



FCC Test Report

FCC ID: 2A6X8-S2

Applicant: Shanghai Huawei Internet of Things Technology Co., Ltd

Address: Room 6-178, 2nd Floor, No. 2351 Changjiang West Road, Baoshan District, Shanghai

Manufacturer: Shanghai Huawei Internet of Things Technology Co., Ltd

Address: Room 6-178, 2nd Floor, No. 2351 Changjiang West Road, Baoshan District, Shanghai

EUT: GPS tracker

Trade Mark: N/A

Model Number: S2
S6

Date of Receipt: Apr. 26, 2022

Test Date: Apr. 26, 2022 – May. 10, 2022

Date of Report: May. 10, 2022

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

Applicable Standards: FCC CFR Title 47 Part22 Subpart H
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-20220510039E

Prepared (Test Engineer): Pxing Huang

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	N/A
Model No.:	S2, S6
Test Model:	S2
Model Difference	All samples are the same except the model number and appearance color, so we prepare " S2" for test only.
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:	GSM Mode with GMSK Modulation
Antenna Type:	Internal Antenna
Antenna gain:	2.0dBi
Power supply:	DC 12V from battery
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	GSM/GPRS	GSM/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

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	$\pm 2\%$



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	Nov. 25, 2019	Nov. 24, 2022
EMI Receiver	R&S	ESR	101421	Nov. 06, 2021	Nov. 05, 2022
LISN	R&S	ENV216	102417	Nov. 06, 2021	Nov. 05, 2022
843 Cable 1#	ChengYu	CE Cable	001	Nov. 06, 2021	Nov. 05, 2022
843 Cable 1#	FUJIKURA	843C1#	001	Nov. 06, 2021	Nov. 05, 2022

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. 06, 2021	Nov. 05, 2022
Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 06, 2021	Nov. 05, 2022
Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 06, 2021	Nov. 05, 2022
Bilog Antenna (30MHz-1GHz)	R&S	VULB9163	9163-519	Nov. 06, 2021	Nov. 05, 2022
Horn Antenna	R&S	BBHA9170	9170C-531	Nov. 06, 2021	Nov. 05, 2022
Horn Antenna	R&S	BBHA 9120D	01774	Nov. 06, 2021	Nov. 05, 2022
Horn Antenna (18-40GHz)	A.H. Systems	SAS-574	588	Nov. 06, 2021	Nov. 05, 2022
Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 06, 2021	Nov. 05, 2022
Amplifier(1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 06, 2021	Nov. 05, 2022
Amplifier(18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 06, 2021	Nov. 05, 2022
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 06, 2021	Nov. 05, 2022
RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 06, 2021	Nov. 05, 2022
RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 06, 2021	Nov. 05, 2022
Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 06, 2021	Nov. 05, 2022
Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 06, 2021	Nov. 05, 2022
Signal Analyzer	Agilent	N9020A	MY55370280	Nov. 06, 2021	Nov. 05, 2022
Test Receiver	R&S	ESU 40	100376	Nov. 06, 2021	Nov. 05, 2022
D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 06, 2021	Nov. 05, 2022
Signal Amplifier	DAZE	ZN3380B	11235	Nov. 06, 2021	Nov. 05, 2022
High Pass filter	KANGMAI	WHDX1.0/1.5G-10SS	40	Nov. 06, 2021	Nov. 05, 2022
Filter	COM-MW	ZBSF-C836.5-25-X	BCTC042	Nov. 06, 2021	Nov. 05, 2022
Filter	COM-MW	ZBSF-C1747.5-75-X2	BCTC045	Nov. 06, 2021	Nov. 05, 2022
Filter	COM-MW	ZBSF-C1880-60-X2	BCTC047	Nov. 06, 2021	Nov. 05, 2022
Splitter	Agilent	11435B	1125162	Nov. 06, 2021	Nov. 05, 2022

RF CONDUCTED TEST

System Simulator	Agilent	E5515C	GB43130252	Nov. 06, 2021	Nov. 05, 2022
Spectrum Analyzer	Agilent	N9020A	MY45108040	Nov. 06, 2021	Nov. 05, 2022
DC Power Supply	LongWei	PS-305D	010965682	Nov. 06, 2021	Nov. 05, 2022
Constant temperature and humidity box	GF	GTH-800-40-2P	MAA9906-012	Nov. 06, 2021	Nov. 05, 2022
Universal radio communication tester	R&S	CMW500	115295	Nov. 06, 2021	Nov. 05, 2022



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
GSM	32.03	32.22	32.44	29.02	29.17	29.64
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

Pass, the next page

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850	128	824.20	243.14	318.9
	190	836.60	242.83	316.5
	251	848.80	243.73	319.4
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	512	1850.20	245.05	317.5
	661	1880.00	243.21	317.8
	810	1909.80	243.44	320.2
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:

GSM 850 Lowest channel



GSM 850 Middle channel



GSM 850 Highest channel:





GPRS 850MHz Lowest channel



GPRS 850MHz Middle channel



GPRS 850MHz Highest channel





PCS 1900 Lowest channel



PCS 1900 Middle channel



PCS 1900 Highest channel





GPRS 1900 Lowest channel



GPRS 1900 Middle channel



GPRS 1900 Highest channel



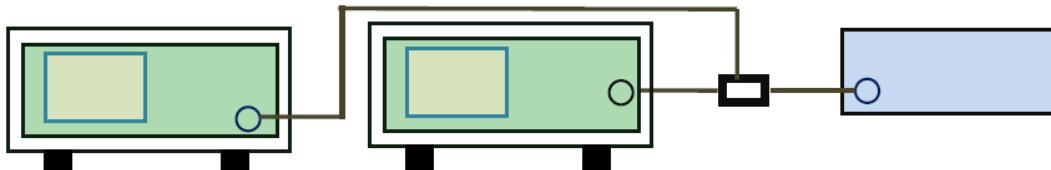


5.3. Peak to Average Radio

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
GSM 850	Low	0.28	≤13	Pass
	Middle	0.30	≤13	Pass
	High	0.48	≤13	Pass
GPRS850	Low	0.27	≤13	Pass
	Middle	0.36	≤13	Pass
	High	0.33	≤13	Pass
GSM1900	Low	0.52	≤13	Pass
	Middle	0.39	≤13	Pass
	High	0.55	≤13	Pass
GPRS1900	Low	0.27	≤13	Pass
	Middle	0.45	≤13	Pass
	High	0.68	≤13	Pass



GSM 850 Lowest channel



GSM 850 Middle channel



GSM 850 Highest channel:





GPRS 850MHz Lowest channel



GPRS 850MHz Middle channel



GPRS 850MHz Highest channel





PCS 1900 Lowest channel



PCS 1900 Middle channel



PCS 1900 Highest channel

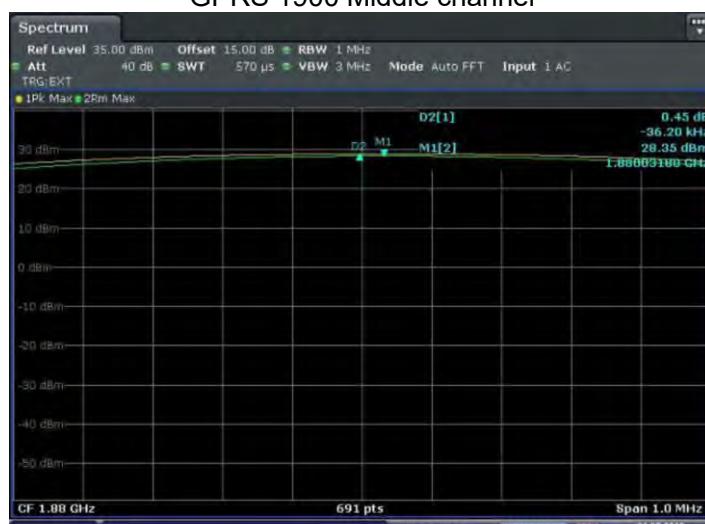




GPRS 1900 Lowest channel



GPRS 1900 Middle channel



GPRS 1900 Highest channel





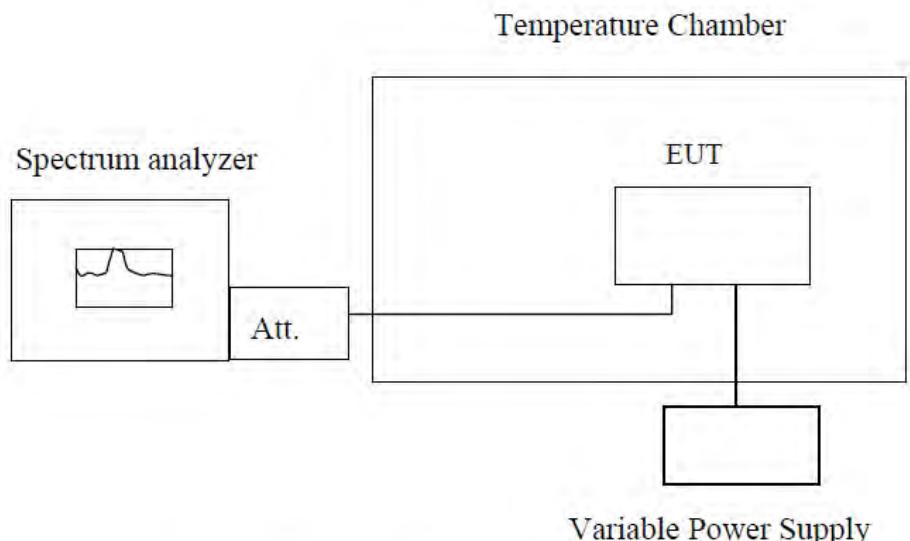
5.4. Frequency Stability

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.

For LTE mode, only test the max bandwidth.

The table and plot please see annex.



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
GSM850 Middle channel 836.0MHz	12.0	-40	54	0.0646	±2.5	PASS
	12.0	-30	34	0.0407		
	12.0	-20	59	0.0706		
	12.0	-10	63	0.0754		
	12.0	0	23	0.0275		
	12.0	10	43	0.0514		
	12.0	20	41	0.0490		
	12.0	30	94	0.1124		
	12.0	40	16	0.0191		
	12.0	50	42	0.0502		
	12.0	60	94	0.1124		
	12.0	70	38	0.0455		
	12.0	80	81	0.0969		
	13.2	25	102	0.1220		
	12.0	25	26	0.0311		
GPRS850 Middle channel 836.0MHz	10.8	25	76	0.0909	±2.5	PASS
	12.0	-40	81	0.0969		
	12.0	-30	56	0.0670		
	12.0	-20	42	0.0502		
	12.0	-10	44	0.0526		
	12.0	0	32	0.0383		
	12.0	10	78	0.0933		
	12.0	20	45	0.0538		
	12.0	30	62	0.0742		
	12.0	40	93	0.1112		
	12.0	50	34	0.0407		
	12.0	60	82	0.0981		
	12.0	70	83	0.0993		
	12.0	80	42	0.0502		
	13.2	25	112	0.1340		
	12.0	25	32	0.0383		
	10.8	25	81	0.0969		



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
GSM1900 Middle channel 1880.0MHz	12.0	-40	52	0.0277	±2.5	PASS
	12.0	-30	43	0.0229		
	12.0	-20	52	0.0277		
	12.0	-10	35	0.0186		
	12.0	0	52	0.0277		
	12.0	10	65	0.0346		
	12.0	20	41	0.0218		
	12.0	30	32	0.0170		
	12.0	40	55	0.0293		
	12.0	50	52	0.0277		
	12.0	60	25	0.0133		
	12.0	70	58	0.0309		
	12.0	80	92	0.0489		
	13.2	25	113	0.0601		
	12.0	25	41	0.0218		
EGPRS1900 Middle channel 1880.0MHz	10.8	25	83	0.0441	±2.5	PASS
	12.0	-40	24	0.0128		
	12.0	-30	62	0.0330		
	12.0	-20	62	0.0330		
	12.0	-10	71	0.0378		
	12.0	0	35	0.0186		
	12.0	10	53	0.0282		
	12.0	20	14	0.0074		
	12.0	30	62	0.0330		
	12.0	40	46	0.0245		
	12.0	50	24	0.0128		
	12.0	60	58	0.0309		
	12.0	70	63	0.0335		
	12.0	80	71	0.0378		
	13.2	25	109	0.0580		
	12.0	25	28	0.0149		
	10.8	25	82	0.0436		

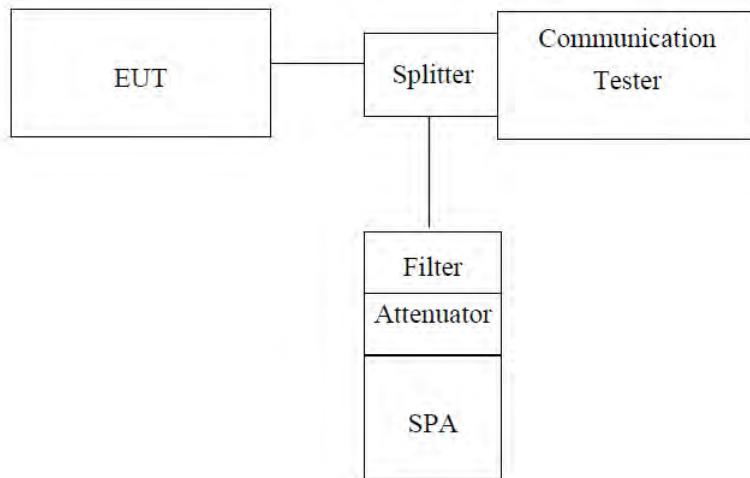


5.5. Conducted Spurious Emissions

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

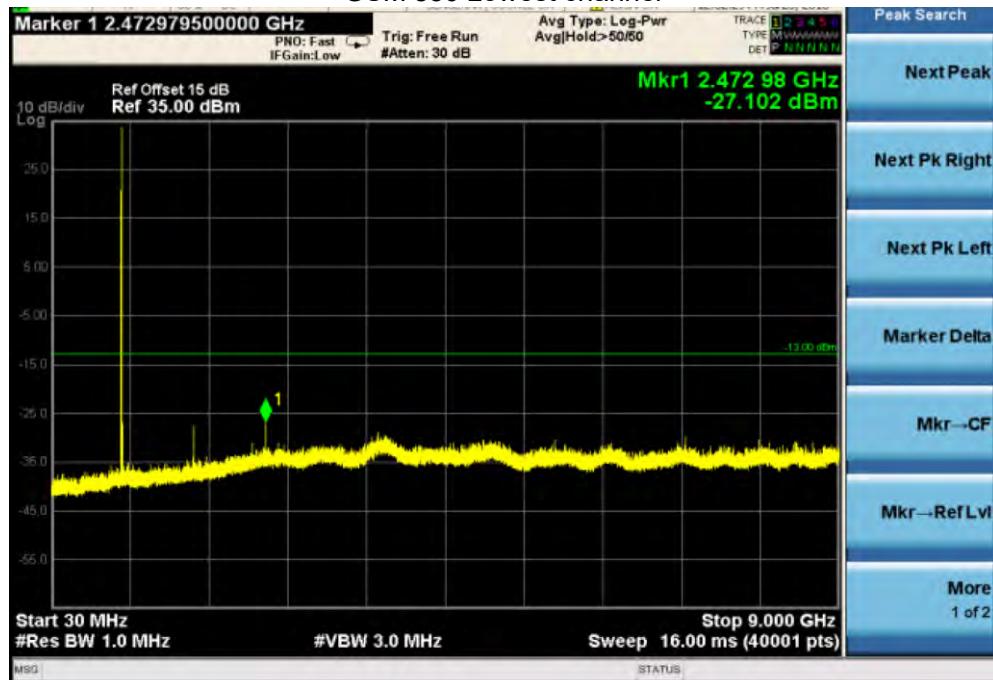
5.5.4. Test Result

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.



GSM 850 Lowest channel

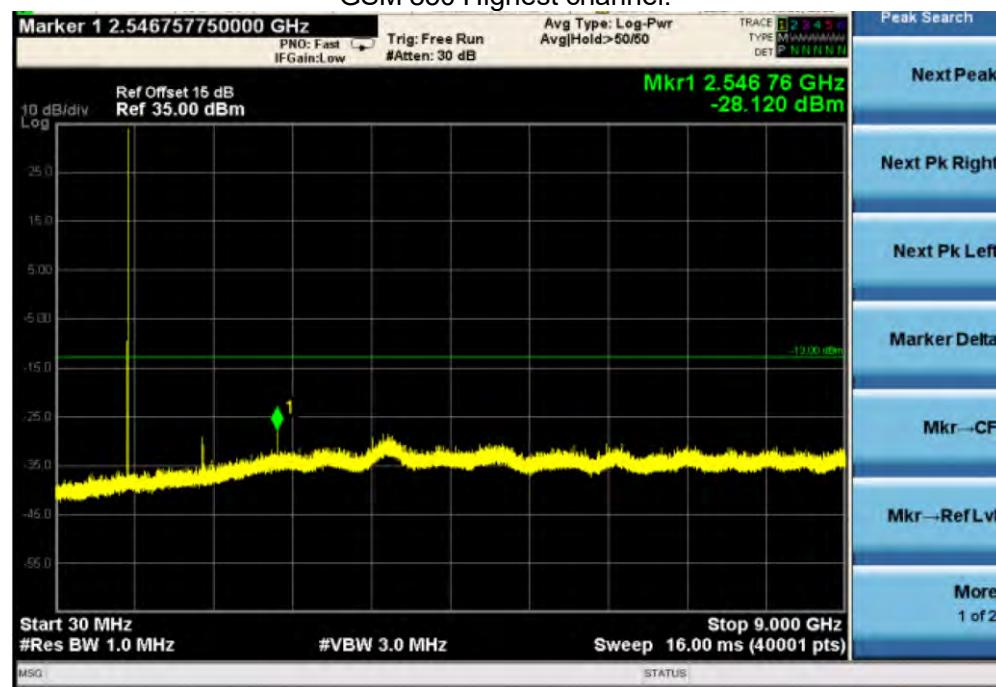


GSM 850 Middle channel

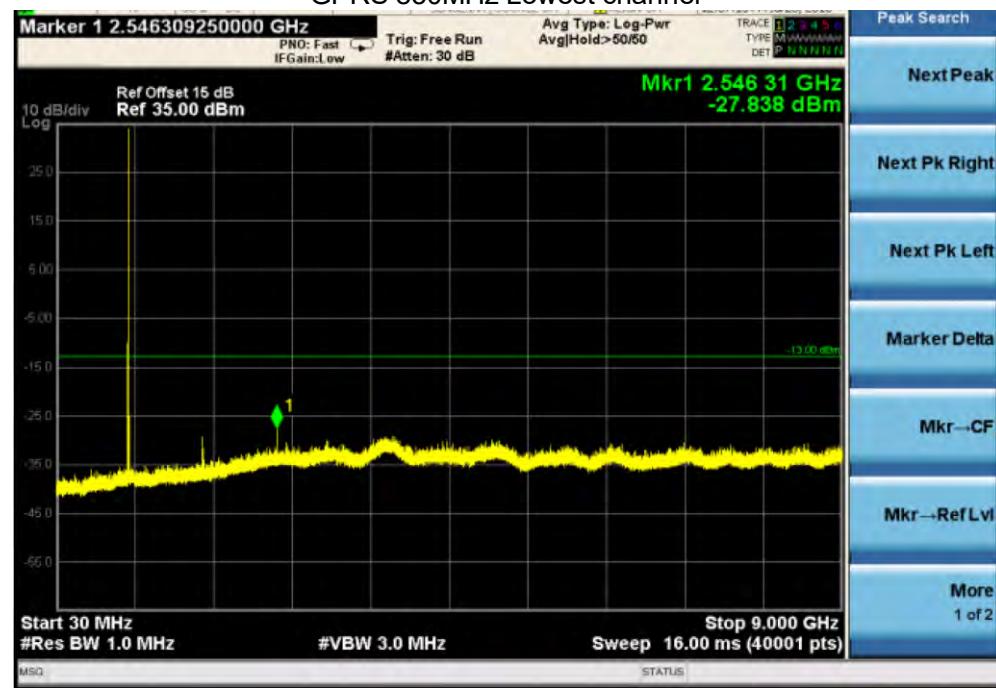


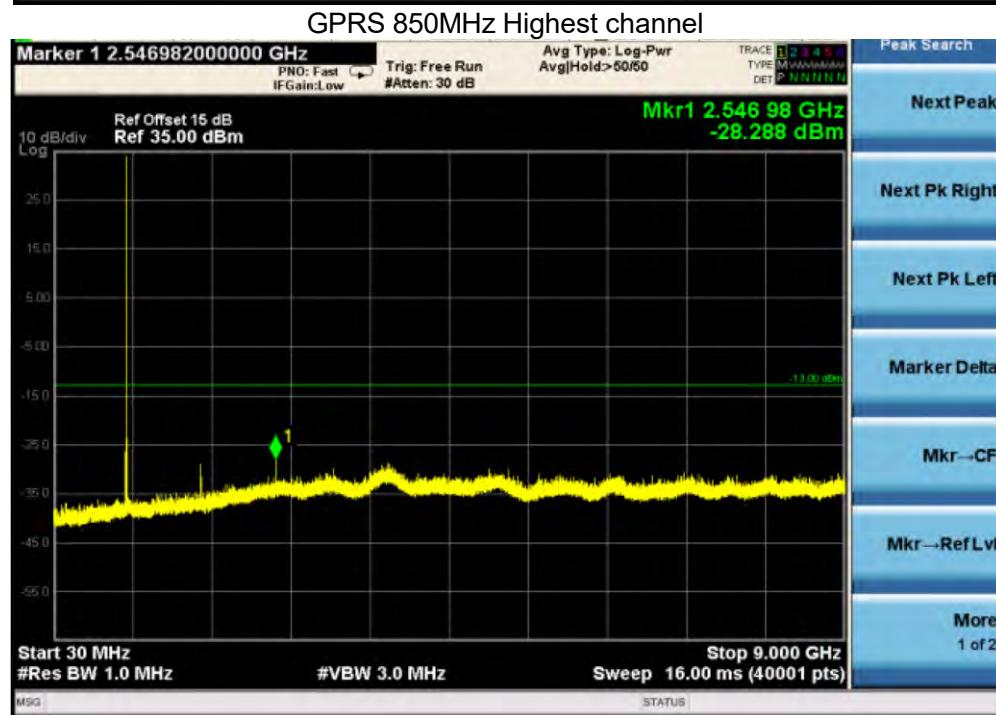
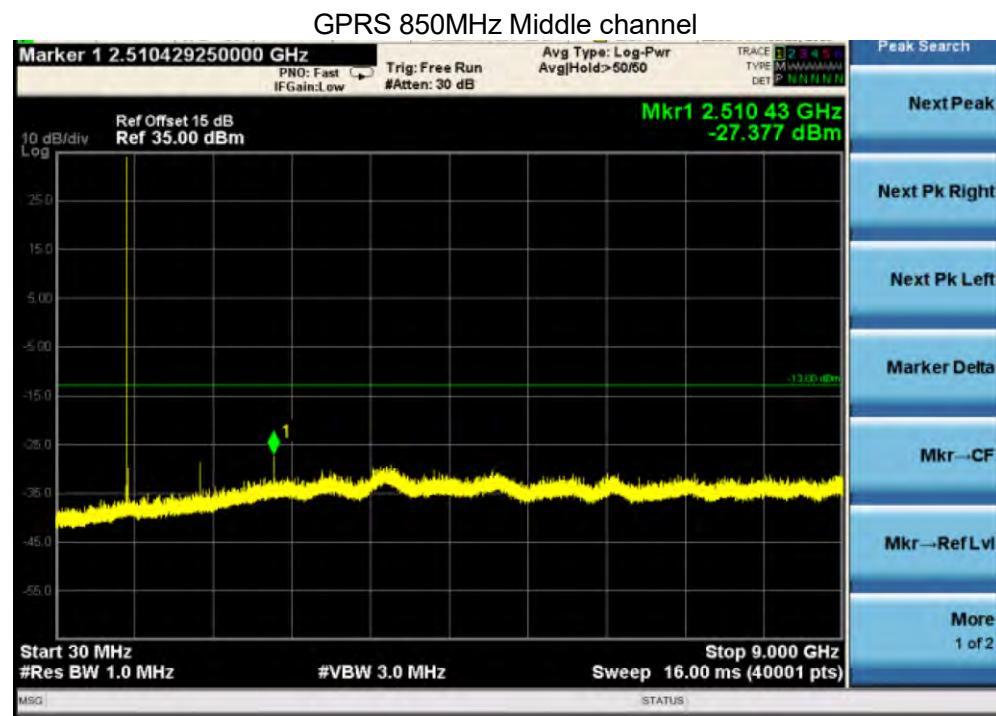


GSM 850 Highest channel:



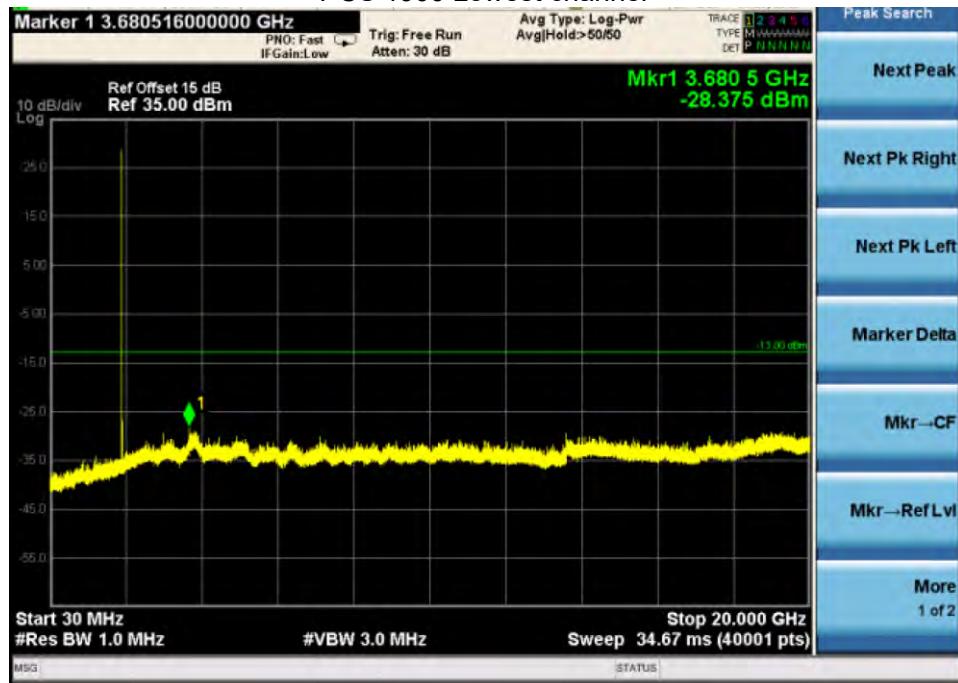
GPRS 850MHz Lowest channel



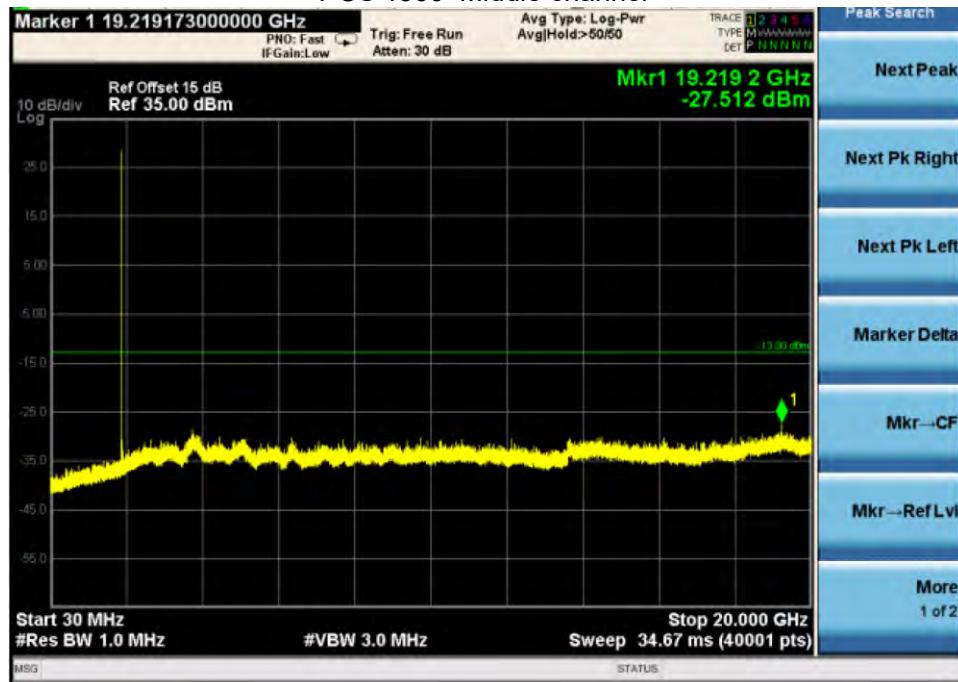




PCS 1900 Lowest channel

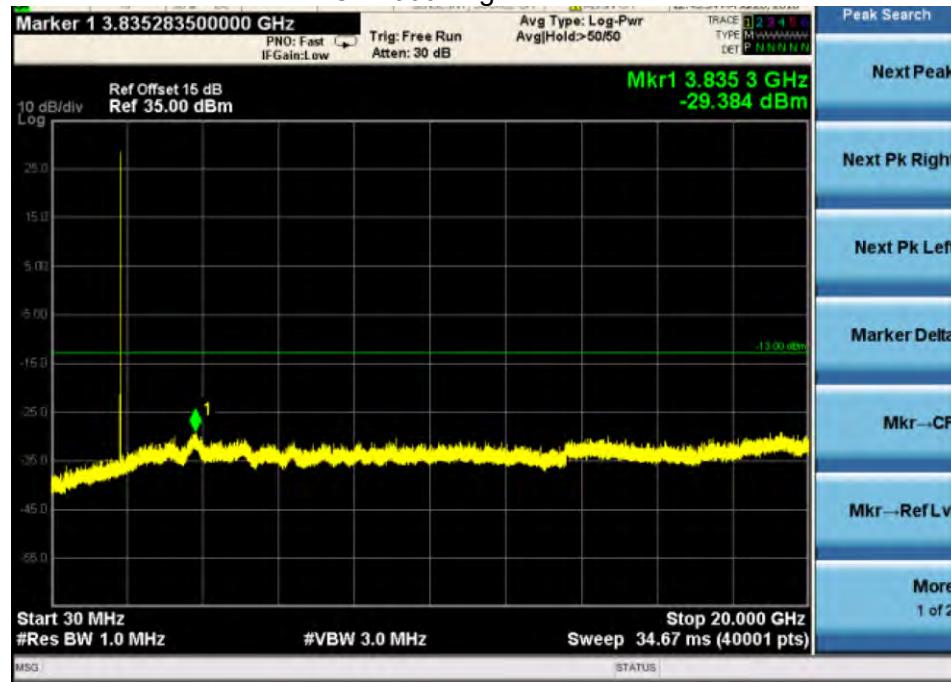


PCS 1900 Middle channel

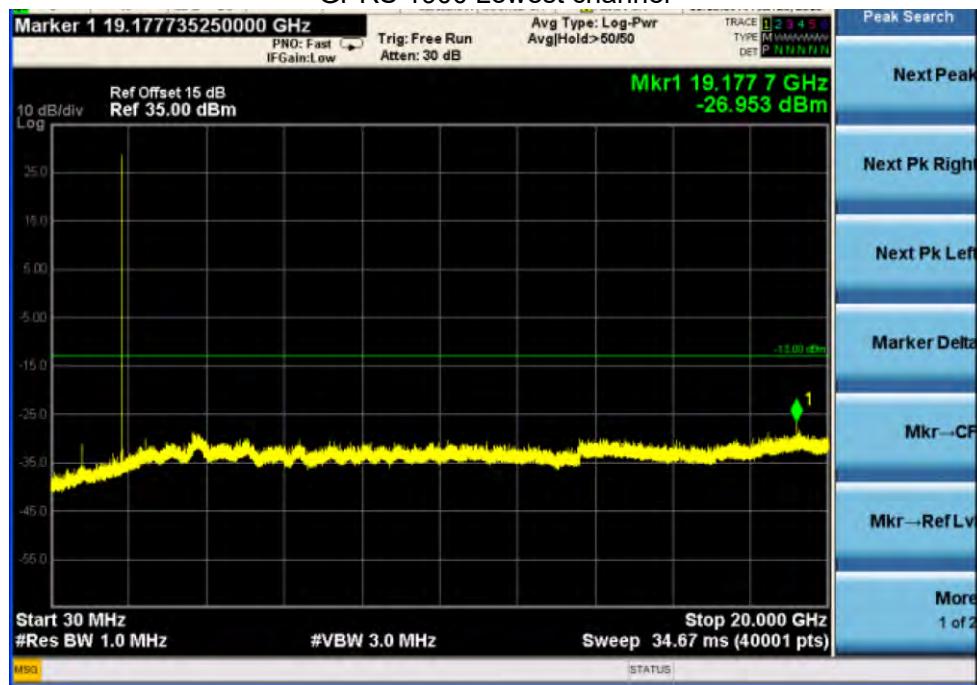




PCS 1900 Highest channel

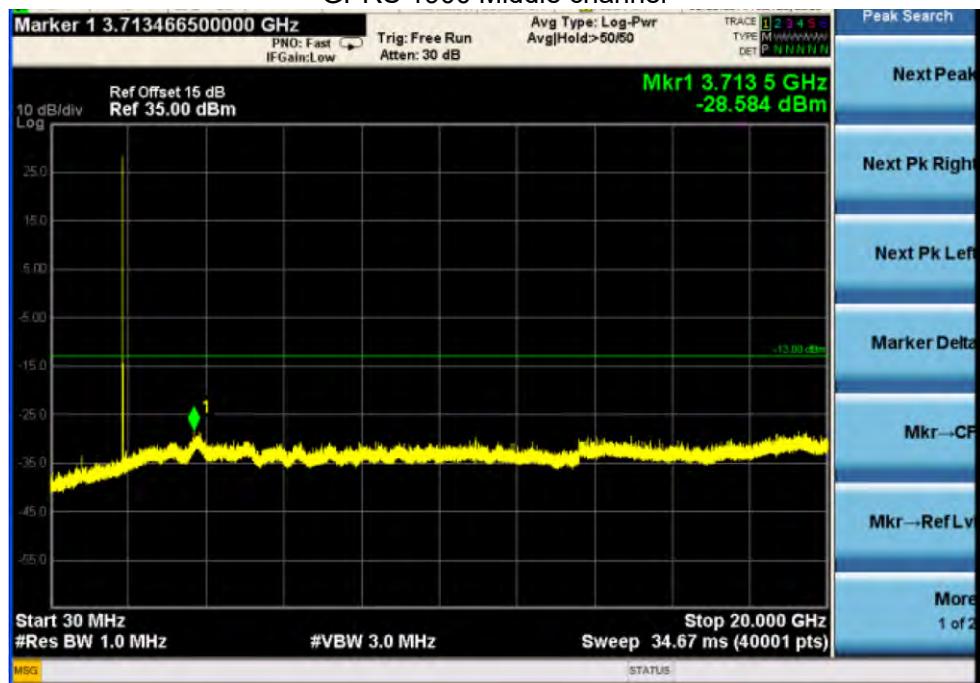


GPRS 1900 Lowest channel

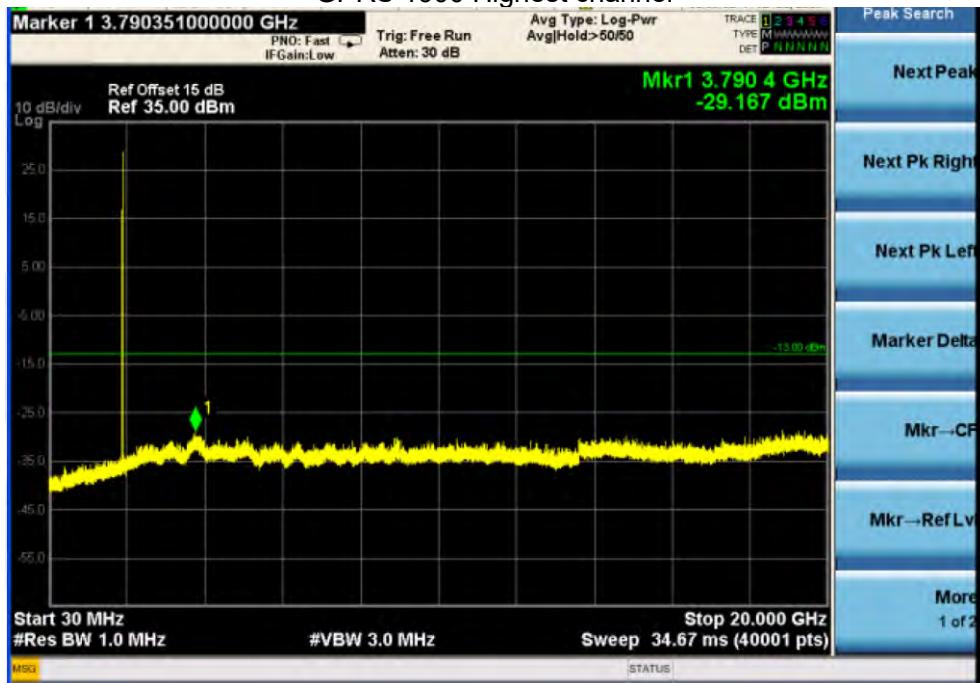




GPRS 1900 Middle channel



GPRS 1900 Highest channel



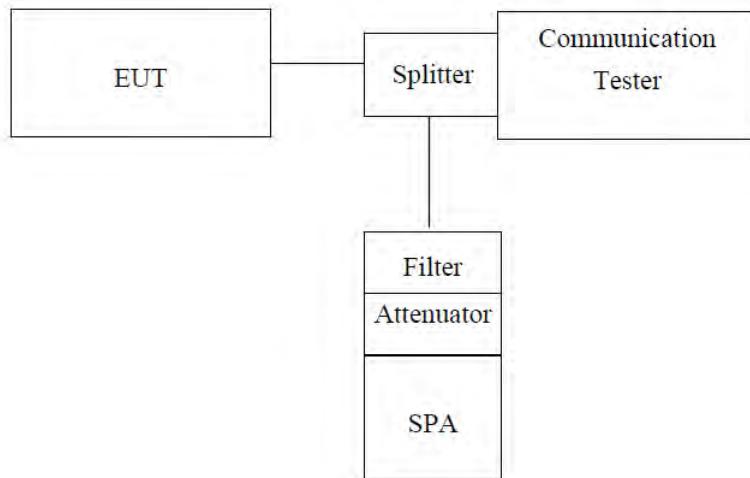


5.6. Conducted Out of Band Emissions

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 GSMS850 Lowest channel,
RBW is set to 3kHz, VBW is set to 10kHz for GSM850 Highest channel,
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 GSMS1900 Lowest channel,
RBW is set to 3kHz, VBW is set to 10kHz for GSM1900 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.



GSMS850 Lowest channel



GSM850 Highest channel:





GPRS850 Lowest channel

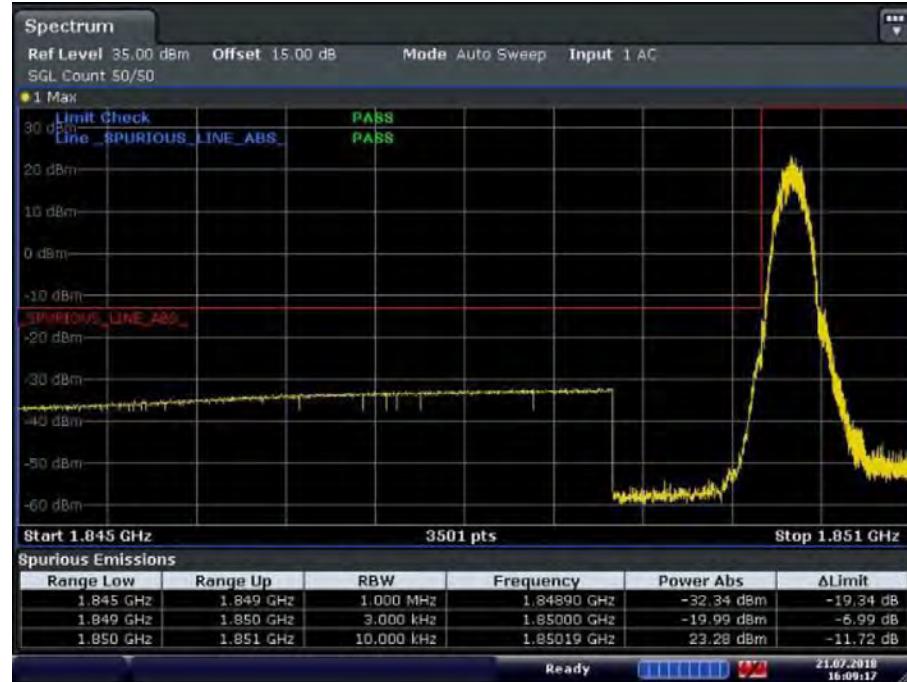


GPRS850 Highest channel:





GSM1900 Lowest channel

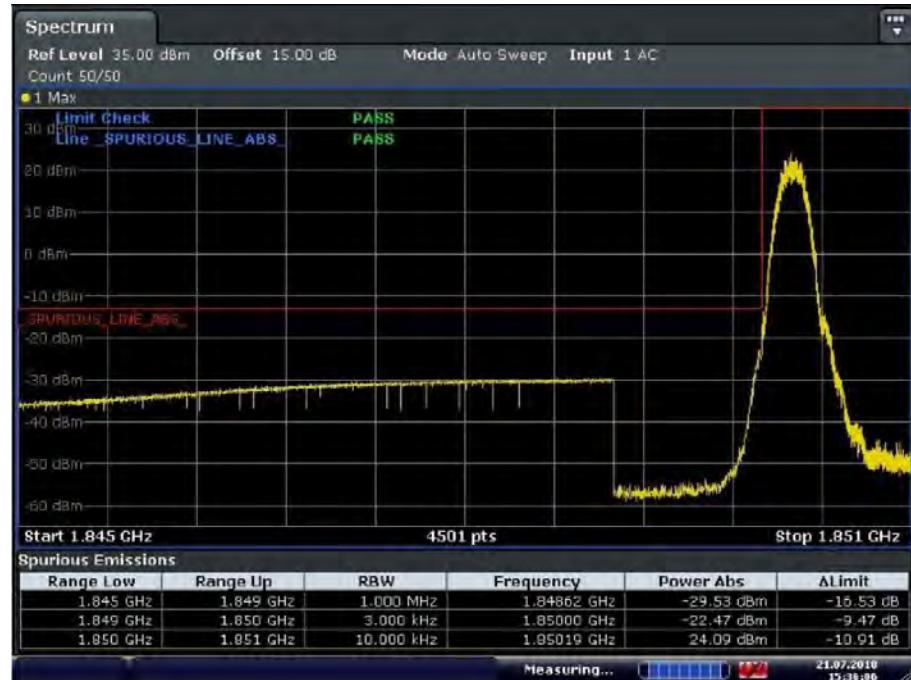


GSM1900 Highest channel:





GPRS1900 Lowest channel



GPRS1900 Highest channel:



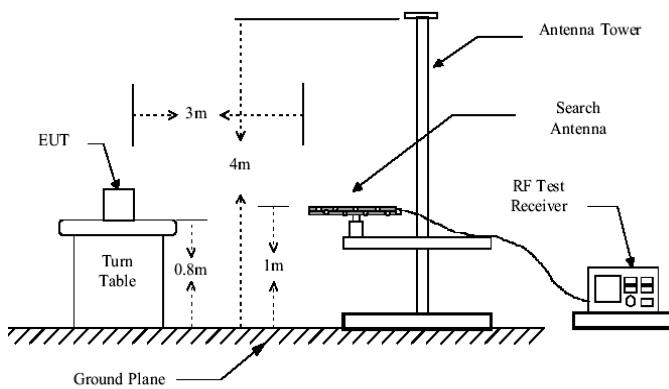
5.7. Transmitter Radiated Power (EIRP/ERP)

5.7.1. Limit

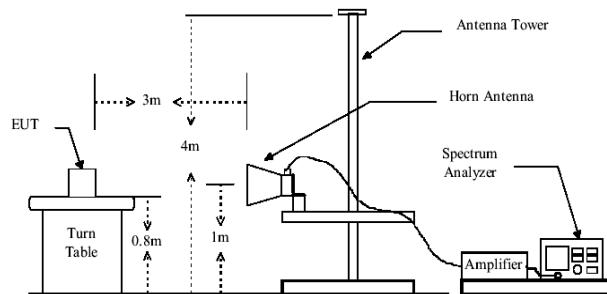
According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, FCC section 27.50 the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.

5.7.2. Test Setup

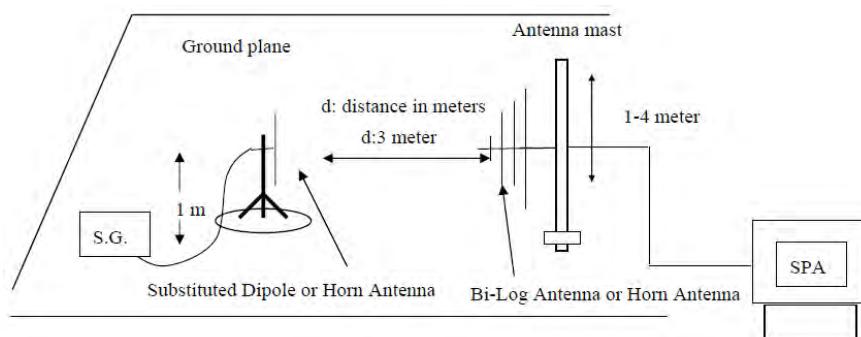
Below 1GHz



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 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:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)} - 2.15$$

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

5.7.4. Test Result

Pass, the table and plot please see next page.

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
GSM 850	Lowest	V	15.31	19.33	2.52	29.97	38.45	Pass
		H	15.17	19.33	2.52	29.83		
	Middle	V	15.13	19.50	2.60	29.88	38.45	Pass
		H	15.26	19.50	2.60	30.01		
	Highest	V	15.31	19.94	2.71	30.39	38.45	Pass
		H	15.24	19.94	2.71	30.32		
GPRS850	Lowest	V	15.11	19.33	2.52	29.77	38.45	Pass
		H	15.20	19.33	2.52	29.86		
	Middle	V	15.16	19.50	2.60	29.91	38.45	Pass
		H	15.21	19.50	2.60	29.96		
	Highest	V	15.27	19.94	2.71	30.35	38.45	Pass
		H	15.20	19.94	2.71	30.28		
EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Result
GSM1900	Lowest	V	16.44	15.68	1.65	30.47	33.00	Pass
		H	16.38	15.68	1.65	30.41		
	Middle	V	16.40	15.70	1.67	30.43	33.00	Pass
		H	16.29	15.70	1.67	30.32		
	Highest	V	16.06	15.70	1.71	30.05	33.00	Pass
		H	16.37	15.70	1.71	30.36		
GPRS1900	Lowest	V	16.33	15.68	1.65	30.36	33.00	Pass
		H	16.27	15.68	1.65	30.30		
	Middle	V	16.30	15.70	1.67	30.33	33.00	Pass
		H	16.28	15.70	1.67	30.31		
	Highest	V	16.16	15.70	1.71	30.15	33.00	Pass
		H	16.21	15.70	1.71	30.20		

5.8. Radiated Out of Band Emissions

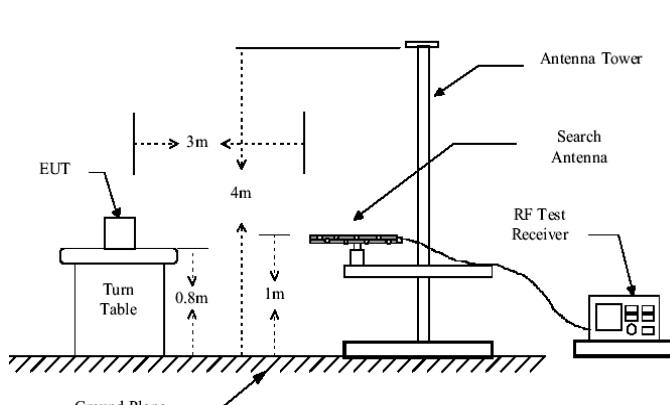
5.8.1. Limit

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.

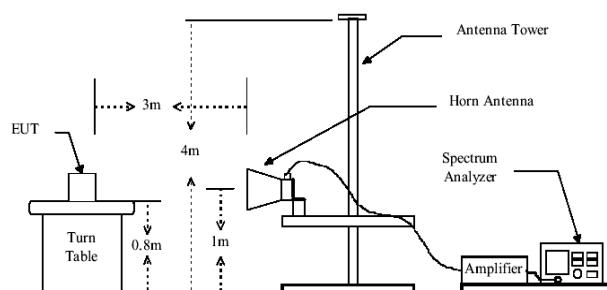
The spurious emission with frequency band 1900 according to FCC section 2.1057.

5.8.2. Test Setup

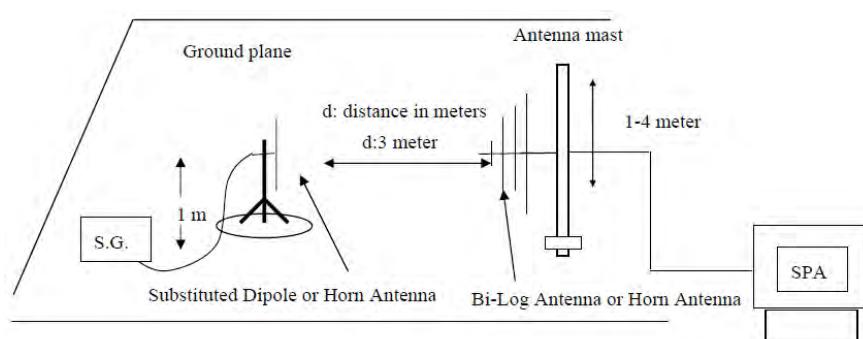
Below 1GHz



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

Note: Measurement Uncertainty: ± 3.6 dB.

The data show only the worst results, and the other results are very low and not shown in the report.

5.8.4. Test Result

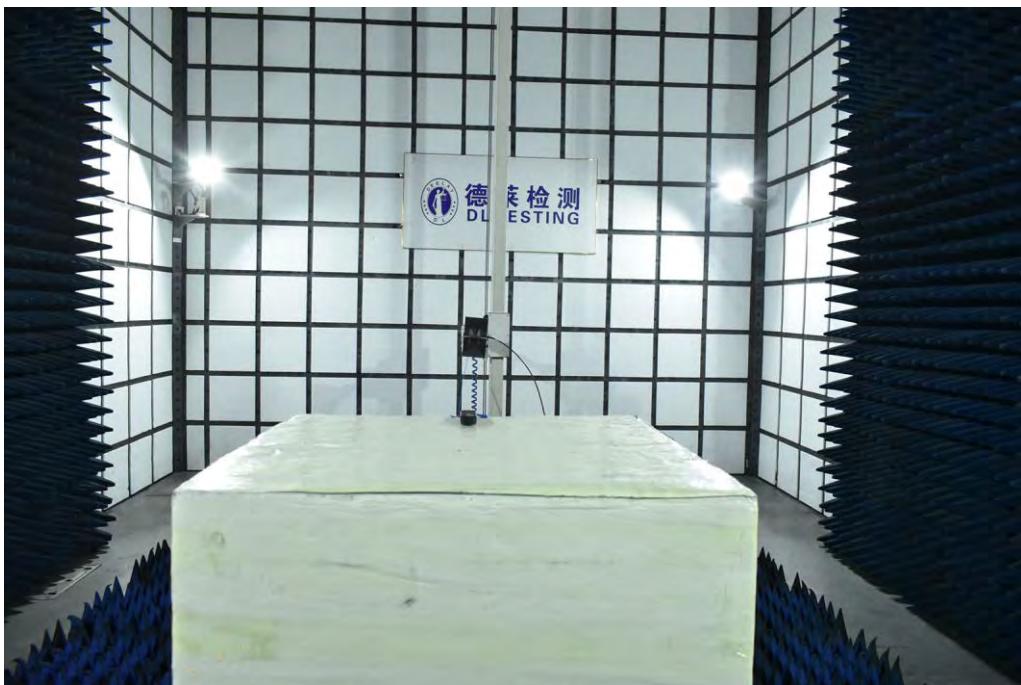
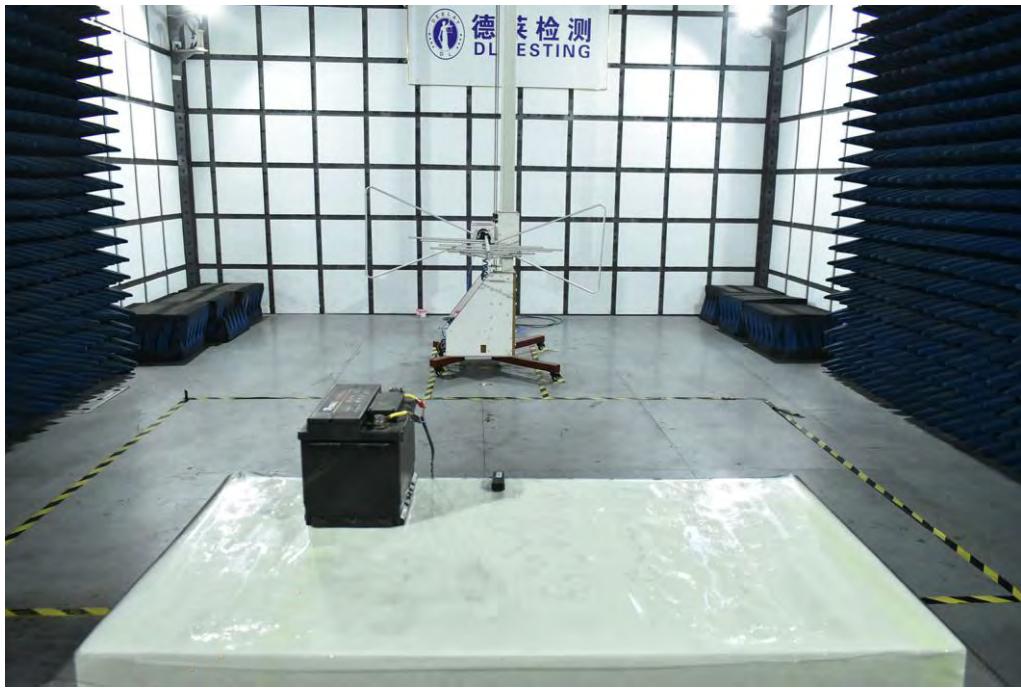
Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
GSM850 Lowest	87.21	Vertical	-74.37	3.35	0.38	-71.40	-13	PASS
	1648.40	Vertical	-45.52	7.76	3.75	-41.51		
	2472.60	Vertical	-46.61	9.84	4.94	-41.71		
	3296.80	Vertical	-39.16	10.21	5.32	-34.27		
	4121.00	Vertical	-42.49	11.36	6.02	-37.15		
	4945.20	Vertical	-44.00	14.52	6.68	-36.16		
GSM850 Middle	88.39	Vertical	-74.37	3.35	0.38	-71.40	-13	PASS
	1673.20	Vertical	-46.82	7.77	3.76	-42.81		
	2509.80	Vertical	-46.42	9.82	4.95	-41.55		
	3346.40	Vertical	-42.11	10.27	5.36	-37.20		
	4183.00	Vertical	-41.53	11.43	6.05	-36.15		
	5019.60	Vertical	-45.42	14.58	6.68	-37.52		
GSM850 Highest	88.24	Vertical	-74.33	3.35	0.38	-71.36	-13	PASS
	1697.60	Vertical	-46.42	7.83	3.58	-42.17		
	2546.40	Vertical	-40.97	9.92	5.07	-36.12		
	3395.20	Vertical	-37.22	10.32	5.56	-32.46		
	4244.00	Vertical	-43.84	11.39	6.18	-38.63		
	5092.80	Vertical	-46.23	14.58	6.76	-38.41		



Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
GSM190 0 Lowest	87.21	Vertical	-73.95	3.35	0.38	-70.98	-13	PASS
	3700.40	Vertical	-45.26	10.34	5.45	-40.37		
	5550.60	Vertical	-46.35	14.87	7.37	-38.85		
	7400.80	Vertical	-38.94	16.12	8.24	-31.06		
	9251.00	Vertical	-42.25	16.78	9.02	-34.49		
	11101.20	Vertical	-43.75	17.54	10.56	-36.77		
GSM190 0 Middle	88.39	Vertical	-73.95	3.35	0.38	-70.98	-13	PASS
	3760.00	Vertical	-46.55	10.65	5.49	-41.39		
	5640.00	Vertical	-46.16	14.95	7.53	-38.74		
	7520.00	Vertical	-41.87	16.35	8.45	-33.97		
	9400.00	Vertical	-41.29	16.89	9.35	-33.75		
	11280.00	Vertical	-45.16	17.73	10.65	-38.08		
GSM190 0 Highest	88.24	Vertical	-73.91	3.35	0.38	-70.94	-13	PASS
	3819.60	Vertical	-46.16	10.67	5.76	-41.25		
	5729.40	Vertical	-40.73	14.98	7.69	-33.44		
	7639.20	Vertical	-37.00	16.67	8.66	-28.99		
	9549.00	Vertical	-43.59	16.94	9.45	-36.10		
	11458.80	Vertical	-45.97	17.89	10.44	-38.52		

6. PHOTOGRAPHS OF TEST SET-UP

RE

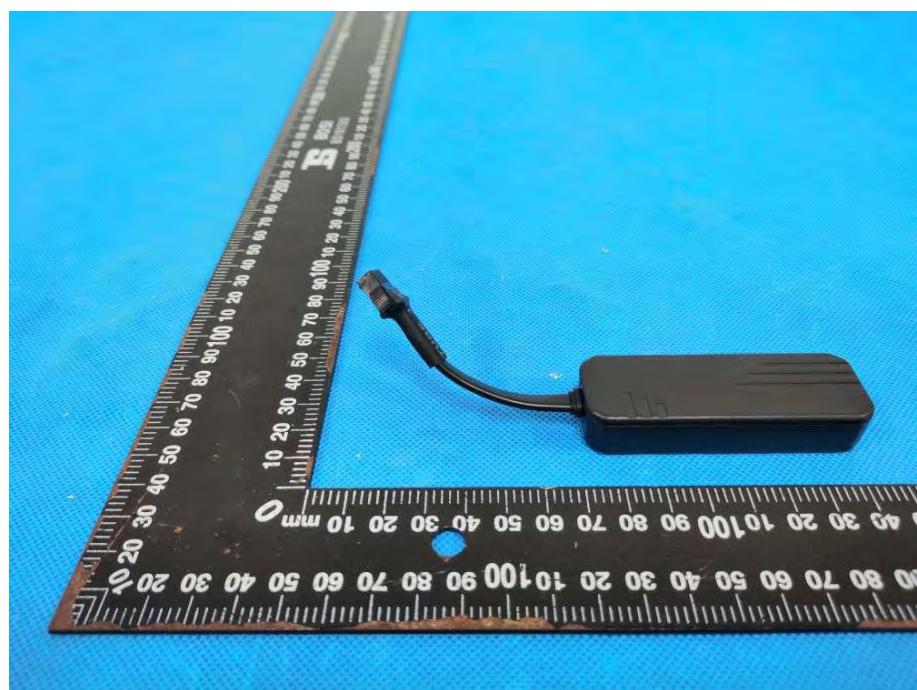
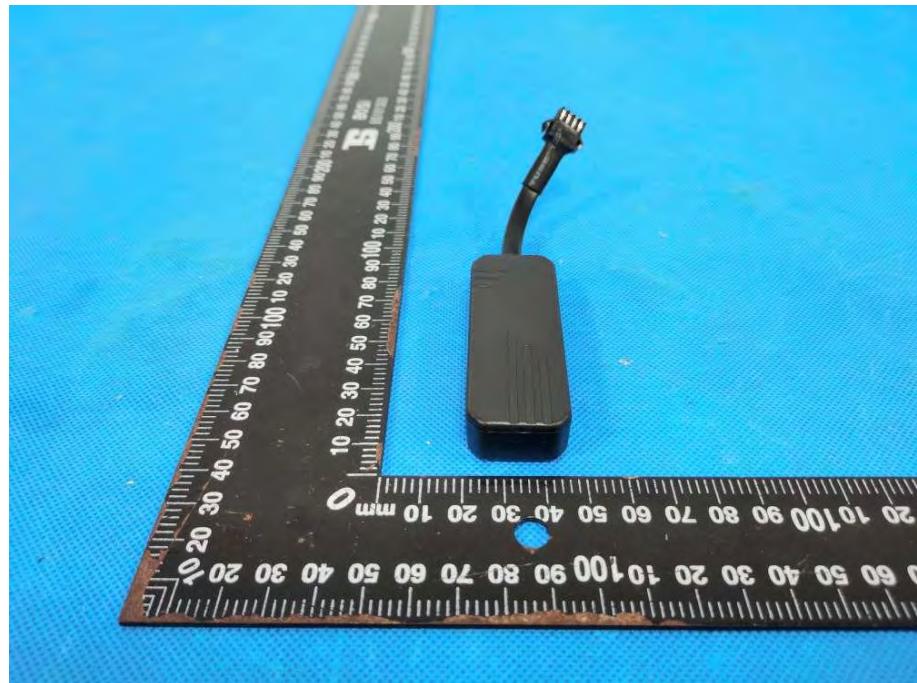


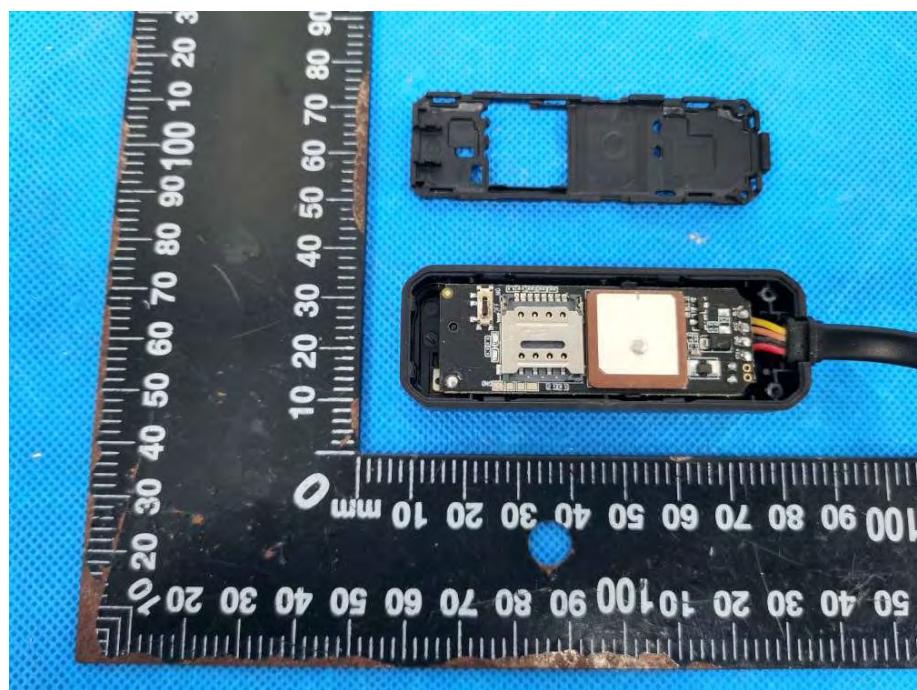


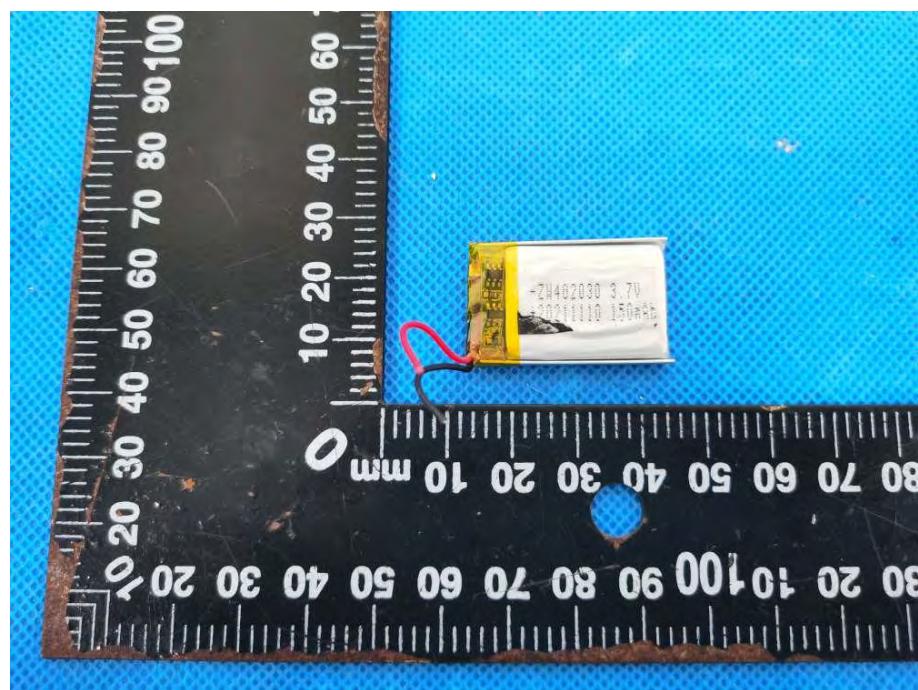
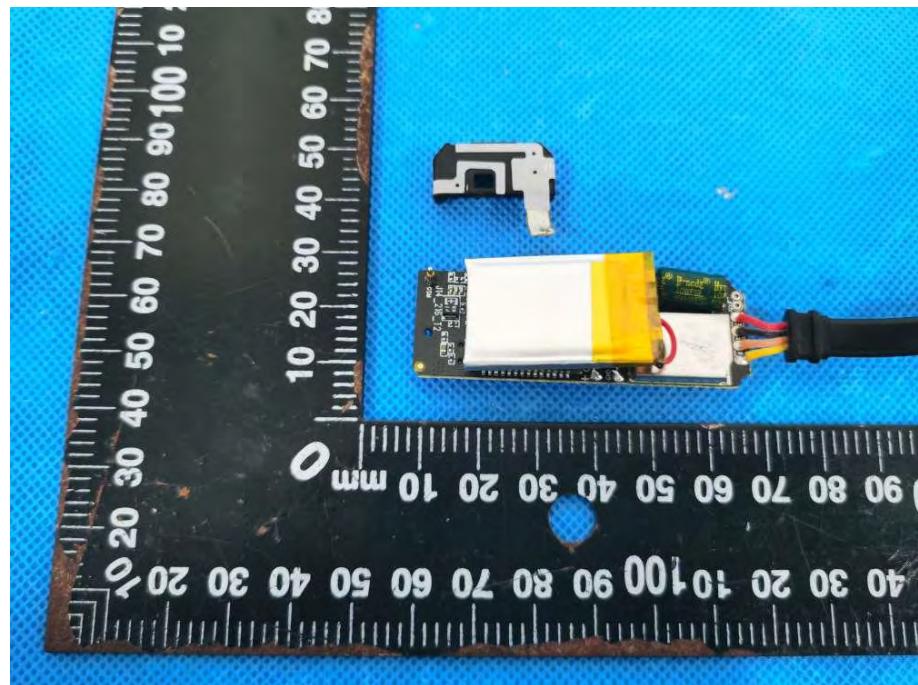
7. PHOTOGRAPHS OF THE EUT

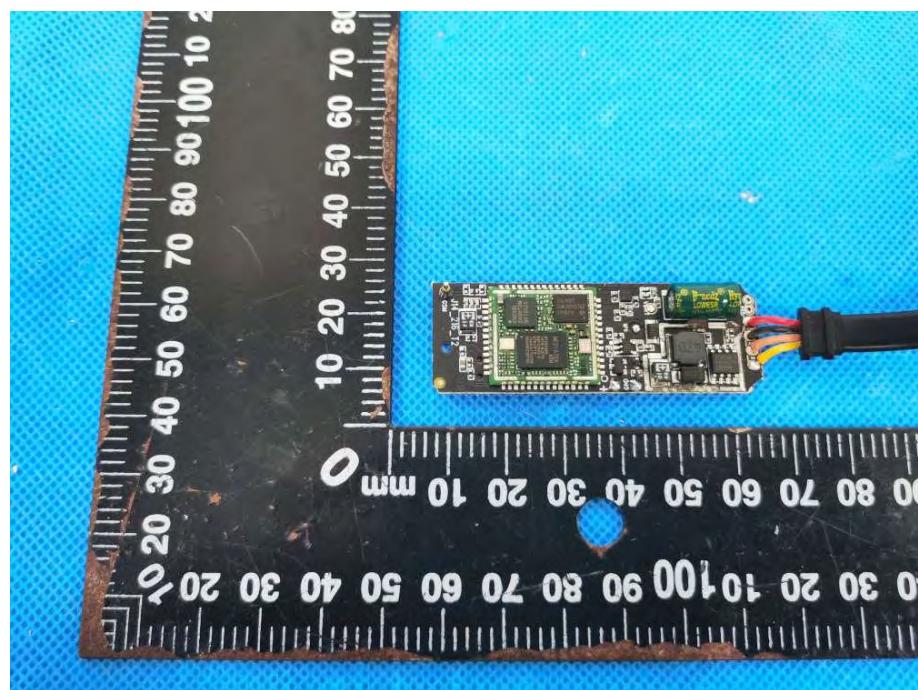
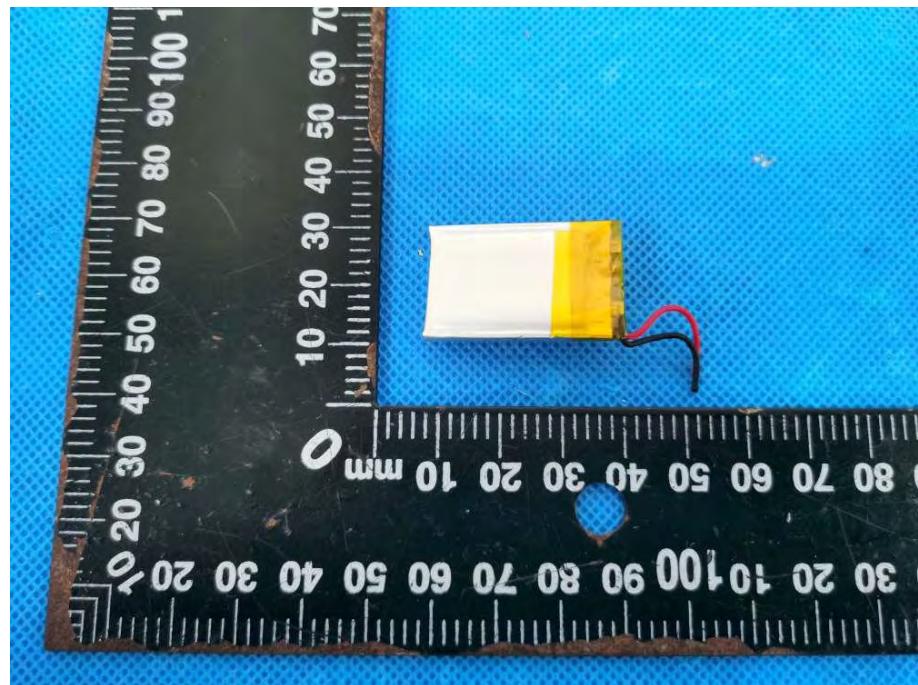


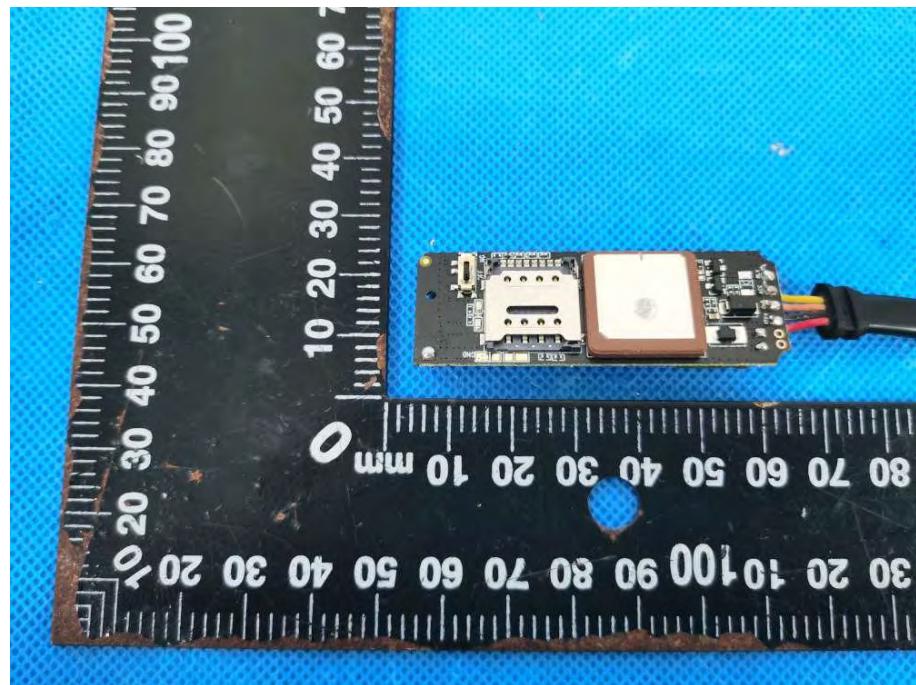












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