FCC Test Report

Product Name	:	Big Key GSM Mobile Phone
Model No.	:	X660,S69,S179
FCC ID.	:	WPMSANDOX-660

Applicant	: Sando Industrial Co., Ltd.
Address	: Flat 3,16/F Perfect Industrial Building,No.31 Tai Yau Street,San Po Kong,KOWLOON.HONG.KONG
Manufacturer	: Sando Industrial Co., Ltd.
Address	: Flat 3,16/F Perfect Industrial Building,No.31 Tai Yau Street,San Po Kong,KOWLOON.HONG.KONG

Date of Receipt	:	Sept. 02, 2008
Date of Test	:	Sept.02, 2008-Sept.10,2008
Report No.	:	200810-3-09019F

Test Report Certification

Test Date: Sept.02, 2008-Sept.10,2008

Report No: 200810-3-09019F

SIMT EMC Lab

Product Name	:	Big Key GSM Mobile Phone
Applicant	:	Sando Industrial Co., Ltd.
Address	:	Flat 3,16/F Perfect Industrial Building,No.31 Tai Yau Street,San Po Kong,KOWLOON.HONG.KONG
Manufacturer	:	Sando Industrial Co., Ltd.
Address	:	Flat 3,16/F Perfect Industrial Building,No.31 Tai Yau Street,San Po Kong,KOWLOON.HONG.KONG
Model No.	:	X660,S69,S179
Rated Voltage	:	DC 3.7V By battery, DC 5V by adaptor
Test Voltage	:	120V/60Hz
Trade Name	:	Sando
Measurement Standard	:	TIA/EIA 603C,ANSI C 63.4:2003
Date of Receipt:	:	Sept.02, 2008
Date of Test	:	Sept.02, 2008-Sept.10,2008
Date of Issue	:	Sept.02, 2008
Test Result	:	Complied

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of SIMT EMC Lab.

Documented By : Ruby Zhu (Ruby Zhu)

Tested By : Liu Qi (Liu Qi)

Approved By : Gong Zeng (Gong Zeng)

TABLE OF CONTENTS

1. General Information

1.1. EUT Description

Product Name	: Big Key GSM Mobile Phone
Trade Name	: Sando
Model No.	: X660,S69,S179
Type of modulation	GMSK
Antenna type	Soldered on PCB
TX Frequency	824MHz~849MHz(GSM 850)
	1850MHz ~ 1910MHz(PCS 1900)
Rx Frequency	869MHz~894MHz(GSM 850)
	1930MHz ~ 1990MHz(PCS 1900)
Hardware version	**V 2.0**
GPRS version	**/**
Type of equipment	Bar phone

1.2. Operational Description

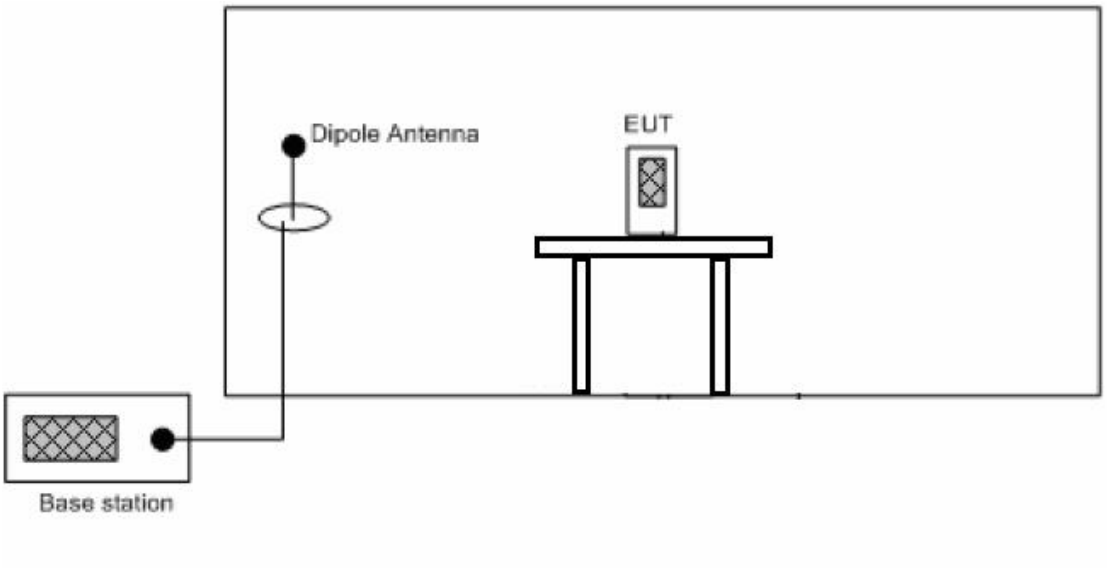
The information contained within this report is intended to show verification of compliance of the 850/1900MHz Mobile Phone to the requirements of 47CFR PART 2, PART 15 Subpart B, PART 22H and PART 24E.

SIMT EMC has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

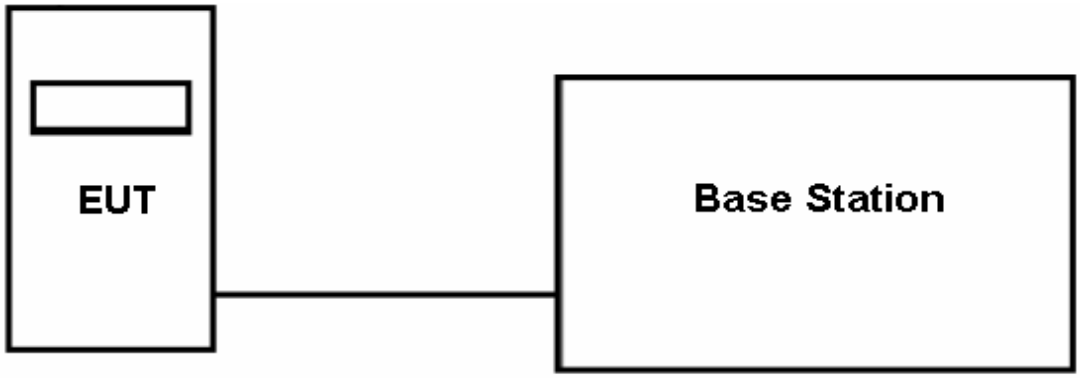
TEST Mode	GSM 850 (keeping the EUT voice communication with CMU200 at 850MHz)
	PCS 1900 (keeping the EUT voice communication with CMU200 at 1900MHz)

1.3. Configuration of Tested System

(a)Configuration of Radiated measurement



(b) Configuration of Conducted measurement



1.4. Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Serial No.
1.	Base Station	R & S	CMU 200	N/A	108591

1.5. General Information of Test Site

Site Description: June 22, 2001 File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046

Site Name: SIMT EMC Lab.

Site Address: 716 Yi Shan Road. Shanghai. China
TEL: 8621-6470-1390 / FAX : 8621-6451-4252
E-Mail: jcxn@SIMT.com.cn

2. Test Summary

FCC Rule	DESCRIPTION OF TEST	Result	Section
§2.1046	RF Output Power	Passed	3
§ 22.913 §24.232	ERP / EIRP	Passed	4
§2.1049, §22.917,	Occupied Bandwidth & Band Edge Measurement	Passed	5
§2.1051	Conducted Spurious Emission	Passed	6
§2.1053	Field Strength of Spurious Radiation	Passed	7
§2.1055, § 22.355,	Frequency Stability vs. Temperature and voltage variations	Passed	8

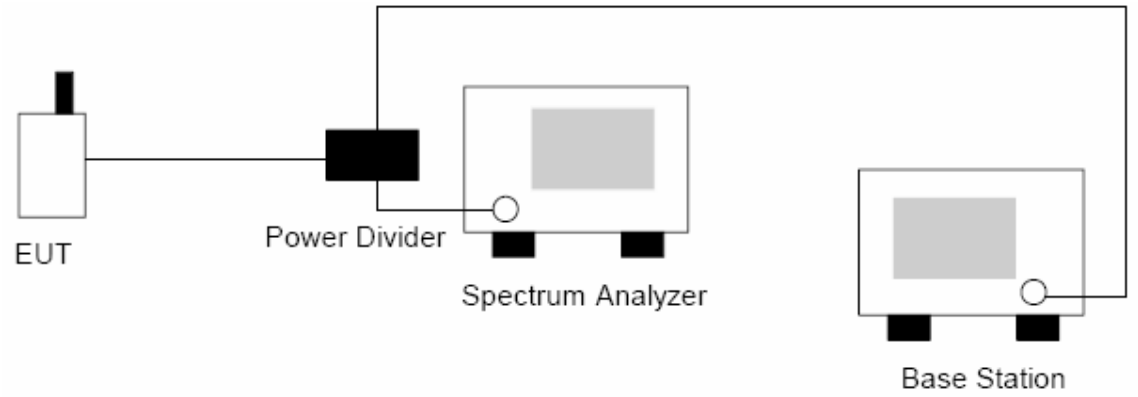
3. RF Output Power

3.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Spectrum Analyzer	R & S	FSU 26/200172	June, 2008
2	Universal Radio Communication Tester	R & S	CMU 200/108591	June, 2008
3	Power Splitter	Agilent	11667A/54400	June, 2008

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

3.2. Test Setup



3.3. Limits

Limits	<33dBm

3.4. Test Procedure

After a radio link has been established between EUT and Base station, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. Then the test data can be read at the tester screen. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration.

The measurement will be conducted at three channels Bottom, middle and top channels.

3.5. Test Specification

CF 47 FCC Part 2.1046, 22.913, 24.232

3.6. EUT Operation

See chapter 1.2 of this test report.

3.7. Test Result

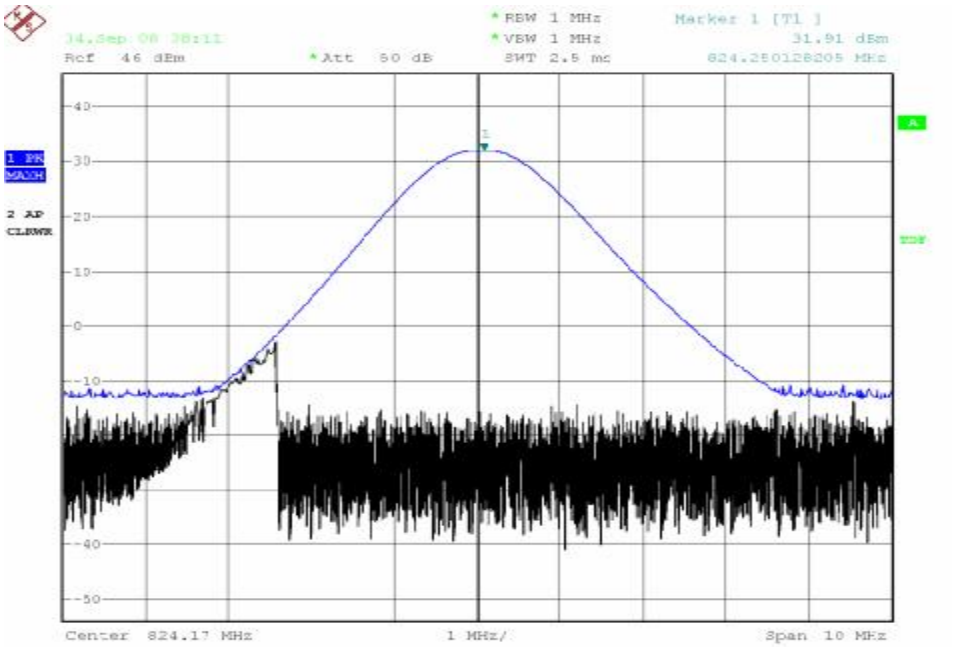
3.7.1 GSM 850

Test channel	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power	Limit (dBm)	Pass/Fail
128	824.2	11.61	20.3	31.91	33	Pass
189	836.4	11.62	20.2	31.82		Pass
251	848.8	11.45	20.3	31.75		Pass

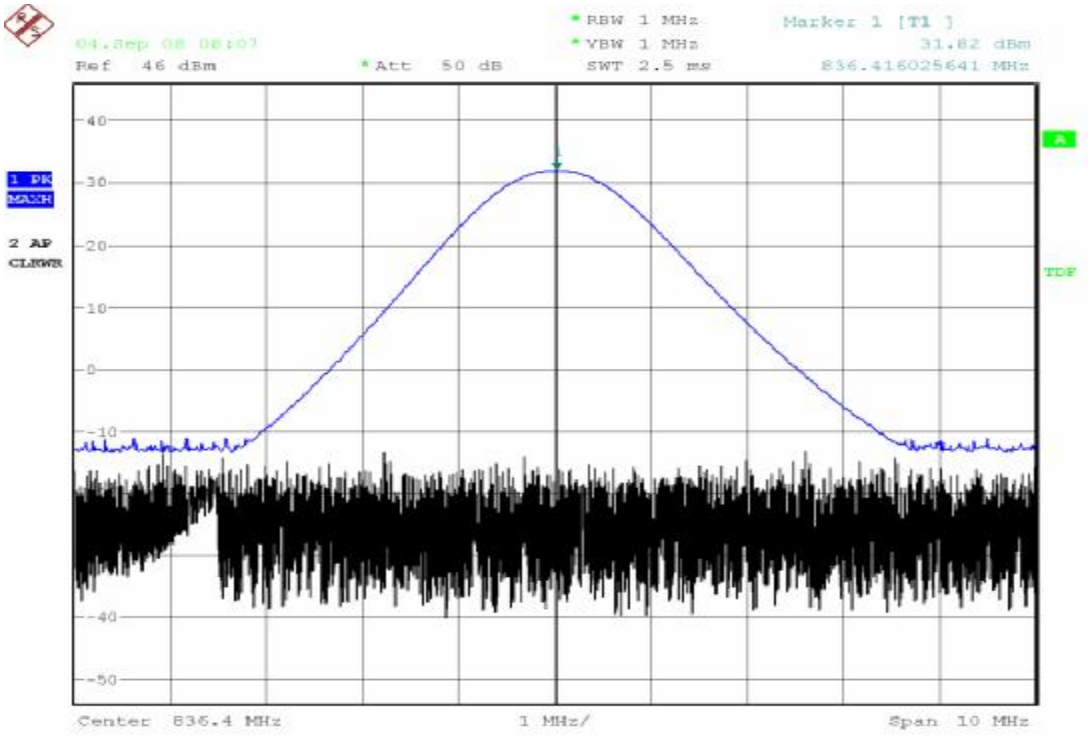
3.7.2 PCS 1900

Test channel	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power	Limit (dBm)	Pass/Fail
512	1850.2	7.56	20.3	27.86	33	Pass
661	1880.0	8.47	20.2	28.67		Pass
810	1909.8	8.43	20.3	28.73		Pass

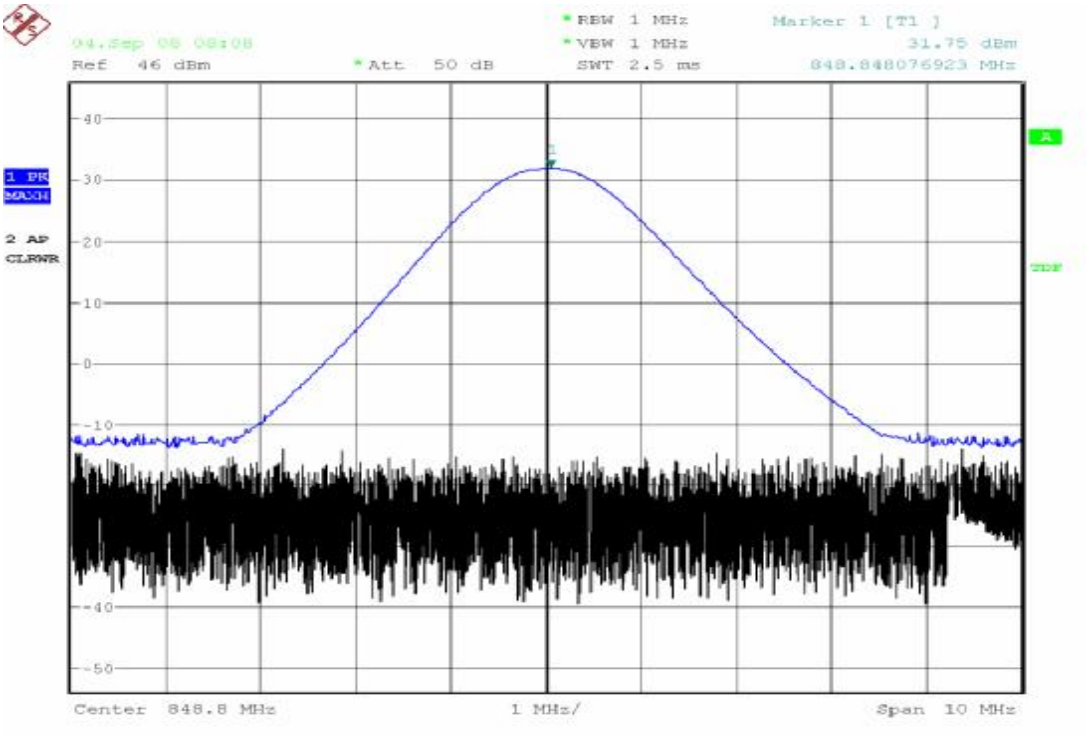
GSM **850 CH 128**



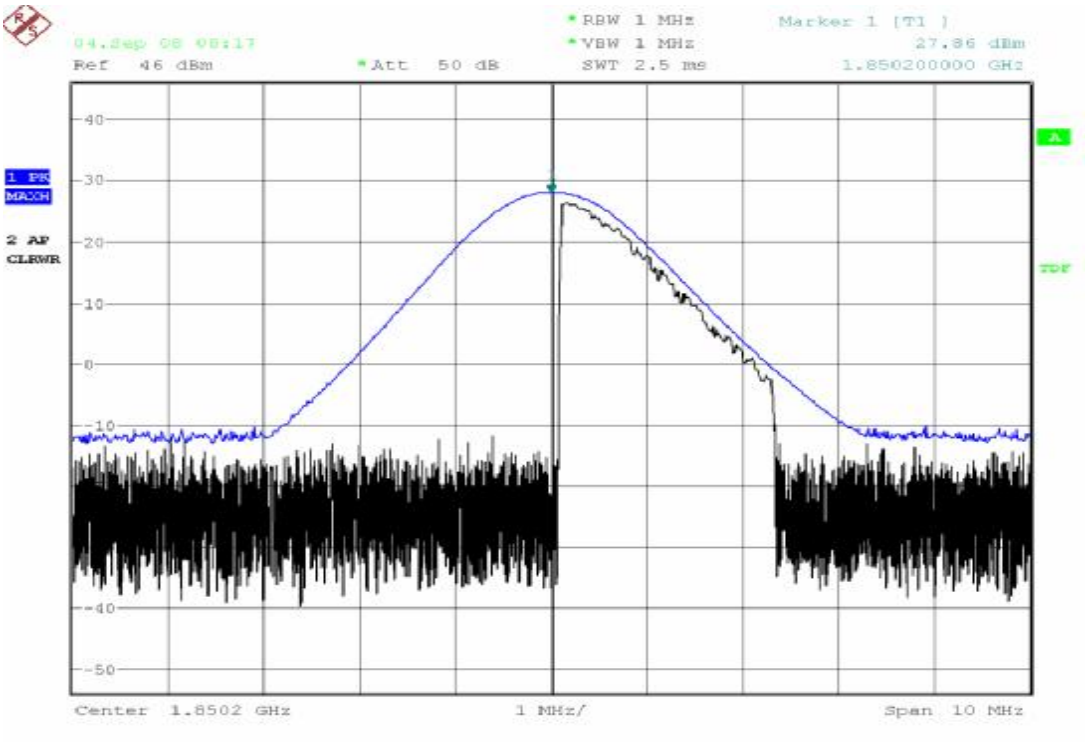
GSM 850 CH 189



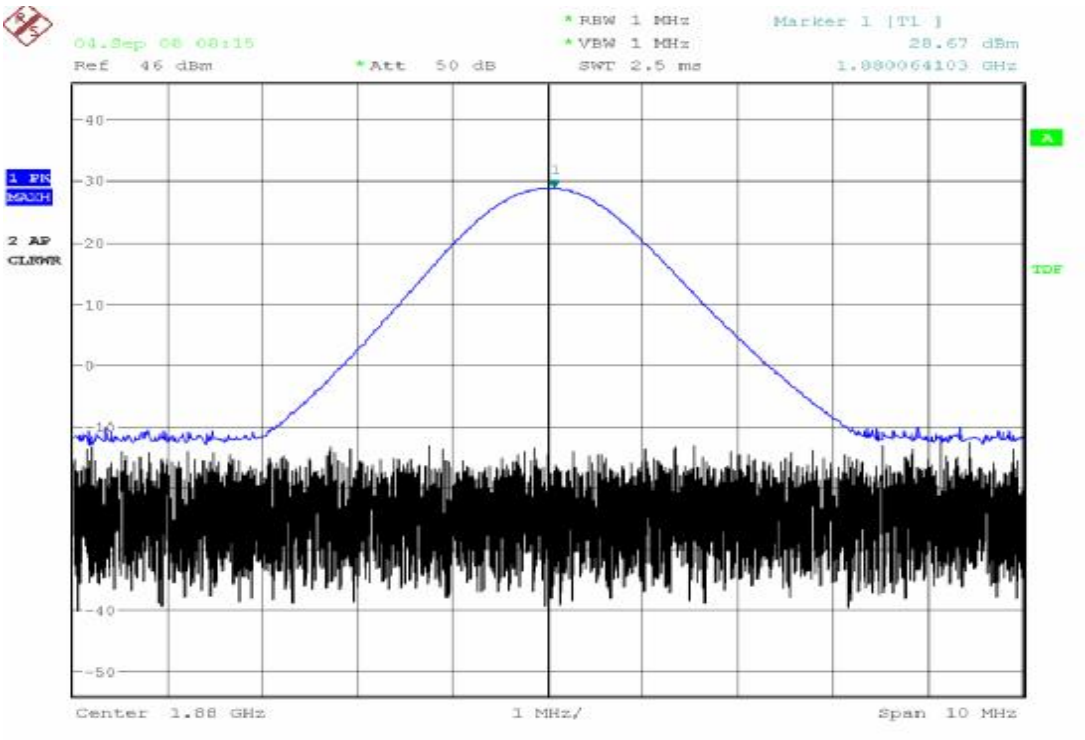
GSM 850 CH 251



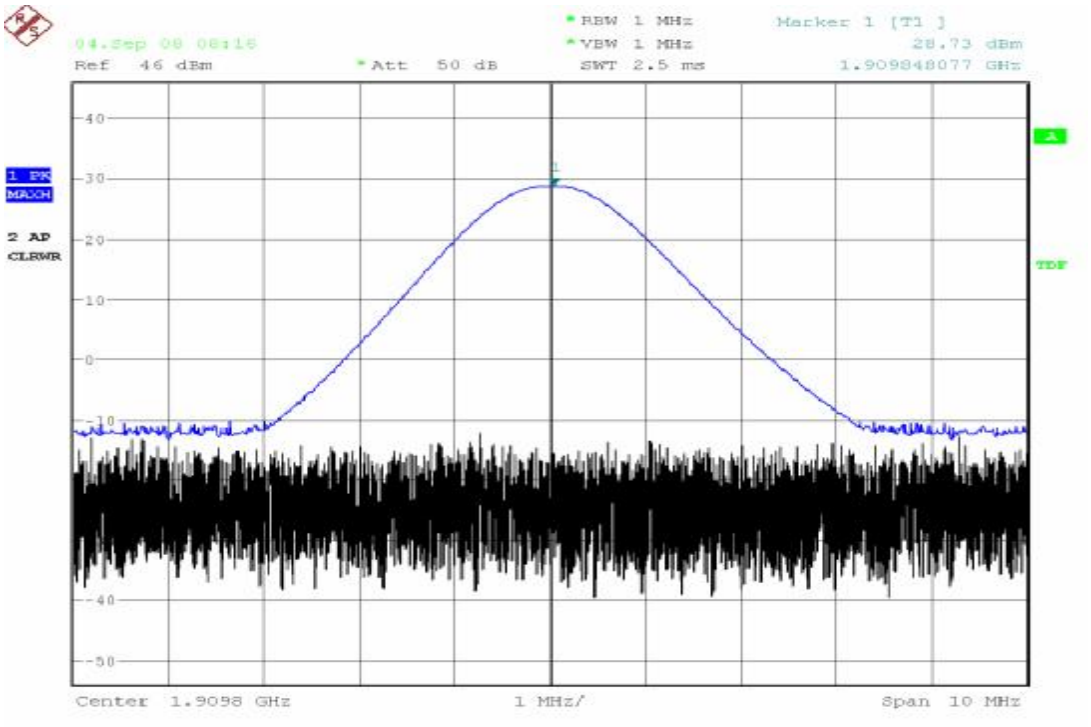
PCS 1900 CH512



PCS 1900 CH661



PCS 1900 CH810



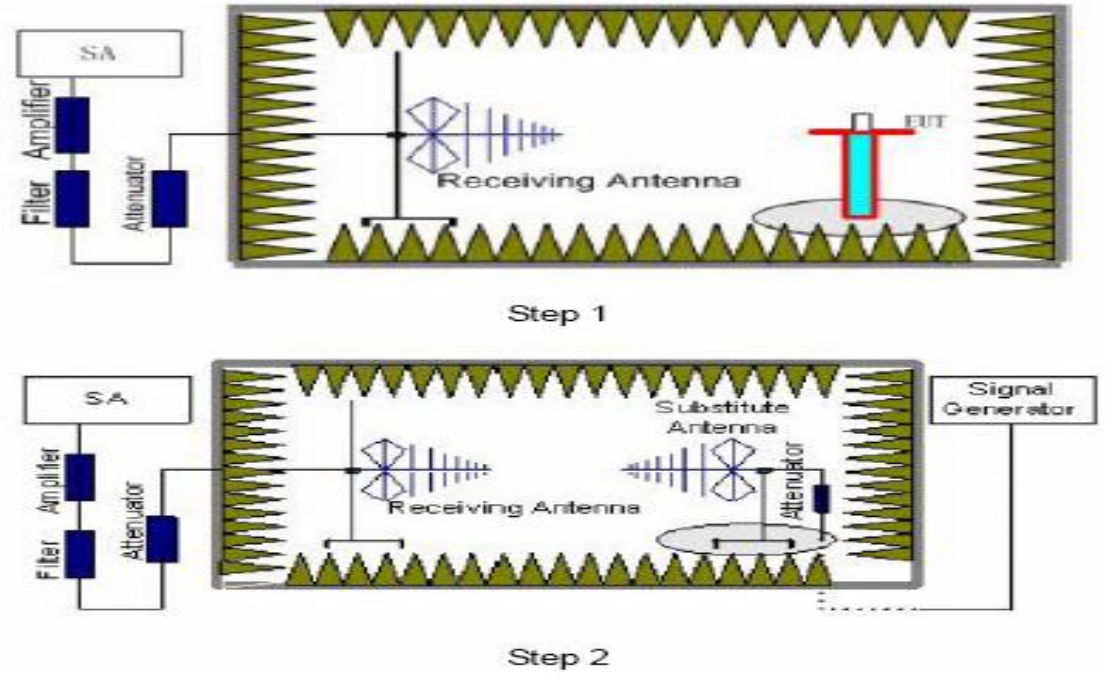
4. ERP / EIRP

4.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.
1	Spectrum Analyzer	R & S	FSU 26/200172	June, 2008
2	Ultra Broadband Antenna	R & S	HL 562/100019	May, 2008
3	VHA 9103 without telescopic rods for use with biconical broad-band elements BBA 9106	SCHWARZBECK	BBA 9106 + VHA 9103/2358	May, 2008
4	Logarithmic Periodic Broadband Antenna	SCHWARZBECK	UHALP 9108 A/ 696	May, 2008
5	Double-Ridged Waveguide Horn Antenna	R & S	HF 906/100023	May, 2008
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120D/ 249	May, 2008
7	Universal Radio Communication Tester	R & S	CMU 200/108591	June, 2008

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

4.2. Test Setup



4.3. Limits

Limits	<38.5dBm

4.4. Test Procedure

Step 1:

EUT was placed on a 1.5 meters high non-conductive table in a fully anechoic chamber. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna is1.5m. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A Peak detector is used and RBW is set to 1MHz.Then turn table rotation is adjusted from 0 degree to 360 degree untill the maximum power value is founded on spectrum analyzer or receiver.

Step 2: A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The EIRP or ERP of the EUT can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading value of the spectrum analyzer or receiver.

Step 3: Calculaton

ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs

Ps (dBm)：Input power to substitution antenna.

$Ps= P_G-Lc$

P_G (dBm)：output level of Signal generator

Lc(dB) ：Loss of the cable from Signal generator to substitution antenna

Gs (dBi or dBd)：Substitution antenna Gain.

Et = Rt + AF

Es = Rs + AF

AF (dB/m)：Receive antenna factor

Rt：The highest received signal in Spectrum Analyzer for EUT.

Rs：The highest received signal in spectrum analyzer for substitution antenna. According to the Step 1 and Step 2, Rt= Rs ERP/EIRP = P_G-Lc + Gs

4.5. Test Specification

CF 47 FCC Part 22.913, 24.232

4.6. EUT Operation

See chapter 1.2 of this test report.

4.7. Test Result

4.7.1 GSM 850

Test channel	Fundamental Frequency (MHz)	Ps		Gs (dBd)	E.R.P (dBm)	Pass/Fail
		P_G (dBm)	Lc (dB)			
128	824.2	26.73	1.23	4.88	30.38	Pass
189	836.4	27.13	1.33	4.86	30.66	Pass
251	848.8	28.26	1.54	4.84	31.56	Pass

4.7.2 PCS 1900

Test channel	Fundamental Frequency (MHz)	Ps		Gs (dBi)	E.I.R.P (dBm)	Pass/Fail
		P_G (dBm)	Lc (dB)			
512	1850.2	18.98	2.34	10.13	26.77	Pass
661	1880.0	21.67	2.56	10.08	29.19	Pass
810	1909.8	19.17	2.77	10.04	26.44	Pass

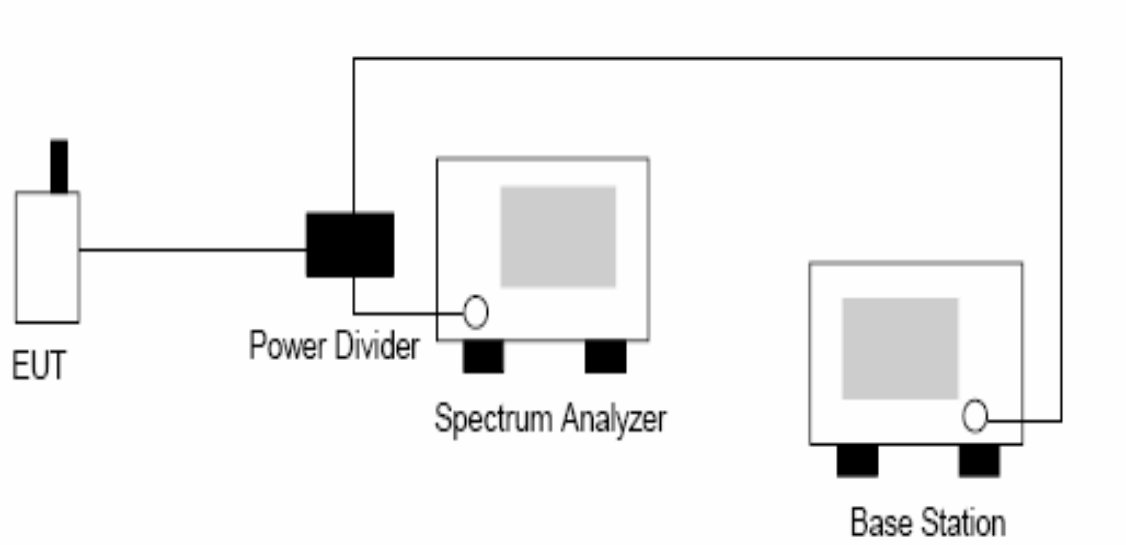
5. Occupied Bandwidth & Band Edge Measurement

5.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Spectrum Analyzer	R & S	FSU 26/200172	June, 2008
2	Universal Radio Communication Tester	R & S	CMU 200/108591	June, 2008
3	Power Splitter	Agilent	11667A/54400	June, 2008

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

5.2. Test Setup



5.3. Limits

No specific occupied bandwidth requirements in part 2.1049

5.4. Test Procedure

After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 3kHz on spectrum analyzer. The bandwidth of 99% power can be read on spectrum analyzer. The measurement will be conducted at Bottom, middle and top three channels

5.5. EUT Operation

See chapter 1.2 of this test report.

5.6. Test Specification

CF 47 FCC Part 2.1049, 22.917, 24.238

5.7. Test Result

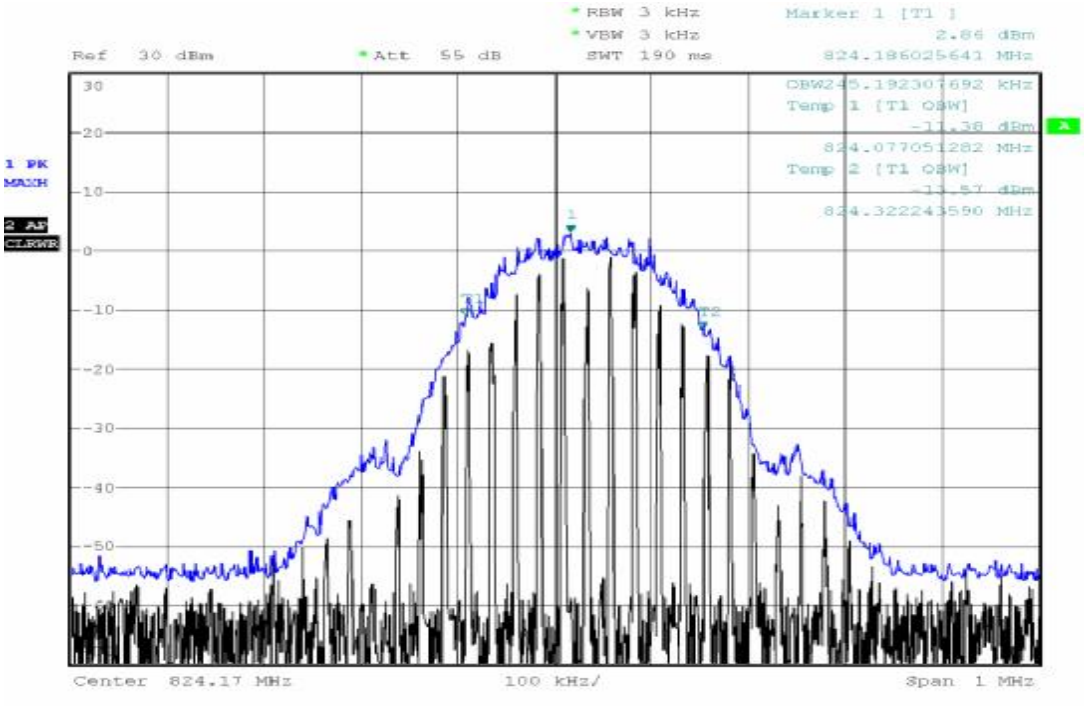
5.7.1 GSM 850

Test channel	Fundamental Frequency (MHz)	Bandwidth of 99% Power (kHz)
128	824.2	245.2
189	836.4	241.9
251	848.8	243.6

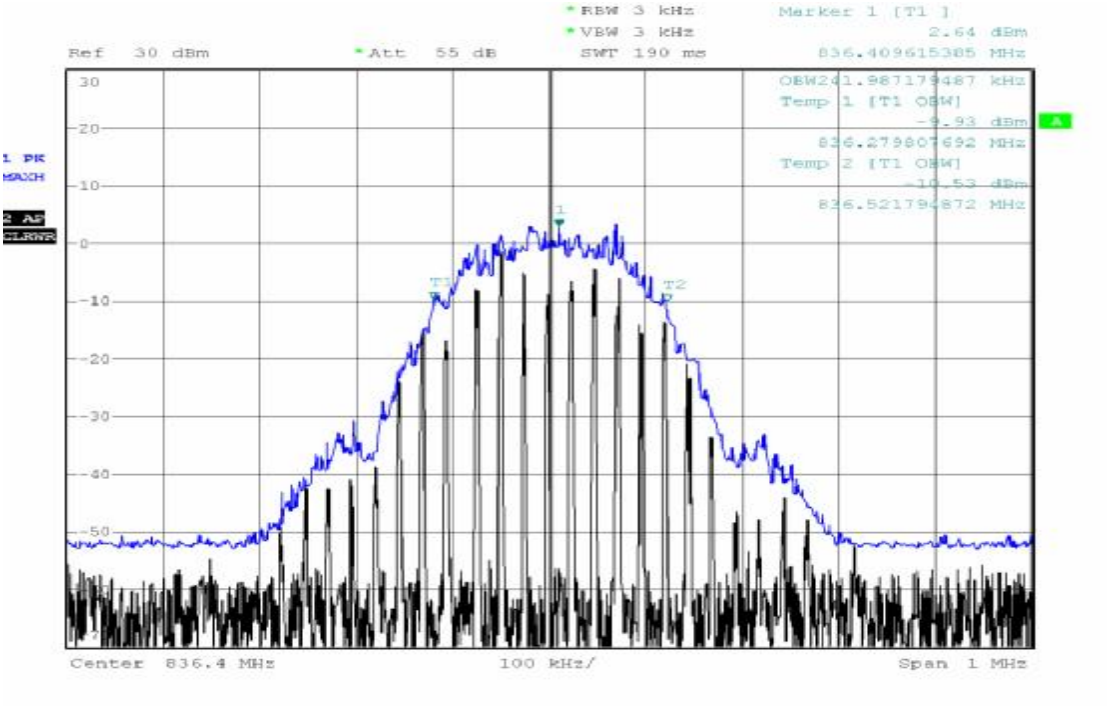
5.7.2 GSM 1900

Test channel	Fundamental Frequency (MHz)	Bandwidth of 99% Power (kHz)
512	1850.2	243.6
661	1880.0	245.2
810	1909.8	241.9

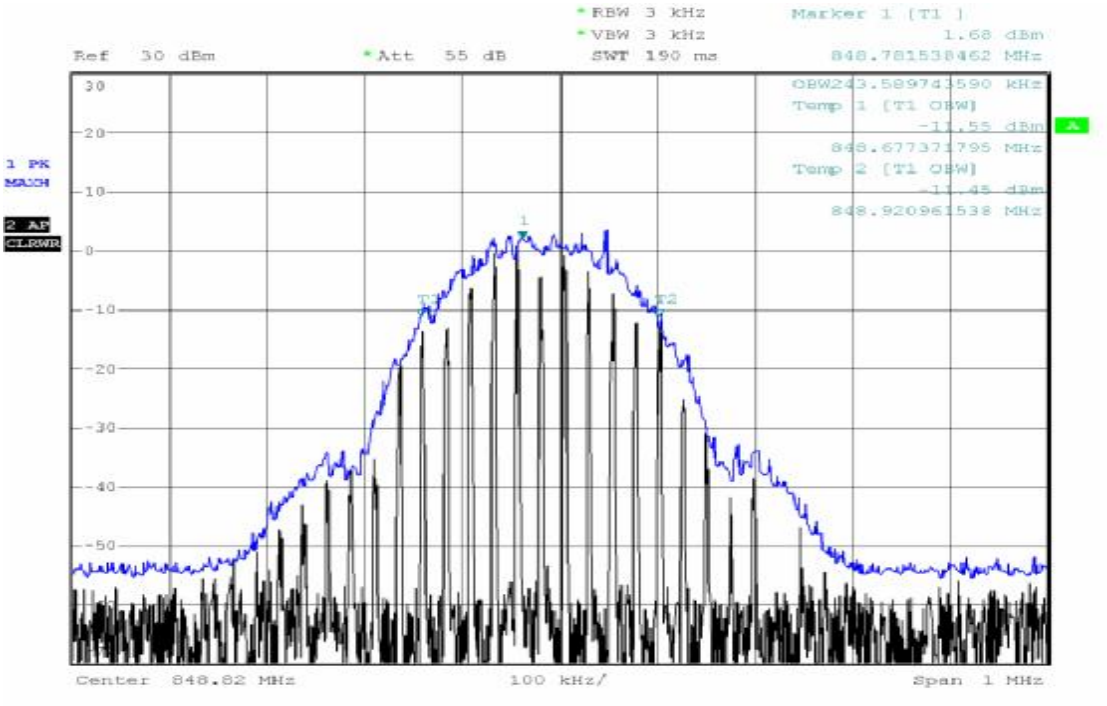
GSM 850 99% Bandwidth for CH 128



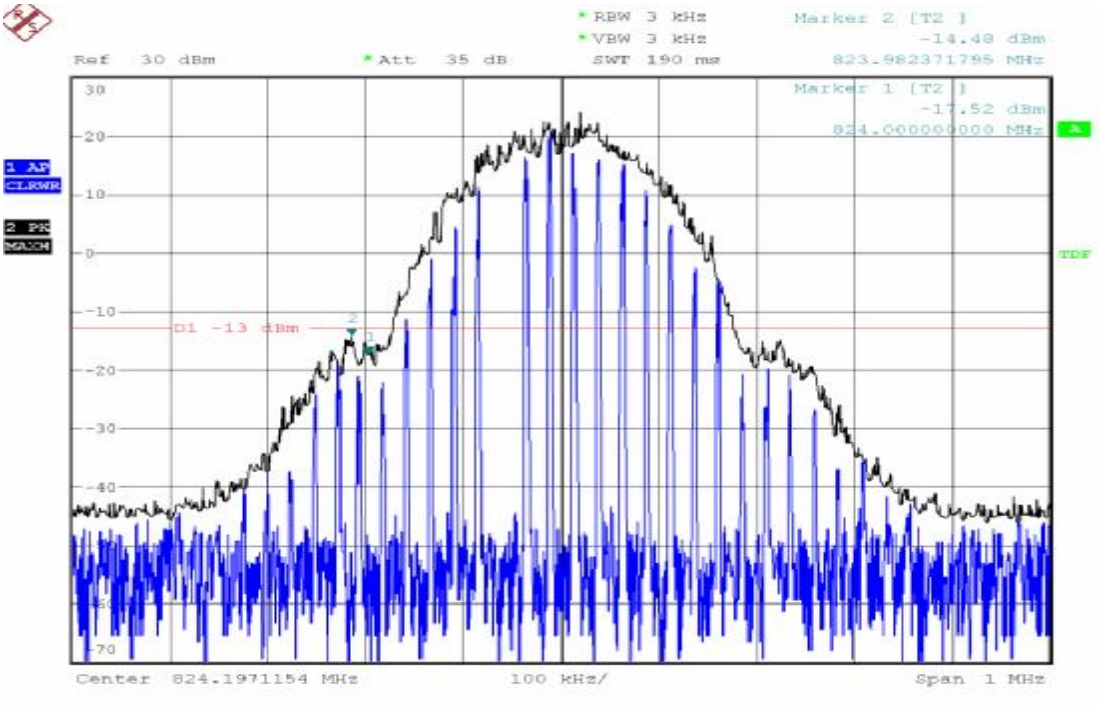
GSM 850 99% Bandwidth for CH 189



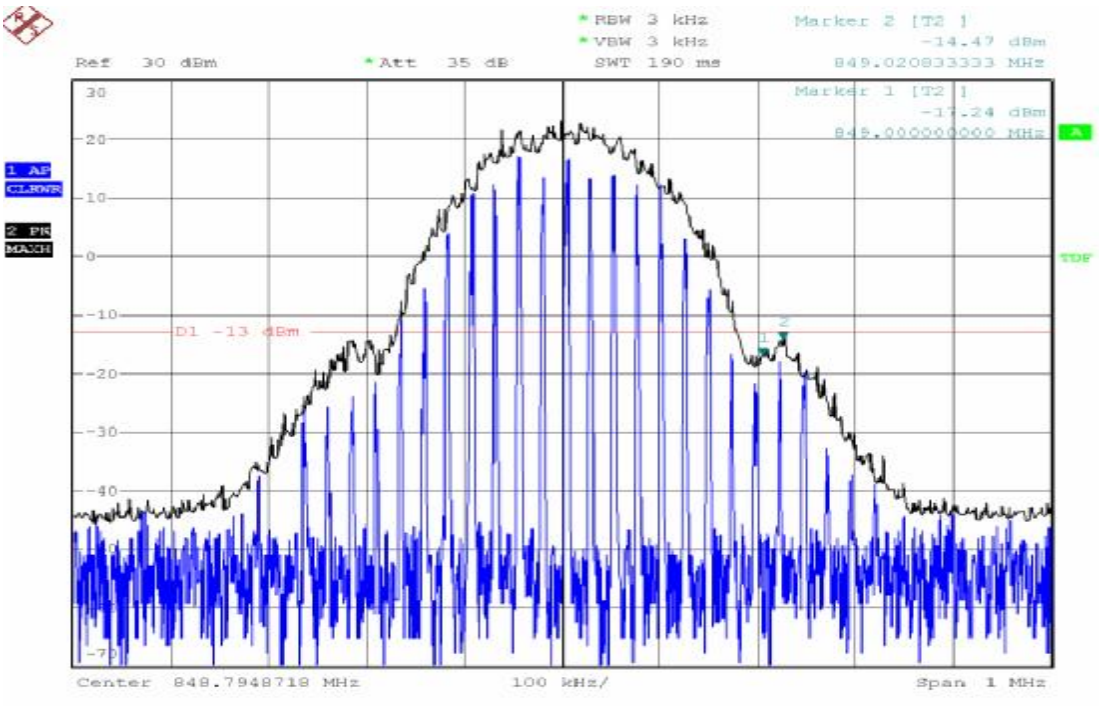
GSM 850 99% Bandwidth for CH 251



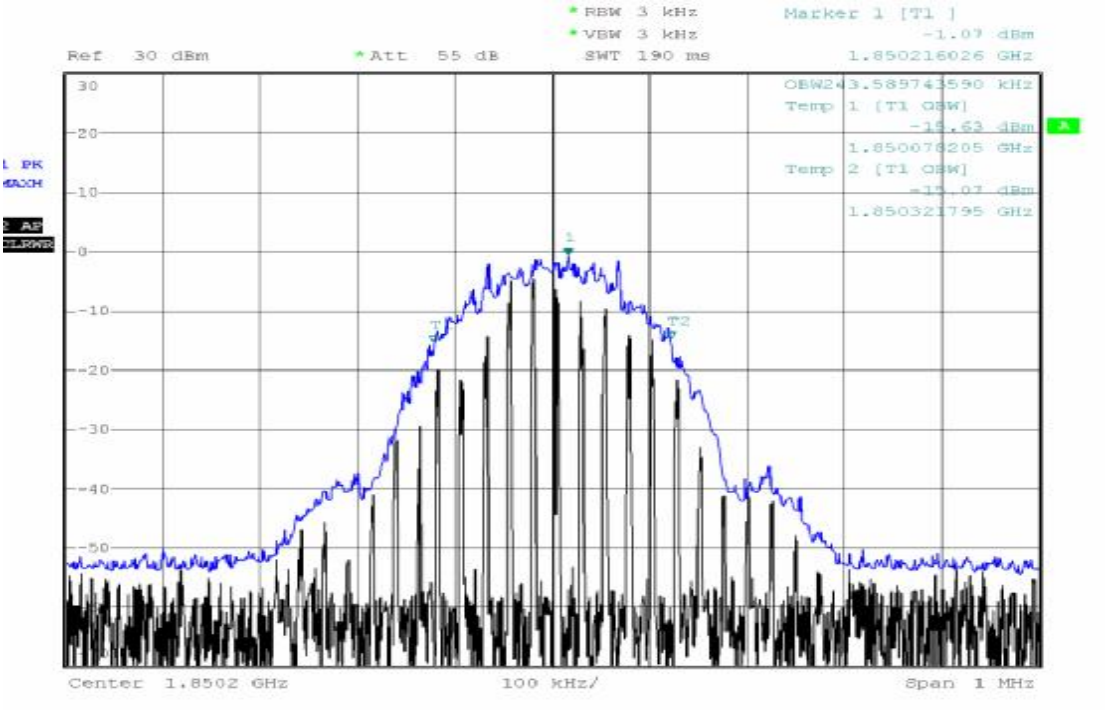
GSM 850 Band Edge for CH 128



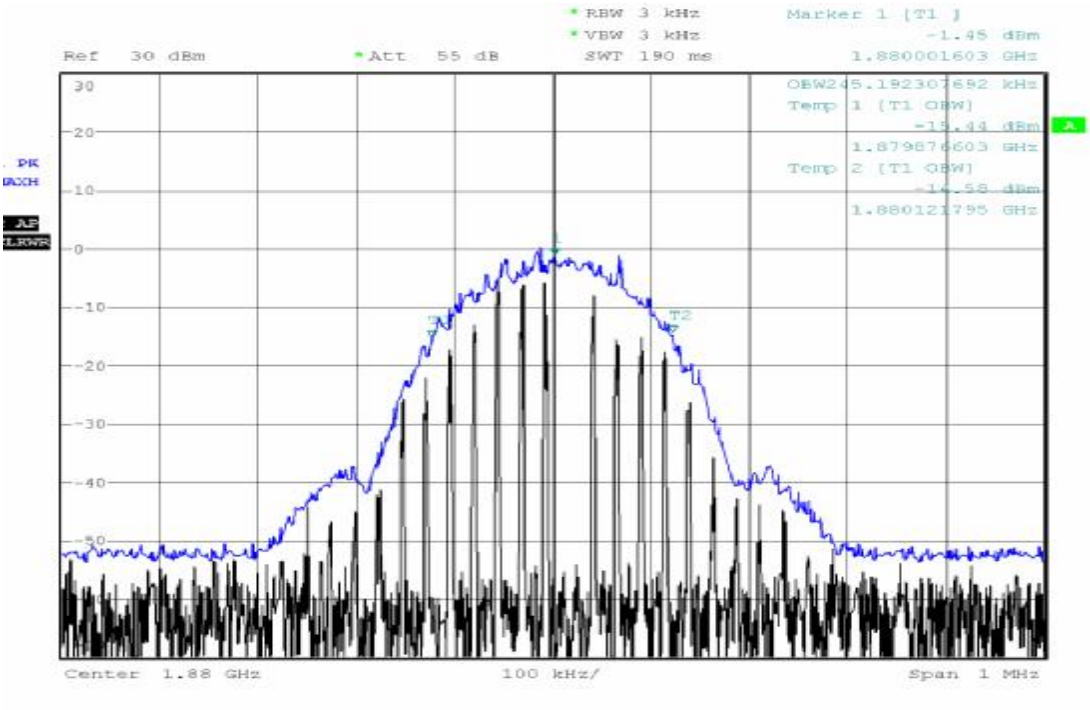
GSM 850 Band Edge for CH 251



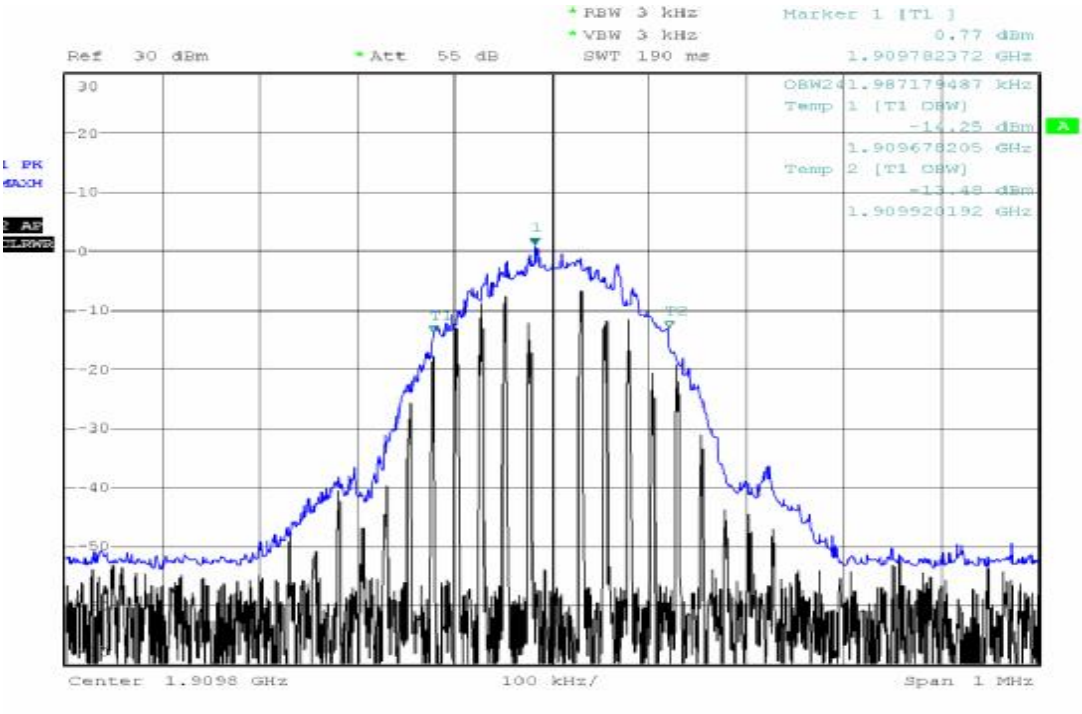
PCS 1900 99% Bandwidth for CH 512



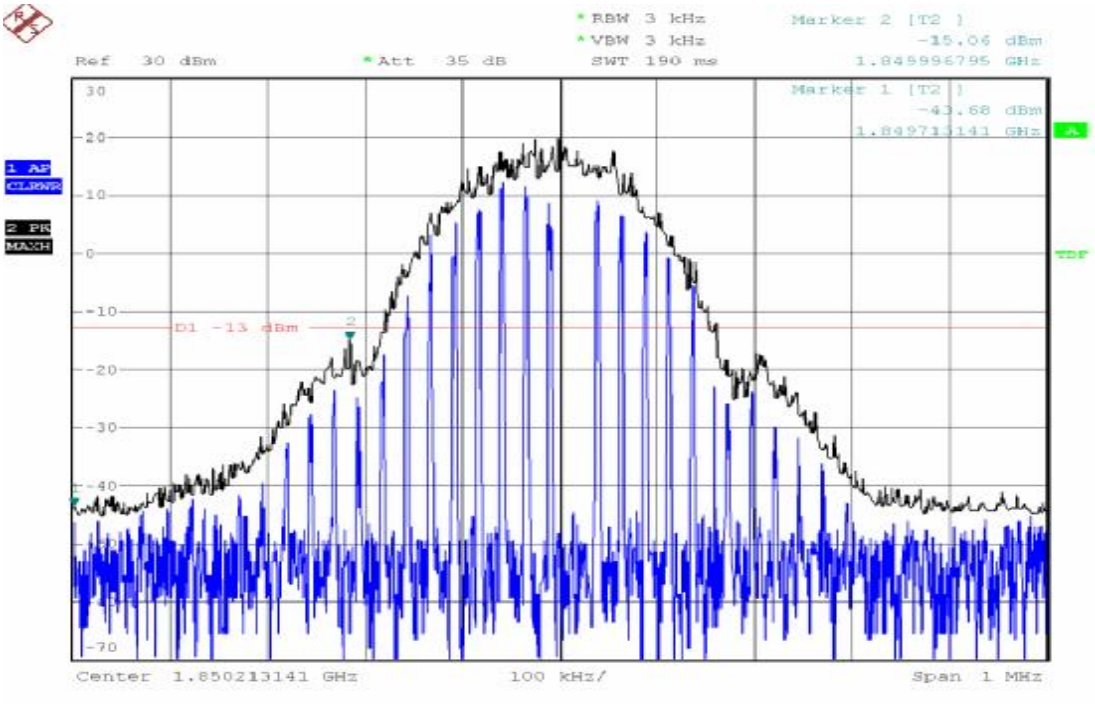
PCS 1900 99% Bandwidth for CH 661



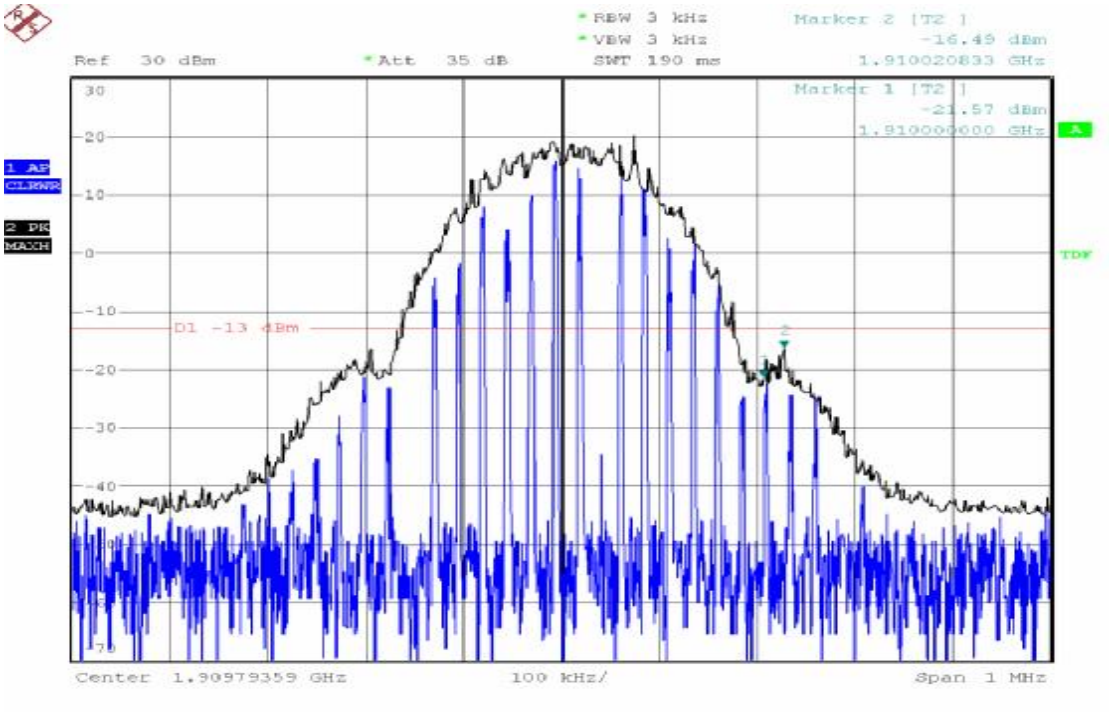
PCS 1900 99% Bandwidth for CH 810



PCS 1900 Band Edge for CH 512



PCS 1900 Band Edge for CH 810



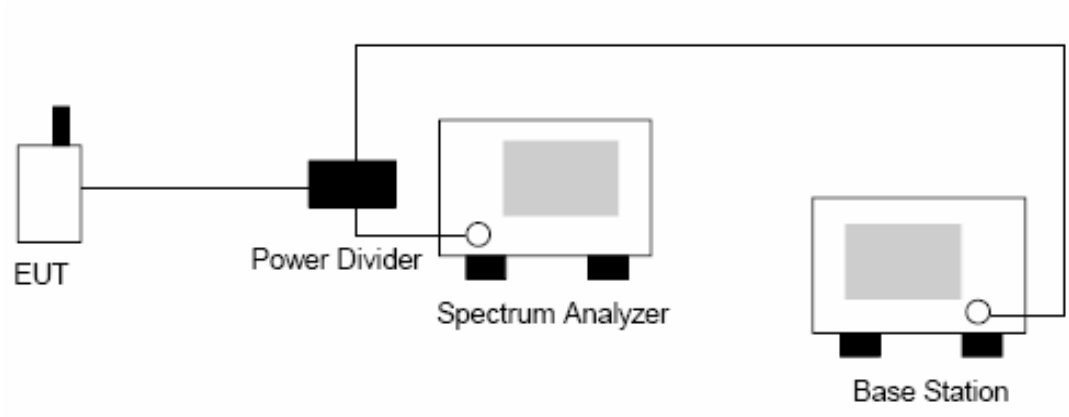
6. Conducted Spurious Emission

6.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Spectrum Analyzer	R & S	FSU 26/200172	June, 2008
2	Universal Radio Communication Tester	R & S	CMU 200/108591	June, 2008
3	Power Splitter	Agilent	11667A/54400	June, 2008

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

6.2. Test Setup



6.3. Limits

Limits	<-13dBm

6.4. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

6.5. Test Specification

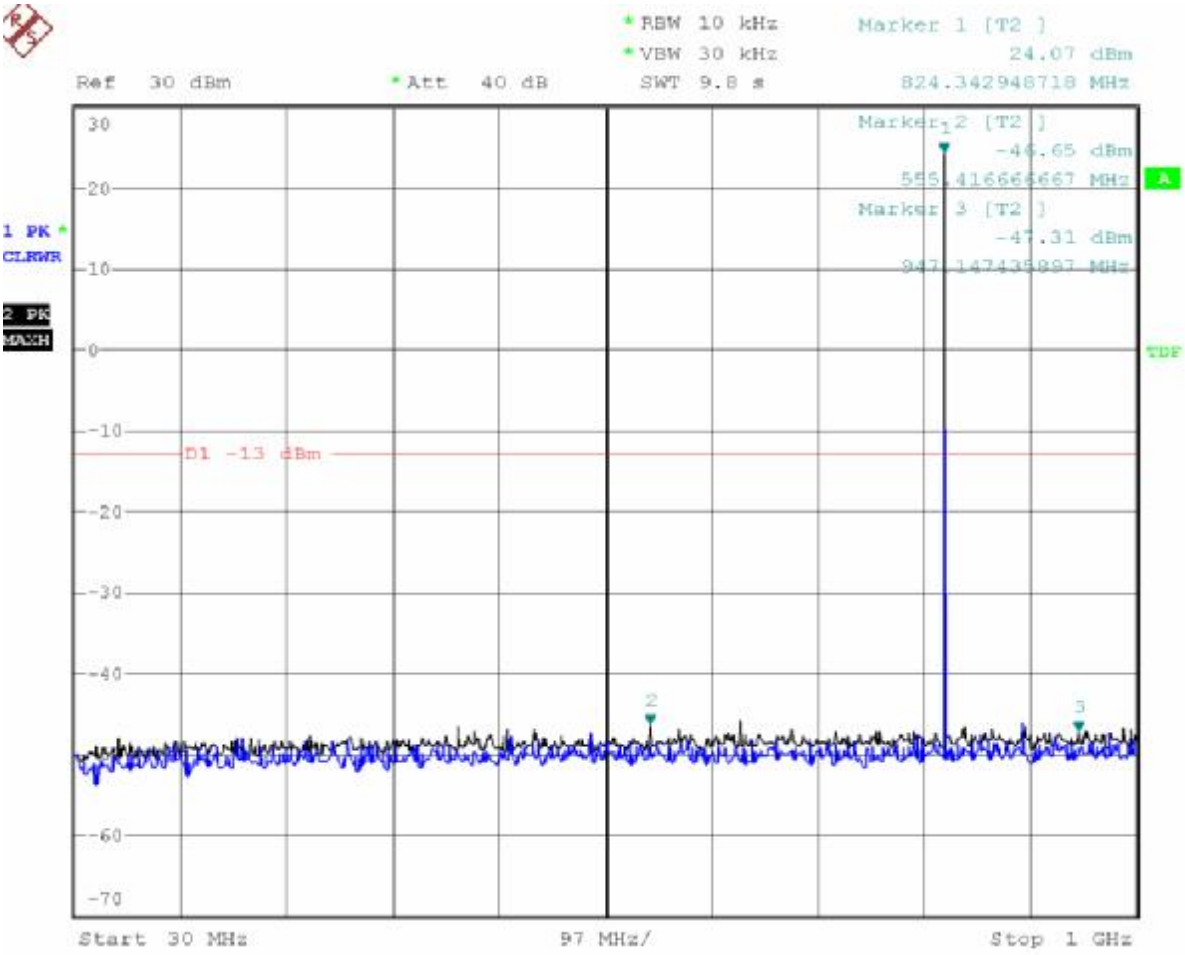
CF 47 FCC Part 2.1051, Part 22.917, Part 24.238

6.6. EUT Operation

See chapter 1.2 of this test report

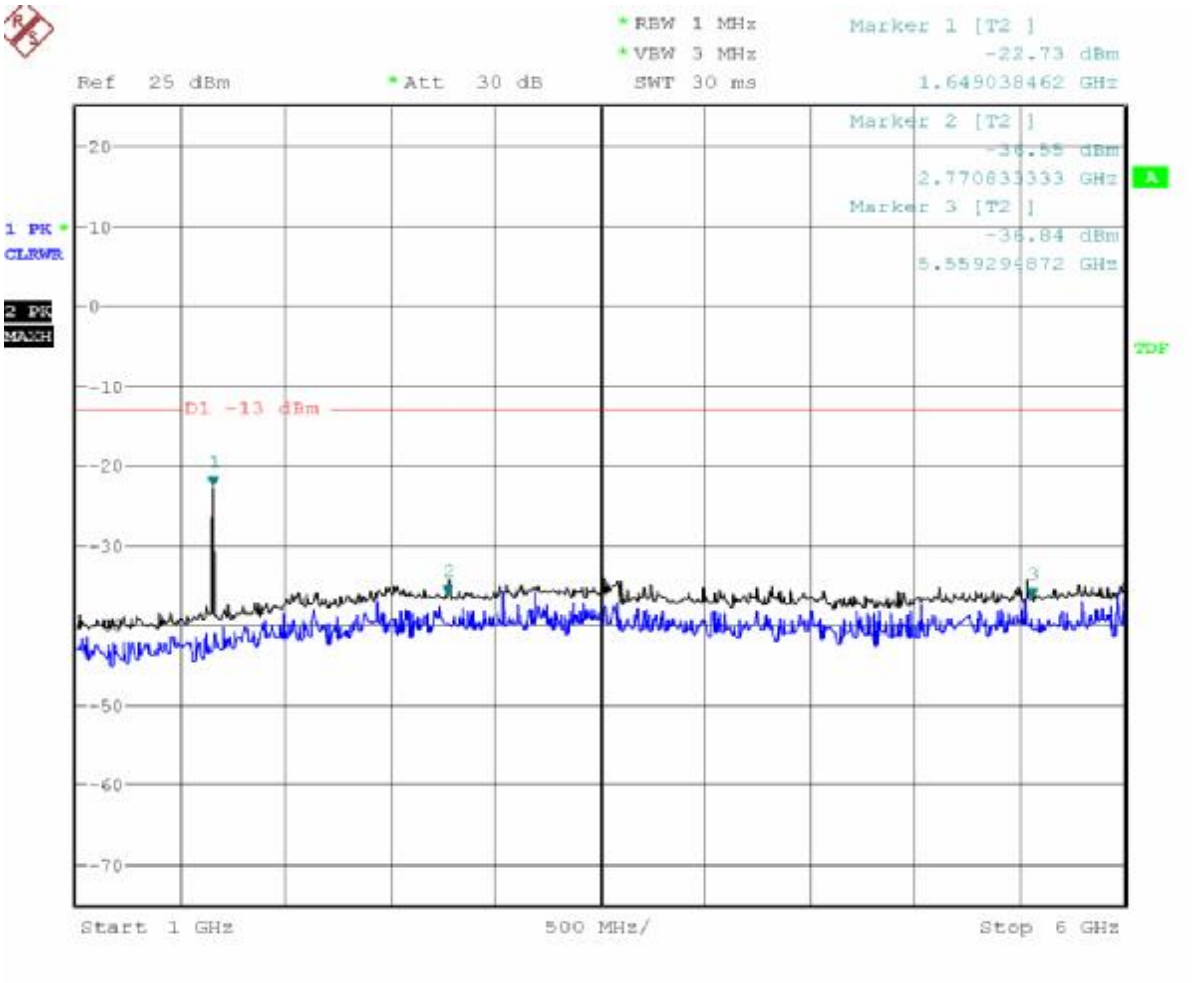
6.7. Test Result

Test Mode : GSM 850 CH 128 Frequency Range : 30M-1G

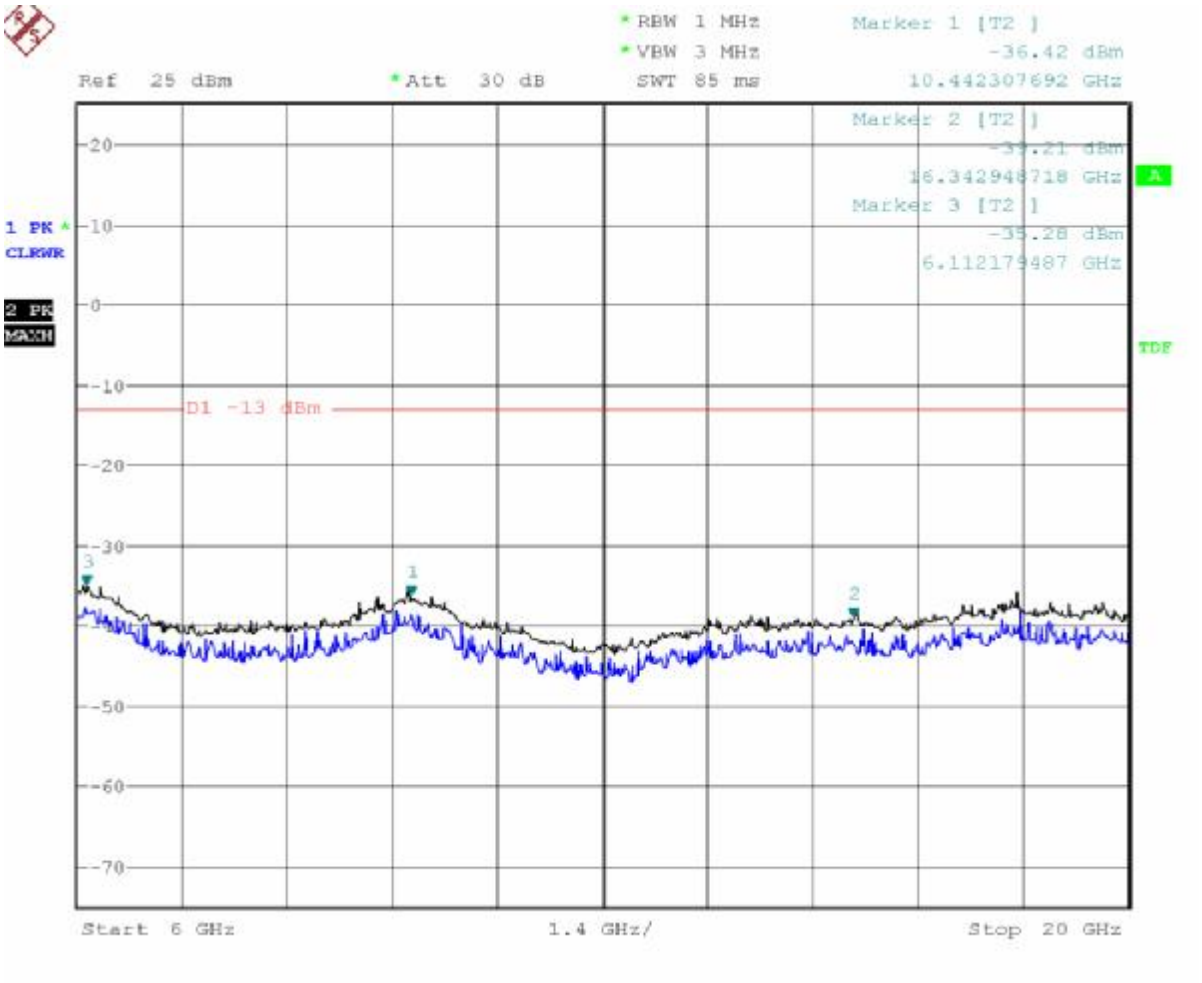


Note: The signal beyond the limit is carrier

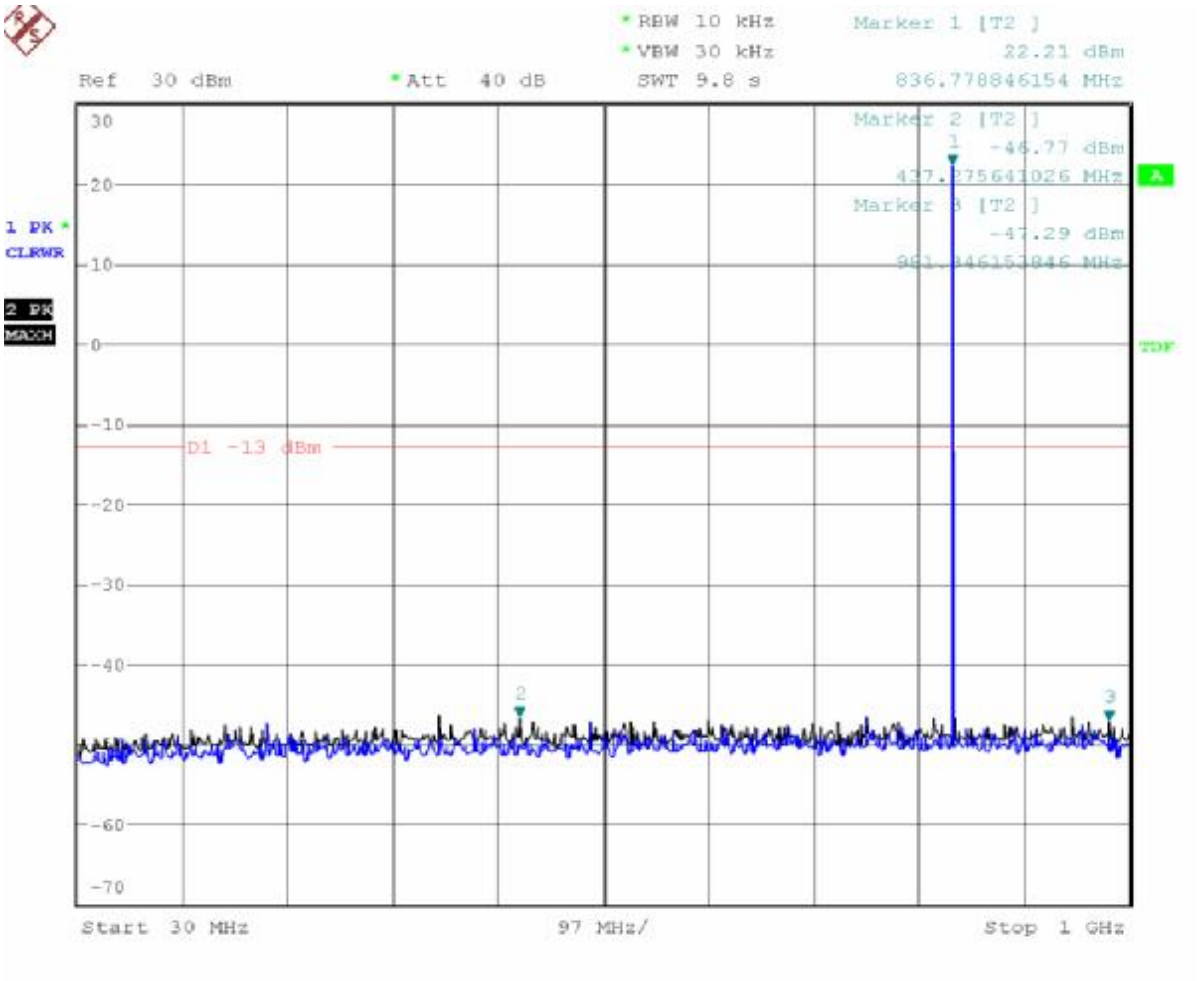
Test Mode : GSM 850 CH 128 Frequency Range : 1G-6G



Test Mode : GSM 850 CH 128 Frequency Range : 6G-20G

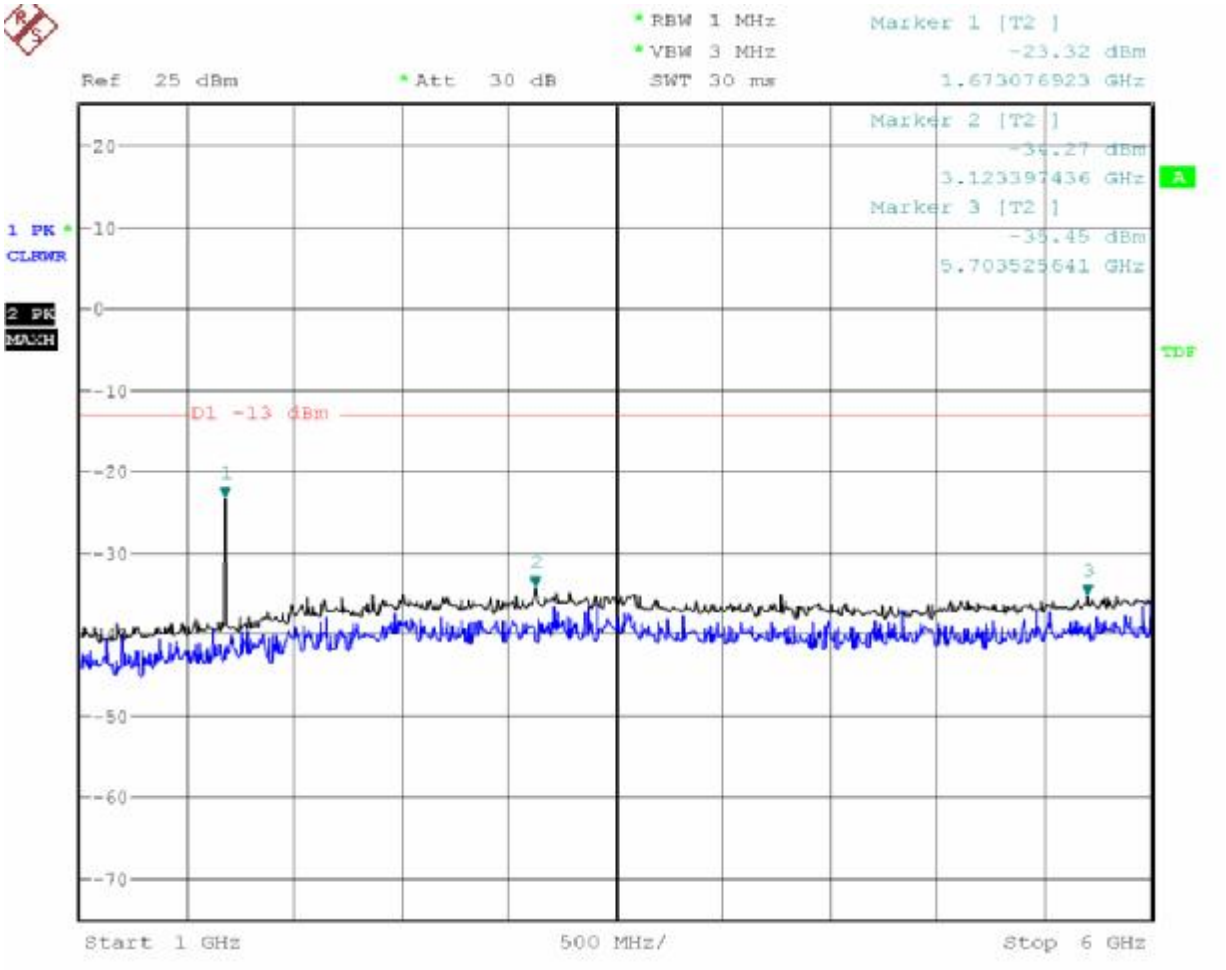


Test Mode : GSM 850 CH 189 Frequency Range : 30M-1G

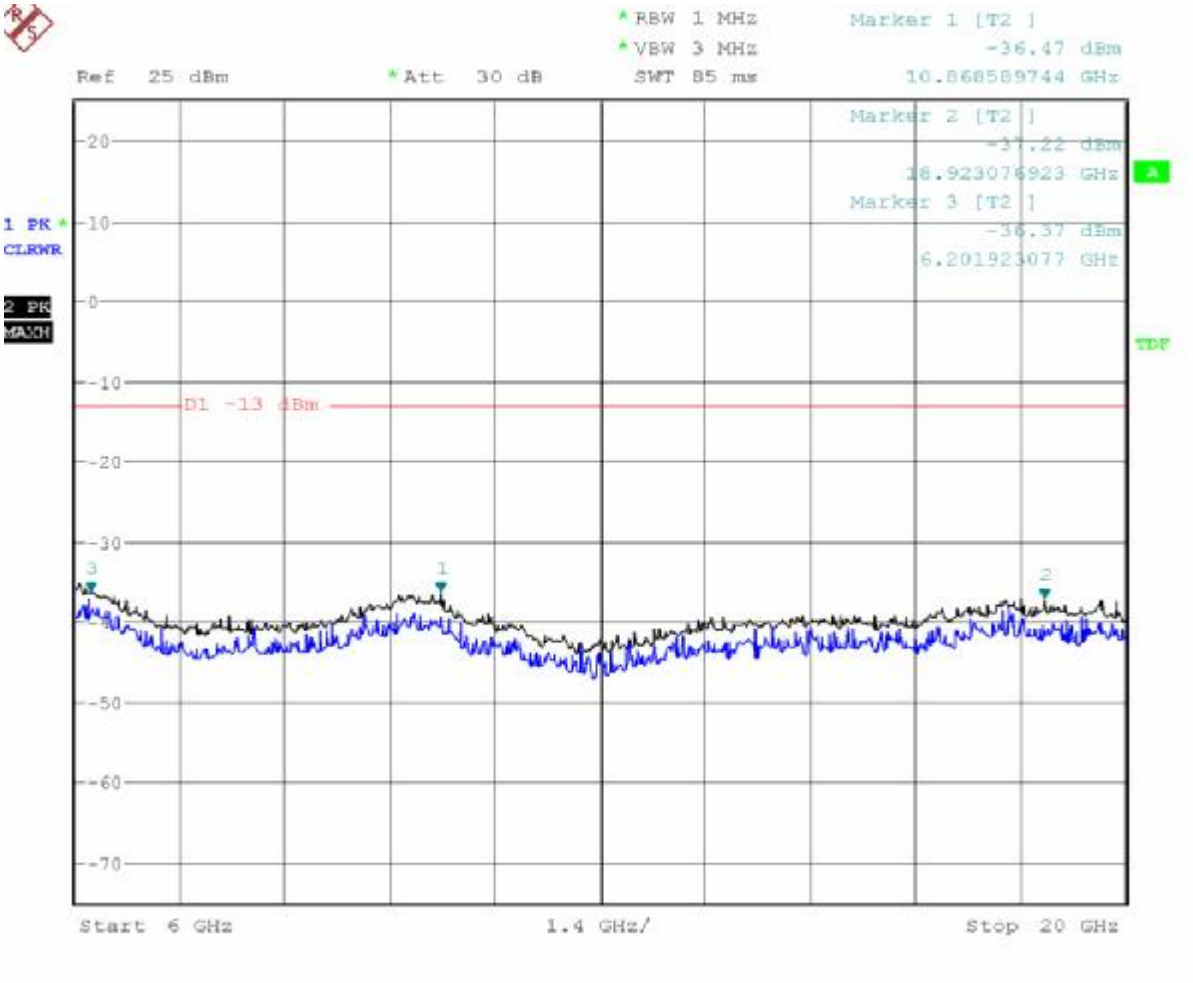


Note: The signal beyond the limit is carrier

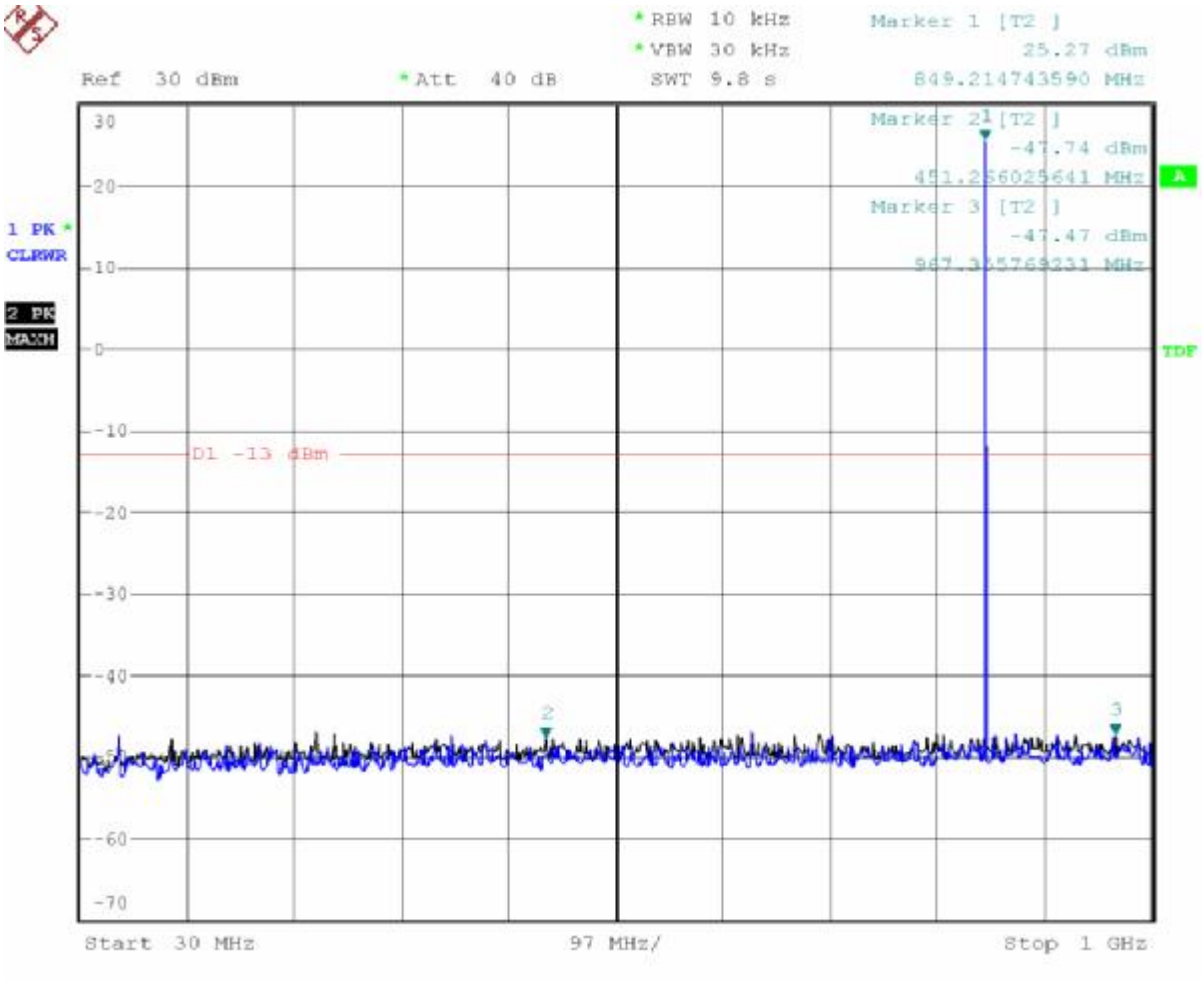
Test Mode : GSM 850 CH 189 Frequency Range : 1G-6G



Test Mode : GSM 850 CH 189 Frequency Range : 6G-20G

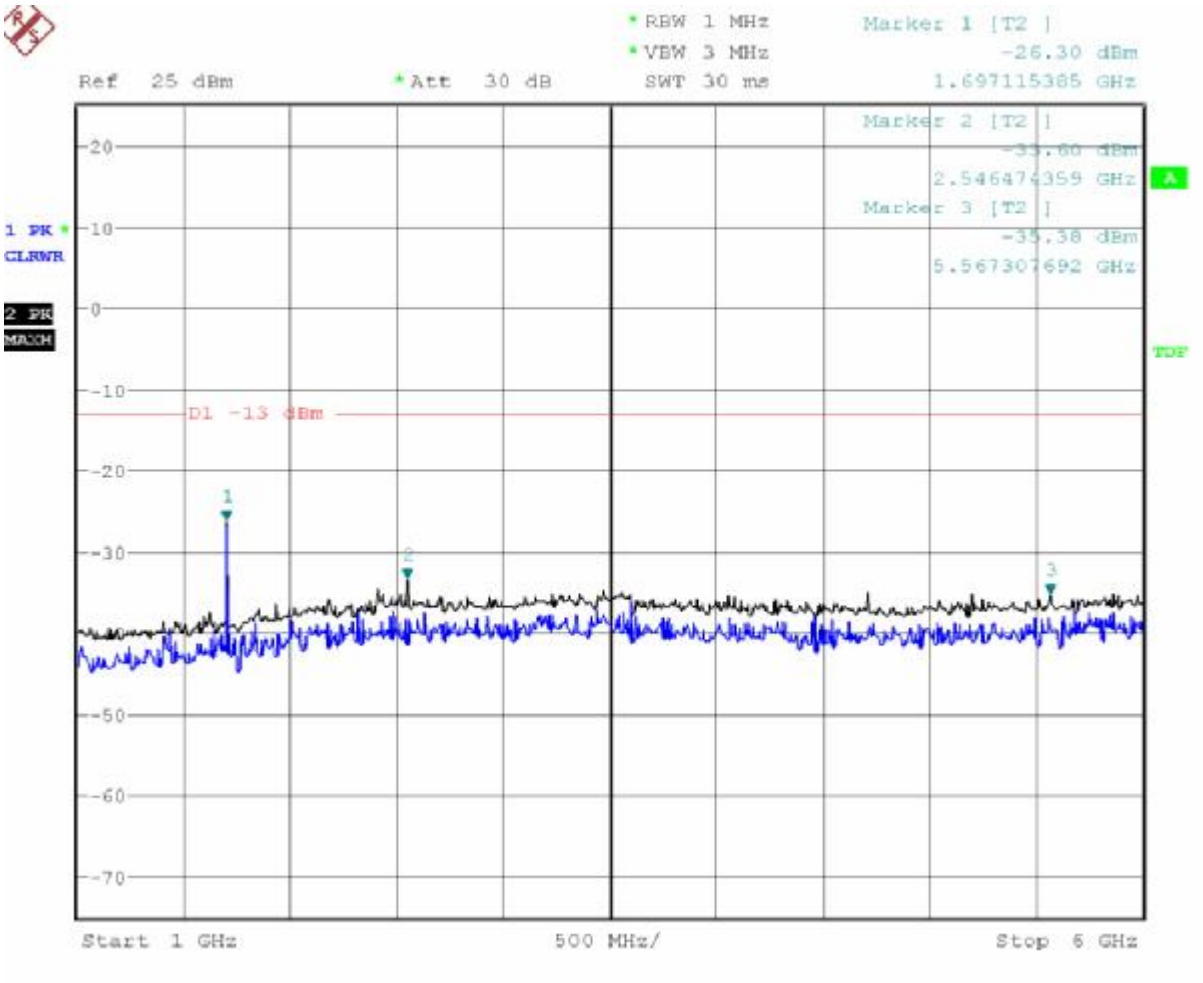


Test Mode : GSM 850 CH 251 Frequency Range : 30M-1G

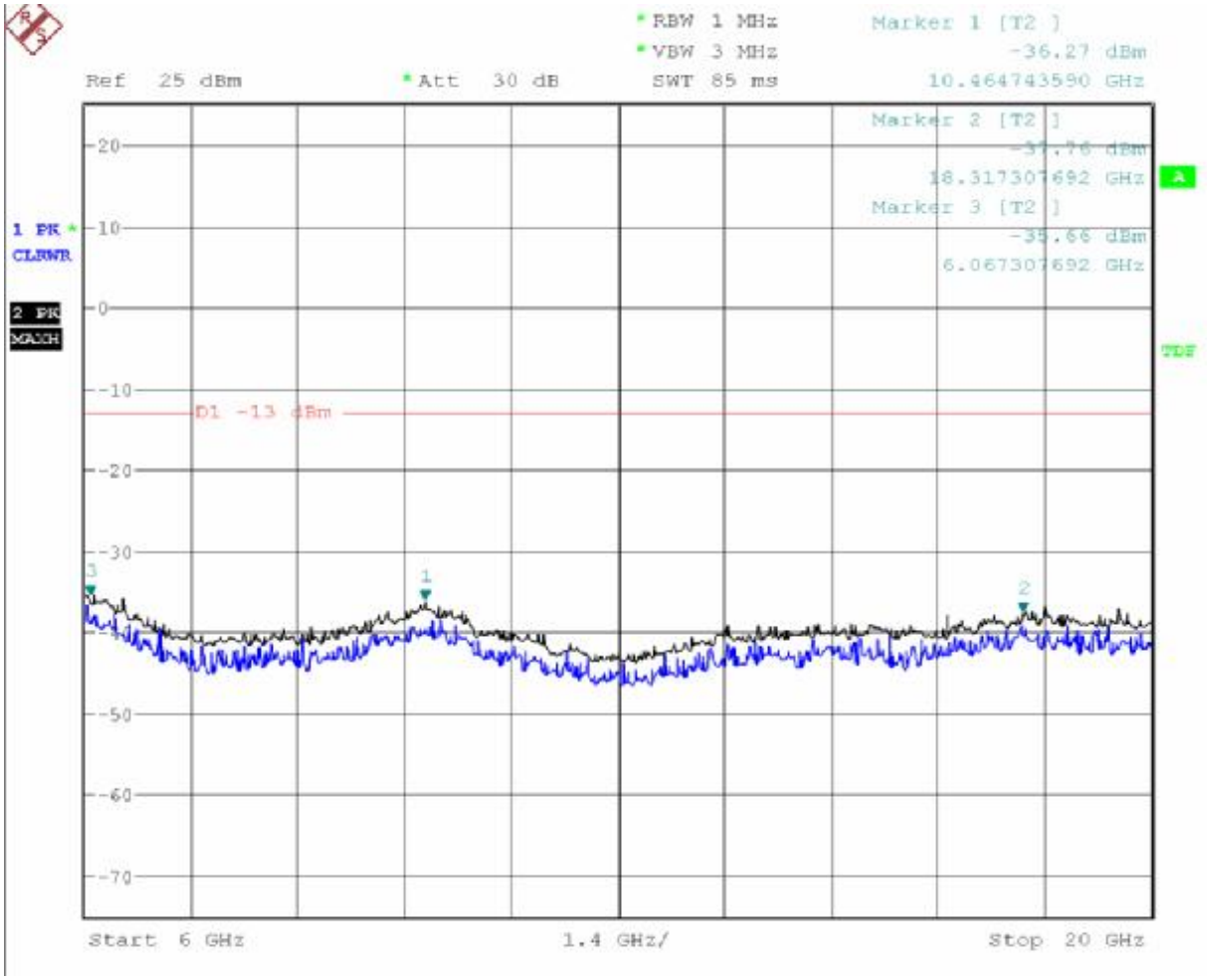


Note: The signal beyond the limit is carrier

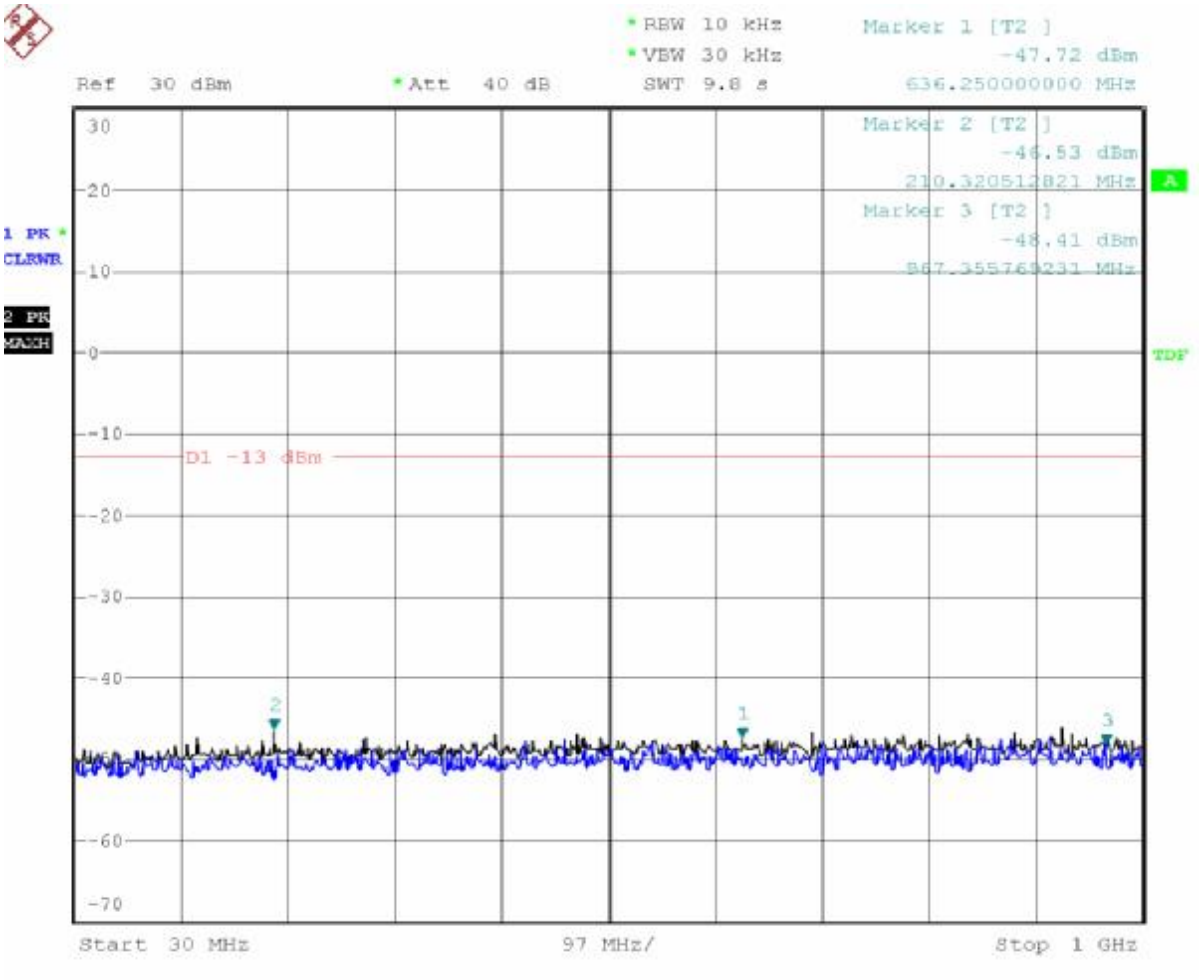
Test Mode : GSM 850 CH 251 Frequency Range : 1G-6G



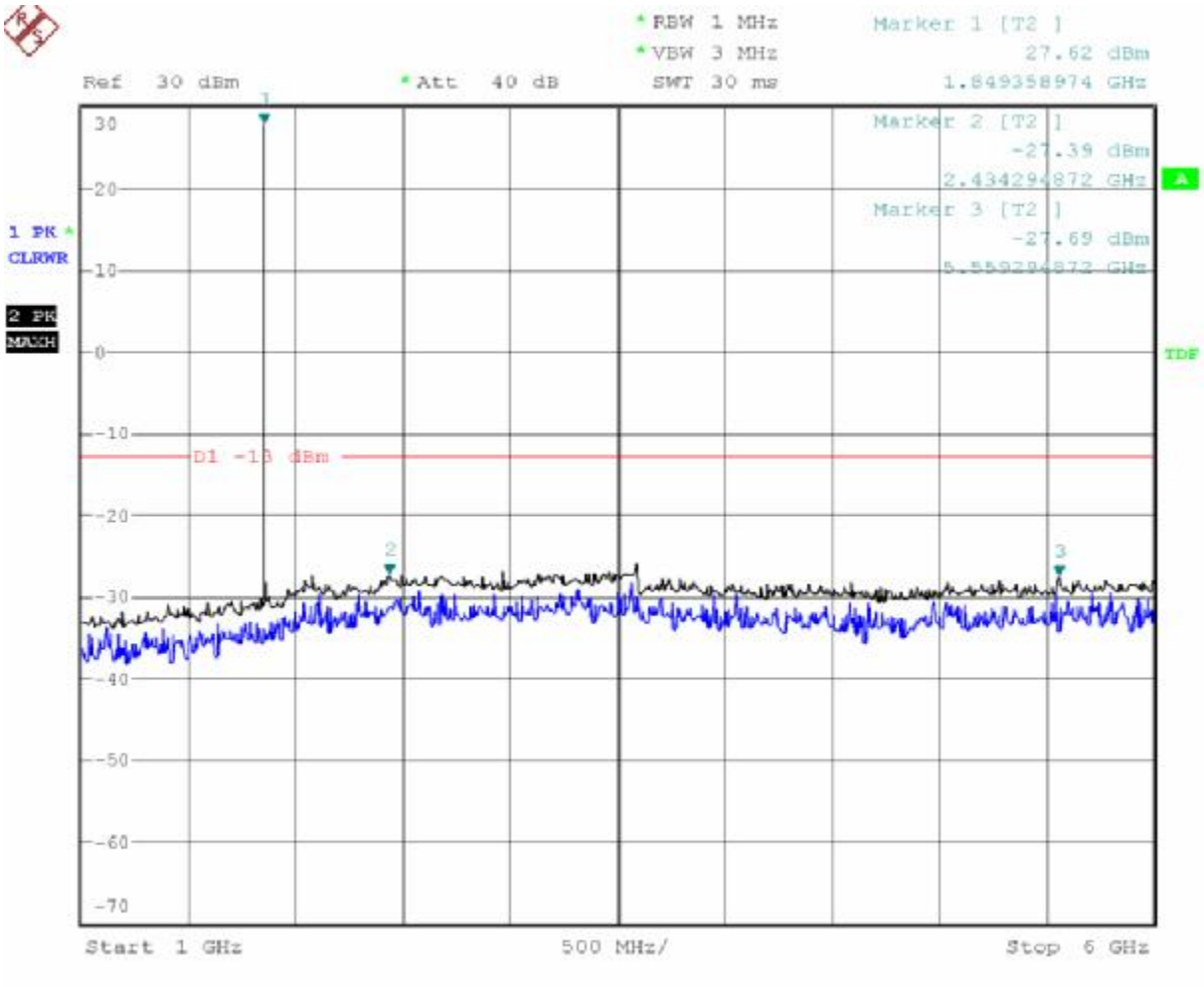
Test Mode : GSM 850 CH 251 Frequency Range : 6G-20G



Test Mode : PCS 1900 CH 512 Frequency Range : 30M-1G

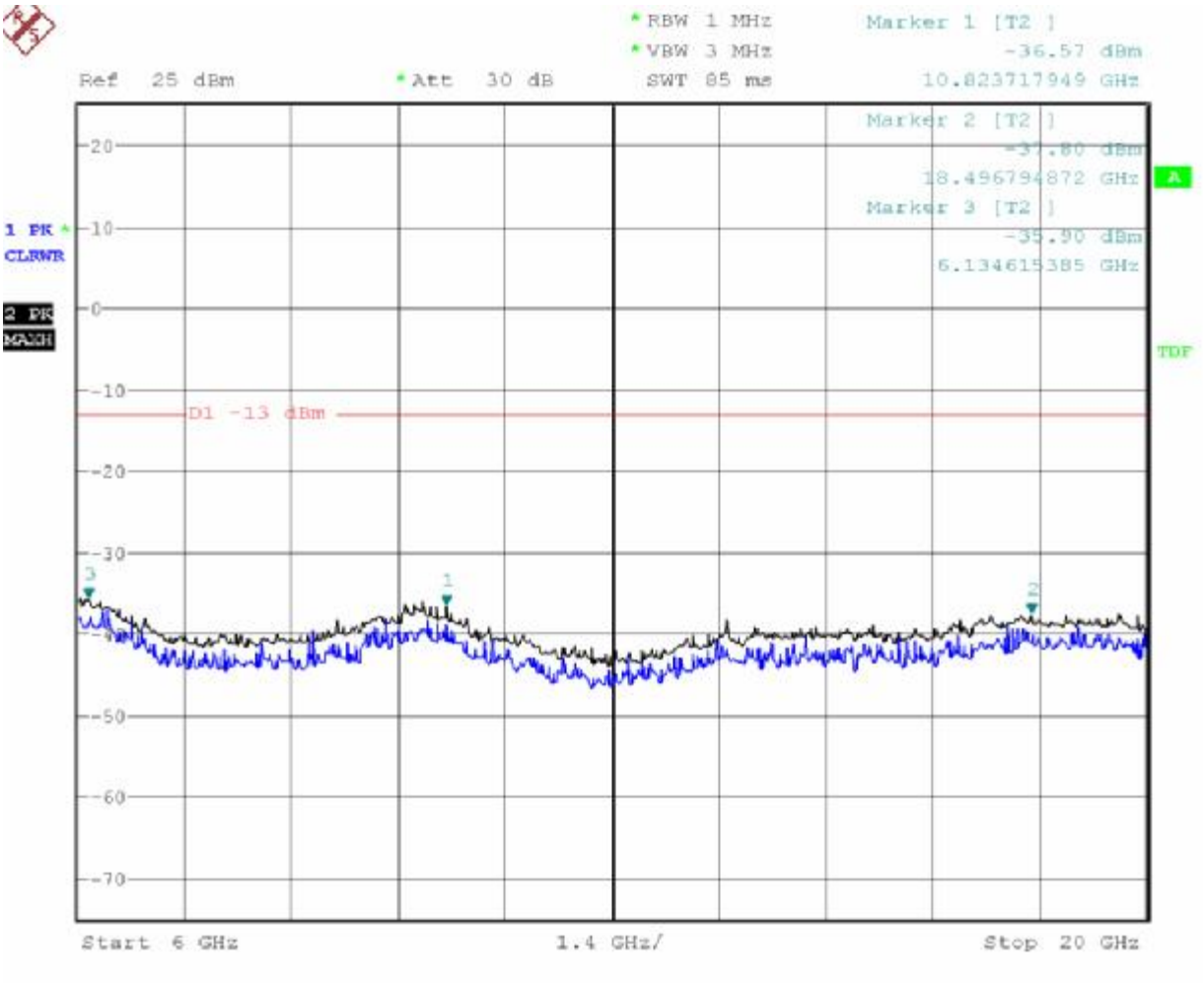


Test Mode : PCS 1900 CH 512 Frequency Range : 1G-6G

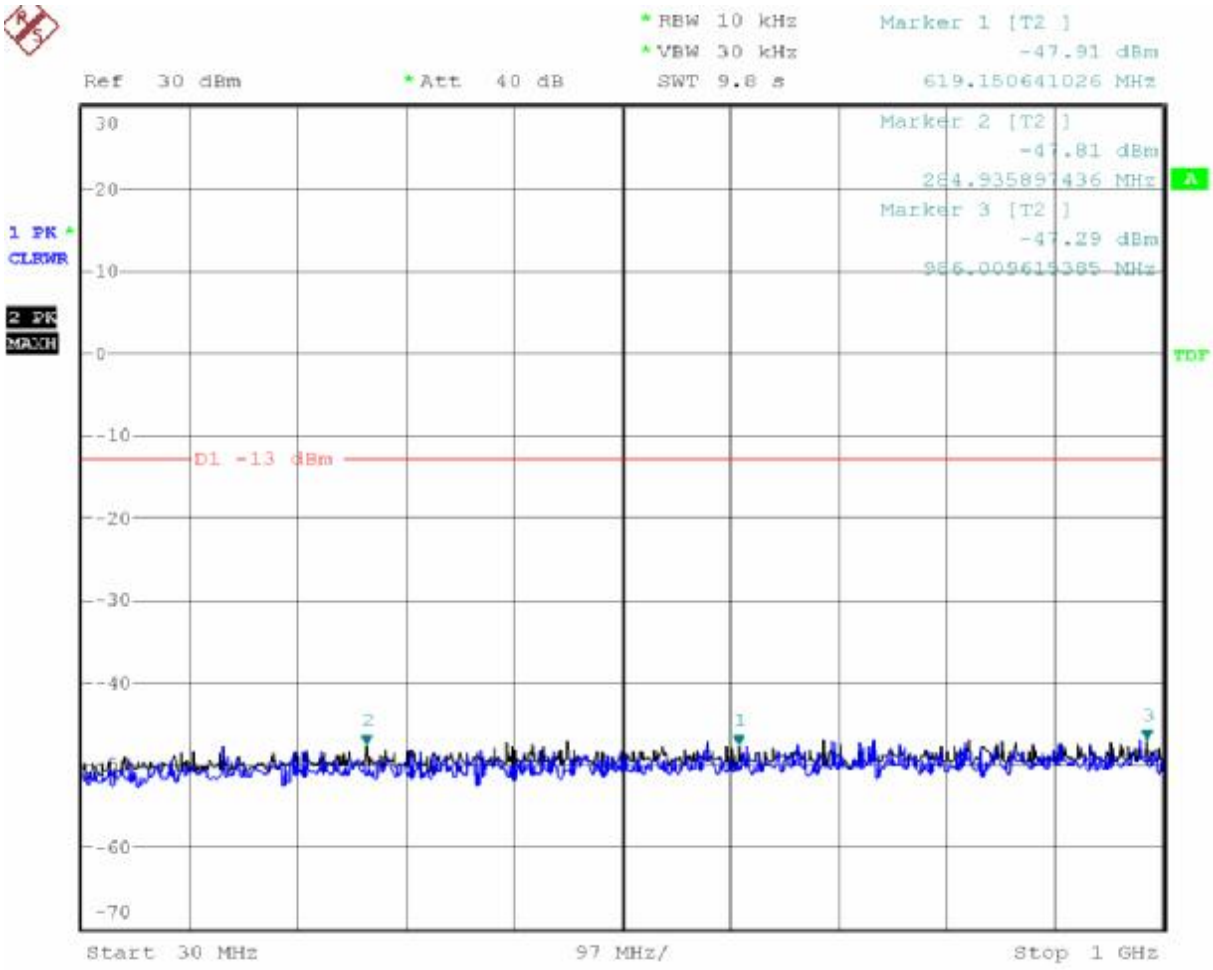


Note: The signal beyond the limit is carrier

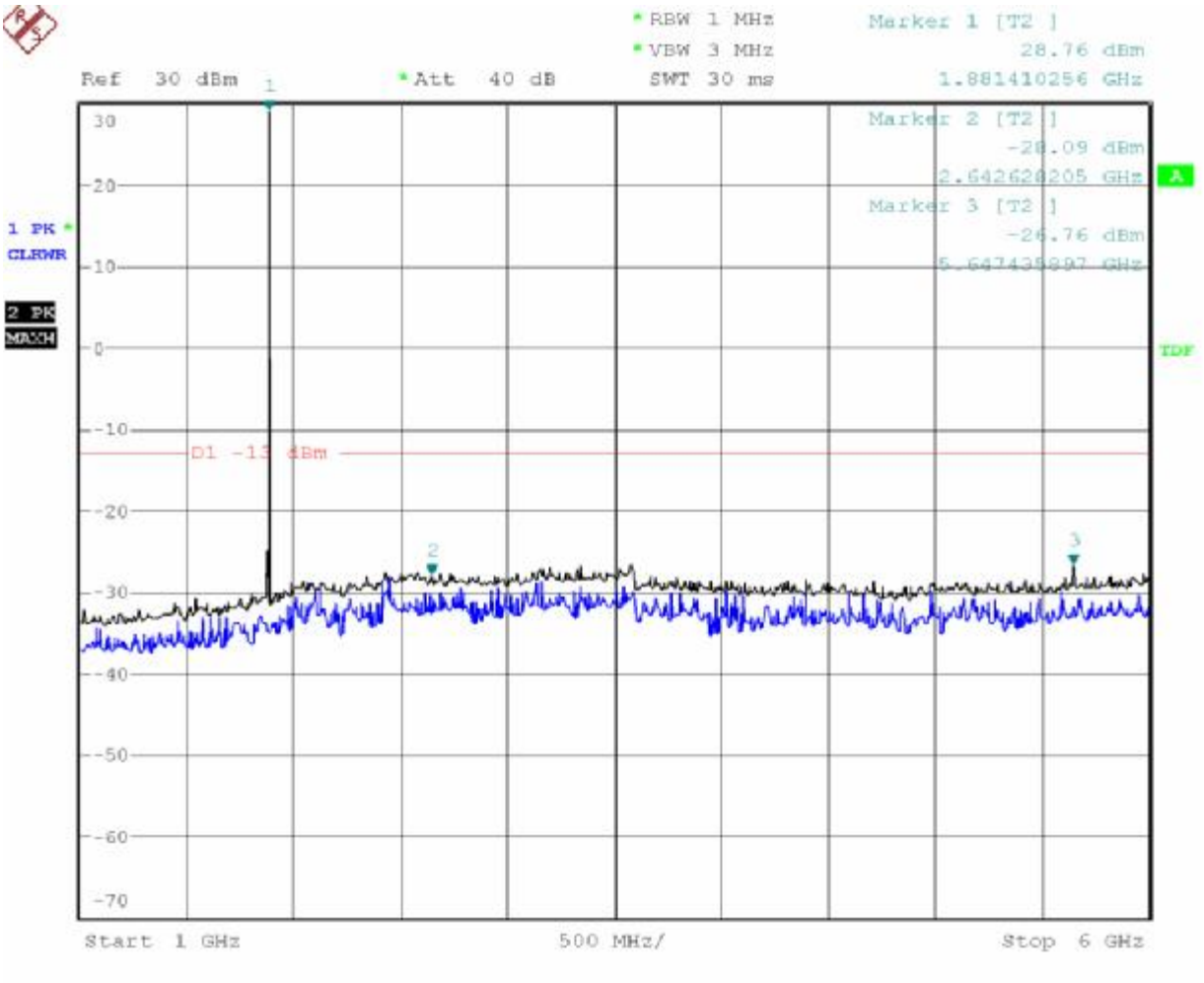
Test Mode : PCS 1900 CH 512 Frequency Range : 6G-20G



Test Mode : PCS 1900 CH 661 Frequency Range : 30M-1G

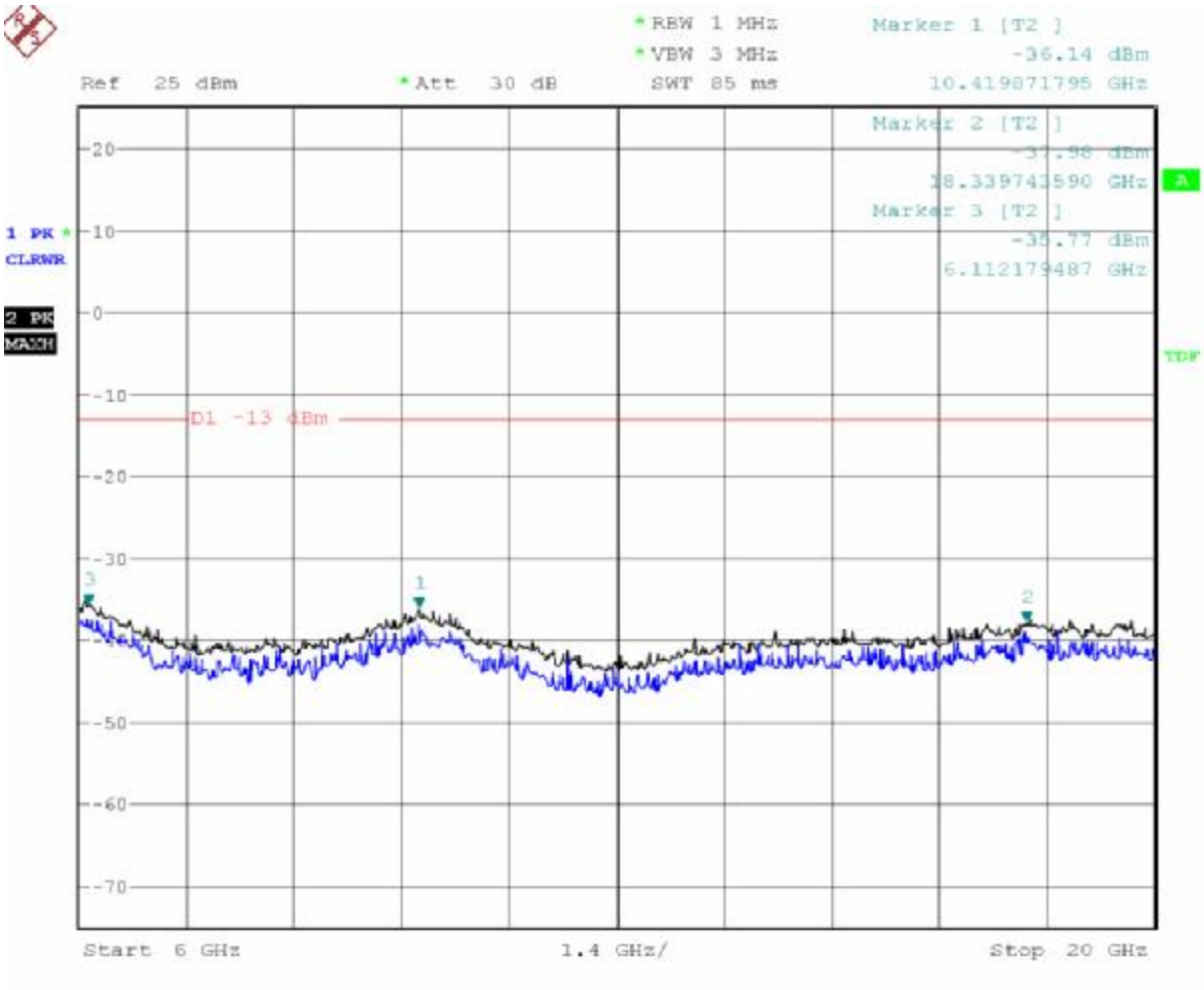


Test Mode : PCS 1900 CH 661 Frequency Range : 1G-6G

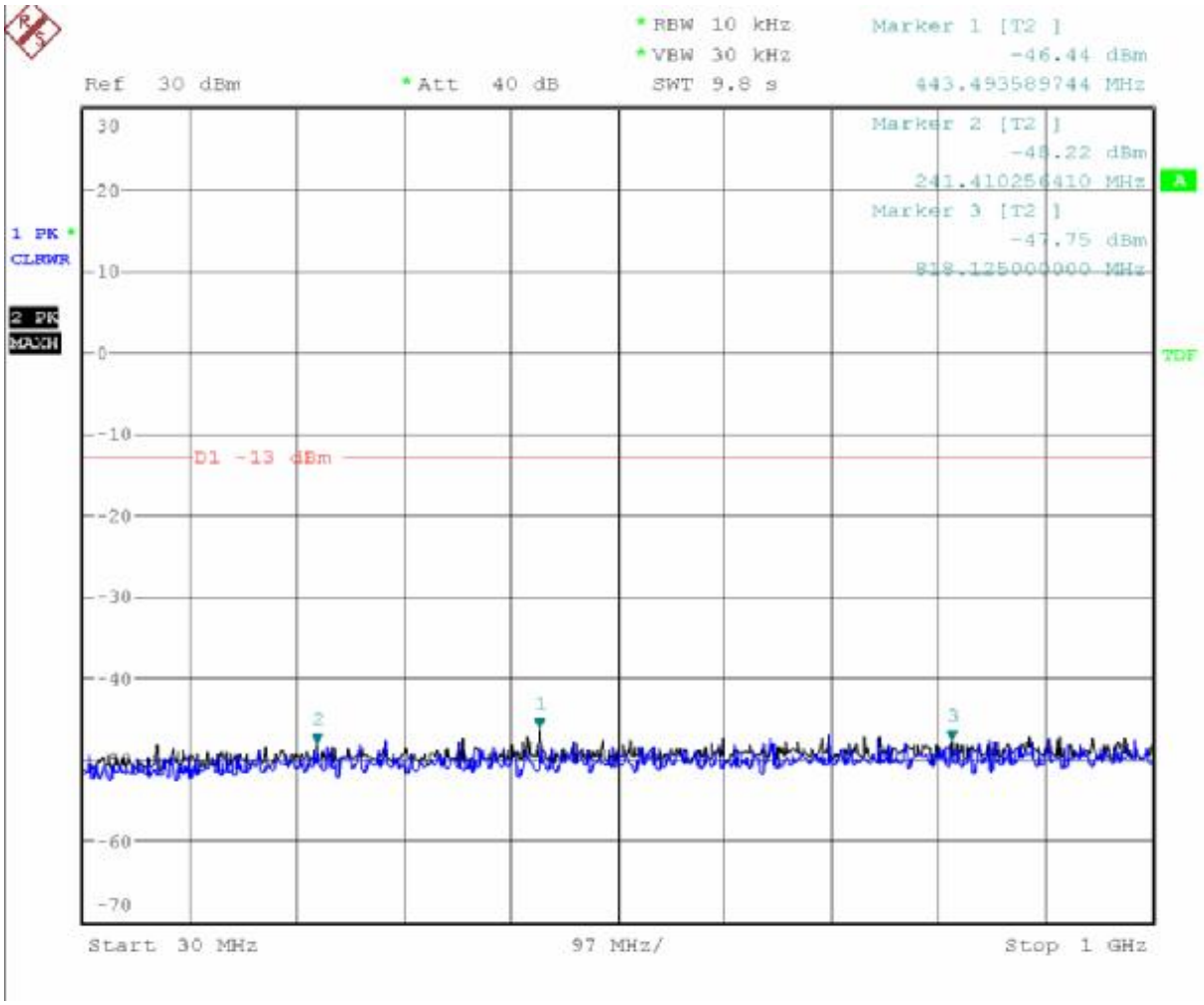


Note: The signal beyond the limit is carrier

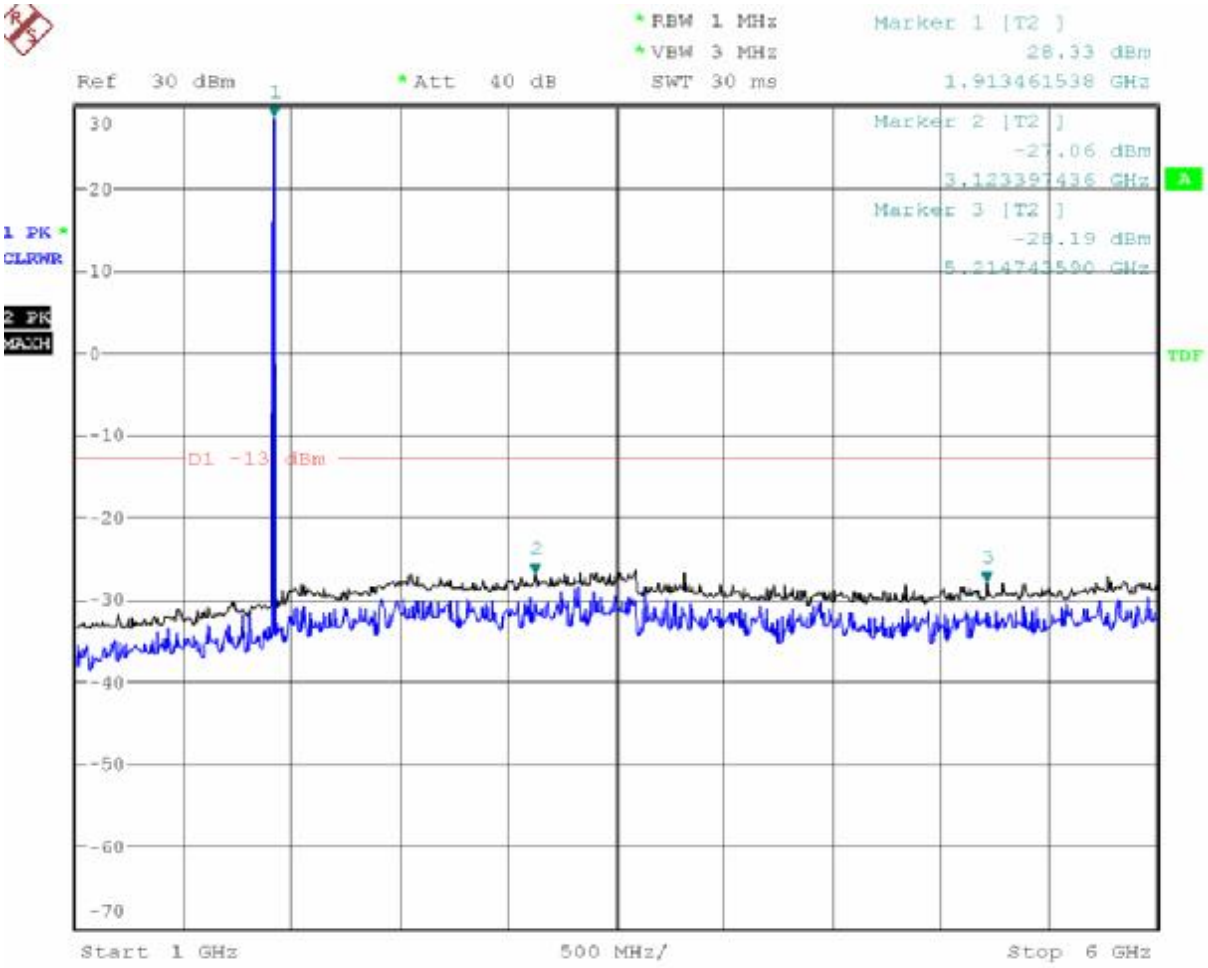
Test Mode : PCS 1900 CH 661 Frequency Range : 6G-20G



Test Mode : PCS 1900 CH 810 Frequency Range : 30M-1G

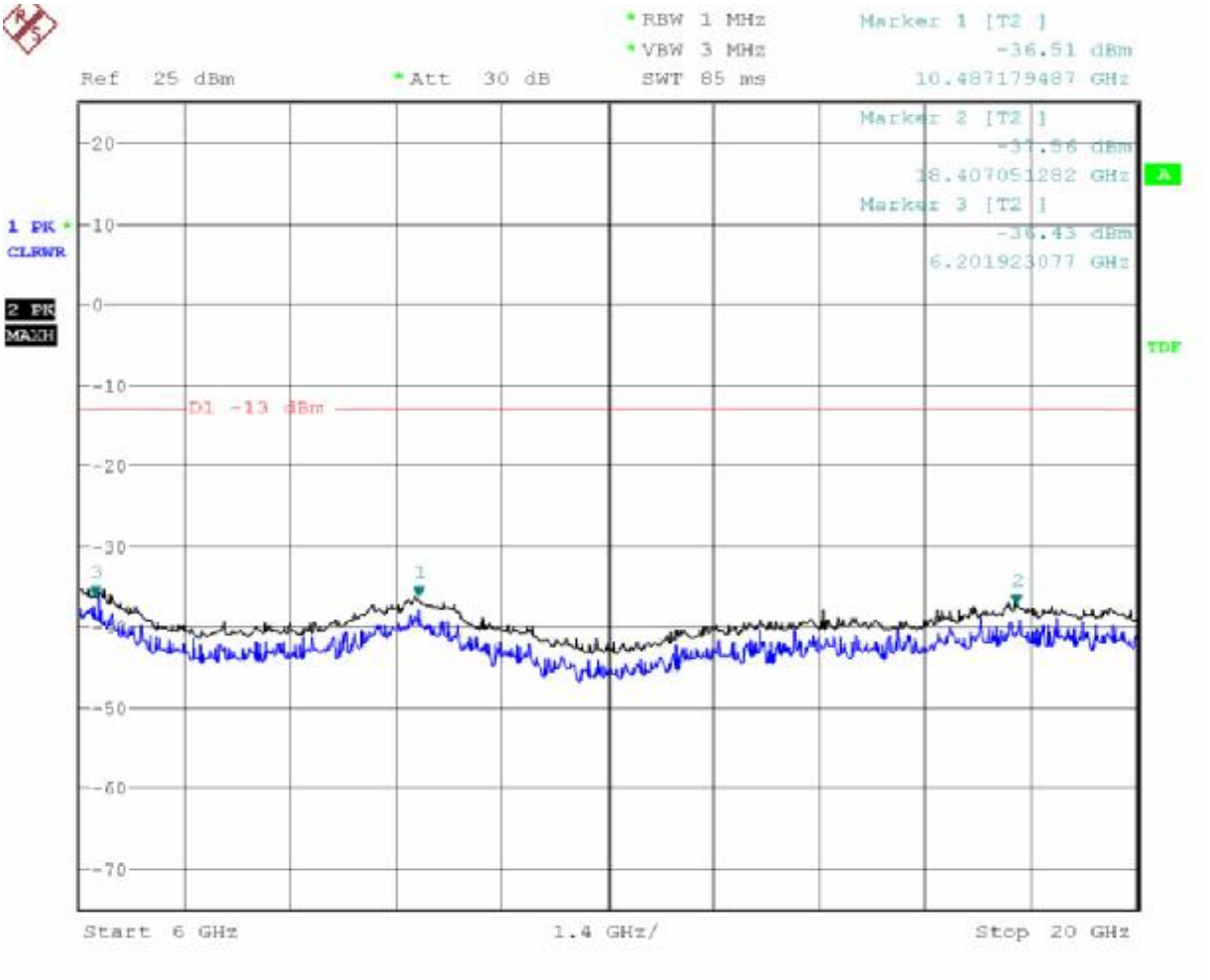


Test Mode : PCS 1900 CH 810 Frequency Range : 1G-6G



Note: The signal beyond the limit is carrier

Test Mode : PCS 1900 CH 810 Frequency Range : 6G-20G



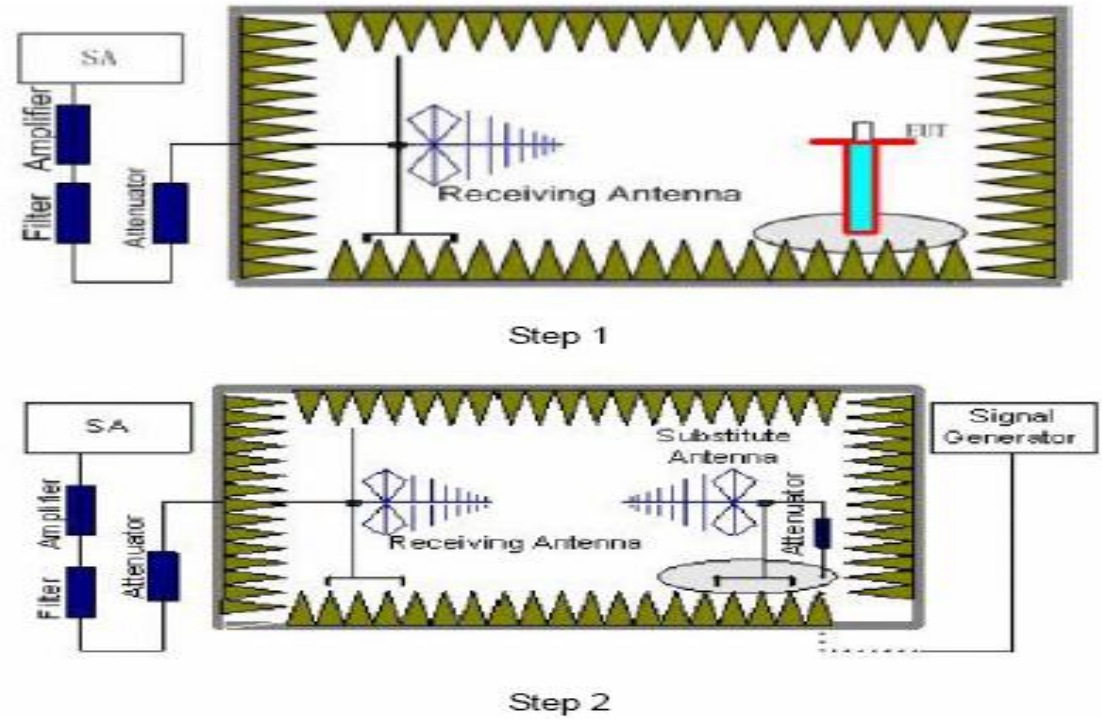
7. Field Strength of Spurious Radiation

7.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Spectrum Analyzer	R & S	FSU 26/200172	June, 2008
2	Ultra Broadband Antenna	R & S	HL 562/100019	May, 2008
3	VHA 9103 without telescopic rods for use with biconical broad-band elements BBA 9106	SCHWARZBECK	BBA 9106 + VHA 9103/2358	May, 2008
4	Logarithmic Periodic Broadband Antenna	SCHWARZBECK	UHALP 9108 A/ 696	May, 2008
5	Double-Ridged Waveguide Horn Antenna	R & S	HF 906/100023	May, 2008
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120D/ 249	May, 2008
7	Universal Radio Communication Tester	R & S	CMU 200/108591	June, 2008

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

7.2. Test Setup



7.3. Limits

Limits	<-13dBm

7.4. Test Procedure

Test procedure: Step 1:

EUT was placed on a 1.5 meter high non-conductive table at a 3 meter test distance from the test receive antenna. The height of receiving antenna is 1.5m. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reaching a maximum value. The measurement is carried out using a spectrum analyzer or receiver. The spectrum analyzer scans from 30MHz to 20GHz (higher than the 10^{th} harmonic of the carrier). The peak detector is used and RBW is set to 1MHz for more than 1GHz and 10KHz for less than 1GHz on spectrum analyzer. Then the antenna height and turn table rotation is adjusted until the maximum power value is founded on spectrum analyzer or receiver. A notch filter is necessary in the band near to the carrier frequency. A high pass filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.

Step 2:

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

Step 3:

Repeat step 1 and step 2 for receiving antenna another polarization.

Step 4:

Repeat step 1, step 2 and step 3 for EUT another two orientation.

7.5. Test Specification

CF 47 FCC Part 2.1051, Part 2.1053, Part 22.917, Part 24.238

7.6. EUT Operation

See chapter 1.2 of this test report.

7.7. Test Result

7.7.1 GSM 850

EUT Axis	Receiving antenna polarization	Frequency (GHz)	Signal generator level (dBm)	Cable loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Result
X	H	1.6732	-55.23	1.26	7.42	-49.07	-13	pass
		2.5096	-56.45	2.23	8.47	-50.21	-13	pass
		4.1820	-57.73	3.12	10.59	-50.26	-13	pass
		5.0160	-56.14	3.67	10.56	-49.25	-13	pass
		10.0380	-41.49	5.89	9.92	-37.46	-13	pass
	V	1.6732	-50.10	1.26	7.42	-43.94	-13	pass
		2.4480	-58.69	2.19	8.38	-52.50	-13	pass
		4.1820	-60.79	3.12	10.59	-53.32	-13	pass
		5.8560	-55.99	3.89	11.15	-48.73	-13	pass
		10.0380	-45.74	5.89	9.92	-41.71	-13	pass
		10.8720	-45.91	5.98	9.34	-42.55	-13	pass
Y	H	1.6728	-54.60	1.26	7.42	-48.44	-13	pass
		2.5088	-58.96	2.23	8.47	-52.72	-13	pass
		4.1820	-59.55	3.12	10.59	-52.08	-13	pass
		5.8500	-55.73	3.89	11.15	-48.47	-13	pass
		10.0380	-49.05	5.89	9.92	-45.02	-13	pass
	V	1.6728	-58.15	1.26	10.59	-48.82	-13	pass
		2.5096	-57.06	2.25	8.47	-50.84	-13	pass
		4.3200	-61.68	3.32	10.61	-54.39	-13	pass
		5.8560	-57.09	3.89	11.15	-49.83	-13	pass
		10.0380	-46.87	5.89	9.92	-42.84	-13	pass
Z	H	1.6736	-57.88	1.26	10.59	-48.55	-13	pass
		2.5096	-58.43	2.25	8.47	-52.21	-13	pass
		5.8560	-56.81	3.89	11.15	-49.55	-13	pass
		10.0380	-47.64	5.89	9.92	-43.61	-13	pass
	V	1.6732	-58.45	1.26	10.59	-49.12	-13	pass
		5.8560	-57.55	3.89	11.15	-50.29	-13	pass
		6.6960	-55.83	4.01	10.21	-49.63	-13	pass
		10.0380	-45.87	5.89	9.92	-41.84	-13	pass

7.7.2 PCS 1900

EUT Axis	Receiving antenna polarization	Frequency (GHz)	Signal generator level (dBm)	Cable loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
X	H	3.7620	-38.65	2.82	12.65	-28.82	-13	pass
		5.6400	-48.33	3.77	13.15	-38.95	-13	pass
		7.5180	-38.84	4.88	11.64	-32.08	-13	pass
		9.4020	-40.97	5.44	12.16	-34.25	-13	pass
		11.2860	-40.75	6.24	11.86	-35.13	-13	pass
		15.0420	-50.42	7.86	12.88	-45.40	-13	pass
	V	3.7620	-39.90	2.82	12.65	-30.07	-13	pass
		5.6400	-50.25	3.77	13.15	-40.87	-13	pass
		7.5180	-44.60	4.88	11.64	-37.84	-13	pass
		9.4020	-44.16	5.44	12.16	-37.44	-13	pass
		11.2860	-42.81	6.24	11.86	-37.19	-13	pass
		13.1640	-47.11	6.88	13.45	-40.54	-13	pass
		16.9260	-50.69	8.12	15.62	-43.19	-13	pass
Y	H	3.7620	-43.17	2.82	12.65	-33.34	-13	pass
		5.6400	-48.35	3.77	13.15	-38.97	-13	pass
		7.5180	-41.22	4.88	11.64	-34.46	-13	pass
		9.4020	-45.06	5.44	12.16	-38.34	-13	pass
		11.2860	-45.63	6.24	11.86	-40.01	-13	pass
		16.0260	-49.25	8.02	17.06	-40.21	-13	pass
	V	3.7620	-39.89	2.82	12.65	-30.06	-13	pass
		5.6400	-49.80	3.77	13.15	-40.42	-13	pass
		7.5180	-45.52	4.88	11.64	-38.76	-13	pass
		9.4020	-43.39	5.44	12.16	-36.67	-13	pass
		11.2860	-43.65	6.24	11.86	-38.03	-13	pass
		13.1640	-46.27	6.88	13.45	-39.70	-13	pass
		16.9260	-51.24	8.12	15.62	-43.74	-13	pass

7.7.2 PCS 1900(Continued)

EUT Axis	Receiving antenna polarization	Frequency (GHz)	Signal generator level (dBm)	Cable loss (dB)	Gain （dBi）	EIRP (dBm)	Limit (dBm)	Result
Z	H	3.7620	-44.50	2.82	12.65	-34.67	-13	pass
		5.6400	-48.87	3.77	13.15	-39.49	-13	pass
		7.5180	-42.14	4.88	11.64	-35.38	-13	pass
		9.4020	-45.01	5.44	12.16	-38.29	-13	pass
		11.2860	-46.31	6.24	11.86	-40.69	-13	pass
		15.0420	-47.08	7.86	12.88	-42.06	-13	pass
		16.9260	-51.24	8.12	15.62	-43.74	-13	pass
	V	3.7620	-39.85	2.82	12.65	-30.02	-13	pass
		5.6400	-49.89	3.77	13.15	-40.51	-13	pass
		7.5180	-44.48	4.88	11.64	-37.72	-13	pass
		9.4020	-43.89	5.44	12.16	-37.17	-13	pass
		11.2860	-44.52	6.24	11.86	-38.90	-13	pass
		13.1640	-46.81	6.88	13.45	-40.24	-13	pass
		16.9260	-51.01	8.12	15.62	-43.51	-13	pass

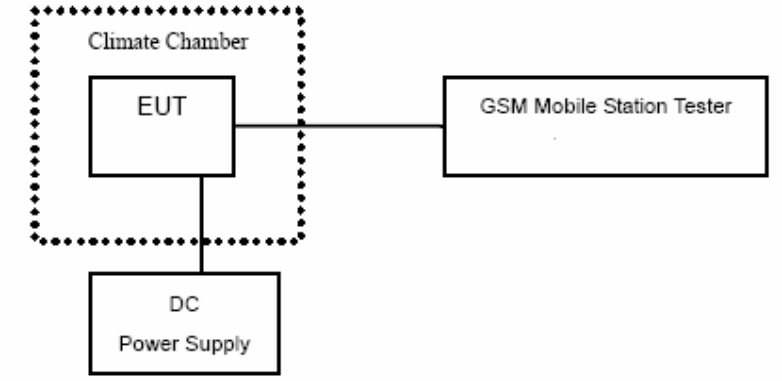
8. Frequency Stability vs. Temperature and voltage variations

8.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Spectrum Analyzer	R & S	FSU 26/200172	June, 2008
2	Universal Radio Communication Tester	R & S	CMU 200/108591	June, 2008
3	Power Splitter	Agilent	11667A/54400	June, 2008
4	Climatic Chamber	WEISS	DU/20/40/582260173400050	June, 2008
5	DC Power Supply	SAKO	SK1730SL20A/0403016	N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

8.2. Test Setup



8.3. Limits

According to part 22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances 2.5ppm.

8.4. Test Procedure

Step 1: Frequency Stability vs. Temperature variations

The EUT and test equipment were set up as shown on the following section. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was note within one minute. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute. The temperature tests were performed for the worst case.

Step 2: Frequency Stability vs. voltage variations

The EUT was placed in a temperature chamber at 25±5 oC and connected as the following section. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT. The variation in frequency was measured for the worst case.

8.5. EUT Operation

See chapter 1.2 of this test report.

8.6. Test Specification

CF 47 FCC Part 2.1055, 22.355, 24.235

8.7. Test Result

GSM 850

Temperature(° C)	Test Result (ppm)		
	Channel 128	Channel 189	Channel 251
-30	0.037	0.030	0.047
-20	0.036	0.019	0.018
-10	0.021	0.017	0.022
0	0.020	0.024	0.014
+10	0.015	0.027	0.031
+20	0.028	0.020	0.040
+30	0.021	0.035	0.029
+40	0.037	0.022	0.031
+50	0.037	0.013	0.013

Voltage (V)	Test Result (ppm)		
	Channel 128	Channel 189	Channel 251
3.3	0.061	0.258	0.235
4.2	0.058	0.235	0.112

PCS 1900

Temperature(° C)	Test Result (ppm)		
	Channel 512	Channel 661	Channel 810
-30	0.040	0.043	0.029
-20	0.017	0.030	0.024
-10	0.025	0.038	0.029
0	0.014	0.018	0.019
+10	0.020	0.030	0.031
+20	0.038	0.030	0.027
+30	0.028	0.019	0.035
+40	0.030	0.032	0.032
+50	0.038	0.033	0.020

Voltage (V)	Test Result (ppm)		
	Channel 512	Channel 661	Channel 810
3.3	0.925	0.023	0.058
4.2	0.653	0.452	0.023

9. Test Setup Photo

9.1 ERP/EIRP & Spurious Radiation Test Setup Photo

9.2 EUT Axis of Setup Photo

X Axis

Y Axis

Z Axis

9.3 Occupied Bandwidth & Band Edge Measurement Setup Photo

10 External Photo

11 Internal Photo