FCC Test Report

FCC ID: 2AHN7VS08

Product Name:	**Smart Watch**
Trademark:	**N/A**
Model Name:	**VS08/GT08** **A1, U8/VS07, U9/VS06, DZ09/VS09, VS19, VS20, VS20 plus, VS21, VS36, VS65**
Prepared For: Address:	**Shenzhen Viota Technology Co., Ltd** Rm.308-311,3rd Floor,Blog 5,Internet Industrial Park,Xixiang Town,Baoyuan Road,Baoan District,Shenzhen,Guangdong,China
Prepared By: Address:	**Shenzhen BCTC Technology Co., Ltd.** No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	**Mar. 9 – Mar. 22, 2016**
Date of Report:	**Mar. 23, 2016**
Report No.:	**BCTC-160302220-2E**

VERIFICATION OF COMPLIANCE

Applicant's name ..... :	**Shenzhen Viota Technology Co., Ltd**
Address ..... :	Rm.308-311,3rd Floor,Blog 5,Internet Industrial Park,Xixiang Town,Baoyuan Road,Baoan District,Shenzhen,Guangdong,China
Manufacture's Name ..... :	**Shenzhen Viota Technology Co., Ltd**
Address ..... :	Rm.308-311,3rd Floor,Blog 5,Internet Industrial Park,Xixiang Town,Baoyuan Road,Baoan District,Shenzhen,Guangdong,China
Product description	
Product name ..... :	Smart Watch
Trademark:	N/A
Model Name:	VS08/GT08 A1, U8/VS07, U9/VS06, DZ09/VS09, VS19, VS20, VS20 plus, VS21, VS36, VS65
Test procedure	FCC CFR Title 47 Part 2: 2014 FCC CFR Title 47 Part22 Subpart H: 2014 FCC CFR Title 47 Part24 Subpart E: 2014

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of BCTC, this document may be altered or revised by BCTC, personal only, and shall be noted in the revision of the document.

Test Result : **Pass**

Testing Engineer : Eric Yang

(Eric Yang)

Technical Manager : Sophie Lee

(Sophia Lee)

Authorized Signatory : Carson. Zhang

(Carson. Zhang)

TABLE OF CONTENTS

1.TEST SUMMARY

Test Items	Test Requirement	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Passed* (Please refer to SAR Report)
Conducted RF Output Power	2.1046	PASS
Peak to Average Radio	2.1055,22.355 24.235,27.54	PASS
99% & -26 dB Occupied Bandwidth	2.1049, 22.917 24.238,	PASS
Frequency Stability	2.1055, 22.355 24.235,	PASS
Conducted Out of Band Emissions	2.1051,2.1057 22.917, 24.238	PASS
Band Edge	2.1051,2.1057 22.917, 24.238	PASS
Transmitter Radiated Power (EIPR/ERP)	22.913, 24.232	PASS
Radiated Out of Band Emissions	2.1053,2.1057 22.917, 24.238	PASS

2.GENERAL PRODUCT INFORMATION

2.1. Product Function

Refer to Technical Construction Form and User Manual.

2.2. Description of Device (EUT)

Product Name:	Smart Watch
Model No.:	VS08/GT08 A1, U8/VS07, U9/VS06, DZ09/VS09, VS19, VS20, VS20 plus, VS21, VS36, VS65
Operation Frequency:	GSM 850MHz: Tx: 824.20 - 848.80MHz (at intervals of 200kHz); Rx: 869.20 - 893.80MHz (at intervals of 200kHz) GSM 1900MHz: Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz); Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)
Modulation technology:	GSM/GPRS Mode with GMSK, 8PSK Modulation
Antenna Type:	Integral Antenna
Antenna gain:	1.2dBi（GSM850/1900）,
Power supply:	DC 5V from adapter Rechargeable lithium-ion battery 3.8V
GPRS Class:	12

2.3. Difference between Model Numbers

The product are different for model, outlook color and size.

2.4. Test Supporting System

None.

2.5. Independent Operation Modes

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.

Test modes		
Band	Radiated	Conducted
GSM 850	■ GSM link ■ GPRS 8 link	■ GSM link ■ GPRS 8 link
PCS 1900	■ GSM link	■ GSM link

Note: The maximum power levels are GSM mode for GMSK link。

The conducted average power tables are as follows:

Conducted Average Power (dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.20	836.60	848.80	1850.20	1880.00	1909.80
GSM	32.17	32.25	32.60	30.17	30.32	30.45

3. TEST SITES

3.1. Test Facilities

Shenzhen BCTC Technology Co., Ltd.
Add.:No.101,Yousong Road,Longhua New District, Shenzhen,China
FCC Registration No.:187086

3.1.1. Measurement Uncertainty

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

3.2. List of Test and Measurement Instruments

3.2.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Test Receiver	R&S	ESCI	101160	2015.06.07	2016.06.06
LISN	SCHWARZBECK	ENV216	101313	2015.08.25	2016.08.24
LISN	EMCO	3816/2	00042990	2015.08.25	2016.08.24
50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2015.06.07	2016.06.06
RF cables	R&S	R204	R20X	2015.07.06	2015.07.05

3.2.2. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Test Receiver	R&S	ESPI	101318	2015.06.07	2016.06.06
System Simulator	Agilent	E5515C	GB43130252	2015.06.07	2016.06.06
Power Splitter	Weinschel	1506A	NW534	2015.06.07	2016.06.06
Bilog Antenna	TESEQ	CBL6111D	31216	2015.07.06	2016.07.05
Bilog Antenna	TESEQ	CBL6111D	31217	2015.06.07	2017.06.06
Loop antenna	ARA	PLA-1030/B	1029	2015.06.07	2016.06.06
Spectrum Analyzer	Agilent	E4411B	MY4511235	2015.07.06	2016.07.05
Signal Amplifier	SONOMA	313	187022	2015.07.06	2016.07.05
Signal Amplifier	Agilent	8449B	3008A00213	2015.07.06	2016.07.05
RF Cable	R&S	R203	R20X	2015.07.06	2016.07.05
MULTI-DEVICE Controller	ETS-LINDGREEN	31250	126821	N/A	N/A
Horn Antenna	EM	EM-AH-10180	2011071402	2015.07.06	2016.07.05
Horn Antenna	EM	EM-AH-10180	2011071401	2015.06.07	2017.06.06
Horn Antenna	Schwarzbeck	BBHA 9170	9170-181	2015.07.06	2016.07.05
Spectrum Analyzer	Agilent	8593E	3911A03928	2015.07.06	2016.07.05
Spectrum Analyzer	Agilent	E4407B	MY45108040	2015.07.06	2016.07.05
Signal Amplifier	DAZE	ZN3380B	11235	2015.08.25	2016.08.24
High Pass filter	KANGMAI	WHKX1.0/1.5G-10SS	40	2015.08.25	2016.08.24
Filter	COM-MW	ZBSF-C836.5-25-X	BCTC042	2015.08.25	2016.08.24
Filter	COM-MW	ZBSF-C1747.5-75-X2	BCTC045	2015.08.25	2016.08.24
Filter	COM-MW	ZBSF-C1880-60-X2	BCTC047	2015.08.25	2016.08.24
DC Power Supply	LongWei	PS-305D	010965682	2015.07.06	2016.07.05
Constant temperature and humidity box	GF	GTH-800-40-2P	MAA9906-012	2015.06.07	2016.06.06
Universal radio communication tester	R&S	CMU200	115295	2015.08.25	2016.08.24
Splitter	Agilent	11435B	1125162	2015.07.06	2016.07.05

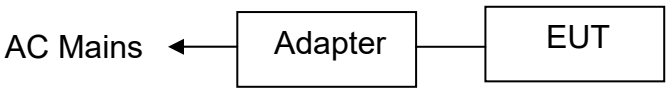
4. TEST SET-UP AND OPERATION MODES

4.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

4.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(EUT: Smart Watch)

.

4.3. Test Operation Mode and Test Software

None.

4.4. Special Accessories and Auxiliary Equipment

None.

4.5. Countermeasures to Achieve EMC Compliance

None.

4.6. Test Environment:

Ambient conditions in the test laboratory:

Items	Actual
Temperature (℃)	21~23
Humidity (%RH)	50~65

5. EMISSION TEST RESULTS

5.1. Conducted RF Output Power

5.1.1. Limit

According to FCC section 2.1046(a) , FCC part22.913(a) and FCC part24.232(b) ,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).

5.1.2. Test Setup

The EUT, which is powered by the adapter, 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 factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power.

5.1.3. Test Result

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

Measurement data

The conducted power tables are as follows:

Average Conducted Power (dBm)						
Band	GSM850			PCS1900		
Frequency	824.20	836.60	848.80	1850.20	1880.00	1909.80
GSM (GMSK, 1 TX slot)	32.17	32.25	32.60	30.17	30.32	30.45
GPRS (GMSK, 1 TX slot)	31.21	31.18	31.52	30.04	30.50	30.46
GPRS (GMSK, 2 TX slot)	30.25	30.43	30.77	29.27	29.33	29.28
GPRS (GMSK, 3 TX slot)	28.30	28.49	28.32	27.24	27.31	27.25
GPRS (GMSK, 4 TX slot)	27.20	27.39	27.63	25.30	25.26	25.20
Limit	38.45			33.01		
Result	Pass					

Note: Measurement Uncertainty: ±2.6 dB.

5.2. Peak to Average Radio

5.2.1. Limit

According to FCC section 27.50(d)(5) , the peak to average ratio(PAR) of the transmission may not exceed 13dB.

5.2.2. Test Setup

See section 5.1.2 of this report.

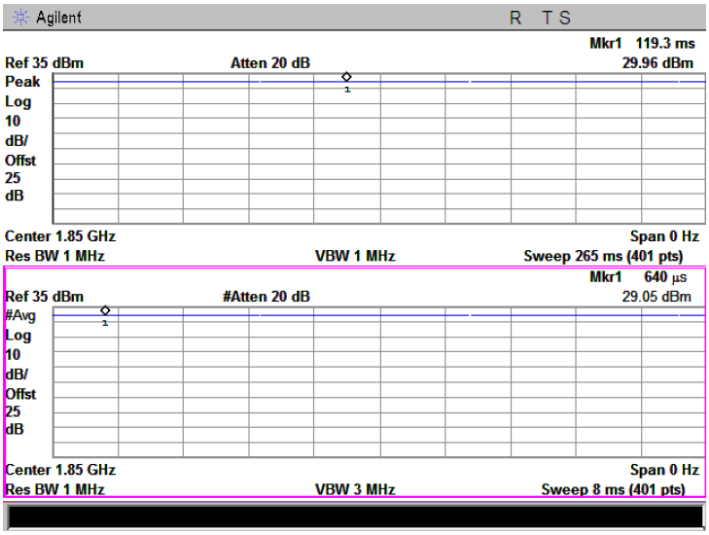
5.2.3. Test Result

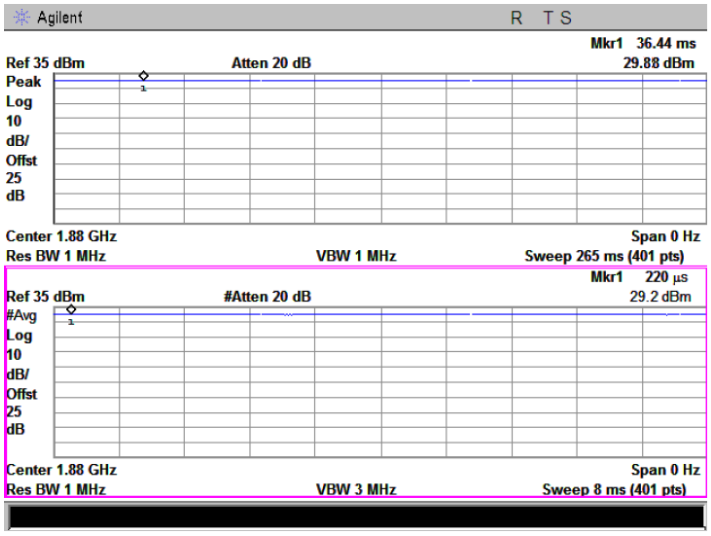
Measurement data as follows:

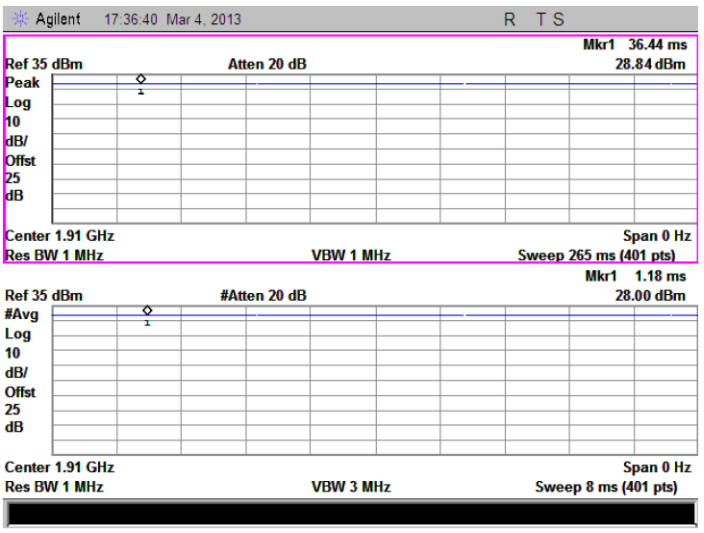
Band	PCS1900			GPRS1900		
	Low	Middle	High	Low	Middle	High
Frequency	1850.20	1880.00	1909.8	1850.20	1880.00	1909.8
Peak-to average ratio(dB)/GSM	0.81	0.68	0.84	0.75	0.62	0.81

Note: Measurement Uncertainty: ±0.2 dB.

The plot only show the worst mode on PCS1900


Agilent
R T S
Mkr1 119.3 ms
Ref 35 dBm
Atten 20 dB
29.96 dBm
Peak
Log
10
dB/
Offst
25
dB
Center 1.85 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 265 ms (401 pts)
Mkr1 640 µs
Ref 35 dBm
#Atten 20 dB
29.05 dBm
#Avg
Log
10
dB/
Offst
25
dB
Center 1.85 GHz
Span 0 Hz
Res BW 1 MHz
VBW 3 MHz
Sweep 8 ms (401 pts)


Agilent
R T S
Mkr1 36.44 ms
Ref 35 dBm
Atten 20 dB
29.88 dBm
Peak
Log
10
dB/
Offst
25
dB
Center 1.88 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 265 ms (401 pts)
Mkr1 220 µs
Ref 35 dBm
#Atten 20 dB
29.2 dBm
#Avg
Log
10
dB/
Offst
25
dB
Center 1.88 GHz
Span 0 Hz
Res BW 1 MHz
VBW 3 MHz
Sweep 8 ms (401 pts)


Agilent 17:36:40 Mar 4, 2013
R T S
Mkr1 36.44 ms
Ref 35 dBm
Atten 20 dB
28.84 dBm
Peak
Log
10
dB/
Offst
25
dB
Center 1.91 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 265 ms (401 pts)
Mkr1 1.18 ms
Ref 35 dBm
#Atten 20 dB
28.00 dBm
#Avg
Log
10
dB/
Offst
25
dB
Center 1.91 GHz
Span 0 Hz
Res BW 1 MHz
VBW 3 MHz
Sweep 8 ms (401 pts)

5.3. -26dB and 99% Occupied Bandwidth

5.3.1. Limit

According to FCC section 2.1049 and FCC part22.913(a) and FCC part24.232(b), 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,

5.3.2. Test Setup

The EUT, which is powered by the adapter, 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 factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power.

5.3.3. Test Result

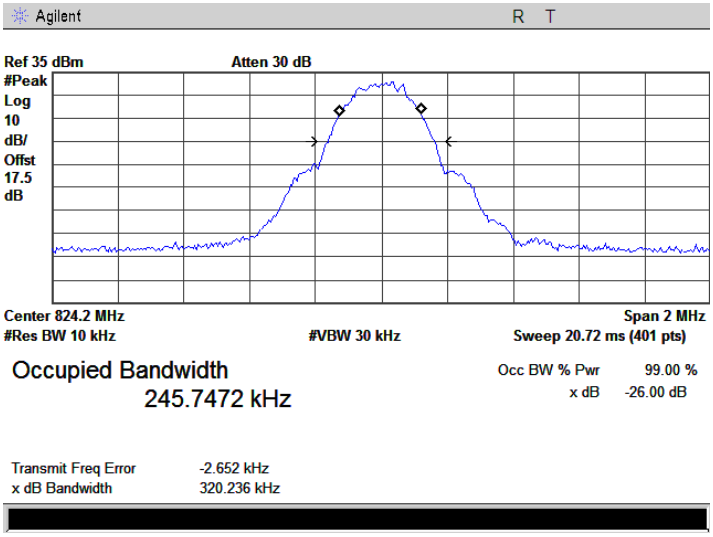
Measurement Data

EUT Mode	Frequency (MHz)	99% Occupy bandwidth (kHz)	26dBOccupy bandwidth (kHz)
GSM 850 (GSM link)	824.20	245.747	320.236
	836.60	244.278	321.347
	848.80	245.476	319.796
GPRS 850 (GSM link)	824.20	248.114	321.082
	836.60	245.256	321.073
	848.80	249.135	322.122
PCS 1900 (GSM link)	1850.20	242.221	319.652
	1880.00	242.117	312.788
	1909.80	243.127	324.344
GPRS 1900 (GSM link)	1850.20	250.813	325.951
	1880.00	245.514	321.571
	1909.80	253.744	324.958

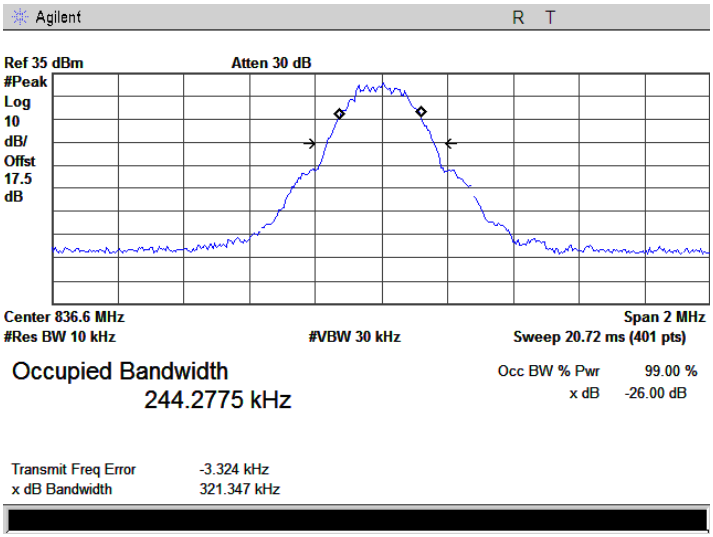
Note: Measurement Uncertainty: ±20Hz.

Test plot as follows:

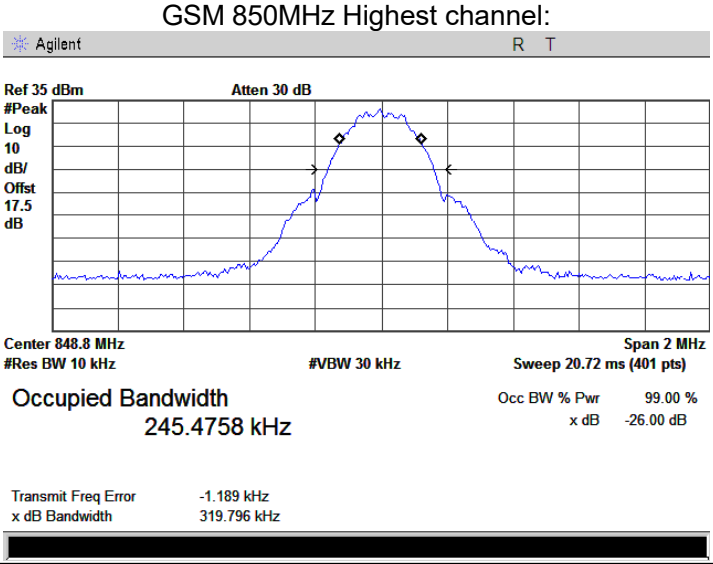
GSM 850MHz Lowest channel



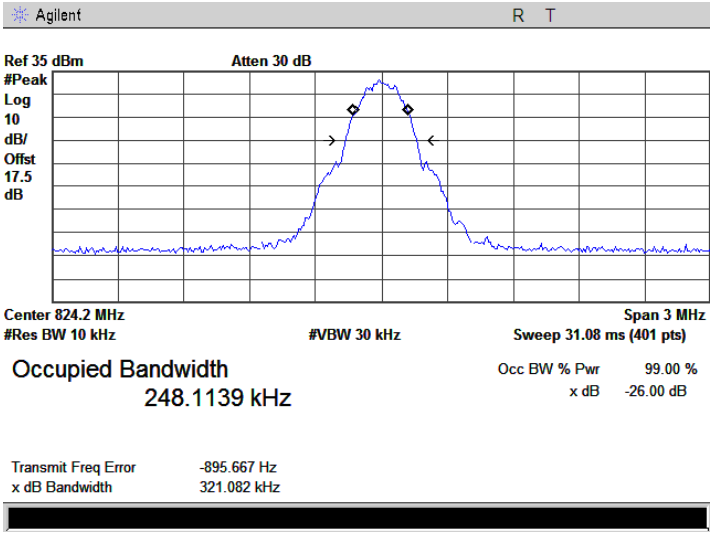
GSM 850MHz Middle channel



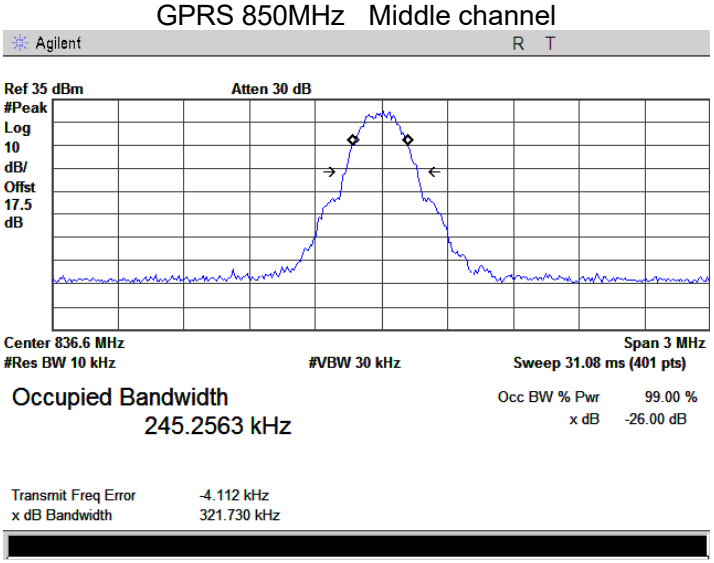
GSM 850MHz Highest channel:



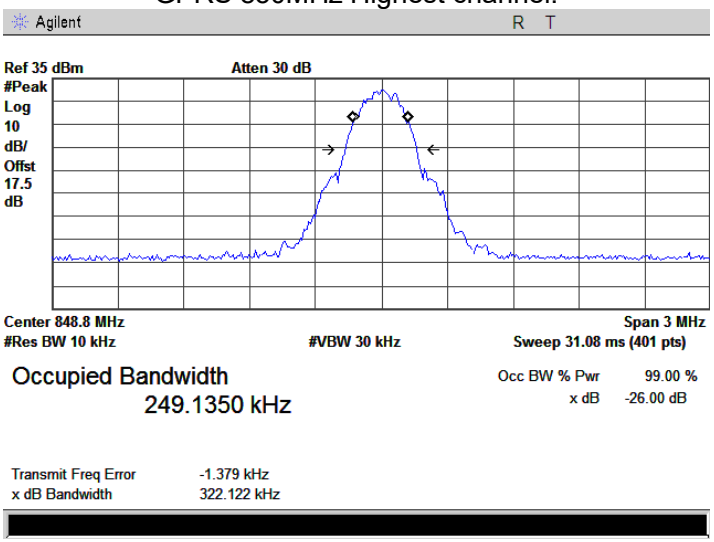
GPRS 850MHz Lowest channel



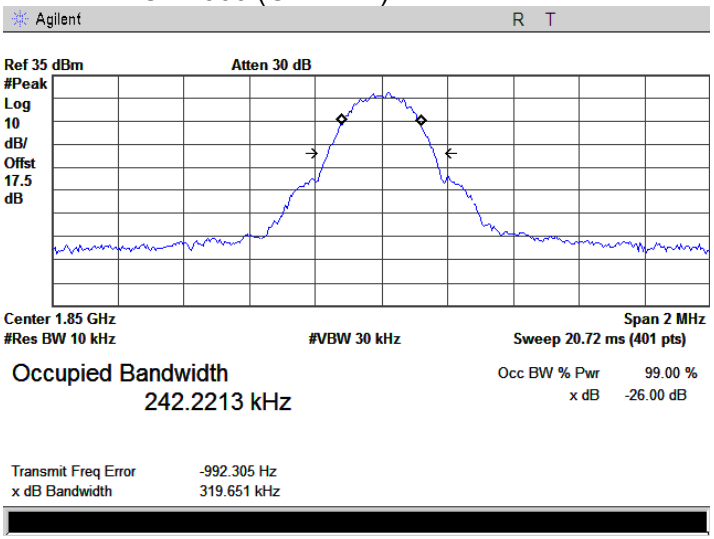
GPRS 850MHz Middle channel



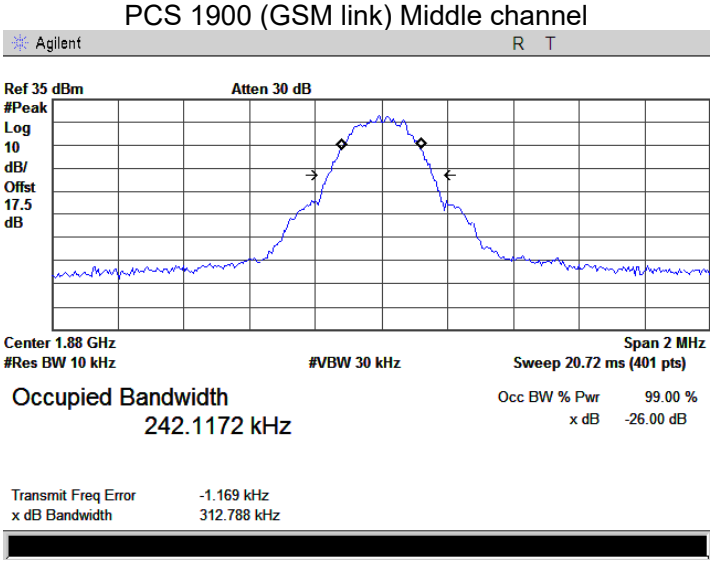
GPRS 850MHz Highest channel:



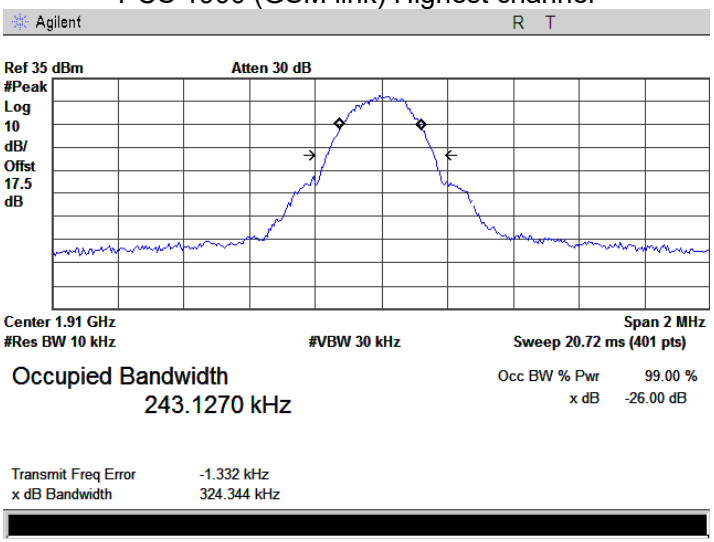
PCS 1900 (GSM link) Lowest channel



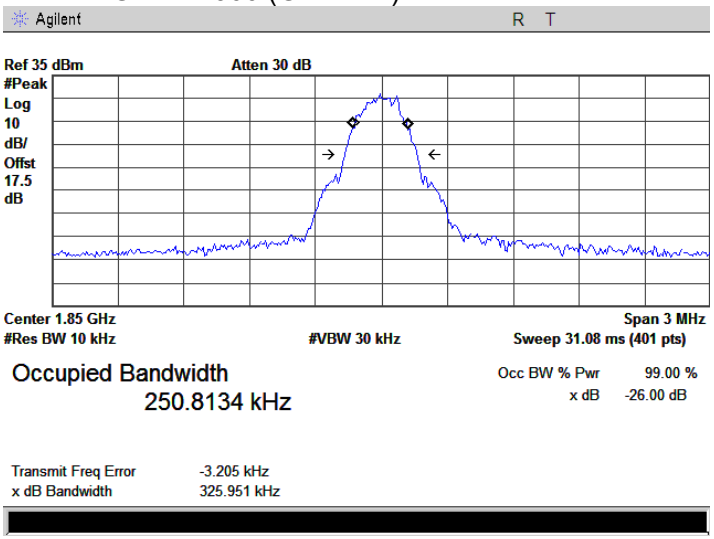
PCS 1900 (GSM link) Middle channel



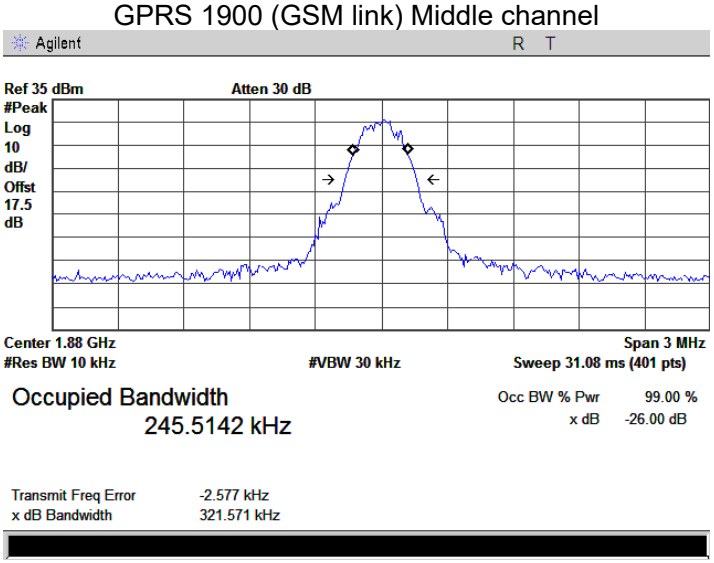
PCS 1900 (GSM link) Highest channel



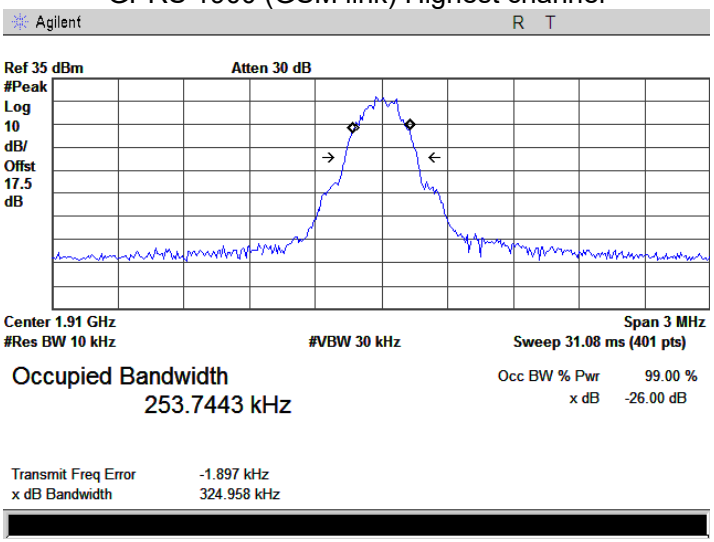
GPRS 1900 (GSM link) Lowest channel



GPRS 1900 (GSM link) Middle channel



GPRS 1900 (GSM link) Highest channel



5.4. Frequency Stability

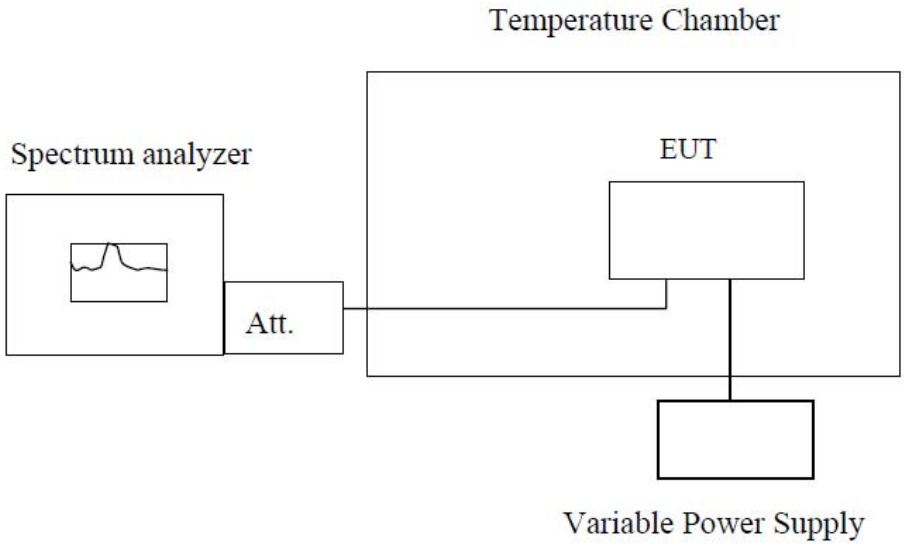
5.4.1. Limit

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℃ to +50℃ at intervals of not more than 10℃.

(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.

5.4.2. Test Setup



Note : Measurement setup for testing on Antenna connector

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

5.4.3. Test Result

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.2VDC and 3.6VDC which are specified by the applicant; the normal temperature here used is 25℃. The frequency deviation limit of 850MHz band is ±2.5ppm, and 1900MHz is ±1ppm

Normal

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(℃)	Frequency Error(Hz)	ppm	Limit	
GSM850 (GSM link) Middle channel=190 channel=836.6MHz	3.7	-30	33	0.0394	±2.5	PASS
	3.7	-20	42	0.0502		
	3.7	-10	28	0.0335		
	3.7	0	34	0.0406		
	3.7	10	42	0.0502		
	3.7	20	36	0.0430		
	3.7	30	28	0.0335		
	3.7	40	39	0.0466		
	3.7	50	41	0.0490		
	4.25	25	35	0.0418		
	3.70	25	44	0.0526		
	3.40	25	25	0.0299		

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(℃)	Frequency Error(Hz)	ppm	Limit	
PCS1900 (GSM link) Middle channel=661 channel=1880MHz	3.7	-30	78	0.0415	±1	PASS
	3.7	-20	94	0.0500		
	3.7	-10	44	0.0234		
	3.7	0	61	0.0324		
	3.7	10	75	0.0399		
	3.7	20	68	0.0362		
	3.7	30	38	0.0202		
	3.7	40	74	0.0394		
	3.7	50	75	0.0399		
	4.25	25	68	0.0362		
	3.70	25	55	0.0293		
	3.40	25	79	0.0420		

Note: Measurement Uncertainty: ±20Hz.

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(℃)	Frequency Error(Hz)	ppm	Limit	
GPRS850 (GSM link) Middle channel=190 channel=836.6MHz	3.7	-30	36	0.0430	±2.5	PASS
	3.7	-20	38	0.0454		
	3.7	-10	31	0.0371		
	3.7	0	28	0.0335		
	3.7	10	35	0.0418		
	3.7	20	22	0.0263		
	3.7	30	27	0.0323		
	3.7	40	42	0.0502		
	3.7	50	45	0.0538		
	4.25	25	38	0.0454		
	3.70	25	42	0.0502		
	3.40	25	36	0.0430		

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(℃)	Frequency Error(Hz)	ppm	Limit	
GPRS1900 (GSM link) Middle channel=661 channel=1880MHz	3.7	-30	88	0.0468	±1	PASS
	3.7	-20	76	0.0404		
	3.7	-10	52	0.0277		
	3.7	0	43	0.0229		
	3.7	10	37	0.0197		
	3.7	20	51	0.0271		
	3.7	30	61	0.0324		
	3.7	40	79	0.0420		
	3.7	50	81	0.0431		
	4.25	25	77	0.0410		
	3.70	25	63	0.0335		
	3.40	25	81	0.0431		

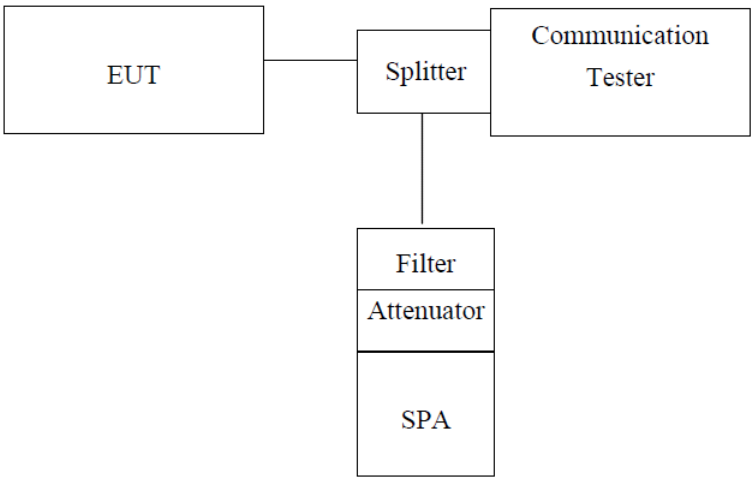
Note: Measurement Uncertainty: ±20Hz.

5.5. Conducted Spurious Emissions

5.5.1. Limit

According to FCC section 22.917(a) and FCC 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.

5.5.2. Test Setup



Note: *Measurement setup for testing on Antenna connector*

5.5.3. Measurement Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 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.

For the out of band: Set the RBW, VBW = 100KHz, Start=30MHz, Stop= 10th harmonic.

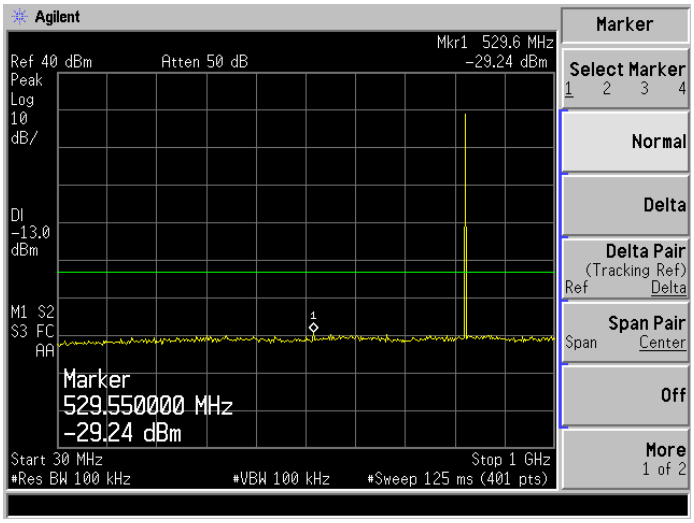
Limit = -13dBm

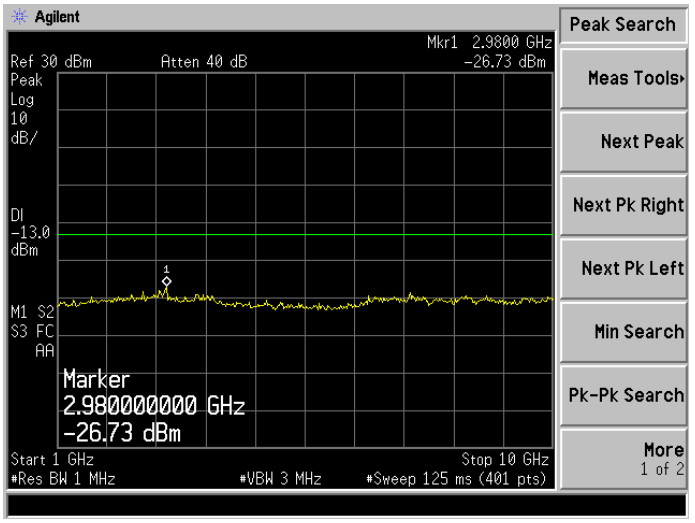
5.5.4. Test Result

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

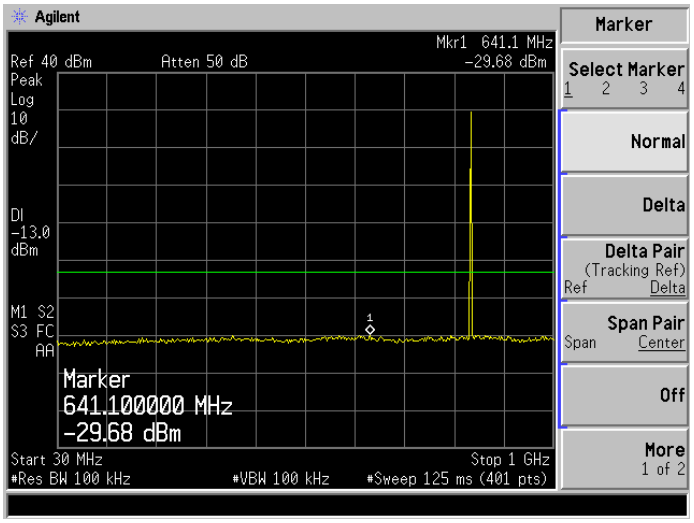
Test plot as follows:

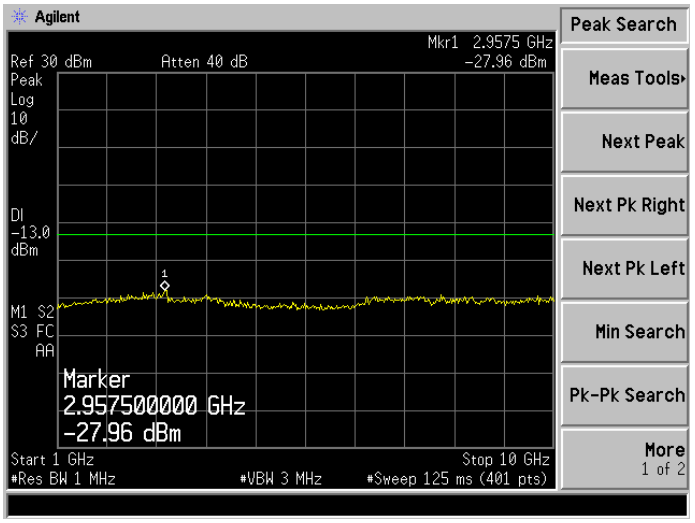
GSM 850MHz Lowest channel



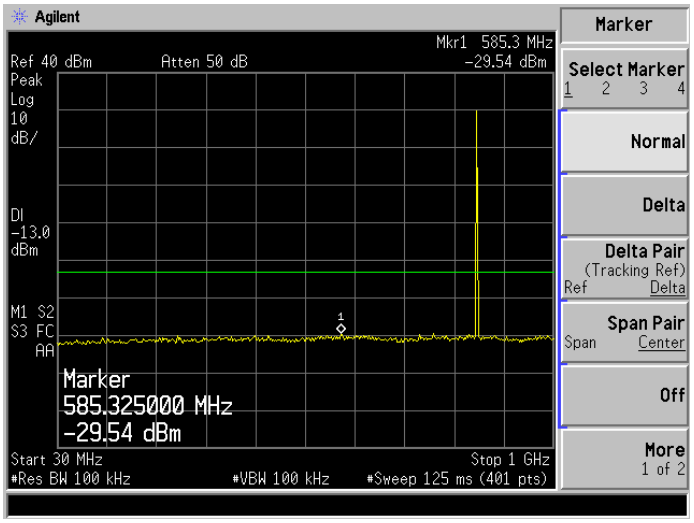


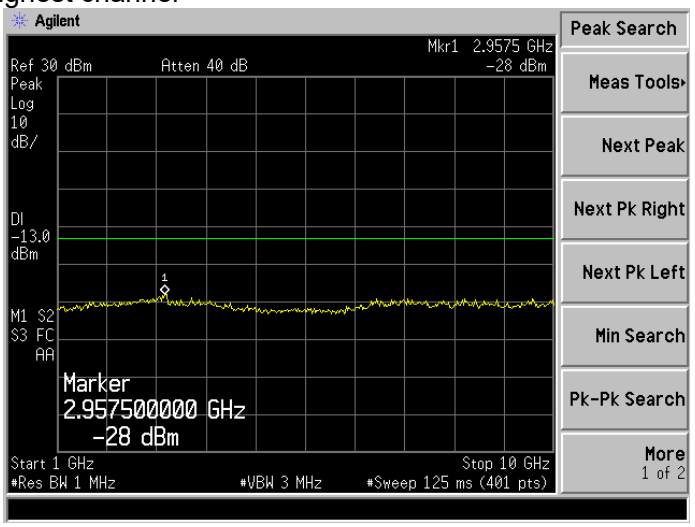
GSM 850MHz Middle channel



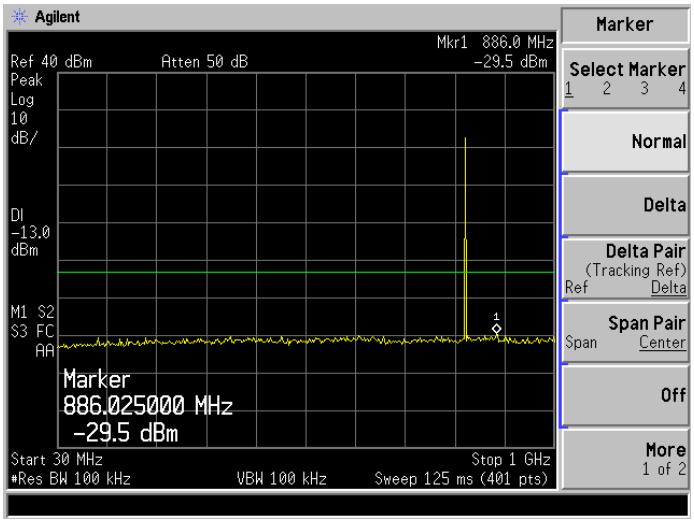


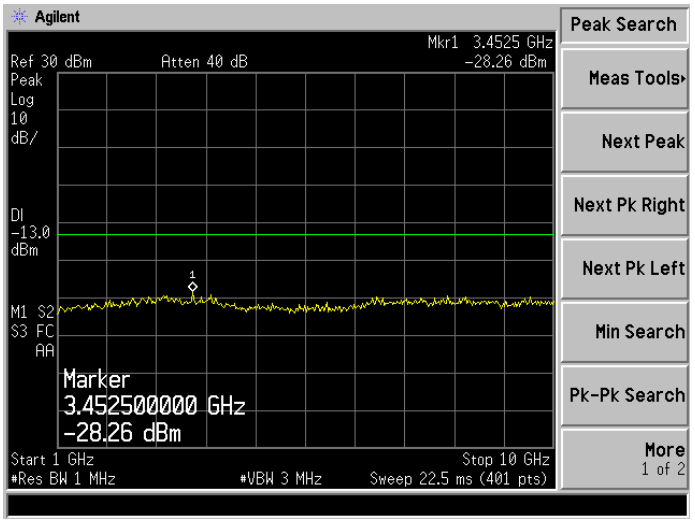
GSM 850MHz Highest channel



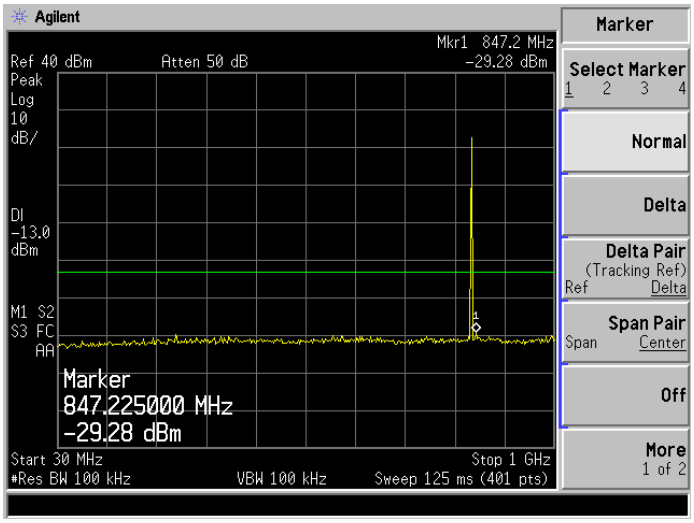


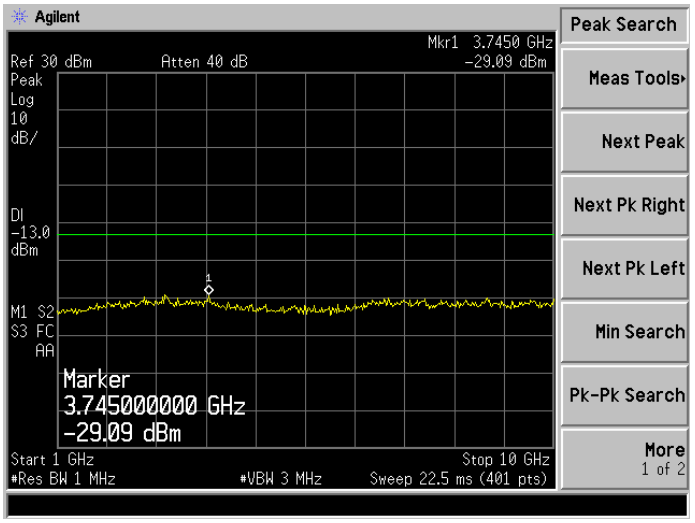
GPRS 850MHz Lowest channel



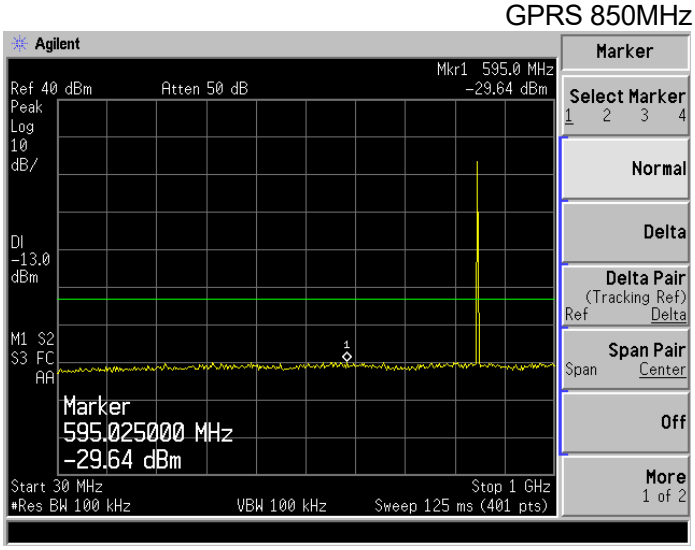


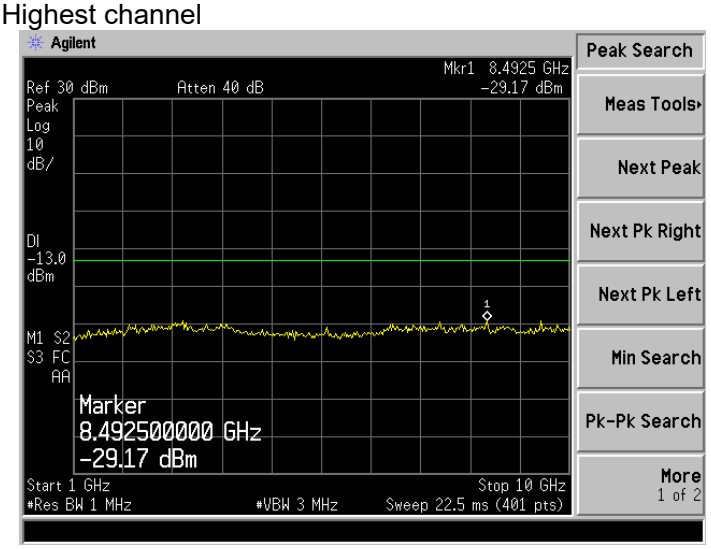
GPRS 850MHz Middle channel



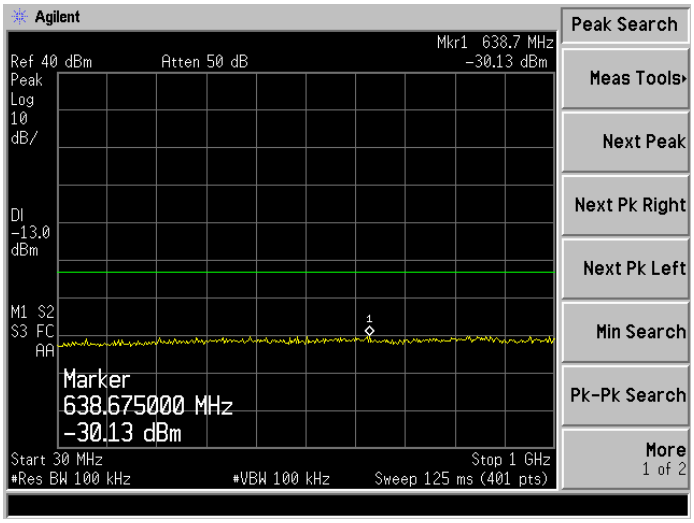


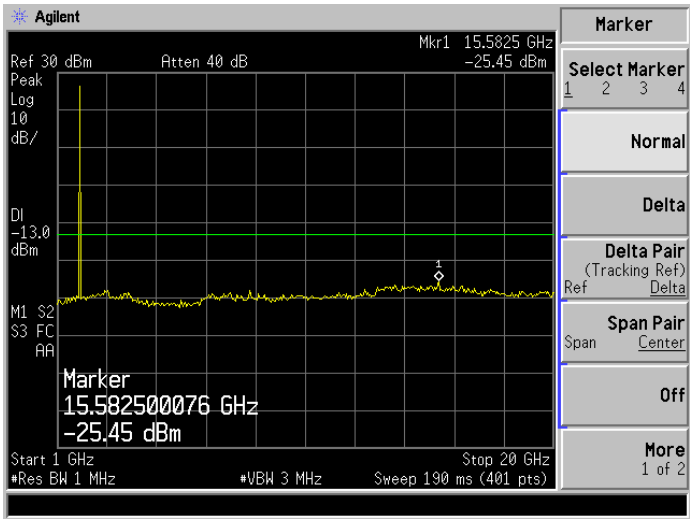
GPRS 850MHz Highest channel



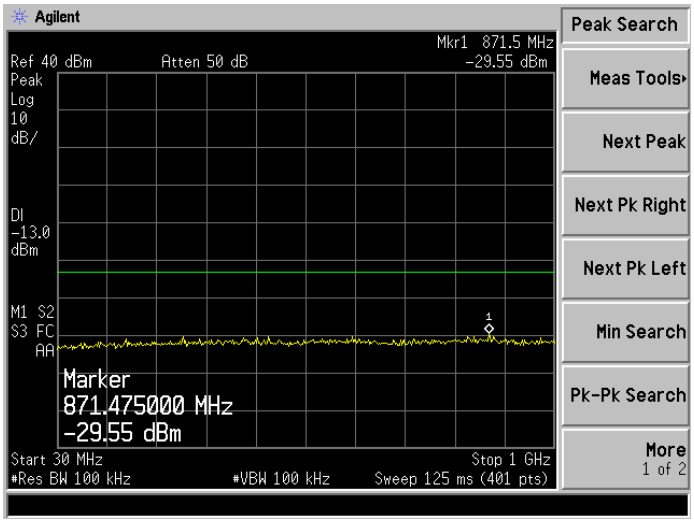


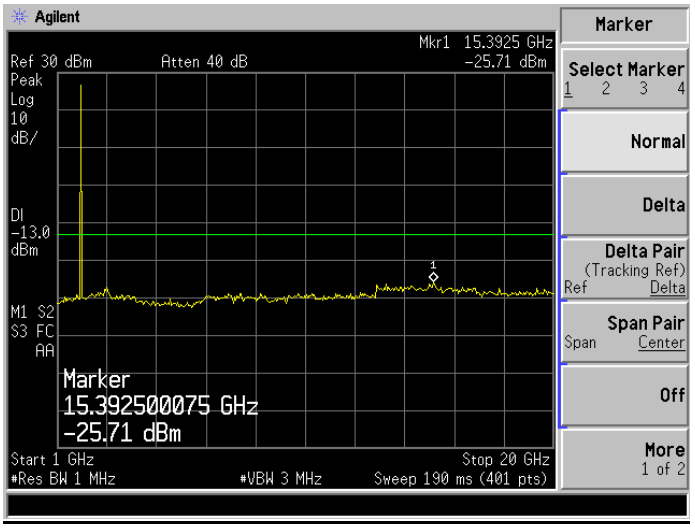
GSM 1900MHz Lowest channel



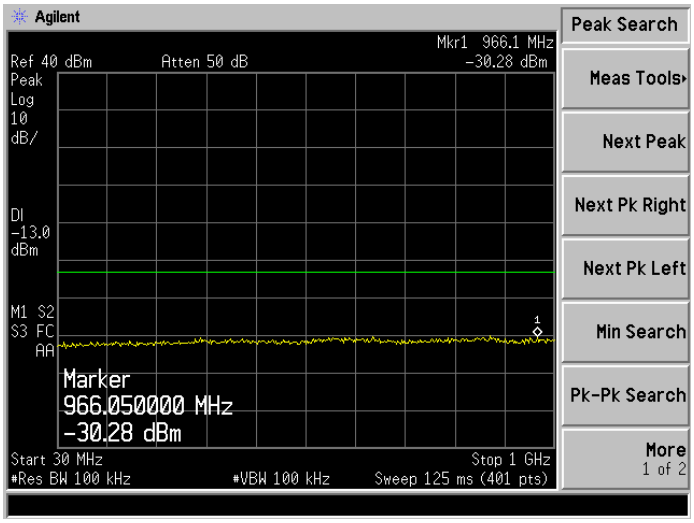


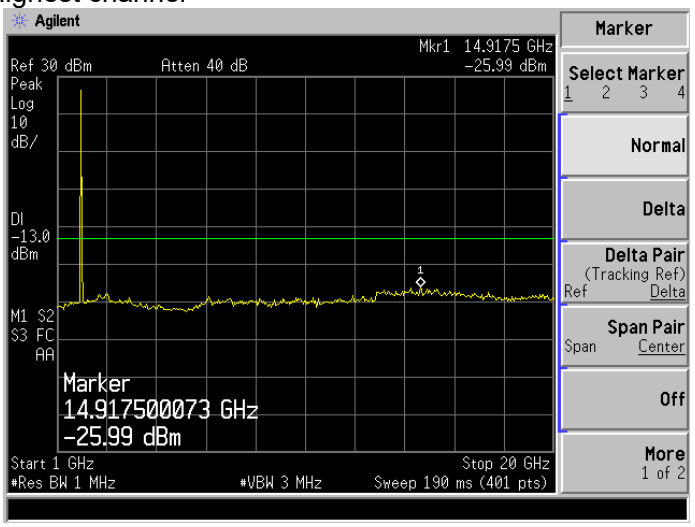
GSM 1900MHz Middle channel



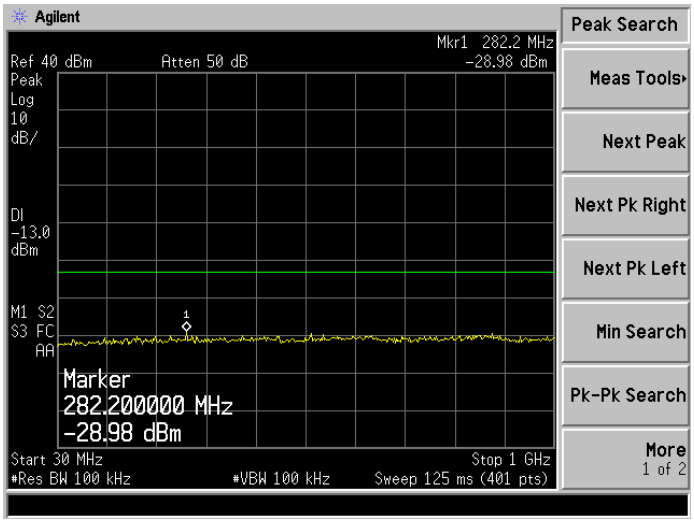


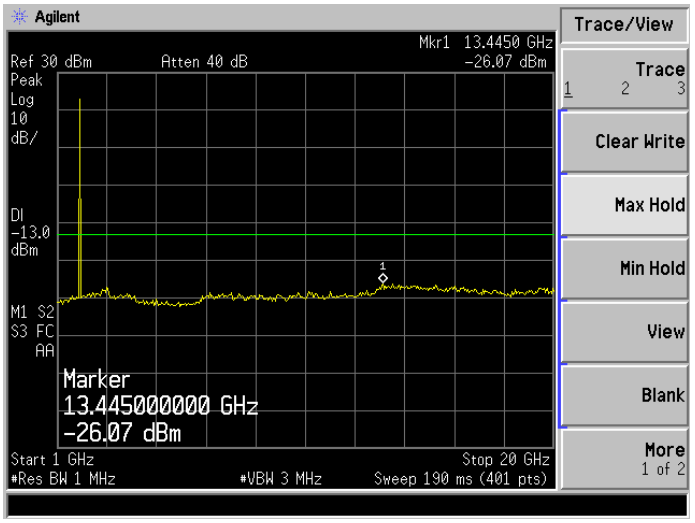
GSM 1900MHz Highest channel



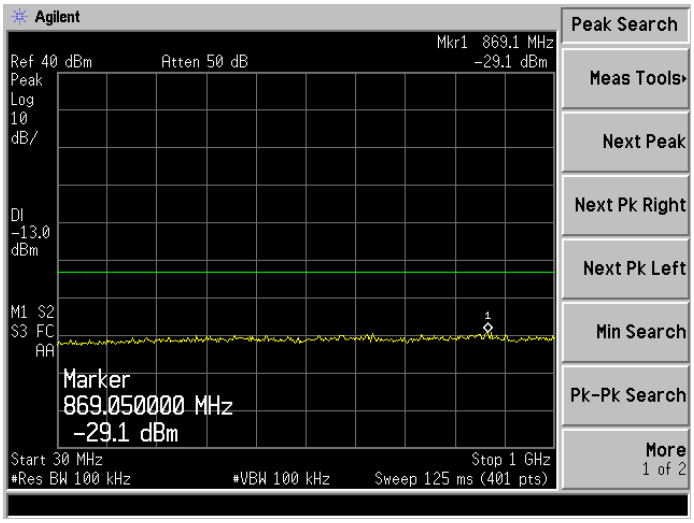


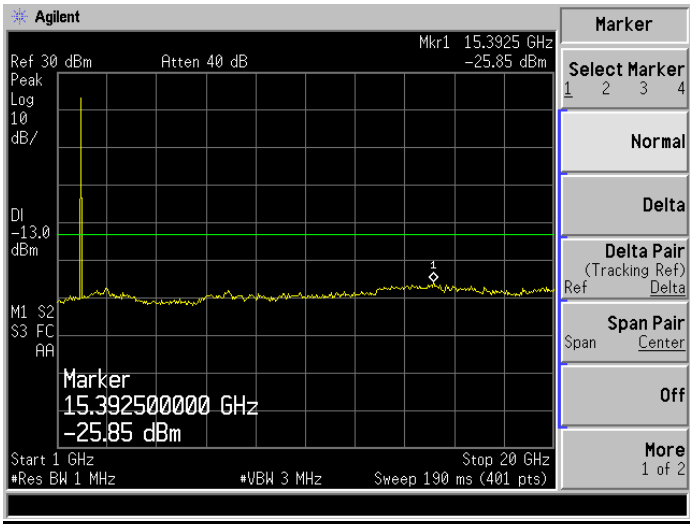
GPRS 1900MHz Lowest channel



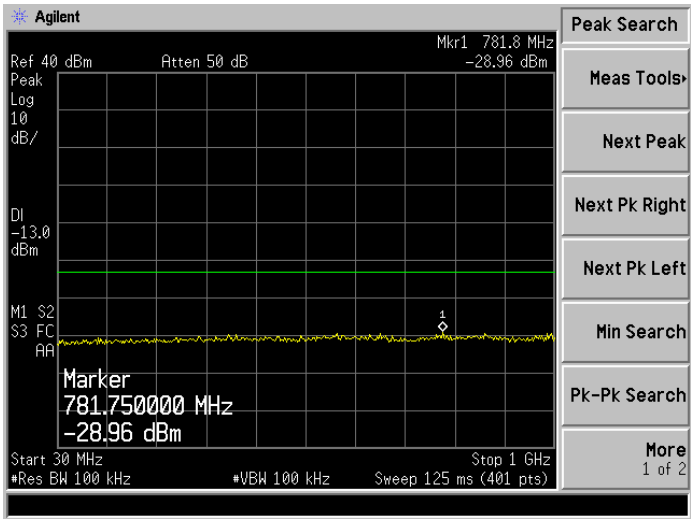


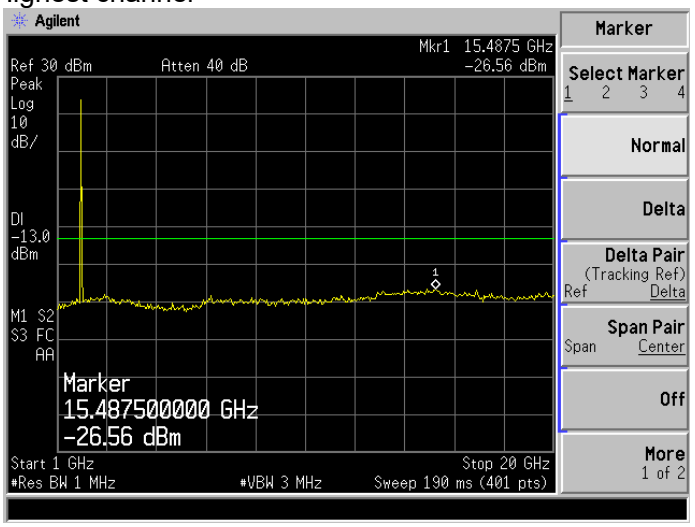
GPRS 1900MHz Middle channel





GPRS 1900MHz Highest channel



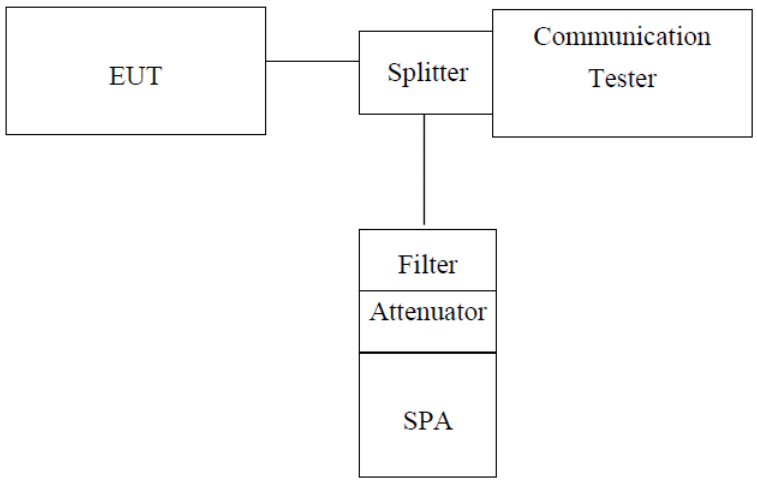


5.6. Conducted Out of Band Emissions

5.6.1. Limit

According to FCC section 22.917(b) and FCC section 24.238(b), 27.53(g)(h) 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.

5.6.2. Test Setup



Note: *Measurement setup for testing on Antenna connector*

5.6.3. Measurement Procedure

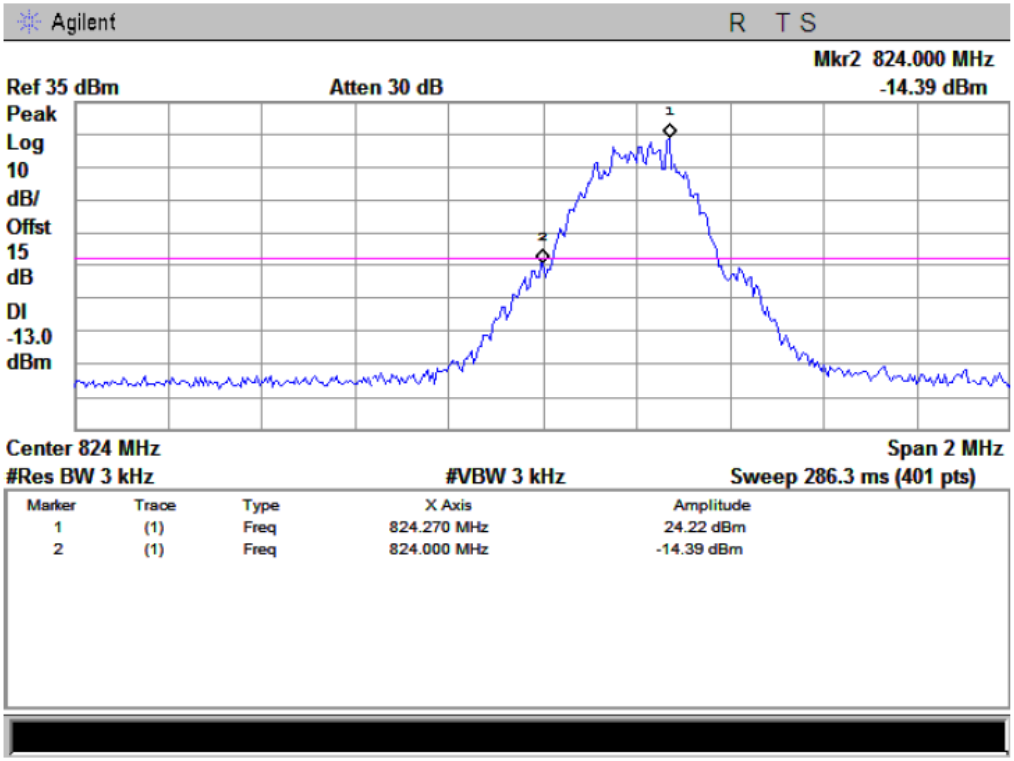
The EUT, which is powered by the adapter, is coupled to the Spectrum Analyzer and the System Simulator with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the System Simulator 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 System Simulator.

5.6.4. Test Result

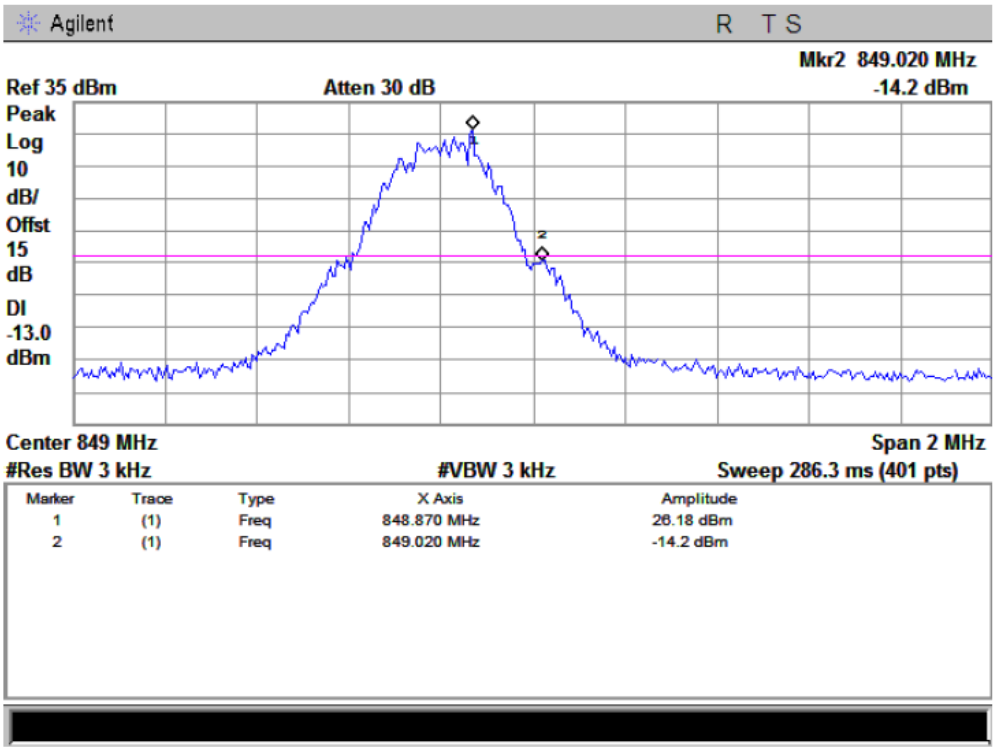
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

Test plot as follows:

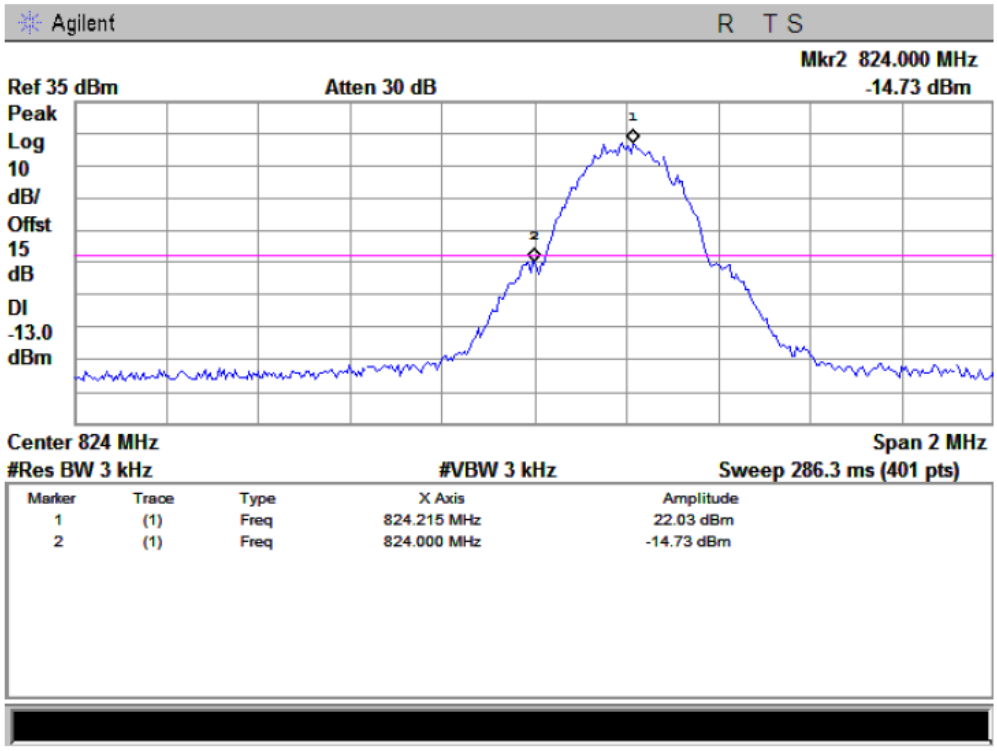
GSM 850MHz Lowest channel



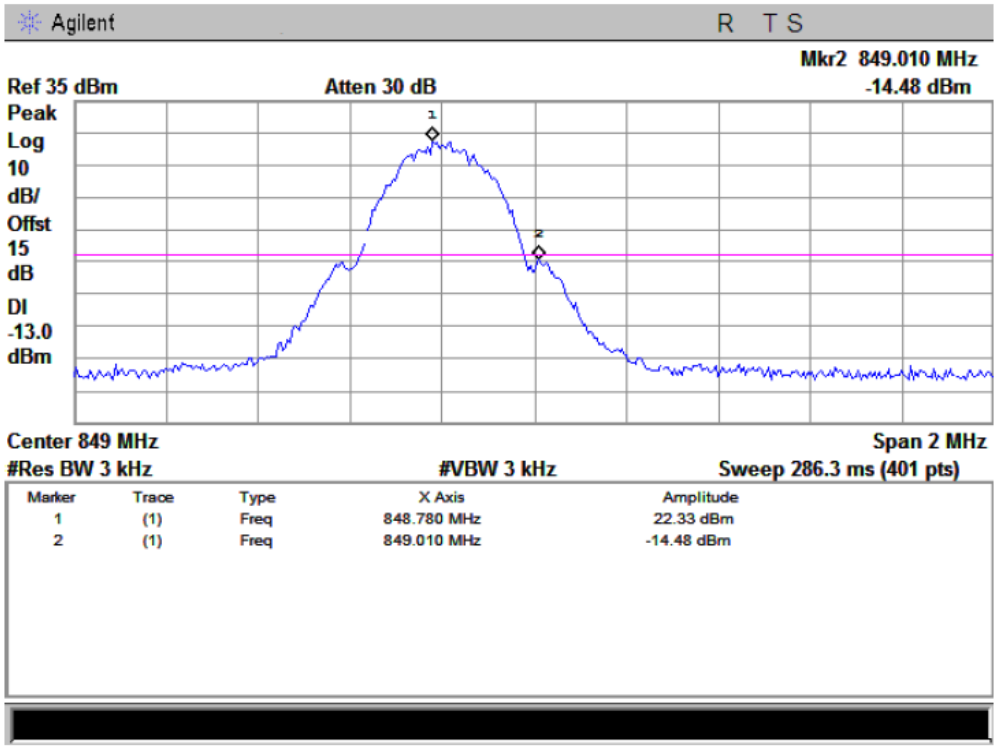
GSM 850MHz Highest channel



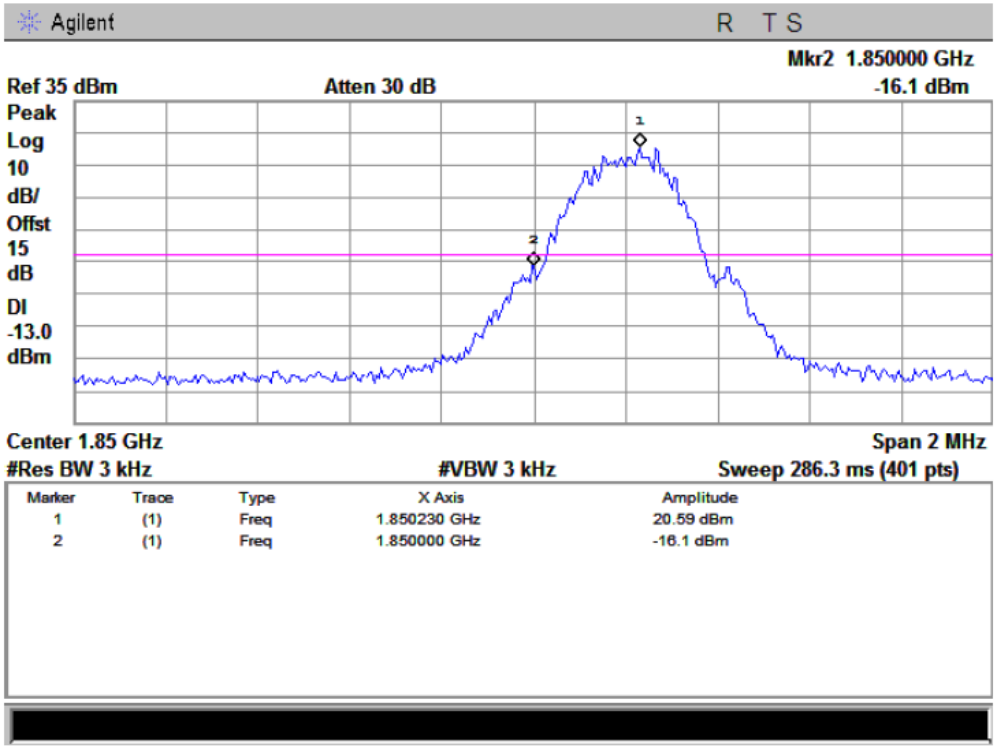
GSM 850MHz Lowest channel



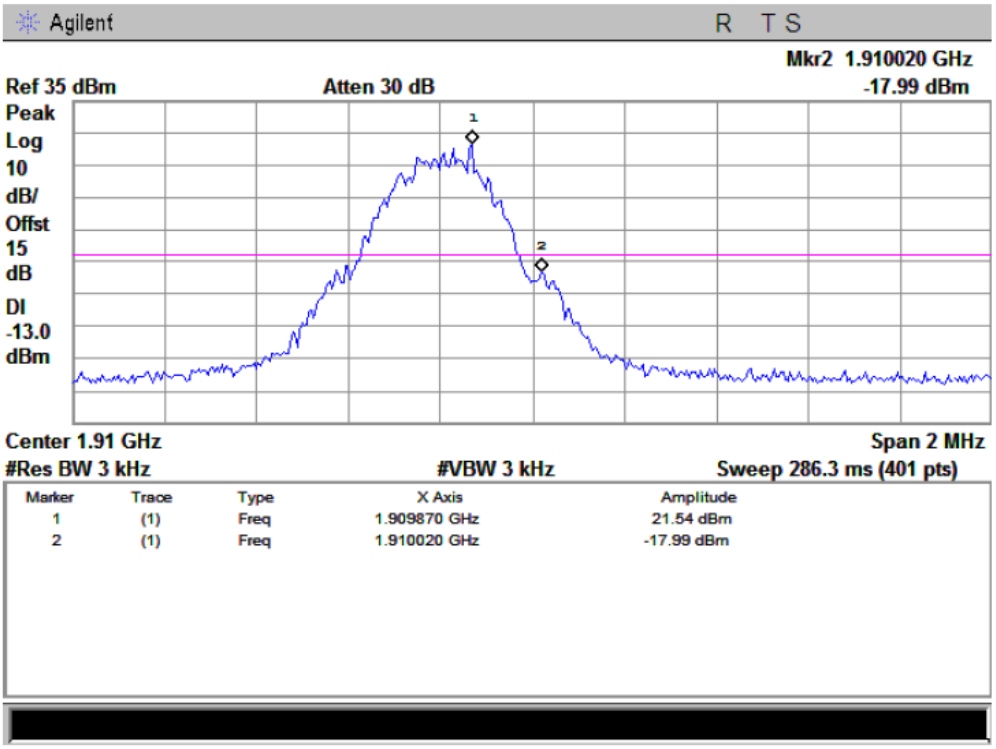
GSM 850MHz Highest channel



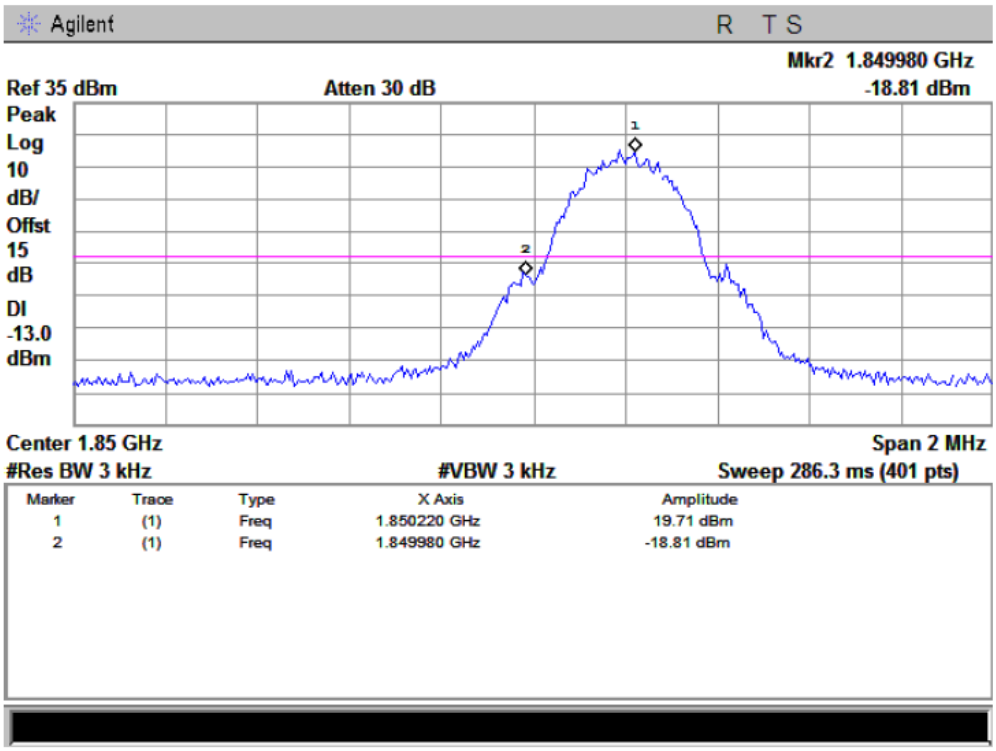
GSM 1900MHz Lowest channel



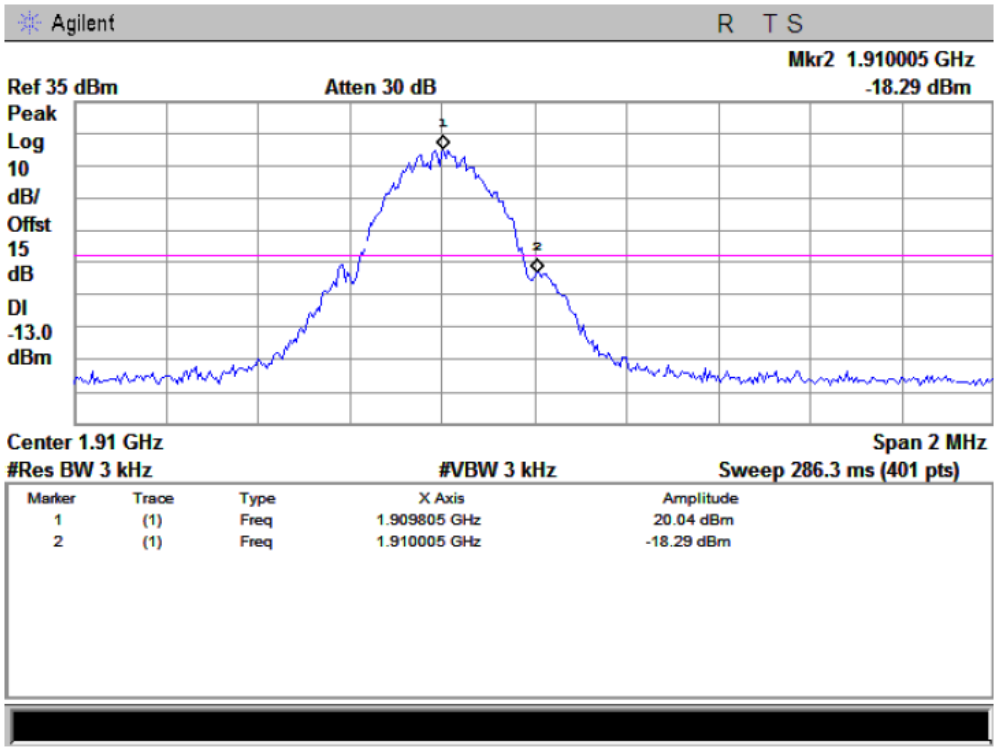
GSM 1900MHz Highest channel



GPRS 1900MHz Lowest channel



GPRS 1900MHz Highest channel



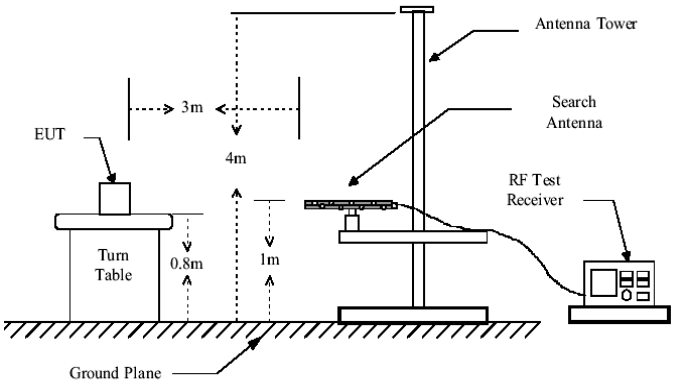
5.7. Transmitter Radiated Power (EIRP/ERP)

5.7.1. Limit

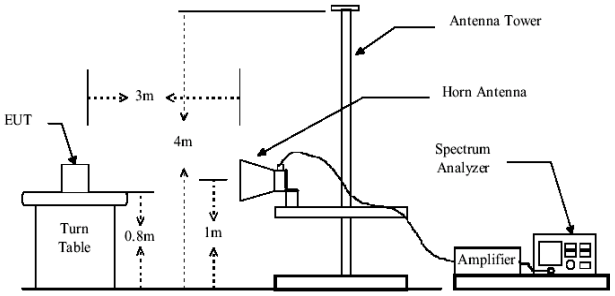
According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.

5.7.2. Test Setup

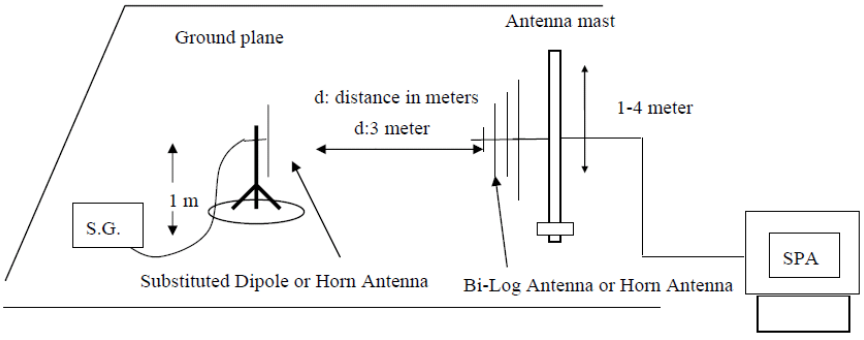
Below 1GHz



Above 1GHz



Substituted method:



5.7.3. Measurement Procedure

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. all test in Full-Anechoic Chamber.

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.

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 as follows:

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:

ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB)

EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)

Note: The EUT polarize means three polarize, H means X polarize, E1 means Y polarize, E2 means Z polarize.

5.7.4. Test Result

EUT mode	Channel	EUT Pol.	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
GSM850 (GSM link)	Lowest	H	V	29.25	3.68	1.65	31.28	38.45	Pass
			H	27.26	3.68	1.65	29.29		
		E1	V	23.16	3.68	1.65	25.19		
			H	27.21	3.68	1.65	29.24		
		E2	V	22.52	3.68	1.65	24.55		
			H	25.48	3.68	1.65	27.51		
	Middle	H	V	29.81	3.70	1.67	31.84	38.45	Pass
			H	27.67	3.70	1.67	29.70		
		E1	V	23.28	3.70	1.67	25.31		
			H	27.56	3.70	1.67	29.59		
		E2	V	23.83	3.70	1.67	25.86		
			H	26.62	3.70	1.67	28.65		
	Highest	H	V	**30.48**	**3.70**	**1.71**	**32.47**	38.45	Pass
			H	27.23	3.70	1.71	29.22		
		E1	V	23.23	3.70	1.71	25.22		
			H	26.84	3.70	1.71	28.83		
		E2	V	22.45	3.70	1.71	24.44		
			H	26.36	3.70	1.71	28.35		

EUT mode	Channel	EUT Pol.	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
GPRS 850 (GSM link)	Lowest	H	V	29.07	3.68	1.65	31.10	38.45	Pass
			H	27.09	3.68	1.65	29.12		
		E1	V	23.02	3.68	1.65	25.05		
			H	27.04	3.68	1.65	29.07		
		E2	V	22.38	3.68	1.65	24.41		
			H	25.32	3.68	1.65	27.35		
	Middle	H	V	29.63	3.70	1.67	31.66	38.45	Pass
			H	27.50	3.70	1.67	29.53		
		E1	V	23.14	3.70	1.67	25.17		
			H	27.39	3.70	1.67	29.42		
		E2	V	23.68	3.70	1.67	25.71		
			H	26.46	3.70	1.67	28.49		
	Highest	H	V	30.29	**3.70**	**1.71**	32.28	38.45	Pass
			H	27.06	3.70	1.71	29.05		
		E1	V	23.09	3.70	1.71	25.08		
			H	26.68	3.70	1.71	28.67		
		E2	V	22.31	3.70	1.71	24.30		
			H	26.20	3.70	1.71	28.19		

EUT mode	Channel	EUT Pol.	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
GPRS 1900 (GSM link)	Lowest	H	V	24.80	7.35	2.54	29.69	38.45	Pass
			H	22.86	7.35	2.54	27.74		
		E1	V	18.37	7.35	2.54	23.24		
			H	22.41	7.35	2.54	27.29		
		E2	V	17.76	7.35	2.54	22.63		
			H	20.90	7.35	2.54	25.78		
	Middle	H	V	25.74	7.51	2.62	**30.71**	38.45	Pass
			H	23.56	7.51	2.62	28.53		
		E1	V	19.92	7.51	2.62	24.87		
			H	24.67	7.51	2.62	29.64		
		E2	V	20.78	7.51	2.62	25.74		
			H	22.66	7.51	2.62	27.62		
	Highest	H	V	25.00	7.96	2.69	30.35	38.45	Pass
			H	21.93	7.96	2.69	27.27		
		E1	V	19.19	7.96	2.69	24.52		
			H	22.43	7.96	2.69	27.64		
		E2	V	24.80	7.96	2.69	22.38		
			H	22.86	7.96	2.69	27.61		

EUT mode	Channel	EUT Pol.	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
GPRS 1900 (GSM link)	Lowest	H	V	24.64	7.35	2.54	29.45	38.45	Pass
			H	22.72	7.35	2.54	27.53		
		E1	V	18.25	7.35	2.54	23.06		
			H	22.27	7.35	2.54	27.08		
		E2	V	17.65	7.35	2.54	22.46		
			H	20.77	7.35	2.54	25.58		
	Middle	H	V	25.58	7.51	2.62	30.47	38.45	Pass
			H	23.41	7.51	2.62	28.30		
		E1	V	19.79	7.51	2.62	24.68		
			H	24.51	7.51	2.62	29.40		
		E2	V	20.65	7.51	2.62	25.54		
			H	22.52	7.51	2.62	27.41		
	Highest	H	V	24.84	7.96	2.69	30.11	38.45	Pass
			H	21.79	7.96	2.69	27.06		
		E1	V	19.07	7.96	2.69	24.34		
			H	22.29	7.96	2.69	27.56		
		E2	V	24.64	7.96	2.69	29.91		
			H	22.72	7.96	2.69	27.99		

5.8. Radiated Out of Band Emissions

5.8.1. Limit

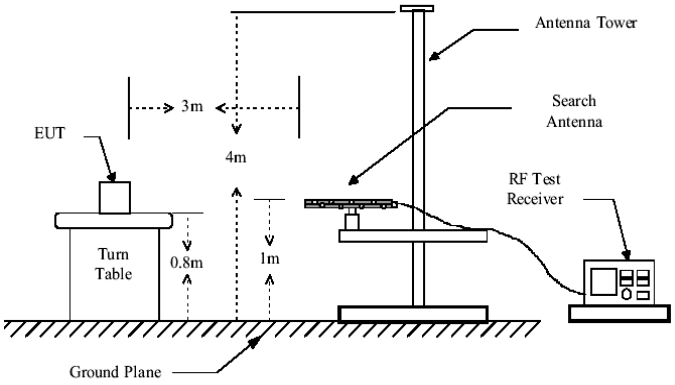
According to FCC section 22.917(a) and section 24.238(a), 27.53(g) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power

(P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

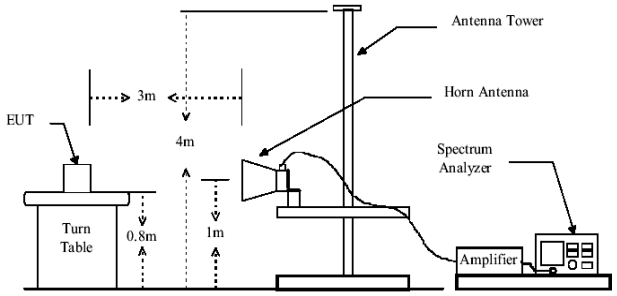
The spurious emission with frequency band 1900 according to FCC section 2.1057.

5.8.2. Test Setup

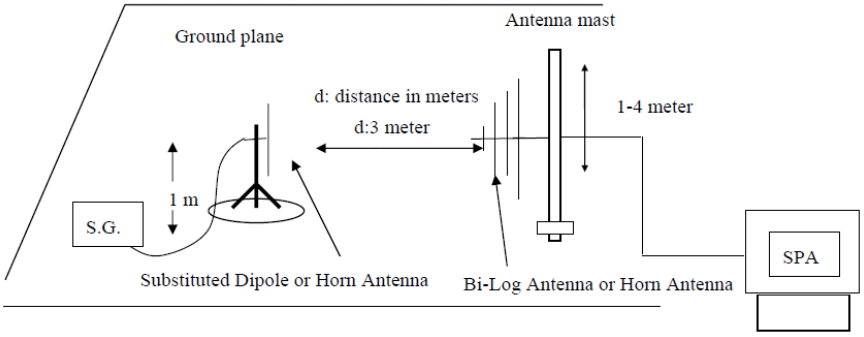
Below 1GHz



Above 1GHz



Substituted method:



5.8.3. Measurement Procedure

The EUT was placed on a non-conductive, The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. all test in Full-Anechoic Chamber.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

EIRP = S.G. output (dBm) + Antenna Gain(dBi) – Cable Loss (dB)

Note: Measurement Uncertainty: ±3.6 dB.

we pretest GSM and GPRS mode, only the GSM mode was worst and the data recording in the report

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
GSM 850 Lowest	76.96	Vertical	-75.98	3.35	0.38	-73.01	-13	PASS
	1648.40	Vertical	-29.41	6.51	1.35	-24.25		
	2472.60	Vertical	-35.65	6.88	2.53	-31.30		
	3296.80	Vertical	-37.49	7.61	3.67	-33.55		
	4121.00	Vertical	-45.65	8.67	4.06	-41.04		
	4945.20	Vertical	-40.17	9.35	4.38	-35.20		
	146.65	Horizontal	-76.10	4.12	0.51	-72.49		
	2472.40	Horizontal	-34.17	6.88	1.35	-28.64		
	3296.80	Horizontal	-37.43	7.61	3.67	-33.49		
	4121.00	Horizontal	-46.10	8.67	4.06	-41.49		
	4945.20	Horizontal	-49.41	9.35	4.38	-44.44		
	5769.40	Horizontal	-43.61	9.94	4.87	-38.54		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
GSM 850 Middle	69.98	Vertical	-74.07	3.35	0.38	-71.10	-13	PASS
	1648.70	Vertical	-32.37	6.51	1.35	-27.21		
	2472.10	Vertical	-32.91	6.88	2.53	-28.56		
	3296.50	Vertical	-40.44	7.61	3.67	-36.50		
	4121.30	Vertical	-48.04	8.67	4.06	-43.43		
	4945.70	Vertical	-43.52	9.35	4.38	-38.55		
	194.63	Horizontal	-76.00	4.12	0.51	-72.39		
	2472.10	Horizontal	-29.68	6.88	1.35	-24.15		
	3296.20	Horizontal	-32.36	7.61	3.67	-28.42		
	4121.70	Horizontal	-48.72	8.67	4.06	-44.11		
	4945.00	Horizontal	-50.14	9.35	4.38	-45.17		
	5769.60	Horizontal	-40.09	9.94	4.87	-35.02		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
GSM 850 Highest	76.29	Vertical	-75.17	3.35	0.38	-72.20	-13	PASS
	1648.30	Vertical	-31.26	6.51	1.35	-26.10		
	2472.10	Vertical	-33.18	6.88	2.53	-28.83		
	3296.50	Vertical	-36.34	7.61	3.67	-32.40		
	4121.40	Vertical	-41.70	8.67	4.06	-37.09		
	4945.20	Vertical	-47.14	9.35	4.38	-42.17		
	124.45	Horizontal	-75.80	4.12	0.51	-72.19		
	2472.90	Horizontal	-30.07	6.88	1.35	-24.54		
	3296.30	Horizontal	-32.97	7.61	3.67	-29.03		
	4121.20	Horizontal	-38.73	8.67	4.06	-34.12		
	4945.70	Horizontal	-47.39	9.35	4.38	-42.42		
	5769.60	Horizontal	-53.67	9.94	4.87	-48.60		

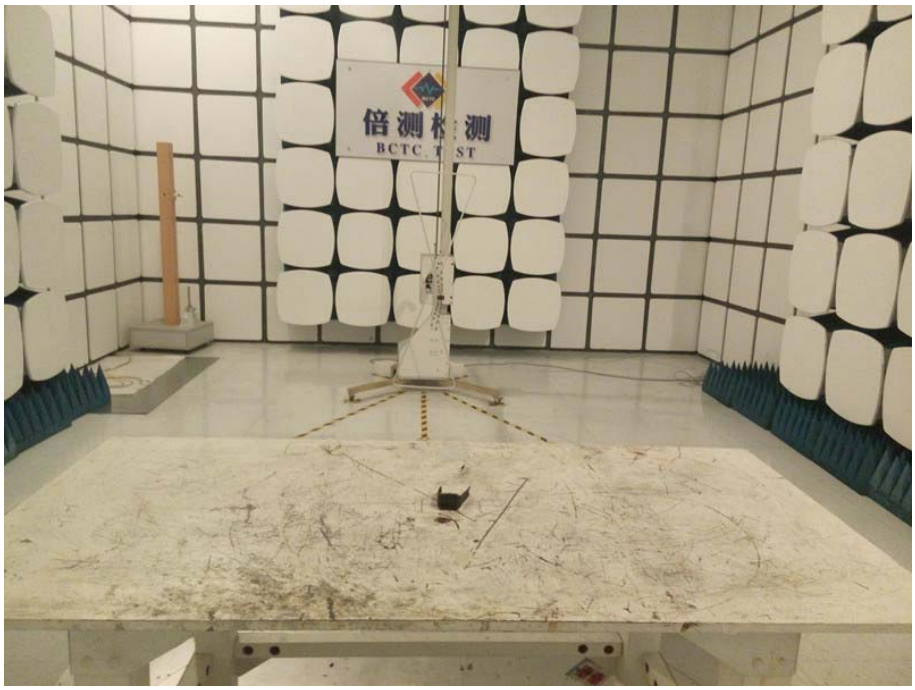
Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
PCS1900 Lowest	66.39	Vertical	-76.21	2.36	0.26	-74.11	-13	PASS
	3700.40	Vertical	-46.50	7.76	3.75	-42.49		
	5550.60	Vertical	-47.63	9.84	4.94	-42.73		
	7400.80	Vertical	-40.01	10.21	5.32	-35.12		
	9251.00	Vertical	-43.41	11.36	6.02	-38.07		
	11101.20	Vertical	-44.96	14.52	6.68	-37.12		
	163.03	Horizontal	-76.85	4.37	0.59	-73.07		
	3700.40	Horizontal	-48.72	7.76	3.75	-44.71		
	5550.60	Horizontal	-48.00	9.84	4.94	-43.10		
	7400.80	Horizontal	-42.63	10.21	5.32	-37.74		
	9251.00	Horizontal	-47.89	11.36	6.02	-42.55		
	11101.20	Horizontal	-47.67	14.52	6.68	-39.83		

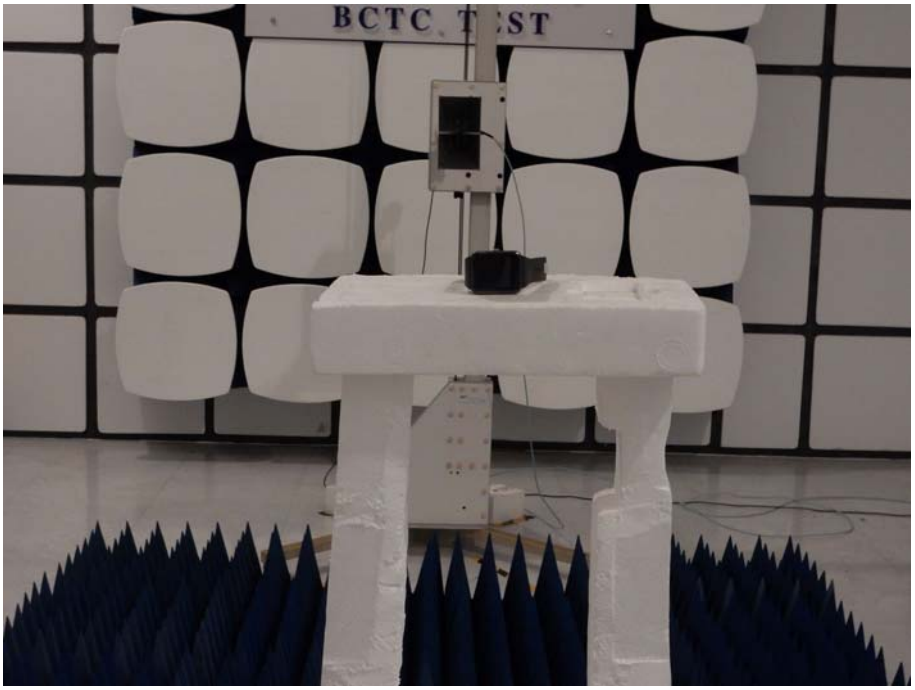
Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
PCS1900 Middle	62.94	Vertical	-73.81	2.36	0.26	-71.71	-13	PASS
	3760.00	Vertical	-47.84	7.76	3.75	-43.83		
	5640.00	Vertical	-47.44	9.84	4.94	-42.54		
	7520.00	Vertical	-43.02	10.21	5.32	-38.13		
	9400.00	Vertical	-42.41	11.36	6.02	-37.07		
	11280.00	Vertical	-46.40	14.52	6.68	-38.56		
	181.68	Horizontal	-77.35	4.37	0.59	-73.57		
	3760.00	Horizontal	-46.25	7.76	3.75	-42.24		
	5640.00	Horizontal	-46.99	9.84	4.94	-42.09		
	7520.00	Horizontal	-39.60	10.21	5.32	-34.71		
	9400.00	Horizontal	-43.51	11.36	6.02	-38.17		
	11280.00	Horizontal	-45.40	14.52	6.68	-37.56		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
PCS1900 Highest	94.86	Vertical	-74.37	2.36	0.29	-72.30	-13	PASS
	3819.60	Vertical	-47.46	7.79	3.53	-43.20		
	5729.40	Vertical	-41.88	9.88	5.02	-37.02		
	7639.20	Vertical	-38.04	10.25	5.54	-33.33		
	9549.00	Vertical	-44.95	11.38	6.16	-39.73		
	11458.80	Vertical	-47.41	14.56	6.72	-39.57		
	162.63	Horizontal	-76.40	4.31	0.61	-72.70		
	3819.60	Horizontal	-45.80	7.79	3.53	-41.54		
	5729.40	Horizontal	-41.78	9.88	5.02	-36.92		
	7639.20	Horizontal	-37.41	10.25	5.54	-32.70		
	9549.00	Horizontal	-43.03	11.38	6.16	-37.81		
	11458.80	Horizontal	-44.95	14.56	6.72	-37.11		

6. PHOTOGRAPHS OF TEST SET-UP

RE





CE

7. PHOTOGRAPHS OF THE EUT


AC/DC ADAPTER


Li-Polymer Battery
Rate capacity:350mAh
Nomimal Voltage:3.7V
Limited Voltage:4.2V
1.295Wh
MADE IN CHINA