

# FCC PART 22H&24E

## Measurement and Test Report

For

**Verykool USA Inc**

**4350 Executive Dr. #100, San Diego**

**FCC ID: WA6S757**

<b>Report Concerns:</b> Original Report	<b>Equipment Type:</b> 3G Mobile Phone
<b>Model:</b>	<u>S757</u>
<b>Report No.:</b>	<u>STR12058081I-1</u>
<b>Test Date:</b>	<u>2012-05-09 to 2012-05-26</u>
<b>Issue Date:</b>	<u>2012-06-01</u>
<b>Tested By:</b>	<u>Seven Song / Engineer</u> <i>Seven Song</i>
<b>Reviewed By:</b>	<u>Lahm Peng / EMC Manager</u> <i>Lahm peng</i>
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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 SEM.Test Compliance Service Co., Ltd.

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## 1. GENERAL INFORMATION

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

#### Client Information

Applicant: Verykool USA Inc  
 Address of applicant: 4350 Executive Dr. #100, San Diego

Manufacturer: Verykool Wireless Technology Ltd.  
 Address of manufacturer: Room 1701, Reward Building C, No.203, 2nd Section of WangJing, Li Ze Zhong Yuan, ChaoYang District, Beijing, P.R. of China 100102

#### General Description of E.U.T

Items	Description
EUT Description:	3G Mobile Phone
Trade Name:	verykool
Model No.:	S757
IMEI:	354727049893647, 354727049893654
Power Supply:	Input 100-240V/50/60Hz Output 5V DC Adaptor DC 3.7V Battery Inside
Adaptor Model:	A361-0501000U
Rated Voltage:	DC 3.7V
Battery Capacity:	2300mAh (8.51Wh)
Hardware Version:	V3.0
Software Version:	S757 20120502-195815
Support Band:	GSM850/PCS1900, WCDMA Band II, Band V
GPRS Class:	Class 12
Frequency range:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz WCDMA/UPA/DPA Band V: 824~849MHz WCDMA/UPA/DPA Band II: 1850~1910MHz
Max. RF Power(Conducted):	GSM850: 33.59dBm GSM1900: 29.65dBm WCDMA Band II: 21.85dBm WCDMA Band V: 21.45dBm
Max. RF Power(ERP/EIRP):	GSM850: 32.85dBm GSM1900: 28.90dBm WCDMA Band II: 20.54dBm WCDMA Band V: 19.78dBm
Network Protocol:	GSM/GPRS/EDGE/UMTS/HSUPA/HSDPA
Modulation:	GMSK for GSM/GPRS; 8PSK for EDGE; QPSK for WCDMA
Type of Emission:	GMSK: 261KGXW

	8PSK: 264KG7W QPSK: 4M17F9W
Antenna Gain:	-0.5dBi for 824~849MHz 2.8dBi for 1850~1910MHz
Type of Antenna:	Integral Antenna

*Note: The test data is gathered from a production sample, provided by the manufacture.*

## 1.2 Test Standards

The following report is prepared on behalf of the Verykool USA 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.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted with Low Channel, Middle Channel and High Channel, accordingly in reference to the Operating Instructions.

## 1.4 Test Facility

- **FCC – Registration No.: 994117**

SEM.Test Compliance Services 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 994117.

- **Industry Canada (IC) Registration No.: 7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service 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 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

### 1.5 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components.

### 1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
N/A	N/A	N/A	N/A

### 1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	Shielded	Without Core
Earphone Cable	1.1	Unshielded	Without Core

## 2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	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 complies with the requirement of the RF exposure, please see the SAR test report.

## 4. RF OUTPUT POWER

### 4.1 Standard Applicable

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

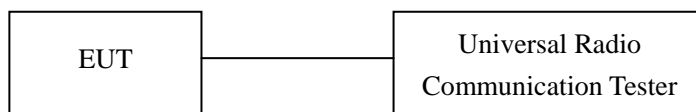
According to §24.232 (c), no any case may the peak output power of mobile or portable station transmitter exceed 2 Watt EIRP.

### 4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	112012	2012-03-28	2013-03-27
Signal Generator	R&S	SMR20	100047	2012-03-28	2013-03-27

### 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	Corrected Ampl.	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	33.63	1.5	0	H	1.5	0	32.13	38.45
824.2	34.04	1.5	0	V	1.5	0	32.54	38.45
Middle Channel								
836.6	33.58	1.5	0	H	1.5	0	32.08	38.45
836.6	33.83	1.5	0	V	1.5	0	32.33	38.45
High Channel								
848.8	33.62	1.5	0	H	1.5	0	32.12	38.45
848.8	34.07	1.5	0	V	1.5	0	32.57	38.45

EIRP For GSM Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	21.82	1.5	0	H	1.9	7.7	27.62	33
1850.2	22.74	1.5	0	V	1.9	7.7	28.54	33
Middle Channel								
1880.0	22.22	1.5	0	H	1.9	7.7	28.02	33
1880.0	22.88	1.5	0	V	1.9	7.7	28.68	33
High Channel								
1909.8	21.87	1.5	0	H	1.9	7.7	27.67	33
1909.8	22.63	1.5	0	V	1.9	7.7	28.43	33

## ERP For GPRS Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	33.52	1.5	0	H	1.5	0	32.02	38.45
824.2	34.17	1.5	0	V	1.5	0	32.67	38.45
Middle Channel								
836.6	33.47	1.5	0	H	1.5	0	31.97	38.45
836.6	34.08	1.5	0	V	1.5	0	32.58	38.45
High Channel								
848.8	32.12	1.5	0	H	1.5	0	30.62	38.45
848.8	34.35	1.5	0	V	1.5	0	32.85	38.45

## EIRP For GPRS Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	21.84	1.5	0	H	1.9	7.7	27.64	33
1850.2	22.98	1.5	0	V	1.9	7.7	28.78	33
Middle Channel								
1880.0	21.94	1.5	0	H	1.9	7.7	27.74	33
1880.0	22.85	1.5	0	V	1.9	7.7	28.65	33
High Channel								
1909.8	21.78	1.5	0	H	1.9	7.7	27.58	33
1909.8	23.10	1.5	0	V	1.9	7.7	28.90	33

## ERP For EDGE Mode GSM850

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
824.2	27.14	1.5	0	H	1.5	0	25.64	38.45
824.2	28.25	1.5	0	V	1.5	0	26.75	38.45
Middle Channel								
836.6	26.87	1.5	0	H	1.5	0	25.37	38.45
836.6	28.32	1.5	0	V	1.5	0	26.82	38.45
High Channel								
848.8	27.05	1.5	0	H	1.5	0	25.55	38.45
848.8	28.30	1.5	0	V	1.5	0	26.80	38.45

## EIRP For EDGE Mode PCS1900

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1850.2	17.87	1.5	0	H	1.9	7.7	23.67	33
1850.2	19.05	1.5	0	V	1.9	7.7	24.85	33
Middle Channel								
1880.0	18.17	1.5	0	H	1.9	7.7	23.97	33
1880.0	19.08	1.5	0	V	1.9	7.7	24.88	33
High Channel								
1909.8	17.96	1.5	0	H	1.9	7.7	23.76	33
1909.8	18.97	1.5	0	V	1.9	7.7	24.77	33

## ERP For WCDMA Mode Band V

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	18.02	1.5	0	H	1.5	0	16.52	38.45
826.4	21.28	1.5	0	V	1.5	0	19.78	38.45
Middle Channel								
836.4	18.28	1.5	0	H	1.5	0	16.78	38.45
836.4	20.92	1.5	0	V	1.5	0	19.42	38.45
High Channel								
846.6	18.74	1.5	0	H	1.5	0	17.24	38.45
846.6	20.86	1.5	0	V	1.5	0	19.36	38.45

## EIRP For WCDMA Mode Band II

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dBi	dBm	dBm
Low Channel								
1852.4	11.72	1.5	0	H	1.9	7.7	17.52	33
1852.4	14.55	1.5	0	V	1.9	7.7	20.35	33
Middle Channel								
1880.0	12.44	1.5	0	H	1.9	7.7	18.24	33
1880.0	14.74	1.5	0	V	1.9	7.7	20.54	33
High Channel								
1907.6	12.09	1.5	0	H	1.9	7.7	17.89	33
1907.6	14.38	1.5	0	V	1.9	7.7	20.18	33

## ERP For HSUPA Mode Band V

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	18.04	1.5	0	H	1.5	0	16.54	38.45
826.4	19.71	1.5	0	V	1.5	0	18.21	38.45
Middle Channel								
836.4	17.75	1.5	0	H	1.5	0	16.25	38.45
836.4	19.92	1.5	0	V	1.5	0	18.42	38.45
High Channel								
846.6	17.82	1.5	0	H	1.5	0	16.32	38.45
846.6	19.97	1.5	0	V	1.5	0	18.47	38.45

## EIRP For HSUPA Mode Band II

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dBi	dBm	dBm
Low Channel								
1852.4	10.07	1.5	0	H	1.9	7.7	15.87	33
1852.4	12.54	1.5	0	V	1.9	7.7	18.34	33
Middle Channel								
1880.0	10.15	1.5	0	H	1.9	7.7	15.95	33
1880.0	12.36	1.5	0	V	1.9	7.7	18.16	33
High Channel								
1907.6	9.86	1.5	0	H	1.9	7.7	15.66	33
1907.6	12.63	1.5	0	V	1.9	7.7	18.43	33

## ERP For HSDPA Mode Band V

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	19.15	1.5	0	H	1.5	0	17.65	38.45
826.4	21.59	1.5	0	V	1.5	0	20.09	38.45
Middle Channel								
836.4	18.37	1.5	0	H	1.5	0	16.87	38.45
836.4	21.18	1.5	0	V	1.5	0	19.68	38.45
High Channel								
846.6	17.75	1.5	0	H	1.5	0	16.25	38.45
846.6	20.96	1.5	0	V	1.5	0	19.46	38.45

## EIRP For HSDPA Mode Band II

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
1852.4	9.65	1.5	0	H	1.9	7.7	15.45	33
1852.4	12.46	1.5	0	V	1.9	7.7	18.26	33
Middle Channel								
1880.0	9.98	1.5	0	H	1.9	7.7	15.78	33
1880.0	13.32	1.5	0	V	1.9	7.7	19.12	33
High Channel								
1907.6	10.65	1.5	0	H	1.9	7.7	16.45	33
1907.6	12.67	1.5	0	V	1.9	7.7	18.47	33

## Max. Conducted Output Power

## For Cellular Band (GSM850)

Test Mode	Channel	Frequency (MHz)	Output Power (dBm)	FCC Part 22.913 Limit (dBm)
GSM	Low Channel	824.2	33.59	38.45
	Middle Channel	836.6	33.47	38.45
	High Channel	848.8	31.08	38.45
GPRS	Low Channel	824.2	33.52	38.45
	Middle Channel	836.6	33.42	38.45
	High Channel	848.8	31.02	38.45
EDGE	Low Channel	824.2	27.12	38.45
	Middle Channel	836.6	27.34	38.45
	High Channel	848.8	27.27	38.45

## For PCS Band (GSM1900)

Test Mode	Channel	Frequency (MHz)	Output Power (dBm)	FCC Part 24.232 Limit (dBm)
GSM	Low Channel	1850.2	29.28	33
	Middle Channel	1880.0	29.33	33
	High Channel	1909.8	29.47	33
GPRS	Low Channel	1850.2	29.44	33
	Middle Channel	1880.0	29.44	33
	High Channel	1909.8	29.65	33
EDGE	Low Channel	1850.2	25.87	33
	Middle Channel	1880.0	25.67	33
	High Channel	1909.8	25.84	33

## For WCDMA Band V

Test Mode	Channel	Frequency (MHz)	Output Power (dBm)	FCC Part 22.913 Limit (dBm)
WCDMA	Low Channel	826.4	21.85	38.45
	Middle Channel	836.4	21.73	38.45
	High Channel	846.6	21.80	38.45
HSUPA	Low Channel	826.4	21.84	38.45
	Middle Channel	836.4	21.72	38.45
	High Channel	846.6	21.77	38.45
HSDPA	Low Channel	826.4	21.81	38.45
	Middle Channel	836.4	21.71	38.45
	High Channel	846.6	21.79	38.45

## For WCDMA Band II

Test Mode	Channel	Frequency (MHz)	Output Power (dBm)	FCC Part 24.232 Limit (dBm)
WCDMA	Low Channel	1852.4	21.45	33
	Middle Channel	1880.0	21.37	33
	High Channel	1907.6	21.39	33
HSUPA	Low Channel	1852.4	21.43	33
	Middle Channel	1880.0	21.36	33
	High Channel	1907.6	21.33	33
HSDPA	Low Channel	1852.4	21.43	33
	Middle Channel	1880.0	21.35	33
	High Channel	1907.6	21.33	33



## 5. EMISSION BANDWIDTH

### 5.1 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.

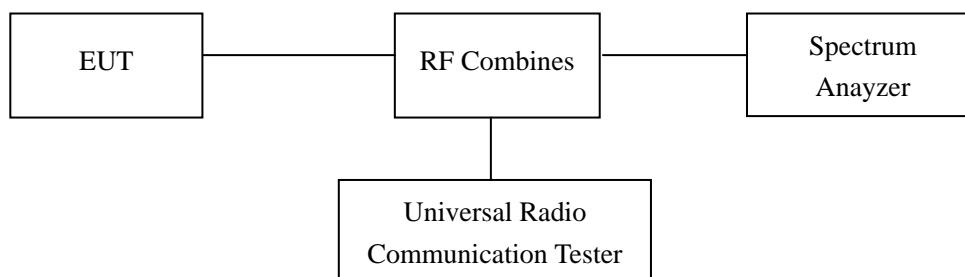
### 5.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B	US41192821	2012-03-28	2013-03-27
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	112012	2012-03-28	2013-03-27

### 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 26dB bandwidth 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/Plots

For Cellular Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	128	824.2	258.5400	360.935
	190	836.6	261.8000	381.444
	251	848.8	256.3100	351.366
GPRS	128	824.2	260.3501	368.710
	190	836.6	261.8066	381.444
	251	848.8	256.6187	351.670
EDGE	128	824.2	264.4306	385.548
	190	836.6	256.4418	359.575
	251	848.8	257.9975	338.507

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	256.7524	344.564
	661	1880.0	255.9621	346.395
	810	1909.8	255.3124	345.247
GPRS	512	1850.2	254.6105	348.413
	661	1880.0	256.4871	347.502
	810	1909.8	254.3460	341.172
EDGE	512	1850.2	254.6639	348.413
	661	1880.0	256.5171	347.542
	810	1909.8	254.4660	342.172

## For Band II

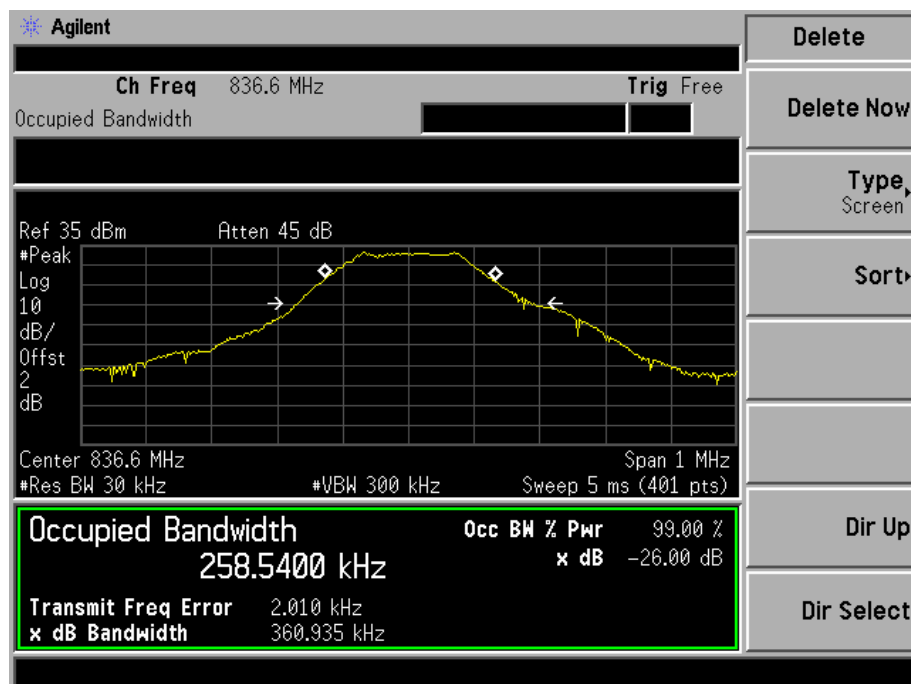
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	9400	1880.0	4165.80	4614.00
HSUPA	9262	1852.4	4176.50	4610.00
HSDPA	9400	1880.0	4168.10	4614.00

## For Band V

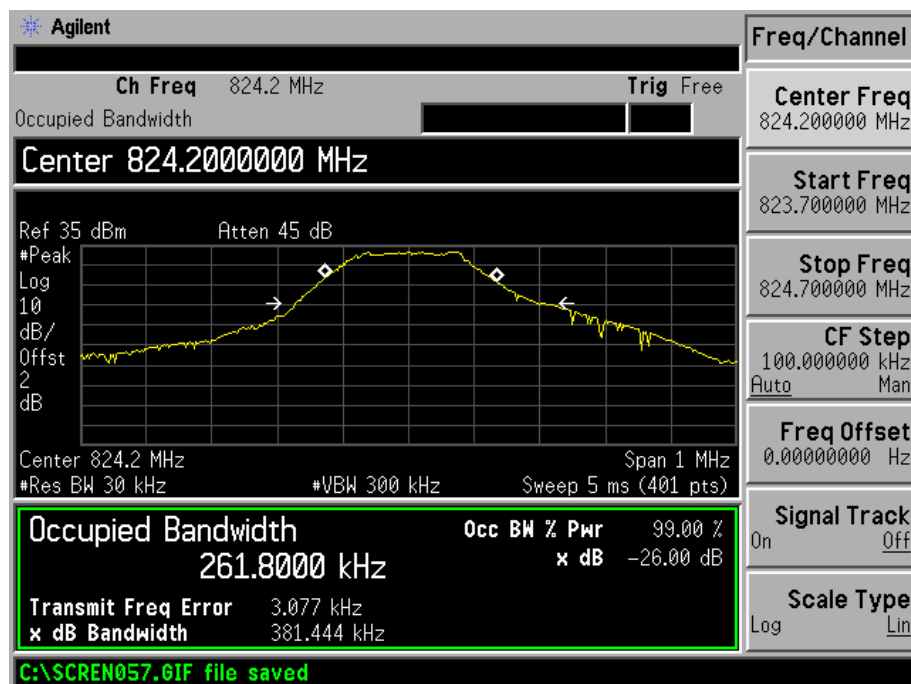
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	4182	836.4	4163.80	4628.00
HSUPA	4182	836.4	4158.80	4648.00
HSDPA	4182	836.4	4148.90	4644.00

*Please refer to the following test plots:*

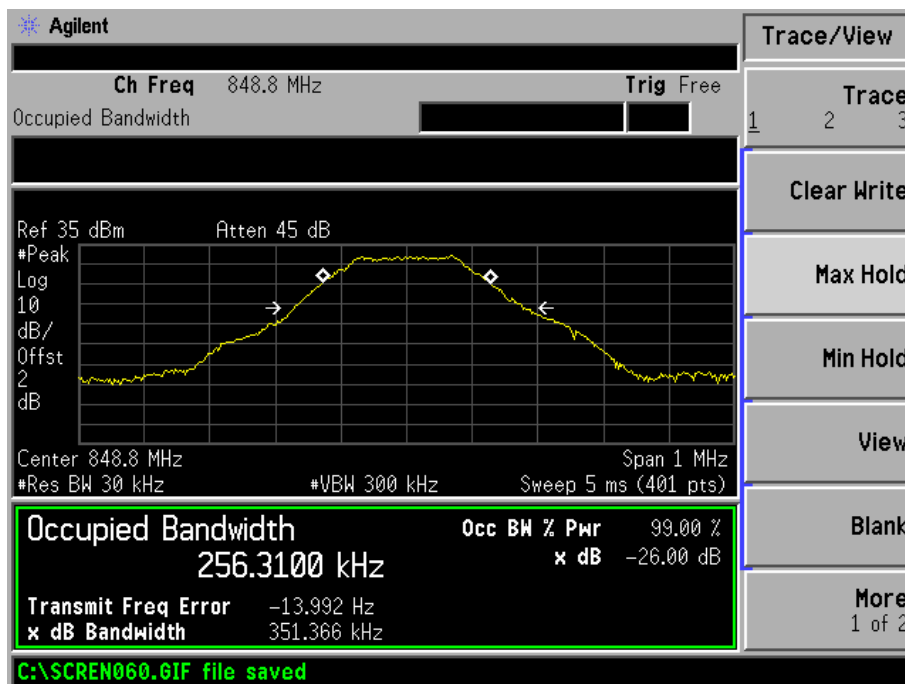
For Cellular Band  
GSM Low Channel



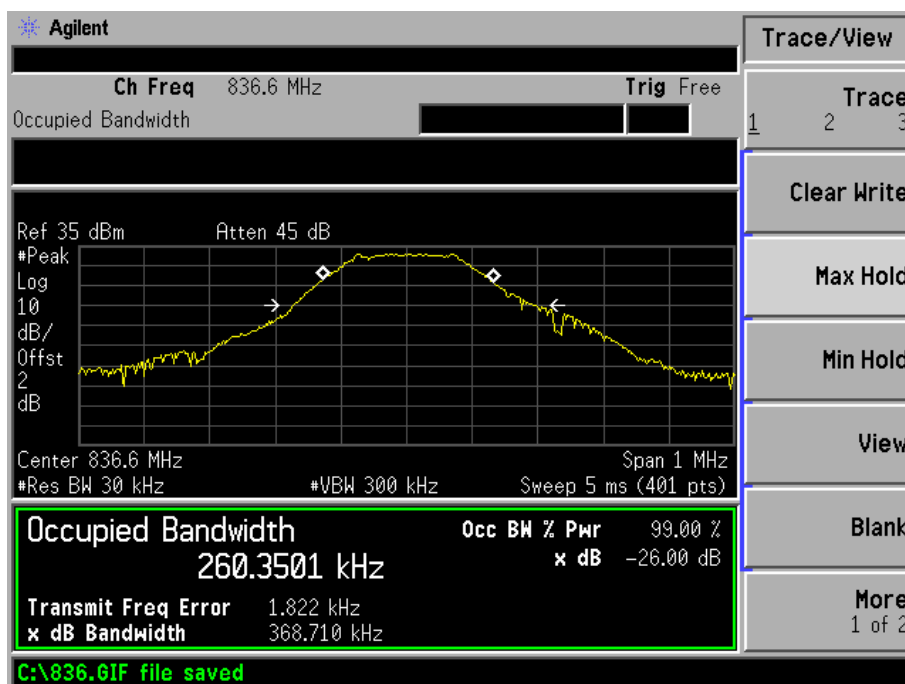
GSM Middle Channel



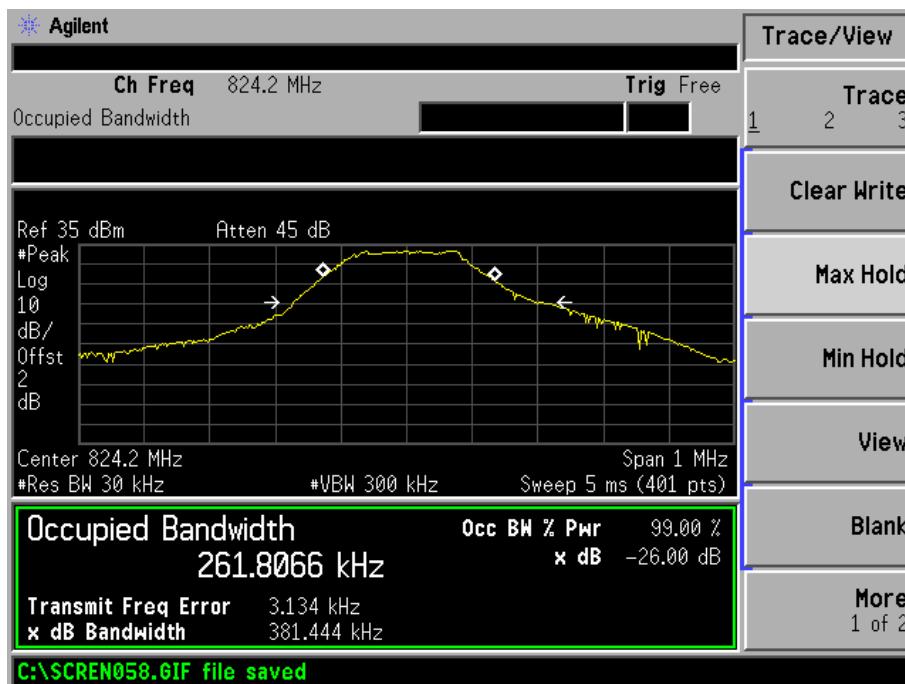
# GSM High channel



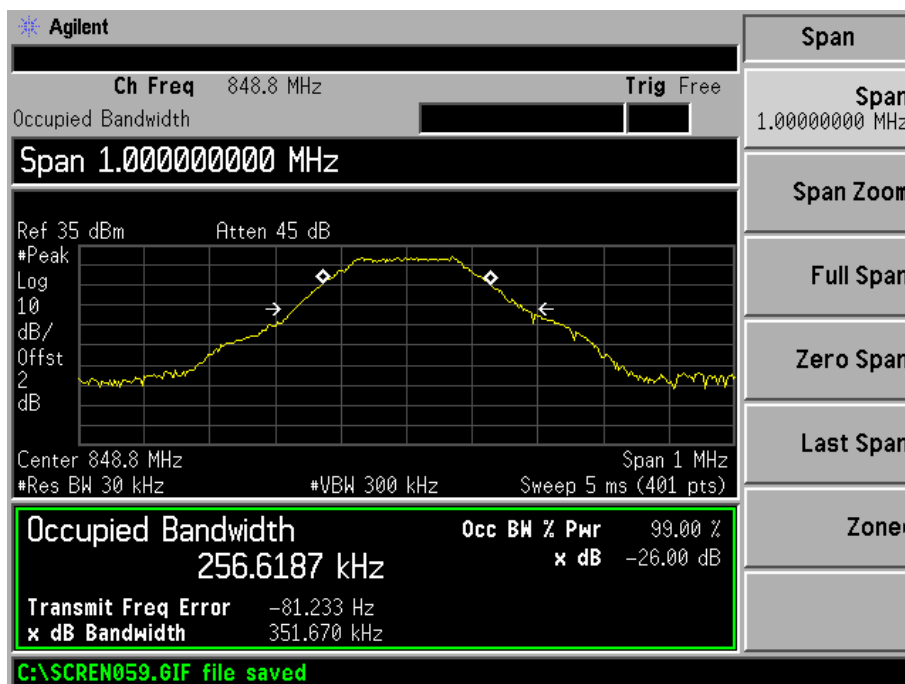
# GPRS Low Channel



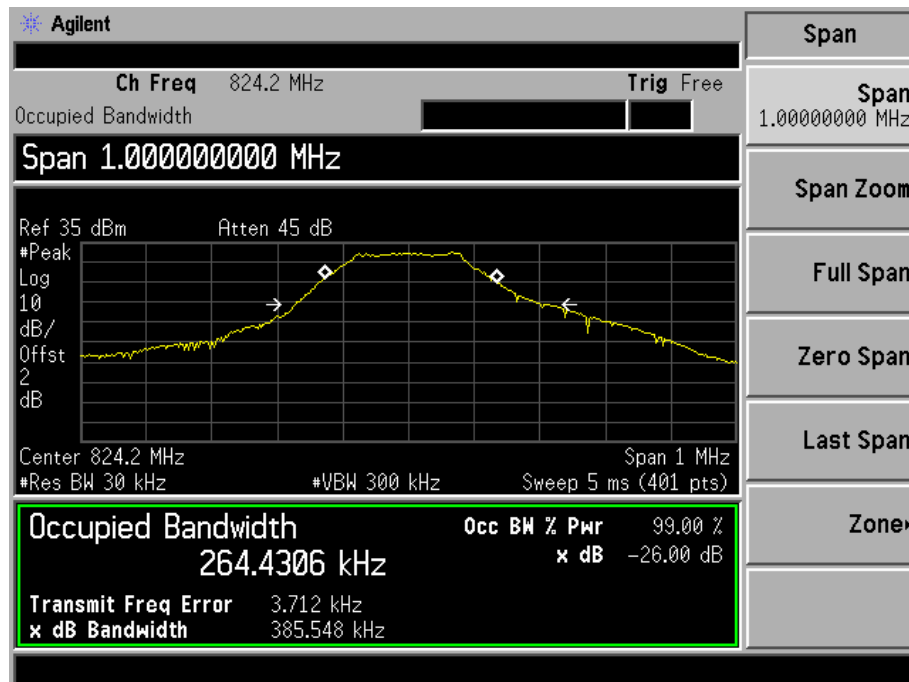
# GPRS Middle Channel



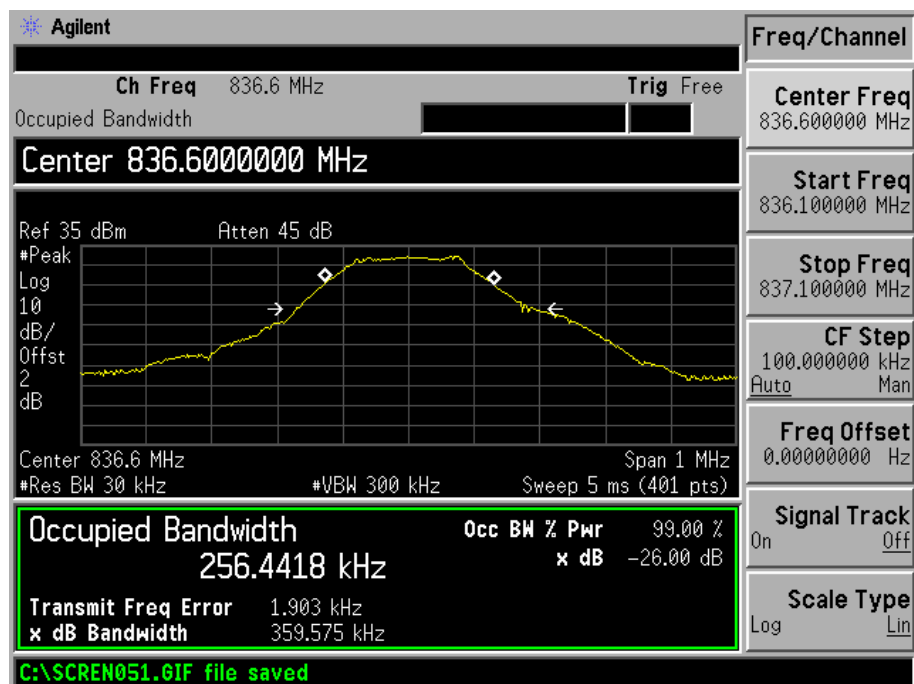
# GPRS High Channel



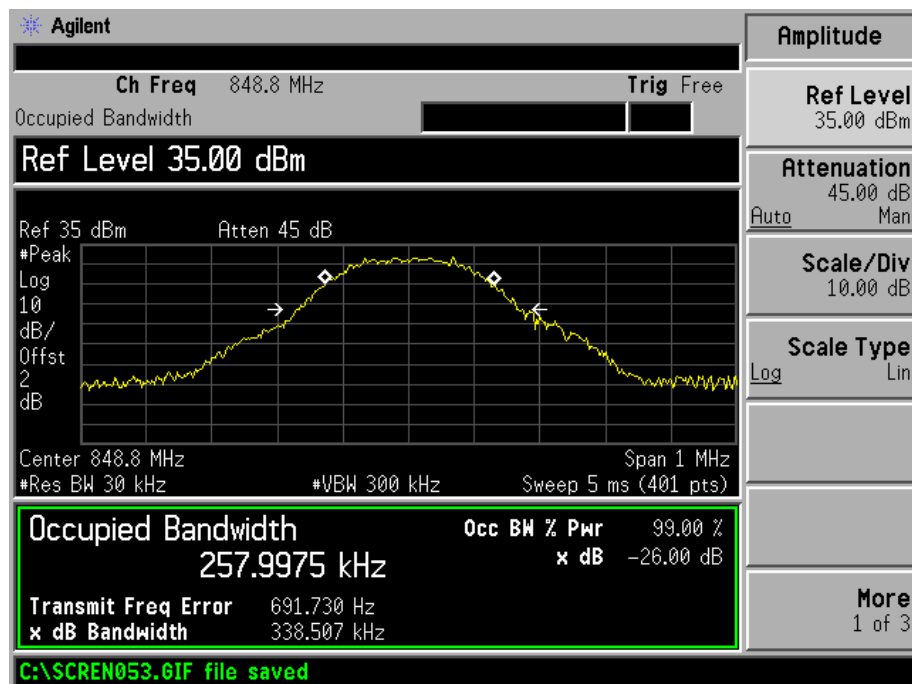
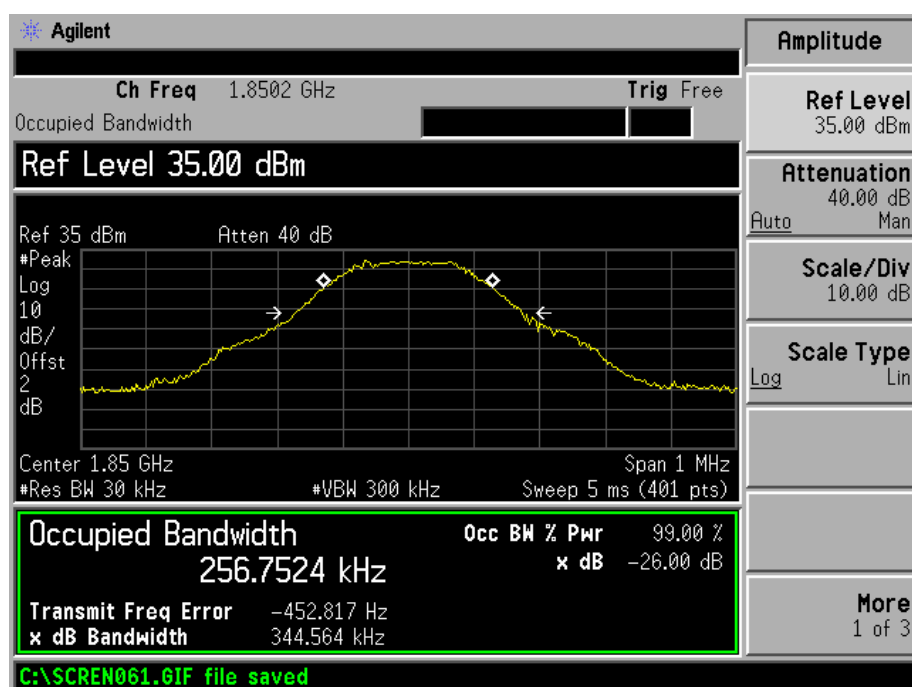
## EDGE Low Channel



## EDGE Middle Channel

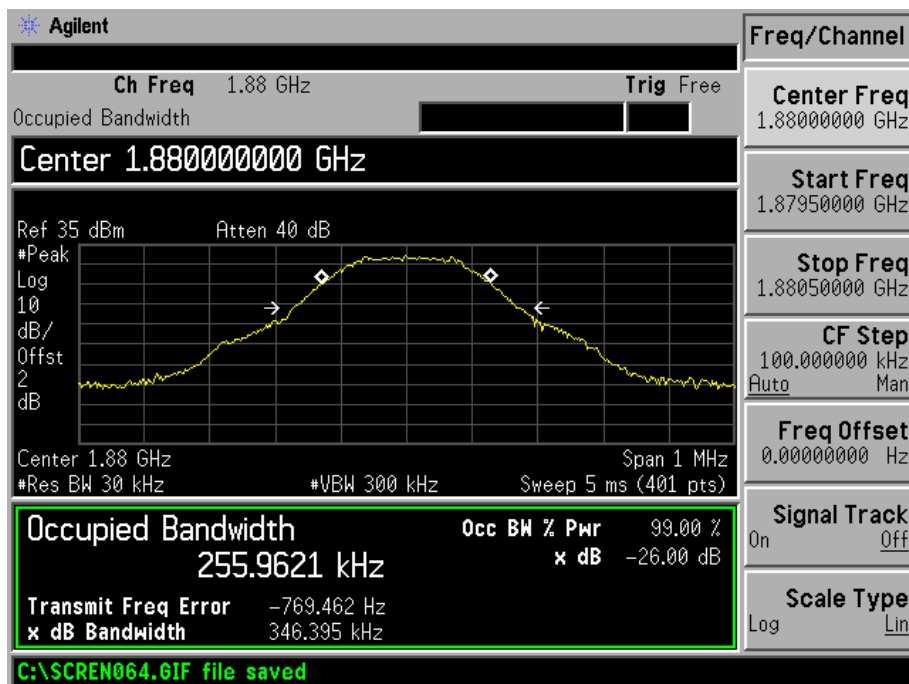


## EDGE High channel

For PCS Band  
GSM Low Channel



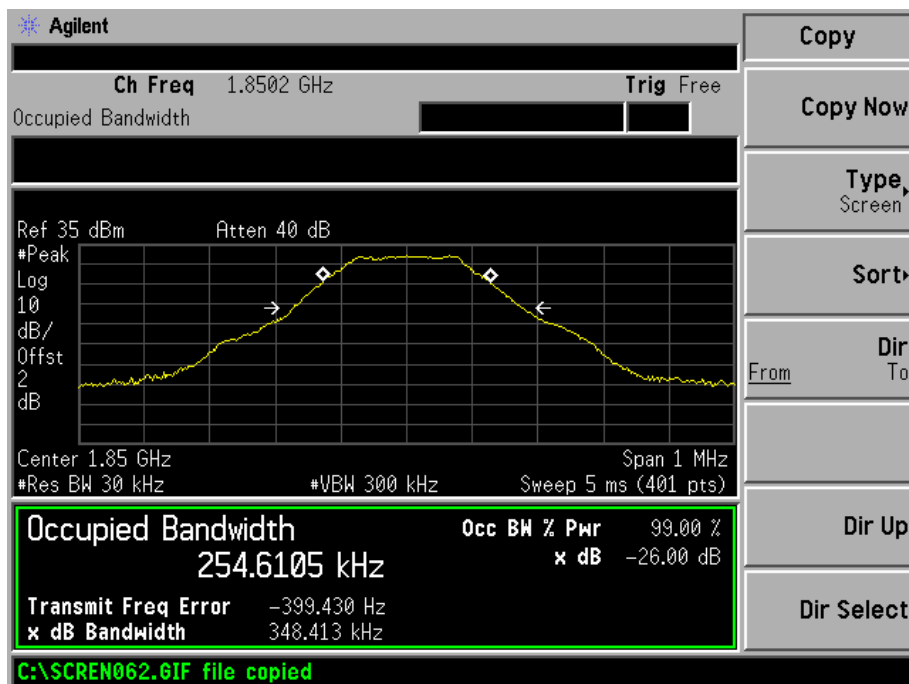
## GSM Middle Channel



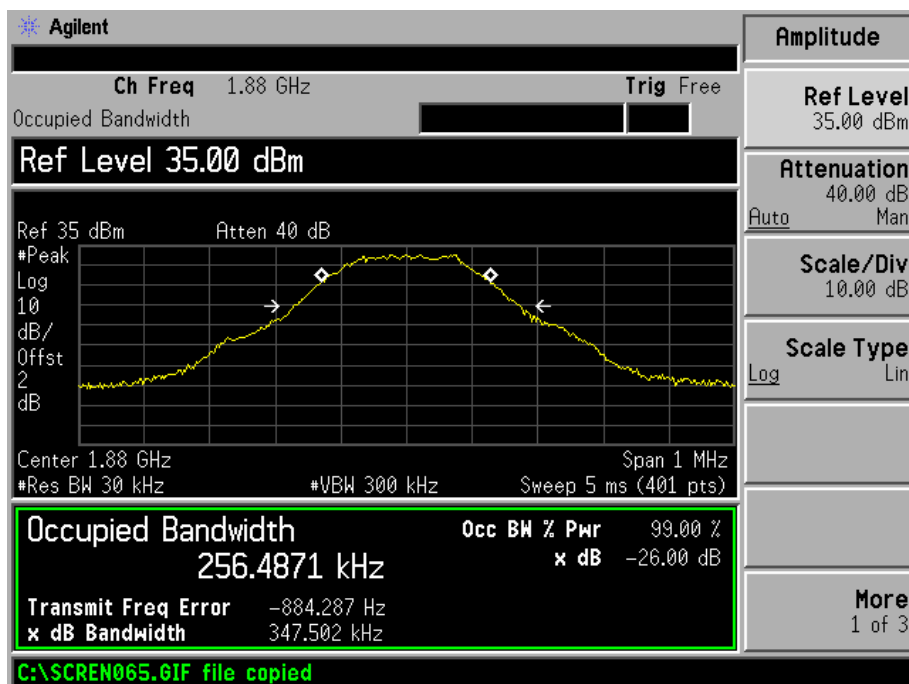
## GSM High channel



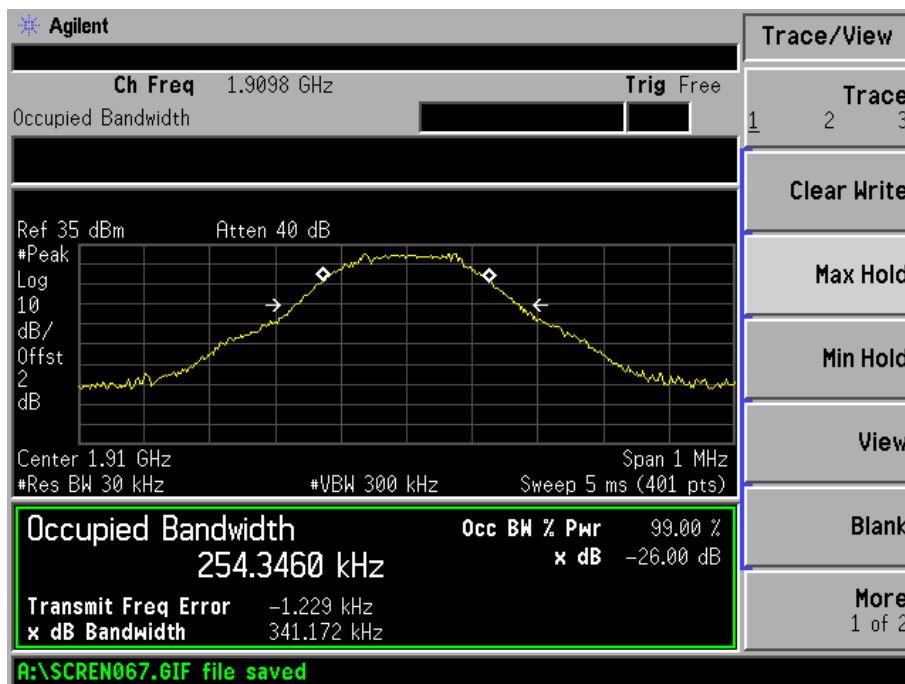
## GPRS Low Channel



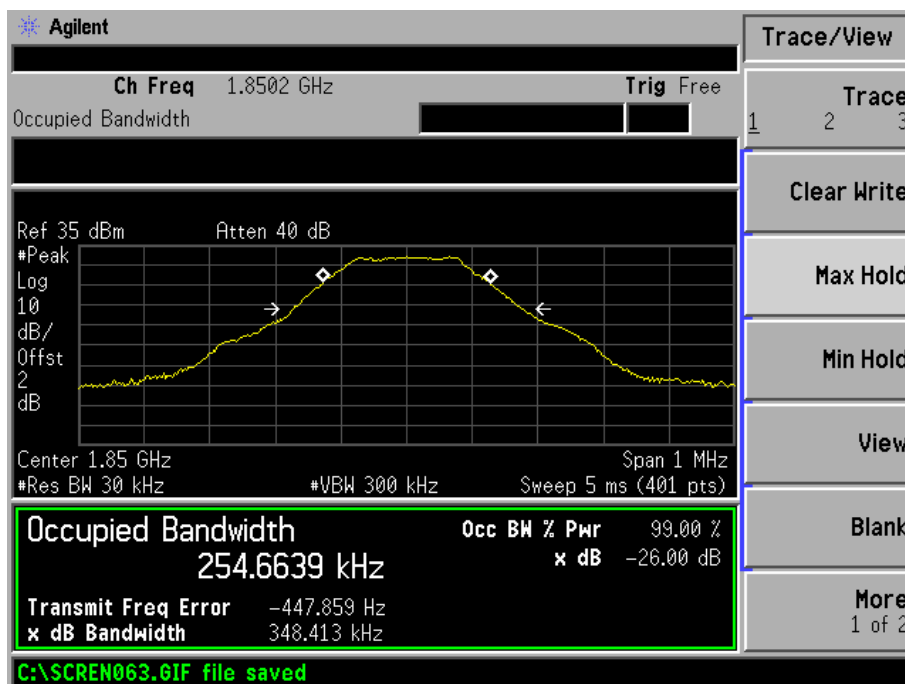
## GPRS Middle Channel



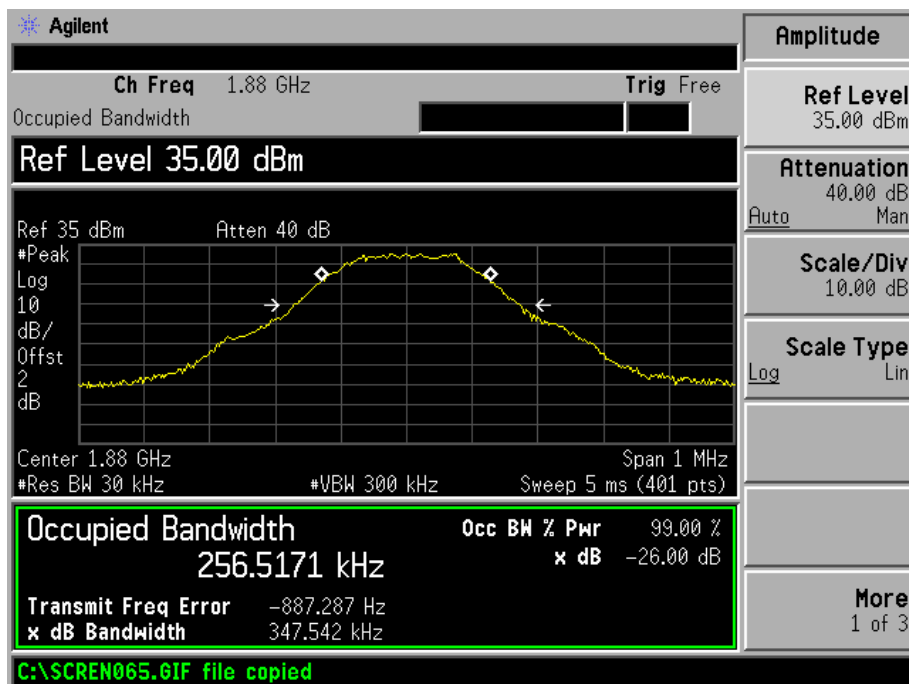
## GPRS High Channel



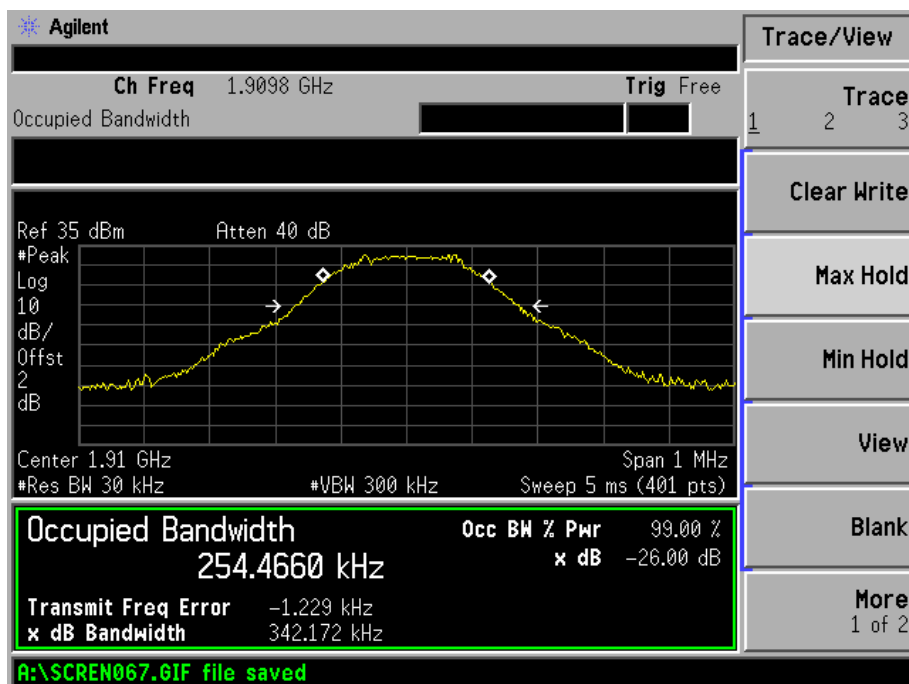
## EDGE Low Channel



## EDGE Middle Channel

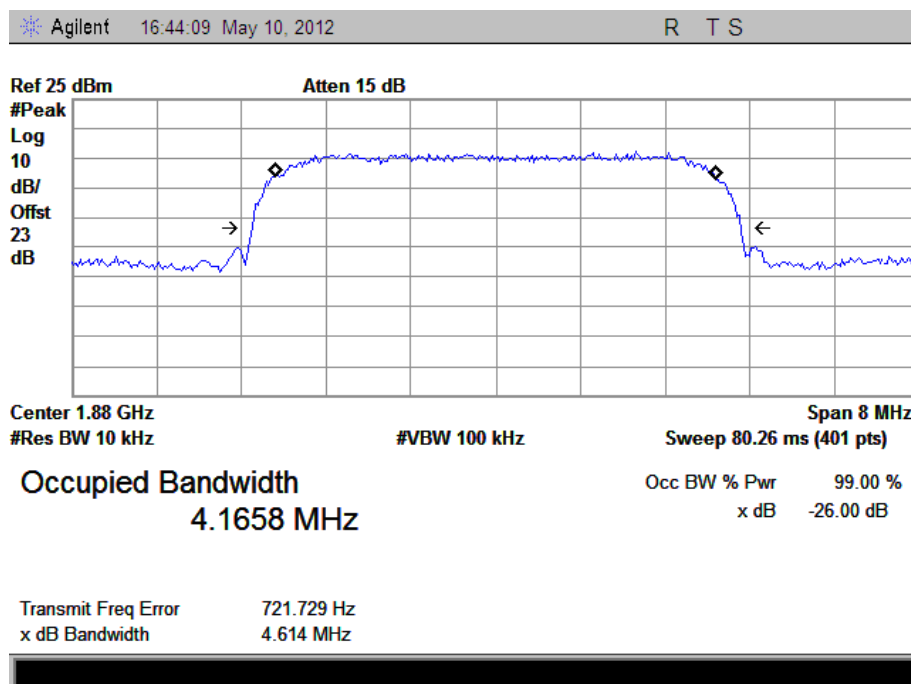


## EDGE High channel

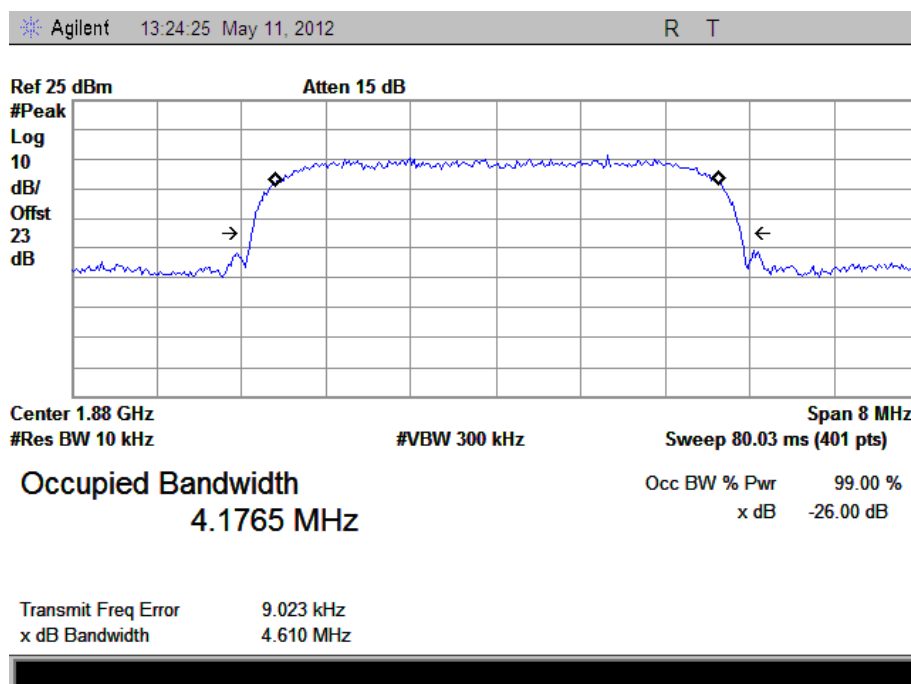


For Band II

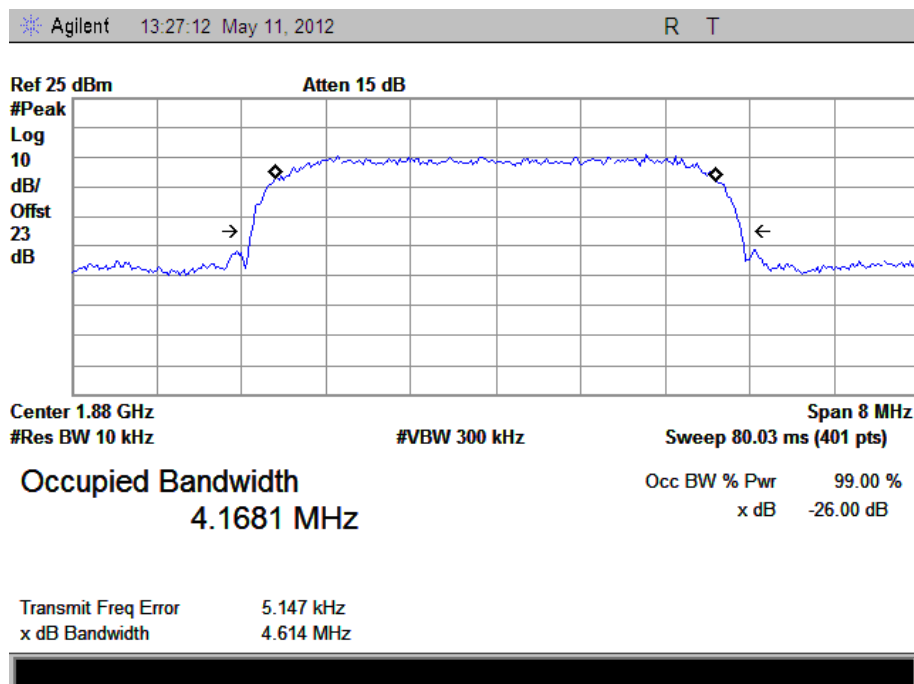
WCDMA Middle Channel



HSUPA Middle Channel

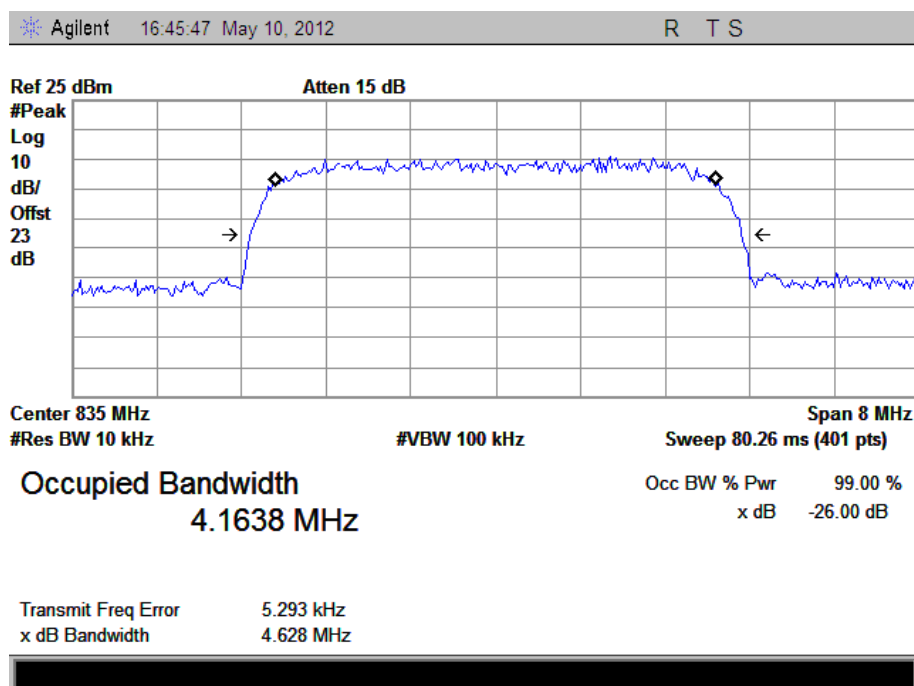


## HSDPA Middle Channel

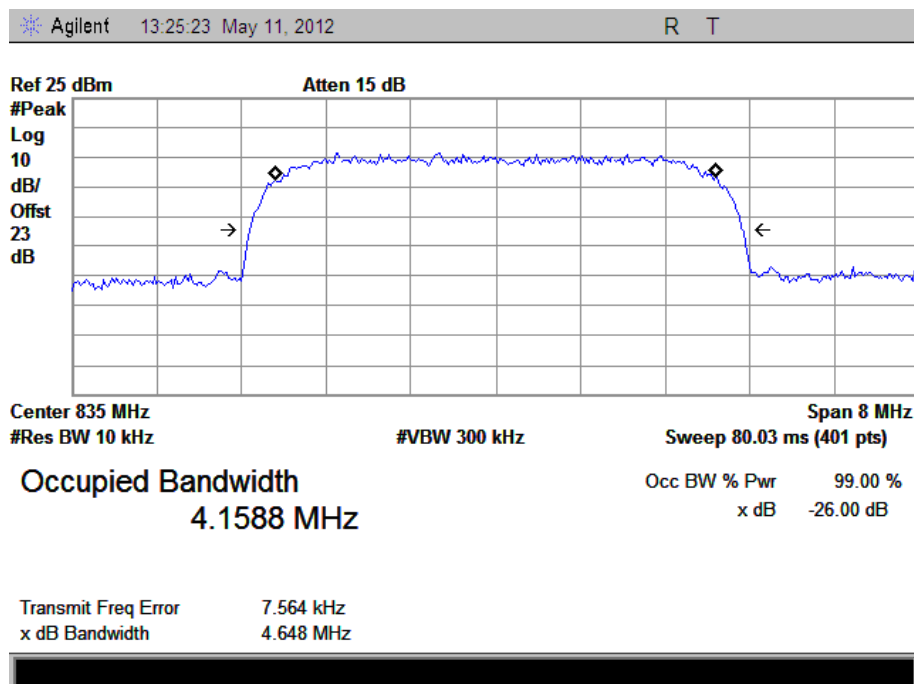


## For Band V

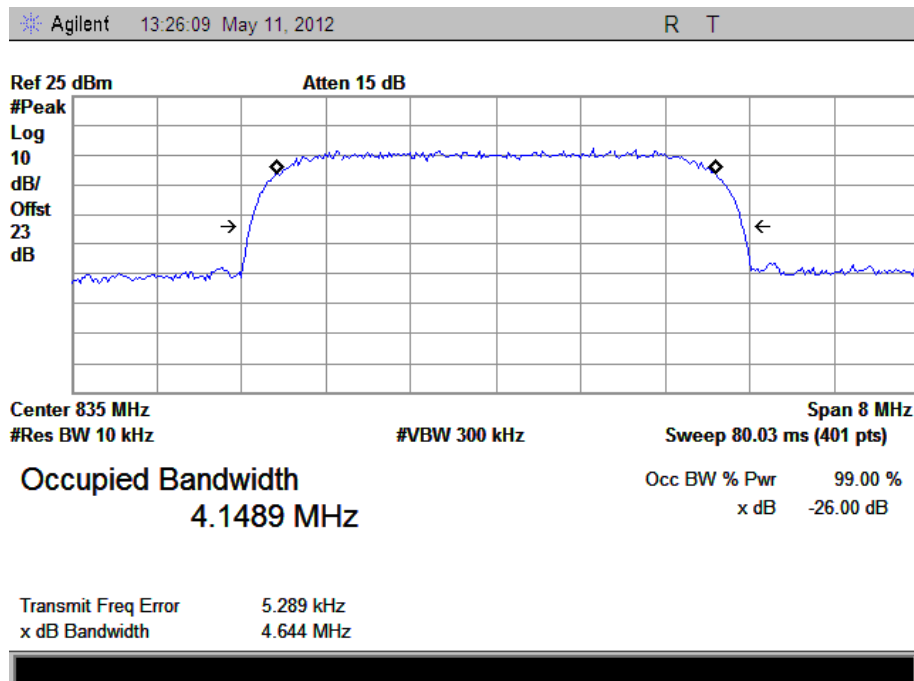
## WCDMA Middle Channel



## HSUPA Middle Channel



## HSDPA Middle Channel



## 6. OUT OF BAND EMISSION AT ANTENNA TERMINAL

### 6.1 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.

### 6.2 Test Equipment List and Details

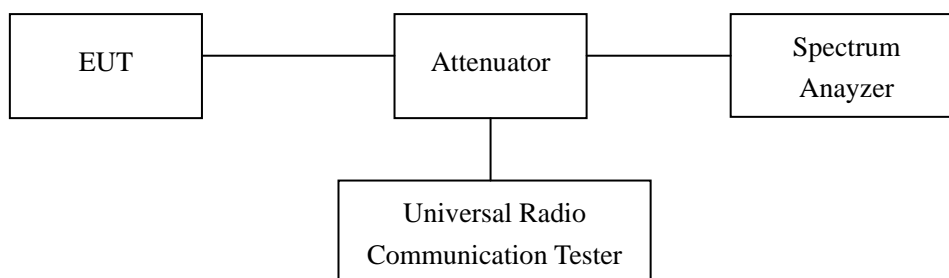
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B	US41192821	2012-03-28	2013-03-27
Rohde & Schwarz	Spectrum Analyzer	FSP	836079/035	2012-03-28	2013-03-27
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	112012	2012-03-28	2013-03-27

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

### 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 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:



### 6.4 Environmental Conditions

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

### 6.5 Summary of Test Results/Plots

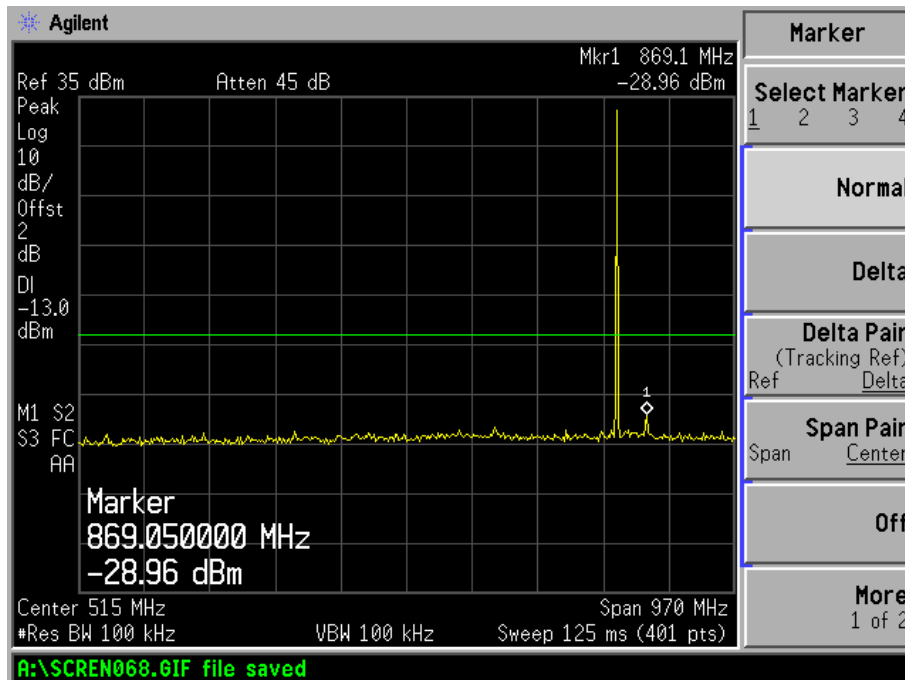


Please refer to the following test plots

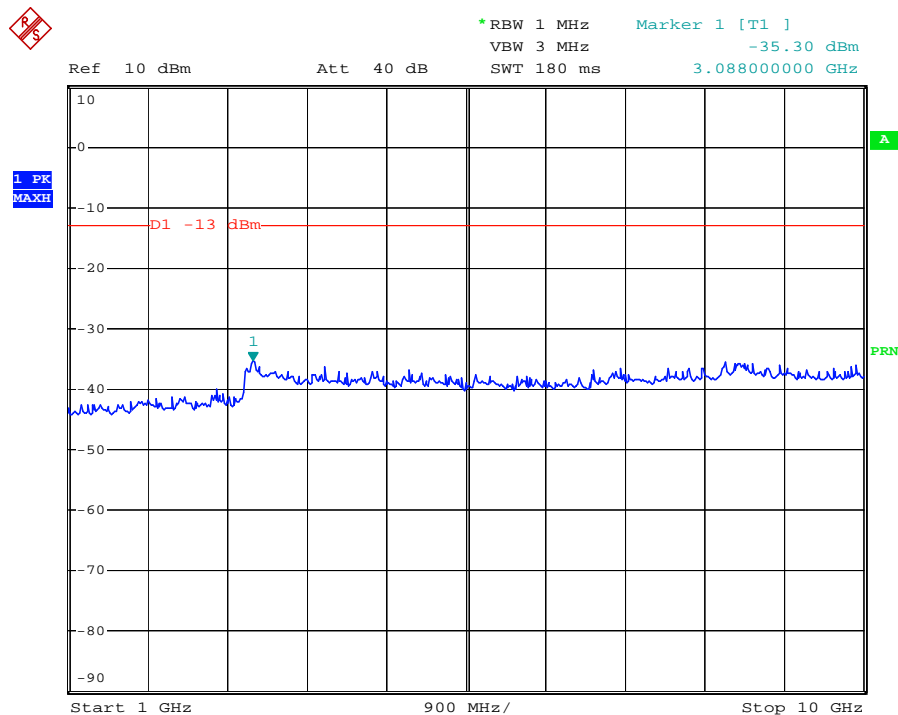
For Cellular Band

GSM Low Channel

30MHz to 1GHz

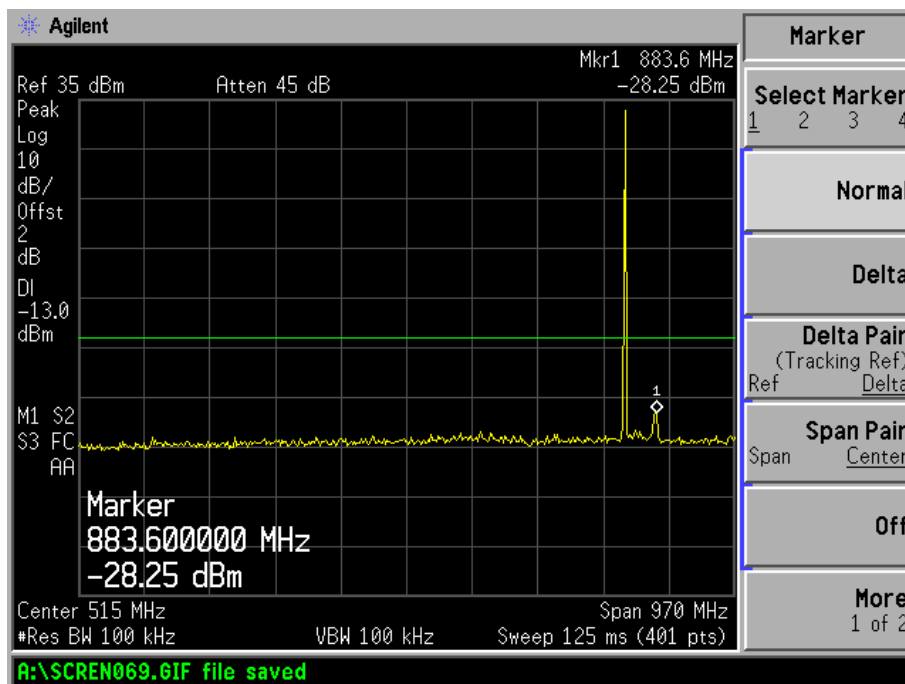


Above 1GHz

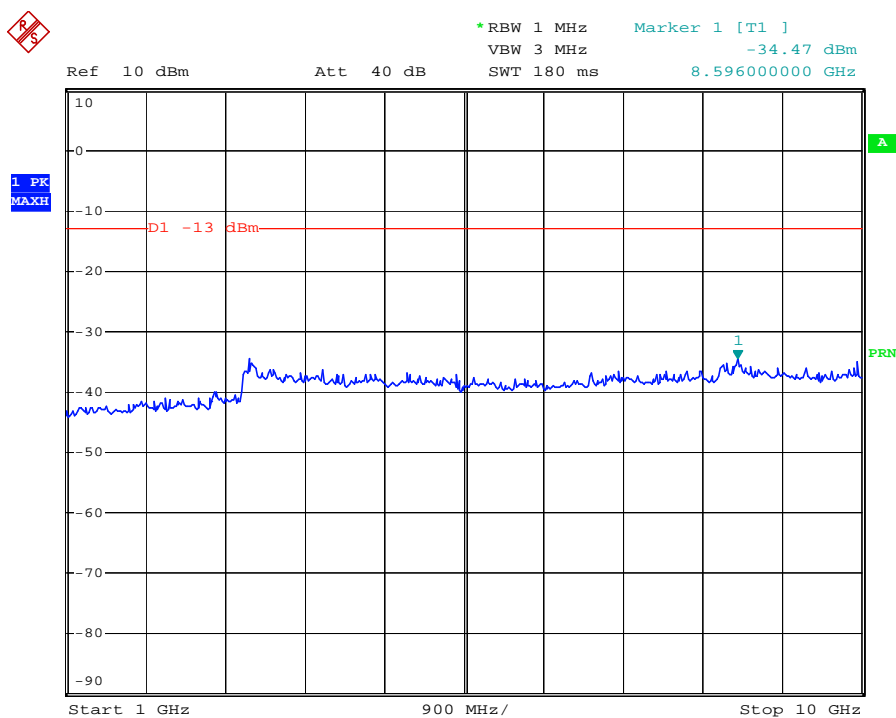


## GSM Middle Channel

30MHz to 1GHz

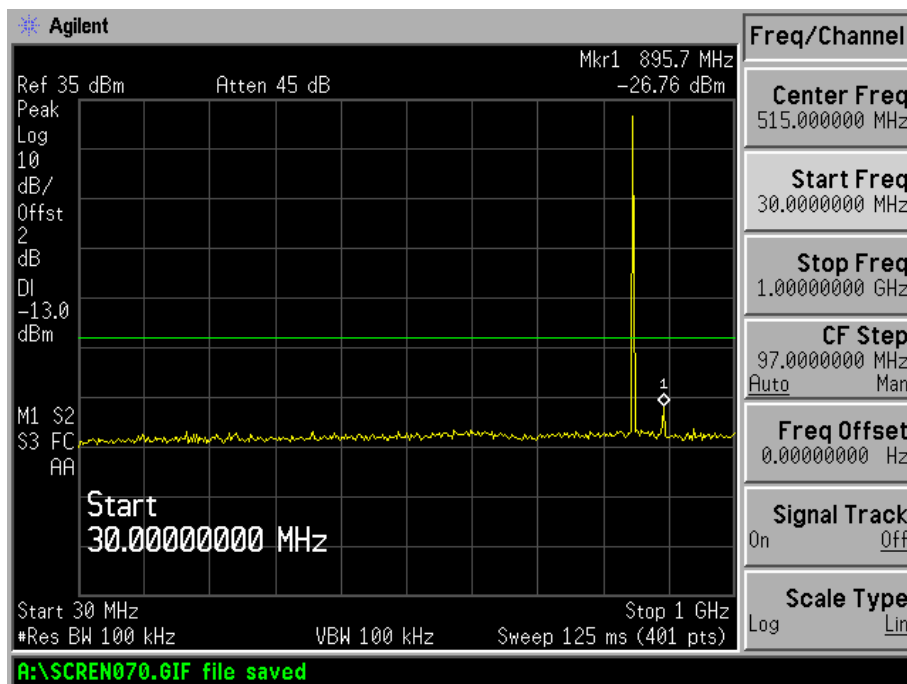


## Above 1GHz

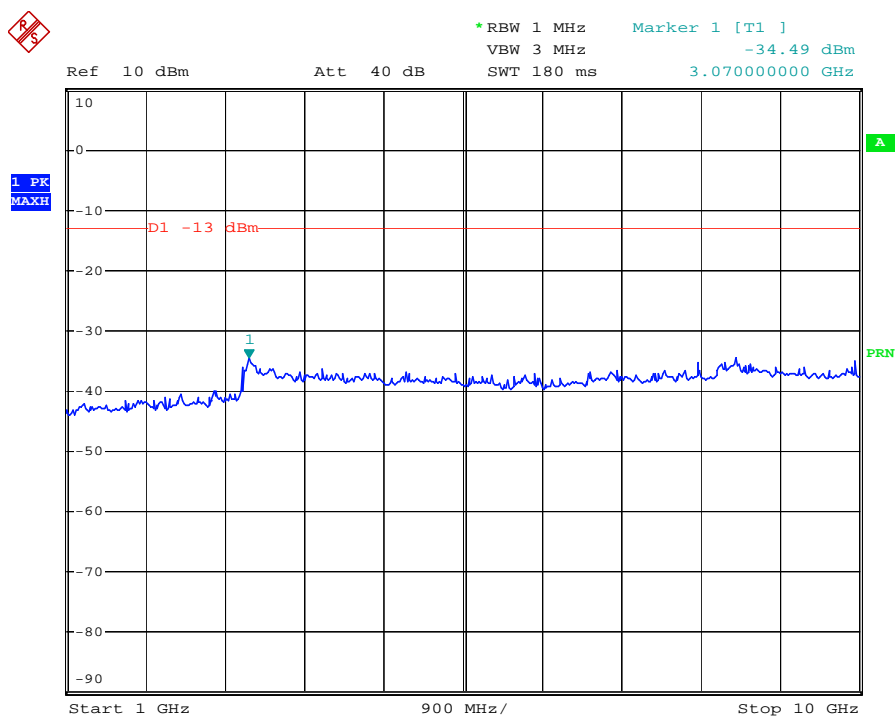


## GSM High Channel

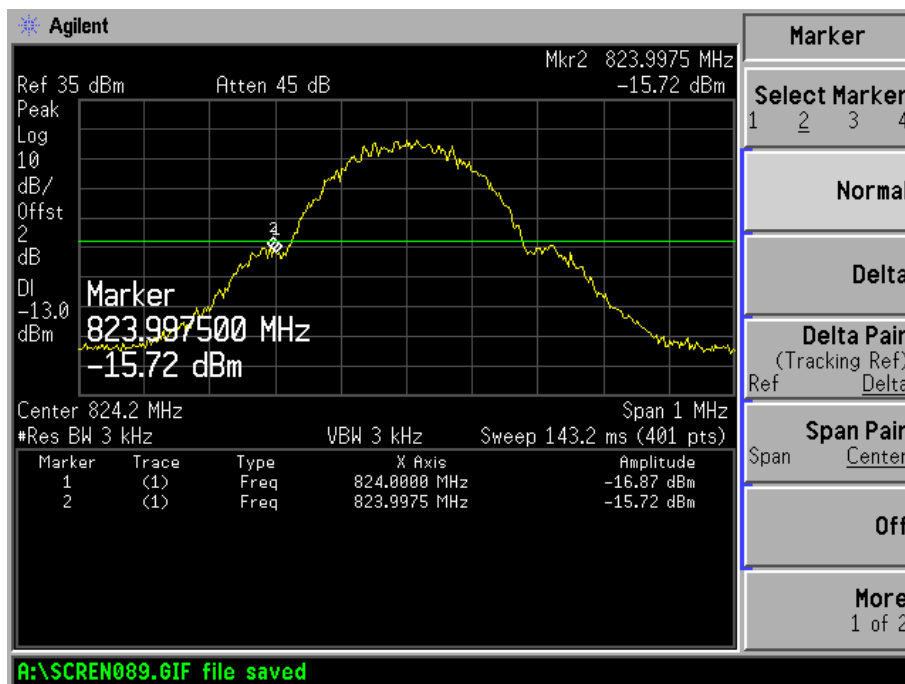
30MHz to 1GHz



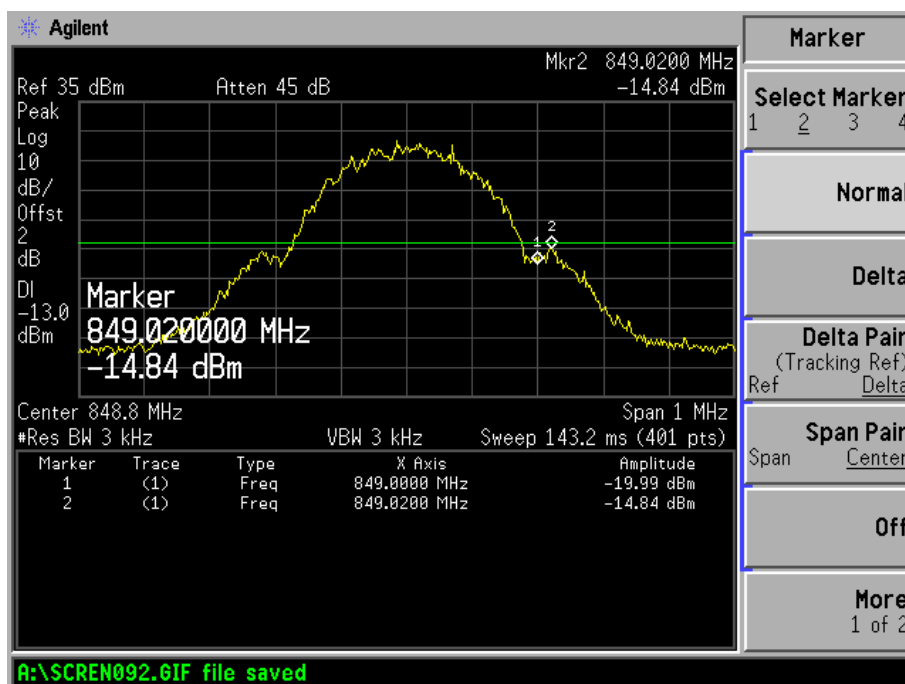
## Above 1GHz



# GSM Low Band Emission

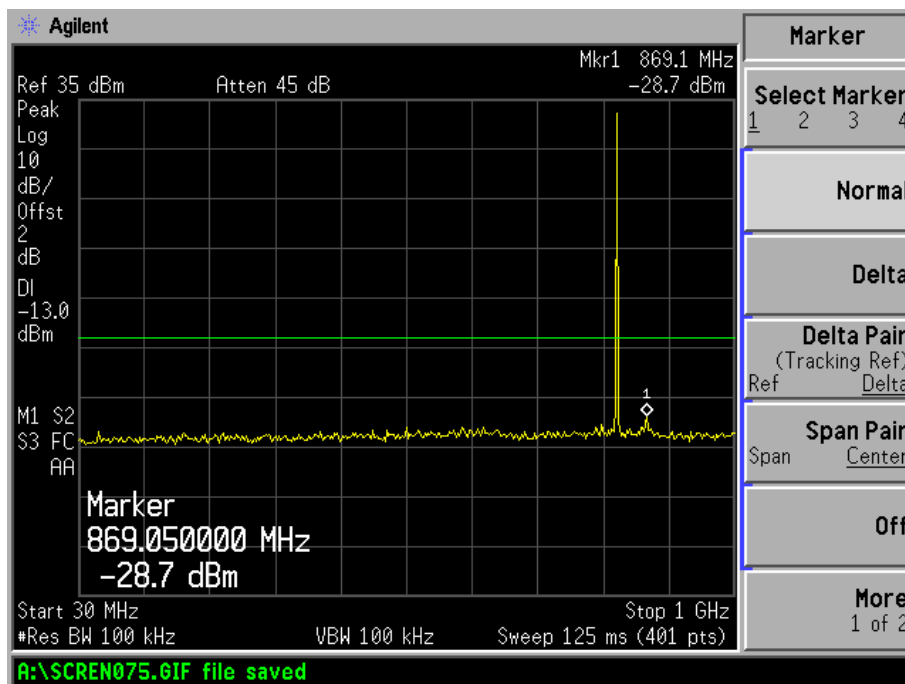


# GSM High Band Emission

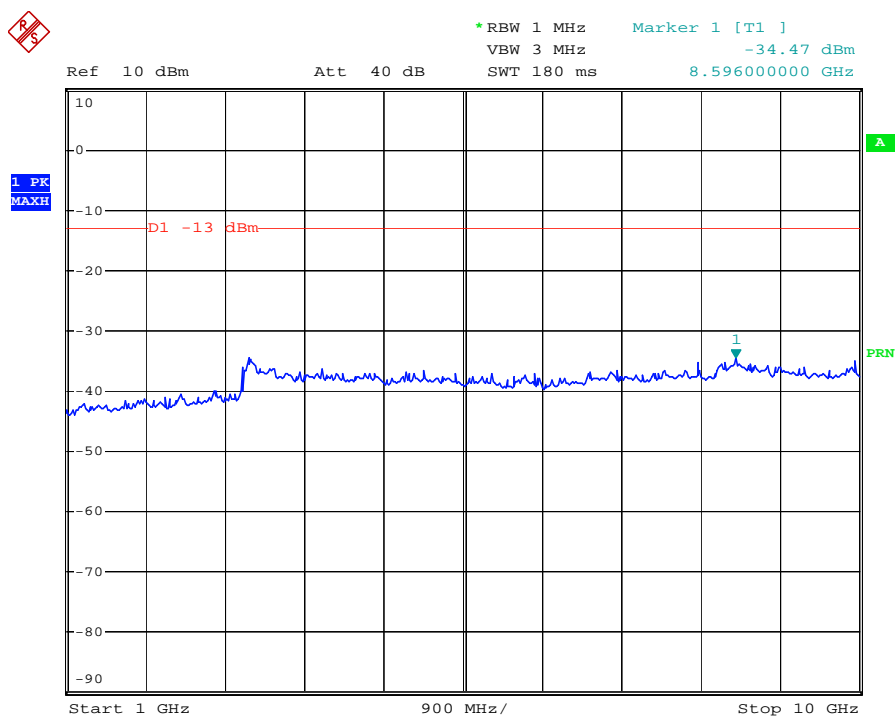


## GPRS Low Channel

30MHz to 1GHz

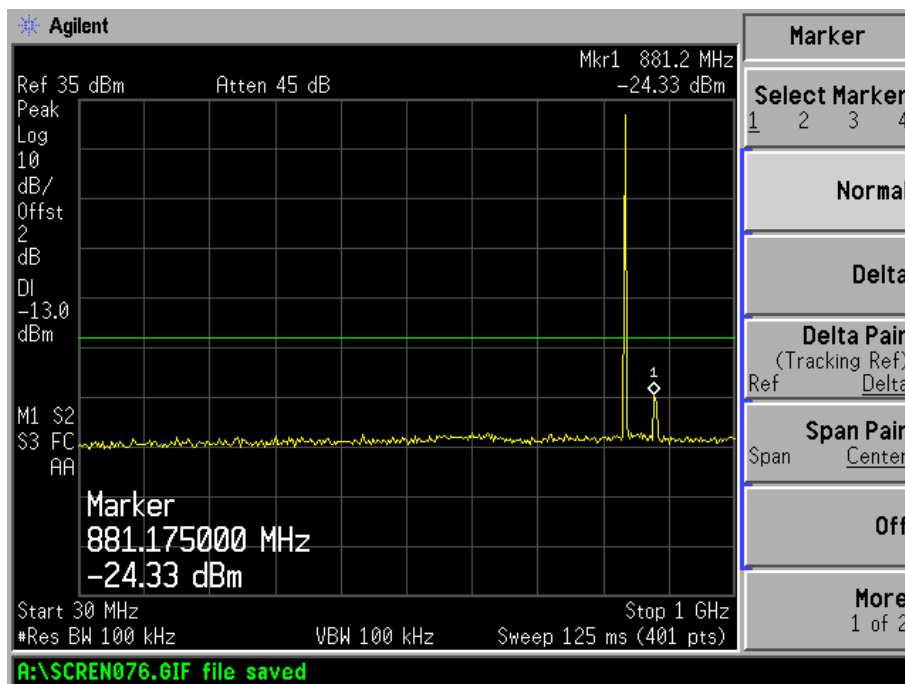


## Above 1GHz

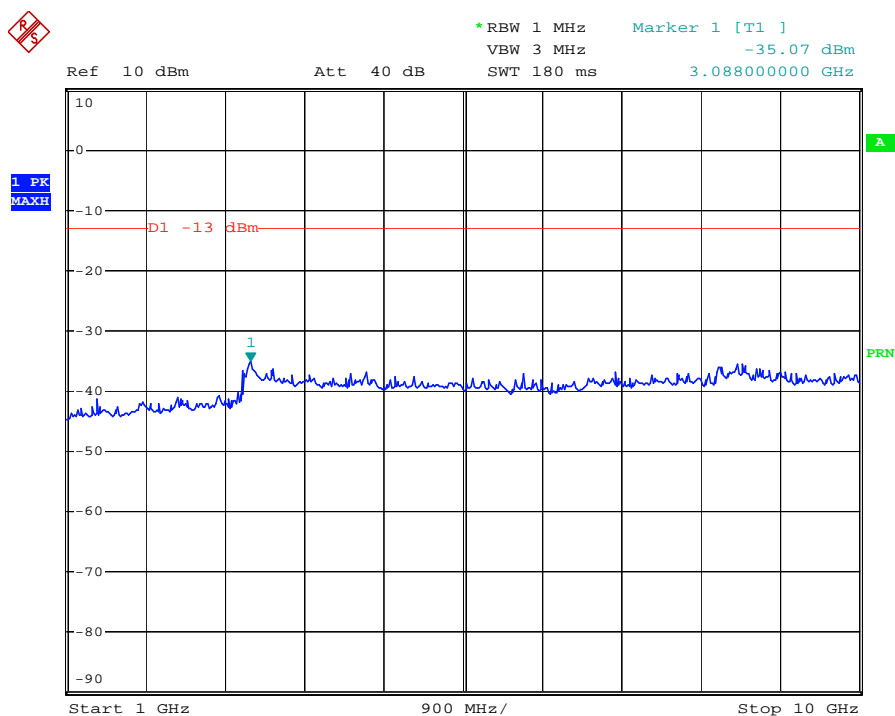


## GPRS Middle Channel

30MHz to 1GHz

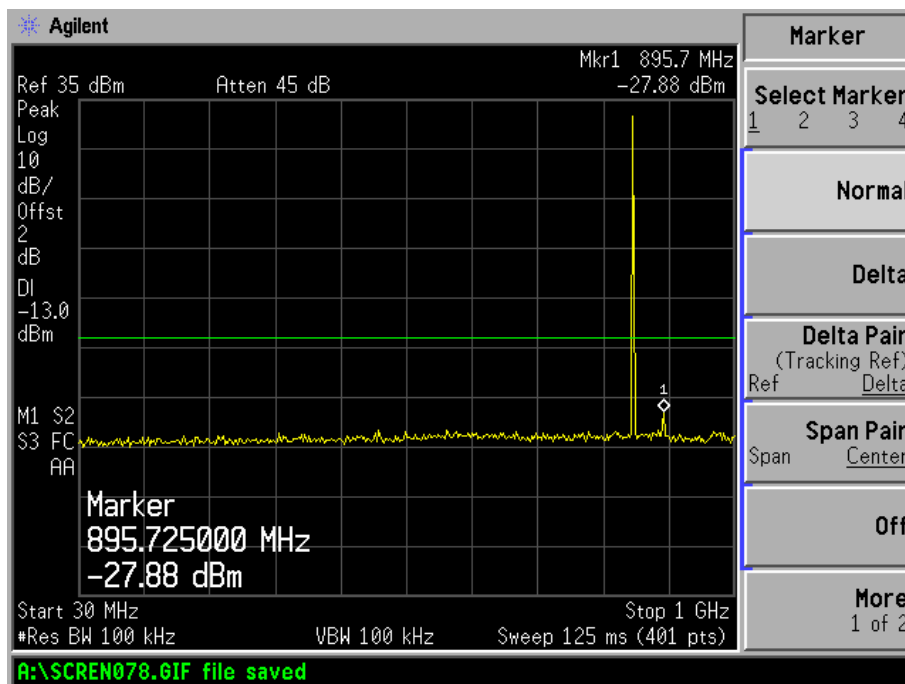


## Above 1GHz

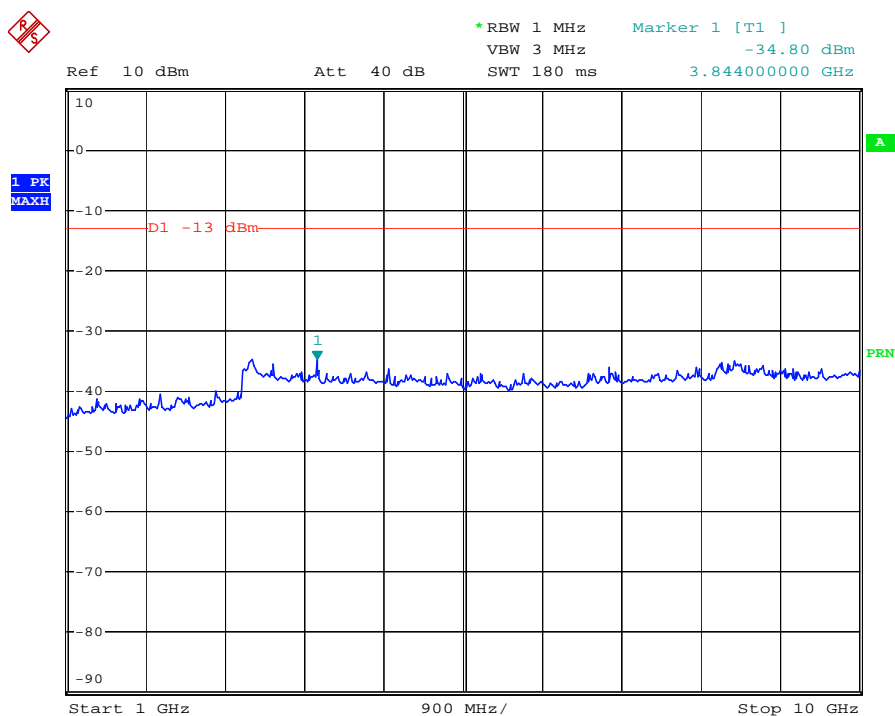


## GPRS High Channel

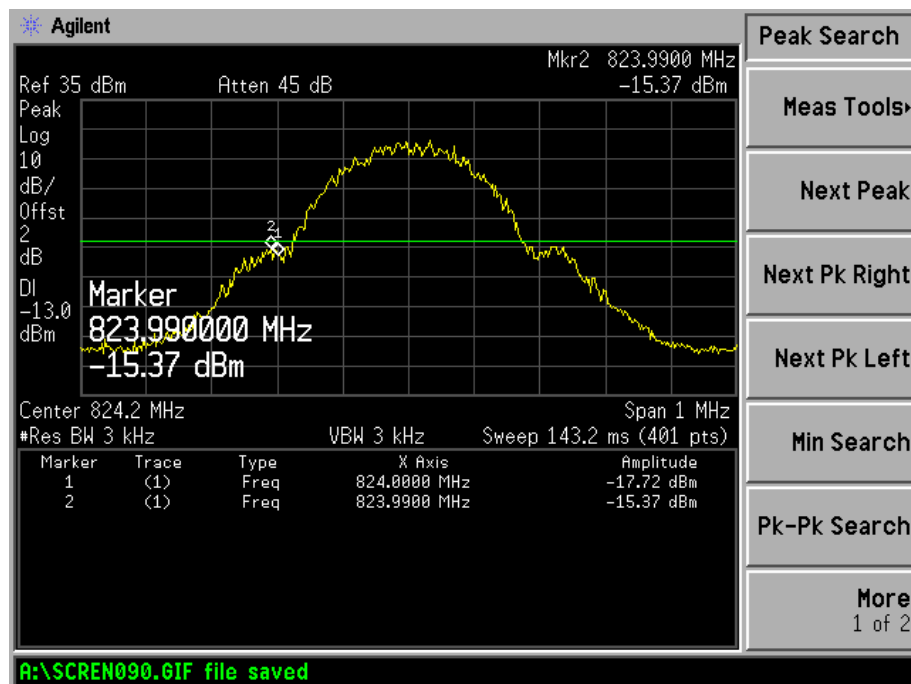
30MHz to 1GHz



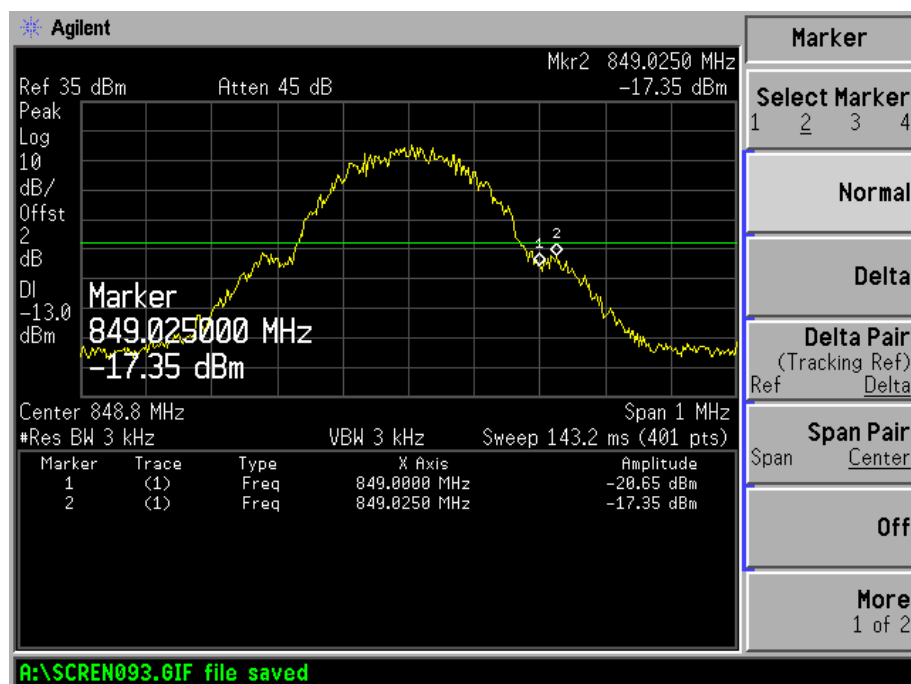
## Above 1GHz



# GPRS Low Band Emission



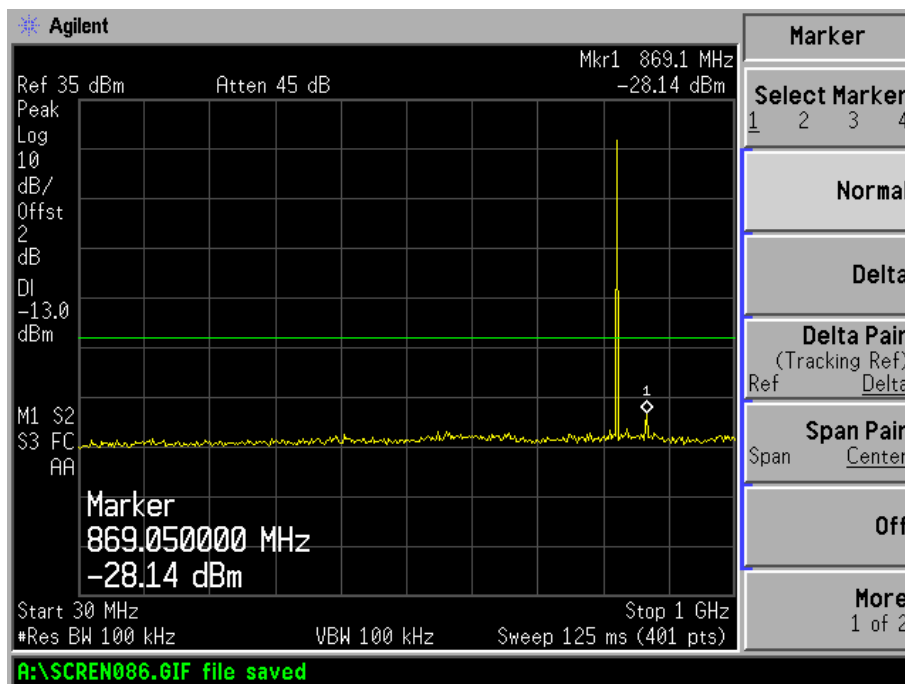
# GPRS High Band Emission



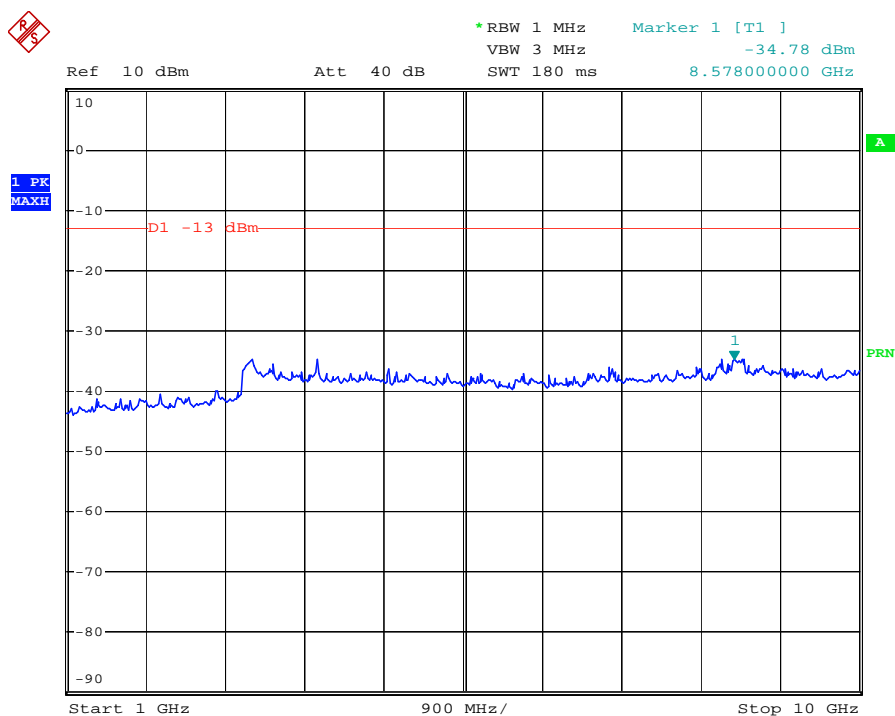


EDGE Low Channel

30MHz to 1GHz

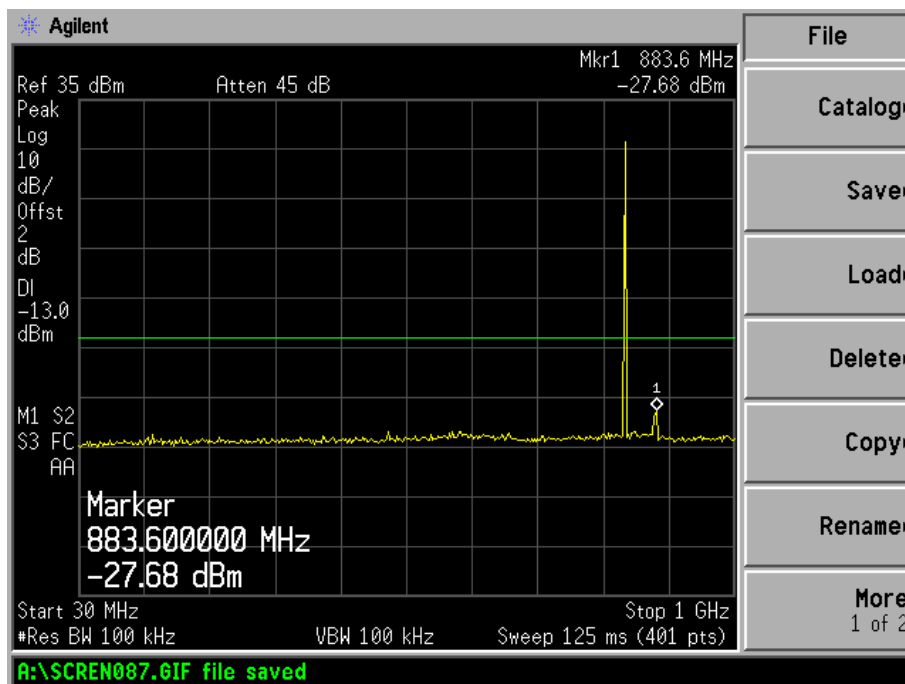


Above 1GHz

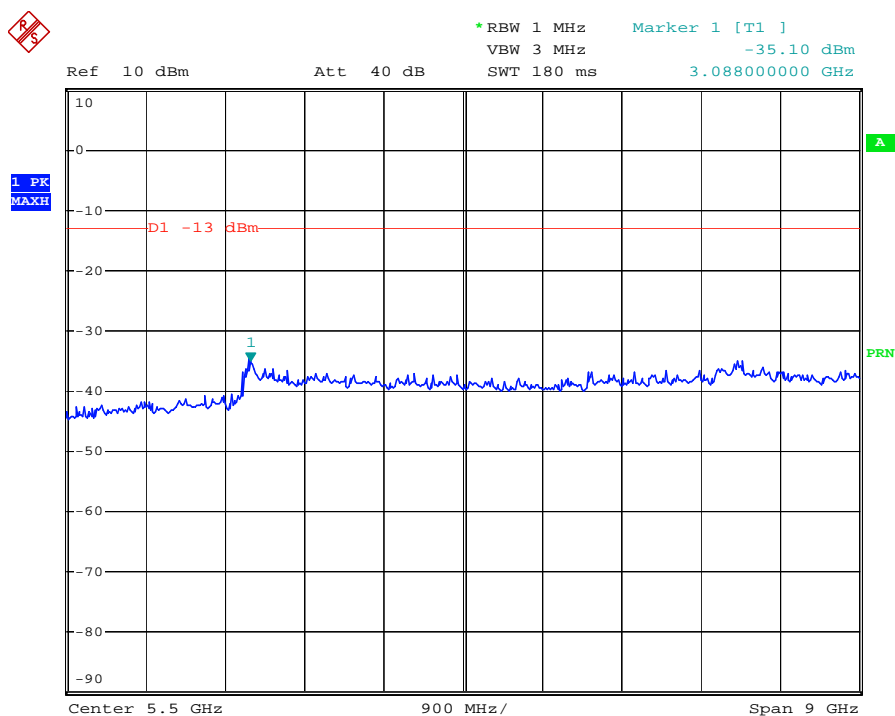


## EDGE Middle Channel

30MHz to 1GHz

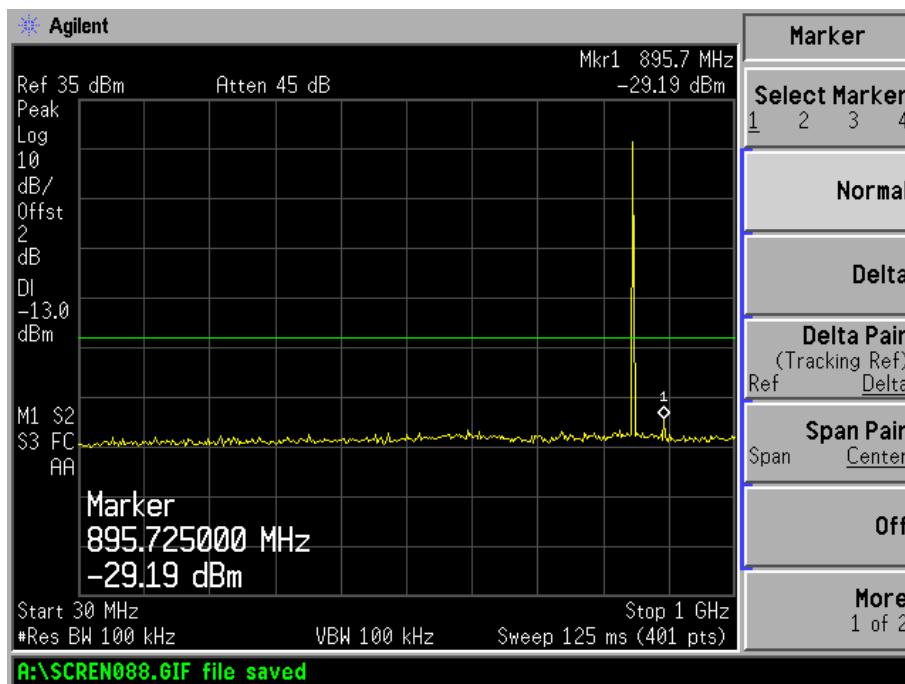


## Above 1GHz

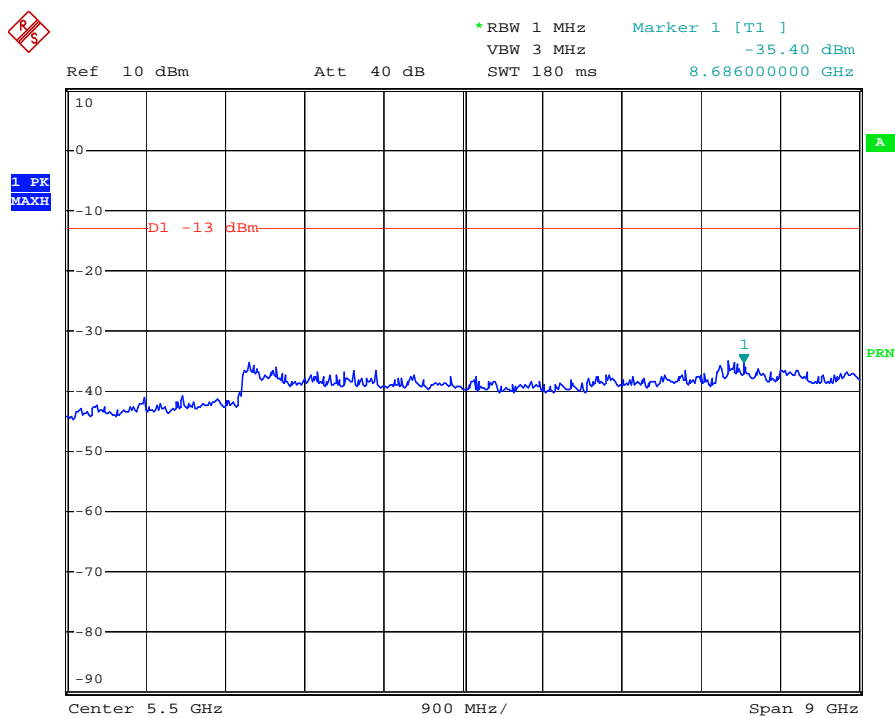


EDGE High Channel

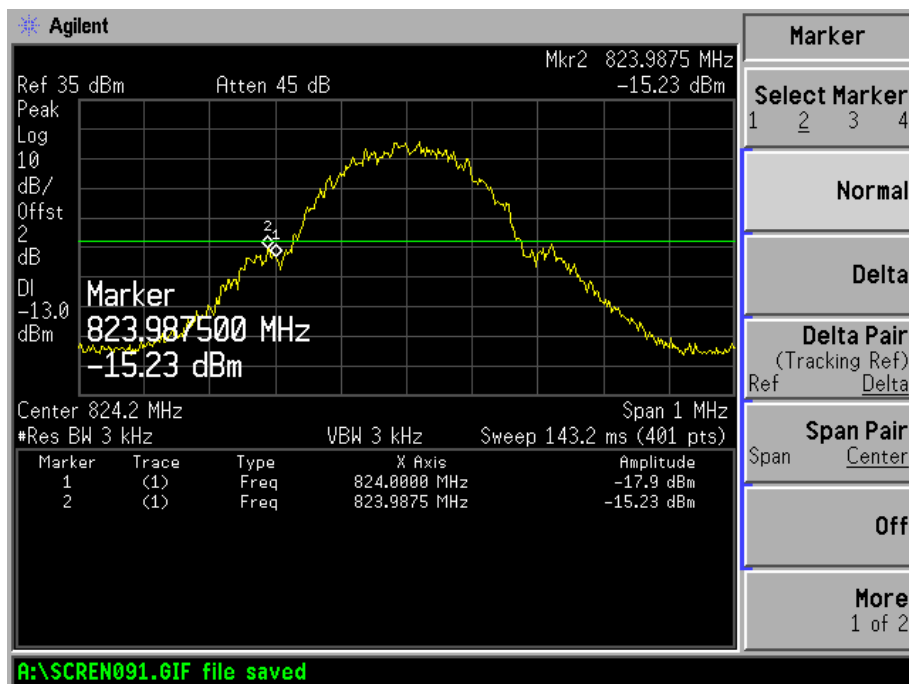
30MHz to 1GHz



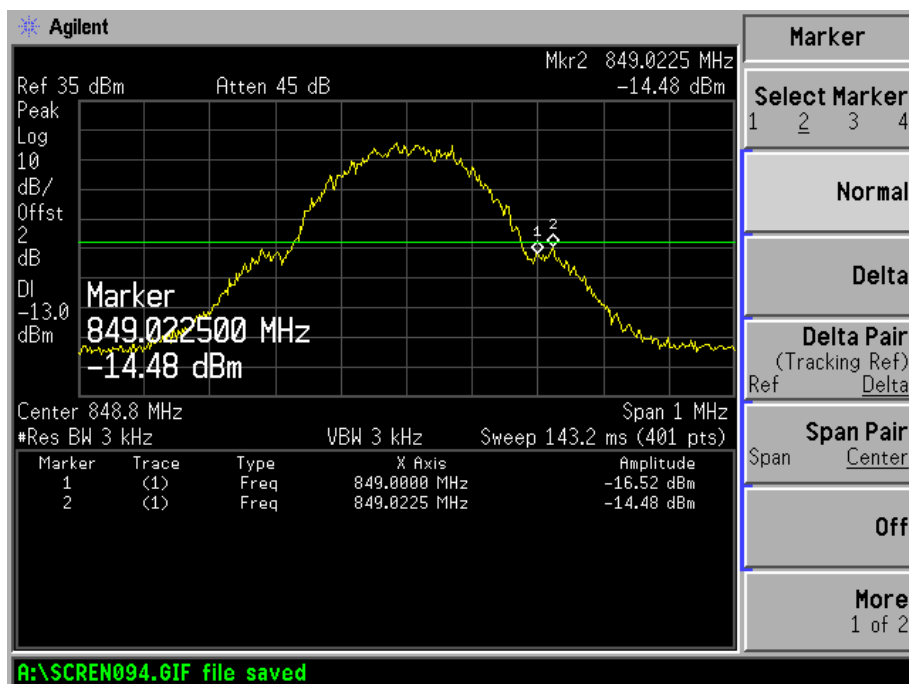
Above 1GHz



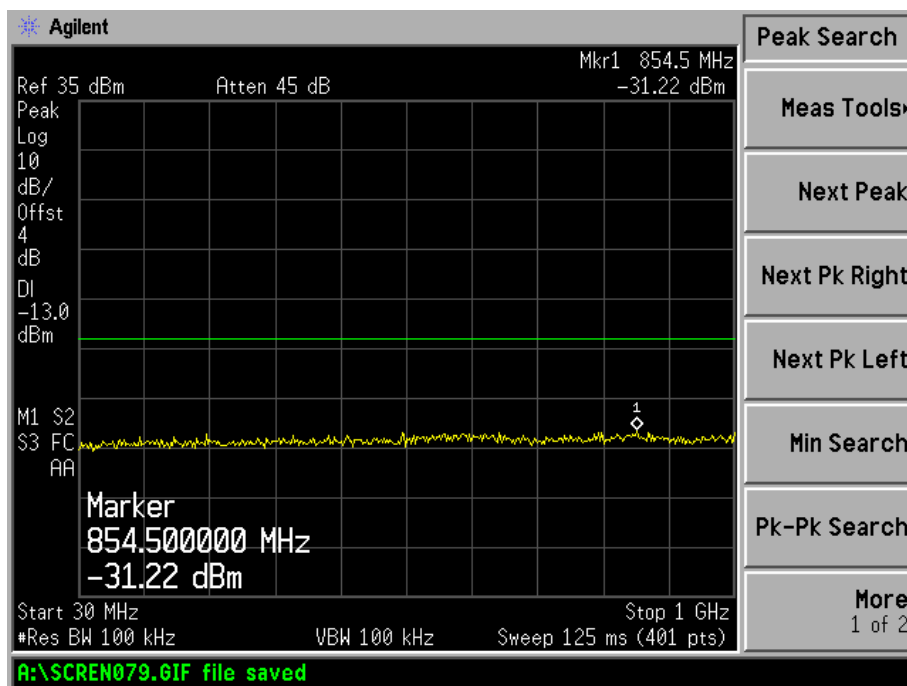
## EDGE Low Band Emission



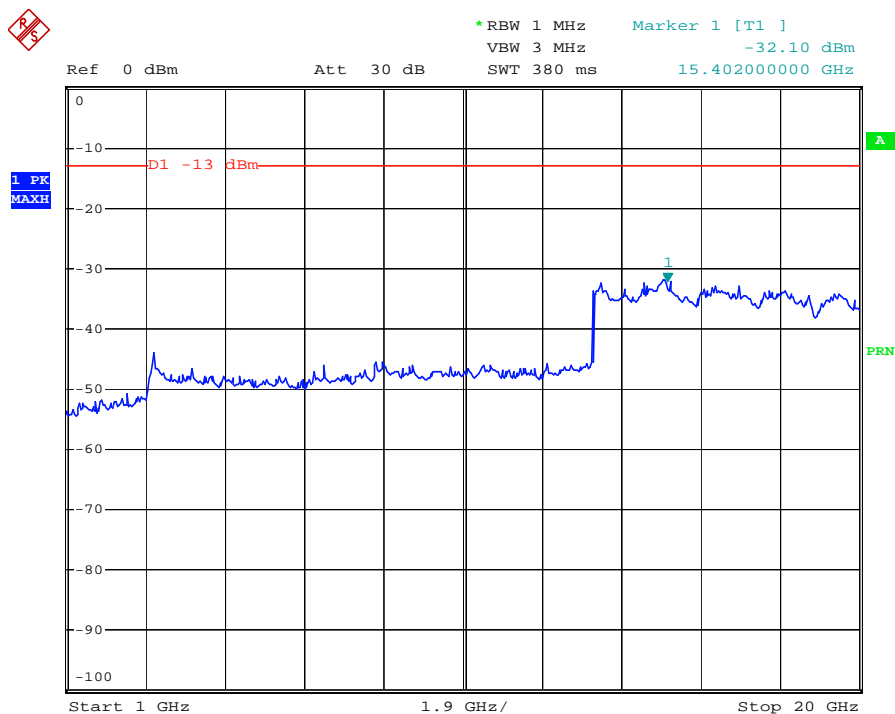
## EDGE High Band Emission



For PCS Band  
GSM Low Channel  
30MHz to 1GHz

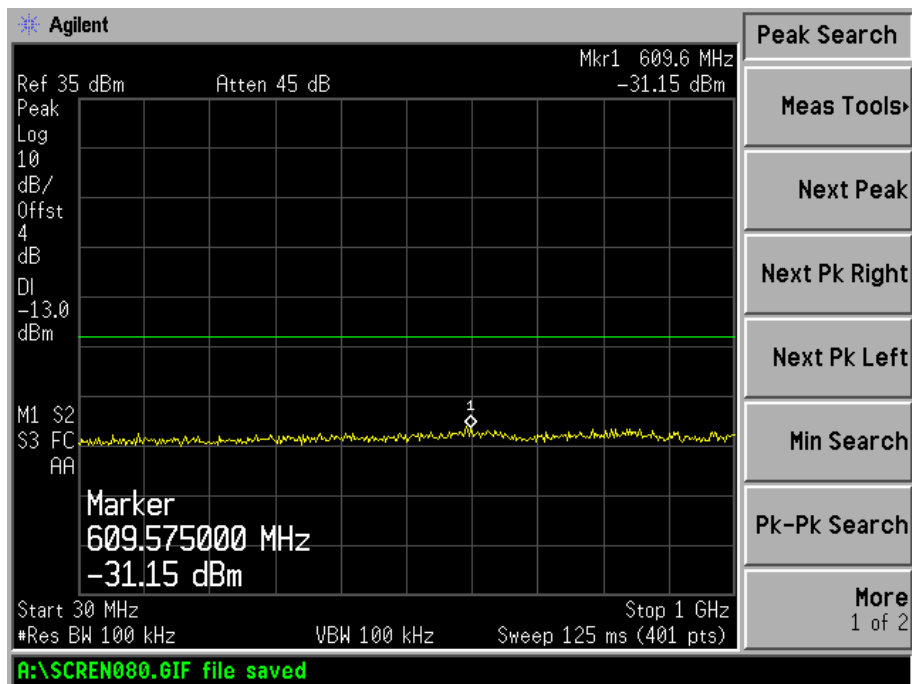


Above 1GHz

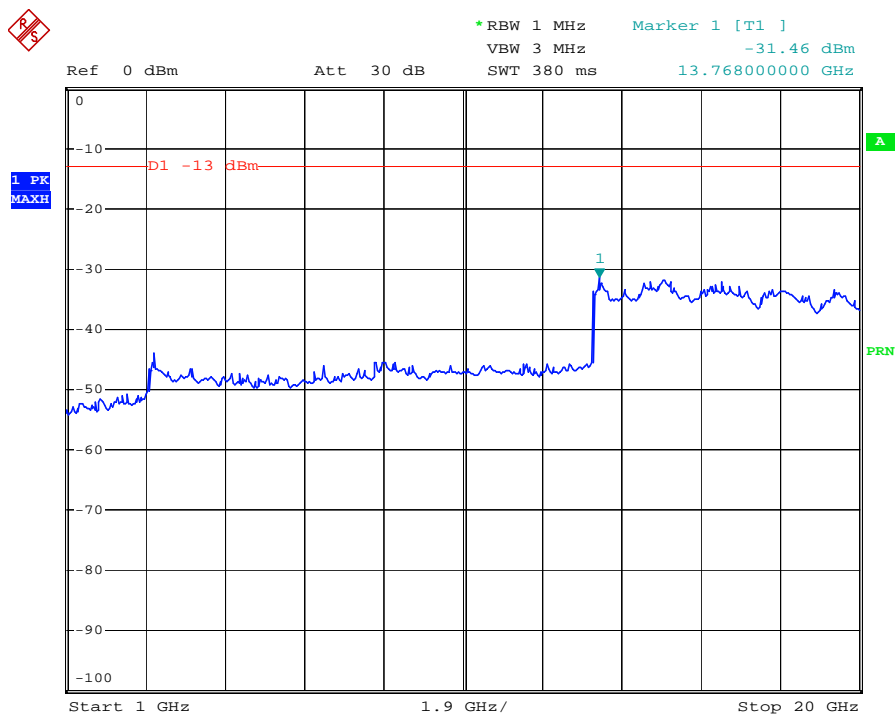


## GSM Middle Channel

30MHz to 1GHz

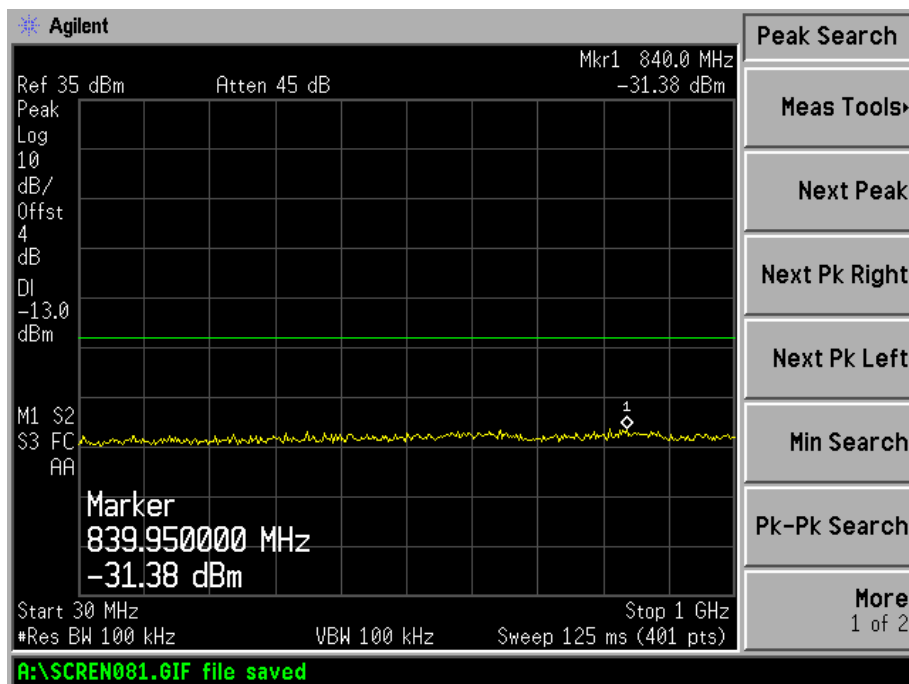


Above 1GHz

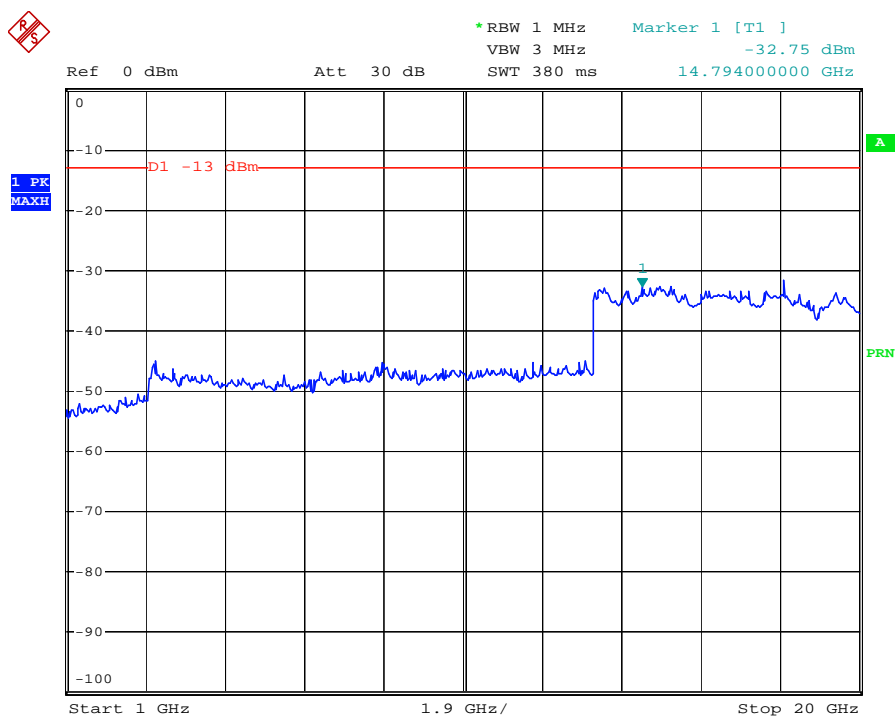


## GSM High Channel

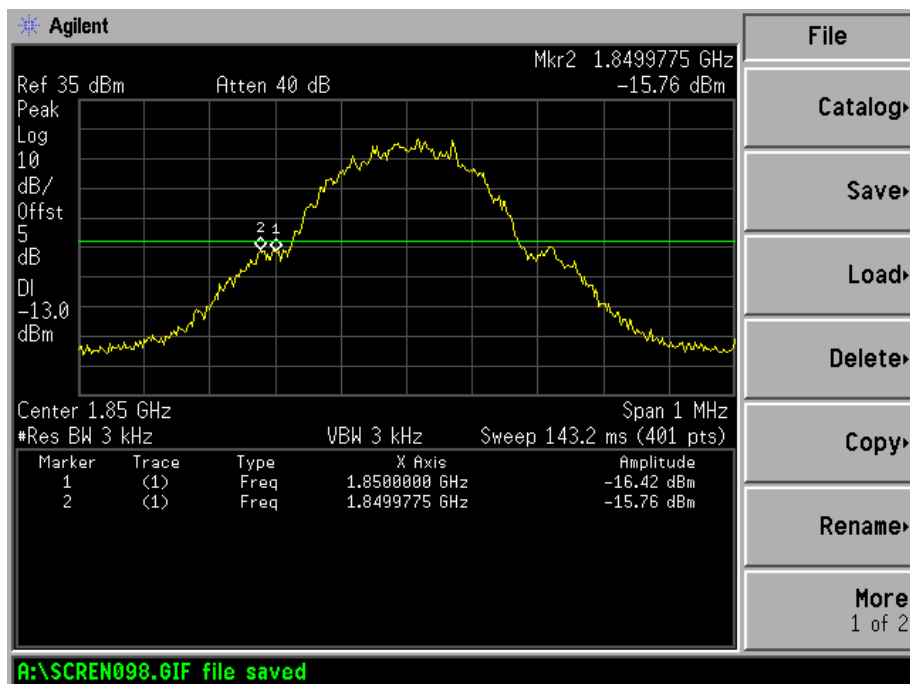
30MHz to 1GHz



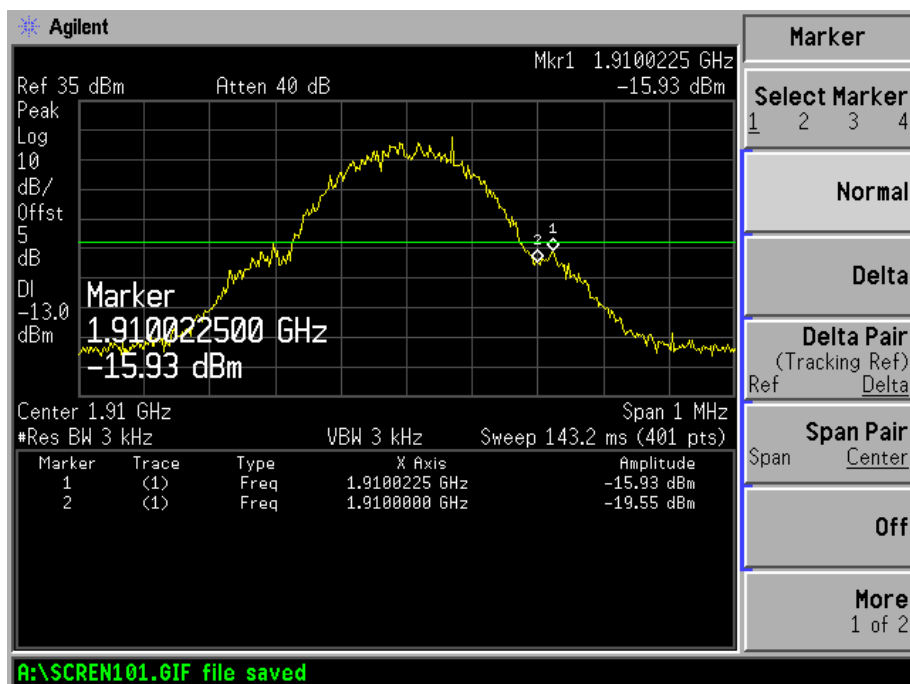
## Above 1GHz



## GSM Low Band Emission



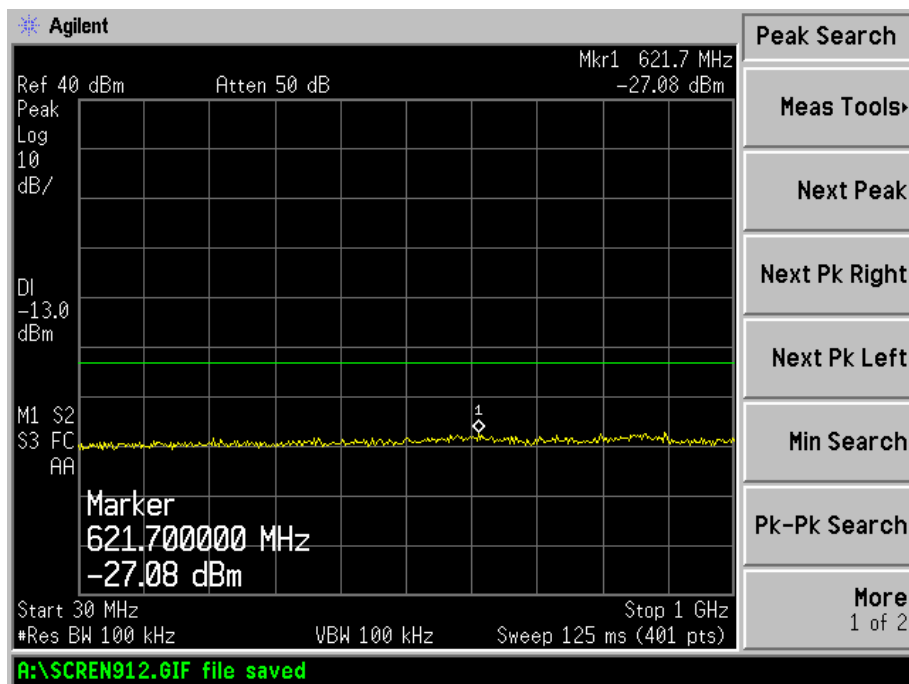
## GSM High Band Emission



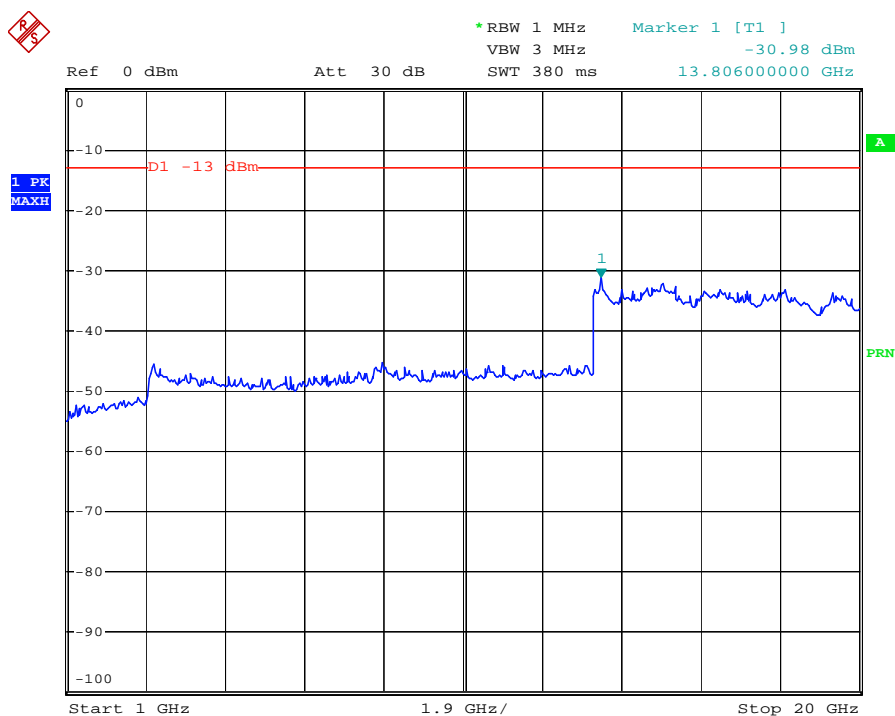


## GPRS Low Channel

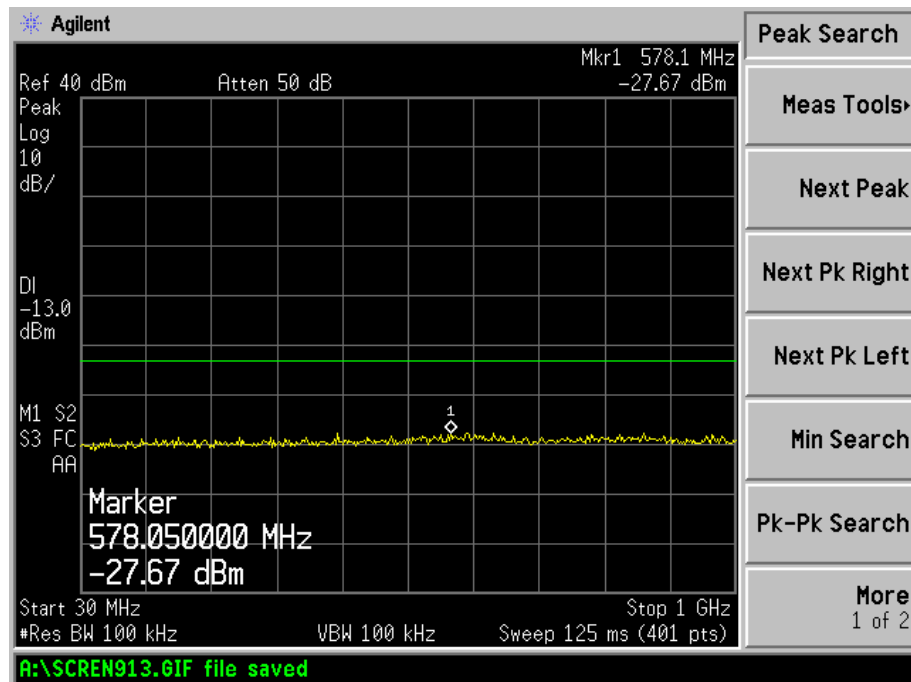
30MHz to 1GHz



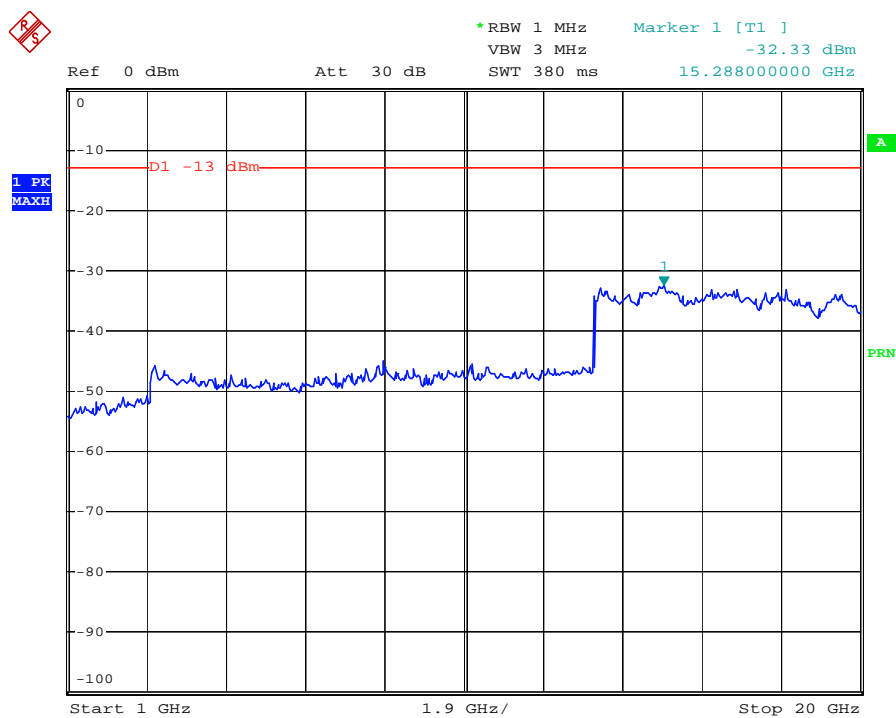
## Above 1GHz



GPRS Middle Channel  
30MHz to 1GHz

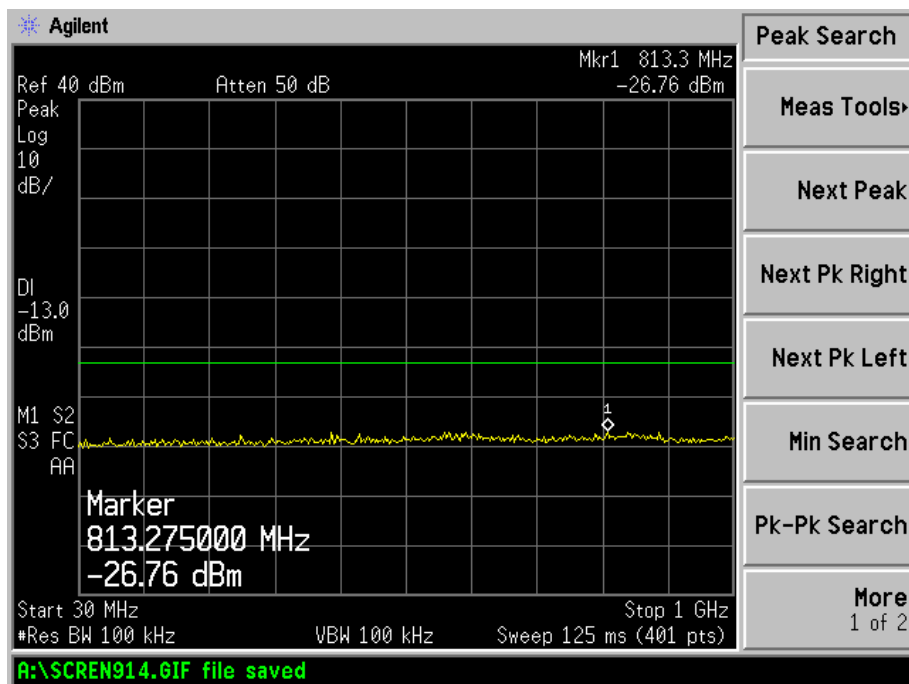


Above 1GHz

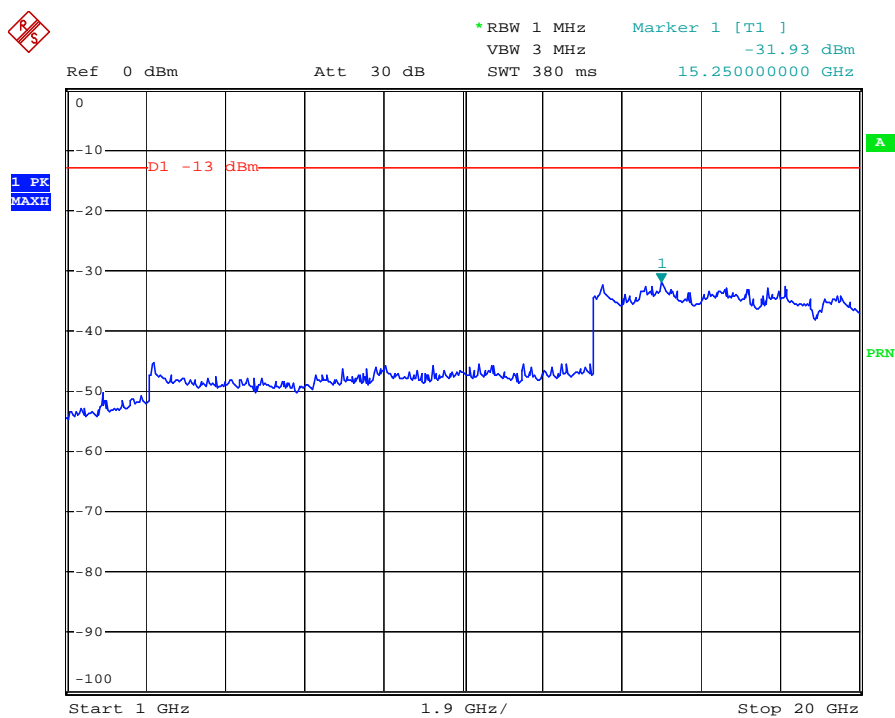


## GPRS High Channel

30MHz to 1GHz



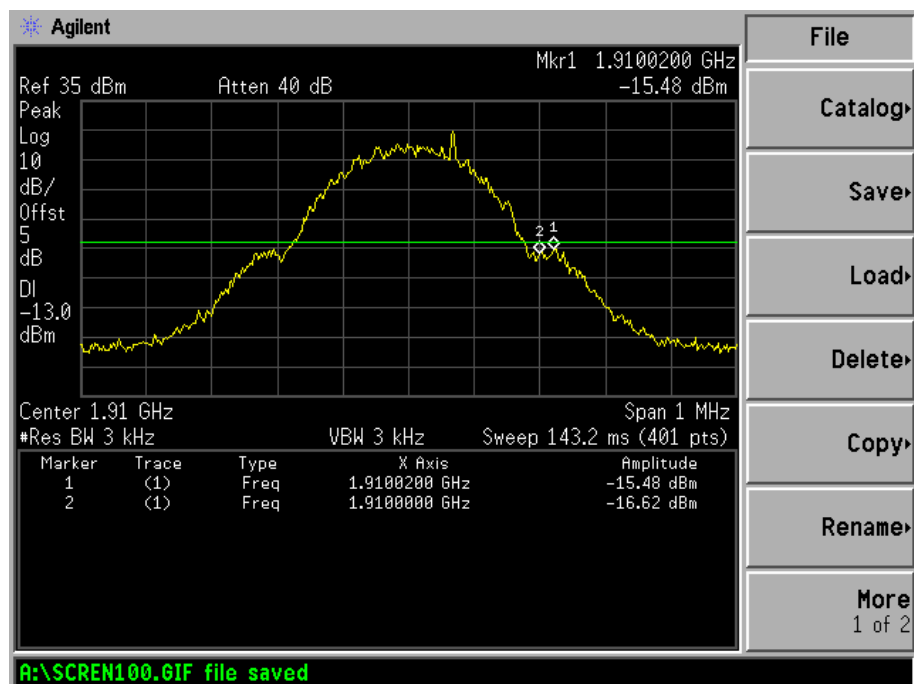
## Above 1GHz



## GPRS Low Band Emission

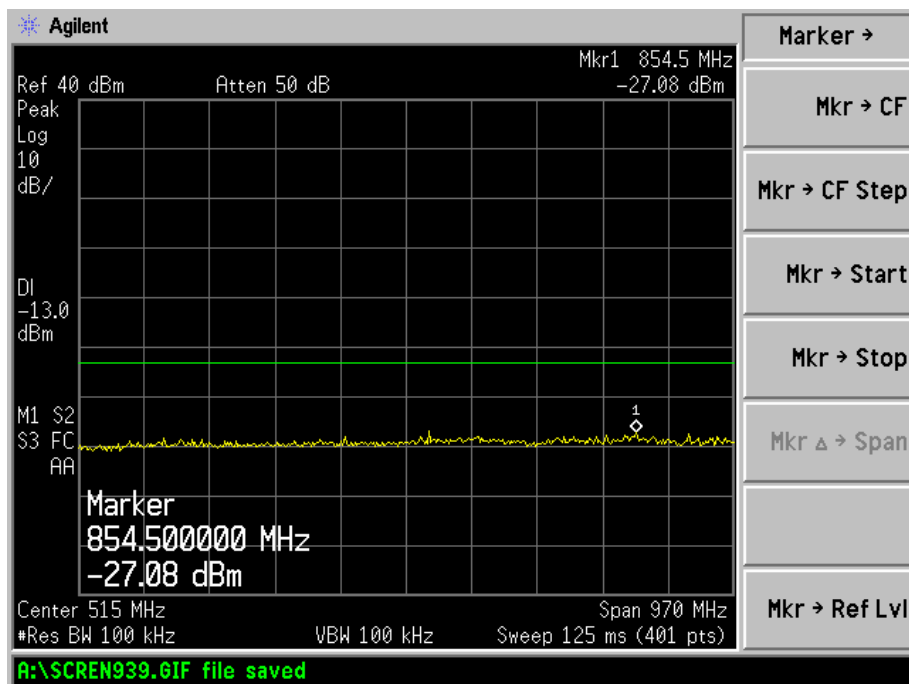


## GPRS High Band Emission

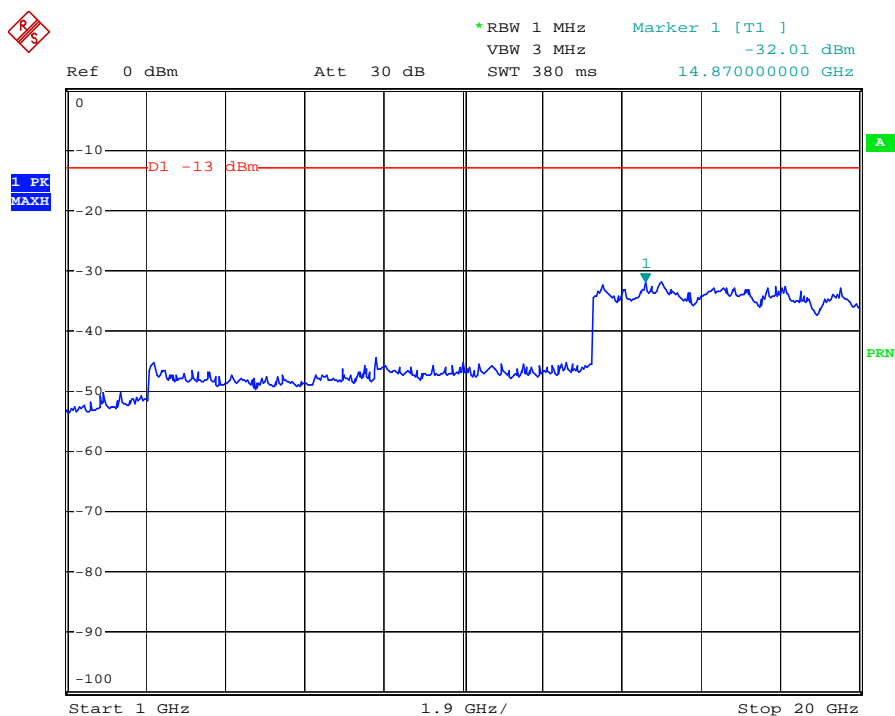


EDGE Low Channel

30MHz to 1GHz

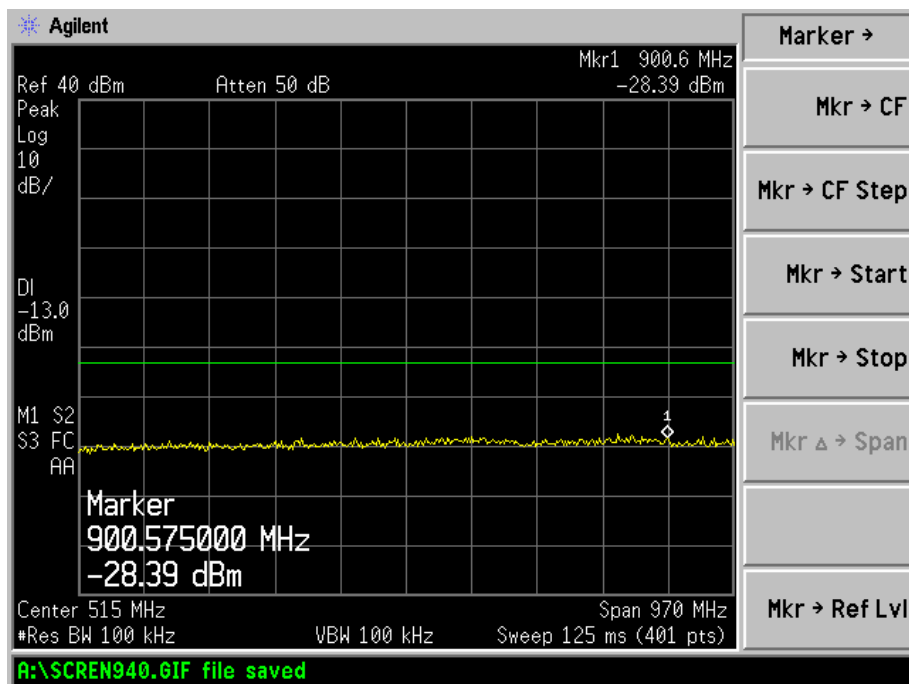


Above 1GHz

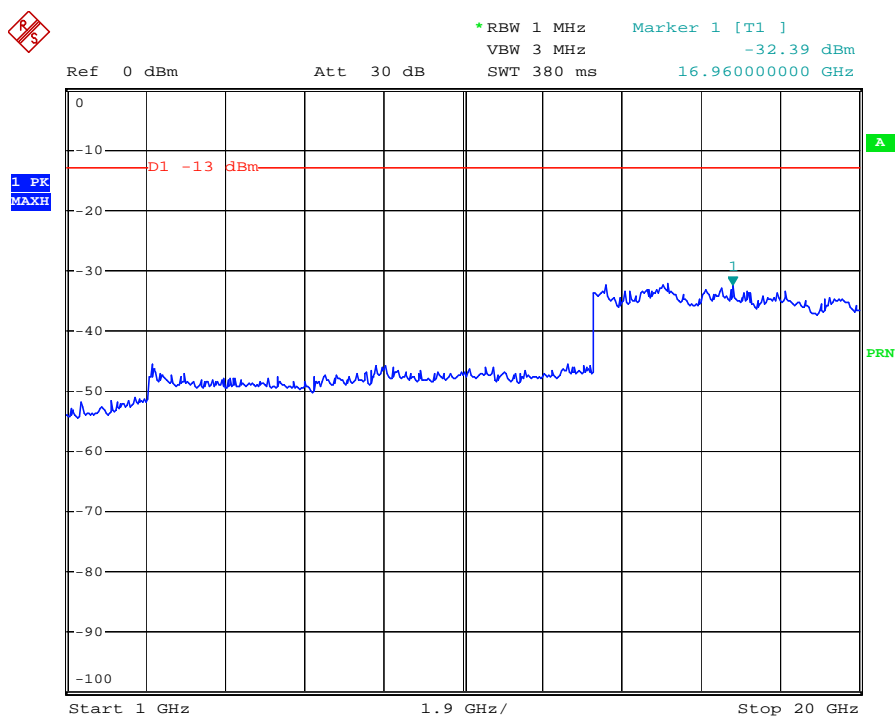


## EDGE Middle Channel

30MHz to 1GHz

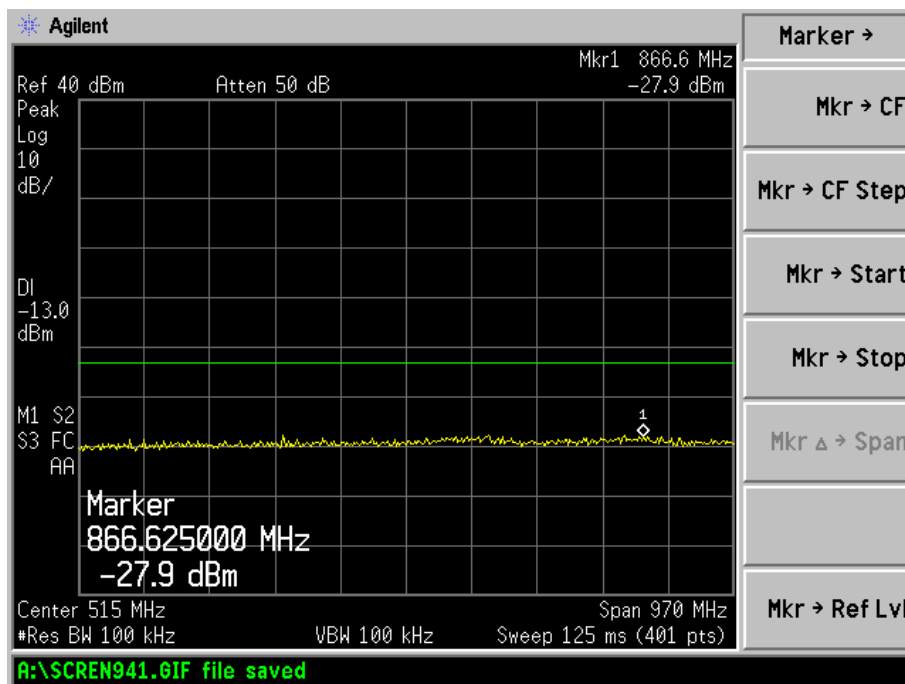


## Above 1GHz

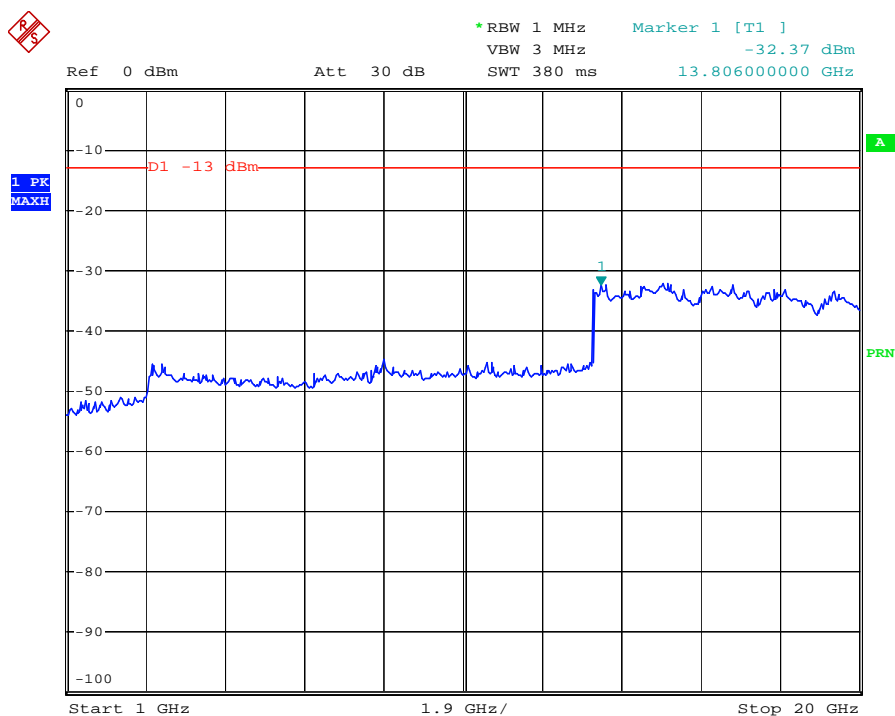


EDGE High Channel

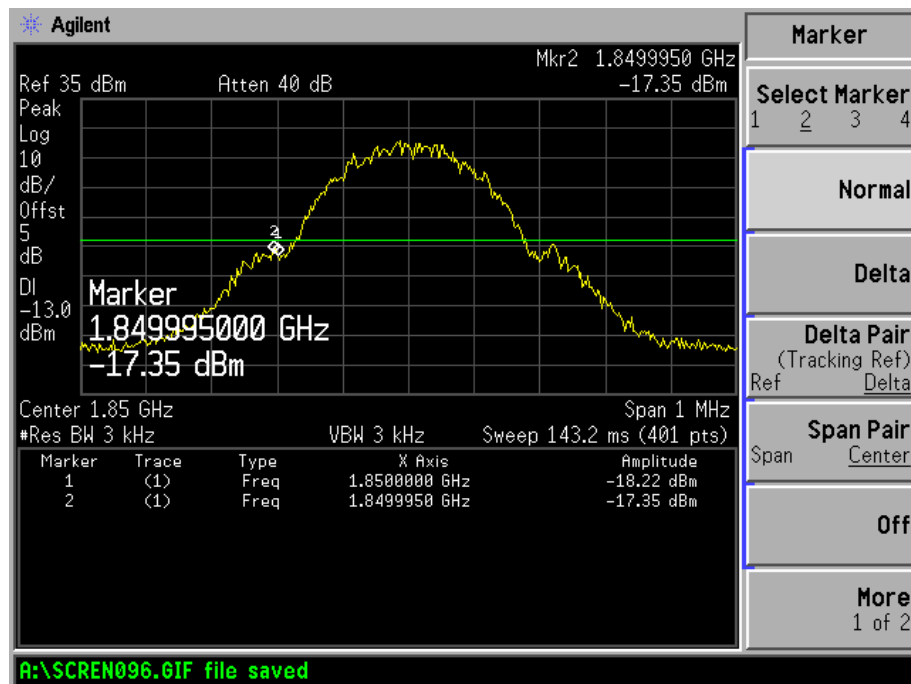
30MHz to 1GHz



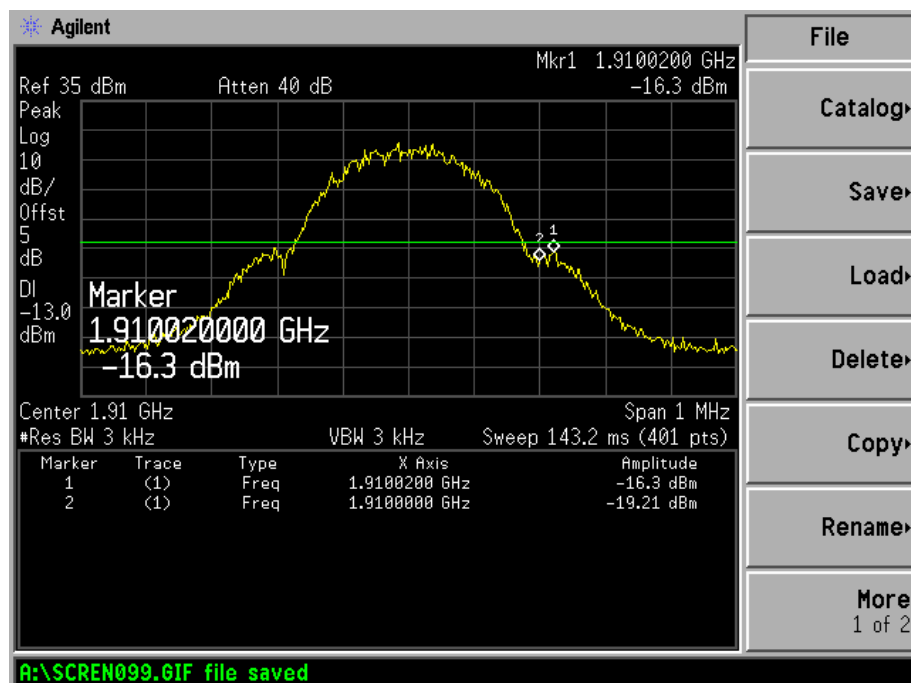
Above 1GHz



## EDGE Low Band Emission



## EDGE High Band Emission

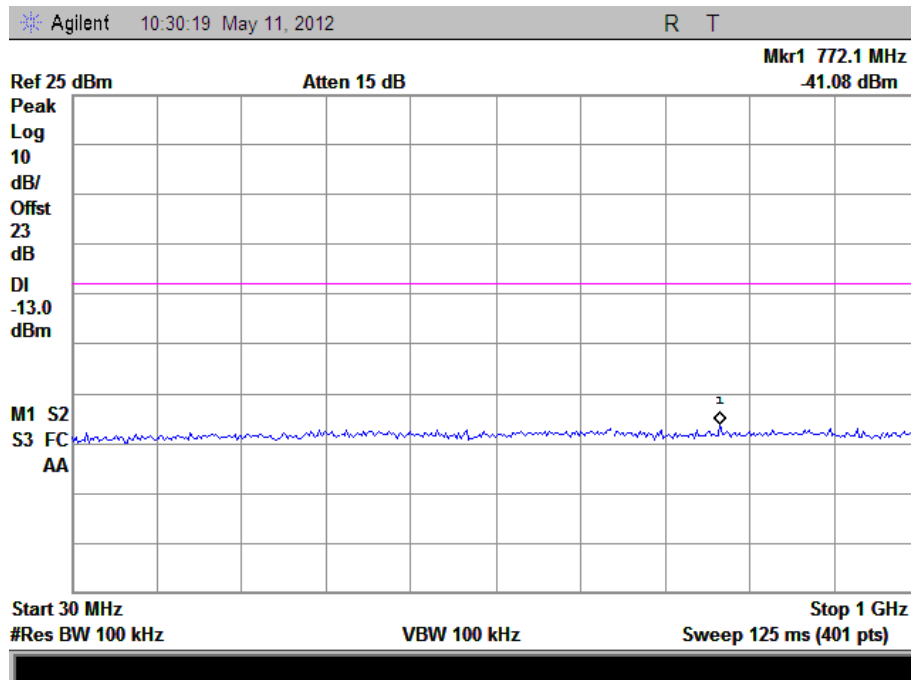




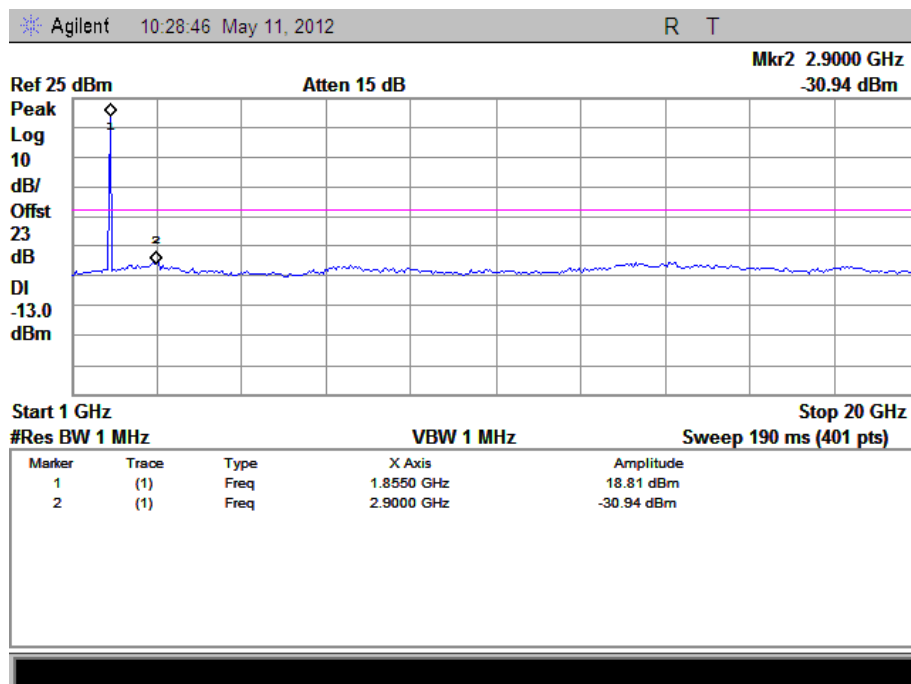
**For Band II**

WCDMA Low Channel

30MHz to 1GHz

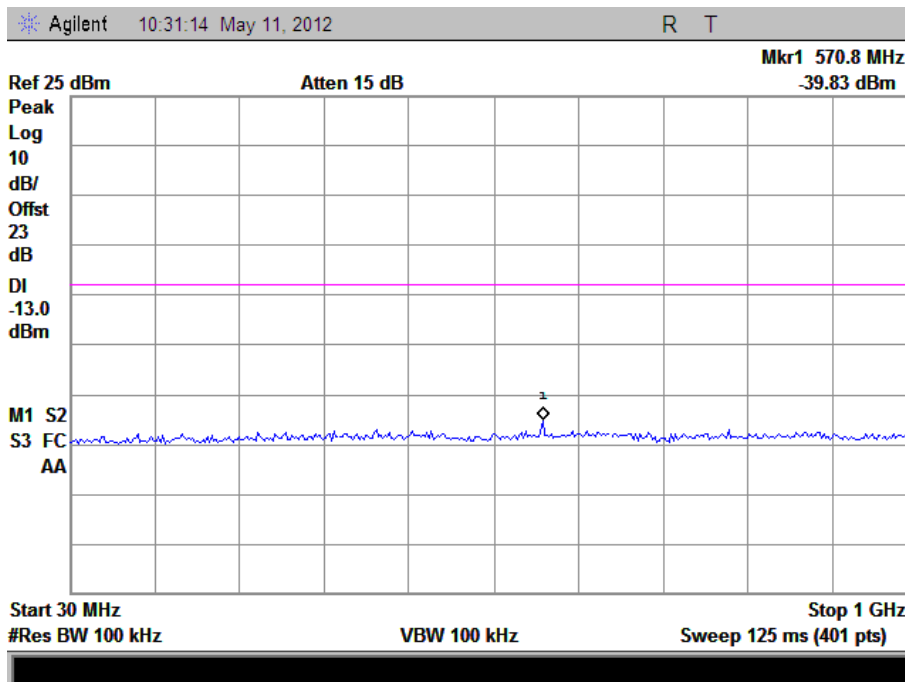


Above 1GHz

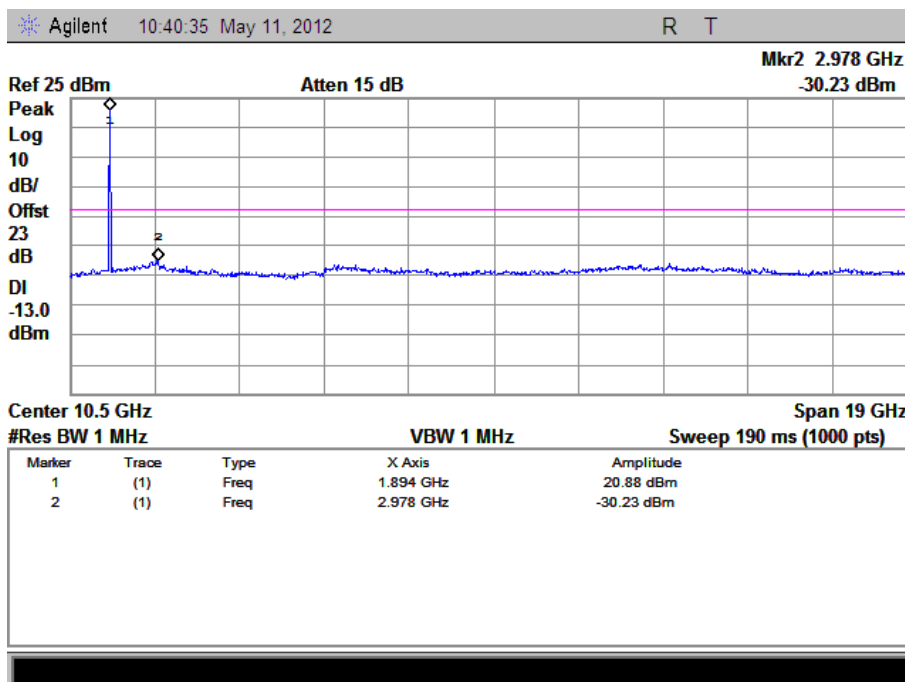


# WCDMA Middle Channel

30MHz to 1GHz

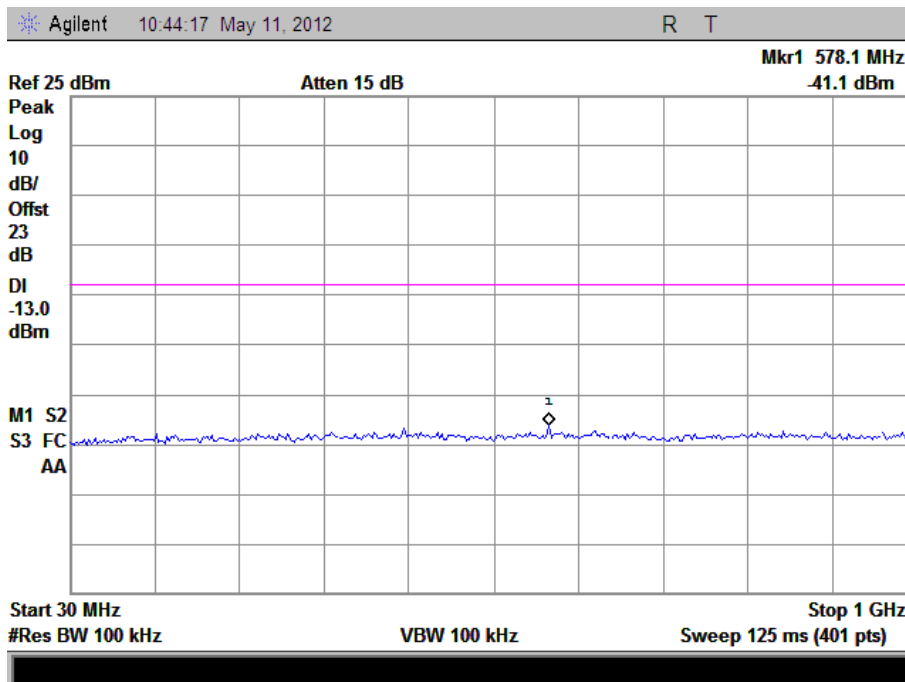


# Above 1GHz

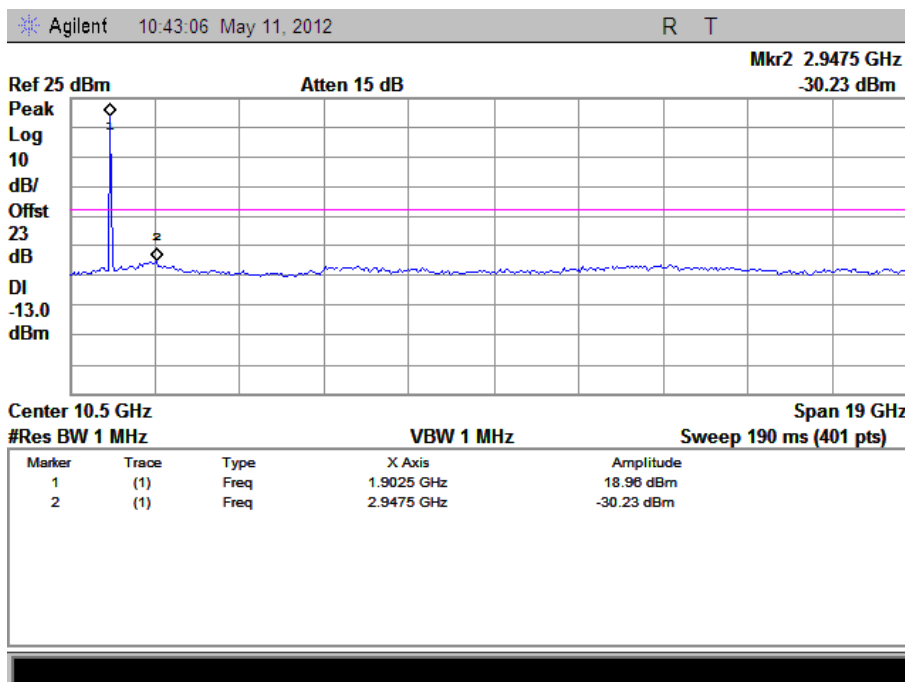


# WCDMA High Channel

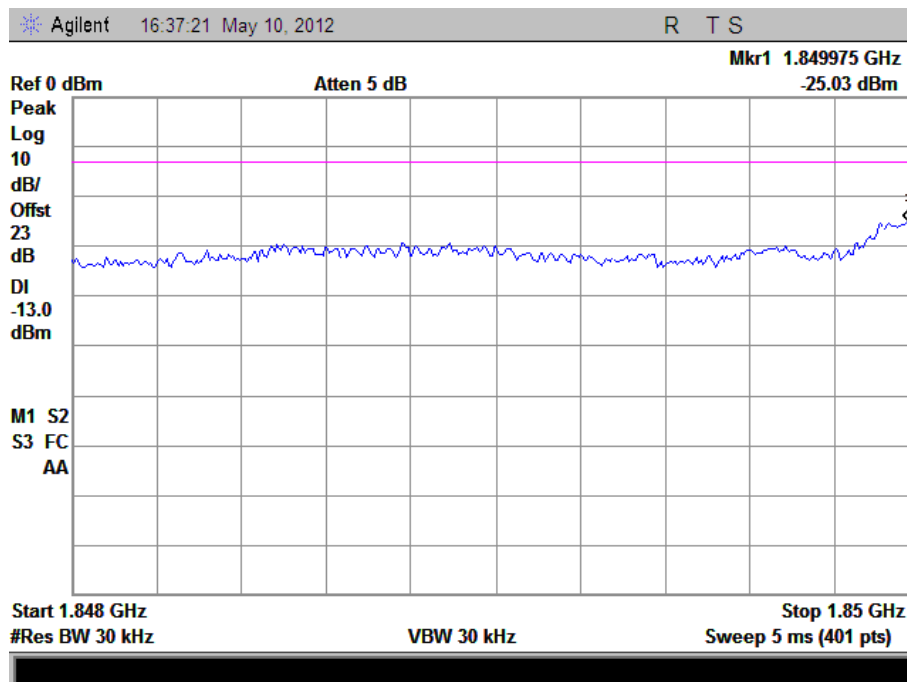
30MHz to 1GHz



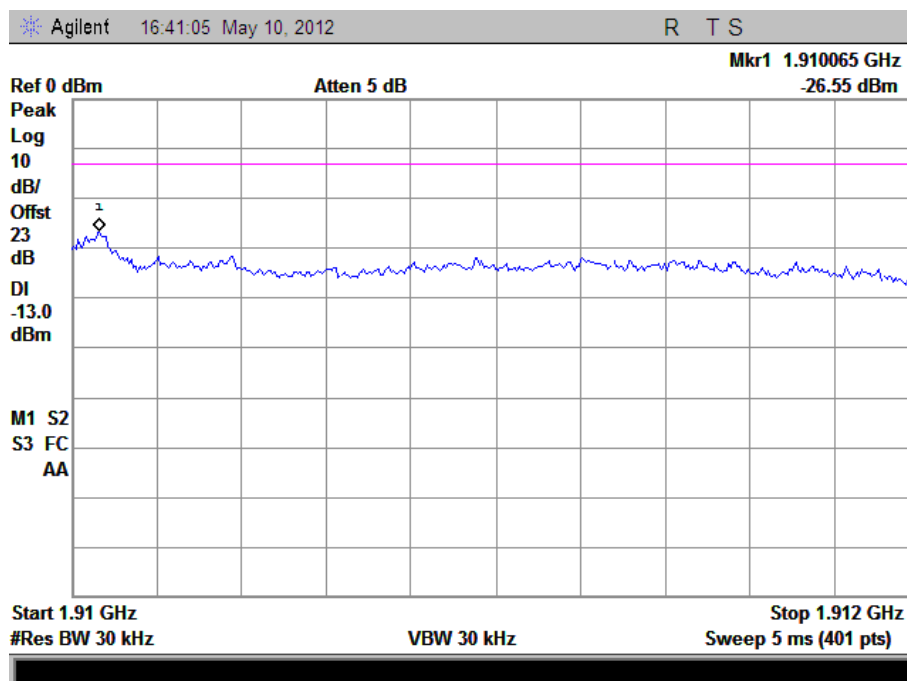
Above 1GHz



## WCDMA Low Band Spurious Emission

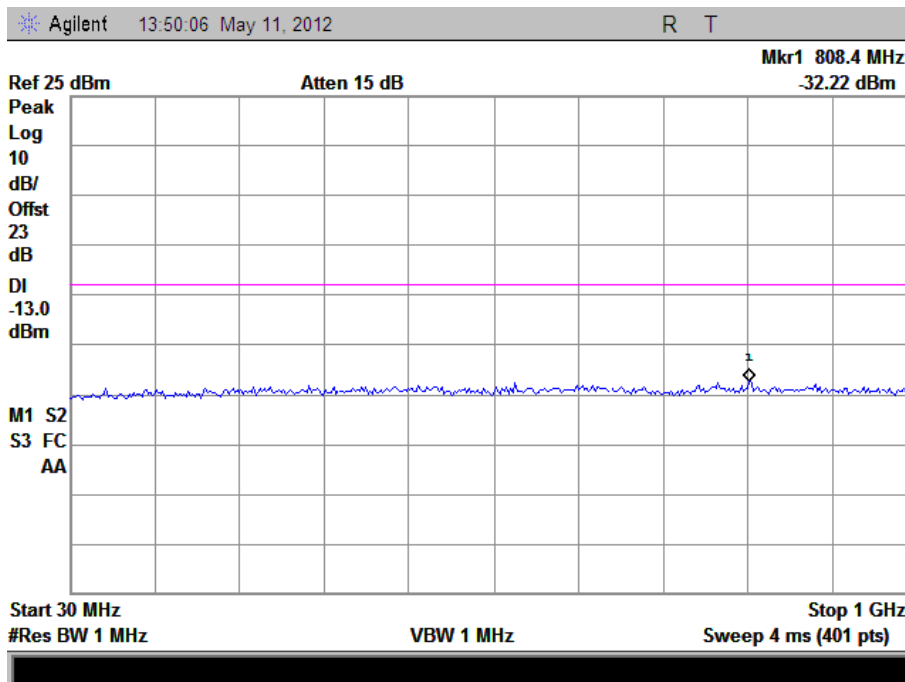


## WCDMA High Band Spurious Emission

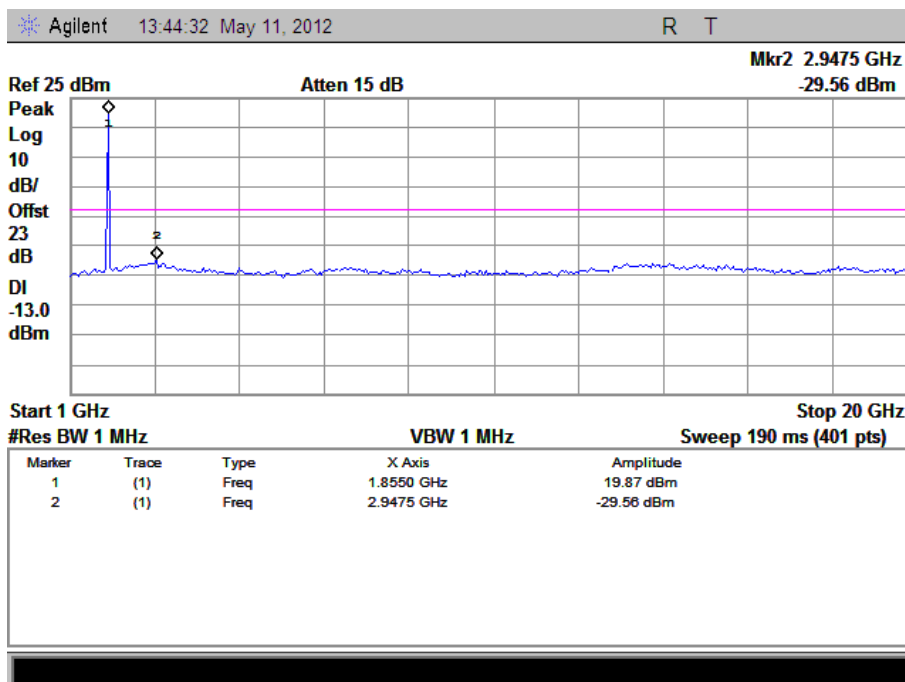


# HSUPA Low Channel

30MHz to 1GHz

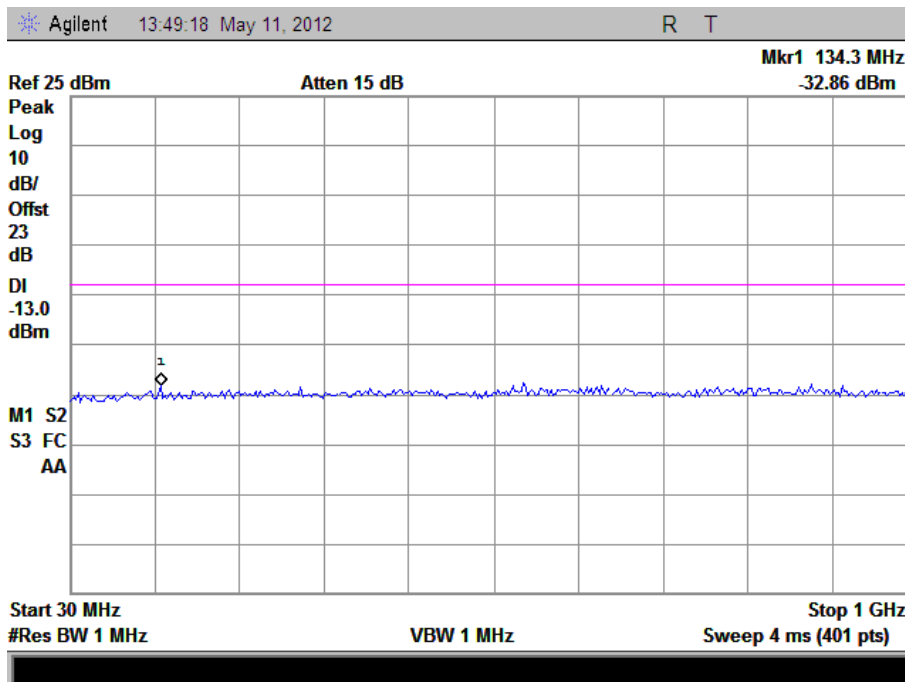


# Above 1GHz

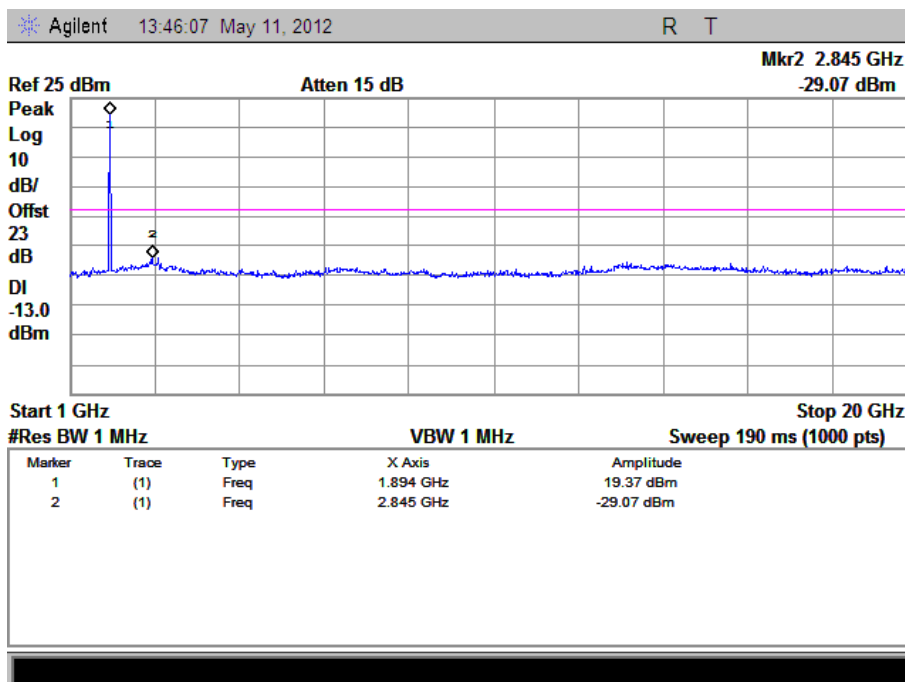


# HSUPA Middle Channel

30MHz to 1GHz

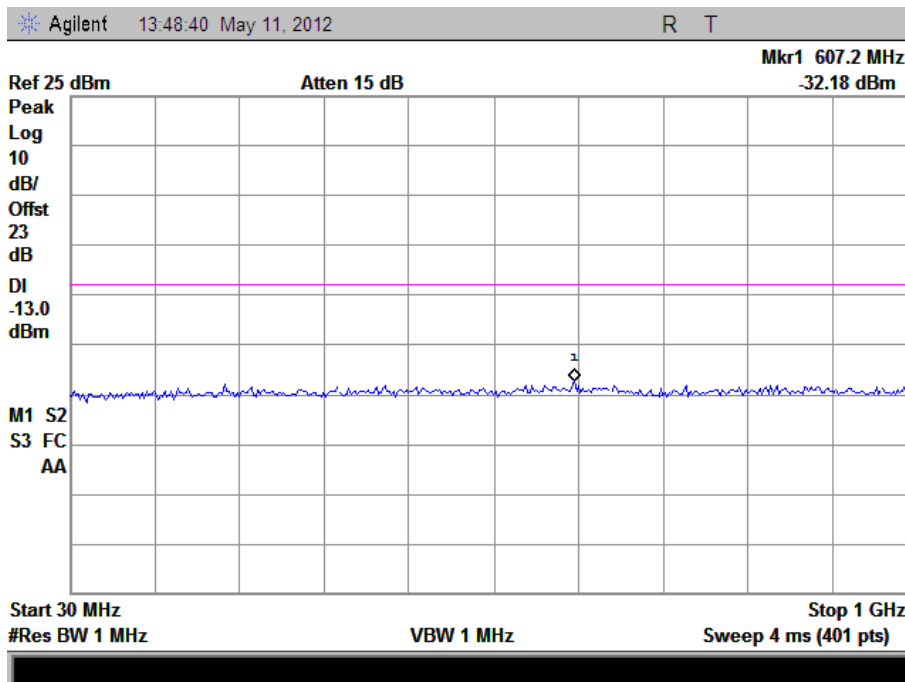


Above 1GHz

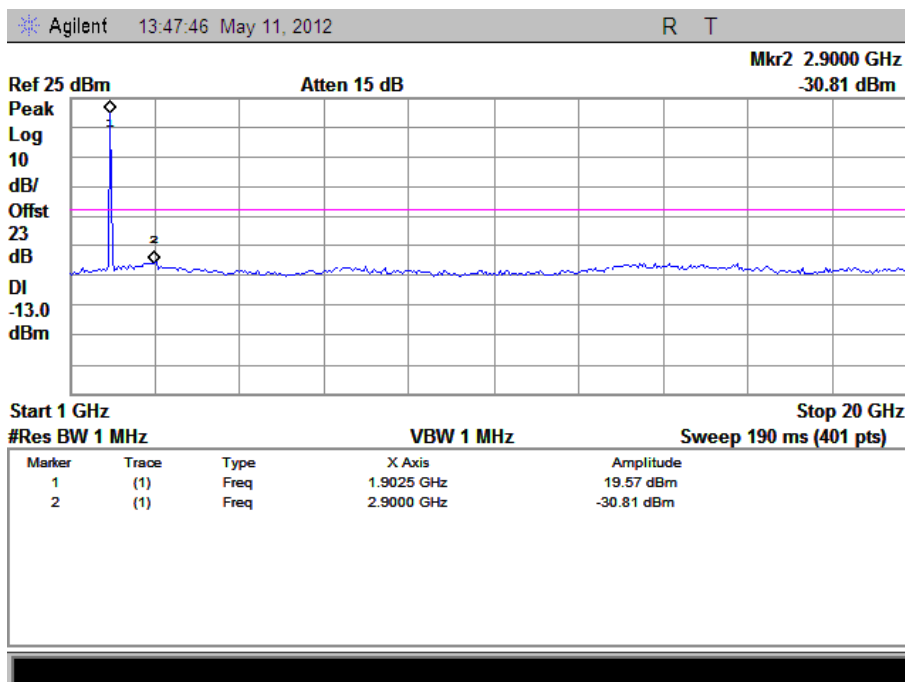


# HSUPA High Channel

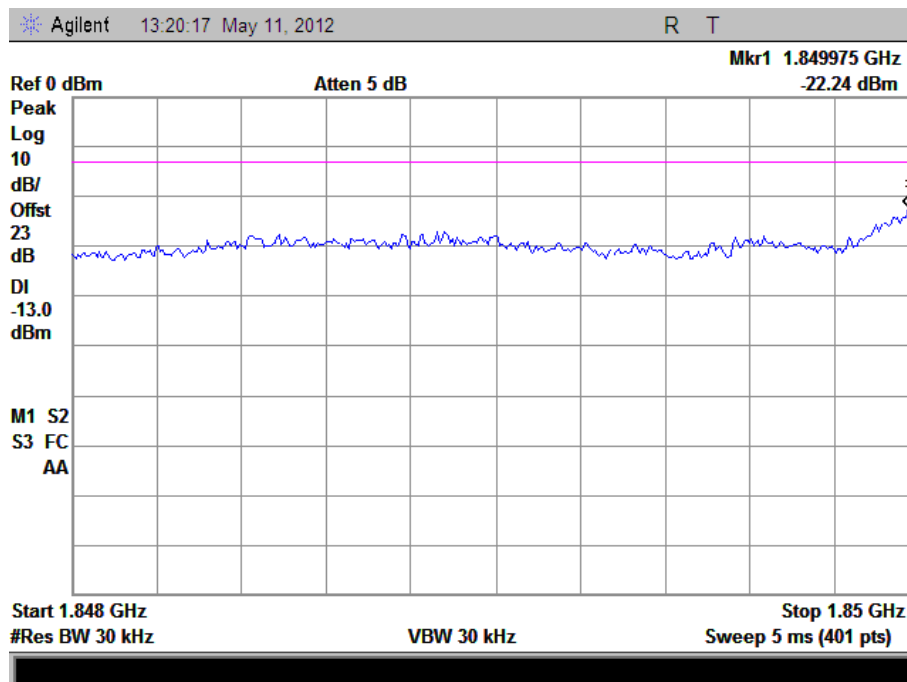
30MHz to 1GHz



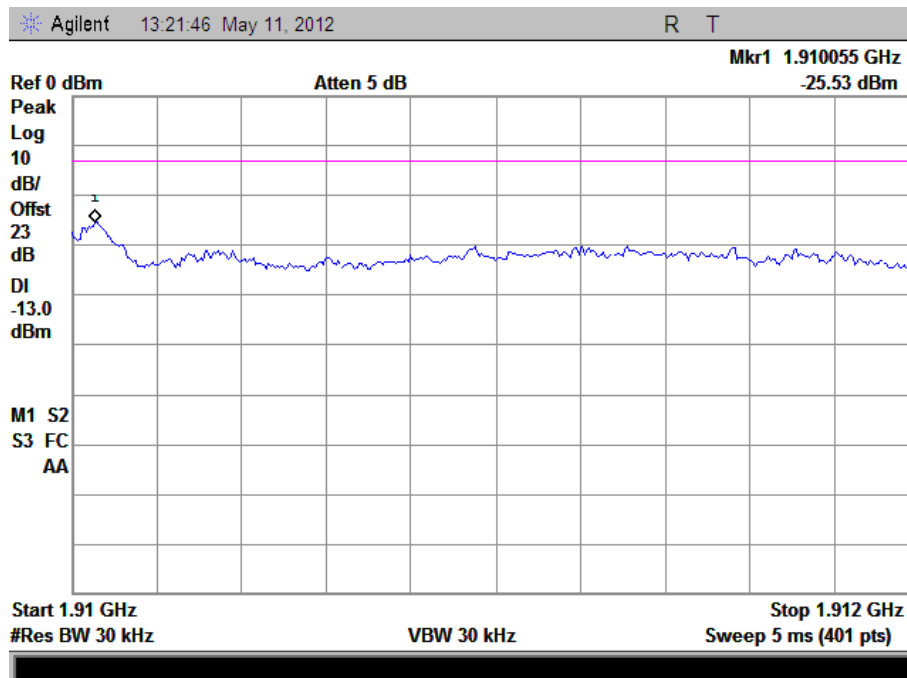
Above 1GHz



# HSUPA Low Band Spurious Emission



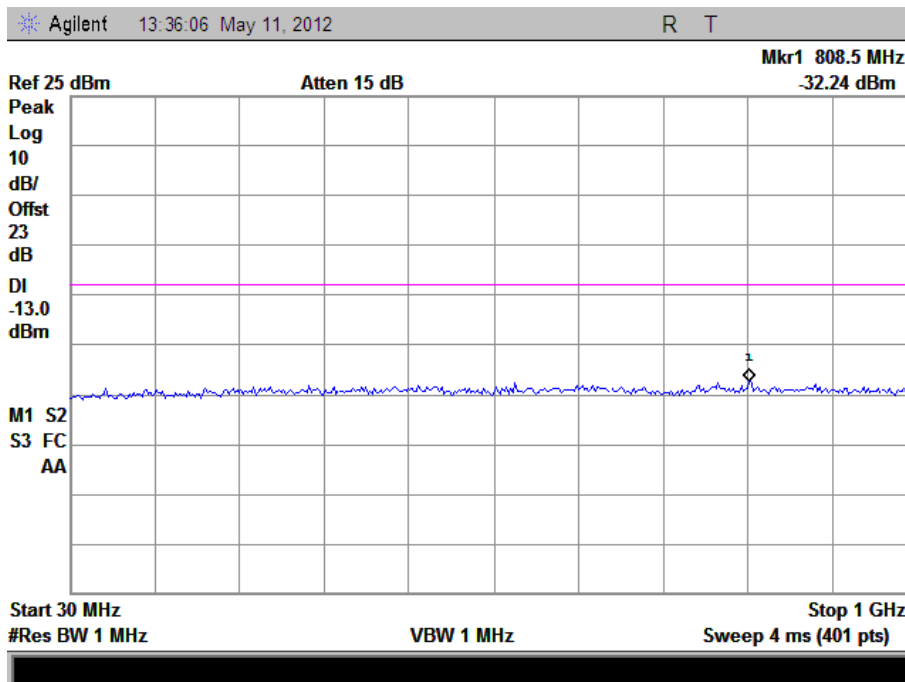
# HSUPA High Band Spurious Emission



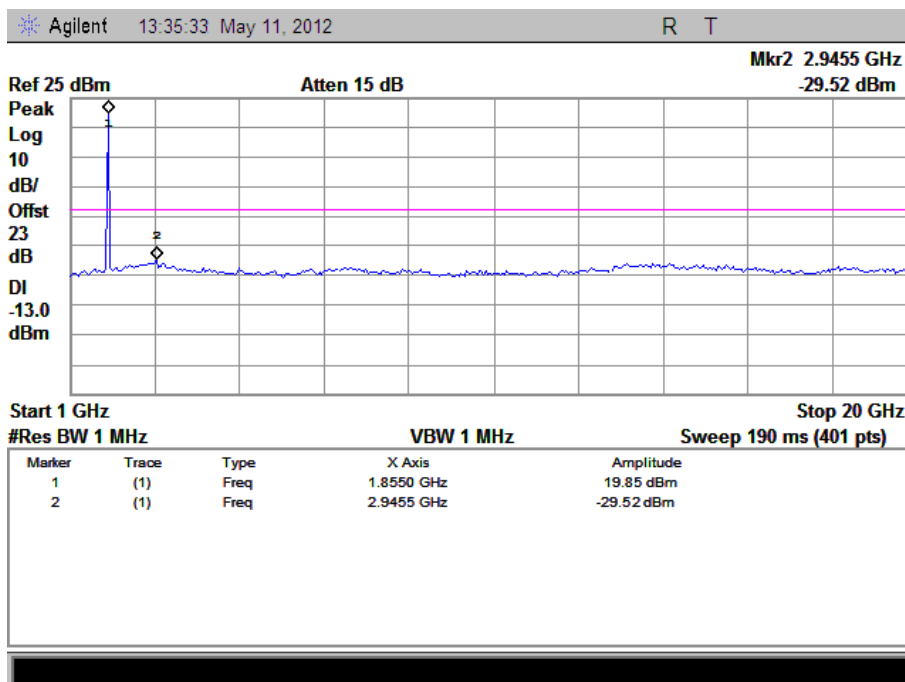


# HSDPA Low Channel

30MHz to 1GHz

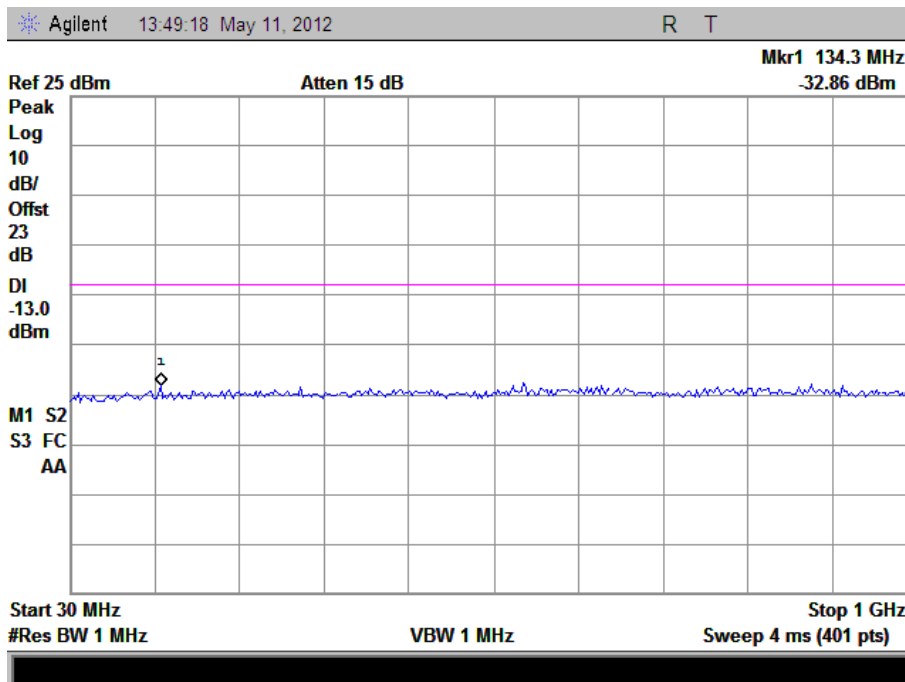


# Above 1GHz

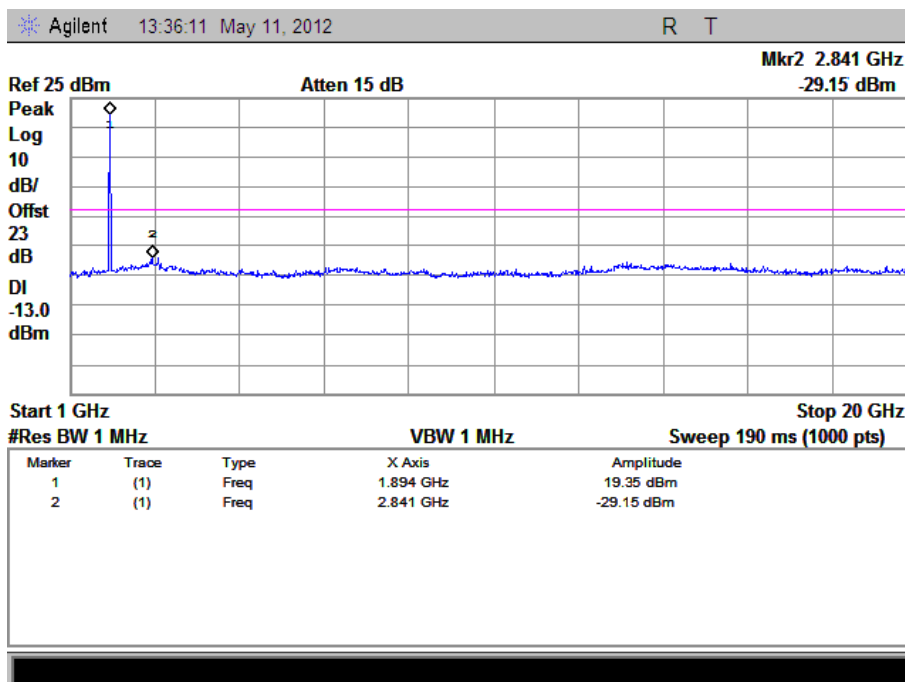


# HSDPA Middle Channel

30MHz to 1GHz

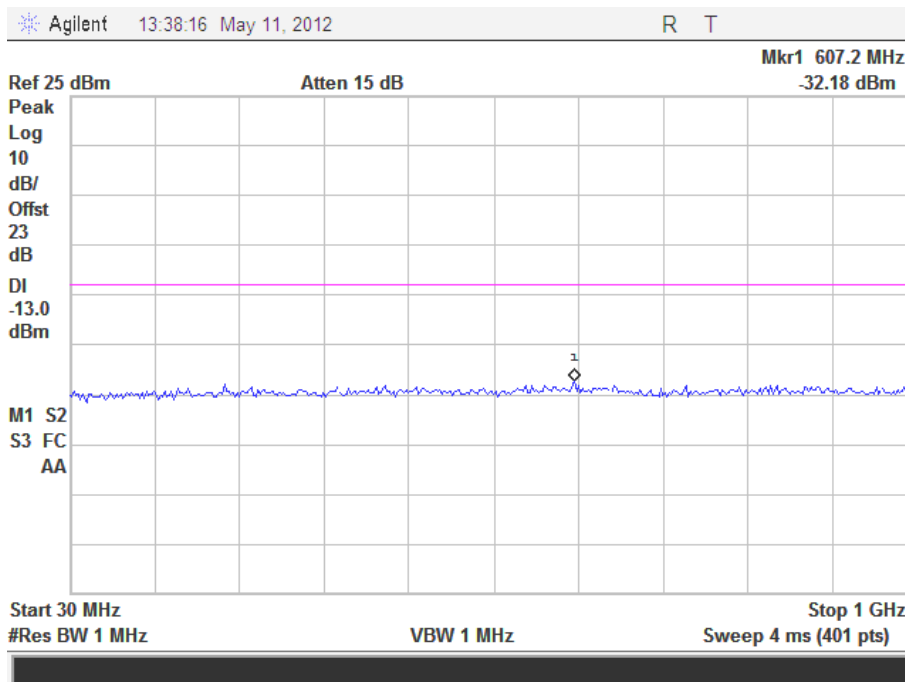


Above 1GHz

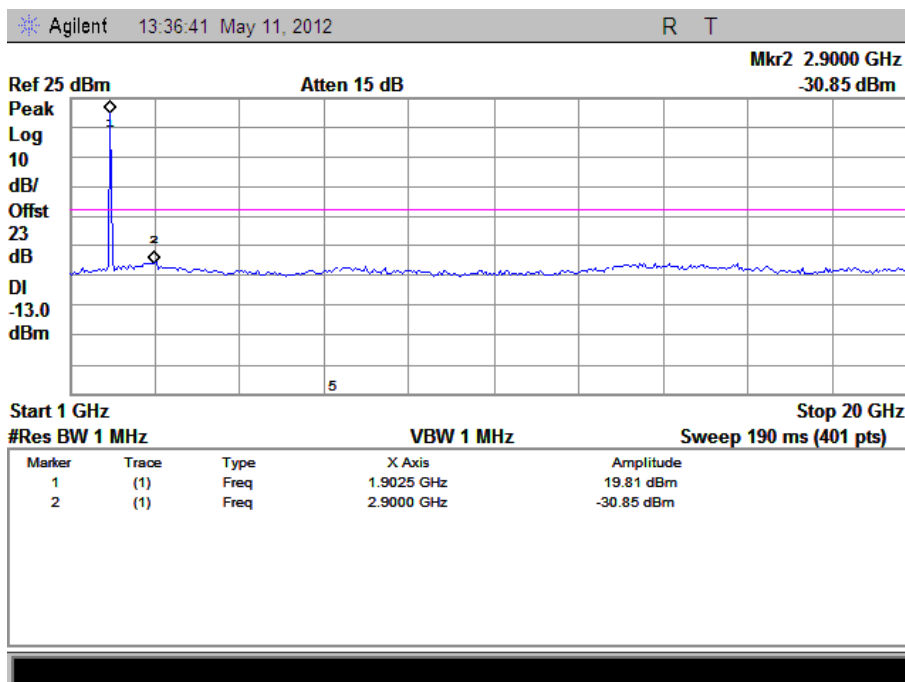


# HSDPA High Channel

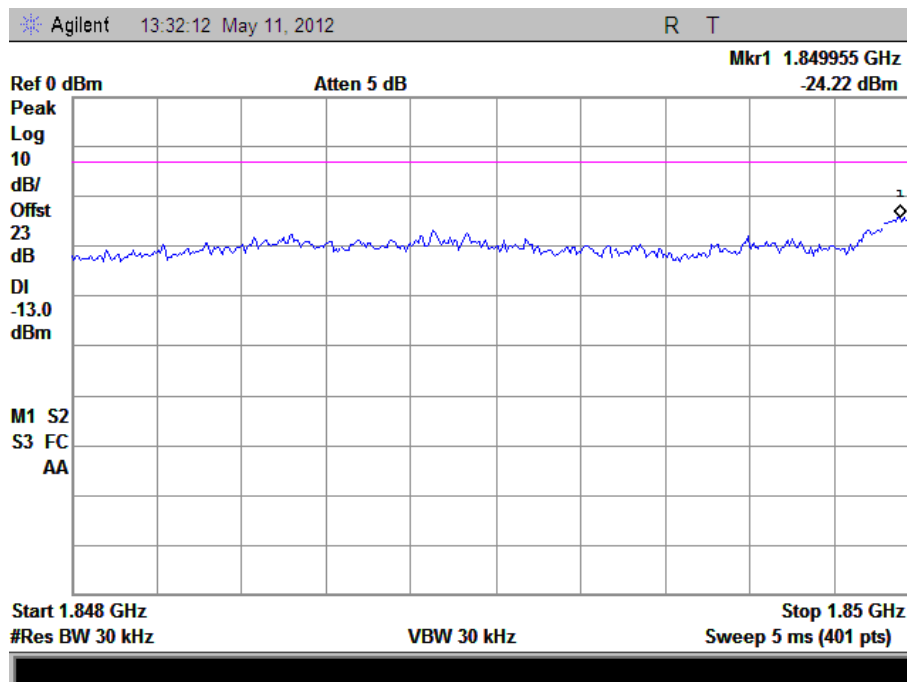
30MHz to 1GHz



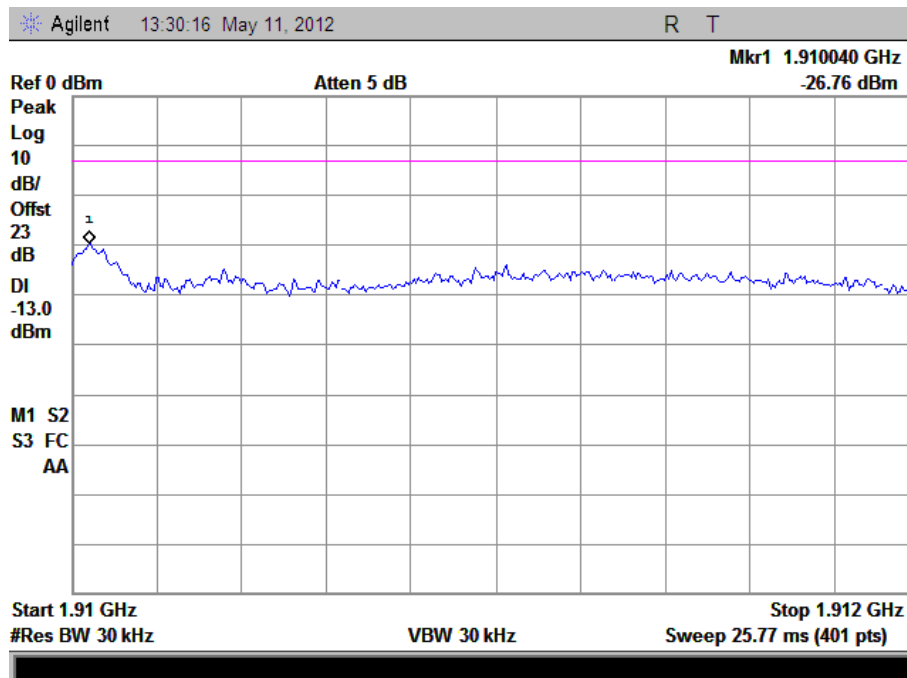
Above 1GHz



# HSDPA Low Band Spurious Emission



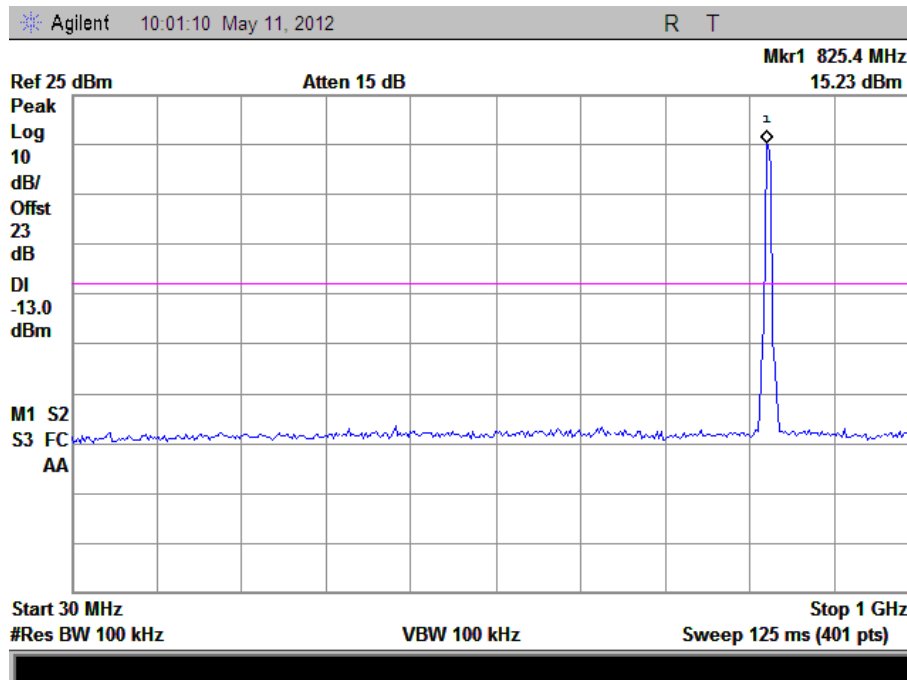
# HSDPA High Band Spurious Emission



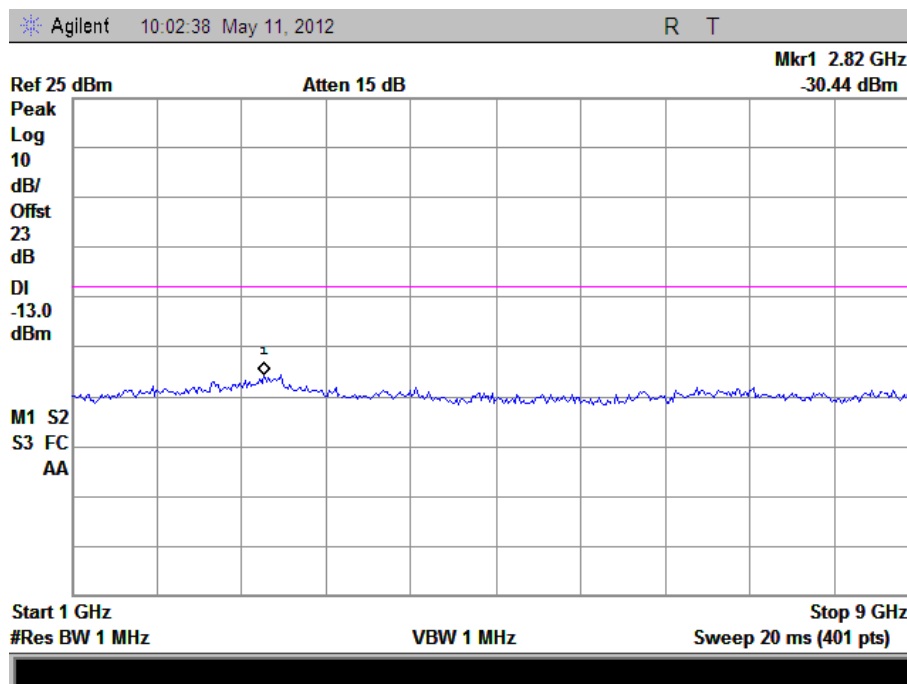
**For Band V**

WCDMA Low Channel

30MHz to 1GHz

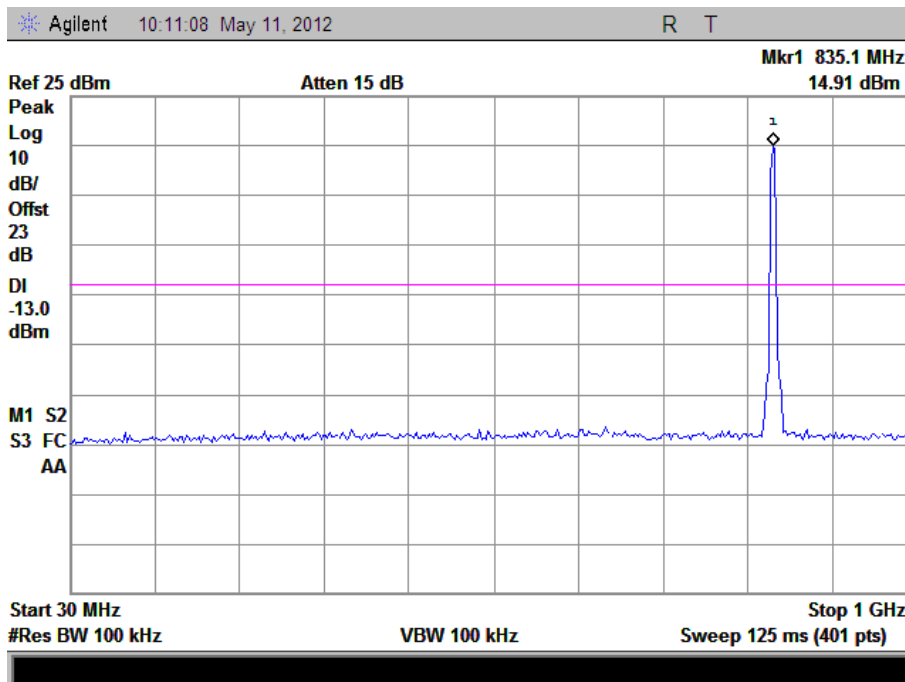


Above 1GHz

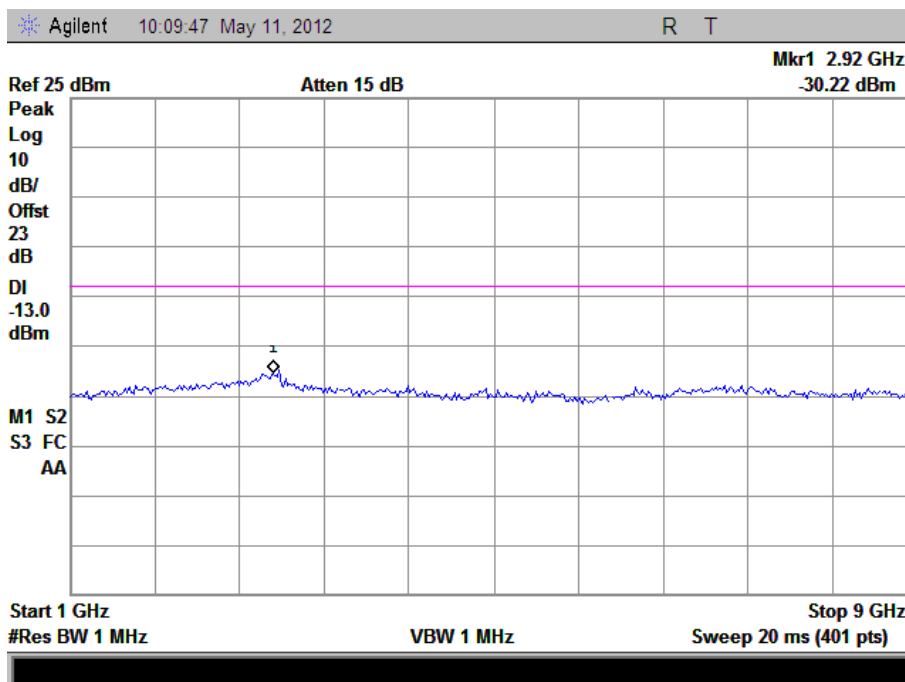


# WCDMA Middle Channel

30MHz to 1GHz

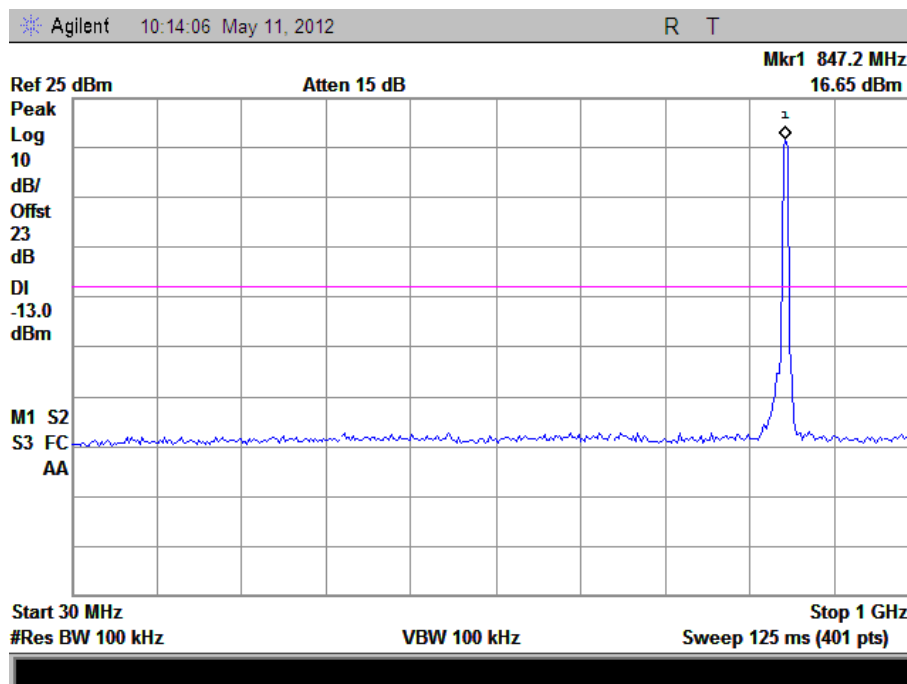


# Above 1GHz

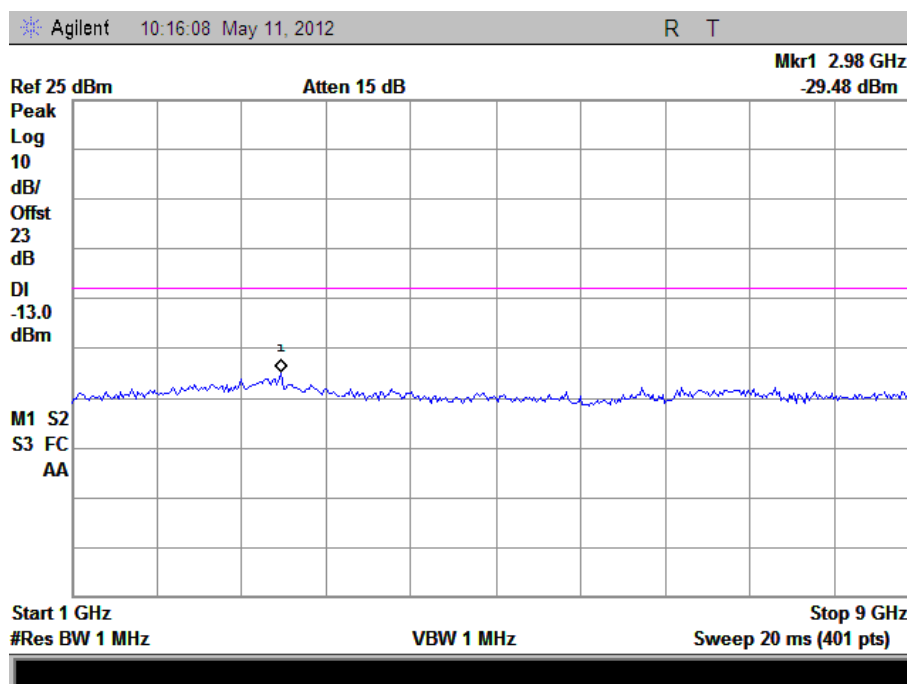


## WCDMA High Channel

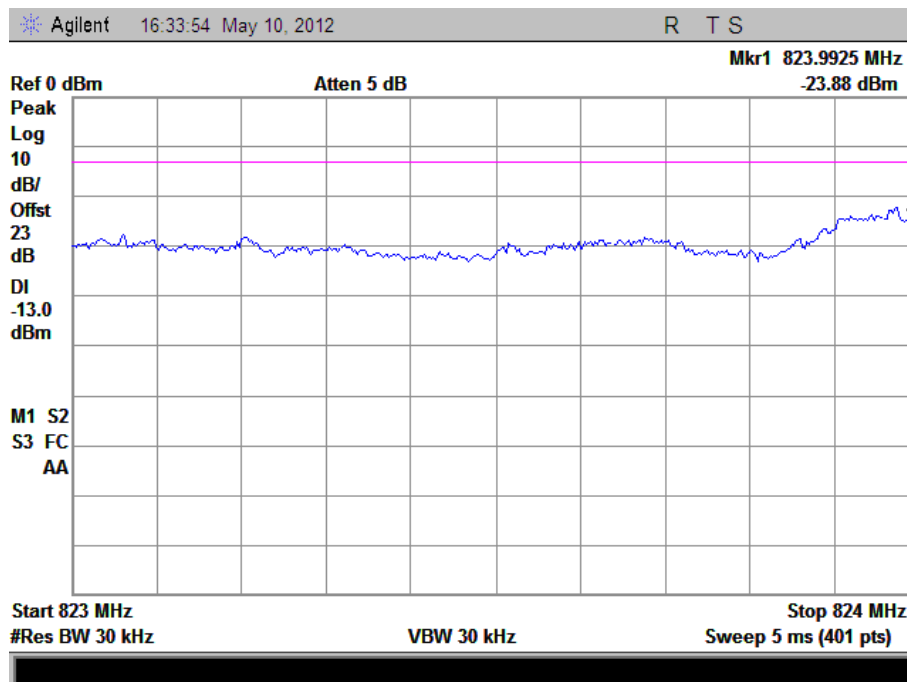
30MHz to 1GHz



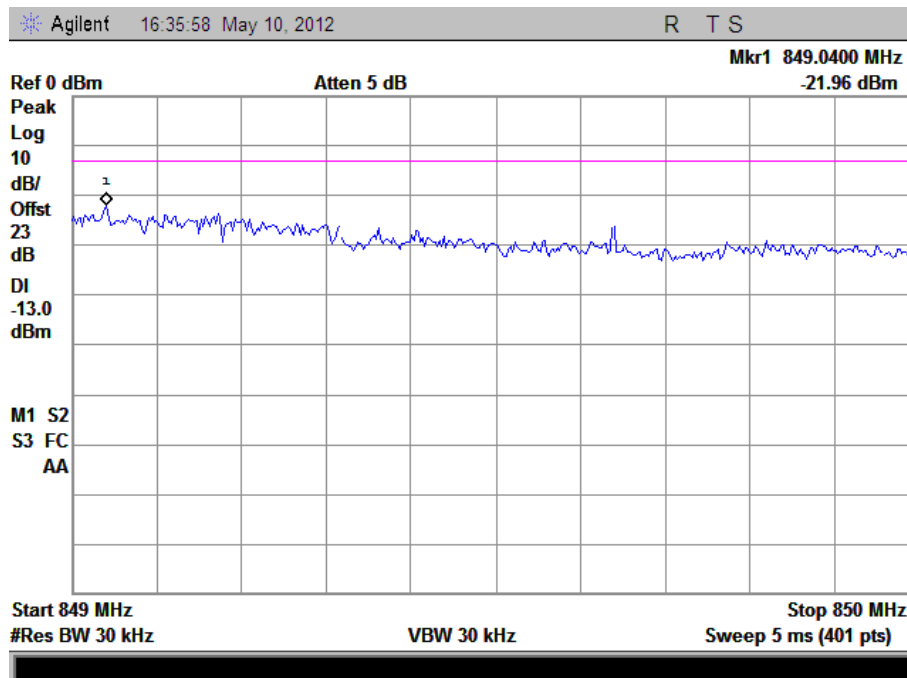
## Above 1GHz



## WCDMA Low Band Spurious Emission



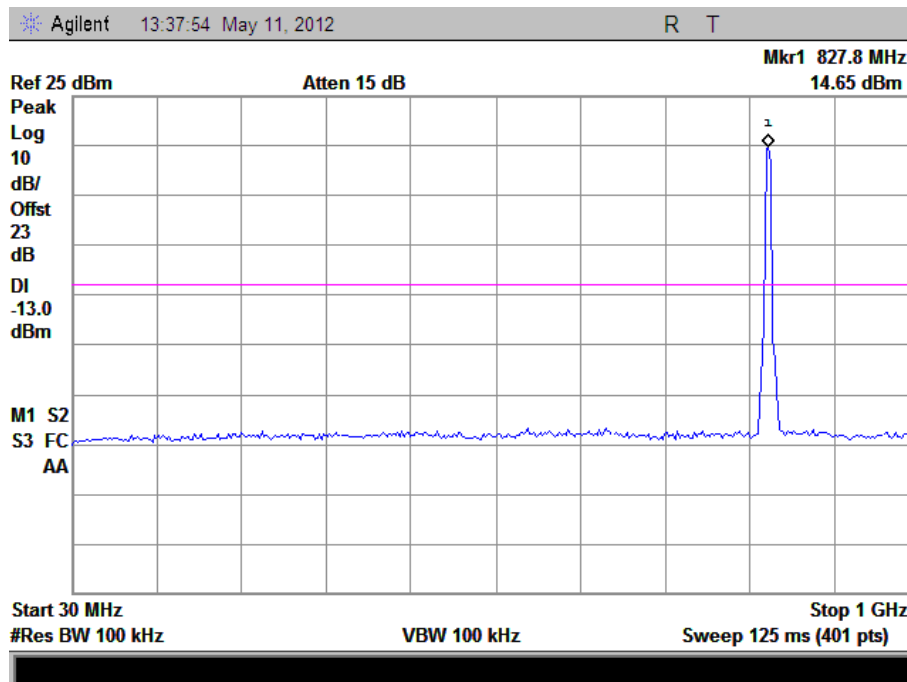
## WCDMA High Band Spurious Emission



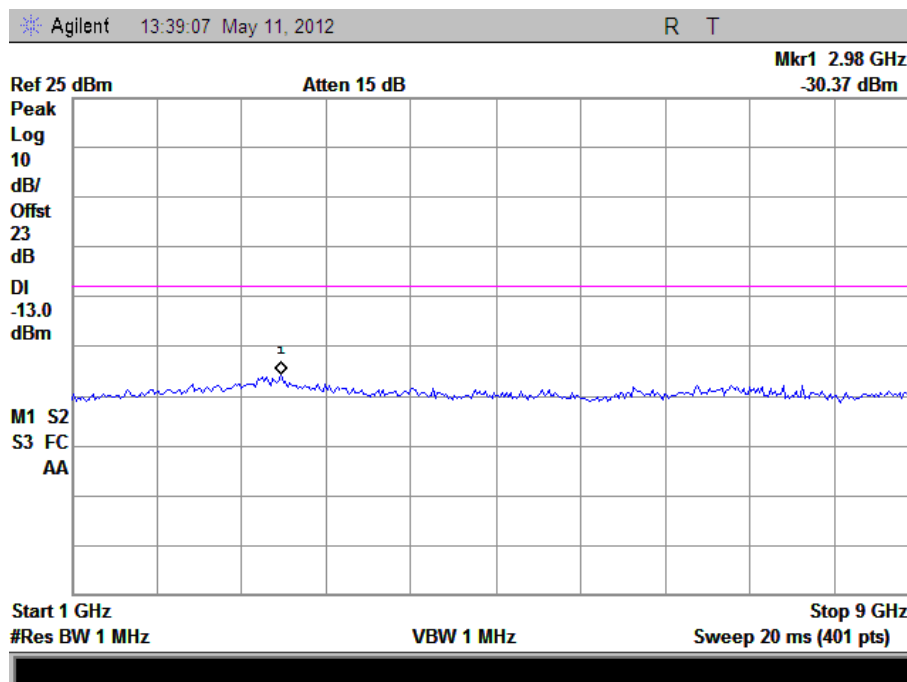


## HSUPA Low Channel

30MHz to 1GHz

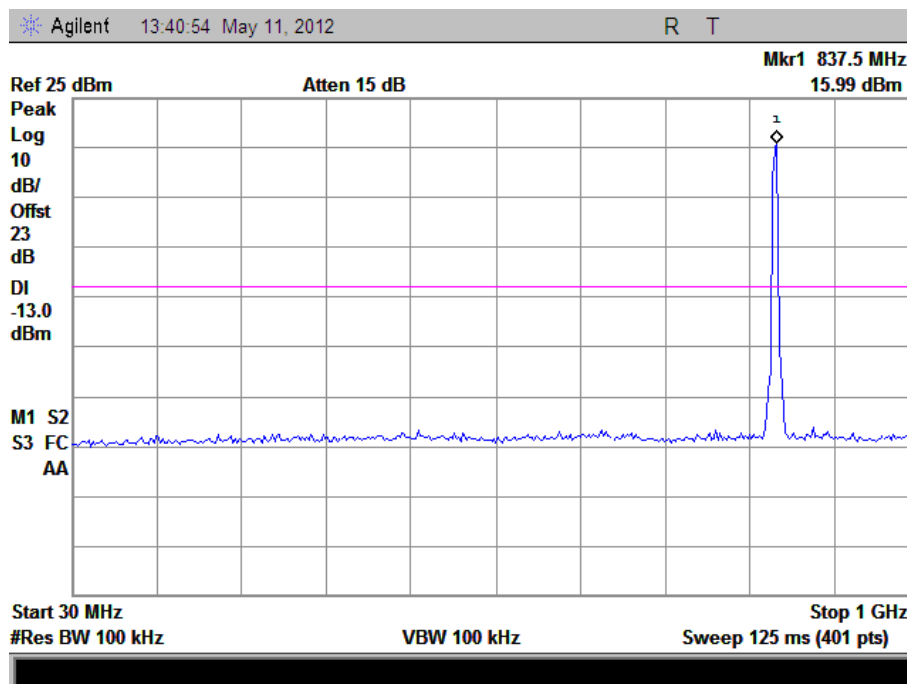


## Above 1GHz

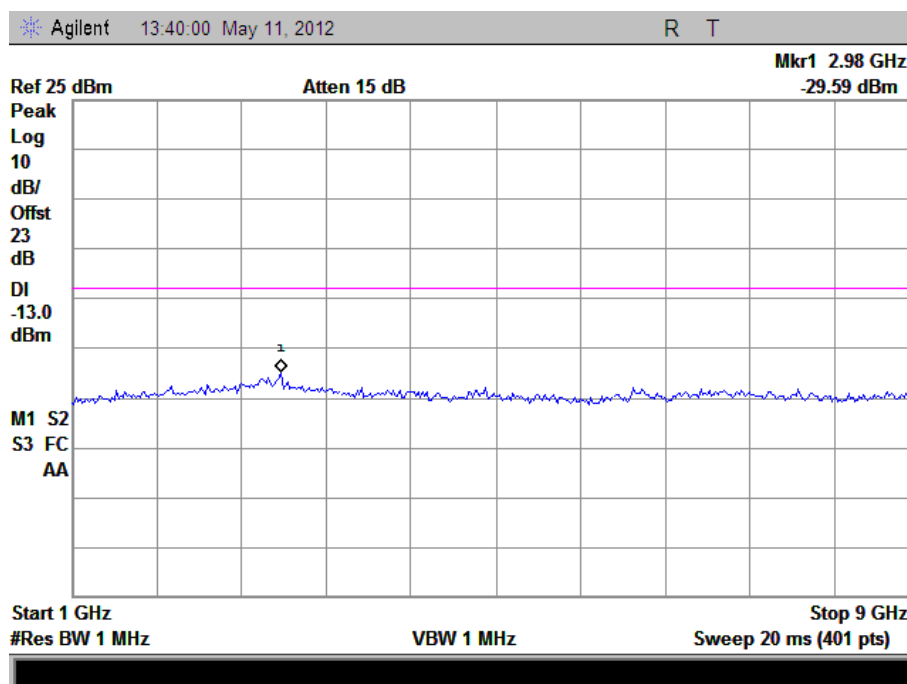


## HSUPA Middle Channel

30MHz to 1GHz

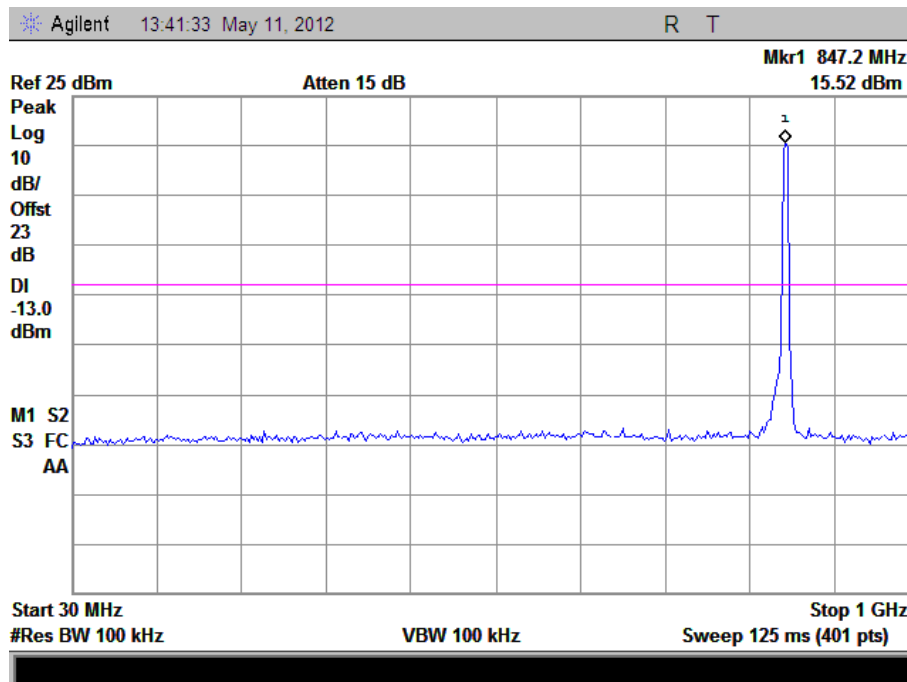


## Above 1GHz

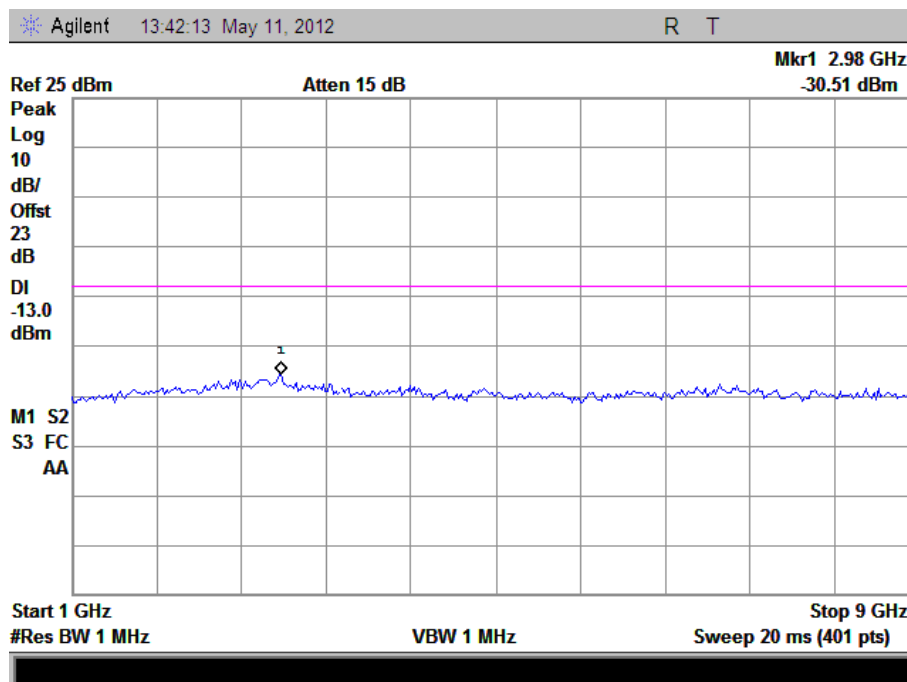


## HSUPA High Channel

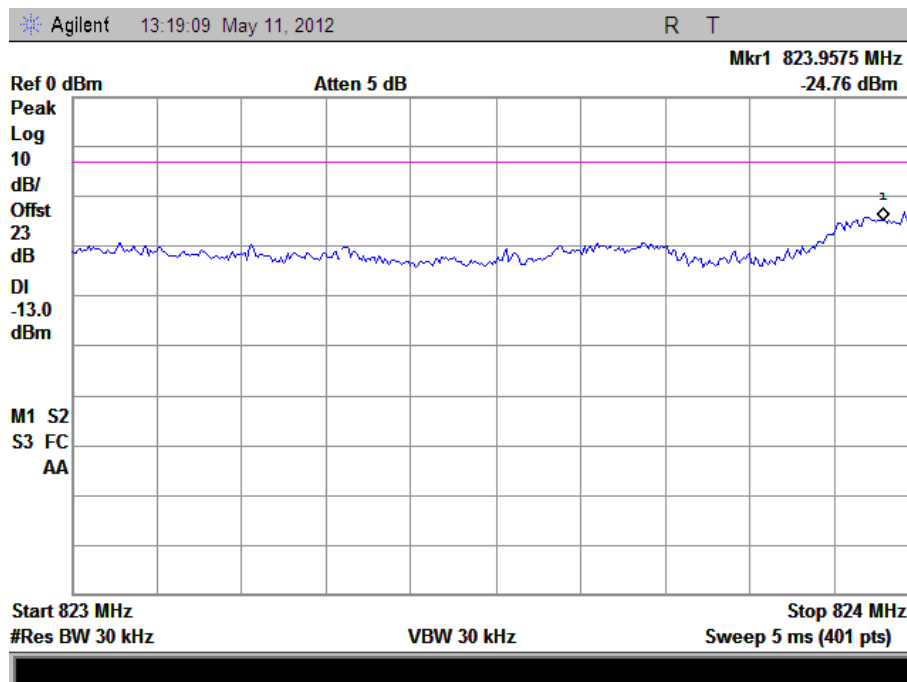
30MHz to 1GHz



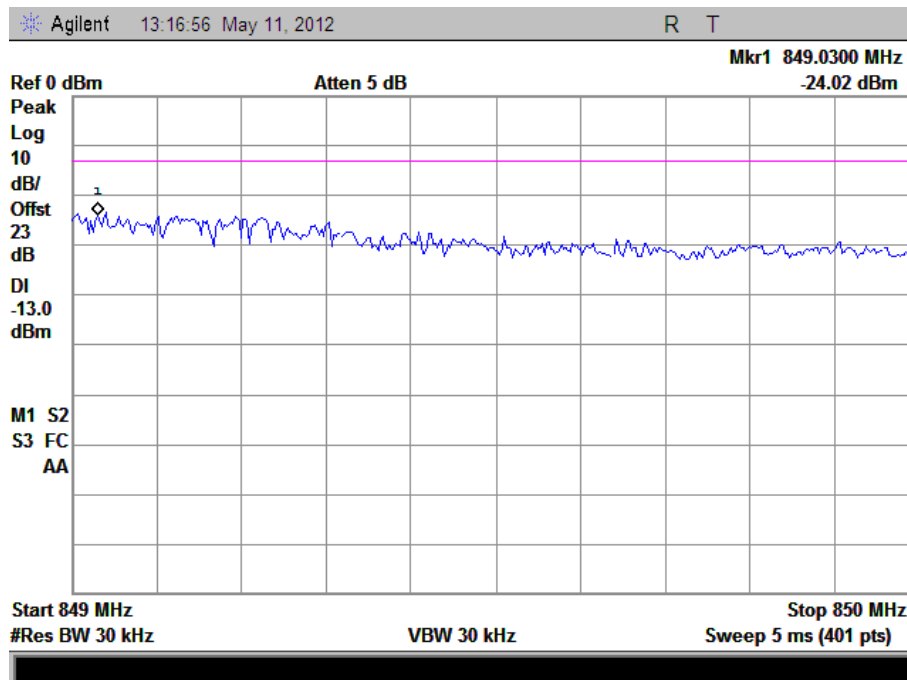
## Above 1GHz



# HSUPA Low Band Spurious Emission

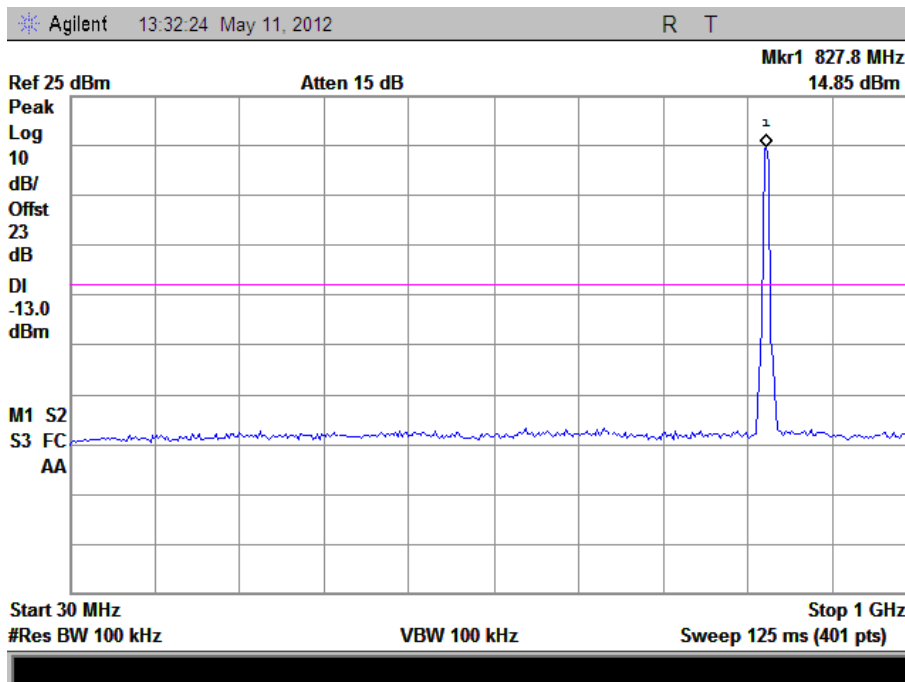


# HSUPA High Band Spurious Emission

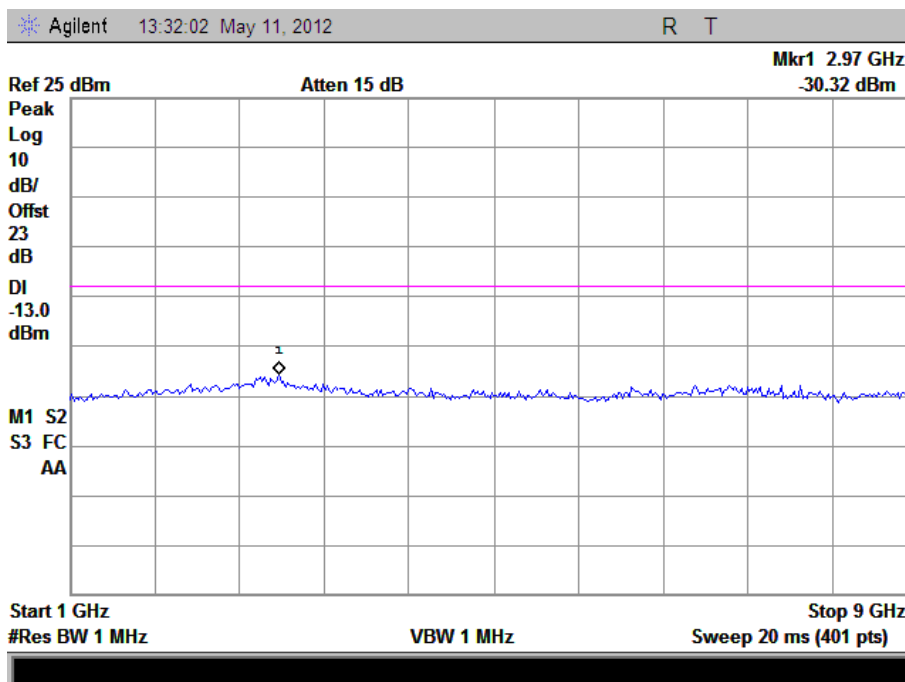


# HSDPA Low Channel

30MHz to 1GHz

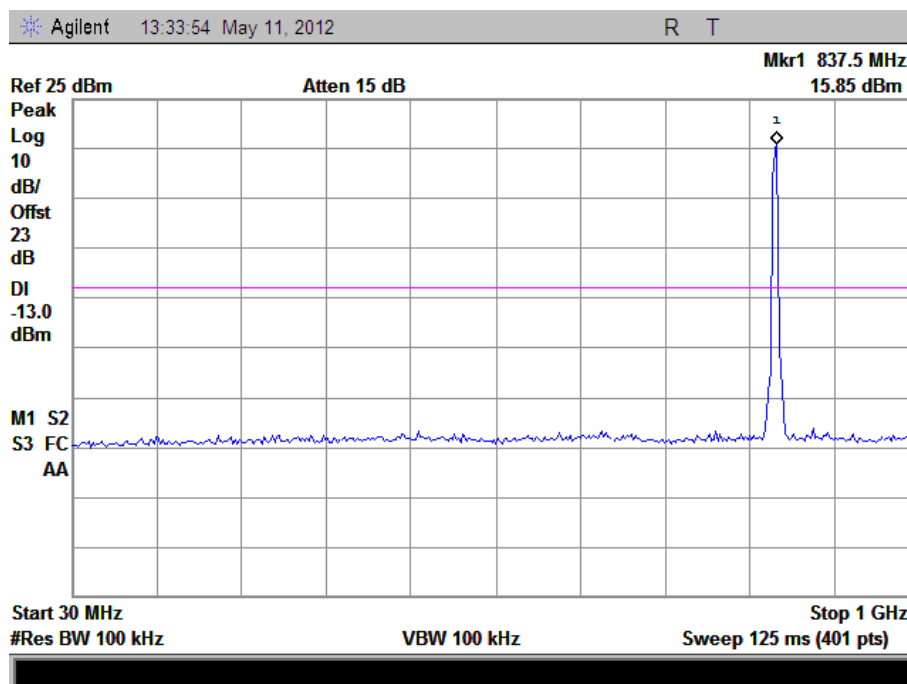


# Above 1GHz

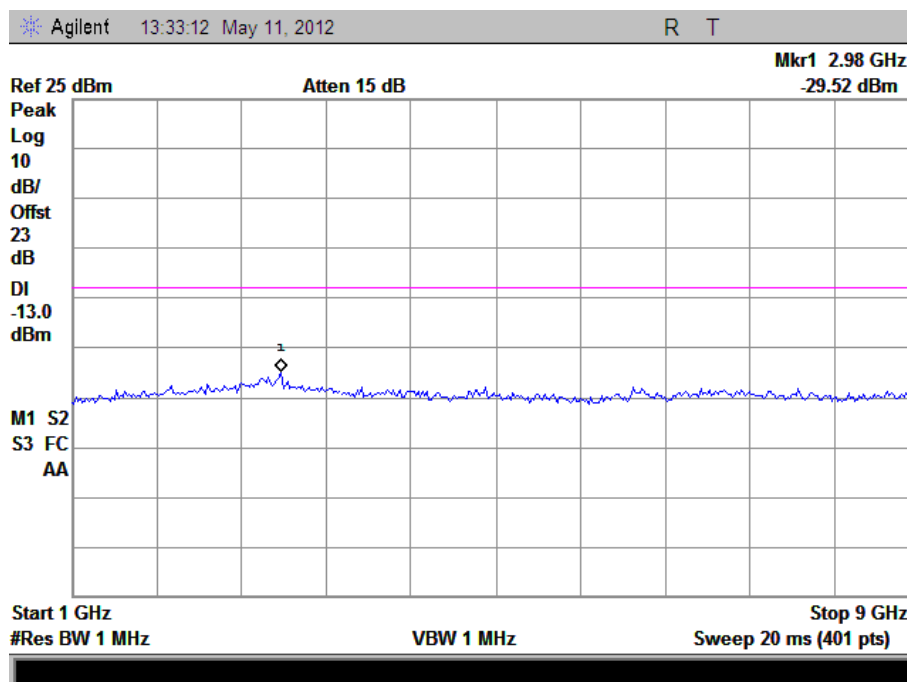


## HSDPA Middle Channel

30MHz to 1GHz

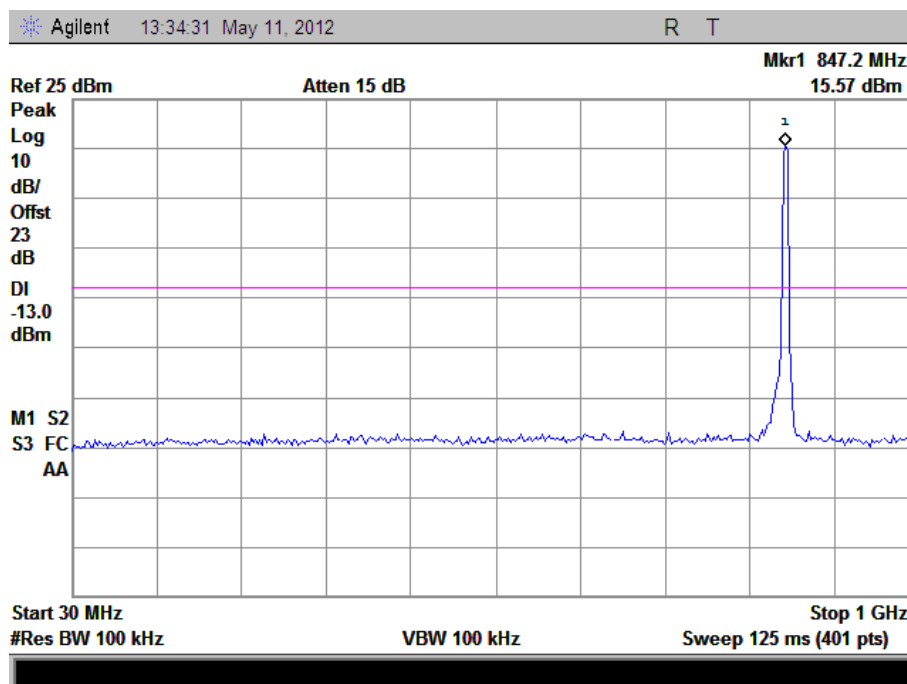


## Above 1GHz

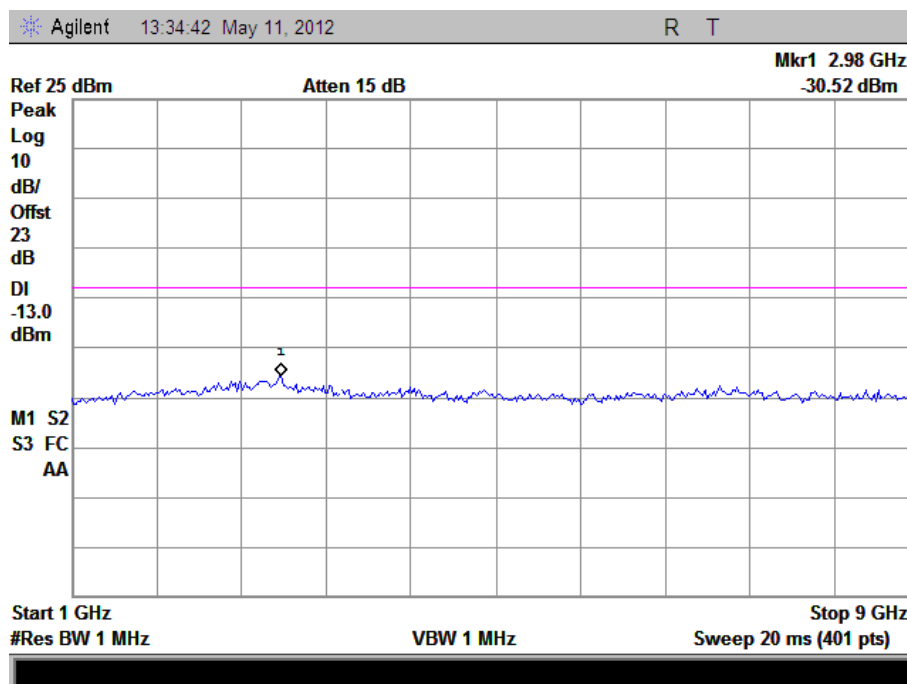


## HSDPA High Channel

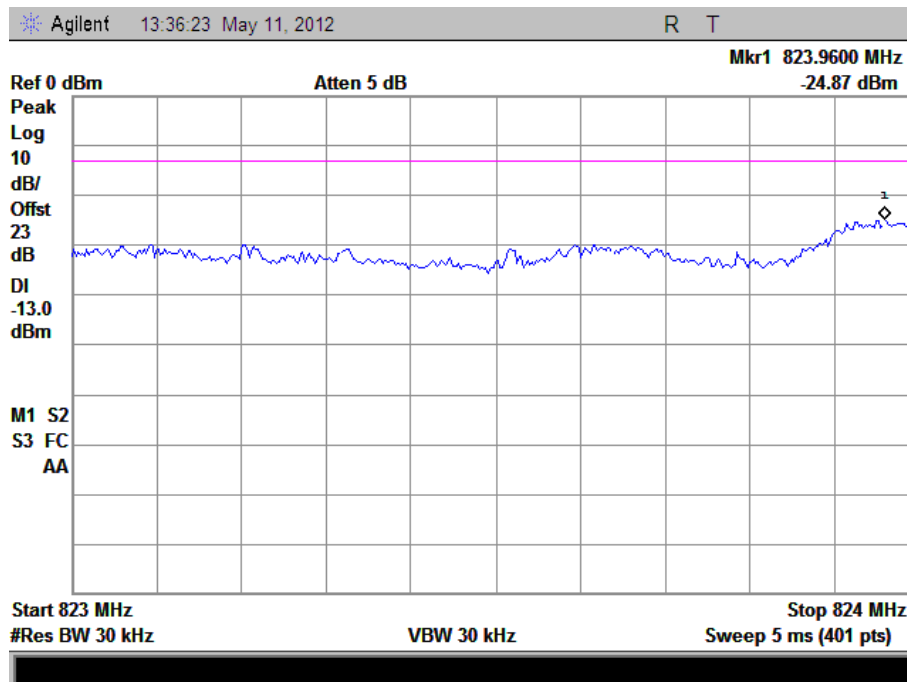
30MHz to 1GHz



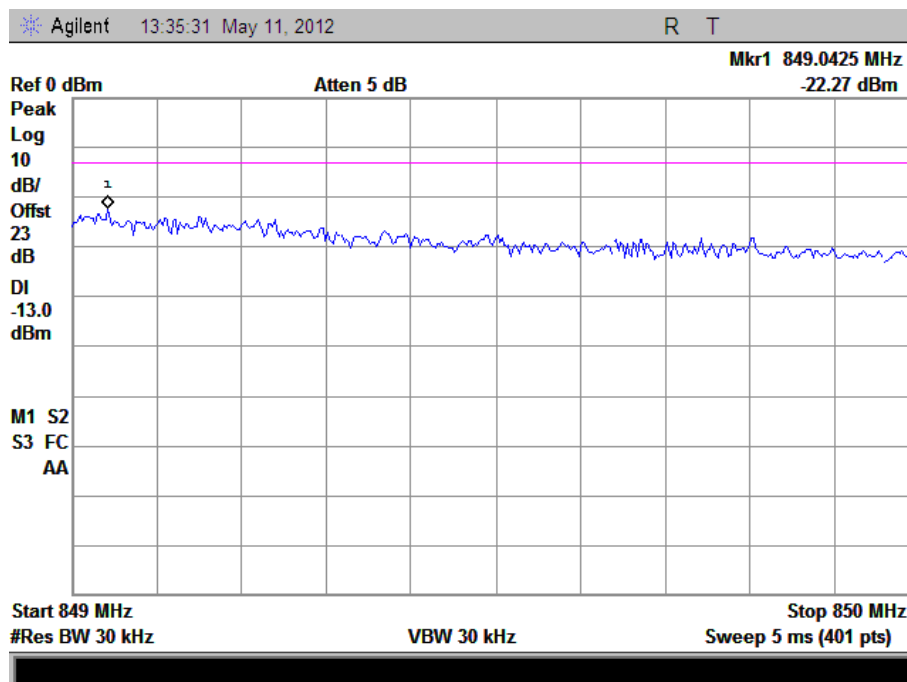
## Above 1GHz



# HSDPA Low Band Spurious Emission



# HSDPA High Band Spurious Emission





## 7. SPURIOUS RADIATION EMISSIONS

### 7.1 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.

### 7.2 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.

### 7.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	112012	2012-03-28	2013-03-27
Signal Generator	R&S	SMR20	100047	2012-03-28	2013-03-27

### 7.4 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)

## 7.5 Environmental Conditions

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

## 7.6 Summary of Test Results/Plots

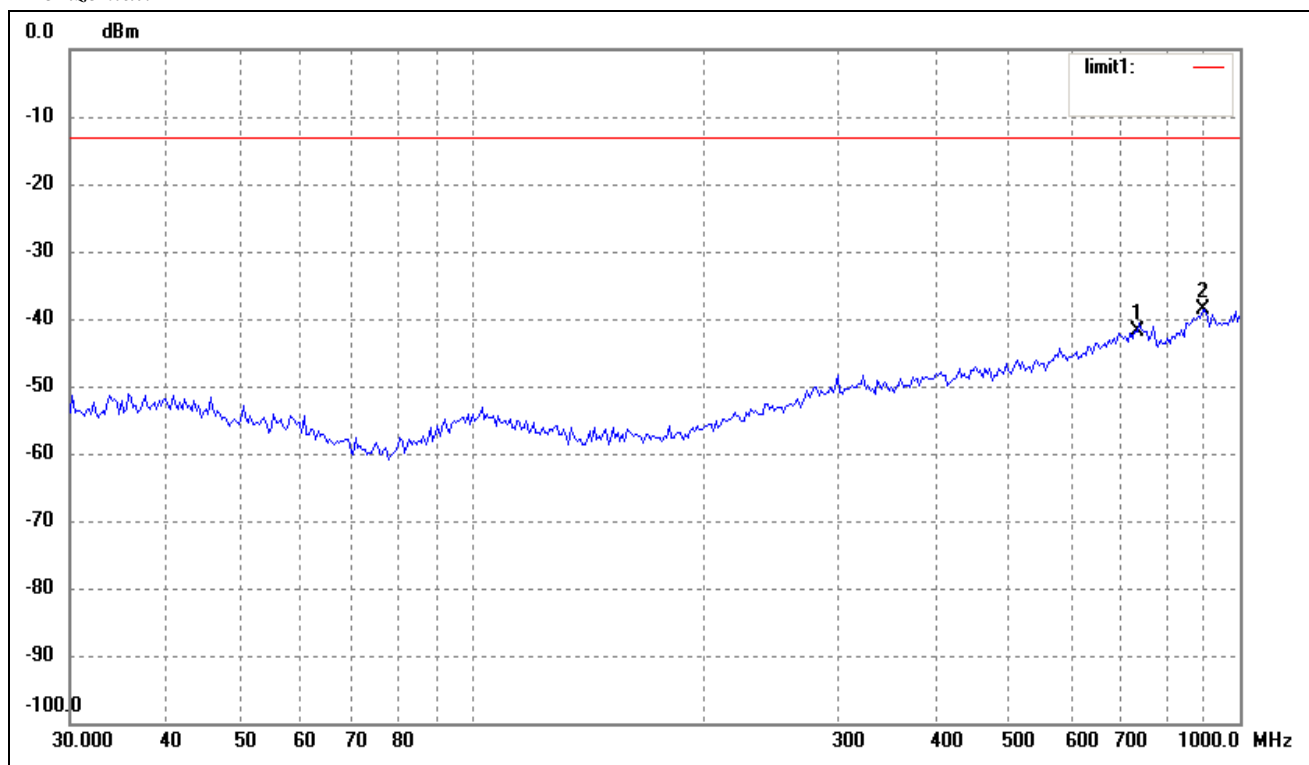
According to the data below, the FCC Part 22.917 and 24.238 standards, and had the worst margin of:

**-21.04 dBm at 919.2866 MHz in the Vertical polarization for WCDMA Band II HSDPA Mode, 30 MHz to 20 GHz.**

*Spurious Emission From 30MHz to 1GHz*

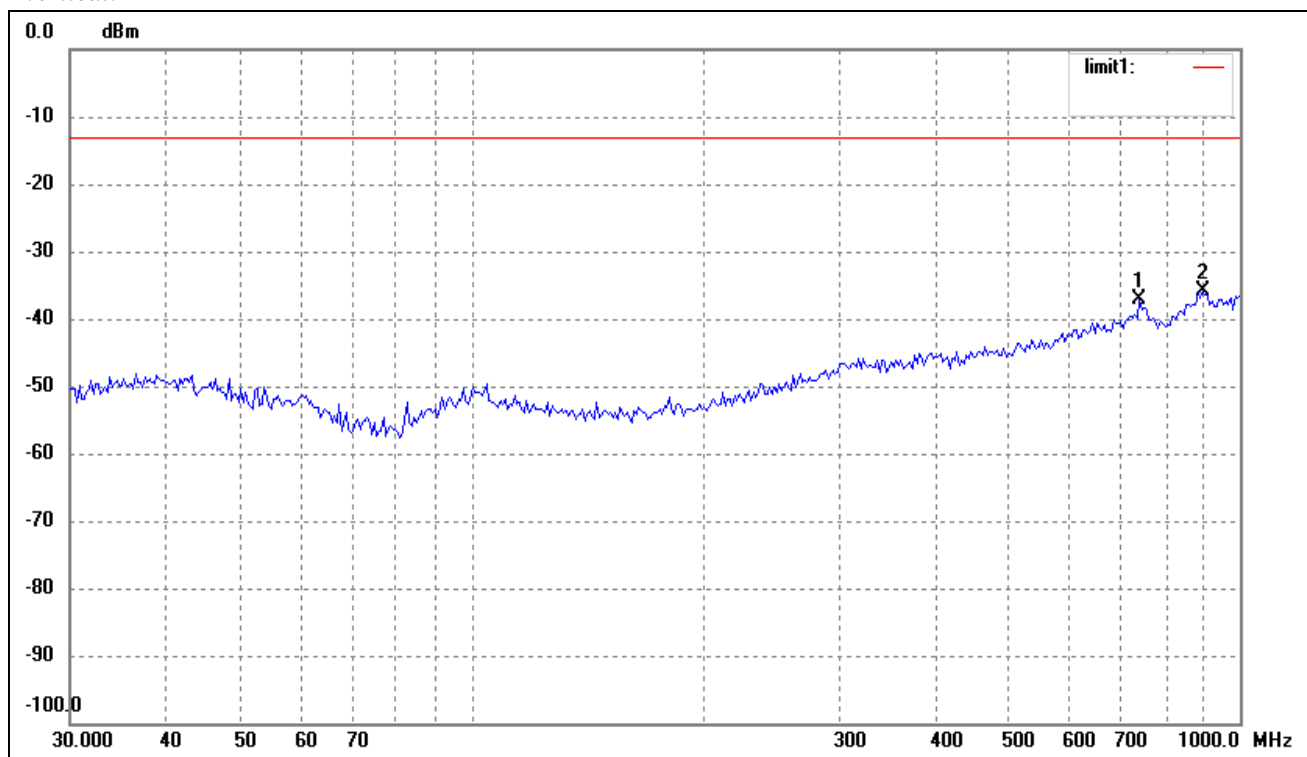
*For Cellular Band\_GSM Mode*

*Horizontal:*



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	734.4913	-71.33	29.48	-41.85	-13.00	-28.85	ERP
2	893.8567	-69.58	31.07	-38.51	-13.00	-25.51	ERP

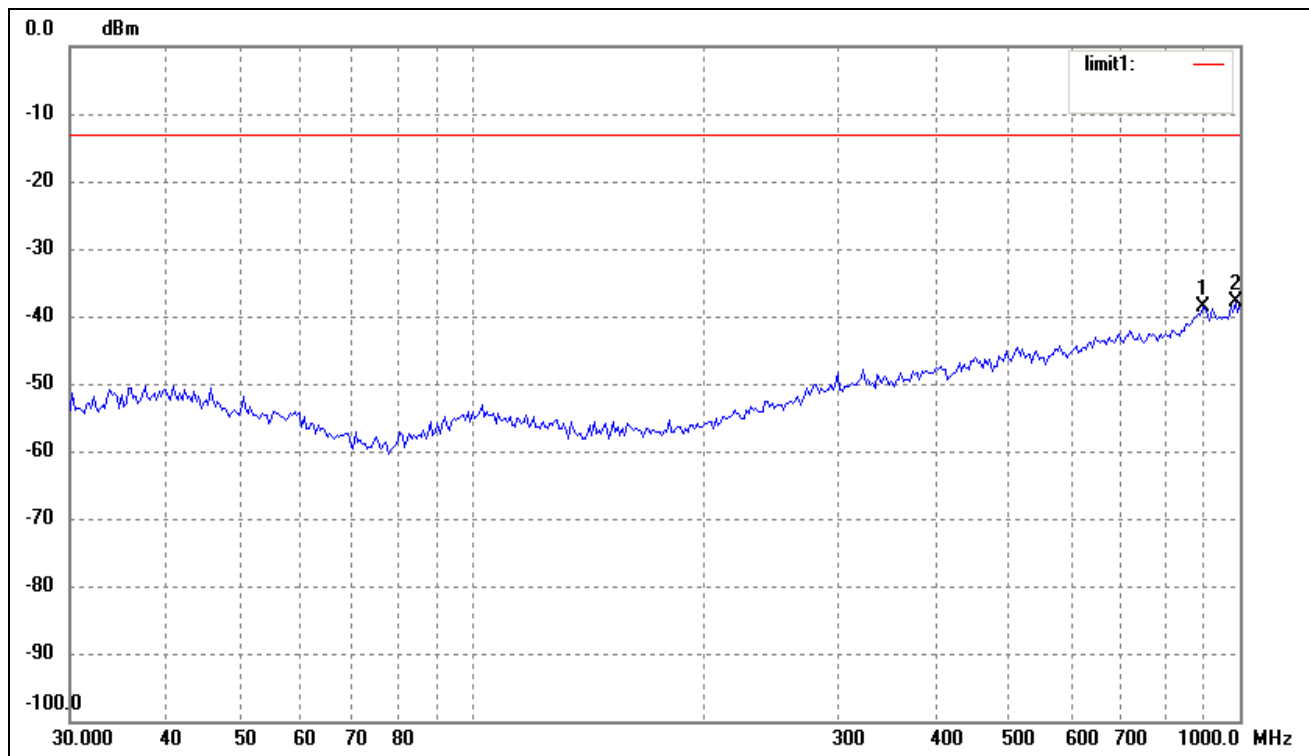
Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	739.6605	-67.09	29.87	-37.22	-13.00	-24.22	ERP
2	893.8567	-66.97	31.07	-35.90	-13.00	-22.90	ERP

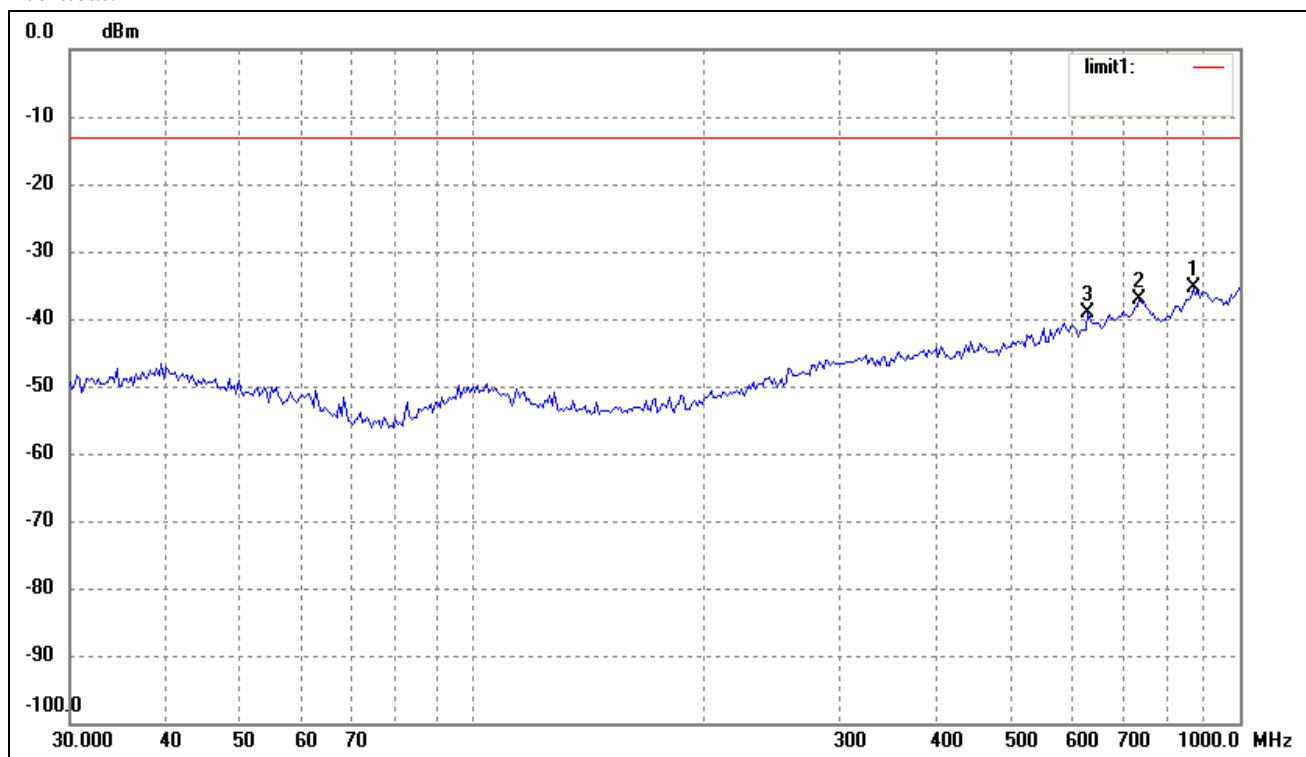
For Cellular Band\_GPRS Mode

Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	893.8567	-69.58	31.07	-38.51	-13.00	-25.51	ERP
2	986.0717	-68.78	30.97	-37.81	-13.00	-24.81	ERP

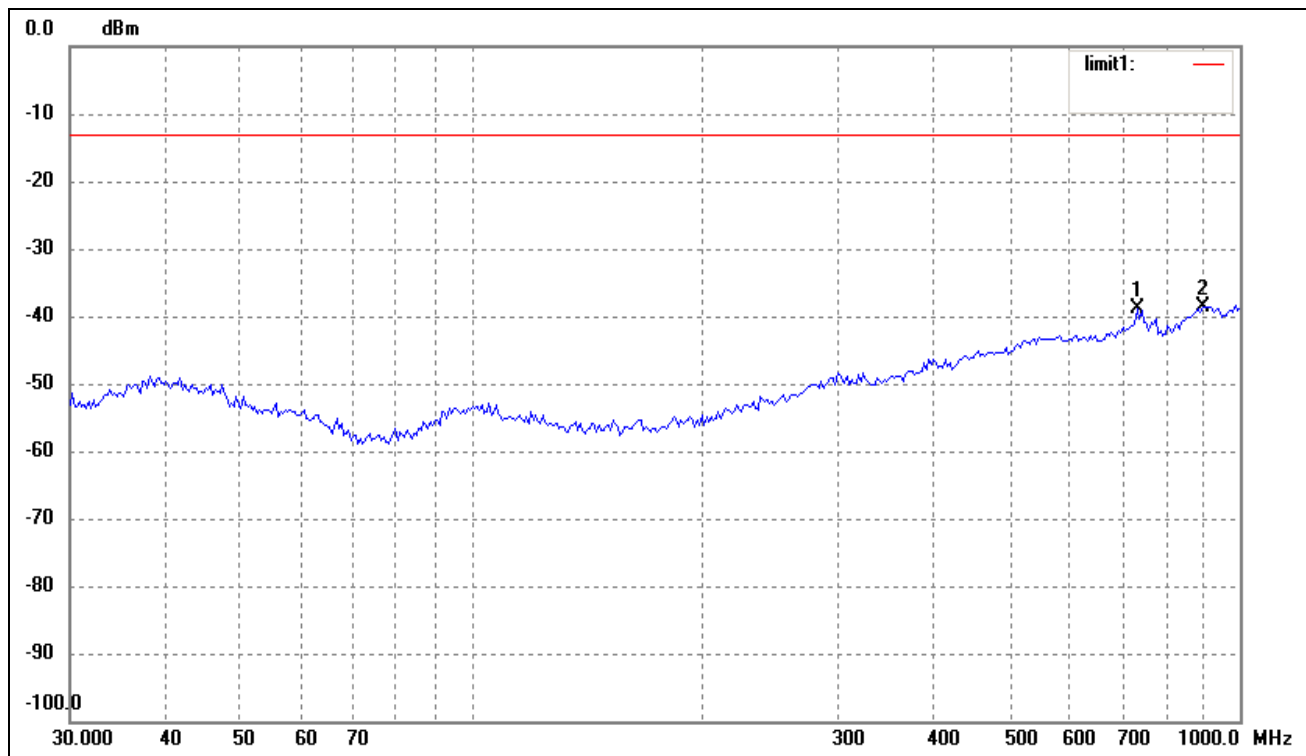
Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	869.1302	-65.70	30.34	-35.36	-13.00	-22.36	ERP
2	739.6605	-67.09	29.87	-37.22	-13.00	-24.22	ERP
3	633.9073	-65.80	26.57	-39.23	-13.00	-26.23	ERP

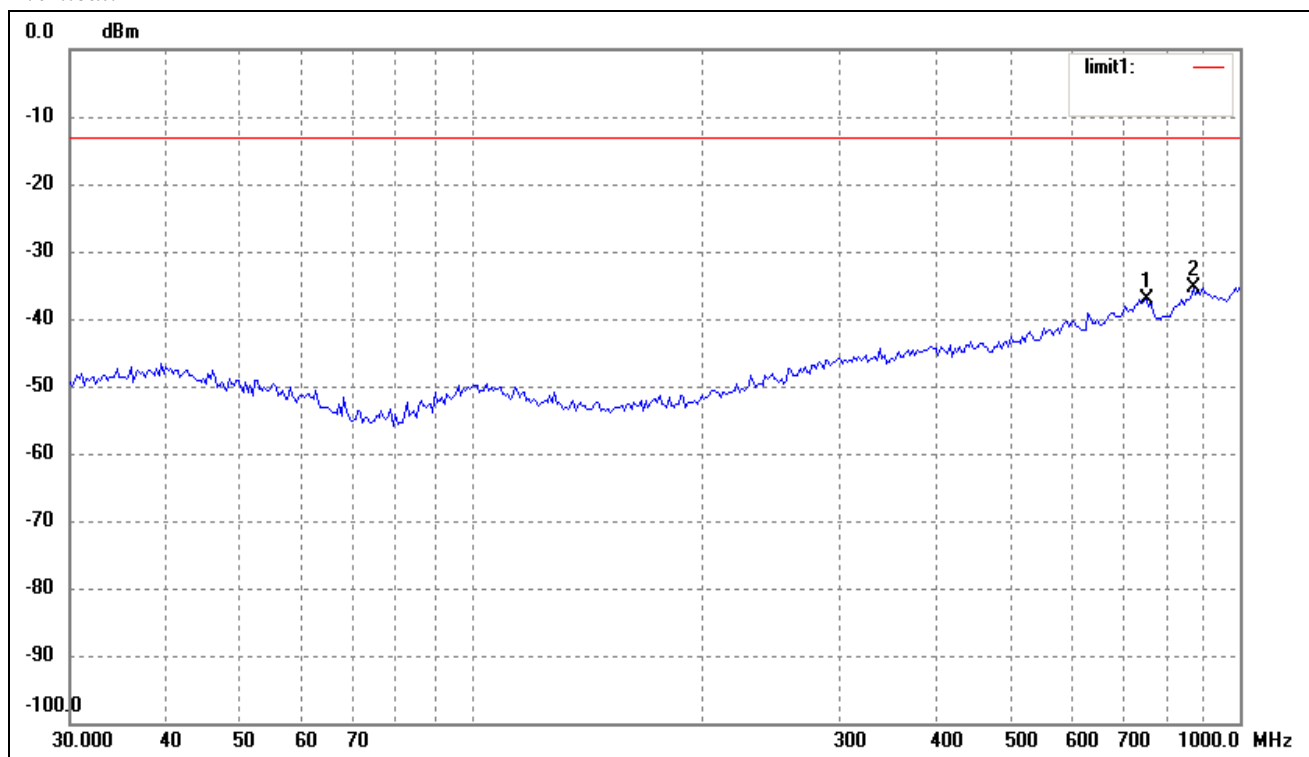
For Cellular Band\_EDGE Mode

Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	734.4913	-68.35	29.48	-38.87	-13.00	-25.87	ERP
2	893.8567	-69.58	31.07	-38.51	-13.00	-25.51	ERP

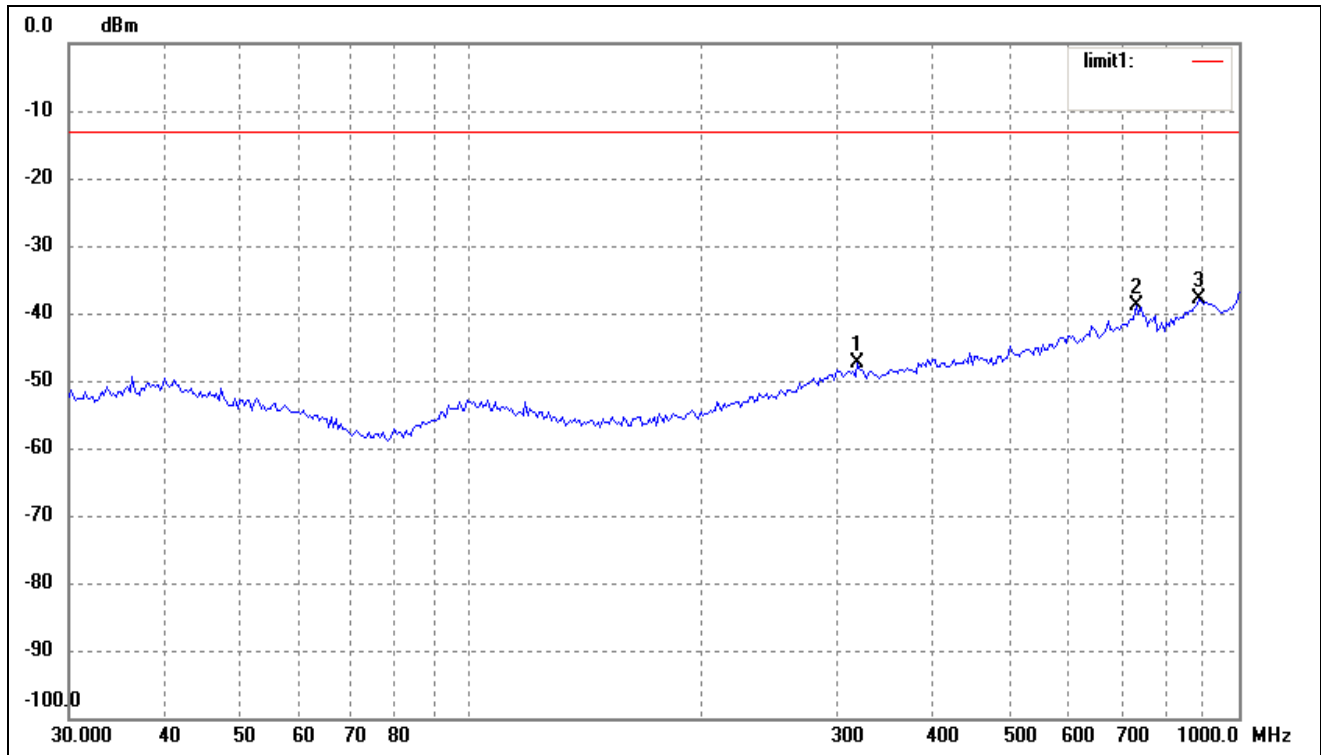
Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	755.3873	-66.41	29.28	-37.13	-13.00	-24.13	ERP
2	869.1302	-65.70	30.34	-35.36	-13.00	-22.36	ERP

For PCS Band\_GSM Mode

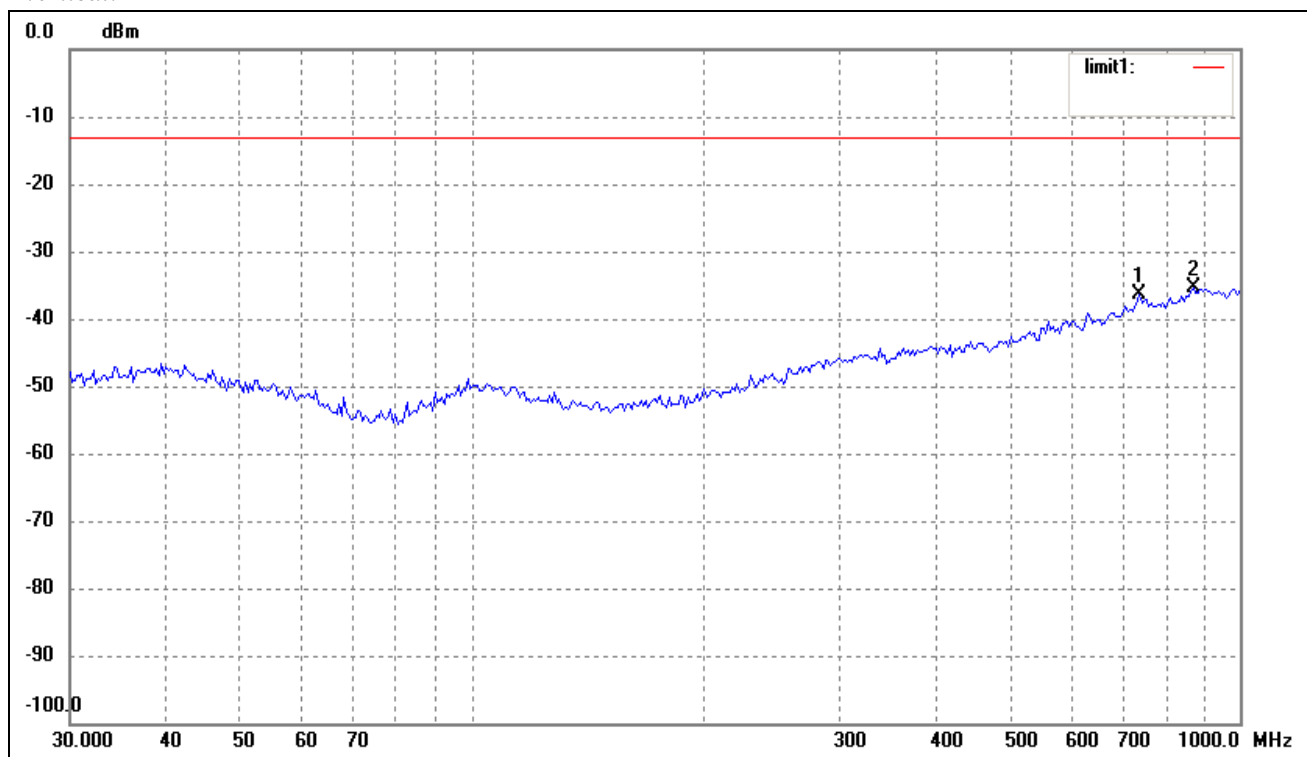
Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	318.8170	-69.75	22.26	-47.49	-13.00	-34.49	ERP
2	734.4913	-68.35	29.48	-38.87	-13.00	-25.87	ERP
3	887.6099	-68.92	30.95	-37.97	-13.00	-24.97	ERP



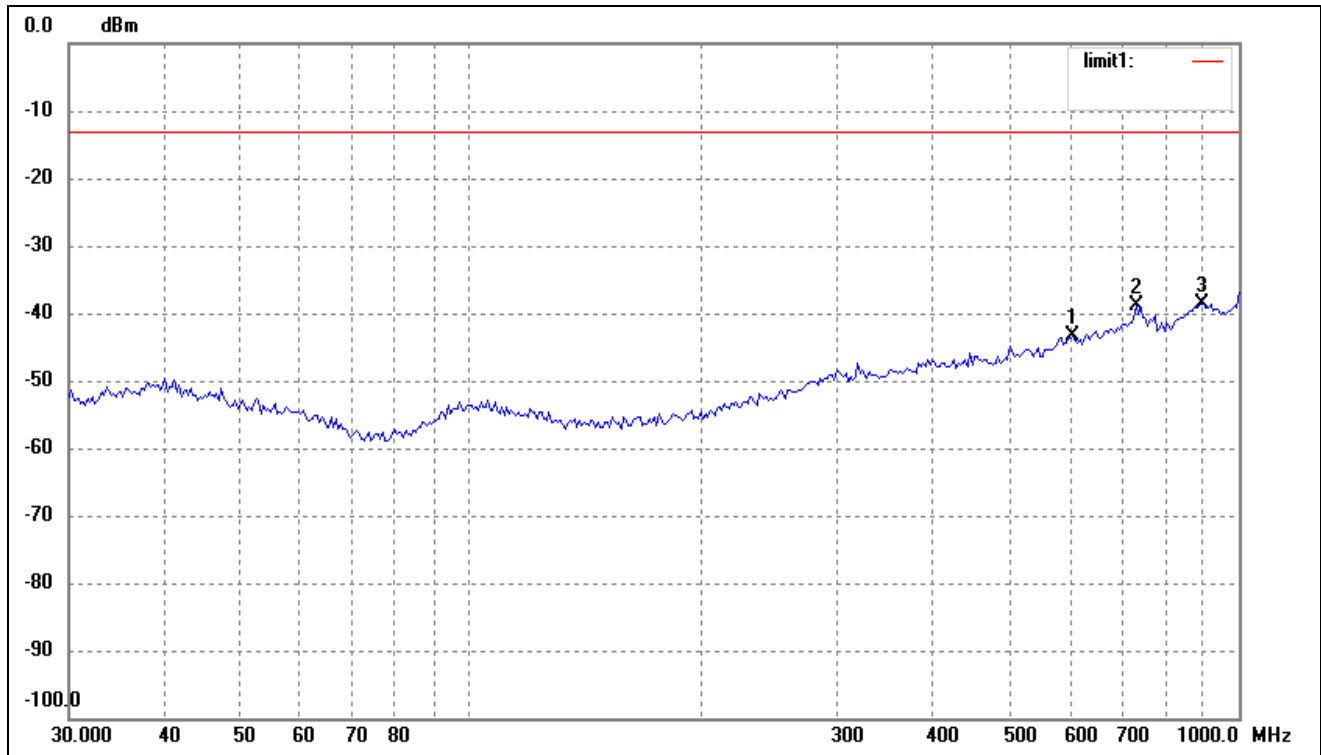
Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	739.6605	-66.25	29.87	-36.38	-13.00	-23.38	ERP
2	869.1302	-65.70	30.34	-35.36	-13.00	-22.36	ERP

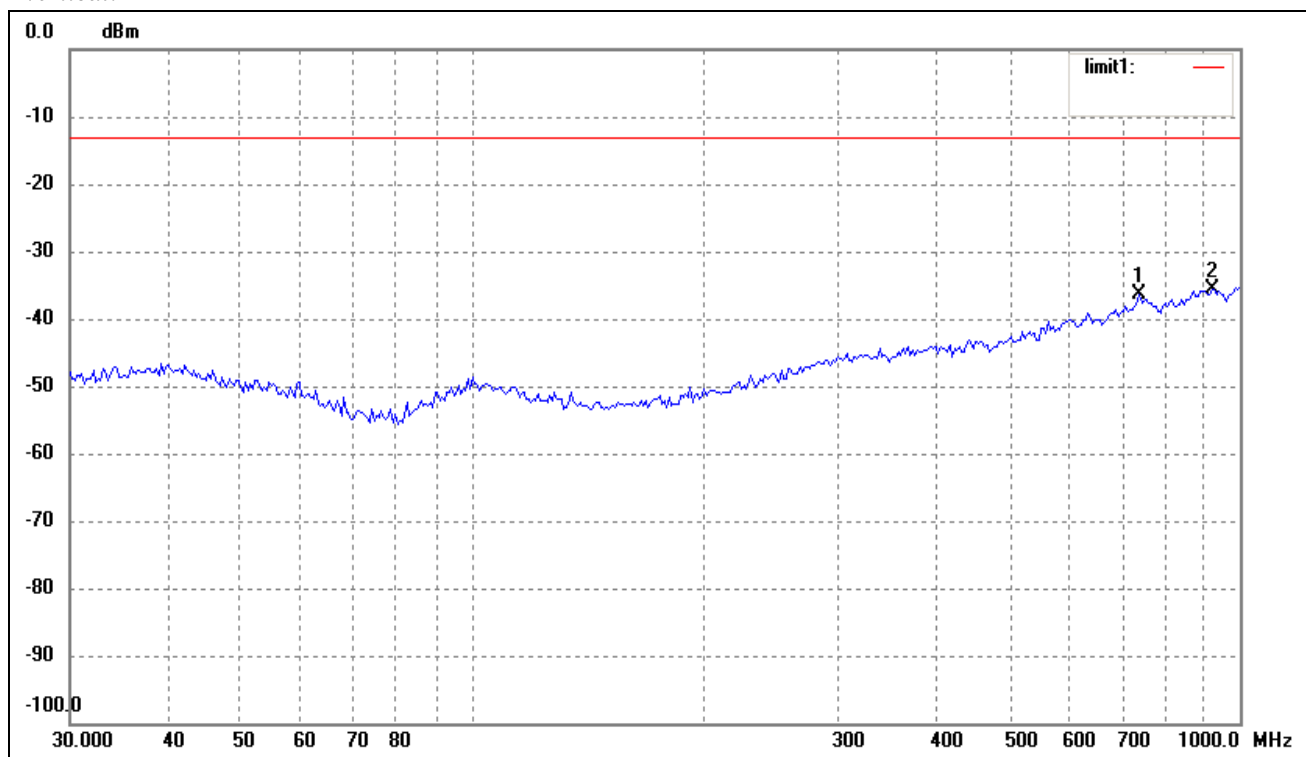
For PCS Band\_GPRS Mode

Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	607.7867	-69.61	26.23	-43.38	-13.00	-30.38	ERP
2	734.4913	-68.35	29.48	-38.87	-13.00	-25.87	ERP
3	893.8567	-69.58	31.07	-38.51	-13.00	-25.51	ERP

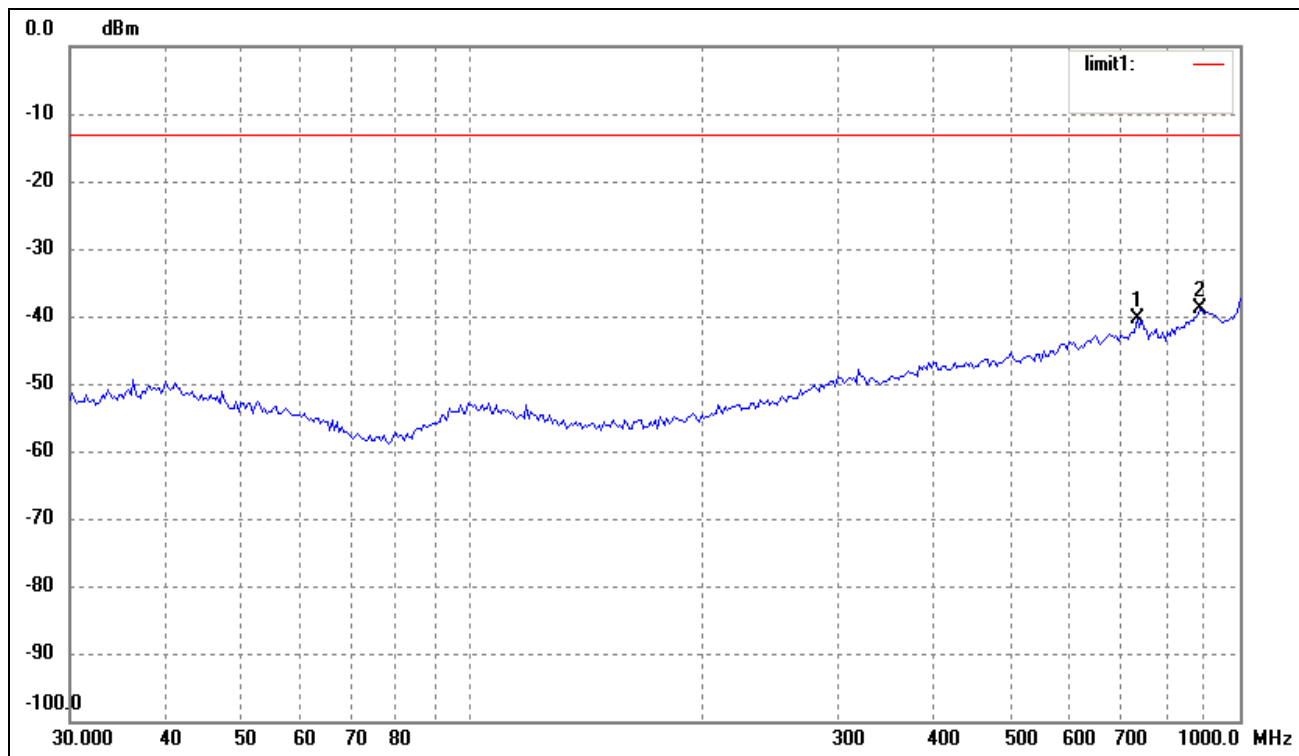
Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	739.6605	-66.25	29.87	-36.38	-13.00	-23.38	ERP
2	919.2866	-66.10	30.50	-35.60	-13.00	-22.60	ERP

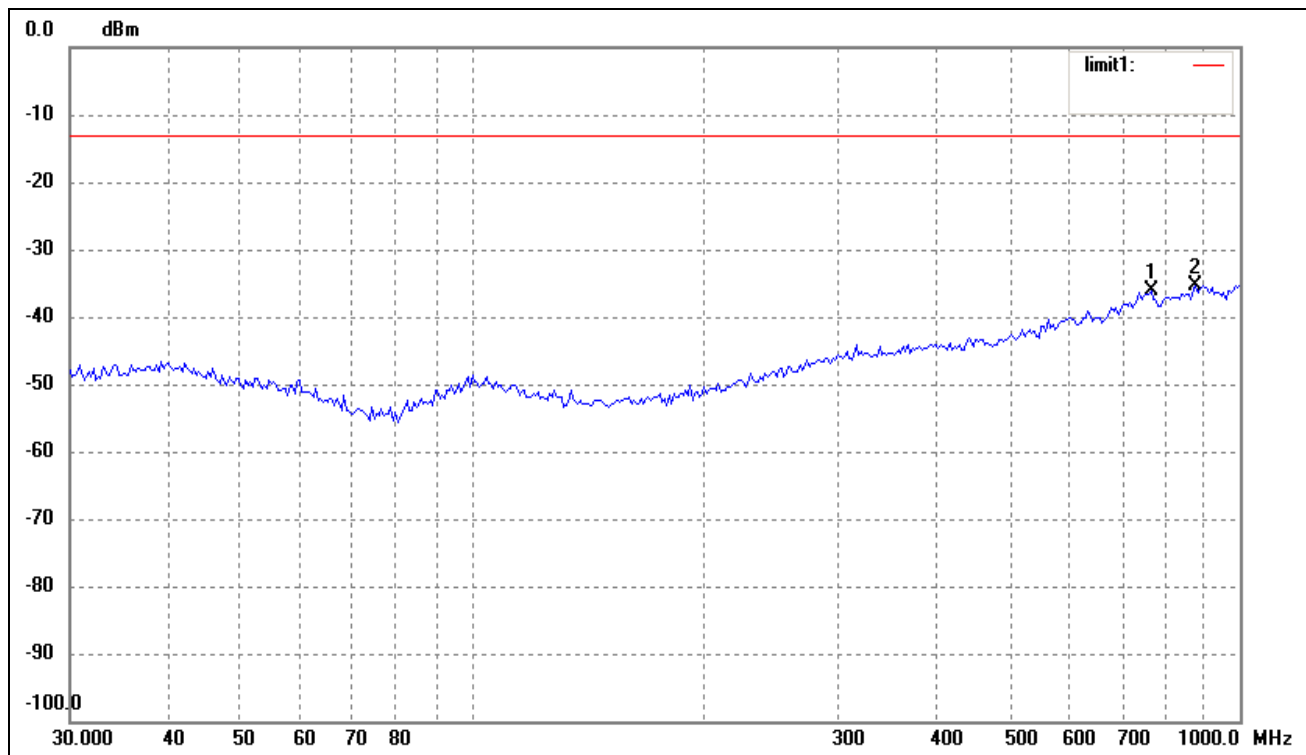
For PCS Band\_EDGE Mode

Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	734.4913	-69.85	29.48	-40.37	-13.00	-27.37	
2	887.6099	-69.92	30.95	-38.97	-13.00	-25.97	ERP

Vertical:

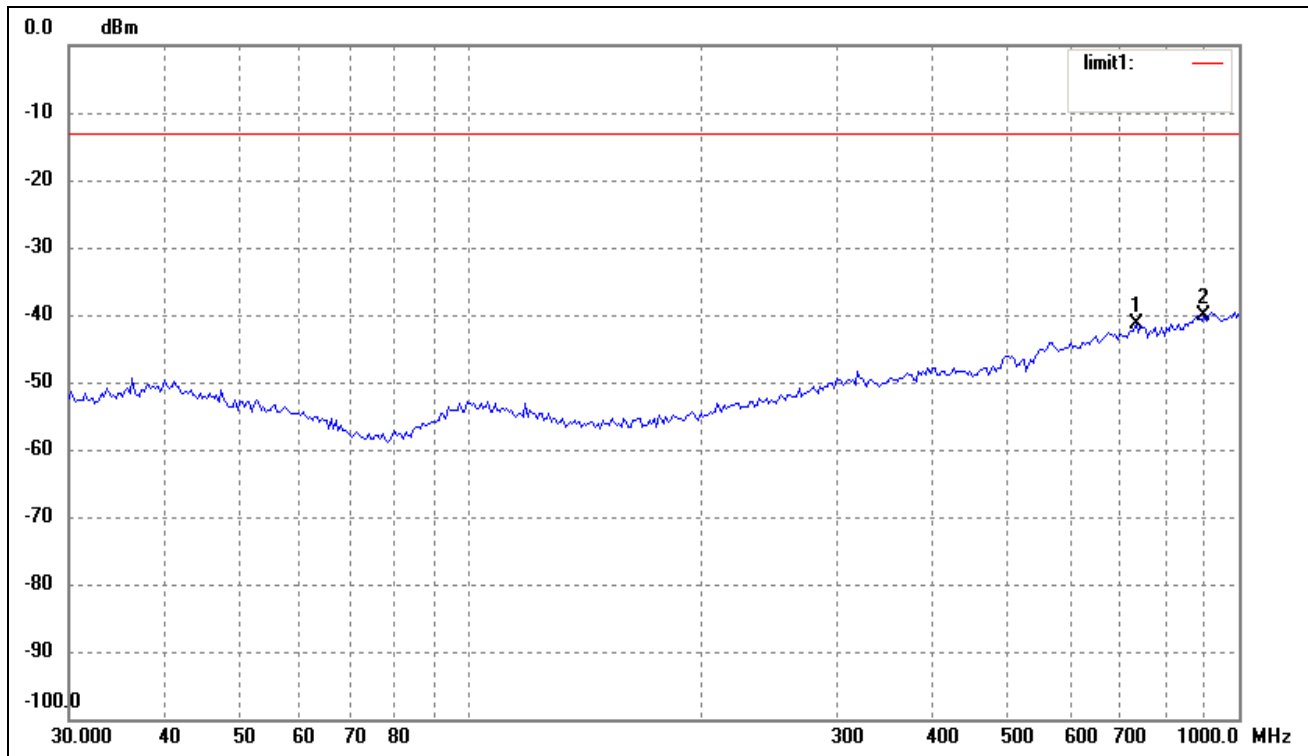


No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	766.0572	-64.80	28.57	-36.23	-13.00	-23.23	ERP
2	875.2470	-65.89	30.60	-35.29	-13.00	-22.29	ERP

Spurious Emission From 30MHz to 1GHz

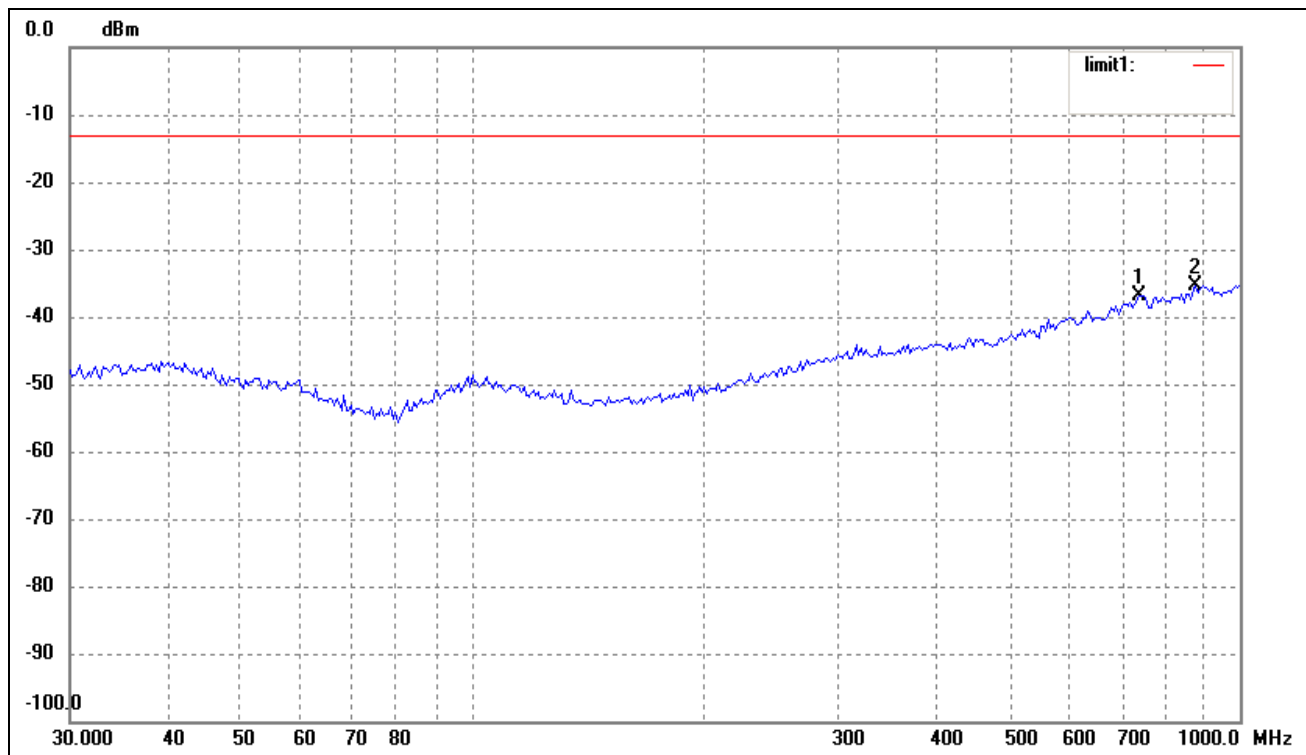
For band V WCDMA Mode

Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	734.4913	-70.85	29.48	-41.37	-13.00	-28.37	ERP
2	900.1474	-71.28	31.18	-40.10	-13.00	-27.10	ERP

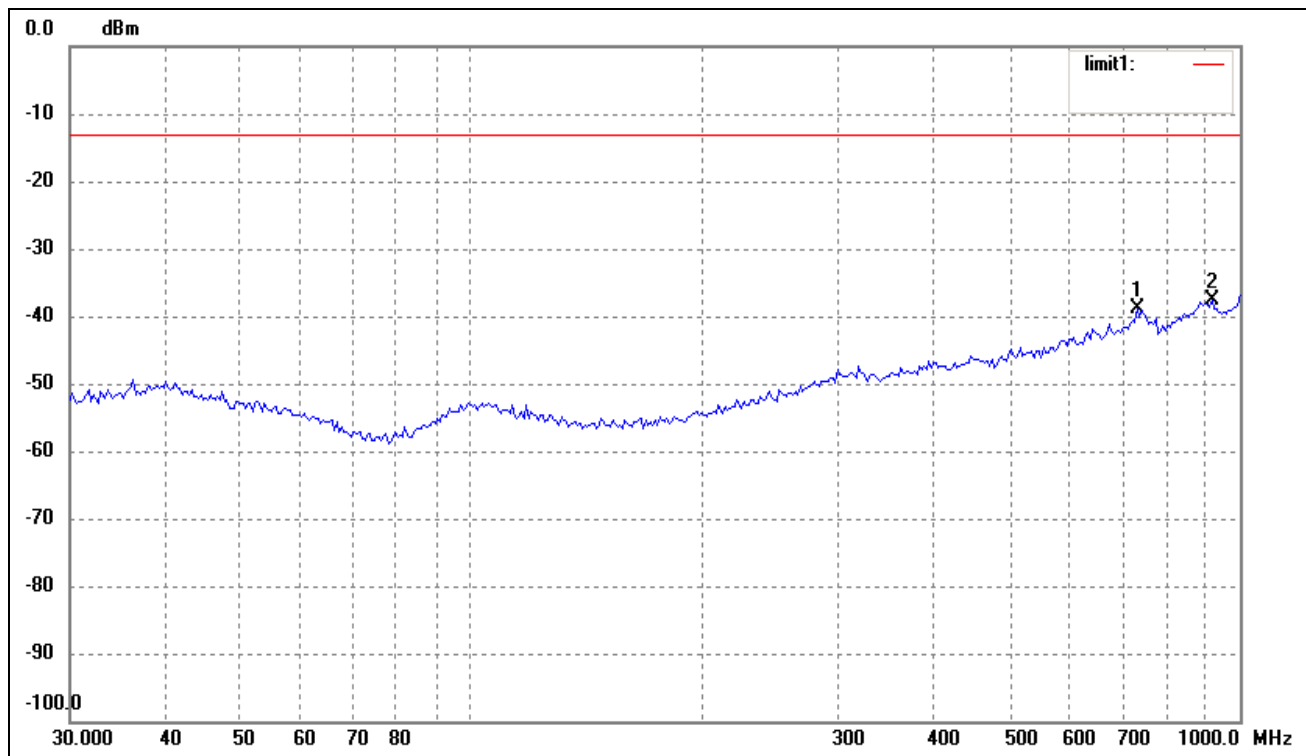
Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	739.6605	-66.75	29.87	-36.88	-13.00	-23.88	ERP
2	875.2470	-65.89	30.60	-35.29	-13.00	-22.29	ERP

For band V HSDPA Mode

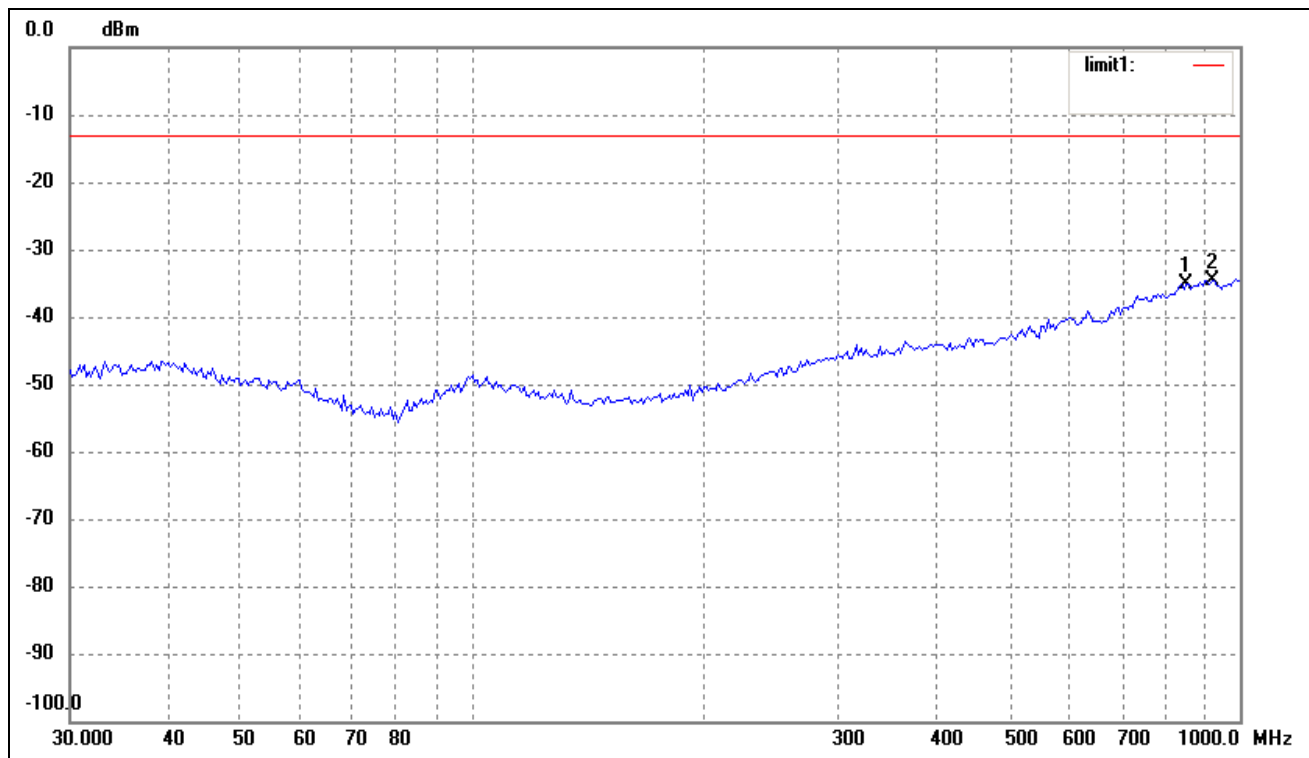
Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	734.4913	-68.35	29.48	-38.87	-13.00	-25.87	ERP
2	919.2866	-68.10	30.50	-37.60	-13.00	-24.60	ERP



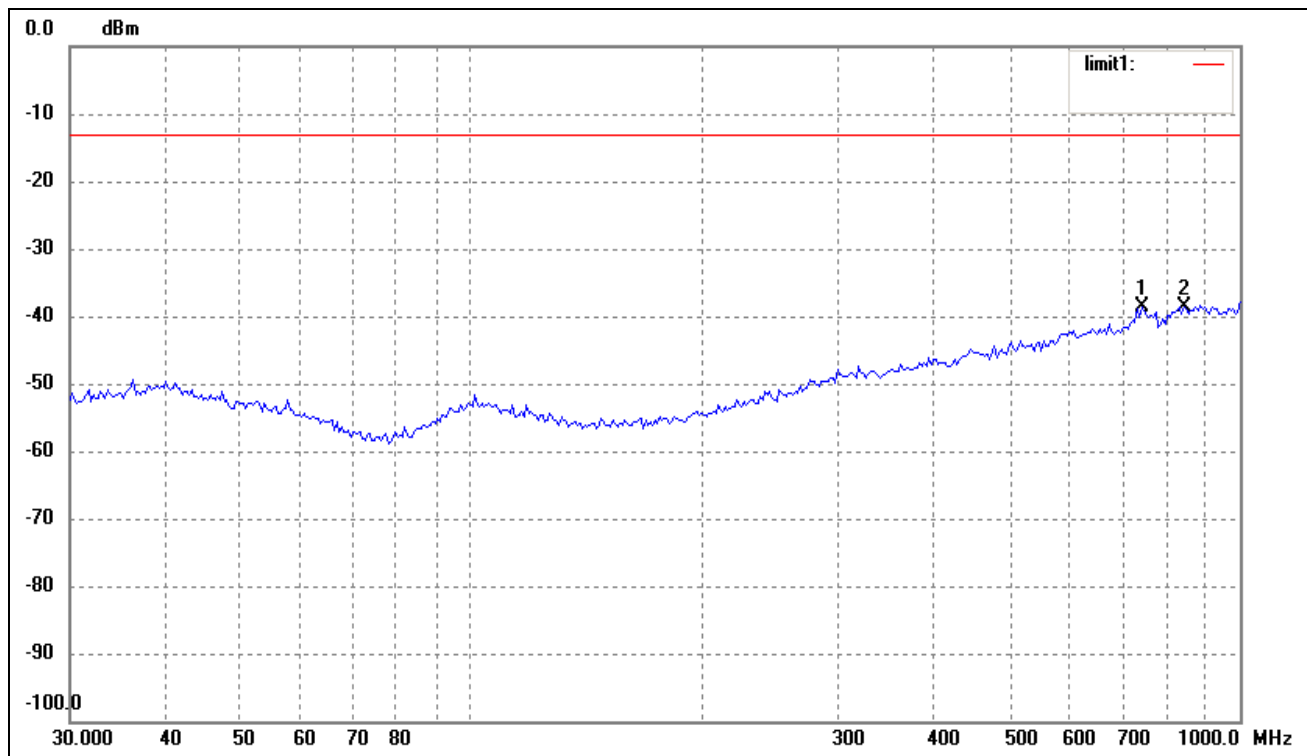
Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	851.0353	-64.64	29.46	-35.18	-13.00	-22.18	ERP
2	919.2866	-65.04	30.50	-34.54	-13.00	-21.54	ERP

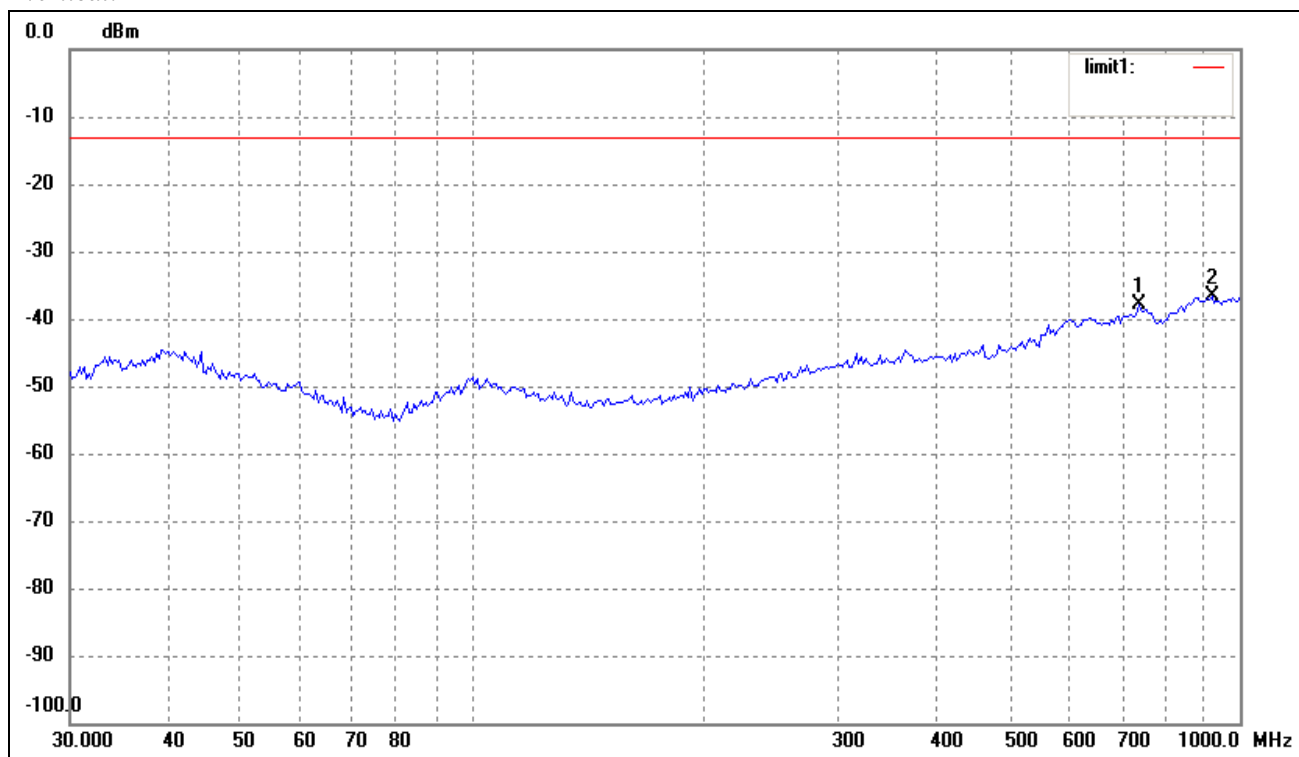
For band V HSDPA Mode

Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	744.8661	-68.45	29.75	-38.70	-13.00	-25.70	ERP
2	845.0878	-67.80	29.25	-38.55	-13.00	-25.55	ERP

Vertical:

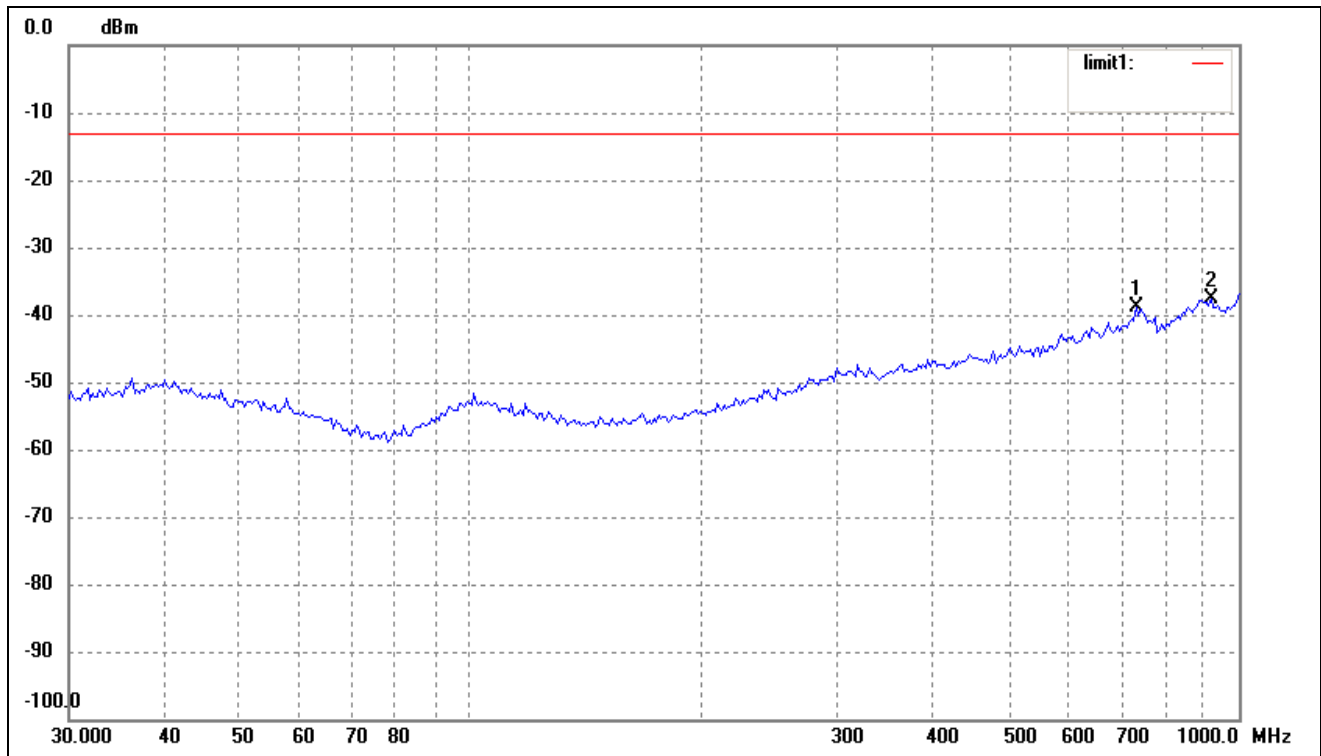


No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	755.3873	-66.41	29.28	-37.13	-13.00	-24.13	ERP
2	869.1302	-65.70	30.34	-35.36	-13.00	-22.36	ERP

Spurious Emission From 30MHz to 1GHz

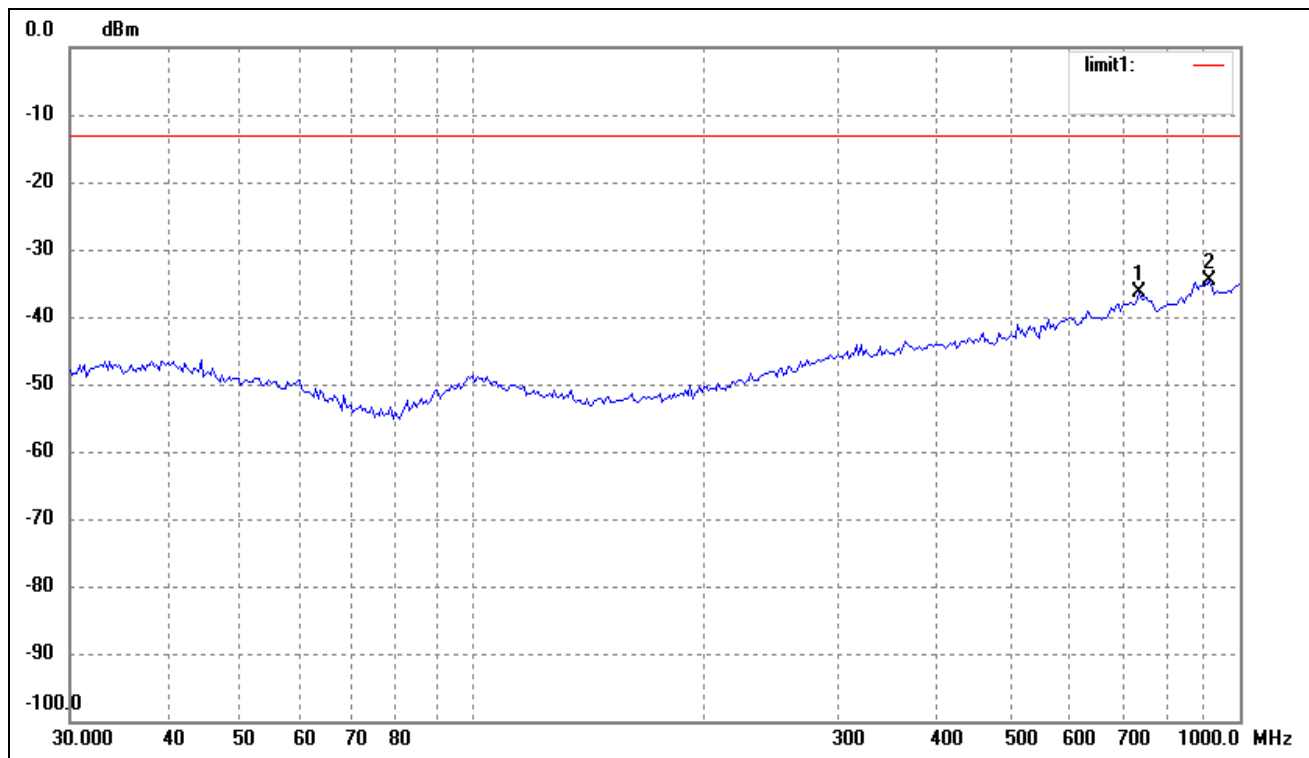
For band II WCDMA Mode

Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	734.4913	-68.35	29.48	-38.87	-13.00	-25.87	ERP
2	919.2866	-68.10	30.50	-37.60	-13.00	-24.60	ERP

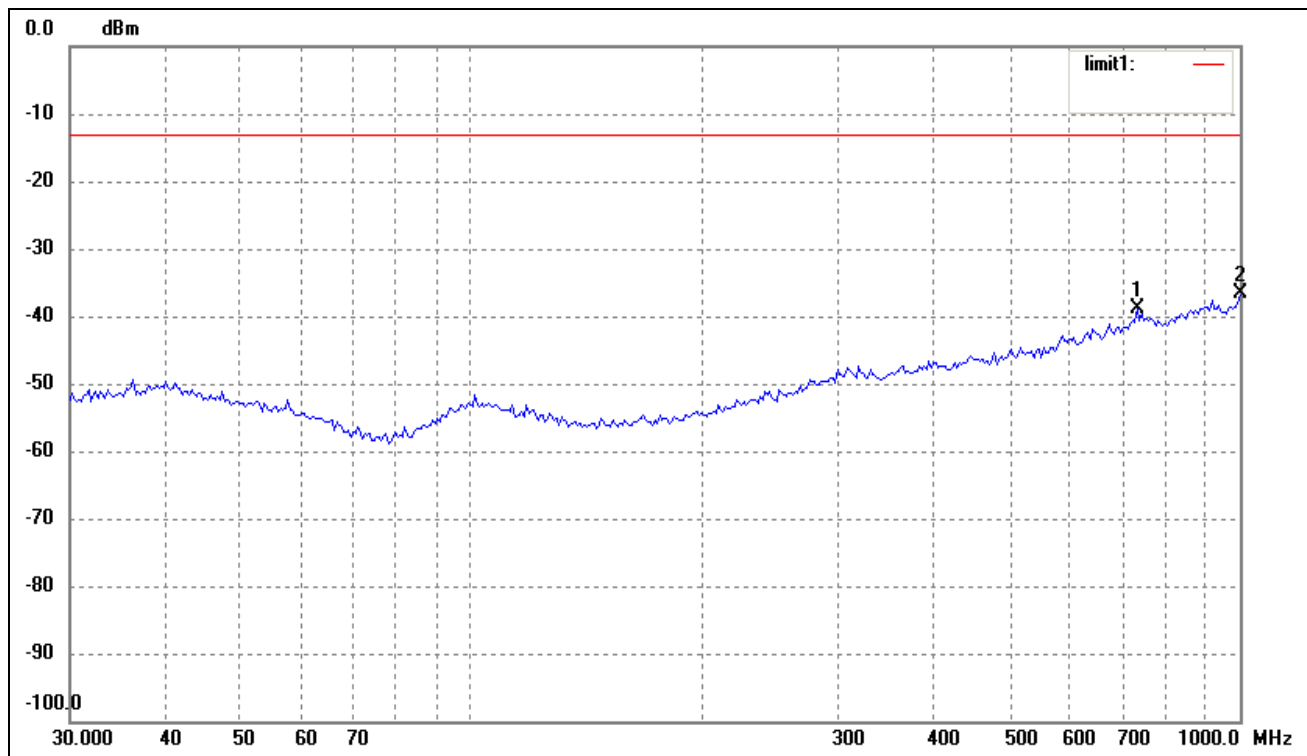
Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	739.6605	-66.25	29.87	-36.38	-13.00	-23.38	ERP
2	912.8620	-65.37	30.73	-34.64	-13.00	-21.64	ERP

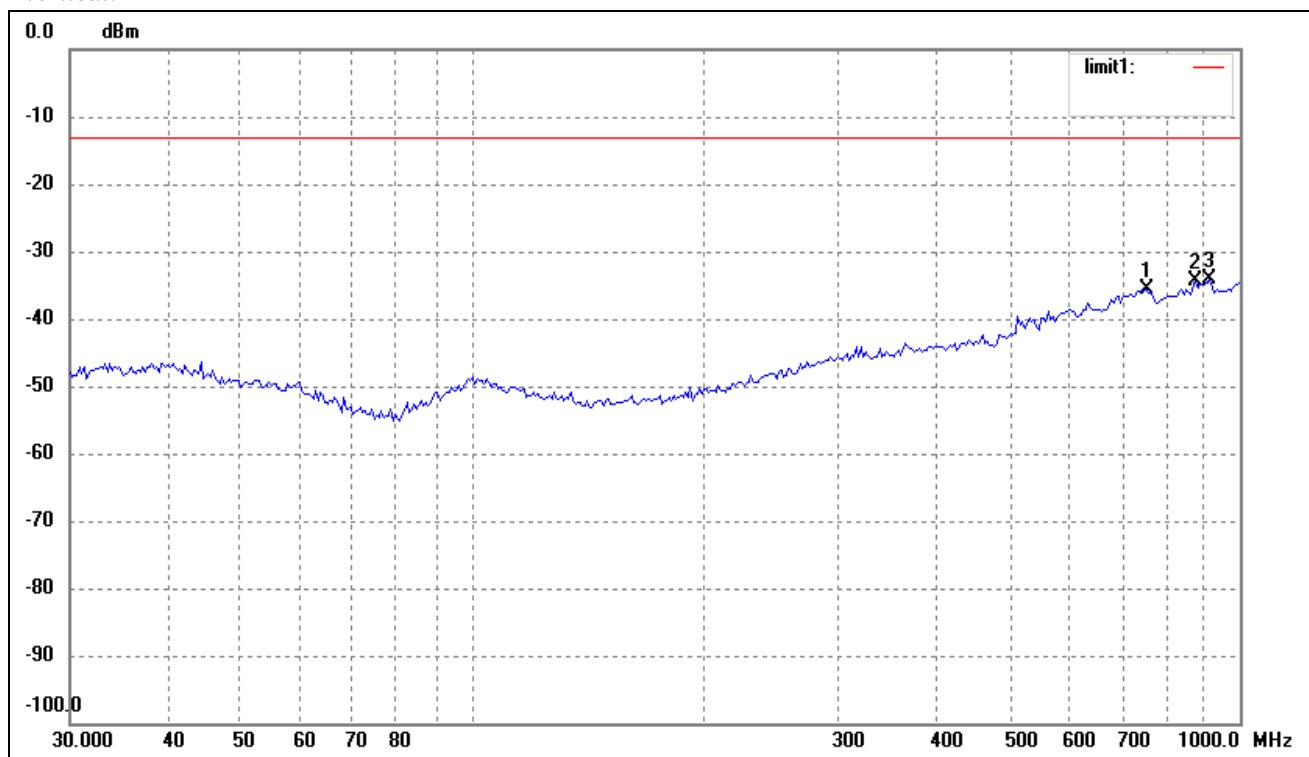
For band II HSDPA Mode

Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	734.4913	-68.35	29.48	-38.87	-13.00	-25.87	ERP
2	1000.0000	-68.44	31.70	-36.74	-13.00	-23.74	ERP

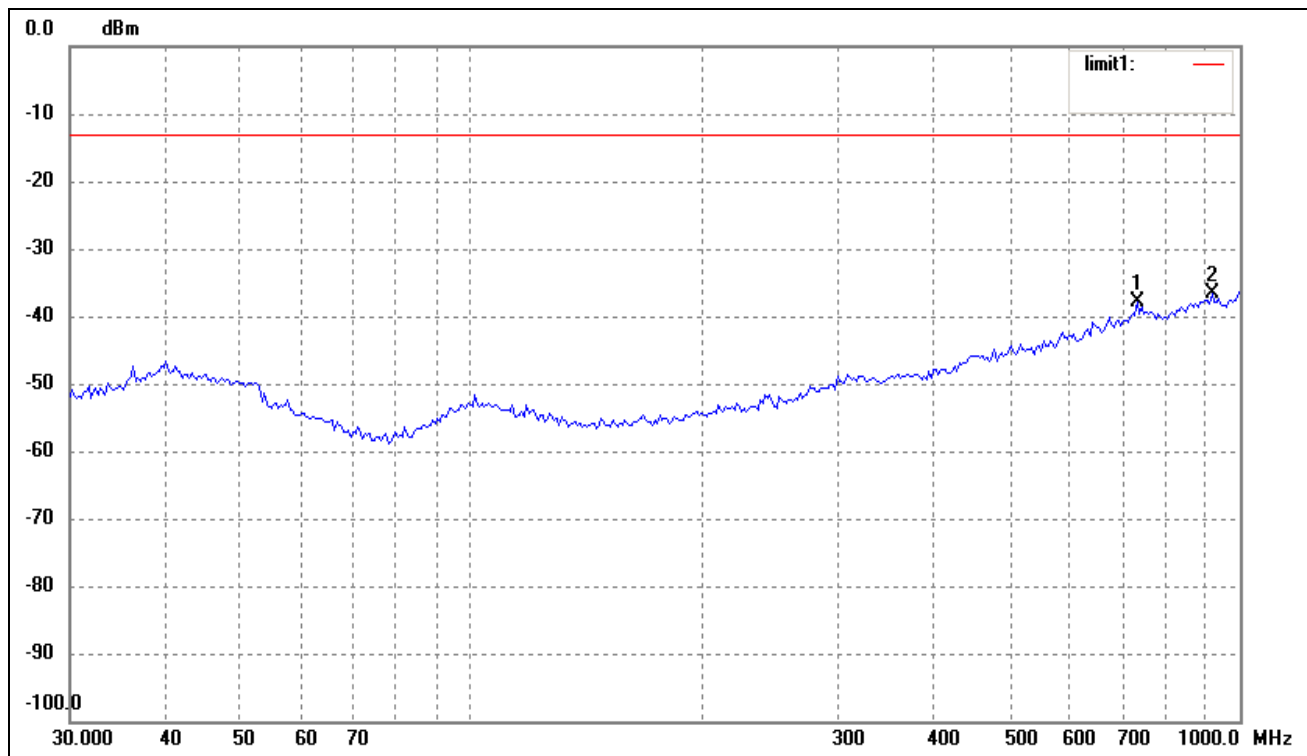
Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	755.3873	-64.91	29.28	-35.63	-13.00	-22.63	ERP
2	875.2470	-64.89	30.60	-34.29	-13.00	-21.29	ERP
3	912.8620	-64.87	30.73	-34.14	-13.00	-21.14	ERP

For band II HSDPA Mode

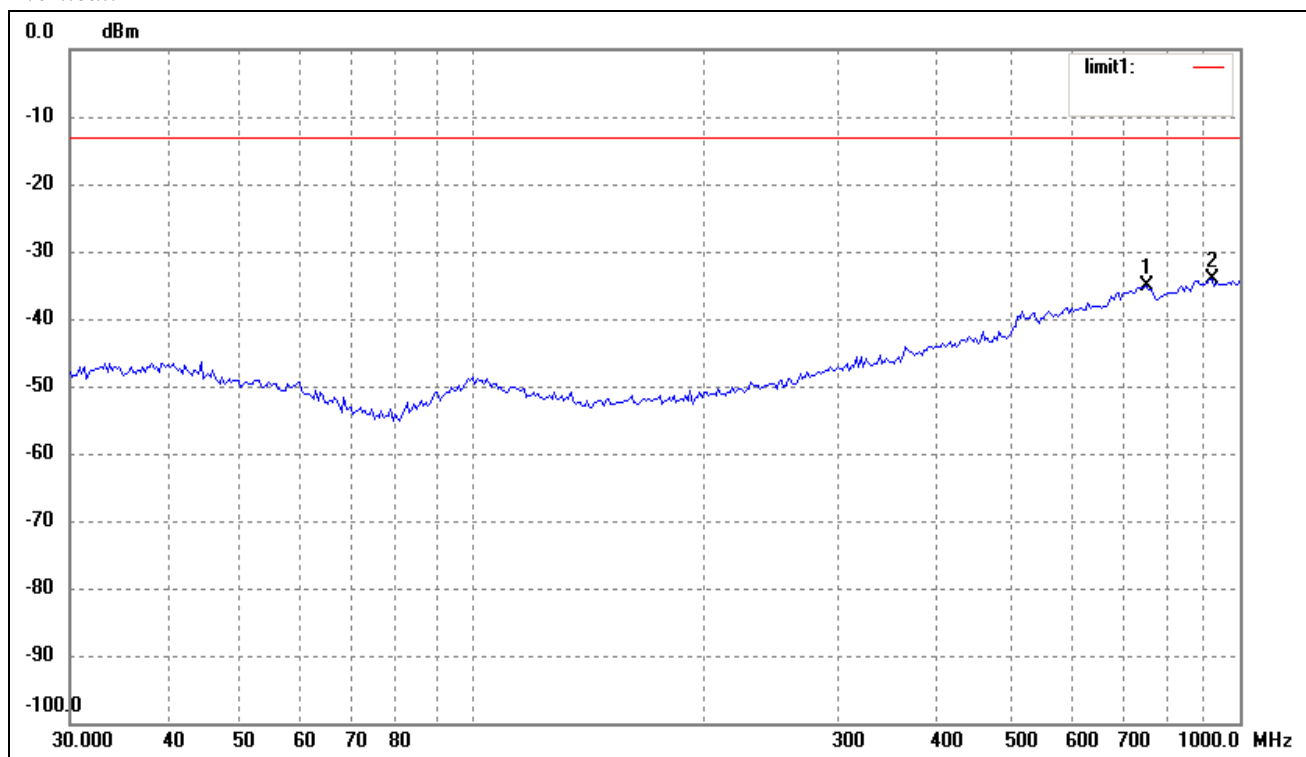
Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	734.4913	-67.35	29.48	-37.87	-13.00	-24.87	ERP
2	919.2866	-67.10	30.50	-36.60	-13.00	-23.60	ERP



Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	755.3873	-64.41	29.28	-35.13	-13.00	-22.13	ERP
2	919.2866	-64.54	30.50	-34.04	-13.00	-21.04	ERP

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

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 22H	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (824.2MHz)								
1648.4	-41.0	1.5	V	1.8	7.6	-35.2	-13.00	-22.2
2472.6	-45.8	1.5	V	2.4	7.9	-40.3	-13.00	-27.3
1648.4	-44.0	1.5	H	1.8	7.6	-38.2	-13.00	-25.2
2472.6	-46.8	1.5	H	2.4	7.9	-41.3	-13.00	-28.3
Middle Channel (836.6MHz)								
1673.2	-42.2	1.5	V	1.9	7.6	-36.5	-13.00	-23.5
2509.8	-45.9	1.5	V	2.5	7.9	-40.5	-13.00	-27.5
1673.2	-44.5	1.5	H	1.9	7.6	-38.8	-13.00	-25.8
2509.8	-47.5	1.5	H	2.5	7.9	-42.1	-13.00	-29.1
High Channel (848.8MHz)								
1697.6	-41.4	1.5	V	2.0	7.6	-35.8	-13.00	-22.8
2546.4	-45.6	1.5	V	2.6	7.9	-40.3	-13.00	-27.3
1697.6	-44.0	1.5	H	2.0	7.6	-38.4	-13.00	-25.4
2546.4	-48.0	1.5	H	2.6	7.9	-42.7	-13.00	-29.7

*For PCS Band\_GSM Mode*

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 24E	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (1850.2MHz)								
3700.4	-41.2	1.5	V	2.9	8.3	-35.8	-13.00	-22.8
5550.6	-45.1	1.5	V	3.7	8.6	-40.2	-13.00	-27.2
3700.4	-43.3	1.5	H	2.9	8.3	-37.9	-13.00	-24.9
5550.6	-46.2	1.5	H	3.7	8.6	-41.3	-13.00	-28.3
Middle Channel (1880MHz)								
3760	-40.3	1.5	V	2.9	8.4	-34.8	-13.00	-21.8
5640	-45.3	1.5	V	3.7	8.7	-40.3	-13.00	-27.3
3760	-42.5	1.5	H	2.9	8.4	-37.0	-13.00	-24.0
5640	-46.1	1.5	H	3.7	8.7	-41.1	-13.00	-28.1
High Channel (1909.8MHz)								
3819.6	-41.0	1.5	V	2.9	8.4	-35.5	-13.00	-22.5
5729.4	-44.8	1.5	V	3.7	8.7	-39.8	-13.00	-26.8
3819.6	-43.7	1.5	H	2.9	8.4	-38.2	-13.00	-25.2
5729.4	-45.5	1.5	H	3.7	8.7	-40.5	-13.00	-27.5

*For Cellular Band\_GPRS Mode*

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 22H	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (824.2MHz)								
1648.4	-42.4	1.5	V	1.8	7.6	-36.6	-13.00	-23.6
2472.6	-45.8	1.5	V	2.4	7.9	-40.3	-13.00	-27.3
1648.4	-44.2	1.5	H	1.8	7.6	-38.4	-13.00	-25.4
2472.6	-46.8	1.5	H	2.4	7.9	-41.3	-13.00	-28.3
Middle Channel (836.6MHz)								
1673.2	-42.9	1.5	V	1.9	7.6	-37.2	-13.00	-24.2
2509.8	-46.7	1.5	V	2.5	7.9	-41.3	-13.00	-28.3
1673.2	-45.5	1.5	H	1.9	7.6	-39.8	-13.00	-26.8
2509.8	-48.6	1.5	H	2.5	7.9	-43.2	-13.00	-30.2
High Channel (848.8MHz)								
1697.6	-42.1	1.5	V	2.0	7.6	-36.5	-13.00	-23.5
2546.4	-45.8	1.5	V	2.6	7.9	-40.5	-13.00	-27.5
1697.6	-43.2	1.5	H	2.0	7.6	-37.6	-13.00	-24.6
2546.4	-47.1	1.5	H	2.6	7.9	-41.8	-13.00	-28.8

*For PCS Band\_GPRS Mode*

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 24E	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (1850.2MHz)								
3700.4	-42.1	1.5	V	2.9	8.3	-36.7	-13.00	-23.7
5550.6	-47.2	1.5	V	3.7	8.6	-42.3	-13.00	-29.3
3700.4	-43.9	1.5	H	2.9	8.3	-38.5	-13.00	-25.5
5550.6	-47.9	1.5	H	3.7	8.6	-43.0	-13.00	-30.0
Middle Channel (1880MHz)								
3760	-42.0	1.5	V	2.9	8.4	-36.5	-13.00	-23.5
5640	-46.0	1.5	V	3.7	8.7	-41.0	-13.00	-28
3760	-44.2	1.5	H	2.9	8.4	-38.7	-13.00	-25.7
5640	-47.3	1.5	H	3.7	8.7	-42.3	-13.00	-29.3
High Channel (1909.8MHz)								
3819.6	-41.7	1.5	V	2.9	8.4	-36.2	-13.00	-23.2
5729.4	-46.8	1.5	V	3.7	8.7	-41.8	-13.00	-28.8
3819.6	-44.9	1.5	H	2.9	8.4	-39.4	-13.00	-26.4
5729.4	-47.2	1.5	H	3.7	8.7	-42.2	-13.00	-29.2

*For Cellular Band\_EDGE Mode*

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 22H	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (824.2MHz)								
1648.4	-44.4	1.5	V	1.8	7.6	-38.6	-13.00	-25.6
2472.6	-48.1	1.5	V	2.4	7.9	-42.6	-13.00	-29.6
1648.4	-45.5	1.5	H	1.8	7.6	-39.7	-13.00	-26.7
2472.6	-50.1	1.5	H	2.4	7.9	-44.6	-13.00	-31.6
Middle Channel (836.6MHz)								
1673.2	-43.5	1.5	V	1.9	7.6	-37.8	-13.00	-24.8
2509.8	-47.7	1.5	V	2.5	7.9	-42.3	-13.00	-29.3
1673.2	-45.5	1.5	H	1.9	7.6	-39.8	-13.00	-26.8
2509.8	-48.7	1.5	H	2.5	7.9	-43.3	-13.00	-30.3
High Channel (848.8MHz)								
1697.6	-43.8	1.5	V	2.0	7.6	-38.2	-13.00	-25.2
2546.4	-49.1	1.5	V	2.6	7.9	-43.8	-13.00	-30.8
1697.6	-45.2	1.5	H	2.0	7.6	-39.6	-13.00	-26.6
2546.4	-49.6	1.5	H	2.6	7.9	-44.3	-13.00	-31.3

*For PCS Band\_EDGE Mode*

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 24E	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (1850.2MHz)								
3700.4	-44.3	1.5	V	2.9	8.3	-38.9	-13.00	-25.9
5550.6	-48.1	1.5	V	3.7	8.6	-43.2	-13.00	-30.2
3700.4	-45.6	1.5	H	2.9	8.3	-40.2	-13.00	-27.2
5550.6	-49.2	1.5	H	3.7	8.6	-44.3	-13.00	-31.3
Middle Channel (1880MHz)								
3760	-44.2	1.5	V	2.9	8.4	-38.7	-13.00	-25.7
5640	-47.3	1.5	V	3.7	8.7	-42.3	-13.00	-29.3
3760	-45.5	1.5	H	2.9	8.4	-40.0	-13.00	-27.0
5640	-49.2	1.5	H	3.7	8.7	-44.2	-13.00	-31.2
High Channel (1909.8MHz)								
3819.6	-44.7	1.5	V	2.9	8.4	-39.2	-13.00	-26.2
5729.4	-48.5	1.5	V	3.7	8.7	-43.5	-13.00	-30.5
3819.6	-46.8	1.5	H	2.9	8.4	-41.3	-13.00	-28.3
5729.4	-49.6	1.5	H	3.7	8.7	-44.6	-13.00	-31.6

## Spurious Emission Test Data for WCDMA/HSUPA/HSDPA

## For Band V\_WCDMA Mode

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 22H	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (826.4MHz)								
1652.80	-49.0	1.5	V	1.8	7.6	-43.2	-13.00	-30.2
3312.00	-54.1	1.5	V	2.4	7.9	-48.6	-13.00	-35.6
1652.80	-51.1	1.5	H	1.8	7.6	-45.3	-13.00	-32.3
3312.00	-54.4	1.5	H	2.4	7.9	-48.9	-13.00	-35.9
Middle Channel (836.4MHz)								
1672.80	-48.3	1.5	V	1.9	7.6	-42.6	-13.00	-29.6
3346.00	-53.2	1.5	V	2.5	7.9	-47.8	-13.00	-34.8
1672.80	-49.1	1.5	H	1.9	7.6	-43.4	-13.00	-30.4
3346.00	-54.1	1.5	H	2.5	7.9	-48.7	-13.00	-35.7
High Channel (846.6MHz)								
-60.46	-47.2	1.5	V	2.0	7.6	-41.6	-13.00	-28.6
-43.45	-53.1	1.5	V	2.6	7.9	-47.8	-13.00	-34.8
-51.81	-48.6	1.5	H	2.0	7.6	-43.0	-13.00	-30
3388.50	-53.8	1.5	H	2.6	7.9	-48.5	-13.00	-35.5

## For Band II\_WCDMA Mode

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 24E	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (1852.4MHz)								
3704.80	-47.0	1.5	V	2.9	8.3	-41.6	-13.00	-33.02
5557.20	-53.3	1.5	V	3.7	8.6	-48.4	-13.00	-35.43
3704.80	-48.7	1.5	H	2.9	8.3	-43.3	-13.00	-33.31
5557.20	-54.1	1.5	H	3.7	8.6	-49.2	-13.00	-36.37
Middle Channel (1880MHz)								
3760	-47.7	1.5	V	2.9	8.4	-42.2	-13.00	-29.2
5640	-52.6	1.5	V	3.7	8.7	-47.6	-13.00	-34.6
3760	-49.5	1.5	H	2.9	8.4	-44.0	-13.00	-31.0
5640	-53.7	1.5	H	3.7	8.7	-48.7	-13.00	-35.7
High Channel (1907.6MHz)								
3815.2	-46.9	1.5	V	2.9	8.4	-41.4	-13.00	-28.4
5722.8	-52.5	1.5	V	3.7	8.7	-47.5	-13.00	-34.5
3815.2	-48.7	1.5	H	2.9	8.4	-43.2	-13.00	-30.2
5722.8	-53.5	1.5	H	3.7	8.7	-48.5	-13.00	-35.5

*For Band V\_HSUPA Mode*

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 22H	
	Reading				Gain		Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (826.4MHz)								
1652.80	-49.3	1.5	V	1.8	7.6	-43.5	-13.00	-30.5
3312.00	-54.1	1.5	V	2.4	7.9	-48.6	-13.00	-35.6
1652.80	-50.3	1.5	H	1.8	7.6	-44.5	-13.00	-31.5
3312.00	-54.8	1.5	H	2.4	7.9	-49.3	-13.00	-36.3
Middle Channel (836.4MHz)								
1672.80	-48.2	1.5	V	1.9	7.6	-42.5	-13.00	-29.5
3346.00	-54.1	1.5	V	2.5	7.9	-48.7	-13.00	-35.7
1672.80	-50.3	1.5	H	1.9	7.6	-44.6	-13.00	-31.6
3346.00	-54.6	1.5	H	2.5	7.9	-49.2	-13.00	-36.2
High Channel (846.6MHz)								
2538.50	-47.9	1.5	V	2.0	7.6	-42.3	-13.00	-29.3
3380.00	-52.5	1.5	V	2.6	7.9	-47.2	-13.00	-34.2
2538.50	-49.6	1.5	H	2.0	7.6	-44.0	-13.00	-31.0
3380.00	-53.3	1.5	H	2.6	7.9	-48.0	-13.00	-35.0

*For Band II\_HSUPA Mode*

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 24E	
	Reading				Gain		Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (1852.4MHz)								
3704.8	-48.0	1.5	V	2.9	8.3	-42.6	-13.00	-29.6
5557.2	-53.2	1.5	V	3.7	8.6	-48.3	-13.00	-35.3
3704.8	-48.6	1.5	H	2.9	8.3	-43.2	-13.00	-30.2
5557.2	-54.5	1.5	H	3.7	8.6	-49.6	-13.00	-36.6
Middle Channel (1880MHz)								
3760	-47.3	1.5	V	2.9	8.4	-41.8	-13.00	-28.8
5640	-52.9	1.5	V	3.7	8.7	-47.9	-13.00	-34.9
3760	-48.8	1.5	H	2.9	8.4	-43.3	-13.00	-30.3
5640	-53.6	1.5	H	3.7	8.7	-48.6	-13.00	-35.6
High Channel (1907.6MHz)								
3815.2	-48.2	1.5	V	2.9	8.4	-42.7	-13.00	-29.7
5722.8	-53.2	1.5	V	3.7	8.7	-48.2	-13.00	-35.2
3815.2	-48.9	1.5	H	2.9	8.4	-43.4	-13.00	-30.4
5722.8	-54.8	1.5	H	3.7	8.7	-49.8	-13.00	-36.8

*For Band V\_HSDPA Mode*

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 22H	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (826.4MHz)								
1652.80	-48.3	1.5	V	1.8	7.6	-42.5	-13.00	-29.5
3312.00	-54.1	1.5	V	2.4	7.9	-48.6	-13.00	-35.6
1652.80	-49.8	1.5	H	1.8	7.6	-44.0	-13.00	-31.0
3312.00	-55.3	1.5	H	2.4	7.9	-49.8	-13.00	-36.8
Middle Channel (836.4MHz)								
1672.80	-47.3	1.5	V	1.9	7.6	-41.6	-13.00	-28.6
3346.00	-53.1	1.5	V	2.5	7.9	-47.7	-13.00	-34.7
1672.80	-48.3	1.5	H	1.9	7.6	-42.6	-13.00	-29.6
3346.00	-54.0	1.5	H	2.5	7.9	-48.6	-13.00	-35.6
High Channel (846.6MHz)								
2538.50	-47.6	1.5	V	2.0	7.6	-42.0	-13.00	-29.0
3380.00	-53.3	1.5	V	2.6	7.9	-48.0	-13.00	-35.0
2538.50	38.7	1.5	H	2.0	7.6	44.3	-13.00	57.3
3380.00	-53.7	1.5	H	2.6	7.9	-48.4	-13.00	-35.4

*For Band II\_HSDPA Mode*

Frequency	SG	Height	Polar	Cable loss	Antenna	Corrected Ampl.	FCC Part 24E	
	Reading						Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (1852.4MHz)								
3704.8	-47.7	1.5	V	2.9	8.3	-42.3	-13.00	-29.3
5557.2	-52.6	1.5	V	3.7	8.6	-47.7	-13.00	-34.7
3704.8	-49.2	1.5	H	2.9	8.3	-43.8	-13.00	-30.8
5557.2	-53.9	1.5	H	3.7	8.6	-49.0	-13.00	-36.0
Middle Channel (1880MHz)								
3760	-47.5	1.5	V	2.9	8.4	-42.0	-13.00	-29.0
5640	-53.2	1.5	V	3.7	8.7	-48.2	-13.00	-35.2
3760	-49.3	1.5	H	2.9	8.4	-43.8	-13.00	-30.8
5640	-54.5	1.5	H	3.7	8.7	-49.5	-13.00	-36.5
High Channel (1907.6MHz)								
3815.2	-47.1	1.5	V	2.9	8.4	-41.6	-13.00	-28.6
5722.8	-52.6	1.5	V	3.7	8.7	-47.6	-13.00	-34.6
3815.2	-49.0	1.5	H	2.9	8.4	-43.5	-13.00	-30.5
5722.8	-54.8	1.5	H	3.7	8.7	-49.8	-13.00	-36.8

*Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 10<sup>h</sup> Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*

## 8. FREQUENCY STABILITY

### 8.1 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.

### 8.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B-ESA	US41192821	2012-03-28	2013-03-27
Rohde & Schwarz	Universal Radio Communication	CMU200	112012	2012-03-28	2013-03-27
GONGWEN	Moisture Test Chamber	GDS-150	SEMT-0013	2012-03-28	2013-03-27

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

### 8.3 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



## 8.4 Environmental Conditions

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

## 8.5 Summary of Test Results/Plots

For Cellular Band

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	120	60	0.0717
40	120	45	0.0538
30	120	33	0.0394
20	120	15	0.0179
10	120	12	0.0143
0	120	-10	-0.0120
-10	120	-13	-0.0155
-20	120	-22	-0.0263
-30	120	-35	-0.0418

For PCS Band

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	120	-50	-0.0266
40	120	-47	-0.0250
30	120	-35	-0.0186
20	120	-21	-0.0112
10	120	-20	-0.0106
0	120	-18	-0.0096
-10	120	-25	-0.0133
-20	120	-33	-0.0176
-30	120	-40	-0.0213

So, Frequency Stability Versus Input Voltage is:

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	102	22	0.0263
	120	15	0.0179
	138	27	0.0323
Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	102	-28	-0.0149
	120	-21	-0.0112
	138	-30	-0.0160

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