



# FCC Test Report

## FCC ID: 2BDZG-XLXW01

Applicant: Guangdong XiaoLangXing IOT Limited Company

Address: Fukang Commercial Square, Fukang Community, Longhua Street, Longhua District, Shenzhen City.

Manufacturer: Guangdong Tutu Intelligent Manufacturing Technology Co., Ltd

Address: Room 401, Building 7, No.95, Jiaping Road, Tangxia Town, Dongguan City, Guangdong Province

EUT: GPS Tracker

Trade Mark:  XLXW-01

Model Number: C028C, GT08D, GT02, GT23, V3, F02, GT07, GT76, GT026A, GT035, GT053, GT012, ST909, V6, GT30B, F18, F99, F20, F19, GT011, C032, GT080X, XLXW-02, XLXW-03, XLXW-04, XLXW-05, XLXW-06, XLXW-07, XLXW-08, XLXW-09, XLXW-10

Date of Receipt: Nov. 22, 2023

Test Date: Nov. 22, 2023 - Dec. 05, 2023

Date of Report: Dec. 05, 2023

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

FCC CFR Title 47 Part22 Subpart H

Applicable Standards: FCC CFR Title 47 Part24 Subpart E

ANSI/TIA-603-E-2016

FCC KDB 971168 D01 Power Meas. License Digital Systems v03v01

ANSI C63.26:2015

Test Result: Pass

Report Number: DL-20231205040E

Prepared (Test Engineer): Alisa Song

Reviewer (Supervisor): Jack Bu

Approved (Manager): Jade Yang



This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

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**1. TEST SUMMARY**

Test Items	Test Requirement	Result
Conducted RF Output Power	2.1046	PASS
Peak to Average Radio	2.1046, 24.232	PASS
99% & -26 dB Occupied Bandwidth	2.1049, 22.917 24.238,	PASS
Frequency Stability	2.1055, 22.355 24.235, 27.54	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. Description of Device (EUT)

Product Name:	GPS Tracker
Trademark	 小狼星 XIAOLANGXING
Model No.:	XLXW-01 C028C, GT08D, GT02, GT23, V3, F02, GT07, GT76, GT026A, GT035, GT053, GT012, ST909, V6, GT30B, F18, F99, F20, F19, GT011, C032, GT080X, XLXW-02, XLXW-03, XLXW-04, XLXW-05, XLXW-06, XLXW-07, XLXW-08, XLXW-09, XLXW-10
Test Model:	XLXW-01
Model Difference	The product's different for model number and appearance color.
Operation Frequency:	GSM 850: Tx: 824.20 - 848.80MHz; Rx: 869.20 - 893.80MHz GSM1900: Tx: 1850.20 - 1909.80MHz; Rx: 1930.20 - 1989.80MHz
Modulation technology:	GPRS Mode with GMSK Modulation
Antenna Type:	Internal Antenna
Antenna gain:	GSM 850: -3.66dBi GSM 1900: -5.05dBi
Power supply:	DC 3.7V from battery DC 5V from USB
Hardware Version	HV10
Software Version	SV10

### 2.2. Product Function

Refer to Technical Construction Form and User Manual.

### 2.3. 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	GPRS	GPRS

Test Channel (MHz)			
Band	Low	Middle	High
GSM850	824.20	836.60	848.80
GSM1900	1850.20	1880.00	1909.80



### 3. TEST SITES

#### 3.1. Test Facilities

##### Site Description

Name of Firm : Shenzhen DL Testing Technology Co., Ltd.

Site Location : 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

FCC Test Firm Registration Number: 854456

Designation Number: CN1307

IC Registered No.: 27485

CAB ID.: CN0118

#### 3.2. Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , 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	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$
8	99% & -26 dB Occupied Bandwidth	$\pm 11.6\text{KHz}$



### 3.3. List of Test and Measurement Instruments

#### 3.3.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
843 Shielded Room	ChengYu	843 Room	843	Sep. 20, 2022	Sep. 19, 2025
EMI Receiver	R&S	ESR	101421	Nov. 04, 2023	Nov. 03, 2024
LISN	R&S	ENV216	102417	Nov. 04, 2023	Nov. 03, 2024
843 Cable 1#	ChengYu	CE Cable	001	Nov. 04, 2023	Nov. 03, 2024
843 Cable 1#	FUJIKURA	843C1#	001	Nov. 04, 2023	Nov. 03, 2024

#### 3.3.2. For radiated test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 04, 2023	Nov. 03, 2024
Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 04, 2023	Nov. 03, 2024
Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 04, 2023	Nov. 03, 2024
Bilog Antenna (30MHz-1GHz)	R&S	VULB9163	9163-519	Nov. 04, 2023	Nov. 03, 2024
Horn Antenna	R&S	BBHA9170	9170C-531	Nov. 04, 2023	Nov. 03, 2024
Horn Antenna	R&S	BBHA 9120D	01774	Nov. 04, 2023	Nov. 03, 2024
Horn Antenna (18-40GHz)	A.H. Systems	SAS-574	588	Nov. 04, 2023	Nov. 03, 2024
Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 04, 2023	Nov. 03, 2024
Amplifier(1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 04, 2023	Nov. 03, 2024
Amplifier(18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 04, 2023	Nov. 03, 2024
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 04, 2023	Nov. 03, 2024
RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 04, 2023	Nov. 03, 2024
RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 04, 2023	Nov. 03, 2024
Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 04, 2023	Nov. 03, 2024
Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 04, 2023	Nov. 03, 2024
Signal Analyzer	Agilent	N9020A	MY55370280	Nov. 04, 2023	Nov. 03, 2024
Test Receiver	R&S	ESU 40	100376	Nov. 04, 2023	Nov. 03, 2024
D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 04, 2023	Nov. 03, 2024
Signal Amplifier	DAZE	ZN3380B	11235	Nov. 04, 2023	Nov. 03, 2024
High Pass filter	KANGMAI	WHDX1.0/1.5G-10SS	40	Nov. 04, 2023	Nov. 03, 2024
Filter	COM-MW	ZBSF-C836.5-25-X	BCTC042	Nov. 04, 2023	Nov. 03, 2024
Filter	COM-MW	ZBSF-C1747.5-75-X2	BCTC045	Nov. 04, 2023	Nov. 03, 2024
Filter	COM-MW	ZBSF-C1880-60-X2	BCTC047	Nov. 04, 2023	Nov. 03, 2024
Splitter	Agilent	11435B	1125162	Nov. 04, 2023	Nov. 03, 2024

#### RF CONDUCTED TEST

System Simulator	Agilent	E5515C	GB43130252	Nov. 04, 2023	Nov. 03, 2024
Spectrum Analyzer	Agilent	N9020A	MY45108040	Nov. 04, 2023	Nov. 03, 2024
DC Power Supply	LongWei	PS-305D	010965682	Nov. 04, 2023	Nov. 03, 2024
Constant temperature and humidity box	GF	GTH-800-40-2P	MAA9906-012	Nov. 04, 2023	Nov. 03, 2024
Universal radio communication tester	R&S	CMW500	115295	Nov. 04, 2023	Nov. 03, 2024



#### 4. TEST SET-UP

##### 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



##### 4.3. 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), FCC part22.50(a) and FCC part 24.232(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

#### 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.

Pass, the table and plot please see annex.

The conducted power tables are as follows:

Band	Average Conducted Power(dBm)					
	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency	824.20	836.60	848.80	1850.20	1880.00	1909.80
GPRS (GMSK, 1 TX slot)	32.01	32.21	32.41	29.00	29.16	29.62
GPRS (GMSK, 2 TX slot)	31.26	31.46	31.66	28.22	28.41	28.87
GPRS (GMSK, 3 TX slot)	29.29	29.49	29.69	26.25	26.43	26.89
GPRS (GMSK, 4 TX slot)	27.18	27.38	27.58	24.15	24.33	24.79



## 5.2. -26dB and 99% Occupied Bandwidth

### 5.2.1. Limit

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

### 5.2.2. 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.

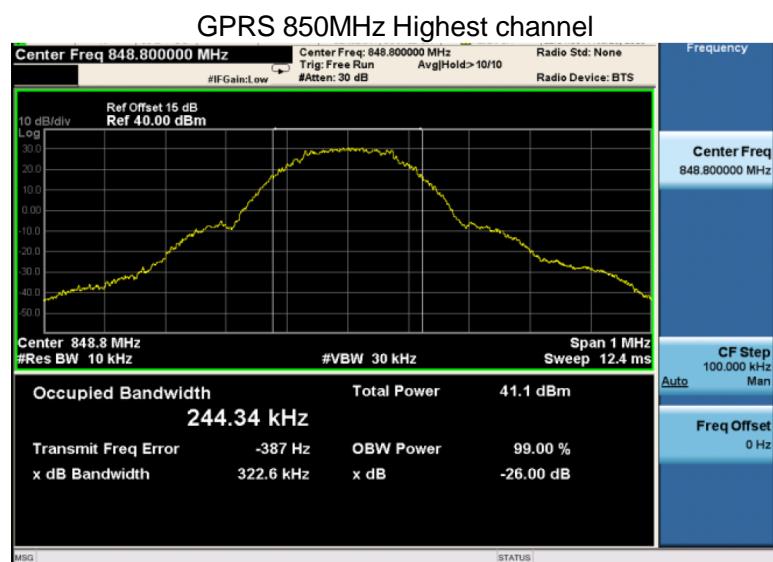
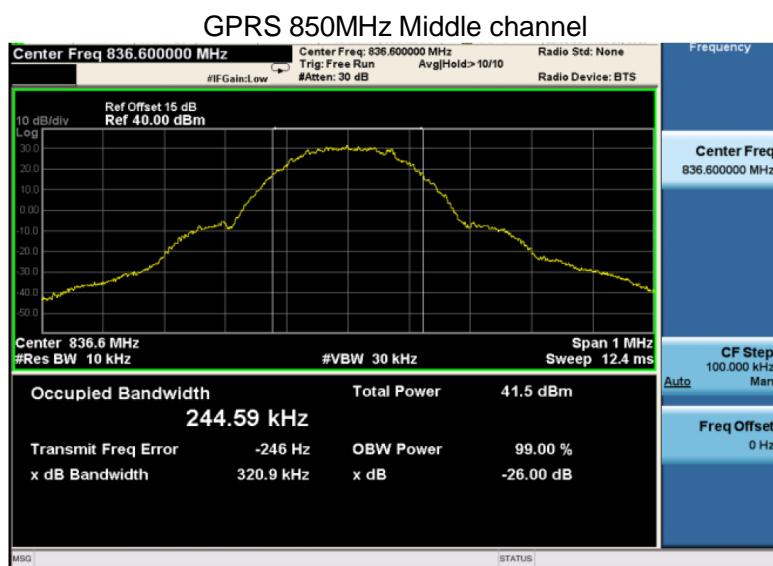
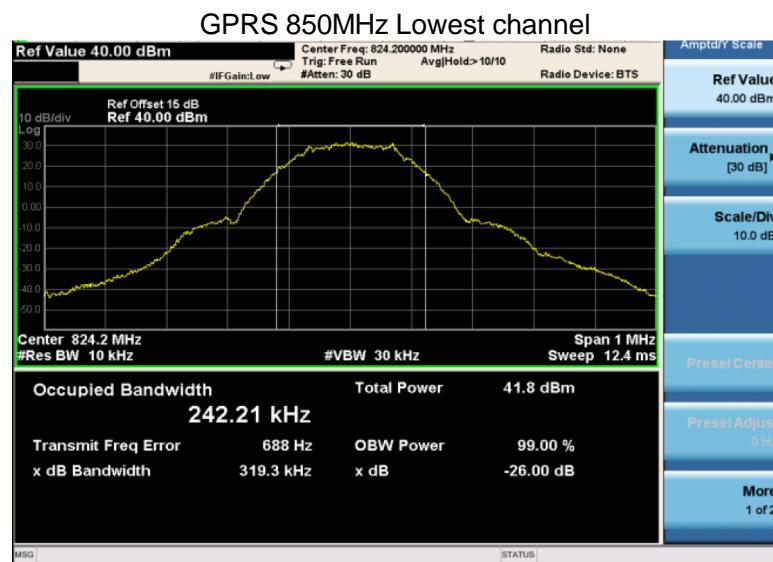
### 5.2.3. Test Result

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EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GPRS)	128	824.20	242.21	319.3
	190	836.60	244.59	320.9
	251	848.80	244.34	322.6
PCS 1900 (GPRS)	512	1850.20	241.22	317.6
	661	1880.00	243.20	317.8
	810	1909.80	244.03	320.4



Test plot as follows:





## GPRS 1900 Lowest channel



## GPRS 1900 Middle channel



## GPRS 1900 Highest channel



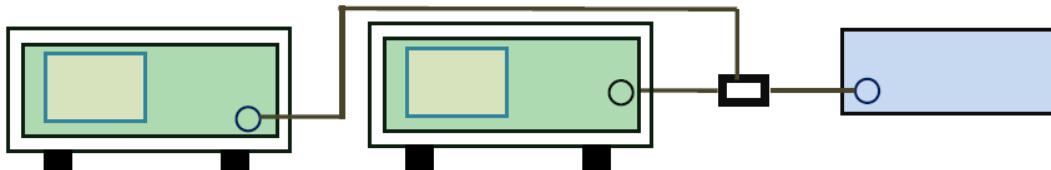


### 5.3. Peak to Average Radio

#### 5.3.1. Limit

According to FCC section 27.50(d)(5), 22.913, 24.232 the peak to average ratio(PAR) of the transmission may not exceed 13dB.

#### 5.3.2. Test Setup



#### 5.3.3. Test Procedure

According with KDB 971168 v02r02

1. The signal analyzer' s CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal “ RF Burst” trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the “ on time” of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

#### 5.3.4. Test Result

Measurement data as follows:

Band	Channel	Peak-Average Ratio(PAR)	Limit (dB)	Result
GPRS850	Low	0.27	≤13	Pass
	Middle	0.36	≤13	Pass
	High	0.33	≤13	Pass
GPRS1900	Low	0.27	≤13	Pass
	Middle	0.45	≤13	Pass
	High	0.68	≤13	Pass



## GPRS 850MHz Lowest channel



## GPRS 850MHz Middle channel



## GPRS 850MHz Highest channel





## GPRS 1900 Lowest channel



## GPRS 1900 Middle channel



## GPRS 1900 Highest channel





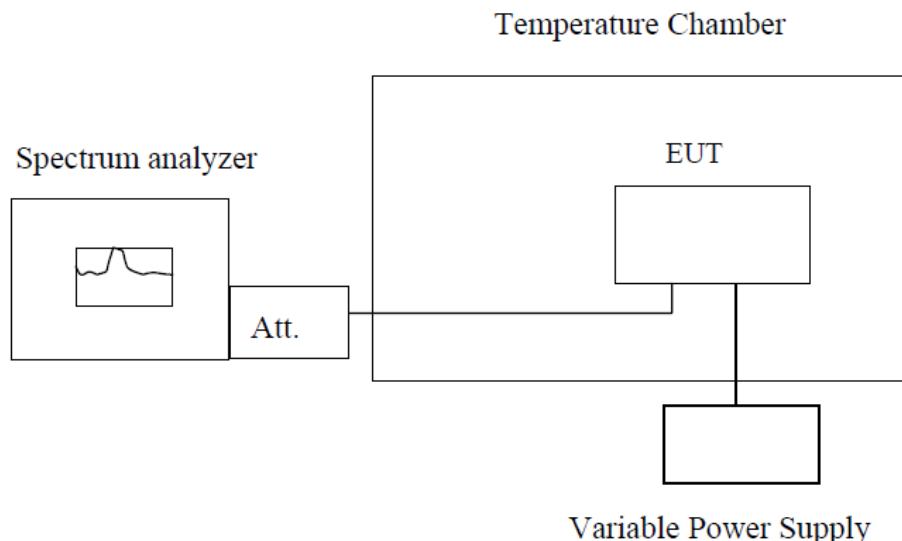
#### 5.4. Frequency Stability

##### 5.4.1. Limit

According to FCC section 22.335 and FCC section 24.235, FCC section 27.54 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 -40°C to +80°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 manufacturer. 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 specified by the applicant; the normal temperature here used is 25°C.

The table and plot please see annex.



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
GPRS850 Middle channel 836.0MHz	3.7	-40	81	0.0969	±2.5	PASS
	3.7	-30	56	0.0670		
	3.7	-20	42	0.0502		
	3.7	-10	44	0.0526		
	3.7	0	32	0.0383		
	3.7	10	78	0.0933		
	3.7	20	45	0.0538		
	3.7	30	62	0.0742		
	3.7	40	93	0.1112		
	3.7	50	34	0.0407		
	3.7	60	82	0.0981		
	3.7	70	83	0.0993		
	3.7	80	42	0.0502		
	4.07	25	112	0.1340		
	3.7	25	32	0.0383		
GPRS1900 Middle channel 1880.0MHz	3.33	25	81	0.0969		
	3.7	-40	24	0.0128	±2.5	PASS
	3.7	-30	62	0.0330		
	3.7	-20	62	0.0330		
	3.7	-10	71	0.0378		
	3.7	0	35	0.0186		
	3.7	10	53	0.0282		
	3.7	20	14	0.0074		
	3.7	30	62	0.0330		
	3.7	40	46	0.0245		
	3.7	50	24	0.0128		
	3.7	60	58	0.0309		
	3.7	70	63	0.0335		
	3.7	80	71	0.0378		
	4.07	25	109	0.0580		
	3.7	25	28	0.0149		
	3.33	25	82	0.0436		

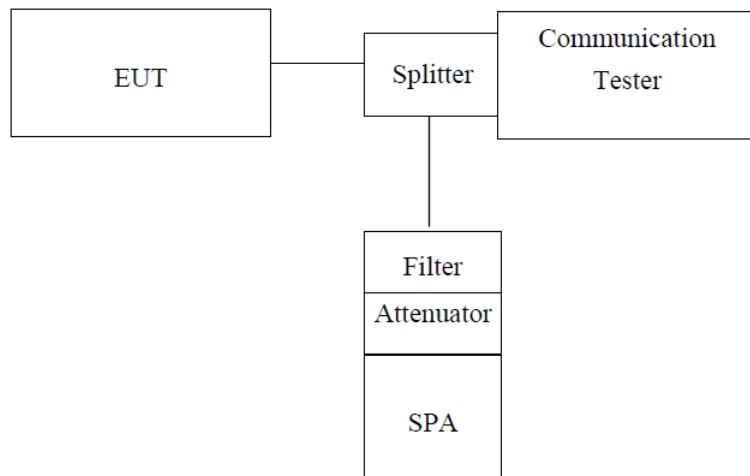


### 5.5. Conducted Spurious Emissions

#### 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= 1MHz, VBW = 3MHz, Start=30MHz, Stop= 10th harmonic.

Limit = -13dBm

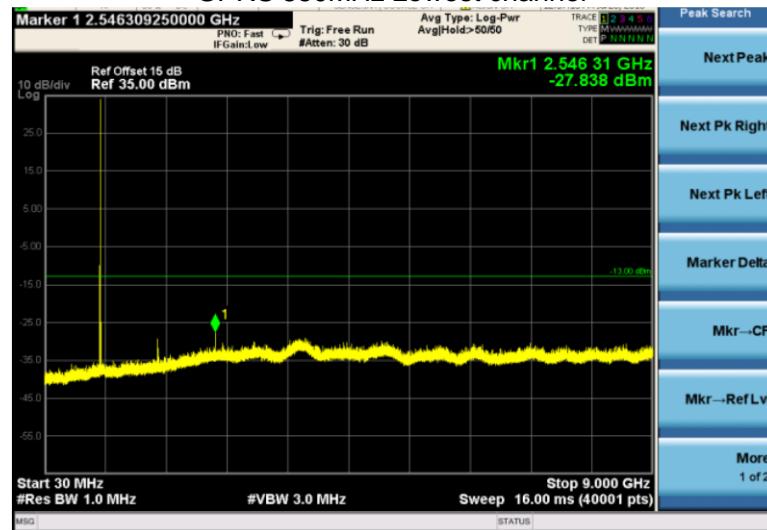
#### 5.5.4. Test Result

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.

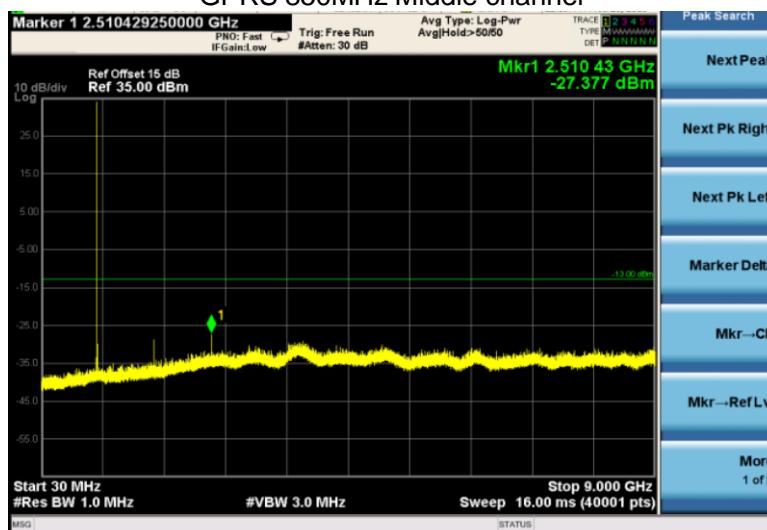
Pass, the table and plot please see next page.



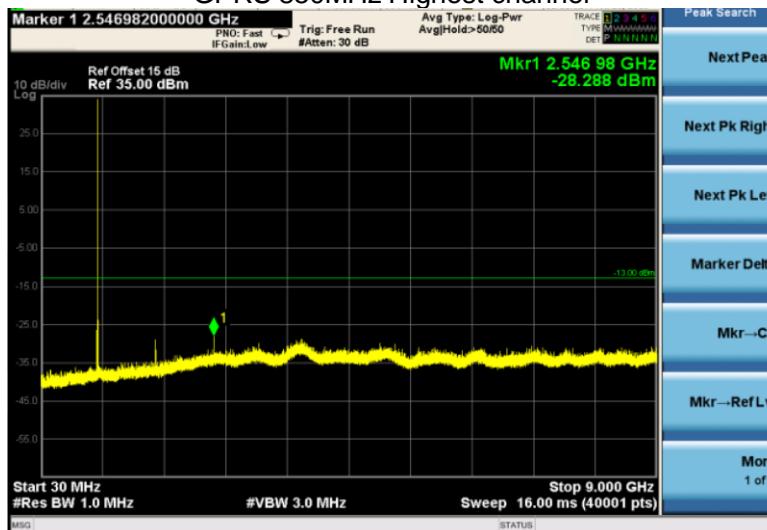
## GPRS 850MHz Lowest channel



## GPRS 850MHz Middle channel



## GPRS 850MHz Highest channel

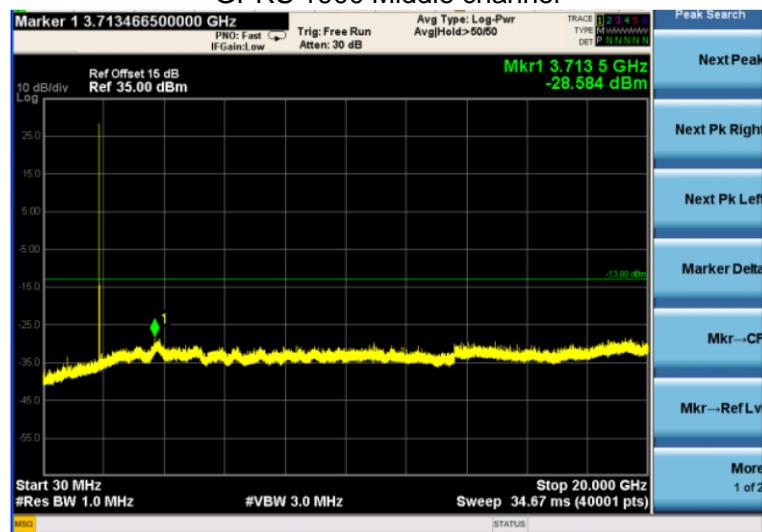




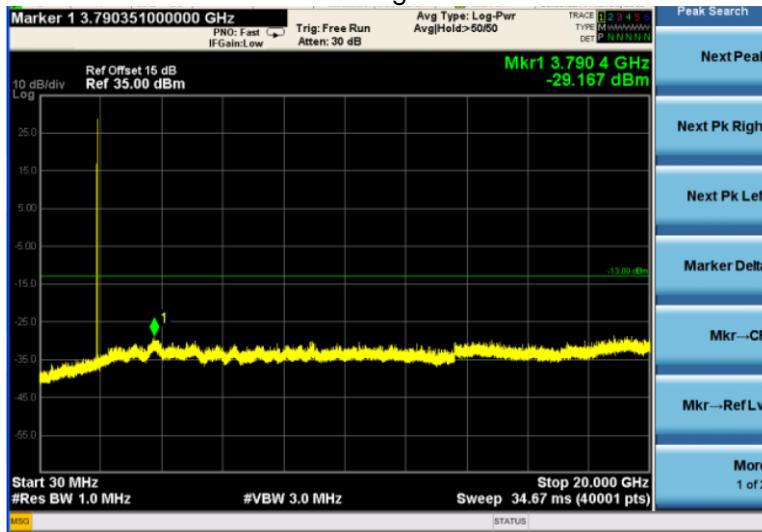
## GPRS 1900 Lowest channel



## GPRS 1900 Middle channel



## GPRS 1900 Highest channel

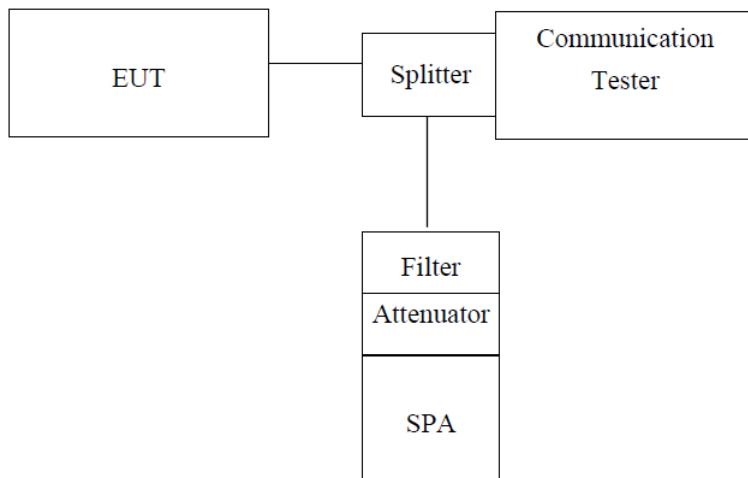


## 5.6. Conducted Out of Band Emissions

### 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.

RBW is set to 3kHz, VBW is set to 10kHz for GPRS850 Lowest channel,  
RBW is set to 3kHz, VBW is set to 10kHz for GPRS850 Highest channel,  
RBW is set to 3kHz, VBW is set to 10kHz for GPRS1900 Lowest channel,  
RBW is set to 3kHz, VBW is set to 10kHz for GPRS1900 Highest channel,

### 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.

Pass, the table and plot please see next page.