

# FCC Part 22H & 24E Measurement and Test Report

For

**Keycafe Inc.,**

**505 – 55 Water Street. Vancouver, BC V6B 1A1 Canada**

**FCC ID: 2AELPU5**

**FCC Rules:** FCC Part 22H, FCC Part 24E

**Product Description:** 3G Smart Phone

**Tested Model:** U5

**Report No.:** STR15048105I-1

**Tested Date:** 2015-04-14 to 2015-04-20

**Issued Date:** 2015-04-22

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM. Test Technology Co., Ltd.

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: Keycafe Inc.,  
Address of applicant: 505 – 55 Water Street. Vancouver, BC V6B 1A1 Canada

Manufacturer: Keycafe Inc.,  
Address of manufacturer: 505 – 55 Water Street. Vancouver, BC V6B 1A1 Canada

General Description of EUT	
Product Name:	3G Smart Phone
Brand Name:	e-sun
Model No.:	U5
Adding Model:	ES-S12
Hardware Version:	E2109_V1.1_20130827
Software Version:	109v82_gq3016_20150313
IMEI:	356878023654014/356878023654022
Rated Voltage:	DC 3.7V Li-ion Battery
Battery:	2800mAh(10.36Wh)
Power Adaptor:	Input 100-240V, 50/60Hz, Output DC 5.2V/1000mA
Device Category:	Portable Device
<i>The EUT is GSM850/900/DCS1800/PCS1900, WCDMA Band II, Band V, 3G smart phone. The 3G smart phone is intended for speech and Multimedia Message Service (MMS) transmission. It is equipped with GPRS class 12 for GSM850 and GSM1900 and Bluetooth, Wi-Fi, and camera functions. For more information see the following datasheet</i>	
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT	
<b>2G</b>	
Support Networks:	GSM, GPRS
Support Band:	GSM850/PCS1900
Uplink Frequency:	GSM/GPRS 850: 824~849MHz GSM/GPRS 1900: 1850~1910MHz
Downlink Frequency:	GSM/GPRS 850: 869~894MHz GSM/GPRS 1900: 1930~1990MHz
Max RF Output Power:	GSM850: 31.94dBm, GSM1900: 28.96dBm
Type of Emission:	GSM850: 256KGXW, GSM1900: 266KGXW
Type of Modulation:	GMSK
Type of Antenna:	Integral Antenna
Antenna Gain:	-1.0dBi
GPRS Class:	Class 12
<b>3G</b>	
Support Networks:	WCDMA
Support Band:	WCDMA Band II, WCDMA Band V
Uplink Frequency:	WCDMA Band II: 1850~1910MHz WCDMA Band V: 824~849MHz
Downlink Frequency:	WCDMA Band II: 1930~1990MHz WCDMA Band V: 869~894MHz
RF Output Power:	WCDMA Band II: 20.43dBm, WCDMA Band V: 22.81dBm
Type of Emission:	WCDMA Band II: 4M19F9W WCDMA Band V: 4M18F9W
Type of Modulation:	BPSK
Antenna Type:	Integral Antenna
Antenna Gain:	-1.0dBi

## 1.2 Test Standards

The following report is prepared on behalf of the Keycafe Inc., in accordance with FCC Part 2 subpart J, FCC Part 22 subpart H and FCC Part 24 subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 2 subpart J, FCC Part 22 subpart H and FCC Part 24 subpart E of the Federal Communication Commissions rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with TIA/EIA 603-C: 2004 and ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

## 1.4 Test Facility

- **FCC – Registration No.: 934118**

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

- **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101)

## 1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	GSM 850	Low, Middle, High Channels
TM2	GPRS 850	Low, Middle, High Channels
TM3	GSM 1900	Low, Middle, High Channels
TM4	GPRS 1900	Low, Middle, High Channels
TM5	WCDMA Band V	Low, Middle, High Channels
TM6	HSDPA Band V	Low, Middle, High Channels
TM7	HSUPA Band V	Low, Middle, High Channels
TM8	WCDMA Band II	Low, Middle, High Channels
TM9	HSDPA Band V	Low, Middle, High Channels
TM10	HSUPA Band V	Low, Middle, High Channels

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
GSM 850	GSM/GPRS	824.2 MHz	128
		836.6 MHz	190
		848.8 MHz	251
PCS 1900	GSM/GPRS	1850.2 MHz	512
		1880.0 MHz	661
		1909.8 MHz	810
WCDMA Band V	WCDMA/HSDPA/HSUPA	826.4 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
WCDMA Band II	WCDMA/HSDPA/HSUPA	1852.4 MHz	9262
		1880.0 MHz	9400
		1907.6 MHz	9538
Note: the transmitter has been tested on the communications mode of GSM, GPRS,WCDMA, HSDPA, HSUPA compliance test and record the worst case.			

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	0.8	Unshielded	Without Ferrite
Earphone	1.0	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E10	LR-63C8R

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

## 2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 1.1307, § 2.1093	RF Exposure	Compliant
§ 22.913 (a), § 24.232 (c)	RF Output Power	Compliant
§ 22.917 (b), § 24.238 (b)	Emission Bandwidth	Compliant
§ 22.917 (a), § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant
§ 22.917 (a), § 24.238 (a)	Spurious Radiation Emissions	Compliant
§ 22.917 (a), § 24.238 (a)	Out of Band Emissions	Compliant
§ 22.355, § 24.235	Frequency Stability	Compliant



### **3. RF Exposure**

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#### **3.1 Standard Applicable**

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

#### **3.2 Test Result**

This product complied with the requirement of the RF exposure, please see the SAR report.

## 4. RF Output Power

### 4.1 Standard Applicable

According to §22.913(a)(2), The ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

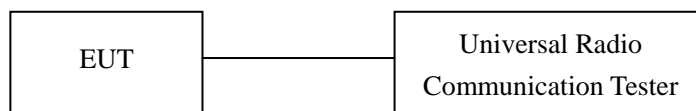
According to §24.232 (c), Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

### 4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	2015-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-24	2015-05-23
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-334	2014-05-24	2015-05-23
Horn Antenna	ETS	3117	00086197	2014-05-24	2015-05-23
Horn Antenna	ETS	3117	00086198	2014-05-24	2015-05-23
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	112012	2014-05-28	2015-05-27
Signal Generator	R&S	SMR20	100047	2014-05-28	2015-05-27

### 4.3 Test Procedure

Conducted output power test method:



Radiated power test method:

1. The setup of EUT is according with per TIA/EIA Standard 603C and ANSI C63.4-2003 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.

4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

#### 4.4 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

#### 4.5 Summary of Test Results/Plots

Radiated Power

ERP For GSM Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	28.55	1.5	0	H	1.5	0	27.05	38.45
824.2	30.65	1.5	0	V	1.5	0	29.15	38.45
Middle Channel								
28.03	28.61	1.5	0	H	1.5	0	27.11	38.45
31.37	30.92	1.5	0	V	1.5	0	29.42	38.45
High Channel								
848.8	28.64	1.5	0	H	1.5	0	27.14	38.45
848.8	31.01	1.5	0	V	1.5	0	29.51	38.45

EIRP For GSM Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	DBm	dBm
Low Channel								
1850.2	20.48	1.5	0	H	1.9	7.7	26.28	33
1850.2	22.58	1.5	0	V	1.9	7.7	28.38	33
Middle Channel								
1880.0	20.44	1.5	0	H	1.9	7.7	26.24	33
1880.0	22.71	1.5	0	V	1.9	7.7	28.51	33
High Channel								
1909.8	20.61	1.5	0	H	1.9	7.7	26.41	33
1909.8	22.64	1.5	0	V	1.9	7.7	28.44	33

## ERP For GPRS Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	29.02	1.5	0	H	1.5	0	27.52	38.45
824.2	30.65	1.5	0	V	1.5	0	29.15	38.45
Middle Channel								
836.6	28.60	1.5	0	H	1.5	0	27.10	38.45
836.6	30.60	1.5	0	V	1.5	0	29.10	38.45
High Channel								
848.8	28.65	1.5	0	H	1.5	0	27.15	38.45
848.8	30.58	1.5	0	V	1.5	0	29.08	38.45

## EIRP For GPRS Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	DBm	dBm
Low Channel								
1850.2	20.72	1.5	0	H	1.9	7.7	26.52	33
1850.2	22.35	1.5	0	V	1.9	7.7	28.15	33
Middle Channel								
1880.0	20.51	1.5	0	H	1.9	7.7	26.31	33
1880.0	22.62	1.5	0	V	1.9	7.7	28.42	33
High Channel								
1909.8	20.53	1.5	0	H	1.9	7.7	26.33	33
1909.8	22.67	1.5	0	V	1.9	7.7	28.47	33

## ERP For WCDMA Mode Band V

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	21.91	1.5	0	H	1.5	0	20.41	38.45
826.4	22.78	1.5	0	V	1.5	0	21.28	38.45
Middle Channel								
836.6	21.75	1.5	0	H	1.5	0	20.25	38.45
836.6	22.84	1.5	0	V	1.5	0	21.34	38.45
High Channel								
846.6	22.02	1.5	0	H	1.5	0	20.52	38.45
846.6	22.66	1.5	0	V	1.5	0	21.16	38.45

## ERP For HSDPA Mode Band V

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	21.65	1.5	0	H	1.5	0	20.15	38.45
826.4	22.55	1.5	0	V	1.5	0	21.05	38.45
Middle Channel								
836.6	21.58	1.5	0	H	1.5	0	20.08	38.45
836.6	22.72	1.5	0	V	1.5	0	21.22	38.45
High Channel								
846.6	21.62	1.5	0	H	1.5	0	20.12	38.45
846.6	22.58	1.5	0	V	1.5	0	21.08	38.45

## ERP For HSUPA Mode Band V

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	20.55	1.5	0	H	1.5	0	19.05	38.45
826.4	21.61	1.5	0	V	1.5	0	20.11	38.45
Middle Channel								
836.6	20.55	1.5	0	H	1.5	0	19.05	38.45
836.6	21.74	1.5	0	V	1.5	0	20.24	38.45
High Channel								
846.6	20.39	1.5	0	H	1.5	0	18.89	38.45
846.6	21.65	1.5	0	V	1.5	0	20.15	38.45

## EIRP For WCDMA Mode Band II

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	DBm	dBm
Low Channel								
1852.4	13.11	1.5	0	H	1.9	7.7	18.91	33
1852.4	14.51	1.5	0	V	1.9	7.7	20.31	33
Middle Channel								
1880.0	13.22	1.5	0	H	1.9	7.7	19.02	33
1880.0	14.25	1.5	0	V	1.9	7.7	20.05	33
High Channel								
1907.6	12.89	1.5	0	H	1.9	7.7	18.69	33
1907.6	14.31	1.5	0	V	1.9	7.7	20.11	33

## EIRP For HSDPA Mode Band II

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	DBm	dBm
Low Channel								
1852.4	13.05	1.5	0	H	1.9	7.7	18.85	33
1852.4	14.20	1.5	0	V	1.9	7.7	20.00	33
Middle Channel								
1880.0	12.45	1.5	0	H	1.9	7.7	18.25	33
1880.0	14.12	1.5	0	V	1.9	7.7	19.92	33
High Channel								
1907.6	12.84	1.5	0	H	1.9	7.7	18.64	33
1907.6	14.25	1.5	0	V	1.9	7.7	20.05	33

## EIRP For HSUPA Mode Band II

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	DBm	dBm
Low Channel								
1852.4	12.45	1.5	0	H	1.9	7.7	18.25	33
1852.4	14.26	1.5	0	V	1.9	7.7	20.06	33
Middle Channel								
1880.0	12.65	1.5	0	H	1.9	7.7	18.45	33
1880.0	14.34	1.5	0	V	1.9	7.7	20.14	33
High Channel								
1907.6	12.78	1.5	0	H	1.9	7.7	18.58	33
1907.6	14.62	1.5	0	V	1.9	7.7	20.42	33

Note: Result = Substitute - Cable loss + Antenna Gain

Max. Conducted Output Power

For Cellular Band (GSM850)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
GSM	Low Channel	824.2	31.94	38.45
	Middle Channel	836.6	31.72	38.45
	High Channel	848.8	31.69	38.45
GPRS(1 Slot)	Low Channel	824.2	31.93	38.45
	Middle Channel	836.6	31.74	38.45
	High Channel	848.8	31.77	38.45

For PCS Band (GSM1900)

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
GSM	Low Channel	1850.2	28.94	33.0
	Middle Channel	1880.0	28.78	33.0
	High Channel	1909.8	28.70	33.0
GPRS(1 Slot)	Low Channel	1850.2	28.96	33.0
	Middle Channel	1880.0	28.81	33.0
	High Channel	1909.8	28.73	33.0



For WCDMA Band V

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
WCDMA	Low Channel	826.4	22.61	38.45
	Middle Channel	836.6	21.60	38.45
	High Channel	846.6	22.81	38.45
HSDPA	Low Channel	826.4	21.69	38.45
	Middle Channel	836.6	20.66	38.45
	High Channel	846.6	21.86	38.45
HSUPA	Low Channel	826.4	21.73	38.45
	Middle Channel	836.6	20.70	38.45
	High Channel	846.6	21.91	38.45

For WCDMA Band II

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
WCDMA	Low Channel	1852.4	20.42	30.0
	Middle Channel	1880.0	20.39	30.0
	High Channel	1907.6	20.43	30.0
HSDPA	Low Channel	1852.4	19.71	30.0
	Middle Channel	1880.0	19.61	30.0
	High Channel	1907.6	19.74	30.0
HSUPA	Low Channel	1852.4	19.79	30.0
	Middle Channel	1880.0	19.60	30.0
	High Channel	1907.6	19.71	30.0

## 5. Peak-to-average Radio (PAR) of Transmitter

### 5.1 Standard Applicable

According to §24.232(d), Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. 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.

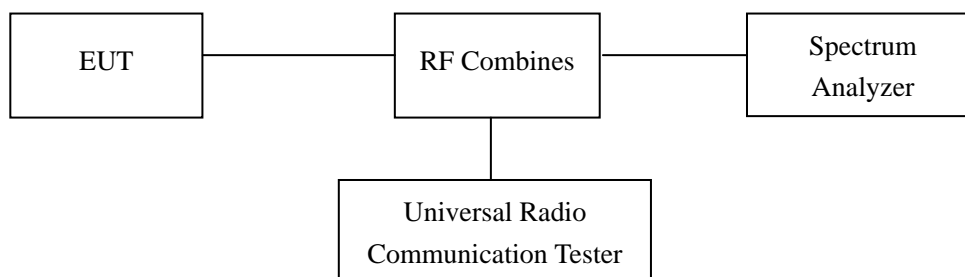
### 5.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B	US41192821	2014-05-28	2015-05-27
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	112012	2014-05-28	2015-05-27

### 5.3 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 30kHz and the peak-to-average ratio (PAR) of the transmission was recorded.

Test Configuration for the emission bandwidth testing:



### 5.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

## 5.5 Summary of Test Results

For Cellular Band

Test Mode	Channel	Frequency (MHz)	Peak Power (dBm)	Average Power (dBm)	PAR (dB)	Limit (dB)
GSM	128	824.2	33.42	31.94	1.48	13
	190	836.6	33.31	31.72	1.59	13
	251	848.8	33.28	31.69	1.59	13
GPRS (1 Slot)	128	824.2	33.40	31.93	1.47	13
	190	836.6	33.37	31.74	1.63	13
	251	848.8	33.30	31.77	1.53	13

For PCS Band

Test Mode	Channel	Frequency (MHz)	Peak Power (dBm)	Average Power (dBm)	PAR	Limit
GSM	512	1850.2	31.72	28.94	2.78	13
	661	1880.0	31.53	28.78	2.75	13
	810	1909.8	31.25	28.70	2.55	13
GPRS (1 Slot)	512	1850.2	31.71	28.96	2.75	13
	661	1880.0	31.54	28.81	2.73	13
	810	1909.8	31.26	28.73	2.53	13

## For WCDMA Band V

Test Mode	Channel	Frequency (MHz)	Peak Power (dBm)	Average Power (dBm)	PAR	Limit
WCDMA	4132	826.4	25.46	22.61	2.85	13
	4183	836.6	25.24	21.60	3.64	13
	4233	846.6	25.90	22.81	3.09	13
HSDPA	4132	826.4	25.41	21.69	3.72	13
	4183	836.6	25.09	20.66	4.43	13
	4233	846.6	25.46	21.86	3.60	13
HSUPA	4132	826.4	25.05	21.73	3.32	13
	4183	836.6	24.96	20.70	4.26	13
	4233	846.6	25.74	21.91	3.83	13

## For WCDMA Band II

Test Mode	Channel	Frequency (MHz)	Peak Power (dBm)	Average Power (dBm)	PAR	Limit
WCDMA	9262	1852.4	23.64	20.42	3.22	13
	9400	1880.0	23.01	20.39	2.62	13
	9538	1907.6	23.06	20.43	2.63	13
HSDPA	9262	1852.4	23.73	19.71	4.02	13
	9400	1880.0	22.98	19.61	3.37	13
	9538	1907.6	23.07	19.74	3.33	13
HSUPA	9262	1852.4	23.38	19.79	3.59	13
	9400	1880.0	23.33	19.60	3.73	13
	9538	1907.6	22.98	19.71	3.27	13

## 6. Emission Bandwidth

### 6.1 Standard Applicable

According to §22.917(b), 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, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §24.238(b), 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, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

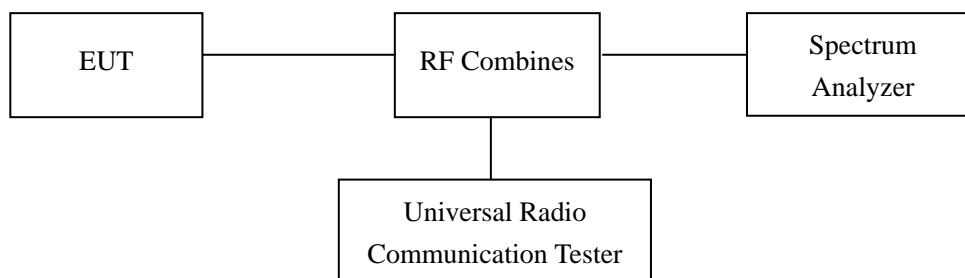
### 6.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B	US41192821	2014-05-28	2015-05-27
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	112012	2014-05-28	2015-05-27

### 6.3 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 30kHz and the 26dB bandwidth was recorded.

Test Configuration for the emission bandwidth testing:



### 6.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

## 6.5 Summary of Test Results/Plots

For Cellular Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	128	824.2	251.5692	337.482
	190	836.6	256.0175	334.718
	251	848.8	254.1602	347.043
GPRS	128	824.2	253.9738	341.685
	190	836.6	251.3246	338.532
	251	848.8	251.0293	335.847

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	255.4043	334.142
	661	1880.0	256.5095	336.026
	810	1909.8	265.6243	339.290
GPRS	512	1850.2	251.9777	340.560
	661	1880.0	252.4112	339.383
	810	1909.8	252.5683	338.142

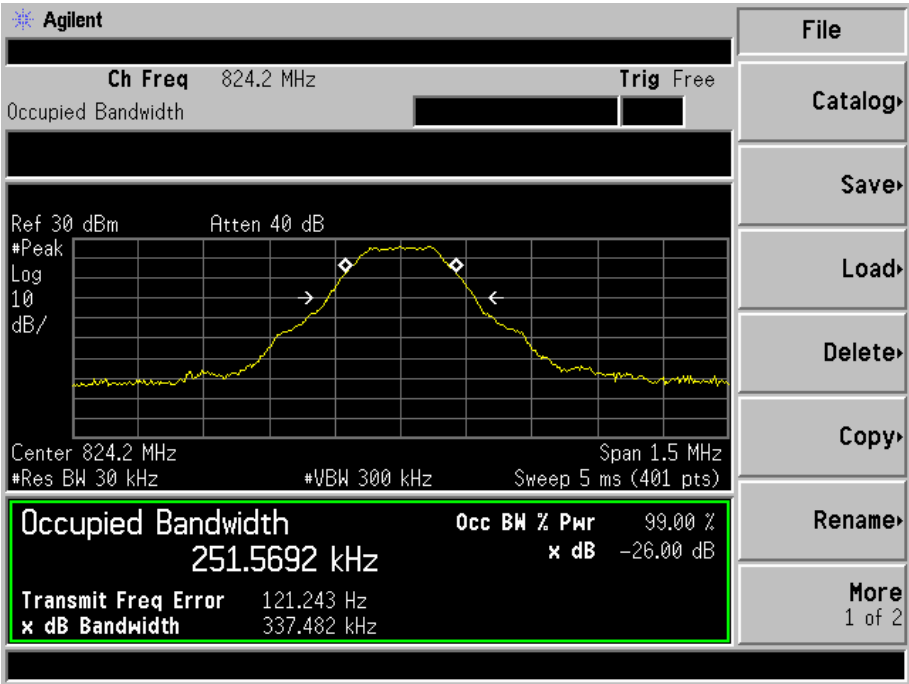
## For Band V

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	4132	826.4	4.1519	4.674
	4183	836.6	4.1756	4.654
	4233	846.6	4.1546	4.664
HSDPA	4132	826.4	4.1482	4.661
	4183	836.6	4.1587	4.639
	4233	846.6	4.1269	4.648

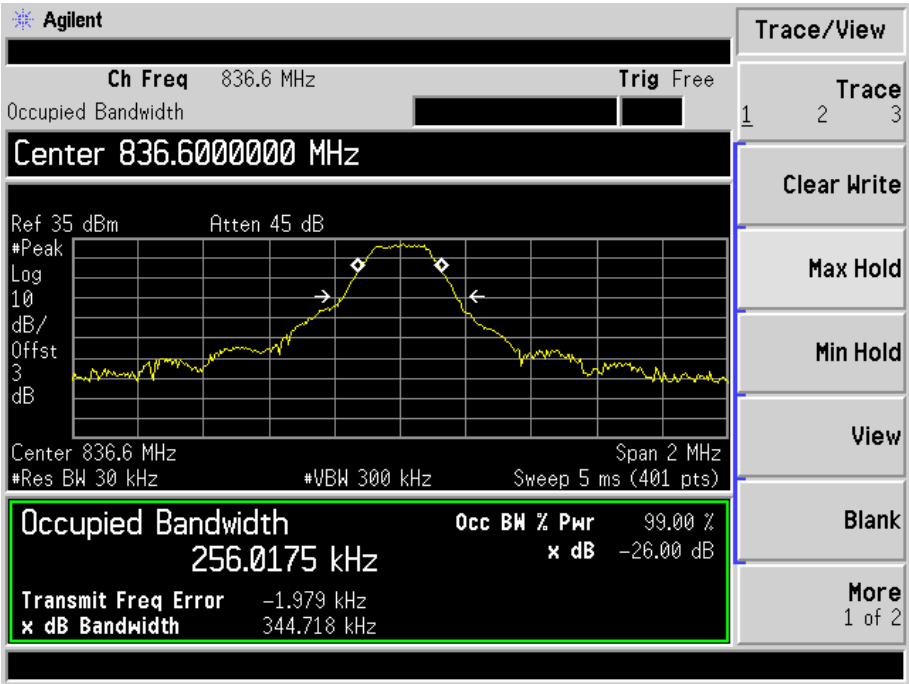
## For Band II

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	9262	1852.4	4.1480	4.677
	9400	1880.0	4.1913	4.705
	9538	1907.6	4.1677	4.711
HSDPA	9262	1852.4	4.1471	4.706
	9400	1880.0	4.1627	4.682
	9538	1907.6	4.1515	4.675

For Cellular Band  
GSM Low Channel

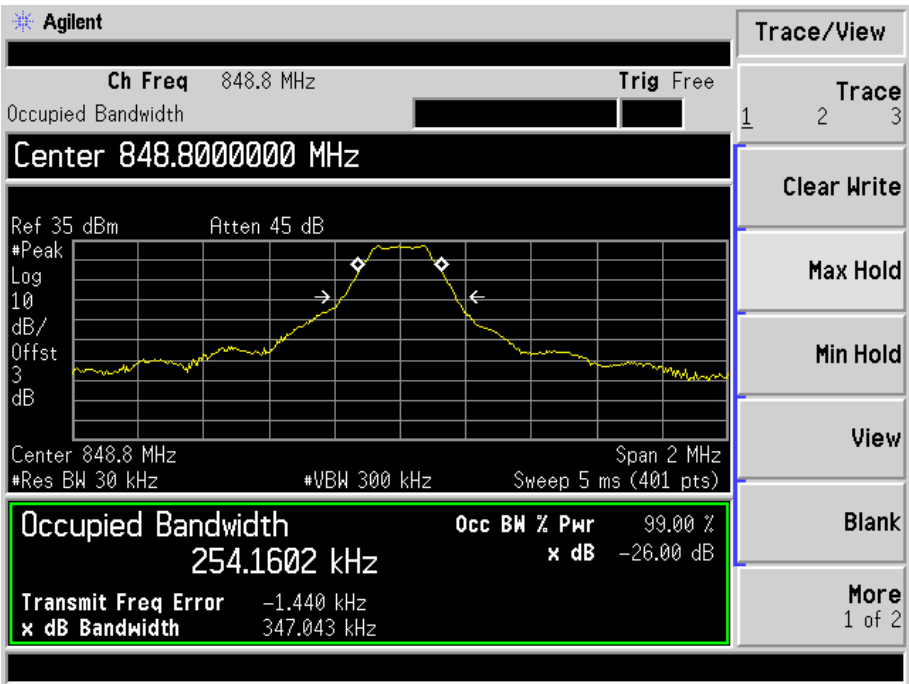


GSM Middle Channel

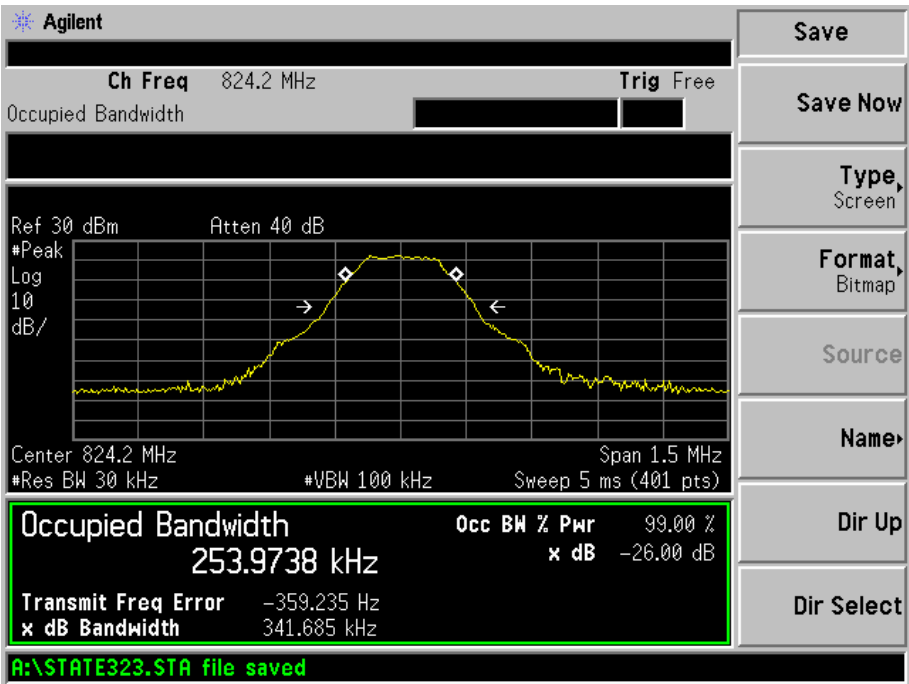




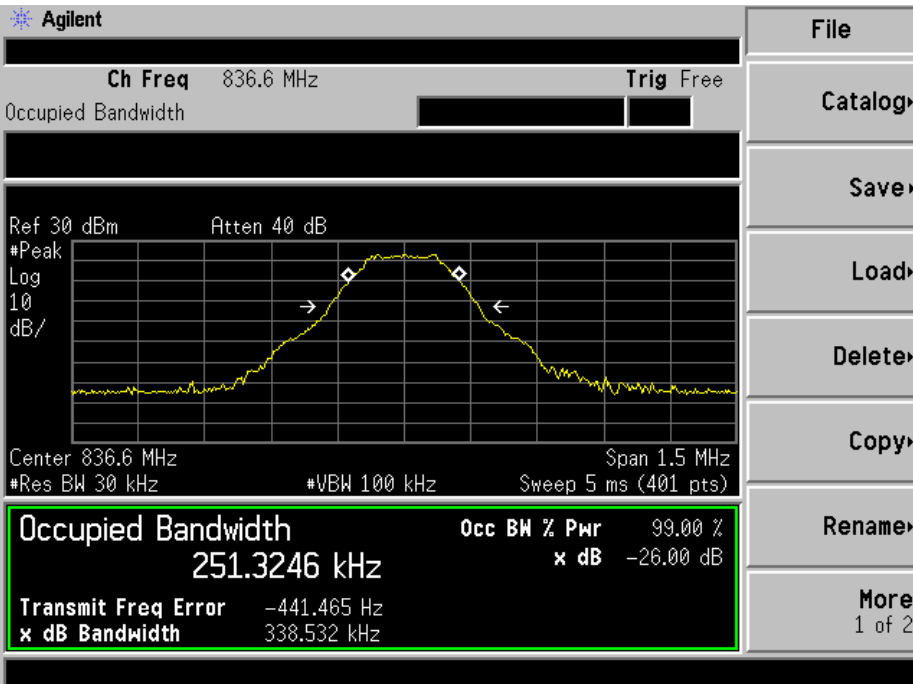
GSM High channel



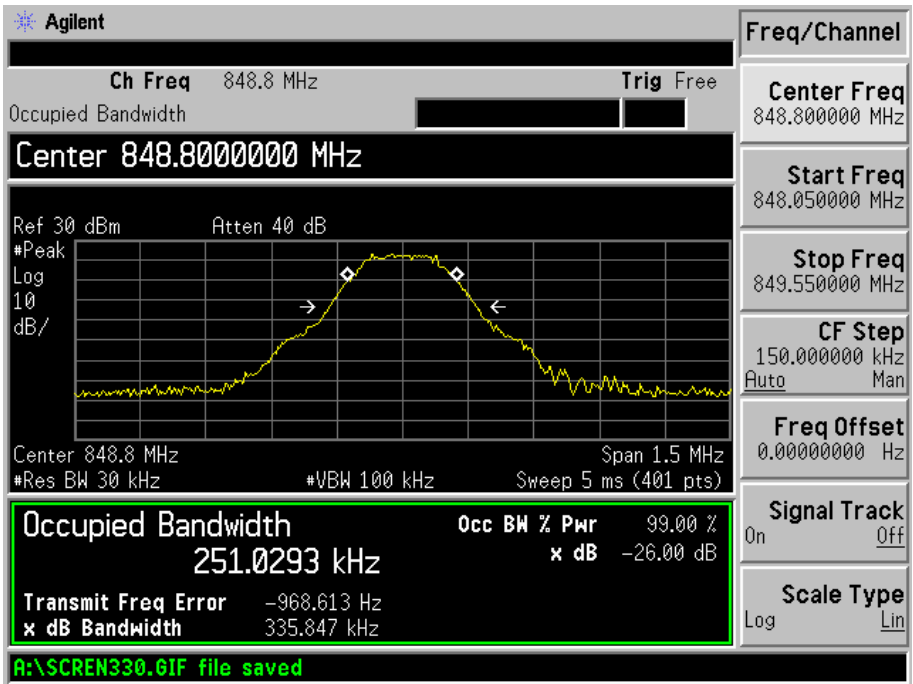
GPRS Low Channel



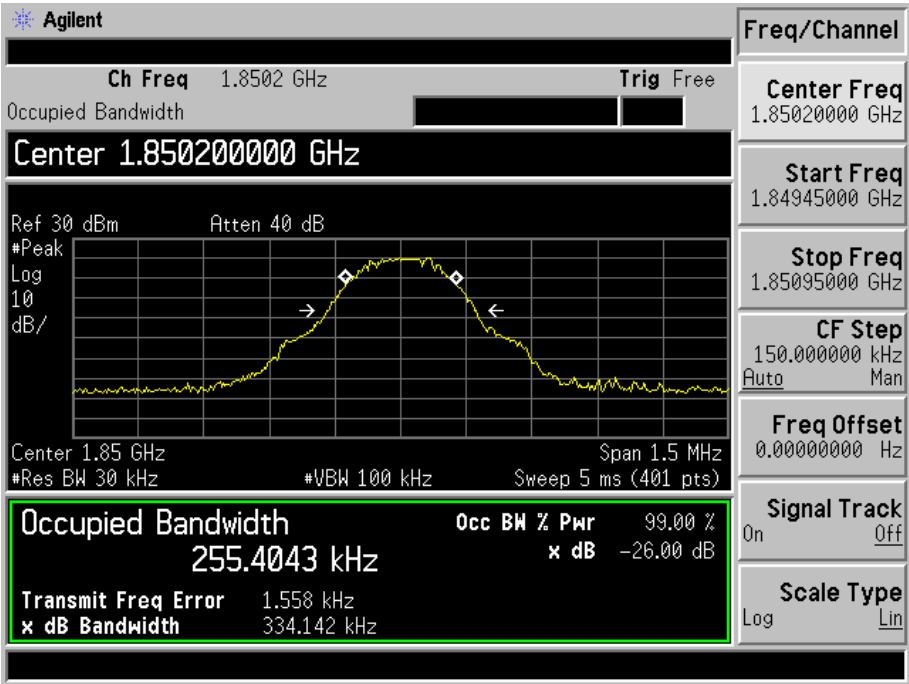
GPRS Middle Channel



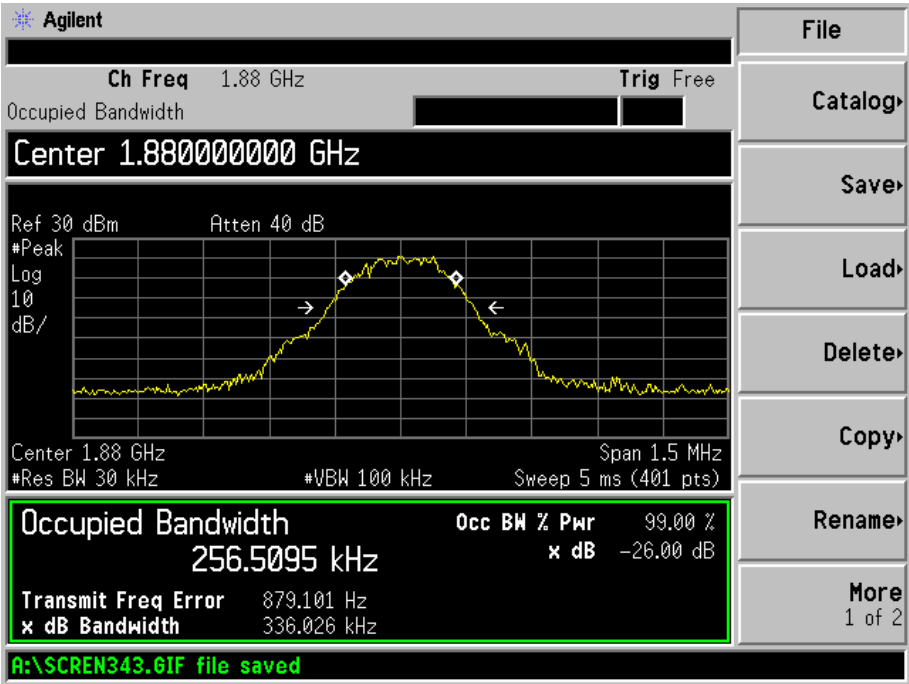
GPRS High Channel



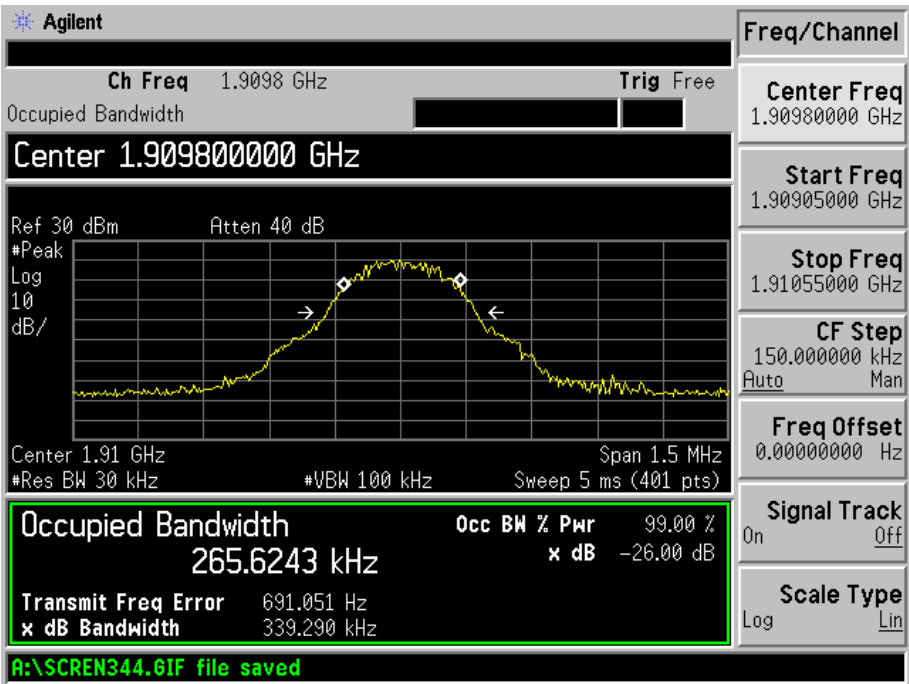
For PCS Band  
GSM Low Channel



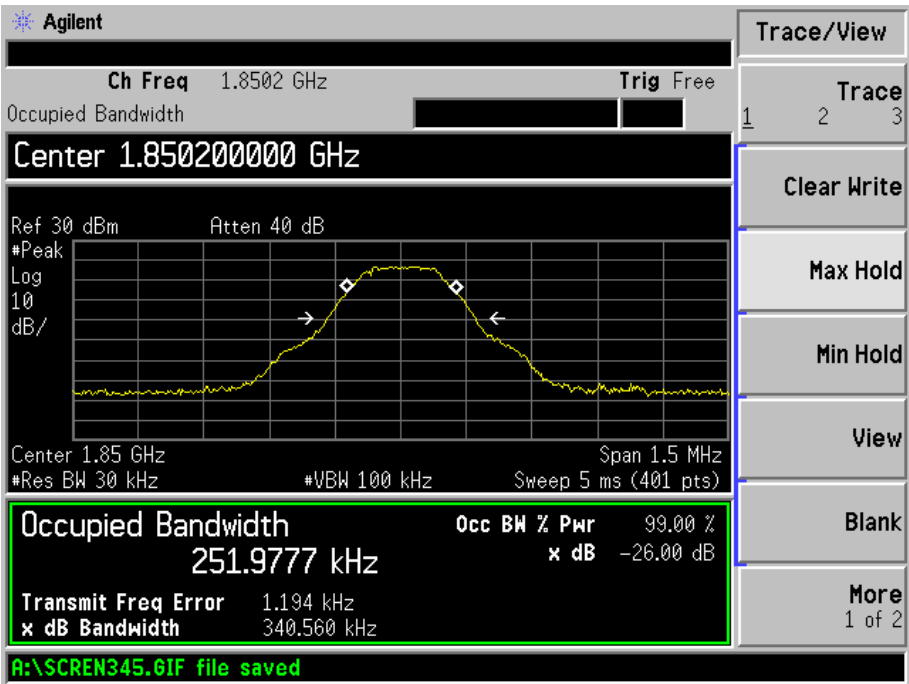
GSM Middle Channel



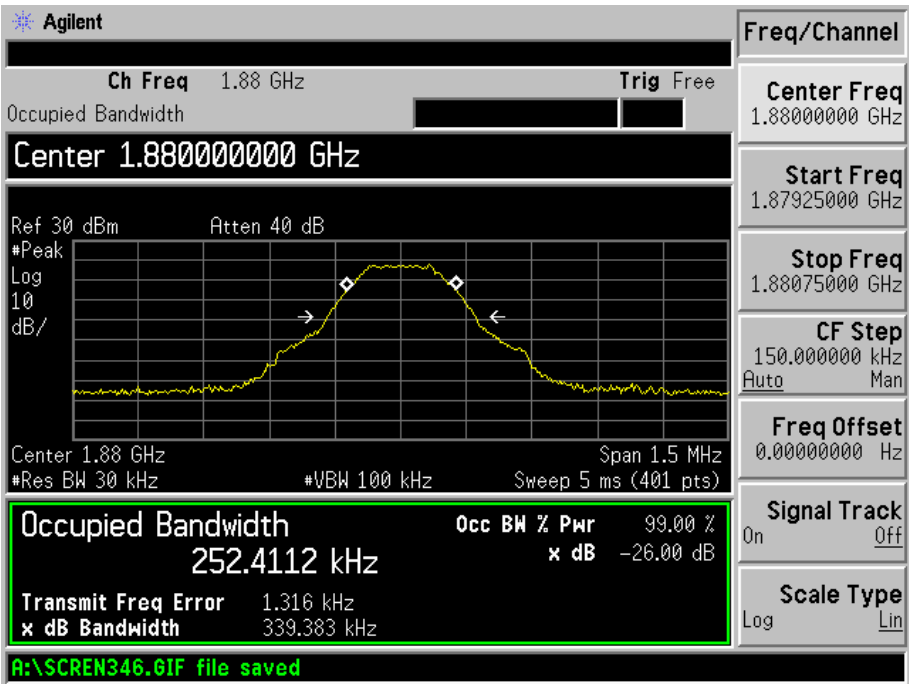
GSM High channel



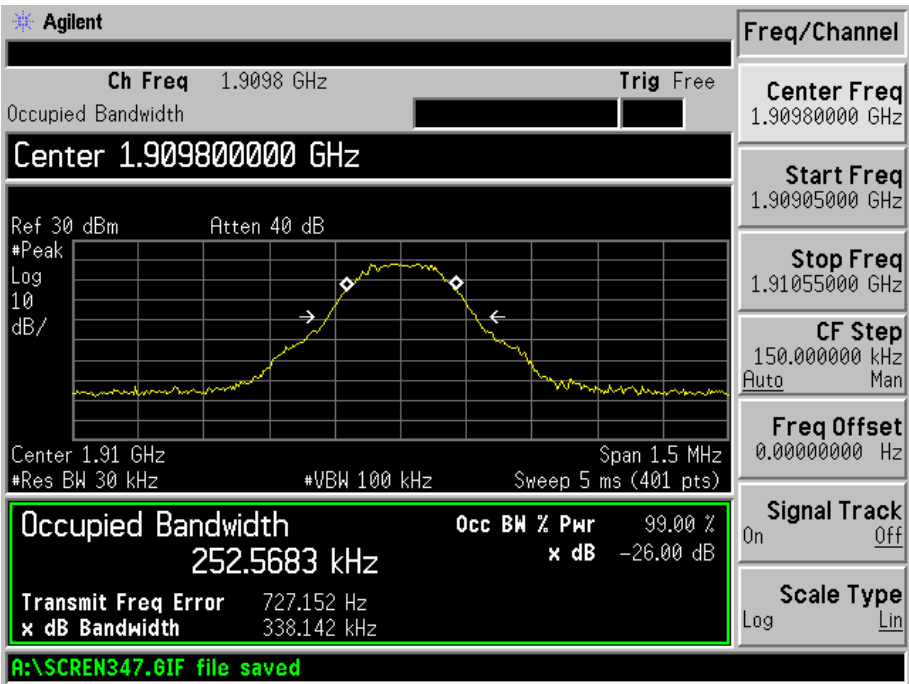
GPRS Low Channel



GPRS Middle Channel

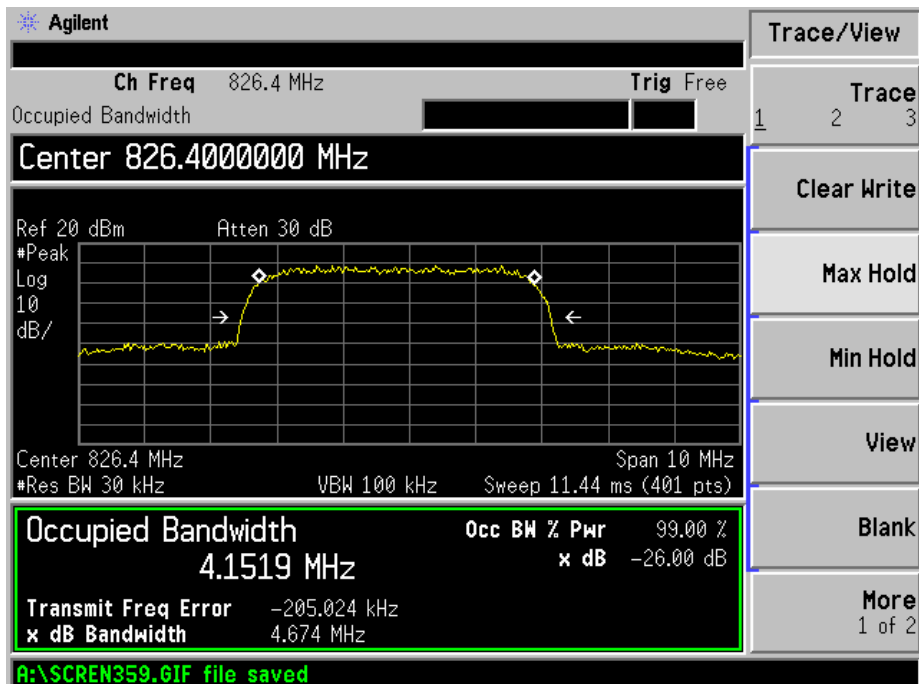


GPRS High Channel

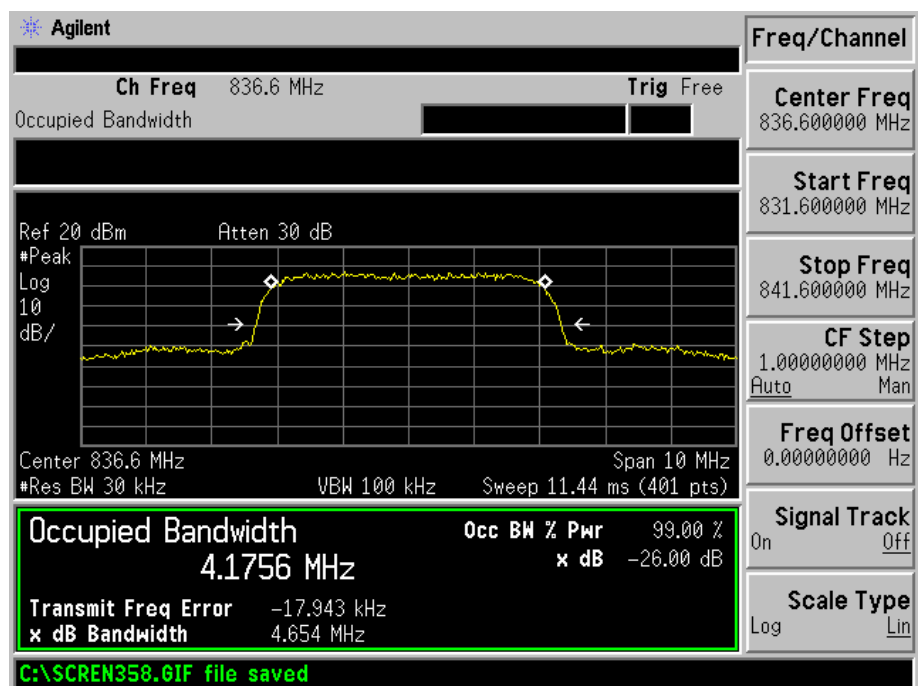


For Band V

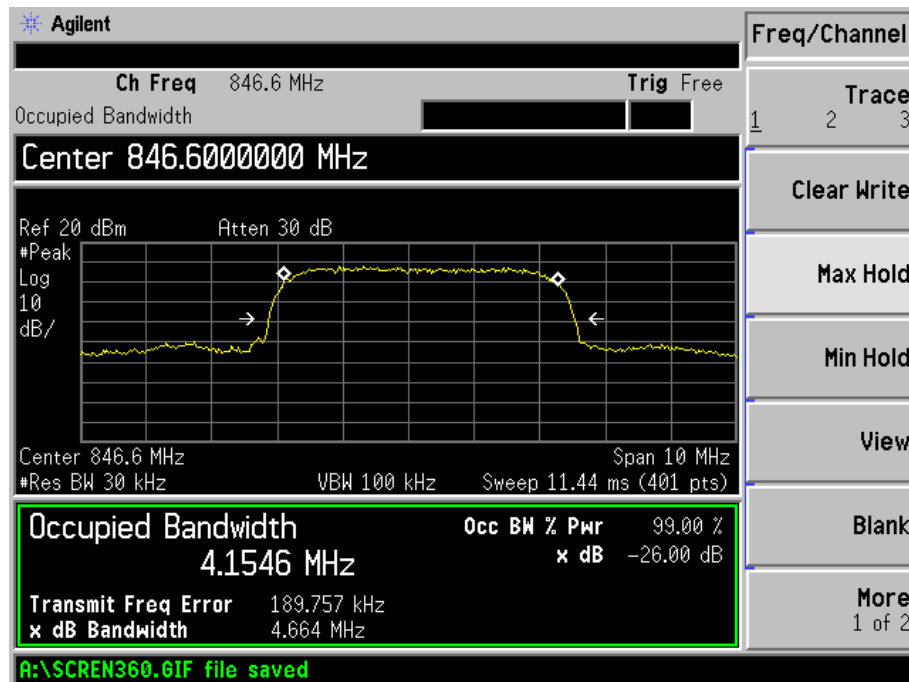
WCDMA Low Channel



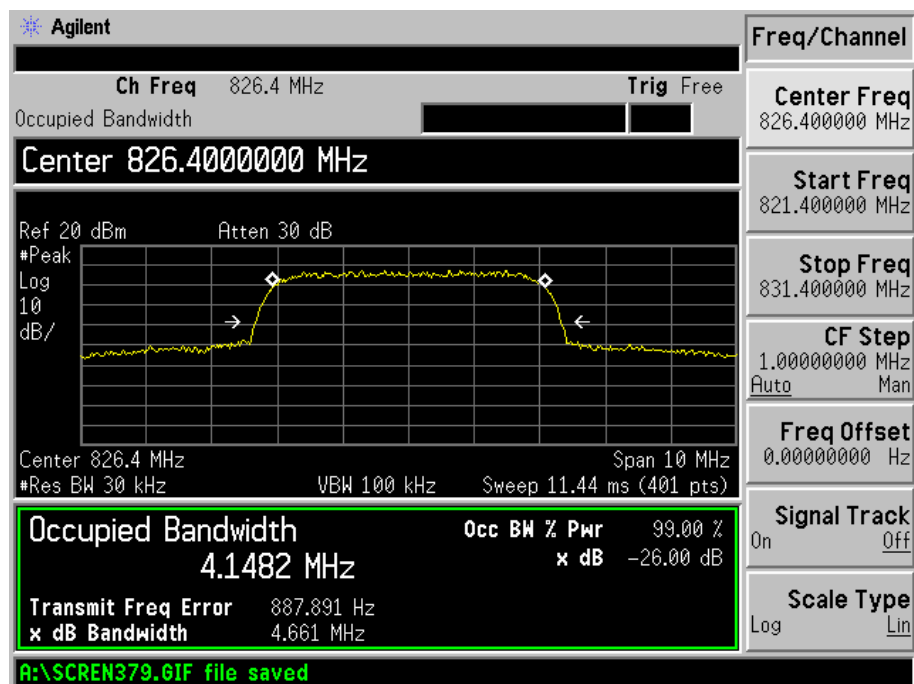
WCDMA Middle Channel



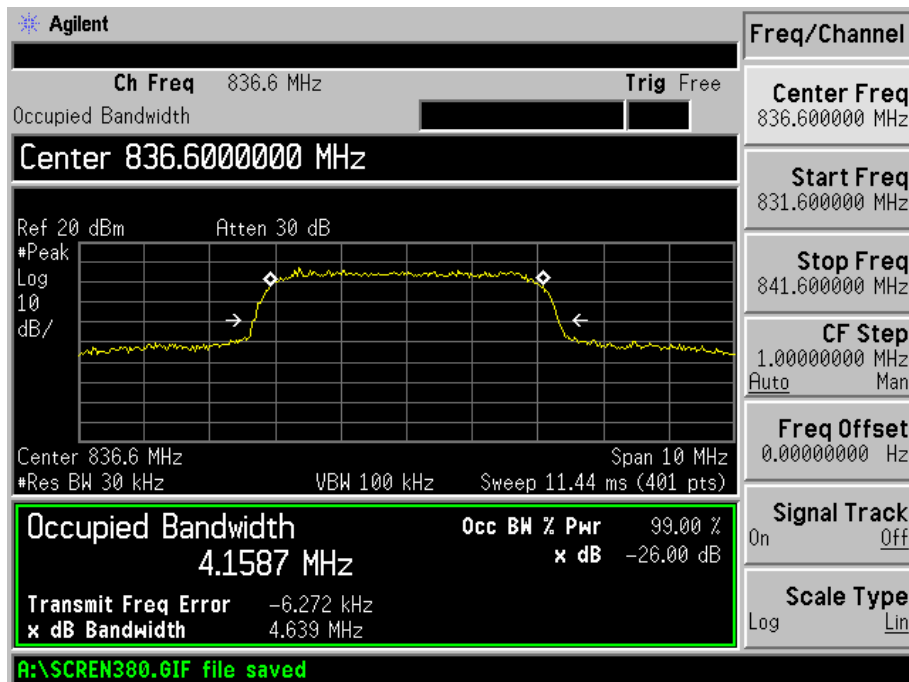
## WCDMA High Channel



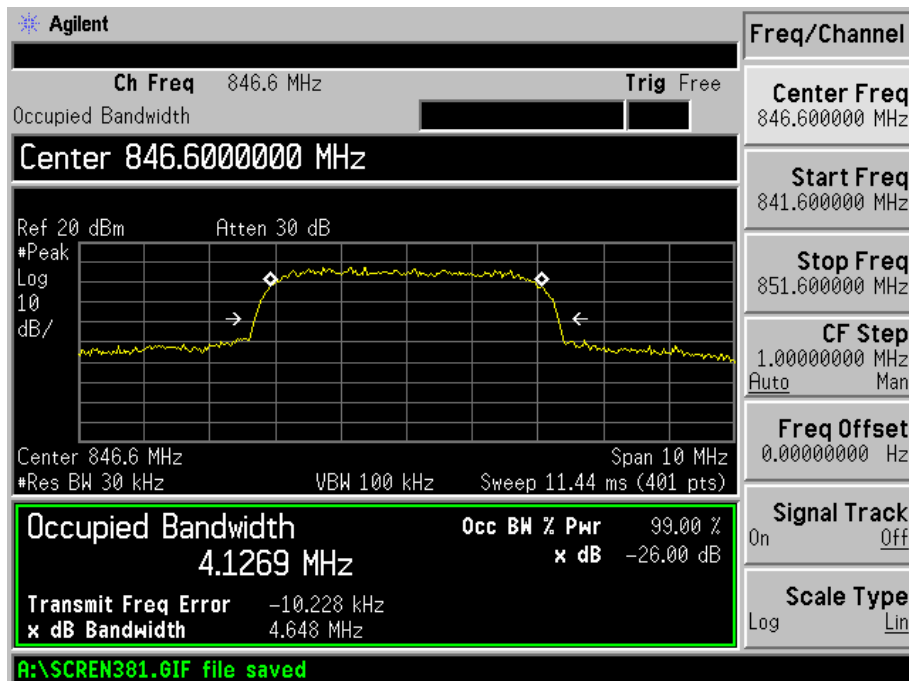
## HSDPA Low Channel



## HSDPA Middle Channel



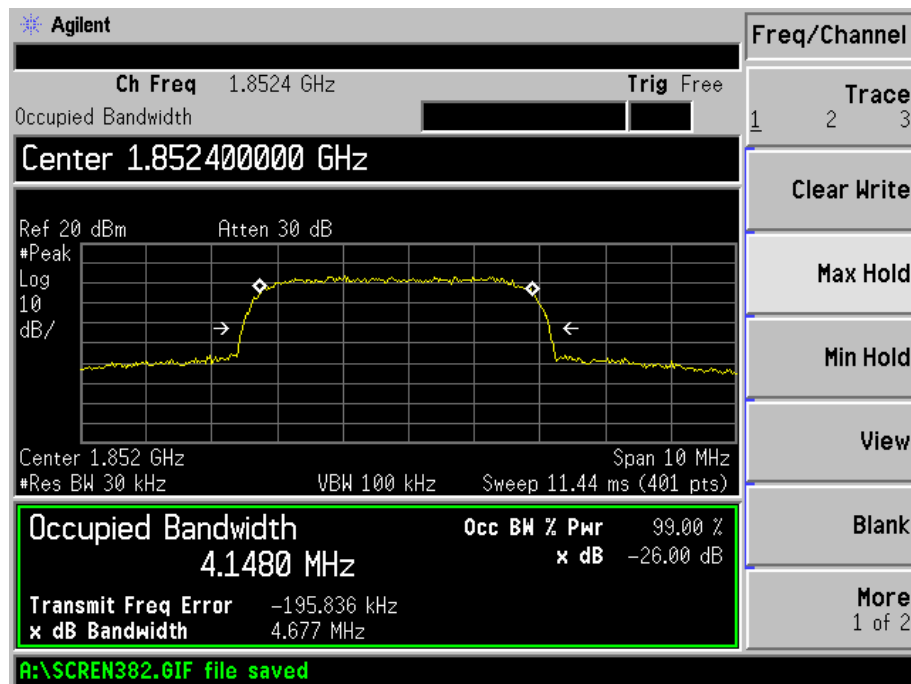
## HSDPA High Channel



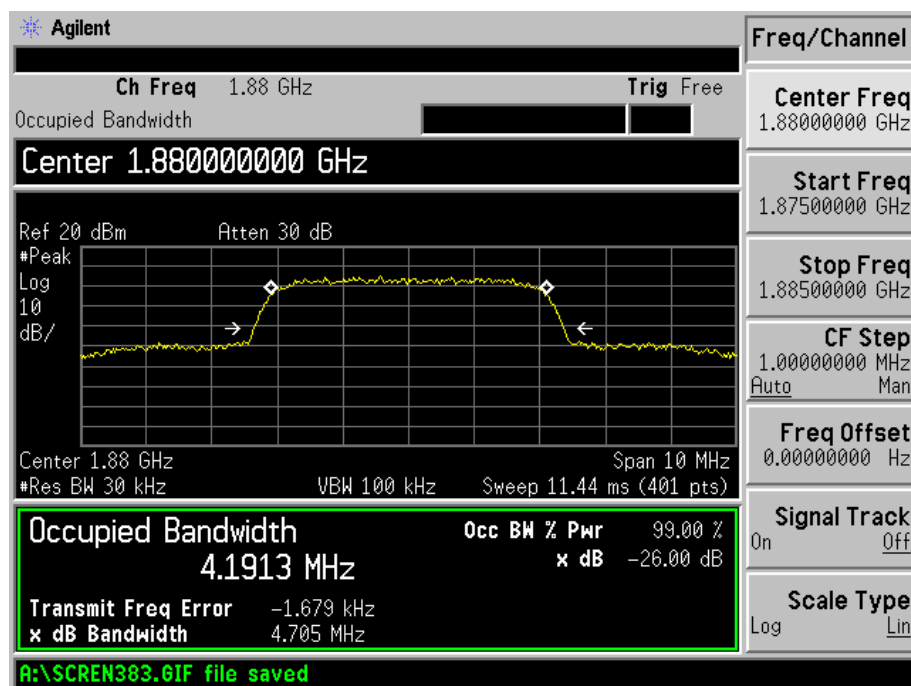


For Band II

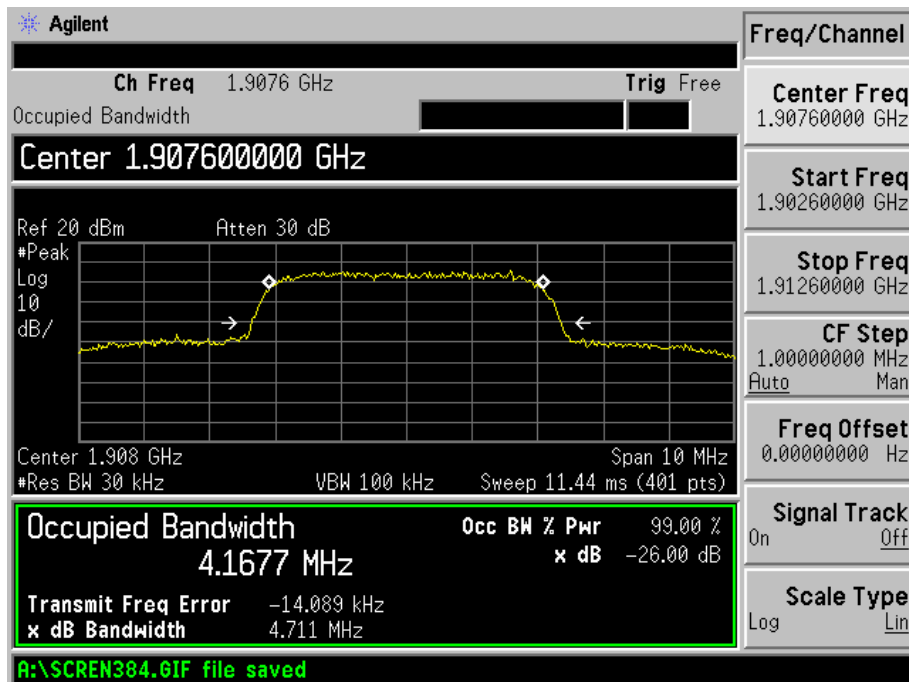
WCDMA Low Channel



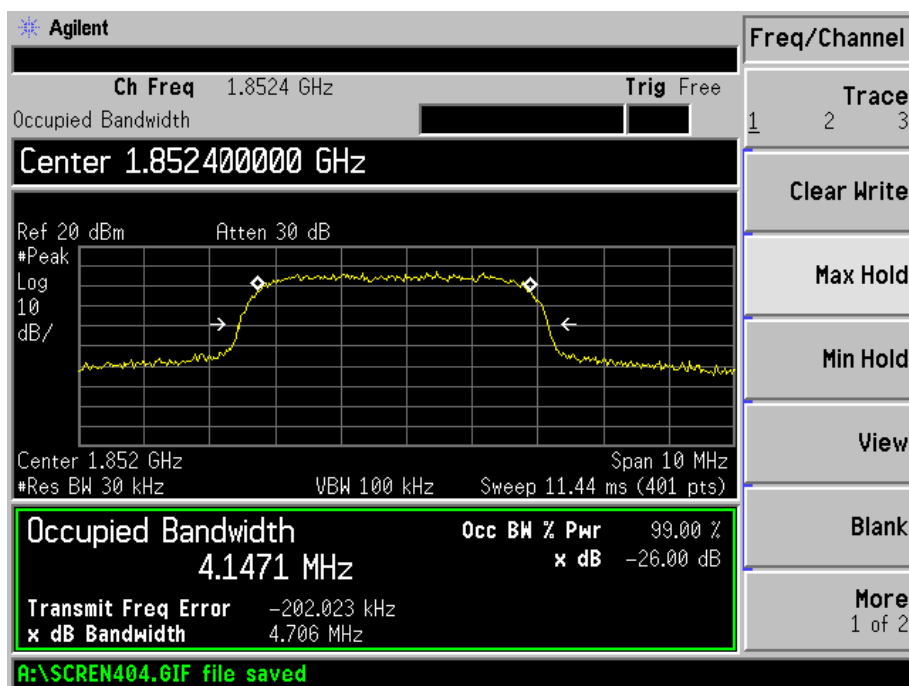
WCDMA Middle Channel



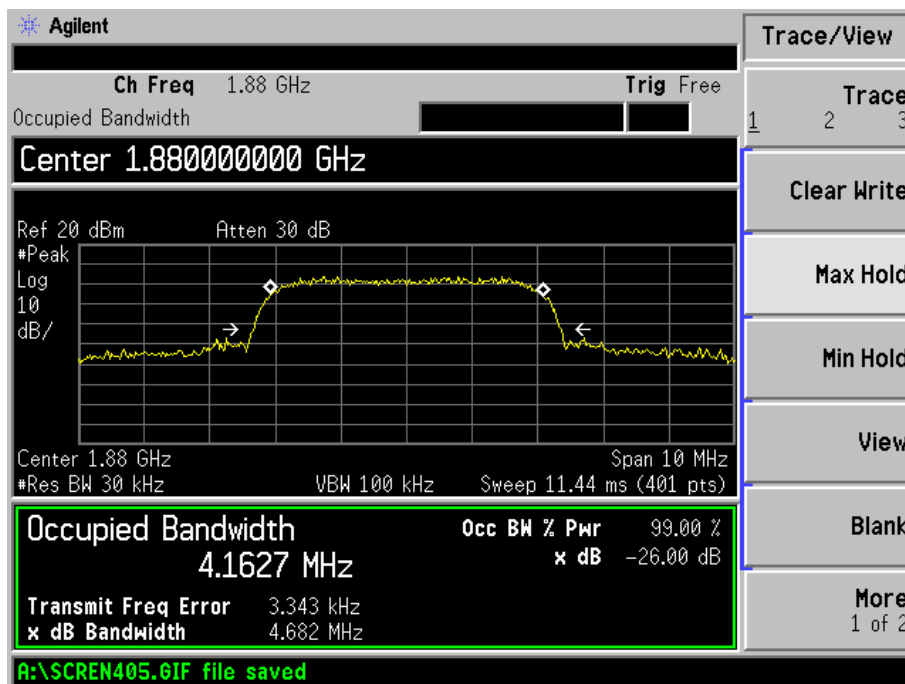
## WCDMA High Channel



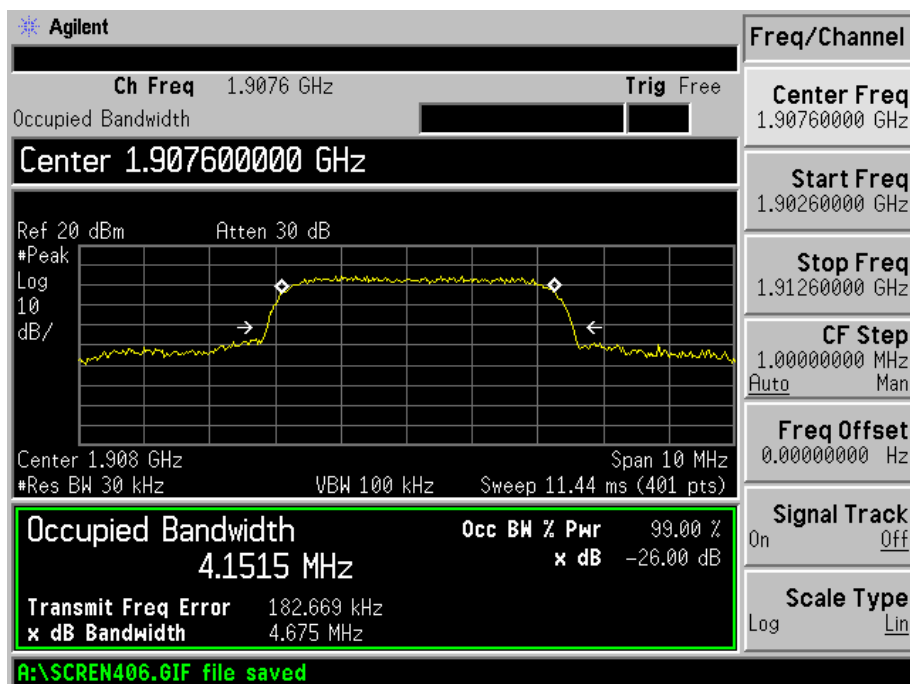
## HSDPA Low Channel



## HSDPA Middle Channel



## HSDPA High Channel



## 7. Out of Band Emissions at Antenna Terminal

### 7.1 Standard Applicable

According to §22.917(a), the power of any emissions 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.

According to §24.238(a), the power of any emissions 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.

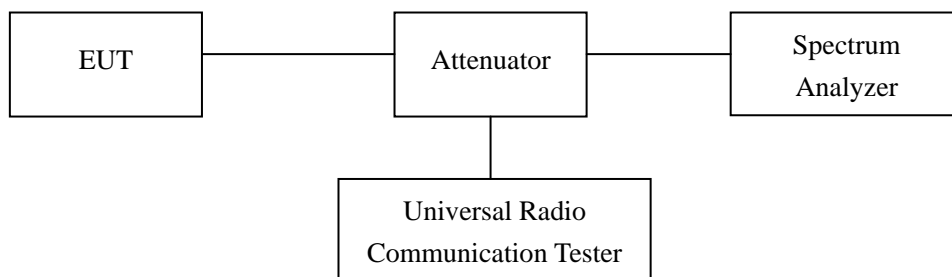
### 7.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B	US41192821	2014-05-28	2015-05-27
Rohde & Schwarz	Spectrum Analyzer	FSP	836079/035	2014-05-28	2015-05-27
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	112012	2014-05-28	2015-05-27

### 7.3 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10<sup>th</sup> harmonic.

Test Configuration for the out of band emissions testing:



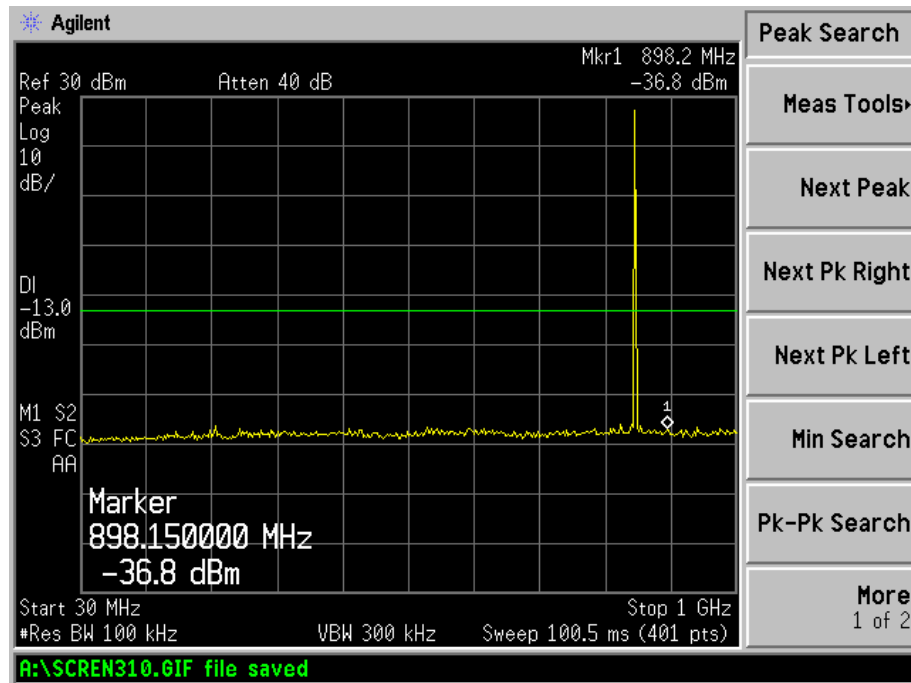
### 7.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

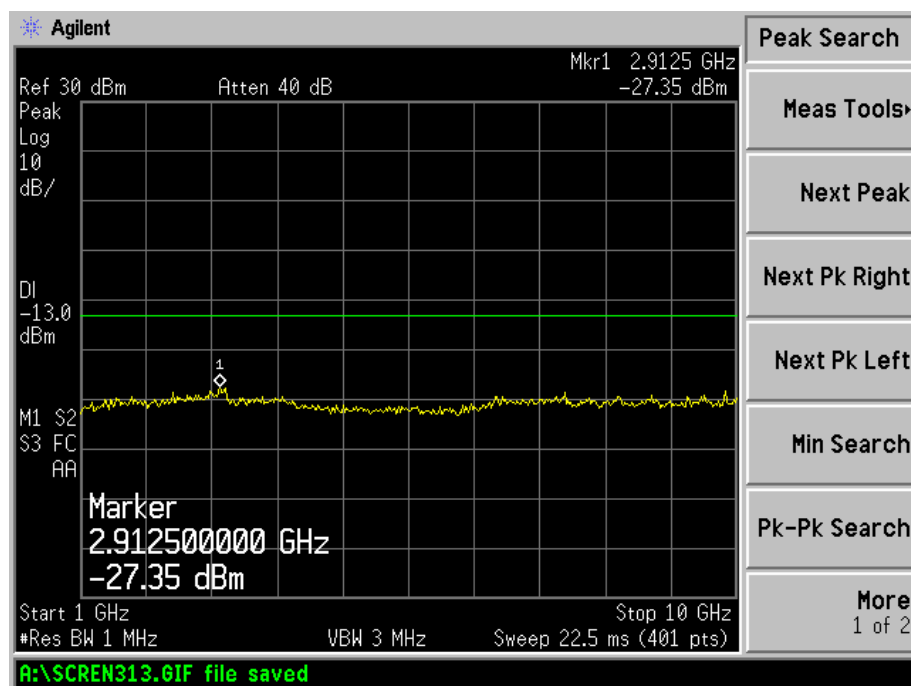
## 7.5 Summary of Test Results/Plots

Please refer to the following test plots For Cellular Band

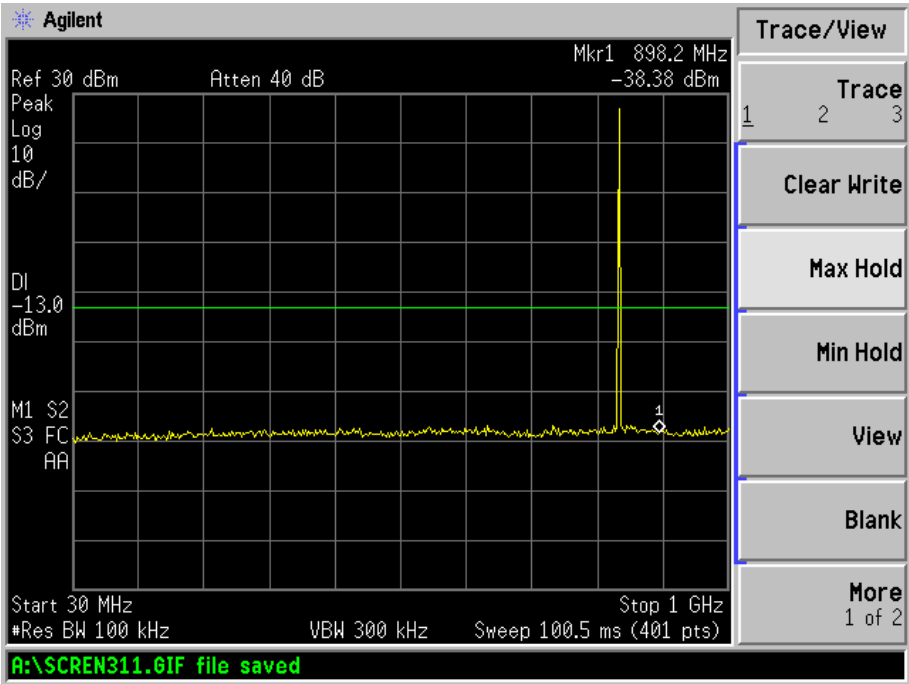
GSM Low Channel 30MHz to 1GHz



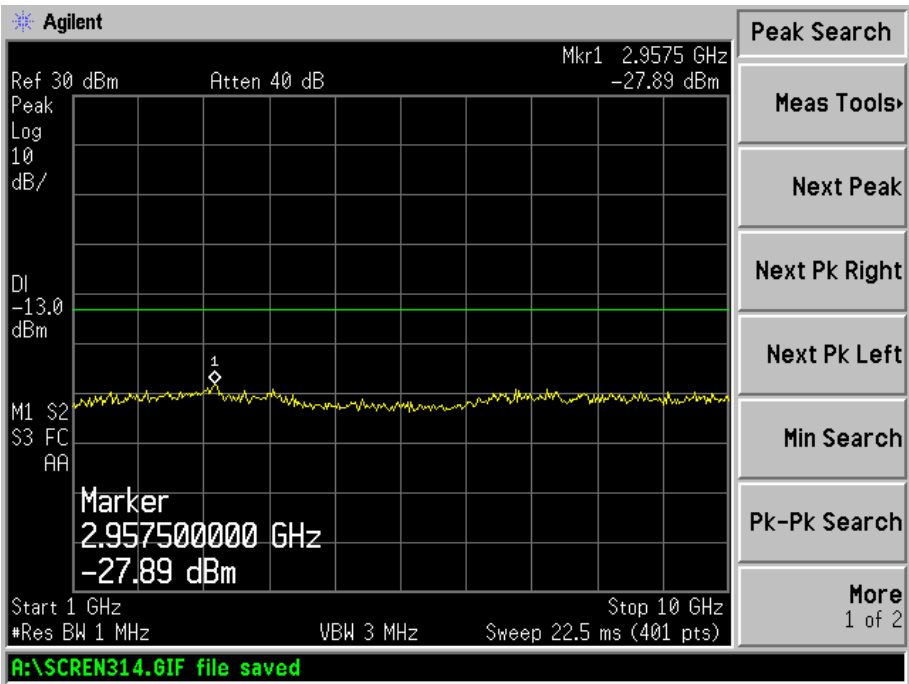
Above 1GHz



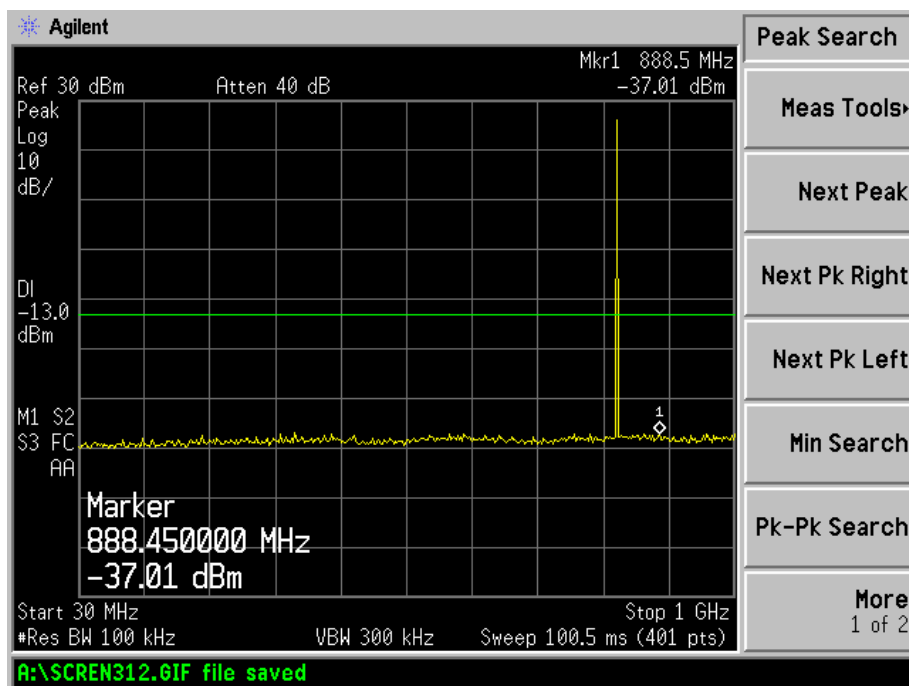
GSM Middle Channel  
30MHz to 1GHz



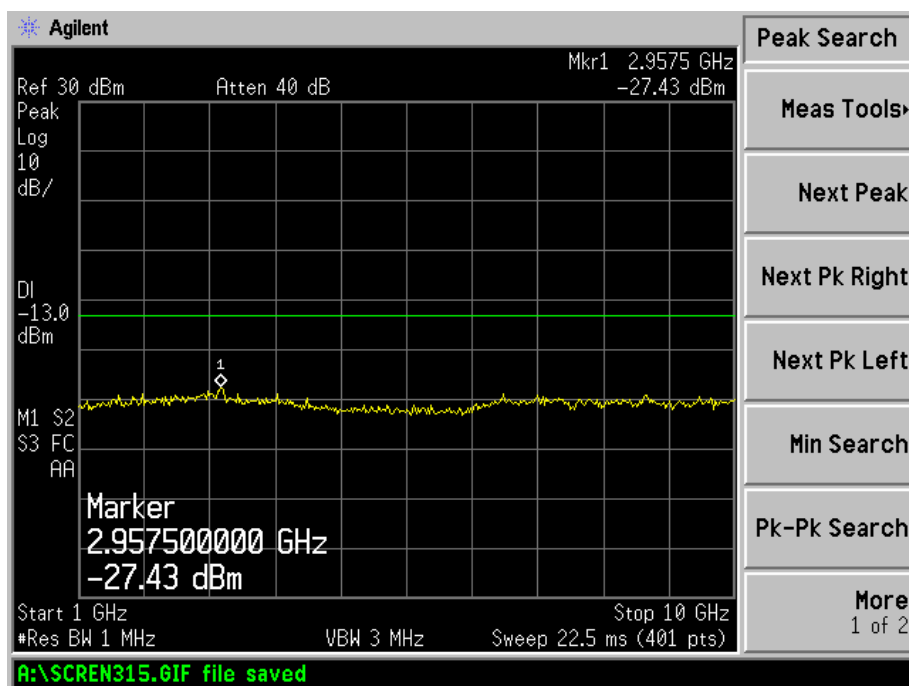
Above 1GHz



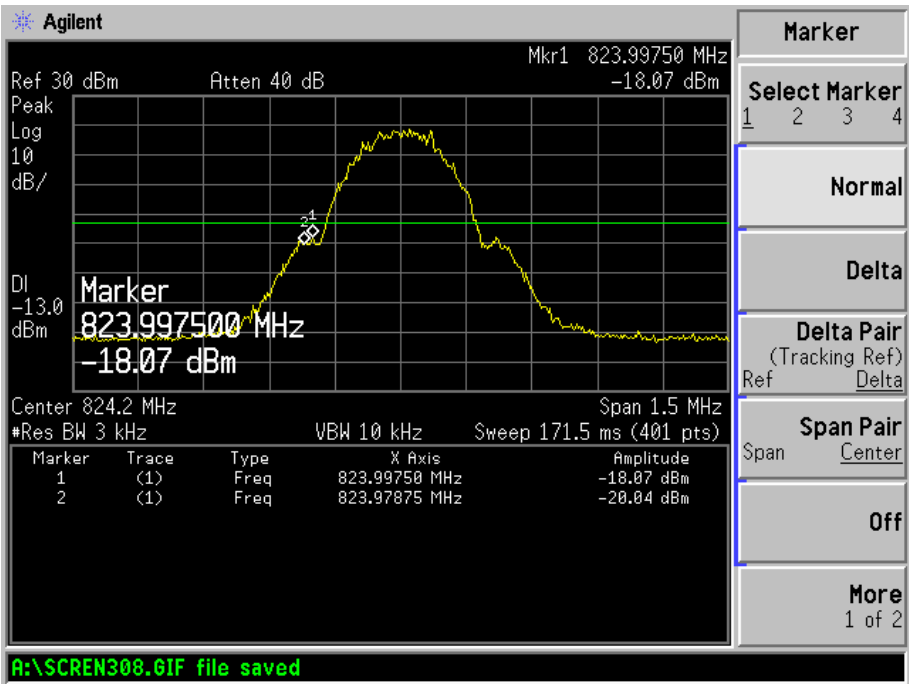
GSM High Channel  
30MHz to 1GHz



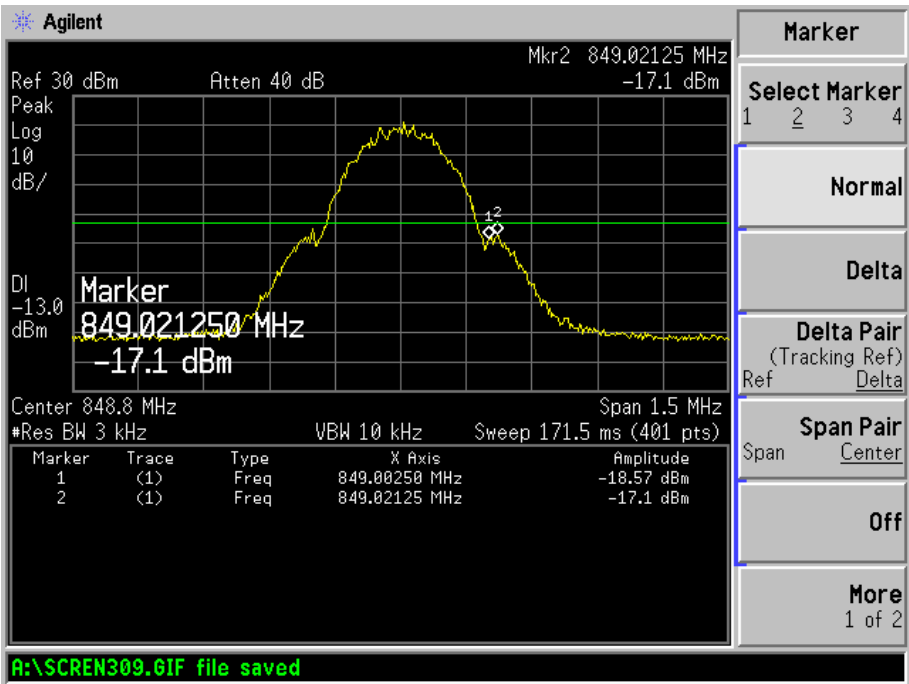
Above 1GHz



GSM Low Band Emission

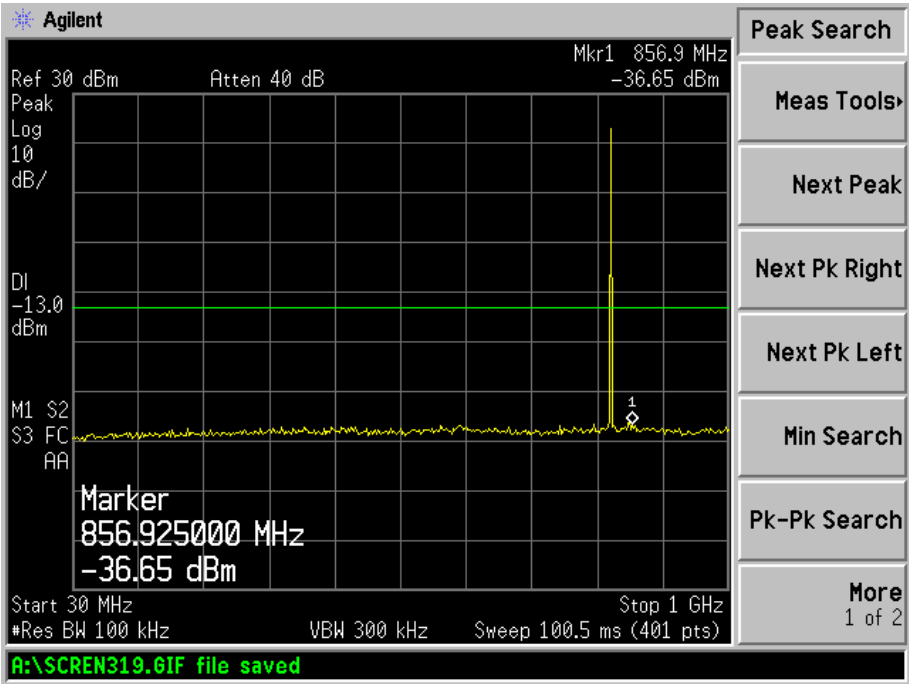


GSM High Band Emission

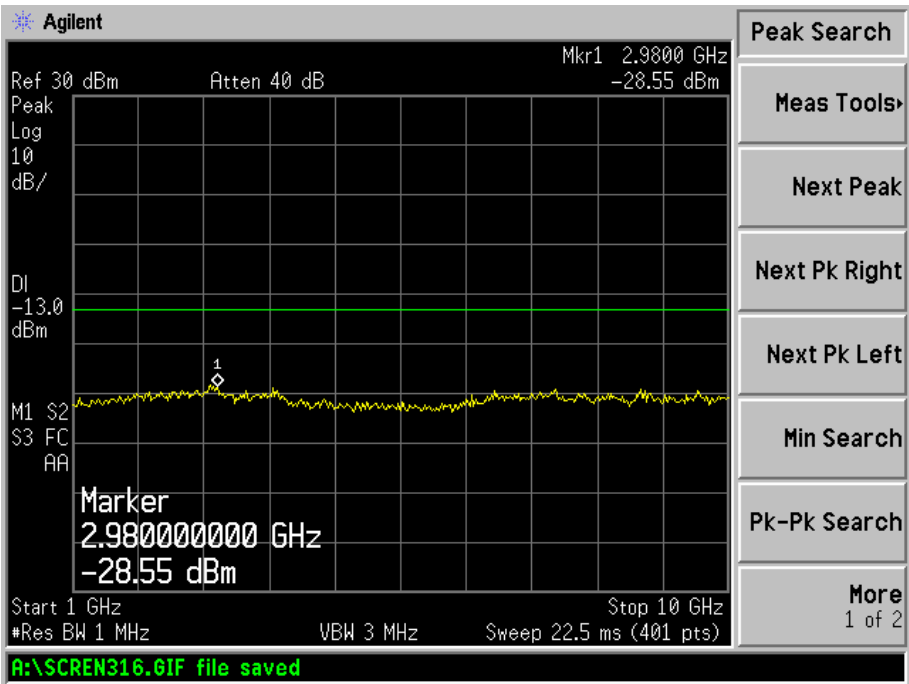




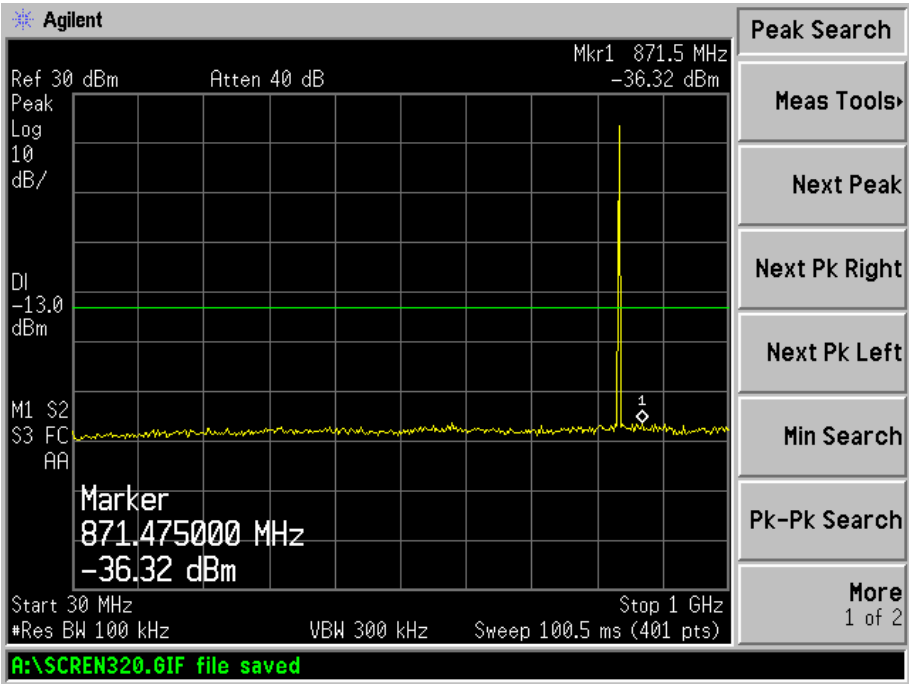
GPRS Low Channel  
30MHz to 1GHz



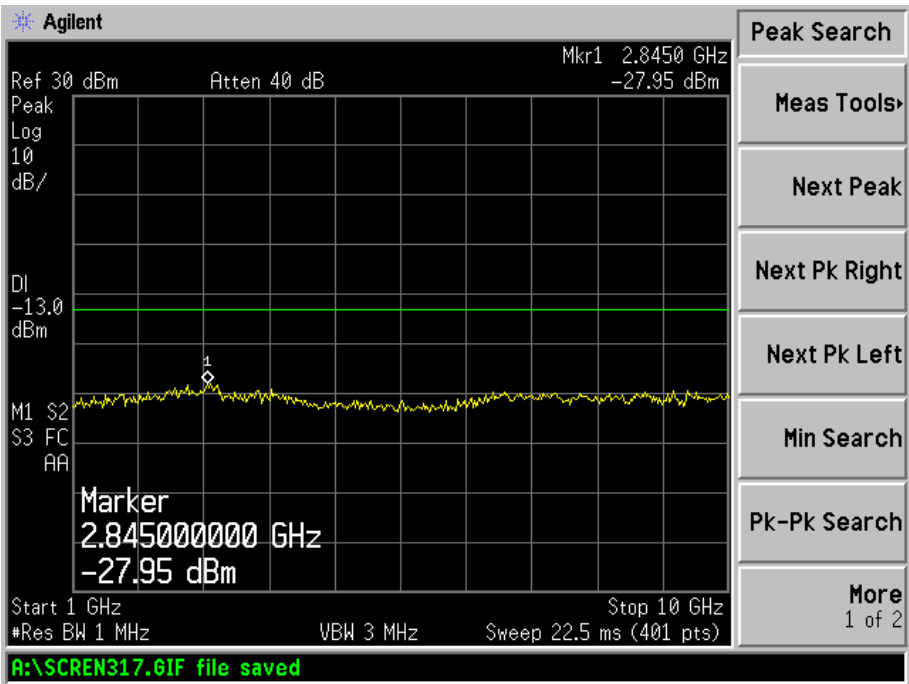
Above 1GHz



GPRS Middle Channel  
30MHz to 1GHz

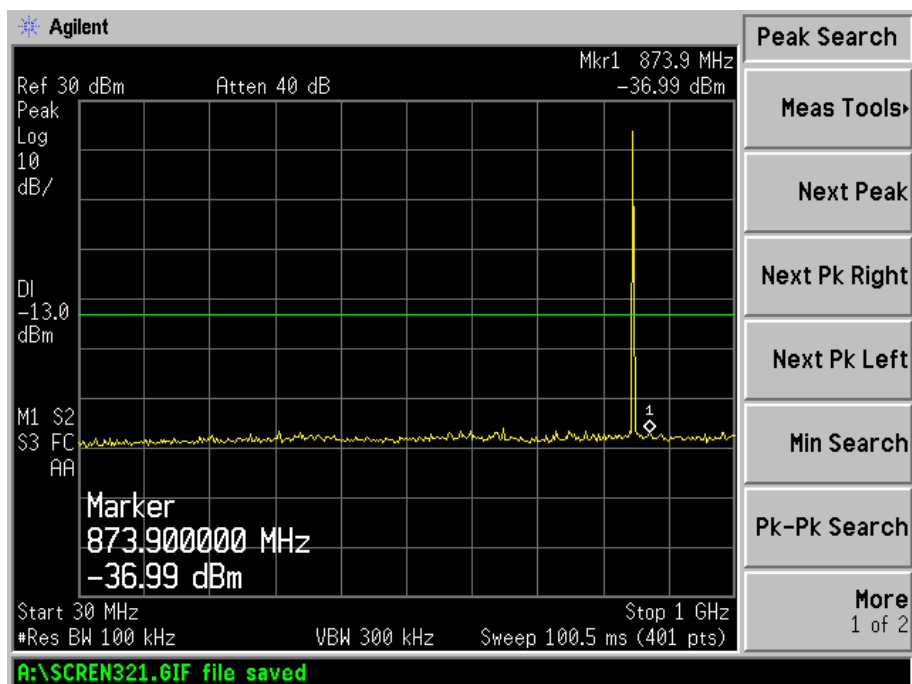


Above 1GHz

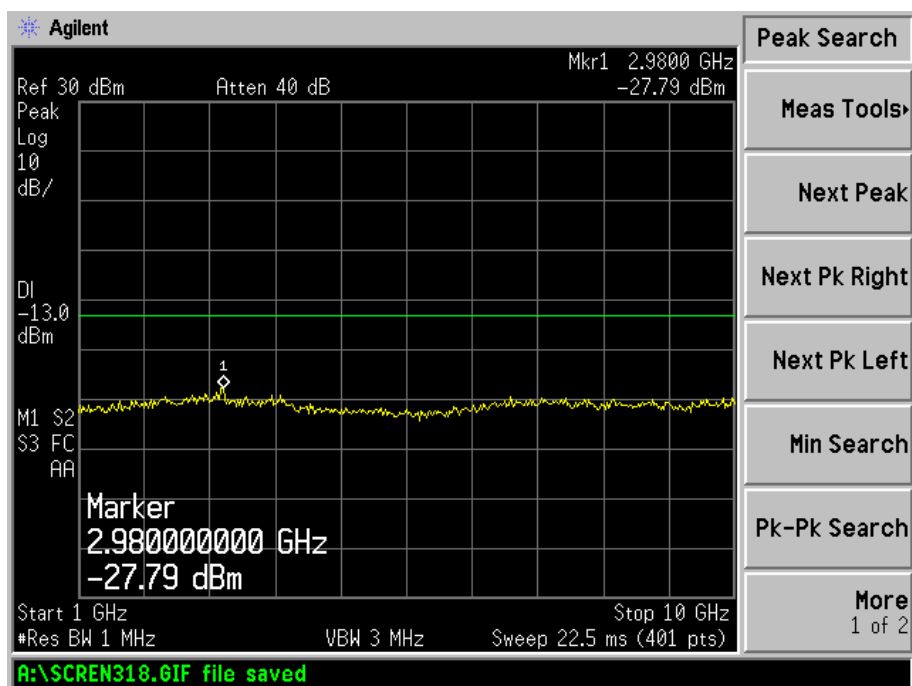


## GPRS High Channel

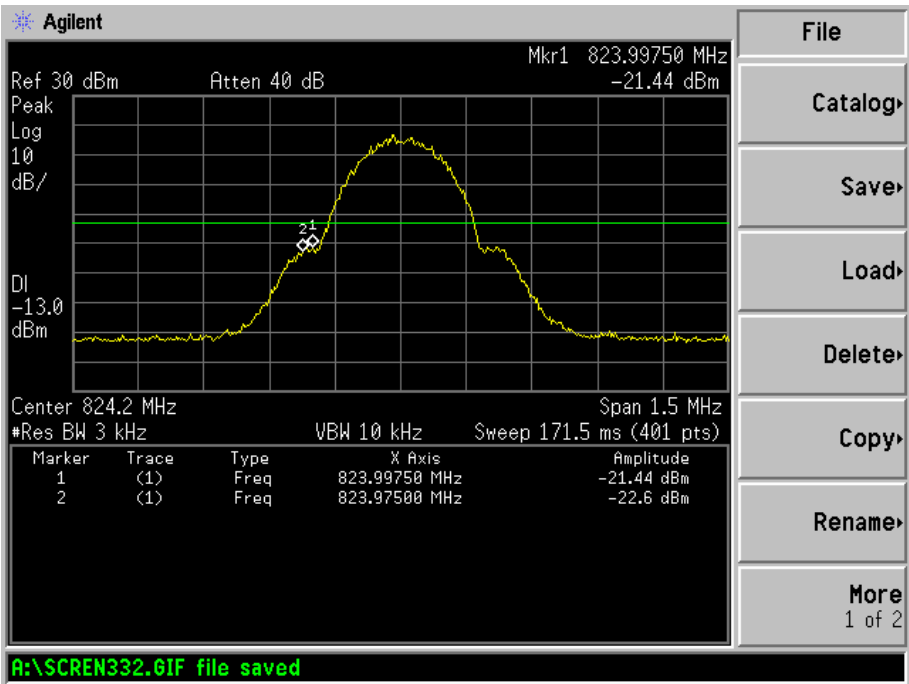
30MHz to 1GHz



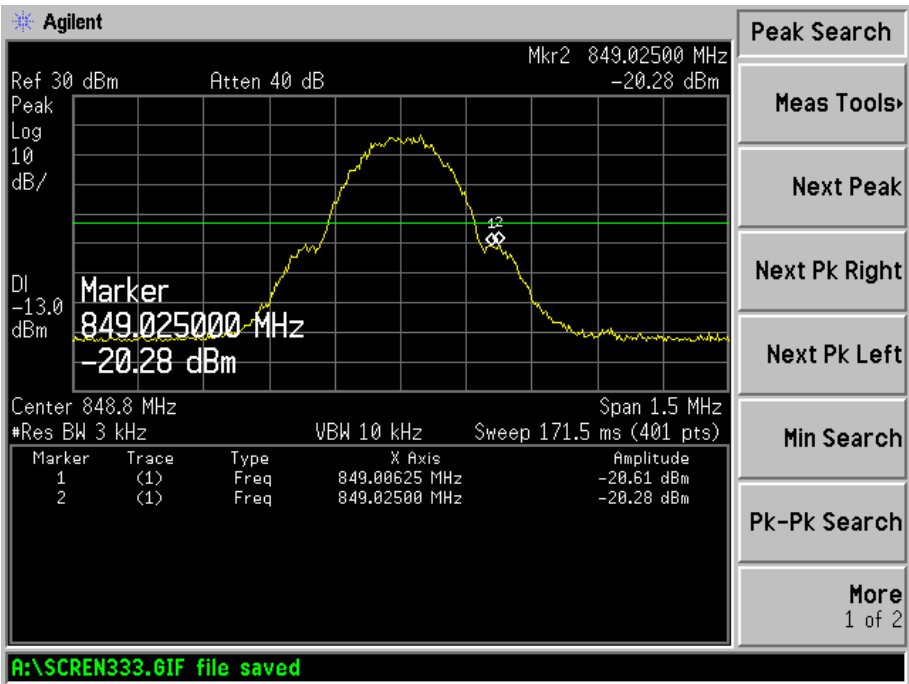
## Above 1GHz



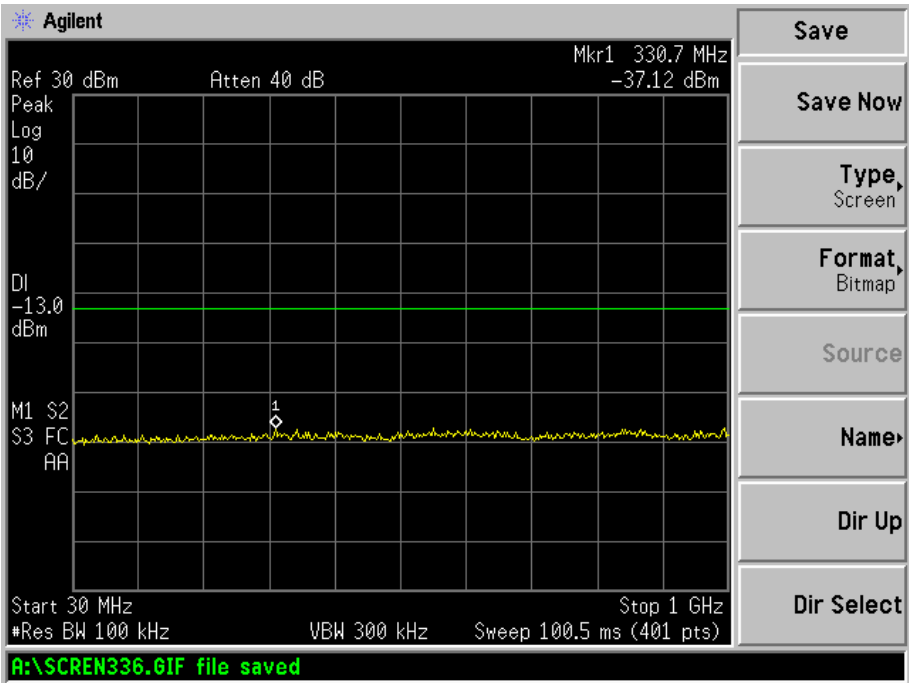
GPRS Low Band Emission



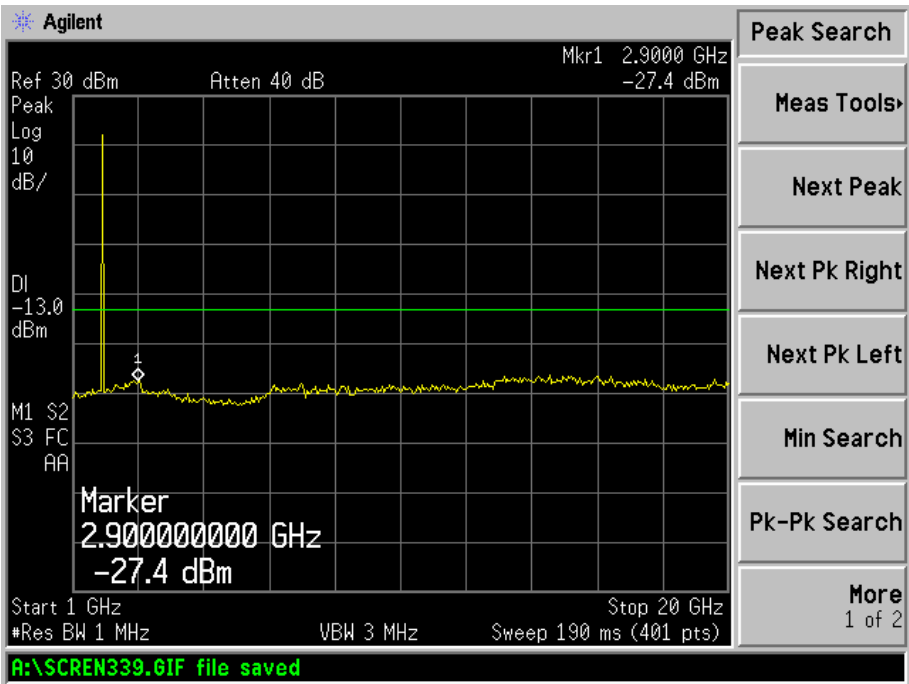
GPRS High Band Emission



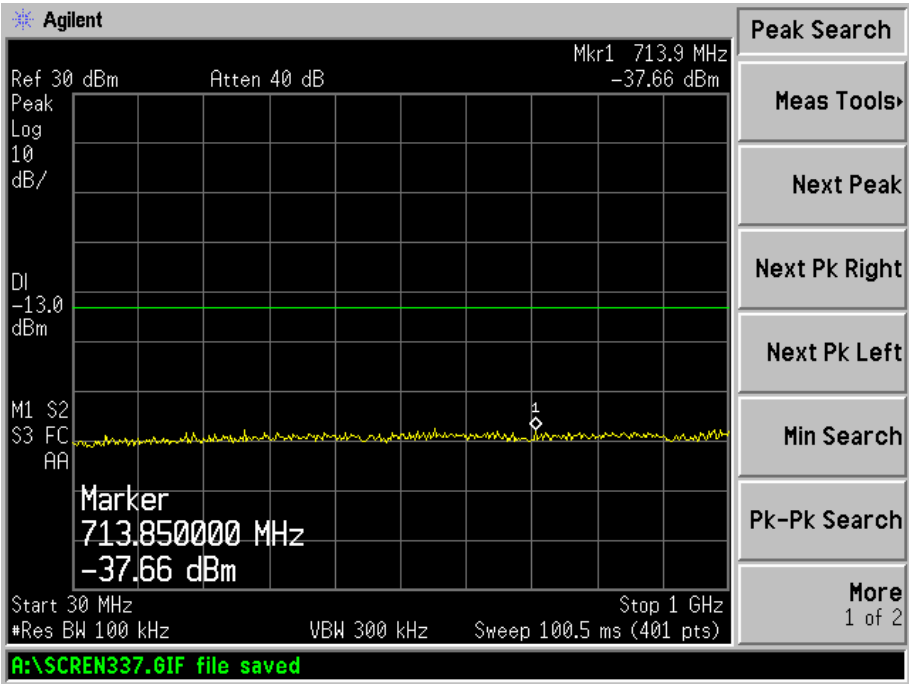
For PCS Band  
GSM Low Channel  
30MHz to 1GHz



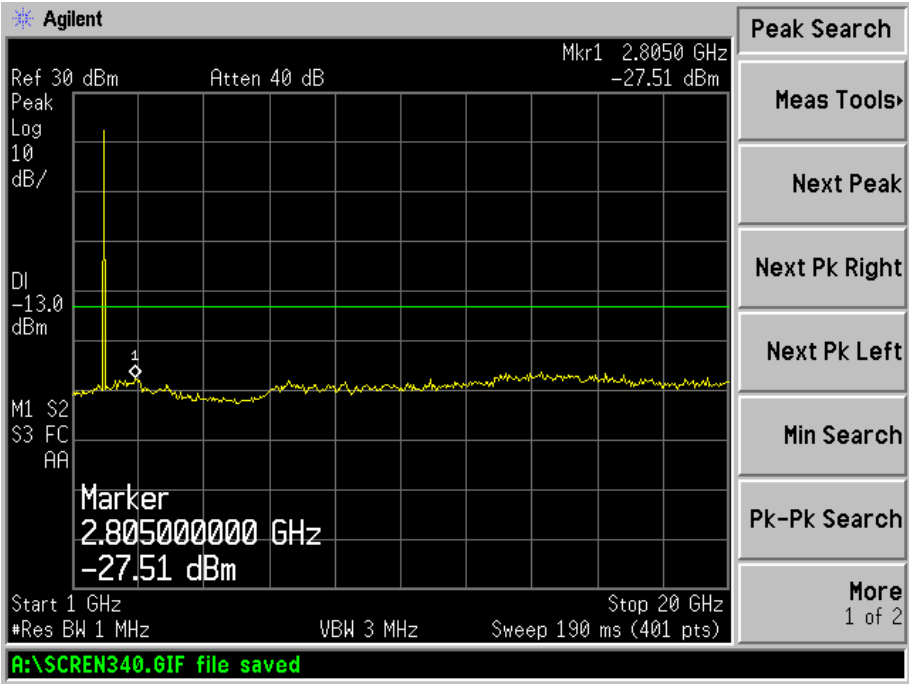
Above 1GHz



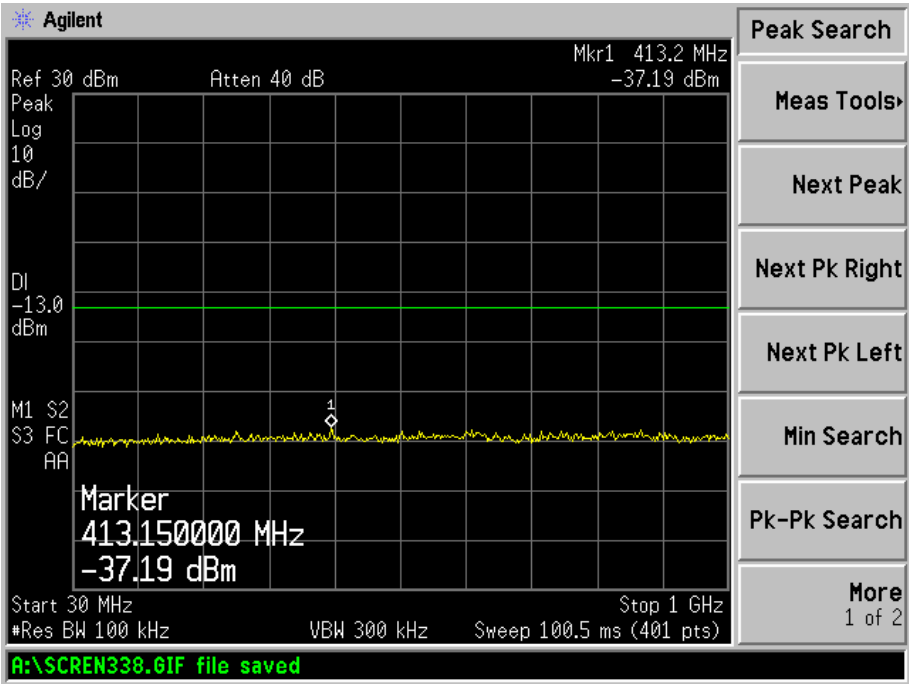
GSM Middle Channel  
30MHz to 1GHz



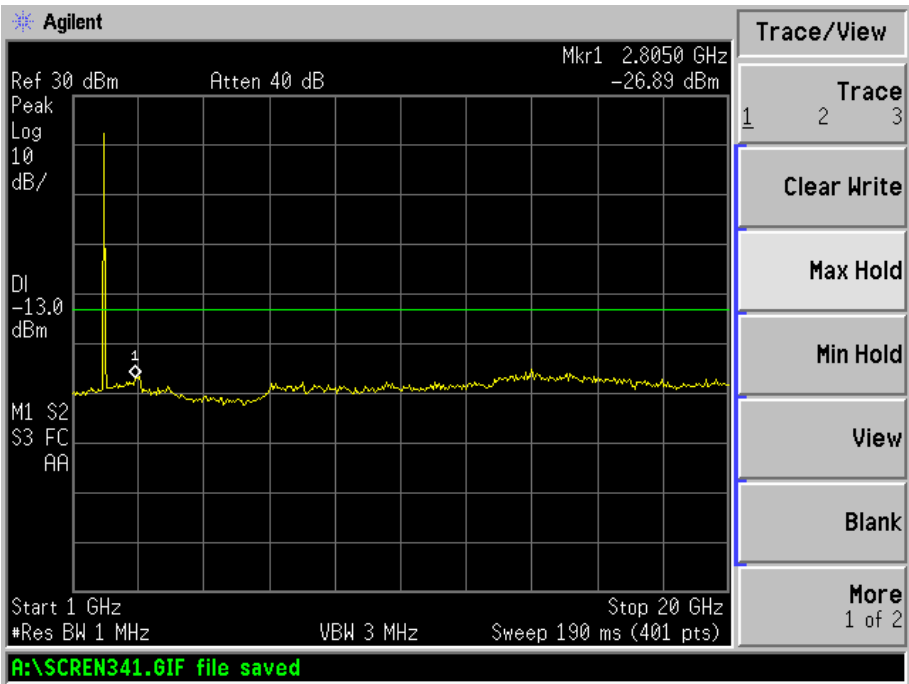
Above 1GHz



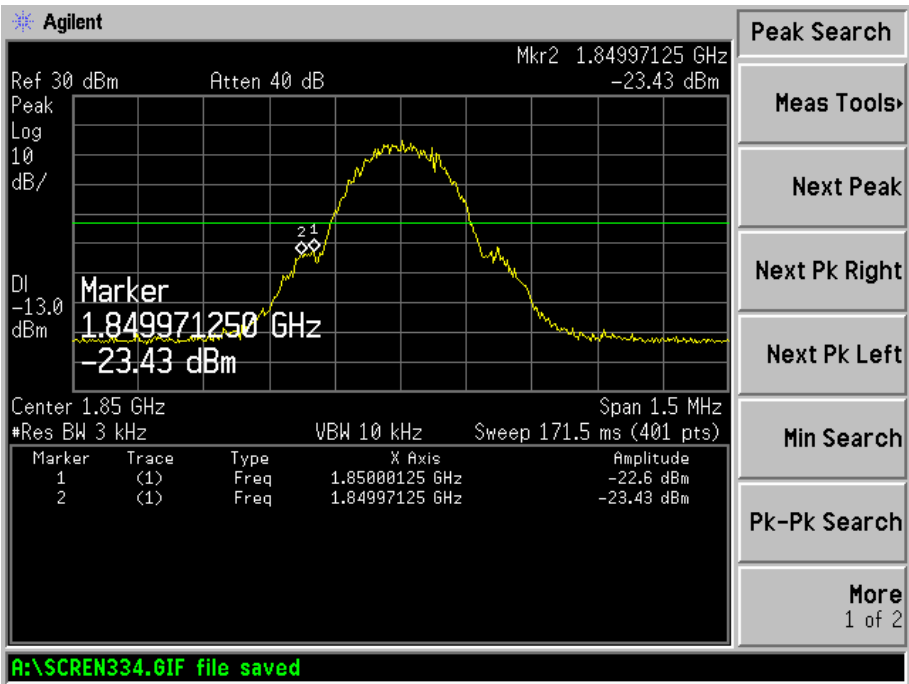
GSM High Channel  
30MHz to 1GHz



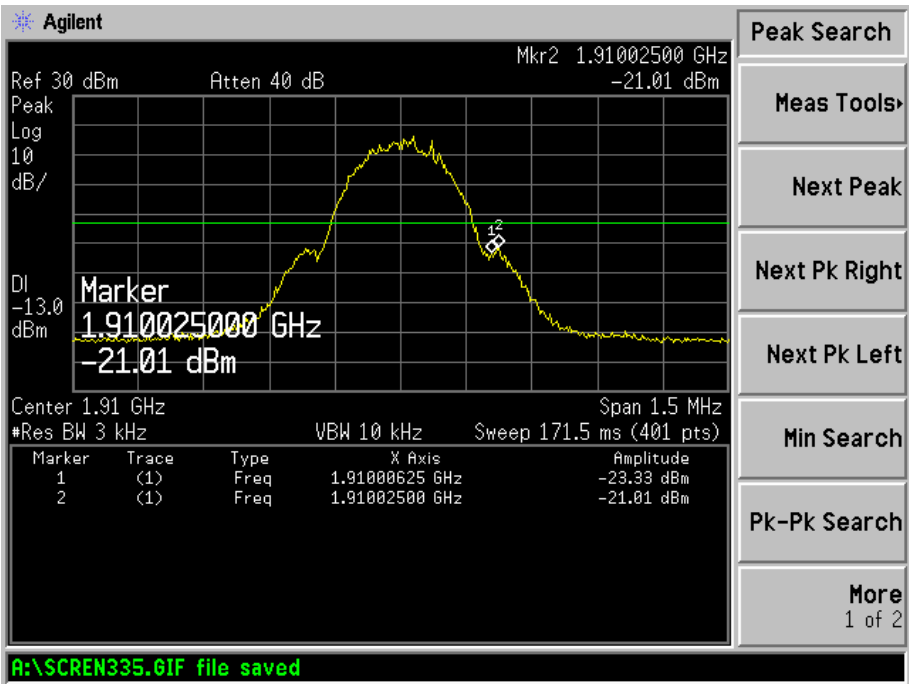
Above 1GHz



GSM Low Band Emission

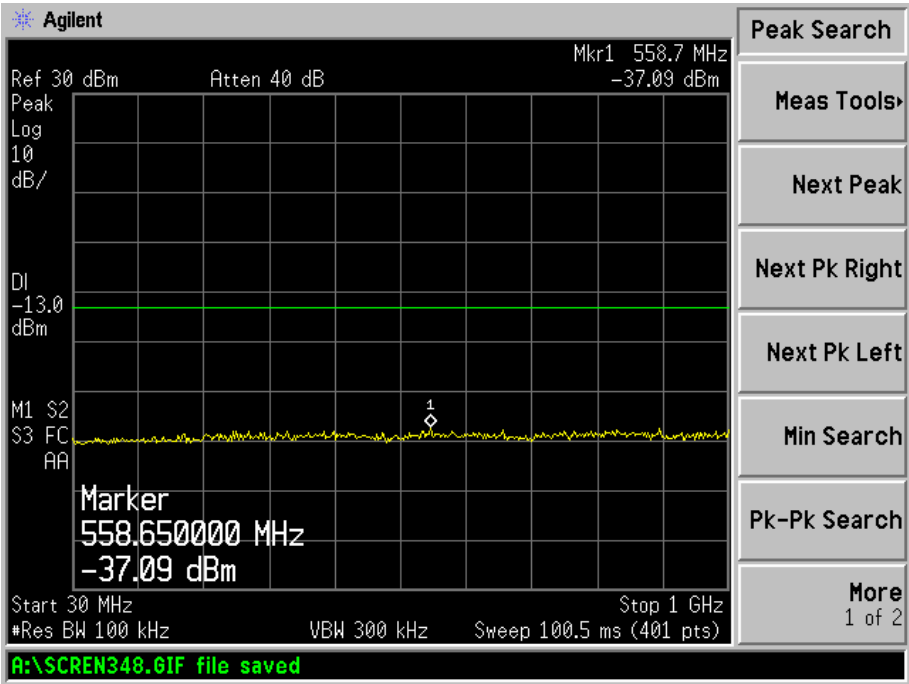


GSM High Band Emission

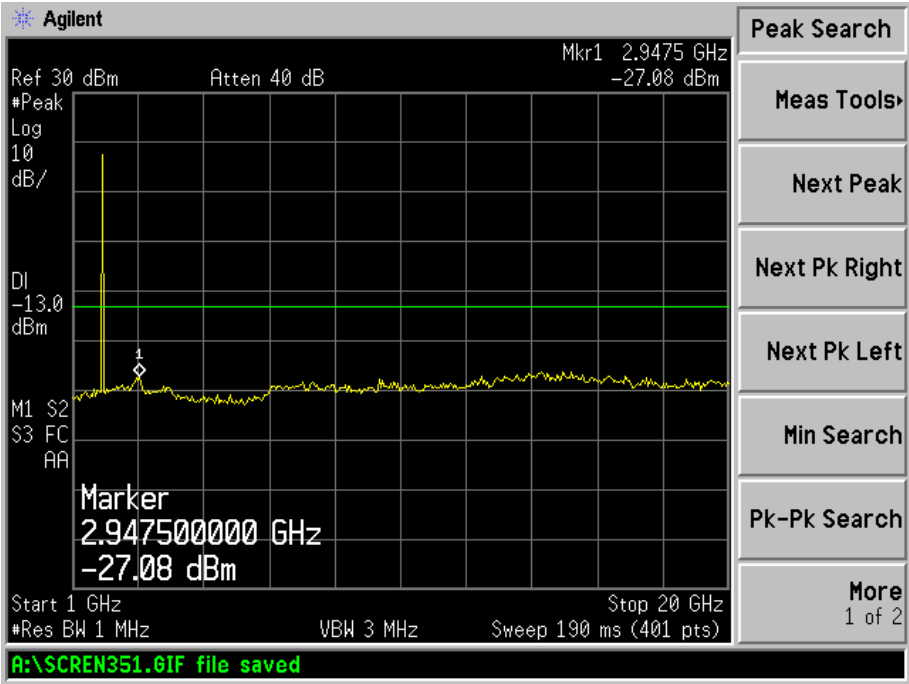




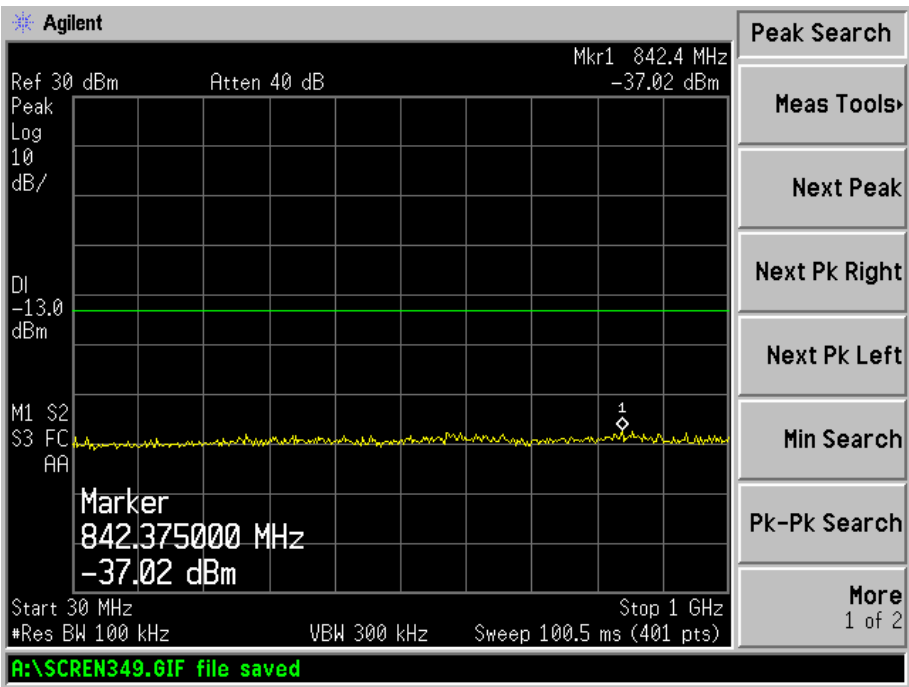
GPRS Low Channel  
30MHz to 1GHz



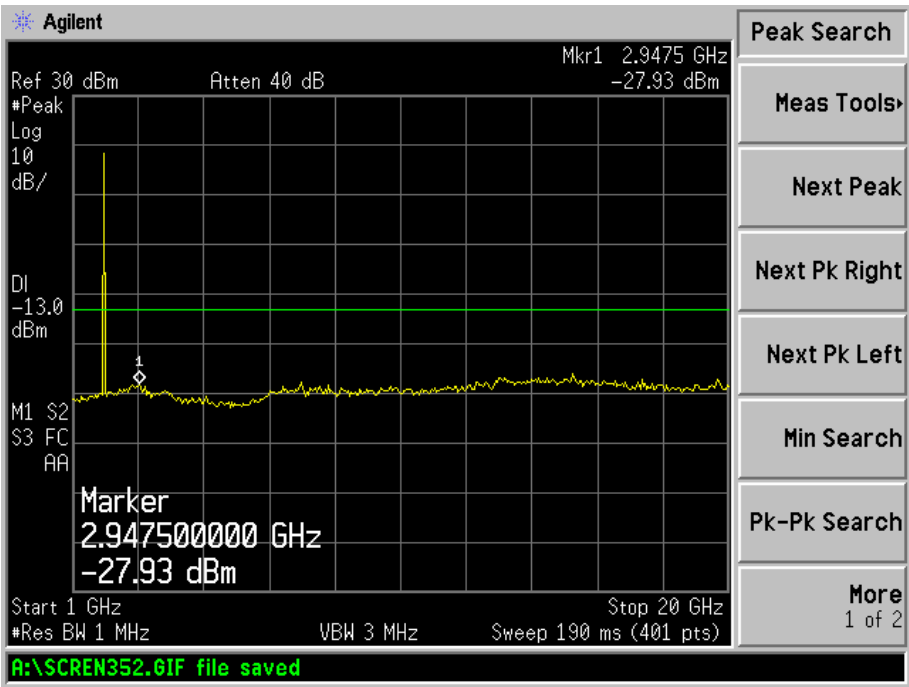
Above 1GHz



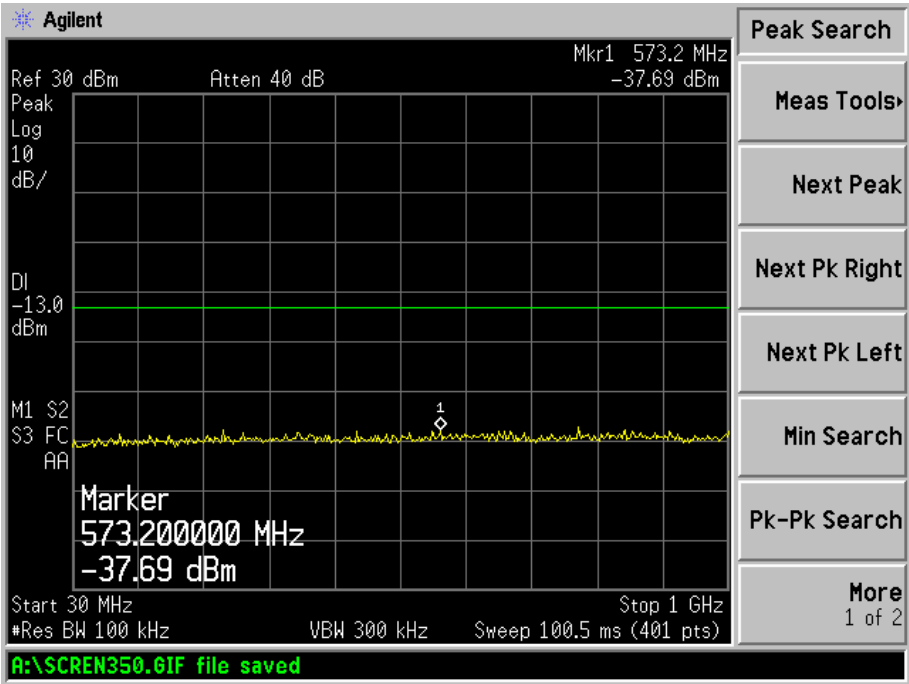
GPRS Middle Channel  
30MHz to 1GHz



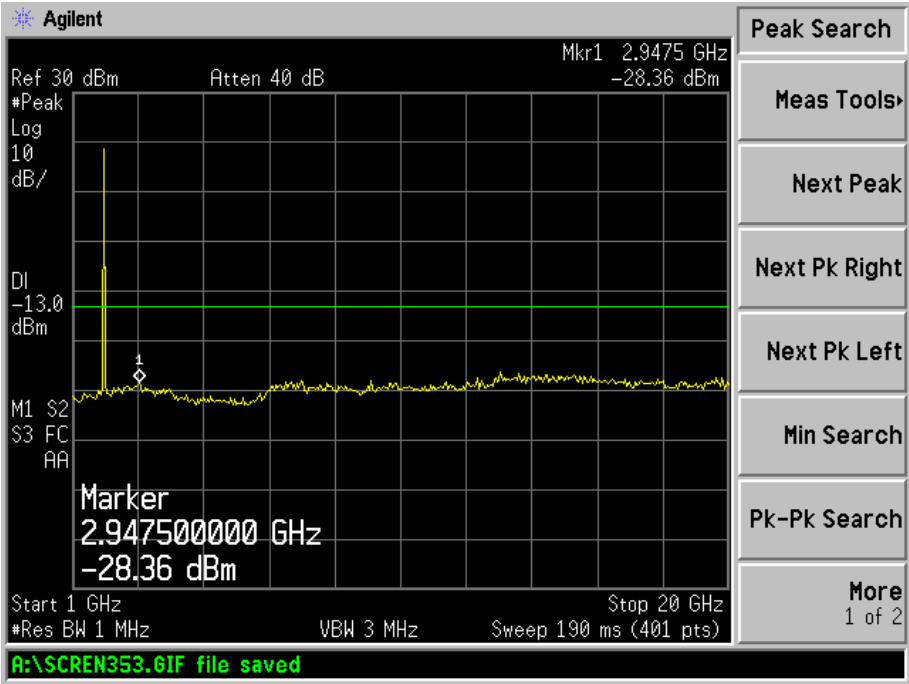
Above 1GHz



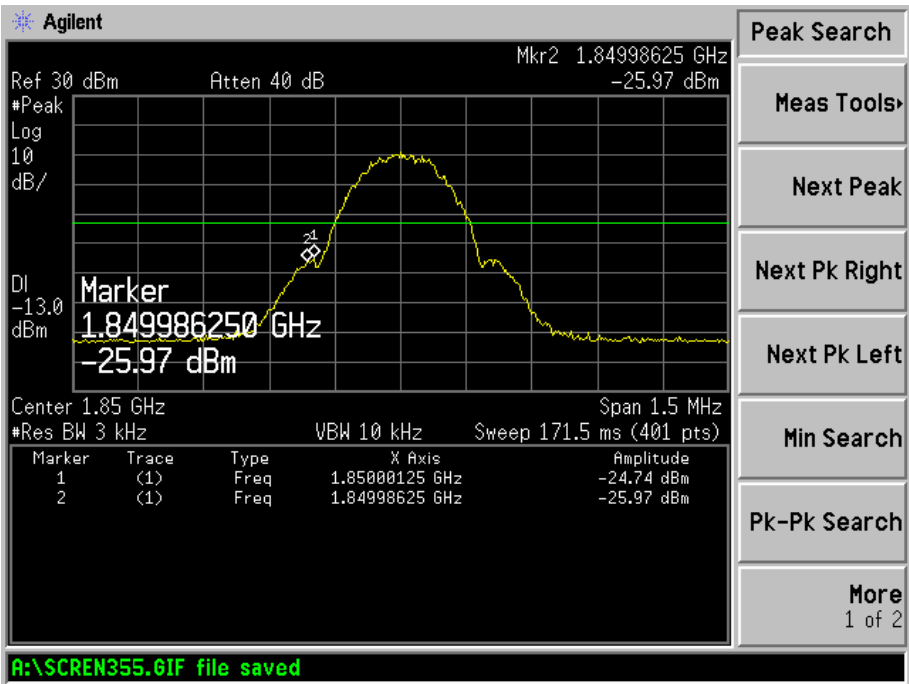
GPRS High Channel  
30MHz to 1GHz



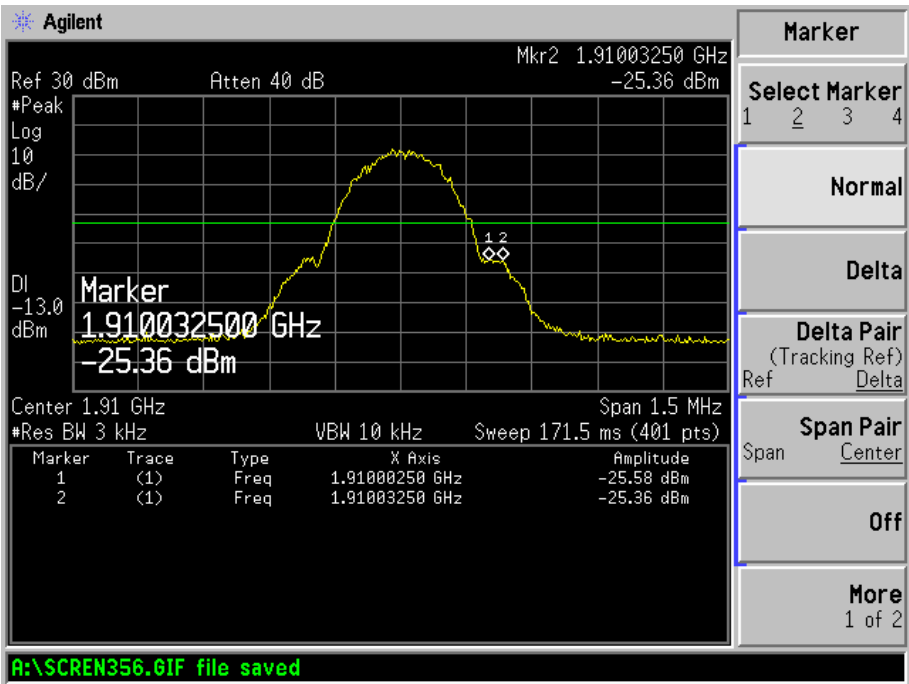
Above 1GHz



GPRS Low Band Emission



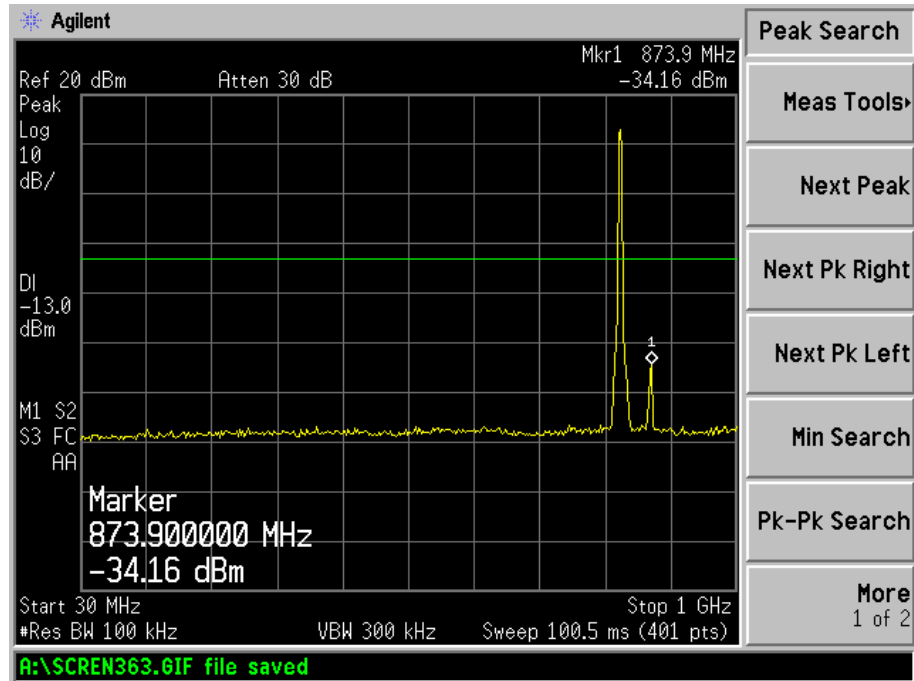
GPRS High Band Emission



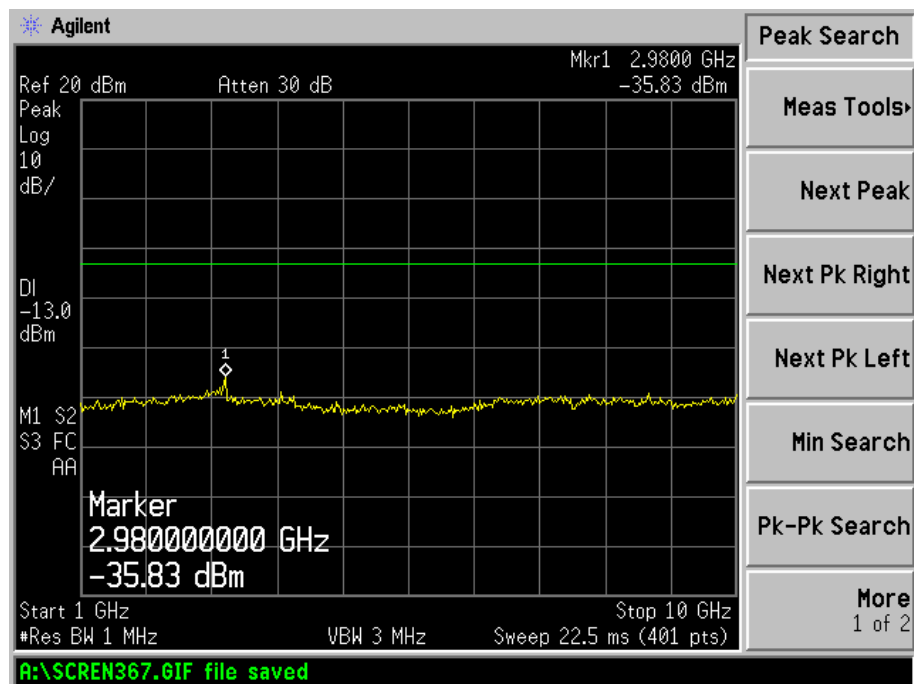
**For Band V**

WCDMA Low Channel

30MHz to 1GHz

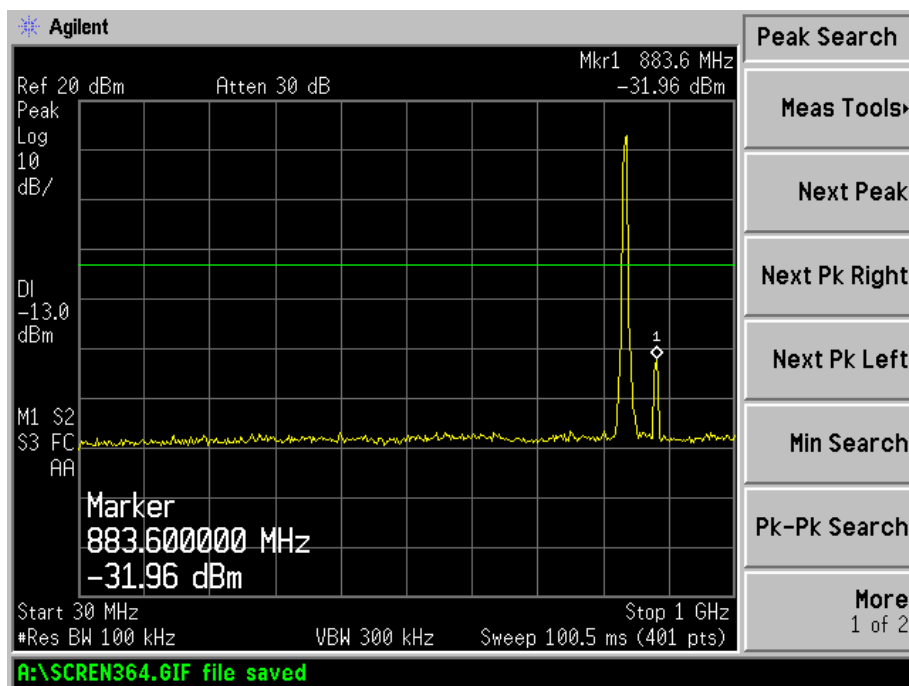


Above 1GHz

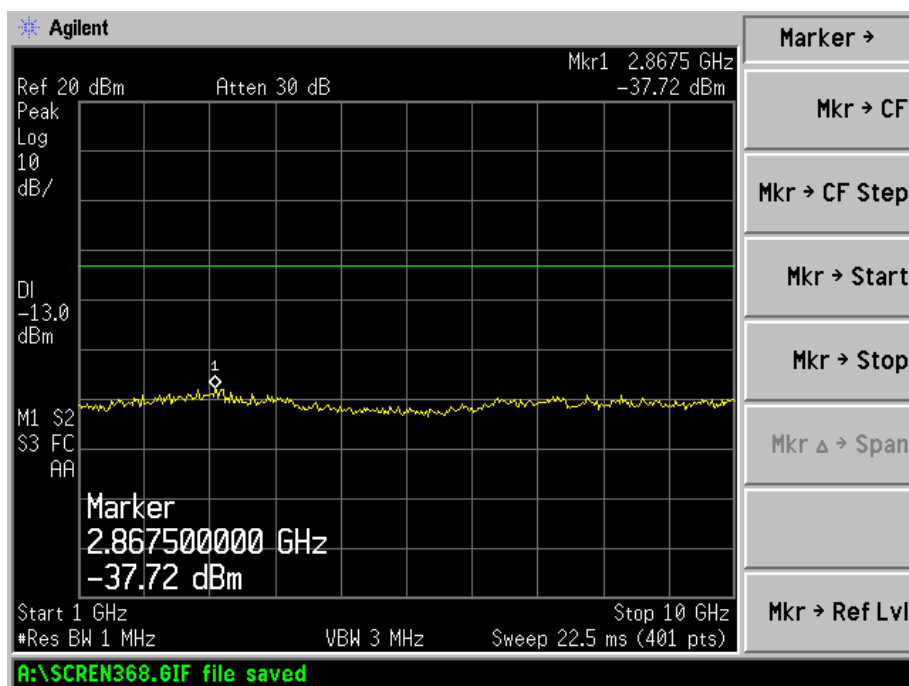


## WCDMA Middle Channel

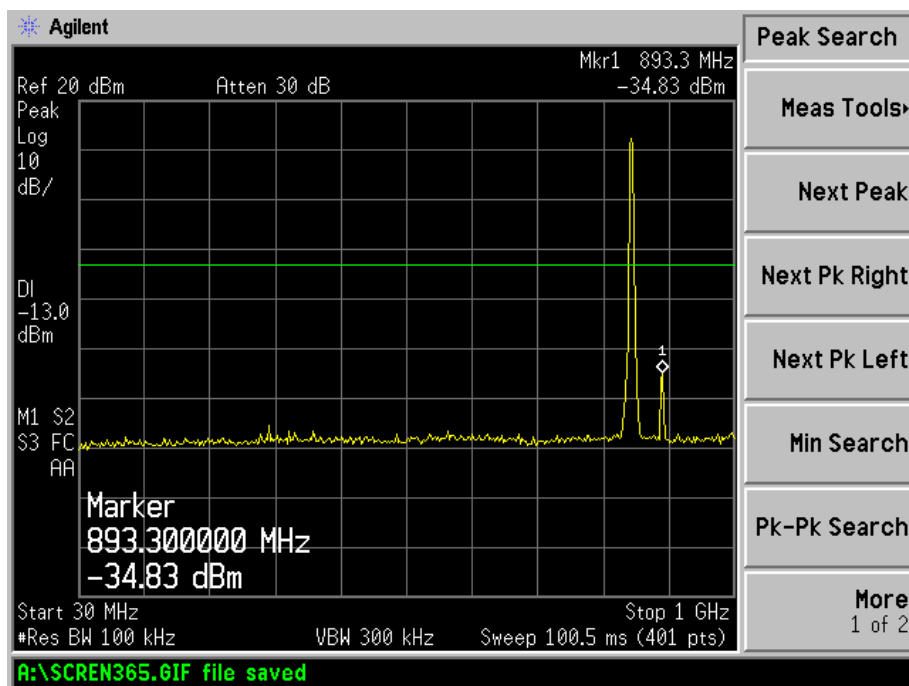
30MHz to 1GHz



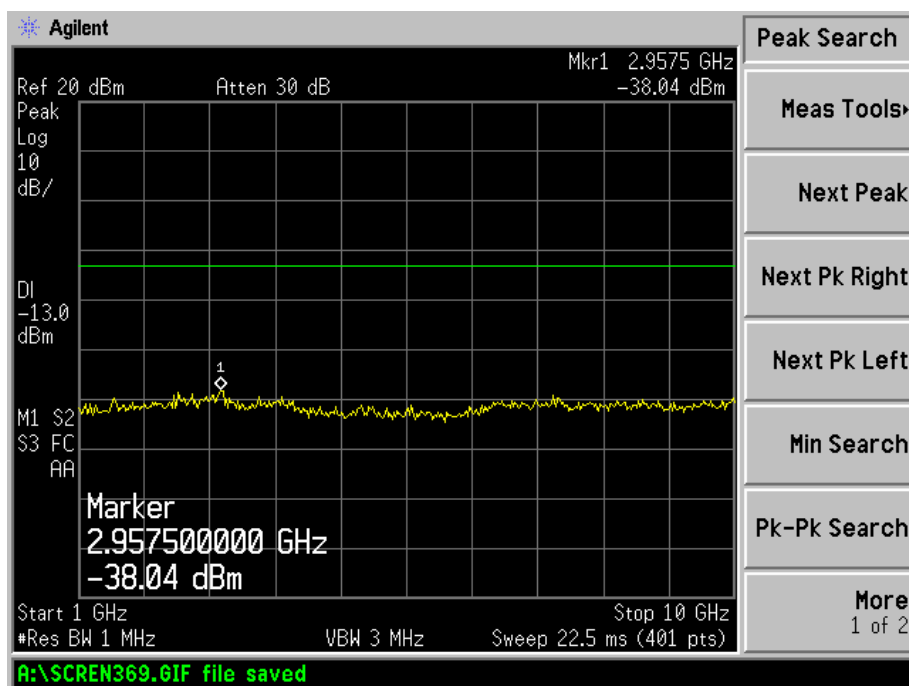
## Above 1GHz



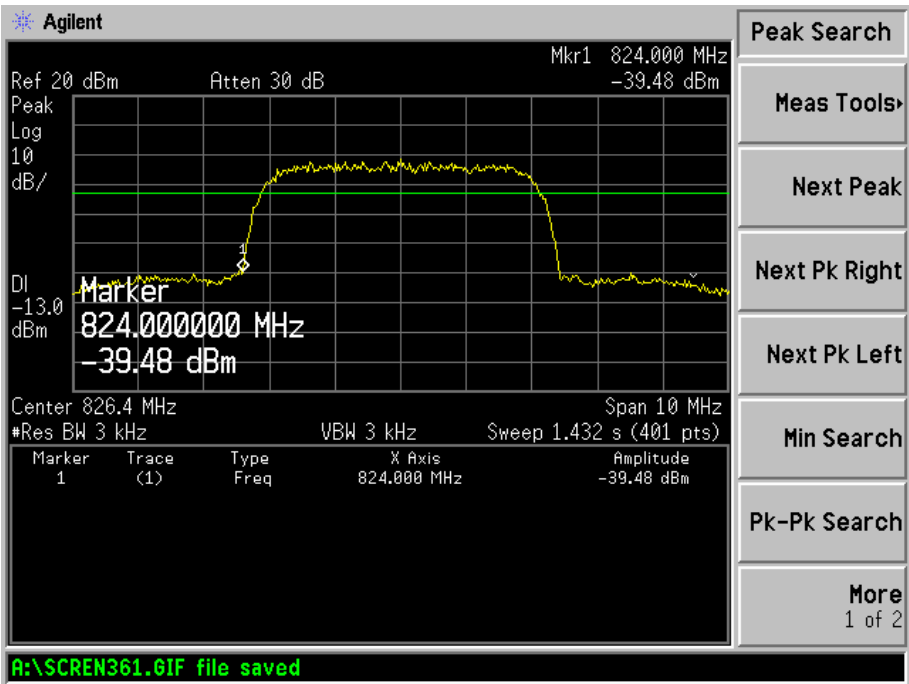
WCDMA High Channel  
30MHz to 1GHz



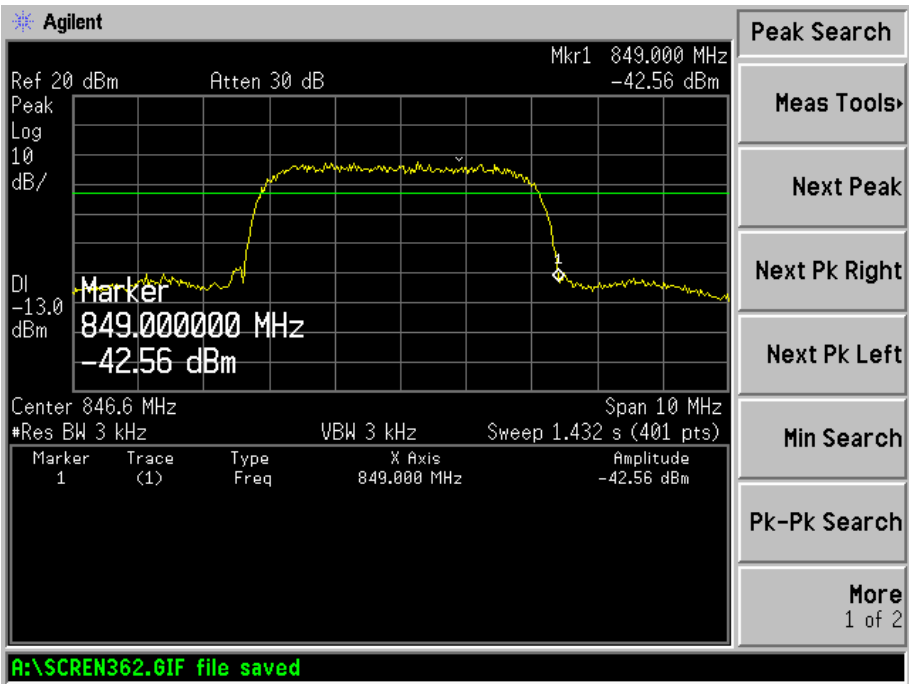
Above 1GHz



WCDMA Low Band Spurious Emission

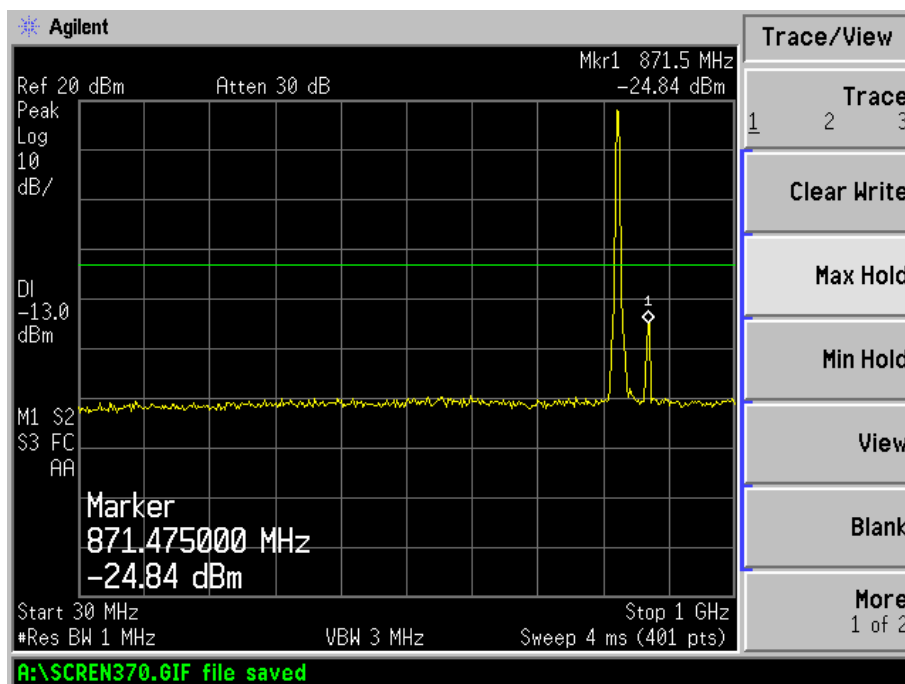


WCDMA High Band Spurious Emission

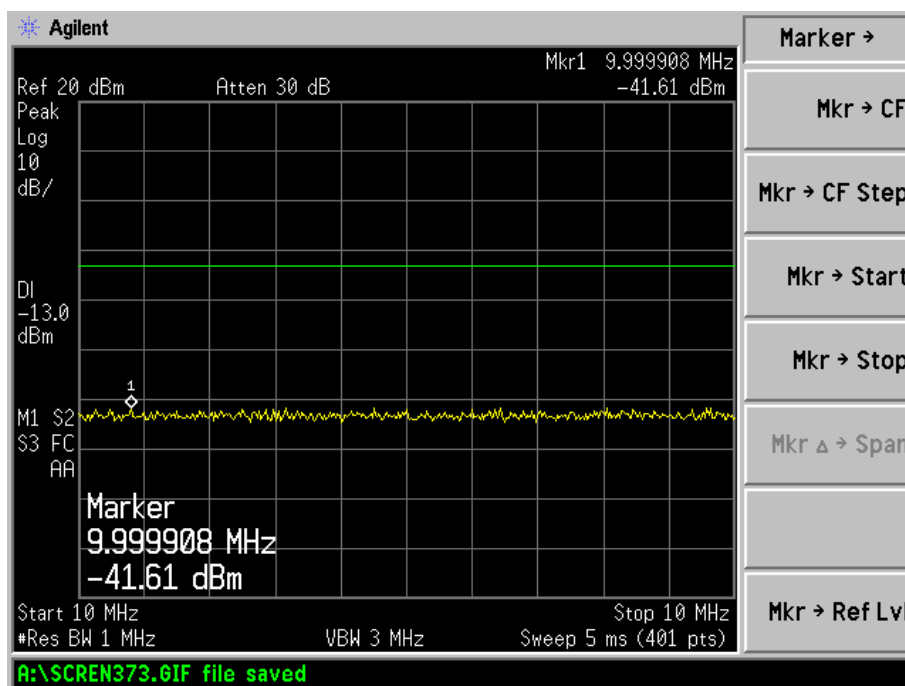




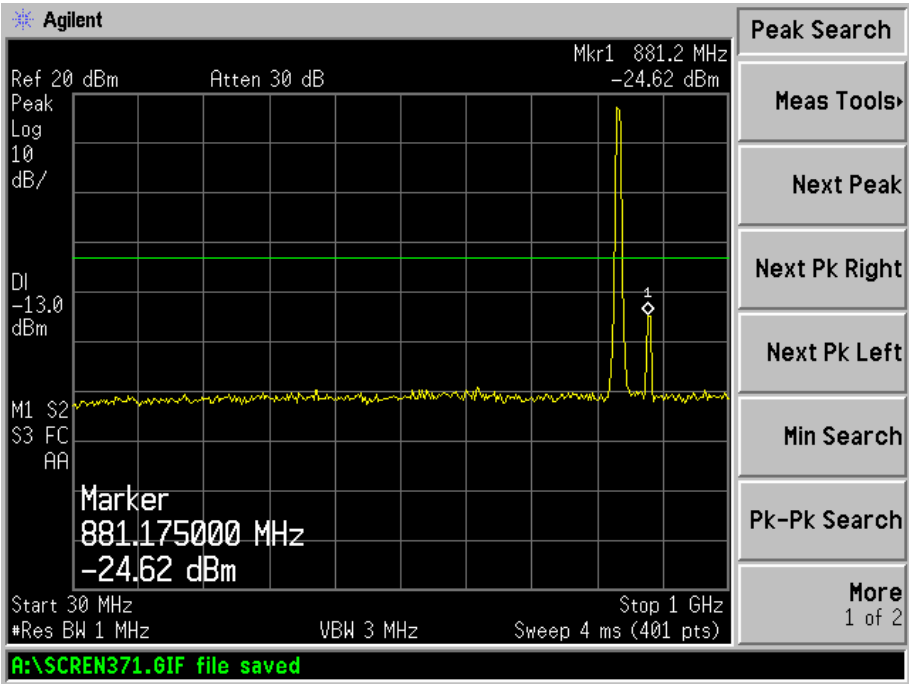
HSDPA Low Channel  
30MHz to 1GHz



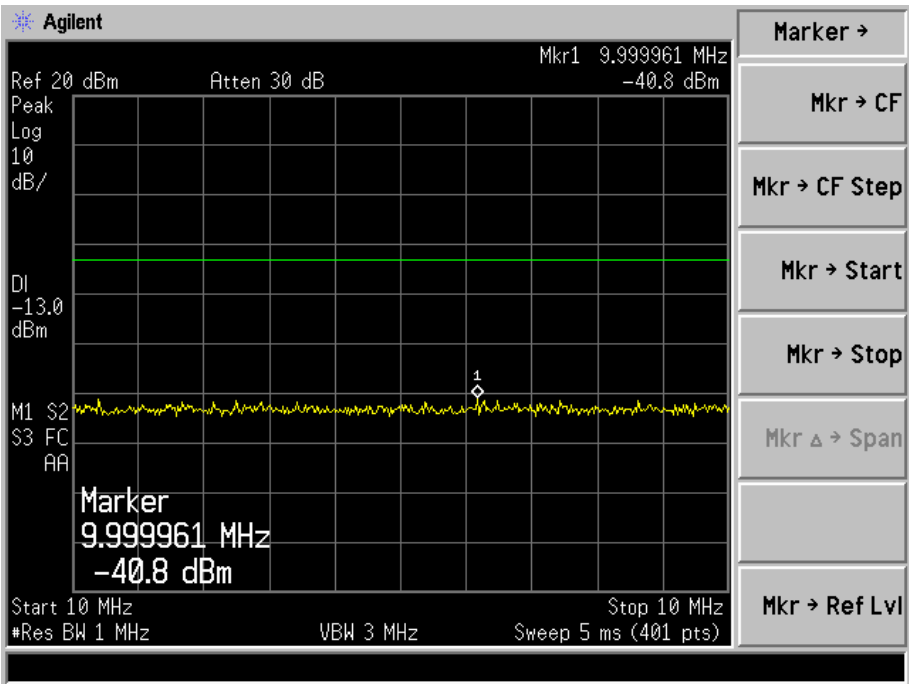
Above 1GHz



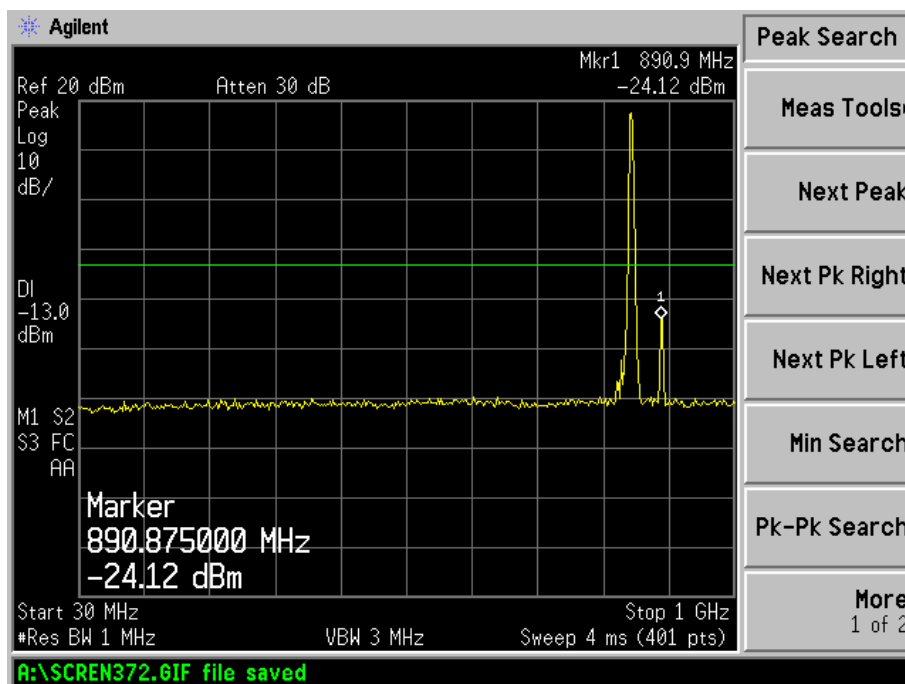
HSDPA Middle Channel  
30MHz to 1GHz



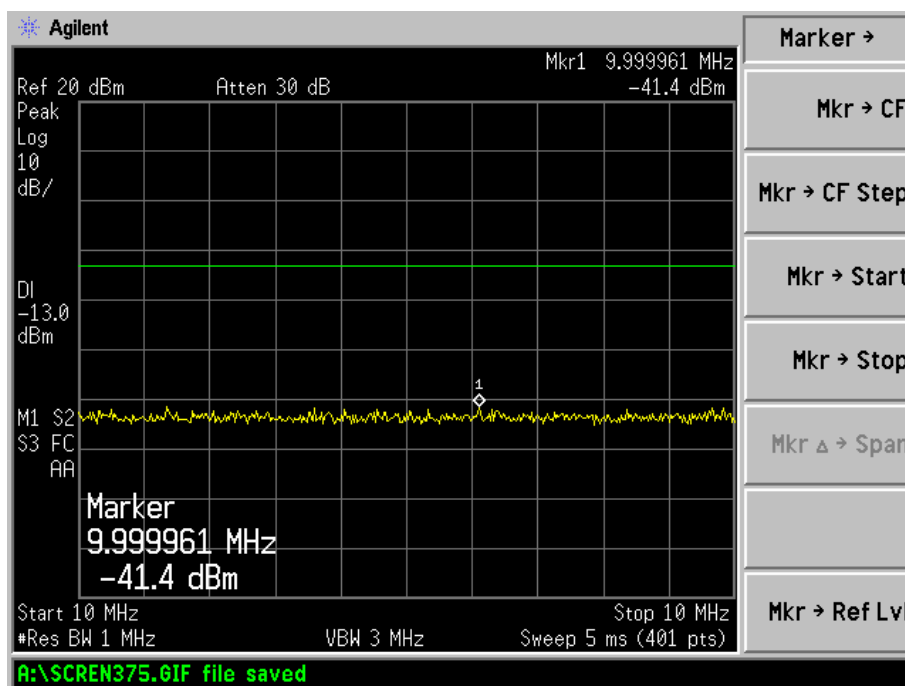
Above 1GHz



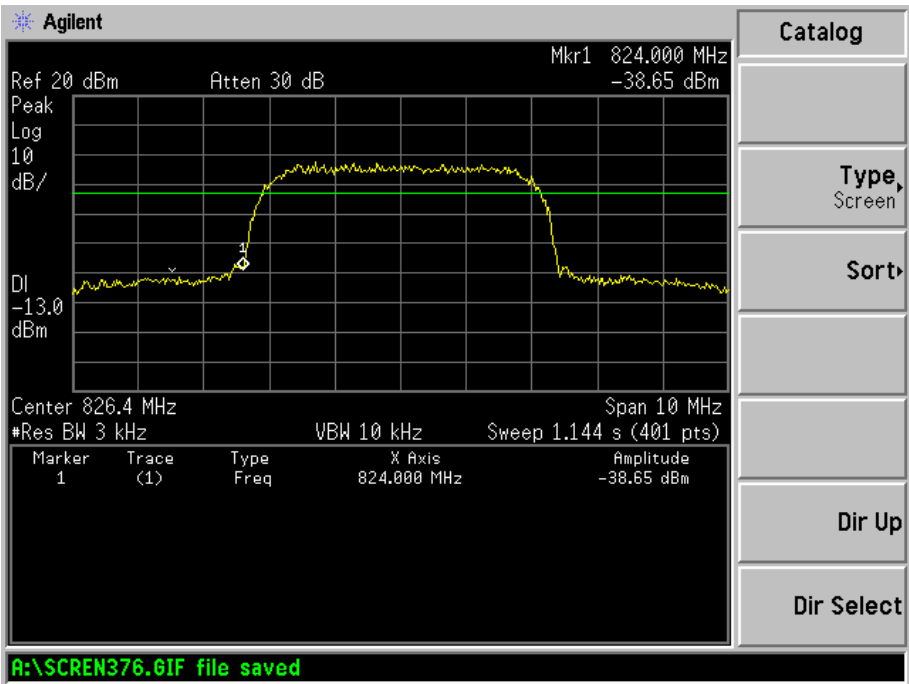
HSDPA High Channel  
30MHz to 1GHz



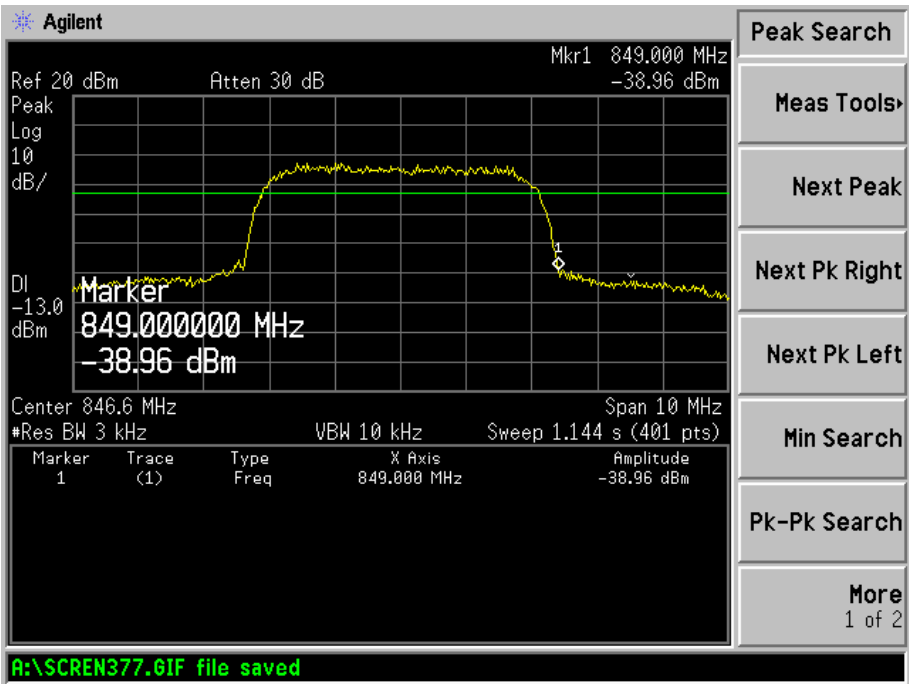
Above 1GHz



HSDPA Low Band Spurious Emission



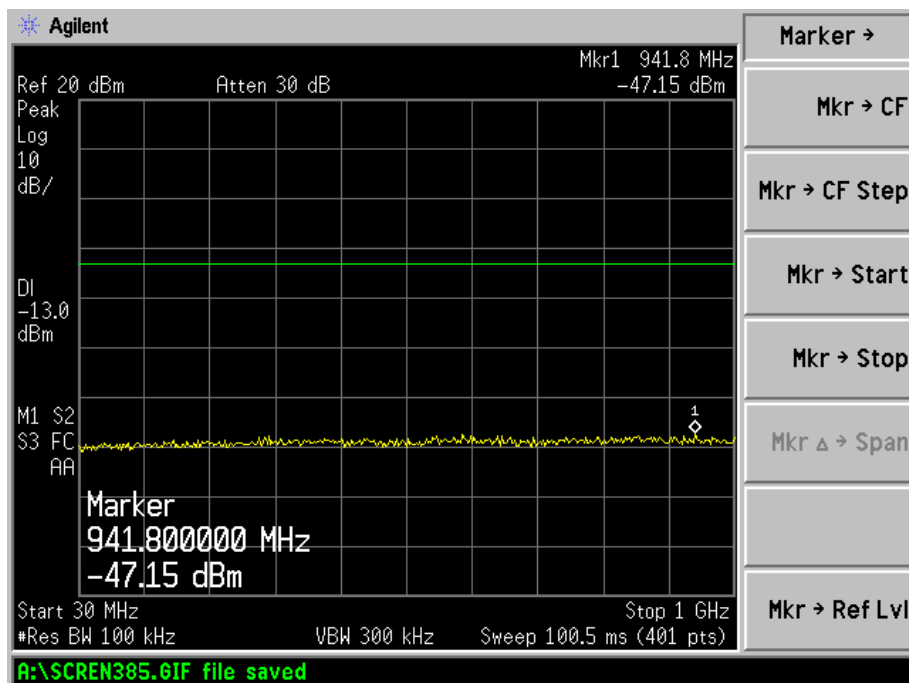
HSDPA High Band Spurious Emission



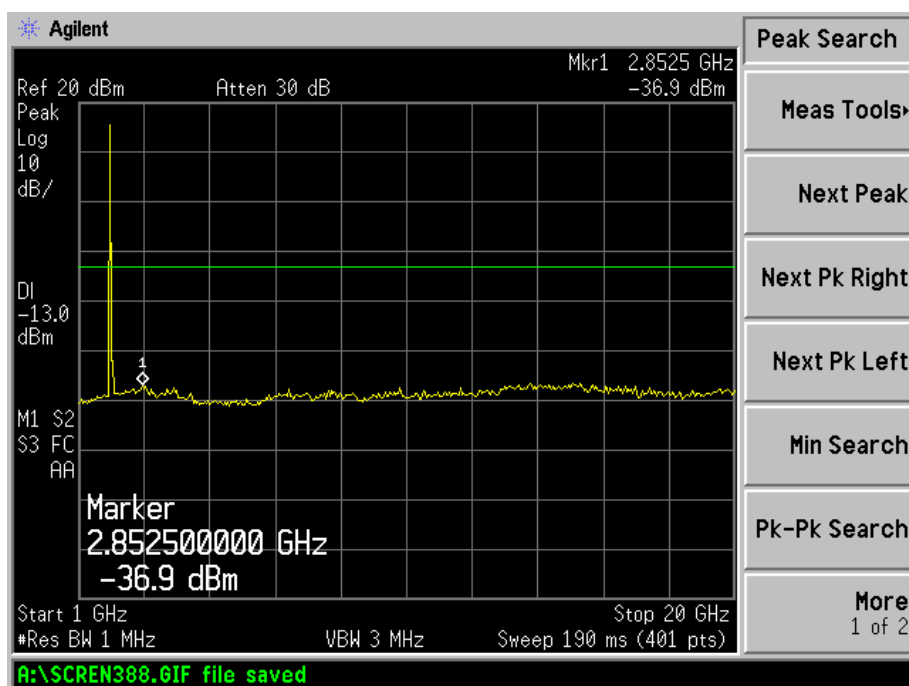
**For Band II**

WCDMA Low Channel

30MHz to 1GHz

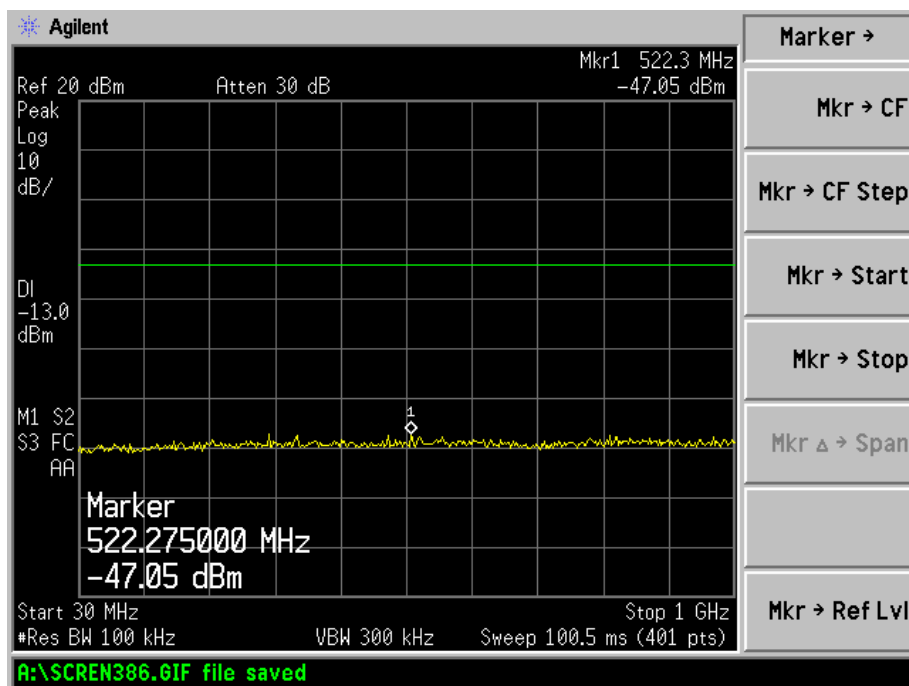


Above 1GHz

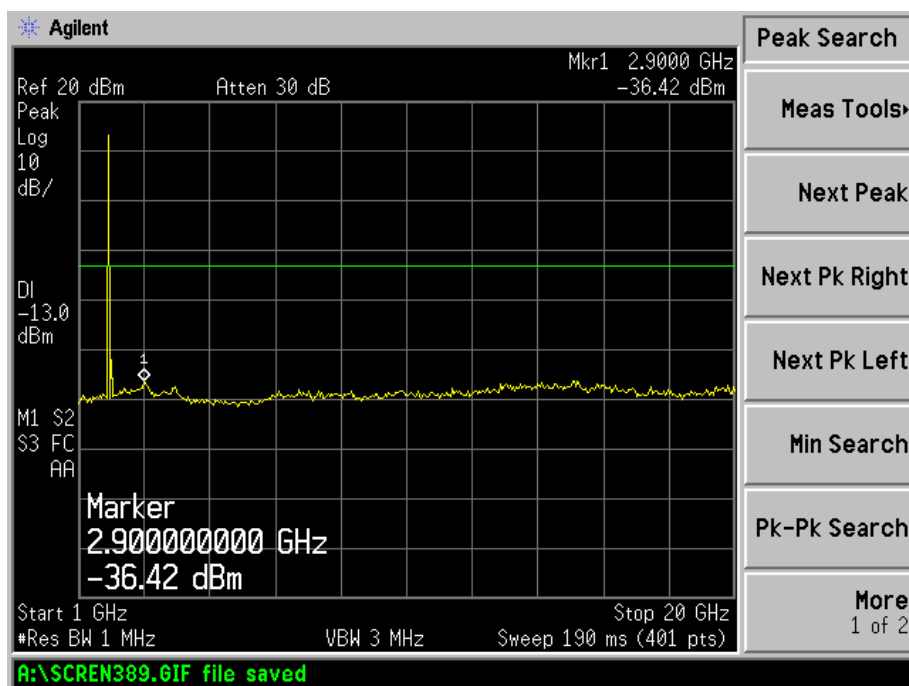


## WCDMA Middle Channel

30MHz to 1GHz

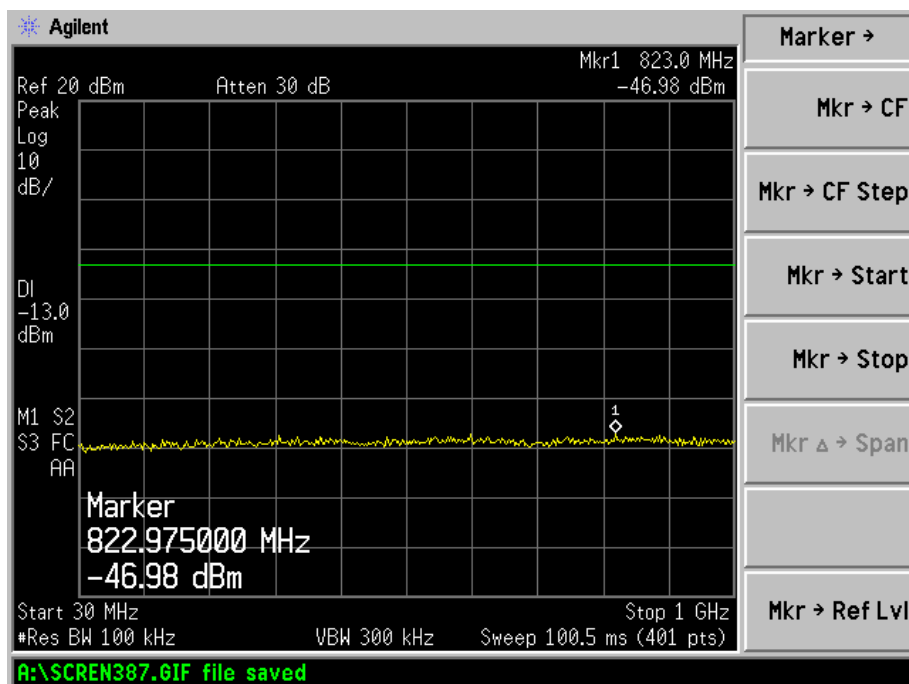


## Above 1GHz

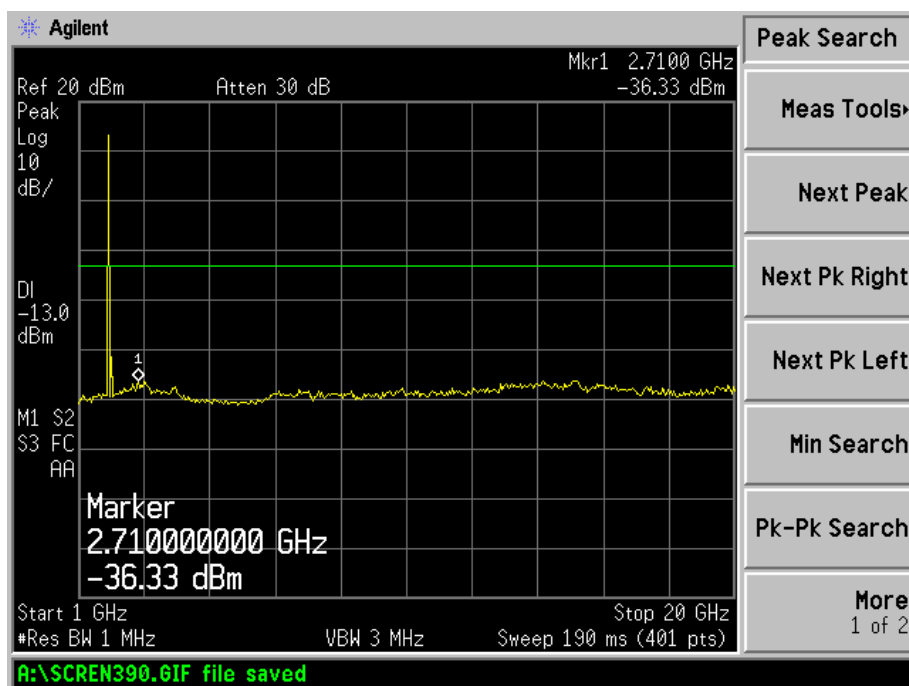


## WCDMA High Channel

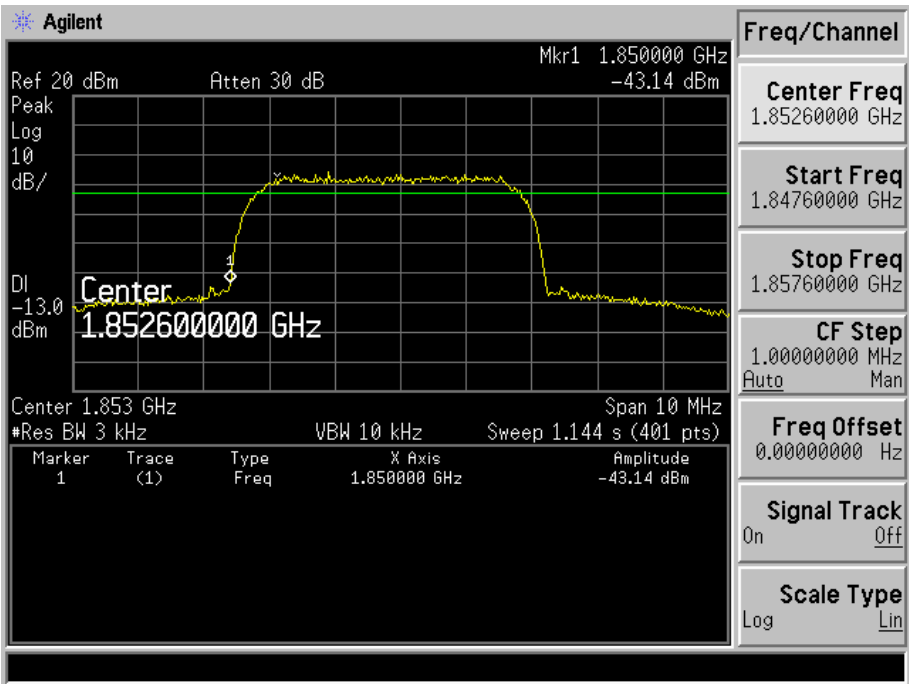
30MHz to 1GHz



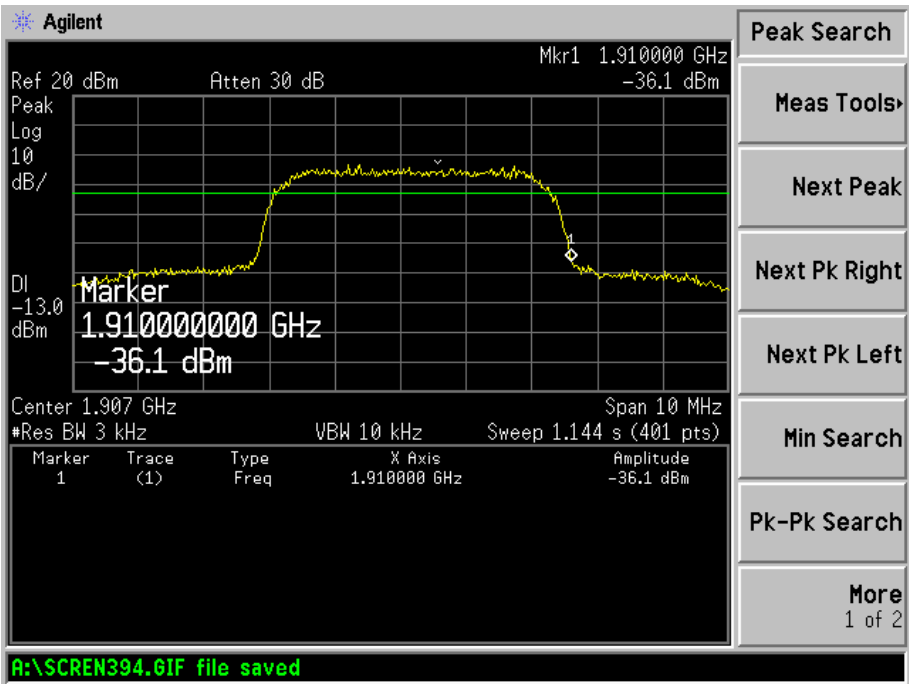
## Above 1GHz



WCDMA Low Band Spurious Emission

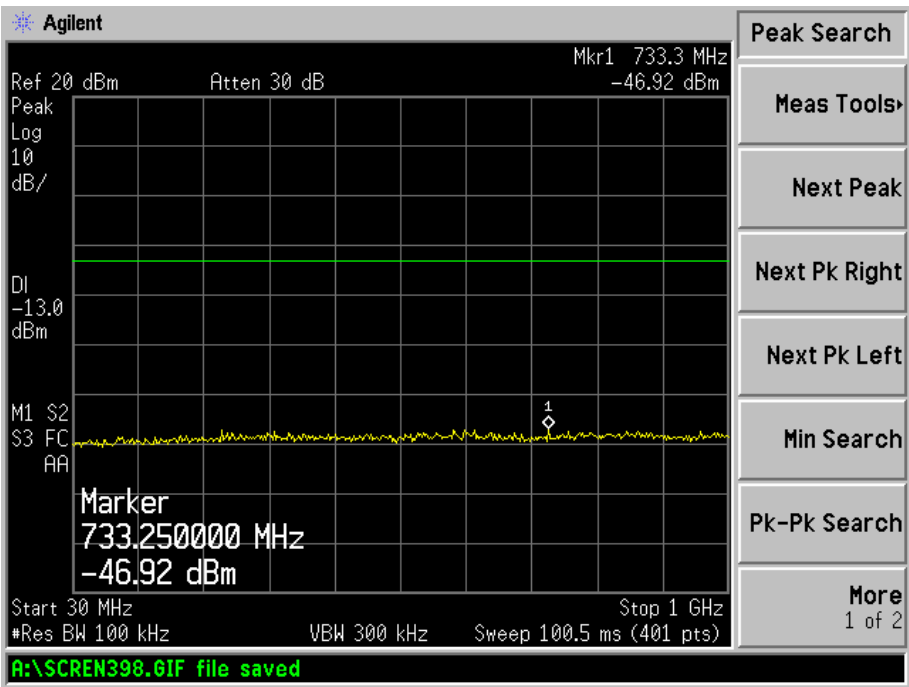


WCDMA High Band Spurious Emission

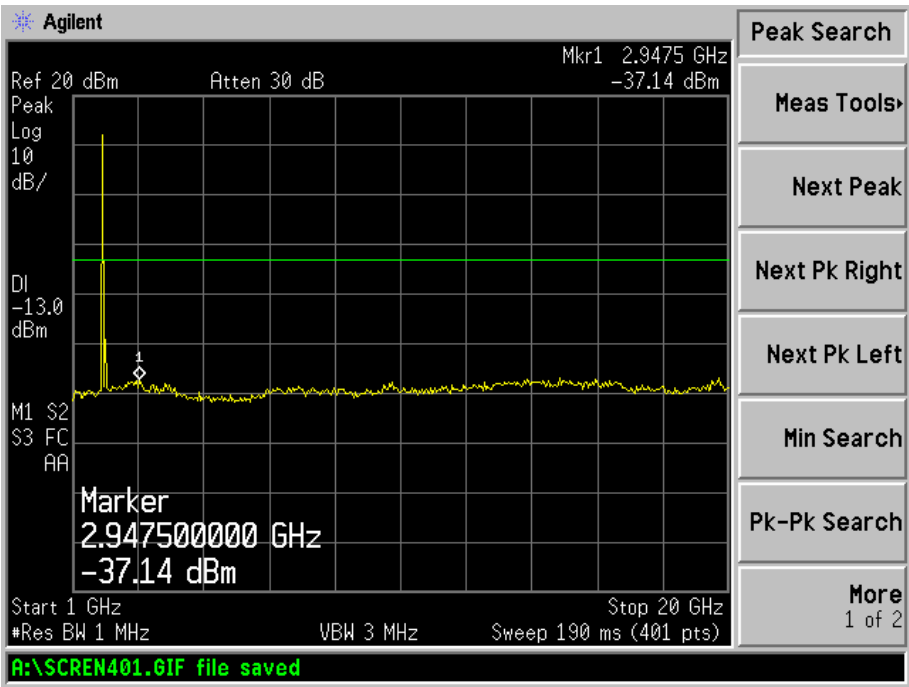




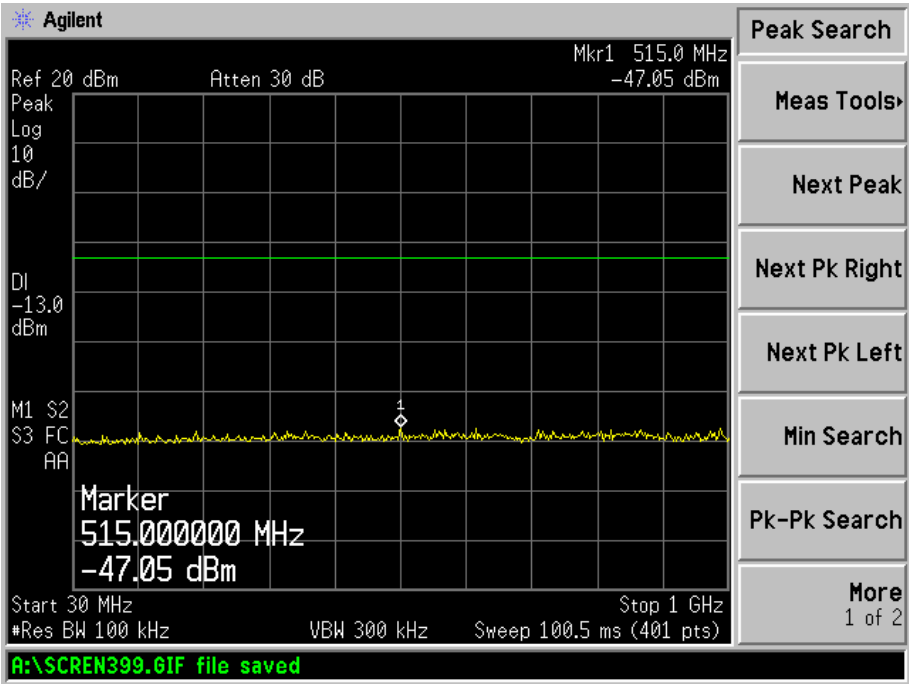
HSDPA Low Channel  
30MHz to 1GHz



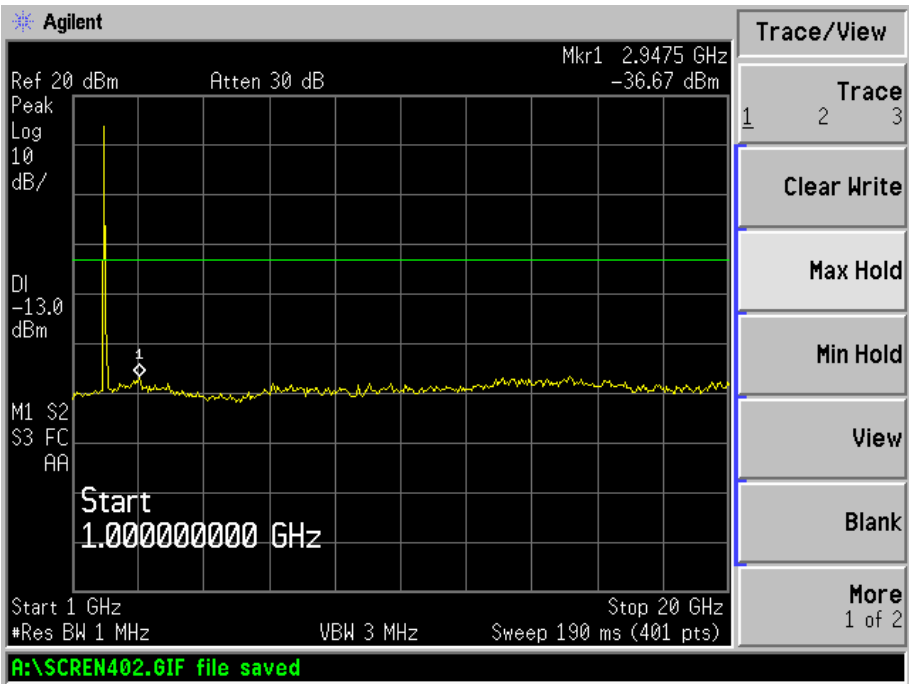
Above 1GHz



HSDPA Middle Channel  
30MHz to 1GHz

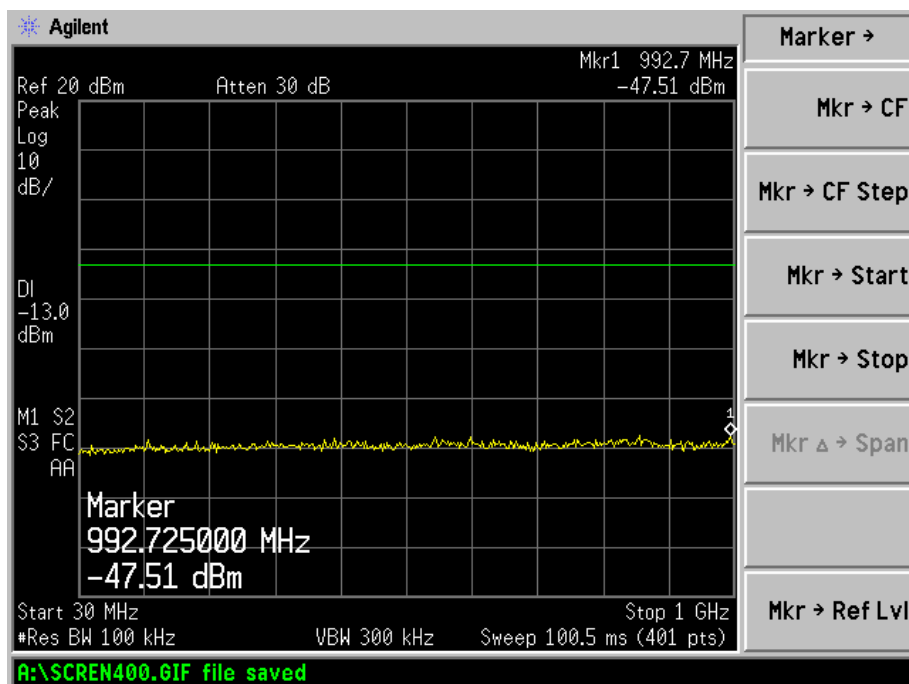


Above 1GHz

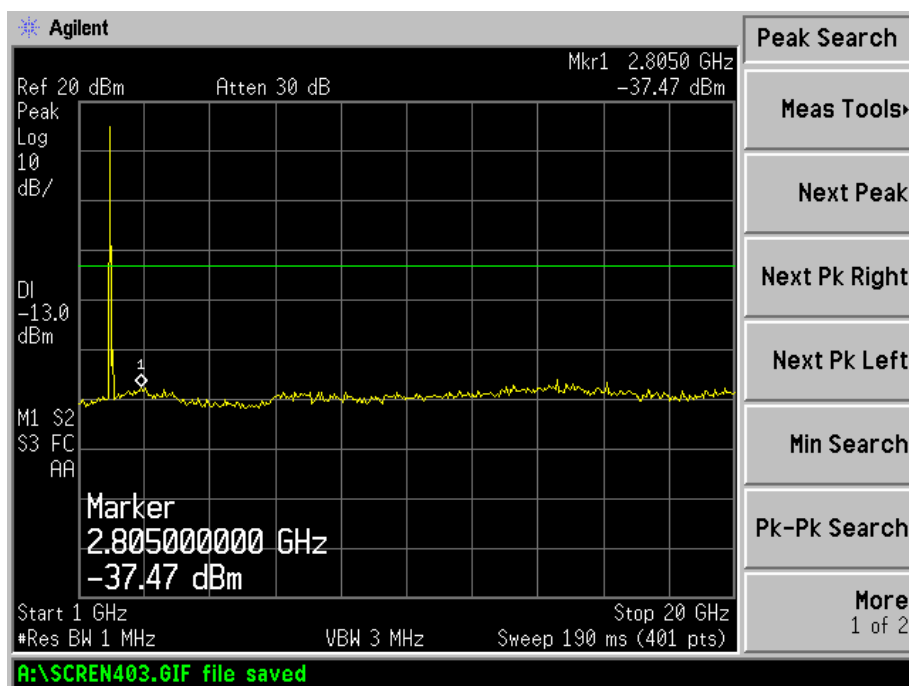


## HSDPA High Channel

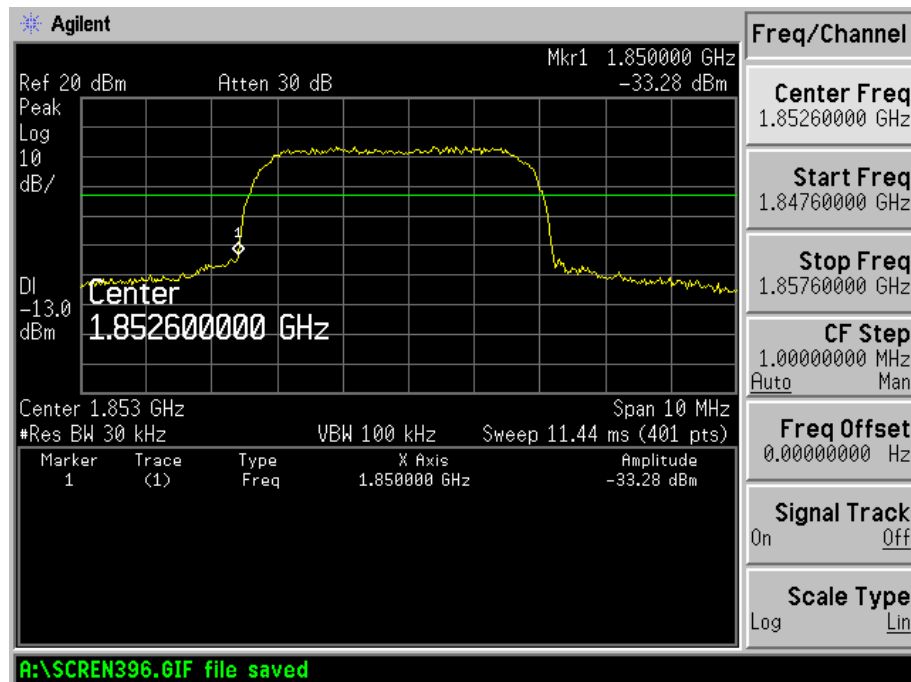
30MHz to 1GHz



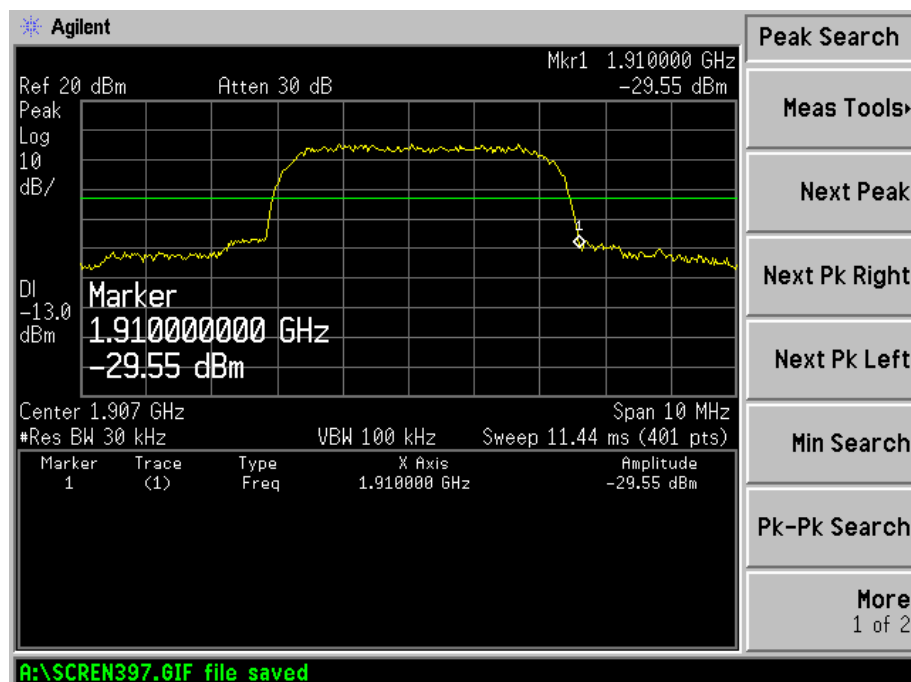
## Above 1GHz



## HSDPA Low Band Spurious Emission



## HSDPA High Band Spurious Emission



## 8. Spurious Radiated Emissions

### 8.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is  $\pm 5.20$  dB.

### 8.2 Standard Applicable

According to §22.917(a), the power of any emissions 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.

According to §24.238(a), the power of any emissions 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.

### 8.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	2015-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-24	2015-05-23
Horn Antenna	ETS	3117	00086197	2014-05-24	2015-05-23
Horn Antenna	EMCO	3116	9203-2178	2014-05-24	2015-05-23
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	112012	2014-05-28	2015-05-27
Signal Generator	R&S	SMR20	100047	2014-05-28	2015-05-27

### 8.4 Test Procedure

1. The setup of EUT is according with per TIA/EIA Standard 603C and ANSI C63.4-2003 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious attenuation limit in dB =  $43 + 10 \log_{10}$  (power out in Watts)

### 8.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

## 8.6 Summary of Test Results/Plots

According to the data below, the FCC Part 22.917 and 24.238 standards, and had the worst margin of:

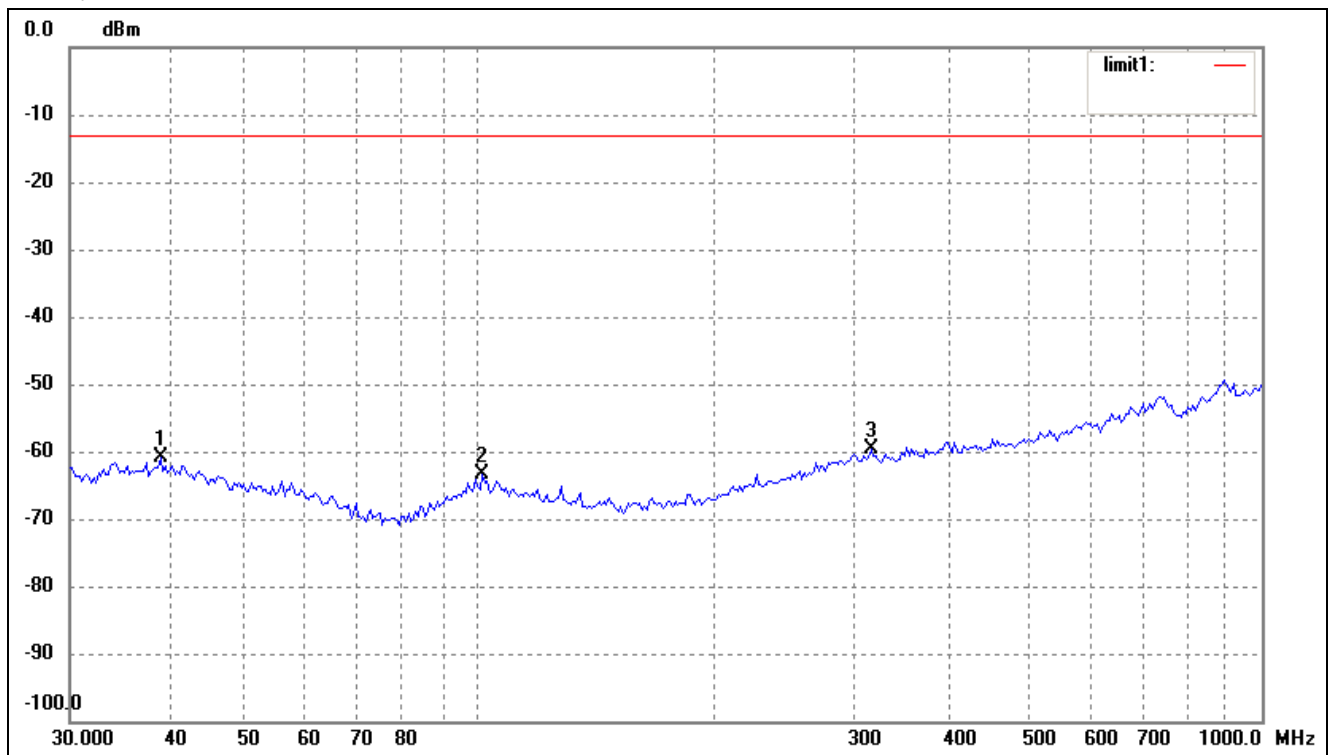
**-27.17 dB at 900.1474 MHz in the Vertical polarization, PCS Band GSM Mode, 9 kHz to 20 GHz, 3Meters**

*Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

*Spurious Emission From 30MHz to 1GHz*

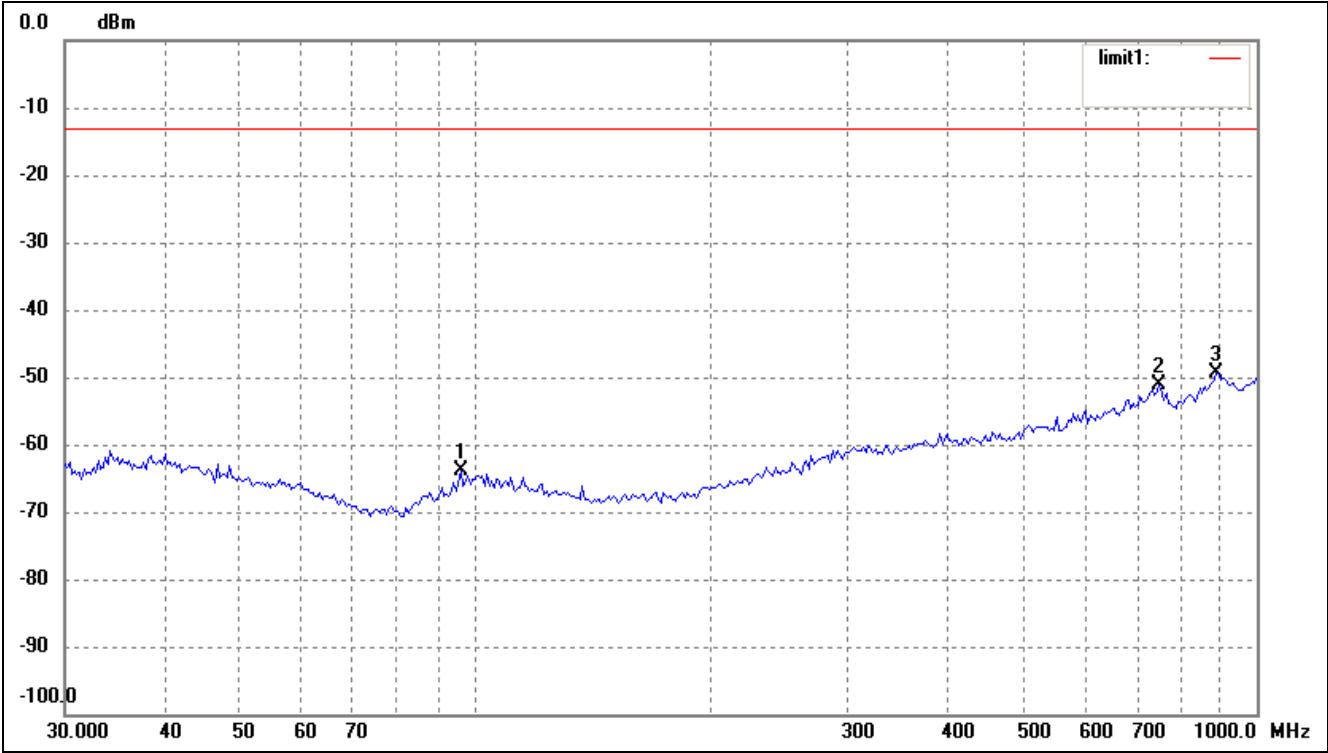
*For Cellular Band\_ GSM850 Mode*

*Horizontal:*



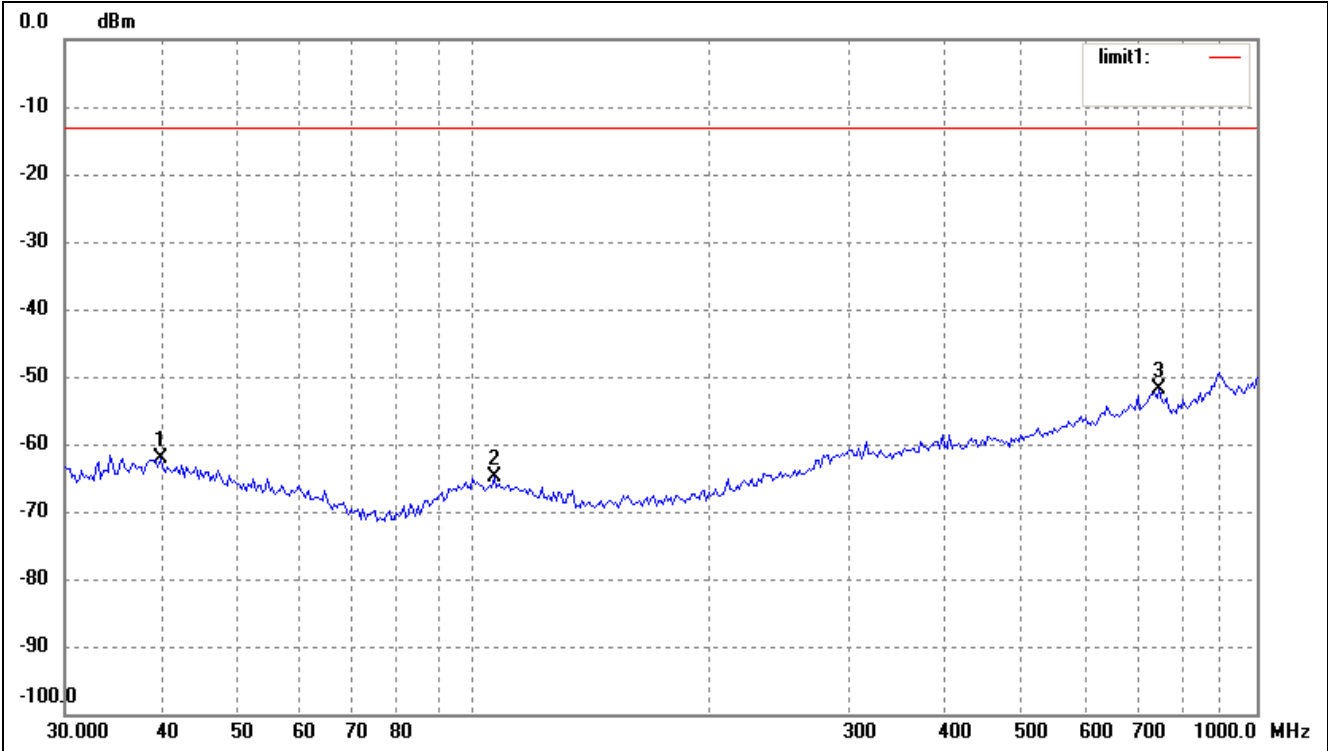
No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	39.1616	-82.13	21.34	-60.79	-13.00	-47.79	ERP
2	100.9340	-81.91	18.55	-63.36	-13.00	-50.36	ERP
3	316.5890	-81.88	22.24	-59.64	-13.00	-46.64	ERP

Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	96.0986	-81.53	17.67	-63.86	-13.00	-50.86	ERP
2	750.1083	-80.64	29.58	-51.06	-13.00	-38.06	ERP
3	887.6099	-80.34	30.95	-49.39	-13.00	-36.39	ERP

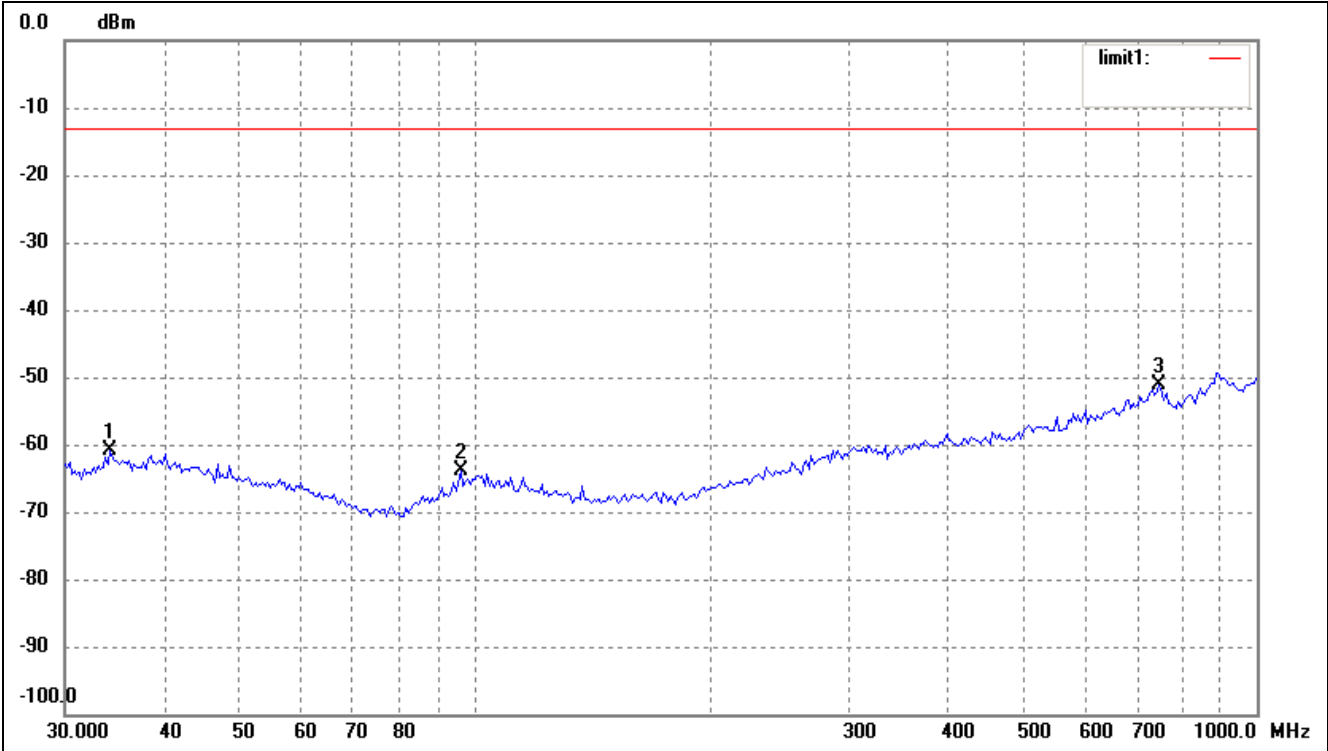
For Cellular Band\_ GSM1900 Mode  
Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	39.7147	-83.58	21.44	-62.14	-13.00	-49.14	ERP
2	106.0126	-82.89	18.04	-64.85	-13.00	-51.85	ERP
3	750.1083	-81.50	29.58	-51.92	-13.00	-38.92	ERP



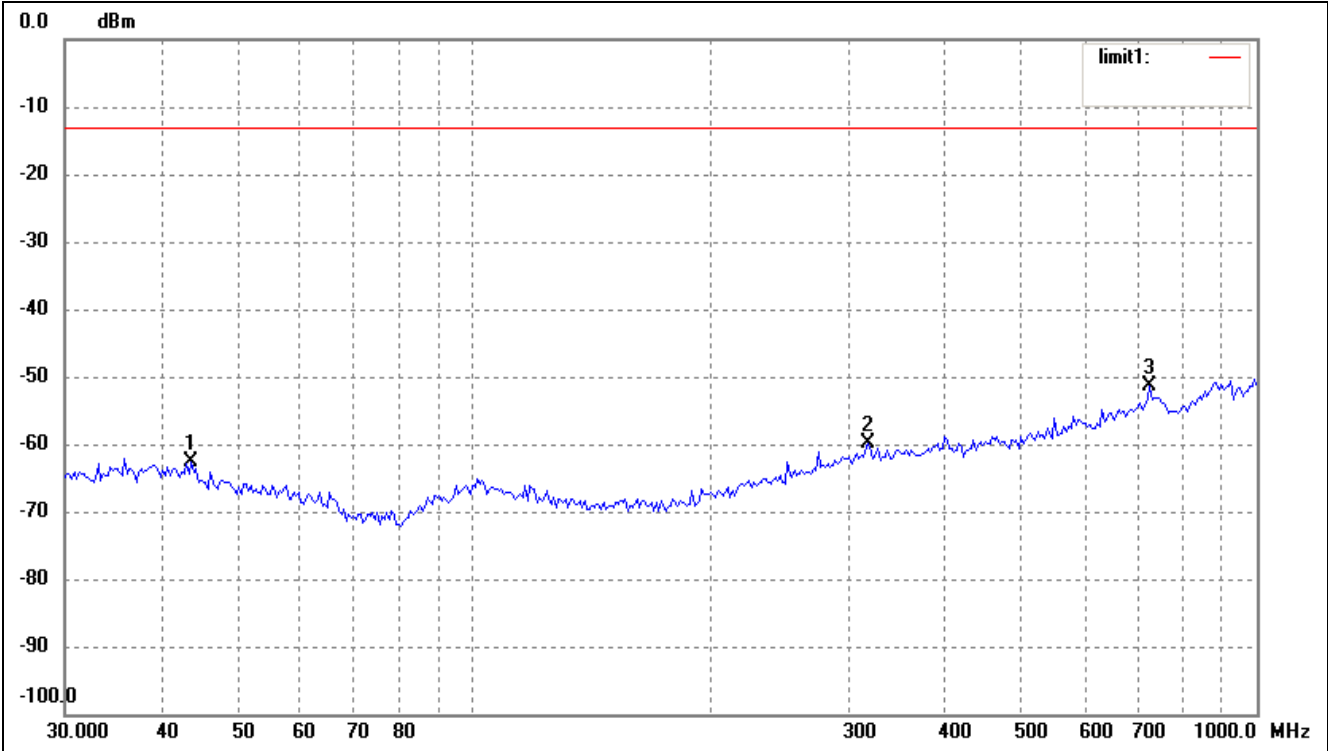
Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	34.2760	-81.32	20.56	-60.76	-13.00	-47.76	ERP
2	96.0986	-81.53	17.67	-63.86	-13.00	-50.86	ERP
3	750.1083	-80.64	29.58	-51.06	-13.00	-38.06	ERP

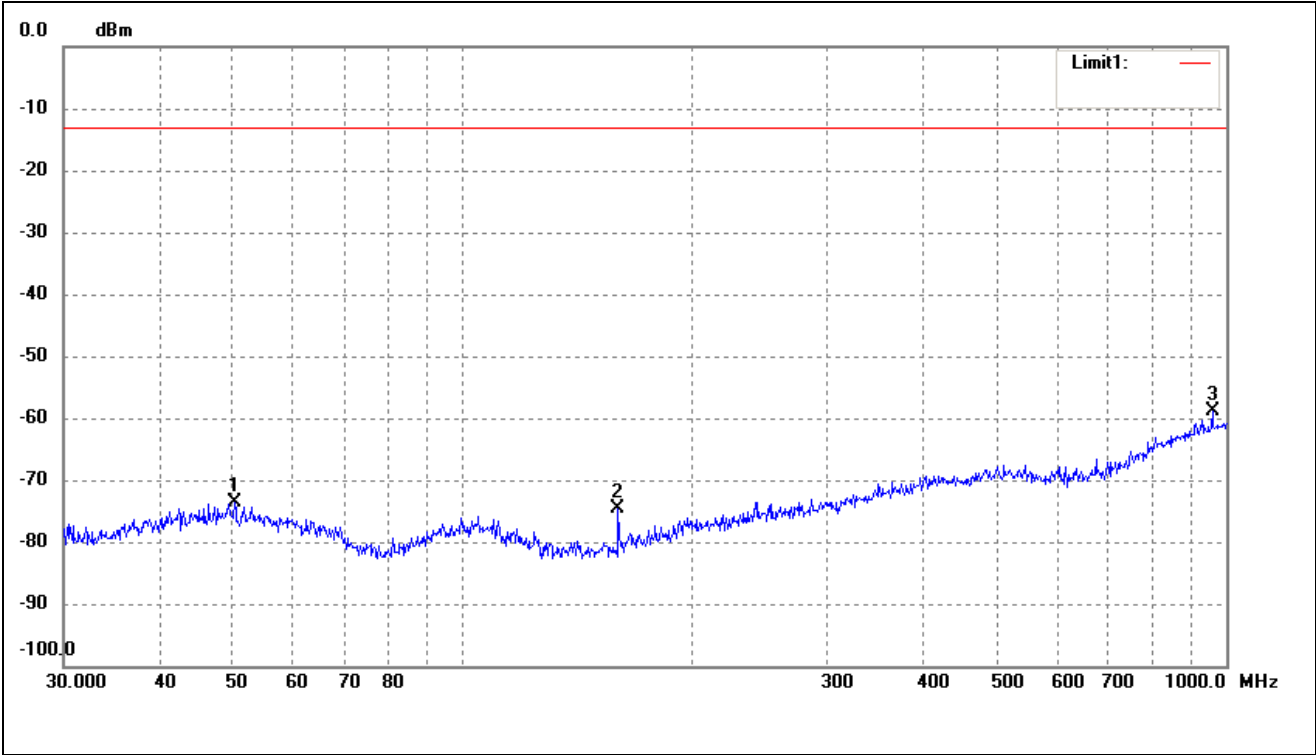
Note:  $\text{Margin} = (\text{Reading} + \text{Correct}) - \text{Limit}$

For band V Mode  
Horizontal:



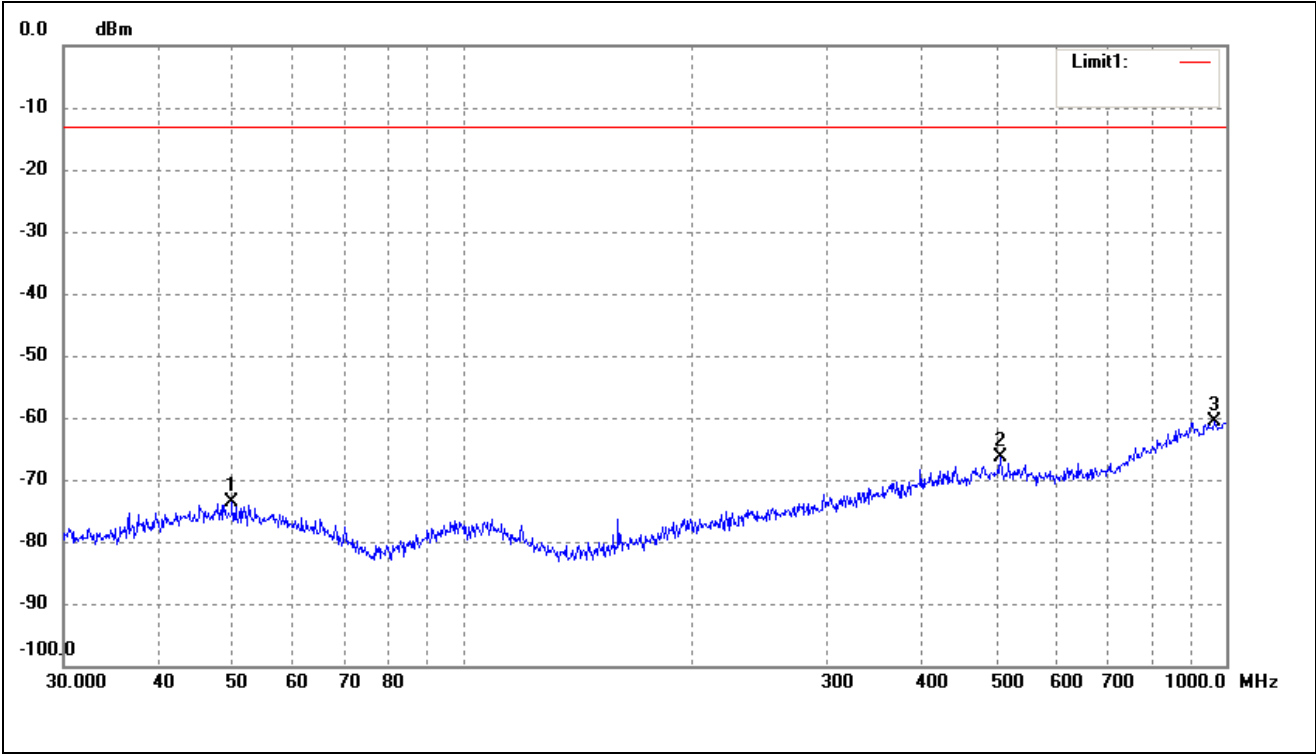
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	43.5057	-82.93	20.41	-62.52	-13.00	-49.52	ERP
2	318.8170	-82.02	22.26	-59.76	-13.00	-46.76	ERP
3	729.3583	-80.51	29.11	-51.40	-13.00	-38.40	ERP

Vertical:



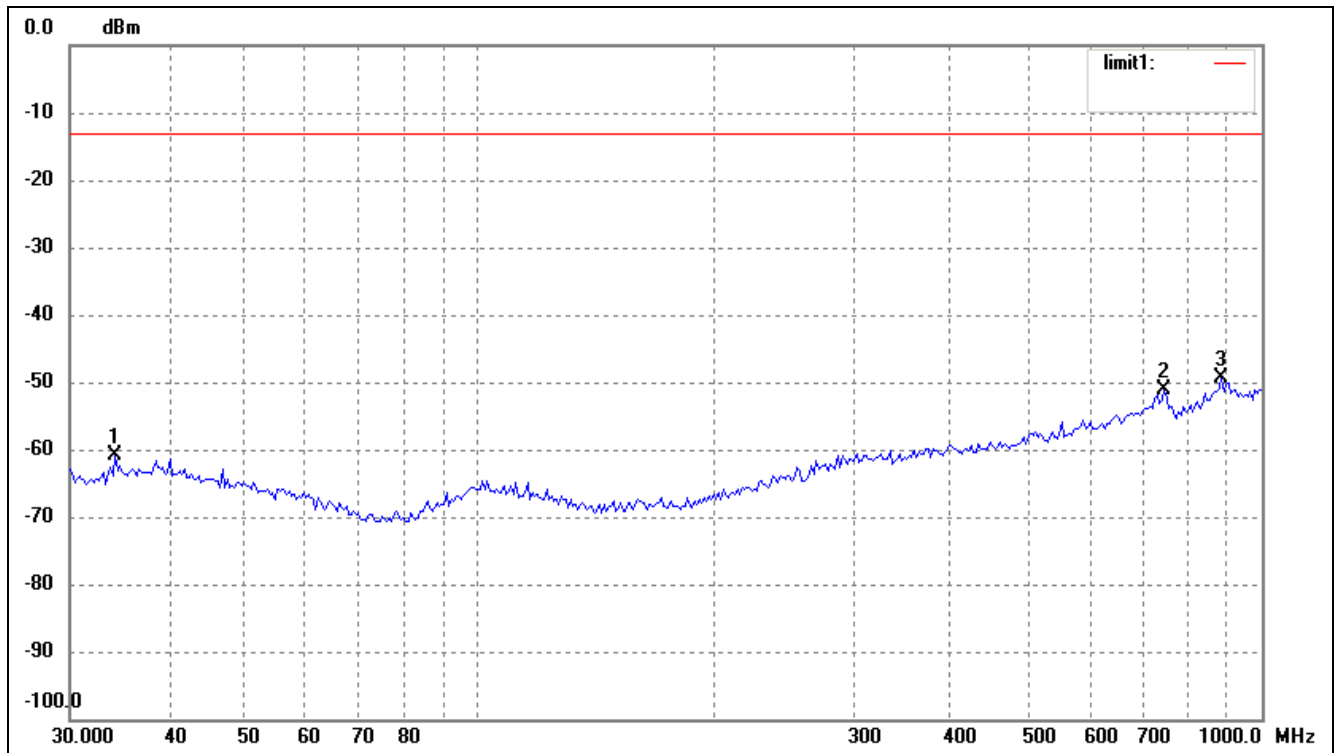
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	50.2325	-78.06	4.33	-73.73	-13.00	-60.73	ERP
2	159.7844	-74.09	-0.55	-74.64	-13.00	-61.64	ERP
3	958.7943	-76.62	17.86	-58.76	-13.00	-45.76	ERP

For band II Mode  
Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	49.8814	-78.07	4.36	-73.71	-13.00	-60.71	ERP
2	506.4791	-77.01	10.64	-66.37	-13.00	-53.37	ERP
3	965.5421	-78.64	17.96	-60.68	-13.00	-47.68	ERP

Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	34.2760	-81.32	20.56	-60.76	-13.00	-47.76	ERP
2	750.1083	-80.64	29.58	-51.06	-13.00	-38.06	ERP
3	887.6099	-80.34	30.95	-49.39	-13.00	-36.39	ERP

Note:  $\text{Margin} = (\text{Reading} + \text{Correct}) - \text{Limit}$

*Spurious Emissions Above 1GHz**For Cellular Band\_GSM850 Mode*

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (824.2MHz)						
1648.4	-55.38	4.94	-50.44	-13.00	-37.44	H
2472.6	-54.23	8.46	-45.77	-13.00	-32.77	H
1648.4	-51.60	4.94	-46.66	-13.00	-33.66	V
2472.6	-52.16	8.46	-43.70	-13.00	-30.70	V
Middle Channel (836.6MHz)						
1673.2	-55.38	5.11	-43.36	-13.00	-30.36	H
2509.8	-54.23	8.54	-42.25	-13.00	-29.25	H
1673.2	-51.60	5.11	-43.25	-13.00	-30.25	V
2509.8	-52.16	8.54	-42.15	-13.00	-29.15	V
High Channel (848.8MHz)						
1697.6	-50.43	5.29	-45.14	-13.00	-32.14	H
2546.4	-52.80	8.59	-44.21	-13.00	-31.21	H
1697.6	-50.30	5.29	-45.01	-13.00	-32.01	V
2546.4	-52.73	8.59	-44.14	-13.00	-31.14	V

*For PCS Band\_GSM1900 Mode*

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (1850.2MHz)						
3700.4	-54.90	10.54	-44.36	-13.00	-33.33	H
5550.6	-57.62	13.37	-44.25	-13.00	-32.23	H
3700.4	-53.90	10.54	-43.36	-13.00	-33.40	V
5550.6	-57.62	13.37	-44.25	-13.00	-31.45	V
Middle Channel (1880MHz)						
3760.0	-53.00	10.64	-42.36	-13.00	-29.36	H
5640.0	-57.79	13.54	-44.25	-13.00	-31.25	H
3760.0	-53.00	10.64	-42.36	-13.00	-29.36	V
5640.0	-57.79	13.54	-44.25	-13.00	-31.25	V
High Channel (1909.8MHz)						
3819.6	-54.43	10.74	-43.69	-13.00	-30.69	H
5729.4	-57.96	13.71	-44.25	-13.00	-31.25	H
3819.6	-55.13	10.74	-44.39	-13.00	-31.39	V
5729.4	-57.46	13.71	-43.75	-13.00	-30.75	V

*For Band V Mode*

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (826.4MHz)						
1652.8	-59.45	14.98	-44.47	-13.00	-31.47	H
2479.2	-59.97	17.02	-42.95	-13.00	-29.95	H
1652.8	-58.42	14.98	-43.44	-13.00	-30.44	V
2479.2	-59.65	17.02	-42.63	-13.00	-29.63	V
Middle Channel (836.6MHz)						
1672.8	-58.68	6.86	-51.82	-13.00	-38.82	H
2509.2	-59.17	14.62	-44.55	-13.00	-31.55	H
1672.8	-59.63	6.86	-52.77	-13.00	-39.77	V
2509.2	-60.66	14.62	-46.04	-13.00	-33.04	V
High Channel (846.6MHz)						
1693.2	-57.79	6.86	-50.93	-13.00	-37.93	H
2539.8	-60.81	15.03	-45.78	-13.00	-32.78	H
1693.2	-58.29	6.86	-51.43	-13.00	-38.43	V
2539.8	-59.73	15.03	-44.70	-13.00	-31.70	V

*For Band II Mode*

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (1852.4MHz)						
3704.8	-58.81	5.88	-52.93	-13.00	-39.93	H
5557.2	-59.37	15.37	-44.00	-13.00	-31.00	H
3704.8	-59.87	5.88	-53.99	-13.00	-40.99	V
5557.2	-60.10	15.37	-44.73	-13.00	-31.73	V
Middle Channel (1880MHz)						
3760.8	-59.29	10.17	-49.12	-13.00	-39.93	H
5640.0	-59.14	14.69	-44.45	-13.00	-31.00	H
3760.8	-58.86	10.17	-48.69	-13.00	-40.99	V
5640.0	-59.41	14.69	-44.72	-13.00	-31.73	V
High Channel (1907.6MHz)						
3815.2	-59.33	6.91	-52.42	-13.00	-39.42	H
5722.8	-59.37	15.33	-44.04	-13.00	-31.04	H
3815.2	-59.63	6.91	-52.72	-13.00	-39.72	V
5722.8	-58.96	15.33	-43.63	-13.00	-30.63	H

Note: Result=Reading+ Correct, Margin= Result- Limit

Testing is carried out with frequency rang 9kHz to 20GHz, which above 3<sup>th</sup> Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured, so the data is not display.

## 9. Frequency Stability

### 9.1 Standard Applicable

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Cellular Band

Frequency range (MHz)	Base, fixed (ppm)	Mobile ≤3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	N/A	N/A
929 to 960	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 9.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B-ESA	US41192821	2014-05-28	2015-05-27
Rohde & Schwarz	Universal Radio Communication	CMU200	112012	2014-05-28	2015-05-27
GONGWEN	Moisture Test Chamber	GDS-150	SEMT-0013	2014-05-28	2015-05-27

### 9.3 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode

Temperature:	Supply Voltage
20°C	85-115% of declared nominal voltage
-30°C to +50°C	Normal



## 9.4 Environmental Conditions

Temperature:	20°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

## 9.5 Summary of Test Results/Plots

For Cellular Band GSM Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.7	64	0.0765
40	3.7	58	0.0693
30	3.7	45	0.0538
20	3.7	25	0.0299
10	3.7	21	0.0251
0	3.7	22	0.0263
-10	3.7	35	0.0418
-20	3.7	45	0.0538
-30	3.7	55	0.0657

For PCS Band GSM Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.7	68	0.0362
40	3.7	55	0.0293
30	3.7	48	0.0255
20	3.7	28	0.0149
10	3.7	18	0.0096
0	3.7	15	0.0080
-10	3.7	35	0.0186
-20	3.7	50	0.0266
-30	3.7	59	0.0314

## For Cellular Band GPRS Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.7	42	0.0502
40	3.7	30	0.0359
30	3.7	25	0.0299
20	3.7	16	0.0191
10	3.7	15	0.0179
0	3.7	08	0.0096
-10	3.7	22	0.0263
-20	3.7	31	0.0371
-30	3.7	43	0.0514

## For PCS Band GPRS Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.7	52	0.0277
40	3.7	41	0.0218
30	3.7	35	0.0186
20	3.7	28	0.0149
10	3.7	15	0.0080
0	3.7	10	0.0053
-10	3.7	15	0.0080
-20	3.7	25	0.0133
-30	3.7	40	0.0213

## For WCDMA Band V Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.7	52	0.0622
40	3.7	44	0.0526
30	3.7	38	0.0454
20	3.7	32	0.0383
10	3.7	30	0.0359
0	3.7	19	0.0227
-10	3.7	42	0.0502
-20	3.7	50	0.0598
-30	3.7	53	0.0634

## For WCDMA Band II Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.7	50	0.0266
40	3.7	43	0.0229
30	3.7	40	0.0213
20	3.7	30	0.0160
10	3.7	24	0.0128
0	3.7	21	0.0112
-10	3.7	32	0.0170
-20	3.7	39	0.0207
-30	3.7	45	0.0239

## For HSDPA Band V Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.7	39	0.0466
40	3.7	32	0.0383
30	3.7	29	0.0347
20	3.7	22	0.0263
10	3.7	20	0.0239
0	3.7	15	0.0179
-10	3.7	22	0.0263
-20	3.7	26	0.0311
-30	3.7	29	0.0347

## For HSDPA Band II Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.7	48	0.0255
40	3.7	40	0.0213
30	3.7	31	0.0165
20	3.7	25	0.0133
10	3.7	20	0.0106
0	3.7	19	0.0101
-10	3.7	24	0.0128
-20	3.7	30	0.0160
-30	3.7	38	0.0202

So, Frequency Stability Versus Input Voltage is:

Reference Frequency(Middle Channel): GSM 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	38	0.0454
	3.7	20	0.0239
	4.2	36	0.0430
Reference Frequency(Middle Channel): GSM 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	28	0.0149
	3.7	20	0.0106
	4.2	31	0.0165
Reference Frequency(Middle Channel): GPRS 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	41	0.0490
	3.7	20	0.0239
	4.2	44	0.0526
Reference Frequency(Middle Channel): GPRS 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	33	0.0176
	3.7	14	0.0074
	4.2	32	0.0170

Reference Frequency(Middle Channel): WCDMA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	39	0.0466
	3.7	16	0.0191
	4.2	34	0.0406
Reference Frequency(Middle Channel): WCDMA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	35	0.0186
	3.7	25	0.0133
	4.2	34	0.0181
Reference Frequency(Middle Channel): HSDPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	29	0.0347
	3.7	16	0.0191
	4.2	28	0.0335
Reference Frequency(Middle Channel): HSDPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	31	0.0165
	3.7	15	0.0080
	4.2	30	0.0160

\*\*\*\*\* END OF REPORT \*\*\*\*\*