TEST REPORT

APPLICANT	:	Reliance Communications LLC
PRODUCT NAME	:	Orbic Magic
MODEL NAME	:	R678EL
BRAND NAME	:	Orbic
FCC ID	:	2ABGH-R678EL
STANDARD(S)	:	47 CFR Part 22 Subpart H 47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart L
RECEIPT DATE	:	2020-10-21
TEST DATE	:	2020-10-29 to 2021-02-03
ISSUE DATE	:	2021-02-03

Edited by: Zeng Xiaoying (Rapporteur)

Approved by: Peng Huarui (Supervisor)

DIRECTORY

Change History		
Version	Date	Reason for change
1.0	2021-02-03	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Reliance Communications LLC
Applicant Address:	91 Colin Drive, Unit 1, HOLBROOK, New York 11741, United States
Manufacturer:	ZJY RIGHT SOURCE INDIA PRIVATE LIMITED
Manufacturer Address:	MIDC industrial Area, Shiravane, Nerul, India

1.2. Equipment Under Test (EUT) Description

Product Name:	Orbic Magic	
Serial No.:	(N/A, marked #1 by test site)	
Hardware Version:	V2.1	
Software Version:	ORB678EL_V1.0.47_BTF	
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:	Top Antenna	PIFA Antenna
	Bottom Antenna	PIFA Antenna
Antenna Gain:	Top Antenna	
	GSM 850:	-2.0dBi
	GSM1900:	-2.4dBi
	WCDMA Band V:	-2.0dBi
	WCDMA Band IV:	-2.9dBi
	WCDMA Band II:	-2.4dBi
	Bottom Antenna	
	GSM 850:	-2.0dBi
	GSM1900:	-2.4dBi
	WCDMA Band V:	-2.0dBi
	WCDMA Band IV:	-2.9dBi
	WCDMA Band II:	-2.4dBi
Accessory Information:	Battery	
	Brand Name:	Orbic
	Model No.:	BLE-5001
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	5000mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.40V
	Manufacturer:	HUIZHOU DXDRAGON INC
	AC Adapter	
	Brand Name:	Orbic
	Model No.:	BLJ-QC06HU
	Serial No.:	(N/A, marked #1 by test site)
	Rated Output:	5V⎓3A, 9V⎓2A, 12V⎓1.5A,
	Rated Input:	100-240V~50/60Hz, 0.5A
	Manufacturer:	Baolijin

Note 1: The EUT supports top antenna and bottom antenna. For test item Conducted RF Output Power, Radiated Power and Radiated Out of Band Emissions we recorded the test result of two antennas separately, for other test items both of the two antennas were tested separately, **we only recorded the worst test results(Bottom Antenna) for GSM850 and WCDMA Band V and the worst test results(Top Antenna) for GSM1900 and WCDMA Band IV& Band II in this report.**

Note 2: 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 3: 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 4: 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).

Note 5: 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 6: 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 7: 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 8: 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
	Top Antenna	Bottom Antenna	
GSM850(GSM)	0.217	0.465	247KGXW
GSM850(EDGE)	0.132	0.116	245KG7W
GSM1900(GSM)	0.385	0.247	251KGXW
GSM1900(EDGE)	0.135	0.171	248KG7W
WCDMA Band V	0.052	0.081	4M15F9W
WCDMA Band IV	0.339	0.073	4M16F9W
WCDMA Band II	0.173	0.040	4M17F9W

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	Feb 01, 2021	Chen Hao Ling Keye	PASS	No deviation
2	24.232(d)	Peak -Average Ratio	Oct 29, 2020	Ling Keye	PASS	No deviation
3	2.1049	Occupied Bandwidth	Oct 29, 2020 Feb 02, 2021	Ling Keye	PASS	No deviation
4	2.1055, 22.355, 24.235, 27.54	Frequency Stability	Feb 02, 2021	Ling Keye	PASS	No deviation
5	2.1051, 22.917(a), 24.238(a), 27.53(h)	Conducted Out of Band Emissions	Oct 29, 2020 Feb 02, 2021	Ling Keye	PASS	No deviation
6	2.1051, 22.917(a), 24.238(a), 27.53(h)	Band Edge	Oct 29, 2020	Ling Keye	PASS	No deviation
7	22.913(a), 24.232(c) 27.50(d)	Transmitter Radiated Power (EIPR/E.R.P.)	Feb 03, 2021	Peng Xuewei	PASS	No deviation
8	2.1051, 22.917(a),	Radiated Out of Band	Nov 11&12, 2021	Peng Xuewei	PASS	No deviation

	24.238(a), 27.53(h)	Emissions				

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 23.5dB contains two parts that cable loss 13.5dB 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% risk level.

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

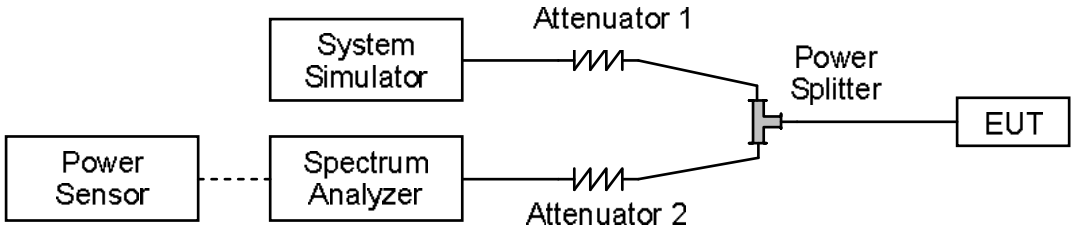
2.1. Conducted RF Output Power

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 Result

Top Antenna			
GSM850	**Average Power (dBm)**		
TX Channel	**128**	**189**	**251**
Frequency (MHz)	**824.2**	**836.4**	**848.8**
GSM 1 Tx slot	27.31	27.27	27.50
GPRS 1 Tx slot	27.32	27.29	27.52
GPRS 2 Tx slots	27.13	27.12	27.36
GPRS 3 Tx slots	27.33	27.21	27.20
GPRS 4 Tx slots	26.55	26.54	26.56
EDGE 1 Tx slot	25.33	25.23	25.37
EDGE 2 Tx slots	24.76	24.94	24.52
EDGE 3 Tx slots	24.90	24.96	24.69
EDGE 4 Tx slots	24.80	24.89	24.84

Bottom Antenna			
GSM850	**Average Power (dBm)**		
TX Channel	**128**	**189**	**251**
Frequency (MHz)	**824.2**	**836.4**	**848.8**
GSM 1 Tx slot	30.68	30.67	30.79
GPRS 1 Tx slot	30.71	30.69	30.82
GPRS 2 Tx slots	30.57	30.64	30.74
GPRS 3 Tx slots	30.51	30.63	30.68
GPRS 4 Tx slots	30.11	30.23	30.42
EDGE 1 Tx slot	24.35	24.55	24.78
EDGE 2 Tx slots	24.52	24.56	24.61
EDGE 3 Tx slots	24.49	24.37	24.50
EDGE 4 Tx slots	24.26	24.28	24.22

Top Antenna			
GSM1900	**Average Power (dBm)**		
TX Channel	**512**	**661**	**810**
Frequency (MHz)	**1850.2**	**1880**	**1909.8**
GSM 1 Tx slot	27.81	28.26	27.95
GPRS 1 Tx slot	27.78	28.24	27.91
GPRS 2 Tx slots	27.65	28.10	27.80
GPRS 3 Tx slots	27.53	27.95	27.66
GPRS 4 Tx slots	27.31	27.78	27.50
EDGE 1 Tx slot	22.99	23.71	23.09
EDGE 2 Tx slots	22.82	23.54	22.92
EDGE 3 Tx slots	22.67	23.29	22.77
EDGE 4 Tx slots	22.55	23.12	22.54

Bottom Antenna			
GSM1900	**Average Power (dBm)**		
TX Channel	**512**	**661**	**810**
Frequency (MHz)	**1850.2**	**1880**	**1909.8**
GSM 1 Tx slot	26.22	26.31	26.24
GPRS 1 Tx slot	26.23	26.32	26.26
GPRS 2 Tx slots	26.13	26.17	26.11
GPRS 3 Tx slots	26.01	26.00	26.12
GPRS 4 Tx slots	25.55	25.80	25.73
EDGE 1 Tx slot	24.57	24.58	24.52
EDGE 2 Tx slots	24.53	24.52	24.72
EDGE 3 Tx slots	24.39	24.43	24.49
EDGE 4 Tx slots	24.14	24.31	24.26

Top Antenna			
WCDMA Band V	**Average Power (dBm)**		
TX Channel	**4132**	**4182**	**4233**
Frequency (MHz)	**826.4**	**836.4**	**846.6**
RMC 12.2Kbps	21.08	21.11	21.15
HSDPA Subtest-1	20.99	21.07	20.98
HSDPA Subtest-2	21.27	21.07	21.23
HSDPA Subtest-3	20.37	20.50	20.71
HSDPA Subtest-4	20.74	20.65	20.67
DC-HSDPA Subtest-1	20.12	20.20	20.11
DC-HSDPA Subtest-2	20.11	20.04	20.00
DC-HSDPA Subtest-3	19.70	19.47	19.59
DC-HSDPA Subtest-4	19.68	19.72	19.60
HSUPA Subtest-1	21.02	20.99	21.08
HSUPA Subtest-2	20.56	20.53	20.54
HSUPA Subtest-3	21.02	21.20	21.05
HSUPA Subtest-4	21.04	21.02	20.98
HSUPA Subtest-5	21.15	21.14	21.17
HSPA+ (16QAM) Subtest-1	21.01	21.17	21.06

Bottom Antenna			
WCDMA Band V	**Average Power (dBm)**		
TX Channel	**4132**	**4182**	**4233**
Frequency (MHz)	**826.4**	**836.4**	**846.6**
RMC 12.2Kbps	24.28	24.30	24.34
HSDPA Subtest-1	23.21	23.17	23.18
HSDPA Subtest-2	23.22	23.18	23.19
HSDPA Subtest-3	22.72	22.63	22.68
HSDPA Subtest-4	22.66	22.67	22.56
DC-HSDPA Subtest-1	22.56	22.74	22.80
DC-HSDPA Subtest-2	22.41	22.50	22.57
DC-HSDPA Subtest-3	22.14	22.31	22.31
DC-HSDPA Subtest-4	22.18	22.05	22.14
HSUPA Subtest-1	23.15	23.20	23.15
HSUPA Subtest-2	22.69	22.67	22.64
HSUPA Subtest-3	23.23	23.21	23.17
HSUPA Subtest-4	23.17	23.26	23.15
HSUPA Subtest-5	23.22	23.16	23.13
HSPA+ (16QAM) Subtest-1	23.26	23.25	23.17

Top Antenna			
WCDMA Band IV	**Average Power (dBm)**		
TX Channel	**1312**	**1413**	**1513**
Frequency (MHz)	**1712.4**	**1732.6**	**1752.6**
RMC 12.2Kbps	25.19	25.30	25.21
HSDPA Subtest-1	24.53	24.51	24.50
HSDPA Subtest-2	24.60	24.41	24.54
HSDPA Subtest-3	23.99	23.93	23.99
HSDPA Subtest-4	24.01	23.91	24.02
DC-HSDPA Subtest-1	23.22	23.35	23.04
DC-HSDPA Subtest-2	23.17	22.98	23.00
DC-HSDPA Subtest-3	22.87	22.60	22.71
DC-HSDPA Subtest-4	22.65	22.58	22.58
HSUPA Subtest-1	24.68	24.27	24.51
HSUPA Subtest-2	24.08	23.83	24.11
HSUPA Subtest-3	24.54	24.32	24.62
HSUPA Subtest-4	24.47	24.32	24.58
HSUPA Subtest-5	24.50	24.28	24.56
HSPA+ (16QAM) Subtest-1	24.04	23.93	24.05

Bottom Antenna			
WCDMA Band IV	**Average Power (dBm)**		
TX Channel	**1312**	**1413**	**1513**
Frequency (MHz)	**1712.4**	**1732.6**	**1752.6**
RMC 12.2Kbps	18.44	18.61	18.54
HSDPA Subtest-1	17.51	17.63	17.61
HSDPA Subtest-2	17.56	17.58	17.64
HSDPA Subtest-3	17.04	17.11	17.18
HSDPA Subtest-4	16.99	17.13	17.12
DC-HSDPA Subtest-1	16.93	16.60	16.63
DC-HSDPA Subtest-2	16.44	16.52	16.53
DC-HSDPA Subtest-3	16.00	16.21	16.20
DC-HSDPA Subtest-4	16.34	16.27	16.31
HSUPA Subtest-1	17.54	17.66	17.64
HSUPA Subtest-2	16.99	17.17	17.14
HSUPA Subtest-3	17.67	17.69	17.69
HSUPA Subtest-4	17.52	17.59	17.61
HSUPA Subtest-5	17.54	17.61	17.67
HSPA+ (16QAM) Subtest-1	17.60	17.64	17.63

Top Antenna			
WCDMA Band II	**Average Power (dBm)**		
TX Channel	**9262**	**9400**	**9538**
Frequency (MHz)	**1852.4**	**1880.0**	**1907.6**
RMC 12.2Kbps	24.54	24.78	24.64
HSDPA Subtest-1	23.31	23.38	23.36
HSDPA Subtest-2	23.31	23.48	23.34
HSDPA Subtest-3	22.76	23.08	22.58
HSDPA Subtest-4	22.63	22.91	22.56
DC-HSDPA Subtest-1	21.80	21.45	21.60
DC-HSDPA Subtest-2	21.67	21.37	21.54
DC-HSDPA Subtest-3	21.00	21.11	21.30
DC-HSDPA Subtest-4	21.05	21.12	21.04
HSUPA Subtest-1	23.34	23.39	22.95
HSUPA Subtest-2	22.74	22.80	22.43
HSUPA Subtest-3	23.30	23.36	22.98
HSUPA Subtest-4	23.31	23.37	22.84
HSUPA Subtest-5	23.36	23.45	22.89
HSPA+ (16QAM) Subtest-1	23.38	23.37	22.90

Bottom Antenna			
WCDMA Band II	**Average Power (dBm)**		
TX Channel	**9262**	**9400**	**9538**
Frequency (MHz)	**1852.4**	**1880.0**	**1907.6**
RMC 12.2Kbps	18.32	18.46	18.42
HSDPA Subtest-1	18.08	18.13	18.12
HSDPA Subtest-2	18.10	18.15	18.08
HSDPA Subtest-3	17.44	17.57	17.57
HSDPA Subtest-4	17.55	17.65	17.45
DC-HSDPA Subtest-1	17.10	17.30	17.32
DC-HSDPA Subtest-2	17.78	17.50	17.41
DC-HSDPA Subtest-3	17.26	17.44	17.21
DC-HSDPA Subtest-4	17.42	17.25	17.34
HSUPA Subtest-1	18.11	18.12	18.16
HSUPA Subtest-2	17.46	17.64	17.07
HSUPA Subtest-3	18.01	18.07	18.12
HSUPA Subtest-4	18.06	18.03	18.08
HSUPA Subtest-5	18.06	18.07	18.13
HSPA+ (16QAM) Subtest-1	18.07	18.12	18.11

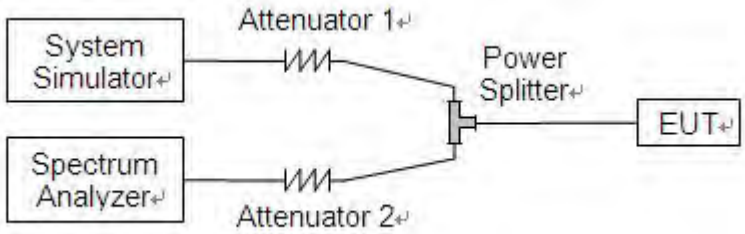
2.2. Peak to Average Ratio

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

The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

A. Test Verdict:

GSM1900					
Mode	Channel	Frequency (MHz)	Peak to Average ratio (dB)	Limit (dB)	Verdict
GSM	512	1850.2	0.064	13	PASS
	661	1880.0	0.005		PASS
	810	1909.8	0.059		PASS
EDGE	512	1850.2	0.074		PASS
	661	1880.0	0.016		PASS
	810	1909.8	0.069		PASS

WCDMA Band IV					
Mode	Channel	Frequency (MHz)	Peak to Average ratio (dB)	Limit (dB)	Verdict
WCDMA	1312	1712.4	6.76	13	PASS
	1413	1732.6	6.56		PASS
	1513	1752.6	6.69		PASS

WCDMA Band II					
Mode	Channel	Frequency (MHz)	Peak to Average ratio (dB)	Limit (dB)	Verdict
WCDMA	9262	1852.4	2.82	13	PASS
	9400	1880.0	2.88		PASS
	9538	1907.6	2.84		PASS

GSM1900(GSM), CH512, 1850.2MHz

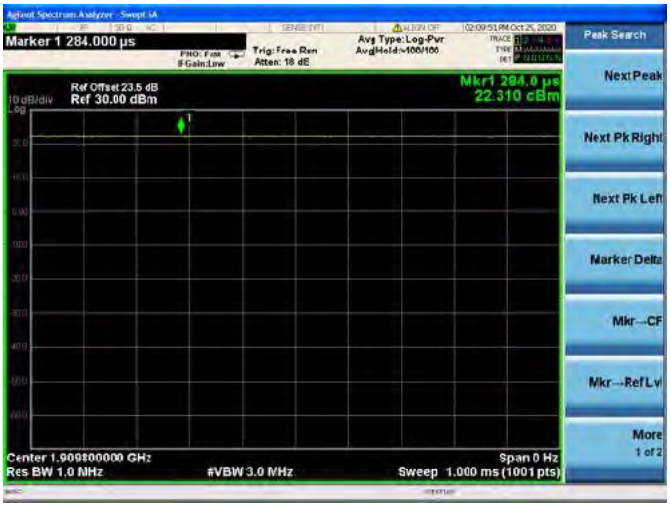
GSM1900(GSM), CH661, 1880.0MHz

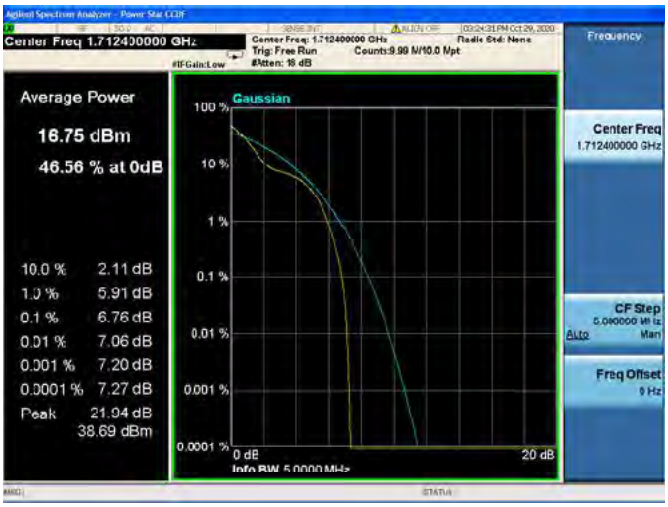
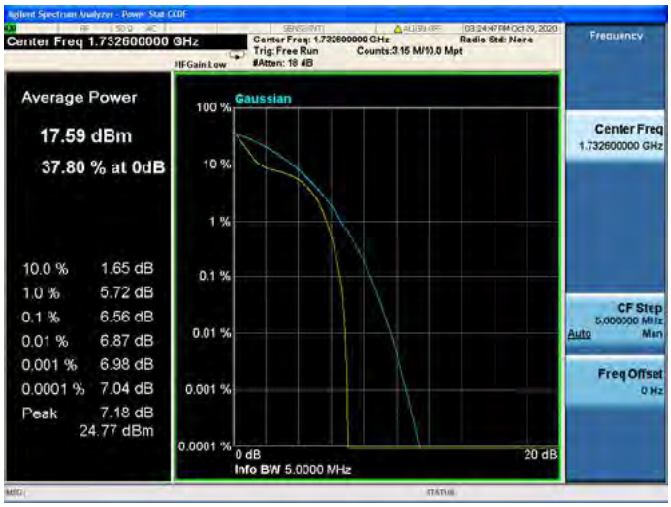
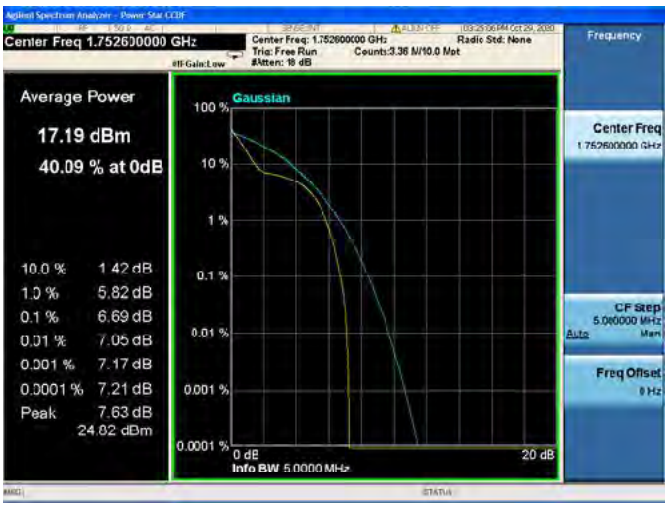
GSM1900(GSM), CH810, 1909.8MHz

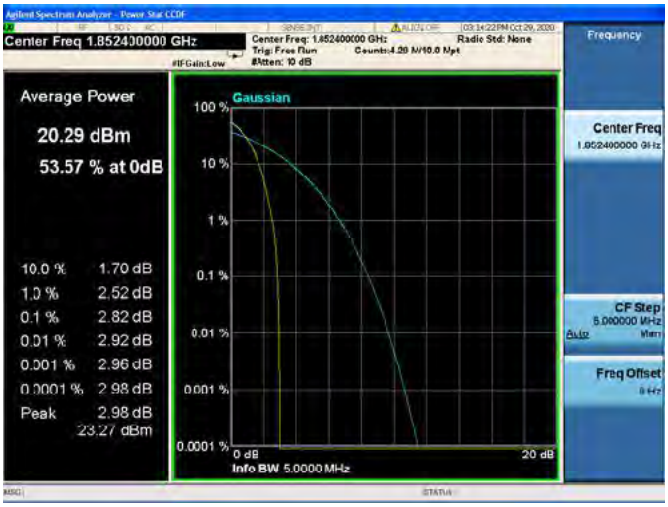
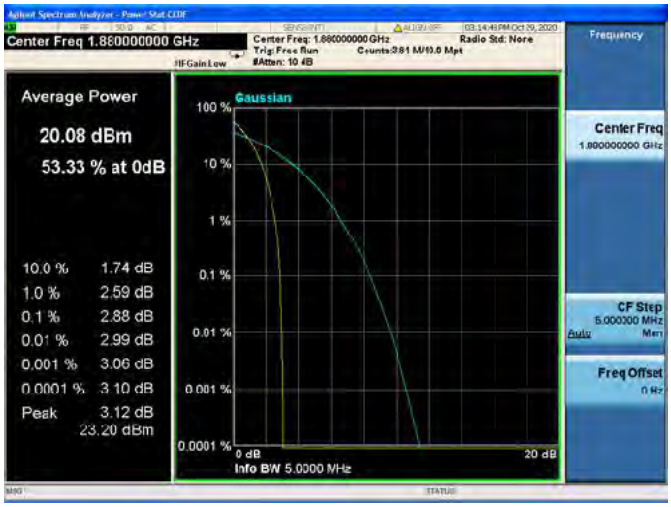
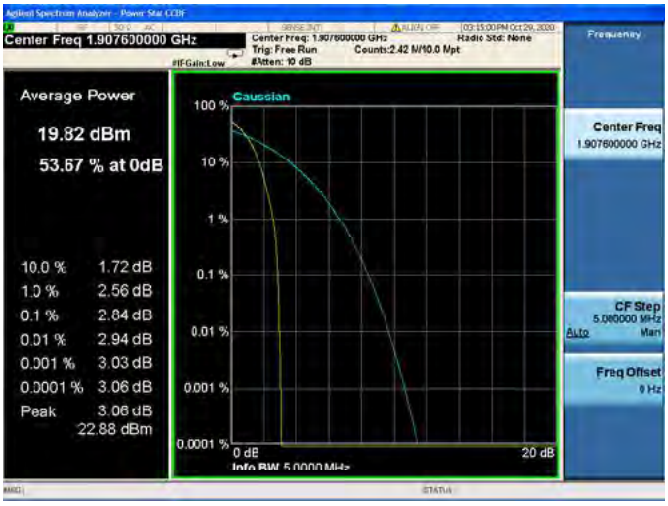
GSM1900(EDGE), CH512, 1850.2MHz

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	
	

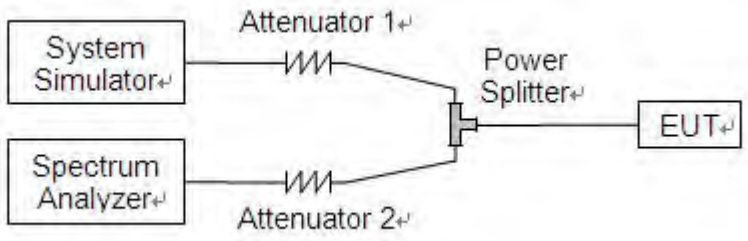
2.3. Occupied Bandwidth

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	242.11	314.00
	189	836.4	247.47	317.50
	251	848.8	242.76	312.20
EDGE	128	824.2	245.20	318.70
	189	836.4	243.47	316.70
	251	848.8	242.85	320.60

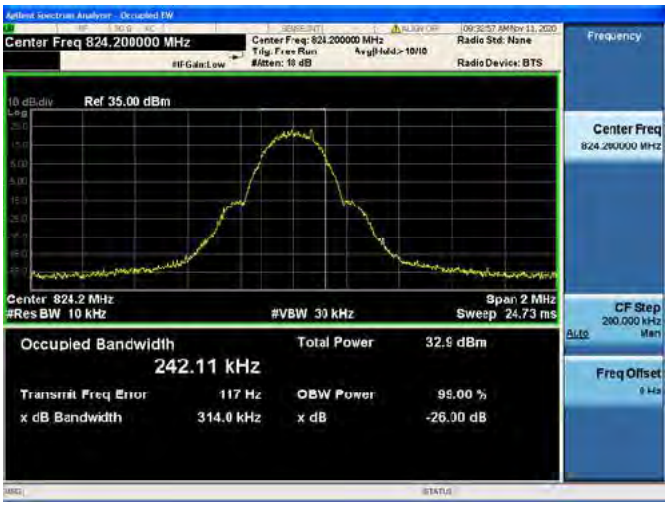
GSM1900				
Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)
GSM	512	1850.2	242.34	316.00
	661	1880.0	236.89	313.60
	810	1909.8	251.70	312.20
EDGE	512	1850.2	246.28	297.80
	661	1880.0	248.45	291.30
	810	1909.8	246.14	307.80

WCDMA Band V				
Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA	4132	826.4	4.145	4.714
	4182	836.4	4.145	4.732
	4233	846.6	4.148	4.718

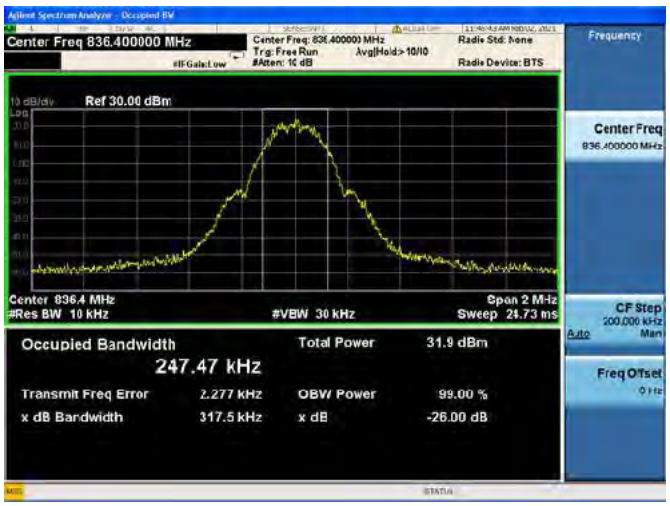
WCDMA Band IV				
Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA	1312	1712.4	4.141	4.705
	1413	1732.6	4.161	4.658
	1513	1752.6	4.150	4.725

WCDMA Band II				
Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA	9262	1852.4	4.142	4.734
	9400	1880.0	4.167	4.736
	9538	1907.6	4.159	4.715

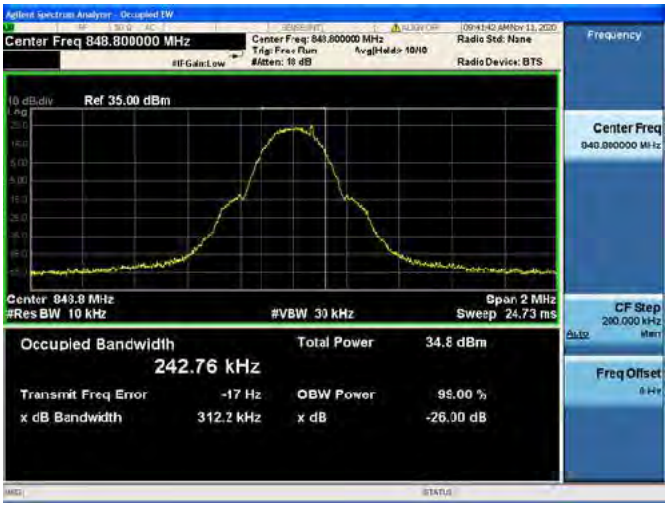
GSM850(GSM), CH128, 824.2MHz

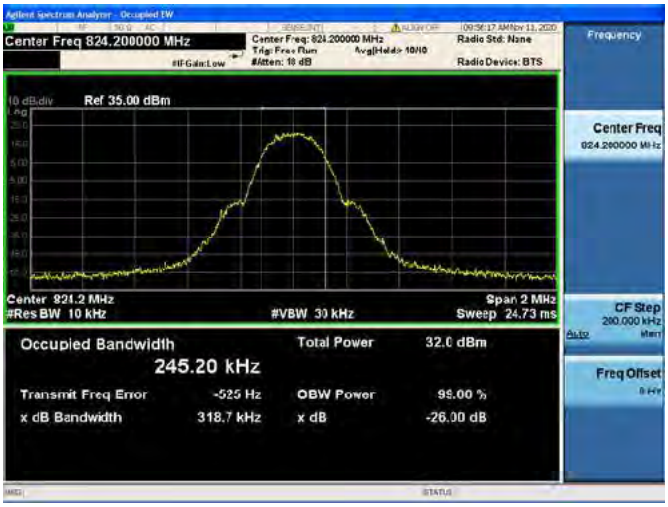
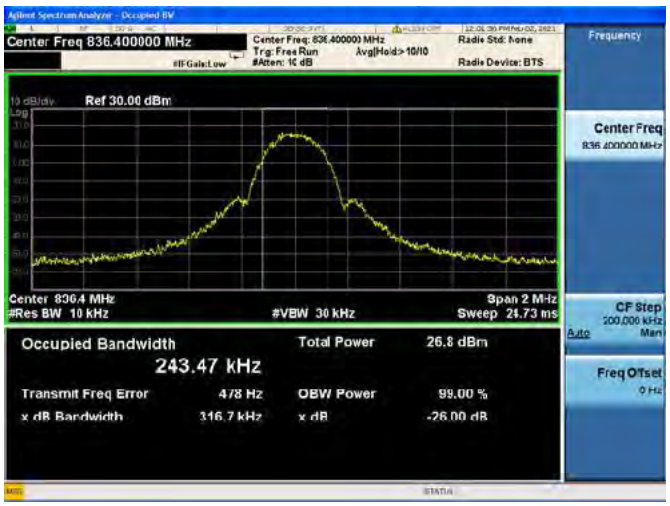
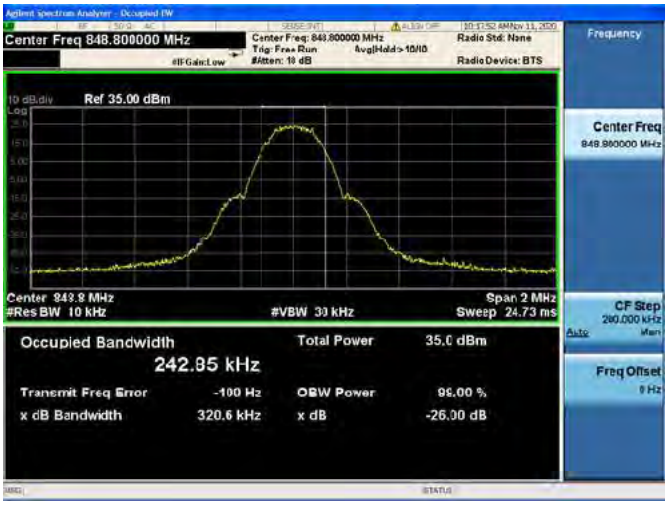


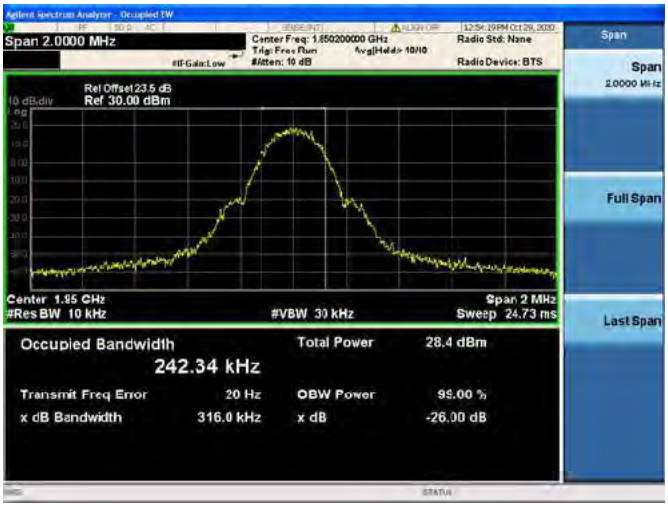
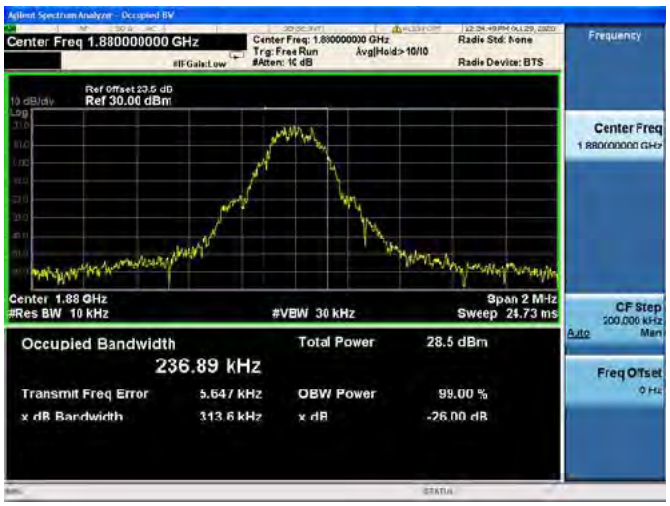
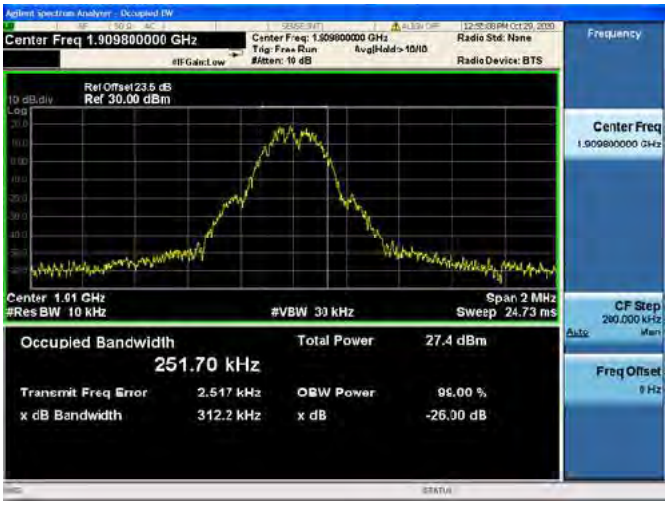
GSM850(GSM), CH189, 836.4MHz

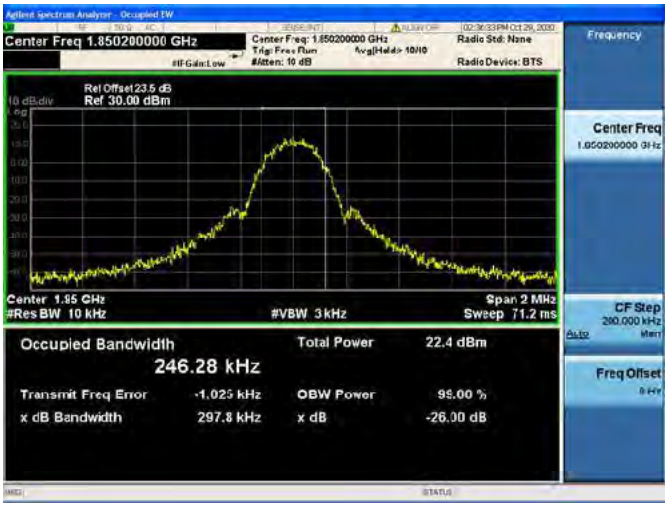
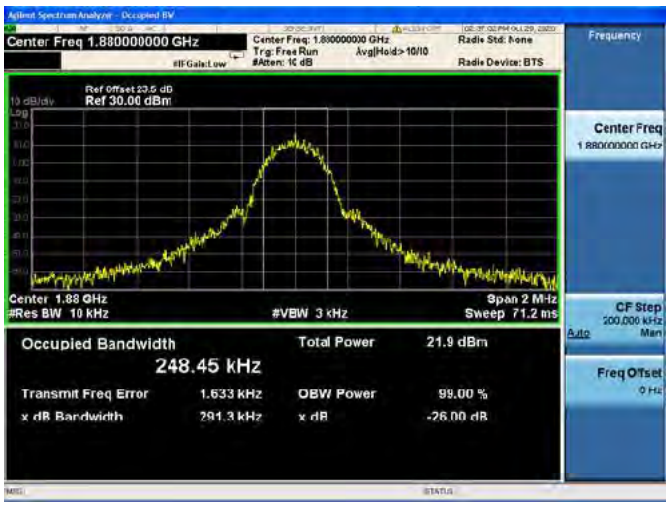
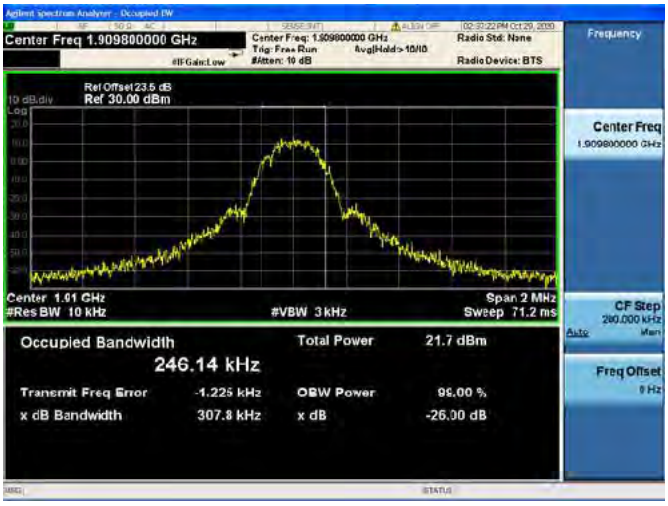


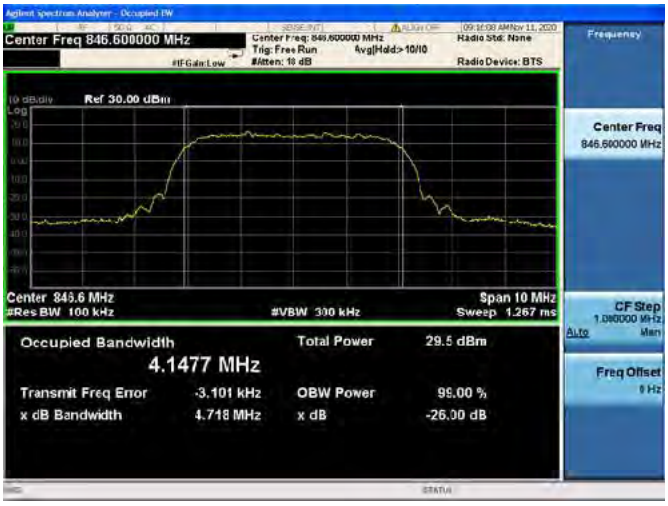
GSM850(GSM), CH251, 848.8MHz



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:

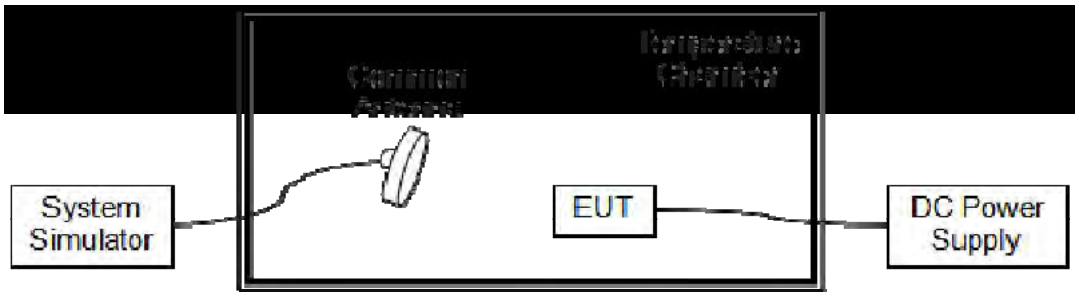
(a) The temperature is varied from-30°C to +50°C at intervals of not more than 10°C.

(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 45°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 3.40V, 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)	24	0.029	PASS
100		0	38	0.045	
100		+10	41	0.049	
100		+20	13	0.016	
100		+30	10	0.012	
100		+40	-13	-0.016	
100		+50	21	0.025	
100		+55	25	0.030	
115	4.40	+20	27	0.032	
85	3.40	+20	13	0.016	

GSM850(EDGE), CH189, 836.4MHz Limit =±2.5ppm					
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result
100	3.85	+20(Ref)	-15	-0.018	PASS
100		0	35	0.042	
100		+10	-20	-0.024	
100		+20	27	0.032	
100		+30	-14	-0.017	
100		+40	-17	-0.020	
100		+50	48	0.057	
100		+55	42	0.050	
115	4.40	+20	38	0.045	
85	3.40	+20	31	0.037	

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)	18	0.010	PASS
100		0	48	0.026	
100		+10	42	0.022	
100		+20	67	0.036	
100		+30	74	0.039	
100		+40	37	0.020	
100		+50	24	0.013	
100		+55	-13	-0.007	
115	4.40	+20	-23	-0.012	
85	3.40	+20	26	0.014	

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)	25	0.013	PASS
100		0	-11	-0.006	
100		+10	23	0.012	
100		+20	-24	-0.013	
100		+30	-14	-0.007	
100		+40	-11	-0.006	
100		+50	17	0.009	
100		+55	15	0.008	
115	4.40	+20	-13	-0.007	
85	3.40	+20	17	0.009	

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)	20	0.024	PASS
100		0	44	0.053	
100		+10	10	0.012	
100		+20	10	0.012	
100		+30	54	0.065	
100		+40	22	0.026	
100		+50	27	0.032	
100		+55	-19	-0.023	
115	4.40	+20	14	0.017	
85	3.40	+20	63	0.075	

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)	-16	-0.009	PASS
100		0	17	0.010	
100		+10	16	0.009	
100		+20	11	0.006	
100		+30	19	0.011	
100		+40	-12	-0.007	
100		+50	16	0.009	
100		+55	-12	-0.007	
115	4.40	+20	11	0.006	
85	3.40	+20	-21	-0.012	

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)	46	0.024	PASS
100		0	28	0.015	
100		+10	-15	-0.008	
100		+20	36	0.019	
100		+30	13	0.007	
100		+40	12	0.006	
100		+50	23	0.012	
100		+55	13	0.007	
115	4.40	+20	47	0.025	
85	3.40	+20	-29	-0.015	

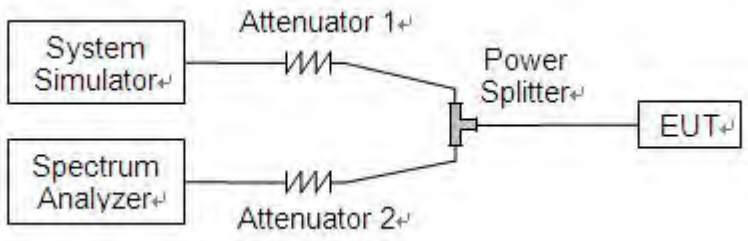
2.5. Conducted Out of Band Emissions

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.

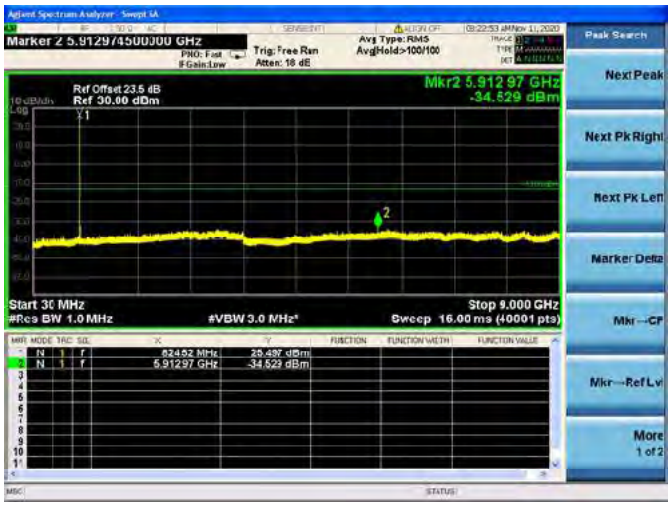
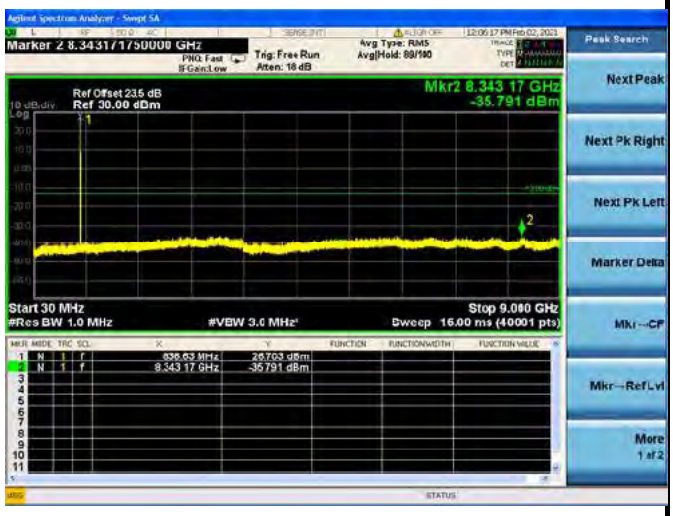
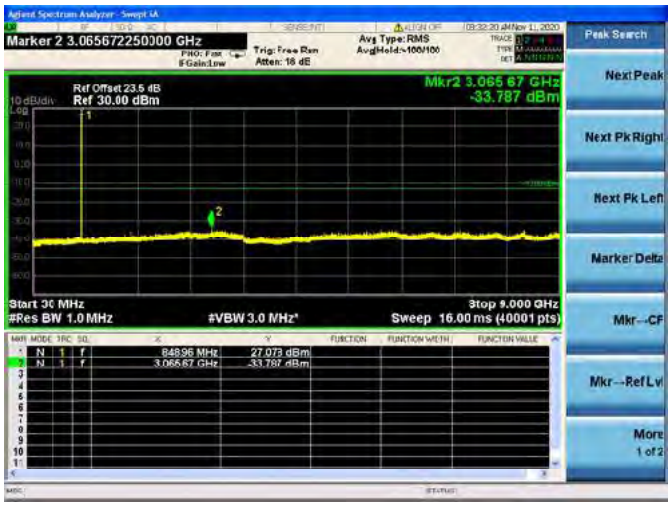
2.5.2. Test Description

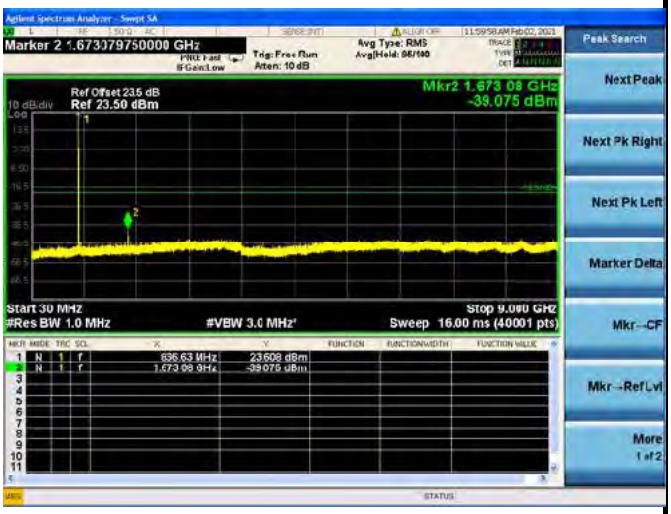
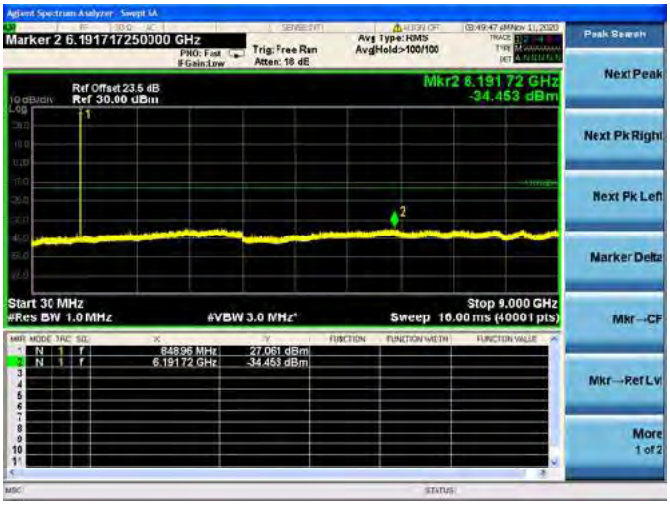
Test Setup:

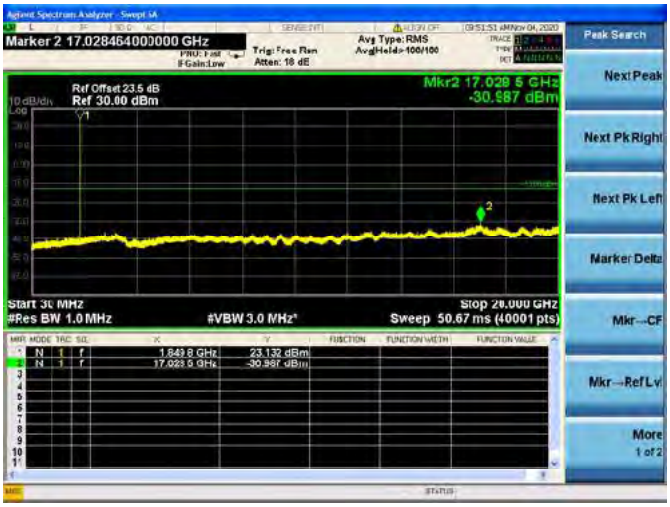
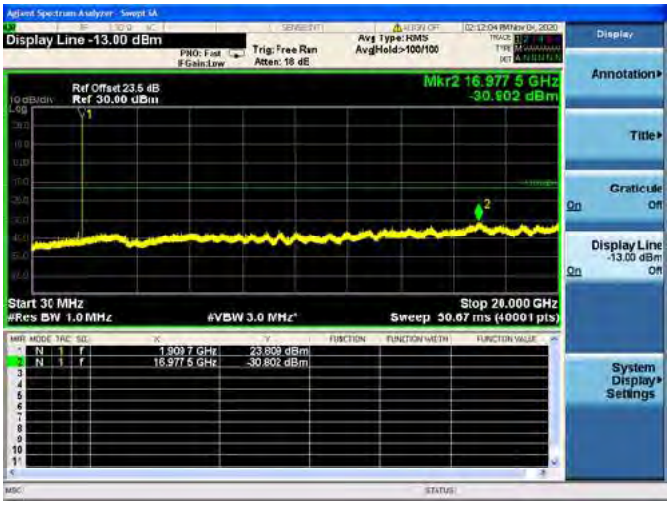


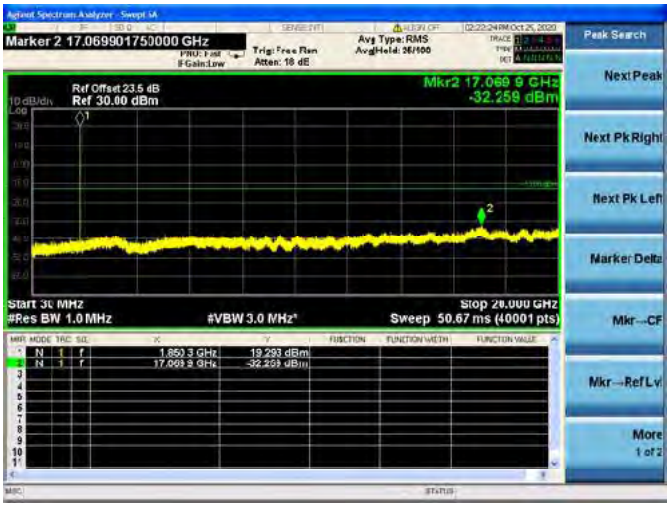
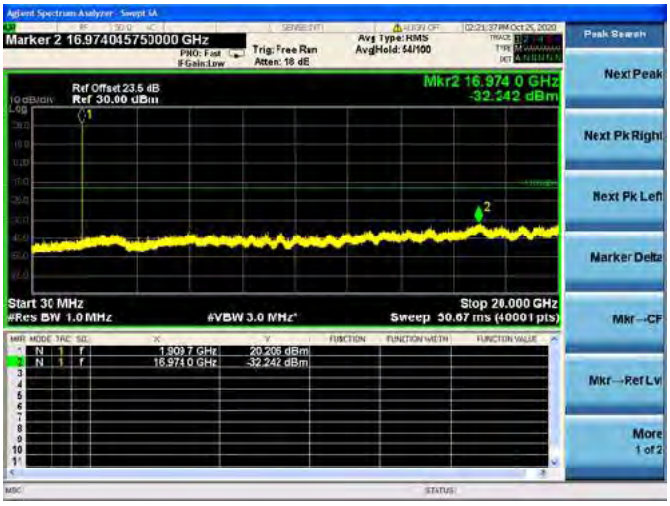
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

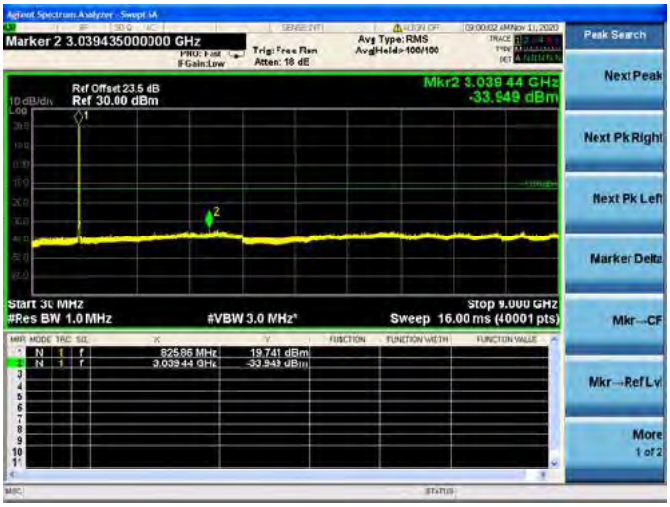
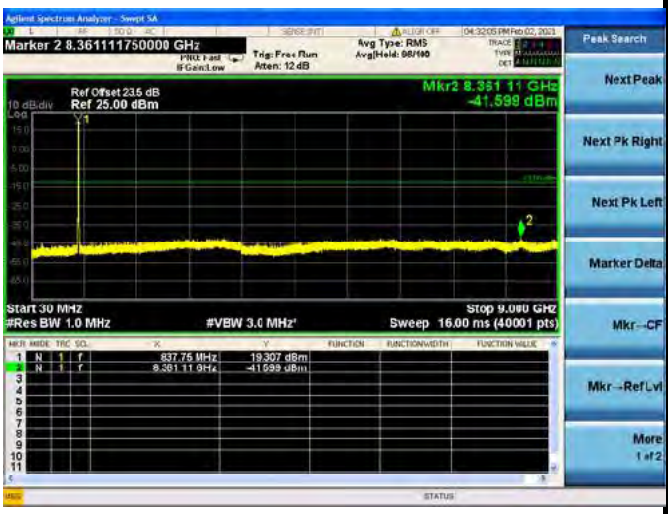
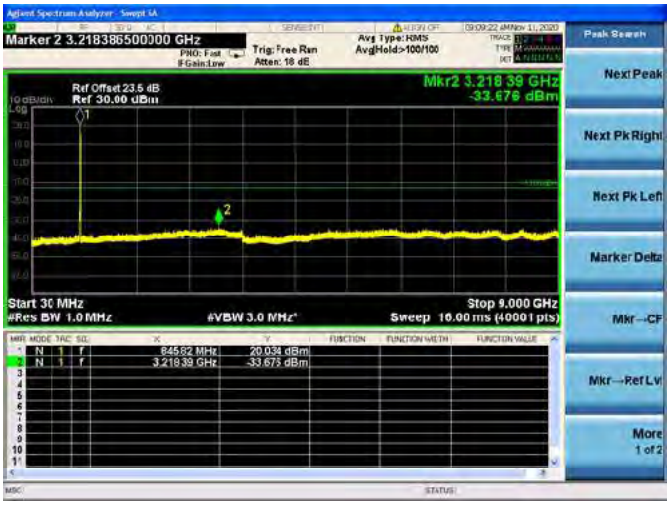
2.5.3. Test Result

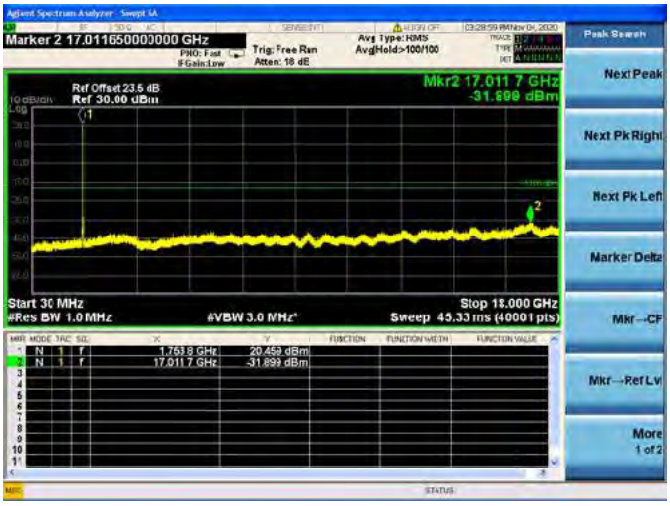
GSM850(GSM), CH128, 824.2MHz	GSM850(GSM), CH189, 836.4MHz
	
GSM850(GSM), CH251, 848.8MHz	
	

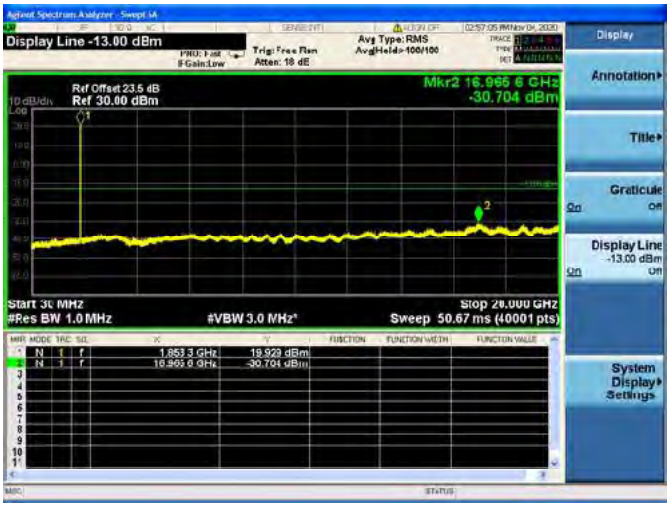
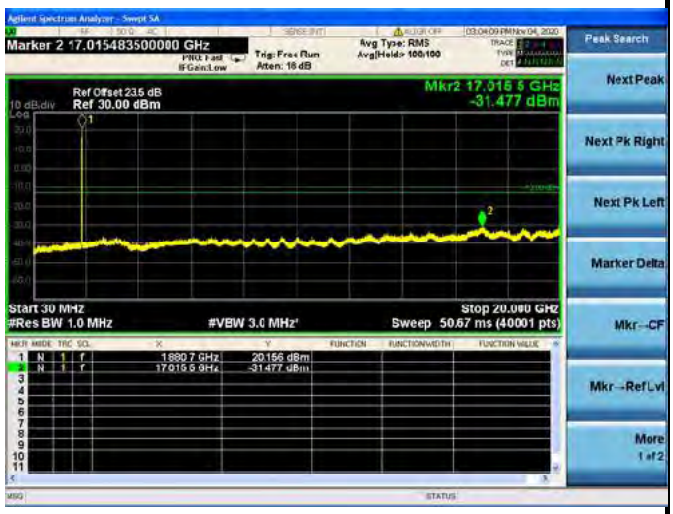
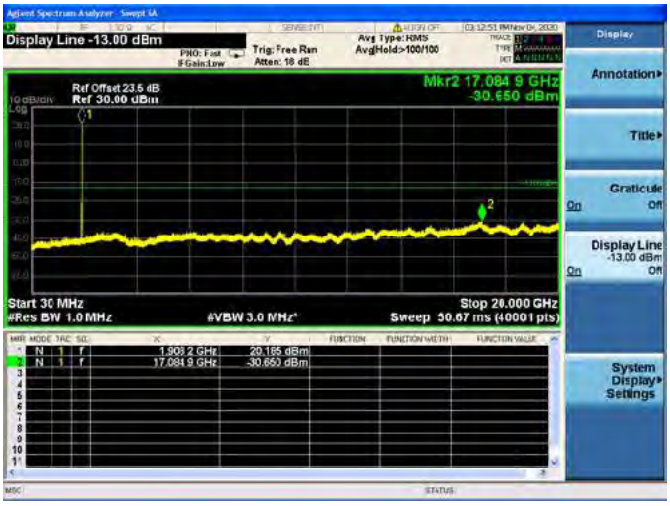
GSM850(EDGE), CH128, 824.2MHz	GSM850(EDGE), CH189, 836.4MHz
	
GSM850(EDGE), CH251, 848.8MHz	
	

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	
	

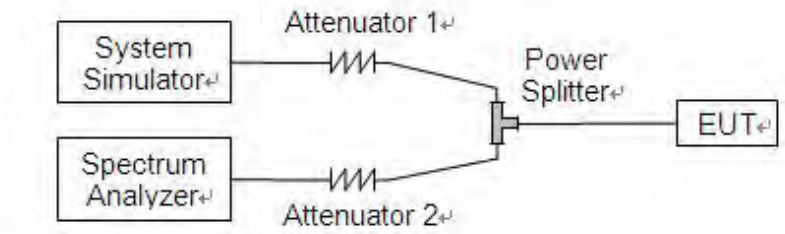
2.6. Band Edge

2.6.1. Requirement

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

2.6.2. Test Description

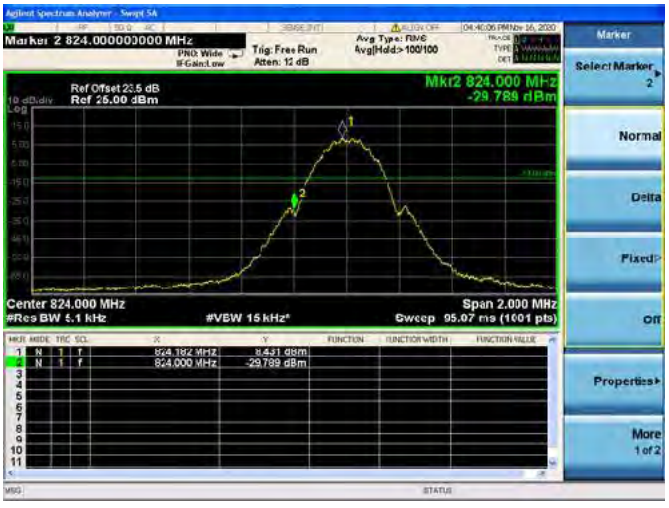
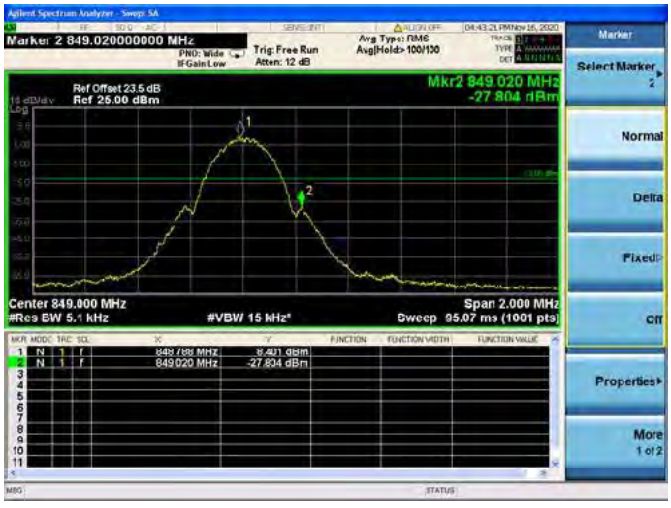
Test Setup:

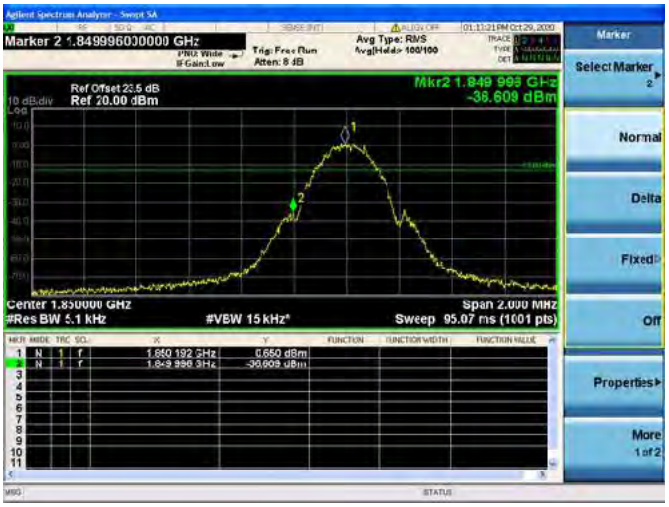
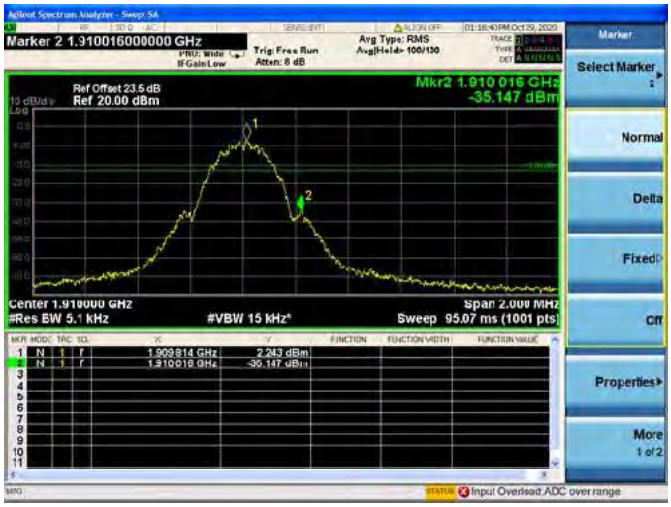
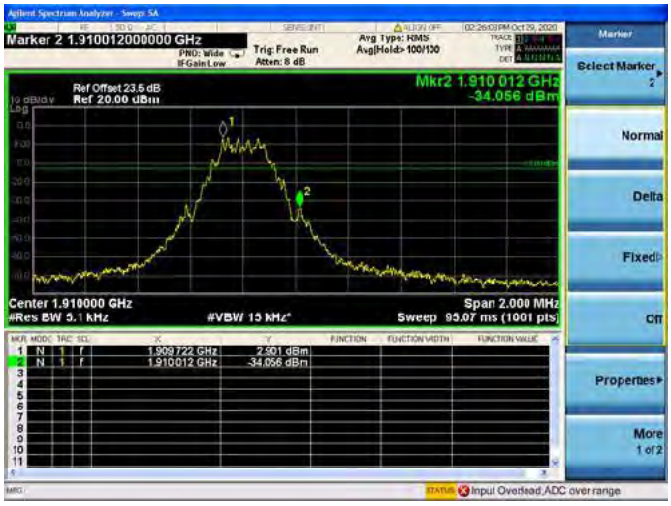


The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum 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, Top Antenna								
Band	Channel	Frequency (MHz)	PCL	Measured E.R.P.		Limit		Verdict
				dBm	W	dBm	W	
GSM	128	824.20	5	23.16	0.207	38.5	7	PASS
	189	836.40	5	23.12	0.205			PASS
	251	848.80	5	23.35	0.216			PASS
GPRS	128	824.20	5	23.17	0.207	38.5	7	PASS
	189	836.40	5	23.14	0.206			PASS
	251	848.80	5	23.37	0.217			PASS
EDGE	128	824.20	5	21.18	0.131	38.5	7	PASS
	189	836.40	5	21.08	0.128			PASS
	251	848.80	5	21.22	0.132			PASS
Note 1: For the GPRS and EDGE mode, all the slots were tested and just the worst data were recorded in this report.								

GSM850, Bottom Antenna								
Band	Channel	Frequency (MHz)	PCL	Measured E.R.P.		Limit		Verdict
				dBm	W	dBm	W	
GSM	128	824.20	5	26.53	0.450	38.5	7	PASS
	189	836.40	5	26.52	0.449			PASS
	251	848.80	5	26.64	0.461			PASS
GPRS	128	824.20	5	26.56	0.453	38.5	7	PASS
	189	836.40	5	26.54	0.451			PASS
	251	848.80	5	26.67	0.465			PASS
EDGE	128	824.20	5	20.20	0.105	38.5	7	PASS
	189	836.40	5	20.40	0.110			PASS
	251	848.80	5	20.63	0.116			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, Top Antenna								
Band	Channel	Frequency (MHz)	PCL	Measured E.I.R.P.		Limit		Verdict
				dBm	W	dBm	W	
GSM	512	1850.2	0	25.41	0.348	33	2	PASS
	661	1880.0	0	25.86	0.385			PASS
	810	1909.8	0	25.55	0.359			PASS
GPRS	512	1850.2	0	25.38	0.345	33	2	PASS
	661	1880.0	0	25.84	0.384			PASS
	810	1909.8	0	25.51	0.356			PASS
EDGE	512	1850.2	0	20.59	0.115	33	2	PASS
	661	1880.0	0	21.31	0.135			PASS
	810	1909.8	0	20.69	0.117			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, Bottom Antenna								
Band	Channel	Frequency (MHz)	PCL	Measured E.I.R.P.		Limit		Verdict
				dBm	W	dBm	W	
GSM	512	1850.2	0	23.82	0.241	33	2	PASS
	661	1880.0	0	23.91	0.246			PASS
	810	1909.8	0	23.84	0.242			PASS
GPRS	512	1850.2	0	23.83	0.242	33	2	PASS
	661	1880.0	0	23.92	0.247			PASS
	810	1909.8	0	23.86	0.243			PASS
EDGE	512	1850.2	0	22.13	0.163	33	2	PASS
	661	1880.0	0	22.12	0.163			PASS
	810	1909.8	0	22.32	0.171			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, Top Antenna							
Band	Channel	Frequency (MHz)	Measured E.R.P.		Limit		Verdict
			dBm	W	dBm	W	
WCDMA	4132	826.4	16.93	0.049	38.5	7	PASS
	4182	836.4	16.96	0.050			PASS
	4233	846.6	17.00	0.050			PASS
HSDPA	4132	826.4	17.12	0.052	38.5	7	PASS
	4182	836.4	16.92	0.049			PASS
	4233	846.6	17.08	0.051			PASS
DC-HSDPA	4132	826.4	15.97	0.040	38.5	7	PASS
	4182	836.4	16.05	0.040			PASS
	4233	846.6	15.96	0.039			PASS
HSUPA	4132	826.4	16.87	0.049	38.5	7	PASS
	4182	836.4	16.84	0.048			PASS
	4233	846.6	16.93	0.049			PASS
HSPA+	4132	826.4	16.86	0.049	38.5	7	PASS
	4182	836.4	17.02	0.050			PASS
	4233	846.6	16.91	0.049			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 V, Bottom Antenna							
Band	Channel	Frequency (MHz)	Measured E.R.P.		Limit		Verdict
			dBm	W	dBm	W	
WCDMA	4132	826.4	20.13	0.103	38.5	7	PASS
	4182	836.4	20.15	0.104			PASS
	4233	846.6	20.19	0.105			PASS
HSDPA	4132	826.4	19.07	0.081	38.5	7	PASS
	4182	836.4	19.03	0.080			PASS
	4233	846.6	19.04	0.080			PASS
DC-HSDPA	4132	826.4	18.41	0.069	38.5	7	PASS
	4182	836.4	18.58	0.072			PASS
	4233	846.6	18.55	0.072			PASS
HSUPA	4132	826.4	19.07	0.081	38.5	7	PASS
	4182	836.4	19.01	0.080			PASS
	4233	846.6	18.98	0.079			PASS
HSPA+	4132	826.4	19.11	0.081	38.5	7	PASS
	4182	836.4	19.10	0.081			PASS
	4233	846.6	19.02	0.080			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, Top Antenna							
Band	Channel	Frequency (MHz)	Measured E.I.R.P.		Limit		Verdict
			dBm	W	dBm	W	
WCDMA	1312	1712.4	25.19	0.330	30	1	PASS
	1413	1732.6	25.30	0.339			PASS
	1513	1752.6	25.21	0.332			PASS
HSDPA	1312	1712.4	24.60	0.288	30	1	PASS
	1413	1732.6	24.41	0.276			PASS
	1513	1752.6	24.54	0.284			PASS
DC-HSDPA	1312	1712.4	20.32	0.108	38.5	7	PASS
	1413	1732.6	20.45	0.111			PASS
	1513	1752.6	20.14	0.103			PASS
HSUPA	1312	1712.4	24.68	0.294	30	1	PASS
	1413	1732.6	24.27	0.267			PASS
	1513	1752.6	24.51	0.282			PASS
HSPA+	1312	1712.4	24.04	0.254	30	1	PASS
	1413	1732.6	23.93	0.247			PASS
	1513	1752.6	24.05	0.254			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, Bottom Antenna							
Band	Channel	Frequency (MHz)	Measured E.I.R.P.		Limit		Verdict
			dBm	W	dBm	W	
WCDMA	1312	1712.4	18.44	0.070	30	1	PASS
	1413	1732.6	18.61	0.073			PASS
	1513	1752.6	18.54	0.071			PASS
HSDPA	1312	1712.4	17.56	0.057	30	1	PASS
	1413	1732.6	17.58	0.057			PASS
	1513	1752.6	17.64	0.058			PASS
DC-HSDPA	1312	1712.4	14.03	0.025	38.5	7	PASS
	1413	1732.6	13.70	0.023			PASS
	1513	1752.6	13.73	0.024			PASS
HSUPA	1312	1712.4	17.67	0.058	30	1	PASS
	1413	1732.6	17.69	0.059			PASS
	1513	1752.6	17.69	0.059			PASS
HSPA+	1312	1712.4	17.60	0.058	30	1	PASS
	1413	1732.6	17.64	0.058			PASS
	1513	1752.6	17.63	0.058			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, Top Antenna							
Band	Channel	Frequency (MHz)	Measured E.I.R.P.		Limit		Verdict
			dBm	W	dBm	W	
WCDMA	9262	1852.4	22.14	0.164	33	2	PASS
	9400	1880.0	22.38	0.173			PASS
	9538	1907.6	22.24	0.167			PASS
HSDPA	9262	1852.4	20.91	0.123	33	2	PASS
	9400	1880.0	21.08	0.128			PASS
	9538	1907.6	20.94	0.124			PASS
DC-HSDPA	9262	1852.4	19.40	0.087	33	2	PASS
	9400	1880.0	19.05	0.080			PASS
	9538	1907.6	19.20	0.083			PASS
HSUPA	9262	1852.4	20.94	0.124	33	2	PASS
	9400	1880.0	20.99	0.126			PASS
	9538	1907.6	20.55	0.114			PASS
HSPA+	9262	1852.4	20.98	0.125	33	2	PASS
	9400	1880.0	20.97	0.125			PASS
	9538	1907.6	20.50	0.112			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, Bottom Antenna							
Band	Channel	Frequency (MHz)	Measured E.I.R.P.		Limit		Verdict
			dBm	W	dBm	W	
WCDMA	9262	1852.4	15.92	0.039	33	2	PASS
	9400	1880.0	16.06	0.040			PASS
	9538	1907.6	16.02	0.040			PASS
HSDPA	9262	1852.4	15.70	0.037	33	2	PASS
	9400	1880.0	15.75	0.038			PASS
	9538	1907.6	15.68	0.037			PASS
DC-HSDPA	9262	1852.4	15.38	0.035	33	2	PASS
	9400	1880.0	15.10	0.032			PASS
	9538	1907.6	15.01	0.032			PASS
HSUPA	9262	1852.4	15.71	0.037	33	2	PASS
	9400	1880.0	15.72	0.037			PASS
	9538	1907.6	15.76	0.038			PASS
HSPA+	9262	1852.4	15.67	0.037	33	2	PASS
	9400	1880.0	15.72	0.037			PASS
	9538	1907.6	15.71	0.037			PASS
Note 1: For the HSDPA and HSUPA mode, all the subtests were tested and just the worst data were recorded in this report.							

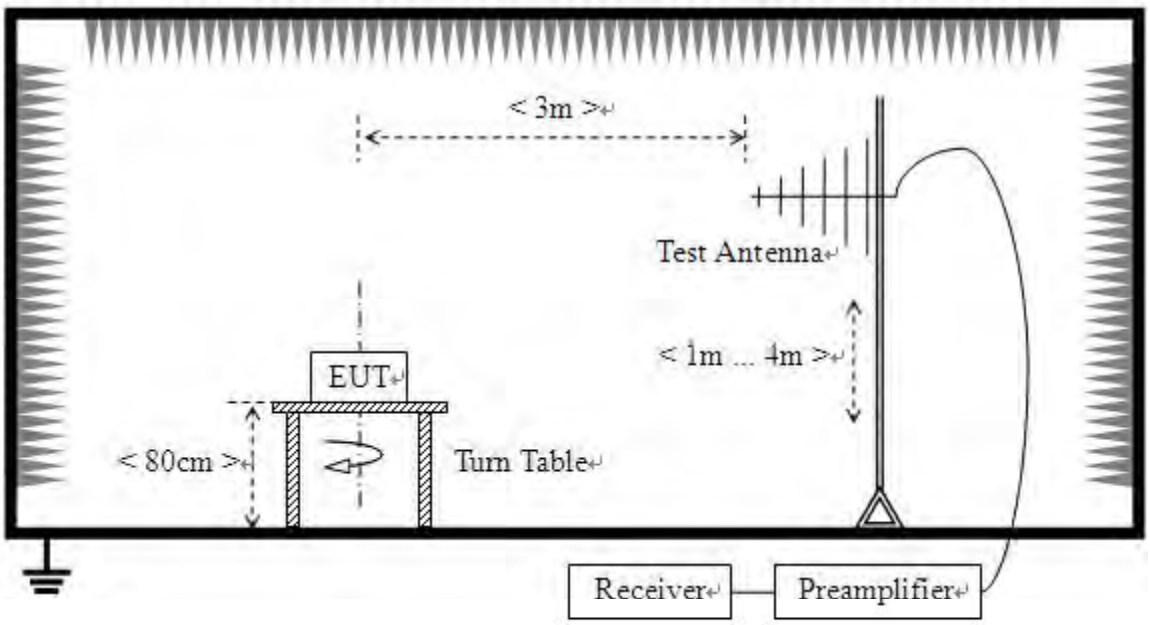
2.8. Radiated Out of Band Emissions

2.8.1. Requirement

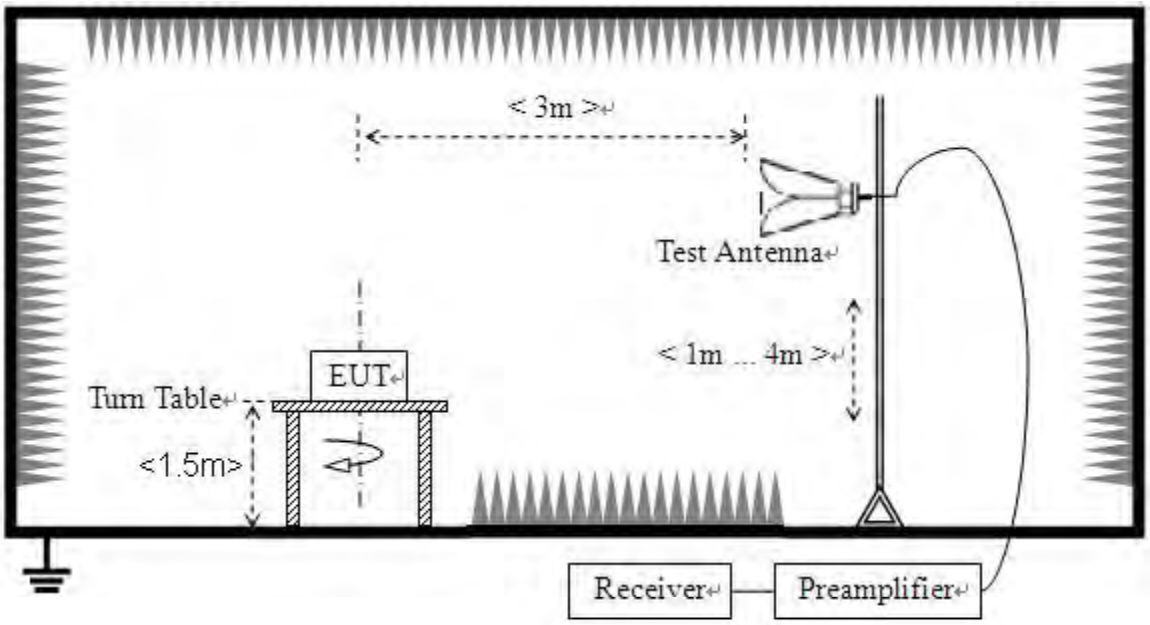
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm. The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency.

2.8.2. Test Description

Test Setup:
1) Below1GHz



2) 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 (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.

- Step size (dB): 3dB

The Test Antenna is a Bi-Log one (used for 30MHz to 1GHz) and a Horn one (used for above 3 GHz), it's located at the same height as the EUT. 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.

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.

2.8.3. 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.

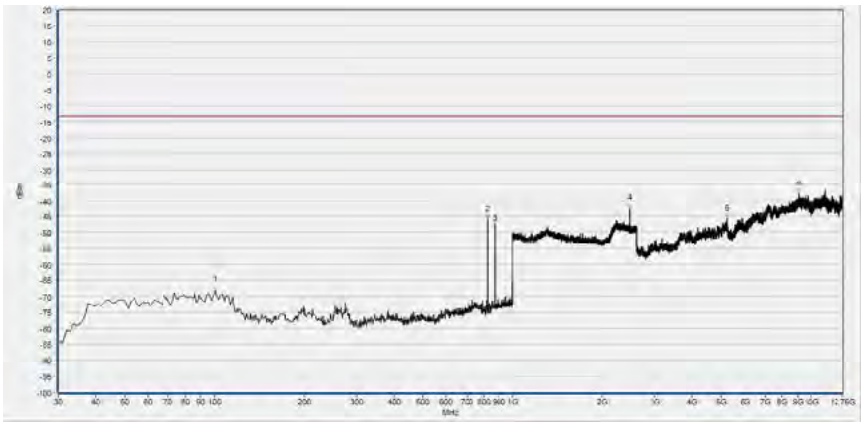
Note2: All test mode and condition mentioned were considered and evaluated respectively by performing full test, only the worst data were recorded and reported.

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.

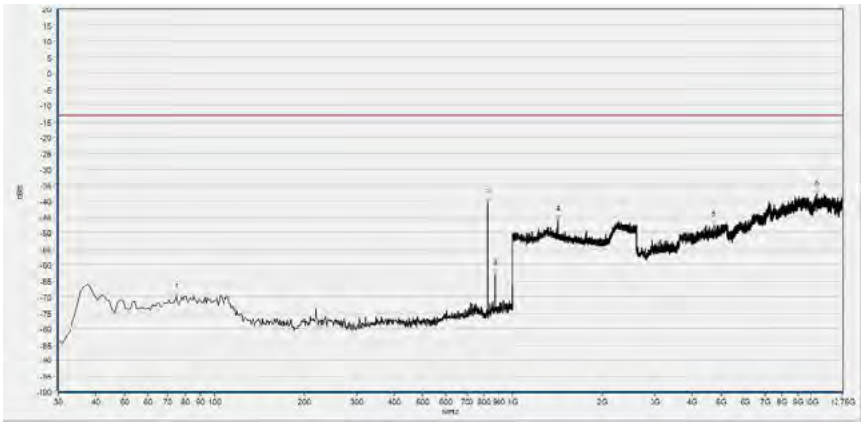
Note 4: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

Top Antenna

GSM850(GSM), Low Channel

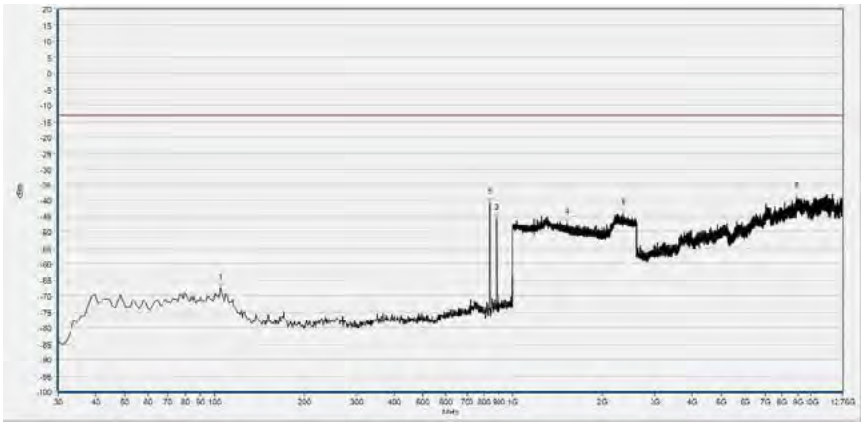


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	100.810	-68.19	-13.00	Horizontal	PASS
2	824.430	-45.88	-13.00	Horizontal	N/A
3	869.050	-47.59	-13.00	Horizontal	N/A
4	2472.589	-42.61	-13.00	Horizontal	PASS
5	5222.868	-45.79	-13.00	Horizontal	PASS
6	9063.957	-37.90	-13.00	Horizontal	PASS

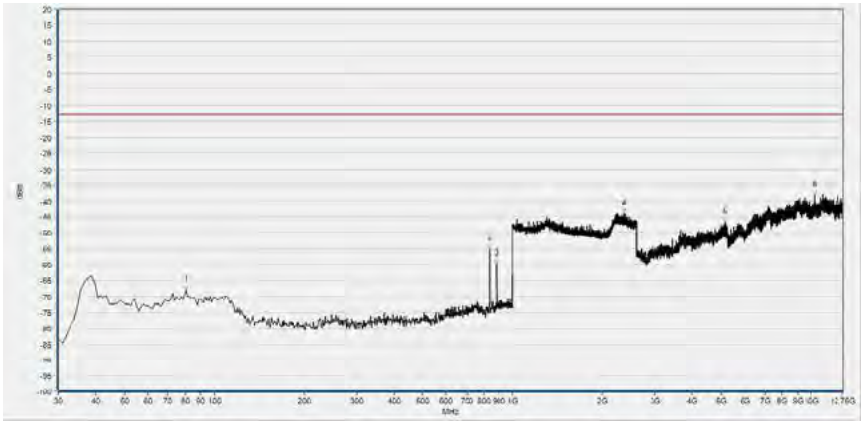


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	74.620	-70.15	-13.00	Vertical	PASS
2	824.430	-40.48	-13.00	Vertical	N/A
3	869.050	-62.94	-13.00	Vertical	N/A
4	1409.124	-45.82	-13.00	Vertical	PASS
5	4704.201	-47.59	-13.00	Vertical	PASS
6	10437.225	-37.81	-13.00	Vertical	PASS

GSM850(GSM), Mid Channel

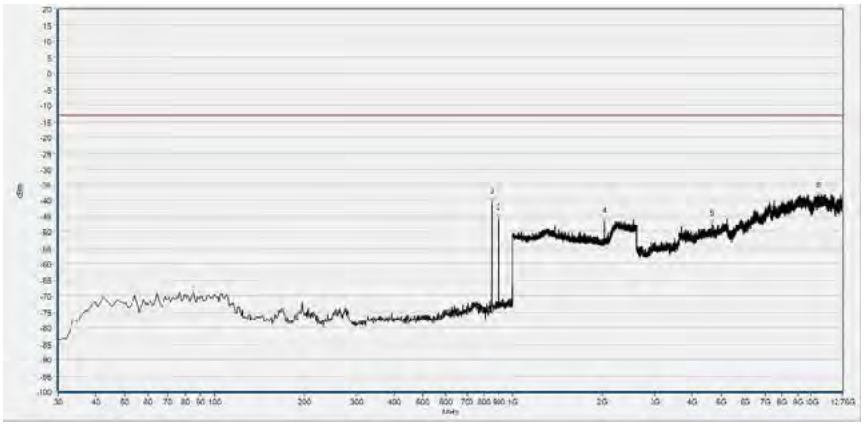


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	104.690	-67.43	-13.00	Horizontal	PASS
2	836.070	-40.99	-13.00	Horizontal	N/A
3	881.660	-45.71	-13.00	Horizontal	N/A
4	1528.211	-47.13	-13.00	Horizontal	PASS
5	2352.861	-44.35	-13.00	Horizontal	PASS
6	8940.289	-39.24	-13.00	Horizontal	PASS

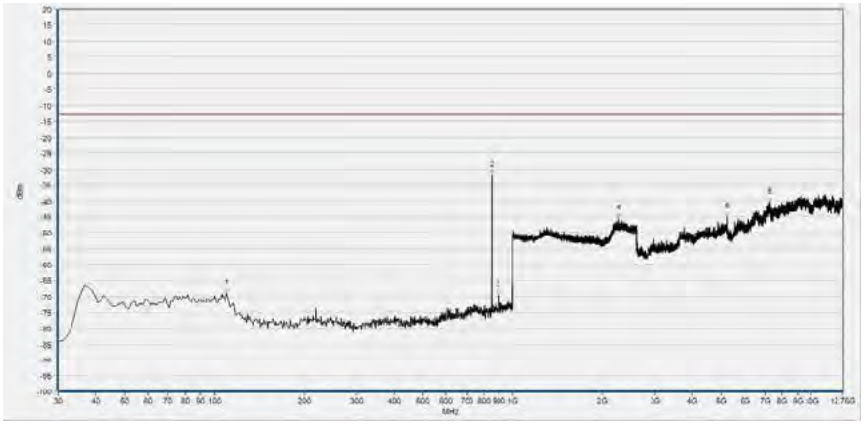


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-68.11	-13.00	Vertical	PASS
2	836.070	-55.32	-13.00	Vertical	N/A
3	881.660	-59.74	-13.00	Vertical	N/A
4	2362.465	-44.02	-13.00	Vertical	PASS
5	5137.961	-46.89	-13.00	Vertical	PASS
6	10296.945	-38.26	-13.00	Vertical	PASS

GSM850(GSM), High Channel

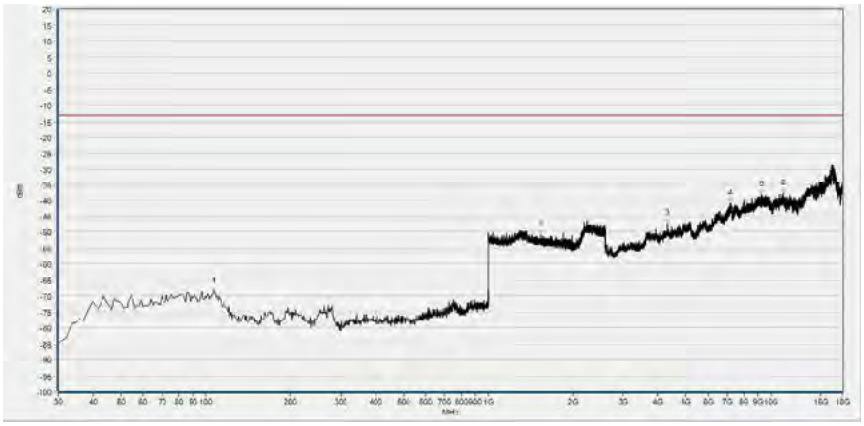


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	85.290	-68.14	-13.00	Horizontal	PASS
2	848.680	-40.78	-13.00	Horizontal	N/A
3	894.270	-45.68	-13.00	Horizontal	N/A
4	2032.093	-46.75	-13.00	Horizontal	PASS
5	4634.061	-47.46	-13.00	Horizontal	PASS
6	10562.739	-38.62	-13.00	Horizontal	PASS

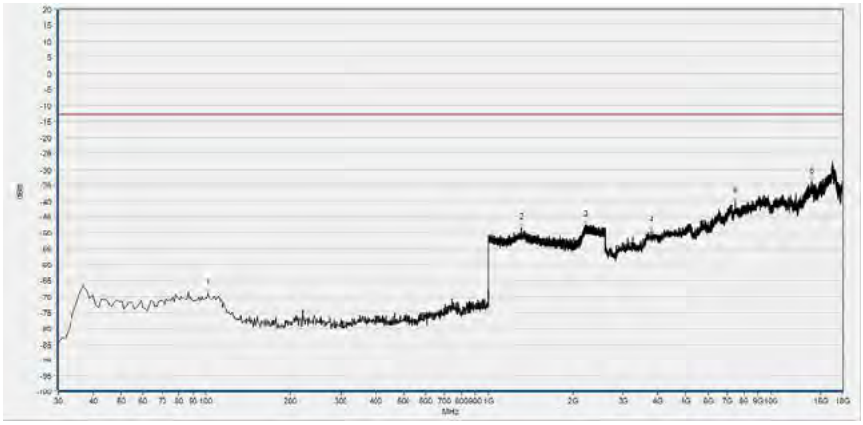


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	110.510	-69.00	-13.00	Vertical	PASS
2	848.680	-31.85	-13.00	Vertical	N/A
3	894.270	-69.50	-13.00	Vertical	N/A
4	2252.981	-45.76	-13.00	Vertical	PASS
5	5221.022	-45.32	-13.00	Vertical	PASS
6	7240.316	-40.46	-13.00	Vertical	PASS

GSM1900(GSM), Low Channel

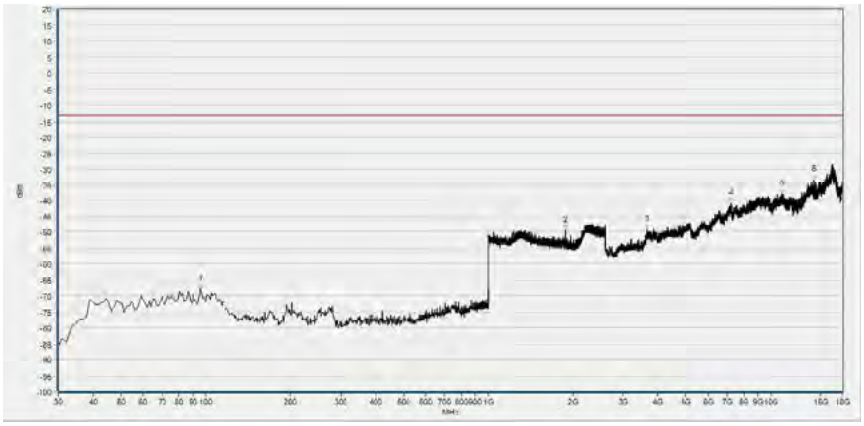


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	106.630	-68.40	-13.00	Horizontal	PASS
2	1535.254	-50.81	-13.00	Horizontal	PASS
3	4316.712	-47.31	-13.00	Horizontal	PASS
4	7184.434	-41.10	-13.00	Horizontal	PASS
5	9296.017	-38.06	-13.00	Horizontal	PASS
6	11133.151	-37.70	-13.00	Horizontal	PASS

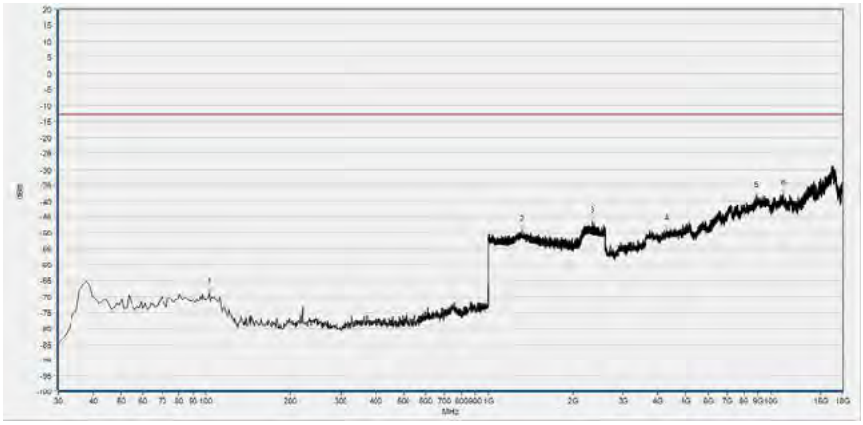


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	101.780	-68.98	-13.00	Vertical	PASS
2	1306.683	-48.71	-13.00	Vertical	PASS
3	2203.681	-47.69	-13.00	Vertical	PASS
4	3765.012	-49.47	-13.00	Vertical	PASS
5	7475.686	-40.33	-13.00	Vertical	PASS
6	14014.875	-33.79	-13.00	Vertical	PASS

GSM1900(GSM), Mid Channel

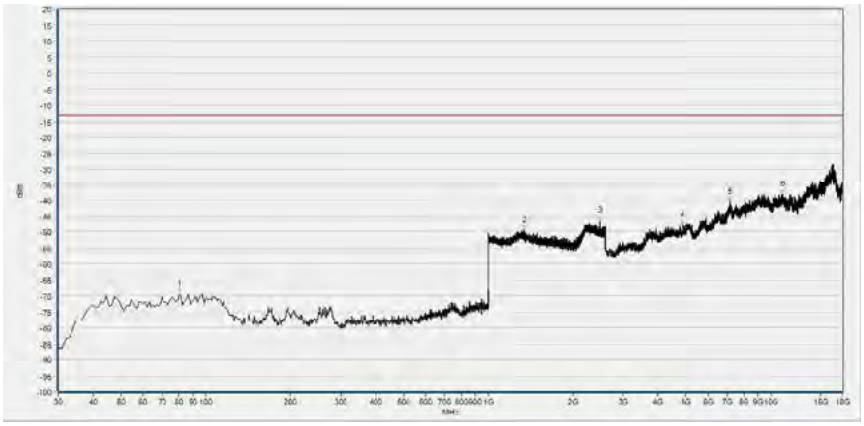


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	95.960	-67.82	-13.00	Horizontal	PASS
2	1880.352	-49.43	-13.00	Horizontal	N/A
3	3641.789	-49.29	-13.00	Horizontal	PASS
4	7243.244	-41.08	-13.00	Horizontal	PASS
5	10967.921	-37.97	-13.00	Horizontal	PASS
6	14266.921	-33.47	-13.00	Horizontal	PASS

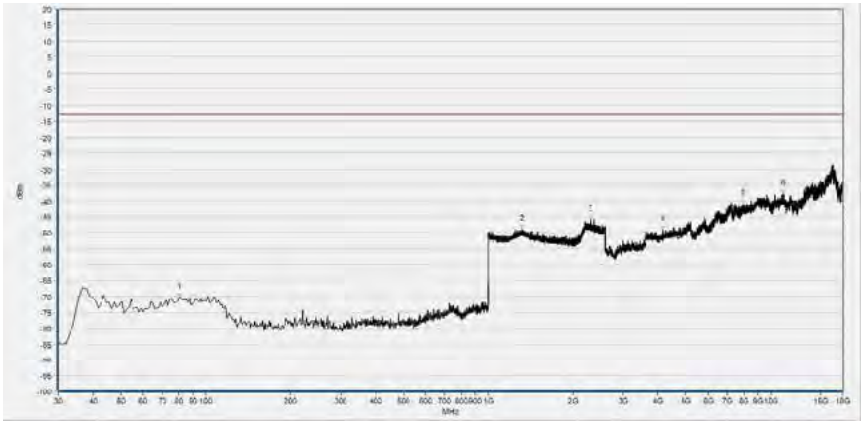


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	102.750	-68.78	-13.00	Vertical	PASS
2	1311.164	-49.31	-13.00	Vertical	PASS
3	2336.855	-46.59	-13.00	Vertical	PASS
4	4288.707	-49.01	-13.00	Vertical	PASS
5	8884.343	-38.51	-13.00	Vertical	PASS
6	11119.149	-37.98	-13.00	Vertical	PASS

GSM1900(GSM), High Channel

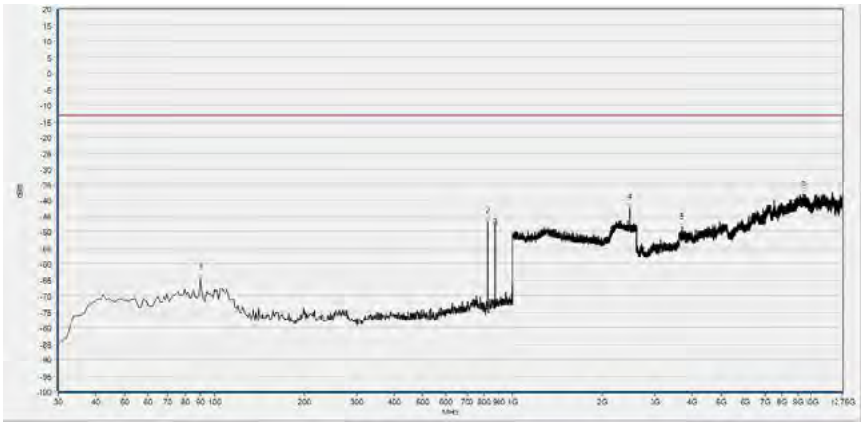


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-69.61	-13.00	Horizontal	PASS
2	1338.055	-49.44	-13.00	Horizontal	PASS
3	2496.919	-46.55	-13.00	Horizontal	PASS
4	4876.814	-47.83	-13.00	Horizontal	PASS
5	7181.633	-40.45	-13.00	Horizontal	PASS
6	11026.732	-38.15	-13.00	Horizontal	PASS

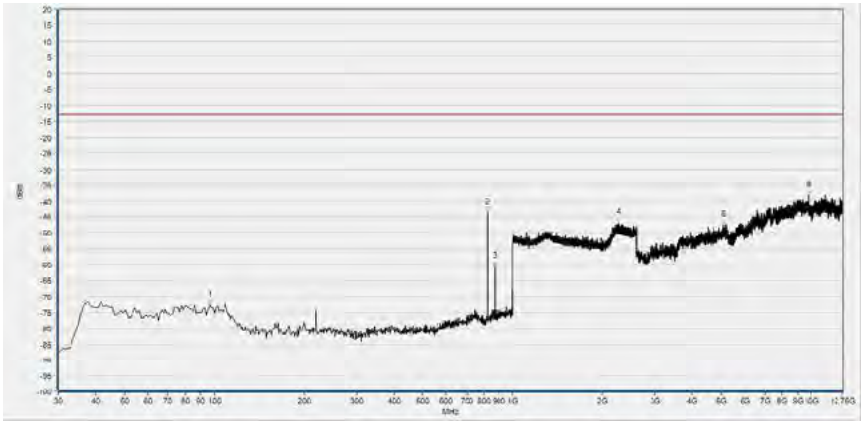


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-70.37	-13.00	Vertical	PASS
2	1315.006	-48.94	-13.00	Vertical	PASS
3	2297.799	-46.17	-13.00	Vertical	PASS
4	4148.682	-49.25	-13.00	Vertical	PASS
5	7985.379	-41.32	-13.00	Vertical	PASS
6	11116.348	-37.95	-13.00	Vertical	PASS

GSM850(EDGE), Low Channel

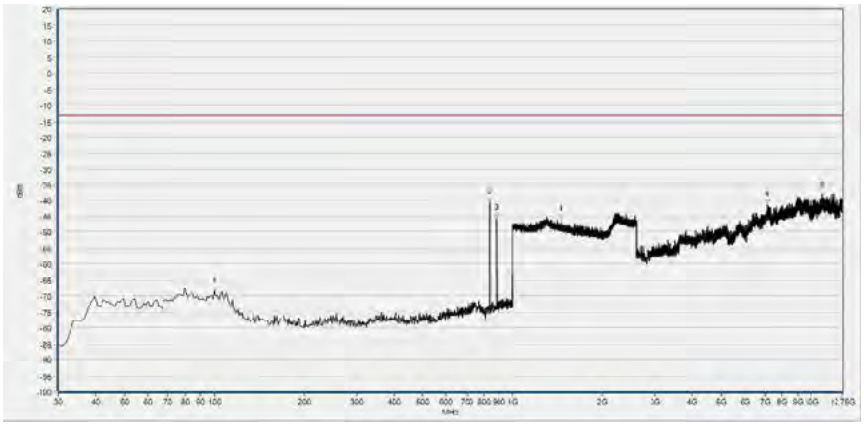


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	90.140	-64.73	-13.00	Horizontal	PASS
2	824.430	-46.75	-13.00	Horizontal	N/A
3	869.050	-47.85	-13.00	Horizontal	N/A
4	2472.589	-42.61	-13.00	Horizontal	PASS
5	3685.325	-48.71	-13.00	Horizontal	PASS
6	9353.746	-38.20	-13.00	Horizontal	PASS

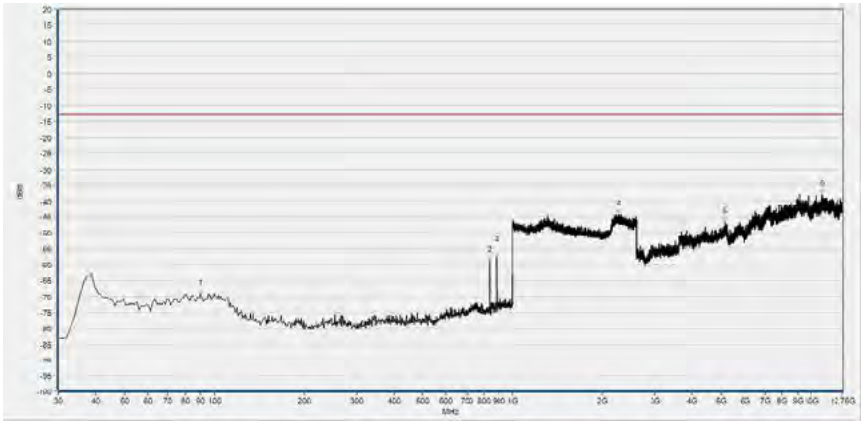


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	96.930	-72.75	-13.00	Vertical	PASS
2	824.430	-43.75	-13.00	Vertical	N/A
3	869.050	-60.70	-13.00	Vertical	N/A
4	2256.823	-47.07	-13.00	Vertical	PASS
5	5075.205	-47.80	-13.00	Vertical	PASS
6	9837.343	-38.38	-13.00	Vertical	PASS

GSM850(EDGE), Mid Channel

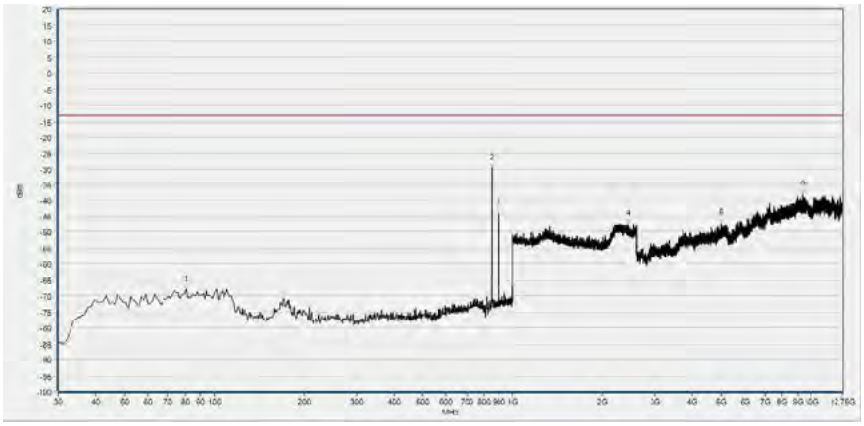


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	99.840	-68.58	-13.00	Horizontal	PASS
2	836.070	-40.88	-13.00	Horizontal	N/A
3	881.660	-45.65	-13.00	Horizontal	N/A
4	1450.100	-45.89	-13.00	Horizontal	PASS
5	7100.036	-41.52	-13.00	Horizontal	PASS
6	10850.682	-38.31	-13.00	Horizontal	PASS

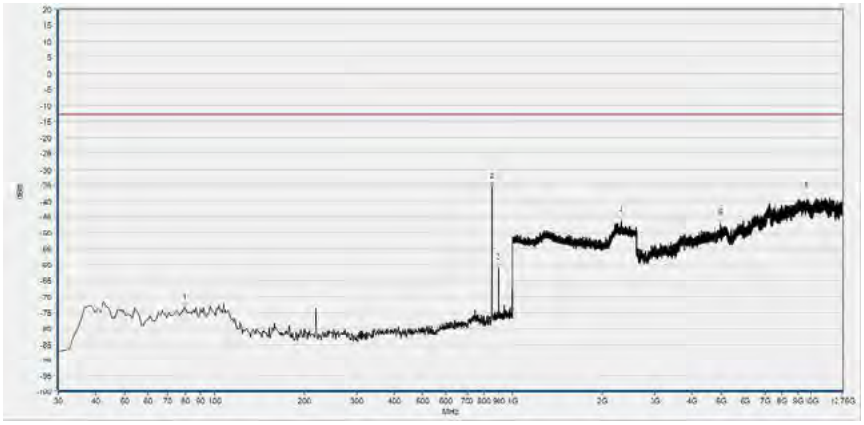


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	90.140	-69.18	-13.00	Vertical	PASS
2	836.070	-58.88	-13.00	Vertical	N/A
3	881.660	-57.56	-13.00	Vertical	N/A
4	2249.780	-44.31	-13.00	Vertical	PASS
5	5156.419	-46.72	-13.00	Vertical	PASS
6	10846.990	-38.21	-13.00	Vertical	PASS

GSM850(EDGE), High Channel

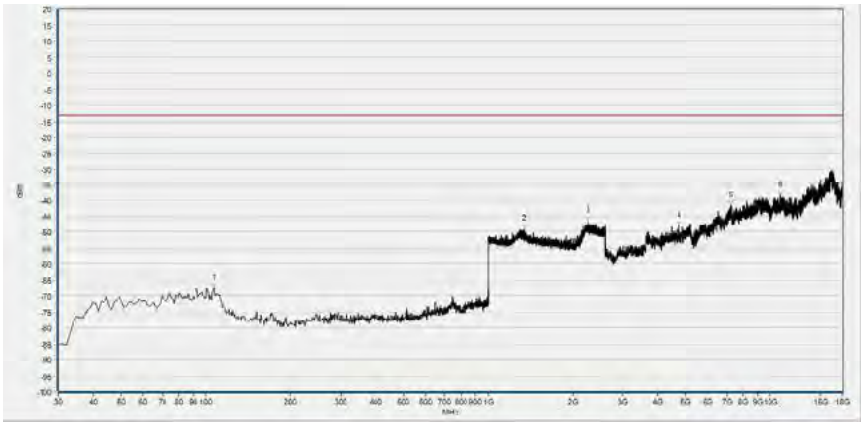


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-67.95	-13.00	Horizontal	PASS
2	848.680	-29.52	-13.00	Horizontal	N/A
3	894.270	-44.38	-13.00	Horizontal	N/A
4	2450.820	-47.46	-13.00	Horizontal	PASS
5	5006.910	-47.25	-13.00	Horizontal	PASS
6	9329.751	-37.82	-13.00	Horizontal	PASS

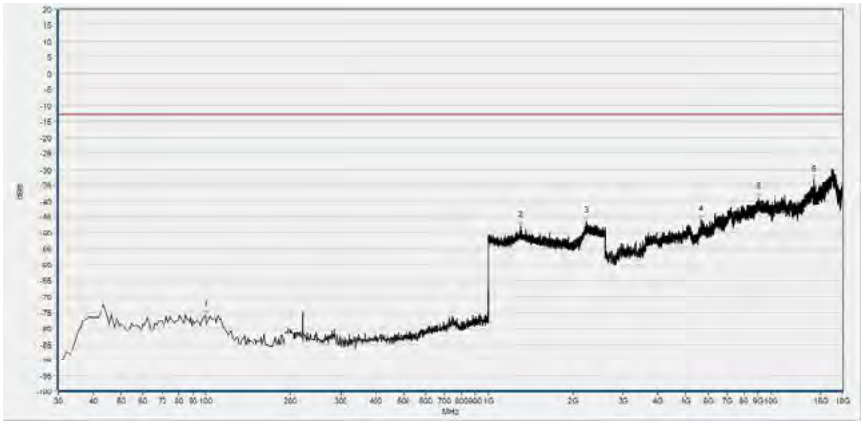


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	79.470	-73.43	-13.00	Vertical	PASS
2	848.680	-35.69	-13.00	Vertical	N/A
3	893.300	-61.11	-13.00	Vertical	N/A
4	2308.043	-46.70	-13.00	Vertical	PASS
5	4971.840	-47.35	-13.00	Vertical	PASS
6	9641.689	-38.75	-13.00	Vertical	PASS

GSM1900(EDGE), Low Channel

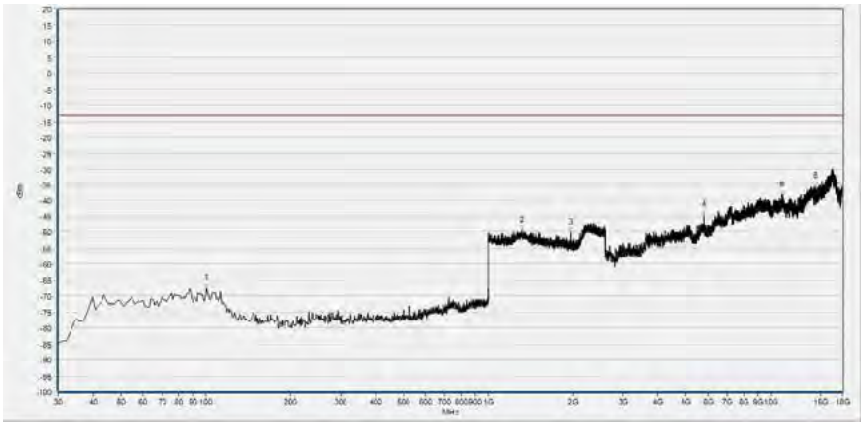


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	106.630	-67.55	-13.00	Horizontal	PASS
2	1339.976	-48.95	-13.00	Horizontal	PASS
3	2259.384	-46.56	-13.00	Horizontal	PASS
4	4750.791	-48.13	-13.00	Horizontal	PASS
5	7229.242	-41.73	-13.00	Horizontal	PASS
6	10850.300	-38.33	-13.00	Horizontal	PASS

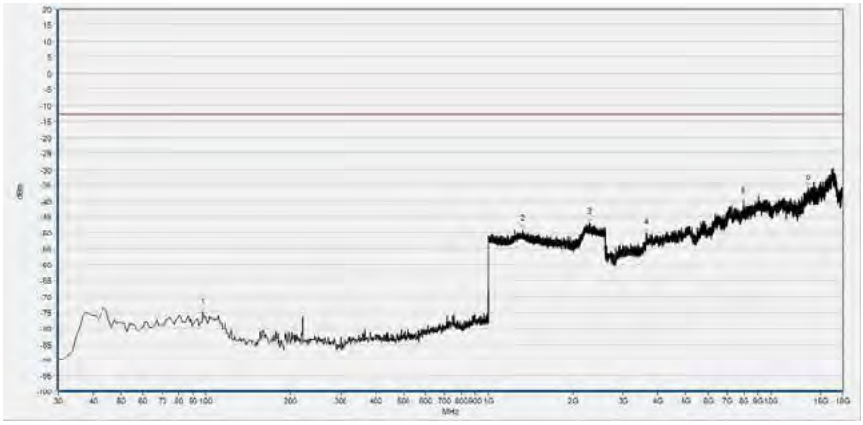


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	99.840	-75.85	-13.00	Vertical	PASS
2	1300.920	-47.91	-13.00	Vertical	PASS
3	2217.767	-46.57	-13.00	Vertical	PASS
4	5652.555	-46.14	-13.00	Vertical	PASS
5	9080.378	-39.23	-13.00	Vertical	PASS
6	14264.121	-33.50	-13.00	Vertical	PASS

GSM1900(EDGE), Mid Channel

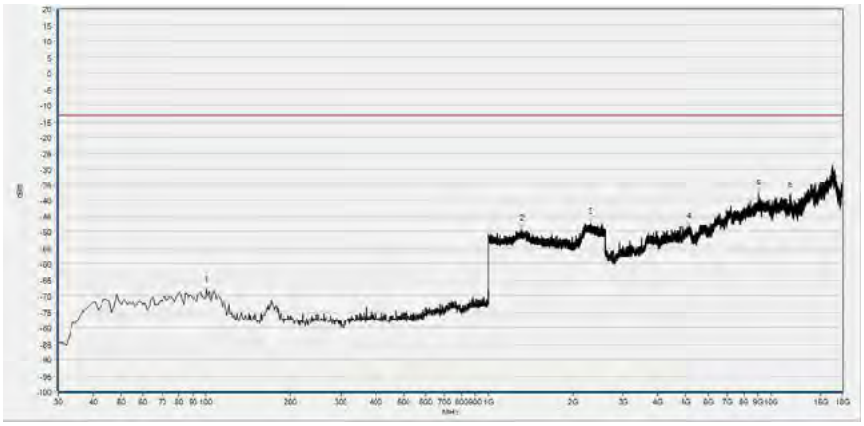


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	100.810	-67.70	-13.00	Horizontal	PASS
2	1316.927	-49.46	-13.00	Horizontal	PASS
3	1959.744	-50.26	-13.00	Horizontal	PASS
4	5806.583	-44.90	-13.00	Horizontal	PASS
5	10984.724	-38.40	-13.00	Horizontal	PASS
6	14412.548	-35.39	-13.00	Horizontal	PASS

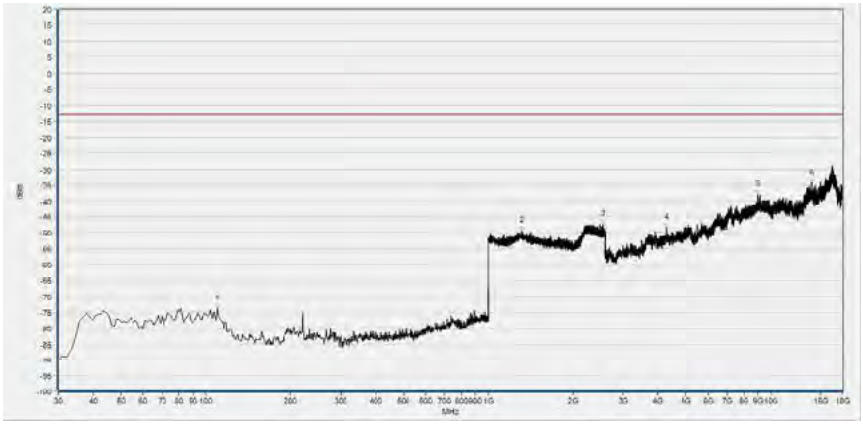


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	97.900	-74.93	-13.00	Vertical	PASS
2	1324.610	-49.15	-13.00	Vertical	PASS
3	2265.786	-47.04	-13.00	Vertical	PASS
4	3613.784	-50.09	-13.00	Vertical	PASS
5	7968.576	-40.36	-13.00	Vertical	PASS
6	13580.797	-36.16	-13.00	Vertical	PASS

GSM1900(EDGD), High Channel

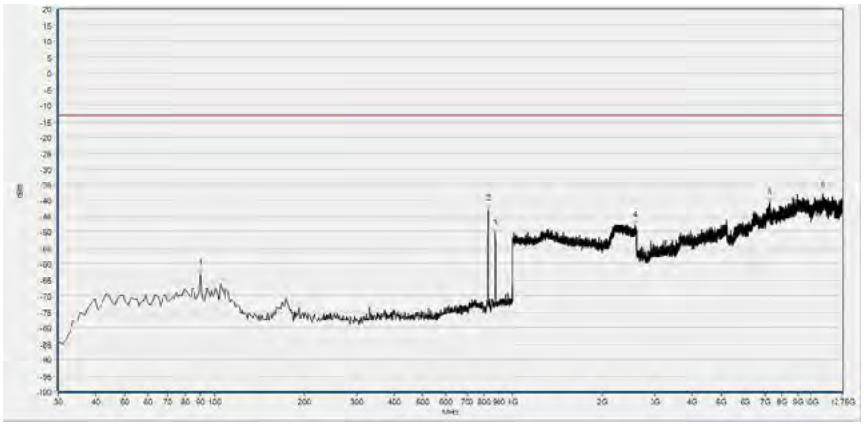


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	100.810	-68.38	-13.00	Horizontal	PASS
2	1314.366	-48.99	-13.00	Horizontal	PASS
3	2299.080	-47.06	-13.00	Horizontal	PASS
4	5148.463	-48.32	-13.00	Horizontal	PASS
5	9066.376	-37.63	-13.00	Horizontal	PASS
6	11712.857	-38.44	-13.00	Horizontal	PASS

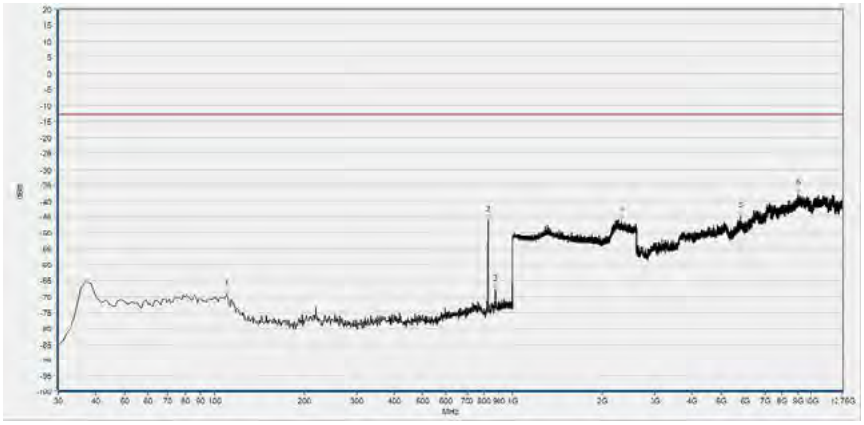


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	109.540	-73.82	-13.00	Vertical	PASS
2	1316.927	-49.58	-13.00	Vertical	PASS
3	2543.657	-47.44	-13.00	Vertical	PASS
4	4288.707	-48.54	-13.00	Vertical	PASS
5	9010.366	-38.01	-13.00	Vertical	PASS
6	14028.878	-34.48	-13.00	Vertical	PASS

WCDMA Band V(WCDMA), Low Channel

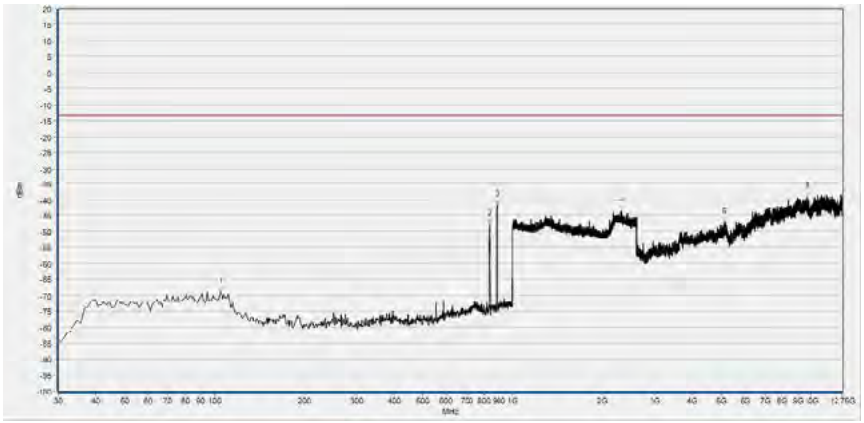


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	90.140	-63.17	-13.00	Horizontal	PASS
2	827.340	-43.07	-13.00	Horizontal	N/A
3	870.990	-50.68	-13.00	Horizontal	N/A
4	2570.548	-47.86	-13.00	Horizontal	PASS
5	7223.704	-40.82	-13.00	Horizontal	PASS
6	10941.126	-38.42	-13.00	Horizontal	PASS

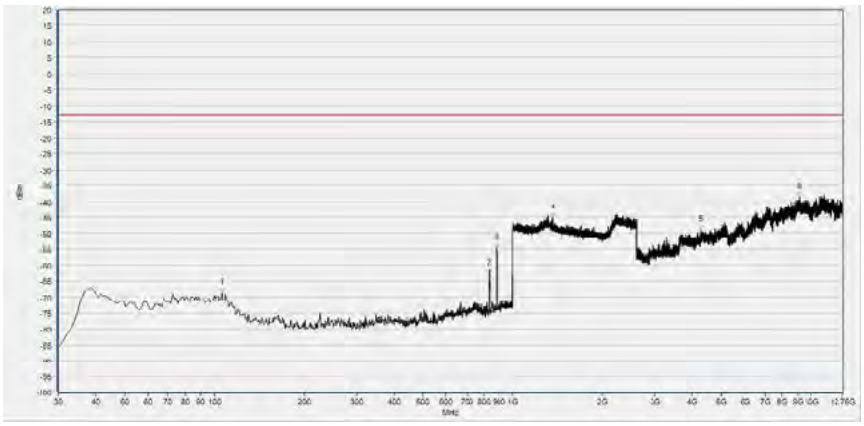


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	110.510	-69.28	-13.00	Vertical	PASS
2	827.340	-46.30	-13.00	Vertical	N/A
3	871.960	-67.73	-13.00	Vertical	N/A
4	2319.568	-46.37	-13.00	Vertical	PASS
5	5778.451	-45.11	-13.00	Vertical	PASS
6	8999.354	-37.85	-13.00	Vertical	PASS

WCDMA Band V(WCDMA), Mid Channel

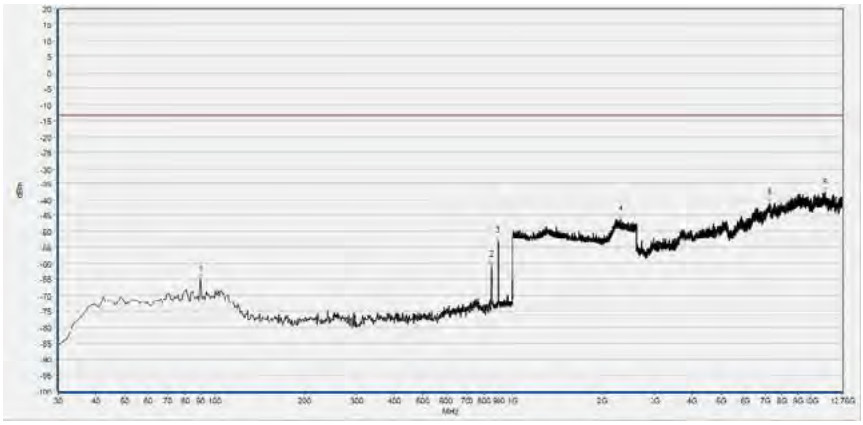


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	104.690	-68.91	-13.00	Horizontal	PASS
2	835.100	-48.02	-13.00	Horizontal	N/A
3	882.630	-41.70	-13.00	Horizontal	N/A
4	2315.086	-43.45	-13.00	Horizontal	PASS
5	5115.812	-47.37	-13.00	Horizontal	PASS
6	9745.054	-39.14	-13.00	Horizontal	PASS

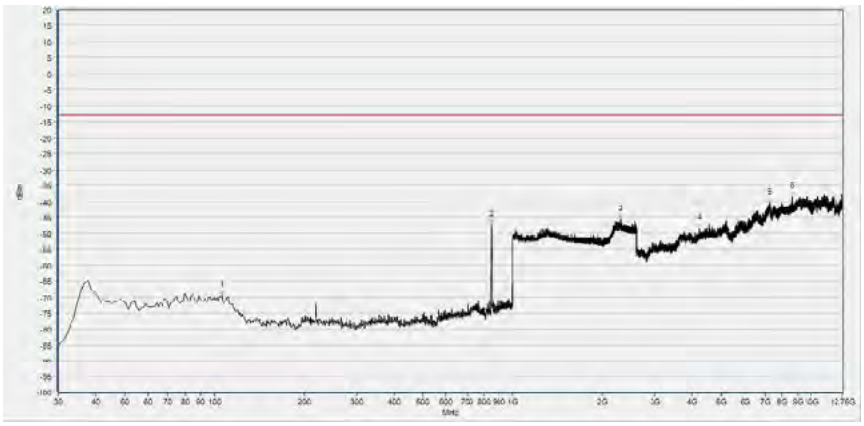


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	105.660	-68.63	-13.00	Vertical	PASS
2	834.130	-62.38	-13.00	Vertical	N/A
3	880.690	-54.88	-13.00	Vertical	N/A
4	1355.342	-45.33	-13.00	Vertical	PASS
5	4261.211	-49.08	-13.00	Vertical	PASS
6	9091.644	-38.87	-13.00	Vertical	PASS

WCDMA Band V(WCDMA), High Channel

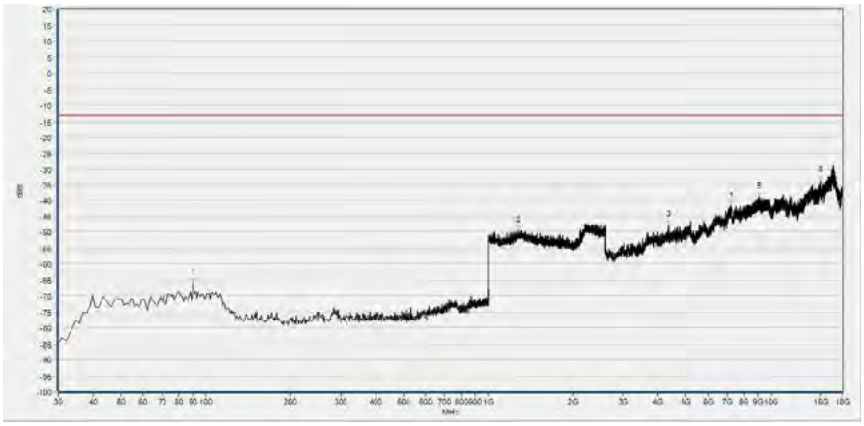


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	90.140	-65.01	-13.00	Horizontal	PASS
2	847.710	-60.77	-13.00	Horizontal	N/A
3	891.360	-53.01	-13.00	Horizontal	N/A
4	2284.994	-46.38	-13.00	Horizontal	PASS
5	7225.550	-41.19	-13.00	Horizontal	PASS
6	11122.013	-37.69	-13.00	Horizontal	PASS

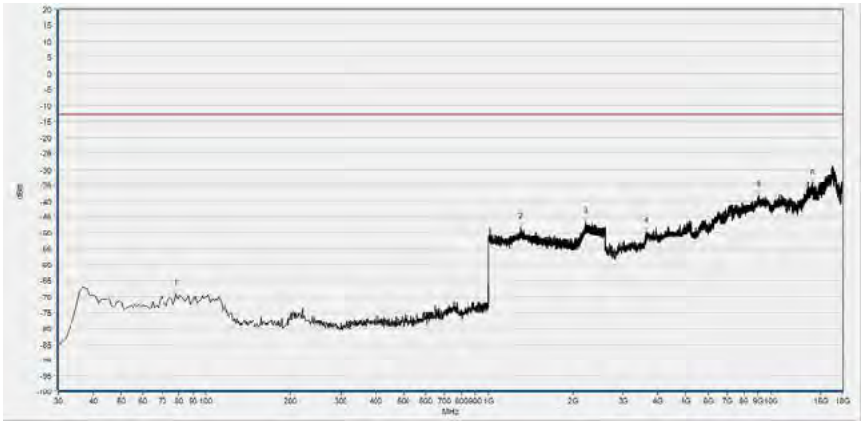


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	105.660	-69.42	-13.00	Vertical	PASS
2	847.710	-47.48	-13.00	Vertical	N/A
3	2286.275	-45.70	-13.00	Vertical	PASS
4	4211.375	-48.70	-13.00	Vertical	PASS
5	7234.779	-40.51	-13.00	Vertical	PASS
6	8643.117	-38.64	-13.00	Vertical	PASS

WCDMA Band IV(WCDMA), Low Channel

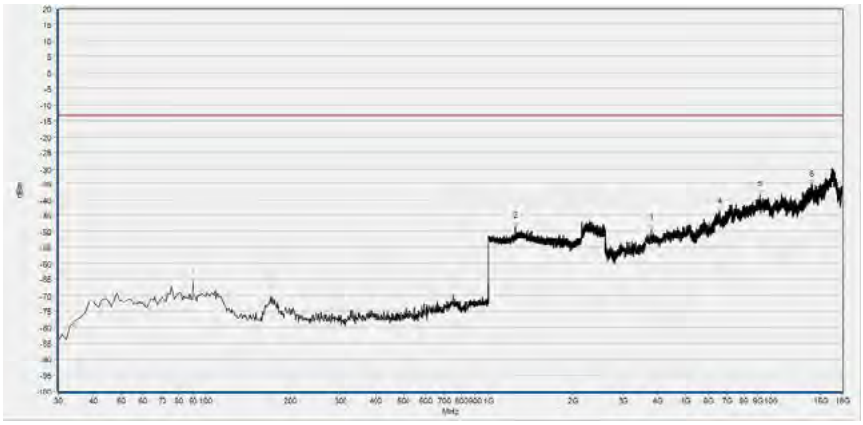


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	90.140	-65.72	-13.00	Horizontal	PASS
2	1275.310	-49.43	-13.00	Horizontal	PASS
3	4353.119	-47.73	-13.00	Horizontal	PASS
4	7204.037	-41.72	-13.00	Horizontal	PASS
5	9108.383	-38.98	-13.00	Horizontal	PASS
6	14995.054	-33.72	-13.00	Horizontal	PASS

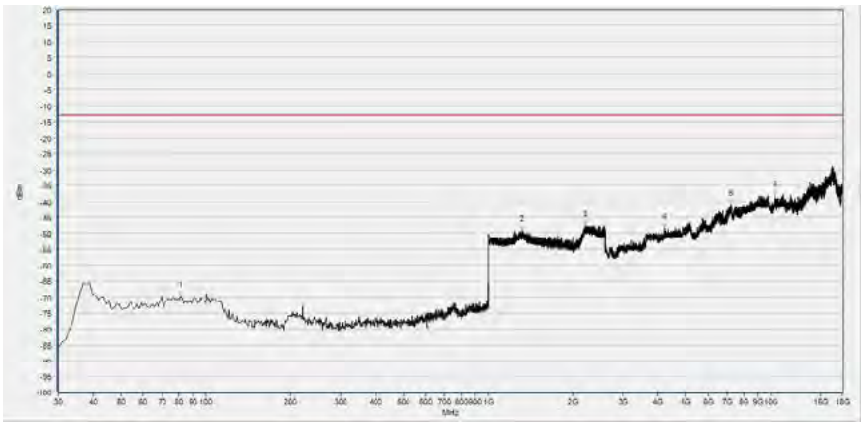


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	78.500	-69.12	-13.00	Vertical	PASS
2	1298.359	-48.39	-13.00	Vertical	PASS
3	2206.242	-46.92	-13.00	Vertical	PASS
4	3610.984	-49.64	-13.00	Vertical	PASS
5	9052.373	-38.43	-13.00	Vertical	PASS
6	14107.292	-34.62	-13.00	Vertical	PASS

WCDMA Band IV(WCDMA), Mid Channel

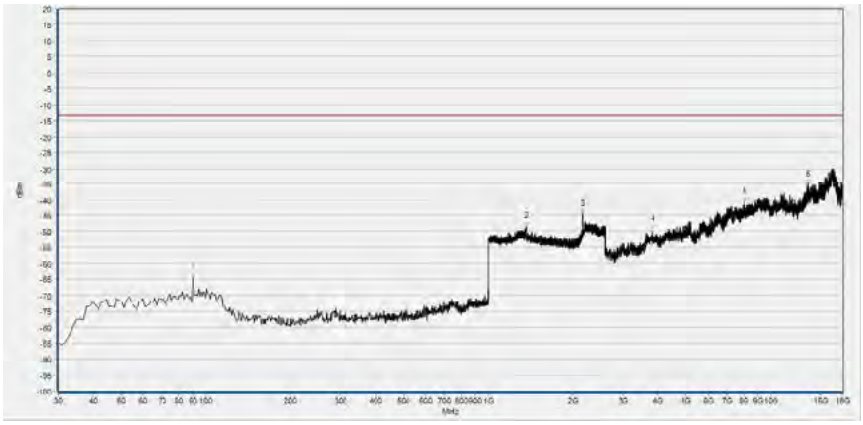


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	90.140	-66.05	-13.00	Horizontal	PASS
2	1248.419	-48.64	-13.00	Horizontal	PASS
3	3759.411	-49.38	-13.00	Horizontal	PASS
4	6615.930	-43.96	-13.00	Horizontal	PASS
5	9183.997	-38.58	-13.00	Horizontal	PASS
6	14045.681	-34.89	-13.00	Horizontal	PASS

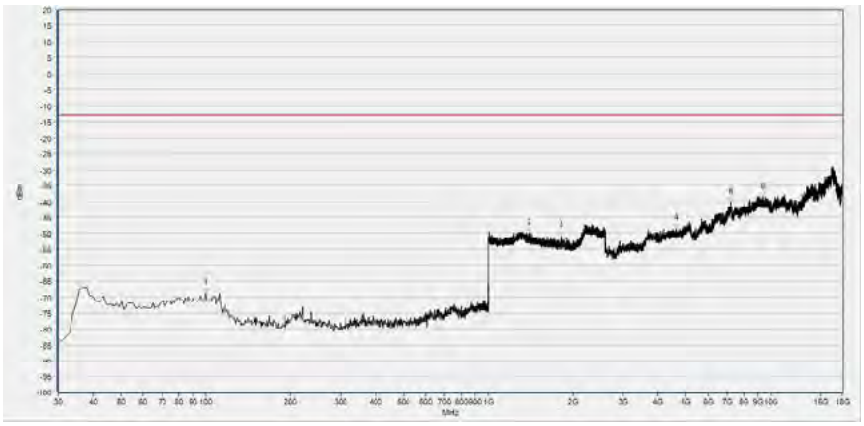


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	81.410	-69.69	-13.00	Vertical	PASS
2	1311.164	-49.14	-13.00	Vertical	PASS
3	2199.200	-47.42	-13.00	Vertical	PASS
4	4215.894	-48.31	-13.00	Vertical	PASS
5	7240.444	-41.05	-13.00	Vertical	PASS
6	10363.011	-38.18	-13.00	Vertical	PASS

WCDMA Band IV(WCDMA), High Channel

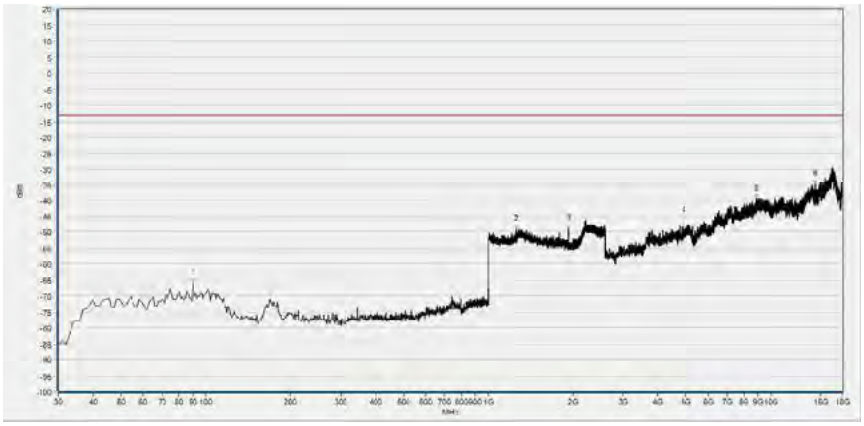


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	90.140	-64.18	-13.00	Horizontal	PASS
2	1357.263	-48.66	-13.00	Horizontal	PASS
3	2153.101	-44.64	-13.00	Horizontal	N/A
4	3823.823	-49.49	-13.00	Horizontal	PASS
5	8044.190	-40.75	-13.00	Horizontal	PASS
6	13583.597	-34.99	-13.00	Horizontal	PASS

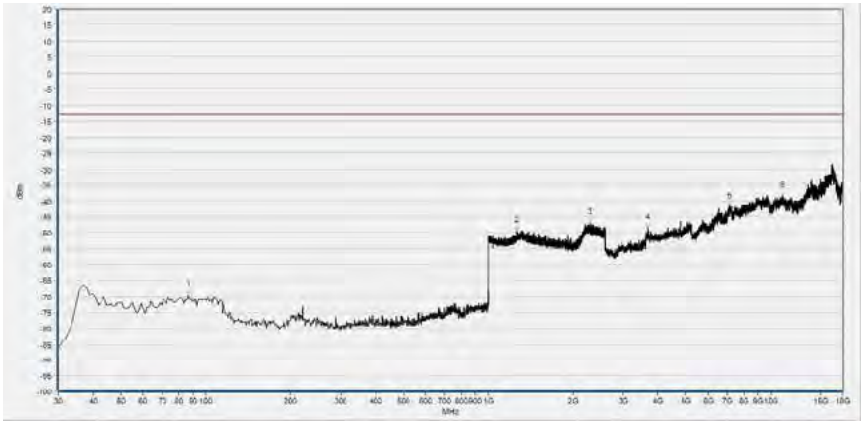


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	99.840	-68.82	-13.00	Vertical	PASS
2	1392.477	-49.86	-13.00	Vertical	PASS
3	1811.845	-50.71	-13.00	Vertical	PASS
4	4607.965	-48.57	-13.00	Vertical	PASS
5	7204.037	-40.34	-13.00	Vertical	PASS
6	9380.033	-38.87	-13.00	Vertical	PASS

WCDMA Band II(WCDMA), Low Channel

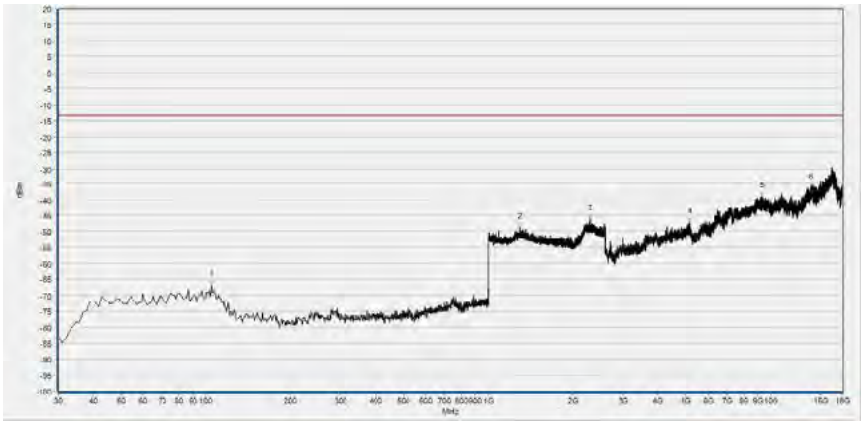


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	90.140	-65.80	-13.00	Horizontal	PASS
2	1256.102	-49.06	-13.00	Horizontal	PASS
3	1932.213	-48.93	-13.00	Horizontal	N/A
4	4921.622	-46.51	-13.00	Horizontal	PASS
5	8895.545	-39.63	-13.00	Horizontal	PASS
6	14426.550	-34.64	-13.00	Horizontal	PASS

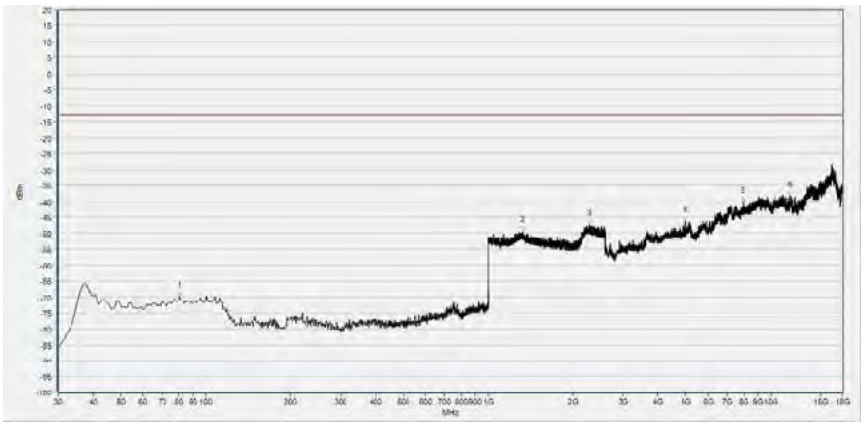


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	86.260	-69.64	-13.00	Vertical	PASS
2	1259.304	-49.55	-13.00	Vertical	PASS
3	2279.232	-46.95	-13.00	Vertical	PASS
4	3666.994	-48.71	-13.00	Vertical	PASS
5	7153.628	-41.96	-13.00	Vertical	PASS
6	11060.338	-38.46	-13.00	Vertical	PASS

WCDMA Band II(WCDMA), Mid Channel

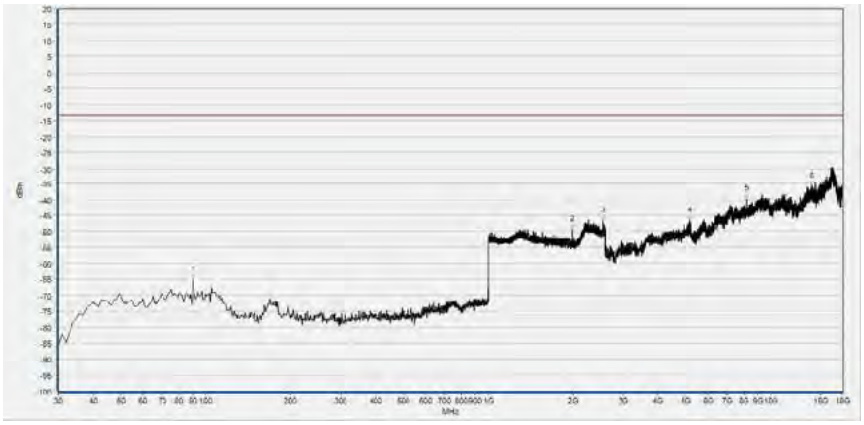


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	104.690	-66.97	-13.00	Horizontal	PASS
2	1294.518	-48.86	-13.00	Horizontal	PASS
3	2288.836	-46.16	-13.00	Horizontal	PASS
4	5190.471	-47.18	-13.00	Horizontal	PASS
5	9346.427	-38.89	-13.00	Horizontal	PASS
6	13919.658	-35.79	-13.00	Horizontal	PASS

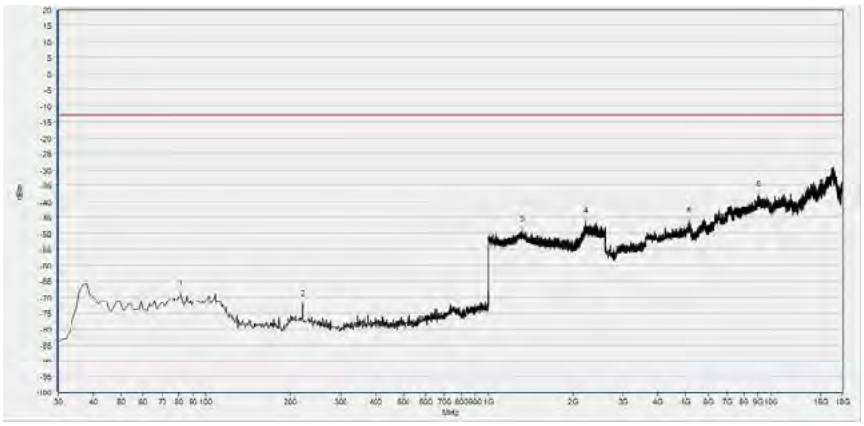


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-69.89	-13.00	Vertical	PASS
2	1325.250	-49.25	-13.00	Vertical	PASS
3	2271.549	-47.30	-13.00	Vertical	PASS
4	5000.036	-46.45	-13.00	Vertical	PASS
5	7988.180	-40.12	-13.00	Vertical	PASS
6	11724.059	-38.38	-13.00	Vertical	PASS

WCDMA Band II(WCDMA), High Channel



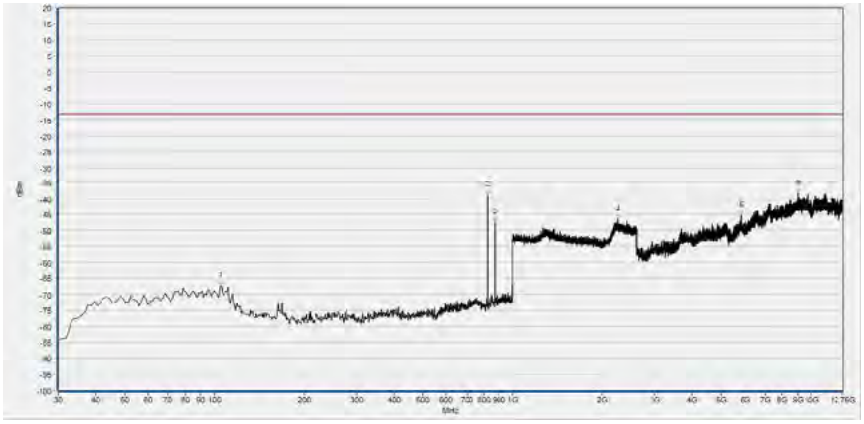
No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	90.140	-65.17	-13.00	Horizontal	PASS
2	1987.275	-49.44	-13.00	Horizontal	N/A
3	2556.463	-46.87	-13.00	Horizontal	PASS
4	5184.870	-46.87	-13.00	Horizontal	PASS
5	8271.031	-39.99	-13.00	Horizontal	PASS
6	14037.280	-35.67	-13.00	Horizontal	PASS



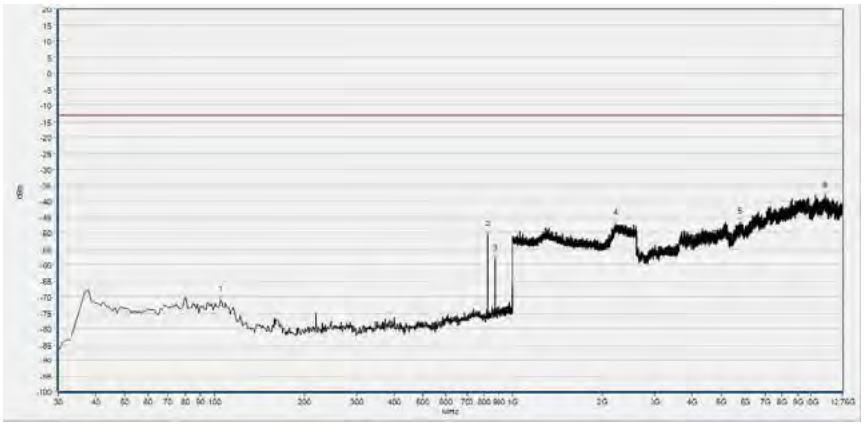
No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	81.410	-69.11	-13.00	Vertical	PASS
2	220.120	-72.21	-13.00	Vertical	PASS
3	1312.445	-49.26	-13.00	Vertical	PASS
4	2208.163	-46.61	-13.00	Vertical	PASS
5	5154.064	-46.33	-13.00	Vertical	PASS
6	9066.376	-38.20	-13.00	Vertical	PASS

Bottom Antenna

GSM850(GSM), Low Channel

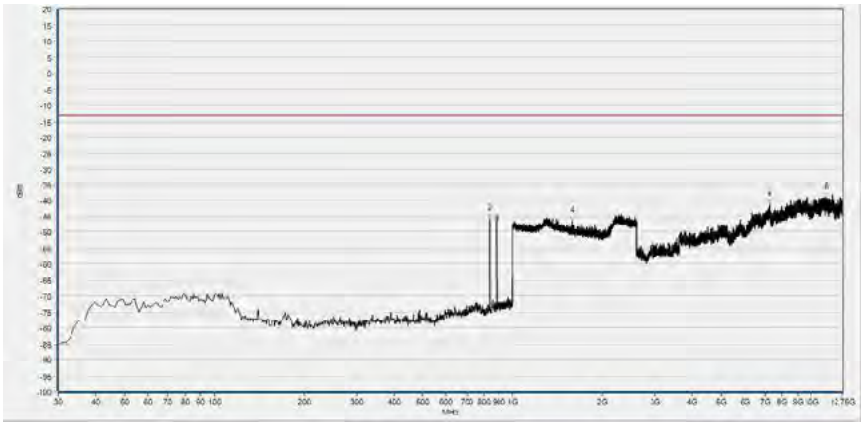


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	104.690	-67.33	-13.00	Horizontal	PASS
2	824.430	-39.04	-13.00	Horizontal	N/A
3	869.050	-47.52	-13.00	Horizontal	N/A
4	2245.298	-46.65	-13.00	Horizontal	PASS
5	5796.909	-45.33	-13.00	Horizontal	PASS
6	9021.504	-38.23	-13.00	Horizontal	PASS

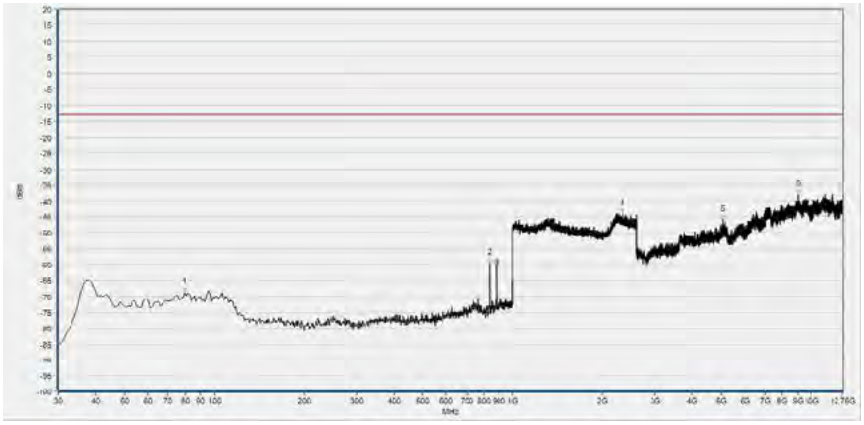


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	104.690	-70.97	-13.00	Vertical	PASS
2	824.430	-50.56	-13.00	Vertical	N/A
3	869.050	-57.94	-13.00	Vertical	N/A
4	2208.804	-47.11	-13.00	Vertical	PASS
5	5741.535	-46.67	-13.00	Vertical	PASS
6	11131.242	-38.40	-13.00	Vertical	PASS

GSM850(GSM), Mid Channel

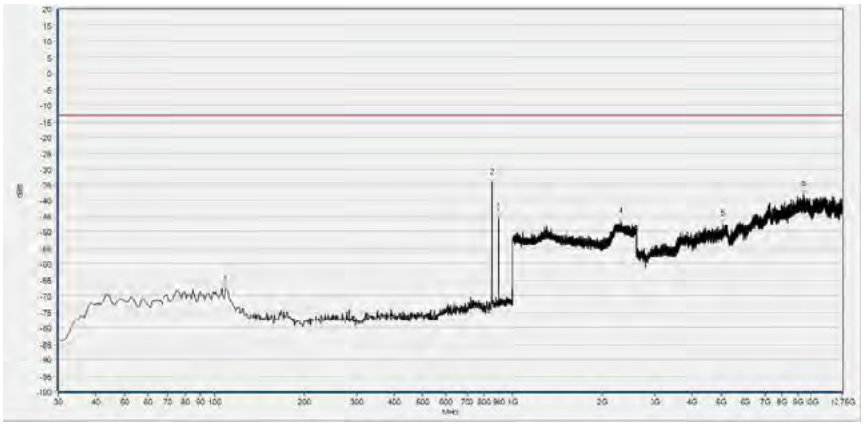


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	85.290	-68.66	-13.00	Horizontal	PASS
2	836.070	-46.03	-13.00	Horizontal	N/A
3	881.660	-46.68	-13.00	Horizontal	N/A
4	1581.993	-46.56	-13.00	Horizontal	PASS
5	7220.013	-41.36	-13.00	Horizontal	PASS
6	11253.064	-39.14	-13.00	Horizontal	PASS

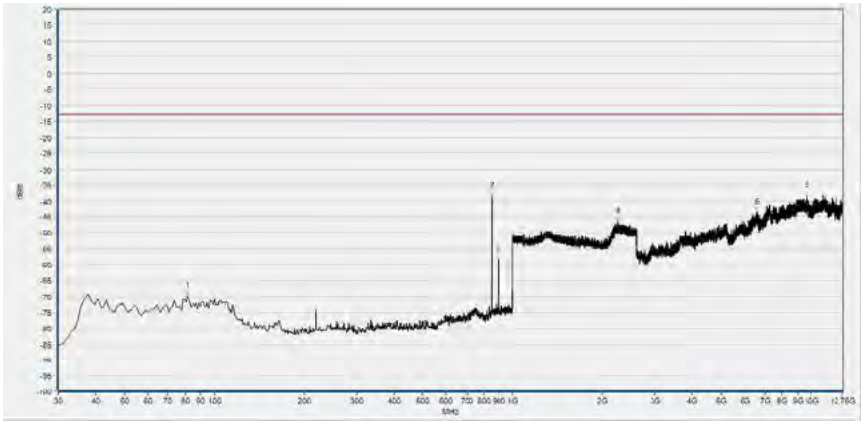


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	79.470	-68.81	-13.00	Vertical	PASS
2	836.070	-59.54	-13.00	Vertical	N/A
3	881.660	-60.15	-13.00	Vertical	N/A
4	2334.934	-43.98	-13.00	Vertical	PASS
5	5067.821	-46.19	-13.00	Vertical	PASS
6	9028.887	-38.21	-13.00	Vertical	PASS

GSM850(GSM), High Channel

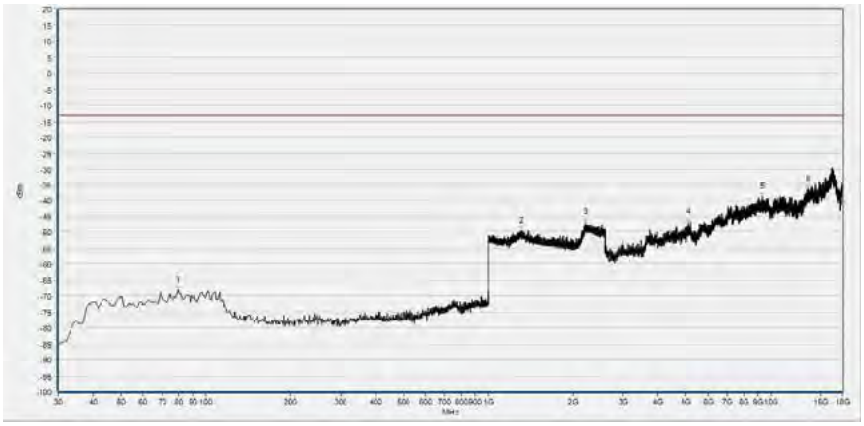


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	109.540	-68.04	-13.00	Horizontal	PASS
2	848.680	-34.28	-13.00	Horizontal	N/A
3	893.300	-45.50	-13.00	Horizontal	N/A
4	2289.476	-46.92	-13.00	Horizontal	PASS
5	5051.209	-47.49	-13.00	Horizontal	PASS
6	9364.821	-38.07	-13.00	Horizontal	PASS

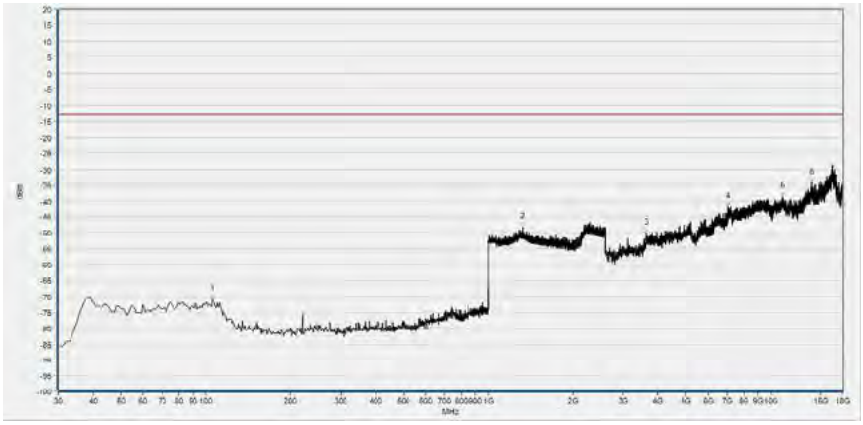


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	81.410	-69.89	-13.00	Vertical	PASS
2	848.680	-38.73	-13.00	Vertical	N/A
3	893.300	-58.85	-13.00	Vertical	N/A
4	2246.579	-46.88	-13.00	Vertical	PASS
5	6573.986	-43.63	-13.00	Vertical	PASS
6	9665.685	-38.62	-13.00	Vertical	PASS

GSM1900(GSM), Low Channel

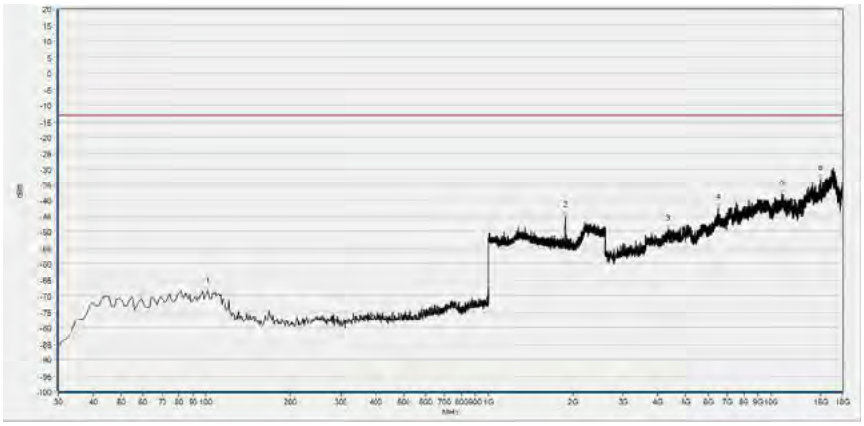


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	79.470	-68.17	-13.00	Horizontal	PASS
2	1304.762	-49.78	-13.00	Horizontal	PASS
3	2204.962	-47.05	-13.00	Horizontal	PASS
4	5137.261	-47.15	-13.00	Horizontal	PASS
5	9312.821	-38.97	-13.00	Horizontal	PASS
6	13586.398	-36.37	-13.00	Horizontal	PASS

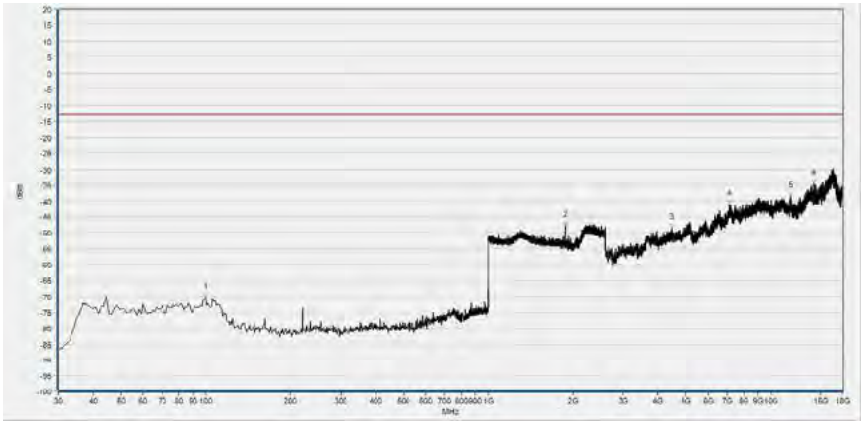


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	105.660	-71.04	-13.00	Vertical	PASS
2	1325.890	-48.29	-13.00	Vertical	PASS
3	3616.585	-50.28	-13.00	Vertical	PASS
4	7058.411	-42.01	-13.00	Vertical	PASS
5	11018.331	-38.70	-13.00	Vertical	PASS
6	14026.077	-34.40	-13.00	Vertical	PASS

GSM1900(GSM), Mid Channel

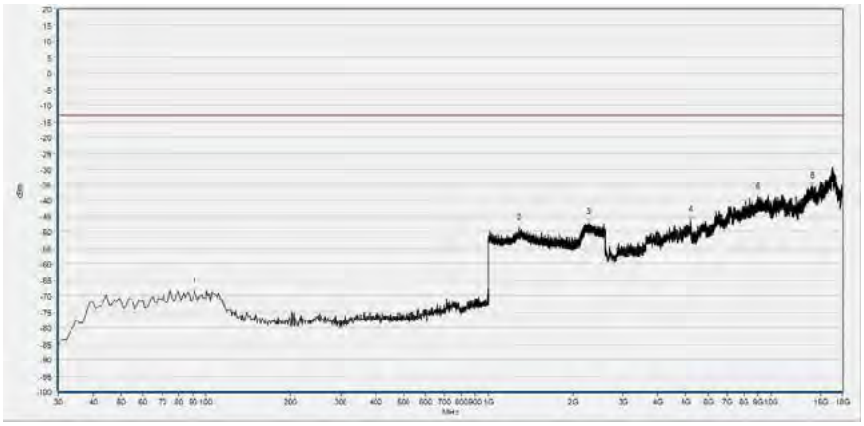


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	101.780	-68.52	-13.00	Horizontal	PASS
2	1879.712	-45.02	-13.00	Horizontal	N/A
3	4339.116	-49.03	-13.00	Horizontal	PASS
4	6540.316	-42.48	-13.00	Horizontal	PASS
5	10967.921	-37.92	-13.00	Horizontal	PASS
6	15000.655	-32.92	-13.00	Horizontal	PASS

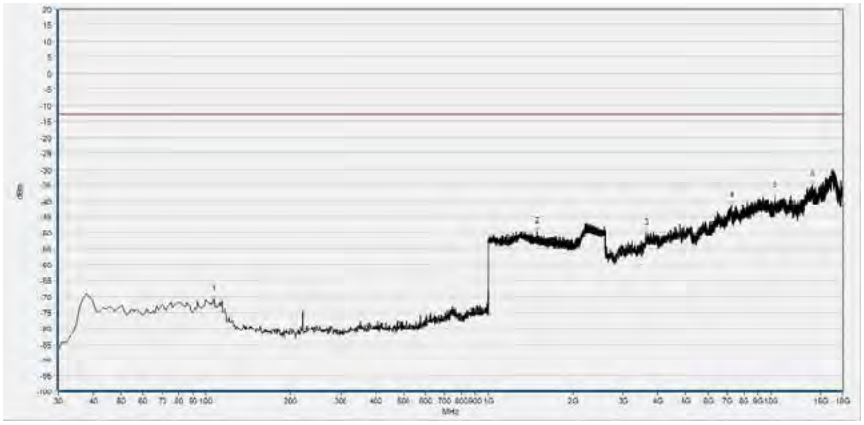


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	99.840	-70.20	-13.00	Vertical	PASS
2	1879.712	-47.95	-13.00	Vertical	N/A
3	4470.740	-48.53	-13.00	Vertical	PASS
4	7150.827	-41.34	-13.00	Vertical	PASS
5	11740.862	-38.64	-13.00	Vertical	PASS
6	14272.522	-34.83	-13.00	Vertical	PASS

GSM1900(GSM), High Channel

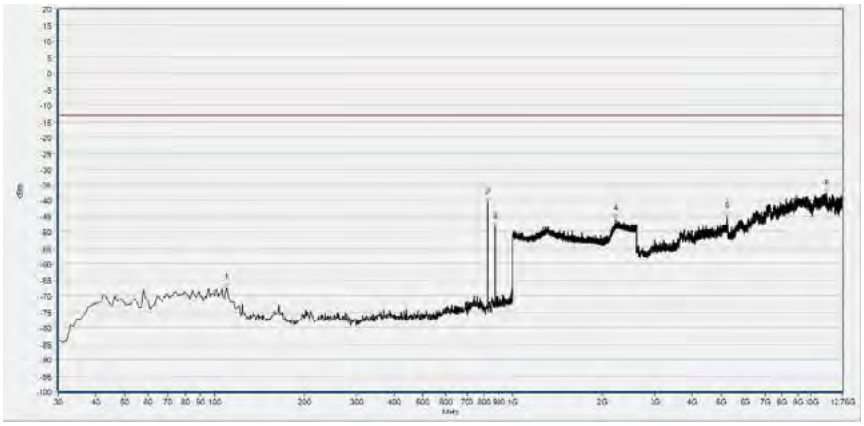


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	91.110	-68.39	-13.00	Horizontal	PASS
2	1286.835	-48.81	-13.00	Horizontal	PASS
3	2254.262	-47.03	-13.00	Horizontal	PASS
4	5221.277	-46.46	-13.00	Horizontal	PASS
5	9021.568	-39.18	-13.00	Horizontal	PASS
6	14073.686	-35.46	-13.00	Horizontal	PASS

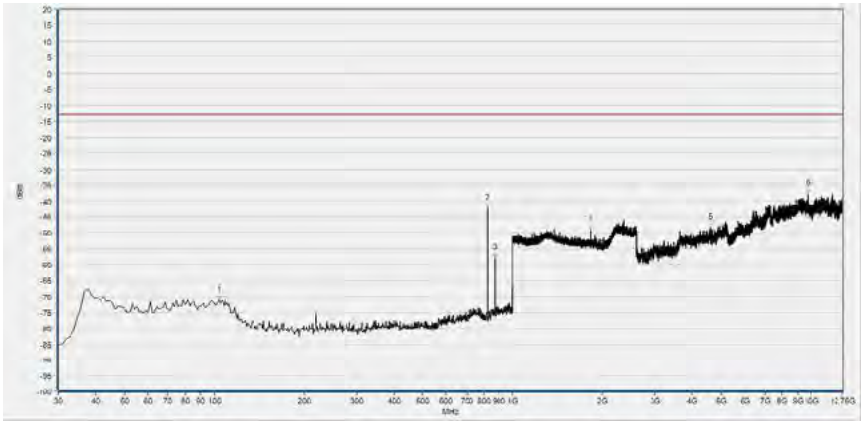


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	106.630	-71.03	-13.00	Vertical	PASS
2	1491.717	-49.76	-13.00	Vertical	PASS
3	3605.383	-50.26	-13.00	Vertical	PASS
4	7246.045	-41.66	-13.00	Vertical	PASS
5	10357.410	-38.53	-13.00	Vertical	PASS
6	14065.285	-35.12	-13.00	Vertical	PASS

GSM850(EDGE), Low Channel

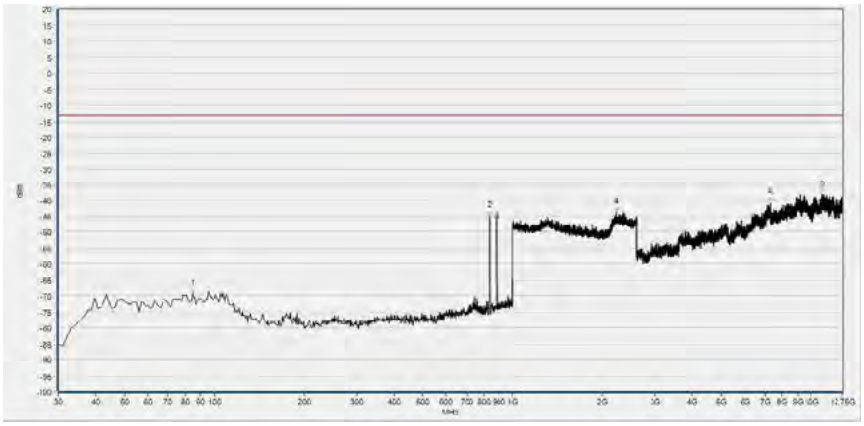


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	110.510	-67.28	-13.00	Horizontal	PASS
2	824.430	-40.88	-13.00	Horizontal	N/A
3	869.050	-48.40	-13.00	Horizontal	N/A
4	2206.242	-45.93	-13.00	Horizontal	PASS
5	5215.485	-45.22	-13.00	Horizontal	PASS
6	11216.148	-37.57	-13.00	Horizontal	PASS

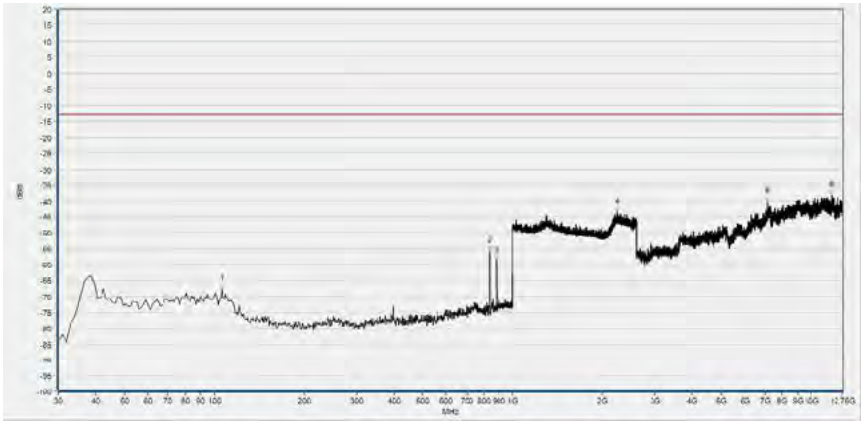


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	103.720	-71.25	-13.00	Vertical	PASS
2	824.430	-42.46	-13.00	Vertical	N/A
3	869.050	-58.01	-13.00	Vertical	N/A
4	1820.168	-49.36	-13.00	Vertical	PASS
5	4576.841	-48.71	-13.00	Vertical	PASS
6	9794.890	-37.85	-13.00	Vertical	PASS

GSM850(EDGE), Mid Channel

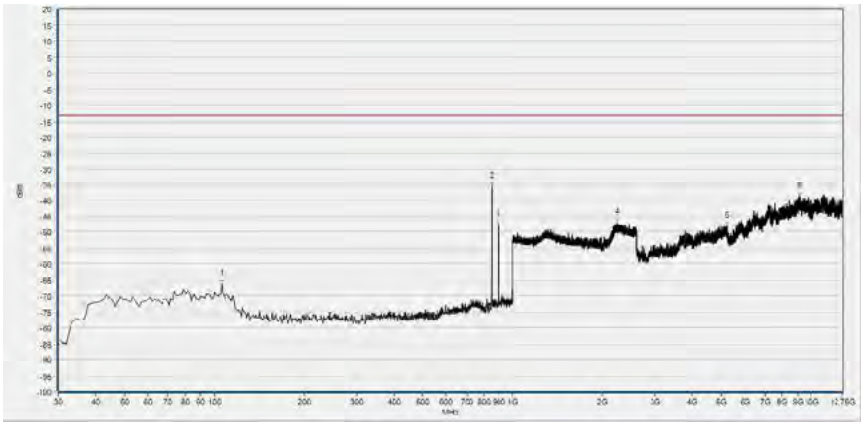


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	84.320	-69.06	-13.00	Horizontal	PASS
2	836.070	-44.98	-13.00	Horizontal	N/A
3	881.660	-46.35	-13.00	Horizontal	N/A
4	2222.249	-44.00	-13.00	Horizontal	PASS
5	7268.003	-40.93	-13.00	Horizontal	PASS
6	10887.598	-38.09	-13.00	Horizontal	PASS

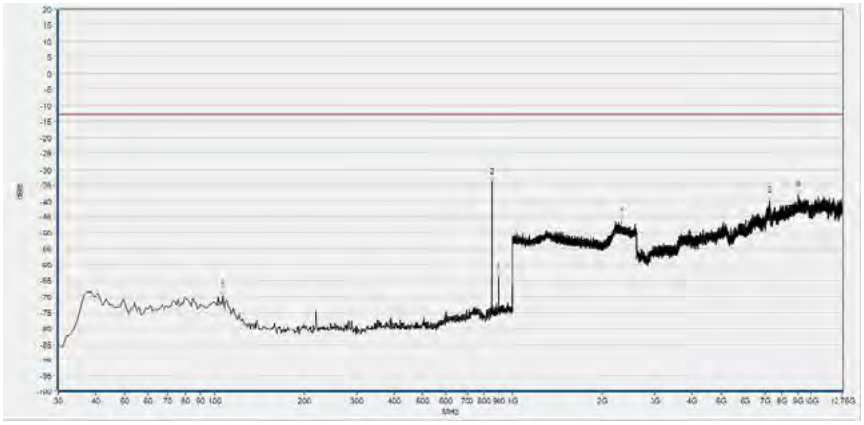


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	105.660	-67.87	-13.00	Vertical	PASS
2	836.070	-56.04	-13.00	Vertical	N/A
3	881.660	-58.38	-13.00	Vertical	N/A
4	2232.493	-43.79	-13.00	Vertical	PASS
5	7133.261	-40.42	-13.00	Vertical	PASS
6	11653.601	-38.33	-13.00	Vertical	PASS

GSM850(EDGE), High Channel

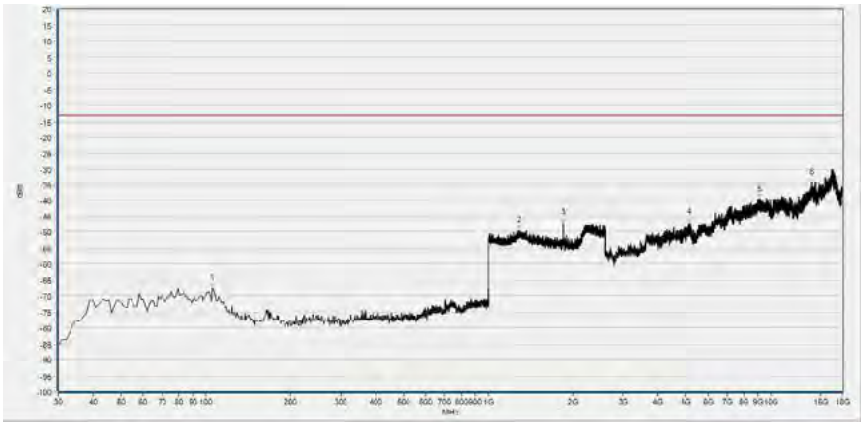


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	105.660	-66.34	-13.00	Horizontal	PASS
2	848.680	-35.40	-13.00	Horizontal	N/A
3	893.300	-47.40	-13.00	Horizontal	N/A
4	2222.889	-47.06	-13.00	Horizontal	PASS
5	5239.480	-48.12	-13.00	Horizontal	PASS
6	9104.564	-38.79	-13.00	Horizontal	PASS

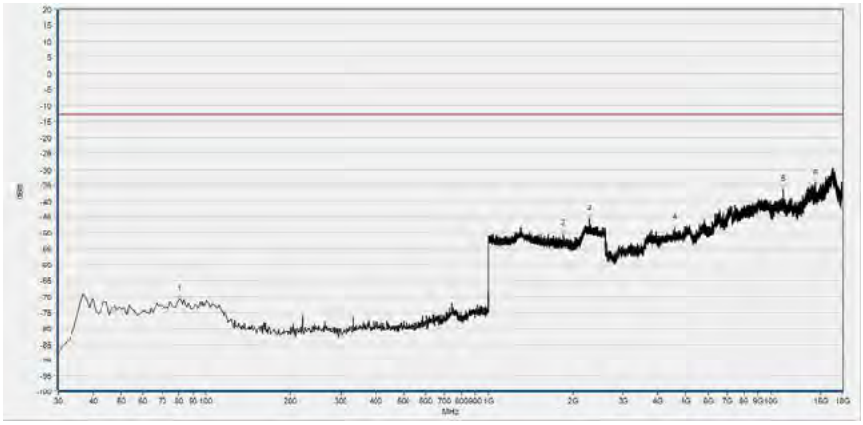


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	106.630	-69.74	-13.00	Vertical	PASS
2	848.680	-34.02	-13.00	Vertical	N/A
3	894.270	-64.03	-13.00	Vertical	N/A
4	2317.007	-46.48	-13.00	Vertical	PASS
5	7240.316	-40.07	-13.00	Vertical	PASS
6	9039.962	-38.38	-13.00	Vertical	PASS

GSM1900(EDGE), Low Channel

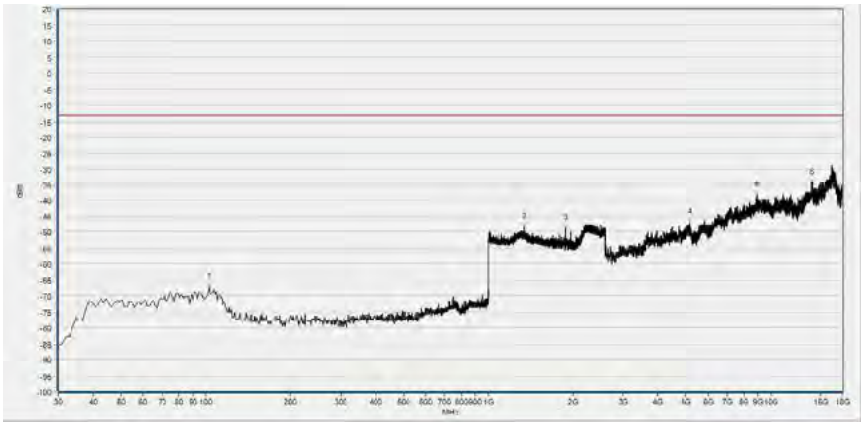


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	105.660	-67.39	-13.00	Horizontal	PASS
2	1286.835	-49.42	-13.00	Horizontal	PASS
3	1850.260	-47.30	-13.00	Horizontal	N/A
4	5148.463	-46.94	-13.00	Horizontal	PASS
5	9139.189	-39.83	-13.00	Horizontal	PASS
6	14034.479	-34.41	-13.00	Horizontal	PASS

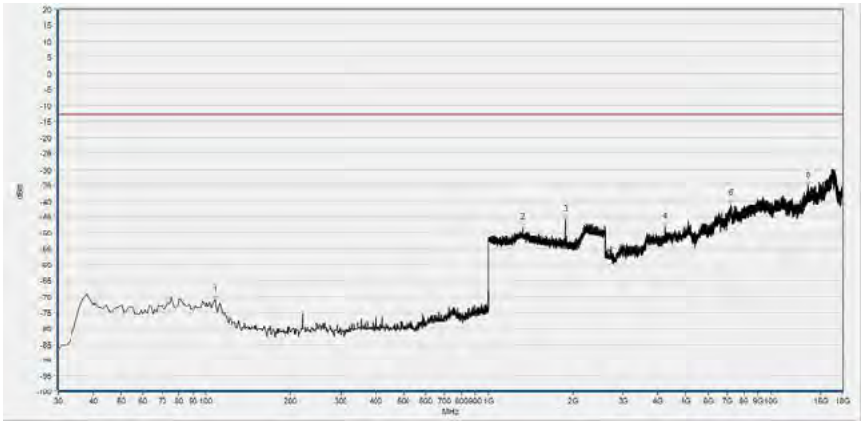


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-71.01	-13.00	Vertical	PASS
2	1849.620	-50.48	-13.00	Vertical	PASS
3	2276.671	-45.63	-13.00	Vertical	PASS
4	4557.556	-48.66	-13.00	Vertical	PASS
5	11127.550	-36.61	-13.00	Vertical	PASS
6	14409.747	-34.46	-13.00	Vertical	PASS

GSM1900(EDGE), Mid Channel

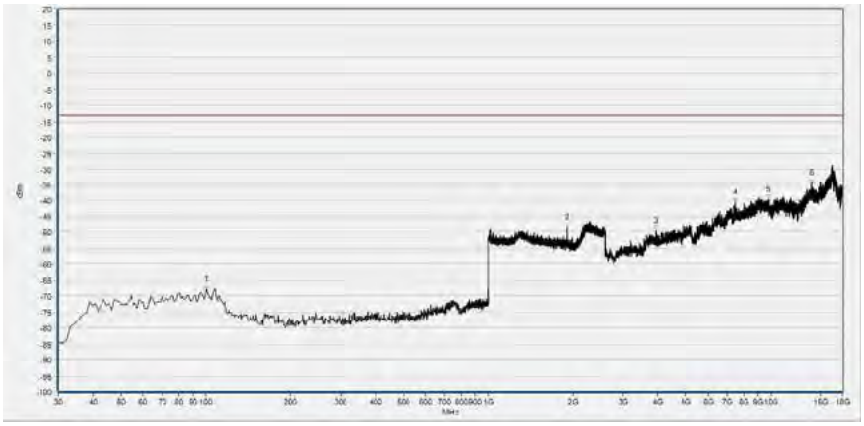


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	102.750	-67.08	-13.00	Horizontal	PASS
2	1337.415	-48.39	-13.00	Horizontal	PASS
3	1879.712	-48.83	-13.00	Horizontal	N/A
4	5182.069	-47.12	-13.00	Horizontal	PASS
5	8945.954	-38.32	-13.00	Horizontal	PASS
6	14028.878	-34.25	-13.00	Horizontal	PASS

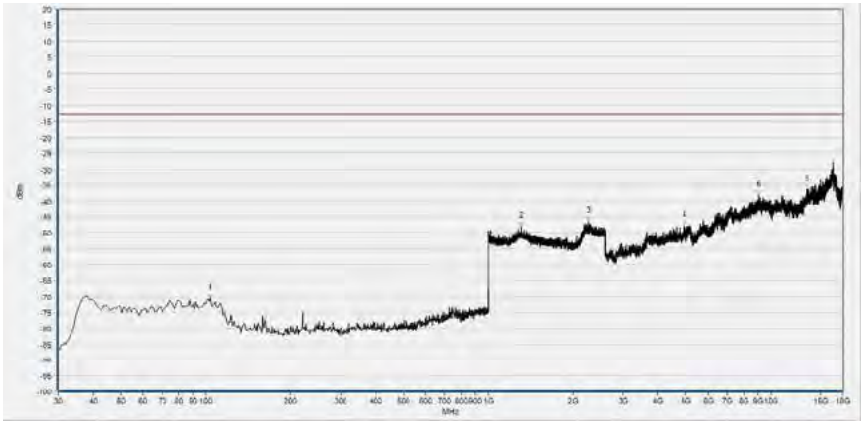


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	107.600	-71.21	-13.00	Vertical	PASS
2	1319.488	-48.61	-13.00	Vertical	PASS
3	1879.712	-46.21	-13.00	Vertical	N/A
4	4238.298	-48.46	-13.00	Vertical	PASS
5	7240.444	-41.06	-13.00	Vertical	PASS
6	13594.799	-35.34	-13.00	Vertical	PASS

GSM1900(EDGD), High Channel

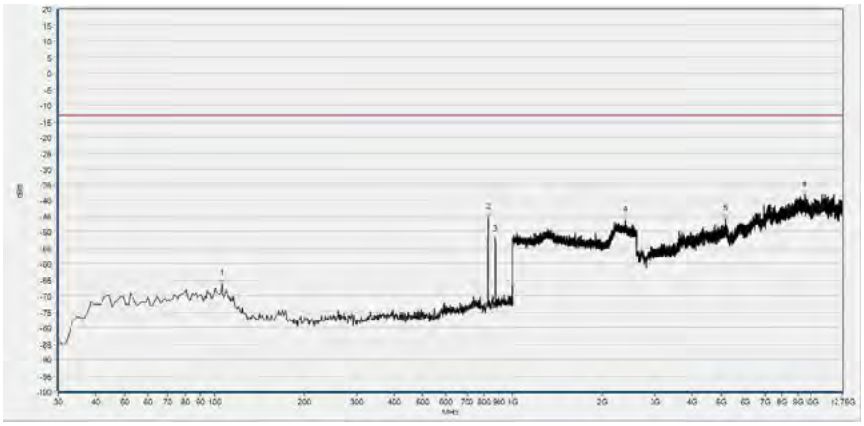


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	100.810	-67.98	-13.00	Horizontal	PASS
2	1909.804	-48.90	-13.00	Horizontal	N/A
3	3949.845	-49.61	-13.00	Horizontal	PASS
4	7461.684	-40.74	-13.00	Horizontal	PASS
5	9752.500	-39.86	-13.00	Horizontal	PASS
6	14000.873	-34.60	-13.00	Horizontal	PASS

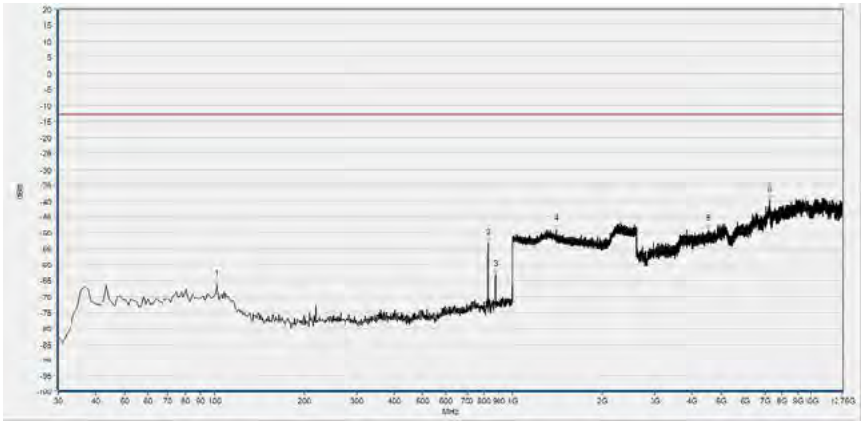


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	103.720	-70.54	-13.00	Vertical	PASS
2	1306.042	-48.20	-13.00	Vertical	PASS
3	2256.823	-46.67	-13.00	Vertical	PASS
4	4938.425	-47.97	-13.00	Vertical	PASS
5	9063.575	-38.22	-13.00	Vertical	PASS
6	13488.380	-36.45	-13.00	Vertical	PASS

WCDMA Band V(WCDMA), Low Channel

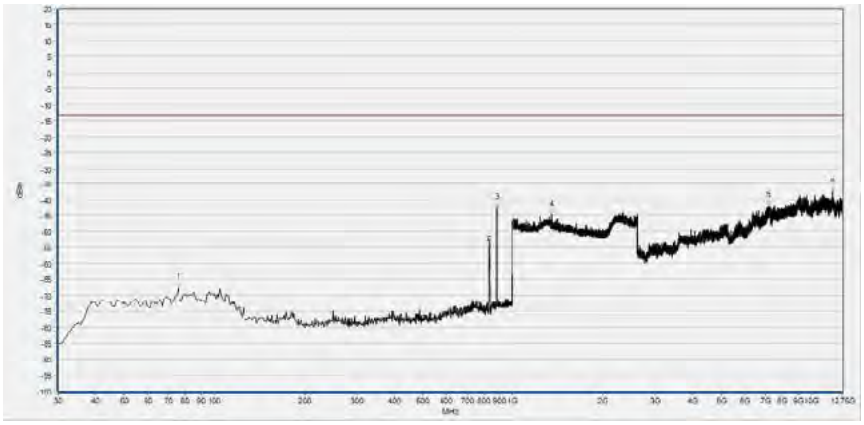


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	105.660	-66.18	-13.00	Horizontal	PASS
2	827.340	-45.42	-13.00	Horizontal	N/A
3	870.990	-52.61	-13.00	Horizontal	N/A
4	2395.758	-46.37	-13.00	Horizontal	PASS
5	5176.723	-46.01	-13.00	Horizontal	PASS
6	9486.643	-38.39	-13.00	Horizontal	PASS

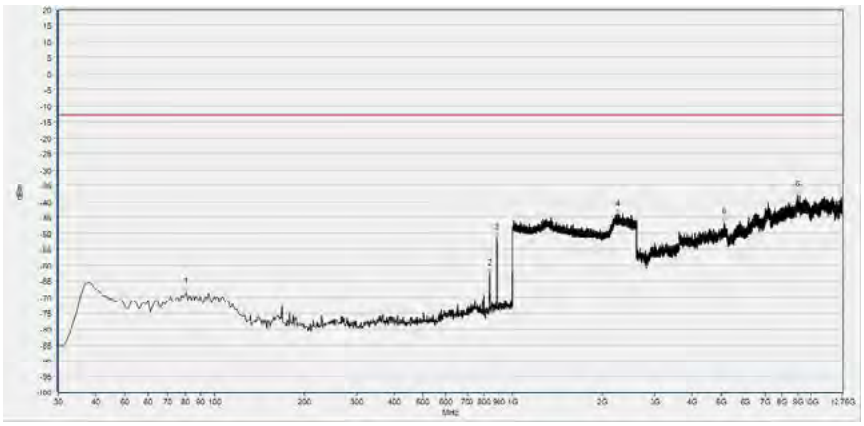


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	101.780	-66.54	-13.00	Vertical	PASS
2	828.310	-53.26	-13.00	Vertical	N/A
3	872.930	-63.12	-13.00	Vertical	N/A
4	1395.038	-49.13	-13.00	Vertical	PASS
5	4504.855	-49.08	-13.00	Vertical	PASS
6	7236.625	-39.92	-13.00	Vertical	PASS

WCDMA Band V(WCDMA), Mid Channel

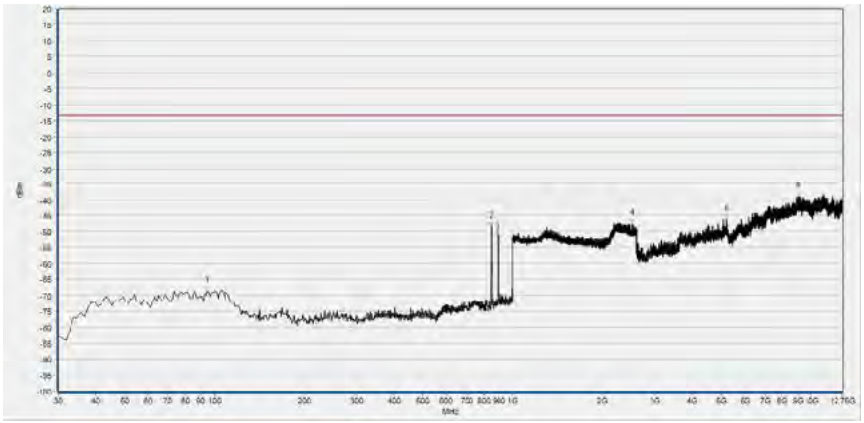


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	75.590	-67.67	-13.00	Horizontal	PASS
2	834.130	-55.75	-13.00	Horizontal	N/A
3	882.630	-42.66	-13.00	Horizontal	N/A
4	1351.501	-44.81	-13.00	Horizontal	PASS
5	7149.873	-41.96	-13.00	Horizontal	PASS
6	11727.432	-37.54	-13.00	Horizontal	PASS

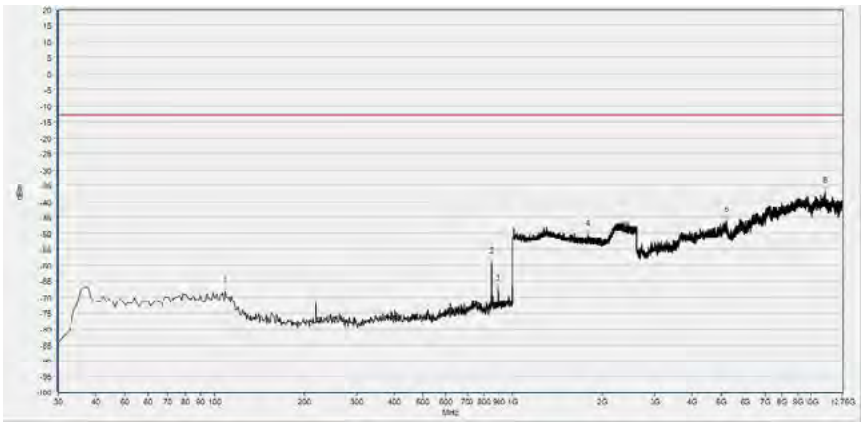


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-68.49	-13.00	Vertical	PASS
2	835.100	-62.77	-13.00	Vertical	N/A
3	881.660	-51.45	-13.00	Vertical	N/A
4	2240.176	-44.06	-13.00	Vertical	PASS
5	5126.887	-46.87	-13.00	Vertical	PASS
6	8982.742	-38.15	-13.00	Vertical	PASS

WCDMA Band V(WCDMA), High Channel

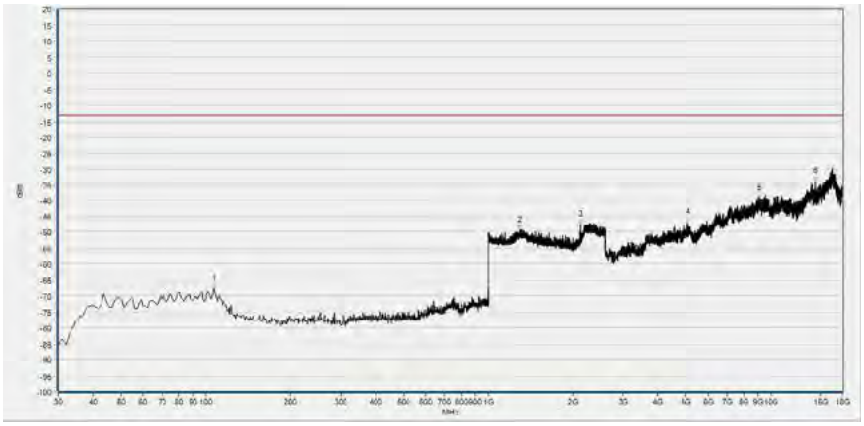


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	94.990	-68.72	-13.00	Horizontal	PASS
2	847.710	-48.58	-13.00	Horizontal	N/A
3	890.390	-50.91	-13.00	Horizontal	N/A
4	2510.364	-47.76	-13.00	Horizontal	PASS
5	5195.181	-46.43	-13.00	Horizontal	PASS
6	9039.962	-38.95	-13.00	Horizontal	PASS

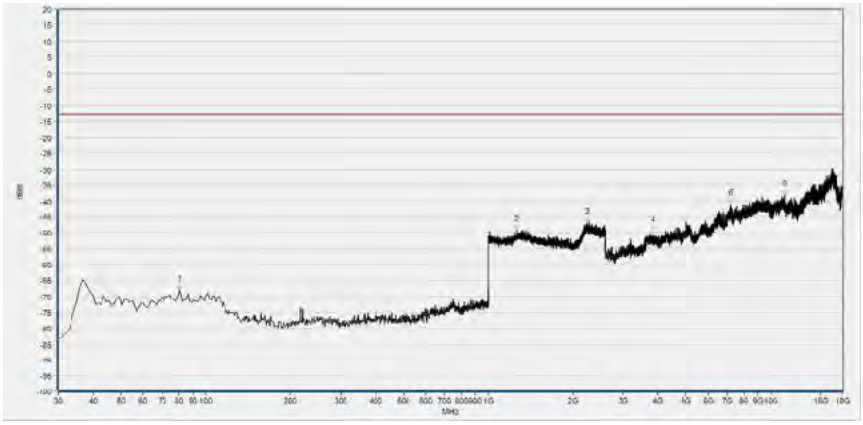


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	109.540	-68.24	-13.00	Vertical	PASS
2	847.710	-59.09	-13.00	Vertical	N/A
3	890.390	-67.55	-13.00	Vertical	N/A
4	1780.472	-50.48	-13.00	Vertical	PASS
5	5213.639	-46.26	-13.00	Vertical	PASS
6	11129.396	-37.01	-13.00	Vertical	PASS

WCDMA Band IV(WCDMA), Low Channel

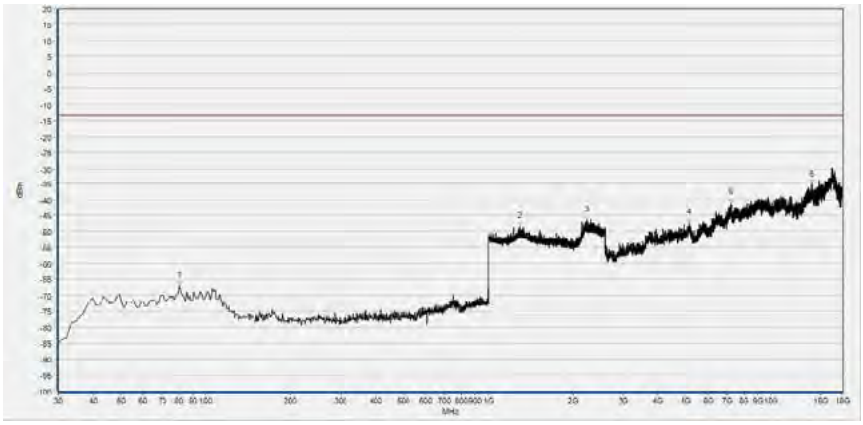


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	106.630	-67.85	-13.00	Horizontal	PASS
2	1290.676	-49.50	-13.00	Horizontal	PASS
3	2113.405	-47.67	-13.00	Horizontal	N/A
4	5084.052	-47.08	-13.00	Horizontal	PASS
5	9094.381	-39.53	-13.00	Horizontal	PASS
6	14446.154	-33.88	-13.00	Horizontal	PASS

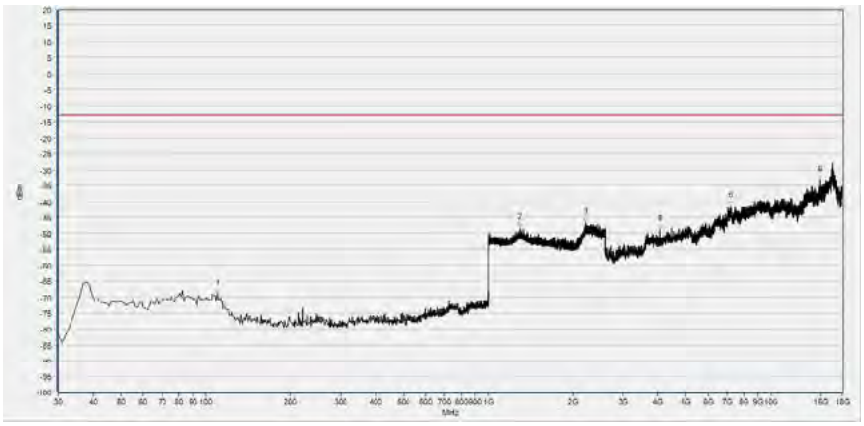


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-68.00	-13.00	Vertical	PASS
2	1259.944	-49.34	-13.00	Vertical	PASS
3	2235.694	-47.10	-13.00	Vertical	PASS
4	3837.825	-49.57	-13.00	Vertical	PASS
5	7234.843	-40.94	-13.00	Vertical	PASS
6	11253.573	-38.12	-13.00	Vertical	PASS

WCDMA Band IV(WCDMA), Mid Channel

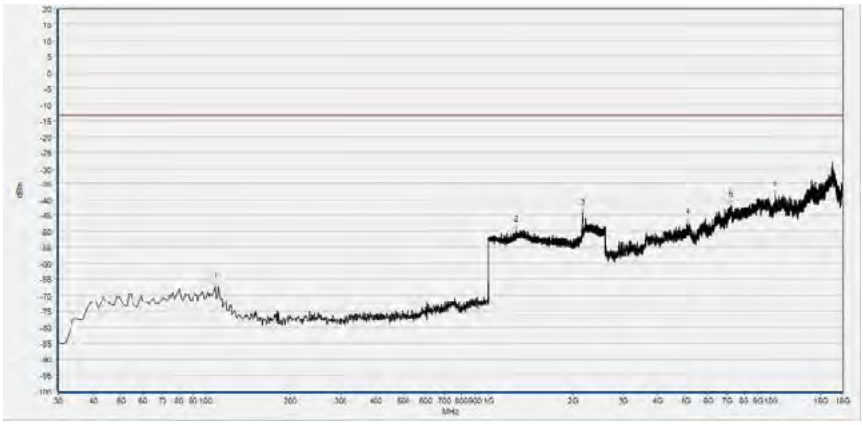


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-67.26	-13.00	Horizontal	PASS
2	1293.878	-48.65	-13.00	Horizontal	PASS
3	2225.450	-46.63	-13.00	Horizontal	PASS
4	5165.266	-47.49	-13.00	Horizontal	PASS
5	7226.441	-41.14	-13.00	Horizontal	PASS
6	14034.479	-35.02	-13.00	Horizontal	PASS

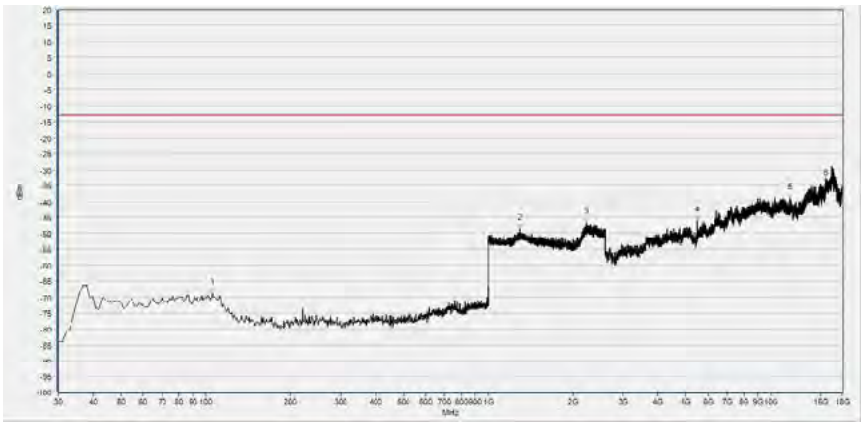


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	109.540	-69.03	-13.00	Vertical	PASS
2	1292.597	-48.38	-13.00	Vertical	PASS
3	2201.761	-46.72	-13.00	Vertical	PASS
4	4064.666	-48.91	-13.00	Vertical	PASS
5	7232.042	-41.47	-13.00	Vertical	PASS
6	14975.450	-33.23	-13.00	Vertical	PASS

WCDMA Band IV(WCDMA), High Channel

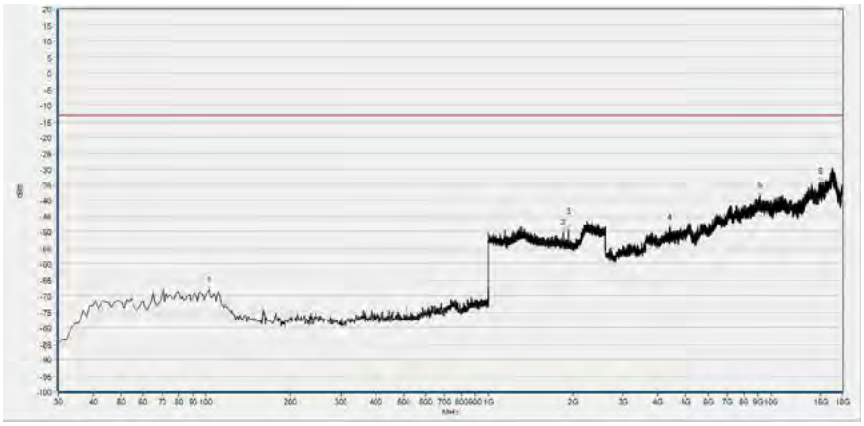


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	107.600	-67.27	-13.00	Horizontal	PASS
2	1253.541	-49.75	-13.00	Horizontal	PASS
3	2151.821	-44.35	-13.00	Horizontal	N/A
4	5081.251	-47.48	-13.00	Horizontal	PASS
5	7226.441	-41.95	-13.00	Horizontal	PASS
6	10335.006	-38.45	-13.00	Horizontal	PASS

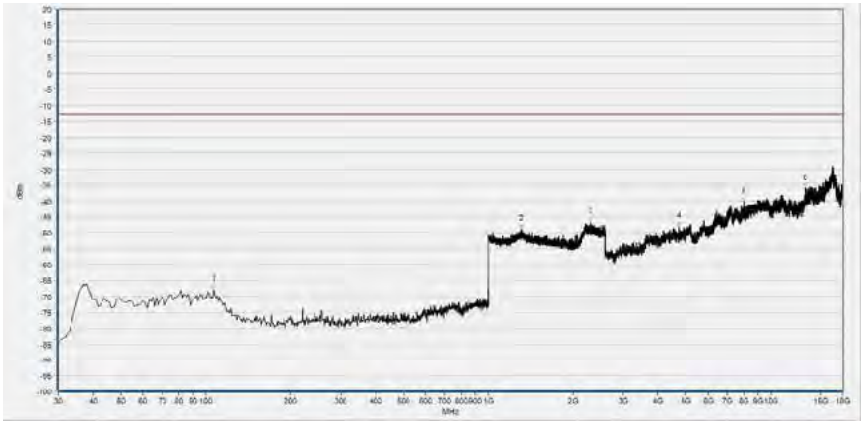


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	105.660	-68.81	-13.00	Vertical	PASS
2	1291.317	-48.68	-13.00	Vertical	PASS
3	2221.609	-46.89	-13.00	Vertical	PASS
4	5506.929	-46.18	-13.00	Vertical	PASS
5	11738.061	-38.89	-13.00	Vertical	PASS
6	15644.772	-34.41	-13.00	Vertical	PASS

WCDMA Band II(WCDMA), Low Channel

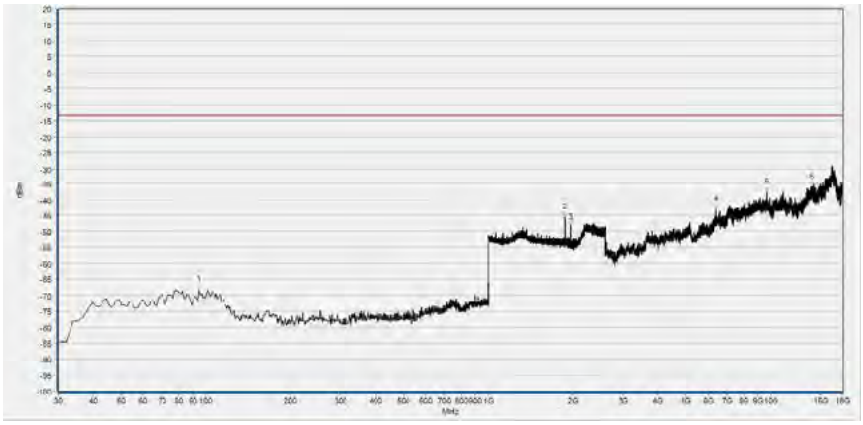


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	102.750	-68.31	-13.00	Horizontal	PASS
2	1851.541	-50.29	-13.00	Horizontal	N/A
3	1933.493	-49.30	-13.00	Horizontal	N/A
4	4392.326	-48.77	-13.00	Horizontal	PASS
5	9169.995	-38.88	-13.00	Horizontal	PASS
6	15003.455	-34.07	-13.00	Horizontal	PASS

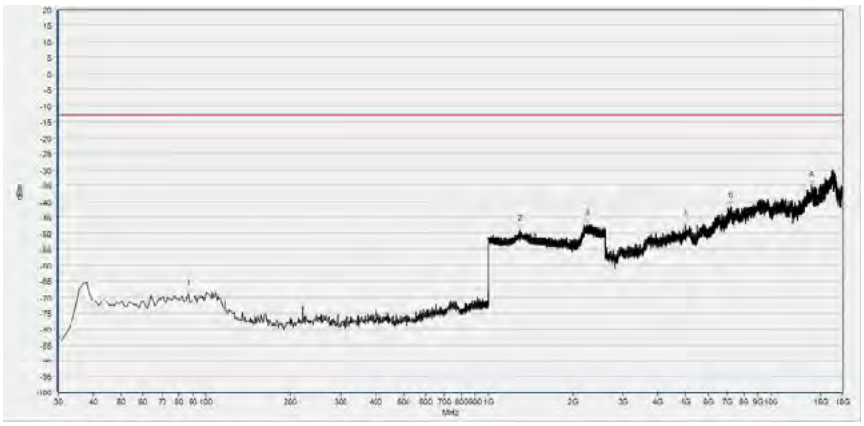


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	106.630	-68.03	-13.00	Vertical	PASS
2	1306.042	-48.95	-13.00	Vertical	PASS
3	2300.360	-46.82	-13.00	Vertical	PASS
4	4722.786	-48.07	-13.00	Vertical	PASS
5	8016.185	-40.26	-13.00	Vertical	PASS
6	13216.730	-36.16	-13.00	Vertical	PASS

WCDMA Band II(WCDMA), Mid Channel

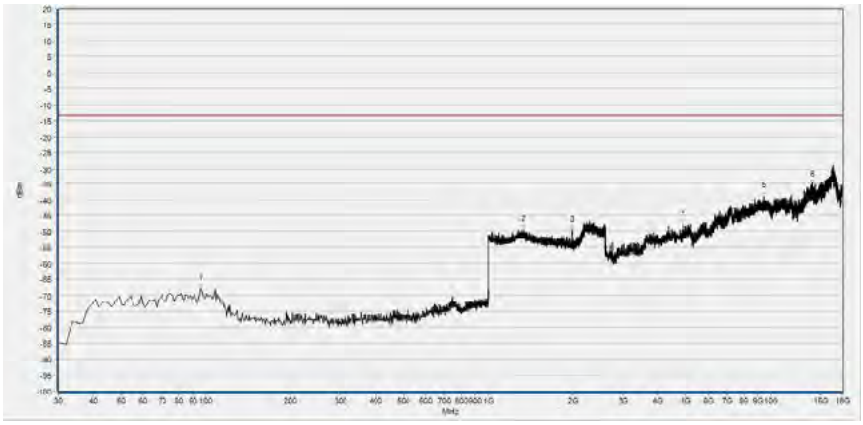


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	94.990	-68.51	-13.00	Horizontal	PASS
2	1878.431	-45.61	-13.00	Horizontal	N/A
3	1961.665	-47.88	-13.00	Horizontal	N/A
4	6431.097	-43.34	-13.00	Horizontal	PASS
5	9640.480	-37.66	-13.00	Horizontal	PASS
6	14003.673	-35.85	-13.00	Horizontal	PASS

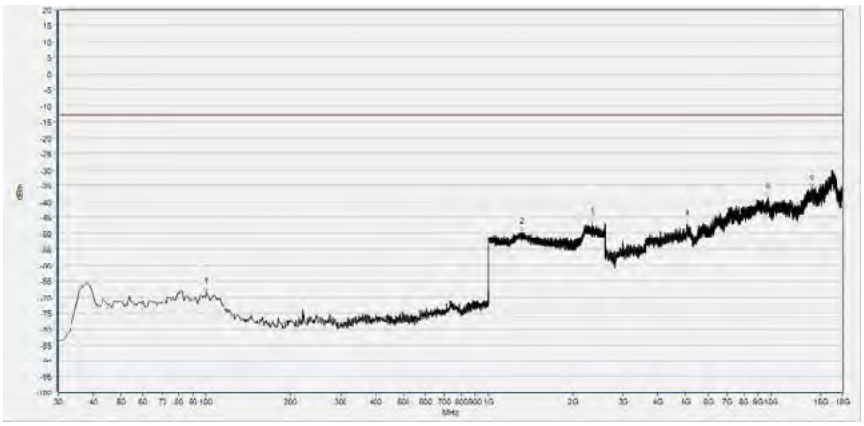


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	86.260	-68.97	-13.00	Vertical	PASS
2	1293.878	-48.85	-13.00	Vertical	PASS
3	2233.133	-47.16	-13.00	Vertical	PASS
4	5005.637	-47.33	-13.00	Vertical	PASS
5	7220.840	-41.40	-13.00	Vertical	PASS
6	13989.671	-35.06	-13.00	Vertical	PASS

WCDMA Band II(WCDMA), High Channel



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	95.960	-68.11	-13.00	Horizontal	PASS
2	1331.012	-49.45	-13.00	Horizontal	PASS
3	1988.555	-49.64	-13.00	Horizontal	N/A
4	4882.415	-47.52	-13.00	Horizontal	PASS
5	9458.447	-39.07	-13.00	Horizontal	PASS
6	14062.484	-35.06	-13.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	100.810	-68.39	-13.00	Vertical	PASS
2	1318.207	-49.77	-13.00	Vertical	PASS
3	2338.135	-46.82	-13.00	Vertical	PASS
4	5078.451	-47.35	-13.00	Vertical	PASS
5	9755.301	-38.81	-13.00	Vertical	PASS
6	14012.075	-35.92	-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. Morlab Laboratory
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. Morlab Laboratory
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	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2020.04.15	2021.04.14
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	2020.07.27	2021.07.26
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	HA06-21216 2-3-3-II	HUT705P	CHONGQING HANBA EXPERIMENTAL EQUIPMENT CO.,LTD	2020.03.25	2021.03.24
Computer	T430i	Think Pad	Lenovo	N/A	N/A

4.2 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
System Simulator	152038	CMW500	R&S	2020.11.19	2021.11.18
Receiver	MY54130016	N9038A	Agilent	2020.07.21	2021.07.20
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	2020.07.21	2021.07.20
18-26.5GHz pre-Amplifier	46732	S10M100L3802	Tonscend	2020.07.21	2021.07.20
26-40GHz pre-Amplifier	56774	S40M400L4002	Tonscend	2020.07.21	2021.07.20
Notch Filter	N/A	WRCG-GSM 850	Wainwright	2020.07.21	2021.07.20
Notch Filter	N/A	WRCG-GSM 1900	Wainwright	2020.07.21	2021.07.20
Notch Filter	N/A	WRCGV-W Band V	Wainwright	2020.07.21	2021.07.20
Notch Filter	N/A	WRCGV-W Band II	Wainwright	2020.07.21	2021.07.20

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Notch Filter	N/A	WRCGV-W Band IV	Wainwright	2020.07.21	2021.07.20
Anechoic Chamber	N/A	9m*6m*6m	CRT	2019.07.13	2022.07.12

END OF REPORT