FCC RADIO TEST REPORT
FCC ID:2AGAQDRAGON

Product：	smartphone
Trade Name：	APRIX, GEEX
Model Number：	Red Dragon
Serial Model：	X5, Red Dragon lite, Shark, X7, X7 elite, X7 lite, X8, X8 Elite, X8 Lite, X10, X10 Elite, X10 lite, X55,X55 Elite, X10 Elite, X10 LITE, Panzer X5, Panzer X6, Panzer X7, Tab 10, Tab 8 and Tab 7
Report No.：	ISOT15100214R1

Prepared for

Computel System SAS

Cra 16A #80-15, Bogota Colombia

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name.....:	Computel System SAS
Address .....:	Cra 16A #80-15, Bogota Colombia
Manufacture's Name .....:	Computel System SAS
Address .....:	Cra 16A #80-15, Bogota Colombia
Product name.....:	smartphone
Model and/or type reference ...:	Red Dragon
Serial Model：	X5, Red Dragon lite, Shark, X7, X7 elite, X7 lite, X8, X8 Elite, X8 Lite, X10, X10 Elite, X10 lite, X55, X55 Elite, X10 Elite, X10 LITE, Panzer X5, Panzer X6, Panzer X7, Tab 10, Tab 8 and Tab 7
Standards.....:	FCC Part 22H and 24E
Test procedure .....:	TIA/EIA 603D

This device described above has been tested by ISOTek, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test.....

Date (s) of performance of tests..... 16 Oct. 2015 ~27 Oct. 2015

Date of Issue ..... 27 Oct. 2015

Test Result ..... **Pass**

Compiled by:	Approved by:
Lisa Huang	Richard Chen
Lisa Huang/ Project Engineer	Richard Chen/ Manager

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	smartphone	
Model Name	Red Dragon	
Serial Model	X5, Red Dragon lite, Shark, X7, X7 elite, X7 lite, X8, X8 Elite, X8 Lite, X10, X10 Elite, X10 lite, X55, X55 Elite, X10 Elite, X10 LITE, Panzer X5, Panzer X6, Panzer X7, Tab 10, Tab 8 and Tab 7	
Model Difference	Only the model name and color is different.	
Hardware version:	WMDBb	
Software version:	Red_dragon_V1.0_20150901	
IMEI	351769070000000	
Frequency Bands:	WCDMA ： ☒HSDPA ☒HSUPA ☐ Band 1:1920 – 1980 MHz ☒ Band 2:1850 – 1910 MHz ☐ Band 4:1710 – 1755 MHz ☒ Band 5:824 – 849 MHz ☐ Band 8:880 – 915 MHz	☒ GSM / PCS ☒ GPRS ☒ EDGE ☒ 850MHz ☐ 900MHz ☐ EGSM 900MHz ☐ PGSM 900MHz ☐ 1800MHz ☒ 1900MHz
GPRS/EDGE Class	Multi-Class12；Only 4 timeslots are used for GPRS	
Modulation Technique:	GSM/GPRS: GMSK；EDGE:8PSK;RMC/AMR: QPSK； WCDMA:QPSK	
Supported mode:	2G:GSM Voice for GSM850,EGSM900,DCS1800 and PCS1900,GPRS Level: class 12; support EDGE; WCDMA:RMC/AMR 12.2Kbps Rel 99, HSDPA Release 7 Cat 16, HSUPA Release 6 Cat 6	
Antenna:	FPCB Antenna	
Antenna gain:	1.0 dBi	
Battery parameter:	DC 3.8V,2200mAh	
Adapter	Input: 100-240V~, 50/60Hz, 0.3A; Output: 5.0V⎓,1000mA	
SIM CARD	The Phone one SIM Card sockets	
Extreme Vol. Limits:	DC3.6 V to 4.4 V (Nominal DC3.8V)	
Extreme Temp. Tolerance	-10℃ to +50℃	

** Note: The High Voltage 4.4V and Low Voltage 3.6V was declared by manufacturer, The EUT couldn’t be operate normally with higher or lower voltage.

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID:2AGAQDRAGON** filing to comply with the FCC Part 22H&24E.

1.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of TIA/EIA 603D and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

1.4 TEST FACILITY

The test site used to collect the radiated data is located at:
Shenzhen ISOTek Standards Technical Services Co.,Ltd.
13/F, HuaFengRui Building, XinHu Rd., XiXiang, Bao'an District,Shenzhen,China.
FCC Registration No.: **918037**

1.5 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Aglient	E4446A	US44300451	2015.07.06	2016.07.05	1 year
2	EMI Test Receiver	R&S	ESCI	101165	2015.07.06	2016.07.05	1 year
3	Communication Tester	r&s	CMU200	A0304247	2015.05.04	2016.05.03	1 year
4	Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2015.07.06	2016.07.05	1 year
5	Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-439	2015.07.06	2016.07.05	1 year
6	Horn Antenna	Schwarzbeck	BBHA 9170	9170-182	2015.07.06	2016.07.05	1 year
7	Horn Antenna	Schwarzbeck	BBHA 9170	9170-181	2015.07.06	2016.07.05	1 year
8	SIGNAL GENERATOR	AGILENT	E4438C	878743	2015.05.04	2016.05.03	1 year
9	Amplifier	Schwarzbeck	BBV9743	9743-019	2015.07.06	2016.07.05	1 year
10	Test Cable Below 1GHz	ATM	R-01	3564	2015.07.06	2016.07.05	1 year
11	Test Cable Above 1GHz	ATM	R-02	3565	2015.07.06	2016.07.05	1 year
12	Horn Antenna	Sunol Sciences	DRH-118	A052604	2015.07.06	2016.07.05	1 year
13	Horn Antenna	Sunol Sciences	DRH-118	A052605	2015.07.06	2016.07.05	1 year

1.6 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

1.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 GENERAL TECHNICAL REQUIREMENTS

Item Number	Item Description		FCC Rules
1	Output Power	Conducted output power	22.913(a) / 24.232 (b), §2.1046 § 27.50(c.10); § 27.50(d.4)
		Radiated output power	
2	Spurious Emission	Conducted spurious emission	2.1051 / 22.917 / 24.238, § 2.1051, § 2.1053,§ 27.53(h)
		Radiated spurious emission	
3	Frequency Stability		2.1055 /24.235/§ 27.5(h);§ 27.54
4	Occupied Bandwidth		2.1049 (h)(i) /§ 27.53(a.5)
5	Emission Bandwidth		22.917(b) / 24.238 (b)/§ 27.53(a.5)
6	Band Edge		22.917(b) / 24.238 (b)/ § 27.53(h)
7	Peak-to-Average Ratio		24.232(d)

2.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	smartphone	Red Dragon	FCC ID:2AGAQDRAGON	EUT

Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

3. SUMMARY OF TEST RESULTS

Item Number	Item Description		FCC Rules	Result
1	Output Power	Conducted Output Power	22.913(a) / 24.232 (b), §2.1046	Pass
		Radiated Output Power		
2	Spurious Emission	Conducted Spurious Emission	2.1051 / 22.917 / 24.238, § 2.1051, § 2.1053	Pass
		Radiated Spurious Emission		
3	Frequency Stability		2.1055 /24.235	Pass
4	Occupied Bandwidth		2.1049 (h)(i)	Pass
5	Emission Bandwidth		22.917(b) / 24.238 (b)	Pass
6	Band Edge		22.917(b) / 24.238 (b)	Pass
7	Peak-to-Average Ratio		24.232(d)	Pass

4. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both GPRS850 and GPRS1900 frequency band.

Note: GSM/GPRS/EDGE 850, GSM/GPRS/EDGE 1900, HSDPA band II, HSUPA band II, HSDPA band V, HSUPA band V modes have been tested during the test. the worst condition (GSM850，GSM1900, RMC 12.2k) be recorded in the test report if no other modes test data.

The phone has one SIM Card sockets.

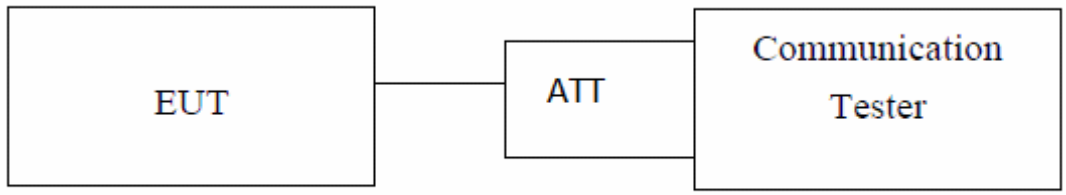
5. OUTPUT POWER

5.1 Conducted Output Power

5.1.1 MEASUREMENT METHOD

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes (GSM/GPRS/EDGE 850, GSM/GPRS/EDGE 1900, HSDPA band II, HSUPA band II, HSDPA band V, HSUPA band V) at 3 typical channels (the Top Channel, the Middle Channel and the Bottom Channel) for each band.

5.1.2 TEST SETUP



Note: *Measurement setup for testing on Antenna connector*

5.1.3 MEASUREMENT RESULT

Test Result:

Band	GSM 850			GSM 1900		
Channel	128	190	251	512	661	810
Frequency(MHz)	824.2	836.6	848.8	1850.2	1880	1909.9
GSM(GMSK,1Uplink)	32.85	32.92	32.89	29.39	29.45	29.35
GPRS 8 (GMSK,1 Uplink)	32.91	32.69	32.65	29.70	29.49	29.48
GPRS 10 (GMSK,2 Uplink)	32.12	31.91	31.84	28.95	28.82	28.75
GPRS 11 (GMSK,3 Uplink)	30.44	30.16	30.04	27.24	27.22	27.28
GPRS 12 (GMSK,4 Uplink)	29.14	29.21	28.79	26.16	26.28	26.18
EDGE 8 (8PSK,1 Uplink)	26.91	26.89	26.85	25.82	25.78	25.74
EDGE 10 (8PSK,2 Uplink)	26.56	26.61	26.58	25.45	25.51	25.47
EDGE 11 (8PSK,3 Uplink)	25.96	25.88	25.91	24.85	24.77	24.83
EDGE 12 (8PSK,4 Uplink)	25.44	25.39	25.37	24.33	24.28	24.26

Band	WCDMA Band II			WCDMA Band V		
Channel	9262	9400	9538	4132	4183	4233
Frequency(MHz)	1850.4	1880	1909.6	824.4	836.6	848.6
AMR	22.67	22.71	21.72	22.71	22.73	22.63
RMC12.2K	22.69	22.79	22.13	22.87	22.94	22.91
HSDPA Subtest-1	21.99	21.89	21.62	21.79	21.81	22.11
HSDPA Subtest-2	21.89	21.70	21.70	21.81	21.97	21.86
HSDPA Subtest-3	21.56	21.67	21.59	21.93	21.99	21.75
HSDPA Subtest-4	21.61	21.68	21.89	21.80	22.03	22.09
HSDPA Subtest-1	21.65	21.68	22.17	21.93	21.91	21.49
HSDPA Subtest-2	21.50	21.86	21.58	21.84	22.06	21.81
HSDPA Subtest-3	21.87	21.77	21.67	21.73	22.11	21.94
HSDPA Subtest-4	21.56	21.86	21.58	22.05	21.81	22.17
HSDPA Subtest-5	21.46	21.58	21.79	22.13	22.25	21.94

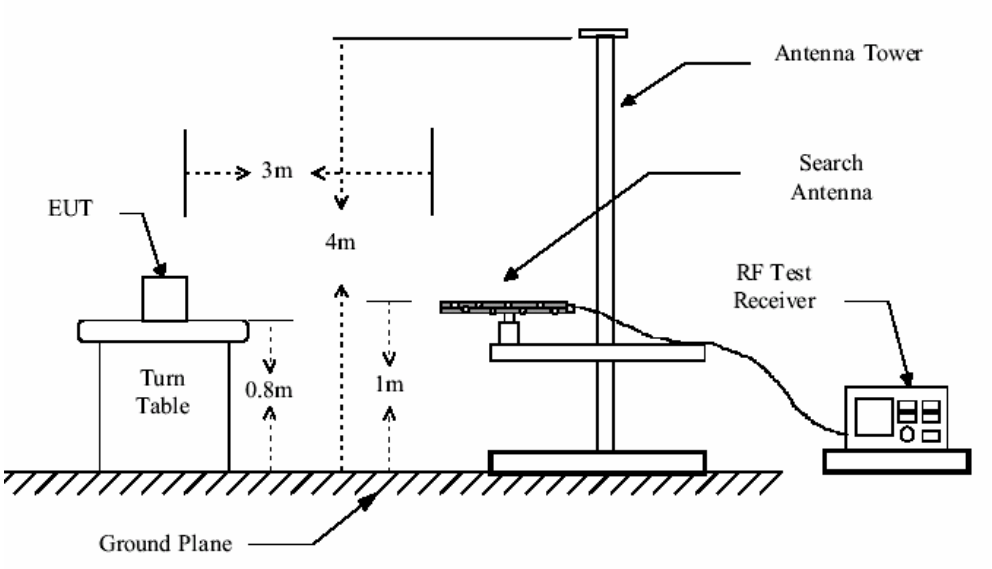
5.2 Radiated Output Power

5.2.1 MEASUREMENT METHOD

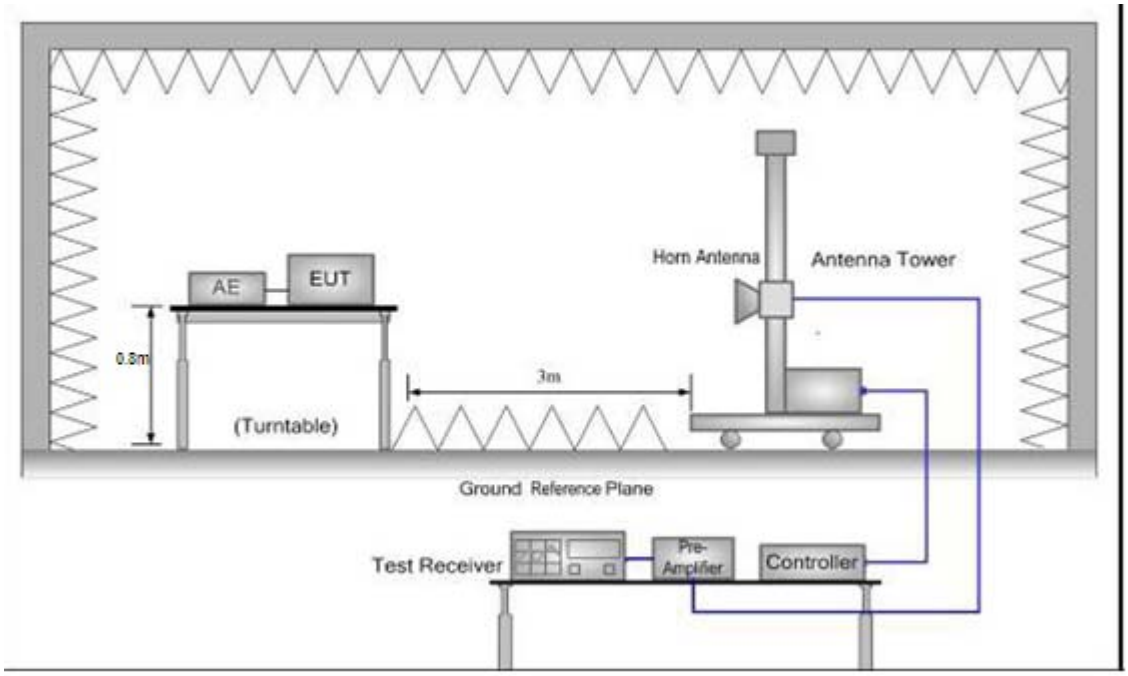
1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were 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. 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.
   Sample Calculation:
   EUT Field Strength (dBm) = Reading (Signal generator) + Antenna Gain (substitution antenna) - Cable loss (From Signal Generator to substitution antenna)

Test setup

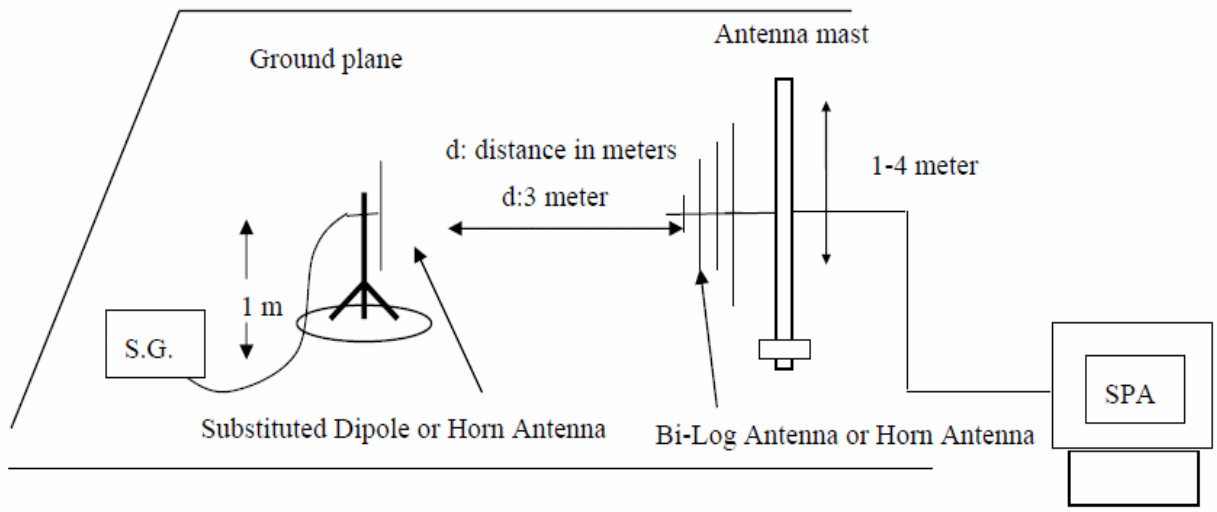
Below 1GHz



Above 1GHz



Substituted method:



Test Result: Pass

5.2.2 MEASUREMENT RESULT

Radiated Power (ERP) for GSM 850 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. ERP	
GSM850	824.2	29.98	Horizontal	Pass
	824.2	28.86	Vertical	Pass
	836.6	**30.75**	Horizontal	Pass
	836.6	27.93	Vertical	Pass
	848.8	30.73	Horizontal	Pass
	848.8	29.98	Vertical	Pass

Radiated Power (ERP) for GPRS 850 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. ERP	
GPRS850	824.2	28.47	Horizontal	Pass
	824.2	29.42	Vertical	Pass
	836.6	29.59	Horizontal	Pass
	836.6	29.03	Vertical	Pass
	848.8	29.56	Horizontal	Pass
	848.8	28.69	Vertical	Pass

Radiated Power (ERP) for EDGE 850 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. ERP	
EDGE850	824.2	24.27	Horizontal	Pass
	824.2	24.54	Vertical	Pass
	836.6	**24.63**	Horizontal	Pass
	836.6	24.61	Vertical	Pass
	848.8	24.06	Horizontal	Pass
	848.8	24.12	Vertical	Pass

Radiated Power (E.I.R.P) for PCS 1900 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
PCS 1900	1850.2	28.63	Horizontal	Pass
	1850.2	27.47	Vertical	Pass
	1880.0	**29.52**	Horizontal	Pass
	1880.0	27.32	Vertical	Pass
	1909.8	29.42	Horizontal	Pass
	1909.8	28.29	Vertical	Pass

Radiated Power (E.I.R.P) for GPRS 1900 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
GPRS 1900	1850.2	27.38	Horizontal	Pass
	1850.2	27.78	Vertical	Pass
	1880.0	27.77	Horizontal	Pass
	1880.0	27.36	Vertical	Pass
	1909.8	27.54	Horizontal	Pass
	1909.8	27.45	Vertical	Pass

Radiated Power (E.I.R.P) for EDGE 1900 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
EDGE 1900	1850.2	23.01	Horizontal	Pass
	1850.2	23.53	Vertical	Pass
	1880.0	**23.59**	Horizontal	Pass
	1880.0	23.52	Vertical	Pass
	1909.8	23.13	Horizontal	Pass
	1909.8	23.24	Vertical	Pass

Radiated Power (E.I.R.P) for UMTS band II				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
RMC 12.2kbps	1852.4	**22.89**	Horizontal	Pass
	1852.4	22.47	Vertical	Pass
	1880.0	21.82	Horizontal	Pass
	1880.0	22.87	Vertical	Pass
	1907.6	22.67	Horizontal	Pass
	1907.6	22.35	Vertical	Pass

Radiated Power (E.R.P) for UMTS band V				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
RMC 12.2kbps	826.4	21.27	Horizontal	Pass
	826.4	22.37	Vertical	Pass
	836.6	**22.77**	Horizontal	Pass
	836.6	21.46	Vertical	Pass
	846.6	21.11	Horizontal	Pass
	846.6	22.68	Vertical	Pass

NOTE 1: in the part, result the worst case GPRS 1slot/ EDGE 1slot for GSM 850 and PCS1900, and RMC 12.2kbps for band II and band V.

6. SPURIOUS EMISSION

6.1 CONDUCTED SPURIOUS EMISSION

6.1.1 MEASUREMENT METHOD

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1, Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.

2, Determine EUT transmit frequencies: the following typical channels were chosen to conducted emissions testing.

Typical Channels for testing of GSM 850 MHz	
Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

Typical Channels for testing of PCS 1900 MHz	
Channel	Frequency (MHz)
512	1850.2
661	1880.0
810	1909.8

Typical Channels for testing of UMTS band II	
Channel	Frequency (MHz)
9262	1852.4
9400	1880.0
9538	1907.6

Typical Channels for testing of UMTS band V	
Channel	Frequency (MHz)
4132	826.4
4183	836.6
4233	846.6

6.1.2 PROVISIONS APPLICABLE

On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

6.1.3 MEASUREMENT RESULT

PLEASE REFER TO : APPENDIX I TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

Note: 1. Below 30MHZ no Spurious found and The GSM modes is the worst condition.

2. As no emission found in standby or receive mode, no recording in this report.

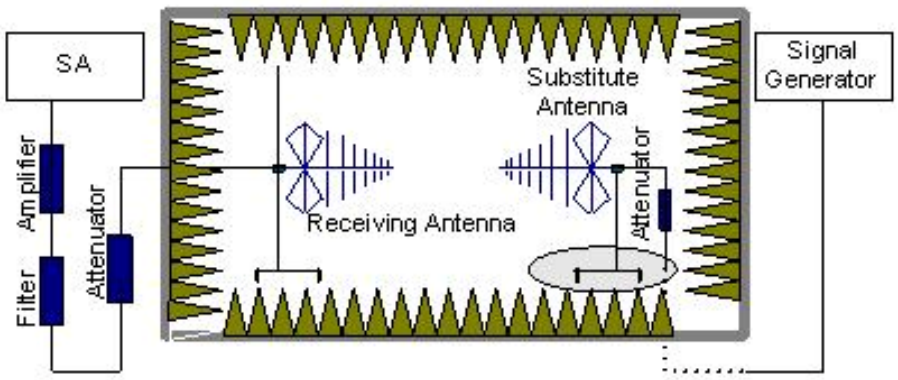
6.2 Radiated Spurious Emission

6.2.1 MEASUREMENT METHOD

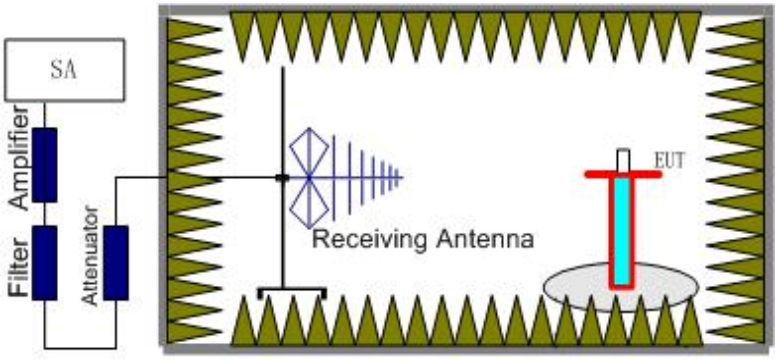
The measurements procedures specified in TIA-603D-2004 were used for testing. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The measurements were performed on all modes(GPRS850, GPRS1900, HSDPA band II/V) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.Only shown the worst data.

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx（dBuV）+CL（dB）+SA（dB）+Gain（dBi）-107（dBuV to dBm）The SA is calibrated using following setup.



b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS 1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) ,GSM850 band (824.2MHz, 836.6MHz, 848.8MHz), UMTS band II(1852.4MHz, 1880MHz, 1907.6MHz), UMTS band V(826.4MHz, 836.6MHz, 846.6MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: $Power=P_{Mea}+A_{Rpl}$

6.2.2 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee’s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Note: only result the worst condition of each test mode:

6.2.3 MEASUREMENT RESULT

GSM 850:

Test Results for Channel 128/824.2 MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1648.4	-32.26	7.8	-24.46	-13	Vertical
1648.4	-32.79	7.8	-24.99	-13	Horizontal
2472.6	-36.29	11	-25.29	-13	Vertical
2472.6	-32.5	11	-21.5	-13	Horizontal
3296.8	-33.23	12.3	-20.93	-13	Horizontal
3296.8	-34.6	12.3	-22.3	-13	Vertical
Test Results for Channel 190/836.6 MHz					
1673.2	-33.4	8	-25.4	-13	Vertical
1673.2	-34.82	8	-26.82	-13	Horizontal
2509.8	-32.71	11.2	-21.51	-13	Vertical
2509.8	-32.04	11.2	-20.84	-13	Horizontal
3346.4	-35.8	12.6	-23.2	-13	Horizontal
3346.4	-33.51	12.6	-20.91	-13	Vertical
Test Results for Channel 251/848.8 MHz					
1697.6	-30.14	8.1	-22.04	-13	Vertical
1697.6	-29.27	8.1	-21.17	-13	Horizontal
2546.4	-31.22	11.69	-19.53	-13	Vertical
2546.4	-31.56	11.69	-19.87	-13	Horizontal
3395.2	-32.47	12.92	-19.55	-13	Horizontal
3395.2	-34.37	12.92	-21.45	-13	Vertical

PCS 1900:

Test Results for Channel 512/1850.2MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3700.4	-37.08	13.42	-23.66	-13	Horizontal
3700.4	-36.01	13.42	-22.59	-13	Vertical
5550.6	-37.86	17.12	-20.74	-13	Vertical
5550.6	-36.41	17.12	-19.29	-13	Horizontal
7400.8	-38.75	19.26	-19.49	-13	Horizontal
7400.8	-41.2	19.26	-21.94	-13	Vertical
Test Results for Channel 661/1880.0MHz					
3760	-36.08	13.76	-22.32	-13	Horizontal
3760	-35.27	13.76	-21.51	-13	Vertical
5640	-40.06	17.56	-22.5	-13	Vertical
5640	-42.08	17.56	-24.52	-13	Horizontal
7520	-41.82	19.6	-22.22	-13	Horizontal
7520	-42.37	19.6	-22.77	-13	Vertical
Test Results for Channel 810/1909.8MHz					
3819.6	-37.91	13.87	-24.04	-13	Horizontal
3819.6	-34.88	13.87	-21.01	-13	Vertical
5729.4	-38.26	17.66	-20.6	-13	Vertical
5729.4	-39.43	17.66	-21.77	-13	Horizontal
7639.2	-39.56	19.75	-19.81	-13	Horizontal
7639.2	-42.2	19.75	-22.45	-13	Vertical

UMTS band II:

Test Results for Channel 9262/1852.4MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3700.8	-32.28	13.42	-18.86	-13	Horizontal
3700.8	-33.49	13.42	-20.07	-13	Vertical
5551.2	-37.28	17.12	-20.16	-13	Vertical
5551.2	-36.97	17.12	-19.85	-13	Horizontal
Test Results for Channel 9400/1880MHz					
3760	-33.9	13.76	-20.14	-13	Horizontal
3760	-33.52	13.76	-19.76	-13	Vertical
5640	-40.02	17.56	-22.46	-13	Vertical
5640	-39.2	17.56	-21.64	-13	Horizontal
Test Results for Channel 9538/1907.6MHz					
3819.2	-34.02	13.87	-20.15	-13	Horizontal
3819.2	-35.91	13.87	-22.04	-13	Vertical
5728.8	-39.02	17.66	-21.36	-13	Vertical
5728.8	-38.02	17.66	-20.36	-13	Horizontal

UMTS band V:

Test Results for Channel 4132/826.4MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1652.8	-30.4	8	-22.4	-13	Vertical
1652.8	-30.6	8	-22.6	-13	Horizontal
2479.2	-31.24	11.2	-20.04	-13	Horizontal
2479.2	-31.23	11.2	-20.03	-13	Vertical
3305.6	-32.55	12.6	-19.95	-13	Horizontal
3305.6	-39.12	12.6	-26.52	-13	Vertical
Test Results for Channel 4183/836.6MHz					
1672.8	-33.24	8	-25.24	-13	Vertical
1672.8	-28.94	8	-20.94	-13	Horizontal
2509.2	-31.24	11.2	-20.04	-13	Horizontal
2509.2	-32.13	11.2	-20.93	-13	Vertical
3345.6	-35.94	12.6	-23.34	-13	Horizontal
3345.6	-32.89	12.6	-20.29	-13	Vertical
Test Results for Channel 4233/846.6MHz					
1693.2	-31.65	8.1	-23.55	-13	Vertical
1693.2	-29.2	8.1	-21.1	-13	Horizontal
2539.8	-37.12	11.69	-25.43	-13	Horizontal
2539.8	-37.33	11.69	-25.64	-13	Vertical
3386.4	-36.21	12.92	-23.29	-13	Horizontal
3386.4	-42.23	12.92	-29.31	-13	Vertical

Note: Below 30MHZ no Spurious found.

7. FREQUENCY STABILITY

7.1 LIMIT

According to the FCC part 22.355&RSS-132 section 5.3 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficientto ensure that the Fundamental emission stays within the authorized frequency block." The frequency error rate is according to the JTC standard that the frequency error rate shall be accurate to within 2.5 ppm of the receivedfrequency from the base station. The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from85 to 115 percent of the nominal valuefor other than hand carried batteryequipment and the extreme temperature rule is comply with the 2.1055(a)(1) –30℃~50℃.

7.2 MEASURING INSTRUMENTS AND SETTING

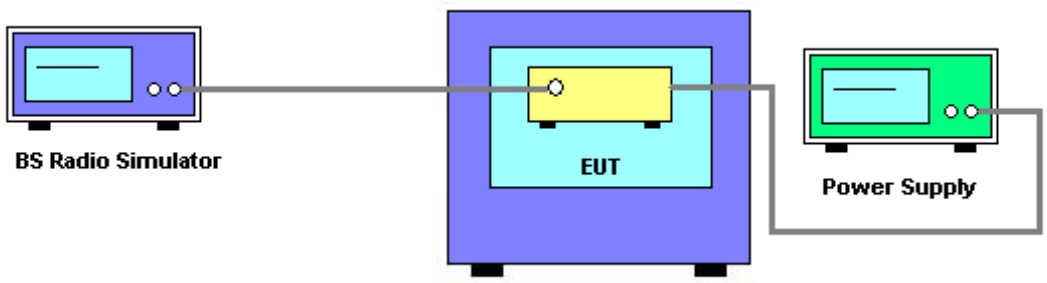
Please refer to section 5 in this report. The following table is the setting of the BS Simulator.

Spectrum Parameters	Setting
Frequency Error	The maximum of transmit frequency error

7.3 TEST PROCEDURES

1. The transmitter output (antenna port) was connected to the BS Simulator.
2. The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.
3. BS simulator used the frequency error function and measured the peak frequency error.
   Power must be removed when changingfrom one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.
   The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. EUT is connected the external power supply to control the DC input power. The various Volts from the minimum 3.6 Volts to 4.4 Volts. Each step shall be record the frequency error rate.
5. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
6. Reduced operating temperature range of -10° ~ +50° C as defined in Operational description and declared in User Manual.

7.4 TESTSETUP LAYOUT



7.5 TESTDEVIATION

There is no deviation with the original standard.

7.6 EUT OPERATIONDURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.

7.7 MEASUREMENT RESULT

Frequency Error Against Voltage for GSM 850 band		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.6	19	0.023
3.8	20	0.024
4.4	21	0.025

Frequency Error Against Temperature for GSM 850 band		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	45	0.054
0	48	**0.057**
10	32	0.038
20	26	0.031
30	28	0.033
40	37	0.044
50	40	0.048

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for EDGE 850 band		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.6	26	0.031
3.8	15	0.018
4.4	13	0.016

Frequency Error Against Temperature for EDGE 850 band		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	39	**0.047**
0	25	0.030
10	27	0.032
20	16	0.019
30	18	0.022
40	22	0.026
50	31	0.037

Frequency Error Against Voltage for PCS 1900 band		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.6	27	0.014
3.8	35	0.019
4.4	31	0.016

Frequency Error Against Temperature for PCS 1900 band		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	39	0.021
0	25	0.013
10	24	0.013
20	32	0.017
30	36	0.019
40	44	0.023
50	48	**0.026**

Frequency Error Against Voltage for EDGE 1900 band		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.6	19	0.010
3.8	33	0.018
4.4	26	0.014

Frequency Error Against Temperature for EDGE 1900 band		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	34	0.018
0	26	0.014
10	27	0.014
20	38	**0.020**
30	19	0.010
40	21	0.011
50	16	0.009

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for UMTS band II		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.6	30	0.016
3.8	28	0.015
4.4	32	0.017

Frequency Error Against Temperature for UMTS band II		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	43	**0.023**
0	35	0.019
10	28	0.015
20	25	0.013
30	30	0.016
40	37	0.020
50	42	0.022

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for UMTS band V		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.6	24	0.029
3.8	22	0.026
4.4	25	0.030

Frequency Error Against Temperature for UMTS band V		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	36	**0.043**
0	32	0.038
10	28	0.033
20	35	0.042
30	28	0.033
40	36	0.043
50	42	0.050

Note: The EUT doesn't work below -10℃

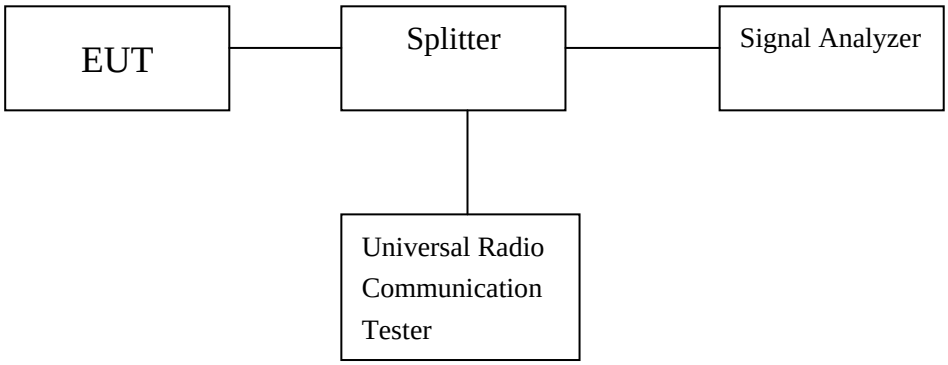
8. BANDWIDTH

8.1APPLICABLE STANDARD

FCC §2.1049, §22.917, §22.905 and §24.238 and §27.53(a.5)

8.2 Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.
3. Details according with KDB 971168 section 4.1 & 4.2.



Test Equipment List and Details

Refer a test equipment and calibration data table in this test report.

8.3 MEASUREMENT RESULT

Occupied Bandwidth (99%) for GSM 850 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	824.2	246.602
Middle Channel	836.6	243.607
High Channel	848.8	238.743

Occupied Bandwidth (99%) for EDGE 850 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	824.2	248.903
Middle Channel	836.6	248.488
High Channel	848.8	244.932

Occupied Bandwidth (99%) for PCS 1900 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	1850.2	242.738
Middle Channel	1880.0	245.386
High Channel	1909.8	241.854

Occupied Bandwidth (99%) for EDGE 1900 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	1850.2	245.186
Middle Channel	1880.0	248.460
High Channel	1909.8	248.360

Occupied Bandwidth (99%) for UMTS band II		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	1852.4	4.161
Middle Channel	1880.0	4.155
High Channel	1907.6	4.151

Occupied Bandwidth (99%) for UMTS band V		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	826.4	4.142
Middle Channel	836.6	4.135
High Channel	846.6	4.153

Emission Bandwidth (-26dBc) for GSM 850 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	824.2	314.173
Middle Channel	836.6	318.970
High Channel	848.8	317.607

Emission Bandwidth (-26dBc) for EDGE 850 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	824.2	319.160
Middle Channel	836.6	323.934
High Channel	848.8	314.065

Emission Bandwidth (-26dBc) for PCS 1900 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	1850.2	319.267
Middle Channel	1880.0	322.926
High Channel	1909.8	315.268

Emission Bandwidth (-26dBc) for EDGE 1900 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	1850.2	319.267
Middle Channel	1880.0	319.707
High Channel	1909.8	317.364

Emission Bandwidth (-26dBc) for UMTS band II		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
Low Channel	1852.4	4.686
Middle Channel	1880.0	4.668
High Channel	1907.6	4.716

Emission Bandwidth (-26dBc) for UMTS band V		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
Low Channel	826.4	4.619
Middle Channel	836.6	4.623
High Channel	846.6	4.639

9. BAND EDGE

9.1 Applicable Standard

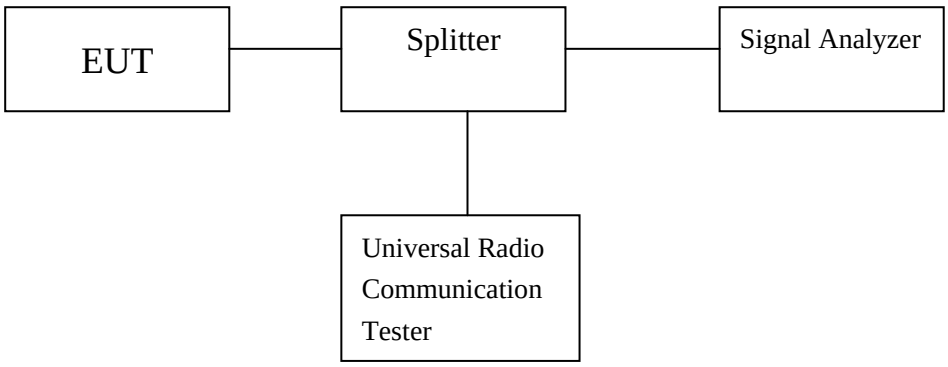
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

. 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 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.

9.2 Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.
3. Details according with KDB 971168 section 6.0.



Test Equipment List and Details

Refer a test equipment and calibration data table in this test report.

9.3 MEASUREMENT RESULT

Please refers to Appendix III for compliance test plots for band edges

10. Peak-to-Average Ratio

DESCRIPTION OF THE PAR MEASUREMENT

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

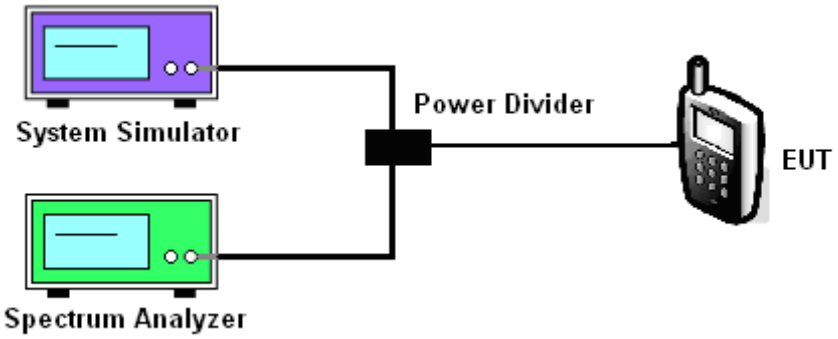
10.1 MEASURING INSTRUMENTS

See list of measuring instruments of this test report.

10.2 TEST PROCEDURES

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For GSM/EDGE operating modes:
   a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
   b. Set EUT in maximum power output, and triggered the burst signal.
   c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS operating modes:
   a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
   b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

10.3 TEST SETUP



10.4 TEST RESULT OF PEAK-TO-AVERAGE RATIO

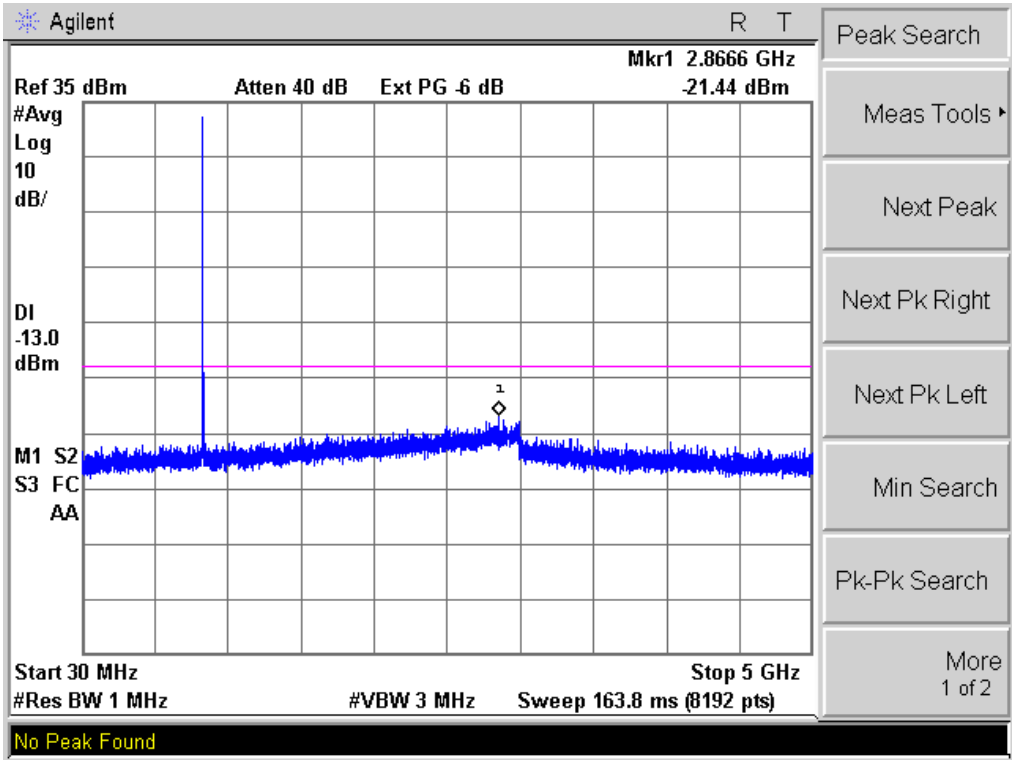
Cellular Band						
Modes	**GSM 850**			**PCS 1900**		
Channel	128 (Low)	190 (Mid)	251 (High)	512 (Low)	661 (Mid)	810 (High)
Frequency(MHz)	824.2	836.6	848.8	1850.2	1880	1909.8
Peak-to-Average Ratio (dB)	0.24	0.23	0.22	0.22	0.28	0.21
Cellular Band						
Modes	**WCDMA Band II (RMC 12.2Kbps)**			**WCDMA Band V (RMC 12.2Kbps)**		
Channel	9262 (Low)	9400 (Mid)	9538 (High)	4132 (Low)	4183 (Mid)	4233 (High)
Frequency(MHz)	1852.4	1880	1907.6	826.4	836.6	846.6
Peak-to-Average Ratio (dB)	2.35	2.29	2.38	2.37	2.48	2.61

APPENDIX I

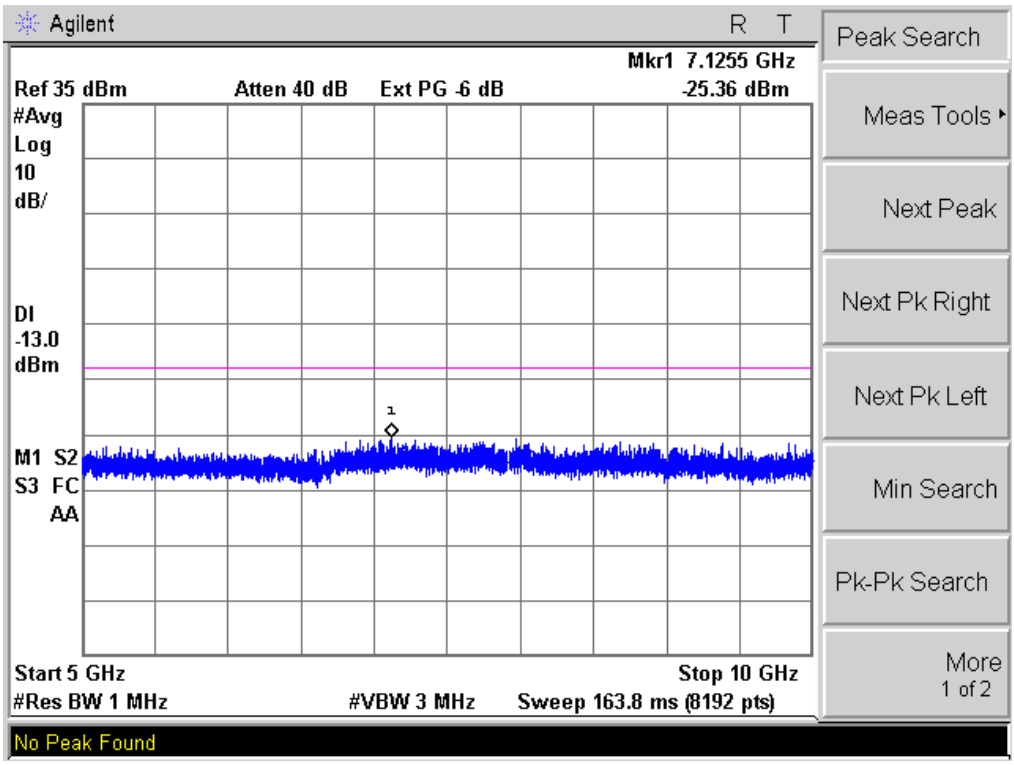
TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

CONDUCTED EMISSION IN GSM 850 BAND

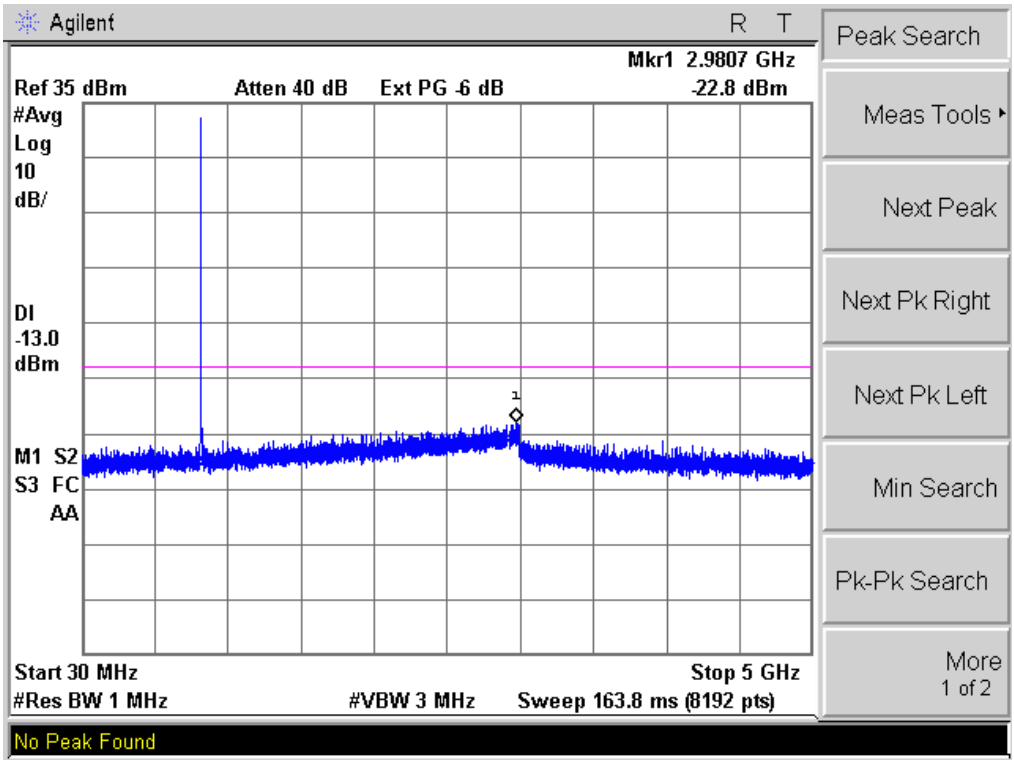
Conducted Emission Transmitting Mode CH 128 30MHz – 5GHz



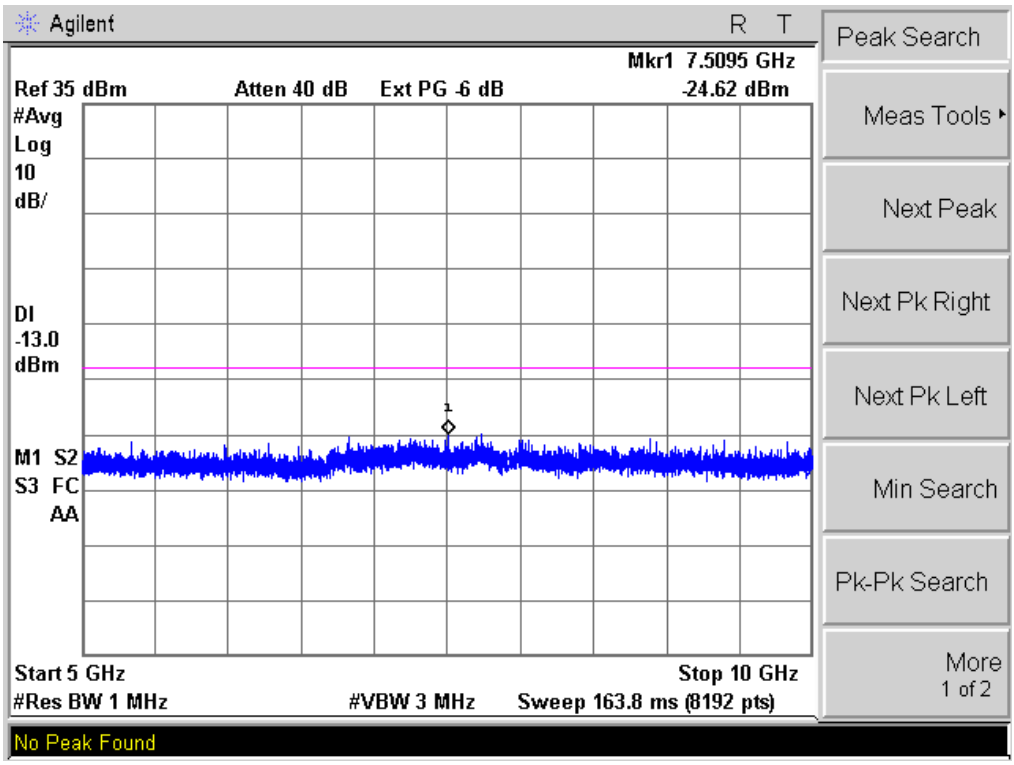
Conducted Emission Transmitting Mode CH 128 5GHz – 10GHz



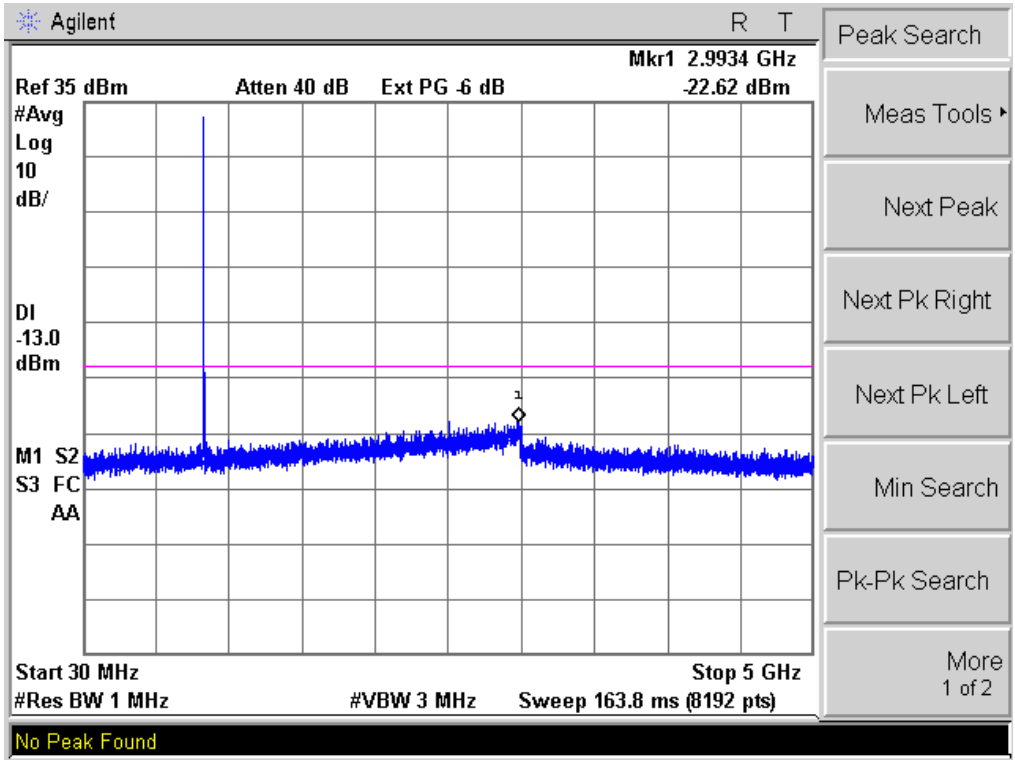
Conducted Emission Transmitting Mode CH 190 30MHz – 5GHz



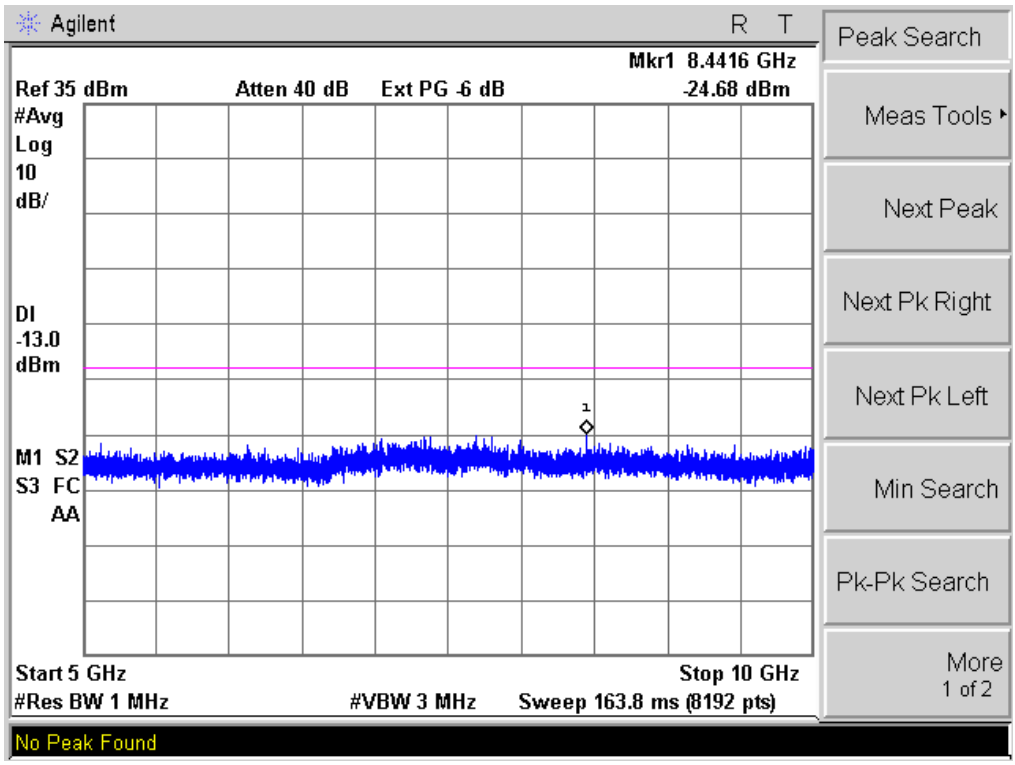
Conducted Emission Transmitting Mode CH 190 5GHz – 10GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 5GHz

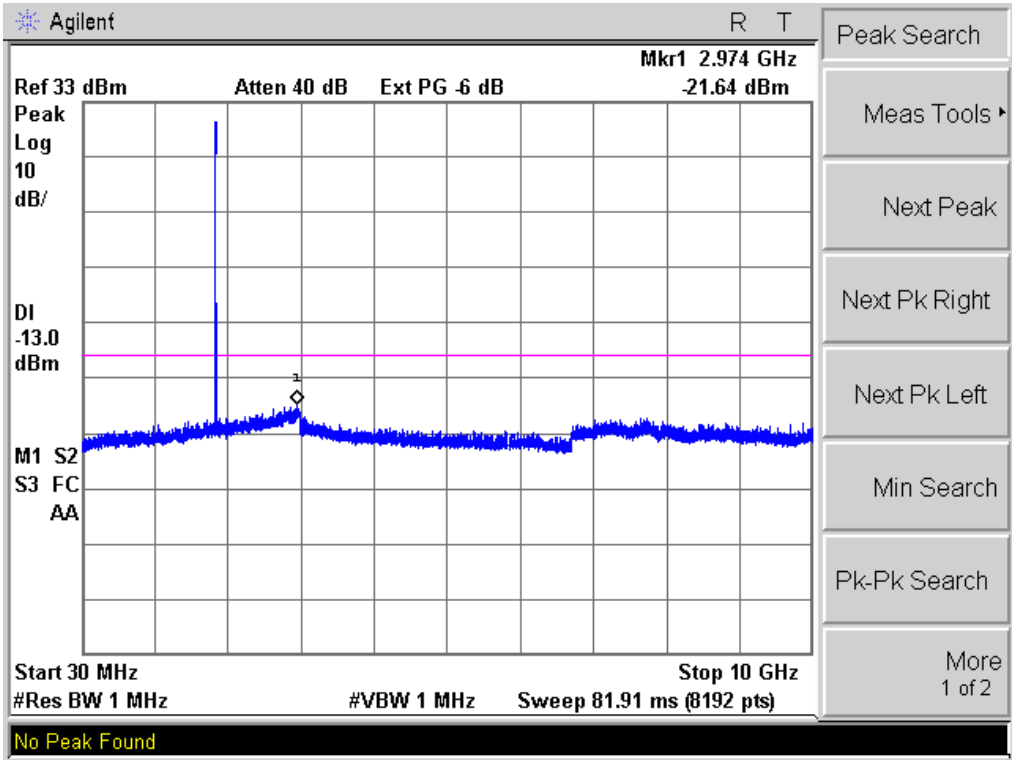


Conducted Emission Transmitting Mode CH 251 5GHz – 10GHz

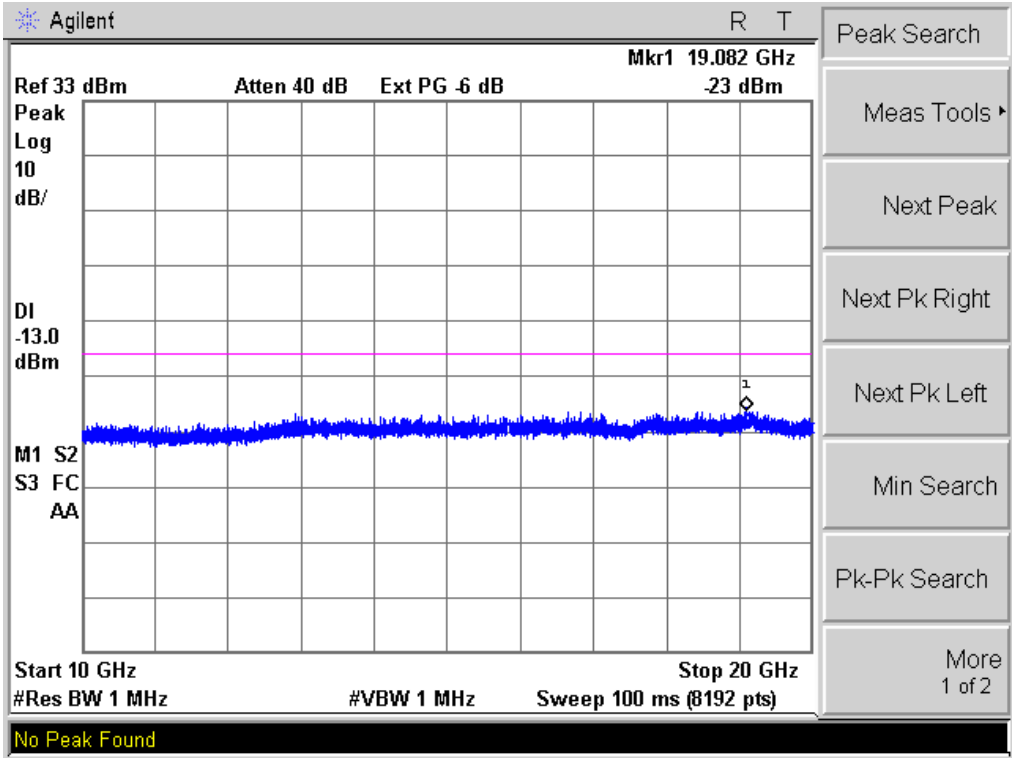


CONDUCTED EMISSION IN PCS1900 BAND

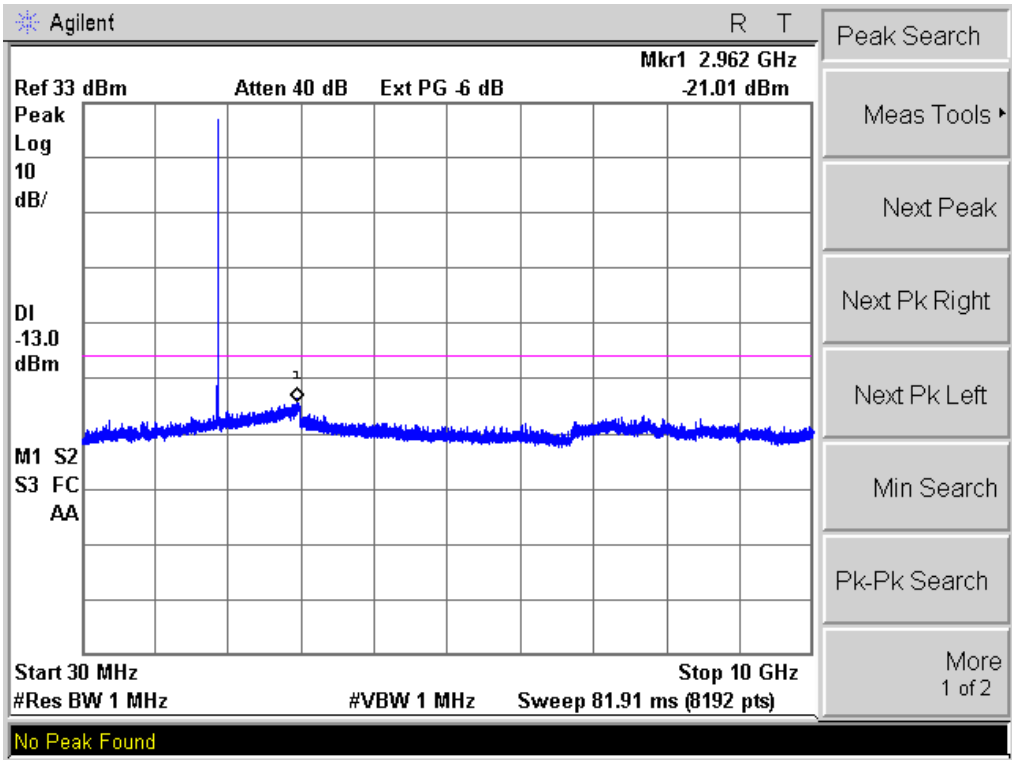
Conducted Emission Transmitting Mode CH 512 30MHz – 10GHz



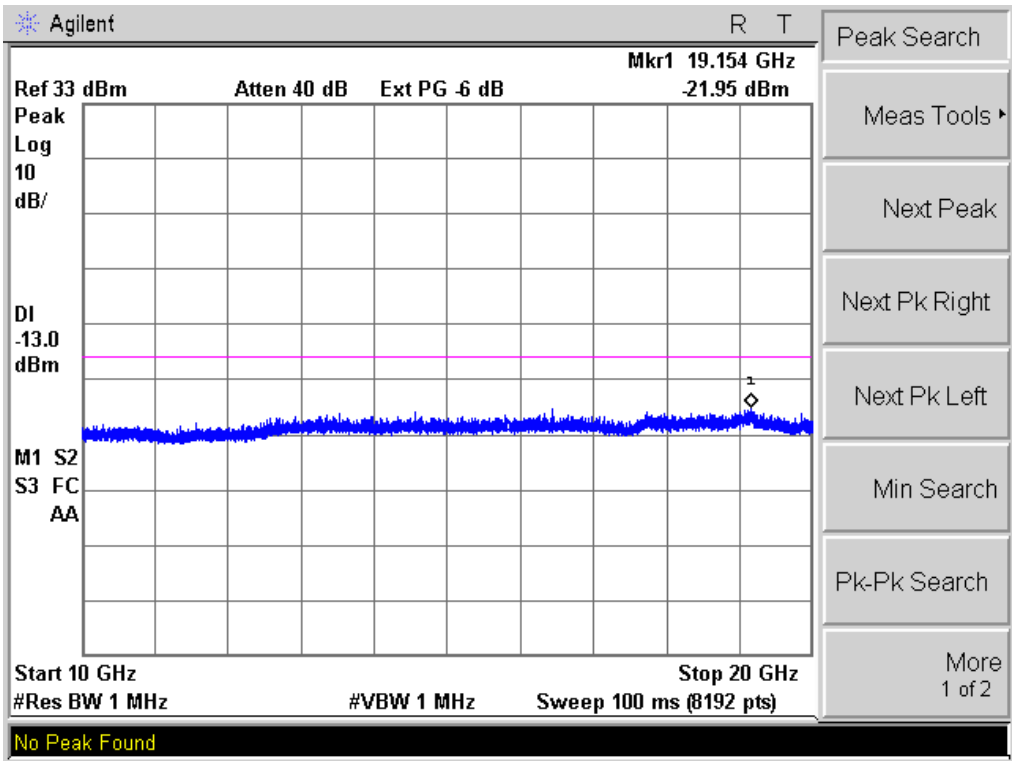
Conducted Emission Transmitting Mode CH 512 10GHz – 20GHz



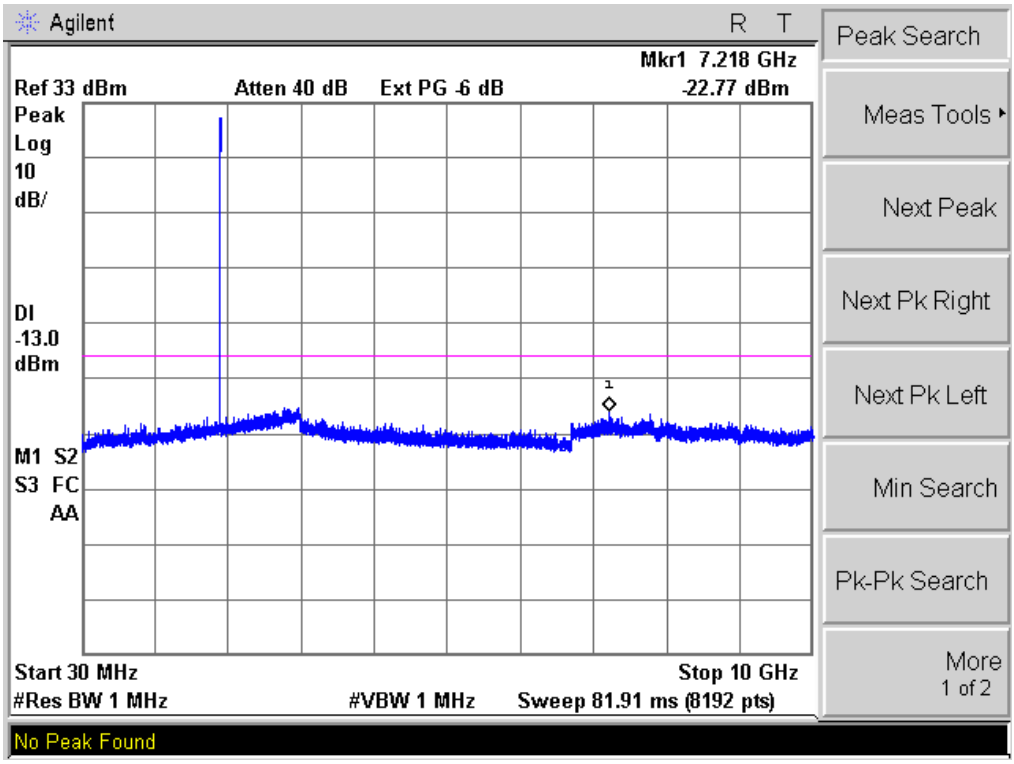
Conducted Emission Transmitting Mode CH 661 30MHz – 10GHz



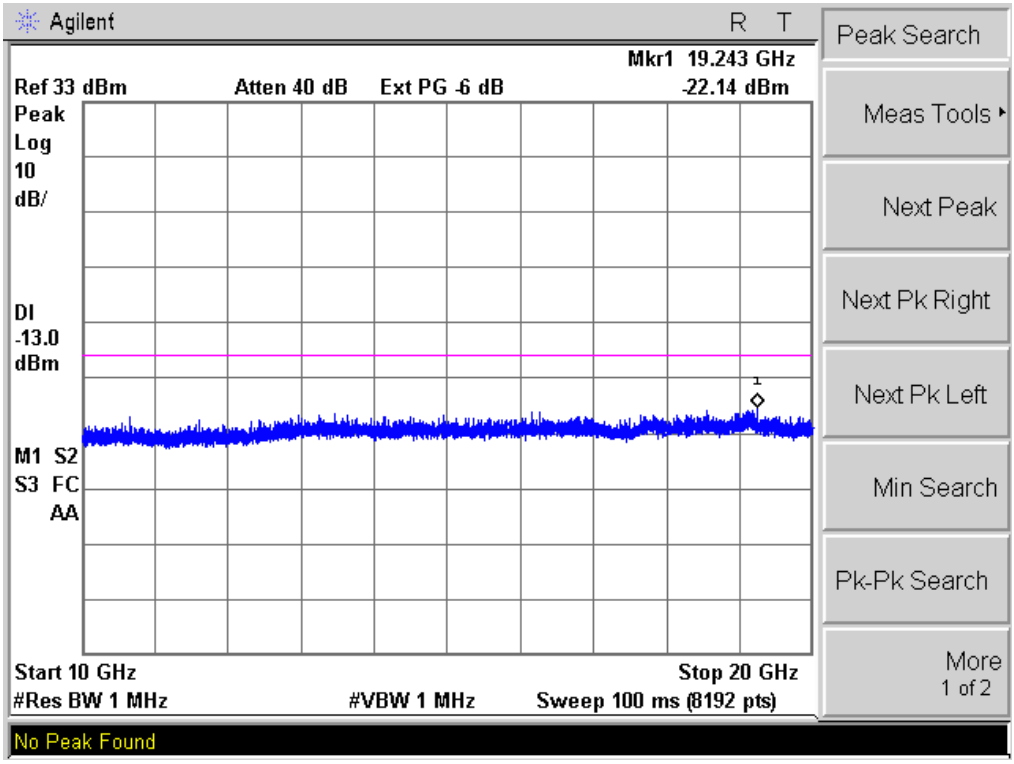
Conducted Emission Transmitting Mode CH 661 10GHz – 20GHz



Conducted Emission Transmitting Mode CH 810 30MHz – 10GHz

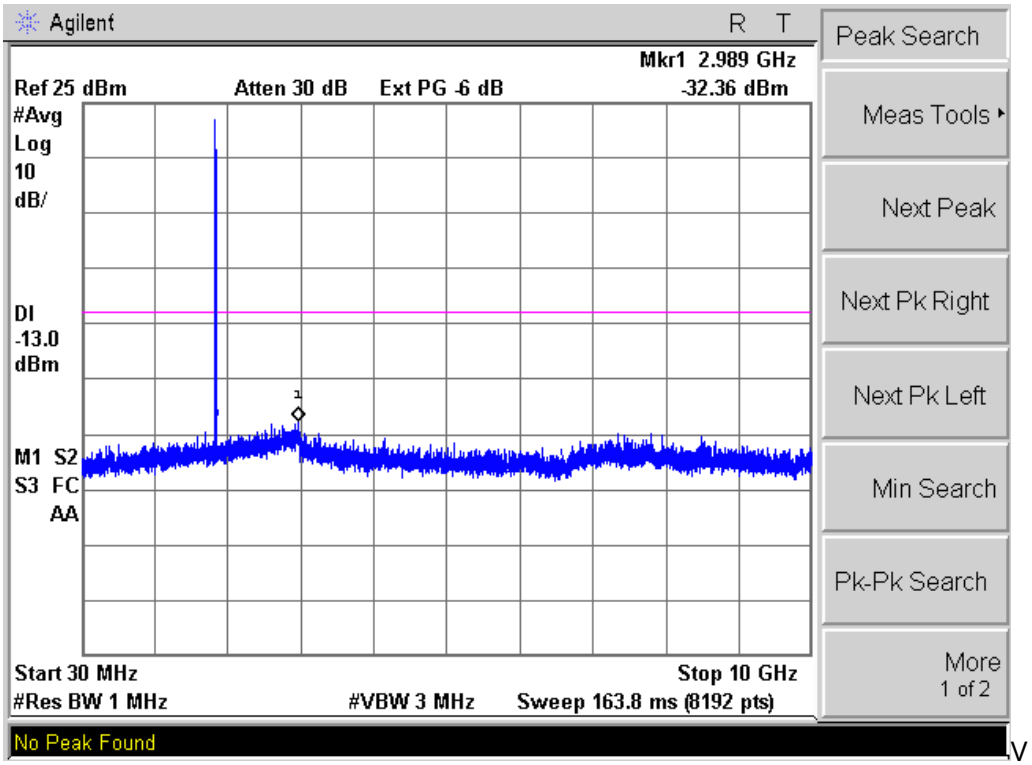


Conducted Emission Transmitting Mode CH 810 10GHz – 20GHz



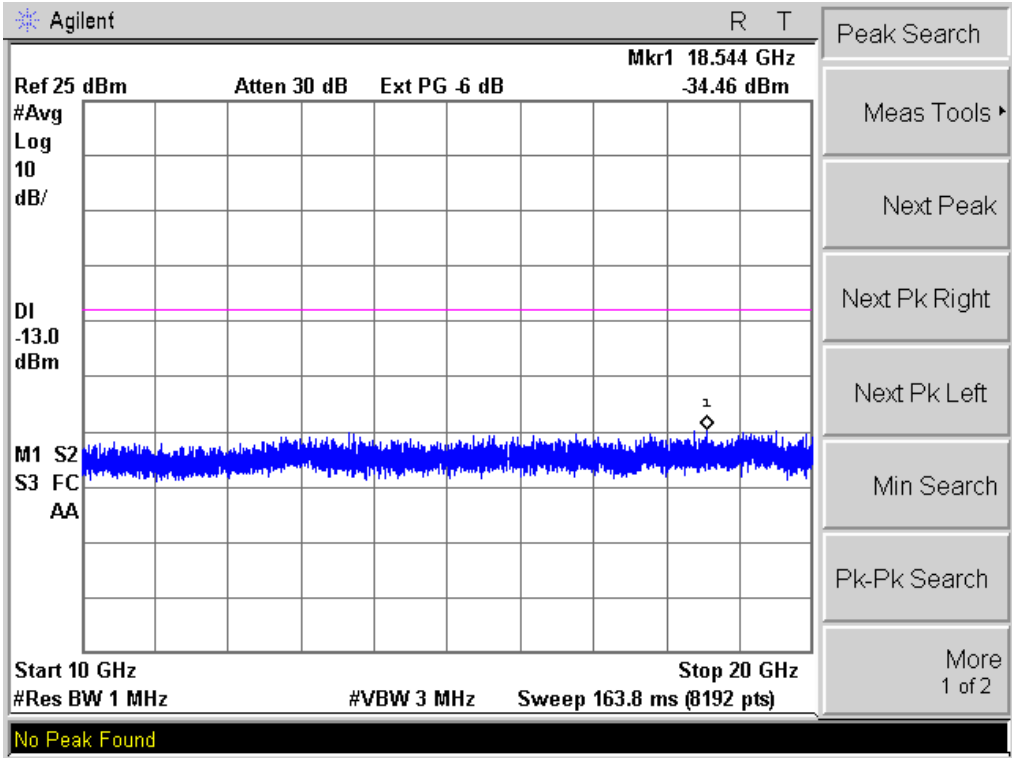
CONDUCTED EMISSION IN UMTS band II

Conducted Emission Transmitting Mode CH 9262 30MHz – 10GHz

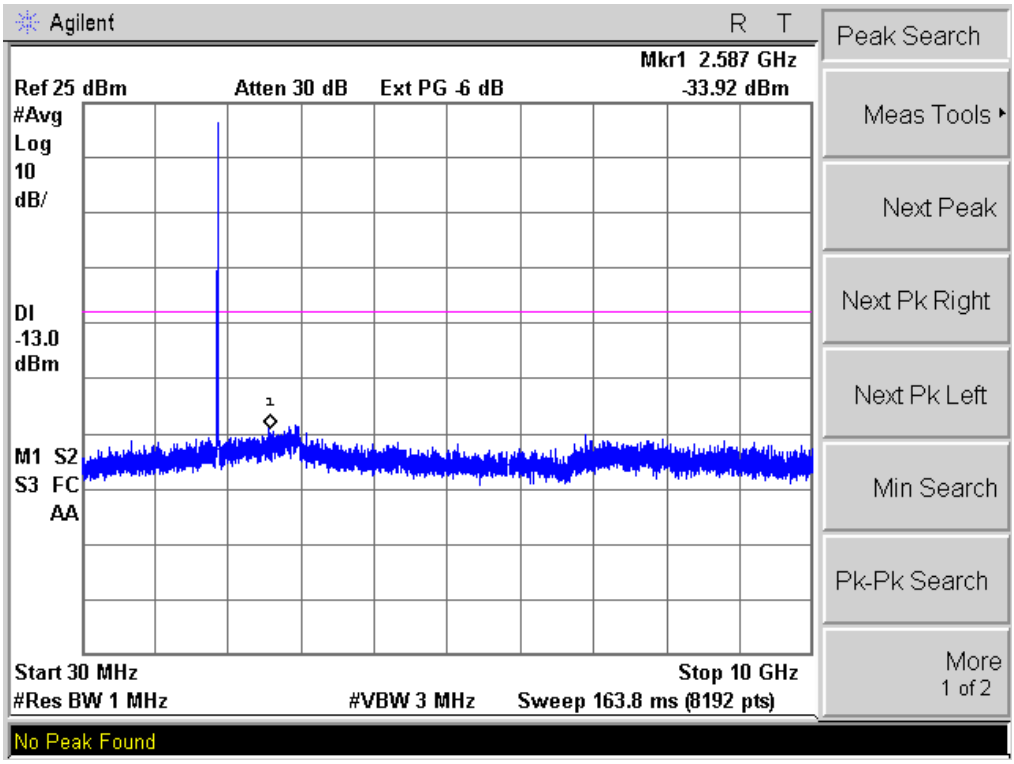


V

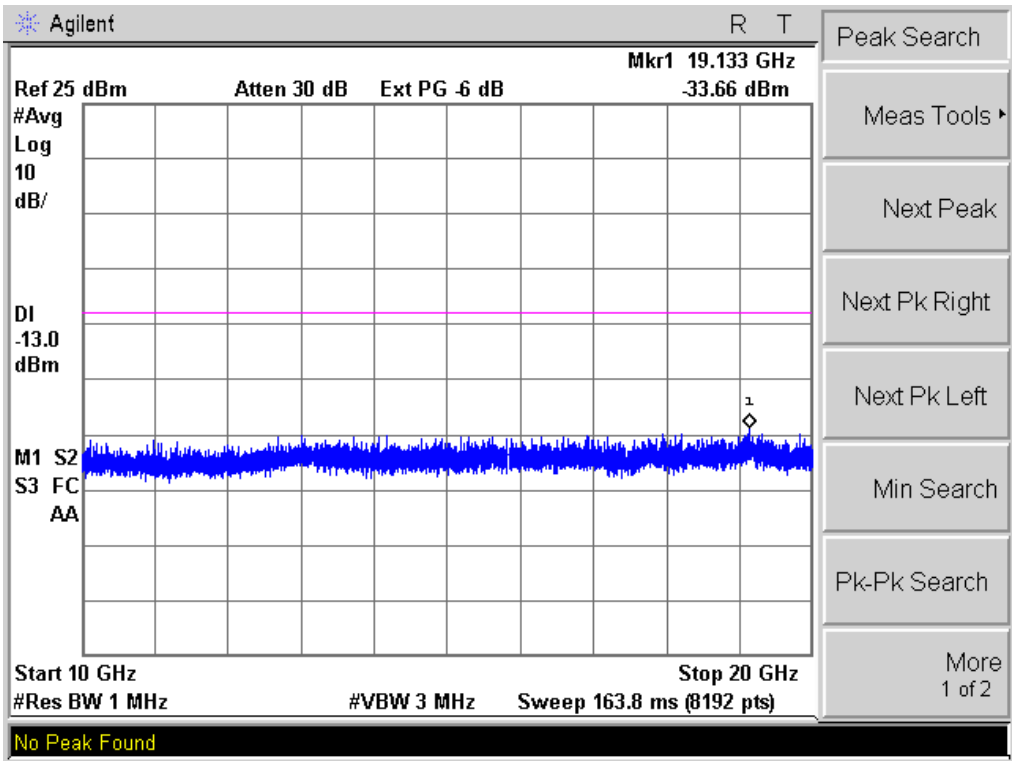
Conducted Emission Transmitting Mode CH 9262 10GHz – 20GHz



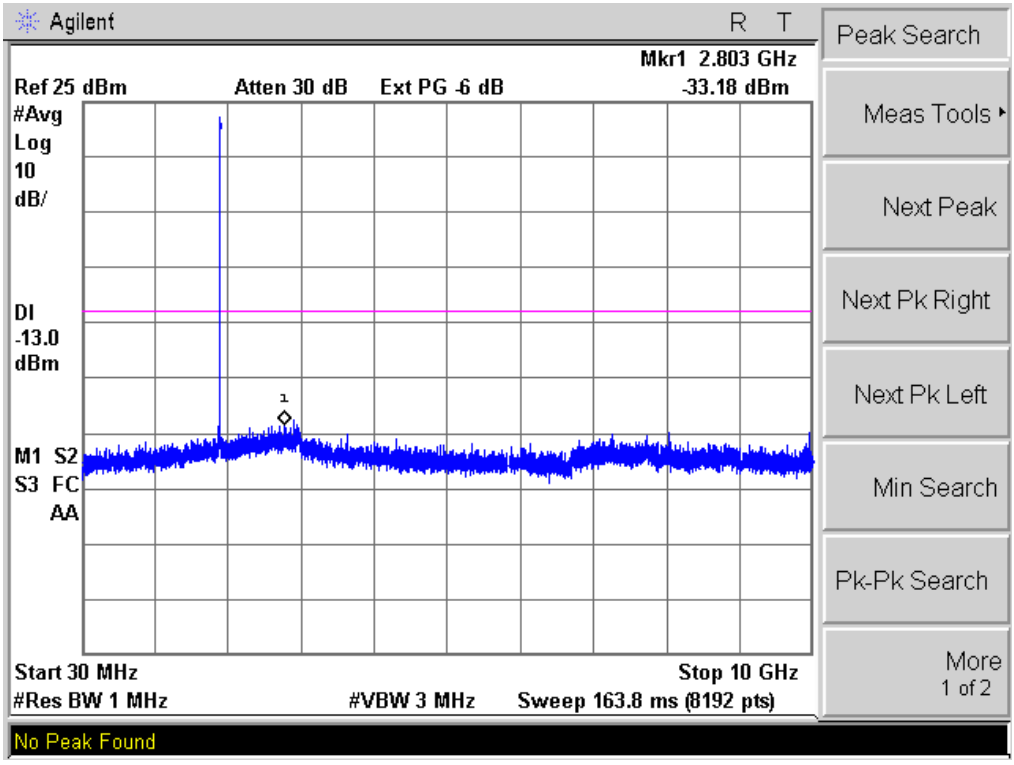
Conducted Emission Transmitting Mode CH 9400 30MHz – 10GHz



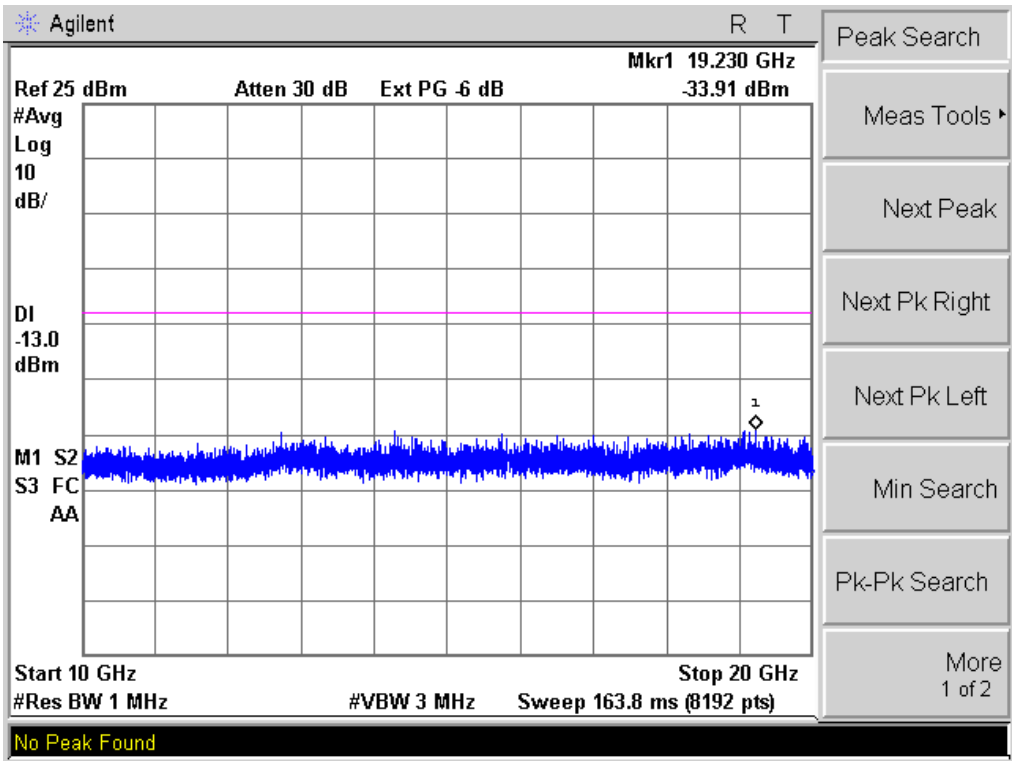
Conducted Emission Transmitting Mode CH 9400 10GHz – 20GHz



Conducted Emission Transmitting Mode CH 9538 30MHz – 10GHz

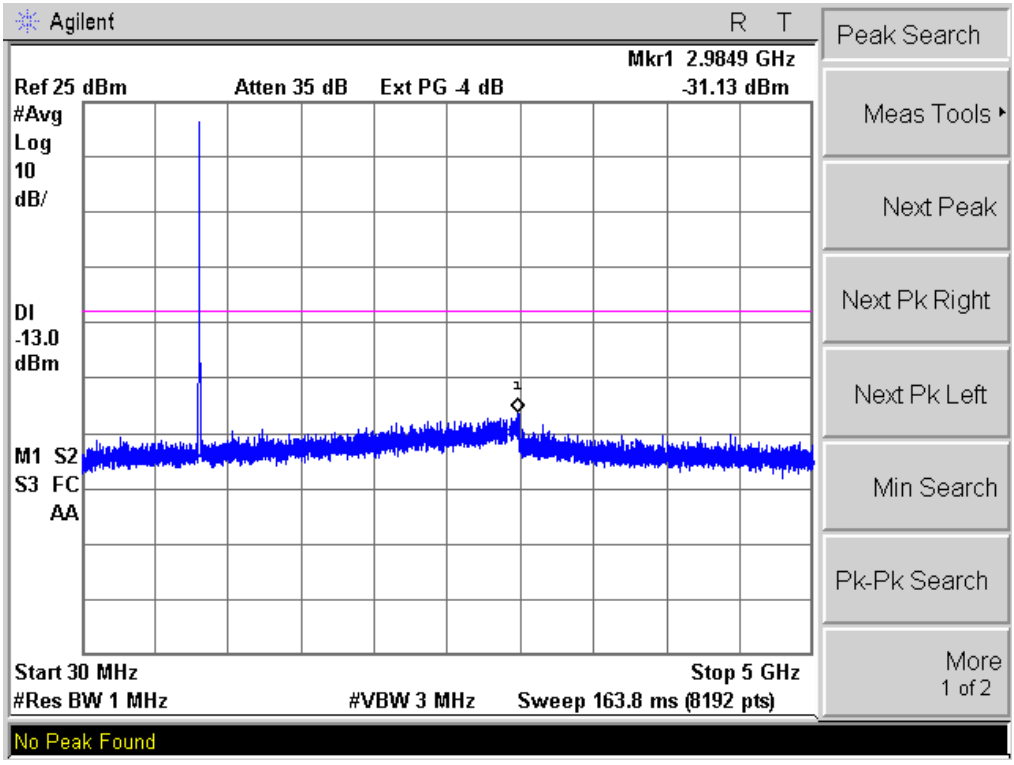


Conducted Emission Transmitting Mode CH 9538 10GHz – 20GHz

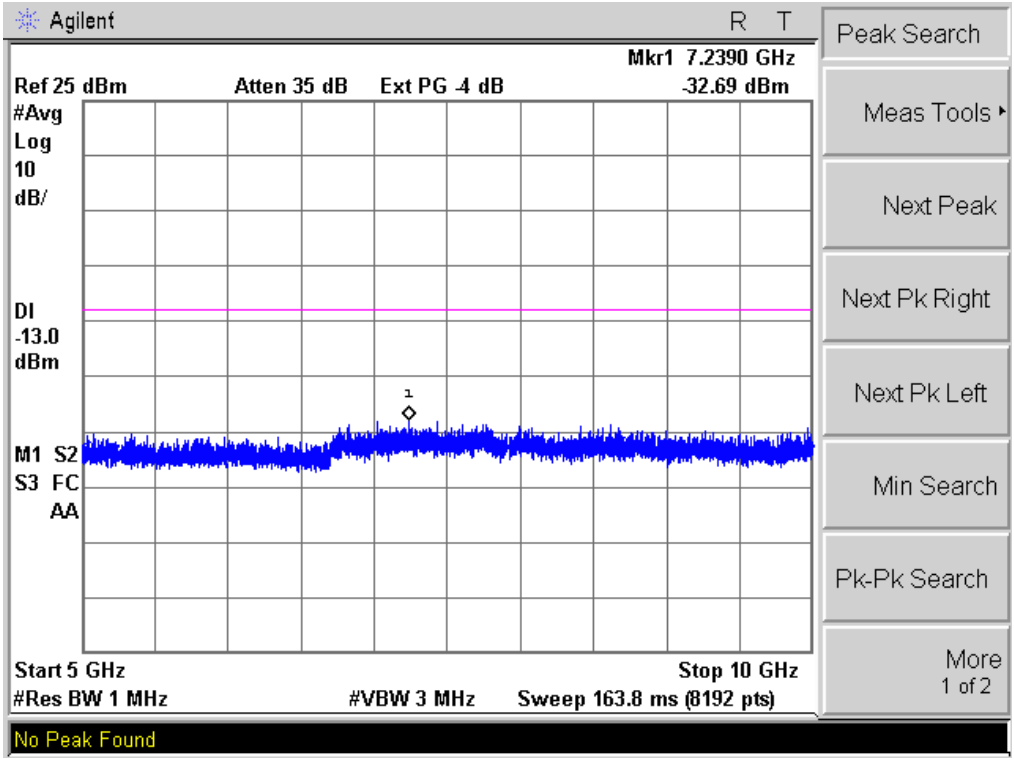


CONDUCTED EMISSION IN UMTS band V

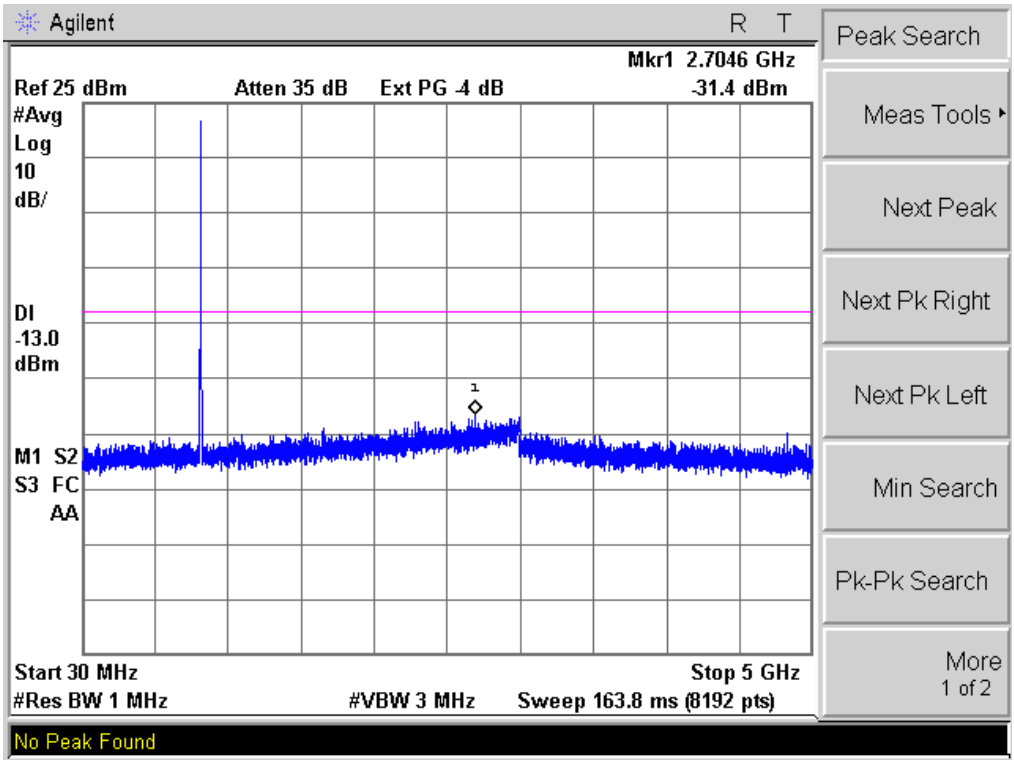
Conducted Emission Transmitting Mode CH 4132 30MHz – 5GHz



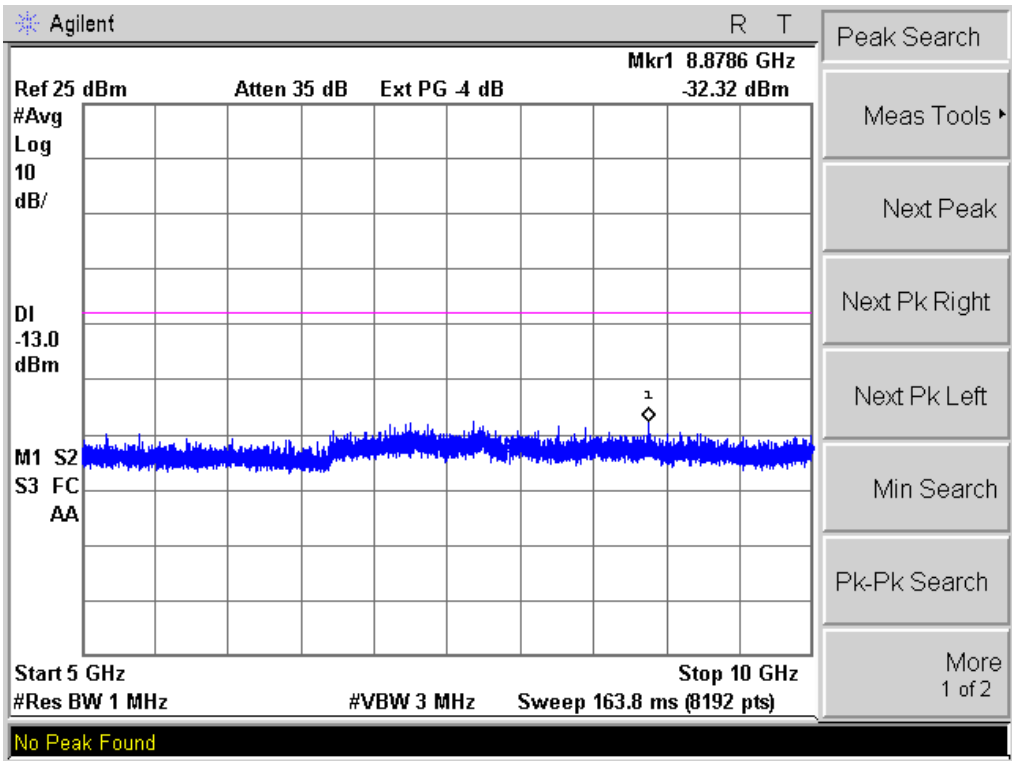
Conducted Emission Transmitting Mode CH 4132 5GHz – 10GHz



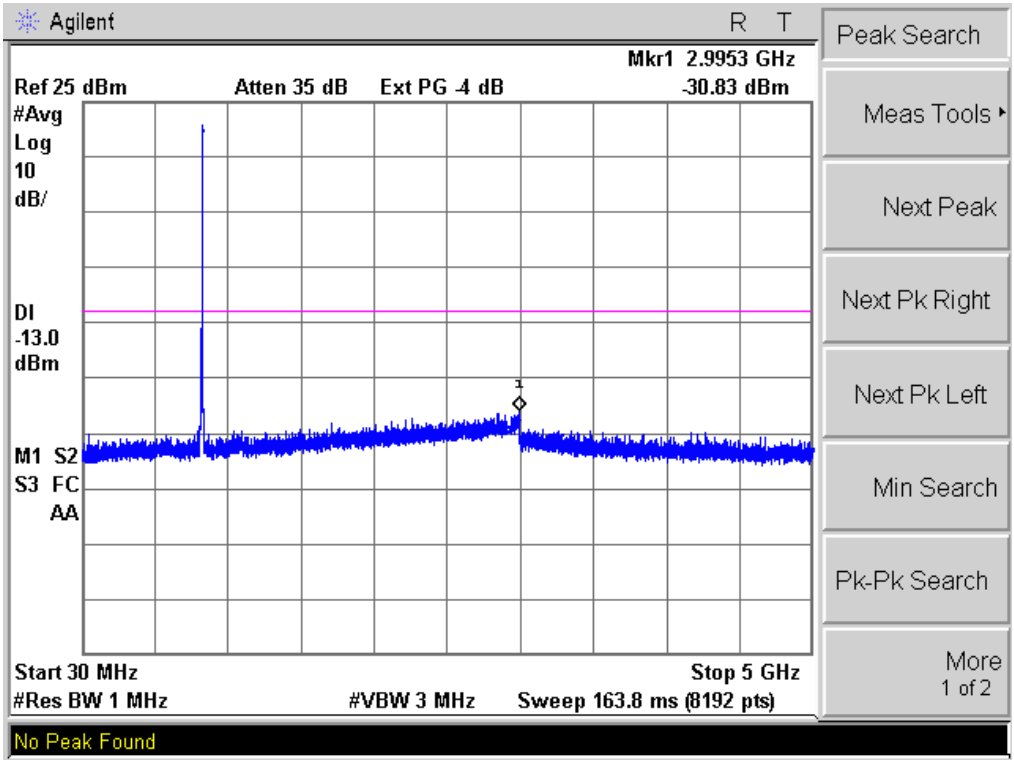
Conducted Emission Transmitting Mode CH 4183 30MHz –5GHz



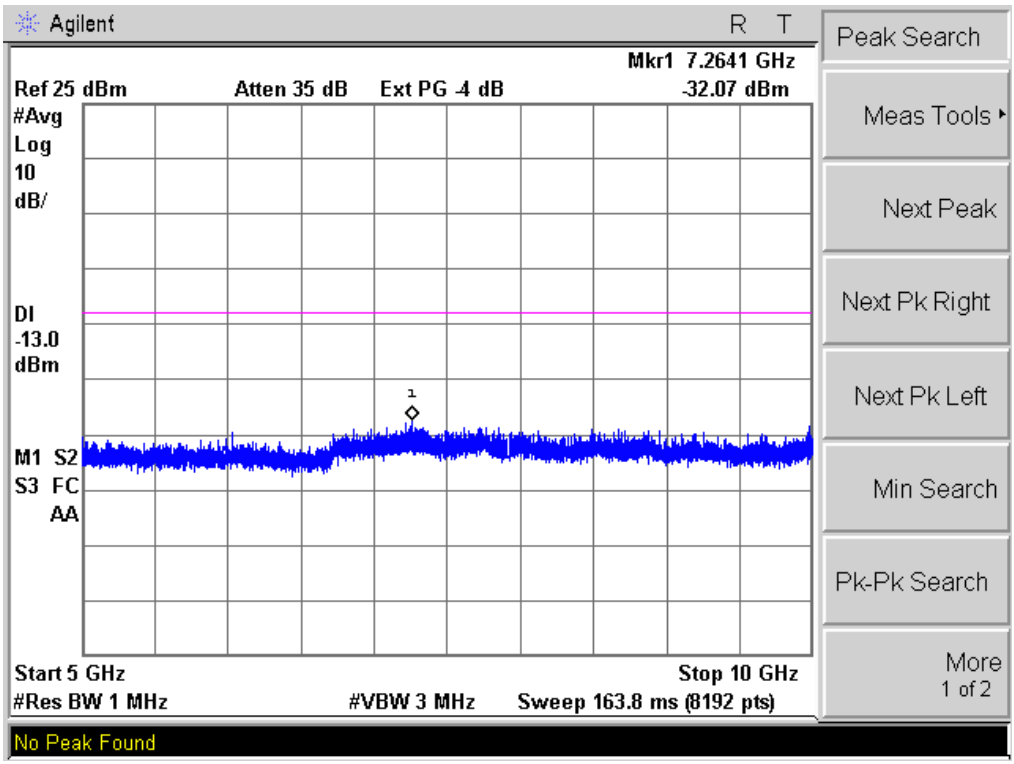
Conducted Emission Transmitting Mode CH 4183 5GHz – 10GHz



Conducted Emission Transmitting Mode CH 4233 30MHz – 5GHz



Conducted Emission Transmitting Mode CH 4233 5GHz – 10GHz

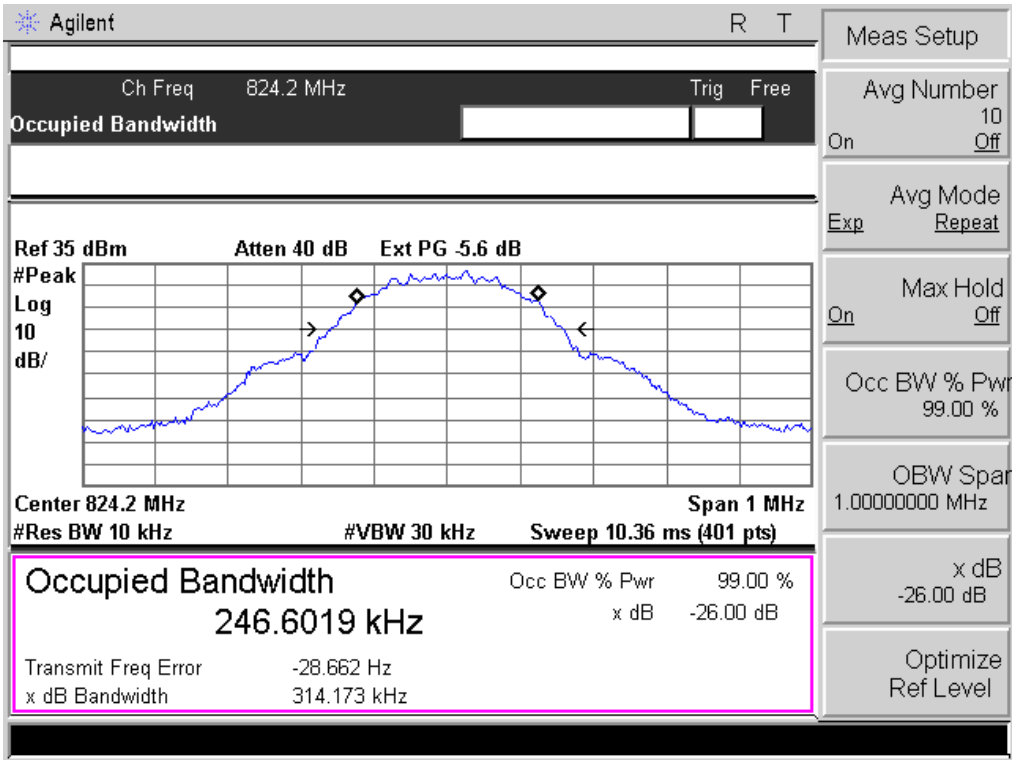


APPENDIX II

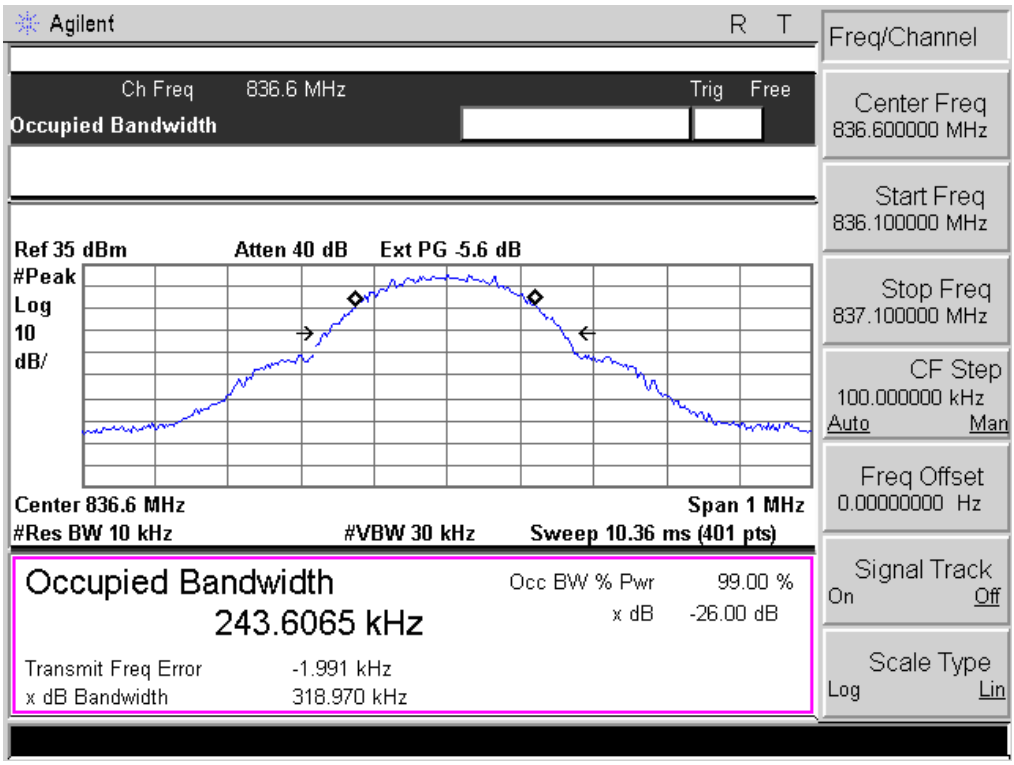
TEST PLOTS FOR OCCUPIED BANDWIDTH (99%)

EMISSION BANDWIDTH (-26dBC)

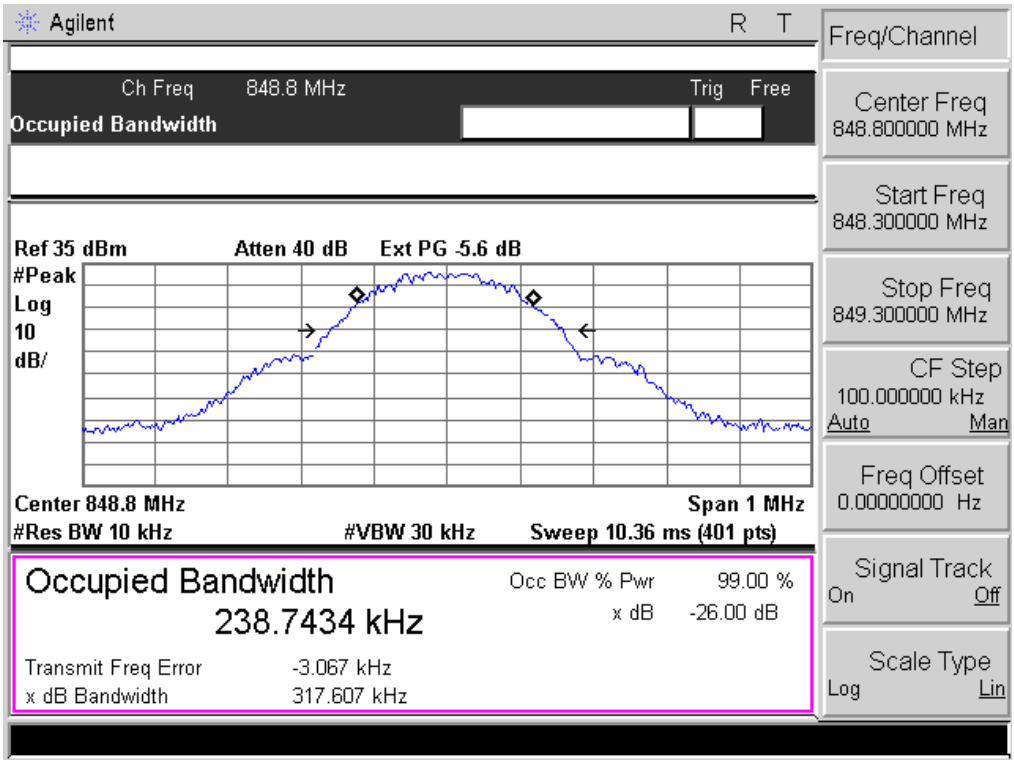
Occupied Bandwidth (99%) GSM 850 BAND CH 128



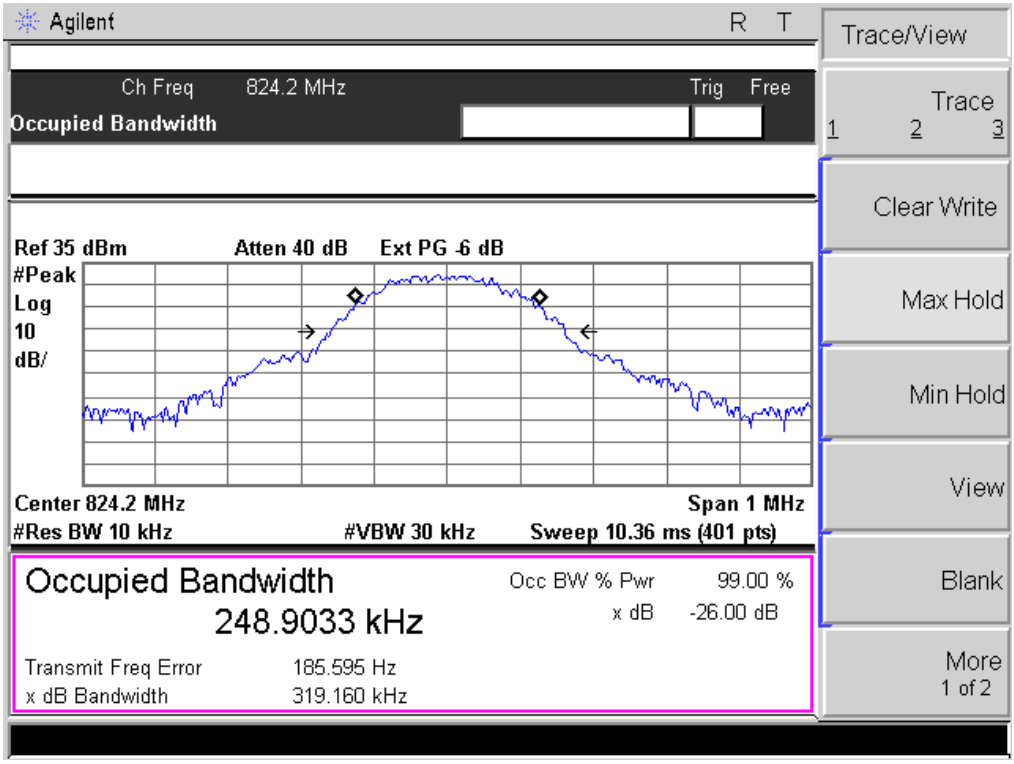
Occupied Bandwidth (99%) GSM 850 BAND CH 190



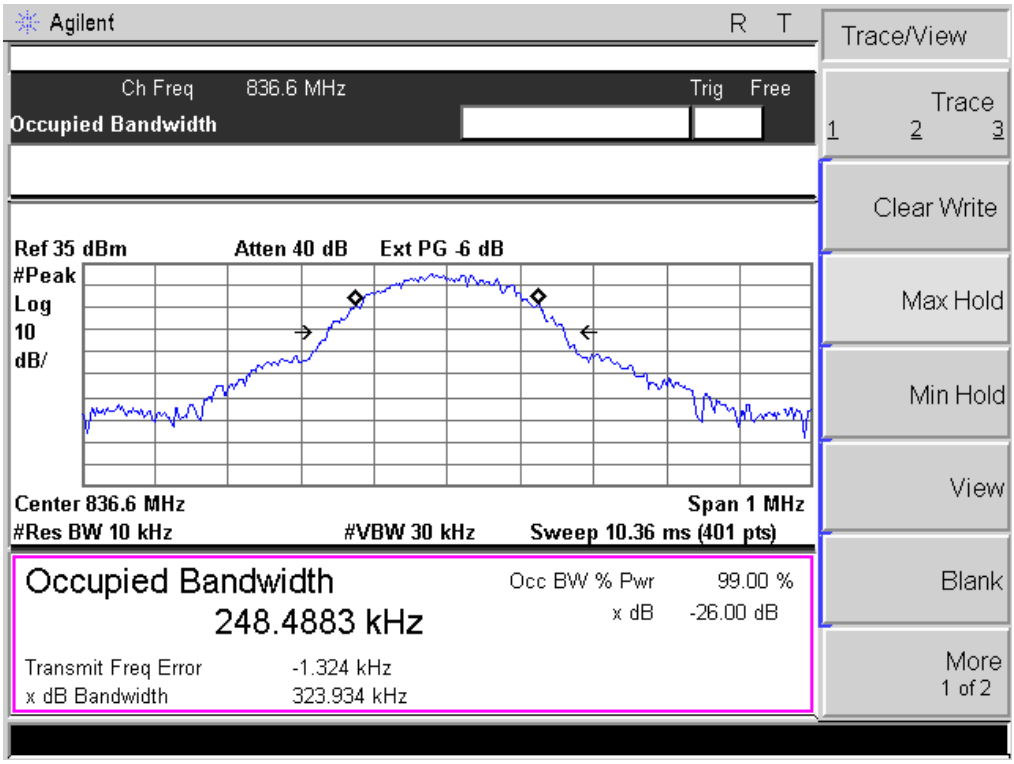
Occupied Bandwidth (99%) GSM 850 BAND CH 251



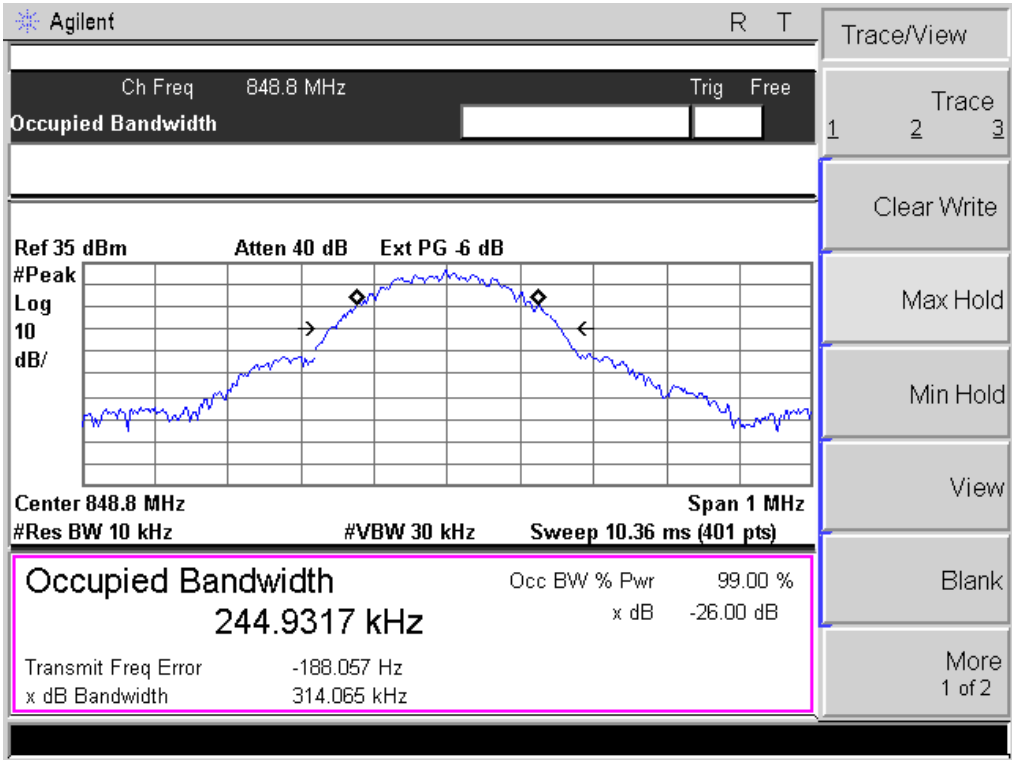
Occupied Bandwidth (99%) EDGE 850 BAND CH 128



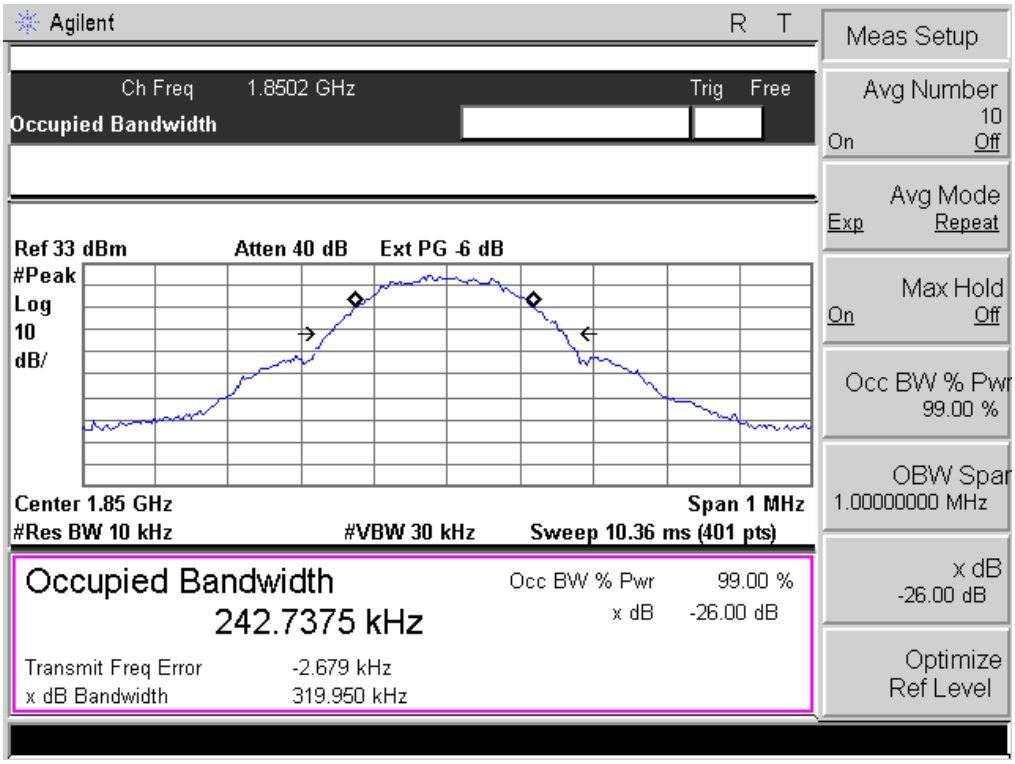
Occupied Bandwidth (99%) EDGE 850 BAND CH 190



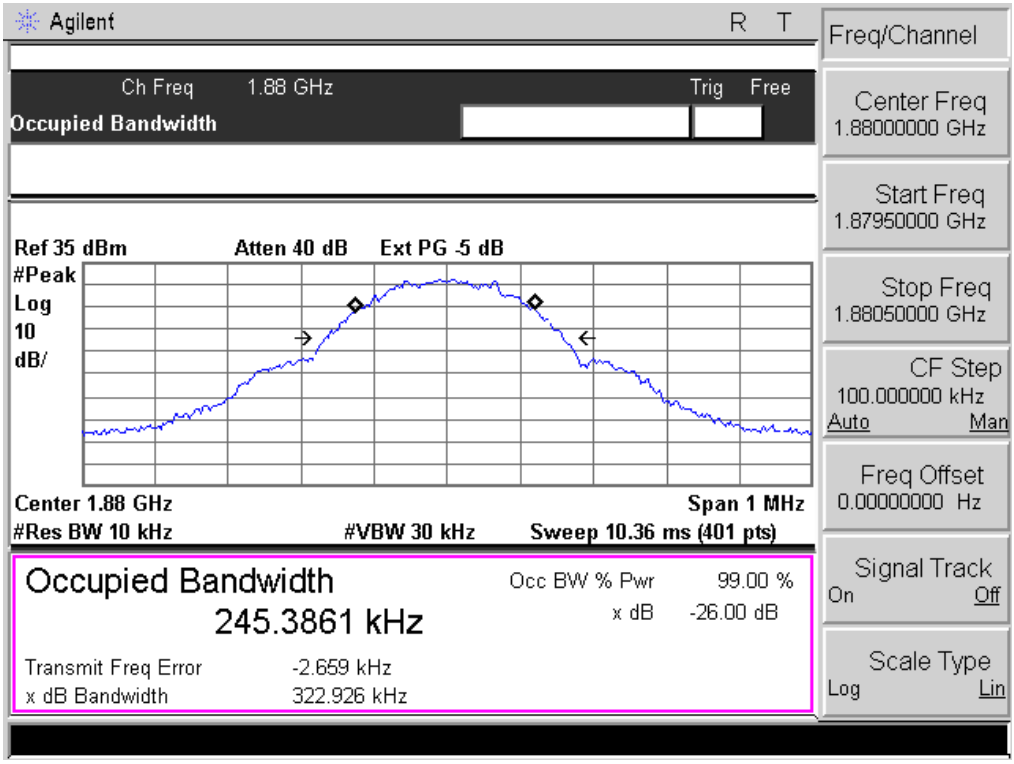
Occupied Bandwidth (99%) EDGE 850 BAND CH 251



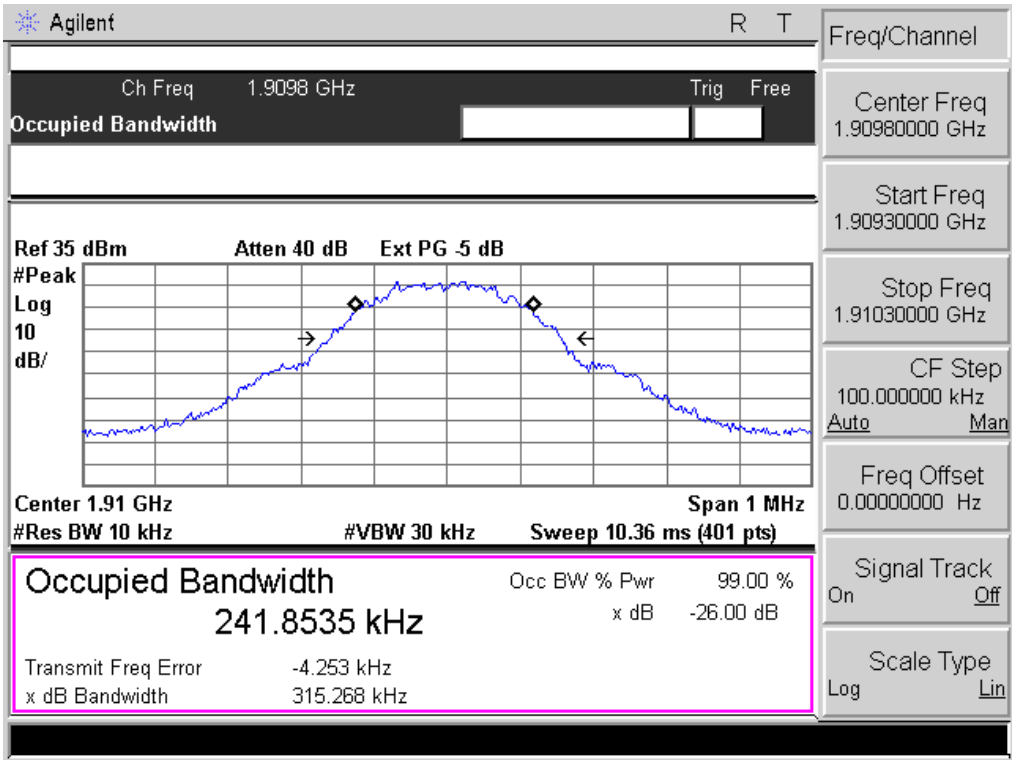
Occupied Bandwidth (99%) PCS 1900 BAND CH 512



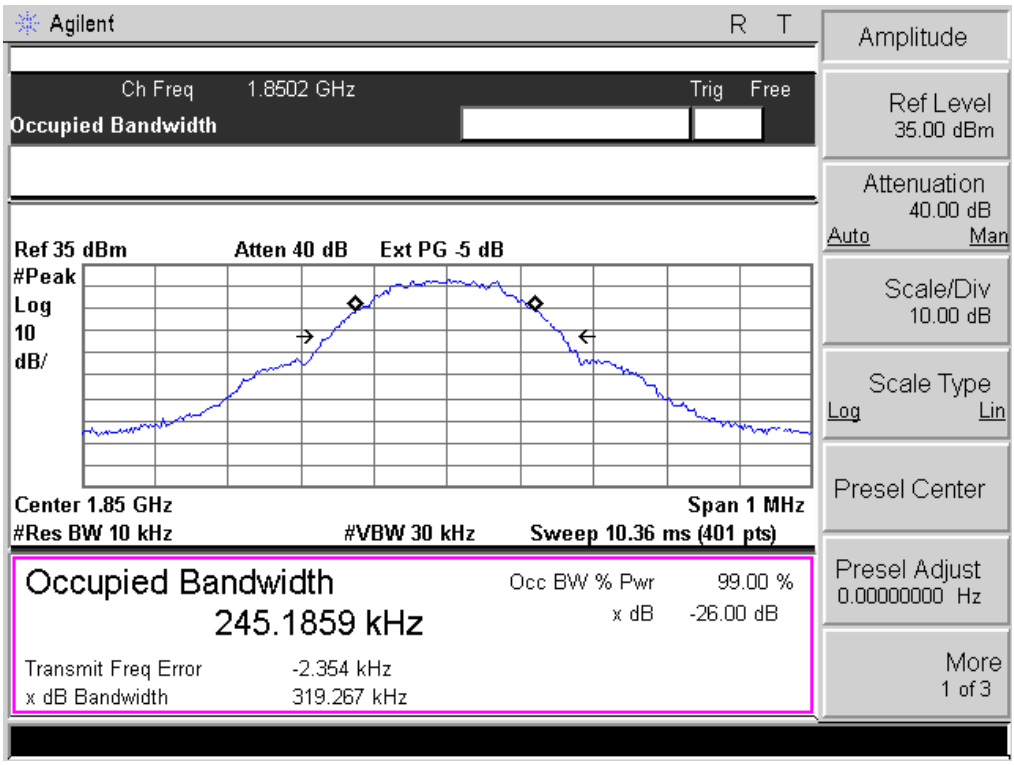
Occupied Bandwidth (99%) PCS 1900 BAND CH 661



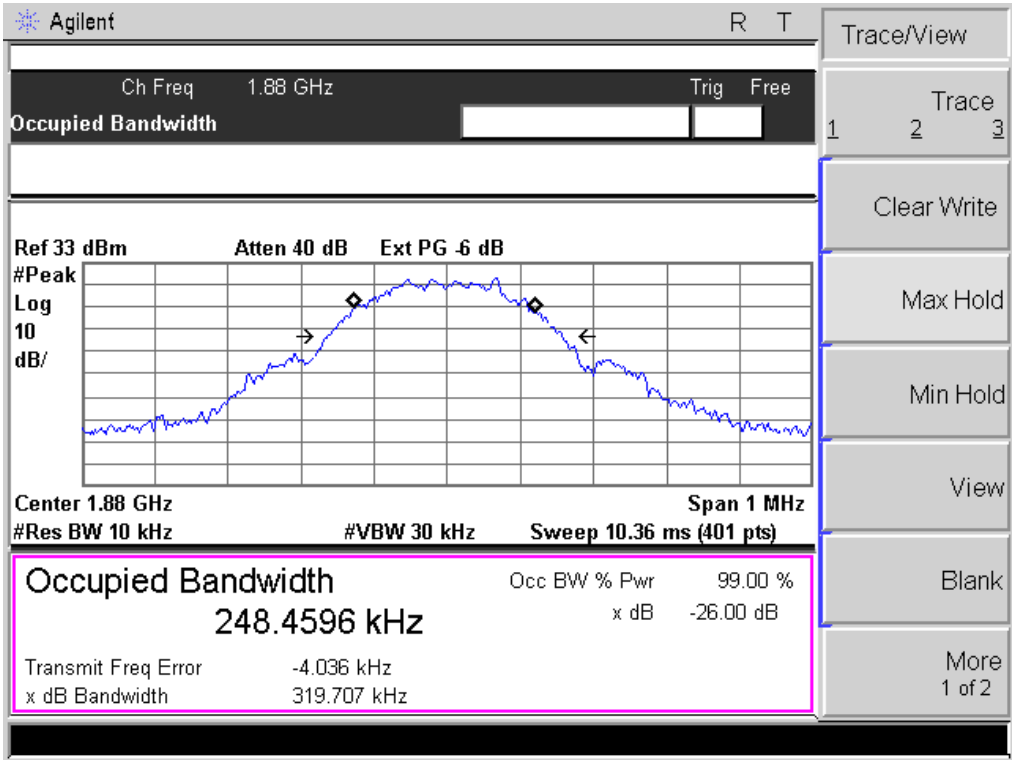
Occupied Bandwidth (99%) PCS 1900 BAND CH 810



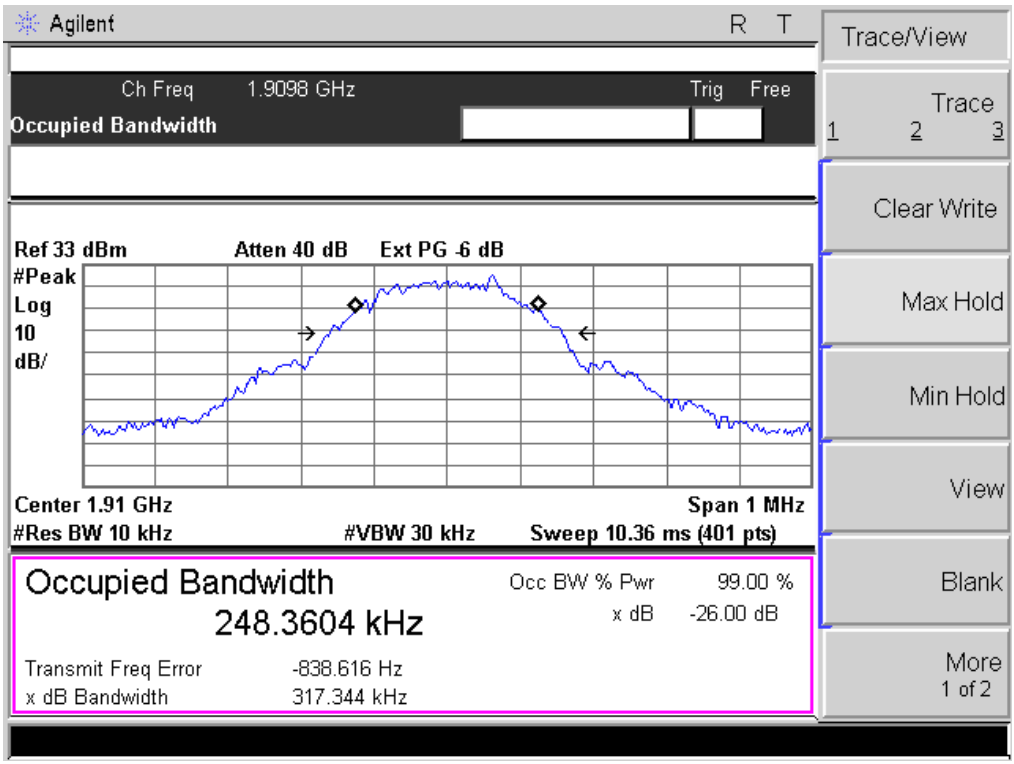
Occupied Bandwidth (99%) EDGE 1900 BAND CH 512



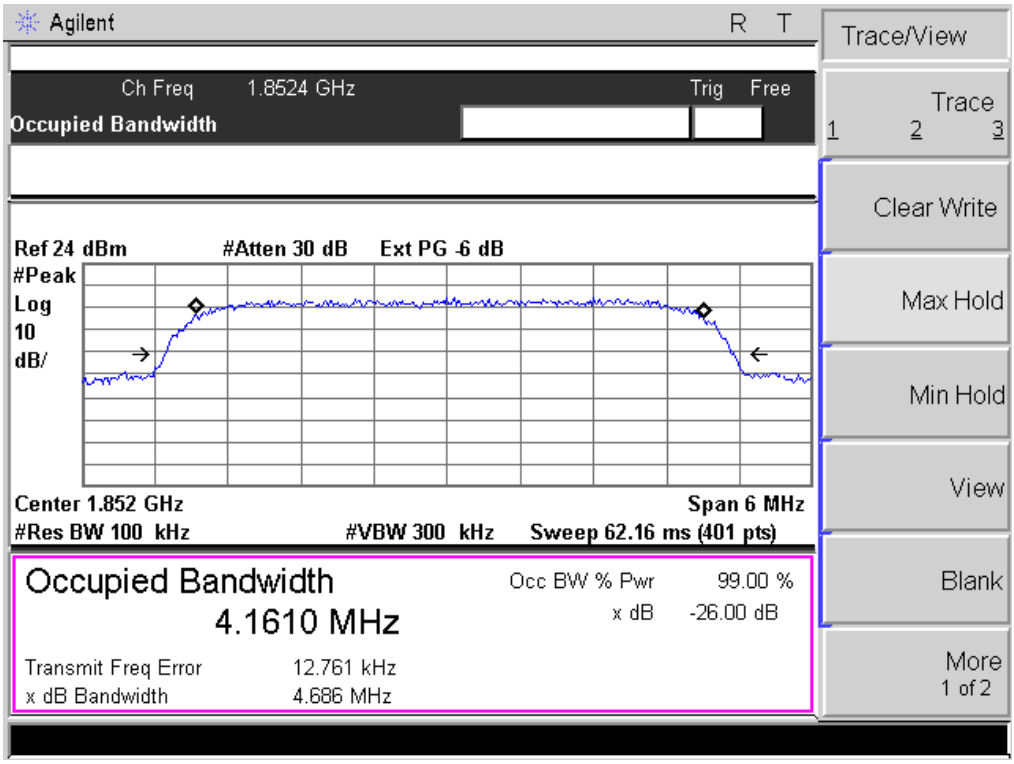
Occupied Bandwidth (99%) EDGE 1900 BAND CH 661



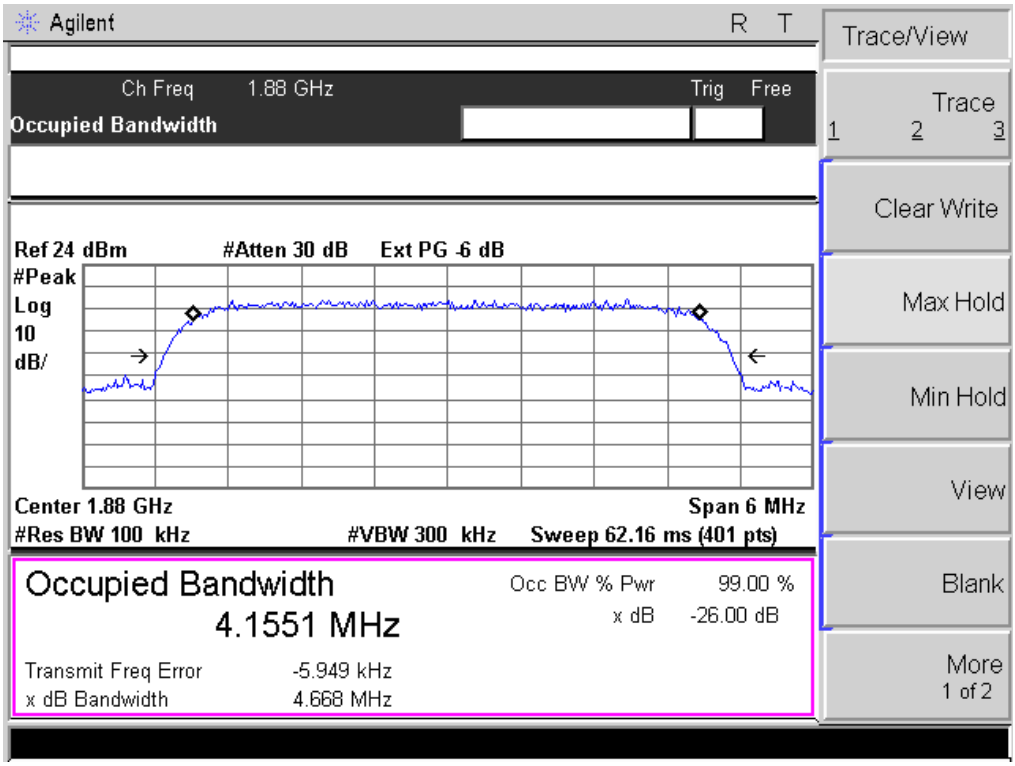
Occupied Bandwidth (99%) EDGE 1900 BAND CH 810



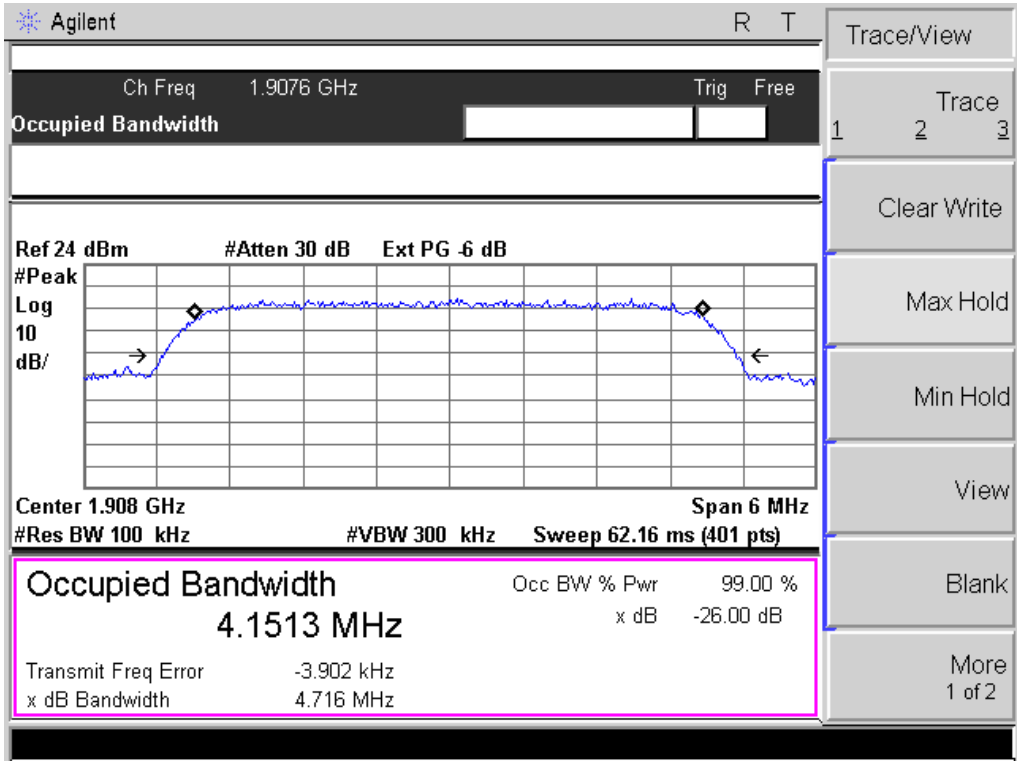
Occupied Bandwidth (99%) UMTS band II CH 9262



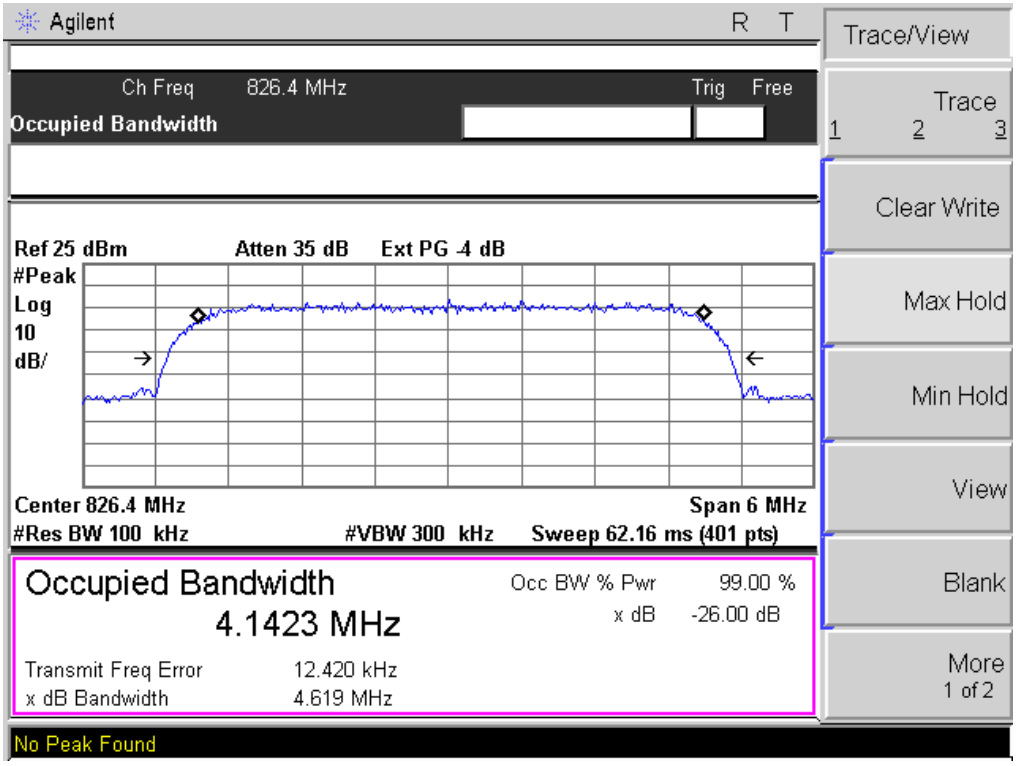
Occupied Bandwidth (99%) UMTS band II CH 9400



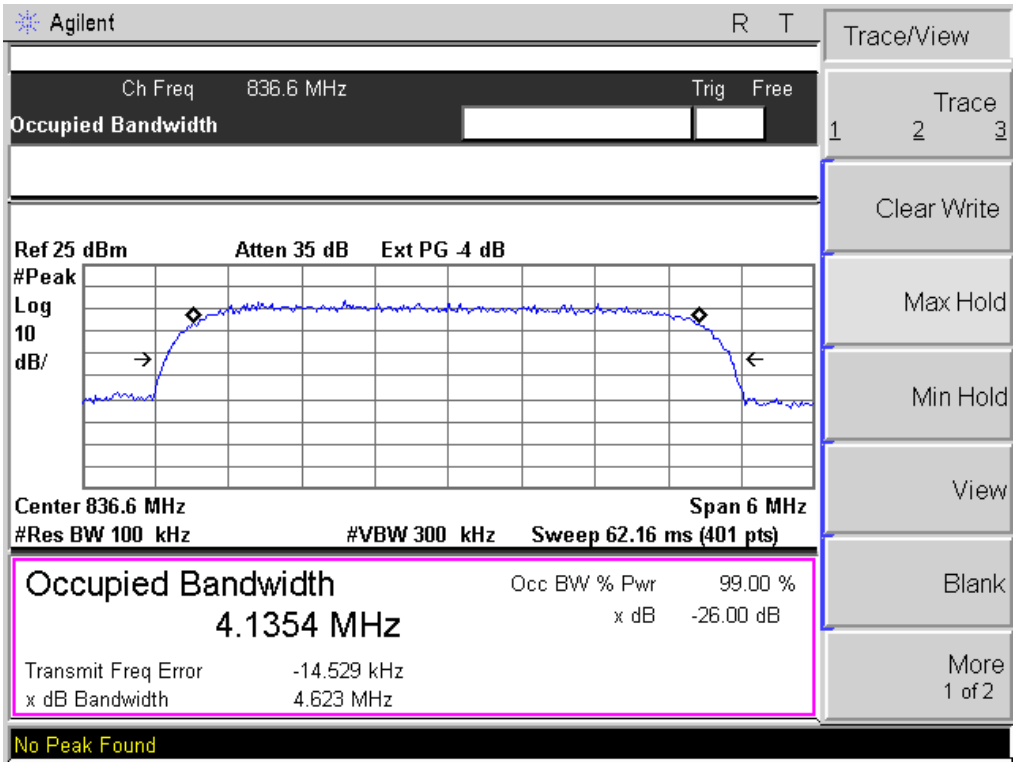
Occupied Bandwidth (99%) UMTS band II CH 9538



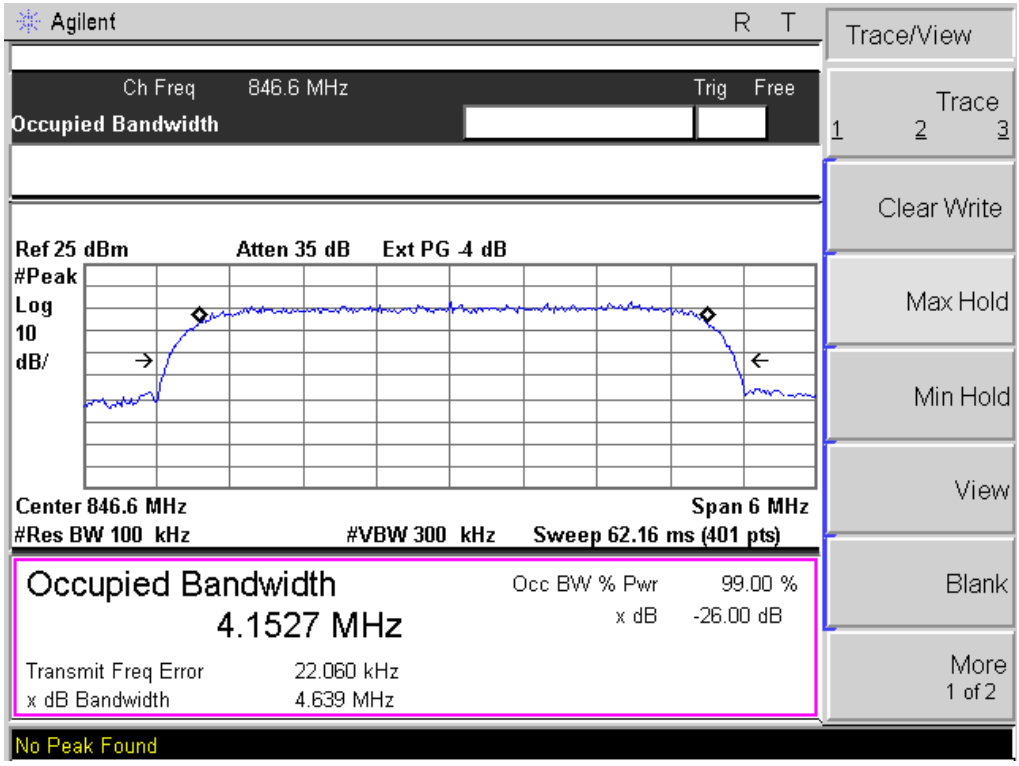
Occupied Bandwidth (99%) UMTS band V CH 4132



Occupied Bandwidth (99%) UMTS band V CH 4183



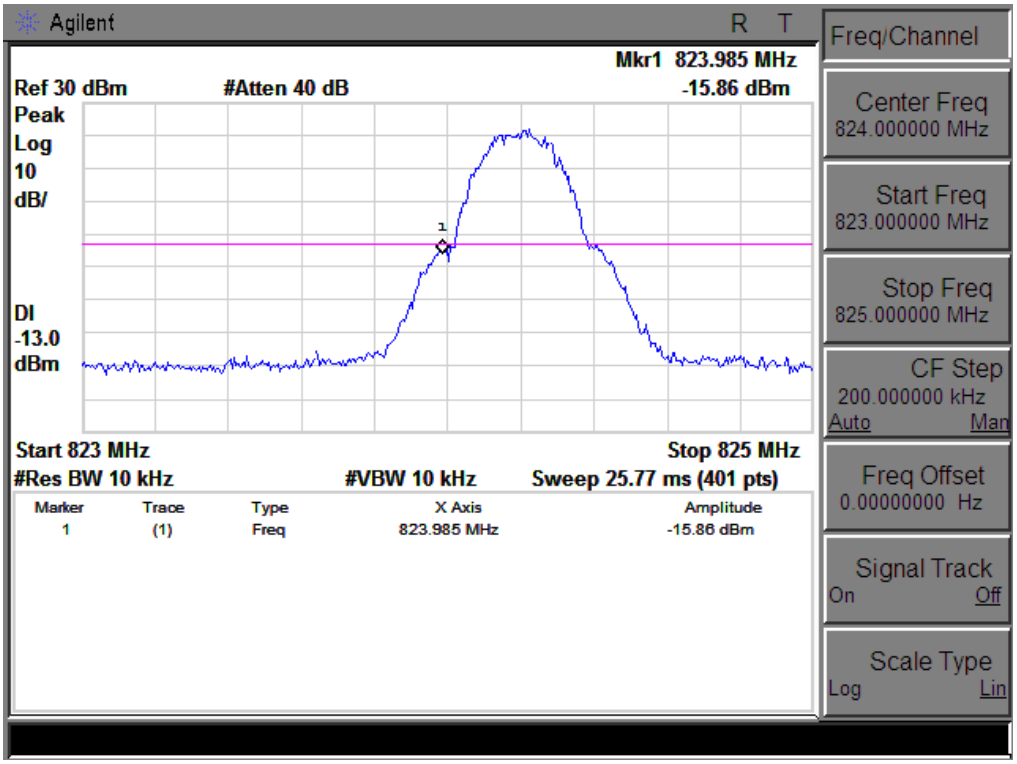
Occupied Bandwidth (99%) UMTS band V CH 4233



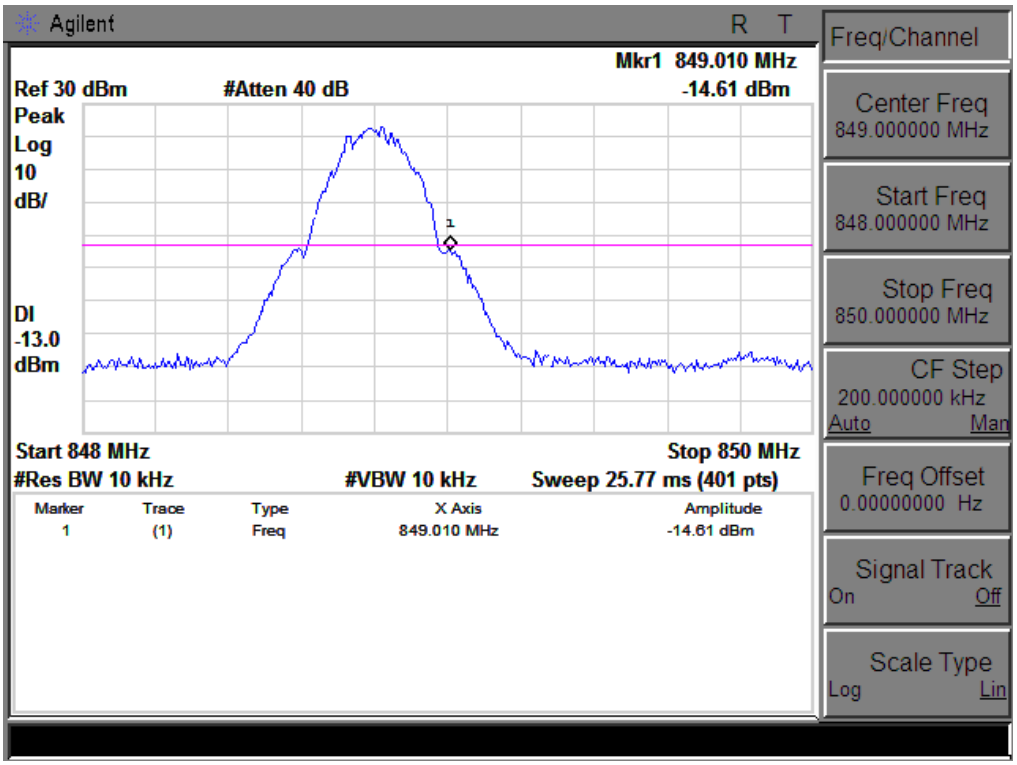
APPENDIX III

TEST PLOTS FOR BAND EDGES

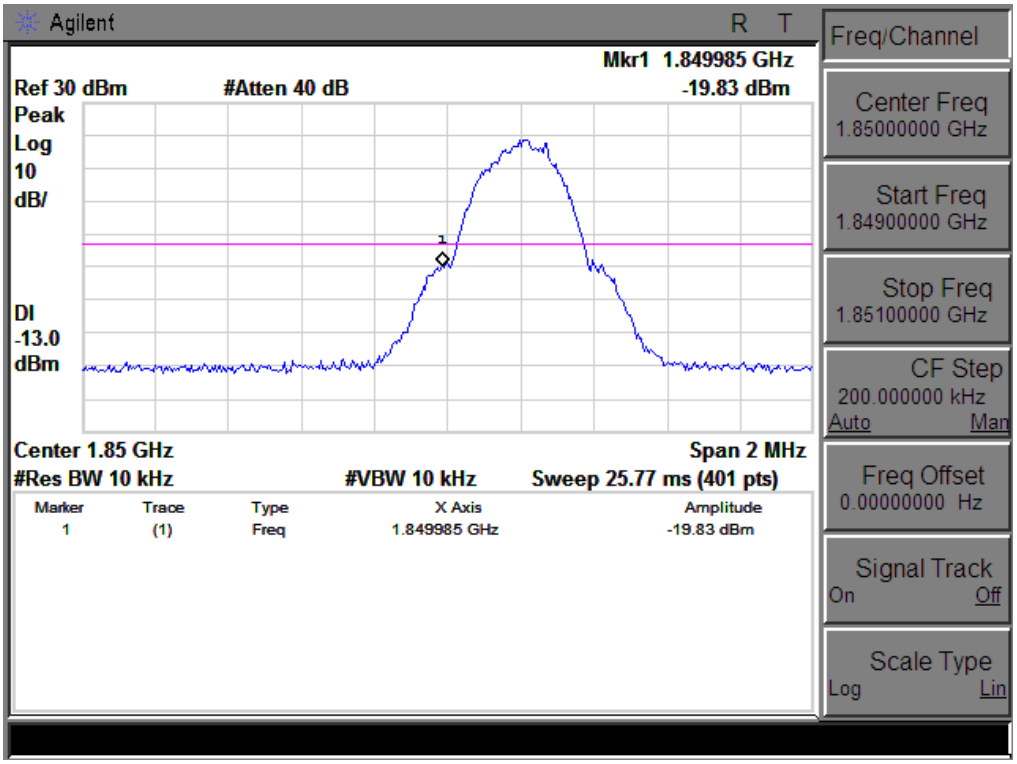
Low Band Edge GSM 850 BAND CH 128



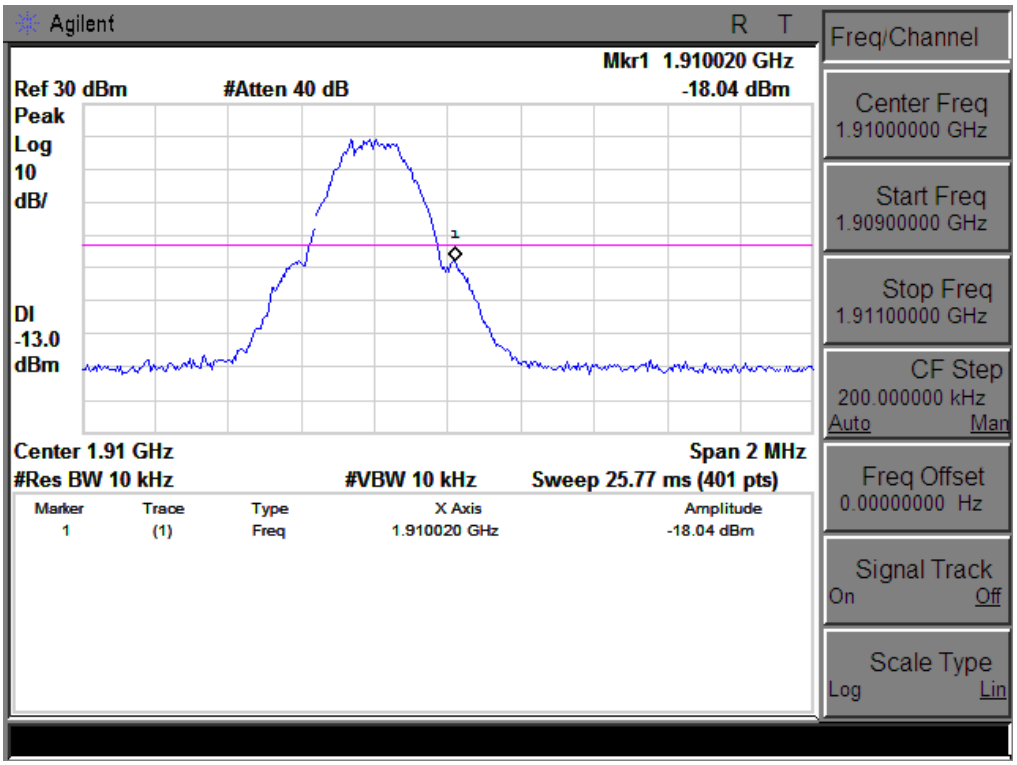
High Band Edge GSM 850 BAND CH 251



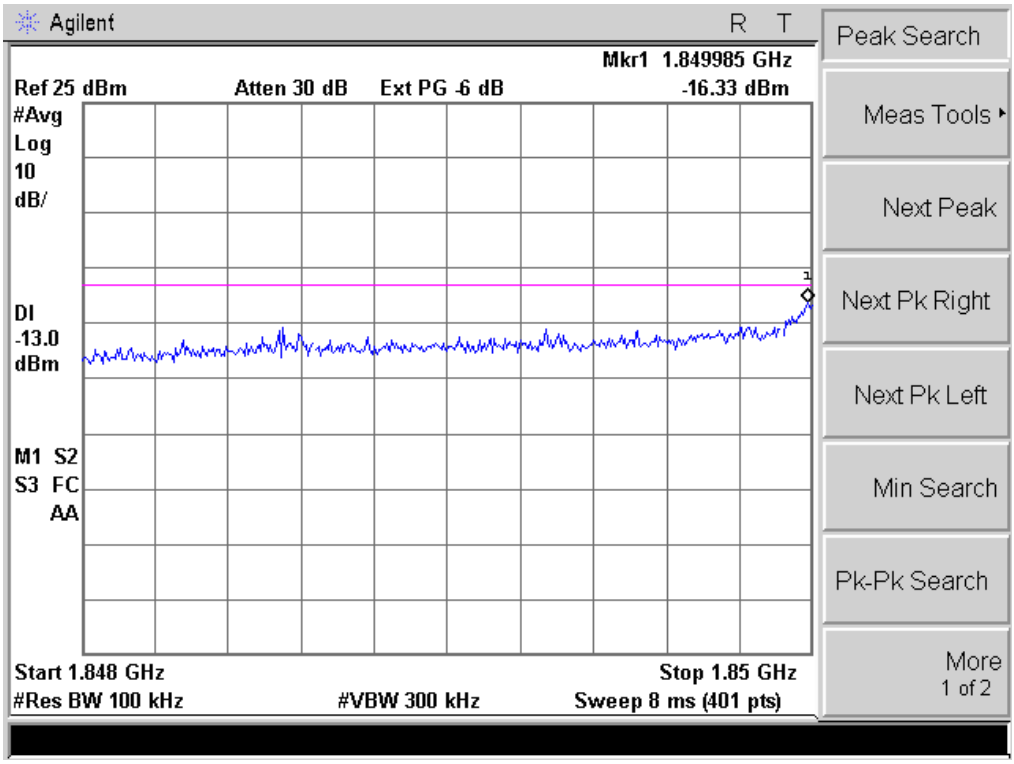
Low Band Edge PCS 1900 BAND CH 512



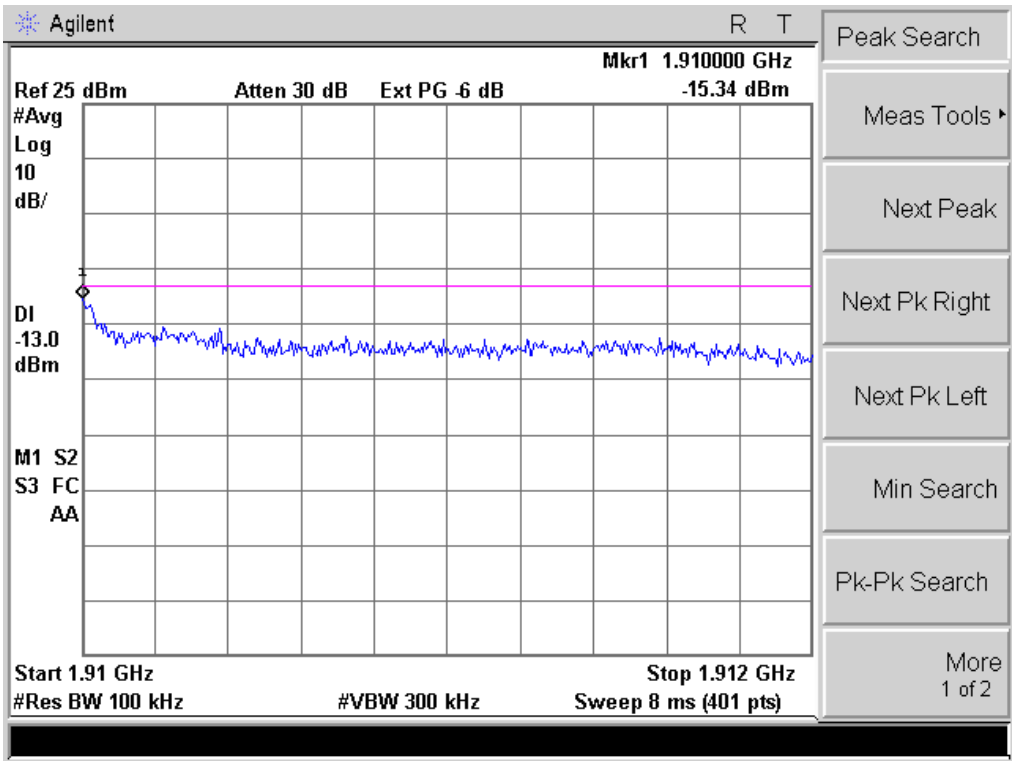
High Band Edge PCS 1900 BAND CH 810



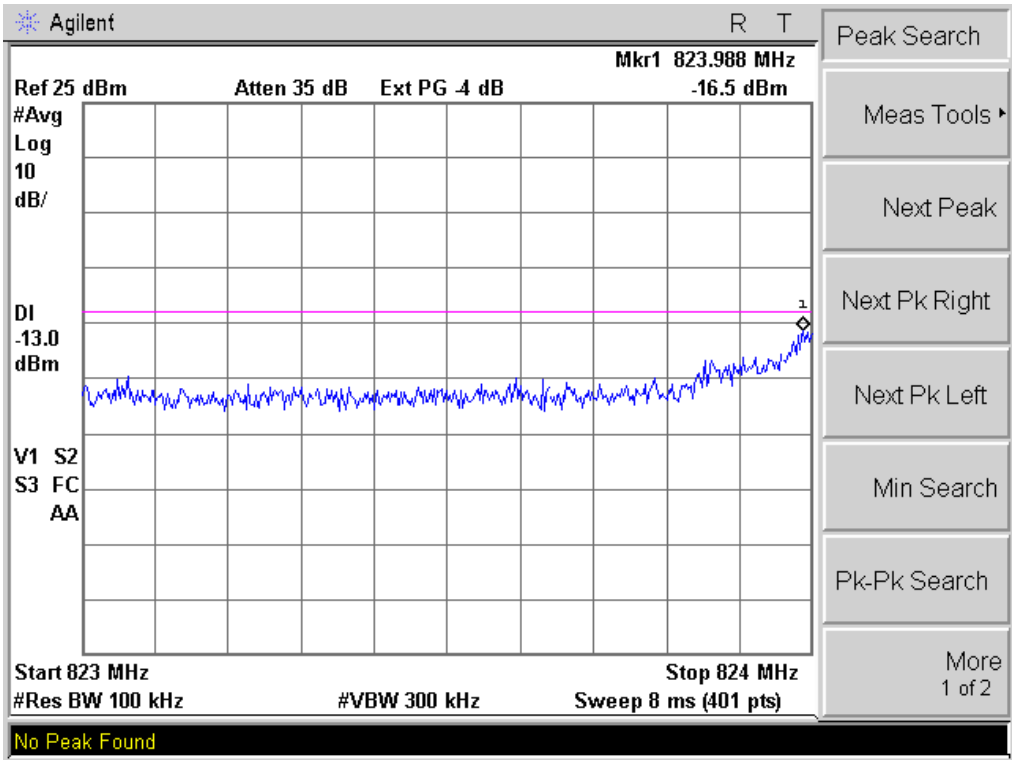
Low Band Edge UMTS BAND II CH 9262



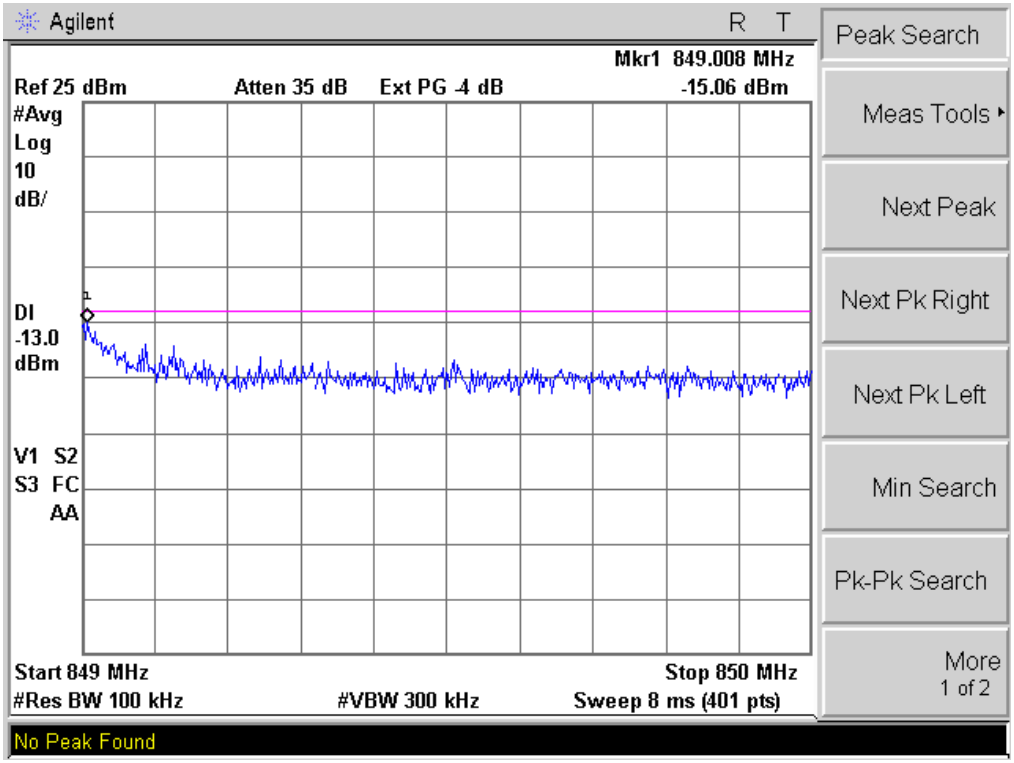
High Band Edge UMTS BAND II CH 9538



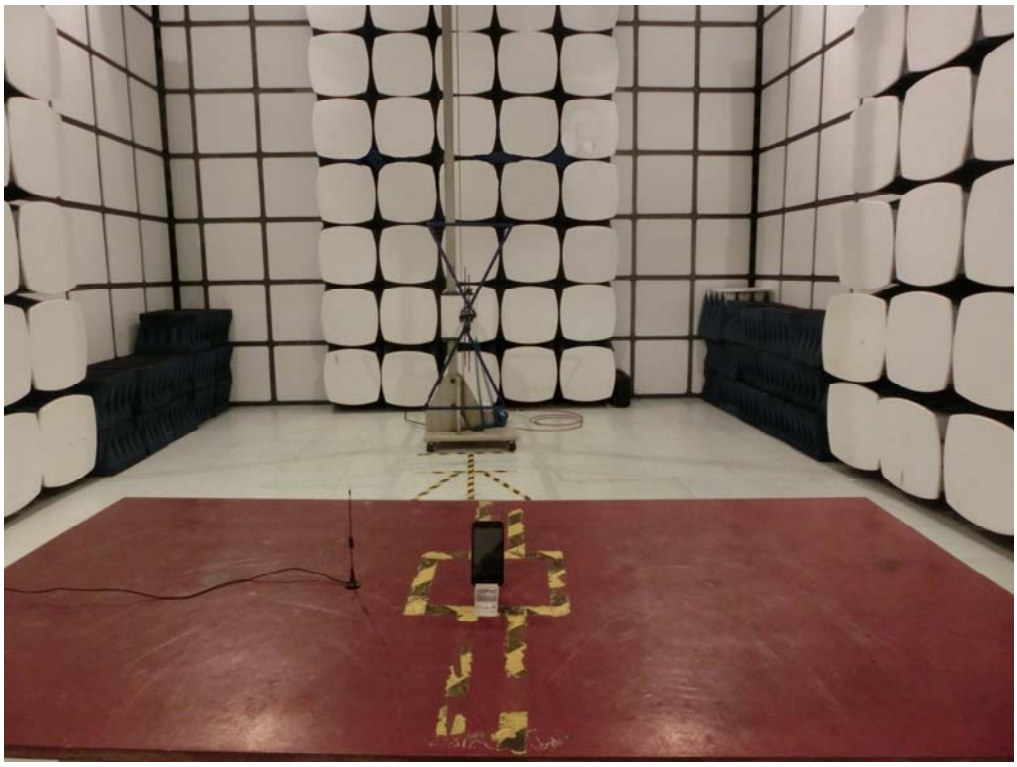
Low Band Edge UMTS BAND V CH 4132



High Band Edge UMTS BAND V CH 4233



APPENDIX IV
PHOTOGRAPHS OF TEST SETUP



----END OF REPORT----