

FCC Report

Mobile Phone

Product Description: Smart Phone

Trade Mark: Skyworth

Model No.: A076, GP353, SPA376

FCC ID: Q7Q-A076

Applicant: Shenzhen Skyworth Wireless Technology Co., Ltd.

Address: Unit A Rm 3A01, Skyworth Bldg, Gaoxin Ave 1S, Nanshan District, Shenzhen, China.

Applicable standards:	FCC CFR Title 47 Part 2: 2012 FCC CFR Title 47 Part22 Subpart H: 2012 FCC CFR Title 47 Part24 Subpart E: 2012
Test Date:	15 May ~ 31 May, 2013
Issued Date:	31 May, 2013
Test Result:	Complied



James Wu
Laboratory Manager

The test result in this test report relate only to the tested samples in this report .

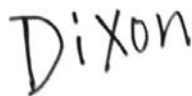
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2 Version

<i>Version No.</i>	<i>Date</i>	<i>Description</i>
00	31 May, 2013	Original

Prepared By:

Young Li
Project Engineer**Date:**31 May, 2013

Check By:

Dixon Hao
Reviewer**Date:**31 May, 2013

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4 Test Summary

Test Item	Test Method	Result
Conducted Output Power	Part 2.1046	Pass
Effective Radiated Power	Part 22.913(a)(2)	Pass
Equivalent Isotropic Radiated Power	Part 24.232(c)	Pass
Occupied Bandwidth	Part 2.1049 Part 22.917 (a) Part 24.238 (a)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Complied: The EUT has complied with the essential requirements in the standard.

5 General Information

5.1 Client Information

Applicant:	Shenzhen Skyworth Wireless Technology Co., Ltd.
Address:	Unit A Rm 3A01, Skyworth Bldg, Gaoxin Ave 1S, Nanshan District, Shenzhen, China.
Manufacturer:	Shenzhen Skyworth Wireless Technology Co., Ltd.
Address:	Unit A Rm 3A01, Skyworth Bldg, Gaoxin Ave 1S, Nanshan District, Shenzhen, China.
Factory:	Shenzhen Skyworth Wireless Technology Co., Ltd.
Address:	Unit A Rm 3A01, Skyworth Bldg, Gaoxin Ave 1S, Nanshan District, Shenzhen, China.

5.2 General Description of EUT

Product Name:	Smart Phone
Brand Mark:	Skyworth
Model No.:	A076, GP353, SPA376
Test model No.:	A076
Software Version:	4.0.4
Hardware Version:	A076_MAIN_PCB_V1.0
Mobile phone	
Support Networks:	GSM/GPRS/EDPRS/WCDMA/HSPA
TX Frequency:	GSM850/GPRS850/EGPRS850: 824.2MHz ~ 848.8MHz GSM1900/GPRS1900/EGPRS1900: 1850.2MHz ~ 1909.8MHz WCDMA Band V: 826.4MHz ~ 846.6MHz WCDMA Band II: 1852.4MHz ~ 1907.6MHz
RX Frequency:	GSM850/GPRS850/EGPRS850: 869.2MHz ~ 893.8MHz GSM1900/GPRS1900/EGPRS1900: 1930.2MHz ~ 1989.8MHz WCDMA Band V: 871.4MHz ~ 891.6MHz WCDMA Band II: 1932.4MHz ~ 1987.6MHz
Modulation Type:	GSM/GPRS: GMSK EGPRS: GMSK/8PSK WCDMA/HSPA: QPSK
Antenna Type:	Integral Antenna
Antenna Gain:	1.06dBi
AC Adapter:	Model: SW-0018 Input: AC 100~240V 50/60Hz 0.5A Output: DC 5.0V 1.0A
Power supply:	lithium-ion charge battery 3.7V

Operation Frequency List:

GSM 850		PCS1900		WCDMA Band V		WCDMA Band II	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)	Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
128	824.20	512	1850.20	4132	826.40	9262	1852.40
129	824.40	513	1850.40	4133	826.60	9263	1852.60
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
189	836.40	660	1879.80	4182	836.40	9399	1879.80
190	836.60	661	1880.00	4183	836.60	9400	1880.00
191	836.80	662	1880.20	4184	836.80	9401	1880.20
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
250	848.60	809	1909.60	4232	846.40	9537	1907.40
251	848.80	810	1909.80	4233	846.6	9538	1907.60

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	GSM 850		PCS1900		WCDMA Band V		WCDMA Band II	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Lowest	128	824.20	512	1850.20	4132	826.40	9262	1852.40
Middle	190	836.60	661	1880.00	4183	836.60	9400	1880.00
Highest	251	848.80	810	1909.80	4233	846.6	9538	1907.60

5.3 Test Mode

Communicate mode (GSM 850)	Keep the EUT in communicating mode on GSM 850 Band.
Data mode (GPRS850)	Keep the EUT in data communicating mode on GPRS 850 Band.
Data mode (EGPRS850)	Keep the EUT in data communicating mode on EGPRS 850 Band.
Communicate mode (PCS1900)	Keep the EUT in communicating mode on PCS1900 Band.
Data mode (GPRS1900)	Keep the EUT in data communicating mode on GPRS 1900 Band.
Data mode (EGPRS1900)	Keep the EUT in data communicating mode on EGPRS 1900 Band.
Communicate mode (UMTS 850)	Keep the EUT in communicating mode on UMTS 850 Band.
Data mode (HSDPA UMTS850)	Keep the EUT in data communicating mode on HSDPA in UMTS 850 Band (Sub-test 1~ Sub-test 4)
Data mode (HSUPA UMTS850)	Keep the EUT in data communicating mode on HSUPA in UMTS 850 Band (Sub-test 1~ Sub-test 5)
Data mode (RMC UMTS850)	Keep the EUT in data communicating mode on RMC in UMTS 850 Band
Communicate mode (UMTS 1900)	Keep the EUT in communicating mode on UMTS 1900 Band.
Data mode (HSDPA UMTS1900)	Keep the EUT in data communicating mode on HSDPA in UMTS 850 Band (Sub-test 1~ Sub-test 4)
Data mode (HSUPA UMTS1900)	Keep the EUT in data communicating mode on HSUPA in UMTS 850 Band (Sub-test 1~ Sub-test 5)
Data mode (RMC UMTS1900)	Keep the EUT in data communicating mode on RMC in UMTS 1900 Band

NOTE: Pre-scan test the output power of all modes, found the below modes were worse case mode,

Communicate mode (GSM 850), Data mode (EGPRS850), Communicate mode (PCS 1900), Data mode (EGPRS1900), Data mode (RMC UMTS850), Data mode (RMC UMTS1900); only these modes were used for all tests.

5.4 Test Facility

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

■ **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. to ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

■ **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, July 20, 2010.

■ **Industry Canada (IC) —Registration No.: 9079A-1**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-1.

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China

6 Test Instruments list

Instrument	Manufacturer	Model No.	Inventory No.	Next Cal. Date
3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 28 2014
Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A
EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 02 2013
BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 23 2014
Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 28 2013
Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 28 2014
EMI Test Software	AUDIX	E3	N/A	N/A
Coaxial Cable	GTS	N/A	GTS213	Mar. 29 2014
Coaxial Cable	GTS	N/A	GTS211	Mar. 29 2014
Coaxial cable	GTS	N/A	GTS210	Mar. 29 2014
Coaxial Cable	GTS	N/A	GTS212	Mar. 29 2014
Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 02 2013
Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 02 2013
Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 28 2013
Band filter	Amindeon	82346	GTS219	Mar. 29 2014
Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	May 10 2014
Signal Generator	Rohde & Schwarz	SML03	GTS236	May 10 2014
Temp. Humidity/ Barometer	Oregon Scientific	BA-888	GTS248	May 10 2014
D.C. Power Supply	Instek	PS-3030	GTS232	NA
Splitter	Agilent	11636B	GTS237	May 10 2014

Conducted Emission				
Instrument	Manufacturer	Model No.	Inventory No.	Next Cal. Date
Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Sep. 07 2013
EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jul. 02 2013
10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	Jul. 02 2013
Coaxial Switch	ANRITSU CORP	MP59B	GTS225	Jul. 02 2013
LISN	SCHWARZBECK MESS- ELEKTRONIK	NSLK 8127	GTS226	Jul. 02 2013
Coaxial Cable	GTS	N/A	GTS227	Jul. 02 2013
EMI Test Software	AUDIX	E3	N/A	N/A
Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Sep. 07 2013
EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jul. 02 2013

7 System test configuration

EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application

EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements

Test Procedure

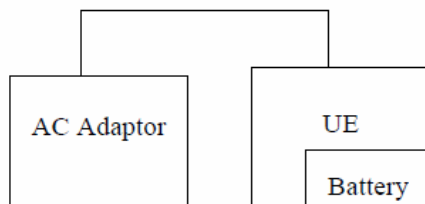
Conducted Emissions

The EUT is placed on a turn table which is 0.8m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15MHz and 30MHz using CISPR Quasi-Peak and Average detector mode

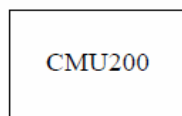
Radiated Emissions

The EUT is placed on a turn table which is 1.0m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003

Configuration of Tested System



Remote Side



Description of test mode

1. The EUT has been tested under operating condition.
2. EUT staying in continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.
3. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for both GSM/PCS with power adaptors, earphone and Data cable. The worst-case H mode for GSM850, PCS1900, WCDMA Band V and WCDMA Band II.

8 Measurement Data and Test Results

8.1 Conducted Emissions

Standard requirement

FCC Part15 C Section 15.207

Test method

ANSI C63.4:2003

Receiver set

RBW=9KHz, VBW=30KHz, Sweep time=auto

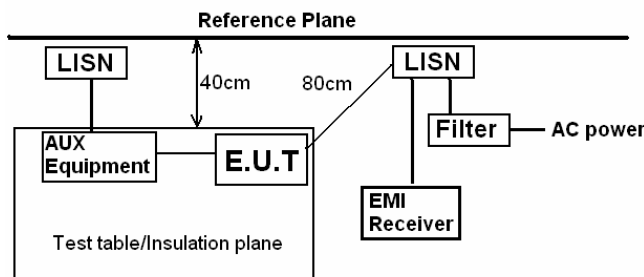
Limit

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

Test mode

Refer to section 5.3 for details

Test setup



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedance Stabilization Network
Test table height=0.8m

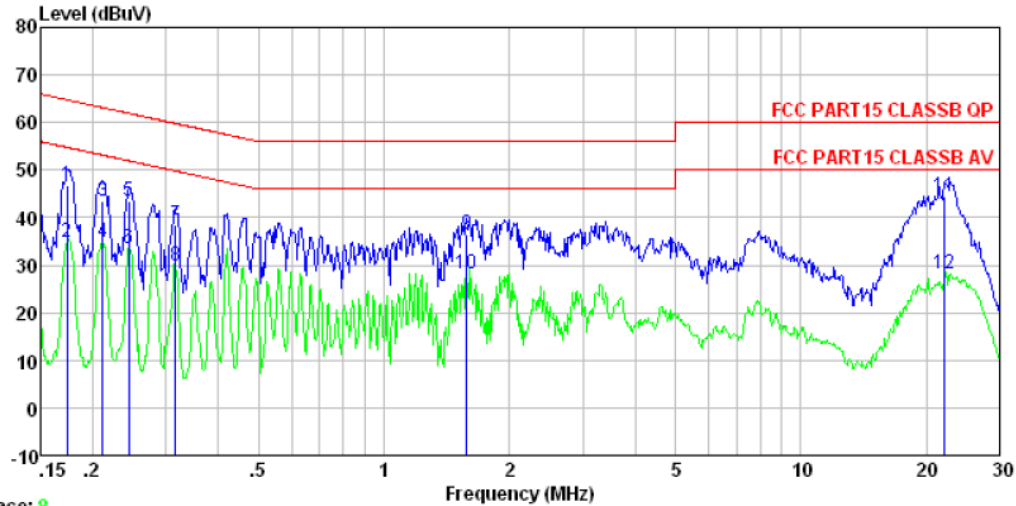
Test mode

1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Test Result

Complied

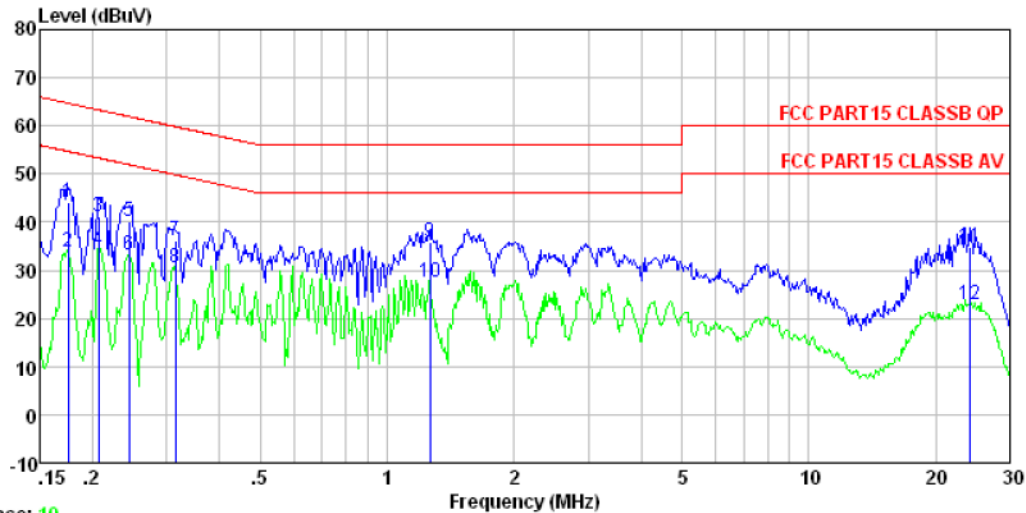
Test mode:	Calling + Charging mode	Temperature:	24~26°C
Phase Polarity:	Line	Relative Humidity:	50~53%



Trace: 8
Condition : FCC PART15 CLASSB QP LISN-2012 LINE
Model No. : A076
Test mode: : Calling + charging mode
Test Engineer:: Yang

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.174	47.08	-0.23	0.10	46.95	64.77	-17.82	QP
2	0.174	35.12	-0.23	0.10	34.99	54.77	-19.78	Average
3	0.212	43.49	-0.23	0.10	43.36	63.14	-19.78	QP
4	0.212	35.12	-0.23	0.10	34.99	53.14	-18.15	Average
5	0.244	43.69	-0.23	0.10	43.56	61.95	-18.39	QP
6	0.244	33.63	-0.23	0.10	33.50	51.95	-18.45	Average
7	0.317	38.73	-0.22	0.10	38.61	59.80	-21.19	QP
8	0.317	29.81	-0.22	0.10	29.69	49.80	-20.11	Average
9	1.577	36.56	-0.23	0.10	36.43	56.00	-19.57	QP
10	1.577	28.32	-0.23	0.10	28.19	46.00	-17.81	Average
11	22.180	44.98	-0.70	0.21	44.49	60.00	-15.51	QP
12	22.180	28.59	-0.70	0.21	28.10	50.00	-21.90	Average

Test mode:	Calling + Charging mode	Temperature:	24~26°C
Phase Polarity:	Nertral	Relative Humidity:	50~53%



Trace: 10
Condition : FCC PART15 CLASSB QP LISN-2012 NEUTRAL
Model No. : A076
Test mode : Calling + Charging mode
Test Engineer: Yang

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.175	44.14	-0.09	0.10	44.15	64.72	-20.57	QP
2	0.175	33.72	-0.09	0.10	33.73	54.72	-20.99	Average
3	0.207	41.11	-0.09	0.10	41.12	63.32	-22.20	QP
4	0.207	34.32	-0.09	0.10	34.33	53.32	-18.99	Average
5	0.244	40.04	-0.09	0.10	40.05	61.95	-21.90	QP
6	0.244	33.14	-0.09	0.10	33.15	51.95	-18.80	Average
7	0.315	36.18	-0.09	0.10	36.19	59.84	-23.65	QP
8	0.315	30.51	-0.09	0.10	30.52	49.84	-19.32	Average
9	1.262	35.98	-0.09	0.10	35.99	56.00	-20.01	QP
10	1.262	27.41	-0.09	0.10	27.42	46.00	-18.58	Average
11	24.015	35.42	-0.72	0.21	34.91	60.00	-25.09	QP
12	24.015	23.47	-0.72	0.21	22.96	50.00	-27.04	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss

8.2 Conducted Output Power

☞ Standard requirement

FCC part22.913(a) and FCC part24.232(b)

☞ Test method

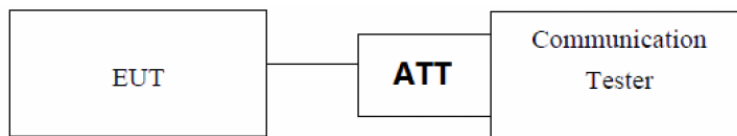
FCC part2.1046

☞ Limit

WCDMA Band V: 7W

WCDMA Band II: 2W

☞ Test setup



Note: Measurement setup for testing on Antenna connector

☞ Test Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a spectrum analysis. Transmitter output was read off the CMU200 in dBm.

☞ Test mode

Refer to section 5.3 for details

☞ Test Result

Complied

Measurement Data

Mode		Test channel	Frequency (MHz)	Burst Conducted Power (dBm)
GSM 850	/	128	824.20	32.47
		190	836.60	32.28
		251	848.80	32.58
GPRS850 (GMSK)	1 Uplink slot	128	824.20	32.46
		190	836.60	32.17
		251	848.80	32.49
	2 Uplink slot	128	824.20	30.38
		190	836.60	30.24
		251	848.80	30.43
	3 Uplink slot	128	824.20	29.59
		190	836.60	29.44
		251	848.80	29.65
EGPRS850 (GMSK)	1 Uplink slot	128	824.20	32.44
		190	836.60	32.18
		251	848.80	32.47
	2 Uplink slot	128	824.20	30.36
		190	836.60	30.24
		251	848.80	30.44
	3 Uplink slot	128	824.20	29.59
		190	836.60	29.43
		251	848.80	29.64
EGPRS850 (8PSK)	1 Uplink slot	128	824.20	26.54
		190	836.60	26.37
		251	848.80	26.64
	2 Uplink slot	128	824.20	24.40
		190	836.60	24.25
		251	848.80	24.43
	3 Uplink slot	128	824.20	23.29
		190	836.60	23.21
		251	848.80	23.42

Mode		Test channel	Frequency (MHz)	Burst Conducted Power (dBm)
PCS1900	/	512	1850.20	29.48
		661	1880.00	29.39
		810	1909.80	29.45
GPRS1900 (GMSK)	1 Uplink slot	512	1850.20	29.47
		661	1880.00	29.39
		810	1909.80	29.46
	2 Uplink slot	512	1850.20	27.72
		661	1880.00	27.60
		810	1909.80	27.67
	3 Uplink slot	512	1850.20	27.05
		661	1880.00	26.85
		810	1909.80	26.97
GPRS1900 (GMSK)	1 Uplink slot	512	1850.20	29.49
		661	1880.00	29.41
		810	1909.80	29.45
	2 Uplink slot	512	1850.20	27.71
		661	1880.00	27.62
		810	1909.80	27.66
	3 Uplink slot	512	1850.20	27.03
		661	1880.00	26.83
		810	1909.80	26.95
EGPRS1900 (8PSK)	1 Uplink slot	512	1850.20	25.09
		661	1880.00	25.00
		810	1909.80	24.92
	2 Uplink slot	512	1850.20	22.63
		661	1880.00	22.22
		810	1909.80	22.44
	3 Uplink slot	512	1850.20	21.49
		661	1880.00	21.08
		810	1909.80	21.30

Mode		Test channel	Frequency (MHz)	Burst Conducted Power (dBm)
UMTS 850 HSDPA	Subtest1	4132	826.40	23.04
		4183	836.00	22.98
		4233	846.60	23.07
	Subtest2	4132	826.40	23.01
		4183	836.00	22.95
		4233	846.60	23.05
	Subtest3	4132	826.40	23.01
		4183	836.00	22.82
		4233	846.60	22.92
	Subtest4	4132	826.40	22.96
		4183	836.00	22.91
		4233	846.60	23.01
UMTS 850 HSUPA	Subtest1	4132	826.40	22.95
		4183	836.00	22.90
		4233	846.60	22.89
	Subtest2	4132	826.40	22.81
		4183	836.00	22.97
		4233	846.60	22.89
	Subtest3	4132	826.40	22.92
		4183	836.00	23.01
		4233	846.60	22.92
	Subtest4	4132	826.40	22.89
		4183	836.00	22.95
		4233	846.60	22.87
	Subtest5	4132	826.40	22.89
		4183	836.00	22.93
		4233	846.60	22.95
UMTS 850 RMC	12.2kbps	4132	826.40	23.28
		4183	836.00	23.22
		4233	846.60	23.34
	64kbps	4132	826.40	23.25
		4183	836.00	23.20
		4233	846.60	23.32
	144kbps	4132	826.40	23.22
		4183	836.00	23.21
		4233	846.60	23.29
	384kbps	4132	826.40	23.19
		4183	836.00	23.17
		4233	846.60	23.30
UMTS 850 AMR	\	4132	826.40	21.14
		4183	836.00	21.07
		4233	846.60	21.22

Mode		Test channel	Frequency (MHz)	Burst Conducted Power (dBm)
UMTS 1900 HSDPA	Subtest1	9262	1852.40	22.49
		9400	1880.00	22.45
		9538	1907.60	22.47
	Subtest2	9262	1852.40	22.43
		9400	1880.00	22.44
		9538	1907.60	22.47
	Subtest3	9262	1852.40	22.38
		9400	1880.00	22.40
		9538	1907.60	22.39
	Subtest4	9262	1852.40	22.35
		9400	1880.00	22.31
		9538	1907.60	22.41
UMTS 1900 HSUPA	Subtest1	9262	1852.40	22.33
		9400	1880.00	22.40
		9538	1907.60	22.35
	Subtest2	9262	1852.40	22.30
		9400	1880.00	22.29
		9538	1907.60	22.37
	Subtest3	9262	1852.40	22.43
		9400	1880.00	22.39
		9538	1907.60	22.41
	Subtest4	9262	1852.40	22.25
		9400	1880.00	22.32
		9538	1907.60	22.37
	Subtest5	9262	1852.40	22.28
		9400	1880.00	22.31
		9538	1907.60	22.29
UMTS 1900 RMC	12.2kbps	9262	1852.40	22.86
		9400	1880.00	22.79
		9538	1907.60	22.74
	64kbps	9262	1852.40	22.85
		9400	1880.00	22.78
		9538	1907.60	22.72
	144kbps	9262	1852.40	22.84
		9400	1880.00	22.79
		9538	1907.60	22.76
	384kbps	9262	1852.40	22.81
		9400	1880.00	22.77
		9538	1907.60	22.74
UMTS 1900 ARM	\	9262	1852.40	20.55
		9400	1880.00	20.58
		9538	1907.60	20.51

8.3 Occupy Bandwidth

Standard requirement

FCC part22.913(a) and FCC part24.232(b)

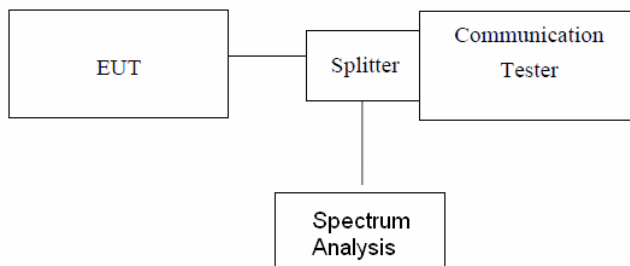
Test method

FCC part2.1049

Limit

N/A

Test setup



Note: Measurement setup for testing on Antenna connector

Test Procedure

1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBW was set to about 1% of emission BW, VBW= 3 times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

Test mode

Refer to section 5.3 for details

Test Result

Complied

Measurement Data

NOTE: Pre-scan test the bandwidth of all modes, found the below modes were worse case mode,

Communicate mode (GSM 850), Communicate mode (PCS 1900), Data mode (RMC UMTS850), Data mode (RMC UMTS1900); only these modes were used for the test item.

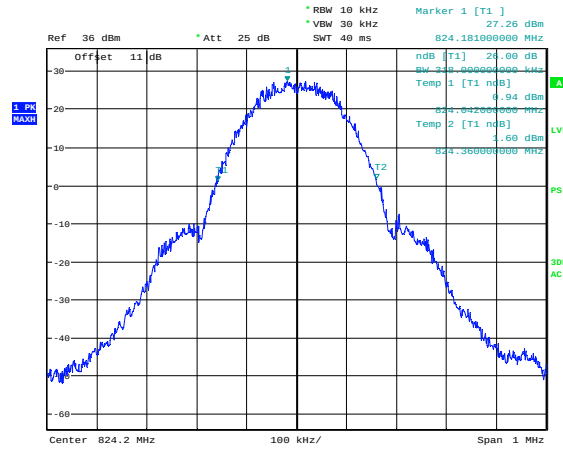
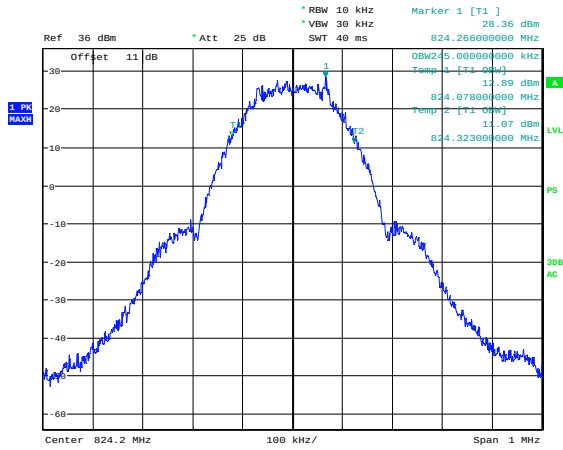
Mode	Test channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850	128	824.20	245	318
	190	836.60	244	300
	251	848.80	246	309
EGPRS 850	128	824.20	246	312
	190	836.60	242	310
	251	848.80	244	316
PCS 1900	512	1850.20	245	313
	661	1880.00	246	310
	810	1909.80	243	317
EGPRS 1900	512	1850.20	244	318
	661	1880.00	248	316
	810	1909.80	244	320
UMTS850 RMC (12.2kbps)	4132	826.40	4180	4680
	4183	836.00	4200	4680
	4233	846.60	4180	4720
UMTS 1900 RMC (12.2kbps)	9262	1852.40	4180	4720
	9400	1880.00	4180	4720
	9538	1907.60	4220	4760

Mode:

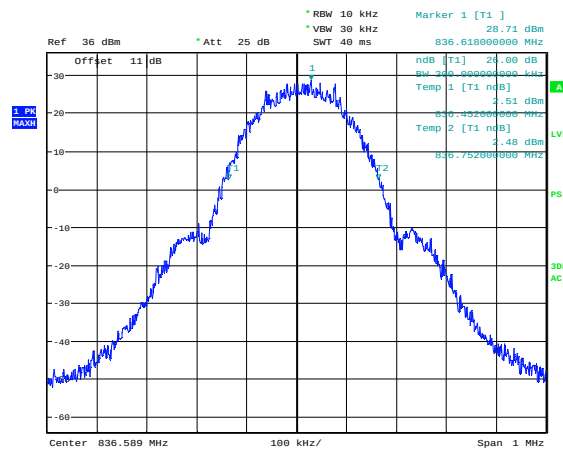
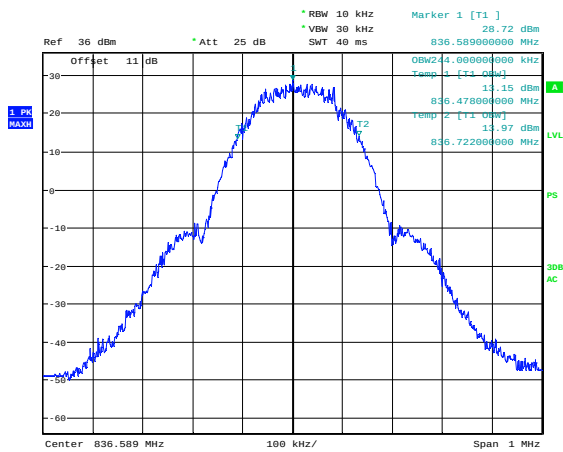
GSM850

99% Occupy bandwidth

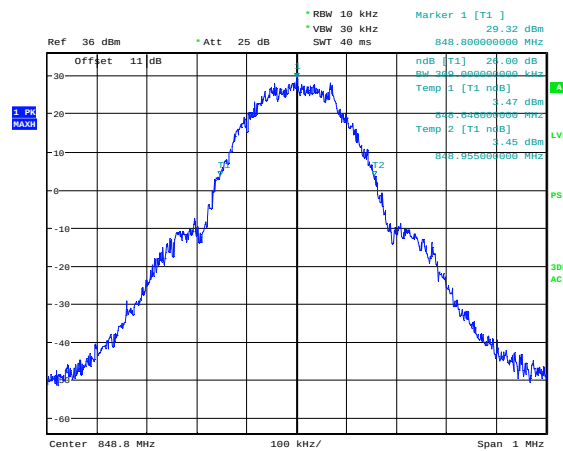
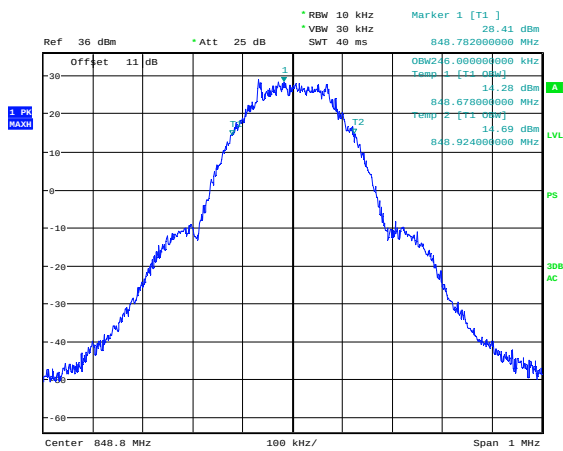
-26dB bandwidth



Lowest channel



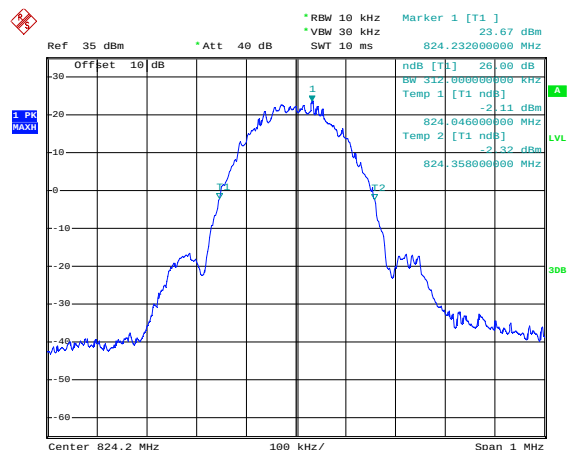
Middle channel



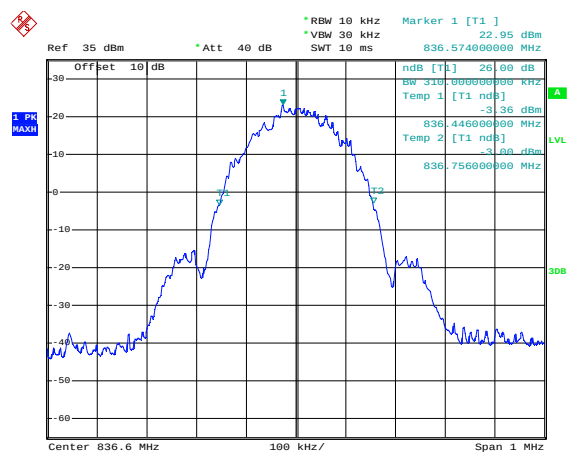
Highest channel

EGPRS850

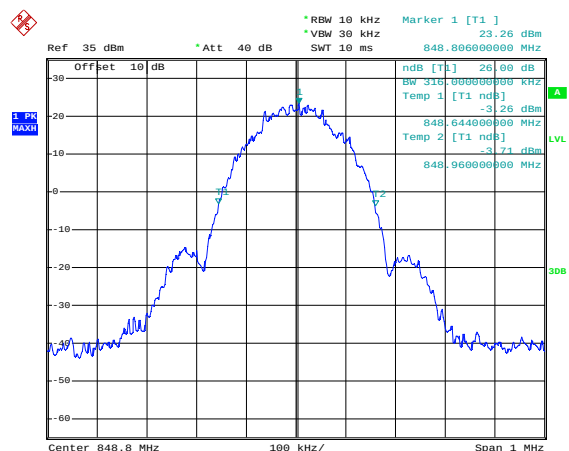
-26dB bandwidth



Lowest channel



Middle channel



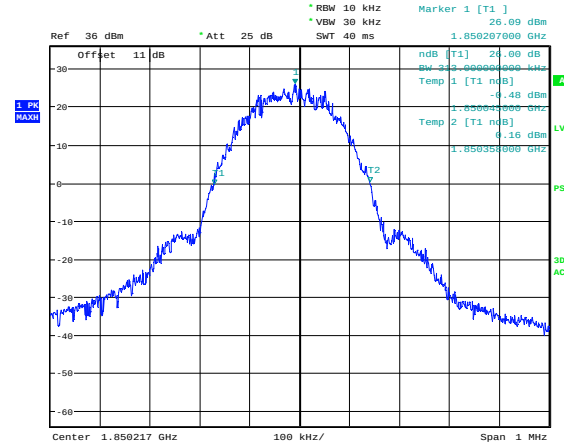
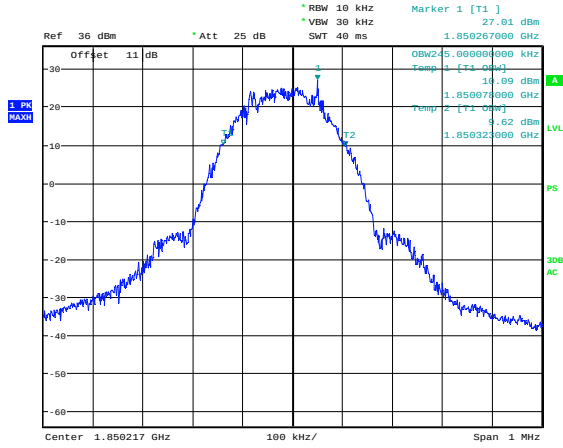
Highest channel

Mode:

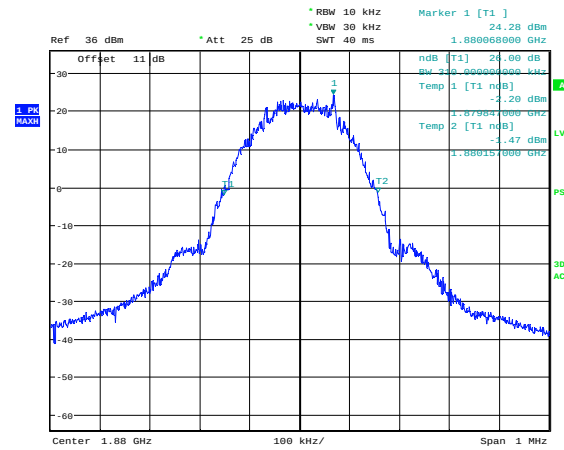
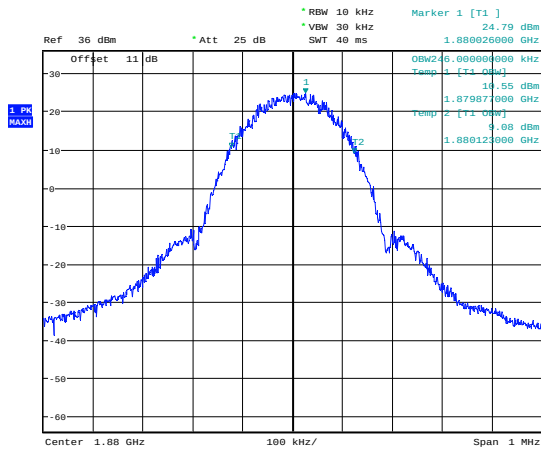
PCS1900

99% Occupancy bandwidth

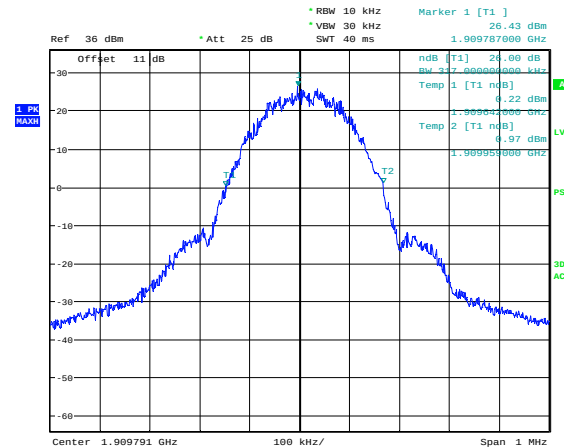
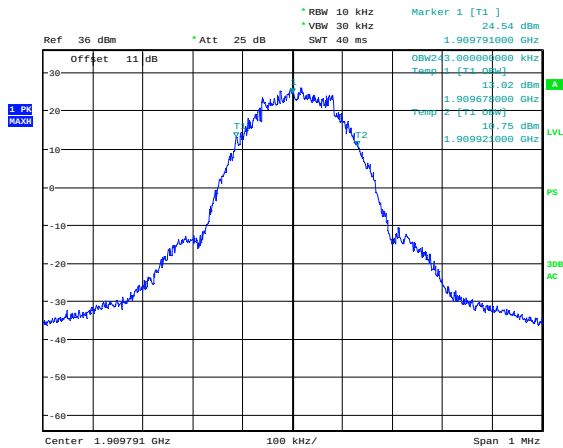
-26dB bandwidth



Lowest channel



Middle channel

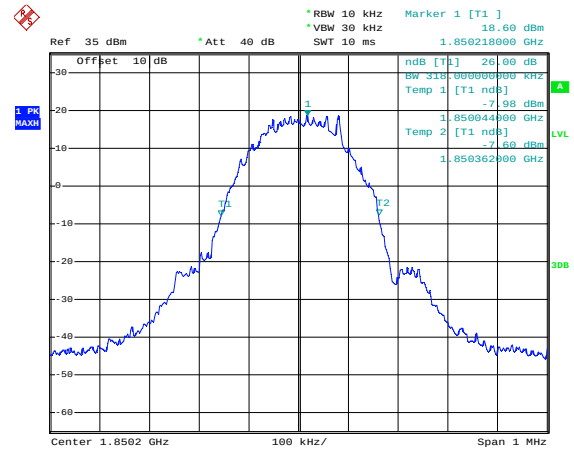
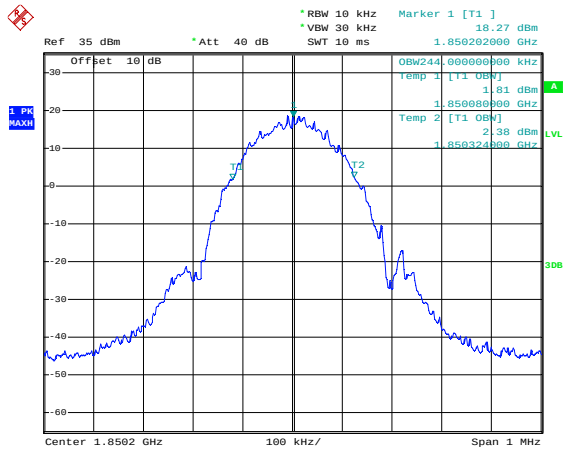


Highest channel

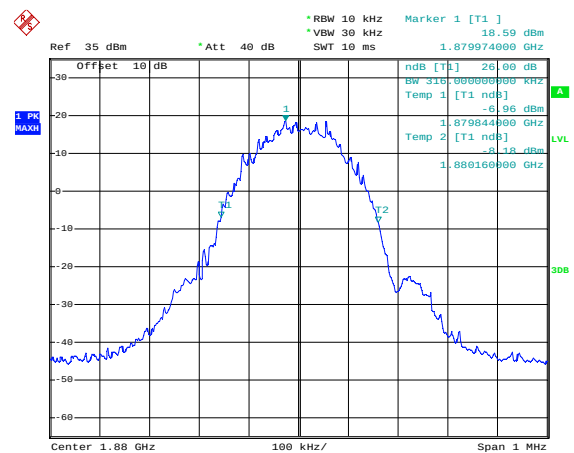
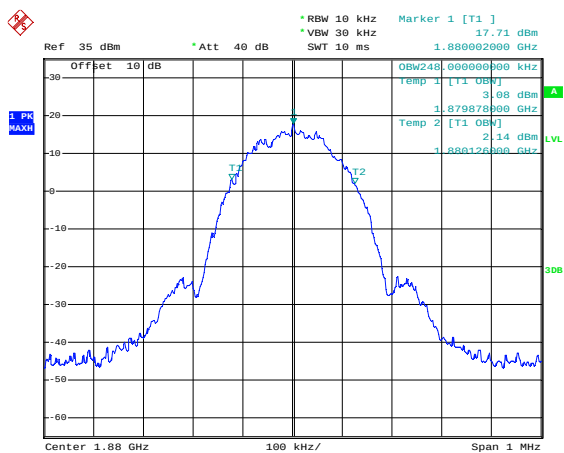
Mode:**EGPRS1900**

99% Occupy bandwidth

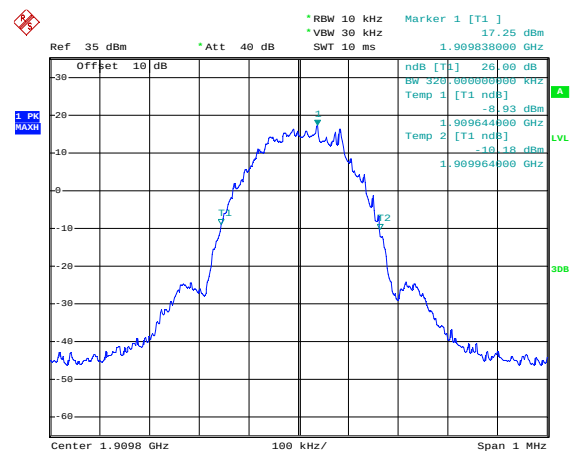
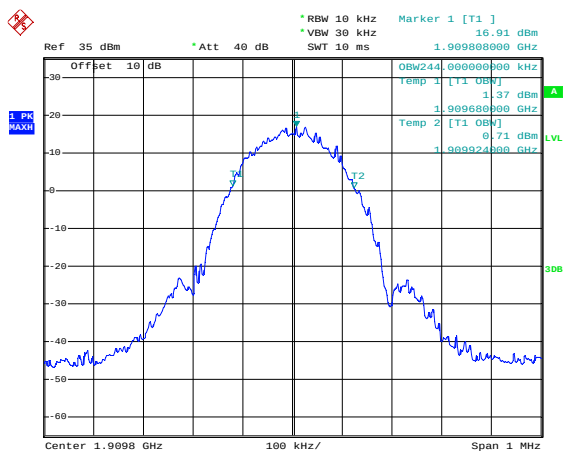
-26dB bandwidth



Lowest channel



Middle channel

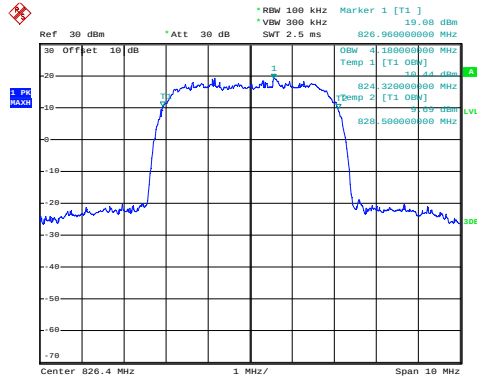


Highest channel

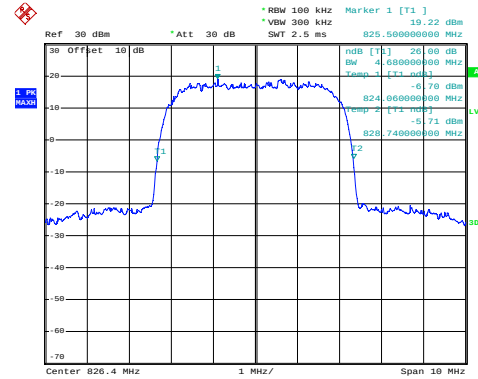
Mode:

UMTS850 RMC (12.2kbps)

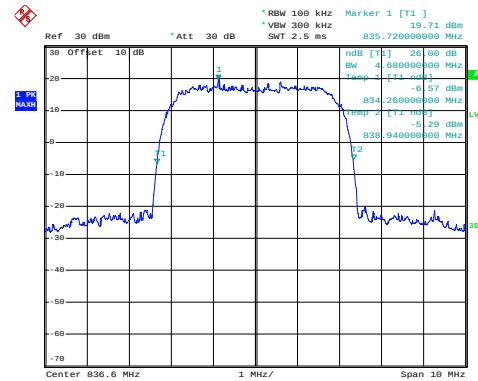
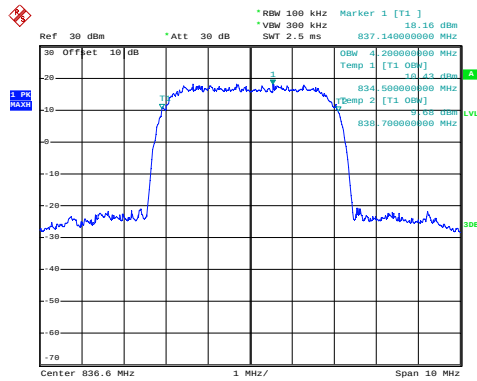
99% Occupy bandwidth



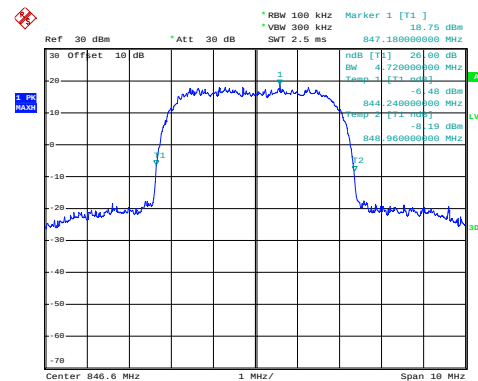
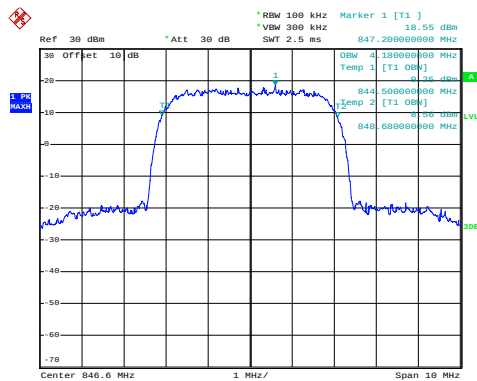
-26dB bandwidth



Lowest channel



Middle channel

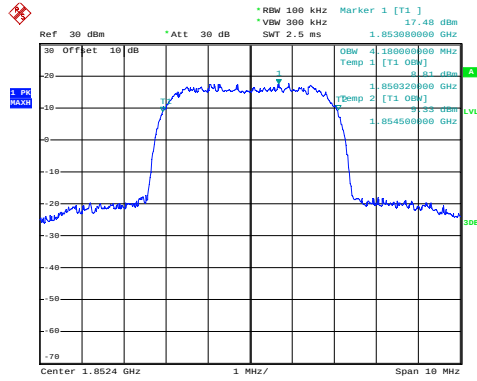


Highest channel

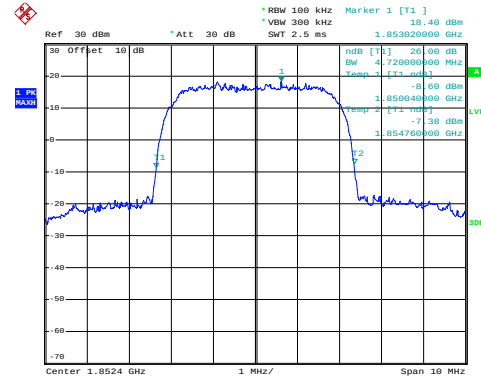
Mode:

UMTS1900 RMC (12.2kbps)

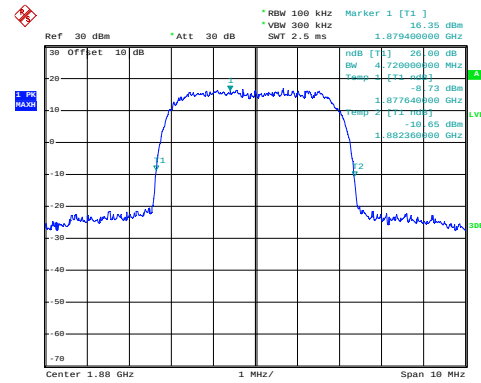
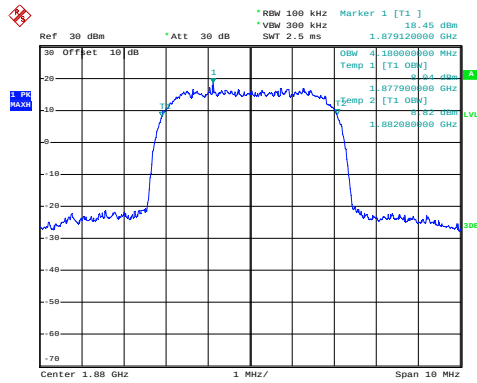
99% Occupy bandwidth



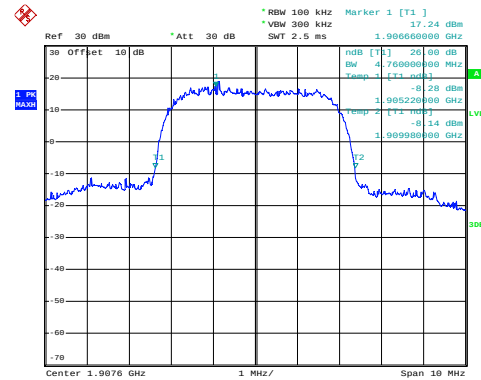
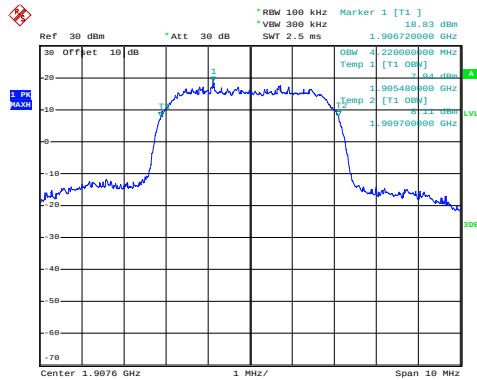
-26dB bandwidth



Lowest channel



Middle channel



Highest channel

8.4 Modulation characteristic

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

8.5 Out of band emission at antenna terminals

☞ Standard requirement

FCC part22.917(a) and FCC part24.238(a)

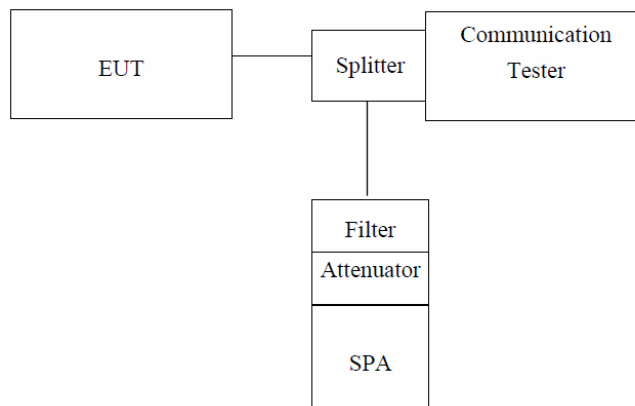
☞ Test method

FCC part2.1051

☞ Limit

-13dBm

☞ Test setup



Note: Measurement setup for testing on Antenna connector

☞ Test Procedure

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic.
4. Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

☞ Test mode

Refer to section 5.3 for details

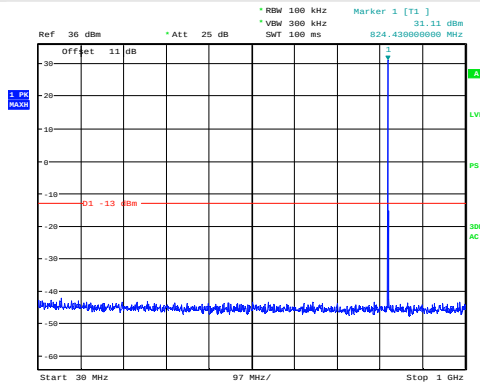
☞ Test Result

Complied

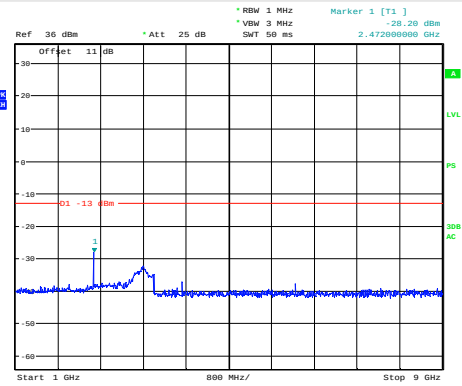
NOTE: Pre-scan test the output power of all modes, found the below modes were worse case mode,

Communicate mdoe (GSM 850), Communicate mdoe (PCS 1900), Data mode (RMC UMTS850), Data mode (RMC UMTS1900); only these modes were used for the test item.

Test item:	Spurious emission	Mode:	GSM850
Test channel:	Lowest channel		

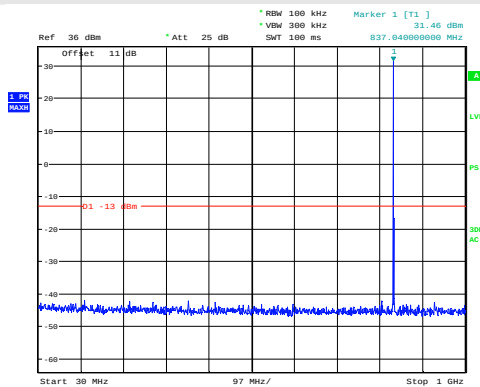


30MHz~1GHz

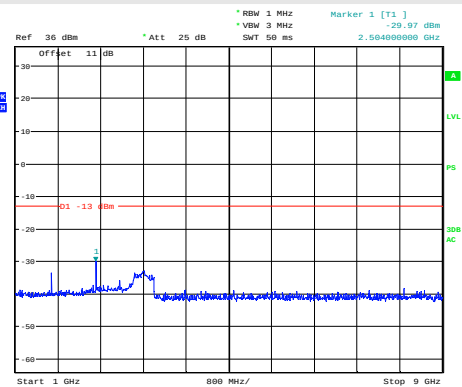


1GHz~9GHz

Test channel:	Middle channel		
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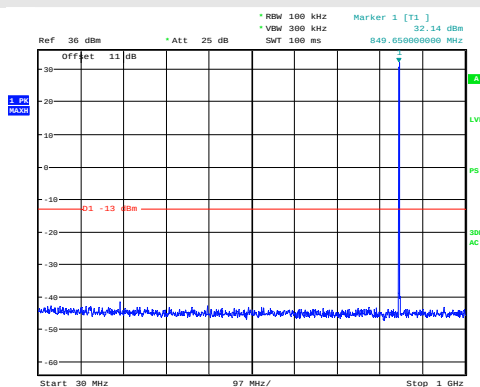


30MHz~1GHz

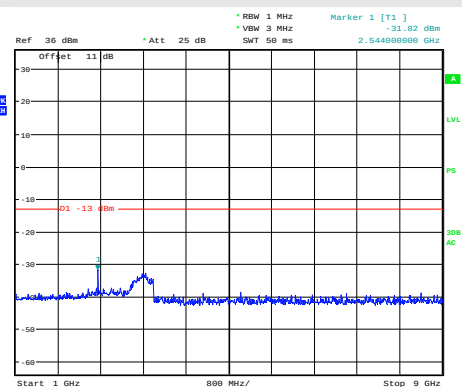


1GHz~9GHz

Test channel:	Highest channel		
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30MHz~1GHz



1GHz~9GHz

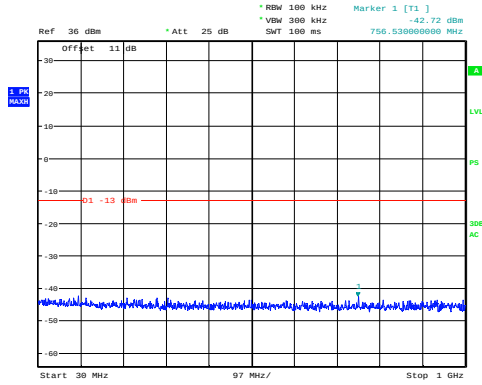
Test item: Spurious emission

Mode:

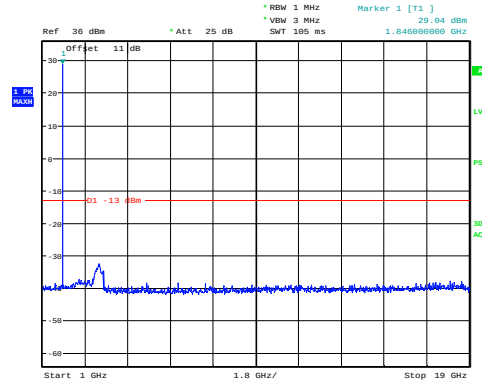
PCS1900

Test channel:

Lowest channel



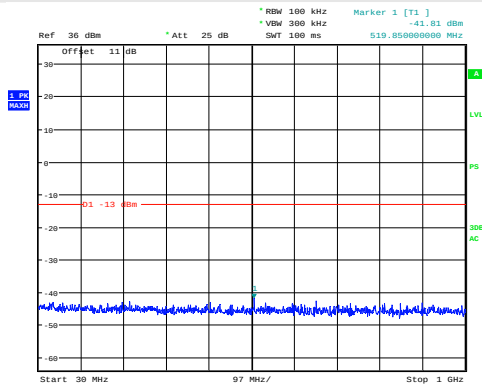
30MHz~1GHz



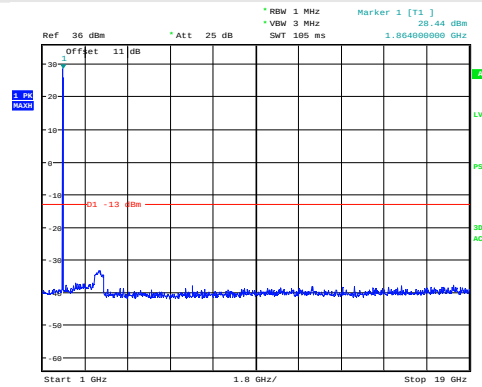
1GHz~9GHz

Test channel:

Middle channel



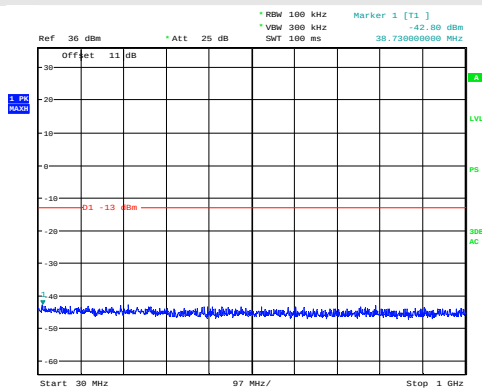
30MHz~1GHz



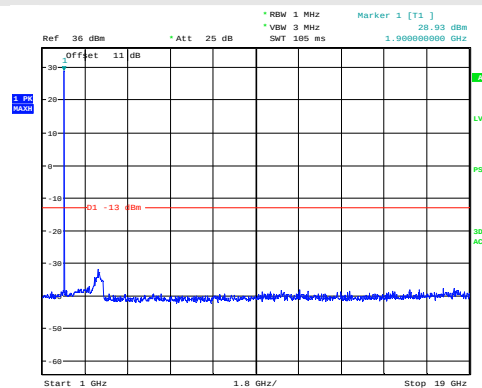
1GHz~9GHz

Test channel:

Highest channel

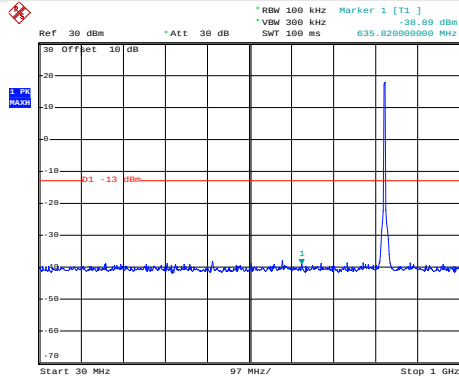


30MHz~1GHz

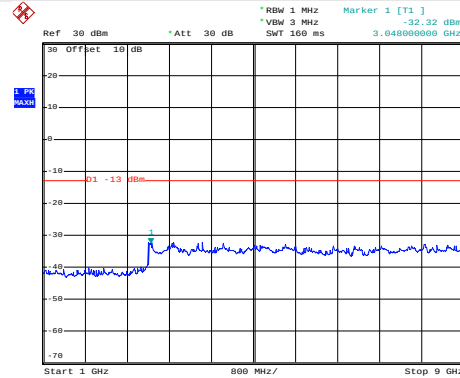


1GHz~9GHz

Test item:	Spurious emission	Mode:	UMTS 850 RMC (12.2kbps)
Test channel:	Lowest channel		

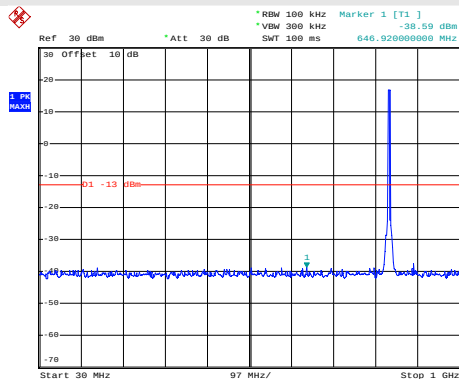


30MHz~1GHz

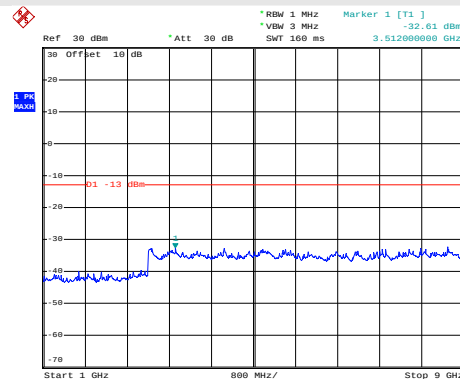


1GHz~9GHz

Test channel:	Middle channel
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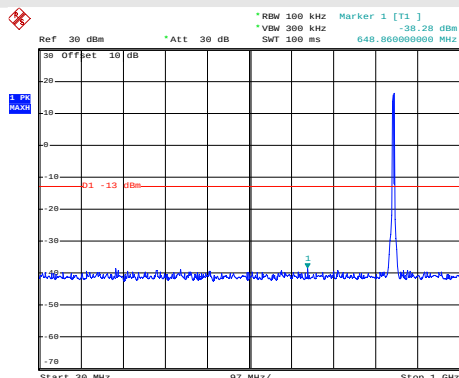


30MHz~1GHz

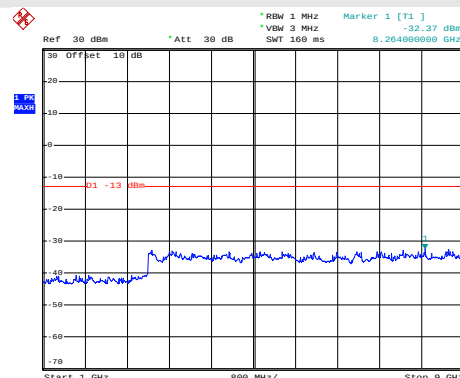


1GHz~9GHz

Test channel:	Highest channel
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30MHz~1GHz



1GHz~9GHz

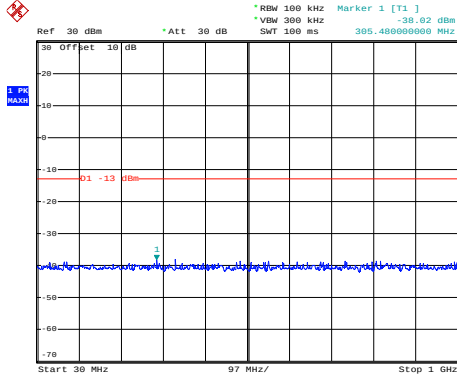
Test item: Spurious emission

Mode:

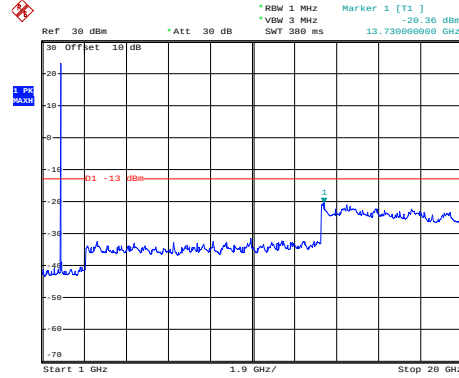
UMTS 1900 RMC
(12.2kbps)

Test channel:

Lowest channel



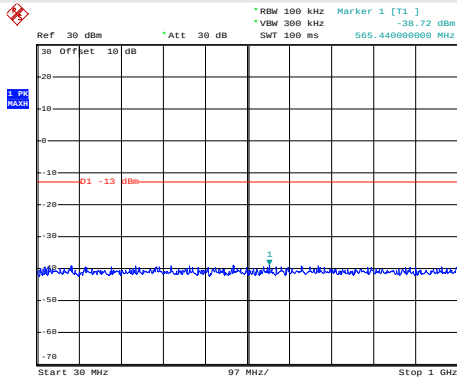
30MHz~1GHz



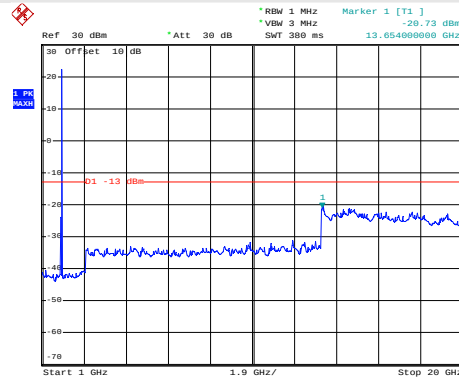
1GHz~9GHz

Test channel:

Middle channel



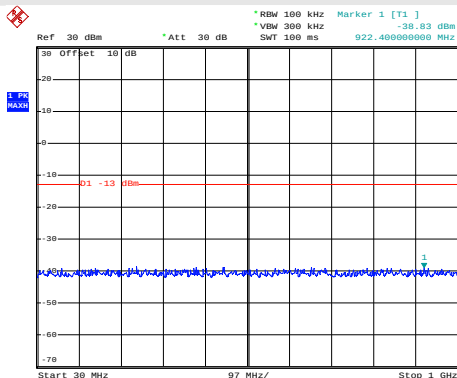
30MHz~1GHz



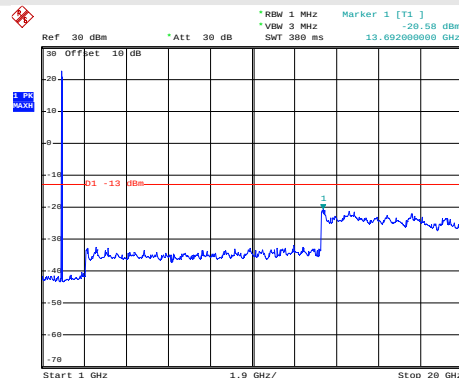
1GHz~9GHz

Test channel:

Highest channel



30MHz~1GHz

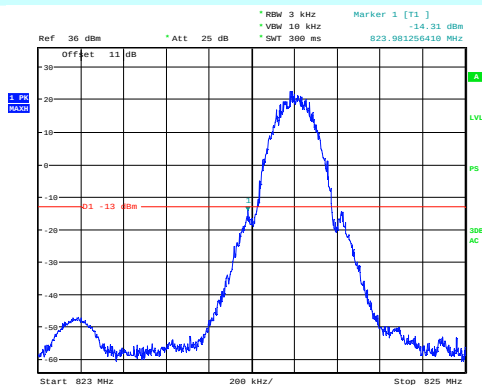


1GHz~9GHz

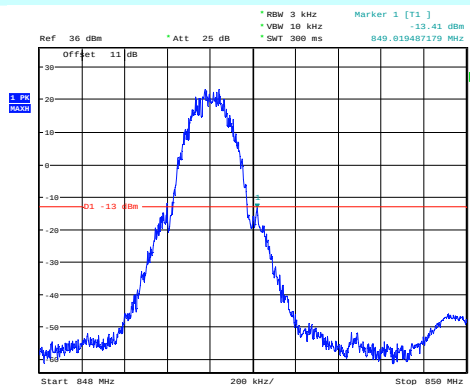
Test item: Band edge

Mode:

GSM 850



Lowest channel

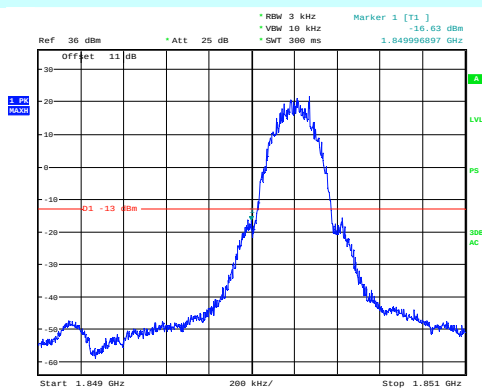


Highest channel

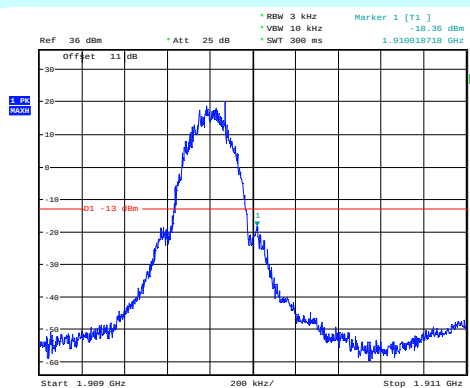
Test item: Band edge

Mode:

PCS1900



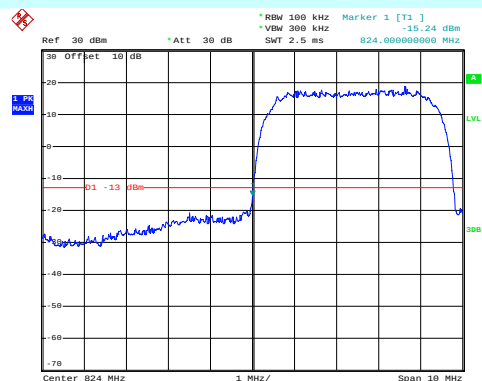
Lowest channel



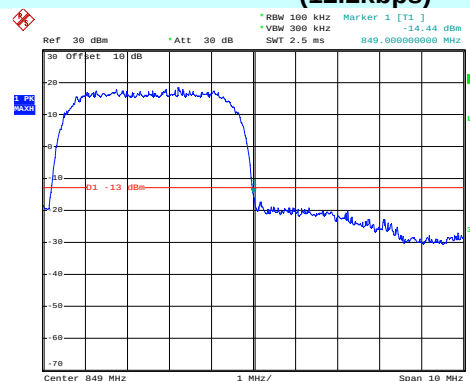
Highest channel

Test item: Band edge

Mode:

UMTS 850 RMC
(12.2kbps)


Lowest channel



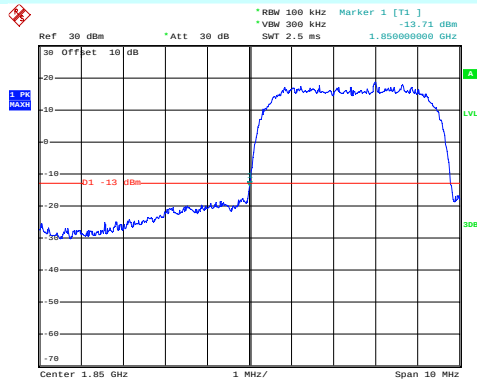
Highest channel

Test item:

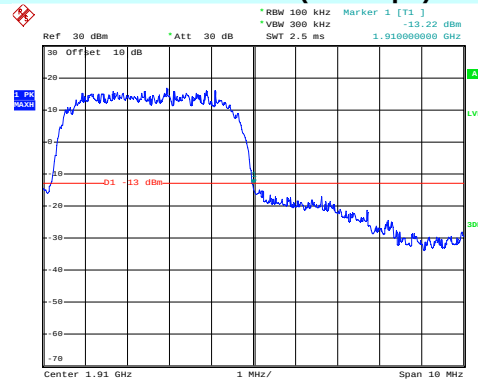
Band edge

Mode:

UMTS 1900 RMC
(12.2kbps)



Lowest channel



Highest channel

8.6 ERP, EIRP Measurement

☞ Standard requirement

FCC part22.913(a) and FCC part24.232(b)

☞ Test method

FCC part2.1046

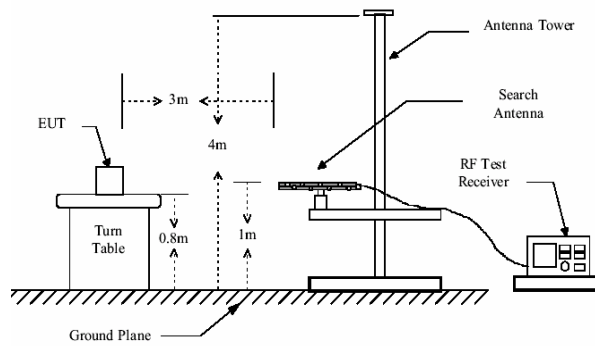
☞ Limit

GSM850 / WCDMA Band V: 7W ERP

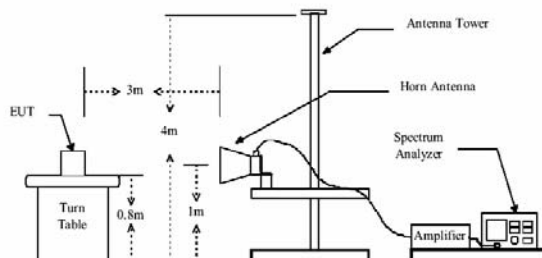
PCS1900 / WCDMA Band II: 2W EIRP

☞ Test setup

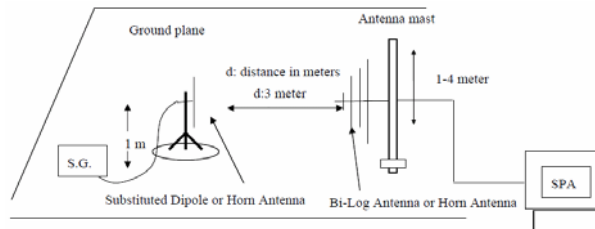
Below 1GHz



Above 1GHz



Substituted method:



☞ Test Procedure

1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
2. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.
3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated asfollows:
$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$
4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:
$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

☞ Test mode

Refer to section 5.3 for details

☞ Test Result**Complied**

Measurement Data

GSM850 / GPRS850 / EGPRS850 Band						
Channel	Mode	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
Lowest 824.2MHz	GSM 850	H	V	33.75	38.45	Pass
			H	27.34		
		E1	V	26.96		
			H	32.06		
		E2	V	27.84		
			H	31.48		
	GPRS850	H	V	33.72		
	EGPRS850	H	V	28.56		
Middle 836.6MHz	GSM 850	H	V	33.67	38.45	Pass
			H	27.30		
		E1	V	27.04		
			H	31.84		
		E2	V	28.73		
			H	31.33		
	GPRS850	H	V	33.70		
	EGPRS850	H	V	28.42		
Highest 848.8MHz	GSM 850	H	V	33.81	38.45	Pass
			H	27.87		
		E1	V	27.59		
			H	31.73		
		E2	V	28.01		
			H	32.13		
	GPRS850	H	V	33.78		
	EGPRS850	H	V	28.74		

PCS1900 / GPRS1900 / EGPRS1900 Band						
Channel	Mode	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
Lowest 1850.2MHz	PCS1900	H	V	30.17	33.01	Pass
			H	26.59		
		E1	V	25.47		
			H	28.94		
		E2	V	26.13		
			H	28.73		
	GPRS1900	H	V	30.14		
	EGPRS1900	H	V	24.69		
Middle 1880MHz	PCS1900	H	V	30.05	33.01	Pass
			H	26.33		
		E1	V	26.05		
			H	29.53		
		E2	V	26.58		
			H	29.36		
	GPRS1900	H	V	29.97		
	EGPRS1900	H	V	24.66		
Highest 1909.8MHz	PCS1900	H	V	30.11	33.01	Pass
			H	26.69		
		E1	V	26.37		
			H	28.95		
		E2	V	26.48		
			H	29.01		
	GPRS1900	H	V	30.02		
	EGPRS1900	H	V	24.58		

UMTS 850 HSDPA / UMTS 850 HSDPA / UMT850 RMC Band						
Channel	Mode	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
Lowest 826.4MHz	UMTS 850 HSDPA	H	V	24.28	38.45	Pass
			H	19.83		
		E1	V	18.54		
			H	22.85		
		E2	V	17.93		
			H	22.17		
	UMTS 850 HSUPA	H	V	24.26		
	UMTS850 RMC (12.2kbps)	H	V	25.12		
Middle 836MHz	UMTS 850 HSDPA	H	V	24.19	38.45	Pass
			H	19.78		
		E1	V	18.83		
			H	22.63		
		E2	V	19.04		
			H	22.72		
	UMTS 850 HSUPA	H	V	24.13		
	UMTS850 RMC (12.2kbps)	H	V	25.07		
Highest 846.6MHz	UMTS 850 HSDPA	H	V	24.23	38.45	Pass
			H	20.03		
		E1	V	18.82		
			H	22.84		
		E2	V	19.13		
			H	22.69		
	UMTS 850 HSUPA	H	V	24.17		
	UMTS850 RMC (12.2kbps)	H	V	25.19		

UMTS 1900 HSDPA / UMTS 1900 HSDPA / UMT 1900 RMC Band						
Channel	Mode	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
Lowest 1852.4MHz	UMTS 1900 HSDPA	H	V	24.20	33.01	Pass
			H	19.35		
		E1	V	19.64		
			H	22.84		
		E2	V	18.79		
			H	22.62		
	UMTS 1900 HSUPA	H	V	24.15		
	UMTS1900 RMC (12.2kbps)	H	V	24.97		
Middle 1880MHz	UMTS 1900 HSDPA	H	V	24.28	33.01	Pass
			H	19.52		
		E1	V	19.16		
			H	22.95		
		E2	V	18.74		
			H	22.58		
	UMTS 1900 HSUPA	H	V	24.26		
	UMTS1900 RMC (12.2kbps)	H	V	25.05		
Highest 1907.6MHz	UMTS 1900 HSDPA	H	V	24.25	33.01	Pass
			H	19.60		
		E1	V	19.22		
			H	22.86		
		E2	V	19.09		
			H	22.52		
	UMTS 1900 HSUPA	H	V	24.23		
	UMTS1900 RMC (12.2kbps)	H	V	25.11		

8.7 Field strength of spurious radiation measurement

☞ Standard requirement

FCC part22.917(a) and FCC part24.238(a)

☞ Test method

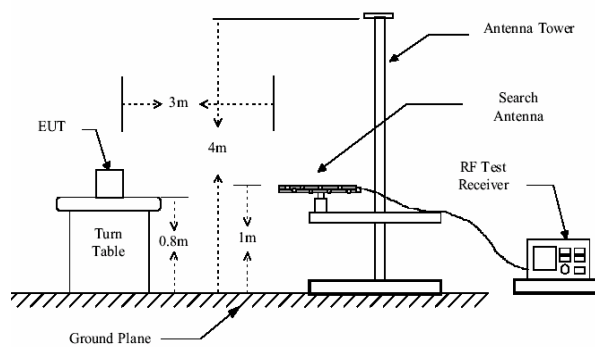
FCC part2.1053

☞ Limit

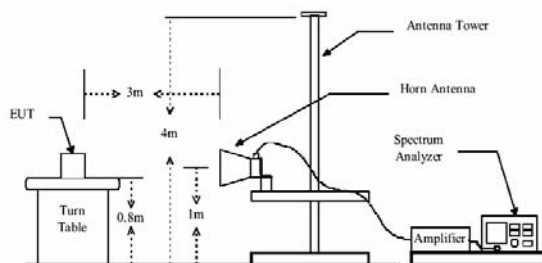
-13dBm

☞ Test setup

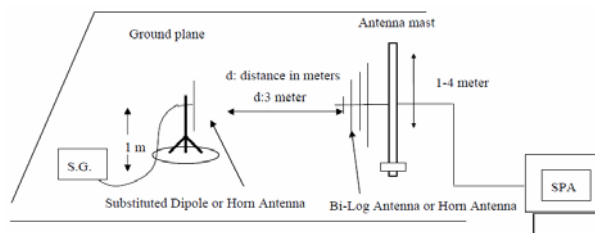
Below 1GHz



Above 1GHz



Substituted method:



☞ Test Procedure

1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
2. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.
3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated asfollows:
$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$
4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:
$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

☞ Test mode

Refer to section 5.3 for details

☞ Test Result

Complied

Measurement Data

Test mode:	GSM850		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1648.40	Vertical	-48.59	-13.00	Pass
2472.60	V	-46.83		
3296.80	V	-45.27		
4121.00	V	-40.82		
4945.20	V	---		
1648.40	Horizontal	-52.34	-13.00	Pass
2472.60	H	-50.84		
3296.80	H	-49.23		
4121.00	H	-45.10		
4945.20	H	---		
Test mode:	GSM850		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-48.27	-13.00	Pass
2509.80	V	-46.46		
3346.40	V	-44.98		
4183.00	V	-40.39		
5019.60	V	---		
1673.20	Horizontal	-50.50	-13.00	Pass
2509.80	H	-48.94		
3346.40	H	-47.49		
4183.00	H	-43.06		
5019.60	H	---		
Test mode:	GSM850		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1697.60	Vertical	-48.45	-13.00	Pass
2546.40	V	-46.67		
3395.20	V	-45.14		
4244.00	V	-40.63		
5092.80	V	---		
1697.60	Horizontal	-50.71	-13.00	Pass
2546.40	H	-49.15		
3395.20	H	-47.69		
4244.00	H	-43.29		
5092.80	H	---		

Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	PCS1900		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3700.40	Vertical	-44.31	-13.00	Pass
5550.60	V	-42.79		
7400.80	V	-40.38		
9251.00	V	-37.95		
11101.20	V	---		
3700.40	Horizontal	-46.59	-13.00	Pass
5550.60	H	-45.04		
7400.80	H	-43.81		
9251.00	H	-40.37		
11101.20	H	---		
Test mode:	PCS1900		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-44.01	-13.00	Pass
5640.00	V	-42.46		
7520.00	V	-40.04		
9400.00	V	-37.60		
11280.00	V	---		
3760.00	Horizontal	-46.25	-13.00	Pass
5640.00	H	-44.73		
7520.00	H	-43.51		
9400.00	H	-40.01		
11280.00	H	---		
Test mode:	PCS1900		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.60	Vertical	-44.18	-13.00	Pass
5729.40	V	-42.64		
7639.20	V	-40.23		
9549.00	V	-37.79		
11458.80	V	---		
3819.60	Horizontal	-46.44	-13.00	Pass
5729.40	H	-44.90		
7639.20	H	-43.67		
9549.00	H	-40.21		
11458.80	H	---		

Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	UMT850 RMC		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1652.80	Vertical	-51.68	-13.00	Pass
2479.20	V	-49.37		
3305.60	V	-46.64		
4132.00	V	-45.28		
4958.40	V	---		
1652.80	Horizontal	-54.23	-13.00	Pass
2479.20	H	-51.62		
3305.60	H	-50.12		
4132.00	H	-47.36		
4958.40	H	---		
Test mode:	UMT850 RMC		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1672.00	Vertical	-51.38	-13.00	Pass
2508.00	V	-49.04		
3344.00	V	-46.30		
4180.00	V	-44.93		
5016.00	V	---		
1672.00	Horizontal	-53.89	-13.00	Pass
2508.00	H	-51.31		
3344.00	H	-49.82		
4180.00	H	-47.00		
5016.00	H	---		
Test mode:	UMT850 RMC		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.20	Vertical	-51.55	-13.00	Pass
2539.80	V	-49.22		
3386.40	V	-46.49		
4233.00	V	-45.12		
5079.60	V	---		
1693.20	Horizontal	-54.08	-13.00	Pass
2539.80	H	-51.48		
3386.40	H	-49.98		
4233.00	H	-47.20		
5079.60	H	---		

Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test mode:	UMT1900 RMC		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3704.80	Vertical	-46.53	-13.00	Pass
5557.20	V	-44.20		
7409.60	V	-40.18		
9262.00	V	-38.55		
11114.40	V	---		
3704.80	Horizontal	-48.94	-13.00	Pass
5557.20	H	-47.11		
7409.60	H	-44.48		
9262.00	H	-41.26		
11114.40	H	---		
Test mode:	UMT1900 RMC		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-46.19	-13.00	Pass
5640.00	V	-43.83		
7520.00	V	-39.86		
9400.00	V	-38.17		
11280.00	V	---		
3760.00	Horizontal	-48.60	-13.00	Pass
5640.00	H	-46.73		
7520.00	H	-44.08		
9400.00	H	-40.89		
11280.00	H	---		
Test mode:	UMT1900 RMC		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3815.20	Vertical	-46.38	-13.00	Pass
5722.80	V	-44.04		
7630.40	V	-40.04		
9538.00	V	-38.38		
11445.60	V	---		
3815.20	Horizontal	-48.79	-13.00	Pass
5722.80	H	-46.94		
7630.40	H	-44.30		
9538.00	H	-41.10		
11445.60	H	---		

Remark :

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

8.8 Frequency stability V.S. Temperature measurement

☞ Standard requirement

FCC Part2.1055(a)(1)(b)

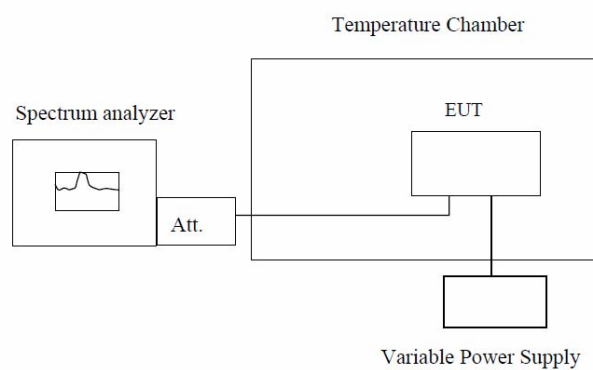
☞ Test method

FCC Part2.1055(a)(1)(b)

☞ Limit

2.5ppm

☞ Test setup



Note : Measurement setup for testing on Antenna connector

☞ Test Procedure

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

☞ Test mode

Refer to section 5.3 for details

☞ Test Result

Complied

Measurement Data

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	-18	-0.022	2.5	Pass
	-20	-17	-0.020		
	-10	-15	-0.018		
	0	-12	-0.014		
	10	-10	-0.012		
	20	-13	-0.016		
	30	-17	-0.020		
	40	-21	-0.025		
	50	-25	-0.030		
Reference Frequency: EGPRS850 Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	-16	-0.019	2.5	Pass
	-20	-16	-0.019		
	-10	-14	-0.017		
	0	-12	-0.014		
	10	-9	-0.011		
	20	-11	-0.013		
	30	-13	-0.016		
	40	-18	-0.022		
	50	-22	-0.026		

Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	-32	-0.017	2.5	Pass
	-20	-29	-0.015		
	-10	-29	-0.015		
	0	-25	-0.013		
	10	-20	-0.011		
	20	-26	-0.014		
	30	-30	-0.016		
	40	-37	-0.020		
	50	-43	-0.023		
Reference Frequency: EGPRS1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	-35	-0.019	2.5	Pass
	-20	-30	-0.016		
	-10	-27	-0.014		
	0	-24	-0.013		
	10	-19	-0.010		
	20	-23	-0.012		
	30	-28	-0.015		
	40	-30	-0.016		
	50	-39	-0.021		

Reference Frequency: UMT850 RMC Middle channel=4183 channel=836MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	-20	-0.024	2.5	Pass
	-20	-19	-0.023		
	-10	-19	-0.023		
	0	-15	-0.018		
	10	-13	-0.016		
	20	-13	-0.016		
	30	-18	-0.022		
	40	-21	-0.025		
	50	-27	-0.032		
Reference Frequency: UMT1900 RMC Middle channel=9400 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	-35	-0.019	2.5	Pass
	-20	-33	-0.018		
	-10	-33	-0.018		
	0	-28	-0.015		
	10	-23	-0.012		
	20	-31	-0.016		
	30	-32	-0.017		
	40	-36	-0.019		
	50	-45	-0.024		

8.9 Frequency stability V.S. Voltage measurement

☞ Standard requirement

FCC Part2.1055(d)(1)(2)

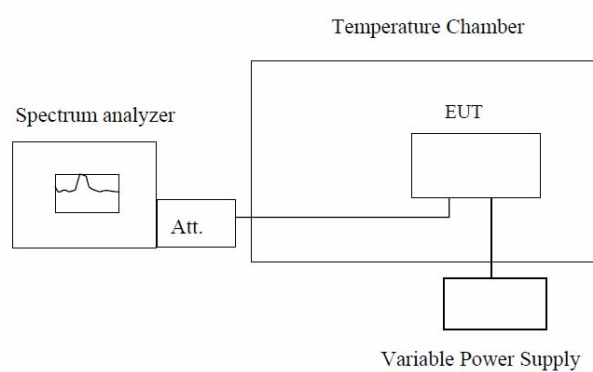
☞ Test method

FCC Part2.1055(d)(1)(2)

☞ Limit

2.5ppm

☞ Test setup



Note : Measurement setup for testing on Antenna connector

☞ Test Procedure

1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage.
2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

☞ Test mode

Refer to section 5.3 for details

☞ Test Result

Complied

Measurement Data

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	-17	-0.020	2.5	Pass
	3.70	-13	-0.016		
	3.40	-21	-0.025		
Reference Frequency: EGPRS850 Middle channel=190 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	-15	-0.018	2.5	Pass
	3.70	-11	-0.013		
	3.40	-22	-0.026		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	-25	-0.013	2.5	Pass
	3.70	-26	-0.014		
	3.40	-37	-0.020		
Reference Frequency: EGPRS1900 Middle channel=661 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	-28	-0.015	2.5	Pass
	3.70	-23	-0.012		
	3.40	-31	-0.016		
Reference Frequency: UMT850 RMC Middle channel=4183 channel=836MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	-15	-0.018	2.5	Pass
	3.70	-13	-0.016		
	3.40	-26	-0.031		
Reference Frequency: UMT1900 RMC Middle channel=9400 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	-33	-0.018	2.5	Pass
	3.70	-31	-0.016		
	3.40	-41	-0.022		