## FCC PART 22H&24E

# **Measurement and Test Report**

For

# Verykool USA Inc

4350 Executive Dr. #100, San Diego

**FCC ID: WA6R800** 

**Report Concerns: Equipment Type:** Original Report Panel computer Model: R800C Report No.: STR11118292I-1 Test Date: 2011-11-28 to 2011-12-15 Issue Date: 2011-12-20 Jason chen Lechm pery Jumyso Tested By: Jason Chen / Engineer Lahm Peng / EMC Manager Reviewed By: Approved & Authorized By: Jandy so / PSQ Manager Prepared By: SEM.Test Compliance Service Co., Ltd 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101) Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

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

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## 1. GENERAL INFORMATION

## 1.1 Product Description for Equipment Under Test (EUT)

## **Client Information**

Applicant: Verykool USA Inc

Address of applicant: 4350 Executive Dr. #100, San Diego

Manufacturer: Verykool Wireless Technology Ltd.

Address of manufacturer: Room 1701, Reward Building C, No.203, 2nd Section of

Wangjing, Li Ze Zhong Yuan, ChaoYang District, Beijing,

P.R. of China 100102

## **General Description of E.U.T**

Items	Description
EUT Description:	Panel computer
Trade Name:	verykool
Model No.:	R800C
Rated Voltage:	Battery DC 3.7V with Power adaptor
IMEI:	354728040752089
	354728040752097
Hardware Version:	R800C-HW-P1
Software Version:	R800C-V1.07-FCC
Frequency range:	GSM/GPRS 850: 824~849MHz
	GSM/GPRS 1900: 1850~1910MHz
	WCDMA Band V: 826.4~846.6MHz
Max. RF Power(Conducted):	GSM 850: 33.11dBm
	GSM1900: 29.92dBm
	WCDMA Band V: 22.37dBm
Max. RF Power(ERP/EIRP):	GSM 850: 31.44dBm
	GSM 1900: 29.42dBm
	WCDMA Band V: 21.60dBm
Cellular Network Protocol:	GSM/GPRS/EDGE/WCDMA/HSDPA
Modulation:	GMSK/8PSK/QPSK/16QAM
Type of Emission:	GMSK: 253KGXW/254G7W
	8PSK: 284KG7W
	QPSK/16QAM: 4M14F9W
Antenna Gain:	GSM850: -2.79dBi, PCS1900: -1.73dBi
Type of Antenna:	Integral Antenna

*Note: The test data is gathered from a production sample, provided by the manufacture.* 

#### 1.2 Test Standards

The following report is prepared on behalf of the Verykool USA Inc in accordance with FCC Part 2 subpart J, FCC Part 22 subpart H and FCC Part 24 subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 2 subpart J, FCC Part 22 subpart H and FCC Part 24 subpart E of the Federal Communication Commissions rules.

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

#### 1.3 Test Methodology

All measurements contained in this report were conducted with TIA/EIA 603-C: 2004 and ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted with Low Channel, Middle Channel and High Channel, accordingly in reference to the Operating Instructions.

#### 1.4 Test Facility

#### • FCC – Registration No.: 994117

SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

## • Industry Canada (IC) Registration No.: 7673A

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

#### • CNAS Registration No.: L4062

Shenzhen SEM. Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

#### 1.5 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components.

## 1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number		
/	/	/	/		

## 1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core	
USB Cable	USB Cable 1.1		Without Core	
Earphone Cable	1.5	Unshielded	Without Core	

## 2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT	
§ 1.1307 § 2.1093	RF Exposure	Compliant	
§ 22.913 (a), § 24.232 (c)	RF Output Power	Compliant	
§ 22.917 (b), § 24.238 (b)	Emission Bandwidth	Compliant	
§ 22.917 (a), § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant	
§ 22.917 (a), § 24.238 (a)	Spurious Radiation Emissions	Compliant	
§ 22.917 (a), § 24.238 (a)	Out of Band Emissions	Compliant	
§ 22.355, § 24.235	Frequency Stability	Compliant	

## 3. RF EXPOSURE

## 3.1 Standard Applicable

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

## 3.2 Test Result

This product complies 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 transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to §24.232 (c), no any case may the peak output power of mobile or portable station transmitter exceed 2 Watt EIRP.

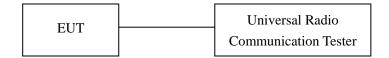
## 4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	112012	2010-12-20	2011-12-19
Signal Generator	R&S	SMR20	100047	2010-12-20	2011-12-19

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

#### **4.3 Test Procedure**

Conducted output power test method:



Radiated power test method:

- 1. The setup of EUT is according with per TIA/EIA Standard 603C and ANSI C63.4-2003 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

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antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

## **4.4 Environmental Conditions**

Temperature:	24 °C
Relative Humidity:	52 %
ATM Pressure:	1011 mbar

## 4.5 Summary of Test Results/Plots

## Radiated Power

## ERP For GSM Mode GSM850

Frequency	Substitude	Height	Table	Polar	Cable loss	Antenna	Corrected	FCC Part 22H			
rrequency	SG	Height	Table	1 Olai	Cable loss	Gain	Ampl.	Limit			
MHz	dBm	Meter	Degree	H/V	dB	dB	dBm	dBm			
	Low Channel										
824.2	20.74	1.5	0	V	1.5	0	19.24	38.45			
824.2	31.61	1.5	0	Н	1.5	0	30.11	38.45			
			N	/Iiddle Ch	annel						
836.6	20.84	1.5	0	V	1.5	0	19.34	38.45			
836.6	32.51	1.5	0	Н	1.5	0	31.01	38.45			
	High Channel										
848.8	20.62	1.5	0	V	1.5	0	19.12	38.45			
848.8	32.83	1.5	0	Н	1.5	0	31.32	38.45			

#### EIRP For GSM Mode PCS1900

Frequency	Substitude SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 24E Limit		
MI	17 7	3.5.4	D	11 /37	1D		•			
MHz	dBm	Meter	Degree	H/V	dB	dB	dBm	dBm		
	Low Channel									
1850.2	11.56	1.5	0	V	1.9	7.7	17.36	33		
1850.2	22.49	1.5	0	Н	1.9	7.7	28.29	33		
			N	/Iiddle Ch	annel					
1880.0	12.61	1.5	0	V	1.9	7.7	18.41	33		
1880.0	23.46	1.5	0	Н	1.9	7.7	29.26	33		
	High Channel									
1909.8	11.67	1.5	0	V	1.9	7.7	17.47	33		
1909.8	22.84	1.5	0	Н	1.9	7.7	28.28	33		

## ERP For GPRS Mode GSM850

Frequency	Substitude SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected	FCC Part 22H Limit	
	30					Gain	Ampl.	Limit	
MHz	dBm	Meter	Degree	H/V	dB	dB	dBm	dBm	
Low Channel									
824.2	22.13	1.5	0	V	1.5	0	20.63	38.45	
824.2	32.03	1.5	0	Н	1.5	0	30.53	38.45	
			N	/Iiddle Ch	annel				
836.6	21.86	1.5	0	V	1.5	0	20.36	38.45	
836.6	32.41	1.5	0	Н	1.5	0	30.91	38.45	
High Channel									
848.8	22.09	1.5	0	V	1.5	0	20.59	38.45	
848.8	32.94	1.5	0	Н	1.5	0	31.44	38.45	

## EIRP For GPRS Mode PCS1900

	TO GIRS MOLE LEST YOU									
Substi Frequency	Substitude	de Height	Table	Polar	Cable loss	Antenna	Corrected	FCC Part 24E		
Trequency	SG	1101giii	14010	1 0141	04010 1055	Gain	Ampl.	Limit		
MHz	dBm	Meter	Degree	H/V	dB	dB	dBm	dBm		
	Low Channel									
1850.2	12.16	1.5	0	V	1.9	7.7	17.96	33		
1850.2	23.62	1.5	0	Н	1.9	7.7	29.42	33		
			N	/Iiddle Ch	annel					
1880.0	11.72	1.5	0	V	1.9	7.7	17.52	33		
1880.0	22.94	1.5	0	Н	1.9	7.7	28.74	33		
	High Channel									
1909.8	11.25	1.5	0	V	1.9	7.7	17.05	33		
1909.8	22.84	1.5	0	Н	1.9	7.7	28.64	33		

## ERP For EDGE Mode GSM850

Frequency	Substitude SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 22H Limit		
MHz	dBm	Meter	Degree	H/V	dB	dB	dBm	dBm		
	Low Channel									
824.2	25.85	1.5	0	Н	1.5	0	24.35	38.45		
824.2	16.84	1.5	0	V	1.5	0	15.34	38.45		
			N	/Iiddle Ch	annel					
836.6	26.62	1.5	0	Н	1.5	0	25.12	38.45		
836.6	17.28	1.5	0	V	1.5	0	15.78	38.45		
High Channel										
848.8	26.16	1.5	0	Н	1.5	0	24.66	38.45		
848.8	16.55	1.5	0	V	1.5	0	15.05	38.45		

## EIRP For EDGE Mode PCS1900

Frequency	Substitude SG	Height	Table	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H/V	dB	dB	dBm	dBm
				Low Cha	nnel			
1850.2	9.72	1.5	0	Н	1.9	7.7	15.52	33
1850.2	5.89	1.5	0	V	1.9	7.7	11.69	33
			N	/Iiddle Ch	annel			
1880.0	10.62	1.5	0	Н	1.9	7.7	16.42	33
1880.0	5.53	1.5	0	V	1.9	7.7	11.33	33
				High Cha	nnel			
1909.8	9.95	1.5	0	Н	1.9	7.7	15.75	33
1909.8	5.77	1.5	0	V	1.9	7.7	11.57	33

## ERP For WCDMA Mode Band V

Frequency	Substitude	Height	Table	e Polar Cable	Cable loss	Antenna	Corrected	FCC Part 22H	
Trequency	SG	Ticigiit	Table	1 Olai	Cable 1033	Gain	Ampl.	Limit	
MHz	dBm	Meter	Degree	H/V	dB	dB	dBm	dBm	
				Low Cha	nnel				
826.4	21.70	1.5	0	Н	1.5	0	20.20	38.45	
826.4	5.60	1.5	0	V	1.5	0	4.10	38.45	
			N	/Iiddle Ch	annel				
836.4	21.80	1.5	0	Н	1.5	0	20.30	38.45	
836.4	5.90	1.5	0	V	1.5	0	4.40	38.45	
	High Channel								
846.6	22.10	1.5	0	Н	1.5	0	20.60	38.45	
846.6	6.20	1.5	0	V	1.5	0	4.70	38.45	

## $ERP\,For\,HSDPA\,Mode\,Band\,V$

Frequency	Substitude	Height Table Polar Cable los	Cable loss	Antenna	Corrected	FCC Part 22H			
	SG	_				Gain	Ampl.	Limit	
MHz	dBm	Meter	Degree	H/V	dB	dB	dBm	dBm	
				Low Cha	nnel				
826.4	23.00	1.5	0	Н	1.5	0	21.50	38.45	
826.4	6.60	1.5	0	V	1.5	0	5.10	38.45	
			N	/Iiddle Ch	annel				
836.4	23.00	1.5	0	Н	1.5	0	21.50	38.45	
836.4	6.50	1.5	0	V	1.5	0	5.00	38.45	
	High Channel								
846.6	23.10	1.5	0	Н	1.5	0	21.60	38.45	
846.6	7.30	1.5	0	V	1.5	0	5.80	38.45	

Max. Conducted Output Power For Cellular Band (GSM850)

Test Mode	Channel	Frequency (MHz)	Output Power (dBm)	FCC Part 22.913 Limit (dBm)
	Low Channel	824.2	32.92	38.45
GSM	Middle Channel	836.6	33.06	38.45
	High Channel	848.8	33.11	38.45
	Low Channel	824.2	32.79	38.45
GPRS	Middle Channel	836.6	32.89	38.45
	High Channel	848.8	32.86	38.45
	Low Channel	1850.2	26.75	38.45
EDGE	Middle Channel	1880.0	26.66	38.45
	High Channel	1909.8	26.54	38.45

## For PCS Band (GSM1900)

Test Mode	Channel	Frequency (MHz)	Output Power (dBm)	FCC Part 24.232 Limit (dBm)
	Low Channel	1850.2	29.92	33
GSM	Middle Channel	1880.0	29.78	33
	High Channel	1909.8	29.44	33
	Low Channel	1850.2	29.88	33
GPRS	Middle Channel	1880.0	29.73	33
	High Channel	1909.8	29.37	33
	Low Channel	1850.2	25.23	33
EDGE	Middle Channel	1880.0	25.12	33
	High Channel	1909.8	25.11	33

## For WCDMA Band V

Test Mode	Channel	Frequency (MHz)	Output Power (dBm)	FCC Part 22.913 Limit (dBm)
	Low Channel	826.4	22.22	38.45
WCDMA	Middle Channel	836.4	22.37	38.45
	High Channel	846.6	22.30	38.45
	Low Channel	826.4	22.06	38.45
HSDPA	Middle Channel	836.4	22.30	38.45
	High Channel	846.6	22.11	38.45

## 5. EMISSION BANDWIDTH

## 5.1 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.

## 5.2 Test Equipment List and Details

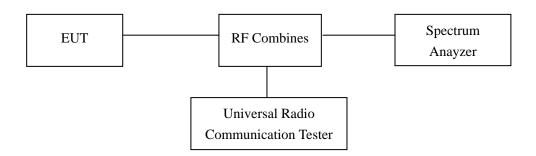
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B	US41192821	2010-12-20	2011-12-19
Rohde & Schwarz	Universal Radio	CMU200	112012	2010-12-20	2011-12-19
	Communication Tester	CMO200	112012	2010-12-20	2011-12-19

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

#### **5.3 Test Procedure**

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 30kHz and the 26dB bandwidth was recorded.

Test Configuration for the emission bandwidth testing:



## **5.4 Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	51%
ATM Pressure:	1011 mbar

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## **5.5 Summary of Test Results/Plots**

For Cellular Band

Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
	128	824.2	252.3935	340.808
GSM	190	836.6	253.2784	339.028
	251	848.8	251.4576	339.905
	128	824.2	253.1522	335.938
GPRS	190	836.6	252.8124	337.570
	251	848.8	251.7504	337.558
	128	824.2	250.8395	336.019
EDGE	190	836.6	259.1249	344.637
	251	848.8	263.9031	342.041

## For PCS Band

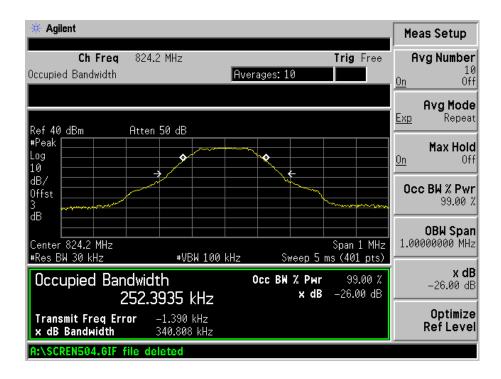
<b>Test Mode</b>	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
	512	1850.2	250.8903	337.270
GSM	661	1880.0	252.7953	334.640
	810	1909.8	254.3004	338.075
	512	1850.2	251.3443	341.104
GPRS	661	1880.0	252.2585	339.594
	810	1909.8	254.2980	343.039
	512	1850.2	284.5279	370.277
EDGE	661	1880.0	271.0166	336.543
	810	1909.8	249.5761	331.892

For Band V

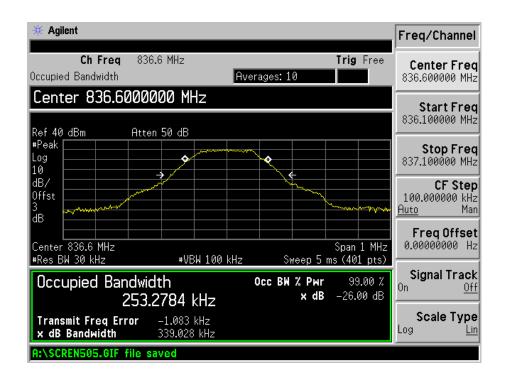
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
	4132	826.4	4.1333	4.621
WCDMA	4182	836.4	4.1393	4.626
	4233	846.6	4.1363	4.614
	4132	826.4	4.1368	4.625
HSDPA	4182	836.4	4.1464	4.623
	4233	846.6	4.1181	4.621

Please refer to the following test plots:

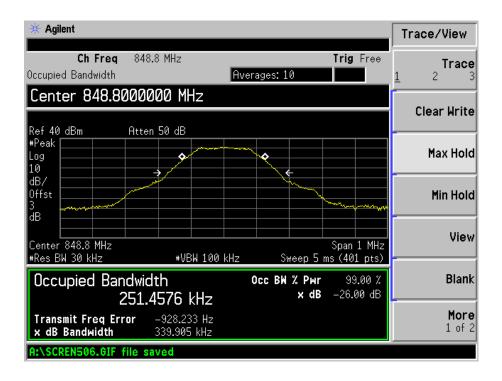
## For Cellular Band GSM Low Channel



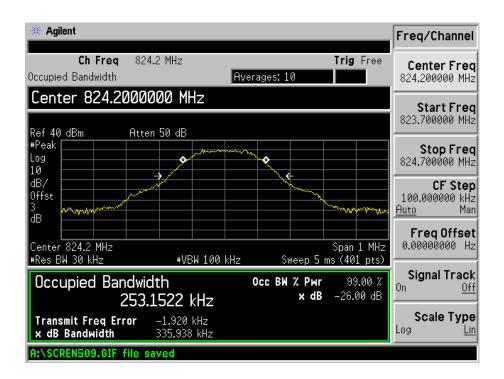
#### **GSM Middle Channel**



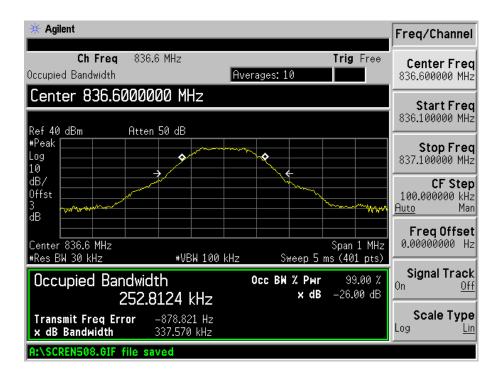
#### **GSM** High channel



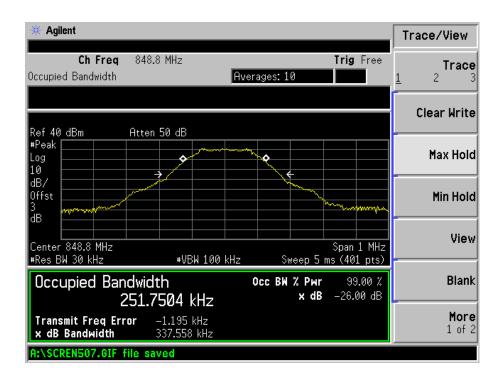
#### **GPRS** Low Channel



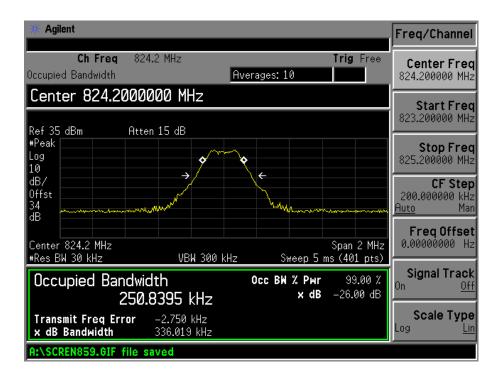
#### GPRS Middle Channel



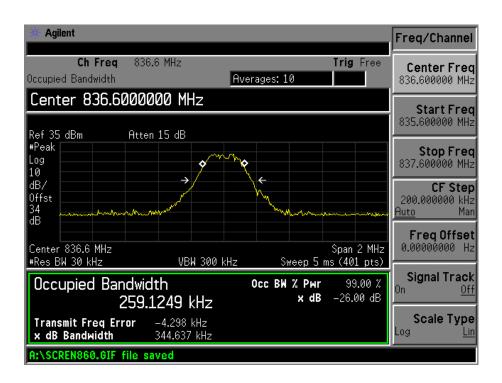
#### **GPRS High Channel**



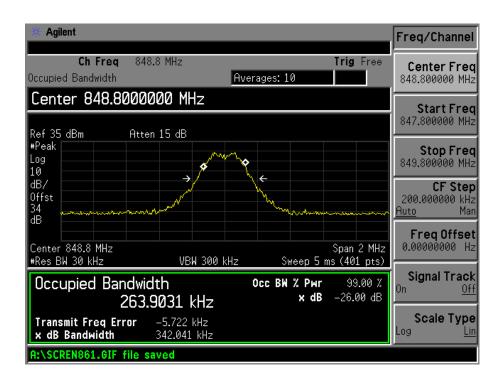
#### **EDGE Low Channel**



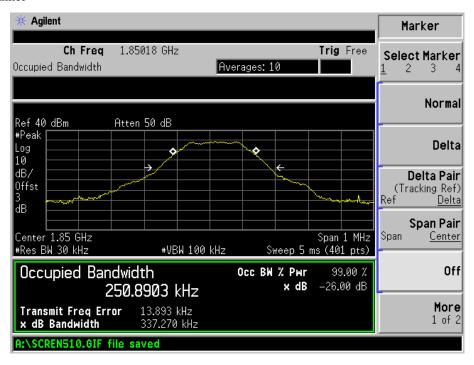
#### **EDGE Middle Channel**



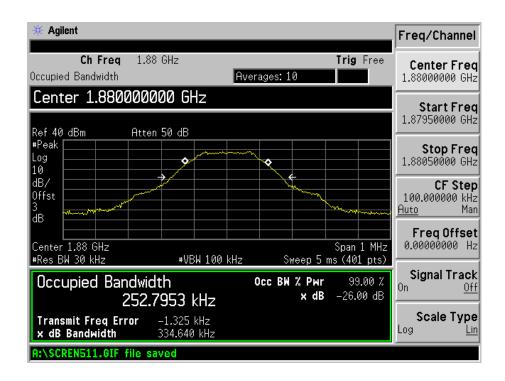
## EDGE High channel



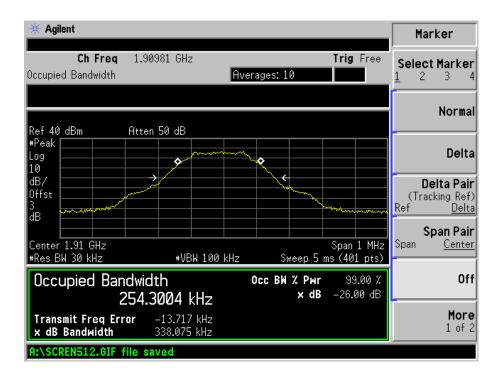
## For PCS Band GSM Low Channel



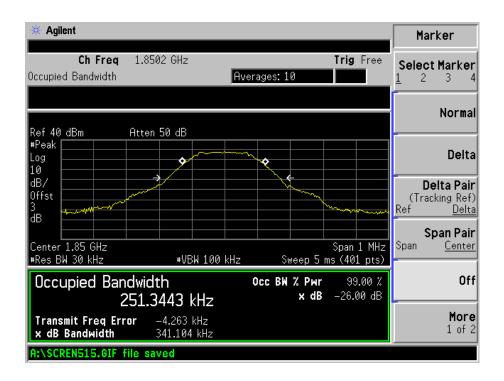
#### **GSM Middle Channel**



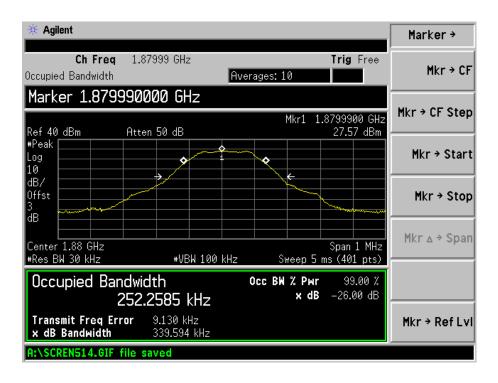
#### GSM High channel



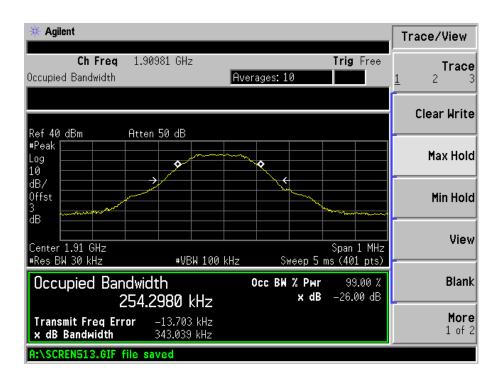
#### **GPRS** Low Channel



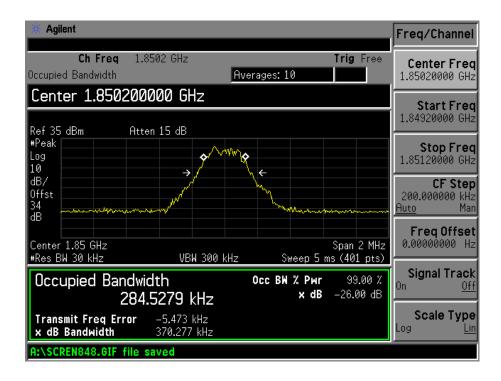
#### GPRS Middle Channel



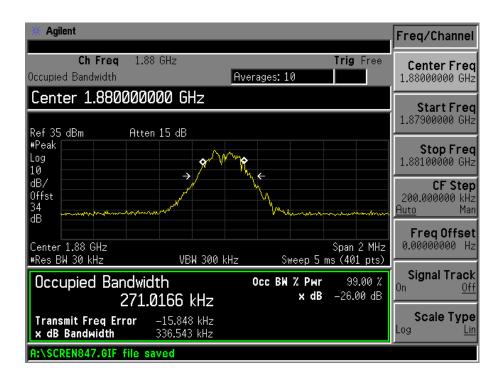
#### **GPRS High Channel**



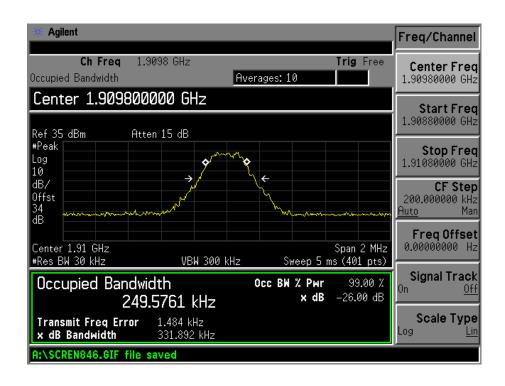
#### **EDGE Low Channel**



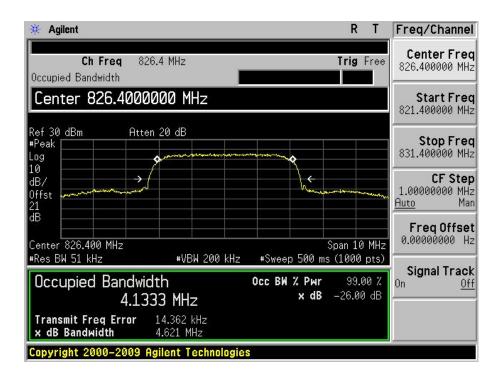
#### **EDGE Middle Channel**



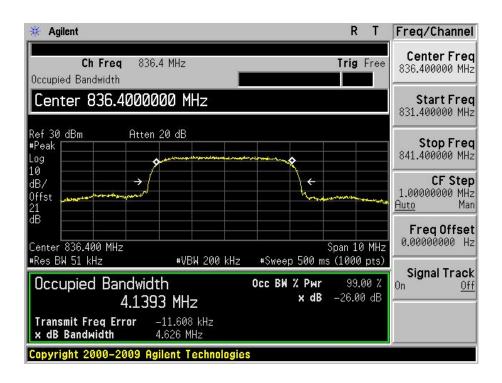
## EDGE High channel



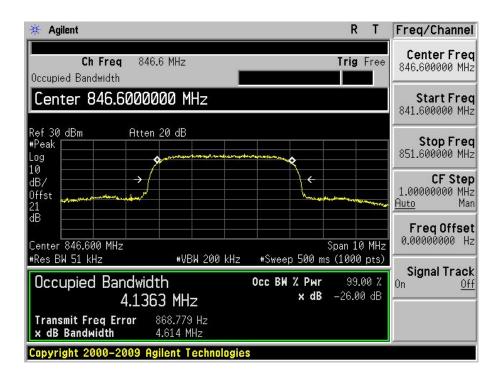
For Band V WCDMA Low Channel



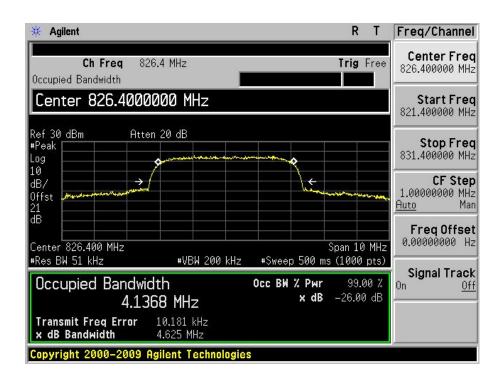
#### WCDMA Middle Channel



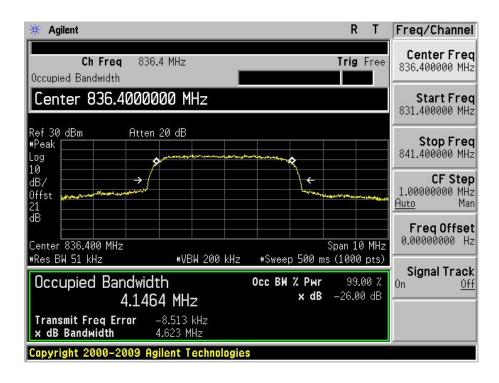
#### WCDMA High Channel



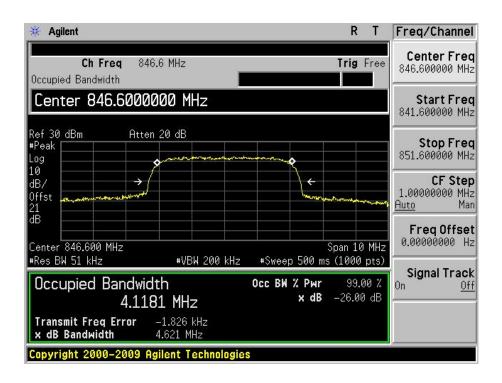
#### **HSDPA** Low Channel



#### **HSDPA Middle Channel**



#### **HSDPA High Channel**



## 6. OUT OF BAND EMISSION AT ANTENNA TERMINAL

## 6.1 Standard Applicable

According to  $\S22.917(a)$ , 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  $\S24.238(a)$ , 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  $43 + 10 \log(P) dB$ .

## 6.2 Test Equipment List and Details

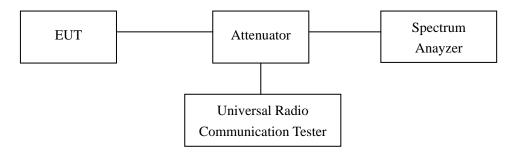
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B	US41192821	2010-12-20	2011-12-19
Rohde & Schwarz	Spectrum Analyzer	FSP	836079/035	2010-12-20	2011-12-19
Rohde & Schwarz	Universal Radio	CMU200	112012	2010-12-20	2011-12-19
Rollde & Schwarz	Communication Tester	CW10200	112012	2010-12-20	2011-12-19

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

#### **6.3 Test Procedure**

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10<sup>th</sup> harmonic.

Test Configuration for the out of band emissions testing:

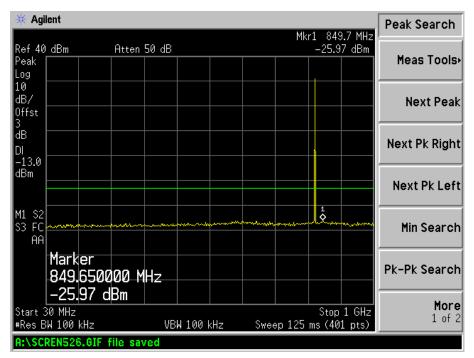


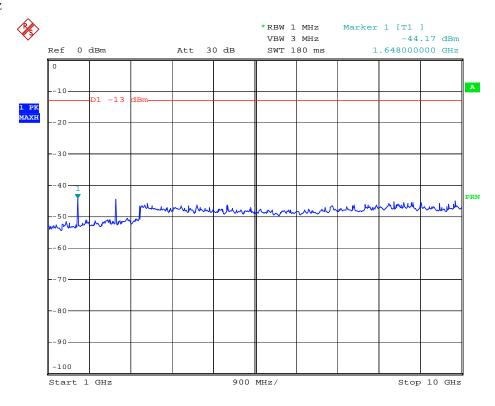
## **6.4 Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1018 mbar

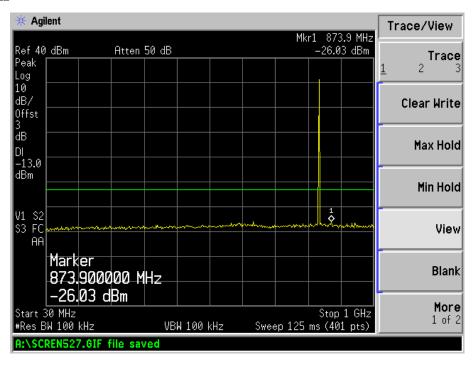
## 6.5 Summary of Test Results/Plots

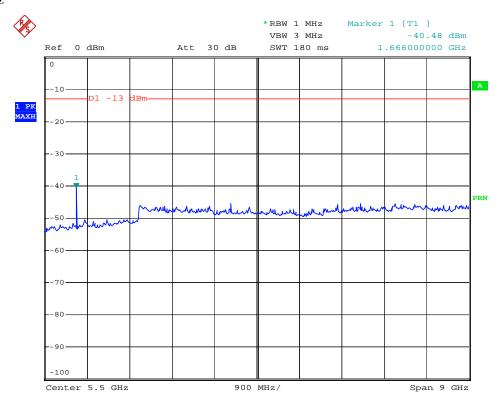
Please refer to the following test plots
For Cellular Band
GSM Low Channel
30MHz to 1GHz



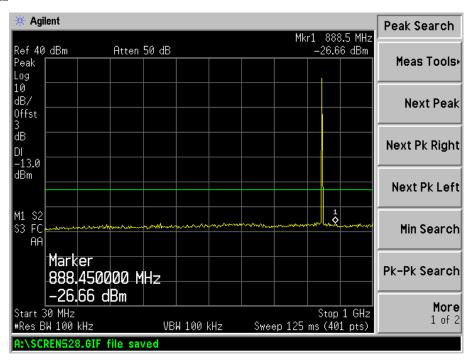


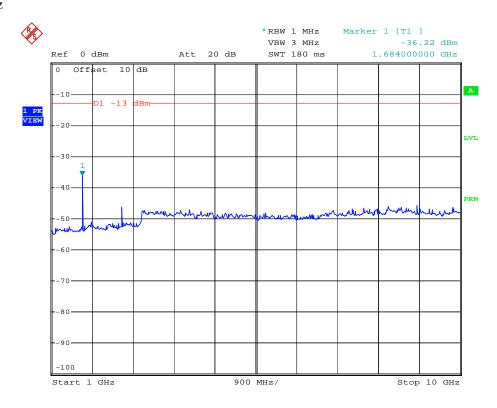
# GSM Middle Channel 30MHz to 1GHz



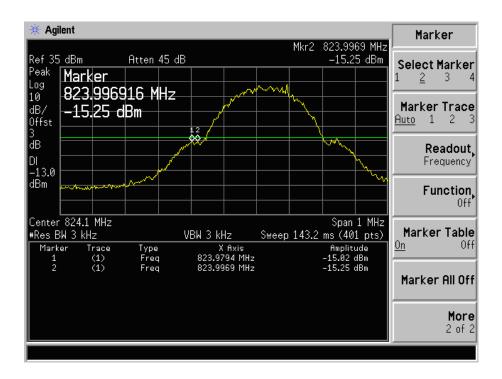


# GSM High Channel 30MHz to 1GHz

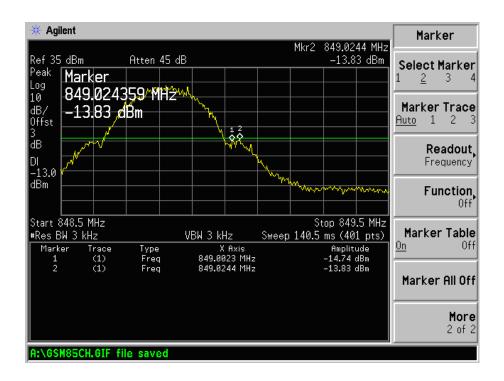




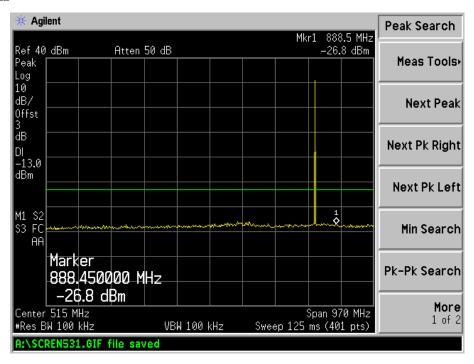
#### **GSM** Low Band Emission

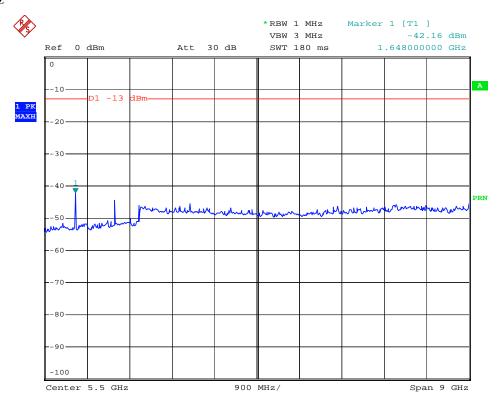


#### **GSM High Band Emission**

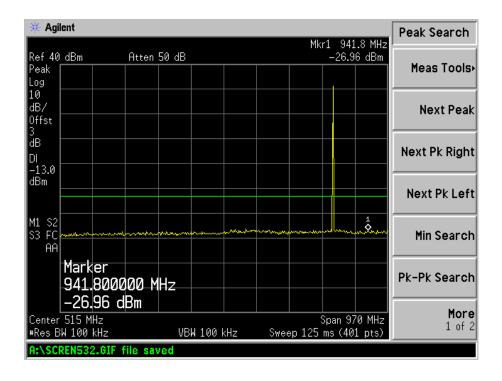


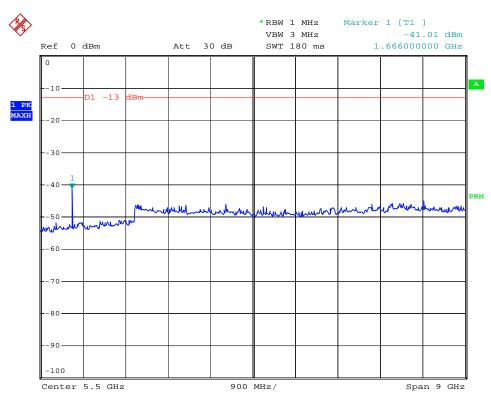
# GPRS Low Channel 30MHz to 1GHz



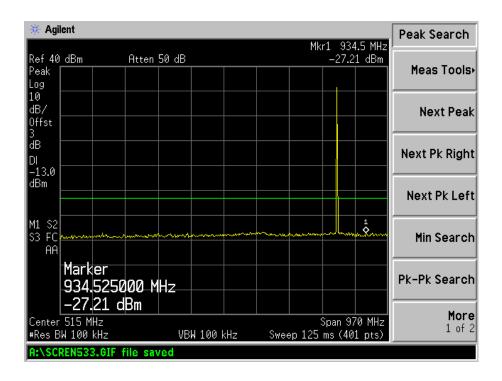


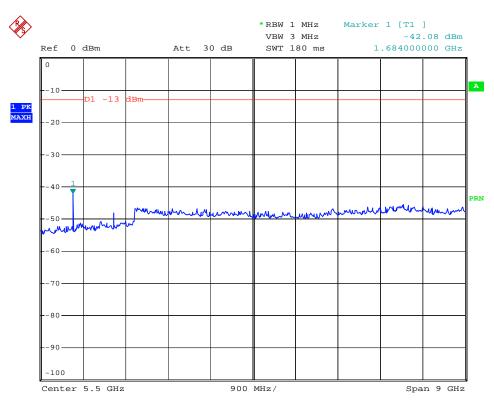
## GPRS Middle Channel 30MHz to 1GHz



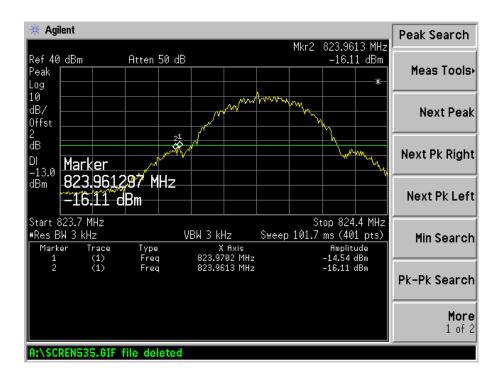


## GPRS High Channel 30MHz to 1GHz

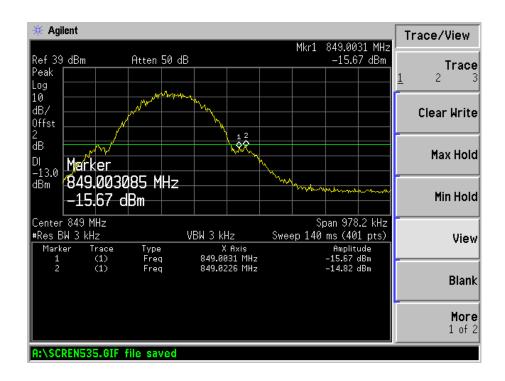




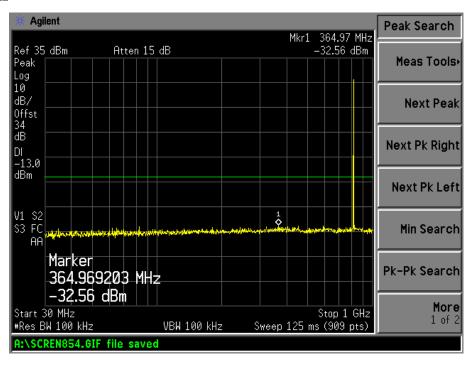
#### **GPRS** Low Band Emission



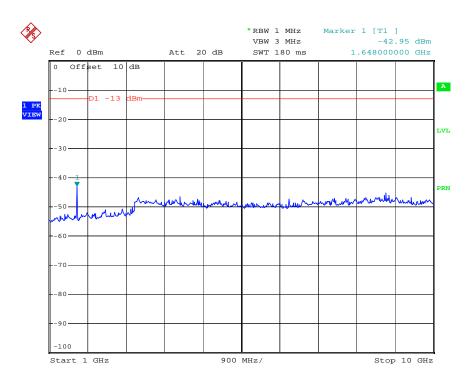
### **GPRS** High Band Emission



## EDGE Low Channel 30MHz to 1GHz

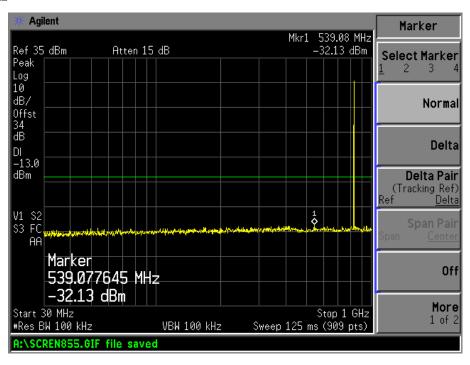


### Above 1GHz

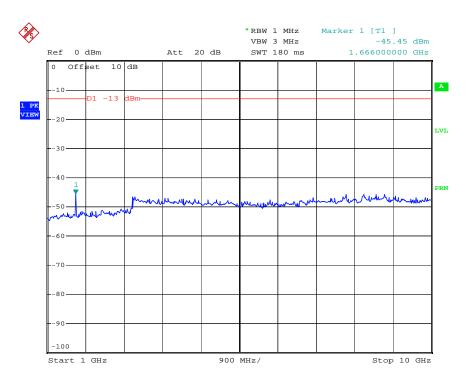


Date: 5.MAR.2011 09:21:04

## EDGE Middle Channel 30MHz to 1GHz

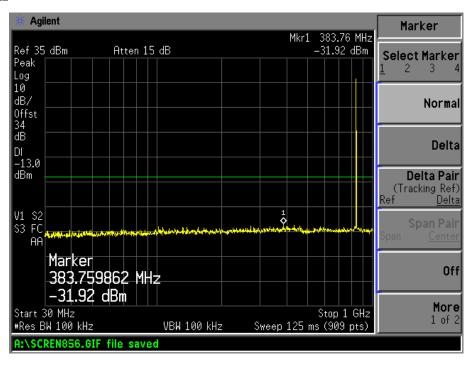


### Above 1GHz

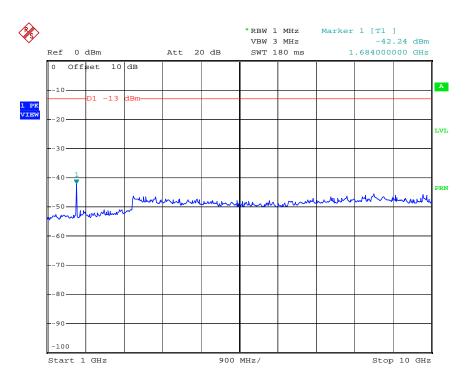


Date: 5.MAR.2011 09:21:53

## EDGE High Channel 30MHz to 1GHz

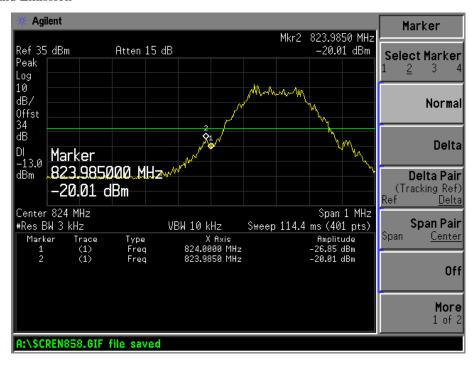


### Above 1GHz

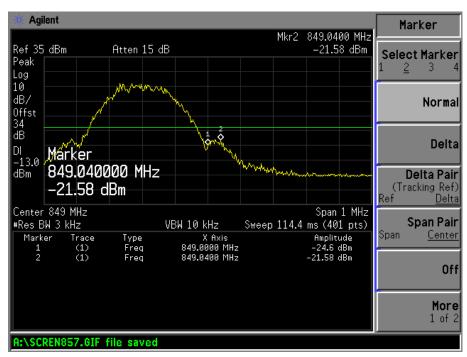


Date: 5.MAR.2011 09:22:38

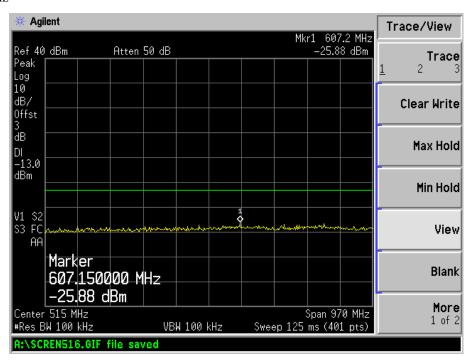
### **EDGE Low Band Emission**

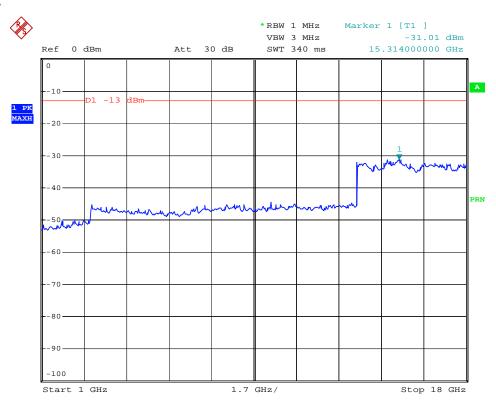


### **EDGE High Band Emission**

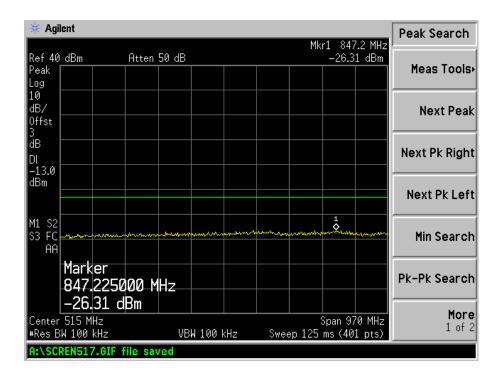


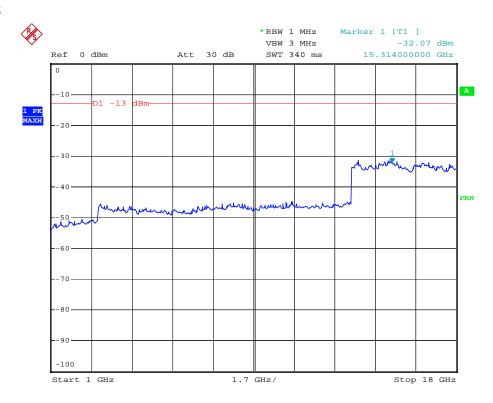
For PCS Band GSM Low Channel 30MHz to 1GHz



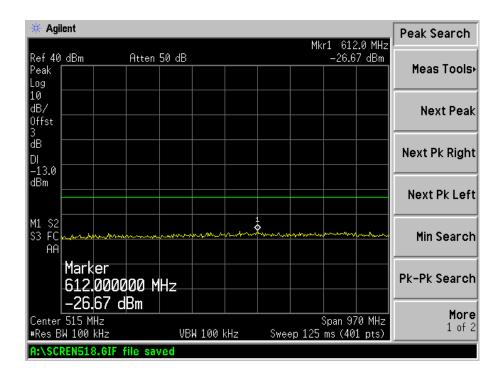


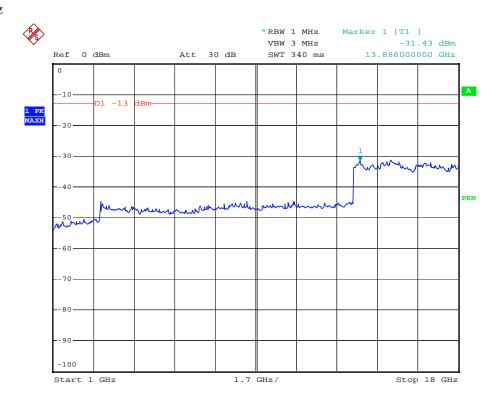
## GSM Middle Channel 30MHz to 1GHz



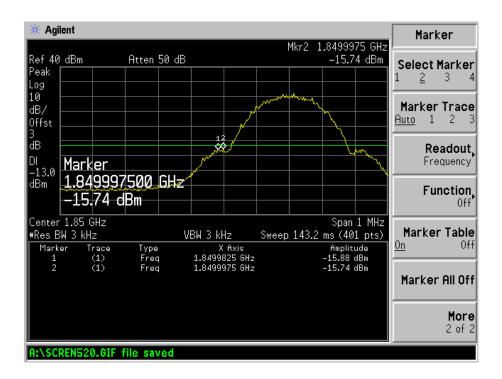


## GSM High Channel 30MHz to 1GHz

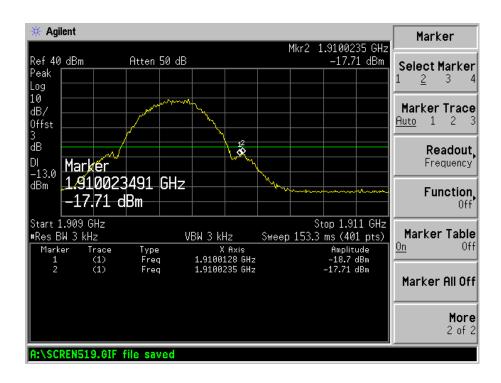




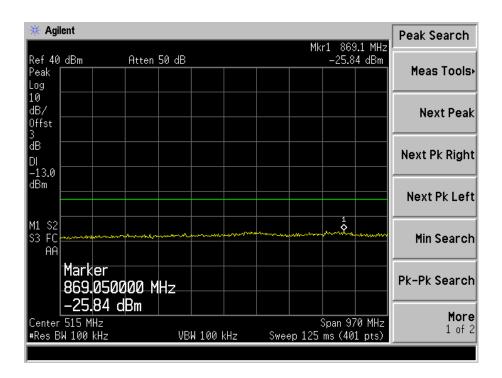
#### **GSM** Low Band Emission

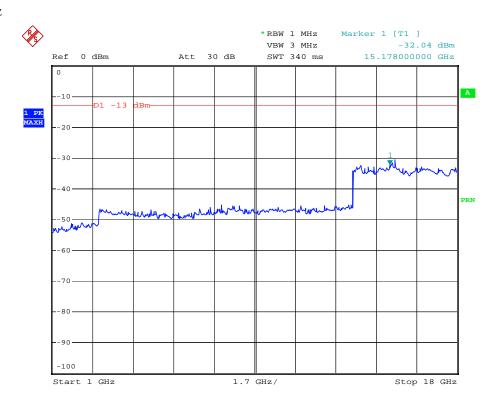


### **GSM High Band Emission**

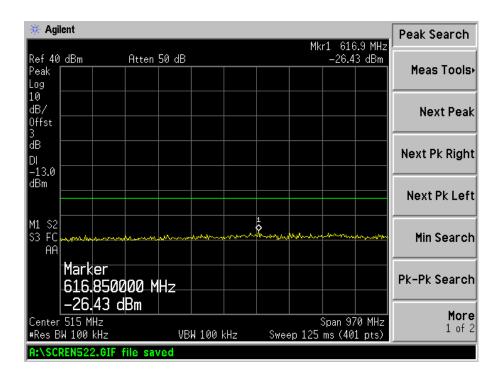


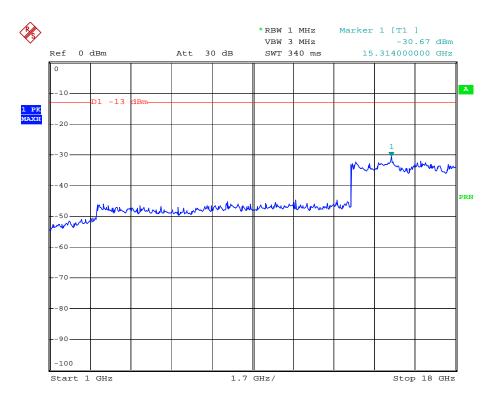
## GPRS Low Channel 30MHz to 1GHz



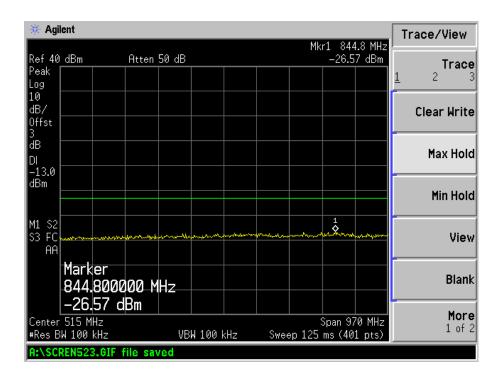


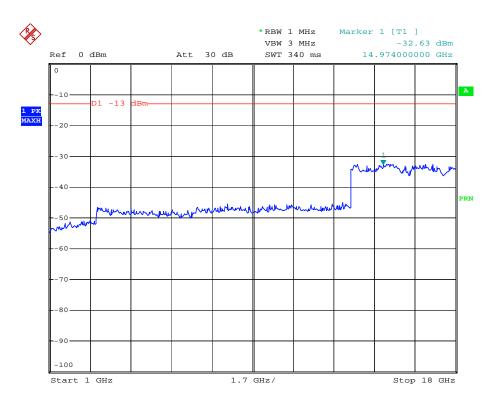
## GPRS Middle Channel 30MHz to 1GHz



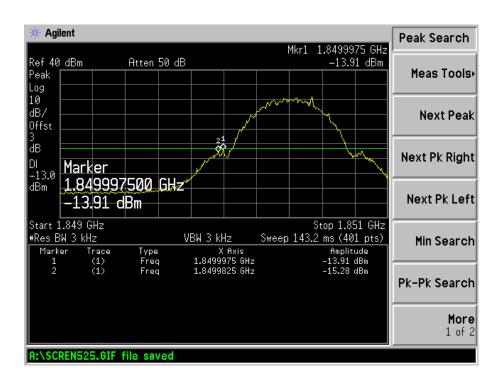


## GPRS High Channel 30MHz to 1GHz

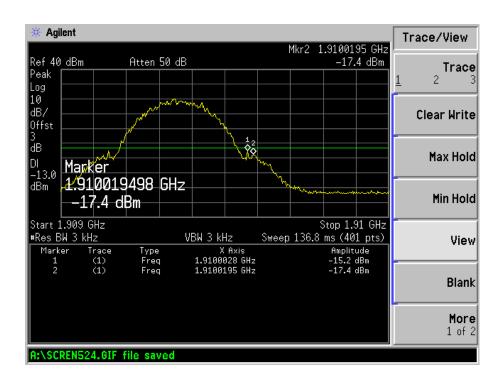




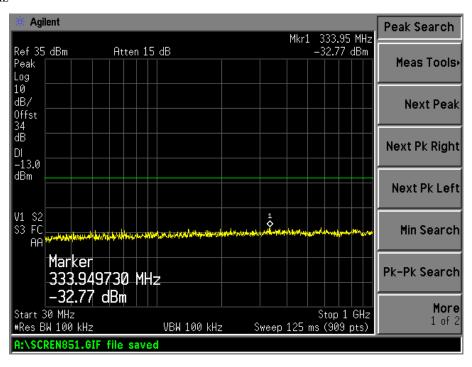
#### **GPRS** Low Band Emission



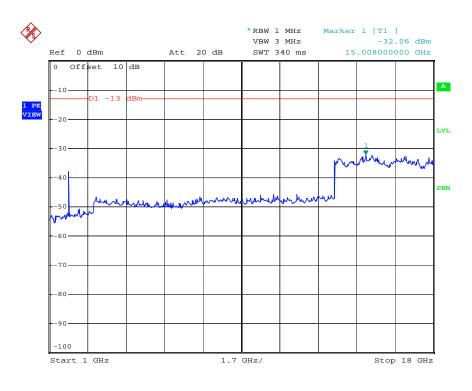
### **GPRS** High Band Emission



## EDGE Low Channel 30MHz to 1GHz

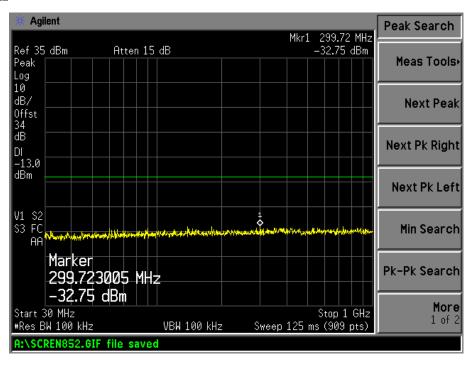


### Above 1GHz

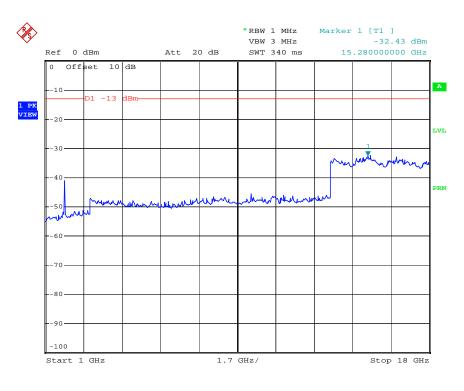


Date: 5.MAR.2011 09:07:57

## EDGE Middle Channel 30MHz to 1GHz

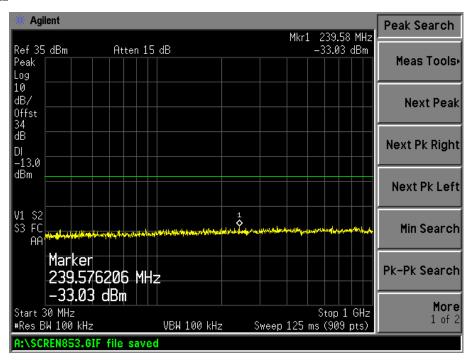


### Above 1GHz

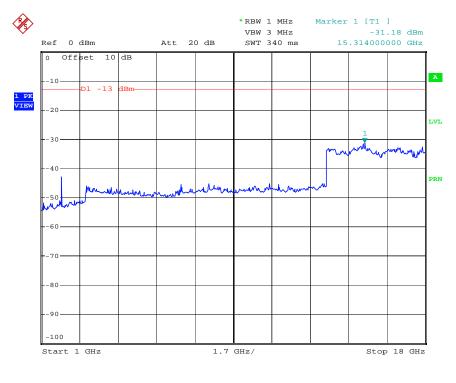


Date: 5.MAR.2011 09:08:28

## EDGE High Channel 30MHz to 1GHz

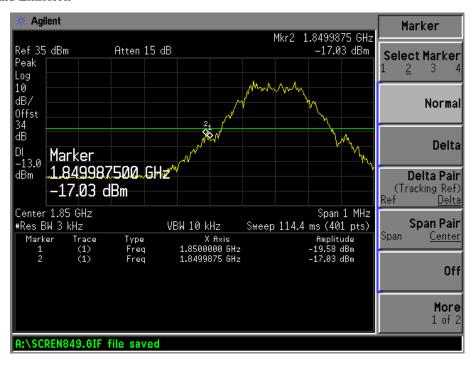


### Above 1GHz

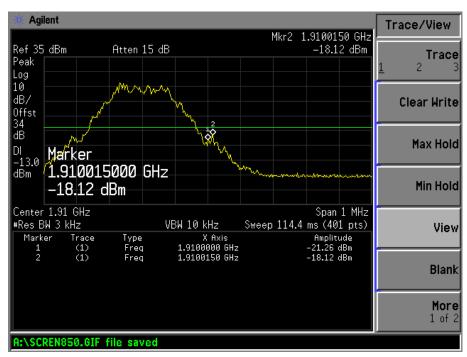


Date: 5.MAR.2011 09:09:21

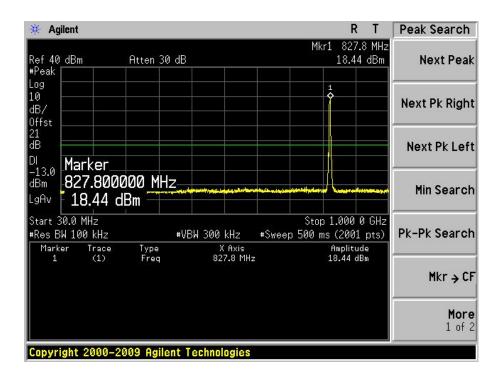
### **EDGE Low Band Emission**

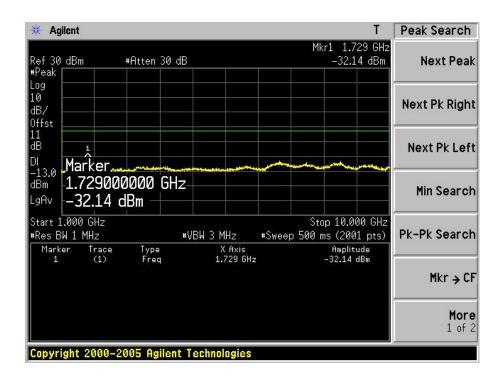


### **EDGE High Band Emission**

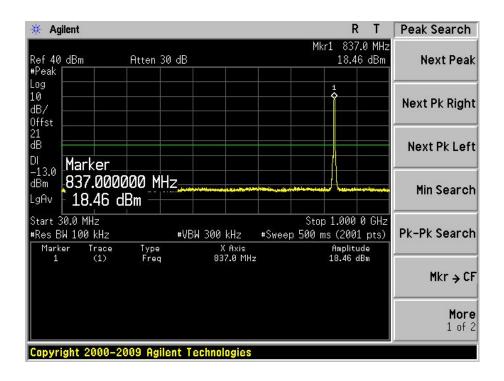


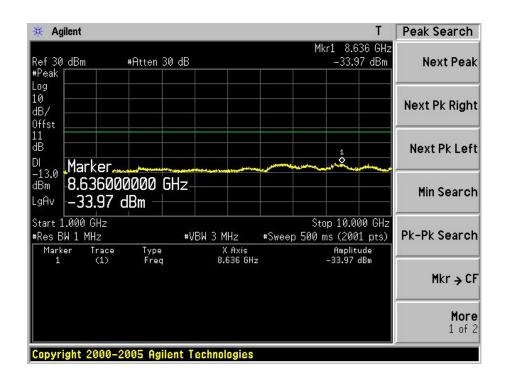
## WCDMA Band V Low Channel 30MHz to 1GHz



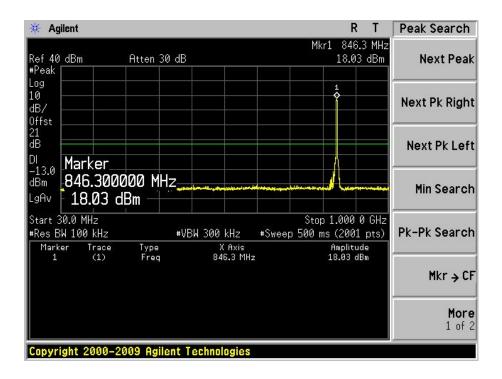


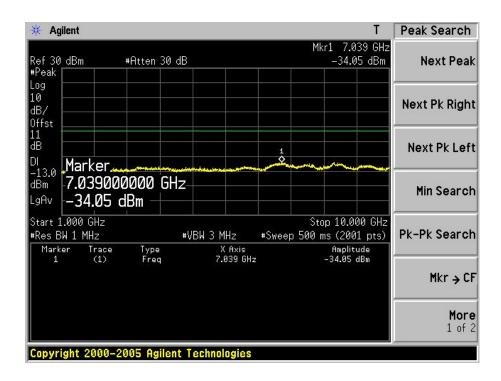
## WCDMA Band V Middle Channel 30MHz to 1GHz



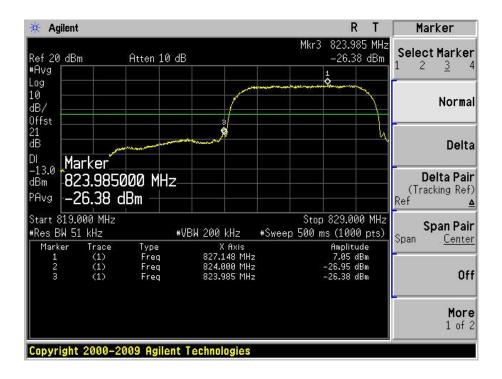


## WCDMA Band V High Channel 30MHz to 1GHz

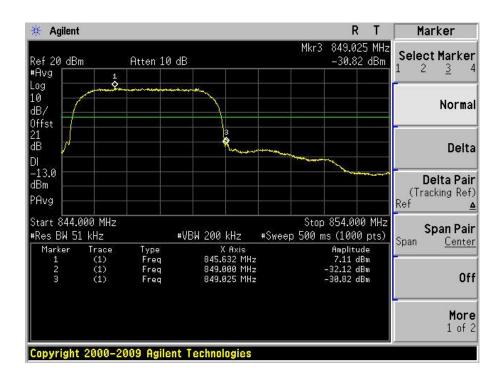




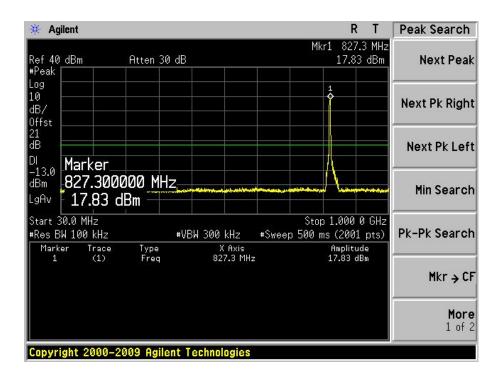
#### WCDMA Band V Low Band Emission

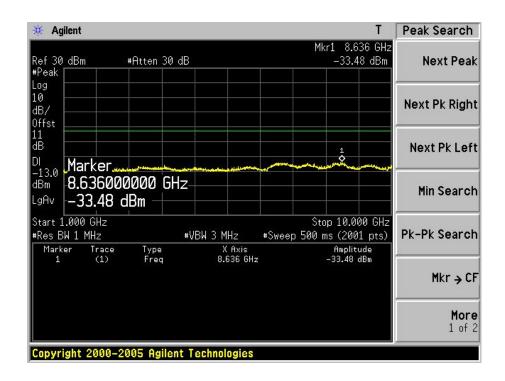


## WCDMA Band V High Band Emission

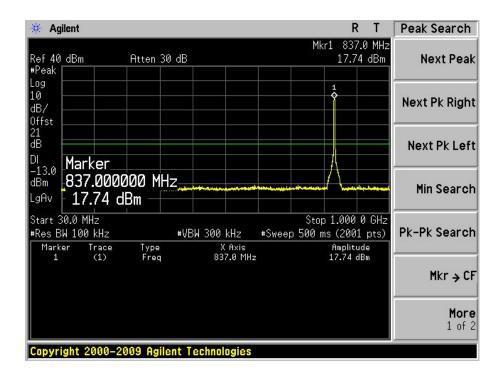


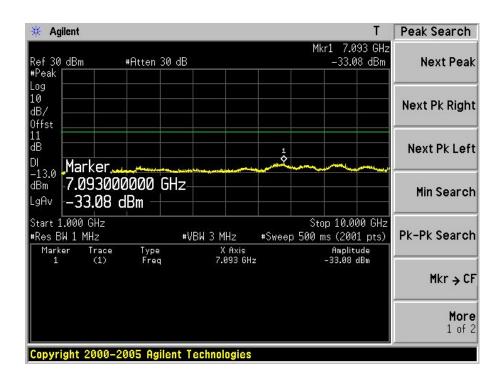
## HSDPA Band V Low Channel 30MHz to 1GHz



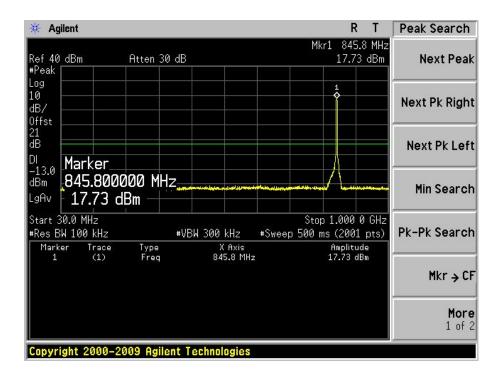


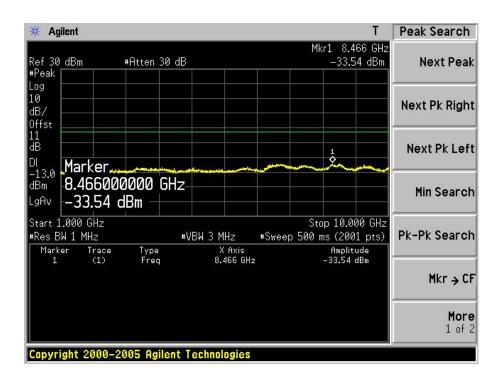
## HSDPA Band V Middle Channel 30MHz to 1GHz



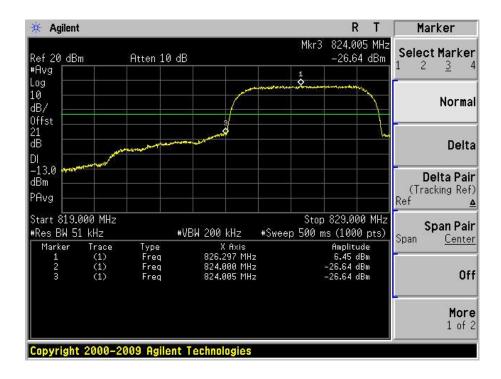


## HSDPA Band V High Channel 30MHz to 1GHz

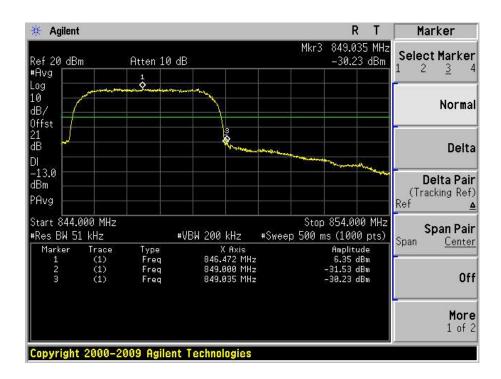




#### HSDPA Band V Low Band Emission



## HSDPA Band V High Band Emission



### 7. SPURIOUS RADIATION EMISSIONS

## 7.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ±5.20 dB.

### 7.2 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  $\S24.238(a)$ , the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P) dB$ .

### 7.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	112012	2010-12-20	2011-12-19
Signal Generator	R&S	SMR20	100047	2010-12-20	2011-12-19

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

### 7.4 Test Procedure

- 1. The setup of EUT is according with per TIA/EIA Standard 603C and ANSI C63.4-2003 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 = $43+10 \text{ Log}_{10}$  (power out in Watts)

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## 7.5 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	48%
ATM Pressure:	1012 mbar

## 7.6 Summary of Test Results/Plots

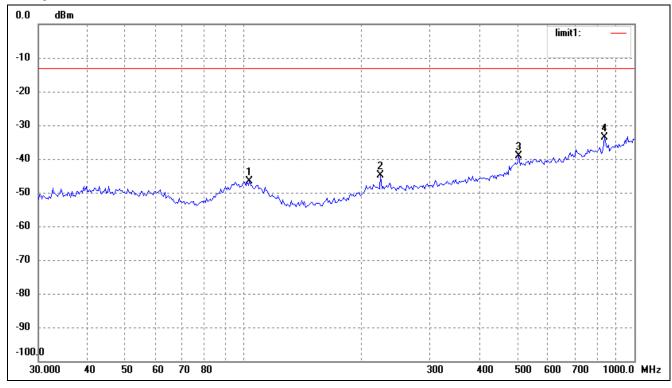
According to the data below, the FCC Part 22.917 and 24.238 standards, and had the worst margin of:

-16.82 dBm at 1648.4 MHz in the Vertical polarization for GSM Band, 30 MHz to 1 GHz.

Spurious Emission From 30MHz to 1GHz

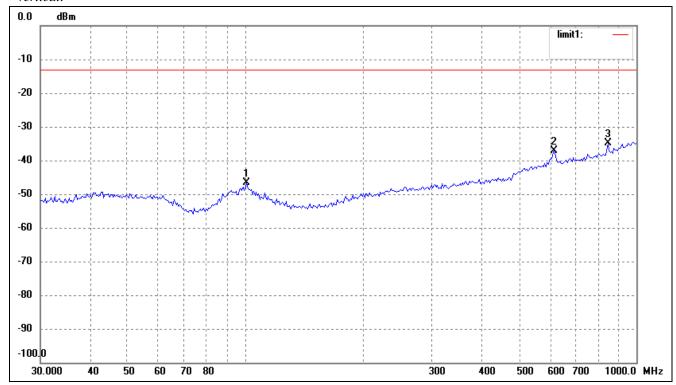
For Cellular Band\_GSM Mode

Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	103.8055	-66.50	19.91	-46.59	-13.00	-33.59	ERP
2	224.5193	-64.25	19.35	-44.90	-13.00	-31.90	ERP
3	506.4791	-65.58	26.35	-39.23	-13.00	-26.23	ERP
4	839.1818	-65.26	31.55	-33.71	-13.00	-20.71	ERP

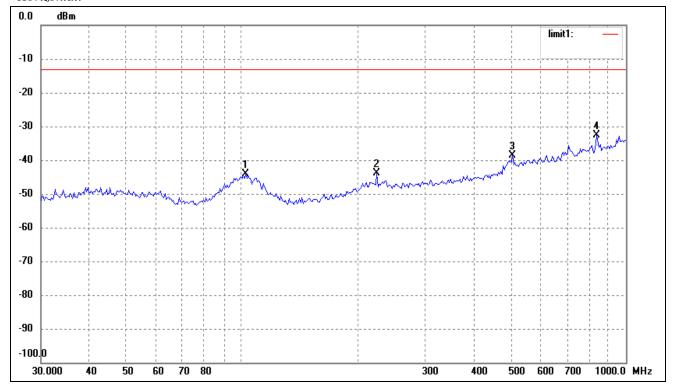
## Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	100.9340	-66.81	20.14	-46.67	-13.00	-33.67	ERP
2	616.3718	-65.72	28.60	-37.12	-13.00	-24.12	ERP
3	845.0878	-66.48	31.66	-34.82	-13.00	-21.82	ERP

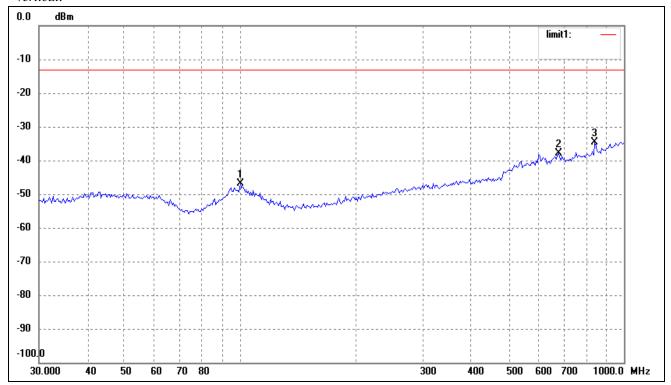
## For Cellular Band\_GPRS Mode

## Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	102.3597	-64.25	20.03	-44.22	-13.00	-31.22	ERP
2	224.5193	-63.25	19.35	-43.90	-13.00	-30.90	ERP
3	506.4791	-65.08	26.35	-38.73	-13.00	-25.73	ERP
4	839.1818	-64.26	31.55	-32.71	-13.00	-19.71	ERP

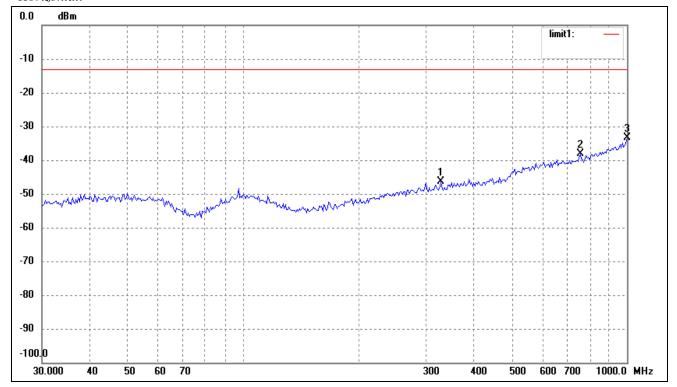
## Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	100.2286	-67.00	20.21	-46.79	-13.00	-33.79	ERP
2	675.2079	-66.99	29.09	-37.90	-13.00	-24.90	ERP
3	839.1817	-66.13	31.55	-34.58	-13.00	-21.58	ERP

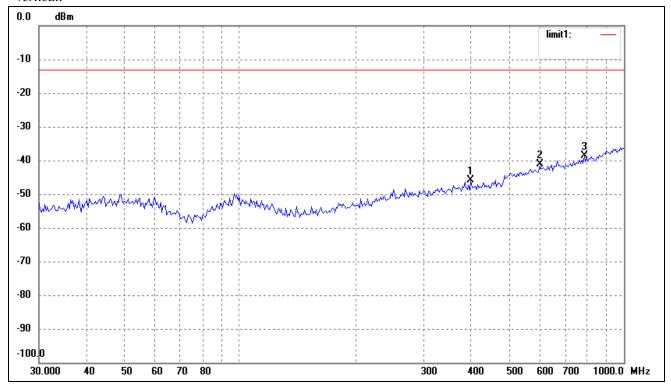
## For PCS Band\_GSM Mode

## Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	327.8873	-68.23	21.97	-46.26	-13.00	-33.26	ERP
2	755.3873	-68.23	30.14	-38.09	-13.00	-25.09	ERP
3	1000.0000	-67.83	34.54	-33.29	-13.00	-20.29	ERP

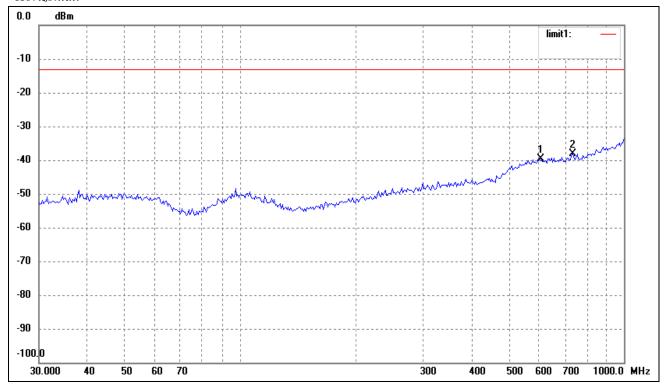
## Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	399.0302	-69.19	23.20	-45.99	-13.00	-32.99	ERP
2	603.5392	-69.51	28.50	-41.01	-13.00	-28.01	ERP
3	787.8513	-69.34	30.63	-38.71	-13.00	-25.71	ERP

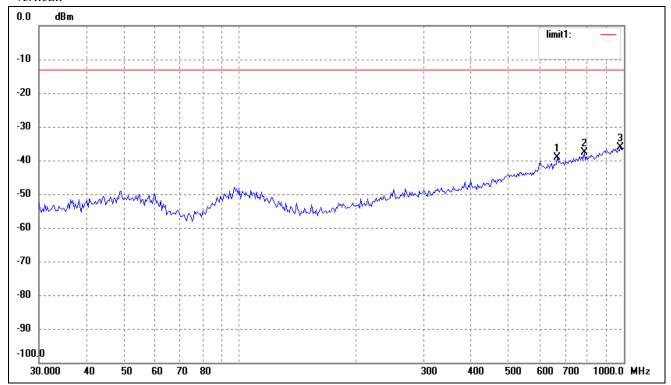
## For PCS Band\_GPRS Mode

## Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	607.7867	-68.10	28.53	-39.57	-13.00	-26.57	ERP
2	734.4913	-67.82	29.82	-38.00	-13.00	-25.00	ERP

## Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	670.4892	-68.11	29.06	-39.05	-13.00	-26.05	ERP
2	787.8513	-68.34	30.63	-37.71	-13.00	-24.71	ERP
3	979.1803	-70.29	34.16	-36.13	-13.00	-23.13	ERP

Spurious Emissions Above 1GHz

## For Cellular Band\_GSM Mode

	SG				Antenna		FCC Pa	art 22H			
Frequency	Reading	Height	Polar	Cable loss	Gain	Corrected Ampl.	Limit	Margin			
MHz	dBm	Meter	H/V	dB	dB	dBm	dBm	dB			
			Lo	w Channel (	(824.2MHz)						
1648.4	-35.23	1.5	V	1.8	7.6	-29.43	-13	-16.43			
2472.6	-43.44	1.5	V	2.4	7.9	-37.94	-13	-24.94			
1648.4	-40.47	2	Н	1.8	7.6	-34.67	-13	-21.67			
2472.6	-46.71	2	Н	2.4	7.9	-41.21	-13	-28.21			
	Middle Channel (836.6MHz)										
1673.2	-37.31	1.5	V	1.9	7.6	-31.61	-13	-18.61			
2509.8	-41.25	1.5	V	2.5	7.9	-35.85	-13	-22.85			
1673.2	-41.13	2	Н	1.9	7.6	-35.43	-13	-22.43			
2509.8	-43.35	2	Н	2.5	7.9	-37.95	-13	-24.95			
			Hig	gh Channel	(848.8MHz)	)					
1697.6	-37.22	1.5	V	2	7.6	-31.62	-13	-18.62			
2546.4	-37.75	1.5	V	2.6	7.9	-32.45	-13	-19.45			
1697.6	-43.42	2	Н	2	7.6	-37.82	-13	-24.82			
2546.4	-43.7	2	Н	2.6	7.9	-38.4	-13	-25.4			

## For PCS Band\_GSM Mode

	GSM MOa							
	SG				Antenna		FCC P	art 24E
Frequency	Reading	Height	Polar	Cable loss	Gain	Corrected Ampl.	Limit	Margin
MHz	dBm	Meter	H/V	dB	dB	dBm	dBm	dB
			Lov	w Channel (	1850.2MHz	)		
3700.4	-35.63	1.5	V	2.9	8.3	-30.23	-13	-17.23
5550.6	-40.71	1.5	V	3.7	8.6	-35.81	-13	-22.81
3700.4	-43.34	2	Н	2.9	8.3	-37.94	-13	-24.94
5550.6	-44.87	2	Н	3.7	8.6	-39.97	-13	-26.97
			Mic	ldle Channe	l (1880MHz	2)		
3760	-37.56	1.5	V	2.9	8.4	-32.06	-13	-19.06
5640	-41.86	1.5	V	3.7	8.7	-36.86	-13	-23.86
3760	-41.11	2	Н	2.9	8.4	-35.61	-13	-22.61
5640	-44.34	2	Н	3.7	8.7	-39.34	-13	-26.34
			Hig	h Channel (	1909.8MHz	<b>:</b> )		
3819.6	-37.03	1.5	V	2.9	8.4	-31.53	-13	-18.53
5729.4	-42.85	1.5	V	3.7	8.7	-37.85	-13	-24.85
3819.6	-45.62	2	Н	2.9	8.4	-40.12	-13	-27.12
5729.4	-47.69	2	Н	3.7	8.7	-42.69	-13	-29.69

## $For \ Cellular \ Band\_GPRS \ Mode$

	SG				Antenna		FCC Pa	art 22H
Frequency	Reading	Height	Polar	Cable loss	Gain	Corrected Ampl.	Limit	Margin
MHz	dBm	Meter	H/V	dB	dB	dBm	dBm	dB
			Lo	w Channel	(824.2MHz)	)		
1648.4	-36.31	1.5	V	1.8	7.6	-30.51	-13	-17.51
2472.6	-42.34	1.5	V	2.4	7.9	-36.84	-13	-23.84
1648.4	-39.36	2	Н	1.8	7.6	-33.56	-13	-20.56
2472.6	-47.23	2	Н	2.4	7.9	-41.73	-13	-28.73
			Mid	dle Channel	(836.6MHz	z)		
1673.2	-35.93	1.5	V	1.9	7.6	-30.23	-13	-17.23
2509.8	-42.19	1.5	V	2.5	7.9	-36.79	-13	-23.79
1673.2	-42.55	2	Н	1.9	7.6	-36.85	-13	-23.85
2509.8	-42.69	2	Н	2.5	7.9	-37.29	-13	-24.29
			Hig	gh Channel	(848.8MHz)	)		
1697.6	-37.16	1.5	V	2	7.6	-31.56	-13	-18.56
2546.4	-38.56	1.5	V	2.6	7.9	-33.26	-13	-20.26
1697.6	-42.06	2	Н	2	7.6	-36.46	-13	-23.46
2546.4	-42.84	2	Н	2.6	7.9	-37.54	-13	-24.54

## For PCS Band\_GPRS Mode

	SG				Antenna		FCC Pa	art 24E
Frequency	Reading	Height	Polar	Cable loss	Gain	Corrected Ampl.	Limit	Margin
MHz	dBm	Meter	H/V	dB	dB	dBm	dBm	dB
			Lov	w Channel (	1850.2MHz	)		
3700.4	-36.43	1.5	V	2.9	8.3	-31.03	-13	-18.03
5550.6	-40.46	1.5	V	3.7	8.6	-35.56	-13	-22.56
3700.4	-41.50	2	Н	2.9	8.3	-36.10	-13	-23.10
5550.6	-45.06	2	Н	3.7	8.6	-40.16	-13	-27.16
			Mic	ldle Channe	l (1880MHz	z)		
3760	-36.73	1.5	V	2.9	8.4	-31.23	-13	-18.23
5640	-41.29	1.5	V	3.7	8.7	-36.29	-13	-23.29
3760	-39.63	2	Н	2.9	8.4	-34.13	-13	-21.13
5640	-45.29	2	Н	3.7	8.7	-40.29	-13	-27.29
			Hig	h Channel (	1909.8MHz	:)		
3819.6	-35.59	1.5	V	2.9	8.4	-30.09	-13	-17.09
5729.4	-43.61	1.5	V	3.7	8.7	-38.61	-13	-25.61
3819.6	-45.61	2	Н	2.9	8.4	-40.11	-13	-27.11
5729.4	-48.28	2	Н	3.7	8.7	-43.28	-13	-30.28

## $For \ Cellular \ Band\_EDGE \ Mode$

	SG				Antenna		FCC P	art 22H
Frequency	Reading	Height	Polar	Cable loss	Gain	Corrected Ampl.	Limit	Margin
MHz	dBm	Meter	H/V	dB	dB	dBm	dBm	dB
			Lo	w Channel	(824.2MHz)	)		
1648.4	-48.13	1.5	V	1.8	7.6	-42.33	-13	-29.33
2472.6	-56.05	1.5	V	2.4	7.9	-50.55	-13	-37.55
1648.4	-49.15	1.5	Н	1.8	7.6	-43.35	-13	-30.35
2472.6	-54.62	1.5	Н	2.4	7.9	-49.12	-13	-36.12
			Mid	dle Channel	(836.6MHz	z)		
1673.2	-47.95	1.5	V	1.9	7.6	-42.25	-13	-29.25
2509.8	-56.62	1.5	V	2.5	7.9	-51.22	-13	-38.22
1673.2	-47.15	1.5	Н	1.9	7.6	-41.45	-13	-28.45
2509.8	-55.61	1.5	Н	2.5	7.9	-50.21	-13	-37.21
			Hiş	gh Channel	(848.8MHz)	)		
1697.6	-47.49	1.5	V	2.0	7.6	-41.89	-13	-28.89
2546.4	-53.53	1.5	V	2.6	7.9	-48.23	-13	-35.23
1697.6	-47.78	1.5	Н	2.0	7.6	-42.18	-13	-29.18
2546.4	-53.53	1.5	Н	2.6	7.9	-48.23	-13	-35.23

## For PCS Band\_EDGE Mode

	SG				Antenna		FCC P	art 24E
Frequency	Reading	Height	Polar	Cable loss	Gain	Corrected Ampl.	Limit	Margin
MHz	dBm	Meter	H/V	dB	dB	dBm	dBm	dB
			Lo	w Channel (	1850.2MHz	)		
3700.4	-52.62	1.5	V	2.9	8.3	-47.22	-13	-34.22
5550.6	-50.25	1.5	V	3.7	8.6	-45.35	-13	-32.35
3700.4	-57.66	1.5	Н	2.9	8.3	-52.26	-13	-39.26
5550.6	-53.17	1.5	Н	3.7	8.6	-48.27	-13	-35.27
			Mic	ldle Channe	l (1880MHz	2)		
3760	-52.62	1.5	V	2.9	8.4	-47.12	-13	-34.12
5640	-51.76	1.5	V	3.7	8.7	-46.76	-13	-33.76
3760	-56.22	1.5	Н	2.9	8.4	-50.72	-13	-37.72
5640	-54.23	1.5	Н	3.7	8.7	-49.23	-13	-36.23
			Hig	h Channel (	1909.8MHz	<b>:</b> )		
3819.6	-52.83	1.5	V	2.9	8.4	-47.33	-13	-34.33
5729.4	-50.45	1.5	V	3.7	8.7	-45.45	-13	-32.45
3819.6	-57.04	1.5	Н	2.9	8.4	-51.54	-13	-38.54
5729.4	-52.69	1.5	Н	3.7	8.7	-47.69	-13	-34.69

For Band  $V\_WCDMA$  Mode

	SG				Antenna		FCC Pa	art 22H
Frequency	Reading	Height	Polar	Cable loss	Gain	Corrected Ampl.	Limit	Margin
MHz	dBm	Meter	H/V	dB	dB	dBm	dBm	dB
			Lo	w Channel (	(826.4MHz)	)		
1652.8	-61.09	1.5	V	1.8	7.6	-55.29	-13	-42.29
3312.0	-65.47	1.5	V	2.6	8.2	-59.87	-13	-46.87
1652.8	-58.17	1.5	Н	1.8	7.6	-52.37	-13	-39.37
3312.0	-64.78	1.5	Н	2.6	8.2	-59.18	-13	-46.18
			Mid	dle Channel	(836.4MH	z)		
1672.8	-58.74	1.5	V	1.8	7.6	-52.94	-13	-39.94
3346.0	-56.78	1.5	V	2.6	8.2	-51.18	-13	-38.18
1672.8	-52.63	1.5	Н	1.8	7.6	-46.83	-13	-33.83
3346.0	-55.56	1.5	Н	2.6	8.2	-49.96	-13	-36.96
			Hig	gh Channel	(846.6MHz)	)		
1693.20	-60.37	1.5	V	1.8	7.6	-54.57	-13	-41.57
3388.50	-62.57	1.5	V	2.6	8.2	-56.97	-13	-43.97
1693.20	-56.24	1.5	Н	1.8	7.6	-50.44	-13	-37.44
3388.50	-60.03	1.5	Н	2.6	8.2	-54.43	-13	-41.43

### For Band V\_HSDPA Mode

	SG				Antenna		FCC P	art 22H
Frequency	Reading	Height	Polar	Cable loss	Gain	Corrected Ampl.	Limit	Margin
MHz	dBm	Meter	H/V	dB	dB	dBm	dBm	dB
			Lo	w Channel (	(826.4MHz)	)		
1652.8	-61.00	1.5	V	1.8	7.6	-55.20	-13.00	-42.20
3312.0	-56.15	1.5	V	2.6	8.2	-50.55	-13.00	-37.55
1652.8	-57.95	1.5	Н	1.8	7.6	-52.15	-13.00	-39.15
3312.0	-55.75	1.5	Н	2.6	8.2	-50.15	-13.00	-37.15
			Mid	dle Channel	(836.4MHz	z)		
1672.8	-58.66	1.5	V	1.8	7.6	-52.86	-13.00	-39.86
3346.0	-55.54	1.5	V	2.6	8.2	-49.94	-13.00	-36.94
1672.8	-52.04	1.5	Н	1.8	7.6	-46.24	-13.00	-33.24
3346.0	-53.33	1.5	Н	2.6	8.2	-47.73	-13.00	-34.73
			Hig	gh Channel	(846.6MHz)	)		
1693.2	-60.83	1.5	V	1.8	7.6	-55.03	-13.00	-42.03
3388.5	-61.71	1.5	V	2.6	8.2	-56.11	-13.00	-43.11
1693.2	-56.10	1.5	Н	1.8	7.6	-50.30	-13.00	-37.30
3388.5	-58.16	1.5	Н	2.6	8.2	-52.56	-13.00	-39.56

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 10<sup>th</sup> Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

## 8. FREQUENCY STABILITY

## 8.1 Standard Applicable

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Cellular Band

Frequency range (MHz)	Base, fixed (ppm)	Mobile ≤3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	N/A	N/A
929 to 960	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 8.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Aglient	Spectrum Analyzer	E4402B-ESA	US41192821	2010-12-20	2011-12-19
Rohde &	Universal Radio	CMU200	112012	2010-12-20	2011-12-19
Schwarz	Communication	CMO200	112012	2010-12-20	2011-12-19
GONGWEN	Moisture Test Chamber	GDS-150	SEMT-0013	2011-07-16	2012-07-15

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

### **8.3 Test Procedure**

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode

Temperature:	Supply Voltage
20°C	85-115% of declared nominal voltage
-30°C to +50°C	Normal

## **8.4 Environmental Conditions**

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

## **8.5 Summary of Test Results/Plots**

For Cellular Band\_GSM Mode

Refe	Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm						
Environment	Power Supplied	Frequency Measure with Time Elapsed					
Temperature (°C)	(VDC)	MCF (Hz)	Error (ppm)				
50	3.7	30	0.03585				
40	3.7	29	0.03466				
30	3.7	22	0.02629				
20	3.7	15	0.01792				
10	3.7	11	0.01314				
0	3.7	-4	-0.00478				
-10	3.7	-7	-0.00836				
-20	3.7	-10	-0.01195				
-30	3.7	-13	-0.01553				

### For Cellular Band GPRS Mode

Refe	Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm						
Environment	Power Supplied	Frequency Measure	with Time Elapsed				
Temperature (°C)	(VDC)	MCF (Hz)	Error (ppm)				
50	3.7	28	0.03346				
40	3.7	25	0.02988				
30	3.7	17	0.02032				
20	3.7	15	0.01792				
10	3.7	5	0.00597				
0	3.7	3	0.00358				
-10	3.7	-6	-0.00717				
-20	3.7	-13	-0.01553				
-30	3.7	-15	-0.01792				

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For PCS Band\_GSM Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm					
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed			
		MCF (Hz)	Error (ppm)		
50	3.7	52	0.02765		
40	3.7	47	0.02500		
30	3.7	41	0.02180		
20	3.7	35	0.01861		
10	3.7	22	0.01170		
0	3.7	11	0.00585		
-10	3.7	3	0.00159		
-20	3.7	-6	-0.00319		
-30	3.7	-10	-0.00531		

## For PCS Band\_GPRS Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure	e with Time Elapsed Error (ppm)	
50	3.7	33	0.01755	
40	3.7	22	0.01170	
30	3.7	20	0.01063	
20	3.7	14	0.00744	
10	3.7	5	0.00265	
0	3.7	-2	-0.00106	
-10	3.7	-11	-0.00585	
-20	3.7	-15	-0.00797	
-30	3.7	-23	-0.01223	

# So, Frequency Stability Versus Input Voltage is: GSM Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm						
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed				
		Frequency (Hz)	Error (ppm)			
20	3.3V	11	0.01314			
	3.7V	13	0.01553			
	4.2V	15	0.01792			
Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm						
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed				
		_ ".,				
(°C)	(VDC)	Frequency (Hz)	Error (ppm)			
(°C)	3.3V	Frequency (Hz)	Error (ppm) 0.01436			
(°C)	,	, , ,	W. P. /			

### GPRS Mode

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm						
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed				
		Frequency (Hz)	Error (ppm)			
20	3.3V	9	0.01075			
	3.7V	13	0.01553			
	4.2V	16	0.01912			
Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm						
Environment	Power Supplied (VDC)	Frequency Measure	with Time Elapsed			
Temperature (°C)		Frequency (Hz)	Error (ppm)			
20	3.3V	8	0.00425			
	3.7V	12	0.00638			
	4.2V	17	0.00904			

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