



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

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Report No.:SHEMO10030019402
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TEST REPORT

Application No. : SHEMO10030019402
Applicant: Sierra Wireless Inc.
FCC ID: N7NQ2687
IC ID: 2417C-Q2687
Equipment Under Test (EUT):
Product Name: Airprime Q2687
Brand Name: WAVECOM
Model Name: Airprime Q2687
Marketing Name: AirPrime Q2687 Intelligent Embedded Moudule
Standards: IC RSS 132 Issue 2,RSS 133 Issue 5/ FCC part 2, 22H & 24E
Date of Receipt: February 16,2010
Date of Test: February 20,2010 to March 8,2010
Date of Issue: March 15,2010

Test Result :	PASS *
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* 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.

San Yuan
Project Engineer
SGS-CSTC (Shanghai)Co., Ltd.

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2 Test Summary

Description of Test	FCC Rules	IC Standards	Result
RF Power Output	2.1046(a) 22.913(a) 24.232(b)	RSS-132,4.4 RSS-133,6.4	Compliant
99% Occupied Bandwidth	2.1049(h)	RSS-Gen,4.6	Compliant
Out of Band Emissions at antenna Terminals and Band Edge	2.1051 22.917(a) 24.238(a)	RSS-132,4.5 RSS-133,6.5	Compliant
Field Strength of Spurious Emissions	2.1053 22.917(a) 24.238(a)	RSS-132,4.5 RSS-133,6.5	Compliant
Frequency Stability vs. Temperature and Voltage	2.1055	RSS-132,4.3 RSS-133,6.3	Compliant



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4 General Information

4.1 Client Information

Applicant: Sierra Wireless Inc.
Address of Applicant: 13811 Wireless Way Richmond, British Columbia Canada, V6V 3A4
Manufacturer: Sierra Wireless Inc.
Address of Manufacturer: 13811 Wireless Way Richmond, British Columbia Canada, V6V 3A4

4.2 General Description of E.U.T.

Product Name:	Airprime Q2687
Brand Name:	WAVECOM
Model Name:	Airprime Q2687
Marketing Name:	AirPrime Q2687 Intelligent Embedded Module
Power Supply:	3.6V DC

GSM and WCDMA:

	Operating frequency		Rated Power
Cellular phone standards Frequency Range and Power:	GSM/GPRS/EDGE, 850 Class 10	824.2MHz-848.8MHz	33dBm
	GSM/GPRS/EDGE, 1900 Class 10	1850.2MHz-1909.8MHz	30dBm
Hardware Version:	520		
Software Version:	Firmware 7.43		
IMEI:	35406001385405		

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.



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5 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2009-6-4	2010-6-3
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2009-6-4	2010-6-3
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2009-4-11	2010-4-10
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2009-6-4	2010-6-3
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2009-10-9	2010-10-8
6	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY—2003P	--	2009-10-15	2010-10-14
7	CLAMP METER	FLUKE	316	86080010	2009-04-27	2010-04-26
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2009-10-15	2010-10-14
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2009-6-18	2010-6-17
10	DC power	KIKUSUI	PMC35—3	NF100260	2010-1-16	2011-1-15
11	Power meter	Rohde & Schwarz	NRP	101641	2009-5-5	2010-5-4
12	UNIVERSAL RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMU 200	112012	2009-08-25	2010-08-24
13	Tunable Notch Filter	Wainwright instruments GmbH	WRCT1800.0/2000.0-0.2/40-5SSK	11	2010-1-27	2011-1-26
14	Tunable Notch Filter	Wainwright instruments GmbH	WRCT800.0/880.0-0.2/40-5SSK	9	2010-1-27	2011-1-26



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6 Test Results

6.1 E.U.T. test conditions

Power supply:	DC 3.6V
Operating Environment:	
Temperature:	20.0 -25.0 °C
Humidity:	38-48 % RH
Atmospheric Pressure:	992 -1006 mbar



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6.2 RF Power Output

Test Requirement:

RSS 132,4.4 The maximum ERP shall be 11.5 watts for mobile stations.

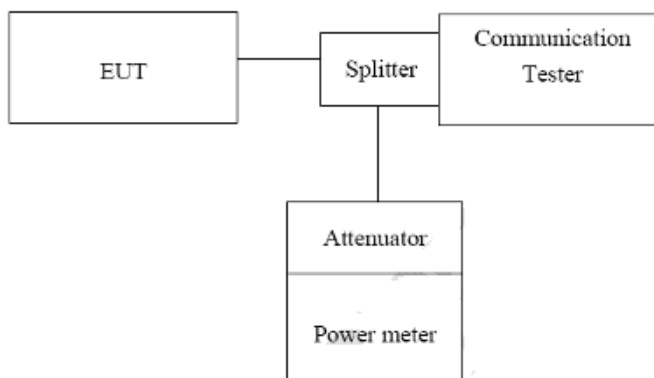
RSS 133,6.4 Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p.

Part 2.1046

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

Part 24.232(d) peak Power measurement, FCC 24.232(c) Maximum Power reduction 3GPP Power Limitation for HSDPA and HSUPA

Test Setup



Measurement Setup for testing on Antenna connector.

Test Date:

March 5,2010 to March 10,2010

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.



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Measurement Result:

RF Conducted output power

GSM/EDGE (GMSK; 8-PSK)

Result:

GSM 850

Frequency (MHz)	Ch	1 Time Slot				2 Time Slot			
		GMSK Mode		8-PSK Mode		GMSK Mode		8-PSK Mode	
		Peak power (dBm)	AV power (dBm)	Peak power (dBm)	AV power (dBm)	Peak power (dBm)	AV power (dBm)	Peak power (dBm)	AV power (dBm)
824.2	128	32.0	31.9	29.2	26.0	32.0	31.9	29.1	25.9
836.6	190	31.9	31.7	29.4	26.1	31.9	31.7	29.6	26.4
848.8	251	31.7	31.6	29.4	26.2	31.7	31.6	29.6	26.4

PCS 1900

Frequency (MHz)	Ch	1 Time Slot				2 Time Slot			
		GMSK Mode		8-PSK Mode		GMSK Mode		8-PSK Mode	
		Peak power (dBm)	AV power (dBm)	Peak power (dBm)	AV power (dBm)	Peak power (dBm)	AV power (dBm)	Peak power (dBm)	AV power (dBm)
1850.2	512	29.4	29.3	28.6	25.5	29.4	29.3	28.6	25.5
1880.0	661	29.3	29.2	28.3	25.1	29.3	29.2	28.4	25.2
1909.8	810	29.5	29.3	28.4	25.1	29.5	29.4	28.4	25.2



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6.3 99% Occupied Bandwidth

Test Requirement: RSS Gen 4.6;
Part 2.1049
Test Date: March 5,2010 to March 10,2010
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 \geq 3 times RBW, 99% bandwidth 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 (MHz)
GSM 850	824.2	128	0.2468
	836.6	190	0.2452
	848.8	251	0.2452

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 850	824.2	128	0.2404
	836.6	190	0.2404
	848.8	251	0.2388

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
PCS 1900	1850.2	512	0.2452
	1880.0	661	0.2420
	1909.8	810	0.2452

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EDGE 1900	1850.2	512	0.2372
	1880.0	661	0.2372
	1909.8	810	0.2388

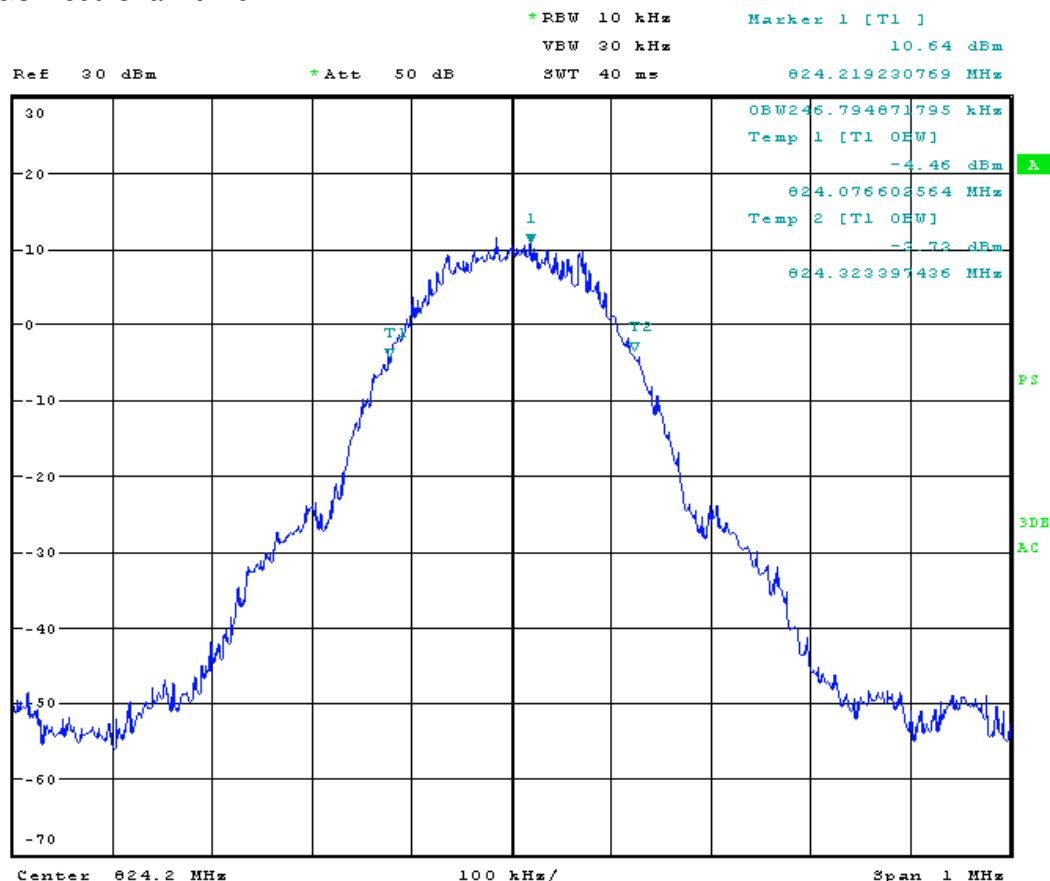


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99% Bandwidth

GSM 850 Channel Low

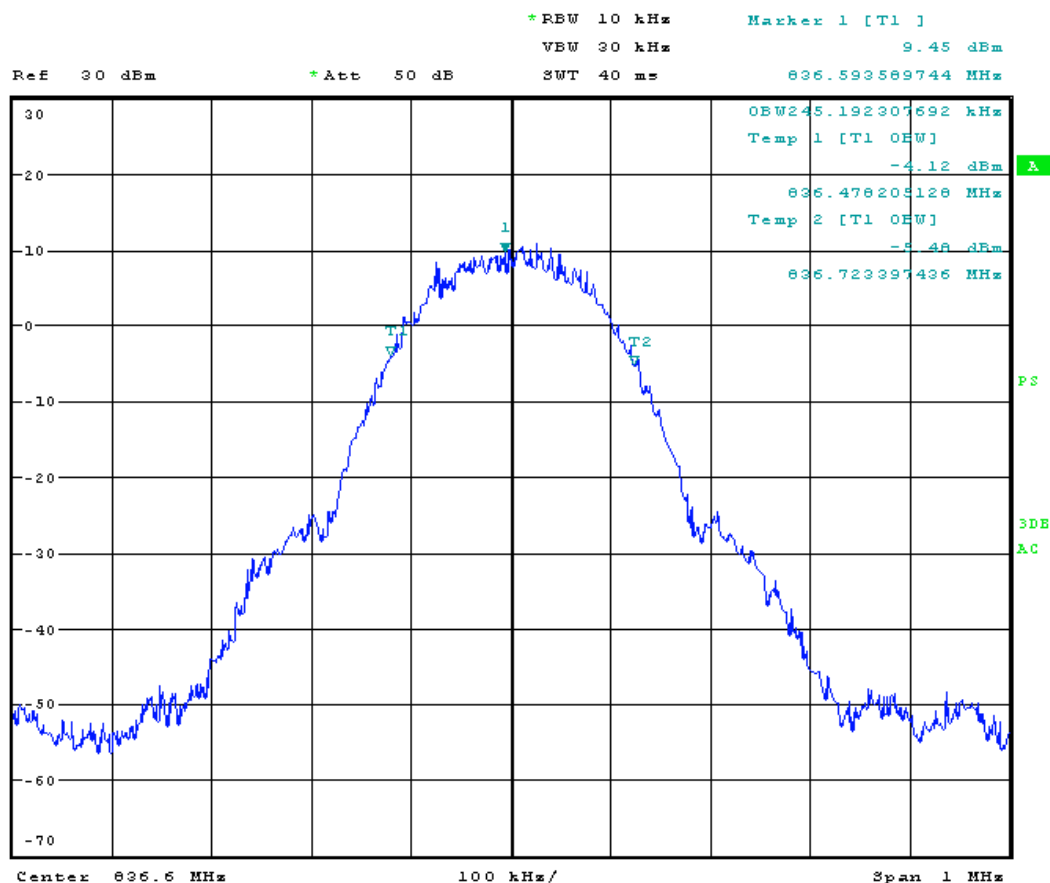




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99% Bandwidth
GSM 850 Channel Mid

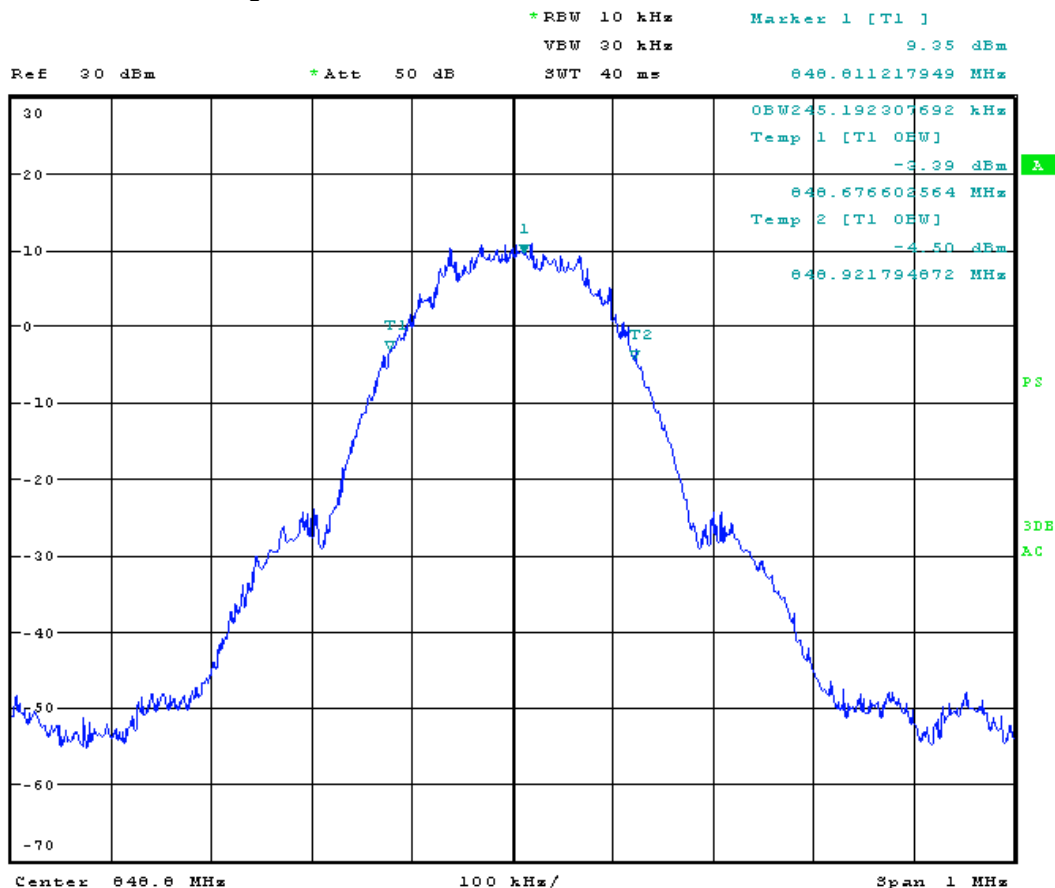




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99% Bandwidth
GSM 850 Channel High



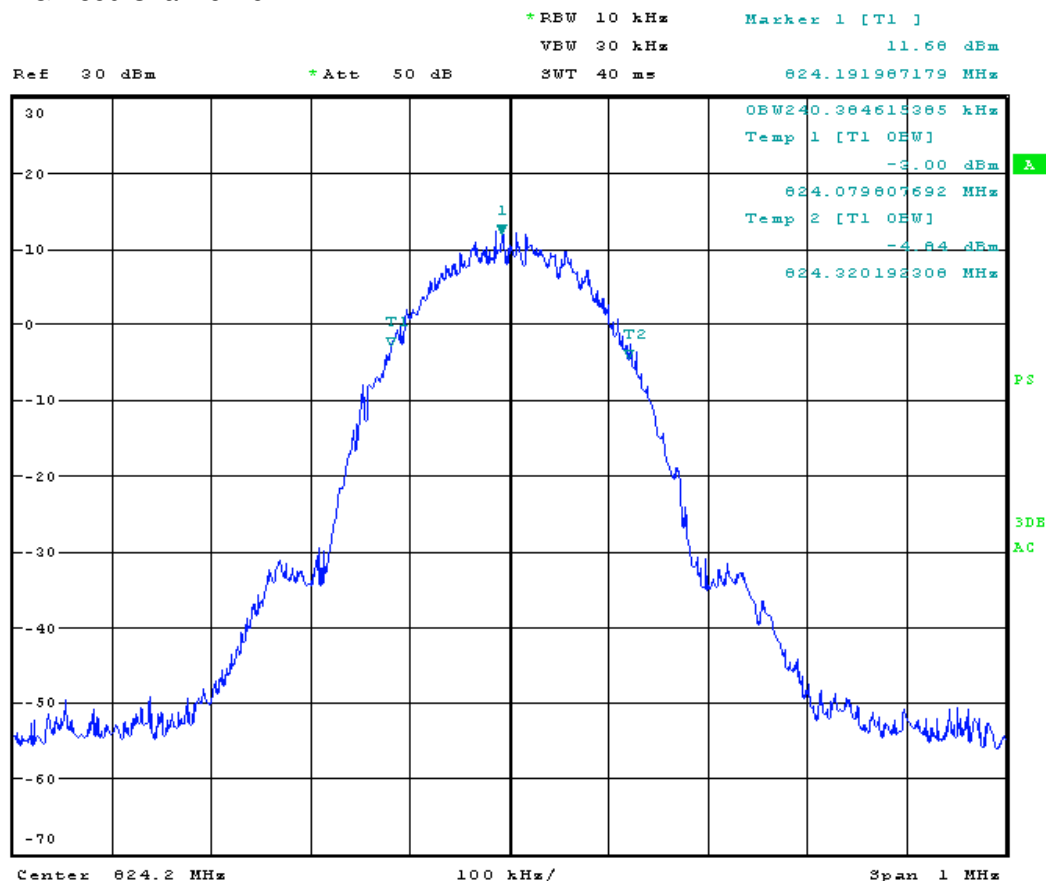


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99% Bandwidth

EDGE 850 Channel Low

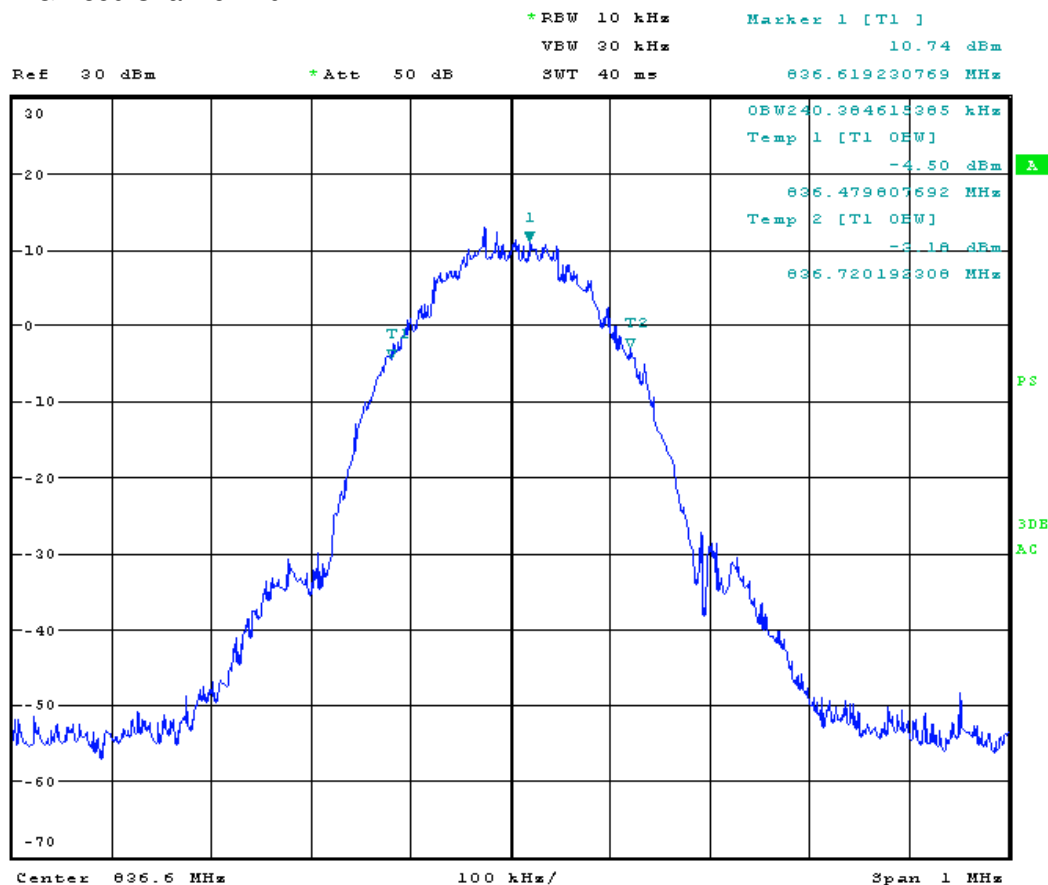




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99% Bandwidth
EDGE 850 Channel Mid

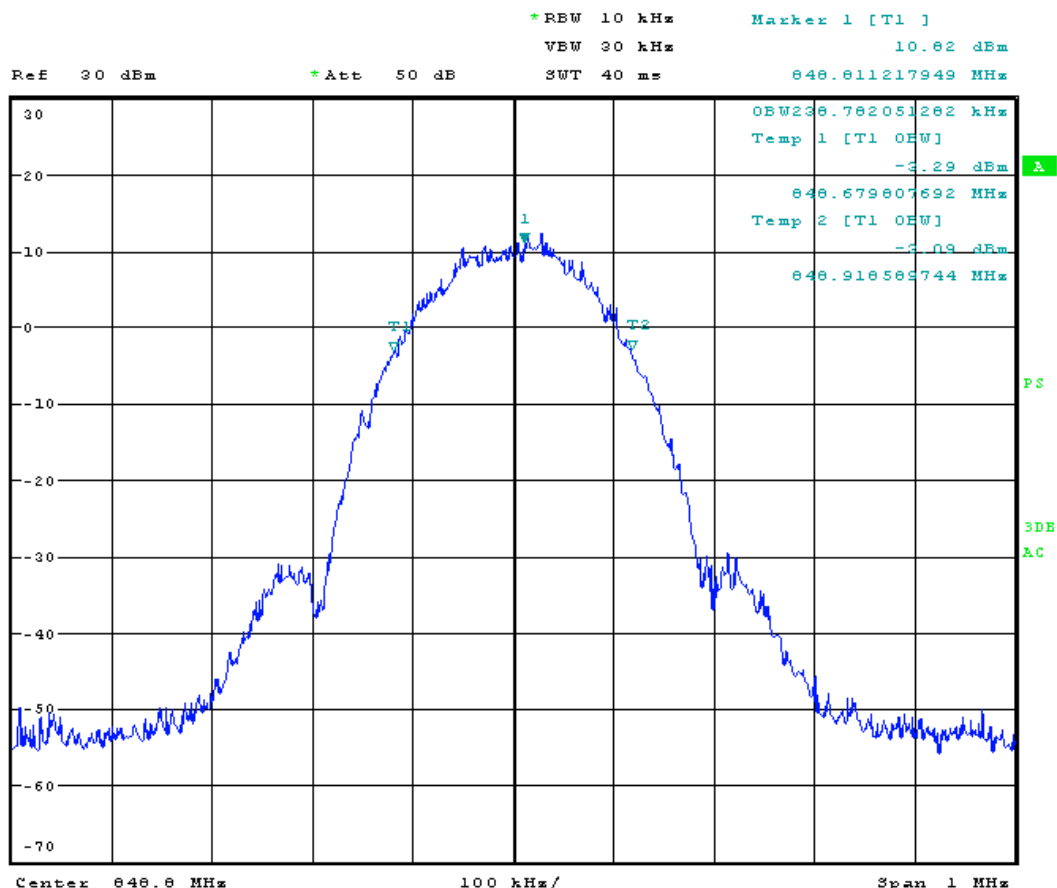




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99% Bandwidth
EDGE 850 Channel High

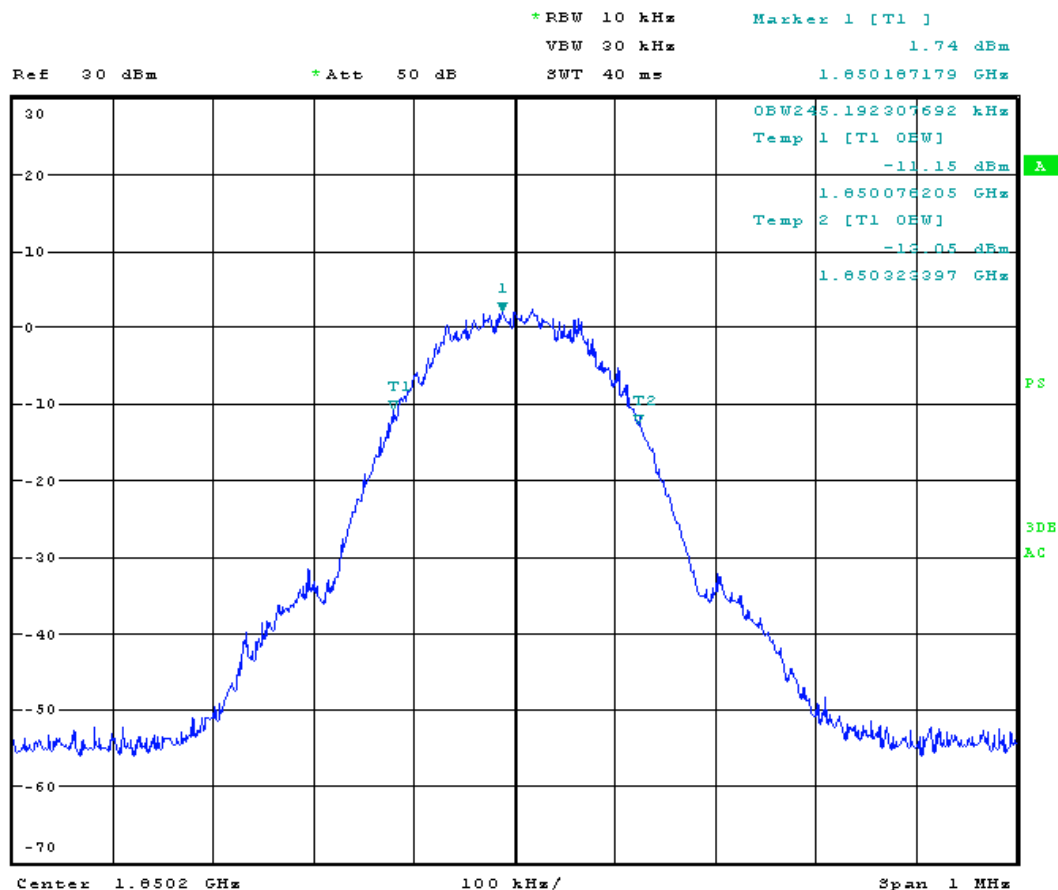




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99% Bandwidth
PCS 1900 Channel Low



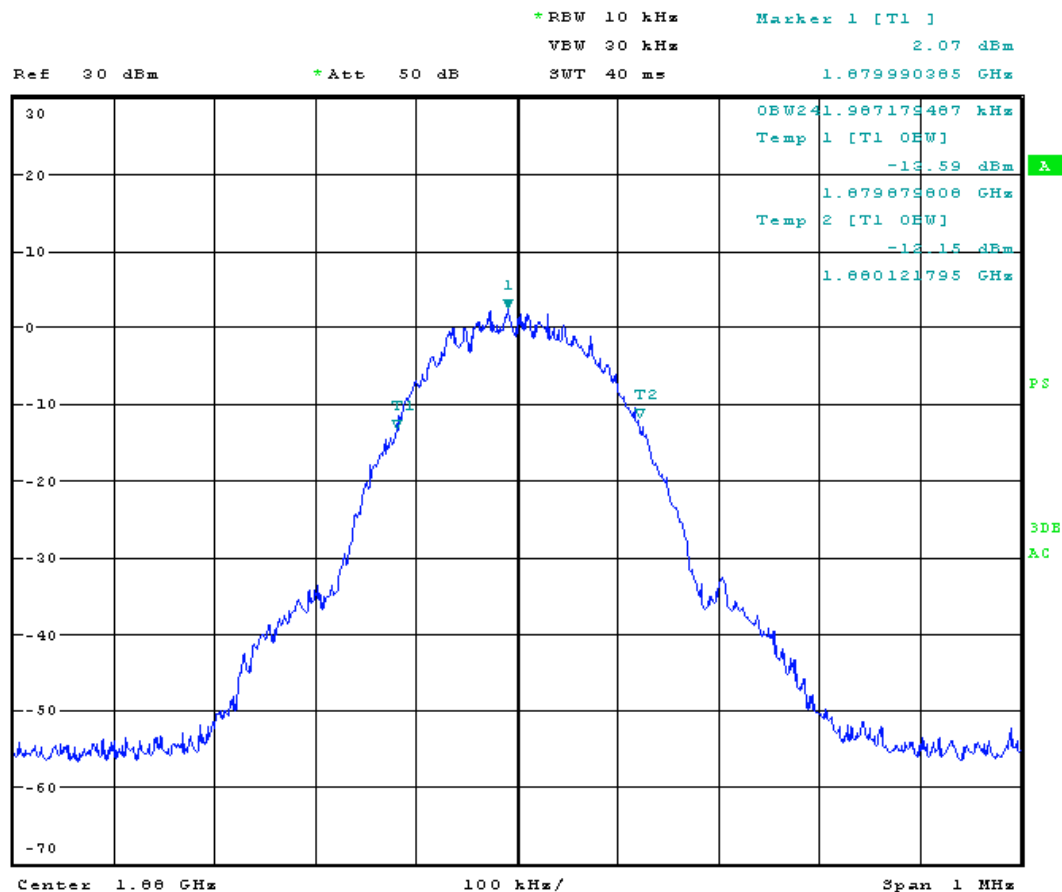


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99% Bandwidth

PCS 1900 Channel Mid



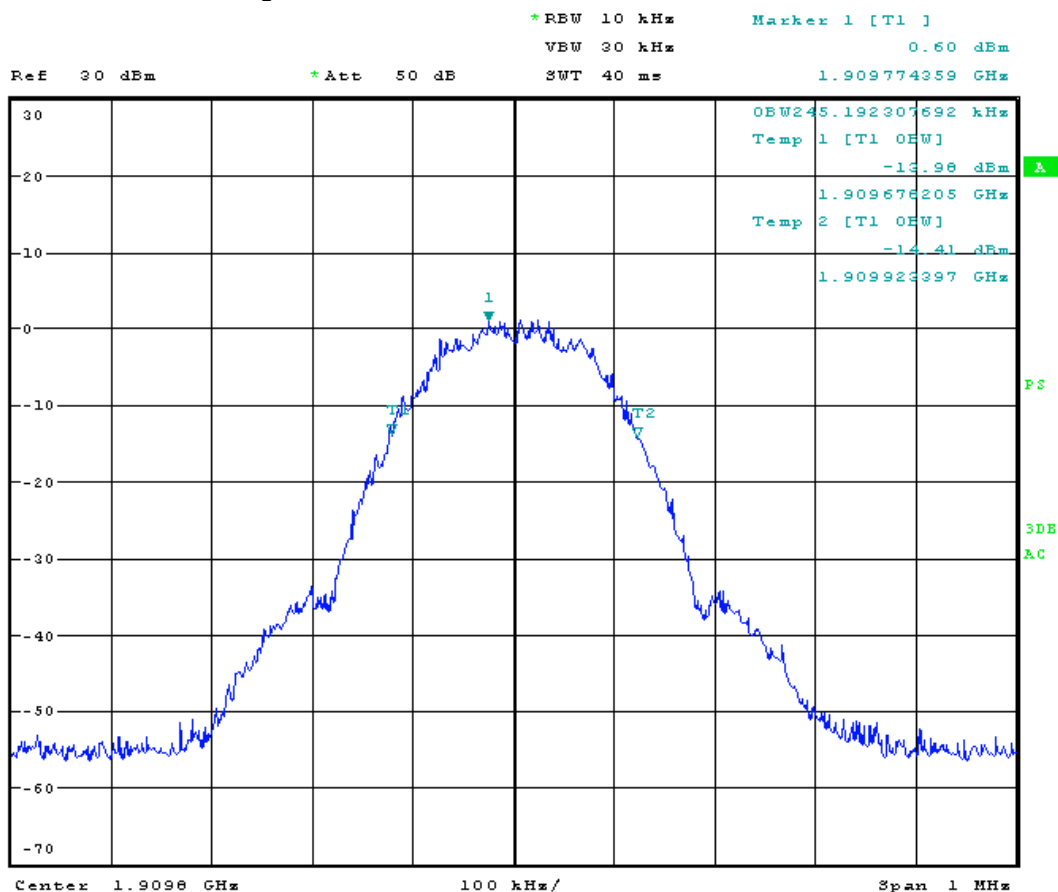


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99% Bandwidth

PCS 1900 Channel High



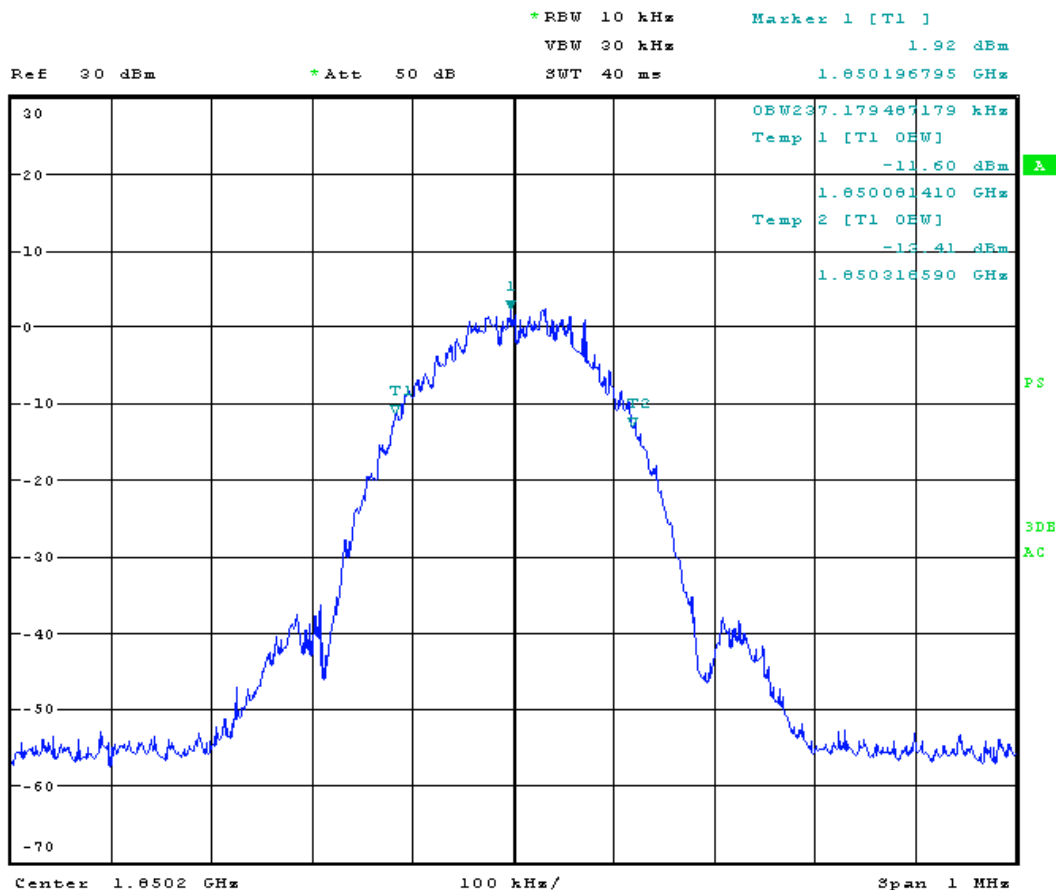


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99% Bandwidth

EDGE 1900 Channel Low



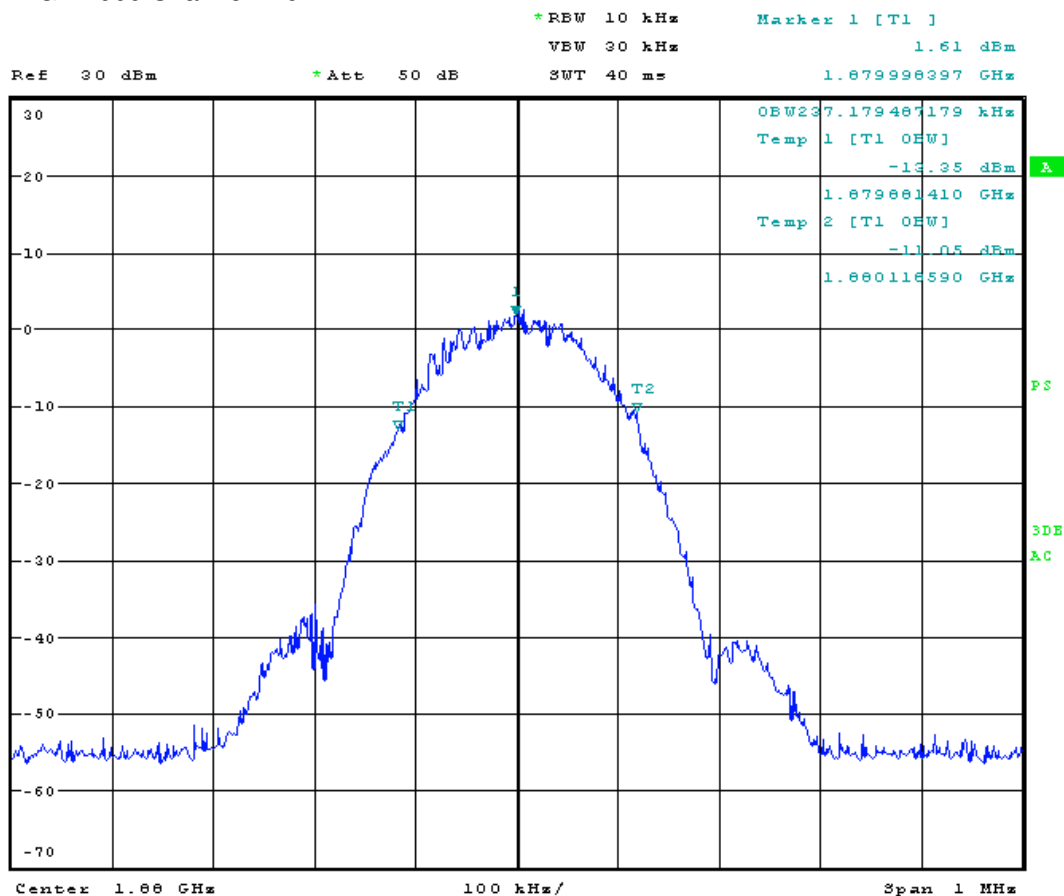


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99% Bandwidth

EDGE 1900 Channel Mid



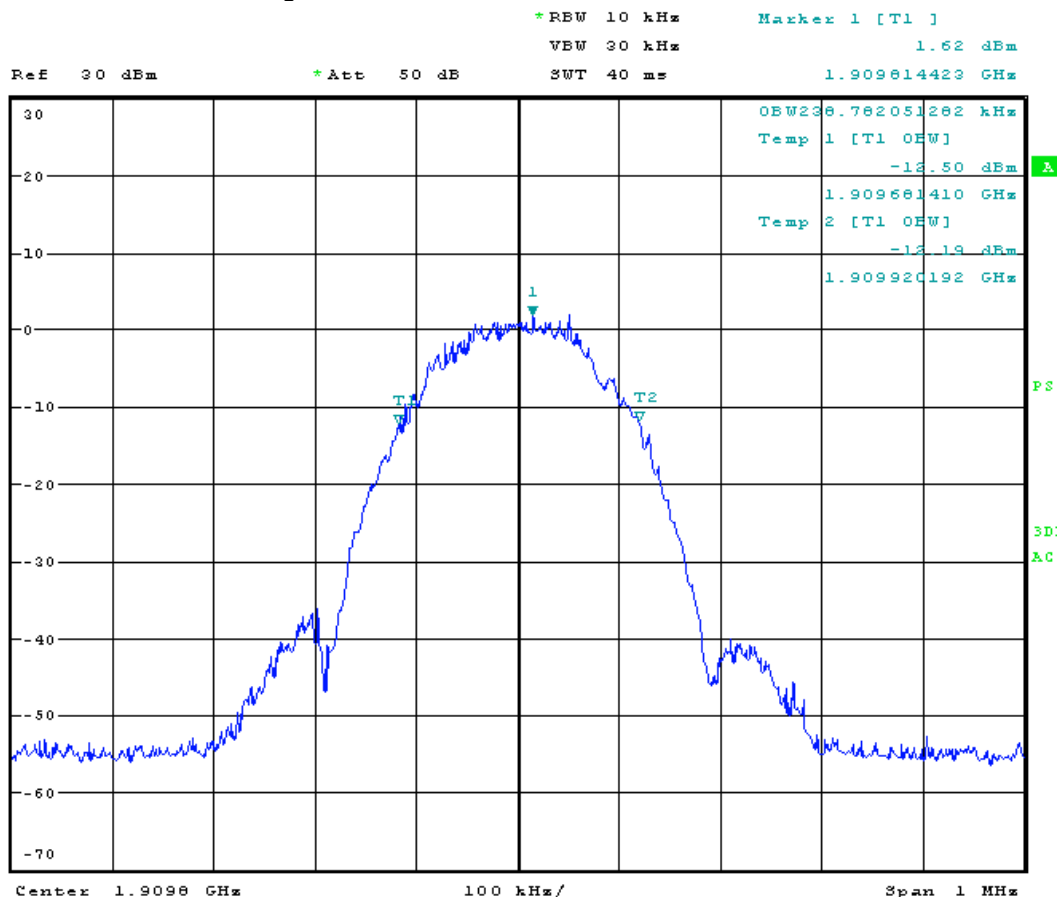


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99% Bandwidth

EDGE 1900 Channel High





6.4 Out of band emissions at antenna Terminals

6.4.1 Band edges emissions

Test Requirement: RSS 132, 4.5.1;RSS 133, 6.5.1(a)(i),(b)
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 $43+10\log(\text{Mean power in watts})$ dBc below the mean power output outside a license's frequency block(-13dBm).

Test Date: March 4,2010

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 10th harmonic.

For the out of band: set RBW, VBW=1MHz, stat=30MHz, stop= 10 th harmonic. Limit= --13dBm

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.



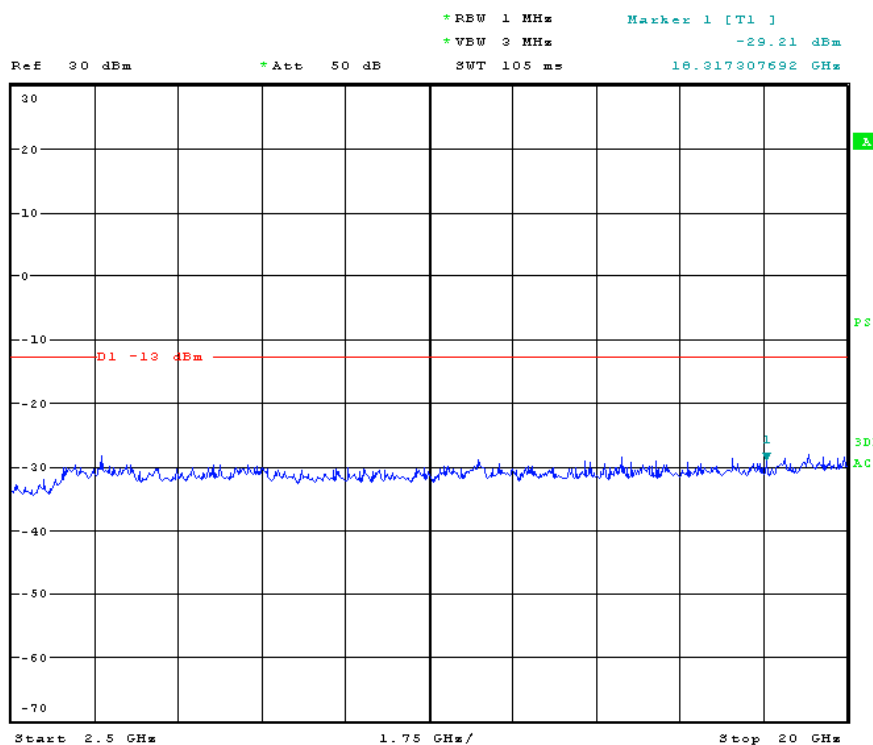
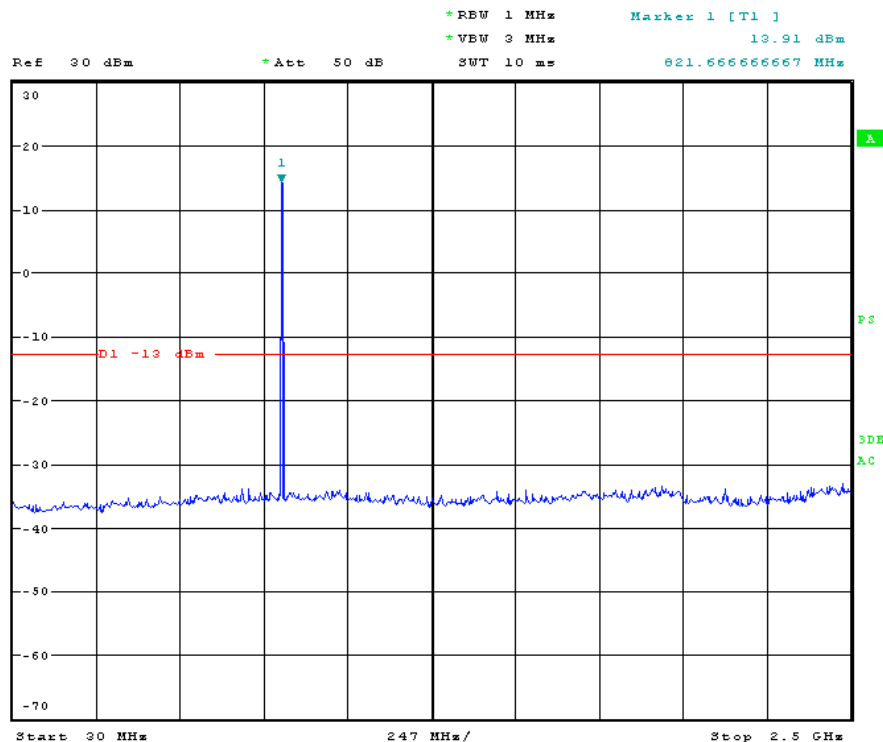
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Measurement result:

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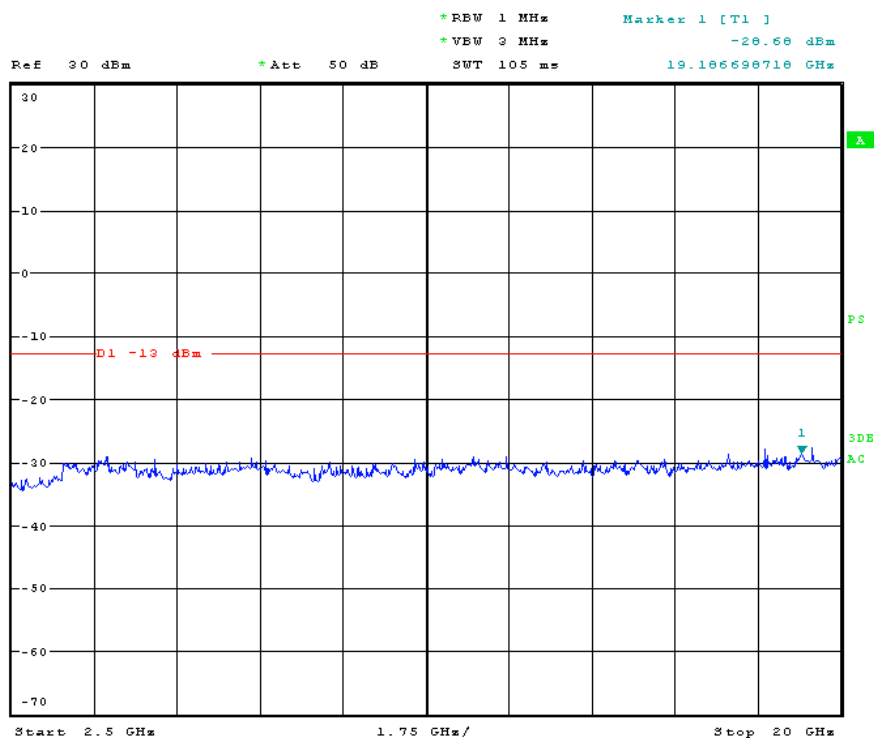
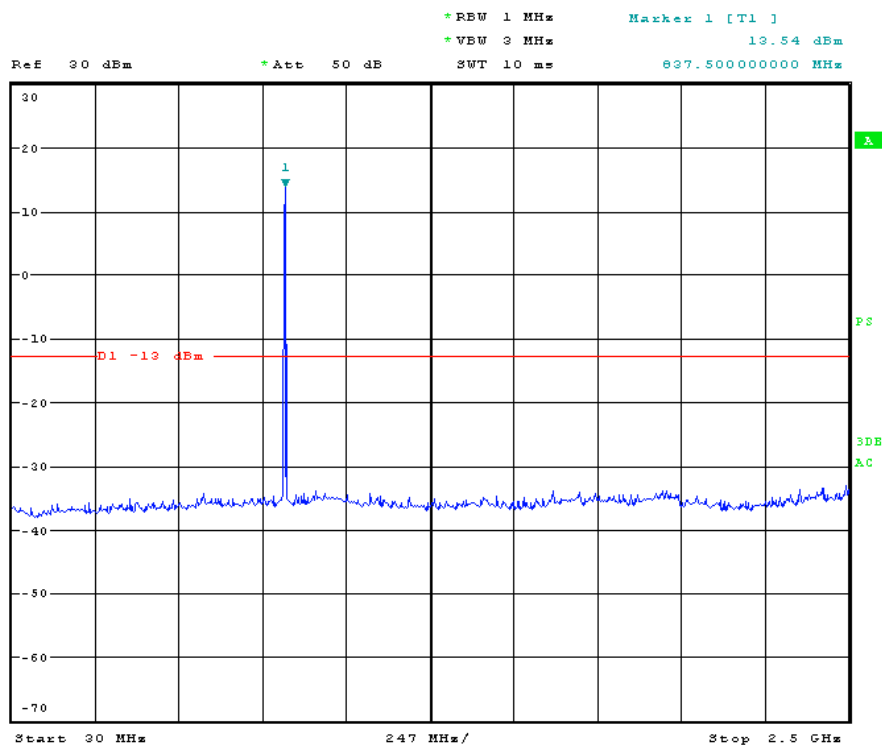
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GSM 850 Channel Mid

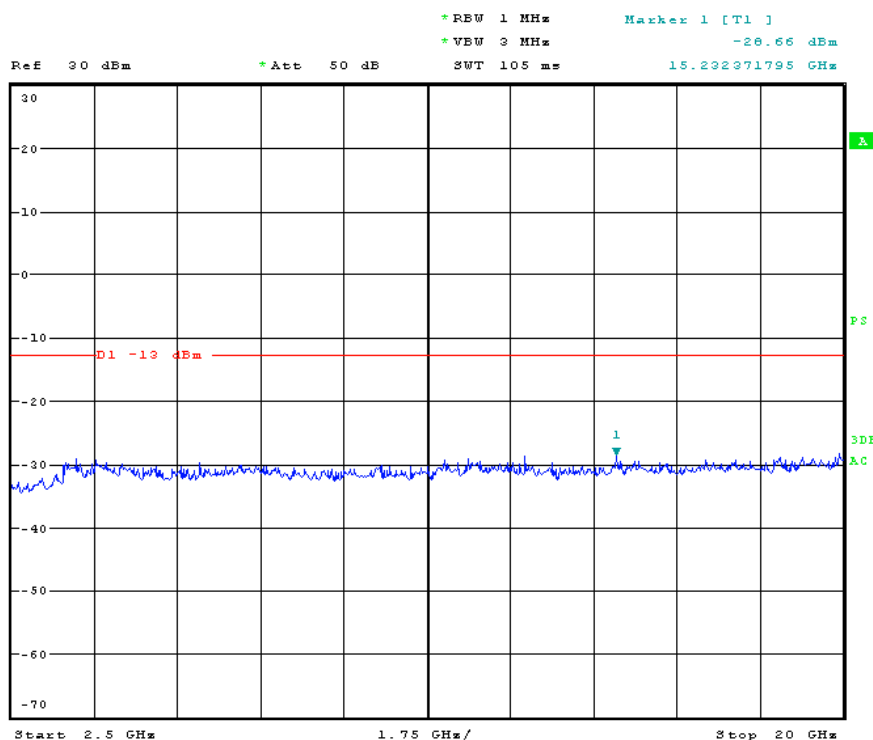
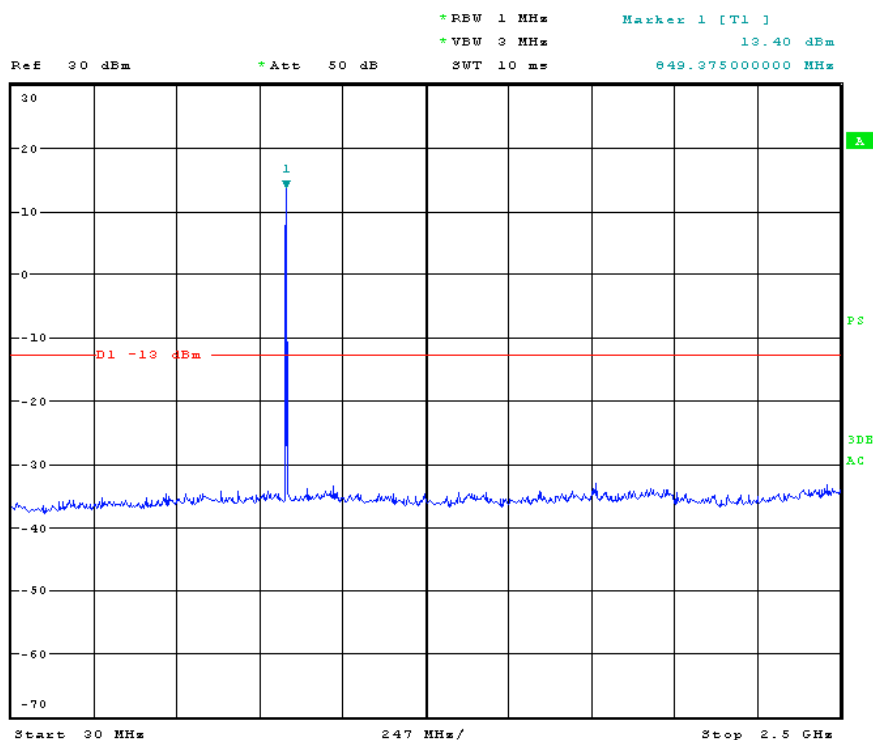




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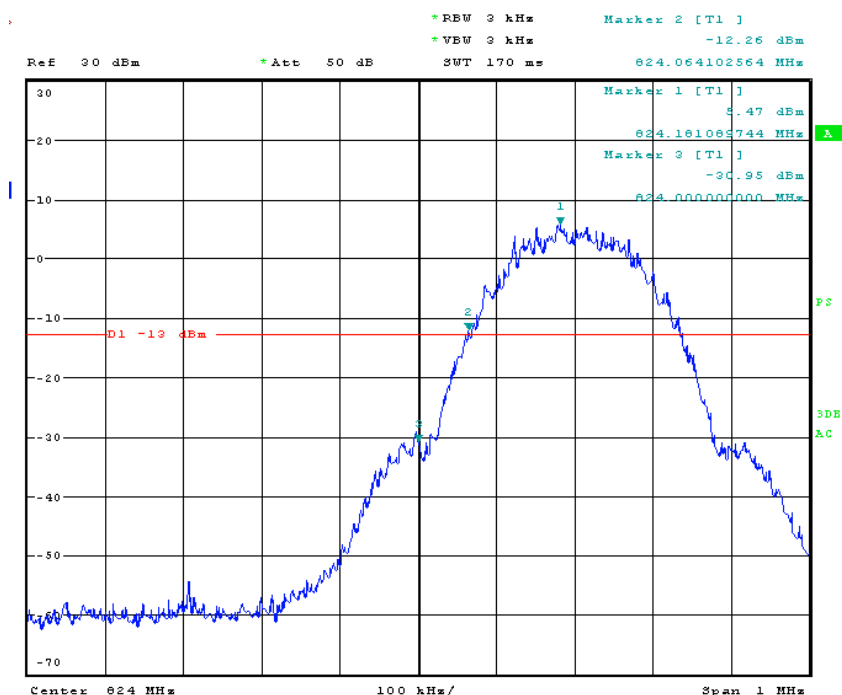
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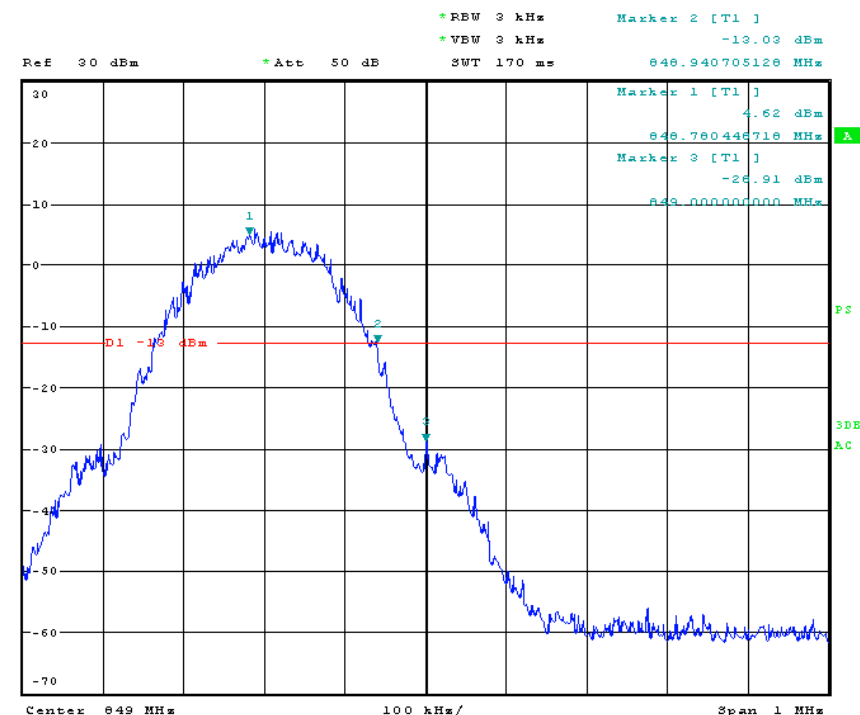
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Band Edge emission GSM 850 Channel Low



Band Edge emission GSM 850 Channel high

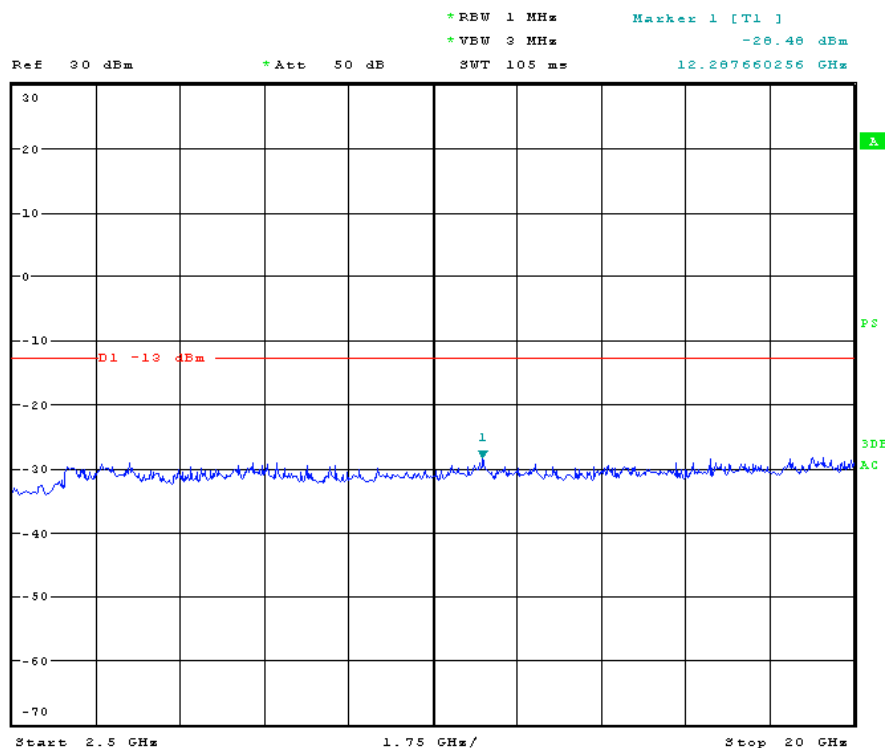
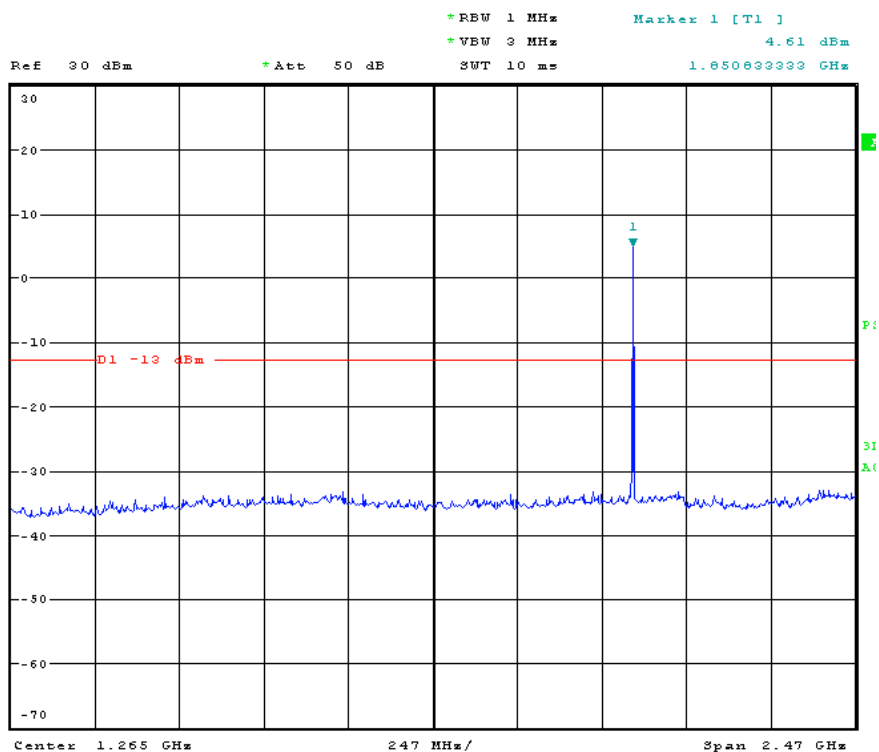




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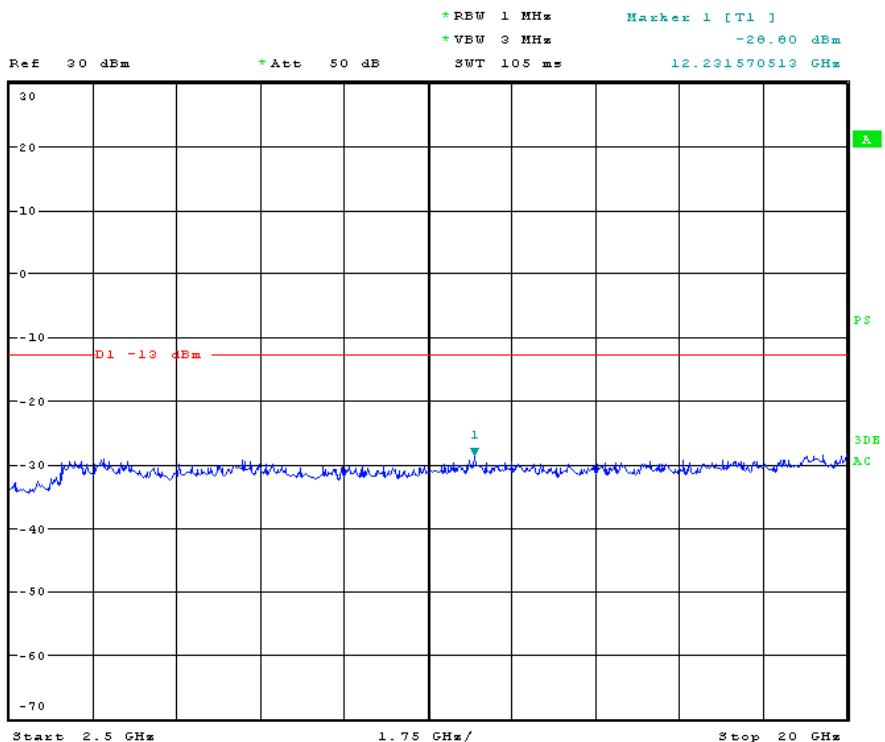
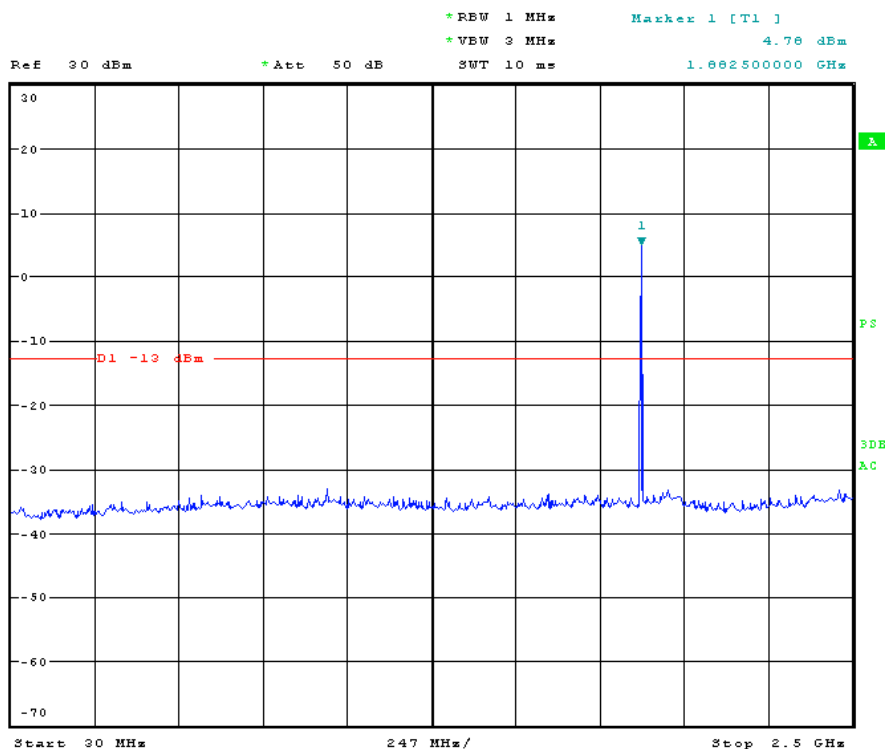




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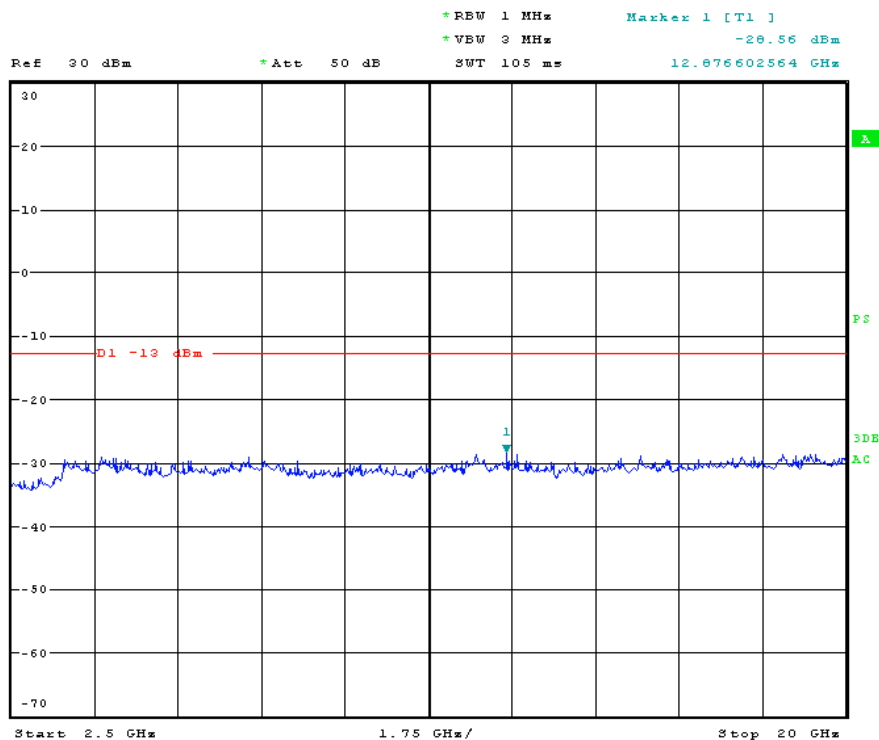
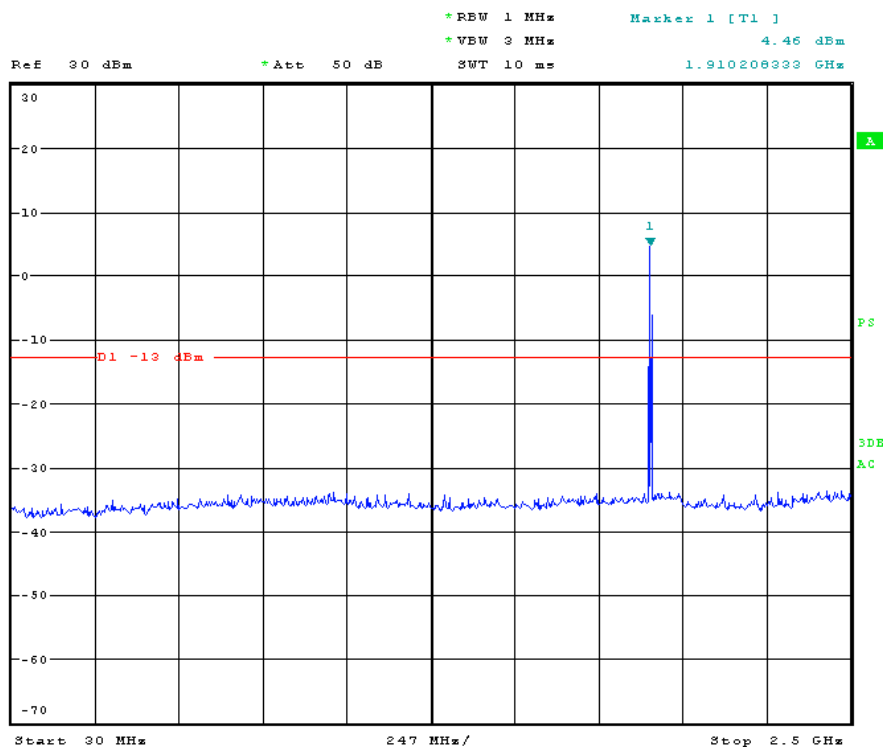
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PCS 1900 Channel High



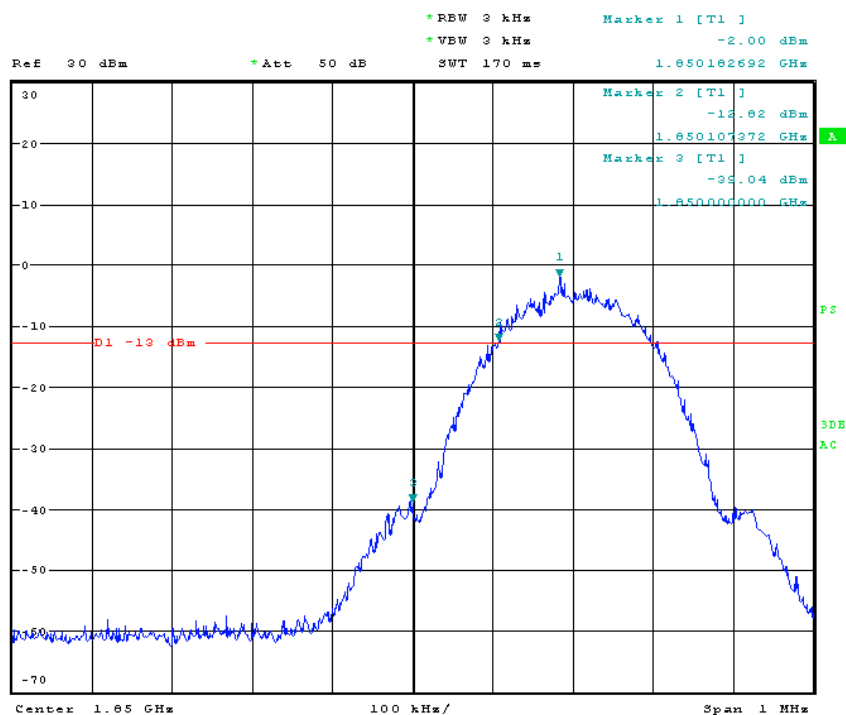
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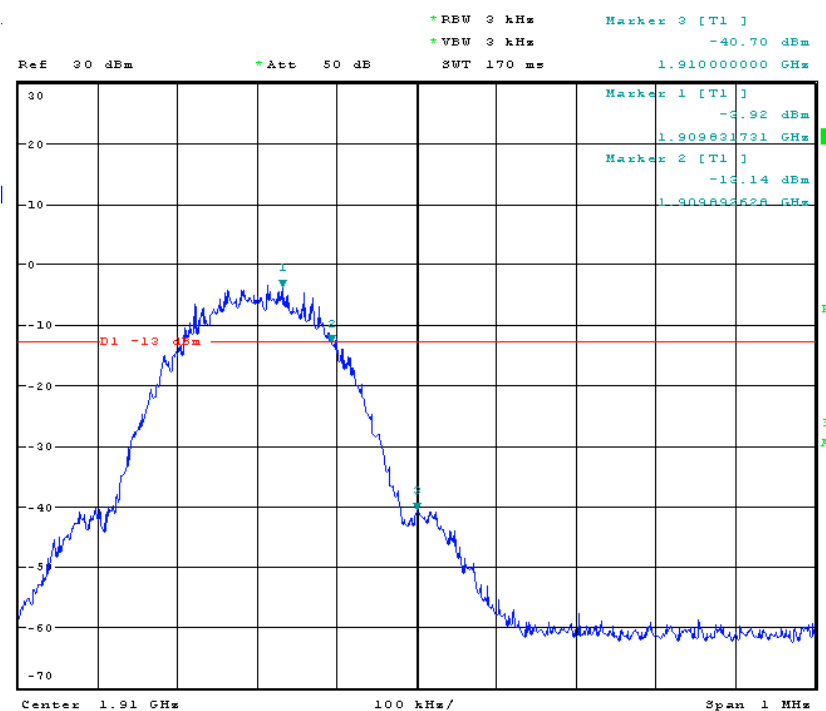
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Band Edge emission PCS 1900 Channel Low



Band Edge emission PCS 1900 Channel high



6.5 Field Strength of Radiated Spurious Emissions

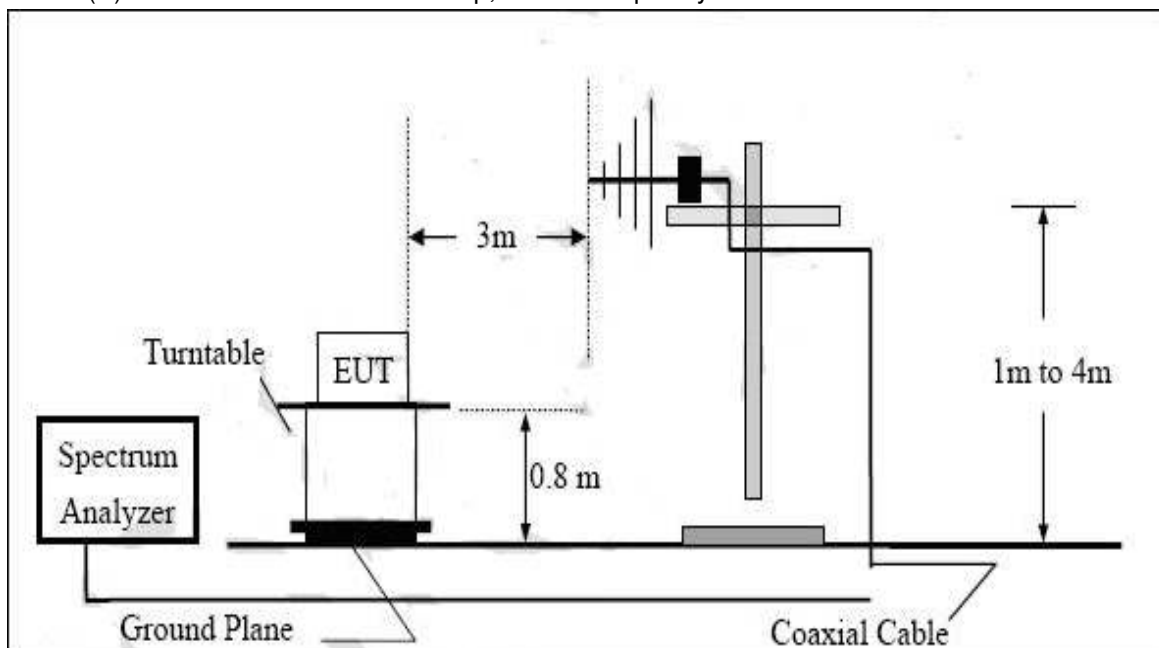
Test Requirement: RSS 132, 4.5.1;RSS 133, 6.5.1(a)(i),(b)
Part 2.1053

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 $43+10\log(\text{Mean power in watts})$ dBc below the mean power output outside a license's frequency block(-13dBm).

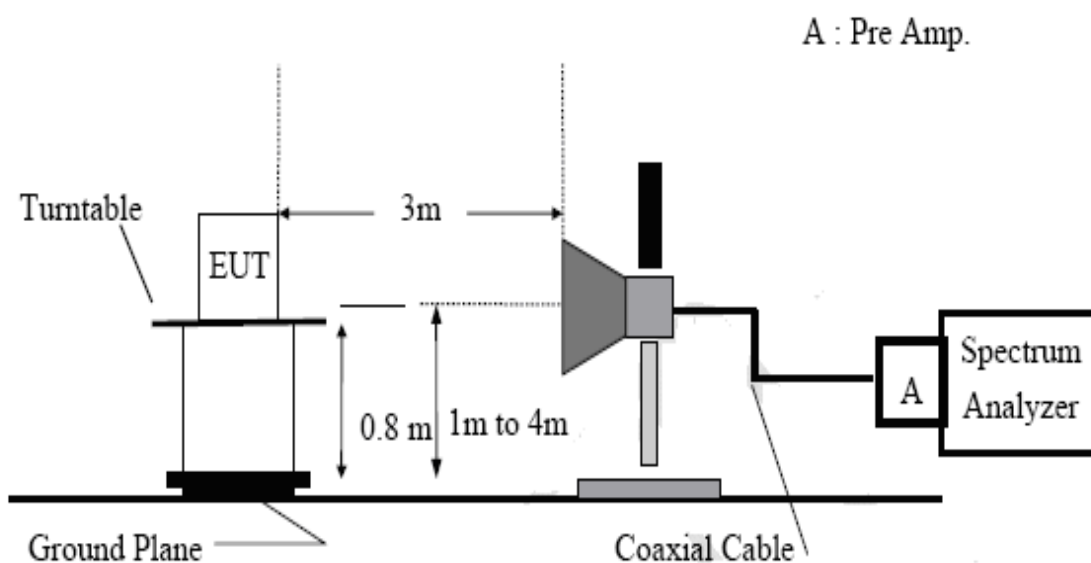
Test Date: March 8,2010

Test Setup:

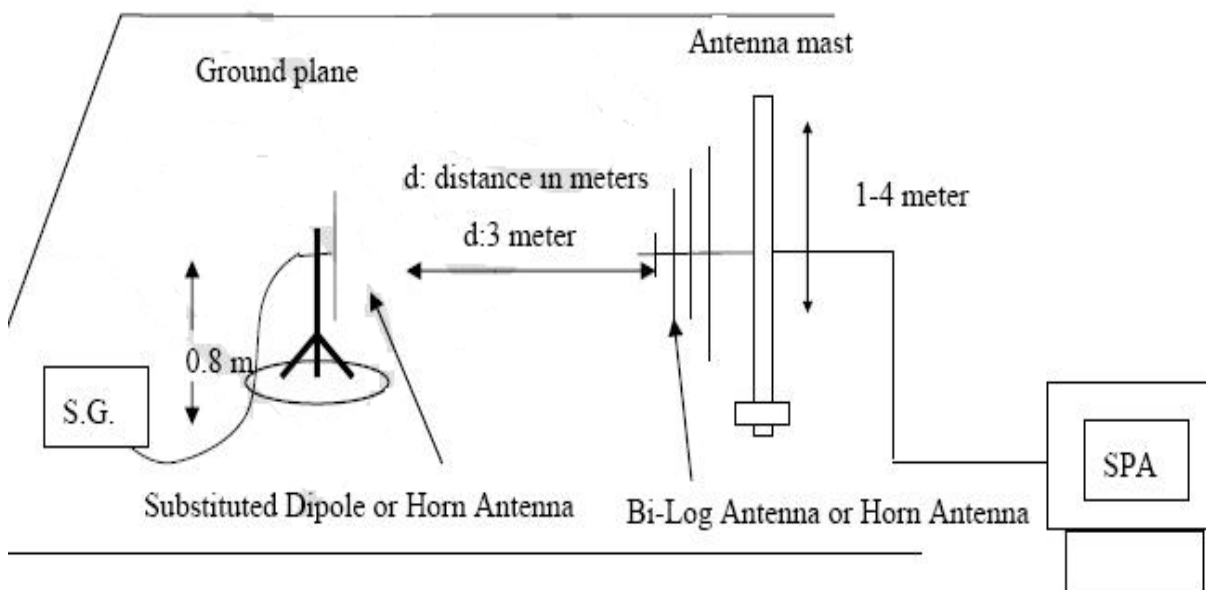
(A) Radiated emission Test setup, Below Frequency 1000MHz:



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



(C) Substituted Method Test setup:





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Test Procedure:

The EUT was placed on an 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 1850.5-1909.8MHz 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)



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Radiated spurious Emission Measurement Result: GSM 850 mode

Operation mode: TX CH Low mode

Fundamental Frequency: 824.2MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dBm)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
100.00	H	-52.27	2.6	1	-50.67	-13	37.67
200.00	H	-52	9.1	1.42	-44.32	-13	31.32
800.00	H	-54.67	8.7	2.86	-48.83	-13	35.83
1648.40	H	-51.73	6.95	4.17	-48.95	-13	35.95
2472.60	H	-52.39	8.35	5.24	-49.28	-13	36.28
3296.80	H	-51.34	8.15	6.11	-49.3	-13	36.3
4121.00	H	-49.84	8.45	6.94	-48.33	-13	35.33
100.00	V	-53.87	2.6	1	-52.27	-13	39.27
200.00	V	-54.57	9.1	1.42	-46.89	-13	33.89
800.00	V	-55.37	8.7	2.86	-49.53	-13	36.53
1648.40	V	-51.43	6.95	4.17	-48.65	-13	35.65
2472.60	V	-52.99	8.35	5.24	-49.88	-13	36.88
3296.80	V	-52.28	8.15	6.11	-50.24	-13	37.24
4121.00	V	-50.3	8.45	6.94	-48.79	-13	35.79

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



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Radiated spurious Emission Measurement Result: GSM 850 mode

Operation mode: TX CH Mid mode

Fundamental Frequency: 836.60MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dBm)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
100.00	H	-52.66	2.6	1	-51.06	-13	38.06
200.00	H	-52.39	9.1	1.42	-44.71	-13	31.71
800.00	H	-55.06	8.7	2.86	-49.22	-13	36.22
1673.20	H	-52.12	6.95	4.2	-49.37	-13	36.37
2509.80	H	-52.78	8.35	5.36	-49.79	-13	36.79
3346.40	H	-51.73	8.15	6.25	-49.83	-13	36.83
4183.00	H	-50.23	8.45	6.98	-48.76	-13	35.76
100.00	V	-54.26	2.6	1	-52.66	-13	39.66
200.00	V	-54.96	9.1	1.42	-47.28	-13	34.28
800.00	V	-55.76	8.7	2.86	-49.92	-13	36.92
1673.20	V	-51.82	6.95	4.2	-49.07	-13	36.07
2509.80	V	-53.38	8.35	5.36	-50.39	-13	37.39
3346.40	V	-52.67	8.15	6.25	-50.77	-13	37.77
4183.00	V	-50.69	8.45	6.98	-49.22	-13	36.22

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



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Radiated spurious Emission Measurement Result: GSM 850 mode

Operation mode: TX CH High mode

Fundamental Frequency: 848.8MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dBm)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
100.00	H	-53.09	2.6	1	-51.49	-13	38.49
200.00	H	-51.81	9.1	1.42	-44.13	-13	31.13
800.00	H	-54.05	8.7	2.86	-48.21	-13	35.21
1697.60	H	-52.21	6.95	4.22	-49.48	-13	36.48
2546.40	H	-51.99	8.35	5.39	-49.03	-13	36.03
3395.20	H	-50.98	8.15	6.35	-49.18	-13	36.18
4244.00	H	-50.76	8.45	7.04	-49.35	-13	36.35
100.00	V	-53.61	2.6	1	-52.01	-13	39.01
200.00	V	-53.13	9.1	1.42	-45.45	-13	32.45
800.00	V	-55.6	8.7	2.86	-49.76	-13	36.76
1697.60	V	-52.1	6.95	4.22	-49.37	-13	36.37
2546.40	V	-52.4	8.35	5.39	-49.44	-13	36.44
3395.20	V	-52.33	8.15	6.35	-50.53	-13	37.53
4244.00	V	-51.29	8.45	7.04	-49.88	-13	36.88

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



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Radiated spurious Emission Measurement Result: PCS 1900 mode

Operation mode: TX CH Low mode

Fundamental Frequency: 1850.2MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dBm)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
100.00	H	-52.67	2.6	1	-51.07	-13	38.07
200.00	H	-52.5	9.1	1.42	-44.82	-13	31.82
800.00	H	-52.17	8.7	2.86	-46.33	-13	33.33
1800.00	H	-51.24	7	4.38	-48.62	-13	35.62
3700.40	H	-52.43	8.35	6.77	-50.85	-13	37.85
5550.60	H	-51.29	9.55	8.1	-49.84	-13	36.84
7400.80	H	-51.17	9.75	9.51	-50.93	-13	37.93
9251.00	H	-53.33	10.55	11.08	-53.86	-13	40.86
100.00	V	-52.17	2.6	1	-50.57	-13	37.57
200.00	V	-53.55	9.1	1.42	-45.87	-13	32.87
800.00	V	-53.69	8.7	2.86	-47.85	-13	34.85
1800.00	V	-49.4	7	4.38	-46.78	-13	33.78
3700.40	V	-51.73	8.35	6.77	-50.15	-13	37.15
5550.60	V	-51.91	9.55	8.1	-50.46	-13	37.46
7400.80	V	-52.67	2.6	1	-51.07	-13	38.07
9251.00	V	-52.5	9.1	1.42	-44.82	-13	31.82

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

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



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Radiated spurious Emission Measurement Result: PCS 1900 mode

Operation mode: TX CH mid mode

Fundamental Frequency: 1880.0MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dBm)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
100.00	H	-52.61	2.6	1	-51.01	-13	38.01
200.00	H	-54.44	9.1	1.42	-46.76	-13	33.76
800.00	H	-54.11	8.7	2.86	-48.27	-13	35.27
1800.00	H	-51.11	7	4.38	-48.49	-13	35.49
3760.00	H	-51.11	8.42	6.84	-49.53	-13	36.53
5640.00	H	-51.21	9.5	8.31	-50.02	-13	37.02
7520.00	H	-51.16	9.78	9.6	-50.98	-13	37.98
9400.00	H	-53.27	10.61	11.32	-53.98	-13	40.98
100.00	V	-54.11	2.6	1	-52.51	-13	39.51
200.00	V	-54.11	9.1	1.42	-46.43	-13	33.43
800.00	V	-53.11	8.7	2.86	-47.27	-13	34.27
1800.00	V	-52.31	7	4.38	-49.69	-13	36.69
3760.00	V	-53.67	8.42	6.84	-52.09	-13	39.09
5640.00	V	-53.81	9.5	8.31	-52.62	-13	39.62
7520.00	V	-52.61	2.6	1	-51.01	-13	38.01
9400.00	V	-54.44	9.1	1.42	-46.76	-13	33.76

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

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



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Radiated spurious Emission Measurement Result: PCS 1900 mode

Operation mode: TX CH High mode

Fundamental Frequency: 1909.8MHz

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dBm)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
100.00	H	-50.96	2.6	1	-49.36	-13	36.36
200.00	H	-50.85	9.1	1.42	-43.17	-13	30.17
800.00	H	-50.64	8.7	2.86	-44.8	-13	31.8
1800.00	H	-51.1	7	4.38	-48.48	-13	35.48
3819.60	H	-51.07	8.42	6.88	-49.53	-13	36.53
5729.80	H	-50.86	9.5	8.48	-49.84	-13	36.84
7639.20	H	-51.89	9.78	9.7	-51.81	-13	38.81
9549.00	H	-51.61	10.61	11.64	-52.64	-13	39.64
100.00	V	-52.13	2.6	1	-50.53	-13	37.53
200.00	V	-52.51	9.1	1.42	-44.83	-13	31.83
800.00	V	-51.81	8.7	2.86	-45.97	-13	32.97
1800.00	V	-50.96	7	4.38	-48.34	-13	35.34
3819.60	V	-52.76	8.42	6.88	-51.22	-13	38.22
5729.80	V	-52.49	9.5	8.48	-51.47	-13	38.47
7639.20	V	-50.96	2.6	1	-49.36	-13	36.36
9549.00	V	-50.85	9.1	1.42	-43.17	-13	30.17

Remark:

1 emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

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

6.6 Receiver Spurious Emissions

Test Requirement: RSS-GEN section 6;
RSS-GEN section 7.2.3.2

Limit: **Table 1 - Spurious Emission Limits for Receivers**

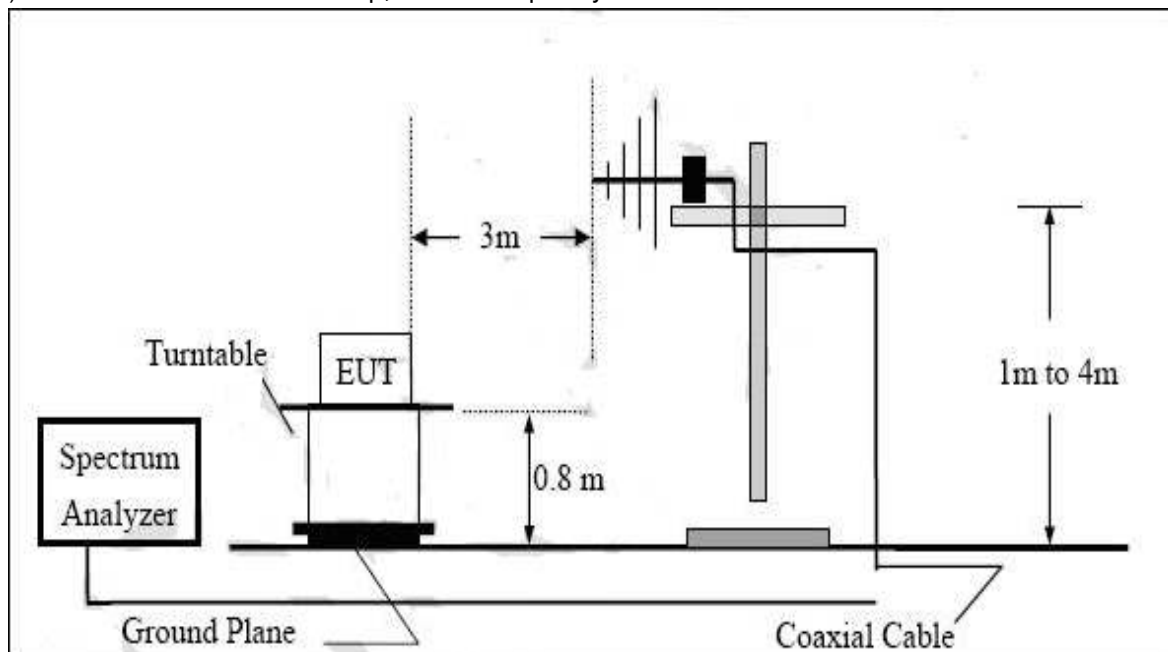
Spurious Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

40.0 dB μ V/m between 30MHz to 88MHz
43.5 dB μ V/m between 88MHz to 216MHz
46.0 dB μ V/m between 216MHz to 960MHz
54.0 dB μ V/m above 960MHz

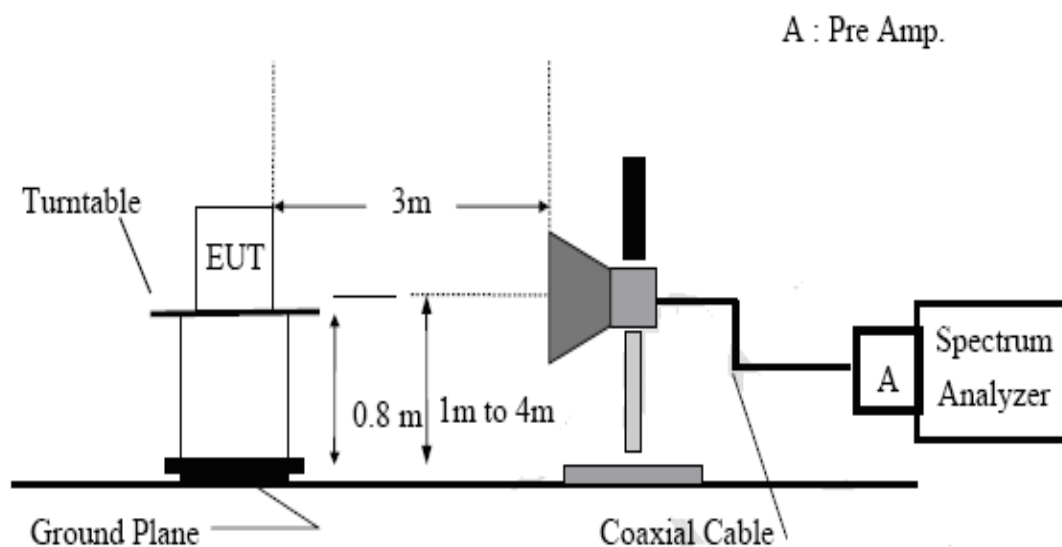
Test Date: March 5,2010

Test Setup:

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



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



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 in communication with the station. The highest emission was recorded with the rotation of the turntable and lowering of the test antenna from 4 m to 1 m. For emissions below 1 GHz, measurements shall be performed using QP detector. Above 1 GHz, measurements shall be performed using an average detector.



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Measurement Result:

Operation mode: GSM 850 Receiver mode

Frequen cy (MHz)	Ant.Pol. H/V	Level (dBuV/m)	Limit (dBuV/m)	Safe Margin (dB)
30.00	H	14.8	40.0	25.2
175.00	H	32.4	43.5	11.1
233.0	H	32.3	46.0	13.7
300.0	H	25.0	46.0	21.0
405.0	H	31.1	46.0	14.9
1500.00	H	18.0	54.0	36.0
30.00	V	15.8	40.0	22.2
156.0	V	31.0	43.5	12.5
176.0	V	27.9	43.5	15.6
404.0	V	26.6	46.0	19.4
1000.00	V	31.0	54.0	23.0
1500.00	V	18.0	54.0	36.0



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Measurement Result:

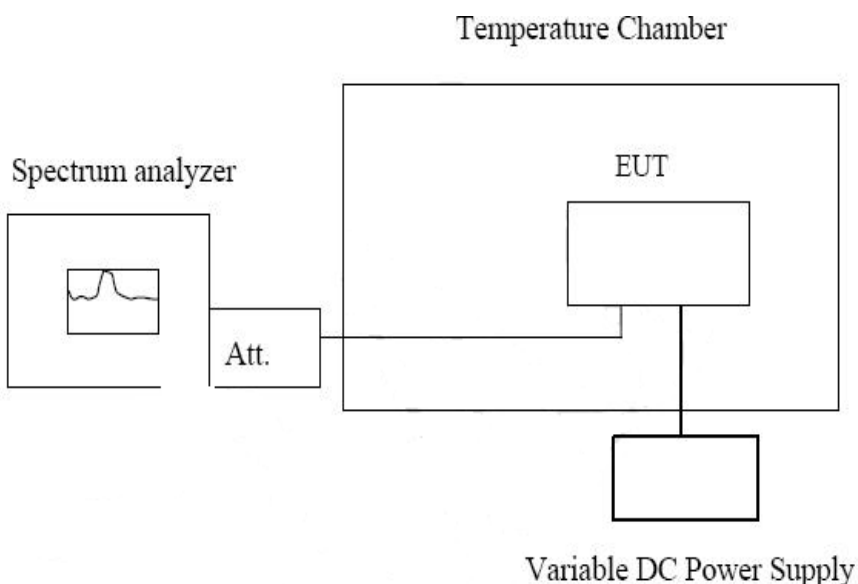
Operation mode: GSM 1900 Receiver mode

Frequen cy (MHz)	Ant.Pol. H/V	Level (dBuV/m)	Limit (dBuV/m)	Safe Margin (dB)
30.00	H	15.9	40.0	24.1
177.00	H	33.9	43.5	9.6
234.00	H	33.1	46.0	12.9
402.00	H	28.0	46.0	18.0
556.00	H	34.3	46.0	11.7
3000.00	H	21.0	54.0	33.0
30.00	V	16.5	40.0	23.5
156.00	V	26.8	43.5	16.7
176.00	V	27.8	43.5	15.7
402.00	V	25.0	46.0	21.0
537.00	V	33.6	46.0	12.4
3000.00	V	21.0	54.0	33.0



6.7 Frequency Stability V.S. TEMPERATURE MEASUREMENT

Test Requirement: RSS-132,4.3; RSS-133,6.3;
Part 2.1055(a)(1)
Test Date: March 5,2010
Test Status: Test lowest channel, middle, highest channel.
Test Setup:



Note: Measurement setup for testing On antenna connector.

Test procedure:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. Reference power supply voltage for these tests is DC 3.6 V. 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



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Reference Frequency: GSM 850 Low channel 824.2MHz@ 25 degree			
Limit: +/- 2.5ppm = 2091Hz			
Environment	Frequency	Delta (Hz)	Limit (Hz)
Temperature(degree)	(MHz)		
-30	824.200043	43	2091
-20	824.200009	9	2091
-10	824.200031	31	2091
10	824.200016	16	2091
20	824.200068	68	2091
30	824.200014	14	2091
40	824.200002	2	2091
50	824.200007	7	2091

Reference Frequency: GSM 850 Mid channel 836.6MHz@ 25 degree			
Limit: +/- 2.5ppm = 2091Hz			
Environment	Frequency	Delta (Hz)	Limit (Hz)
Temperature(degree)	(MHz)		
-30	836.400006	6	2091
-20	836.400012	12	2091
-10	836.400004	4	2091
10	836.399992	8	2091
20	836.400016	16	2091
30	836.400008	8	2091
40	836.400020	20	2091
50	836.400011	11	2091



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Reference Frequency: GSM 850 High channel 848.8MHz@ 25 degree			
Limit: +/- 2.5ppm = 2091Hz			
Environment	Frequency	Delta (Hz)	Limit (Hz)
Temperature(degree)	(MHz)		
-30	848.800022	22	2091
-20	848.800073	73	2091
-10	848.800006	6	2091
10	848.800009	9	2091
20	848.800029	29	2091
30	848.800040	40	2091
40	848.800012	12	2091
50	848.800017	17	2091

Reference Frequency: PCS 1900 Low channel 1850.2MHz@ 25 degree			
Limit: +/- 2.5ppm = 4700Hz			
Environment	Frequency	Delta (Hz)	Limit (Hz)
Temperature(degree)	(MHz)		
-30	1850.199997	3	4700
-20	1850.199921	79	4700
-10	1850.199973	27	4700
10	1850.199920	70	4700
20	1850.199922	78	4700
30	1850.199991	9	4700
40	1850.199932	68	4700
50	1850.199988	12	4700



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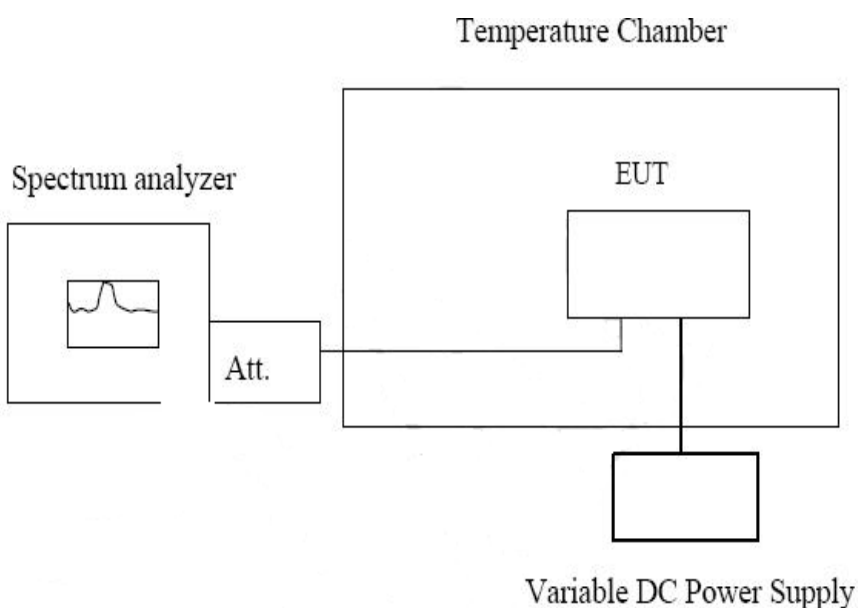
Reference Frequency: PCS 1900 Mid channel 1880MHz@ 25 degree			
Limit: +/- 2.5ppm = 4700Hz			
Environment	Frequency	Delta	Limit
Temperature(degree)	(MHz)		
-30	1879.999982	18	4700
-20	1879.999992	9	4700
-10	1879.999950	50	4700
10	1879.999914	86	4700
20	1879.999994	6	4700
30	1879.999987	13	4700
40	1879.999973	27	4700
50	1879.999986	14	4700

Reference Frequency: PCS 1900 High channel 1909.8MHz@ 25 degree			
Limit: +/- 2.5ppm = 4700Hz			
Environment	Frequency	Delta	Limit
Temperature(degree)	(MHz)		
-30	1909.799990	10	4700
-20	1909.799986	14	4700
-10	1909.799972	28	4700
10	1909.799976	24	4700
20	1909.799992	8	4700
30	1909.799991	9	4700
40	1909.799986	14	4700
50	1909.799969	31	4700



6.8 Frequency Stability V.S. VOLTAGE MEASUREMENT

Test Requirement: RSS-132,4.3; RSS-133,6.3 ;
Part 2.1055(d)(1)
Test Date: March 5,2010
Test Status: Test lowest channel, middle, highest channel.
Test Setup:



Note: Measurement setup for testing On antenna connector.

Test procedure:

Set chamber temperature to 25 degree. Use a variable AC power/ DC power supply to power the EUT and set the Voltage to rated voltage. Reference power supply voltage for these tests is DC 3.6 V. 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



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Reference Frequency: GSM 850 Low channel 824.2MHz@ 25 degree			
Limit: +/- 2.5ppm = 2091Hz			
Power Supply	Frequency	Delta	Limit
Vdc	(MHz)		
4.8	824.200011	11	2091
3.6	824.200000	0	2091
3.2	824.200013	13	2091

Reference Frequency: GSM 850 Mid channel 836.6MHz@ 25 degree			
Limit: +/- 2.5ppm = 2091Hz			
Power Supply	Frequency	Delta	Limit
Vdc	(MHz)		
4.8	836.400014	14	2091
3.6	836.600000	0	2091
3.2	836.400012	12	2091

Reference Frequency: GSM 850 High channel 848.8MHz@ 25 degree			
Limit: +/- 2.5ppm = 2091Hz			
Power Supply	Frequency	Delta	Limit
Vdc	(MHz)		
4.8	848.800025	25	2091
3.6	848.800000	0	2091
3.2	848.800011	11	2091



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Reference Frequency: PCS 1900 Low channel 1850.2MHz@ 25 degree			
Limit: +/- 2.5ppm = 4700Hz			
Power Supply	Frequency	Delta	Limit
Vdc	(MHz)		
4.8	1850.199982	18	4700
3.6	1850.200000	0	4700
3.2	1850.199991	9	4700

Reference Frequency: PCS 1900 Mid channel 1880MHz@ 25 degree			
Limit: +/- 2.5ppm = 4700Hz			
Power Supply	Frequency	Delta	Limit
Vdc	(MHz)		
4.8	1879.999994	6	4700
3.6	1880.000000	0	4700
3.2	1879.999988	12	4700

Reference Frequency: PCS 1900 High channel 1909.8MHz@ 25 degree			
Limit: +/- 2.5ppm = 4700Hz			
Power Supply	Frequency	Delta	Limit
Vdc	(MHz)		
4.8	1909.799984	16	4700
3.6	1909.800000	0	4700
3.2	1909.799986	14	4700

~End of Report~

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