FCC Part 22H & 24E
Measurement and Test Report

For

Universal Physicians, LLC

7747 Supreme Ave NW North Canton, OH 44720 United States

FCC ID: 2AJG4-FH911A

FCC Rules:	FCC Part 22H, FCC Part 24E
Product Description:	Emergency Help Device
Tested Model:	FH911A
Report No.:	STR18098182I
Sample Receipt Date:	2019-09-13
Tested Date:	2019-09-14 to 2019-09-28
Issued Date:	2019-09-28
Tested By:	Jason Su / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy So / PSQ Manager

Prepared By:

Shenzhen SEM Test Technology Co., Ltd.
1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,
Bao'an District, Shenzhen, P.R.C.（518101）
Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Universal Physicians, LLC
Address of applicant:	7747 Supreme Ave NW North Canton, OH 44720 United States
Manufacturer:	Soan Electronic Technology Co., Ltd
Address of manufacturer:	3/F, Building D, Xinhelianyou industrial area, No.28 industrial road, fuyong district, Bao'an, ShenZhen, China.

General Description of EUT:	
Product Name:	Emergency Help Device
Brand Name:	FastHelp
Model No.:	FH911A
Adding Model(s):	/
Rated Voltage:	Battery DC 3.7V
Battery:	720mAh
Adapter Model:	/
Software Version:	/
Hardware Version:	/
Device Category:	Portable Device
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT:	
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: 22.61dBm, WCDMA Band 5: 22.58dBm
Type of Emission:	WCDMA Band 2: 4M13F9W WCDMA Band 5: 4M13F9W
Type of Modulation:	BPSK, QPSK, 16QAM
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 2: -0.12dBi, WCDMA Band 5: -2.5dBi

1.2 Test Standards

The following report is prepared on behalf of the Universal Physicians, LLC 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-E: 2016 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 v03r01 shall be performed also.

1.4 Test Facility

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

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.

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	WCDMA Band 5	Low, Middle, High Channels
TM2	HSDPA Band 5	Low, Middle, High Channels
TM3	HSUPA Band 5	Low, Middle, High Channels
TM4	WCDMA Band 2	Low, Middle, High Channels
TM5	HSDPA Band 2	Low, Middle, High Channels
TM6	HSUPA Band 2	Low, Middle, High Channels

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
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, GPRS, 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
/	/	/	/

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Adapter	QINGY	YMS-0501000	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	0.6	Unshielded	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	Conducted	±0.42dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
SEMT-1075	Communication Tester	Rohde & Schwarz	CMW500	148650	2018-05-22	2019-05-21
SEMT-1063	GSM Tester	Rohde & Schwarz	CMU200	114403	2018-05-22	2019-05-21
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2018-05-22	2019-05-21
SEMT-1079	Spectrum Analyzer	Agilent	N9020A	US47140102	2018-05-22	2019-05-21
SEMT-1080	Signal Generator	Agilent	83752A	3610A01453	2018-05-22	2019-05-21
SEMT-1081	Vector Signal Generator	Agilent	N5182A	MY47070202	2018-05-22	2019-05-21
SEMT-1028	Power Divider	Weinschel	1506A	PM204	2018-05-22	2019-05-21
SEMT-1082	Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2018-05-22	2019-05-21
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2018-05-22	2019-05-21
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2018-05-22	2019-05-21
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2018-05-22	2019-05-21
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2018-05-22	2019-05-21
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2020-06-07
SEMT-1068	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2020-06-07
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-08	2020-06-07
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-08	2020-06-07
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2018-05-22	2019-05-21

SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2018-05-22	2019-05-21
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2018-05-22	2019-05-21
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2018-03-19	2021-03-18
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2018-05-22	2019-05-21
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2018-05-22	2019-05-21
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2018-05-22	2019-05-21
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2018-03-19	2019-03-18
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2018-03-19	2019-03-18
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2018-03-19	2019-03-18
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2018-03-19	2019-03-18
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2018-03-19	2019-03-18
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2018-03-19	2019-03-18

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 1.1307, § 2.1093	RF Exposure	Compliant
§ 22.913 (a), § 24.232 (c)	RF Output Power	Compliant
§ 24.51	Peak-to-average Ratio (PAR) of Transmitter	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

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

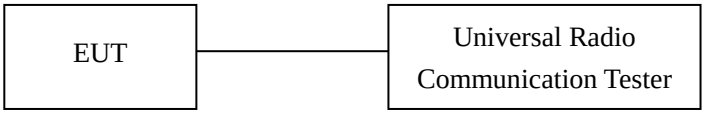
4.1 Standard Applicable

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 603E-2016 and ANSI C63.26-2015 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:	23 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.4 Summary of Test Results/Plots

Max. Radiated Power

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	23.13	1.5	0	H	1.5	0	21.63	38.45
826.4	22.94	1.5	0	V	1.5	0	21.44	38.45
Middle Channel								
836.6	23.29	1.5	0	H	1.5	0	21.79	38.45
836.6	21.76	1.5	0	V	1.5	0	20.26	38.45
High Channel								
846.6	21.77	1.5	0	H	1.5	0	20.27	38.45
846.6	22.73	1.5	0	V	1.5	0	21.23	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	21.13	1.5	0	H	1.5	0	19.63	38.45
826.4	20.02	1.5	0	V	1.5	0	18.52	38.45
Middle Channel								
836.6	21.45	1.5	0	H	1.5	0	19.95	38.45
836.6	21.51	1.5	0	V	1.5	0	20.01	38.45
High Channel								
846.6	21.61	1.5	0	H	1.5	0	20.11	38.45
846.6	20.55	1.5	0	V	1.5	0	19.05	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	21.06	1.5	0	H	1.5	0	19.56	38.45
826.4	20.31	1.5	0	V	1.5	0	18.81	38.45
Middle Channel								
836.6	20.42	1.5	0	H	1.5	0	18.92	38.45
836.6	20.53	1.5	0	V	1.5	0	19.03	38.45
High Channel								
846.6	21.19	1.5	0	H	1.5	0	19.69	38.45
846.6	21.74	1.5	0	V	1.5	0	20.24	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	16.62	1.5	0	H	1.9	7.7	22.42	33
1852.4	15.95	1.5	0	V	1.9	7.7	21.75	33
Middle Channel								
1880.0	14.82	1.5	0	H	1.9	7.7	20.62	33
1880.0	15.88	1.5	0	V	1.9	7.7	21.68	33
High Channel								
1907.6	15.56	1.5	0	H	1.9	7.7	21.36	33
1907.6	15.91	1.5	0	V	1.9	7.7	21.71	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	13.92	1.5	0	H	1.9	7.7	19.72	33
1852.4	13.35	1.5	0	V	1.9	7.7	19.15	33
Middle Channel								
1880.0	14.59	1.5	0	H	1.9	7.7	20.39	33
1880.0	13.12	1.5	0	V	1.9	7.7	18.92	33
High Channel								
1907.6	14.46	1.5	0	H	1.9	7.7	20.26	33
1907.6	13.02	1.5	0	V	1.9	7.7	18.82	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	14.28	1.5	0	H	1.9	7.7	20.08	33
1852.4	13.77	1.5	0	V	1.9	7.7	19.57	33
Middle Channel								
1880.0	13.79	1.5	0	H	1.9	7.7	19.59	33
1880.0	14.25	1.5	0	V	1.9	7.7	20.05	33
High Channel								
1907.6	14.37	1.5	0	H	1.9	7.7	20.17	33
1907.6	14.56	1.5	0	V	1.9	7.7	20.36	33

Note: Result = Substitude - Cable loss + Antenna Gain

Max. Conducted Output Power

For WCDMA Band 5

Test Mode	Channel	Frequency (MHz)	Average Power (dBm)	FCC Part 22.913 Limit (dBm)
WCDMA	Low Channel	826.4	22.58	38.45
	Middle Channel	836.6	22.54	38.45
	High Channel	846.6	22.54	38.45
HSDPA	Low Channel	826.4	21.60	38.45
	Middle Channel	836.6	21.62	38.45
	High Channel	846.6	21.64	38.45
HSUPA	Low Channel	826.4	21.09	38.45
	Middle Channel	836.6	21.34	38.45
	High Channel	846.6	21.17	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	22.56	33.00
	Middle Channel	1880.0	22.37	33.00
	High Channel	1907.6	22.61	33.00
HSDPA	Low Channel	1852.4	20.32	33.00
	Middle Channel	1880.0	20.38	33.00
	High Channel	1907.6	20.38	33.00
HSUPA	Low Channel	1852.4	20.46	33.00
	Middle Channel	1880.0	20.32	33.00
	High Channel	1907.6	20.65	33.00

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

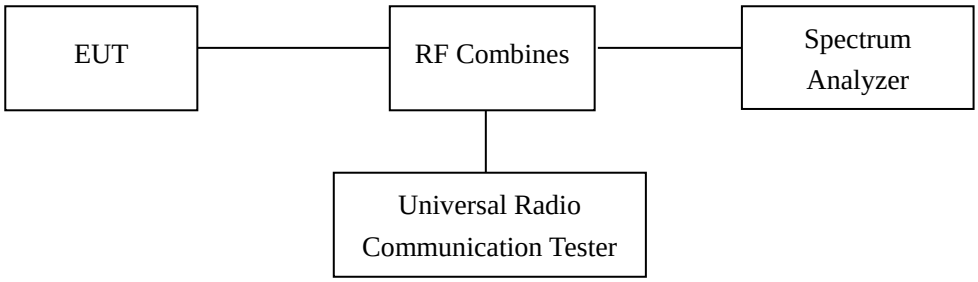
5.1 Standard Applicable

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. Record the maximum PAPR level associated with a probability of 0.1%.

Test Configuration for the emission bandwidth testing:



5.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.4 Summary of Test Results

Only the worst case was selected to record

For WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9400	1880	4.74	13
HSDPA	9400	1880	5.32	13
HSUPA	9400	1880	4.31	13

6. Emission Bandwidth

6.1 Standard Applicable

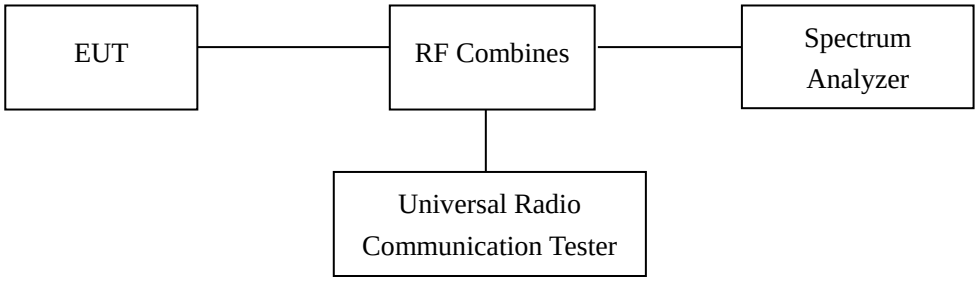
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §24.238(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

6.2 Test 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:	23 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

6.4 Summary of Test Results/Plots

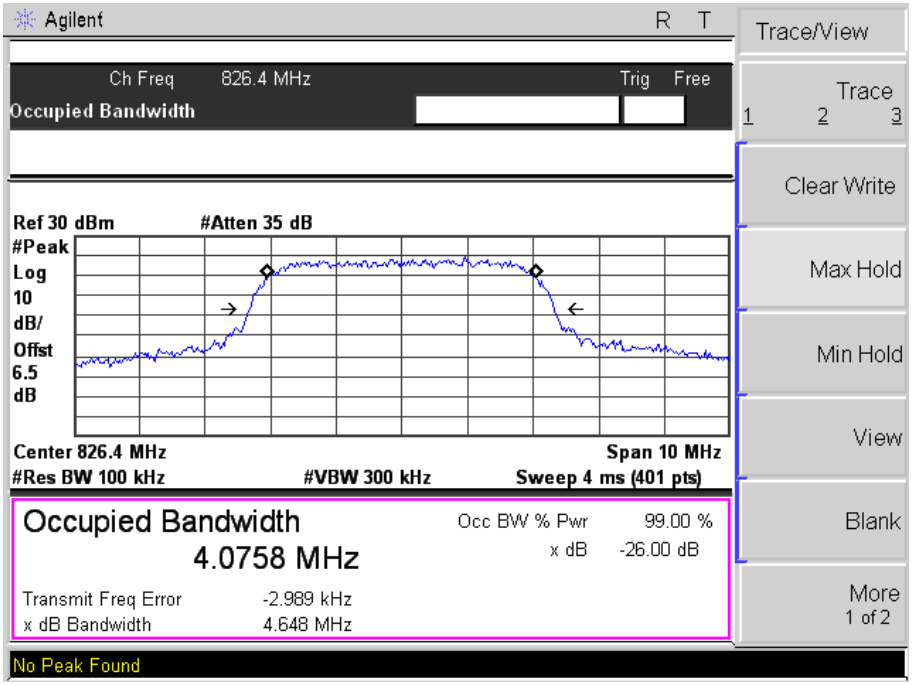
For Band 5

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	4132	826.4	4.0758	4.648
	4183	836.6	4.1272	4.702
	4233	846.6	4.0890	4.679
HSDPA	4132	826.4	4.0912	4.676
	4183	836.6	4.1090	4.647
	4233	846.6	4.0650	4.675
HSUPA	4132	826.4	4.0967	4.640
	4183	836.6	4.0945	4.639
	4233	846.6	4.0949	4.701

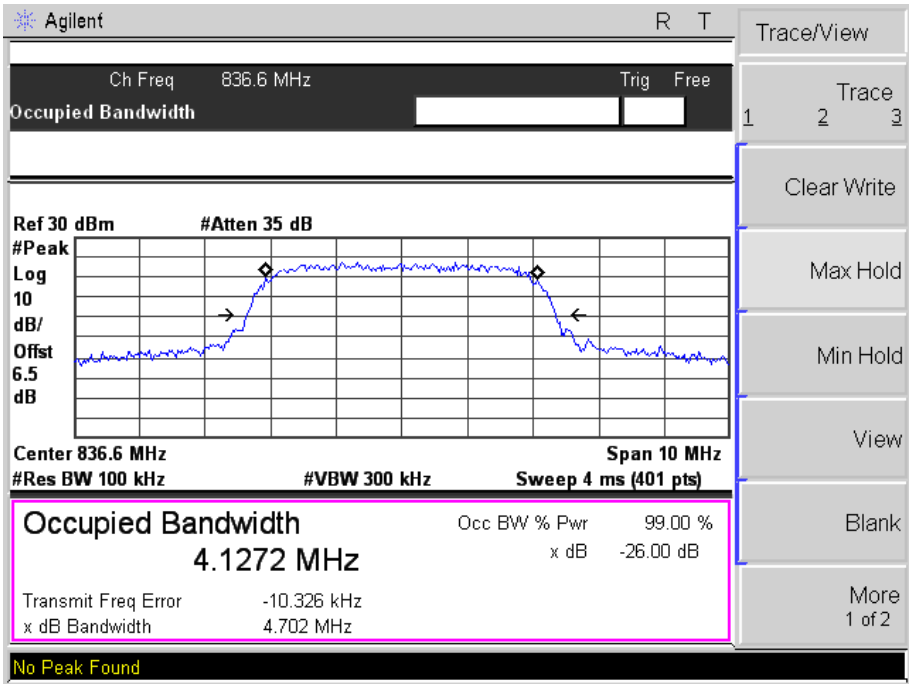
For Band 2

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA	9262	1852.4	4.1063	4.690
	9400	1880.0	4.1290	4.693
	9538	1907.6	4.1167	4.711
HSDPA	9262	1852.4	4.1081	4.697
	9400	1880.0	4.1131	4.692
	9538	1907.6	4.1225	4.693
HSUPA	9262	1852.4	4.1349	4.722
	9400	1880.0	4.1266	4.741
	9538	1907.6	4.1408	4.683

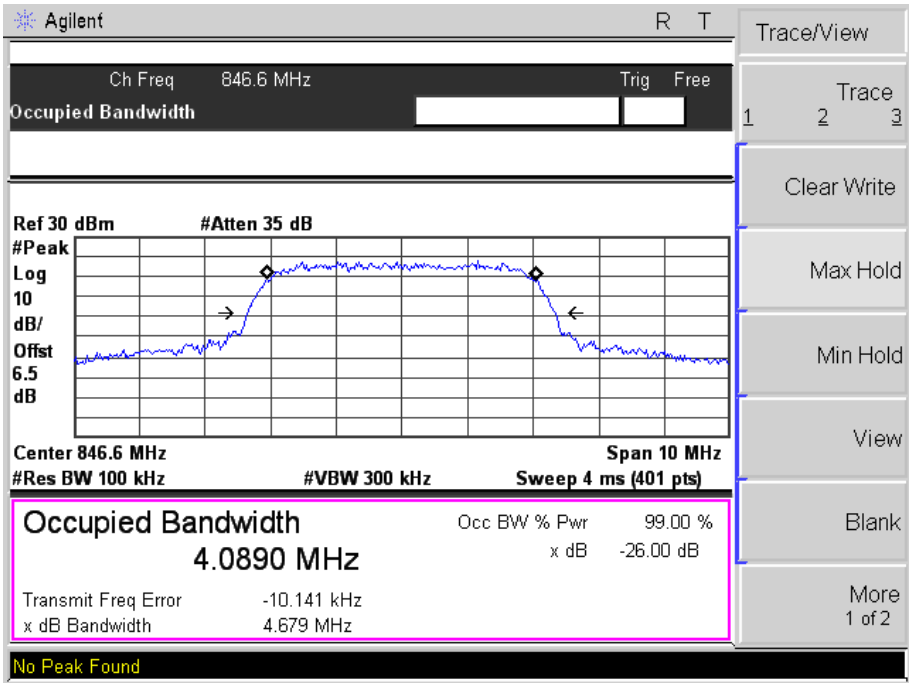
For Band V
WCDMA Low Channel



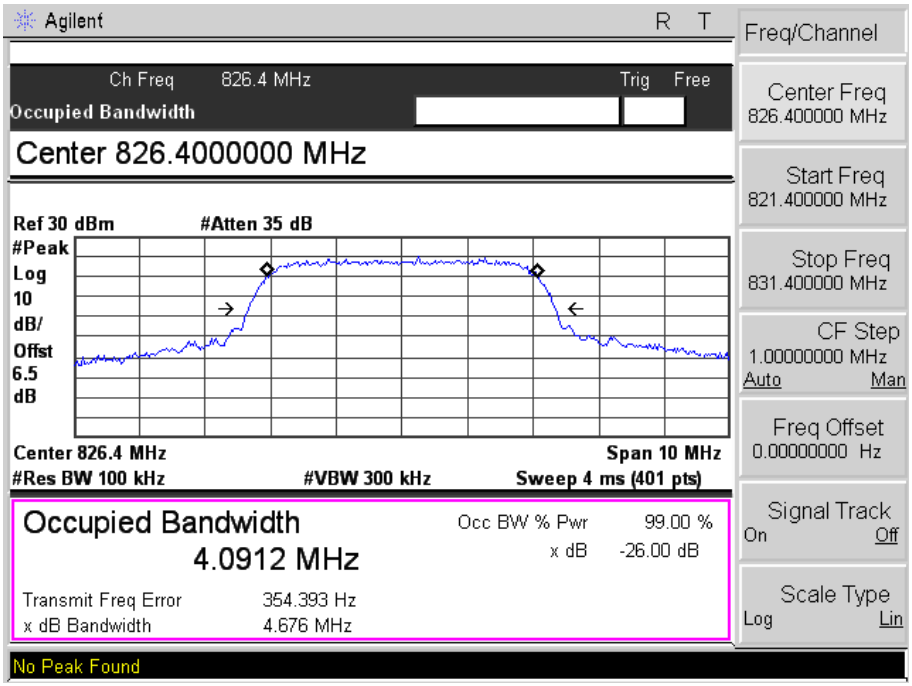
WCDMA Middle Channel



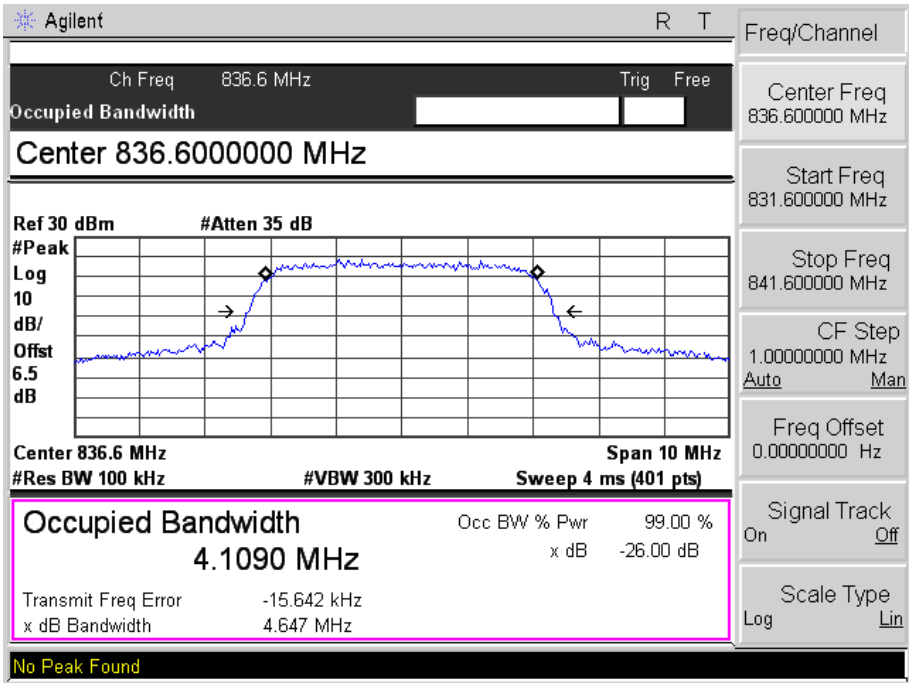
WCDMA High Channel



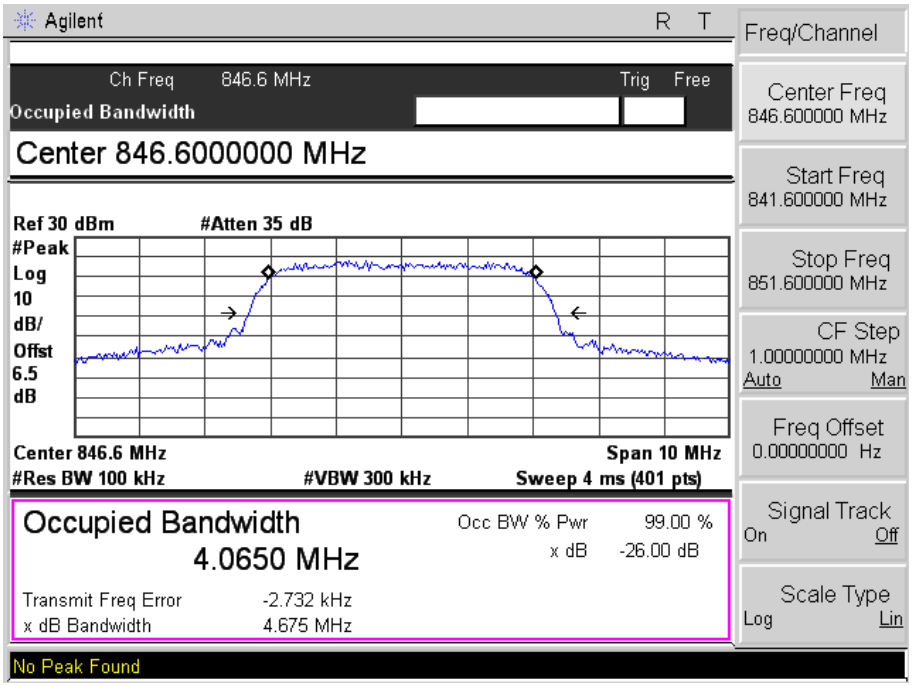
HSDPA Low Channel



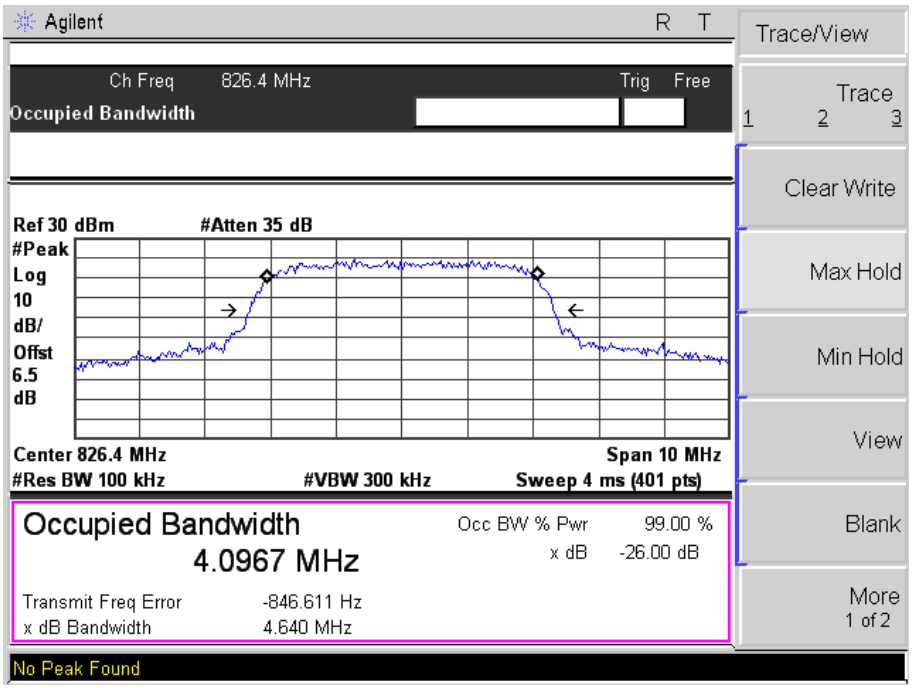
HSDPA Middle Channel



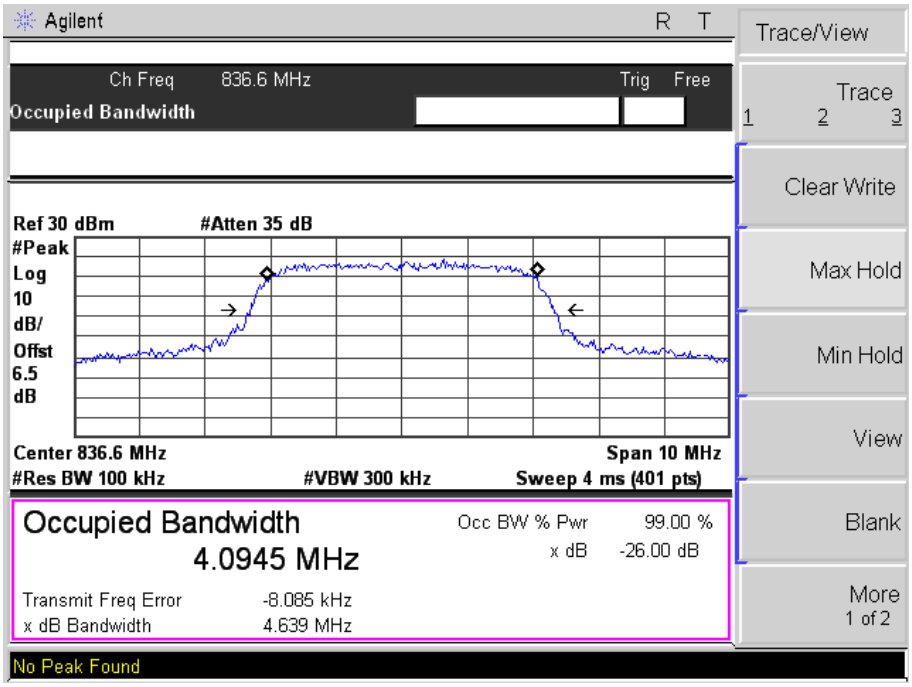
HSDPA High Channel



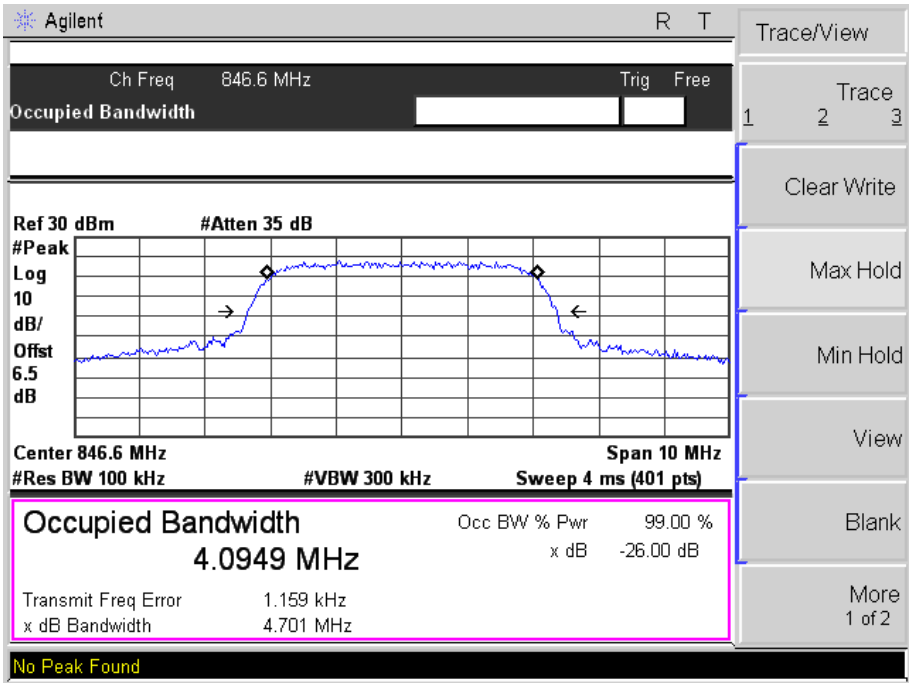
HSUPA Low Channel



HSUPA Middle Channel

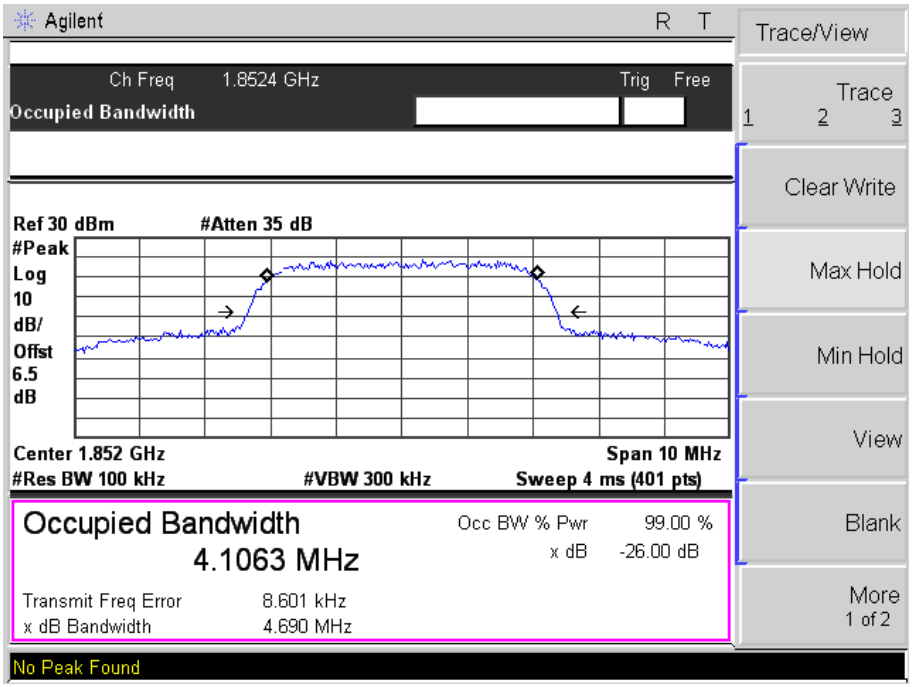


HSUPA High Channel

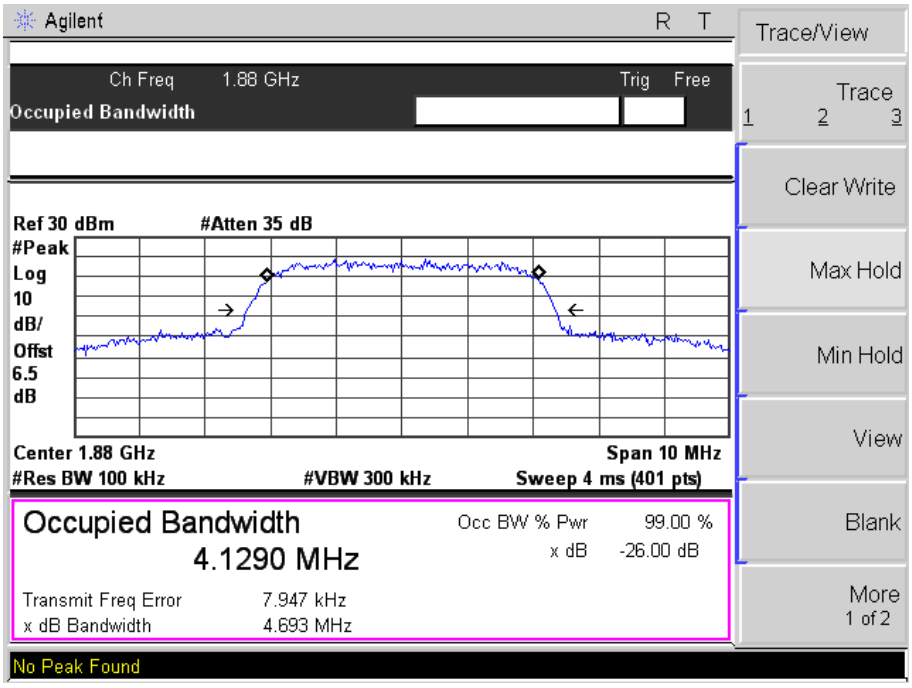


For Band II

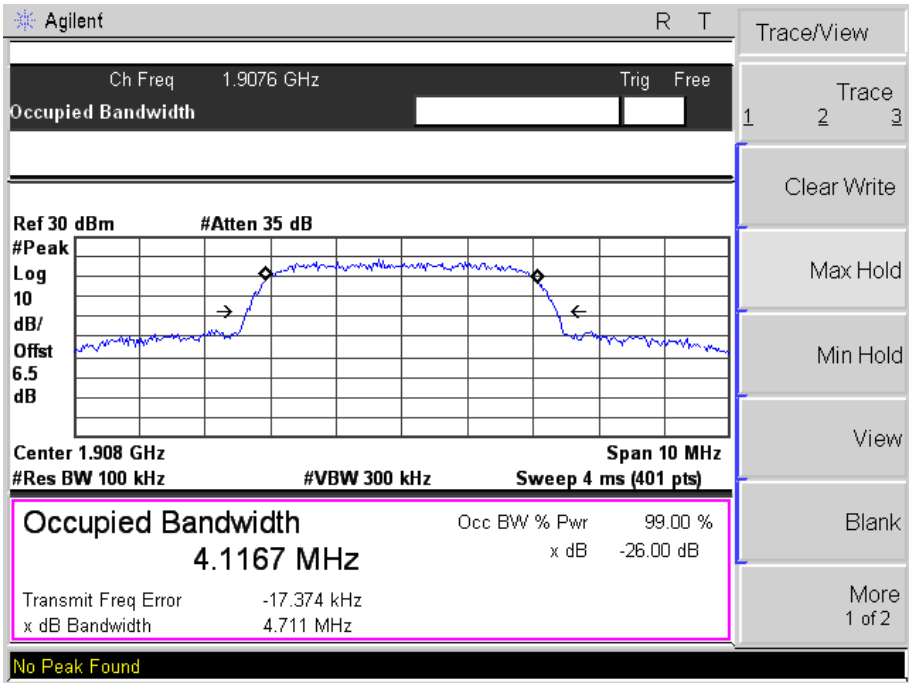
WCDMA Low Channel



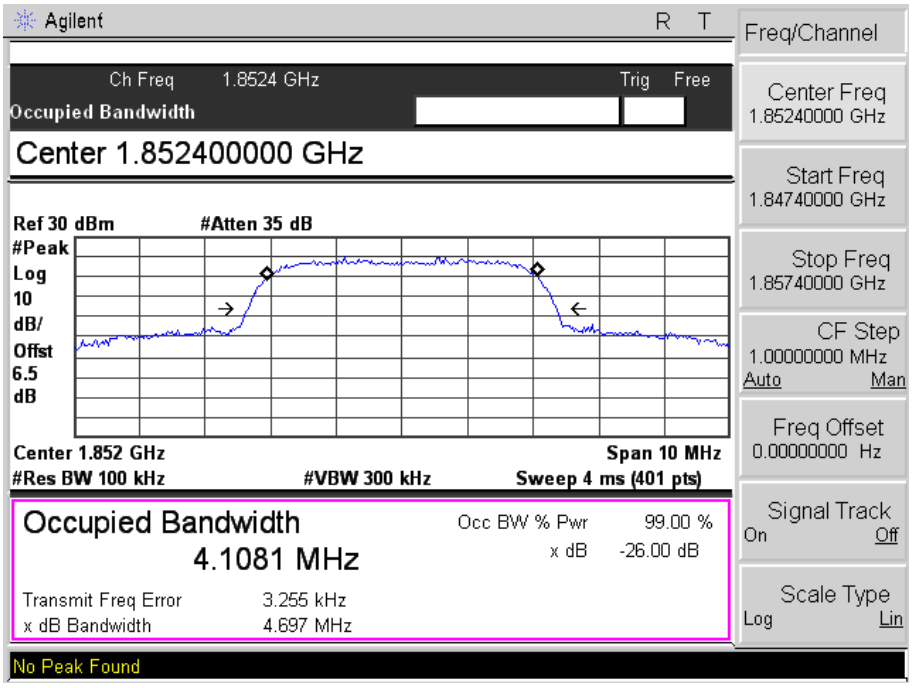
WCDMA Middle Channel



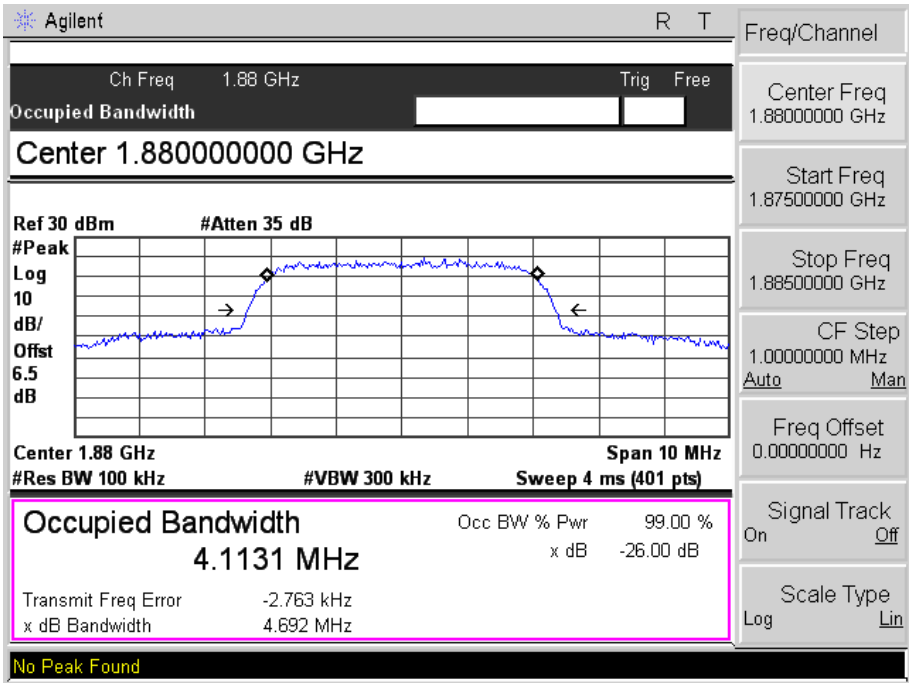
WCDMA High Channel



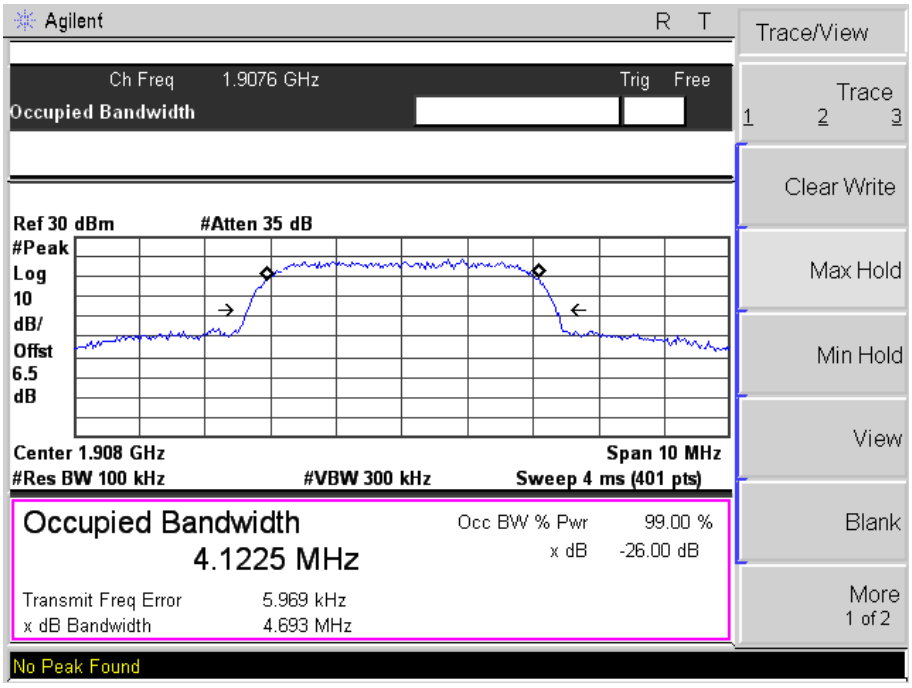
HSDPA Low Channel



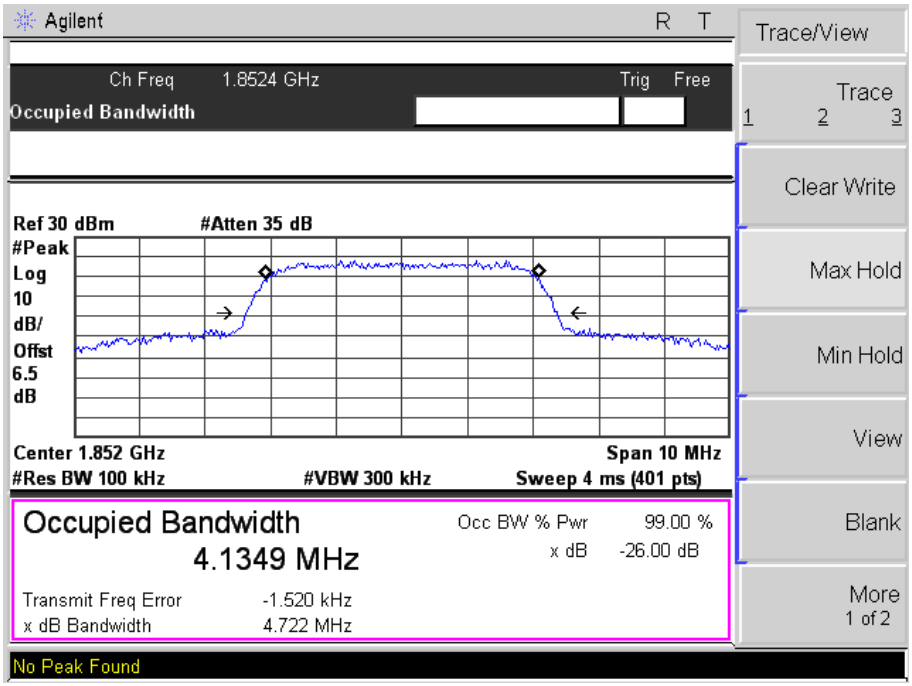
HSDPA Middle Channel



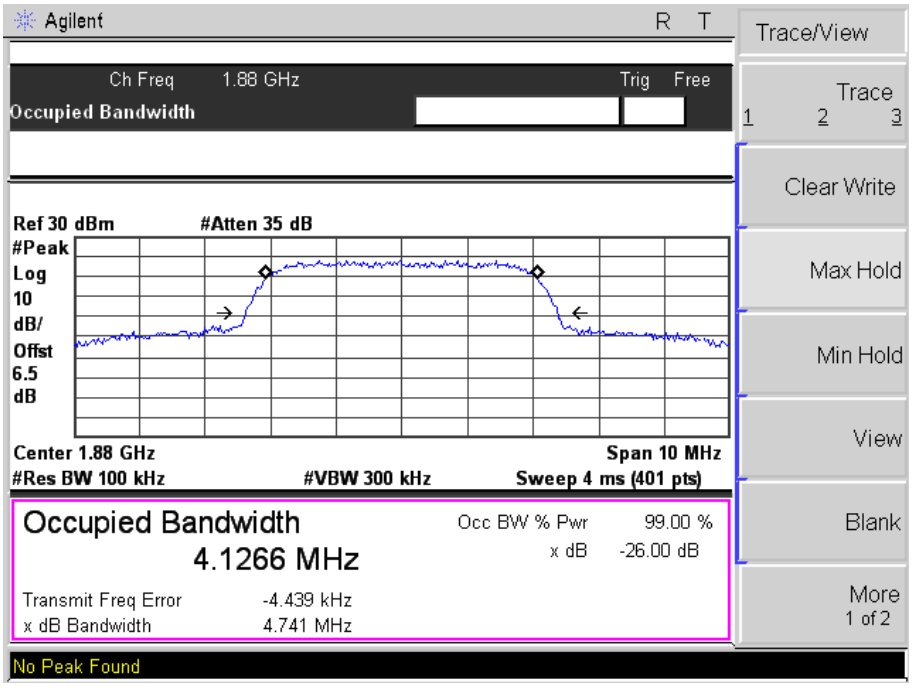
HSDPA High Channel



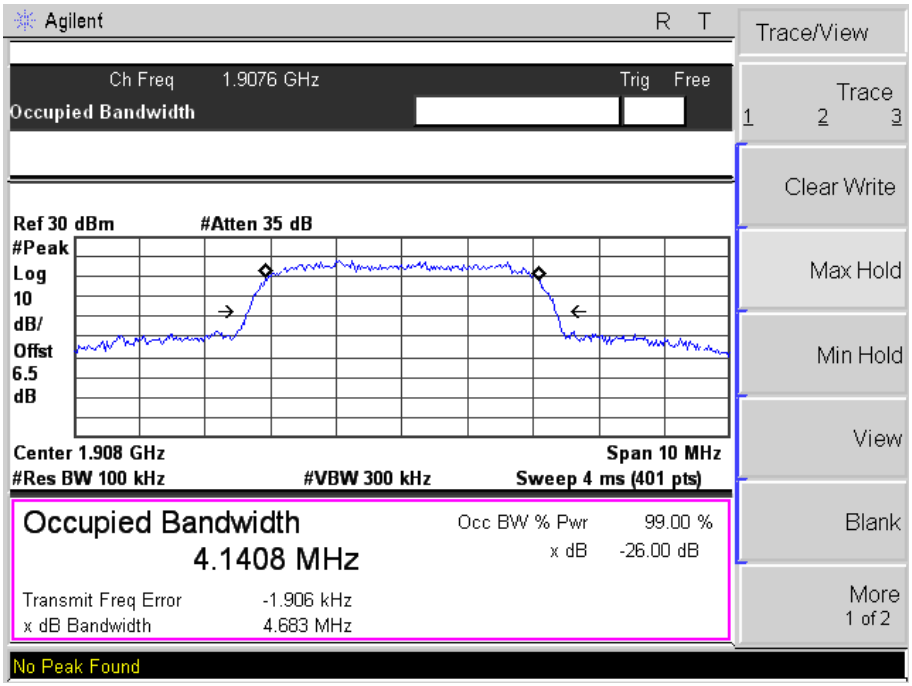
HSUPA Low Channel



HSUPA Middle Channel



HSUPA High Channel



7. Out of Band Emissions at Antenna Terminal

7.1 Standard Applicable

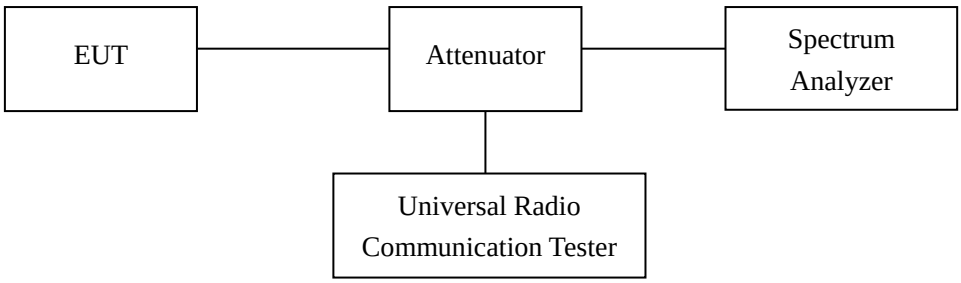
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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 10th harmonic.

Test Configuration for the out of band emissions testing:



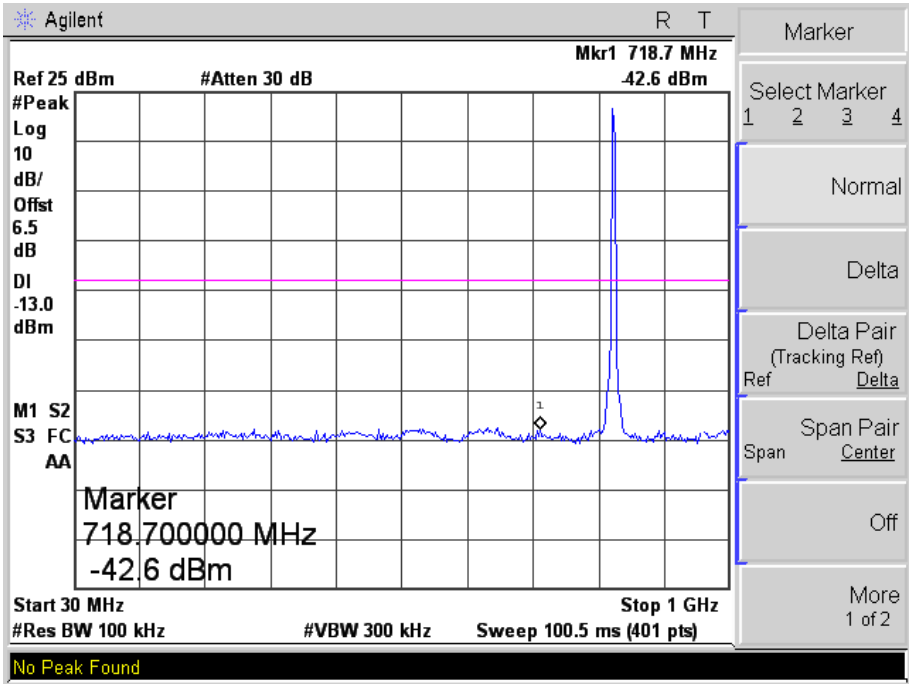
7.3 Environmental Conditions

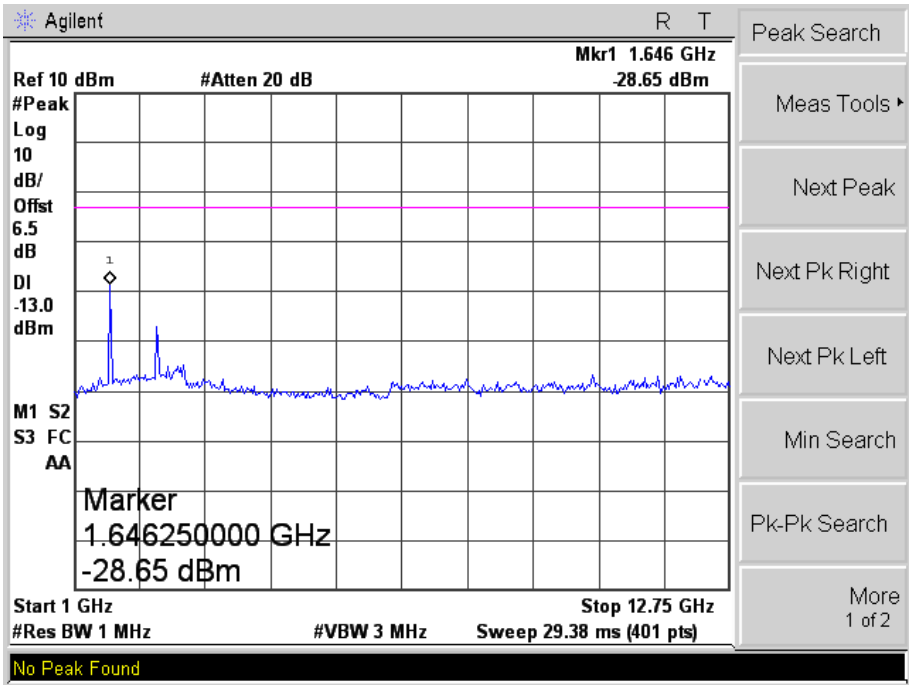
Temperature:	23 °C
Relative Humidity:	54%
ATM Pressure:	1018 mbar

7.4 Summary of Test Results/Plots

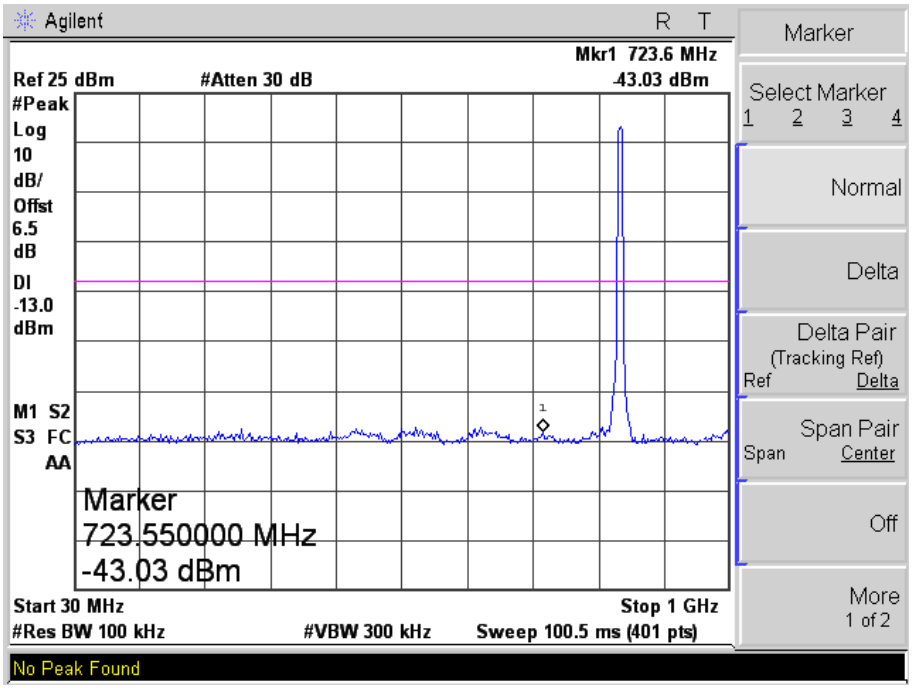
For Band V

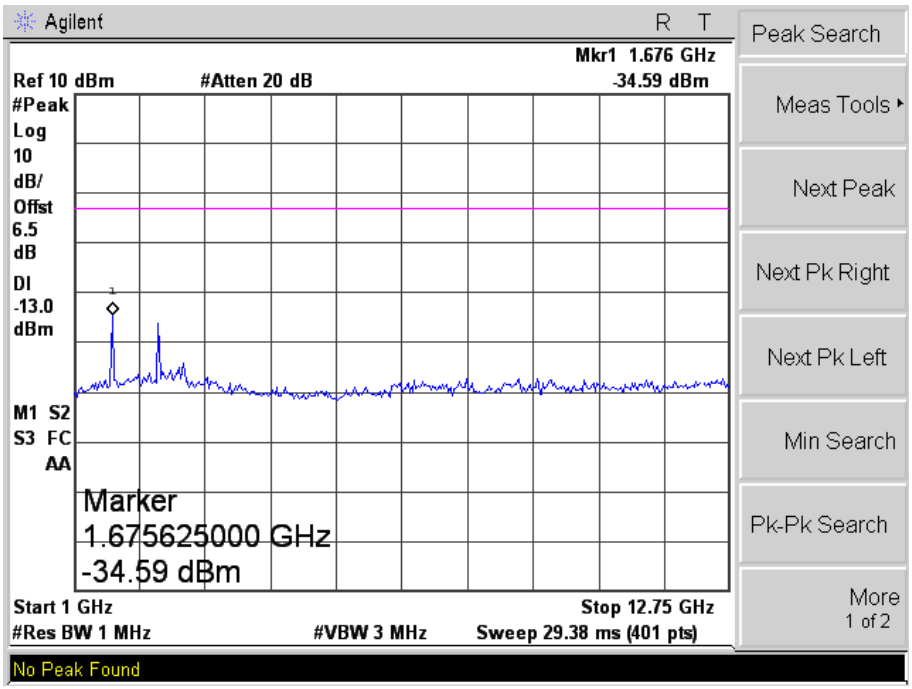
WCDMA Low Channel



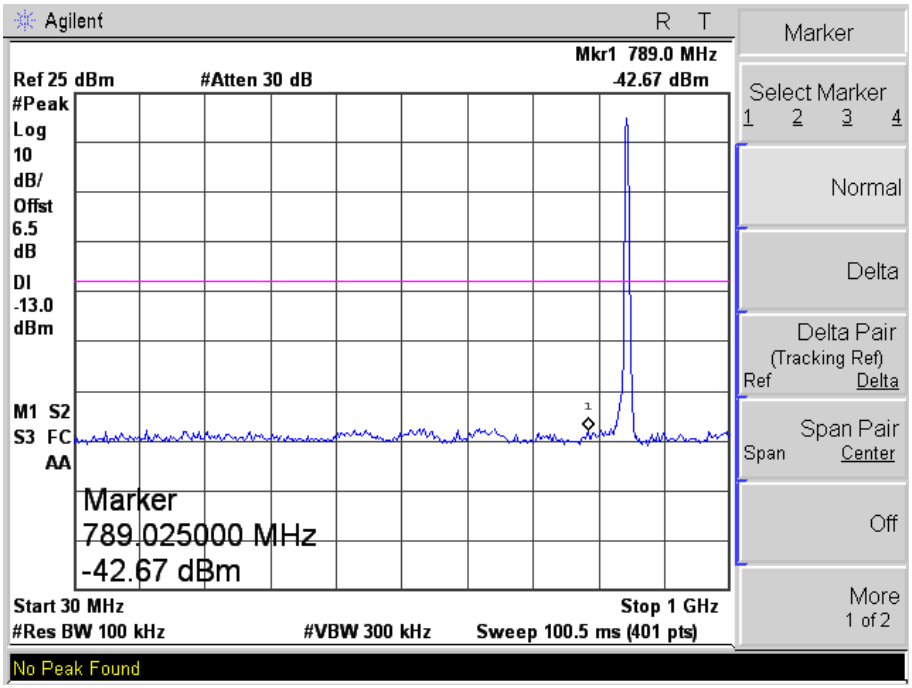


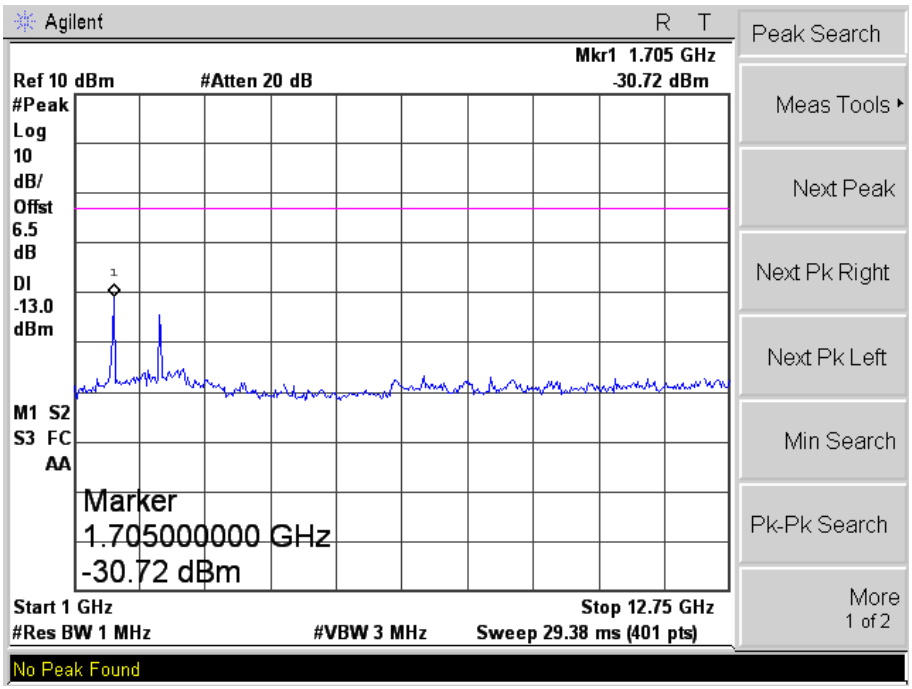
WCDMA Middle Channel



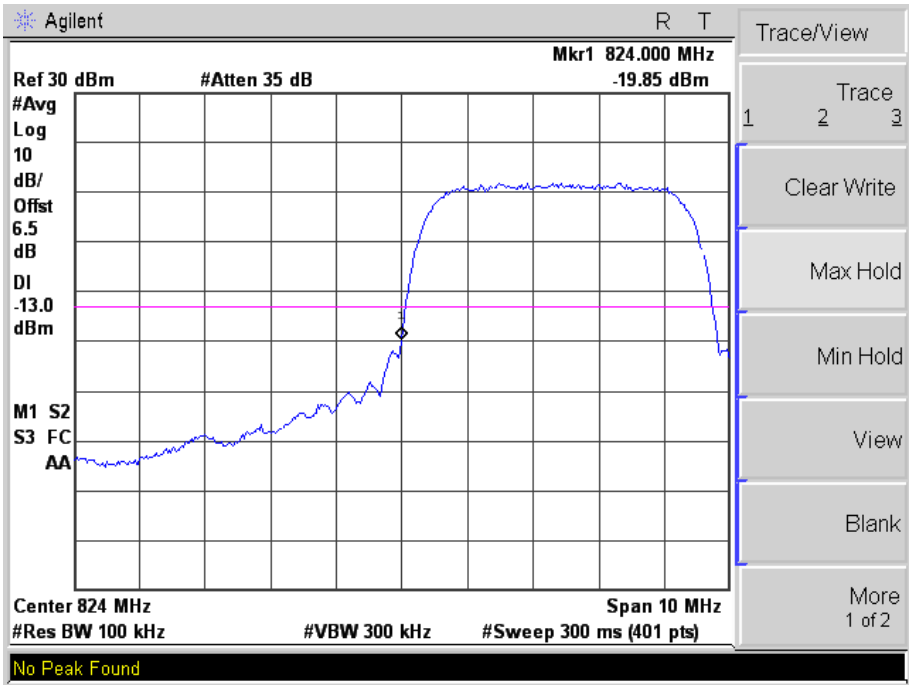


WCDMA High Channel

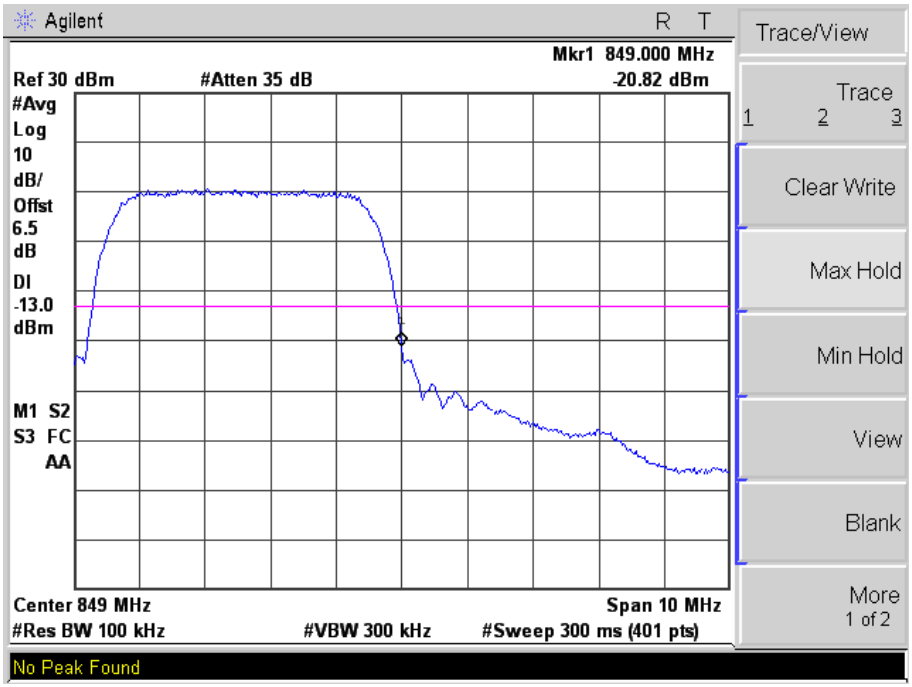




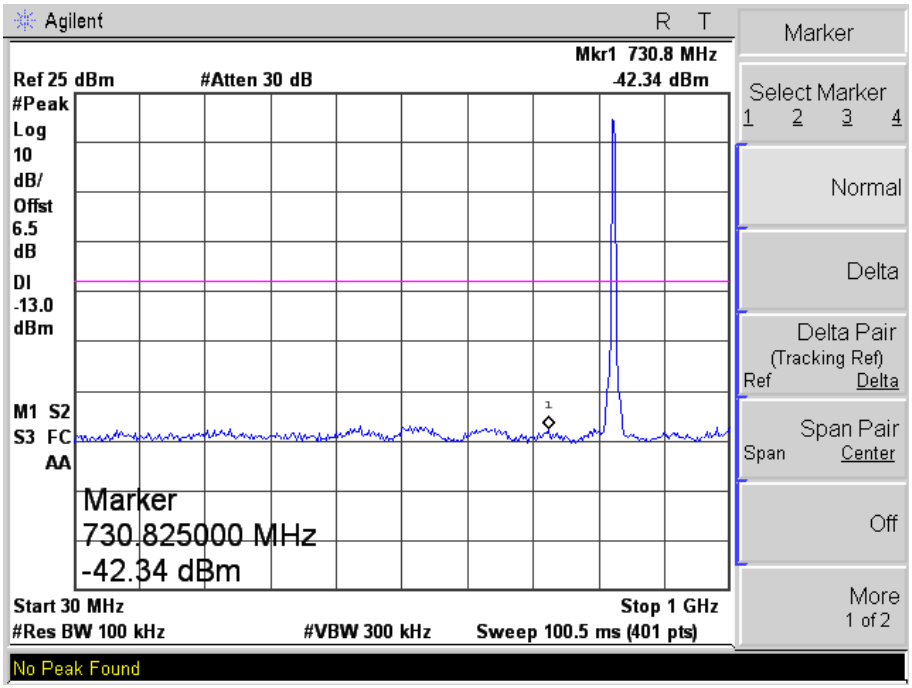
WCDMA Low Band Spurious Emission

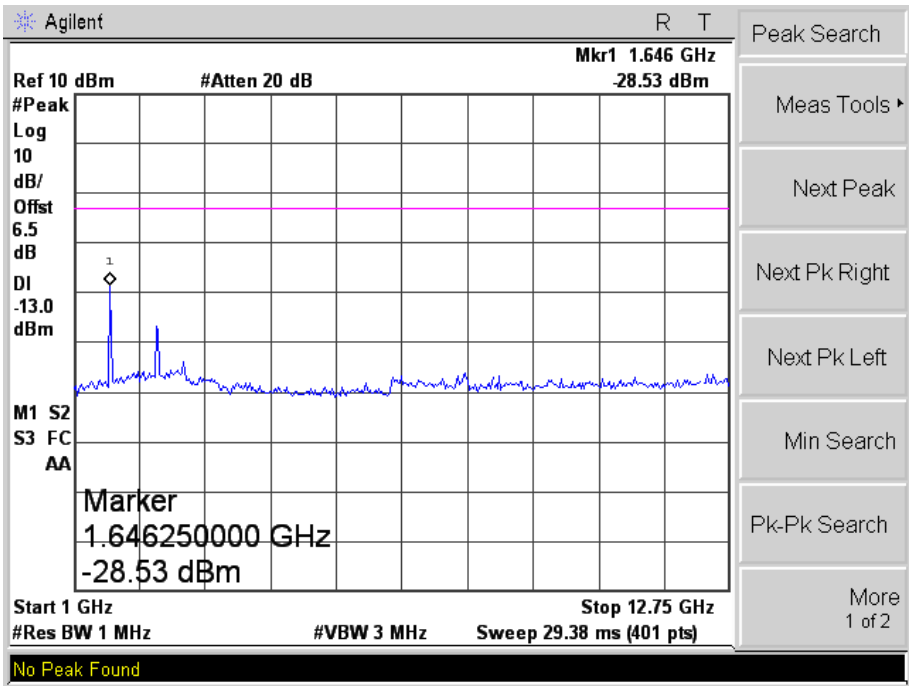


WCDMA High Band Spurious Emission

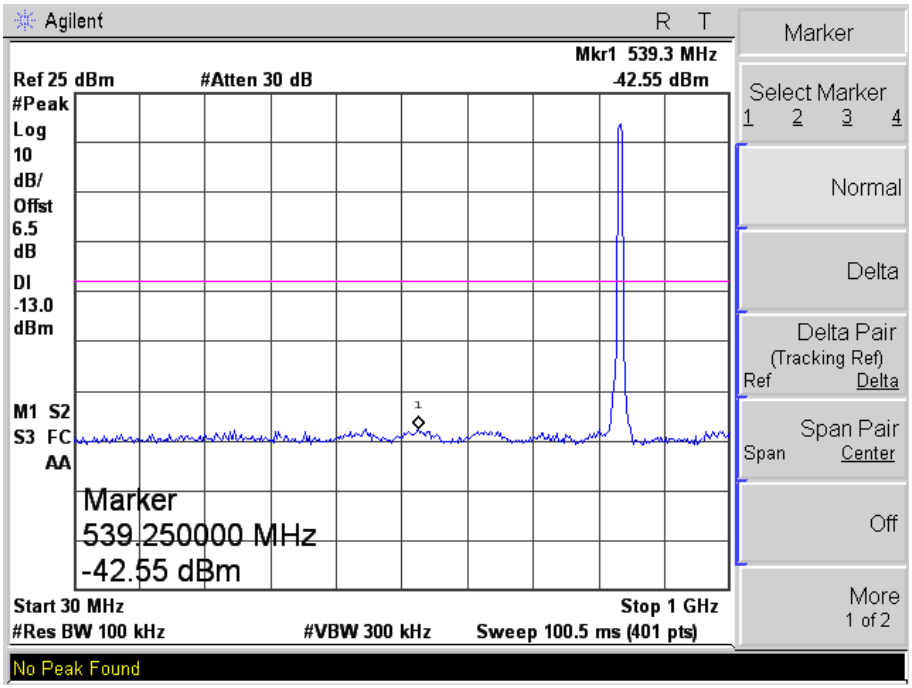


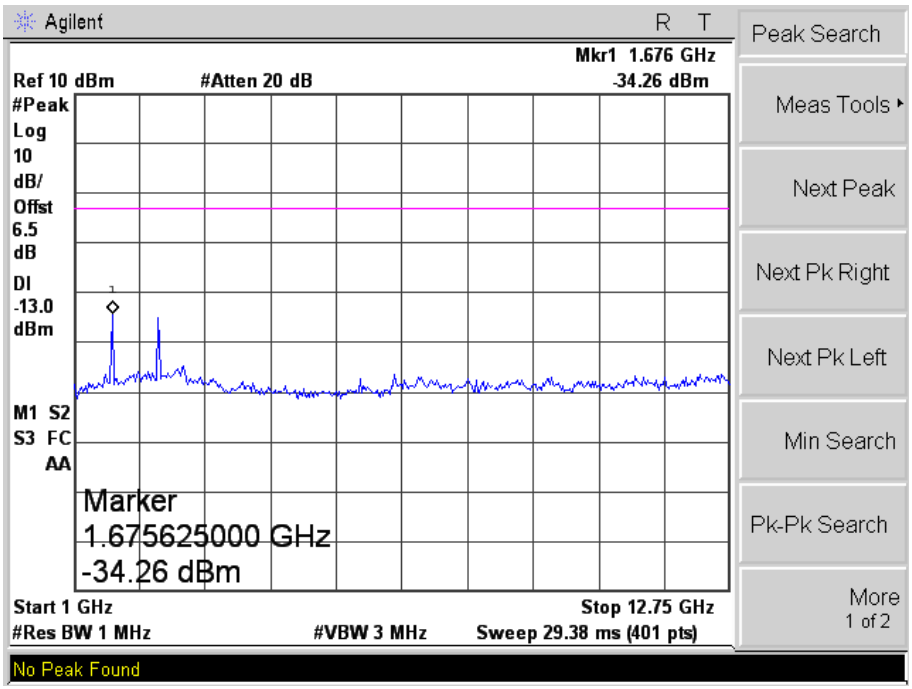
HSDPA Low Channel



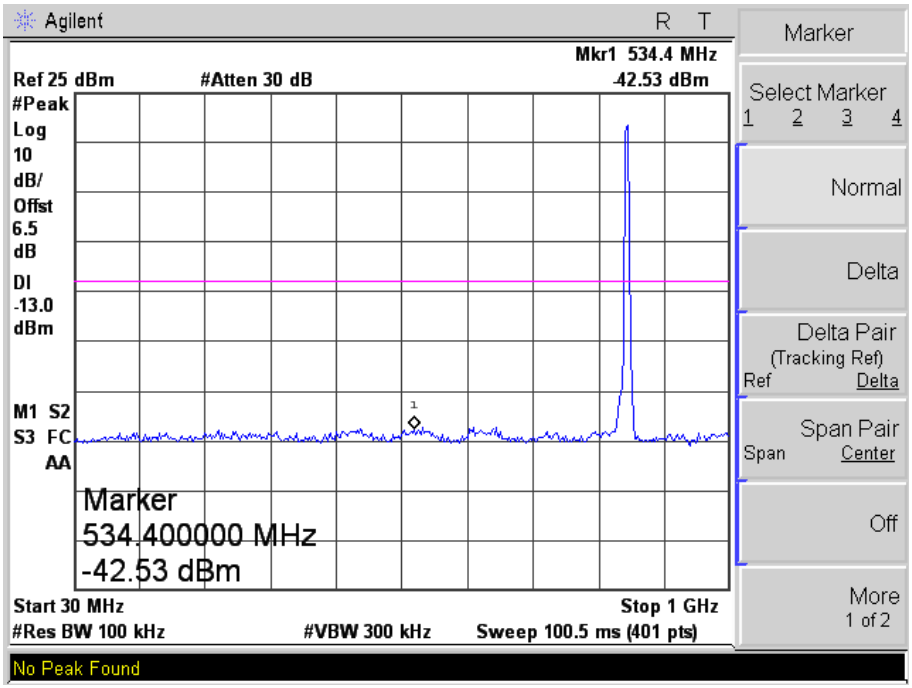


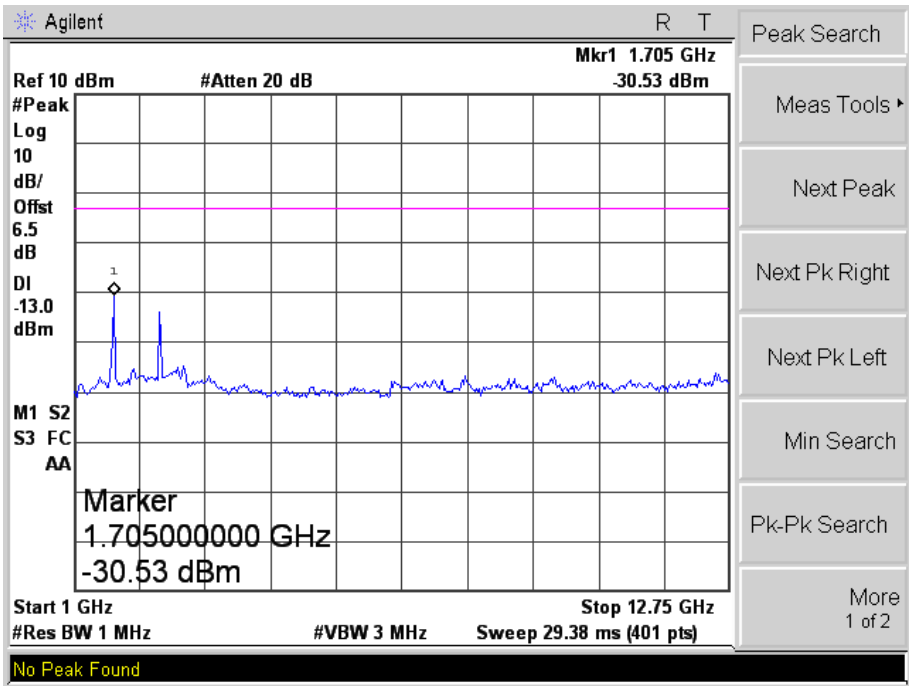
HSDPA Middle Channel



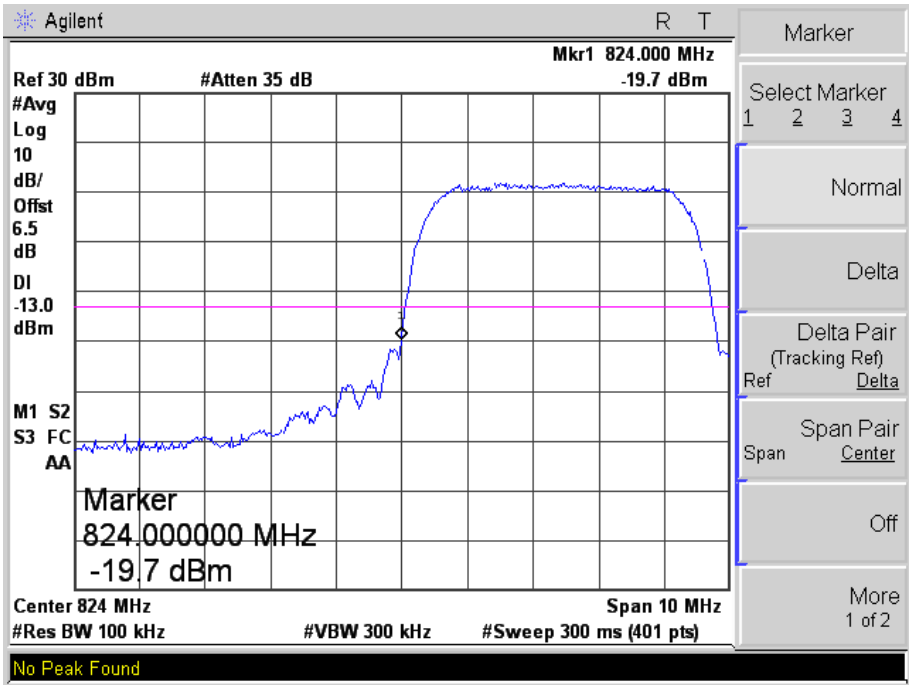


HSDPA High Channel

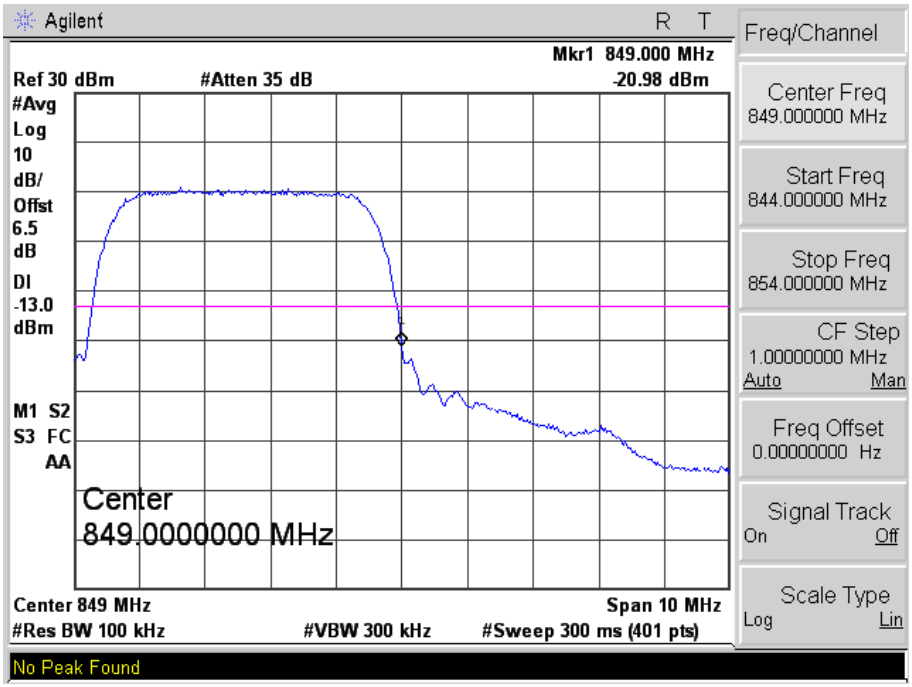




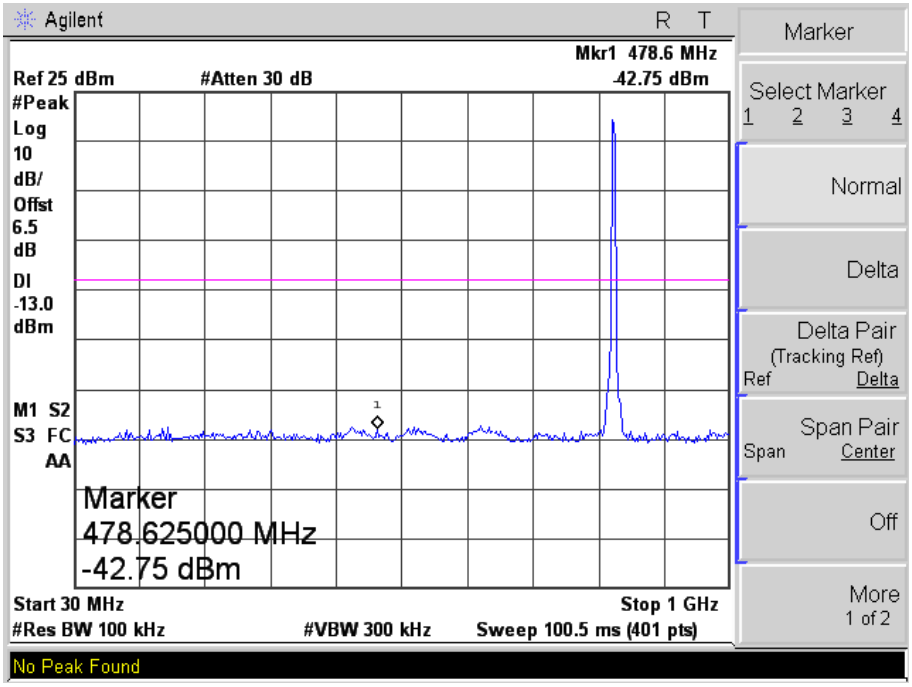
HSDPA Low Band Spurious Emission

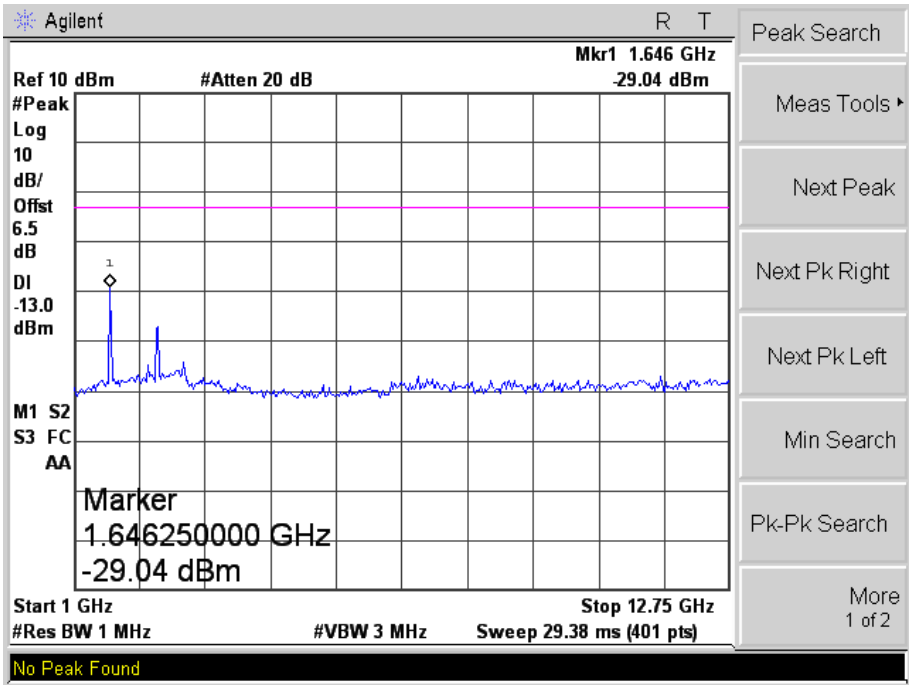


HSDPA High Band Spurious Emission

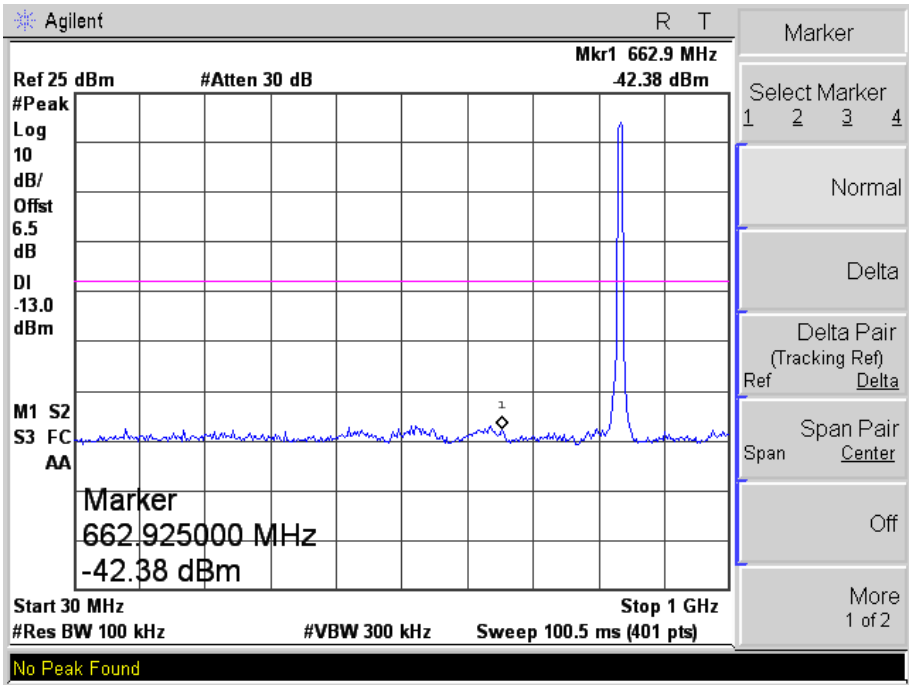


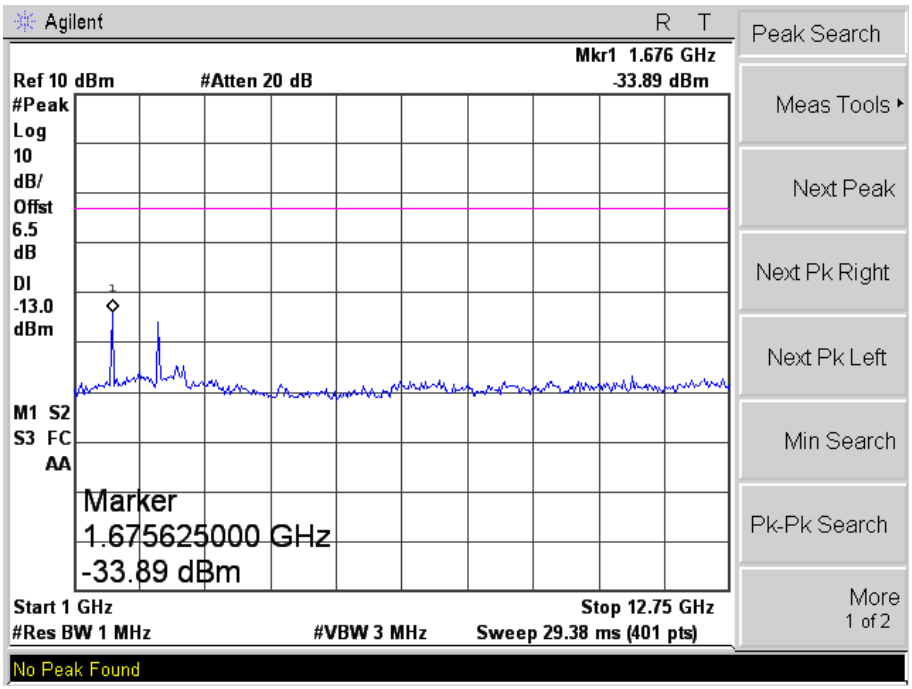
HSUPA Low Channel



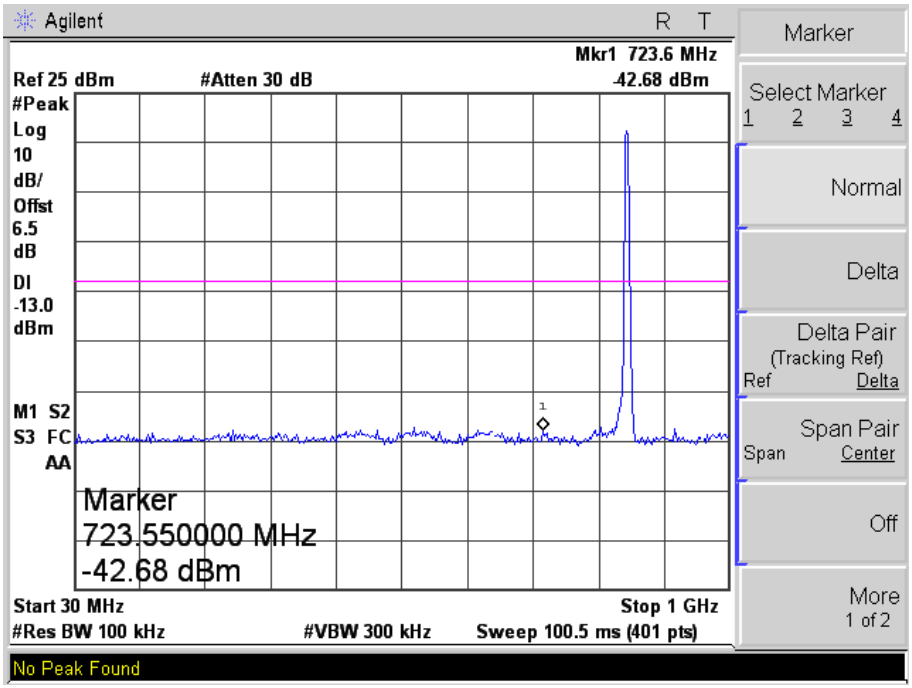


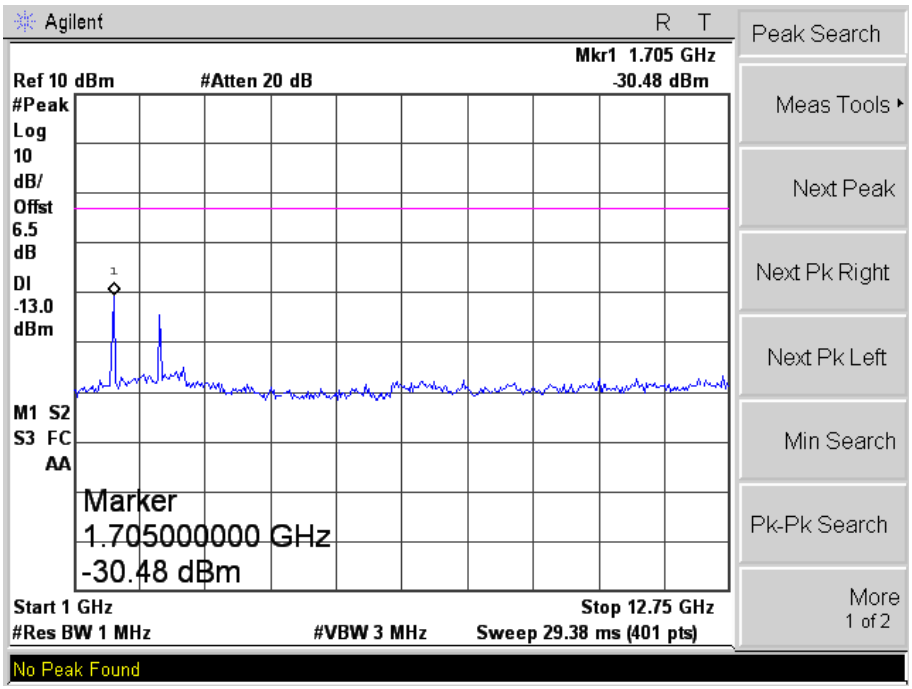
HSUPA Middle Channel



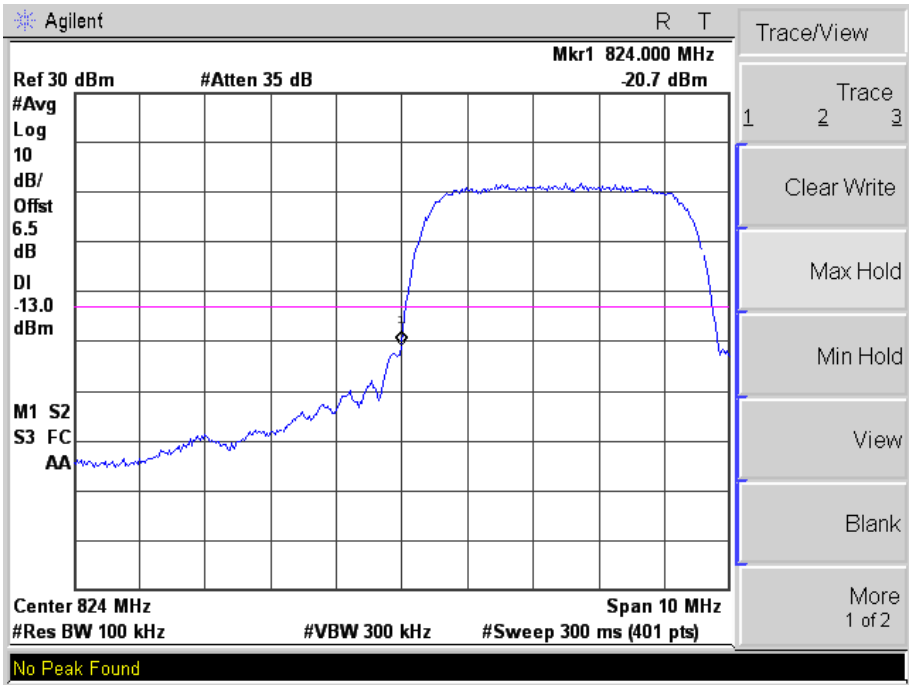


HSUPA High Channel

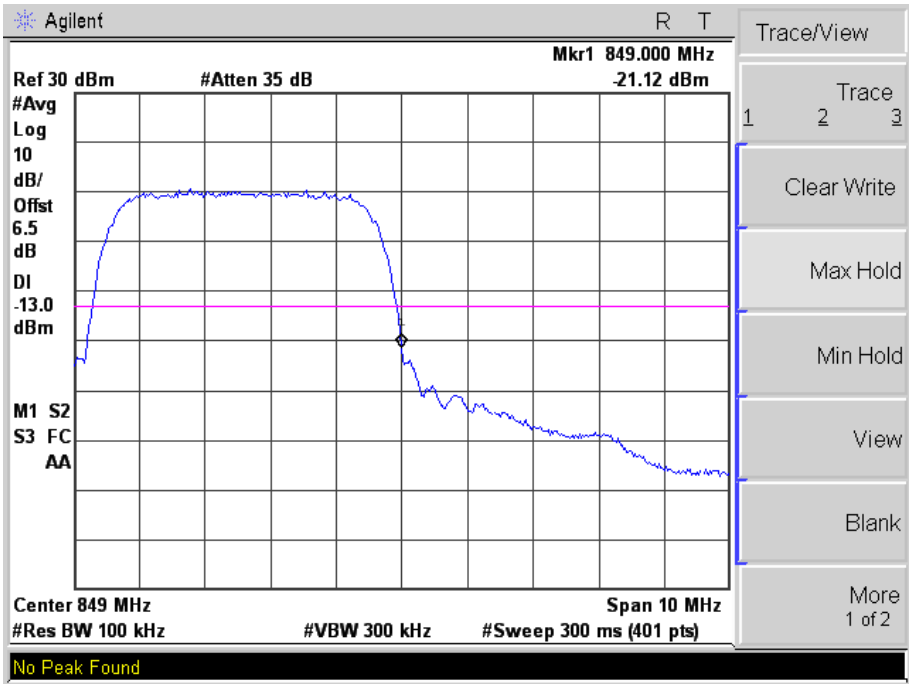




HSUPA Low Band Spurious Emission

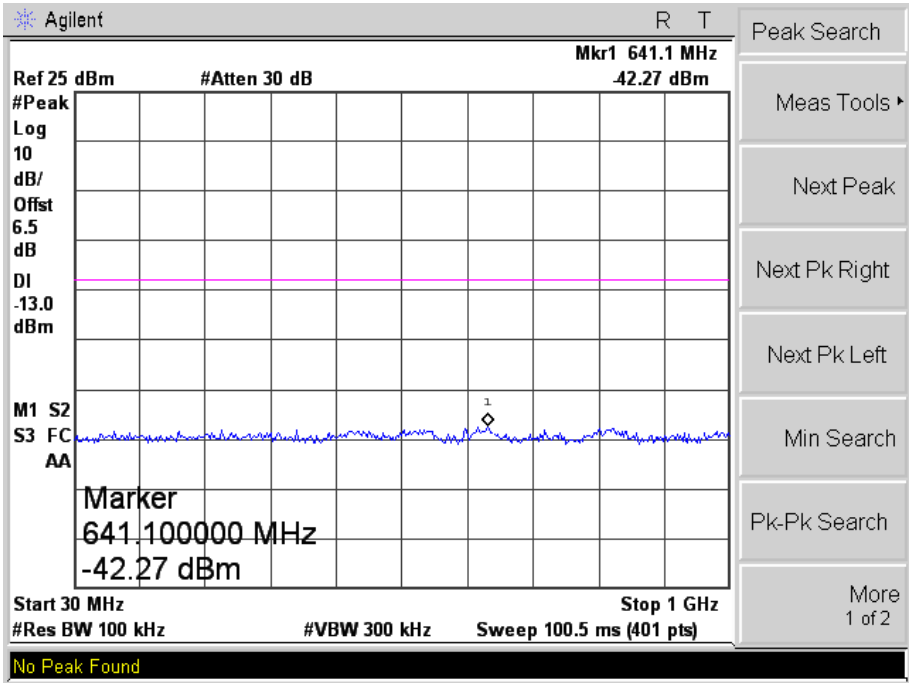


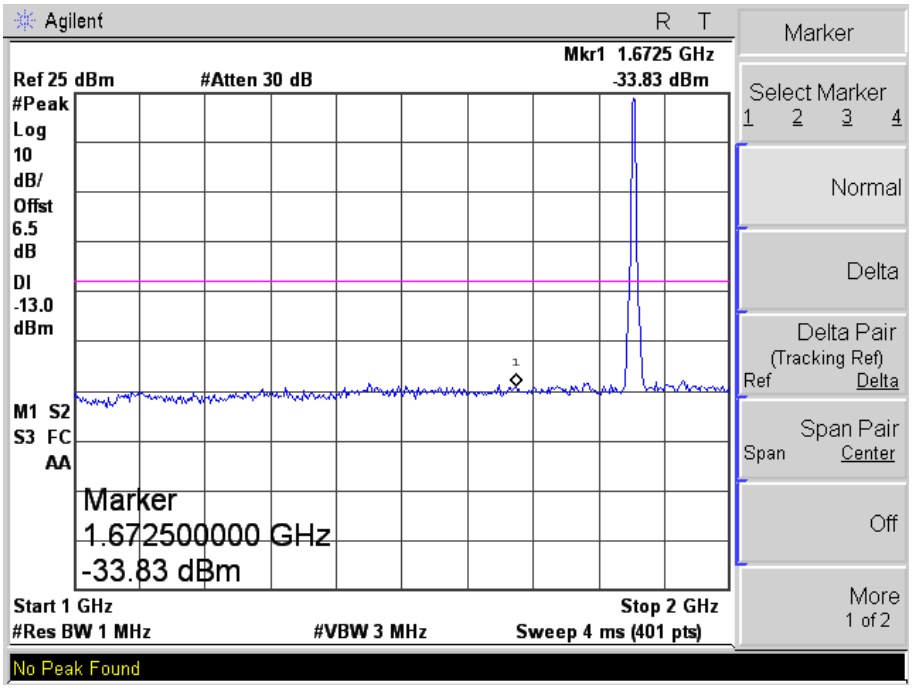
HSUPA High Band Spurious Emission

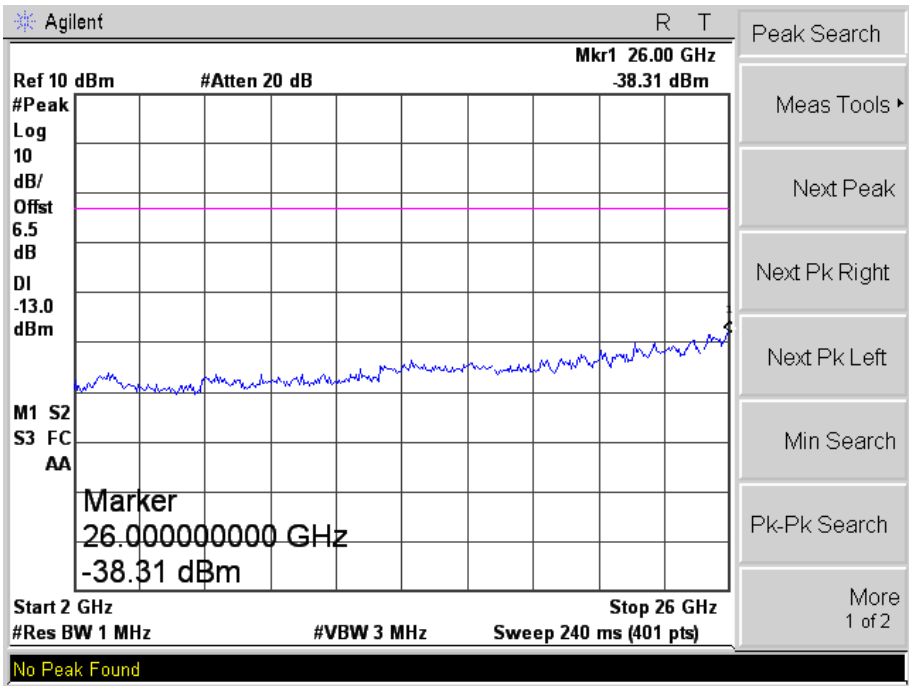


For Band II

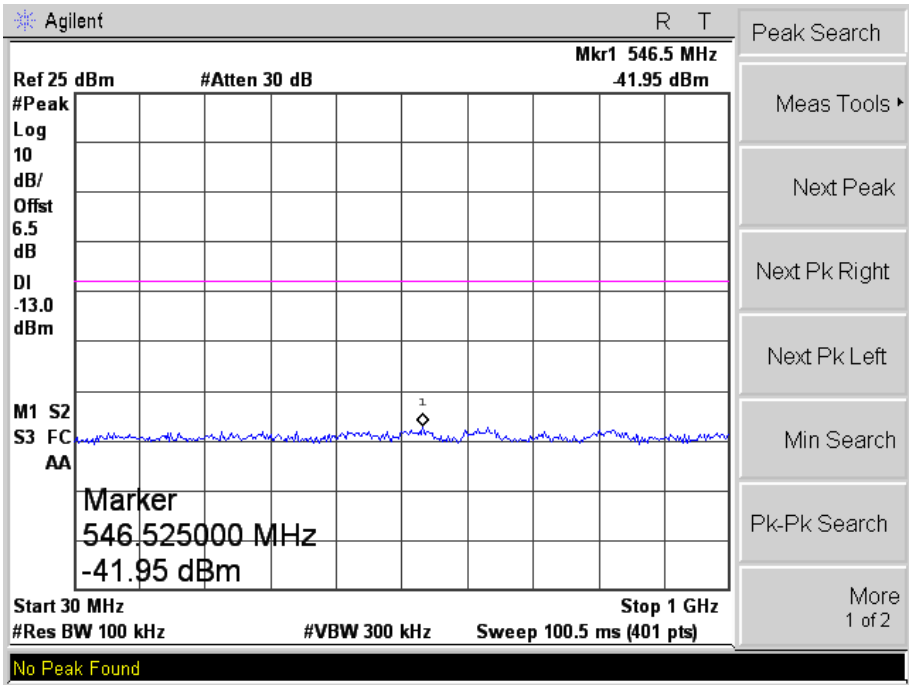
WCDMA Low Channel

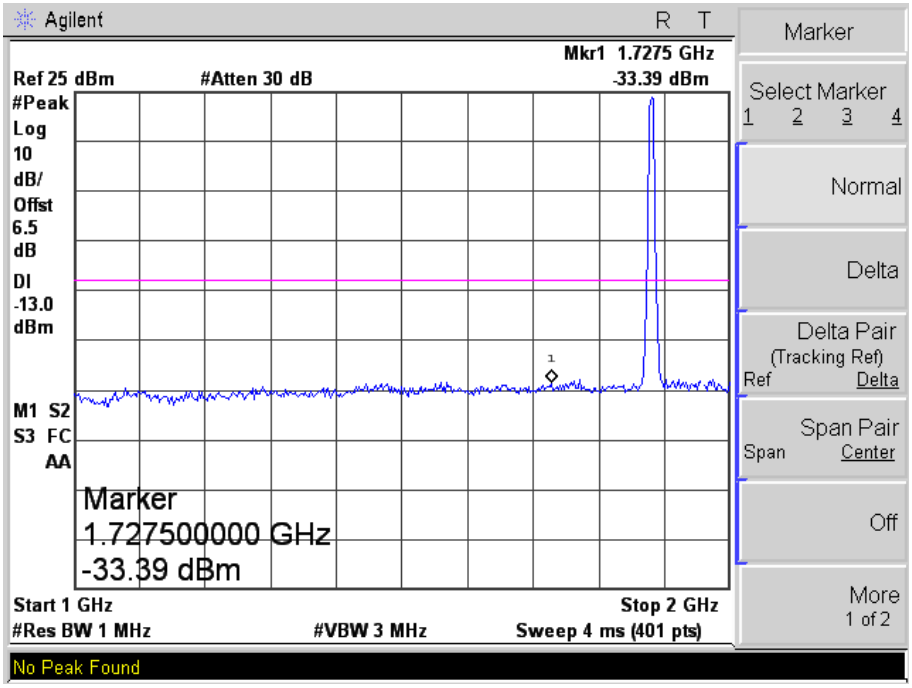


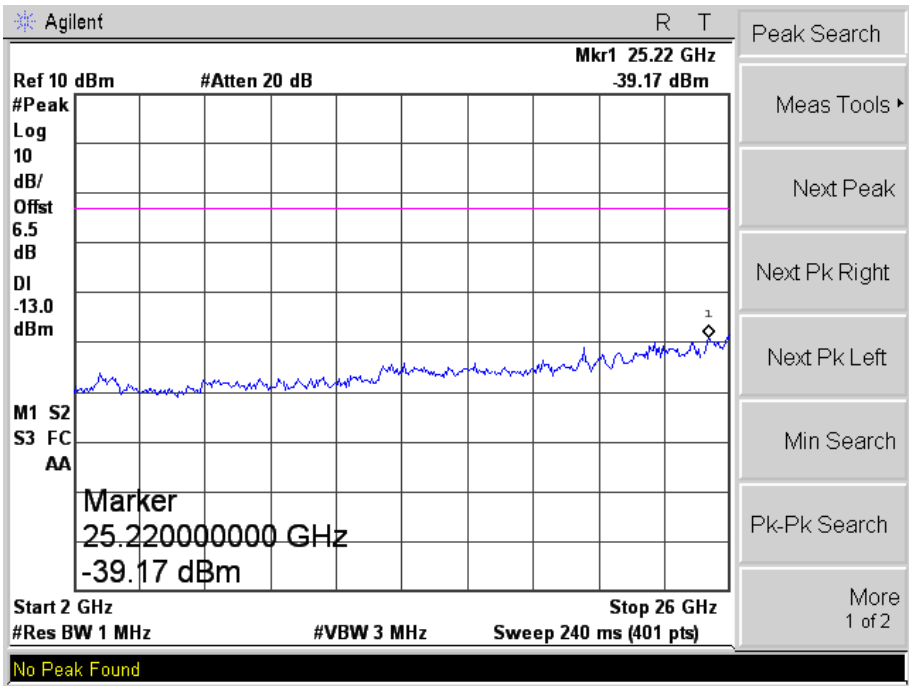




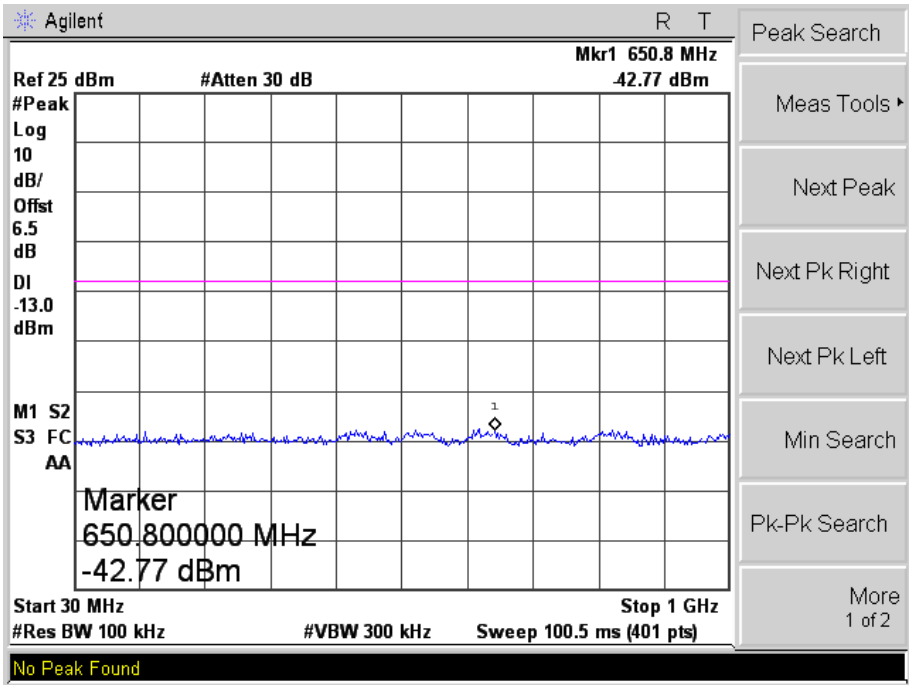
WCDMA Middle Channel

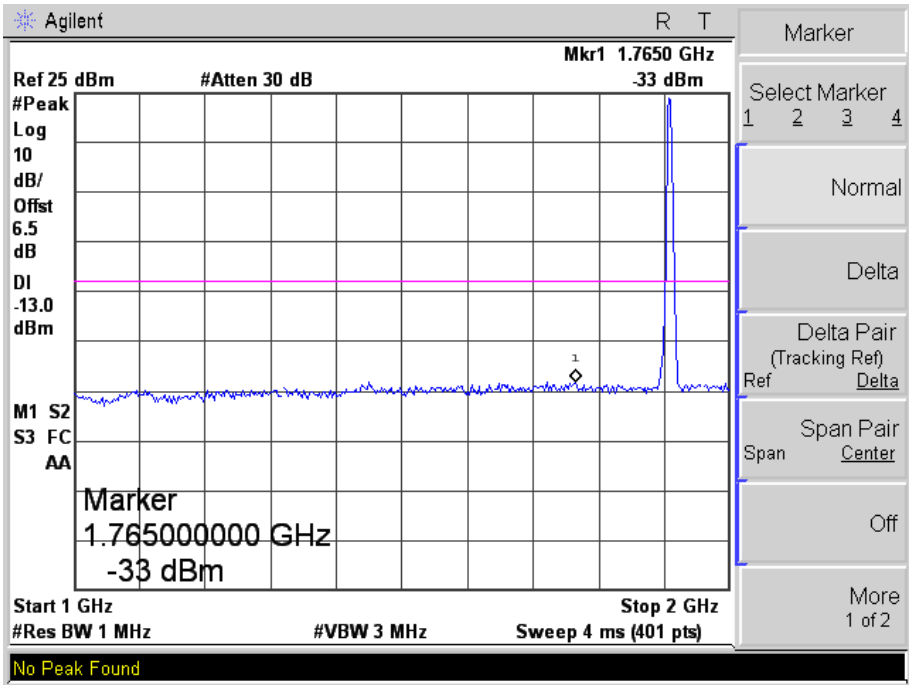


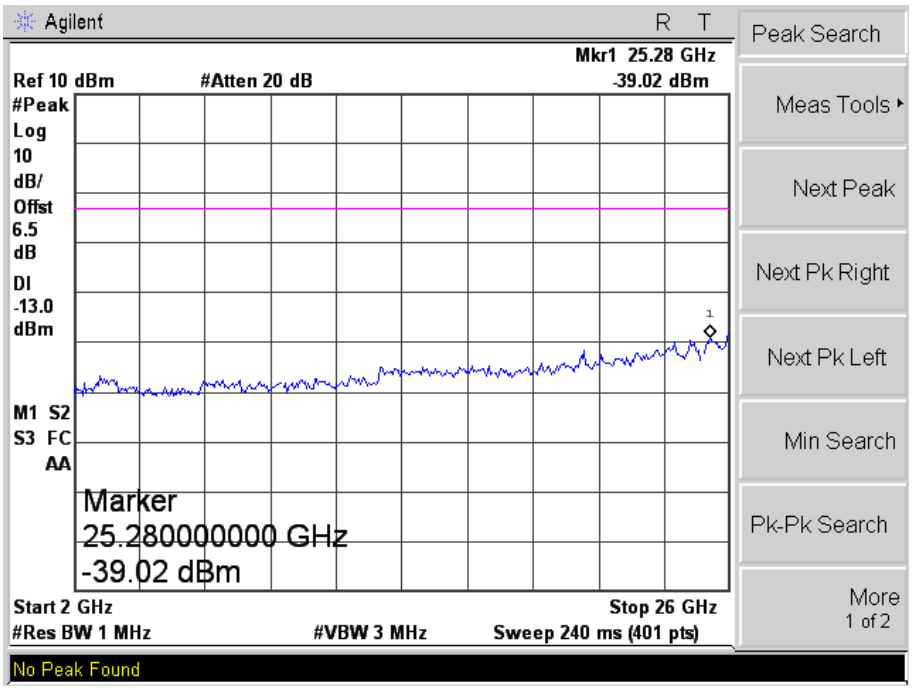

Agilent
R T
Mkr1 1.7275 GHz
Ref 25 dBm
#Atten 30 dB
-33.39 dBm
#Peak
Log
10
dB/
Offst
6.5
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Marker
1.727500000 GHz
-33.39 dBm
Start 1 GHz
Stop 2 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4 ms (401 pts)
No Peak Found
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2


Agilent
R T
Mkr1 25.22 GHz
Ref 10 dBm
#Atten 20 dB
-39.17 dBm
#Peak
Log
10
dB/
Offst
6.5
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Marker
25.220000000 GHz
-39.17 dBm
Start 2 GHz
Stop 26 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 240 ms (401 pts)
No Peak Found
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

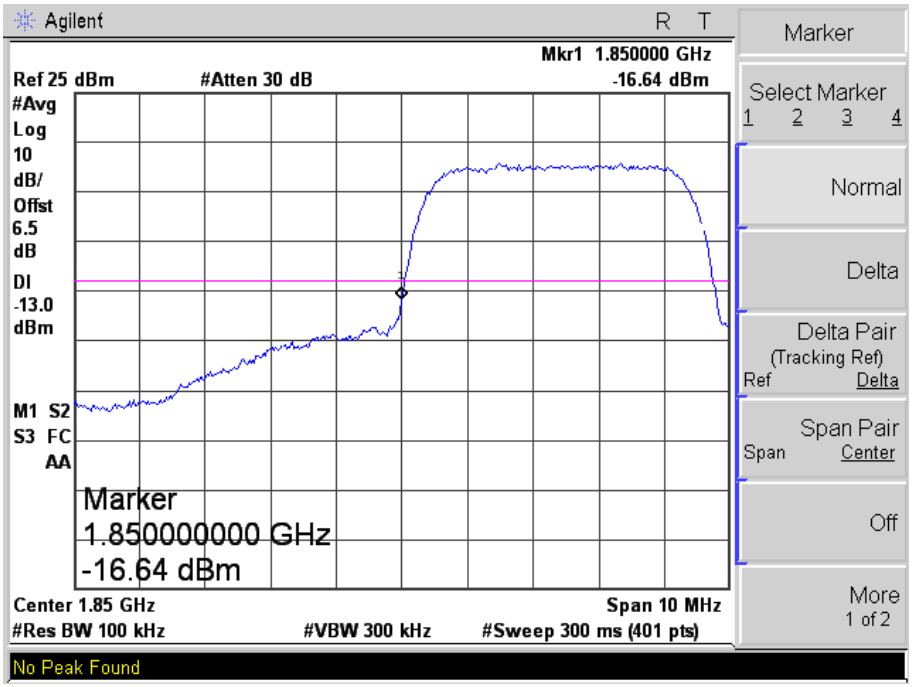
WCDMA High Channel



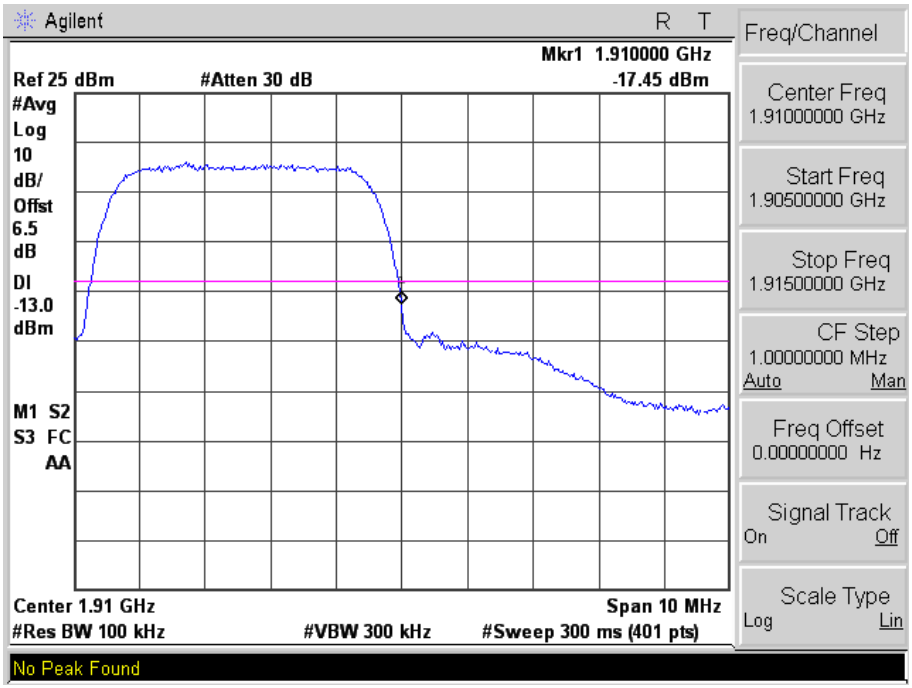




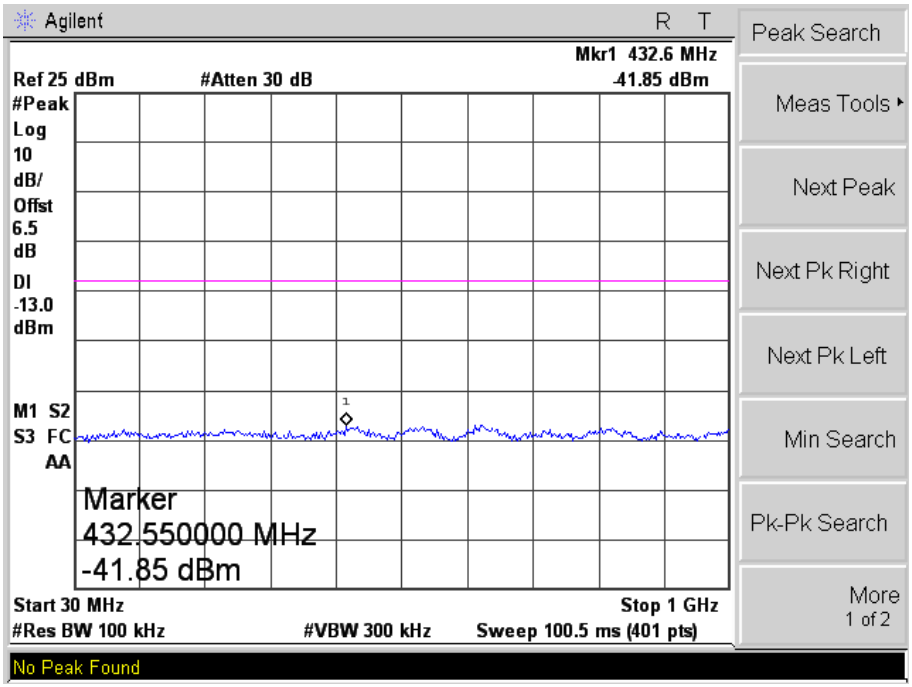
WCDMA Low Band Spurious Emission

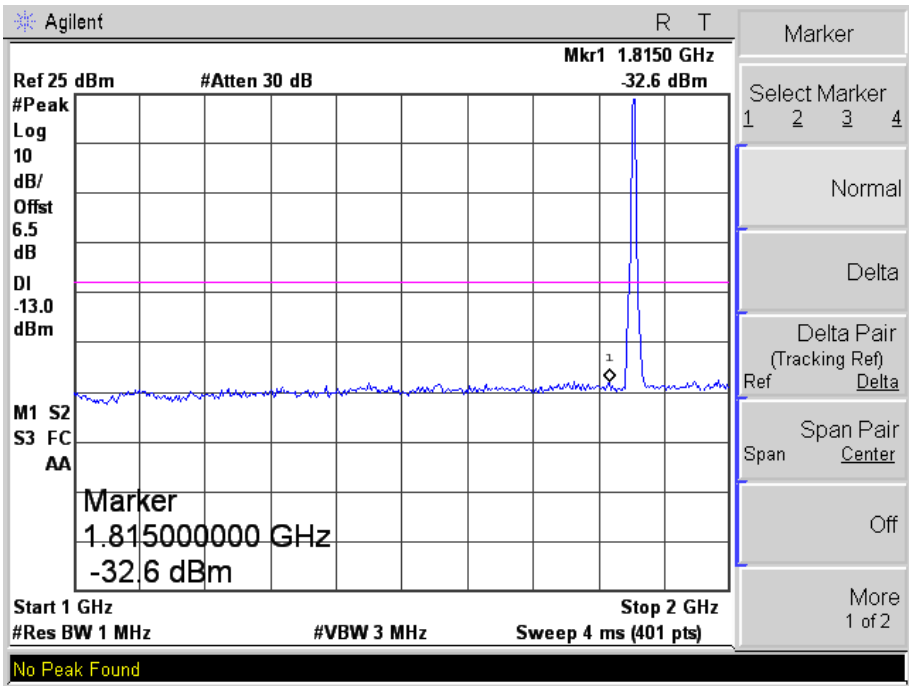


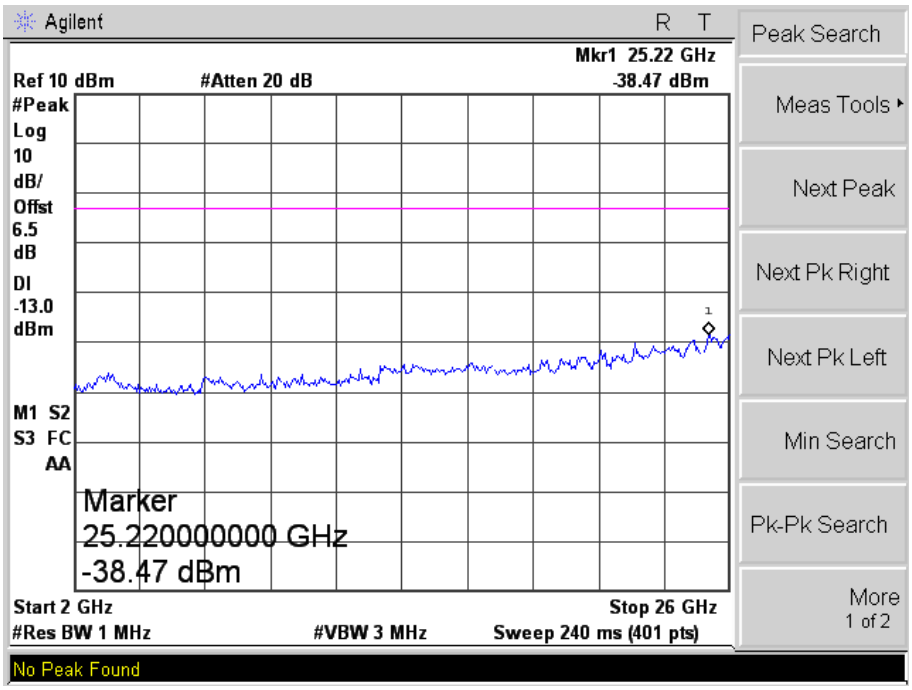
WCDMA High Band Spurious Emission



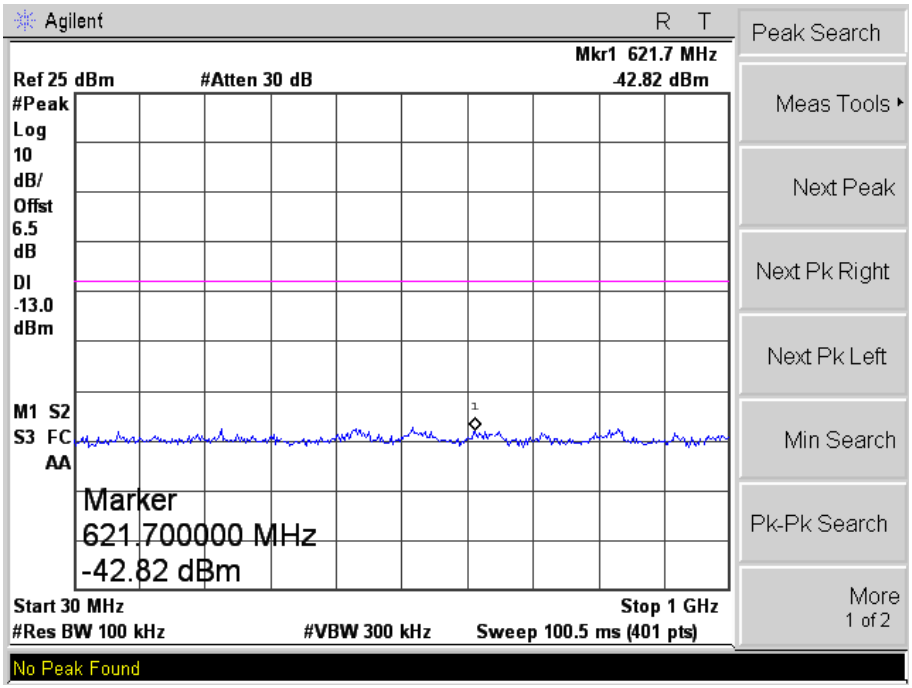
HSDPA Low Channel

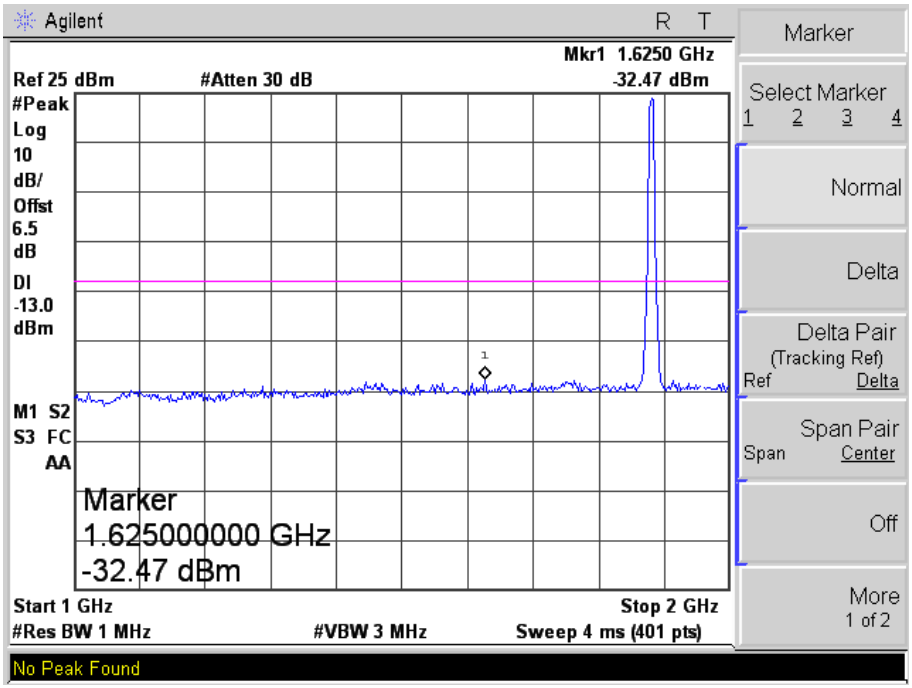


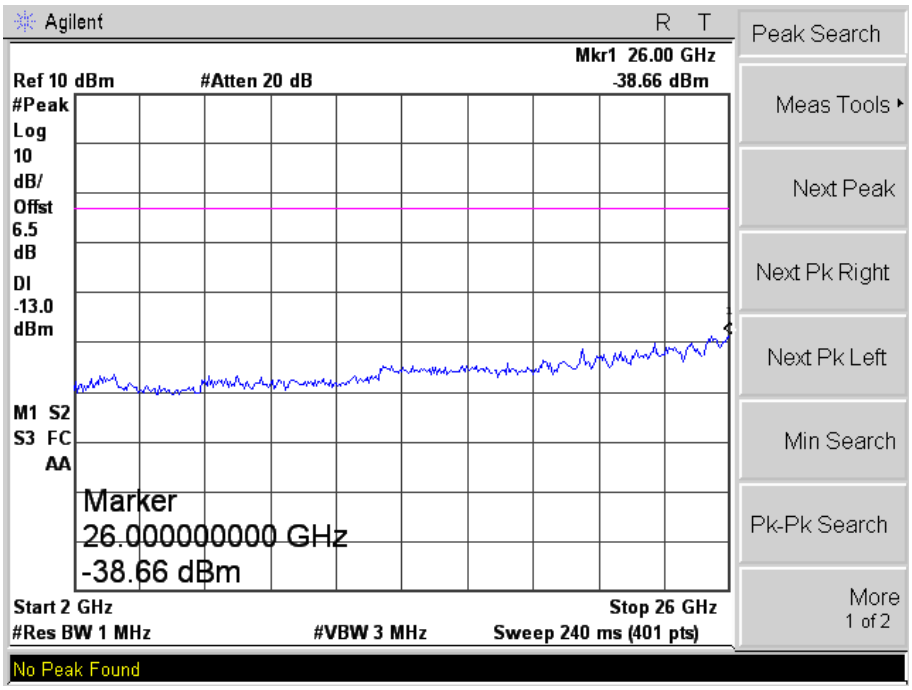

Agilent
R T
Mkr1 1.8150 GHz
-32.6 dBm
Ref 25 dBm
#Atten 30 dB
#Peak
Log
10
dB/
Offst
6.5
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Marker
1.815000000 GHz
-32.6 dBm
Start 1 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 2 GHz
Sweep 4 ms (401 pts)
No Peak Found
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2


Agilent
R T
Mkr1 25.22 GHz
-38.47 dBm
Ref 10 dBm
#Atten 20 dB
#Peak
Log
10
dB/
Offst
6.5
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Marker
25.220000000 GHz
-38.47 dBm
Start 2 GHz
#Res BW 1 MHz
#VBW 3 MHz
Stop 26 GHz
Sweep 240 ms (401 pts)
No Peak Found
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

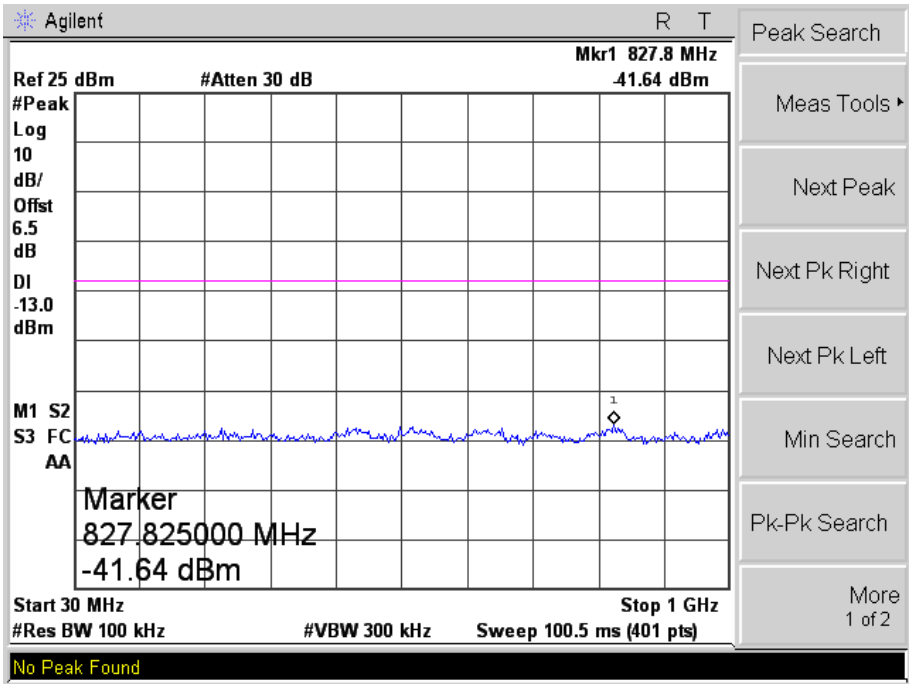
HSDPA Middle Channel

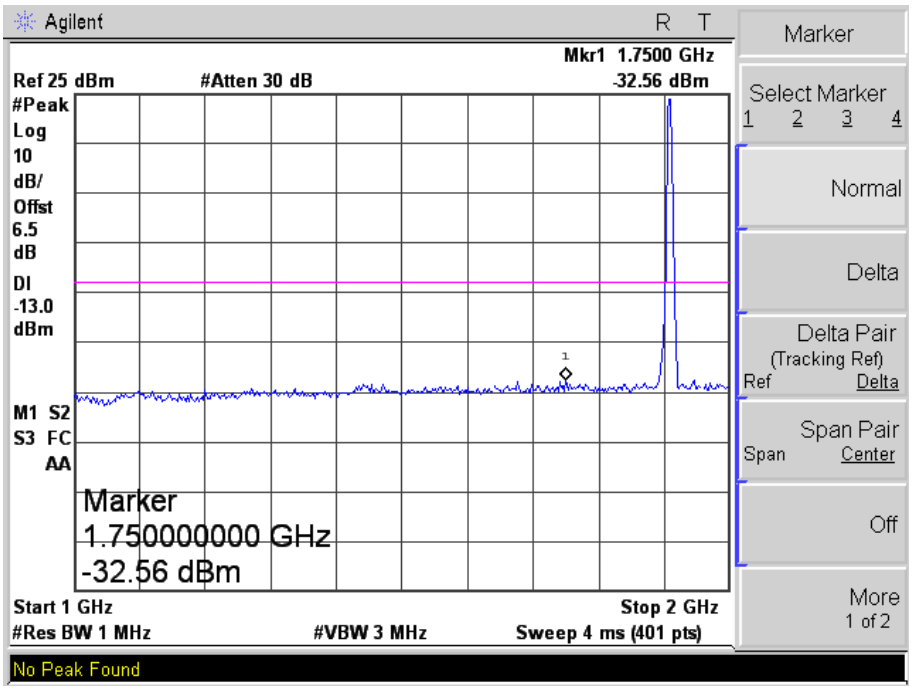


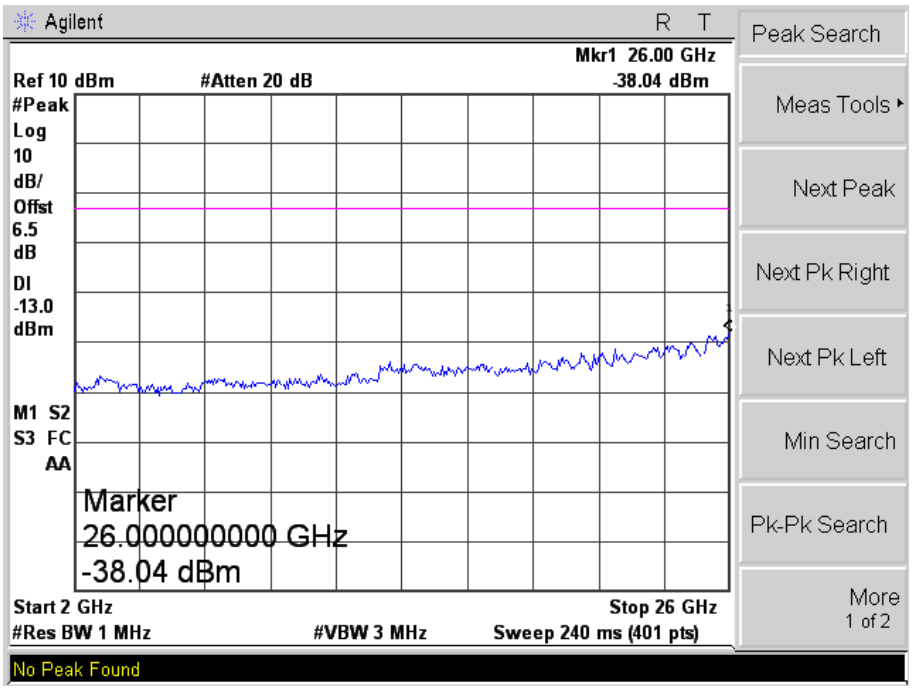




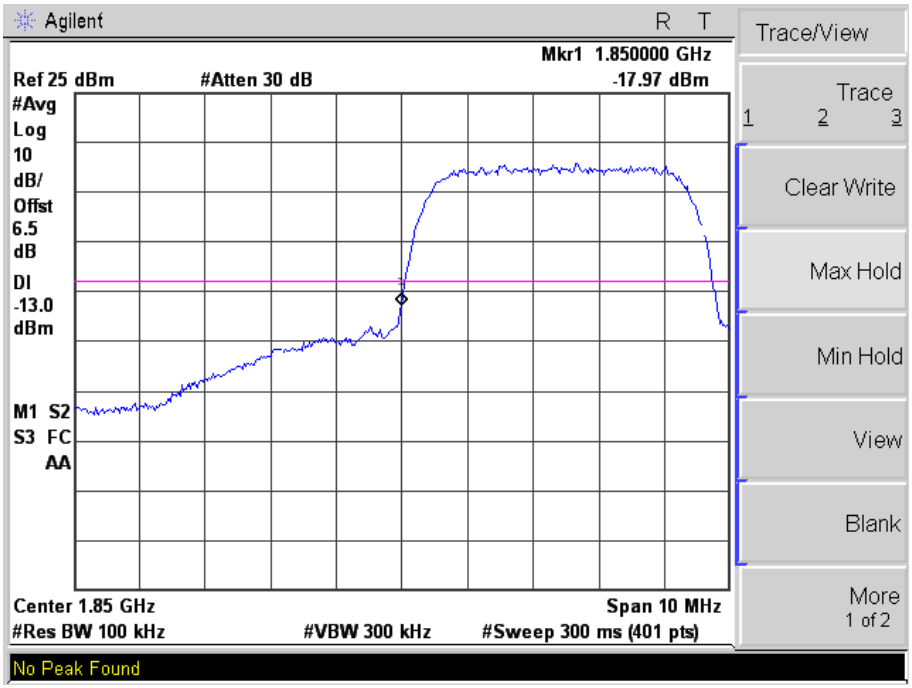
HSDPA High Channel



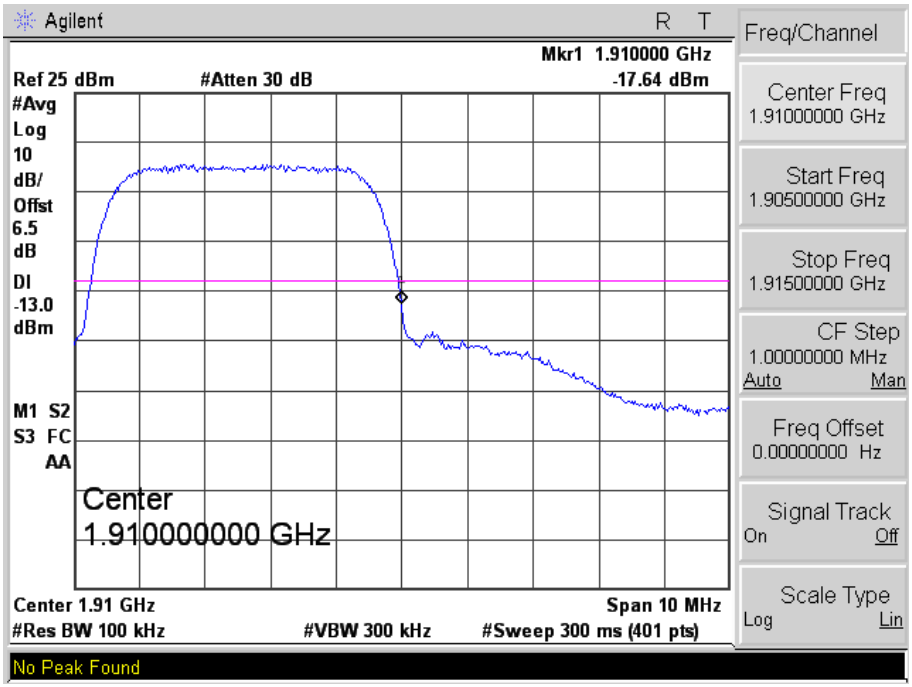

Agilent
R T
Mkr1 1.7500 GHz
Ref 25 dBm
#Atten 30 dB
-32.56 dBm
#Peak
Log
10
dB/
Offst
6.5
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Marker
1.750000000 GHz
-32.56 dBm
Start 1 GHz
Stop 2 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4 ms (401 pts)
No Peak Found
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2


Agilent
R T
Mkr1 26.00 GHz
Ref 10 dBm
#Atten 20 dB
-38.04 dBm
#Peak
Log
10
dB/
Offst
6.5
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Marker
26.000000000 GHz
-38.04 dBm
Start 2 GHz
Stop 26 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 240 ms (401 pts)
No Peak Found
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

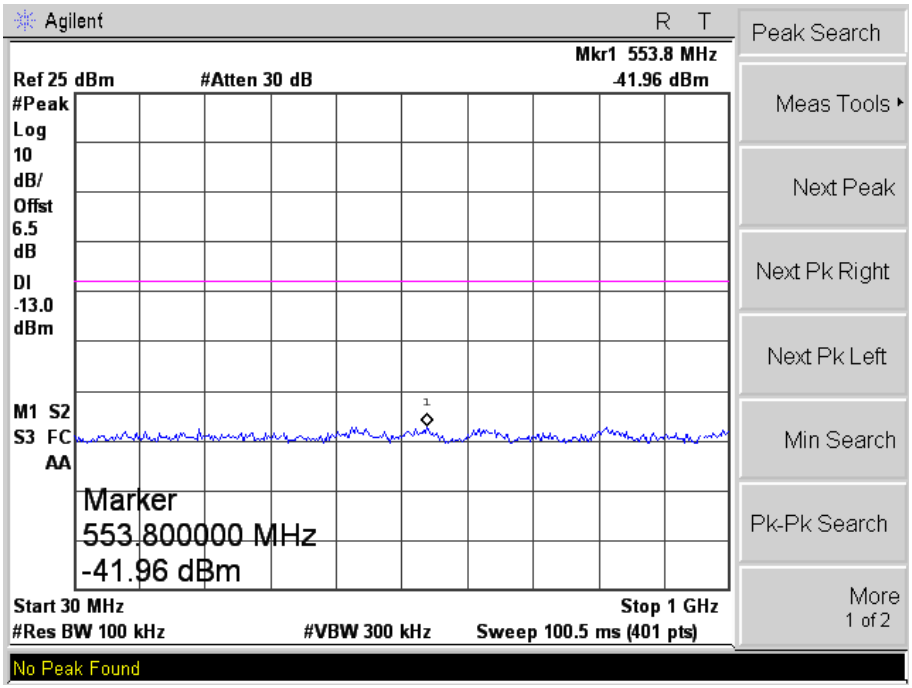
HSDPA Low Band Spurious Emission

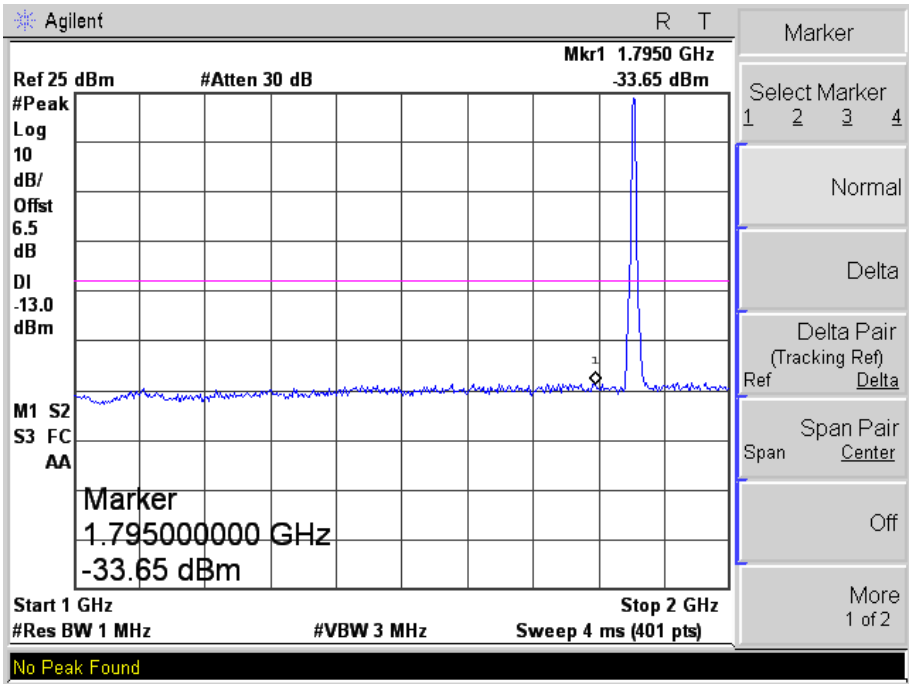


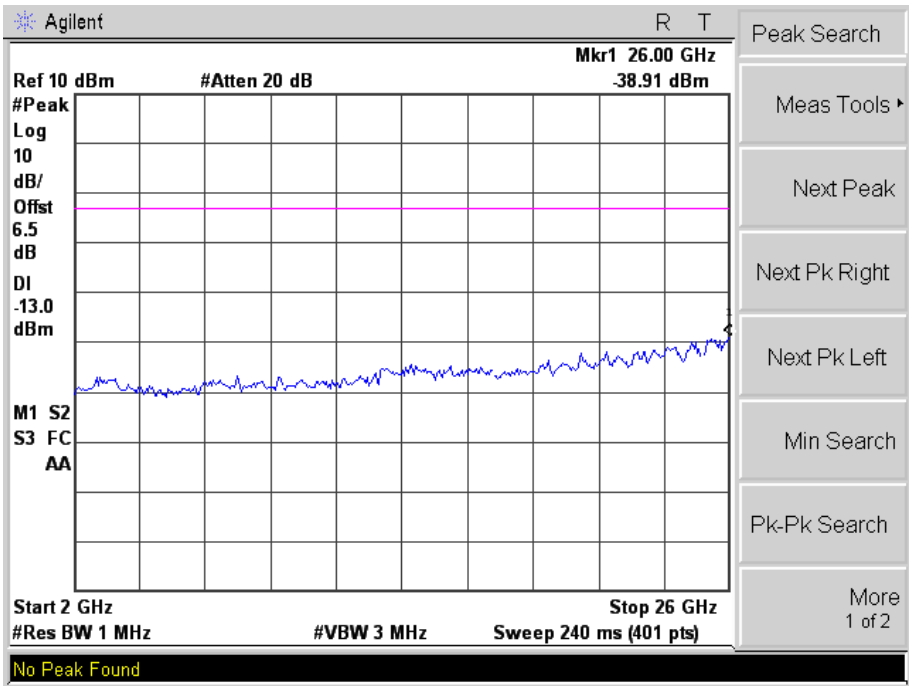
HSDPA High Band Spurious Emission



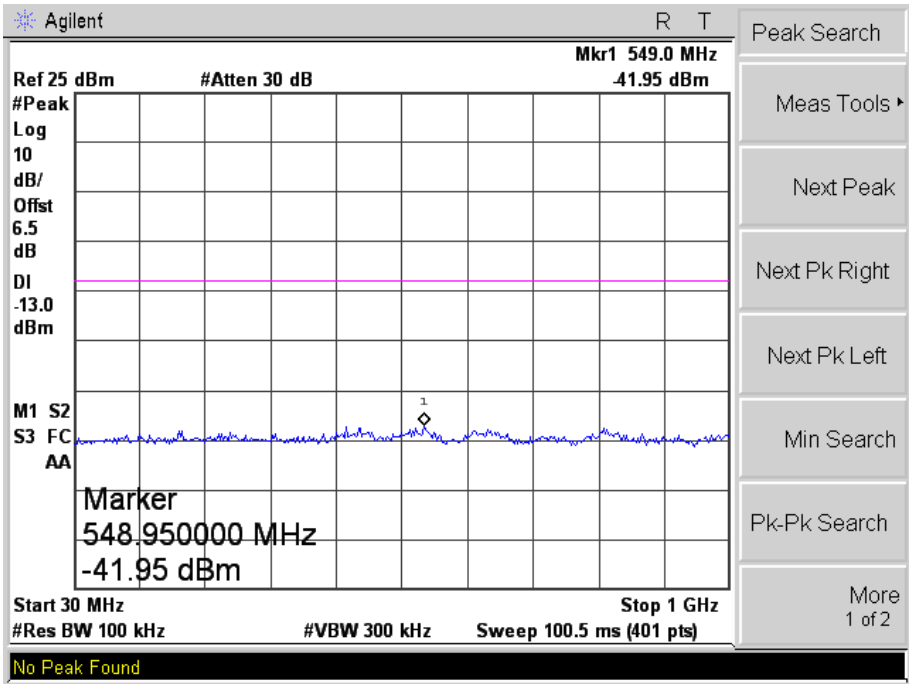
HSUPA Low Channel

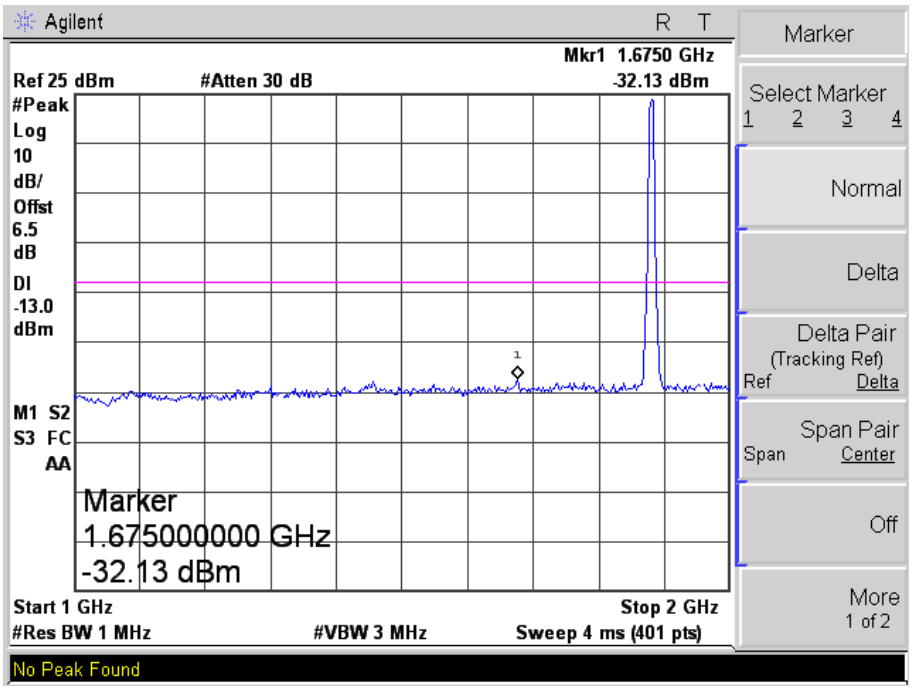


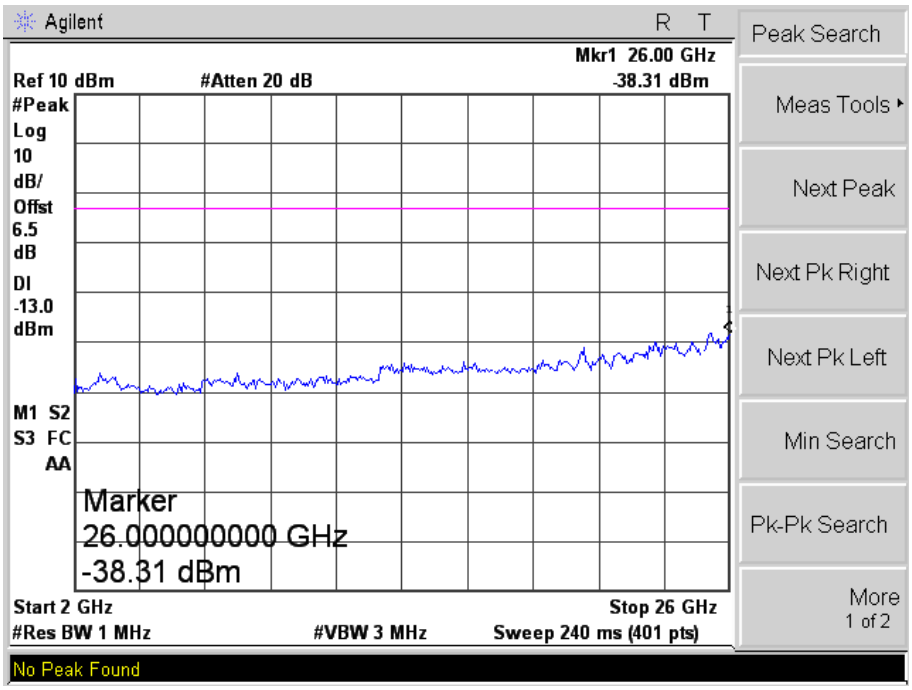




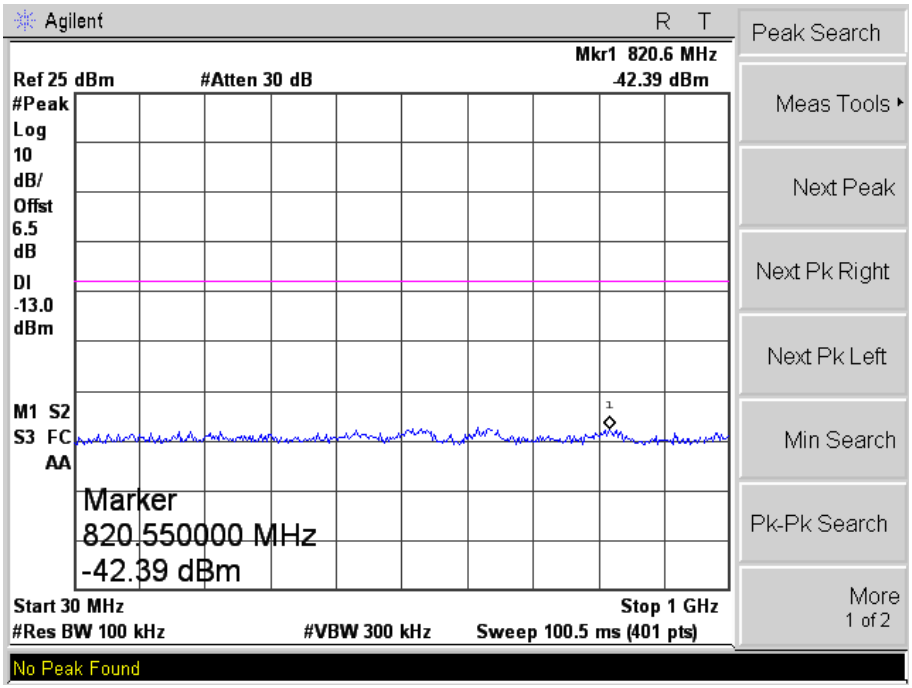
HSUPA Middle Channel

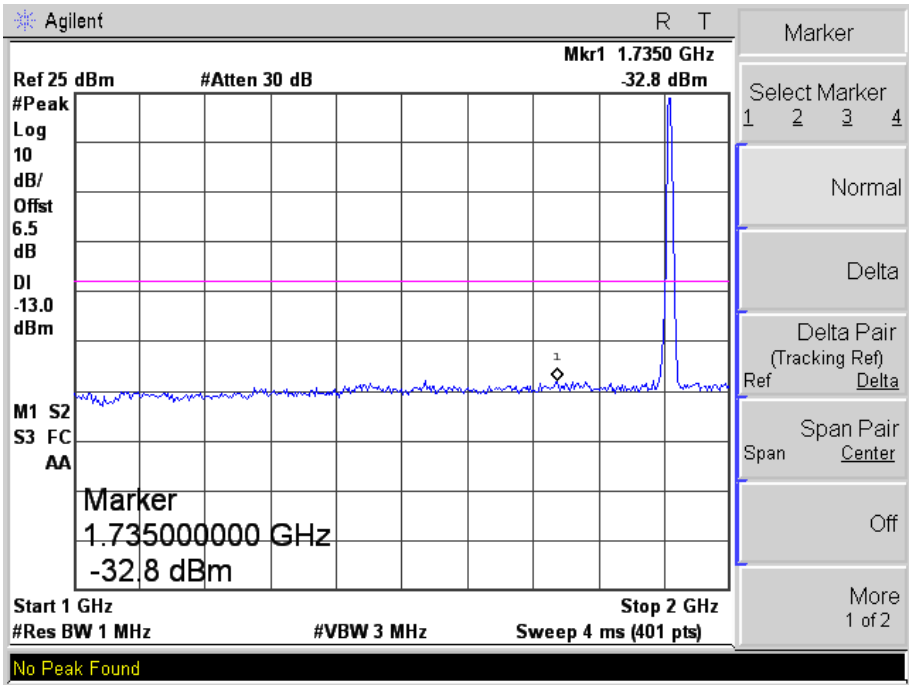


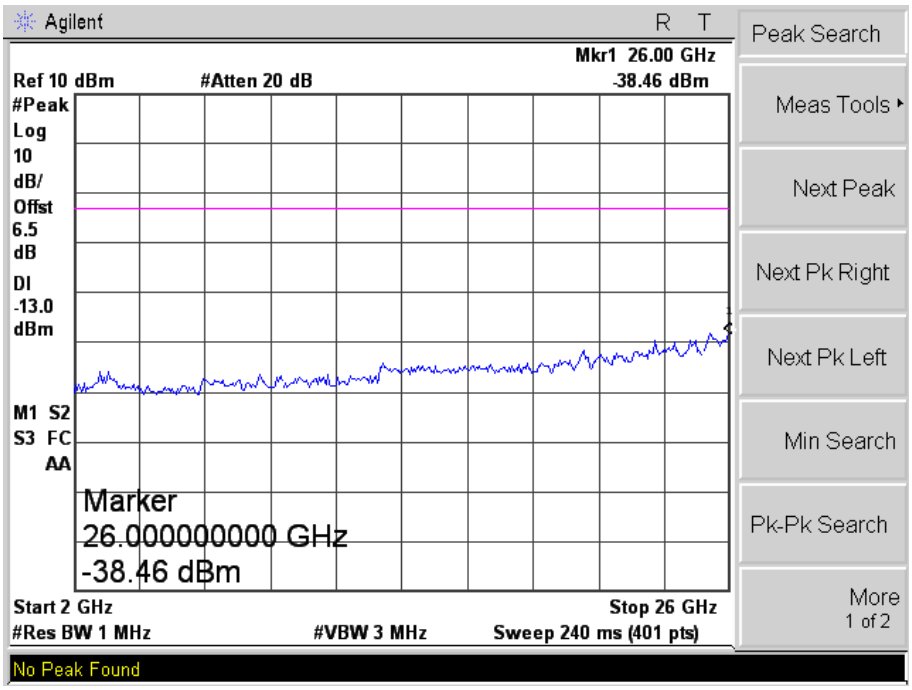

Agilent
R T
Mkr1 1.6750 GHz
Ref 25 dBm
#Atten 30 dB
-32.13 dBm
#Peak
Log
10
dB/
Offst
6.5
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Marker
1.675000000 GHz
-32.13 dBm
Start 1 GHz
Stop 2 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4 ms (401 pts)
No Peak Found
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2


Agilent
R T
Mkr1 26.00 GHz
Ref 10 dBm
#Atten 20 dB
-38.31 dBm
#Peak
Log
10
dB/
Offst
6.5
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Marker
26.000000000 GHz
-38.31 dBm
Start 2 GHz
Stop 26 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 240 ms (401 pts)
No Peak Found
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

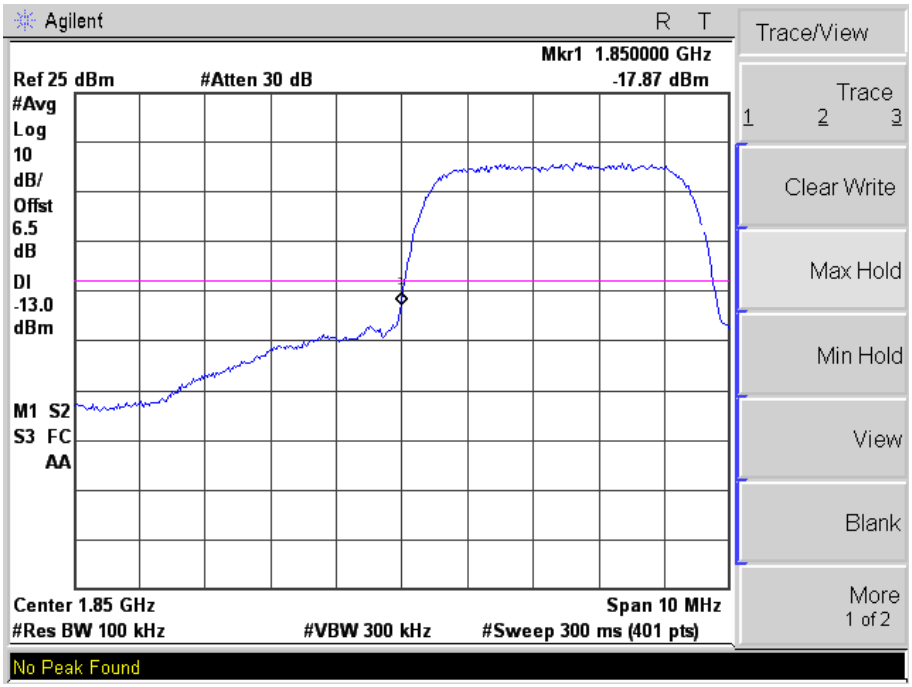
HSUPA High Channel



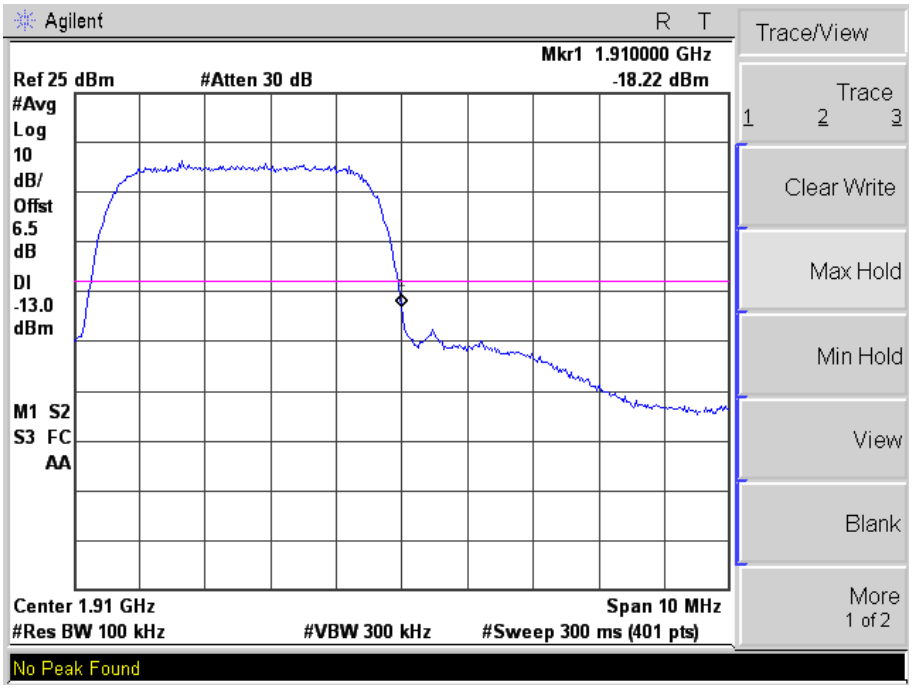




HSUPA Low Band Spurious Emission



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.

According to §27.53 (h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

8.2 Test Procedure

1. The setup of EUT is according with per ANSI/TIA Standard 603E-2016 and ANSI C63.26-2015 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:	23 °C
Relative Humidity:	54%
ATM Pressure:	1012 mbar

8.4 Summary of Test Results/Plots

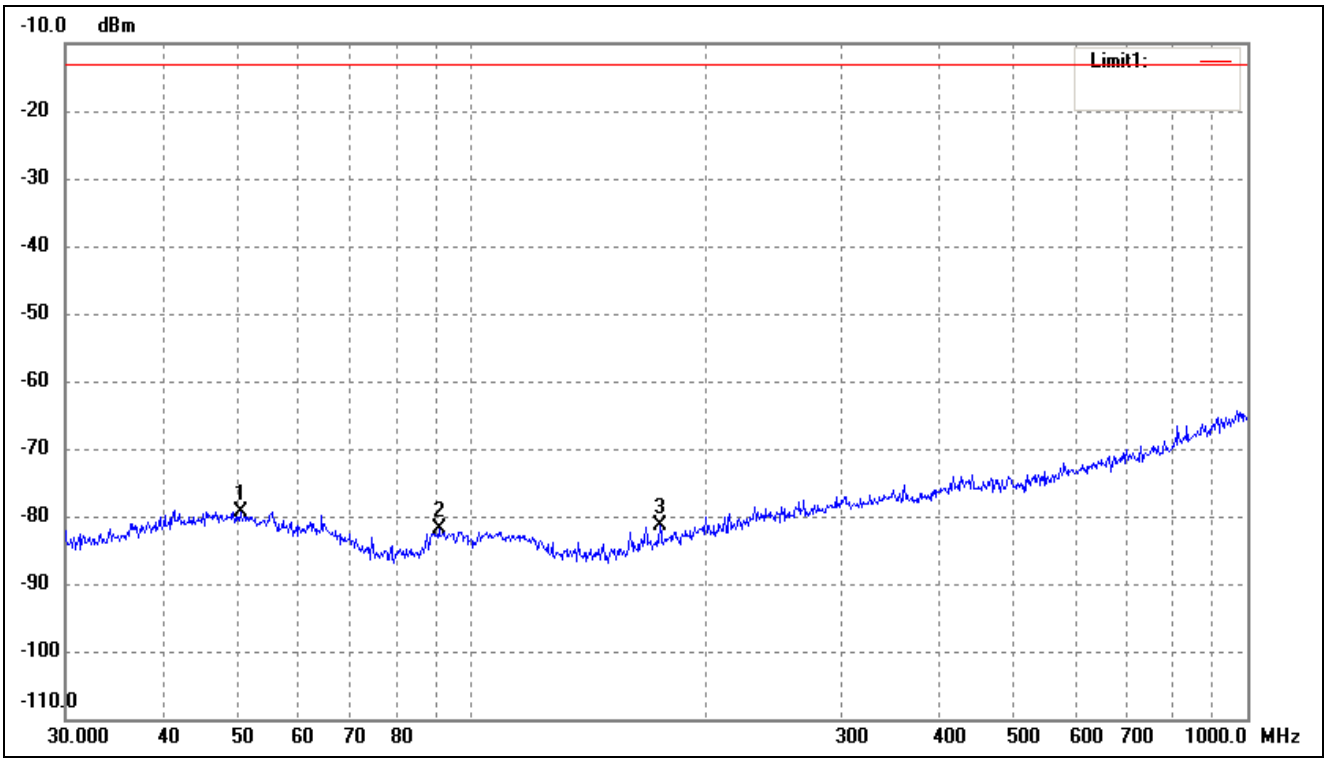
According to the data below, the FCC Part 22.917 and 24.238 standards, and had the worst margin of:

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

Spurious Emission From 30MHz to 1GHz

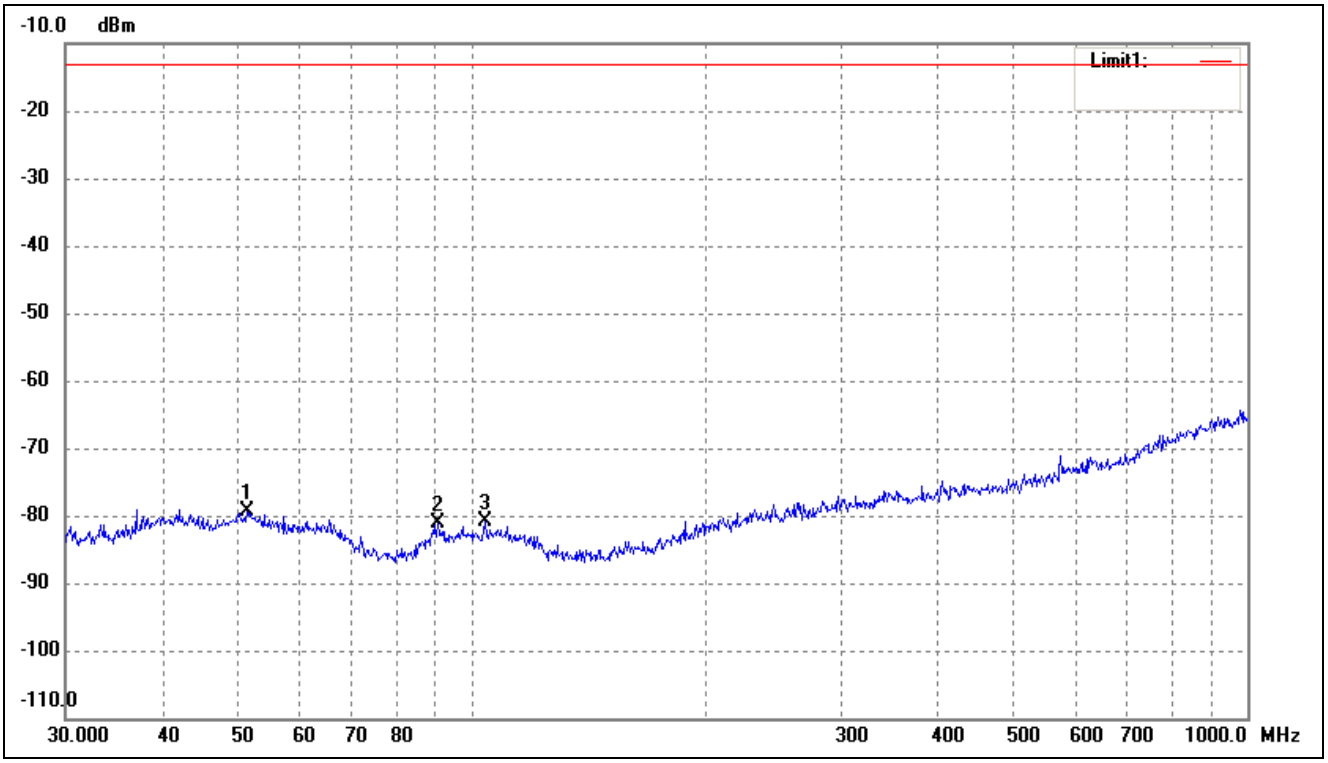
For band 5 Mode

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	50.4089	-79.50	0.20	-79.30	-13.00	-66.30	ERP
2	90.8554	-80.07	-1.77	-81.84	-13.00	-68.84	ERP
3	175.0367	-77.10	-4.15	-81.25	-13.00	-68.25	ERP

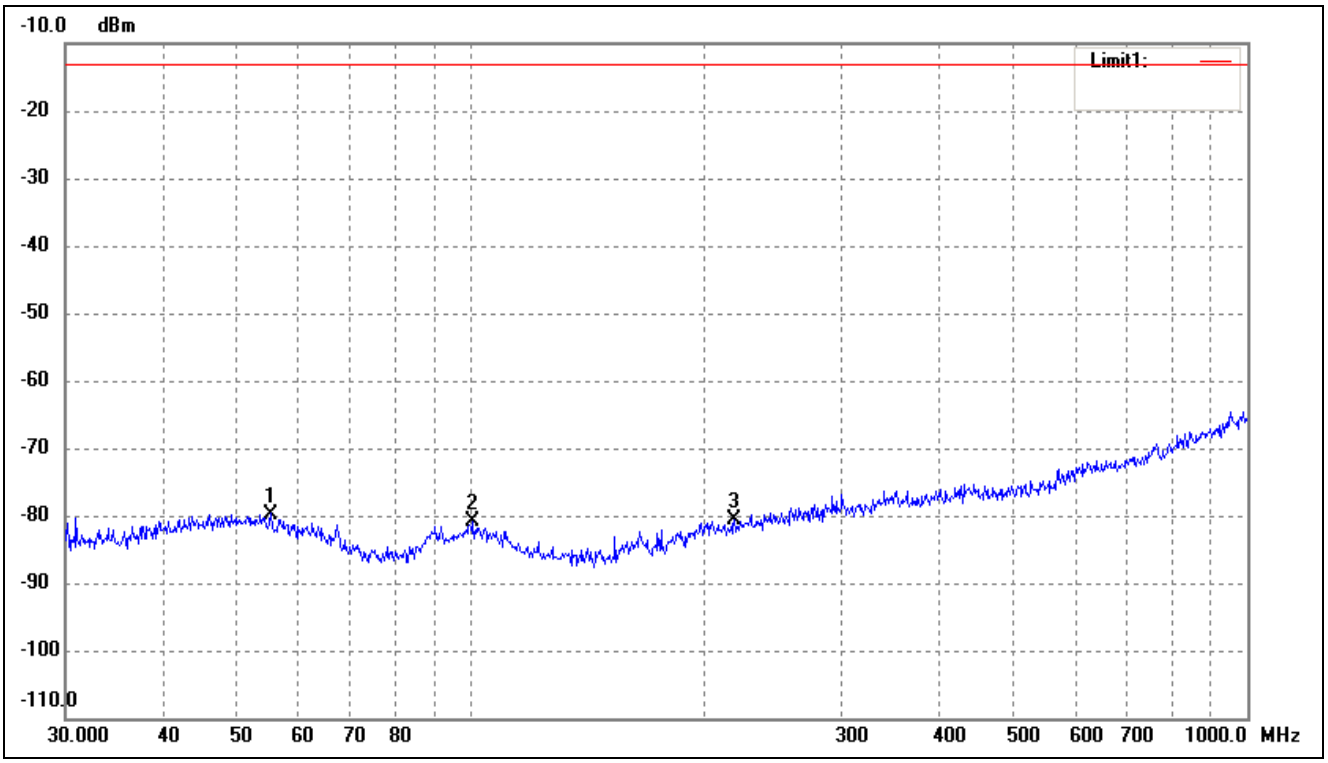
Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	51.4806	-79.55	0.21	-79.34	-13.00	-66.34	ERP
2	90.5374	-79.42	-1.71	-81.13	-13.00	-68.13	ERP
3	104.1701	-79.22	-1.65	-80.87	-13.00	-67.87	ERP

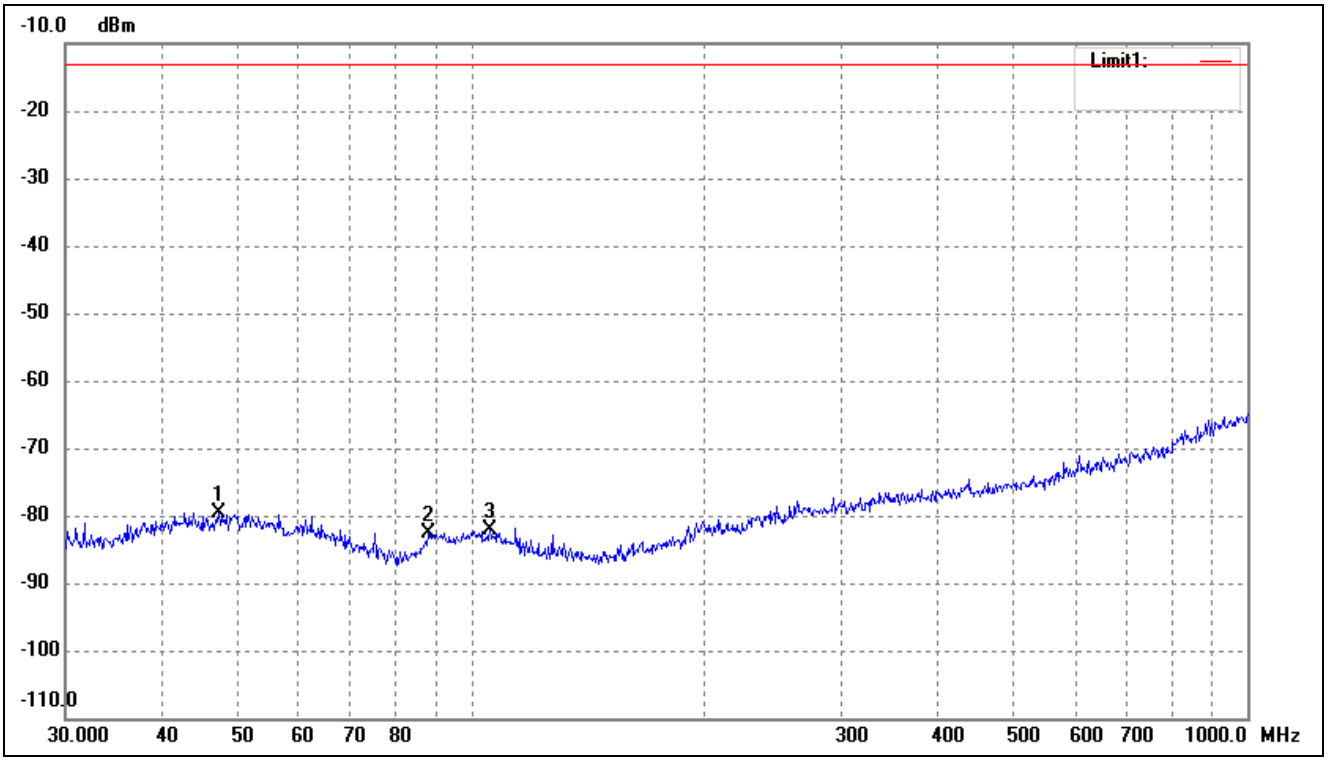
For band 2 Mode

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	55.2207	-79.37	-0.38	-79.75	-13.00	-66.75	ERP
2	100.5806	-78.84	-1.95	-80.79	-13.00	-67.79	ERP
3	218.3085	-79.38	-1.30	-80.68	-13.00	-67.68	ERP

Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	47.3254	-79.66	0.10	-79.56	-13.00	-66.56	ERP
2	88.0328	-79.42	-3.13	-82.55	-13.00	-69.55	ERP
3	105.6414	-80.44	-1.64	-82.08	-13.00	-69.08	ERP

Note: Margin= (Reading+ Correct)- Limit

Spurious Emissions Above 1GHz

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	-36.22	4.94	-31.28	-13	-18.28	H
2479.2	-41.83	8.46	-33.37	-13	-20.37	H
1652.8	-34.48	4.94	-29.54	-13	-16.54	V
2479.2	-44.12	8.46	-35.66	-13	-22.66	V
Middle Channel (836.6MHz)						
1672.8	-36.72	5.11	-31.61	-13	-18.61	H
2509.2	-41.63	8.54	-33.09	-13	-20.09	H
1672.8	-35.07	5.11	-29.96	-13	-16.96	V
2509.2	-43.4	8.54	-34.86	-13	-21.86	V
High Channel (846.6MHz)						
1693.2	-34.42	5.25	-29.17	-13	-16.17	H
2539.8	-44.95	8.57	-36.38	-13	-23.38	H
1693.2	-36.61	5.25	-31.36	-13	-18.36	V
2539.8	-42.38	8.57	-33.81	-13	-20.81	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	-36.95	10.17	-26.78	-13	-13.78	H
5557.2	-43.12	14.69	-28.43	-13	-15.43	H
3704.8	-36.46	10.17	-26.29	-13	-13.29	V
5557.2	-43.36	14.69	-28.67	-13	-15.67	V
Middle Channel (1880MHz)						
3760.8	-34.2	10.26	-23.94	-13	-10.94	H
5640.0	-44.8	14.78	-30.02	-13	-17.02	H
3760.8	-37.35	10.26	-27.09	-13	-14.09	V
5640.0	-44.55	14.78	-29.77	-13	-16.77	V
High Channel (1907.6MHz)						
3815.2	-35.77	10.59	-25.18	-13	-12.18	H
5722.8	-41.49	15.03	-26.46	-13	-13.46	H
3815.2	-34.49	10.59	-23.9	-13	-10.9	V
5722.8	-42.83	15.03	-27.8	-13	-14.8	H

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

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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.

According to §27.54 The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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

9.3 Environmental Conditions

Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

9.4 Summary of Test Results/Plots

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	3.7	63	0.0753
40	3.7	49	0.0586
30	3.7	42	0.0502
20	3.7	34	0.0406
10	3.7	26	0.0311
0	3.7	19	0.0227
-10	3.7	25	0.0299
-20	3.7	28	0.0335
-30	3.7	33	0.0394

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	3.7	67	0.0356
40	3.7	62	0.0330
30	3.7	55	0.0293
20	3.7	51	0.0271
10	3.7	45	0.0239
0	3.7	38	0.0202
-10	3.7	42	0.0223
-20	3.7	46	0.0245
-30	3.7	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	3.7	57	0.0681
40	3.7	45	0.0538
30	3.7	36	0.0430
20	3.7	32	0.0383
10	3.7	28	0.0335
0	3.7	22	0.0263
-10	3.7	29	0.0347
-20	3.7	35	0.0418
-30	3.7	39	0.0466

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	3.7	48	0.0255
40	3.7	43	0.0229
30	3.7	38	0.0202
20	3.7	31	0.0165
10	3.7	25	0.0133
0	3.7	19	0.0101
-10	3.7	27	0.0144
-20	3.7	33	0.0176
-30	3.7	41	0.0218

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	3.7	72	0.0861
40	3.7	57	0.0681
30	3.7	45	0.0538
20	3.7	38	0.0454
10	3.7	31	0.0371
0	3.7	24	0.0287
-10	3.7	30	0.0359
-20	3.7	35	0.0418
-30	3.7	40	0.0478

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	3.7	71	0.0378
40	3.7	66	0.0351
30	3.7	56	0.0298
20	3.7	48	0.0255
10	3.7	43	0.0229
0	3.7	37	0.0197
-10	3.7	41	0.0218
-20	3.7	45	0.0239
-30	3.7	52	0.0277

So, Frequency Stability Versus Input Voltage is:

Reference Frequency(Middle Channel): WCDMA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (℃)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.5	35	0.0418
	3.7	34	0.0406
	4.2	31	0.0371
Reference Frequency(Middle Channel): WCDMA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (℃)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.5	52	0.0277
	3.7	51	0.0271
	4.2	54	0.0287
Reference Frequency(Middle Channel): HSDPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (℃)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.5	31	0.0371
	3.7	32	0.0383
	4.2	33	0.0394
Reference Frequency(Middle Channel): HSDPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (℃)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.5	34	0.0181
	3.7	31	0.0165
	4.2	36	0.0191

Reference Frequency(Middle Channel): HSUPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (℃)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.5	39	0.0466
	3.7	38	0.0454
	4.2	35	0.0418
Reference Frequency(Middle Channel): HSUPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (℃)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.5	48	0.0255
	3.7	48	0.0255
	4.2	42	0.0223

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