FCC Part 22H & 24E
Measurement and Test Report

For

Etung Technology Co., Ltd

RM305 Geng Fang Plaza, Jia 13 Huayuan Road Haidian Dist.

Beijing, China

FCC ID: 2AEWIER-800

FCC Rules:	FCC Part 22H, FCC Part 24E
Product Description:	ROUTER
Tested Model:	ER-800
Report No.:	STR16018203I-1
Tested Date:	2016-01-26 to 2016-03-07
Issued Date:	2016-03-09
Tested By:	Jason Su / Engineer
Reviewed By:	Silin Chen / EMC Manager
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Prepared By:

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Etung Technology Co., Ltd
Address of applicant:	RM305 Geng Fang Plaza, jia 13 Huayuan Road Haidian Dist. Beijing, China
Manufacturer:	Etung Technology Co., Ltd
Address of manufacturer:	RM305 Geng Fang Plaza, jia 13 Huayuan Road Haidian Dist. Beijing, China

General Description of EUT:	
Product Name:	ROUTER
Brand Name:	ETUNG
Model No.:	ER-800
Adding Model(s):	WXXX-OTV200 ; NXXX-OTV200A ; WXXX-OTV200A
Hardware version:	V1.4 20151113
Software version:	V1.4 20151113
IMEI:	240305003081404
Rated Voltage:	Adapter DC12V
Battery:	/
Device Category:	Fixed Device
The EUT Main board support GSM850/PCS1900, WCDMA Band 2/5 function. It is intended for speech, Multimedia Message Service (MMS) transmission and Alba 5400. It is equipped with GPRS/EDGE class 12 for GSM850/PCS1900, Wi-Fi functions. For more information see the following datasheet	
Note: The test data is gathered from a production sample provided by the manufacturer. The appearance of others models listed in the report is different from main-test model ER-800, but the circuit and the electronic construction do not change, declared by the manufacturer.	

Technical Characteristics of EUT:	
2G	
Support Networks:	GSM, GPRS, EDGE
Support Band:	GSM850/PCS1900
Uplink Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz
Downlink Frequency:	GSM/GPRS/EDGE 850: 869~894MHz GSM/GPRS/EDGE 1900: 1930~1990MHz
Max RF Output Power:	GSM850: 31.59dBm, GSM1900: 28.56dBm
	GPRS850: 31.31dBm, GPRS1900: 28.24dBm
	EDGE850: 27.36dBm, EDGE1900: 23.79dBm
Type of Emission:	GSM850: 251KGXW, GSM1900: 258KGXW EDGE850: 289KG7W, EDGE1900: 254KG7W
Type of Modulation:	GMSK, 8PSK
Type of Antenna:	External uniqueness Antenna
Antenna Gain:	GSM850: 2dBi; GSM1900: 2dBi
GPRS/EDGE Class:	Class 12
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Band:	WCDMA Band 2, WCDMA Band 5
Uplink Frequency:	WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz
Downlink Frequency:	WCDMA Band 2: 1930~1990MHz WCDMA Band 5: 869~894MHz
RF Output Power:	WCDMA Band 2: 21.90dBm, WCDMA Band 5: 22.75dBm
Type of Emission:	WCDMA Band 2: 4M22F9W WCDMA Band 5: 4M22F9W
Type of Modulation:	BPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 2: 2dBi WCDMA Band 5: 2dBi

1.2 Test Standards

The following report is prepared on behalf of the Etung Technology Co., Ltd 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 ANSI/TIA-603-D: 2010 and ANSI C63.4-2014, 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 measurement guide KDB 971168 D01 Power Meas License Digital Systems v02r02 shall be performed also.

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	EDGE 850	Low, Middle, High Channels
TM4	GSM 1900	Low, Middle, High Channels
TM5	GPRS 1900	Low, Middle, High Channels
TM6	EDGE 1900	Low, Middle, High Channels
TM7	WCDMA Band 5	Low, Middle, High Channels
TM8	HSDPA Band 5	Low, Middle, High Channels
TM9	HSUPA Band 5	Low, Middle, High Channels
TM10	WCDMA Band 2	Low, Middle, High Channels
TM11	HSDPA Band 2	Low, Middle, High Channels
TM12	HSUPA Band 2	Low, Middle, High Channels

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
GSM 850	GSM/GPRS/EDGE	824.2 MHz	128
		836.6 MHz	190
		848.8 MHz	251
PCS 1900	GSM/GPRS/EDGE	1850.2 MHz	512
		1880.0 MHz	661
		1909.8 MHz	810
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.4 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
WCDMA Band 2	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, AGPRS, EDGE, 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
DC Cable	1.15	Unshielded	Without Ferrite
RJ45 Cable	1.40	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

Special Cable List and Details

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

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Frequency Stability	Conducted	2.3%
Transmitter Spurious Emissions	Radiated	±5.1dB

1.7 Test Equipment List and Details

Kind of Equipment	Manufacturer	Type	S/N	Cal Date	Due Date
Equipment list of < Shenzhen SEM.Test Technology Co., Ltd.>					
Test SIM card	-		-	N/A	
GSM Tester	Rohde & Schwarz	CMU200	104036	2015-06-17	2016-06-16
Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
Spectrum Analyzer	Agilent	N9020A	US47140102	2015-06-17	2016-06-16
Signal Generator	Agilent	83752A	3610A01453	2015-06-17	2016-06-16
Vector Signal Generator	Agilent	N5182A	MY47070202	2015-06-17	2016-06-16
Power Divider	Weinschel	1506A	PM204	2015-06-17	2016-06-16
Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2015-06-17	2016-06-16
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
Horn Antenna	ETS	3116B	00088203	2015-06-17	2016-06-16

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), §27.50(d)	RF Output Power	Compliant
§ 24.51	Peak-to-average Radio (PAR) of Transmitter	Compliant
§ 22.917 (b), § 24.238 (b), § 27.53	Emission Bandwidth	Compliant
§ 22.917 (a), § 24.238 (a), § 27.53(h)	Spurious Emissions at Antenna Terminal	Compliant
§ 22.917 (a), § 24.238 (a), § 27.53(h)	Spurious Radiation Emissions	Compliant
§ 22.917 (a), § 24.238 (a), § 27.53(h)	Out of Band Emissions	Compliant
§ 22.355, § 24.235, § 27.54	Frequency Stability	Compliant

3. RF Exposure

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

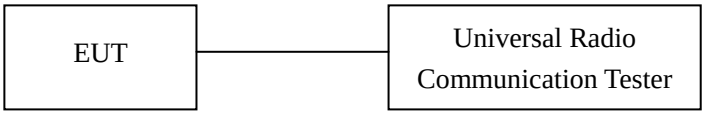
4.1 Standard Applicable

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 Procedure

Conducted output power test method:



Radiated power test method:

1.The setup of EUT is according with per ANSI/TIA Standard 603D and ANSI C63.4-2014 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.

4.3 Environmental Conditions

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

4.4 Summary of Test Results/Plots

Max. Radiated Power

ERP For GSM Mode GSM850

Frequency	Substitude 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	30.86	1.5	0	H	1.5	0	29.36	38.45
824.2	32.87	1.5	0	V	1.5	0	31.37	38.45
Middle Channel								
836.4	31.01	1.5	0	H	1.5	0	29.51	38.45
836.4	33.02	1.5	0	V	1.5	0	31.52	38.45
High Channel								
848.8	31.01	1.5	0	H	1.5	0	29.51	38.45
848.8	33.06	1.5	0	V	1.5	0	31.56	38.45

EIRP For GSM Mode PCS1900

Frequency	Substitude 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	20.23	1.5	0	H	1.9	7.7	26.03	33.00
1850.2	22.12	1.5	0	V	1.9	7.7	27.92	33.00
Middle Channel								
1880.0	20.05	1.5	0	H	1.9	7.7	25.85	33.00
1880.0	22.06	1.5	0	V	1.9	7.7	27.86	33.00
High Channel								
1909.8	19.97	1.5	0	H	1.9	7.7	25.77	33.00
1909.8	22.04	1.5	0	V	1.9	7.7	27.84	33.00

ERP For GPRS Mode GSM850

Frequency	Substitude 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	30.76	1.5	0	H	1.5	0	29.26	38.45
824.2	32.75	1.5	0	V	1.5	0	31.25	38.45
Middle Channel								
836.6	30.98	1.5	0	H	1.5	0	29.48	38.45
836.6	32.89	1.5	0	V	1.5	0	31.39	38.45
High Channel								
848.8	30.92	1.5	0	H	1.5	0	29.42	38.45
848.8	32.96	1.5	0	V	1.5	0	31.46	38.45

EIRP For GPRS Mode PCS1900

Frequency	Substitude 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	20.15	1.5	0	H	1.9	7.7	25.95	33.00
1850.2	22.18	1.5	0	V	1.9	7.7	27.98	33.00
Middle Channel								
1880.0	20.09	1.5	0	H	1.9	7.7	25.89	33.00
1880.0	22.02	1.5	0	V	1.9	7.7	27.82	33.00
High Channel								
1909.8	19.96	1.5	0	H	1.9	7.7	25.76	33.00
1909.8	22.02	1.5	0	V	1.9	7.7	27.82	33.00

ERP For EDGE Mode GSM850

Frequency	Substitude 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	24.68	1.5	0	H	1.5	0	23.18	38.45
824.2	26.69	1.5	0	V	1.5	0	25.19	38.45
Middle Channel								
836.6	24.94	1.5	0	H	1.5	0	23.44	38.45
836.6	26.95	1.5	0	V	1.5	0	25.45	38.45
High Channel								
848.8	24.96	1.5	0	H	1.5	0	23.46	38.45
848.8	26.99	1.5	0	V	1.5	0	25.49	38.45

EIRP For EDGE Mode PCS1900

Frequency	Substitude 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	15.87	1.5	0	H	1.9	7.7	21.67	33.00
1850.2	17.85	1.5	0	V	1.9	7.7	23.65	33.00
Middle Channel								
1880.0	15.56	1.5	0	H	1.9	7.7	21.36	33.00
1880.0	17.51	1.5	0	V	1.9	7.7	23.31	33.00
High Channel								
1909.8	15.55	1.5	0	H	1.9	7.7	21.35	33.00
1909.8	17.69	1.5	0	V	1.9	7.7	23.49	33.00

ERP For WCDMA Mode Band 5

Frequency	Substitude 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	22.06	1.5	0	H	1.5	0	20.56	38.45
826.4	22.85	1.5	0	V	1.5	0	21.35	38.45
Middle Channel								
836.6	21.65	1.5	0	H	1.5	0	20.15	38.45
836.6	23.01	1.5	0	V	1.5	0	21.51	38.45
High Channel								
846.6	21.42	1.5	0	H	1.5	0	19.92	38.45
846.6	22.86	1.5	0	V	1.5	0	21.36	38.45

ERP For HSDPA Mode Band 5

Frequency	Substitude 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	21.08	1.5	0	H	1.5	0	19.58	38.45
826.4	21.89	1.5	0	V	1.5	0	20.39	38.45
Middle Channel								
836.6	20.55	1.5	0	H	1.5	0	19.05	38.45
836.6	22.06	1.5	0	V	1.5	0	20.56	38.45
High Channel								
846.6	20.41	1.5	0	H	1.5	0	18.91	38.45
846.6	21.86	1.5	0	V	1.5	0	20.36	38.45

ERP For HSUPA Mode Band 5

Frequency	Substitude 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	21.08	1.5	0	H	1.5	0	19.58	38.45
826.4	21.84	1.5	0	V	1.5	0	20.34	38.45
Middle Channel								
836.6	20.65	1.5	0	H	1.5	0	19.15	38.45
836.6	22.09	1.5	0	V	1.5	0	20.59	38.45
High Channel								
846.6	20.41	1.5	0	H	1.5	0	18.91	38.45
846.6	21.85	1.5	0	V	1.5	0	20.35	38.45

EIRP For WCDMA Mode Band 2

Frequency	Substitude 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	14.07	1.5	0	H	1.9	7.7	19.87	33
1852.4	15.78	1.5	0	V	1.9	7.7	21.58	33
Middle Channel								
1880.0	13.88	1.5	0	H	1.9	7.7	19.68	33
1880.0	16.05	1.5	0	V	1.9	7.7	21.85	33
High Channel								
1907.6	14.26	1.5	0	H	1.9	7.7	20.06	33
1907.6	16.01	1.5	0	V	1.9	7.7	21.81	33

EIRP For HSDPA Mode Band 2

Frequency	Substitude 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	12.96	1.5	0	H	1.9	7.7	18.76	33
1852.4	14.65	1.5	0	V	1.9	7.7	20.45	33
Middle Channel								
1880.0	12.87	1.5	0	H	1.9	7.7	18.67	33
1880.0	15.05	1.5	0	V	1.9	7.7	20.85	33
High Channel								
1907.6	13.36	1.5	0	H	1.9	7.7	19.16	33
1907.6	15.01	1.5	0	V	1.9	7.7	20.81	33

EIRP For HSUPA Mode Band 2

Frequency	Substitude 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	12.98	1.5	0	H	1.9	7.7	18.78	33
1852.4	14.65	1.5	0	V	1.9	7.7	20.45	33
Middle Channel								
1880.0	12.86	1.5	0	H	1.9	7.7	18.66	33
1880.0	15.02	1.5	0	V	1.9	7.7	20.82	33
High Channel								
1907.6	13.35	1.5	0	H	1.9	7.7	19.15	33
1907.6	15.09	1.5	0	V	1.9	7.7	20.89	33

Note: Result = Substitude - 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	31.59	38.45
	Middle Channel	836.6	31.43	38.45
	High Channel	848.8	31.38	38.45
GPRS(1 Slot)	Low Channel	824.2	31.31	38.45
	Middle Channel	836.6	31.25	38.45
	High Channel	848.8	31.08	38.45
EDGE(1 Slot)	Low Channel	824.2	26.78	38.45
	Middle Channel	836.6	27.01	38.45
	High Channel	848.8	27.36	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	28.56	33.0
	Middle Channel	1880.0	28.21	33.0
	High Channel	1909.8	28.16	33.0
GPRS(1 Slot)	Low Channel	1850.2	28.24	33.0
	Middle Channel	1880.0	27.86	33.0
	High Channel	1909.8	28.11	33.0
EDGE(1 Slot)	Low Channel	1850.2	23.79	33.0
	Middle Channel	1880.0	23.54	33.0
	High Channel	1909.8	23.18	33.0

For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
WCDMA	Low Channel	826.4	21.41	38.45
	Middle Channel	836.6	21.60	38.45
	High Channel	846.6	21.78	38.45
HSDPA	Low Channel	826.4	22.45	38.45
	Middle Channel	836.6	22.50	38.45
	High Channel	846.6	22.75	38.45
HSUPA	Low Channel	826.4	22.35	38.45
	Middle Channel	836.6	22.29	38.45
	High Channel	846.6	22.17	38.45

For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 24.232 Limit (dBm)
WCDMA	Low Channel	1852.4	21.46	33.00
	Middle Channel	1880.0	21.29	33.00
	High Channel	1907.6	20.91	33.00
HSDPA	Low Channel	1852.4	21.46	33.00
	Middle Channel	1880.0	21.37	33.00
	High Channel	1907.6	21.90	33.00
HSUPA	Low Channel	1852.4	21.59	33.00
	Middle Channel	1880.0	21.65	33.00
	High Channel	1907.6	21.57	33.00

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

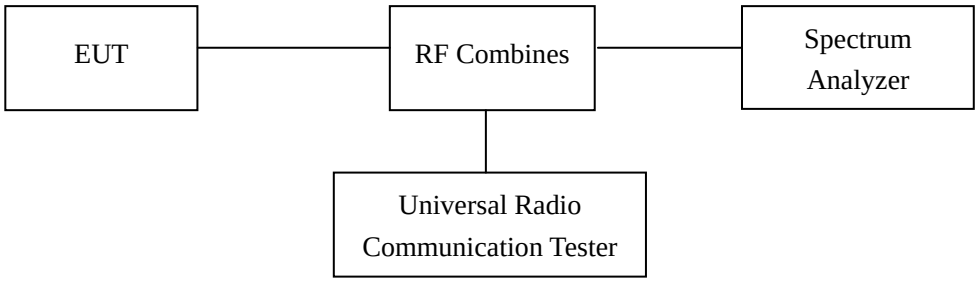
5.1 Standard Applicable

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 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:



5.3 Environmental Conditions

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

5.4 Summary of Test Results

Only the worst case was selected to record

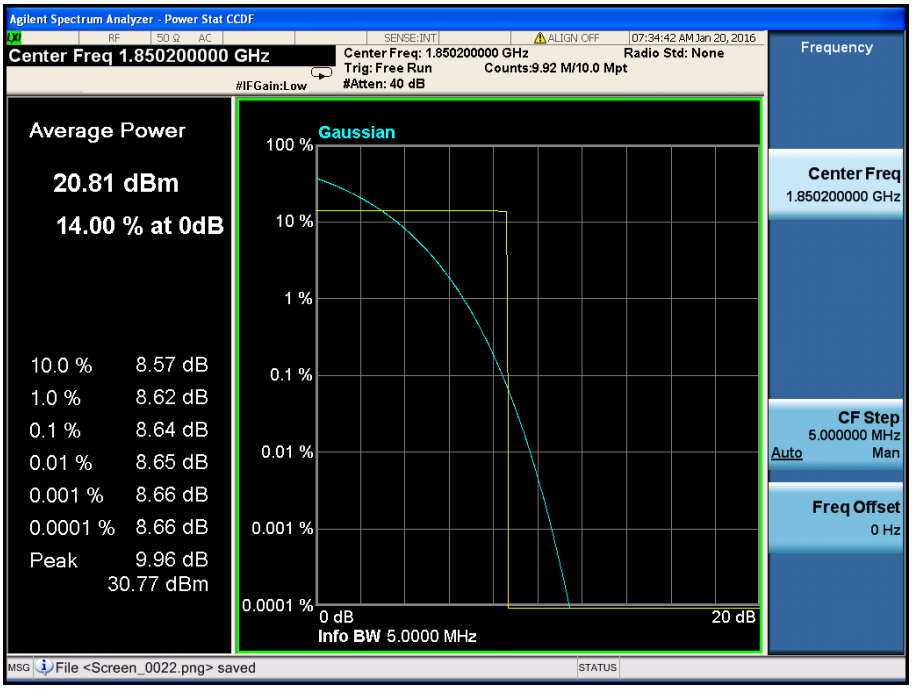
For PCS Band

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	8.66	13
GPRS(1 Slot)	512	1850.2	10.07	13
EDGE(1 Slot)	512	1850.2	12.20	13

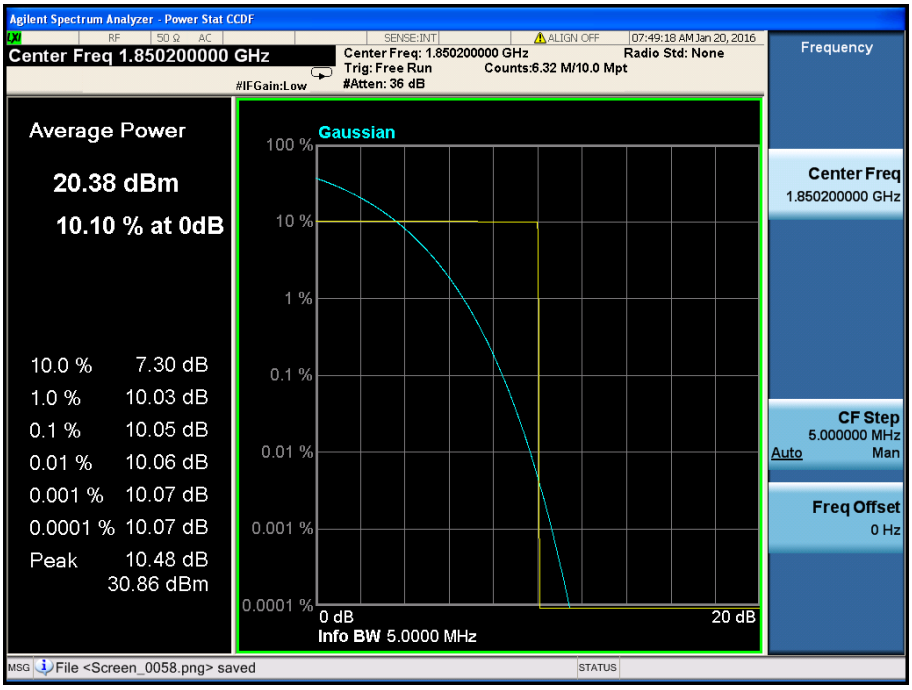
For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	3.24	13
HSDPA	9400	1880.0	4.34	13
HSUPA	9400	1880.0	4.34	13

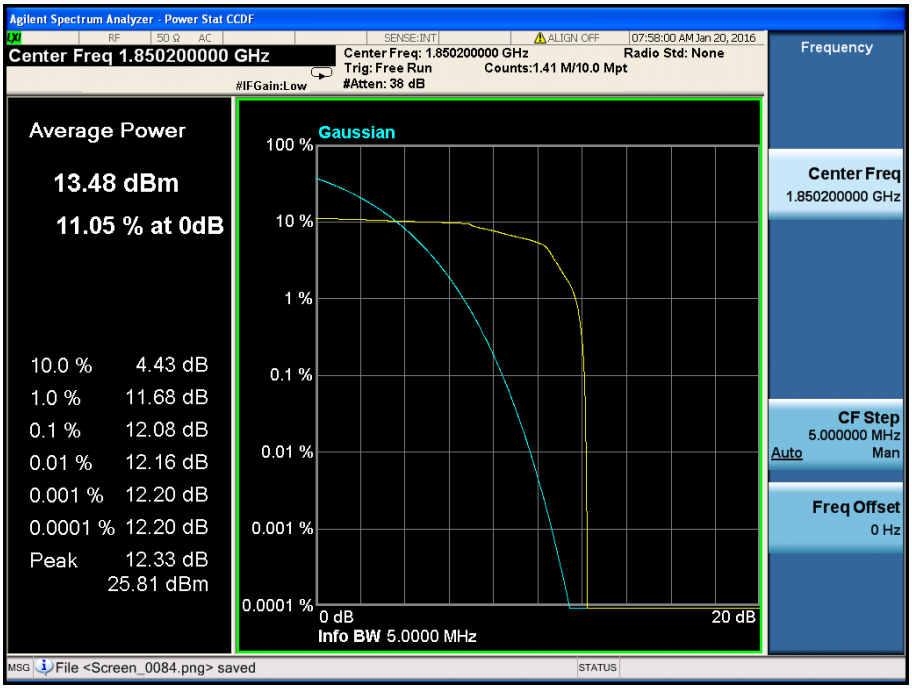
For GSM



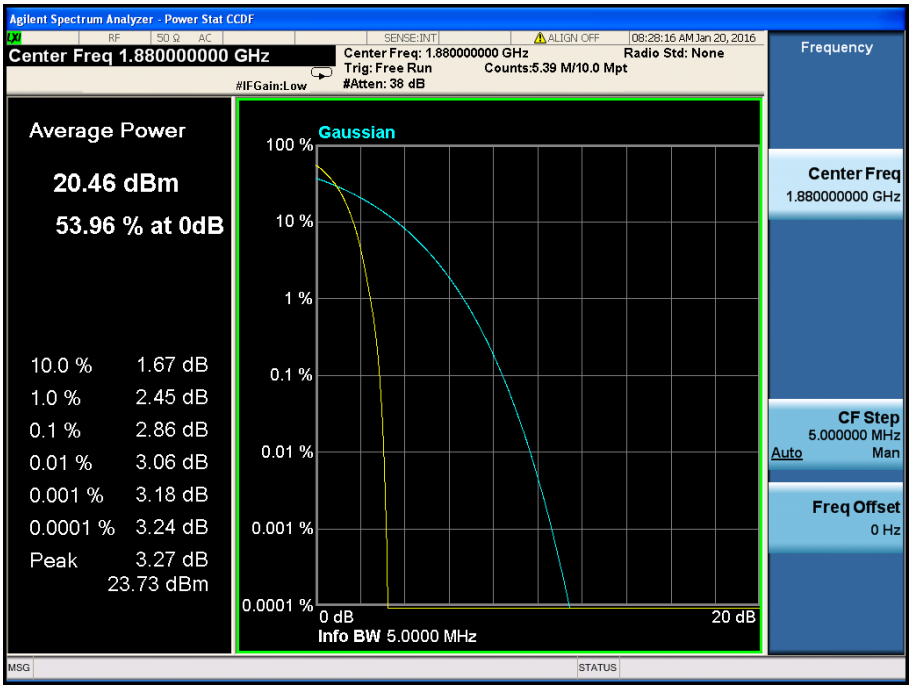
For GPRS



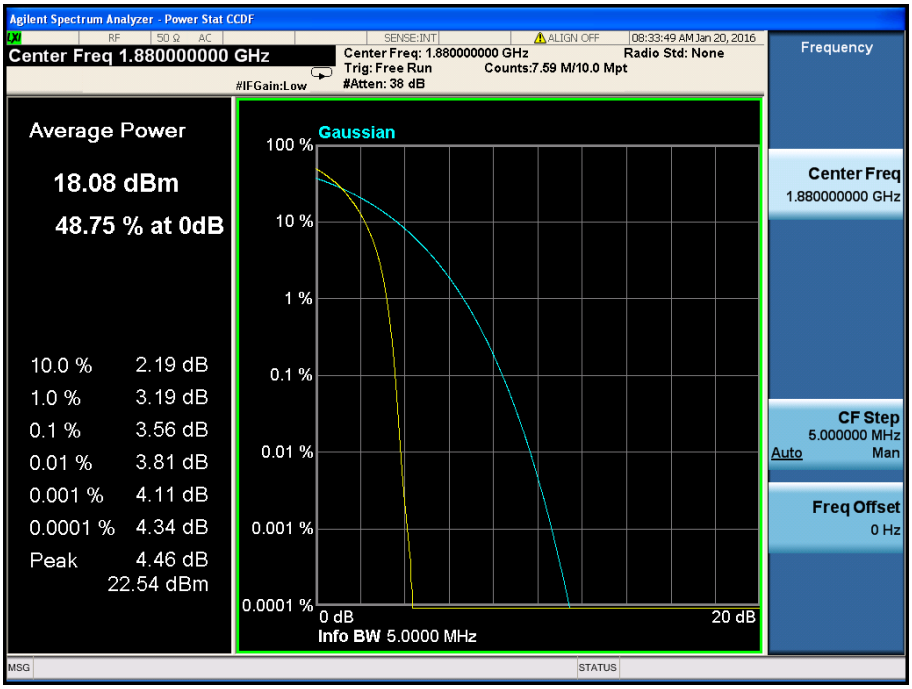
For EDGE



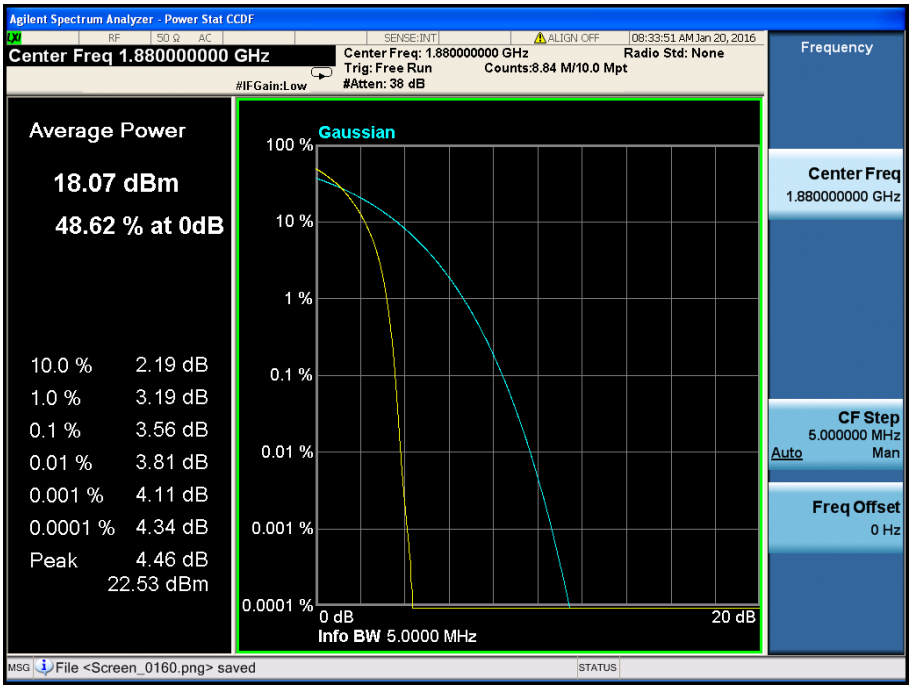
For WCDMA



For HSDPA



For HSUPA


Agilent Spectrum Analyzer - Power Stat CCDF
RF
50 Ω
AC
SENSE:INT
ALIGN OFF
08:33:51 AM Jan 20, 2016
Center Freq 1.880000000 GHz
Center Freq: 1.880000000 GHz
Trig: Free Run
#Atten: 38 dB
Radio Std: None
Counts:8.84 M/10.0 Mpt
#IFGain:Low
Frequency
Average Power
18.07 dBm
48.62 % at 0dB
10.0 % 2.19 dB
1.0 % 3.19 dB
0.1 % 3.56 dB
0.01 % 3.81 dB
0.001 % 4.11 dB
0.0001 % 4.34 dB
Peak 4.46 dB
22.53 dBm
Gaussian
100 %
10 %
1 %
0.1 %
0.01 %
0.001 %
0.0001 %
0 dB
20 dB
Info BW 5.0000 MHz
Center Freq
1.880000000 GHz
CF Step
5.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
File <Screen_0160.png> saved
STATUS

6. Emission Bandwidth

6.1 Standard Applicable

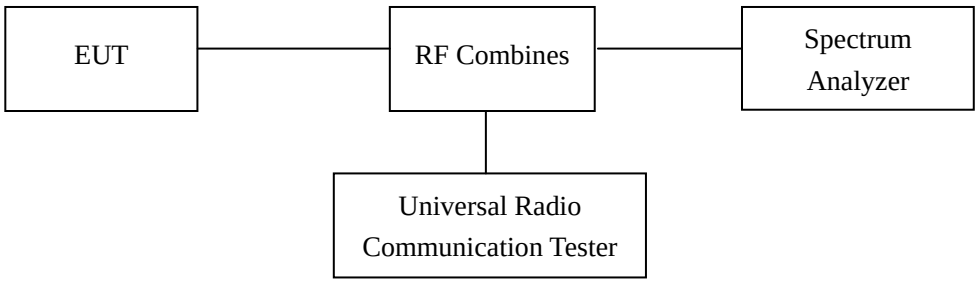
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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 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 10kHz for GSM mode and 100kHz for WCDMA mode, VBW shall be at least 3 times the RBW, and the 26dB bandwidth was recorded.

Test Configuration for the emission bandwidth testing:



6.3 Environmental Conditions

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

6.4 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	253.6328	330.844
	190	836.6	255.7647	336.158
	251	848.8	254.5349	337.858
GPRS	128	824.2	251.5453	330.044
	190	836.6	252.6995	337.553
	251	848.8	253.2655	332.768
EDGE	128	824.2	257.9256	331.959
	190	836.6	256.3761	331.198
	251	848.8	254.9209	334.860

For PCS Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM	512	1850.2	252.4603	328.356
	661	1880.0	255.0221	334.202
	810	1909.8	248.5105	333.075
GPRS	512	1850.2	251.8461	336.372
	661	1880.0	252.4075	336.892
	810	1909.8	252.1420	334.520
EDGE	512	1850.2	251.5453	330.044
	661	1880.0	252.6995	337.553
	810	1909.8	253.2655	332.768

For Band 5

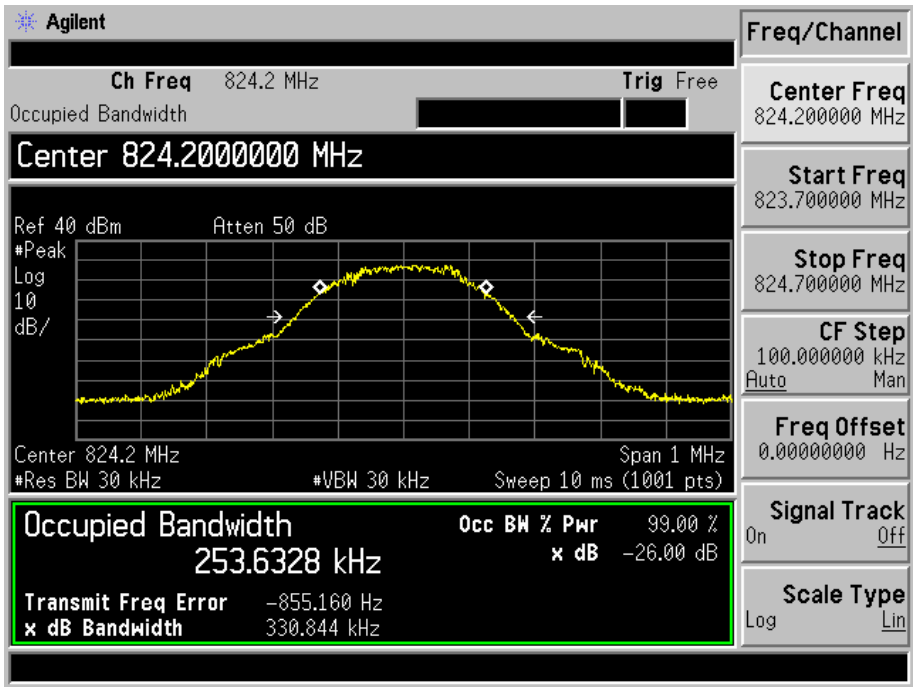
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	4132	826.4	4.1569	4.693
	4183	836.6	4.1641	4.687
	4233	846.6	4.1637	4.660
HSDPA	4132	826.4	4.1620	4.717
	4183	836.6	4.1458	4.668
	4233	846.6	4.1680	4.678
HSUPA	4132	826.4	4.1650	4.665
	4183	836.6	4.1554	4.687
	4233	846.6	4.1583	4.702

For Band 2

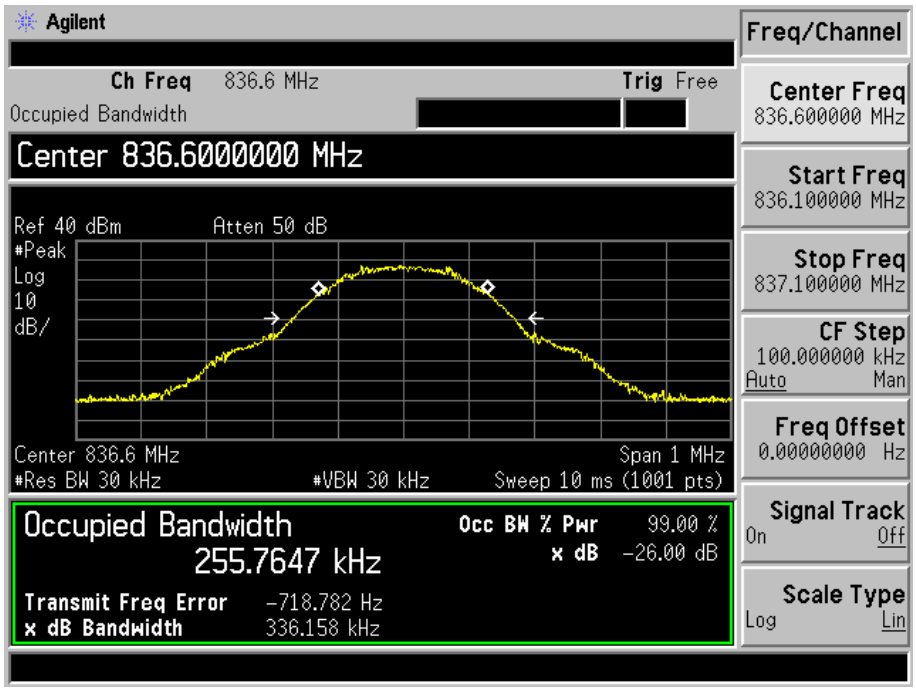
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	9262	1852.4	4.1675	4.715
	9400	1880.0	4.1620	4.707
	9538	1907.6	4.1882	4.761
HSDPA	9262	1852.4	4.1717	4.702
	9400	1880.0	4.1611	4.696
	9538	1907.6	4.1705	4.682
HSUPA	9262	1852.4	4.1624	4.740
	9400	1880.0	4.1698	4.695
	9538	1907.6	4.1807	5.262

For Cellular Band

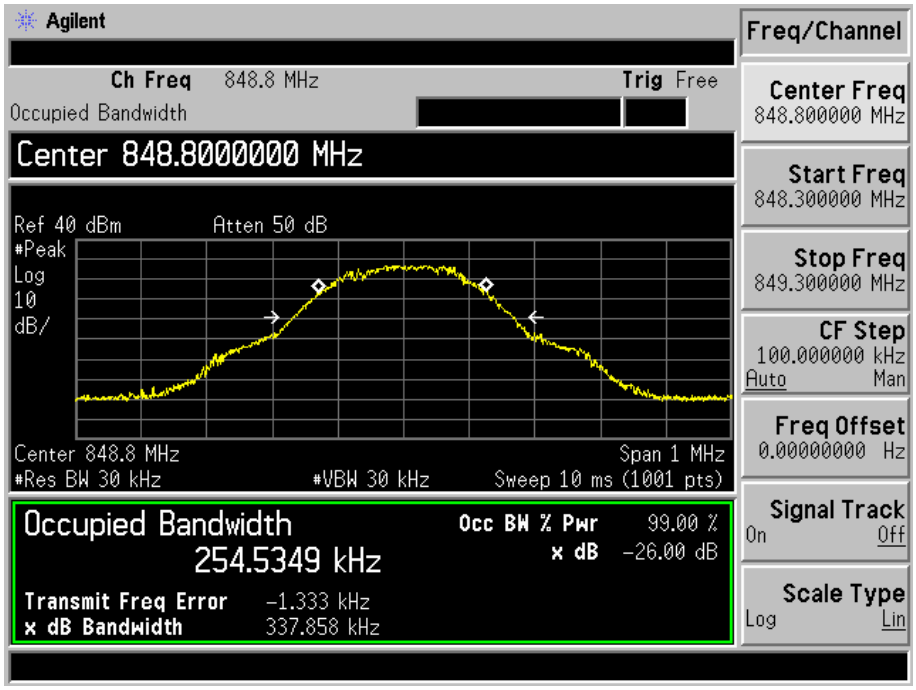
GSM Low Channel



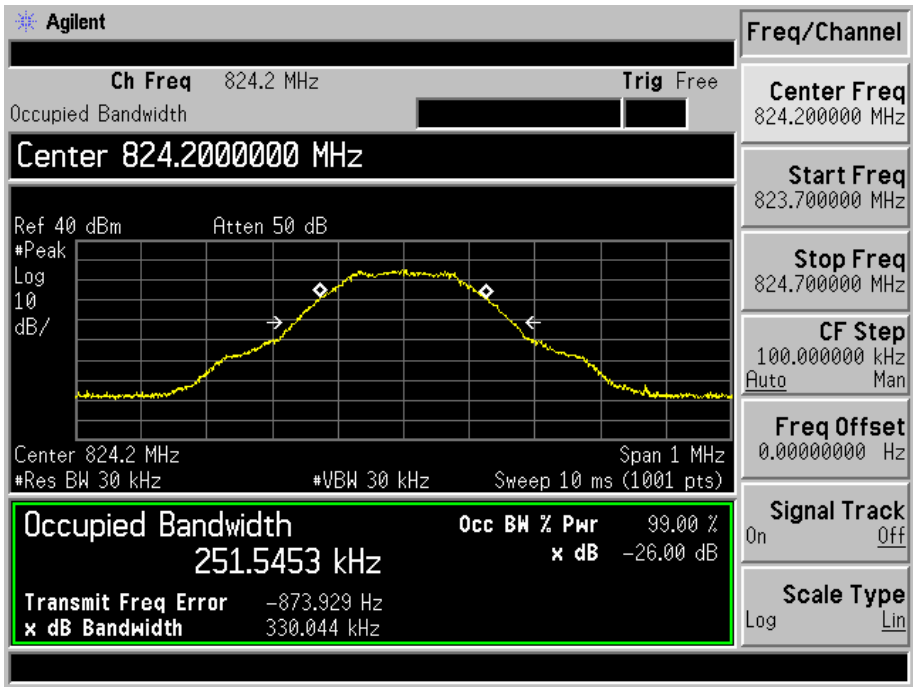
GSM Middle Channel



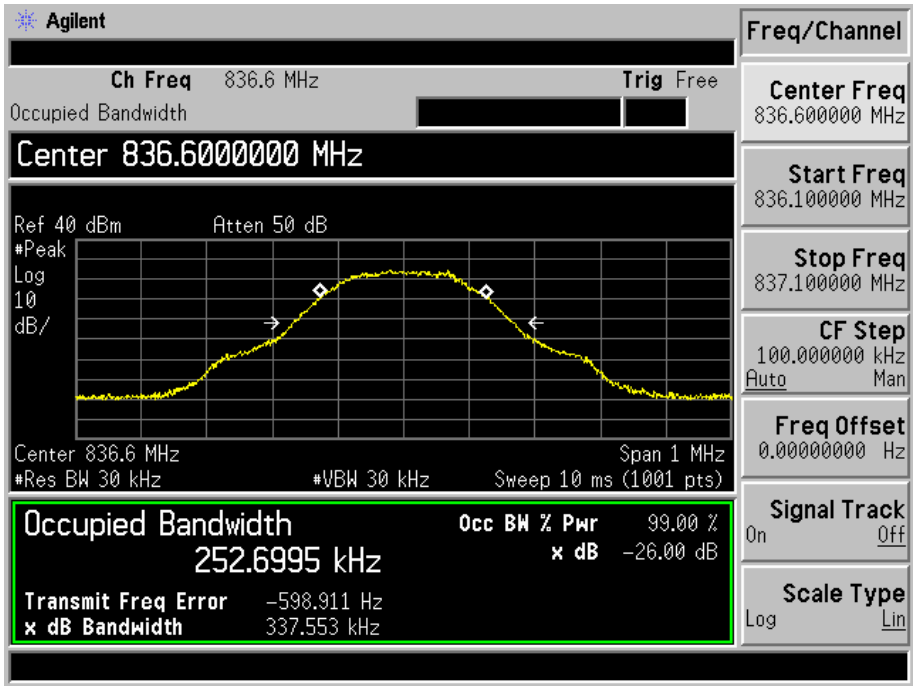
GSM High channel



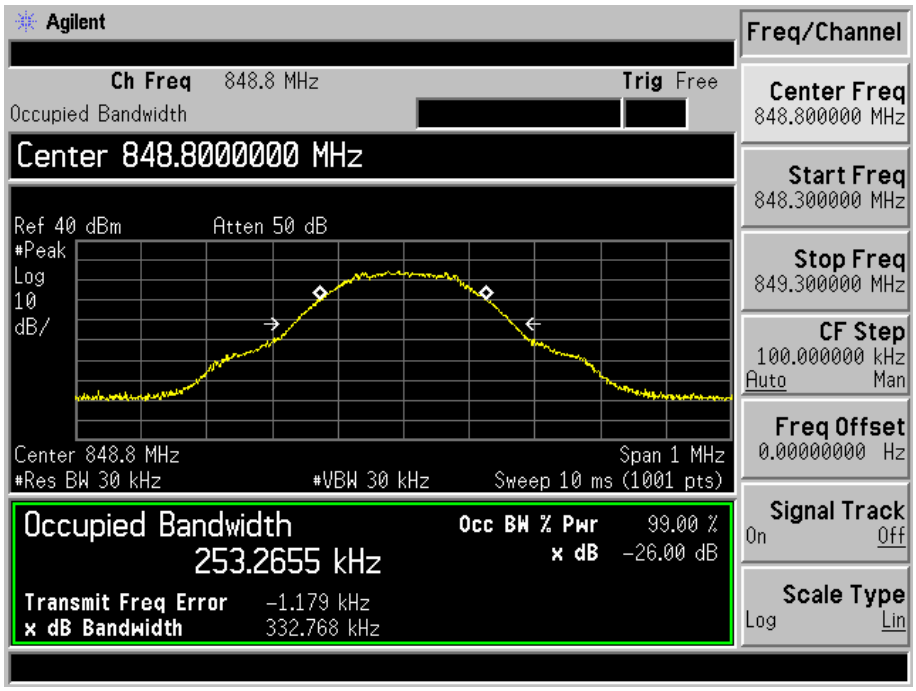
GPRS Low Channel



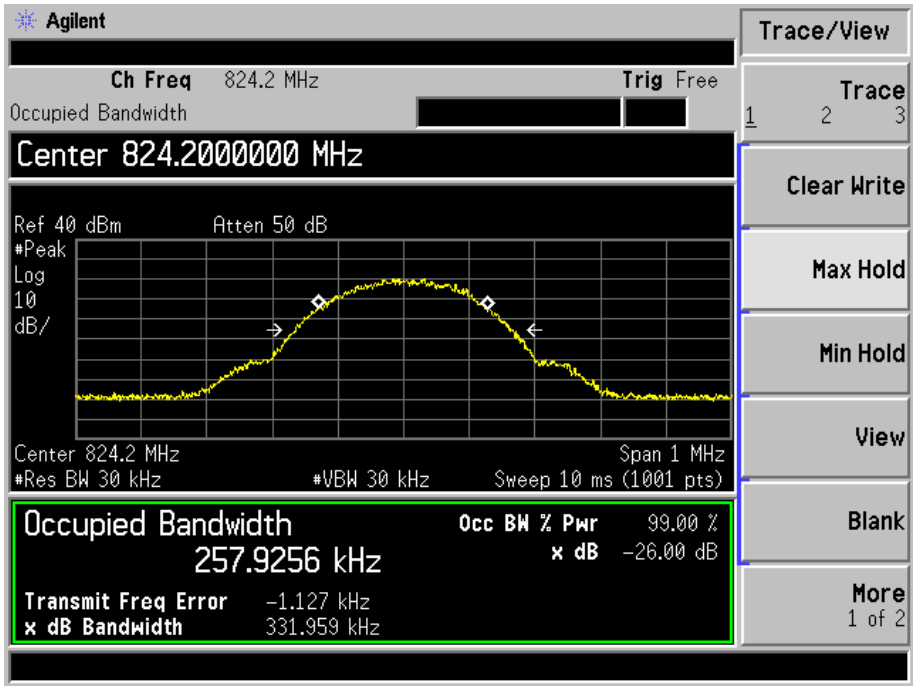
GPRS Middle Channel



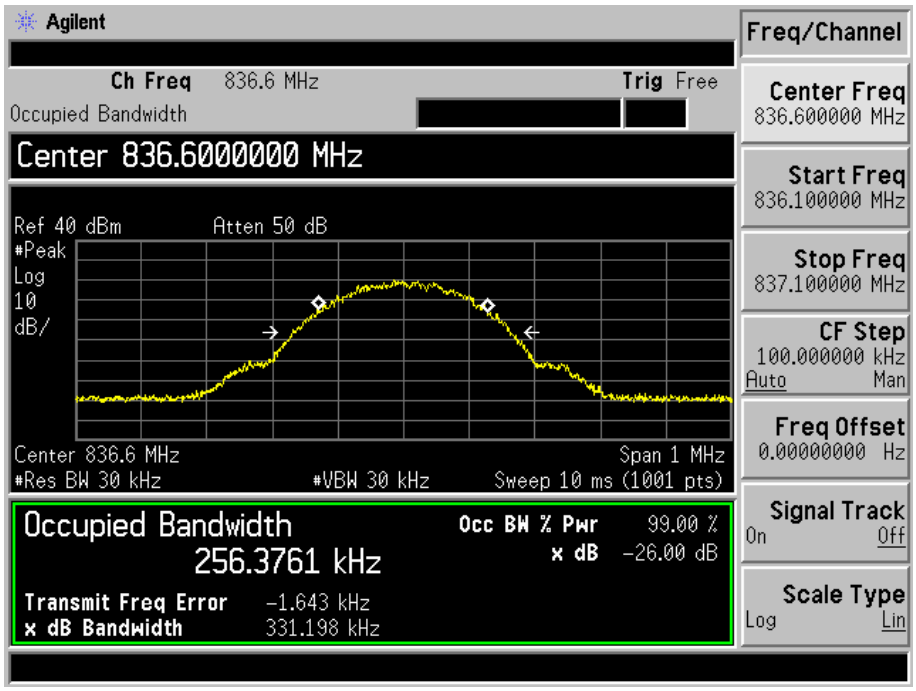
GPRS High Channel



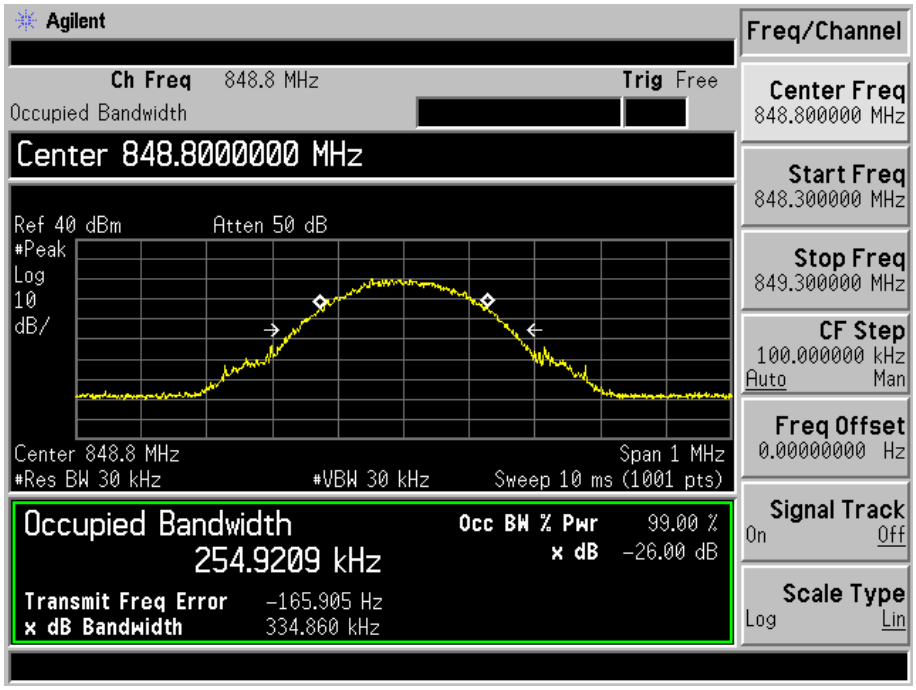
EDGE Low Channel



EDGE Middle Channel

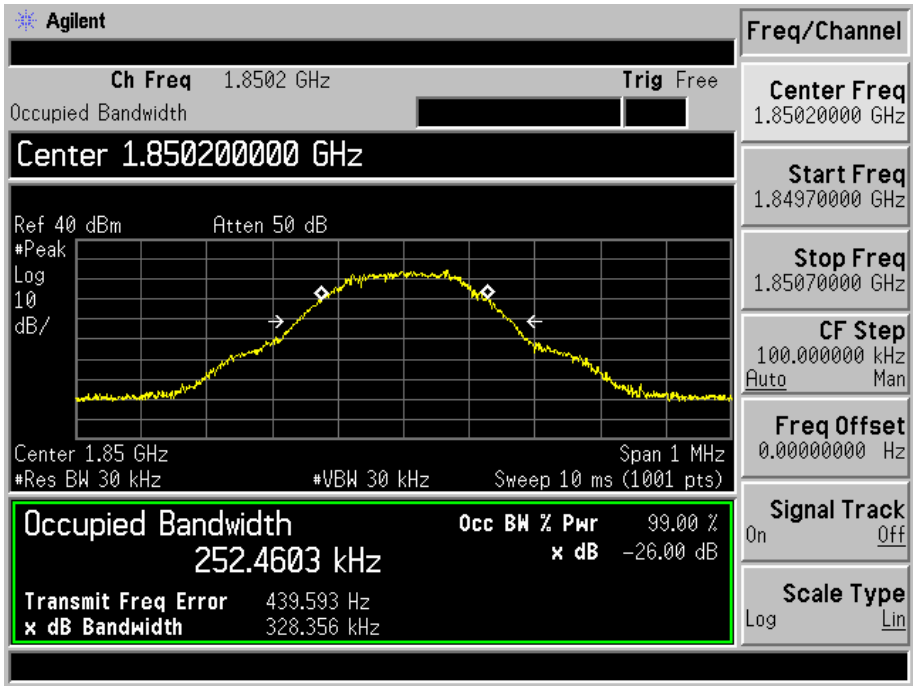


EDGE High Channel

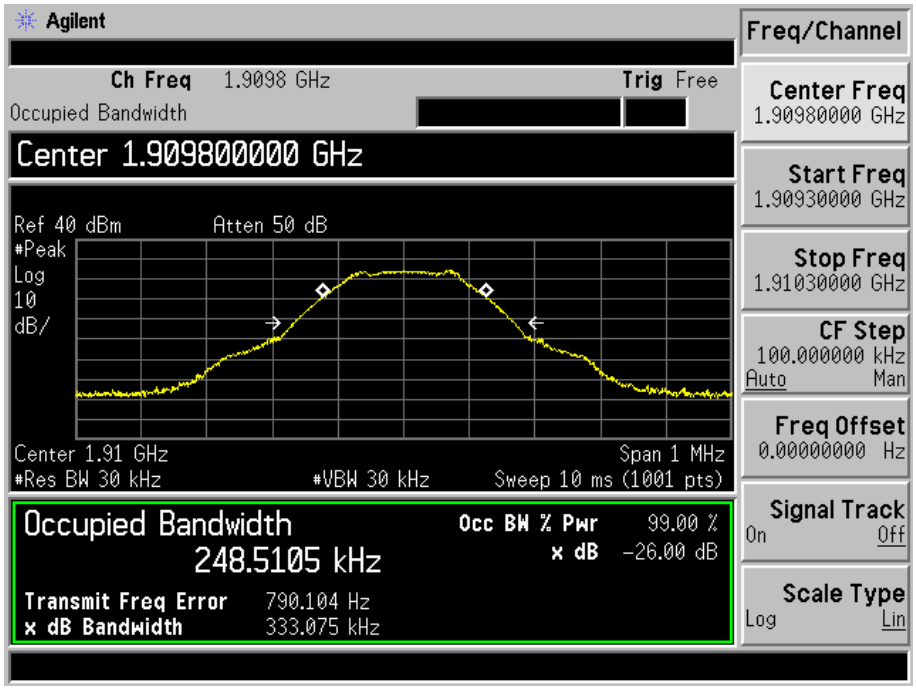


For PCS Band

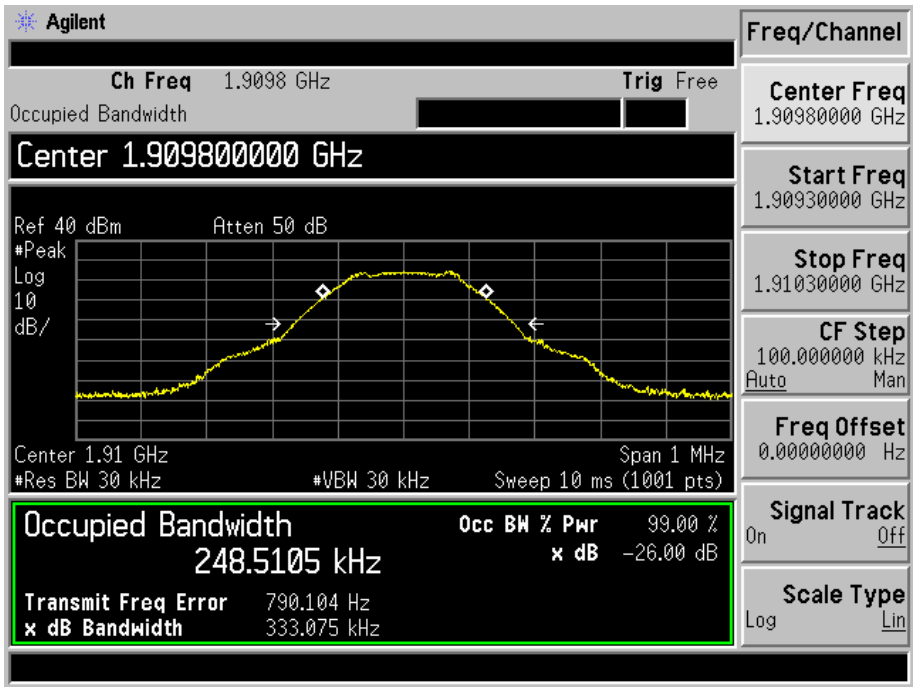
GSM Low Channel



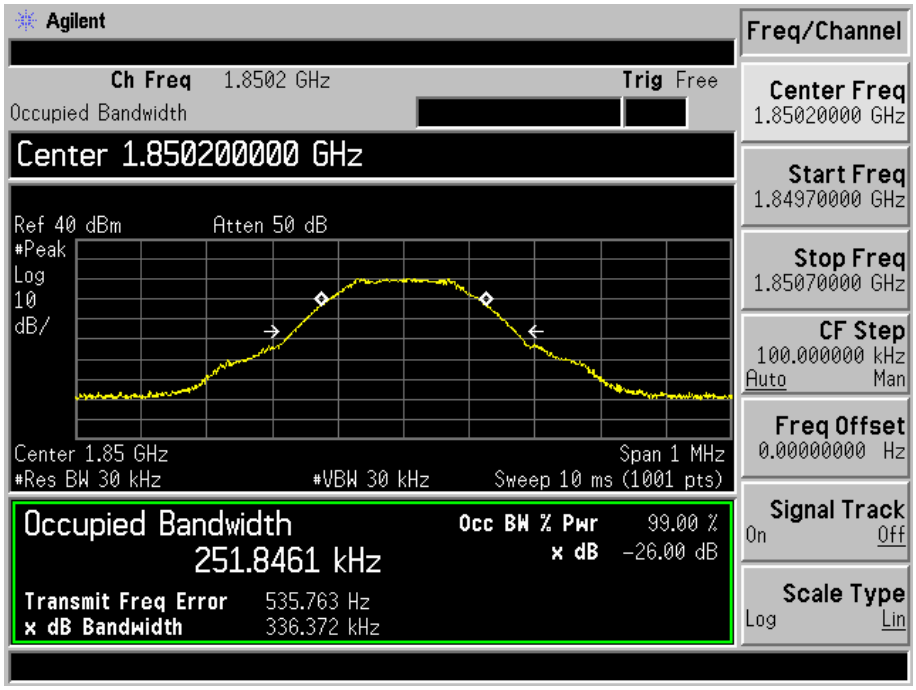
GSM Middle Channel



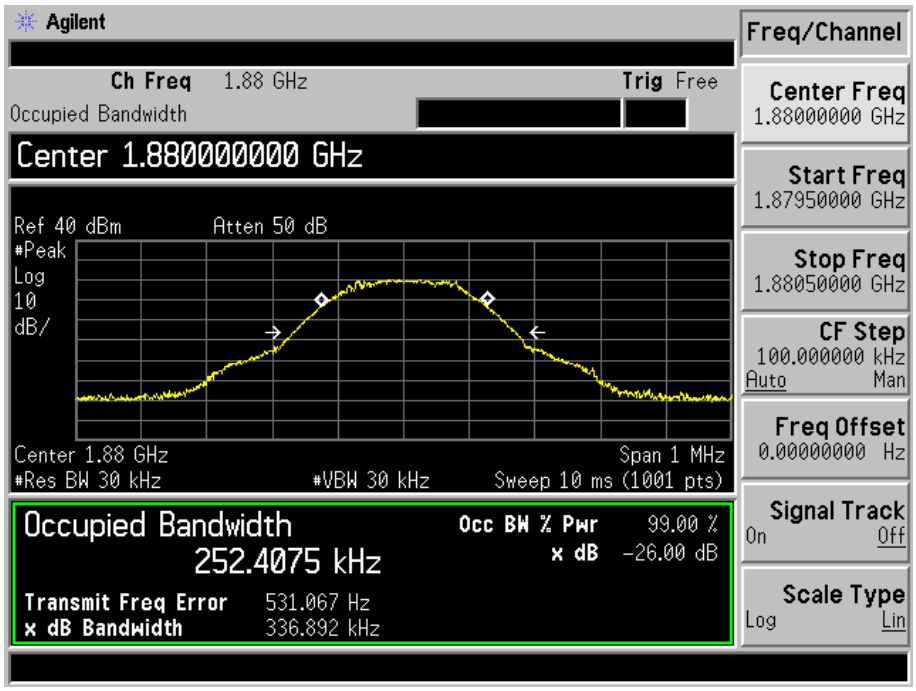
GSM High channel



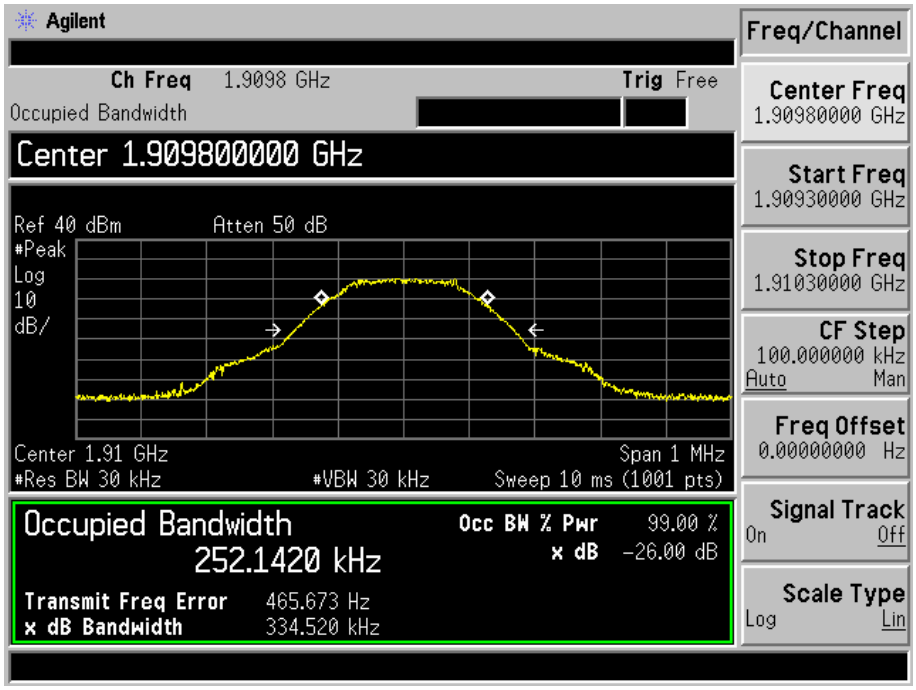
GPRS Low Channel



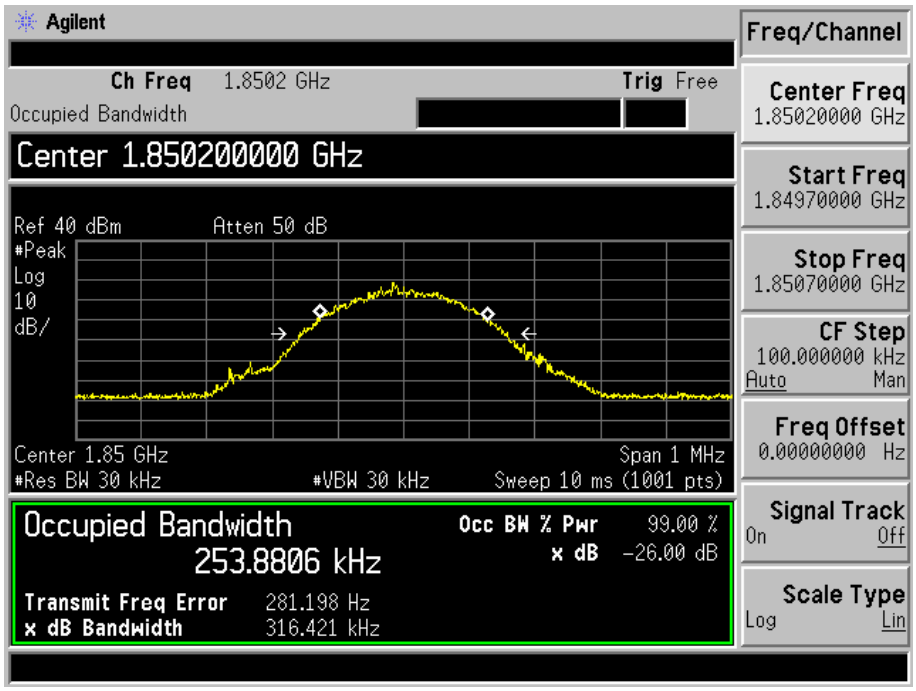
GPRS Middle Channel



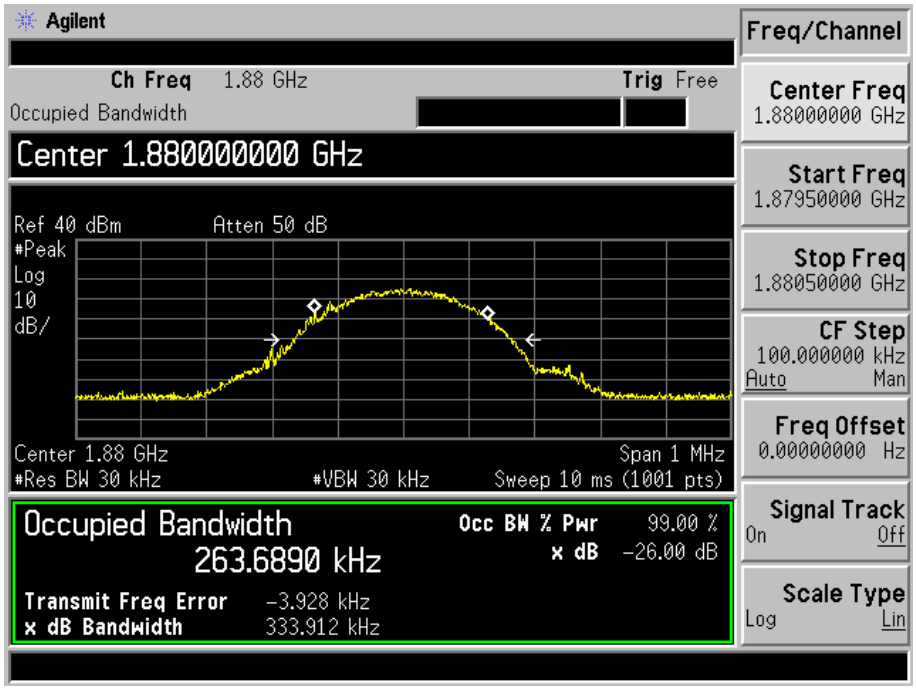
GPRS High Channel



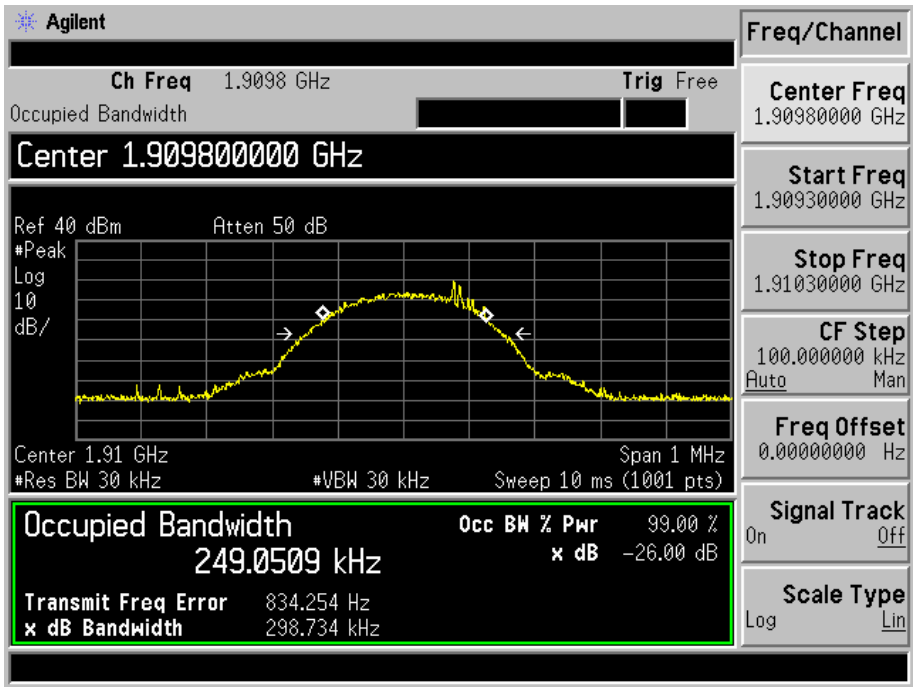
EDGE Low Channel



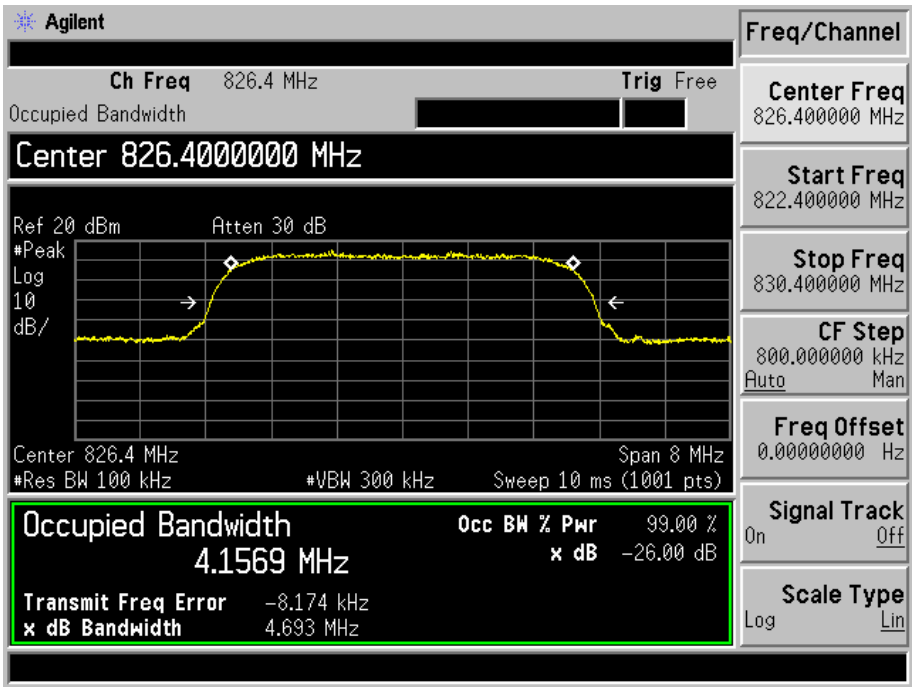
EDGE Middle Channel



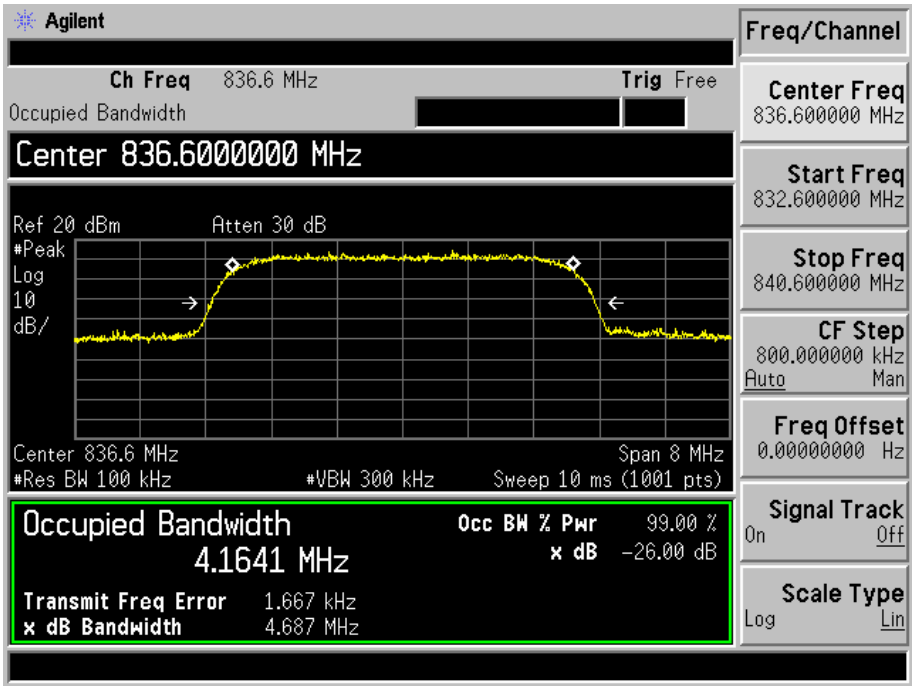
EDGE High Channel



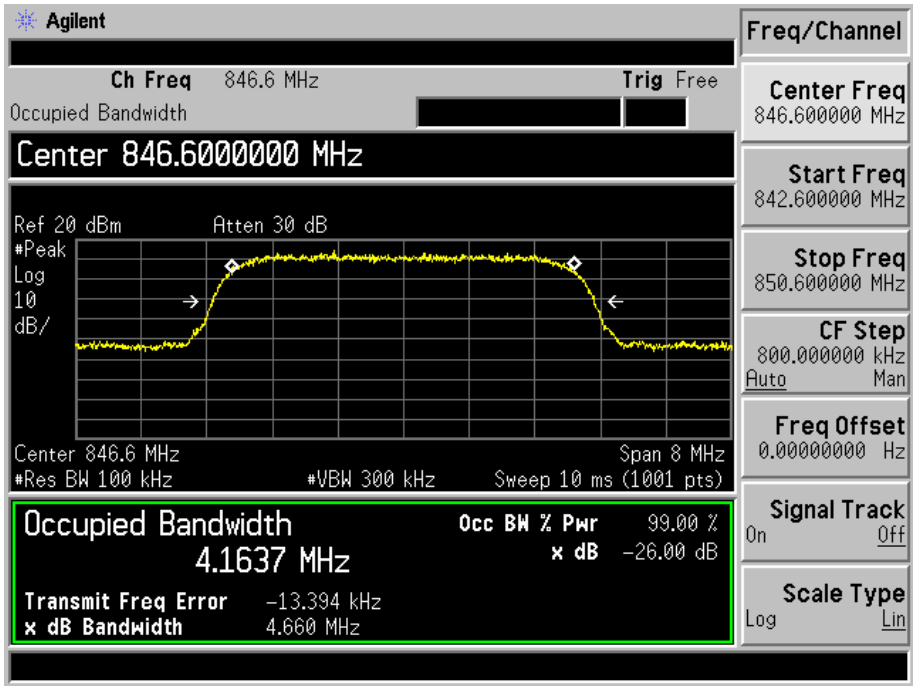
For Band V
WCDMA Low Channel



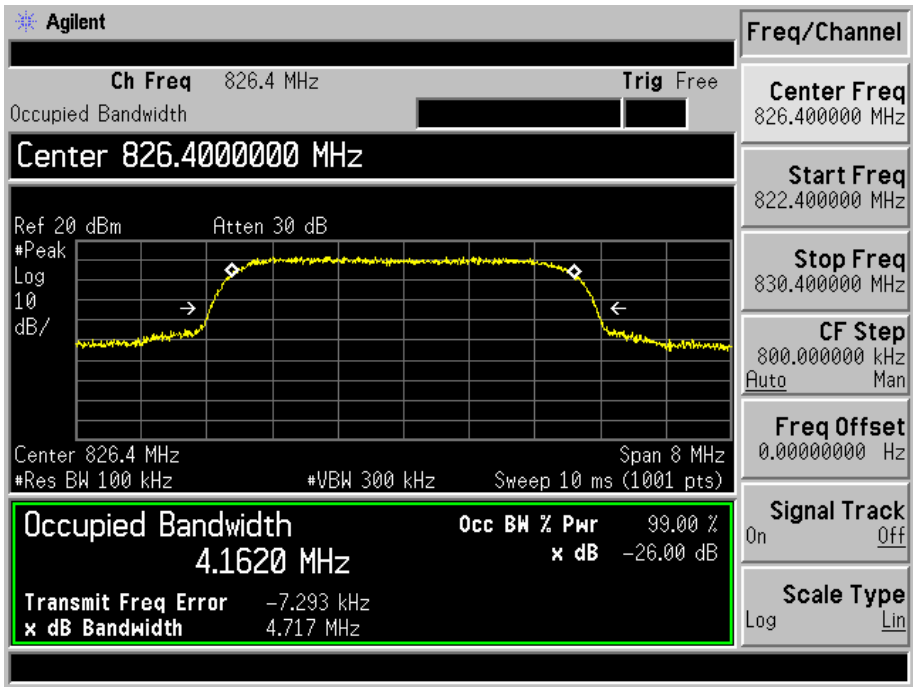
WCDMA Middle Channel



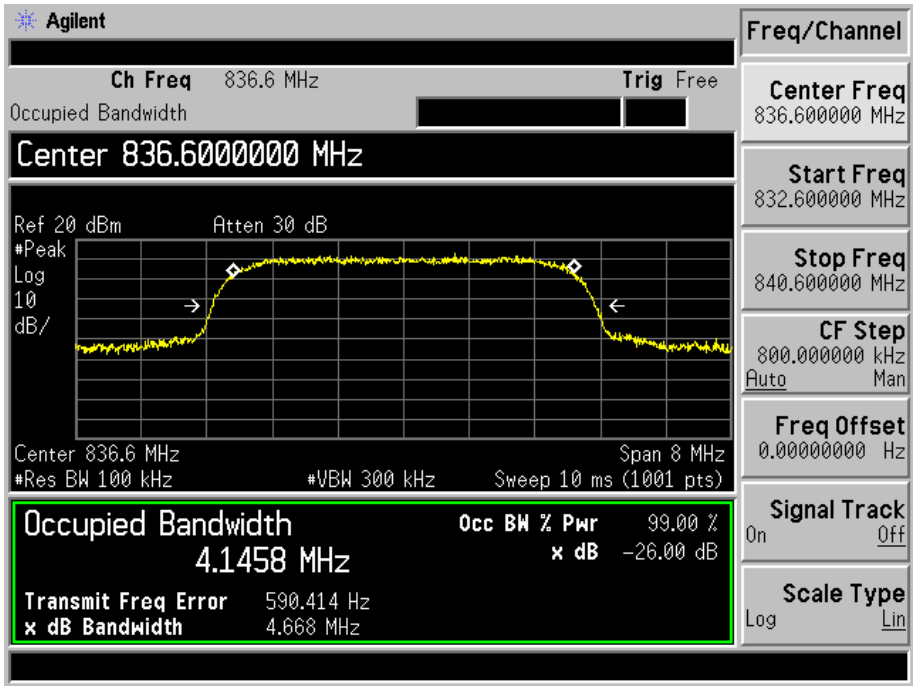
WCDMA High Channel



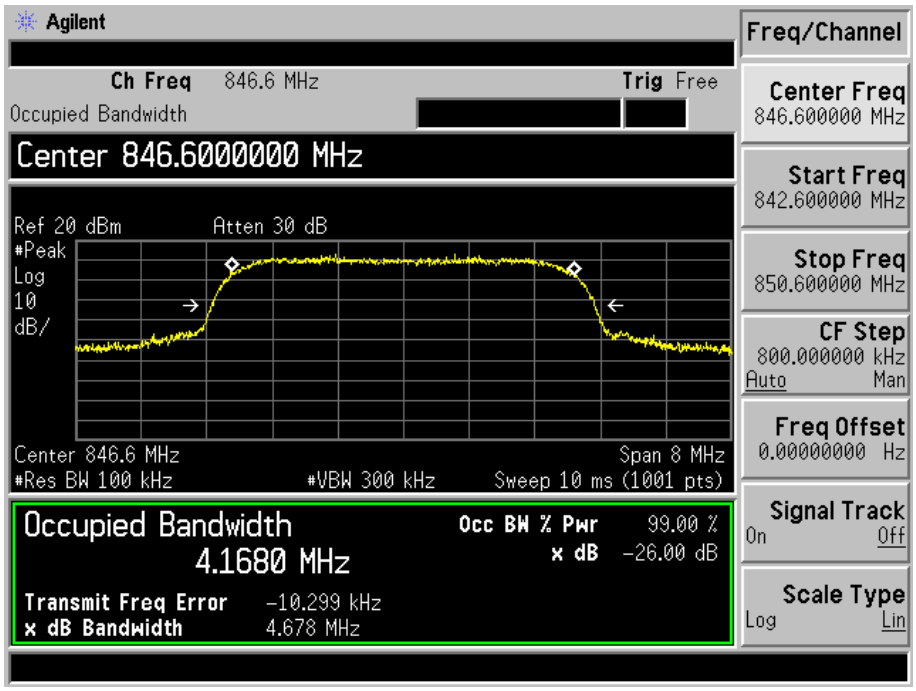
HSDPA Low Channel



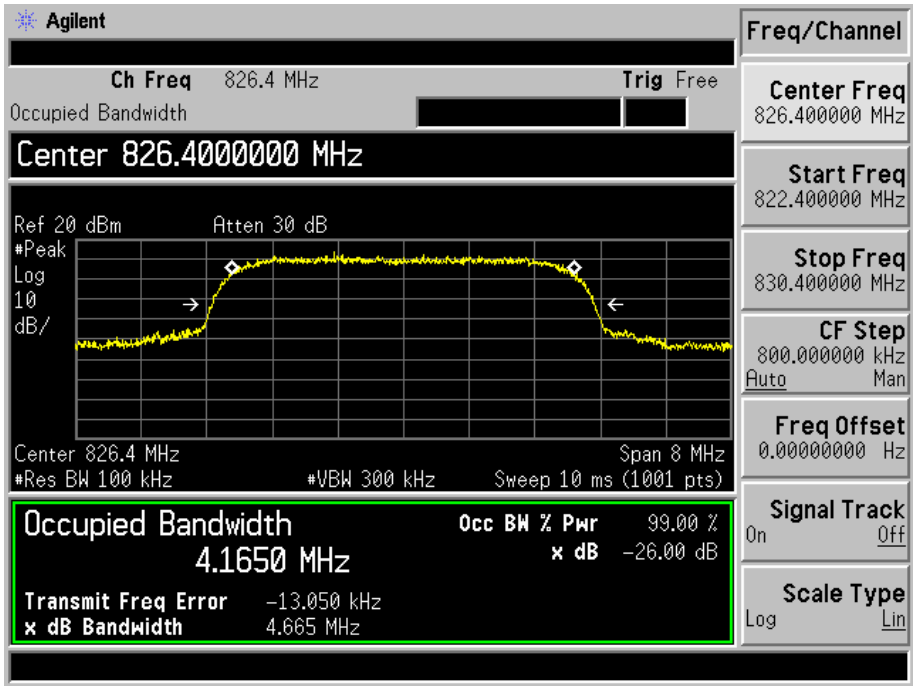
HSDPA Middle Channel



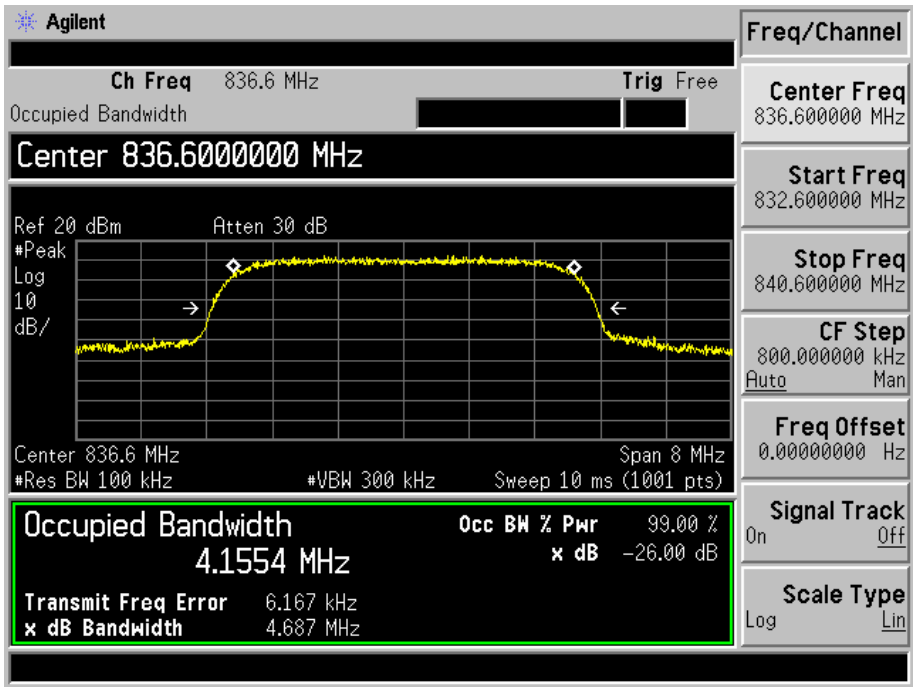
HSDPA High Channel



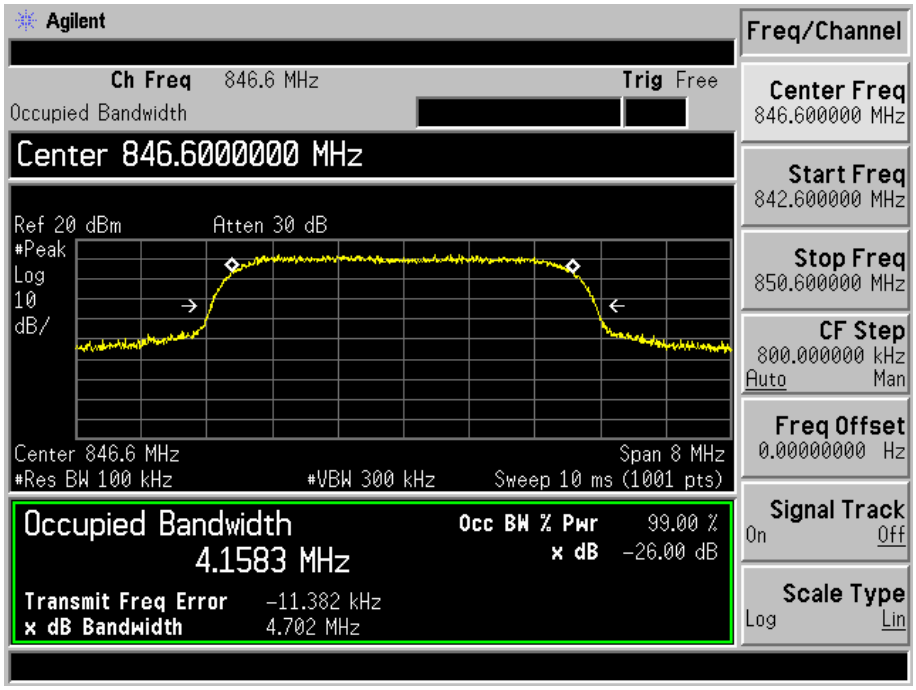
HSUPA Low Channel



HSUPA Middle Channel

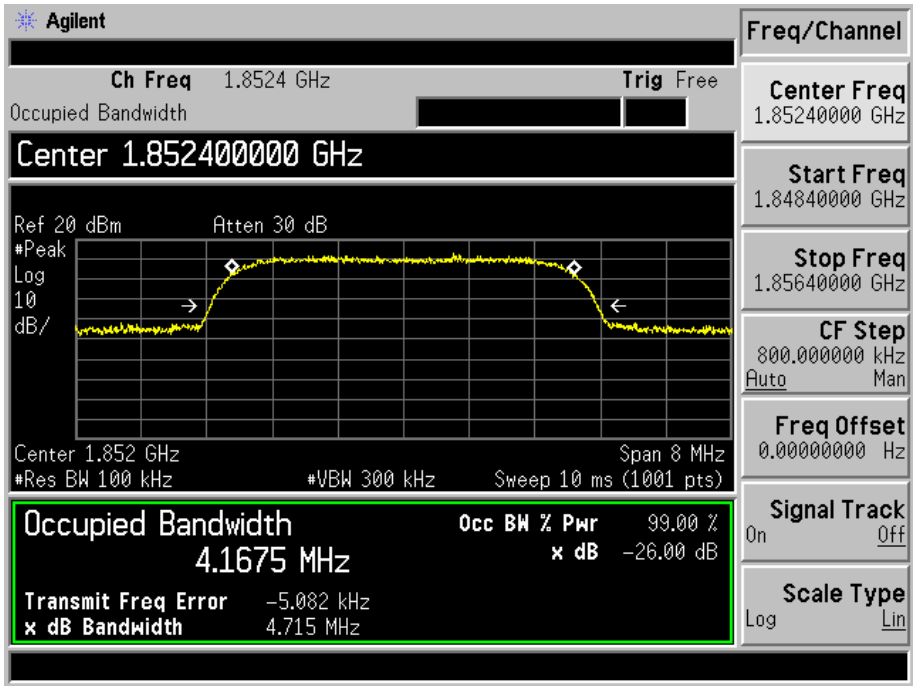


HSUPA High Channel

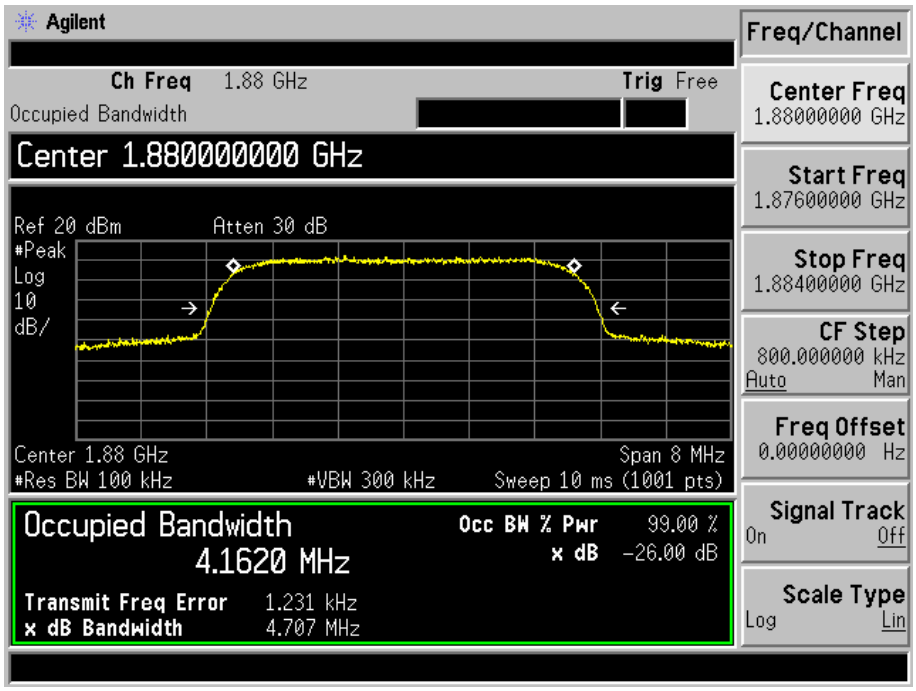


For Band II

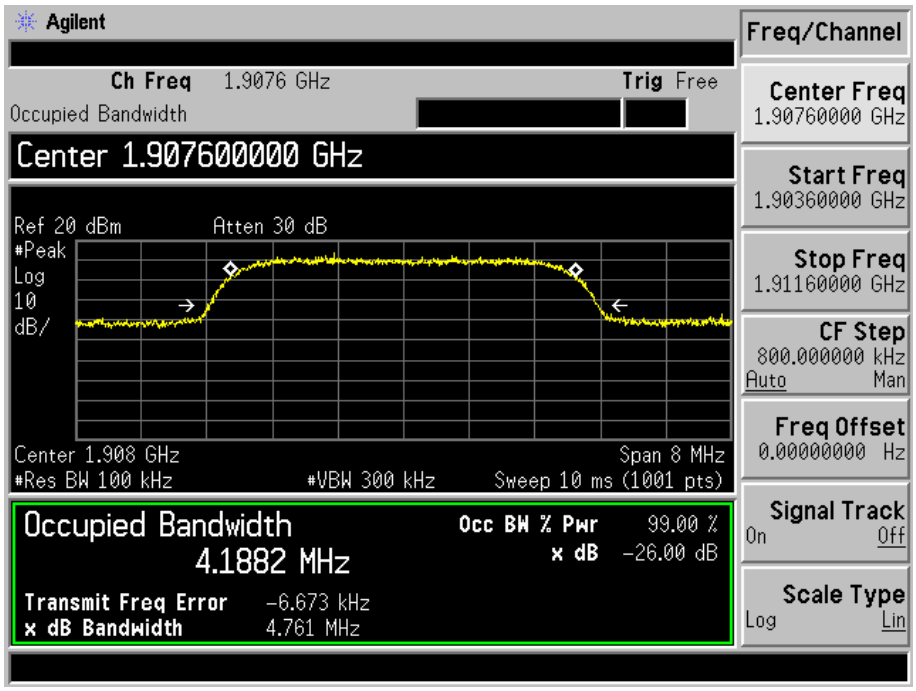
WCDMA Low Channel



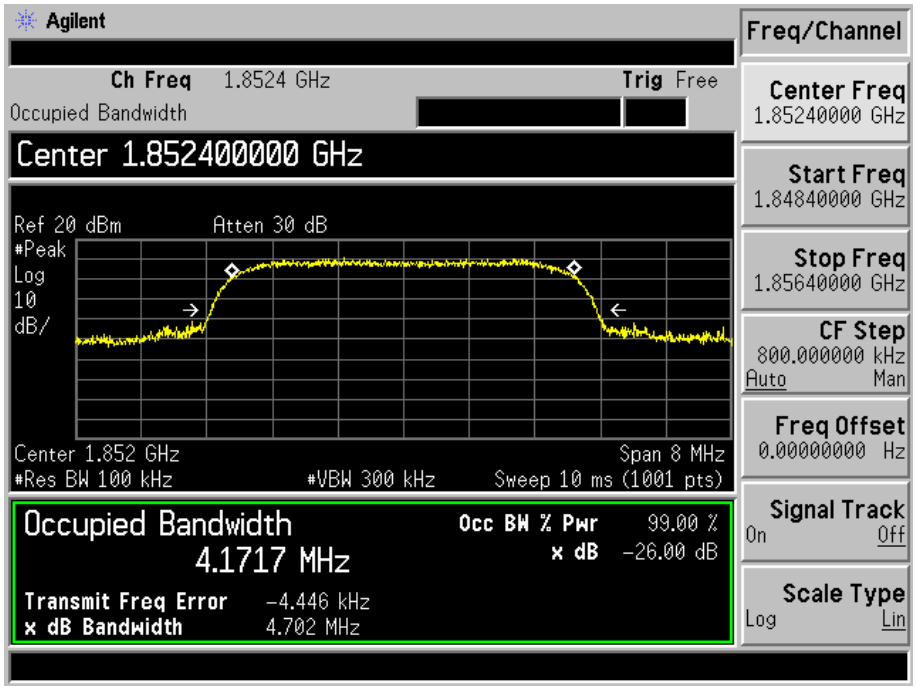
WCDMA Middle Channel



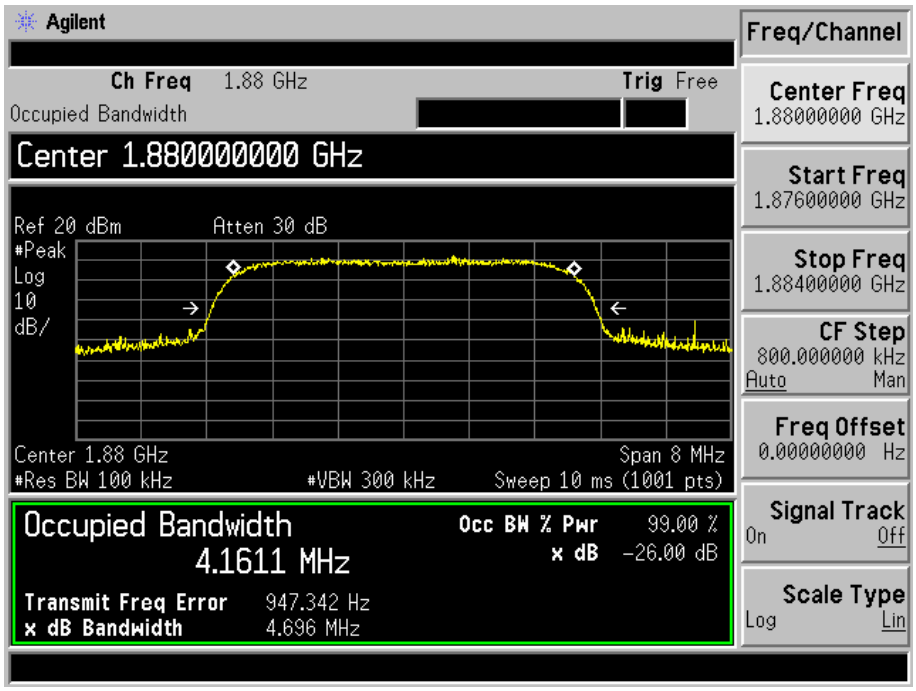
WCDMA High Channel



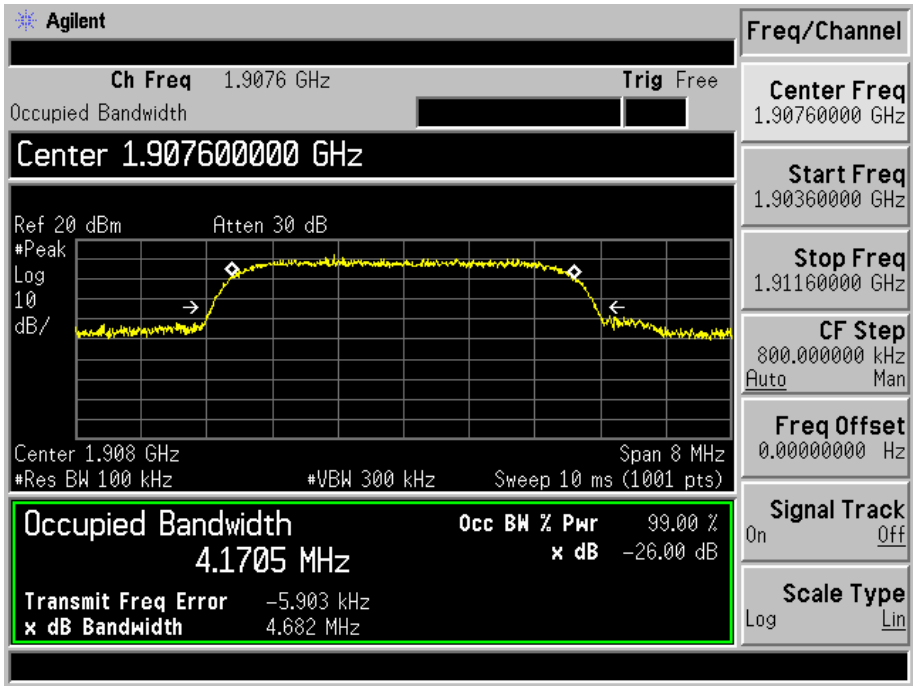
HSDPA Low Channel



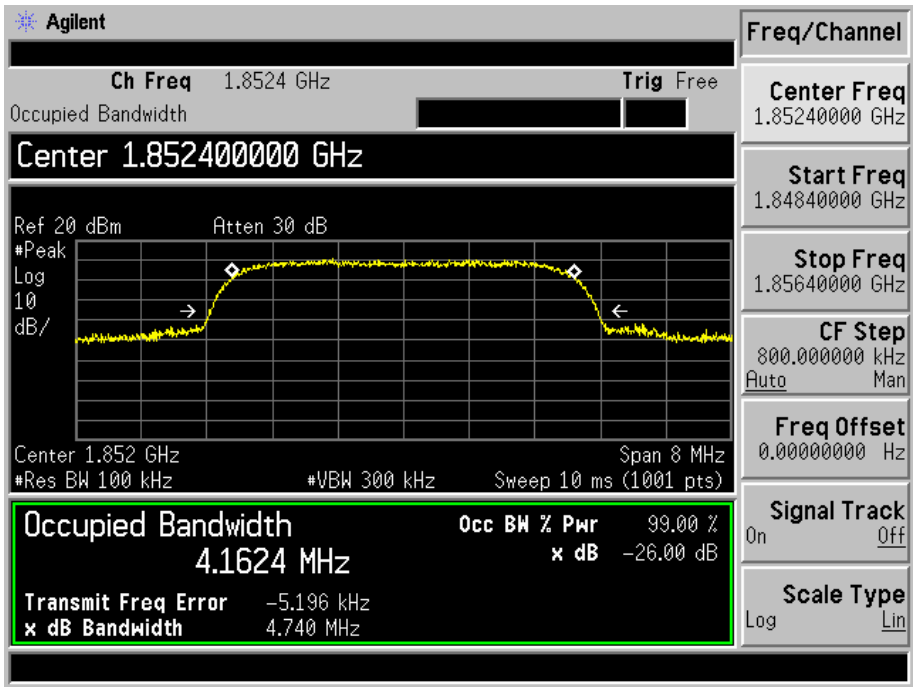
HSDPA Middle Channel



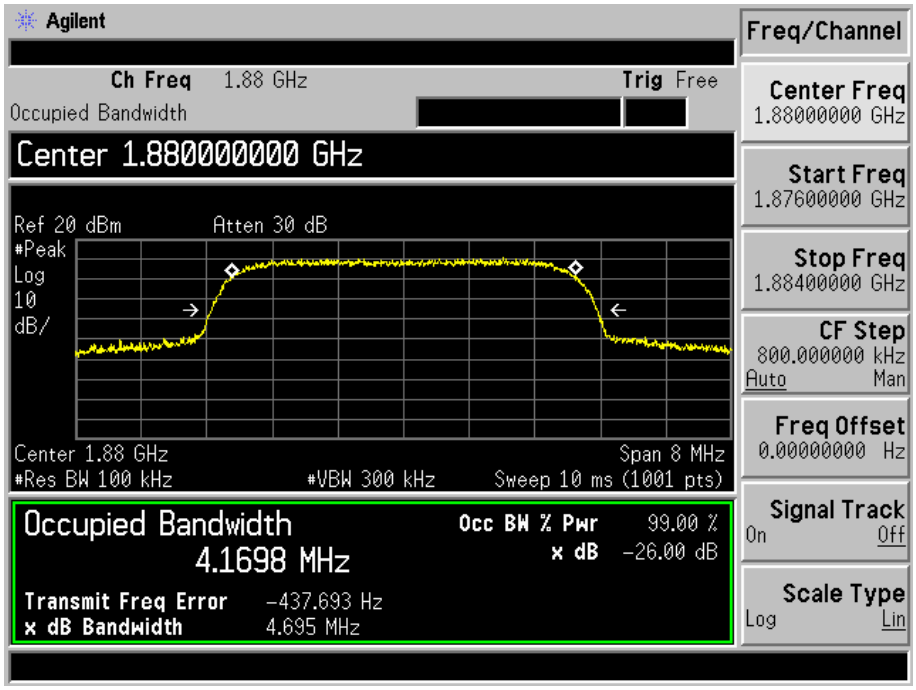
HSDPA High Channel



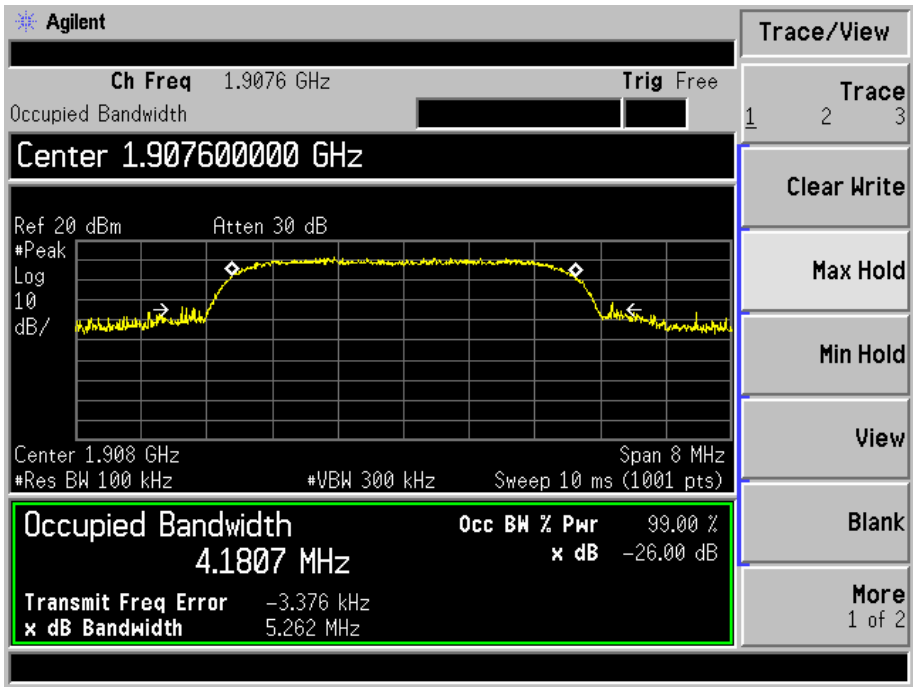
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



7. Out of Band Emissions at Antenna Terminal

7.1 Standard Applicable

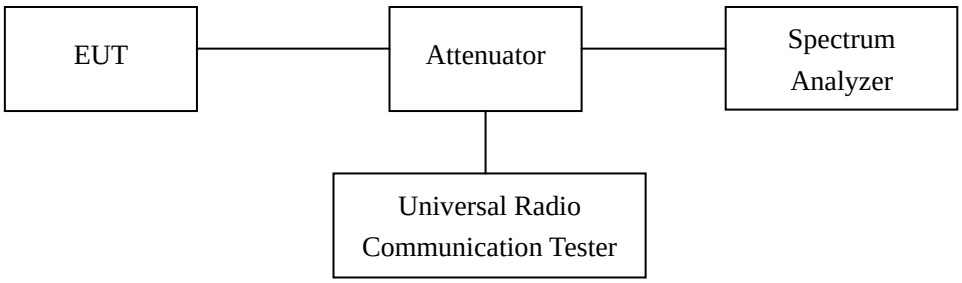
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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 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^{th} harmonic.

Test Configuration for the out of band emissions testing:



7.3 Environmental Conditions

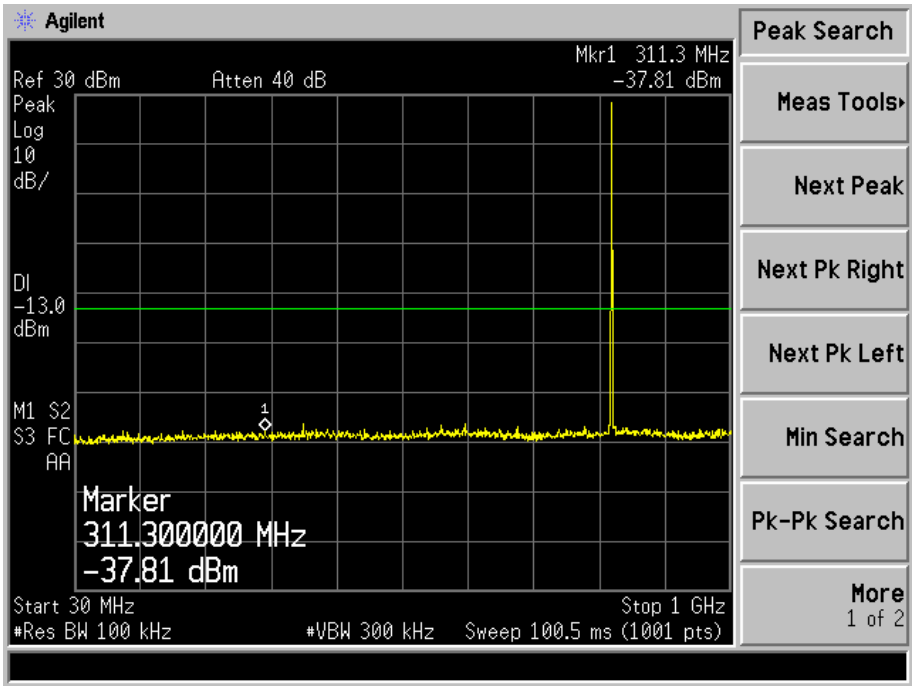
Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

7.4 Summary of Test Results/Plots

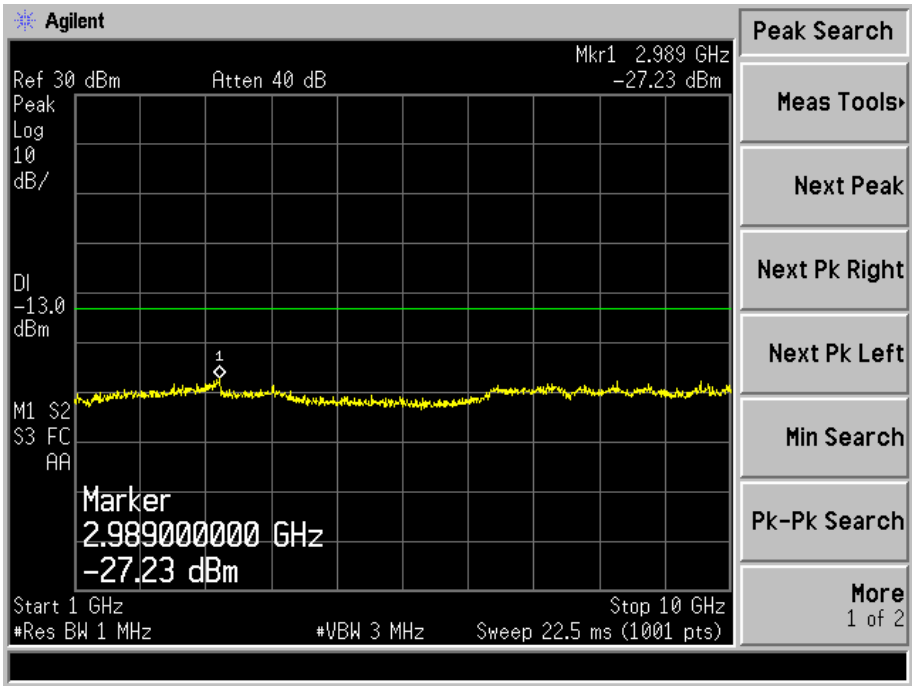
Please refer to the following test plots For Cellular Band

GSM Low Channel

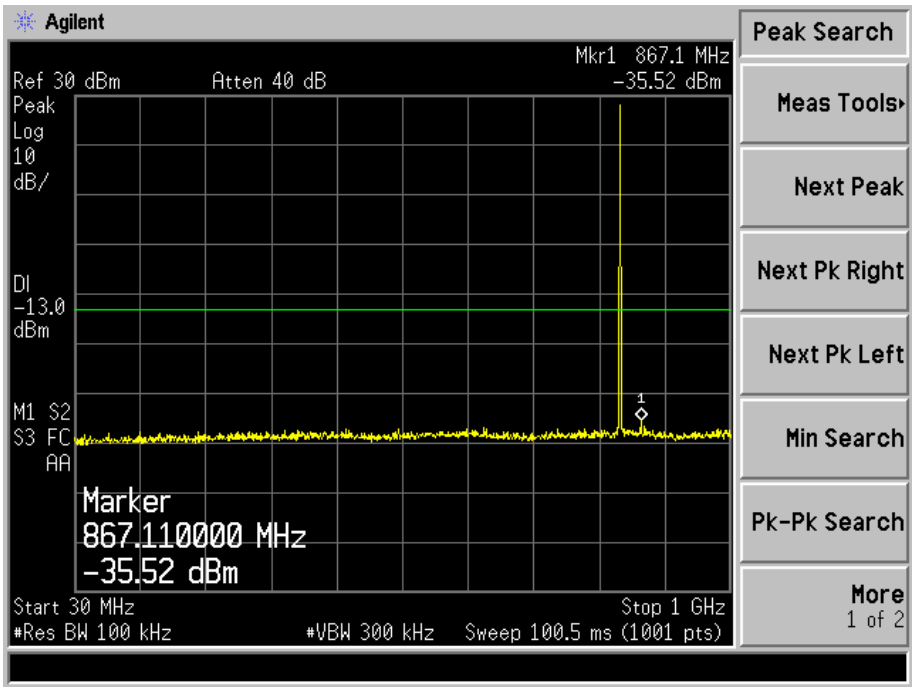
30MHz to 1GHz



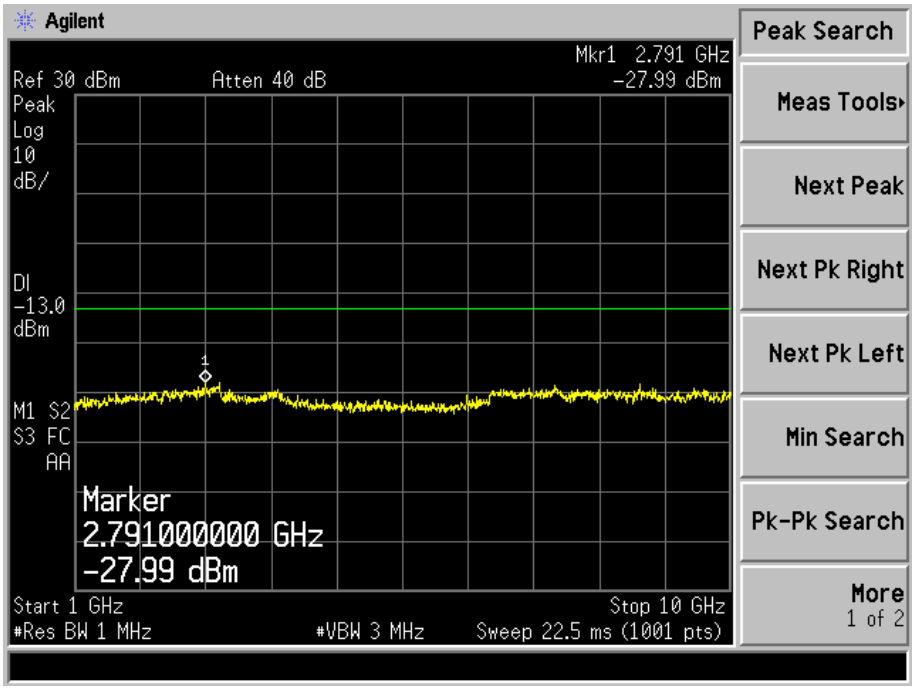
Above 1GHz



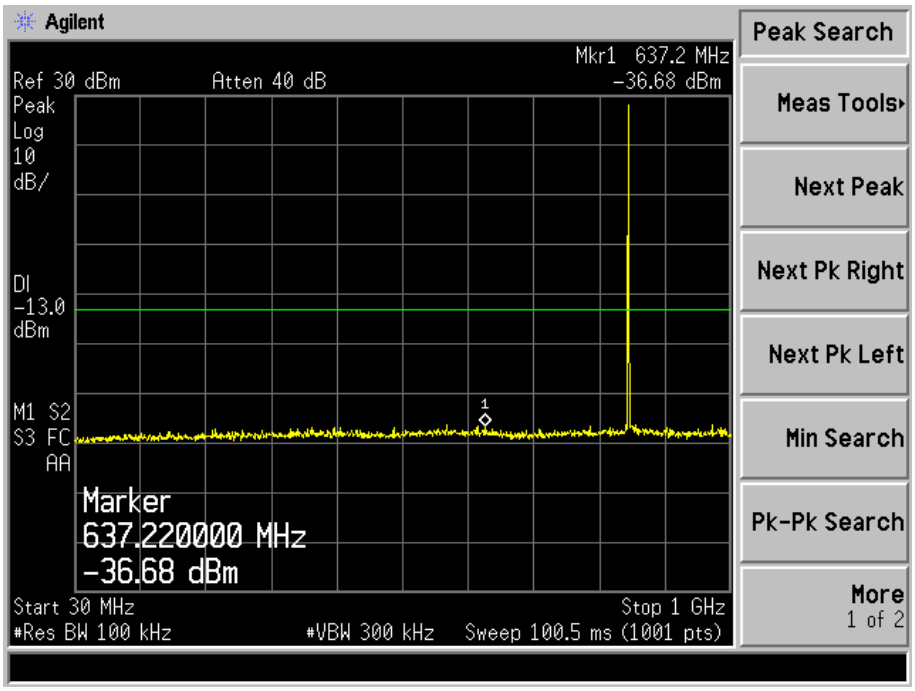
GSM Middle Channel
30MHz to 1GHz



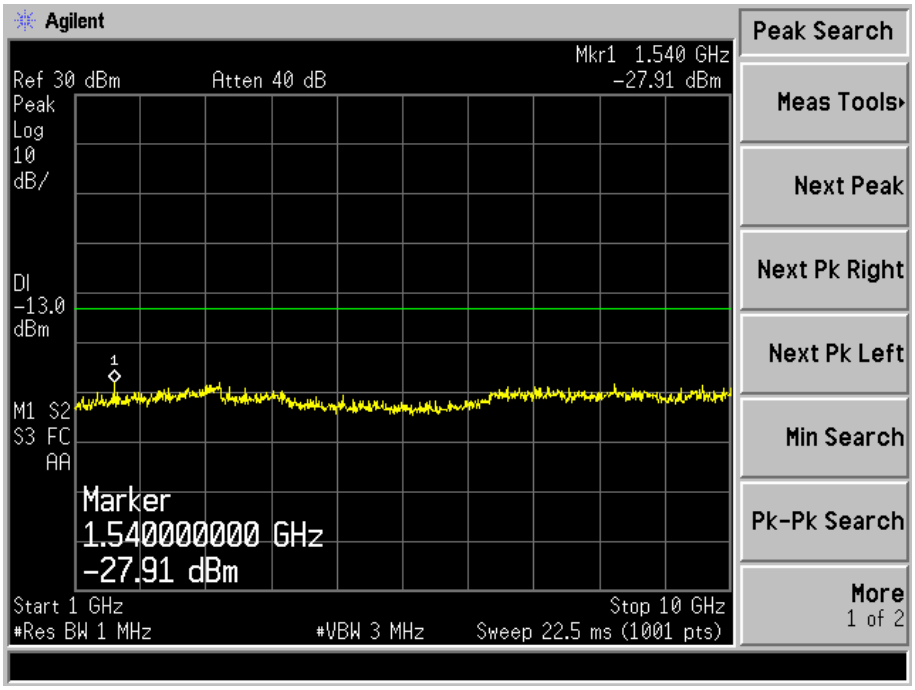
Above 1GHz



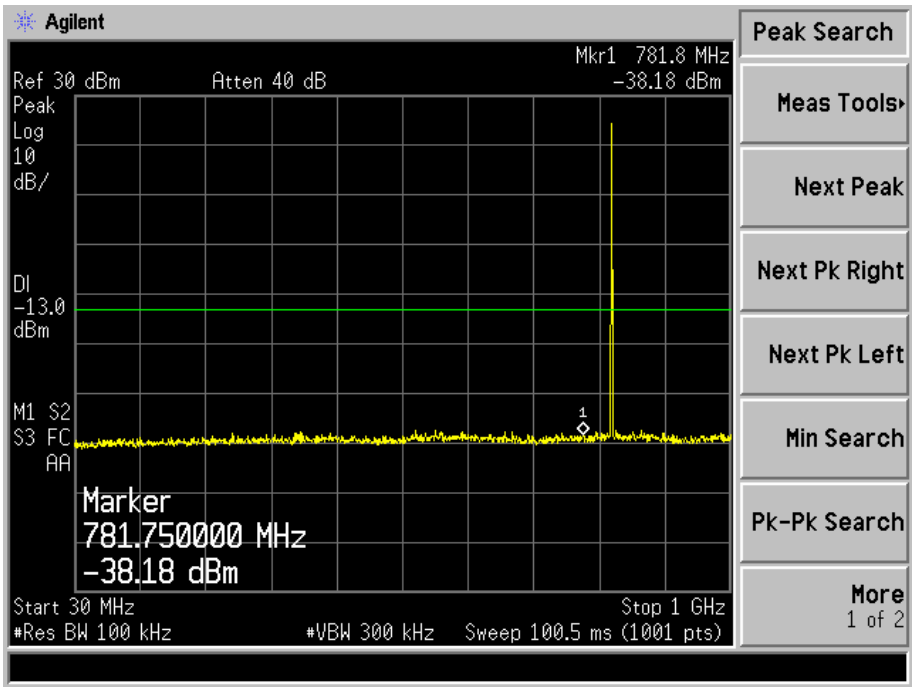
GSM High Channel
30MHz to 1GHz



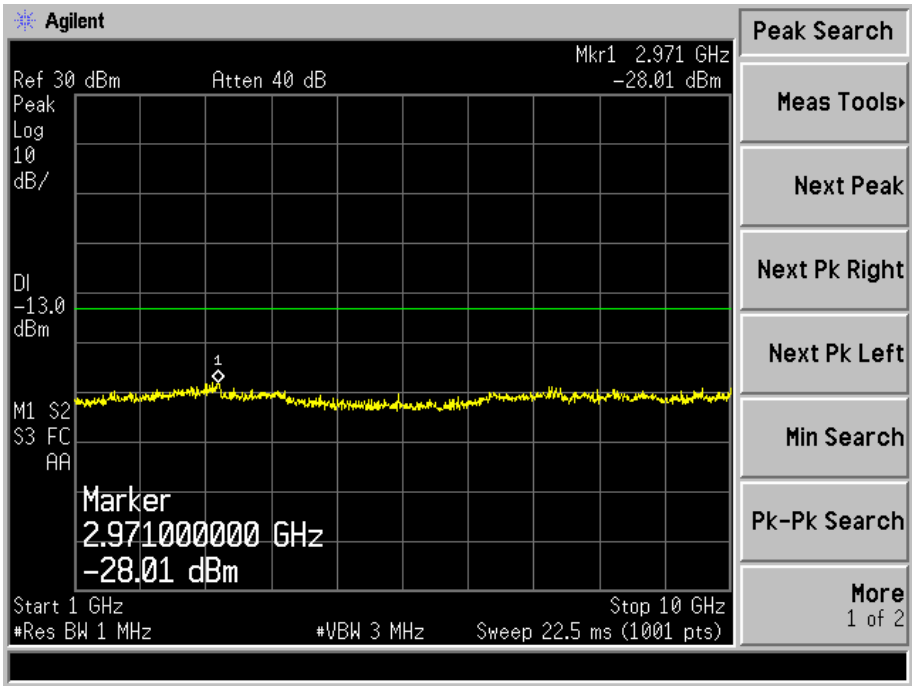
Above 1GHz



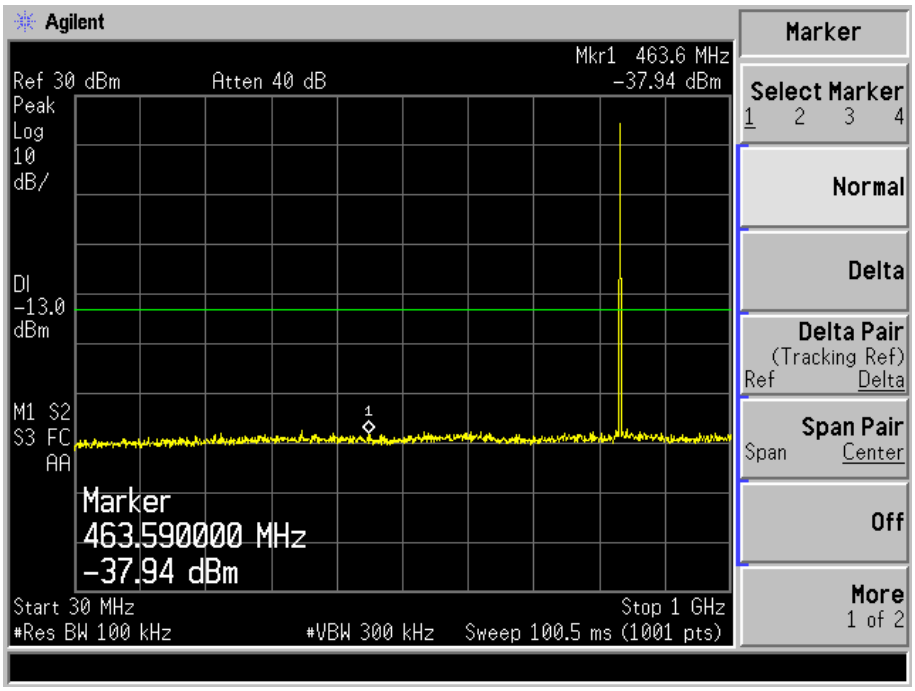
GPRS Low Channel
30MHz to 1GHz



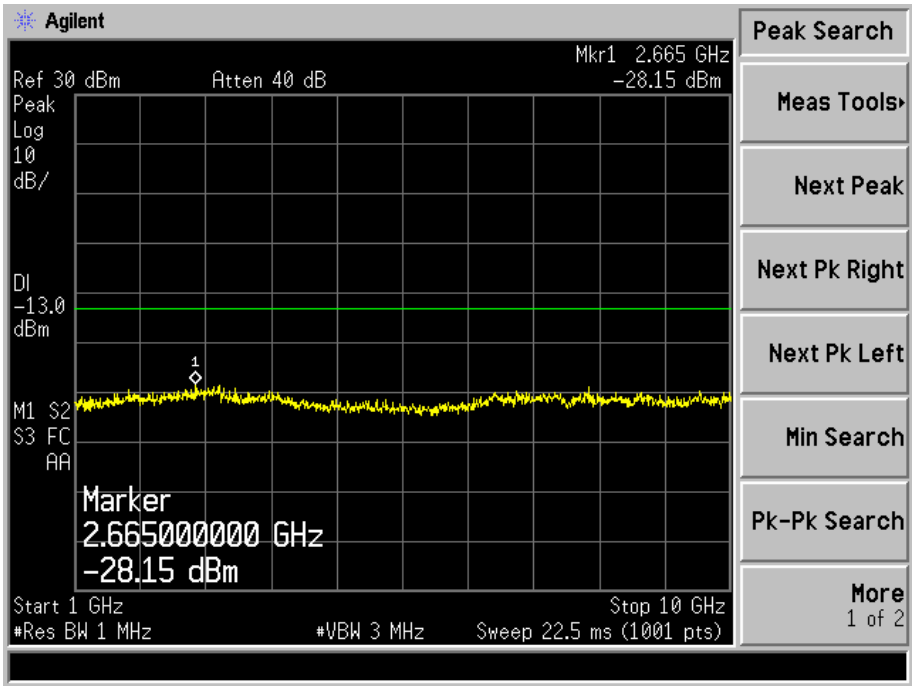
Above 1GHz



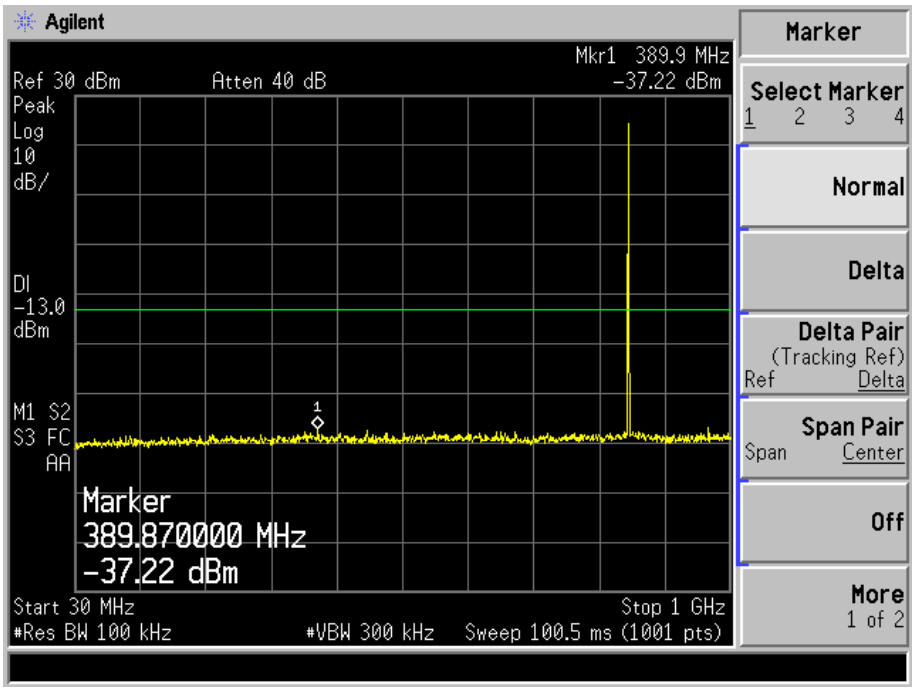
GPRS Middle Channel
30MHz to 1GHz



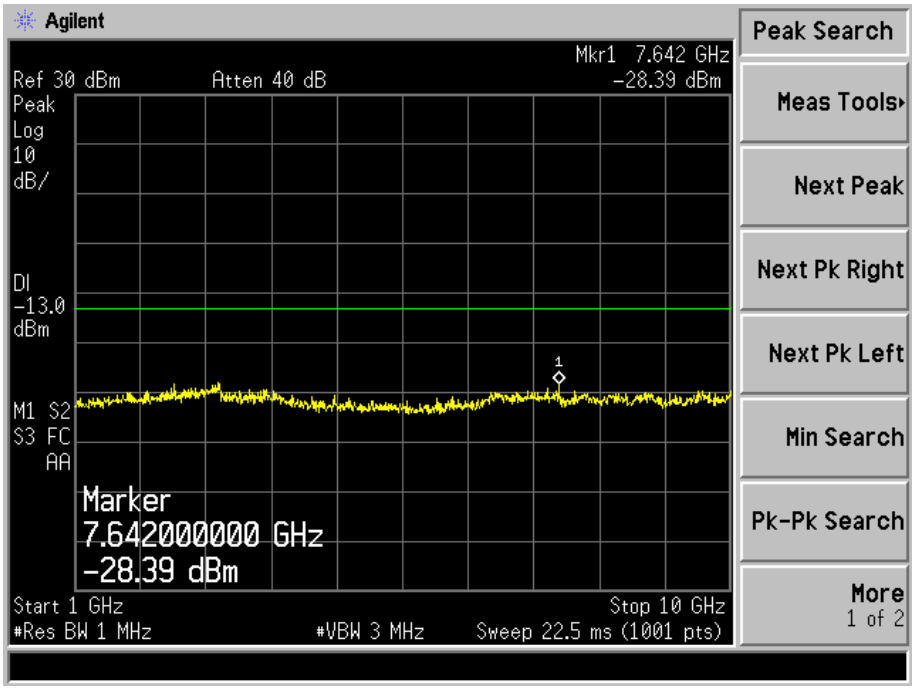
Above 1GHz



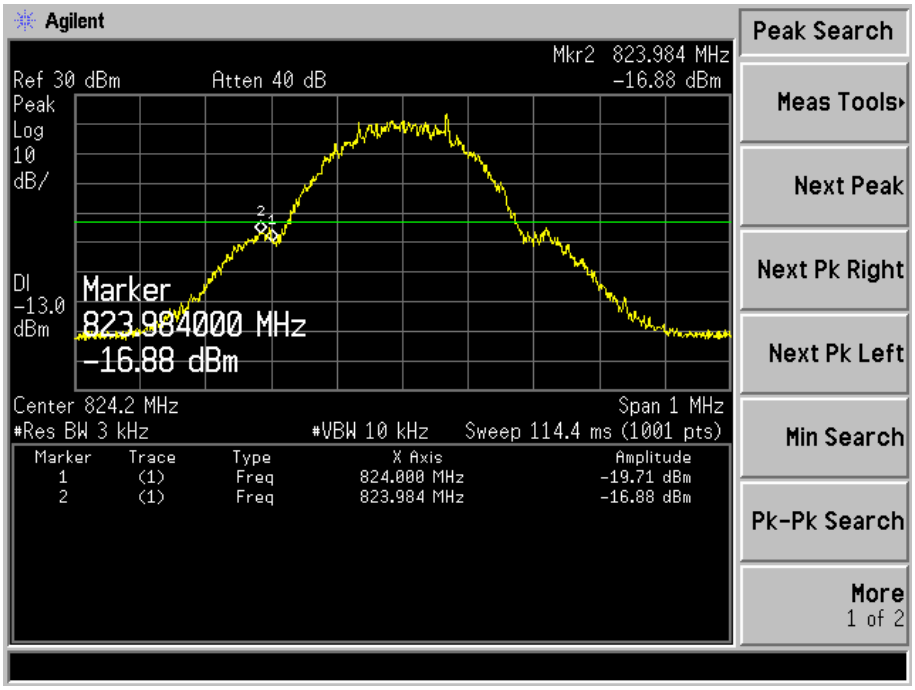
GPRS High Channel
30MHz to 1GHz



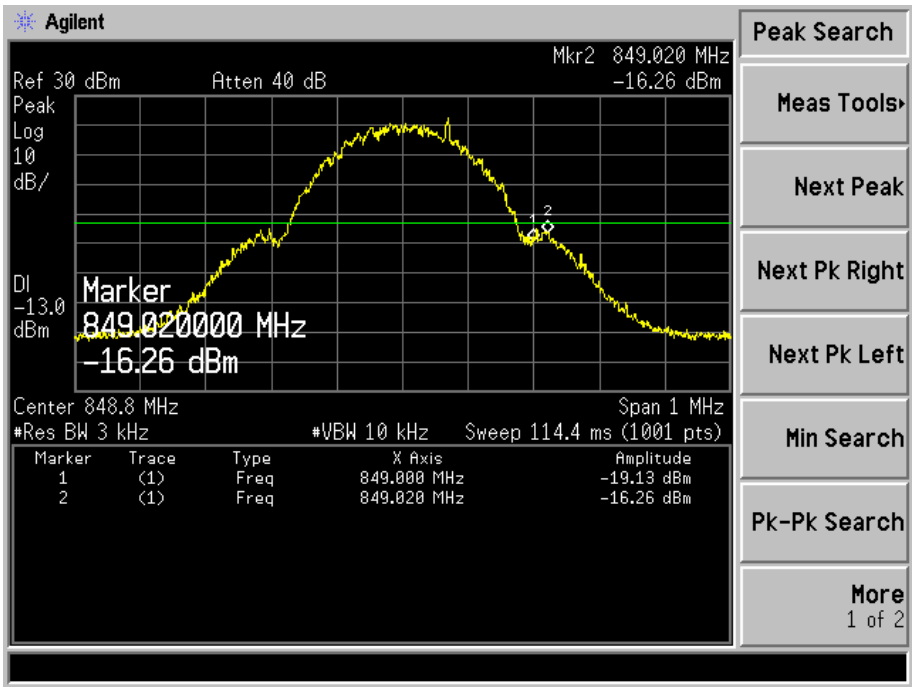
Above 1GHz



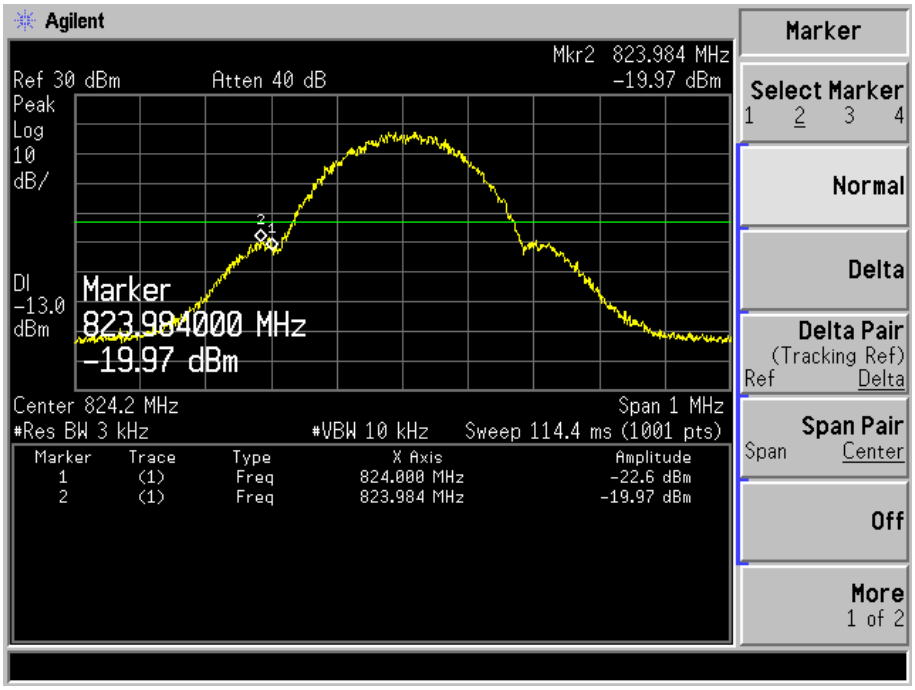
GSM Low Band Emission



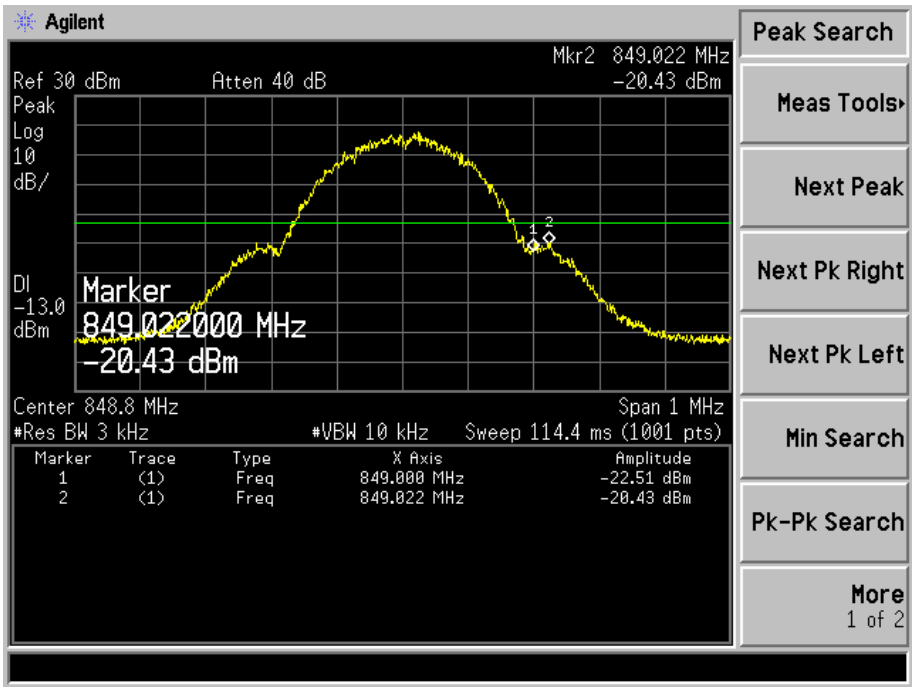
GSM High Band Emission



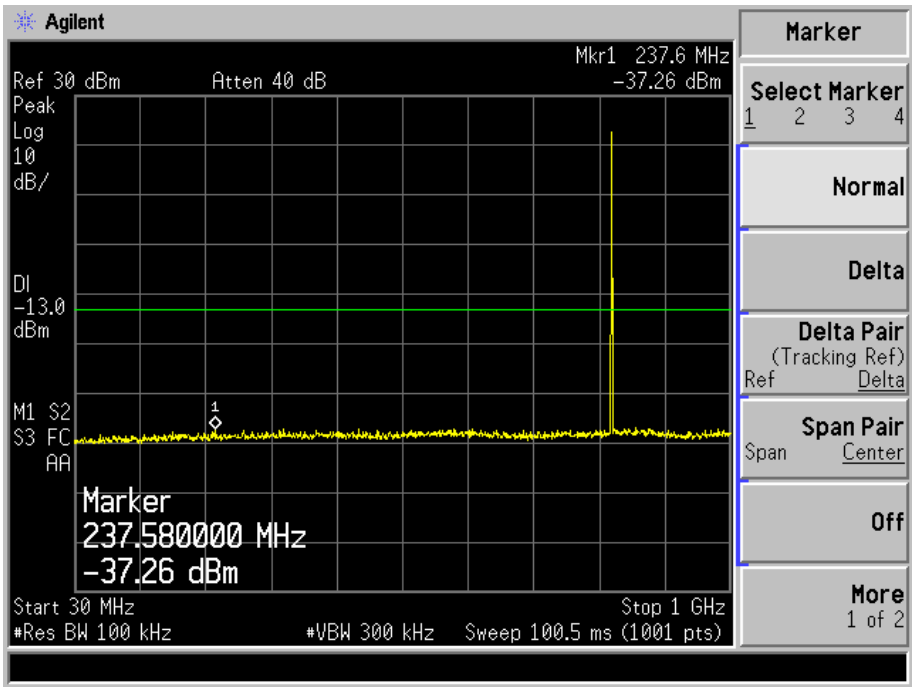
GPRS Low Band Emission



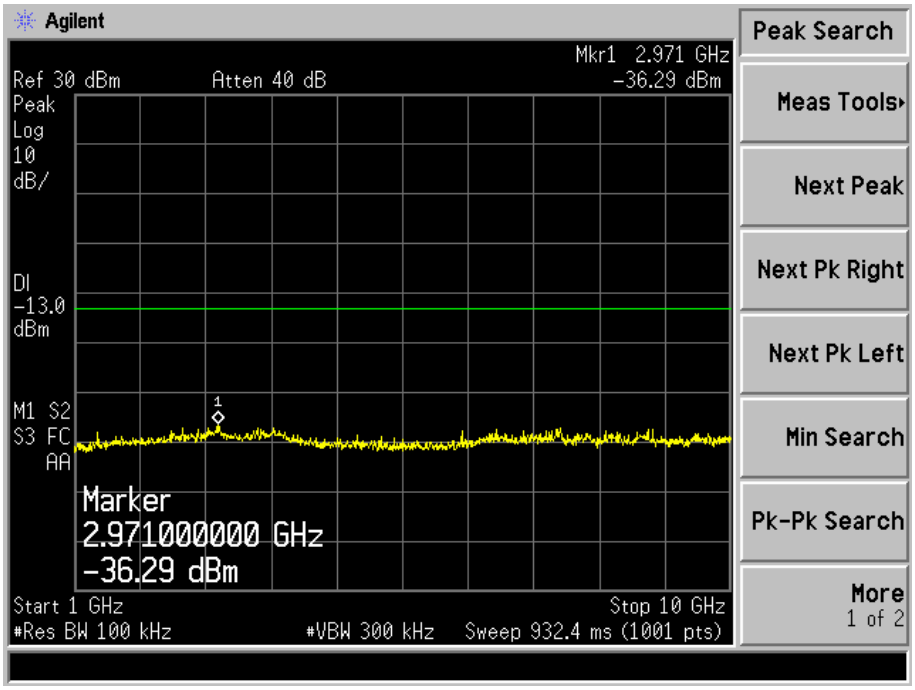
GPRS High Band Emission



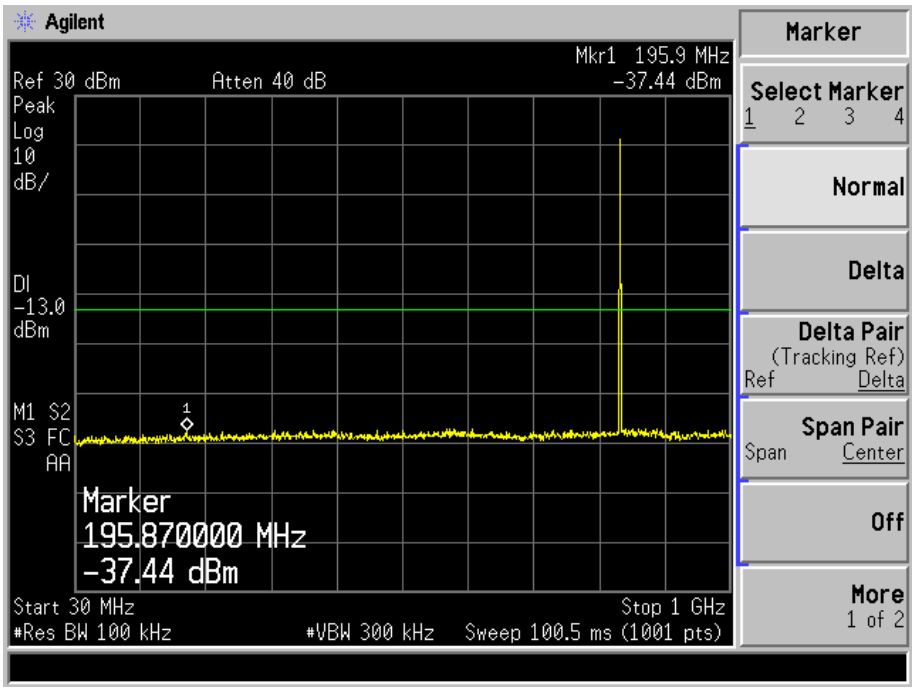
EDGE Low Channel
30MHz to 1GHz



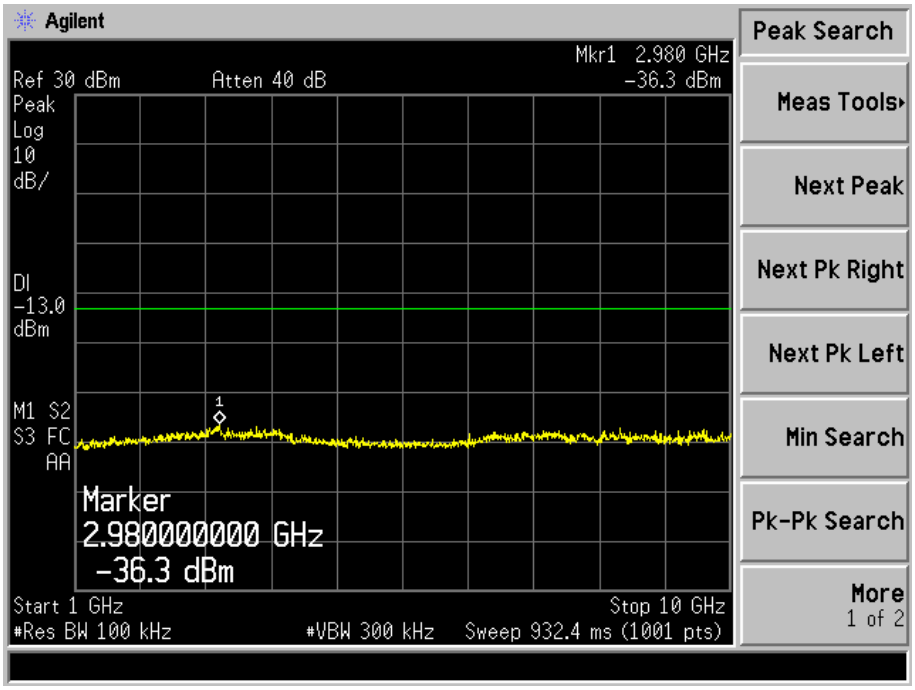
Above 1GHz



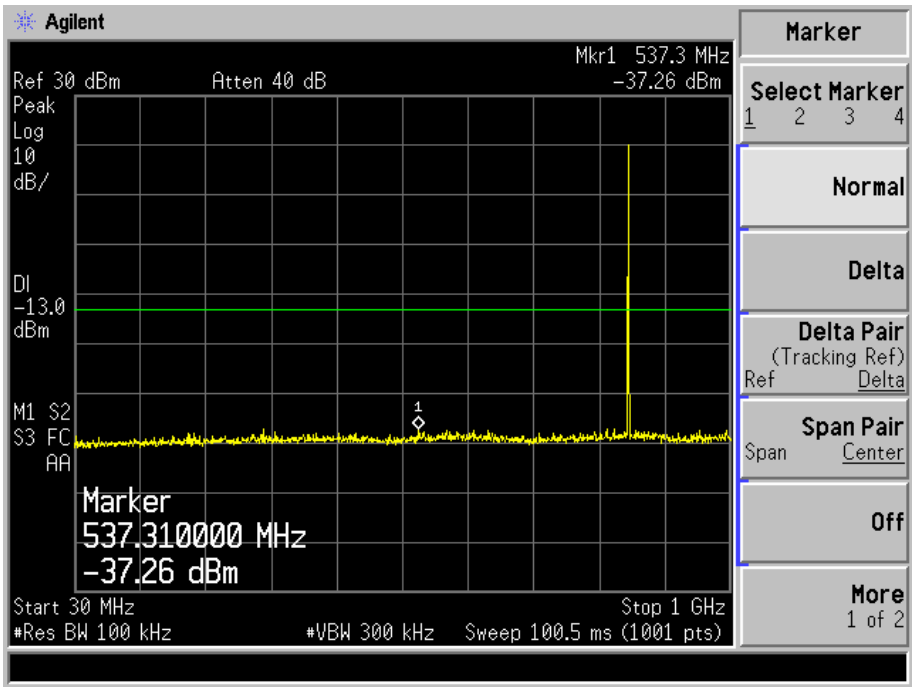
EDGE Middle Channel
30MHz to 1GHz



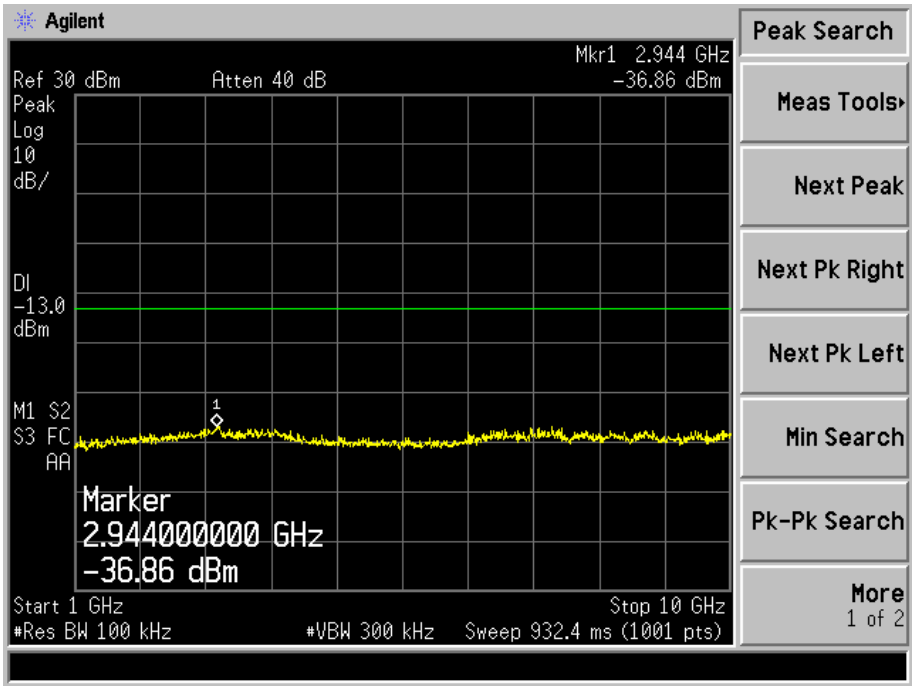
Above 1GHz



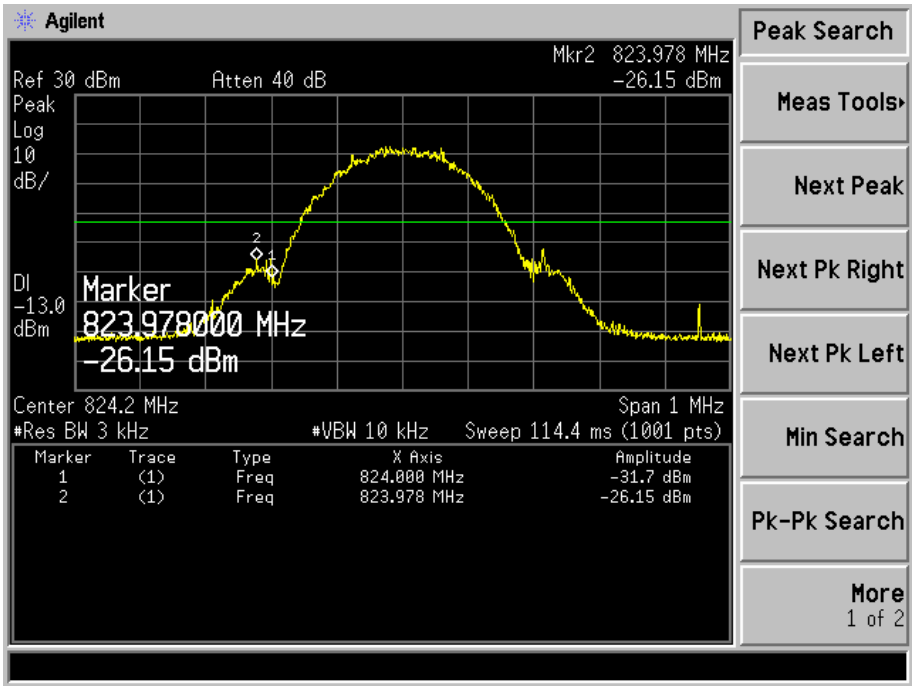
EDGE High Channel
30MHz to 1GHz



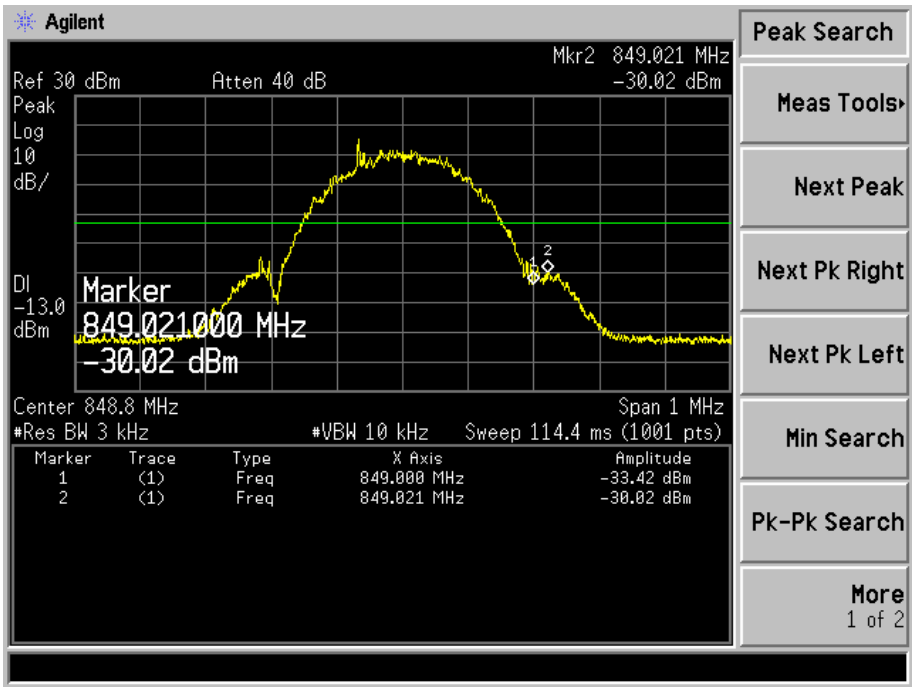
Above 1GHz



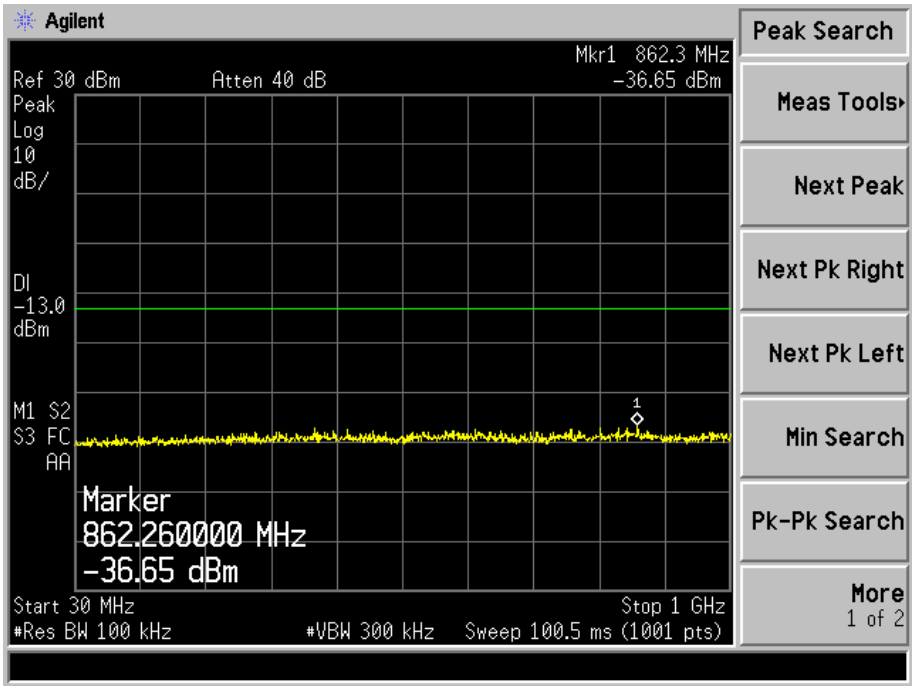
EDGE Low Band Emission



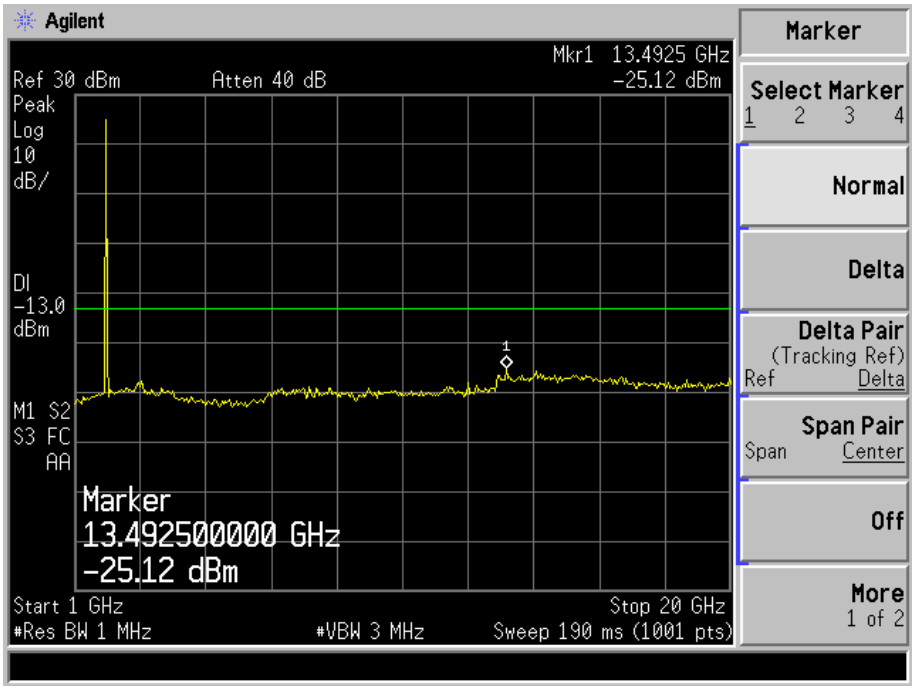
EDGE High Band Emission



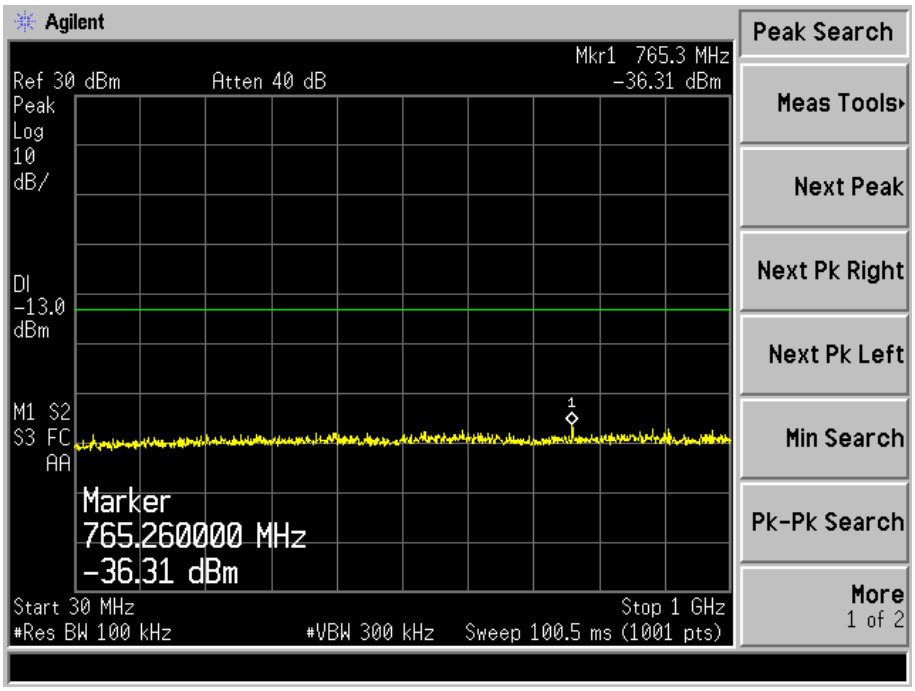
For PCS Band
GSM Low Channel
30MHz to 1GHz



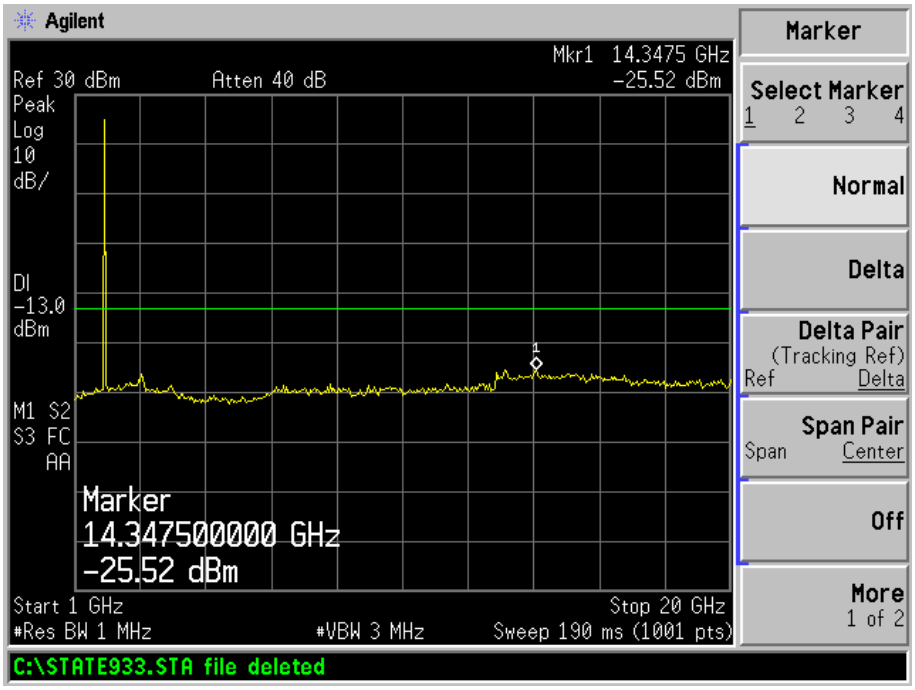
Above 1GHz



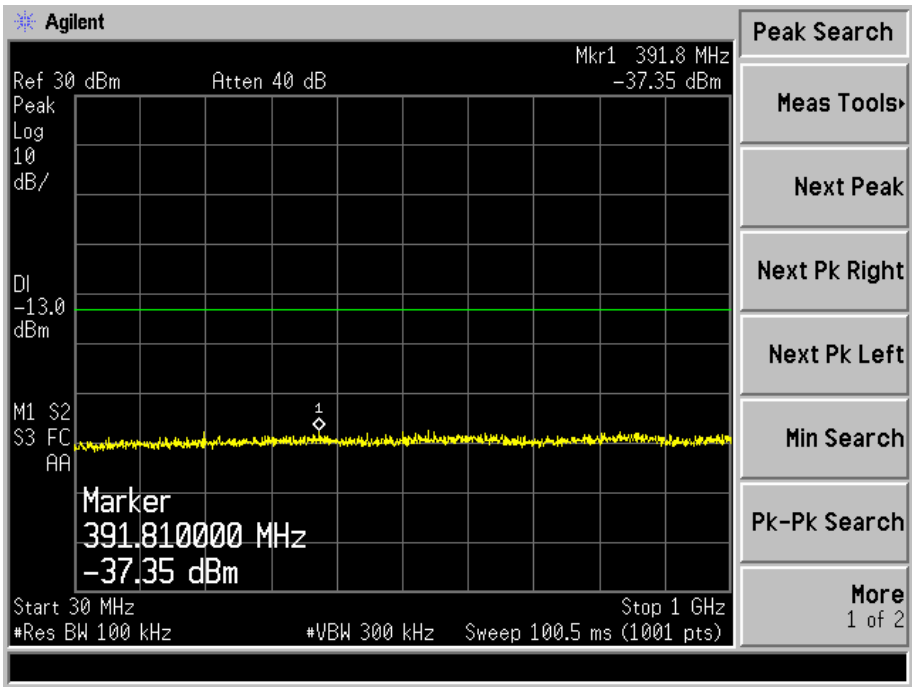
GSM Middle Channel
30MHz to 1GHz



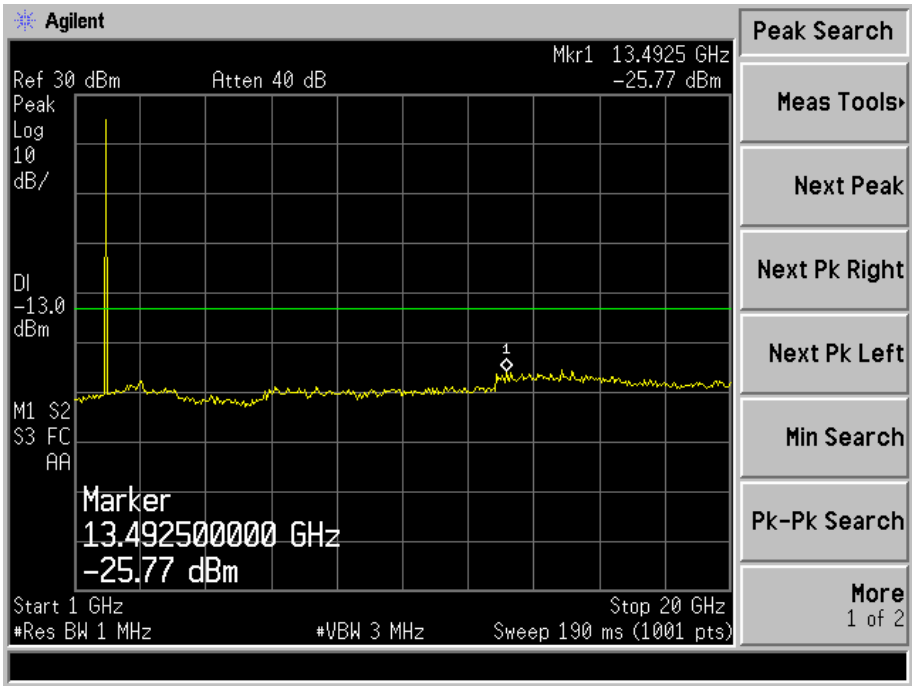
Above 1GHz



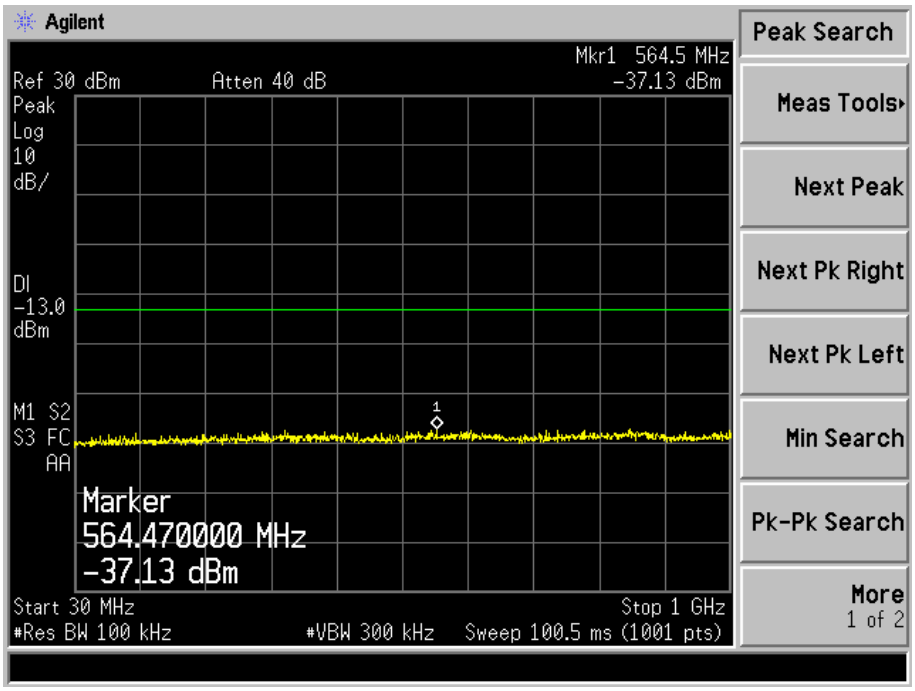
GSM High Channel
30MHz to 1GHz



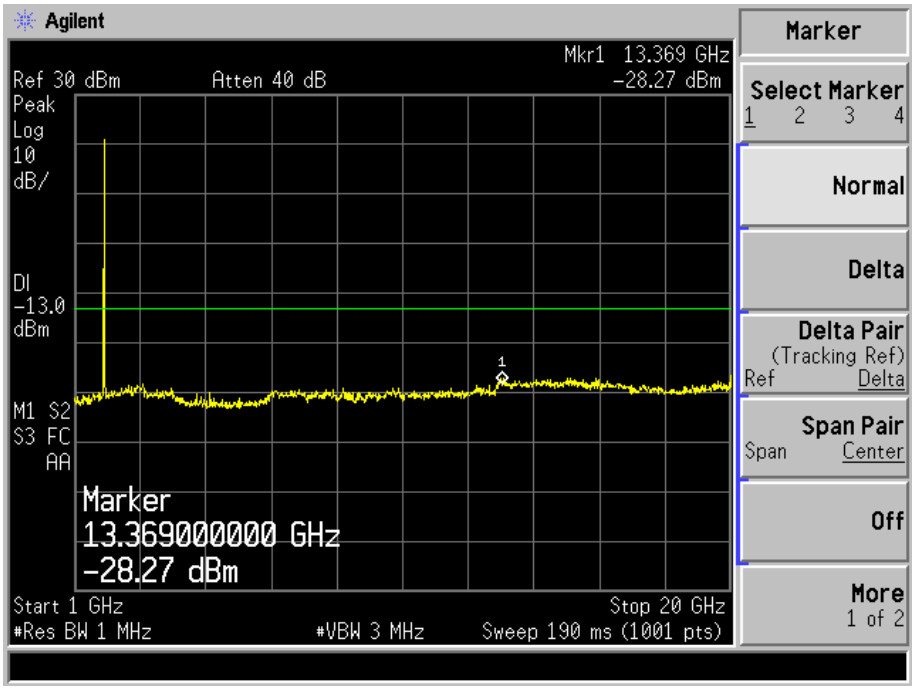
Above 1GHz



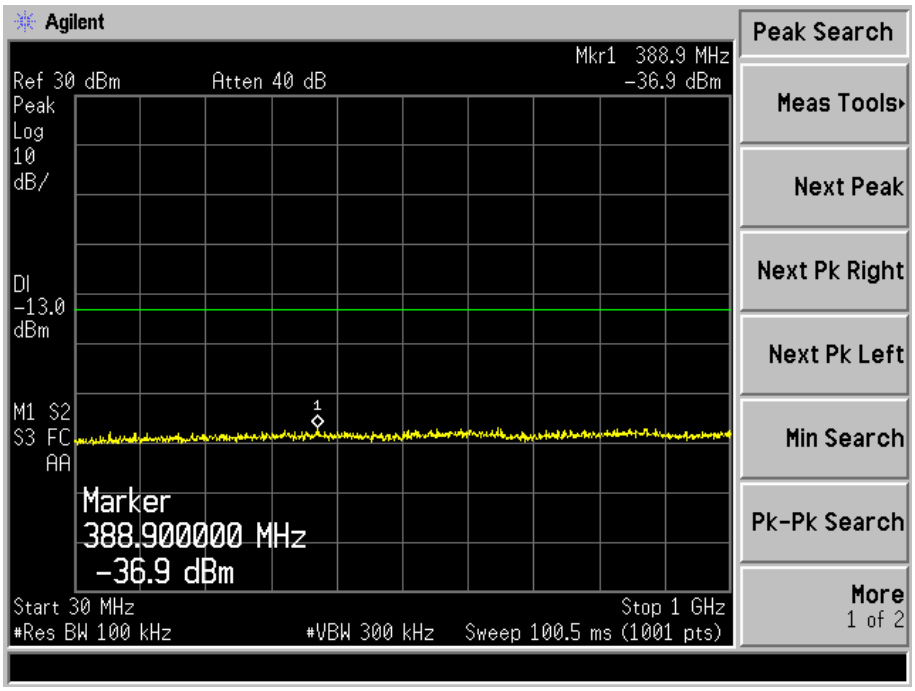
GPRS Low Channel
30MHz to 1GHz



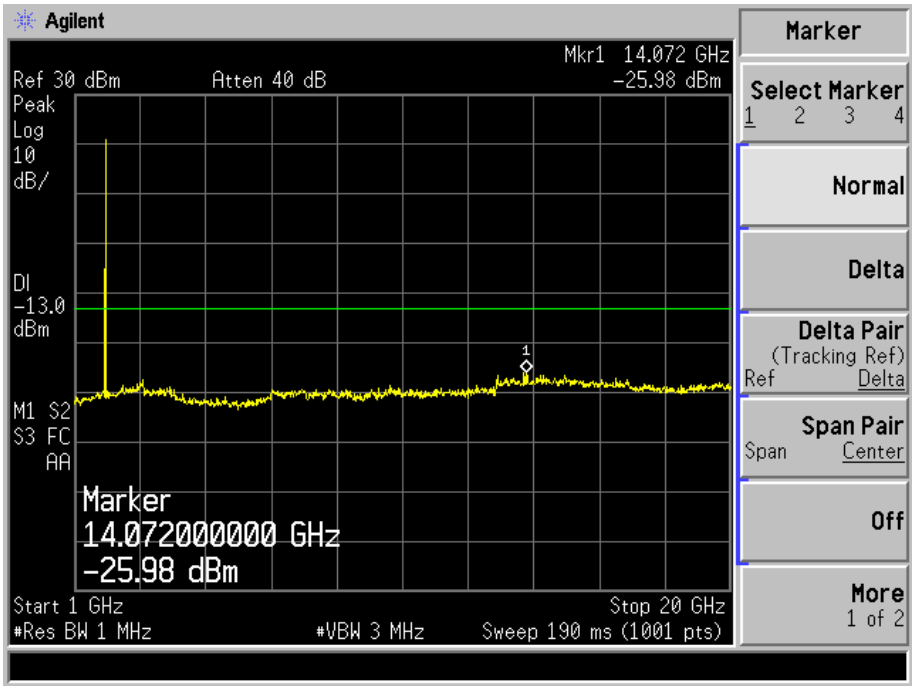
Above 1GHz



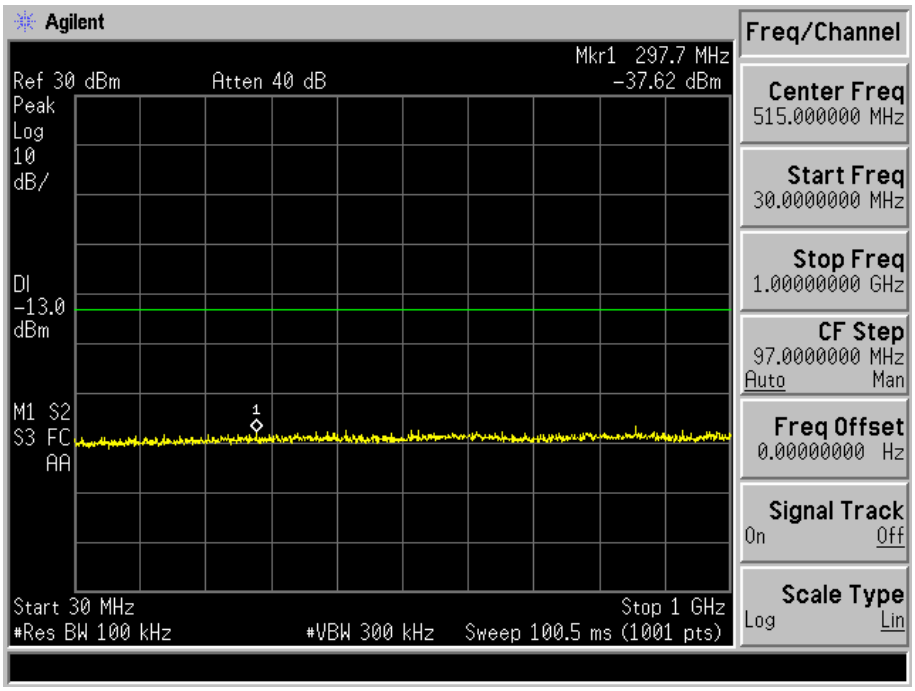
GPRS Middle Channel
30MHz to 1GHz



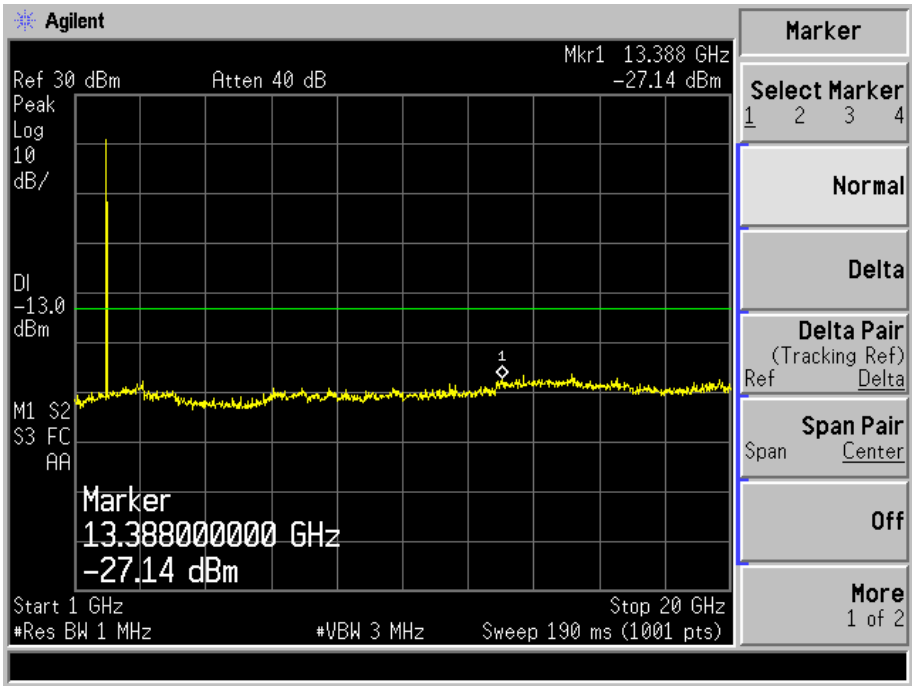
Above 1GHz



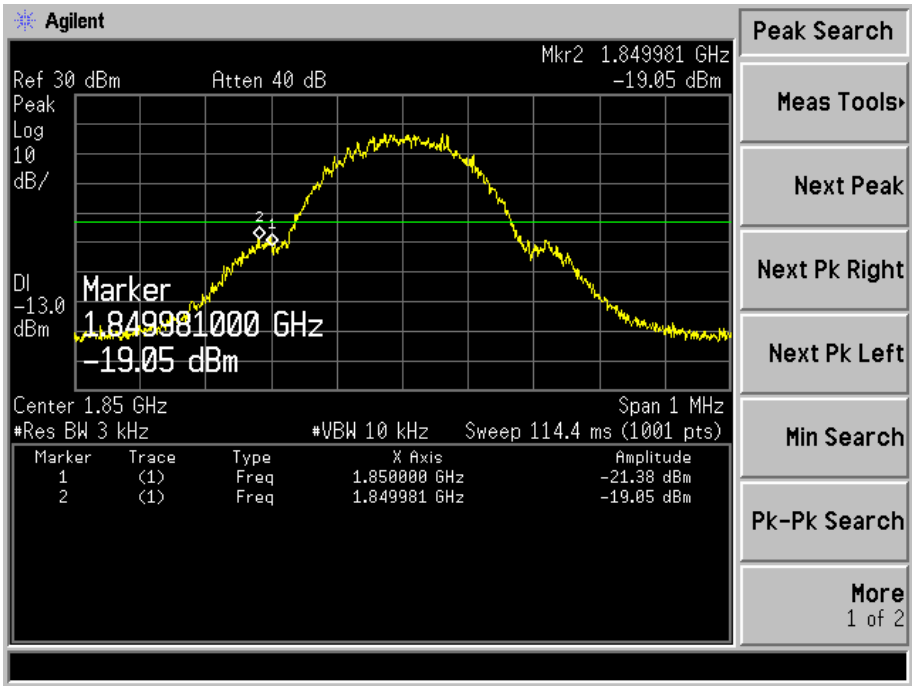
GPRS High Channel
30MHz to 1GHz



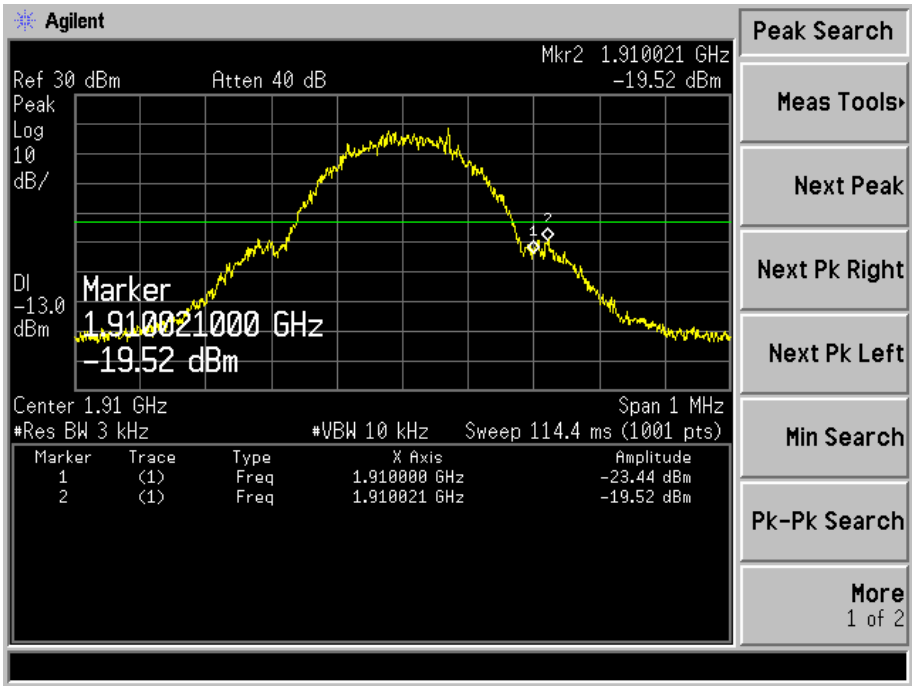
Above 1GHz



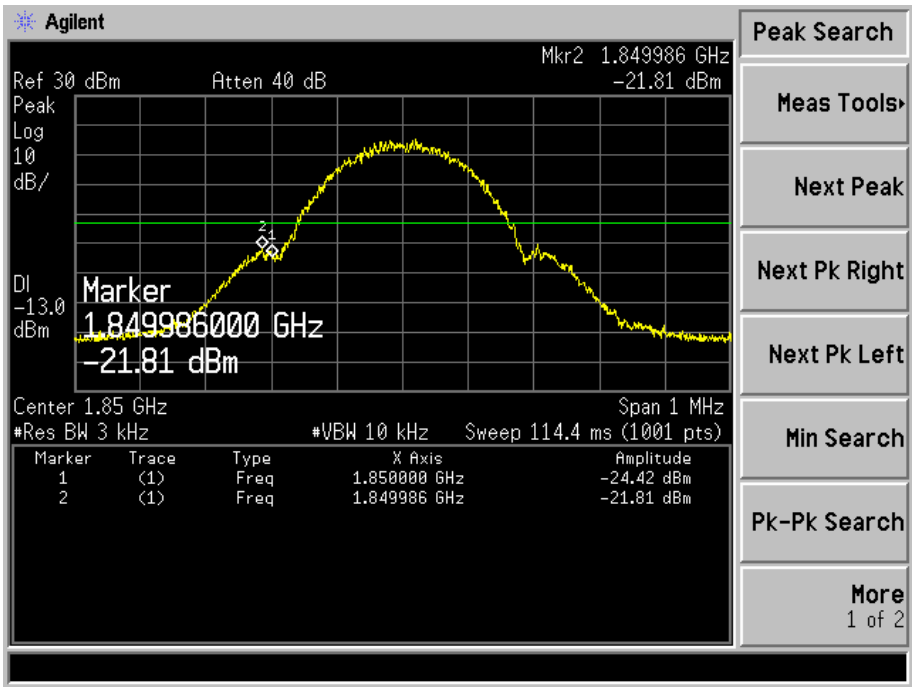
GSM Low Band Emission



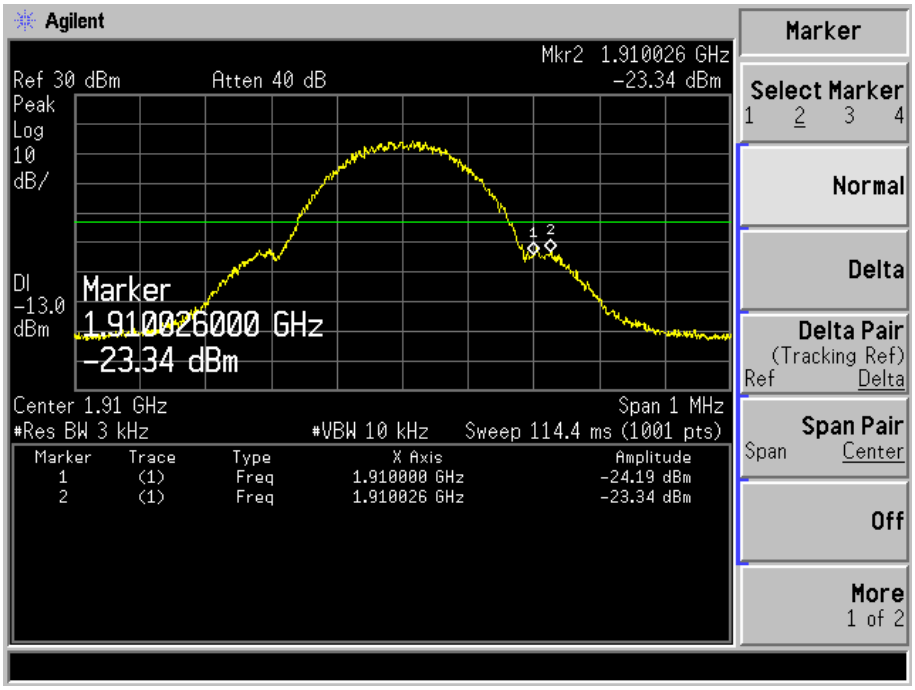
GSM High Band Emission



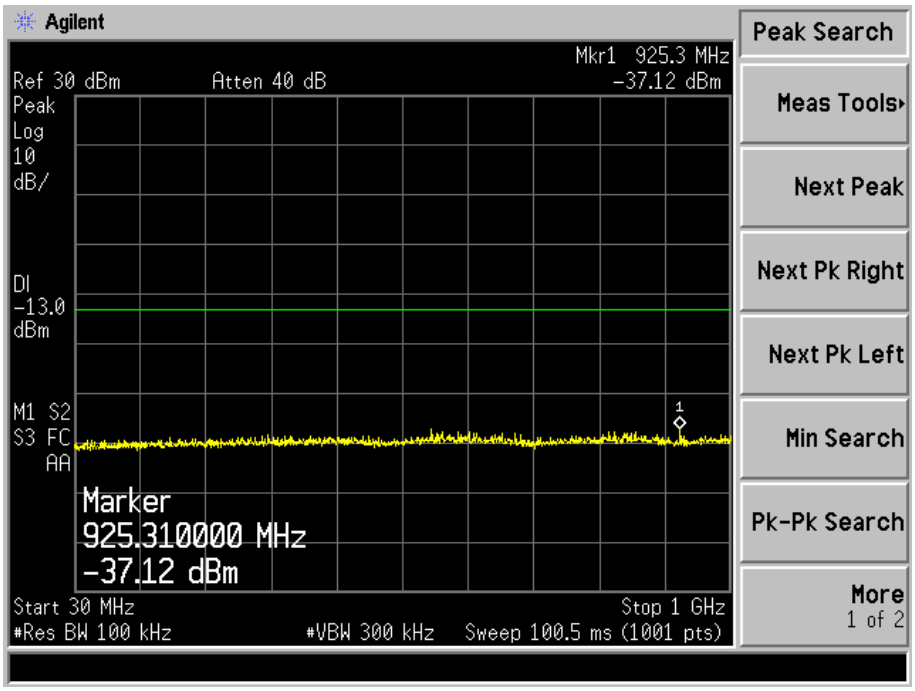
GPRS Low Band Emission



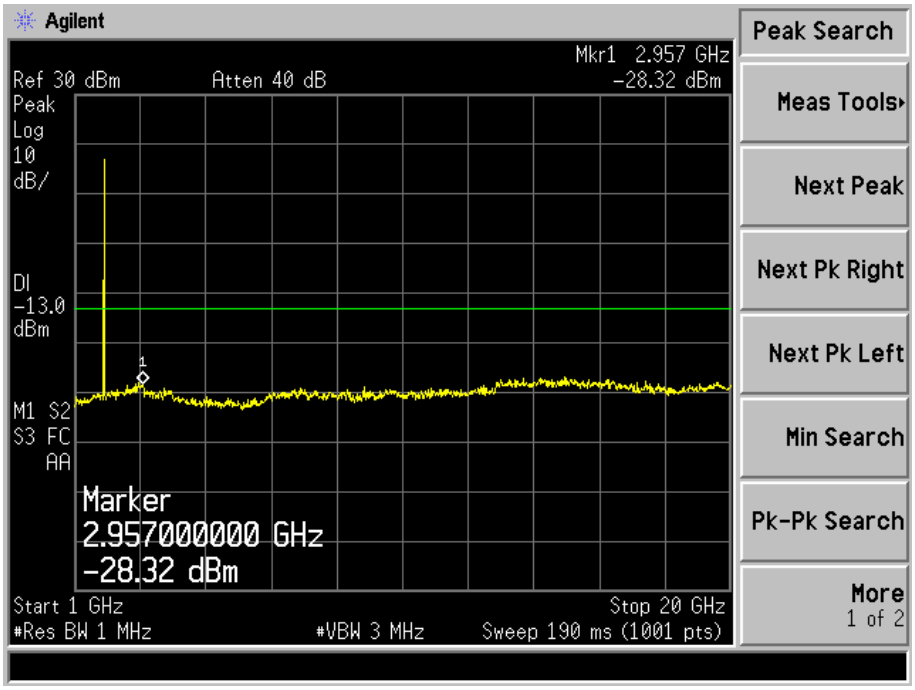
GPRS High Band Emission



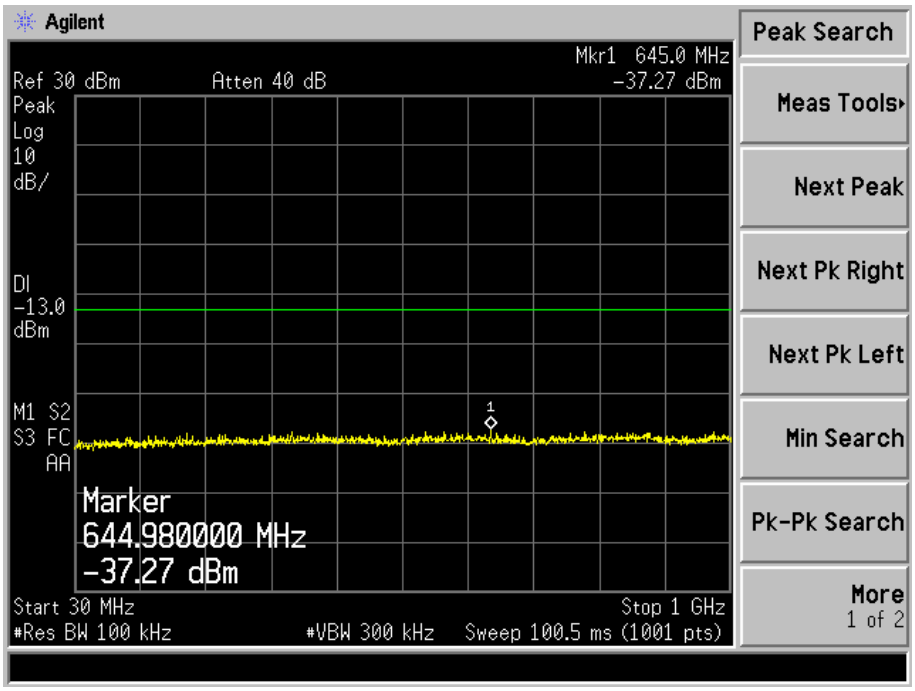
EDGE Low Channel
30MHz to 1GHz



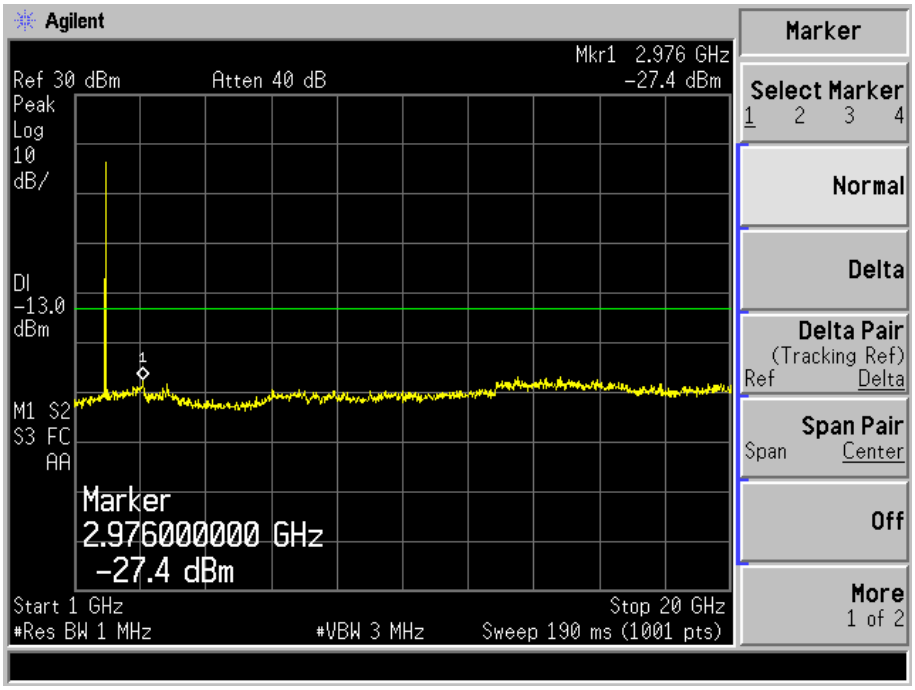
Above 1GHz



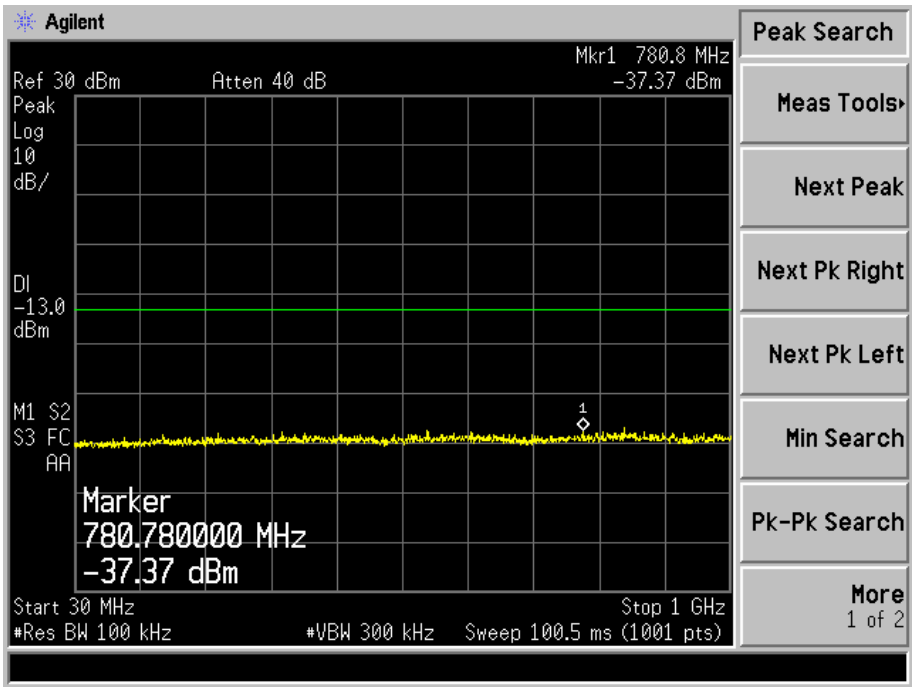
EDGE Middle Channel
30MHz to 1GHz



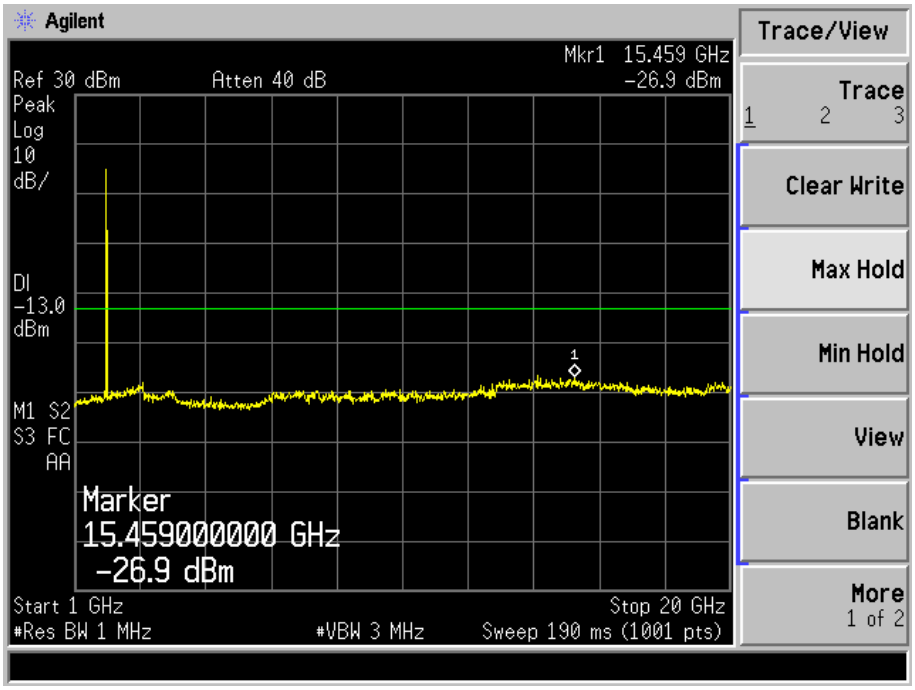
Above 1GHz



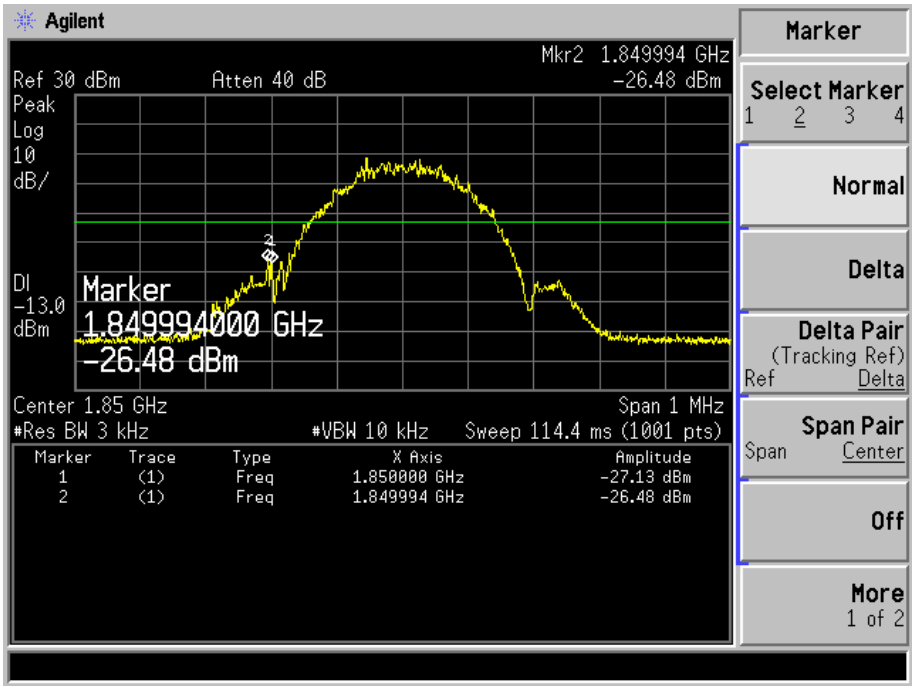
EDGE High Channel
30MHz to 1GHz



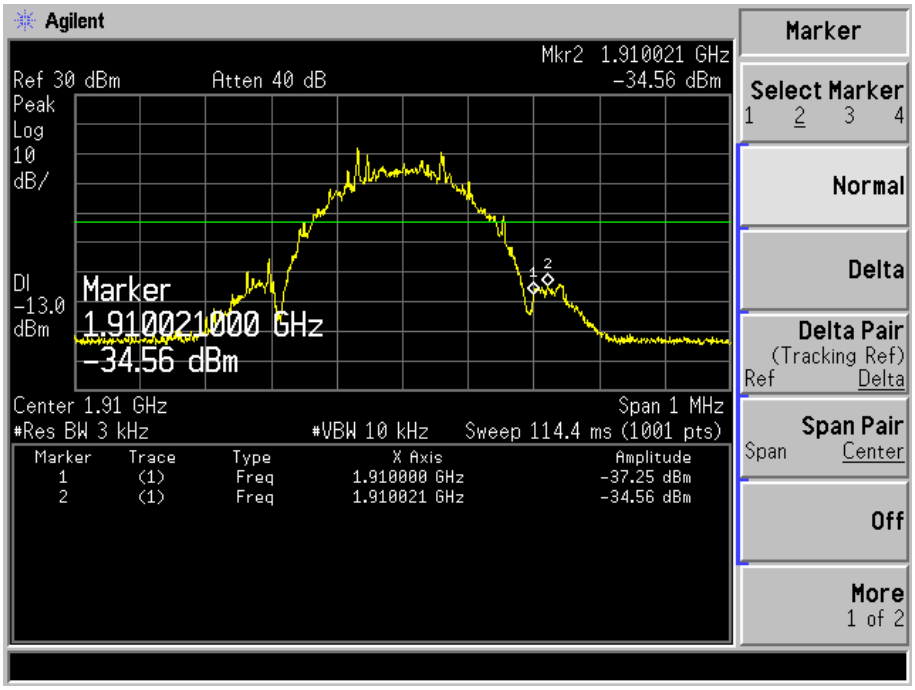
Above 1GHz



EDGE Low Band Emission



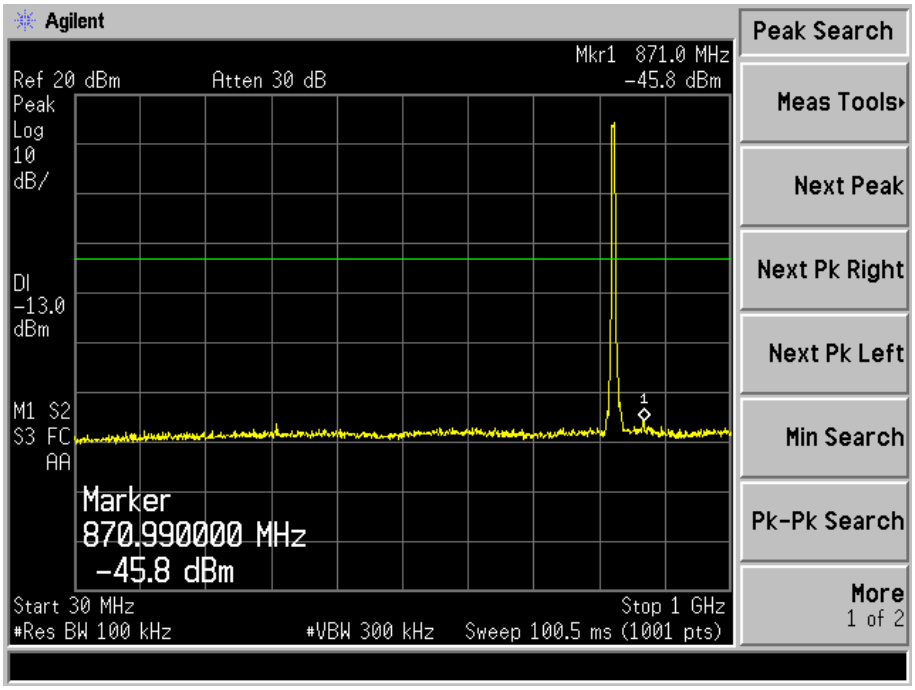
EDGE High Band Emission



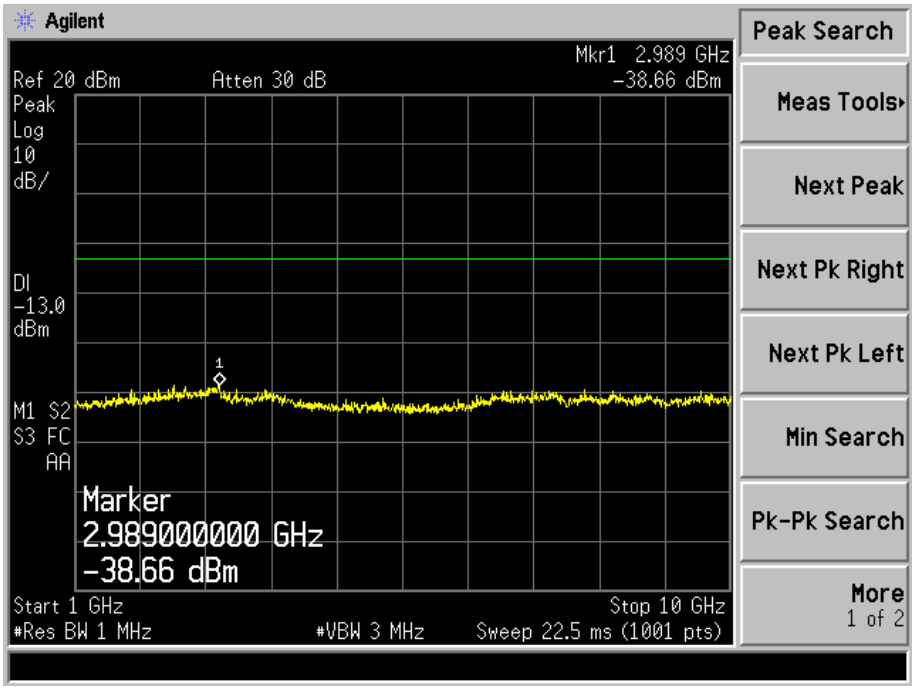
For Band V

WCDMA Low Channel

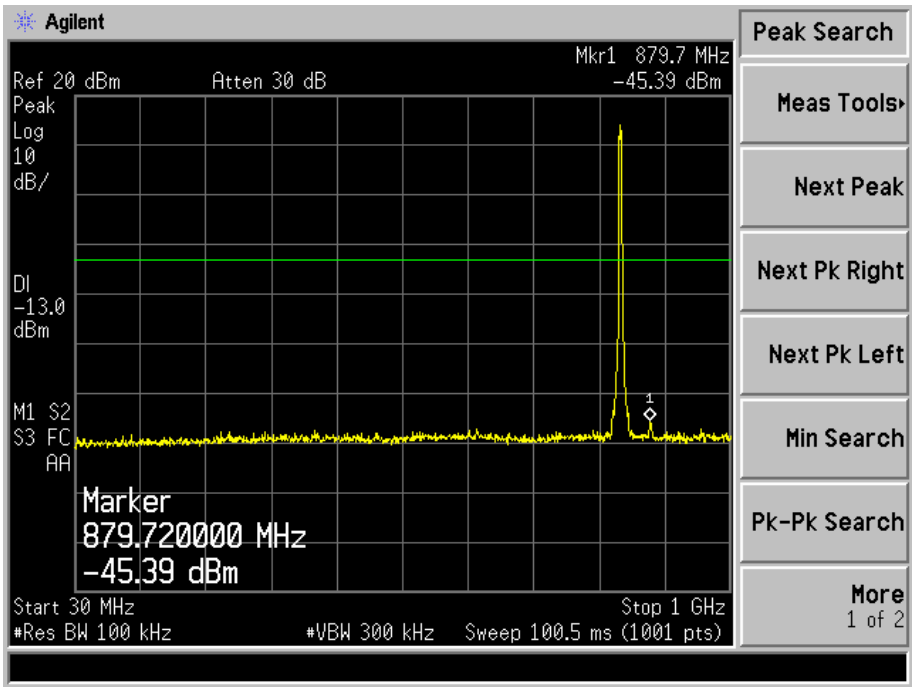
30MHz to 1GHz



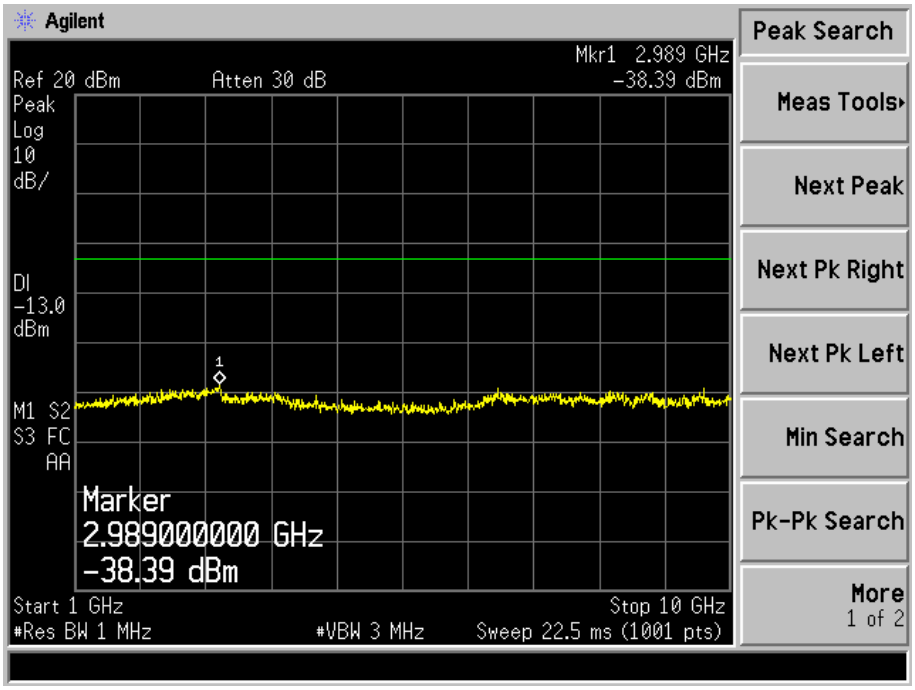
Above 1GHz



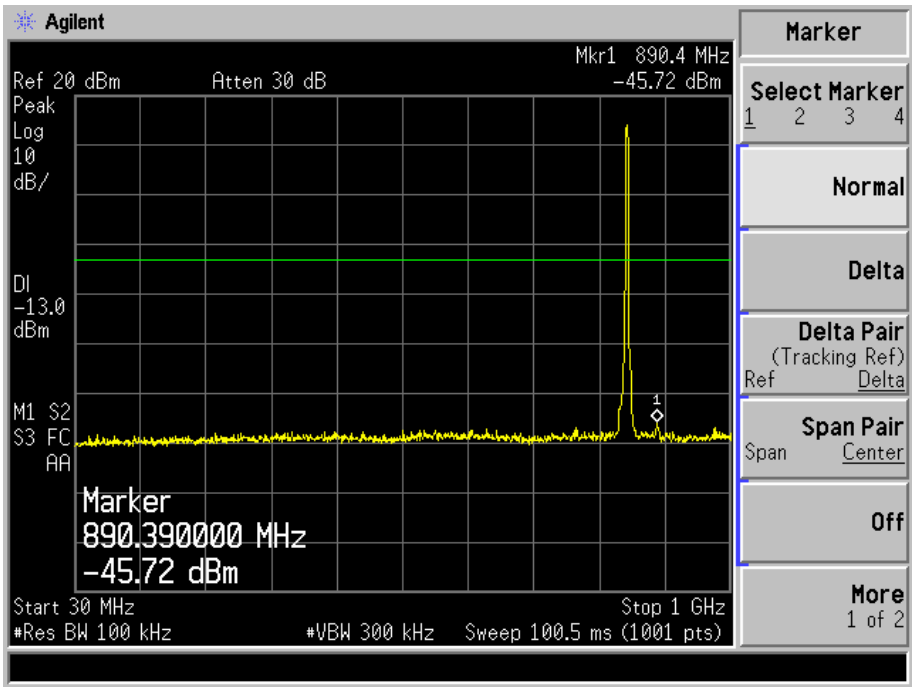
WCDMA Middle Channel
30MHz to 1GHz



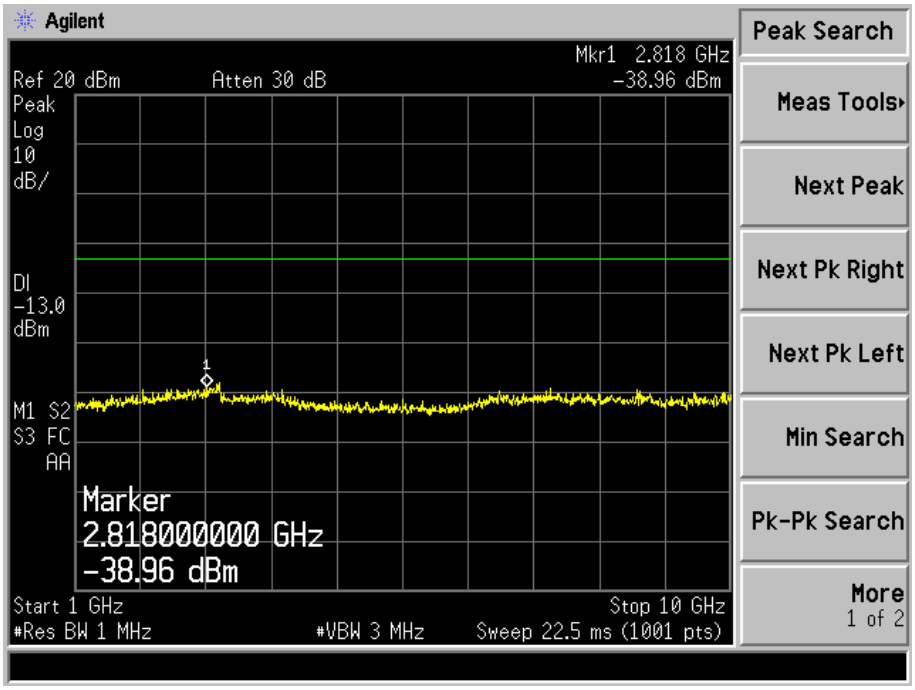
Above 1GHz



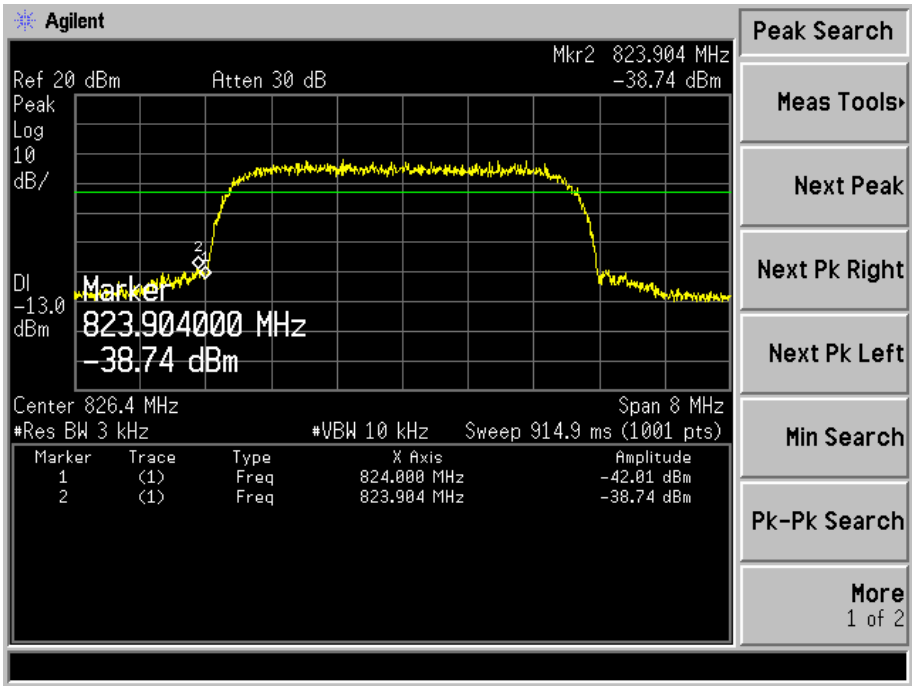
WCDMA High Channel
30MHz to 1GHz



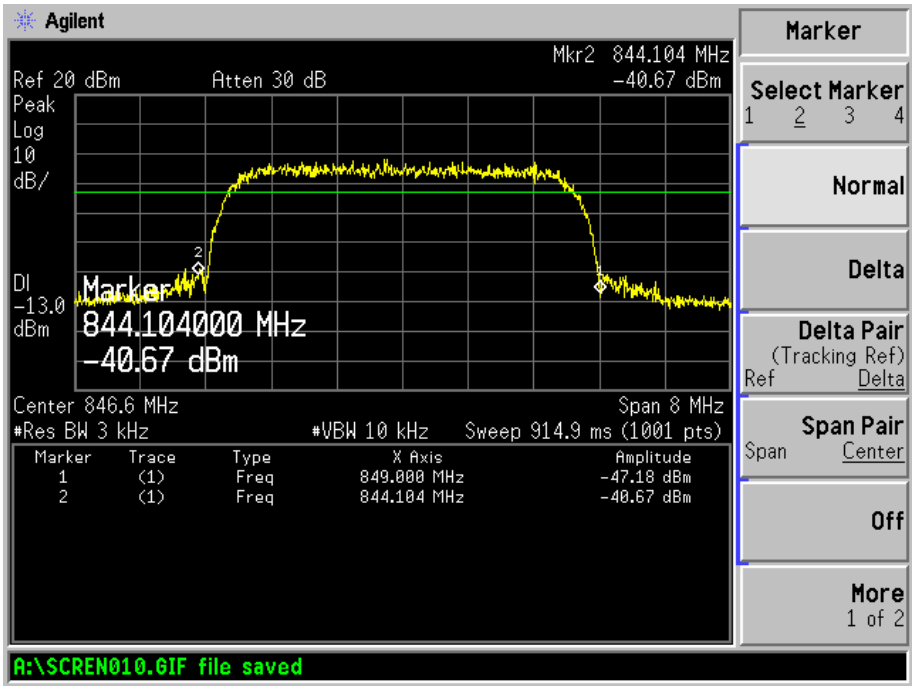
Above 1GHz



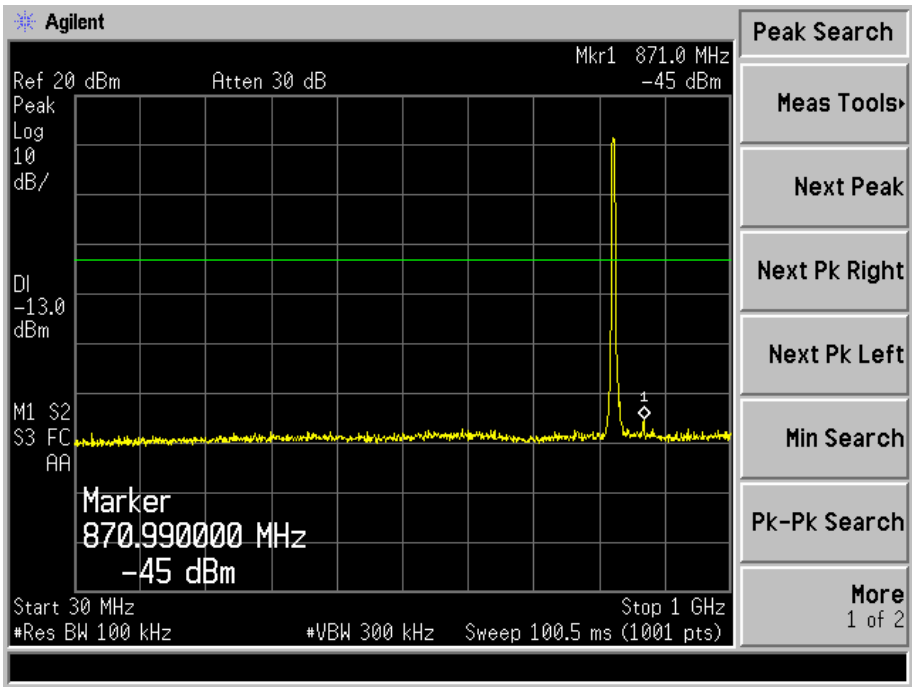
WCDMA Low Band Spurious Emission



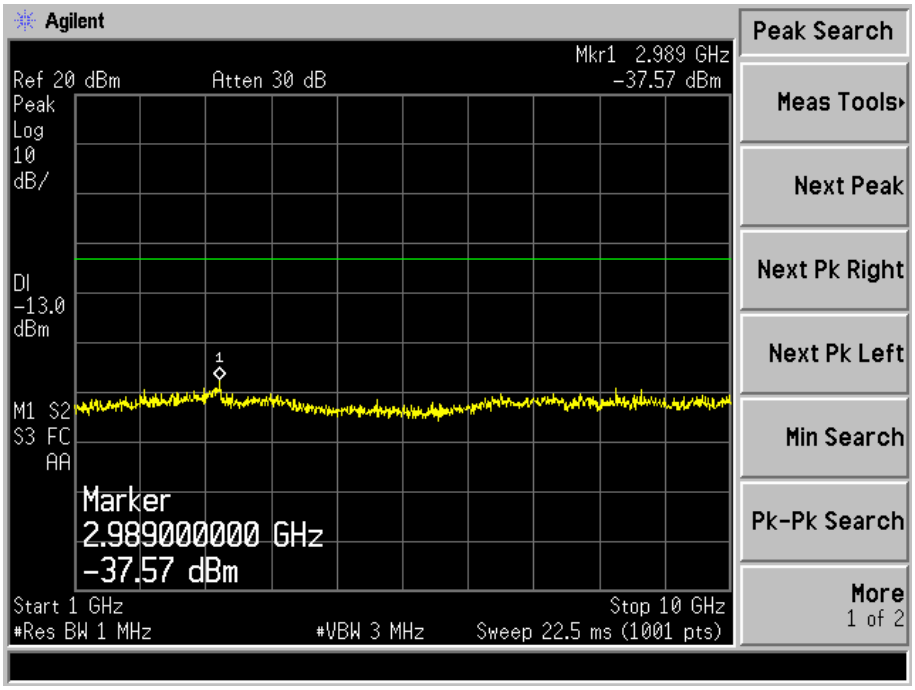
WCDMA High Band Spurious Emission



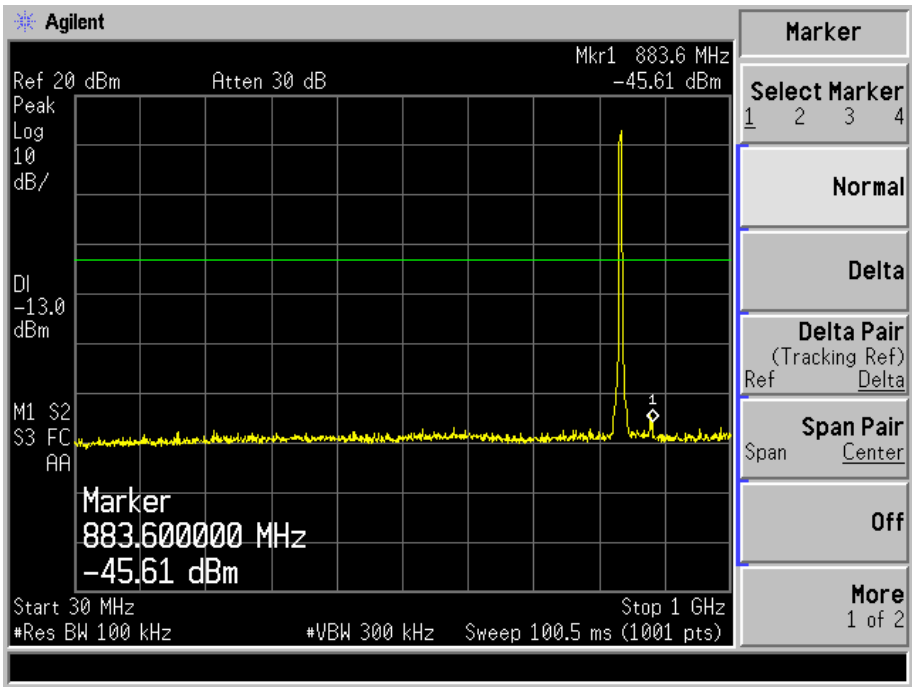
HSDPA Low Channel
30MHz to 1GHz



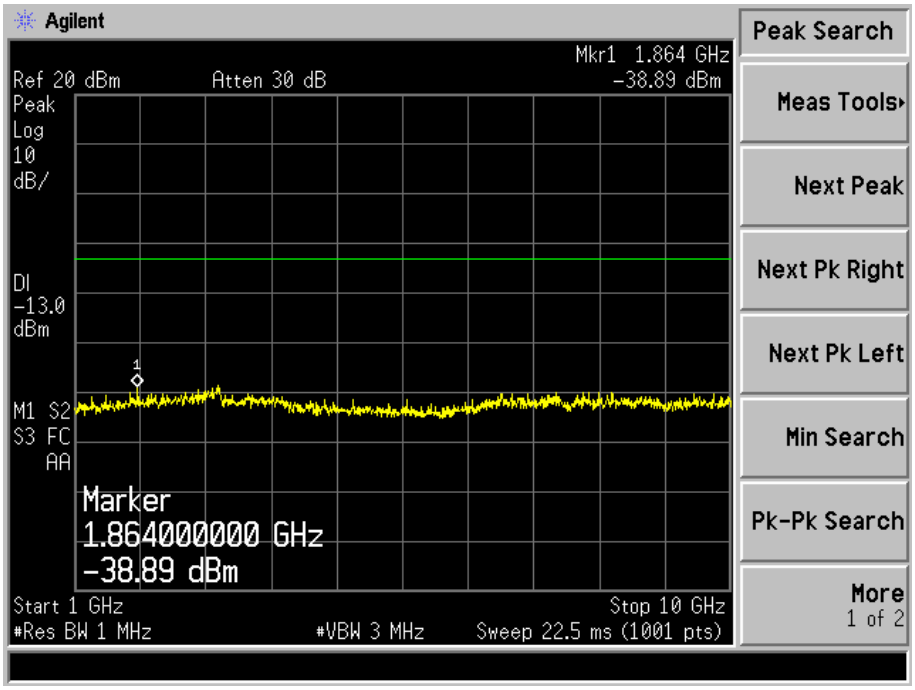
Above 1GHz



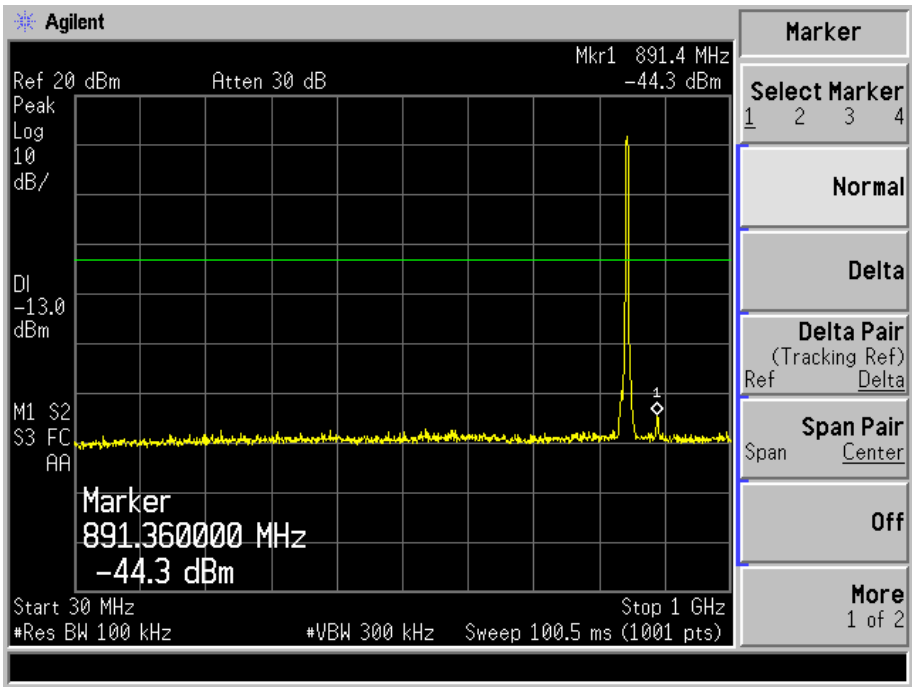
HSDPA Middle Channel
30MHz to 1GHz



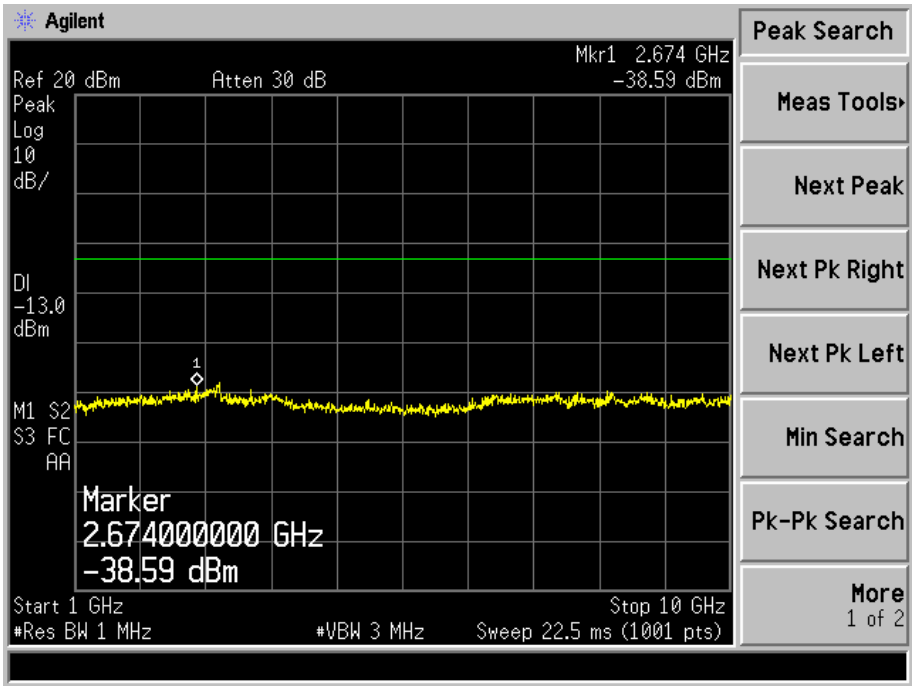
Above 1GHz



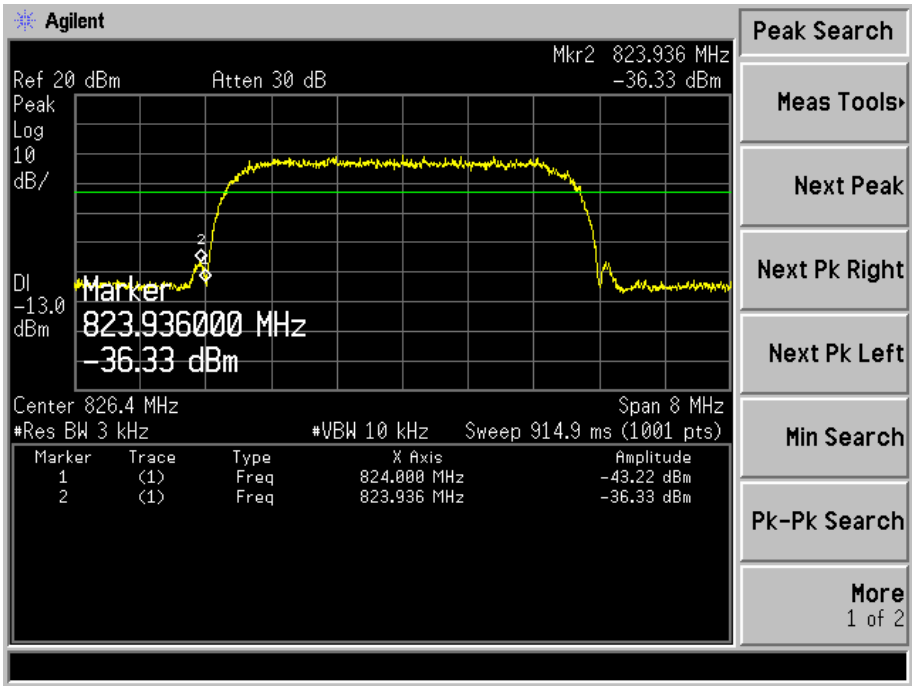
HSDPA High Channel
30MHz to 1GHz



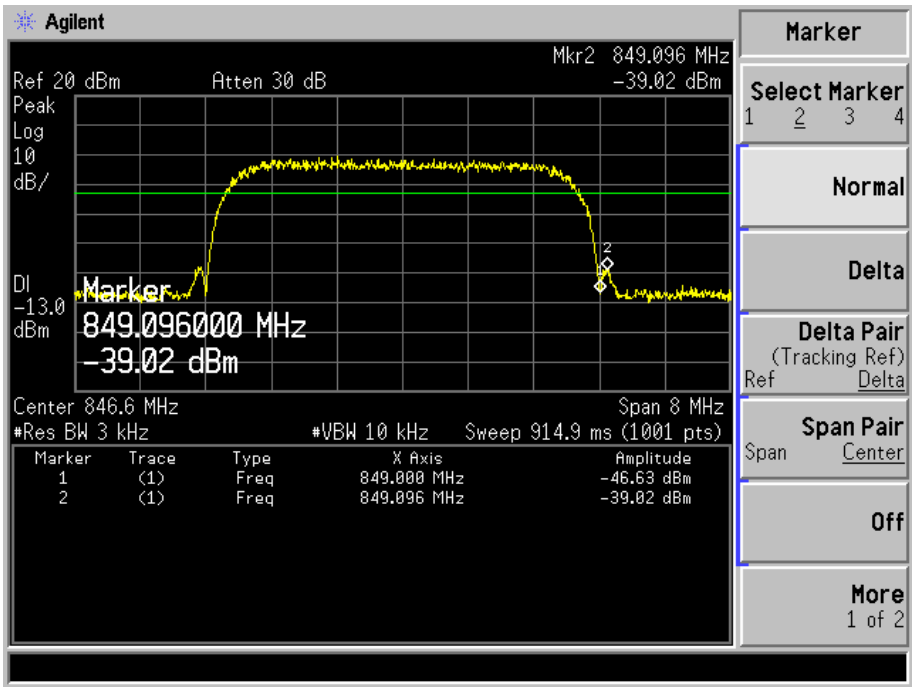
Above 1GHz



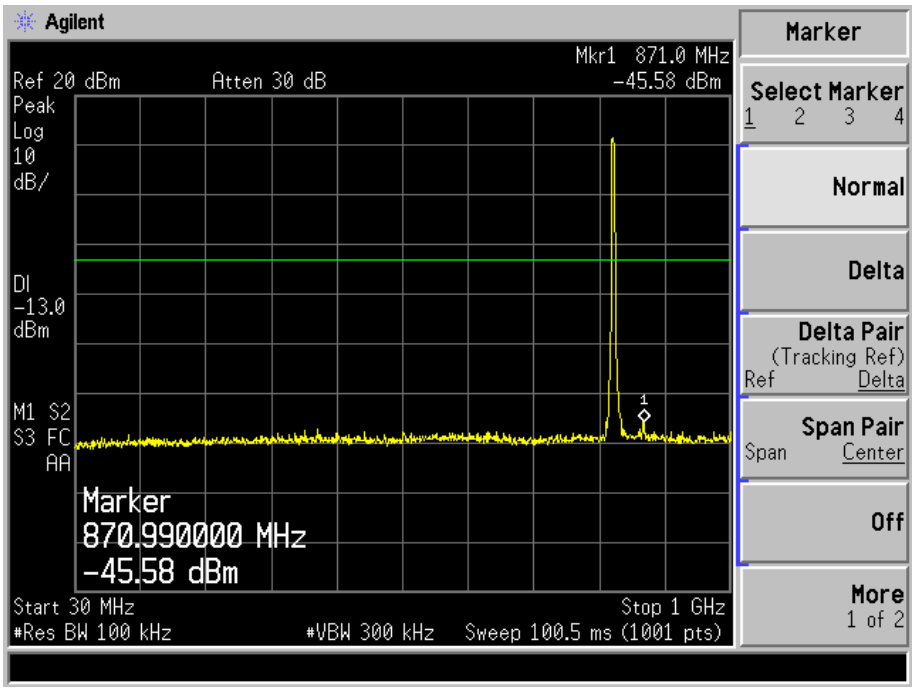
HSDPA Low Band Spurious Emission



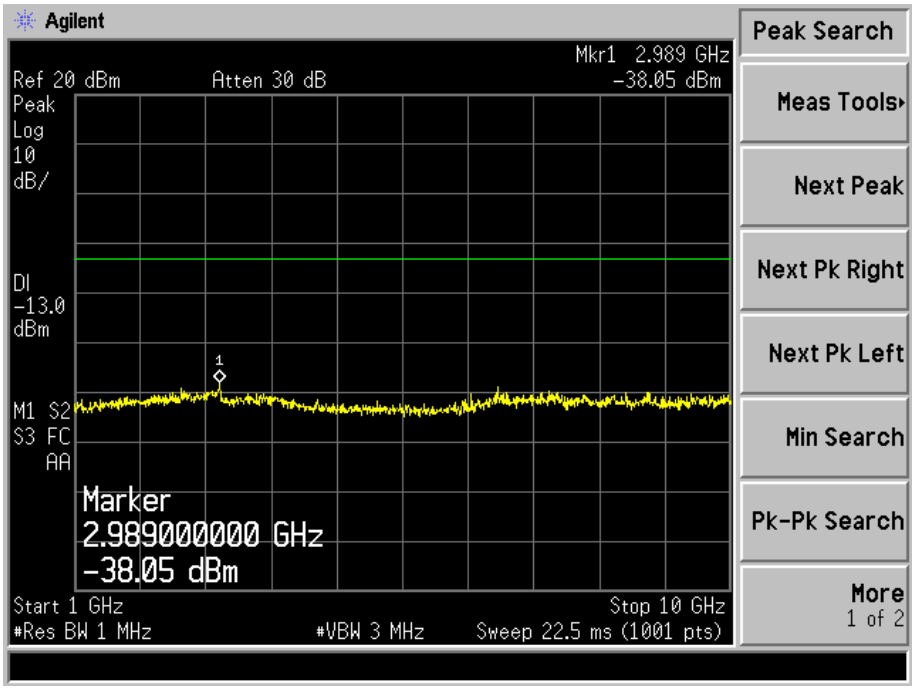
HSDPA High Band Spurious Emission



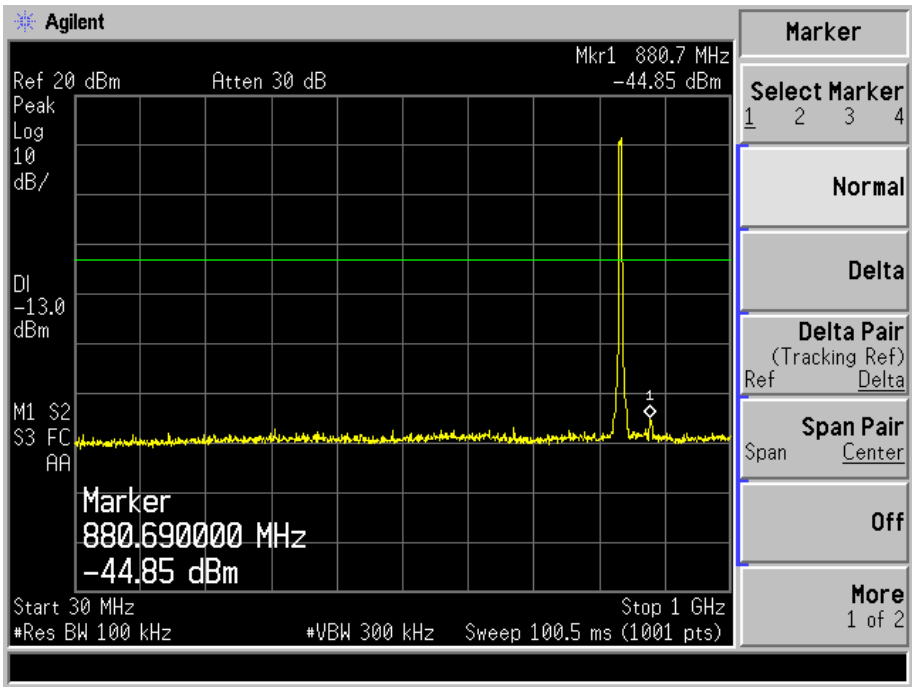
HSUPA Low Channel
30MHz to 1GHz



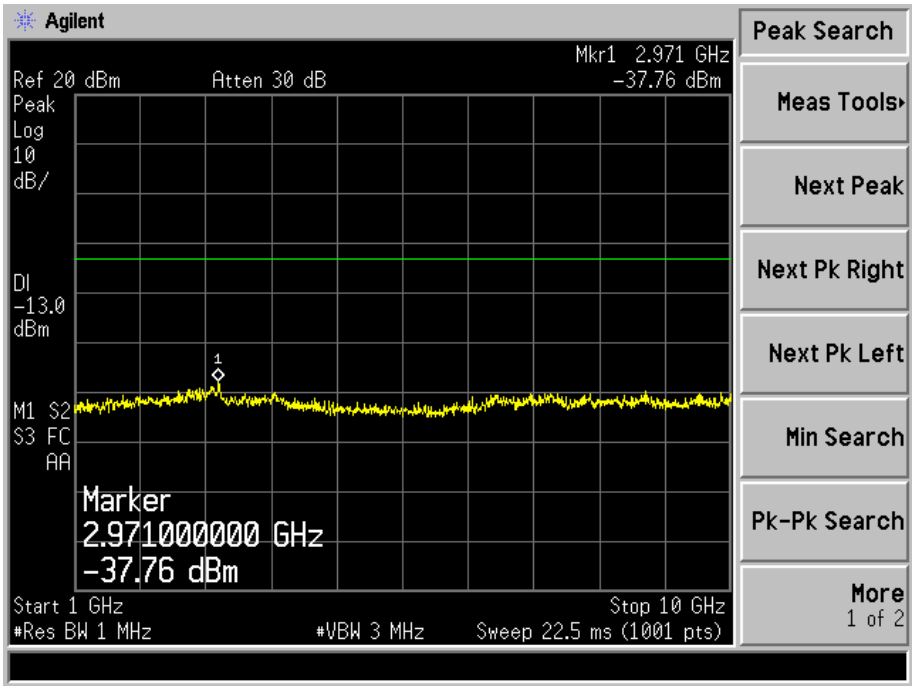
Above 1GHz



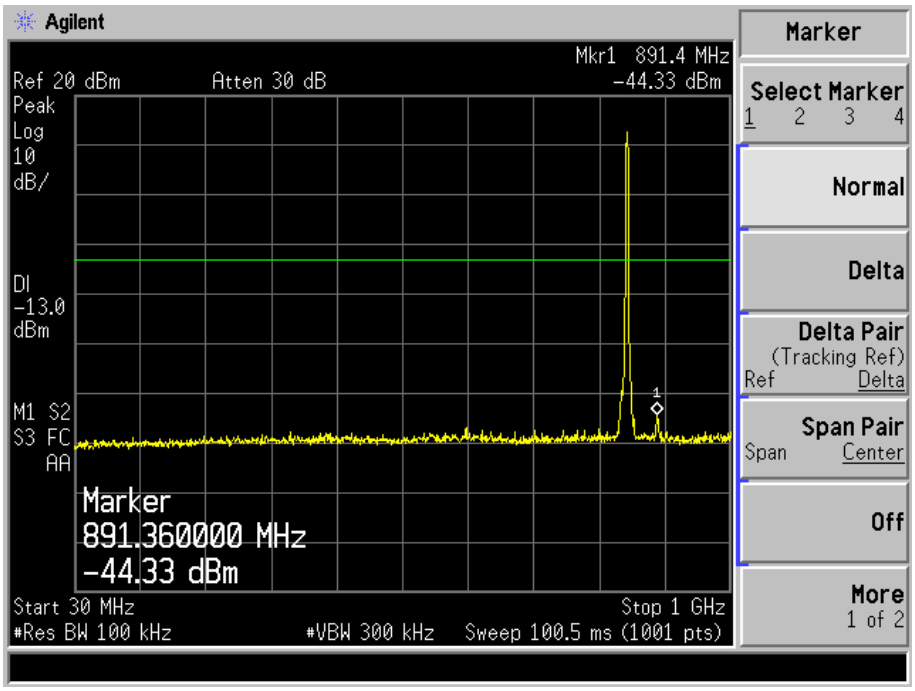
HSUPA Middle Channel
30MHz to 1GHz



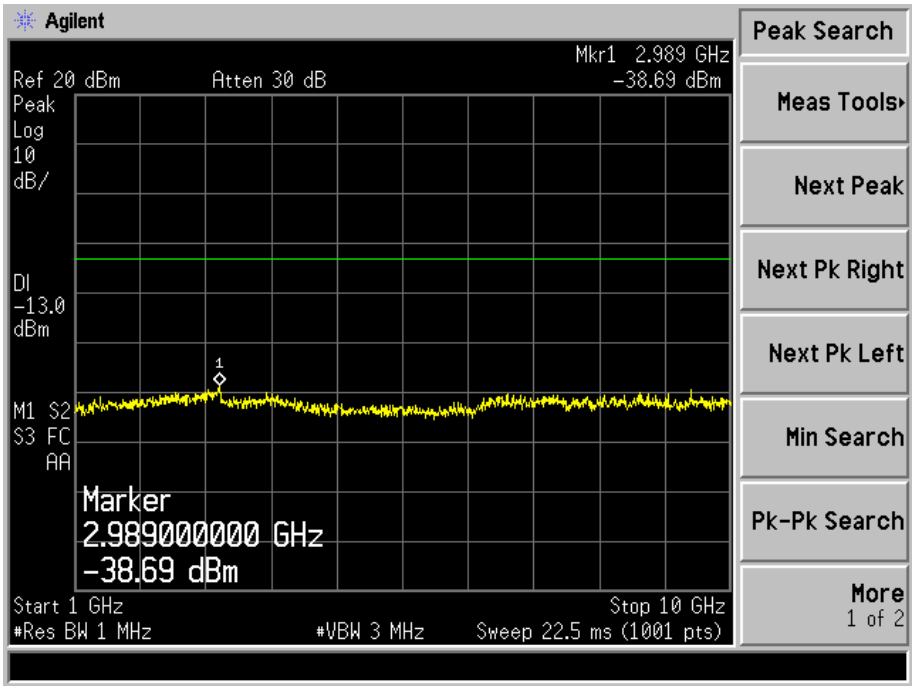
Above 1GHz



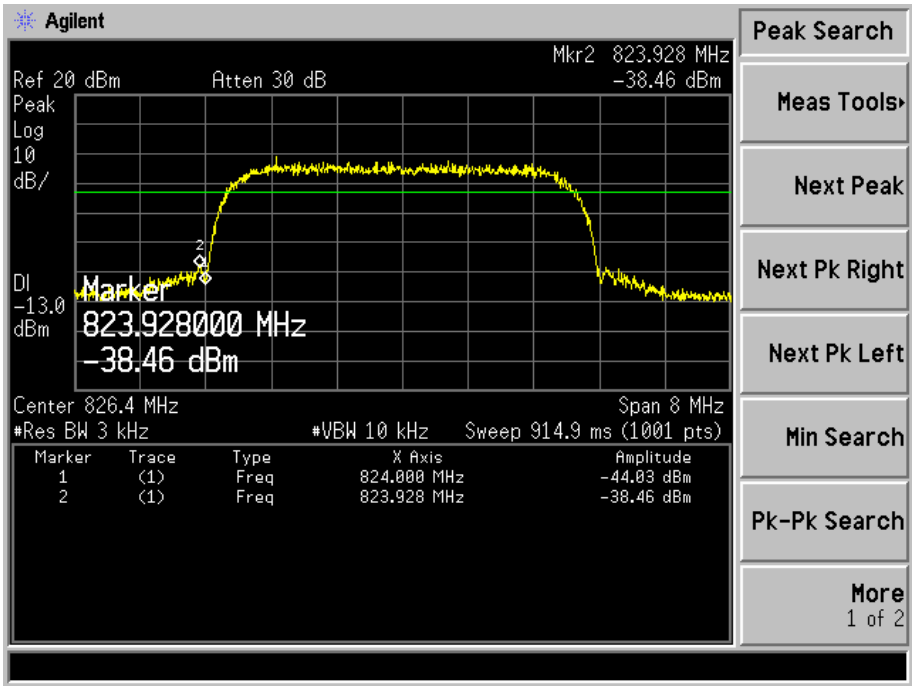
HSUPA High Channel
30MHz to 1GHz



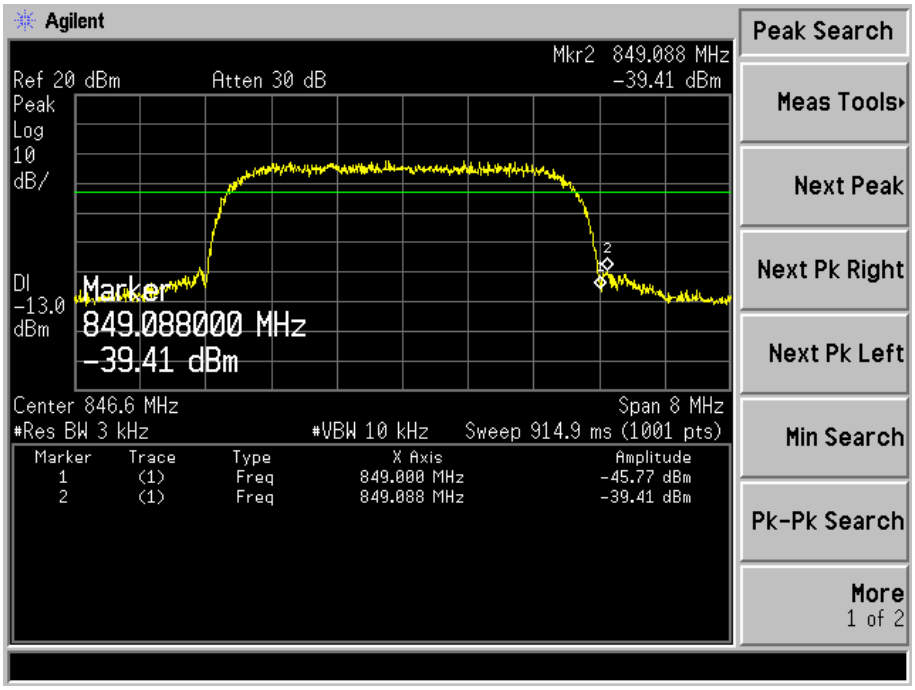
Above 1GHz



HSUPA Low Band Spurious Emission



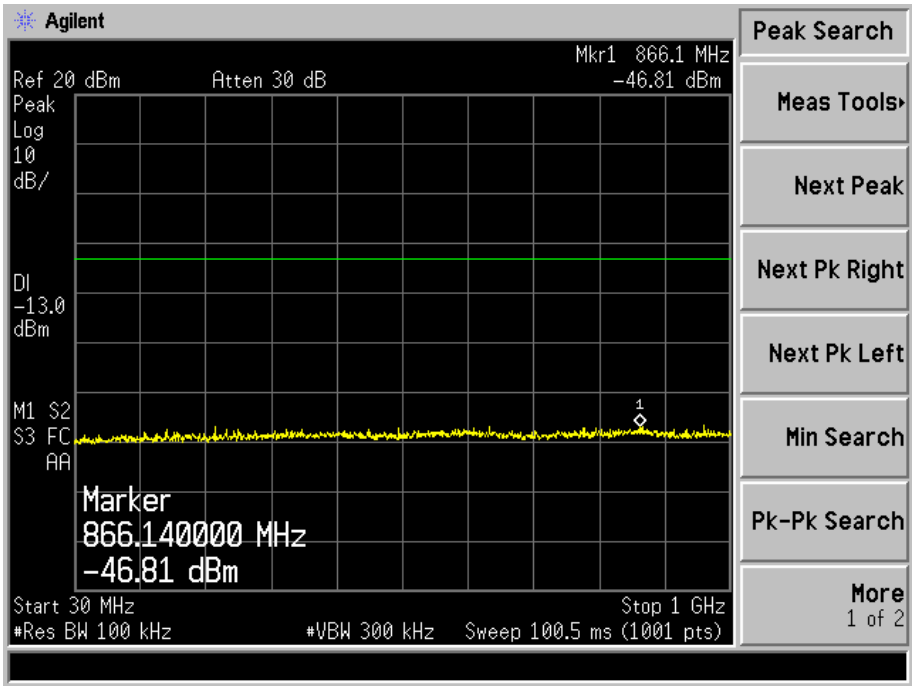
HSUPA High Band Spurious Emission



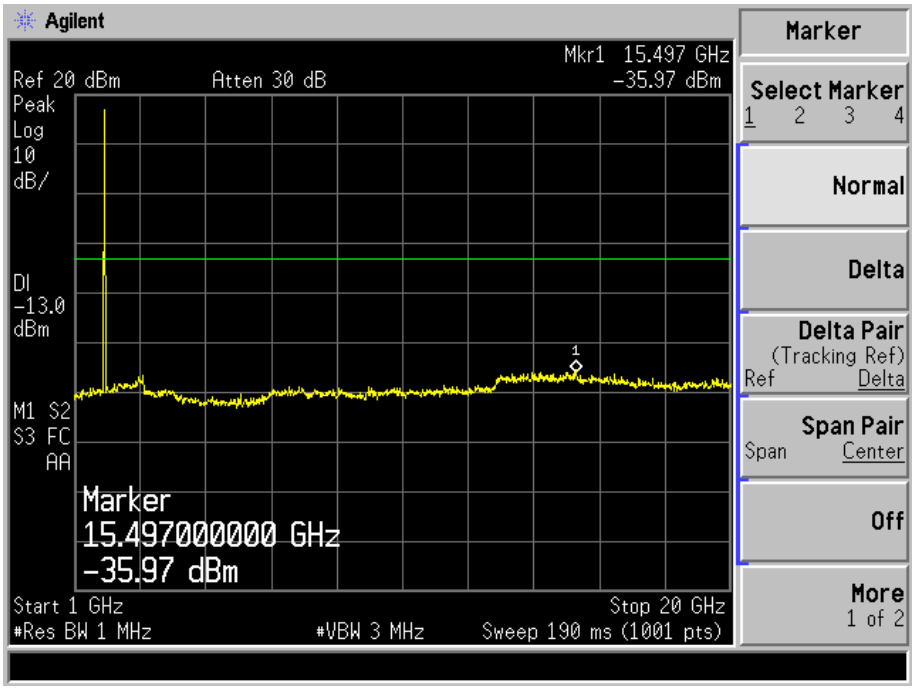
For Band II

WCDMA Low Channel

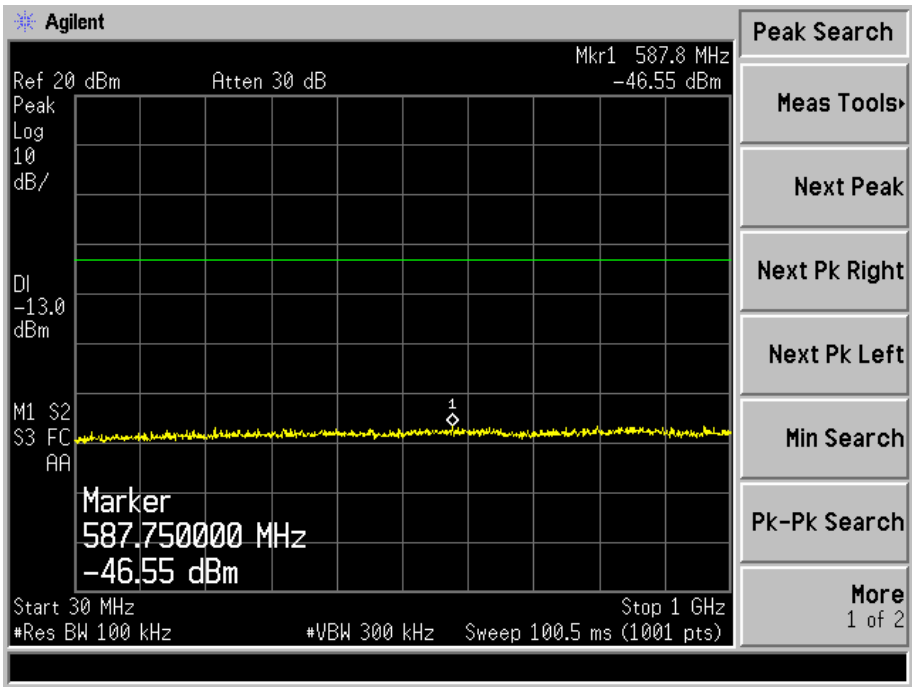
30MHz to 1GHz



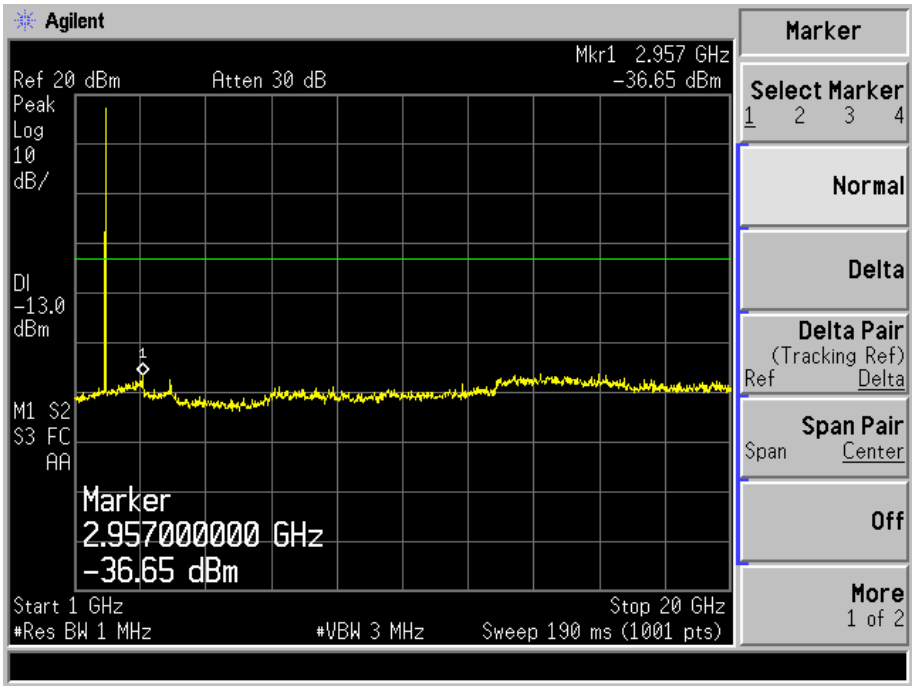
Above 1GHz



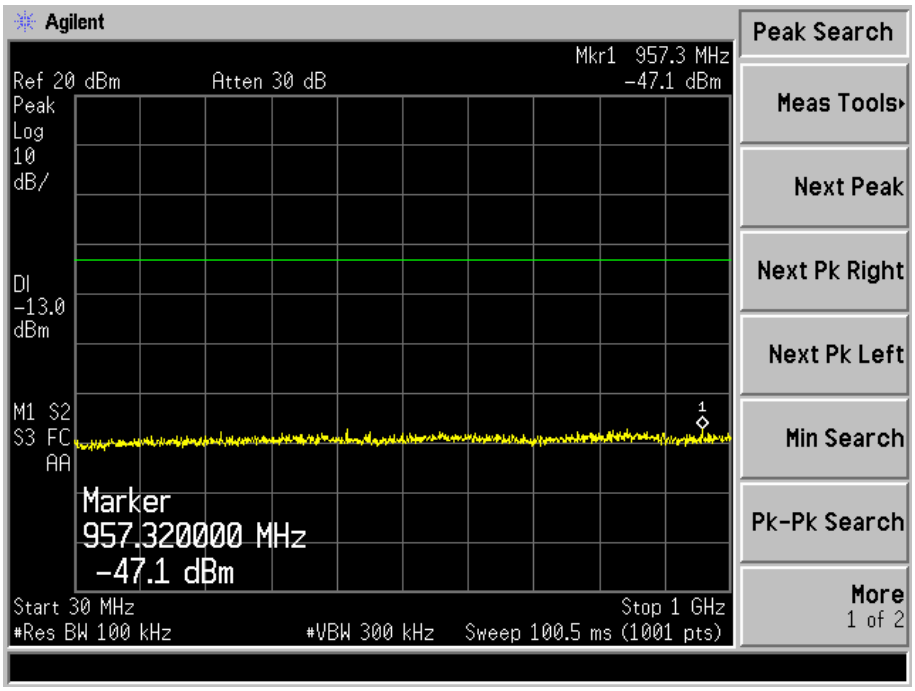
WCDMA Middle Channel
30MHz to 1GHz



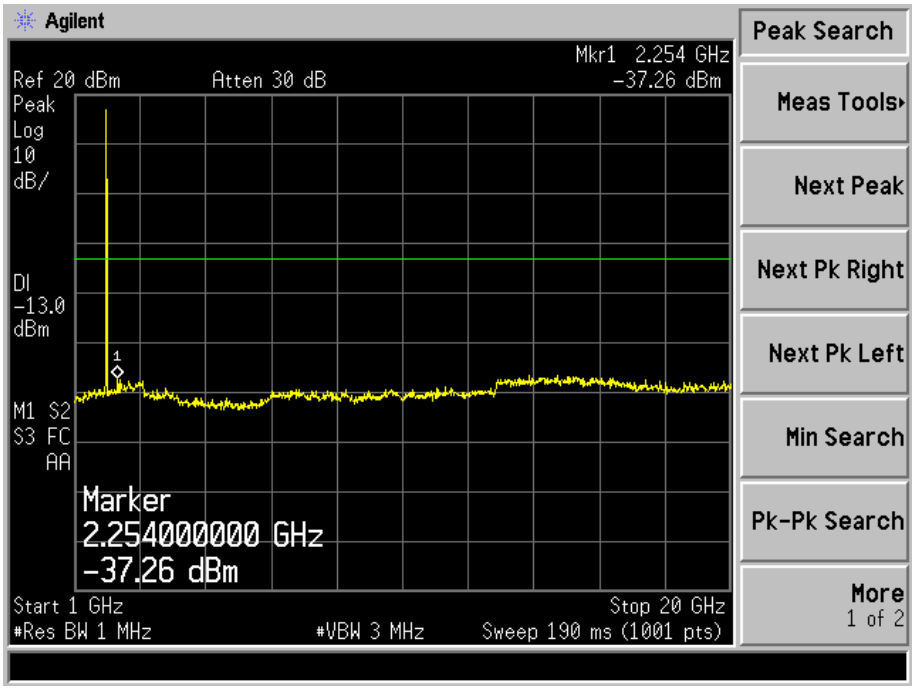
Above 1GHz



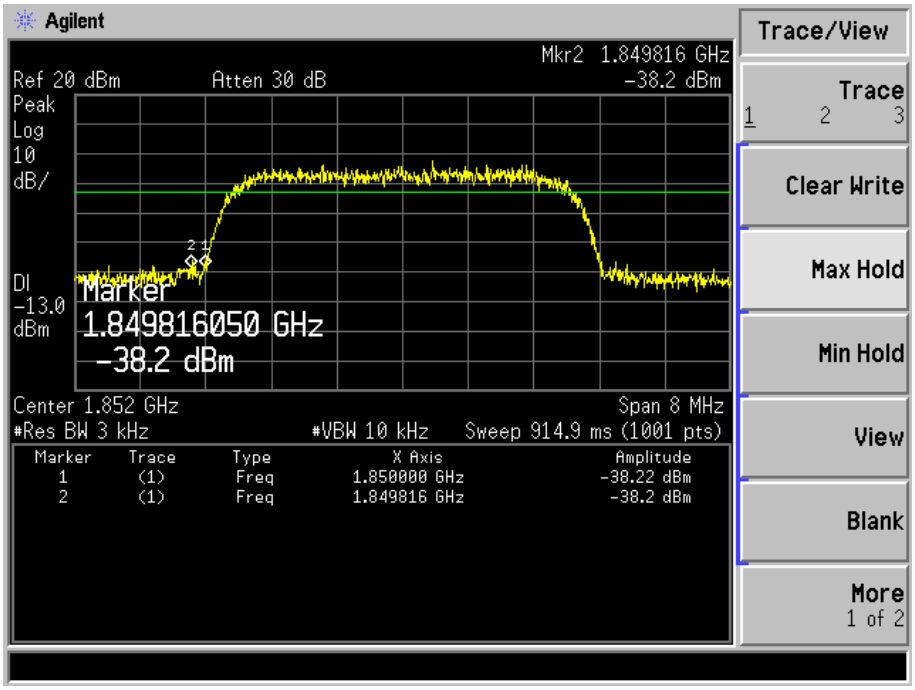
WCDMA High Channel
30MHz to 1GHz



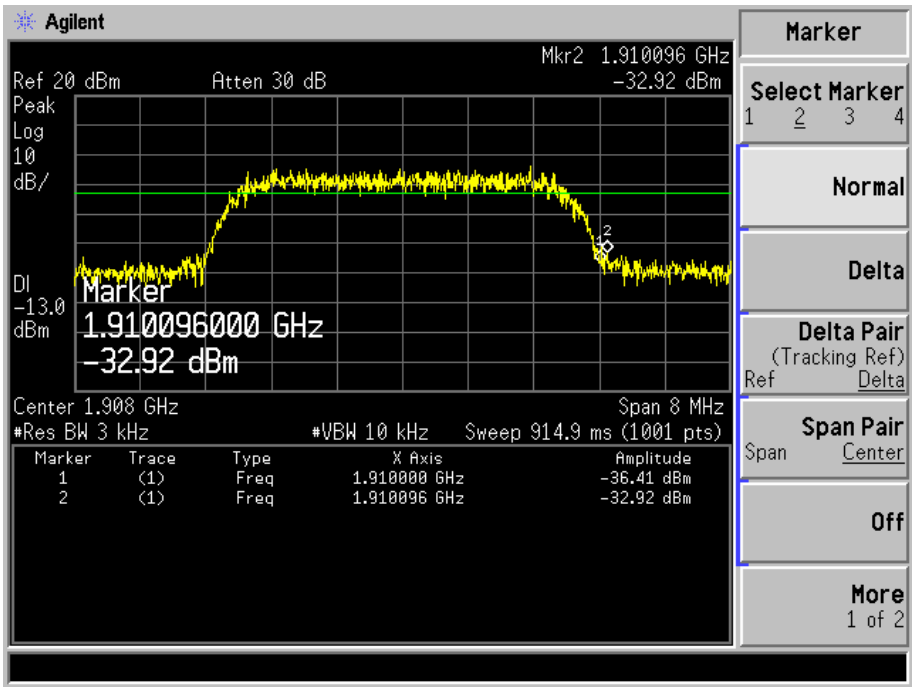
Above 1GHz



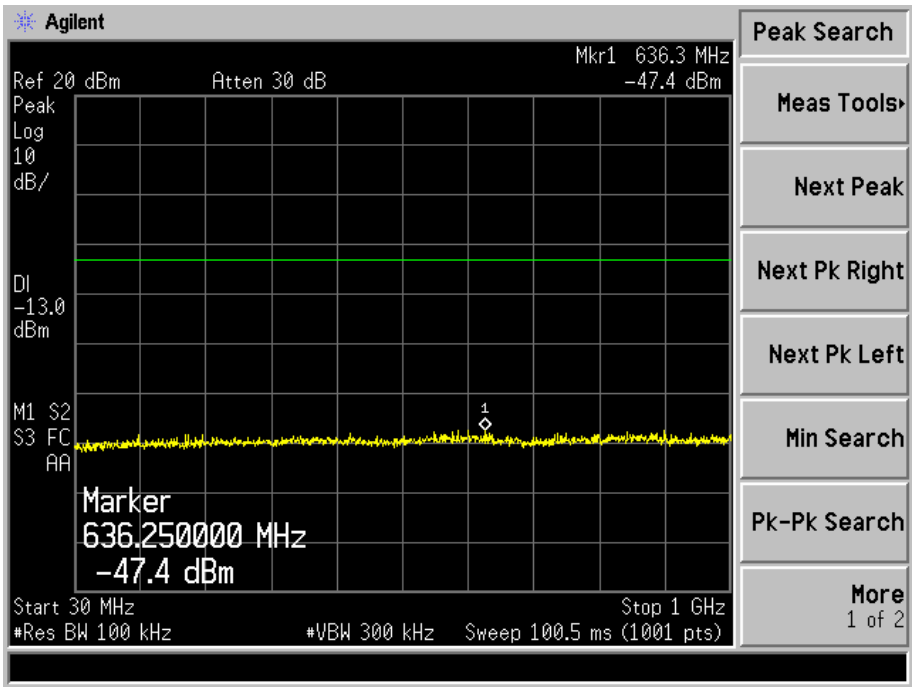
WCDMA Low Band Spurious Emission



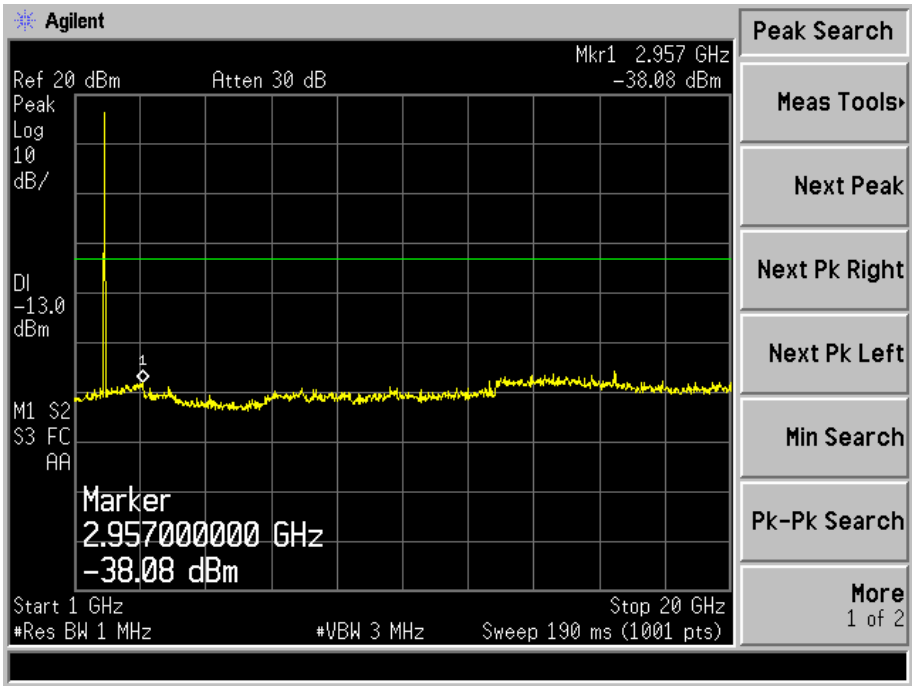
WCDMA High Band Spurious Emission



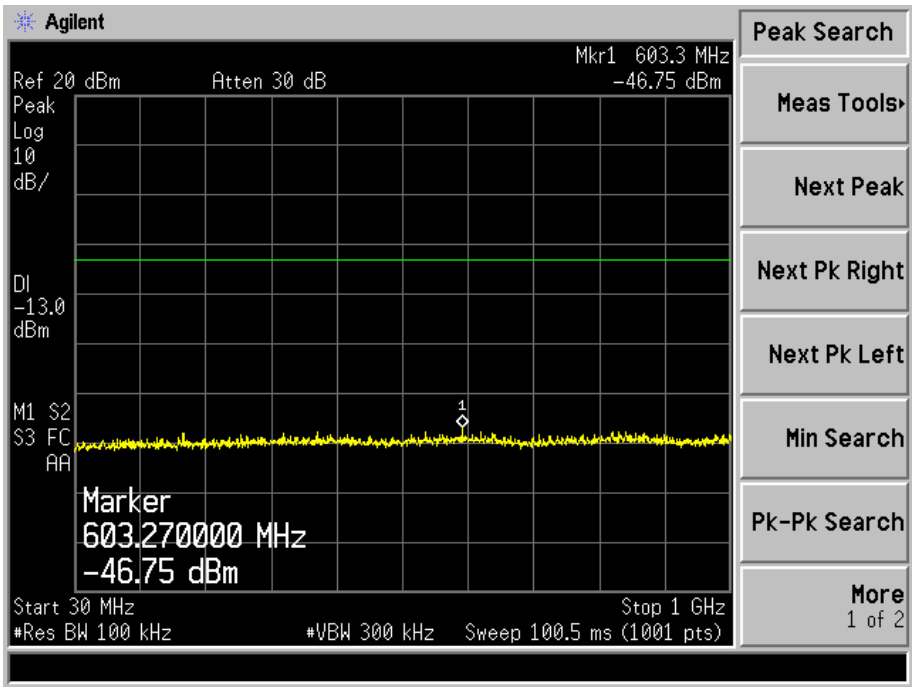
HSDPA Low Channel
30MHz to 1GHz



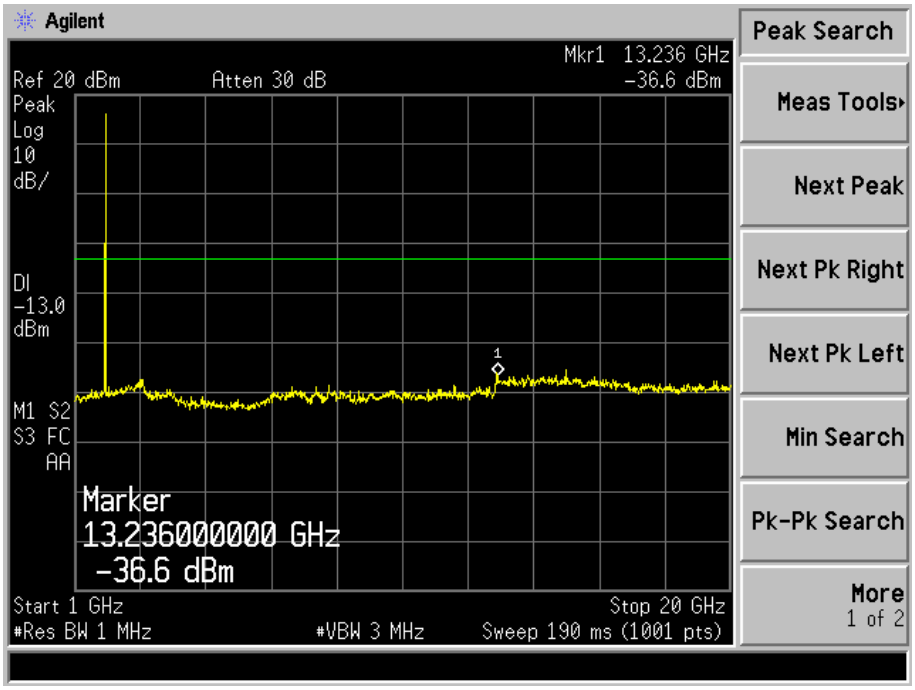
Above 1GHz



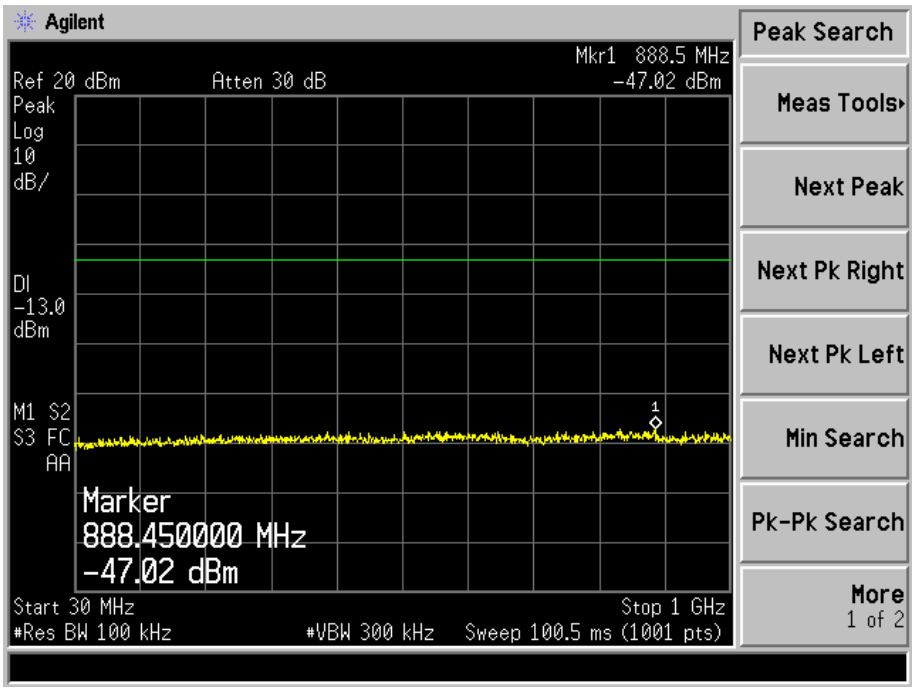
HSDPA Middle Channel
30MHz to 1GHz



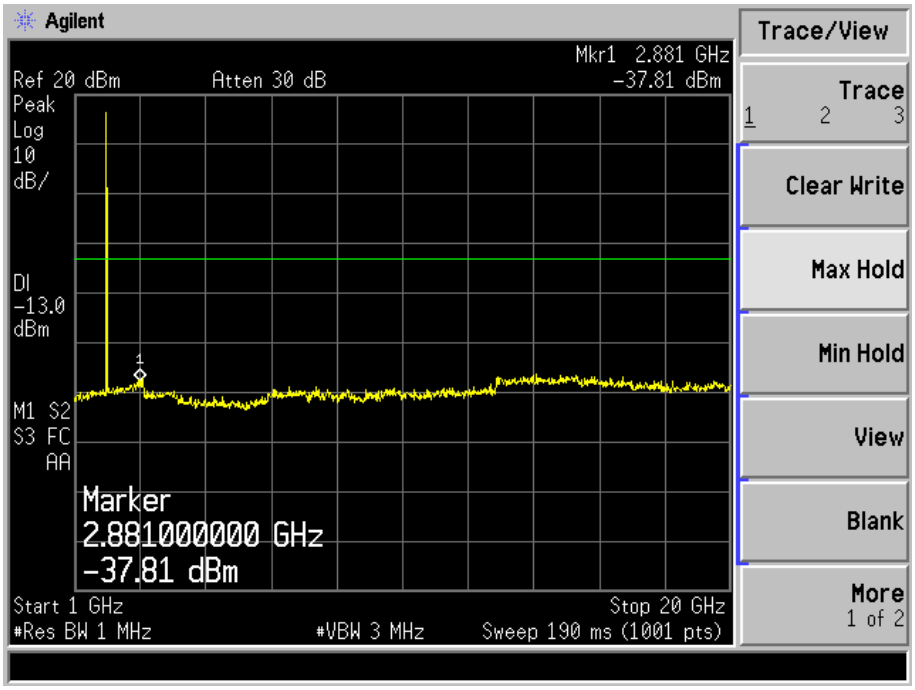
Above 1GHz



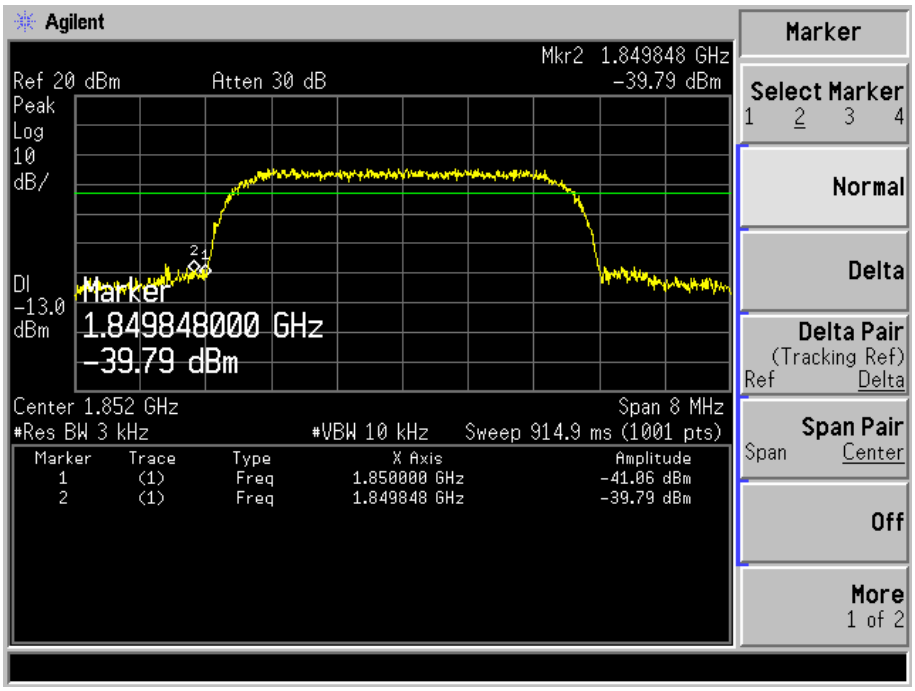
HSDPA High Channel
30MHz to 1GHz



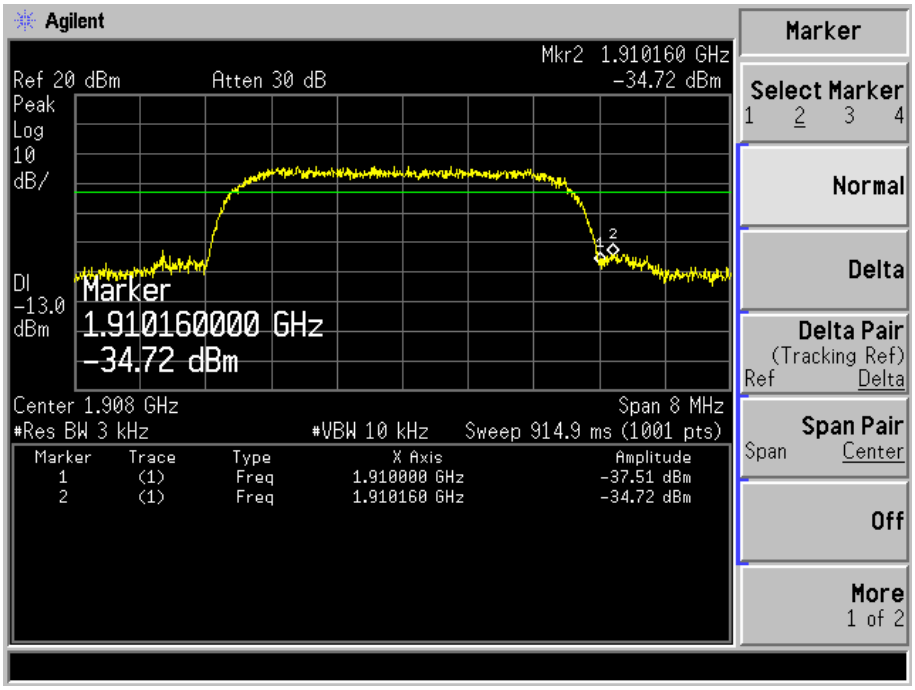
Above 1GHz



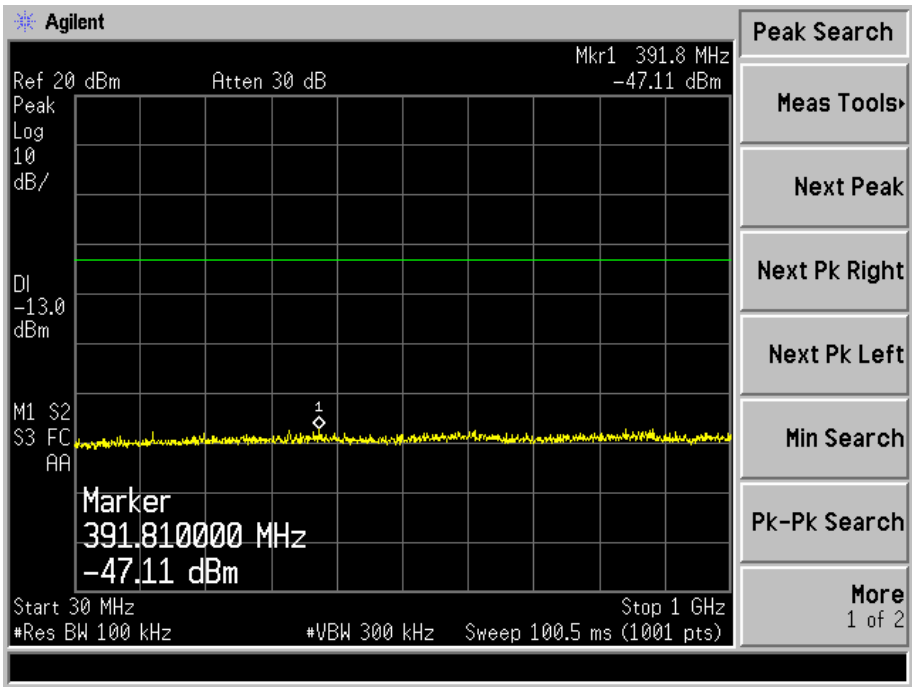
HSDPA Low Band Spurious Emission



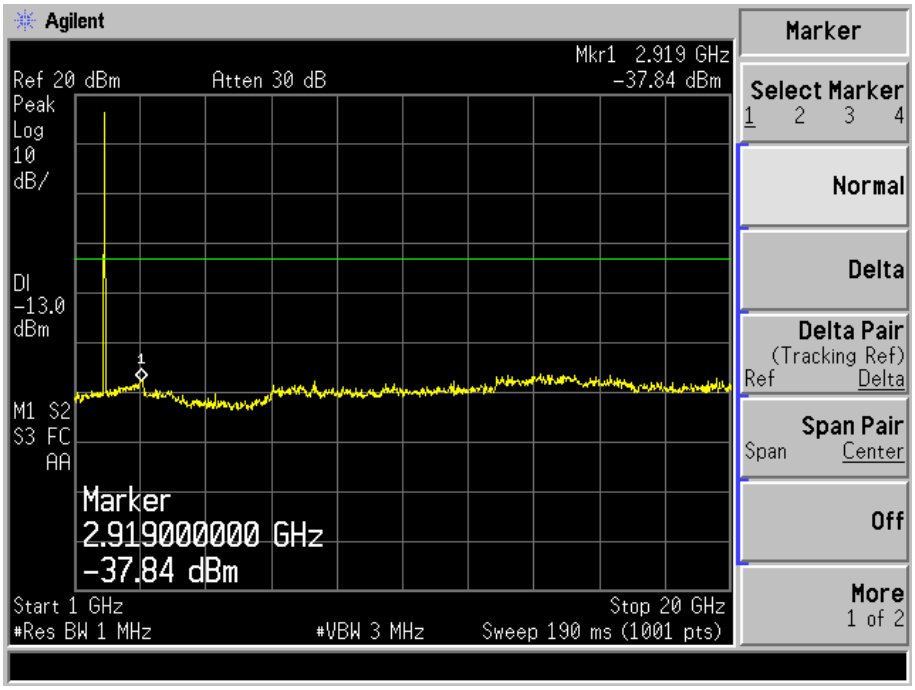
HSDPA High Band Spurious Emission



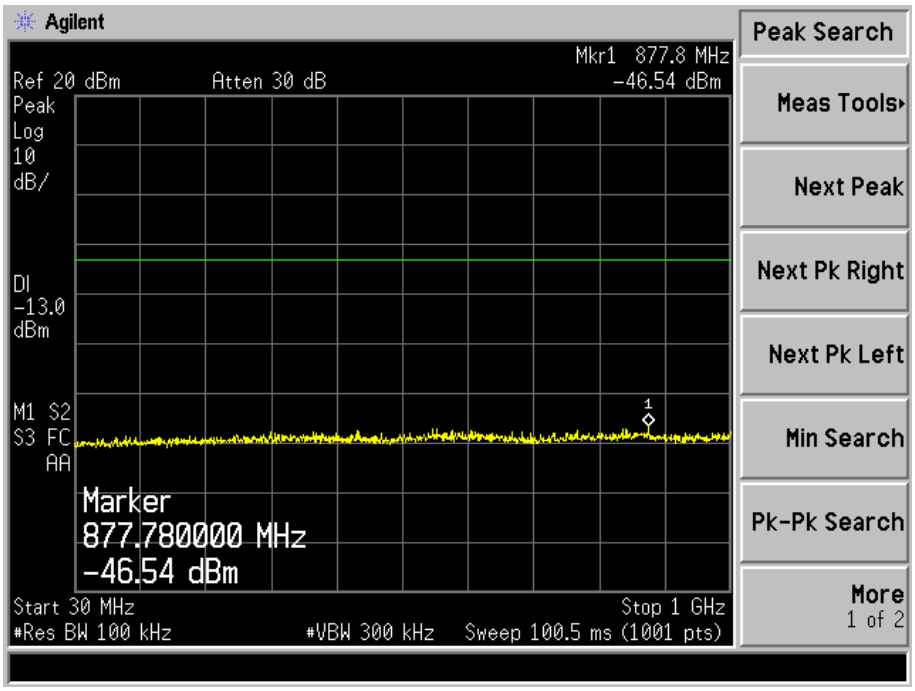
HSUPA Low Channel
30MHz to 1GHz



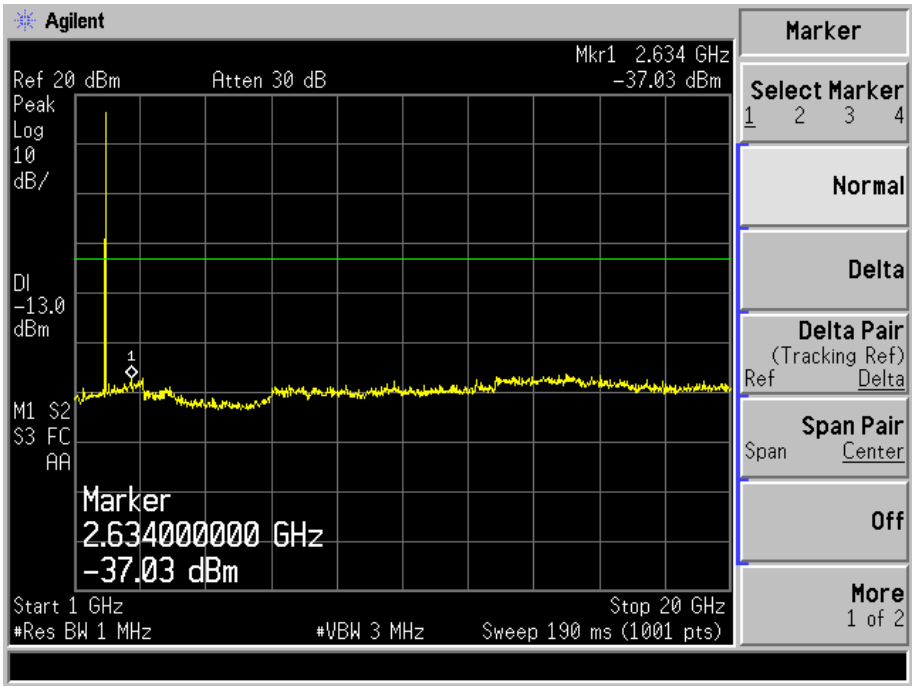
Above 1GHz



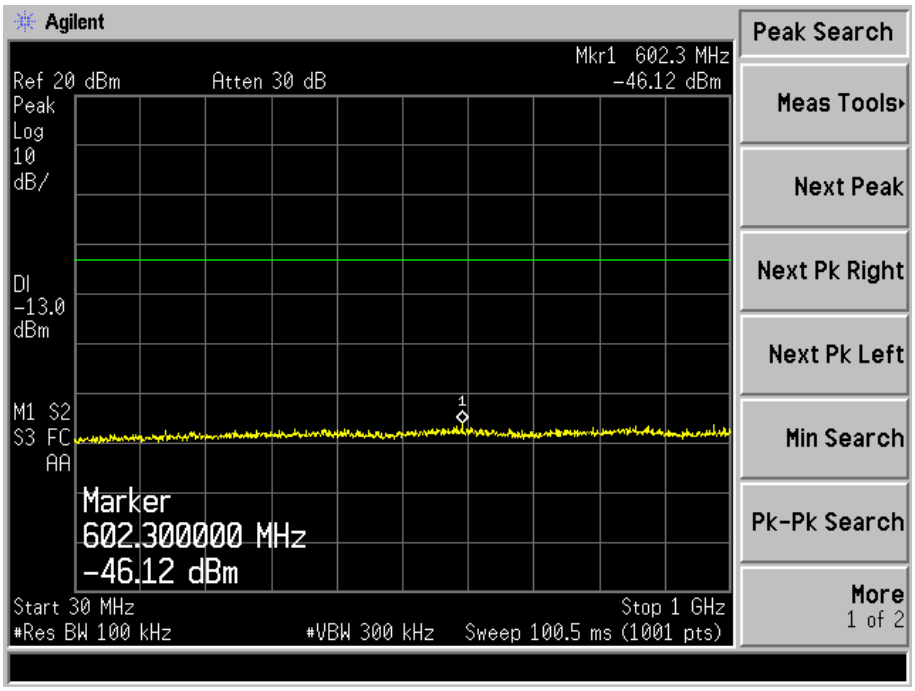
HSUPA Middle Channel
30MHz to 1GHz



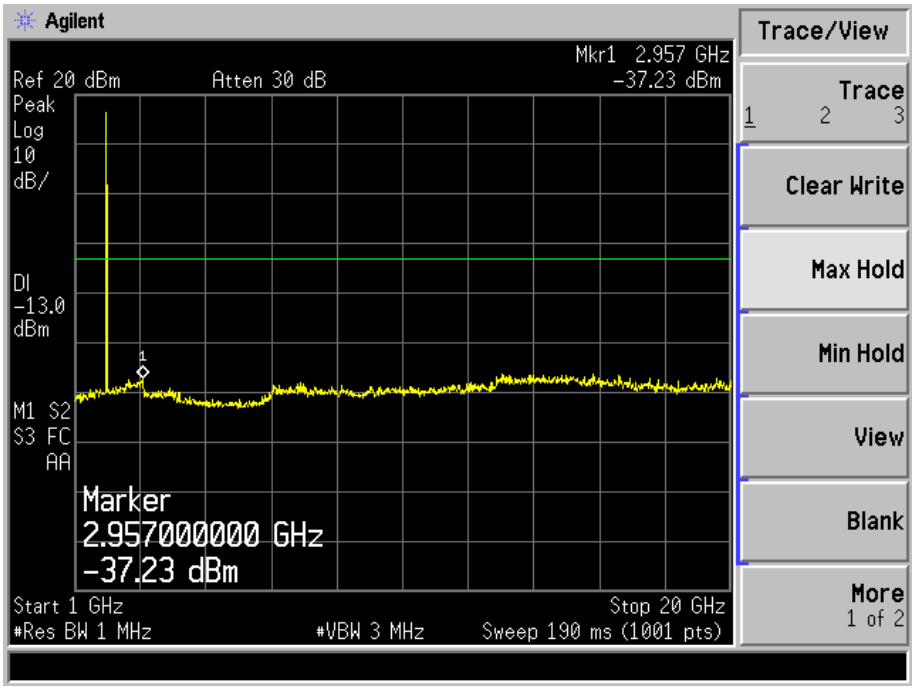
Above 1GHz



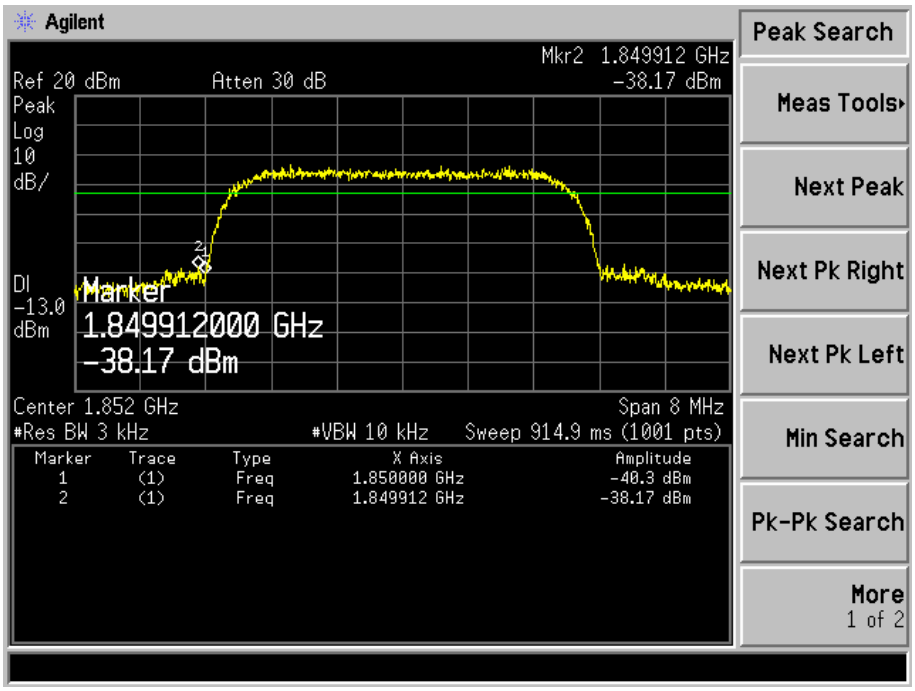
HSUPA High Channel
30MHz to 1GHz



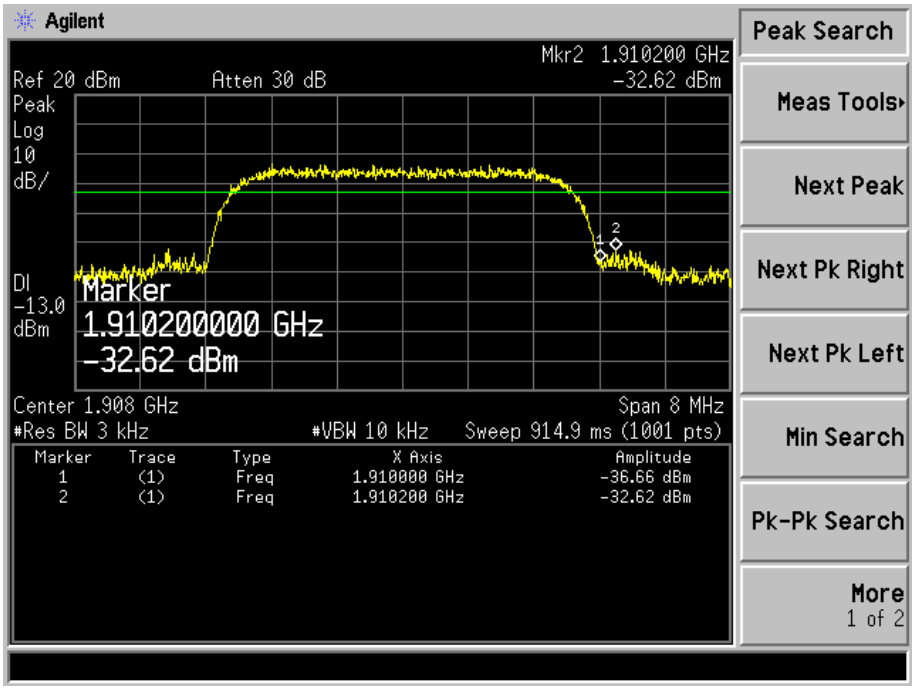
Above 1GHz



HSUPA Low Band Spurious Emission



HSUPA High Band Spurious Emission



8. Spurious Radiated Emissions

8.1 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.

8.2 Test Procedure

1. The setup of EUT is according with per ANSI/TIA Standard 603D and ANSI C63.4-2014 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)

8.3 Environmental Conditions

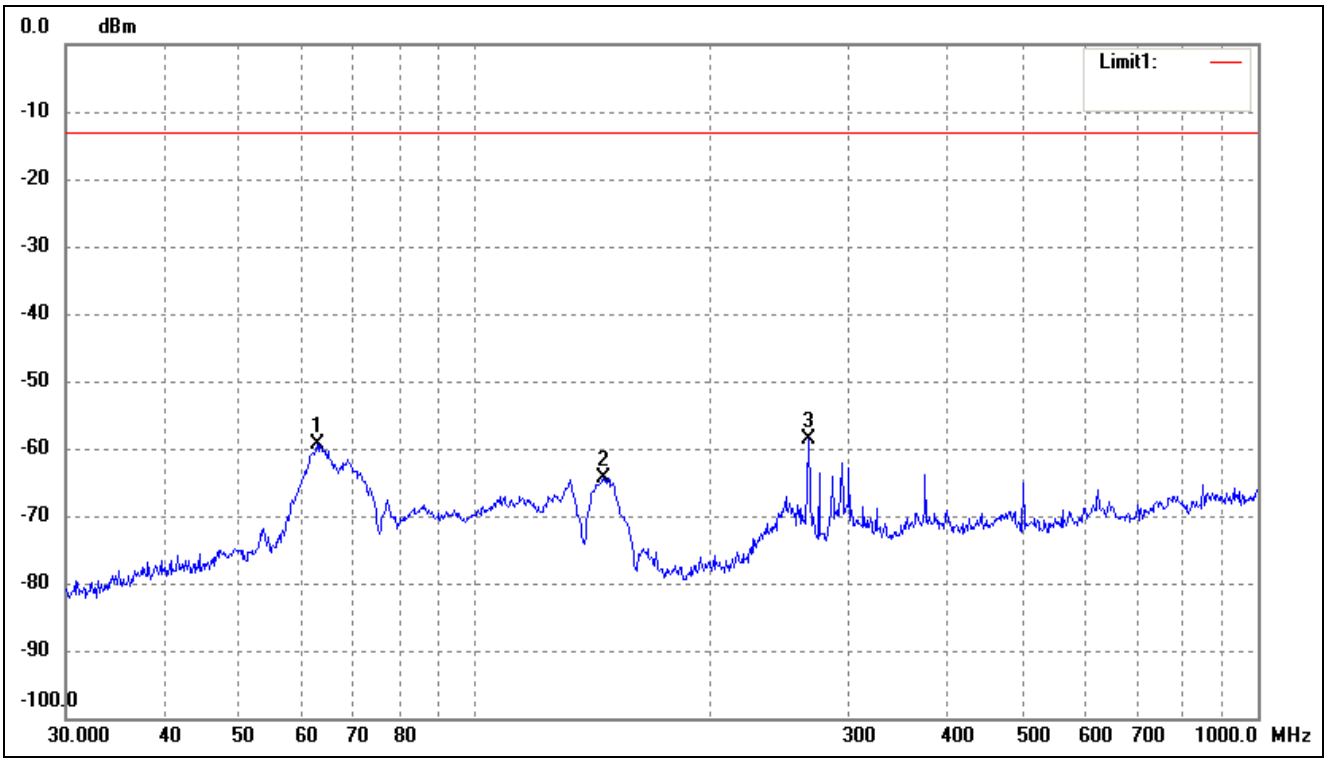
Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

8.4 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:

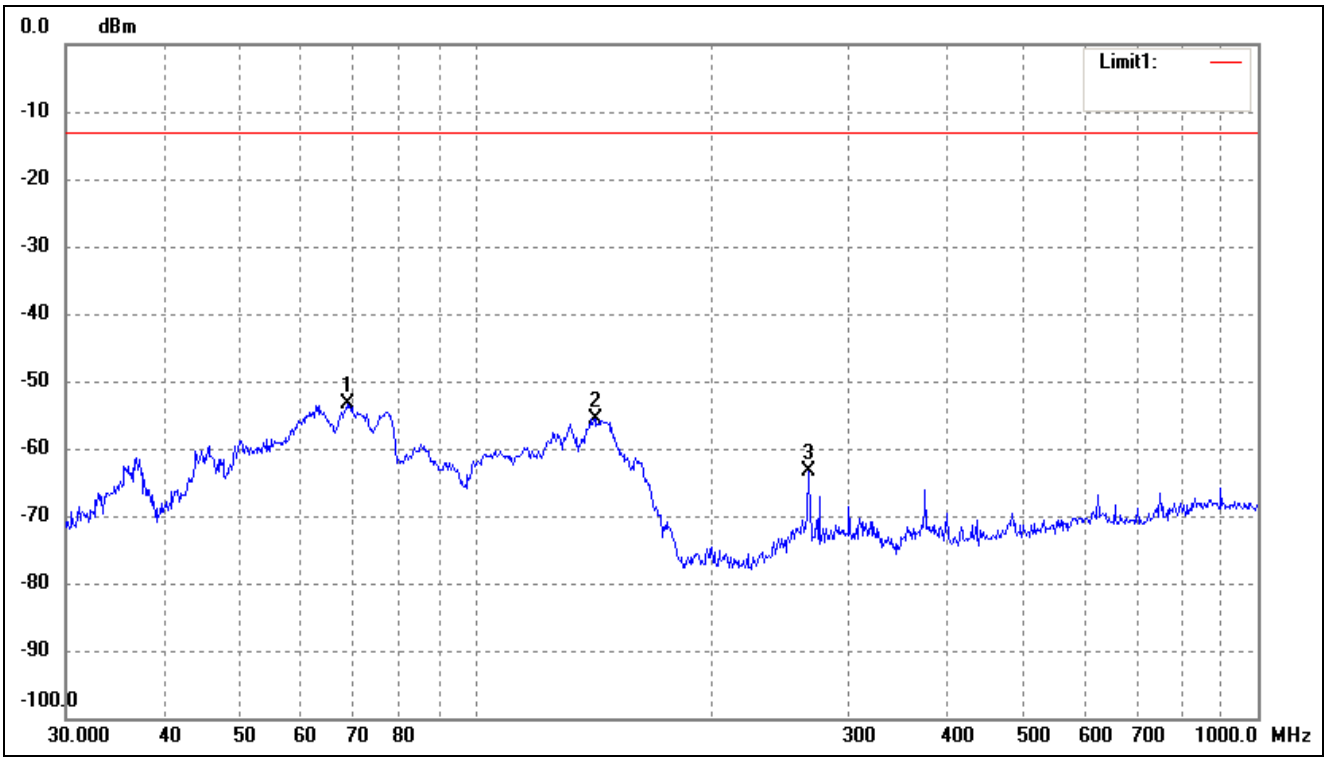
Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Spurious Emission From 30MHz to 1GHz
For Cellular Band_ GSM850 Mode
Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	62.8708	-60.63	1.29	-59.34	-13.00	-46.34	ERP
2	145.8610	-63.62	-0.68	-64.30	-13.00	-51.30	ERP
3	266.6089	-63.76	5.13	-58.63	-13.00	-45.63	ERP

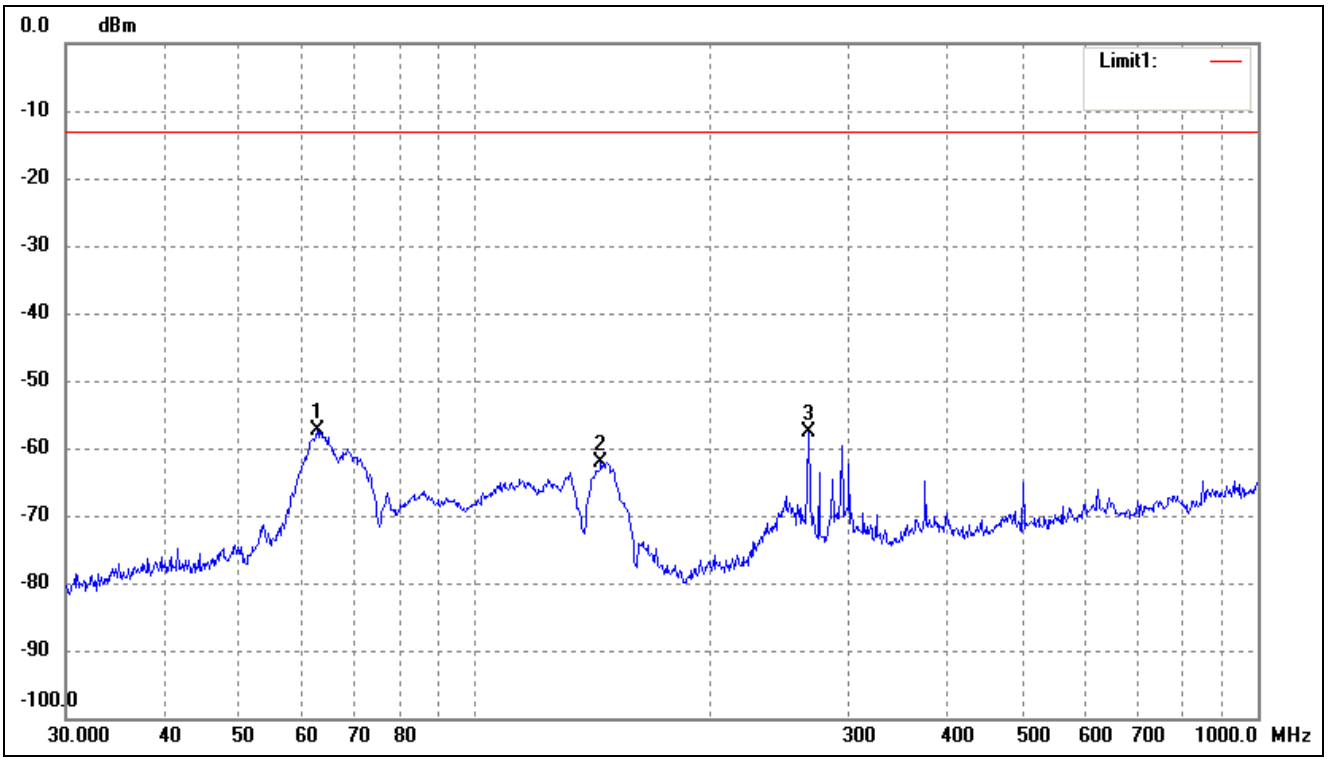
Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	68.6310	-52.67	-0.59	-53.26	-13.00	-40.26	ERP
2	142.3243	-54.94	-0.73	-55.67	-13.00	-42.67	ERP
3	266.6089	-68.51	5.13	-63.38	-13.00	-50.38	ERP

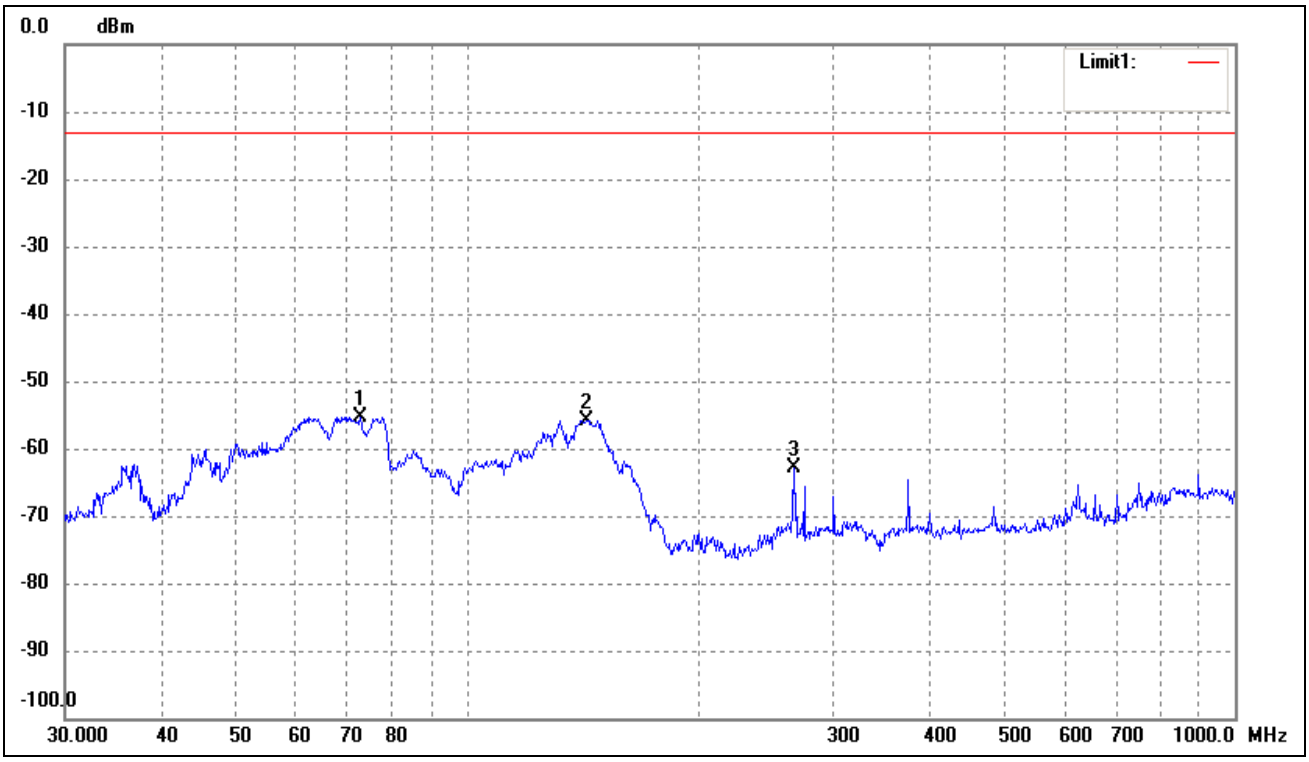
For Cellular Band_ GSM1900 Mode

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	62.8708	-58.63	1.29	-57.34	-13.00	-44.34	ERP
2	144.8418	-61.44	-0.70	-62.14	-13.00	-49.14	ERP
3	266.6089	-62.76	5.13	-57.63	-13.00	-44.63	ERP

Vertical:

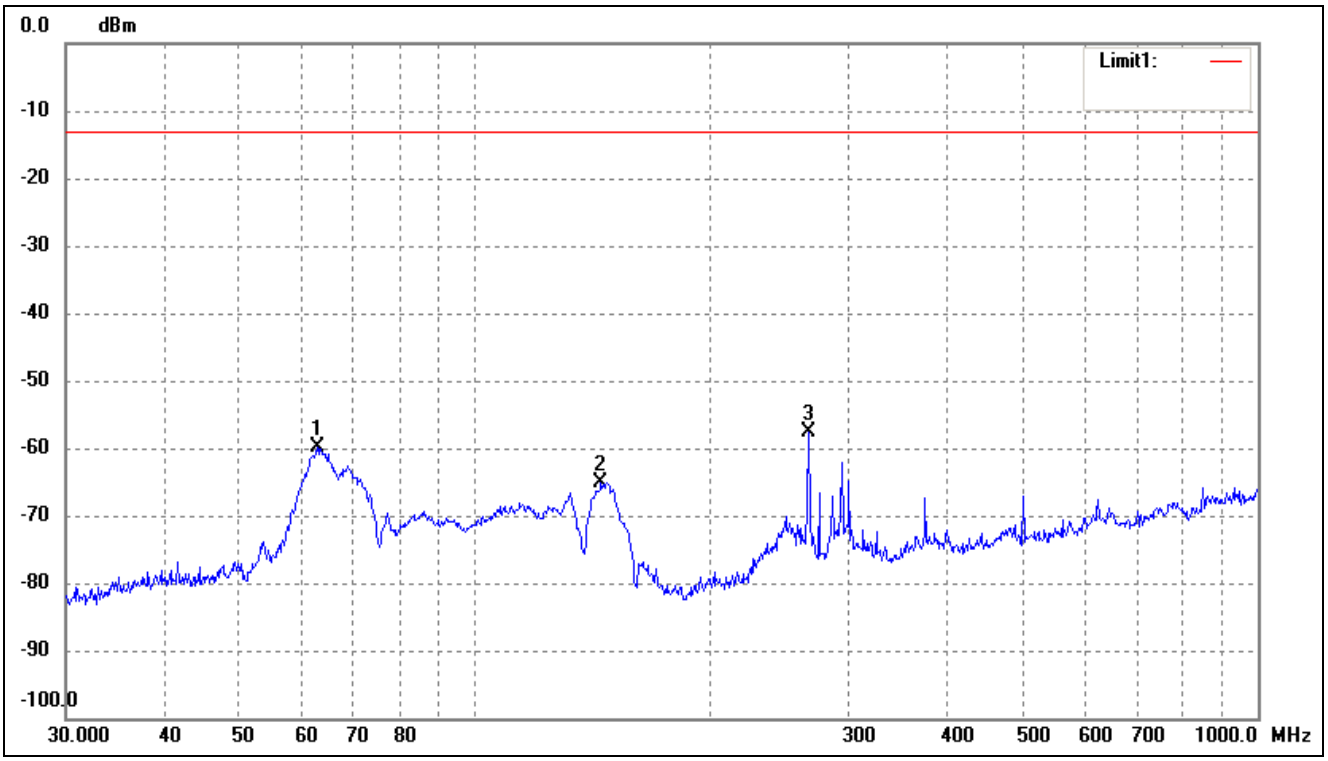


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	72.8465	-54.46	-0.79	-55.25	-13.00	-42.25	ERP
2	143.3260	-55.06	-0.71	-55.77	-13.00	-42.77	ERP
3	266.6089	-68.01	5.13	-62.88	-13.00	-49.88	ERP

Note: Margin= (Reading+ Correct)- Limit

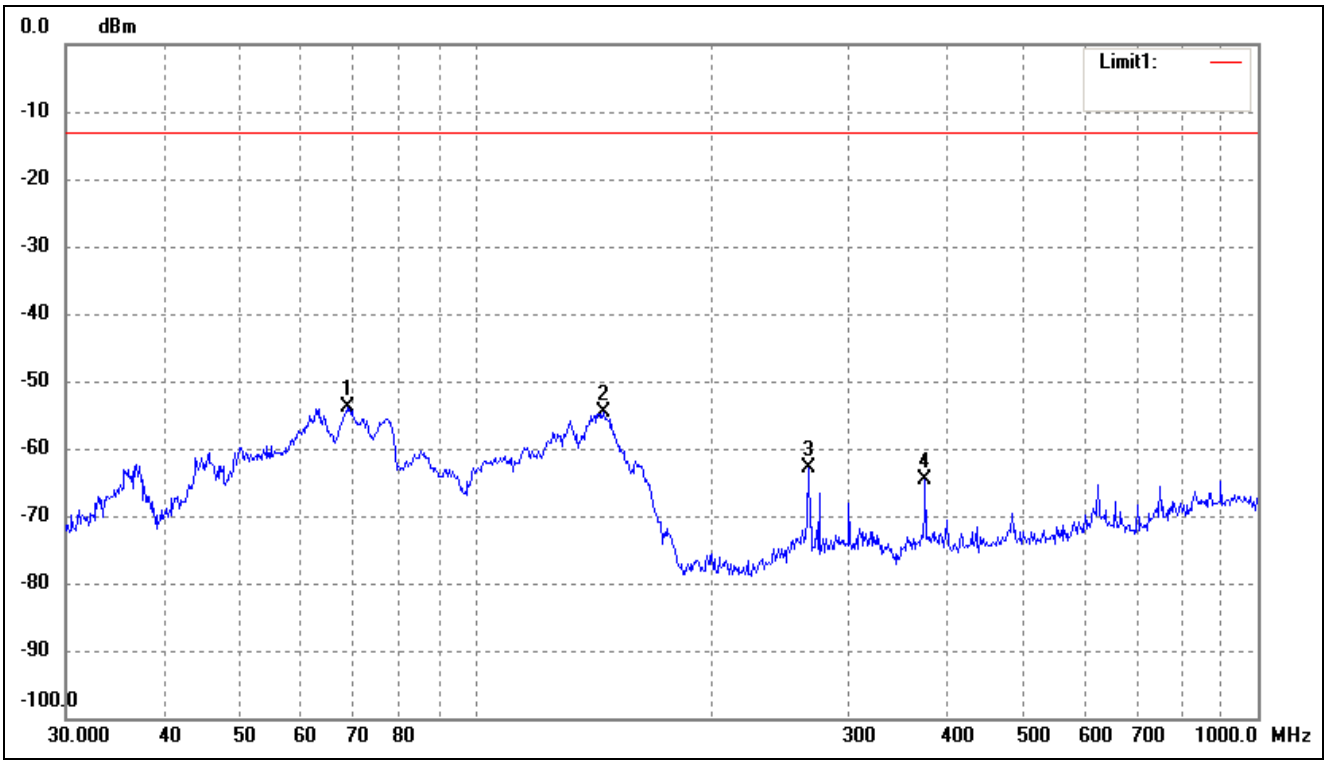
For band 5 Mode

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	62.8708	-61.13	1.29	-59.84	-13.00	-46.84	ERP
2	144.8418	-64.44	-0.70	-65.14	-13.00	-52.14	ERP
3	266.6089	-62.76	5.13	-57.63	-13.00	-44.63	ERP

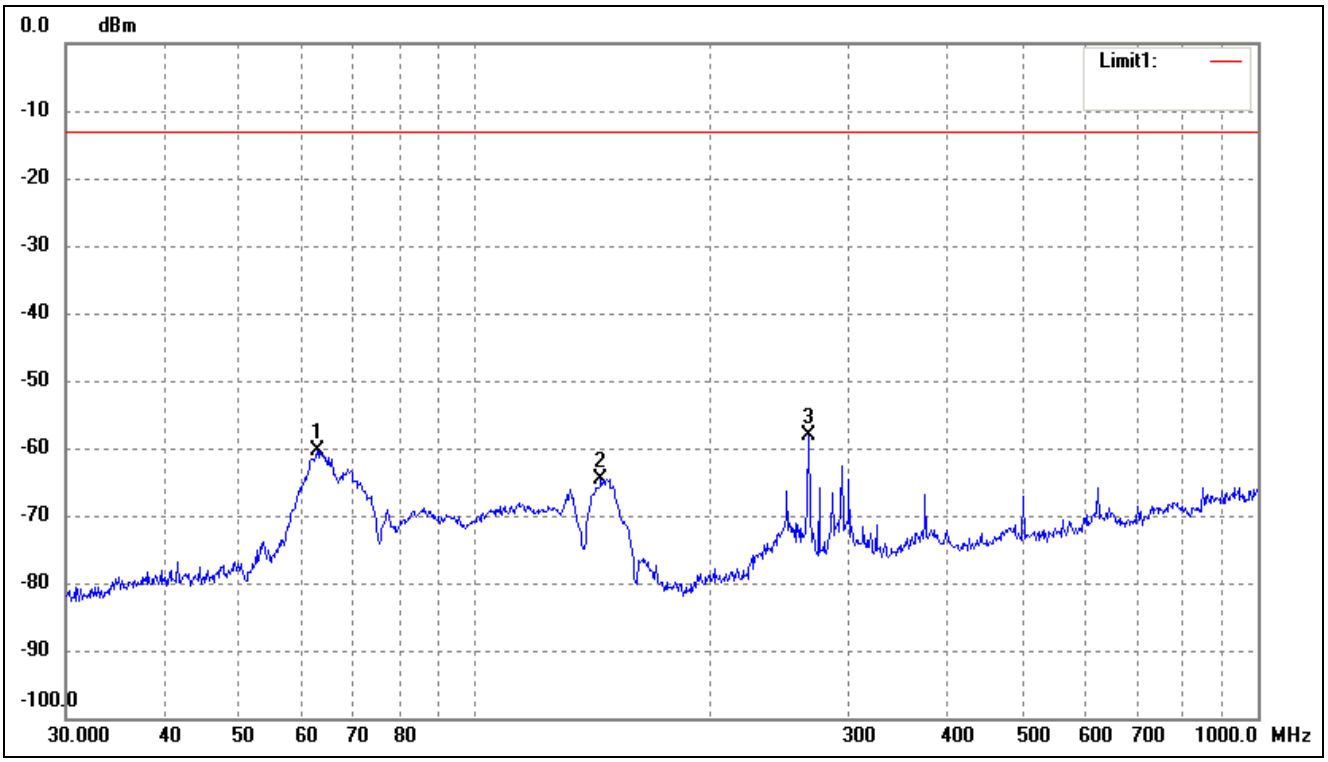
Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	68.6310	-53.17	-0.59	-53.76	-13.00	-40.76	ERP
2	145.8611	-54.06	-0.68	-54.74	-13.00	-41.74	ERP
3	266.6089	-68.01	5.13	-62.88	-13.00	-49.88	ERP
4	375.9385	-74.00	9.47	-64.53	-13.00	-51.53	ERP

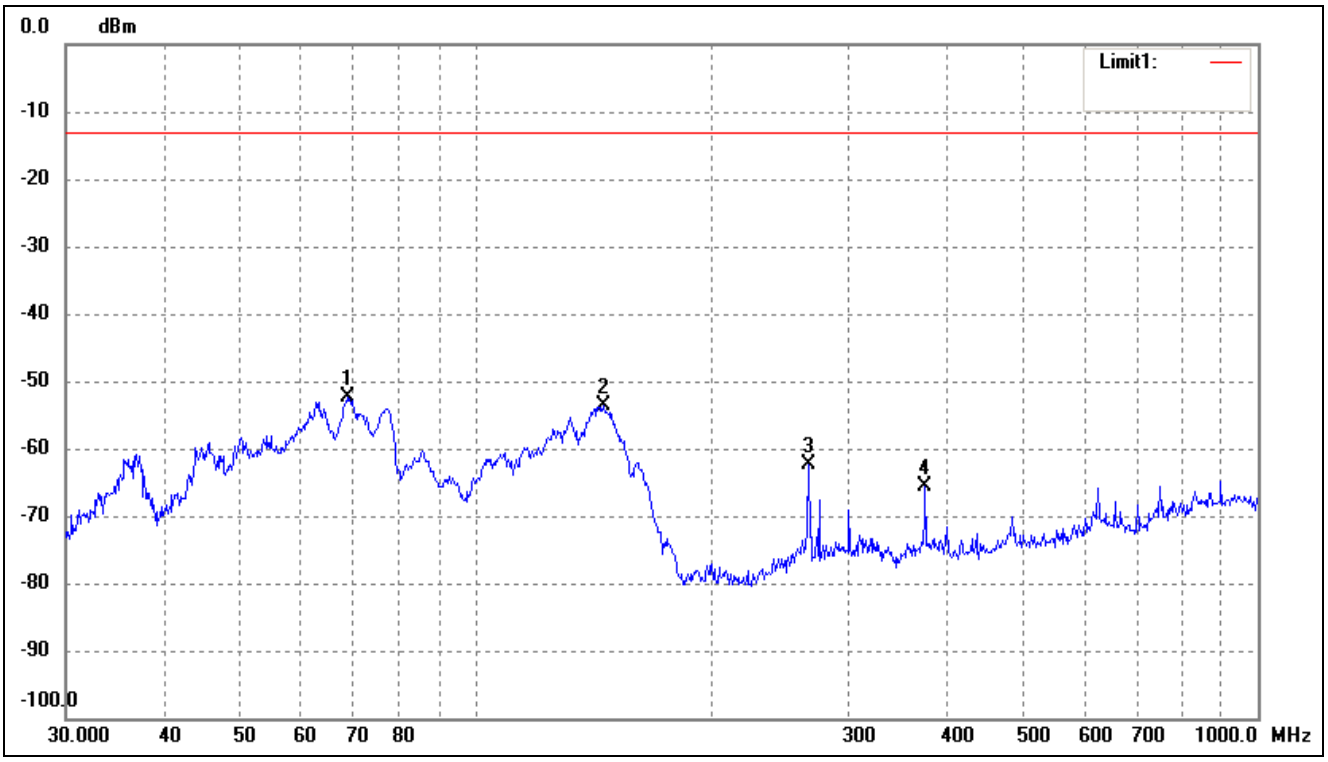
For band 2 Mode

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	62.8708	-61.63	1.29	-60.34	-13.00	-47.34	ERP
2	144.8418	-63.94	-0.70	-64.64	-13.00	-51.64	ERP
3	266.6089	-63.26	5.13	-58.13	-13.00	-45.13	ERP

Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	68.6310	-51.67	-0.59	-52.26	-13.00	-39.26	ERP
2	145.8611	-53.06	-0.68	-53.74	-13.00	-40.74	ERP
3	266.6089	-67.51	5.13	-62.38	-13.00	-49.38	ERP
4	375.9385	-75.00	9.47	-65.53	-13.00	-52.53	ERP

Note: Margin= (Reading+ Correct)- 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	-54.13	4.94	-49.19	-13.00	-36.19	H
2472.6	-52.95	8.46	-44.49	-13.00	-31.49	H
1648.4	-50.34	4.94	-45.40	-13.00	-32.40	V
2472.6	-50.91	8.46	-42.45	-13.00	-29.45	V
Middle Channel (836.6MHz)						
1673.2	-54.12	5.11	-49.01	-13.00	-36.01	H
2509.8	-52.96	8.54	-44.42	-13.00	-31.42	H
1673.2	-50.31	5.11	-45.20	-13.00	-32.20	V
2509.8	-50.91	8.54	-42.37	-13.00	-29.37	V
High Channel (848.8MHz)						
1697.6	-49.15	5.29	-43.86	-13.00	-30.86	H
2546.4	-51.56	8.59	-42.97	-13.00	-29.97	H
1697.6	-49.04	5.29	-43.75	-13.00	-30.75	V
2546.4	-51.41	8.59	-42.82	-13.00	-29.82	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	-53.61	10.54	-43.07	-13.00	-30.07	H
5550.6	-56.35	13.37	-42.98	-13.00	-29.98	H
3700.4	-52.66	10.54	-42.12	-13.00	-29.12	V
5550.6	-56.31	13.37	-42.94	-13.00	-29.94	V
Middle Channel (1880MHz)						
3760.0	-51.71	10.64	-41.07	-13.00	-28.07	H
5640.0	-56.52	13.54	-42.98	-13.00	-29.98	H
3760.0	-51.76	10.64	-41.12	-13.00	-28.12	V
5640.0	-56.51	13.54	-42.97	-13.00	-29.97	V
High Channel (1909.8MHz)						
3819.6	-53.11	10.74	-42.37	-13.00	-29.37	H
5729.4	-56.64	13.71	-42.93	-13.00	-29.93	H
3819.6	-53.85	10.74	-43.11	-13.00	-30.11	V
5729.4	-56.16	13.71	-42.45	-13.00	-29.45	V

For Band 5 Mode

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (826.4MHz)						
1652.8	-58.29	4.94	-53.35	-13.00	-40.35	H
2479.2	-58.71	8.46	-50.25	-13.00	-37.25	H
1652.8	-57.15	4.94	-52.21	-13.00	-39.21	V
2479.2	-58.46	8.46	-50.00	-13.00	-37.00	V
Middle Channel (836.6MHz)						
1672.8	-57.41	5.11	-52.30	-13.00	-39.30	H
2509.2	-57.95	8.54	-49.41	-13.00	-36.41	H
1672.8	-58.34	5.11	-53.23	-13.00	-40.23	V
2509.2	-59.47	8.54	-50.93	-13.00	-37.93	V
High Channel (846.6MHz)						
1693.2	-56.58	5.29	-51.29	-13.00	-38.29	H
2539.8	-59.59	8.59	-51.00	-13.00	-38.00	H
1693.2	-57.01	5.29	-51.72	-13.00	-38.72	V
2539.8	-58.41	8.59	-49.82	-13.00	-36.82	V

For Band 2 Mode

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (1852.4MHz)						
3704.8	-57.59	10.17	-47.42	-13.00	-34.42	H
5557.2	-58.12	14.69	-43.43	-13.00	-30.43	H
3704.8	-58.63	10.17	-48.46	-13.00	-35.46	V
5557.2	-58.82	14.69	-44.13	-13.00	-31.13	V
Middle Channel (1880MHz)						
3760.8	-58.02	10.26	-47.76	-13.00	-34.76	H
5640.0	-57.91	14.78	-43.13	-13.00	-30.13	H
3760.8	-57.65	10.26	-47.39	-13.00	-34.39	V
5640.0	-58.16	14.78	-43.38	-13.00	-30.38	V
High Channel (1907.6MHz)						
3815.2	-58.06	10.59	-47.47	-13.00	-34.47	H
5722.8	-58.13	15.03	-43.10	-13.00	-30.10	H
3815.2	-58.30	10.59	-47.71	-13.00	-34.71	V
5722.8	-57.62	15.03	-42.59	-13.00	-29.59	H

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

Testing is carried out with frequency rang 9kHz to 20GHz, which above 3th 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 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	DC 10.8-13.2 V of nominal voltage declared by manufacturer
-30°C to +50°C	Normal

9.3 Environmental Conditions

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

9.4 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	12	77	0.0920
40	12	73	0.0873
30	12	68	0.0813
20	12	66	0.0789
10	12	71	0.0849
0	12	65	0.0777
-10	12	50	0.0598
-20	12	61	0.0729
-30	12	58	0.0693

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	12	48	0.0255
40	12	45	0.0239
30	12	41	0.0218
20	12	50	0.0266
10	12	46	0.0245
0	12	50	0.0266
-10	12	61	0.0324
-20	12	56	0.0298
-30	12	63	0.0335

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	12	63	0.0753
40	12	59	0.0705
30	12	54	0.0645
20	12	52	0.0622
10	12	57	0.0681
0	12	51	0.0610
-10	12	36	0.0430
-20	12	47	0.0562
-30	12	44	0.0526

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	12	72	0.0383
40	12	69	0.0367
30	12	65	0.0346
20	12	74	0.0394
10	12	70	0.0372
0	12	74	0.0394
-10	12	75	0.0399
-20	12	60	0.0319
-30	12	64	0.0340

For Cellular Band EDGE 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	12	65	0.0777
40	12	61	0.0729
30	12	56	0.0669
20	12	54	0.0645
10	12	59	0.0705
0	12	53	0.0634
-10	12	38	0.0454
-20	12	49	0.0586
-30	12	46	0.0550

For PCS Band EDGE 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	12	67	0.0356
40	12	64	0.0340
30	12	60	0.0319
20	12	69	0.0367
10	12	65	0.0346
0	12	69	0.0367
-10	12	70	0.0372
-20	12	55	0.0293
-30	12	59	0.0314

For WCDMA Band 5 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	12	69	0.0825
40	12	65	0.0777
30	12	60	0.0717
20	12	58	0.0693
10	12	63	0.0753
0	12	57	0.0681
-10	12	42	0.0502
-20	12	53	0.0634
-30	12	50	0.0598

For WCDMA Band 2 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	12	64	0.0340
40	12	51	0.0271
30	12	47	0.0250
20	12	56	0.0298
10	12	42	0.0223
0	12	31	0.0165
-10	12	77	0.0410
-20	12	60	0.0319
-30	12	50	0.0266

For HSDPA Band 5 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	12	67	0.0801
40	12	63	0.0753
30	12	58	0.0693
20	12	56	0.0669
10	12	61	0.0729
0	12	55	0.0657
-10	12	40	0.0478
-20	12	51	0.0610
-30	12	48	0.0574

For HSDPA Band 2 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	12	59	0.0314
40	12	46	0.0245
30	12	42	0.0223
20	12	51	0.0271
10	12	37	0.0197
0	12	26	0.0138
-10	12	72	0.0383
-20	12	55	0.0293
-30	12	42	0.0223

For HSUPA Band 5 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	12	75	0.0896
40	12	71	0.0849
30	12	66	0.0789
20	12	64	0.0765
10	12	69	0.0825
0	12	63	0.0753
-10	12	48	0.0574
-20	12	59	0.0705
-30	12	56	0.0669

For HSUPA Band 2 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	12	71	0.0378
40	12	58	0.0309
30	12	54	0.0287
20	12	63	0.0335
10	12	49	0.0261
0	12	38	0.0202
-10	12	84	0.0447
-20	12	67	0.0356
-30	12	54	0.0287

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	10.8	69	0.0825
	12	66	0.0789
	13.2	67	0.0800
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	10.8	51	0.0271
	12	50	0.0266
	13.2	52	0.0277
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	10.8	47	0.0562
	12	52	0.0622
	13.2	53	0.0634
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	10.8	73	0.0388
	12	74	0.0394
	13.2	74	0.0394

Reference Frequency(Middle Channel): EDGE 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	10.8	52	0.0621
	12	54	0.0645
	13.2	53	0.0634
Reference Frequency(Middle Channel): EDGE 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	10.8	66	0.0351
	12	69	0.0367
	13.2	71	0.0378
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	10.8	51	0.0610
	12	58	0.0693
	13.2	59	0.0705
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	10.8	54	0.0287
	12	56	0.0298
	13.2	58	0.0309

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	10.8	54	0.0645
	12	56	0.0669
	13.2	57	0.0681
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	10.8	53	0.0282
	12	51	0.0271
	13.2	48	0.0255
Reference Frequency(Middle Channel): HSUPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	10.8	65	0.0777
	12	64	0.0765
	13.2	66	0.0789

Reference Frequency(Middle Channel): HSUPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	10.8	64	0.0340
	12	63	0.0335
	13.2	65	0.0346

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