Report No.SH14060005W01

FCC RF TESTREPORT

Issued to

Roadefend Vision Technology (Shanghai) Co., Ltd

For

Driver Fatigue Surveillance System

Model Name	:	RTD-300B
Trade Name	:	Roadefend
Brand Name	:	Roadefend
FCC ID		2ACYXRDT14001
Standard	:	47 CFR Part 22 Subpart H
		47 CFR Part 24 Subpart E
Test date	:	Aug.05,2014 to Aug.08,2014
Issue date	:	Aug.10,2014

by

Shanghai MORLAB Communications Technology Co., Ltd.

Tested by Mu Wenping — Mu Wenping

Approved by wei Bei — Wei Bei

Review by Gu Yeqiang — GuYeqiang

CTIA Authorized Test Lab LAB CODE 20081223-00 IEEE 1725 OTA OFTA 電訊管理局 ilac-MRA TAF Testing Laboratory 2030 GCF Official Observer of Global Certification Forum Bluetooth BQTF FCC Reg. No.741109

The report refers only to the sample tested and does not apply to the bulk. This report is issued in confidence to the client and it will be strictly treated as such by the Shanghai MORLAB Communication Technology Co., Ltd. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it .or a certified copy there of prepared by the Shanghai MORLAB Telecommunications Co., Ltd to his customer. Supplier or others persons directly concerned. Shanghai MORLAB Telecommunications Co., Ltd will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report. In the event of the improper use of the report,Shanghai MORLAB Telecommunications Co., Ltd reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

DIRECTORY

1. General Information 4

1.1 Applicant 4

1.2 Manufacturer 4

1.3 Description of EUT 5

2. Facilities and Accreditations 6

2.1 Test Facility 6

2.2 Environmental Conditions 6

2.3 List of Equipments Used 6

3. Test Standards and Results 7

4. Test Result 8

4.1 Conducted Output Power 8

4.2 Occupied Bandwidth 10

4.3 Frequency Stability 14

4.4 Conducted Out of Band Emissions 20

4.5 Band Edge 27

4.6 Transmitter Radiated Power (EIRP/ERP) 32

4.7 Radiated Out of Band Emissions 35

Change History

Issue	Date	Reason for change
1.0	Aug.10,2014	First edition

1. General Information

1.1 Applicant

Roadefend Vision Technology (Shanghai) Co.,Ltd
Room 602~604, 1st Building, No. 65 Chifeng Road, Shanghai 200092, China

1.2 Manufacturer

Roadefend Vision Technology (Shanghai) Co.,Ltd
Room 602~604, 1st Building, No. 65 Chifeng Road, Shanghai 200092, China

1.3 Description of EUT

EUT Type ..... :	Driver Fatigue Surveillance System
Brand Name..... :	Roadefend
TradeName ..... :	Roadefend
ModelName..... :	RTD-300B
Hardware Version ..... :	RPHV2.0
Software Version ..... :	RPHS2.0
Antenna type…… :	Monopole
Antenna gain…… :	-1 dBi
Frequency Range.....	GSM 850MHz: Tx: 824.20-848.80 MHz (at intervals of 200kHz); Rx: 869.20-893.80 MHz (at intervals of 200kHz) GSM 1900MHz Tx: 1850.20-1909.80 MHz (at intervals of 200kHz); Rx: 1930.20-1989.80 MHz (at intervals of 200kHz)
Modulation Type ..... :	GPRS/GSM mode with GMSK modulation EGPRS mode with 8PSK modulation
Power supply ..... :	DC9-36V

NOTE：

(1) The transmitter (Tx) frequency arrangement of the cellular850MHz used by the EUT can be represented with the formula F(n)=824.2+0.2(n-128), 128<=n<=251; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190(836.6MHz) and 251 (848.8MHz)；the PCS 1900MHz used by the EUT can be represented with the formula F(n)=1850.2+0.2*(n-512), 512<=n<=810; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661(1880.0MHz) and 810 (1909.8MHz).*

(2) For a more detailed description, please refer toSpecification or User'sManual supplied by the applicant and/or manufacturer.

2. Facilities and Accreditations

2.1 Test Facility

ShanghaiMORLABCommunications Technology Co., Ltd. MORLABLaboratory is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6644. A 9*6*6(m) fully anechoic chamber was used for the radiated spurious emissions test.

2.2 Environmental Conditions

Ambient temperature: 20~25°C
Relative humidity: 40~60%
Atmosphere pressure: 86-102kPa

2.3 List of Equipments Used

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB46040102	2013.9	1year
Spectrum Analyzer	Agilent	E4440A	MY49420287	2013.9	1year
Spectrum Analyzer	Rohde&Schwarz	FSU26	200880	2013.10	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Power Splitter	Mini-Circuits	ZFRSC-183-S+	765001016	(n.a.)	(n.a.)
Attenuator 1	Mini-Circuits	10dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	10dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 3	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)
DC Power Supply	Good Will	GPS-3030DD	EF920938	2013.10	2year
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2013.9	1year
Full-AnechoicChamber	Albatross	9m*6m*6m	(n.a.)	2013.1	2year
Singal Generator	Agilent	E4433B	MY43350266	2013.9	1year
Broadband Trilog Antenna	Schwarzbeck	VULB 9163	9163-561	2012.7	3year
Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1033	2012.7	3year
Test Antenna-Loop	Rohde&Schwarz	HFH2-Z2	860004/001	2013.9	1year

NOTE:
Equipments listed above have been calibrated and are in the period of validation.

3. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22and part 24 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS
2	47 CFR Part 22	PUBLIC MOBILE SERVICES
3	47 CFR Part 24	PERSONAL COMMUNICATIONS SERVICES

Test detailed items/section required by FCC rules& IC rulesandresults are as below:

No.	FCC Rules	Description	Result
1	2.1046	Conducted Output Power	PASS
2	2.1049	99%/-26dBOccupied Bandwidth	PASS
3	2.1055 22.355 24.235	Frequency Stability	PASS
4	2.1051 2.1057 22.917 24.238	Conducted Out of Band Emissions	PASS
5	2.1051 2.1057 22.917 24.238	Band Edge	PASS
6	22.913 24.232	Transmitter Radiated Power (EIPR/ERP)	PASS
7	2.1053 2.1057 22.917 24.238	Radiated Out of Band Emissions	PASS

NOTE: Measurement method according to TIA/EIA 603.D-2010

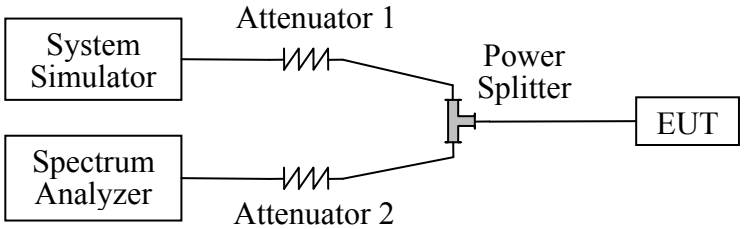
4. Test Result

4.1 Conducted Output Power

4.1.1 Requirement

According toFCCsection2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

4.1.2 Test Description



The EUT, which is powered by the DC Power Supply, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter;the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factoris calibrated to correct the reading.The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. Acall is established between the EUT and the SS.

4.1.3 Test Result

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

Band	Channel	Frequency (MHz)	Measured Output Power(dBm)	Limited (dBm)	Verdict
GSM 850MHz	128	824.2	31.45	38.5	PASS
	190	836.6	31.63	38.5	PASS
	251	848.8	31.78	38.5	PASS
GSM 1900MHz	512	1850.2	29.03	33.0	PASS
	661	1880	29.35	33.0	PASS
	810	1909.8	29.55	33.0	PASS
GPRS 850MHz	128	824.2	30.77	38.5	PASS
	190	836.6	30.89	38.5	PASS
	251	848.8	31.00	38.5	PASS
GPRS 1900MHz	512	1850.2	28.78	33.0	PASS
	661	1880	29.34	33.0	PASS
	810	1909.8	29.57	33.0	PASS
EGPRS 850MHz	128	824.2	26.77	38.5	PASS
	190	836.6	26.89	38.5	PASS
	251	848.8	26.00	38.5	PASS
EGPRS 1900MHz	512	1850.2	25.78	33.0	PASS
	661	1880	25.34	33.0	PASS
	810	1909.8	25.57	33.0	PASS

Note :

1) For the GPRS/EGPRS model, all the slots were tested and just the worst data was record in this report.

4.2 99%/-26dBOccupied Bandwidth

4.2.1 Definition

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.
Occupied bandwidth is also known as the 99% emission bandwidth.

4.2.2 Test Description

See section 4.1.1 of this report.

4.2.3 Test Results

Here the lowest, middle and highest channels are tested to record the 99% occupied bandwidth, it's about 300kHz.

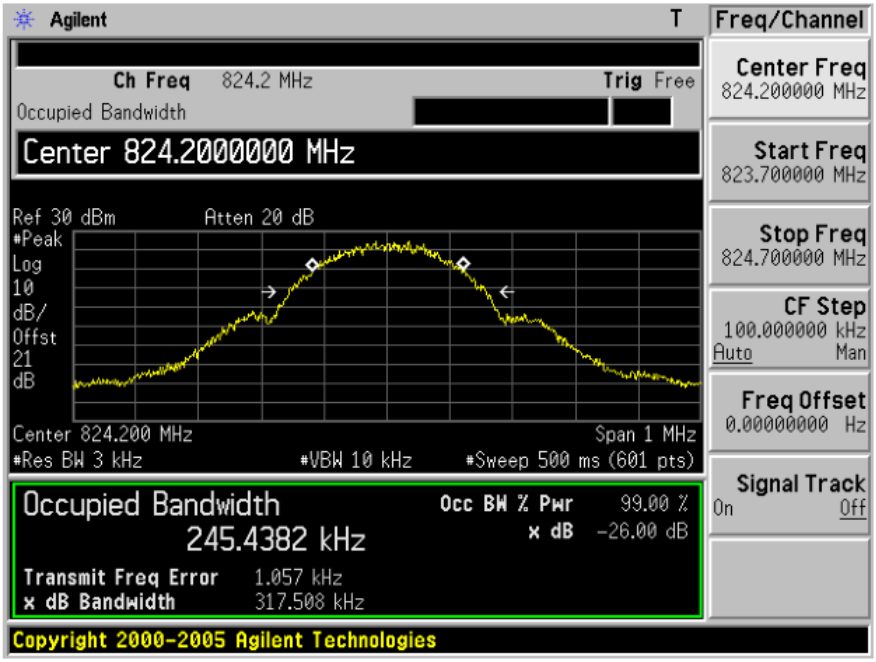
Band	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26dB Occupied Bandwidth (MHz)	Refer to Plot
GSM/GPRS 850MHz	128	824.2	0.2454	0.3175	A1
	189	836.4	0.2441	0.3130	A2
	251	848.8	0.2457	0.3213	A3
GSM/GPRS 1900MHz	512	1850.2	0.2395	0.3132	B1
	661	1880	0.2440	0.3137	B2
	810	1909.8	0.2434	0.3103	B3
EGPRS 850MHz	128	824.2	0.2372	0.3138	C1
	189	836.4	0.2462	0.3044	C2
	251	848.8	0.2397	0.2967	C3
EGPRS 1900MHz	512	1850.2	0.2467	0.2990	D1
	661	1880	0.2451	0.3080	D2
	810	1909.8	0.2442	0.3137	D3

Note :

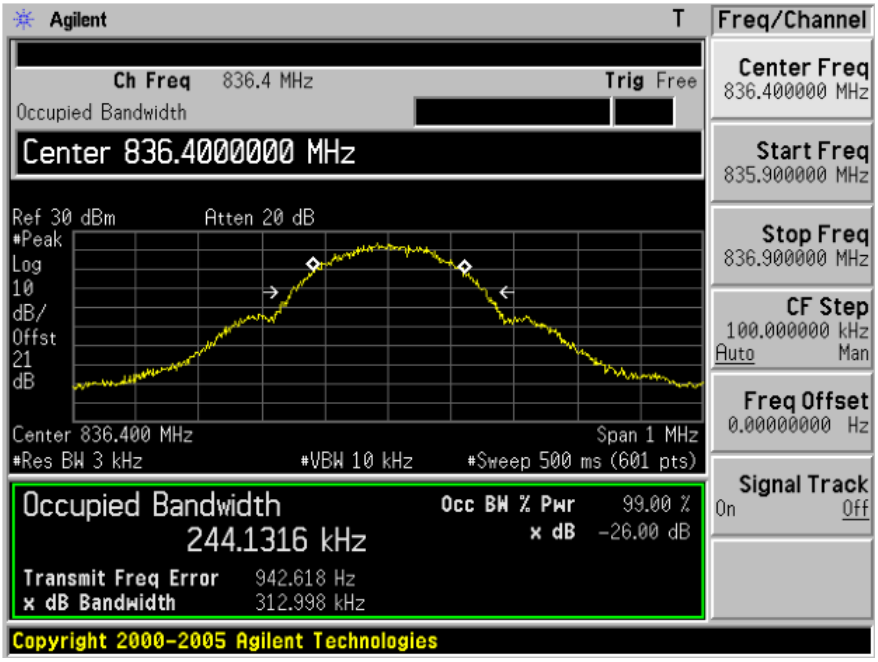
1) Both GSM/GPRS mode was tested and the worst data was record.

2) For the GPR/EGPRS mode, all the slots were tested and just the worst data was record in this report.

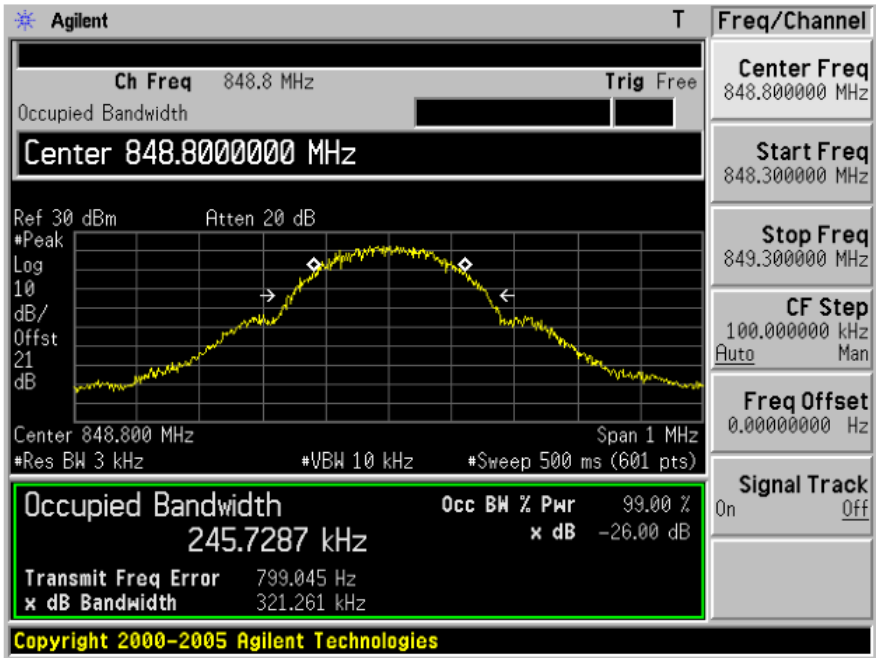
Test Plots:



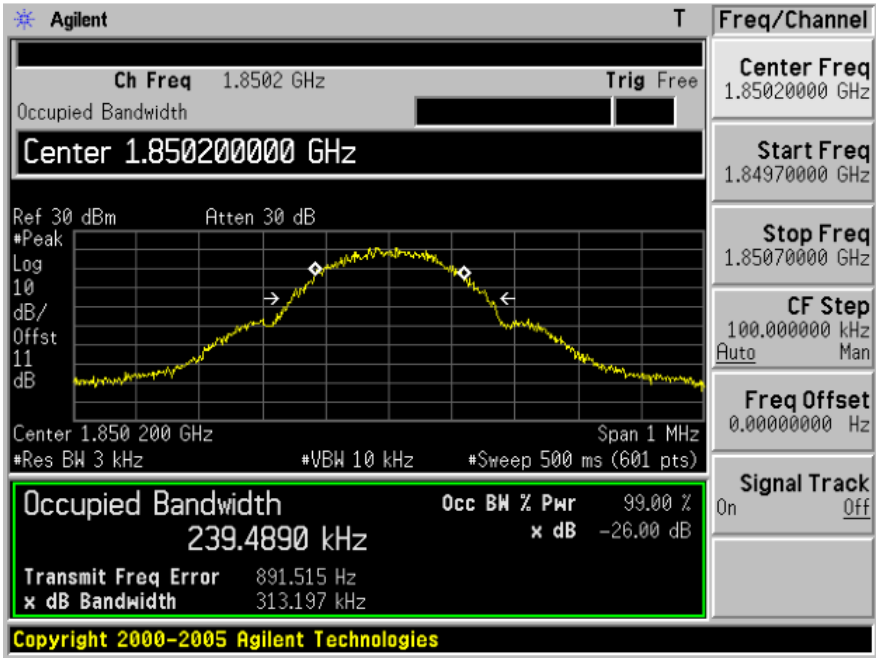
(Plot A1: GSM 850MHz, Channel = 128)



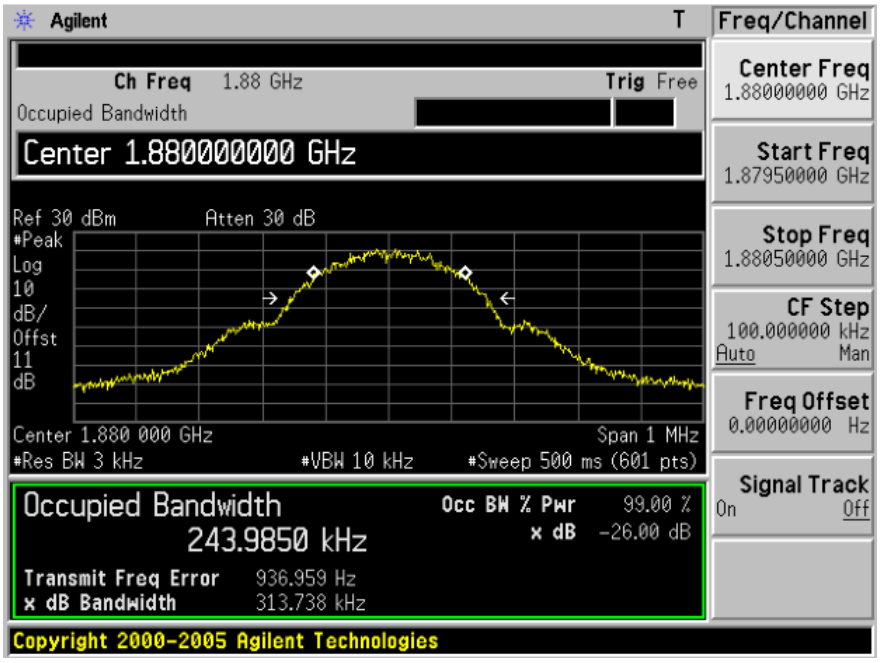
(Plot A2: GSM 850MHz, Channel = 189)



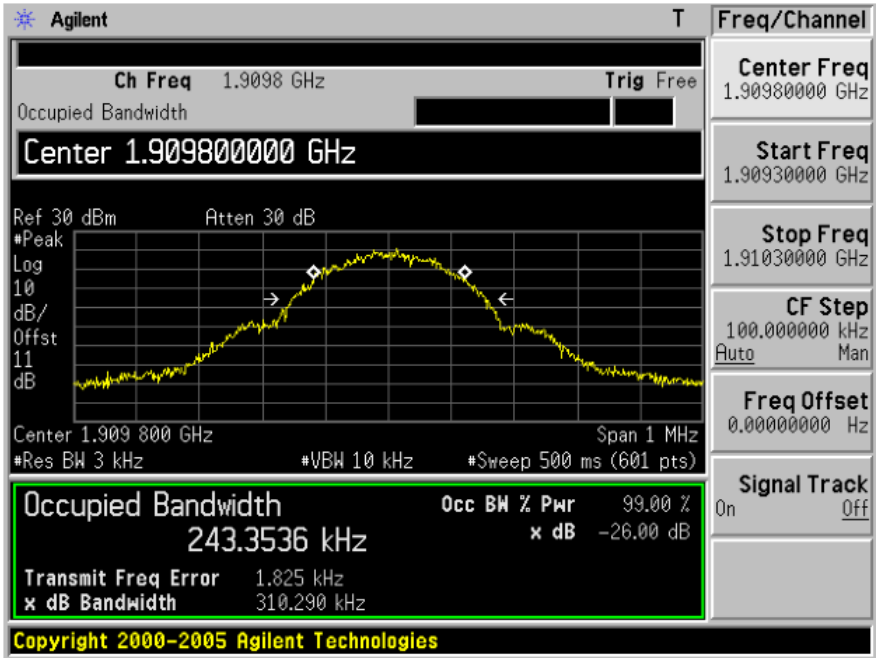
(Plot A3: GSM 850MHz, Channel = 251)



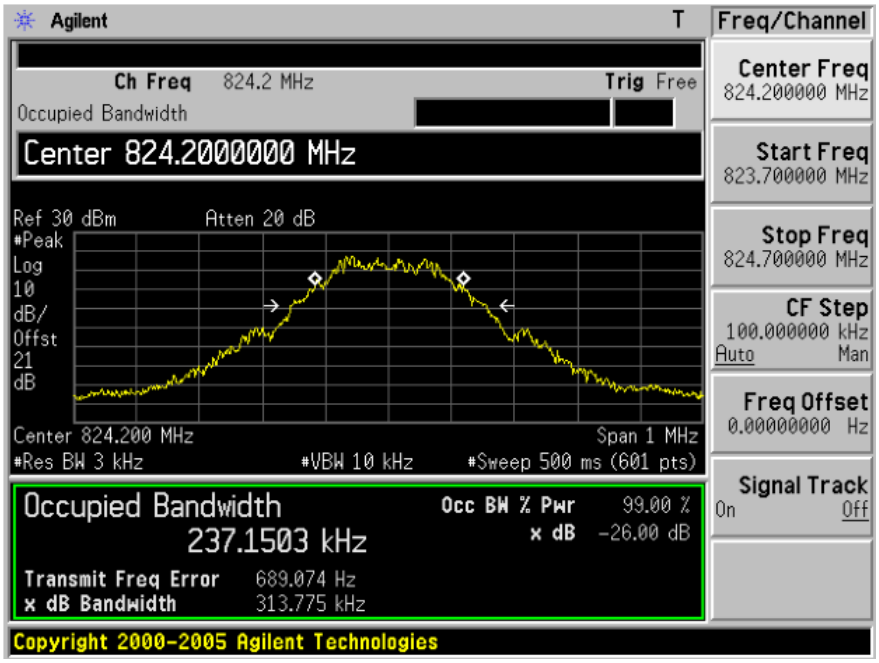
(Plot B1: GSM 1900MHz, Channel =512)



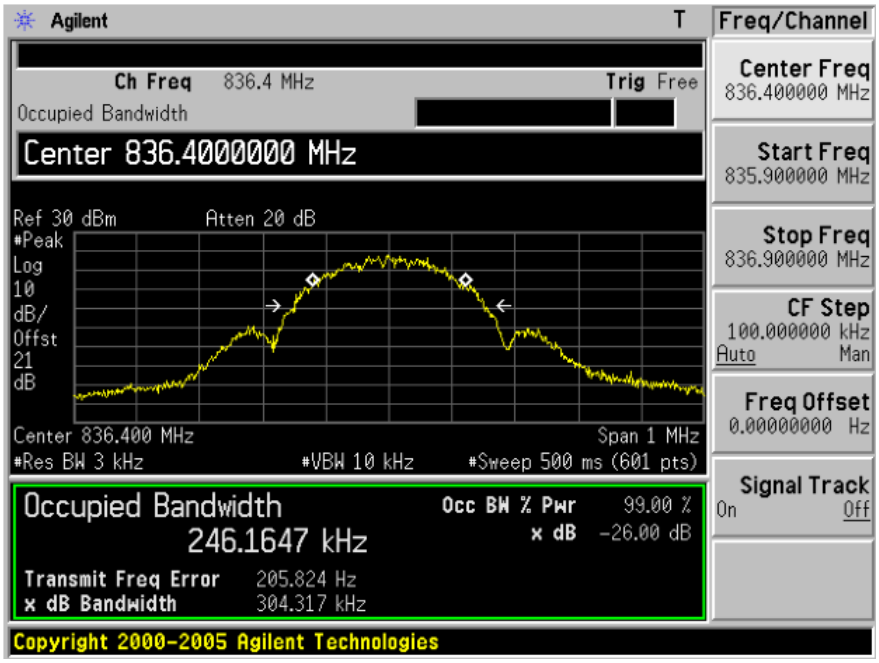
(Plot B2: GSM 1900MHz, Channel =661)



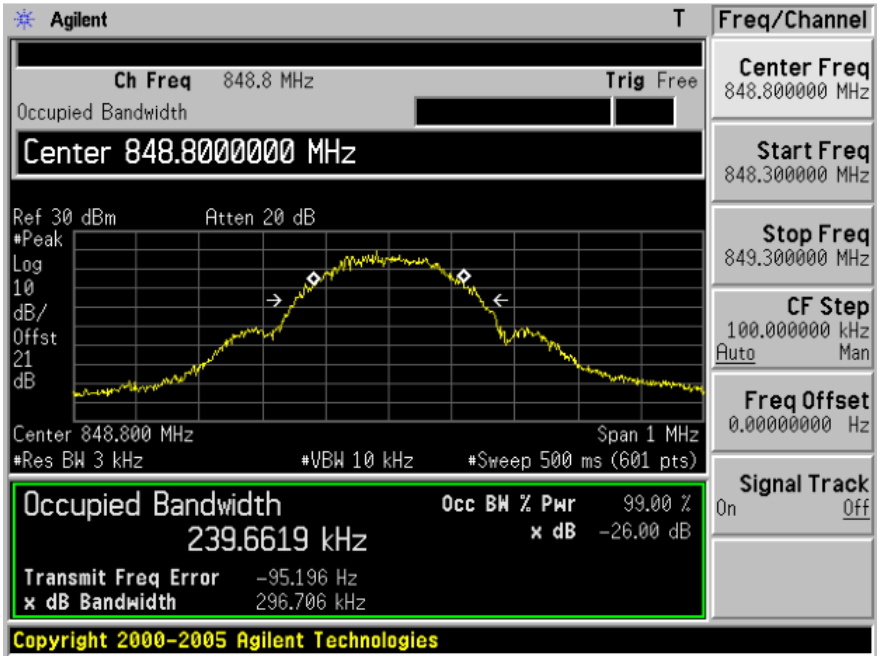
(Plot B3:GSM 1900MHz, Channel =810)



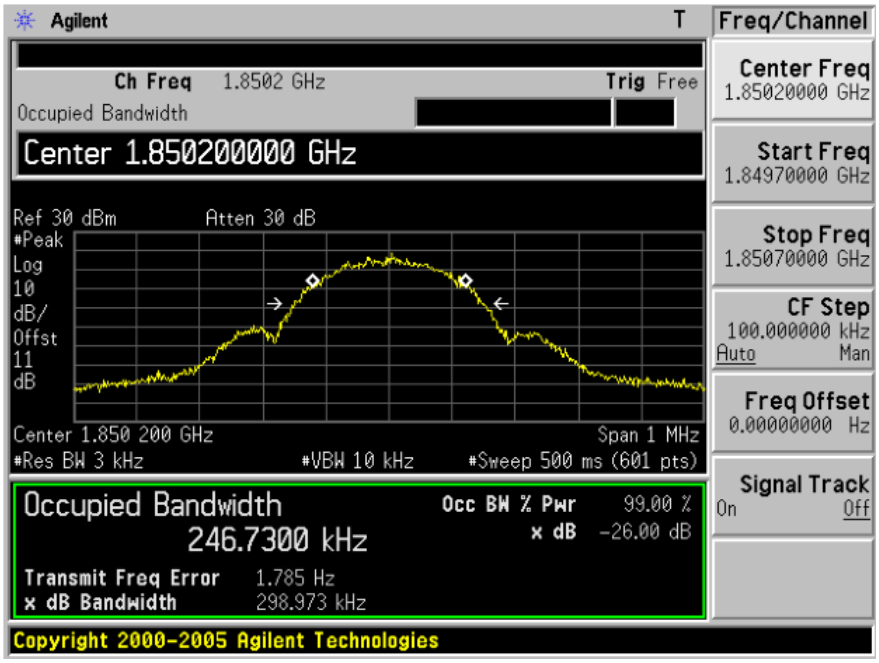
(Plot C1: EGPRS 850MHz, Channel = 128)



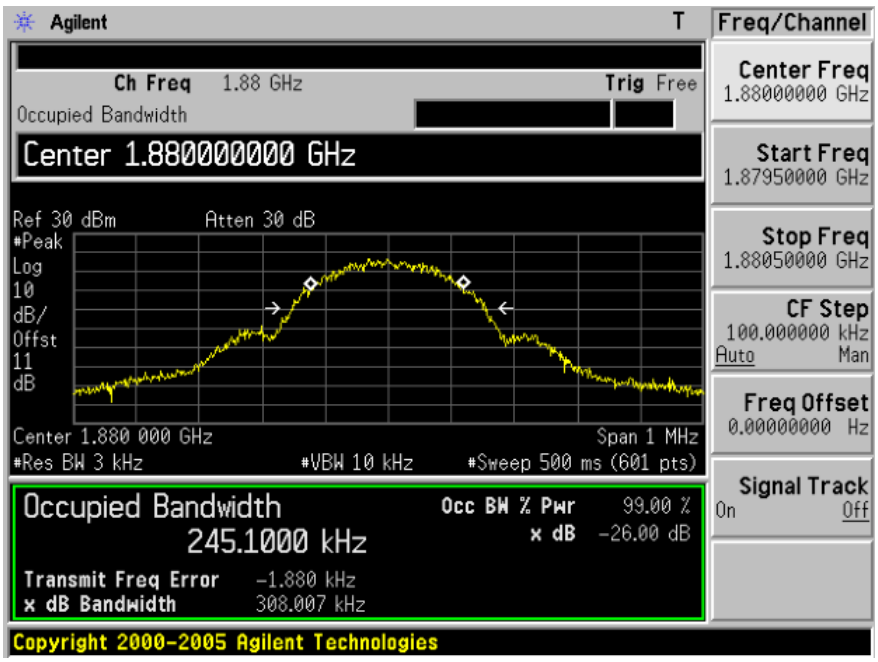
(Plot C2: EGPRS 850MHz, Channel = 189)



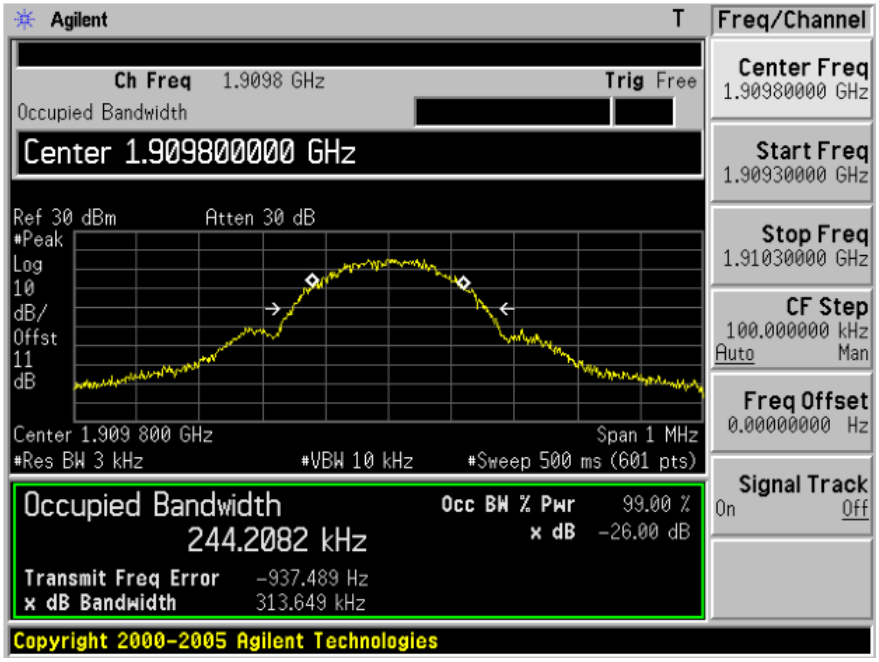
(Plot C3: EGPRS 850MHz, Channel = 251)



(Plot D1: EGPRS 1900MHz, Channel =512)



(Plot D2: EGPRS 1900MHz, Channel =661)



(Plot D3: EGPRS 1900MHz, Channel =810)

4.3 Frequency Stability

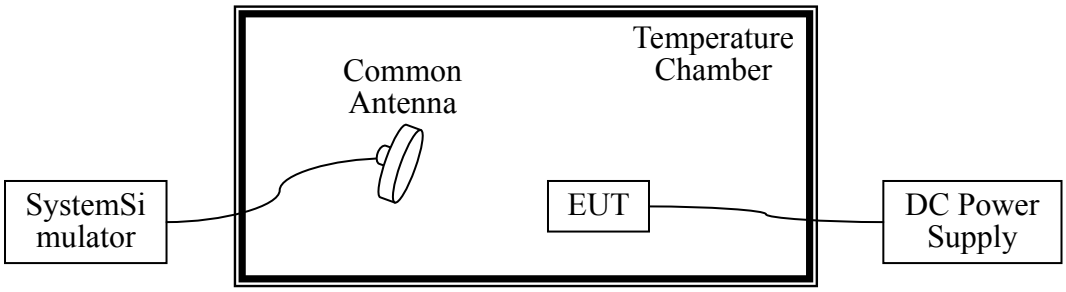
4.3.1 Requirement

According to FCC section 22.355 and FCC section 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

4.3.2 Test Description



4.3.3 Test Setup

The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber.The EUT is commanded by the System Simulator (SS) to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS via a Common Antenna.

4.3.4 Test Results

For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer; the normal temperature here used is 25°C. The frequency deviation limit is ±2.5ppm.

GSM/GPRS mode

Band	Test Conditions		Frequency Deviation						Limit/Verdict
	Power (VDC)	Temp (°C)	Low Channel		Middle Channel		High Channel		±2.5ppm 850 ±1ppm 1900
			Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	
850 MHz GSM	24	-30	---	---	---	---	---	---	PASS
		-20	38	0.045	47	0.055	-43	-0.051	
		-10	-37	-0.044	42	0.049	-44	-0.052	
		0	55	0.065	48	0.056	-53	-0.062	
		10	-57	-0.067	-52	-0.061	45	0.053	
		20	49	0.058	-48	-0.056	43	0.051	
		30	33	0.039	53	0.062	47	0.055	
		40	-38	-0.045	-46	-0.054	49	0.058	
		50	44	0.052	54	0.064	-51	-0.060	
		60	53	0.062	-33	-0.039	-61	-0.072	
		70	---	---	---	---	---	---	
	36	25	41	0.048	38	0.045	-41	-0.048	
	9	25	-39	-0.046	44	0.052	-43	-0.051	
1900 MHz GSM	24	-30	---	---	---	---	---	---	PASS
		-20	56	0.029	-45	-0.024	42	0.022	
		-10	-55	-0.029	38	0.020	45	0.024	
		0	-56	-0.029	44	0.023	39	0.021	
		10	43	0.023	-41	-0.022	-38	-0.020	
		20	-44	-0.023	38	0.020	43	0.023	
		30	-40	-0.021	-41	-0.022	46	0.024	
		40	43	0.023	-48	-0.025	41	0.022	
		50	47	0.025	-36	-0.019	-35	-0.018	
		60	57	0.030	38	0.020	-43	-0.023	
		70	---	---	---	---	---	---	
	36	25	33	0.017	38	0.020	41	0.022	
	9	25	38	0.020	43	0.023	-39	-0.021	

EDGE mode

Band	Test Conditions		Frequency Deviation						Limit/Verdict
	Power (VDC)	Temp (°C)	Low Channel		Middle Channel		High Channel		±2.5ppm 850 ±1ppm 1900
			Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	Dev. Freq. Hz	Deviation (ppm)	
850 MHz EDGE	24	-30	---	---	---	---	---	---	PASS
		-20	19	0.022	24	0.029	-32	-0.039	
		-10	-53	-0.063	-18	-0.022	59	0.071	
		0	-1	-0.001	-23	-0.027	28	0.033	
		10	19	0.023	30	0.036	19	0.023	
		20	-11	-0.013	3	0.004	-34	-0.041	
		30	42	0.050	-35	-0.042	-24	-0.028	
		40	-4	-0.005	57	0.068	-20	-0.024	
		50	-24	-0.028	-22	-0.026	35	0.042	
		60	31	0.037	-43	-0.052	-51	-0.060	
		70	---	---	---	---	---	---	
	36	25	25	0.030	48	0.058	57	0.068	
	9	25	-32	-0.039	10	0.012	-18	-0.022	
1900 MHz EDGE	24	-30	---	---	---	---	---	---	PASS
		-20	-41	-0.021	-35	-0.018	74	0.039	
		-10	-15	-0.008	11	0.006	-25	-0.013	
		0	19	0.010	26	0.014	75	0.040	
		10	40	0.021	-7	-0.004	-87	-0.046	
		20	65	0.034	-9	-0.005	7	0.004	
		30	-81	-0.043	71	0.037	-55	-0.029	
		40	-21	-0.011	-14	-0.007	29	0.015	
		50	-13	-0.007	-89	-0.047	85	0.045	
		60	22	0.012	67	0.035	27	0.014	
		70	---	---	---	---	---	---	
	36	25	59	0.031	-62	-0.032	50	0.026	
	9	25	62	0.033	32	0.017	-39	-0.021	

NOTE:

(1) The EUT stops transmitting at temperatures -20°C, 65°C

(2) The manufacturer declared that the EUT could work properly between temperatures -20°C~60°C.

(3) Normal Voltage = 24.0V; Max Voltage= 36.0V; Min Voltage=9.0V.

4.4 Conducted Out of Band Emissions

4.4.1 Requirement

According toFCCsection22.917(a) and FCCsection24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

4.4.2 Test Description

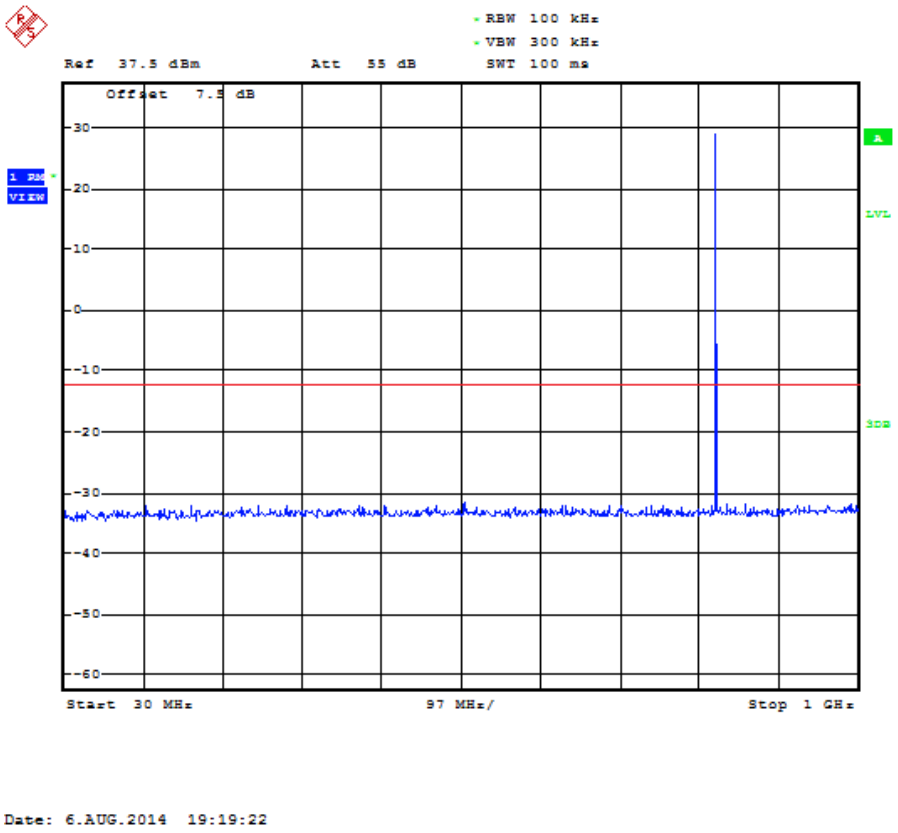
See section 4.2.1 of this report.

4.4.3 Test Results

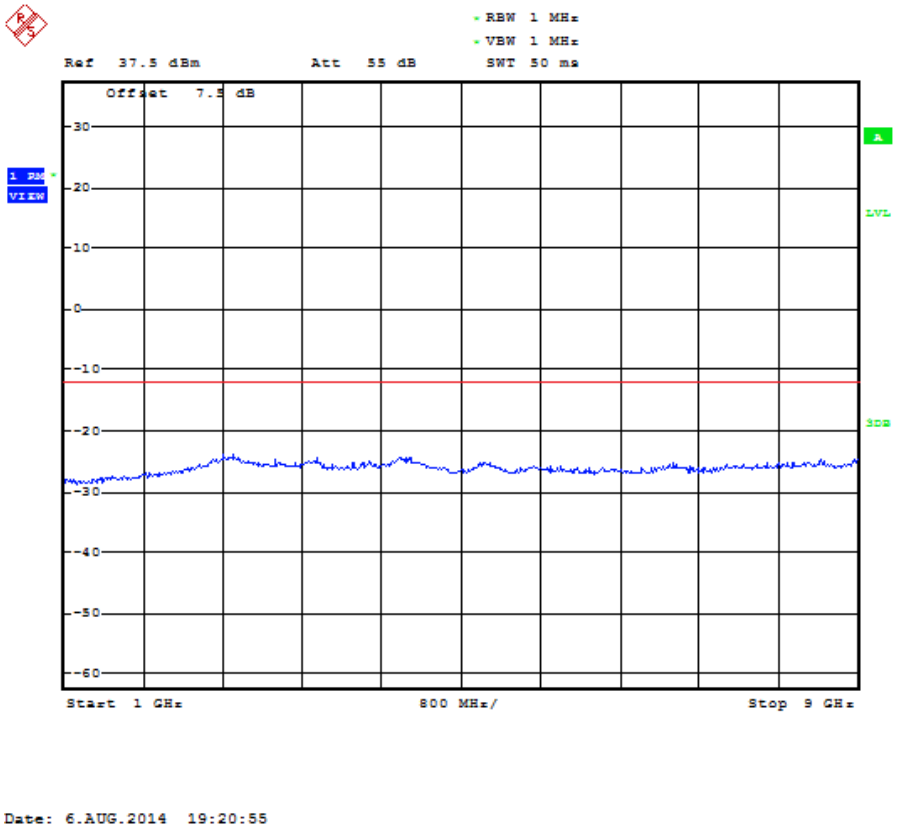
The measurement frequency range is from 30MHz to the 10thharmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

Test Plots:

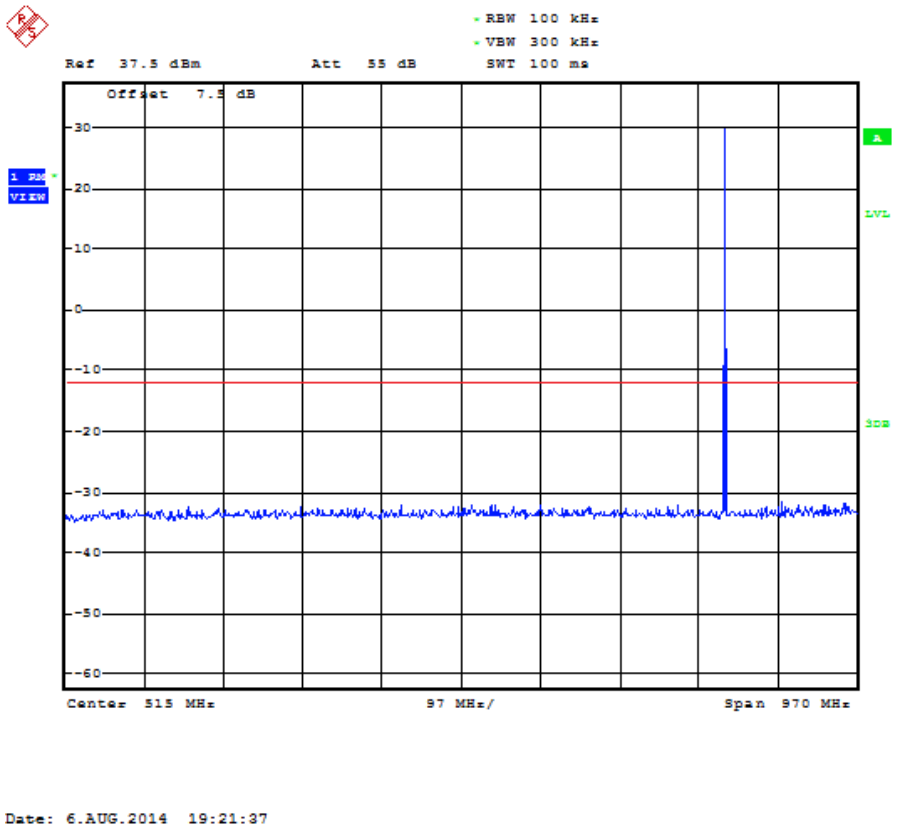
NOTE：
the power of the EUT transmitting frequency should be ignored.



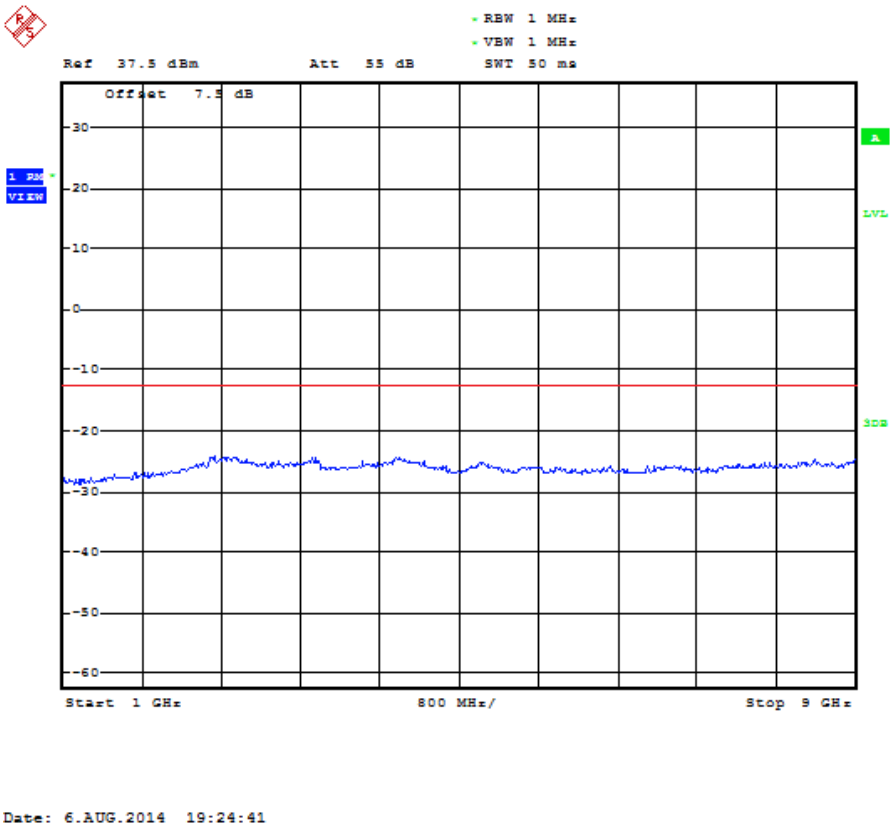
(GSM 850MHz, Channel = 128, 30MHz to 1GHz)



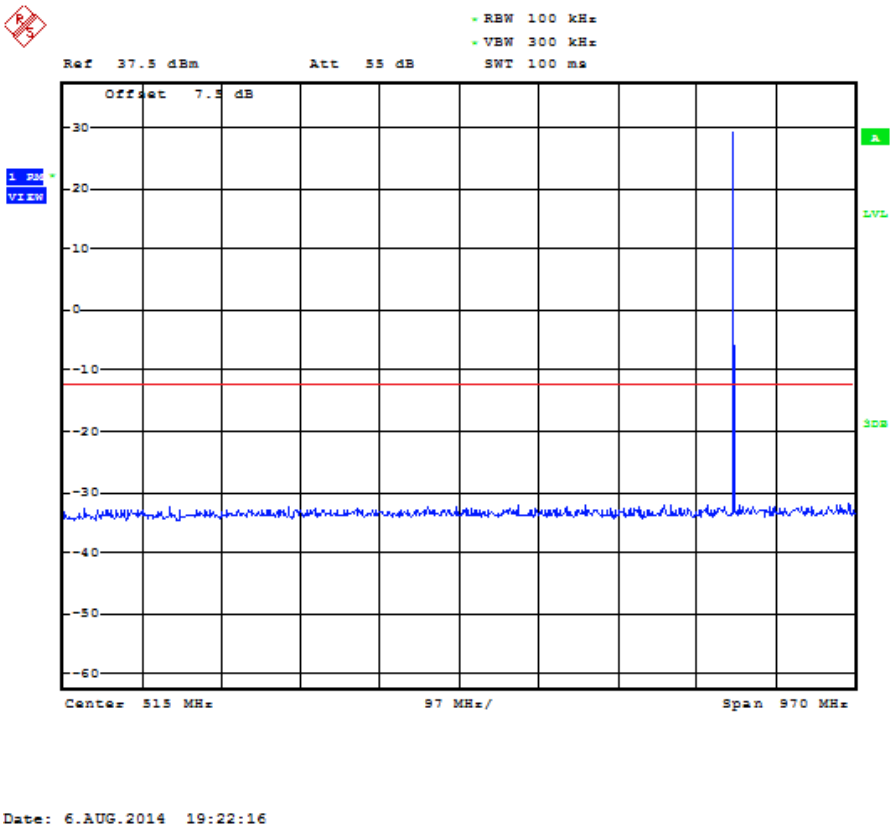
(GSM 850MHz, Channel = 128, 1GHz to 9GHz)



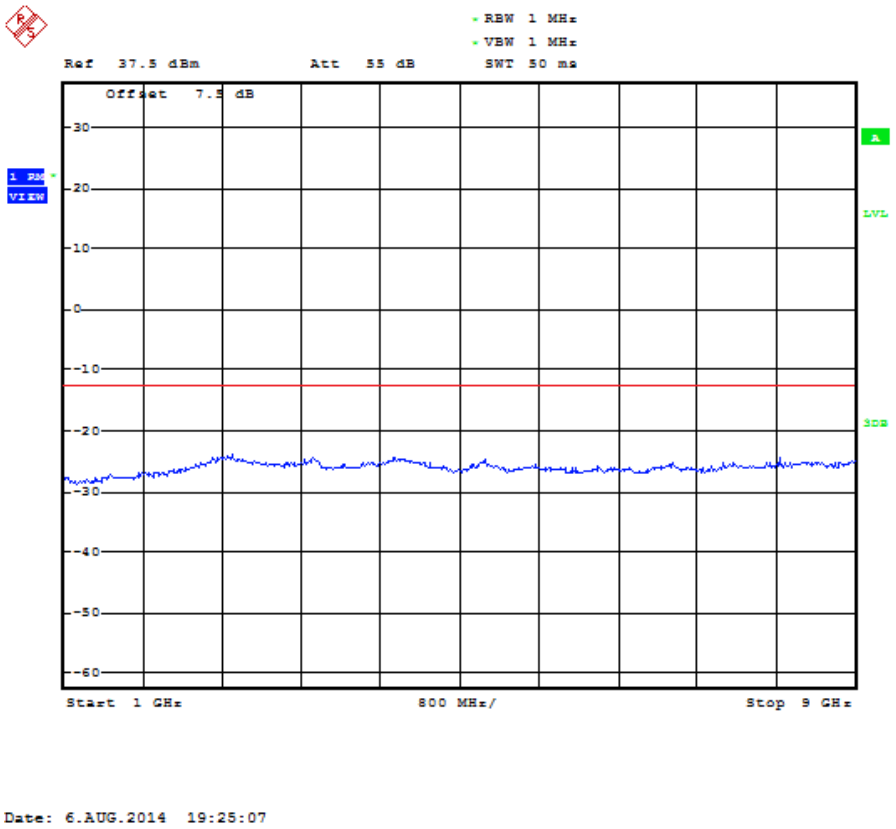
(GSM 850MHz, Channel = 190, 30MHz to 1GHz)



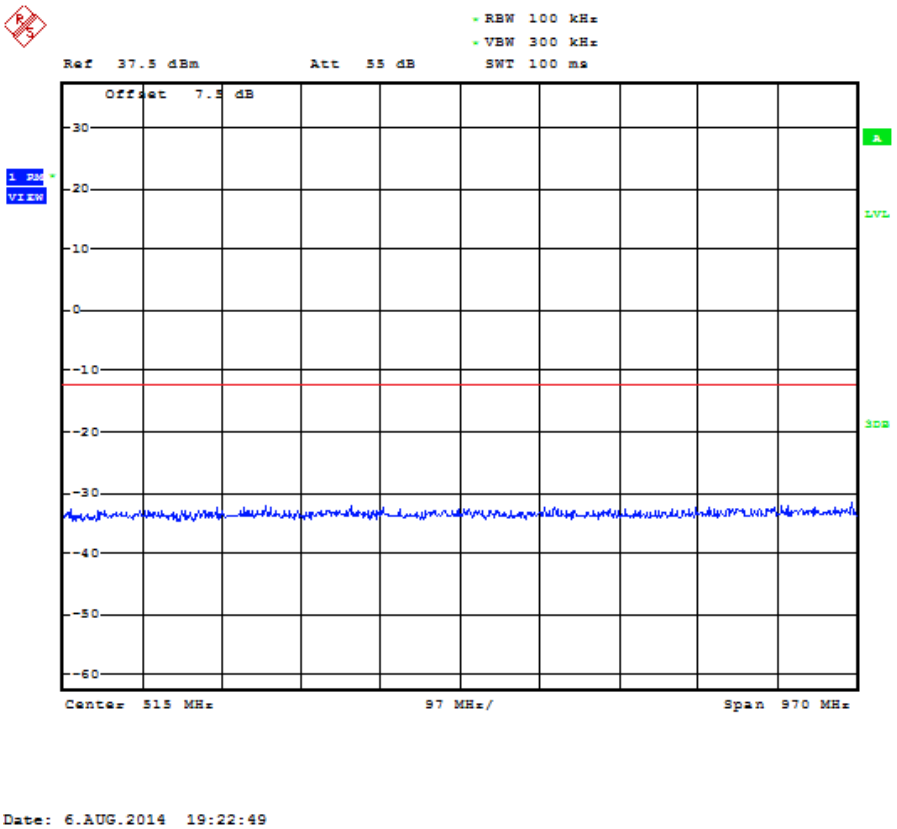
(GSM 850MHz, Channel = 190, 1GHz to 9GHz)



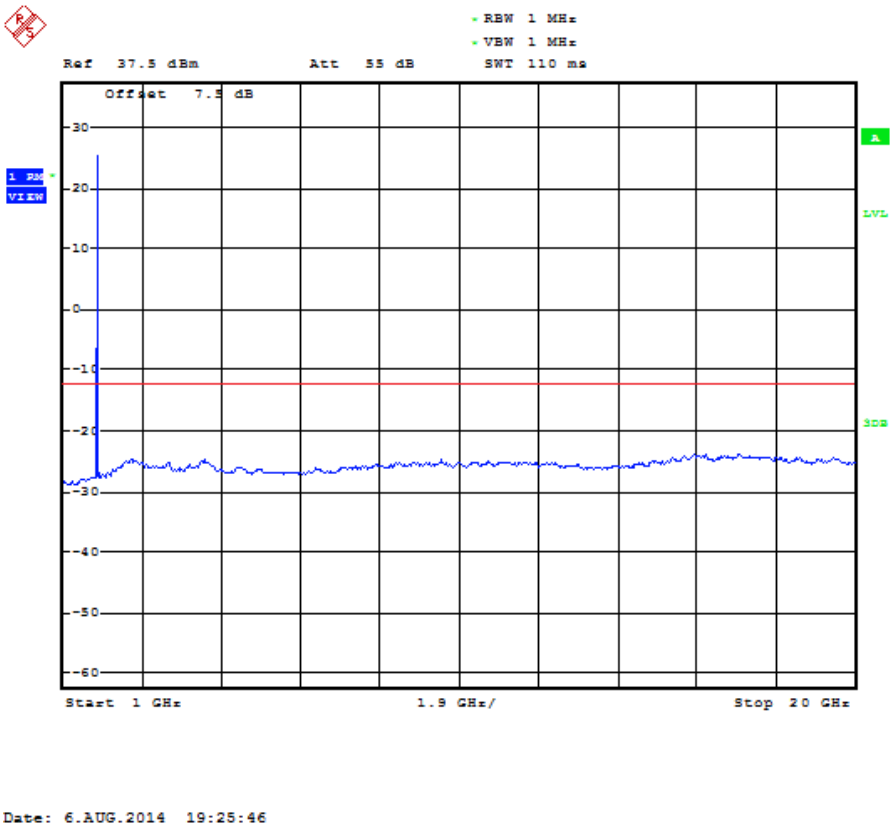
(GSM 850MHz, Channel = 251, 30MHz to 1GHz)



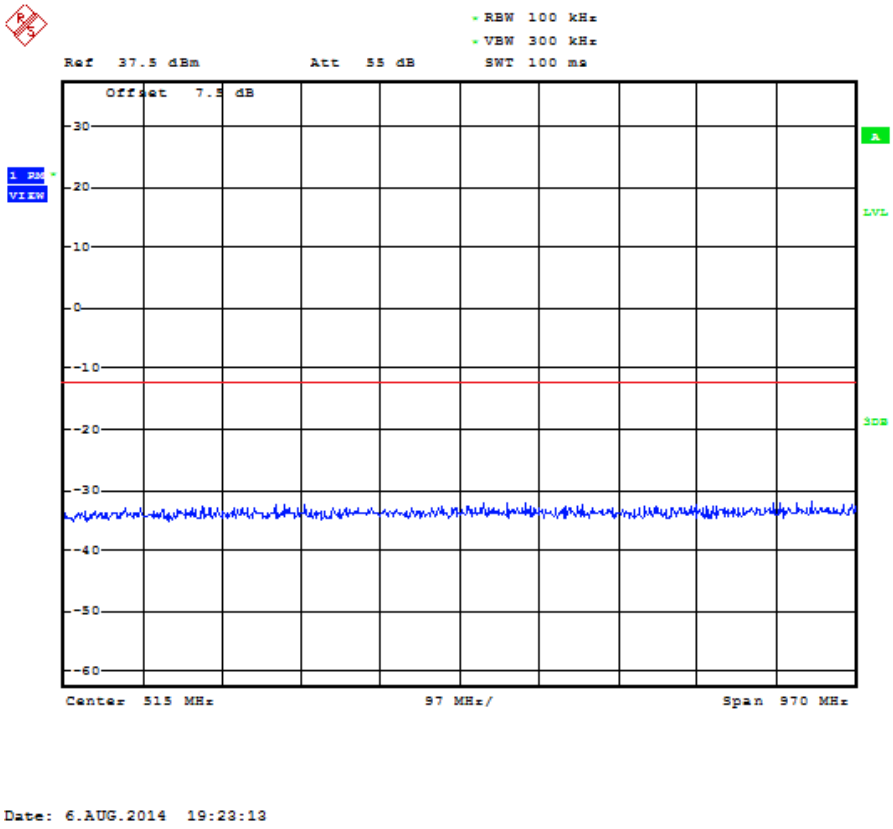
(GSM 850MHz, Channel = 251, 1GHz to 9GHz)



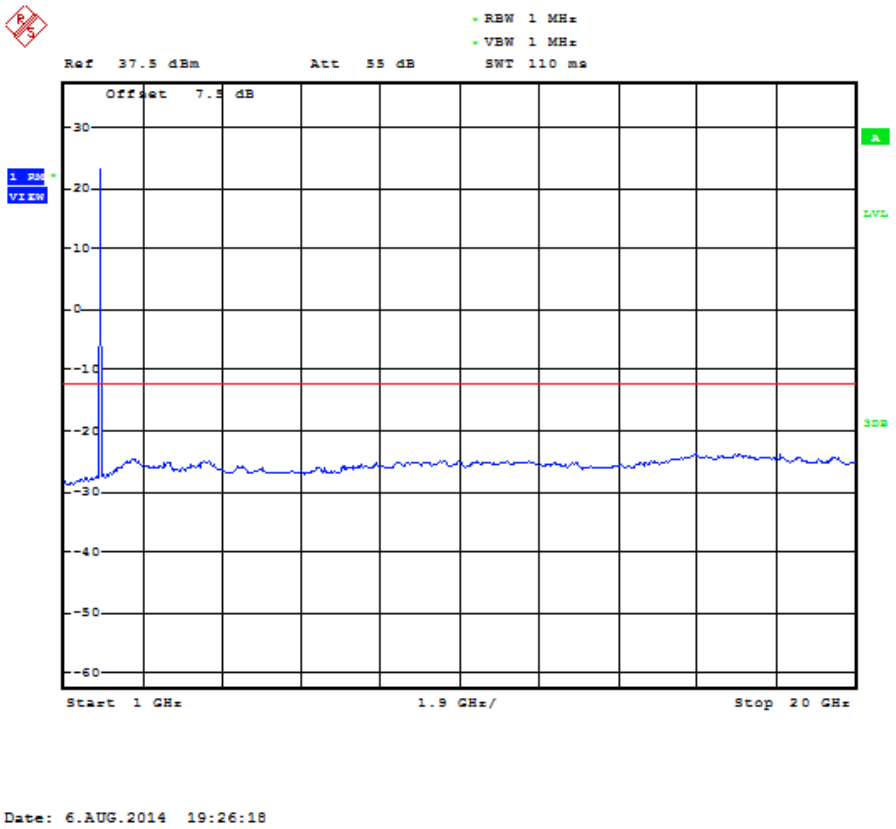
(GSM 1900MHz, Channel = 512, 30MHz to 1GHz)



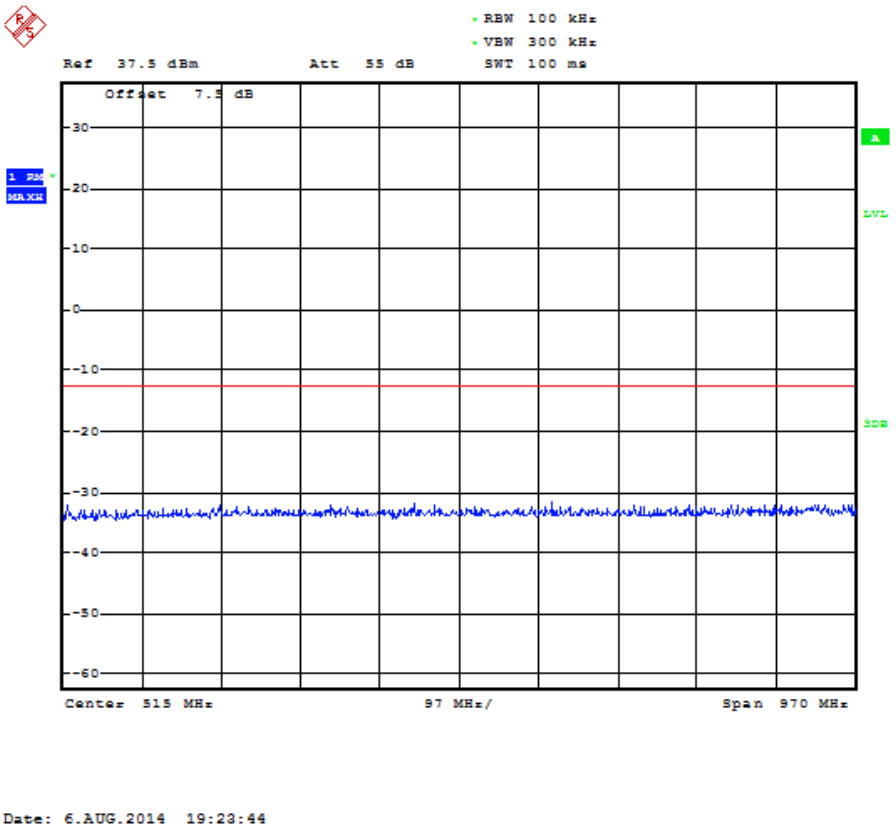
(GSM 1900MHz, Channel = 512, 1GHz to 20GHz)



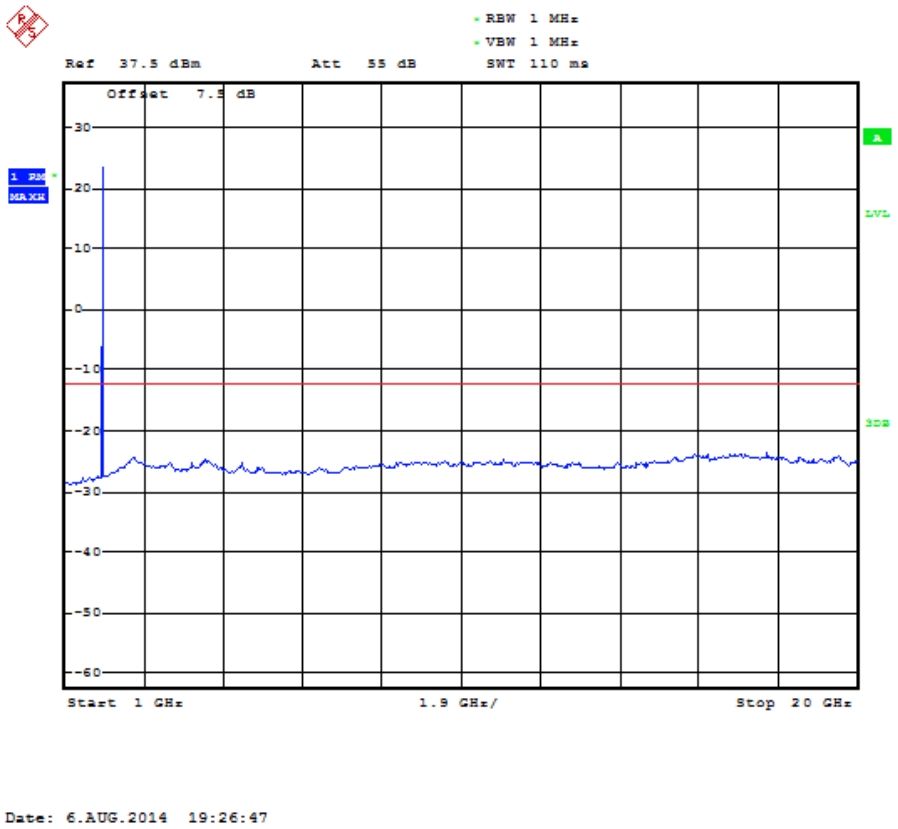
(GSM 1900MHz, Channel = 661, 30MHz to 1GHz)



(GSM 1900MHz, Channel = 661, 1GHz to 20GHz)



(GSM 1900MHz, Channel = 810, 30MHz to 1GHz)



(GSM 1900MHz, Channel = 810, 1GHz to 20GHz)

NOTE:

(1) GSM/GPRS/EGRPS was tested and the worst result was reported.

4.5 Band Edge

4.5.1 Requirement

According toFCCsection22.917(b) and FCC section 24.238(b), in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

4.5.2 Test Description

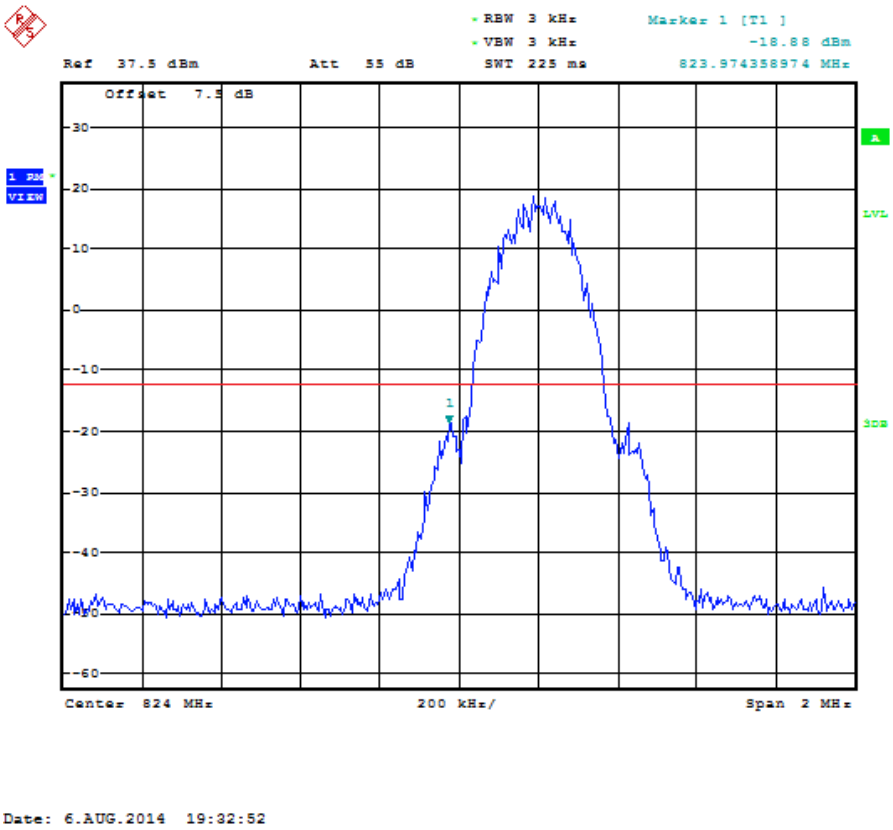
See section 4.2.1 of this report.

4.5.3 Test Results

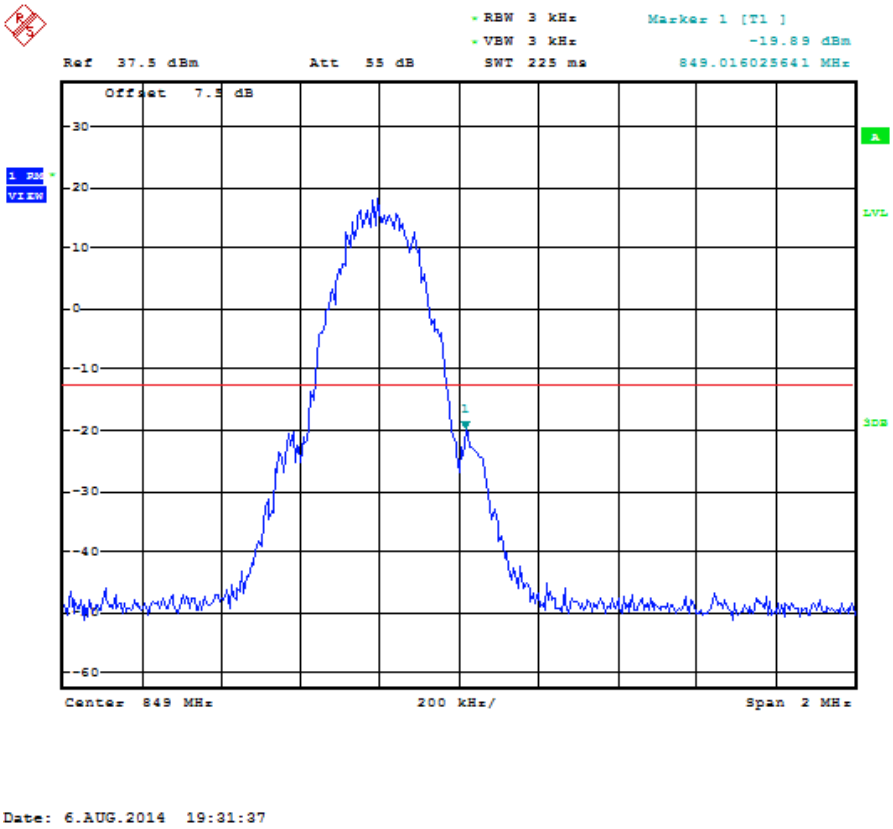
The lowest and highest channels are tested to verify the band edge emissions.

Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-18.88	Plat A1	-13	PASS
	251	848.8	-19.87	Plot A2		PASS
GSM 1900MHz	512	1850.2	-20.13	Plat B1		PASS
	810	1909.8	-21.79	Plot B2		PASS
EGRPS 850MHz	128	824.2	--25.12	Plat C1		PASS
	251	848.8	-27.12	Plot C2		PASS
EGPRS 1900MHz	512	1850.2	-25.56	Plat D1		PASS
	810	1909.8	-28.63	Plot D2		PASS

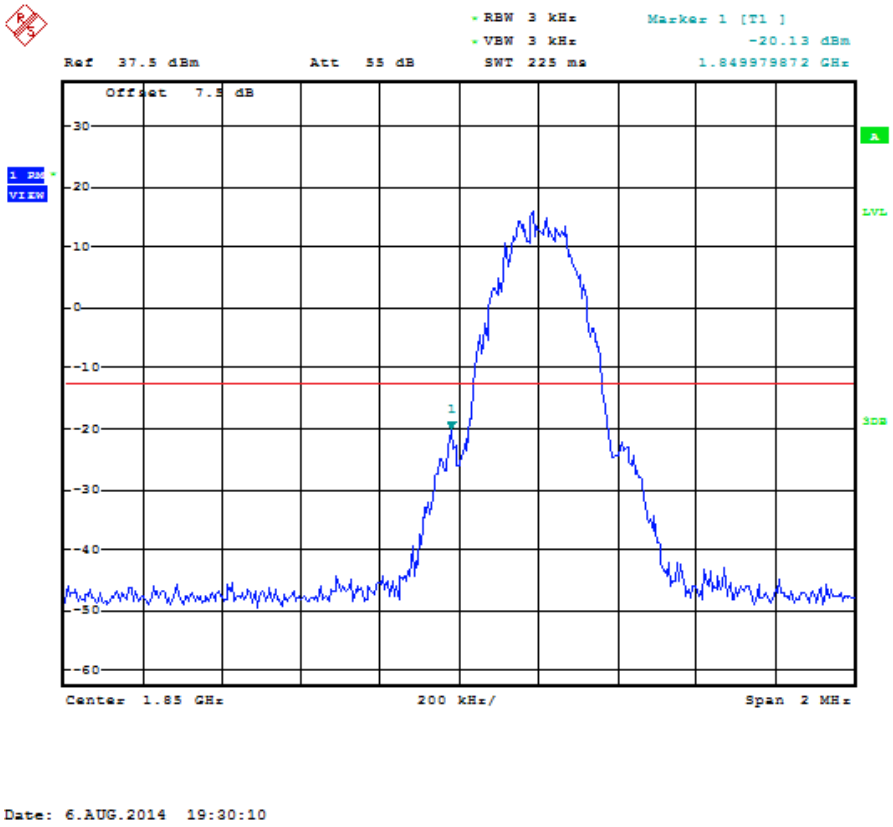
Test Plots:



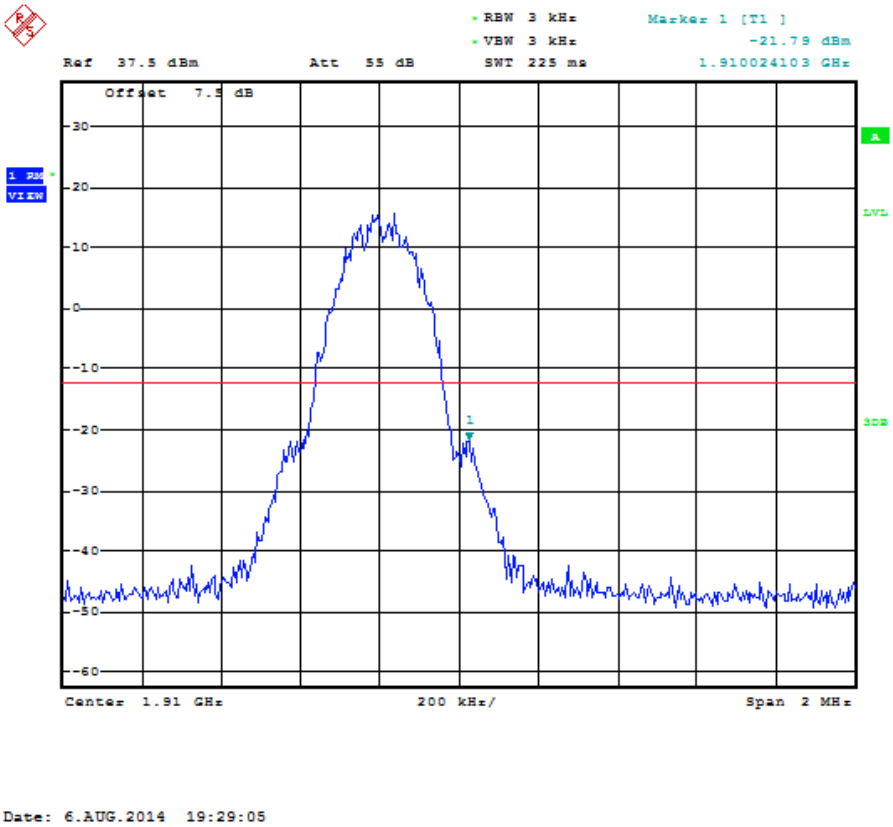
(Plot A1:GSM 850 Channel = 128)



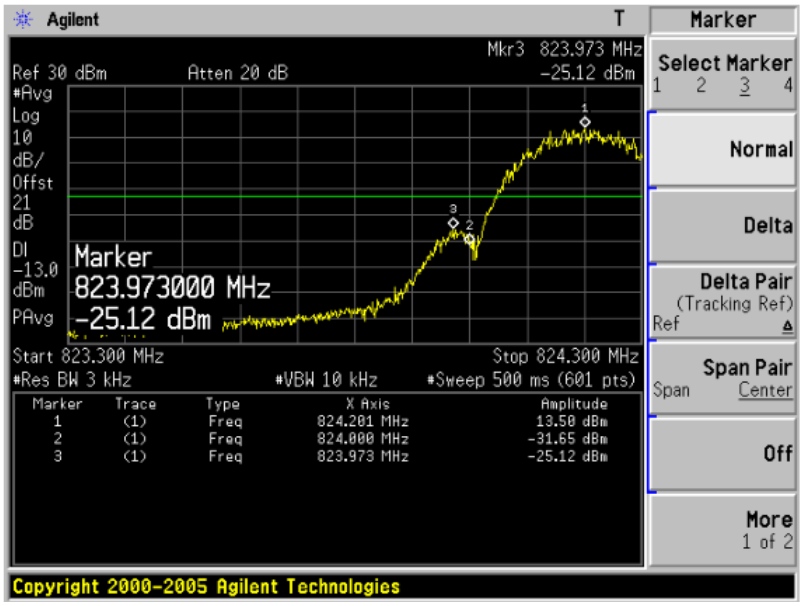
(Plot A2:GSM 850 Channel = 251)



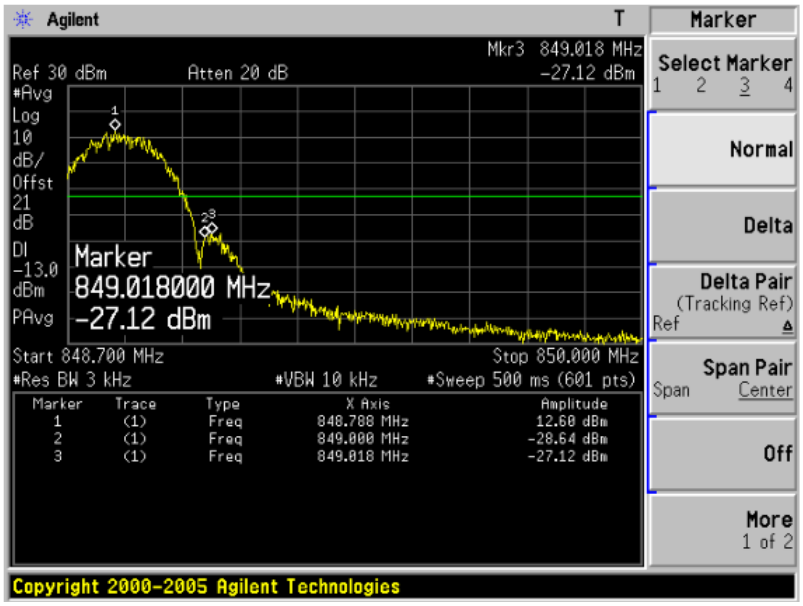
(Plot B1:GSM 1900 Channel = 512)



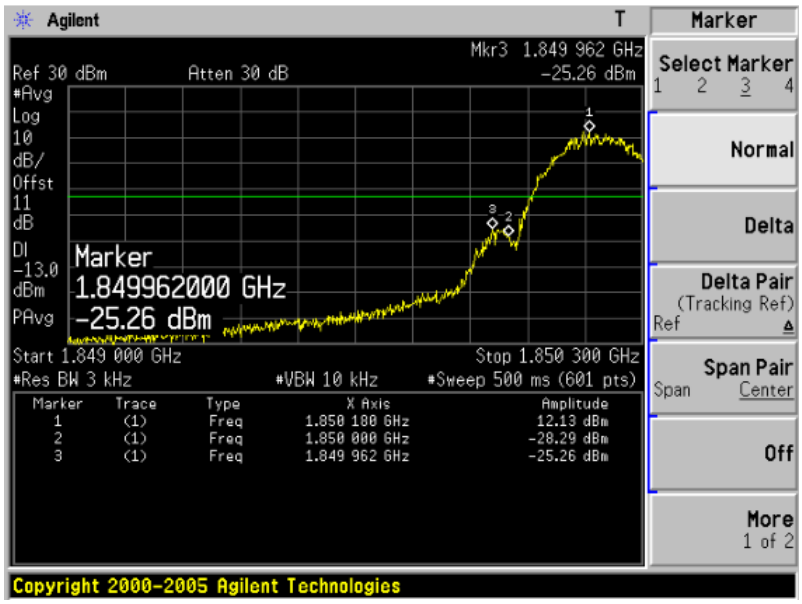
(Plot B2:GSM 1900 Channel = 810)



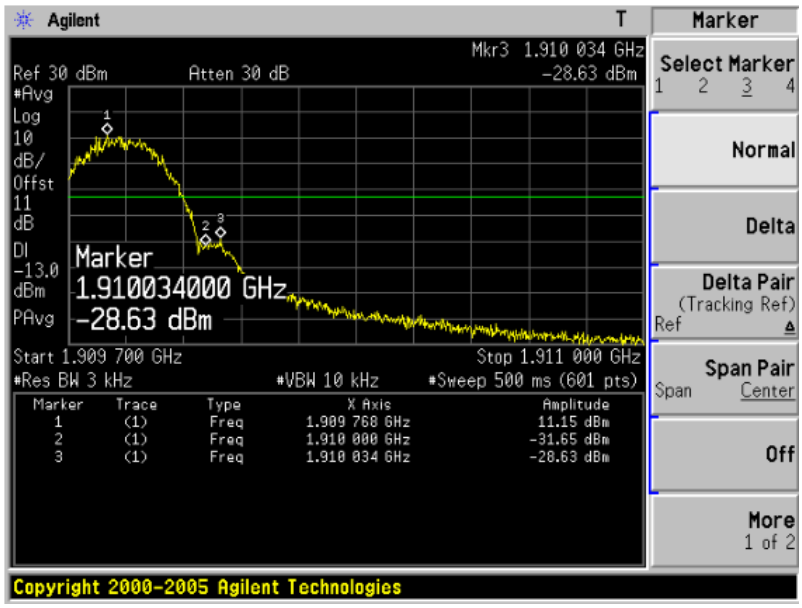
(Plot C1: EGPRS 850 Channel = 128)



(Plot C2: EGPRS 850 Channel = 251)



(Plot D1: EGPRS 1900 Channel = 512)



(Plot D2: EGPRS 1900 Channel = 810)

NOTE:

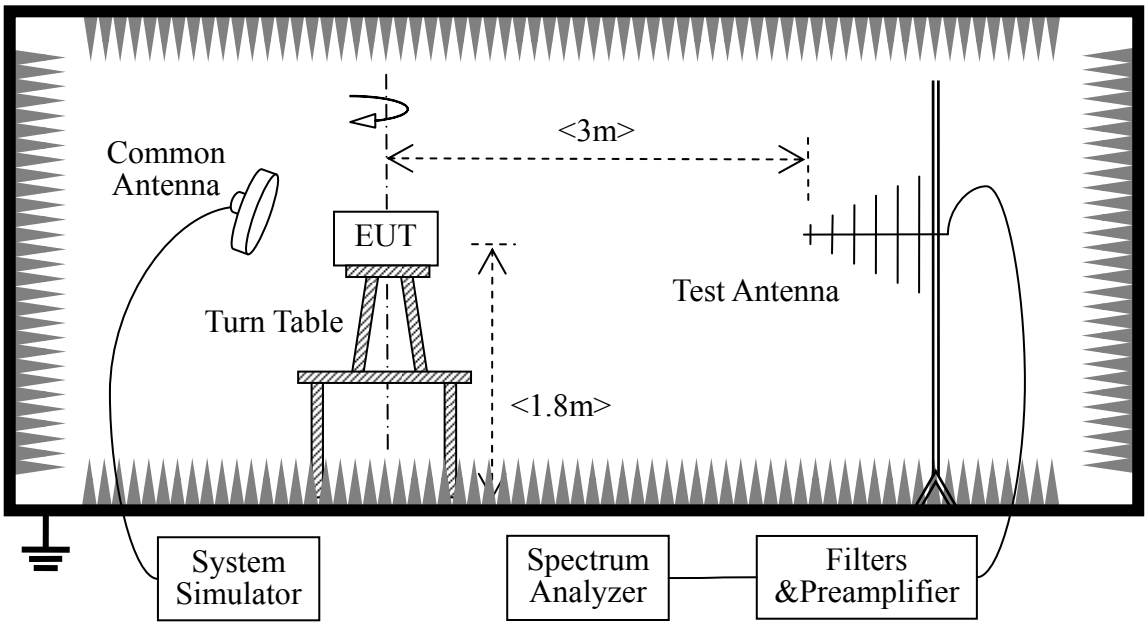
(1)BothGSM/GPRS was tested and the worst result was report ed.

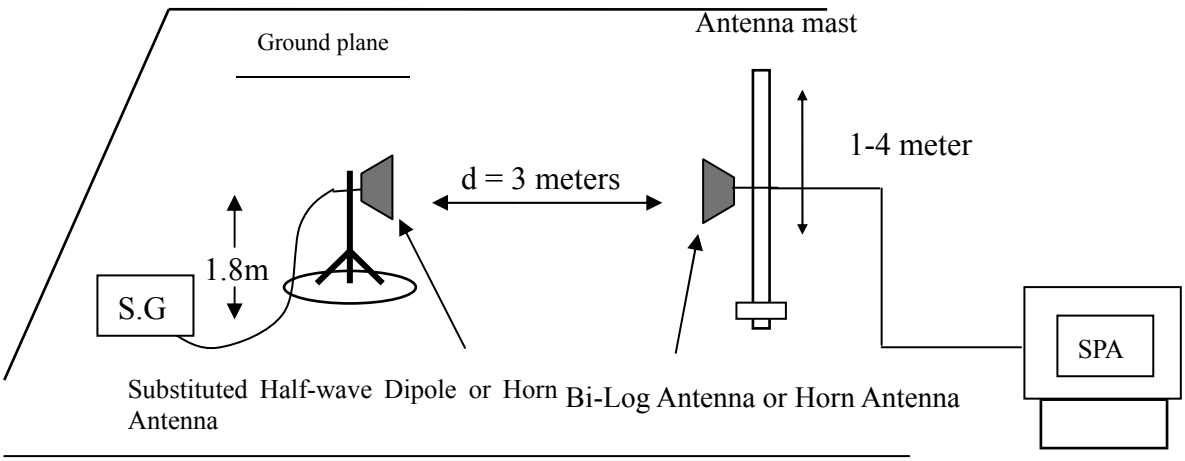
4.6 Transmitter Radiated Power (EIRP/ERP)

4.6.1 Requirement

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCCsection24.232, the broadband PCS mobile station is limited to 2Wattse.i.r.p.peak power.

4.6.2 Test Procedure





The measurements procedures in TIA-603C-2004 are used.

1. EUT was placed on a 1.8 meter high non-conductive stand at a 3 meter test distance from thereceive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUTfor emission measurements. The height of receiving antenna is 1.8m. Detected emissions were maximized at each frequency by rotating the EUTthrough 360° and adjusting the receiving antenna polarization. The radiated emissionmeasurements of all transmit frequencies in three channels (High, Middle, Low) weremeasured with peak detector.

2. The EUT is then put into continuously transmitting mode at its maximum power level duringthe test. And the maximum value of the receiver should be recorded as (P_r).
3. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at thereference point of the chamber. An RF Signal source for the frequency band of interest isconnected to the substitution antenna with a cable that has been constructed to not interferewith the radiation pattern of the antenna. Apower (P_{Mea}) is applied to the input of thesubstitution antenna, and adjust the level of the signal generator output until the value of thereceiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. Thetest should be performed by rotating the test item and adjusting the receiving antennapolarization.
4. The cable loss (P_{cl}) between the Signal Source with the Substitution Antenna and theSubstitution Antenna Gain (G_a) should be recorded after test.The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea}+ P_{cl} + G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

4.6.3 Test Results

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power.The lowest, middle and highest channels are tested.All modes are tested.

Limits

Band	Burst Peak ERP (dBm)
GSM 850MHz	≤38.5dBm (7W)
GSM 1900MHz	≤33.0dBm (2W)

Measurement Result

Band	Channel	PeakERP (dBm)	Limit(dBm)	Polarization
GSM 850	128	32.55	38.45	Horizontal
	190	31.97	38.45	Horizontal
	251	32.25	38.45	Horizontal
	128	30.73	38.45	Vertical
	190	30.55	38.45	Vertical
	251	30.36	38.45	Vertical
GSM 1900	512	28.77	33	Horizontal
	661	28.23	33	Horizontal
	810	28.59	33	Horizontal
	512	27.54	33	Vertical
	661	27.47	33	Vertical
	810	27.36	33	Vertical
EGPRS 850	128	27.53	38.45	Horizontal
	190	27.82	38.45	Horizontal
	251	27.54	38.45	Horizontal
	128	25.59	38.45	Vertical
	190	25.62	38.45	Vertical
	251	25.53	38.45	Vertical
EGPRS 1900	512	26.89	33	Horizontal
	661	26.93	33	Horizontal
	810	26.45	33	Horizontal
	512	25.12	33	Vertical
	661	25.04	33	Vertical
	810	25.11	33	Vertical

Remark:

$ERP(dBm)= P_{Mea}+ P_{cl}+G_a- 2.15$

4.7 Radiated Out of Band Emissions

4.7.1 Requirement

According to FCC section 22.917(a) and section 24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

4.7.2 Test Description

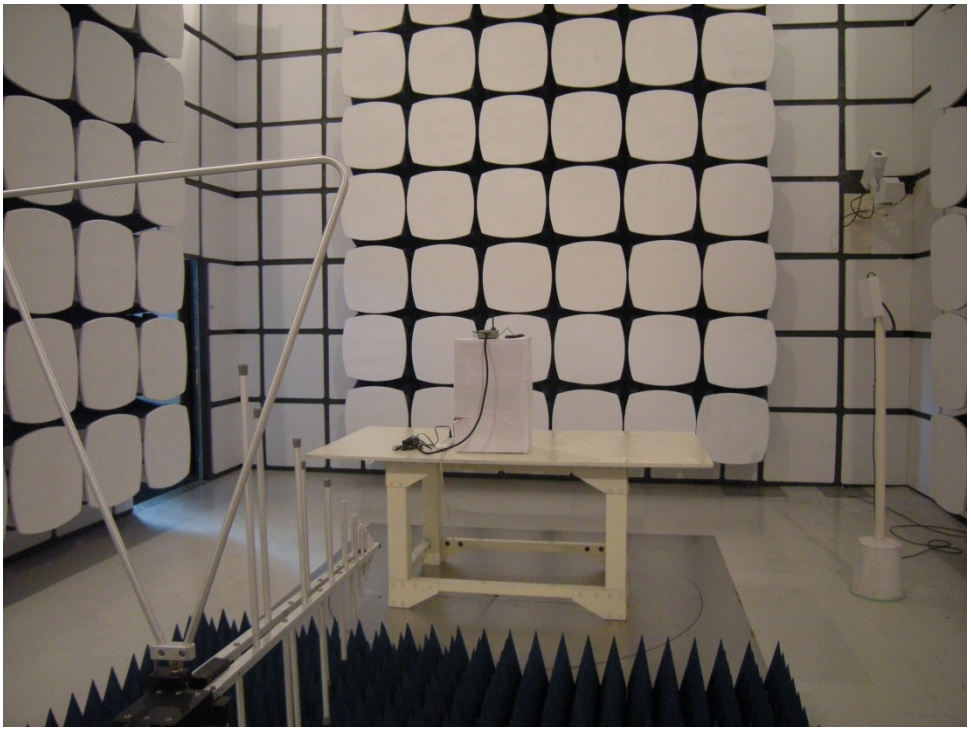
See section 4.6.2 of this report.

4.7.3 Test Procedure

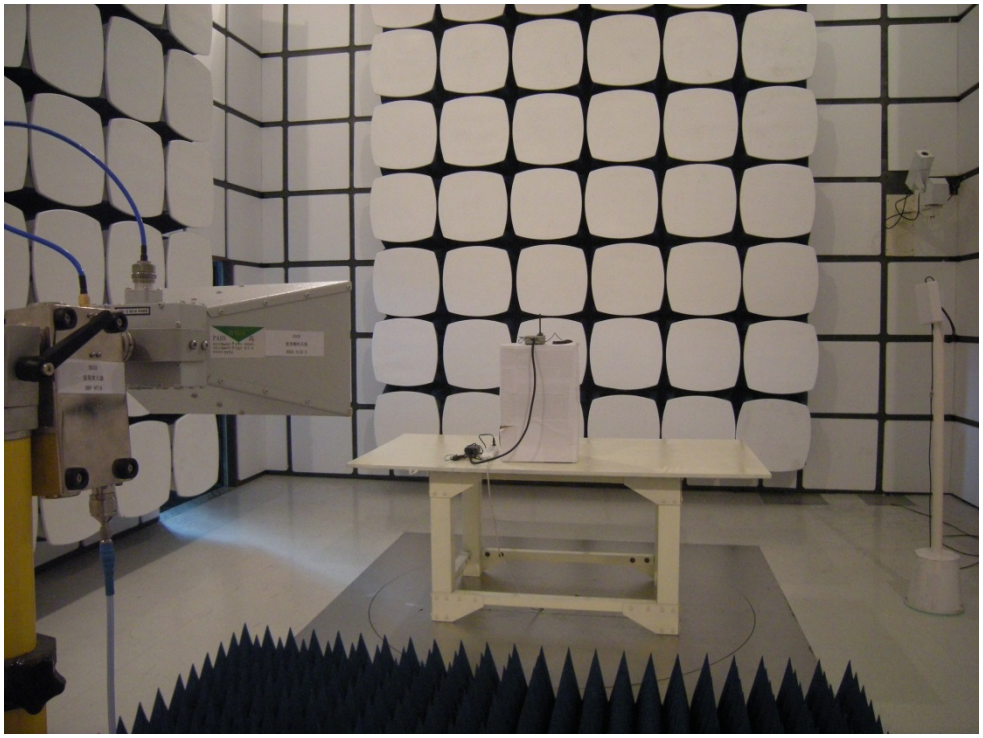
1. The lowest, middle and the highest channel were selected to perform tests respectively.
2. Employ the bi-log Test Antenna as the test system receiving antenna and set the frequency range of the Spectrum Analyzer from 30MHz to 1GHz.
3. The measurement is performed with the Test Antenna at both horizontal and vertical polarization respectively. Set the polarization of the Test Antenna to be horizontal.
4. The EUT was tested by rotating it 360 degrees with the antennas in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the signal levels were maximized, mark the fundamental frequency and the harmonics thereof, after then record the harmonics and the plot.
5. Set the polarization of the Test Antenna to be vertical, then repeat step 5.
6. Employ the horn Test Antenna as the test system receiving antenna and set the frequency range of the Spectrum Analyzer from 1GHz to 10th harmonic of the fundamental frequency, then repeat step 4 to 6.
7. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.

4.7.4 Test photograph

Description: Transmitter Spurious Emissions Test Setup for 30MHz ~ 1GHz



Description: Transmitter Spurious Emissions Test Setup for above 1GHz



4.7.5 Test Results

Measured Max. Spurious Emission(dBm)						
Band	Channel	Polarization	Frequency	Level(dBm)	Limit(dBm)	Verdict
GSM 850MHz	128	V	1648.4	-29.9	-13	Pass
		V	2472.6	-39.4	-13	Pass
		V	3296.8	-46.7	-13	Pass
		V	4121.0	-45.6	-13	Pass
		V	4945.2	nf	-13	Pass
		H	1648.4	-48.1	-13	Pass
		H	2472.6	-38.1	-13	Pass
		H	3296.8	-48.8	-13	Pass
		H	4121.0	-49.2	-13	Pass
		H	4945.2	nf	-13	Pass
	190	V	1673.2	-29.9	-13	Pass
		V	2509.8	-43.2	-13	Pass
		V	3346.4	-46.5	-13	Pass
		V	4183.0	-45.7	-13	Pass
		V	5019.6	nf	-13	Pass
		H	1673.2	-50.4	-13	Pass
		H	2509.8	-43.2	-13	Pass
		H	3346.4	-47.5	-13	Pass
		H	4183.0	-45.8	-13	Pass
		H	5019.6	nf	-13	Pass
	251	V	1697.6	-43.3	-13	Pass
		V	2546.4	-46.9	-13	Pass
		V	3395.2	-48.2	-13	Pass
		V	4244.0	-49.1	-13	Pass
		V	5092.8	nf	-13	Pass
		H	1697.6	-52.4	-13	Pass
		H	2546.4	-42.5	-13	Pass
		H	3395.2	-47.3	-13	Pass
		H	4244.0	-45.8	-13	Pass
		H	5092.8	nf	-13	Pass

Measured Max. Spurious Emission(dBm)						
Band	Channel	Polarization	Frequency	Level(dBm)	Limit(dBm)	Verdict
GSM 1900MHz	512	V	3700.4	-52.6	-13	Pass
		V	5550.6	-46.8	-13	Pass
		V	7400.8	-44.6	-13	Pass
		V	9251.0	-39.7	-13	Pass
		V	11101.2	nf	-13	Pass
		H	3700.4	-49.2	-13	Pass
		H	5550.6	-46.3	-13	Pass
		H	7400.8	-44.2	-13	Pass
		H	9251.0	-40.8	-13	Pass
		H	11101.2	nf	-13	Pass
	661	V	3760.0	-48.3	-13	Pass
		V	5640.0	-47.1	-13	Pass
		V	7520.0	-43.6	-13	Pass
		V	9400.0	-40.3	-13	Pass
		V	11280.0	nf	-13	Pass
		H	3760.0	-48.9	-13	Pass
		H	5640.0	-46.7	-13	Pass
		H	7520.0	-44.7	-13	Pass
		H	9400.0	-40.9	-13	Pass
		H	11280.0	nf	-13	Pass
	810	V	3819.6	-49.3	-13	Pass
		V	5729.4	-47.1	-13	Pass
		V	7639.2	-43.6	-13	Pass
		V	9549.0	-42.1	-13	Pass
		V	11458.8	nf	-13	Pass
		H	3819.6	-48.2	-13	Pass
		H	5729.4	-47.3	-13	Pass
		H	7639.2	-43.4	-13	Pass
		H	9549.0	-40.4	-13	Pass
		H	11458.8	nf	-13	Pass

Measured Max. Spurious Emission(dBm)						
Band	Channel	Polarization	Frequency	Level(dBm)	Limit(dBm)	Verdict
EGPRS 850MHz	512	V	3700.4	-50.4	-13	Pass
		V	5550.6	-49.8	-13	Pass
		V	7400.8	-45.4	-13	Pass
		V	9251.0	-41.5	-13	Pass
		V	11101.2	nf	-13	Pass
		H	3700.4	-50.2	-13	Pass
		H	5550.6	-47.3	-13	Pass
		H	7400.8	-46.7	-13	Pass
		H	9251.0	-42.4	-13	Pass
		H	11101.2	nf	-13	Pass
	661	V	3760.0	-48.8	-13	Pass
		V	5640.0	-49.2	-13	Pass
		V	7520.0	-46.0	-13	Pass
		V	9400.0	-41.8	-13	Pass
		V	11280.0	nf	-13	Pass
		H	3760.0	-49.4	-13	Pass
		H	5640.0	-49.5	-13	Pass
		H	7520.0	-46.9	-13	Pass
		H	9400.0	-42.5	-13	Pass
		H	11280.0	nf	-13	Pass
	810	V	3819.6	-51.4	-13	Pass
		V	5729.4	-50.0	-13	Pass
		V	7639.2	-45.6	-13	Pass
		V	9549.0	-43.6	-13	Pass
		V	11458.8	nf	-13	Pass
		H	3819.6	-50.7	-13	Pass
		H	5729.4	-50.2	-13	Pass
		H	7639.2	-45.7	-13	Pass
		H	9549.0	-41.8	-13	Pass
		H	11458.8	nf	-13	Pass

Measured Max. Spurious Emission(dBm)						
Band	Channel	Polarization	Frequency	Level(dBm)	Limit(dBm)	Verdict
EGPRS 1900MHz	512	V	3700.4	-48.9	-13	Pass
		V	5550.6	-46.9	-13	Pass
		V	7400.8	-47.3	-13	Pass
		V	9251.0	-41.9	-13	Pass
		V	11101.2	nf	-13	Pass
		H	3700.4	-51.3	-13	Pass
		H	5550.6	-48.5	-13	Pass
		H	7400.8	-46.8	-13	Pass
		H	9251.0	-43.7	-13	Pass
		H	11101.2	nf	-13	Pass
	661	V	3760.0	-48.9	-13	Pass
		V	5640.0	-49.4	-13	Pass
		V	7520.0	-46.0	-13	Pass
		V	9400.0	-42.0	-13	Pass
		V	11280.0	nf	-13	Pass
		H	3760.0	-50.5	-13	Pass
		H	5640.0	-48.9	-13	Pass
		H	7520.0	-46.7	-13	Pass
		H	9400.0	-42.8	-13	Pass
		H	11280.0	nf	-13	Pass
	810	V	3819.6	-51.3	-13	Pass
		V	5729.4	-50.0	-13	Pass
		V	7639.2	-46.3	-13	Pass
		V	9549.0	-43.6	-13	Pass
		V	11458.8	nf	-13	Pass
		H	3819.6	-48.3	-13	Pass
		H	5729.4	-48.7	-13	Pass
		H	7639.2	-46.1	-13	Pass
		H	9549.0	-41.8	-13	Pass
		H	11458.8	nf	-13	Pass

NOTE:

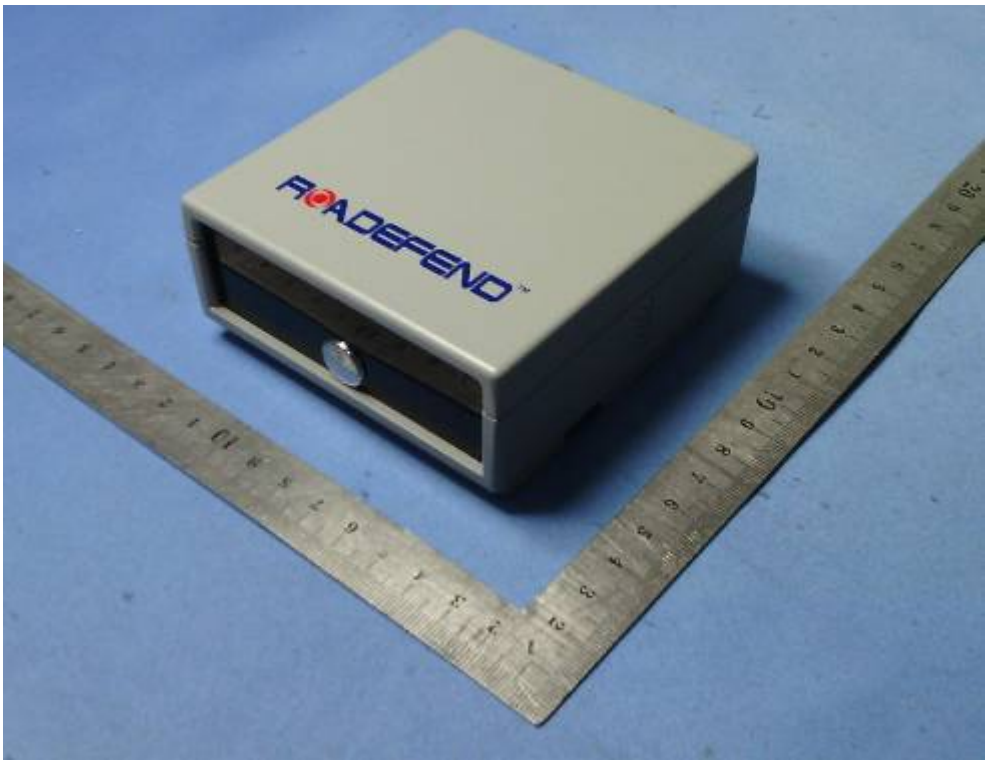
1) the power of the EUT transmitting frequency should be ignored.

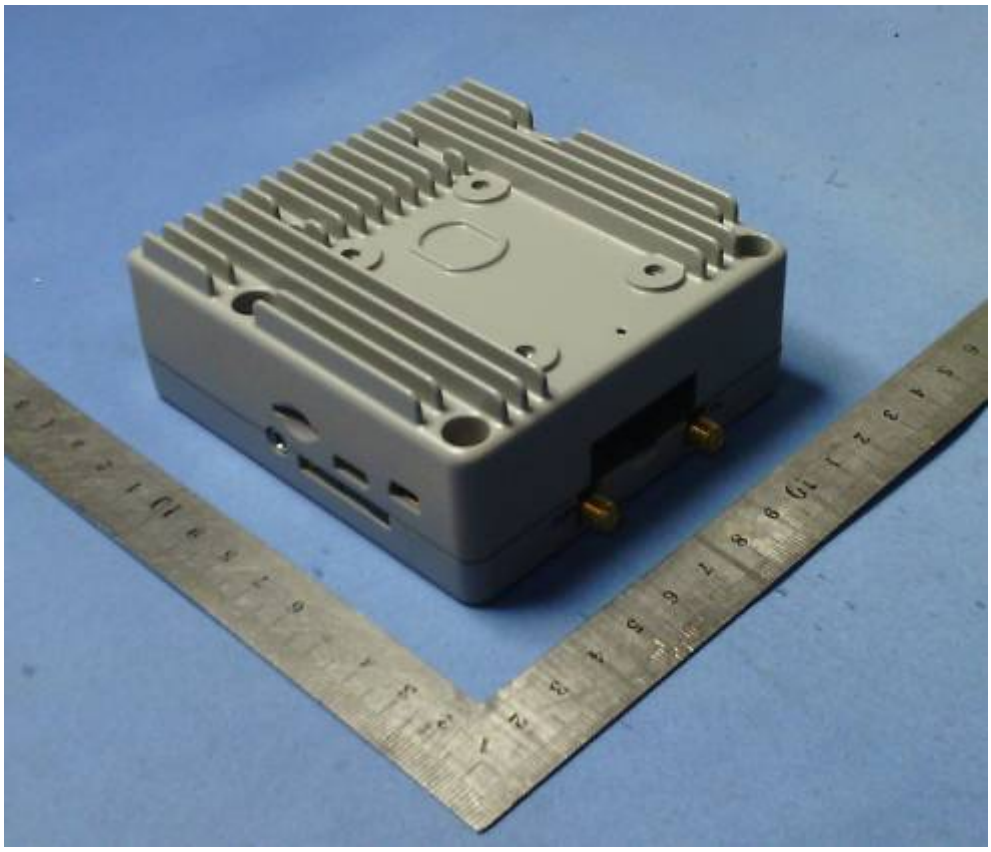
2) All spurious emission tests were performed in X,Y,Z axis direction and EUT was tested in GSM and GPRS mode, Only the worst axis test condition was recored in this test report.

3) 'nf' means that the emission level is too low to read out from the noise floor.

4) The emission levels of below 1 GHz are very lower than the limit(<-40dBm) and not show in this report.

Photos of the EUT





** END OF REPORT **