FCC RF Test Report

FCC 47 CFR Part 2, 22(H), 24(E)

Product Name	:	GSM 850/900/1800/1900 GPRS Mobile Phone
Model No.	:	A1034
FCC ID	:	T38A1034

Prepared By:	:	Inventec Appliances(Pudong) Corporation
Address:	:	No.789 Pu Xing Road,Shanghai,PRC
Date of Receipt	:	2012.09.17
Date of Test	:	2012.09.17-2012.09.25
Report No.	:	20120917FCC-D

Test Report Certification

Date of Issue : Sep.25.2012

Report No. : 20120917FCC-D

Product Name	:	GSM 850/900/1800/1900 GPRS Mobile Phone
Model No.	:	A1034
Trade Name	:	CLARO
Applicant	:	Cellon Communications Technology (Shenzhen) Co.,Ltd.
Address	:	13/F, Skyworth C Building, Gaoxin S.Ave1, Hi-Tech Industrial Park, Nanshan District,
Standard	:	FCC 47 CFR Part 2, 22(H), 24(E)
Classification	:	PCS Licensed Transmitter Held to Ear (PCE)
Test Result	:	Complied

TX/RX Frequency Range	:	GSM/GPRS 850	824.2 ~ 848.8 MHz	869.2 ~ 893.8 MHz
		GSM/GPRS 1900	1850.2 ~ 1909.8 MHz	1930.2 ~ 1989.8 MHz

The Test Results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of Inventec Appliances(Pudong) Corporation

Documented By : _____, Sep.25.2012
Judy Ge/Engineer

Tested By : _____, Sep.25.2012
Alice Lee/Engineer

Approved By : _____, Sep.25.2012
Jeff Huang/Director of Operations

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SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
2.1	§2.1046	N/A	Conducted Output Power	N/A	PASS	
2.2	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
2.2	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
2.3	§2.1049 §22.917(a) §24.238(a)	N/A	Occupied Bandwidth	N/A	PASS	-
2.4	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Measurement	< $43+10\log_{10}$(P[Watts])	PASS	-
2.5	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Conducted Emission	< $43+10\log_{10}$(P[Watts])	PASS	-
2.6	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	< $43+10\log_{10}$(P[Watts])	PASS	-
2.7	§2.1055 §22.355 §24.235	RSS-132(4.3) RSS-133(6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-

1. GENERAL INFORMATION

1.1 Applicant

Company Name: Cellon Communications Technology (Shenzhen) Co.,Ltd.

Address: 13/F, Skyworth C Building, Gaoxin S.Ave1, Hi-Tech Industrial Park, Nanshan District,

1.2 Manufacturer

Company Name: Cellon Communications Technology (Shenzhen) Co.,Ltd.

Address: 13/F, Skyworth C Building, Gaoxin S.Ave1, Hi-Tech Industrial Park, Nanshan District,

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	GSM 850/900/1800/1900 GPRS Mobile Phone
Brand Name	CLARO
Model Name	A1034
FCC ID	T38A1034
Tx/Rx Frequency Range	GSM/GPRS 850 : 824.2 ~ 848.8 MHz / 869.2 ~ 893.8 MHz GSM/GPRS 1900: 1850.2 ~ 1909.8 MHz/ 1930.2 ~ 1989.8 MHz
Number of Channels	GSM850： 128 189 251 GSM1900： 512 661 810
Carrier Frequency of Each Channel	GSM850： 824.2 836.4 848.8 GSM1900： 1850.2 1880.0 1909.8
Maximum Output Power to Antenna	GSM850： 32.43 (dBm), 1.750(W) GSM1900： 29.64(dBm), 0.920(W)
Antenna Type	Fixed Internal Antenna
HW Version	P2
SW Version	A1034_01.09_61010F_70401_MTK_026
Type of Modulation	GSM/GPRS:GMSK
Type of Emission	GMSK:248KGXW

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of PCS Licensed Transmitter Held to Ear (PCE).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- FCC 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

2.1 Conducted Power

The conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	**GSM850**			**GSM1900**		
Channel	**128**	**189**	**251**	**512**	**661**	**810**
Frequency	**824.2**	**836.4**	**848.8**	**1850.2**	**1880.0**	**1909.8**
GSM	**32.43**	32.29	32.17	**29.64**	29.46	29.28
GPRS8(1up)	32.23	32.18	32.07	29.56	29.41	29.24
GPRS10(2up)	31.42	31.31	31.27	28.53	28.40	28.31
GPRS12(4up)	29.49	29.47	29.45	26.71	26.54	26.47

2.2 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850.
2. 30 MHz to 19000 MHz for GSM1900.

The following table shows the test modes as the worst cases and recorded in this report.

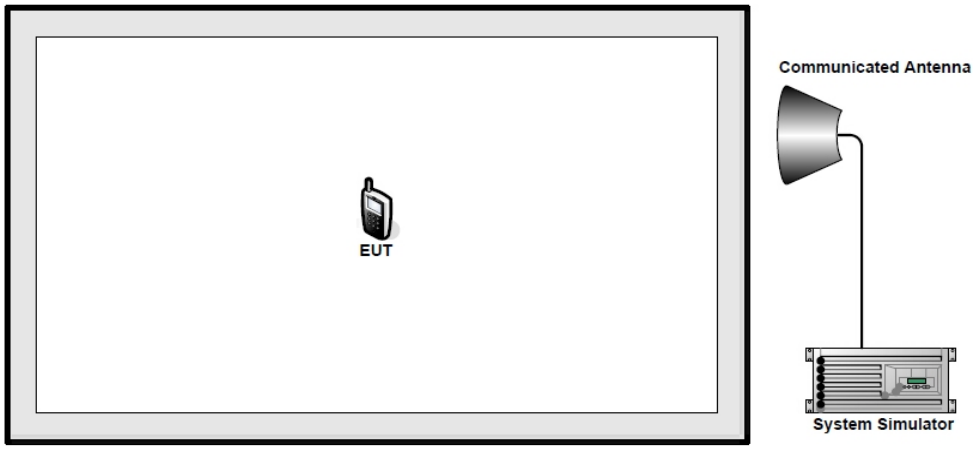
Test Mode		
Band	**Radiated TCs**	**Conducted TCs**
GSM850	■ GSM Link	■ GSM Link
GSM1900	■ GSM Link	■ GSM Link

Note:

1. The maximum power levels are performed on GSM mode.
2. The radiated emission testing was performed together with Adapter.

2.3 Connection Diagram of Test System

The EUT with adapter was placed on the turn table in a semi-anechoic chamber, and it was coupled to the supporting unit, system simulator, which was located outside the chamber.



3. Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

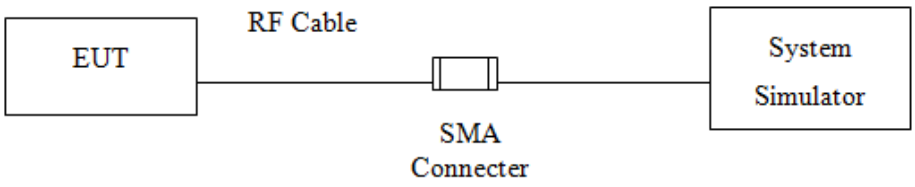
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Cellular Band				
Modes	**Channel**	**Frequency (MHz)**	**Conducted Power (dBm)**	**Conducted Power (Watts)**
GSM850 (GSM)	128 (Low)	824.2	**32.43**	1.75
	189 (Mid)	836.4	32.29	1.69
	251 (High)	848.8	32.17	1.65

PCS Band				
Modes	**Channel**	**Frequency (MHz)**	**Conducted Power (dBm)**	**Conducted Power (Watts)**
GSM1900 (GSM)	512 (Low)	1850.2	**29.64**	0.92
	661 (Mid)	1880.0	29.46	0.88
	810 (High)	1909.8	29.28	0.85

3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.2.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

3.2.2 Measuring Instruments

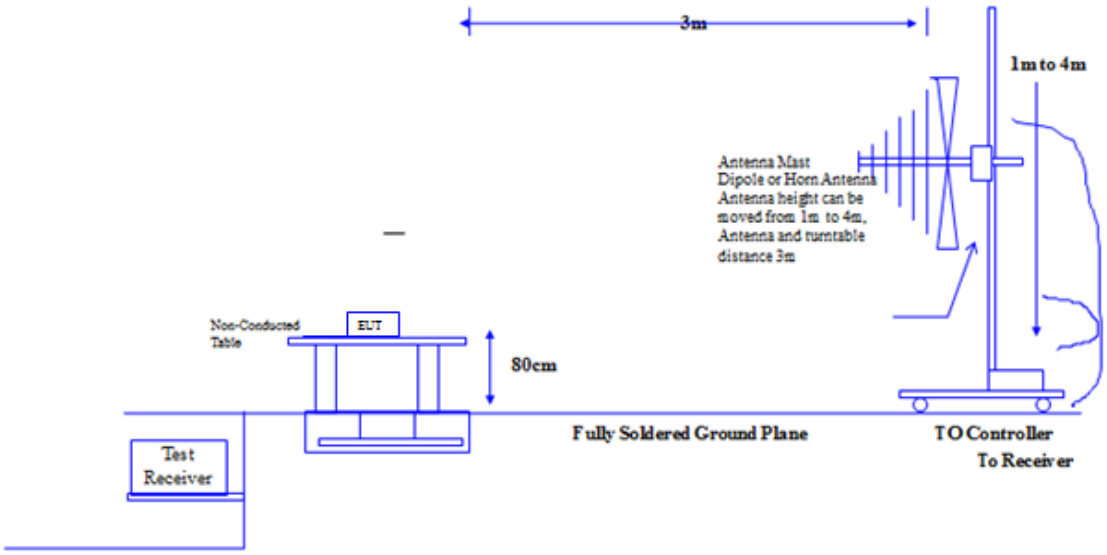
See list of measuring instruments of this test report.

3.2.3 Test Procedure

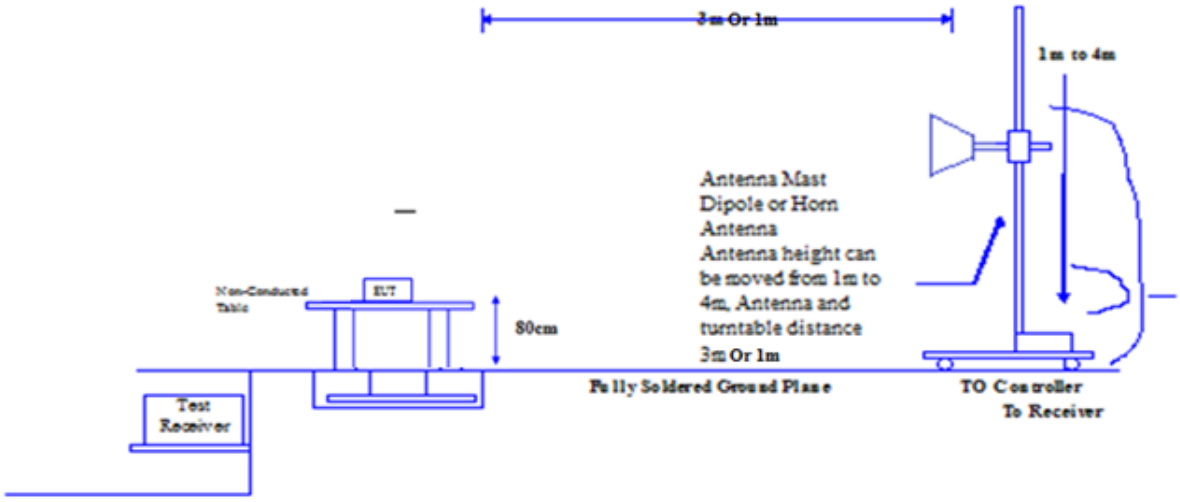
1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3MHz,VBW= 3MHz, and peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The Path Loss(dB)= S.G. Power-TX Cable loss+ TX Antenna Gain-SPA. Reading. Then the EUT's EIRP and ERP was calculated with the Path Loss(dB), EIRP=SPA. Reading+ Path Loss. ERP= SPA. Reading+ Path Loss-2.15

3.2.4 Test Setup

30MHz~1GHz



Above 1GHz



3.2.5 Test Result of ERP

GSM850 (GSM) Radiated Power ERP							
Frequency (MHz)	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**ERP(dBm)**	**ERP(W)**	**Polarization (H/V)**
824.2	-0.47	31.35	0.85	0.23	28.58	0.72	H
836.4	-0.29	31.13	0.85	0.51	28.64	0.73	H
848.8	-0.51	30.85	0.86	0.74	28.58	0.72	H
824.2	-13.29	22.04	0.85	0.23	19.27	0.08	V
836.4	-12.98	22.33	0.85	0.51	19.84	0.10	V
848.8	-11.04	23.78	0.86	0.74	21.51	0.14	V

ERP= SPA. Reading+ Path Loss-2.15

Path Loss						
Frequency (MHz)	**Path Loss(dB)**	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**Polarization (H/V)**
824.2	31.2	-31.82	0	0.85	0.23	H
836.4	31.08	-31.42	0	0.85	0.51	H
848.8	31.24	-31.36	0	0.86	0.74	H
824.2	34.71	-35.33	0	0.85	0.23	V
836.4	34.97	-35.31	0	0.85	0.51	V
848.8	34.7	-34.82	0	0.86	0.74	V

Path Loss(dB)= S.G. Power-TX Cable loss+ TX Antenna Gain-SPA. Reading

3.2.6 Test Result of EIRP

GSM1900(GSM) Radiated Power EIRP							
Frequency (MHz)	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**EIRP(dBm)**	**EIRP(W)**	**Polarization (H/V)**
1850.2	-5.48	29.39	1.64	1.25	26.85	0.48	H
1880	-5.93	28.75	1.64	1.56	26.52	0.45	H
1909.8	-6.29	28.6	1.64	1.79	26.60	0.46	H
1850.2	-16.43	22.45	1.64	1.25	19.91	0.10	V
1880	-17.37	21.3	1.64	1.56	19.07	0.08	V
1909.8	-16.84	21.02	1.64	1.79	19.02	0.08	V

EIRP= SPA. Reading+ Path Loss

Path Loss						
Frequency (MHz)	**Path Loss(dB)**	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**Polarization (H/V)**
1850.2	32.33	-32.72	0	1.64	1.25	H
1880	32.45	-32.53	0	1.64	1.56	H
1909.8	32.89	-32.74	0	1.64	1.79	H
1850.2	36.34	-36.73	0	1.64	1.25	V
1880	36.44	-36.52	0	1.64	1.56	V
1909.8	35.86	-35.71	0	1.64	1.79	V

Path Loss(dB)= S.G. Power-TX Cable loss+ TX Antenna Gain-SPA. Reading

3.3 Occupied Bandwidth Measurement

3.3.1 Description of Occupied Bandwidth Measurement

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

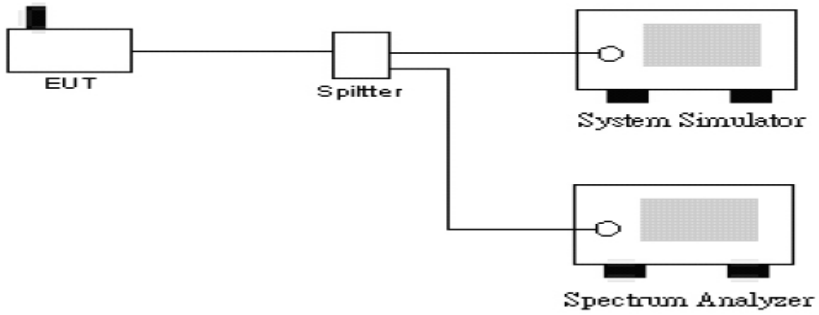
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the highest /middle /lowest channel for the highest RF powers were measured.

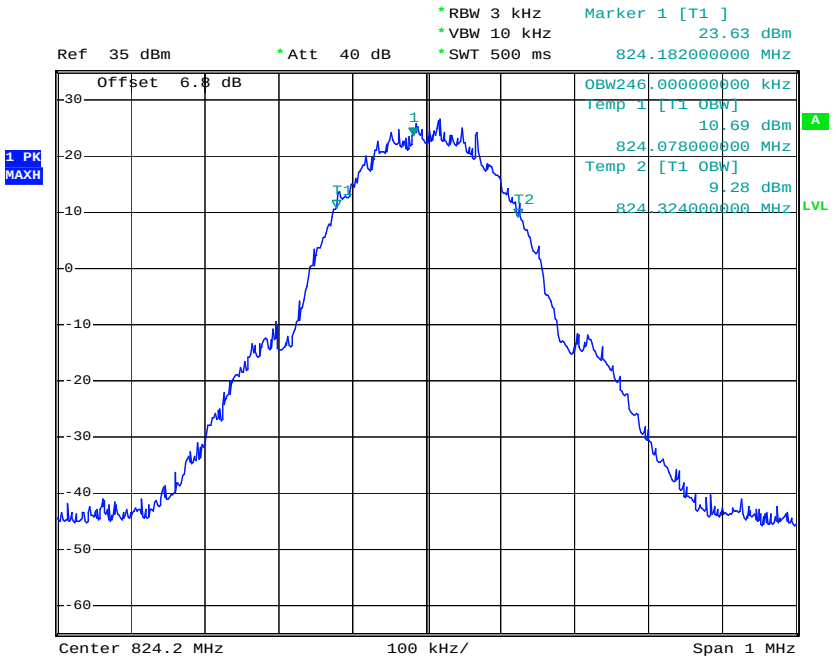
3.3.4 Test Setup



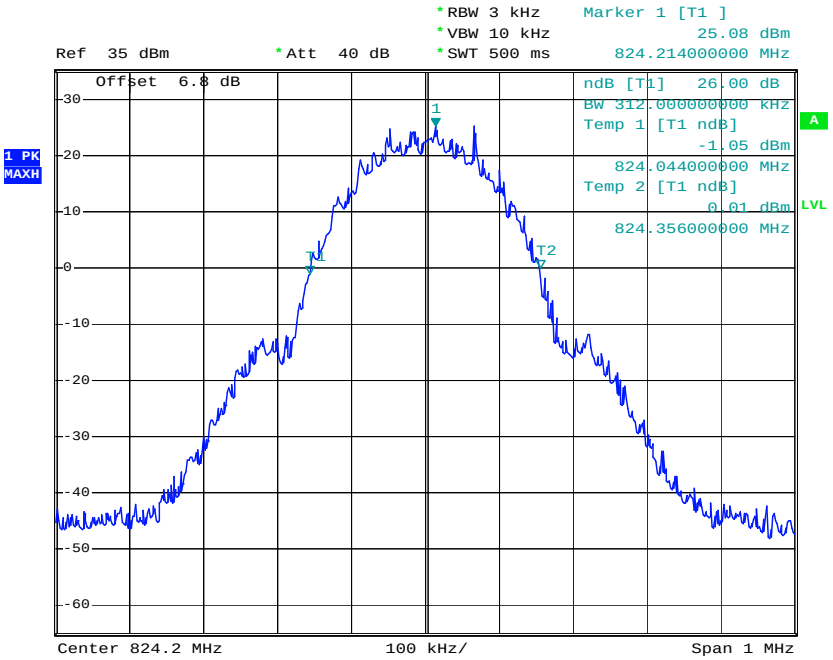
3.3.5 Test Result (Plots) of Occupied Bandwidth

Band :	GSM 850	Power Stage : High
Test Mode :	GSM Link	

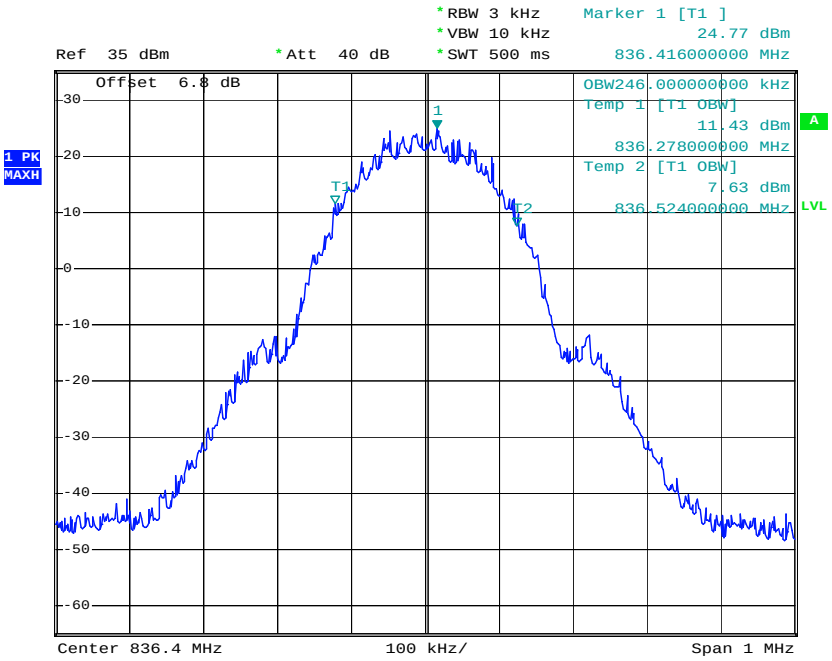
99% Occupied Bandwidth Plot on Channel 128



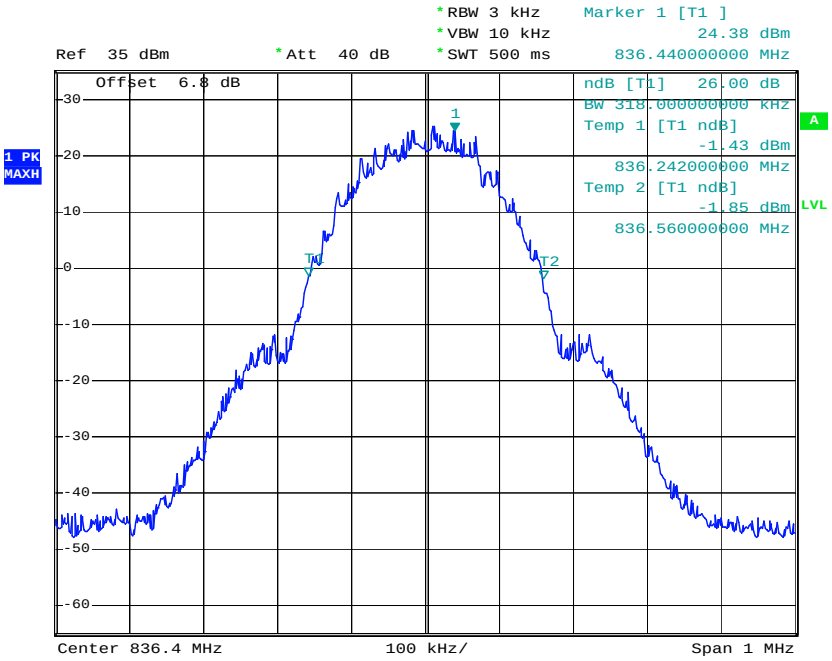
26dB Bandwidth Plot on Channel 128



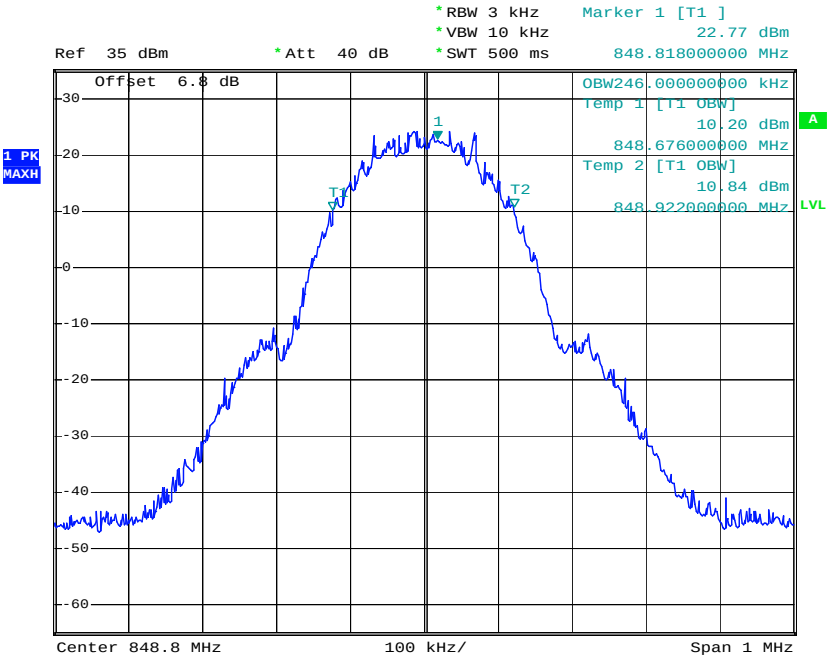
99% Occupied Bandwidth Plot on Channel 189



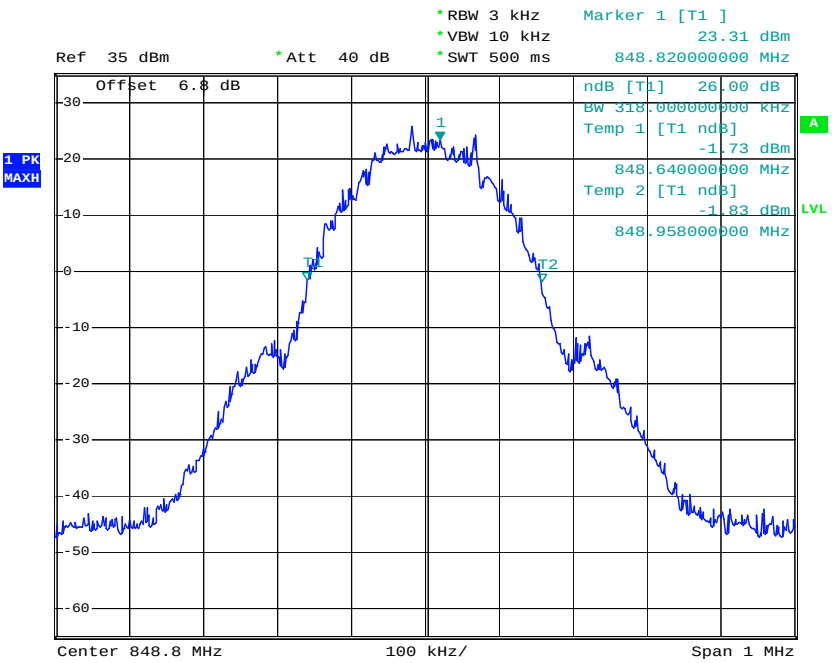
26dB Bandwidth Plot on Channel 189



99% Occupied Bandwidth Plot on Channel 251

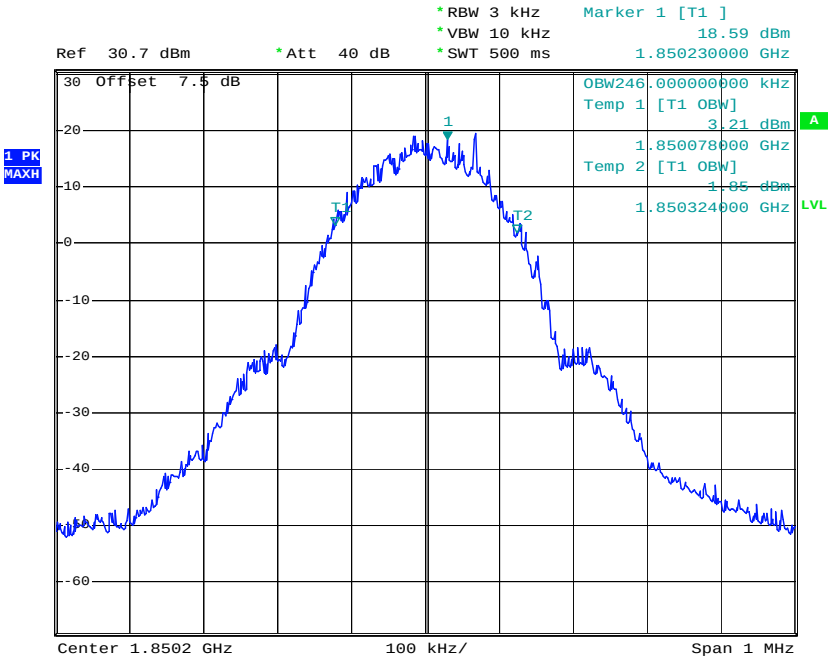


26dB Bandwidth Plot on Channel 251

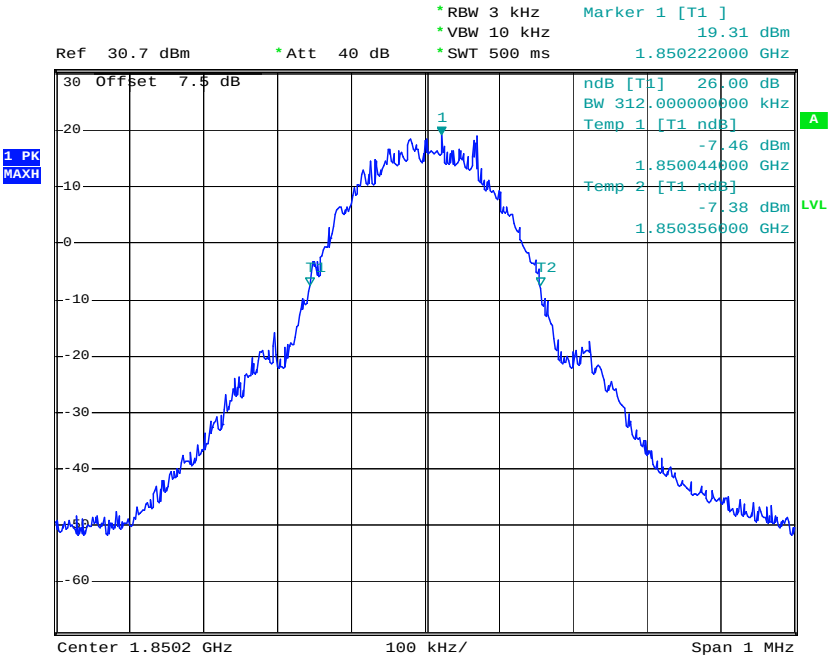


Band :	GSM 1900	Power Stage : High
Test Mode :	GSM Link	

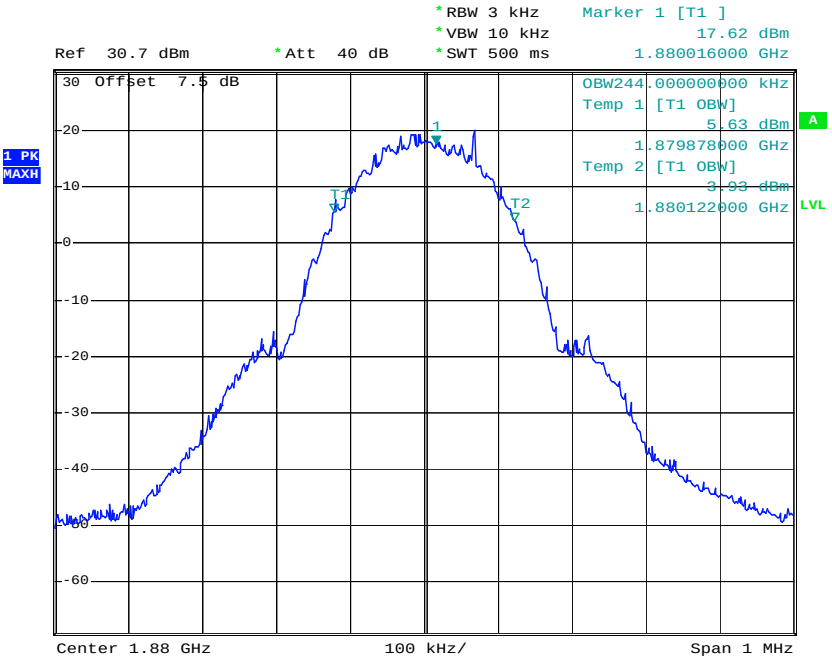
99% Occupied Bandwidth Plot on Channel 512



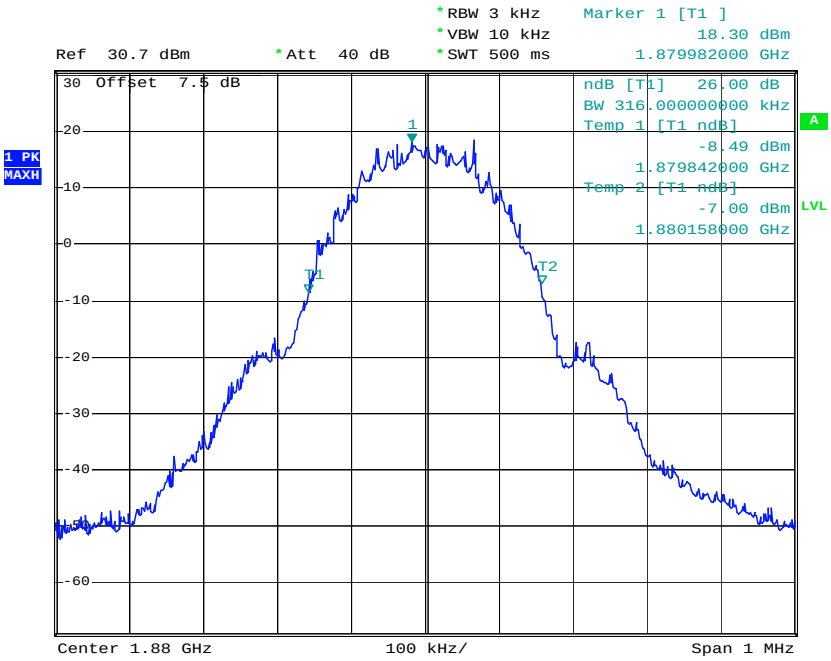
26dB Bandwidth Plot on Channel 512



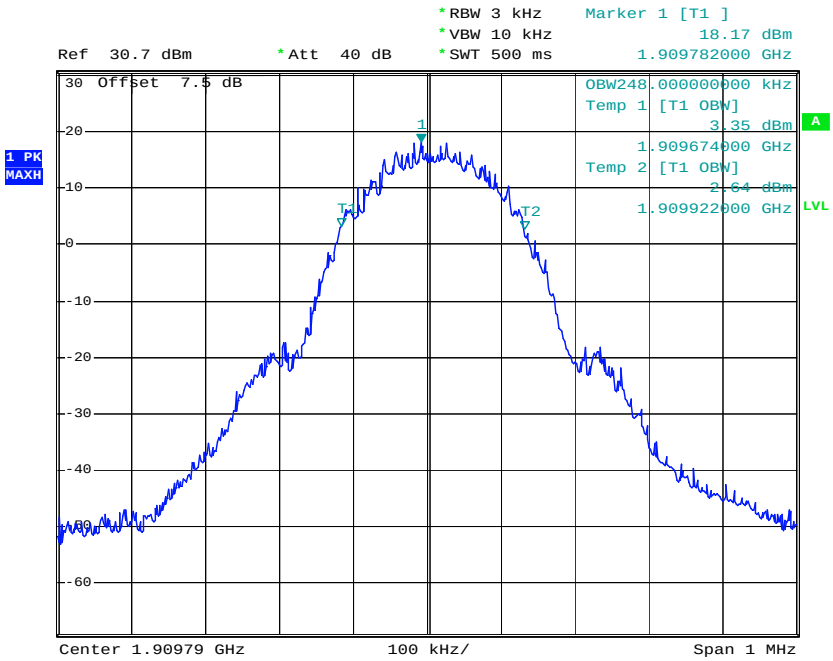
99% Occupied Bandwidth Plot on Channel 661



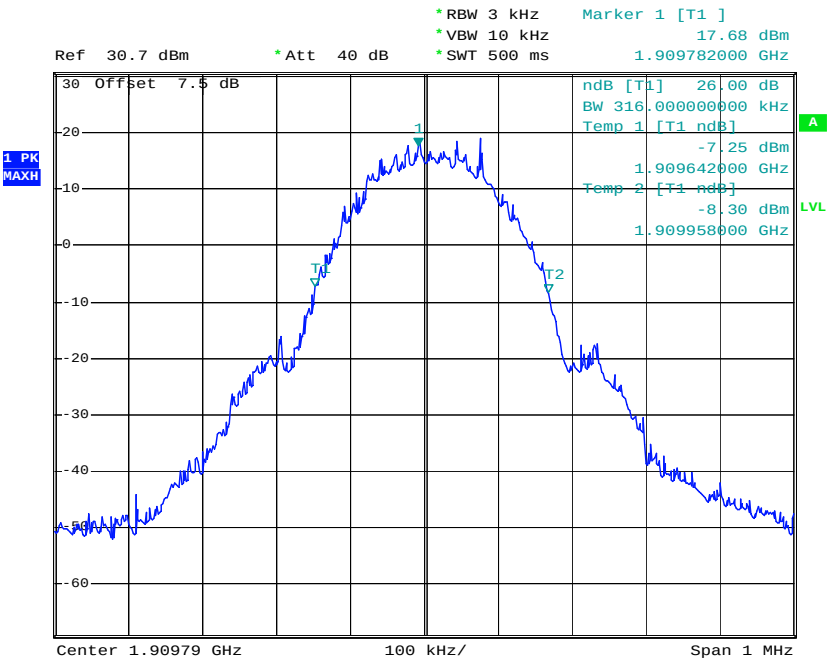
26dB Bandwidth Plot on Channel 661



99% Occupied Bandwidth Plot on Channel 810



26dB Bandwidth Plot on Channel 810



3.4 Band Edge Measurement

3.4.1 Description of Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB

3.4.2 Measuring Instruments

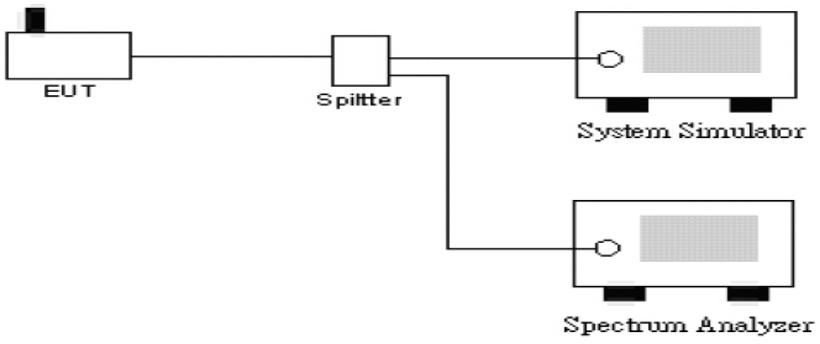
See list of measuring instruments of this test report.

3.4.3 Test Procedure

a. The EUT was connected to Spectrum Analyzer and Base Station via power divider.

b. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.

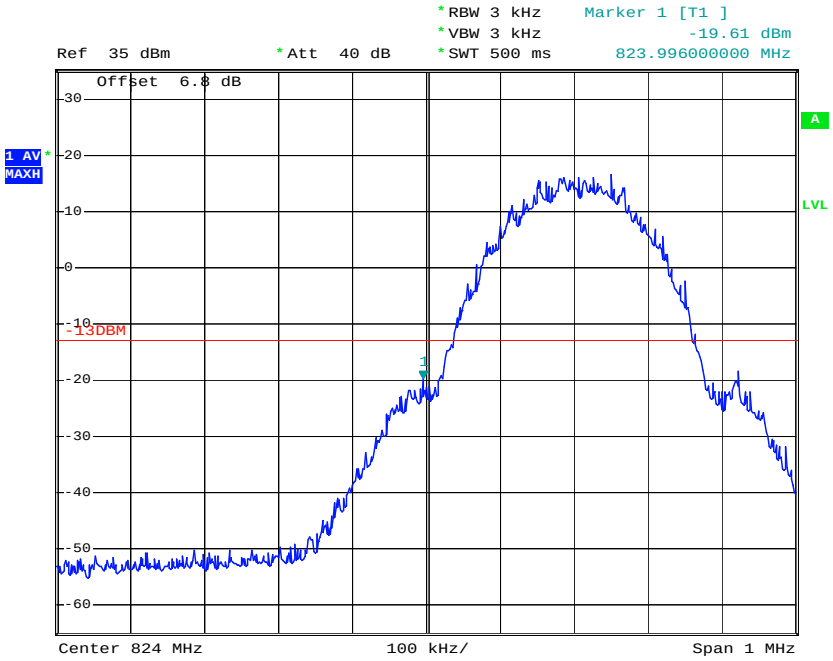
3.4.4 Test Setup



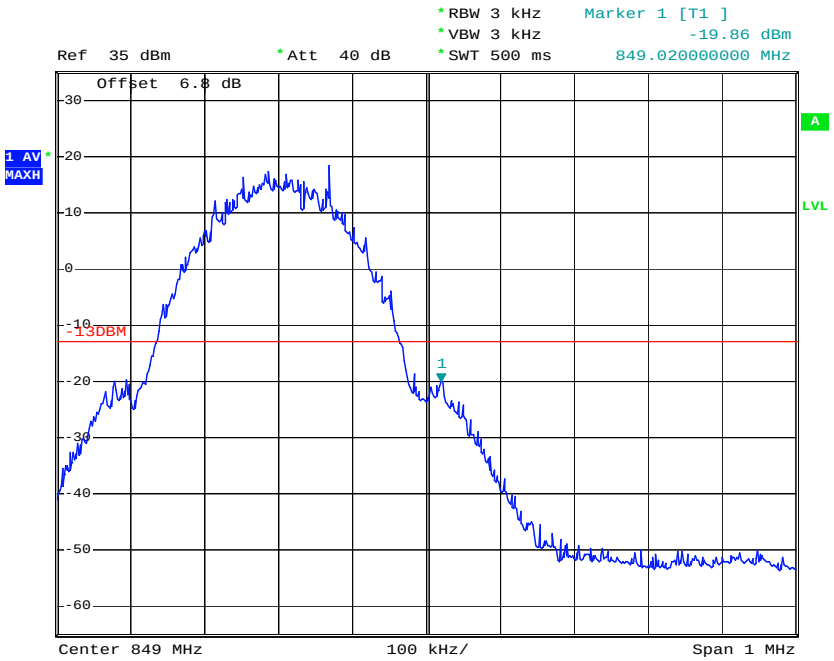
3.4.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	Power Stage :	High
Test Mode :	GSM Link		

Lower Band Edge Plot on Channel 128

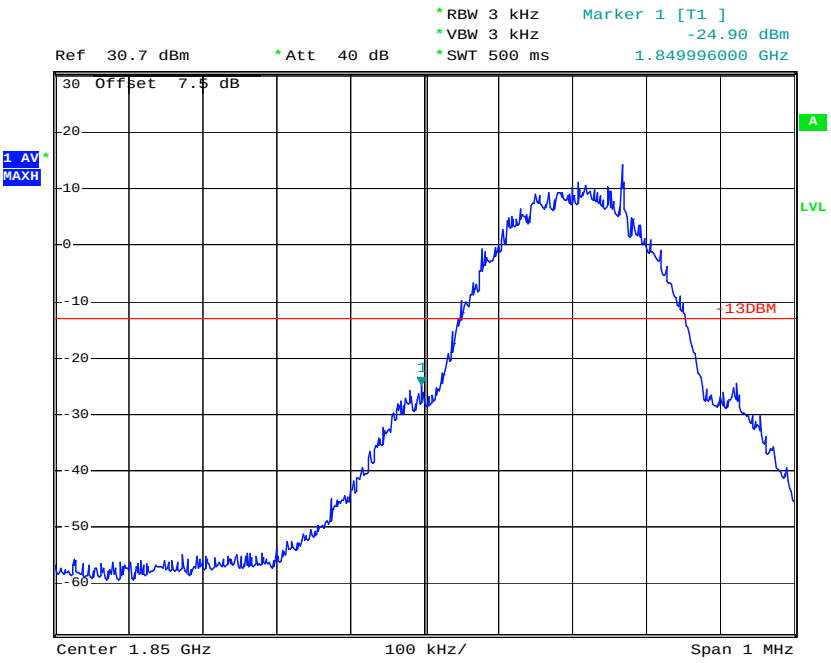


Higher Band Edge Plot on Channel 251

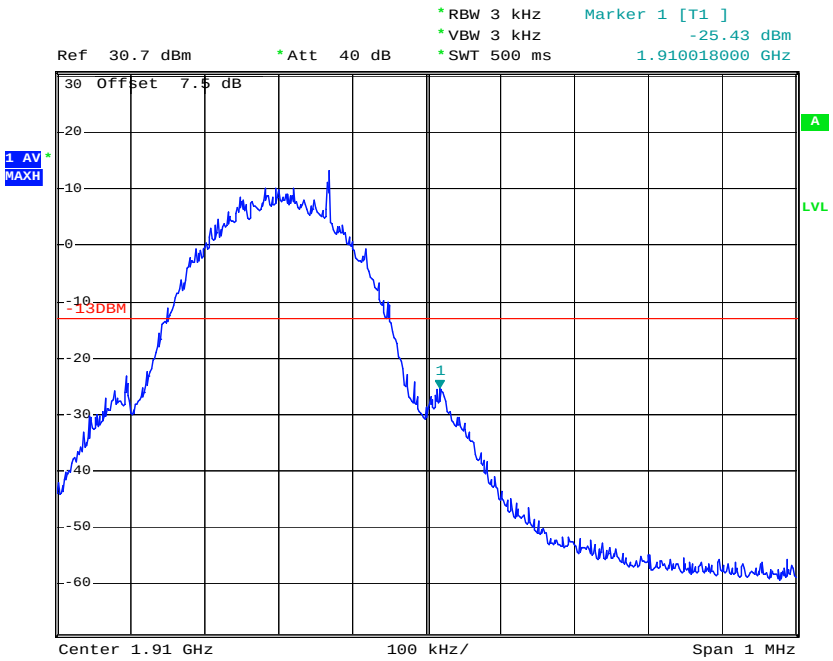


Band :	GSM1900	Power Stage :	High
Test Mode :	GSM Link		

Lower Band Edge Plot on Channel 512



Higher Band Edge Plot on Channel 810



3.5 Conducted Emission Measurement

3.5.1 Description of Conducted Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 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.

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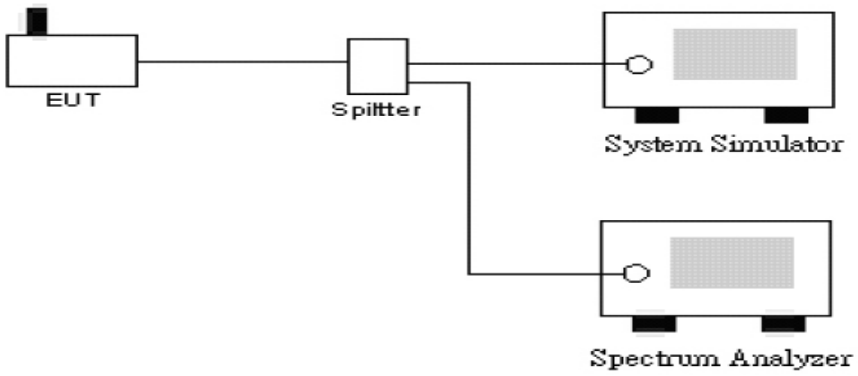
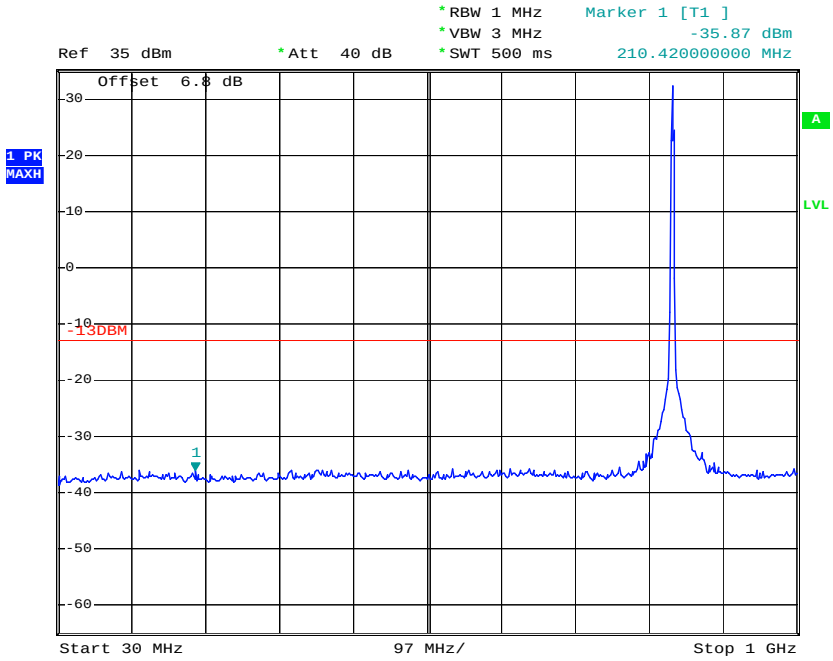
3.5.4 Test Setup



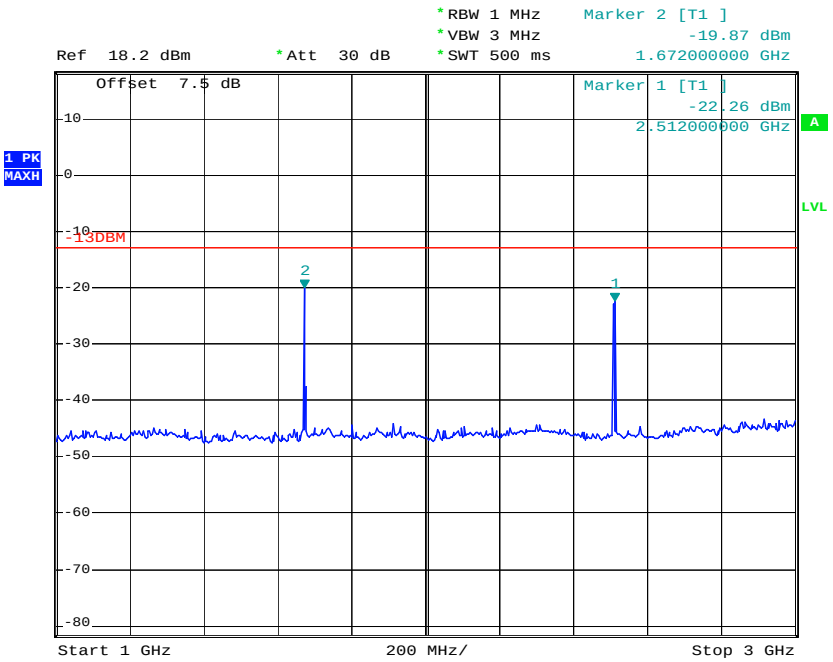
3.5.5 Test Result (Plots) of Conducted Emission

Band :	GSM850	Chnnel :	CH189
Test Mode :	GSM Link		

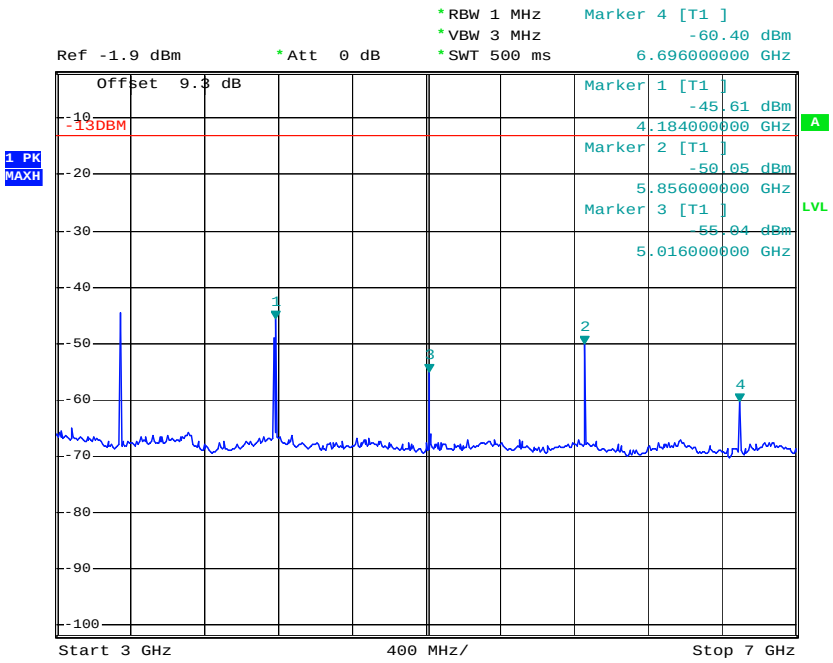
Conducted Emission Plot between 30MHz ~ 1GHz



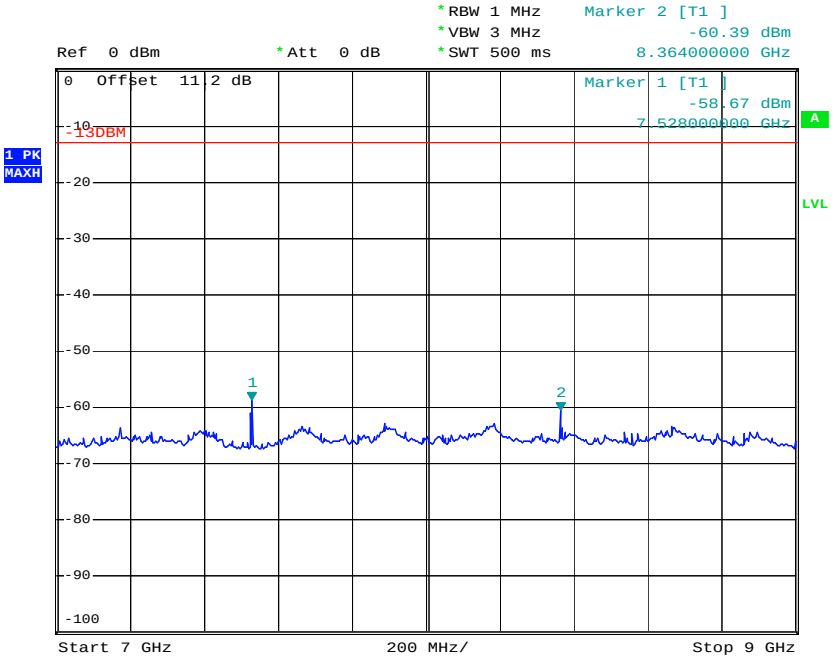
Conducted Emission Plot between 1GHz ~ 3GHz



Conducted Emission Plot between 3GHz ~ 7GHz

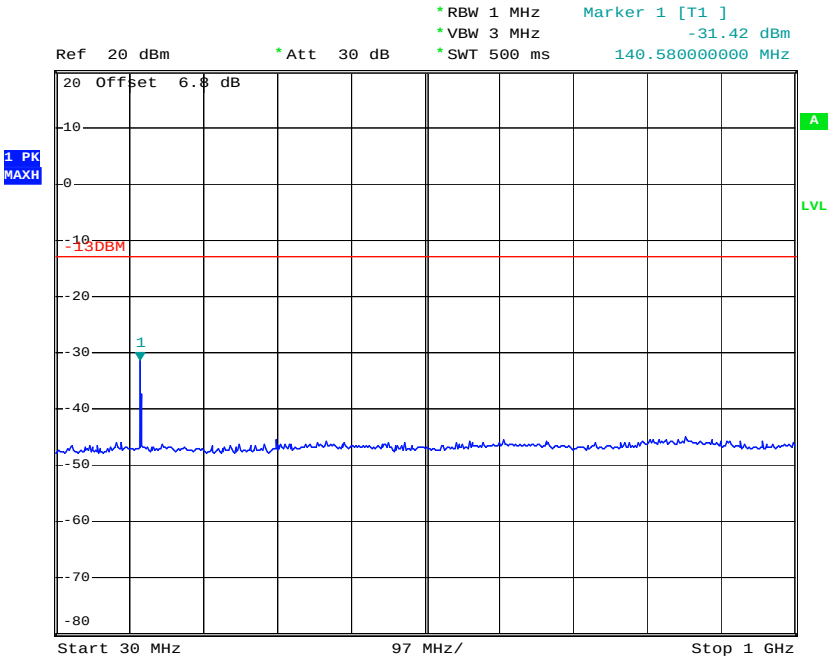


Conducted Emission Plot between 7GHz ~ 9GHz

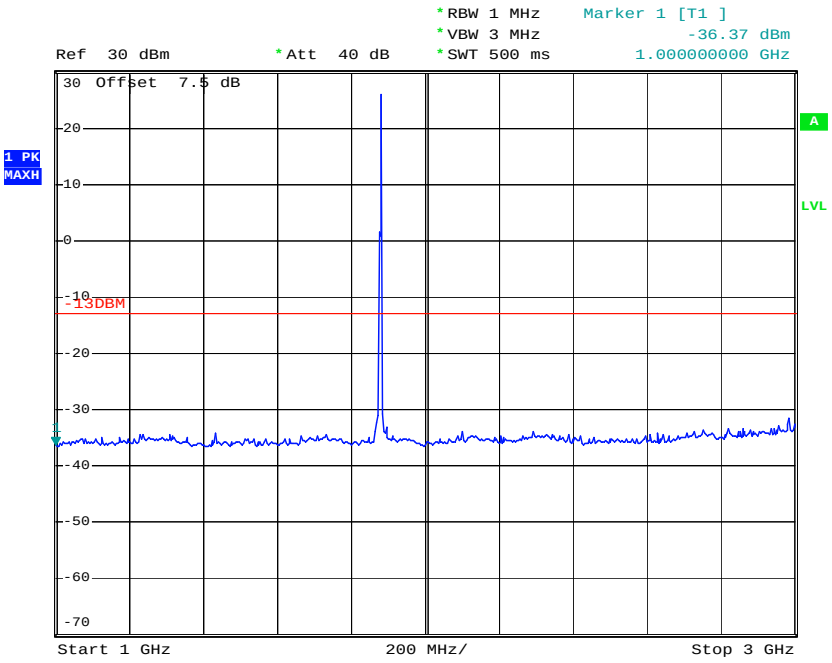


Band :	GSM1900	Channel :	CH661
Test Mode :	GSM Link		

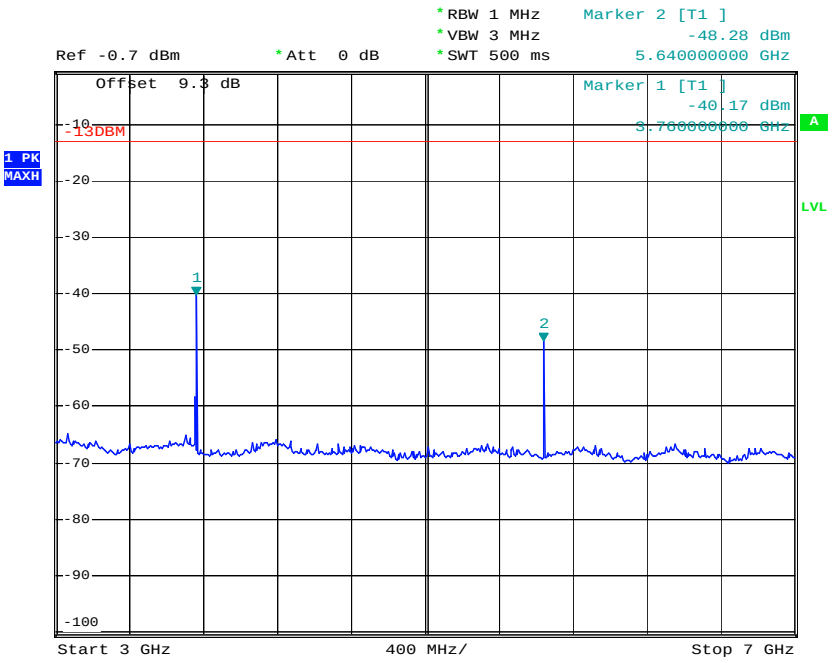
Conducted Emission Plot between 30MHz ~ 1GHz



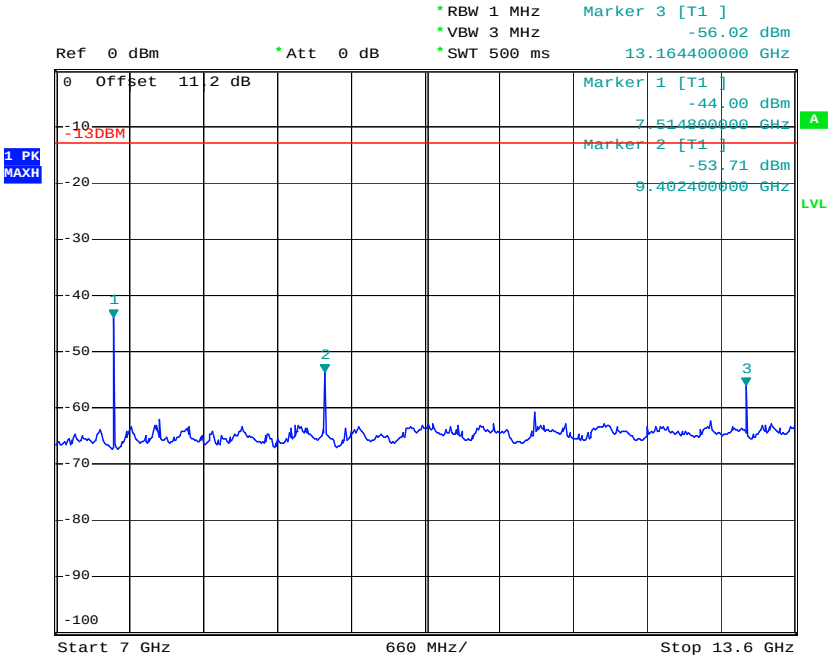
Conducted Emission Plot between 1GHz ~ 3GHz



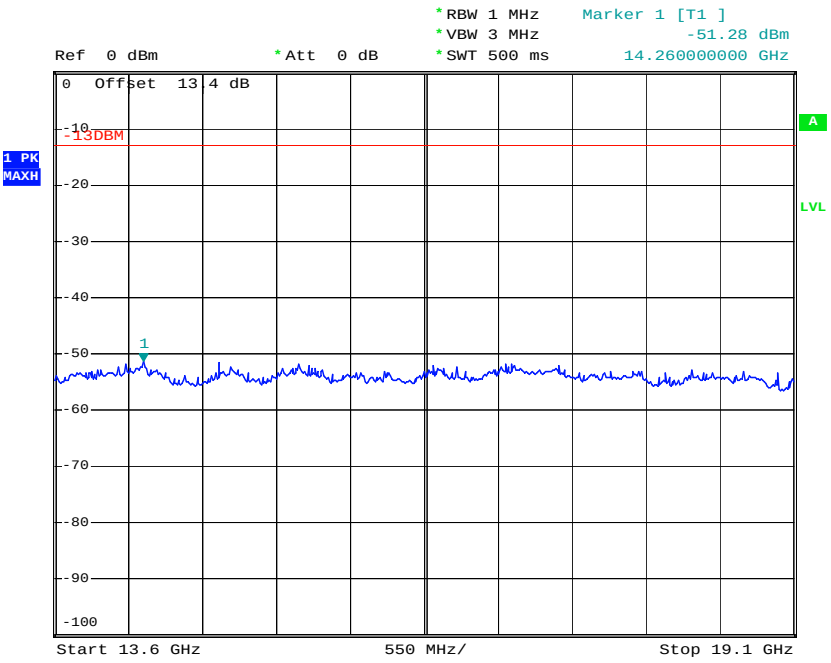
Conducted Emission Plot between 3GHz ~ 7GHz



Conducted Emission Plot between 7GHz ~ 13.6GHz



Conducted Emission Plot between 13.6GHz ~ 19.1GHz



3.6 Field Strength of Spurious Radiation Measurement

3.6.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic

3.6.2 Measuring Instruments

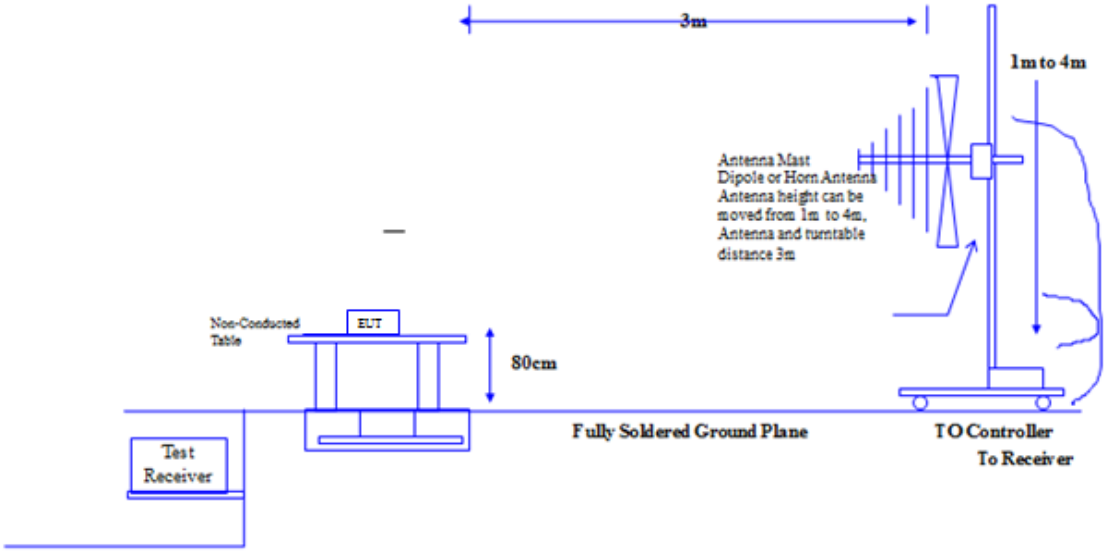
See list of measuring instruments of this test report.

3.6.3 Test Procedure

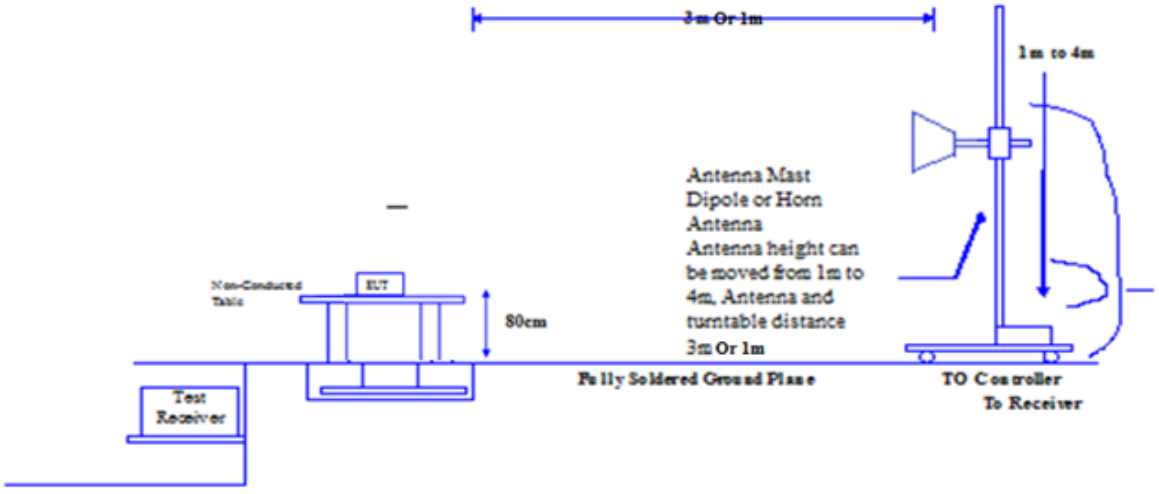
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Use the following spectrum analyzer settings:
   (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
   (2) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
   Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB)
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15

3.6.4 Test Setup

30MHz~1GHz



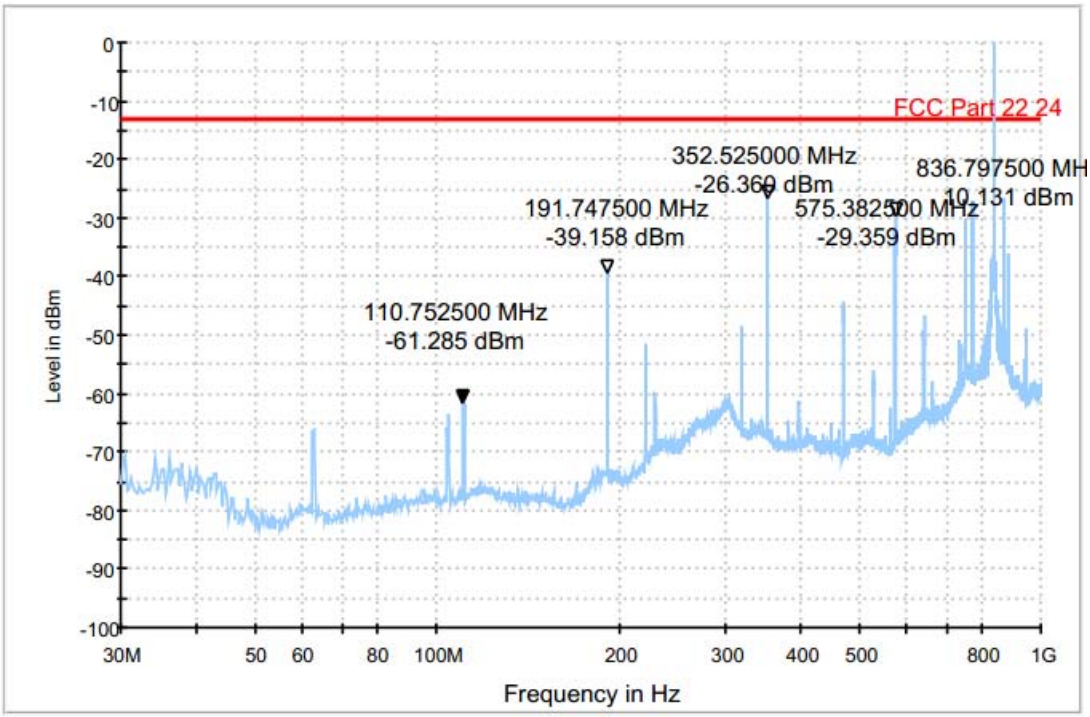
Above 1GHz



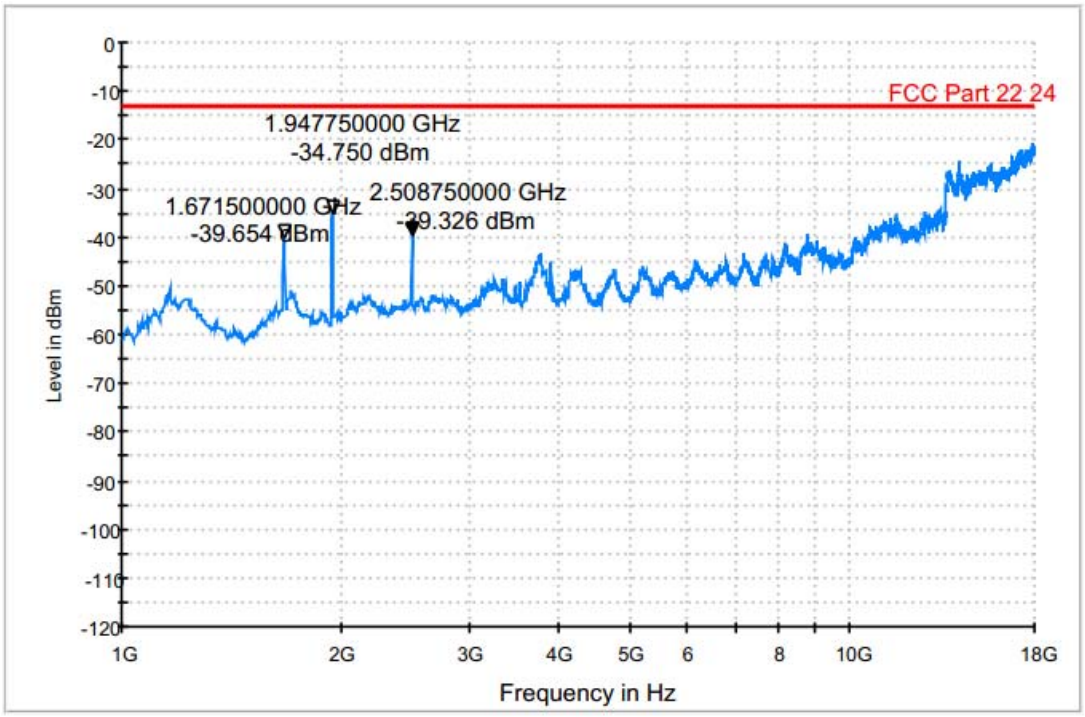
3.6.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM850
Test Mode :	GSM850 Link + Adapter
Test Voltage	120V/60Hz
Remark:	850MHz is Fundamental signal which can be ignored

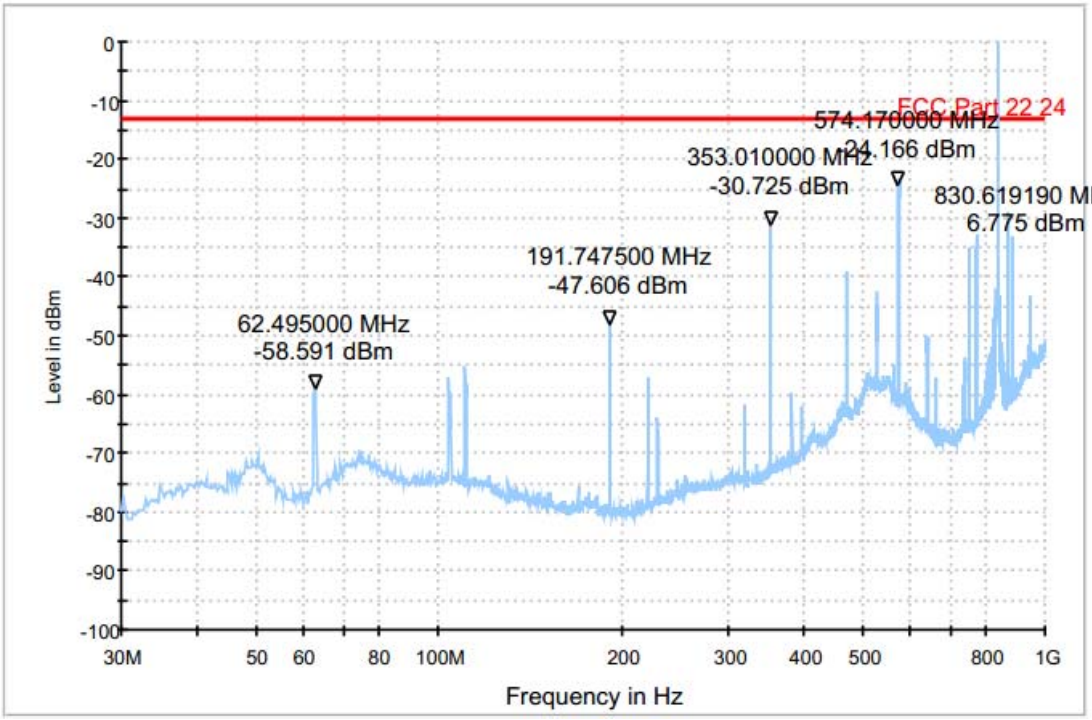
Field Strength of Spurious Radiated 30MHz-1GHz Vertical



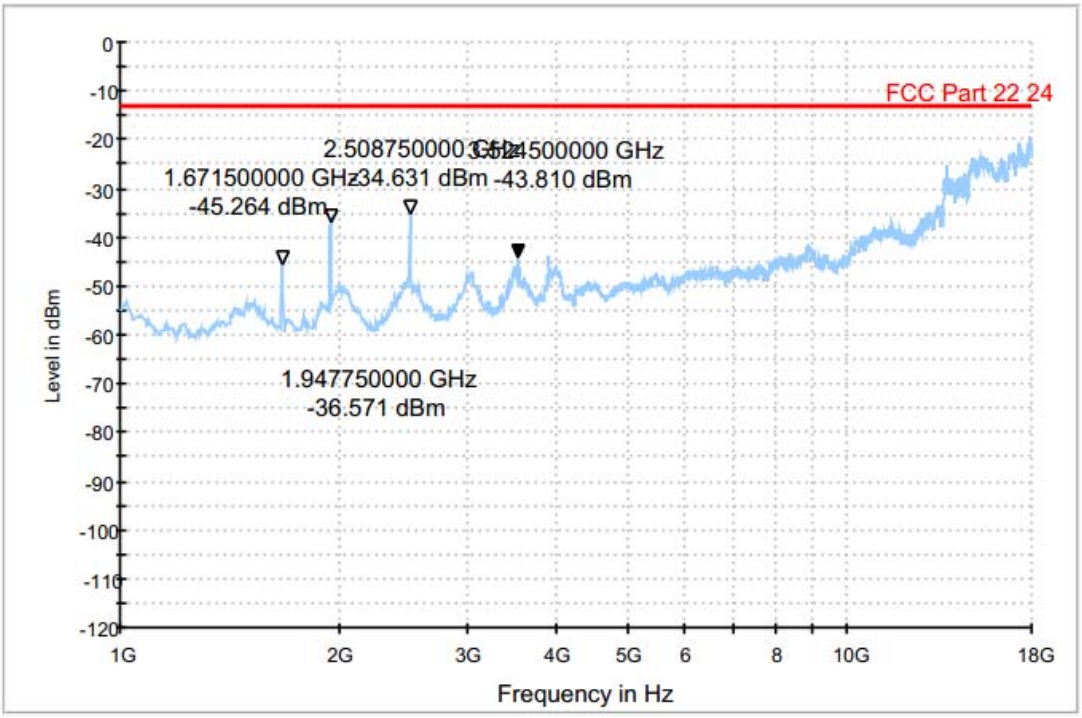
Field Strength of Spurious Radiated 1GHz-18GHz Vertical



Field Strength of Spurious Radiated 30MHz-1GHz Horizontal

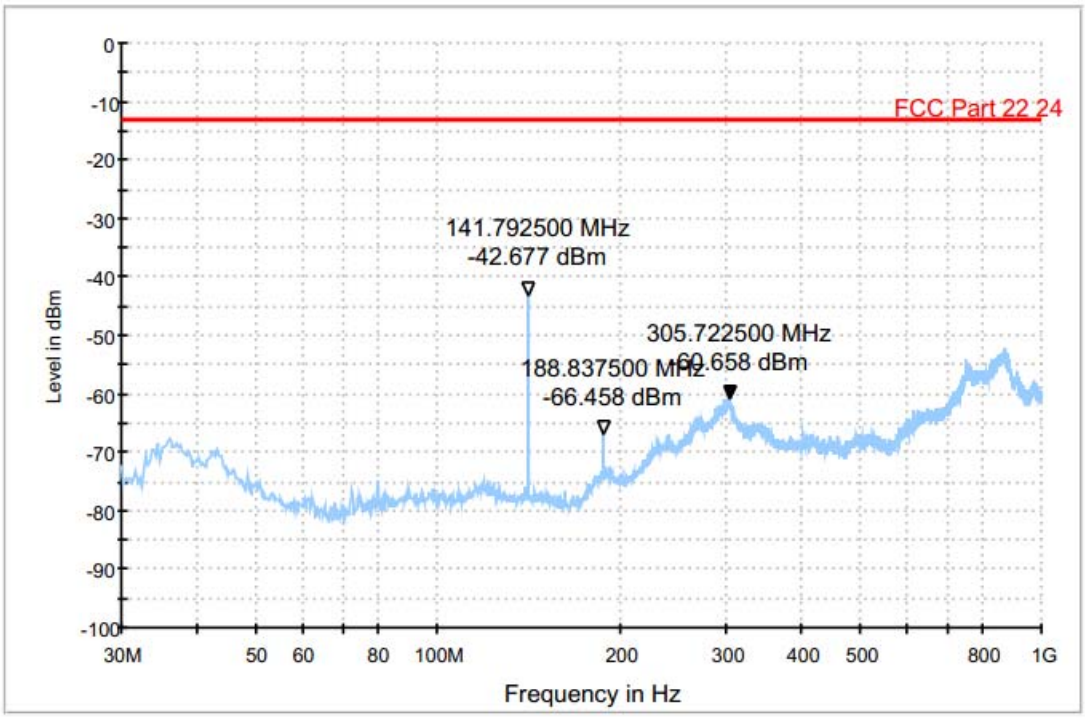


Field Strength of Spurious Radiated 1GHz-18GHz Horizontal

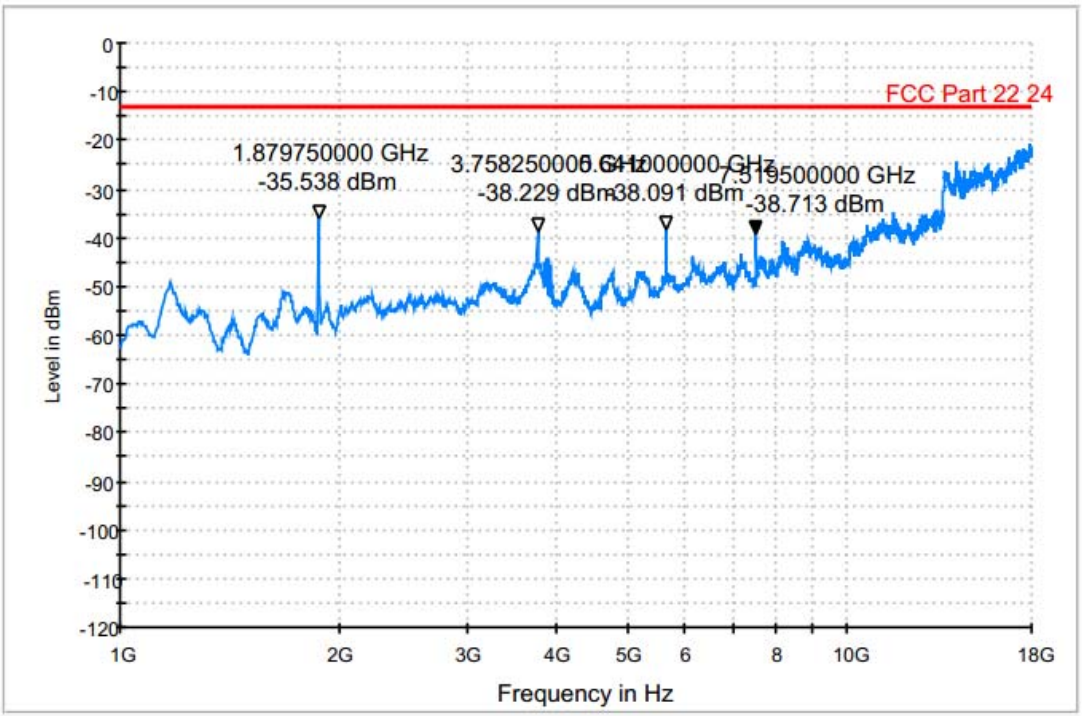


Band :	GSM1900
Test Mode :	GSM1900 Link + Adapter
Test Voltage	120V/60Hz
Remark:	1900MHz is Fundamental signal which can be ignored

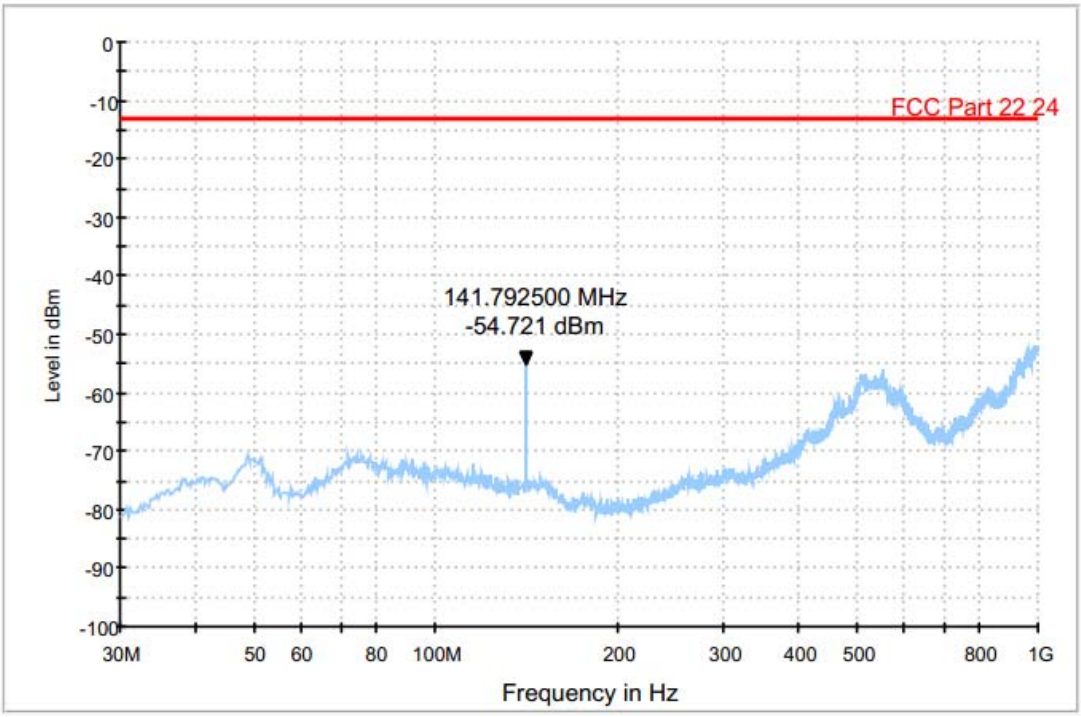
Field Strength of Spurious Radiated 30MHz-1GHz Vertical



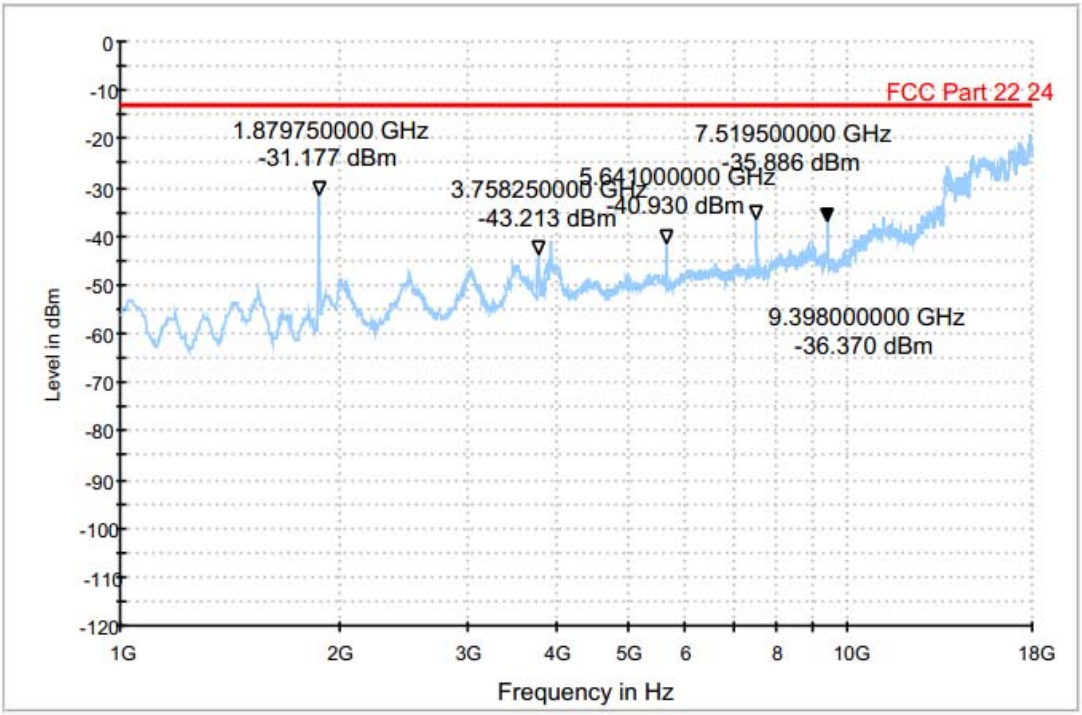
Field Strength of Spurious Radiated 1GHz-18GHz Vertical



Field Strength of Spurious Radiated 30MHz-1GHz Horizontal



Field Strength of Spurious Radiated 1GHz-18GHz Horizontal



3.6.6 Radiated Emission Measurement Results (18GHz-19.1GHz)

Test Engineer :	Hogan. He	**Temperature :**	23℃~26℃
		Relative Humidity :	35%~60%

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Notes:

The amplitude of radiated emissions that are attenuated by more than 20dB below the permissible value has no need to be reported. The measurement performed at 1meter distance from turn table to antenna.

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

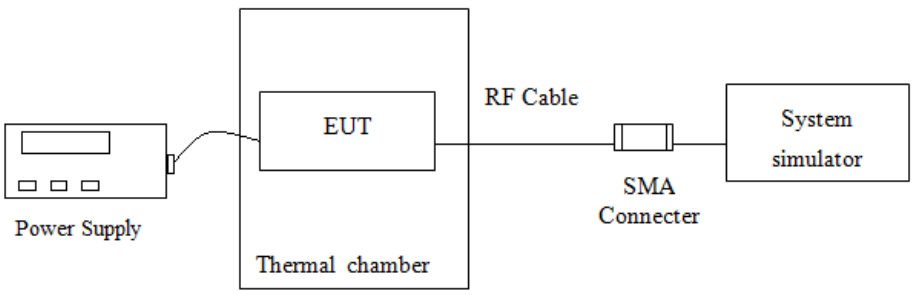
3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each
4. step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
5. If the EUT can not be turned on at -30°C, the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.7.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.7.5 Test Setup



3.7.6 Test Result of Temperature Variation

Band :	GSM 850	**Channel :**	189
Limit (ppm) :	2.5		

Temperature	**GSM850**		**Result**
	Feq. Dev.(Hz)	**Deviation(ppm)**	
-30	-61.3	-0.07	PASS
-20	-53.4	-0.06	
-10	-60.4	-0.07	
0	-55.7	-0.07	
10	-58.3	-0.07	
20	52.4	0.06	
30	-66.3	-0.08	
40	**-67.6**	**-0.08**	
50	-48.5	-0.06	

Band :	GSM 1900	**Channel :**	661
Limit (ppm) :	2.5		

Temperature	**GSM1900**		**Result**
	Feq. Dev.(Hz)	**Deviation(ppm)**	
-30	-62.4	-0.03	PASS
-20	-58.4	-0.03	
-10	-62.5	-0.03	
0	-57.4	-0.03	
10	-68.5	-0.04	
20	**-71.4**	**-0.04**	
30	49.5	0.03	
40	-51.3	-0.03	
50	-47.9	-0.03	

3.7.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Feq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GSM	3.8	-61.2	-0.07	2.5	PASS
		3.55	**-65.4**	**-0.08**		
		4.2	-48.3	-0.06		
GSM 1900 CH661	GSM	3.8	-56.4	-0.03		
		3.55	**-71.3**	**-0.04**		
		4.2	-59.4	-0.03		

4 List of Measuring Equipment

No	Instrument/Ancillary	Provider	Type/Model	Cal. Date
01	Base Station	Agilent	E5515C	2011.12.14
02	Spectrum Analyzer	R&S	FSP30(9kHz~30GHz)	2012.07.19
03	Antenna	Schwarzbeck	VULB9165(30M-1G)	2011.11.09
04	Antenna	Schaffner	HLA6120(9KHz~30MHz)	2011.11.09
05	Antenna	R&S	HF906(1G-18G)	2012.08.02
06	Antenna	Schwarzbeck	BBHA 9170 (15G-26.5G)	2011.11.09
07	High Pass Filter	R&S	System Integrated	2011.11.14
08	Thermal chamber	Hitachi	EC- 85MHP	2011.12.25
09	Pre-Amplifier	Agilent	83006A(0.01GHz-26.5GHz)	2012.8.06
10	Pre-Amplifier	Agilent	83006A(0.01GHz-26.5GHz)	2012.8.06
11	Helical Antenna	ETS	3102 (1G-10G)	NCR
12	Power Meter	R&S	NRP(10MHz~8GHz)	2011.12.05
13	Relay Switch	R&S	TS-REMI	NCR
14	Signal Generator	R&S	SMR20(10MHz-20 GHz)	2011.12.05
15	LISN	ROHDE&SCHWARZ	ENV216 TWO-LINE V-NETWORK	2011.11.13
16	Power Meter	Agilent	E4418B (EPM Series)	2011.12.14
17	Power Sensor	Agilent	E4412A (E-series CW)	

5 Uncertainty Evaluation

5.1 Ucertainty of Radiated Spurious Emission evaluation (30MHz~1GHz)

Radiated Spurious Emission Measurement Uncertainty Evaluation					
Contribution		Probability Distribution	Partition Coefficient	u(xi)	
				Horizontal 30-1000MHz	Vertical 30-1000MHz
Cable Loss Calibration	U_{01}	U-Shape	1.41	0.16	0.16
Sine wave voltage accuracy of Spectrum analyzer	U02	Triangle	2.45	0.82	0.82
Impulse response of spectrum analyzer	U03	Triangle	2.45	0.61	0.61
Pulse repetition rate of spectrum analyzer	U04	Triangle	2.45	0.61	0.61
Spectrum analyzer noise level	U05	Normal	2.00	0.25	0.25
Measurement of the signal path mismatch	U06	U-Shape	1.41	0.28	0.28
Free-space antenna factor	U07	Normal	2.00	0.70	0.70
Antenna Factor Interpolation for Frequency	U08	Rectangular	1.73	0.17	0.17
Antenna factor with height in the correlation	U09	Rectangular	1.73	0.17	0.17
Measurementantennaand theabsorbingmaterialintheimageof themutualcoupling effect	U10	Rectangular	1.73	0.58	0.58
Antenna phase center variation	U11	Rectangular	1.73	0.13	0.13
Antenna cross polarization response	U12	Rectangular	1.73	0.52	0.52
Antenna imbalance	U13	Rectangular	1.73	0.52	0.52
Test distance error	U14	Rectangular	2.45	1.02	1.22
Desktop terrain clearance variation	U15	Normal	1.73	0.17	0.17
Random uncertainty	U16	Standard deviation	2.00	0.05	0.05
Pre-Amplifier gain Calibration	U17	U-Shape	1.00	0.10	0.11
Combined Standard Uncertainty Uc(y)	Uc	Normal	1.00	2.03	2.14
Measuring Uncertainty for a level of Confidence of 95%(U= 2Uc(y))	U=kUc	Normal	k	4.05	4.28

5.2 Uncertainty of Radiated Spurious Emission evaluation (1GHz~26.5GHz)

Radiated Spurious Emission Measurement Uncertainty Evaluation					
Contribution		Probability Distribution	Partition Coefficient	u(xi)	
				Horizontal 1-26.5GHz	Vertical 1-26.5GHz
Cable Loss Calibration	U01	U-Shape	2.00	0.04	0.04
Sine wave voltage accuracy of Spectrum analyzer	U02	Triangle	2.45	0.82	0.82
Impulse response of spectrum analyzer	U03	Triangle	2.45	0.61	0.61
Pulse repetition rate of spectrum analyzer	U04	Triangle	2.45	0.61	0.61
Spectrum analyzer noise level	U05	Normal	2.00	0.25	0.25
Measurement of the signal path mismatch	U06	U-Shape	1.41	0.69	0.69
Free-space antenna factor	U07	Normal	2.00	0.50	0.50
Antenna Factor Interpolation for Frequency	U08	Rectangular	1.73	0.17	0.17
Antenna factor with height in the correlation	U09	Rectangular	1.73	NA	NA
Measurementantennaand theabsorbingmaterialintheimageof themutualcoupling effect	U10	Rectangular	1.73	0.58	0.58
Antenna phase center variation	U11	Rectangular	1.73	0.13	0.13
Antenna cross polarization response	U12	Rectangular	1.73	0.52	0.52
Antenna imbalance	U13	Rectangular	1.73	0.52	0.52
Test distance error	U14	Rectangular	2.45	2.36	2.36
Desktop terrain clearance variation	U15	Normal	1.73	0.17	0.17
Random uncertainty	U16	Standard deviation	2.00	0.05	0.05
Pre-Amplifier gain Calibration	U17	U-Shape	1.00	0.09	0.10
Combined Standard Uncertainty Uc(y)	Uc	Normal	1.00	2.95	2.96
Measuring Uncertainty for a level of Confidence of 95%(U= 2Uc(y))	U=kUc	Normal	k	5.91	5.92