

# FCC Radio Test Report

## FCC ID: QISMS2372H-517

This report concerns (check one):  Original Grant  Class II Change

**Project No.** : 1708C331  
**Equipment** : LTE USB Stick  
**Model Name** : MS2372h-517  
**Applicant** : Huawei Technologies Co., Ltd.  
**Address** : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

**Date of Receipt** : Aug. 30, 2017  
**Date of Test** : Aug. 30, 2017 ~ Sep. 22, 2017  
**Issued Date** : Sep. 25, 2017  
**Tested by** : BTL Inc.

**Technical Engineer** : Kenji Lin  
(Kenji Lin)

**Authorized Signatory** : Andy Chiu  
(Andy Chiu)

# B T L I N C .

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### **Limitation**

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**Table of Contents****Page**

<b>REPORT ISSUED HISTORY</b>	<b>5</b>
<b>1 . CERTIFICATION</b>	<b>6</b>
<b>2 . SUMMARY OF TEST RESULTS</b>	<b>7</b>
2.1 TEST FACILITY	8
2.2 MEASUREMENT UNCERTAINTY	8
<b>3 . GENERAL INFORMATION</b>	<b>9</b>
3.1 GENERAL DESCRIPTION OF EUT	9
3.2 DESCRIPTION OF TEST MODES AND TEST CONDITION	10
3.3 BLOCKDIAGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED FOR RADIATED	12
3.4 DESCRIPTION OF SUPPORT UNITS	12
<b>4 . TEST RESULT</b>	<b>13</b>
4.1 OUTPUT POWER MEASUREMENT	13
4.1.1 LIMIT	13
4.1.2 TEST PROCEDURE	13
4.1.3 TESTSETUP LAYOUT	13
4.1.4 TEST DEVIATION	13
4.1.5 TEST RESULTS	13
4.2 OCCUPIED BANDWIDTH MEASUREMENT	14
4.2.1 TEST PROCEDURE	14
4.2.2 TEST SETUP LAYOUT	14
4.2.3 TEST DEVIATION	14
4.2.4 TEST RESULTS	14
4.3 CONDUCTED EMISSIONS MEASUREMENT	15
4.3.1 LIMIT	15
4.3.2 TEST PROCEDURES	15
4.3.3 TESTSETUP LAYOUT	15
4.3.4 TESTDEVIATION	15
4.3.5 TEST RESULTS	15
4.4 RADIATED EMISSIONS MEASUREMENT	16
4.4.1 LIMIT	16
4.4.2 TEST PROCEDURES	16
4.4.3 TESTSETUP LAYOUT	16
4.4.4 TESTDEVIATION	16
4.4.5 TEST RESULTS	16
4.5 BAND EDGE MEASUREMENT	17
4.5.1 LIMIT	17

<b>Table of Contents</b>	<b>Page</b>
4.5.2 TEST PROCEDURES	17
4.5.3 TESTSETUP LAYOUT	17
4.5.4 TESTDEVIATION	17
4.5.5 TEST RESULTS	17
4.6 PEAK TO AVERAGE RATIO MEASUREMENT	18
4.6.1 LIMIT	18
4.6.2 TEST PROCEDURES	18
4.6.3 TESTSETUP LAYOUT	18
4.6.4 TESTDEVIATION	18
4.6.5 TEST RESULTS	18
4.7 FREQUENCY STABILITY MEASUREMENT	19
4.7.1 LIMIT	19
4.7.2 TEST PROCEDURES	19
4.7.3 TESTSETUP LAYOUT	19
4.7.4 TESTDEVIATION	19
4.7.5 TEST RESULTS	19
5. LIST OF MEASUREMENT EQUIPMENTS	20
ATTACHMENT A - OUTPUT POWER	21
ATTACHMENT B - OCCUPIED BANDWIDTH	26
ATTACHMENT C - CONDUCTED EMISSIONS	36
ATTACHMENT D - RADIATED EMISSION	43
ATTACHMENT E - BAND EDGE	76
ATTACHMENT F - PEAK TO AVERAGE RATIO	81
ATTACHMENT G - FREQUENCY STABILITY	88

### REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-1-1708C331	Original Issue.	Sep. 25, 2017

## 1. CERTIFICATION

Equipment : LTE USB Stick  
Brand Name : HUAWEI  
Model Name : MS2372h-517  
Applicant : Huawei Technologies Co.,Ltd.  
Manufacturer : Huawei Technologies Co.,Ltd.  
Address : Administration Building, Huawei Base, Bantian, Longgang District ,Shenzhen  
518129, P.R.China  
Factory : Huawei Technologies Co.,Ltd.  
Address : Administration Building, Huawei Base, Bantian, Longgang District ,Shenzhen  
518129, P.R.China  
Date of Test : Aug. 30, 2017 ~ Sep. 22, 2017  
Test Sample : Engineering Sample  
Standard(s) : 47 CFR FCC Part 22 Subpart H  
47 CFR FCC Part 2  
ANSI/TIA-603-D-2010  
KDB 971168 D01 Power Meas License Digital Systems v02r02

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1708C331) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

**Test result included in this report is only for the GSM850, WCDMA Band 5 and LTE Band 5 part.**

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 22 Subpart H& Part 2			
Standard(s) Section	Test Item	Judgment	Tested By
2.1046 22.913(a)	Radiated power	PASS	Paul Li
2.1046 22.913(a)	Conducted Output Power	PASS	Paul Li
2.1049(h) 22.917(a)	Occupied Bandwidth	PASS	Paul Li
2.1051 22.917(a)	Conducted Spurious Emissions	PASS	Paul Li
2.1053 22.917(a)	Radiated Spurious Emissions	PASS	Paul Li
22.917(a)	Band Edge Measurements	PASS	Paul Li
-	Peak To Average Ratio	PASS	Paul Li
2.1055 22.355	Frequency Stability	PASS	Paul Li

NOTE:

(1) "N/A" denotes test is not applicable to this device.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

### Radiated emissions Test (Below 1 GHz):

**CB15:** (FCC RN:674415; FCC DN:TW0659)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

### Radiated emissions Test (Above 1 GHz):

**CB15:** (FCC RN:674415; FCC DN:TW0659)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

### Conducted Test:

**TR01:** (FCC RN:674415; FCC DN:TW0659)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

## 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{cispr}$  requirement.

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95%**.

### A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m)	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	3.82
		30MHz ~ 200MHz	H	3.78
		200MHz ~ 1,000MHz	V	4.10
		200MHz ~ 1,000MHz	H	4.06

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m)	CISPR	1GHz ~ 18GHz	V	3.12
		1GHz ~ 18GHz	H	3.68

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (1m)	CISPR	18GHz ~ 40GHz	V	4.15
		18GHz ~ 40GHz	H	4.14

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	LTE USB Stick			
Brand Name	HUAWEI			
Model Name	MS2372h-517			
Model Difference	N/A			
Modulation Type	GSM/GPRS	GMSK		
	EDGE	GMSK, 8PSK		
	WCDMA	Uplink: BPSK Downlink: QPSK		
	WCDMA(HSDPA/HSUPA/HSPA+)	16QAM		
	LTE	QPSK, 16QAM		
Operation Frequency	GSM /EDGE/GPRS	824.2 ~ 848.8 MHz		
	WCDMA Band 5	826.4 ~ 846.6 MHz		
	LTE 5 (Channel Bandwidth: 5MHz)	826.5 ~ 846.5 MHz		
	LTE 5 (Channel Bandwidth: 10MHz)	829.0 ~ 844.0 MHz		
Max. ERP Power	GSM/GPRS	GMSK	31.58	dBm
	EDGE	8PSK	25.26	dBm
	WCDMA	BPSK	22.72	dBm
	WCDMA_HSDPA	16QAM	22.07	dBm
	WCDMA_HSUPA	16QAM	20.93	dBm
	LTE 5 (Channel Bandwidth: 5MHz)	QPSK	23.54	dBm
		16QAM	22.07	dBm
	LTE 5 (Channel Bandwidth: 10MHz)	QPSK	23.34	dBm
16QAM		22.14	dBm	
Antenna Type	Fixed Internal Antenna			
Antenna Gain	1.8 dBi(GSM 850&WCDMA BAND 5),2.0 dBi(LTE BAND 5)			
Hardware Version	21.328.01.03.00			
Software Version	CL1MS2372HM VER.B			
IMEI No.1	Radiated	866667030005580		
	Conducted	866667030005572		
Power Source	Supplied from AC/DC adapter.			
Power Rating	100-240V~ 5V/1.0A			

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

### 3.2 DESCRIPTION OF TEST MODES AND TEST CONDITION

Following channel(s) was (were) selected for the final test as listed below:

GSM MODE			
Test Item	Available Channel	Tested Channel	Mode
ERP	128 to 251	128, 190, 251	GSM, EDGE
Conducted Output Power	128 to 251	128, 190, 251	GSM, EDGE
Occupied Bandwidth	128 to 251	128, 190, 251	GSM, EDGE
Condcudeted Emission	128 to 251	190	GSM, EDGE
Radiated Emission	128 to 251	251	GSM, EDGE
Band Edge	128 to 251	128, 251	GSM, EDGE
Peak to Average Ratio	128 to 251	128, 190, 251	GSM, EDGE
Frequency Stability	128 to 251	190	GSM, EDGE

WCDMA MODE			
Test Item	Available Channel	Tested Channel	Mode
ERP	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
Conducted Output Power	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
Condcudeted Emission	4132 to 4233	4182	WCDMA, HSDPA, HSUPA
Radiated Emission	4132 to 4233	4182	WCDMA, HSDPA, HSUPA
Band Edge	4132 to 4233	4132, 4233	WCDMA, HSDPA, HSUPA
Peak to Average Ratio	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
Frequency Stability	4132 to 4233	4182	WCDMA, HSDPA, HSUPA

**Note:** 1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in **QPSK** modulation.

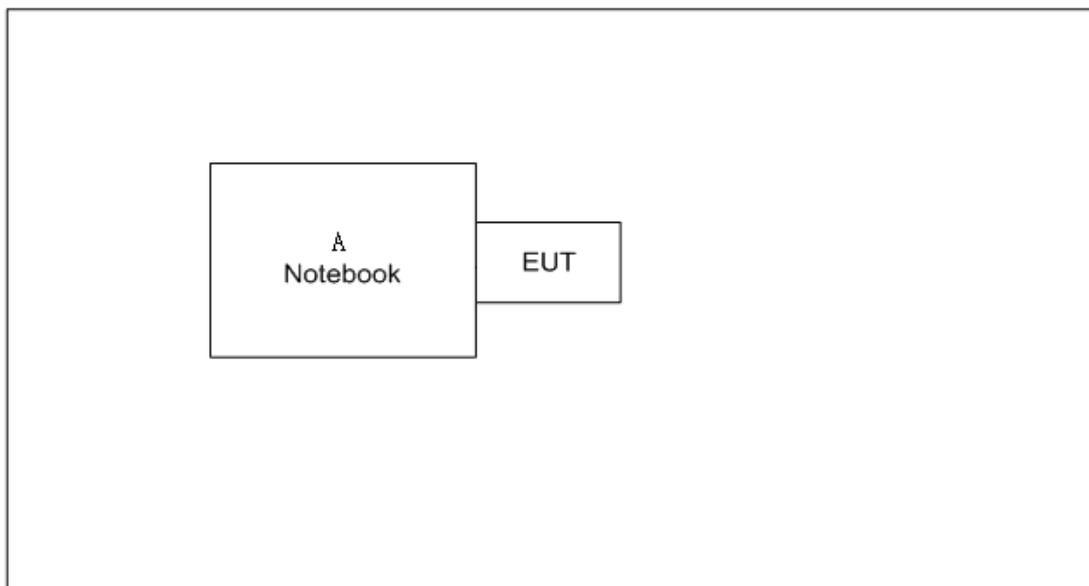
2. For 18G to 26.5G, the highest bandwidth is worst case and recording in the test report.

LTE BAND 5 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
ERP	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
Occupied Bandwidth	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
Conducted Emission	20425 to 20625	20525	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20525	10MHz	QPSK	1 RB / 0 RB Offset
Radiated Emission	20425 to 20625	20425	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20600	10MHz	QPSK	1 RB / 0 RB Offset
Band Edge	20425 to 20625	20425	5MHz	QPSK	1 RB / 0 RB Offset
		20625	5MHz	QPSK	25 RB / 0 RB Offset
	20450 to 20600	20450	10MHz	QPSK	1 RB / 0 RB Offset
					50 RB / 0 RB Offset
		20600	10MHz	QPSK	1 RB / 49 RB Offset
					50 RB / 0 RB Offset
Peak To Average Ratio	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
Frequency Stability	20425 to 20625	20525	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20525	10MHz	QPSK	1 RB / 0 RB Offset

**EUT TEST CONDITIONS:**

Test Item	Environmental Conditions	Test Voltage
ERP	25°C, 60%RH	DC 3.8V
Conducted Output Power	25°C, 65%RH	DC 3.8V
Occupied Bandwidth	25°C, 65%RH	DC 3.8V
Conducted Emission	25°C, 65%RH	DC 3.8V
Radiated Emission	25°C, 60%RH	AC 120V/60Hz
Band Edge	25°C, 65%RH	DC 3.8V
Peak to Average Ratio	25°C, 65%RH	DC 3.8V
Frequency Stability	25°C, 65%RH	DC 3.8V

**3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED FOR RADIATED**



**3.4 DESCRIPTION OF SUPPORT UNITS**

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
A	Notebook	Dell 745	DCSM	DOC	G7K832X

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-

## 4. TEST RESULT

### 4.1 OUTPUT POWER MEASUREMENT

#### 4.1.1 LIMIT

Mobile / Portable station are limited to 7 watts e.r.p.

#### 4.1.2 TEST PROCEDURE

##### EIRP/ERP:

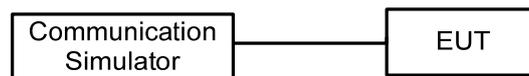
1. EIRP= Conducted Power +Antenan gain  
ERP power=EIPR power-2.15dBi.

##### Conducted Power:

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

#### 4.1.3 TESTSETUP LAYOUT

##### Conducted Power Measurement



#### 4.1.4 TEST DEVIATION

No deviation

#### 4.1.5 TEST RESULTS

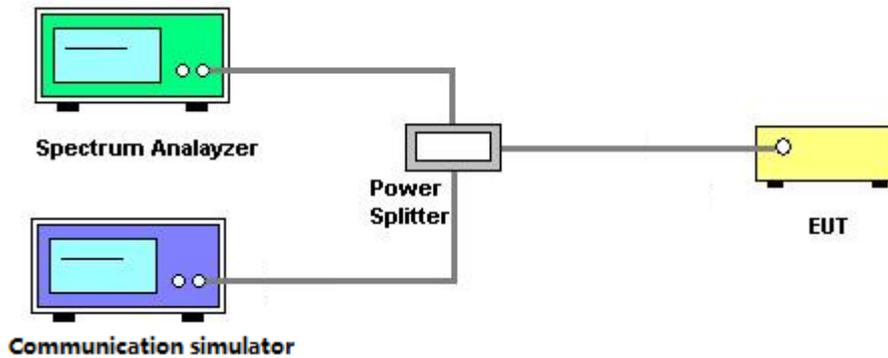
Please refer to the Attachment A.

## 4.2 OCCUPIED BANDWIDTH MEASUREMENT

### 4.2.1 TEST PROCEDURE

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. 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 and 26dB bandwidth.

### 4.2.2 TEST SETUP LAYOUT



### 4.2.3 TEST DEVIATION

No deviation

### 4.2.4 TEST RESULTS

Please refer to the Attachment B.

### 4.3 CONDUCTED EMISSIONS MEASUREMENT

#### 4.3.1 LIMIT

The 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. The emission limit equal to  $-13\text{dBm}$ .

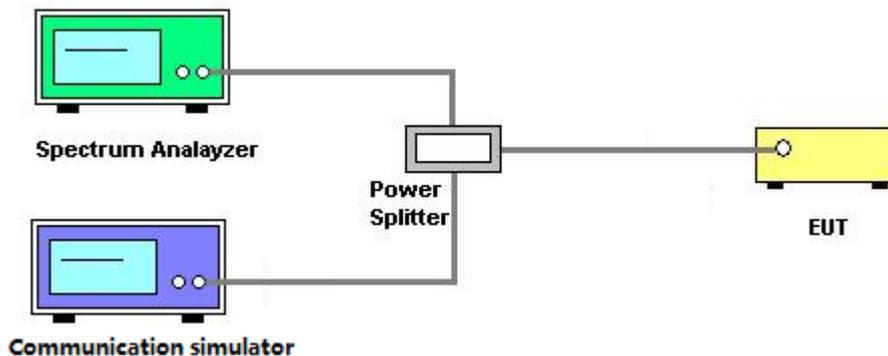
#### 4.3.2 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured. Set  $\text{RBW} \geq 1\%$  EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from  $43+10\log(P)\text{dB}$  below the transmitter power P(Watts)
 
$$= P(W) - [43 + 10\log(P)](\text{dB})$$

$$= [30 + 10\log(P)](\text{dBm}) - [43 + 10\log(P)](\text{dB})$$

$$= -13\text{dBm}$$

#### 4.3.3 TESTSETUP LAYOUT



#### 4.3.4 TESTDEVIATION

No deviation

#### 4.3.5 TEST RESULTS

Please refer to the Attachment C.

## 4.4 RADIATED EMISSIONS MEASUREMENT

### 4.4.1 LIMIT

The 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. The emission limit equal to -13dBm.

### 4.4.2 TEST PROCEDURES

1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G
3. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

### 4.4.3 TESTSETUP LAYOUT

This test setup layout is the same as that shown in **section 4.1.3**.

### 4.4.4 TESTDEVIATION

No deviation

### 4.4.5 TEST RESULTS

Please refer to the Attachment D.

## 4.5 BAND EDGE MEASUREMENT

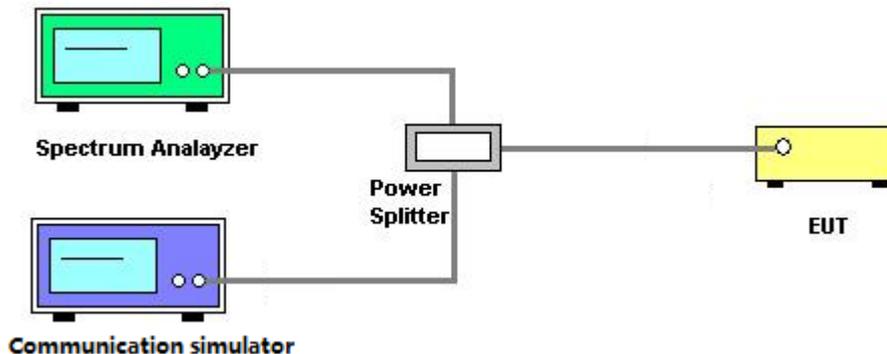
### 4.5.1 LIMIT

A 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.

### 4.5.2 TEST PROCEDURES

1. All measurements were done at low and high operational frequency range.
2. 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 10kHz (GSM/GPRS/EDGE).
3. 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 300kHz (WCDMA).
4. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 13kHz and VB of the spectrum is 51kHz (LTE Bandwidth 1.4MHz).
5. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Bandwidth 3MHz).
6. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 5MHz/10MHz).
7. Record the max trace plot into the test report.

### 4.5.3 TESTSETUP LAYOUT



### 4.5.4 TESTDEVIATION

No deviation

### 4.5.5 TEST RESULTS

Please refer to the Attachment E.

## 4.6 PEAK TO AVERAGE RATIO MEASUREMENT

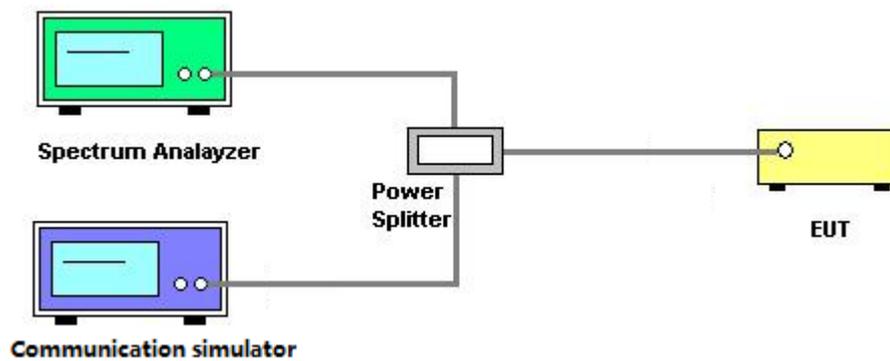
### 4.6.1 LIMIT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 4.6.2 TEST PROCEDURES

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

### 4.6.3 TESTSETUP LAYOUT



### 4.6.4 TESTDEVIATION

No deviation

### 4.6.5 TEST RESULTS

Please refer to the Attachment F.

## 4.7 FREQUENCY STABILITY MEASUREMENT

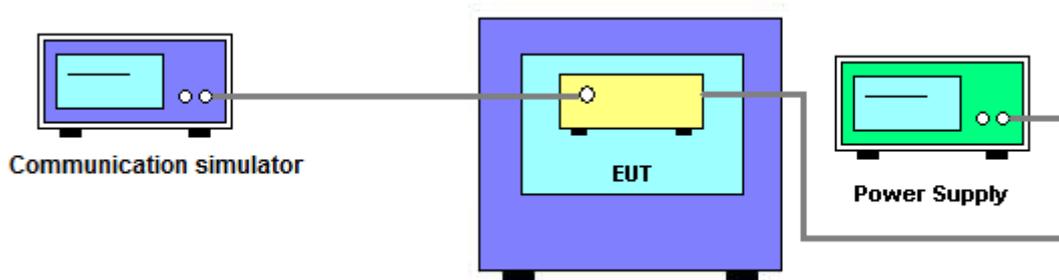
### 4.7.1 LIMIT

1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

### 4.7.2 TEST PROCEDURES

1. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
2. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}\text{C}$  during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. The frequency error was recorded frequency error from the communication simulator.

### 4.7.3 TESTSETUP LAYOUT



### 4.7.4 TESTDEVIATION

No deviation

### 4.7.5 TEST RESULTS

Please refer to the Attachment G.

## 5. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Preamplifier	EMCI	012645B	980267	Feb. 28, 2018
2	Preamplifier	EMCI	EMC02325	980217	Dec. 29, 2017
3	Preamplifier	EMCI	EMC2654045	980030	Feb. 14, 2018
4	Test Cable	EMCI	EMC104-SM-S M-8000	8m	Jan. 04, 2018
5	Test Cable	EMCI	EMC104-SM-S M-800	150207	Jan. 04, 2018
6	Test Cable	EMCI	EEMC104-SM-S M-3000	151205	Jan. 04, 2018
7	MXE EMI Receiver	Agilent	N9038A	MY55420127	Jan. 09, 2018
8	Signal Analyzer	Agilent	N9010A	MY52220990	Feb. 22, 2018
9	Loop Ant	EMCO	6502	42960	Nov. 24, 2017
10	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	Feb. 28, 2018
11	Horn Ant	Schwarzbeck	BBHA 9170	187	Dec. 07, 2017
12	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-548	Jan. 16, 2018
13	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0623	Jan. 16, 2018

Conducted Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Keysight	N9010A	MY54200240	Aug. 27, 2018
2	Radio Com Analyzer	Anritsu	MT8820C	6201525878	Sep. 05, 2019

Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Keysight	N9010A	MY54200240	Aug. 27, 2018
2	Radio Com Analyzer	Anritsu	MT8820C	6201525878	Sep. 05, 2019
3	Thermal Chamber	HOLINK	CHOLINK/H-T-1F-D	BA03101701	May 14, 2018

Remark: "N/A" denotes no model name, serial no. or calibration specified.  
All calibration period of equipment list is one year.

## ATTACHMENT A - OUTPUT POWER

**Conducted Power:**

GSM850 (Capsensor Off)		Burst Conducted Power (dBm)		
		128CH	190CH	251CH
		824.2MHz	836.6MHz	848.8MHz
GSM (CS)		31.51	31.65	31.68
GPRS/EDGE (GMSK)	1 Tx Slot	31.77	31.93	31.89
	2 Tx Slot	29.35	29.58	29.47
	3 Tx Slot	27.17	27.39	27.32
	4 Tx Slot	25.93	26.03	26.04
EDGE (8PSK)	1 Tx Slot	25.49	25.61	25.59
	2 Tx Slot	23.47	23.37	23.46
	3 Tx Slot	21.46	21.49	21.44
	4 Tx Slot	19.35	19.52	19.29

Modulation	Band	WCDMA V(Capsensor Off)		
	Tx Channel	4132CH	4182CH	4233CH
	Rx Channel	4357CH	4407CH	4458CH
	Frequency	826.4MHz	836.4MHz	846.6MHz
BPSK	RMC 12.2K	22.47	22.3	22.53
	RMC 64K	22.46	22.32	22.59
	RMC 144K	22.57	22.32	22.51
	RMC 384K	22.51	22.27	22.52
16QAM	HSDPA Subtest-1	21.92	21.74	21.94
	HSDPA Subtest-2	21.91	21.75	21.96
	HSDPA Subtest-3	21.92	21.74	21.93
	HSDPA Subtest-4	21.88	21.74	21.91
16QAM	HSUPA Subtest-1	21.87	21.72	21.92
	HSUPA Subtest-2	19.97	20.04	19.96
	HSUPA Subtest-3	19.32	19.35	19.41
	HSUPA Subtest-4	20.01	20.13	20.07
	HSUPA Subtest-5	21.09	20.99	21.29

LTE Band / BW	Modulation	RB Sizing	RB Offset	Low CH	Mid CH	High CH
				20425 CH	20525 CH	20625 CH
				826.5 MHz	836.5 MHz	846.5 MHz
5 / 5M	QPSK	1	0	23.24	23.10	22.70
		1	12	23.69	23.68	23.31
		1	24	22.80	23.17	22.43
		12	0	22.59	22.72	22.11
		12	6	22.74	22.95	22.33
		12	13	22.48	22.93	22.19
	16QAM	25	0	22.62	22.84	22.05
		1	0	21.35	21.86	21.22
		1	12	22.22	22.64	21.81
		1	24	21.50	21.93	20.92
		12	0	20.56	20.53	20.08
		12	6	20.74	20.74	20.34
		12	13	20.55	20.72	20.21
		25	0	20.47	20.57	20.11

LTE Band / BW	Modulation	RB Sizing	RB Offset	Low CH	Mid CH	High CH
				20450 CH	20525 CH	20600 CH
				829.0 MHz	836.5 MHz	844.0 MHz
5 / 10M	QPSK	1	0	23.05	22.71	22.95
		1	24	23.36	23.49	23.20
		1	49	22.66	22.65	22.42
		25	0	21.97	21.86	22.15
		25	12	22.12	22.23	22.19
		25	25	21.88	21.96	21.86
	16QAM	50	0	21.94	22.02	22.08
		1	0	21.63	21.55	21.65
		1	24	22.02	22.29	22.13
		1	49	21.33	21.53	21.11
		25	0	20.09	20.06	20.33
		25	12	20.28	20.40	20.41
		25	25	20.03	20.14	20.13
		50	0	20.11	20.16	20.29

**ERP Power:**

GSM850 (Capsensor Off)	ERP Power (dBm)		
	128CH	190CH	251CH
	824.2MHz	836.6MHz	848.8MHz
GSM (CS)	31.16	31.30	31.33
GPRS/EDGE (GMSK)	31.42	<b>31.58</b>	31.54
	29.00	29.23	29.12
	26.82	27.04	26.97
	25.58	25.68	25.69
EDGE (8PSK)	25.14	<b>25.26</b>	25.24
	23.12	23.02	23.11
	21.11	21.14	21.09
	19.00	19.17	18.94

Modulation	Band	WCDMA V(Capsensor Off)		
	Tx Channel	4132CH	4182CH	4233CH
	Rx Channel	4357CH	4407CH	4458CH
	Frequency	826.4MHz	836.4MHz	846.6MHz
BPSK	RMC 12.2K	<b>22.72</b>	22.5	22.66
	RMC 64K	22.68	22.5	22.55
	RMC 144K	22.66	22.5	22.66
	RMC 384K	22.66	22.41	22.59
16QAM	HSDPA Subtest-1	<b>22.07</b>	21.87	21.99
	HSDPA Subtest-2	22.03	21.85	21.94
	HSDPA Subtest-3	22.02	21.84	21.93
	HSDPA Subtest-4	22.03	21.83	21.93
16QAM	HSUPA Subtest-1	<b>22.02</b>	21.83	21.93
	HSUPA Subtest-2	20	19.82	19.93
	HSUPA Subtest-3	19.36	19.09	19.44
	HSUPA Subtest-4	20.03	20.37	20.03
	HSUPA Subtest-5	20.93	20.89	20.74

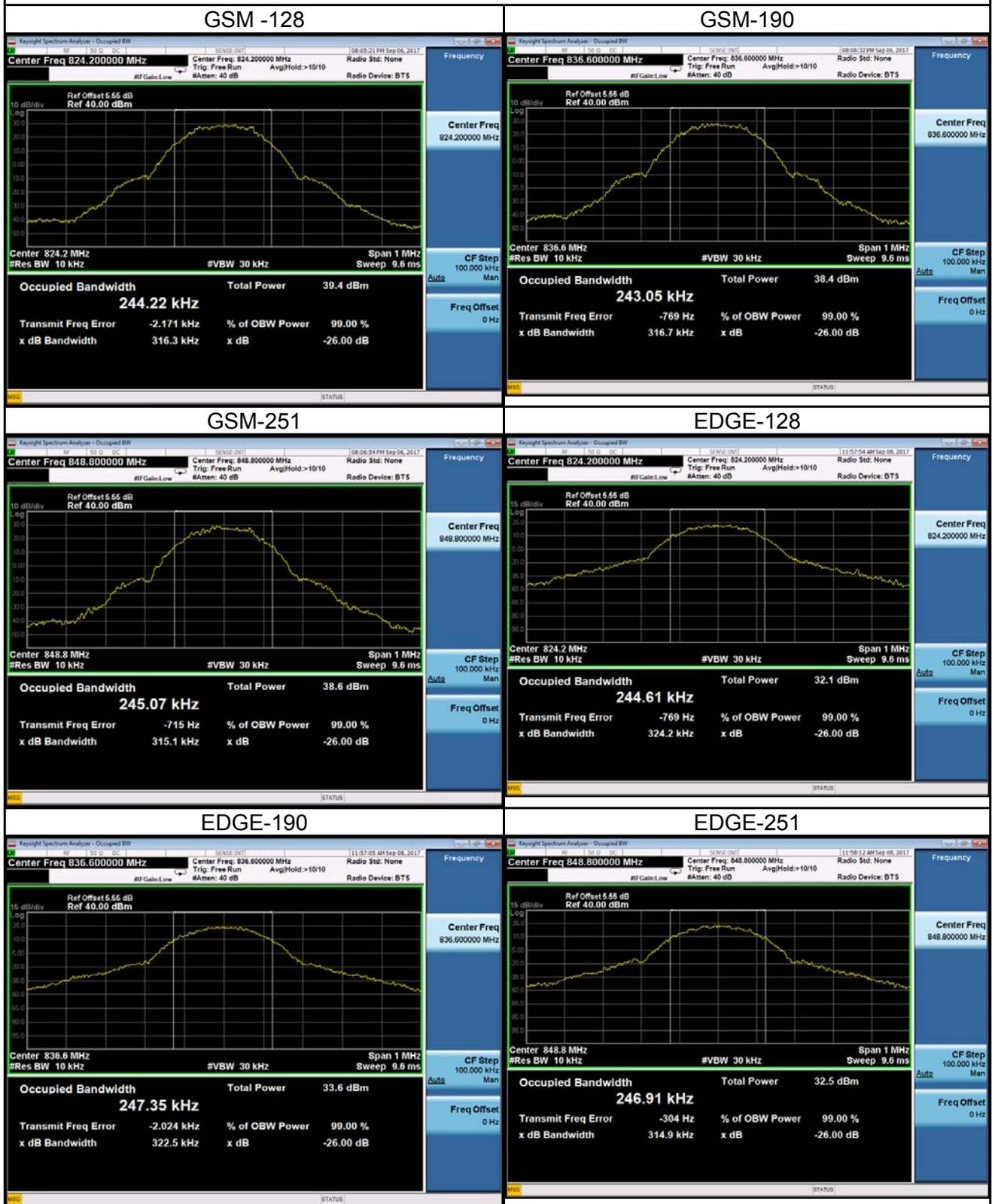
LTE Band / BW	Modulation	RB Siset	RB Offset	Low CH	Mid CH	High CH
				20425 CH	20525 CH	20625 CH
				826.5 MHz	836.5 MHz	846.5 MHz
5 / 5M	QPSK	1	0	23.09	22.95	22.55
		1	12	<b>23.54</b>	23.53	23.16
		1	24	22.65	23.02	22.28
		12	0	22.44	22.57	21.96
		12	6	22.59	22.80	22.18
		12	13	22.33	22.78	22.04
	16QAM	25	0	22.47	22.69	21.90
		1	0	21.20	21.71	21.07
		1	12	<b>22.07</b>	22.49	21.66
		1	24	21.35	21.78	20.77
		12	0	20.41	20.38	19.93
		12	6	20.59	20.59	20.19
		12	13	20.40	20.57	20.06
		25	0	20.32	20.42	19.96

LTE Band / BW	Modulation	RB Siset	RB Offset	Low CH	Mid CH	High CH
				20450 CH	20525 CH	20600 CH
				829.0 MHz	836.5 MHz	844.0 MHz
5 / 10M	QPSK	1	0	22.90	22.56	22.80
		1	24	23.21	<b>23.34</b>	23.05
		1	49	22.51	22.50	22.27
		25	0	21.82	21.71	22.00
		25	12	21.97	22.08	22.04
		25	25	21.73	21.81	21.71
		50	0	21.79	21.87	21.93
	16QAM	1	0	21.48	21.40	21.50
		1	24	21.87	<b>22.14</b>	21.98
		1	49	21.18	21.38	20.96
		25	0	19.94	19.91	20.18
		25	12	20.13	20.25	20.26
		25	25	19.88	19.99	19.98
		50	0	19.96	20.01	20.14

## ATTACHMENT B - OCCUPIED BANDWIDTH

GSM850					
GSM			EDGE		
GMSK			8PSK		
Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)
128	824.2	244.22	128	824.2	244.61
190	836.6	243.05	190	836.6	247.35
251	848.8	245.07	251	848.8	246.91
Channel	Frequency (MHz)	26dB Bandwidth (kHz)	Channel	Frequency (MHz)	26dB Bandwidth (kHz)
128	824.2	316.30	128	824.2	324.20
190	836.6	316.70	190	836.6	322.50
251	848.8	315.10	251	848.8	314.90

### Spectrum Plot



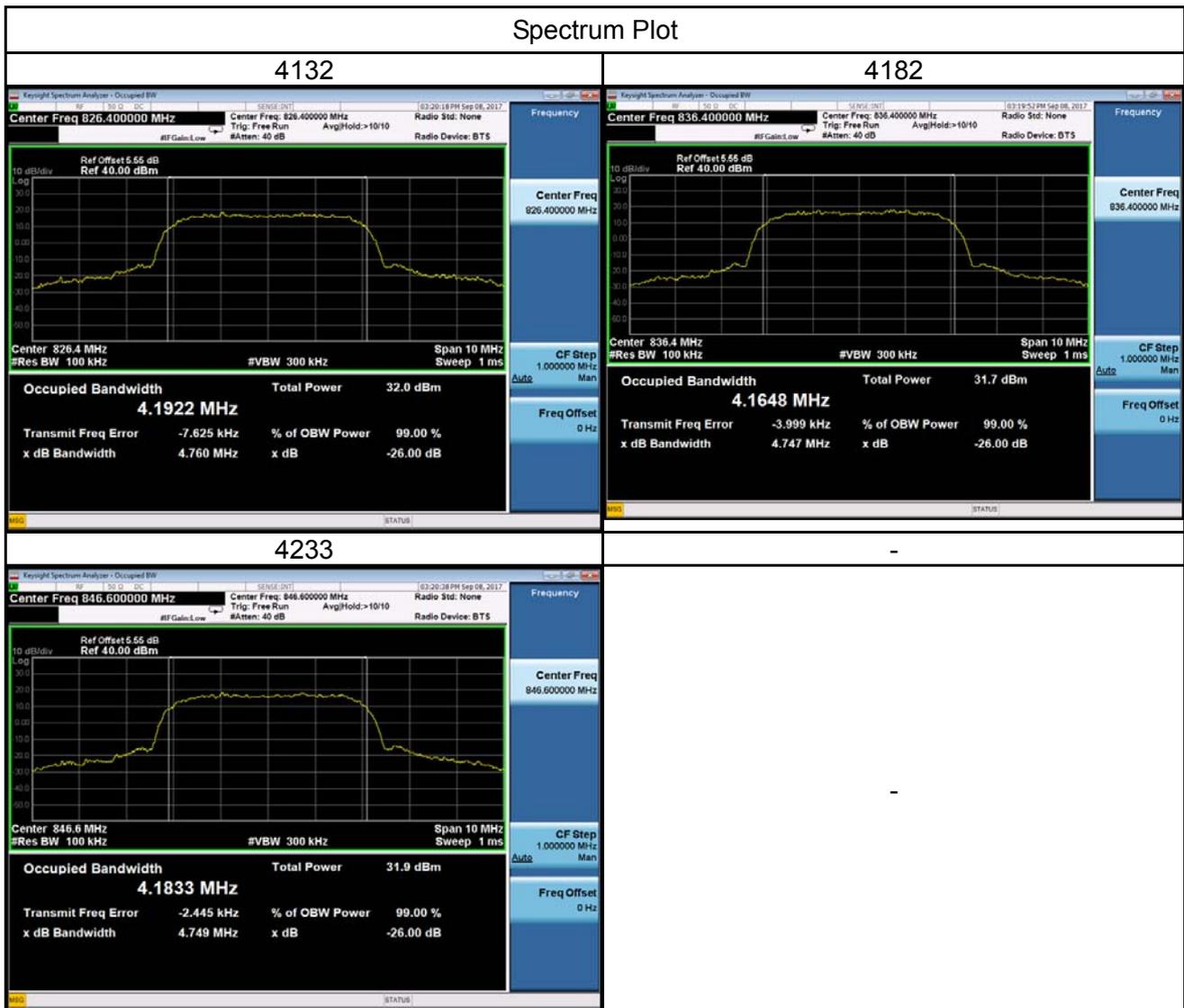
WCDMA Band V					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
4132	826.4	4.1946	4132	826.4	5.065
4182	836.4	4.1562	4182	836.4	4.712
4233	846.6	4.1722	4233	846.6	4.725



WCDMA_HSDPA Band V					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
4132	826.4	4.1803	4132	826.4	4.760
4182	836.4	4.1665	4182	836.4	4.754
4233	846.6	4.1784	4233	846.6	4.761



WCDMA_HSUPA Band V					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
4132	826.4	4.1922	4132	826.4	4.760
4182	836.4	4.1648	4182	836.4	4.747
4233	846.6	4.1833	4233	846.6	4.729



LTE Band 5_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20425	826.5	4.5006	20425	826.5	4.921
20525	836.5	4.4959	20525	836.5	4.922
20625	846.5	4.5053	20625	846.5	4.935
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20425	826.5	4.5051	20425	826.5	4.936
20525	836.5	4.4997	20525	836.5	4.962
20625	846.5	4.5057	20625	846.5	4.958

### Spectrum Plot



LTE Band 5_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20450	829.0	9.0122	20450	829.0	9.0000
20525	836.5	8.9702	20525	836.5	8.9849
20600	844.0	9.0062	20600	844.0	9.0385
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20450	829.0	9.886	20450	829.0	9.916
20525	836.5	9.902	20525	836.5	9.857
20600	844.0	9.844	20600	844.0	9.918

### Spectrum Plot



## ATTACHMENT C - CONDUCTED EMISSIONS

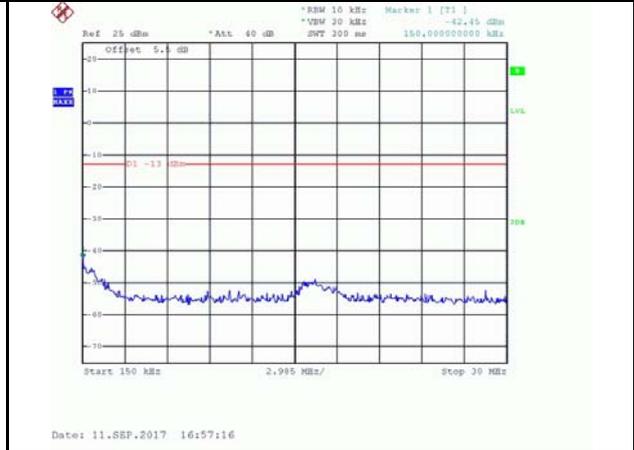
GSM850			
GSM		GSM	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
190	836.6	190	836.6
Date: 11.SEP.2017 16:26:02		Date: 11.SEP.2017 16:56:24	
GSM		EDGE	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
190	836.6	190	836.6
Date: 11.SEP.2017 16:25:06		Date: 11.SEP.2017 16:25:06	
EDGE		EDGE	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
190	836.6	190	836.6
Date: 11.SEP.2017 16:56:07		Date: 11.SEP.2017 16:56:07	

WCDMA Band V

Channel	Frequency(MHz)	Channel	Frequency(MHz)
4182	836.4	4182	836.4
Channel	Frequency(MHz)	-	-
4182	836.4	-	-

WCDMA\_HSDPA Band V

Channel	Frequency(MHz)	Channel	Frequency(MHz)
4182	836.4	4182	836.4



Channel	Frequency(MHz)	Channel	Frequency(MHz)
4182	836.4	-	-



Channel	Frequency(MHz)	Channel	Frequency(MHz)
-	-	-	-

WCDMA\_HSUPA Band V

Channel	Frequency(MHz)	Channel	Frequency(MHz)
4182	836.4	4182	836.4
Channel	Frequency(MHz)	-	-
4182	836.4	-	-

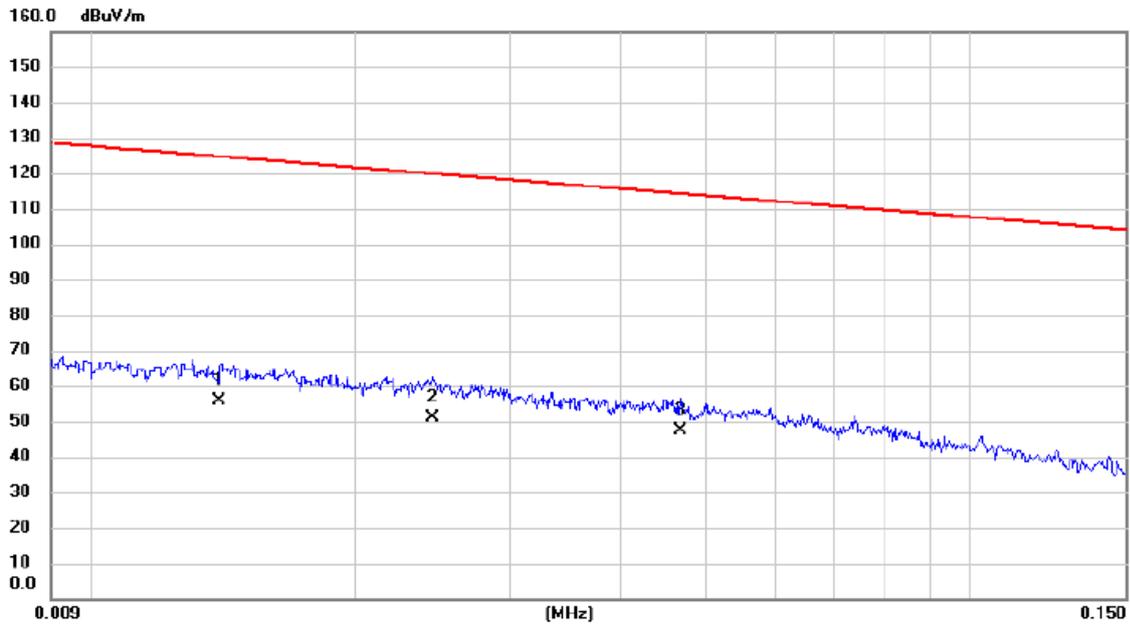
LTE Band 5_5M			
Channel	Frequency(MHz)	Channel	Frequency(MHz)
20525	836.5	20525	836.5
Channel	Frequency(MHz)	-	-
20525	836.5	-	-

LTE Band 5_10M			
Channel	Frequency(MHz)	Channel	Frequency(MHz)
20525	836.5	20525	836.5
Channel	Frequency(MHz)	-	-
20525	836.5	-	-

## ATTACHMENT D - RADIATED EMISSION

Test Mode: TX Mode

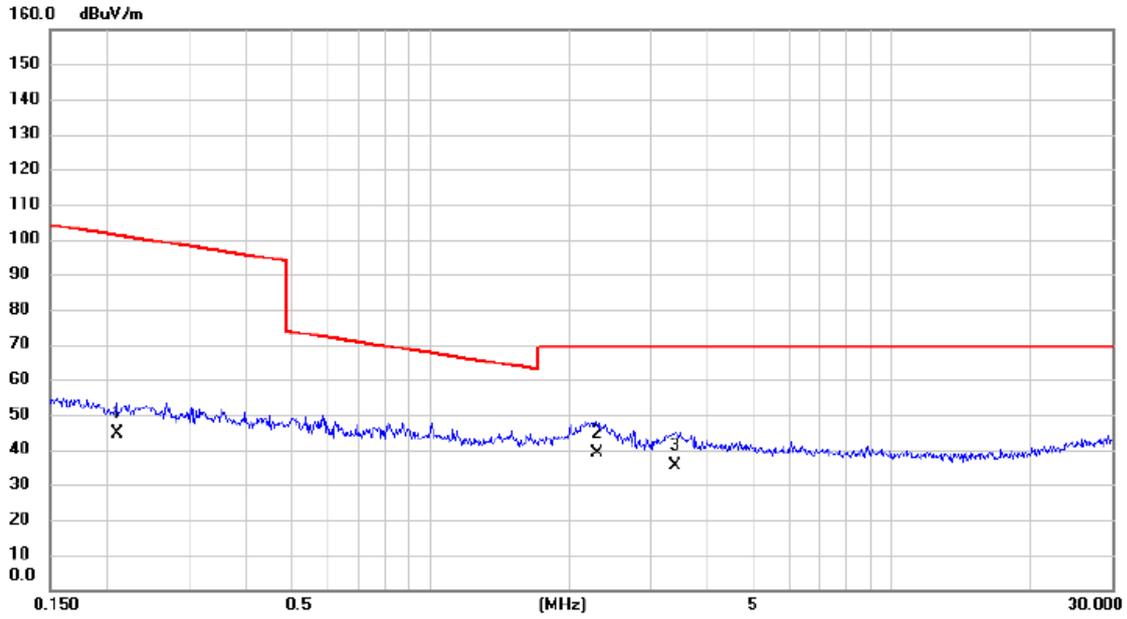
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		0.014	36.48	19.40	55.88	124.68	-68.80	AVG	
2		0.025	34.66	16.51	51.17	119.82	-68.65	AVG	
3	*	0.047	33.93	13.32	47.25	114.20	-66.95	AVG	

Test Mode: TX Mode

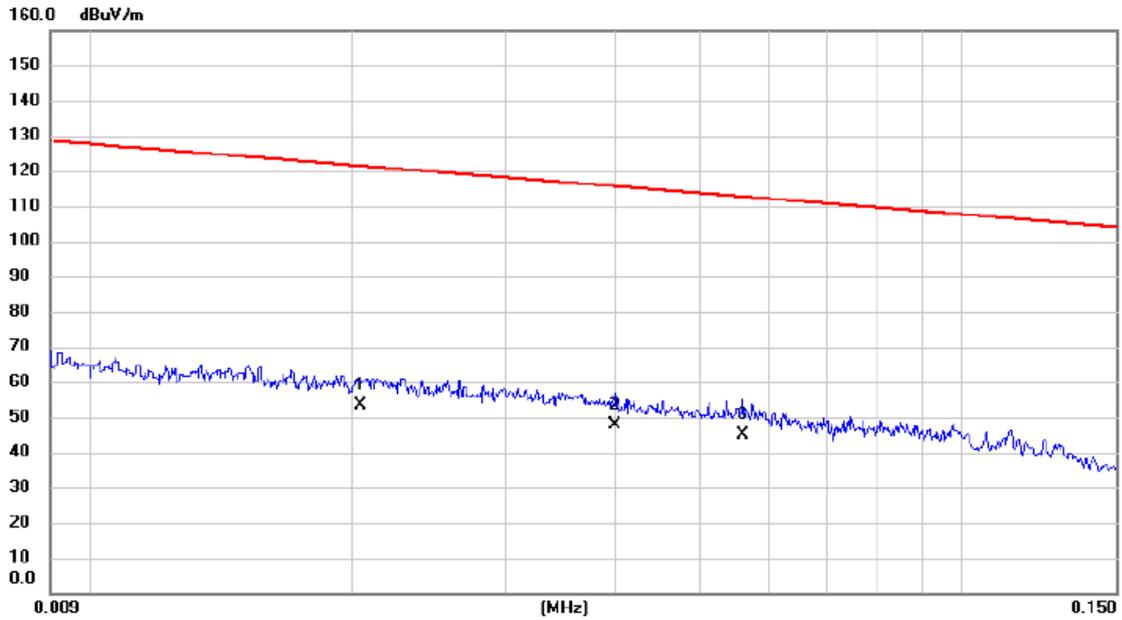
Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.209	32.52	11.94	44.46	101.19	-56.73	AVG	
2	*	2.297	27.46	11.42	38.88	69.54	-30.66	QP	
3		3.399	24.35	11.16	35.51	69.54	-34.03	QP	

Test Mode: TX Mode

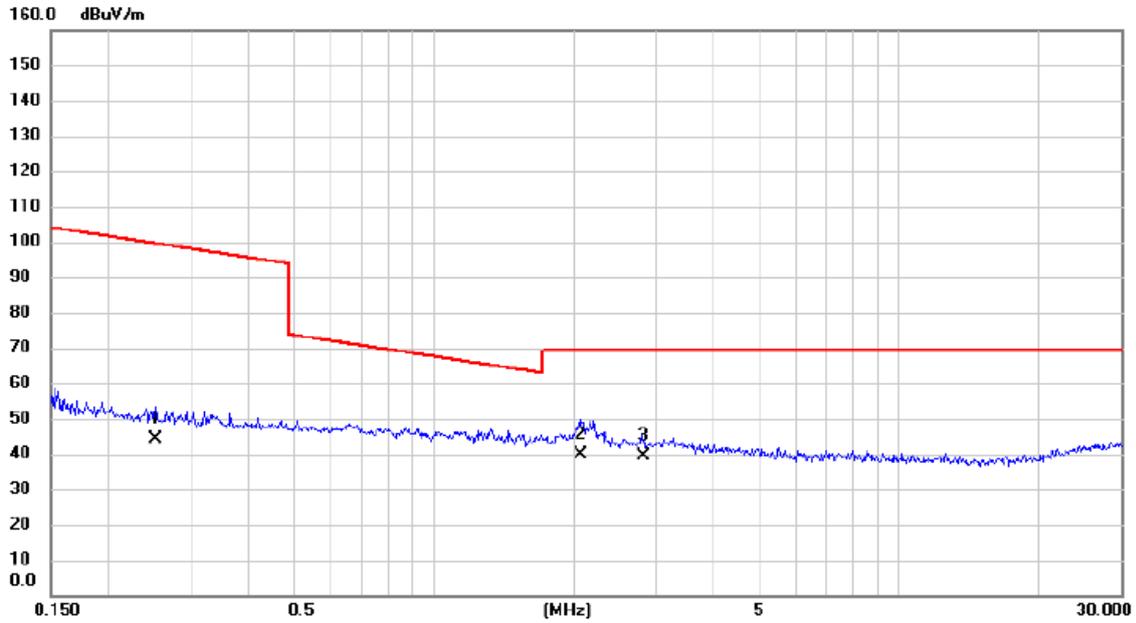
Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		0.020	35.66	17.64	53.30	121.41	-68.11	AVG	
2		0.040	33.78	14.00	47.78	115.56	-67.78	AVG	
3	*	0.056	32.20	12.89	45.09	112.64	-67.55	AVG	

Test Mode: TX Mode

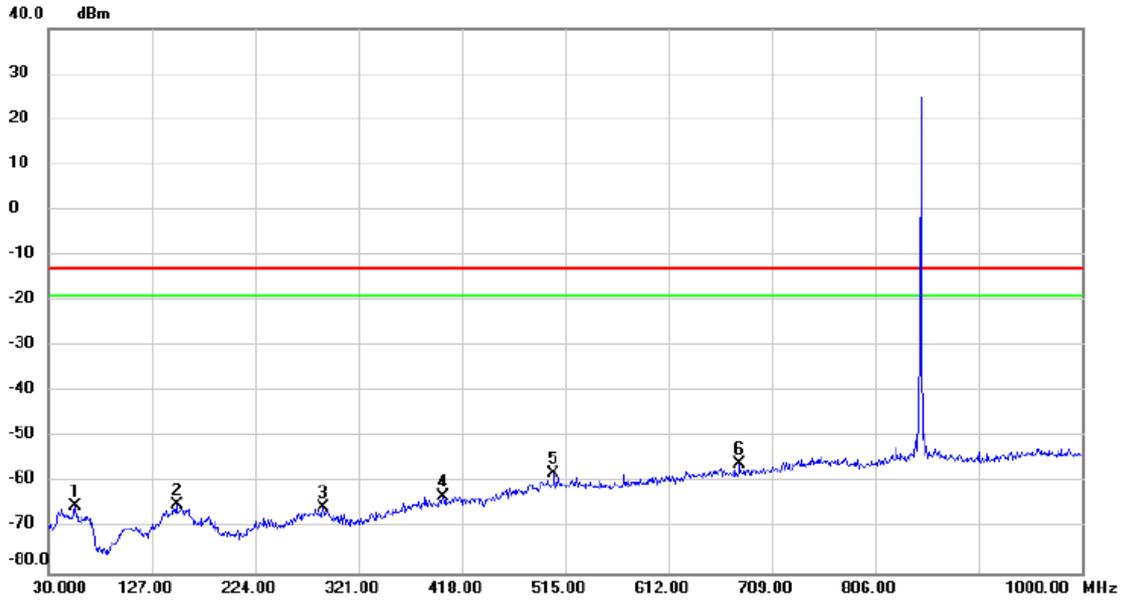
Ant 90°



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	0.252	32.37	11.87	44.24	99.58	-55.34	AVG	
2 *	2.077	28.11	11.52	39.63	69.54	-29.91	QP	
3	2.824	28.05	11.18	39.23	69.54	-30.31	QP	

Test Mode: GSM850\_TX CH251\_GSM

Vertical



No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measurement dBm	Limit dBm	Margin dB	Detector	Comment
1	55.220	-69.61	4.57	-65.04	-13.00	-52.04	peak	
2	150.280	-74.91	9.96	-64.95	-13.00	-51.95	peak	
3	288.020	-74.06	8.73	-65.33	-13.00	-52.33	peak	
4	400.540	-76.30	13.36	-62.94	-13.00	-49.94	peak	
5	504.330	-72.64	14.55	-58.09	-13.00	-45.09	peak	
6 *	678.930	-73.01	17.16	-55.85	-13.00	-42.85	peak	

Test Mode: GSM850\_TX CH251\_GSM

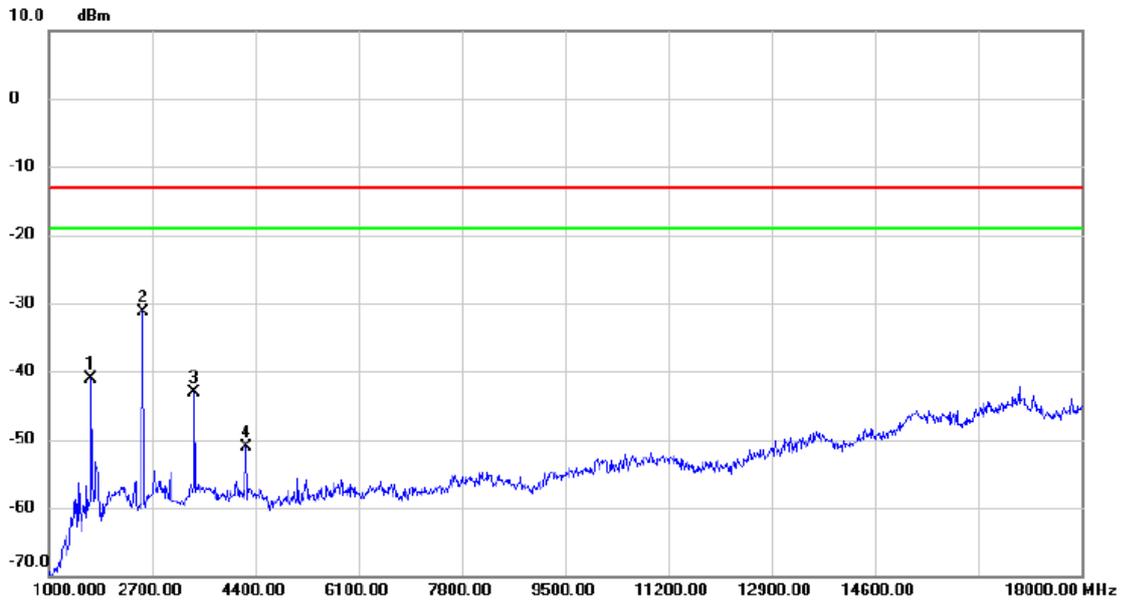
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		55.220	-70.24	4.57	-65.67	-13.00	-52.67	peak	
2		148.340	-74.10	10.02	-64.08	-13.00	-51.08	peak	
3		233.700	-71.26	6.29	-64.97	-13.00	-51.97	peak	
4		416.060	-74.07	13.55	-60.52	-13.00	-47.52	peak	
5		514.030	-73.37	14.60	-58.77	-13.00	-45.77	peak	
6	*	688.630	-69.95	17.28	-52.67	-13.00	-39.67	peak	

Test Mode: GSM850\_TX CH251\_GSM

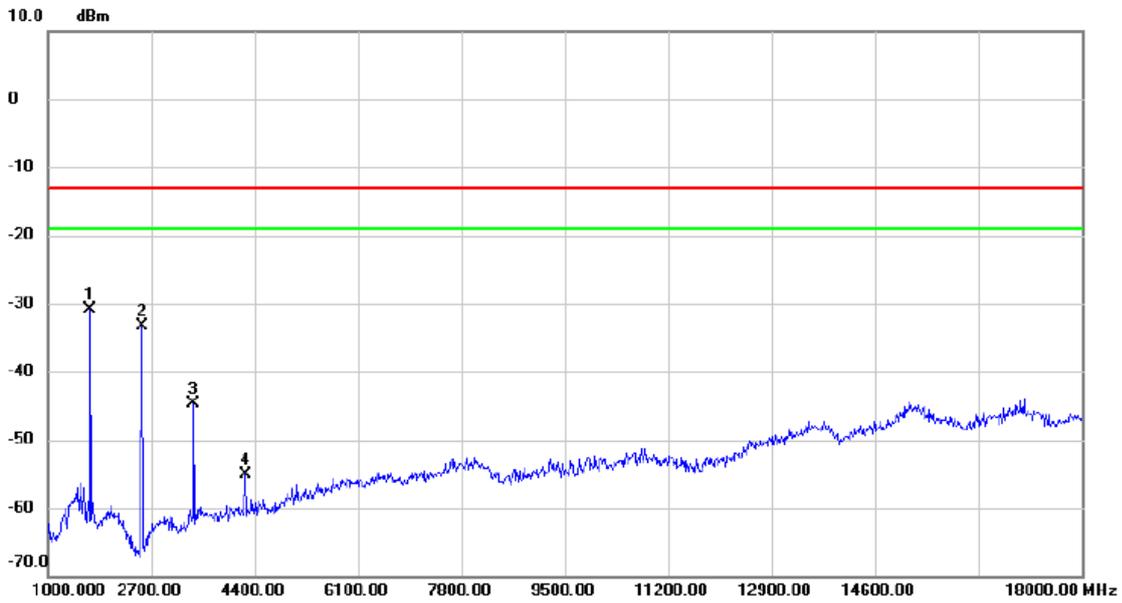
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1697.000	-32.16	-9.00	-41.16	-13.00	-28.16	peak	
2	*	2547.000	-25.96	-5.35	-31.31	-13.00	-18.31	peak	
3		3397.000	-39.28	-3.81	-43.09	-13.00	-30.09	peak	
4		4247.000	-51.85	0.76	-51.09	-13.00	-38.09	peak	

Test Mode: GSM850\_TX CH251\_GSM

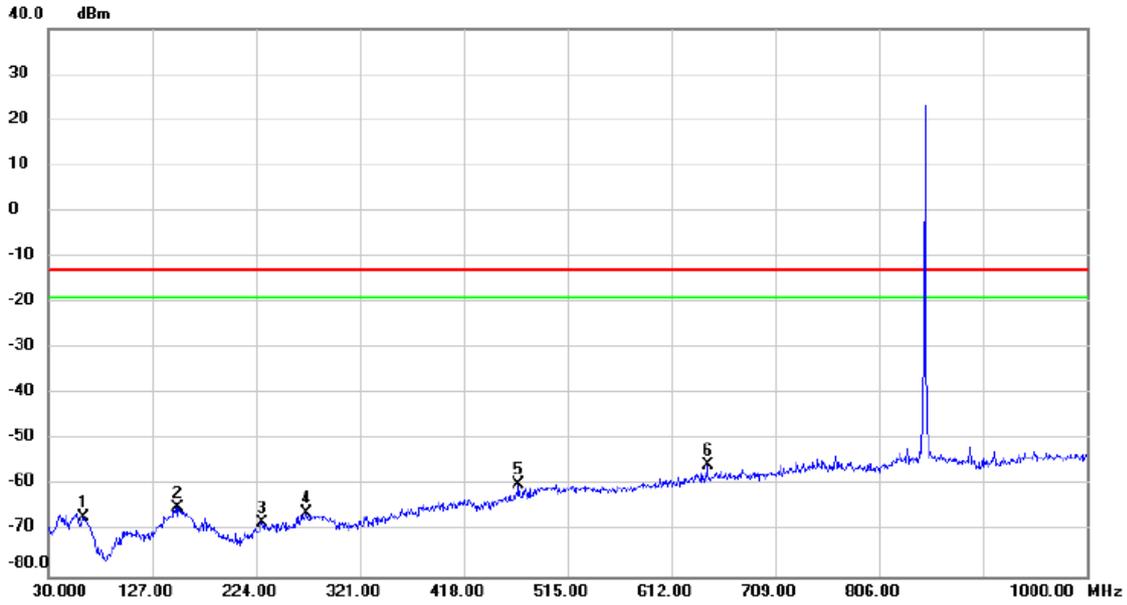
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No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	1697.000	-21.86	-9.00	-30.86	-13.00	-17.86	peak	
2		2547.000	-27.95	-5.35	-33.30	-13.00	-20.30	peak	
3		3397.000	-40.92	-3.81	-44.73	-13.00	-31.73	peak	
4		4247.000	-55.79	0.76	-55.03	-13.00	-42.03	peak	

Test Mode: GSM850\_TX CH251\_EDGE

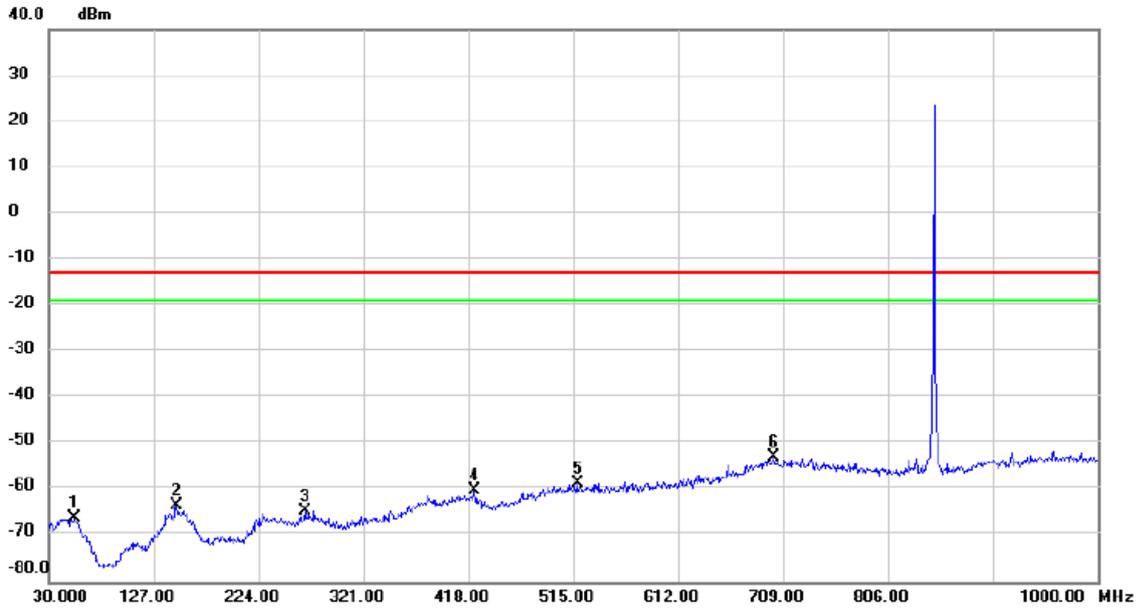
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No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		62.980	-72.00	5.00	-67.00	-13.00	-54.00	peak	
2		151.250	-74.73	9.89	-64.84	-13.00	-51.84	peak	
3		229.820	-74.16	6.08	-68.08	-13.00	-55.08	peak	
4		271.530	-74.15	7.97	-66.18	-13.00	-53.18	peak	
5		469.410	-73.92	14.19	-59.73	-13.00	-46.73	peak	
6	*	645.950	-72.30	16.73	-55.57	-13.00	-42.57	peak	

Test Mode: GSM850\_TX CH251\_EDGE

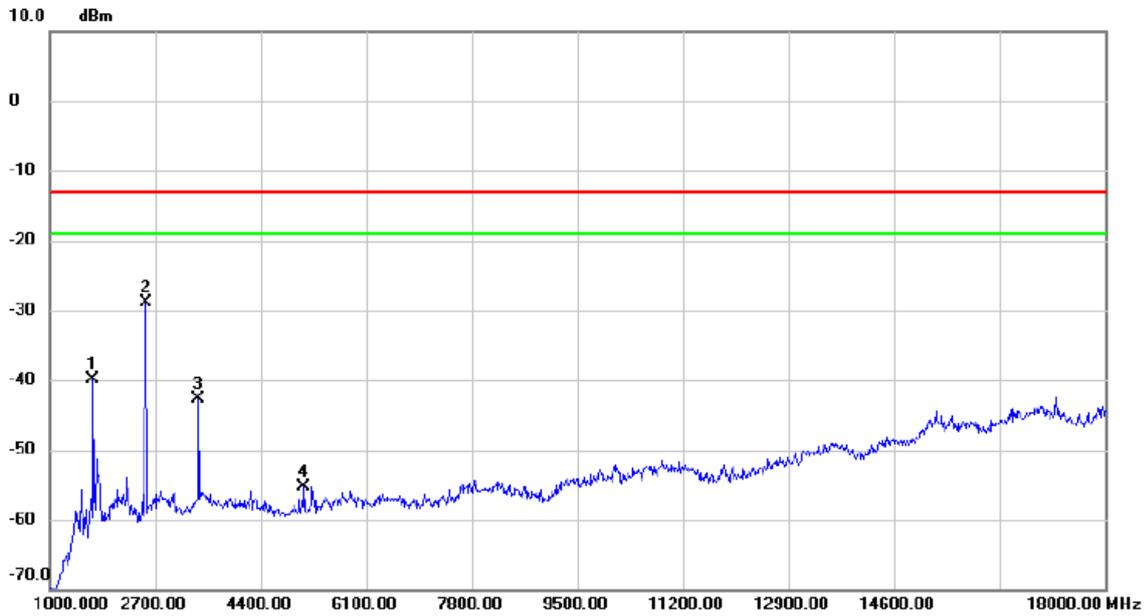
Horizontal



No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	53.280	-71.01	4.95	-66.06	-13.00	-53.06	peak	
2	148.340	-73.34	10.02	-63.32	-13.00	-50.32	peak	
3	266.680	-72.19	7.66	-64.53	-13.00	-51.53	peak	
4	423.820	-73.80	13.65	-60.15	-13.00	-47.15	peak	
5	518.880	-73.30	14.62	-58.68	-13.00	-45.68	peak	
6 *	700.270	-70.39	17.44	-52.95	-13.00	-39.95	peak	

Test Mode: GSM850\_TX CH251\_EDGE

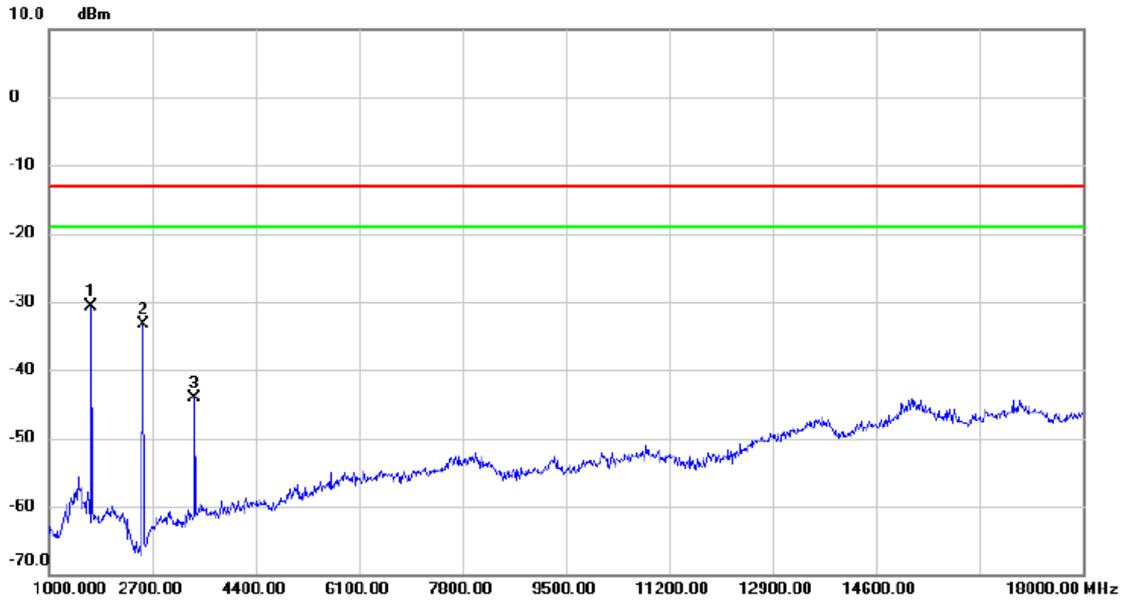
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1697.000	-30.92	-9.00	-39.92	-13.00	-26.92	peak	
2	*	2547.000	-23.52	-5.35	-28.87	-13.00	-15.87	peak	
3		3397.000	-38.87	-3.81	-42.68	-13.00	-29.68	peak	
4		5097.000	-58.40	3.05	-55.35	-13.00	-42.35	peak	

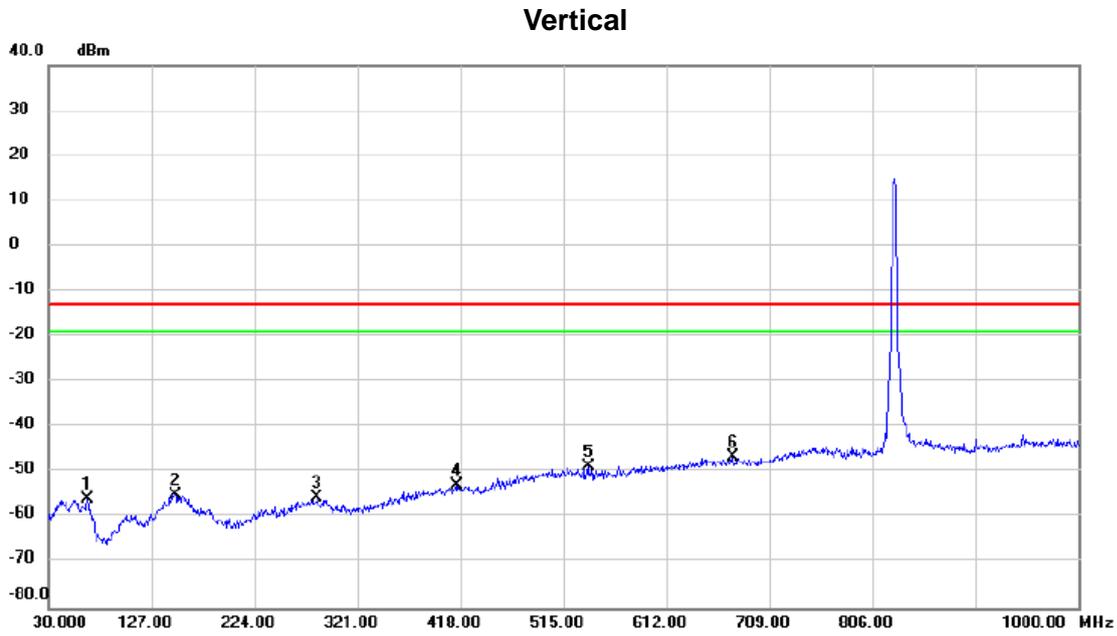
Test Mode: GSM850\_TX CH251\_EDGE

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	1697.000	-21.71	-9.00	-30.71	-13.00	-17.71	peak	
2		2547.000	-27.97	-5.35	-33.32	-13.00	-20.32	peak	
3		3397.000	-40.31	-3.81	-44.12	-13.00	-31.12	peak	

Test Mode: WCDMA Band V\_TX CH4182



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		66.860	-62.73	6.76	-55.97	-13.00	-42.97	peak	
2		149.310	-64.91	10.00	-54.91	-13.00	-41.91	peak	
3		283.170	-64.12	8.67	-55.45	-13.00	-42.45	peak	
4		414.120	-66.49	13.53	-52.96	-13.00	-39.96	peak	
5		538.280	-63.46	14.72	-48.74	-13.00	-35.74	peak	
6	*	674.080	-63.60	17.10	-46.50	-13.00	-33.50	peak	

Test Mode: WCDMA Band V\_TX CH4182

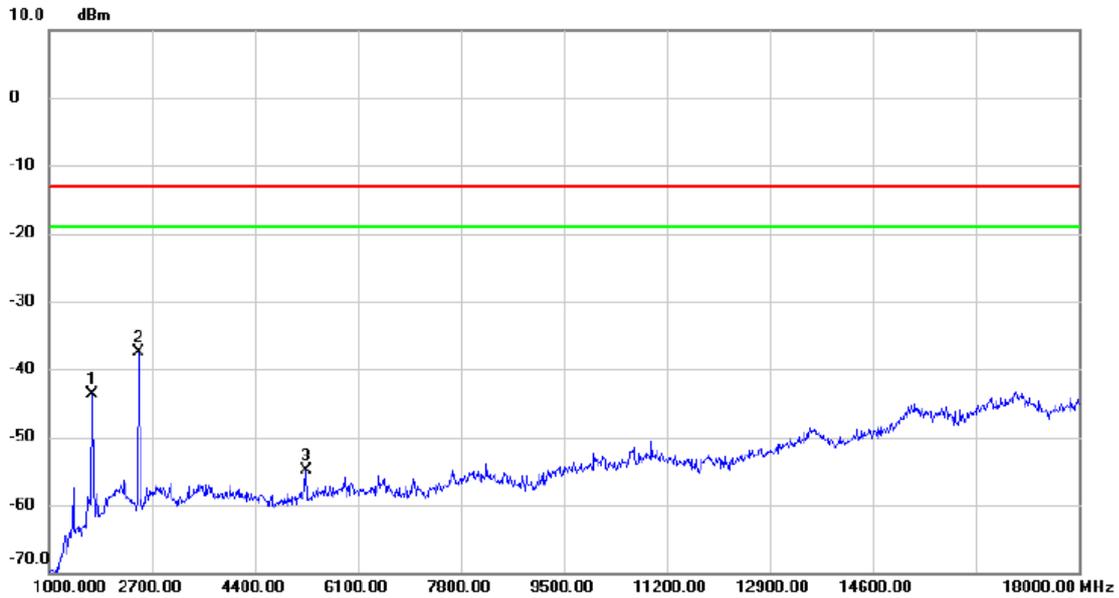
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		45.520	-58.42	2.75	-55.67	-13.00	-42.67	peak	
2		151.250	-63.70	9.89	-53.81	-13.00	-40.81	peak	
3		229.820	-61.34	6.08	-55.26	-13.00	-42.26	peak	
4		419.940	-64.78	13.60	-51.18	-13.00	-38.18	peak	
5		508.210	-63.41	14.57	-48.84	-13.00	-35.84	peak	
6	*	698.330	-61.01	17.41	-43.60	-13.00	-30.60	peak	

Test Mode: WCDMA Band V\_TX CH4182

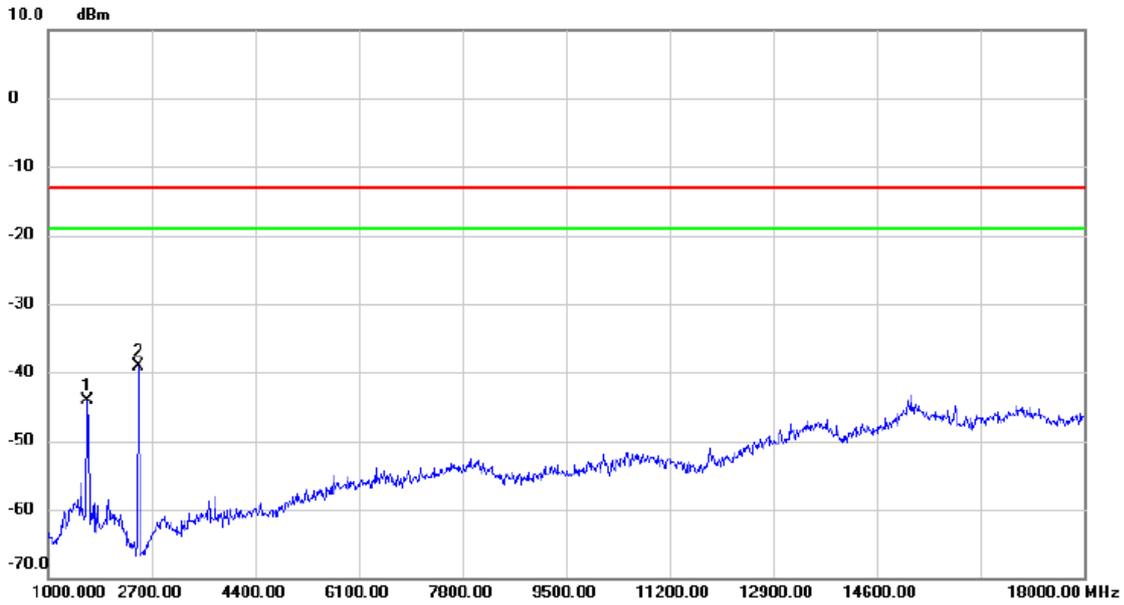
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1714.000	-34.65	-8.98	-43.63	-13.00	-30.63	peak	
2	*	2479.000	-31.84	-5.58	-37.42	-13.00	-24.42	peak	
3		5250.000	-58.29	3.35	-54.94	-13.00	-41.94	peak	

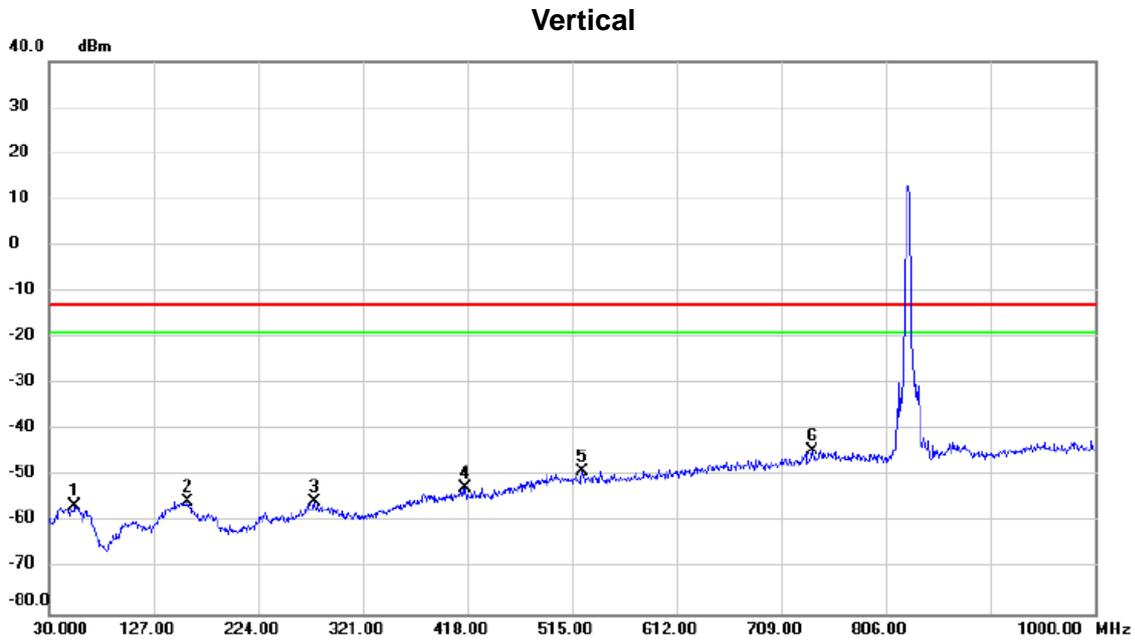
Test Mode: WCDMA Band V\_TX CH4182

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1646.000	-34.99	-9.06	-44.05	-13.00	-31.05	peak	
2	*	2479.000	-33.46	-5.58	-39.04	-13.00	-26.04	peak	

Test Mode: WCDMA Band V\_TX CH4182\_HSDPA



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		54.250	-61.12	4.76	-56.36	-13.00	-43.36	peak	
2		159.010	-64.81	9.31	-55.50	-13.00	-42.50	peak	
3		276.380	-64.01	8.35	-55.66	-13.00	-42.66	peak	
4		416.060	-66.18	13.55	-52.63	-13.00	-39.63	peak	
5		524.700	-63.66	14.65	-49.01	-13.00	-36.01	peak	
6	*	738.100	-62.60	18.27	-44.33	-13.00	-31.33	peak	

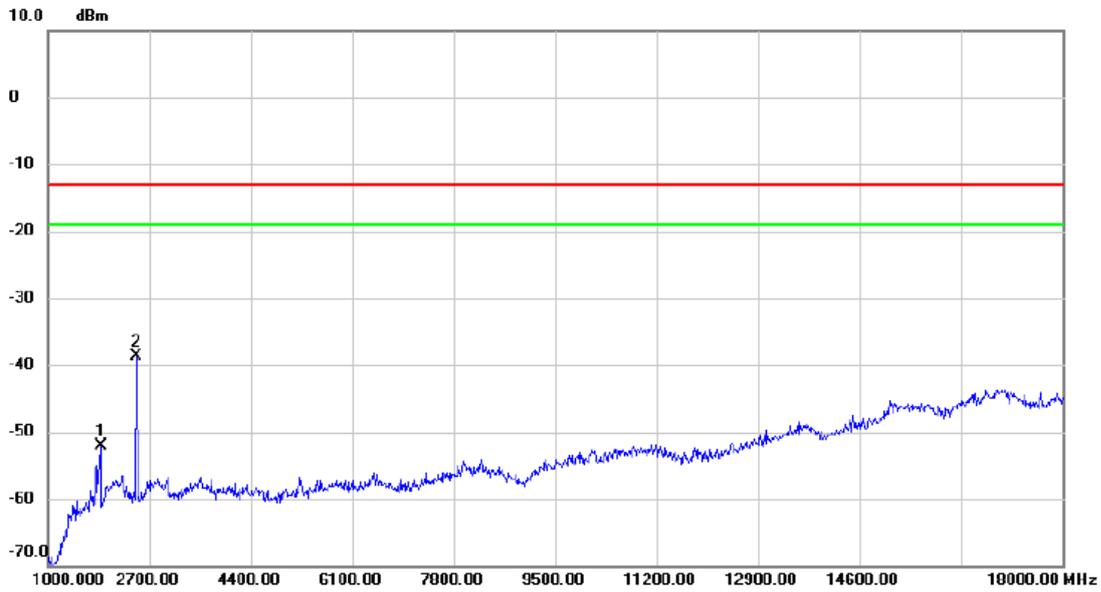
Test Mode: WCDMA Band V\_TX CH4182\_HSDPA



No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	43.580	-57.23	1.99	-55.24	-13.00	-42.24	peak	
2	150.280	-64.38	9.96	-54.42	-13.00	-41.42	peak	
3	240.490	-60.67	6.65	-54.02	-13.00	-41.02	peak	
4	416.060	-64.04	13.55	-50.49	-13.00	-37.49	peak	
5	524.700	-63.08	14.65	-48.43	-13.00	-35.43	peak	
6 *	709.000	-60.98	17.63	-43.35	-13.00	-30.35	peak	

Test Mode: WCDMA Band V\_TX CH4182\_HSDPA

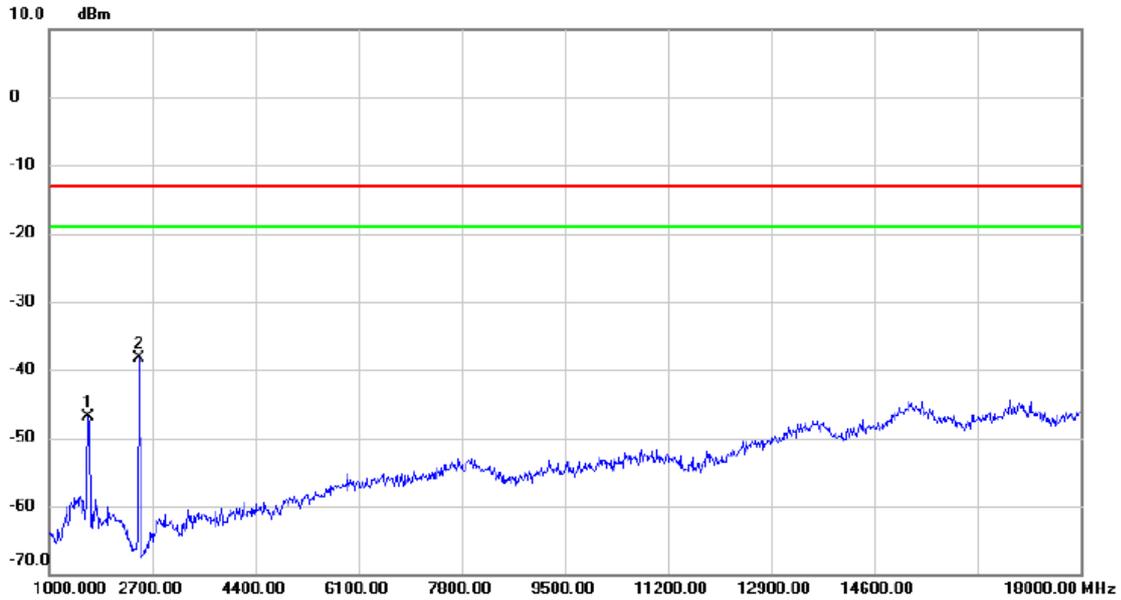
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1884.000	-43.29	-8.77	-52.06	-13.00	-39.06	peak	
2	*	2479.000	-33.10	-5.58	-38.68	-13.00	-25.68	peak	

Test Mode: WCDMA Band V\_TX CH4182\_HSDPA

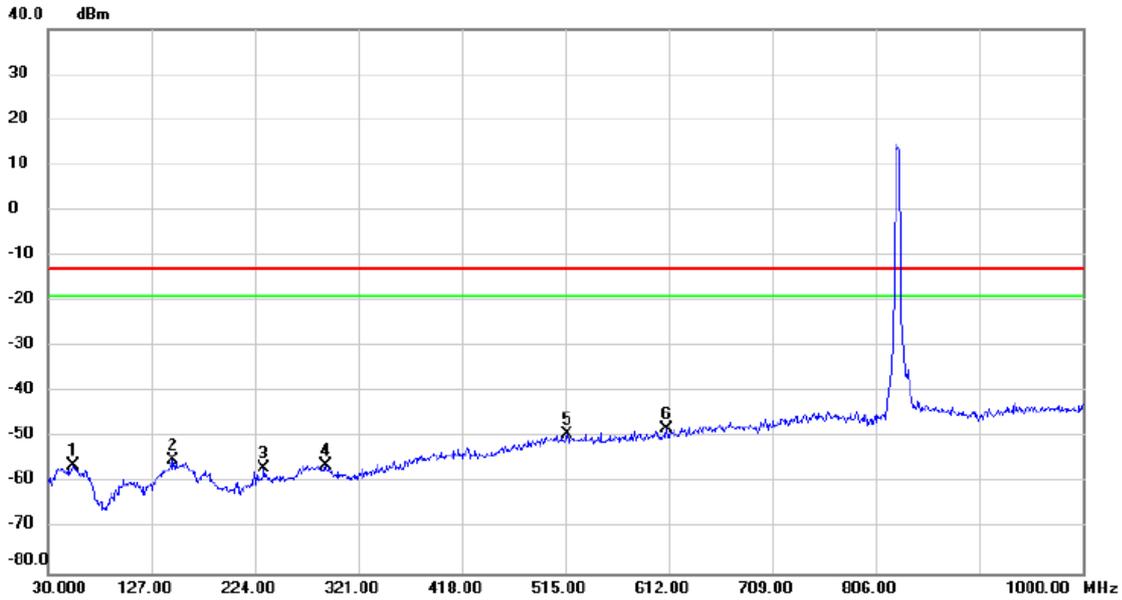
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1646.000	-37.80	-9.06	-46.86	-13.00	-33.86	peak	
2	*	2479.000	-32.68	-5.58	-38.26	-13.00	-25.26	peak	

Test Mode: WCDMA Band V\_TX CH4182\_HSUPA

Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		53.280	-61.00	4.95	-56.05	-13.00	-43.05	peak	
2		147.370	-65.09	10.05	-55.04	-13.00	-42.04	peak	
3		232.730	-63.03	6.23	-56.80	-13.00	-43.80	peak	
4		290.930	-64.80	8.77	-56.03	-13.00	-43.03	peak	
5		516.940	-63.84	14.61	-49.23	-13.00	-36.23	peak	
6	*	610.060	-64.22	16.18	-48.04	-13.00	-35.04	peak	

Test Mode: WCDMA Band V\_TX CH4182\_HSUPA

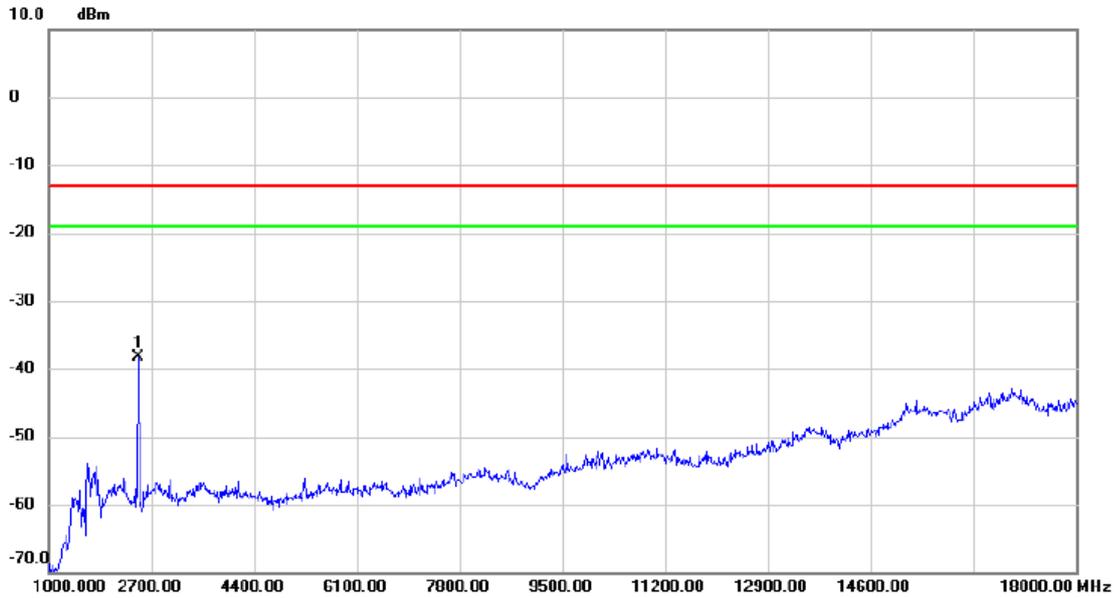
### Horizontal



No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	45.520	-57.67	2.75	-54.92	-13.00	-41.92	peak	
2	149.310	-65.04	10.00	-55.04	-13.00	-42.04	peak	
3	230.790	-59.68	6.13	-53.55	-13.00	-40.55	peak	
4	381.140	-63.04	12.43	-50.61	-13.00	-37.61	peak	
5	497.540	-63.26	14.50	-48.76	-13.00	-35.76	peak	
6 *	710.940	-61.03	17.67	-43.36	-13.00	-30.36	peak	

Test Mode: WCDMA Band V\_TX CH4182\_HSUPA

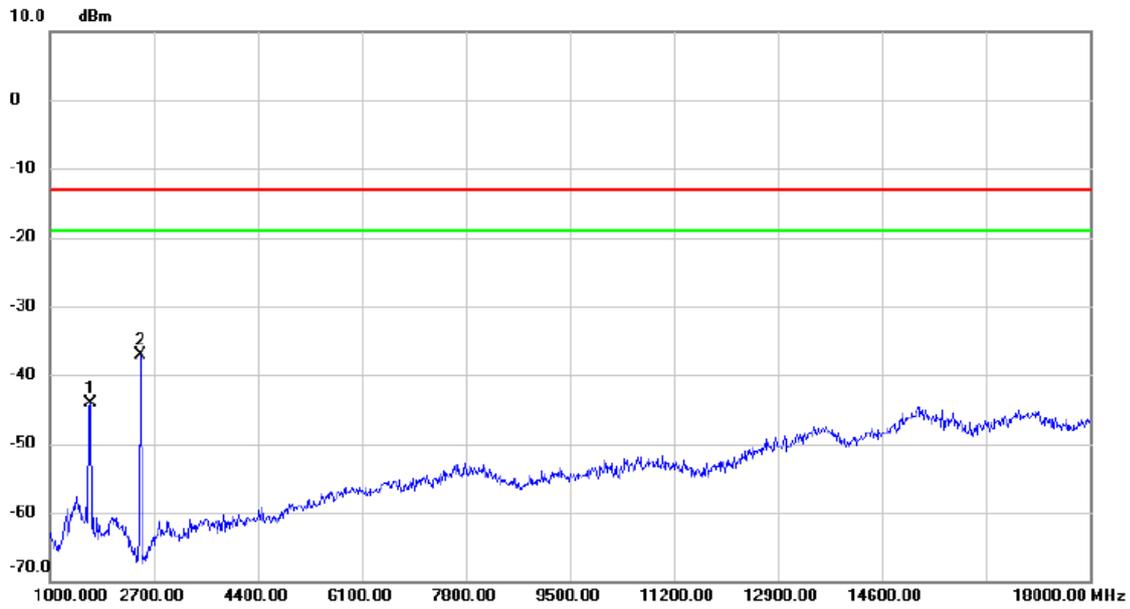
**Vertical**



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	2479.000	-32.65	-5.58	-38.23	-13.00	-25.23	peak	

Test Mode: WCDMA Band V\_TX CH4182\_HSUPA

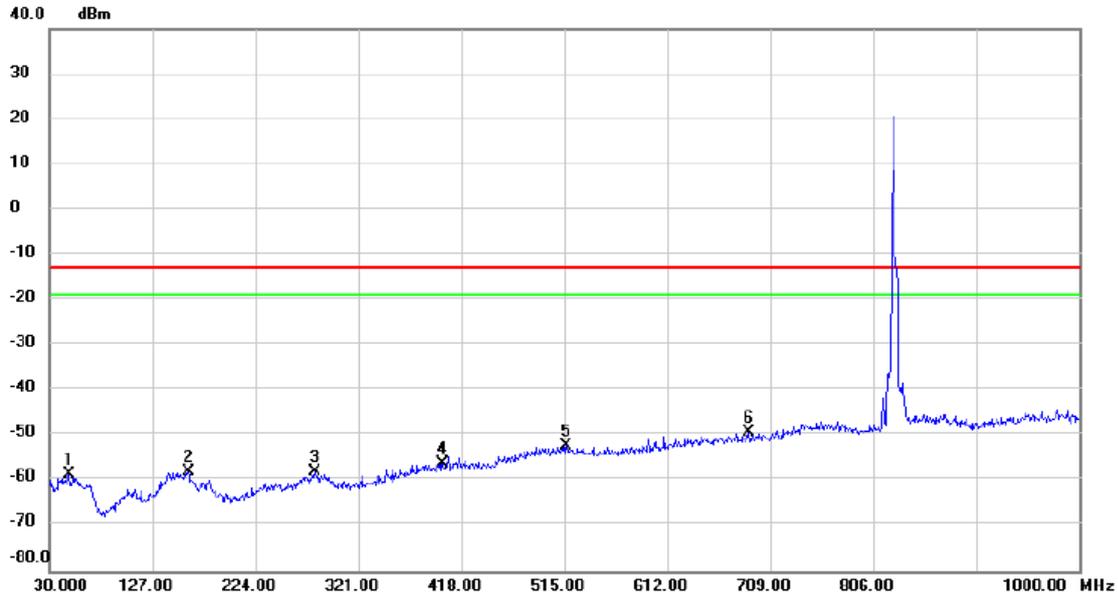
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1663.000	-35.08	-9.04	-44.12	-13.00	-31.12	peak	
2	*	2479.000	-31.54	-5.58	-37.12	-13.00	-24.12	peak	

Test Mode: LTE Band 5\_TX CH20425\_5M

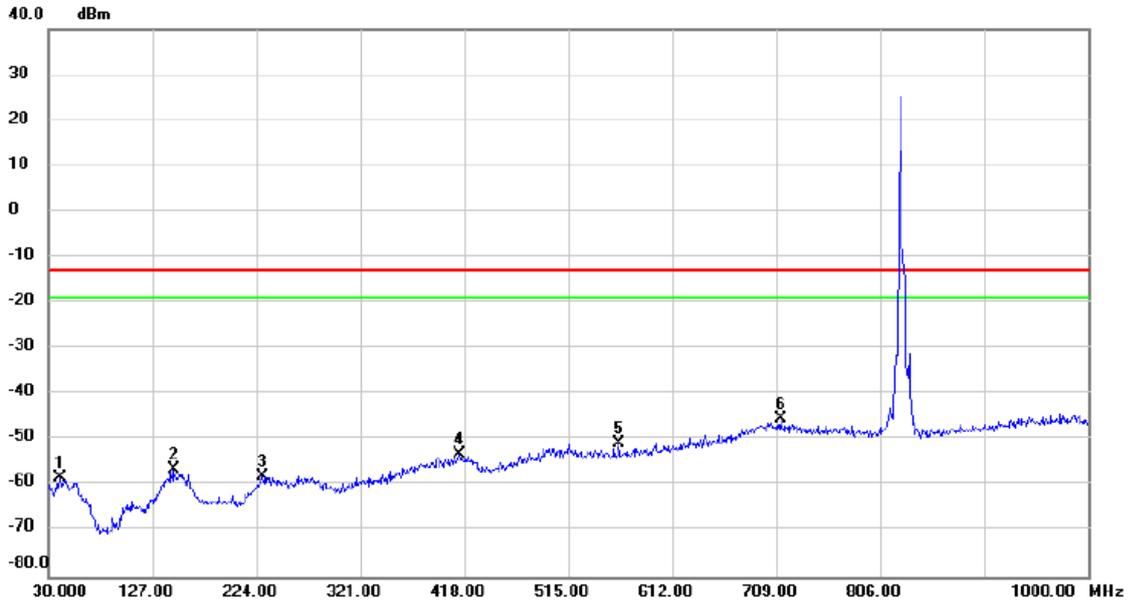
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		48.430	-63.17	4.59	-58.58	-13.00	-45.58	peak	
2		160.950	-67.13	9.19	-57.94	-13.00	-44.94	peak	
3		280.260	-66.65	8.64	-58.01	-13.00	-45.01	peak	
4		400.540	-69.47	13.36	-56.11	-13.00	-43.11	peak	
5		516.940	-66.71	14.61	-52.10	-13.00	-39.10	peak	
6	*	688.630	-66.46	17.28	-49.18	-13.00	-36.18	peak	

Test Mode: LTE Band 5\_TX CH20425\_5M

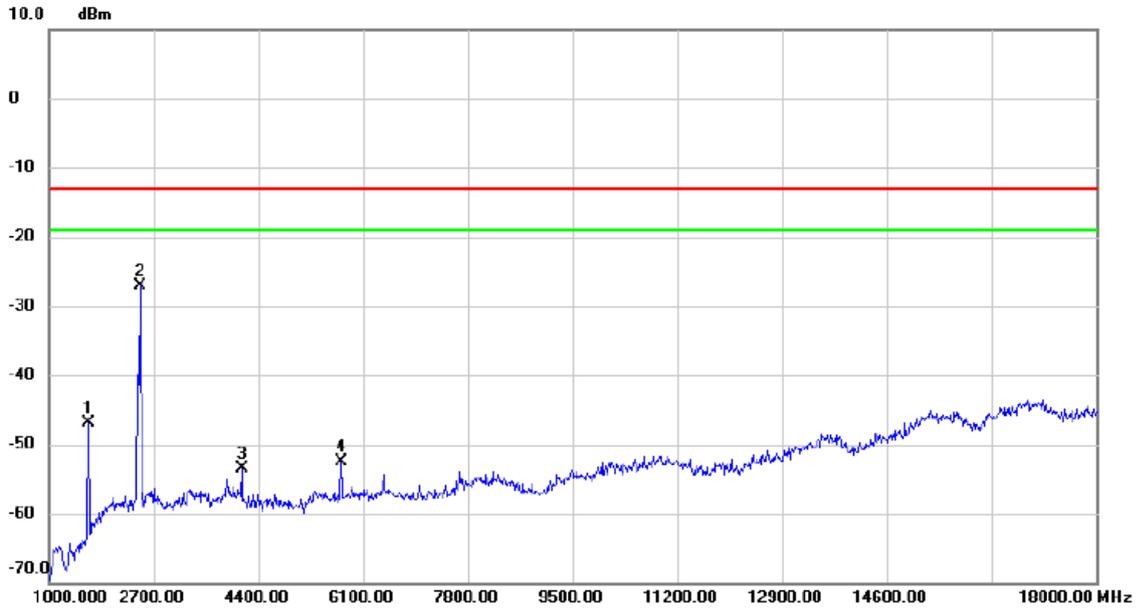
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		40.670	-59.51	1.11	-58.40	-13.00	-45.40	peak	
2		146.400	-66.65	10.07	-56.58	-13.00	-43.58	peak	
3		229.820	-63.91	6.08	-57.83	-13.00	-44.83	peak	
4		413.150	-66.73	13.52	-53.21	-13.00	-40.21	peak	
5		562.530	-65.97	15.09	-50.88	-13.00	-37.88	peak	
6	*	712.880	-62.91	17.71	-45.20	-13.00	-32.20	peak	

Test Mode: LTE Band 5\_TX CH20425\_5M

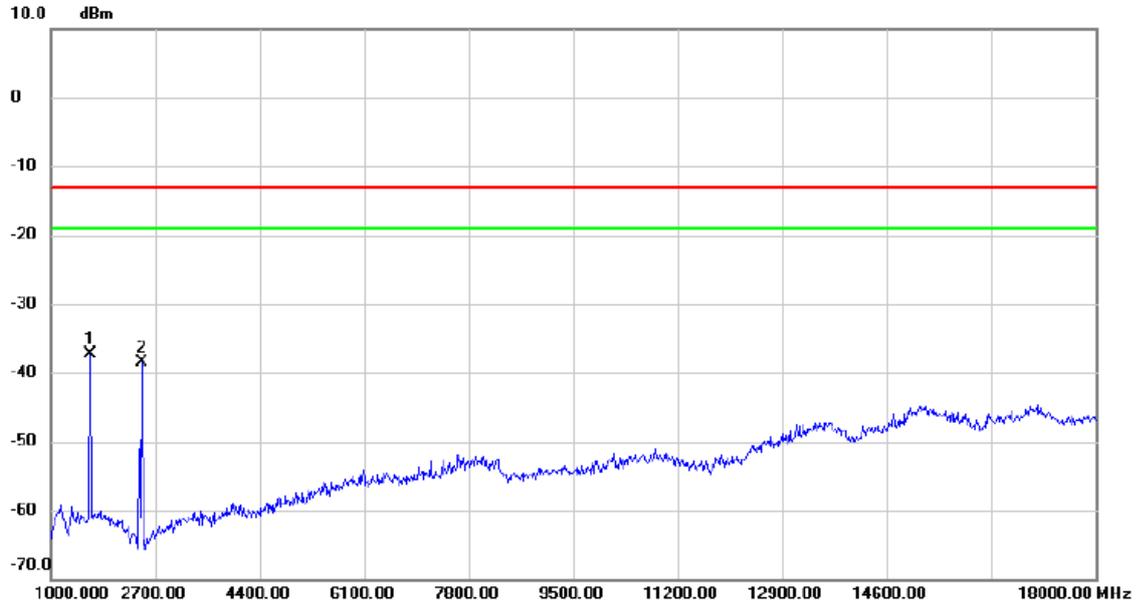
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1646.000	-37.92	-9.06	-46.98	-13.00	-33.98	peak	
2	*	2479.000	-21.56	-5.58	-27.14	-13.00	-14.14	peak	
3		4128.000	-53.97	0.45	-53.52	-13.00	-40.52	peak	
4		5743.000	-56.99	4.58	-52.41	-13.00	-39.41	peak	

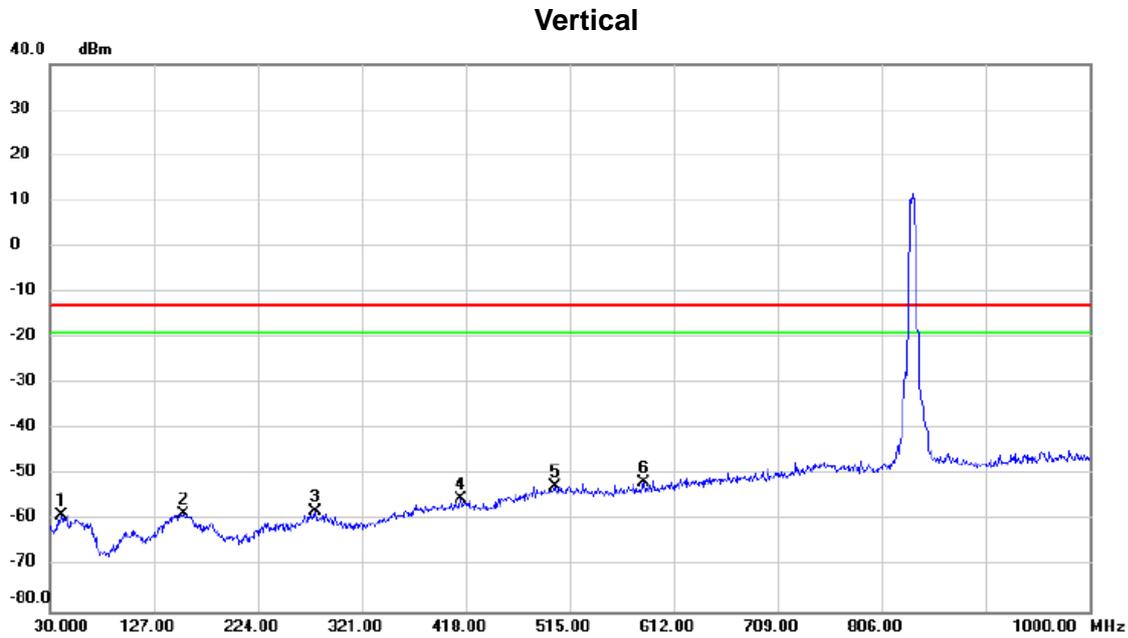
Test Mode: LTE Band 5\_TX CH20425\_5M

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1	*	1646.000	-28.21	-9.06	-37.27	-13.00	-24.27	peak	
2		2479.000	-32.95	-5.58	-38.53	-13.00	-25.53	peak	

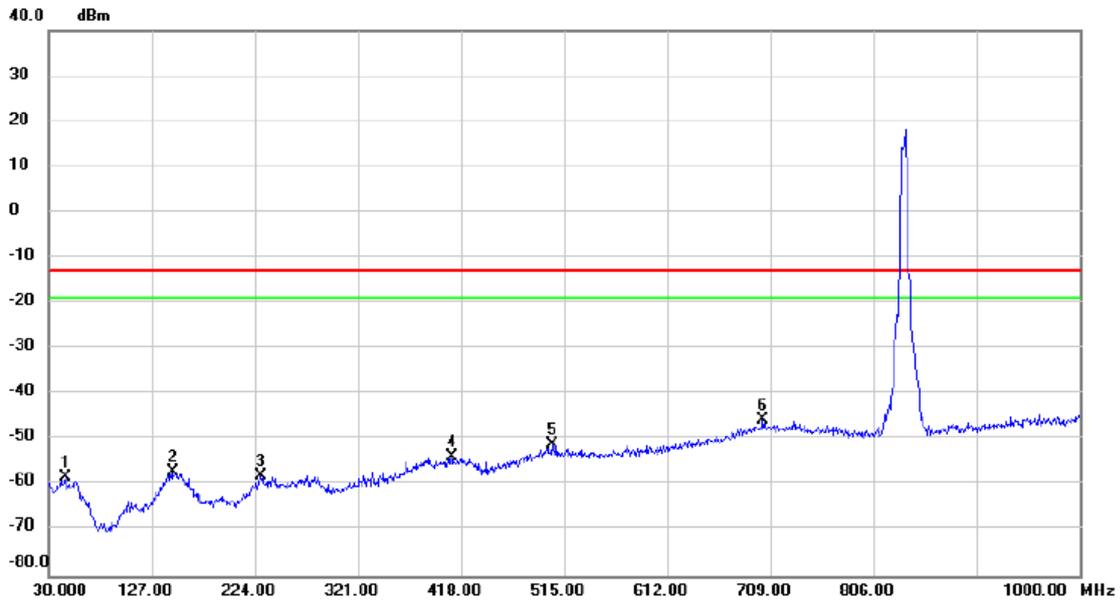
Test Mode: LTE Band 5\_TX CH20600\_10M



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		40.670	-59.85	1.11	-58.74	-13.00	-45.74	peak	
2		155.130	-68.02	9.60	-58.42	-13.00	-45.42	peak	
3		277.350	-66.51	8.43	-58.08	-13.00	-45.08	peak	
4		413.150	-68.72	13.52	-55.20	-13.00	-42.20	peak	
5		501.420	-67.09	14.54	-52.55	-13.00	-39.55	peak	
6	*	583.870	-67.38	15.63	-51.75	-13.00	-38.75	peak	

Test Mode: LTE Band 5\_TX CH20600\_10M

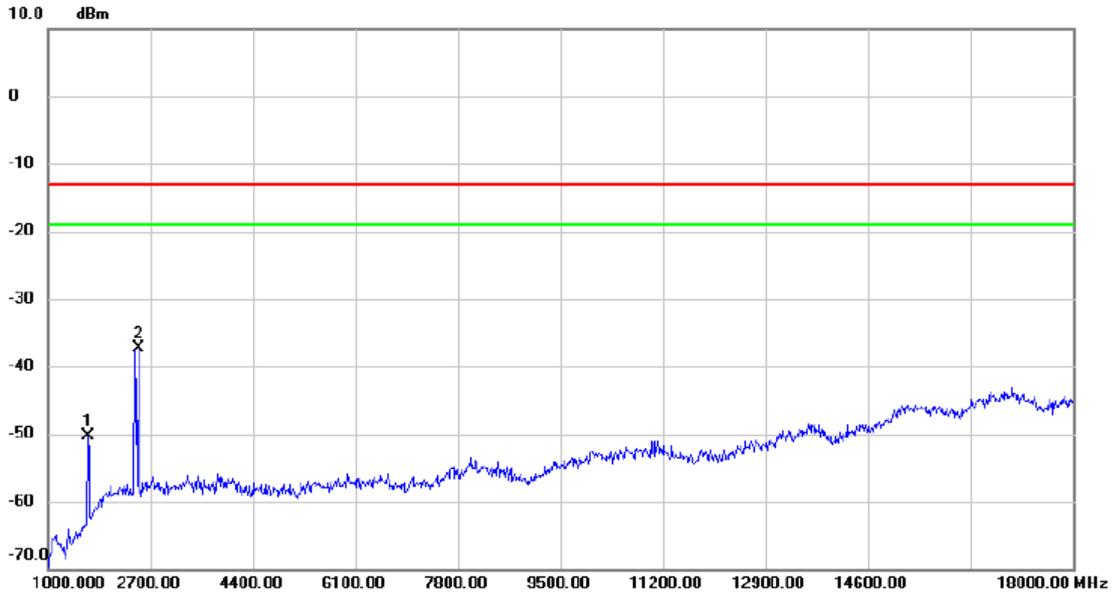
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		45.520	-61.13	2.75	-58.38	-13.00	-45.38	peak	
2		146.400	-67.11	10.07	-57.04	-13.00	-44.04	peak	
3		229.820	-63.99	6.08	-57.91	-13.00	-44.91	peak	
4		409.270	-67.16	13.47	-53.69	-13.00	-40.69	peak	
5		503.360	-65.62	14.55	-51.07	-13.00	-38.07	peak	
6	*	702.210	-63.20	17.48	-45.72	-13.00	-32.72	peak	

Test Mode: LTE Band 5\_TX CH20600\_10M

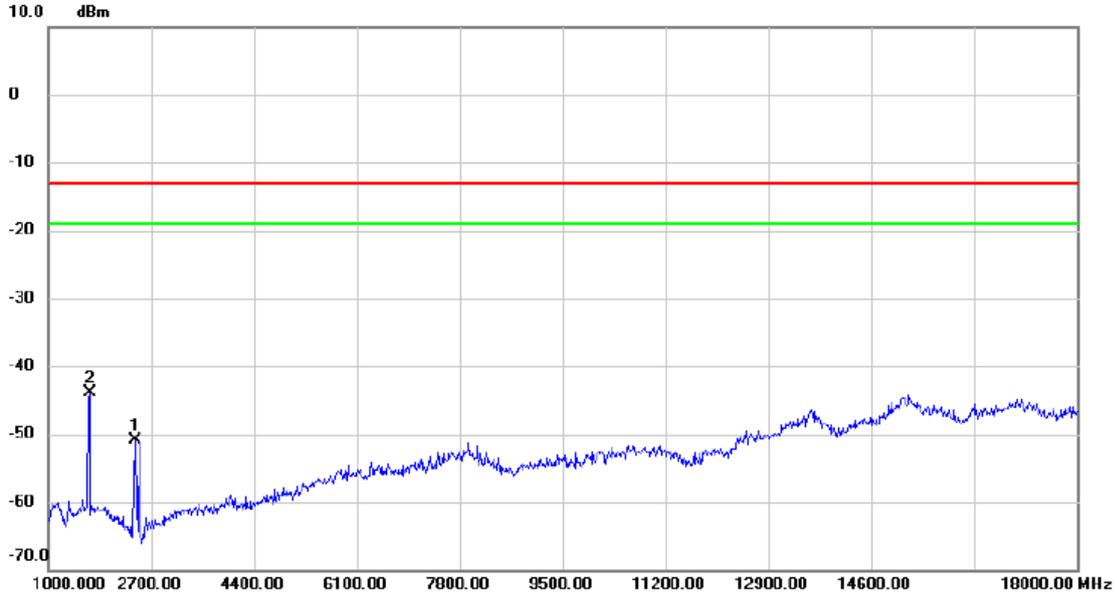
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		1663.000	-41.25	-9.04	-50.29	-13.00	-37.29	peak	
2	*	2513.000	-31.88	-5.42	-37.30	-13.00	-24.30	peak	

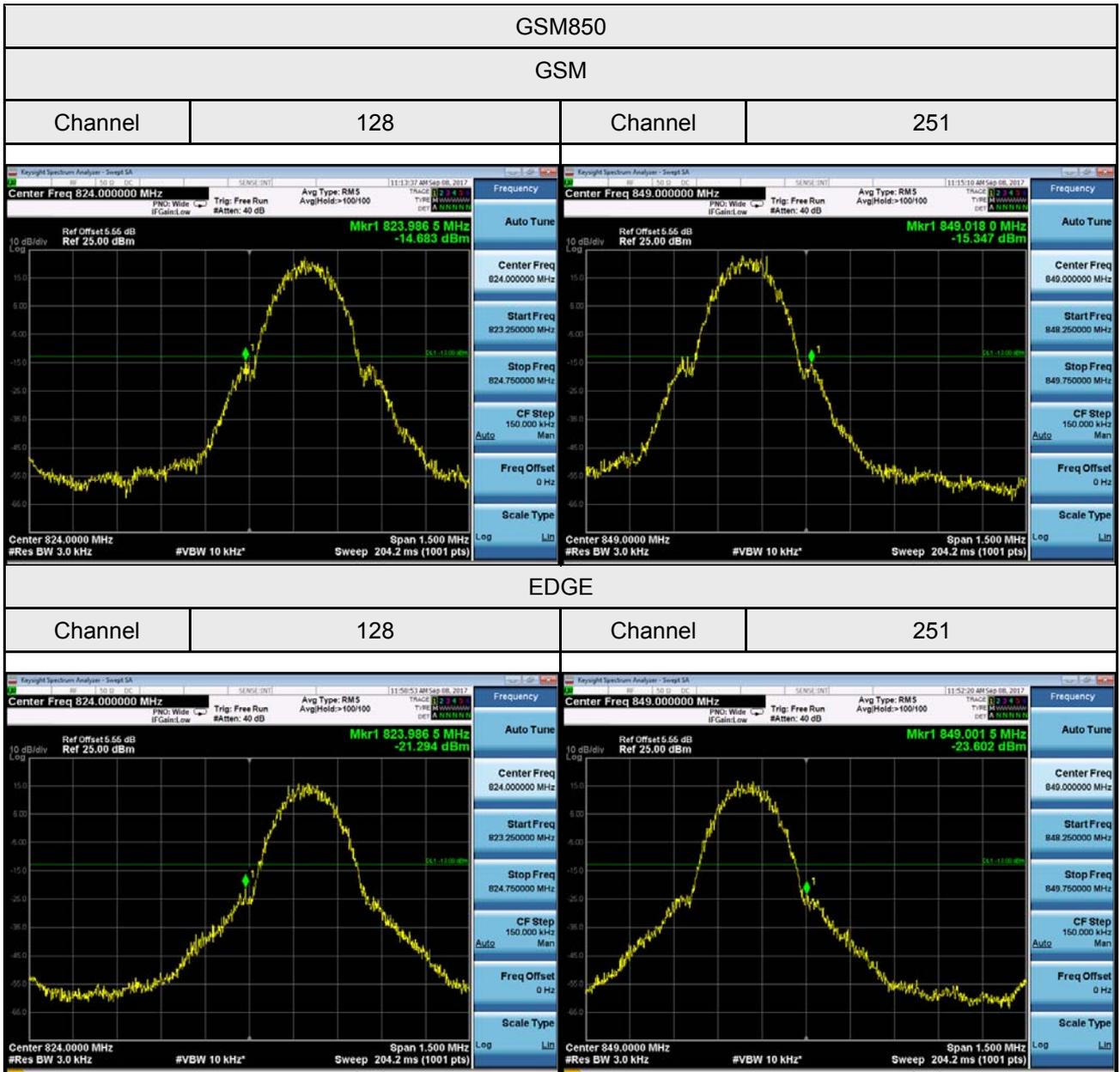
Test Mode: LTE Band 5\_TX CH20600\_10M

Horizontal

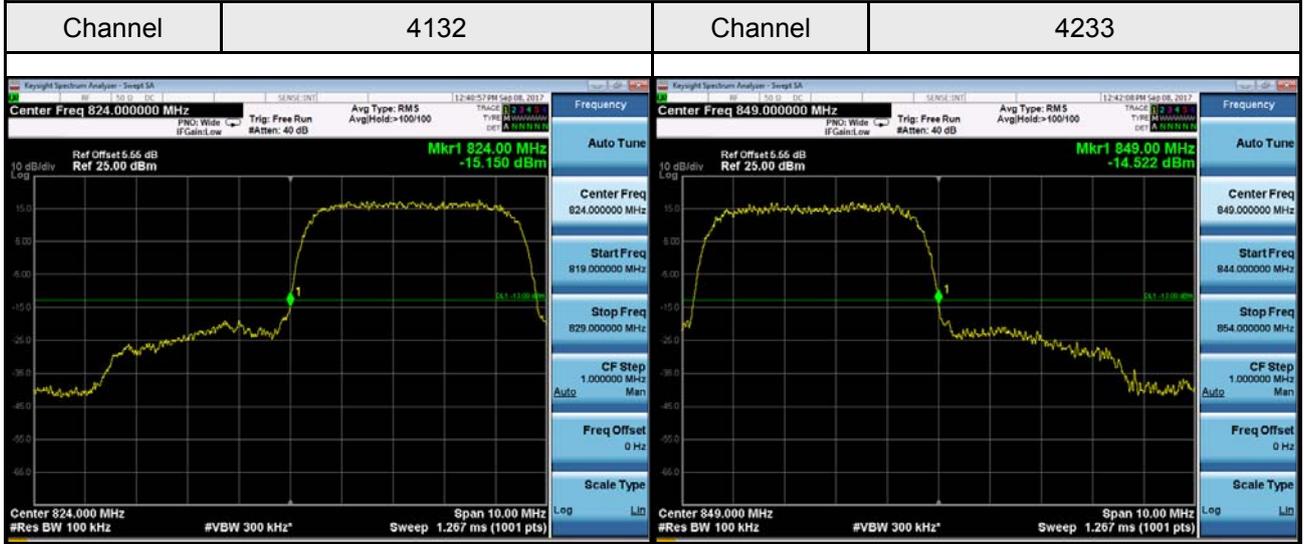


No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		2428.000	-44.95	-5.91	-50.86	-13.00	-37.86	peak	
2	*	1680.000	-34.90	-9.02	-43.92	-13.00	-30.92	peak	

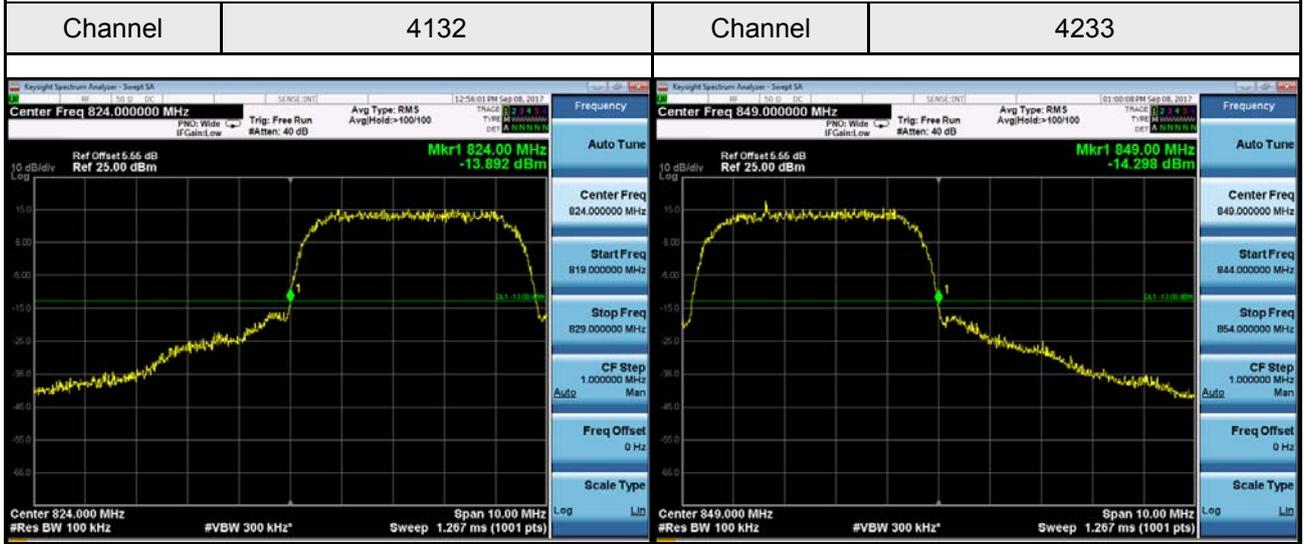
## ATTACHMENT E - BAND EDGE



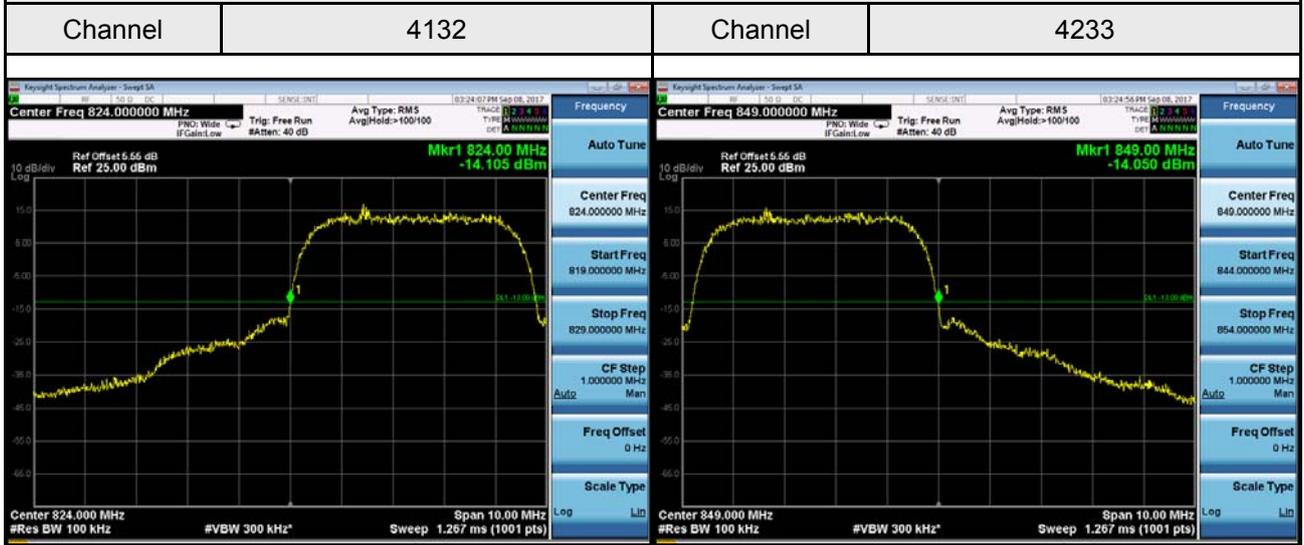
### WCDMA Band V



### WCDMA\_HSDPA Band V



### WCDMA\_HSUPA Band V



LTE Band 5\_5M

1RB0

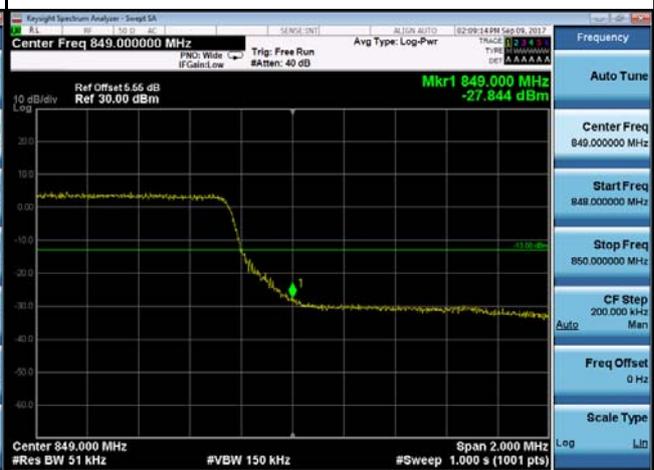
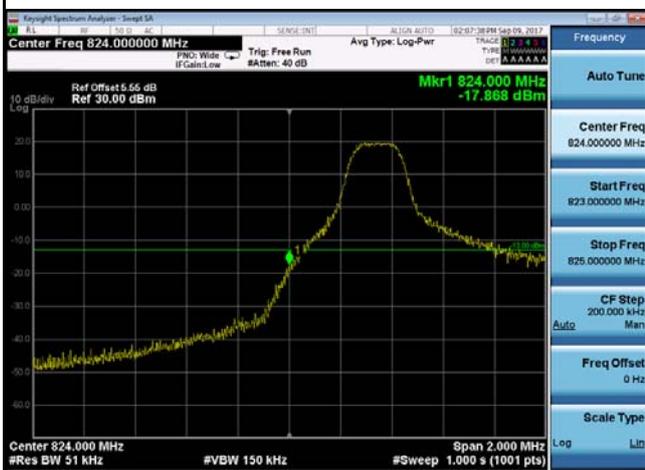
1RB24

Channel

20425

Channel

20625



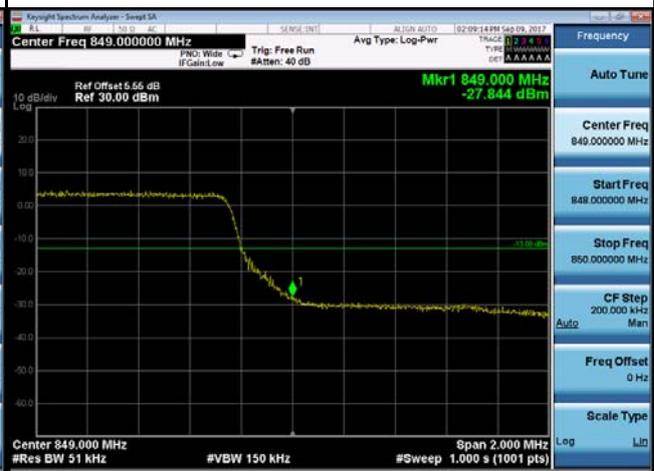
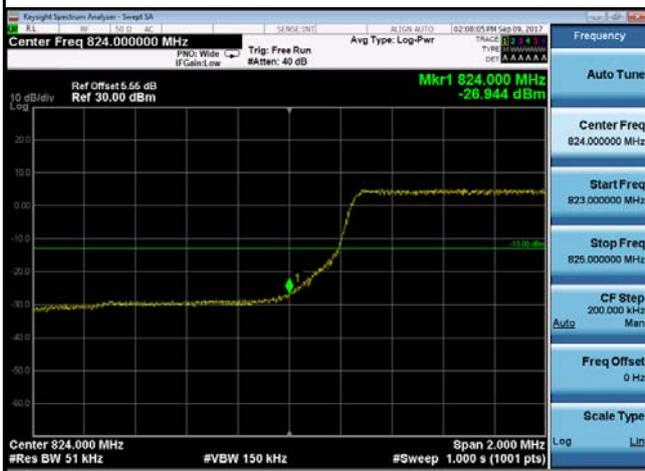
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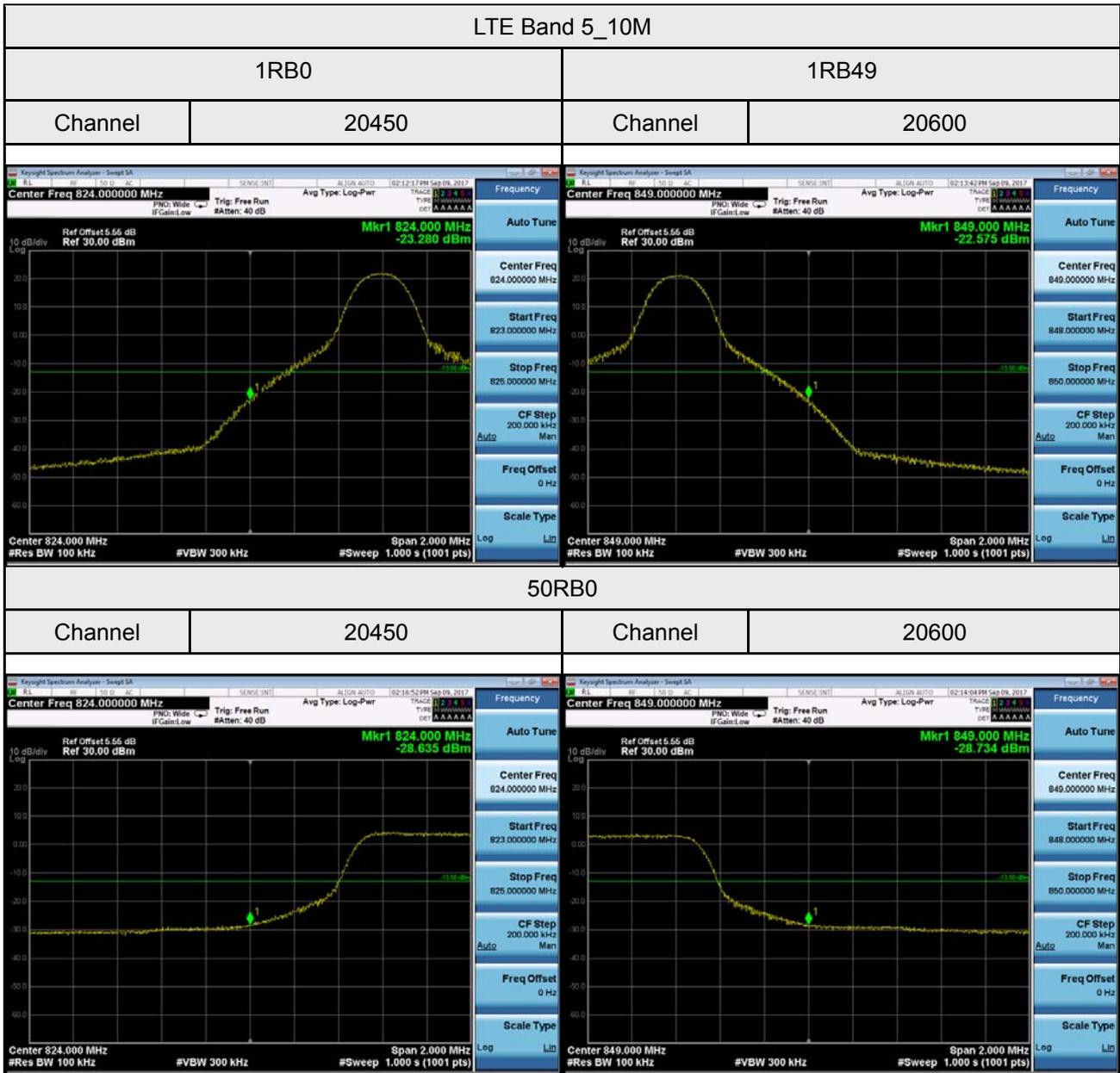
Channel

20425

Channel

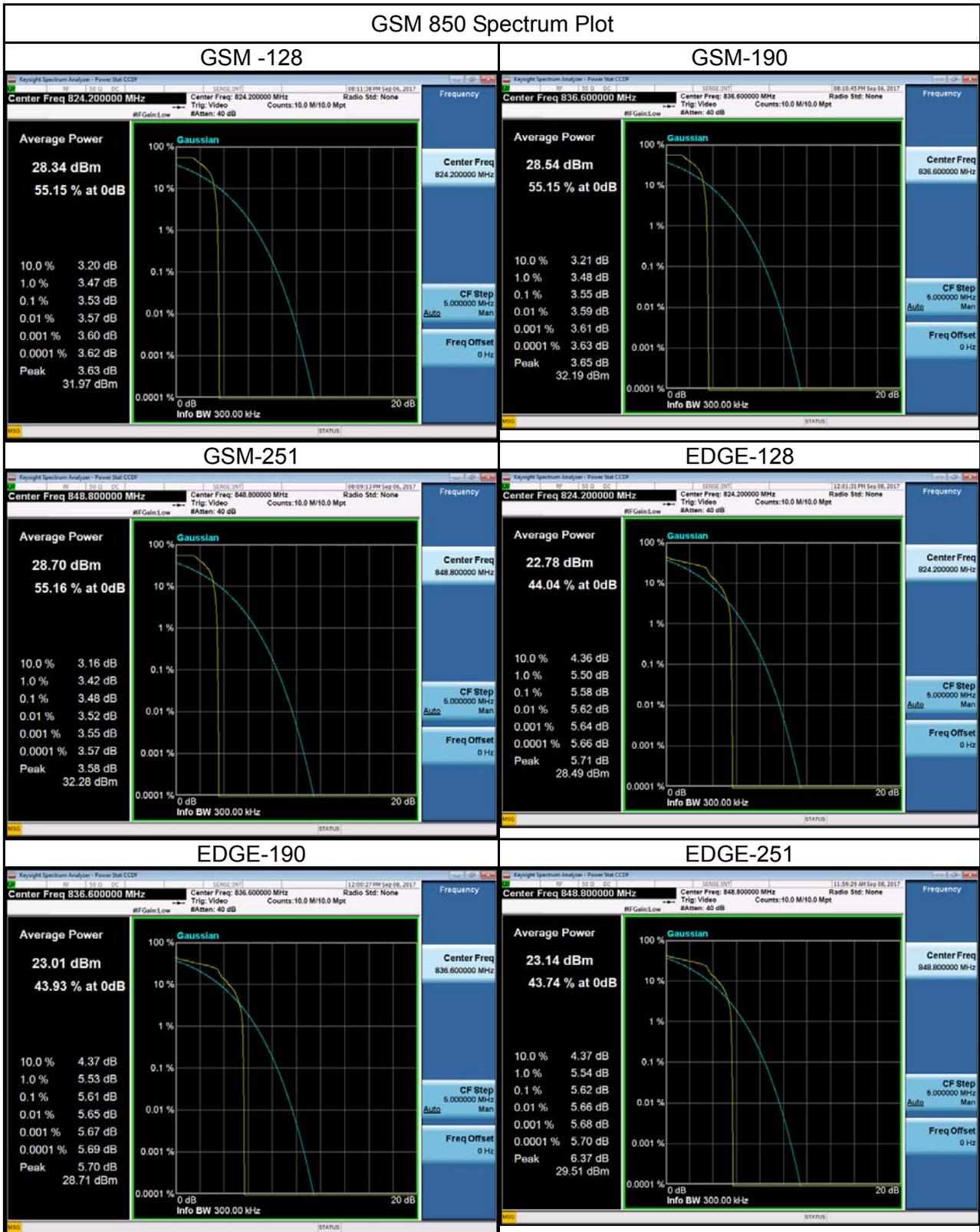
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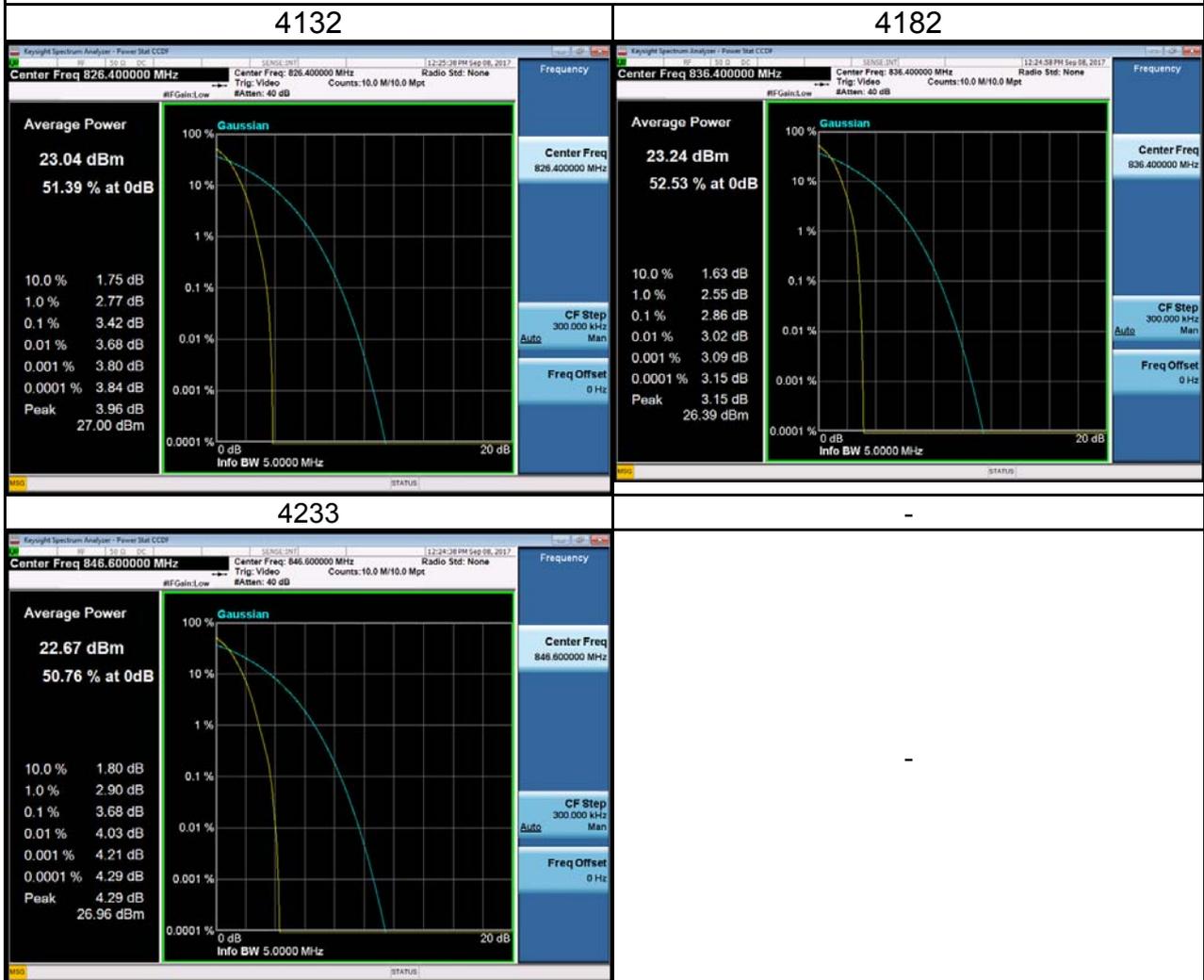


## ATTACHMENT F - PEAK TO AVERAGE RATIO

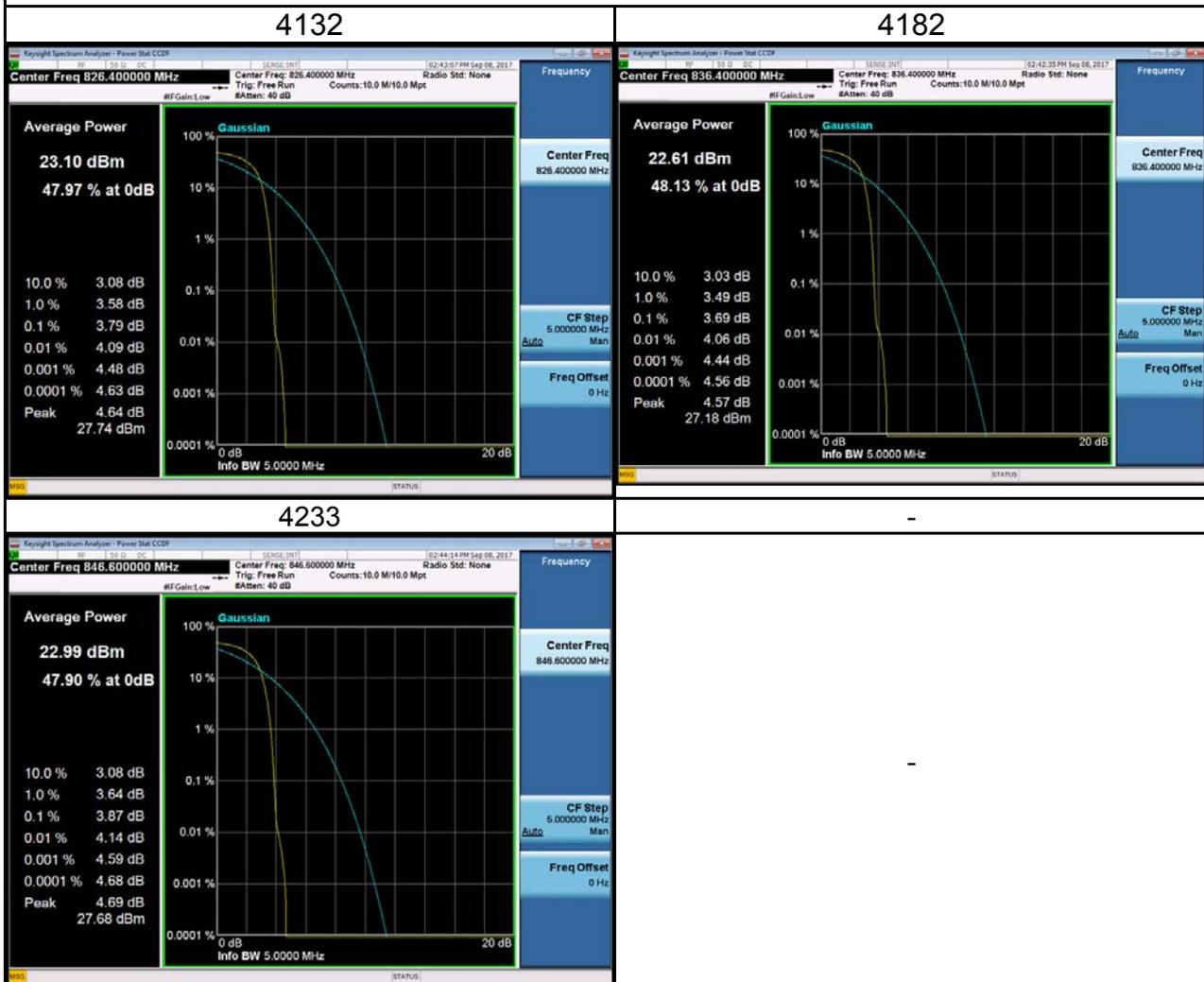
### GSM 850 Spectrum Plot



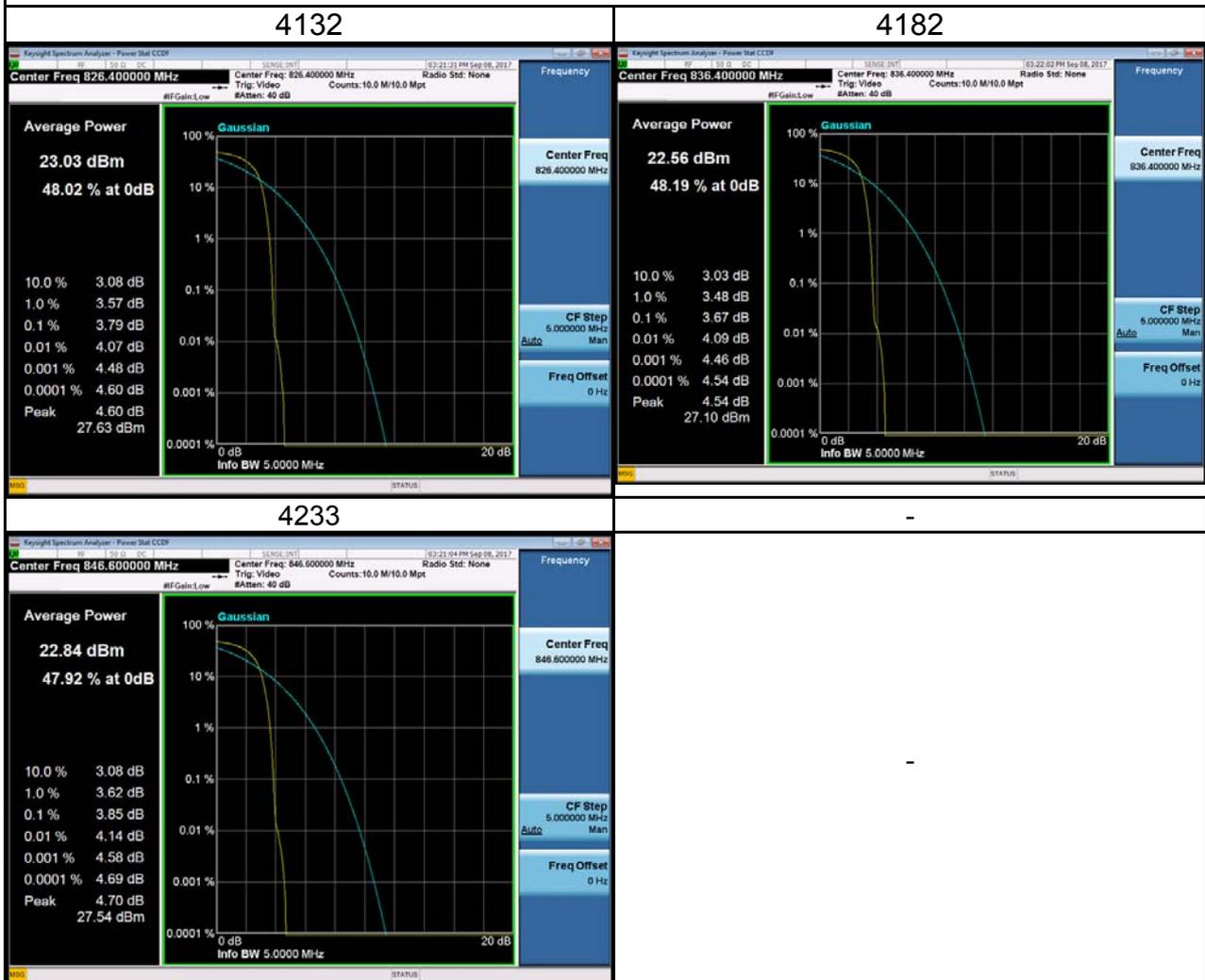
### WCDMA Band V Spectrum Plot



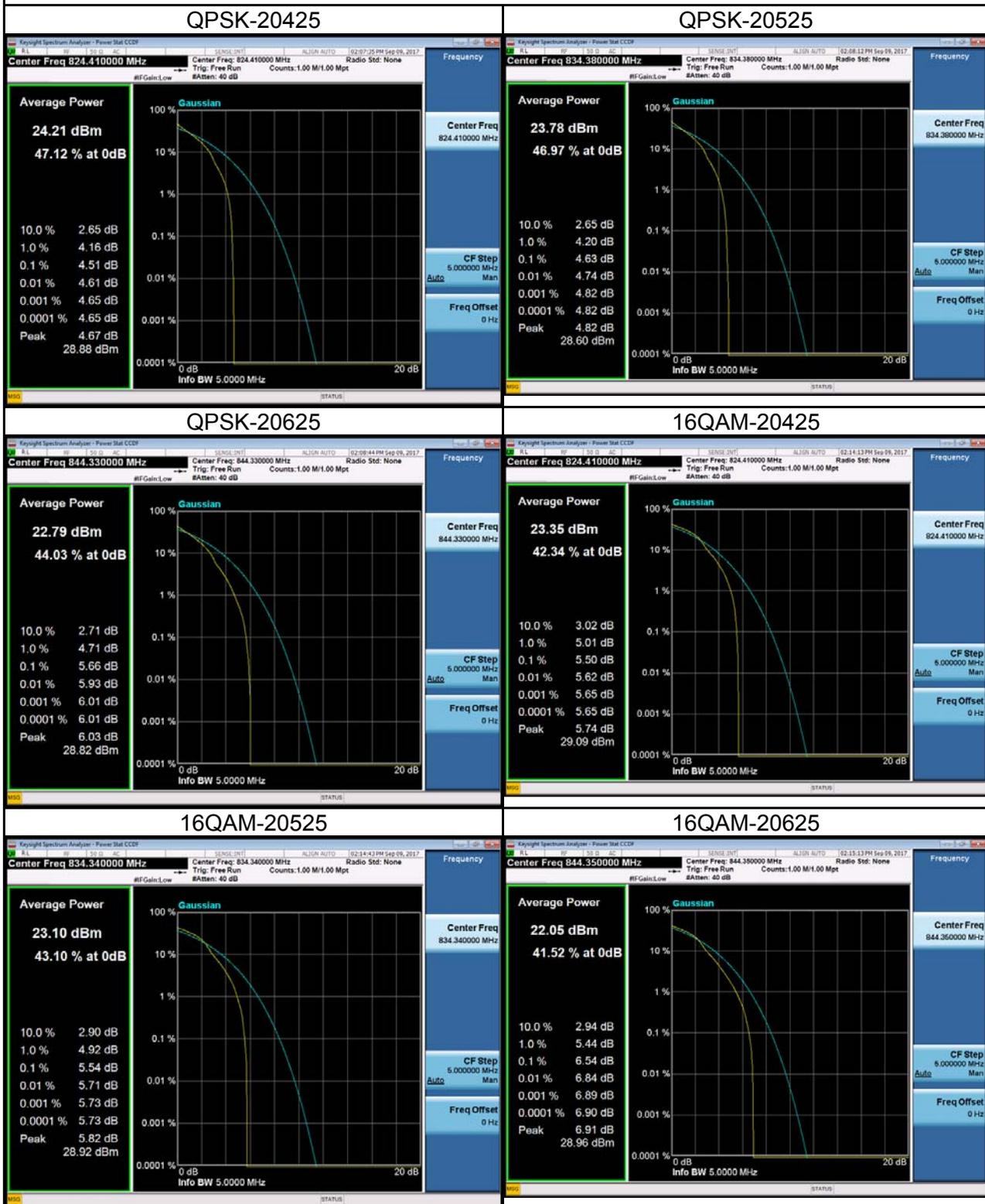
### WCDMA\_HSDPA Band V Spectrum Plot



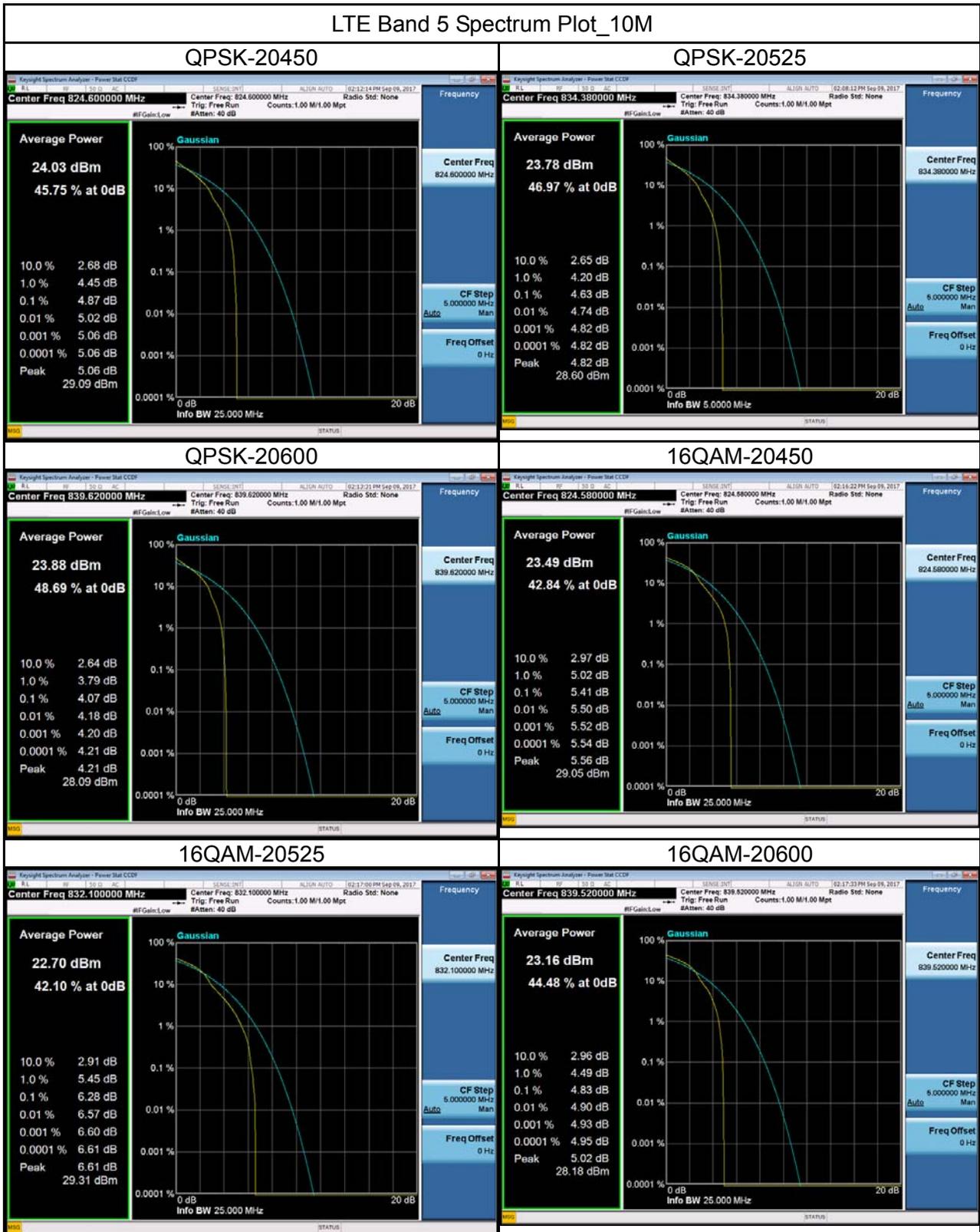
### WCDMA\_HSUPA Band V Spectrum Plot



### LTE Band 5 Spectrum Plot\_5M



### LTE Band 5 Spectrum Plot\_10M



## ATTACHMENT G - FREQUENCY STABILITY

Test Mode:	GSM850_CH190
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### Temperature vs. Frequency Stability

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-30	6.36	0.007716574	2.5
-20	6.63	0.008044164	2.5
-10	7.28	0.008832808	2.5
0	5.98	0.007255521	2.5
10	8.03	0.009742781	2.5
20	6.79	0.008238292	2.5
30	7.84	0.009512254	2.5
40	8.17	0.009912643	2.5
50	7.62	0.009245329	2.5
Max. Deviation (ppm)	<b>8.17</b>	<b>0.009912643</b>	2.5

### Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
4.5	4.48	0.005435574	2.5
5	5.24	0.00635768	2.5
5.5	4.88	0.005920893	2.5
Max. Deviation (ppm)	<b>5.24</b>	<b>0.00635768</b>	2.5

Test Mode:	WCDMA Band 5_CH4182
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### Temperature vs. Frequency Stability

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-30	7.14	0.008536585	2.5
-20	6.52	0.007795313	2.5
-10	8.33	0.00995935	2.5
0	8.19	0.009791966	2.5
10	6.15	0.007352941	2.5
20	7.18	0.008584409	2.5
30	7.68	0.009182209	2.5
40	7.48	0.008943089	2.5
50	6.29	0.007520325	2.5
Max. Deviation (ppm)	<b>8.33</b>	<b>0.00995935</b>	2.5

### Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
4.5	6.69	0.007998565	2.5
5	8.04	0.009612626	2.5
5.5	8.14	0.009732186	2.5
Max. Deviation (ppm)	<b>8.14</b>	<b>0.009732186</b>	2.5

Test Mode:	LTE Band 5_CH20525_5M
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### Temperature vs. Frequency Stability

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-30	3.33	0.003980873	2.5
-20	4.28	0.005116557	2.5
-10	-1.68	0.002008368	2.5
0	2.67	0.003191871	2.5
10	-3.13	0.003741781	2.5
20	-2.45	0.00292887	2.5
30	1.48	0.001769277	2.5
40	2.55	0.003048416	2.5
50	-3.01	0.003598326	2.5
Max. Deviation (ppm)	<b>4.28</b>	<b>0.005116557</b>	2.5

### Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
4.5	1.81	0.002163778	2.5
5	-1.96	0.002343096	2.5
5.5	2.04	0.002438733	2.5
Max. Deviation (ppm)	<b>2.04</b>	<b>0.002438733</b>	2.5

Test Mode:	LTE Band 5_CH20525_10M
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### Temperature vs. Frequency Stability

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-30	-1.93	0.002307233	2.5
-20	2.87	0.003430962	2.5
-10	4.12	0.004925284	2.5
0	-4.33	0.00517633	2.5
10	3.82	0.004566647	2.5
20	-2.84	0.003395099	2.5
30	2.67	0.003191871	2.5
40	-2.97	0.003550508	2.5
50	3.44	0.004112373	2.5
Max. Deviation (ppm)	<b>4.33</b>	<b>0.00517633</b>	2.5

### Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
3.8	3.11	0.003717872	2.5
4	-2.67	0.003191871	2.5
4.2	-2.49	0.002976689	2.5
Max. Deviation (ppm)	<b>3.11</b>	<b>0.003717872</b>	2.5