TEST REPORT

APPLICANT	:	BLU Products, Inc.
PRODUCT NAME	:	Smart Phone
MODEL NAME	:	G91S
BRAND NAME	:	BLU
FCC ID	:	YHLBLUG91S
STANDARD(S)	:	47 CFR Part 22 Subpart H 47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart L
RECEIPT DATE	:	2021-08-05
TEST DATE	:	2021-08-06 to 2021-09-23
ISSUE DATE	:	2021-09-28

Edited by: Zeng Xiaoying (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

NOTE: This document is issued by Shenzhen Morlab Communications Technology Co., Ltd., the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.

MORLAB
Shenzhen Morlab Communications Technology Co., Ltd.
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China
Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

DIRECTORY

1. Technical Information ····· 3
1.1. Applicant and Manufacturer Information ····· 3
1.2. Equipment Under Test (EUT) Description ····· 3
1.3. Maximum E.R.P./E.I.R.P. and Emission Designator ····· 5
1.4. Test Standards and Results ····· 6
1.5. Environmental Conditions ····· 7
2. 47 CFR Part 2, Part 22H , 24E&27L Requirements ····· 8
2.1. Conducted RF Output Power ····· 8
2.2. Peak to Average Ratio ····· 12
2.3. Occupied Bandwidth ····· 18
2.4. Frequency Stability ····· 27
2.5. Conducted Out of Band Emissions ····· 32
2.6. Band Edge ····· 40
2.7. Determining E.R.P. and/or E.I.R.P. from conducted RF output power measurements ····· 44
2.8. Radiated Out of Band Emissions ····· 48
Annex A Test Uncertainty ····· 72
Annex B Testing Laboratory Information ····· 73

Change History		
Version	Date	Reason for change
1.0	2021-09-28	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	BLU Products, Inc.
Applicant Address:	10814 NW 33rd St # 100 Doral, FL 33172,USA
Manufacturer:	BLU Products, Inc.
Manufacturer Address:	10814 NW 33rd St # 100 Doral, FL 33172,USA

1.2. Equipment Under Test (EUT) Description

Product Name:	Smart Phone	
Sample No.:	1#	
Hardware Version:	KK9Q_01	
Software Version:	BLU_G0550WW_V11.0.03.00_GENERIC_20210903_2205	
Modulation Type:	GSM/GPRS Mode with GMSK Modulation EDGE Mode with 8PSK Modulation WCDMA Mode with QPSK Modulation HSDPA Mode with QPSK Modulation HSUPA Mode with QPSK Modulation HSPA+ Mode with 16QAM Modulation	
Operating Frequency Range:	GSM 850MHz	Tx: 824MHz-849MHz
		Rx: 869MHz-894MHz
	GSM 1900MHz	Tx: 1850MHz-1910MHz
		Rx: 1930MHz-1990MHz
	WCDMA Band V	Tx: 824MHz-849MHz
		Rx: 869MHz-894MHz
	WCDMA Band IV	Tx: 1710MHz-1755MHz
		Rx: 2110MHz-2155MHz
	WCDMA Band II	Tx: 1850MHz-1910MHz
		Rx: 1930MHz-1990MHz

Antenna Type:	PIFA Antenna	
Antenna Gain:	GSM 850:	-3.70dBi
	GSM1900:	0.30dBi
	WCDMA Band V:	-3.70dBi
	WCDMA Band IV:	0.45dBi
	WCDMA Band II:	0.30dBi
Accessory Information:	Battery	
	Brand Name:	BLU
	Model No.:	C996749600P
	Serial No.:	N/A
	Capacity:	5900mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
	Manufacturer:	Zhongshan Tianmao Battery Co., Ltd.
	AC Adapter	
	Brand Name:	BLU
	Model No.:	US-WT-2000
	Serial No.:	N/A
	Rated Output:	5V⎓2000mA
	Rated Input:	100-240V~50/60Hz, 0.3A
	Manufacturer:	Shenzhen Tianyin Electronics Co.,Ltd

Note 1: The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula F(n)=824.2+0.2*(n-128), 128<=n<=251; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 189 (836.4MHz) and 251 (848.8MHz).

Note 2: The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula F(n)=1850.2+0.2*(n-512), 512<=n<=810; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661 (1880.0MHz) and 810 (1909.8MHz).The transmitter (Tx) frequency arrangement of the WCDMA Band V used by the EUT can be represented with the formula F(n)=826.4+0.2*(n-4132), 4132<=n<=4233; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 4132 (826.4MHz), 4182(836.4MHz) and 4233 (846.6MHz).

Note 3: The transmitter (Tx) frequency arrangement of the WCDMA IV band used by the EUT can be represented with the formula F(n)=1712.4+0.2*(n-1312), 1312<=n<=1513; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 1312 (1712.4MHz), 1413 (1732.6MHz) and 1513 (1752.6MHz).

Note 4: The transmitter (Tx) frequency arrangement of the WCDMA Band II used by the EUT can be represented with the formula F(n)=1852.4+0.2*(n-9262), 9262<=n<=9538; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).

Note 5: All test modes and data rates were considered and evaluated respectively by performing full test. Test modes are chosen to be reported as the worst case below:

GSM mode and EDGE mode for GSM 850;

GSM mode and EDGE mode for GSM 1900;

WCDMA mode for WCDMA band V;

WCDMA mode for WCDMA band IV;

WCDMA mode for WCDMA band II;

Note 6: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Maximum E.R.P./E.I.R.P. and Emission Designator

Test Mode	Maximum E.R.P./E.I.R.P. (W)	Emission Designator
GSM850(GSM)	0.475	254KGXW
GSM850(EDGE)	0.109	252KG7W
GSM1900(GSM)	1.119	251KGXW
GSM1900(EDGE)	0.458	253KG7W
WCDMA Band V	0.057	4M18F9W
WCDMA Band IV	0.243	4M19F9W
WCDMA Band II	0.248	4M18F9W

1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24 and Part 27 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2 (10-1-12 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-12 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-12 Edition)	Personal Communications Services
4	47 CFR Part 27 (10-1-12 Edition)	Miscellaneous Wireless Communications Services

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method determination/ Remark
1	2.1046	Conducted RF Output Power	Sep 23, 2021	Liang Yumei	PASS	No deviation
2	24.232(d)	Peak -Average Ratio	Aug 06, 2021	Li Huaijie	PASS	No deviation
3	2.1049	Occupied Bandwidth	Aug 06, 2021	Li Huaijie	PASS	No deviation
4	2.1055, 22.355, 24.235, 27.54	Frequency Stability	Aug 06, 2021	Li Huaijie	PASS	No deviation
5	2.1051, 22.917(a), 24.238(a), 27.53(h)	Conducted Out of Band Emissions	Aug 06, 2021	Li Huaijie	PASS	No deviation
6	2.1051, 22.917(a), 24.238(a), 27.53(h)	Band Edge	Aug 06, 2021	Li Huaijie	PASS	No deviation
7	22.913(a), 24.232(c) 27.50(d)	Transmitter Radiated Power (EIPR/E.R.P.)	Sep 23, 2021	Lin Jiayong	PASS	No deviation
8	2.1051,	Radiated Out	Aug 20&22,	Huang Zhiye	PASS	No deviation

	22.917(a), 24.238(a), 27.53(h)	of Band Emissions	2021			

Note 1: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03r01 and ANSI/TIA-603-E-2016.

Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 24.5dB contains two parts that cable loss 14.5dB and Attenuator 10dB.

Note 3: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 4: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR Part 2, Part 22H , 24E&27L Requirements

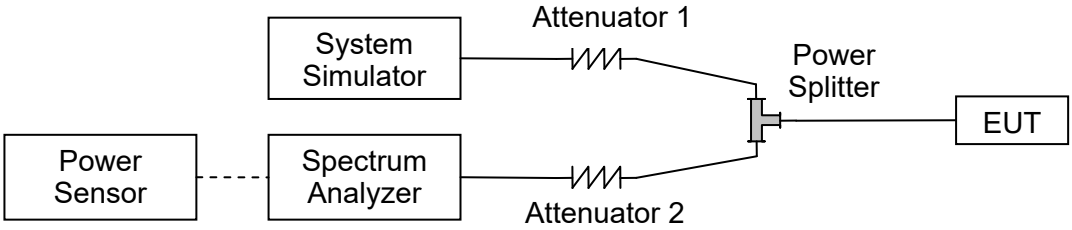
2.1. Conducted RF Output Power

2.1.1. Requirement

According to FCC section 2.1046(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).

2.1.2. Test Description

Test Setup:



The EUT 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 i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.1.3.Test Results

GSM850	Average Power (dBm)		
TX Channel	**128**	**189**	**251**
Frequency (MHz)	**824.2**	**836.4**	**848.8**
GSM 1 Tx slot	32.58	32.61	32.54
GPRS 1 Tx slot	32.58	32.62	32.53
GPRS 2 Tx slots	31.52	31.55	31.46
GPRS 3 Tx slots	29.36	29.45	29.38
GPRS 4 Tx slots	28.27	28.28	28.23
EDGE 1 Tx slot	26.13	26.24	26.15
EDGE 2 Tx slots	24.53	24.61	24.51
EDGE 3 Tx slots	21.62	21.82	21.66
EDGE 4 Tx slots	20.34	20.37	20.26

GSM1900	Average Power (dBm)		
TX Channel	**512**	**661**	**810**
Frequency (MHz)	**1850.2**	**1880**	**1909.8**
GSM 1 Tx slot	30.14	30.18	30.13
GPRS 1 Tx slot	30.15	30.19	30.15
GPRS 2 Tx slots	29.22	29.24	29.21
GPRS 3 Tx slots	27.20	27.25	27.15
GPRS 4 Tx slots	25.62	25.55	25.46
EDGE 1 Tx slot	26.21	26.31	26.22
EDGE 2 Tx slots	25.22	25.12	25.24
EDGE 3 Tx slots	22.46	22.46	22.35
EDGE 4 Tx slots	21.62	21.65	21.42

WCDMA Band V	Average Power (dBm)		
TX Channel	**4132**	**4182**	**4233**
Frequency (MHz)	**826.4**	**836.4**	**846.6**
RMC 12.2Kbps	23.38	23.43	23.36
HSDPA Subtest-1	22.19	22.15	22.25
HSDPA Subtest-2	22.16	22.10	22.27
HSDPA Subtest-3	21.65	21.74	21.84
HSDPA Subtest-4	21.70	21.73	21.83
HSUPA Subtest-1	21.71	21.71	21.76
HSUPA Subtest-2	22.17	22.12	22.21
HSUPA Subtest-3	21.16	21.18	21.30
HSUPA Subtest-4	22.19	22.09	22.32
HSUPA Subtest-5	21.17	21.15	21.24
HSPA+ (16QAM) Subtest-1	21.17	21.20	21.28

WCDMA Band IV	Average Power (dBm)		
TX Channel	**1312**	**1413**	**1513**
Frequency (MHz)	**1712.4**	**1732.6**	**1752.6**
RMC 12.2Kbps	23.41	23.46	23.37
HSDPA Subtest-1	22.12	22.04	22.07
HSDPA Subtest-2	22.05	22.07	22.02
HSDPA Subtest-3	21.57	21.52	21.54
HSDPA Subtest-4	21.55	21.52	21.48
HSUPA Subtest-1	21.55	21.56	21.53
HSUPA Subtest-2	22.06	21.99	22.01
HSUPA Subtest-3	21.10	21.03	21.07
HSUPA Subtest-4	22.09	22.04	22.03
HSUPA Subtest-5	21.02	21.00	21.00
HSPA+ (16QAM) Subtest-1	21.16	21.02	20.99

WCDMA Band II	Average Power (dBm)		
TX Channel	**9262**	**9400**	**9538**
Frequency (MHz)	**1852.4**	**1880.0**	**1907.6**
RMC 12.2Kbps	23.62	23.64	23.61
HSDPA Subtest-1	22.34	22.40	22.34
HSDPA Subtest-2	22.29	22.38	22.37
HSDPA Subtest-3	21.78	21.84	21.87
HSDPA Subtest-4	21.76	21.85	21.87
HSUPA Subtest-1	21.80	21.89	21.85
HSUPA Subtest-2	22.32	22.39	22.31
HSUPA Subtest-3	21.30	21.37	21.35
HSUPA Subtest-4	22.28	22.42	22.36
HSUPA Subtest-5	21.31	21.33	21.32
HSPA+ (16QAM) Subtest-1	21.29	21.35	21.33

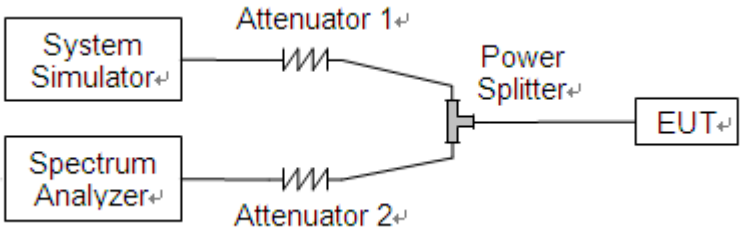
2.2. Peak to Average Ratio

2.2.1.Requirement

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

2.2.2.Test Description

Test Setup:



The EUT 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 i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.2.3.Test procedure

1 .For GSM/EDGE operating mode:

a. Set RBW=1MHz, VBW=3MHz, peak detector in spectrum analyzer.
b. Set EUT in maximum output power, and triggered the bust signal.
c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average ratio.

2. For UMTS operating mode:

a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

2.2.4.Test Result

A. Test Verdict:

GSM1900					
Mode	**Channel**	**Frequency (MHz)**	**Peak to Average ratio (dB)**	**Limit (dB)**	**Verdict**
GSM	512	1850.2	0.006	13	PASS
	661	1880.0	0.030		PASS
	810	1909.8	0.011		PASS
EDGE	512	1850.2	0.815		PASS
	661	1880.0	0.835		PASS
	810	1909.8	1.072		PASS

WCDMA Band IV					
Mode	**Channel**	**Frequency (MHz)**	**Peak to Average ratio (dB)**	**Limit (dB)**	**Verdict**
WCDMA	1312	1712.4	2.80	13	PASS
	1413	1732.6	2.73		PASS
	1513	1752.6	2.93		PASS

WCDMA Band II					
Mode	**Channel**	**Frequency (MHz)**	**Peak to Average ratio (dB)**	**Limit (dB)**	**Verdict**
WCDMA	9262	1852.4	2.97	13	PASS
	9400	1880.0	2.70		PASS
	9538	1907.6	2.76		PASS

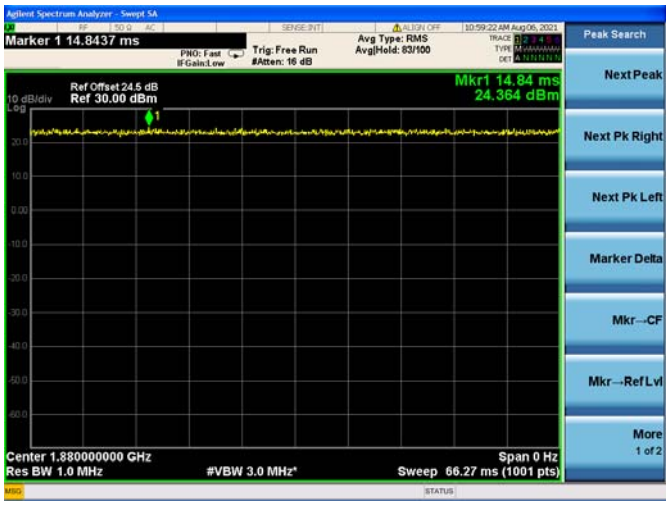
GSM1900(GSM), CH512, 1850.2MHz

GSM1900(GSM), CH661, 1880.0MHz

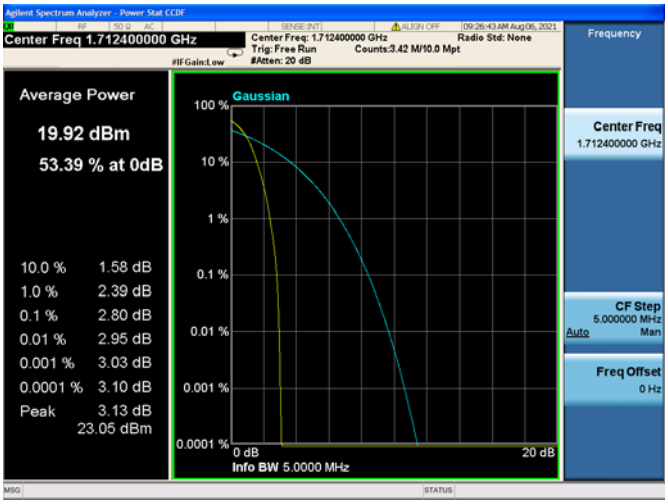
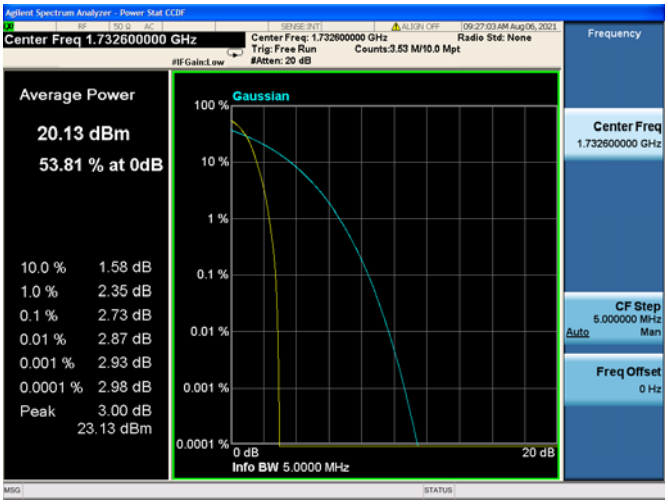
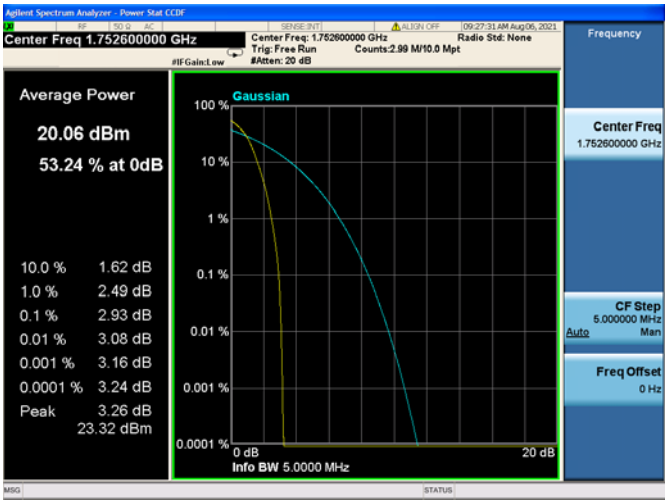
GSM1900(GSM), CH810, 1909.8MHz

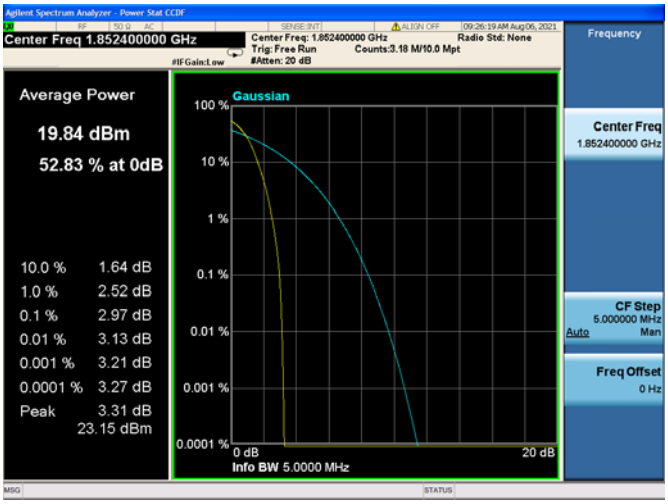
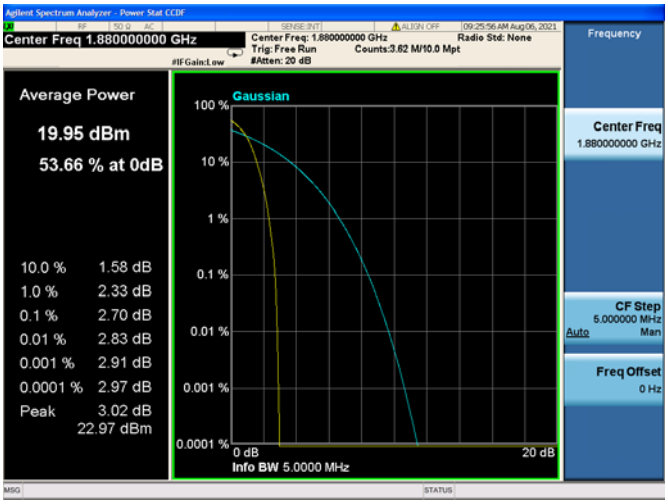
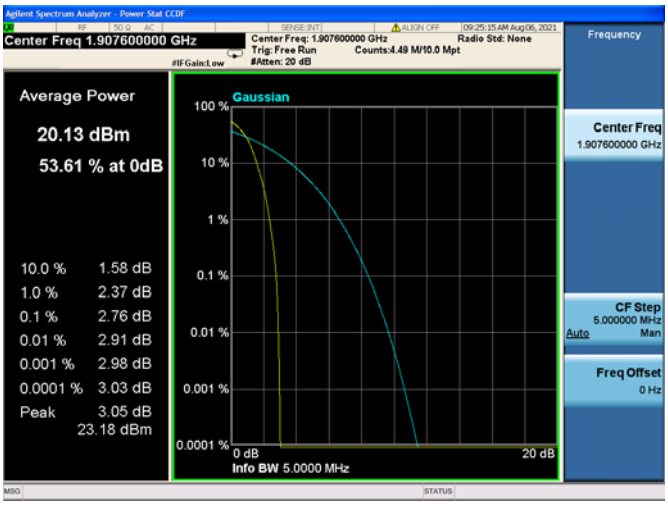
GSM1900(EDGE), CH512, 1850.2MHz

GSM1900(EDGE), CH661, 1880.0MHz



GSM1900(EDGE), CH810, 1909.8MHz

WCDMA Band IV, CH1312, 1712.4MHz	WCDMA Band IV, CH1413, 1732.6MHz
	
WCDMA Band IV, CH1513, 1752.6MHz	
	

WCDMA Band II, CH9262, 1852.4MHz	WCDMA Band II, CH9400, 1880.0MHz
	
WCDMA Band II, CH9538, 1907.6MHz	
	

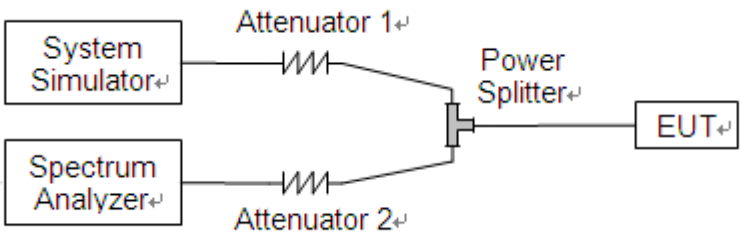
2.3. Occupied Bandwidth

2.3.1.Requirement

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.

2.3.2.Test Description

Test Setup:



The EUT 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 i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.3.3.Test Result

GSM850				
Mode	**Channel**	**Frequency (MHz)**	**99% Occupied Bandwidth (kHz)**	**26dB Bandwidth (kHz)**
GSM	128	824.2	245.77	316.50
	189	836.4	245.70	315.50
	251	848.8	253.79	313.80
EDGE	128	824.2	251.12	318.90
	189	836.4	251.43	310.50
	251	848.8	251.92	312.60

GSM1900				
Mode	**Channel**	**Frequency (MHz)**	**99% Occupied Bandwidth (kHz)**	**26dB Bandwidth (kHz)**
GSM	512	1850.2	247.37	307.80
	661	1880.0	242.23	311.80
	810	1909.8	251.07	311.30
EDGE	512	1850.2	251.91	322.40
	661	1880.0	240.60	310.60
	810	1909.8	252.87	311.40

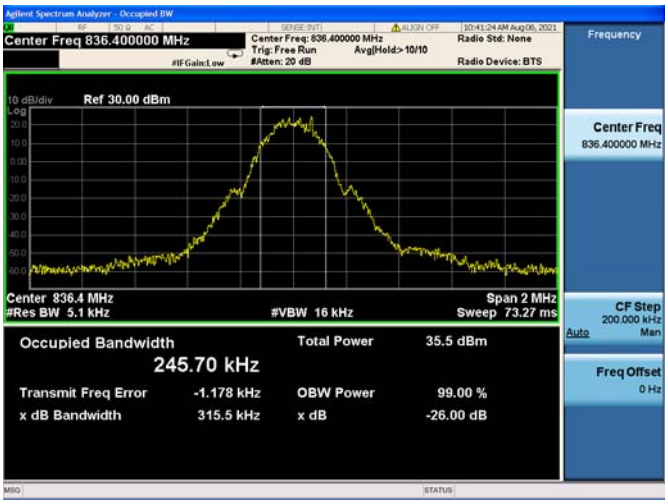
WCDMA Band V				
Mode	**Channel**	**Frequency (MHz)**	**99% Occupied Bandwidth (MHz)**	**26dB Bandwidth (MHz)**
WCDMA	4132	826.4	4.17	4.74
	4182	836.4	4.18	4.72
	4233	846.6	4.17	4.72

WCDMA Band IV				
Mode	**Channel**	**Frequency (MHz)**	**99% Occupied Bandwidth (MHz)**	**26dB Bandwidth (MHz)**
WCDMA	1312	1712.4	4.18	4.74
	1413	1732.6	4.18	4.73
	1513	1752.6	4.19	4.71

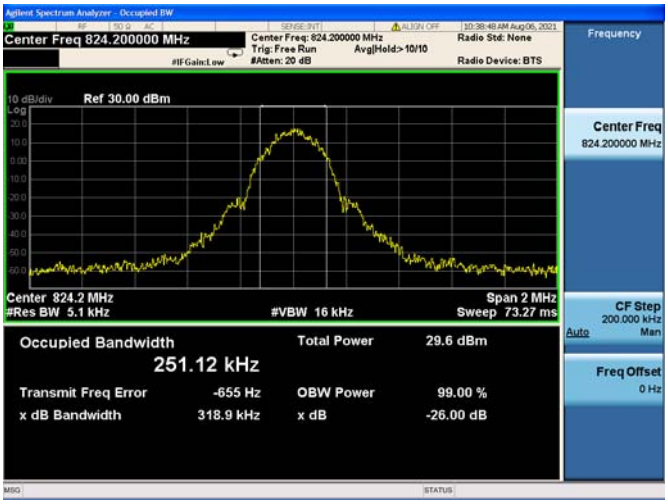
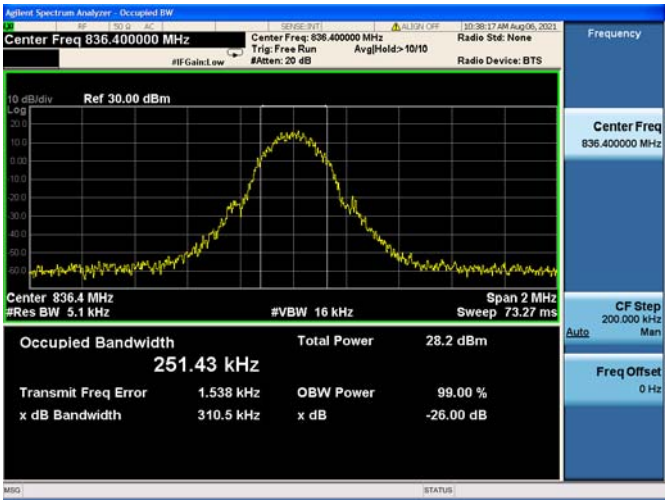
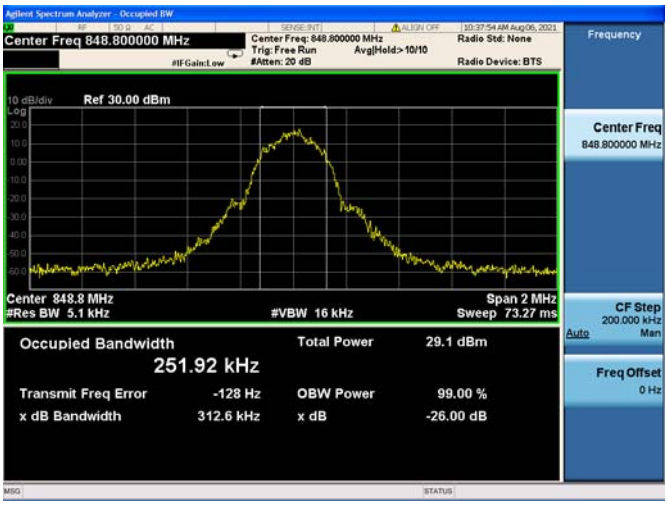
WCDMA Band II				
Mode	**Channel**	**Frequency (MHz)**	**99% Occupied Bandwidth (MHz)**	**26dB Bandwidth (MHz)**
WCDMA	9262	1852.4	4.17	4.73
	9400	1880.0	4.18	4.74
	9538	1907.6	4.17	4.71

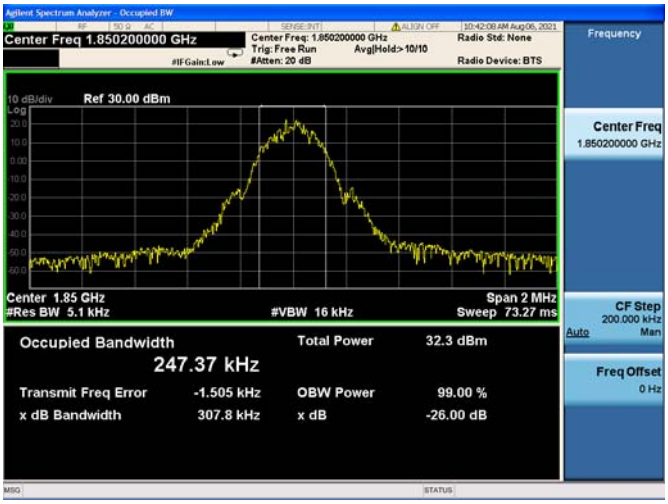
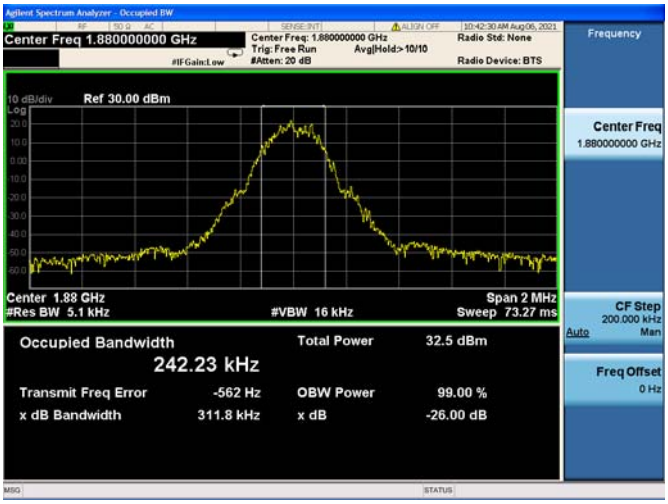
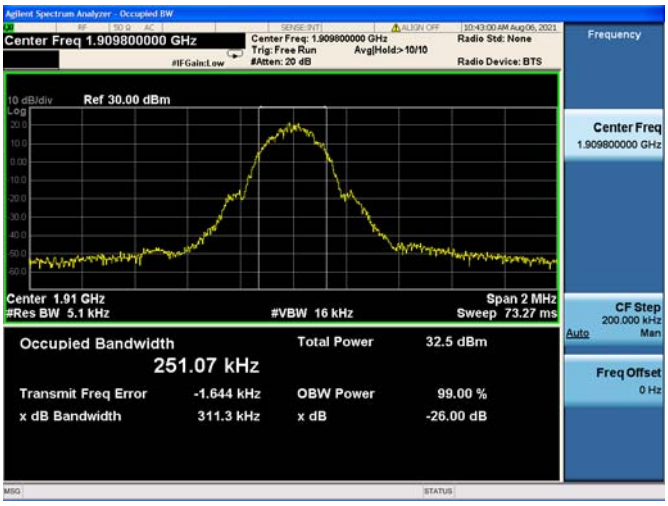
GSM850(GSM), CH128, 824.2MHz

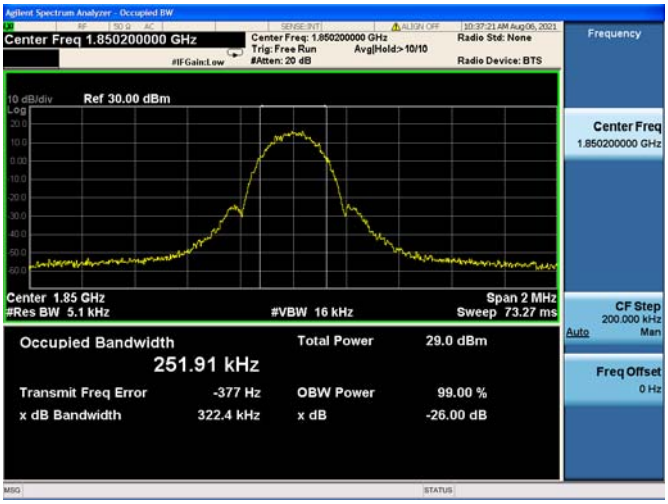
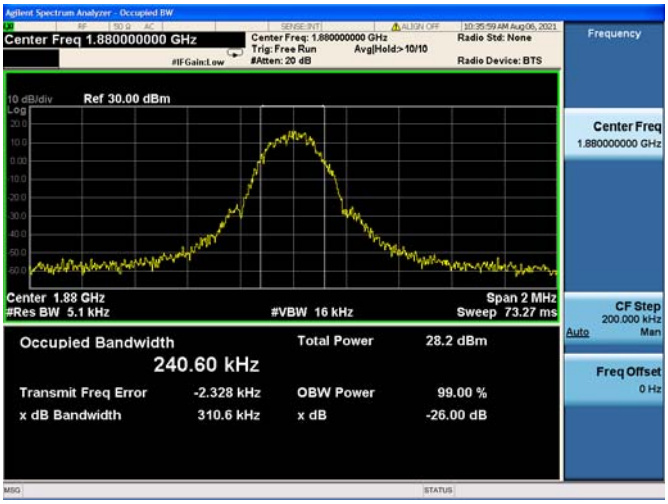
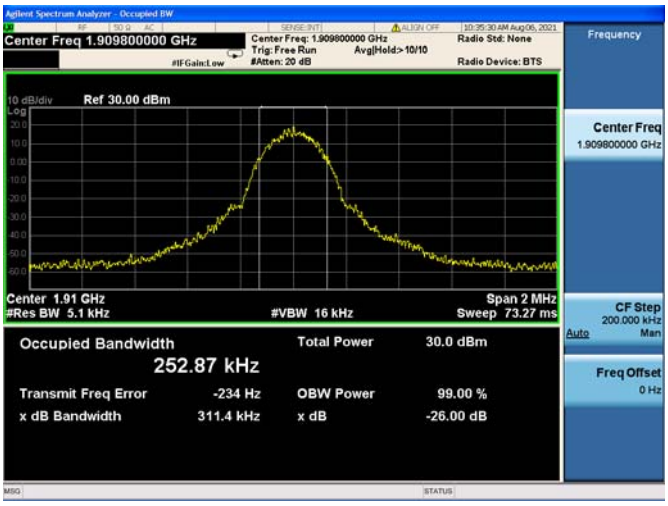
GSM850(GSM), CH189, 836.4MHz

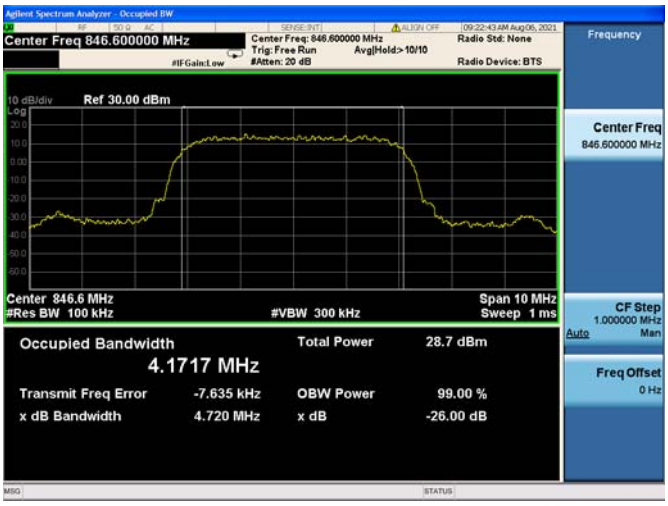


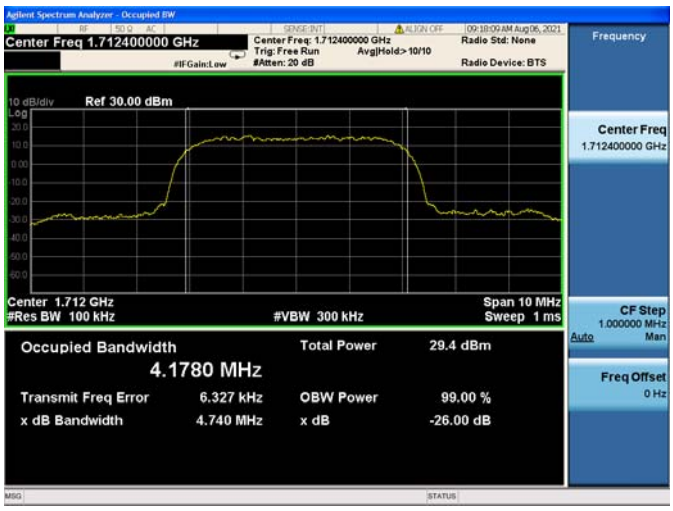
GSM850(GSM), CH251, 848.8MHz

GSM850(EDGE), CH128, 824.2MHz	GSM850(EDGE), CH189, 836.4MHz
	
GSM850(EDGE), CH251, 848.8MHz	
	

GSM1900(GSM), CH512, 1850.2MHz	GSM1900(GSM), CH661, 1880.0MHz
	
GSM1900(GSM), CH810, 1909.8MHz	
	

GSM1900(EDGE), CH512, 1850.2MHz	GSM1900(EDGE), CH661, 1880.0MHz
	
GSM1900(EDGE), CH810, 1909.8MHz	
	

WCDMA Band V, CH4132, 826.4MHz	WCDMA Band V, CH4182, 836.4MHz
WCDMA Band V, CH4233, 846.6MHz	
	

WCDMA Band IV, CH1312, 1712.4MHz	WCDMA Band IV, CH1413, 1732.6MHz
	
WCDMA Band IV, CH1513, 1752.6MHz	

WCDMA Band II, CH9262, 1852.4MHz	WCDMA Band II, CH9400, 1880.0MHz
WCDMA Band II, CH9538, 1907.6MHz	

2.4. Frequency Stability

2.4.1.Requirement

According to FCC section 22.355, 24.235 and 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:

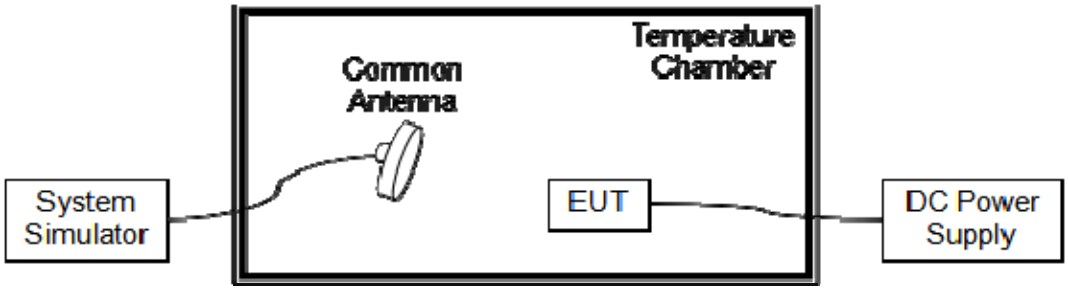
(a) The temperature is varied from-30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

Note: The operating temperature of EUT is from -10°C to 55°C, which are specified by the applicant.

2.4.2.Test Description

Test Setup:



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 i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS via a Common Antenna.

2.4.3.Test Result

The nominal, highest and lowest extreme voltages are separately 3.85V, 4.40V and 3.45V, which are specified by the applicant; the normal temperature here used is 20°C.

GSM850(GSM), CH189, 836.4MHz Limit =±2.5ppm					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20(Ref)	17	0.020	PASS
100		-10	49	0.059	
100		0	-27	-0.032	
100		+10	38	0.045	
100		+20	18	0.022	
100		+30	-40	-0.048	
100		+40	-51	-0.061	
100		+50	36	0.043	
100		+55	43	0.051	
115	4.40	+20	-45	-0.054	
85	3.45	+20	41	0.049	

GSM850(EDGE), CH189, 836.4MHz Limit =±2.5ppm					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20(Ref)	36	0.043	PASS
100		-10	36	0.043	
100		0	19	0.023	
100		+10	47	0.056	
100		+20	-39	-0.047	
100		+30	-32	-0.038	
100		+40	-39	-0.047	
100		+50	56	0.067	
100		+55	14	0.017	
115	4.40	+20	35	0.042	
85	3.45	+20	-16	-0.019	

GSM1900(GSM), CH661, 1880.0MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20(Ref)	53	0.028	PASS
100		-10	-53	-0.028	
100		0	-58	-0.031	
100		+10	24	0.013	
100		+20	-40	-0.021	
100		+30	-45	-0.024	
100		+40	-36	-0.019	
100		+50	28	0.015	
100		+55	40	0.021	
115	4.40	+20	-56	-0.030	
85	3.45	+20	-14	-0.007	

GSM1900(EDGE), CH661, 1880.0MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20(Ref)	15	0.008	PASS
100		-10	51	0.027	
100		0	54	0.029	
100		+10	45	0.024	
100		+20	20	0.011	
100		+30	26	0.014	
100		+40	26	0.014	
100		+50	50	0.027	
100		+55	19	0.010	
115	4.40	+20	19	0.010	
85	3.45	+20	40	0.021	

WCDMA Band V, CH4182, 836.4MHz Limit =±2.5ppm					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20(Ref)	28	0.033	PASS
100		-10	-44	-0.053	
100		0	49	0.059	
100		+10	19	0.023	
100		+20	-54	-0.065	
100		+30	15	0.018	
100		+40	27	0.032	
100		+50	42	0.050	
100		+55	29	0.035	
115	4.40	+20	-30	-0.036	
85	3.45	+20	29	0.035	

WCDMA Band IV, CH1413, 1732.6MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20(Ref)	-17	-0.010	PASS
100		-10	20	0.012	
100		0	57	0.033	
100		+10	34	0.020	
100		+20	50	0.029	
100		+30	-28	-0.016	
100		+40	52	0.030	
100		+50	47	0.027	
100		+55	43	0.025	
115	4.40	+20	36	0.021	
85	3.45	+20	32	0.018	

WCDMA Band II, CH9400, 1880.0MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20(Ref)	32	0.017	PASS
100		-10	-27	-0.014	
100		0	-37	-0.020	
100		+10	21	0.011	
100		+20	48	0.026	
100		+30	23	0.012	
100		+40	21	0.011	
100		+50	-36	-0.019	
100		+55	-19	-0.010	
115	4.40	+20	-30	-0.016	
85	3.45	+20	-25	-0.013	

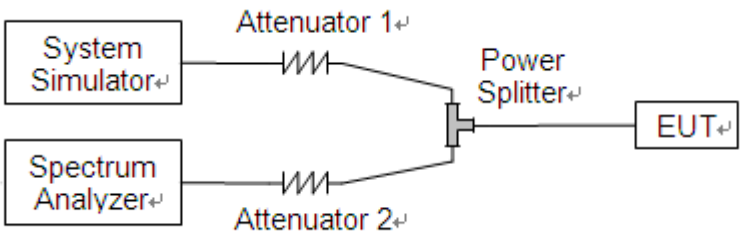
2.5. Conducted Out of Band Emissions

2.5.1. Requirement

According to FCC section 22.917(a), 24.238(a) and 27.53(h) 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 measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency.

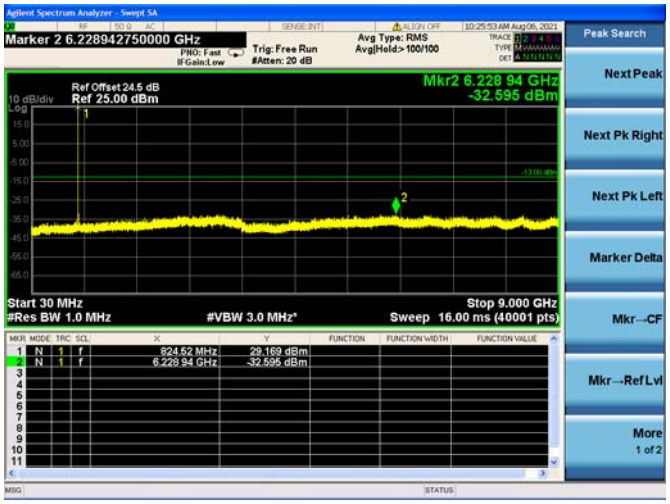
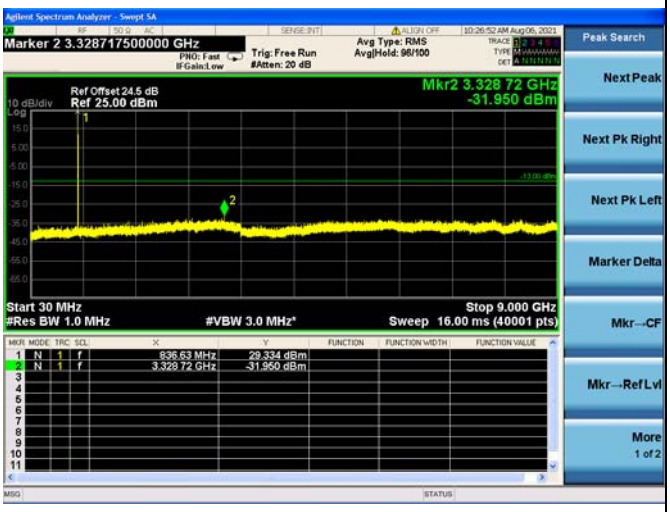
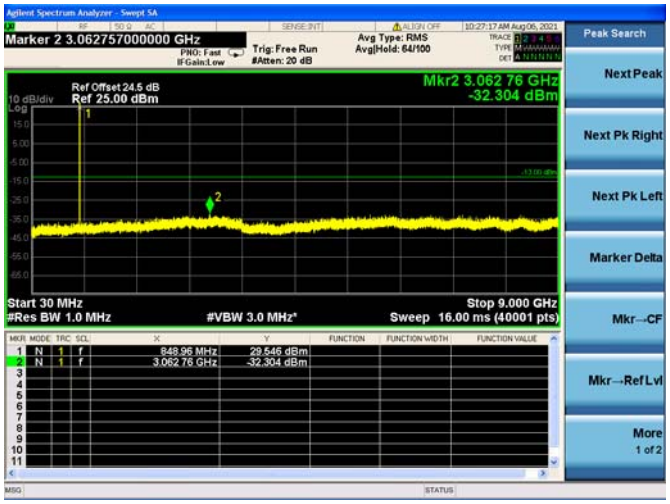
2.5.2. Test Description

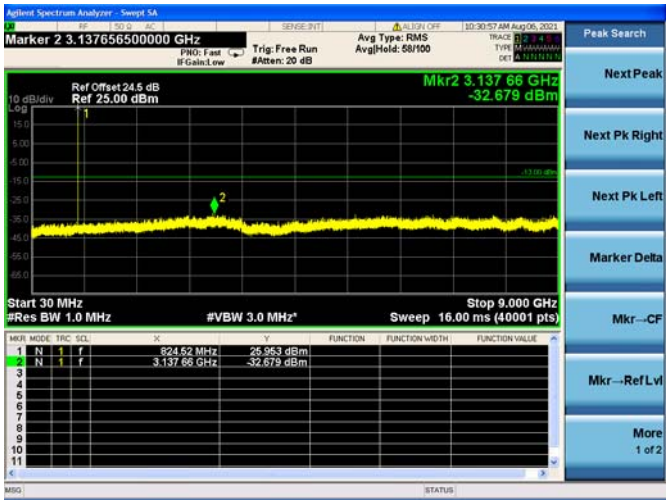
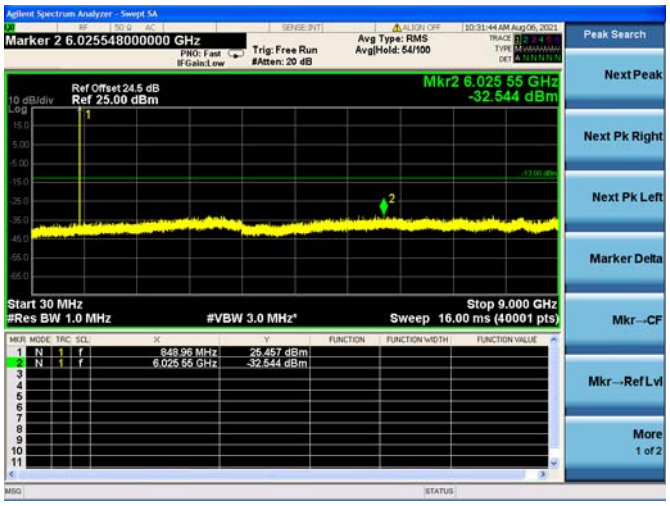
Test Setup:

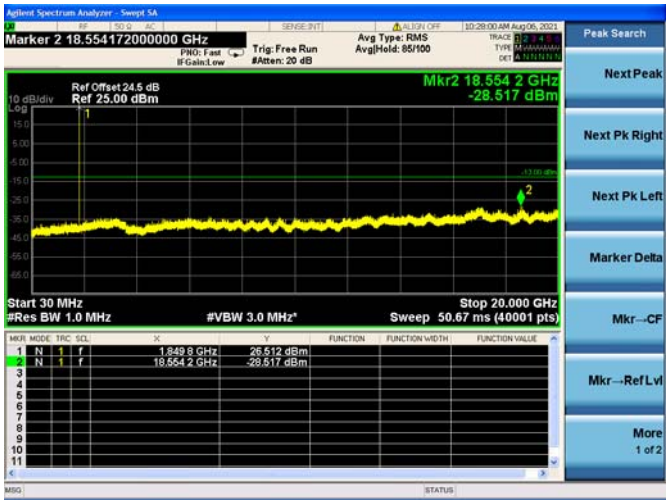
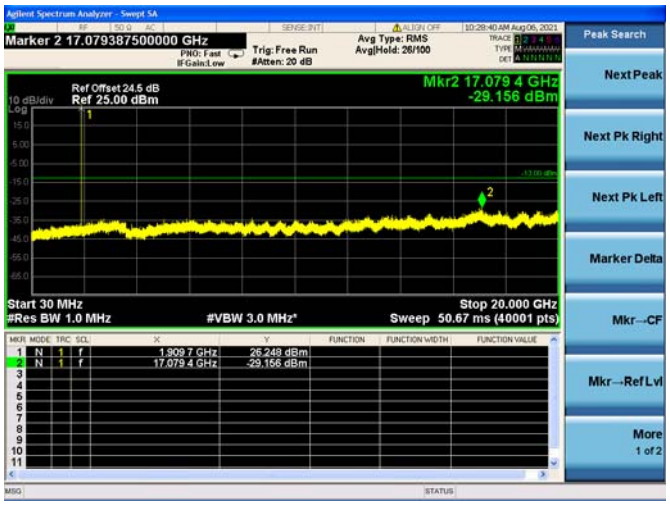


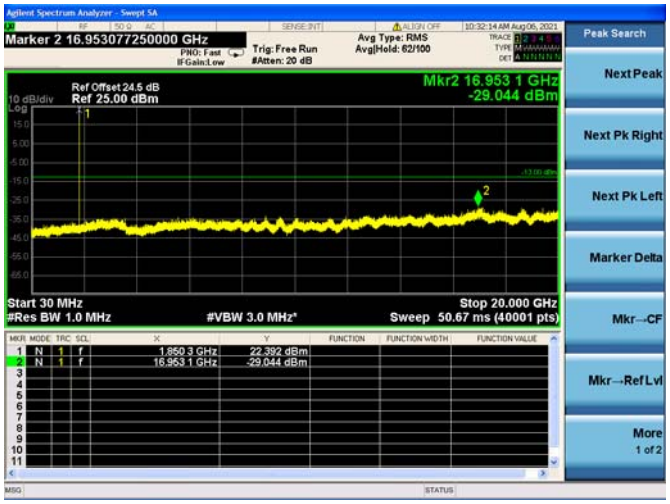
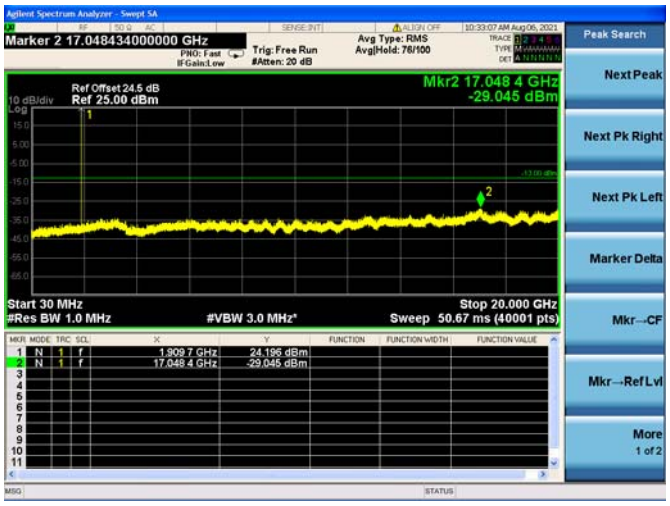
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

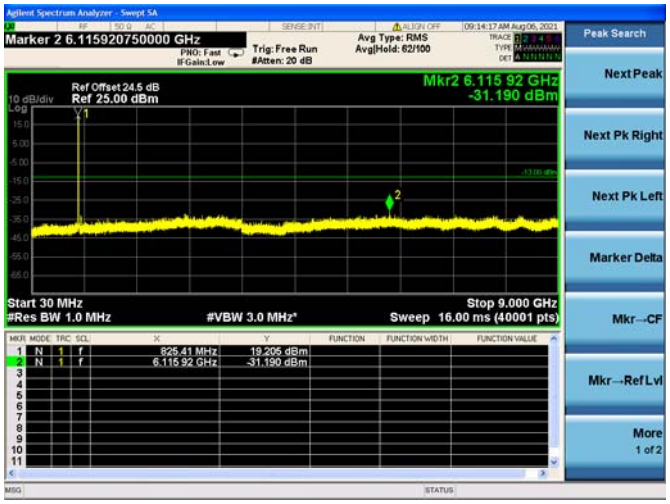
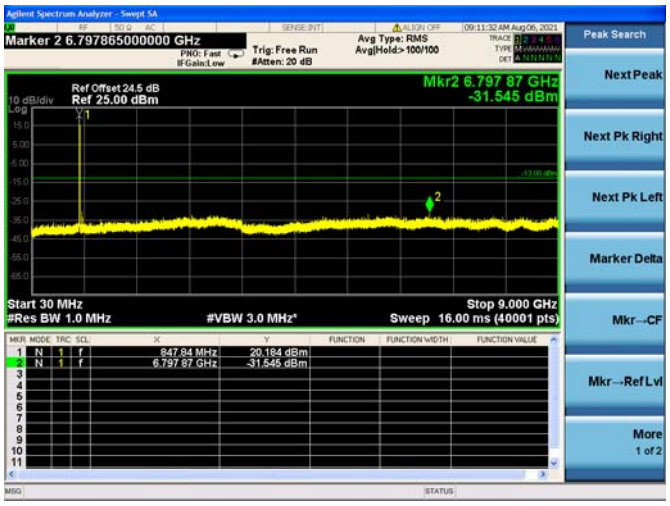
2.5.3.Test Result

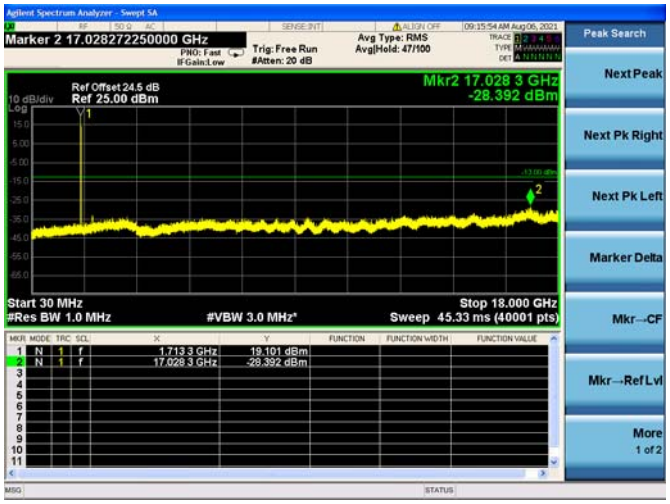
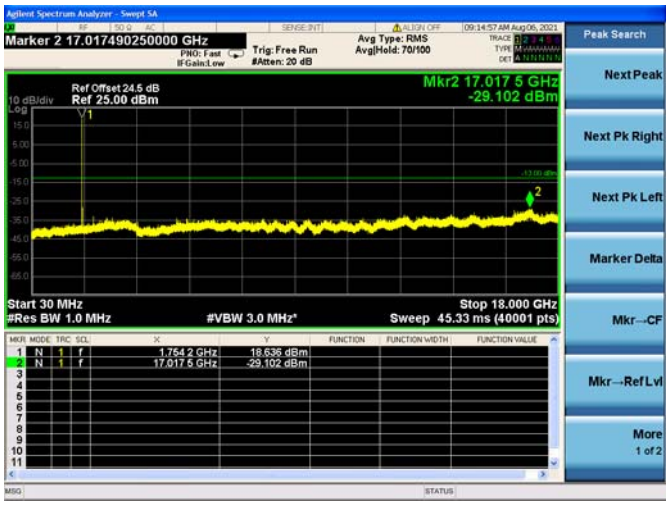
GSM850(GSM), CH128, 824.2MHz	GSM850(GSM), CH189, 836.4MHz
	
GSM850(GSM), CH251, 848.8MHz	
	

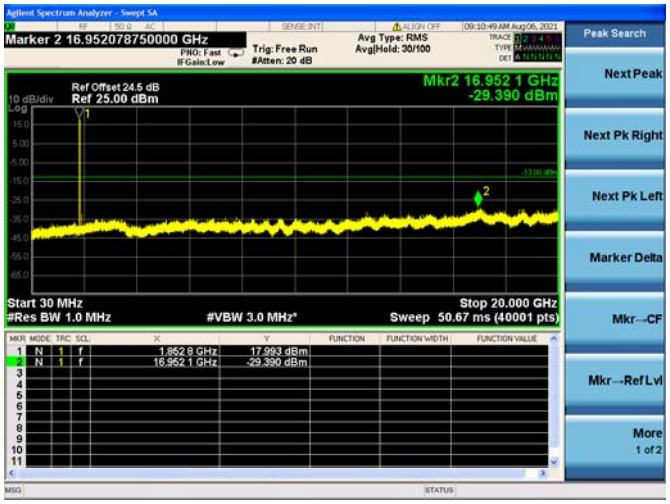
GSM850(EDGE), CH128, 824.2MHz	GSM850(EDGE), CH189, 836.4MHz
	
GSM850(EDGE), CH251, 848.8MHz	
	

GSM1900(GSM), CH512, 1850.2MHz	GSM1900(GSM), CH661, 1880.0MHz
	
GSM1900(GSM), CH810, 1909.8MHz	
	

GSM1900(EDGE), CH512, 1850.2MHz	GSM1900(EDGE), CH661, 1880.0MHz
	
GSM1900(EDGE), CH810, 1909.8MHz	
	

WCDMA Band V, CH4132, 826.4MHz	WCDMA Band V, CH4182, 836.4MHz
	
WCDMA Band V, CH4233, 846.6MHz	
	

WCDMA Band IV,CH1312, 1712.4MHz	WCDMA Band IV, CH1413, 1732.6MHz
	
WCDMA Band IV, CH1513, 1752.6MHz	
	

WCDMA Band II, CH9262, 1852.4MHz	WCDMA Band II, CH9400, 1880.0MHz
	
WCDMA Band II, CH9538, 1907.6MHz	

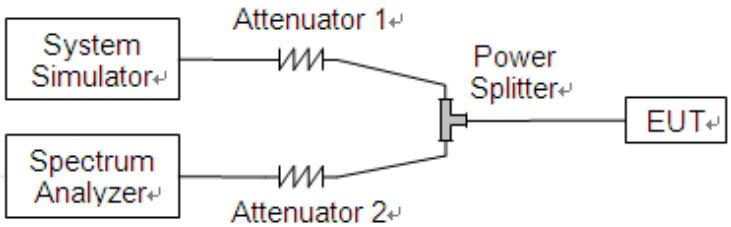
2.6. Band Edge

2.6.1.Requirement

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

2.6.2.Test Description

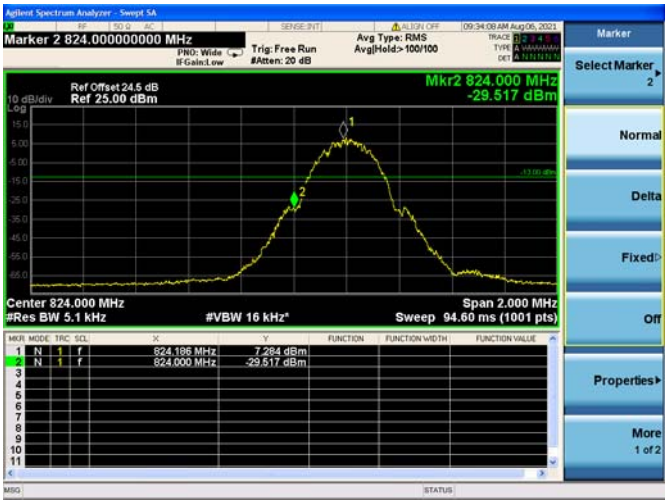
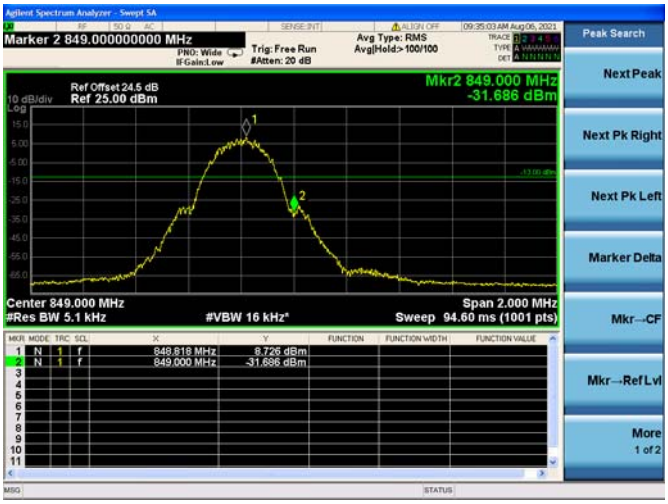
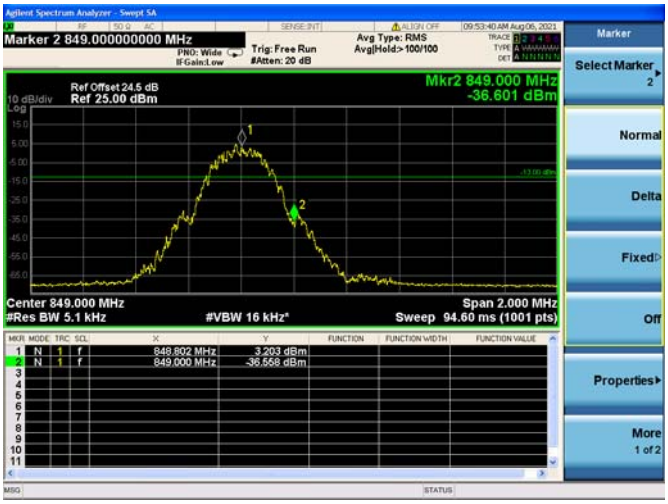
Test Setup:

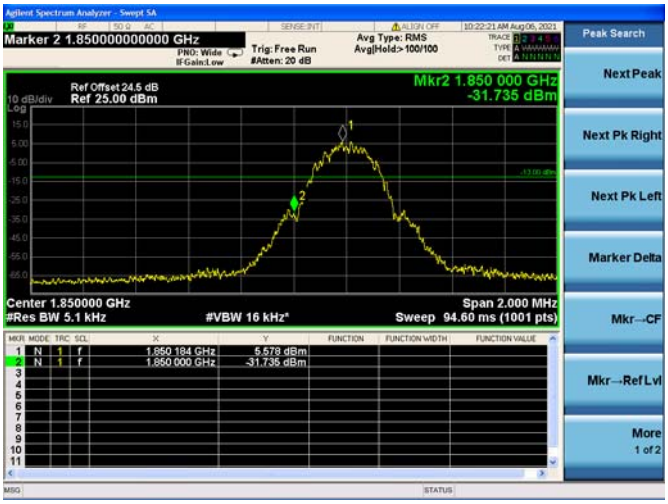
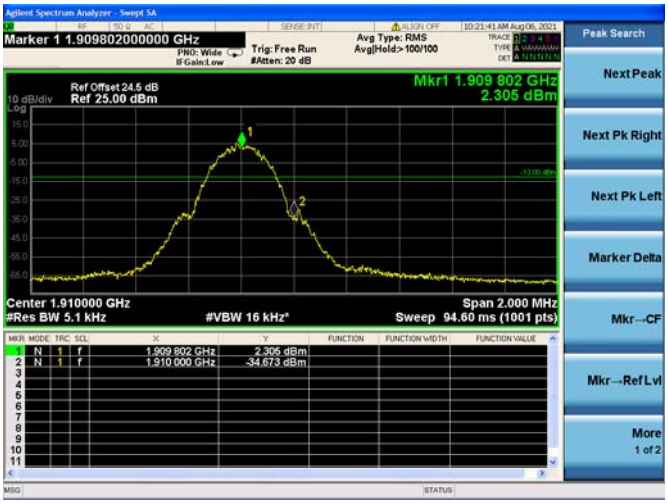
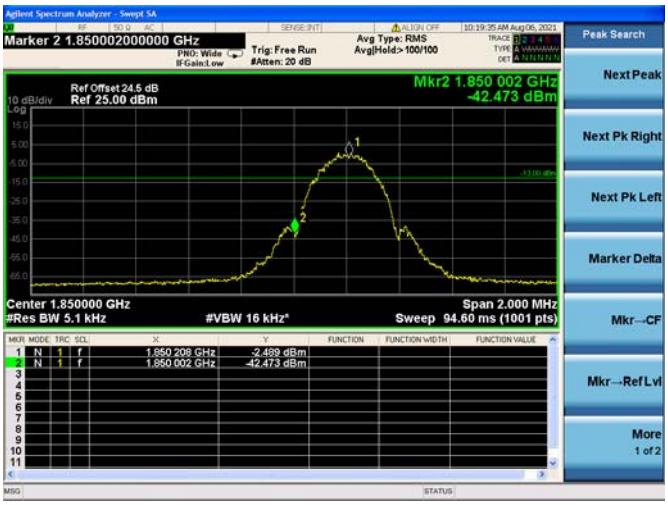
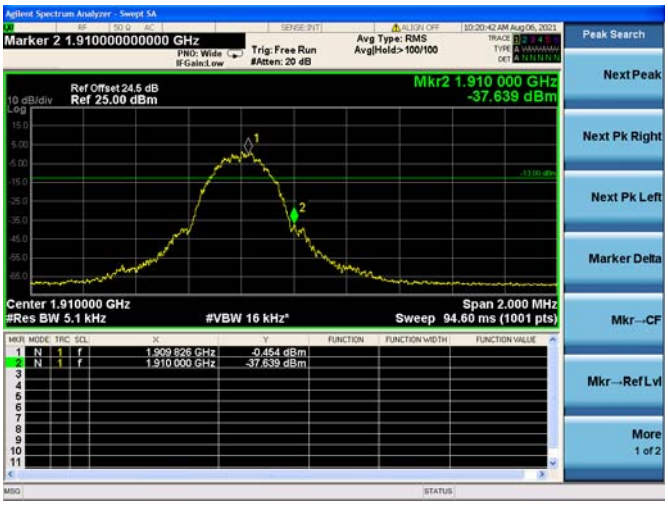


The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

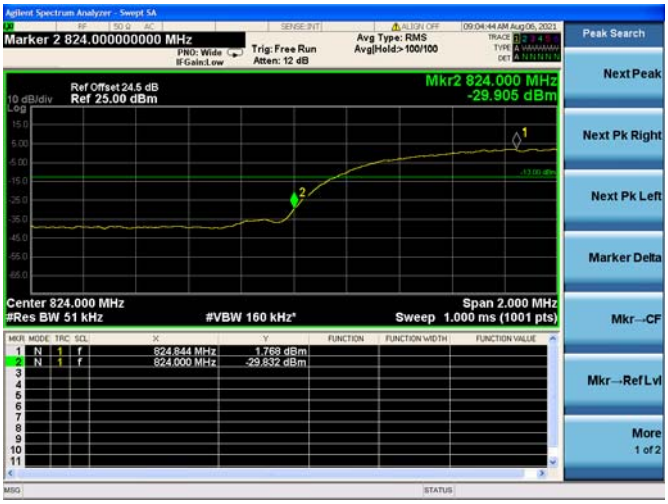
2.6.3.Test Result

The lowest and highest channels are tested to verify the band edge emissions.

GSM850(GSM), CH128, 824.2MHz	GSM850(GSM), CH251, 848.8MHz
	
GSM850(EDGE), CH128, 824.2MHz	**GSM850(EDGE), CH251, 848.8MHz**
	

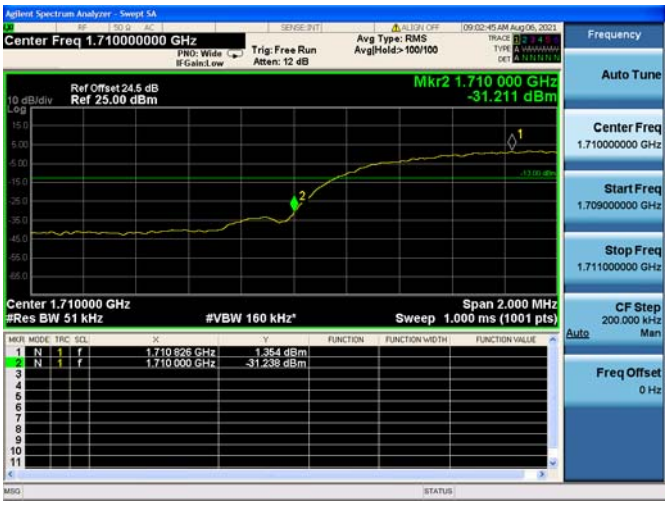
GSM1900(GSM), CH512, 1850.2MHz	GSM1900(GSM), CH810, 1909.8MHz
	
GSM1900(EDGE), CH512, 1850.2MHz	**GSM1900(EDGE), CH810, 1909.8MHz**
	

WCDMA Band V, CH4132, 826.4MHz



WCDMA Band V, CH4233, 846.6MHz

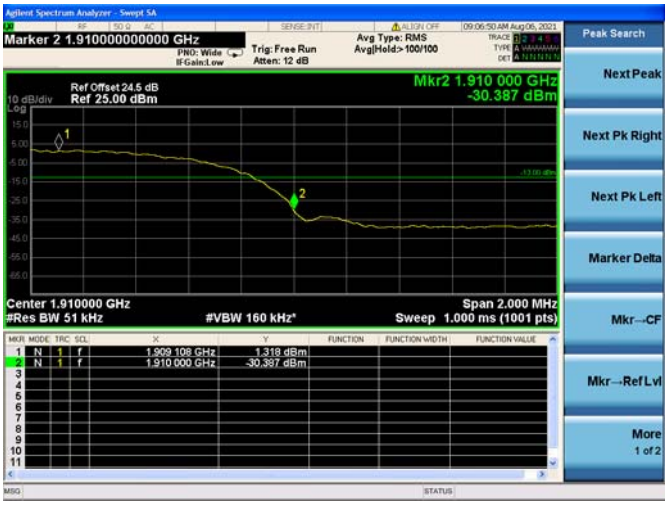
WCDMA Band IV, CH1312, 1712.4MHz



WCDMA Band IV, CH1513, 1752.6MHz

WCDMA Band II, CH9262, 1852.4MHz

WCDMA Band II, CH9538, 1907.6MHz



2.7. Determining E.R.P. and/or E.I.R.P. from conducted RF output power measurements

2.7.1. Requirement

According to FCC section 22.913, the Effective Radiated Power (E.R.P.) of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
According to FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.
According to FCC section 27.50, mobile, and portable (hand-held) stations is limited to 1 Watts e.i.r.p. peak power.

2.7.2. Test Description

The test setups refer to section 2.1.3
A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power (i.e. GSM850MHz band Power Control Level (PCL) = 5/19 and Power Class = 4, GSM1900MHz band Power Control Level (PCL) = 0/15 and Power Class = 1), and only the test result of the maximum output power was recorded. Please refer to section 2.1.3 of this report.
The relevant equation for determining the maximum E.R.P. or E.I.R.P. from the measured RF output power is given in Equation (1) as follows:
E.R.P. or E.I.R.P. = $P_{Meas} + G_T$
Where:
E.R.P. or E.I.R.P. effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, e.g., dBm or dBW)
P_{Meas} measured transmitter output power or PSD, in dBm or dBW
G_T gain of the transmitting antenna, in dBd (E.R.P.) or dBi (E.I.R.P.)
For devices utilizing multiple antennas, see ANSI C63.25-2015 6.4 for guidance with respect to determining the effective array transmit antenna gain term to be used in the above equation.
The following equations demonstrate the mathematical relationship between E.R.P. and E.I.R.P.:
a) E.R.P. = E.I.R.P. − 2.15, where E.R.P. and E.I.R.P. are expressed in consistent units.
b) E.I.R.P. = E.R.P. + 2.15, where E.R.P. and E.I.R.P. are expressed in consistent units.

2.7.3.Test Result

GSM850								
Band	Channel	Frequency (MHz)	PCL	Measured E.R.P.		Limit		Verdict
				dBm	W	dBm	W	
GSM	128	824.20	5	26.73	0.471	38.5	7	PASS
	189	836.40	5	26.76	0.474			PASS
	251	848.80	5	26.69	0.467			PASS
GPRS	128	824.20	5	26.73	0.471	38.5	7	PASS
	189	836.40	5	26.77	0.475			PASS
	251	848.80	5	26.68	0.466			PASS
EDGE	128	824.20	5	20.28	0.107	38.5	7	PASS
	189	836.40	5	20.39	0.109			PASS
	251	848.80	5	20.30	0.107			PASS
Note 1: For the GPRS and EDGE mode, all the slots were tested and just the worst data were recorded in this report.								

GSM1900								
Band	Channel	Frequency (MHz)	PCL	Measured E.I.R.P.		Limit		Verdict
				dBm	W	dBm	W	
GSM	512	1850.2	0	30.44	1.107	33	2	PASS
	661	1880.0	0	30.48	1.117			PASS
	810	1909.8	0	30.43	1.104			PASS
GPRS	512	1850.2	0	30.45	1.109	33	2	PASS
	661	1880.0	0	30.49	1.119			PASS
	810	1909.8	0	30.45	1.109			PASS
EDGE	512	1850.2	0	26.51	0.448	33	2	PASS
	661	1880.0	0	26.61	0.458			PASS
	810	1909.8	0	26.52	0.449			PASS
Note 1: For the GPRS and EDGE mode, all the slots were tested and just the worst data were recorded in this report.								

WCDMA Band V							
Band	Channel	Frequency (MHz)	Measured E.R.P.		Limit		Verdict
			dBm	W	dBm	W	
WCDMA	4132	826.4	17.53	0.057	38.5	7	PASS
	4182	836.4	17.58	0.057			PASS
	4233	846.6	17.51	0.056			PASS
HSDPA	4132	826.4	16.34	0.043	38.5	7	PASS
	4182	836.4	16.30	0.043			PASS
	4233	846.6	16.40	0.044			PASS
HSUPA	4132	826.4	16.34	0.043	38.5	7	PASS
	4182	836.4	16.24	0.042			PASS
	4233	846.6	16.47	0.044			PASS
HSPA+	4132	826.4	15.32	0.034	38.5	7	PASS
	4182	836.4	15.35	0.034			PASS
	4233	846.6	15.43	0.035			PASS
Note 1: For the HSDPA and HSUPA mode, all the subtests were tested and just the worst data were recorded in this report.							

WCDMA Band IV							
Band	Channel	Frequency (MHz)	Measured E.I.R.P.		Limit		Verdict
			dBm	W	dBm	W	
WCDMA	1312	1712.4	23.81	0.240	30	1	PASS
	1413	1732.6	23.86	0.243			PASS
	1513	1752.6	23.77	0.238			PASS
HSDPA	1312	1712.4	22.52	0.179	30	1	PASS
	1413	1732.6	22.44	0.175			PASS
	1513	1752.6	22.47	0.177			PASS
HSUPA	1312	1712.4	22.49	0.177	30	1	PASS
	1413	1732.6	22.44	0.175			PASS
	1513	1752.6	22.43	0.175			PASS
HSPA+	1312	1712.4	21.56	0.143	30	1	PASS
	1413	1732.6	21.42	0.139			PASS
	1513	1752.6	21.39	0.138			PASS
Note 1: For the HSDPA and HSUPA mode, all the subtests were tested and just the worst data were recorded in this report.							

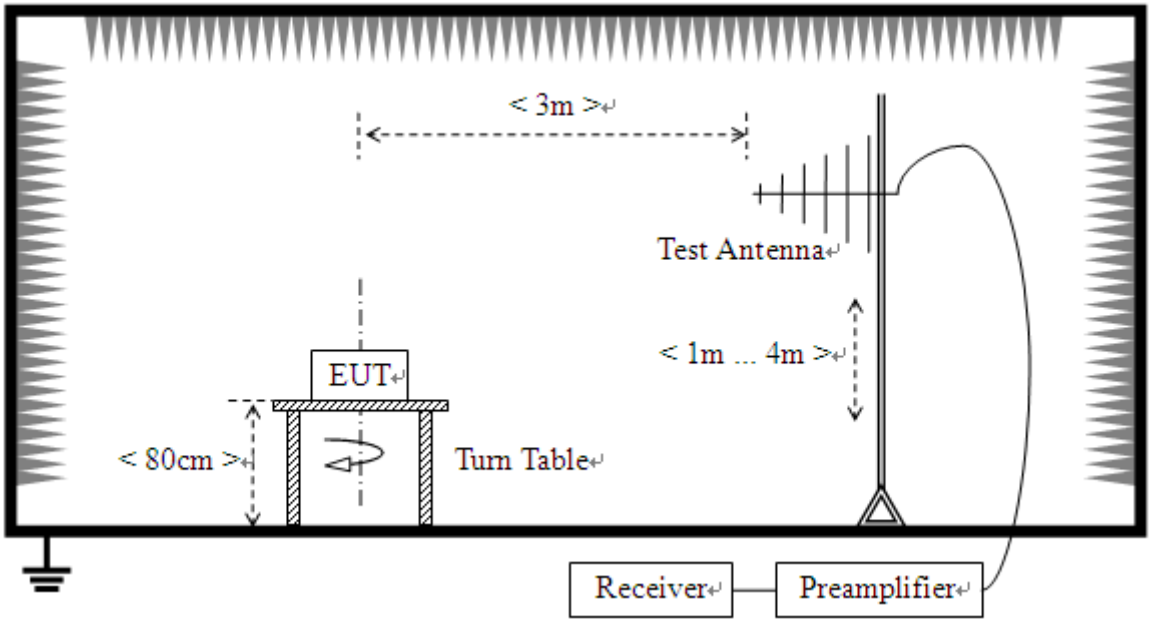
WCDMA Band II							
Band	Channel	Frequency (MHz)	Measured E.I.R.P.		Limit		Verdict
			dBm	W	dBm	W	
WCDMA	9262	1852.4	23.92	0.247	33	2	PASS
	9400	1880.0	23.94	0.248			PASS
	9538	1907.6	23.91	0.246			PASS
HSDPA	9262	1852.4	22.64	0.184	33	2	PASS
	9400	1880.0	22.70	0.186			PASS
	9538	1907.6	22.64	0.184			PASS
HSUPA	9262	1852.4	22.62	0.183	33	2	PASS
	9400	1880.0	22.69	0.186			PASS
	9538	1907.6	22.61	0.182			PASS
HSPA+	9262	1852.4	21.59	0.144	33	2	PASS
	9400	1880.0	21.65	0.146			PASS
	9538	1907.6	21.63	0.146			PASS
Note 1: For the HSDPA and HSUPA mode, all the subtests were tested and just the worst data were recorded in this report.							

2.8. Radiated Out of Band Emissions

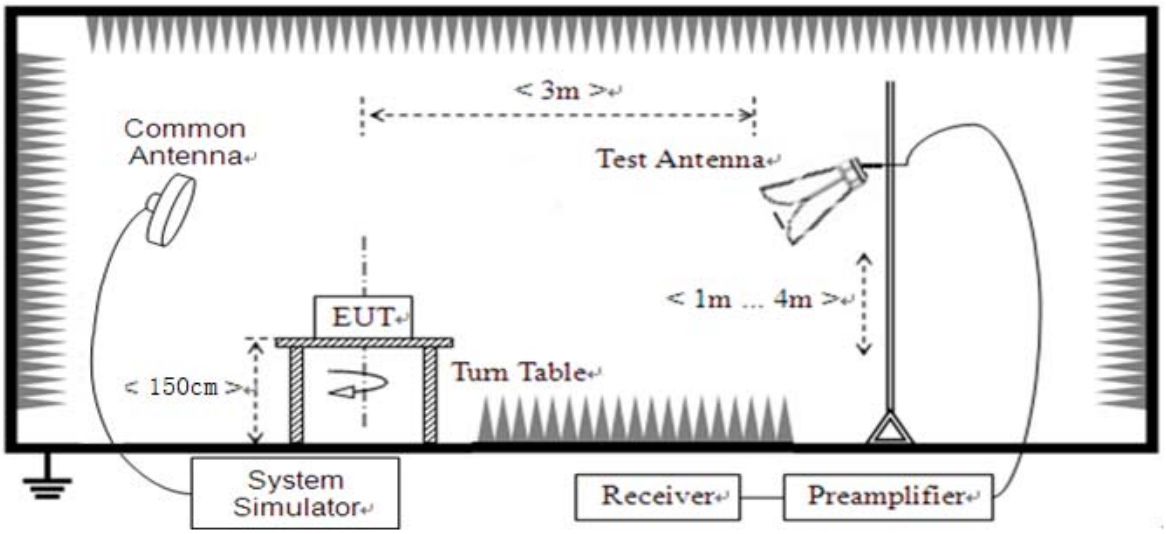
2.8.1.Requirement

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 measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency.

2.8.2.Test Description



(For the test frequency from 30MHz to1GHz)



(For the test frequency above 1GHz)

The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.
A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power and only the test result of the maximum output power was recorded.
In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360°to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.
Note: When doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

2.8.3.Test Procedure

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements.

2.8.4.Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.

The substitution corrections are obtained as described below:

$A_{SUBST} = P_{SUBST_TX} - P_{SUBST_RX} - L_{SUBST_CABLES} + G_{SUBST_TX_ANT}$

$A_{TOT} = L_{CABLES} + A_{SUBST}$

Where A_{SUBST} is the final substitution correction including receive antenna gain.

P_{SUBST_TX} is signal generator level,

P_{SUBST_RX} is receiver level,

L_{SUBST_CABLES} is cable losses including TX cable,

$G_{SUBST_TX_ANT}$ is substitution antenna gain.

A_{TOT} is total correction factor including cable loss and substitution correction

During the test, the data of A_{TOT} was added in the test spectrum analyze, so spectrum analyze reading is the final values which contain the data of A_{TOT}.

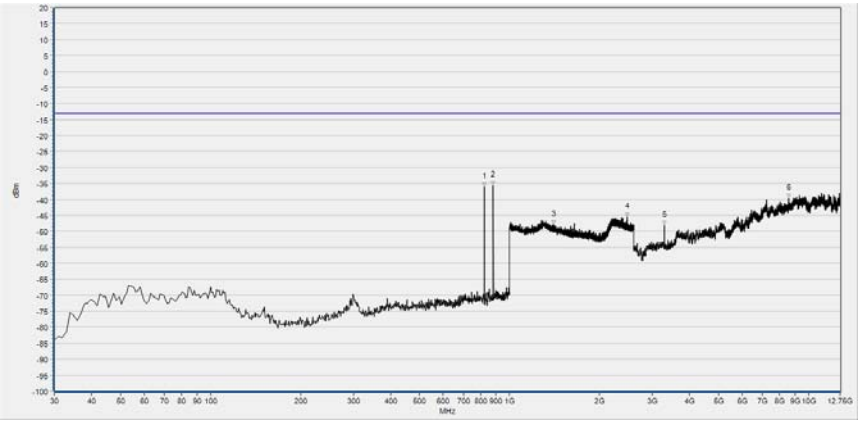
Note1: The power of the EUT transmitting frequency should be ignored.

Note2: All test mode and condition mentioned were considered and evaluated respectively by performing full test, only the worst data were recorded and reported.

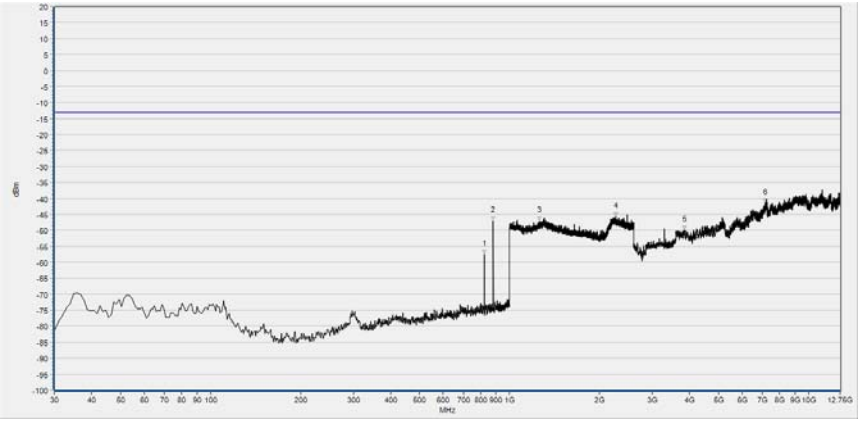
Note3: All spurious emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note 4: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

GSM850(GSM), Low Channel

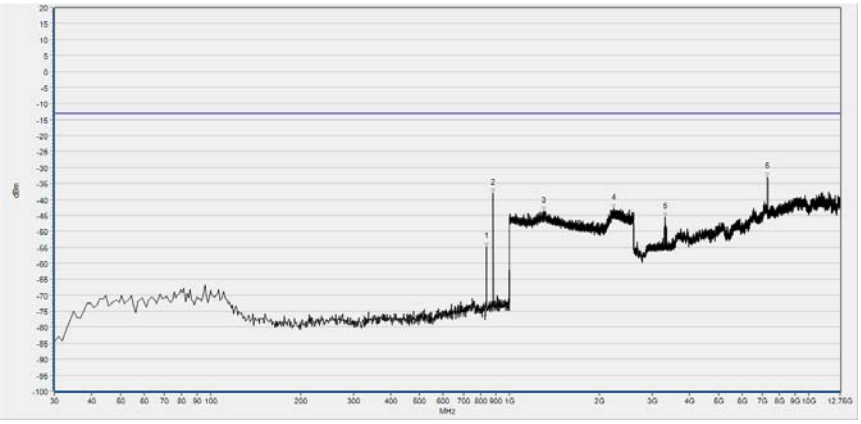


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	824.254	-35.98	-13.00	Horizontal	N/A
2	881.542	-35.53	-13.00	Horizontal	N/A
3	1400.133	-48.04	-13.00	Horizontal	PASS
4	2472.491	-45.54	-13.00	Horizontal	PASS
5	3297.199	-48.06	-13.00	Horizontal	PASS
6	8580.343	-39.68	-13.00	Horizontal	PASS

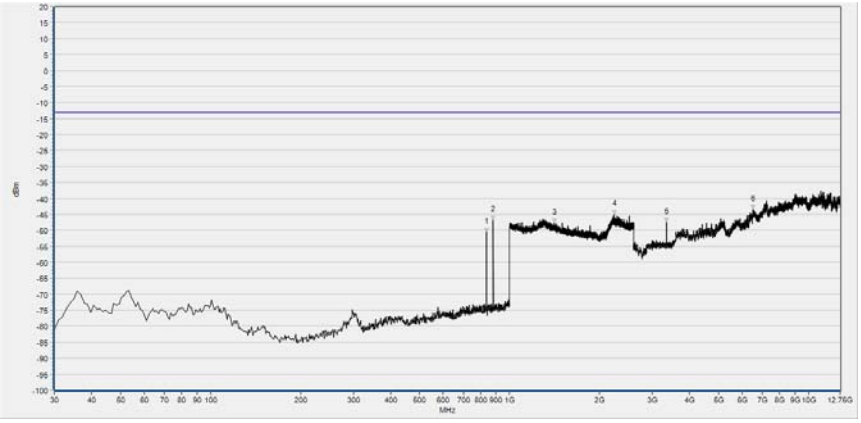


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	824.254	-57.65	-13.00	Vertical	N/A
2	881.542	-47.07	-13.00	Vertical	N/A
3	1260.887	-47.14	-13.00	Vertical	PASS
4	2259.620	-45.74	-13.00	Vertical	PASS
5	3831.944	-49.92	-13.00	Vertical	PASS
6	7152.101	-41.44	-13.00	Vertical	PASS

GSM850(GSM), Mid Channel

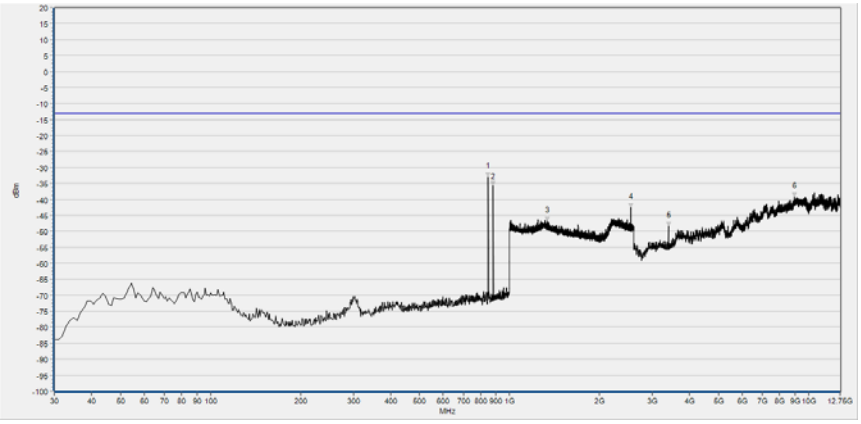


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	836.070	-54.87	-13.00	Horizontal	N/A
2	881.660	-38.18	-13.00	Horizontal	N/A
3	1296.439	-43.76	-13.00	Horizontal	PASS
4	2232.493	-42.89	-13.00	Horizontal	PASS
5	3312.475	-45.55	-13.00	Horizontal	PASS
6	7291.999	-32.91	-13.00	Horizontal	PASS

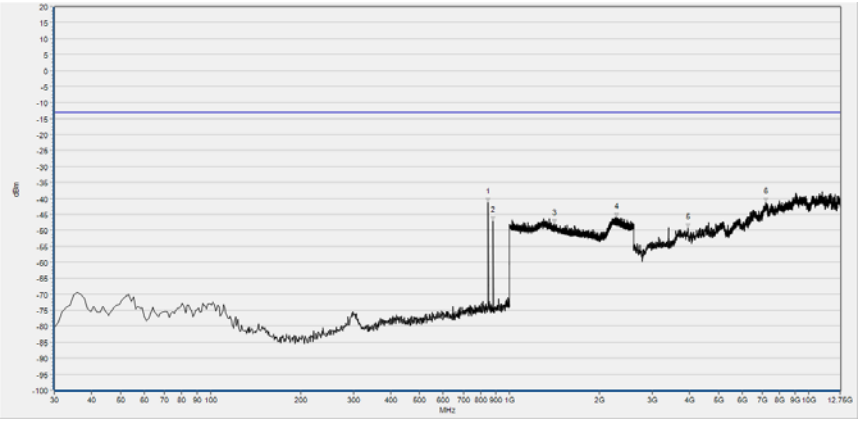


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	835.906	-50.67	-13.00	Vertical	N/A
2	881.542	-46.85	-13.00	Vertical	N/A
3	1409.737	-47.68	-13.00	Vertical	PASS
4	2235.078	-45.12	-13.00	Vertical	PASS
5	3344.582	-47.39	-13.00	Vertical	PASS
6	6519.206	-43.43	-13.00	Vertical	PASS

GSM850(GSM), High Channel

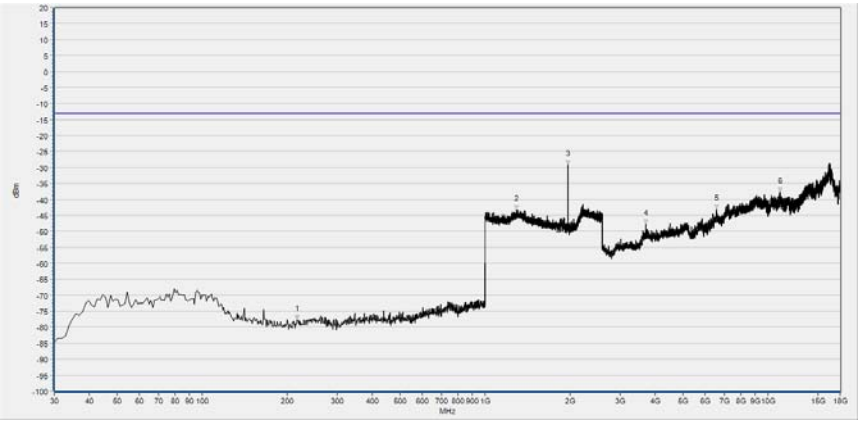


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	848.529	-32.91	-13.00	Horizontal	N/A
2	881.542	-35.72	-13.00	Horizontal	N/A
3	1337.179	-46.89	-13.00	Horizontal	PASS
4	2546.649	-42.61	-13.00	Horizontal	PASS
5	3395.348	-48.27	-13.00	Horizontal	PASS
6	8952.634	-39.16	-13.00	Horizontal	PASS

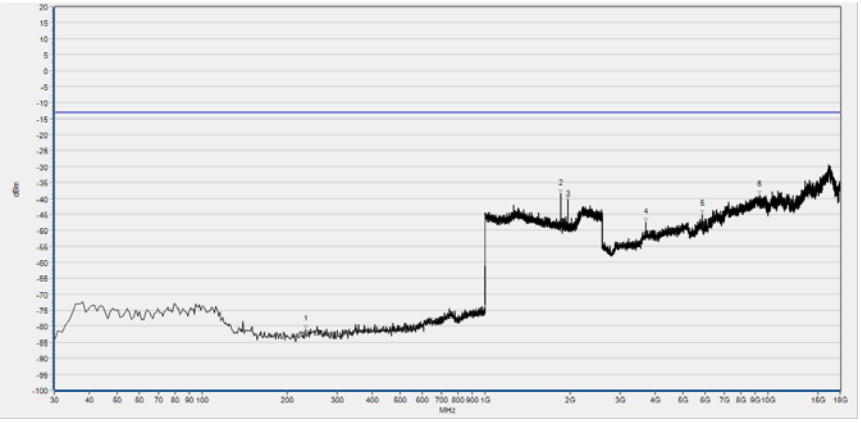


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	848.529	-41.21	-13.00	Vertical	N/A
2	881.542	-47.00	-13.00	Vertical	N/A
3	1411.871	-47.86	-13.00	Vertical	PASS
4	2272.958	-46.02	-13.00	Vertical	PASS
5	3950.400	-49.20	-13.00	Vertical	PASS
6	7179.176	-41.21	-13.00	Vertical	PASS

GSM1900(GSM), Low Channel

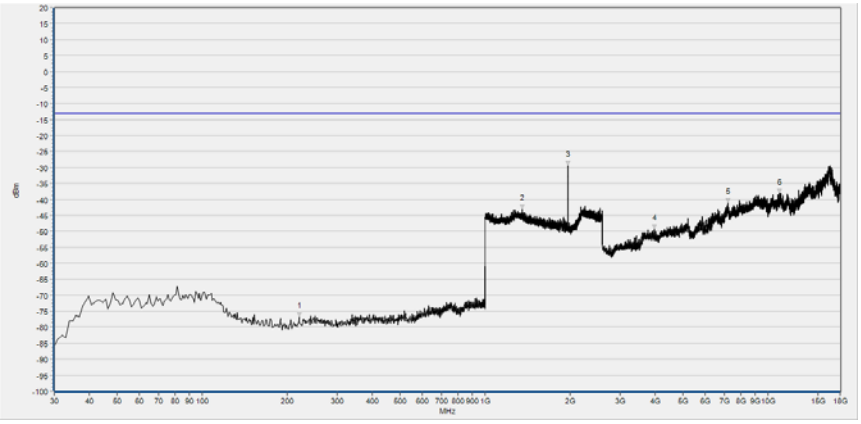


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	216.240	-77.63	-13.00	Horizontal	PASS
2	1289.396	-43.20	-13.00	Horizontal	PASS
3	1959.744	-29.23	-13.00	Horizontal	N/A
4	3700.600	-47.60	-13.00	Horizontal	PASS
5	6565.521	-43.09	-13.00	Horizontal	PASS
6	11012.730	-37.72	-13.00	Horizontal	PASS

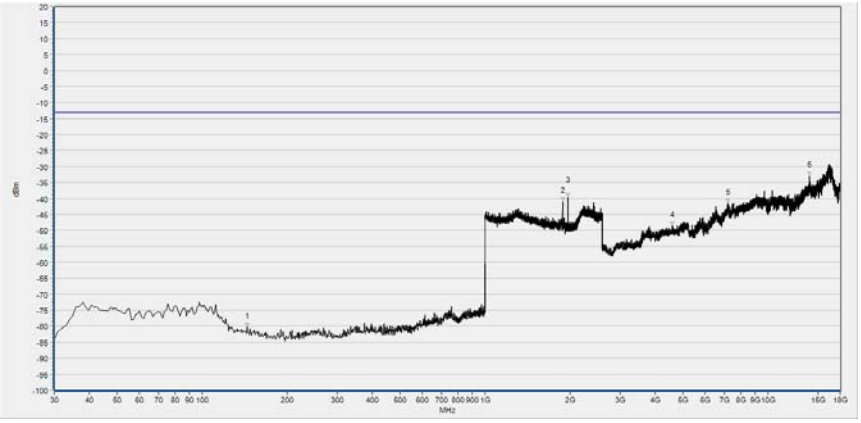


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	232.730	-81.08	-13.00	Vertical	PASS
2	1850.260	-38.64	-13.00	Vertical	N/A
3	1959.744	-40.38	-13.00	Vertical	N/A
4	3700.600	-47.52	-13.00	Vertical	PASS
5	5848.591	-45.10	-13.00	Vertical	PASS
6	9349.227	-38.98	-13.00	Vertical	PASS

GSM1900(GSM), Mid Channel

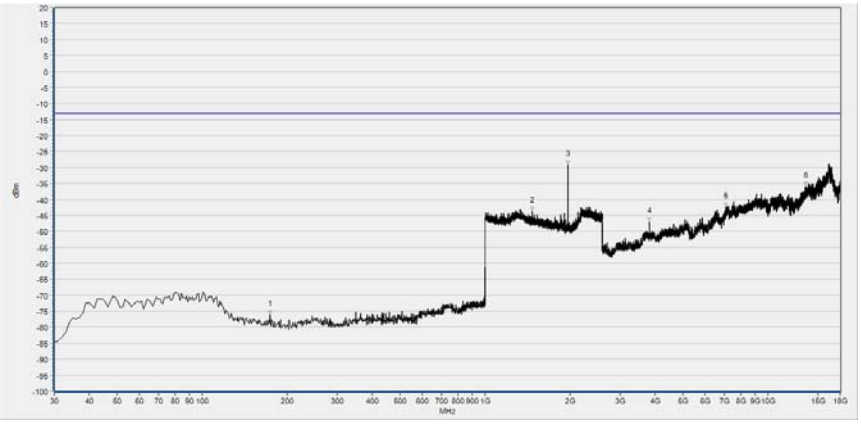


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	220.120	-76.81	-13.00	Horizontal	PASS
2	1350.220	-43.06	-13.00	Horizontal	PASS
3	1959.744	-29.37	-13.00	Horizontal	N/A
4	3977.851	-49.21	-13.00	Horizontal	PASS
5	7226.441	-40.97	-13.00	Horizontal	PASS
6	11004.328	-38.19	-13.00	Horizontal	PASS

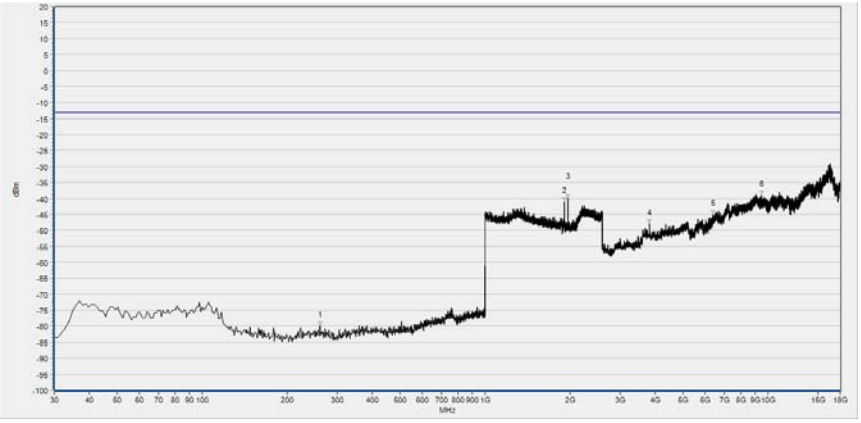


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	144.460	-80.30	-13.00	Vertical	PASS
2	1879.712	-40.99	-13.00	Vertical	N/A
3	1959.744	-39.58	-13.00	Vertical	N/A
4	4585.561	-48.70	-13.00	Vertical	PASS
5	7237.643	-41.40	-13.00	Vertical	PASS
6	14000.873	-32.96	-13.00	Vertical	PASS

GSM1900(GSM), High Channel

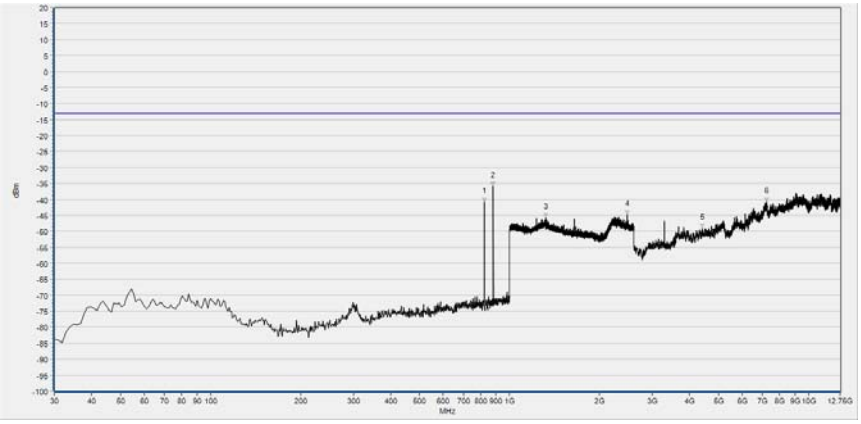


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	173.560	-76.16	-13.00	Horizontal	PASS
2	1471.228	-43.79	-13.00	Horizontal	PASS
3	1959.744	-29.14	-13.00	Horizontal	N/A
4	3818.221	-47.03	-13.00	Horizontal	PASS
5	7111.620	-42.43	-13.00	Horizontal	PASS
6	13600.400	-35.88	-13.00	Horizontal	PASS

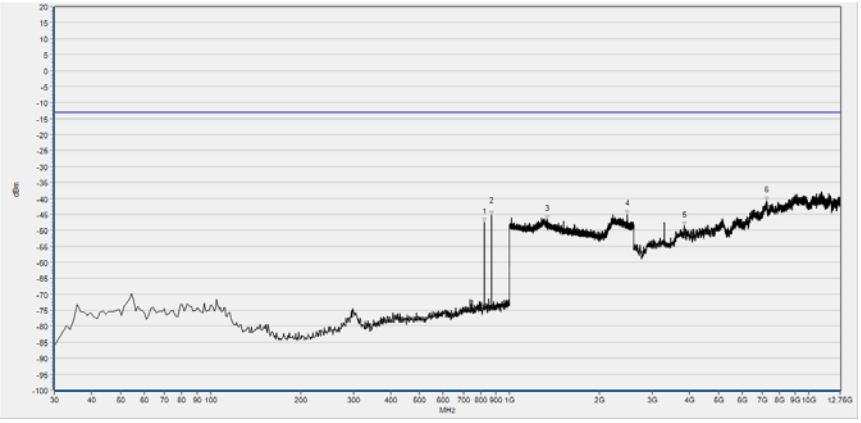


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	260.860	-79.87	-13.00	Vertical	PASS
2	1909.804	-41.00	-13.00	Vertical	N/A
3	1960.384	-40.19	-13.00	Vertical	N/A
4	3818.221	-47.93	-13.00	Vertical	PASS
5	6375.086	-44.93	-13.00	Vertical	PASS
6	9475.250	-39.02	-13.00	Vertical	PASS

GSM850(EDGE), Low Channel

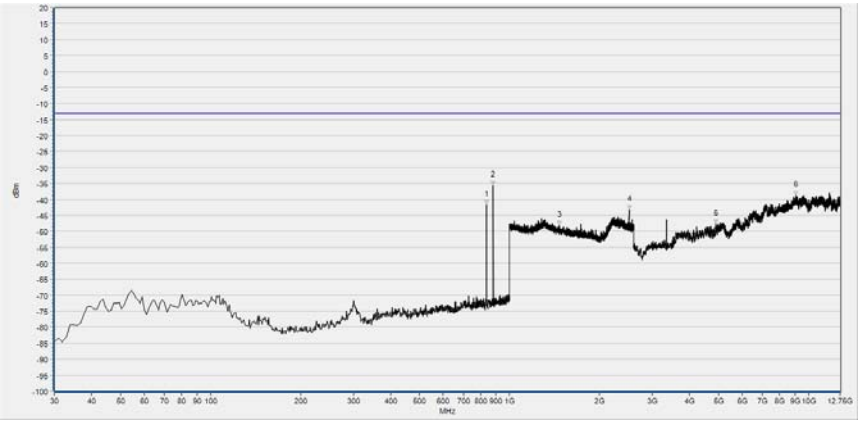


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	824.254	-40.78	-13.00	Horizontal	N/A
2	881.542	-35.81	-13.00	Horizontal	N/A
3	1321.707	-45.69	-13.00	Horizontal	PASS
4	2471.957	-44.85	-13.00	Horizontal	PASS
5	4414.071	-49.05	-13.00	Horizontal	PASS
6	7243.481	-40.87	-13.00	Horizontal	PASS

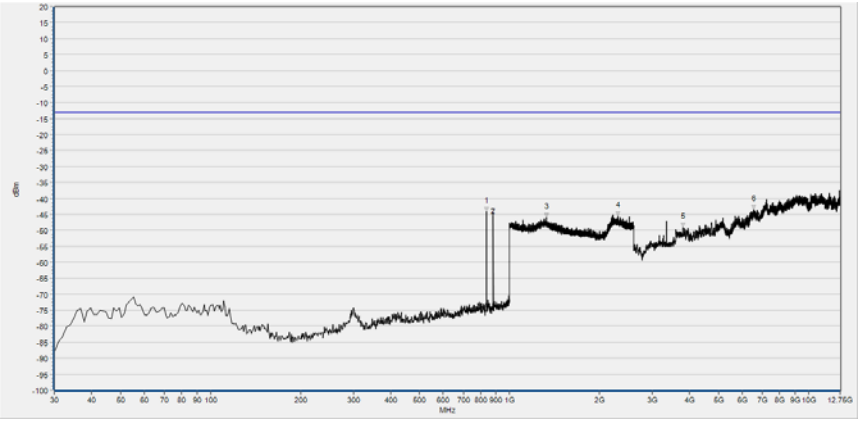


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	824.254	-47.50	-13.00	Vertical	N/A
2	868.919	-45.17	-13.00	Vertical	N/A
3	1338.780	-46.60	-13.00	Vertical	PASS
4	2471.957	-44.96	-13.00	Vertical	PASS
5	3831.944	-48.71	-13.00	Vertical	PASS
6	7246.866	-40.69	-13.00	Vertical	PASS

GSM850(EDGE), Mid Channel

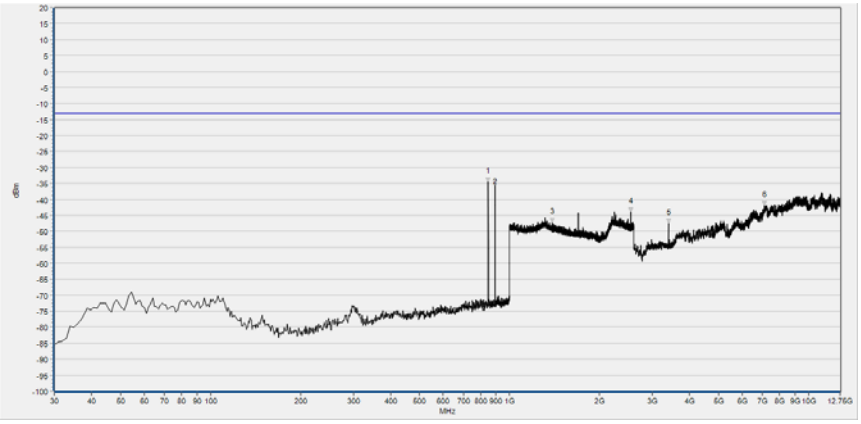


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	835.906	-41.65	-13.00	Horizontal	N/A
2	881.542	-35.69	-13.00	Horizontal	N/A
3	1464.688	-48.12	-13.00	Horizontal	PASS
4	2509.303	-43.22	-13.00	Horizontal	PASS
5	4908.203	-47.68	-13.00	Horizontal	PASS
6	9054.168	-38.87	-13.00	Horizontal	PASS

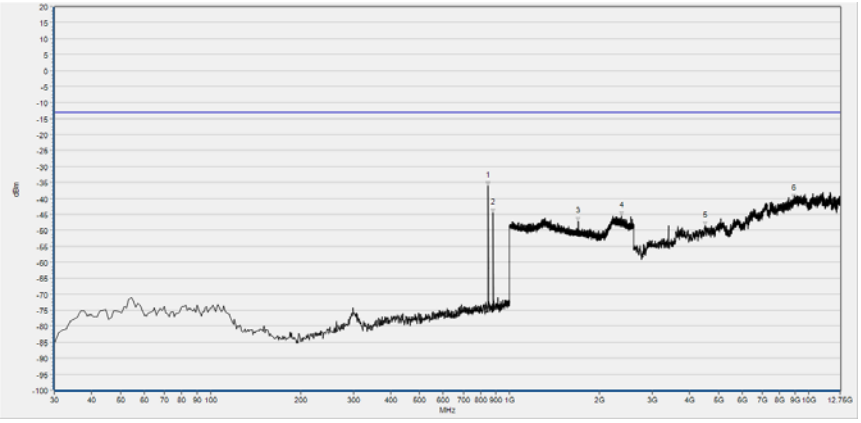


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	835.906	-44.20	-13.00	Vertical	N/A
2	881.542	-44.28	-13.00	Vertical	N/A
3	1331.310	-45.93	-13.00	Vertical	PASS
4	2299.100	-45.45	-13.00	Vertical	PASS
5	3801.484	-49.05	-13.00	Vertical	PASS
6	6536.129	-43.55	-13.00	Vertical	PASS

GSM850(EDGE), High Channel

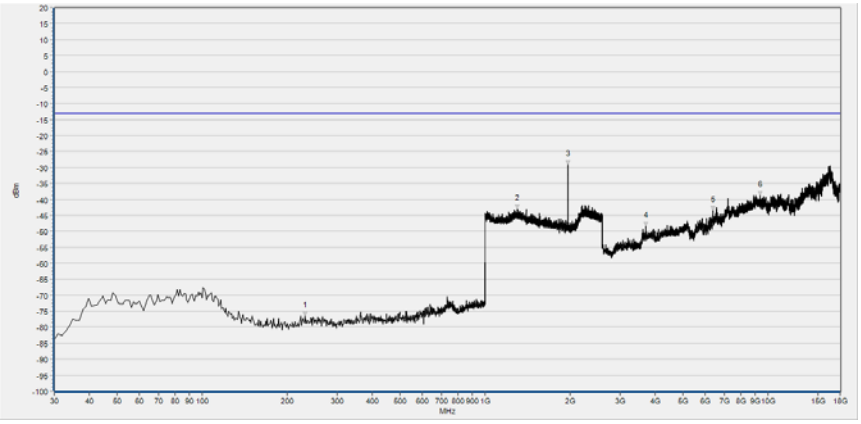


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	848.529	-34.51	-13.00	Horizontal	N/A
2	894.164	-35.46	-13.00	Horizontal	N/A
3	1387.329	-47.22	-13.00	Horizontal	PASS
4	2546.649	-43.85	-13.00	Horizontal	PASS
5	3395.348	-47.59	-13.00	Horizontal	PASS
6	7128.409	-41.98	-13.00	Horizontal	PASS

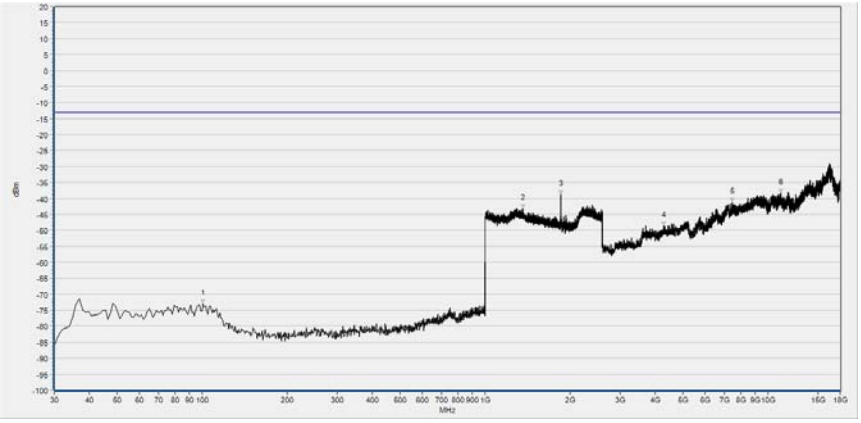


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	848.529	-36.16	-13.00	Vertical	N/A
2	881.542	-44.50	-13.00	Vertical	N/A
3	1697.299	-47.23	-13.00	Vertical	PASS
4	2365.789	-45.37	-13.00	Vertical	PASS
5	4515.605	-48.67	-13.00	Vertical	PASS
6	8915.405	-40.16	-13.00	Vertical	PASS

GSM1900(EDGE), Low Channel

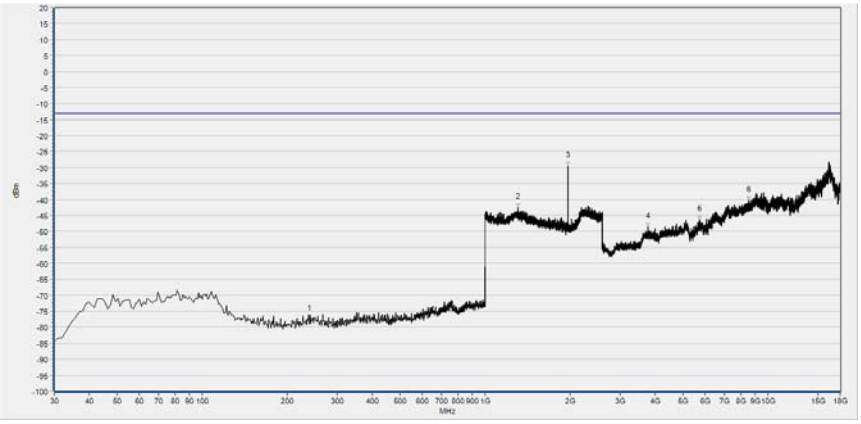


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	230.790	-76.58	-13.00	Horizontal	PASS
2	1297.079	-43.02	-13.00	Horizontal	PASS
3	1959.744	-29.06	-13.00	Horizontal	N/A
4	3700.600	-48.45	-13.00	Horizontal	PASS
5	6383.488	-43.38	-13.00	Horizontal	PASS
6	9405.237	-38.72	-13.00	Horizontal	PASS

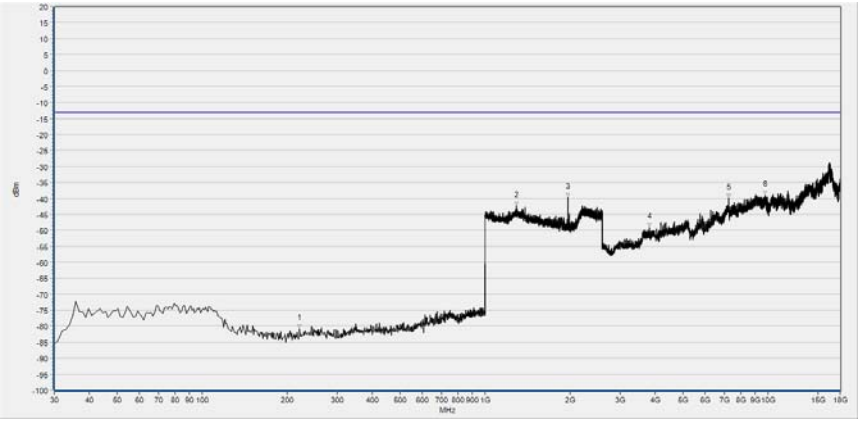


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	100.810	-73.04	-13.00	Vertical	PASS
2	1361.104	-43.30	-13.00	Vertical	PASS
3	1850.260	-38.87	-13.00	Vertical	N/A
4	4288.707	-48.49	-13.00	Vertical	PASS
5	7495.290	-41.27	-13.00	Vertical	PASS
6	11107.947	-38.29	-13.00	Vertical	PASS

GSM1900(EDGE), Mid Channel

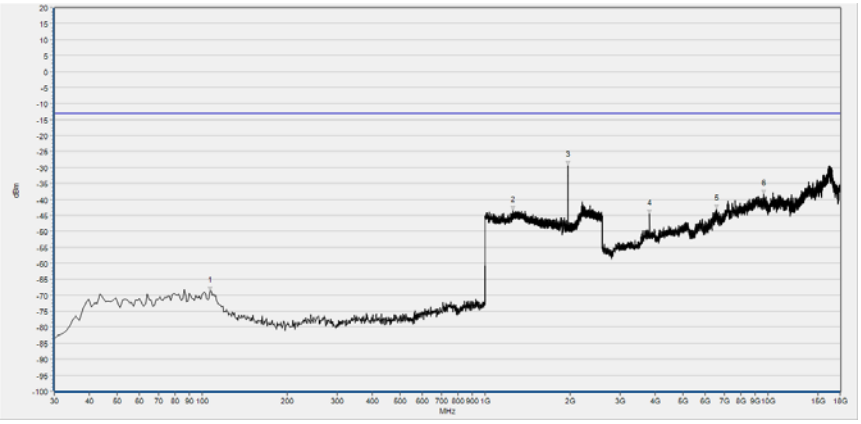


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	238.550	-77.50	-13.00	Horizontal	PASS
2	1304.122	-42.62	-13.00	Horizontal	PASS
3	1959.744	-29.53	-13.00	Horizontal	N/A
4	3759.411	-48.58	-13.00	Horizontal	PASS
5	5733.770	-46.46	-13.00	Horizontal	PASS
6	8537.079	-40.38	-13.00	Horizontal	PASS

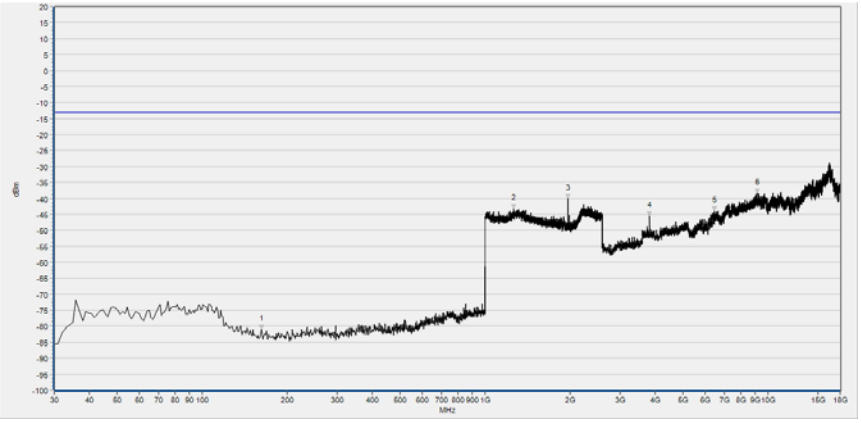


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	221.090	-80.69	-13.00	Vertical	PASS
2	1294.518	-42.39	-13.00	Vertical	PASS
3	1959.744	-39.67	-13.00	Vertical	N/A
4	3818.221	-48.98	-13.00	Vertical	PASS
5	7268.449	-39.90	-13.00	Vertical	PASS
6	9774.905	-38.96	-13.00	Vertical	PASS

GSM1900(EDGD), High Channel

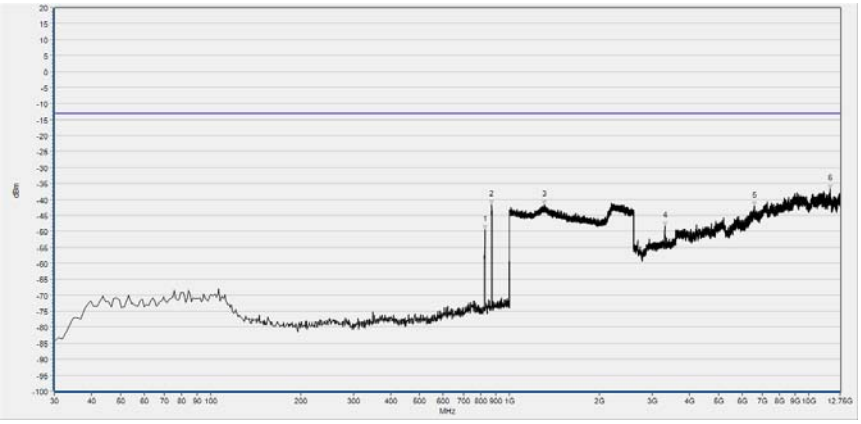


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	106.630	-68.74	-13.00	Horizontal	PASS
2	1252.901	-43.57	-13.00	Horizontal	PASS
3	1959.744	-29.37	-13.00	Horizontal	N/A
4	3818.221	-44.61	-13.00	Horizontal	PASS
5	6579.524	-42.95	-13.00	Horizontal	PASS
6	9654.483	-38.26	-13.00	Horizontal	PASS

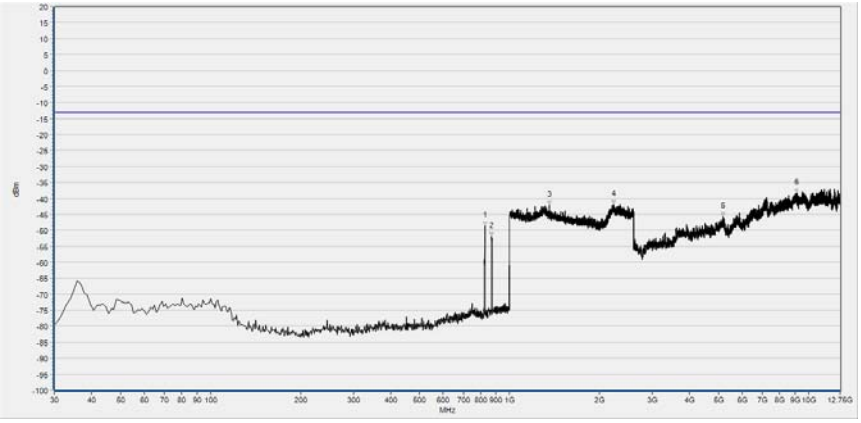


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	161.920	-80.95	-13.00	Vertical	PASS
2	1263.786	-43.26	-13.00	Vertical	PASS
3	1959.744	-40.13	-13.00	Vertical	N/A
4	3818.221	-45.58	-13.00	Vertical	PASS
5	6475.905	-43.84	-13.00	Vertical	PASS
6	9144.790	-38.34	-13.00	Vertical	PASS

WCDMA Band V(WCDMA), Low Channel

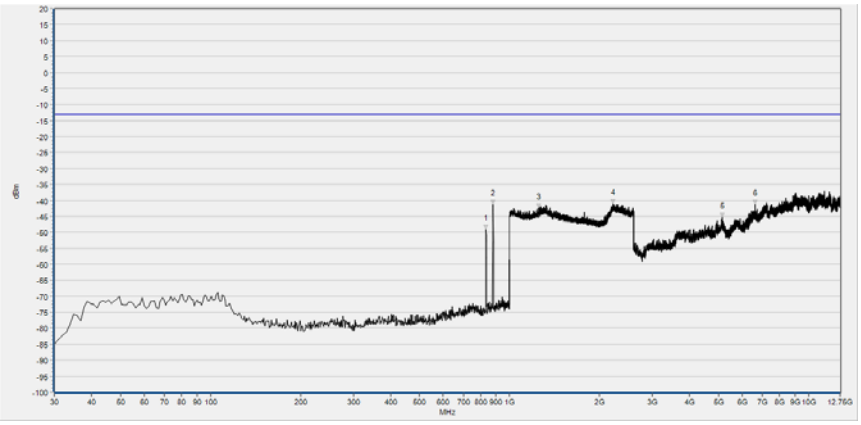


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	827.340	-49.44	-13.00	Horizontal	N/A
2	871.960	-41.69	-13.00	Horizontal	N/A
3	1303.481	-41.70	-13.00	Horizontal	PASS
4	3305.092	-48.30	-13.00	Horizontal	PASS
5	6570.295	-42.09	-13.00	Horizontal	PASS
6	11823.413	-36.85	-13.00	Horizontal	PASS

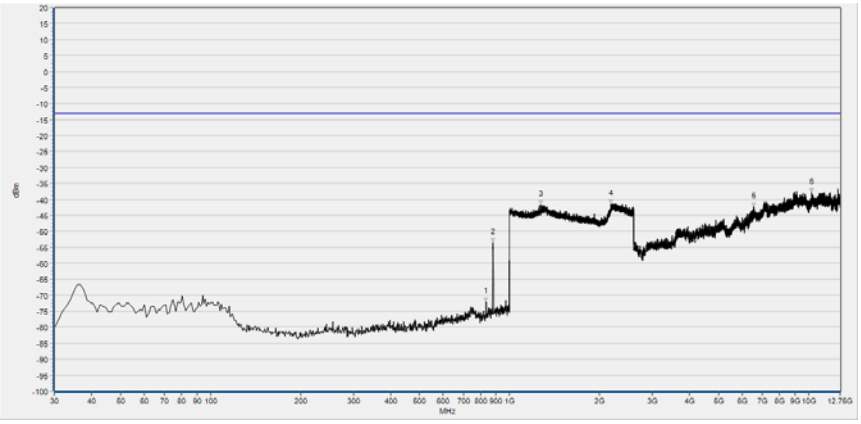


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	827.340	-48.63	-13.00	Vertical	N/A
2	870.990	-51.92	-13.00	Vertical	N/A
3	1356.623	-42.20	-13.00	Vertical	PASS
4	2229.932	-41.83	-13.00	Vertical	PASS
5	5185.952	-45.66	-13.00	Vertical	PASS
6	9134.097	-38.42	-13.00	Vertical	PASS

WCDMA Band V(WCDMA), Mid Channel

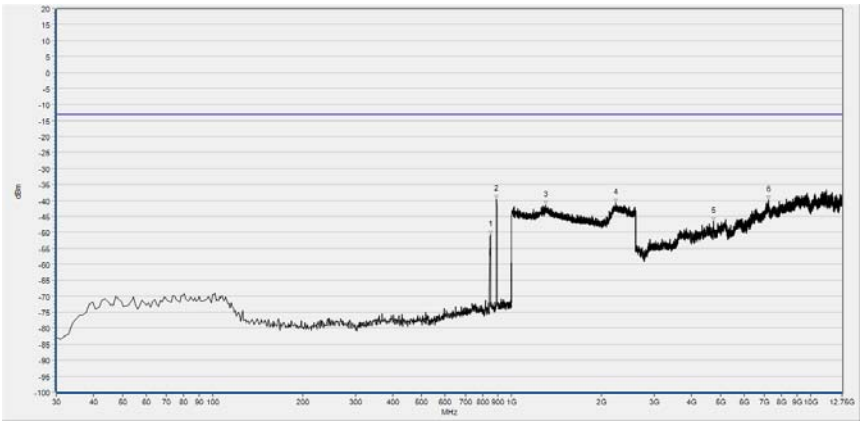


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	834.130	-49.09	-13.00	Horizontal	N/A
2	879.720	-41.20	-13.00	Horizontal	N/A
3	1250.340	-42.35	-13.00	Horizontal	PASS
4	2212.005	-41.10	-13.00	Horizontal	PASS
5	5134.270	-45.20	-13.00	Horizontal	PASS
6	6612.748	-41.13	-13.00	Horizontal	PASS

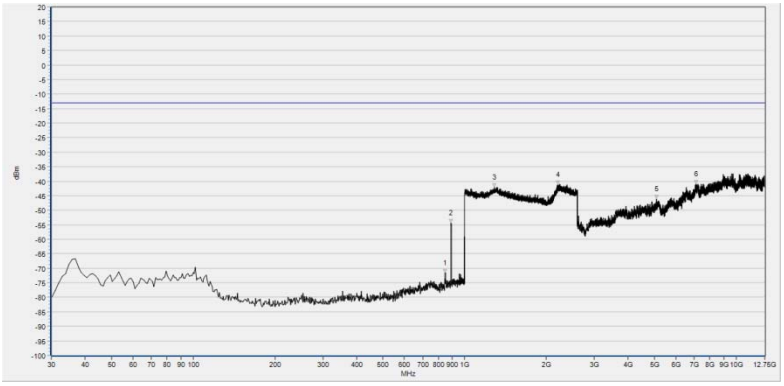


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	834.130	-72.08	-13.00	Vertical	N/A
2	880.690	-53.51	-13.00	Vertical	N/A
3	1270.188	-41.65	-13.00	Vertical	PASS
4	2185.754	-41.41	-13.00	Vertical	PASS
5	6548.145	-42.25	-13.00	Vertical	PASS
6	10258.183	-37.80	-13.00	Vertical	PASS

WCDMA Band V(WCDMA), High Channel

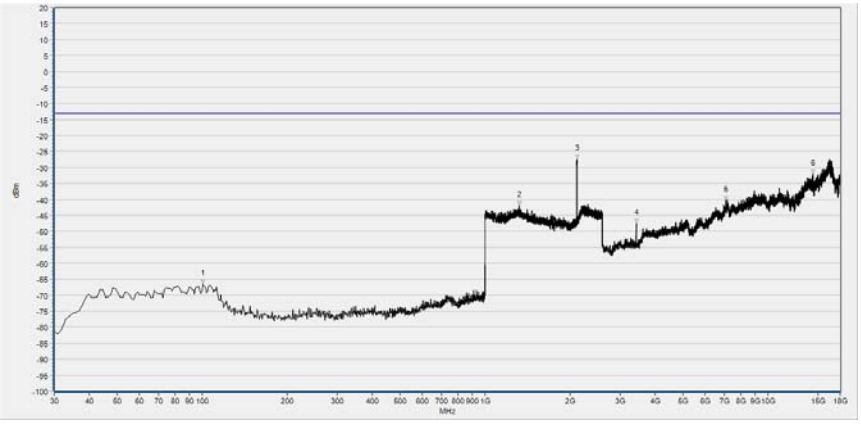


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	848.680	-50.78	-13.00	Horizontal	N/A
2	891.360	-39.74	-13.00	Horizontal	N/A
3	1297.719	-41.51	-13.00	Horizontal	PASS
4	2224.170	-40.88	-13.00	Horizontal	PASS
5	4730.042	-46.58	-13.00	Horizontal	PASS
6	7227.396	-40.00	-13.00	Horizontal	PASS

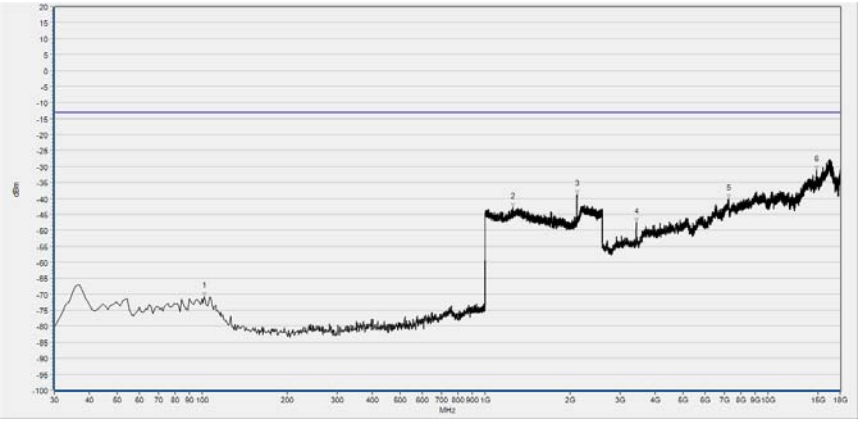


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	847.710	-71.67	-13.00	Vertical	N/A
2	891.360	-54.43	-13.00	Vertical	N/A
3	1288.756	-42.21	-13.00	Vertical	PASS
4	2209.444	-41.21	-13.00	Vertical	PASS
5	5101.046	-46.25	-13.00	Vertical	PASS
6	7127.723	-40.96	-13.00	Vertical	PASS

WCDMA Band IV(WCDMA), Low Channel

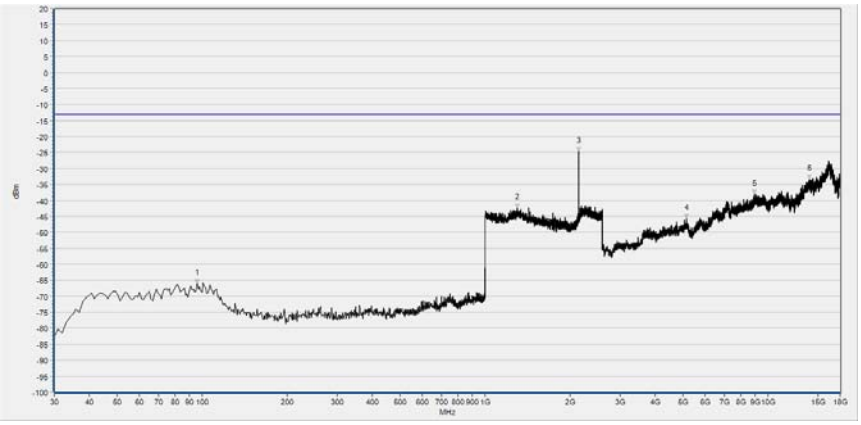


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	100.810	-66.56	-13.00	Horizontal	PASS
2	1323.970	-41.87	-13.00	Horizontal	PASS
3	2112.765	-27.40	-13.00	Horizontal	N/A
4	3423.350	-47.60	-13.00	Horizontal	PASS
5	7106.019	-40.34	-13.00	Horizontal	PASS
6	14412.548	-32.15	-13.00	Horizontal	PASS

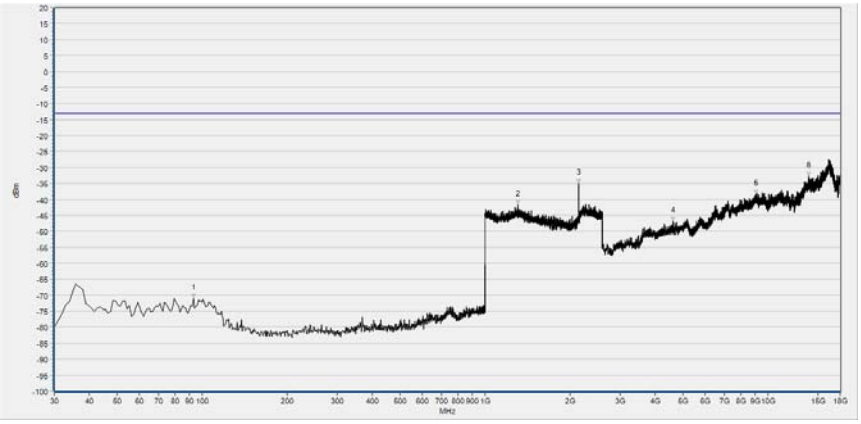


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	101.780	-70.67	-13.00	Vertical	PASS
2	1255.462	-42.85	-13.00	Vertical	PASS
3	2112.765	-38.85	-13.00	Vertical	N/A
4	3423.350	-47.47	-13.00	Vertical	PASS
5	7257.247	-40.10	-13.00	Vertical	PASS
6	14891.435	-31.20	-13.00	Vertical	PASS

WCDMA Band IV(WCDMA), Mid Channel

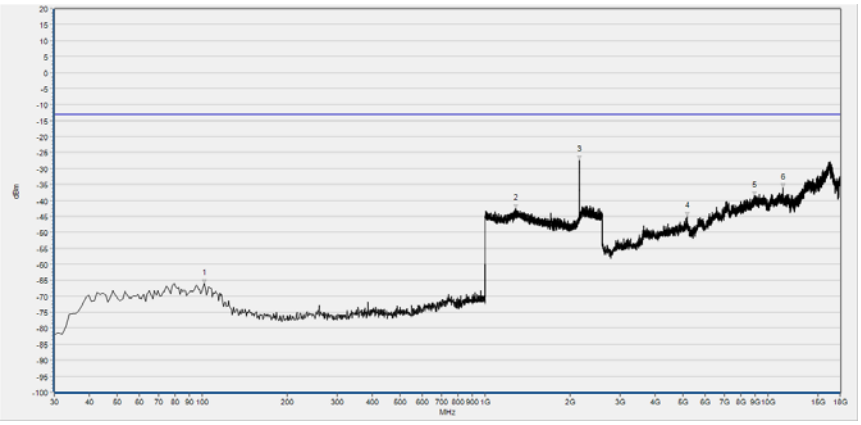


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	95.960	-66.02	-13.00	Horizontal	PASS
2	1302.841	-42.43	-13.00	Horizontal	PASS
3	2140.296	-24.79	-13.00	Horizontal	N/A
4	5165.266	-45.77	-13.00	Horizontal	PASS
5	8968.358	-38.07	-13.00	Horizontal	PASS
6	14014.875	-33.31	-13.00	Horizontal	PASS

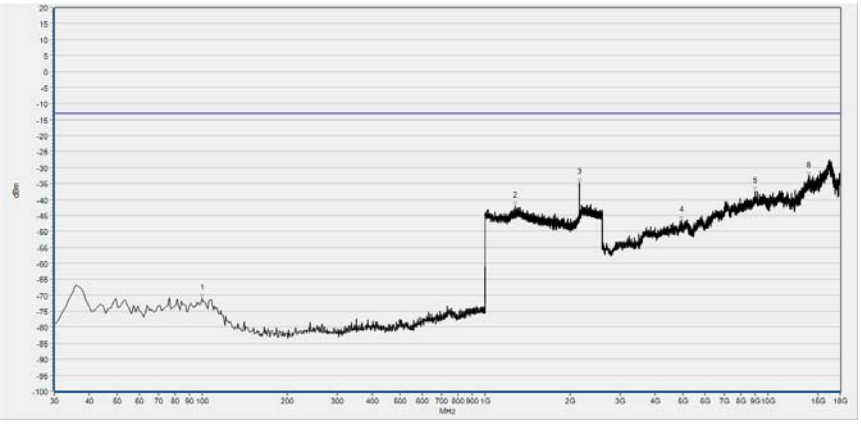


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	93.050	-71.02	-13.00	Vertical	PASS
2	1309.244	-41.71	-13.00	Vertical	PASS
3	2140.936	-34.98	-13.00	Vertical	N/A
4	4627.569	-46.91	-13.00	Vertical	PASS
5	9060.775	-38.31	-13.00	Vertical	PASS
6	13900.055	-32.76	-13.00	Vertical	PASS

WCDMA Band IV(WCDMA), High Channel

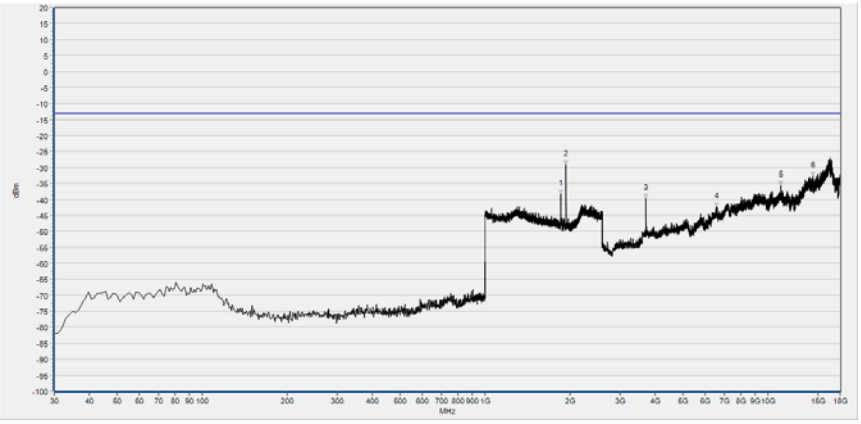


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	101.780	-66.09	-13.00	Horizontal	PASS
2	1282.993	-42.59	-13.00	Horizontal	PASS
3	2152.461	-27.48	-13.00	Horizontal	N/A
4	5170.867	-45.03	-13.00	Horizontal	PASS
5	8968.358	-38.59	-13.00	Horizontal	PASS
6	11278.778	-36.19	-13.00	Horizontal	PASS

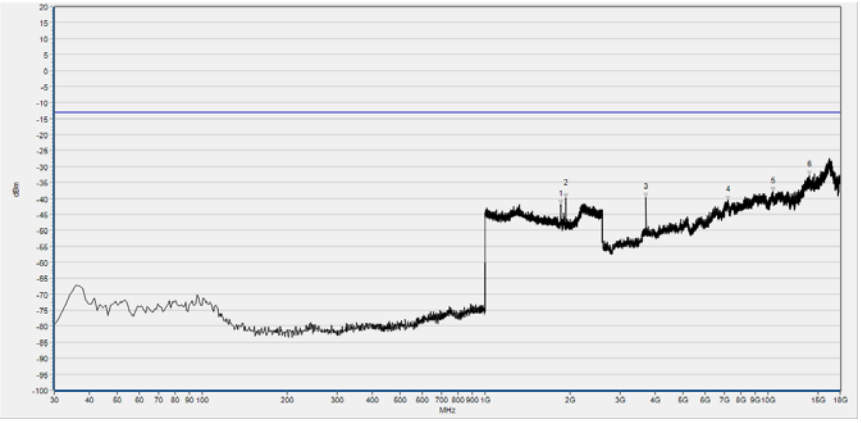


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	99.840	-70.93	-13.00	Vertical	PASS
2	1279.152	-42.04	-13.00	Vertical	PASS
3	2153.741	-34.81	-13.00	Vertical	N/A
4	4958.029	-46.62	-13.00	Vertical	PASS
5	8999.163	-37.32	-13.00	Vertical	PASS
6	13967.267	-32.84	-13.00	Vertical	PASS

WCDMA Band II(WCDMA), Low Channel

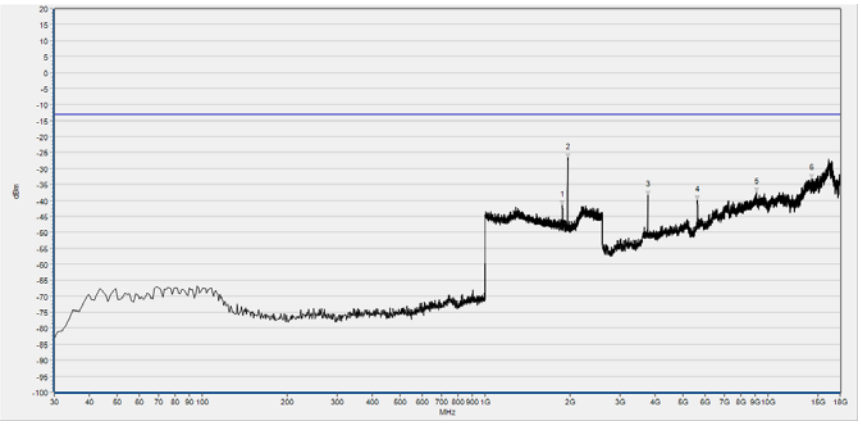


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1851.541	-38.41	-13.00	Horizontal	N/A
2	1932.853	-29.25	-13.00	Horizontal	N/A
3	3706.201	-39.58	-13.00	Horizontal	PASS
4	6573.923	-42.40	-13.00	Horizontal	PASS
5	11130.351	-35.73	-13.00	Horizontal	PASS
6	14404.146	-32.81	-13.00	Horizontal	PASS

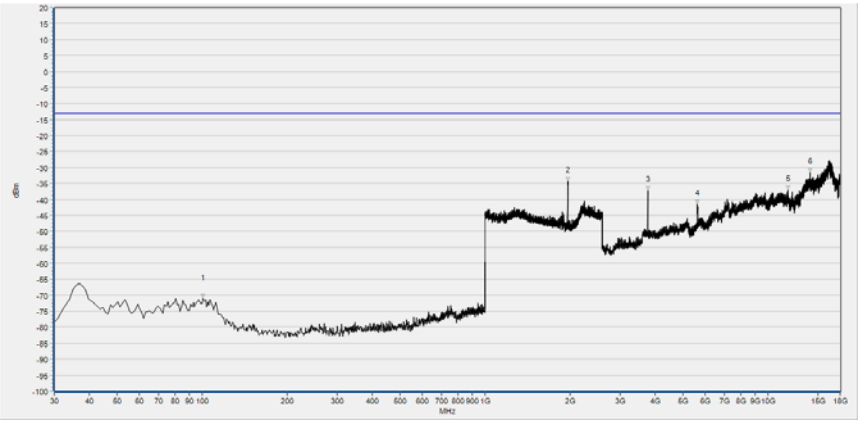


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1851.541	-41.84	-13.00	Vertical	N/A
2	1933.493	-39.79	-13.00	Vertical	N/A
3	3706.201	-39.56	-13.00	Vertical	PASS
4	7243.244	-40.47	-13.00	Vertical	PASS
5	10407.820	-37.98	-13.00	Vertical	PASS
6	14012.075	-32.71	-13.00	Vertical	PASS

WCDMA Band II(WCDMA), Mid Channel

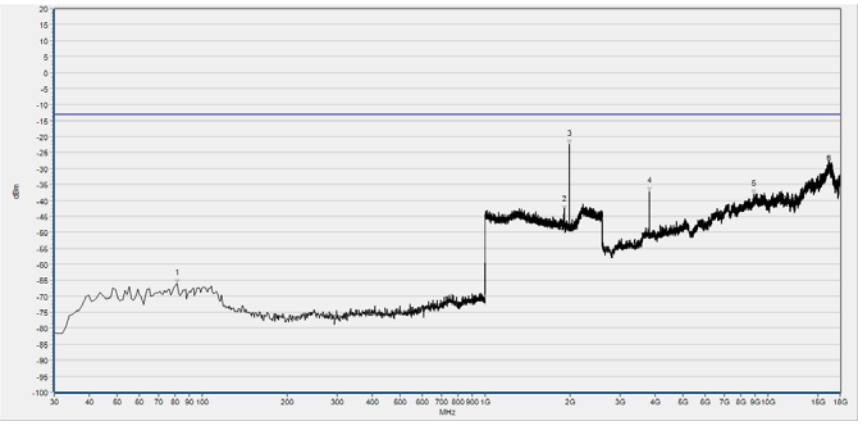


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1878.431	-41.41	-13.00	Horizontal	N/A
2	1958.463	-26.71	-13.00	Horizontal	N/A
3	3756.610	-38.28	-13.00	Horizontal	PASS
4	5641.353	-39.90	-13.00	Horizontal	PASS
5	9130.787	-37.50	-13.00	Horizontal	PASS
6	14266.921	-33.16	-13.00	Horizontal	PASS

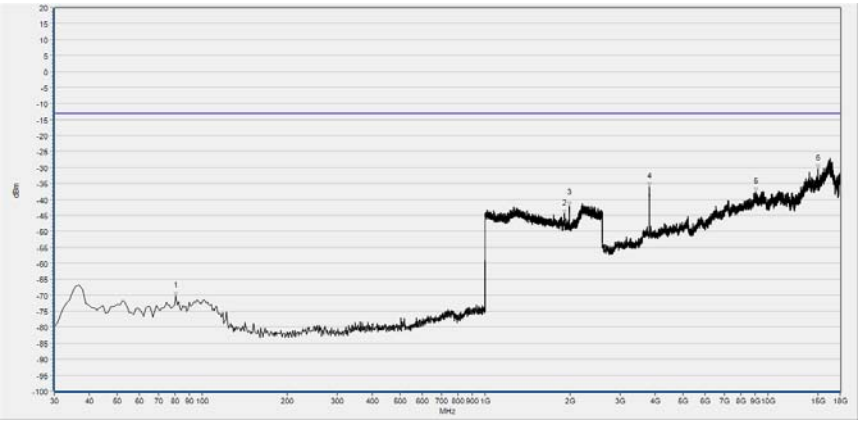


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	100.810	-70.88	-13.00	Vertical	PASS
2	1961.024	-34.30	-13.00	Vertical	N/A
3	3756.610	-37.24	-13.00	Vertical	PASS
4	5635.752	-41.54	-13.00	Vertical	PASS
5	11743.662	-36.88	-13.00	Vertical	PASS
6	14073.686	-31.65	-13.00	Vertical	PASS

WCDMA Band II(WCDMA), High Channel



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	81.410	-66.08	-13.00	Horizontal	PASS
2	1907.883	-42.93	-13.00	Horizontal	N/A
3	1988.555	-22.50	-13.00	Horizontal	N/A
4	3812.620	-37.28	-13.00	Horizontal	PASS
5	8923.550	-38.08	-13.00	Horizontal	PASS
6	16412.111	-27.38	-13.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-70.27	-13.00	Vertical	PASS
2	1907.883	-44.59	-13.00	Vertical	N/A
3	1985.994	-42.13	-13.00	Vertical	N/A
4	3812.620	-36.05	-13.00	Vertical	PASS
5	9063.575	-37.75	-13.00	Vertical	PASS
6	15003.455	-30.48	-13.00	Vertical	PASS

Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test Items	Uncertainty
Output Power	±2.22dB
Bandwidth	±5%
Conducted Spurious Emission	±2.77 dB
Radiated Emission	±2.95dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Power Splitter	NW521	1506A	Weinschel	N/A	N/A
Attenuator 1	(N/A.)	10dB	Resnet	N/A	N/A
Attenuator 2	(N/A.)	3dB	Resnet	N/A	N/A
EXA Signal Analzyer	MY51511149	N9020A	Agilent	2021.07.26	2022.07.25
System Simulator	6200995016	MT8820C	Anritsu	2020.10.28	2021.10.27
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial Cable	CB02	RF02	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Temperature Chamber	20171112102	HZ-2019	Dongguan Lixian Instrument Technology Co., Ltd	2020.10.26	2021.10.25
Computer	T430i	Think Pad	Lenovo	N/A	N/A

4.2 List of Software Used

Description	Manufacturer	Software Version
Morlab FCC Test System	MORLAB	V2.8
MORLAB EMCR V1.2	MORLAB	V1.0

4.3 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
System Simulator	152038	CMW500	R&S	2020.11.19	2021.11.18
Receiver	MY54130016	N9038A	Agilent	2021.07.16	2022.07.15
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2019.07.26	2022.07.25
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2019.07.26	2022.07.25
Coaxial cable (N male) (9kHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-40GHz)	CB05	EMC05	Morlab	N/A	N/A
1-18GHz pre-Amplifier	61171/61172	S020180L3203	Tonscend	2021.07.16	2022.07.15
18-26.5GHz pre-Amplifier	46732	S10M100L3802	Tonscend	2021.07.16	2022.07.15
26-40GHz pre-Amplifier	56774	S40M400L4002	Tonscend	2021.07.16	2022.07.15
Notch Filter	N/A	WRCG-GSM 850	Wainwright	2021.07.16	2022.07.15
Notch Filter	N/A	WRCG-GSM 1900	Wainwright	2021.07.16	2022.07.15
Notch Filter	N/A	WRCGV-W Band V	Wainwright	2021.07.16	2022.07.15
Notch Filter	N/A	WRCGV-W Band II	Wainwright	2021.07.16	2022.07.15

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Notch Filter	N/A	WRCGV-W Band IV	Wainwright	2021.07.16	2022.07.15
Anechoic Chamber	N/A	9m*6m*6m	CRT	2019.07.13	2022.07.12

END OF REPORT