SGS-CSTC Standards Technical Services （Shanghai）Co., Ltd.

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TEST REPORT

Application No. :	SHEMO10090121603
Applicant:	Lenovo Mobile Communication Technology LTD.
FCC ID:	YCNT90
Equipment Under Test (EUT):	
Product Name:	GSM/GPRS Mobile
Brand Name:	LANIX
Model Name:	T90
Standards:	FCC Part 2, 22H & 24E
Date of Receipt:	Sep 25, 2010
Date of Test:	Sep 26, 2010 to Oct 14, 2010
Date of Issue:	Oct 14, 2010
Test Result :	**PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further details.

Tino Pan
E&E Section Manager
SGS-CSTC(Shanghai) Co., Ltd.

Thunder Jin
Project Engineer
SGS-CSTC(Shanghai) Co., Ltd.

2 Test Summary

Description of Test	FCC Rules	Result
RF Power Output	2.1046(a) 22.913(a) 24.232(b)	Compliant
Occupied Bandwidth	2.1049(h)	Compliant
Effective Isotropic Radiated Power	2.1046(a) 22.913(a) 24.232(b)	Compliant
Out of Band Emissions at antenna Terminals and Band Edge	2.1051 22.917(a) 24.238(a)	Compliant
Field Strength of Spurious Emissions	2.1053 22.917(a) 24.238(a)	Compliant
Frequency Stability vs. Temperature and Voltage	2.1055	Compliant
Conducted Emission	Section 15.207	Compliant

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4 General Information

4.1 Client Information

Applicant:	Lenovo Mobile Communication Technology LTD.
Address of Applicant:	No.999,Qishan North 2nd Road,Information&Optoelectronics Park,Torch Hi-tech Industry Development Zone,Xiamen,P.R.China P.C:361006
Manufacturer:	Lenovo Mobile Communication Technology LTD.
Address of Manufacturer:	No.999,Qishan North 2nd Road,Information&Optoelectronics Park,Torch Hi-tech Industry Development Zone,Xiamen,P.R.China P.C:361006

4.2 General Description of E.U.T.

Product Name:	GSM/GPRS Mobile
Brand Name:	LANIX
Model Name:	T90
Power Supply:	3.8 V DC
Charger:	T90-C, 100-240V~ 50/60Hz 150mA
Battery:	T90-BAT, 3.7V 880mAh / 3.25Wh

GSM 850/1900:

	Operating frequency		Rated Power
Cellular phone standards Frequency Range and Power:	GSM/GPRS/EGPRS 1900	1850MHz-1910MHz	30dBm
	GSM/GPRS/EGPRS 850	824MHz-849MHz	33dBm
IMEI:	863189000725702, 863189000725611		
Hardware Version:	H402		
Software Version:	LANIX_T90_S107_100830		

4.3 Test Location

Tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shanghai EMC Laboratory

588 West Jindu Road, Songjiang District, Shanghai, China

Tel: +86 21 61915666 Fax: +86 21 61915678

4.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2011-07-29.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2011-09-29.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.

4.5 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA-603-C-2004 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

5 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100324	2010-4-19	2011-4-18
2	EMI test receiver	Rohde & Schwarz	ESU40	100109	2010-6-3	2011-6-2
4	Horn Antenna	Rohde & Schwarz	HF906	100284	2010-4-9	2011-4-8
5	Horn Antenna	Rohde & Schwarz	HF906	100285	2009-10-9	2010-10-8
6	ANTENNA	SCHWARZBECK	BBHA9120D	9120D-679	2010-6-3	2011-6-2
7	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2009-10-09	2010-10-08
8	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY-2003P	--	2009-10-15	2010-10-14
9	CLAMP METER	FLUKE	316	86080010	2010-04-28	2011-04-27
10	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2009-10-21	2010-10-20
11	Digital illuminance meter	TES electrical electronic Corp.	TES-1330A	050602219	2009-10-16	2010-10-15
12	TEMPERATURE& HUMIDITY BOX	KSON	THS-D2C-100	K40723	2009-11-18	2010-11-17
13	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2010-6-27	2011-6-26
14	DC power	KIKUSUI	PMC35－3	NF100260	2010-1-16	2011-1-15
15	Power meter	Rohde & Schwarz	NRP	101641	2010-5-4	2011-5-3
16	UNIVERSAL RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMU 200	112012	2010-08-25	2011-08-24
17	Tunable Notch Filter	WRCT800.0/880.0-0.2/40-5SSK	Wainwright instruments Gmbh	9	2010-1-27	2011-1-26
18	Tunable Notch Filter	WRCT1800.0/2000.0-0.2/40-5SSK	Wainwright instruments Gmbh	11	2010-1-27	2011-1-26
19	Band Reject Filter	WRCG 824/849-814/859-40/8SS	Amiden,Ireland	1	2010-1-27	2011-1-26
20	Band Reject Filter	WRCG 1850/1910-1835/1925-40/8SS	Amiden,Ireland	13	2010-1-27	2011-1-26

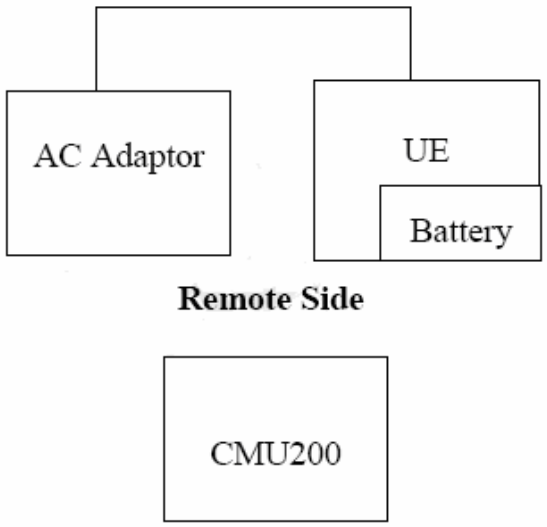
6 Test Results

6.1 E.U.T. test conditions

Power supply: DC 3.8V

Operating Environment:
Temperature: 20.0 -25.0 °C
Humidity: 38-48 % RH
Atmospheric Pressure: 992 -1006 mbar

Configuration of Tested System:



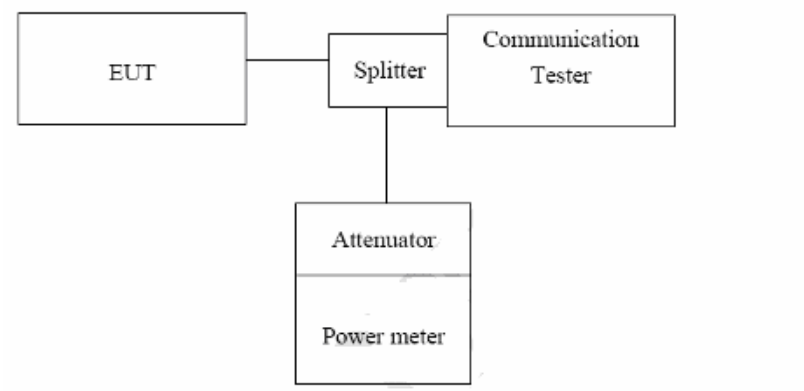
6.2 RF Power Output

Test Requirement: Part 2.1046

Part 22.913(a) Mobile station are limited to 7W

Part 24.232(b) Peak power measurement, Mobile station are limited to 2W

Test Setup



Measurement Setup for testing on Antenna connector.

Test Date: Oct 08, 2010

Test Status: Test lowest, middle, highest channel.

Test Procedure:

The transmitter output was connected to calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power in dBm. The power output at the transmitter antenna port was determined by adding the value of attenuator to the power meter reading.

RF Conducted output power:

GSM 850(GMSK) Result:

Frequency(MHz)	Channel	Output power 1 Slot (dBm)	Output power 2 Slot (dBm)
824.2	128	32.5	32.5
836.4	189	32.6	32.6
848.8	251	32.7	32.7

GSM 850(8PSK) Result:

Frequency(MHz)	Channel	Output power 1 Slot (dBm)	Output power 2 Slot (dBm)
824.2	128	25.7	25.5
836.4	189	26.2	25.9
848.8	251	26.3	26.0

PCS 1900(GMSK) Result:

Frequency(MHz)	Channel	Output power 1 Slot (dBm)	Output power 2 Slot (dBm)
1850.2	512	29.4	29.5
1880.0	661	29.4	29.5
1909.8	810	29.5	29.5

PCS 1900(8PSK) Result:

Frequency(MHz)	Channel	Output power 1 Slot (dBm)	Output power 2 Slot (dBm)
1850.2	512	25.5	25.3
1880.0	661	25.4	25.0
1909.8	810	25.3	24.9

6.3 Occupied Bandwidth

Test Requirement: Part 2.1049

Test Date: Oct 08, 2010

Test Status: Test lowest, middle, highest channel.

Test Procedure:

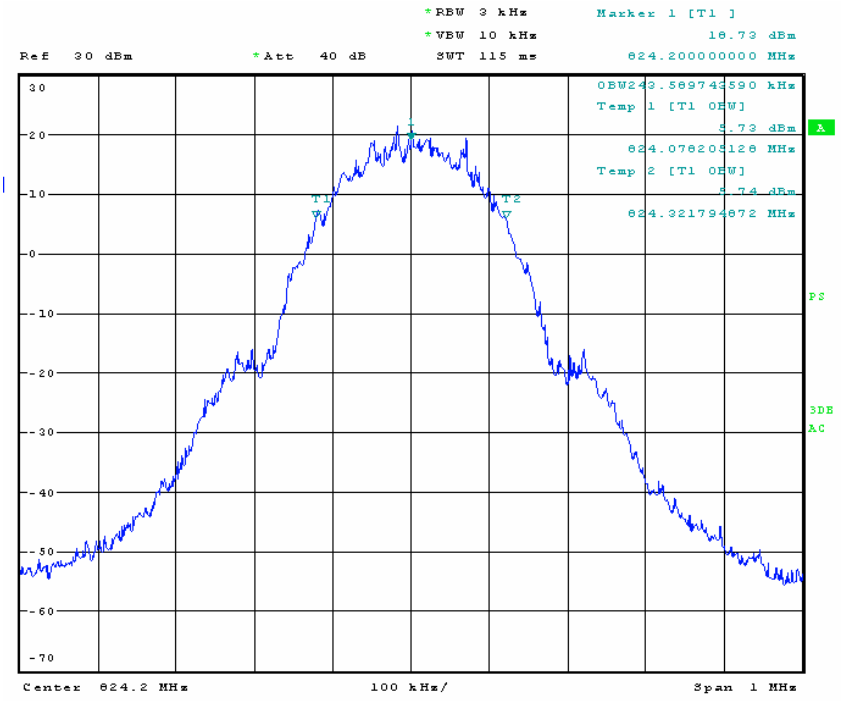
The EUT output RF connector was connected with a short a cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW>=3 times RBW, 99% bandwidth were measured, the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

Test result:

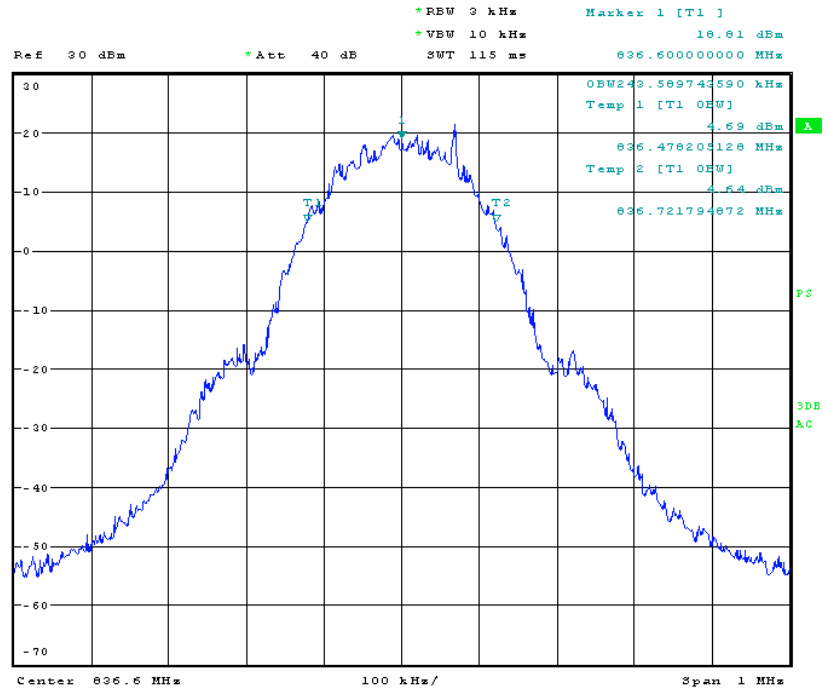
EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GSM 850 GMSK	824.2	128	243.590
	836.4	189	243.590
	848.8	251	240.385
GSM 850 8PSK	824.2	128	241.987
	836.4	189	241.987
	848.8	251	243.590
EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
PCS 1900 GMSK	1850.2	512	243.590
	1880.0	661	246.795
	1909.8	810	243.590
PCS 1900 8PSK	1850.2	512	241.987
	1880.0	661	243.590
	1909.8	810	243.590

99% Bandwidth

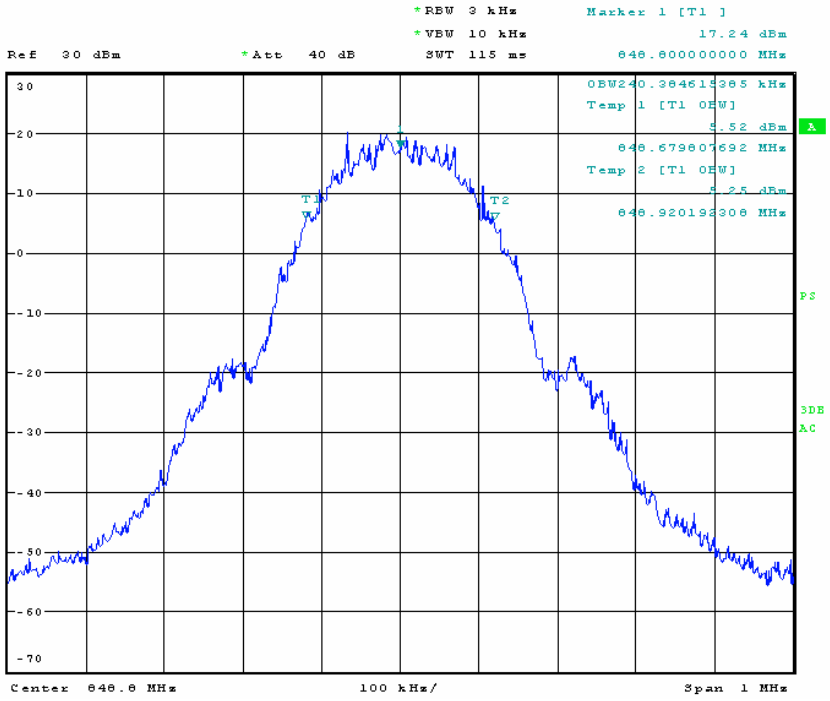
GSM 850 GMSK Channel Low



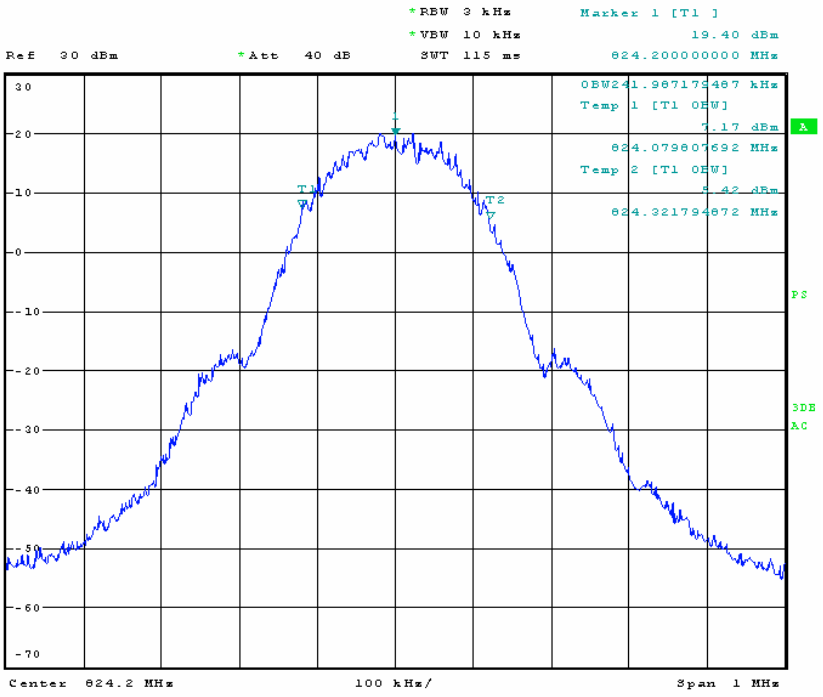
GSM 850 GMSK Channel Mid



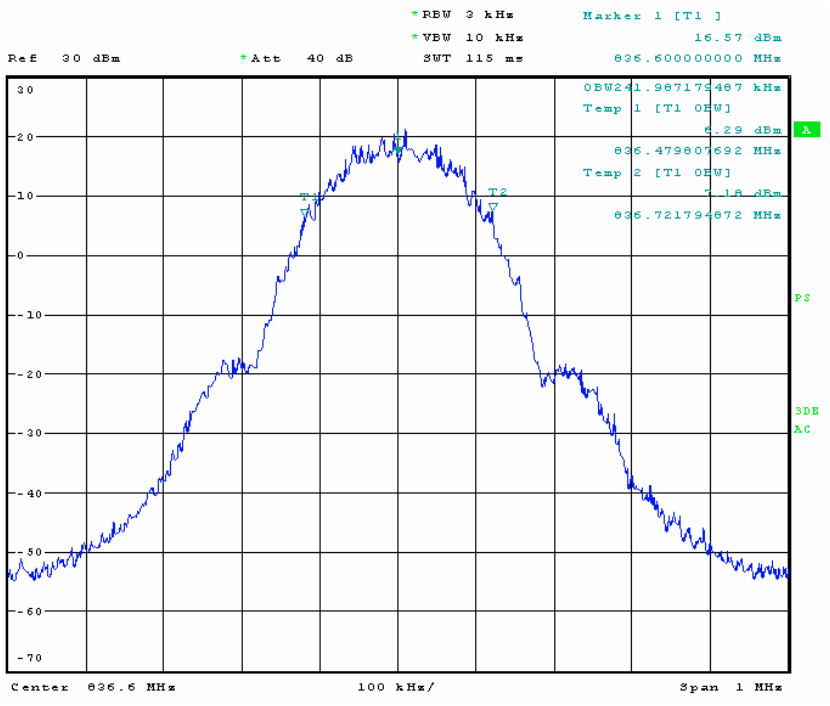
GSM 850 GMSK Channel High



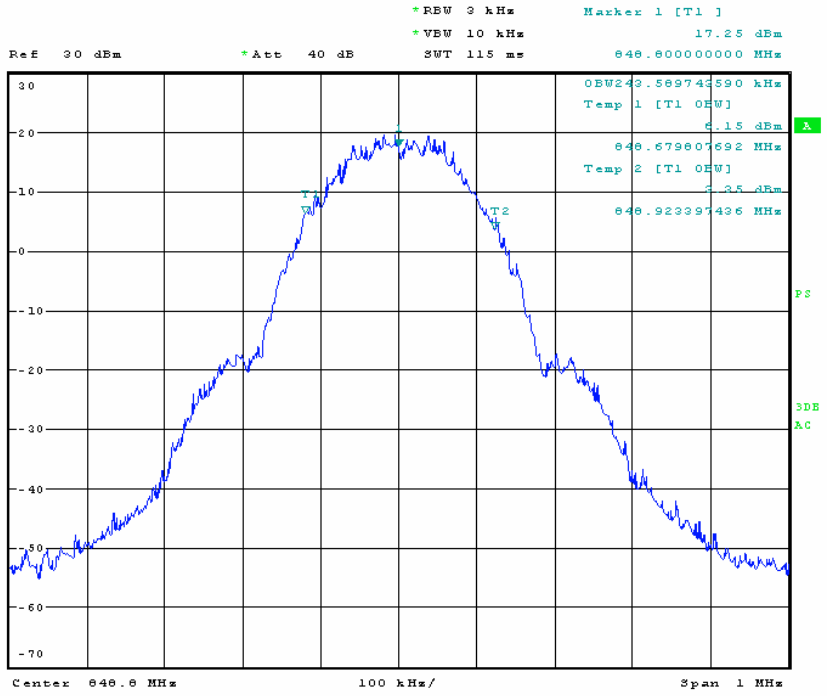
GSM 850 8PSK Channel Low



GSM 850 8PSK Channel Mid

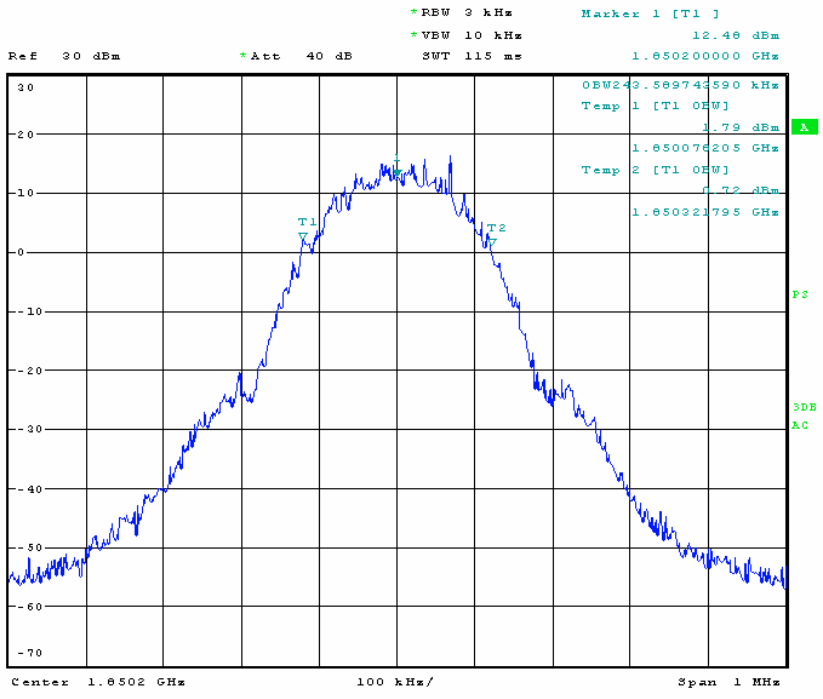


GSM 850 8PSK Channel High

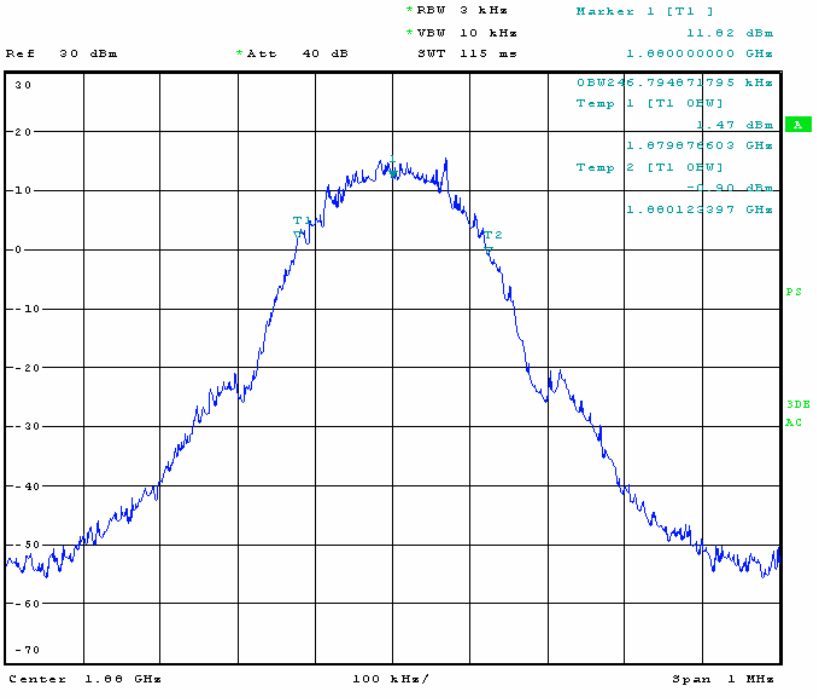


99% Bandwidth

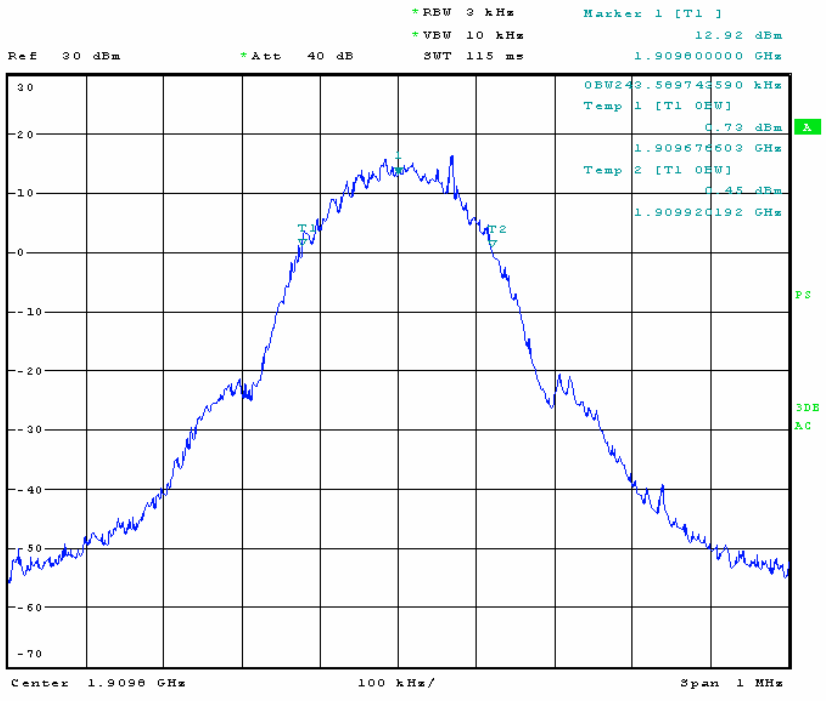
PCS 1900 GMSK Channel Low



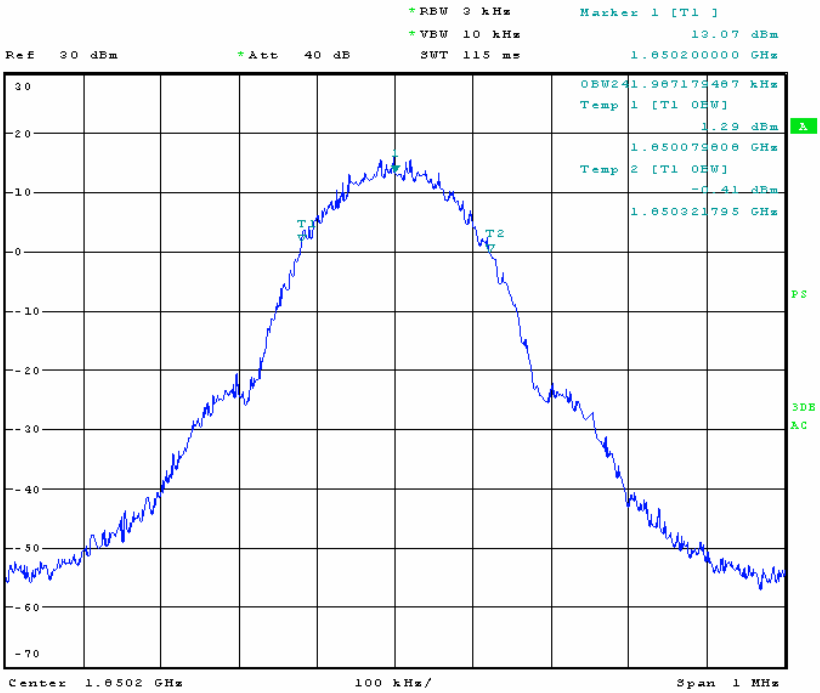
PCS 1900 GMSK Channel Mid



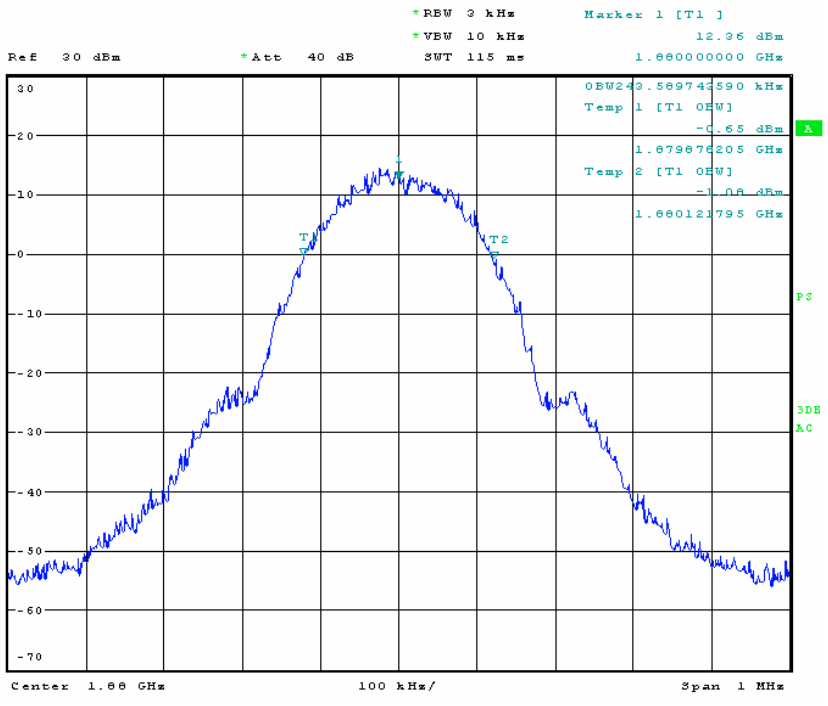
PCS 1900 GMSK Channel High



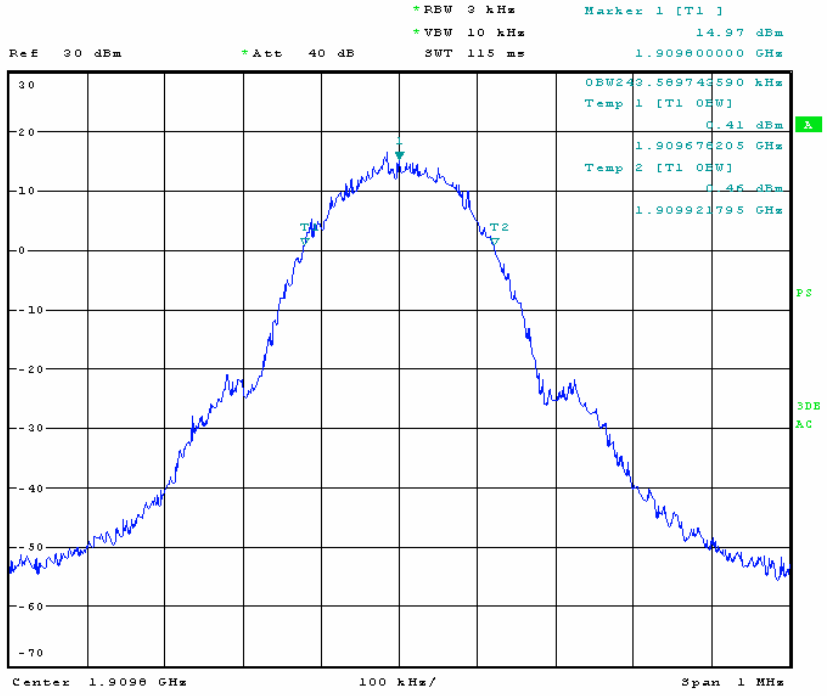
GSM 1900 8PSK Channel Low



GSM 1900 8PSK Channel Mid



GSM 1900 8PSK Channel High



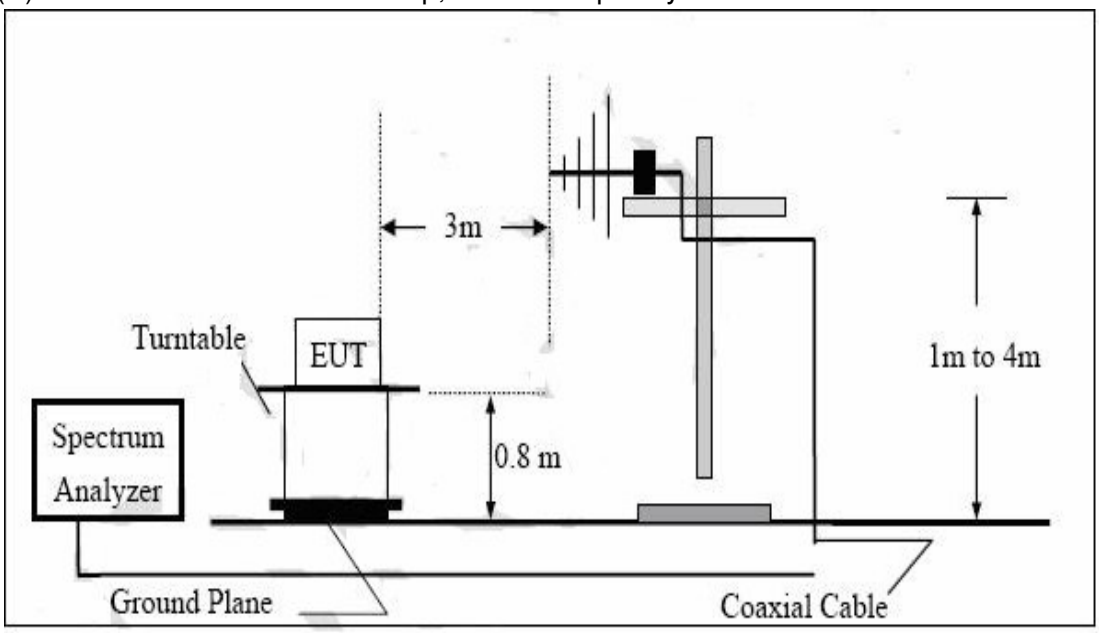
6.4 Effective Isotropic Radiated Power

Test Requirement: Part 2.1046
Part 22.913(a) Mobile station are limited to 7W ERP.
Part 24.232(b) Mobile station are Limited to 2W EIRP.

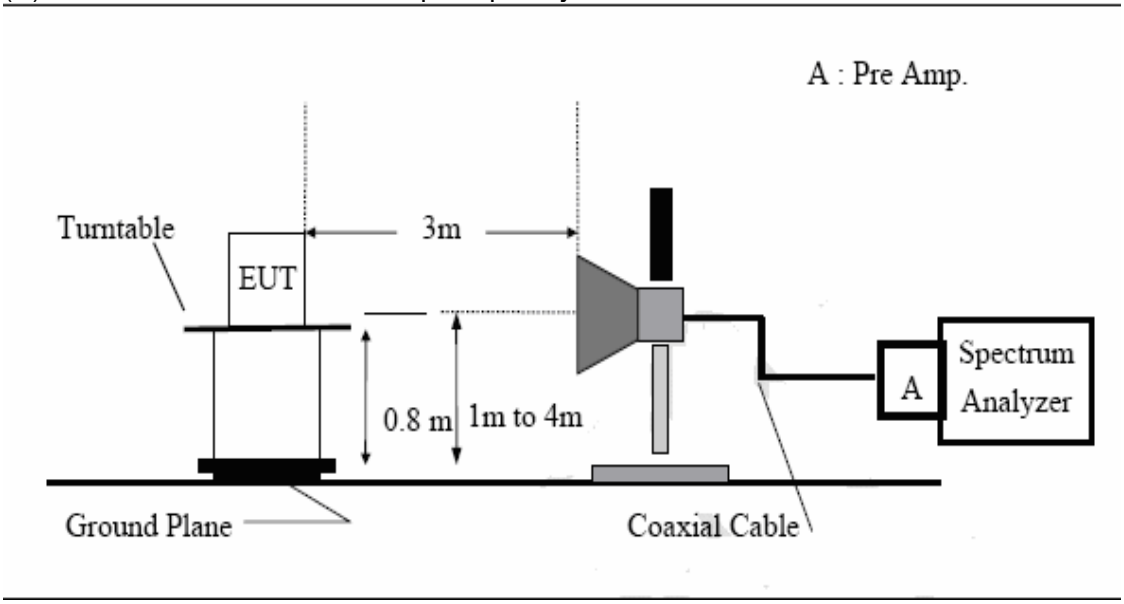
Test Date: Oct 10, 2010

Test Setup:

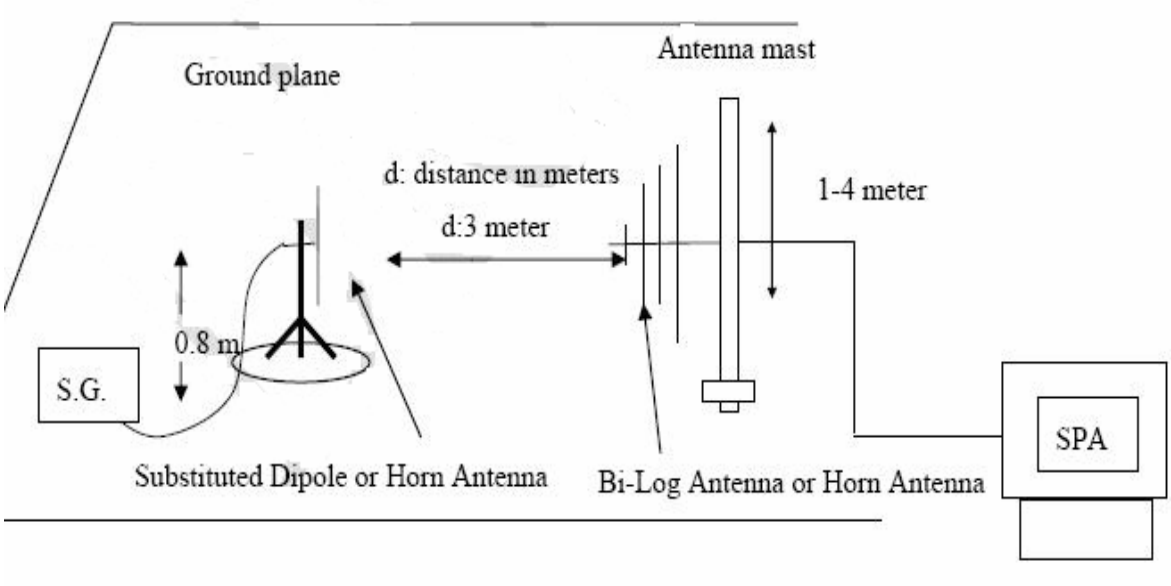
(A) Radiated emission Test setup, Below Frequency 1000MHz:



(B) Radiated emission Test setup frequency over 1GHz:



(C) Substituted Method Test setup:



Test Procedure:

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength(E in dBuV/m) was calculated.

ERP in frequency band 824.2-848.8MHz were measured using substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follow:

EIRP in frequency band 1850.2-1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

ERP=S.G. output (dBm) + Antenna Gain (dBd) - Cable Loss(dB)

EIRP= S.G. output (dBm) + Antenna Gain (dBi) - Cable Loss(dB)

Measurement result:

The RBW, VBW of SPA for frequency

Below 1GHz was RBW=300KHz, VBW=1MHz;

Above 1GHz was RBW=1MHz, VBW=3MHz

EUT mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. output (dBm)	Antenna Gain (dBd)	Cable loss (dB)	ERP (dBm)	Limit (dBm)
GSM 850 (GMSK)	824.2	128	H	V	105.77	20.56	8.4	2.89	26.07	38.45
				H	107.36	23.25	8.4	2.89	28.76	38.45
	836.6	190	H	V	106.14	21.45	8.45	2.93	26.97	38.45
				H	107.35	23.12	8.45	2.93	28.64	38.45
	848.8	251	H	V	106.04	21.21	8.76	2.97	27.00	38.45
				H	107.13	22.72	8.79	2.97	28.54	38.45
GSM 850 (8PSK)	824.2	128	H	V	102.85	17.64	8.4	2.89	23.15	38.45
				H	104.24	20.13	8.4	2.89	25.64	38.45
	836.6	190	H	V	102.90	18.21	8.45	2.93	23.73	38.45
				H	104.21	19.98	8.45	2.93	25.50	38.45
	848.8	251	H	V	103.01	18.18	8.76	2.97	23.97	38.45
				H	104.02	19.63	8.76	2.97	25.42	38.45

EUT mode	Frequency(MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV	S.G. output (dBm)	Antenna Gain (dBi)	Cable loss (dB)	EIRP (dBm)	Limit (dBm)
PCS 1900 (GMSK)	1850.2	512	H	V	103.60	19.80	7.05	4.45	24.50	33
				H	105.13	21.51	7.05	4.45	26.21	33
	1880.0	661	H	V	104.38	20.73	7.13	4.57	25.38	33
				H	105.63	22.29	7.13	4.57	26.94	33
	1909.8	810	H	V	103.59	19.69	7.25	4.48	24.46	33
				H	105.37	21.79	7.25	4.48	26.56	33
PCS 1900 (8PSK)	1850.2	512	H	V	101.51	17.71	7.05	4.45	22.41	33
				H	103.04	19.42	7.05	4.45	24.12	33
	1880.0	661	H	V	102.23	18.58	7.13	4.57	23.23	33
				H	103.52	20.18	7.13	4.57	24.83	33
	1909.8	810	H	V	101.46	17.56	7.25	4.48	22.35	33
				H	103.26	19.68	7.25	4.48	24.45	33

6.5 Out of band emissions at antenna Terminals

6.5.1 Band edges emissions

Test Requirement: Part 2.1051

FCC part 22.917(a), 24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specification in the instruction manual and/or alignment procedure, shall not be less than 43+10log(Mean power in watts) dBc below the mean power output outside a license's frequency block(-13dBm).

Test Date: Oct 10, 2010

Test Procedure:

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emission is any up to 10^{th} harmonic.

For the out of band:

Below 1GHz, RBW = 10kHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold)

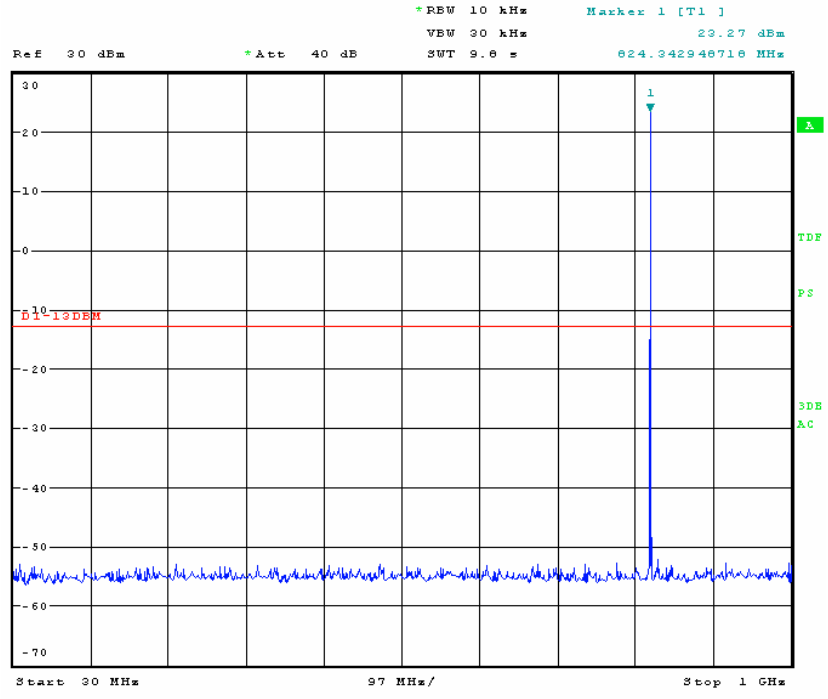
Above 1GHz, RBW = 1MHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold)

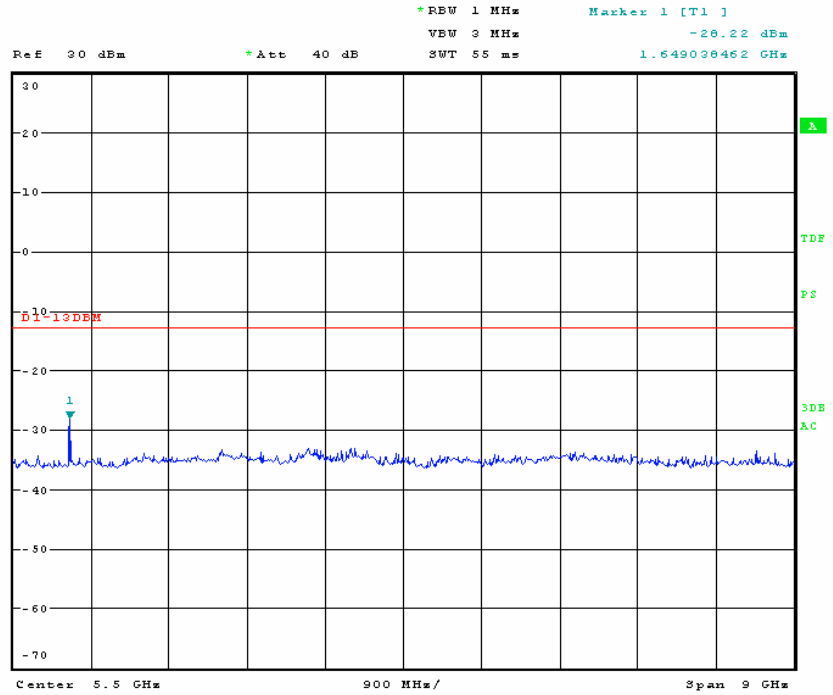
Band Edge requirements:

In 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 % of bandwidth of fundamental emission of the transmitter any be employed to measure the out of band emission. Limit=-13dBm.

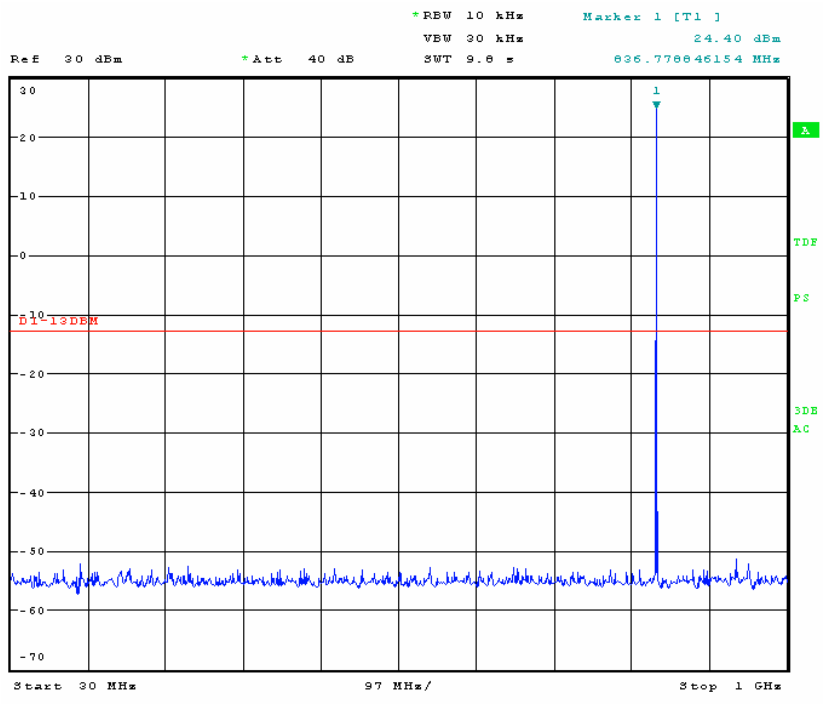
Measurement result:

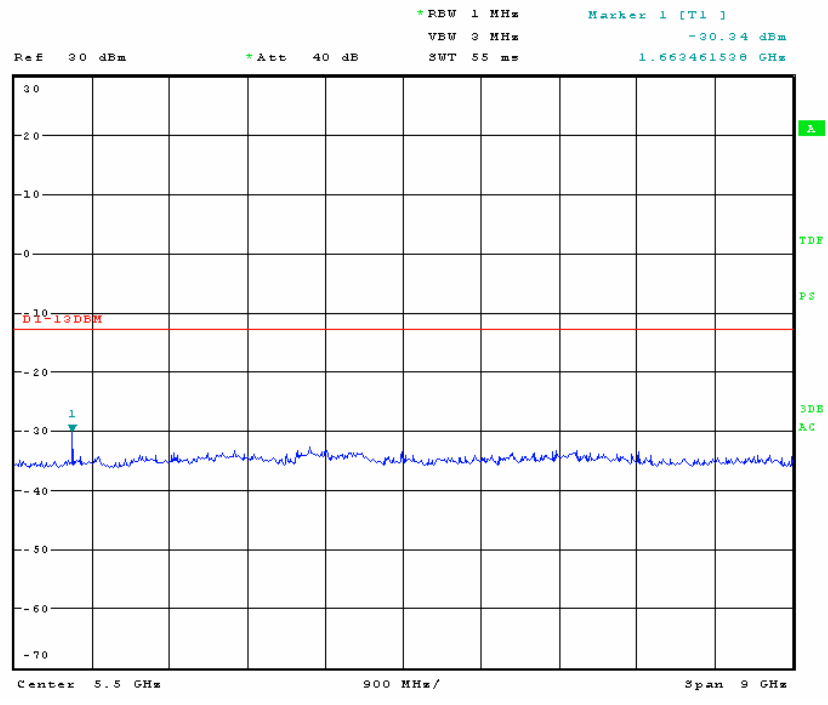
GSM 850 GMSK Channel Low



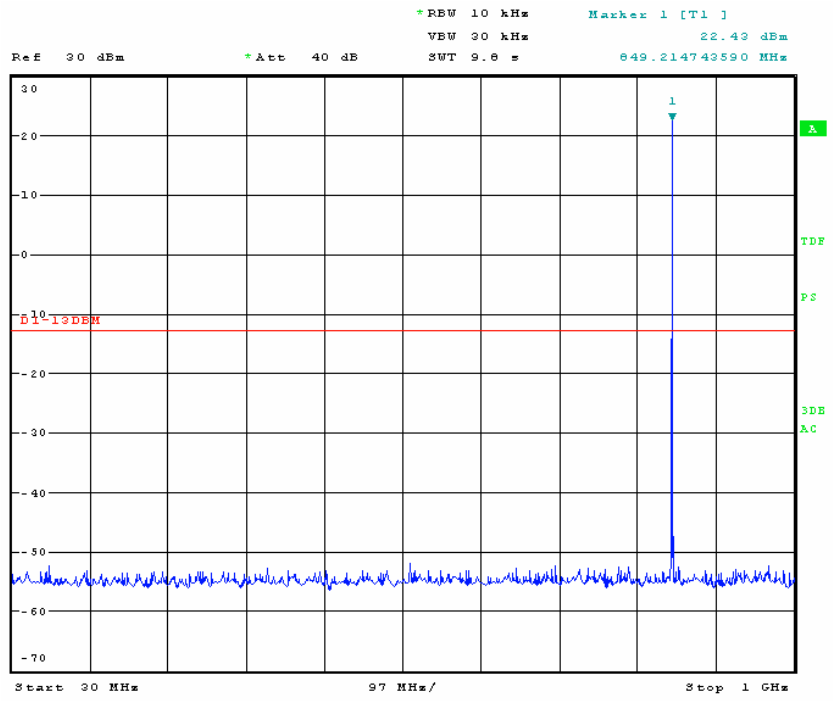


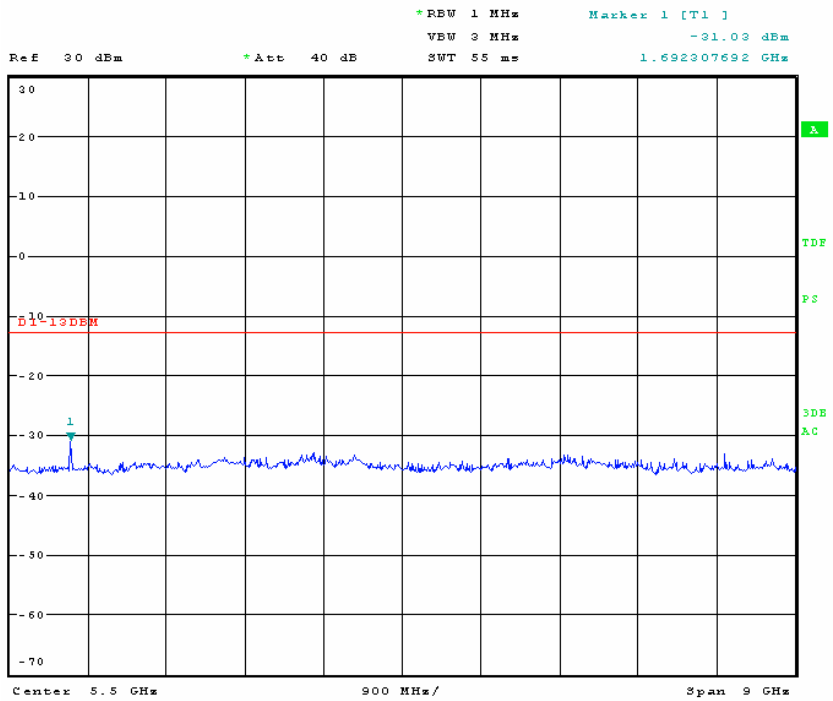
GSM 850 GMSK Channel Mid



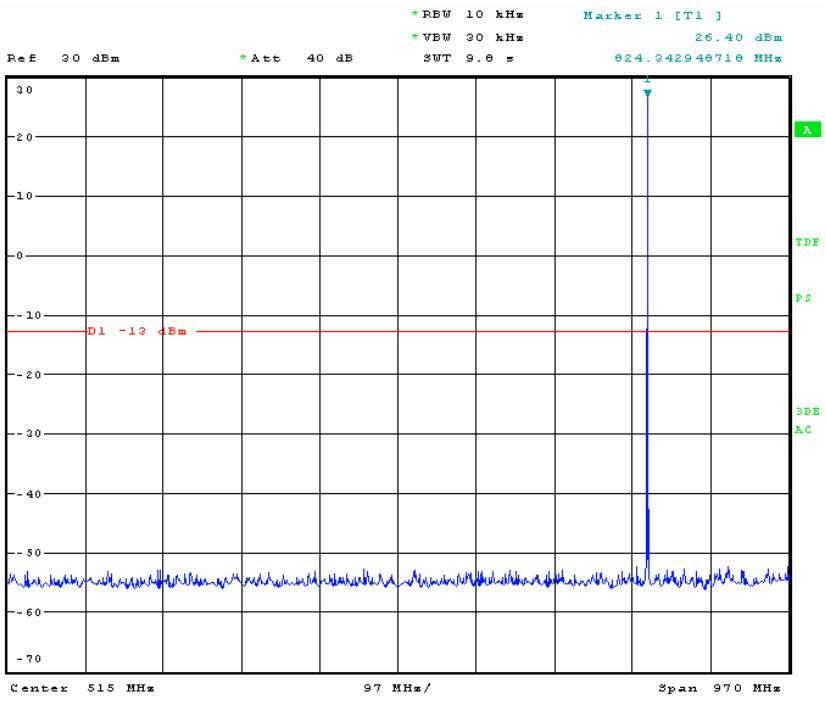


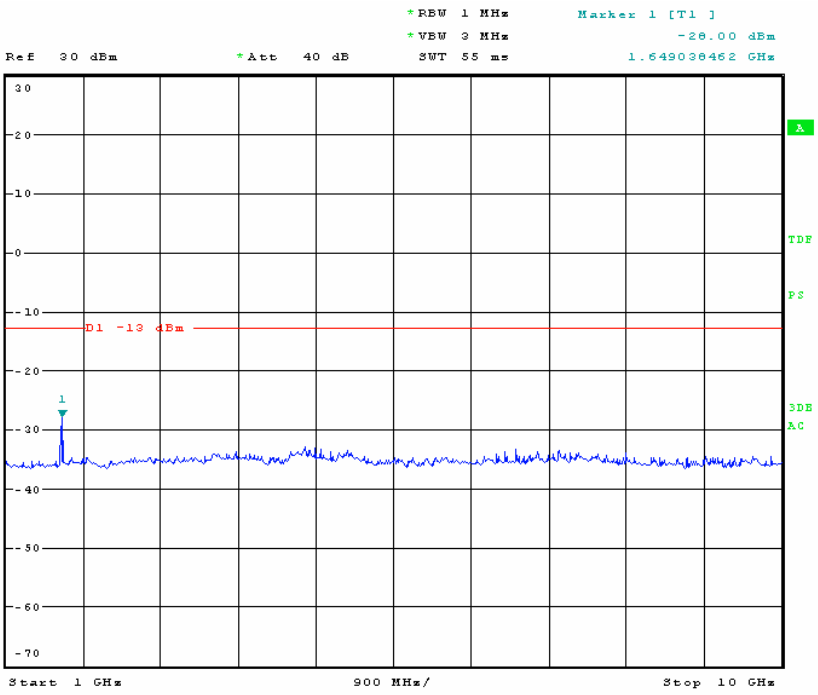
GSM 850 GMSK Channel High



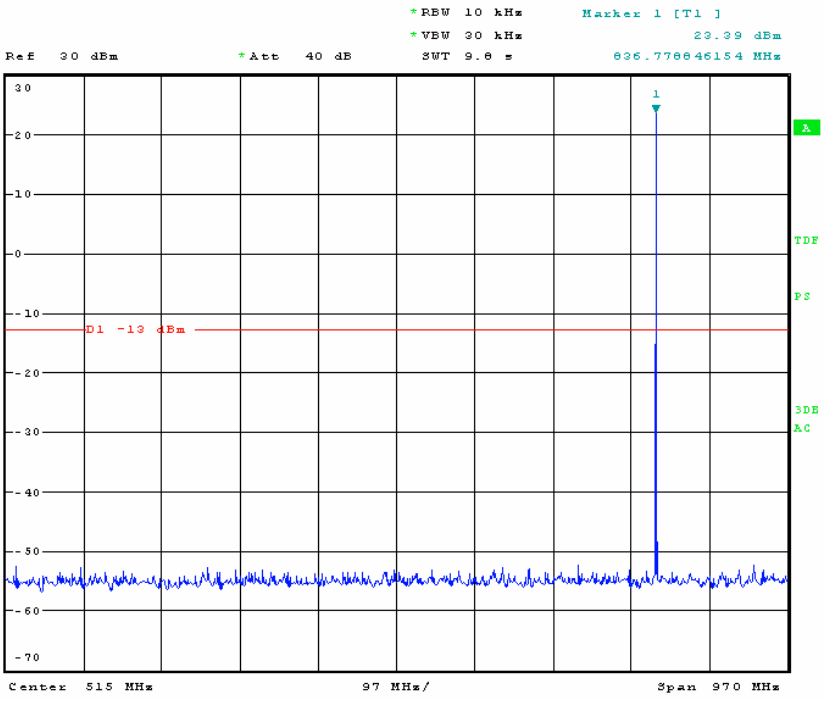


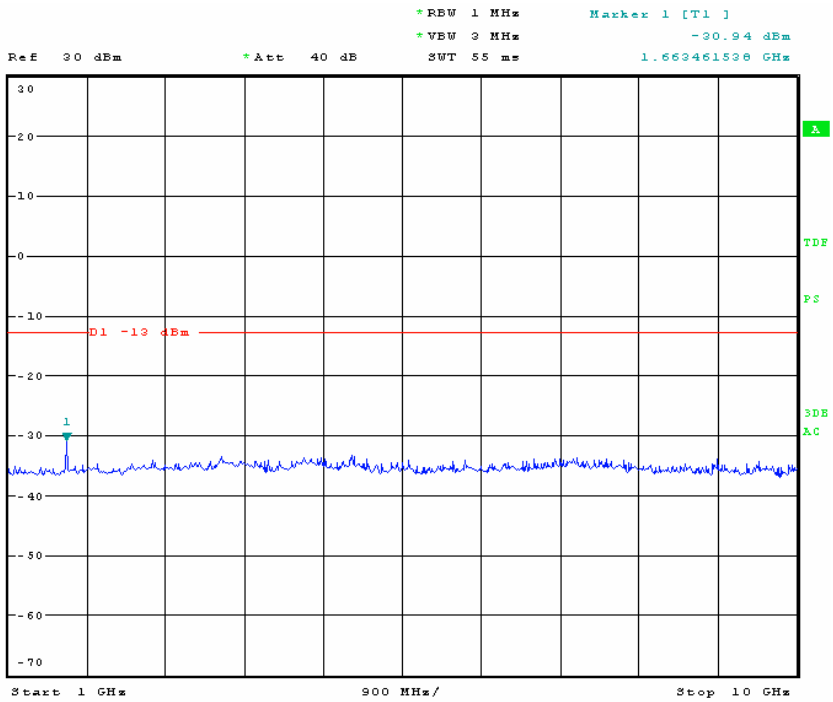
GSM 850 8PSK Channel Low



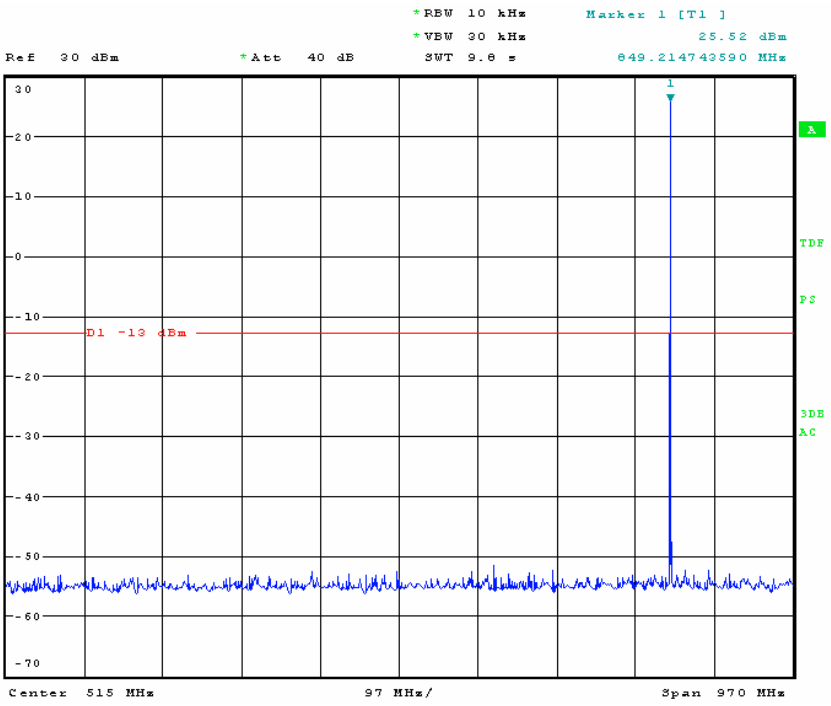


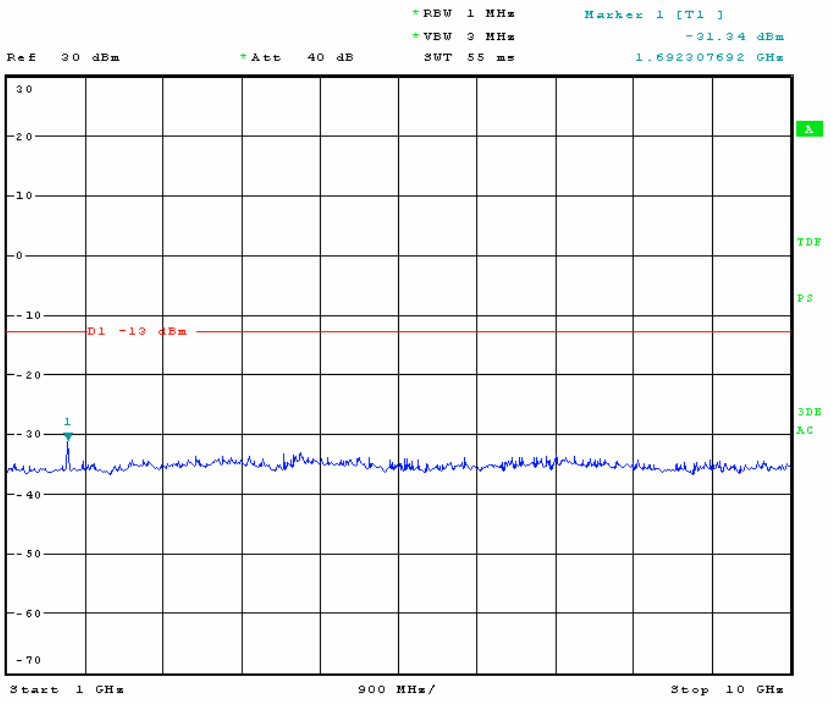
GSM 850 8PSK Channel Mid



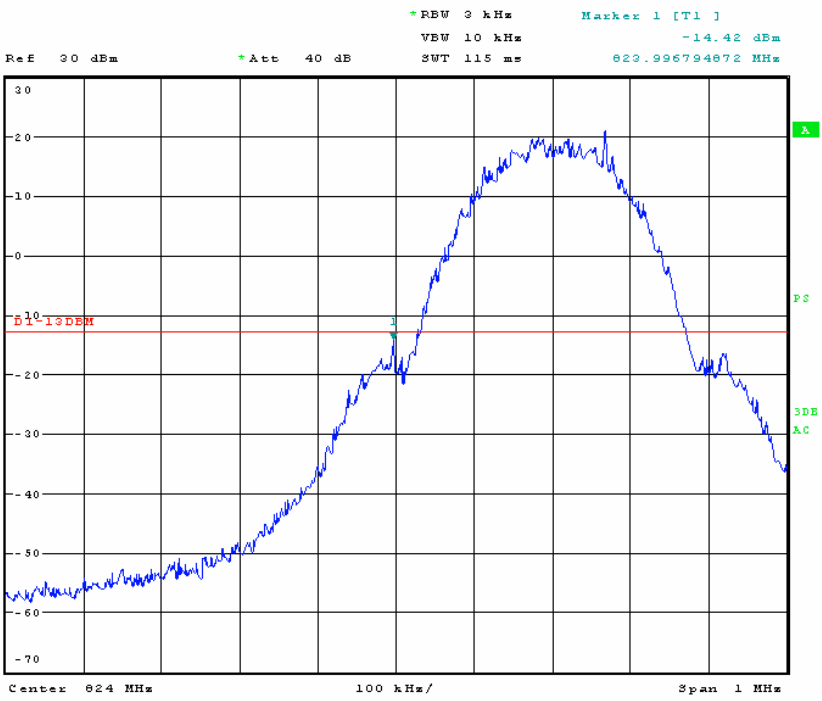


GSM 850 8PSK Channel High

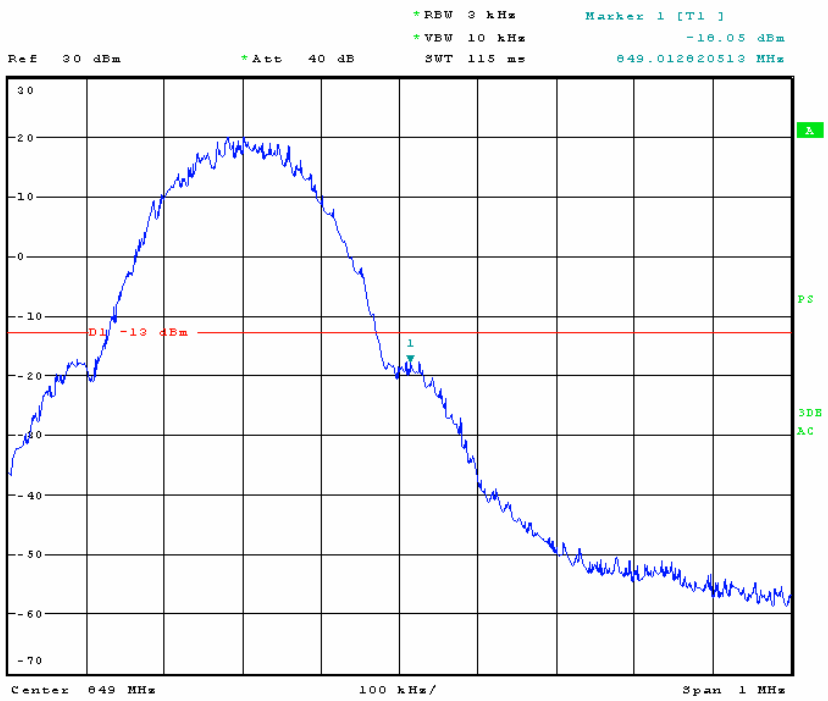




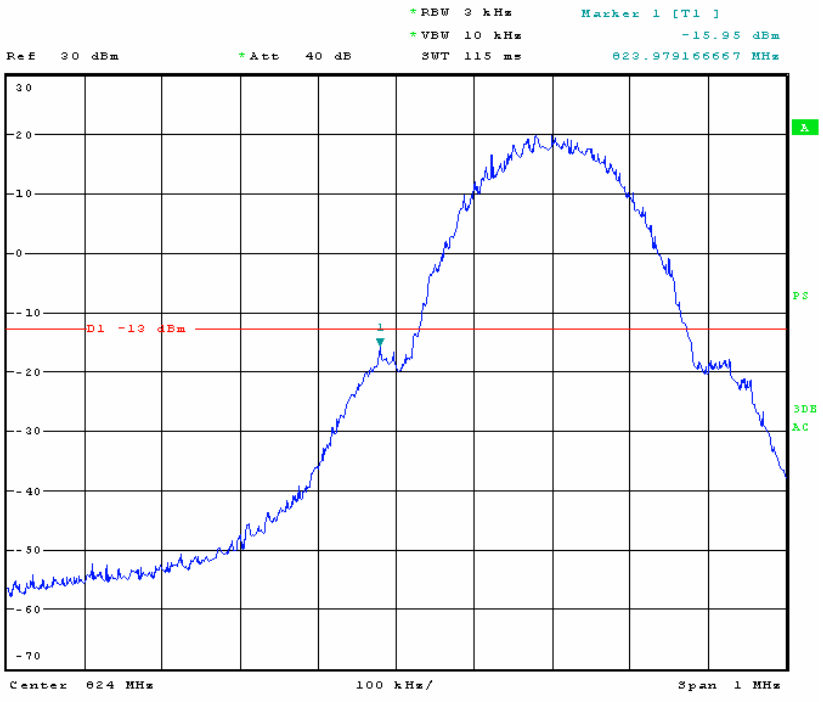
Band Edge emission GSM 850 GMSK Channel Low



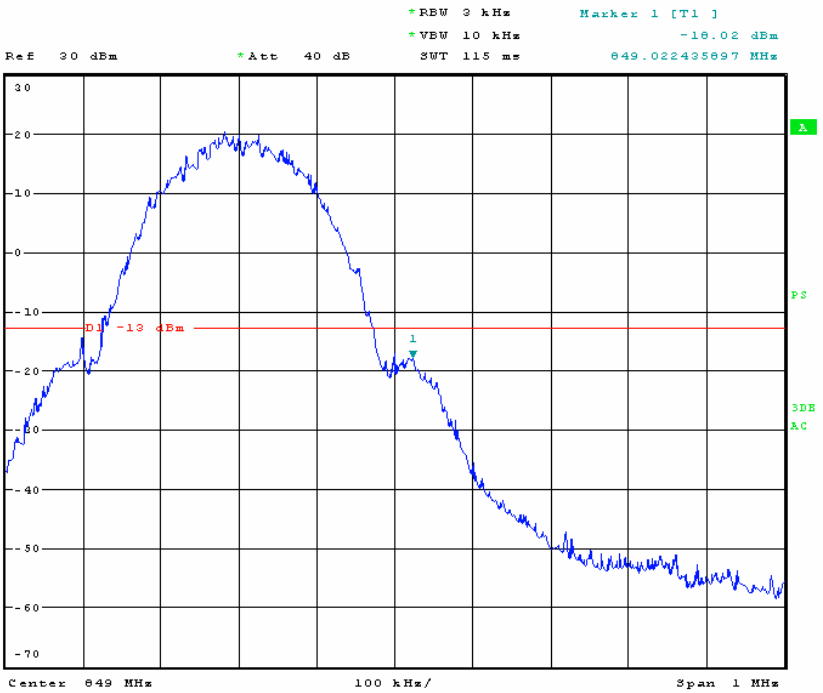
Band Edge emission GSM 850 GMSK Channel high



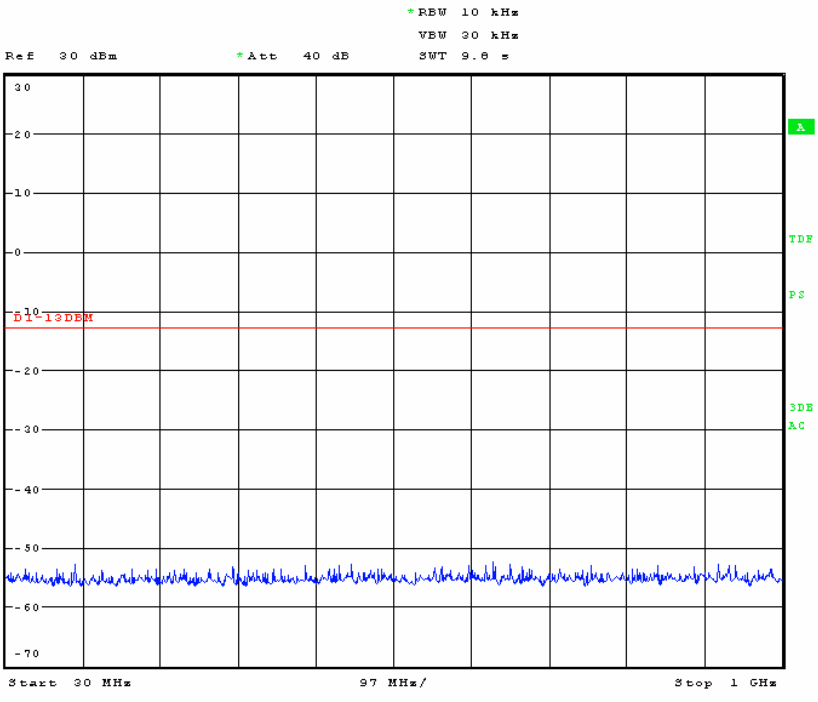
Band Edge emission GSM 850 8PSK Channel Low

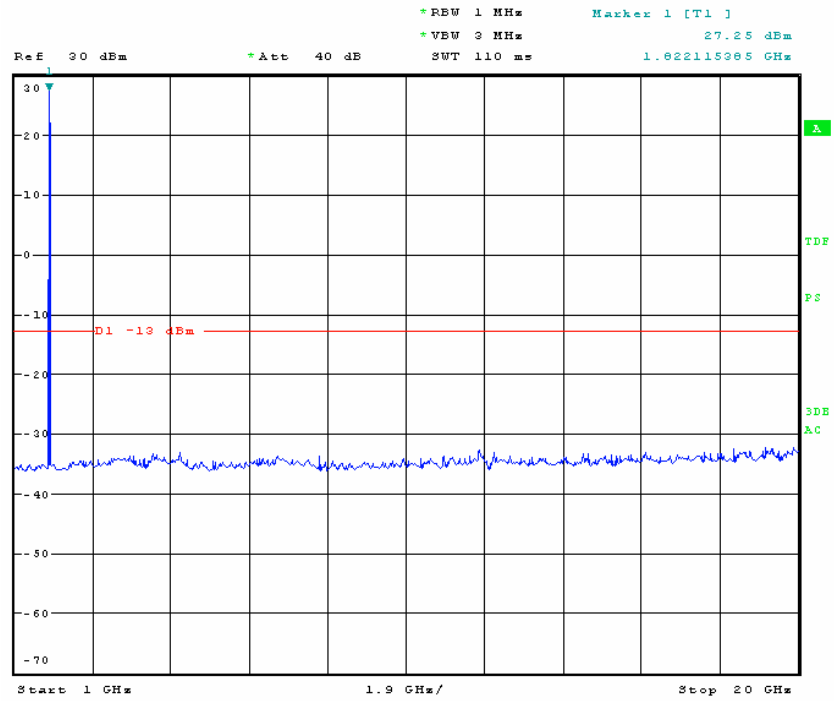


Band Edge emission GSM 850 8PSK Channel high

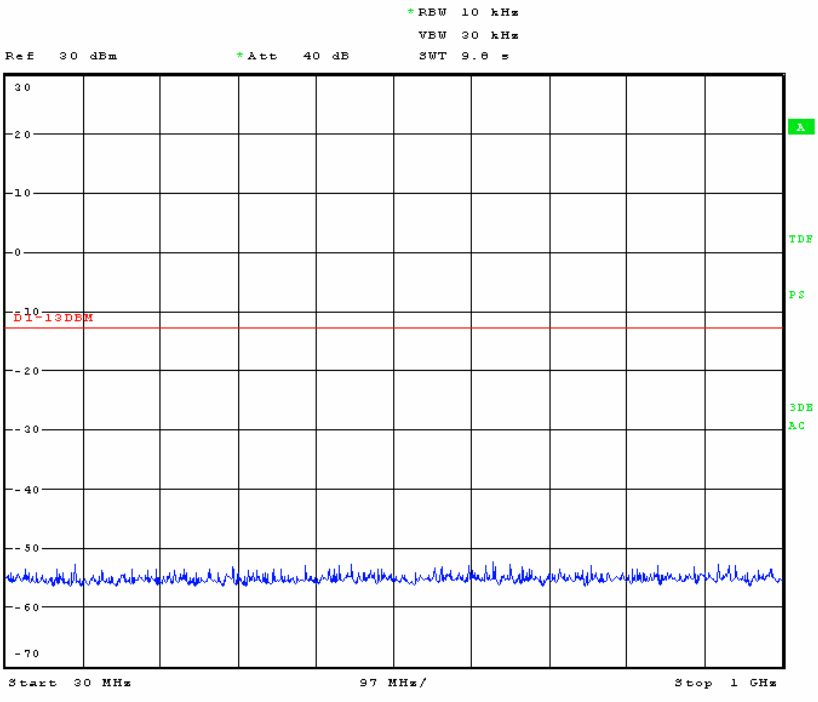


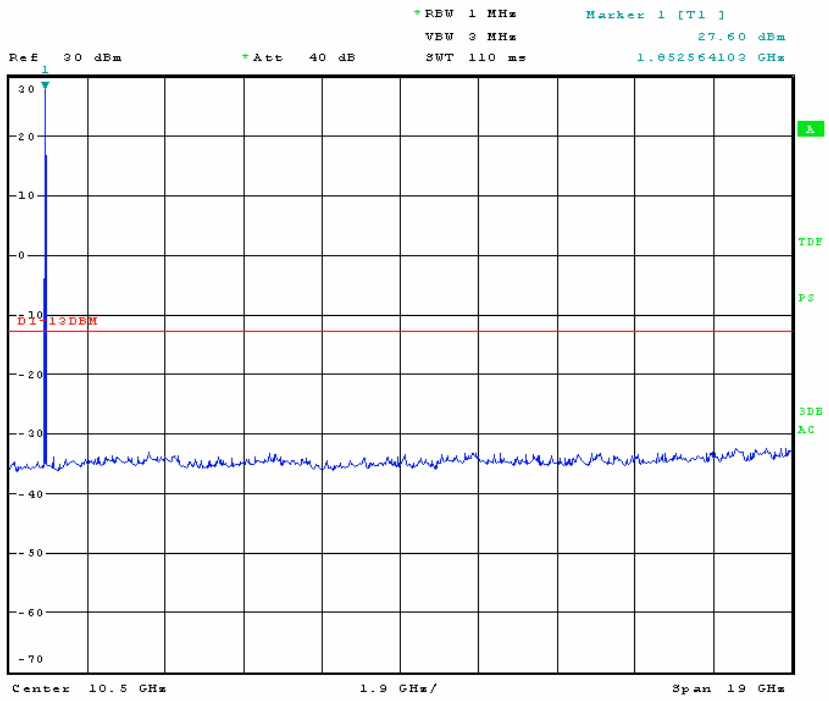
PCS 1900 GMSK Channel Low



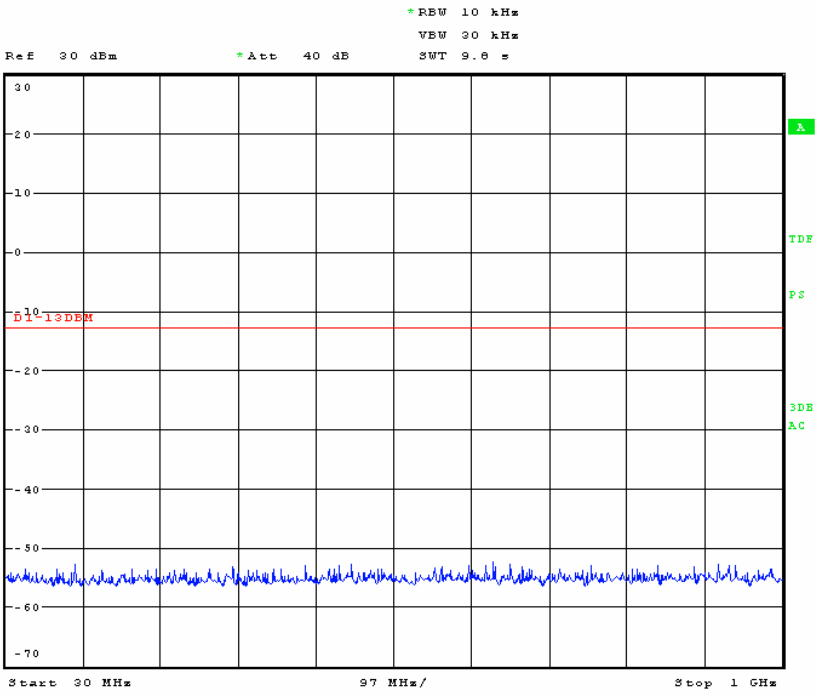


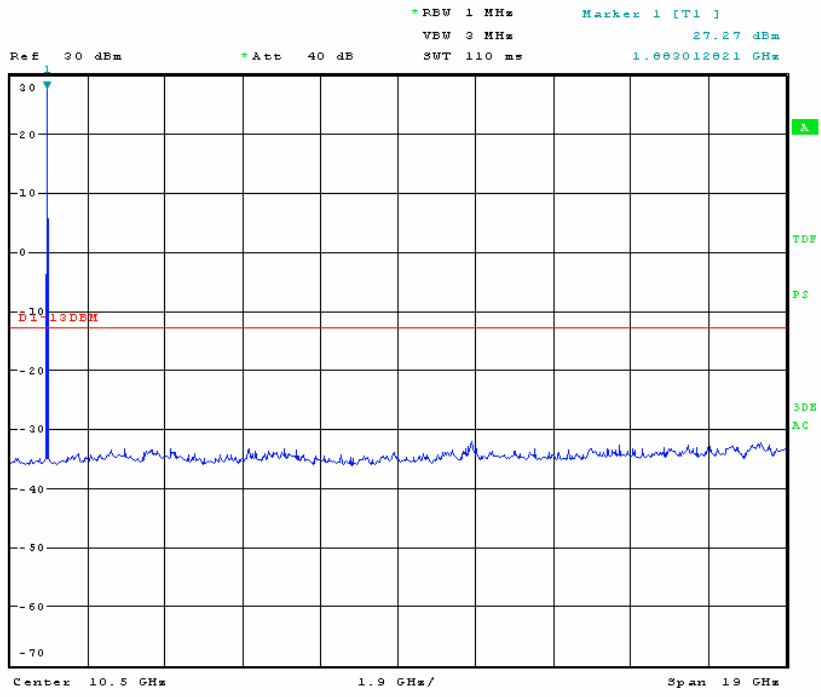
PCS 1900 GMSK Channel Mid



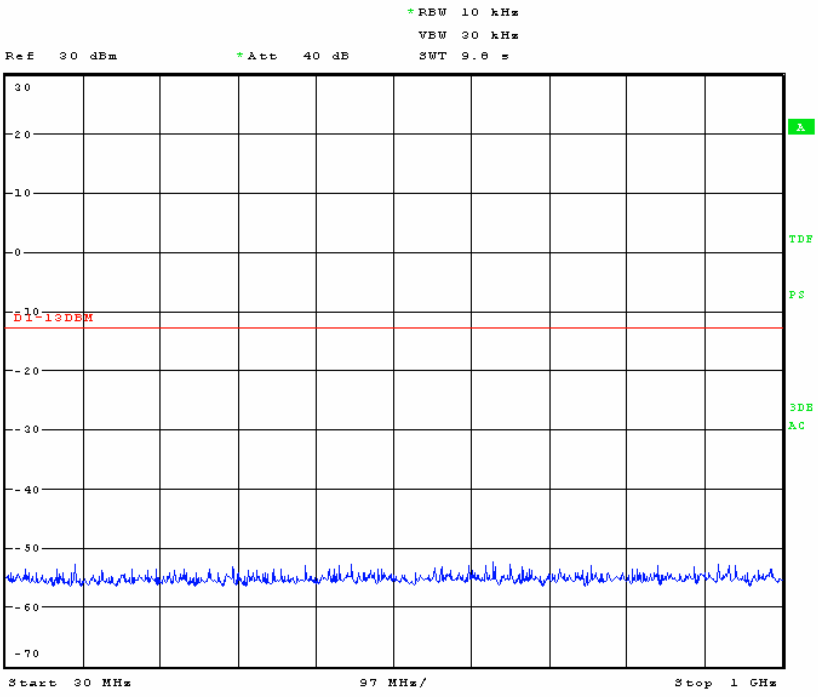


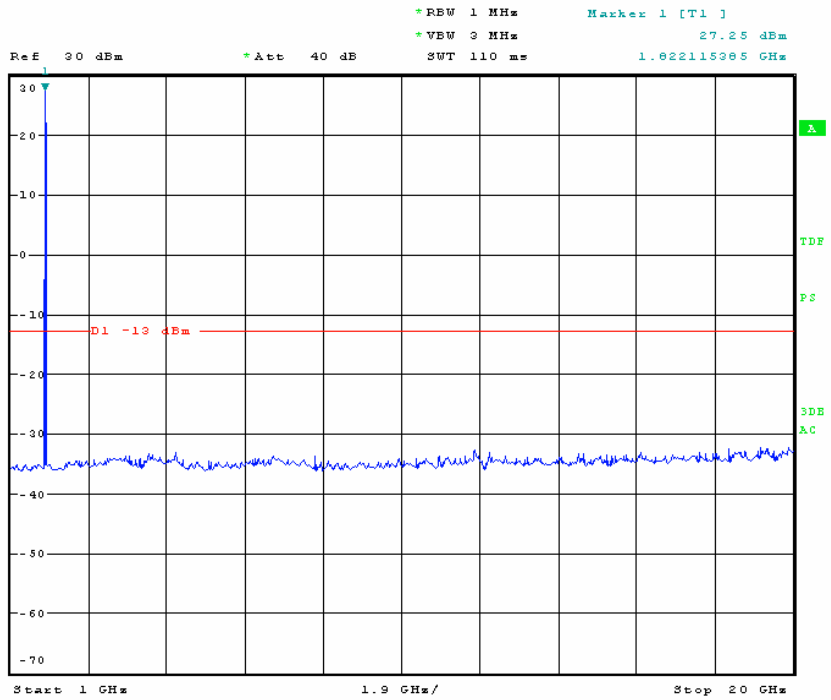
PCS 1900 GMSK Channel High



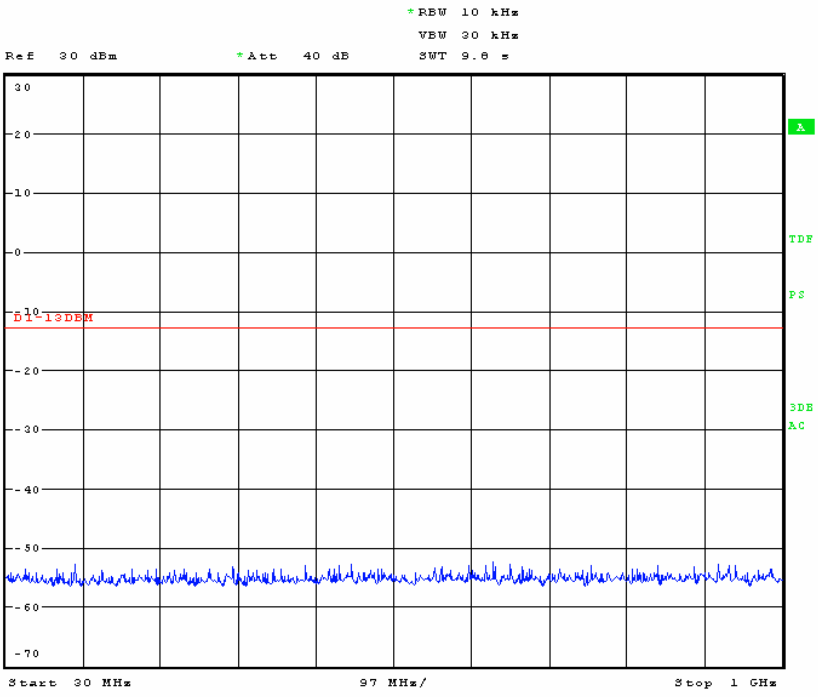


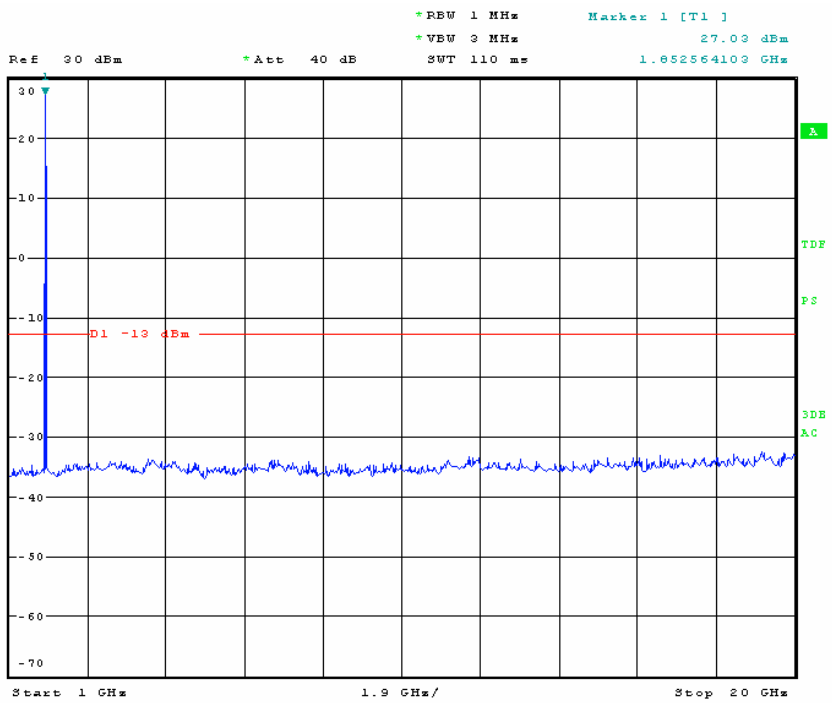
PCS 1900 8PSK Channel Low



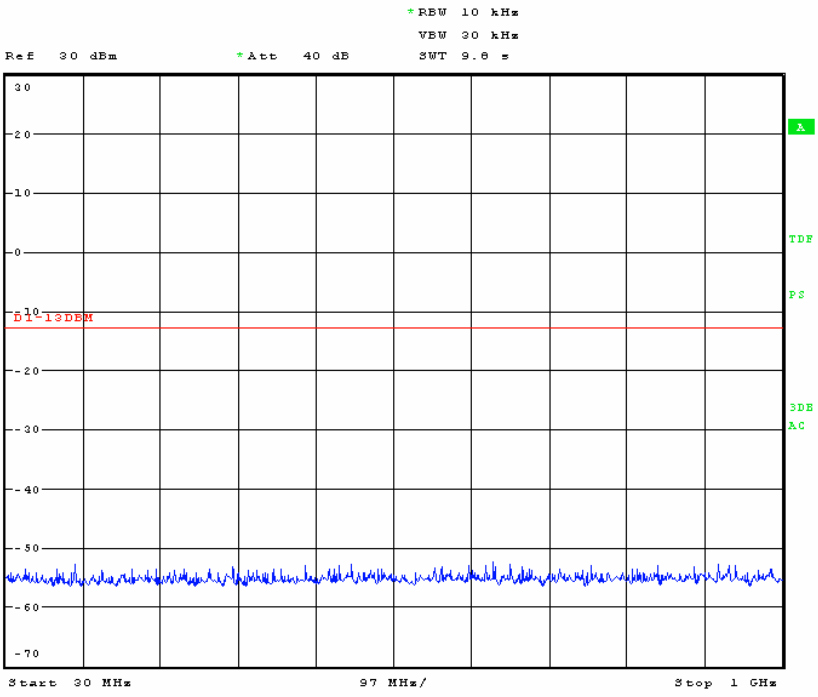


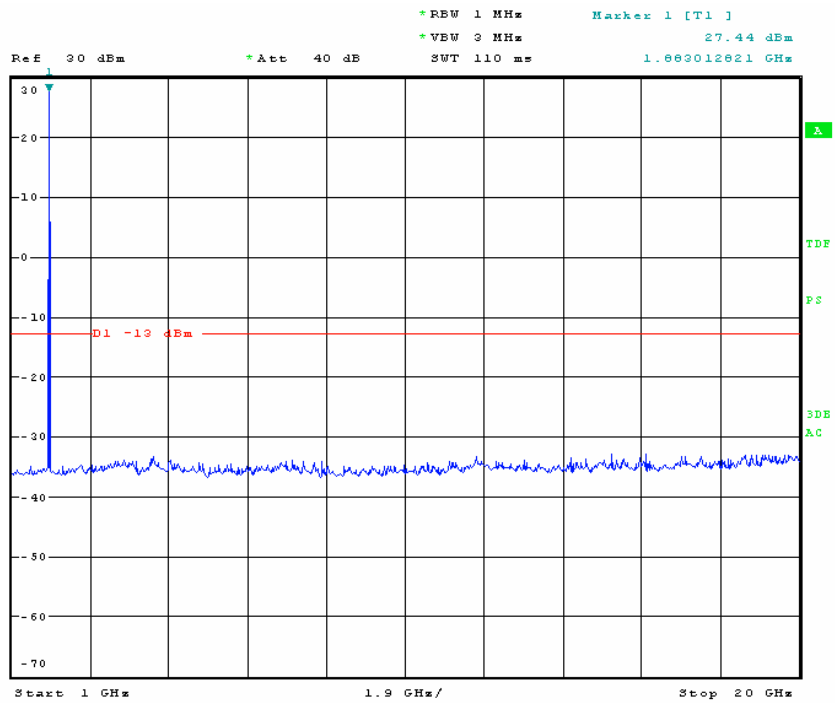
PCS 1900 8PSK Channel Mid



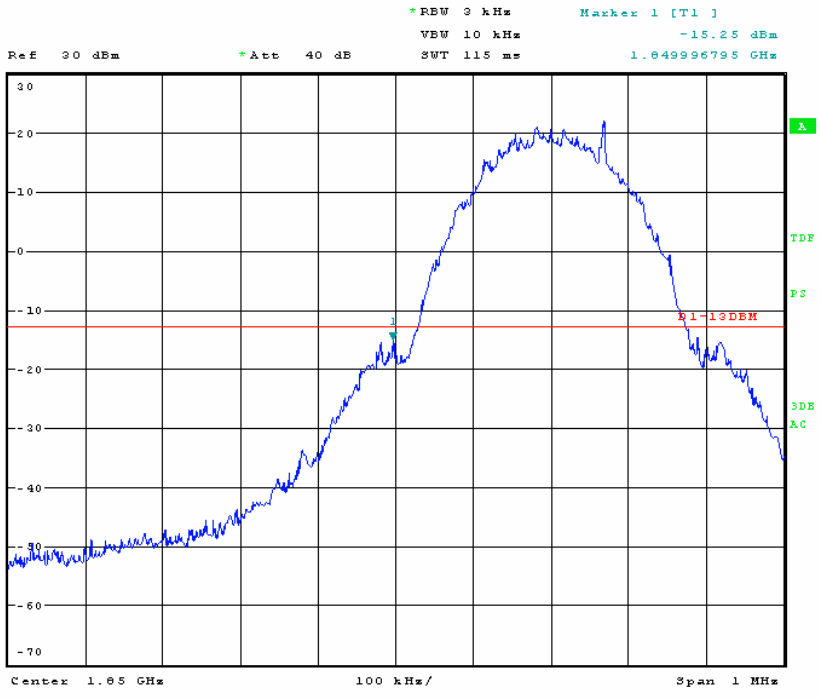


PCS 1900 8PSK Channel High

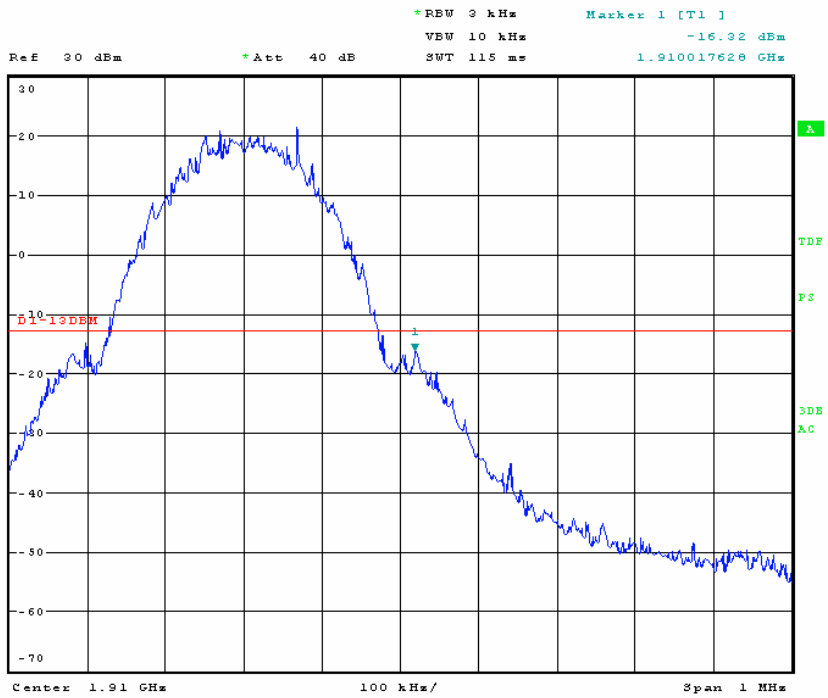




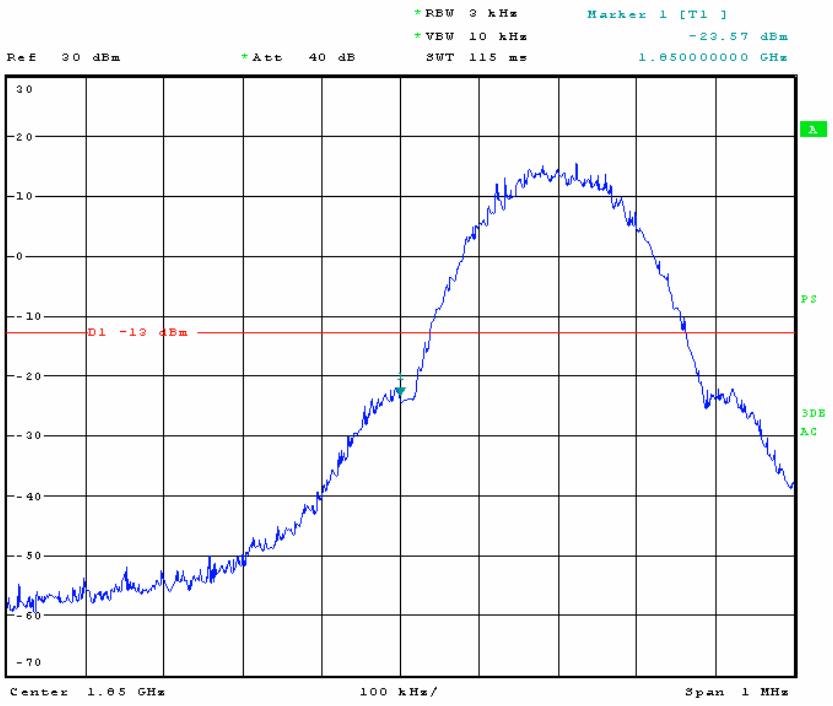
Band Edge emission PCS 1900 GMSK Channel Low



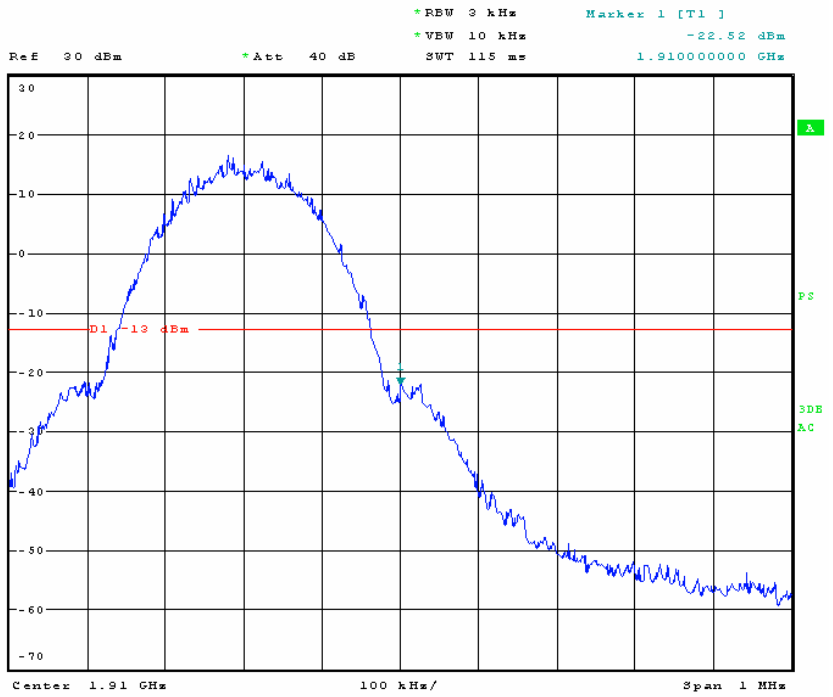
Band Edge emission PCS 1900 GMSK Channel high



Band Edge emission PCS 1900 8PSK Channel Low



Band Edge emission PCS 1900 8PSK Channel high



6.6 Field Strength of Radiated Spurious Emissions

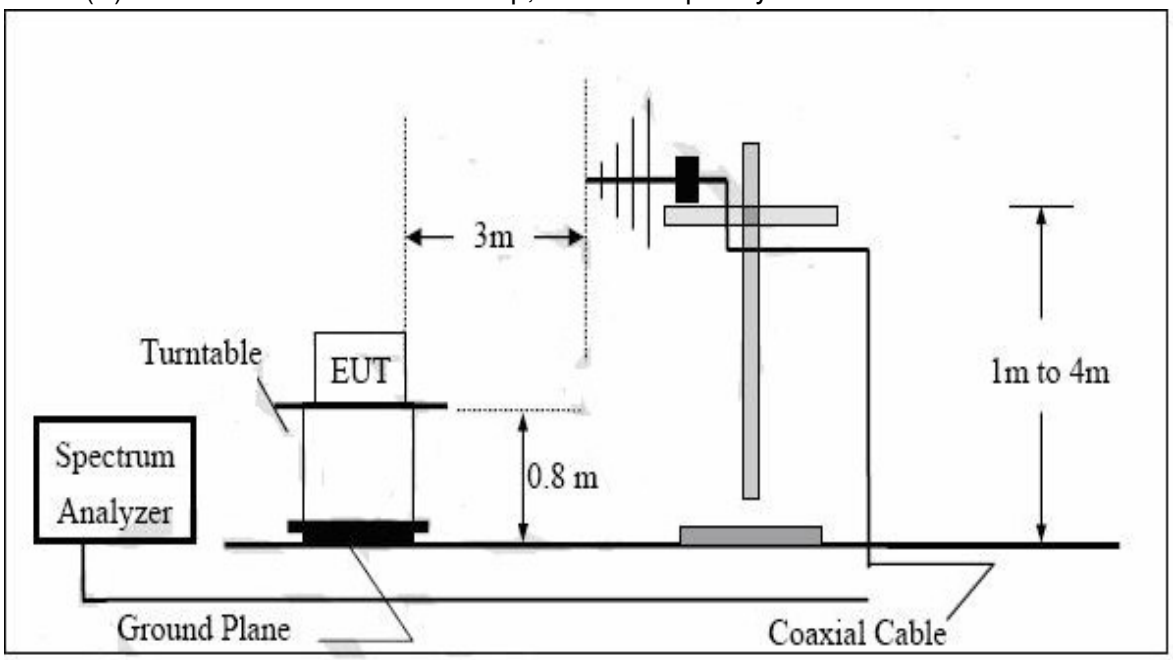
Test Requirement: Part 2.1053

FCC part 22.917(a), 24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specification in the instruction manual and/or alignment procedure, shall not be less than 43+10log(Mean power in watts) dBc below the mean power output outside a license's frequency block(-13dBm).

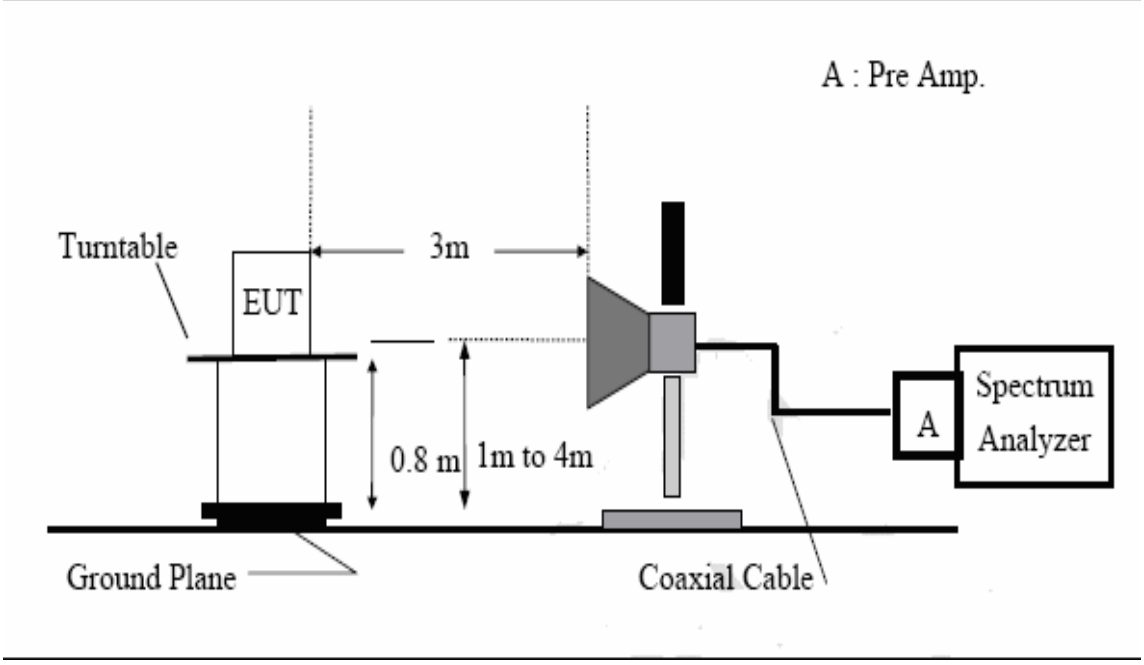
Test Date: Oct 08, 2010 to Oct 12, 2010

Test Setup:

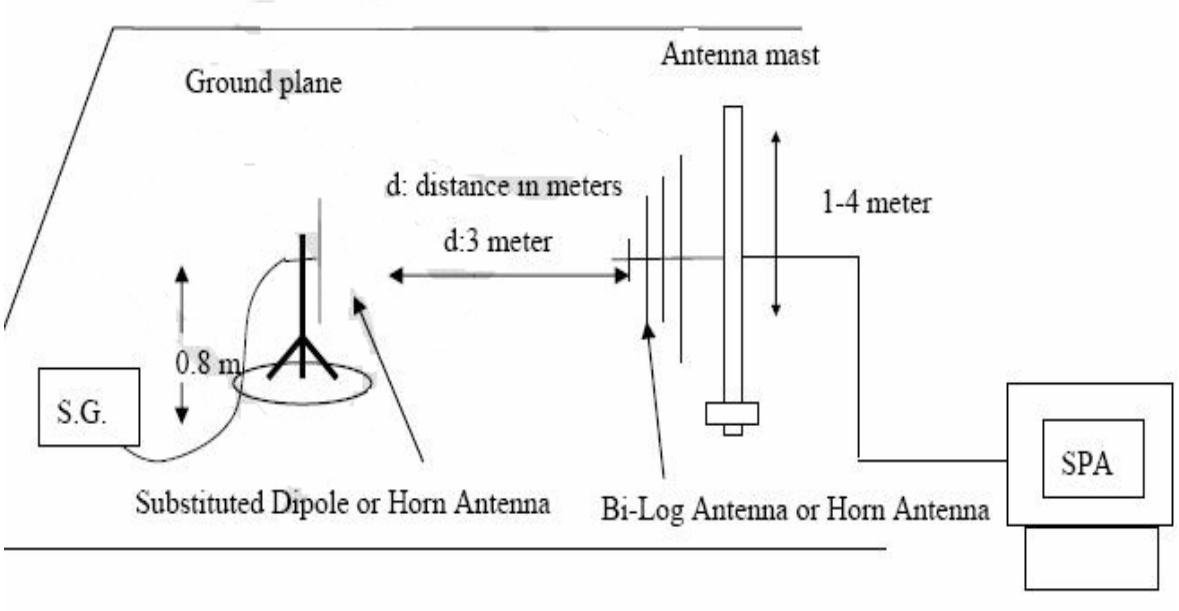
(A) Radiated emission Test setup, Below Frequency 1000MHz:



(B) Radiated emission Test setup frequency over 1GHz:



(C) Substituted Method Test setup:



Test Procedure:

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the measurement, the EUT was communication with

the station. The highest emission was recorded with the rotation of the turntable and lowering of the test antenna from 4m to 1m.

ERP in frequency band 824.2-848.8MHz were measured using substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follow:

EIRP in frequency band 1850.5-1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

ERP=S.G. output (dBm) + Antenna Gain (dBd)-Cable Loss (dB)
EIRP=S.G. output (dBm) + Antenna Gain (dBi)-Cable Loss (dB)

Radiated spurious Emission Measurement Result:

Operation mode: GSM 850 Channel Low

Fundamental Frequency: 824.2MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
100	H	-52.27	2.6	1	-50.67	-13	37.67
200	H	-52	9.1	1.42	-44.32	-13	31.32
800	H	-54.67	8.7	2.86	-48.83	-13	35.83
1648.4	H	-51.73	6.95	4.17	-48.95	-13	35.95
2472.6	H	-52.39	8.35	5.24	-49.28	-13	36.28
3201.7	H	-51.34	8.15	6.11	-49.3	-13	36.3
4147.1	H	-49.84	8.45	6.94	-48.33	-13	35.33
100	V	-53.87	2.6	1	-52.27	-13	39.27
200	V	-54.57	9.1	1.42	-46.89	-13	33.89
800	V	-55.37	8.7	2.86	-49.53	-13	36.53
1648.4	V	-51.43	6.95	4.17	-48.65	-13	35.65
2472.6	V	-52.99	8.35	5.24	-49.88	-13	36.88
3296.8	V	-52.28	8.15	6.11	-50.24	-13	37.24
3869.8	V	-50.3	8.35	6.64	-48.59	-13	35.59

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss

Operation mode: GSM 850 Channel Mid

Fundamental Frequency: 836.60MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
100	H	-52.66	2.6	1.02	-51.08	-13	38.08
200	H	-52.39	9.1	1.66	-44.95	-13	31.95
800	H	-55.06	8.7	2.1	-48.46	-13	35.46
1673.2	H	-52.12	7	4.04	-49.16	-13	36.16
2509.8	H	-52.78	8.44	5.02	-49.36	-13	36.36
3346.4	H	-51.73	8.22	5.71	-49.22	-13	36.22
4183	H	-50.23	8.51	6.2	-47.92	-13	34.92
100	V	-54.26	2.6	1.02	-52.68	-13	39.68
200	V	-54.96	9.1	1.66	-47.52	-13	34.52
800	V	-55.76	8.7	2.1	-49.16	-13	36.16
1673.2	V	-51.82	7	4.04	-48.86	-13	35.86
2509.8	V	-53.38	8.44	5.02	-49.96	-13	36.96
3346.4	V	-52.67	8.22	5.71	-50.16	-13	37.16
4183	V	-50.69	8.51	6.2	-48.38	-13	35.38

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss

Operation mode: GSM 850 Channel High

Fundamental Frequency: 848.80MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
100	H	-53.09	2.6	1.02	-51.51	-13	38.51
200	H	-51.81	9.1	1.66	-44.37	-13	31.37
800	H	-54.05	8.7	2.1	-47.45	-13	34.45
1697.6	H	-52.21	7.12	3.93	-49.02	-13	36.02
2546.4	H	-51.99	8.48	5.02	-48.53	-13	35.53
3395.2	H	-50.98	8.25	5.62	-48.35	-13	35.35
4244	H	-50.76	8.6	6.13	-48.29	-13	35.29
100	V	-53.61	2.6	1.02	-52.03	-13	39.03
200	V	-53.13	9.1	1.66	-45.69	-13	32.69
800	V	-55.6	8.7	2.1	-49	-13	36
1697.6	V	-52.1	7.12	3.93	-48.91	-13	35.91
2546.4	V	-52.4	8.48	5.02	-48.94	-13	35.94
3395.2	V	-52.33	8.25	5.62	-49.7	-13	36.7
4244	V	-51.29	8.6	6.13	-48.82	-13	35.82

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss

Radiated spurious Emission Measurement Result:

Operation mode: GSM 1900 Channel Low

Fundamental Frequency: 1850.2MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
100	H	-52.67	2.6	1	-51.08	-13	38.08
200	H	-52.5	9.1	1.42	-44.95	-13	31.95
800	H	-52.17	8.7	2.86	-48.46	-13	35.46
1800	H	-51.24	7	4.38	-49.16	-13	36.16
3700.4	H	-52.43	8.35	6.77	-49.36	-13	36.36
5550.6	H	-51.29	9.55	8.1	-49.22	-13	36.22
7400.8	H	-51.17	9.75	9.51	-47.92	-13	34.92
9251	H	-53.33	10.55	11.08	-52.68	-13	39.68
100	V	-52.17	2.6	1	-47.52	-13	34.52
200	V	-53.55	9.1	1.42	-49.16	-13	36.16
800	V	-53.69	8.7	2.86	-48.86	-13	35.86
1800	V	-49.4	7	4.38	-49.96	-13	36.96
3700.4	V	-51.73	8.35	6.77	-50.16	-13	37.16
5550.6	V	-51.91	9.55	8.1	-48.38	-13	35.38
7400.8	V	-51.25	9.75	9.51	-48.38	-13	35.38
9251	V	-51.39	10.55	11.08	-48.38	-13	35.38

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss

Operation mode: GSM 1900 Channel Mid

Fundamental Frequency: 1880.0MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
100	H	-52.61	2.6	1	-51.08	-13	38.08
200	H	-54.44	9.1	1.42	-44.95	-13	31.95
800	H	-54.11	8.7	2.86	-48.46	-13	35.46
1800	H	-51.11	7	4.38	-49.16	-13	36.16
3760	H	-51.11	8.42	6.84	-49.36	-13	36.36
5640	H	-51.21	9.5	8.31	-49.22	-13	36.22
7520	H	-51.16	9.78	9.6	-47.92	-13	34.92
9400	H	-53.27	10.61	11.32	-52.68	-13	39.68
100	V	-54.11	2.6	1	-47.52	-13	34.52
200	V	-54.11	9.1	1.42	-49.16	-13	36.16
800	V	-53.11	8.7	2.86	-48.86	-13	35.86
1800	V	-52.31	7	4.38	-49.96	-13	36.96
3760	V	-53.67	8.35	6.77	-50.16	-13	37.16
5640	V	-53.81	9.55	8.1	-48.38	-13	35.38
7520	V	-53.19	9.75	9.51	-48.38	-13	35.38
9400	V	-53.31	10.55	11.08	-48.38	-13	35.38

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss

Operation mode: GSM 1900 Channel High

Fundamental Frequency: 1909.8MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
100	H	-50.96	2.6	1	-51.08	-13	38.08
200	H	-50.85	9.1	1.42	-44.95	-13	31.95
800	H	-50.64	8.7	2.86	-48.46	-13	35.46
1800	H	-51.1	7	4.38	-49.16	-13	36.16
3819.6	H	-51.07	8.42	6.88	-49.36	-13	36.36
5729.8	H	-50.86	9.5	8.48	-49.22	-13	36.22
7639.2	H	-51.89	9.78	9.7	-47.92	-13	34.92
9549	H	-51.61	10.61	11.64	-52.68	-13	39.68
100	V	-52.13	2.6	1	-47.52	-13	34.52
200	V	-52.51	9.1	1.42	-49.16	-13	36.16
800	V	-51.81	8.7	2.86	-48.86	-13	35.86
1800	V	-50.96	7	4.38	-49.96	-13	36.96
3819.6	V	-52.76	8.35	6.77	-50.16	-13	37.16
5729.8	V	-52.49	9.55	8.1	-48.38	-13	35.38
7639.2	V	-51.87	9.75	9.51	-48.38	-13	35.38
9549	V	-52.27	10.55	11.08	-48.38	-13	35.38

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss

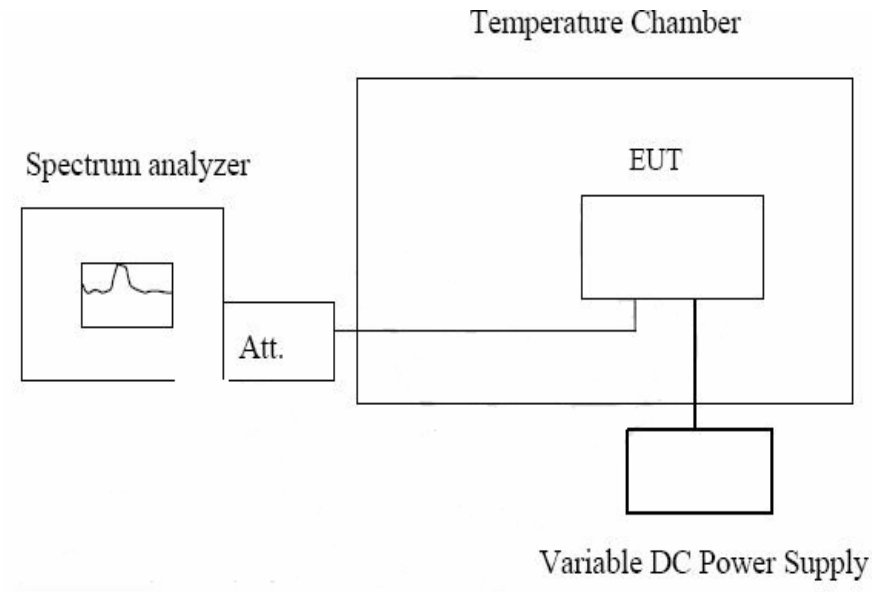
6.7 Frequency Stability V.S. TEMPERATURE MEASUREMENT

Test Requirement: Part 2.1055(a)(1)

Test Date: Oct 11, 2010

Test Status: Test in fixed channel.

Test Setup:



Note: Measurement setup for testing On antenna connector.

Test procedure:

The equipment under test was connected to an external DC power supply and input rated voltage. Reference power supply voltage for these tests is DC 3.7V. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the Spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25 degree operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30 degree. After the temperature stabilized for approximately 30 minutes record the frequency. Repeat step measure with 10 degree per stage until the highest temperature of 50 degree reached.

Frequency Tolerance: +/-2.5ppm for 850MHz band
+/-2.5ppm for 1900MHz band

GSM850:

Reference Frequency: GSM channel 824.2MHz@ 25 degree				
Limit: +/- 2.5ppm = 2091Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
3.7	-30	824.200043	43	2091
3.7	-20	824.200009	9	2091
3.7	-10	824.200031	31	2091
3.7	10	824.200016	16	2091
3.7	20	824.200068	68	2091
3.7	30	824.200014	14	2091
3.7	40	824.200002	2	2091
3.7	50	824.200007	7	2091

Reference Frequency: GSM channel 836.4MHz@ 25 degree				
Limit: +/- 2.5ppm = 2091Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
3.7	-30	836.400006	6	2091
3.7	-20	836.400012	12	2091
3.7	-10	836.400004	4	2091
3.7	10	836.399992	8	2091
3.7	20	836.400016	16	2091
3.7	30	836.400008	8	2091
3.7	40	836.400020	20	2091
3.7	50	836.400011	11	2091

Reference Frequency: GSM channel 848.8MHz@ 25 degree				
Limit: +/- 2.5ppm = 2091Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
3.7	-30	848.800022	22	2091
3.7	-20	848.800073	73	2091
3.7	-10	848.800006	6	2091
3.7	10	848.800009	9	2091
3.7	20	848.800029	29	2091
3.7	30	848.800040	40	2091
3.7	40	848.800012	12	2091
3.7	50	848.800017	17	2091

PCS1900:

Reference Frequency: PCS channel 1850.2MHz@ 25 degree				
Limit: +/- 2.5ppm = 4700Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
3.7	-30	1850.200055	55	4700
3.7	-20	1850.200046	46	4700
3.7	-10	1850.200019	19	4700
3.7	10	1850.200010	10	4700
3.7	20	1850.200008	8	4700
3.7	30	1850.200011	11	4700
3.7	40	1850.200020	20	4700
3.7	50	1850.200034	34	4700

Reference Frequency: PCS channel 1880MHz@ 25 degree				
Limit: +/- 2.5ppm = 4700Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
3.7	-30	1880.000044	44	4700
3.7	-20	1880.000040	40	4700
3.7	-10	1880.000026	26	4700
3.7	10	1880.000015	15	4700
3.7	20	1880.000006	6	4700
3.7	30	1880.000022	22	4700
3.7	40	1880.000018	18	4700
3.7	50	1880.000029	29	4700

Reference Frequency: PCS channel 1909.8MHz@ 25 degree				
Limit: +/- 2.5ppm = 4700Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
3.7	-30	1909.799976	24	4700
3.7	-20	1909.799978	22	4700
3.7	-10	1909.800018	18	4700
3.7	10	1909.800009	9	4700
3.7	20	1909.800006	6	4700
3.7	30	1909.800017	17	4700
3.7	40	1909.800022	22	4700
3.7	50	1909.800031	31	4700

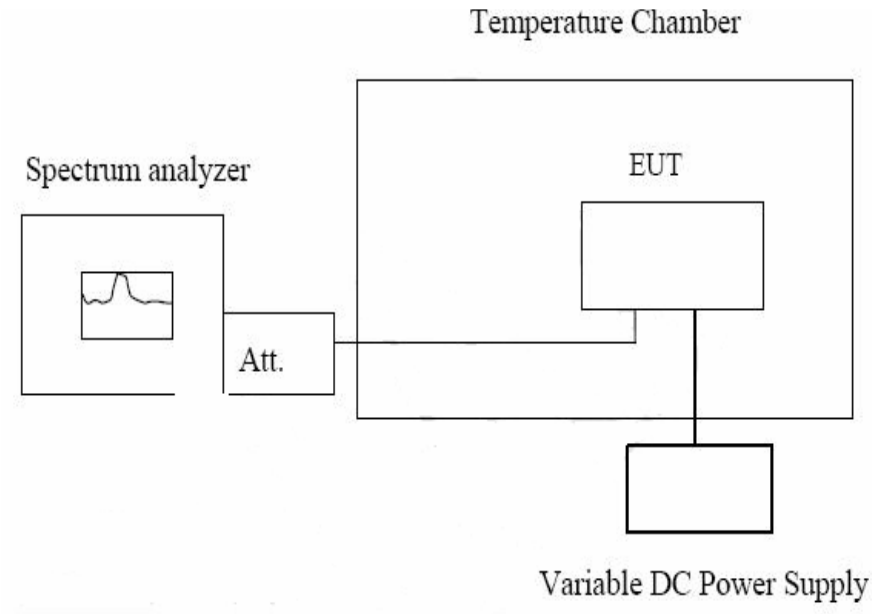
6.8 Frequency Stability V.S. VOLTAGE MEASUREMENT

Test Requirement: Part 2.1055(d)

Test Date: Sep 05, 2010

Test Status: Test in fixed channel.

Test Setup:



Note: Measurement setup for testing On antenna connector.

Test procedure:

Set chamber temperature to 25 degree. Use a variable DC power supply to power the EUT and set the Voltage to rated voltage. Reference power supply voltage for these tests is DC 3.7V. Set the spectrum analyzer RBW enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specified extreme voltage variation(+/-15%) and endpoint, record the maximum frequency change.

Frequency Tolerance: +/-2.5ppm for 850MHz band

+/-2.5ppm for 1900MHz band

GSM850:

Reference Frequency: GSM channel 824.2MHz@ 25 degree				
Limit: +/- 2.5ppm = 2091Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
4.2	25	824.200011	11	2091
4.1	25	824.200017	17	2091
4.0	25	824.200013	13	2091
3.9	25	824.200015	15	2091
3.8	25	824.200009	9	2091
3.7	25	824.200020	20	2091
3.6	25	824.200014	14	2091
3.5 (Endpoint)	25	824.200031	31	2091

Reference Frequency: GSM channel 836.4MHz@ 25 degree				
Limit: +/- 2.5ppm = 2091Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
4.2	25	836.400014	14	2091
4.1	25	836.400021	21	2091
4.0	25	836.400006	6	2091
3.9	25	836.400008	8	2091
3.8	25	836.400011	11	2091
3.7	25	836.400012	12	2091
3.6	25	836.400008	8	2091
3.5 (Endpoint)	25	836.400027	27	2091

Reference Frequency: GSM channel 848.8MHz@ 25 degree				
Limit: +/- 2.5ppm = 2091Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
4.2	25	848.800025	25	2091
4.1	25	848.800016	16	2091
4.0	25	848.800011	11	2091
3.9	25	848.800009	9	2091
3.8	25	848.800021	21	2091
3.7	25	848.800013	13	2091
3.6	25	848.800008	8	2091
3.5 (Endpoint)	25	848.800023	23	2091

PCS1900:

Reference Frequency: PCS channel 1850.2MHz@ 25 degree				
Limit: +/- 2.5ppm = 4700Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
4.2	25	1850.199982	18	4700
4.1	25	1850.199980	20	4700
4.0	25	1850.199991	9	4700
3.9	25	1850.199979	21	4700
3.8	25	1850.199989	11	4700
3.7	25	1850.199990	10	4700
3.6	25	1850.199976	24	4700
3.5 (Endpoint)	25	1850.199981	19	4700

Reference Frequency: PCS channel 1880MHz@ 25 degree				
Limit: +/- 2.5ppm = 4700Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
4.2	25	1879.999994	6	4700
4.1	25	1879.999988	12	4700
4.0	25	1879.999992	8	4700
3.9	25	1879.999990	10	4700
3.8	25	1879.999994	6	4700
3.7	25	1879.999980	20	4700
3.6	25	1879.999981	19	4700
3.5 (Endpoint)	25	1879.999982	18	4700

Reference Frequency: PCS channel 1909.8MHz@ 25 degree				
Limit: +/- 2.5ppm = 4700Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
4.2	25	1909.799984	16	4700
4.1	25	1909.799986	14	4700
4.0	25	1909.799990	10	4700
3.9	25	1909.799987	13	4700
3.8	25	1909.799982	18	4700
3.7	25	1909.799991	9	4700
3.6	25	1909.799992	8	4700
3.5 (Endpoint)	25	1909.799987	13	4700

Note: The High voltage is DC 4.2V, normal voltage is DC 3.7V and low voltage is DC 3.5V.

6.9 Conducted Emissions Mains Terminals, 150 kHz to 30MHz

Test Requirement: Part 15.207

Test Method: ANSI C63.4:2003

Test Date: Oct 08, 2010

Frequency Range: 150KHz to 30MHz

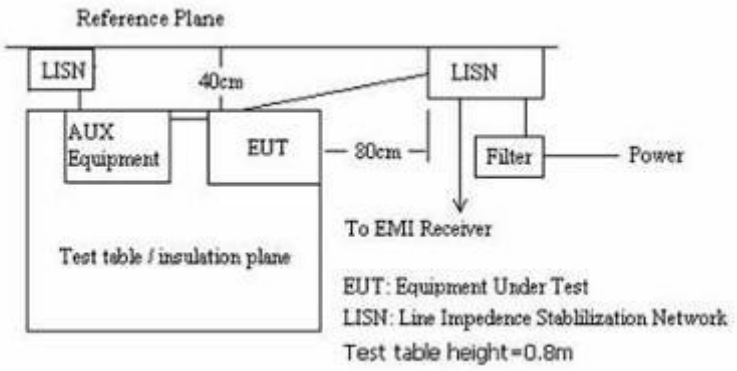
Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit

EUT Operation:

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Plan View of Test Setup

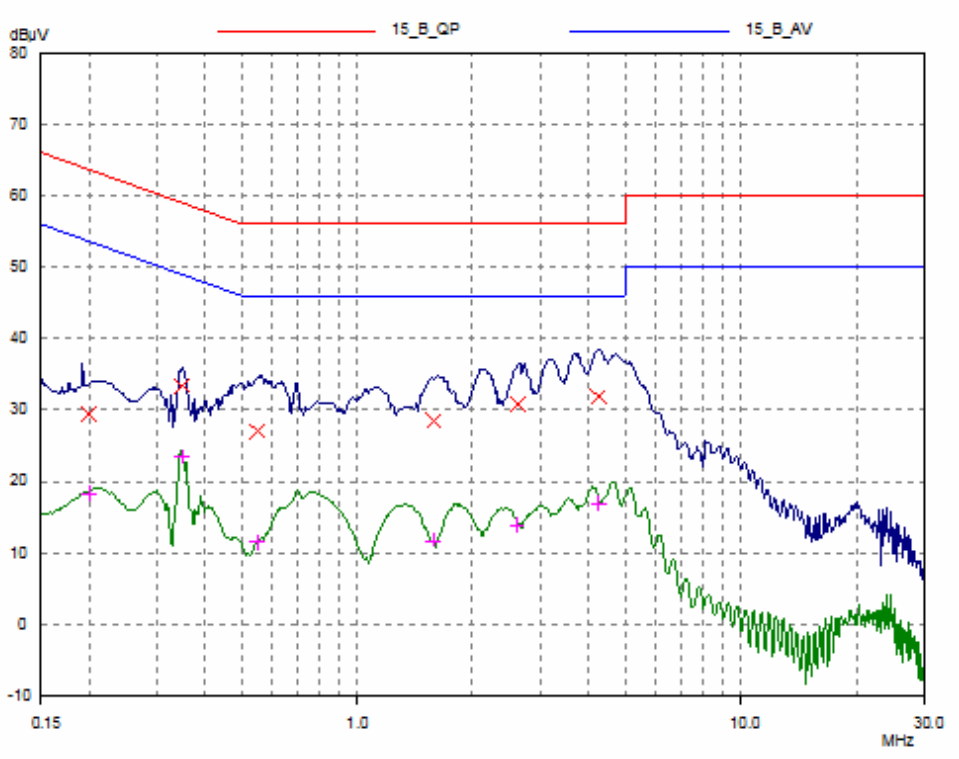


Limit:

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

GSM 850 connected mode:

L Line:

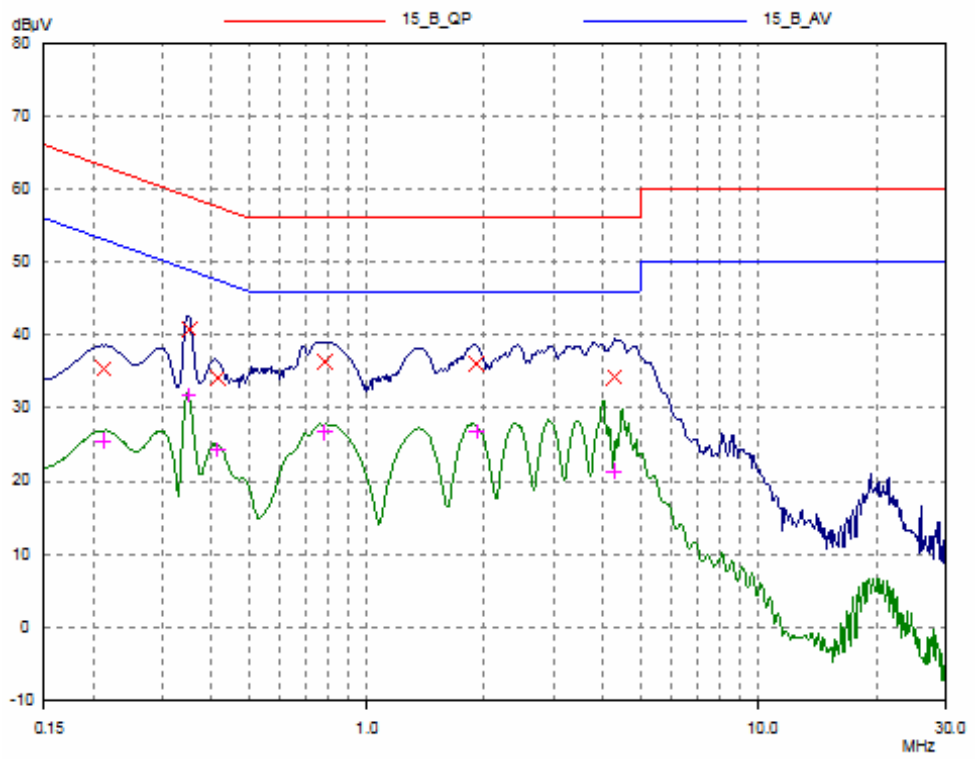


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.19983	29.44	63.62	34.18
0.34906	33.36	58.98	25.62
0.54974	27.03	56.00	28.97
1.58638	28.45	56.00	27.55
2.62073	30.83	56.00	25.17
4.26103	31.85	56.00	24.15

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.19983	18.29	53.62	35.33
0.34906	23.42	48.98	25.56
0.54974	11.43	46.00	34.57
1.58638	11.67	46.00	34.33
2.62073	13.86	46.00	32.14
4.26103	16.94	46.00	29.06

N Line:



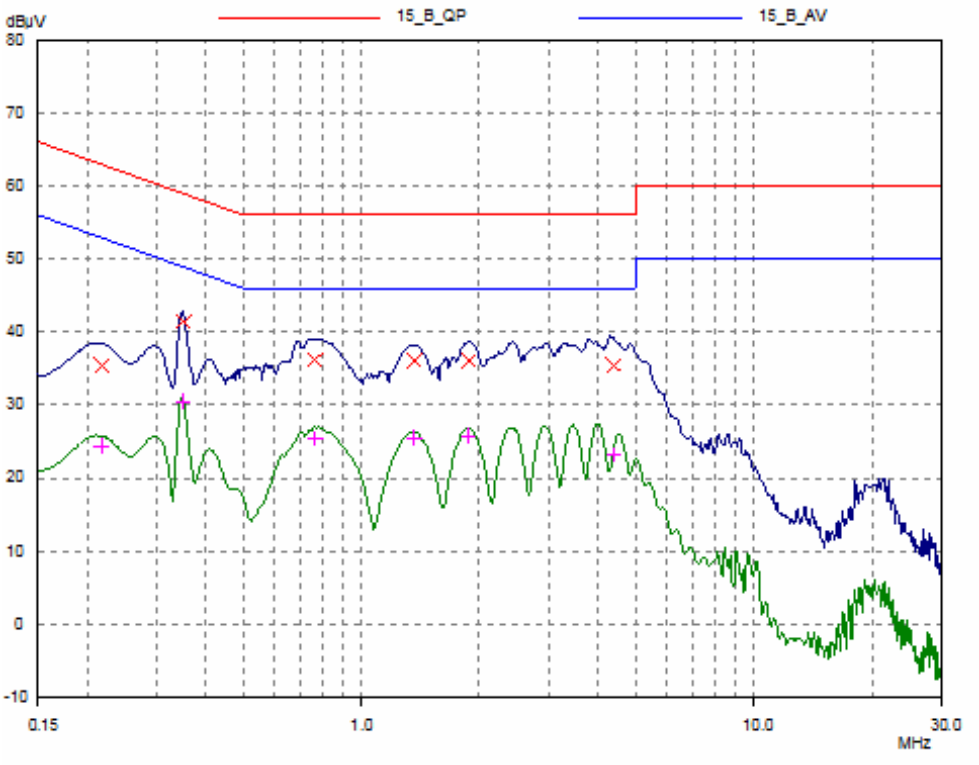
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.21298	35.44	63.09	27.65
0.35185	40.80	58.92	18.12
0.41594	34.04	57.53	23.49
0.78058	36.34	56.00	19.66
1.90546	36.09	56.00	19.91
4.29511	34.15	56.00	21.85

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.21298	25.45	53.09	27.64
0.35185	31.79	48.92	17.13
0.41594	24.23	47.53	23.30
0.78058	26.71	46.00	19.29
1.90546	26.82	46.00	19.18
4.29511	21.26	46.00	24.74

GSM 1900 connected mode:

L Line:

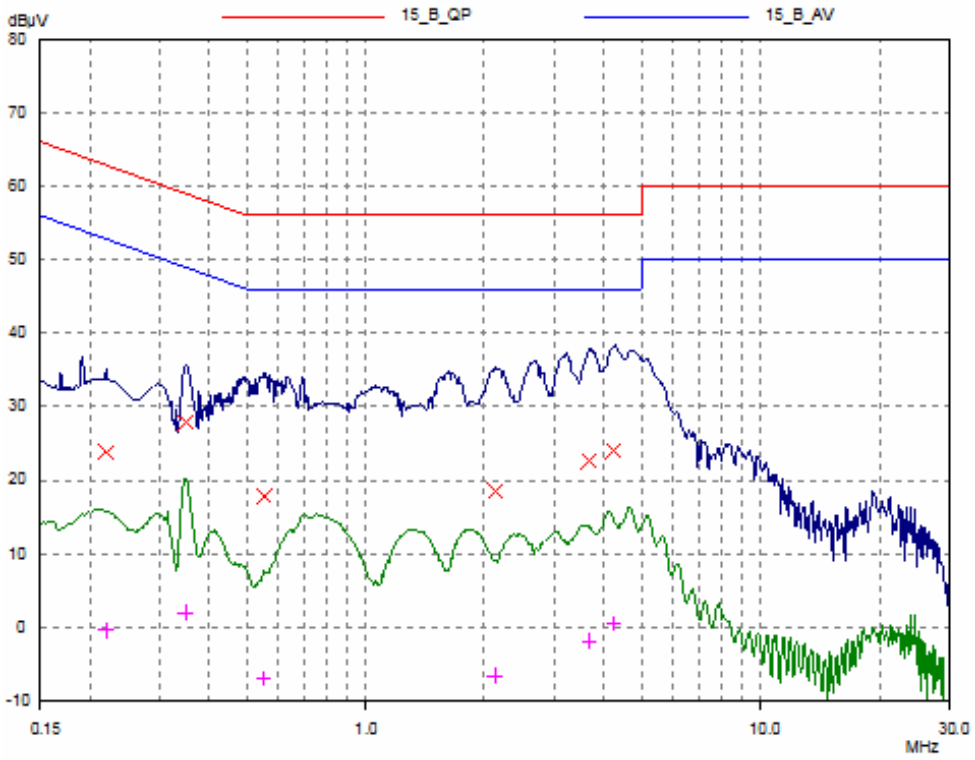


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.21814	35.46	62.89	27.43
0.35185	41.40	58.92	17.52
0.76214	36.18	56.00	19.82
1.36351	36.07	56.00	19.93
1.87533	36.03	56.00	19.97
4.39902	35.43	56.00	20.57

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.21814	24.28	52.89	28.61
0.35185	30.46	48.92	18.46
0.76214	25.34	46.00	20.66
1.36351	25.54	46.00	20.46
1.87533	25.78	46.00	20.22
4.39902	23.12	46.00	22.88

N Line:



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.21988	23.83	62.82	38.99
0.34906	27.88	58.98	31.10
0.55413	17.84	56.00	38.16
2.13033	18.56	56.00	37.44
3.69168	22.60	56.00	33.40
4.26103	23.98	56.00	32.02

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.21988	-0.46	52.82	53.28
0.34906	1.95	48.98	47.03
0.55413	-6.95	46.00	52.95
2.13033	-6.70	46.00	52.70
3.69168	-1.93	46.00	47.93
4.26103	0.48	46.00	45.52

~End of Report~