

FCC Part 22H & 24E

Test Report

FCC ID: 2AWTVS102A

Product Name:	GPS Tracker
Trademark:	N/A
Model Name:	S102A GS03A, GS03B, GS05A, GS05B, GS03C, GS03D, GS05C, GS05D, S003, S003T, S005, S005T, S102, S102T, S102L, S103, S06U, S06A, S06L, S09L, S03, S05, S11, S13, S15, S18, S19, S709, S709N, S708, S208, S288, S228, S308, S5E, S5L, S116L, S116, S116N, S112U, S006, S007
Prepared For:	SEEWORLD Technology Co.,Ltd
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Test Date:	Jun. 19 - Jun. 30, 2020
Date of Report:	Jul. 01, 2020
Report No.:	BCTC2006001465E

VERIFICATION OF COMPLIANCE

Applicant's name.....: SEEWORLD Technology Co.,ltd

Address.....: 4th Floor, No.121, Kecheng Building, Science Road, Luogang
District, Guangzhou, Guangdong Province, China. 510700

Manufacture's Name.....: SEEWORLD Technology Co.,ltd

Address.....: 4th Floor, No.121, Kecheng Building, Science Road, Luogang
District, Guangzhou, Guangdong Province, China. 510700

Product description

Product name.....: GPS Tracker

Trademark: N/A

Model Name: S102A
GS03A, GS03B, GS05A, GS05B, GS03C, GS03D, GS05C, GS05D,
S003, S003T, S005, S005T, S102, S102T, S102L, S103, S06U,
S06A, S06L, S09L, S03, S05, S11, S13, S15, S18, S19, S709,
S709N, S708, S208, S288, S228, S308, S5E, S5L, S116L, S116,
S116N, S112U, S006, S007

Test procedure: FCC Part 22H & 24E

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 FCC requirements. And it is applicable only to the tested sample identified in the report.

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TABLE OF CONTENTS

Test Report Declaration Page

1. TEST SUMMARY	4
2. GENERAL PRODUCT INFORMATION	5
2.1. Product Function.....	5
2.2. Description of Device (EUT)	5
2.3. Difference between Model Numbers	5
2.4. Test Supporting System	5
2.5. Independent Operation Modes.....	6
3. TEST SITES	7
3.1. Test Facilities	7
3.2. List of Test and Measurement Instruments	8
4. TEST SET-UP AND OPERATION MODES.....	10
4.1. Principle of Configuration Selection.....	10
4.2. Block Diagram of Test Set-up.....	10
4.3. Test Operation Mode and Test Software	10
4.4. Special Accessories and Auxiliary Equipment.....	10
4.5. Countermeasures to Achieve EMC Compliance	10
4.6. Test Environment:	10
5. EMISSION TEST RESULTS	11
5.1. Conducted RF Output Power	11
5.2. Peak to Average Ratio.....	12
5.3. 99% Occupied Bandwidth	14
5.4. Frequency Stability.....	18
5.5. Conducted Out of Band Emissions.....	20
5.6. Conducted Out of Band Emissions.....	25
5.7. Transmitter Radiated Power (EIRP/ERP)	27
5.8. Radiated Out of Band Emissions	30
6. EUT TEST PHOTO.....	34
7 EUT PHOTO	35

1.TEST SUMMARY

FCC Rules	Description of Test Item	Result
§1.1307,§2.1093	RF Exposure	Compliant
§22.913 (a), §24.232 (c),	RF Output Power	Compliant
§24.51,	Peak-to-average Ratio(PAR) of Transmitter	Compliant
§22.917 (b), §24.238 (b),	Emission Bandwidth	Compliant
§22.917 (a), §24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant
§22.917 (a), §24.238 (a)	Spurious Radiation Emissions	Compliant
§22.917 (a), §24.238 (a),	Out of Band Emissions	Compliant
§22.355, §24.235	Frequency Stability	Compliant

2.GENERAL PRODUCT INFORMATION

2.1. Product Function

Refer to Technical Construction Form and User Manual.

2.2. Description of Device (EUT)

Product Name:	GPS Tracker
Model No.:	S102A GS03A, GS03B, GS05A, GS05B, GS03C, GS03D, GS05C, GS05D, S003, S003T, S005, S005T, S102, S102T, S102L, S103, S06U, S06A, S06L, S09L, S03, S05, S11, S13, S15, S18, S19, S709, S709N, S708, S208, S288, S228, S308, S5E, S5L, S116L, S116, S116N, S112U, S006, S007
Model Difference:	All the model are the same circuit and RF module, except model names.
Operation Frequency:	GPRS 850MHz: Tx: 824.20 - 848.80MHz (at intervals of 200kHz); Rx: 869.20 - 893.80MHz (at intervals of 200kHz) GPRS 1900MHz: Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz); Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz) GPS Rx:1575.42MHz
Modulation technology:	GMSK
Antenna Type:	PCB Antenna
Antenna gain:	1.0dBi
Power supply:	DC 3.7V From Internal Battery DC 12V From External Power
GPRS Class:	12

2.3. Difference between Model Numbers

Just the product model is different.

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
GPRS 850	■ GPRS link	■ GPRS link
GPRS 1900	■ GPRS link	■ GPRS link

Note: The maximum power levels are GPRS mode for GMSK link, RMC12.2Kbps mode

The conducted average power tables are as follows:

Conducted Average Power (dBm)						
Band	GPRS 850			GPRS 1900		
Channel	128	190	251	512	661	810
Frequency	824.20	836.60	848.80	1850.20	1880.00	1909.80
GPRS	32.15	31.68	31.71	30.05	30.15	30.37

3. TEST SITES

3.1. Test Facilities

FCC Test Firm Registration Number: 712850

IC Registered No.: 23583

Shenzhen BCTC Testing Co., Ltd.

Add. : BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

3.1.1. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded 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	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
3	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
4	Conducted Adjacent channel power	U=1.38dB
5	Conducted output power uncertainty Above 1G	U=1.576dB
6	Conducted output power uncertainty below 1G	U=1.28dB
7	humidity uncertainty	U=5.3%
8	Temperature uncertainty	U=0.59℃

3.2. List of Test and Measurement Instruments

3.2.1. For conducted emission at the mains terminals test

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESR3	102075	Jun. 08, 2020	Jun. 07, 2021
2	LISN	SCHWARZBECK	NSLK8127	8127739	Jun. 04, 2020	Jun. 03, 2021
3	LISN	R&S	ENV216	101375	Jun. 04, 2020	Jun. 03, 2021
4	RF cables	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jun. 08, 2020	Jun. 07, 2021
5	Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

3.2.2. For radiated emission test

tem	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4407B	MY45109572	Jun. 08, 2020	Jun. 07, 2021
2	Test Receiver (9kHz-7GHz)	R&S	ESR7	101154	Jun. 08, 2020	Jun. 07, 2021
3	Bilog Antenna (30MHz-3GHz)	SCHWARZBECK	VULB9163	VULB9163-942	Jun. 08, 2020	Jun. 07, 2021
4	Horn Antenna (1GHz-18GHz)	SCHWARZBECK	BBHA9120D	1541	Jun. 10, 2020	Jun. 09, 2021
5	Horn Antenna (18GHz-40GHz)	SCHWARZBECK	BBHA9170	822	Jun. 10, 2020	Jun. 09, 2021
6	Amplifier (9KHz-6GHz)	SCHWARZBECK	BBV9744	9744-0037	Jun. 04, 2020	Jun. 03, 2021
7	Amplifier (0.5GHz-18GHz)	SCHWARZBECK	BBV9718	9718-309	Jun. 04, 2020	Jun. 03, 2021
8	Amplifier (18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	Jun. 08, 2020	Jun. 07, 2021
9	Loop Antenna (9KHz-30MHz)	SCHWARZBECK	FMZB1519B	014	Jun. 08, 2020	Jun. 07, 2021
10	RF cables1 (9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jun. 08, 2020	Jun. 07, 2021
11	RF cables2 (30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	Jun. 08, 2020	Jun. 07, 2021
12	RF cables3 (1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	Jun. 08, 2020	Jun. 07, 2021
13	Power Metter	Keysight	E4419B	\	Jun. 08, 2020	Jun. 07, 2021
14	Power Sensor (AV)	Keysight	E9300A	\	Jun. 08, 2020	Jun. 07, 2021
15	Signal Analyzer 20kHz-26.5GHz	KEYSIGHT	N9020A	MY49100060	Jun. 04, 2020	Jun. 03, 2021
16	Spectrum Analyzer 9kHz-40GHz	Agilent	FSP40	100363	Jun. 08, 2020	Jun. 07, 2021
17	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
18	Software	Frad	EZ-EMC	FA-03A2 RE	\	\

3.2.3. RF Conducted Test

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Signal Analyzer	KEYSIGHT	N9020A	MY49100060	Jun. 04, 2020	Jun. 03, 2021
2	Universal Radio Communication Tester	R&S	CMU200	119435	Jun. 04, 2020	Jun. 03, 2021
3	RF cables	Huber+Suhnar	30MHz-1GHz	F02-170707-010	\	\
4	RF cables	Huber+Suhnar	1GHz-40GHz	SFL402-105FLEX		
5	D.C. Power Supply	LongWei	TPR-6405D	\	\	\

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: GPS Tracker)

4.3. Test Operation Mode and Test Software

GPRS850, GPRS1800

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 (°C)	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:

Conducted Power (dBm)						
Band	GPRS 850			GPRS 1900		
Frequency	824.20	836.60	848.80	1850.20	1880.00	1909.80
GPRS (GMSK, 1 TX slot)	32.15	31.68	31.71	30.05	30.15	30.37
GPRS (GMSK, 2 TX slot)	30.57	30.85	30.81	29.49	29.70	29.15
GPRS (GMSK, 3 TX slot)	29.53	29.62	29.14	28.47	27.96	27.82
GPRS (GMSK, 4 TX slot)	28.34	28.51	28.62	25.77	25.25	25.44
Limit	N/A			N/A		
Result	Pass					

Note: Measurement Uncertainty: ± 2.6 dB.

5.2. Peak to Average Ratio

5.2.1. Limit

According to §24.232(d), Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

5.2.2. Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 30kHz and the peak-to-average ratio (PAR) of the transmission was recorded. Record the maximum PAPR level associated with a probability of 0.1%.

5.2.3. Test Setup

See section 5.1.2 of this report.

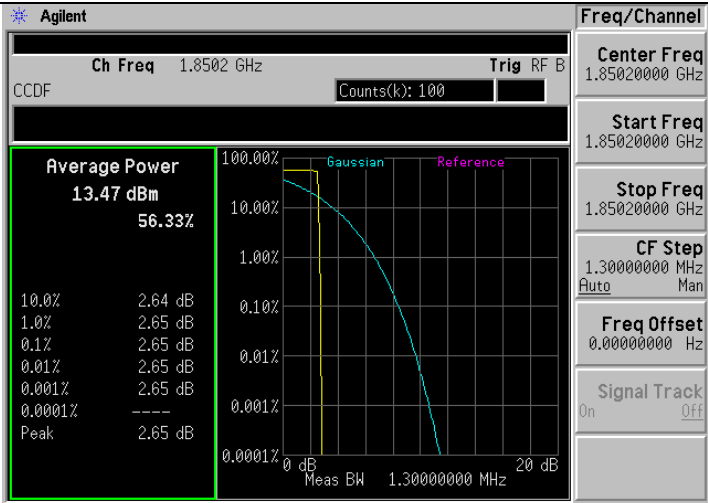
5.2.4. Test Result

Measurement data as follows:

Test Mode	Frequency (MHz)	PAR (dB)	Limit (dB)
GPRS (850)	824.2	2.60	13
	836.4	2.62	13
	848.8	2.59	13

Test Mode	Frequency (MHz)	PAR	Limit
GPRS (1900)	1850.2	2.65	13
	1880.0	2.65	13
	1909.8	2.65	13

Note: Worst data graph is recorded in the report

LCH	 Agilent Spectrum Analyzer screenshot for LCH. The display shows a CCDF plot with a Gaussian fit. The average power is 13.47 dBm with a 56.33% occupancy. The measurement bandwidth is 1.30000000 MHz. The center frequency is 1.8502 GHz. The plot shows a steep roll-off from 0 dB to -20 dB.
MCH	 Agilent Spectrum Analyzer screenshot for MCH. The display shows a CCDF plot with a Gaussian fit. The average power is 13.67 dBm with a 56.36% occupancy. The measurement bandwidth is 1.30000000 MHz. The center frequency is 1.88 GHz. The plot shows a steep roll-off from 0 dB to -20 dB.
HCH	 Agilent Spectrum Analyzer screenshot for HCH. The display shows a CCDF plot with a Gaussian fit. The average power is 13.62 dBm with a 56.37% occupancy. The measurement bandwidth is 1.30000000 MHz. The center frequency is 1.9098 GHz. The plot shows a steep roll-off from 0 dB to -20 dB.

5.3. 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

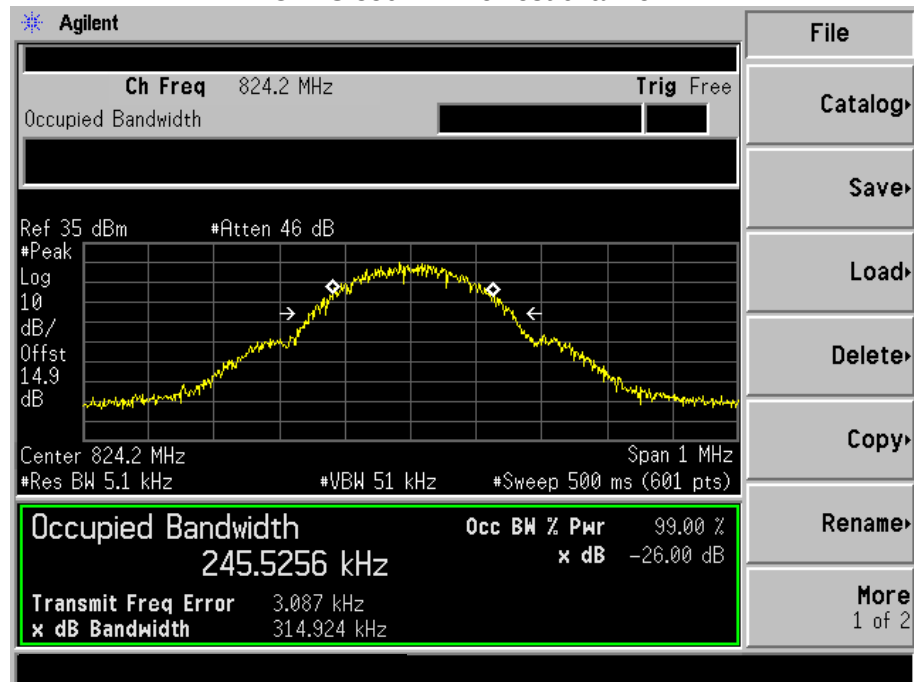
Measurement Data

EUT Mode	Frequency (MHz)	99% Occupy bandwidth (kHz)	26dB Occupy bandwidth (kHz)
GPRS 850 (GPRS link)	824.20	245.53	314.92
	836.60	247.64	314.88
	848.80	249.78	314.05
GPRS 1900 (GPRS link)	1850.20	252.46	321.90
	1880.00	255.19	322.42
	1909.80	255.29	325.35

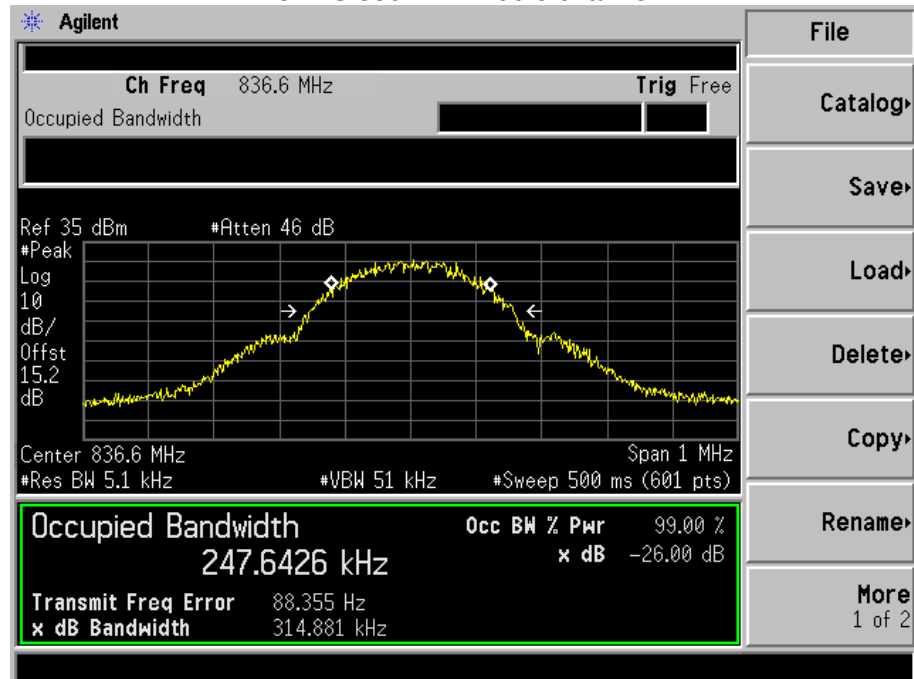
Note: Measurement Uncertainty: $\pm 20\text{Hz}$.

Test plot as follows:

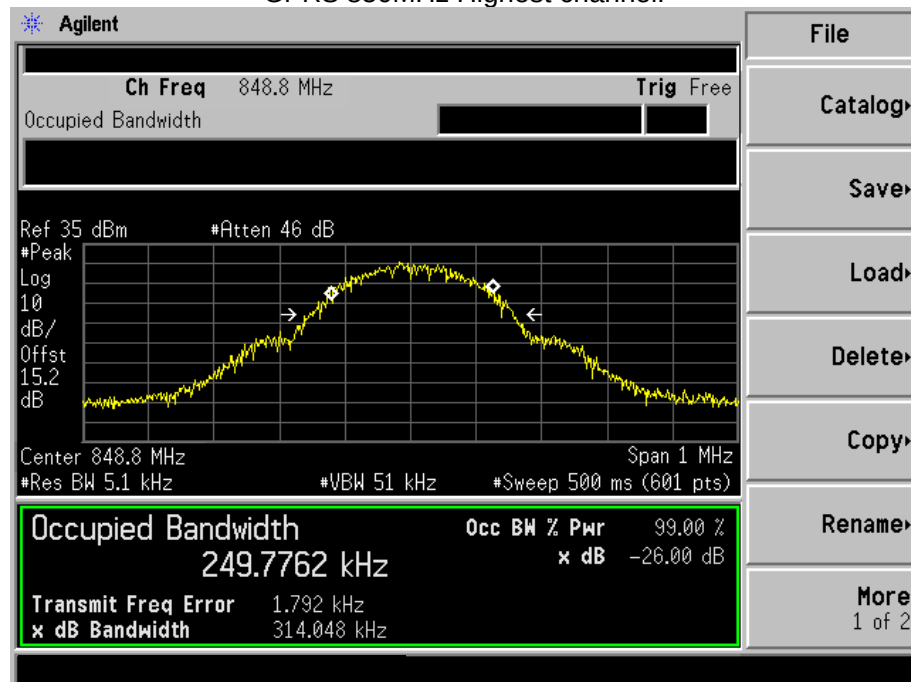
GPRS 850MHz Lowest channel



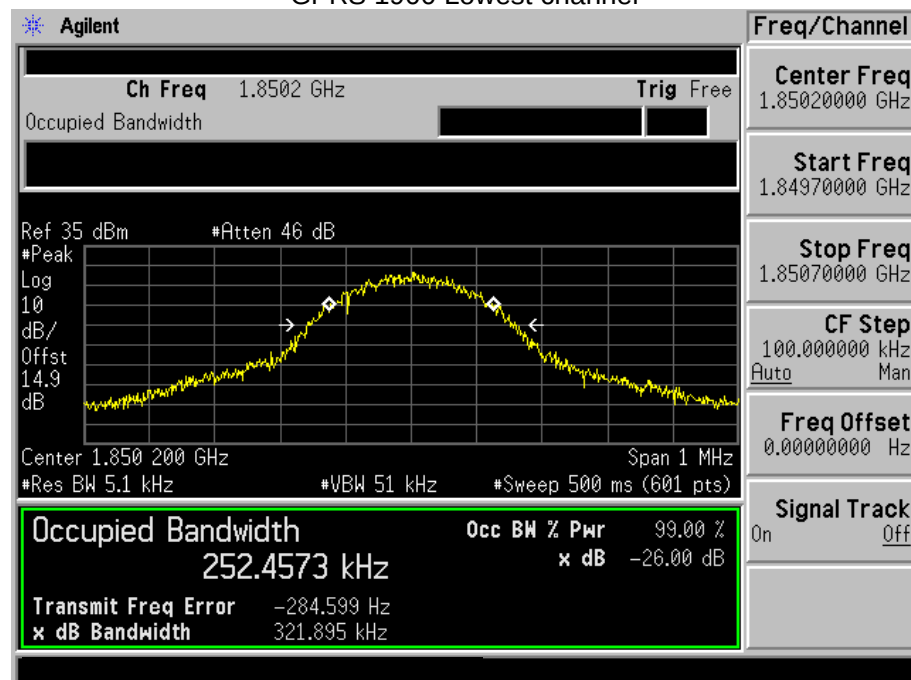
GPRS 850MHz Middle channel



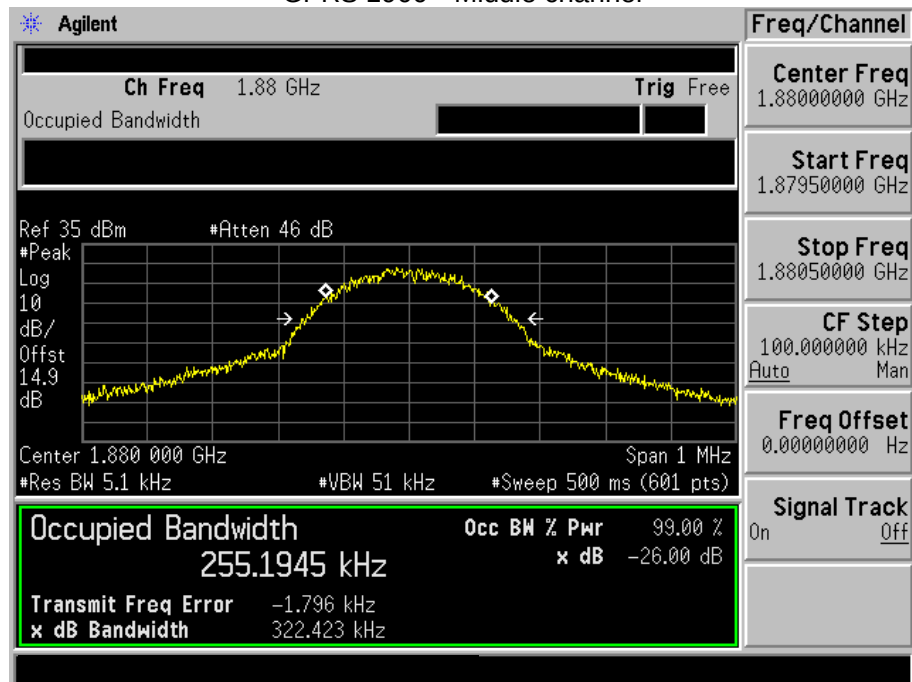
GPRS 850MHz Highest channel:



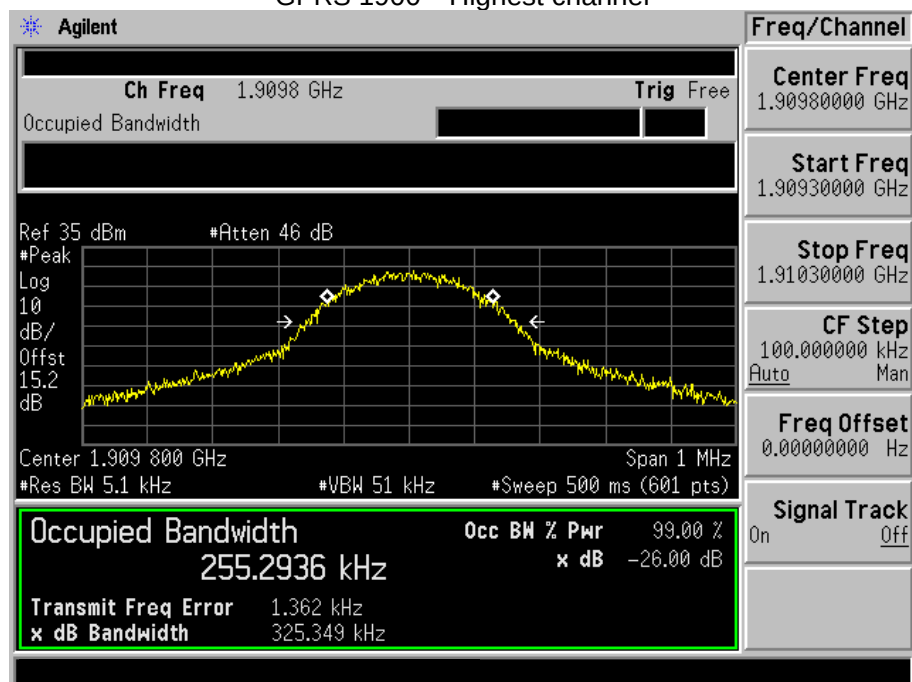
GPRS 1900 Lowest channel



GPRS 1900 Middle channel



GPRS 1900 Highest channel



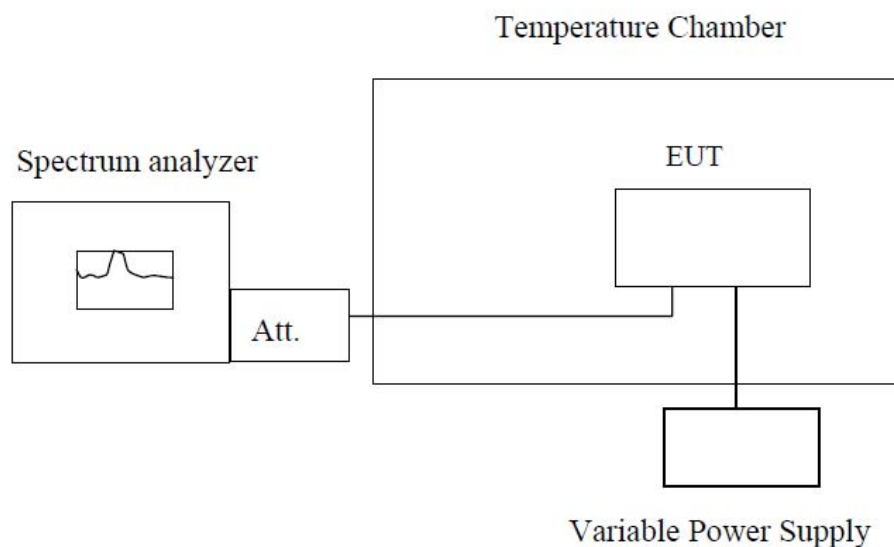
5.4. Frequency Stability

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°C to $+50^{\circ}\text{C}$ at intervals of not more than 10°C .
- (b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

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 3.7VDC, 4.2VDC and 3.6VDC which are specified by the applicant; the normal temperature here used is 25°C . The frequency deviation limit of 850MHz band is $\pm 2.5\text{ppm}$ and 1900MHz is $\pm 2.5\text{ppm}$

Normal

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
GPRS 850 (GPRS link) Middle channel=190 channel=836. 6MHz	3.70	-30	23	0.02749	±2.5	PASS
	3.70	-20	17	0.02032		
	3.70	-10	22	0.02630		
	3.70	0	18	0.02152		
	3.70	10	16	0.01913		
	3.70	20	20	0.02391		
	3.70	30	19	0.02271		
	3.70	40	15	0.01793		
	3.70	50	17	0.02032		
	4.25	25	16	0.01913		
	3.70	25	18	0.02152		
	3.40	25	17	0.02032		
	3.70	-30	15	0.00798	±2.5	PASS
GPRS 1900 (GPRS link) Middle channel=661 channel=188 0MHz	3.70	-20	16	0.00851		
	3.70	-10	13	0.00691		
	3.70	0	19	0.01011		
	3.70	10	16	0.00851		
	3.70	20	13	0.00691		
	3.70	30	12	0.00638		
	3.70	40	14	0.00745		
	3.70	50	12	0.00638		
	4.25	25	11	0.00585		
	3.70	25	10	0.00532		
	3.40	25	11	0.00585		

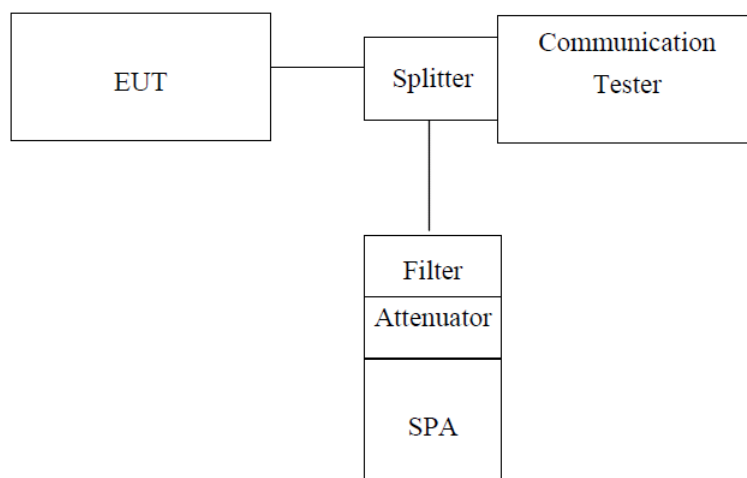
Note: Measurement Uncertainty: ±20Hz.

5.5. Conducted Out of Band 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.

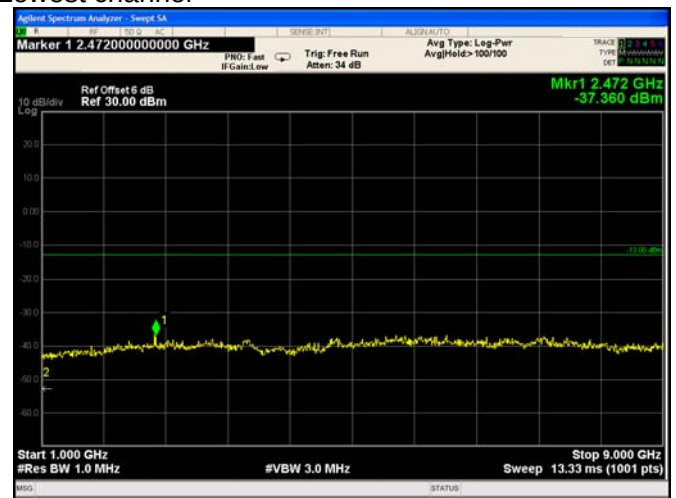
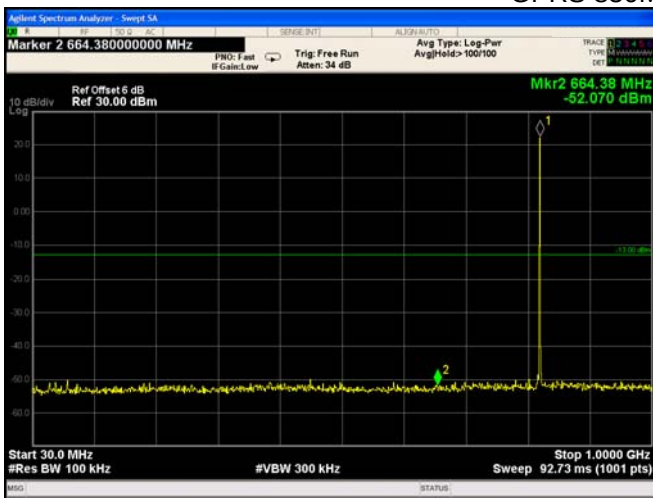
Limit = -13dBm

5.5.4. Test Result

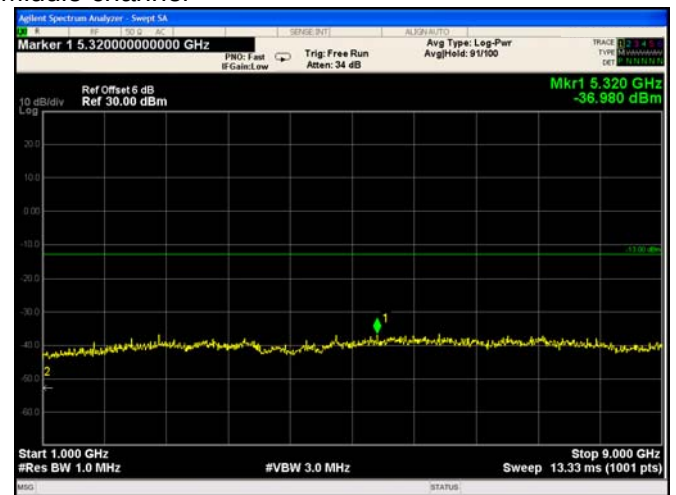
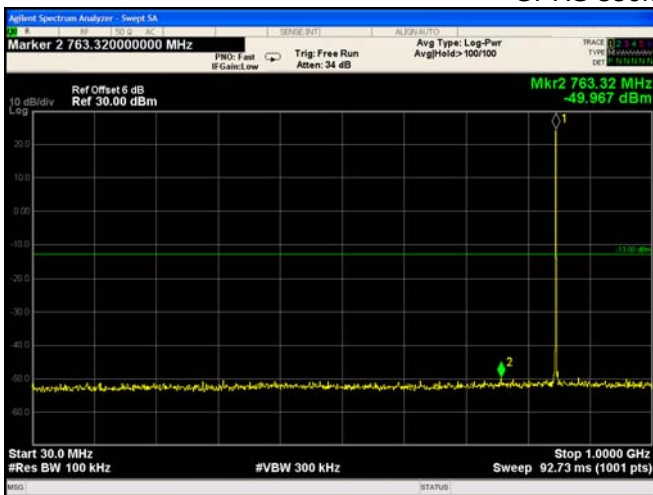
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

Test plot as follows:

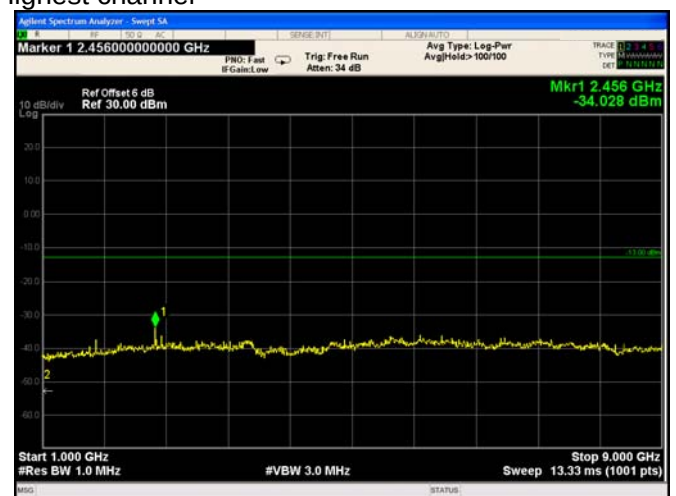
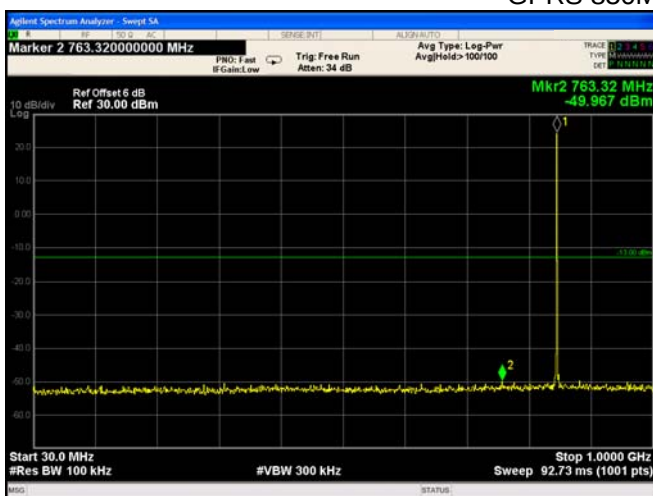
GPRS 850MHz Lowest channel



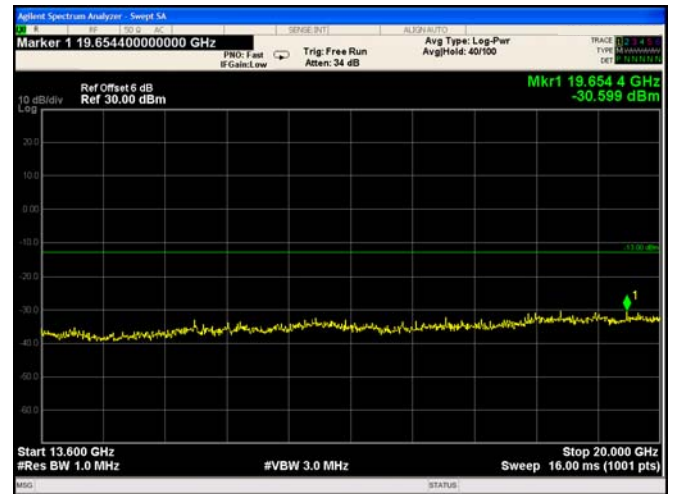
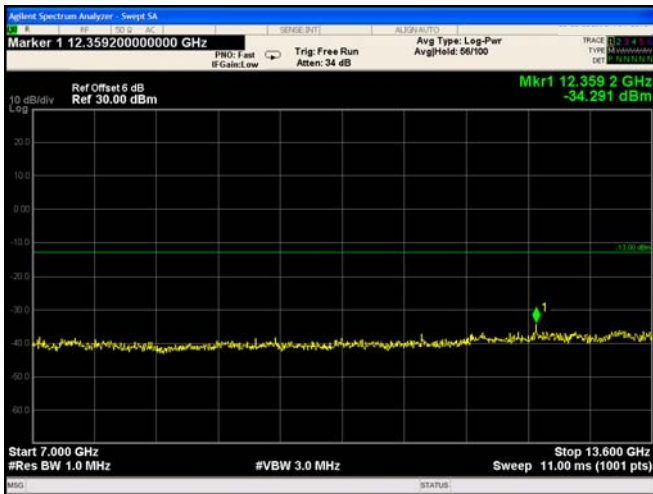
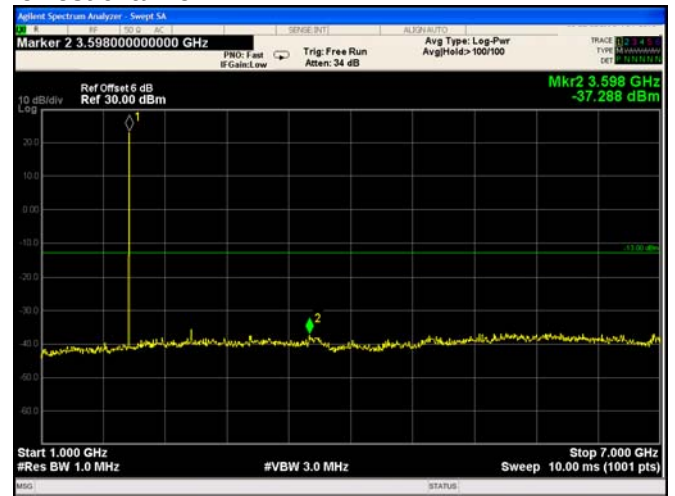
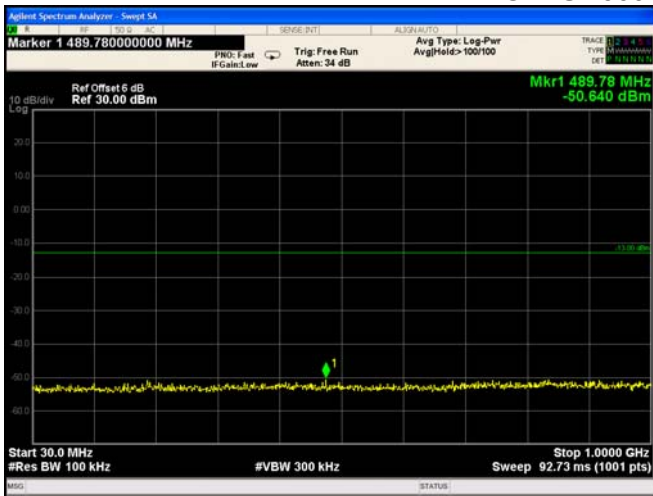
GPRS 850MHz Middle channel



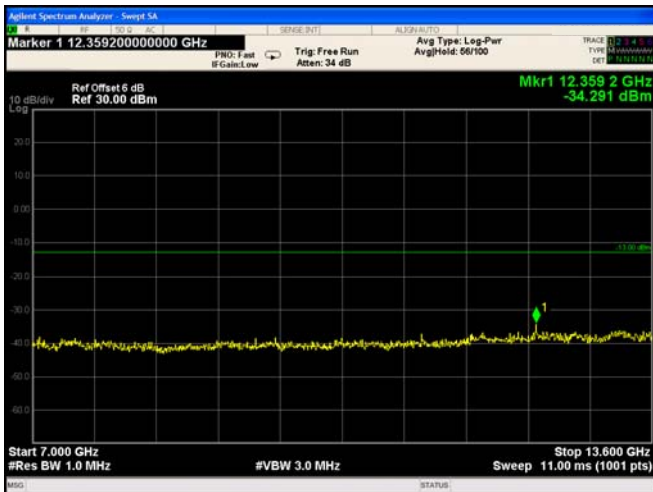
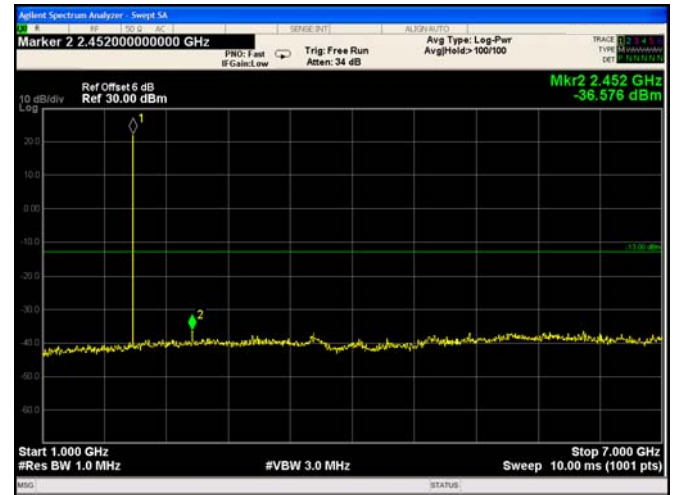
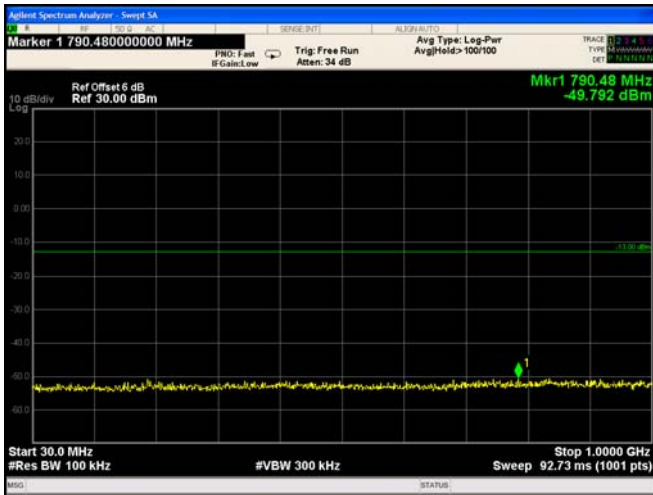
GPRS 850MHz Highest channel



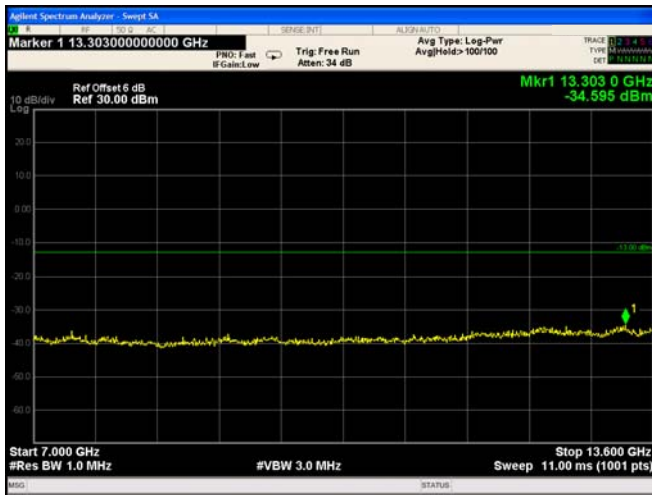
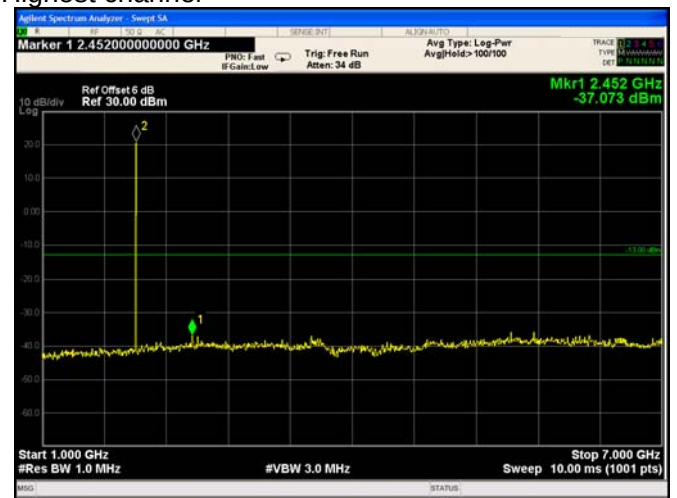
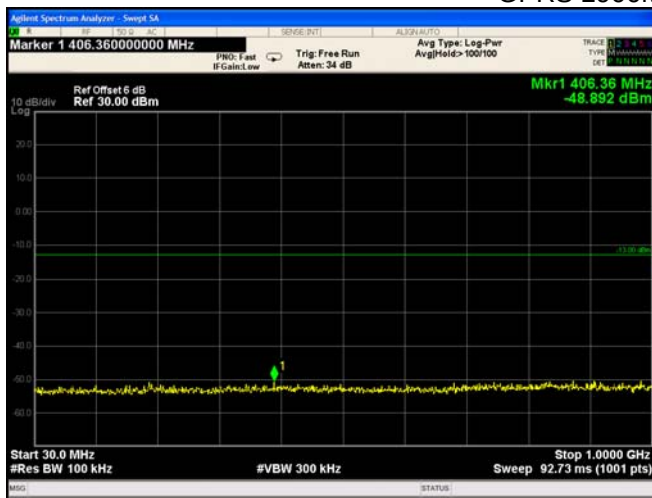
GPRS 1900MHz Lowest channel



GPRS 1900MHz Middle channel



GPRS 1900MHz Highest channel

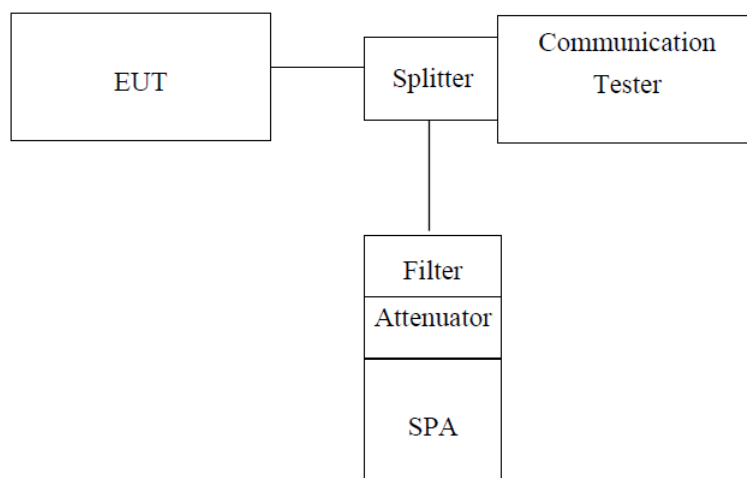


5.6. Conducted Out of Band Emissions

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

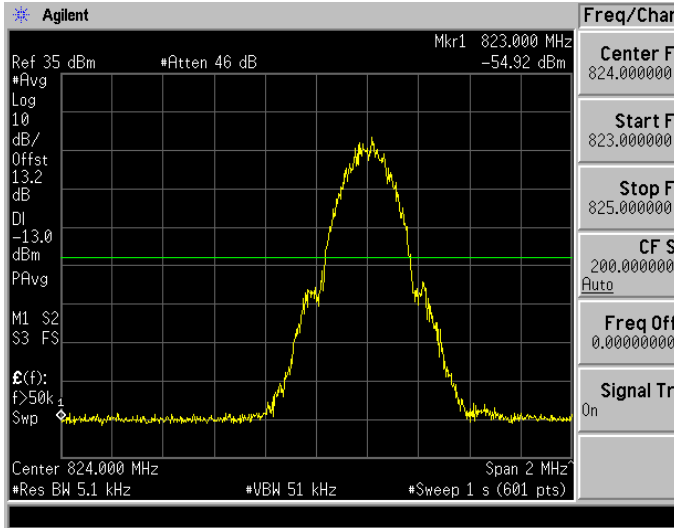
The EUT, which is powered by the adapter, is coupled to the Spectrum Analyzer and the System Simulator with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the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

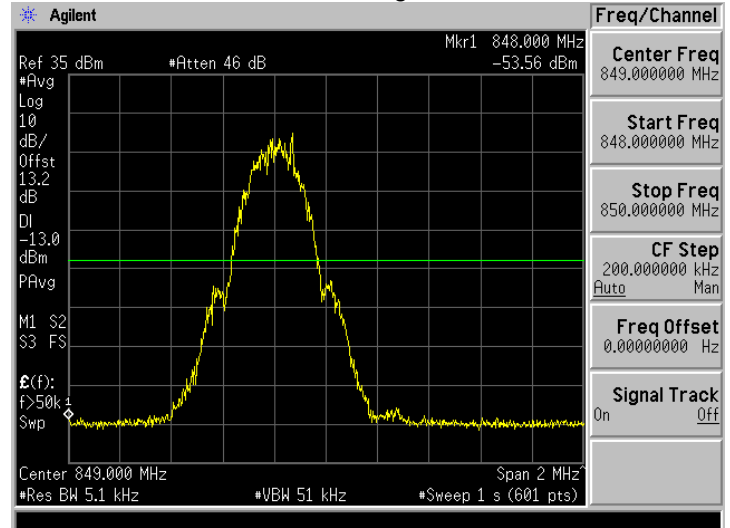
Test plot as follows:

GPRS 850MHz Lowest channel



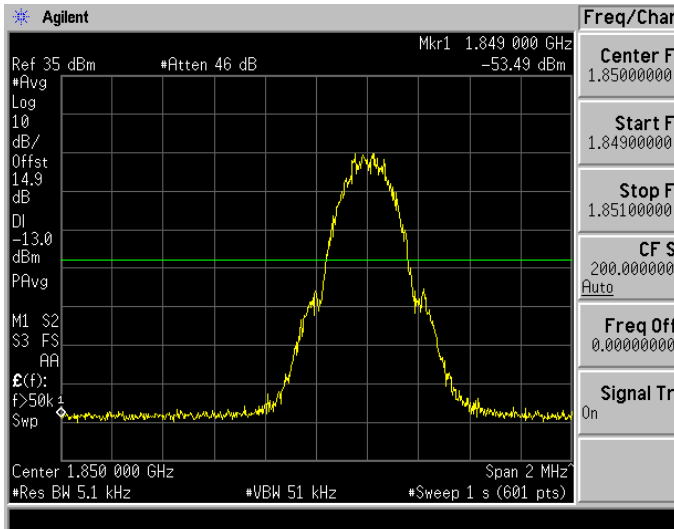
Note: Offset=Cable loss (1.0) + 10log(3.15/3)=1.0+0.2=1.2dB

GPRS 850MHz Highest channel



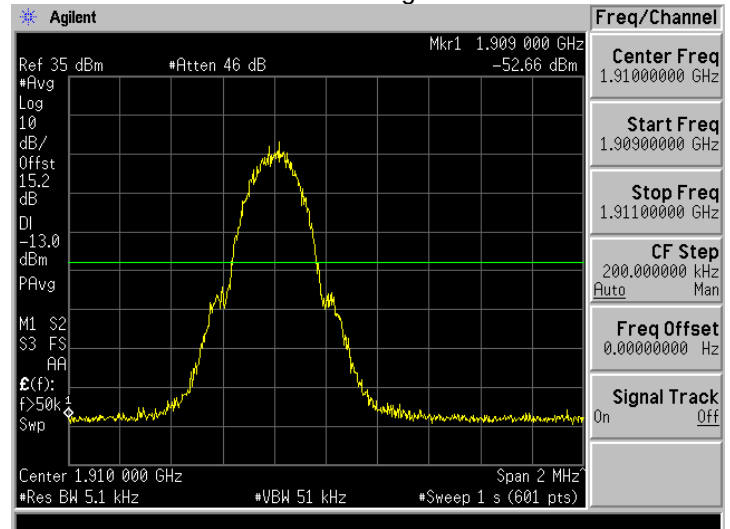
Note: Offset=Cable loss (1.0) + 10log(3.15/3)=1.0+0.2=1.2dB

GPRS 1900MHz Lowest channel



Note: Offset=Cable loss (1.0) + 10log(3.15/3)=1.0+0.2=1.2dB

GPRS 1900MHz Highest channel



Note: Offset=Cable loss (1.0) + 10log(3.15/3)=1.0+0.2=1.2dB

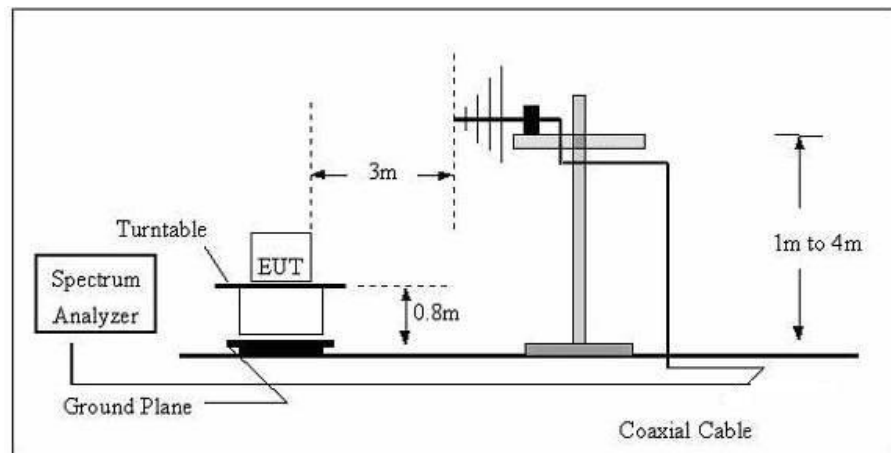
5.7. Transmitter Radiated Power (EIRP/ERP)

5.7.1. Limit

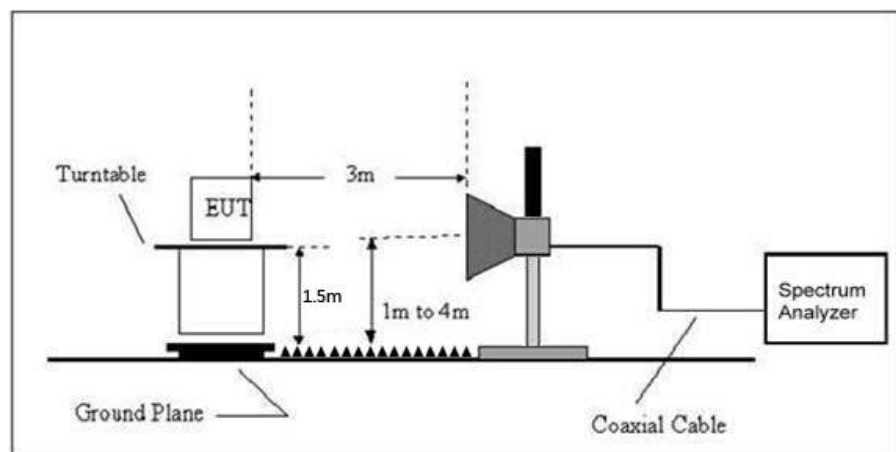
According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.

5.7.2. Test Setup

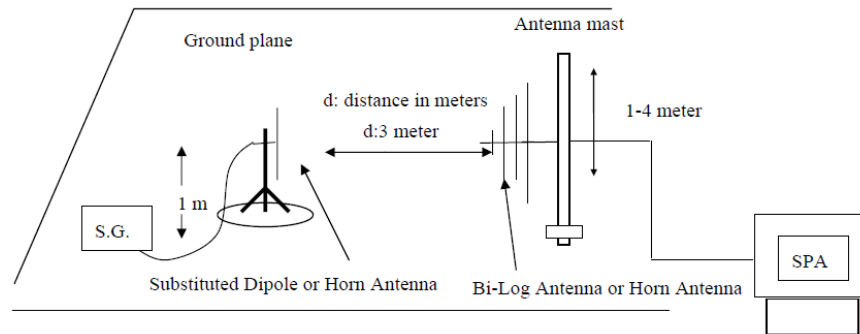
Below 1GHz



Above 1GHz



Substituted method:



5.7.3. Measurement Procedure

The EUT was placed on a 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 tests were conducted in a Full-Anechoic Chamber.

During the measurement, the EUT was in communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4 m to 1 m. The reading was recorded and the field strength (E in dBV/m) was calculated.

ERP in the frequency band 824.2 – 848.80.8 MHz were measured using a substitution method. The EUT was replaced by a dipole antenna connected to the S.G. output was recorded and ERP was calculated as follows:

EIRP in the frequency band 1850.2 – 1909.8 MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected to the S.G. output was recorded and EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

5.7.4. Test Result

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss(dB)	ERP(dBm)	Limit (dBm)	Result
GPRS 850 (GPRS link)	Lowest	V	5.56	15.68	1.65	19.59	38.45	Pass
		H	6.11	15.68	1.65	20.14		
	Middle	V	5.63	15.7	1.67	19.66	38.45	Pass
		H	5.67	15.7	1.67	19.70		
	Highest	V	6.04	15.7	1.71	20.03	38.45	Pass
		H	6.21	15.7	1.71	20.20		

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss(dB)	ERP(dBm)	Limit (dBm)	Result
GPRS 1900 (GPRS link)	Lowest	V	6.23	19.35	2.54	23.04	33	Pass
		H	5.46	19.35	2.54	22.27		
	Middle	V	6.85	19.51	2.62	23.74	33	Pass
		H	6.69	19.51	2.62	23.58		
	Highest	V	6.52	19.96	2.69	23.79	33	Pass
		H	5.98	19.96	2.69	23.25		

5.8. Radiated Out of Band Emissions

5.8.1. Limit

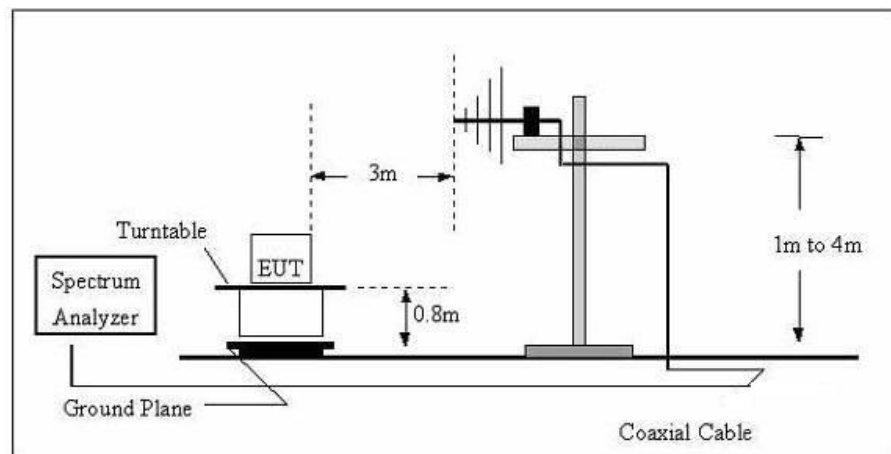
According to FCC section 22.917(a) and section 24.238(a), 27.53(g) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power

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

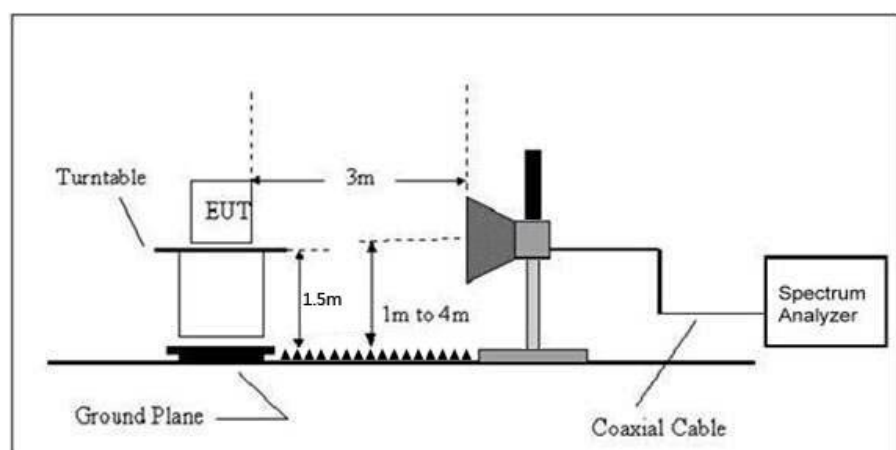
The spurious emission with frequency band 1900 according to FCC section 2.1057.

5.8.2. Test Setup

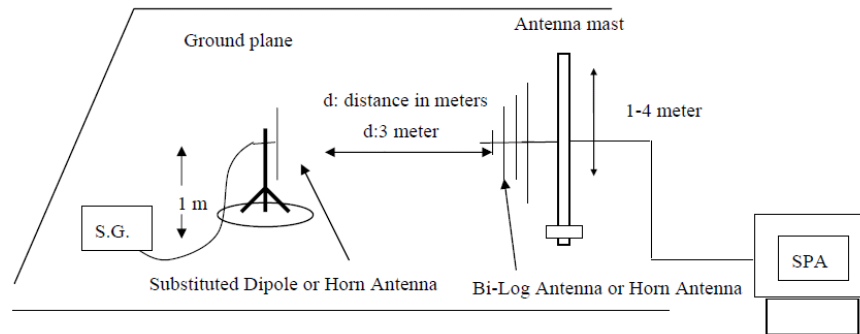
Below 1GHz



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.

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss (dB)}$$

Note: Measurement Uncertainty: ± 3.6 dB.

GPRS 850_ Low Channel

Frequency (MHz)	P _g (dBm)	cable loss (dB)	Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1648.4	-31.62	3.00	9.58	-25.04	-13.00	12.04	H
2472.6	-37.26	3.03	10.72	-29.57	-13.00	16.57	H
1648.4	-30.59	3.00	9.68	-23.91	-13.00	10.91	V
2472.6	-39.49	3.03	10.72	-31.80	-13.00	18.80	V

GPRS 850_ Middle Channel

Frequency (MHz)	P _g (dBm)	cable loss (dB)	Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.2	-28.36	3.00	9.58	-21.78	-13.00	8.78	H
2509.8	-39.96	3.03	10.72	-32.27	-13.00	19.27	H
1673.2	-31.36	3.00	9.68	-24.68	-13.00	11.68	V
2509.8	-39.02	3.03	10.72	-31.33	-13.00	18.33	V

GPRS 850_ High Channel

Frequency (MHz)	P _g (dBm)	cable loss (dB)	Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1697.6	-32.58	3.00	9.58	-26.00	-13.00	13.00	H
2546.4	-37.75	3.03	10.72	-30.06	-13.00	17.06	H
1697.6	-30.66	3.00	9.68	-23.98	-13.00	10.98	V
2546.4	-35.12	3.03	10.72	-27.43	-13.00	14.43	V

GPRS 1900_ Low Channel

Frequency (MHz)	P _g (dBm)	cable loss (dB)	Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3700.4	-36.31	4.41	12.34	-28.38	-13.00	15.38	H
5550.6	-41.47	5.38	13.58	-33.27	-13.00	20.27	H
3700.4	-35.25	4.41	12.34	-27.32	-13.00	14.32	V
5550.6	-43.05	5.38	13.58	-34.85	-13.00	21.85	V

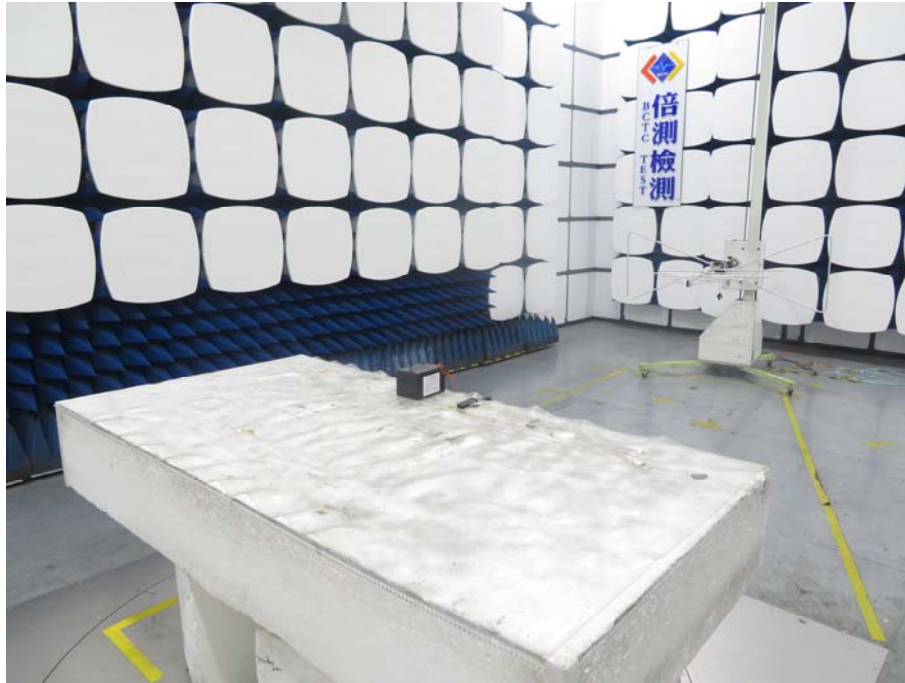
GPRS 1900_ Middle Channel

Frequency (MHz)	P _g (dBm)	cable loss (dB)	Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3760.0	-37.32	4.41	12.34	-29.39	-13.00	16.39	H
5640.0	-42.44	5.38	13.58	-34.24	-13.00	21.24	H
3760.0	-35.88	4.41	12.34	-27.95	-13.00	14.95	V
5640.0	-43.11	5.38	13.58	-34.91	-13.00	21.91	V

GPRS 1900_ High Channel

Frequency (MHz)	P _g (dBm)	cable loss (dB)	Antenna Gain(dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3819.6	-36.28	4.41	12.34	-28.35	-13.00	15.35	H
5729.4	-42.43	5.38	13.58	-34.23	-13.00	21.23	H
3819.6	-35.53	4.41	12.34	-27.60	-13.00	14.60	V
5729.4	-43.26	5.38	13.58	-35.06	-13.00	22.06	V

6. EUT TEST PHOTO



7 EUT PHOTO





***** END OF REPORT *****