

FCC Part 22H & 24E Measurement and Test Report

For

PAJ GPS Inc.

444 Brickell Ave, Suite 51270 Miami, FL 33131 USA

FCC ID: 2ASPJPAJGPS319

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

Product Description: GPS Tracker

Tested Model: PAJ GPS Finder 01

Report No.: WTX19X03011999W-1

Sample Receipt Date: 2019-03-06

Tested Date: 2019-03-07 to 2019-03-16

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

**TABLE OF CONTENTS**

1. GENERAL INFORMATION.....	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	5
1.3 TEST METHODOLOGY.....	5
1.4 TEST FACILITY.....	5
1.5 EUT SETUP AND TEST MODE.....	6
1.6 MEASUREMENT UNCERTAINTY.....	7
1.7 TEST EQUIPMENT LIST AND DETAILS.....	8
2. SUMMARY OF TEST RESULTS.....	10
3. RF EXPOSURE.....	11
3.1 STANDARD APPLICABLE.....	11
3.2 TEST RESULT.....	11
4. RF OUTPUT POWER.....	12
4.1 STANDARD APPLICABLE.....	12
4.2 TEST PROCEDURE.....	12
4.3 SUMMARY OF TEST RESULTS/PLOTS.....	12
5. PEAK-TO-AVERAGE RATIO (PAR) OF TRANSMITTER.....	16
5.1 STANDARD APPLICABLE.....	16
5.2 TEST PROCEDURE.....	16
5.3 SUMMARY OF TEST RESULTS.....	16
6. EMISSION BANDWIDTH.....	18
6.1 STANDARD APPLICABLE.....	18
6.2 TEST PROCEDURE.....	18
6.3 SUMMARY OF TEST RESULTS/PLOTS.....	18
7. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL.....	31
7.1 STANDARD APPLICABLE.....	31
7.2 TEST PROCEDURE.....	31
7.3 SUMMARY OF TEST RESULTS/PLOTS.....	31
8. SPURIOUS RADIATED EMISSIONS.....	56
8.1 STANDARD APPLICABLE.....	56
8.2 TEST PROCEDURE.....	56
8.3 SUMMARY OF TEST RESULTS/PLOTS.....	56
9. FREQUENCY STABILITY.....	67
9.1 STANDARD APPLICABLE.....	67
9.2 TEST PROCEDURE.....	67
9.3 SUMMARY OF TEST RESULTS/PLOTS.....	67
10. MODULATION CHARACTERISTICS.....	71
10.1 STANDARD APPLICABLE.....	71
10.2 TEST PROCEDURE.....	71
10.3 SUMMARY OF TEST RESULTS/PLOTS.....	71



1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: PAJ GPS Inc.
Address of applicant: 444 Brickell Ave, Suite 51270 Miami, FL 33131 USA

Manufacturer: PAJ GPS Inc.
Address of manufacturer: 444 Brickell Ave, Suite 51270 Miami, FL 33131 USA

General Description of EUT:	
Product Name:	GPS Tracker
Brand Name:	PAJ GPS
Model No.:	PAJ GPS Finder 01
Adding Model(s):	GPS Tracker 01
Rated Voltage:	DC 12V/24V/Battery:DC3.7V
Battery:	200mAh
Adapter Model:	/
Software Version:	LK210_3G_170928B_4Band
Hardware Version:	LK210-3G-V3.2
<i>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 PAJ GPS Finder 01, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT:	
2G	
Support Networks:	GSM, GPRS
Support Band:	GSM850/PCS1900
Uplink Frequency:	GSM/GPRS 850: 824~849MHz GSM/GPRS 1900: 1850~1910MHz
Downlink Frequency:	GSM/GPRS 850: 869~894MHz GSM/GPRS 1900: 1930~1990MHz
Max RF Output Power:	GSM850: 32.94dBm, GSM1900: 29.70dBm
Type of Emission:	GSM850: 253KGXW, GSM1900: 251KGXW
Type of Modulation:	GMSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM850: -2dBi; GSM1900: -3dBi
GPRS 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: 22.94dBm, WCDMA Band 5: 22.14dBm
Type of Emission:	WCDMA Band 2: 4M22F9W WCDMA Band 5: 4M20F9W
Type of Modulation:	BPSK,QPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 2: -3dBi, WCDMA Band 5: -2dBi

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 2: FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

FCC Rules Part 22: PRIVATE LAND MOBILE RADIO SERVICES.

FCC Rules Part 24: PUBLIC MOBILE SERVICES

TIA/EIA 603 E March 2016: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

KDB 971168 D01 Power Meas License Digital Systems v03r01: MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

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

1.3 Test Methodology

All measurements contained in this report were conducted with TIA/EIA 603 E/ KDB 971168/ ANSI C63.26

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

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	GSM 850	Low, Middle, High Channels
TM2	GPRS 850	Low, Middle, High Channels
TM3	GSM 1900	Low, Middle, High Channels
TM4	GPRS 1900	Low, Middle, High Channels
TM5	WCDMA Band 5	Low, Middle, High Channels
TM6	HSDPA Band 5	Low, Middle, High Channels
TM7	HSUPA Band 5	Low, Middle, High Channels
TM8	WCDMA Band 2	Low, Middle, High Channels
TM9	HSDPA Band 2	Low, Middle, High Channels
TM10	HSUPA Band 2	Low, Middle, High Channels

Testing Configure			
Support Band	Support Standard	Channel Frequency(MHz)	Channel Number
GSM 850	GSM/GPRS/EDGE	824.2	128
		836.6	190
		848.8	251
PCS 1900	GSM/GPRS/EDGE	1850.2	512
		1880.0	661
		1909.8	810
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.4	4132
		836.6	4183
		846.6	4233
WCDMA Band 2	WCDMA/HSDPA/HSUPA	1852.4	9262
		1880.0	9400
		1907.6	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.			

Test Conditions	
Temperature:	22~25 °C
Relative humidity	50~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
DC cable	1.5	Unshielded	Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Frequency Stability	Conducted	2.3%
Transmitter Spurious Emissions	Conducted	$\pm 0.42\text{dB}$
Transmitter Spurious Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-18GHz $\pm 3.92\text{dB}$

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 RF exposure report.

4. RF Output Power

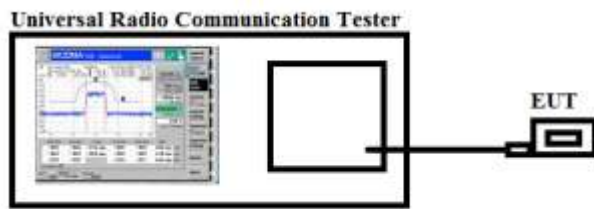
4.1 Standard Applicable

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 and ANSI C63.26 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 Summary of Test Results/Plots

➤ **Max. Radiated Power**

Mode	Channel	Antenna Polar	ERP (dBm)	Limit (dBm)	Result
GSM850	128	V	29.89	<38.45	Pass
		H	29.49		
	190	V	29.68		
		H	29.32		
	251	V	28.45		
		H	28.12		
GPRS850	128	V	29.96	<38.45	Pass
		H	29.78		
	190	V	29.72		
		H	29.53		
	251	V	28.38		
		H	28.21		

Mode	Channel	Antenna Polar	EIRP (dBm)	Limit (dBm)	Result
PCS1900	512	V	28.50	<33.00	Pass
		H	27.99		
	661	V	28.56		
		H	28.12		
	810	V	28.38		
		H	28.50		
GPRS1900	512	V	27.49	<33.00	Pass
		H	27.74		
	661	V	27.93		
		H	27.49		
	810	V	27.12		
		H	27.50		

Mode	Channel	Antenna Polar	ERP	Limit (dBm)	Result
WCDMA Band V	4132	V	21.20	<38.45	Pass
		H	20.89		
	4183	V	20.97		
		H	21.10		
	4233	V	21.13		
		H	21.01		

Mode	Channel	Antenna Polar	EIRP	Limit (dBm)	Result
WCDMA Band II	9262	V	21.29	<33.00	Pass
		H	20.75		
	9400	V	20.94		
		H	20.99		
	9538	V	20.87		
		H	21.25		

Note: Pre-scan mode WCDMA/HSDPA/HSUPA find the worst case at WCDMA mode and recorded in the test report.

➤ **Max. Conducted Power (Average power)**

Conducted Average power (dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency(MHz)	824.20	836.60	848.80	1850.20	1880.00	1909.80
GSM	32.88	32.93	32.82	29.70	29.15	28.99
GPRS(1Slot)	32.87	32.94	32.85	29.69	29.15	29.00

Conducted Average power (dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4183	4233	9262	9400	9538
Frequency(MHz)	826.4	836.6	846.6	1852.4	1880.0	1907.6
RMC 12.2k	22.14	21.97	21.90	22.94	22.41	22.23
HSDPA Subtest-1	21.12	21.00	20.88	22.00	21.46	21.25
HSDPA Subtest-2	21.01	20.86	20.63	21.85	21.26	21.10
HSDPA Subtest-3	20.97	20.88	20.78	21.77	21.23	21.03
HSDPA Subtest-4	20.92	20.81	20.75	21.82	21.25	21.08
HSUPA Subtest-1	21.05	20.90	20.84	21.90	21.44	21.13
HSUPA Subtest-2	20.83	20.73	20.71	21.69	21.28	20.97
HSUPA Subtest-3	20.89	20.74	20.63	21.70	21.31	20.90
HSUPA Subtest-4	20.82	20.80	20.69	21.79	21.28	20.91
HSUPA Subtest-5	20.83	20.65	20.70	21.78	21.24	20.97

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

5.1 Standard Applicable

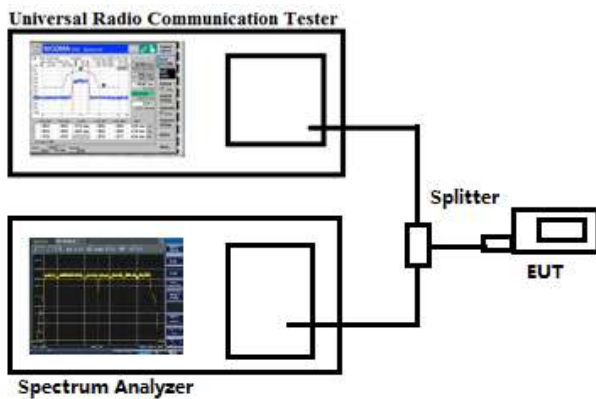
According to §24.232(d), Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in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

According with KDB 971168

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Configuration for the emission bandwidth testing:



5.3 Summary of Test Results

PCS1900				
Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	661	1850.2	4.82	13
GPRS(1 Slot)	661	1850.2	4.26	13



WCDMA Band II				
Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	6.96	13
	9400	1880.0	5.12	13
	9538	1907.6	4.38	13

Note: Only the worst case was selected to record.

6. Emission Bandwidth

6.1 Standard Applicable

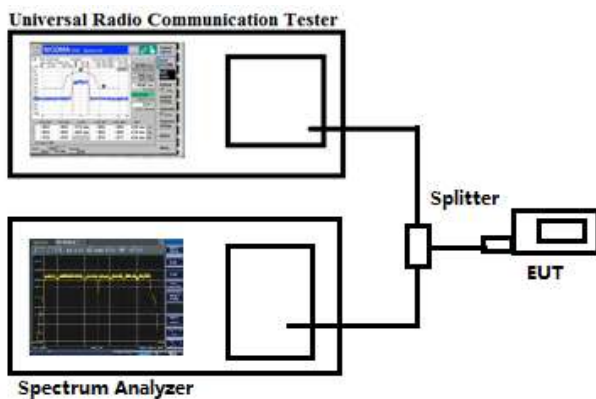
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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.

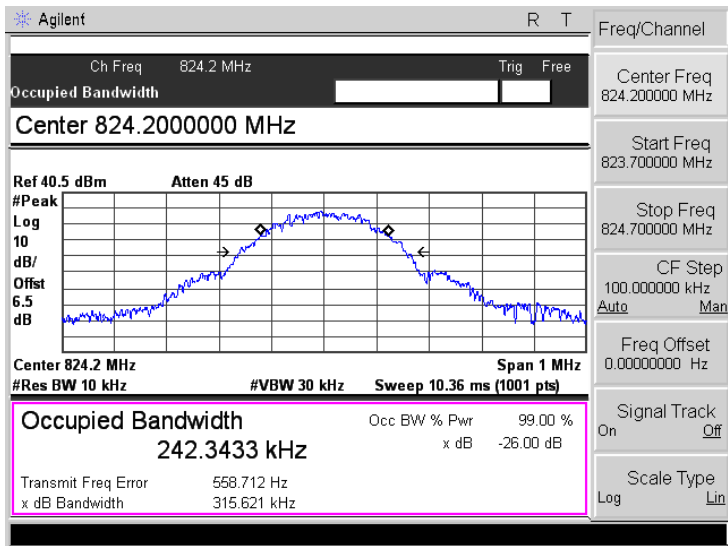
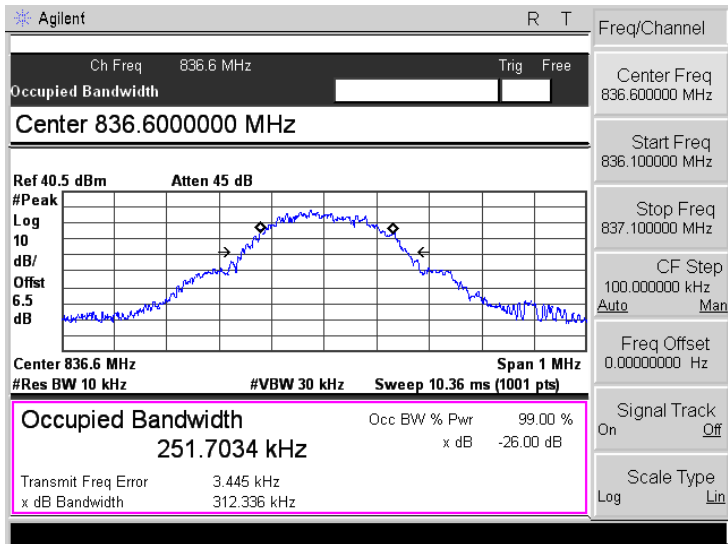
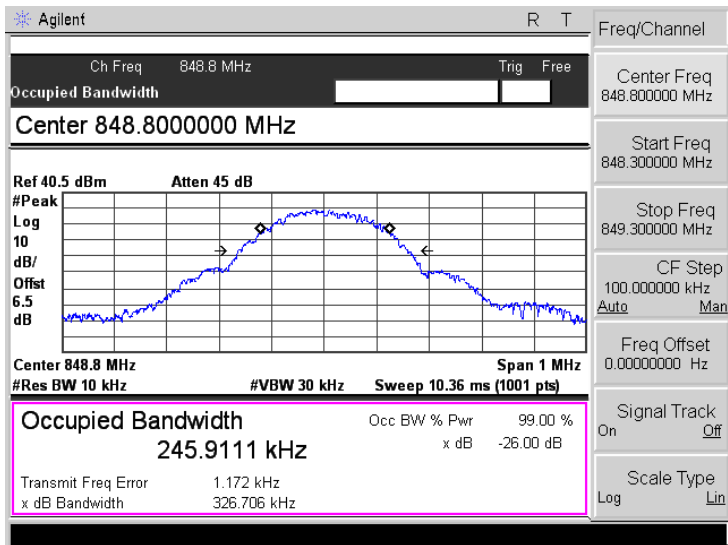
Test Configuration for the emission bandwidth testing:

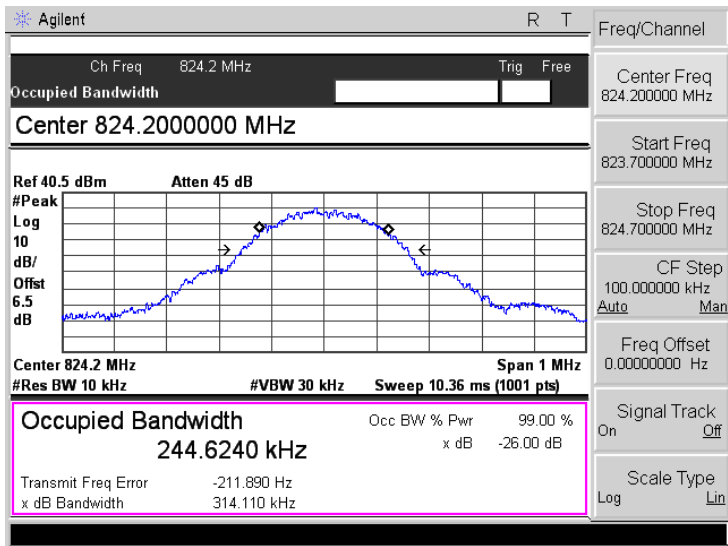
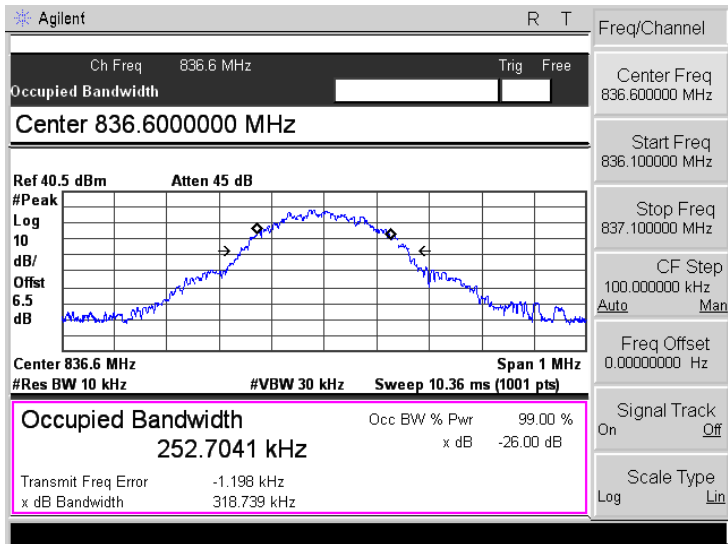
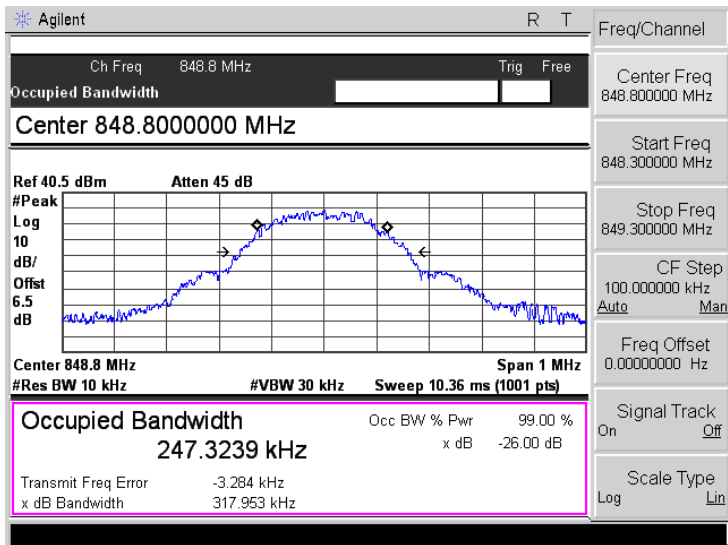


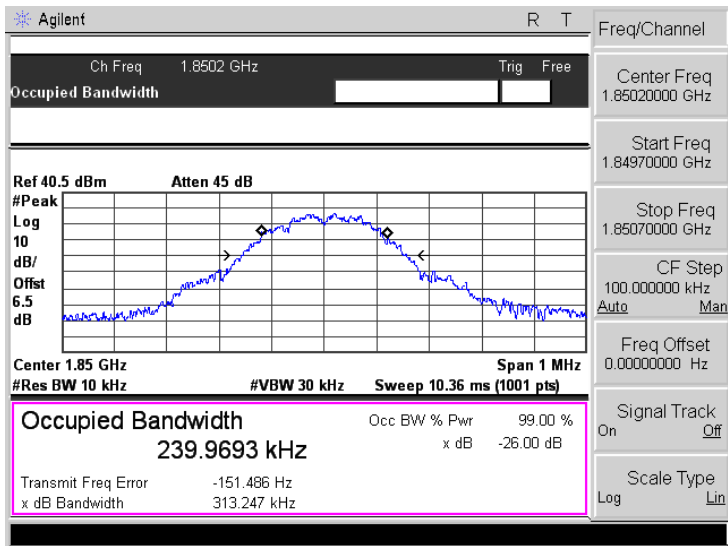
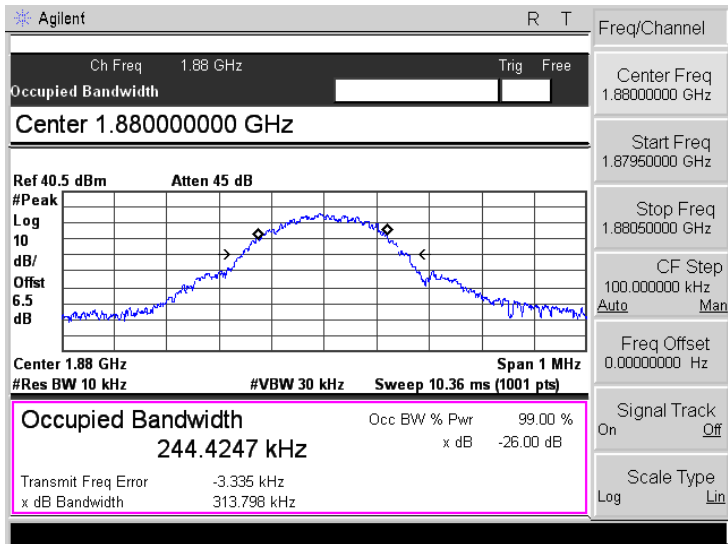
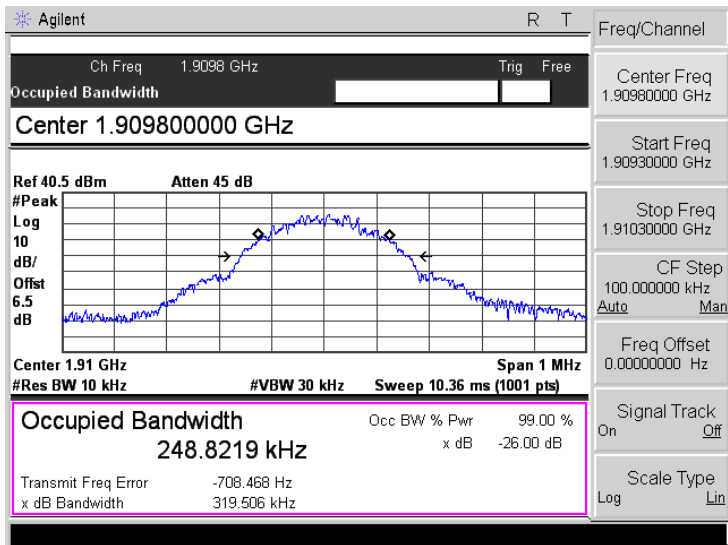
6.3 Summary of Test Results/Plots

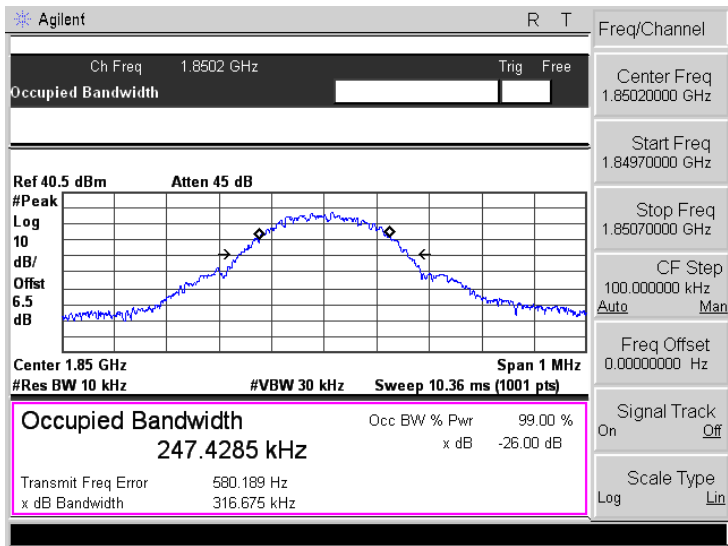
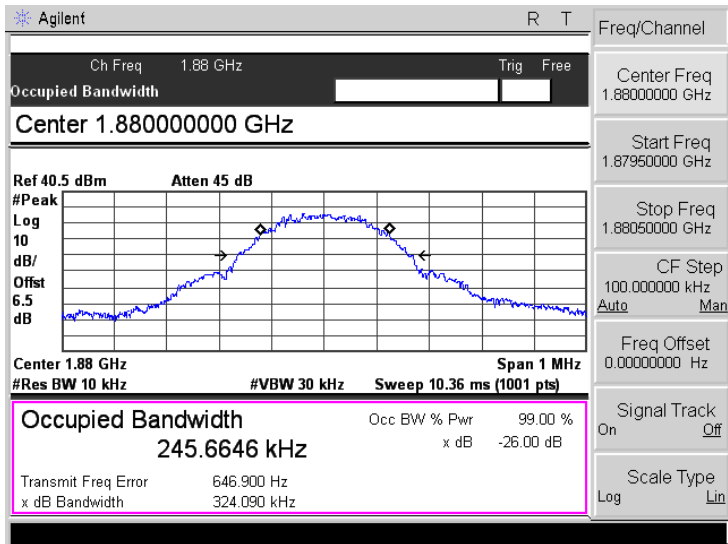
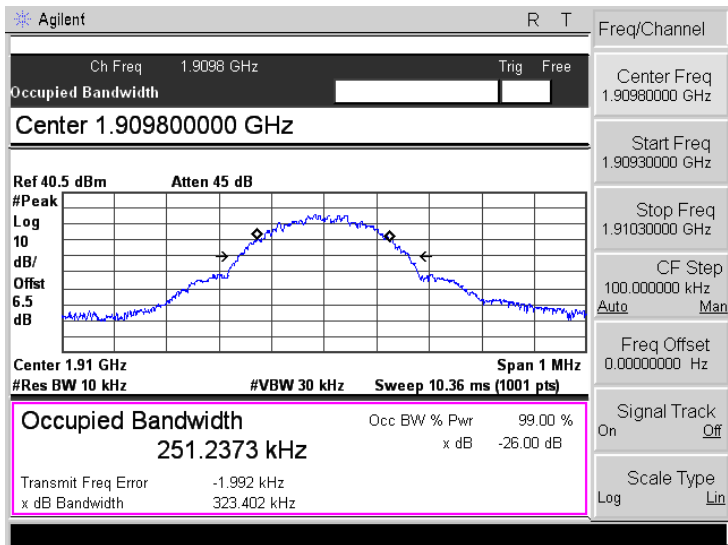
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (kHz)	-26dB bandwidth (kHz)
GSM 850 (GMSK)	128	824.20	242.3433	315.621
	190	836.60	251.7034	312.336
	251	848.80	245.9111	326.706
GPRS850 (GMSK,1Slot)	128	824.20	244.6240	314.110
	190	836.60	252.7041	318.739
	251	848.80	247.3239	317.953
PCS1900 (GMSK)	512	1850.20	239.9693	313.247
	661	1880.00	244.4247	313.798
	810	1909.80	248.8219	319.506
GPRS1900 (GMSK,1Slot)	512	1850.20	247.4285	316.675
	661	1880.00	245.6646	324.090
	810	1909.80	251.2373	323.402

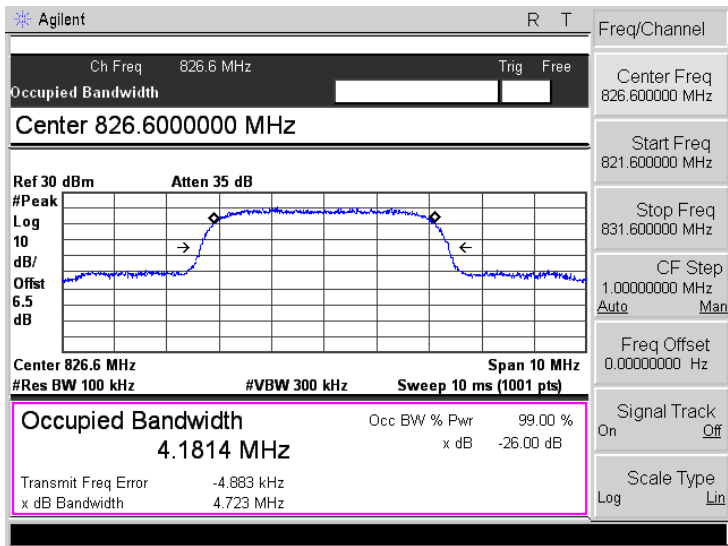
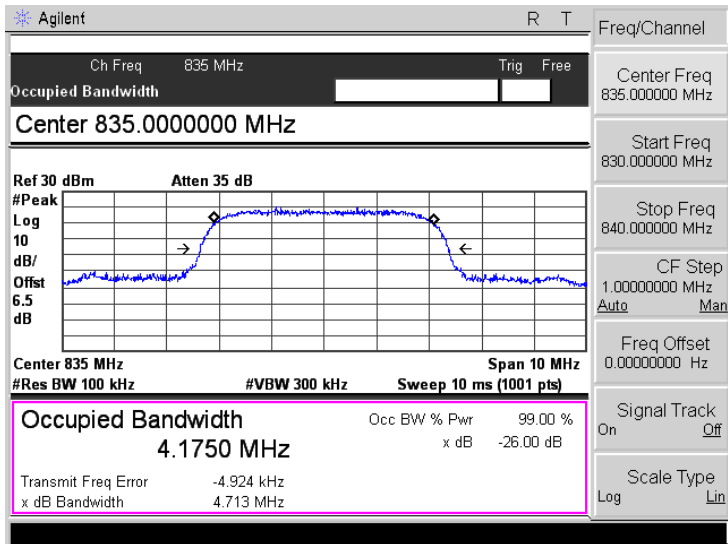
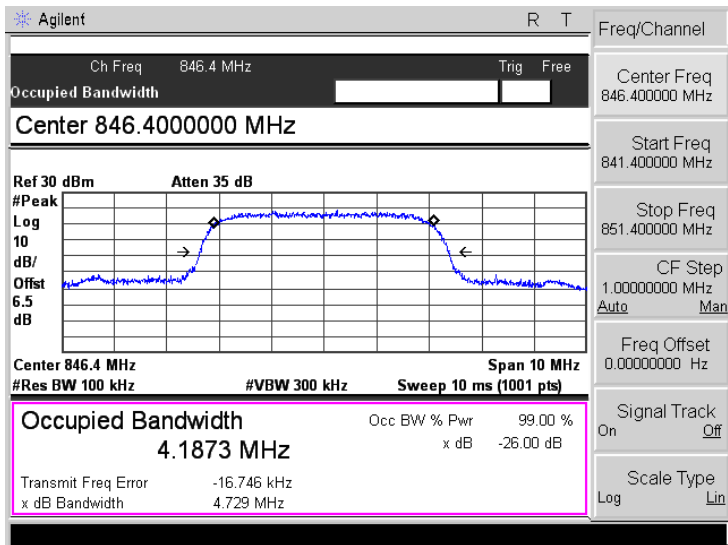
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (kHz)	-26dB bandwidth (kHz)
WCDMA Band V	4132	826.40	4.1814	4.723
	4183	836.60	4.1750	4.713
	4233	846.60	4.1873	4.729
HSDPA	4132	826.40	4.1802	4.726
	4183	836.60	4.1990	4.727
	4233	846.60	4.1753	4.705
HSUPA	4132	826.40	4.1769	4.728
	4183	836.60	4.1712	4.724
	4233	846.60	4.1651	4.737
WCDMA Band II	9262	1852.40	4.1716	4.733
	9400	1880.00	4.1978	4.745
	9538	1907.60	4.1965	4.754
HSDPA	9262	1852.40	4.1744	4.727
	9400	1880.00	4.2156	4.759
	9538	1907.60	4.1902	4.732
HSUPA	9262	1852.40	4.1749	4.725
	9400	1880.00	4.1978	4.774
	9538	1907.60	4.1840	4.733

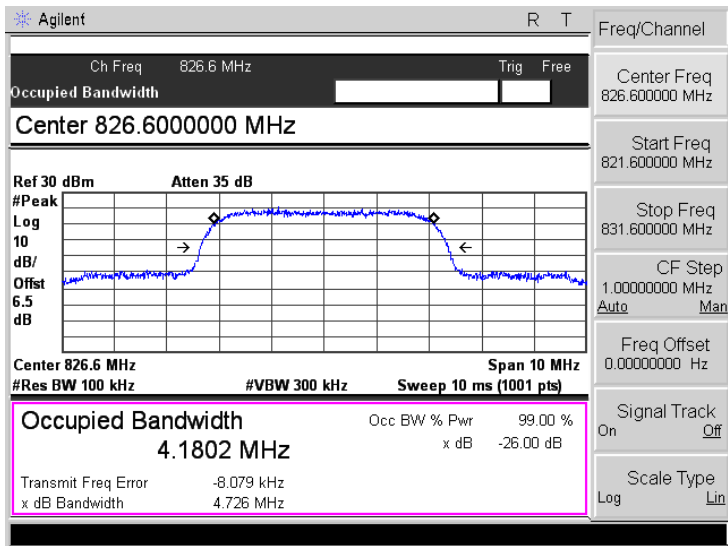
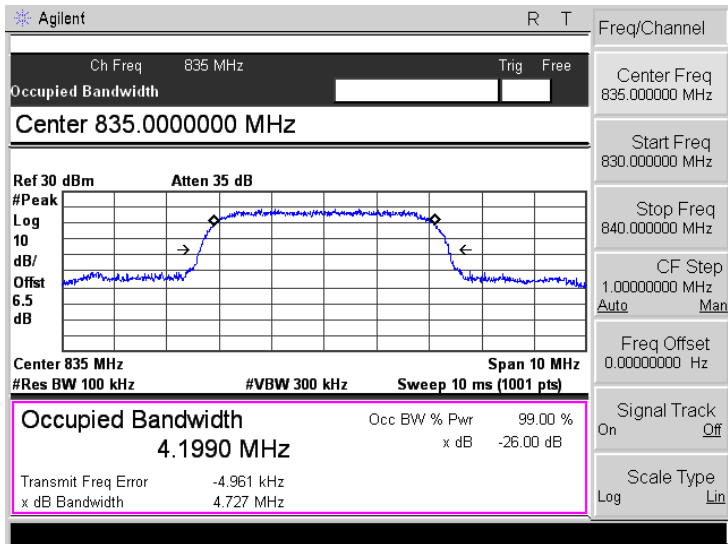
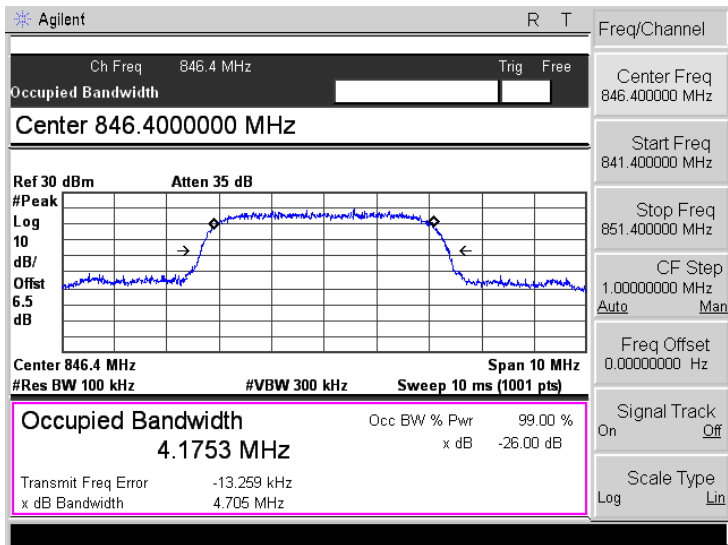
GSM850	
Low Channel	 Agilent R T Ch Freq 824.2 MHz Trig Free Occupied Bandwidth Center 824.200000 MHz Ref 40.5 dBm Atten 45 dB #Peak Log 10 dB/Offset 6.5 dB Center 824.2 MHz Span 1 MHz #Res BW 10 kHz #VBW 30 kHz Sweep 10.36 ms (1001 pts) Occupied Bandwidth 242.3433 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 558.712 Hz x dB Bandwidth 315.621 kHz Freq/Channel Center Freq 824.200000 MHz Start Freq 823.700000 MHz Stop Freq 824.700000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off Scale Type Log Lin
Middle Channel	 Agilent R T Ch Freq 836.6 MHz Trig Free Occupied Bandwidth Center 836.600000 MHz Ref 40.5 dBm Atten 45 dB #Peak Log 10 dB/Offset 6.5 dB Center 836.6 MHz Span 1 MHz #Res BW 10 kHz #VBW 30 kHz Sweep 10.36 ms (1001 pts) Occupied Bandwidth 251.7034 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 3.445 kHz x dB Bandwidth 312.336 kHz Freq/Channel Center Freq 836.600000 MHz Start Freq 836.100000 MHz Stop Freq 837.100000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off Scale Type Log Lin
High Channel	 Agilent R T Ch Freq 848.8 MHz Trig Free Occupied Bandwidth Center 848.800000 MHz Ref 40.5 dBm Atten 45 dB #Peak Log 10 dB/Offset 6.5 dB Center 848.8 MHz Span 1 MHz #Res BW 10 kHz #VBW 30 kHz Sweep 10.36 ms (1001 pts) Occupied Bandwidth 245.9111 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 1.172 kHz x dB Bandwidth 326.706 kHz Freq/Channel Center Freq 848.800000 MHz Start Freq 848.300000 MHz Stop Freq 849.300000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off Scale Type Log Lin

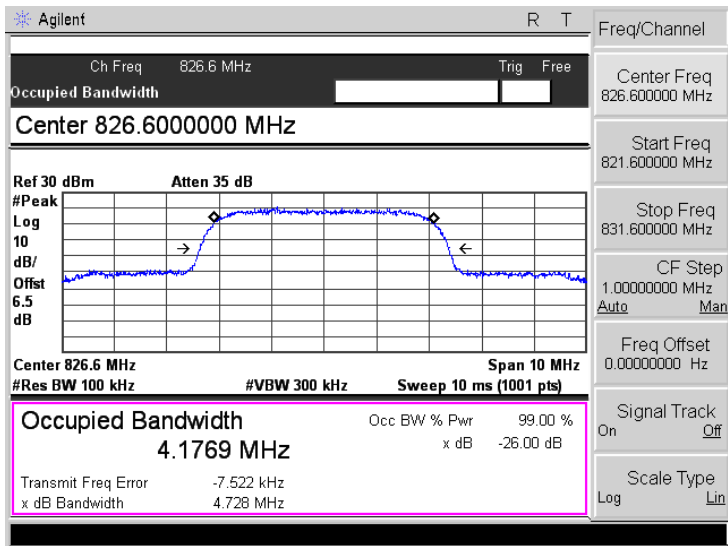
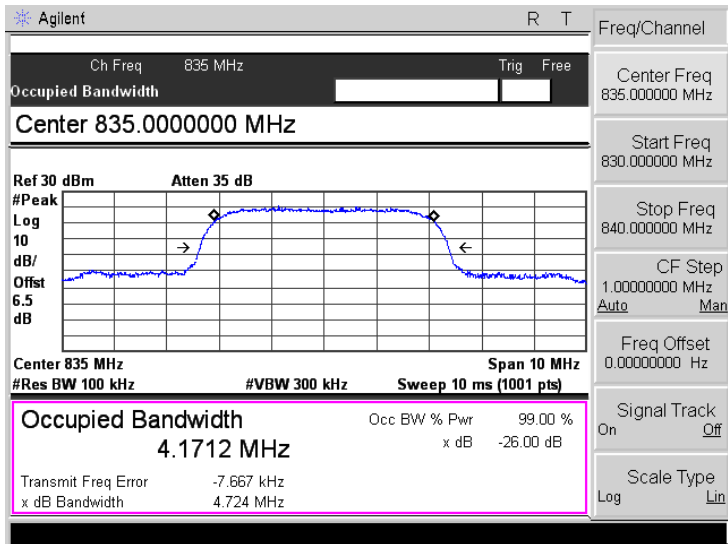
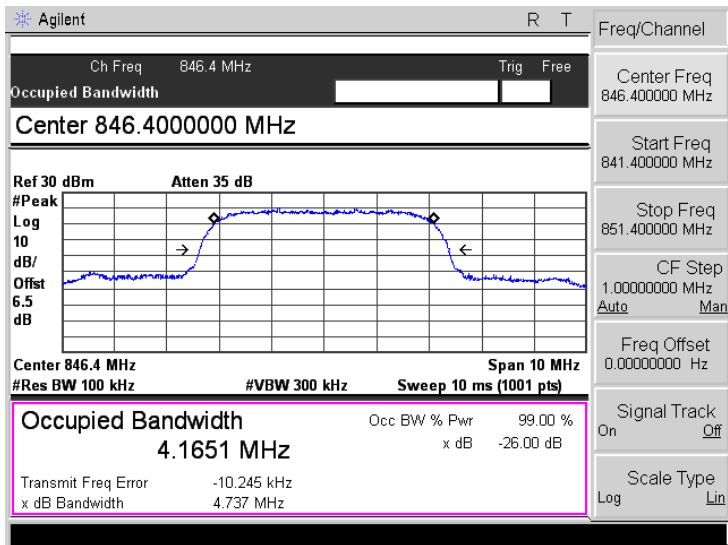
GPRS850	
Low Channel	 Agilent R T Ch Freq 824.2 MHz Trig Free Occupied Bandwidth Center 824.200000 MHz Ref 40.5 dBm Atten 45 dB #Peak Log 10 dB/Offset 6.5 dB Center 824.2 MHz Span 1 MHz #Res BW 10 kHz #VBW 30 kHz Sweep 10.36 ms (1001 pts) Occupied Bandwidth 244.6240 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -211.890 Hz x dB Bandwidth 314.110 kHz Freq/Channel Center Freq 824.200000 MHz Start Freq 823.700000 MHz Stop Freq 824.700000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
Middle Channel	 Agilent R T Ch Freq 836.6 MHz Trig Free Occupied Bandwidth Center 836.600000 MHz Ref 40.5 dBm Atten 45 dB #Peak Log 10 dB/Offset 6.5 dB Center 836.6 MHz Span 1 MHz #Res BW 10 kHz #VBW 30 kHz Sweep 10.36 ms (1001 pts) Occupied Bandwidth 252.7041 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -1.198 kHz x dB Bandwidth 318.739 kHz Freq/Channel Center Freq 836.600000 MHz Start Freq 836.100000 MHz Stop Freq 837.100000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
High Channel	 Agilent R T Ch Freq 848.8 MHz Trig Free Occupied Bandwidth Center 848.800000 MHz Ref 40.5 dBm Atten 45 dB #Peak Log 10 dB/Offset 6.5 dB Center 848.8 MHz Span 1 MHz #Res BW 10 kHz #VBW 30 kHz Sweep 10.36 ms (1001 pts) Occupied Bandwidth 247.3239 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -3.284 kHz x dB Bandwidth 317.953 kHz Freq/Channel Center Freq 848.800000 MHz Start Freq 848.300000 MHz Stop Freq 849.300000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

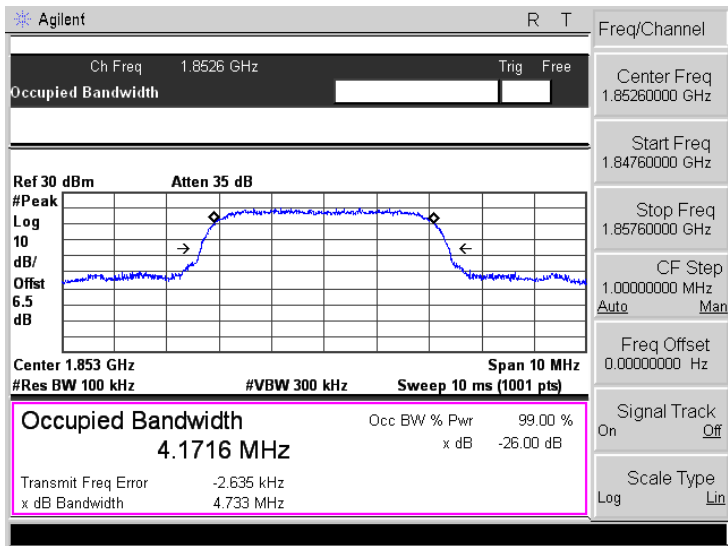
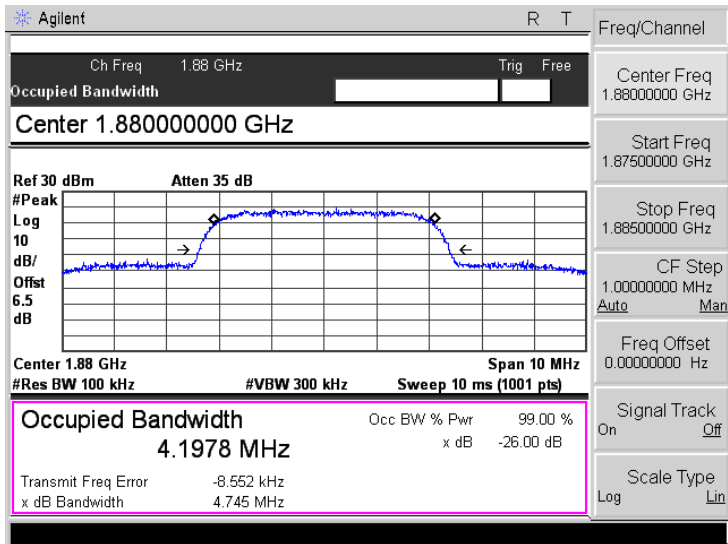
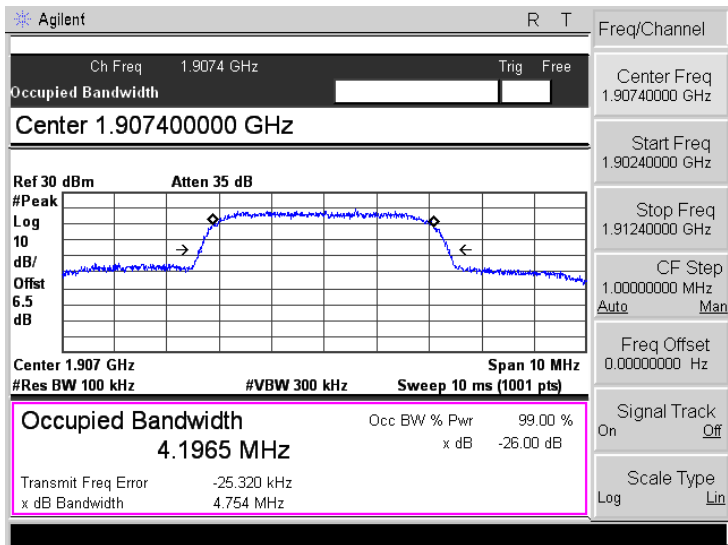
PCS1900	
Low Channel	
Middle Channel	
High Channel	

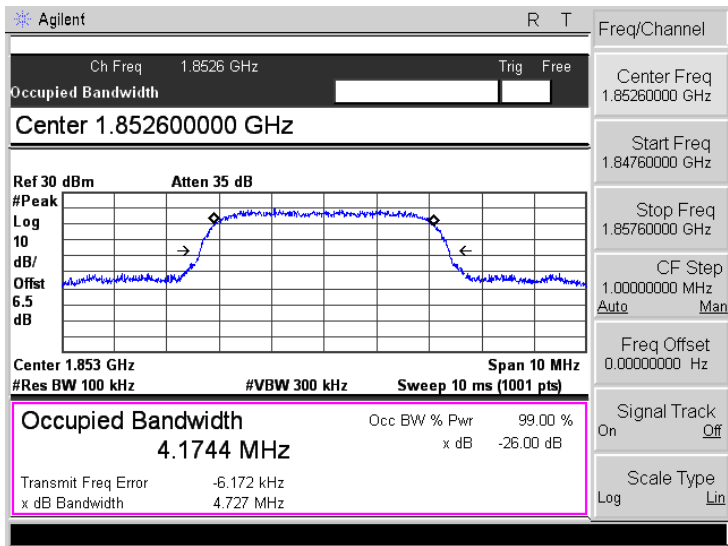
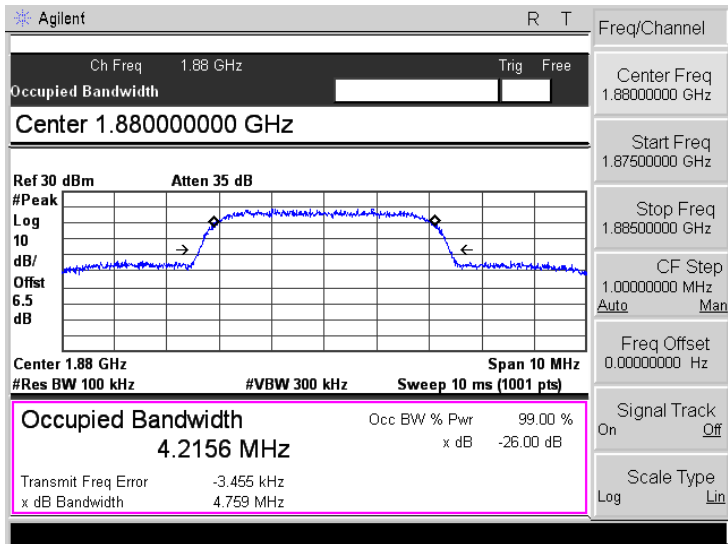
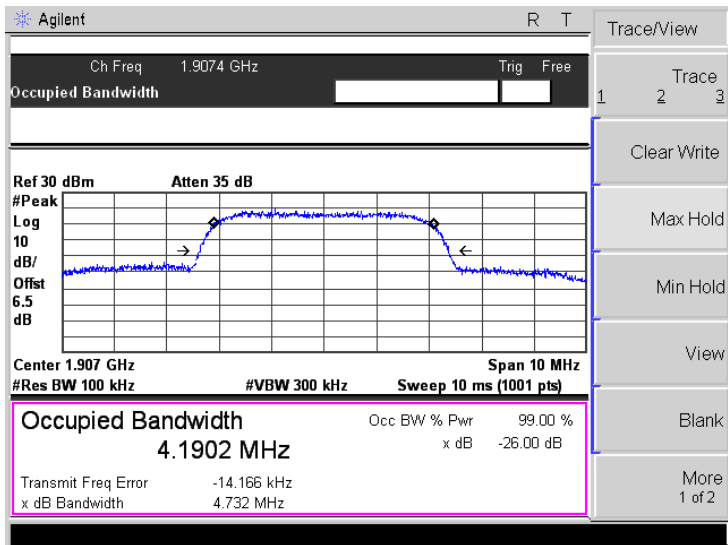
GPRS1900	
Low Channel	
Middle Channel	
High Channel	

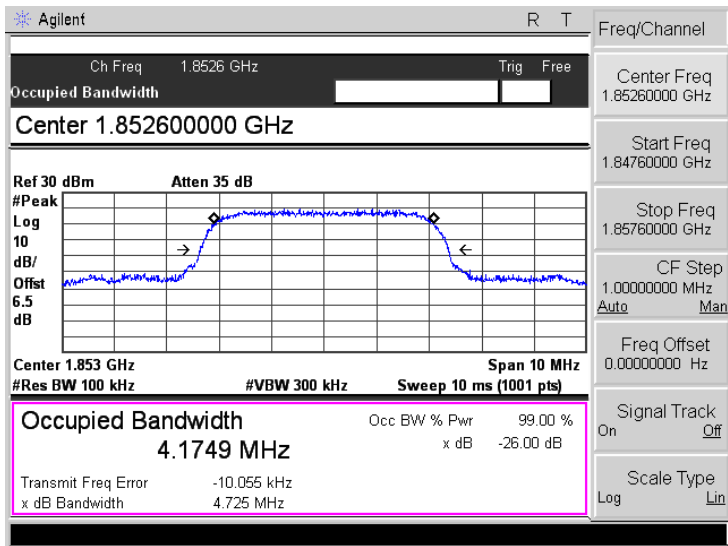
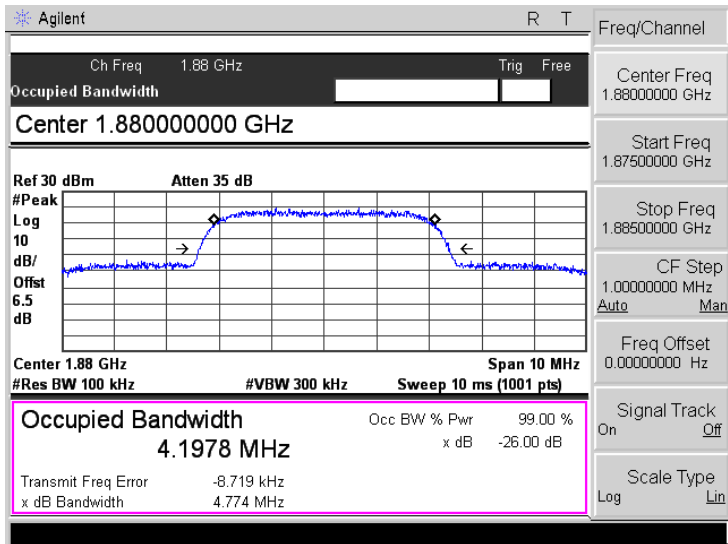
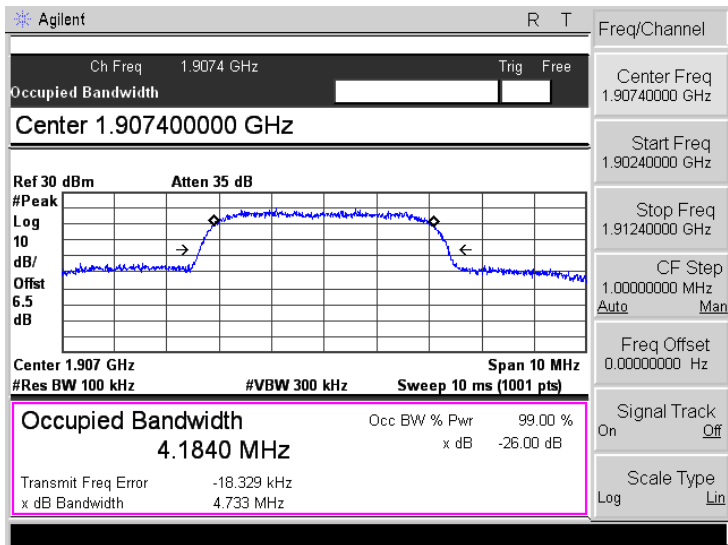
WCDMA Band V	
Low Channel	
Middle Channel	
High Channel	

WCDMA Band V- HSDPA	
Low Channel	 Agilent R T Ch Freq 826.6 MHz Trig Free Occupied Bandwidth Center 826.600000 MHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/ Offst 6.5 dB Center 826.6 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1802 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -8.079 kHz x dB Bandwidth 4.726 MHz Freq/Channel Center Freq 826.600000 MHz Start Freq 821.600000 MHz Stop Freq 831.600000 MHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
Middle Channel	 Agilent R T Ch Freq 835 MHz Trig Free Occupied Bandwidth Center 835.000000 MHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/ Offst 6.5 dB Center 835 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1990 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -4.961 kHz x dB Bandwidth 4.727 MHz Freq/Channel Center Freq 835.000000 MHz Start Freq 830.000000 MHz Stop Freq 840.000000 MHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
High Channel	 Agilent R T Ch Freq 846.4 MHz Trig Free Occupied Bandwidth Center 846.400000 MHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/ Offst 6.5 dB Center 846.4 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1753 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -13.259 kHz x dB Bandwidth 4.705 MHz Freq/Channel Center Freq 846.400000 MHz Start Freq 841.400000 MHz Stop Freq 851.400000 MHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

WCDMA Band V- HSUPA	
Low Channel	 Agilent R T Ch Freq 826.6 MHz Trig Free Occupied Bandwidth Center 826.600000 MHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/Offset 6.5 dB Center 826.6 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1769 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -7.522 kHz x dB Bandwidth 4.728 MHz Freq/Channel Center Freq 826.600000 MHz Start Freq 821.600000 MHz Stop Freq 831.600000 MHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
Middle Channel	 Agilent R T Ch Freq 835 MHz Trig Free Occupied Bandwidth Center 835.000000 MHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/Offset 6.5 dB Center 835 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1712 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -7.667 kHz x dB Bandwidth 4.724 MHz Freq/Channel Center Freq 835.000000 MHz Start Freq 830.000000 MHz Stop Freq 840.000000 MHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
High Channel	 Agilent R T Ch Freq 846.4 MHz Trig Free Occupied Bandwidth Center 846.400000 MHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/Offset 6.5 dB Center 846.4 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1651 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -10.245 kHz x dB Bandwidth 4.737 MHz Freq/Channel Center Freq 846.400000 MHz Start Freq 841.400000 MHz Stop Freq 851.400000 MHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

WCDMA Band II	
Low Channel	
Middle Channel	
High Channel	

WCDMA Band II- HSDPA	
Low Channel	 Agilent R T Ch Freq 1.8526 GHz Trig Free Occupied Bandwidth Center 1.852600000 GHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/ Offst 6.5 dB Center 1.853 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1744 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -6.172 kHz x dB Bandwidth 4.727 MHz Freq/Channel Center Freq 1.85260000 GHz Start Freq 1.84760000 GHz Stop Freq 1.85760000 GHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
Middle Channel	 Agilent R T Ch Freq 1.88 GHz Trig Free Occupied Bandwidth Center 1.880000000 GHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/ Offst 6.5 dB Center 1.88 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.2156 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -3.455 kHz x dB Bandwidth 4.759 MHz Freq/Channel Center Freq 1.88000000 GHz Start Freq 1.87500000 GHz Stop Freq 1.88500000 GHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
High Channel	 Agilent R T Ch Freq 1.9074 GHz Trig Free Occupied Bandwidth Center 1.907 GHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/ Offst 6.5 dB Center 1.907 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1902 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -14.166 kHz x dB Bandwidth 4.732 MHz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

WCDMA Band II- HSUPA	
Low Channel	 Agilent R T Ch Freq 1.8526 GHz Trig Free Occupied Bandwidth Center 1.852600000 GHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/Offset 6.5 dB Center 1.853 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1749 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -10.055 kHz x dB Bandwidth 4.725 MHz Freq/Channel Center Freq 1.85260000 GHz Start Freq 1.84760000 GHz Stop Freq 1.85760000 GHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
Middle Channel	 Agilent R T Ch Freq 1.88 GHz Trig Free Occupied Bandwidth Center 1.880000000 GHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/Offset 6.5 dB Center 1.88 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1978 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -8.719 kHz x dB Bandwidth 4.774 MHz Freq/Channel Center Freq 1.88000000 GHz Start Freq 1.87500000 GHz Stop Freq 1.88500000 GHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin
High Channel	 Agilent R T Ch Freq 1.9074 GHz Trig Free Occupied Bandwidth Center 1.907400000 GHz Ref 30 dBm Atten 35 dB #Peak Log 10 dB/Offset 6.5 dB Center 1.907 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1840 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -18.329 kHz x dB Bandwidth 4.733 MHz Freq/Channel Center Freq 1.90740000 GHz Start Freq 1.90240000 GHz Stop Freq 1.91240000 GHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

7. Out of Band Emissions at Antenna Terminal

7.1 Standard Applicable

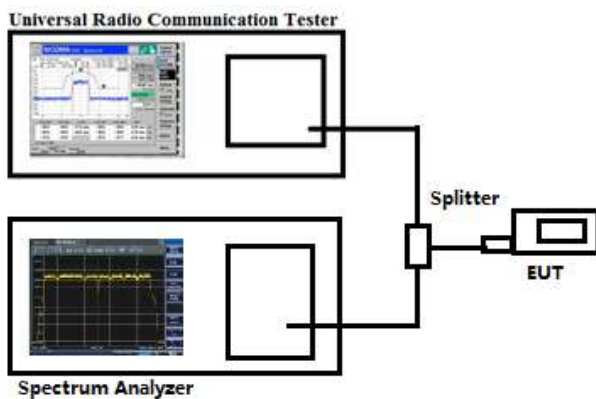
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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:



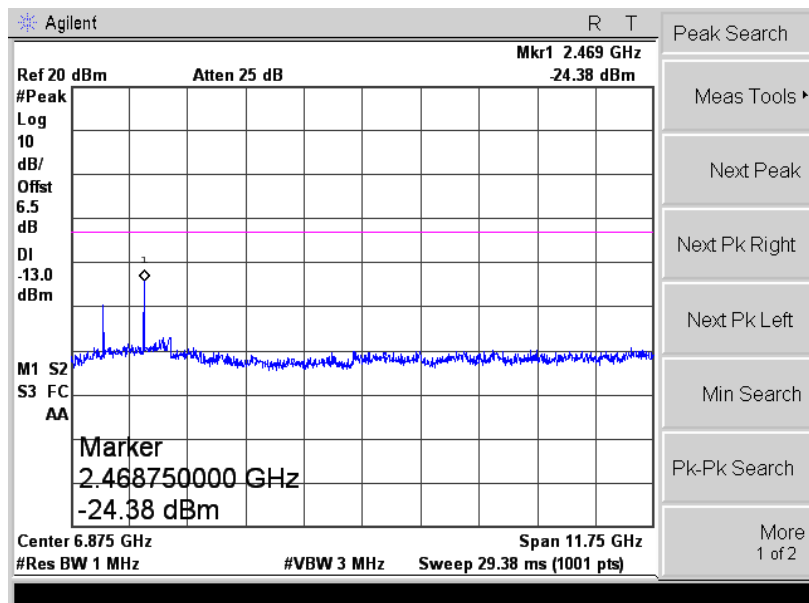
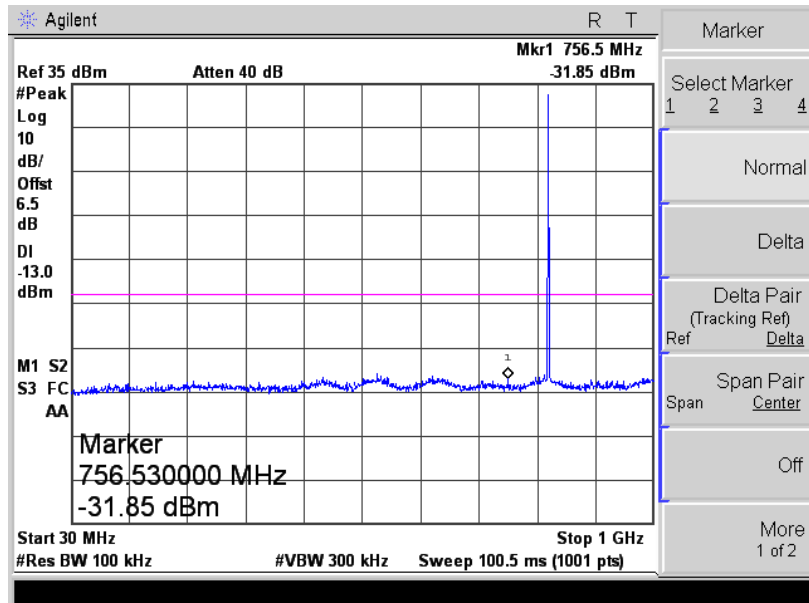
7.3 Summary of Test Results/Plots

Note: Pre-scan mode WCDMA/HSDPA/HSUPA find the worst case at WCDMA mode and recorded in the test report.

Please refer to the following test plots

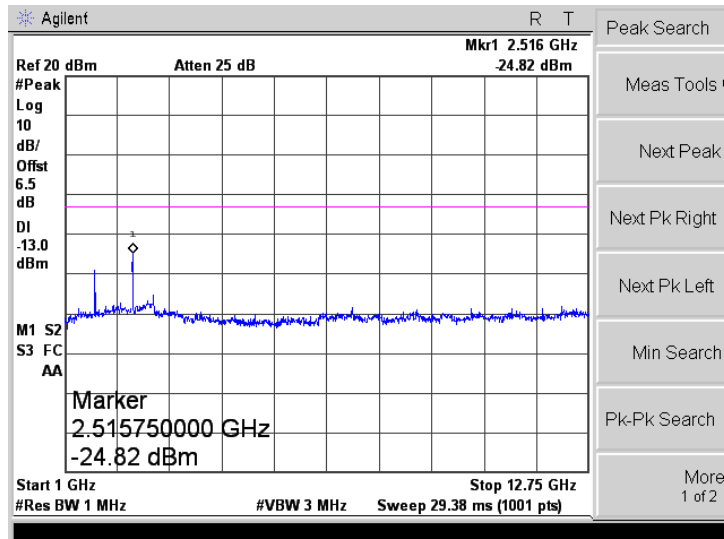
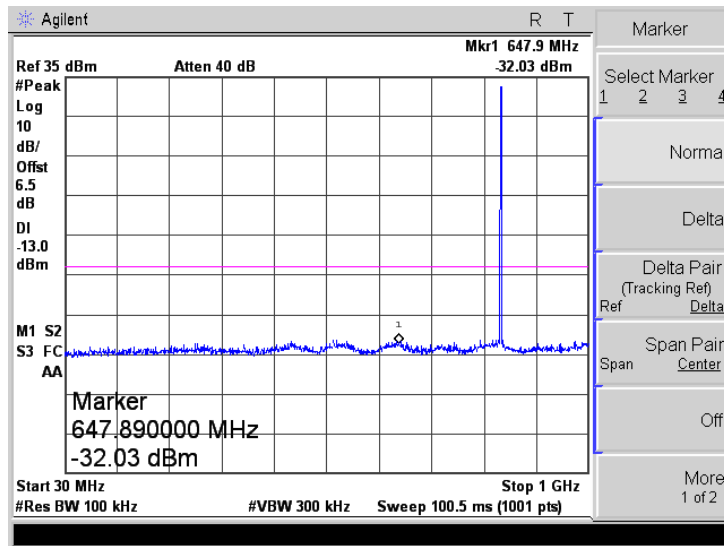
GSM850

Low Channel



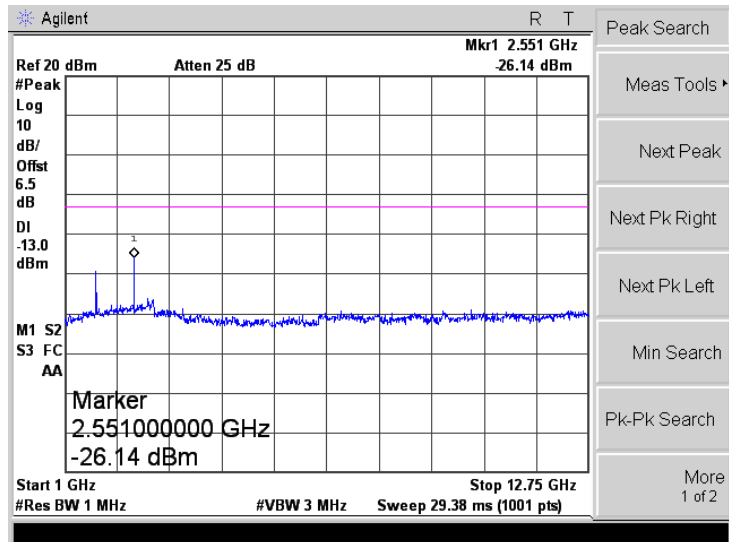
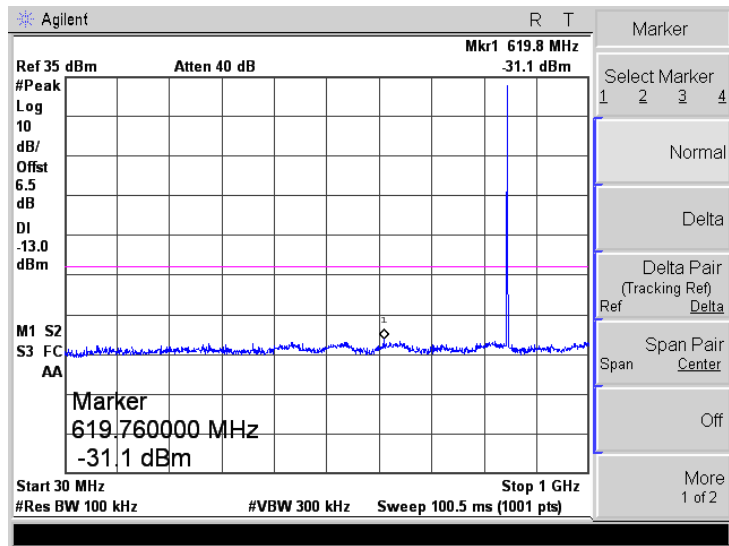
GSM850

Middle Channel



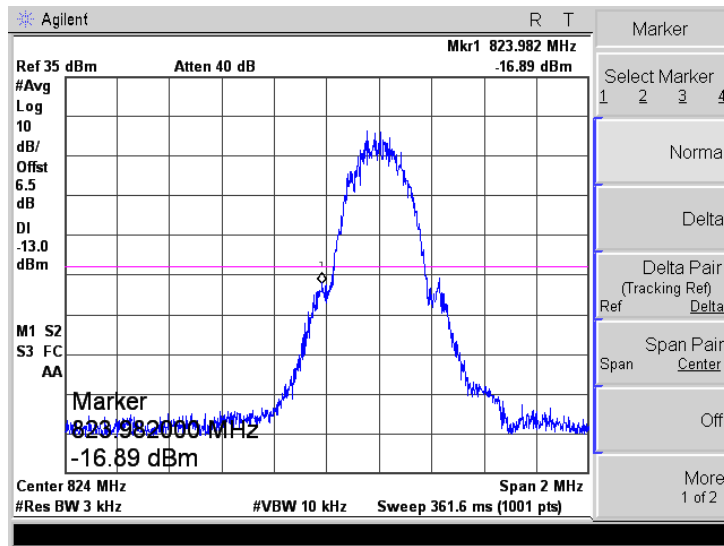
GSM850

High Channel

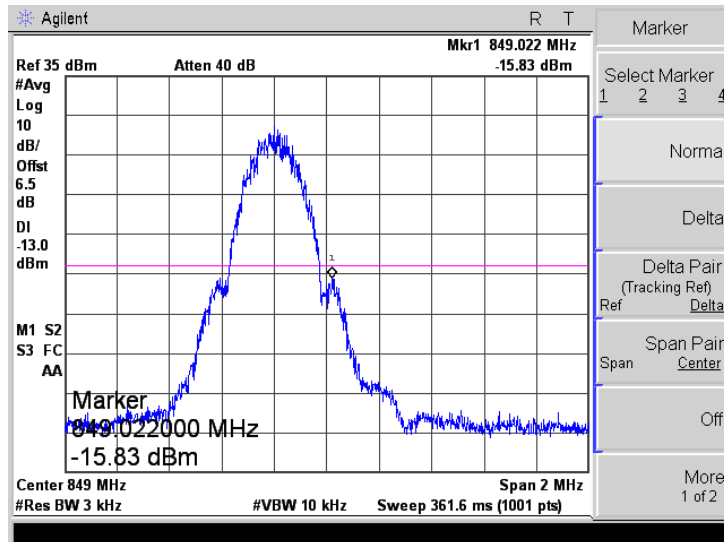


GSM850

Low Band Emission

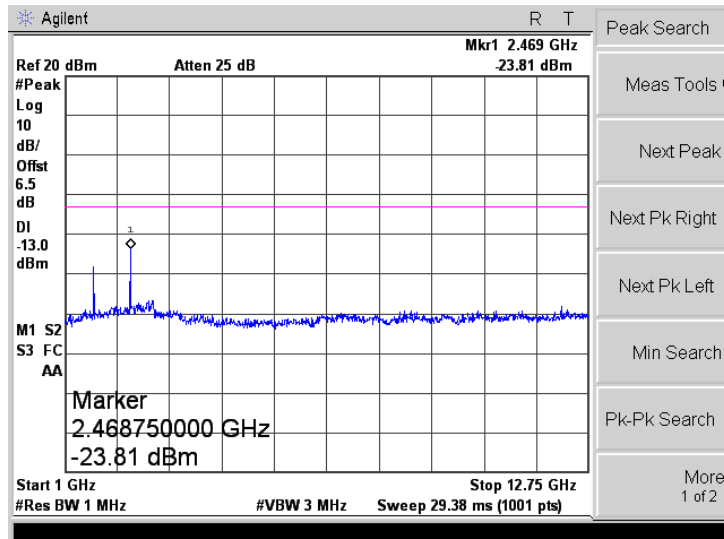
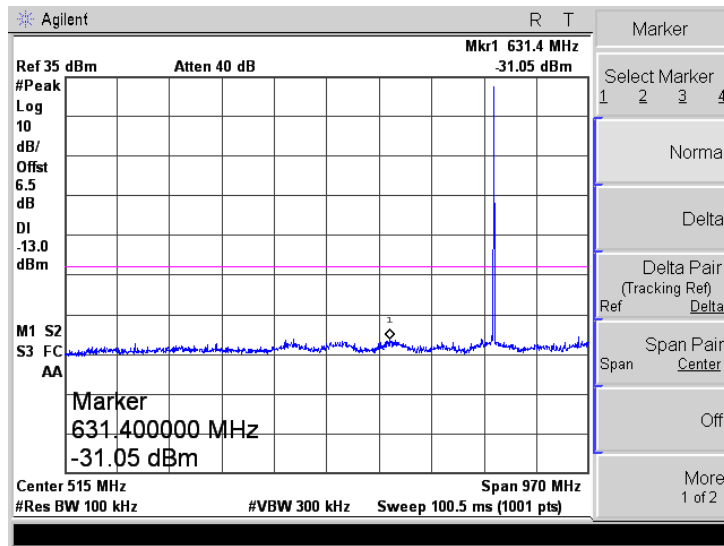


High Band Emission



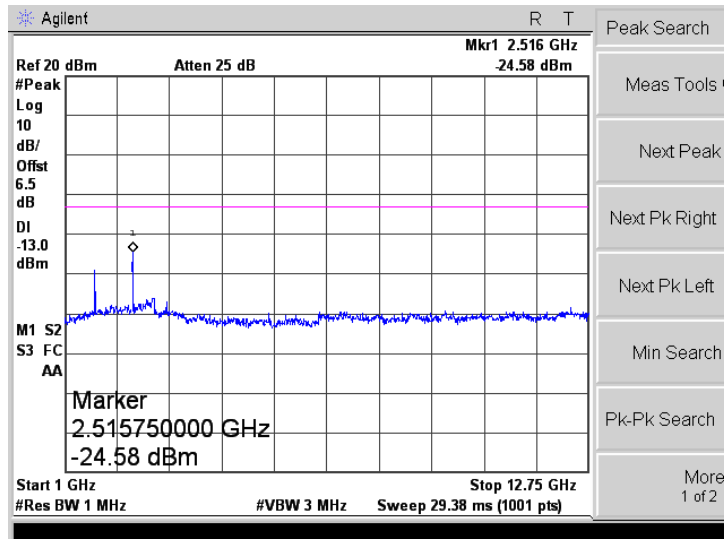
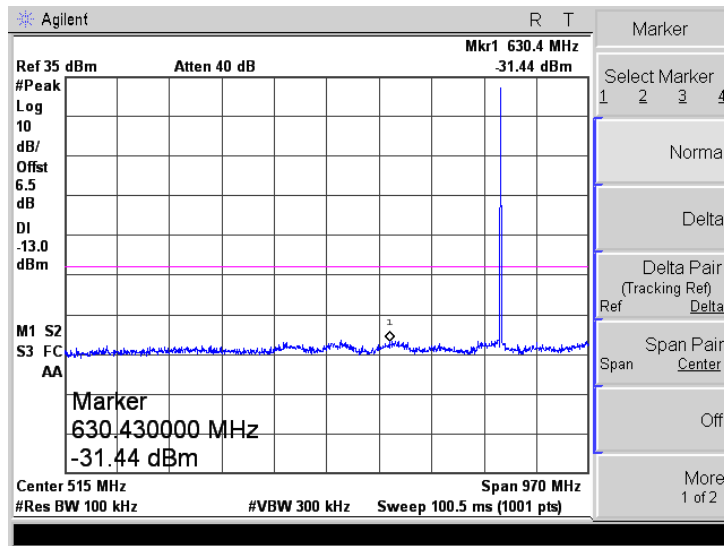
For Cellular Band

GPRS Low Channel



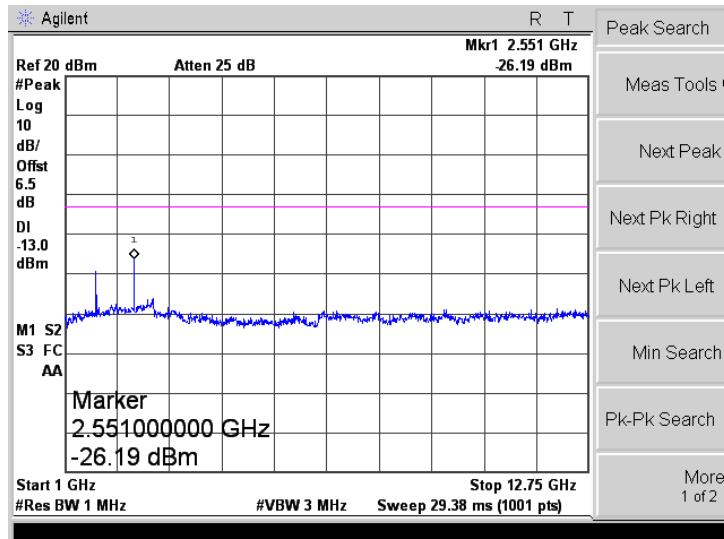
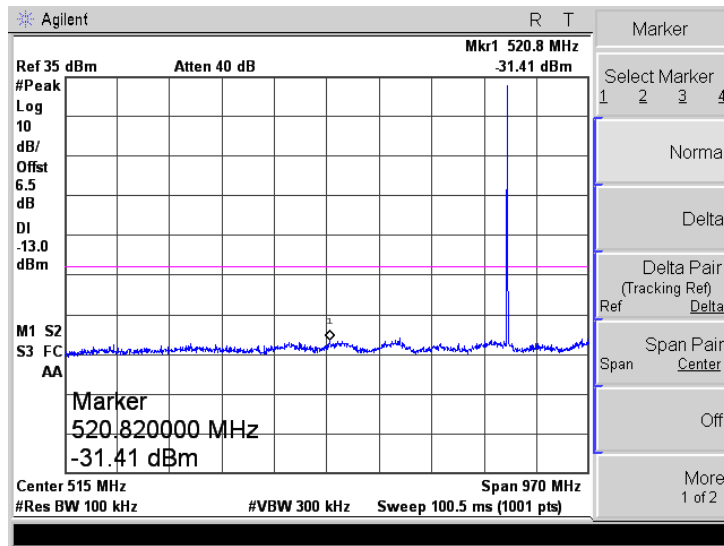
GPRS850

Middle Channel



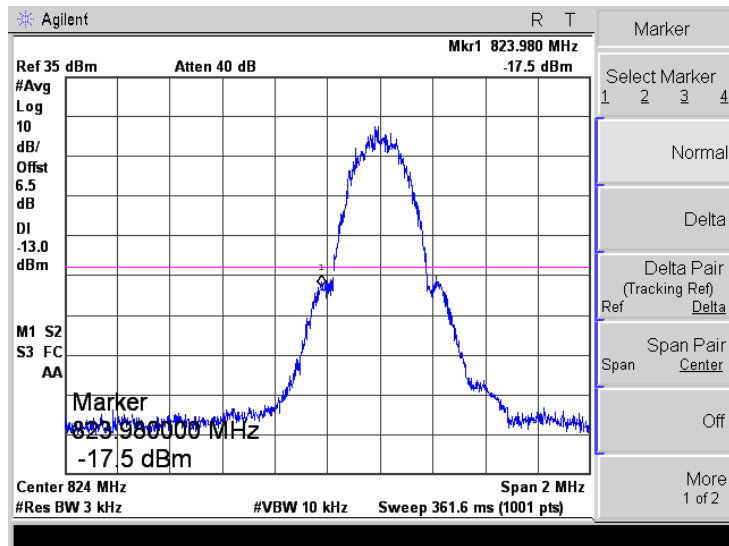
GPRS850

High Channel

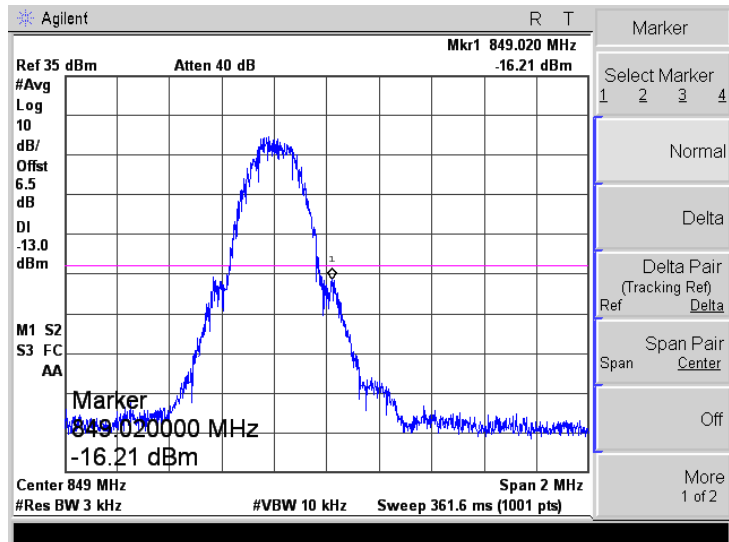


GPRS850

Low Band Emission

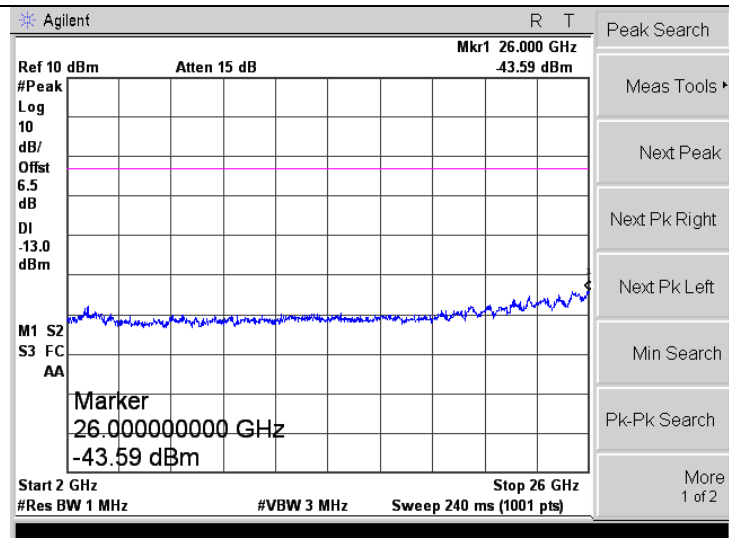
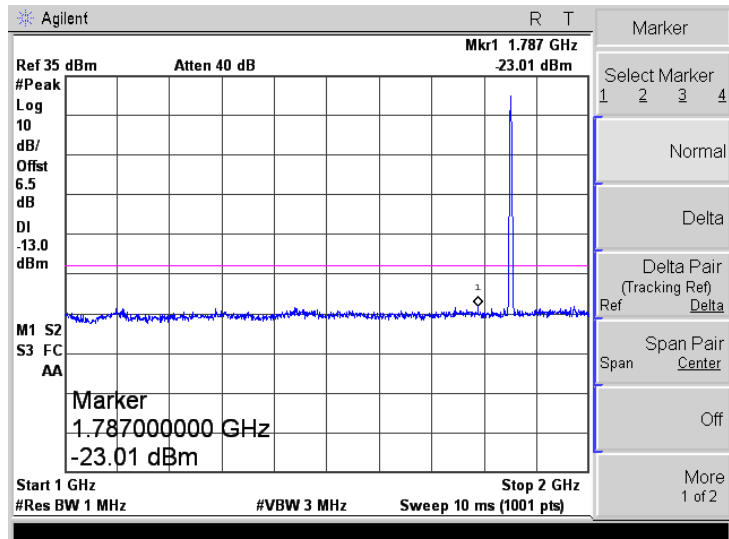
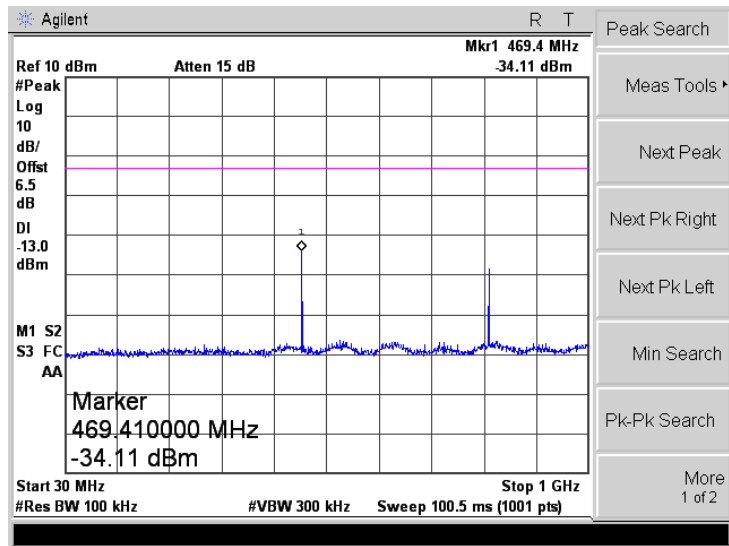


High Band Emission



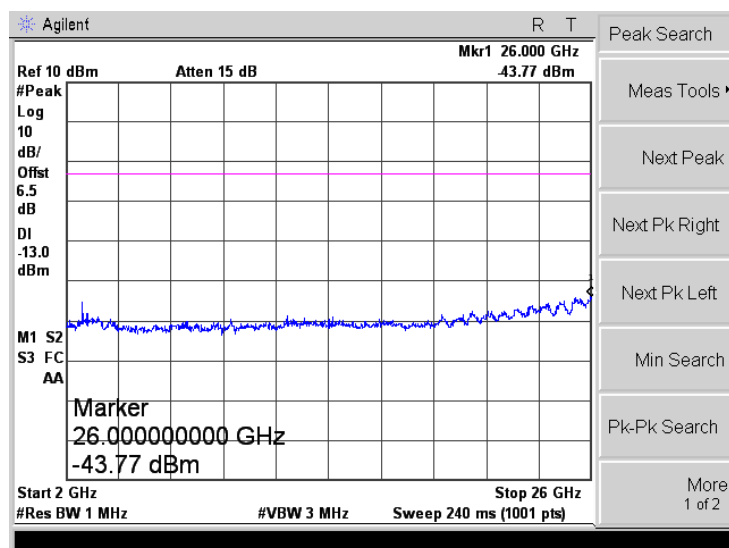
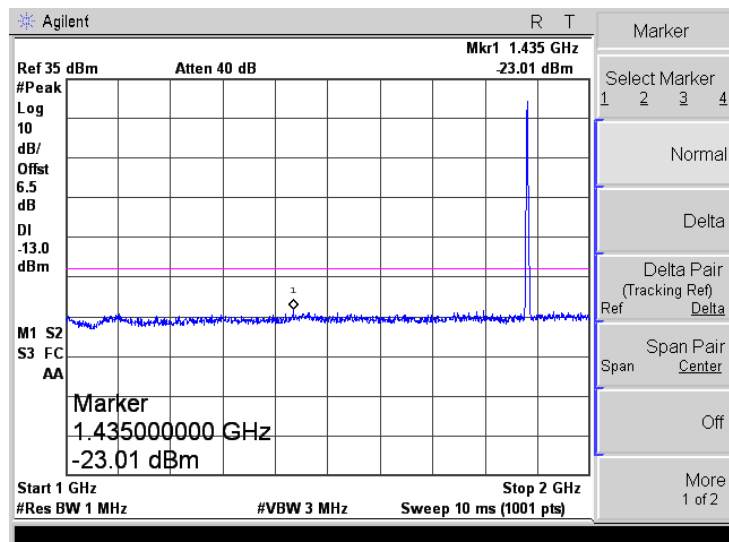
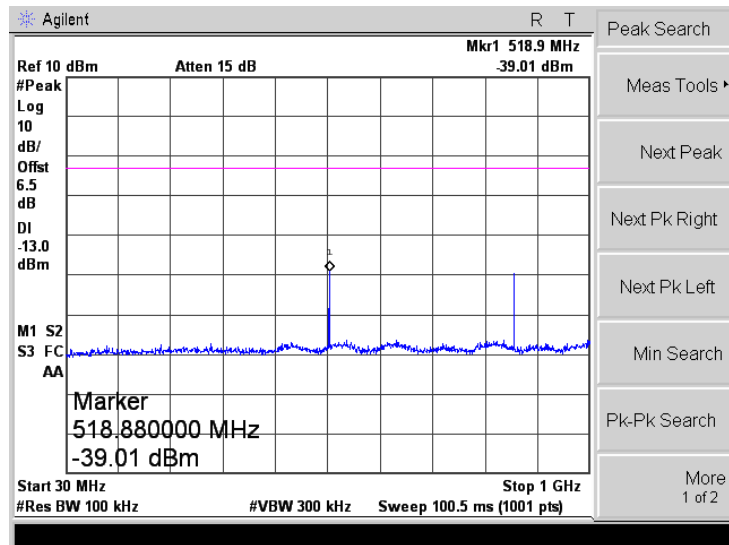
PCS1900

Low Channel



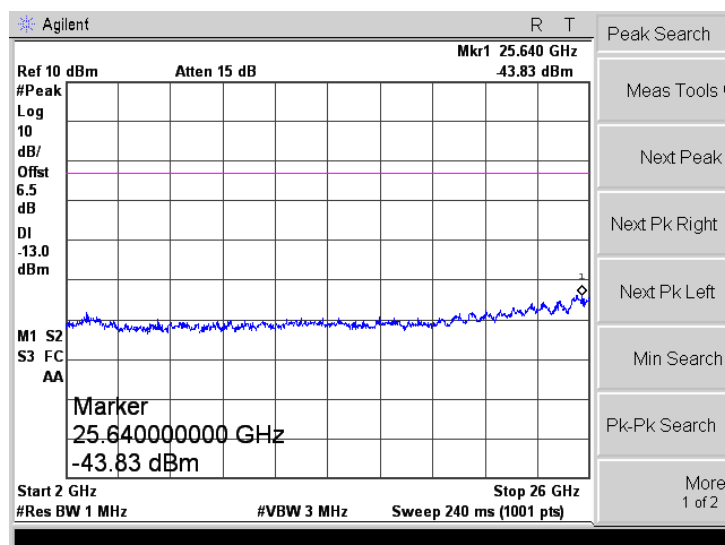
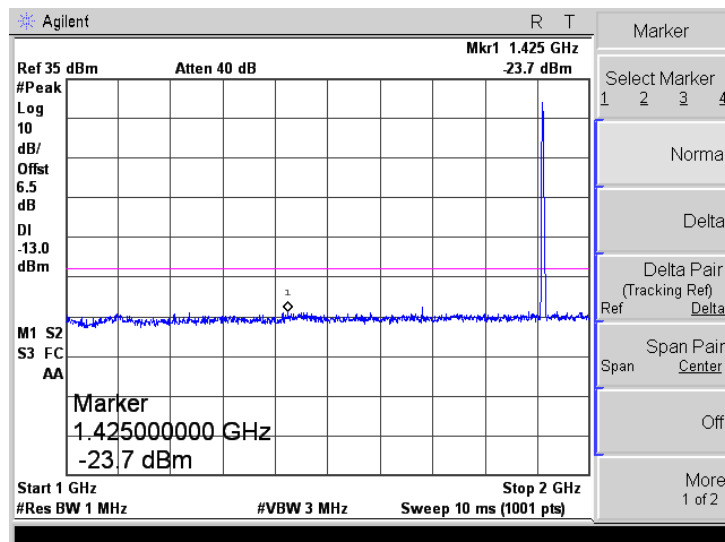
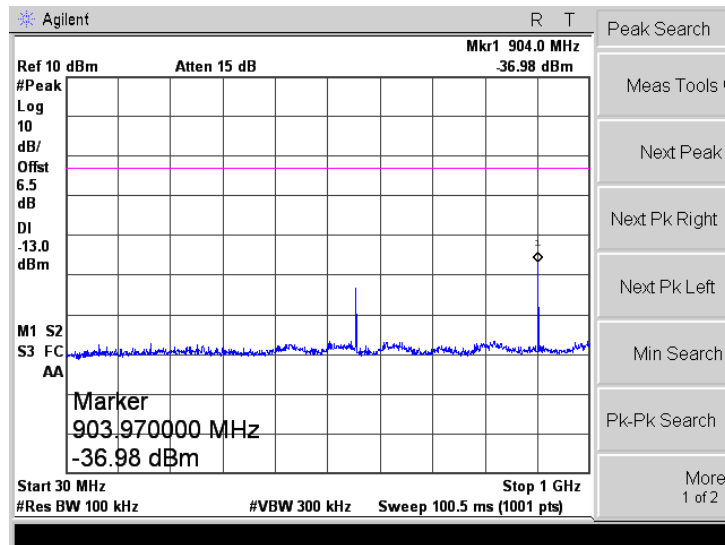
PCS1900

Middle Channel



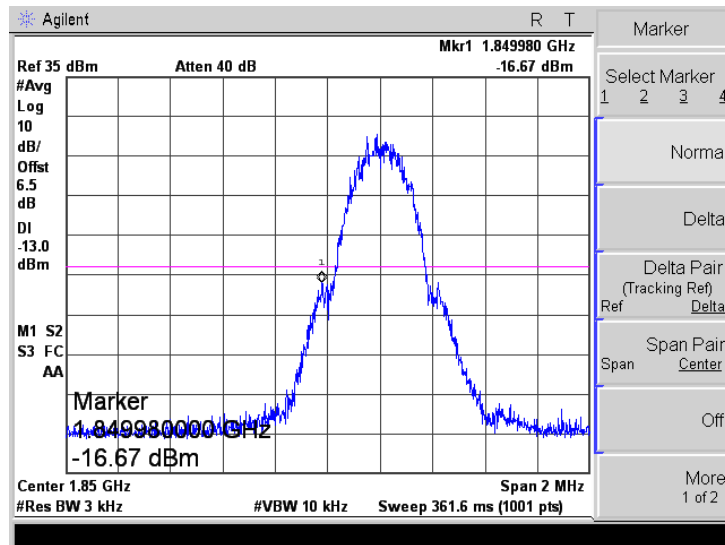
PCS1900

High Channel

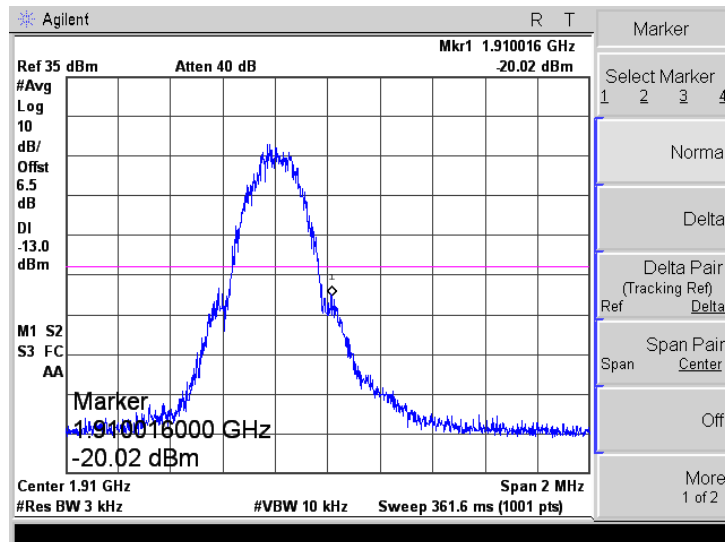


PCS1900

Low Band Emission

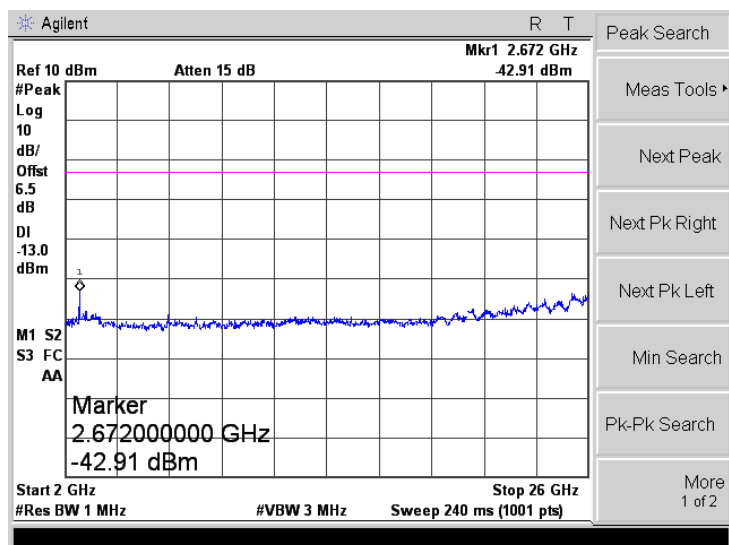
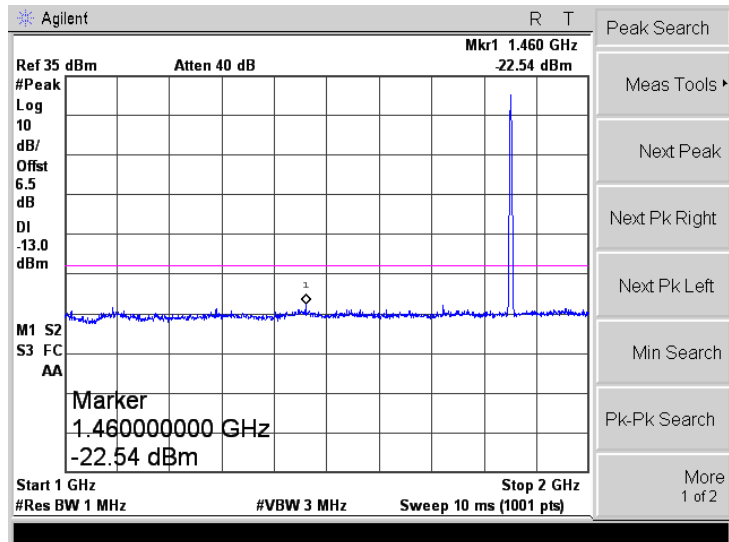
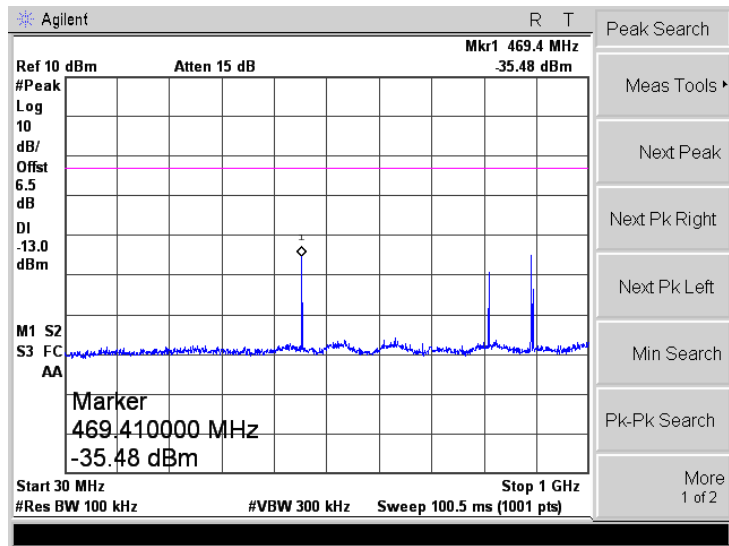


High Band Emission



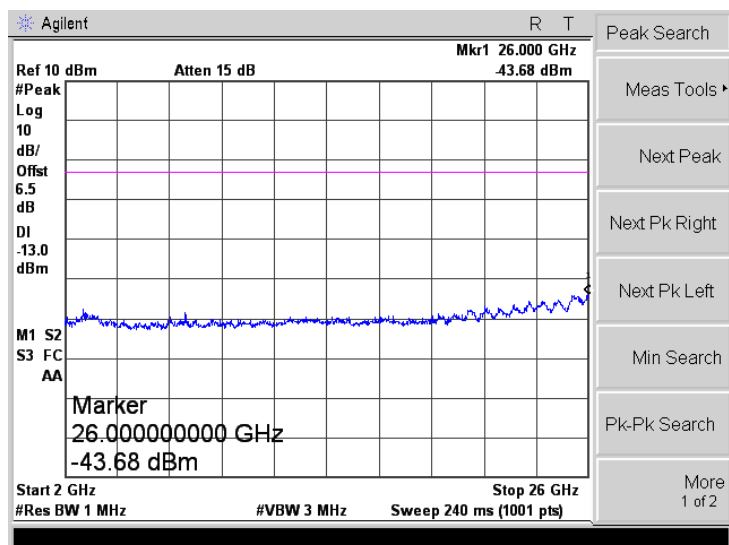
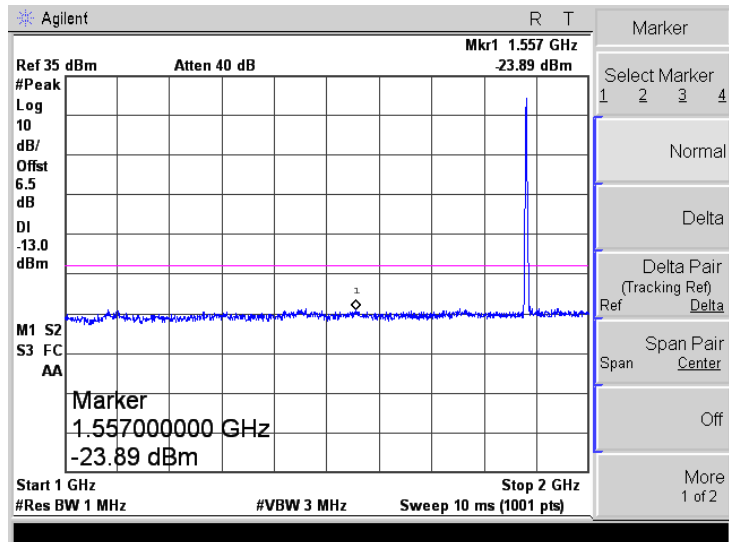
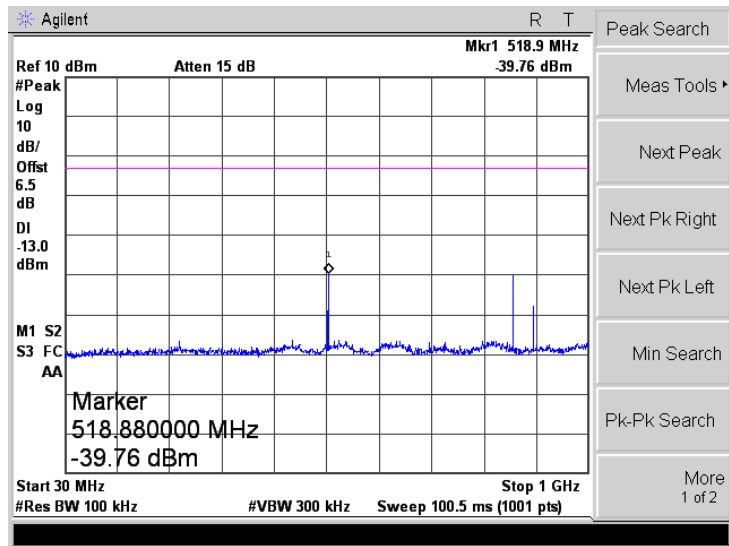
GPRS1900

Low Channel

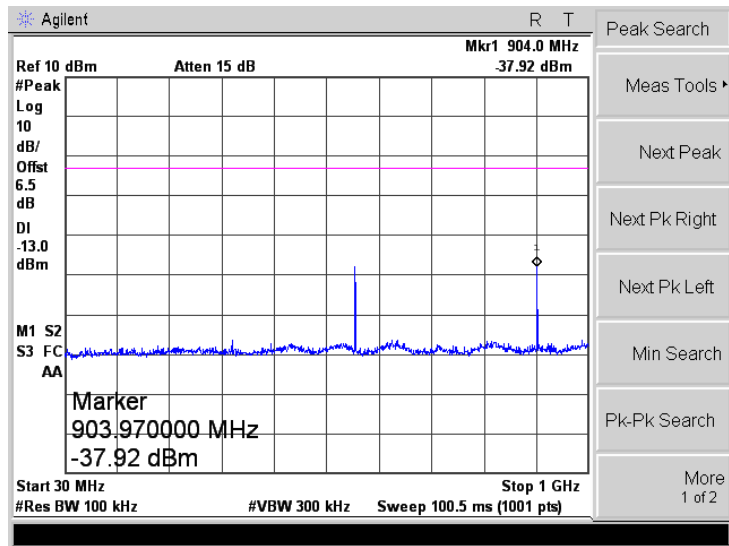


GPRS1900

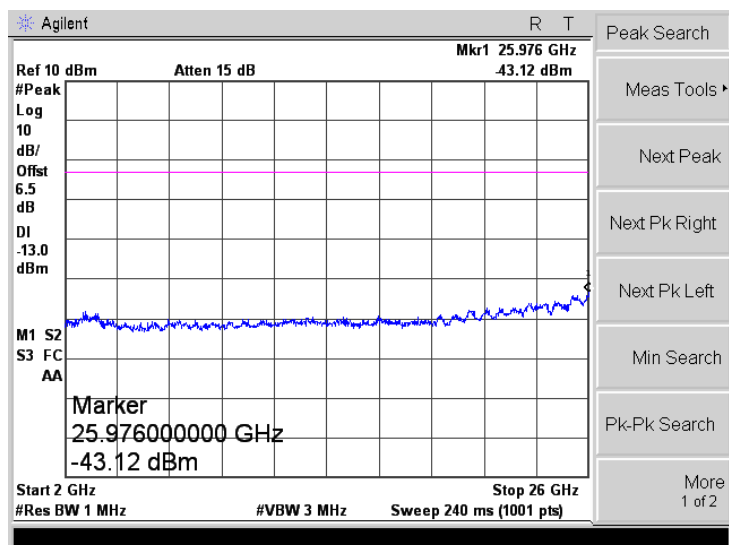
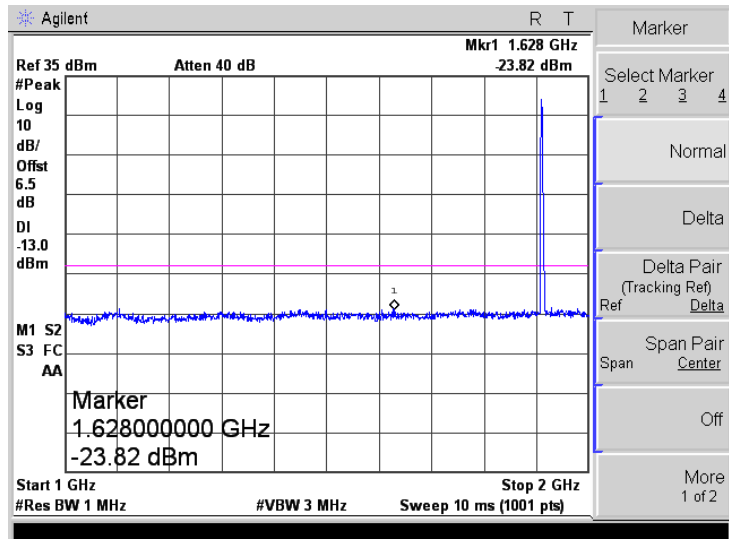
Middle Channel



GPRS1900

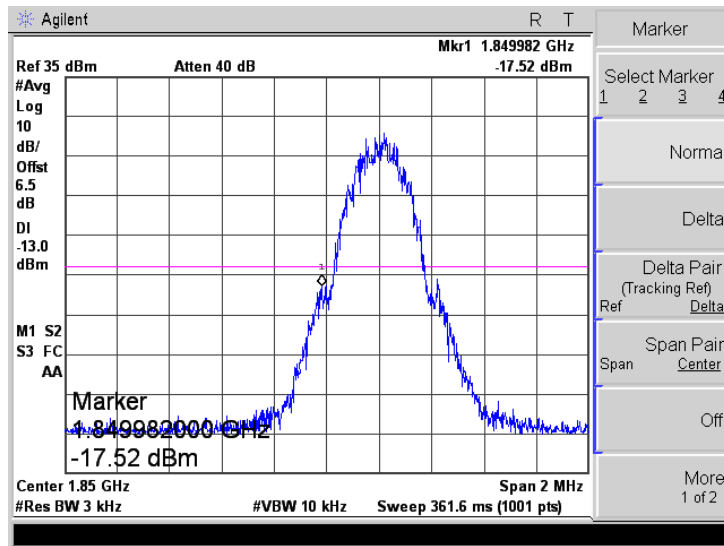


High Channel

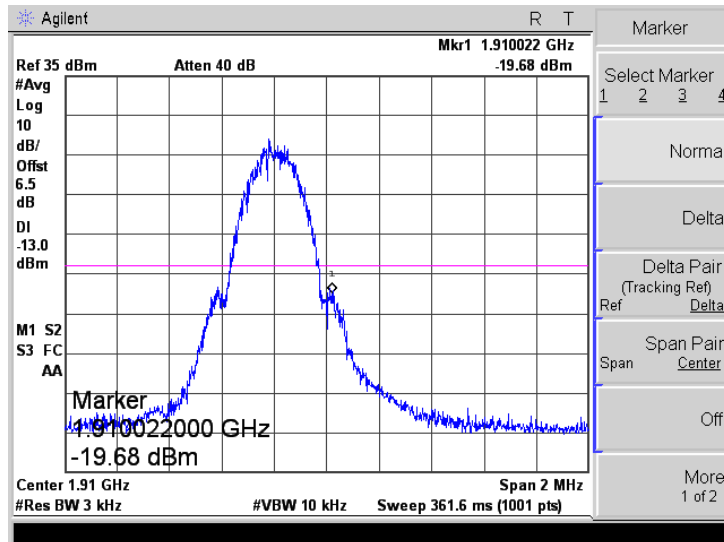


GPRS1900

Low Band Emission

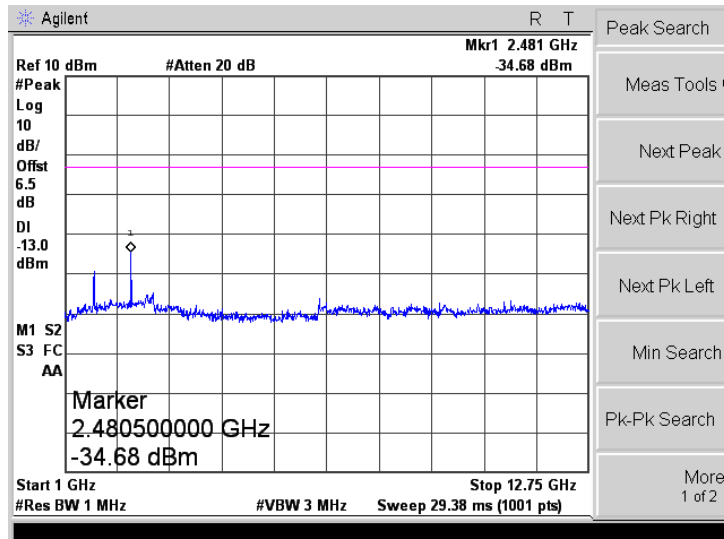
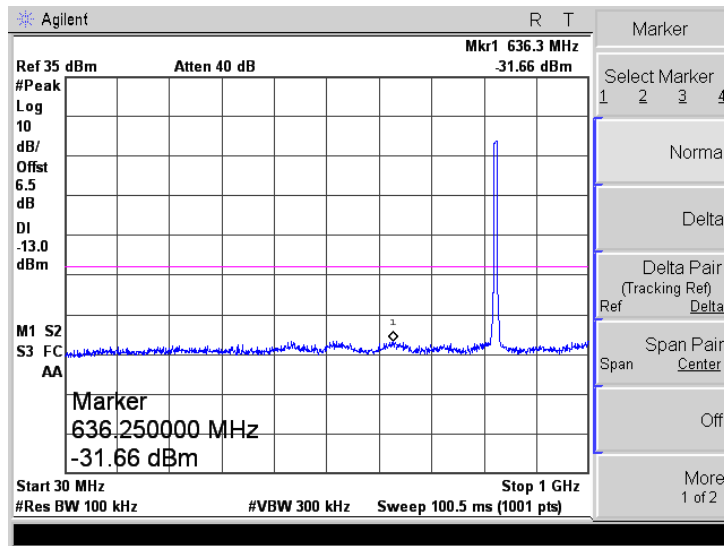


High Band Emission



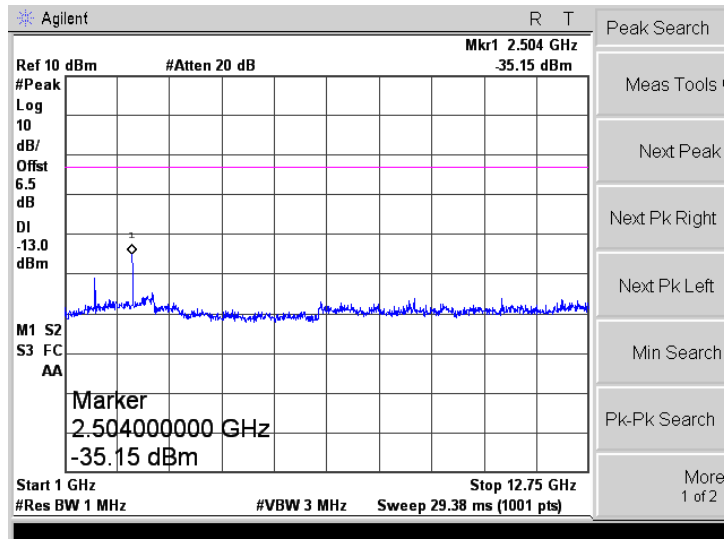
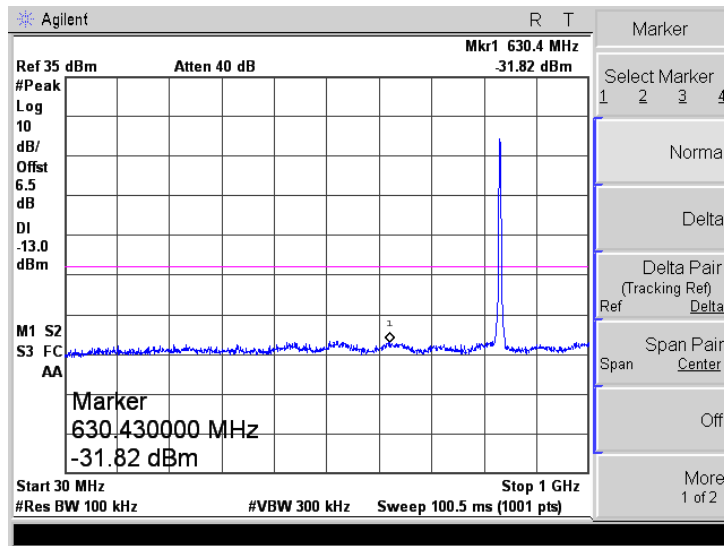
WCDMA Band V

Low Channel



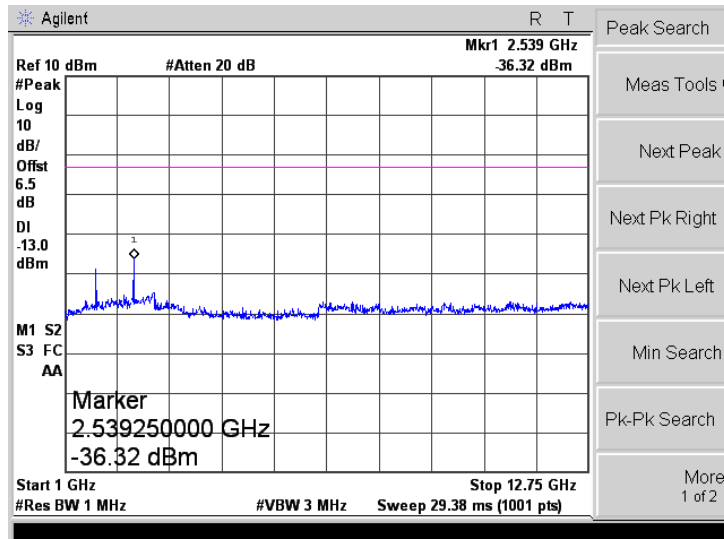
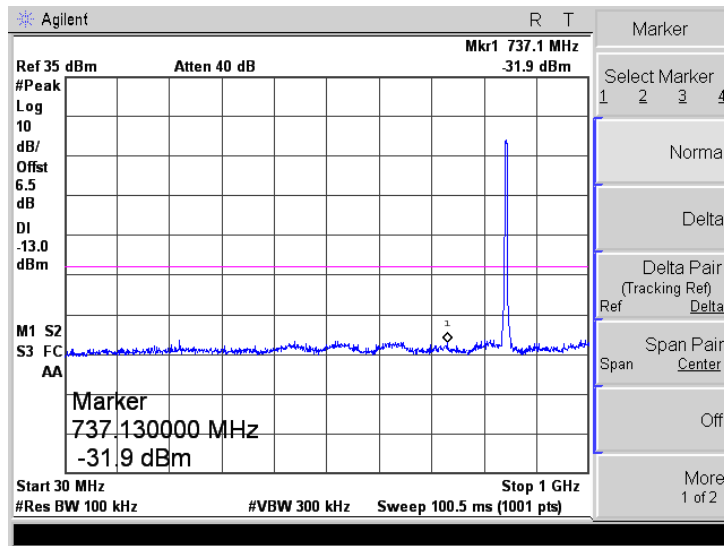
WCDMA Band V

Middle Channel



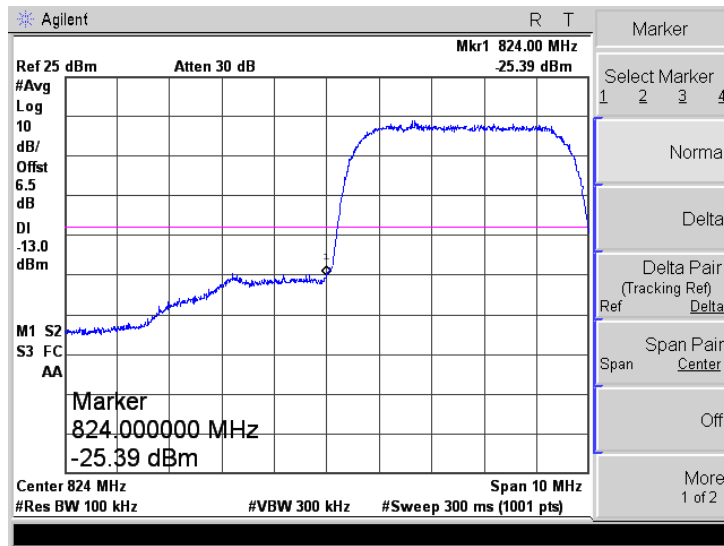
WCDMA Band V

High Channel

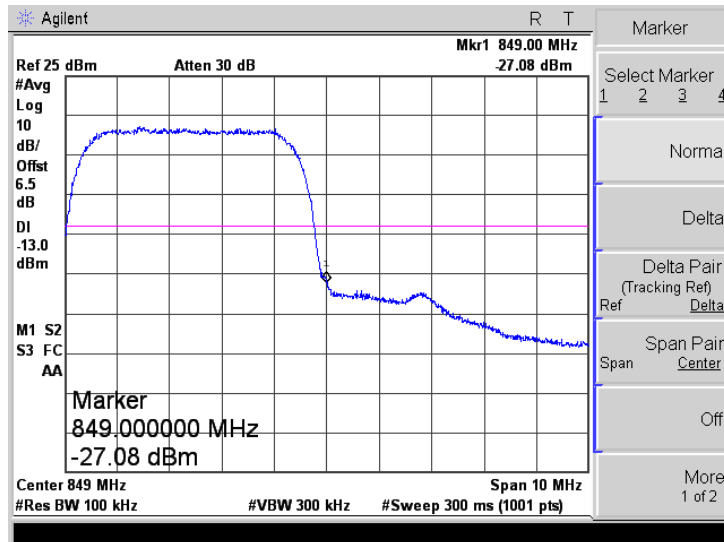


WCDMA Band V

Low Band Emission

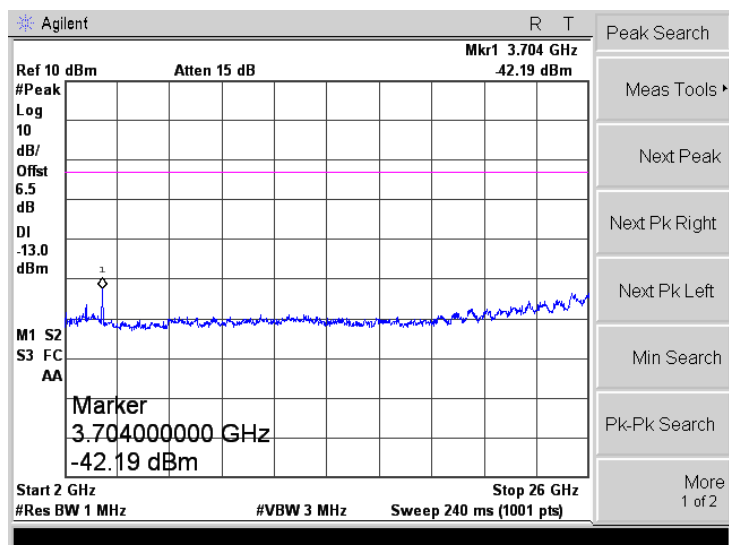
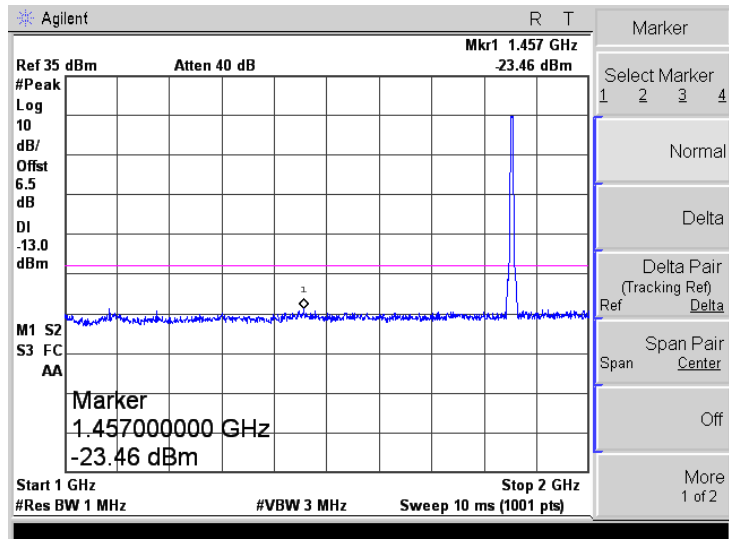
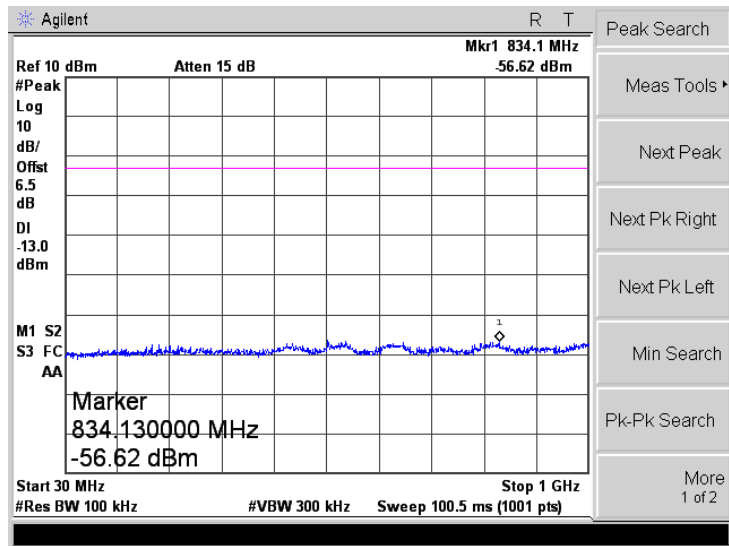


High Band Emission



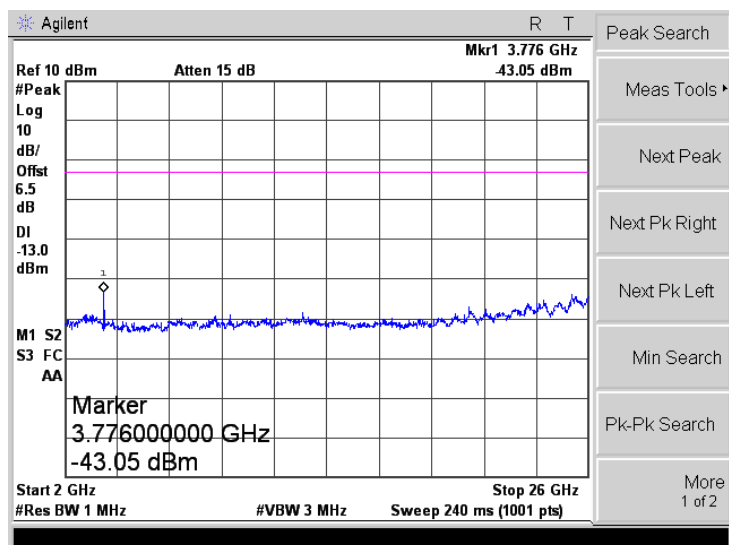
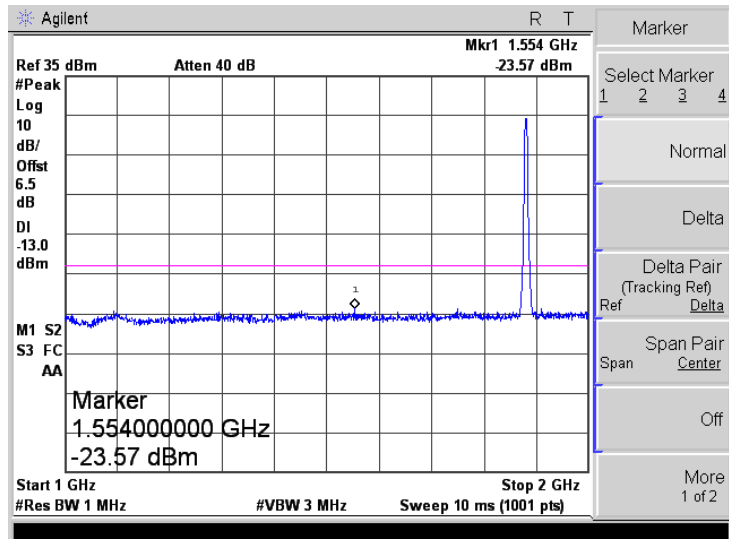
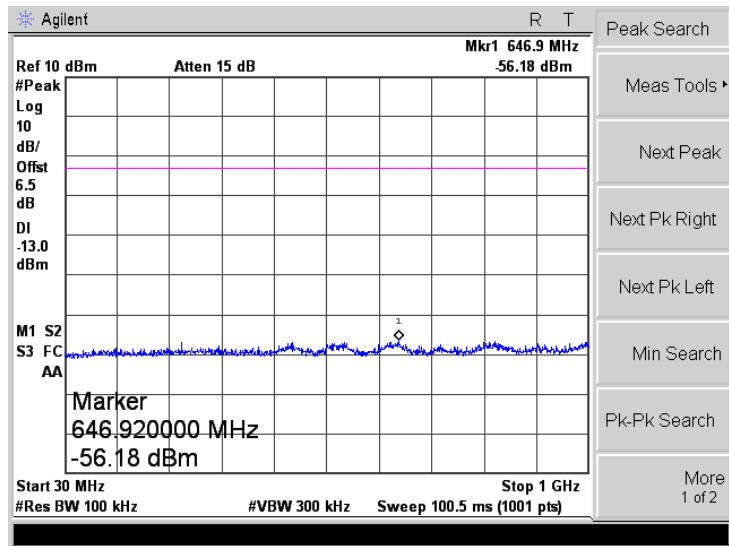
WCDMA Band II

Low Channel



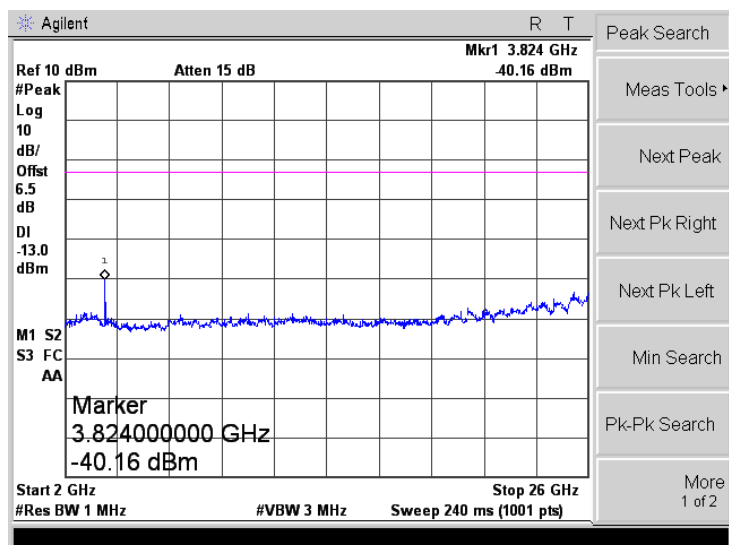
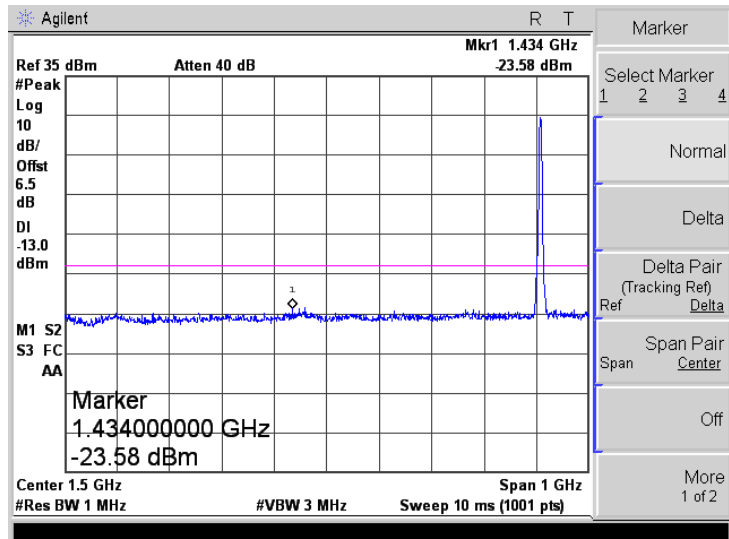
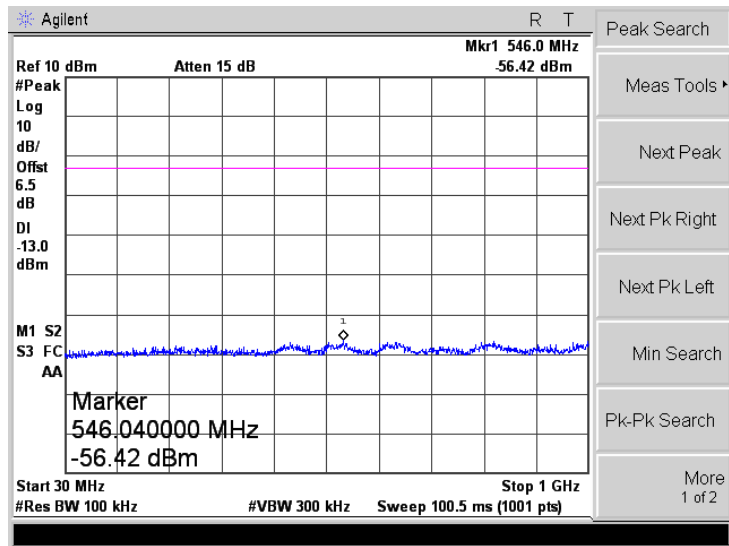
WCDMA Band II

Middle Channel



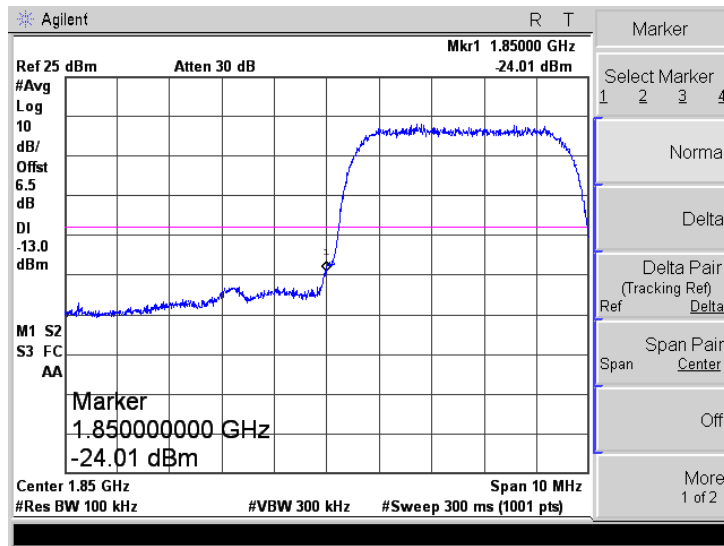
WCDMA Band II

High Channel

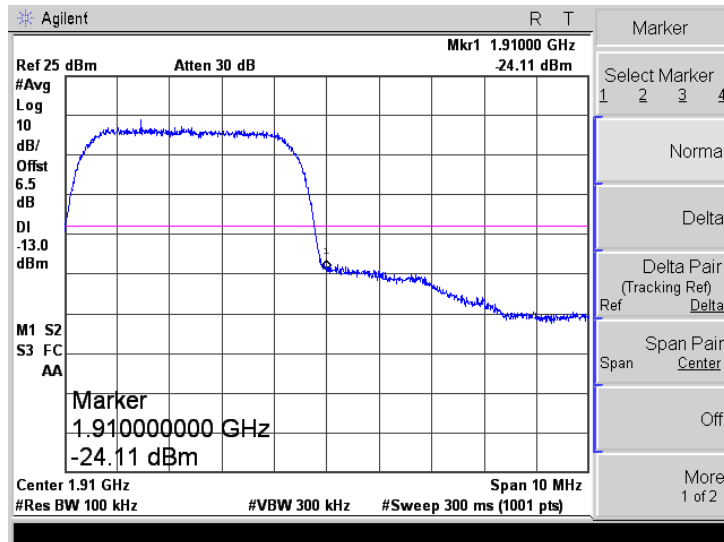


WCDMA Band II

Low Band Emission



High Band 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 603E and ANSI C63.26 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.

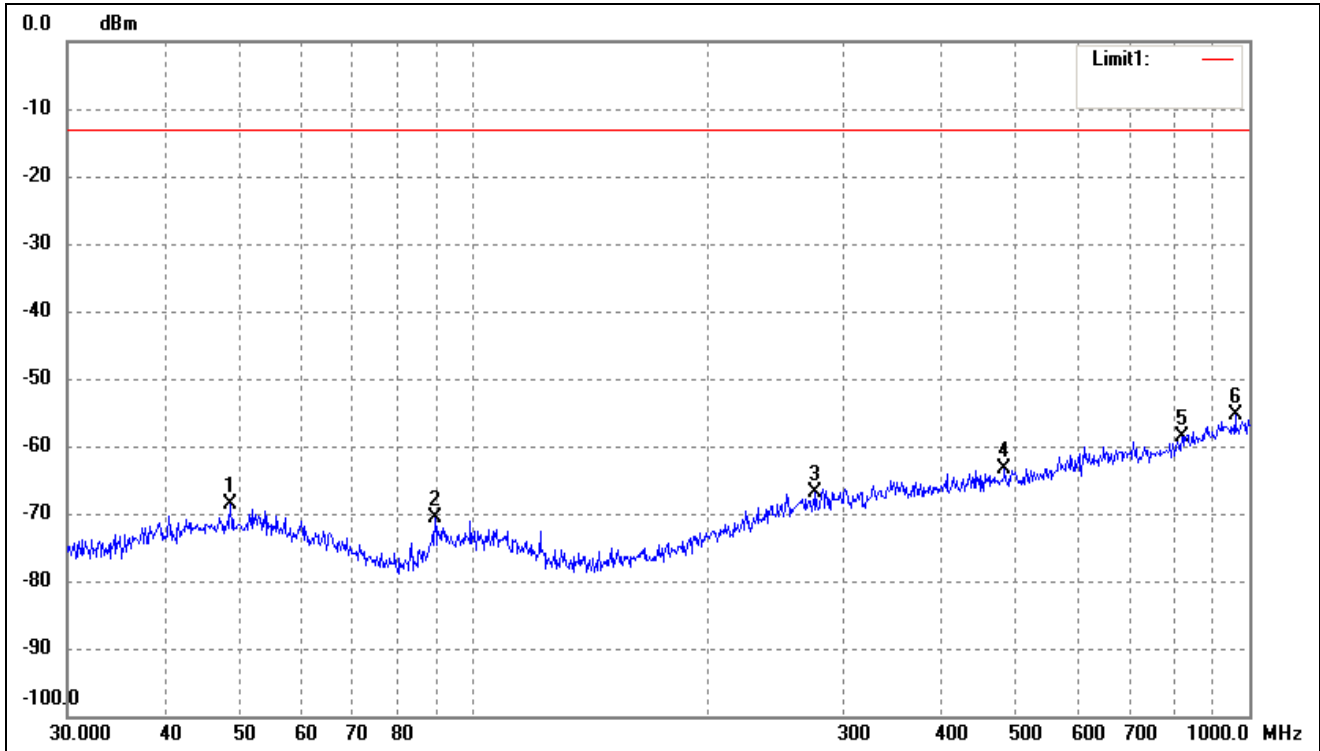
Spurious attenuation limit in dB $= 43 + 10 \log_{10}(\text{power out in Watts})$

8.3 Summary of Test Results/Plots

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

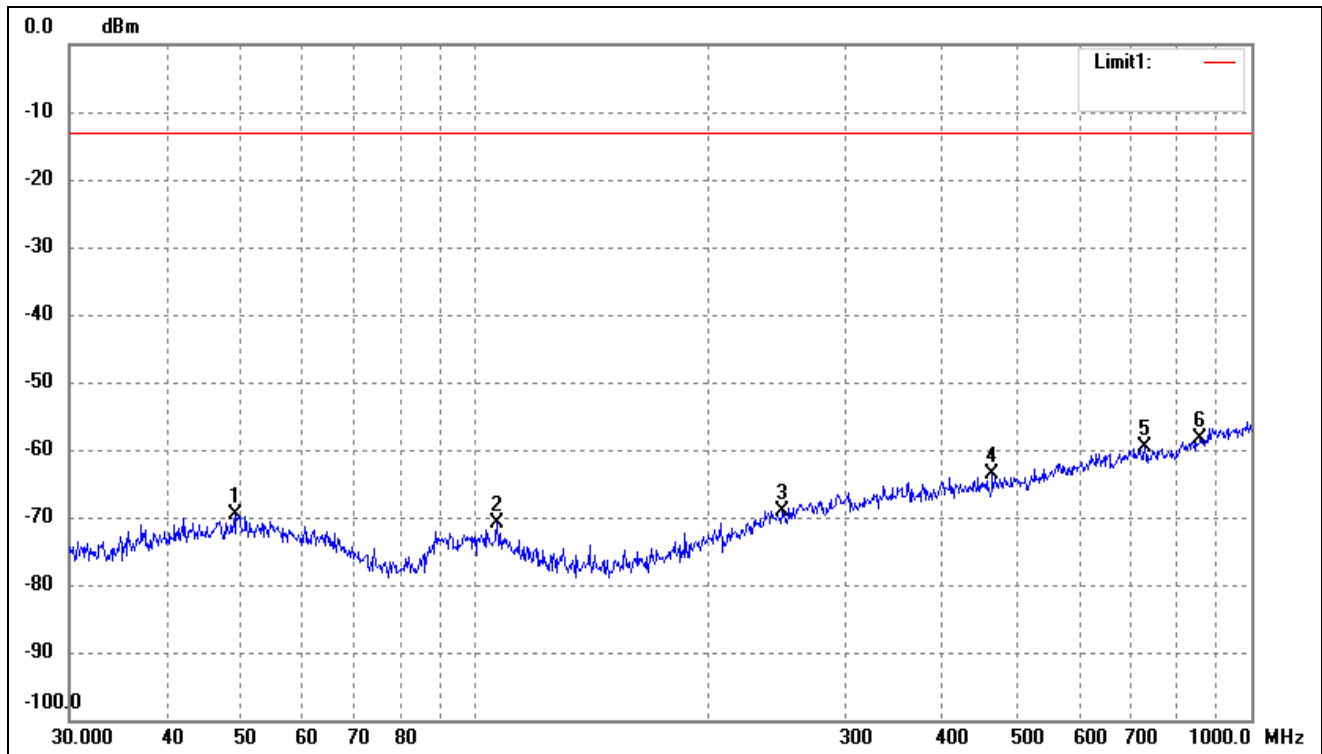
➤ Spurious Emissions Below 1GHz

For Cellular Band			
Test Channel	GSM850	Polarity:	Horizontal



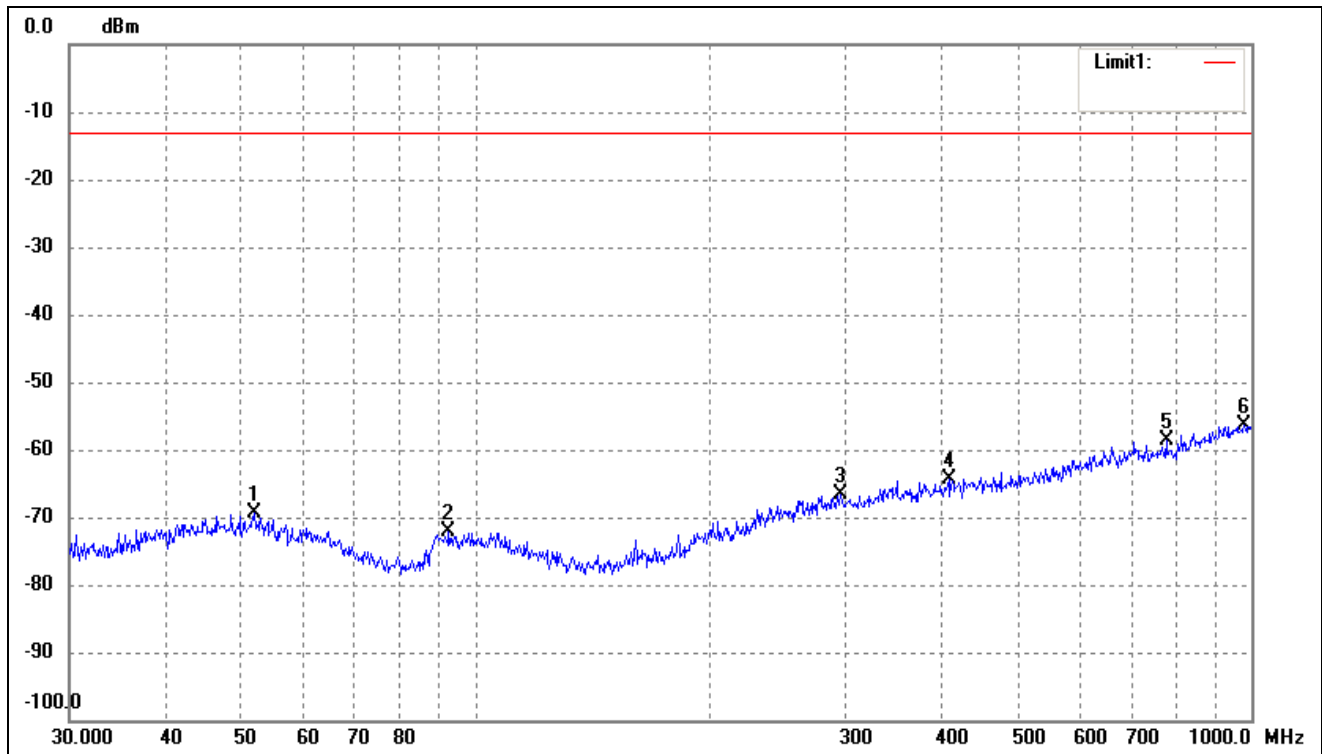
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	48.6719	-68.88	0.16	-68.72	-13.00	-55.72	291	100	peak
2	89.2764	-68.48	-2.16	-70.64	-13.00	-57.64	99	100	peak
3	276.1236	-69.83	2.85	-66.98	-13.00	-53.98	228	100	peak
4	483.9094	-69.38	6.11	-63.27	-13.00	-50.27	92	100	peak
5	818.8341	-69.99	11.42	-58.57	-13.00	-45.57	92	100	peak
6	958.7943	-69.08	13.60	-55.48	-13.00	-42.48	299	100	peak

For Cellular Band			
Test Channel	GSM850	Polarity:	Vertical



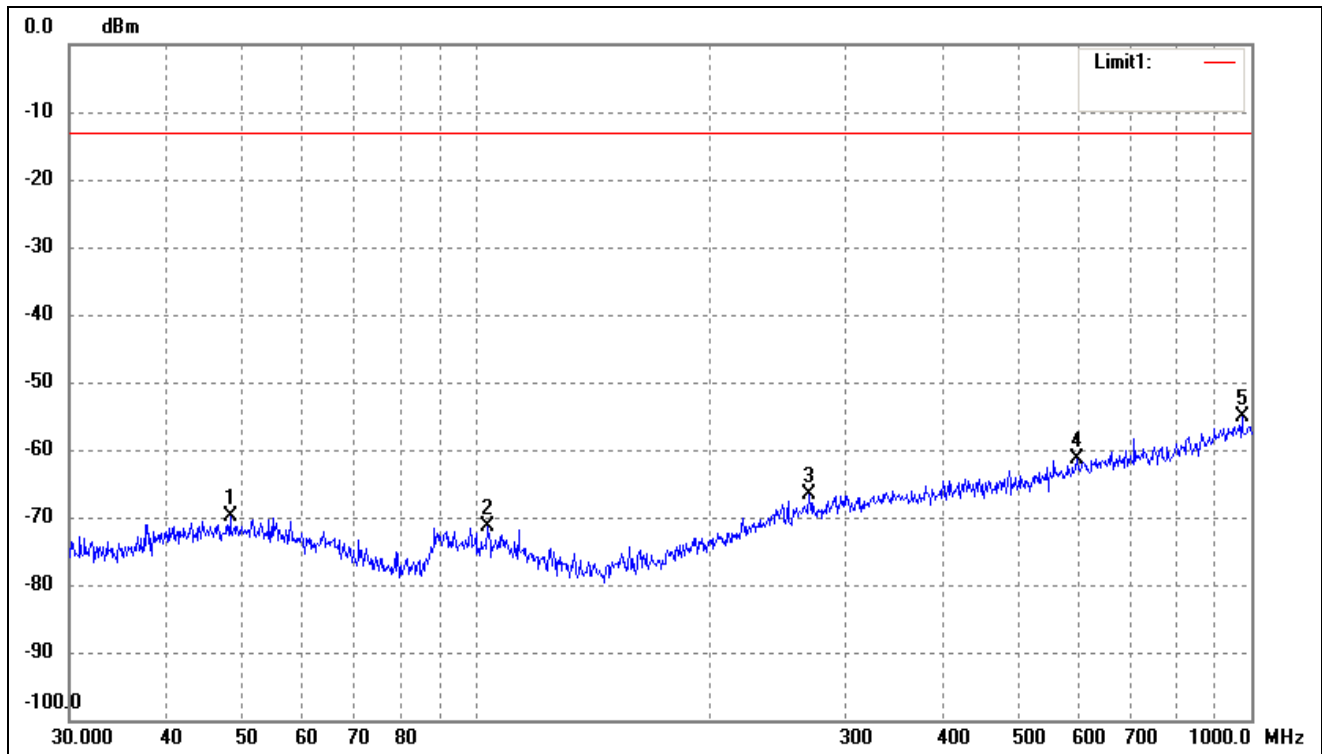
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.1866	-69.80	0.17	-69.63	-13.00	-56.63	249	100	peak
2	106.7587	-69.01	-1.75	-70.76	-13.00	-57.76	296	100	peak
3	248.5519	-71.04	1.90	-69.14	-13.00	-56.14	57	100	peak
4	463.9696	-69.35	5.76	-63.59	-13.00	-50.59	314	100	peak
5	729.3583	-69.40	9.74	-59.66	-13.00	-46.66	93	100	peak
6	860.0352	-70.31	11.89	-58.42	-13.00	-45.42	149	100	peak

For Cellular Band			
Test Channel	GSM1900	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.0251	-69.60	0.21	-69.39	-13.00	-56.39	272	100	peak
2	92.4624	-70.14	-2.09	-72.23	-13.00	-59.23	210	100	peak
3	295.1469	-70.23	3.63	-66.60	-13.00	-53.60	93	100	peak
4	407.5145	-69.64	5.25	-64.39	-13.00	-51.39	113	100	peak
5	776.8778	-68.84	10.13	-58.71	-13.00	-45.71	311	100	peak
6	979.1804	-70.41	14.04	-56.37	-13.00	-43.37	249	100	peak

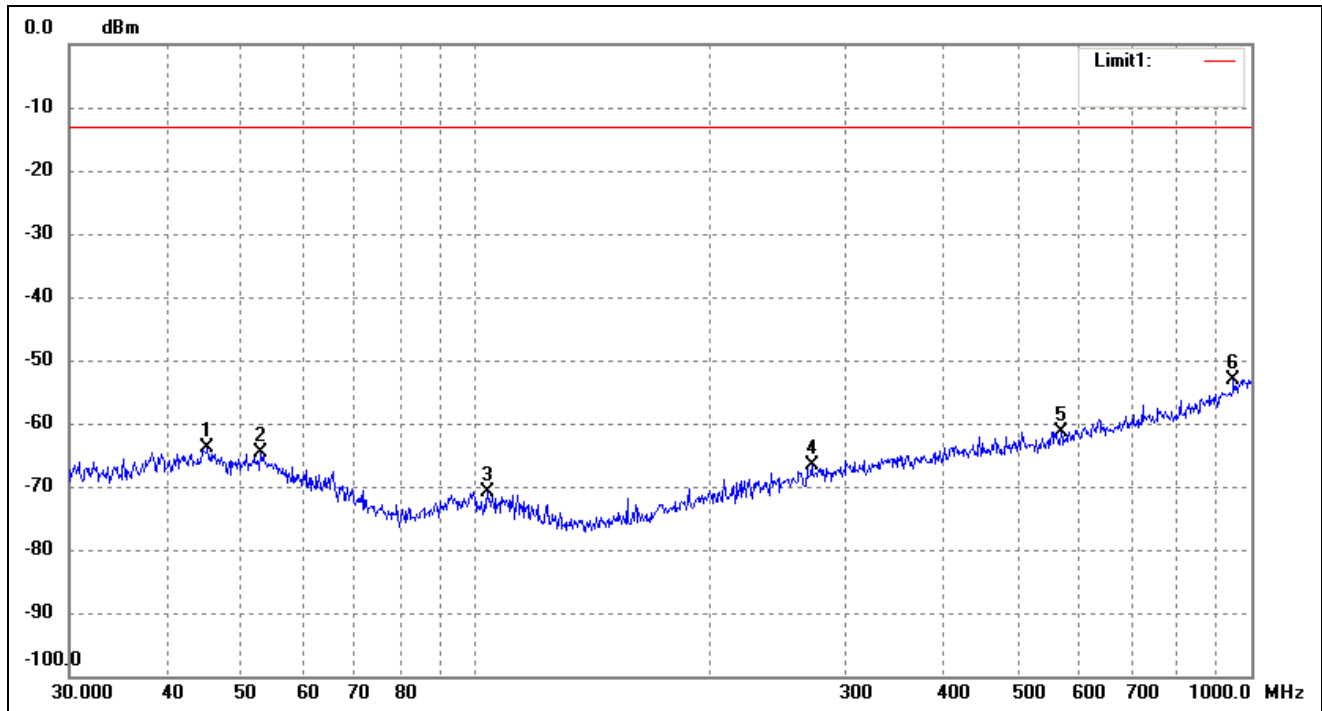
For Cellular Band			
Test Channel	GSM1900	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	48.3318	-69.96	0.16	-69.80	-13.00	-56.80	309	100	peak
2	103.8055	-69.74	-1.68	-71.42	-13.00	-58.42	94	100	peak
3	269.4284	-69.43	2.72	-66.71	-13.00	-53.71	175	100	peak
4	595.1329	-69.78	8.45	-61.33	-13.00	-48.33	92	100	peak
5	972.3374	-68.95	13.74	-55.21	-13.00	-42.21	272	100	peak

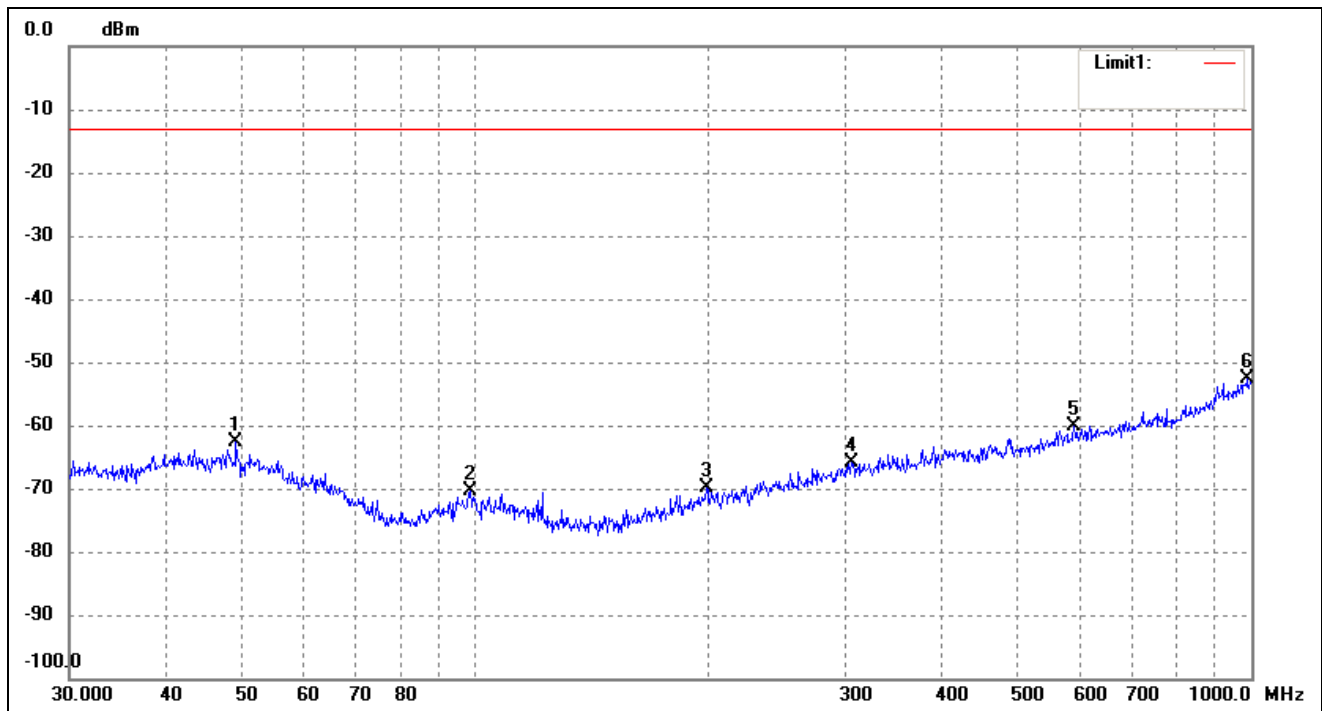
Note: Margin= (Reading+ Correct)- Limit

Test Channel	band 5	Polarity:	Horizontal
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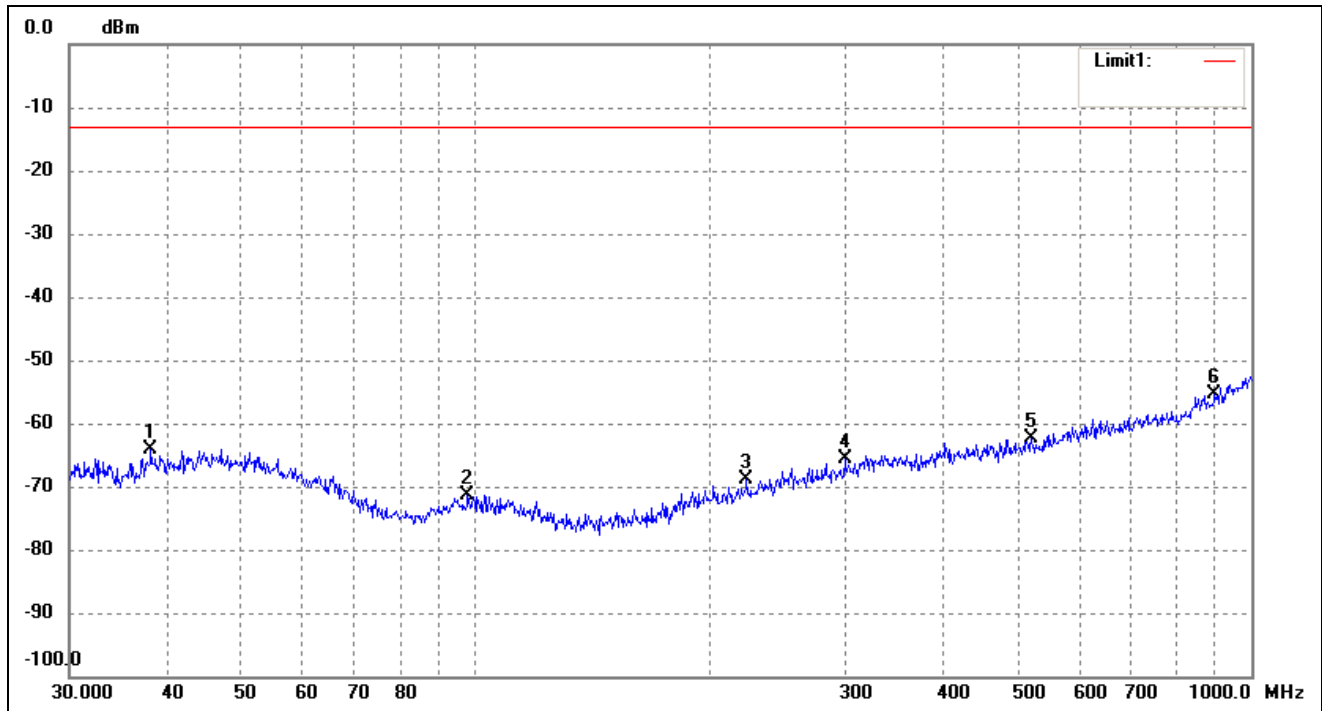
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.2166	-67.72	3.75	-63.97	-13.00	-50.97	314	100	peak
2	52.9453	-67.66	3.05	-64.61	-13.00	-51.61	98	100	peak
3	103.8055	-68.04	-2.81	-70.85	-13.00	-57.85	77	100	peak
4	271.3246	-68.10	1.40	-66.70	-13.00	-53.70	107	100	peak
5	568.6127	-68.35	7.05	-61.30	-13.00	-48.30	345	100	peak
6	948.7610	-67.70	14.58	-53.12	-13.00	-40.12	315	100	peak

Test Channel	band 5	Polarity:	Vertical
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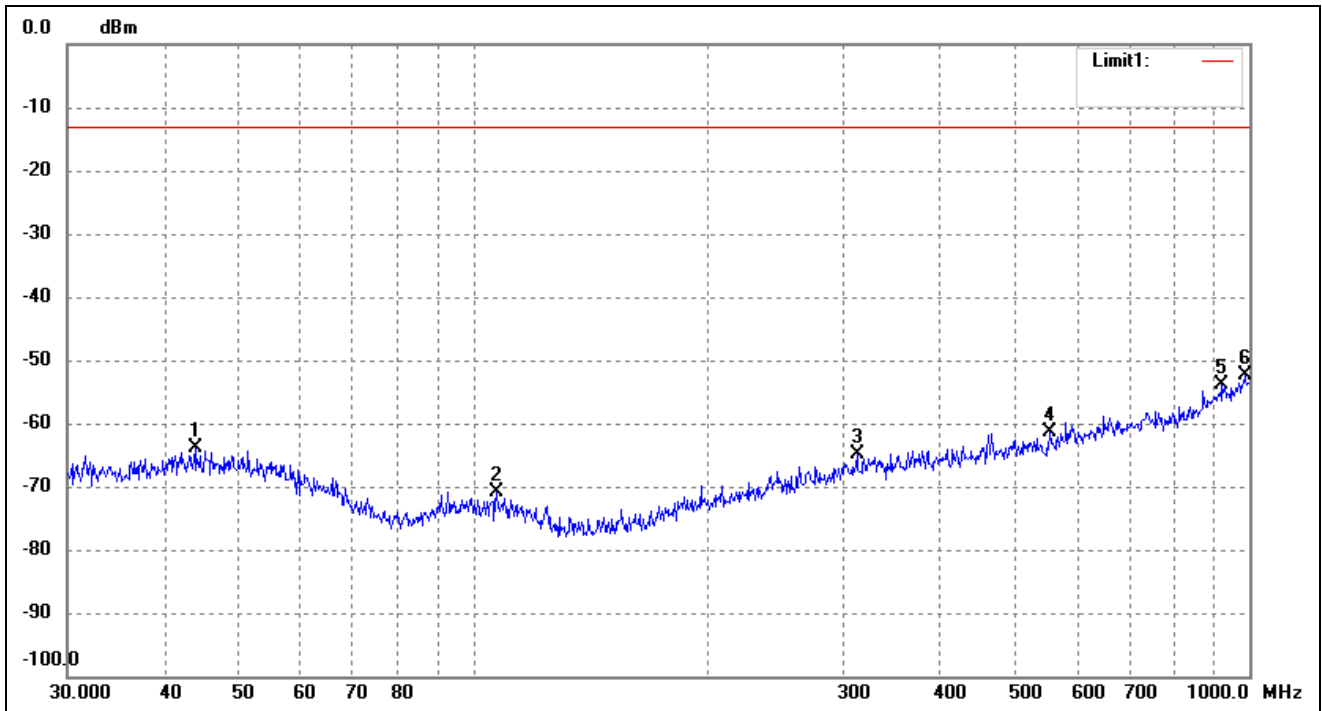
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.1866	-66.04	3.42	-62.62	-13.00	-49.62	355	100	peak
2	98.4866	-67.10	-3.17	-70.27	-13.00	-57.27	150	100	peak
3	198.5880	-68.53	-1.40	-69.93	-13.00	-56.93	64	100	peak
4	305.6800	-68.37	2.59	-65.78	-13.00	-52.78	132	100	peak
5	590.9737	-68.02	7.81	-60.21	-13.00	-47.21	311	100	peak
6	989.5355	-68.23	15.68	-52.55	-13.00	-39.55	254	100	peak

Test Channel	band 2	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	38.2120	-67.07	3.05	-64.02	-13.00	-51.02	200	100	peak
2	97.7983	-68.17	-3.20	-71.37	-13.00	-58.37	310	100	peak
3	223.7334	-68.16	-0.60	-68.76	-13.00	-55.76	71	100	peak
4	299.3158	-68.10	2.38	-65.72	-13.00	-52.72	195	100	peak
5	520.8882	-68.40	6.00	-62.40	-13.00	-49.40	288	100	peak
6	896.9965	-68.47	13.07	-55.40	-13.00	-42.40	164	100	peak

Test Channel	band 2	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	43.8119	-67.70	3.79	-63.91	-13.00	-50.91	200	100	peak
2	107.1337	-68.12	-2.68	-70.80	-13.00	-57.80	97	100	peak
3	312.1794	-67.67	2.77	-64.90	-13.00	-51.90	329	100	peak
4	552.8833	-68.05	6.58	-61.47	-13.00	-48.47	109	100	peak
5	922.5157	-67.49	13.74	-53.75	-13.00	-40.75	246	100	peak
6	986.0717	-68.11	15.62	-52.49	-13.00	-39.49	286	100	peak

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	-35.88	4.94	-30.94	-13.00	-17.94	H
2472.6	-43.77	8.46	-35.31	-13.00	-22.31	H
1648.4	-36.13	4.94	-31.19	-13.00	-18.19	V
2472.6	-43.99	8.46	-35.53	-13.00	-22.53	V
Middle Channel (836.6MHz)						
1673.2	-36.68	4.94	-31.74	-13.00	-18.74	H
2509.8	-44.20	8.46	-35.74	-13.00	-22.74	H
1673.2	-35.30	4.94	-30.36	-13.00	-17.36	V
2509.8	-46.27	8.46	-37.81	-13.00	-24.81	V
High Channel (848.8MHz)						
1697.6	-34.38	5.25	-29.13	-13.00	-16.13	H
2546.4	-41.96	8.57	-33.39	-13.00	-20.39	H
1697.6	-37.06	5.25	-31.81	-13.00	-18.81	V
2546.4	-43.99	8.57	-35.42	-13.00	-22.42	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	-41.24	10.54	-30.70	-13.00	-17.70	H
5550.6	-48.48	13.37	-35.11	-13.00	-22.11	H
3700.4	-40.08	10.54	-29.54	-13.00	-16.54	V
5550.6	-46.80	13.37	-33.43	-13.00	-20.43	V
Middle Channel (1880MHz)						
3760.0	-40.97	10.64	-30.33	-13.00	-17.33	H
5640.0	-47.74	13.54	-34.20	-13.00	-21.20	H
3760.0	-41.15	10.64	-30.51	-13.00	-17.51	V
5640.0	-47.21	13.54	-33.67	-13.00	-20.67	V
High Channel (1909.8MHz)						
3819.6	-40.34	10.74	-29.60	-13.00	-16.60	H
5729.4	-50.26	13.71	-36.55	-13.00	-23.55	H
3819.6	-39.42	10.74	-28.68	-13.00	-15.68	V
5729.4	-47.49	13.71	-33.78	-13.00	-20.78	V

➤ For WCDMA Band V Mode

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (826.4MHz)						
1652.8	-36.83	4.94	-31.89	-13.00	-18.89	H
2479.2	-45.14	8.46	-36.68	-13.00	-23.68	H
1652.8	-36.55	4.94	-31.61	-13.00	-18.61	V
2479.2	-41.98	8.46	-33.52	-13.00	-20.52	V
Middle Channel (836.6MHz)						
1672.8	-35.69	5.11	-30.58	-13.00	-17.58	H
2509.2	-45.74	8.54	-37.20	-13.00	-24.20	H
1672.8	-39.60	5.11	-34.49	-13.00	-21.49	V
2509.2	-43.84	8.54	-35.30	-13.00	-22.30	V
High Channel (846.6MHz)						
1693.2	-35.69	5.11	-30.58	-13.00	-17.58	H
2539.8	-45.74	8.54	-37.20	-13.00	-24.20	H
1693.2	-39.60	5.11	-34.49	-13.00	-21.49	V
2539.8	-43.84	8.54	-35.30	-13.00	-22.30	V

➤ For WCDMA Band II Mode

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (1852.4MHz)						
3704.8	-36.14	10.17	-25.97	-13.00	-12.97	H
5557.2	-41.43	14.69	-26.74	-13.00	-13.74	H
3704.8	-37.47	10.17	-27.30	-13.00	-14.30	V
5557.2	-42.01	14.69	-27.32	-13.00	-14.32	V
Middle Channel (1880MHz)						
3760.8	-38.53	10.26	-28.27	-13.00	-15.27	H
5640.0	-43.79	14.78	-29.01	-13.00	-16.01	H
3760.8	-40.78	10.26	-30.52	-13.00	-17.52	V
5640.0	-44.01	14.78	-29.23	-13.00	-16.23	V
High Channel (1907.6MHz)						
3815.2	-38.35	10.59	-27.76	-13.00	-14.76	H
5722.8	-41.55	15.03	-26.52	-13.00	-13.52	H
3815.2	-37.13	10.59	-26.54	-13.00	-13.54	V
5722.8	-46.17	15.03	-31.14	-13.00	-18.14	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, §24.235 the limit is 2.5ppm.

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 Summary of Test Results/Plots

Note: 1. Worst case at GSM850/PCS1900/WCDMA B2/B5 middle channel

2. Normal Voltage NV=DC3.7V; Low Voltage LV=DC3.5V; High Voltage HV=DC4.2V

➤ Frequency stability V.S. Temperature measurement

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	172	0.2056	2.50	Pass
	-20	155	0.1853		
	-10	163	0.1948		
	0	177	0.2116		
	10	185	0.2211		
	20	171	0.2044		
	30	177	0.2116		
	40	178	0.2128		
	50	182	0.2175		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	150	0.0798	2.50	Pass
	-20	168	0.0894		
	-10	148	0.0787		
	0	153	0.0814		
	10	155	0.0824		
	20	148	0.0787		
	30	164	0.0872		
	40	166	0.0883		
	50	159	0.0846		

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	149	0.1781	2.50	Pass
	-20	159	0.1901		
	-10	146	0.1745		
	0	161	0.1924		
	10	159	0.1901		
	20	147	0.1757		
	30	164	0.1960		
	40	163	0.1948		
	50	154	0.1841		
Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	156	0.0830	2.50	Pass
	-20	161	0.0856		
	-10	137	0.0729		
	0	157	0.0835		
	10	154	0.0819		
	20	142	0.0755		
	30	147	0.0782		
	40	153	0.0814		
	50	160	0.0851		

➤ Frequency stability V.S. Voltage measurement

Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	HV	150	0.1793	2.50	Pass
	NV	168	0.2008		
	LV	156	0.1865		
Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	HV	152	0.0809	2.50	Pass
	NV	163	0.0867		
	LV	156	0.0830		
Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	
		Hz	ppm	Result	
25	HV	141	0.1685	2.50	Pass
	NV	159	0.1901		
	LV	148	0.1769		
Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	HV	157	0.0835	2.50	Pass
	NV	157	0.0835		
	LV	142	0.0755		

10. Modulation characteristics

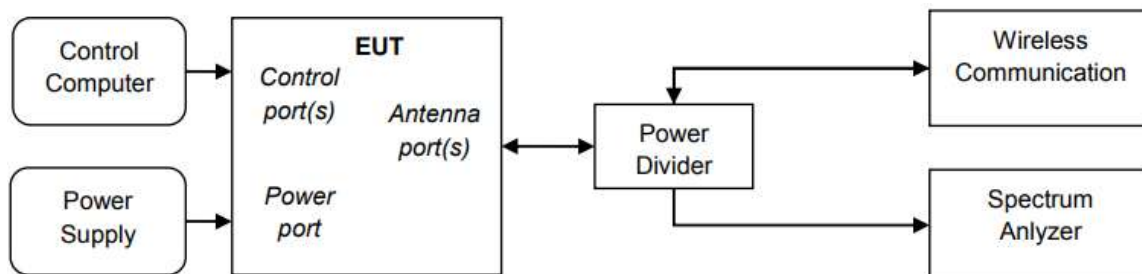
10.1 Standard Applicable

According to §2.1047, Measurements required: Modulation characteristics is given below:

- (a) Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.
- (b) Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.
- (c) Single sideband and independent sideband radiotelephone transmitters which employ a device or circuit to limit peak envelope power. A curve showing the peak envelope power output versus the modulation input voltage shall be supplied. The modulating signals shall be the same in frequency as specified in paragraph (c) of §2.1049 for the occupied bandwidth tests.
- (d) Other types of equipment. A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

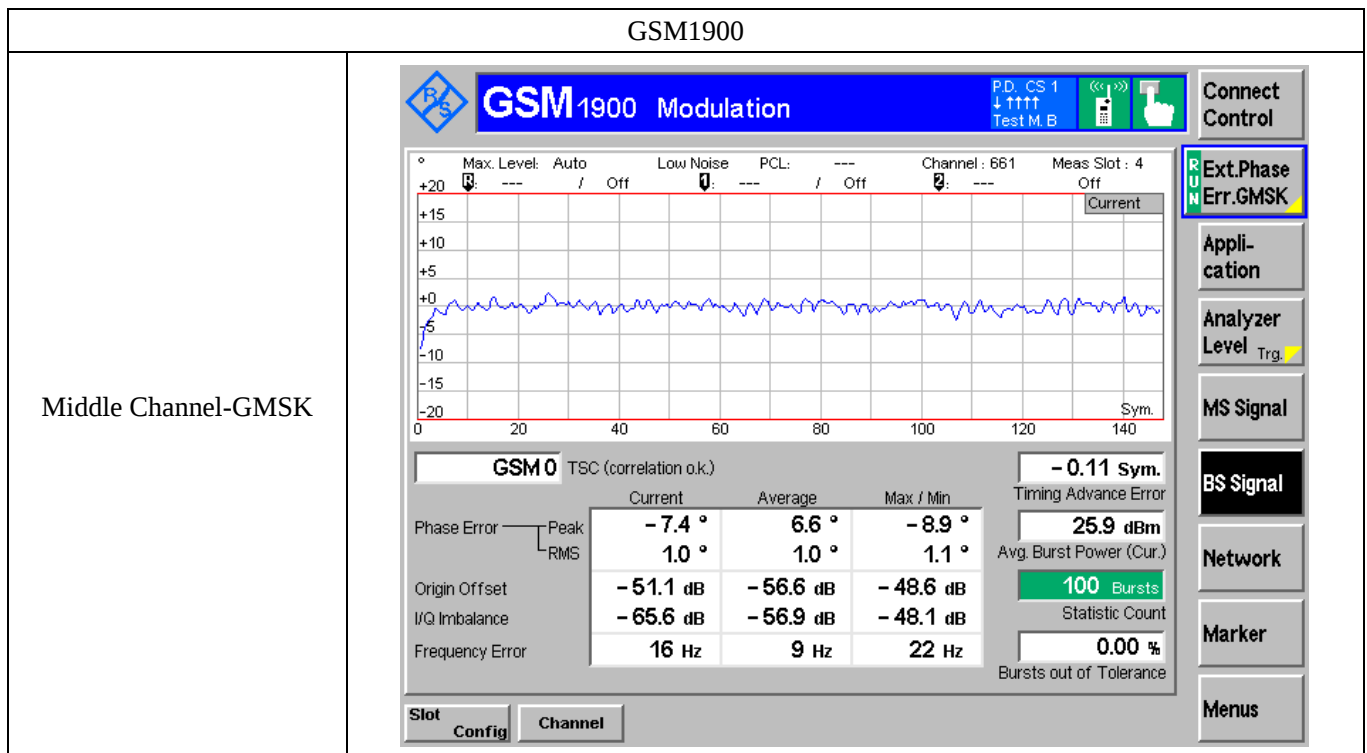
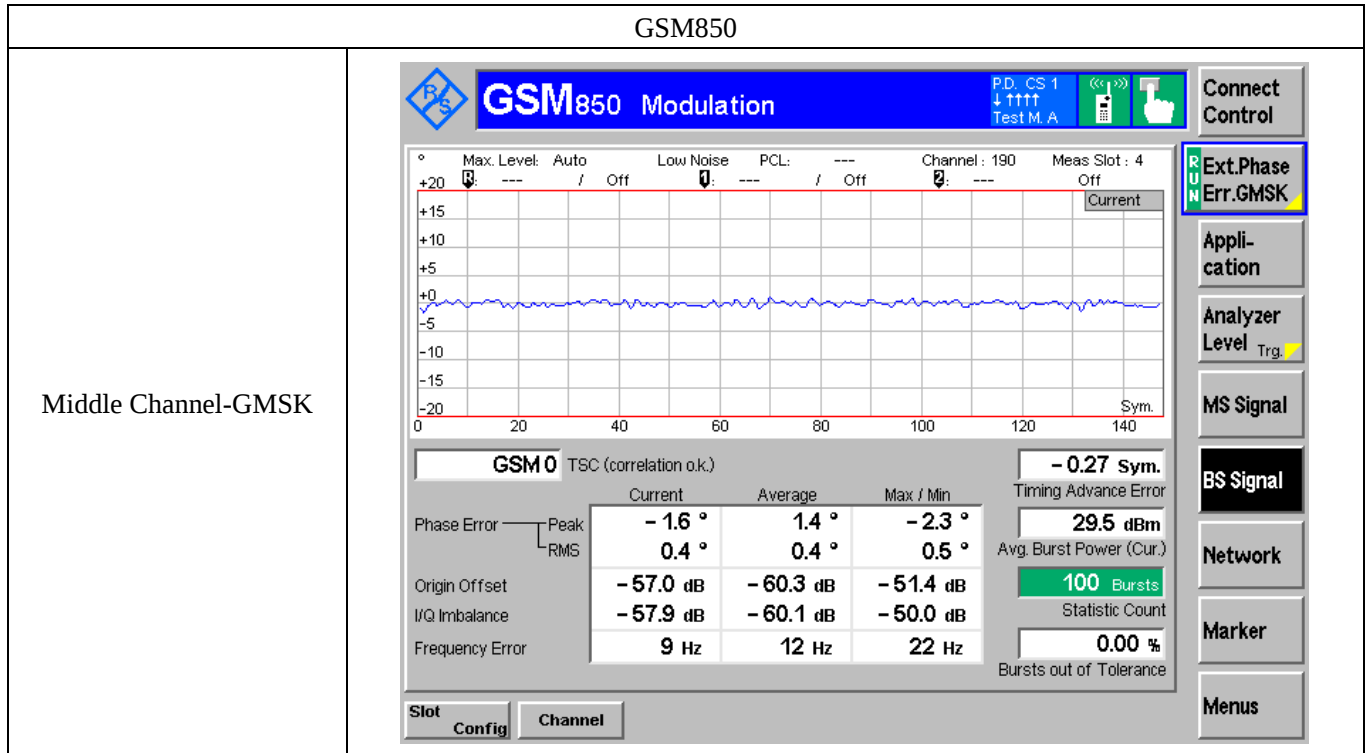
10.2 Test Procedure

According to ANSI C63.26-2015 section 5.3.2, the following test setup was performed.

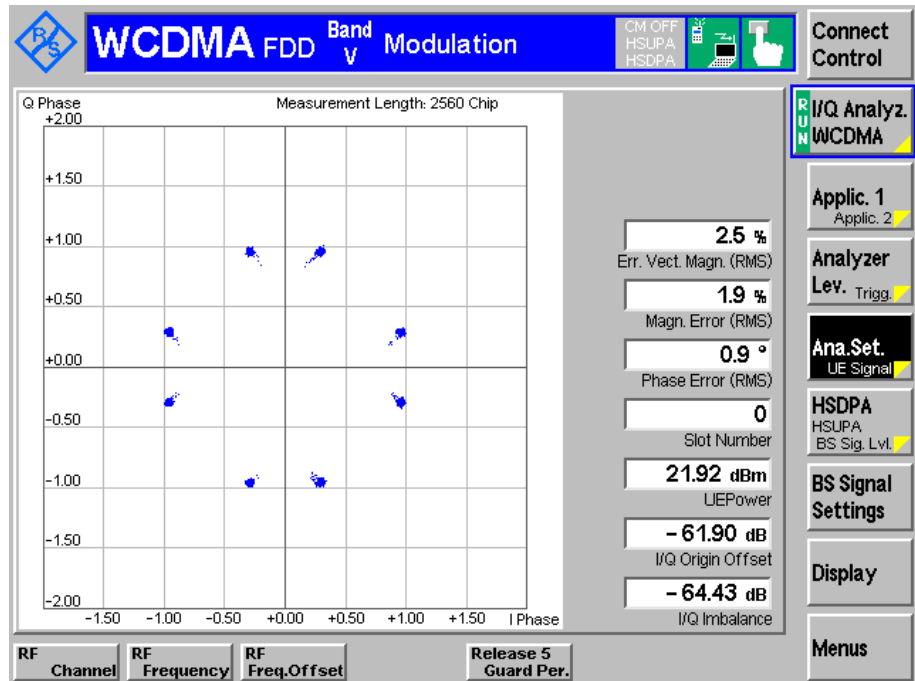


10.3 Summary of Test Results/Plots

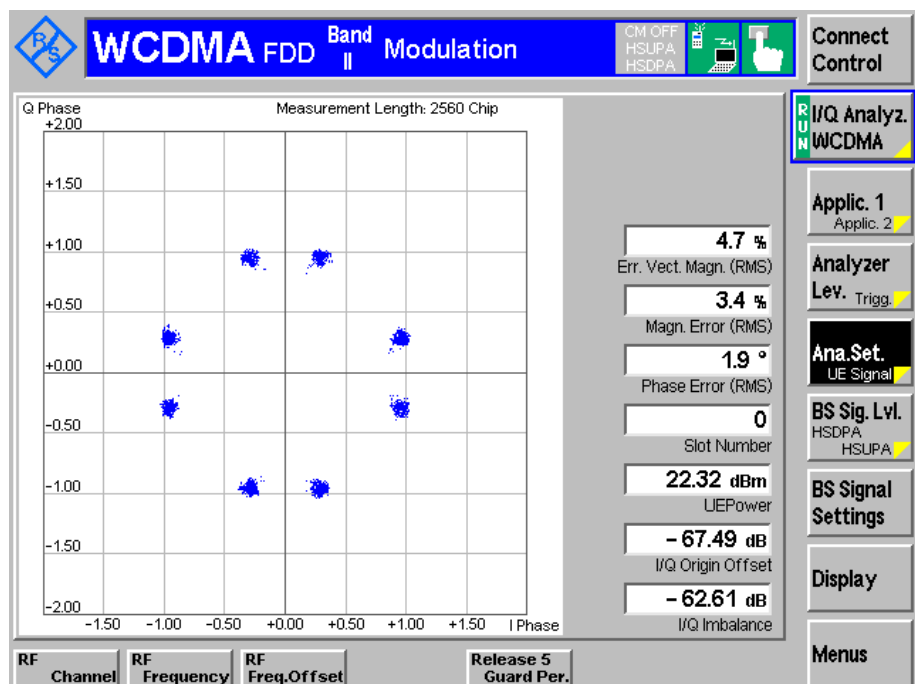
Only the worst case was selected to record



WCDMA B5



WCDMA B2



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