

**CERTIFICATE OF COMPLIANCE**  
**FCC Certification****Applicant Name:**  
NEC CASIO Mobile Communications, Ltd.**Address:**  
1753 Shimonumabe, Nakahara-ku, Kawasaki,  
Kanagawa 211-8666 Japan**Date of Issue:**  
August 06, 2012  
**Test Site/Location:**  
HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon,  
Icheon-si, Kyunggi-Do, Korea  
**Report No.:** HCTR1208FR03  
**HCT FRN:** 0005866421**FCC ID:** **TYK-JDS9507****APPLICANT:** **NEC CASIO Mobile Communications, Ltd.**

**FCC Model(s):** C811  
**EUT Type:** CDMA/GSM/WCDMA/LTE Phone with Bluetooth/WLAN/NFC  
**FCC Classification:** Licensed Portable Transmitter Held to Ear (PCE)  
**FCC Rule Part(s):** §2 , §27  
**Tx Frequency:** 777 MHz ~ 787 MHz (LTE – Band 13)  
**Rx Frequency:** 746 MHz ~ 756 MHz (LTE – Band 13)  
**Max. RF Output Power:** Standard Battery Cover: 0.176W (22.45 dBm) ERP (QPSK)  
0.167W (22.24 dBm) ERP (16-QAM)  
Extended Battery Cover: 0.167W (22.22 dBm) ERP (QPSK)  
0.165W (22.17 dBm) ERP (16-QAM)  
Wireless Battery Cover: 0.174W (22.41 dBm) ERP (QPSK)  
0.171W (22.33 dBm) ERP (16-QAM)

**Emission Designator(s):** 8M93G7D (QPSK) / 8M92W7D (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)

  
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# Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1208FR03	August 06, 2012	First Approval Report

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# MEASUREMENT REPORT

## 1. GENERAL INFORMATION

**Applicant Name:** NEC CASIO Mobile Communications, Ltd.

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**Application Type:** Certification

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

**FCC Rule Part(s):** §2 , §27

**EUT Type:** CDMA/GSM/WCDMA/LTE Phone with Bluetooth/WLAN/NFC

**FCC Model(s):** C811

**Tx Frequency:** 777 MHz ~ 787 MHz (LTE – Band 13)

**Rx Frequency:** 746 MHz ~ 756 MHz (LTE – Band 13)

**Max. RF Output Power:**

Standard Battery Cover:	0.176W (22.45 dBm) ERP (QPSK) 0.167W (22.24 dBm) ERP (16-QAM)
Extended Battery Cover:	0.167W (22.22 dBm) ERP (QPSK) 0.165W (22.17 dBm) ERP (16-QAM)
Wireless Battery Cover:	0.174W (22.41 dBm) ERP (QPSK) 0.171W (22.33 dBm) ERP (16-QAM)

**Emission**

**Designator(s):** 8M93G7D (QPSK) / 8M92W7D (16-QAM)

**Date(s) of Tests:** July 2, 2012 ~ July 27, 2012

**Antenna Specification**

Manufacturer:	DONGNAM
Antenna type:	Built in Antenna
Peak Gain:	-0.2 dBi

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## 2. INTRODUCTION

### 2.1. EUT DESCRIPTION

The C811 CDMA/GSM/WCDMA/LTE Phone with Bluetooth/WLAN/NFC consists of LTE13.

### 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

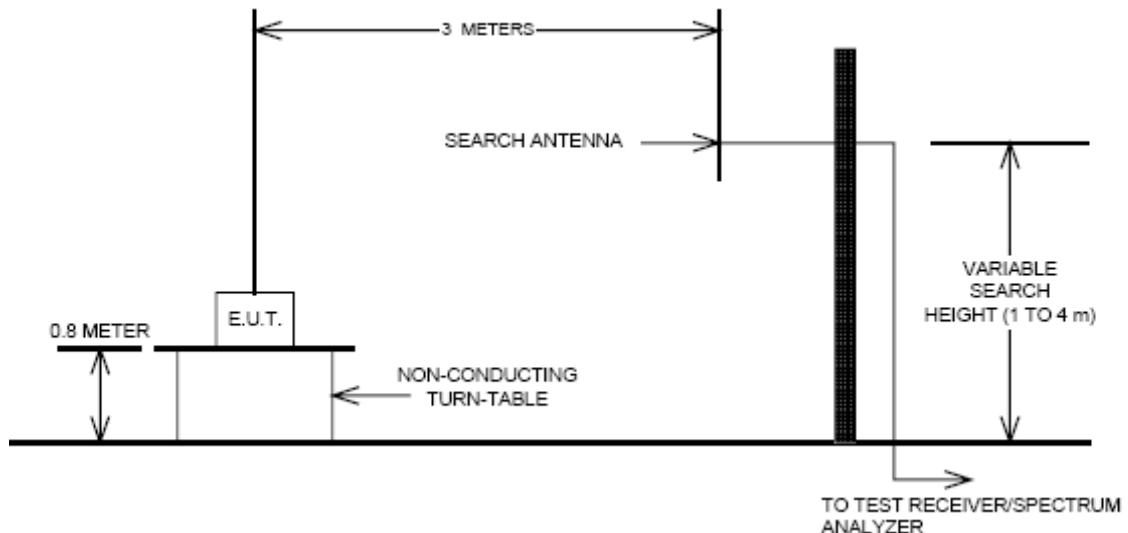
The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, Korea. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated March 02, 2011 (Registration Number: 90661)

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### 3. DESCRIPTION OF TESTS

#### 3.1 EFFECTIVE RADIATED POWER/EQUIVALENT ISOTROPIC RADIATED POWER

##### Test Set-up



##### Test Procedure

Radiated emission measurements were performed at an Fully-anechoic chamber.

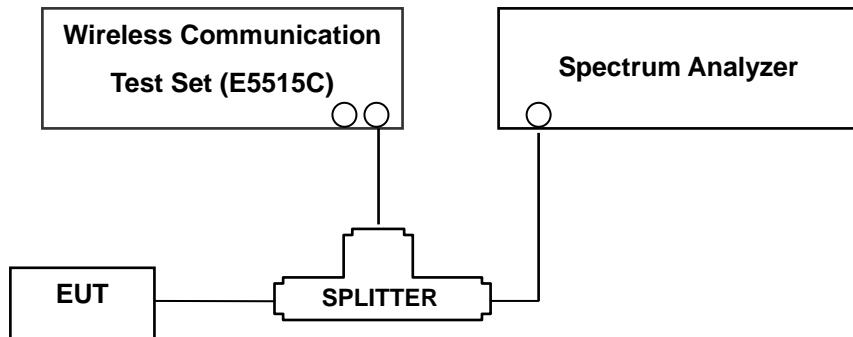
The equipment under test is placed on a non-conductive table 3-meters from the receive antenna. A turntable was rotated 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the previously recorded signal was duplicated.

The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration

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### 3.2 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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### 3.3 BLOCK FREQUENCY RANGE

Two paired channels of 11 megahertz each are available for assignment in Block C in the 746–757 MHz and 776 – 787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results do not satisfy the applicable reserve price, the spectrum in the 746 – 757 MHz and 776 – 787 MHz bands will instead be made available for assignment at a subsequent auction as follows:

- (i) Two paired channels of 6 megahertz each available for assignment in Block C1 in the 746–752 MHz and 776–782 MHz bands.
- (ii) Two paired channels of 5 megahertz each available for assignment in Block C2 in the 752–757 MHz and 782–787 MHz bands

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### 3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

#### Test Procedure

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

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. The RBW settings used in the testing are greater than 1 % of the occupied bw. The 1 MHz RBW was used to scan from 10 MHz to 10 GHz. (GSM1900 Mode: 10 MHz to 20 GHz). A display line was placed at – 13 dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

- Band Edge Requirement : According to FCC 22.917 , 24.238(a) specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

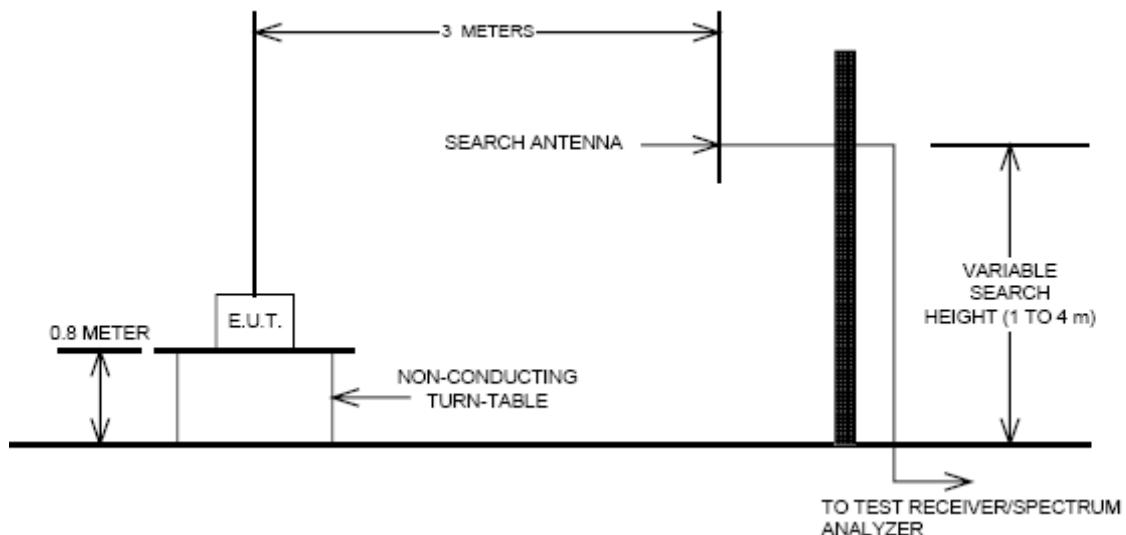
The center frequency of spectrum is the band edge frequency and span is 1MHz RB of the spectrum is 3KHz and VB of the spectrum is 3KHz (GSM)

The center frequency of spectrum is the band edge frequency and span is 5MHz RB of the spectrum is 100KHz and VB of the spectrum is 100KHz(WCDMA)

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### 3.5 RADIATED SPURIOUS AND HARMONIC EMISSIONS

#### Test Set-up



The measurement facilities used for this test have been documented in previous filings with the commission pursuant to section § 2.948. The Fully-anechoic chamber meets requirements in ANSI C63.4 –2003. A mast capable of lifting the receiving antenna from a height of one to four meters is used together with a rotatable platform mounted at three from the antenna mast.

- 1) The unit mounted on a turntable  $1.5 \text{ m} \times 1.0 \text{ m} \times 0.80 \text{ m}$  is 0.8 meter above test site ground level.
- 2) During the emission test, the turntable is rotated and the EUT is manipulated to find the configuration resulting in maximum emission under normal condition of installation and operation.
- 3) The antenna height and polarization are also varied from 1 to 4 meters until the maximum signal is found.
- 4) The spectrum shall be scanned up to the 10<sup>th</sup> harmonic of the fundamental frequency.

#### Test Procedure

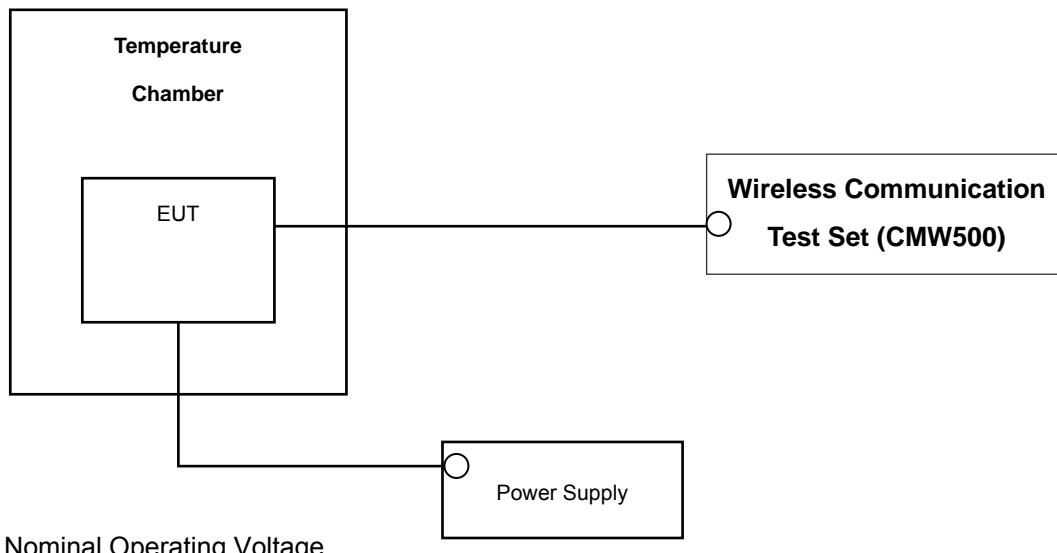
The equipment under test is placed on a non-conductive table 3-meters from the receive antenna. A turntable was rotated 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the previously recorded signal was duplicated.

The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

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### 3.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

#### Test Set-up



#### Test Procedure

The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

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

**NOTE: The EUT is tested down to the battery endpoint.**

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## 4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Interval	Calibration Due
Agilent	N9020A	MY51110020	Annual	09/23/2012
Agilent	E9327A/ Power Sensor	MY4442009	Annual	05/02/2013
R&S	CMW500/ Base Station	1201.0002K50_116858	Annual	01/17/2013
MITEQ	AMF-6D-001180-35-20P/AMP	1081666	Annual	09/24/2012
Wainwright	WHK1.2/15G-10EF/H.P.F	2	Annual	05/02/2013
Wainwright	WHK3.3/18G-10EF/H.P.F	1	Annual	05/02/2013
Hewlett Packard	11667B / Power Splitter	10126	Annual	11/04/2012
Digital	EP-3010/ Power Supply	3110117	Annual	11/07/2012
Schwarzbeck	UHAP/ Dipole Antenna	557	Biennial	03/11/2013
Schwarzbeck	UHAP/ Dipole Antenna	558	Biennial	03/11/2013
Korea Engineering	KR-1005L / Chamber	KRAB05063-3CH	Annual	11/07/2012
Schwarzbeck	BBHA 9120D/ Horn Antenna	296	Biennial	02/20/2014
Agilent	E4440A/Spectrum Analyzer	US45303008	Annual	05/02/2013
WEINSCHEL	ATTENUATOR	BR0592	Annual	11/07/2012
REOHDE&SCHWARZ	FSP30/Spectrum Analyzer	839117/011	Annual	02/09/2013
Agilent	8960 (E5515C)/ Base Station	GB44400269	Annual	02/10/2013

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## 5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 27.53(c)(2)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	< 43 +10 log <sub>10</sub> (P[Watts]) < 65 + 10 log <sub>10</sub> (P[Watts]) in a 6.25 KHz bandwidth for emissions in the 763 – 775 MHz and 793 – 805 MHz bands		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)	Effective Radiated Power	< 3 Watts max. ERP	RADIATED	PASS
2.1053, 27.53(c)(2) 27.53(c)(4)	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

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## 6. SAMPLE CALCULATION

### **A. ERP Sample Calculation**

Mode	Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL(dBm)	Ant. Gain	C.L	Pol.	ERP	
	channel	Freq.(MHz)						W	dBm
LTE	23230	782	-11.56	34.28	-8.32	1.17	H	0.30	24.79

**ERP = SubstituteLEVEL(dBm) + Ant. Gain – CL(Cable Loss)**

- 1) The EUT mounted on a non-conductive turntable is 0.8 meter above test site ground level.
- 2) During the test , the turn table is rotated and the antenna height is also varied from 1 to 4 meters 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**

**Emission Designator = 8M95G7D**

LTE BW = 8.95 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Amplitude/Angle Modulated

#### **16QAM Modulation**

**Emission Designator = 8M94W7D**

LTE BW = 8.94 MHz

D = Amplitude/Angle Modulated

7 = Quantized/Digital Info

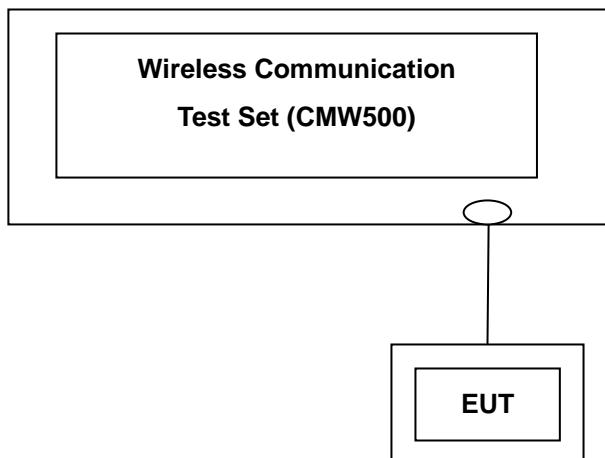
W = Combination (Audio/Data)

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## 7. TEST DATA

### 7.1 CONDUCTED OUTPUT POWER

A base station simulator was used to establish communication with the EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



Test Result

Band	Frequency(Mhz)	Channel	Resource Block Size	Resource Block Offset	Average Power [dBm]	
					QPSK	16-QAM
LTE	782	23230	1	0	23.10	21.64
			1	49	23.09	21.68
			25	12	21.77	20.85
			50	0	21.69	20.66

(LTE Conducted Average Output Powers)

Note : Detecting mode is average.

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## 7.2 PEAK-TO-AVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown Page 25.

## 7.3 OCCUPIED BANDWIDTH

- Plots of the EUT's Occupied Bandwidth are shown Page 24.

## 7.4 CONDUCTED SPURIOUS EMISSIONS

- Plots of the EUT's Conducted Spurious Emissions are shown Page 30 ~ 31.

### 7.4.1 BAND EDGE

Note : In the 763 – 775 MHz and 793 – 805 MHz band, the FCC limit is  $65 + 10\log_{10}(P_{[Watts]}) = - 35$  dBm in a 6.25 KHz bandwidth.

By using a 10KHz bandwidth, the limit was adjusted by  $10\log_{10}(10KHz/6.25KHz) = 2.04$  dB.

LIMIT : - 35 dBm + 2.04 dB = - 32.96 dBm.

- Plots of the EUT's Band Edge are shown Page 26 ~29.

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## 7.5 EFFECTIVE RADIATED POWER OUTPUT

### (10 MHz)-Standard Battery Cover

Ch / Freq		Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	ERP	
channel	Freq (MHz)							W	dBm
23230	782.00	QPSK	-13.68	34.50	-10.52	1.53	V	0.176	22.45
		16-QAM	-13.89	34.29	-10.52	1.53	H	0.167	22.24

### (10 MHz)-Extended Battery Cover

Ch / Freq		Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	ERP	
channel	Freq (MHz)							W	dBm
23230	782.00	QPSK	-13.91	34.27	-10.52	1.53	H	0.167	22.22
		16-QAM	-13.96	34.22	-10.52	1.53	H	0.165	22.17

### (10 MHz)-Wireless Battery Cover

Ch / Freq		Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	ERP	
channel	Freq (MHz)							W	dBm
23230	782.00	QPSK	-13.72	34.46	-10.52	1.53	H	0.174	22.41
		16-QAM	-13.80	34.38	-10.52	1.53	H	0.171	22.33

Note: Worst case is 1 resource block.

The EUT has three types of battery covers. Standard Battery Cover, Extended Battery Cover and Wireless Battery Cover.

#### NOTES:

Effective Radiated Power Output Measurements by Substitution Method

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

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For 1 MHz BW signals, a peak detector is used, with RBW = VBW = 1 MHz. For 10 MHz BW signals, a peak detector is used, with RBW = VBW = 10 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the 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 x plane in LTE mode. Also worst case of detecting Antenna is horizontal polarization in LTE mode.

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## 7.6 RADIATED SPURIOUS EMISSIONS

### 7.6.1 RADIATED SPURIOUS EMISSIONS

EUT TYPE: Standard Battery Cover  
 OPERATING FREQUENCY : 782.00 MHz  
 MEASURED OUTPUT POWER: 22.45 dBm = 0.176 W  
 MODULATION SIGNAL: QPSK  
 DISTANCE: 3 meters  
 LIMIT: - (43 + 10 log<sub>10</sub>(W)) = - 35.45 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	dBc
23230 (782.00)	2346.00	-47.16	10.57	-52.60	2.14	V	-44.17	-66.62
	3128.00	-	-	-	-	-	-	-
	3910.00	-55.61	12.66	-60.04	2.69	H	-50.07	-72.52

EUT TYPE: Extended Battery Cover  
 OPERATING FREQUENCY : 782.00 MHz  
 MEASURED OUTPUT POWER: 22.22 dBm = 0.167 W  
 MODULATION SIGNAL: QPSK-  
 DISTANCE: 3 meters  
 LIMIT: - (43 + 10 log<sub>10</sub>(W)) = - 35.22 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	ERP (dBm)	dBc
23230 (782.00)	2346.00	-40.19	10.57	-45.63	2.14	V	-37.20	-59.42
	3128.00	-	-	-	-	-	-	-
	3910.00	-55.26	12.66	-59.69	2.69	V	-49.72	-71.94

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EUT TYPE: Wireless Battery Cover  
 OPERATING FREQUENCY : 782.00 MHz  
 MEASURED OUTPUT POWER: 22.41 dBm = 0.174 W  
 MODULATION SIGNAL: QPSK  
 DISTANCE: 3 meters  
 LIMIT: - (43 + 10  $\log_{10}$  (W)) = - 35.41 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitution Level (dBm)	C.L	Pol	ERP (dBm)	dBc
23230 (782.00)	2346.00	-46.51	10.57	-51.95	2.14	V	-43.52	-65.93
	3128.00	-	-	-	-	-	-	-
	3910.00	-55.06	12.66	-59.49	2.69	H	-49.52	-71.93

**NOTES:**

1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:
2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5<sup>th</sup> Harmonic for all channel.
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. The EUT has three types of battery covers. Standard Battery Cover, Extended Battery Cover and Wireless Battery Cover.

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

EUT TYPE: Standard Battery Cover  
 OPERATING FREQUENCY : 782.00 MHz  
 MODULATION SIGNAL: QPSK  
 DISTANCE: 3 meters  
 NARROWBAND EMISSION LIMIT: - 50 dBm  
 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)
1578.4	WIDEBAND	-58.22	8.91	-66.72	1.71	V	-59.52	-19.52

EUT TYPE: Extended Battery Cover  
 OPERATING FREQUENCY : 782.00 MHz  
 MODULATION SIGNAL: QPSK  
 DISTANCE: 3 meters  
 NARROWBAND EMISSION LIMIT: - 50 dBm  
 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)
1578.4	WIDEBAND	-57.63	8.91	-66.13	1.71	V	-58.93	-18.93

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EUT TYPE: Wireless Battery Cover  
 OPERATING FREQUENCY : 782.00 MHz  
 MODULATION SIGNAL: QPSK  
 DISTANCE: 3 meters  
 NARROWBAND EMISSION LIMIT: - 50 dBm  
 WIDEBAND EMISSION LIMIT: - 40 dBm/MHz

FREQUENCY (MHz)	EMISSION TYPE	Measured Level (dBm)	Ant. Gain (dBd)	Substitution Level (dBm)	C.L	Pol	ERP (dBm)	MARGIN (dB)
1578.4	WIDEBAND	-58.29	8.91	-66.79	1.71	V	-59.59	-19.59

**NOTES:**

1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004;
2. The magnitude of spurious emissions attenuated more than 20dB below the limit above 5<sup>th</sup> Harmonic for all channel.
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. The EUT has three types of battery covers. Standard Battery Cover, Extended Battery Cover and Wireless Battery Cover.

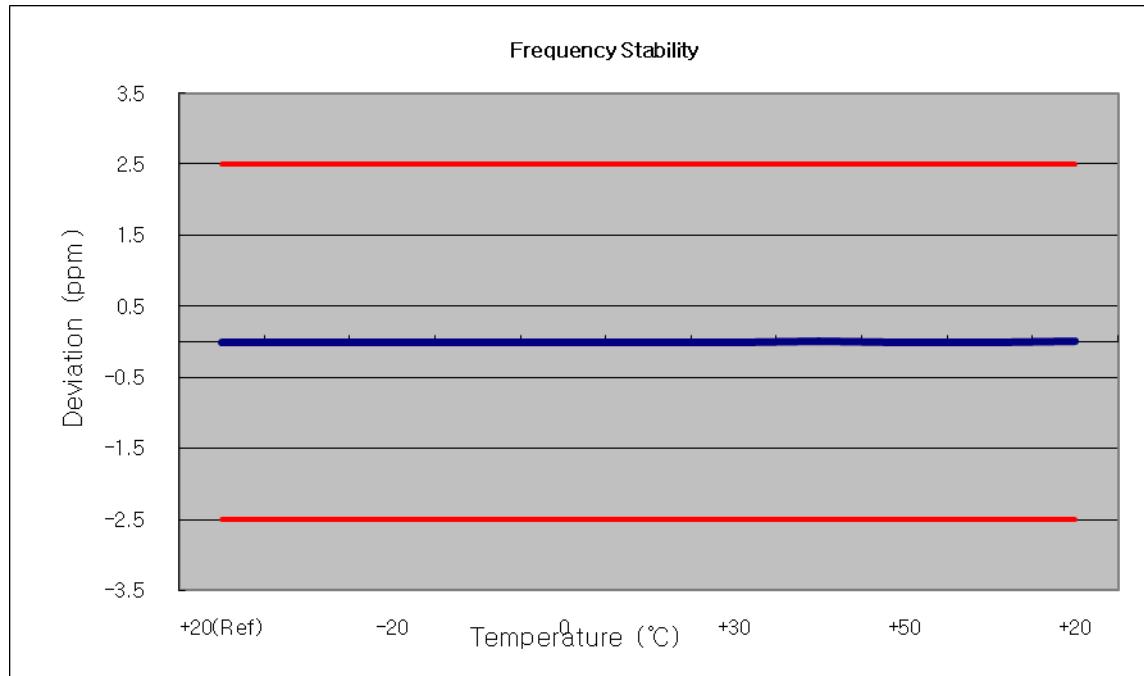
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## 7.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

### 7.7.1 FREQUENCY STABILITY (LTE)

OPERATING FREQUENCY: 782,000,000 Hz  
 CHANNEL: 23230  
 REFERENCE VOLTAGE: 3.7 VDC  
 DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.700	+20(Ref)	782 000 004	0	0.000 000	0.000
100%		-30	781 999 998	-1.59	0.000 000	-0.002
100%		-20	781 999 997	-2.79	0.000 000	-0.004
100%		-10	781 999 999	-0.59	0.000 000	-0.001
100%		0	781 999 999	-1.27	0.000 000	-0.002
100%		+10	781 999 998	-2.29	0.000 000	-0.003
100%		+30	781 999 999	-0.87	0.000 000	-0.001
100%		+40	782 000 001	1.00	0.000 000	0.001
100%		+50	782 000 000	-0.50	0.000 000	-0.001
115%	4.255	+20	781 999 998	-1.53	0.000 000	-0.002
Batt. Endpoint	3.400	+20	782 000 001	1.24	0.000 000	0.002



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## 8. TEST PLOTS

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### ■ Occupied Bandwidth (QPSK – RB Size 50)



### ■ Occupied Bandwidth (16-QAM – RB Size 50)



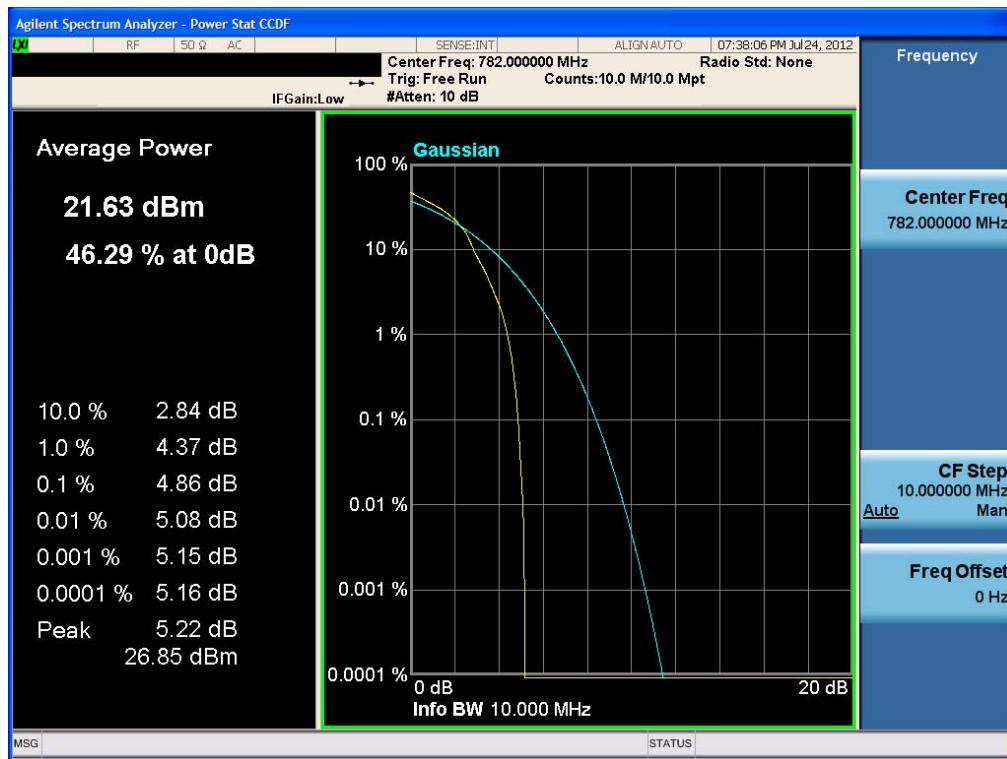
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■ Peak-Average Ratio Plot ( QPSK )



■ Peak-Average Ratio Plot ( 16-QAM )



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■ Low Band Edge (QPSK – RB Size 50)



■ Upper Band Edge ( QPSK – RB Size 50)



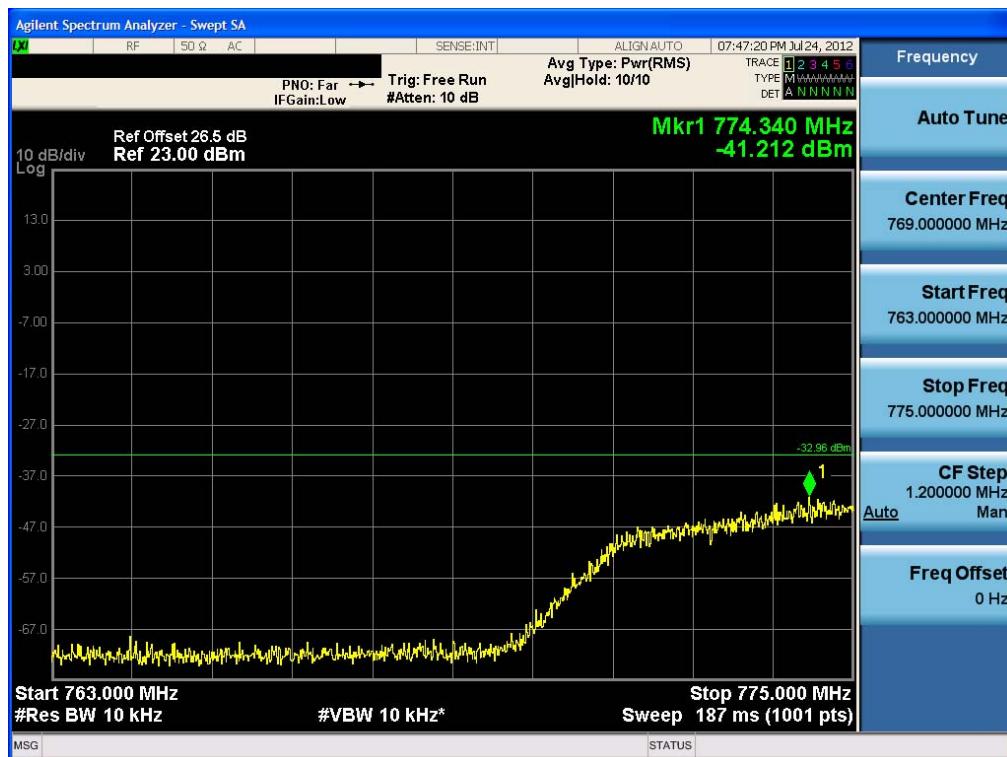
■ Low Band Edge (16-QAM – RB Size 50)



■ Upper Band Edge (16-QAM – RB Size 50)



■ Low Emission Mask (763 MHz – 775 MHz) QPSK –RB Size 50

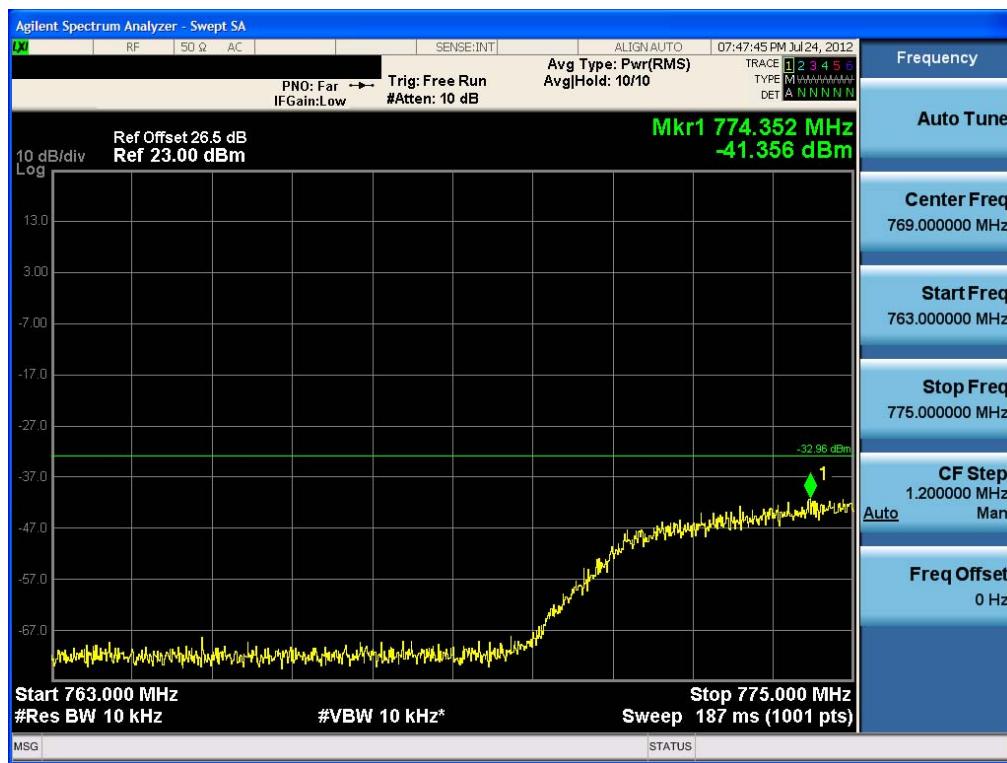


■ Upper Emission Mask (793 MHz – 805 MHz) QPSK –RB Size 50



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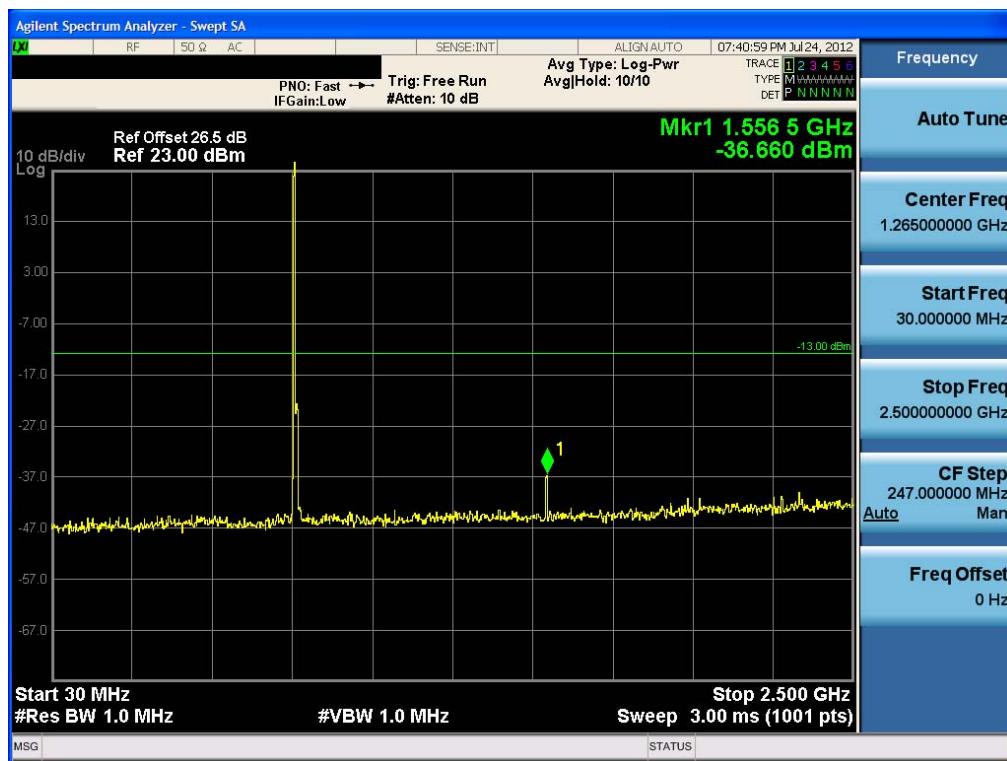
■ Low Emission Mask (763 MHz – 775 MHz) 16-QAM –RB Size 50



■ Upper Emission Mask (793 MHz – 805 MHz) 16-QAM –RB Size 50



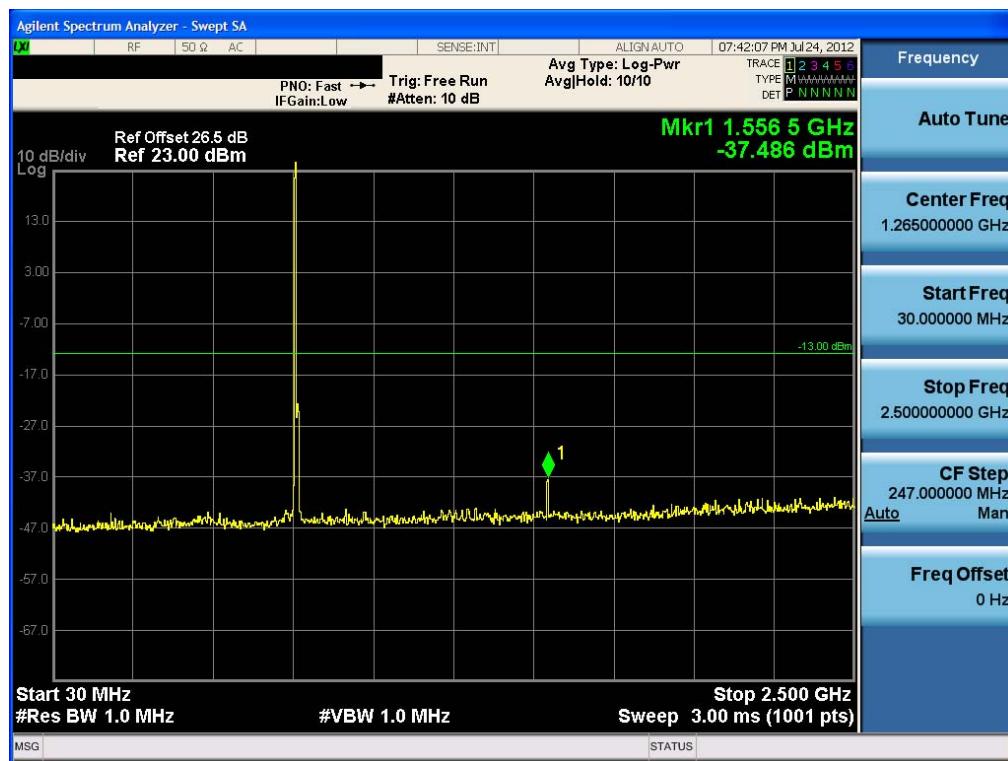
■ Conducted Spurious Emission (QPSK – RB Size 1, RB Offset 0)-1



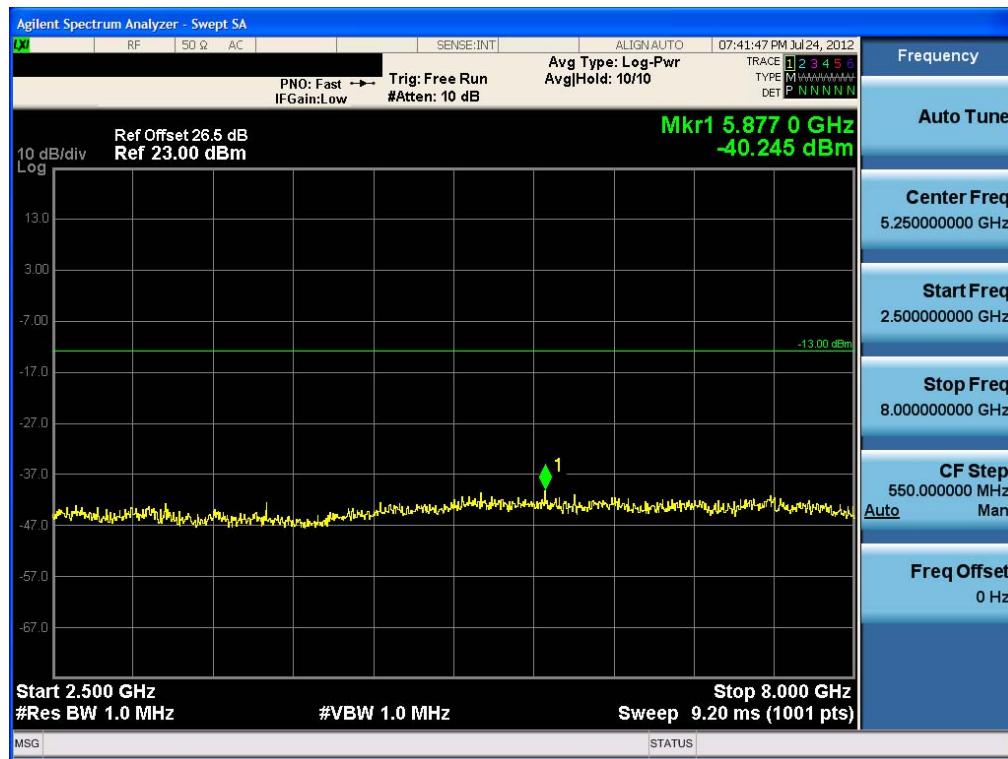
■ Conducted Spurious Emission (QPSK – RB Size 1, RB Offset 0)-2



■ Conducted Spurious Emission (16-QAM – RB Size 1, RB Offset 0)-1



■ Conducted Spurious Emission (16-QAM – RB Size 1, RB Offset 0)-2



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