FCC Part 22H & 24E & 27
Measurement and Test Report

For

Cyrus Technology GmbH

Hergelsbendenstrasse 49, D-52080 Aachen, Germany

FCC ID: 2AI3KCS45XA

FCC Rules:	FCC Part 22H, FCC Part 24E, FCC Part 27
Product Description:	Rugged Phone
Tested Model:	CS45XA
Report No.:	WTX19X11079863W-1
Sample Receipt Date:	2019-11-18
Tested Date:	2019-11-18 to 2019-12-11
Issued Date:	2019-12-12
Tested By:	Jason Su / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy So / PSQ Manager

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Report version

Version No.	Date of issue	Description
Rev.00	2019-12-12	Original
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Cyrus Technology GmbH
Address of applicant: Hergelsbendenstrasse 49, D-52080 Aachen, Germany

Manufacturer: Cyrus Technology GmbH
Address of manufacturer: Hergelsbendenstrasse 49, D-52080 Aachen, Germany

General Description of EUT:	
Product Name:	Rugged Phone
Brand Name:	CYRUS
Model No.:	CS45XA
Adding Model(s):	/
Rated Voltage:	DC3.85V
Battery:	4400mAh
Adapter Model:	MKC-0502000SU INPUT: AC100-240V, 50/60Hz, 0.4A; Output: DC5V, 2000mA
Software Version:	CS45XA_ROW_1.0.3
Hardware Version:	V1.1
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT:	
2G	
Support Networks:	GSM, GPRS, EDGE
Support Band:	GSM850/PCS1900
Uplink Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz
Downlink Frequency:	GSM/GPRS/EDGE 850: 869~894MHz GSM/GPRS/EDGE 1900: 1930~1990MHz
Max RF Output Power:	GSM850: 32.52dBm, GSM1900: 30.33dBm EDGE850: 26.86dBm, EDGE1900: 26.04dBm
Type of Emission:	GSM850: 250KGXW, GSM1900: 254KGXW EDGE850: 255KG7W, EDGE1900: 250KG7W
Type of Modulation:	GMSK, 8PSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM850: 1.62dBi; GSM1900: 1.46dBi
GPRS/EDGE Class:	Class 12
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Band:	WCDMA Band 2, WCDMA Band 4, WCDMA Band 5
Uplink Frequency:	WCDMA Band 2: 1850~1910MHz WCDMA Band 4: 1710~1755MHz WCDMA Band 5: 824~849MHz
Downlink Frequency:	WCDMA Band 2: 1930~1990MHz WCDMA Band 4: 2110~2155MHz WCDMA Band 5: 869~894MHz
RF Output Power:	WCDMA Band 2: 22.75dBm, WCDMA Band 4: 21.52dBm WCDMA Band 5: 22.97dBm
Type of Emission:	WCDMA Band 2: 4M19F9W WCDMA Band 4: 4M19F9W WCDMA Band 5: 4M20F9W
Type of Modulation:	BPSK,QPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 2: 1.22dBi, WCDMA Band 4: 1.11dBi, WCDMA Band 5: 1.61dBi

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 2: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
FCC Rules Part 22: PRIVATE LAND MOBILE RADIO SERVICES.
FCC Rules Part 24: PUBLIC MOBILE SERVICES
FCC Rules Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS 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

Address of the test laboratory
Laboratory: Shenzhen SEM Test Technology Co., Ltd.
Address: 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101）

FCC – Registration No.: 125990
Shenzhen SEM Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010.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	EDGE 850	Low, Middle, High Channels
TM4	GSM 1900	Low, Middle, High Channels
TM5	GPRS 1900	Low, Middle, High Channels
TM6	EDGE 1900	Low, Middle, High Channels
TM7	WCDMA Band 5	Low, Middle, High Channels
TM8	HSDPA Band 5	Low, Middle, High Channels
TM9	HSUPA Band 5	Low, Middle, High Channels
TM10	WCDMA Band 4	Low, Middle, High Channels
TM11	HSDPA Band 4	Low, Middle, High Channels
TM12	HSUPA Band 4	Low, Middle, High Channels
TM13	WCDMA Band 2	Low, Middle, High Channels
TM14	HSDPA Band 2	Low, Middle, High Channels
TM15	HSUPA Band 2	Low, Middle, High Channels

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
GSM 850	GSM/GPRS/EDGE	824.2 MHz	128
		836.6 MHz	190
		848.8 MHz	251
PCS 1900	GSM/GPRS/EDGE	1850.2 MHz	512
		1880.0 MHz	661
		1909.8 MHz	810
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.4 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
WCDMA Band 4	WCDMA/HSDPA/HSUPA	1712.4 MHz	1312
		1732.4 MHz	1412
		1752.6 MHz	1513
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.			

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
/	/	/	/

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	±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	2019-04-30	2020-04-29
SEMT-1063	GSM Tester	Rohde & Schwarz	CMU200	114403	2019-04-30	2020-04-29
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2019-04-30	2020-04-29
SEMT-1079	Spectrum Analyzer	Agilent	N9020A	US47140102	2019-04-30	2020-04-29
SEMT-1080	Signal Generator	Agilent	83752A	3610A01453	2019-04-30	2020-04-29

SEMT-1081	Vector Signal Generator	Agilent	N5182A	MY47070202	2019-04-30	2020-04-29
SEMT-1028	Power Divider	Weinschel	1506A	PM204	2019-04-30	2020-04-29
SEMT-1082	Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2019-04-30	2020-04-29
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2019-04-30	2020-04-29
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2019-04-30	2020-04-29
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2019-04-30	2020-04-29
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2019-04-30	2020-04-29
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
SEMT-1068	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
SEMT-1042	Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2019-05-05	2021-05-04
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2019-04-30	2020-04-29
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2019-04-30	2020-04-29
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2019-04-30	2020-04-29
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2019-05-05	2021-05-04
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2019-04-30	2020-04-29
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2019-04-30	2020-04-29
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2019-04-30	2020-04-29
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2019-03-18	2020-03-17
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2019-03-18	2020-03-17
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2019-03-18	2020-03-17
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2019-03-18	2020-03-17
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2019-03-18	2020-03-17
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2019-03-18	2020-03-17

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§1.1307, §2.1093	RF Exposure	Compliant
§22.913(a), §24.232(c), §27.50(d)	RF Output Power	Compliant
§24.51, §27.50	Peak-to-average Ratio (PAR) of Transmitter	Compliant
§22.917(b), §24.238(b), §27.53	Emission Bandwidth	Compliant
§22.917(a), §24.238(a), §27.53(h)	Spurious Emissions at Antenna Terminal	Compliant
§22.917(a), §24.238(a), §27.53(h)	Spurious Radiation Emissions	Compliant
§22.917(a), §24.238(a), §27.53(h)	Out of Band Emissions	Compliant
§22.355, §24.235, §27.54	Frequency Stability	Compliant

3. RF Exposure

3.1 Standard Applicable

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

3.2 Test Result

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

4. RF Output Power

4.1 Standard Applicable

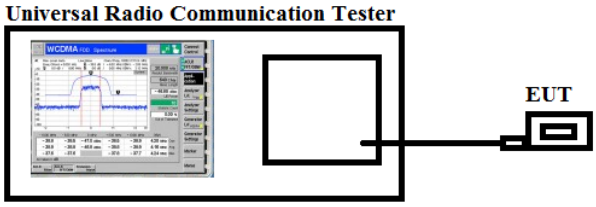
According to §22.913(a)(2), the ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

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

According to §27.50(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

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	30.18	<38.45	Pass
		H	23.26		
	190	V	30.52		
		H	23.19		
	251	V	30.37		
		H	23.54		
GPRS850	128	V	30.76	<38.45	Pass
		H	23.25		
	190	V	30.67		
		H	23.59		
	251	V	30.71		
		H	23.63		
EGPRS850	128	V	24.14	<38.45	Pass
		H	17.65		
	190	V	24.23		
		H	17.98		
	251	V	24.46		
		H	17.95		

Mode	Channel	Antenna Polar	EIRP (dBm)	Limit (dBm)	Result
PCS1900	512	V	28.34	<33.00	Pass
		H	21.36		
	661	V	28.69		
		H	21.65		
	810	V	28.49		
		H	21.14		
GPRS1900	512	V	28.74	<33.00	Pass
		H	21.39		
	661	V	28.65		
		H	21.13		
	810	V	28.72		
		H	21.36		
EGPRS1900	512	V	23.31	<33.00	Pass
		H	16.47		
	661	V	23.98		
		H	16.39		
	810	V	23.57		
		H	16.57		

Mode	Channel	Antenna Polar	ERP	Limit (dBm)	Result
WCDMA Band V	4132	V	20.69	<38.45	Pass
		H	14.14		
	4183	V	20.98		
		H	14.35		
	4233	V	20.97		
		H	14.31		

Mode	Channel	Antenna Polar	EIRP	Limit (dBm)	Result
WCDMA Band IV	1312	V	19.78	<30.00	Pass
		H	14.14		
	1412	V	19.51		
		H	14.36		
	1513	V	19.87		
		H	14.05		

Mode	Channel	Antenna Polar	EIRP	Limit (dBm)	Result
WCDMA Band II	9262	V	20.47	<33.00	Pass
		H	14.83		
	9400	V	20.31		
		H	14.25		
	9538	V	20.69		
		H	14.61		

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	32.4	32.42	32.34	30.26	30.31	30.33
GPRS(1Slot)	32.52	32.43	32.36	30.26	30.25	30.27
EGPRS(1Slot)	26.86	26.75	26.73	26.04	25.9	25.76

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	22.97	22.93	22.90	22.72	22.75	22.74
HSDPA Subtest-1	21.76	21.99	21.97	21.75	21.78	21.76
HSDPA Subtest-2	21.73	21.96	21.95	21.73	21.76	21.73
HSDPA Subtest-3	21.74	21.97	21.94	21.74	21.75	21.74
HSDPA Subtest-4	21.75	21.98	21.96	21.72	21.74	21.75
HSUPA Subtest-1	21.80	21.98	22.01	21.87	21.82	21.80
HSUPA Subtest-2	21.76	21.96	21.96	21.85	21.8	21.76
HSUPA Subtest-3	21.78	21.95	21.98	21.84	21.81	21.78
HSUPA Subtest-4	21.79	21.97	21.98	21.86	21.79	21.79
HSUPA Subtest-5	21.76	21.96	21.99	21.85	21.78	21.76

Conducted Average power (dBm)						
Band	WCDMA Band IV					
Channel	1312	1412	1513			
Frequency(MHz)	1712.4	1733.4	1752.6			
RMC 12.2k	21.26	21.34	21.52			
HSDPA Subtest-1	20.35	20.37	20.59			
HSDPA Subtest-2	20.32	20.35	20.56			
HSDPA Subtest-3	20.31	20.34	20.56			
HSDPA Subtest-4	20.32	20.35	20.57			
HSUPA Subtest-1	20.67	20.32	20.61			
HSUPA Subtest-2	20.65	20.31	20.59			
HSUPA Subtest-3	20.63	20.31	20.6			
HSUPA Subtest-4	20.64	20.31	20.58			
HSUPA Subtest-5	20.65	20.31	20.58			

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.

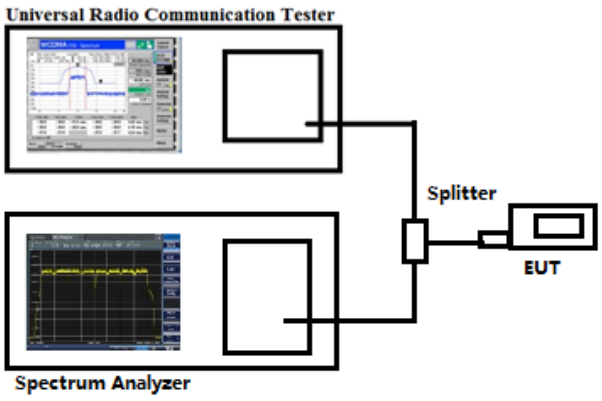
According to §27.50(B), the peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

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	4.87	13
GPRS(1 Slot)	661	1850.2	5.05	13
EDGE(1 Slot)	661	1850.2	4.92	13

WCDMA Band IV				
Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	1312	1712.4	5.65	13
	1412	1733.4	5.14	13
	1513	1752.6	5.98	13

WCDMA Band II				
Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	4.38	13
	9400	1880.0	4.54	13
	9538	1907.6	4.80	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.

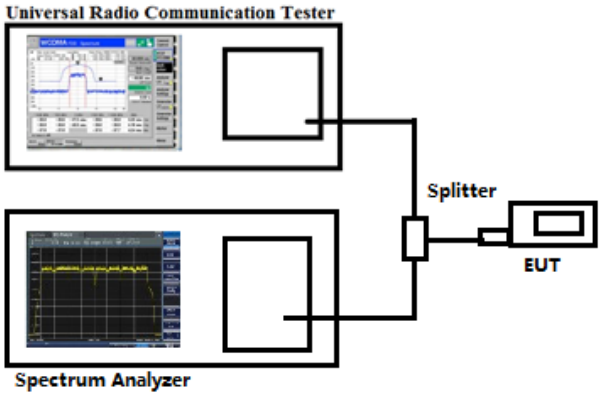
According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §27.53, 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.

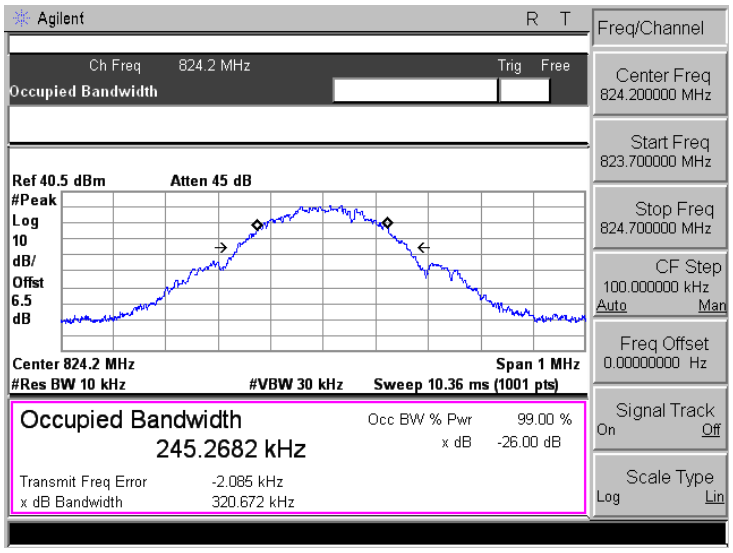
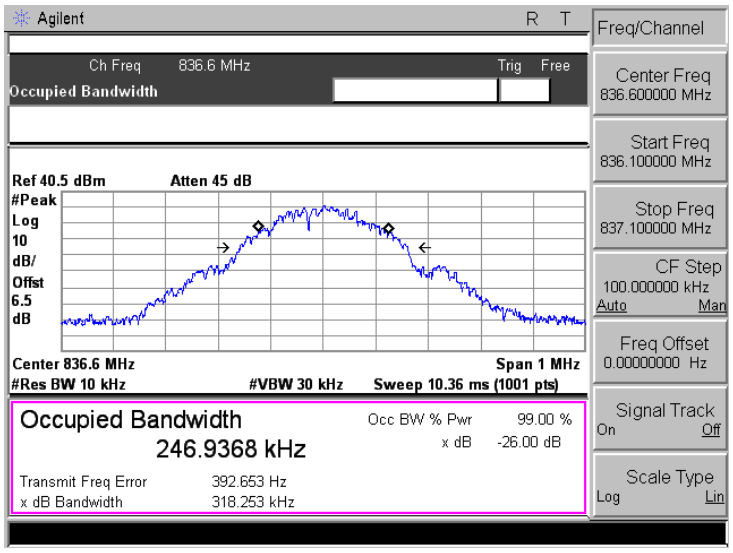
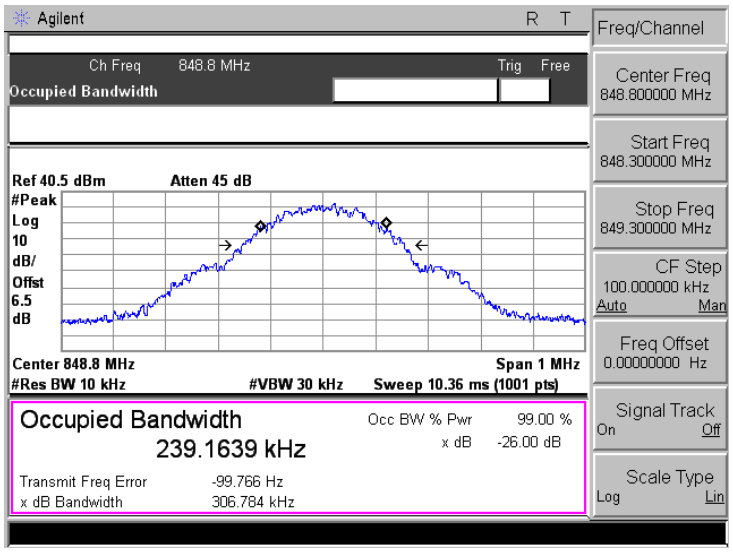
Test Configuration for the emission bandwidth testing:

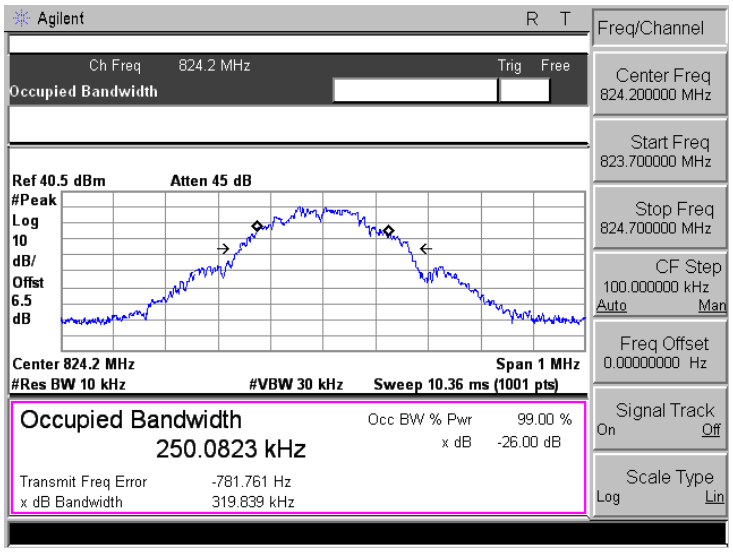
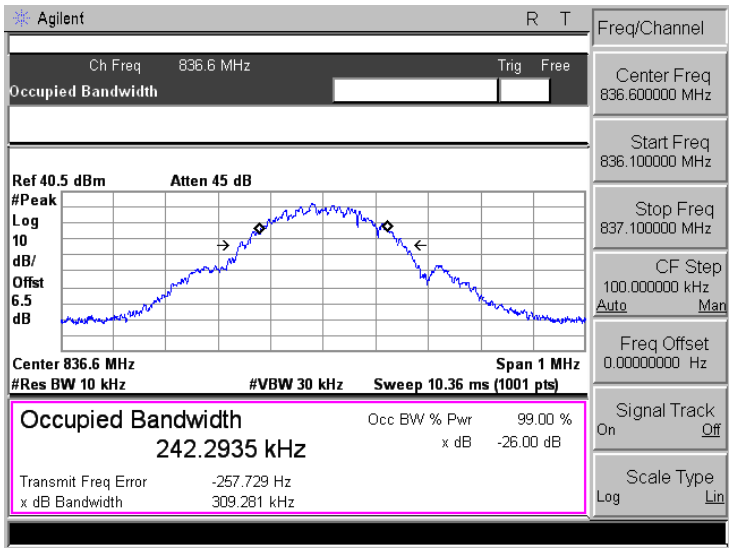
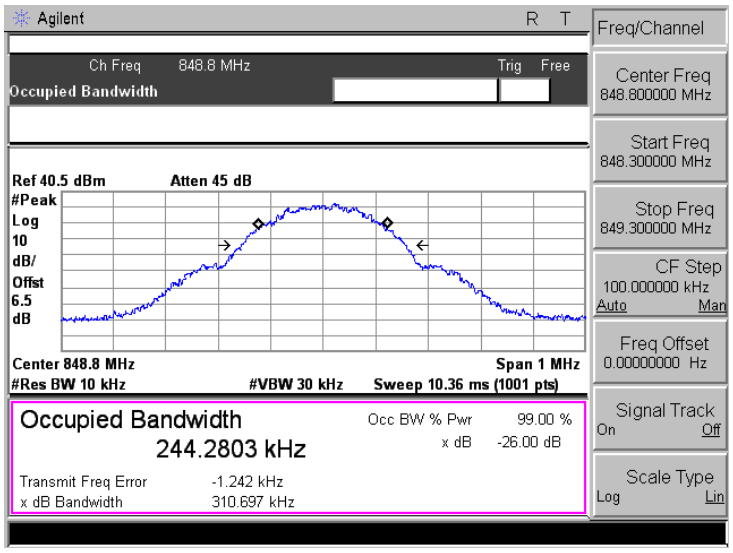


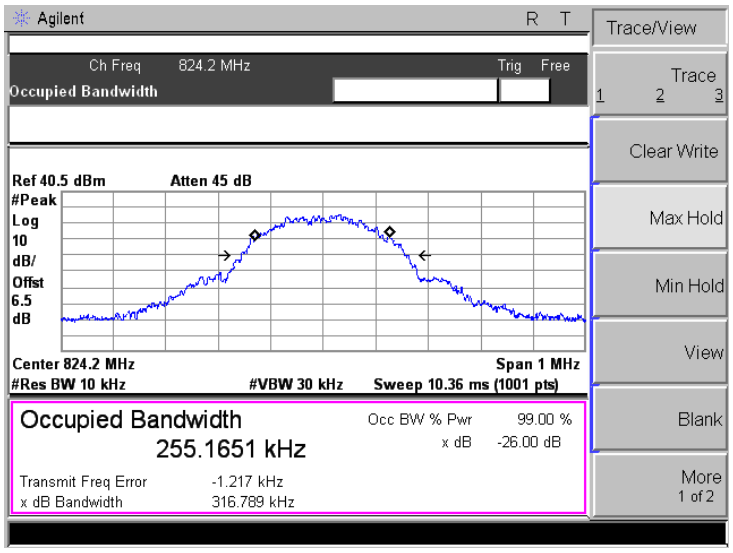
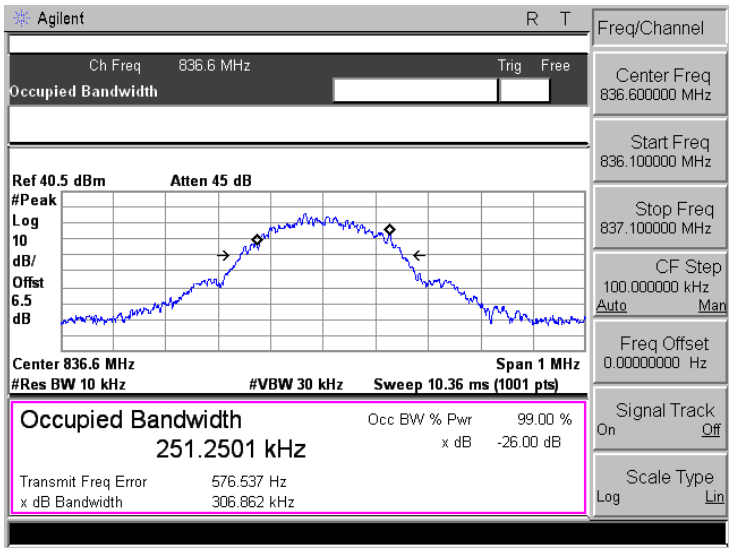
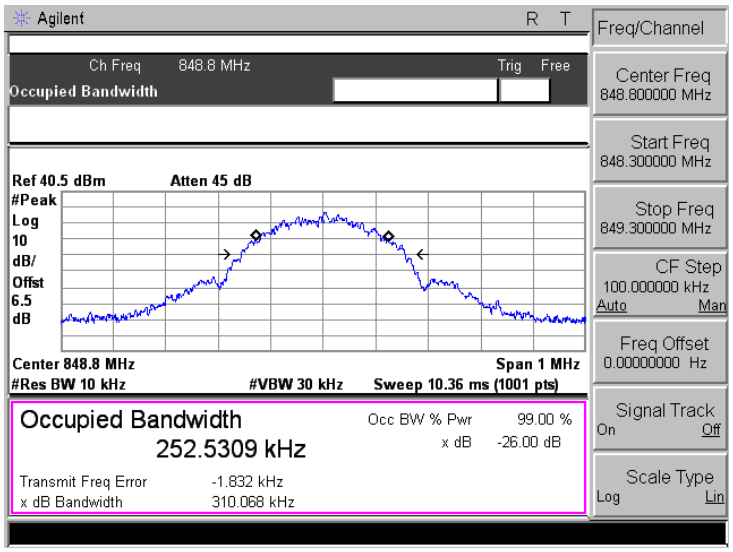
6.3 Summary of Test Results/Plots

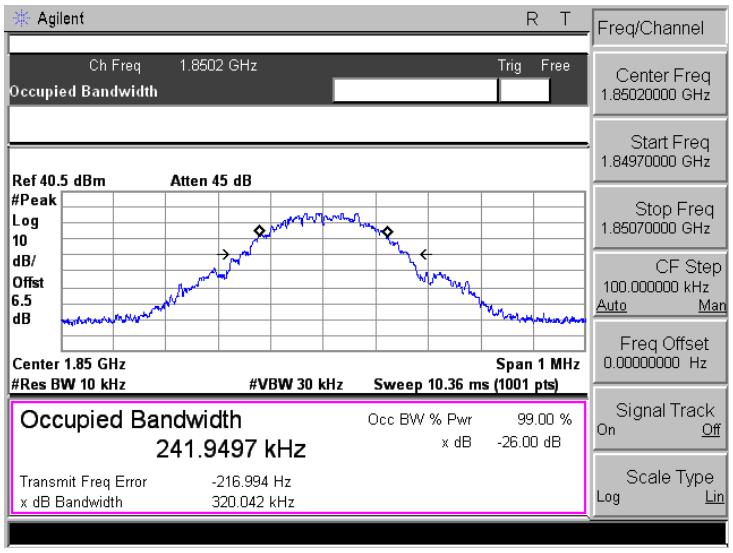
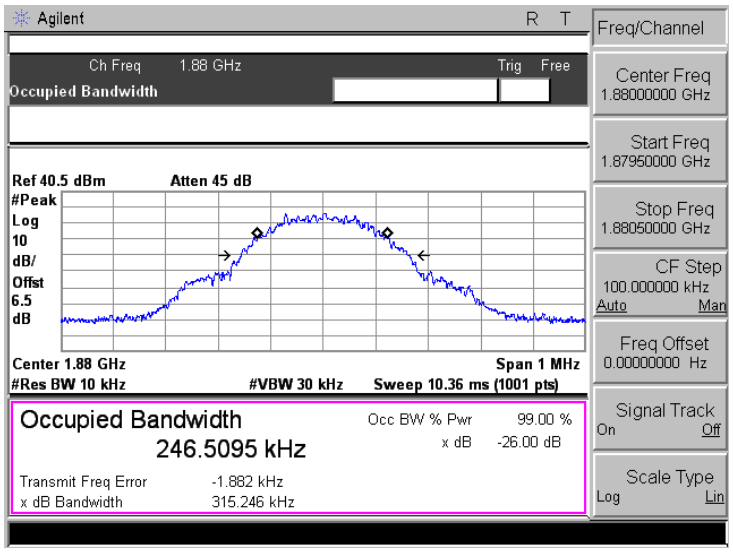
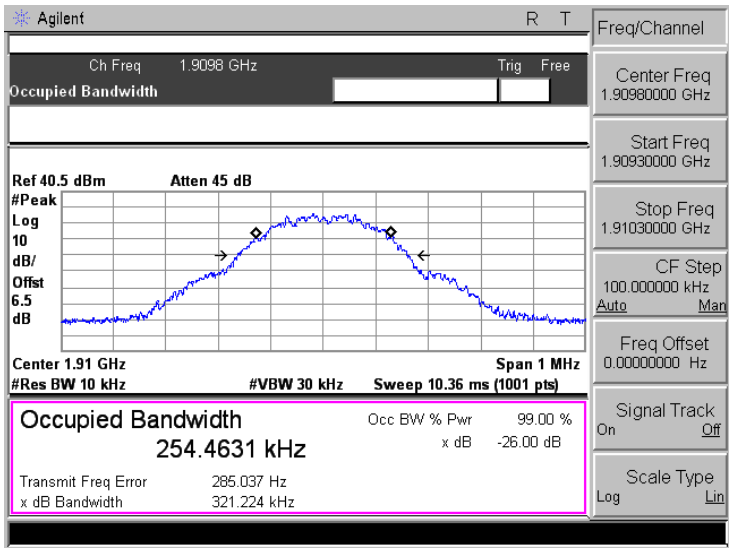
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (kHz)	-26dB bandwidth (kHz)
GSM 850 (GMSK)	128	824.20	245.2682	320.672
	190	836.60	246.9368	318.253
	251	848.80	239.1639	306.784
GPRS850 (GMSK,1Slot)	128	824.20	250.0823	319.839
	190	836.60	242.2935	309.281
	251	848.80	244.2803	310.697
EGPRS850 (8PSK,1Slot)	128	824.20	255.1651	316.789
	190	836.60	251.2501	306.862
	251	848.80	252.5309	310.068
PCS1900 (GMSK)	512	1850.20	241.9497	320.042
	661	1880.00	246.5095	315.246
	810	1909.80	254.4631	321.224
GPRS1900 (GMSK,1Slot)	512	1850.20	252.2805	312.031
	661	1880.00	247.9078	319.084
	810	1909.80	241.8669	310.527
EGPRS1900 (8PSK,1Slot)	512	1850.20	245.9469	314.317
	661	1880.00	244.9251	304.221
	810	1909.80	249.7355	302.343

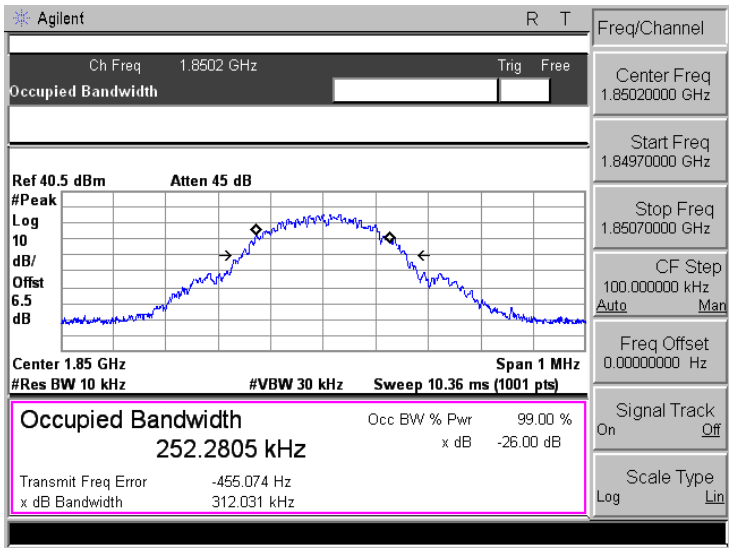
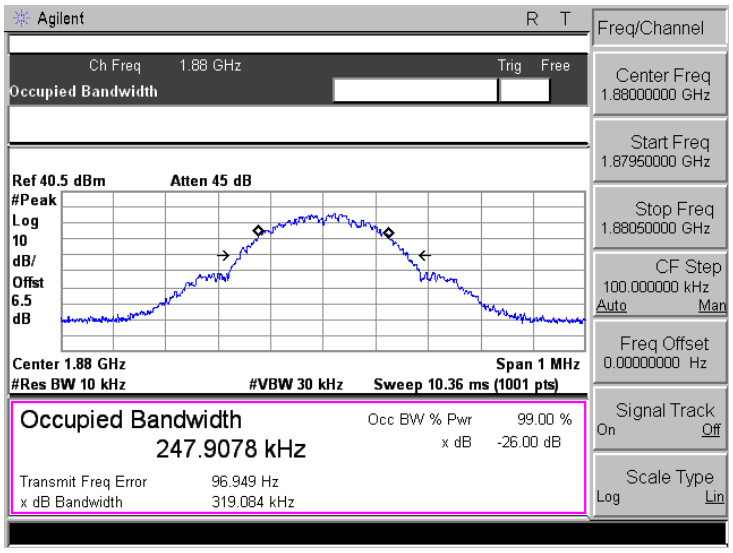
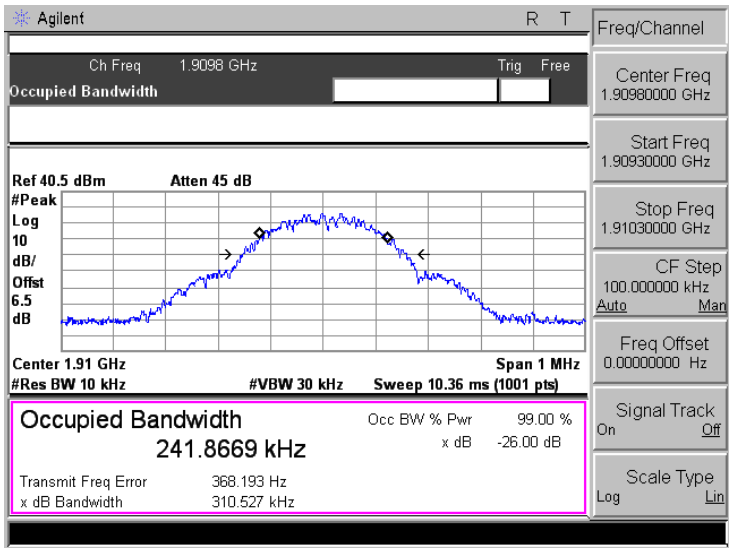
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (kHz)	-26dB bandwidth (kHz)
WCDMA Band V	4132	826.40	4181.4	4672
	4183	836.60	4163.9	4699
	4233	846.60	4.1810	4709
HSDPA	4132	826.40	4180.5	4700
	4183	836.60	4180.3	4716
	4233	846.60	4175.4	4712
HSUPA	4132	826.40	4190.1	4713
	4183	836.60	4184.1	4726
	4233	846.60	4199.0	4706
WCDMA Band II	9262	1852.40	4175.0	4712
	9400	1880.00	4190.6	4726
	9538	1907.60	4155.6	4696
HSDPA	9262	1852.40	4173.1	4714
	9400	1880.00	4179.7	4727
	9538	1907.60	4178.1	4707
HSUPA	9262	1852.40	4166.7	4715
	9400	1880.00	4158.1	4690
	9538	1907.60	4156.5	4686
WCDMA Band IV	1312	1712.4	4187.2	4725
	1412	1733.4	4174.1	4731
	1513	1752.6	4177.7	4732
HSDPA	1312	1712.4	4171.7	4733
	1412	1733.4	4187.8	4699
	1513	1752.6	4171.9	4705
HSUPA	1312	1712.4	4167.9	4706
	1412	1733.4	4188.1	4746
	1513	1752.6	4189.9	4732

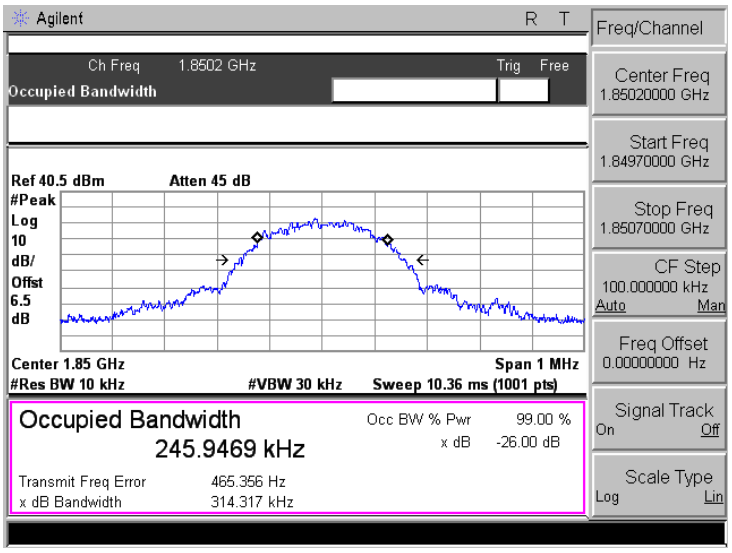
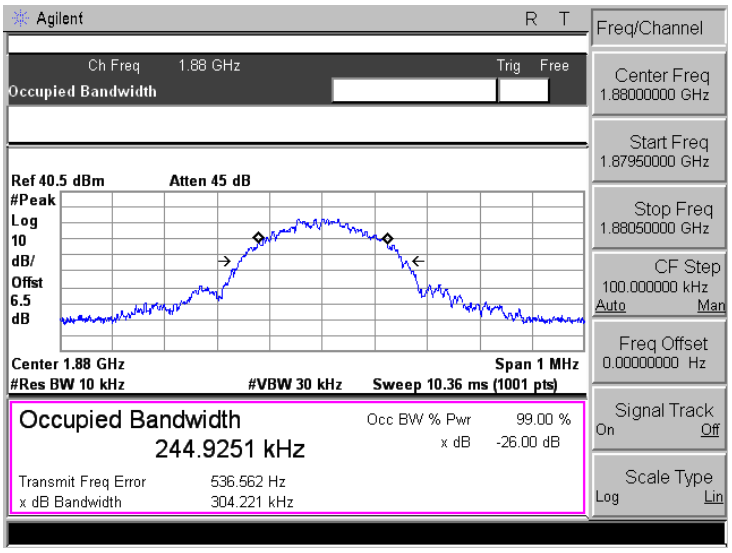
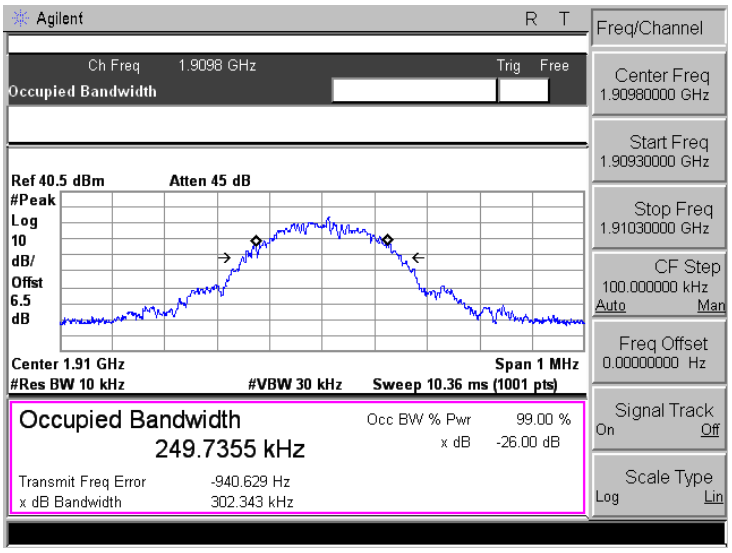
GSM900	
Low Channel	
Middle Channel	
High Channel	

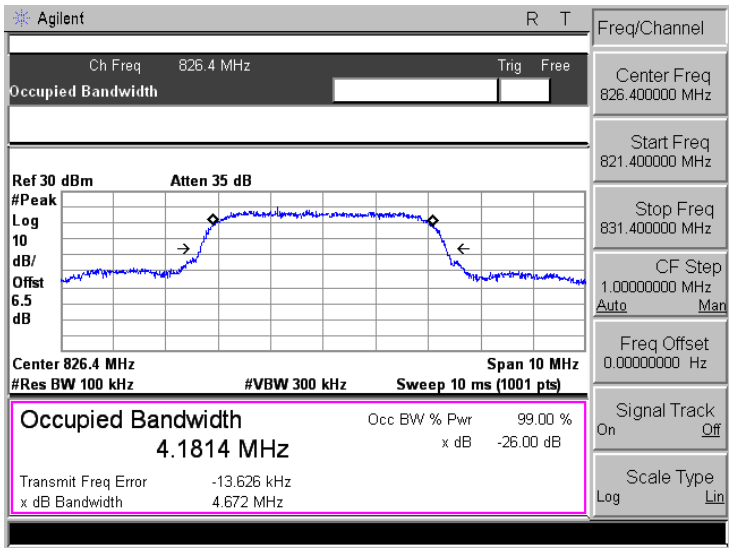
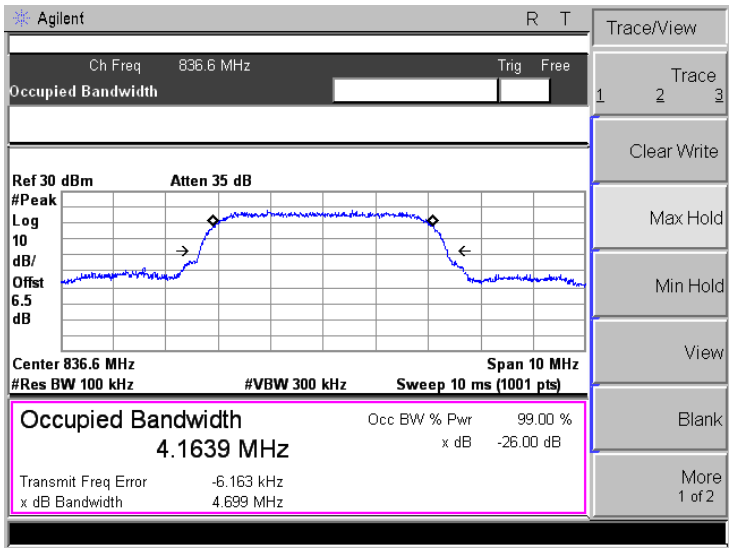
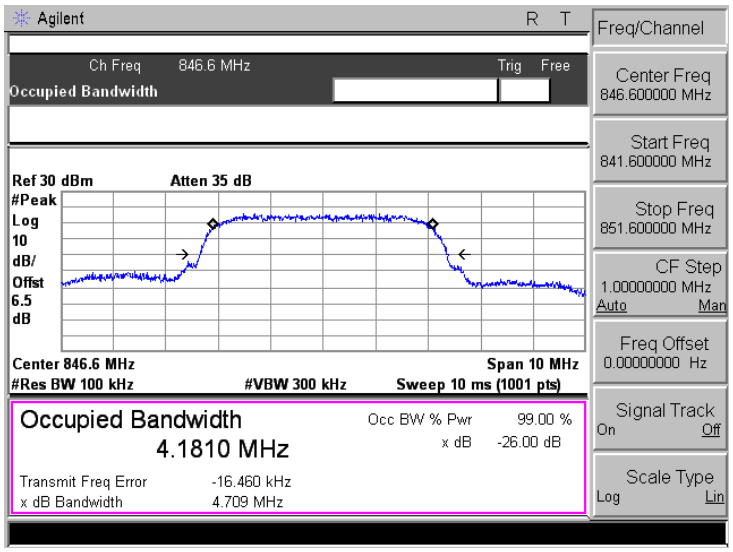
GPRS900	
Low Channel	
Middle Channel	
High Channel	

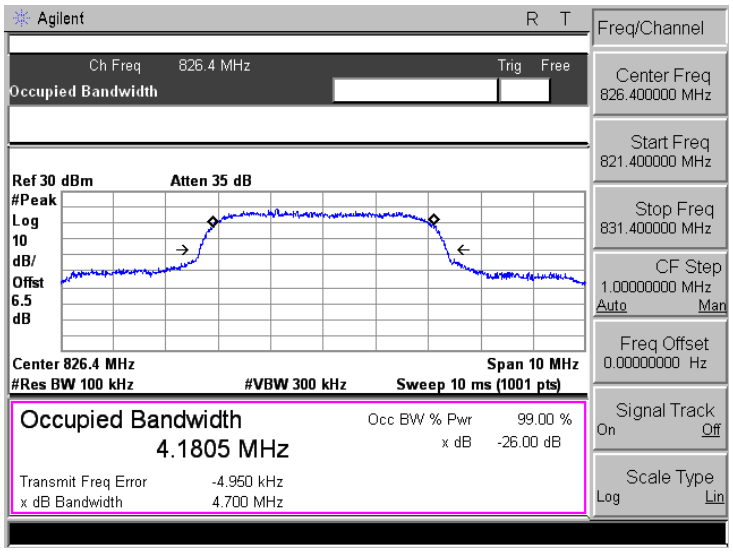
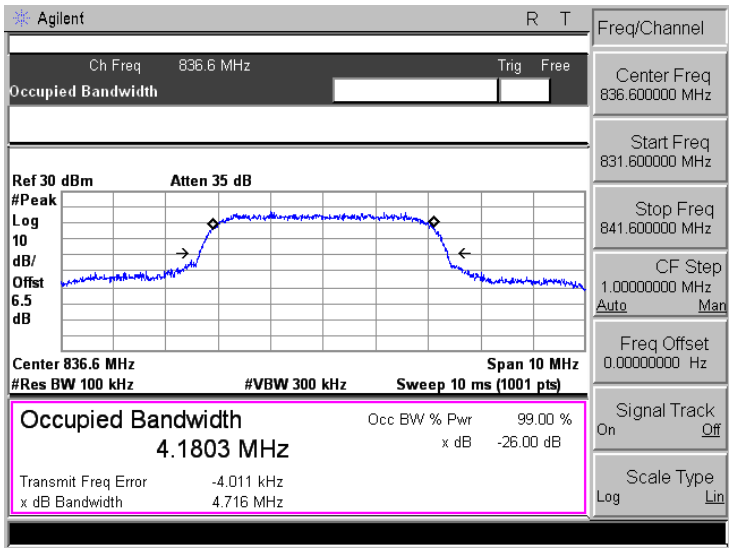
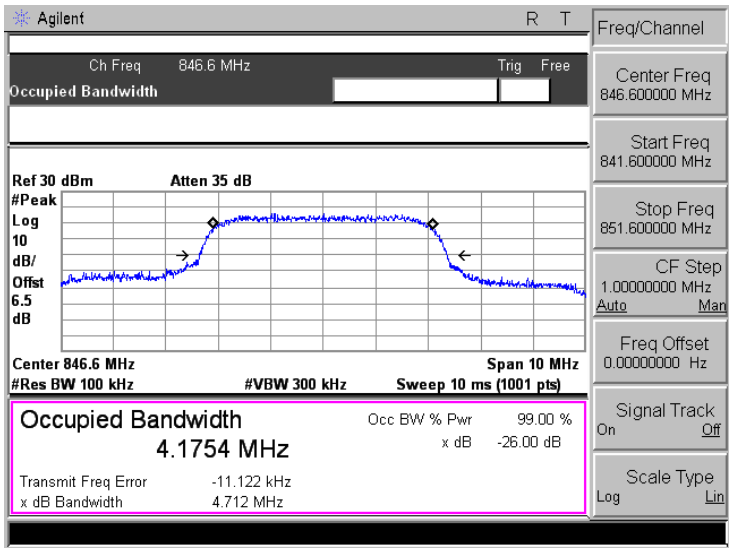
EGPRS900	
Low Channel	
Middle Channel	
High Channel	

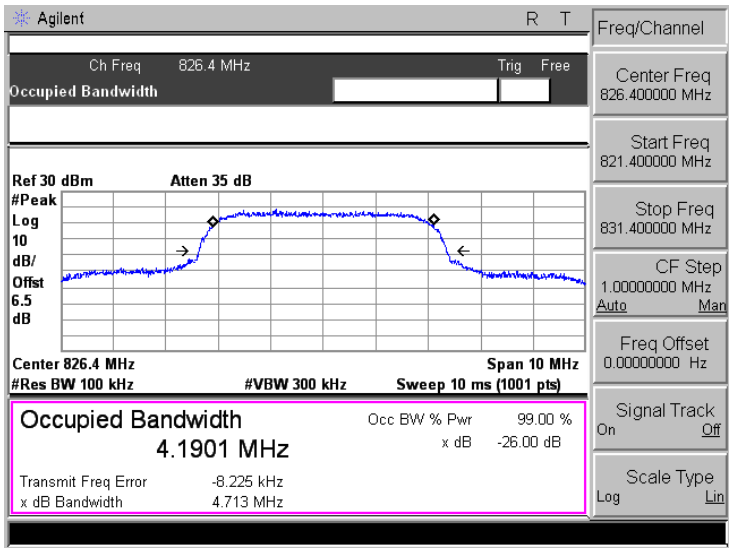
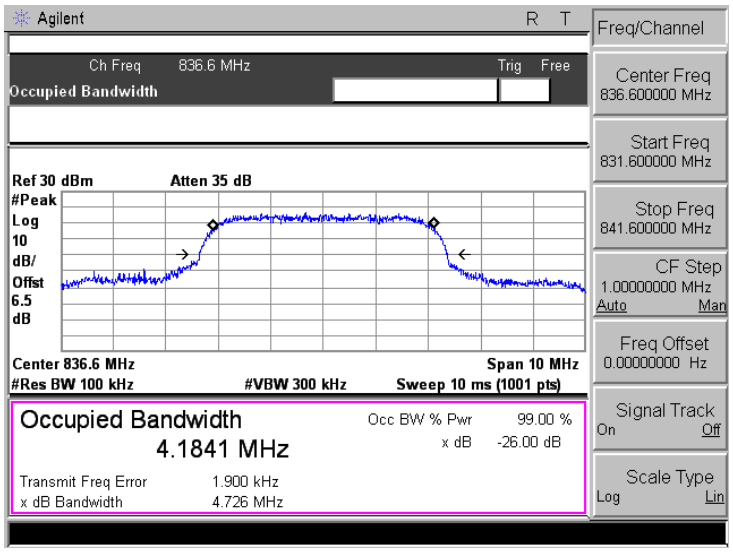
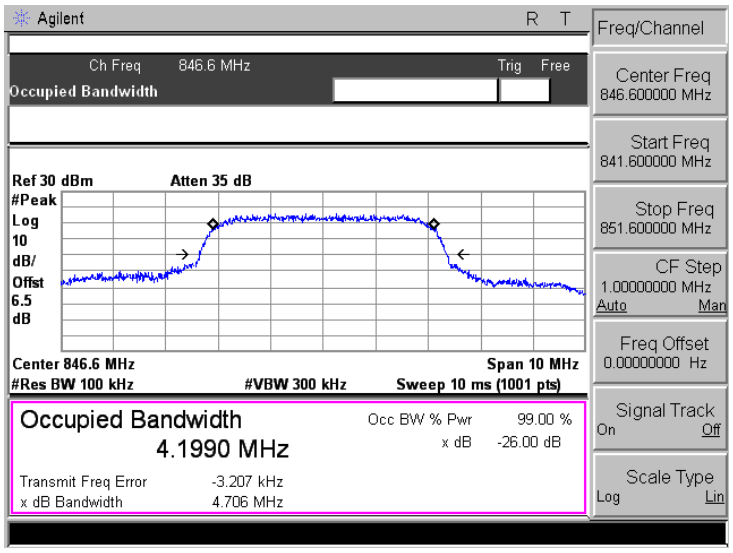
PCS1900	
Low Channel	
Middle Channel	
High Channel	

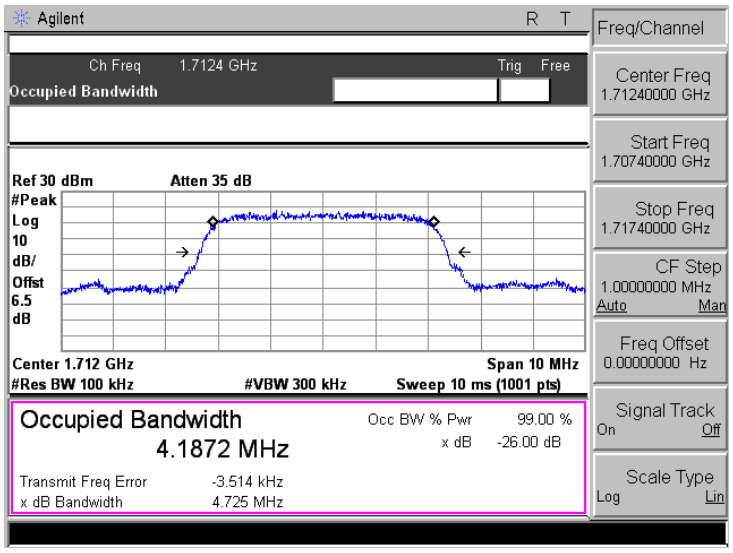
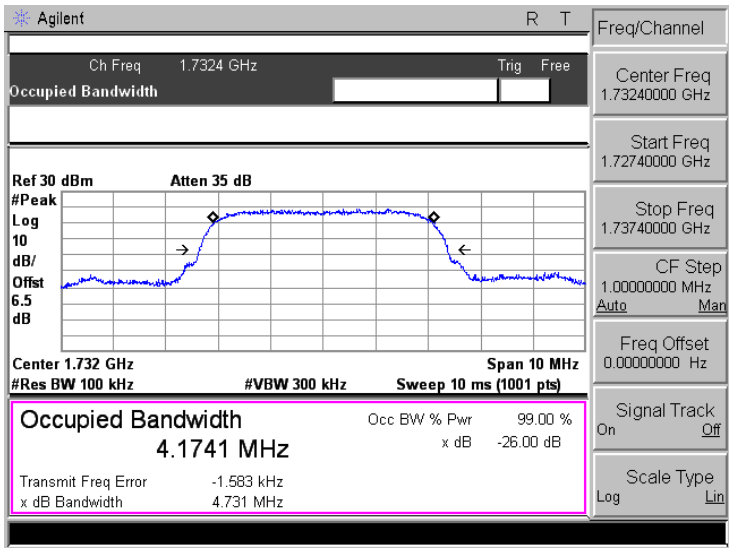
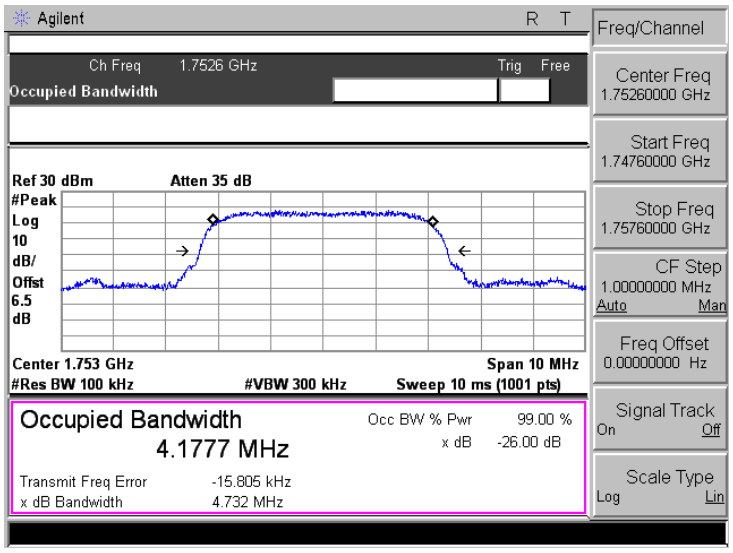
GPRS1900	
Low Channel	
Middle Channel	
High Channel	

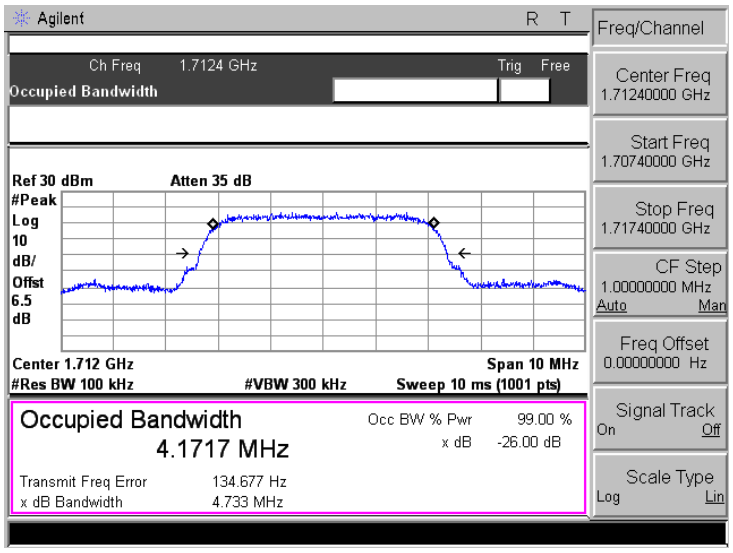
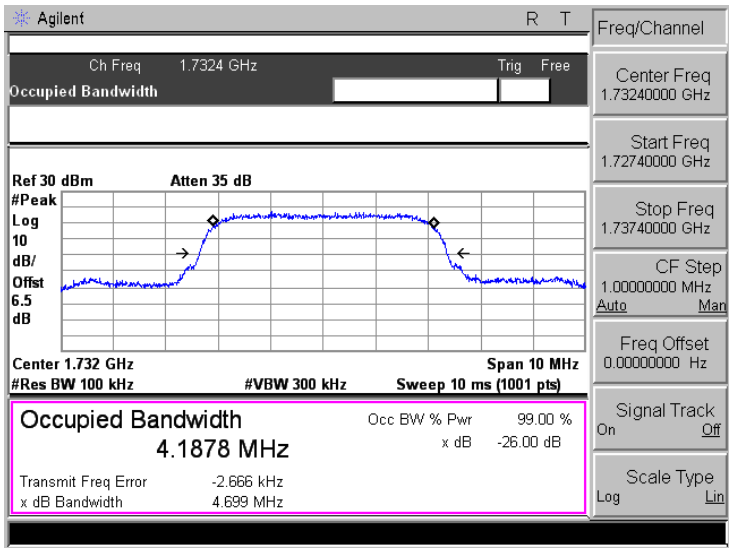
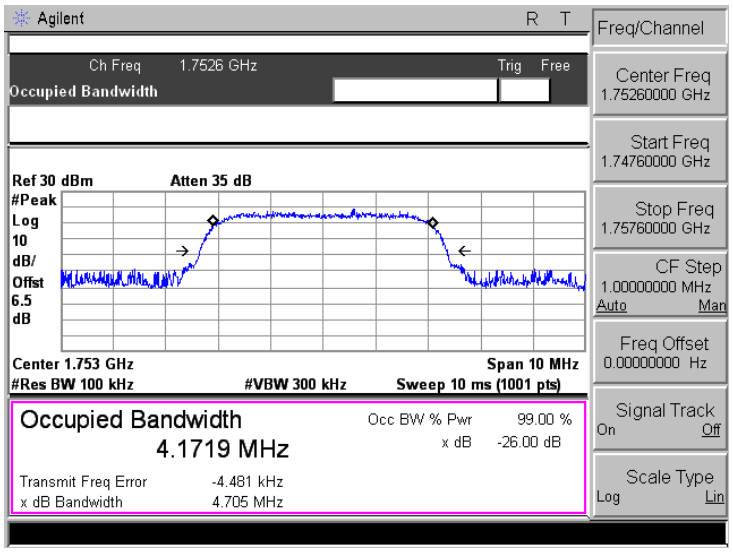
EGPRS1900	
Low Channel	
Middle Channel	
High Channel	

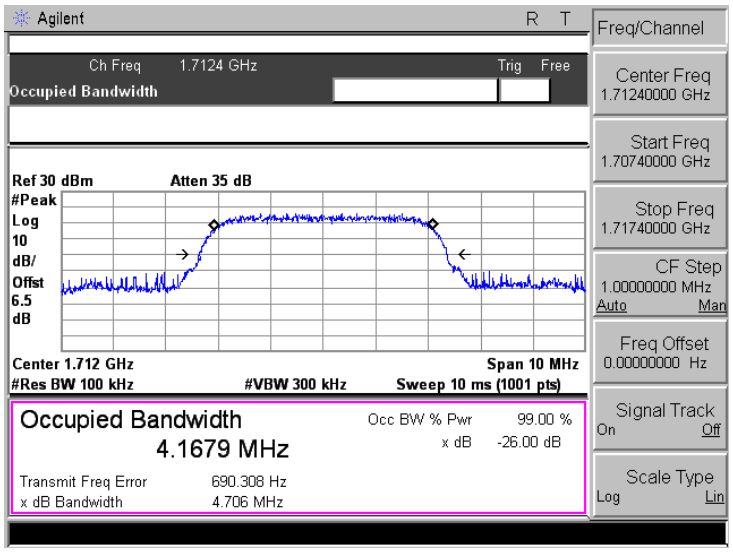
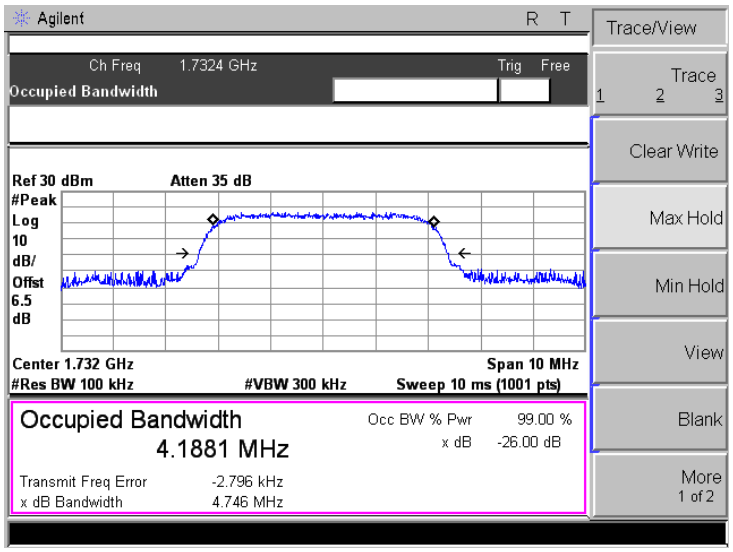
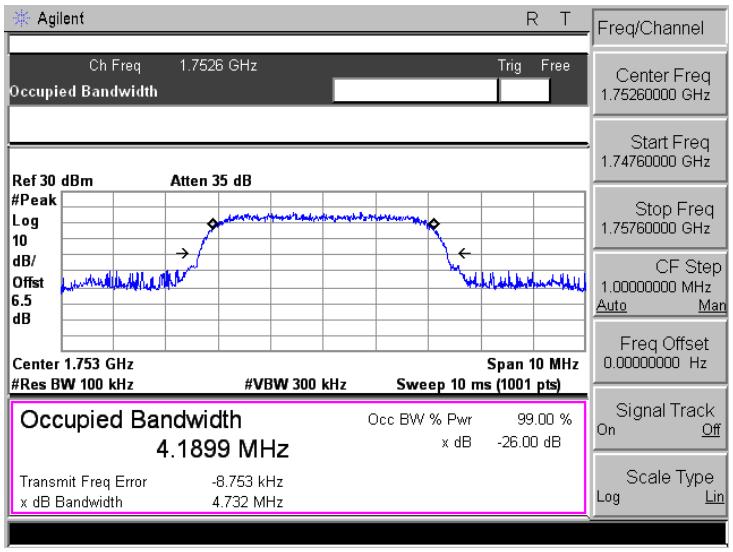
WCDMA Band V	
Low Channel	
Middle Channel	
High Channel	

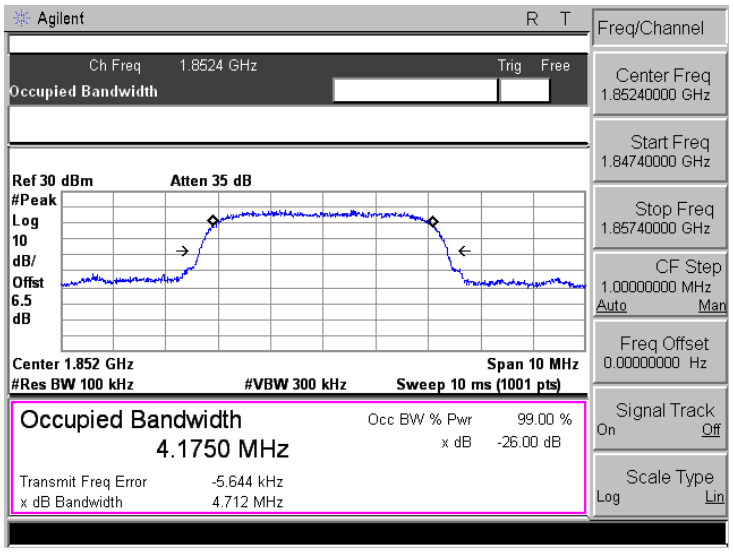
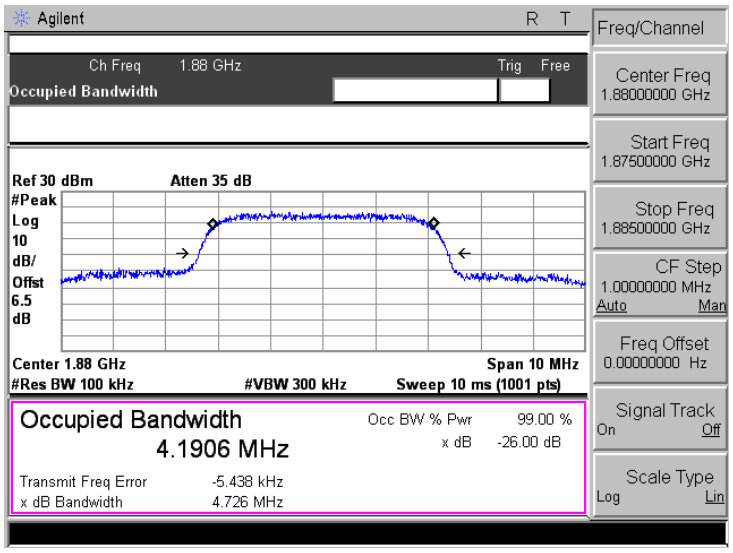
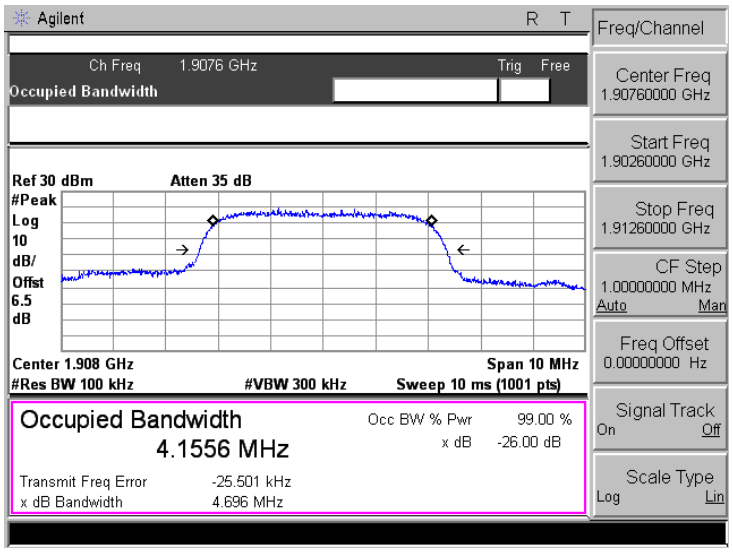
WCDMA Band V- HSDPA	
Low Channel	
Middle Channel	
High Channel	

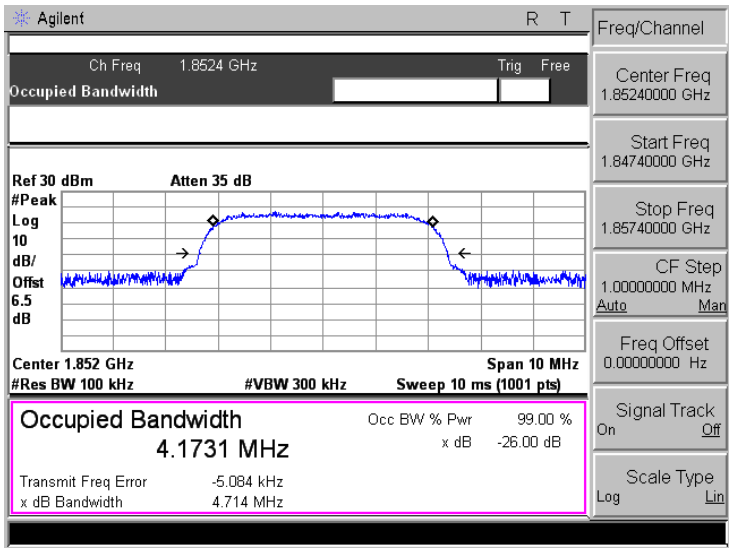
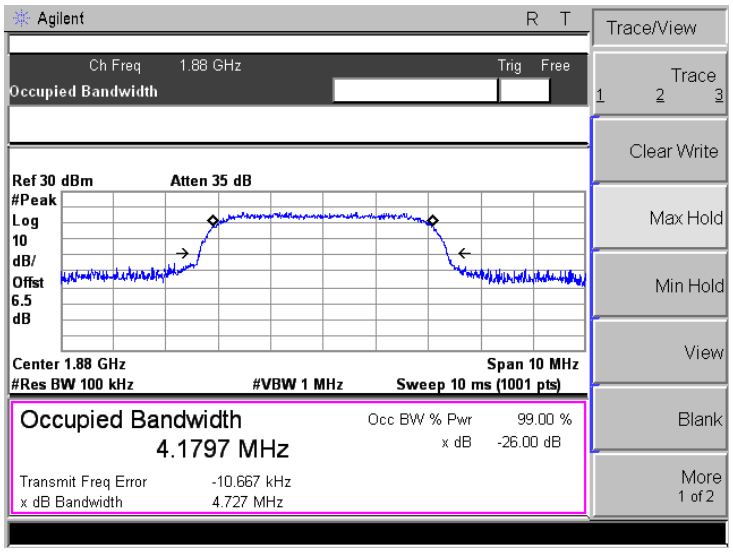
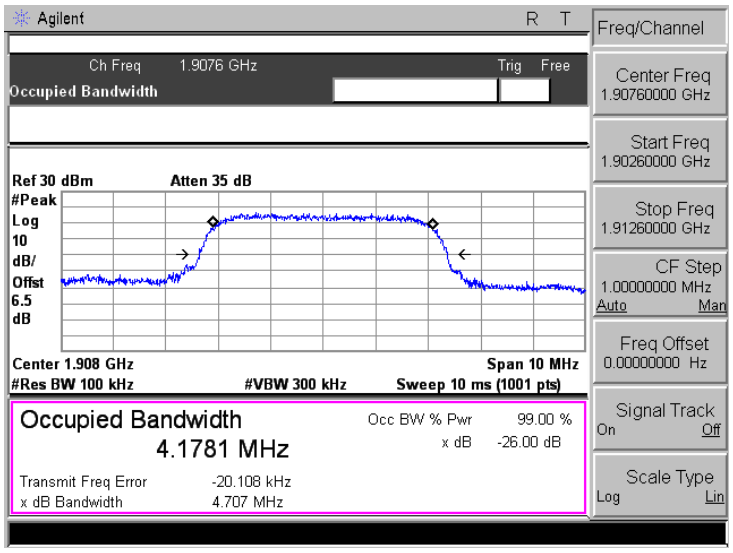
WCDMA Band V- HSUPA	
Low Channel	
Middle Channel	
High Channel	

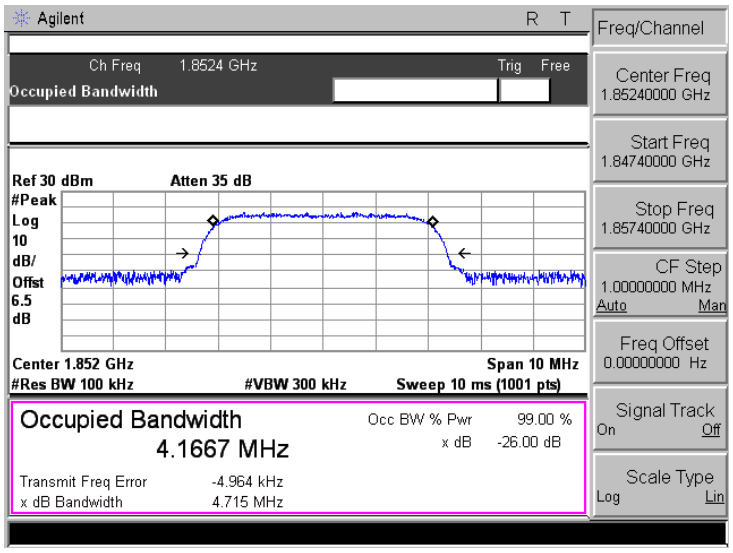
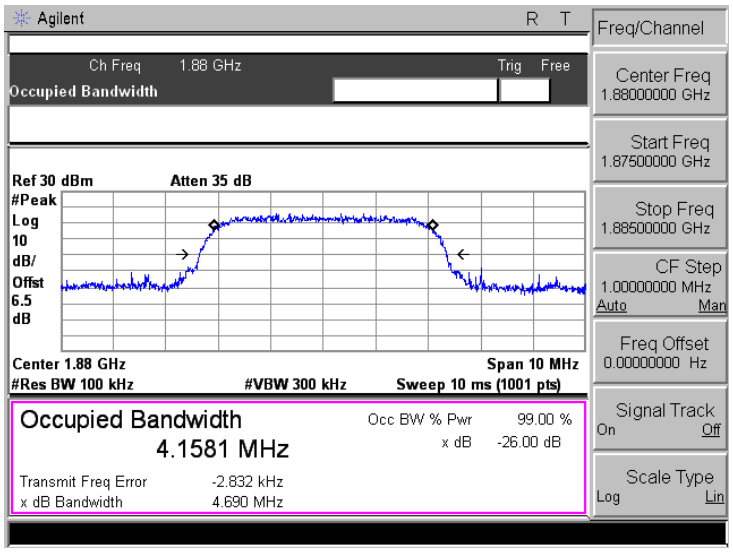
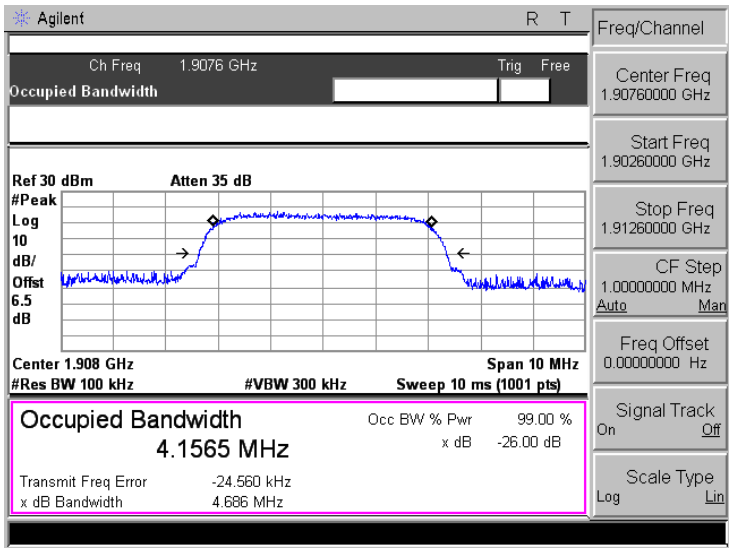
WCDMA Band IV	
Low Channel	
Middle Channel	
High Channel	

WCDMA Band IV- HSDPA	
Low Channel	
Middle Channel	
High Channel	

WCDMA Band IV- HSUPA	
Low Channel	
Middle Channel	
High Channel	

WCDMA Band II	
Low Channel	
Middle Channel	
High Channel	

WCDMA Band II- HSDPA	
Low Channel	
Middle Channel	
High Channel	

WCDMA Band II- HSUPA	
Low Channel	
Middle Channel	
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.

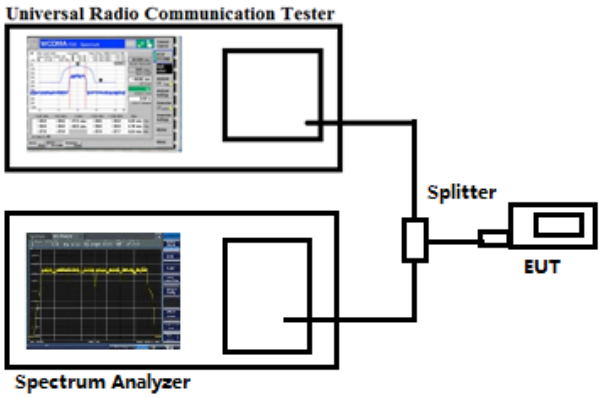
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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.

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.

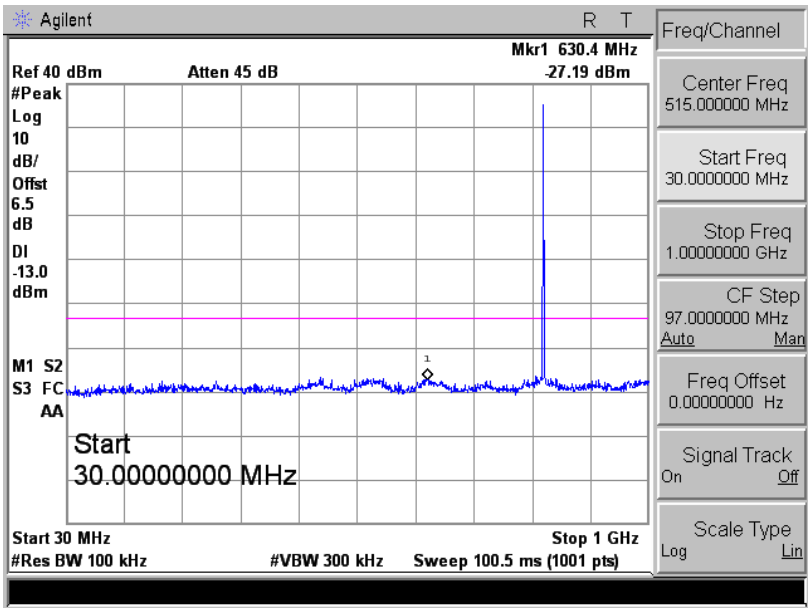
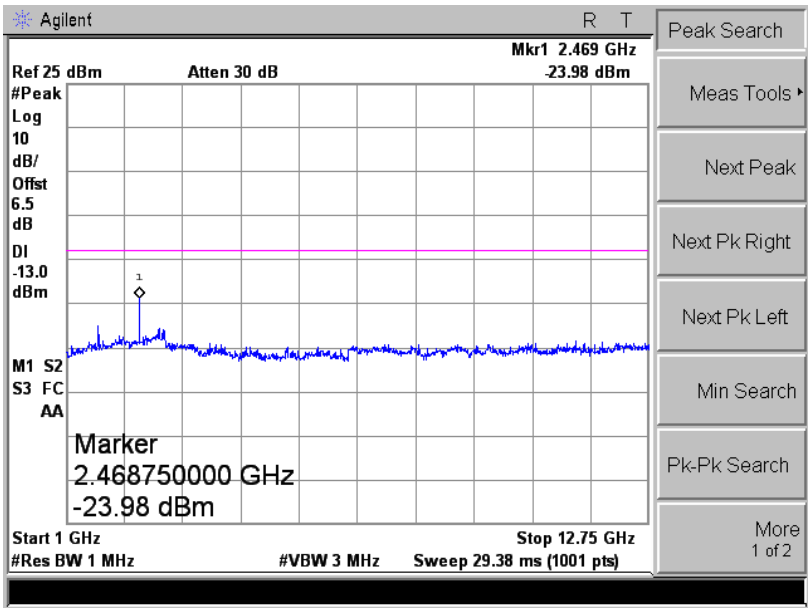
Test Configuration for the out of band emissions testing:

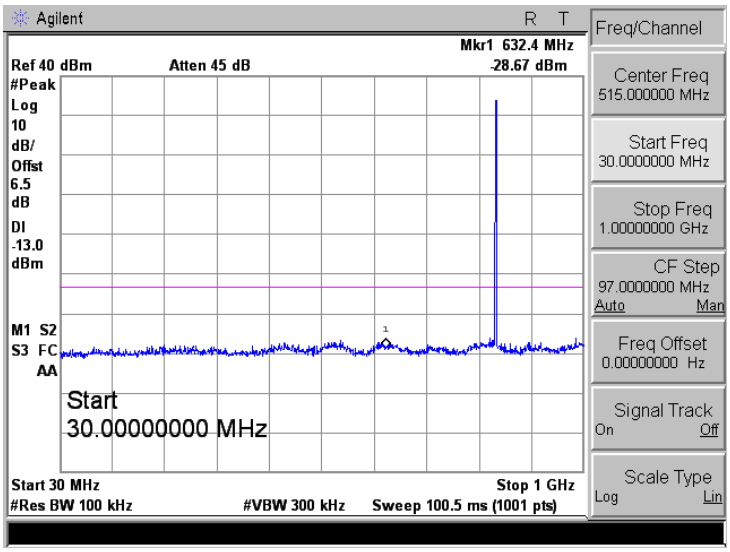
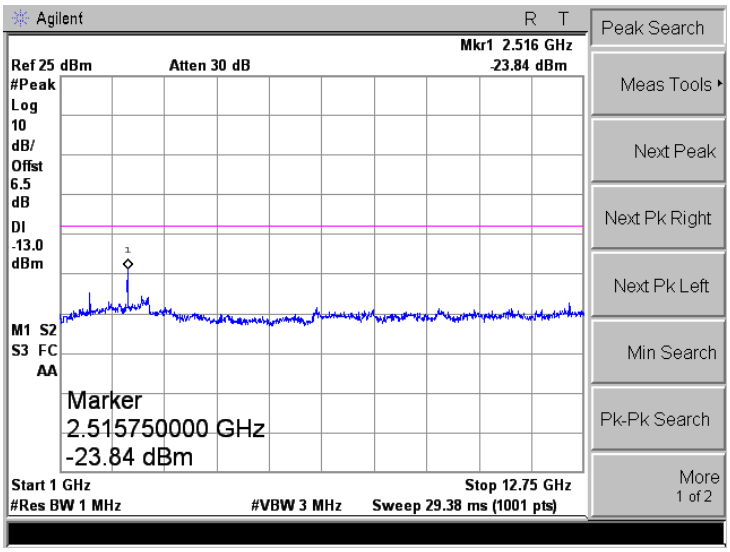


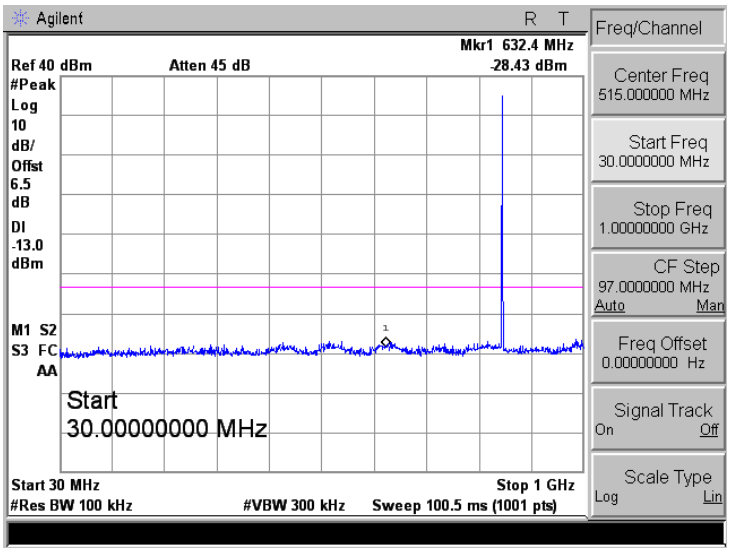
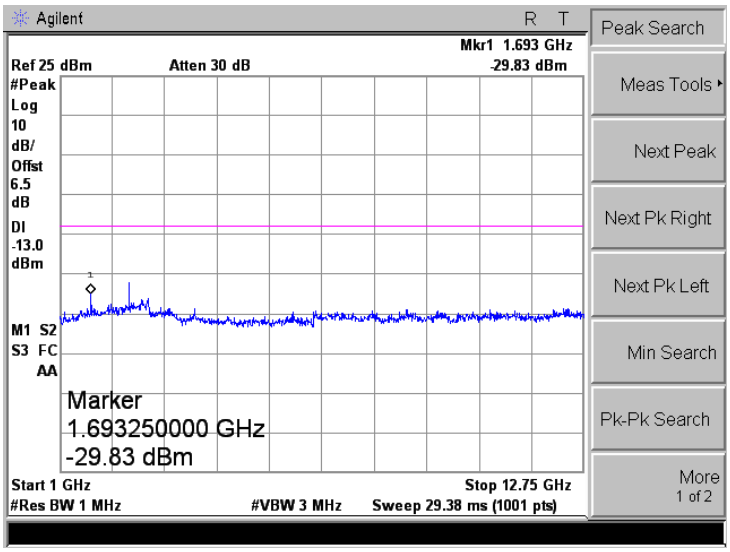
7.3 Summary of Test Results/Plots

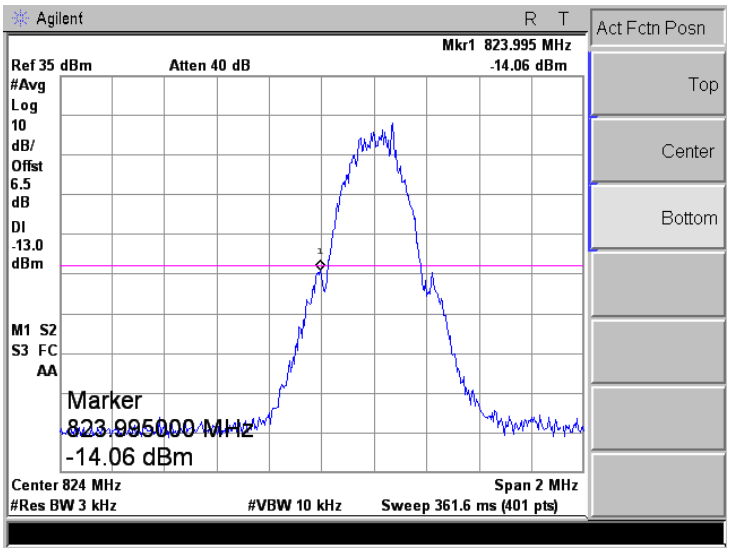
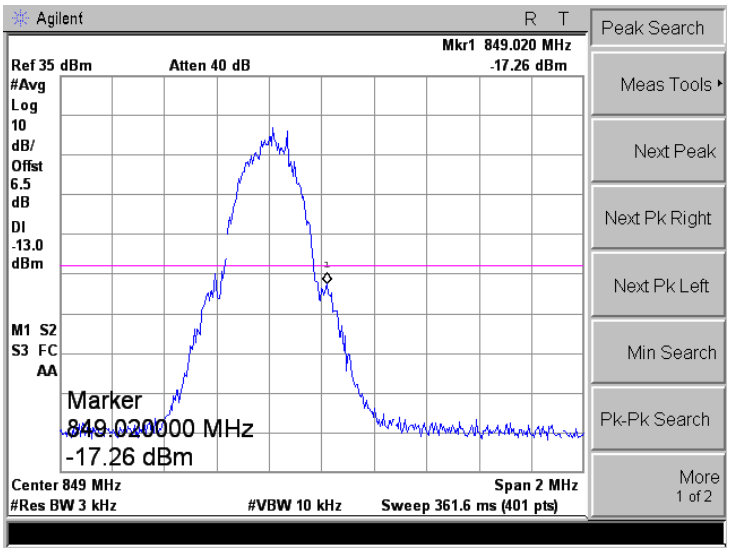
Note: Pre-scan mode WCDMA/HSDPA/HSUPA find the worst case at WCDMA mode and recorded in the test report.

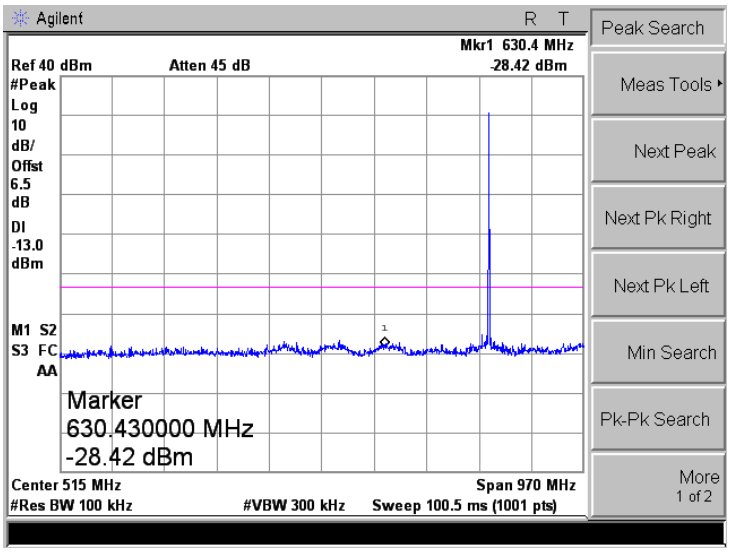
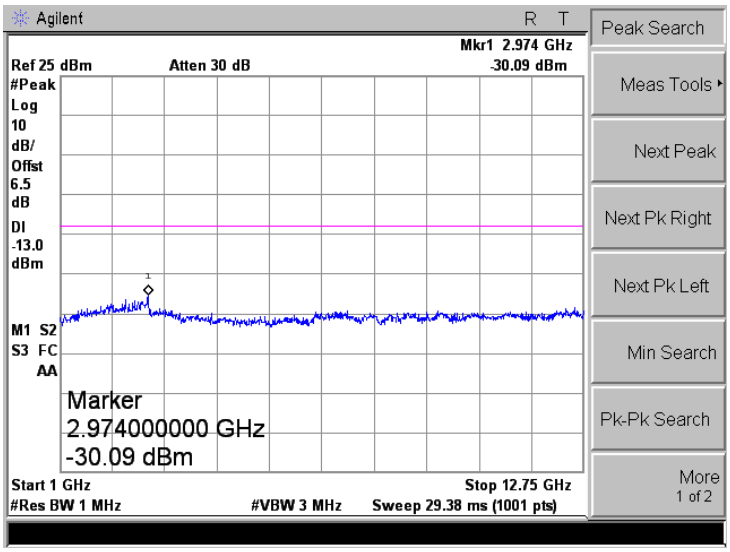
Please refer to the following test plots

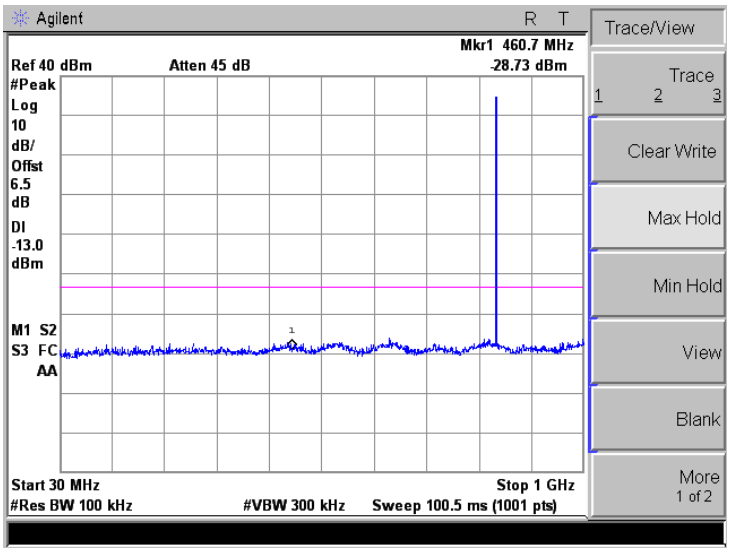
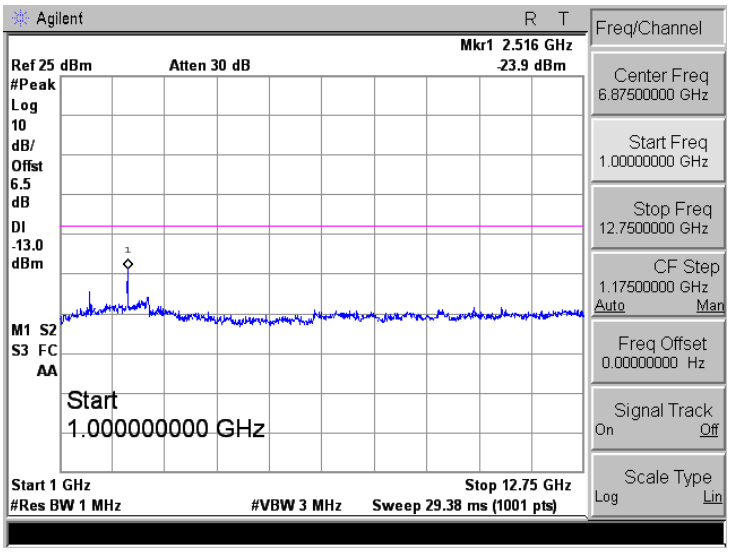
GSM850	
Low Channel	 

GSM850	
Middle Channel	 

GSM850	
High Channel	 

GSM850	
Low Band Emission	
High Band Emission	

For Cellular Band	
GPRS Low Channel	
	

GPRS850	
Middle Channel	
	

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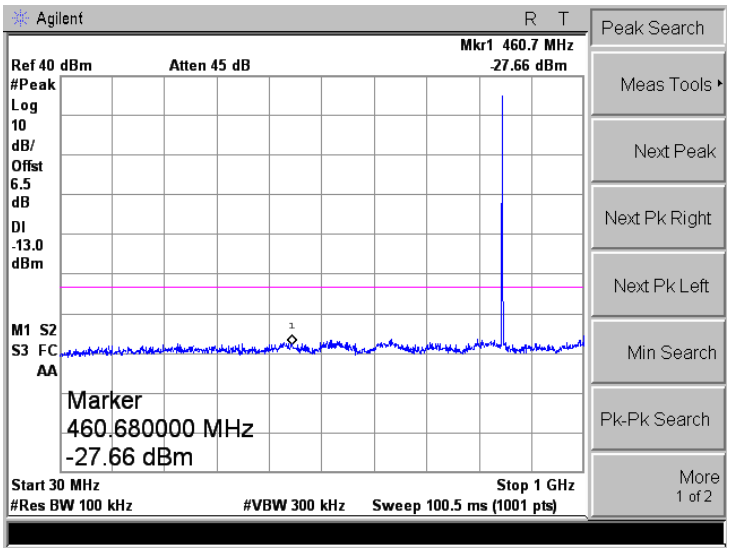
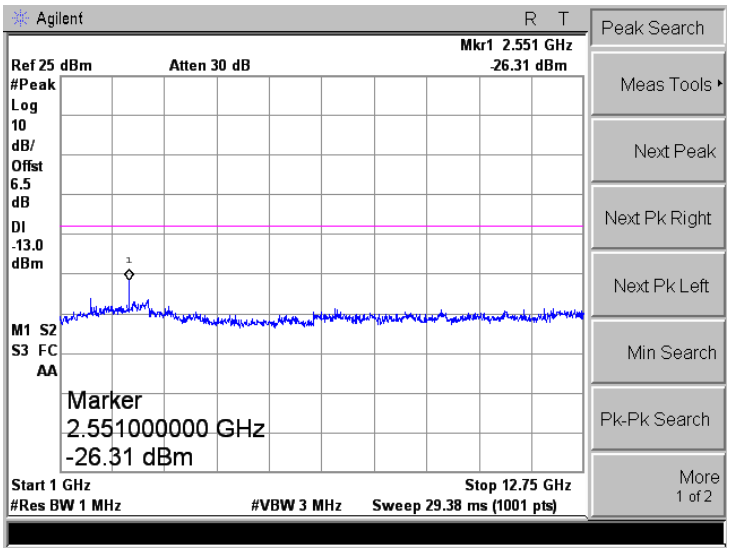
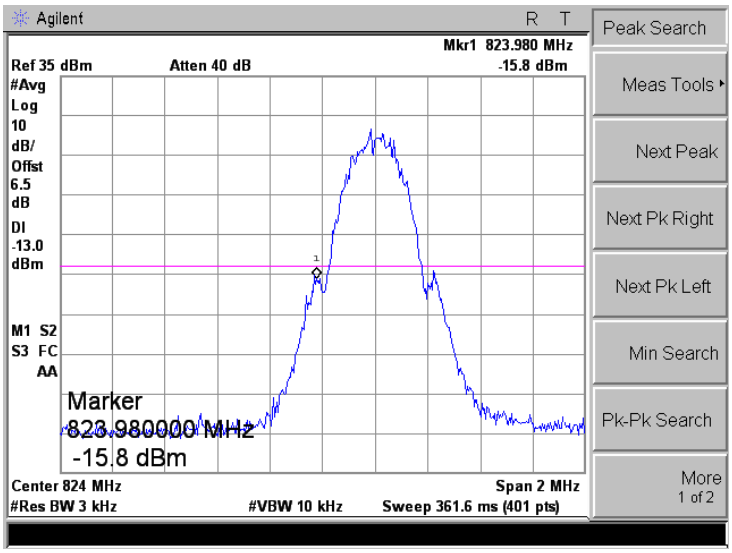
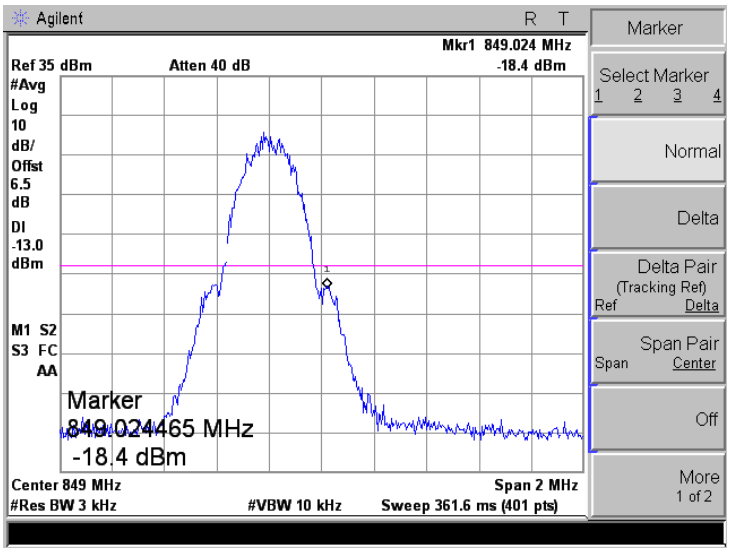
High Channel	
	

GPRS850	
Low Band Emission	
High Band Emission	

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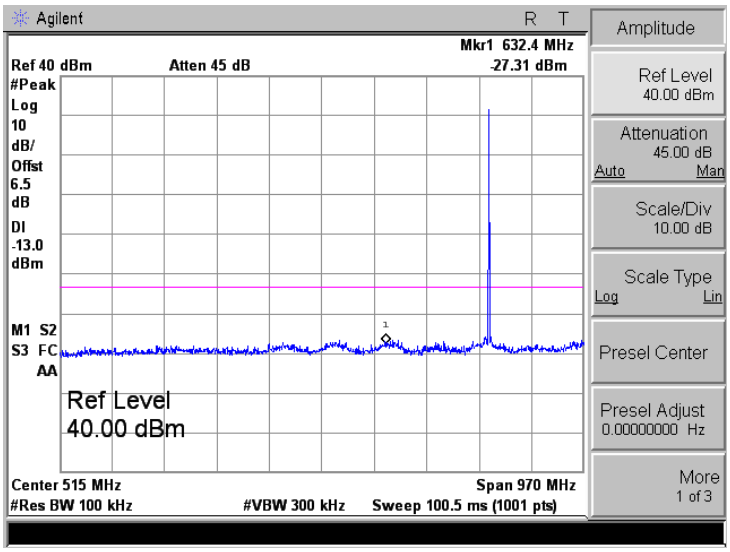
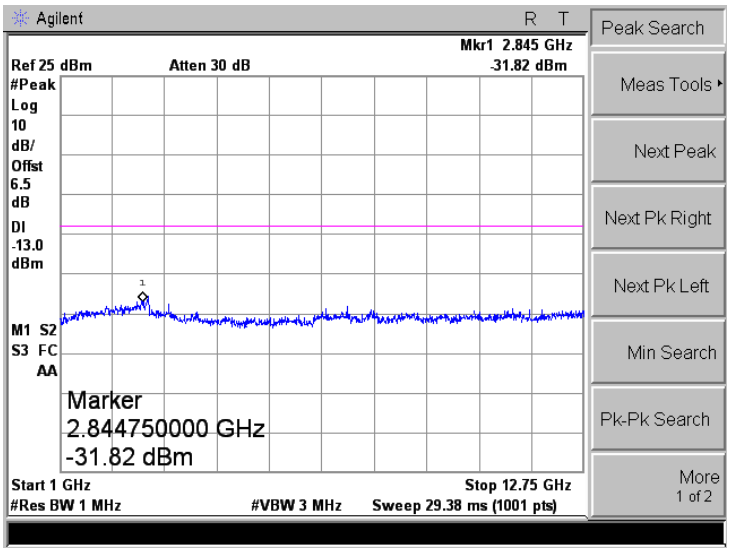
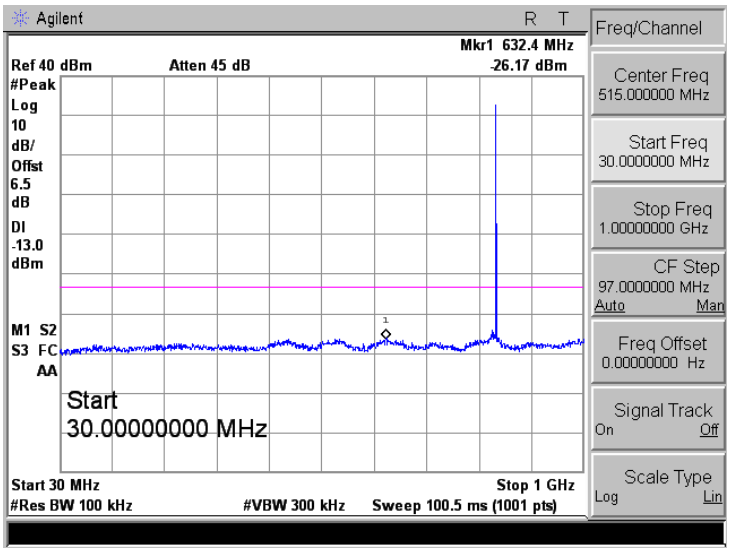
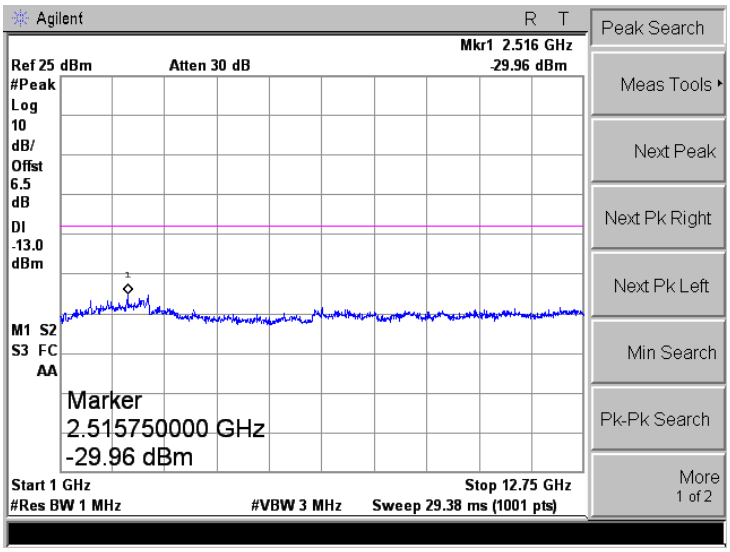
Low Channel	 

EGPRS850	
Middle Channel	 

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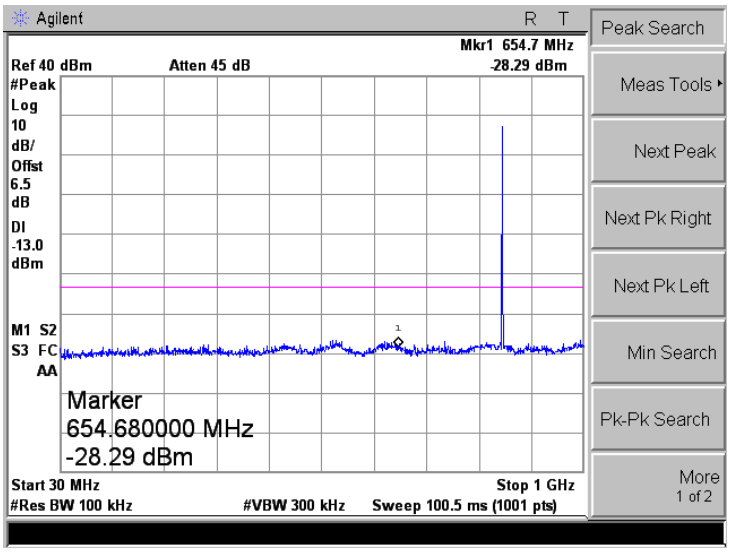
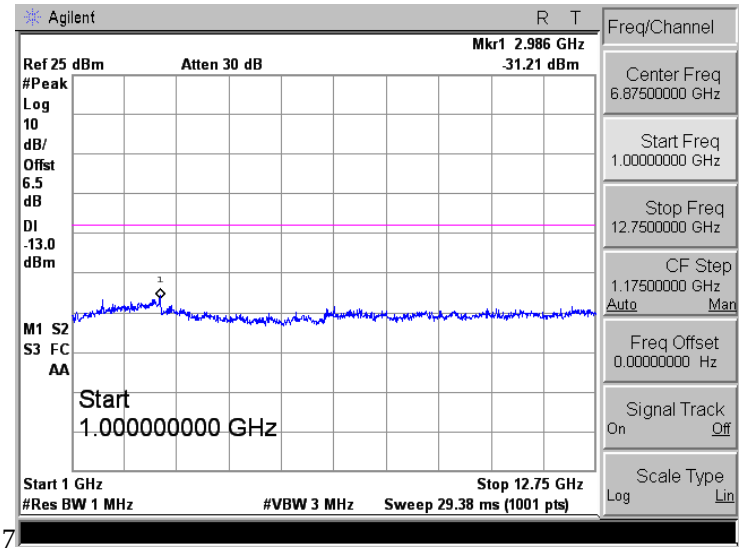
High Channel	
	

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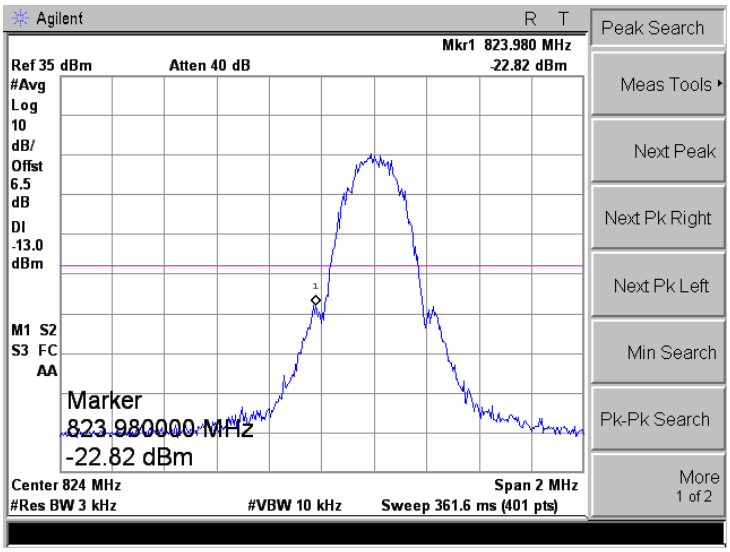
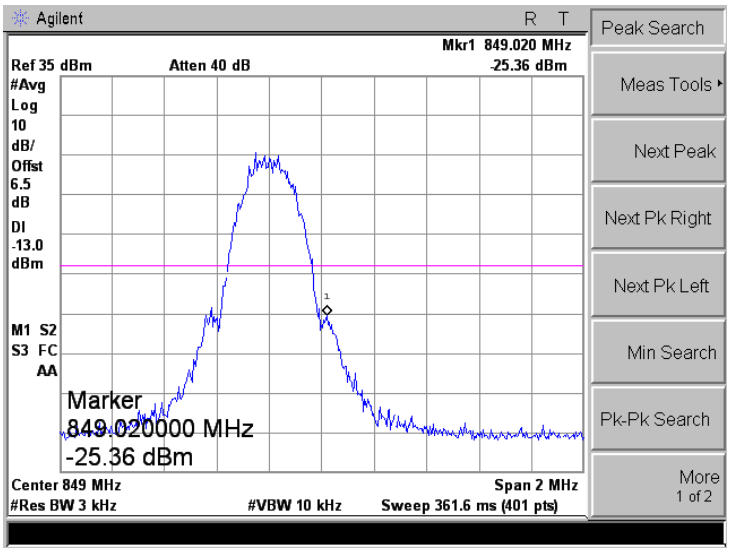
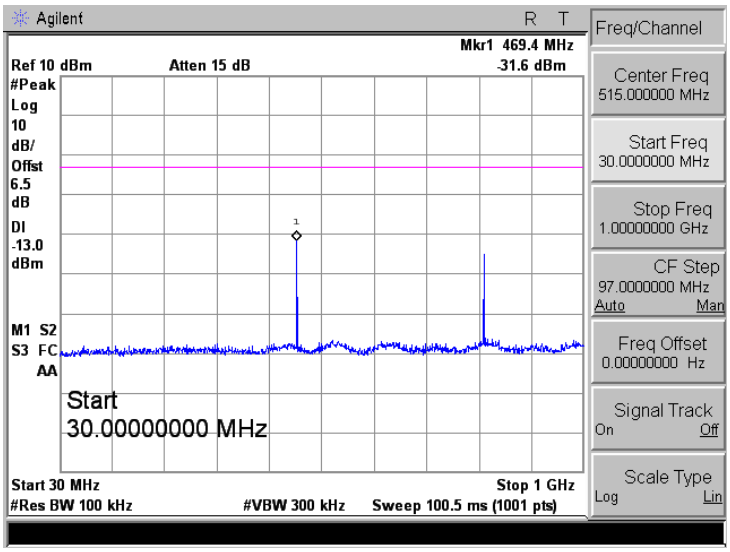
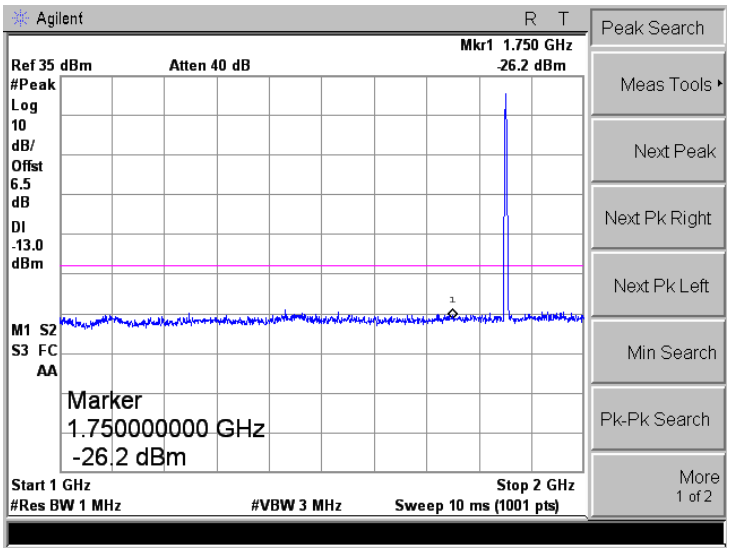
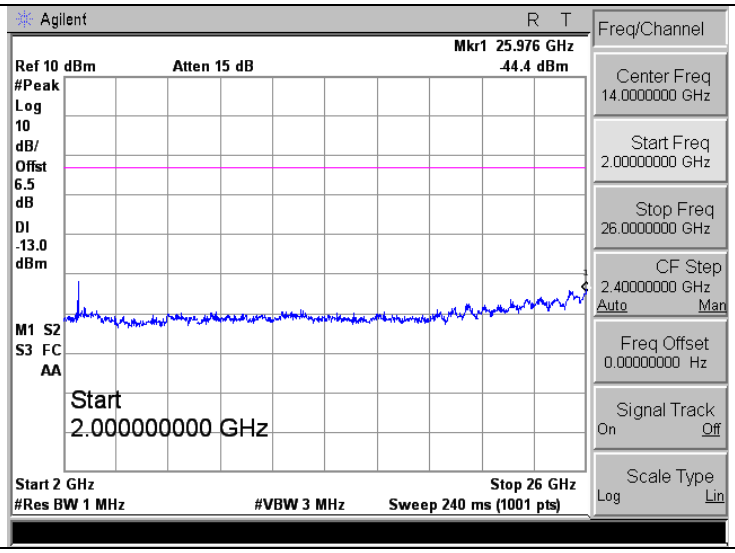
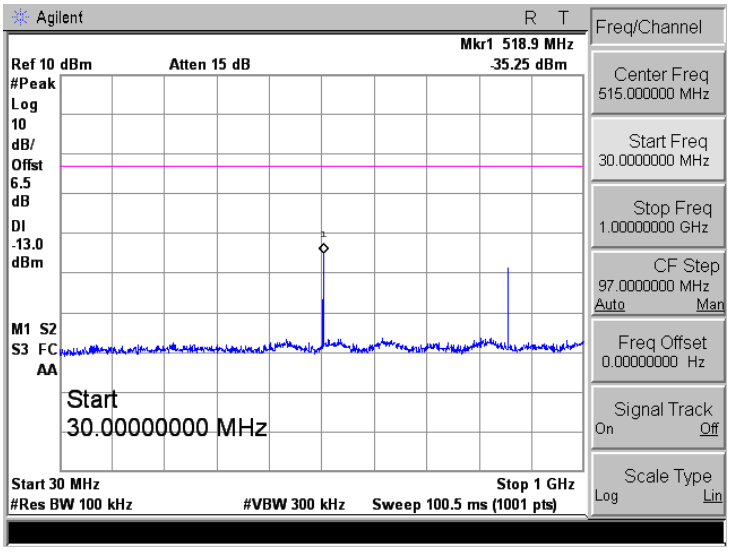
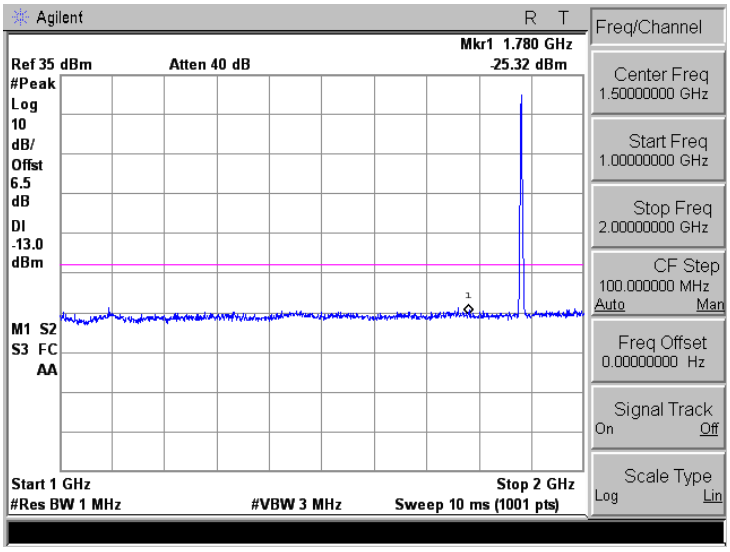
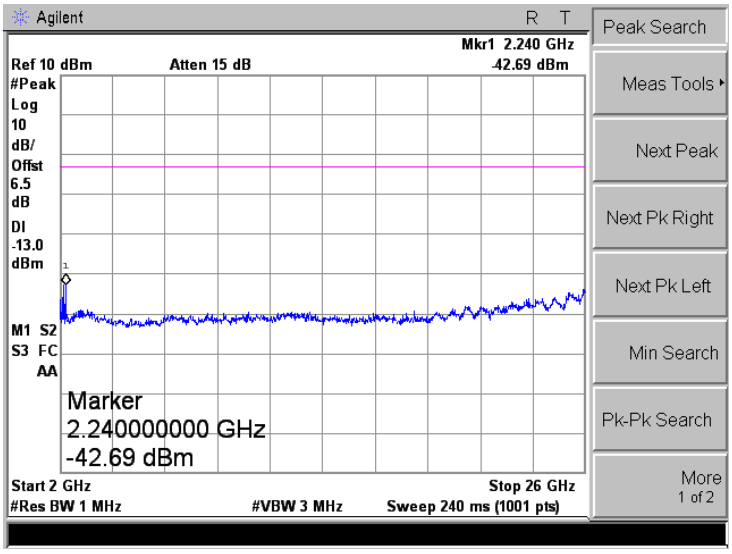
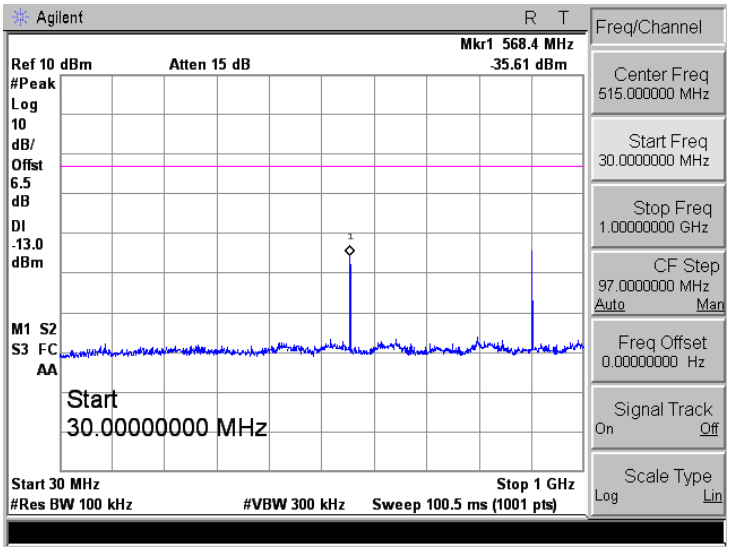
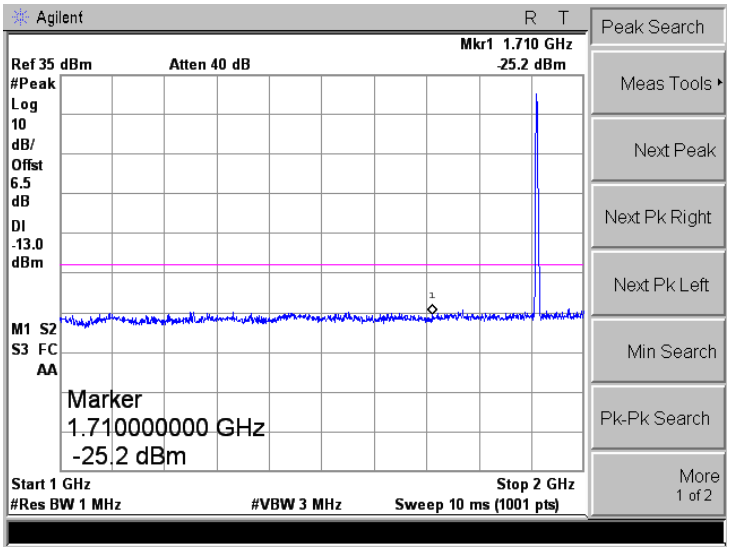
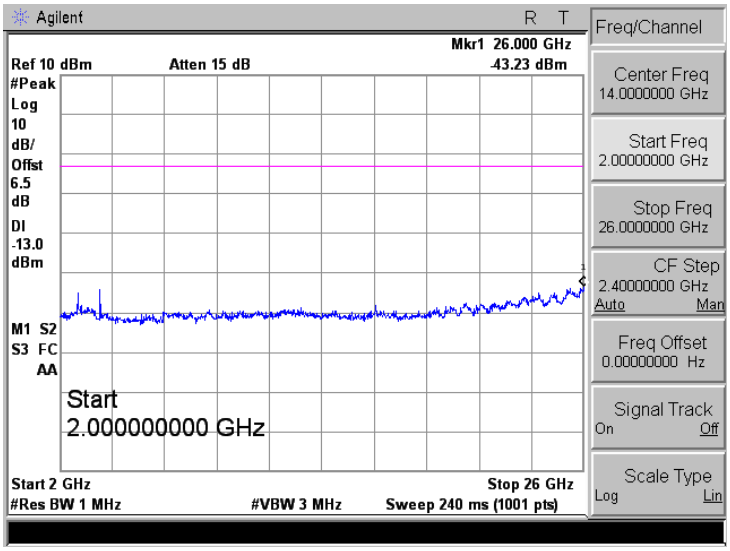
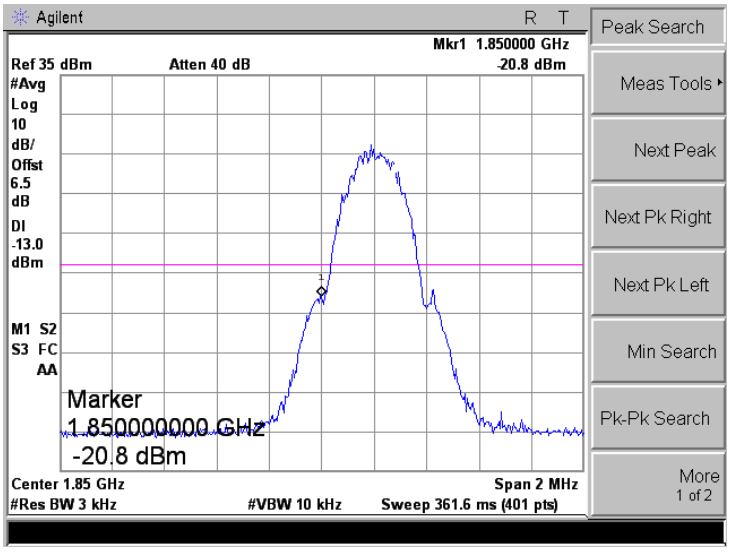
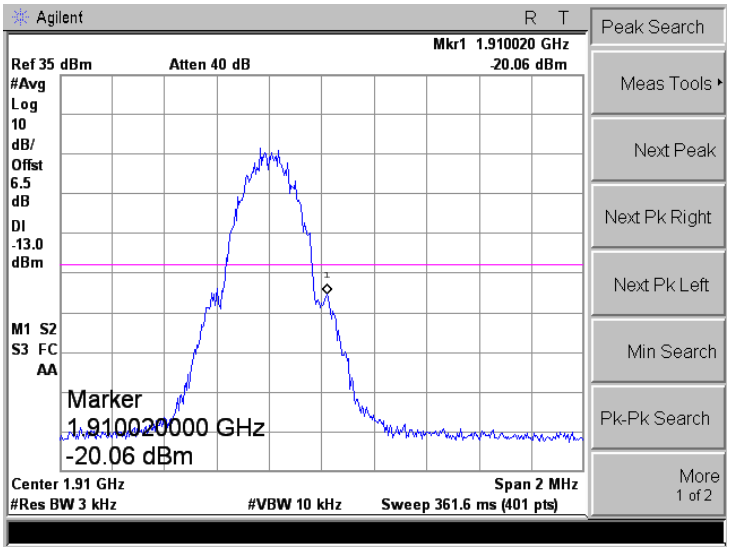
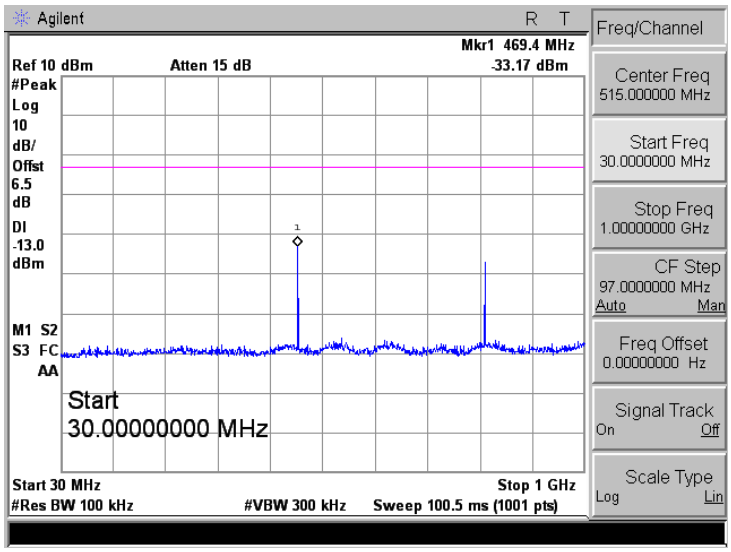
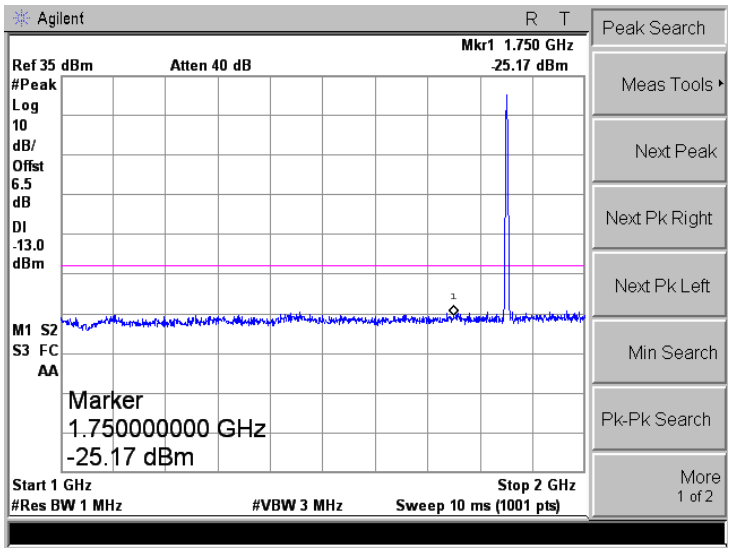
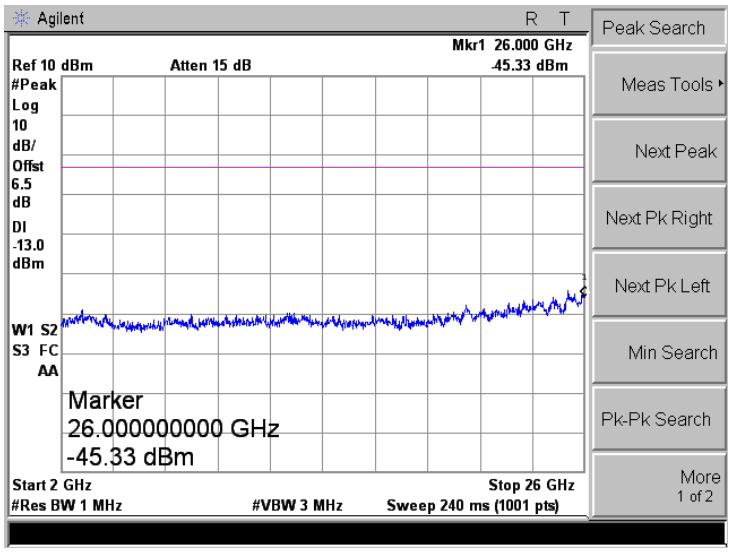
Low Band Emission	
High Band Emission	

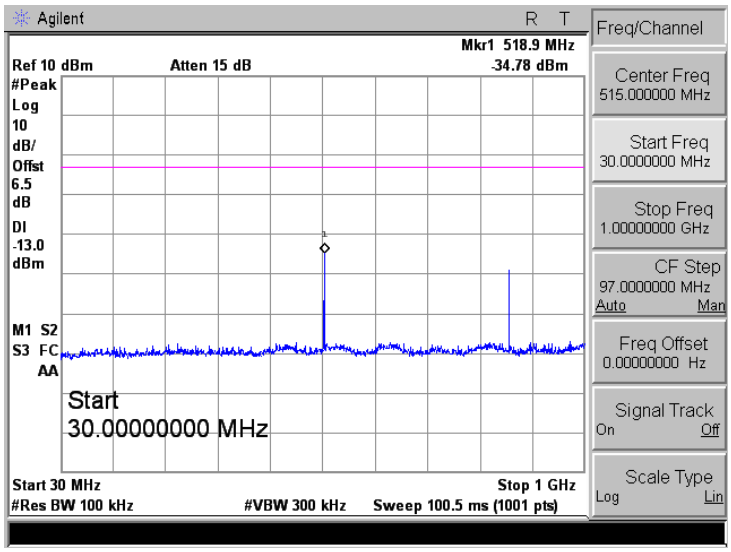
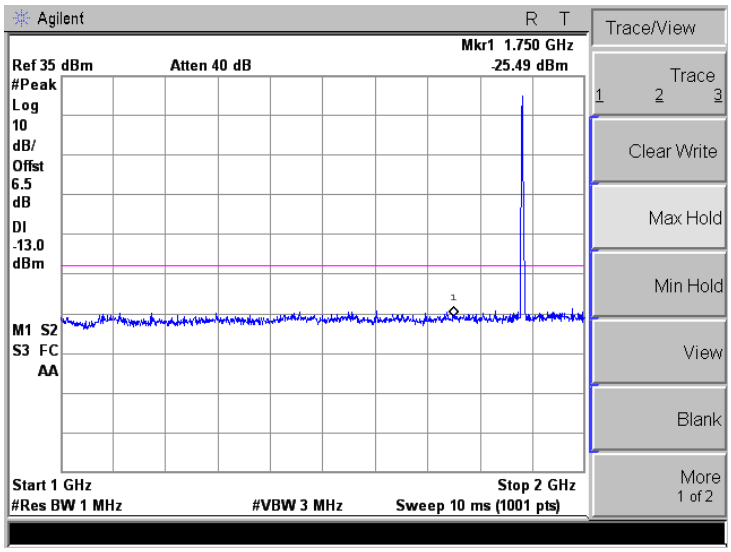
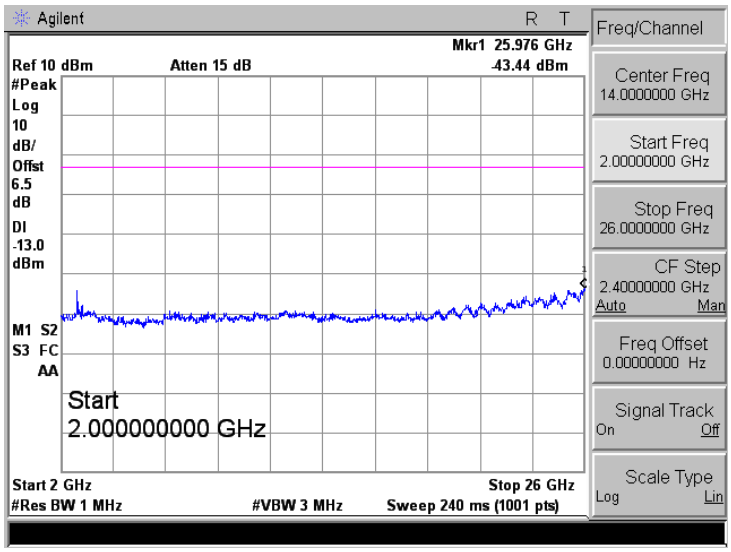
PCS1900	
Low Channel	  

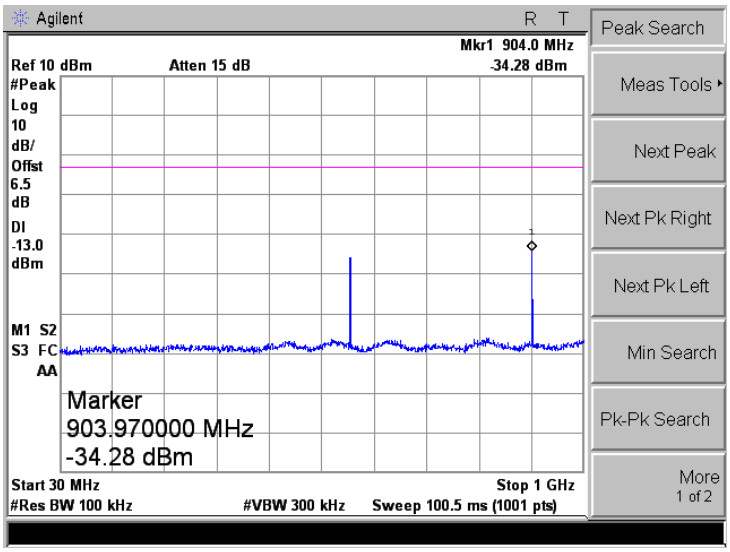
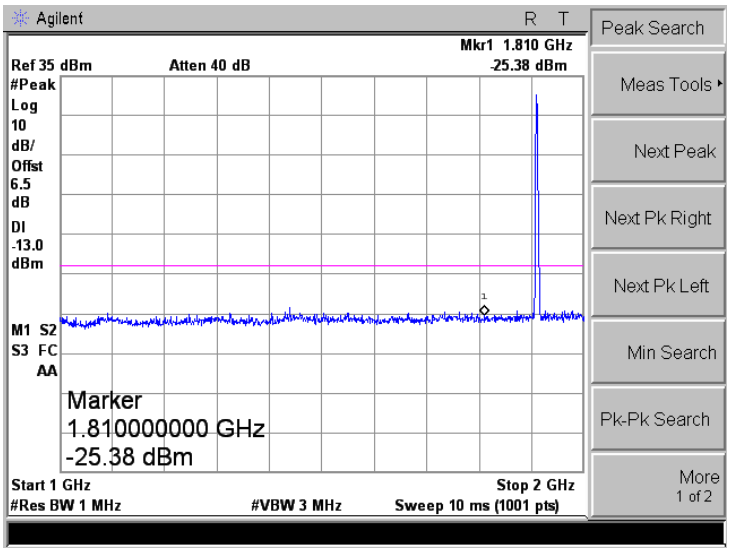
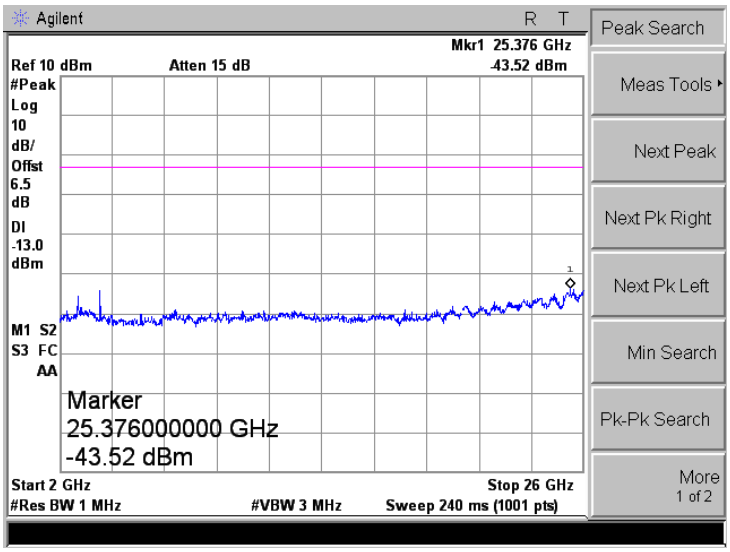
PCS1900	
Middle Channel	  

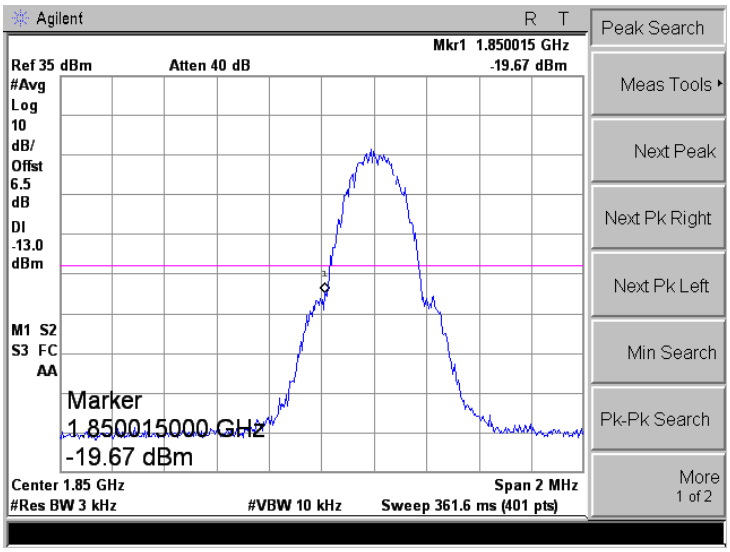
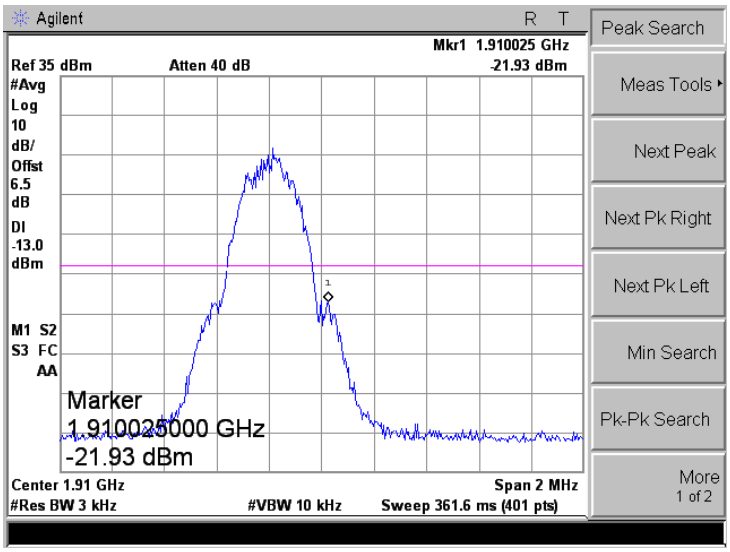
PCS1900	
High Channel	
	
	

PCS1900	
Low Band Emission	
High Band Emission	

GPRS1900	
Low Channel	  

GPRS1900	
Middle Channel	
	
	

GPRS1900	
High Channel	
	
	

GPRS1900	
Low Band Emission	
High Band Emission	

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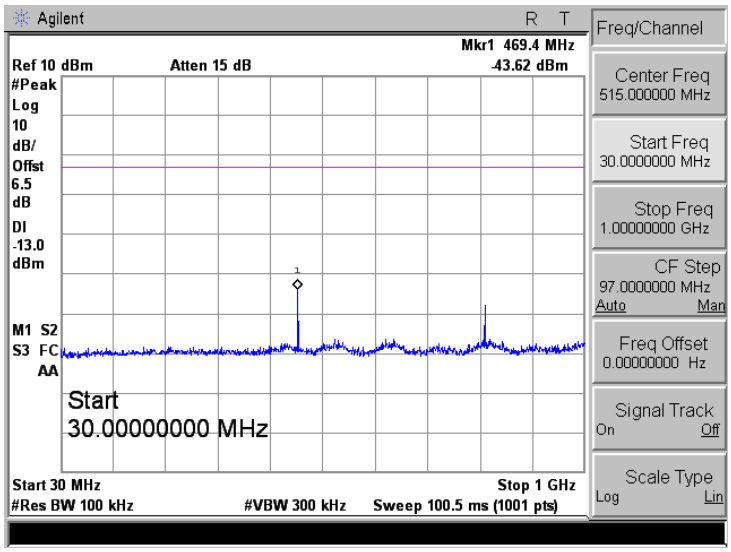
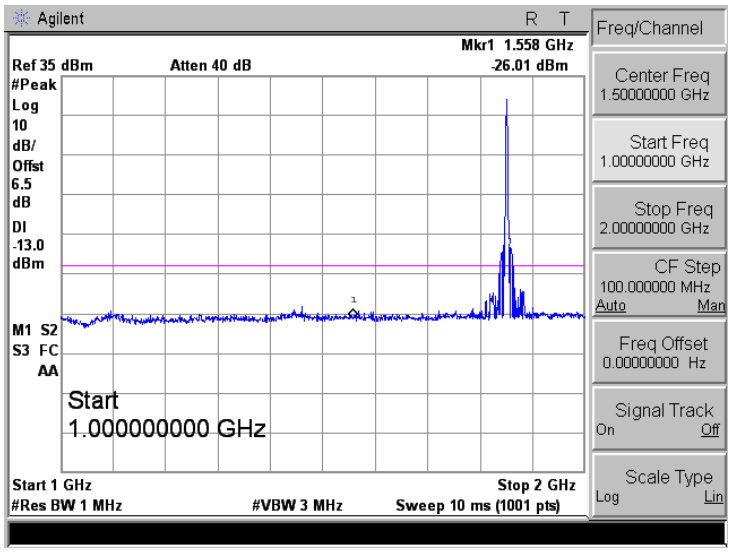
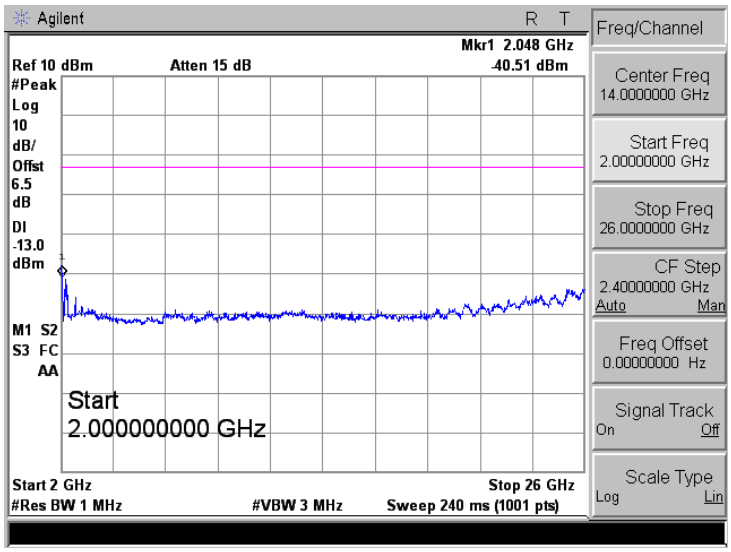
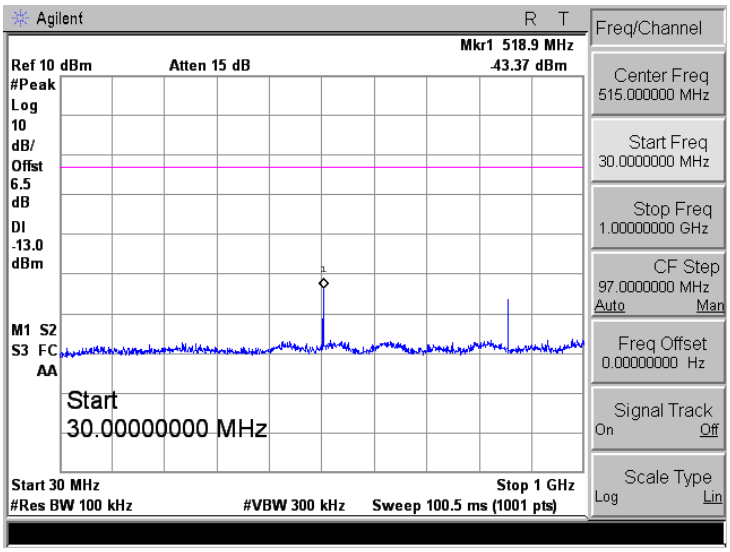
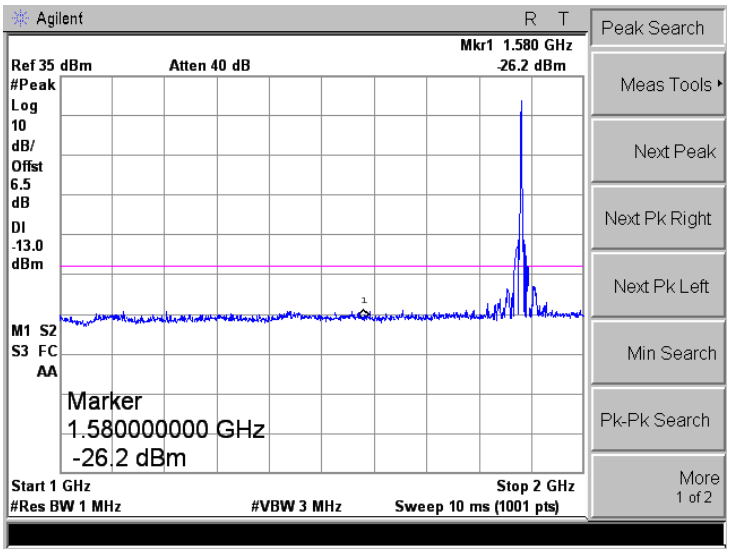
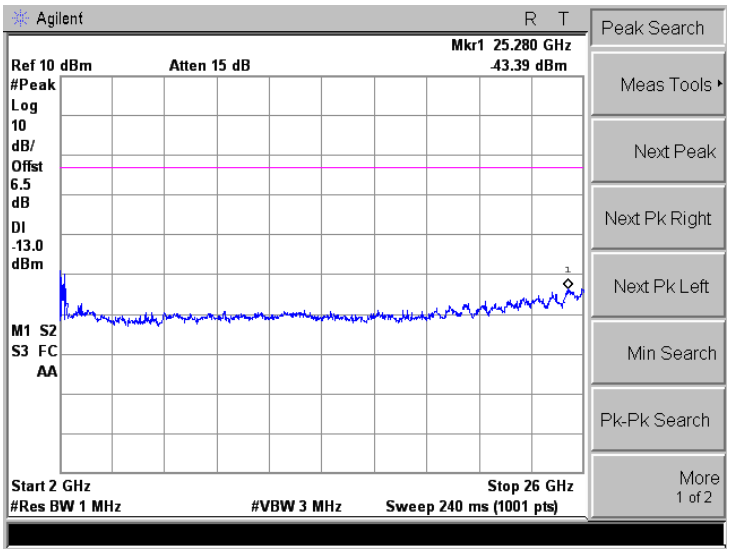
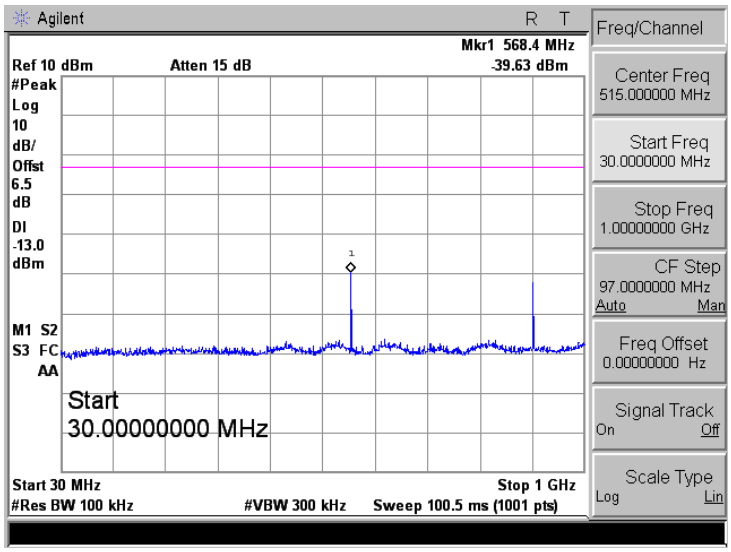
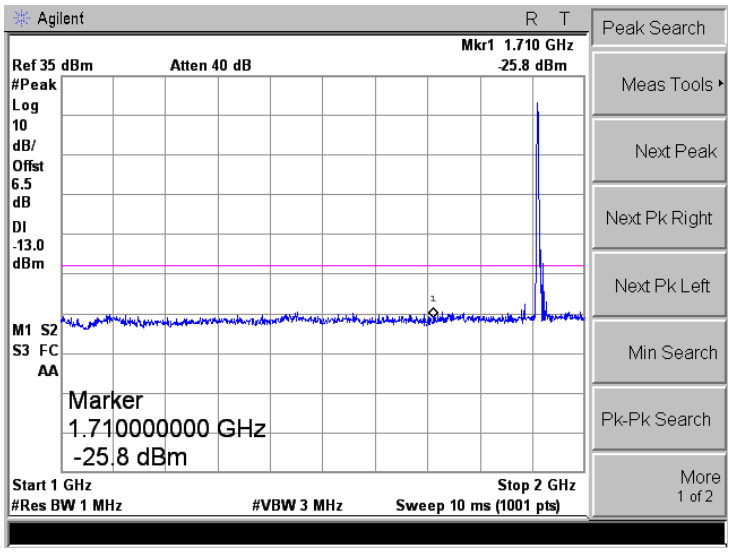
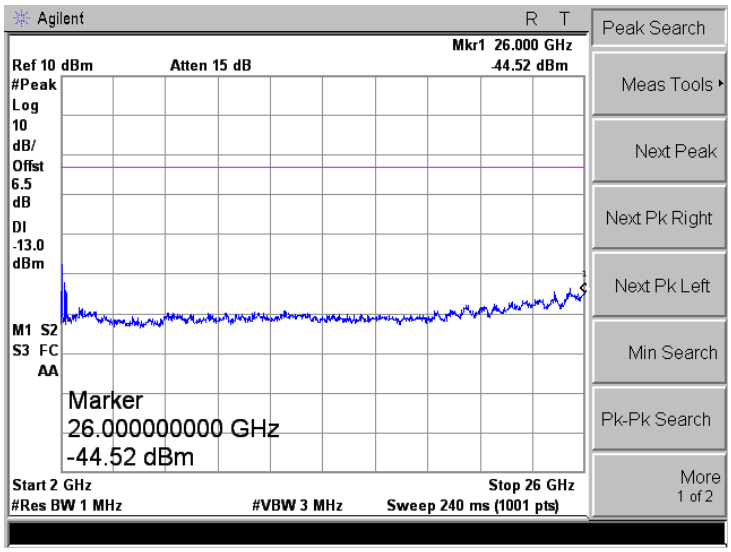
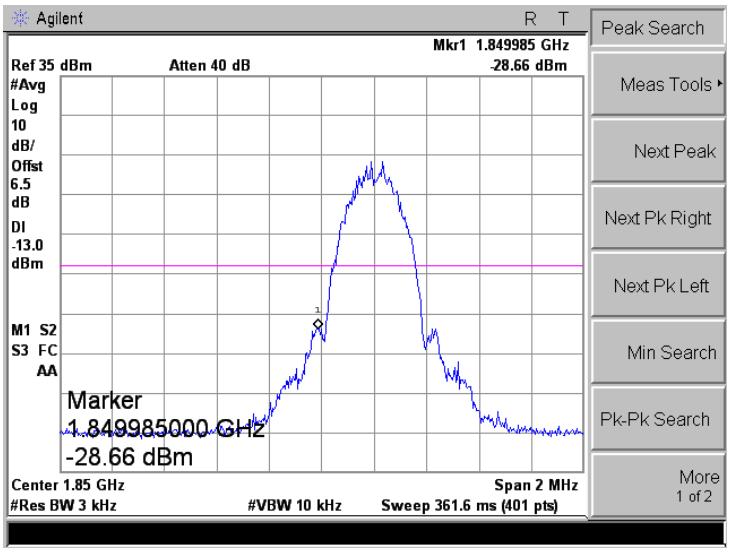
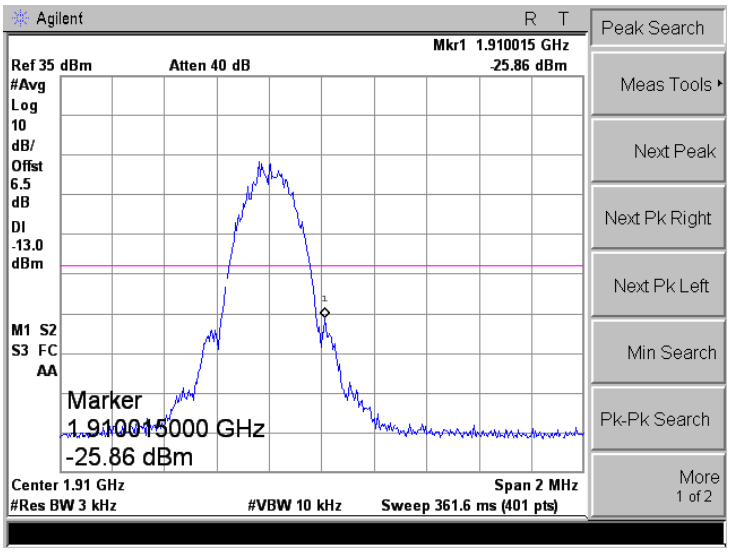
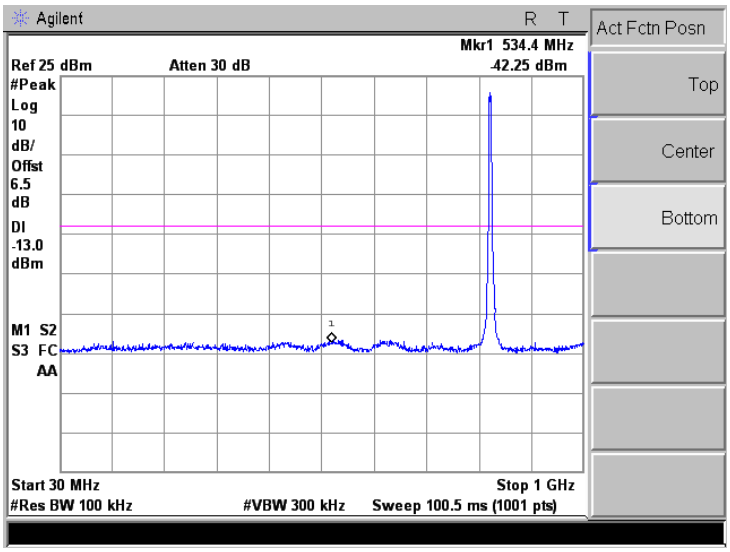
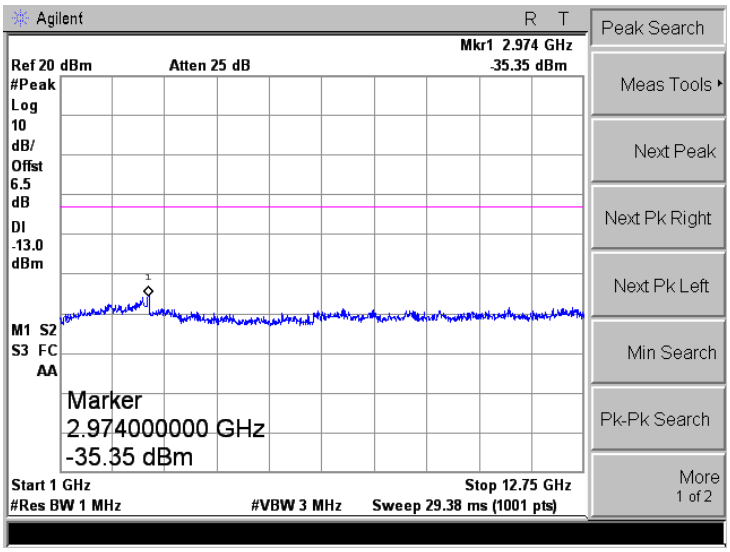
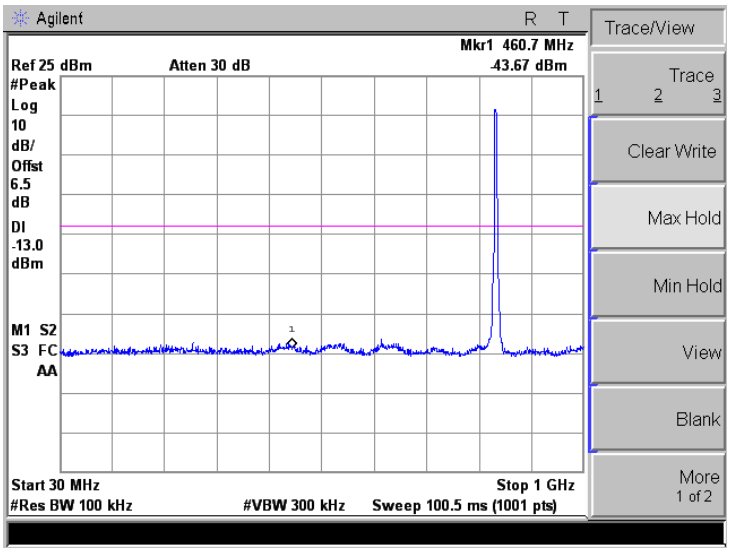
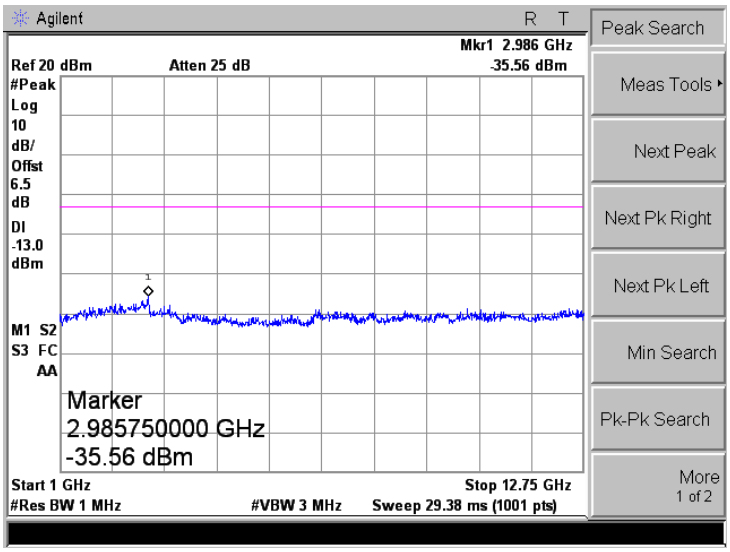
Low Channel	
	
	

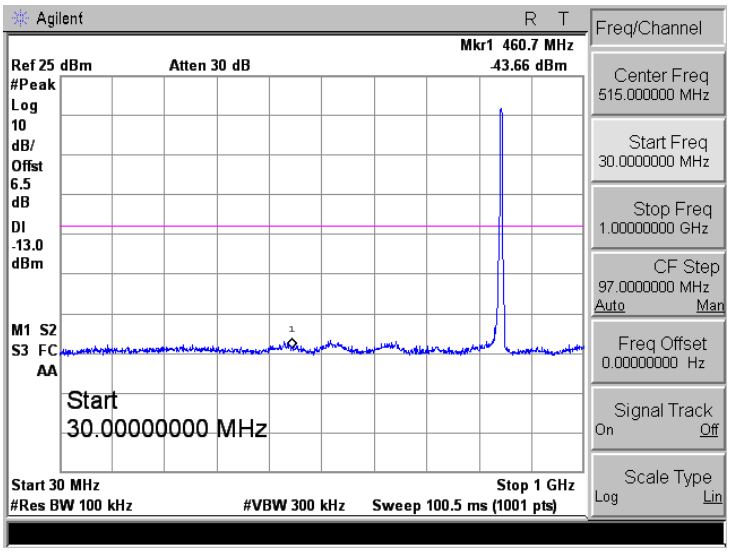
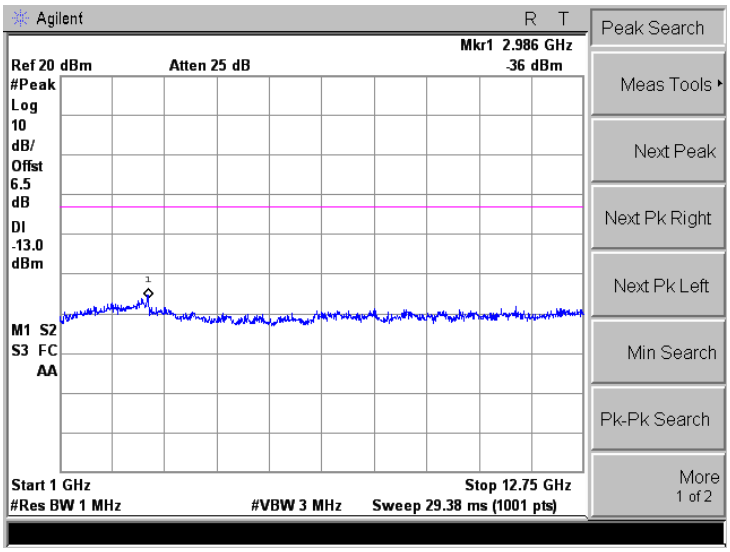
EGPRS1900	
Middle Channel	  

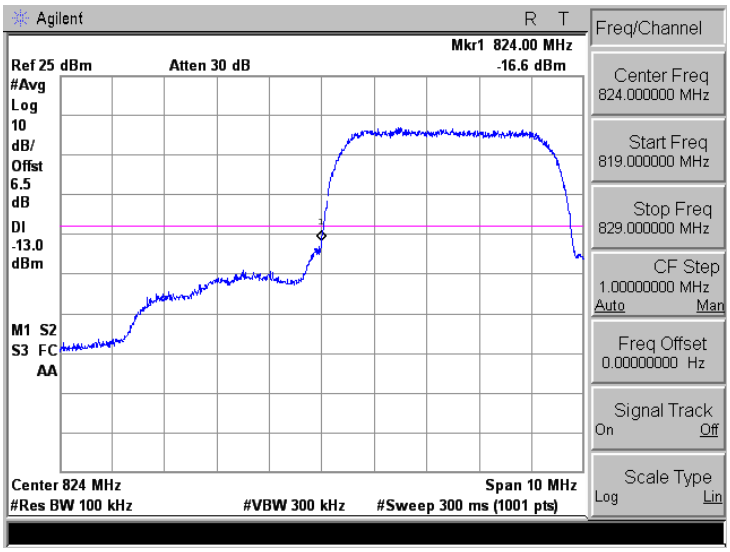
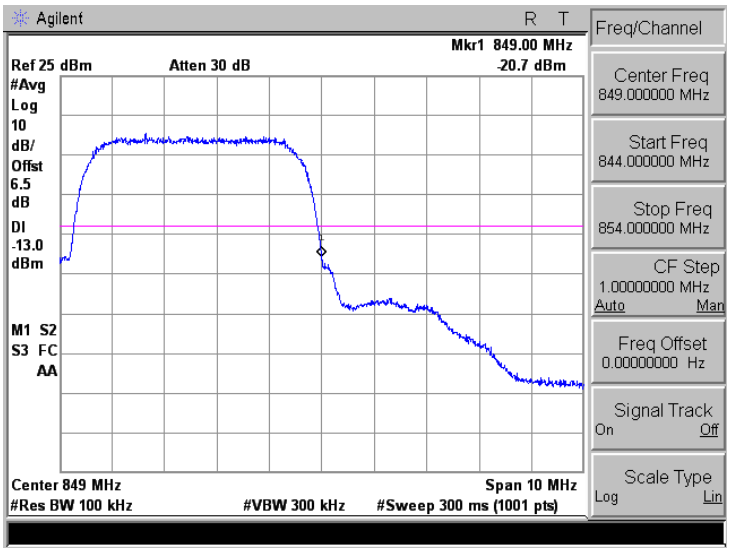
EGPRS1900	
High Channel	  

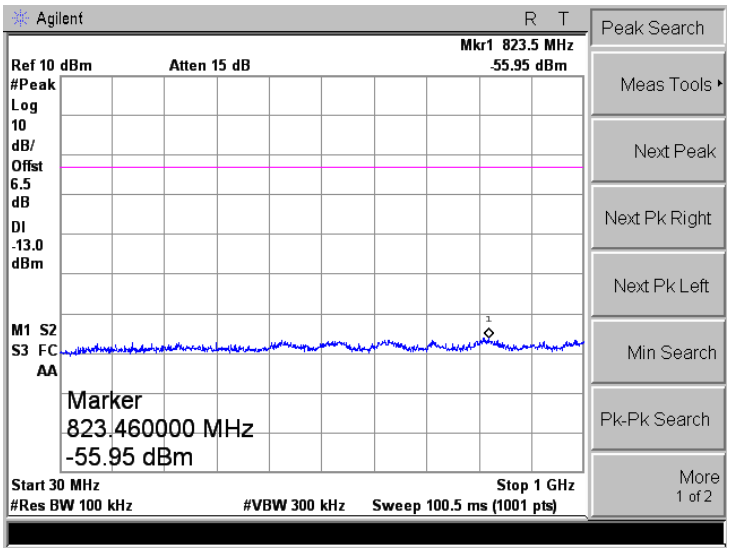
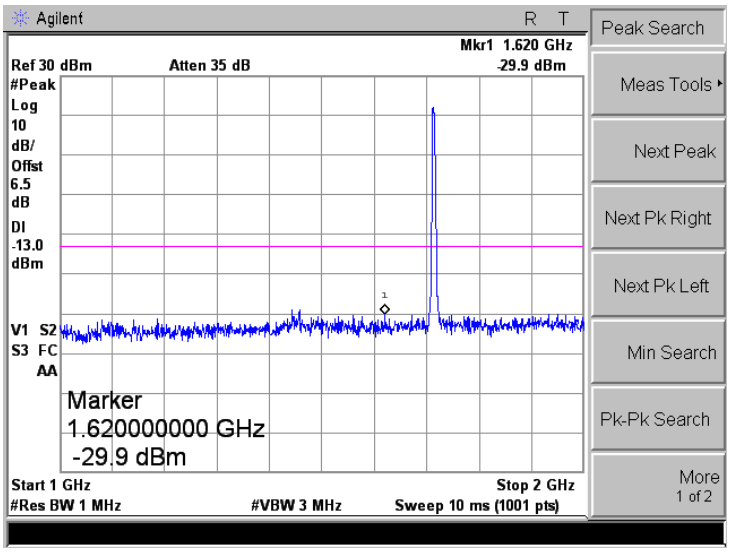
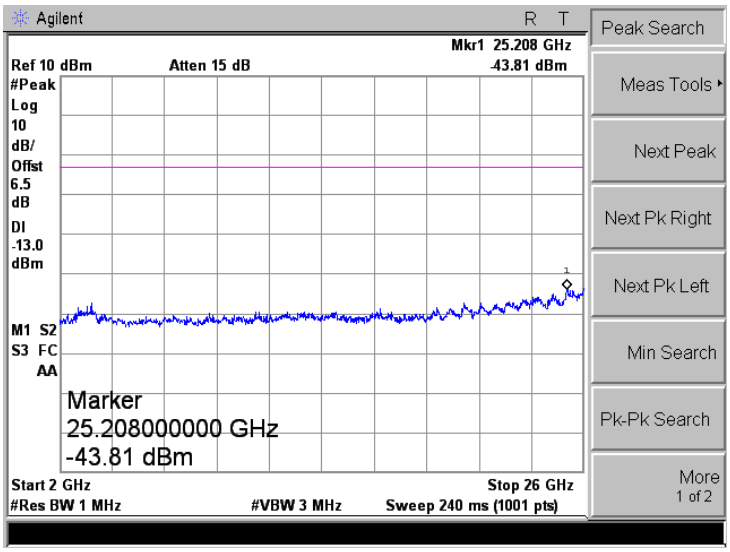
EGPRS1900	
Low Band Emission	
High Band Emission	

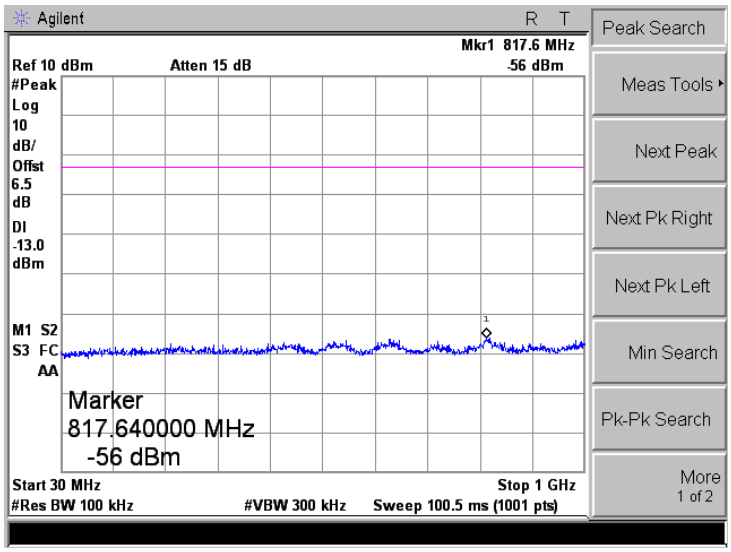
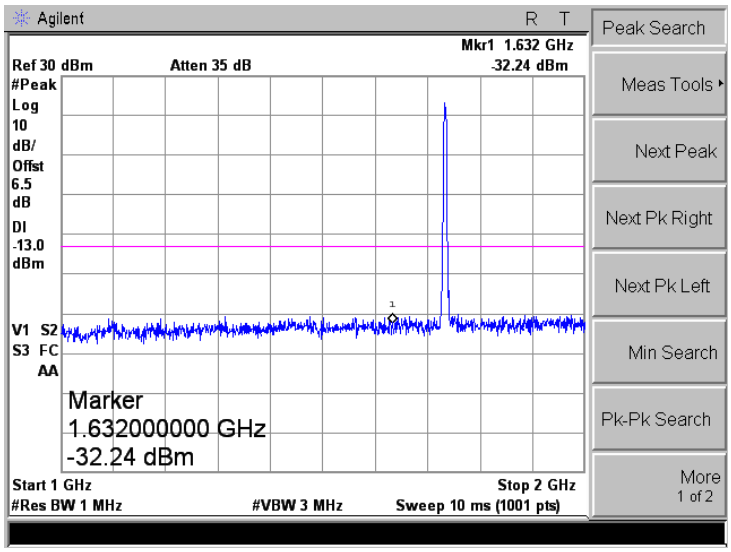
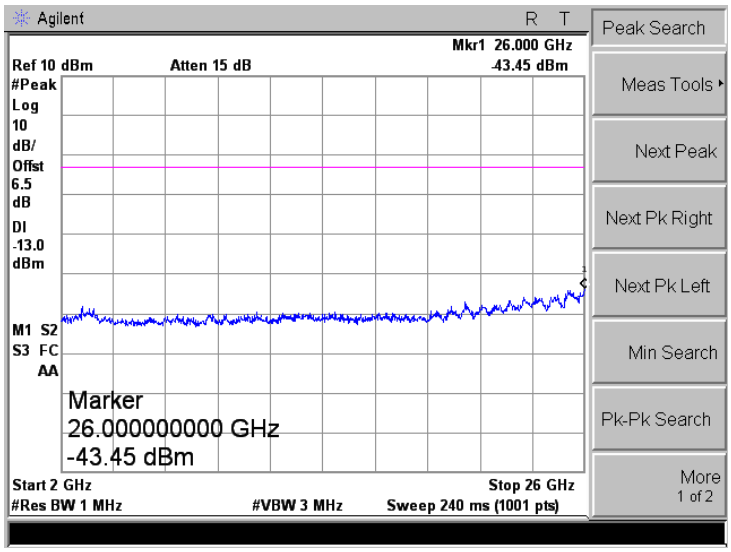
WCDMA Band V	
Low Channel	
	

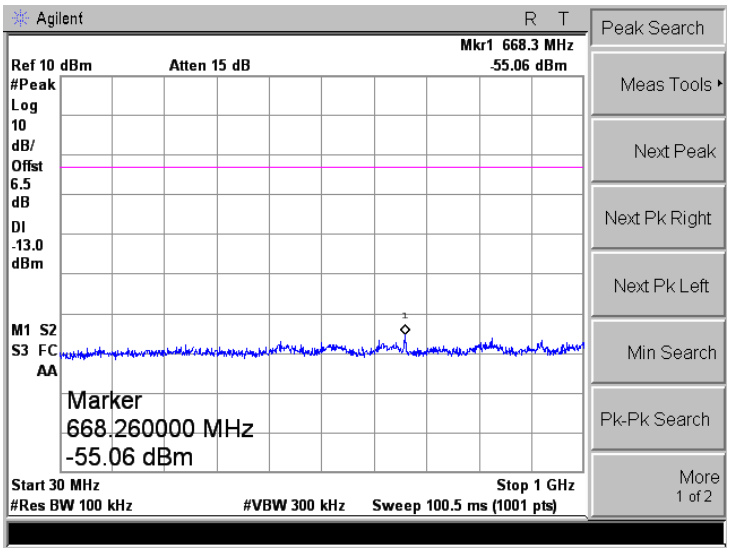
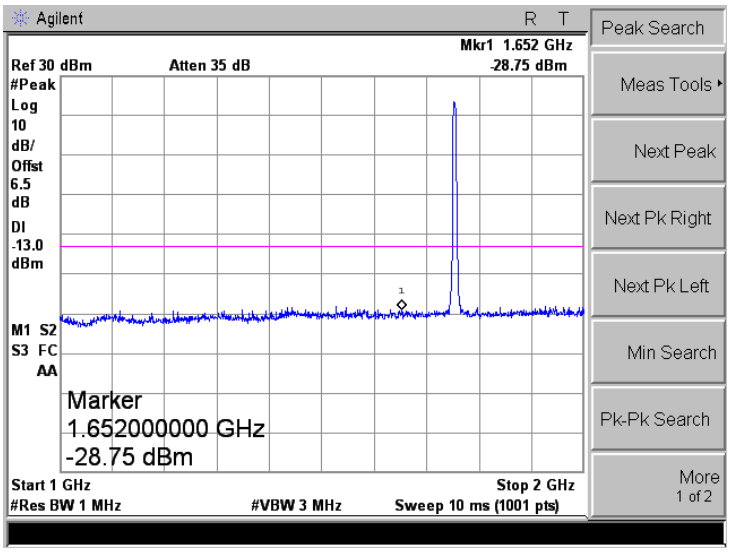
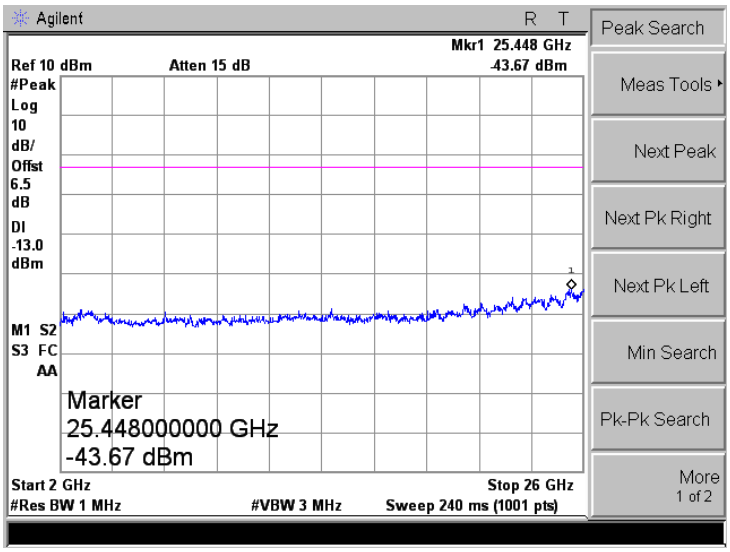
WCDMA Band V	
Middle Channel	
	

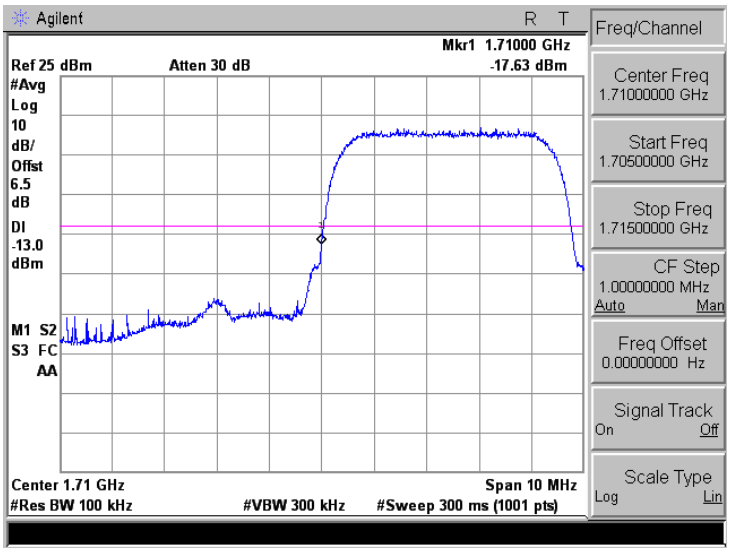
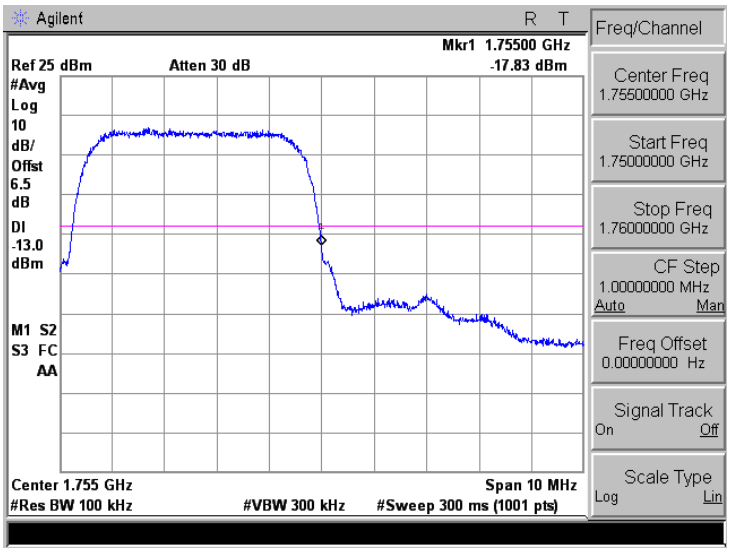
WCDMA Band V	
High Channel	 

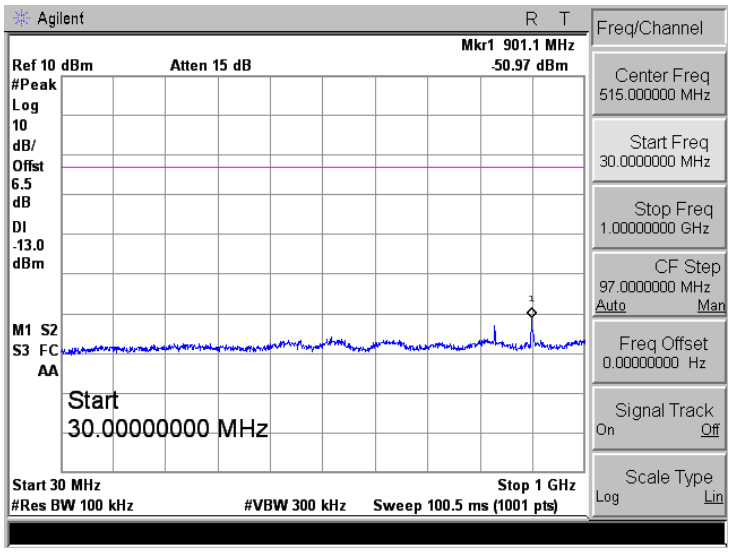
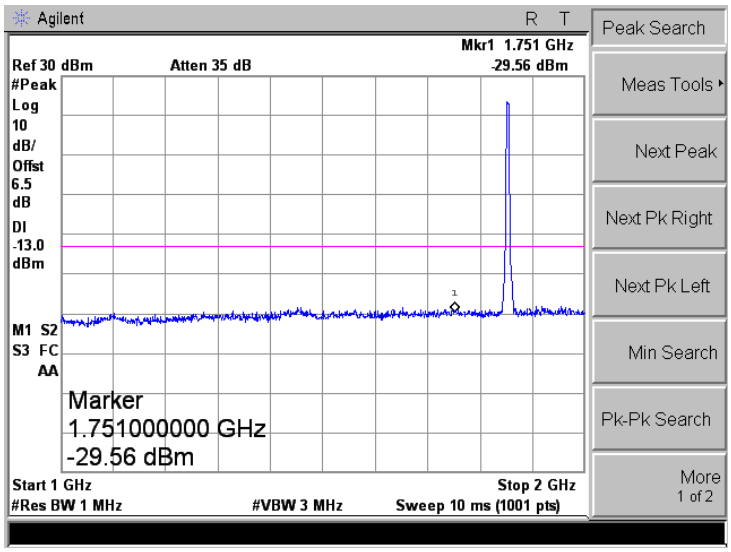
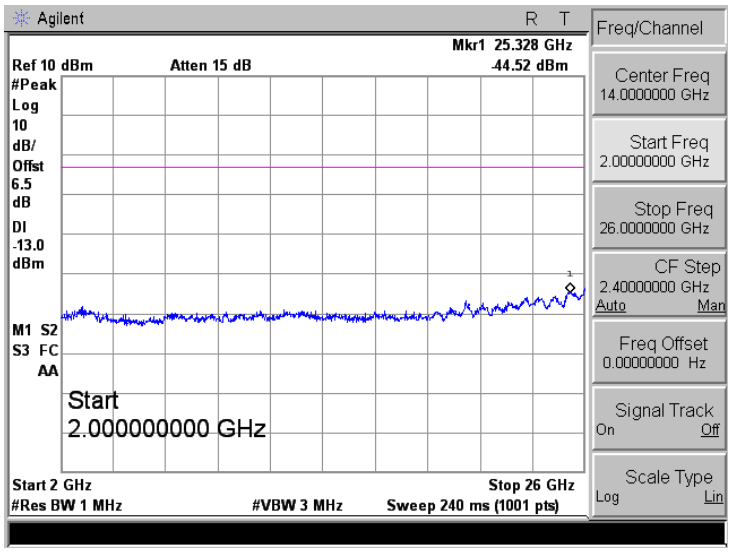
WCDMA Band V	
Low Band Emission	
High Band Emission	

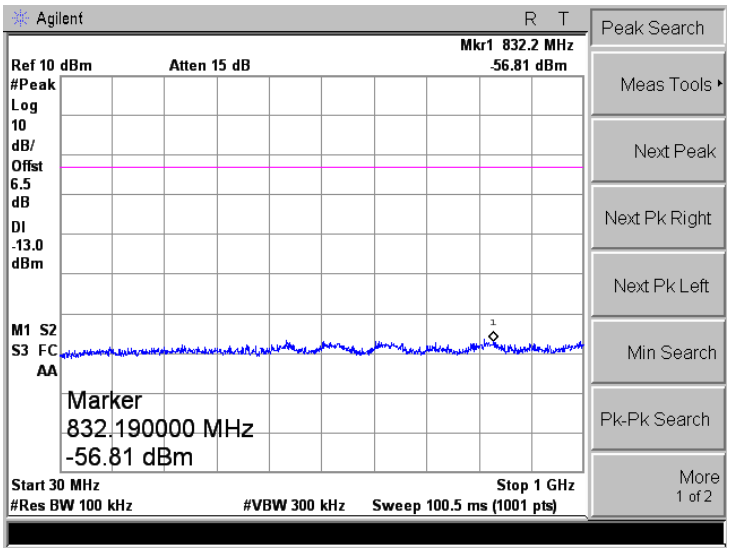
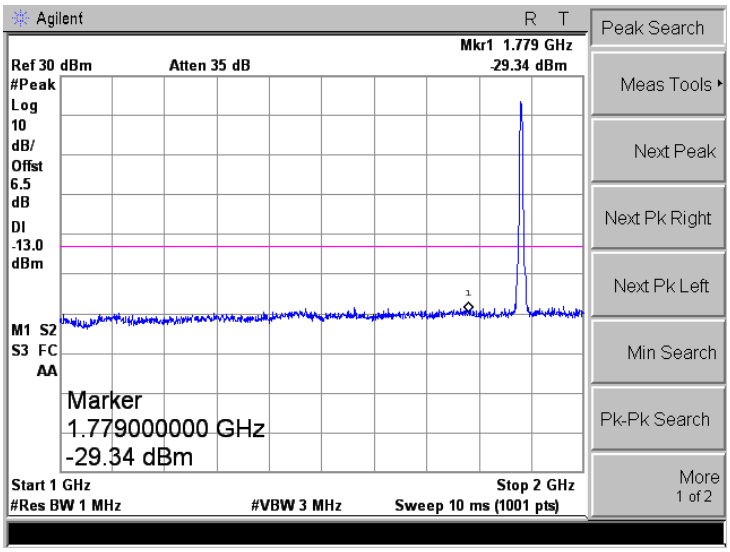
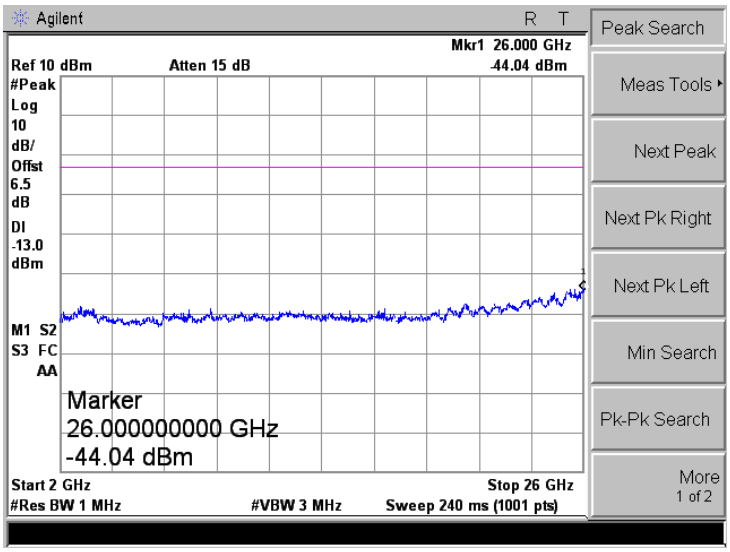
WCDMA Band IV	
Low Channel	
	
	

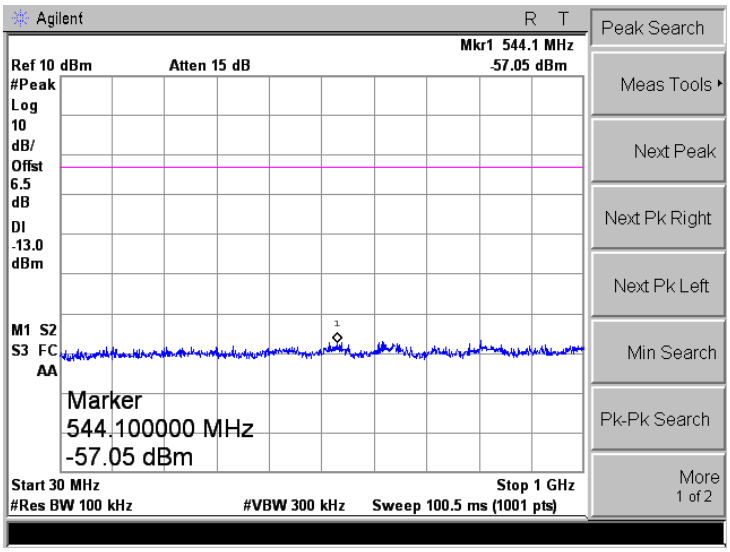
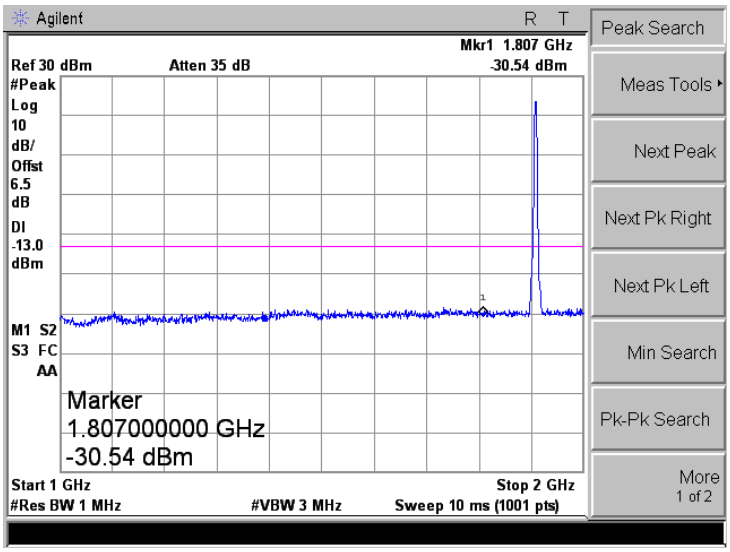
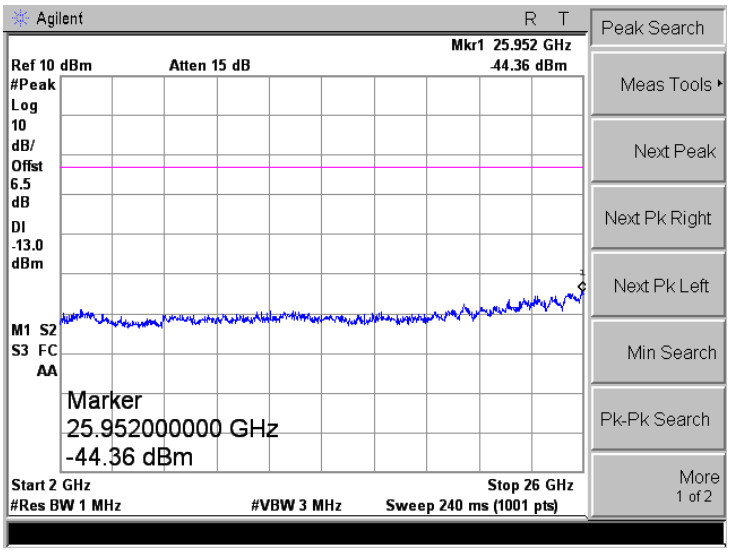
WCDMA Band IV	
Middle Channel	
	
	

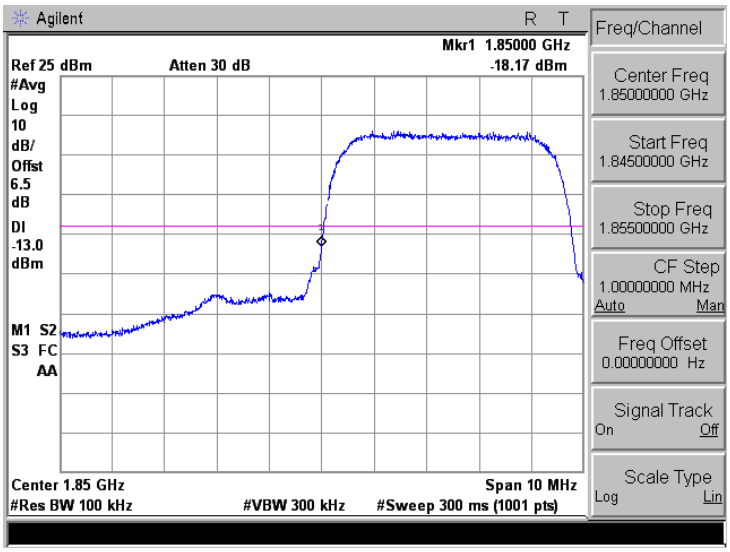
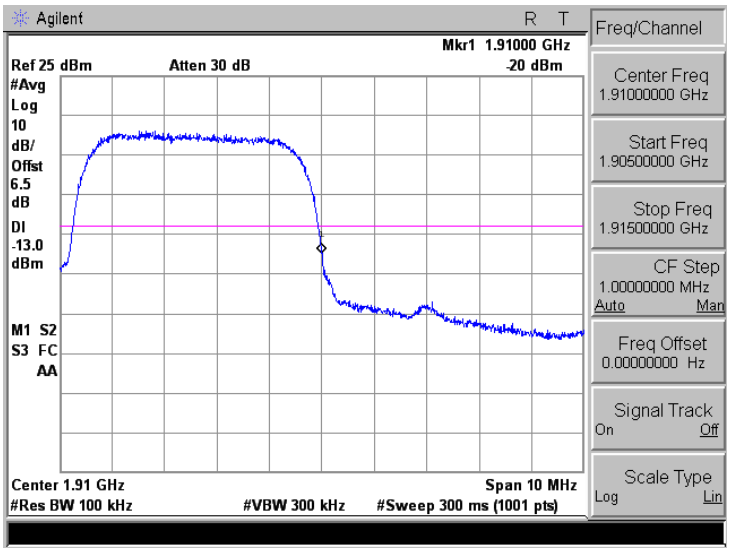
WCDMA Band IV	
High Channel	
	
	

WCDMA Band IV	
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.

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 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.

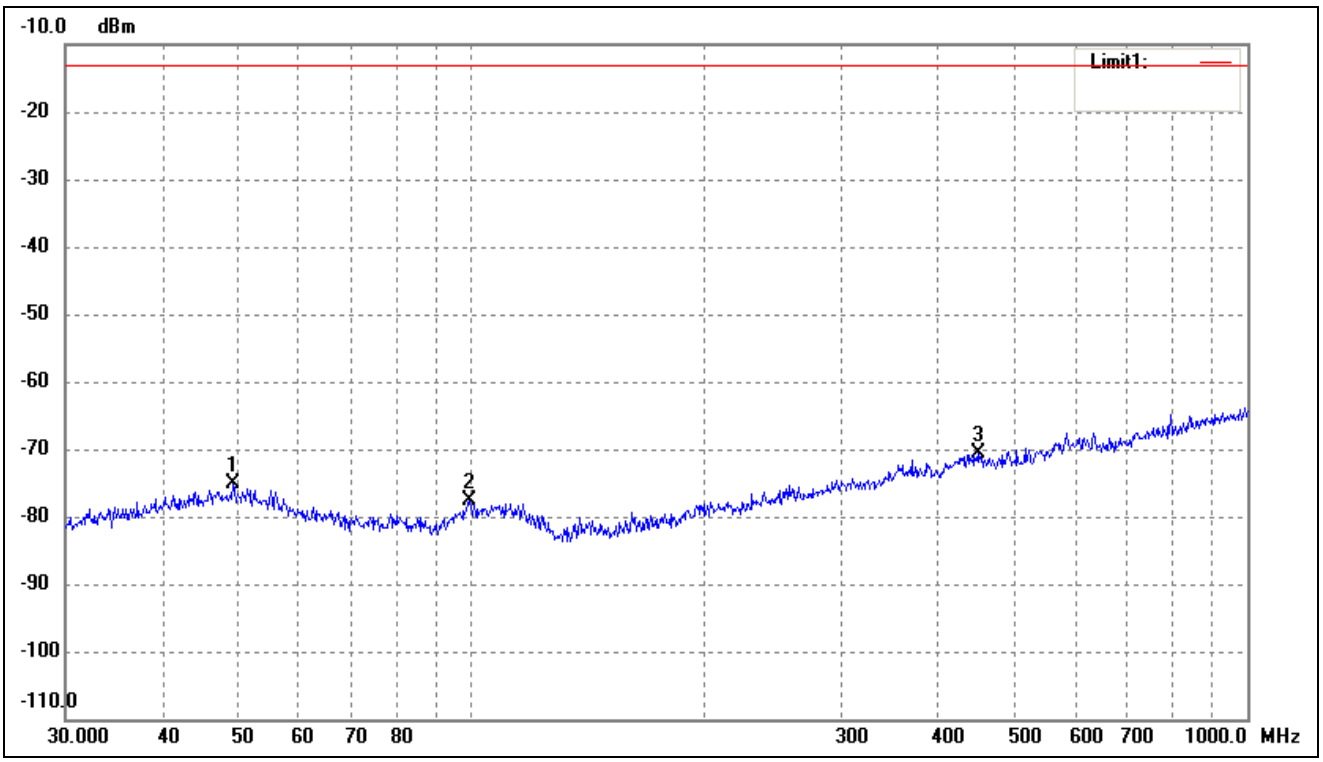
Spurious attenuation limit in dB =43+10 Log_{10} (power out in Watts)

8.3 Summary of Test Results/Plots

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

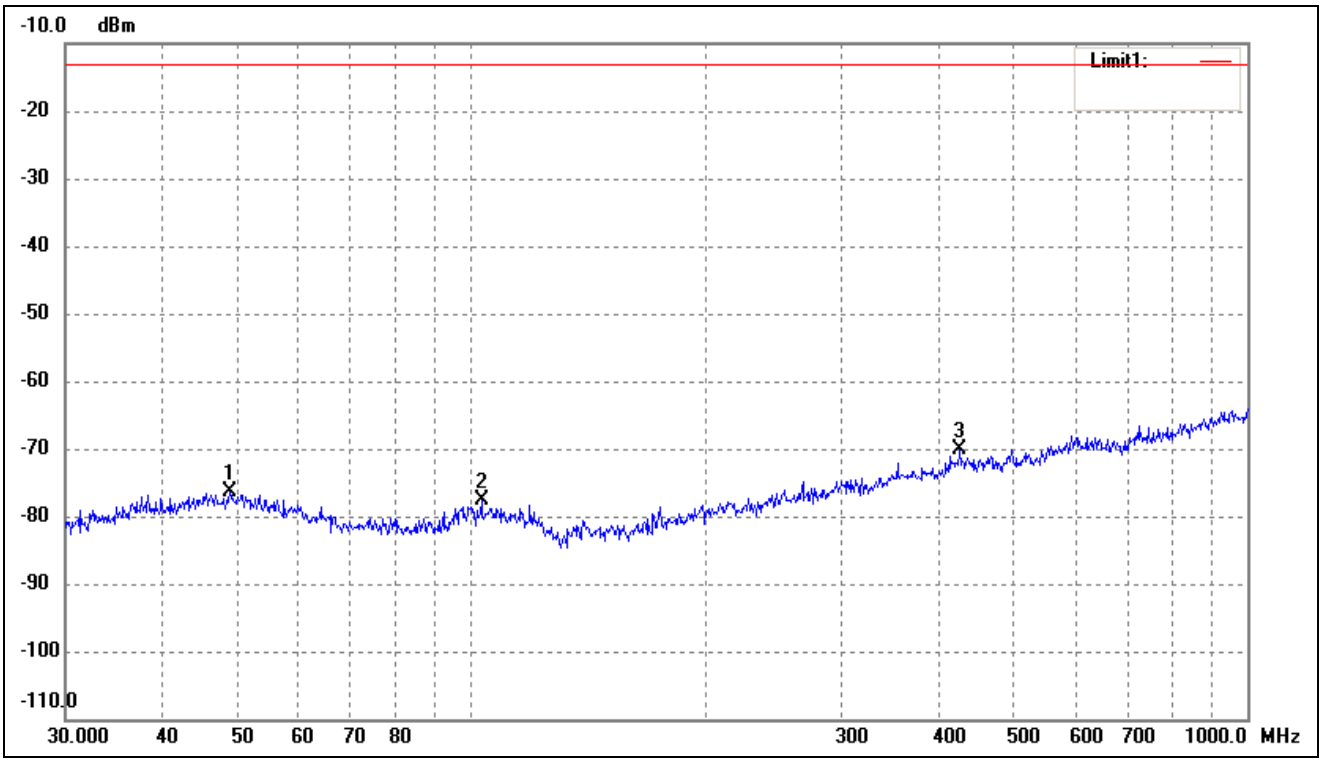
➢ Spurious Emissions Below 1GHz

For Cellular Band			
Test Channel	GSM850	Polarity:	Horizontal



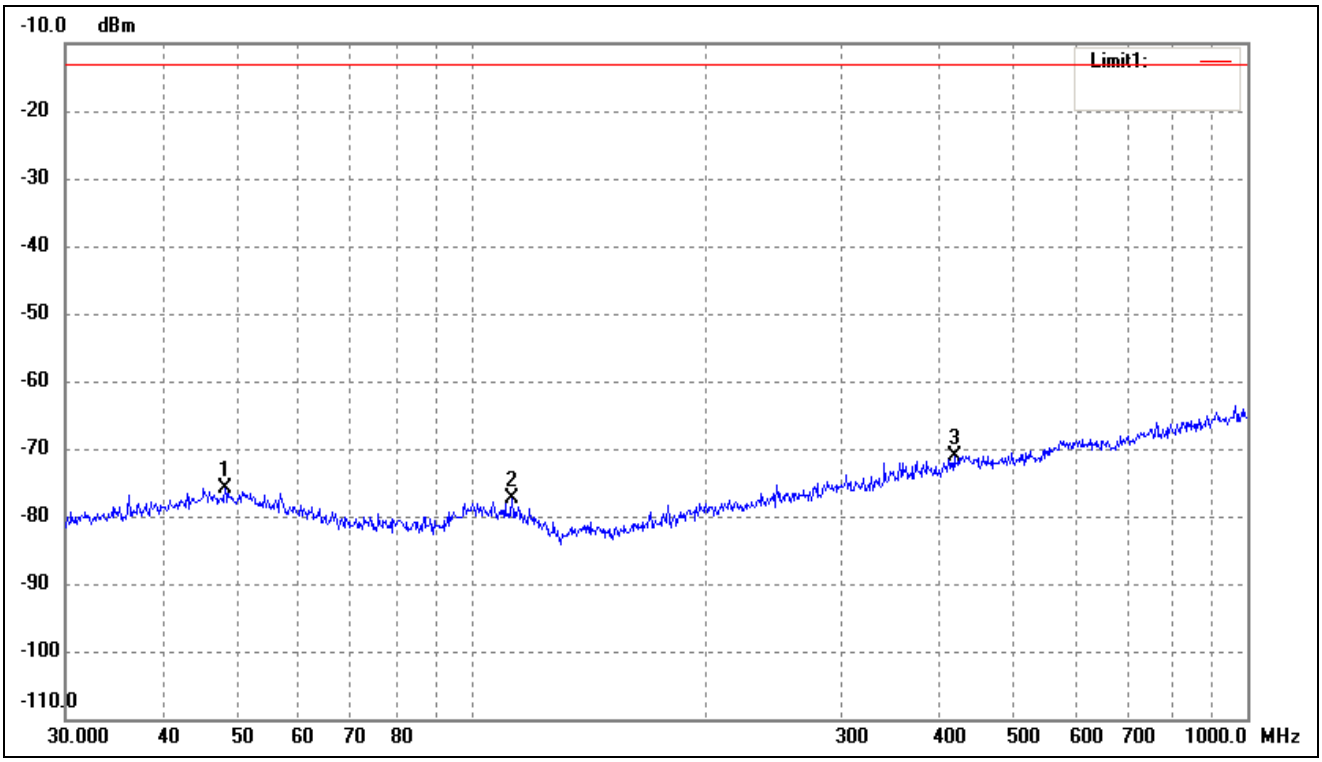
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	49.3594	-75.84	0.76	-75.08	-13.00	-62.08	ERP
2	99.5281	-76.12	-1.49	-77.61	-13.00	-64.61	ERP
3	449.5558	-76.05	5.45	-70.60	-13.00	-57.60	ERP

For Cellular Band			
Test Channel	GSM850	Polarity:	Vertical



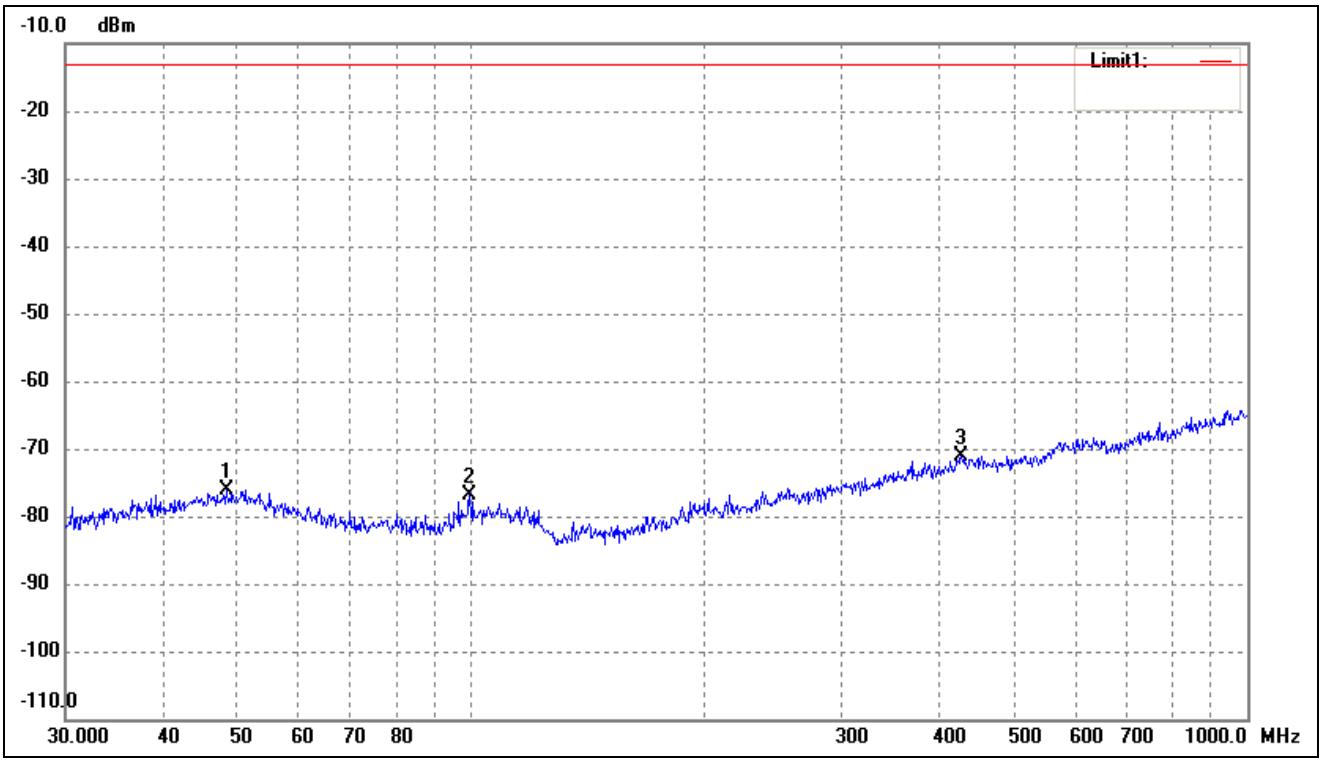
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	48.8429	-77.22	0.73	-76.49	-13.00	-63.49	ERP
2	103.0800	-76.34	-1.33	-77.67	-13.00	-64.67	ERP
3	426.5210	-75.73	5.61	-70.12	-13.00	-57.12	ERP

For Cellular Band			
Test Channel	GSM1900	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	48.1626	-76.62	0.68	-75.94	-13.00	-62.94	ERP
2	112.9196	-75.83	-1.54	-77.37	-13.00	-64.37	ERP
3	419.1081	-76.38	5.37	-71.01	-13.00	-58.01	ERP

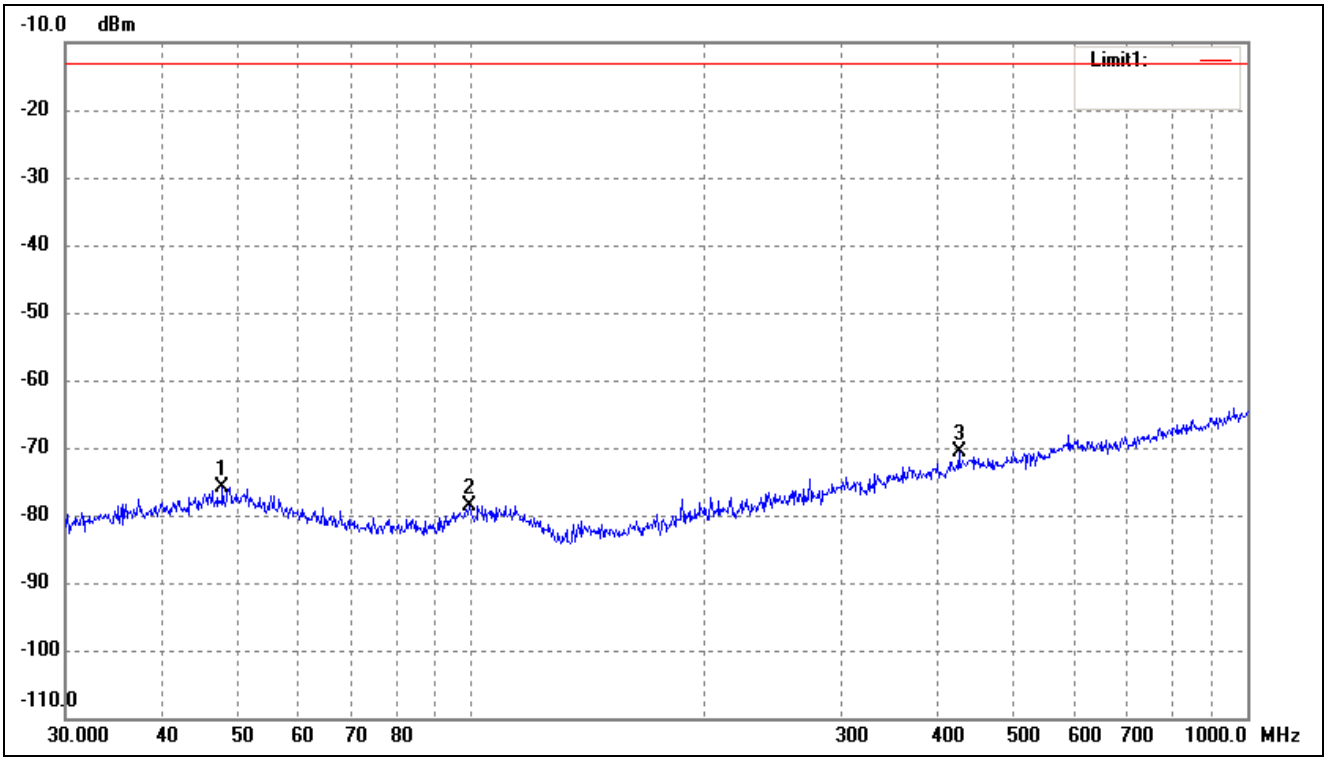
For Cellular Band			
Test Channel	GSM1900	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	48.3318	-76.76	0.69	-76.07	-13.00	-63.07	ERP
2	99.5281	-75.44	-1.49	-76.93	-13.00	-63.93	ERP
3	428.0193	-76.75	5.61	-71.14	-13.00	-58.14	ERP

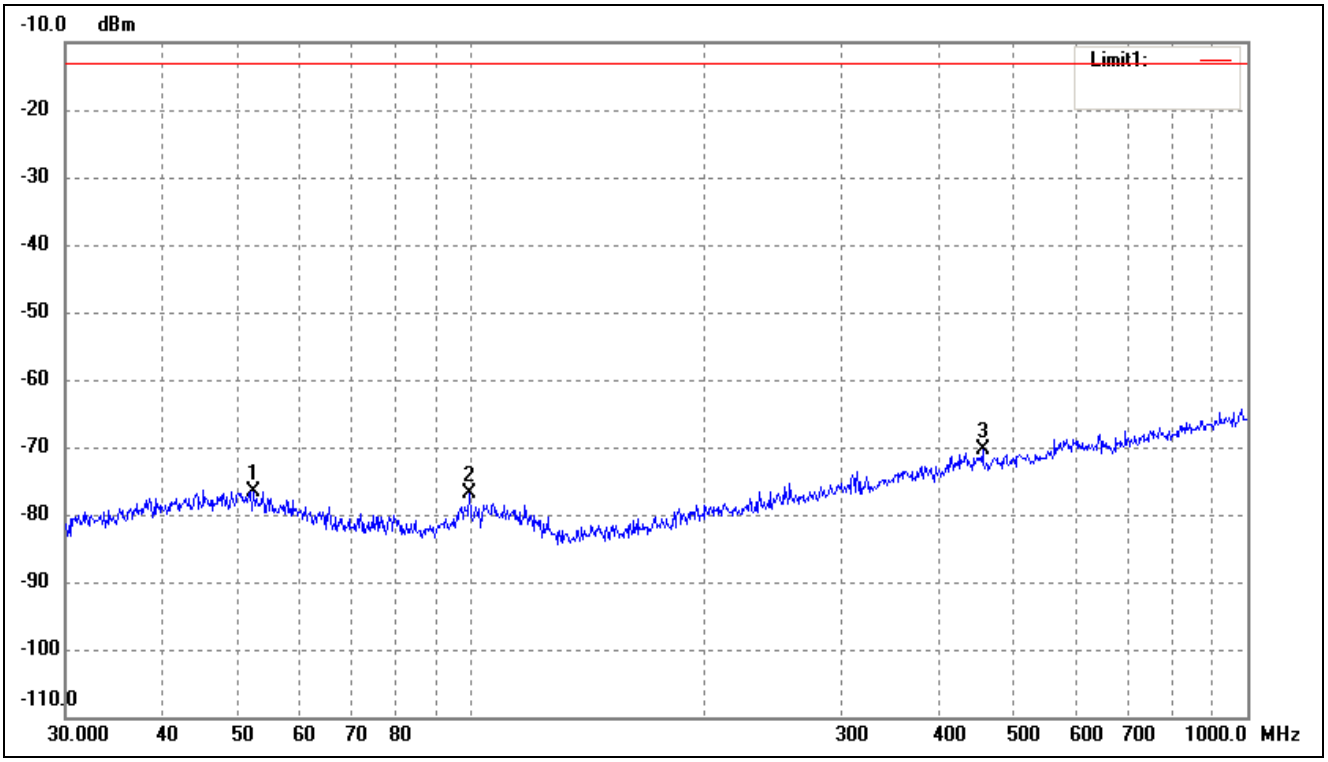
Note: Margin= (Reading+ Correct)- Limit

Test Channel	WCDMA Band V	Polarity:	Horizontal



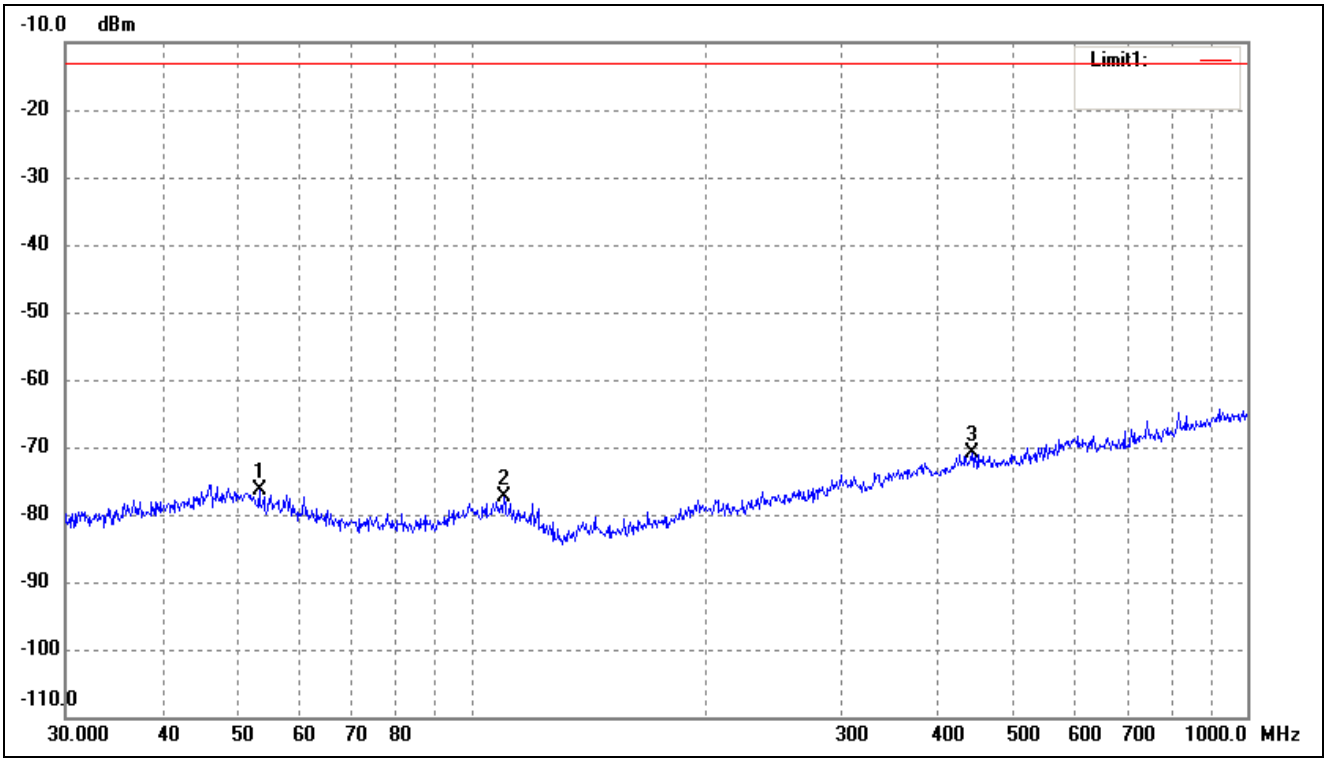
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	47.8260	-76.45	0.66	-75.79	-13.00	-62.79	ERP
2	99.5281	-77.05	-1.49	-78.54	-13.00	-65.54	ERP
3	425.0280	-76.28	5.61	-70.67	-13.00	-57.67	ERP

Test Channel	WCDMA Band V	Polarity:	Vertical



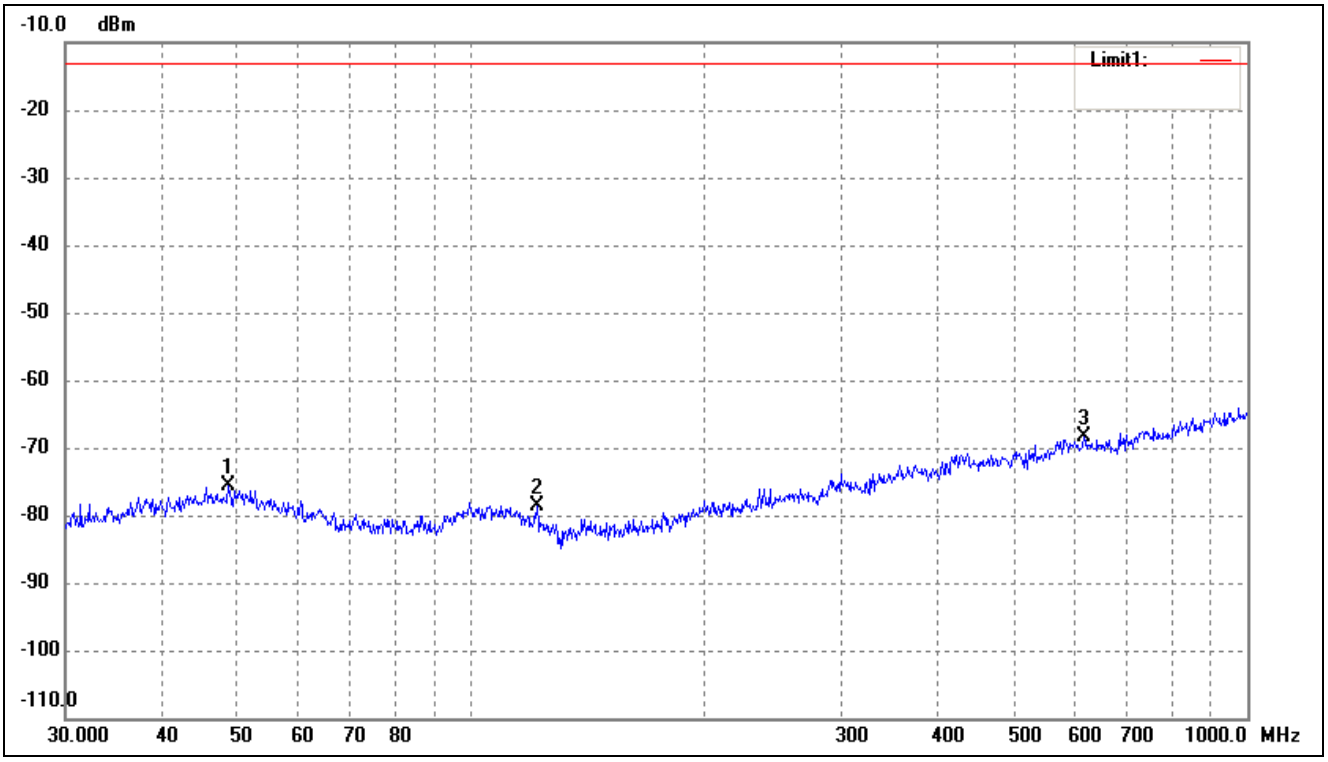
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	52.3913	-76.78	0.26	-76.52	-13.00	-63.52	ERP
2	99.5281	-75.46	-1.49	-76.95	-13.00	-63.95	ERP
3	455.9058	-75.56	5.30	-70.26	-13.00	-57.26	ERP

Test Channel	WCDMA Band IV	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	53.3179	-76.52	0.04	-76.48	-13.00	-63.48	ERP
2	110.1816	-76.14	-1.23	-77.37	-13.00	-64.37	ERP
3	441.7426	-76.44	5.57	-70.87	-13.00	-57.87	ERP

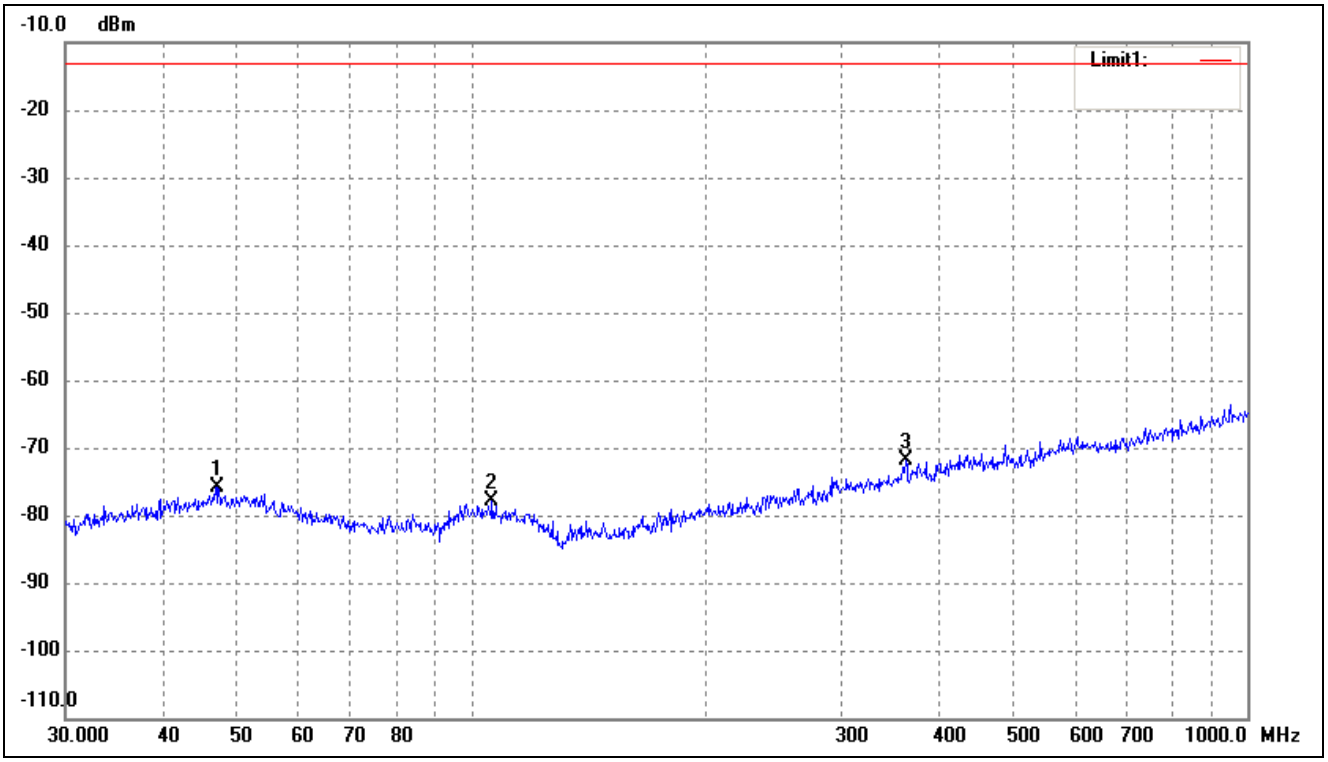
Test Channel	WCDMA Band IV	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	48.6719	-76.44	0.72	-75.72	-13.00	-62.72	ERP
2	121.5486	-75.82	-2.77	-78.59	-13.00	-65.59	ERP
3	616.3718	-76.10	7.72	-68.38	-13.00	-55.38	ERP

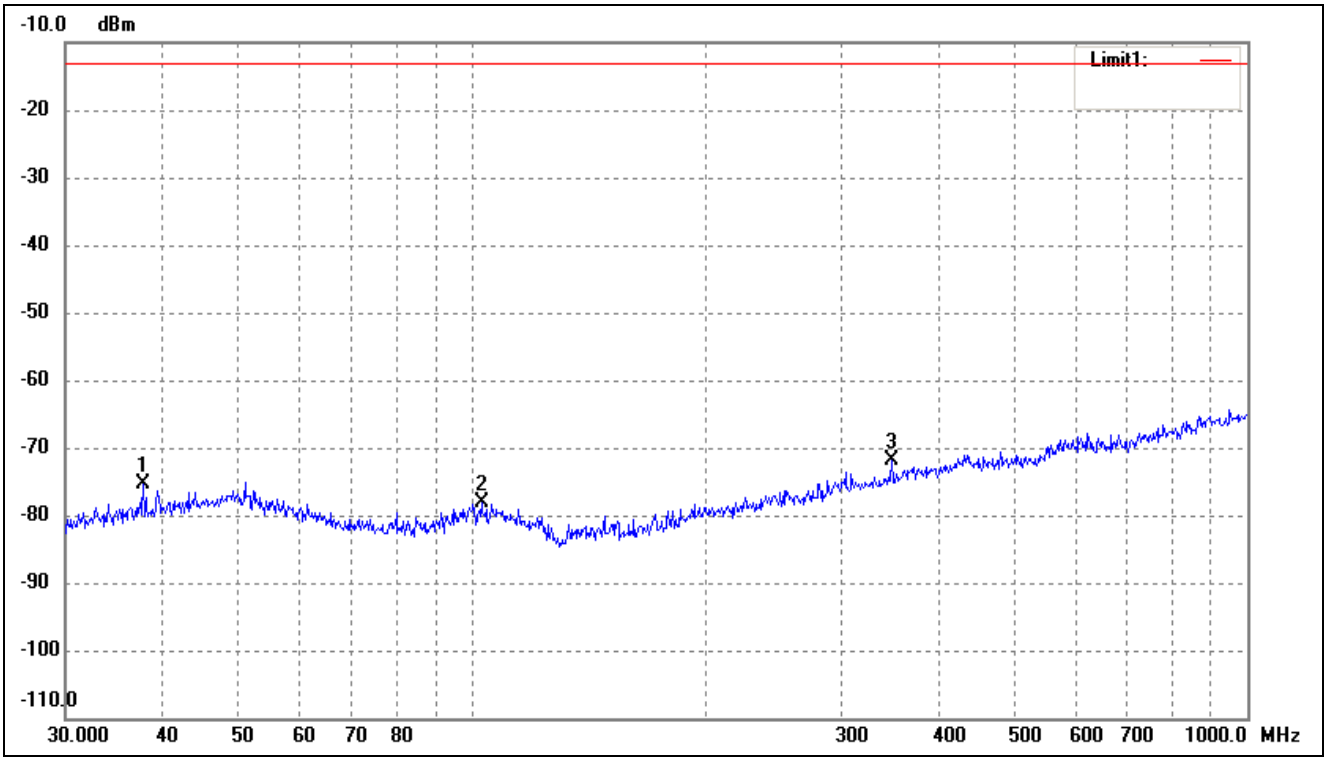
Note: Margin= (Reading+ Correct)- Limit

Test Channel	WCDMA Band II	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	47.1599	-76.44	0.61	-75.83	-13.00	-62.83	ERP
2	106.3850	-76.65	-1.28	-77.93	-13.00	-64.93	ERP
3	362.9845	-75.78	3.98	-71.80	-13.00	-58.80	ERP

Test Channel	WCDMA Band II	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	Factor(dB)	(dBm)	(dBm)	(dB)	
1	37.8121	-74.42	-1.07	-75.49	-13.00	-62.49	ERP
2	103.0800	-76.71	-1.33	-78.04	-13.00	-65.04	ERP
3	348.0274	-75.50	3.64	-71.86	-13.00	-58.86	ERP

Note: Margin= (Reading+ Correct)- Limit

- Spurious Emissions Above 1GHz
- For Cellular Band_GSM850 Mode

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (824.2MHz)						
1648.4	-34.03	4.94	-29.09	-13	-16.09	H
2472.6	-44.64	8.46	-36.18	-13	-23.18	H
1648.4	-35.27	4.94	-30.33	-13	-17.33	V
2472.6	-43.67	8.46	-35.21	-13	-22.21	V
Middle Channel (836.6MHz)						
1673.2	-37.23	5.11	-32.12	-13	-19.12	H
2509.8	-42.27	8.54	-33.73	-13	-20.73	H
1673.2	-35.96	5.11	-30.85	-13	-17.85	V
2509.8	-43.05	8.54	-34.51	-13	-21.51	V
High Channel (848.8MHz)						
1697.6	-34.81	5.25	-29.56	-13	-16.56	H
2546.4	-42.83	8.57	-34.26	-13	-21.26	H
1697.6	-34.86	5.25	-29.61	-13	-16.61	V
2546.4	-42.74	8.57	-34.17	-13	-21.17	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	-40.22	10.54	-29.68	-13	-16.68	H
5550.6	-49.65	13.37	-36.28	-13	-23.28	H
3700.4	-40.5	10.54	-29.96	-13	-16.96	V
5550.6	-46.64	13.37	-33.27	-13	-20.27	V
Middle Channel (1880MHz)						
3760.0	-40.55	10.64	-29.91	-13	-16.91	H
5640.0	-46.25	13.54	-32.71	-13	-19.71	H
3760.0	-42.25	10.64	-31.61	-13	-18.61	V
5640.0	-49.08	13.54	-35.54	-13	-22.54	V
High Channel (1909.8MHz)						
3819.6	-41.3	10.74	-30.56	-13	-17.56	H
5729.4	-49.11	13.71	-35.4	-13	-22.4	H
3819.6	-41.81	10.74	-31.07	-13	-18.07	V
5729.4	-49.82	13.71	-36.11	-13	-23.11	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	-34.45	4.94	-29.51	-13	-16.51	H
2479.2	-43.06	8.46	-34.6	-13	-21.6	H
1652.8	-37.18	4.94	-32.24	-13	-19.24	V
2479.2	-41.29	8.46	-32.83	-13	-19.83	V
Middle Channel (836.6MHz)						
1672.8	-36.14	5.11	-31.03	-13	-18.03	H
2509.2	-41.7	8.54	-33.16	-13	-20.16	H
1672.8	-35.78	5.11	-30.67	-13	-17.67	V
2509.2	-43.98	8.54	-35.44	-13	-22.44	V
High Channel (846.6MHz)						
1693.2	-37.99	5.25	-32.74	-13	-19.74	H
2539.8	-44.56	8.57	-35.99	-13	-22.99	H
1693.2	-37.2	5.25	-31.95	-13	-18.95	V
2539.8	-44.23	8.57	-35.66	-13	-22.66	V

➢ For WCDMA Band IV Mode

Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Low Channel (1712.4MHz)						
3424.8	-39.97	8.65	-31.32	-13	-18.32	H
5137.2	-48.45	12.03	-36.42	-13	-23.42	H
3424.8	-39.64	8.65	-30.99	-13	-17.99	V
5137.2	-47.86	12.03	-35.83	-13	-22.83	V
Middle Channel (1732.4MHz)						
3466.8	-39.61	8.91	-30.7	-13	-17.7	H
5200.2	-47.98	12.29	-35.69	-13	-22.69	H
3466.8	-41.16	8.91	-32.25	-13	-19.25	V
5200.2	-46.59	12.29	-34.3	-13	-21.3	V
High Channel (1752.6MHz)						
3505.2	-40.52	9.11	-31.41	-13	-18.41	H
5257.8	-46.58	12.56	-34.02	-13	-21.02	H
3505.2	-42.09	9.11	-32.98	-13	-19.98	V
5257.8	-48.63	12.56	-36.07	-13	-23.07	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	-34.47	10.17	-24.3	-13	-11.30	H
5557.2	-43.81	14.69	-29.12	-13	-16.12	H
3704.8	-37.52	10.17	-27.35	-13	-14.35	V
5557.2	-43.37	14.69	-28.68	-13	-15.68	V
Middle Channel (1880MHz)						
3760.8	-37.48	10.26	-27.22	-13	-14.22	H
5640.0	-43.1	14.78	-28.32	-13	-15.32	H
3760.8	-35.68	10.26	-25.42	-13	-12.42	V
5640.0	-44.43	14.78	-29.65	-13	-16.65	V
High Channel (1907.6MHz)						
3815.2	-34.58	10.59	-23.99	-13	-10.99	H
5722.8	-41.01	15.03	-25.98	-13	-12.98	H
3815.2	-35.85	10.59	-25.26	-13	-12.26	V
5722.8	-43.24	15.03	-28.21	-13	-15.21	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, §27.54 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/B4 middle channel
2. Normal Voltage NV=DC3.85V; Low Voltage LV=DC3.5V;High Voltage HV=DC4.35V

➢ 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	58	0.0690	2.50	Pass
	-20	49	0.0588		
	-10	38	0.0451		
	0	32	0.0377		
	10	25	0.0303		
	20	18	0.0221		
	30	25	0.0303		
	40	31	0.0368		
	50	36	0.0432		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	48	0.0254	2.50	Pass
	-20	43	0.0229		
	-10	38	0.0205		
	0	33	0.0176		
	10	28	0.0147		
	20	24	0.0127		
	30	29	0.0155		
	40	33	0.0176		
	50	38	0.0200		

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	53	0.0634	2.50	Pass
	-20	48	0.0570		
	-10	38	0.0460		
	0	33	0.0395		
	10	27	0.0322		
	20	19	0.0230		
	30	27	0.0322		
	40	32	0.0386		
	50	38	0.0460		
Reference Frequency: WCDMA Band IV Middle channel=1412 channel=1733.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	76	0.0440	2.50	Pass
	-20	62	0.0355		
	-10	51	0.0293		
	0	45	0.0262		
	10	39	0.0226		
	20	32	0.0186		
	30	38	0.0222		
	40	46	0.0266		
	50	53	0.0306		
Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	62	0.0327	2.50	Pass
	-20	58	0.0307		
	-10	46	0.0245		
	0	40	0.0213		
	10	35	0.0188		
	20	28	0.0151		
	30	35	0.0184		
	40	41	0.0217		
	50	45	0.0237		

➢ Frequency stability V.S. Voltage measurement

Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	HV	59	0.0708	2.50	Pass
	NV	50	0.0598		
	LV	43	0.0515		
Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error			Result
		Hz	ppm		
25	HV	42	0.0225	2.50	Pass
	NV	38	0.0200		
	LV	31	0.0164		
Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error			
		Hz	ppm		
25	HV	39	0.0469	2.50	Pass
	NV	44	0.0524		
	LV	48	0.0579		
Reference Frequency: WCDMA Band IV Middle channel=1412 channel=1733.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error			Result
		Hz	ppm		
25	HV	55	0.0315	2.50	Pass
	NV	47	0.0271		
	LV	40	0.0231		
Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	HV	68	0.0364	2.50	Pass
	NV	62	0.0331		
	LV	54	0.0286		

10. Modulation characteristics

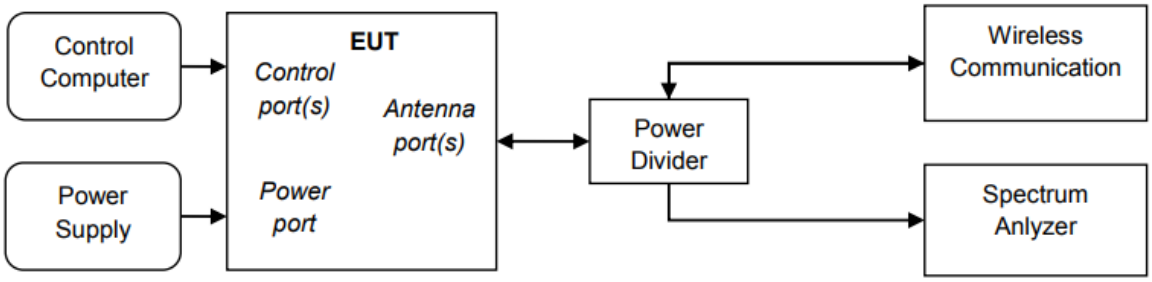
10.1 Standard Applicable

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.

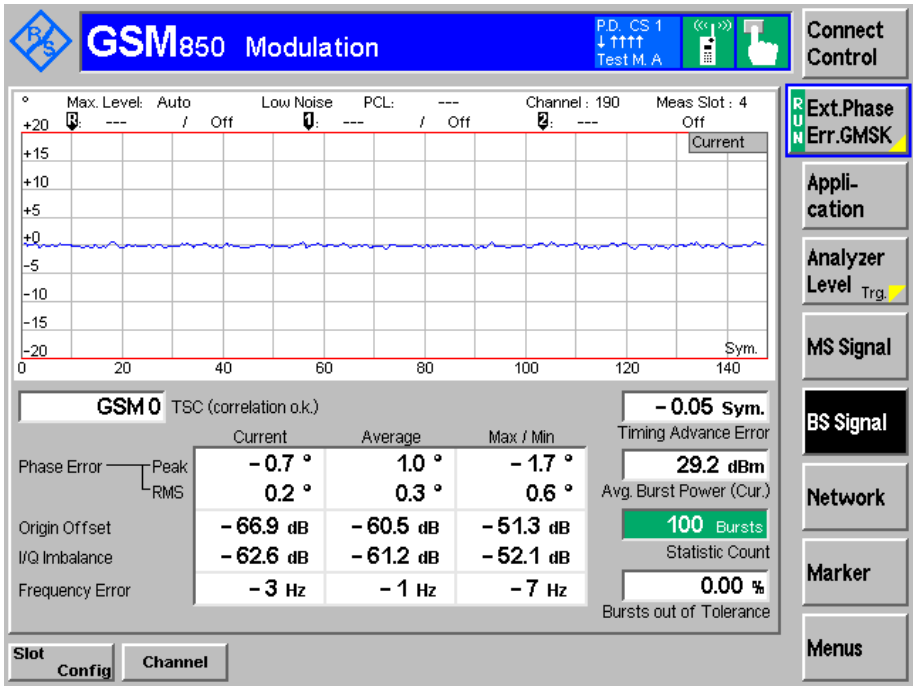
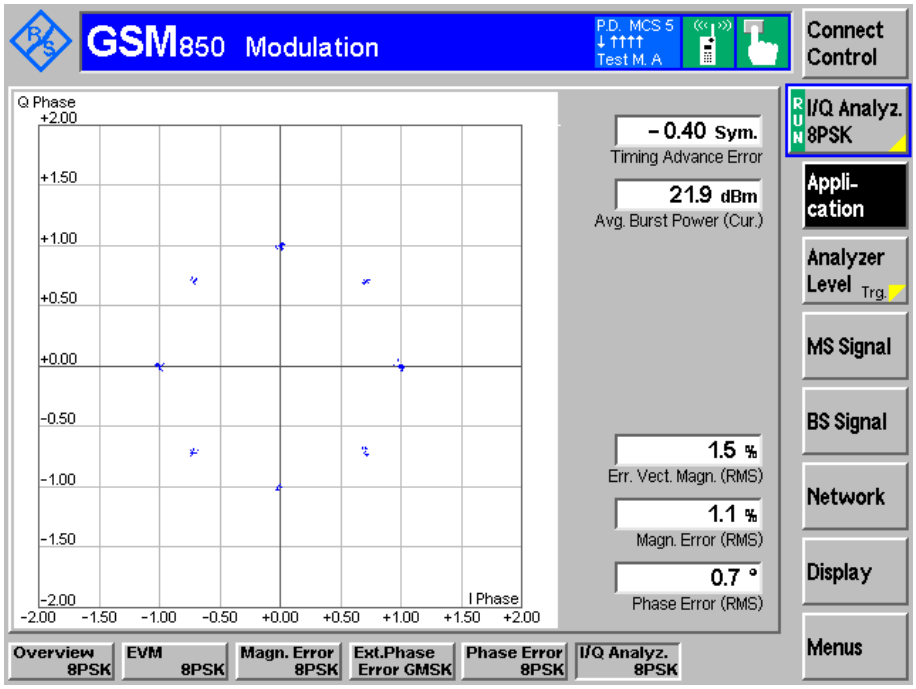
10.2 Test Procedure

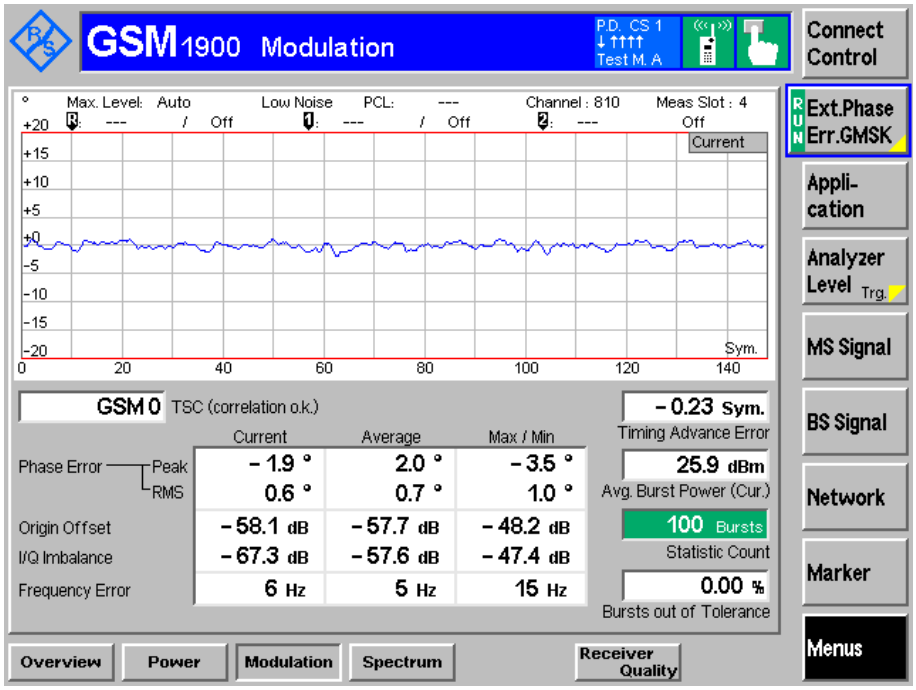
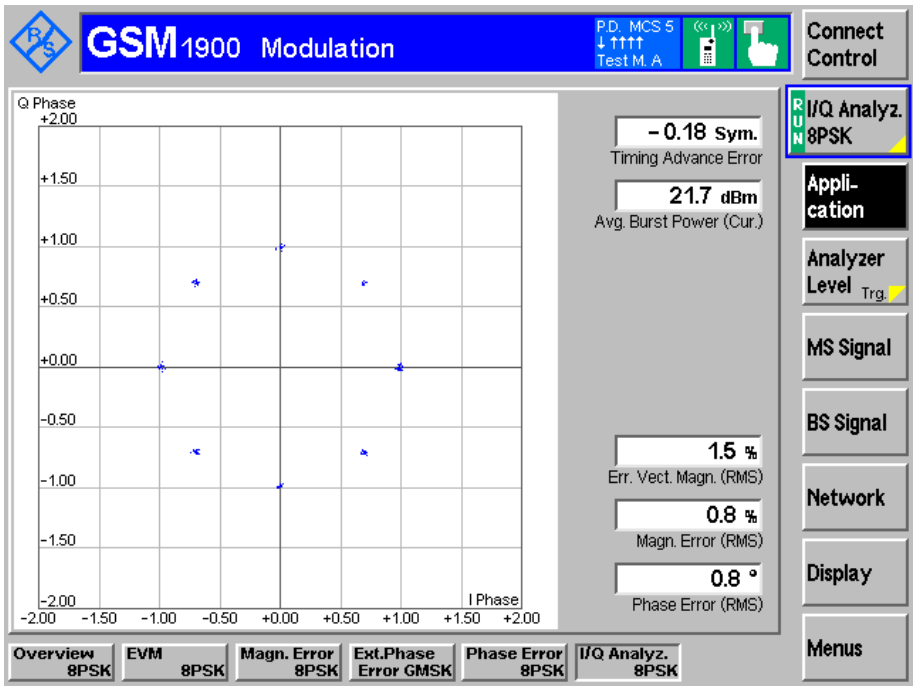
According to ANSI C63.26-2015 section 5.3.2, the following test setup was performed.

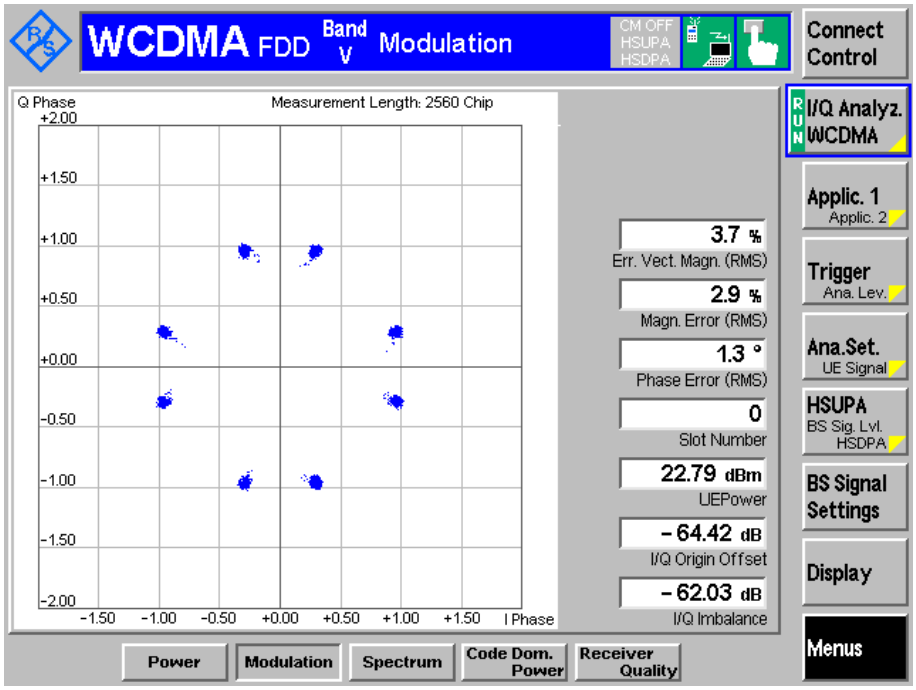
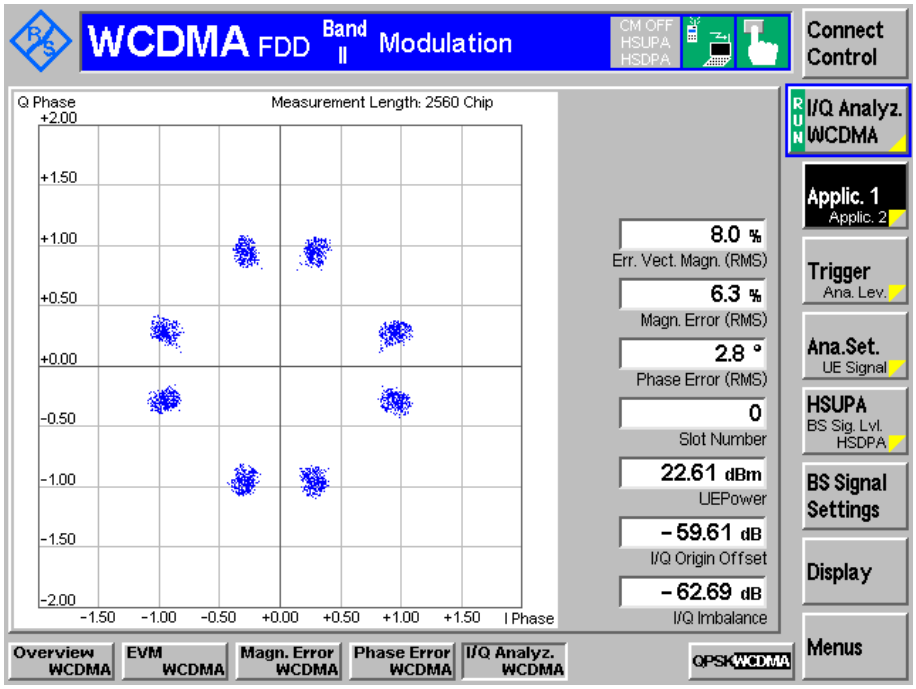


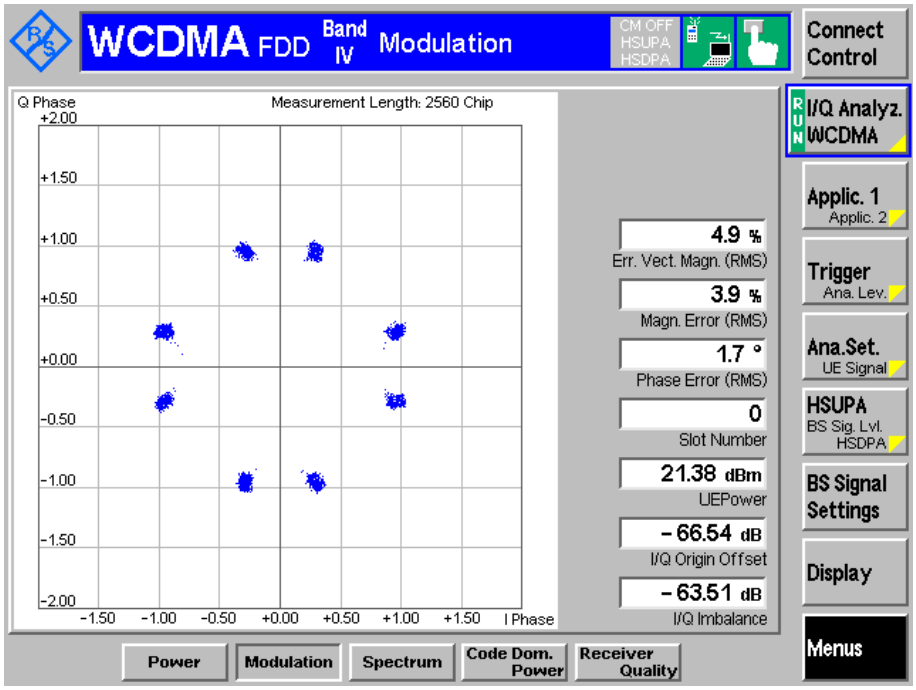
10.3 Summary of Test Results/Plots

Only the worst case was selected to record

GSM850	
Middle Channel-GMSK	
Middle Channel-8PSK	

GSM1900	
Middle Channel-GMSK	
Middle Channel-8PSK	

WCDMA B5	
WCDMA B2	

WCDMA B4	

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