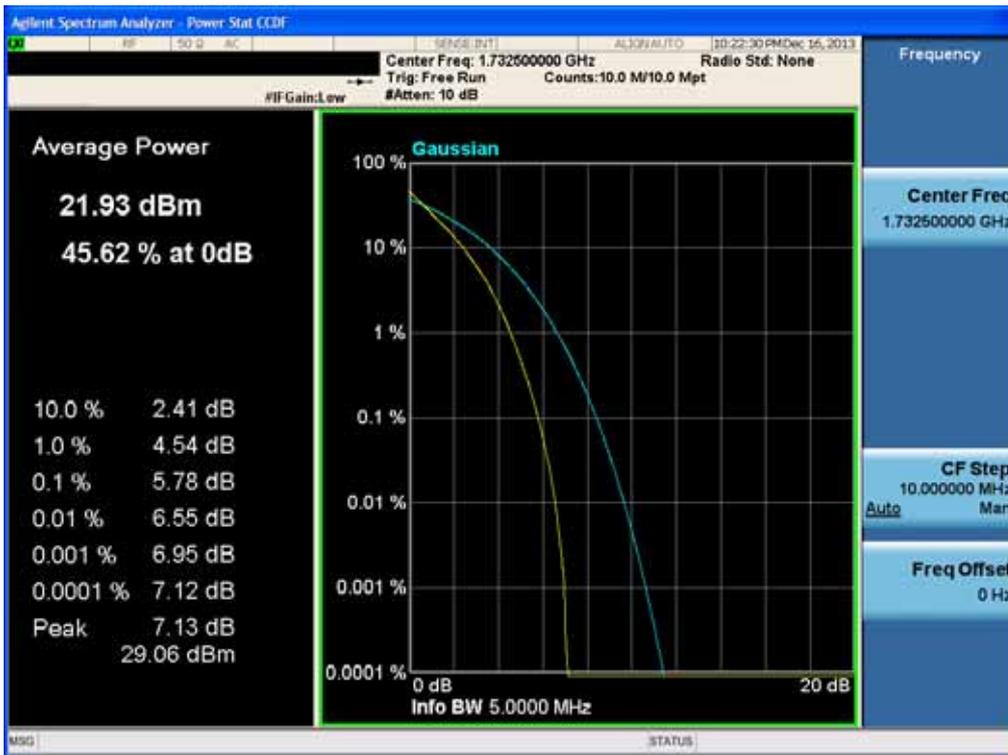
BAND 17. Occpied Bandwidth Plot (Ch.23790 16-QAM RB 50) 10 MHz



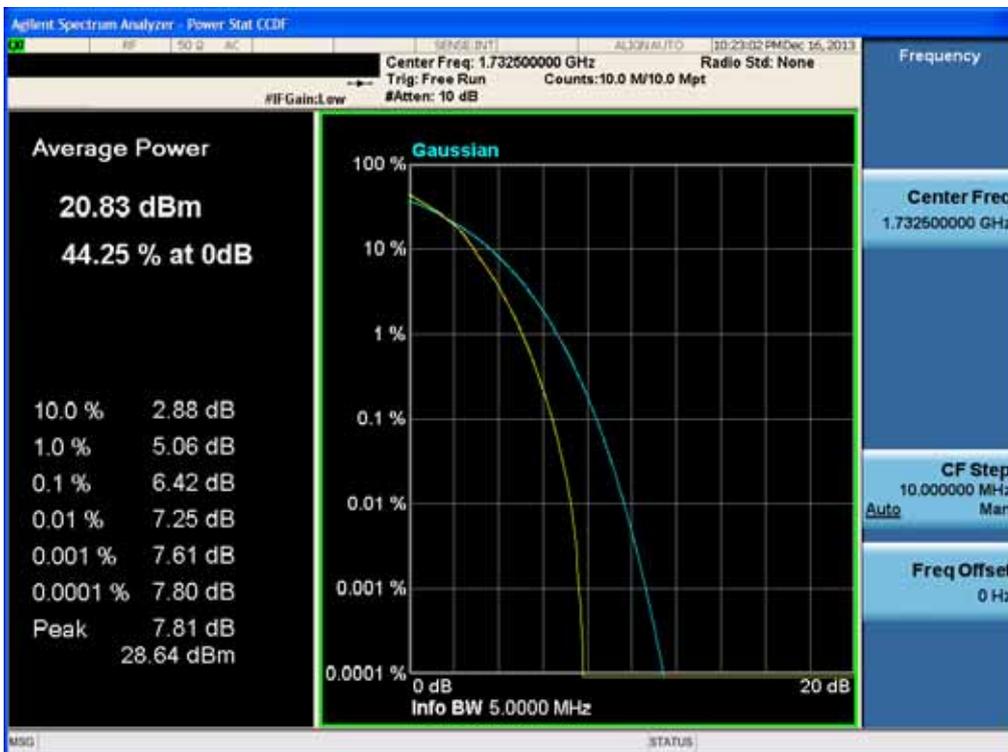
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Peak to Average Ratio Plot (Ch.20175 QPSK RB 25) 5 MHz



BAND 4. Peak to Average Ratio Plot (Ch.20175 16-QAM RB 25) 5 MHz



FCC CERTIFICATION REPORT

Test Report No.  
HCTR1312FR06-3

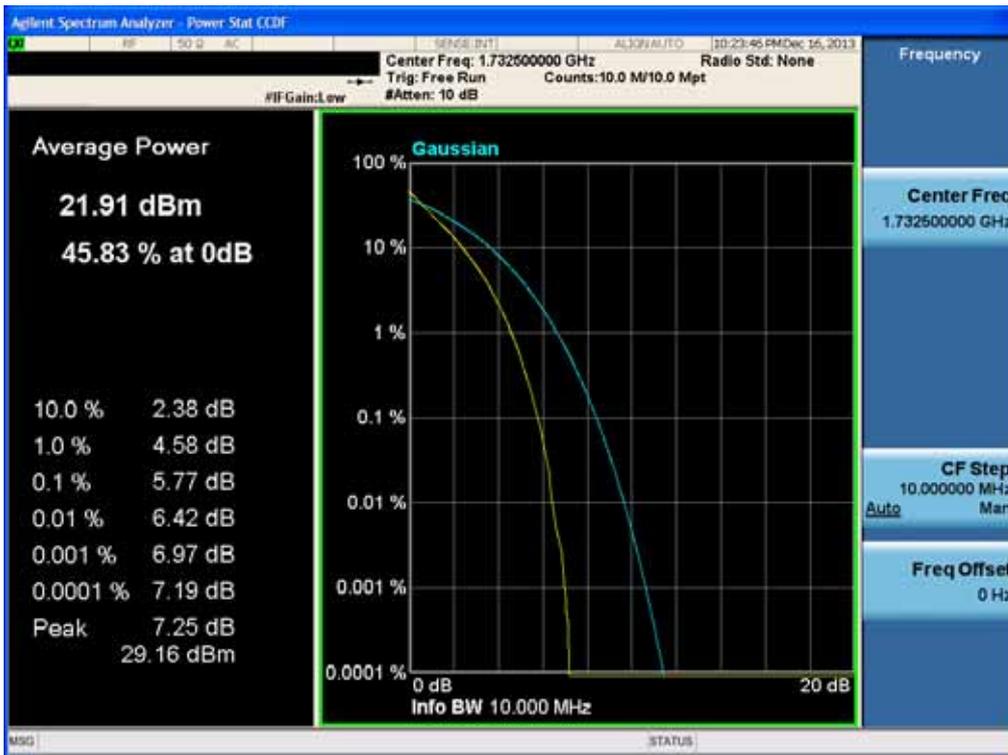
Date of Issue:  
December 27, 2013

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

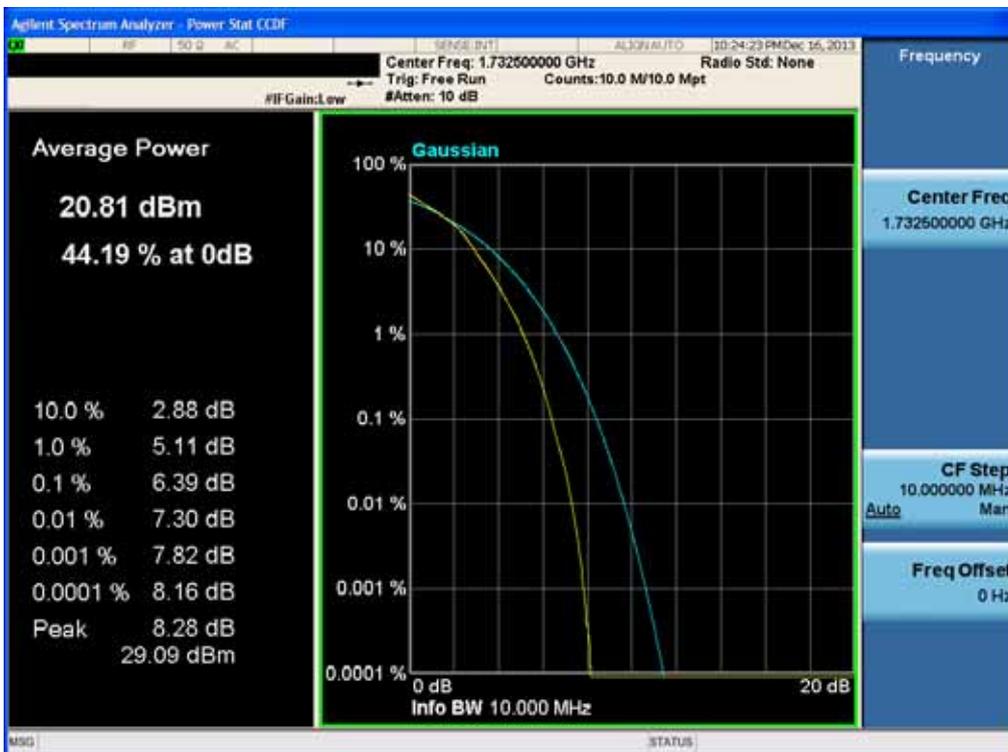
[www.hct.co.kr](http://www.hct.co.kr)

FCC ID:  
BEJLTC10

BAND 4. Peak to Average Ratio Plot (Ch.19975 QPSK RB 50) 10 MHz



BAND 4. Peak to Average Ratio Plot (Ch.19975 16-QAM RB 50) 10 MHz



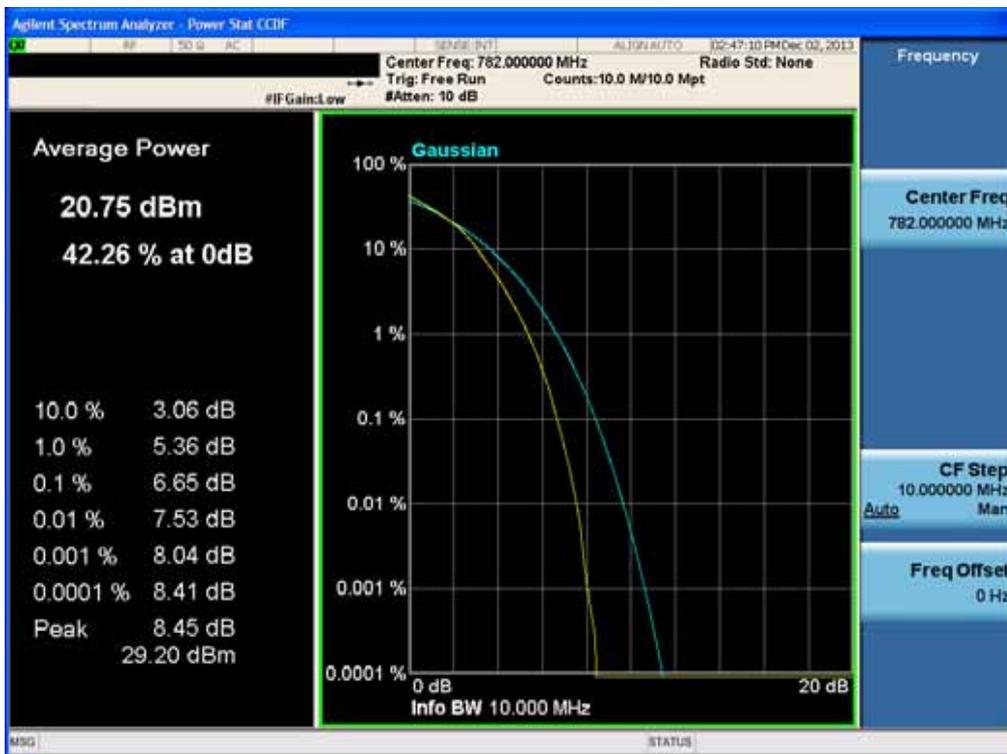
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 13. PAR Plot (23230ch\_10MHz\_QPSK\_RB 50)



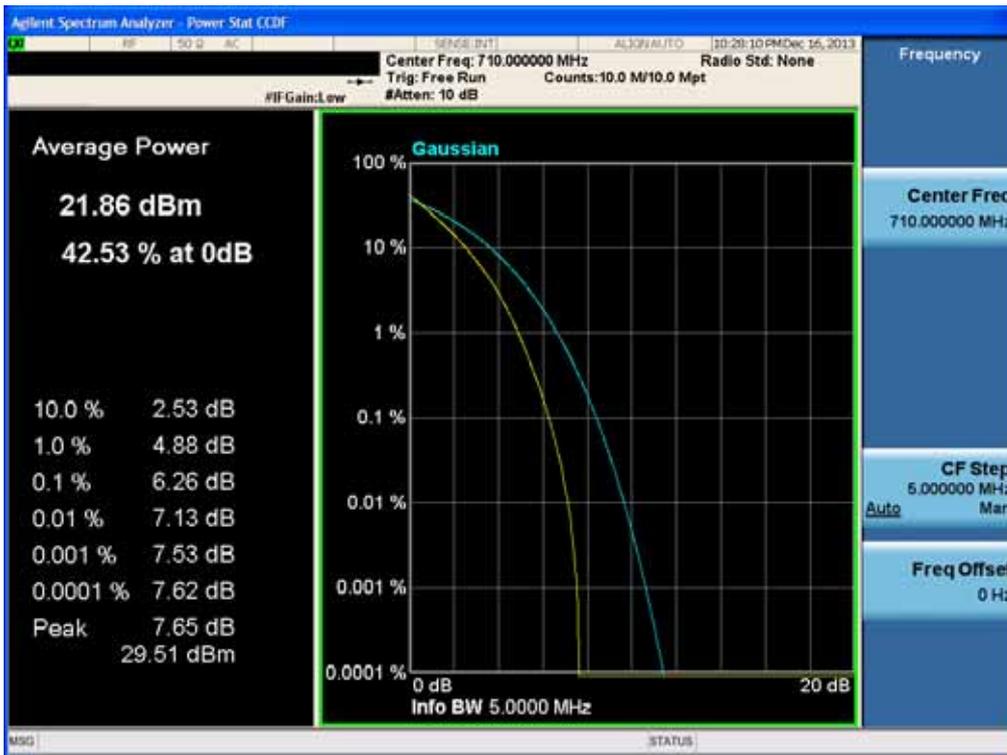
BAND 13. PAR Plot (Ch.23230 16-QAM RB 50)



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Peak to Average Ratio Plot (Ch.23790 QPSK RB 25) 5 MHz



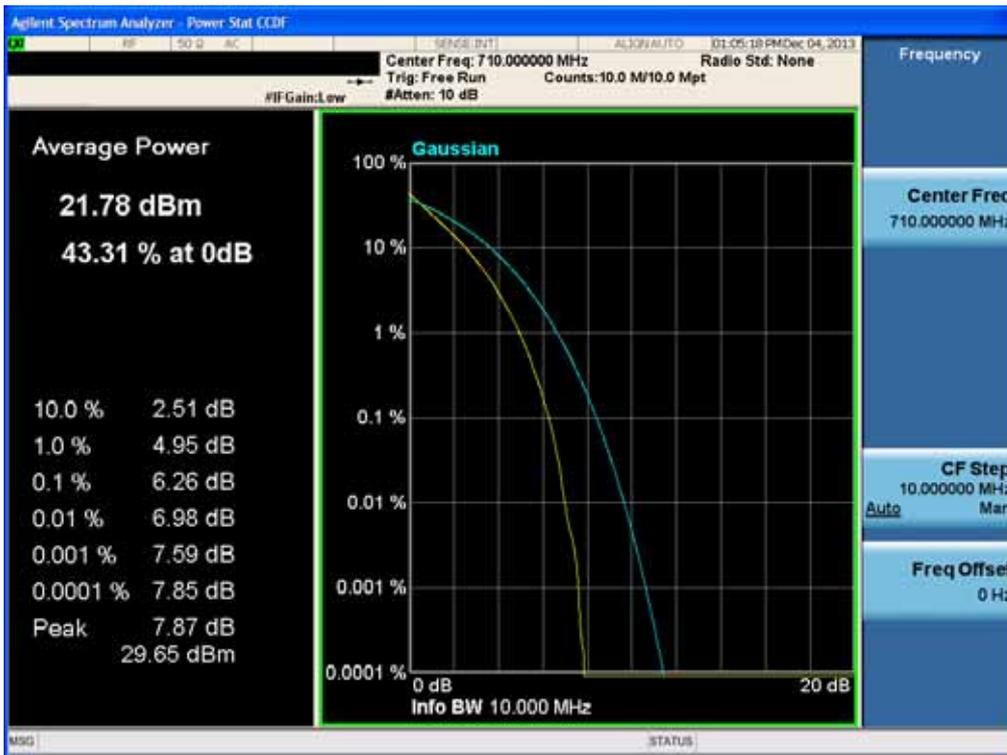
BAND 17. Peak to Average Ratio Plot (Ch.23790 16-QAM RB 25) 5 MHz



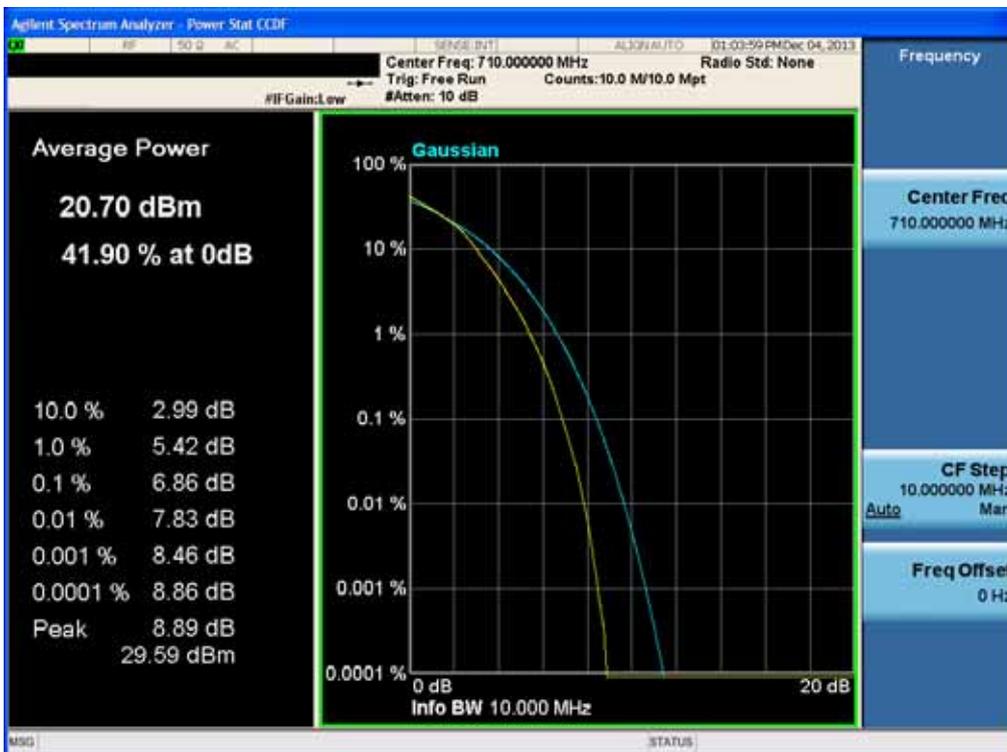
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Peak to Average Ratio Plot (Ch.23790 QPSK RB 50) 5 MHz



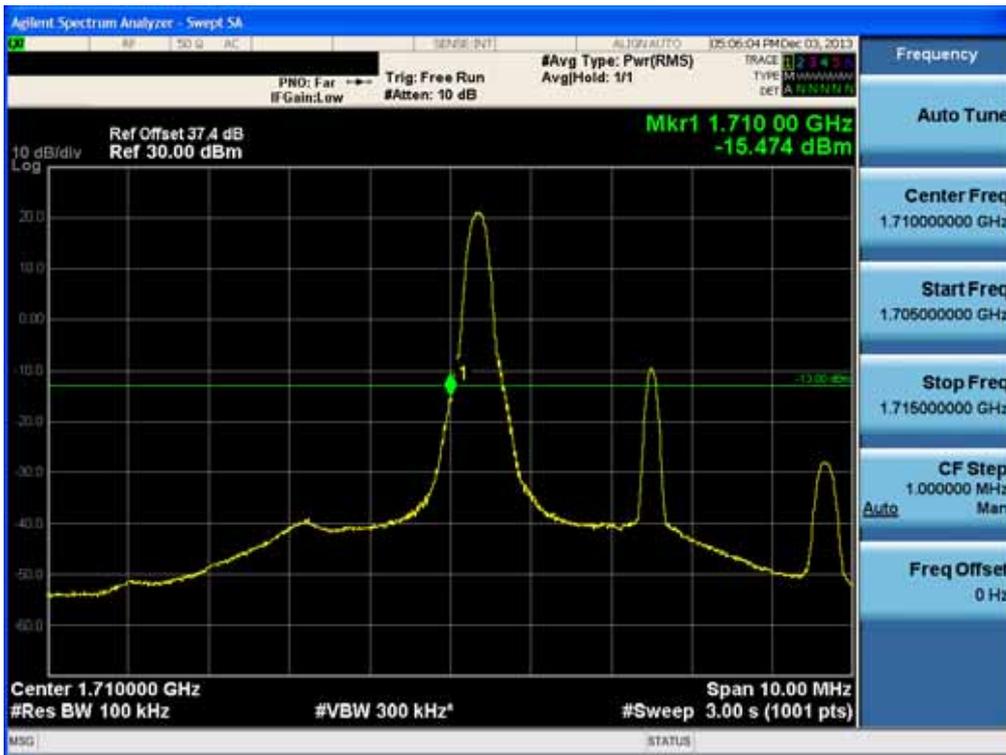
BAND 17. Peak to Average Ratio Plot (Ch.23790 16-QAM RB 50) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Lower Band Edge Plot 1 (Ch.19975 QPSK RB 1, Offset 0) 5 MHz



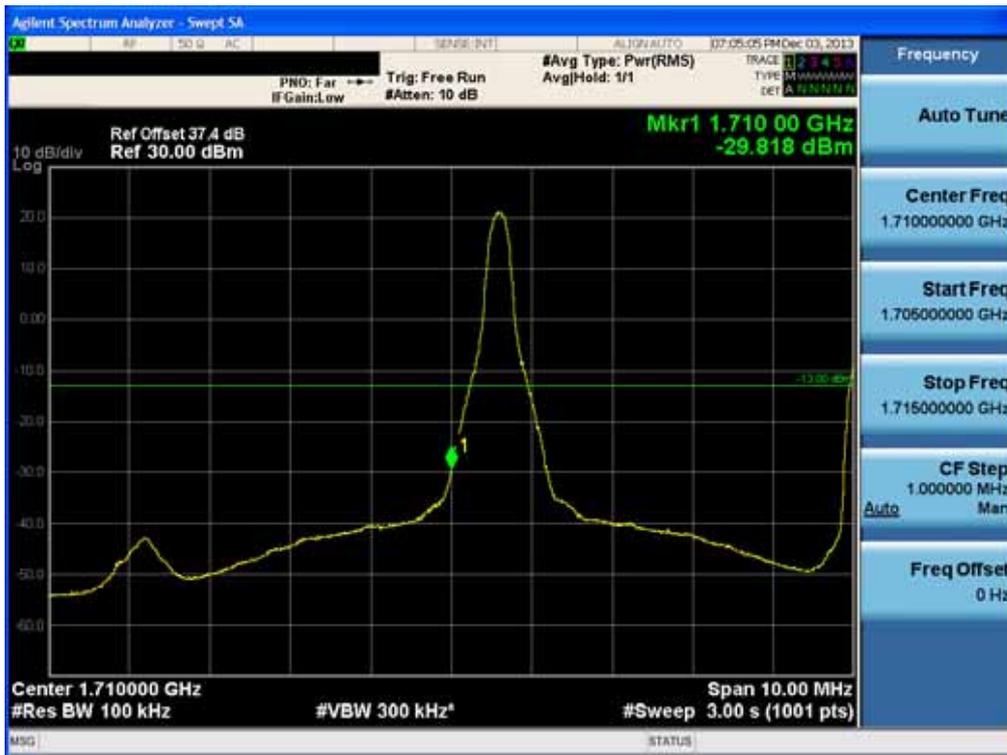
BAND 4. Lower Band Edge Plot 2 (Ch.19975 QPSK RB 25) 5 MHz



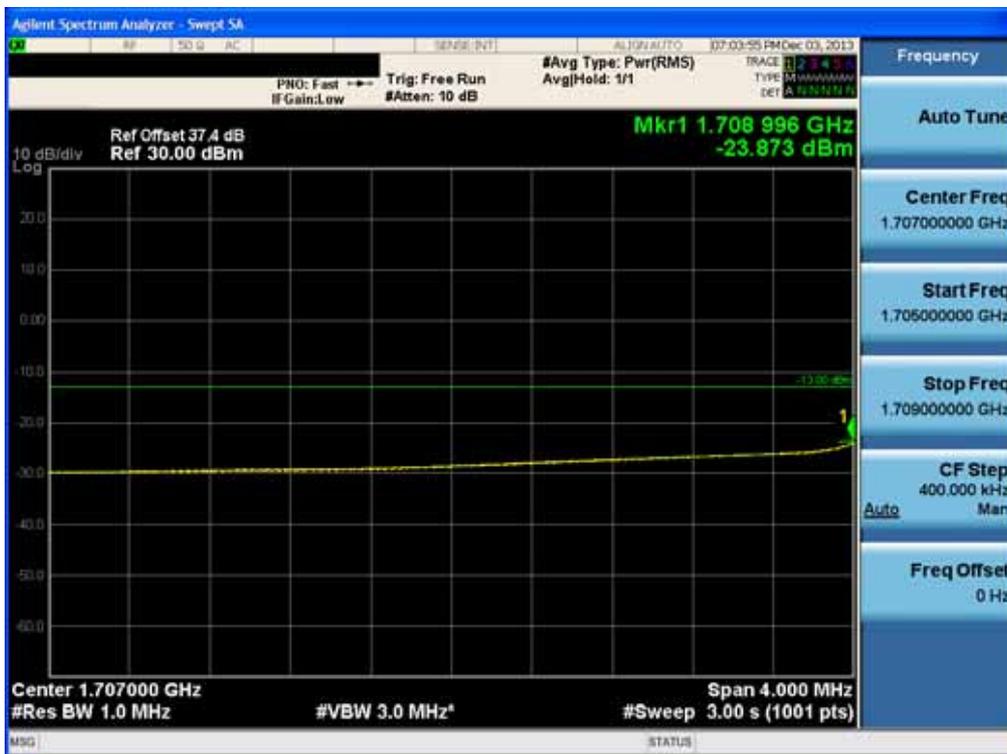
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Lower Band Edge Plot 1 (Ch.20000 QPSK RB 1, Offset 0) 10 MHz



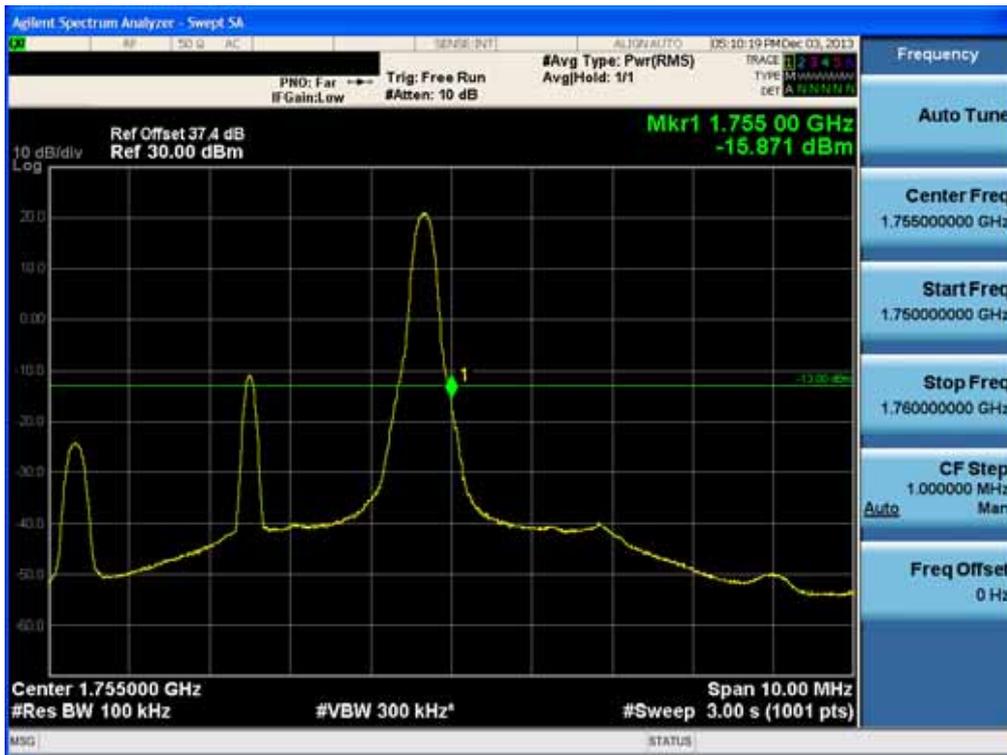
BAND 4. Lower Band Edge Plot 2 (Ch.20000 QPSK RB 50) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Upper Band Edge Plot 1 (Ch.20375 QPSK RB 1, Offset 24) 5 MHz



BAND 4. Upper Band Edge Plot 2 (Ch.20375 QPSK RB 25) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Upper Band Edge Plot 1 (Ch.20350 QPSK RB 50) 10 MHz



BAND 4. Upper Band Edge Plot 2 (Ch.20350 QPSK RB 50) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---



BAND 13. Lower Emission Mask Plot (Ch.23230 QPSK RB 50)



BAND 13. Lower Emission Mask Plot (Ch.23230 16-QAM RB 50)



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---



BAND 13. Upper Emission Mask Plot (Ch.23230 QPSK RB 50)



BAND 13. Upper Emission Mask Plot (Ch.23230 16-QAM RB 50)



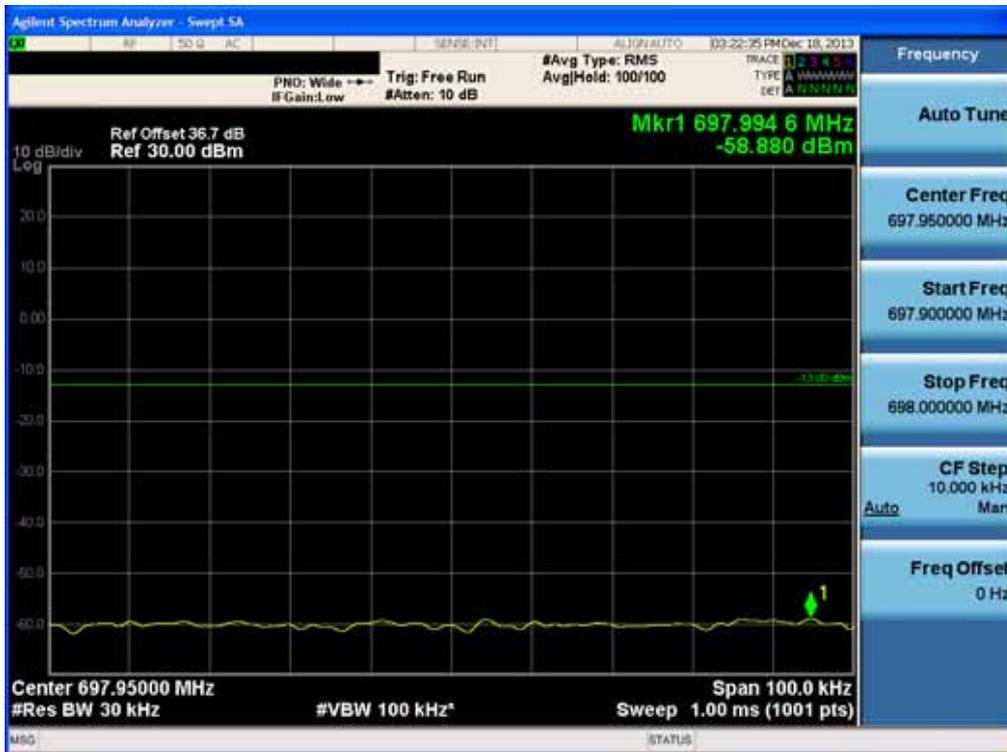
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Lower Band Edge Plot 1 (Ch.23755 QPSK RB 25) 5 MHz



BAND 17. Lower Band Edge Plot 2 (Ch.23755 QPSK RB 25) 5 MHz



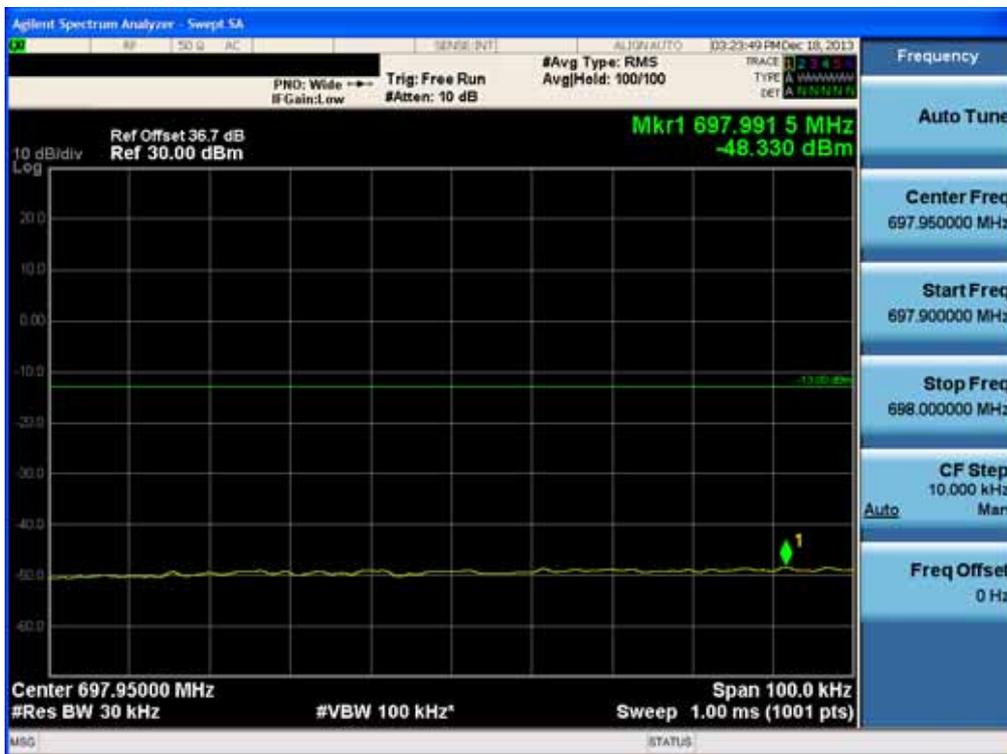
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Lower Band Edge Plot 1 (Ch.23780 QPSK RB 50) 10 MHz



BAND 17. Lower Band Edge Plot 2 (Ch.23780 QPSK RB 50) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Upper Band Edge Plot 1 (Ch.23825 QPSK RB 25) 5 MHz



BAND 17. Upper Band Edge Plot 2 (Ch.23825 QPSK RB 25) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Upper Band Edge Plot 1 (Ch.23800 QPSK RB 50) 10 MHz



BAND 17. Upper Band Edge Plot 2 (Ch.23800 QPSK RB 50) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Conducted Spurious Plot 1 (Ch.19975 QPSK RF 1, Offset 0) 5 MHz



BAND 4. Conducted Spurious Plot 2 (Ch.19975 QPSK RF 1, Offset 0) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Conducted Spurious Plot 1 (Ch.20175 QPSK RF 1, Offset 0) 5 MHz



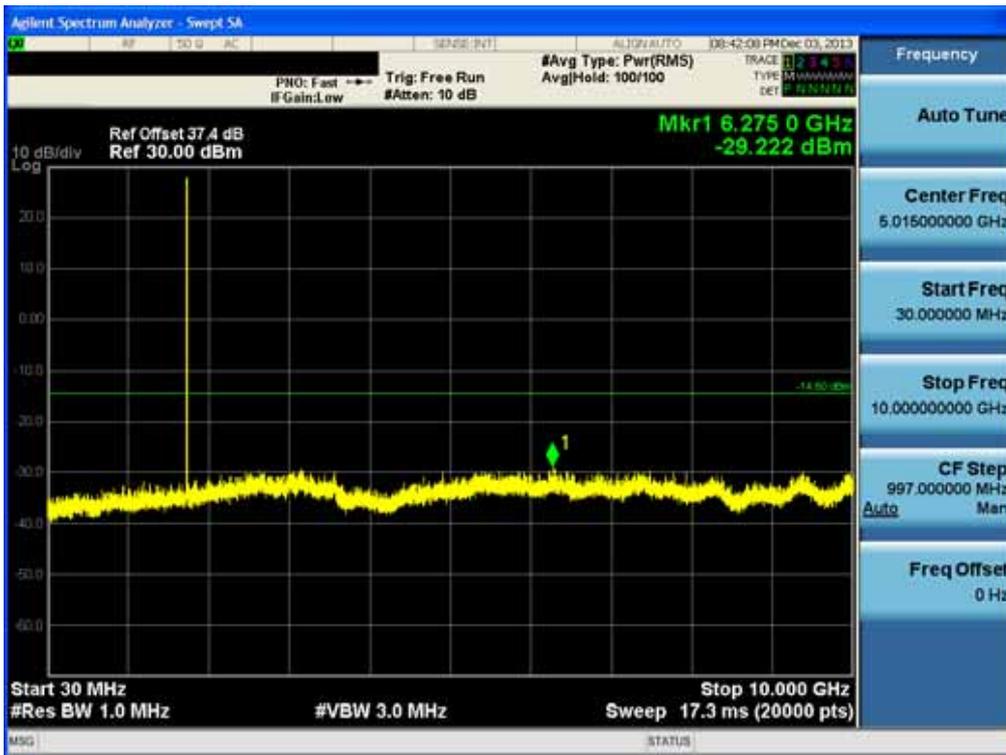
BAND 4. Conducted Spurious Plot 2 (Ch.20175 QPSK RF 1, Offset 0) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Conducted Spurious Plot 1 (Ch.20375 QPSK RF 1, Offset 0) 5 MHz



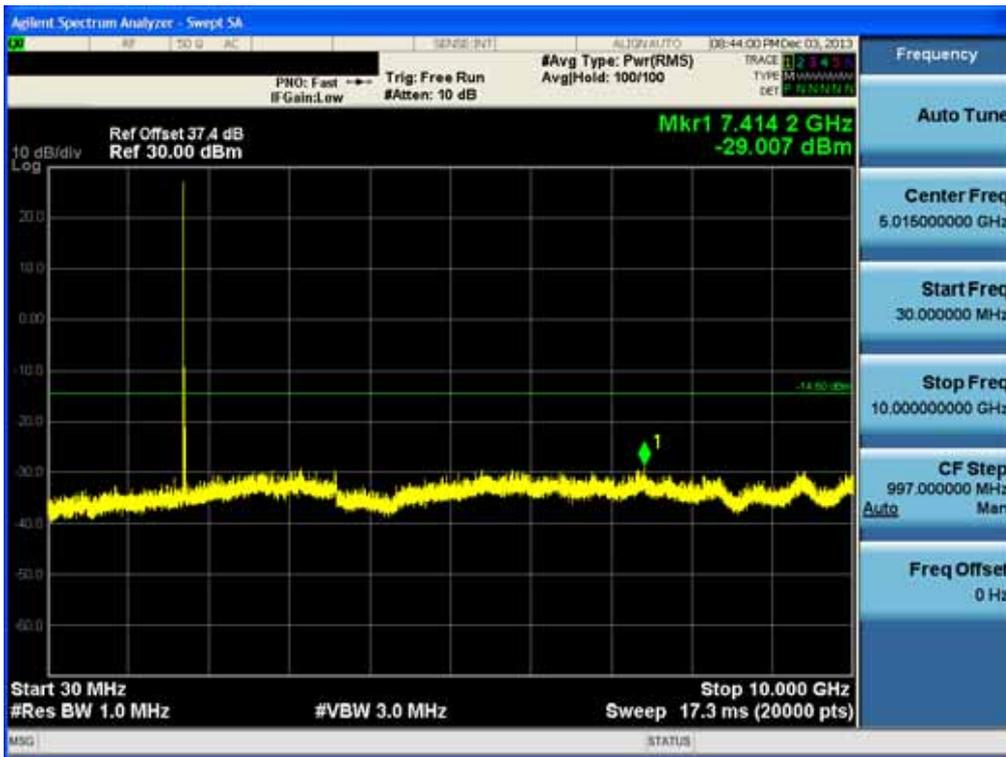
BAND 4. Conducted Spurious Plot 2 (Ch.20375 QPSK RF 1, Offset 0) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Conducted Spurious Plot 1 (Ch.20000 QPSK RF 1, Offset 0) 10 MHz



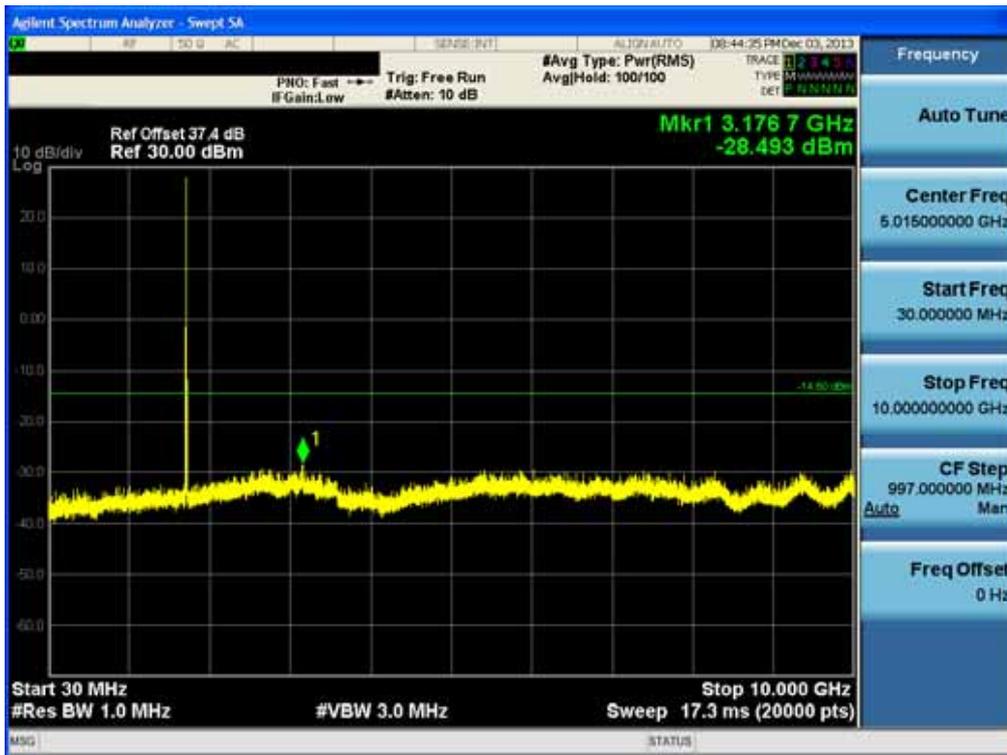
BAND 4. Conducted Spurious Plot 2 (Ch.20000 QPSK RF 1, Offset 0) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Conducted Spurious Plot 1 (Ch.20175 QPSK RF 1, Offset 0) 10 MHz



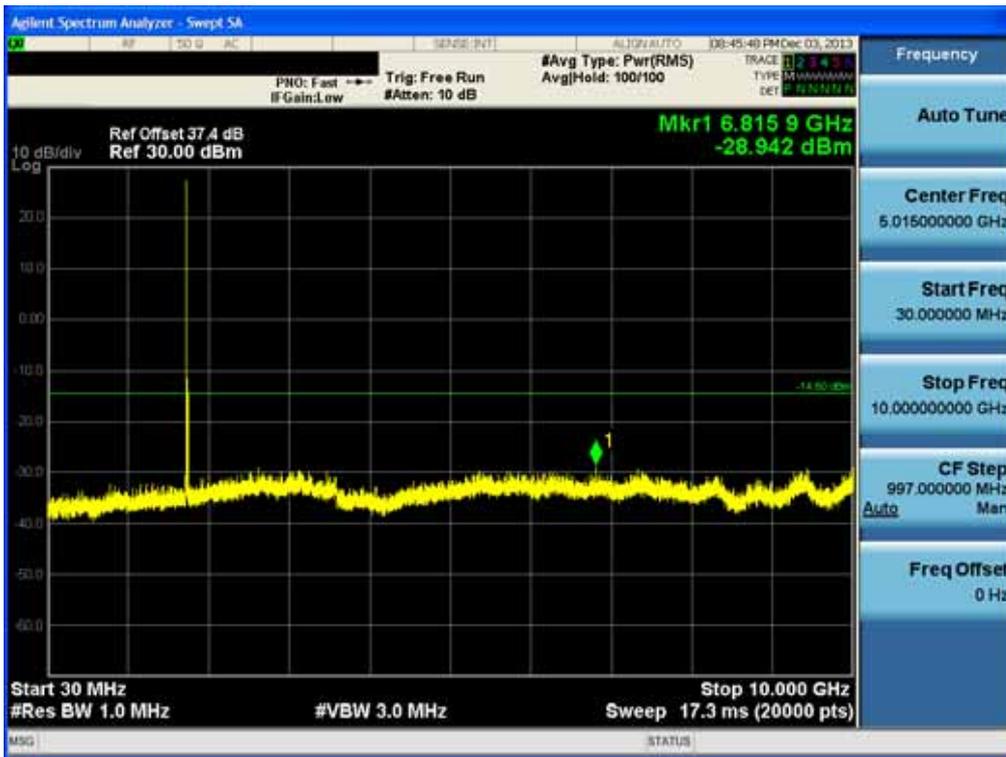
BAND 4. Conducted Spurious Plot 2 (Ch.20175 QPSK RF 1, Offset 0) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 4. Conducted Spurious Plot 1 (Ch.20350 QPSK RF 1, Offset 0) 10 MHz



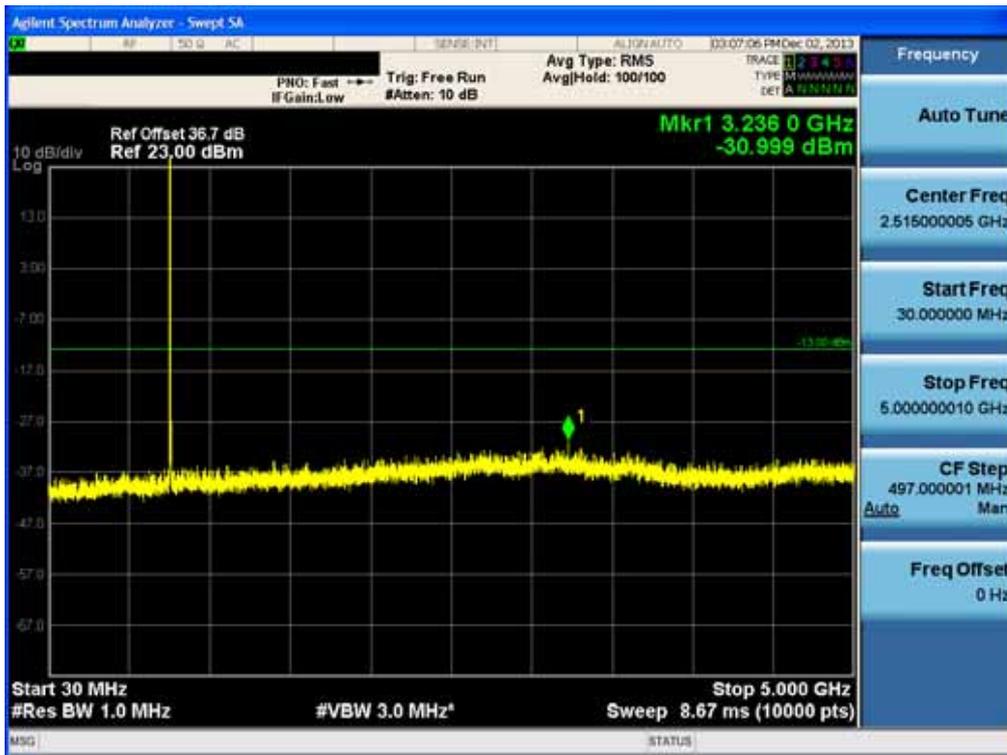
BAND 4. Conducted Spurious Plot 2 (Ch.20350 QPSK RF 1, Offset 0) 10 MHz



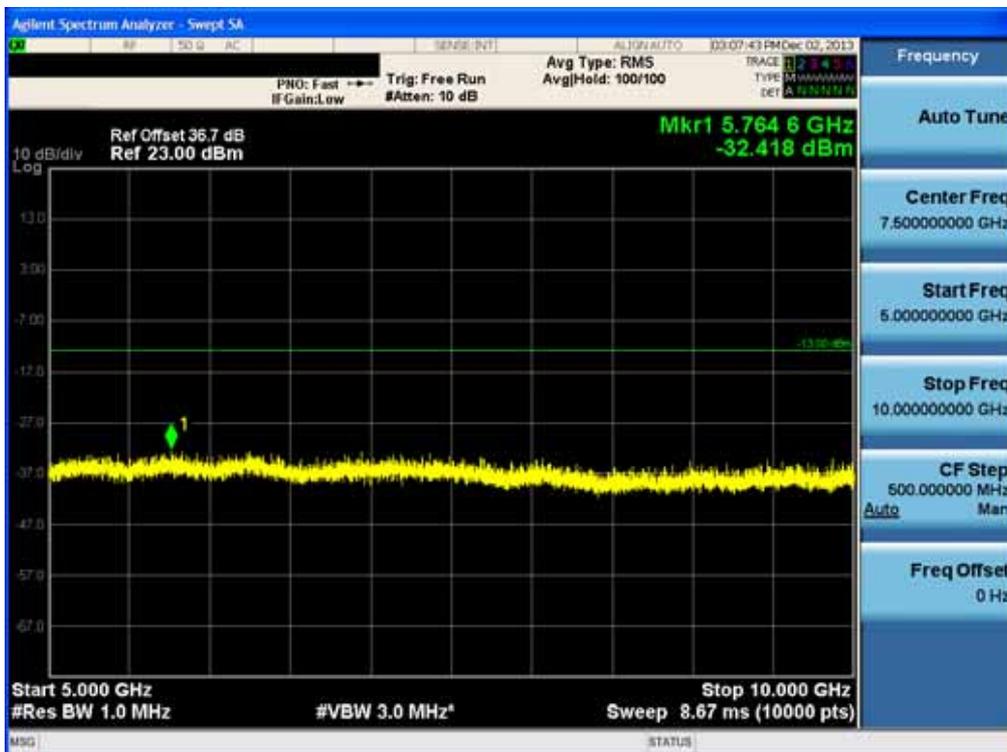
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 13. Conducted Spurious Plot 1 (Ch.23230 QPSK RB 1, Offset 0)



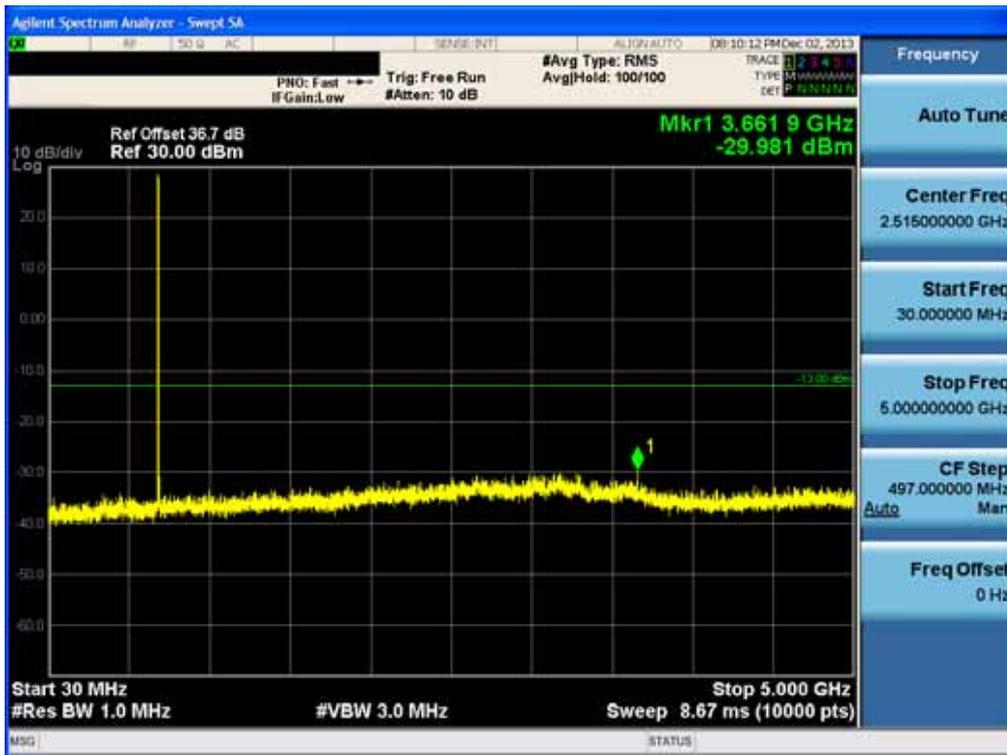
BAND 13. Conducted Spurious Plot 2 (Ch.23230 QPSK RB 1, Offset 0)



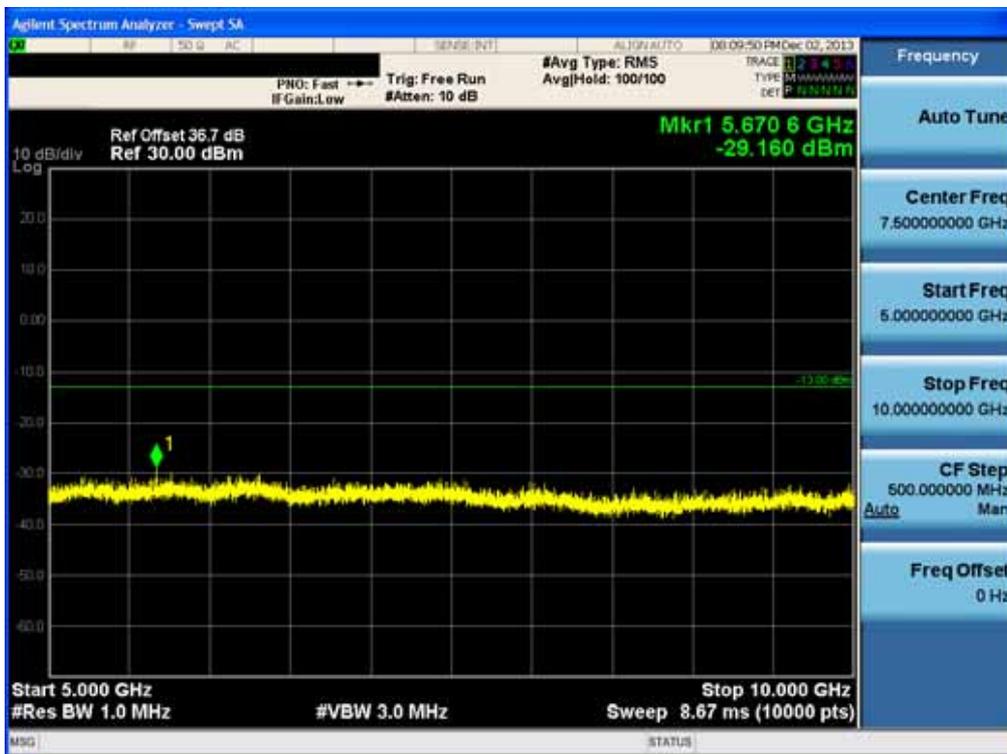
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Conducted Spurious Plot 1 (Ch.23755 QPSK RF 1, Offset 0) 5 MHz



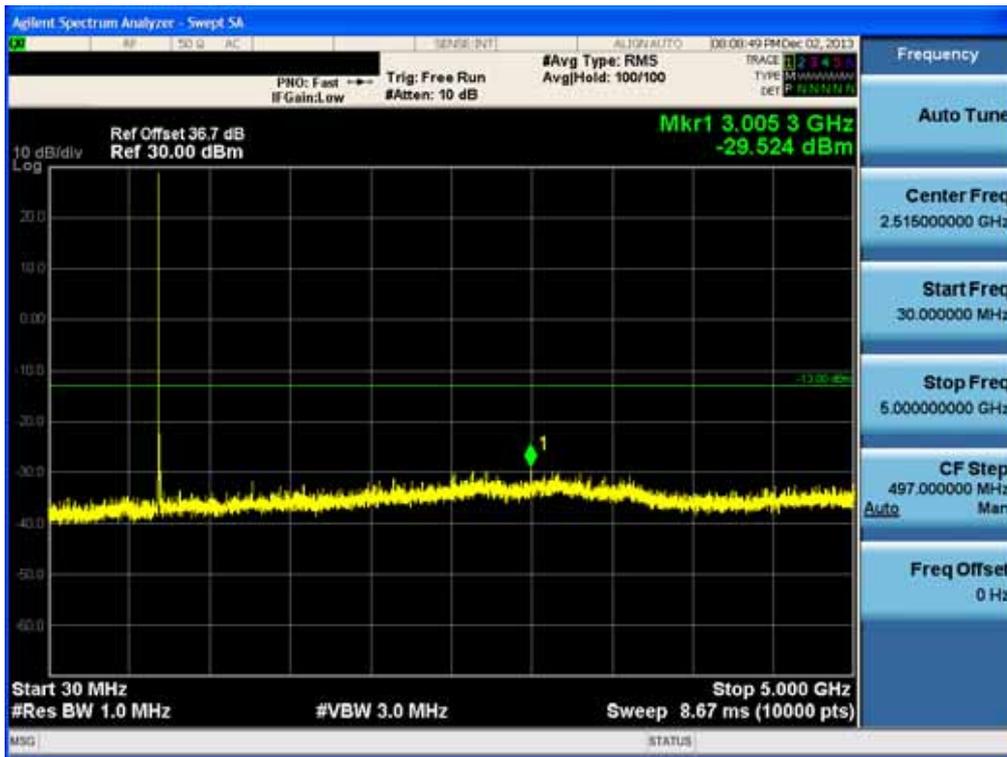
BAND 17. Conducted Spurious Plot 2 (Ch.23755 QPSK RF 1, Offset 0) 5 MHz



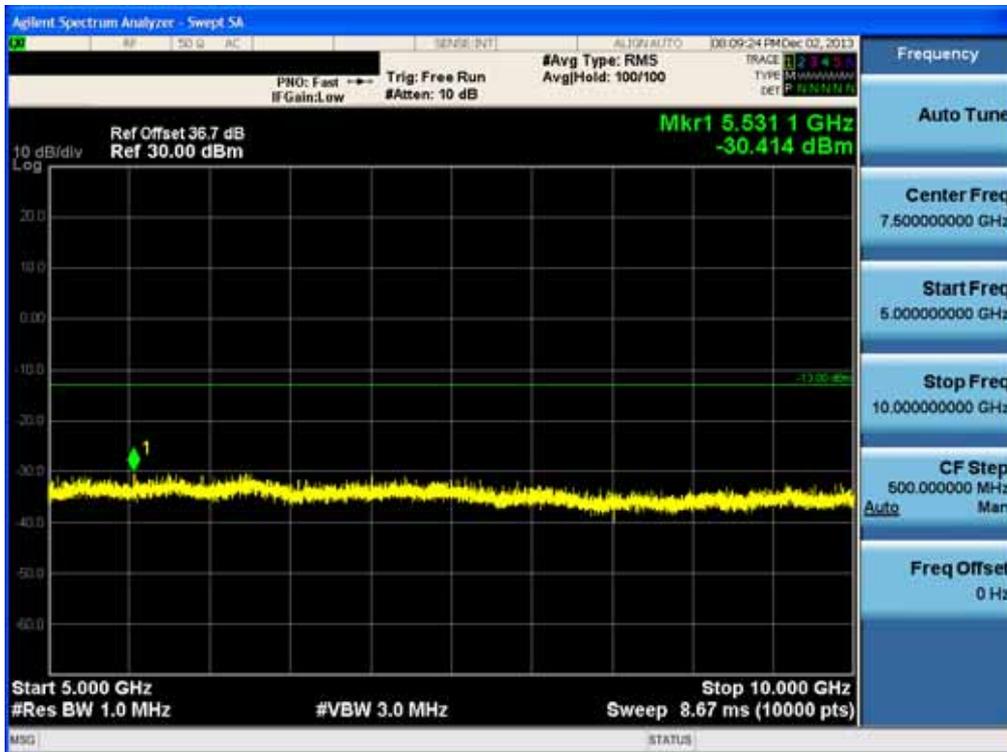
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Conducted Spurious Plot 1 (Ch.23790 QPSK RF 1, Offset 0) 5 MHz



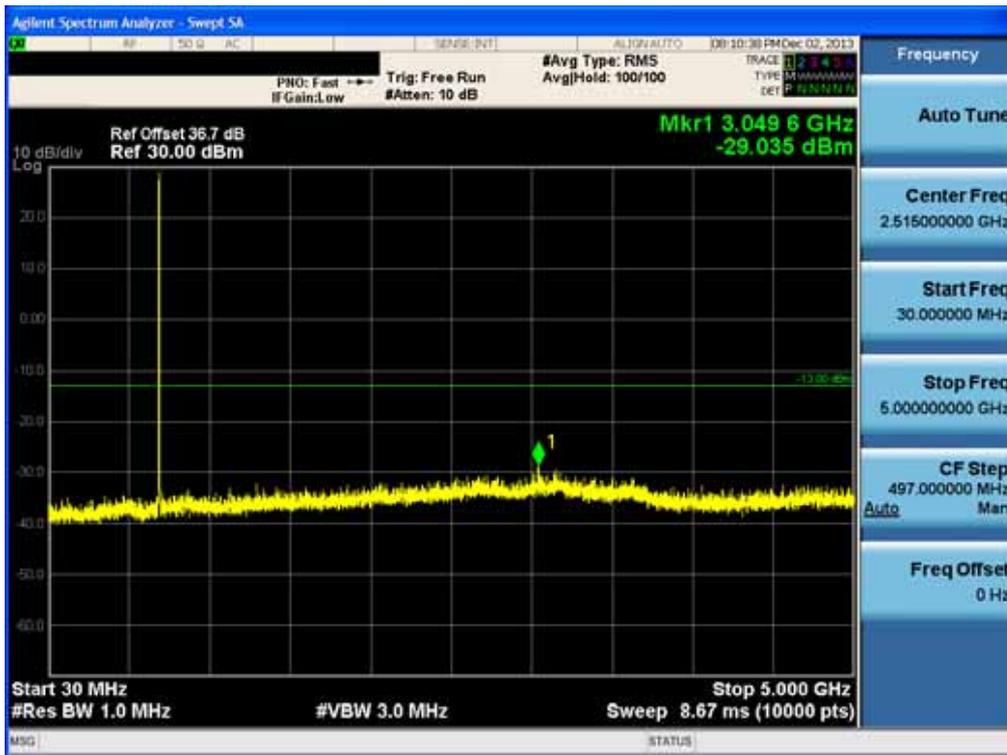
BAND 17. Conducted Spurious Plot 2 (Ch.23790 QPSK RF 1, Offset 0) 5 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Conducted Spurious Plot 1 (Ch.23825 QPSK RF 1, Offset 0) 5 MHz



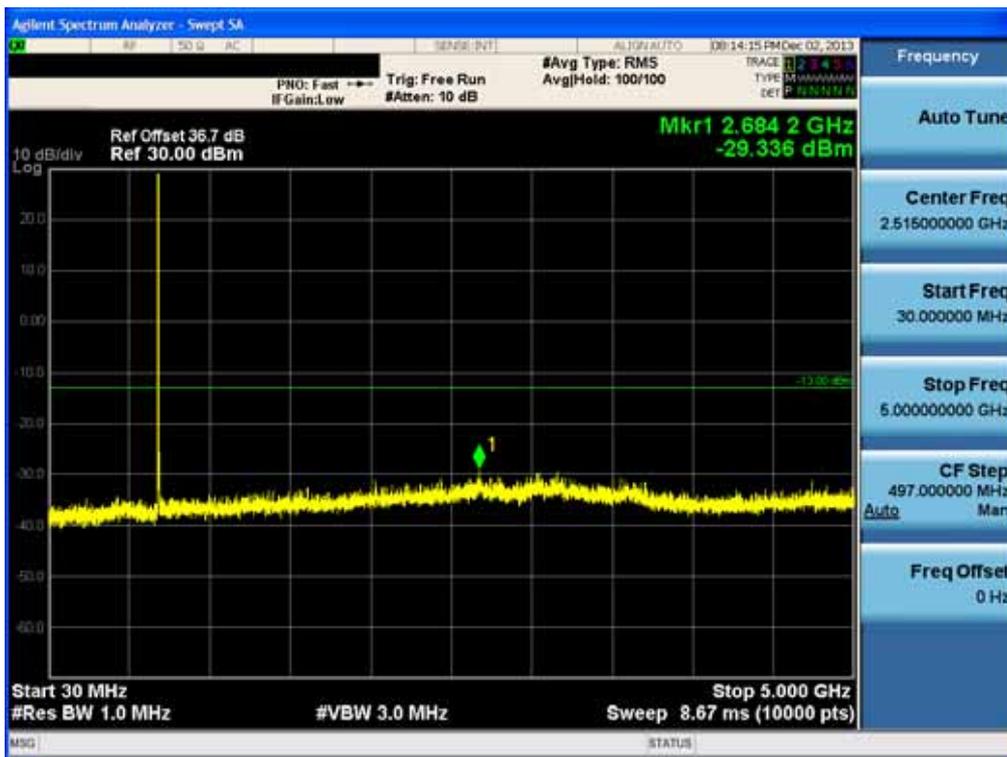
BAND 17. Conducted Spurious Plot 2 (Ch.23825 QPSK RF 1, Offset 0) 5 MHz



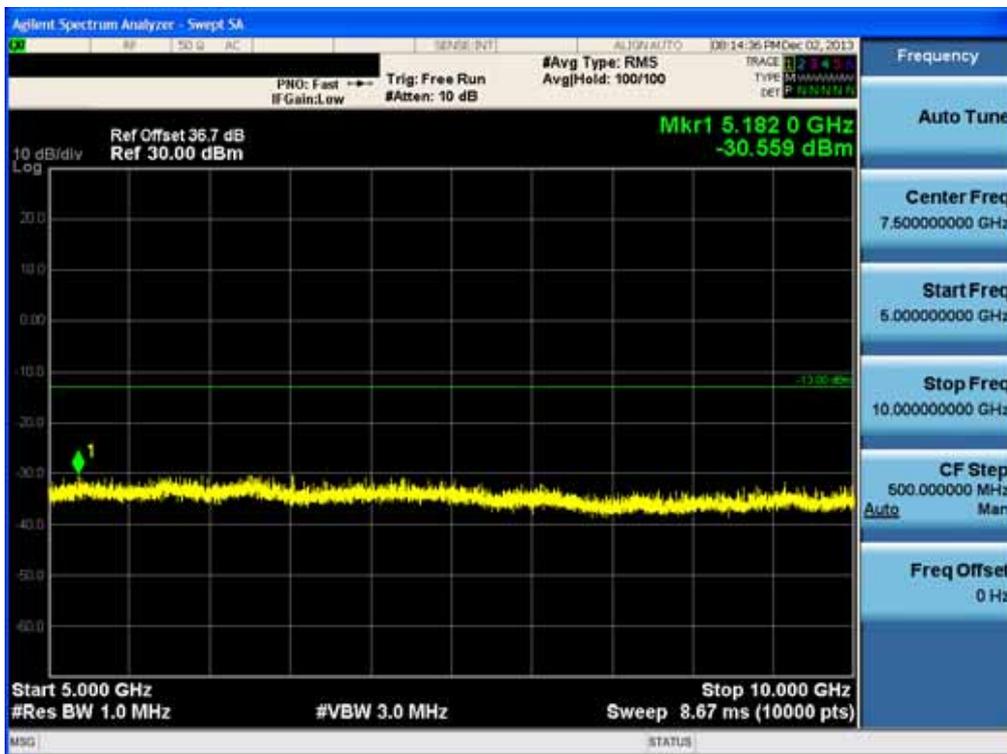
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Conducted Spurious Plot 1 (Ch.23780 QPSK RF 1, Offset 0) 10 MHz



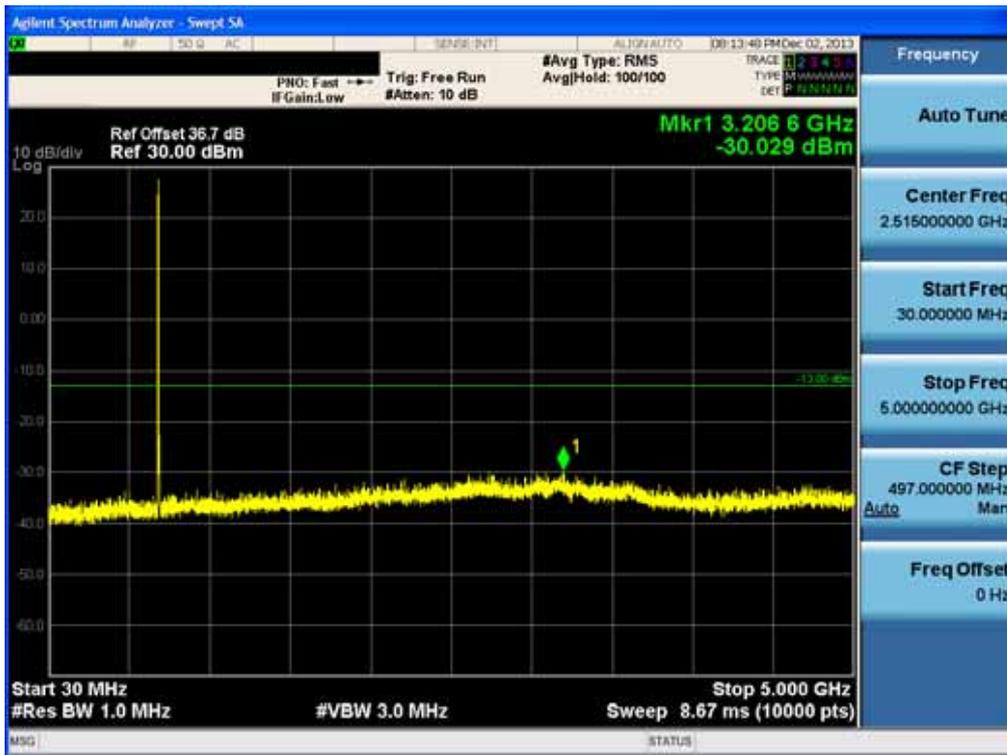
BAND 17. Conducted Spurious Plot 2 (Ch.23780 QPSK RF 1, Offset 0) 10 MHz



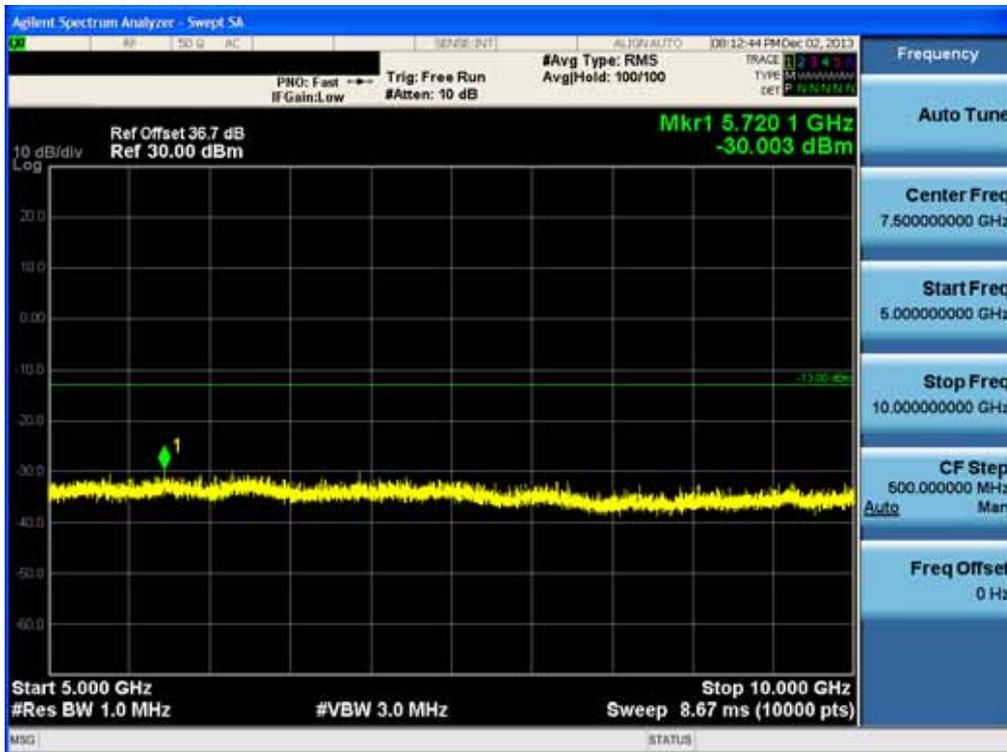
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Conducted Spurious Plot 1 (Ch.23790 QPSK RF 1, Offset 0) 10 MHz



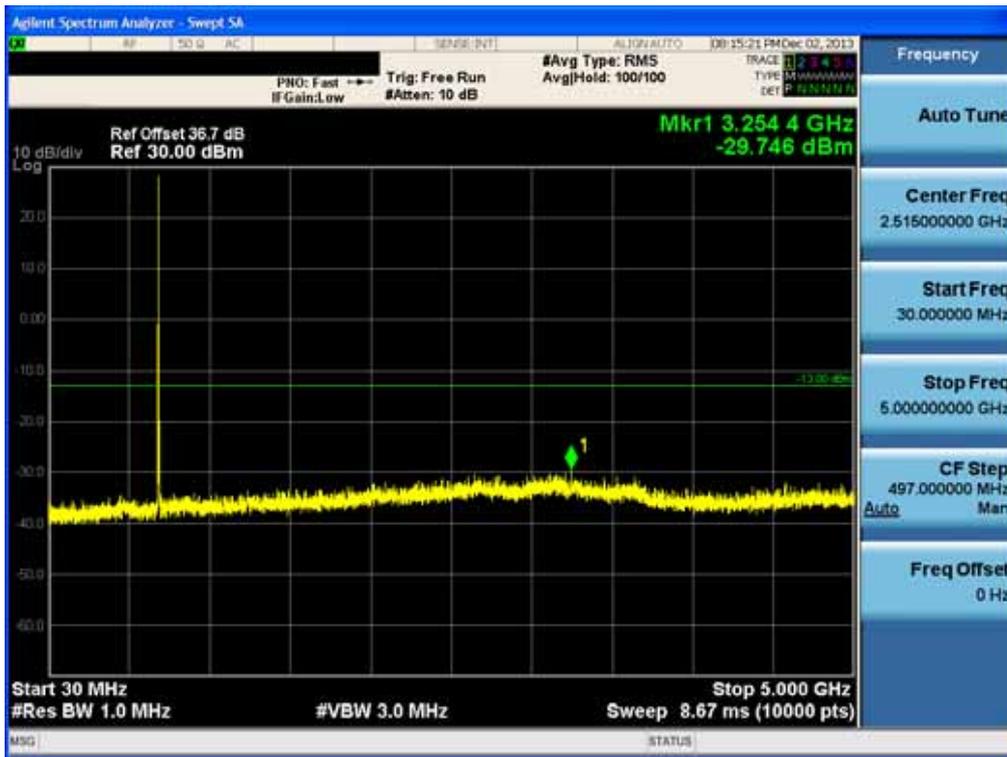
BAND 17. Conducted Spurious Plot 2 (Ch.23790 QPSK RF 1, Offset 0) 10 MHz



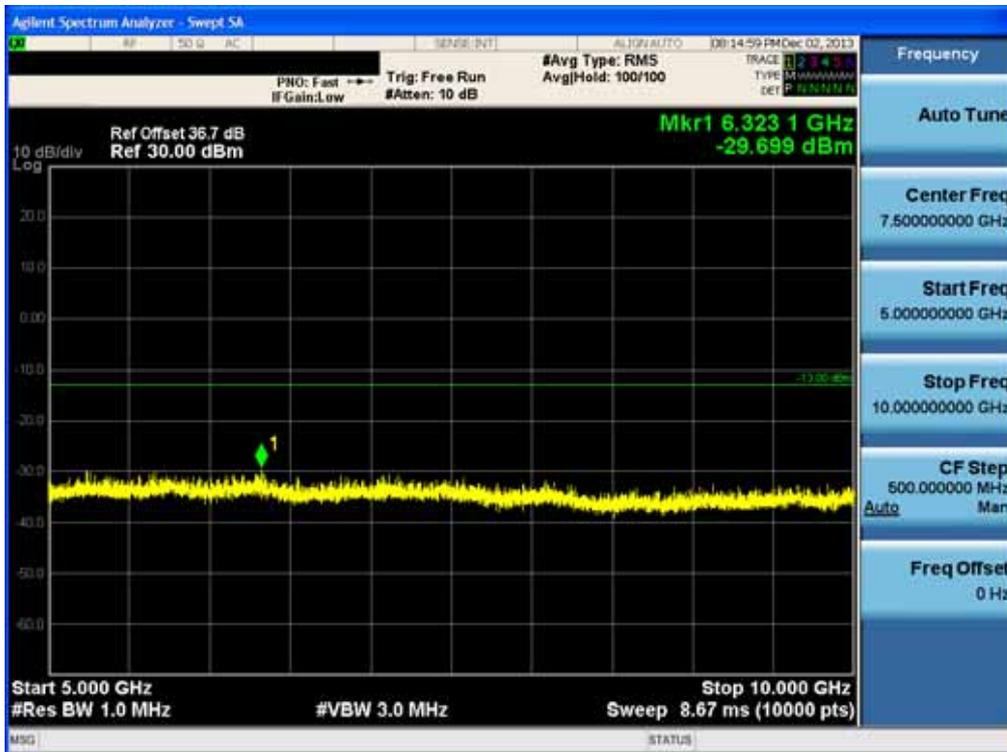
FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---

BAND 17. Conducted Spurious Plot 1 (Ch.23800 QPSK RF 1, Offset 0) 10 MHz



BAND 17. Conducted Spurious Plot 2 (Ch.23800 QPSK RF 1, Offset 0) 10 MHz



FCC CERTIFICATION REPORT

Test Report No. HCTR1312FR06-3	Date of Issue: December 27, 2013	EUT Type: CDMA/GSM/WCDMA/LTE Telematics NAD module	<a href="http://www.hct.co.kr">www.hct.co.kr</a> FCC ID: BEJLTC10
-----------------------------------	-------------------------------------	---	---