FCC Test Report

FCC ID:2AMYUKQ-H002

Product Name:	Smart watch phone
Trademark:	KETRON
Model Name:	KQ-H002
Prepared For: Address:	Ningbo Keqiang Battery Co.,ltd. Dajiahe Industrial zone,ninghai,ningbo,china
Prepared By: Address:	Shenzhen BCTC Technology Co., Ltd. NO.101, Yousong Road, Longhua New District, Shenzhen, Guangdong, P.R.China
Test Date:	May 04 – May 12, 2017
Date of Report:	May 12, 2017
Report No.:	BCTC-FY170502592E

VERIFICATION OF COMPLIANCE

Applicant's name ..... :	Ningbo Keqiang Battery Co.,ltd.
Address ..... :	Dajiahe Industrial zone,ninghai,ningbo,china
Manufacture's Name ..... :	Ningbo Keqiang Battery Co.,ltd.
Address ..... :	Dajiahe Industrial zone,ninghai,ningbo,china

Product description

Product name ..... :	Smart watch phone
Trademark:	KETRON
Model Name:	KQ-H002
Test procedure	FCC CFR Title 47 Part 2: 2015 FCC CFR Title 47 Part22 Subpart H: 2015 FCC CFR Title 47 Part24 Subpart E: 2015 ANSI/ TIA/ EIA-603-D-2010 FCC KDB 971168 D01 Power Meas. License Digital Systems v02v02

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.

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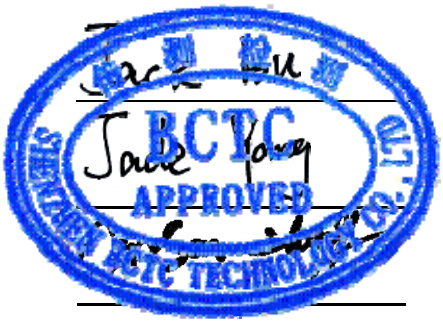
Test Result : **Pass**

Prepared by(Engineer):	Jack Bu
Reviewer(Supervisor):	Jade Yang
Approved(Manager):	Carson Zhang



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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. Description of Device (EUT)

Product Name:	Smart watch phone
Trademark	KETRON
Model No.:	KQ-H002
Model Difference	N/A
Operation Frequency:	GSM 850: Tx: 824.20 - 848.80MHz (at intervals of 200kHz); Rx: 869.20 - 893.80MHz (at intervals of 200kHz) GSM 1900: Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz); Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)
Modulation technology:	GMSK
Antenna Type:	Internal Antenna
Antenna gain:	1.5dBi
Power supply:	DC 3.7V from battery
GPRS Class:	12

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 850	■ GSM link ■ GPRS 8 link	■ GSM link ■ GPRS 8 link
PCS 1900	■ GSM link ■ GPRS 8 link	■ GSM link ■ GPRS 8 link

Note: The maximum power levels are GSM mode for GMSK link, GPRS multi-slot class 8 mode for 8PSK link,. only these modes were used for all tests.

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
	32.47	32.38	32.43	29.86	29.74	29.78

3. TEST SITES

3.1. Test Facilities

Site Description

Name of Firm	:	Shenzhen BCTC Technology Co., Ltd.
Site Location	:	NO.101, Yousong Road, Longhua New District, Shenzhen, Guangdong, P.R.China
Lab Qualifications	:	Certificated by Industry Canada Registration No.: 12655A Date of registration: January 19, 2015 Certificated by FCC, USA Registration No.: 187086 Date of registration: November 28, 2014 Certificated by CNAS China Registration No.: CNAS L6046 Date of registration: February 3, 2013

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

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESCI	1166.5950K03 -101165-ha	2016.08.27	2017.08.26
2	LISN	SCHWARZBECK	NSLK8127	8127739	2016.08.27	2017.08.26
3	LISN	R&S	NSLK8126	8126487	2016.08.27	2017.08.26
4	RF cables	R&S	R204	R20X	2016.08.27	2017.08.26
5	Attenuator	R&S	ESH3-Z2	143206	2016.08.27	2017.08.26

3.2.2. For radiated test

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4407B	MY45108040	2016.08.27	2017.08.26
2	Test Receiver (9kHz-7GHz)	R&S	ESPI	101318	2016.08.27	2017.08.26
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB 9168	VULB91 68-438	2016.08.27	2017.08.26
4	Horn Antenna (1GHz-18GHz)	SCHWARZBECK	BBHA9120D	1201	2016.09.03	2017.09.03
5	Horn Antenna (14GHz-40GHz)	SCHWARZBECK	BBHA 9170	9170-181	2016.09.03	2017.09.03
6	Amplifier (9KHz-6GHz)	SCHWARZBECK	BBV9744	9744-0037	2016.08.27	2017.08.26
7	Amplifier (1GHz-18GHz)	SCHWARZBECK	BBV9718	9718-309	2016.08.27	2017.08.26
8	Amplifier (18GHz-40GHz)	SCHWARZBECK	BBV 9721	9721-205	2016.08.27	2017.08.26
9	Loop Antenna (9KHz-30MHz)	SCHWARZBECK	FMZB1519B	00014	2016.09.03	2017.09.03
10	RF cables1 (9kHz-1GHz)	R&S	R203	R20X	2016.08.27	2017.08.26
11	RF cables2 (1GHz-40GHz)	R&S	R204	R21X	2016.08.27	2017.08.26
12	Antenna connector	Florida RF Labs	N/A	RF 01#	2016.08.27	2017.08.26
13	Power Metter	ANRITSU	ML2487A	6K00001568	2016.08.27	2017.08.26
14	Power Sensor (AV)	ANRITSU	ML2491A	030989	2016.08.27	2017.08.26
15	Signal Analyzer 9kHz-26.5GHz	Agilent	N9010A	MY48030494	2016.08.27	2017.08.26
16	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	2016.08.27	2017.08.26
17	D.C. Power Supply	LongWei	PS-305D	010964729	2016.08.27	2017.08.26
18	Bilog Antenna	TESEQ	CBL6111D	31217	2016.08.27	2017.08.26

19	System Simulator	Agilent	E5515C	GB43130252	2016.08.27	2017.08.26
20	High Pass filter	KANGMAI	WHKX1.0/1.5G-10SS	40	2016.08.27	2017.08.26
21	Filter	COM-MW	ZBSF-C836.5-25-X	BCTC042	2016.08.27	2017.08.26
22	Filter	COM-MW	ZBSF-C1747.5-75-X2	BCTC045	2016.08.27	2017.08.26
23	Filter	COM-MW	ZBSF-C1880-60-X2	BCTC047	2016.08.27	2017.08.26
24	Splitter	Agilent	11435B	1125162	2016.08.27	2017.08.26
RF CONDUCTED TEST						
1	System Simulator	Agilent	E5515C	GB43130252	2016.08.27	2017.08.26
2	Spectrum Analyzer	Agilent	E4407B	MY45108040	2016.08.27	2017.08.26
3	DC Power Supply	LongWei	PS-305D	010965682	2016.08.27	2017.08.26
4	Constant temperature and humidity box	GF	GTH-800-40-2P	MAA9906-012	2016.08.27	2017.08.26
5	Universal radio communication tester	R&S	CMU200	115295	2016.08.27	2017.08.26

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

EUT

(EUT: Smart watch phone)

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4.3. 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 part 24.232(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		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.20	836.60	848.80	1850.20	1880.00	1909.80
GSM (GMSK, 1 TX slot)	32.42	32.39	32.56	29.65	29.59	29.55
GPRS (GMSK, 1 TX slot)	32.38	32.45	32.39	29.09	28.34	28.86
GPRS (GMSK, 2 TX slot)	31.41	31.63	31.26	27.92	27.92	27.53
GPRS (GMSK, 3 TX slot)	29.35	29.48	29.44	26.54	26.36	26.26
GPRS (GMSK, 4 TX slot)	27.50	27.57	27.39	24.37	24.47	24.72

Note: Measurement Uncertainty: ±2.6 dB.

5.2. -26dB and 99% Occupied Bandwidth

5.2.1. 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,

5.2.2. 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

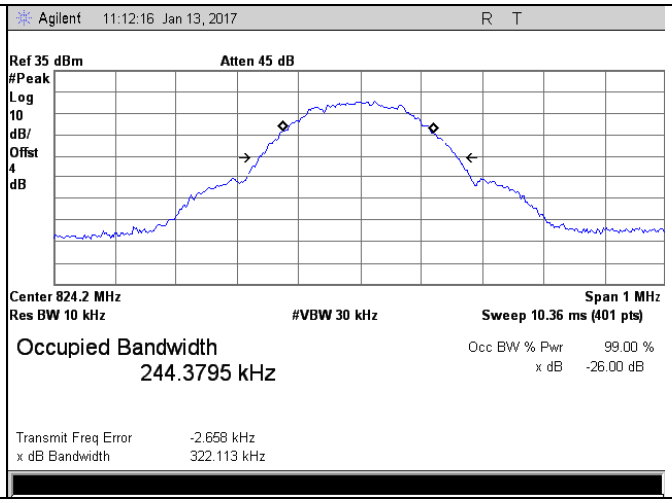
Measurement Data

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GSM link)	128	824.20	244.380	322.113
	190	836.60	**248.926**	**321.610**
	251	848.80	246.984	321.130
GSM 850 (GPRS 8 link)	128	824.20	243.435	320.829
	190	836.60	244.238	318.408
	251	848.80	**245.565**	**318.404**
PCS 1900 (GSM link)	512	1850.20	245.977	**324.823**
	661	1880.00	**246.762**	323.863
	810	1909.80	244.749	319.911
PCS 1900 (GPRS 8 link)	512	1850.20	**246.639**	**324.536**
	661	1880.00	245.427	319.614
	810	1909.80	245.843	317.283

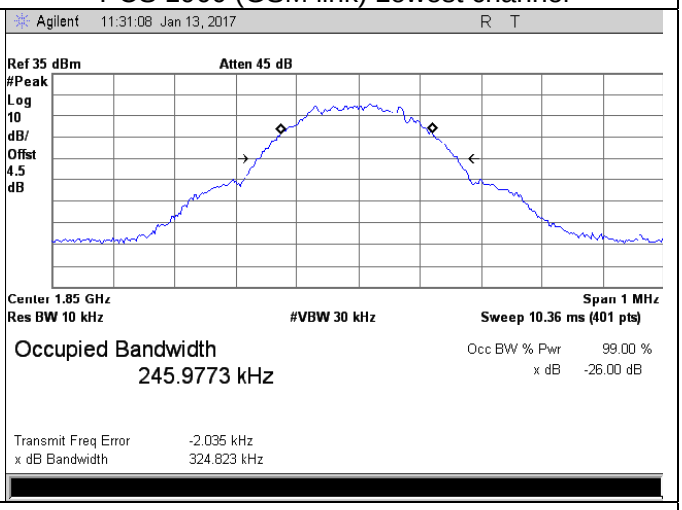
Note: Measurement Uncertainty: ±20Hz.

Test plot as follows:

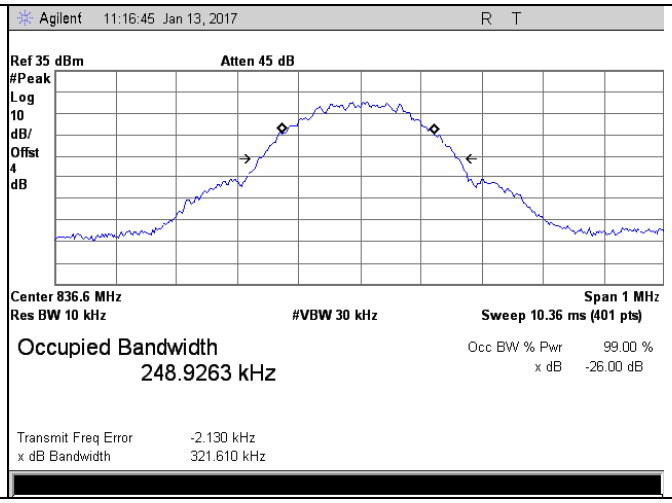
GSM 850MHz Lowest channel



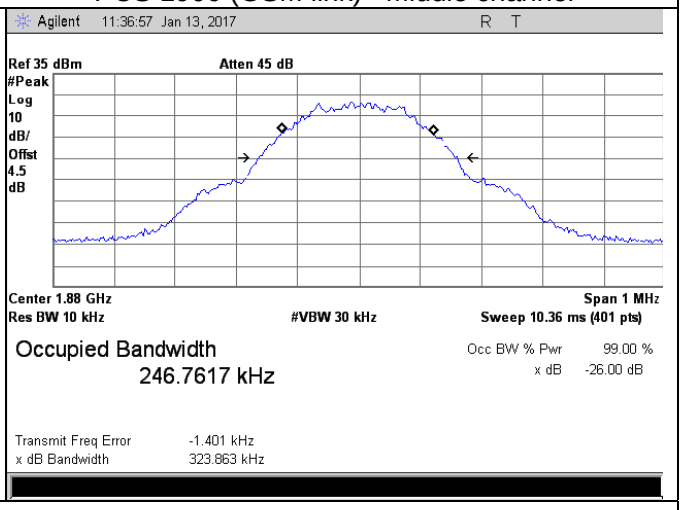
PCS 1900 (GSM link) Lowest channel



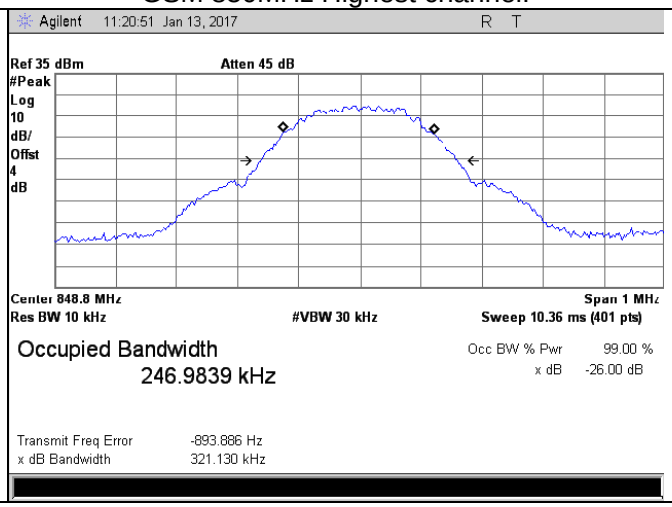
GSM 850MHz Middle channel



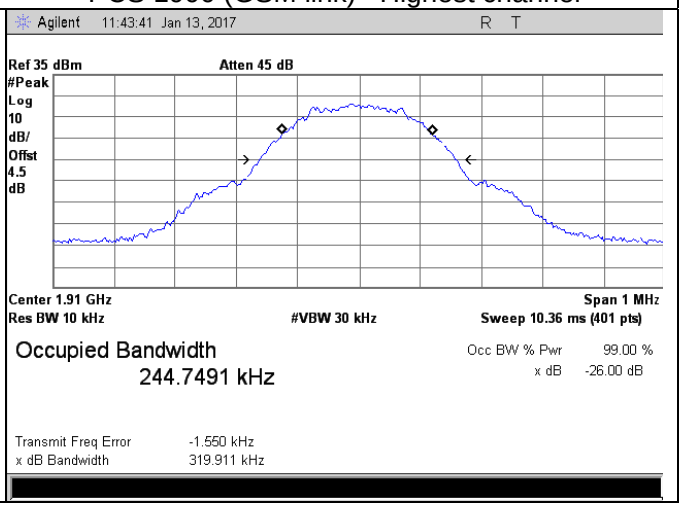
PCS 1900 (GSM link) Middle channel



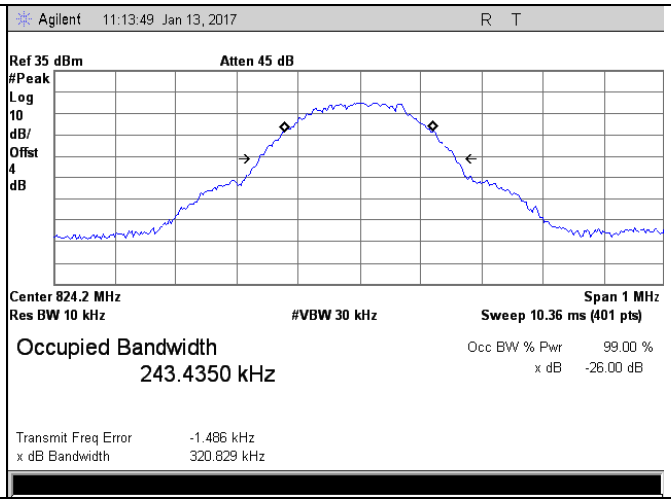
GSM 850MHz Highest channel:



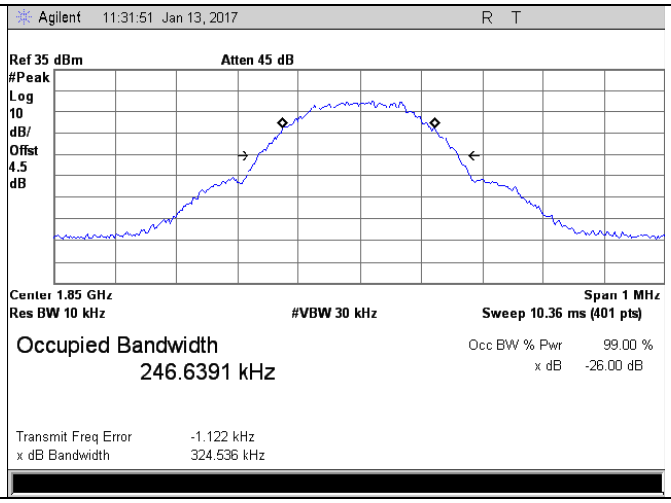
PCS 1900 (GSM link) Highest channel



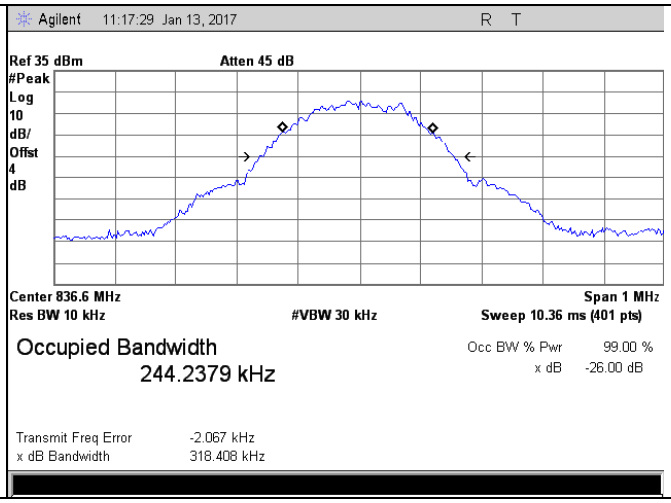
GPRS 850MHz Lowest channel



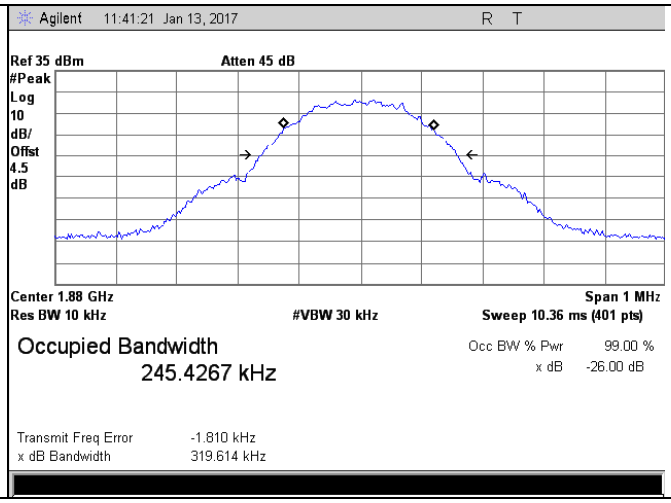
GPRS 1900 Lowest channel



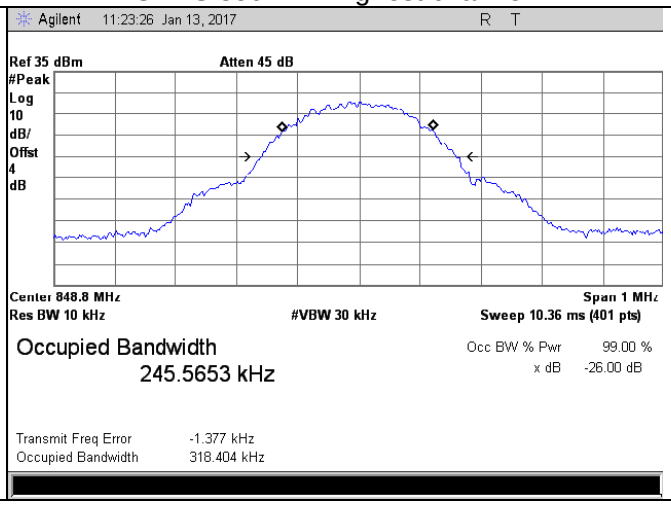
GPRS 850MHz Middle channel



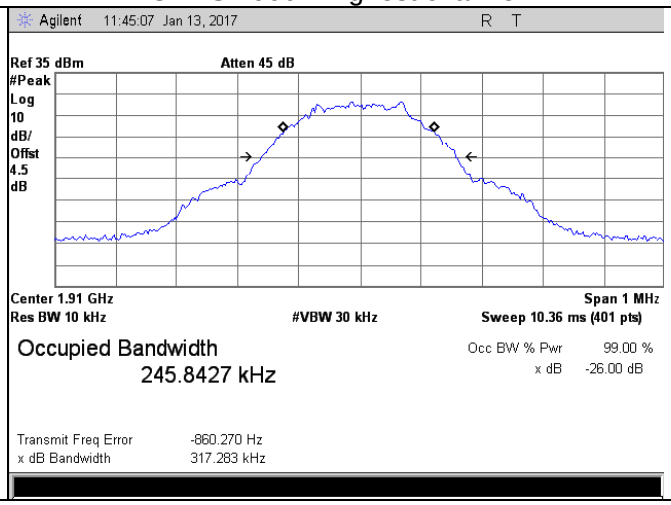
GPRS 1900 Middle channel



GPRS 850MHz Highest channel:



GPRS 1900 Highest channel

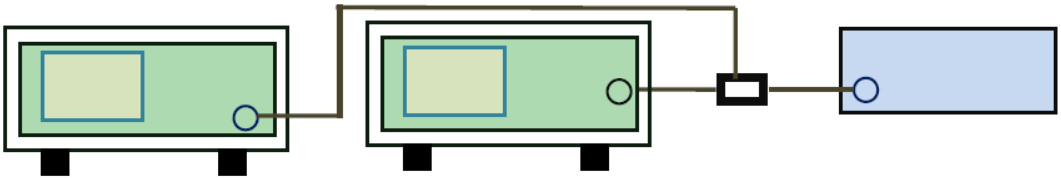


5.3. Peak to Average Radio

5.3.1. Limit

According to FCC section 27.50(d)(5) , 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	Conducted power(dBm)		Peak-Average Ratio(PAR)
		Peak	Average	
PCS1900	Low	30.74	29.55	1.19
	Middle	30.68	29.43	1.25
	High	30.63	29.57	1.06

Note: Measurement Uncertainty: ±0.2 dB.

5.4. Frequency Stability

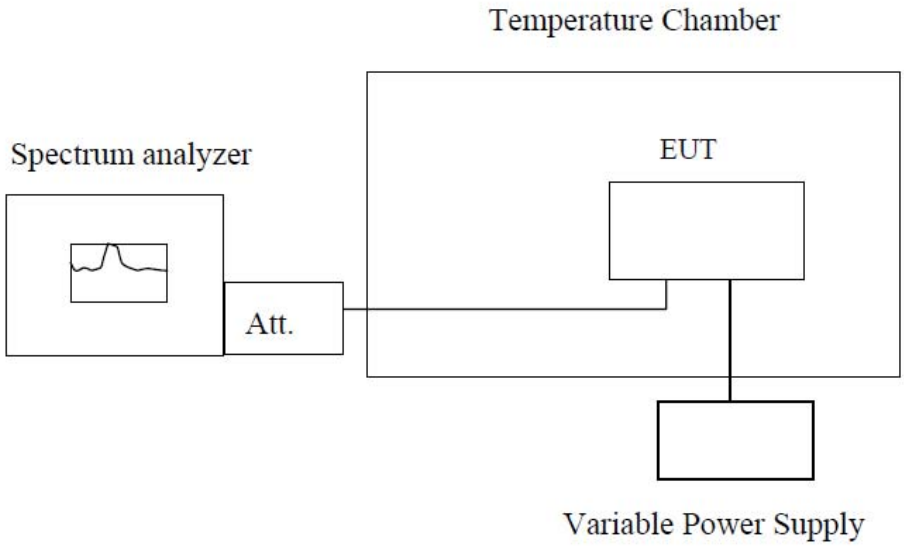
5.4.1. Limit

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, 4.25VDC 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

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature (℃)	Frequency Error(Hz)	ppm	Limit	
GSM850 (GSM link) Middle channel =836.6MHz	3.7	-30	54	0.0645	±2.5	PASS
	3.7	-20	67	0.0801		
	3.7	-10	46	0.055		
	3.7	0	53	0.0634		
	3.7	10	52	0.0622		
	3.7	20	**68**	**0.0813**		
	3.7	30	37	0.0442		
	3.7	40	32	0.0383		
	3.7	50	47	0.0562		
	4.25	25	39	0.0466		
	3.70	25	36	0.043		
	3.40	25	55	0.0657		
GPRS850 (Middle channel =836.6MHz	3.7	-30	**62**	**0.0741**	±2.5	PASS
	3.7	-20	43	0.0514		
	3.7	-10	30	0.0359		
	3.7	0	28	0.0335		
	3.7	10	38	0.0454		
	3.7	20	25	0.0299		
	3.7	30	29	0.0347		
	3.7	40	46	0.055		
	3.7	50	41	0.049		
	4.25	25	28	0.0335		
	3.70	25	26	0.0311		
	3.40	25	44	0.0526		

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(℃)	Frequency Error(Hz)	ppm	Limit	
PCS1900 (GSM link) Middle channel =1880MHz	3.7	-30	64	0.034	±1	PASS
	3.7	-20	42	0.0223		
	3.7	-10	57	0.0303		
	3.7	0	36	0.0191		
	3.7	10	52	0.0277		
	3.7	20	55	0.0293		
	3.7	30	37	0.0197		
	3.7	40	29	0.0154		
	3.7	50	31	0.0165		
	4.25	25	56	0.0298		
	3.70	25	**61**	**0.0324**		
	3.40	25	43	0.0229		
GPRS1900 Middle channel =1880MHz	3.7	-30	53	0.0282	±1	PASS
	3.7	-20	42	0.0223		
	3.7	-10	51	0.0271		
	3.7	0	**67**	**0.0356**		
	3.7	10	49	0.0261		
	3.7	20	52	0.0277		
	3.7	30	48	0.0255		
	3.7	40	35	0.0186		
	3.7	50	24	0.0128		
	4.25	25	26	0.0138		
	3.70	25	50	0.0266		
	3.40	25	36	0.0191		

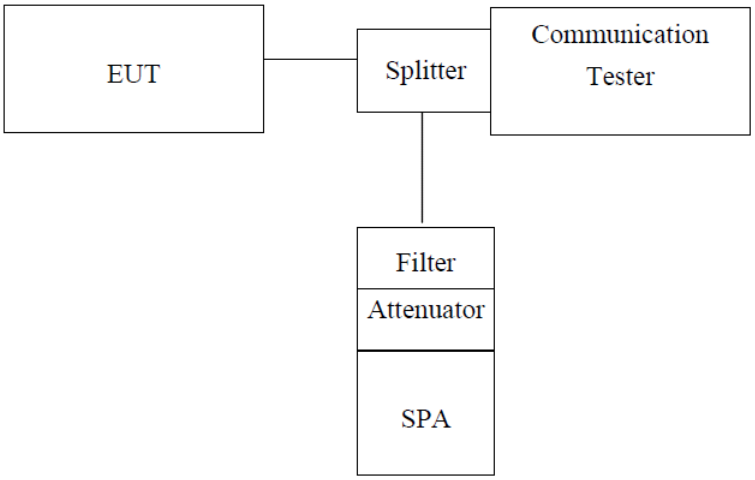
Note: Measurement Uncertainty: ±20Hz.

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.

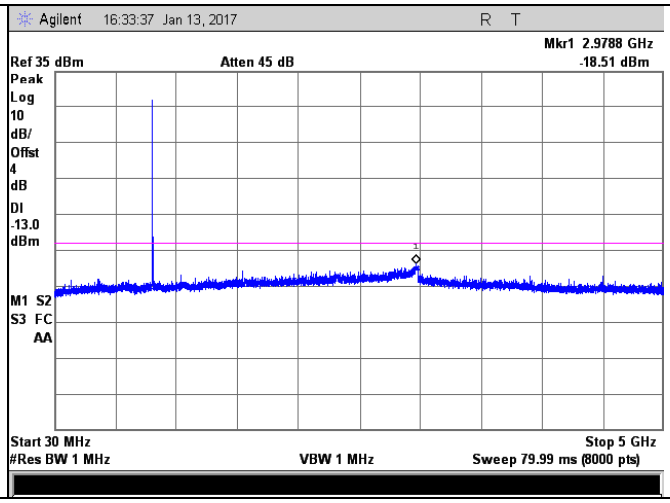
Limit = -13dBm

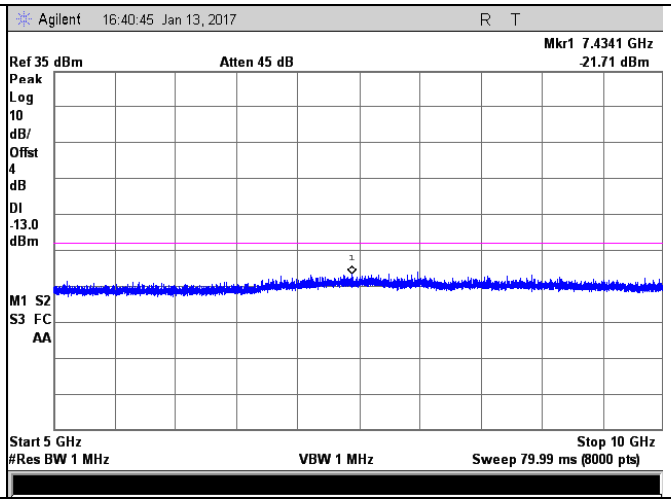
5.5.4. Test Result

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.

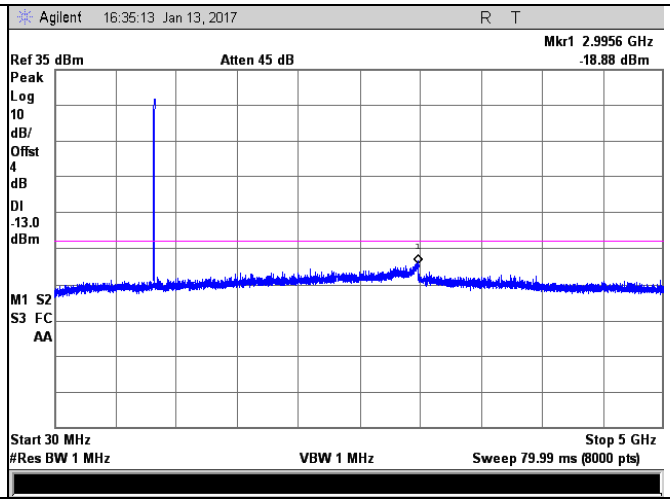
Test plot as follows:

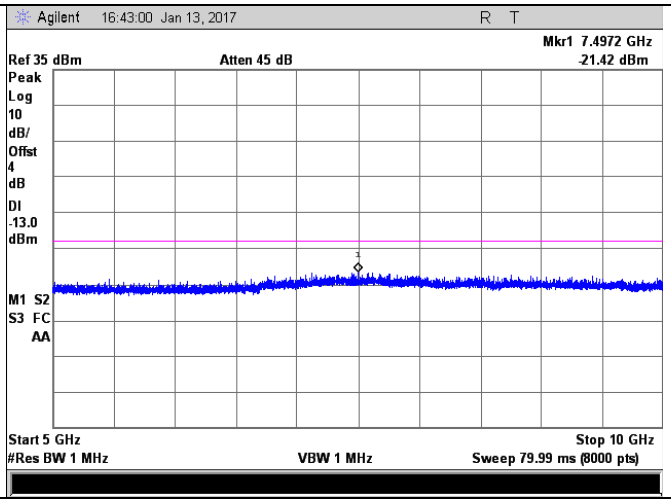
GSM 850MHz Lowest channel



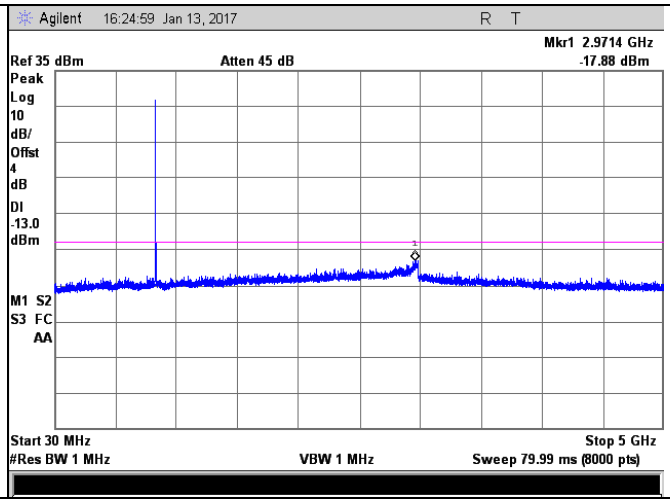


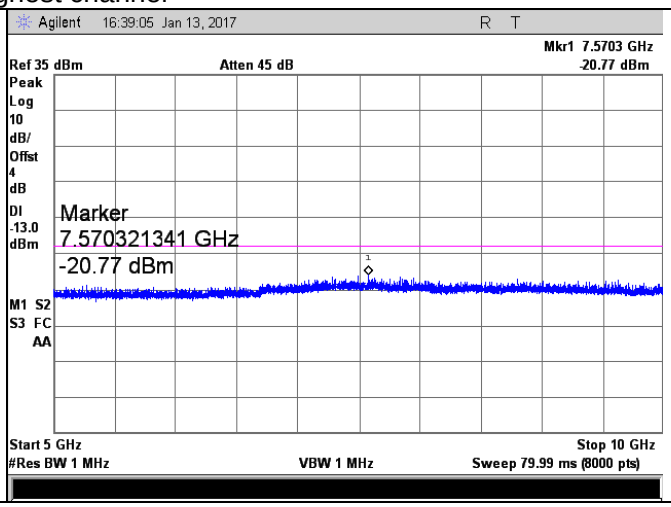
GSM 850MHz Middle channel



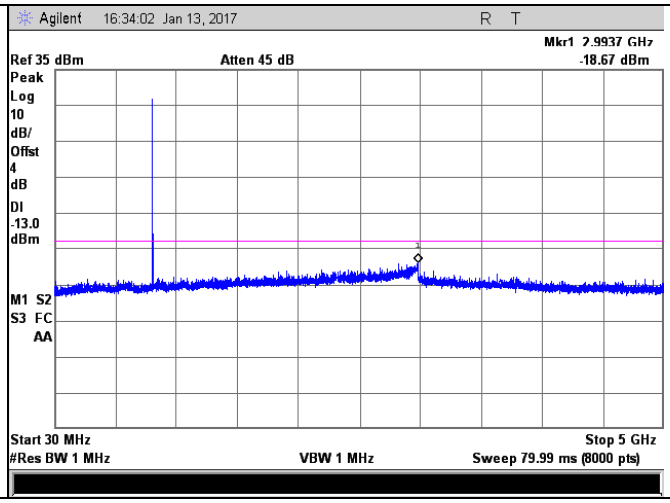


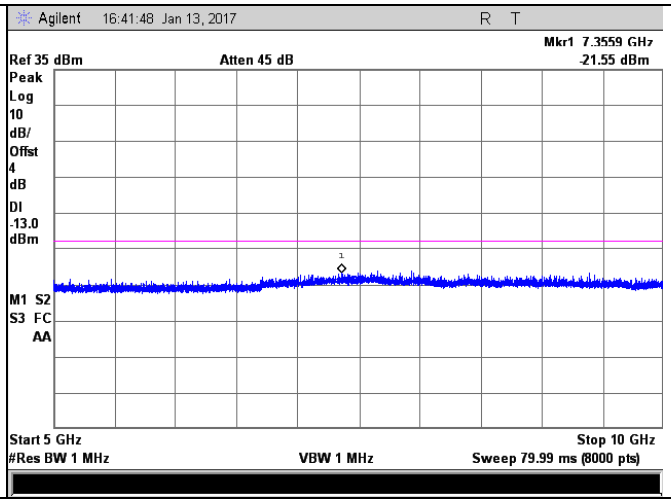
GSM 850MHz Highest channel



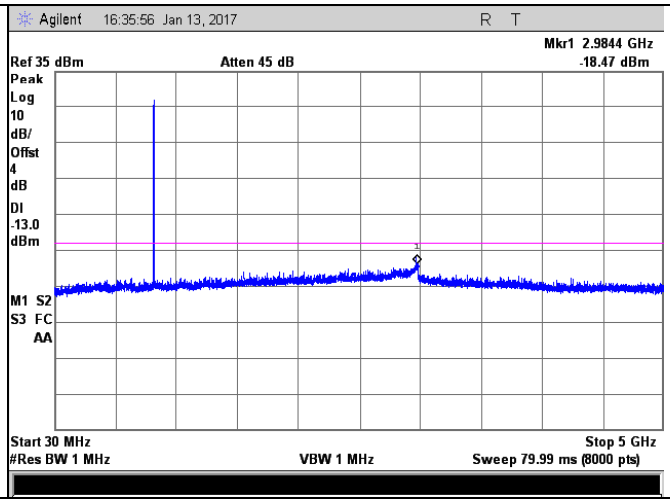


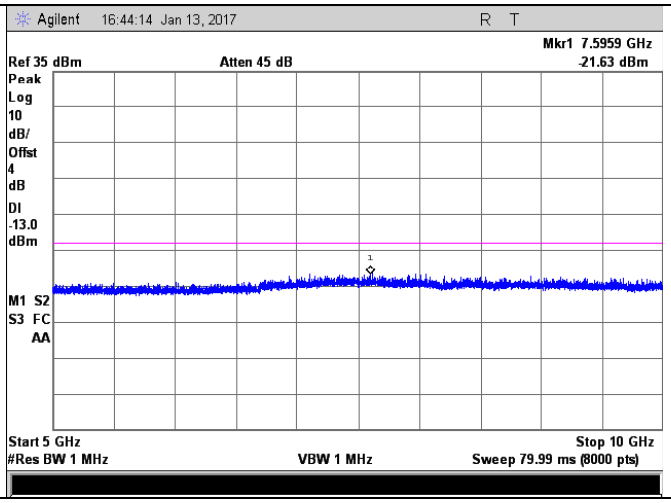
GPRS 850MHz Lowest channel



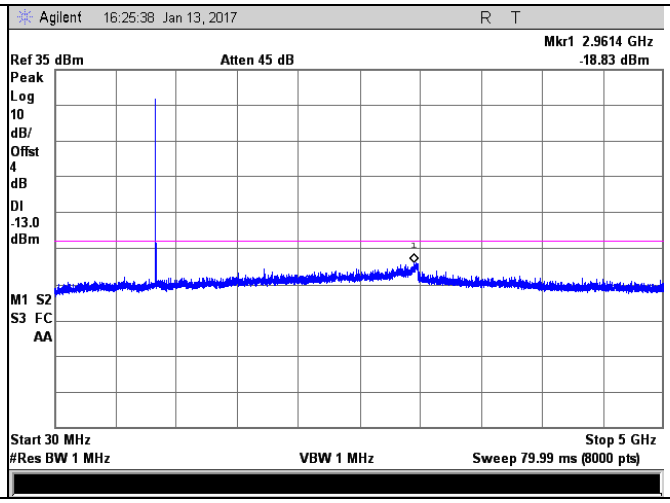


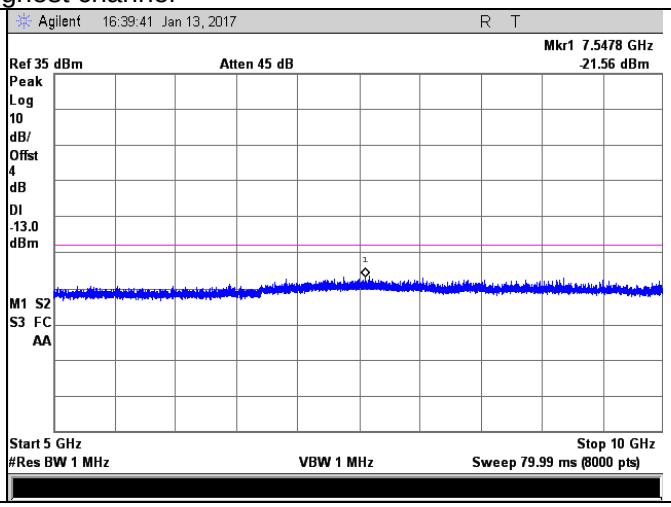
GPRS 850MHz Middle channel



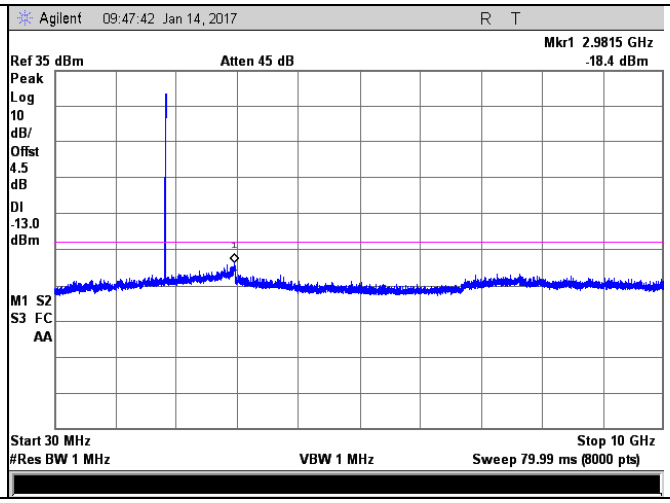


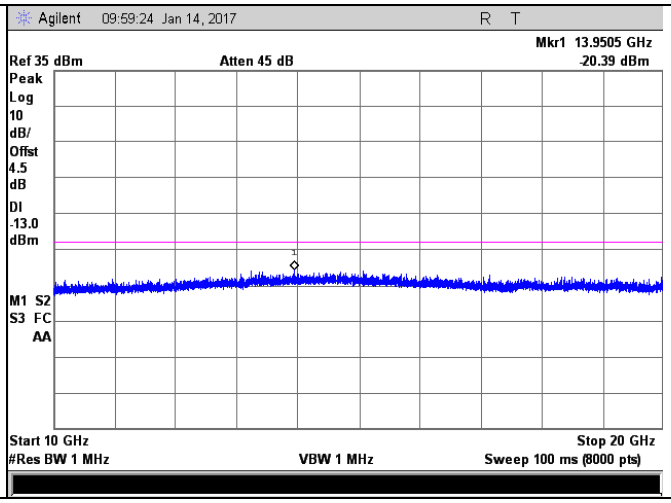
GPRS 850MHz Highest channel



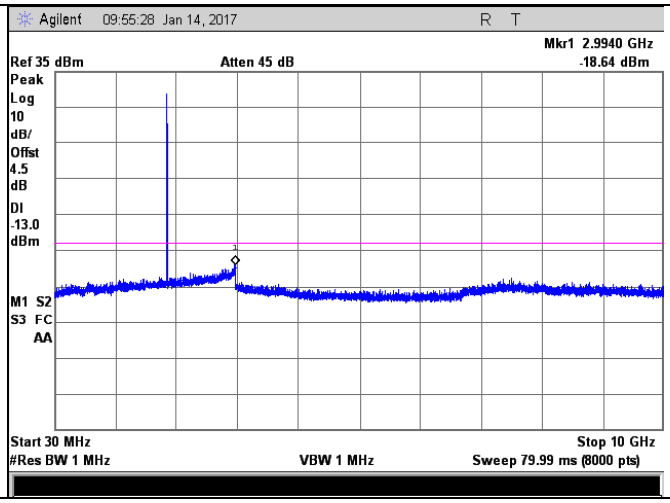


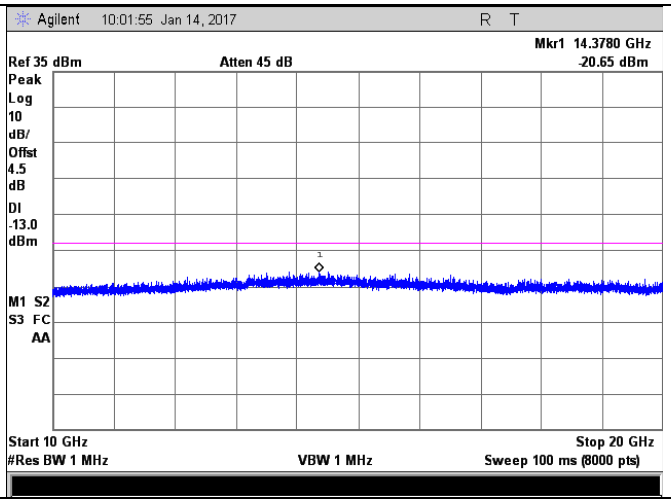
GSM 1900MHz Lowest channel



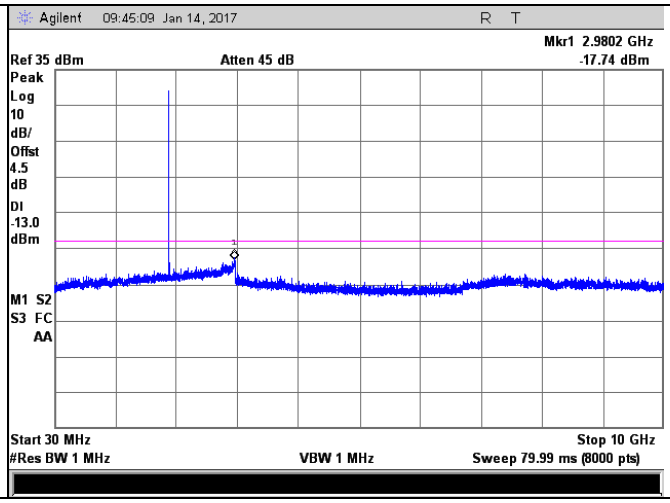


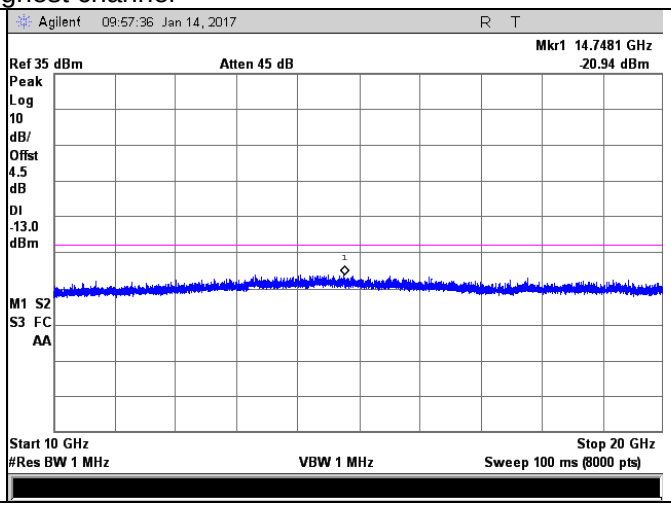
GSM 1900MHz Middle channel



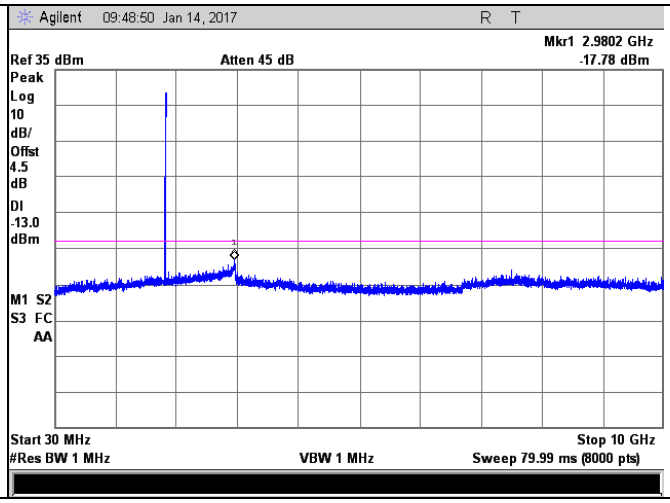


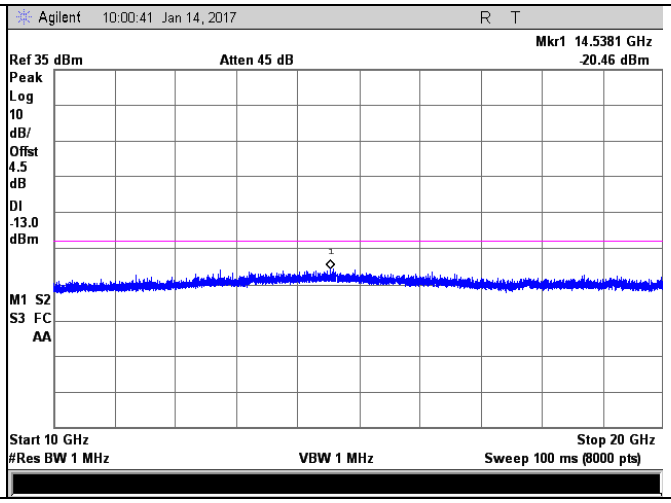
GSM 1900MHz Highest channel



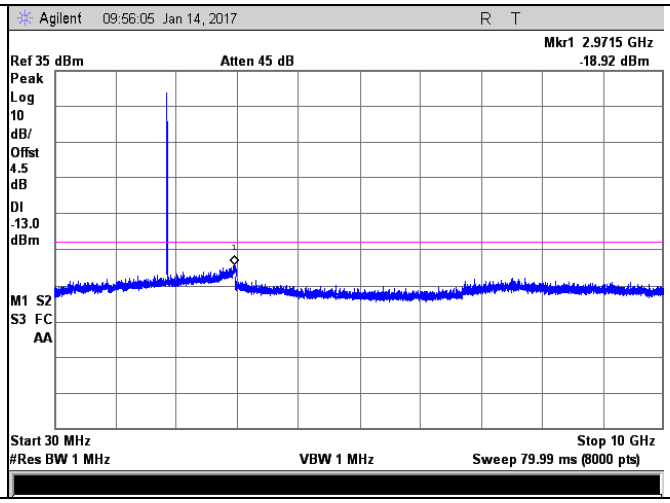


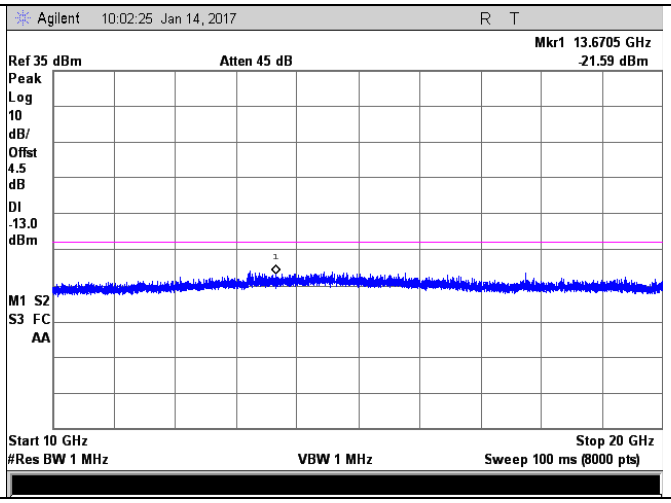
GPRS 1900MHz Lowest channel



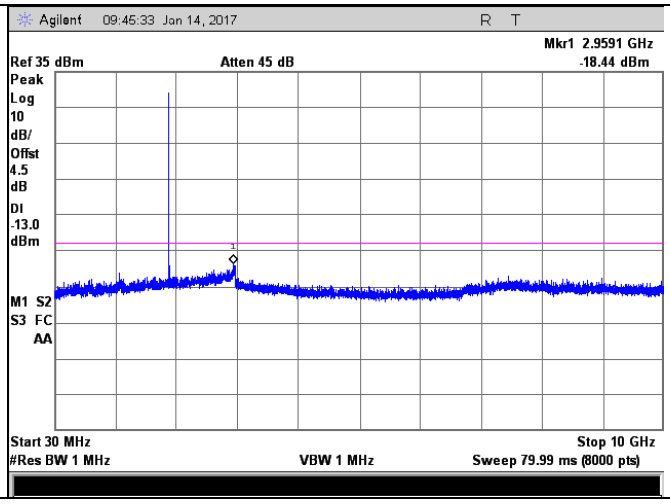


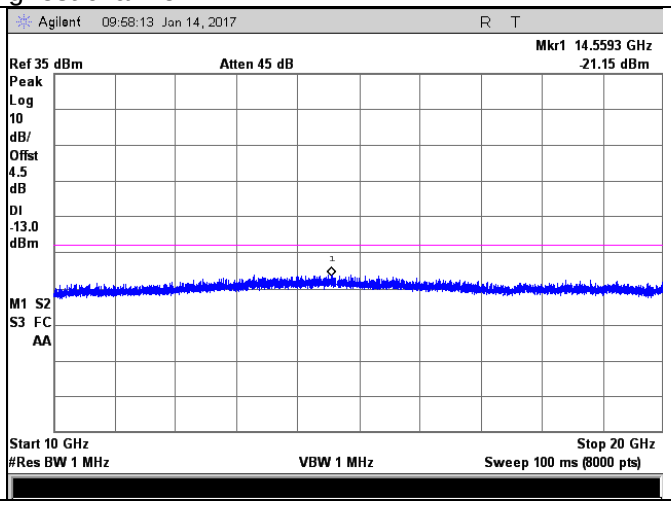
GPRS 1900MHz Middle channel





GPRS 1900MHz Highest channel



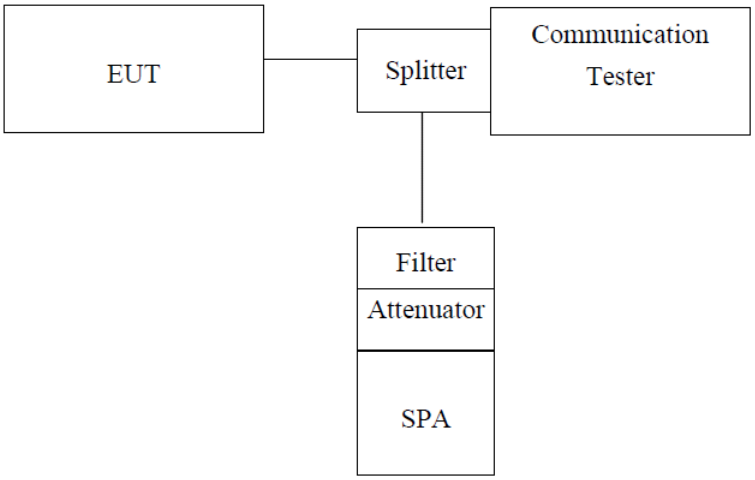


5.6. Conducted Out of Band Emissions

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.

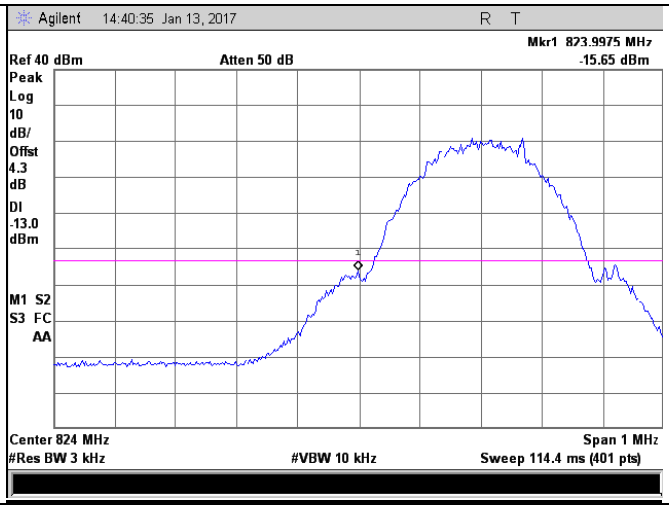
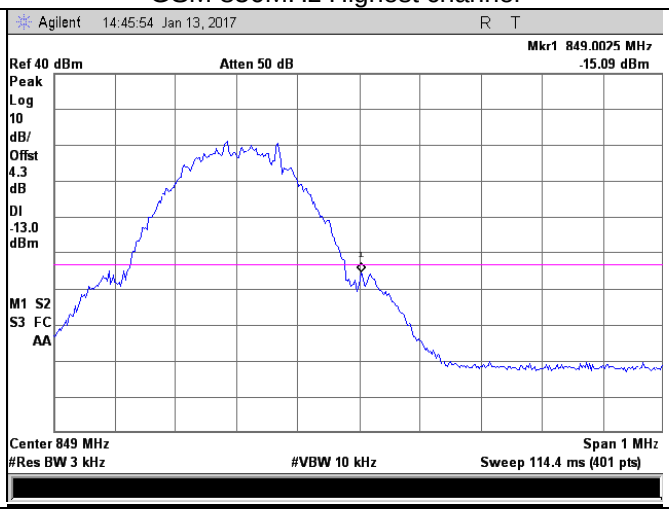
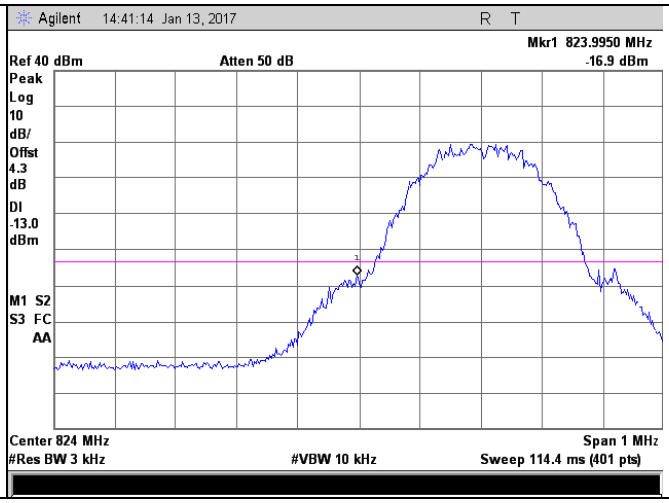
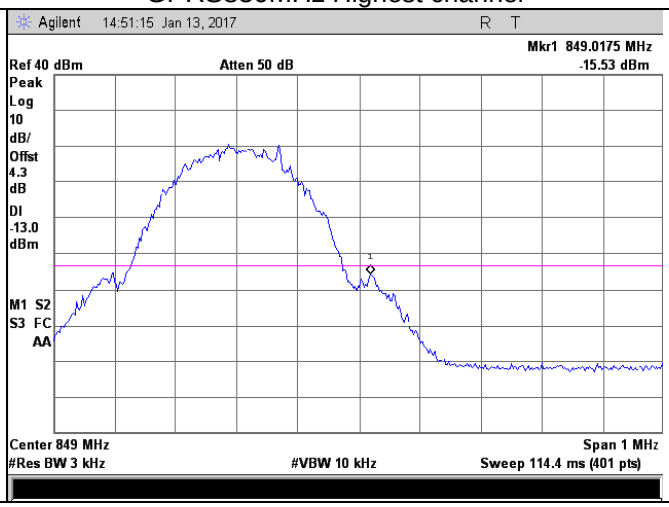
and reference KDB 971168 D01 Power Meas. License Digital Systems v02v02

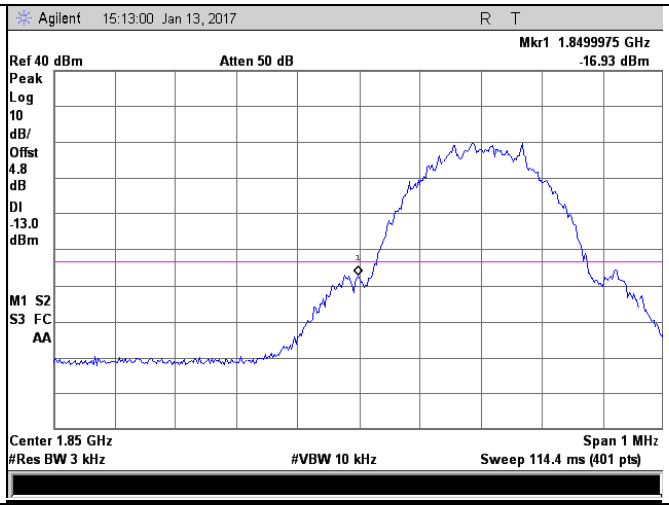
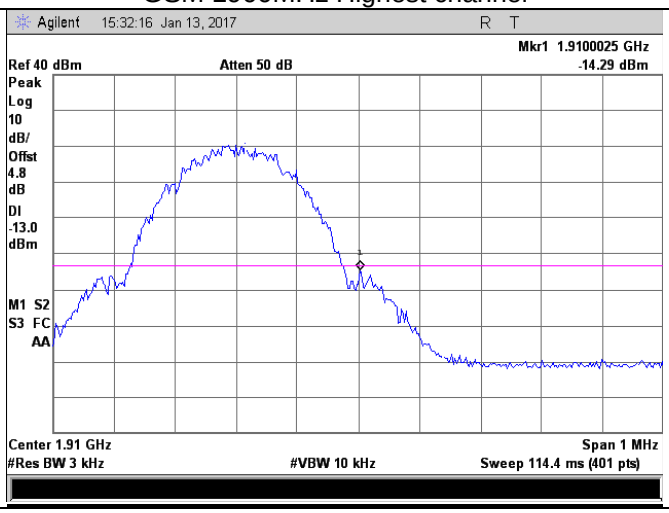
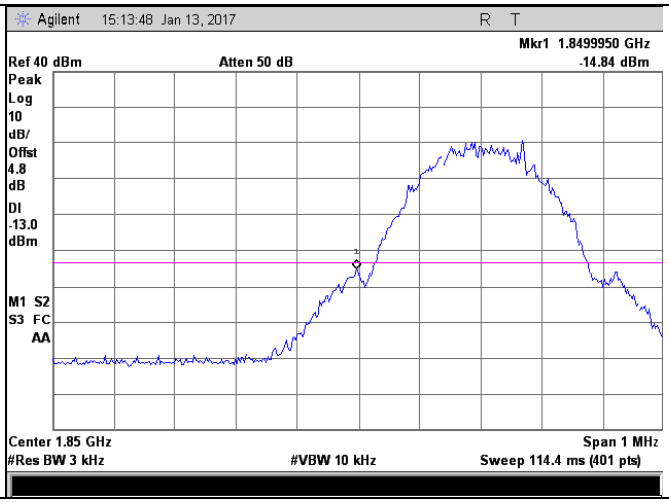
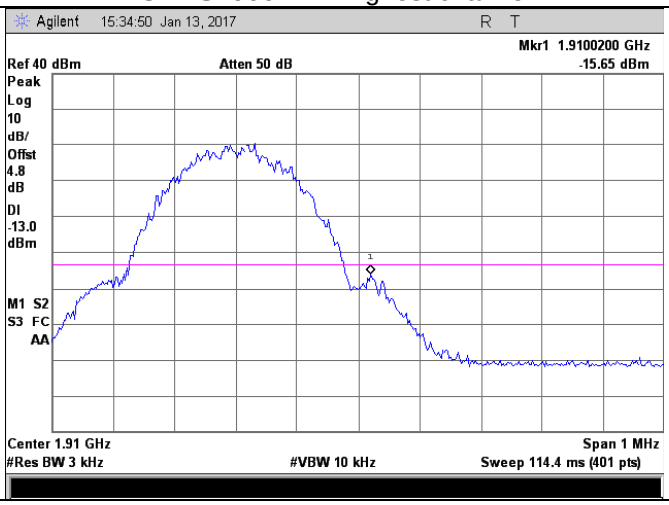
5.6.4. Test Result

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.

Note: Offset=Cable loss+ 10log((-26dB bandwidth/100)/RBW)

Test plot as follows:

GSM 850MHz Lowest channel	GSM 850MHz Highest channel
	
Note: Offset=Cable loss (4.0) + 10log(3.22/3)=4.0+0.3=4.3dB	Note: Offset=Cable loss (4.0) + 10log(3.21/3)=4.0+0.3=4.3dB
GPRS850MHz Lowest channel	GPRS850MHz Highest channel
	
Note: Offset=Cable loss (4.0) + 10log(3.20/3)=4.0+0.3=4.3dB	Note: Offset=Cable loss (4.0) + 10log(3.18/3)=4.0+0.3=4.3dB

GSM 1900MHz Lowest channel	GSM 1900MHz Highest channel
	
Note: Offset=Cable loss (4.5) + 10log (3.24/3)=4.5+0.3=4.8dB	Note: Offset=Cable loss (4.5) + 10log (3.19 /3)=4.5+0.3=4.8dB
GPRS1900MHz Lowest channel	GPRS1900MHz Highest channel
	
Note: Offset=Cable loss (4.5) + 10log (3.24/3)=4.5+0.3=4.8dB	Note: Offset=Cable loss (4.5) + 10log (3.17/3)=4.5+0.3=4.8dB

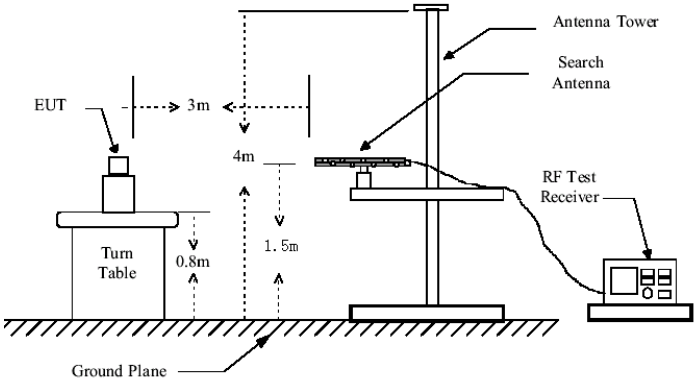
5.7. Transmitter Radiated Power (EIRP/ERP)

5.7.1. Limit

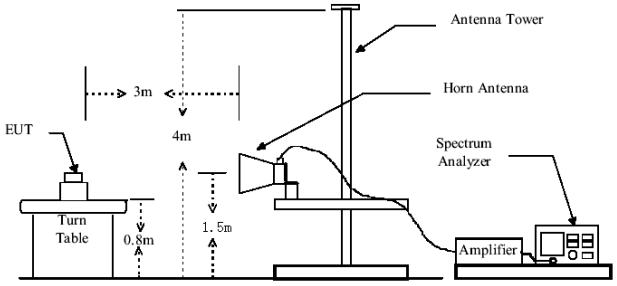
According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.

5.7.2. Test Setup

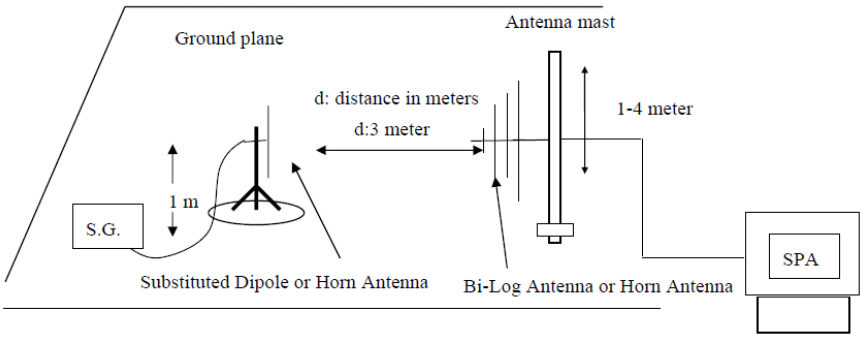
Below 1GHz



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:

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

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

5.7.4. Test Result

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
GSM850 (GSM link)	Lowest	V	18.12	15.68	1.65	32.15	38.45	Pass
		H	16.45	15.68	1.65	30.48		
	Middle	V	16.83	15.70	1.67	30.86	38.45	Pass
		H	14.27	15.70	1.67	28.3		
	Highest	V	**18.84**	**15.70**	**1.71**	**32.83**	38.45	Pass
		H	16.37	15.70	1.71	30.36		
GPRS850	Lowest	V	16.93	15.68	1.65	30.96	38.45	Pass
		H	15.75	15.68	1.65	29.78		
	Middle	V	16.43	15.70	1.67	30.46	38.45	Pass
		H	14.26	15.70	1.67	28.29		
	Highest	V	**17.26**	**15.70**	**1.71**	**31.25**	38.45	Pass
		H	15.83	15.70	1.71	29.82		

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GSM link)	Lowest	V	13.34	19.35	2.54	30.15	38.45	Pass
		H	11.62	19.35	2.54	28.43		
	Middle	V	**13.67**	**19.51**	**2.62**	**30.56**	38.45	Pass
		H	11.14	19.51	2.62	28.03		
	Highest	V	12.59	19.96	2.69	29.86	38.45	Pass
		H	11.36	19.96	2.69	28.63		
GPRS1900	Lowest	V	12.53	19.35	2.54	29.34	38.45	Pass
		H	11.24	19.35	2.54	28.05		
	Middle	V	12.46	19.51	2.62	29.35	38.45	Pass
		H	11.10	19.51	2.62	27.99		
	Highest	V	**12.76**	**19.96**	**2.69**	**30.03**	38.45	Pass
		H	11.35	19.96	2.69	28.62		

5.8. Radiated Out of Band Emissions

5.8.1. Limit

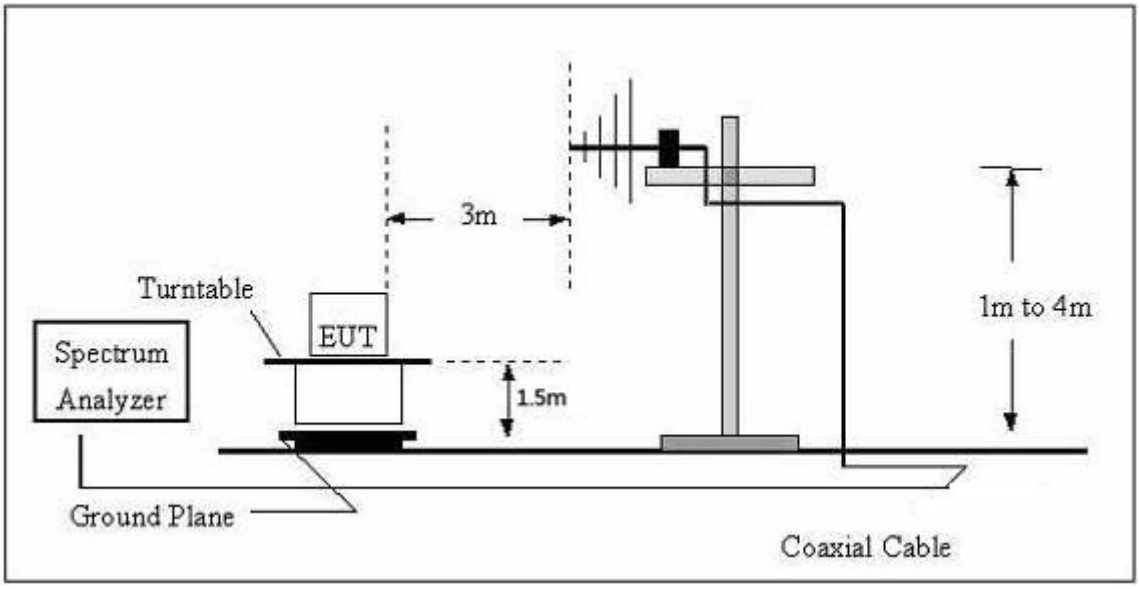
According to FCC section 22.917(a) and section 24.238(a), 27.53(g) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power

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

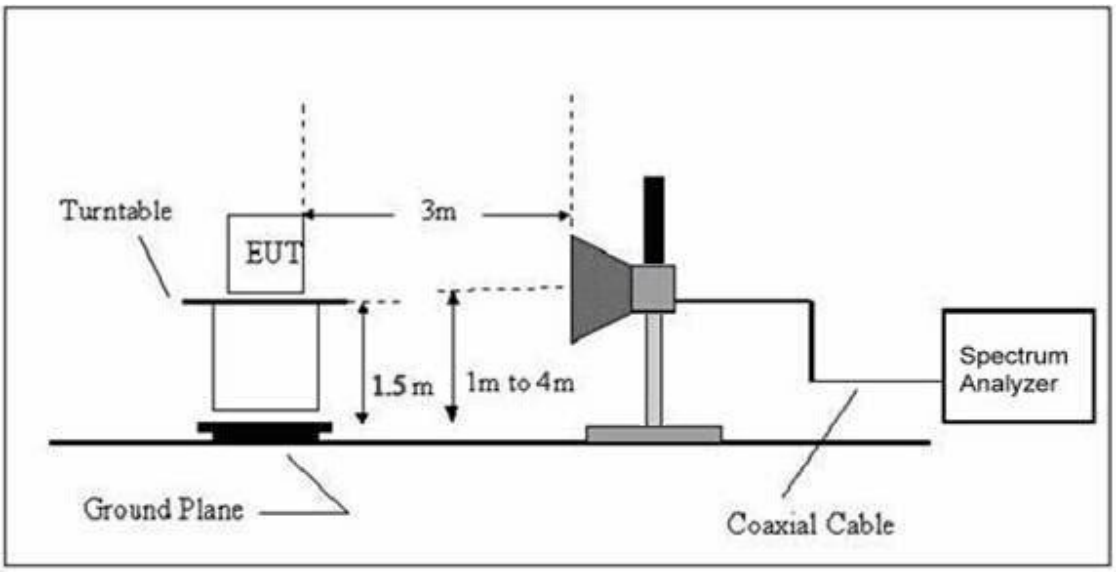
The spurious emission with frequency band 1900 according to FCC section 2.1057.

5.8.2. Test Setup

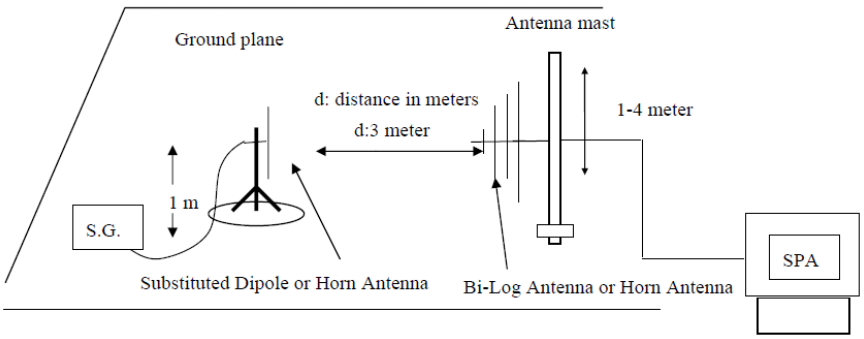
Below 1GHz



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.

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
GSM 850 Lowest	65.57	Vertical	-74.31	3.21	0.38	-71.48	-13	PASS
	1648.40	Vertical	-28.57	6.51	1.35	-23.41		
	2472.60	Vertical	-34.26	6.88	2.53	-29.91		
	3296.80	Vertical	-36.92	7.61	3.67	-32.98		
	4121.00	Vertical	-44.38	8.67	4.06	-39.77		
	4945.20	Vertical	-38.67	9.35	4.38	-33.7		
	157.64	Horizontal	-74.14	4.58	0.51	-70.07		
	2472.40	Horizontal	-33.99	6.51	1.35	-28.83		
	3296.80	Horizontal	-36.27	6.88	2.53	-31.92		
	4121.00	Horizontal	-44.48	7.61	3.67	-40.54		
	4945.20	Horizontal	-48.29	8.67	4.06	-43.68		
	5769.40	Horizontal	-44.73	9.35	4.38	-39.76		

Remark:

1. Only show worest test data, there was not any unwanted emission detected to 10th foundation frequency.
2. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
GSM 850 Middle	94.52	Vertical	-75.57	3.62	0.38	-72.33	-13	PASS
	1648.70	Vertical	-32.22	6.51	1.35	-27.06		
	2472.10	Vertical	-32.76	6.88	2.53	-28.41		
	3296.50	Vertical	-40.24	7.61	3.67	-36.3		
	4121.30	Vertical	-47.81	8.67	4.06	-43.2		
	4945.70	Vertical	-43.32	9.35	4.38	-38.35		
	124.74	Horizontal	-76.06	4.43	0.51	-72.14		
	2472.10	Horizontal	-29.54	6.51	1.35	-24.38		
	3296.20	Horizontal	-32.21	6.88	2.53	-27.86		
	4121.70	Horizontal	-48.50	7.61	3.67	-44.56		
	4945.00	Horizontal	-49.89	8.67	4.06	-45.28		
	5769.60	Horizontal	-39.91	9.35	4.38	-34.94		

Remark:

1. Only show worest test data, there was not any unwanted emission detected to 10th foundation frequency.
2. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
GSM 850 Highest	53.75	Vertical	-74.46	2.86	0.38	-71.98	-13	PASS
	1648.30	Vertical	-30.58	6.51	1.35	-25.42		
	2472.10	Vertical	-32.17	6.88	2.53	-27.82		
	3296.50	Vertical	-35.69	7.61	3.67	-31.75		
	4121.40	Vertical	-40.53	8.67	4.06	-35.92		
	4945.20	Vertical	-47.31	9.35	4.38	-42.34		
	99.41	Horizontal	-75.86	3.86	0.51	-72.51		
	2472.90	Horizontal	-28.54	6.51	1.35	-23.38		
	3296.30	Horizontal	-33.26	6.88	2.53	-28.91		
	4121.20	Horizontal	-37.59	7.61	3.67	-33.65		
	4945.70	Horizontal	-46.43	8.67	4.06	-41.82		
	5769.60	Horizontal	-52.64	9.35	4.38	-47.67		

Remark:

1. Only show worest test data, there was not any unwanted emission detected to 10th foundation frequency.
2. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
PCS1900 Lowest	72.96	Vertical	-75.46	3.54	0.38	-72.3	-13	PASS
	3700.40	Vertical	-45.32	7.76	3.75	-41.31		
	5550.60	Vertical	-46.94	9.84	4.94	-42.04		
	7400.80	Vertical	-38.35	10.21	5.32	-33.46		
	9251.00	Vertical	-42.77	11.36	6.02	-37.43		
	11101.20	Vertical	-45.41	14.52	6.68	-37.57		
	124.54	Horizontal	-74.38	4.09	0.51	-70.8		
	3700.40	Horizontal	-47.62	7.76	3.75	-43.61		
	5550.60	Horizontal	-46.54	9.84	4.94	-41.64		
	7400.80	Horizontal	-43.43	10.21	5.32	-38.54		
	9251.00	Horizontal	-46.82	11.36	6.02	-41.48		
	11101.20	Horizontal	-46.54	14.52	6.68	-38.7		

Remark:

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2. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
PCS1900 Middle	101.38	Vertical	-74.19	3.9	0.38	-70.67	-13	PASS
	3760.00	Vertical	-46.28	7.76	3.75	-42.27		
	5640.00	Vertical	-46.64	9.84	4.94	-41.74		
	7520.00	Vertical	-43.27	10.21	5.32	-38.38		
	9400.00	Vertical	-42.16	11.36	6.02	-36.82		
	11280.00	Vertical	-45.66	14.52	6.68	-37.82		
	48.53	Horizontal	-74.57	2.74	0.51	-72.34		
	3760.00	Horizontal	-44.32	7.76	3.75	-40.31		
	5640.00	Horizontal	-45.76	9.84	4.94	-40.86		
	7520.00	Horizontal	-38.58	10.21	5.32	-33.69		
	9400.00	Horizontal	-42.69	11.36	6.02	-37.35		
	11280.00	Horizontal	-44.87	14.52	6.68	-37.03		

Remark:

1. Only show worest test data, there was not any unwanted emission detected to 10th foundation frequency.
2. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

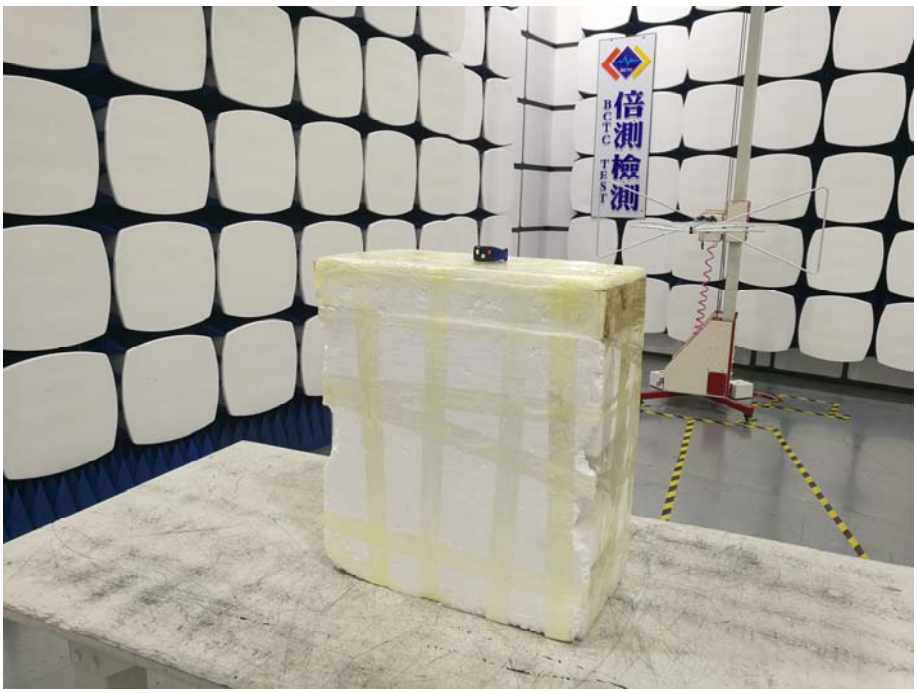
Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
PCS1900 Highest	74.69	Vertical	-74.92	3.17	0.38	-72.13	-13	PASS
	3819.60	Vertical	-46.84	7.79	3.53	-42.58		
	5729.40	Vertical	-42.30	9.88	5.02	-37.44		
	7639.20	Vertical	-36.48	10.25	5.54	-31.77		
	9549.00	Vertical	-43.28	11.38	6.16	-38.06		
	11458.80	Vertical	-46.13	14.56	6.72	-38.29		
	93.28	Horizontal	-74.25	3.75	0.51	-71.01		
	3819.60	Horizontal	-44.63	7.79	3.53	-40.37		
	5729.40	Horizontal	-42.75	9.88	5.02	-37.89		
	7639.20	Horizontal	-36.51	10.25	5.54	-31.8		
	9549.00	Horizontal	-41.36	11.38	6.16	-36.14		
	11458.80	Horizontal	-43.84	14.56	6.72	-36		

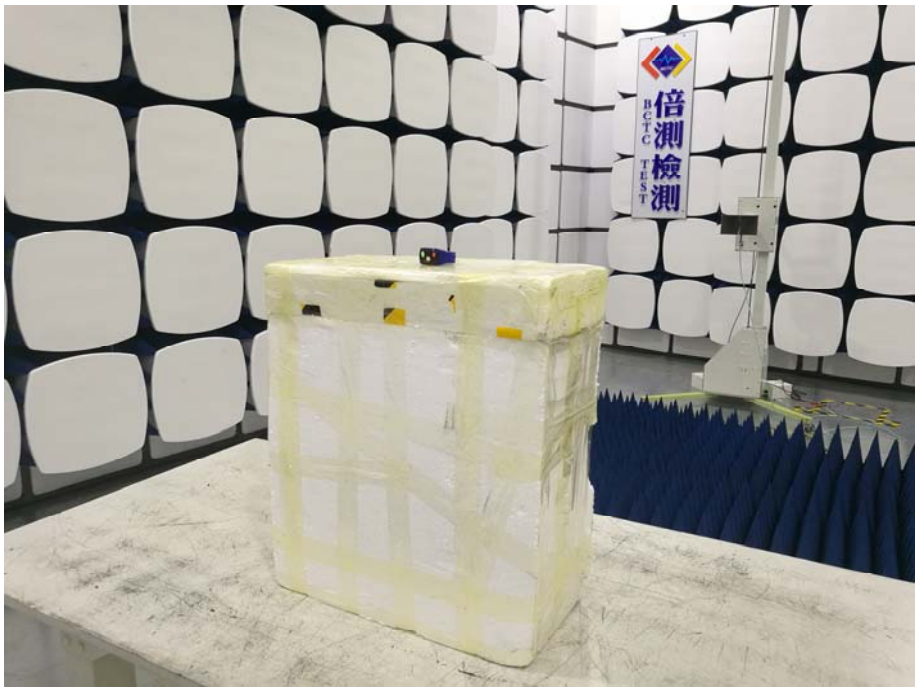
Remark:

1. Only show worest test data, there was not any unwanted emission detected to 10th foundation frequency.
2. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

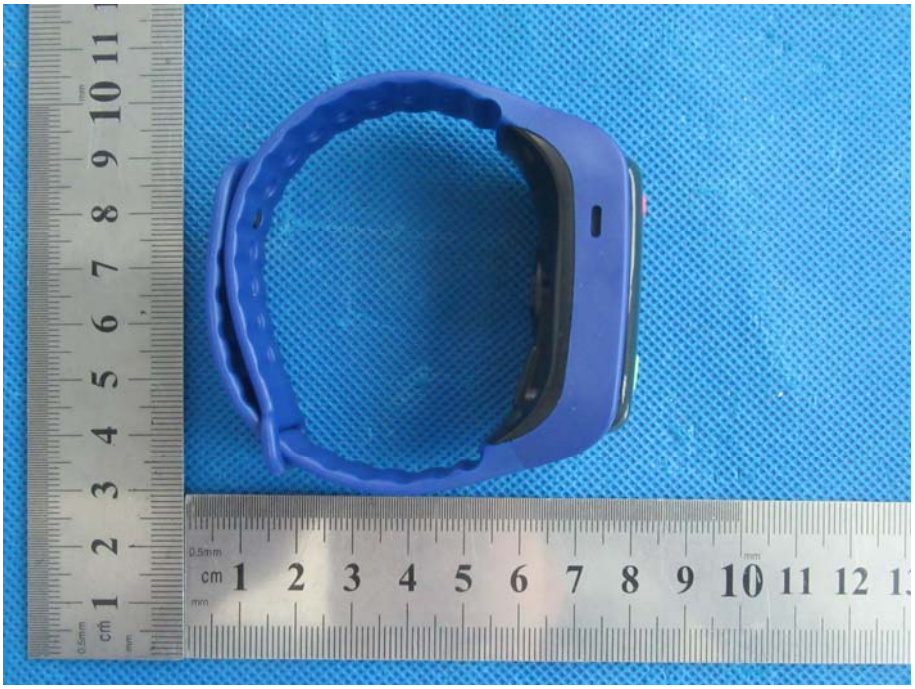
6. PHOTOGRAPHS OF TEST SET-UP

RE





7. PHOTOGRAPHS OF THE EUT

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