REPORT No.: SZ16050024W03

FCC RF TEST REPORT

APPLICANT	:	Shenzhen Santiago Technology Ltd.
PRODUCT NAME	:	DUO Bluetooth Communication Accessory
MODEL NAME	:	DUO-A1
TRADE NAME	:	DUOSIM
BRAND NAME	:	DUO
FCC ID	:	2AIU7-1508A01
STANDARD(S)	:	47 CFR Part 22 Subpart H 47 CFR Part 24 Subpart E
ISSUE DATE	:	2016-07-11

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

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DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2016-07-11	First edition

TEST REPORT DECLARATION

Applicant	Shenzhen Santiago Technology Ltd.
Applicant Address	REITH INTERNATIONAL 11A, LUOHU DISTRICT, SHENZHEN
Manufacturer	Shenzhen Santiago Technology Ltd.
Manufacturer Address	REITH INTERNATIONAL 11A, LUOHU DISTRICT, SHENZHEN
Product Name	DUO Bluetooth Communication Accessory
Model Name	DUO-A1
Brand Name	DUO
HW Version	ST-5106
SW Version	DuoPlus_v1.2.018
Test Standards	47 CFR Part 22 Subpart H 47 CFR Part 24 Subpart E
Test Date	2016-06-03 to 2016-06-13
Test Result	PASS

Tested by : Yuan Ling
Yuan Ling

Reviewed by : Qiu Xiaojun
Qiu Xiaojun

Approved by : Peng Huarui
Peng Huarui

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type ..... :	DUO Bluetooth Communication Accessory
Serial No. ..... :	(n.a, marked #1 by test site)
Hardware Version ..... :	ST-5106
Software Version ..... :	DuoPlus_v1.2.018
Applicant ..... :	Shenzhen Santiago Technology Ltd. REITH INTERNATIONAL 11A, LUOHU DISTRICT, SHENZHEN
Manufacturer ..... :	Shenzhen Santiago Technology Ltd. REITH INTERNATIONAL 11A, LUOHU DISTRICT, SHENZHEN
Frequency Range ..... :	GSM 850MHz: Tx: 824.20 - 848.80MHz (at intervals of 200kHz); Rx: 869.20 - 893.80MHz (at intervals of 200kHz) GSM 1900MHz: Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz); Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)
Modulation Type ..... :	GSM Mode with GMSK Modulation
Antenna Type ..... :	PCB Antenna
Emission Designators ..... :	GSM 850:243KGXW,GSM 1900:246KGXW

Note 1: The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula F(n)=824.2+0.2*(n-128), 128<=n<=251; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190 (836.6MHz) and 251 (848.8MHz).

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

Note 3: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22 and Part 24 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

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

No.	Section	Description	Result
1	2.1046	Conducted RF Output Power	PASS
2.	24.232(d)	Peak to average radio	PASS
2	2.1049,22.917, 24.238,	99% Occupied Bandwidth	PASS
3	2.1055,22.355, 24.235	Frequency Stability	PASS
4	2.1051,2.1057, 22.917, 24.238,	Conducted Out of Band Emissions	PASS
5	2.1051, 2.1057, 22.917, 24.238	Band Edge	PASS
6	22.913, 24.232	Transmitter Radiated Power (EIPR/ERP)	PASS
7	2.1053, 2.1057, 22.917, 24.238	Radiated Out of Band Emissions	PASS

NOTE: Measurement method according to TIA/EIA 603.D-2010.

1.3 Facilities and Accreditations

1.3.1 Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at FL.1, Building A, FeiYang Science Park, No.8 LongChang Road,Block 67, BaoAn District, ShenZhen, GuangDong Province,P. R. China 518101. The test site is constructed in conformance with the requirements of ANSI C63.7-2009, ANSI C63.4-2009 and CISPR Publication 22:2010; the FCC registration number is 695796.

1.3.2 Test Environment 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 REQUIREMENTS

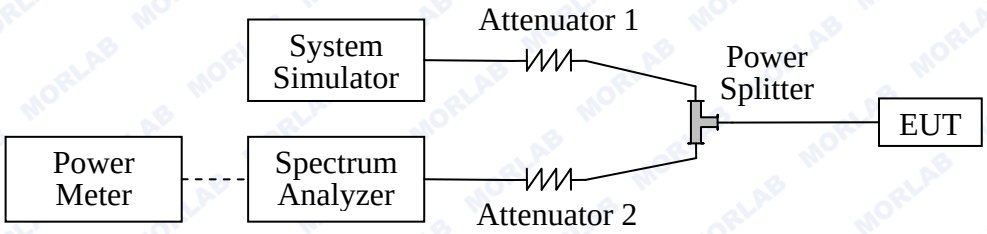
2.1 Conducted RF Output Power

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, which is powered by the Battery, 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.

The Power Meter was just used for the Conducted RF Output Power test of WCDMA Model.

Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2016.03.02	2017.03.01
Spectrum Analyzer	Agilent	E7405A	US44210471	2016.03.02	2017.03.01
Power Meter	Agilent	E4418B	GB43318055	2016.03.02	2017.03.01
Power Sensor	Agilent	8482A	MY41091706	2016.03.02	2017.03.01
Power Splitter	Weinschel	1506A	NW521	2016.03.02	2017.03.01
Attenuator 1	Resnet	20dB	(n.a.)	2016.03.02	2017.03.01
Attenuator 2	Resnet	3dB	(n.a.)	2016.03.02	2017.03.01

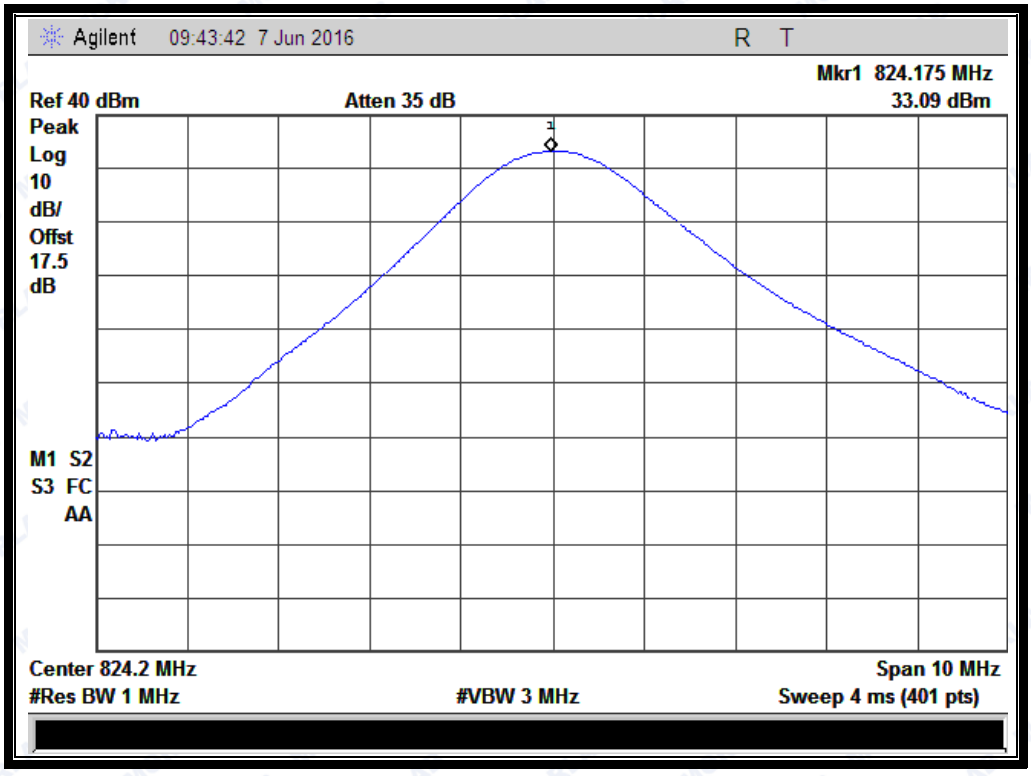
2.1.3 Test Results

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

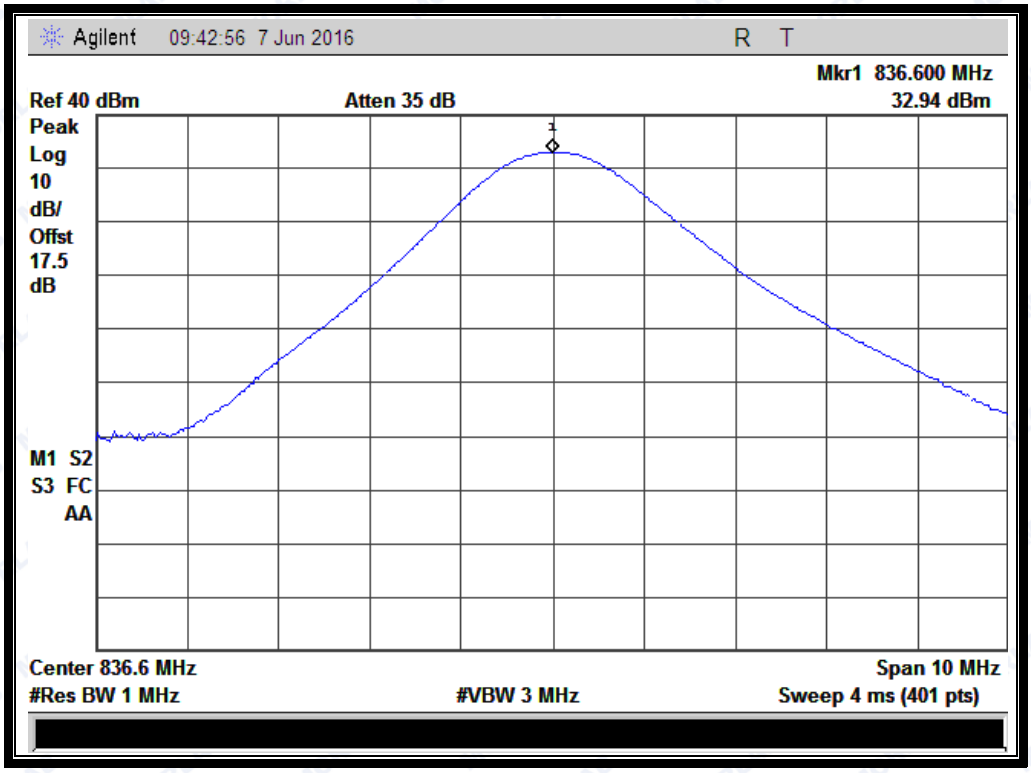
GSM Model Test Verdict:

Band	Channel	Frequency (MHz)	Measured Output Power		Limit	Verdict
			dBm	Refer to Plot	dBm	
GSM 850MHz	128	824.2	33.09	Plot A1 to A3	35	PASS
	190	836.6	32.94			PASS
	251	848.8	32.87			PASS
GSM 1900MHz	512	1850.2	25.35	Plot B1 to B3	32	PASS
	661	1880.0	25.30			PASS
	810	1909.8	25.61			PASS

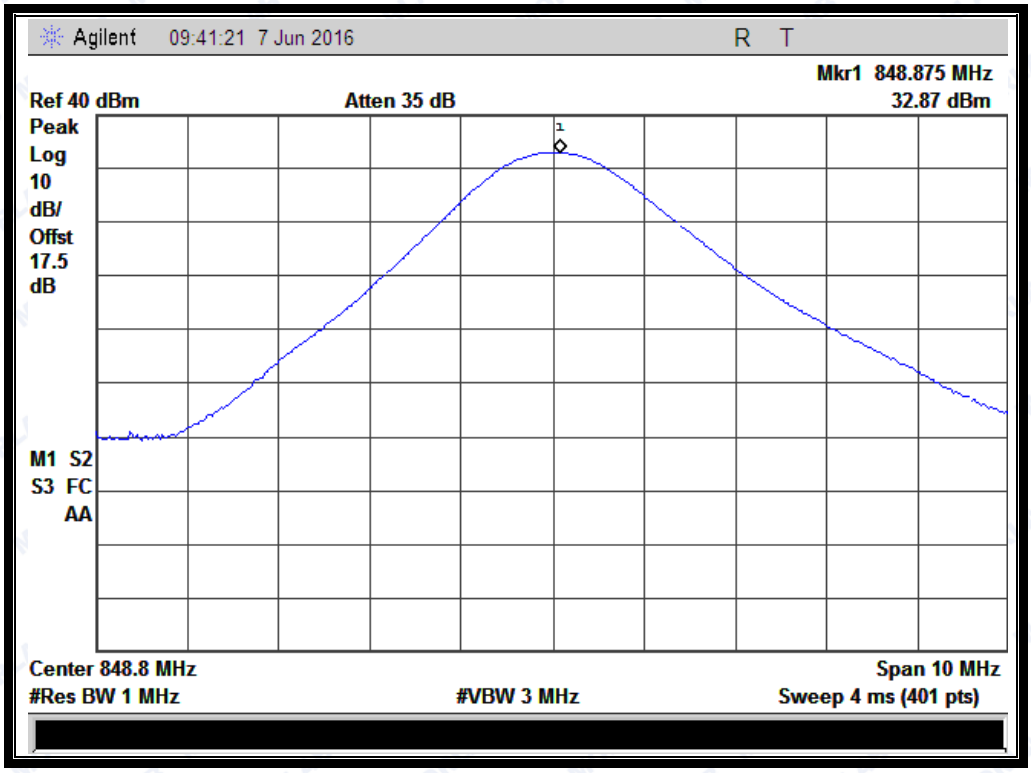
GSM Model Test Plots:



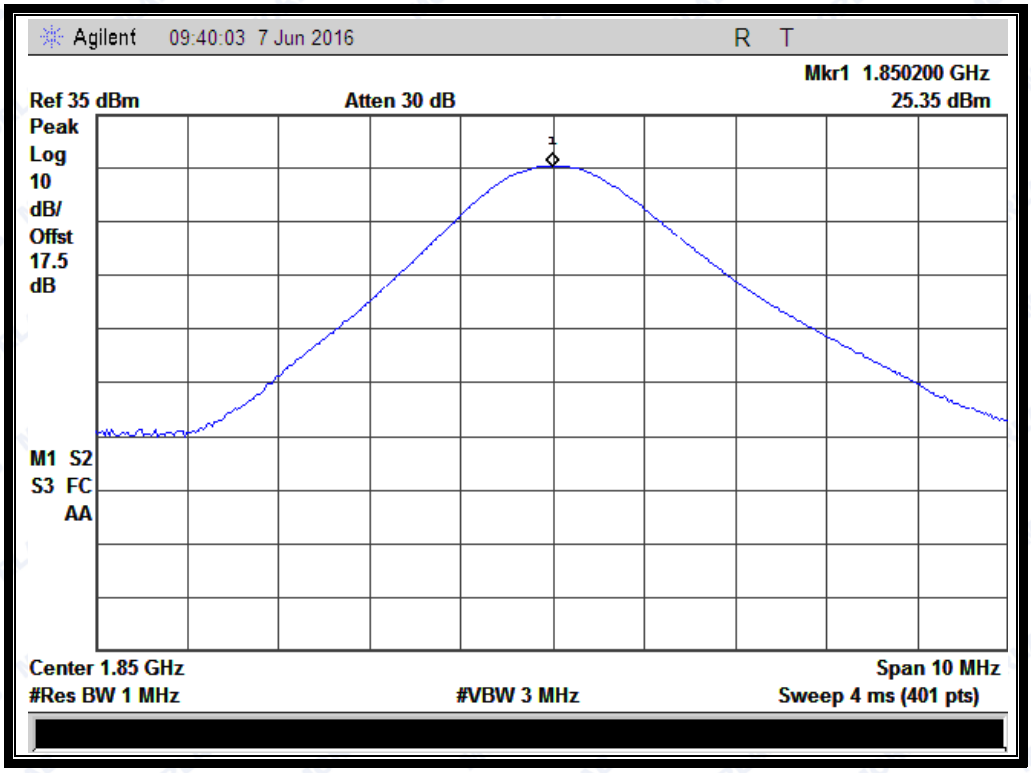
(Plot A1: GSM 850MHz Channel = 128)



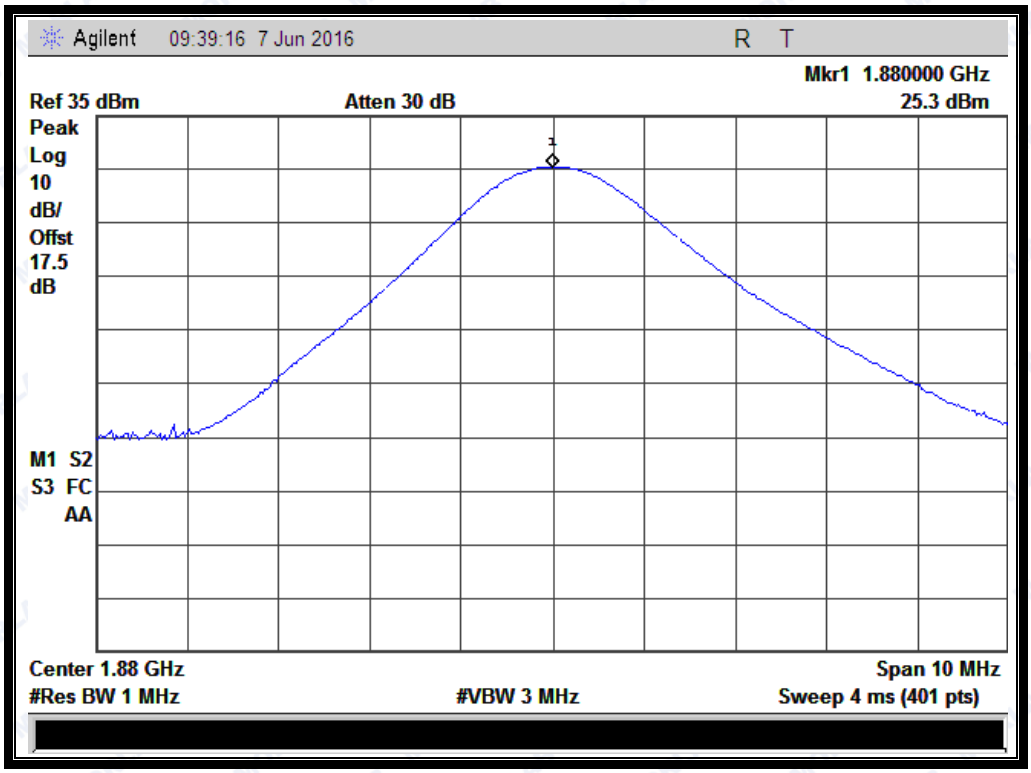
(Plot A2: GSM 850MHz Channel = 190)



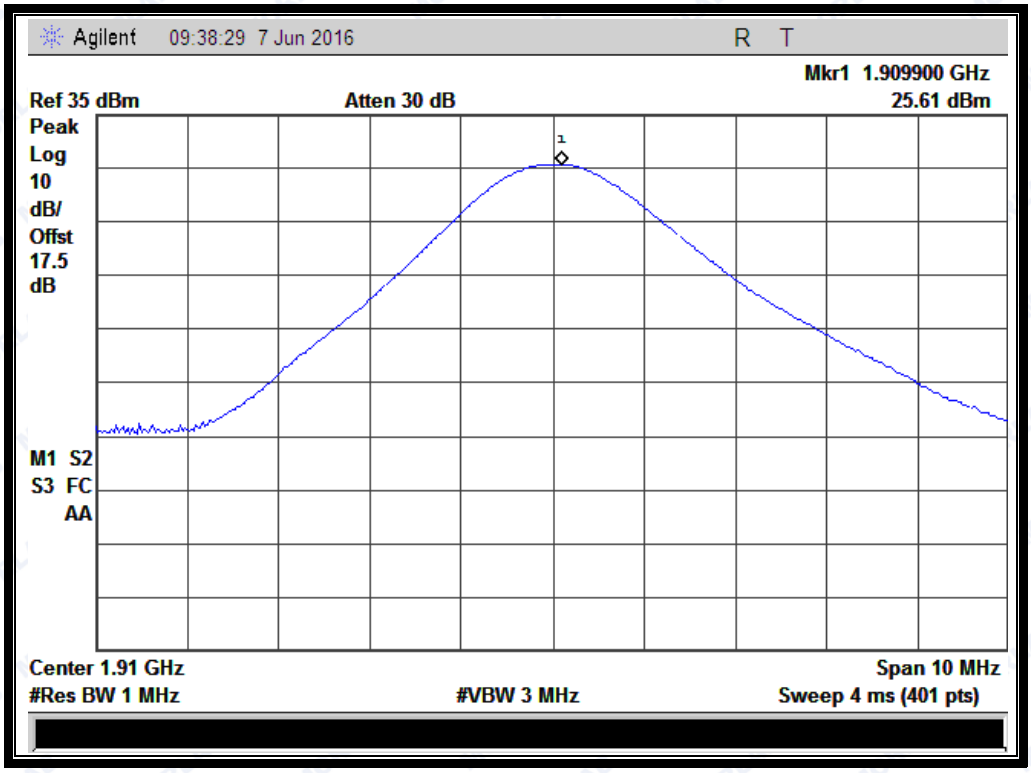
(Plot A3: GSM 850MHz Channel = 251)



(Plot B1: GSM 1900MHz Channel = 512)



(Plot B2: GSM 1900MHz Channel = 661)



(Plot B3: GSM 1900Hz Channel = 810)

2.2 Peak to Average Radio

2.2.1 Definition

According to FCC section 2.1049 and FCC 24.232(d) the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

2.2.2 Test Description

See section 2.1.2 of this report.

2.2.3 Test Verdict

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio.

Test procedures:

A .For GSM/EGPRS 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 radio.

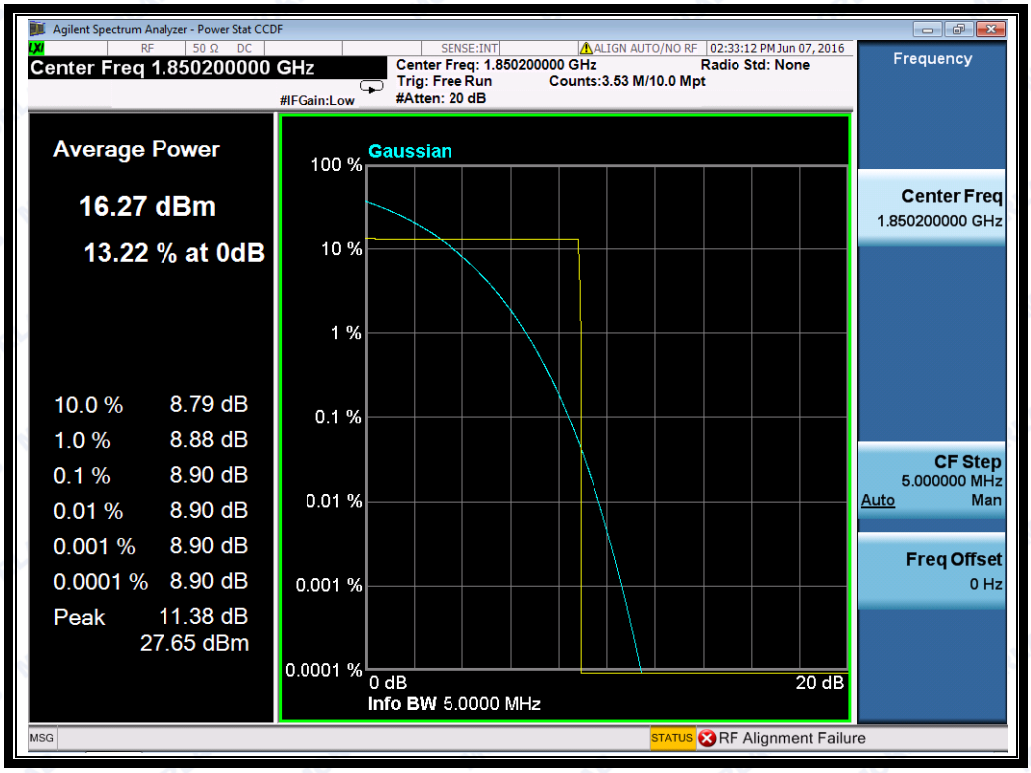
B. For UMTS operating mode:

a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.

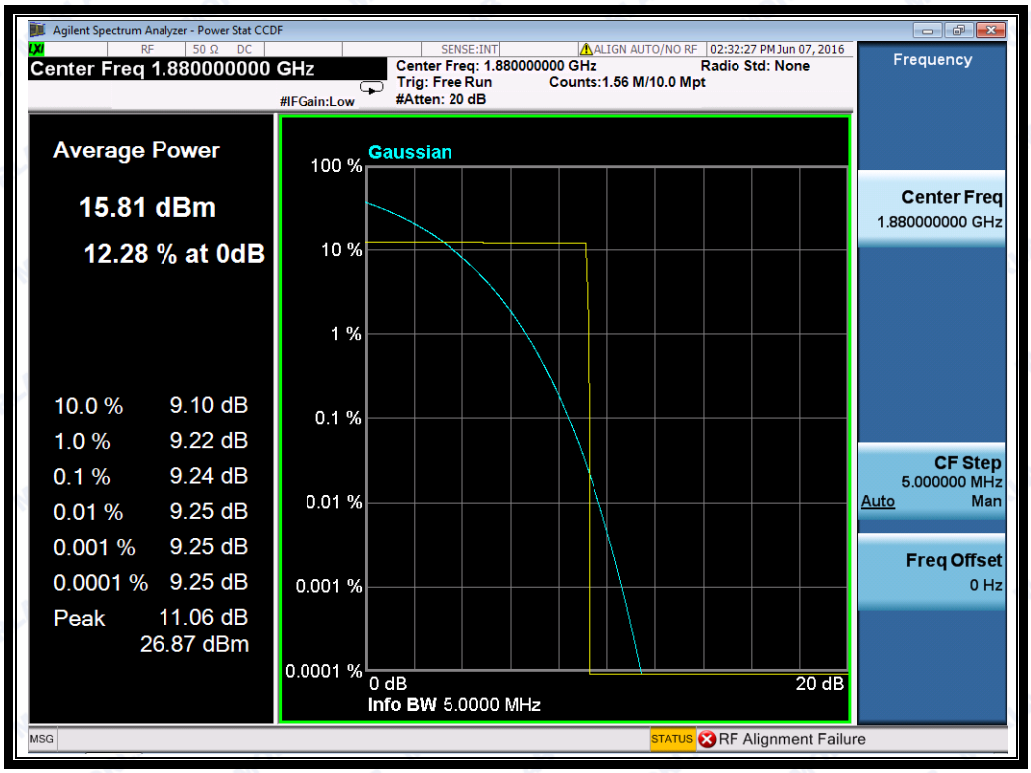
b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

Test Verdict:

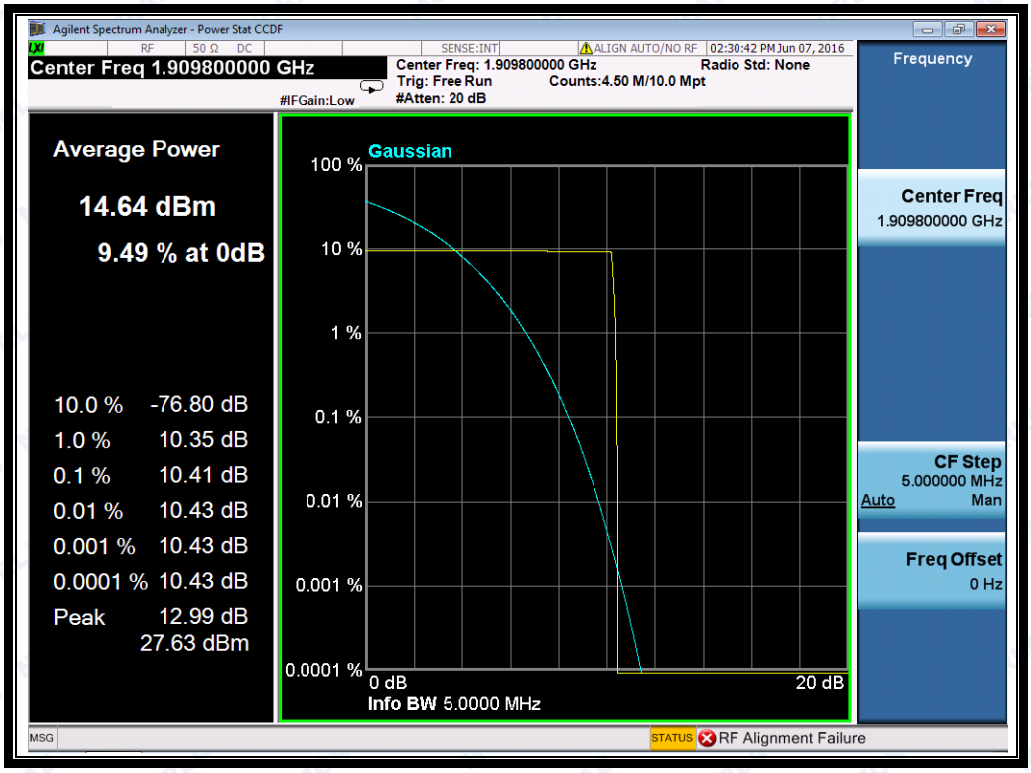
Band	Channel	Frequency (MHz)	Peak to Average radio		Limit	Verdict
			dB	Refer to Plot	dB	
GSM 1900MHz	512	1850.2	8.90	Plot A1 to A3	13	PASS
	661	1880.0	9.24			PASS
	810	1909.8	10.41			PASS



(Plot A1: GSM 1900 MHz Channel = 512)



(Plot A2: GSM 1900 MHz Channel = 661)



(Plot A3: GSM 1900MHz Channel = 810)

2.3 99% Occupied Bandwidth

2.3.1 Definition

According to FCC section 2.1049 and FCC § 22.917 &24.238, 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

See section 2.1.2 of this report.

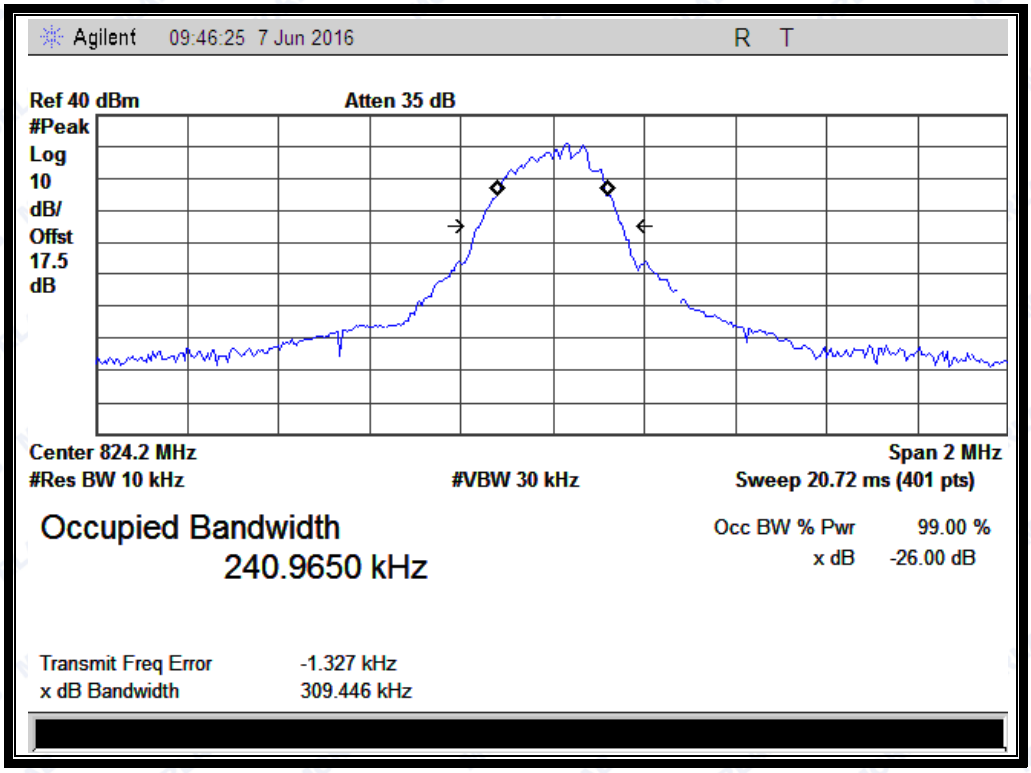
2.3.3 Test Verdict

Here the lowest, middle and highest channels are selected to perform testing to verify the 99% occupied bandwidth.

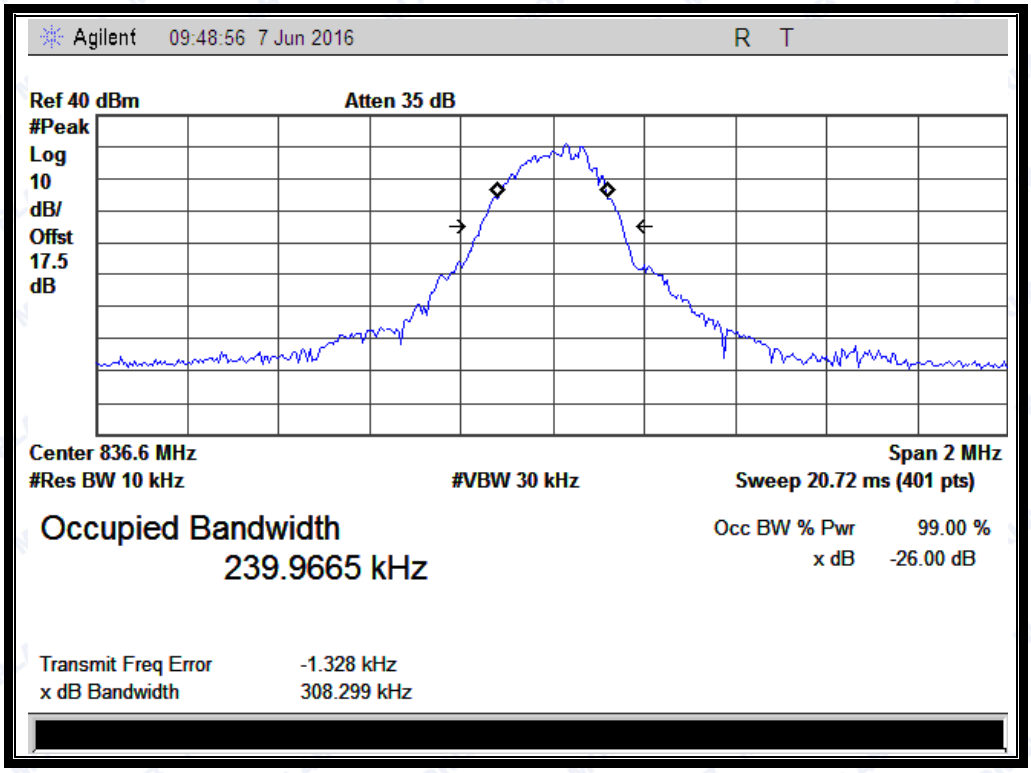
Test Verdict:

Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
GSM 850MHz	128	824.2	309.446 KHz	240.9650 KHz	Plot A1 to A3
	190	836.6	308.299 KHz	239.9665 KHz	
	251	848.8	312.239 KHz	243.3762 KHz	
GSM 1900MHz	512	1850.2	301.461 KHz	244.3206 KHz	Plot B1 to B3
	661	1880.0	308.103 KHz	243.5450 KHz	
	810	1909.8	305.758 KHz	246.2774 KHz	

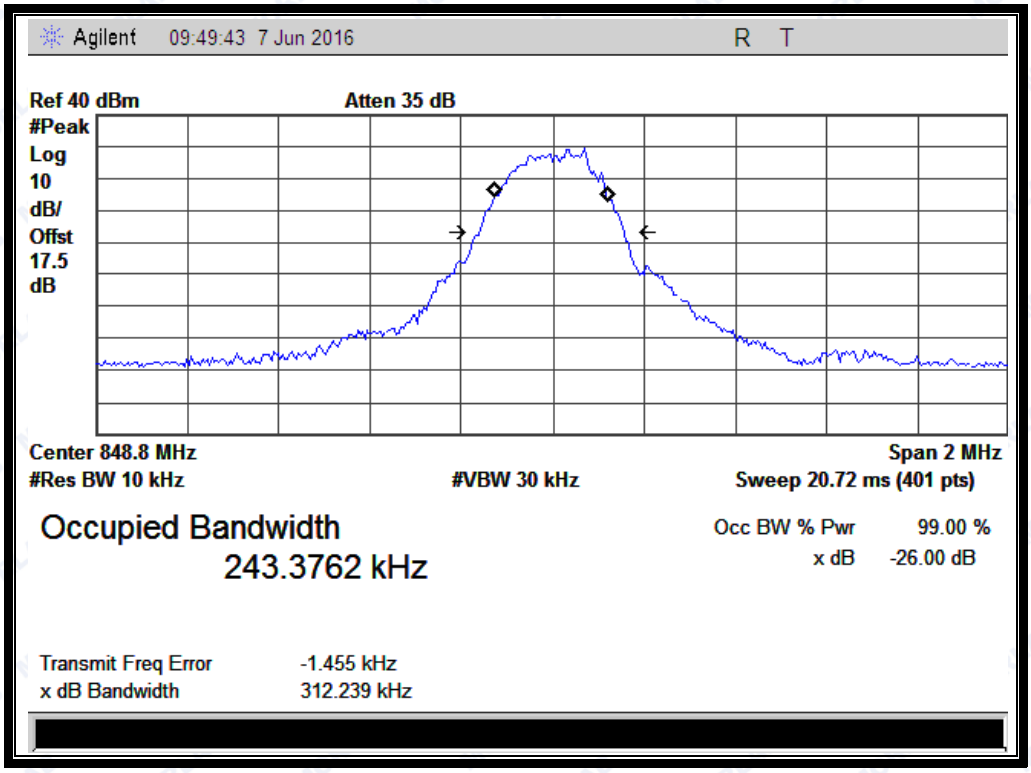
Test Plots:



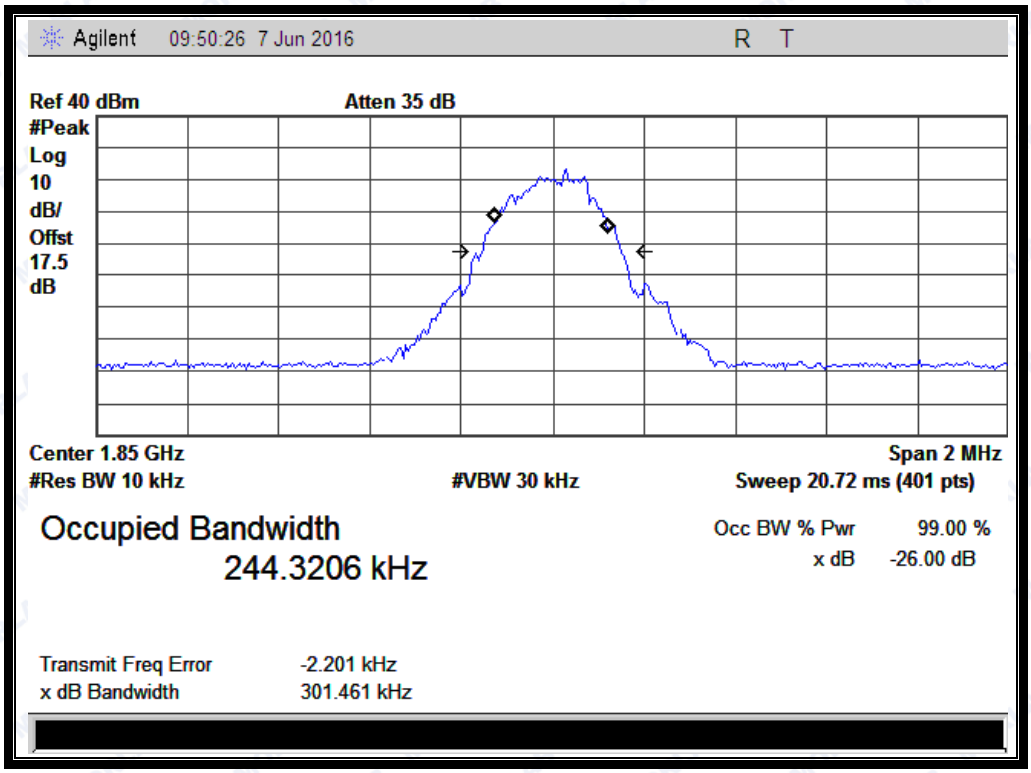
(Plot A1: GSM 850MHz Channel = 128)



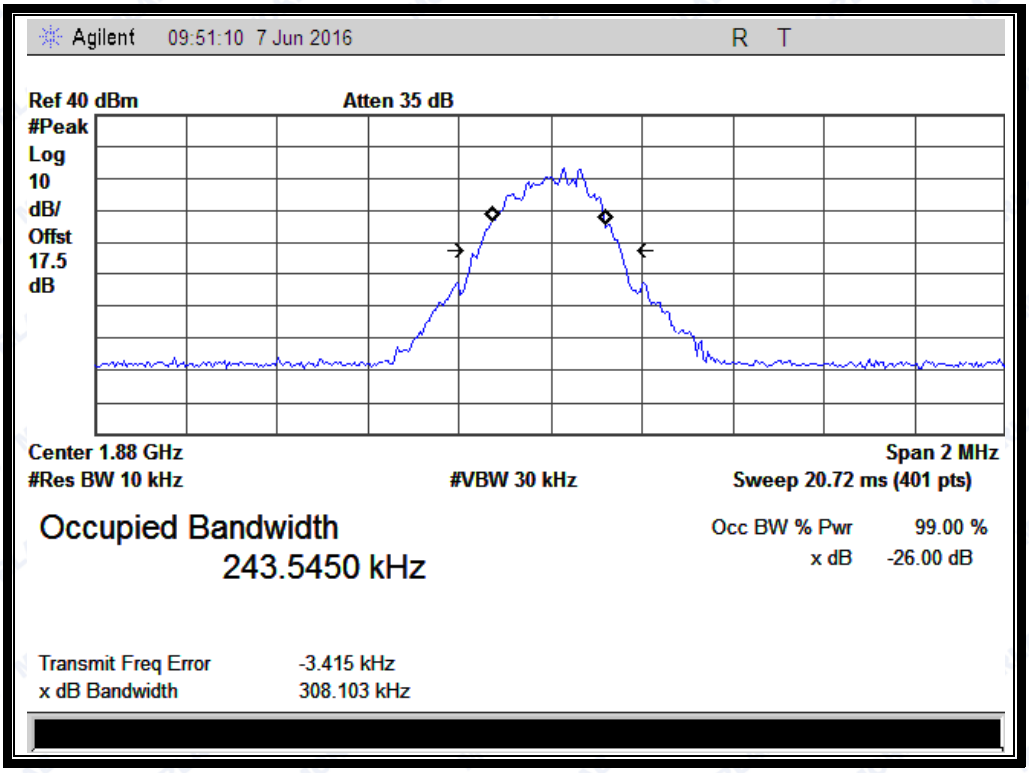
(Plot A2: GSM 850MHz Channel = 190)



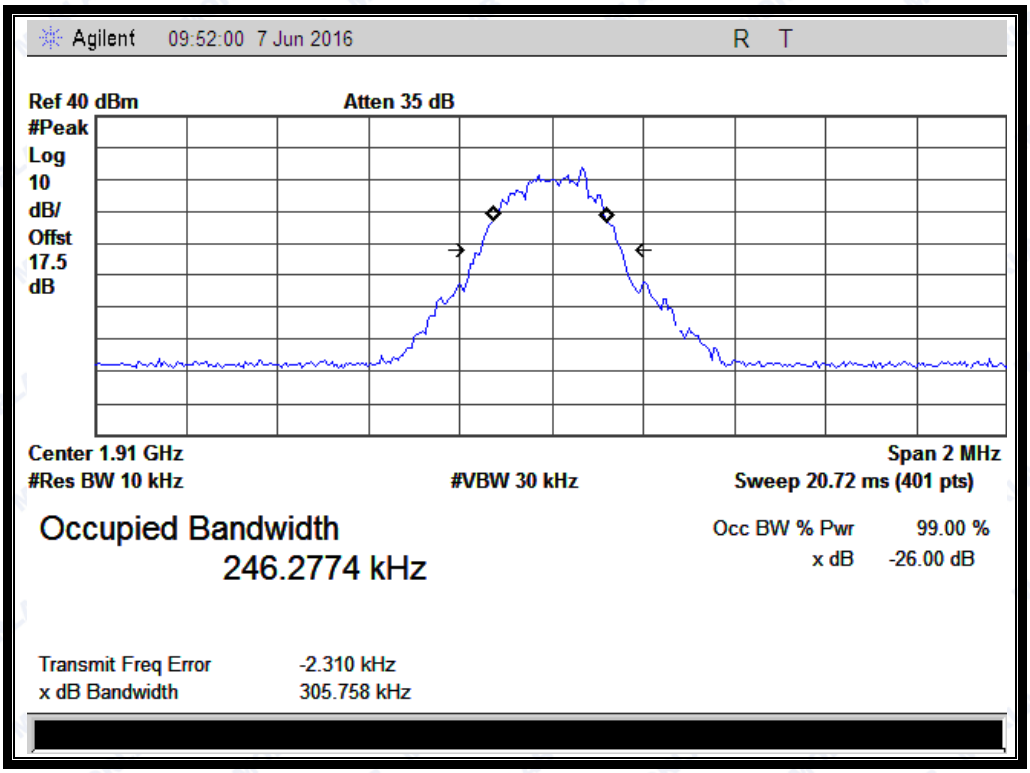
(Plot A3: GSM 850MHz Channel = 251)



(Plot B1: GSM1900MHz Channel = 512)



(Plot B2: GSM1900MHz Channel = 661)



(Plot B3: GSM 1900MHz Channel = 810)

2.4 Frequency Stability

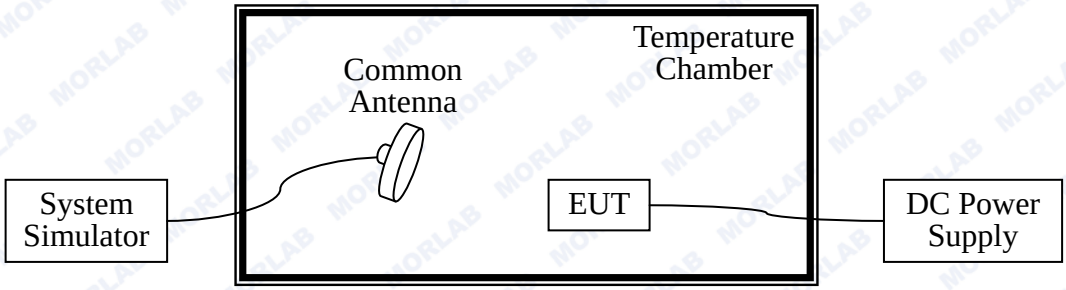
2.4.1 Requirement

According to FCC section 22.355 and FCC section 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°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.

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.

Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2016.03.02	2017.03.01
DC Power Supply	Good Will	GPS -3030DD	EF920938	2016.03.02	2017.03.01
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2016.03.02	2017.03.01

2.4.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.2VDC and 3.45VDC, which are specified by the applicant; the normal temperature here used is 25°C. The frequency deviation limit of 850MHz band is ±2.5ppm, and 1900MHz is ±1ppm.

1. GSM 850MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 128 (824.2MHz)		Channel = 190 (836.6MHz)		Channel = 251 (848.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.80	-20	5.8	±2060.5	4.48	±2091.5	-6.48	±2122	PASS
	-10	-16.83		3.36		15.36		
	0	-12.32		3.44		-13.78		
	+10	1.83		7.56		26.95		
	+20	-7.66		0.58		28.36		
	+30	5.76		6.9		-7.77		
	+40	23.73		-5.42		26.95		
	+50	-16.33		-3.29		21.56		
	+60	-6.64		6.78		-6.41		
4.35	+25	-16.83		8.35		15.36		
3.40	+25	-12.32		10.58		-7.85		

2. GSM 1900MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
3.80	-20	-18.21	±1850.2	12.46	±1880.0	-13.41	±1909.8	PASS
	-10	15.31		22.25		0.26		
	0	-14.2		-14.09		24.98		
	+10	-19.84		-12.72		23.39		
	+20	-30.2		36.45		-11.82		
	+30	6.96		-7.07		25.98		
	+40	-20.64		-12.68		19.59		
	+50	17.48		15.65		-8		
	+60	11.13		22.79		13.6		
4.35	+25	29.34		-23.13		0.26		
3.40	+25	-23.96		12.26		25		

2.5 Conducted Out of Band Emissions

2.5.1 Requirement

According to FCC section 22.917(a) and FCC section 24.238(a) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

2.5.2 Test Description

See section 2.1.2 of this report.

2.5.3 Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

1. Equipment List

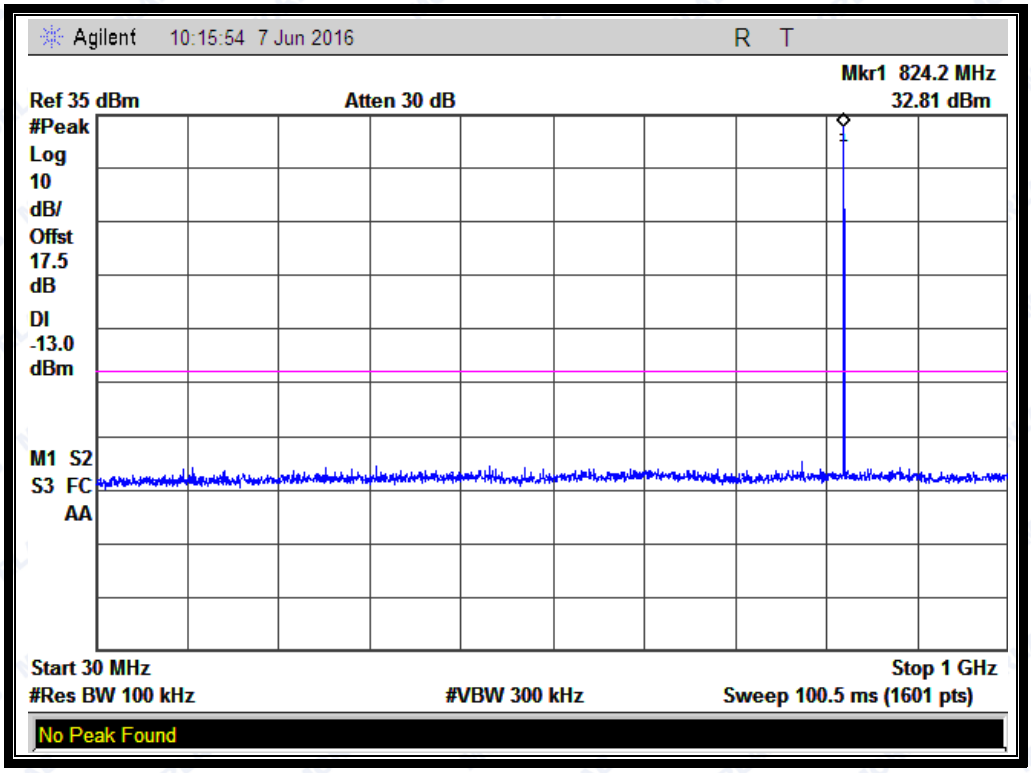
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2016.03.02	2017.03.01
Spectrum Analyzer	Agilent	E7405A	US44210471	2016.03.02	2017.03.01
Power Meter	Agilent	E4418B	GB43318055	2016.03.02	2017.03.01
Power Sensor	Agilent	8482A	MY41091706	2016.03.02	2017.03.01
Power Splitter	Weinschel	1506A	NW521	2016.03.02	2017.03.01
Attenuator 1	Resnet	20dB	(n.a.)	2016.03.02	2017.03.01
Attenuator 2	Resnet	3dB	(n.a.)	2016.03.02	2017.03.01

2. Test Verdict:

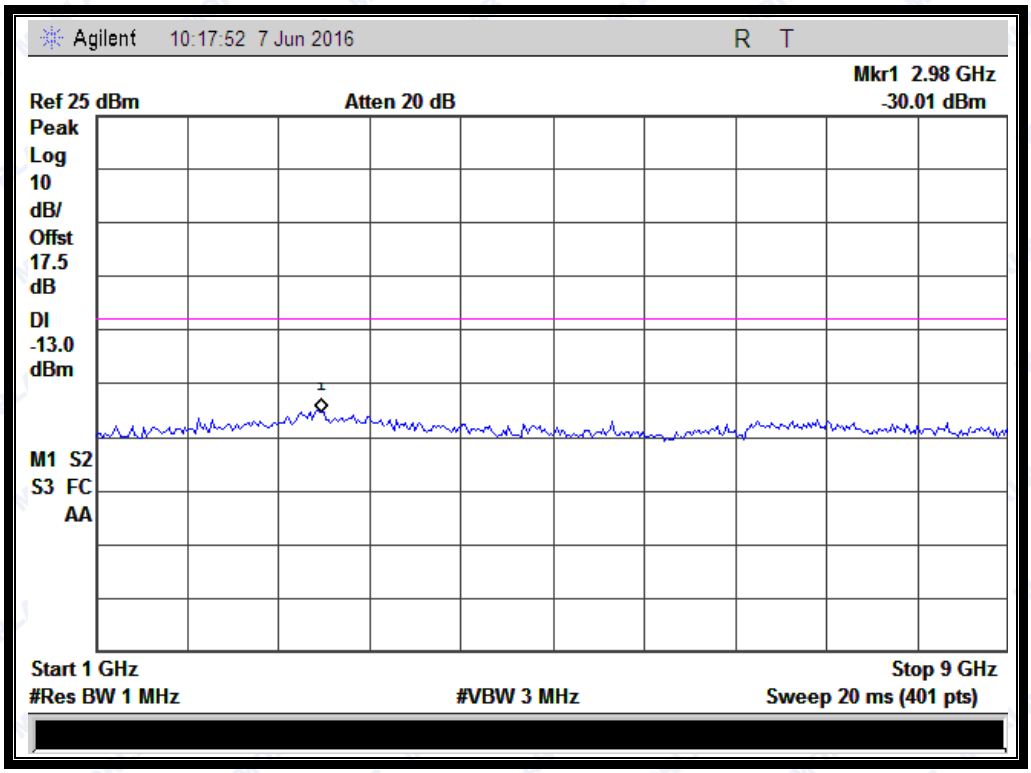
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-30.01	Plot A1 to A1.1	-13	PASS
	190	836.6	-31.06	Plot A2 to A2.1		PASS
	251	848.8	-30.31	Plot A3 to A3.1		PASS
GSM 1900MHz	512	1850.2	-20.59	Plot B1 to B1.1	-13	PASS
	661	1880.0	-19.60	Plot B2 to B2.1		PASS
	810	1909.8	-21.03	Plot B3 to B3.1		PASS

Test Plots for the Whole Measurement Frequency Range:

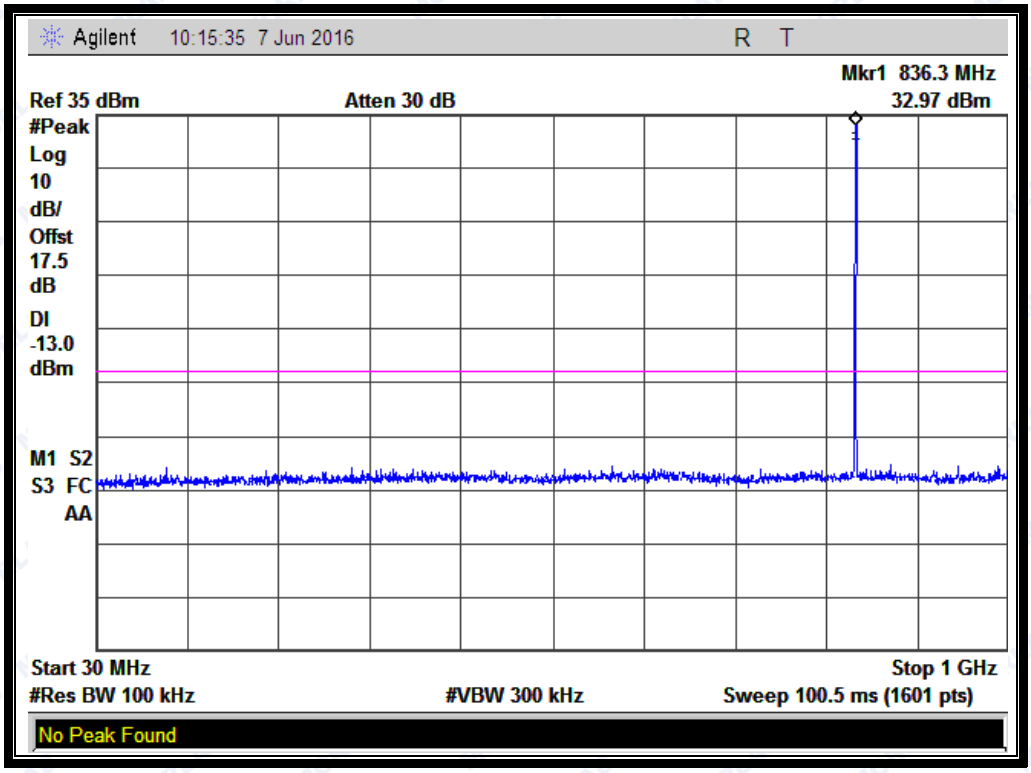
Note: the power of the EUT transmitting frequency should be ignored.



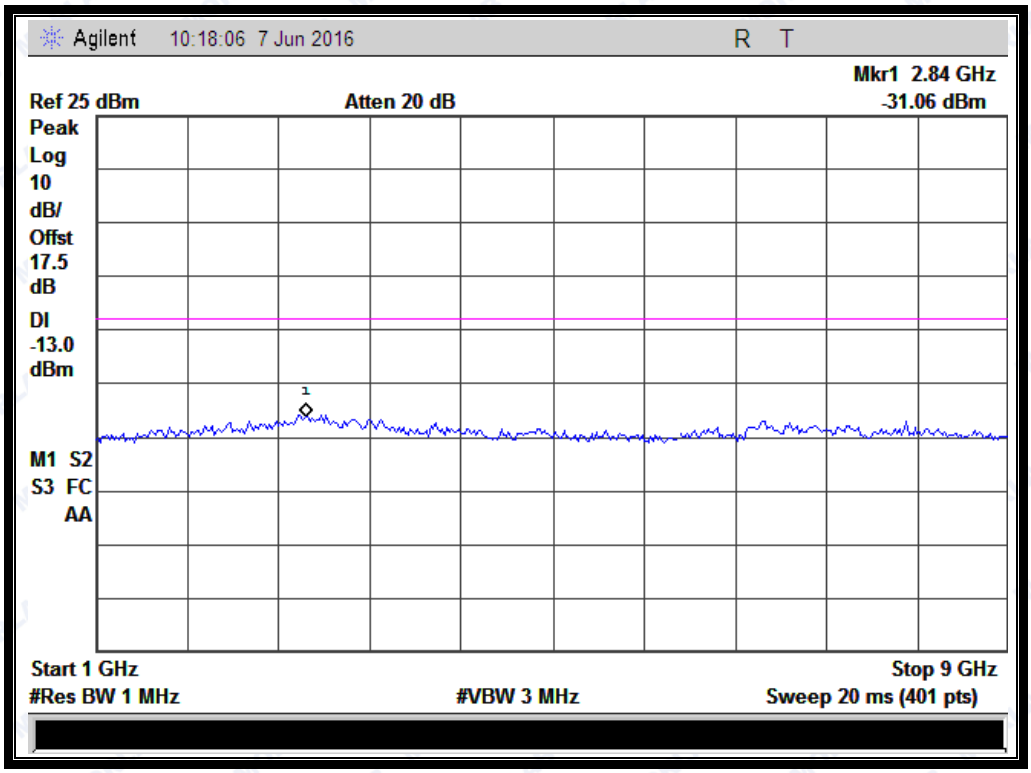
(Plot A1: GSM 850MHz Channel = 128, 30MHz to 1GHz)



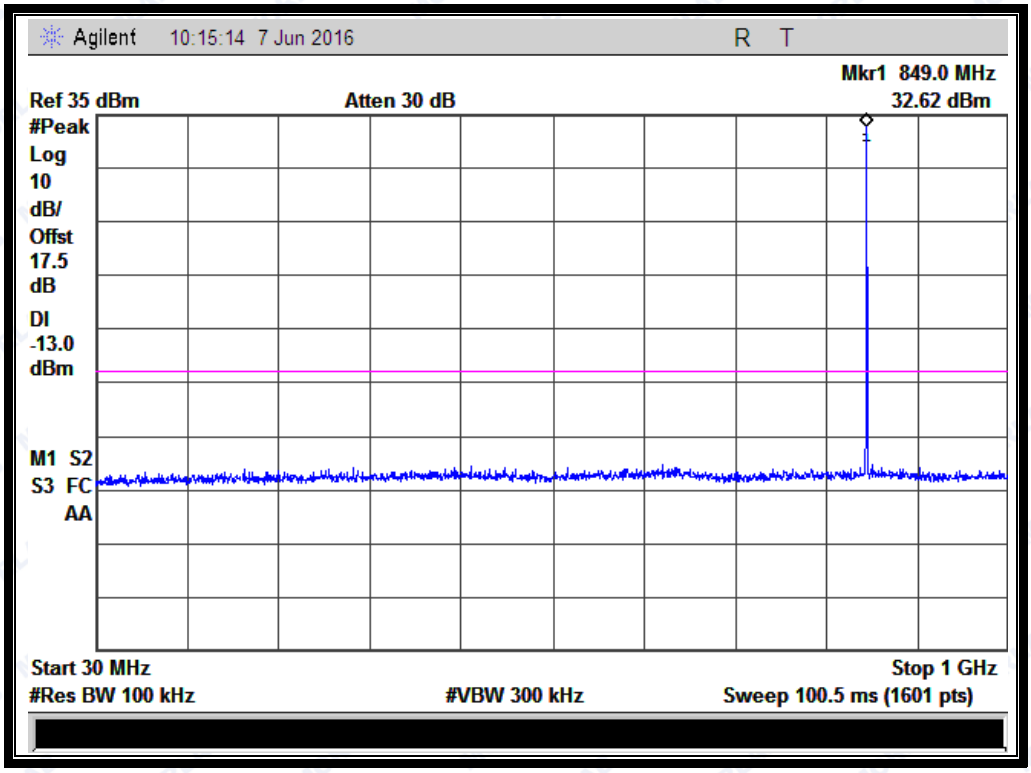
(Plot A1.1: GSM 850MHz Channel = 128, 1GHz to 9GHz)



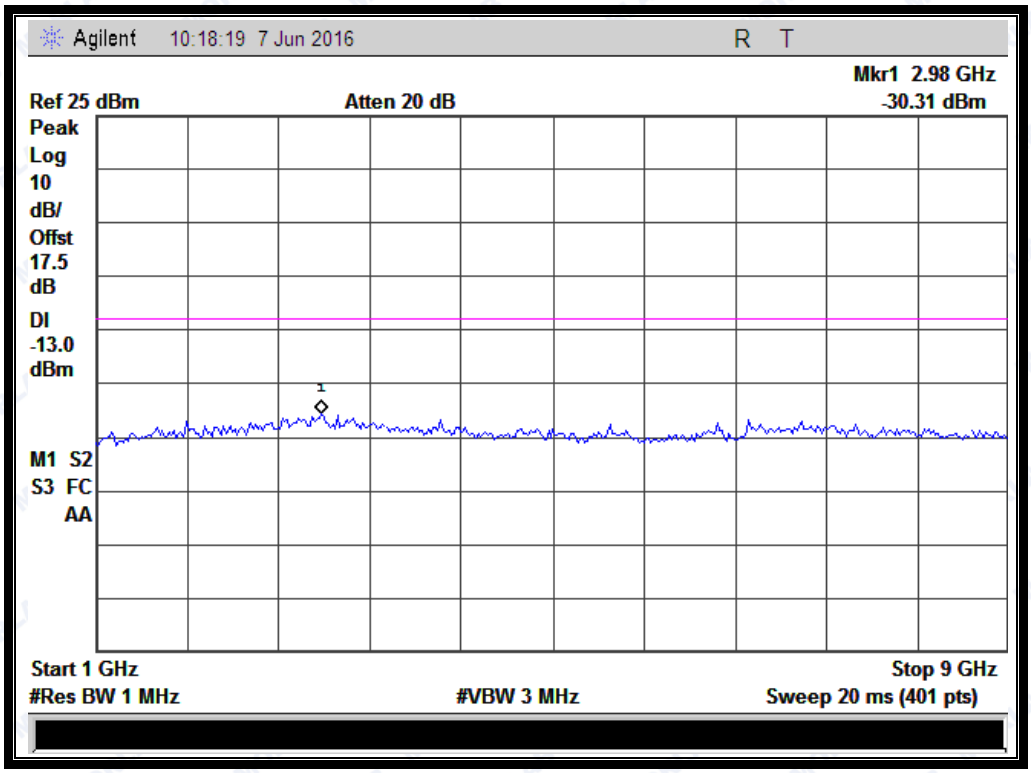
(Plot A2: GSM 850MHz Channel = 190, 30MHz to 1GHz)



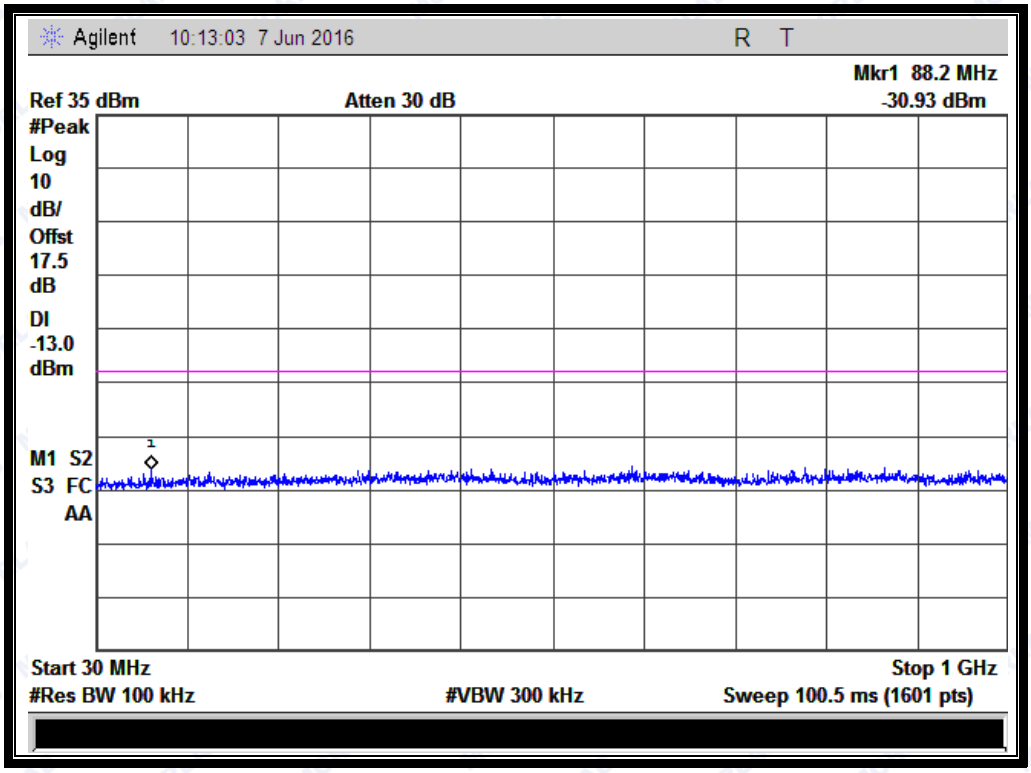
(Plot A2.1: GSM 850MHz Channel = 190, 1GHz to 9GHz)



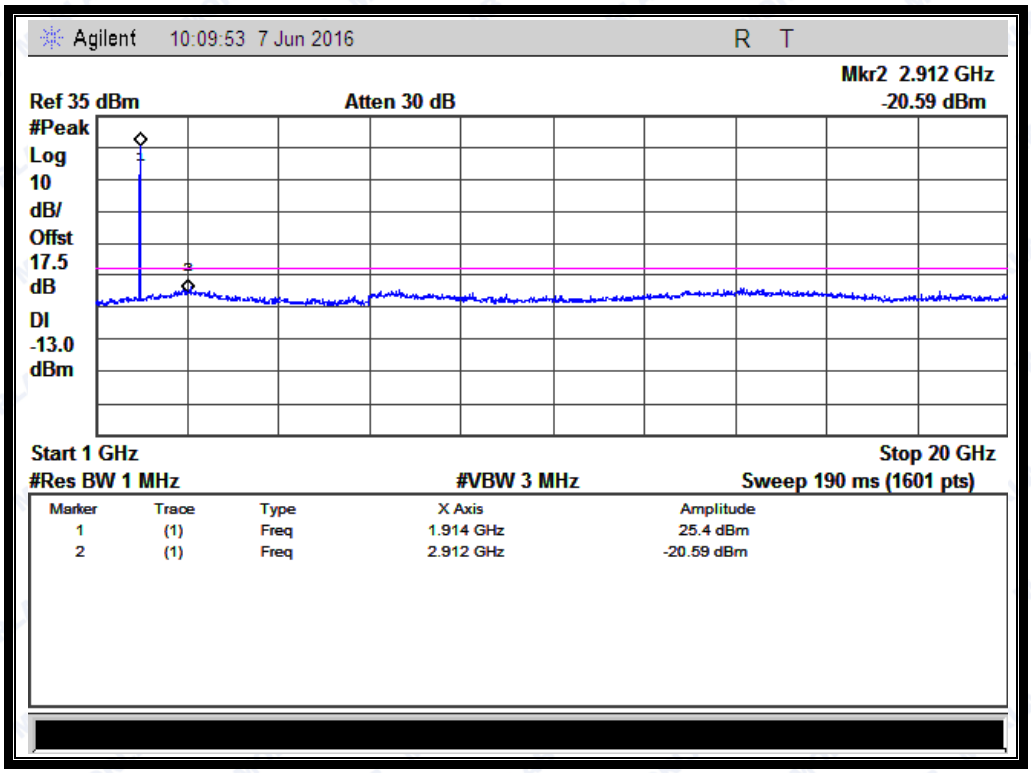
(Plot A3: GSM 850MHz Channel = 251, 30MHz to 1GHz)



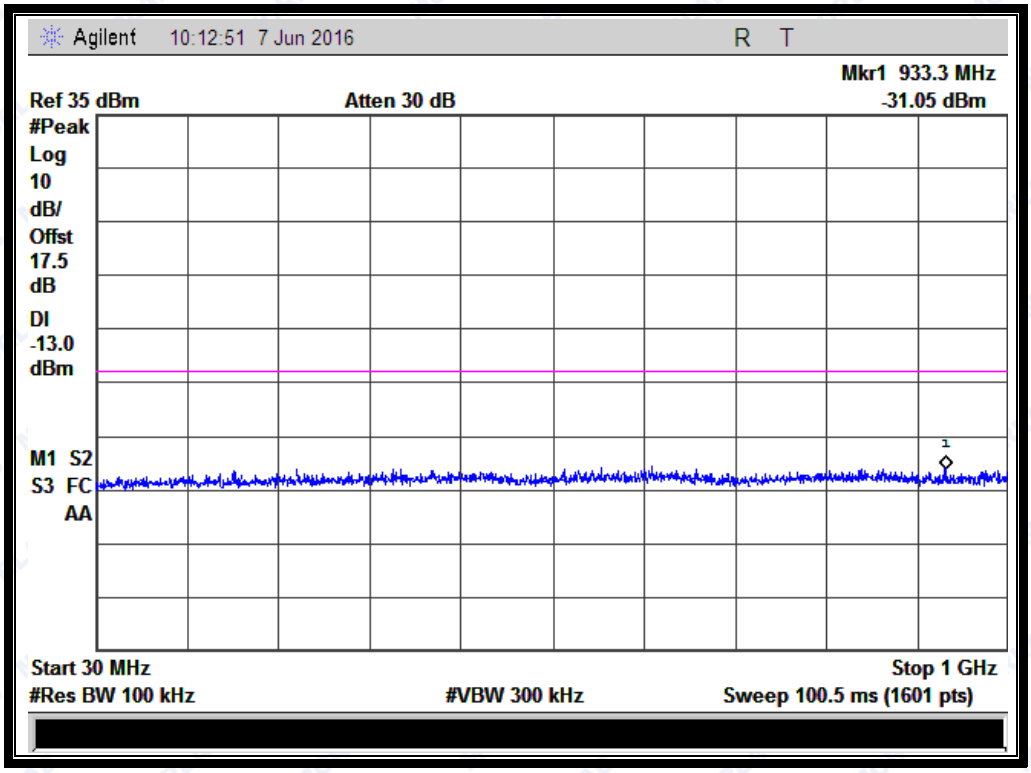
(Plot A3.1: GSM 850MHz Channel = 251, 1GHz to 9GHz)



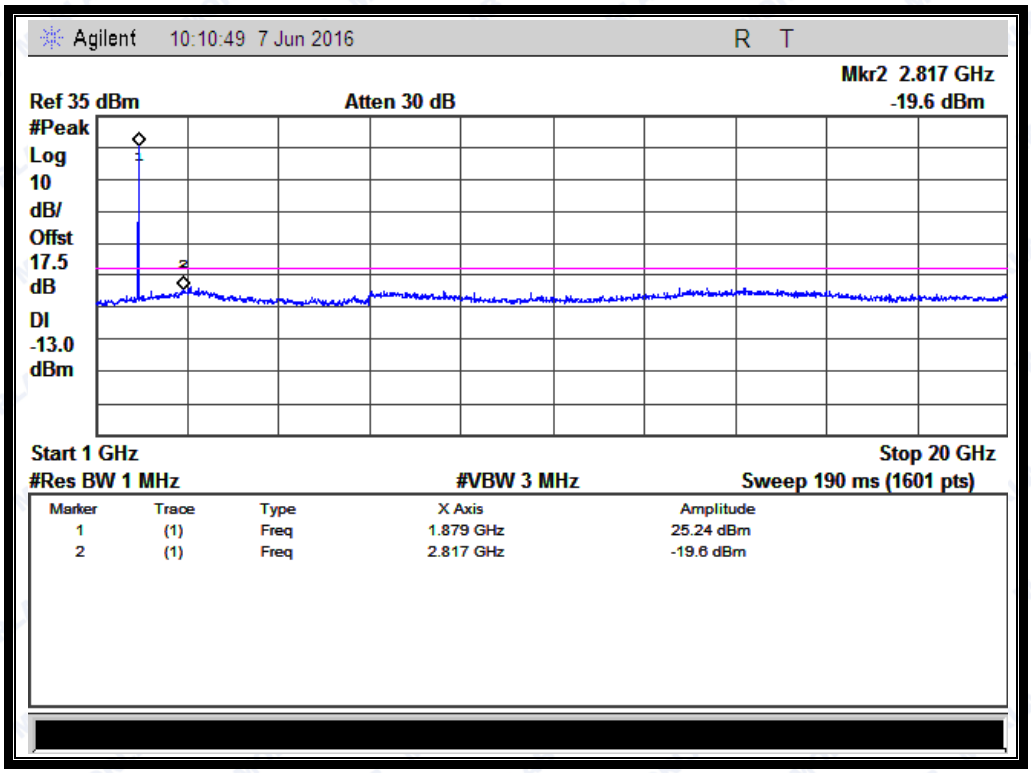
(Plot B1: GSM 1900MHz Channel = 512, 30MHz to 1GHz)



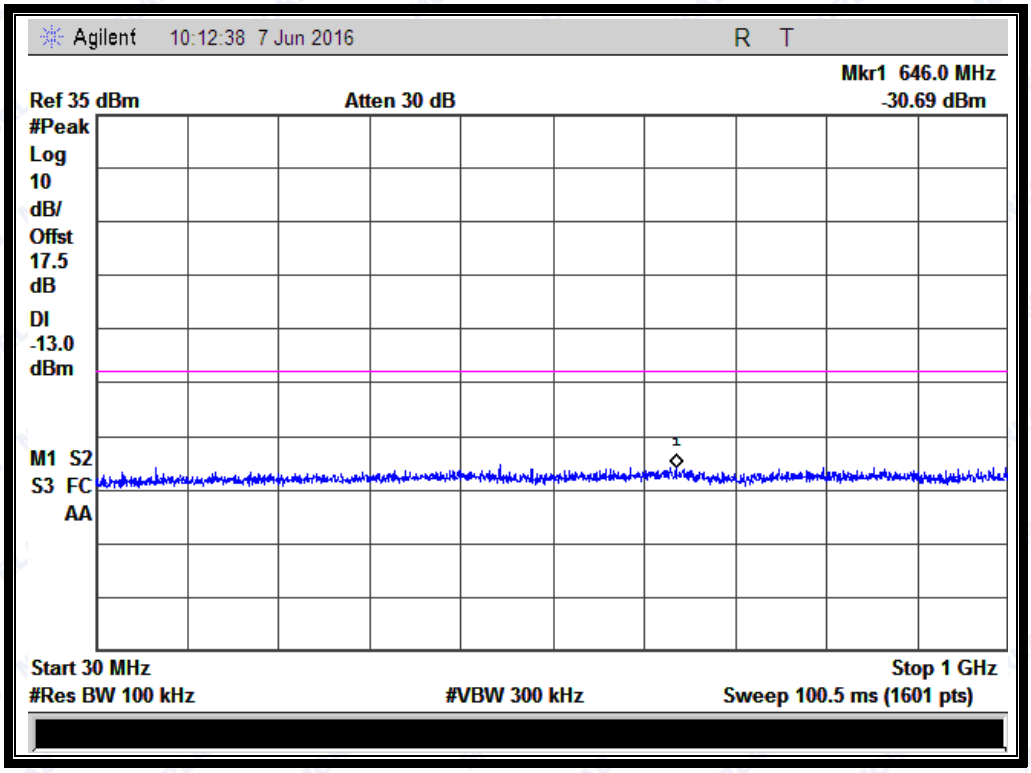
(Plot B1.1: GSM 1900MHz Channel = 512, 1GHz to 20GHz)



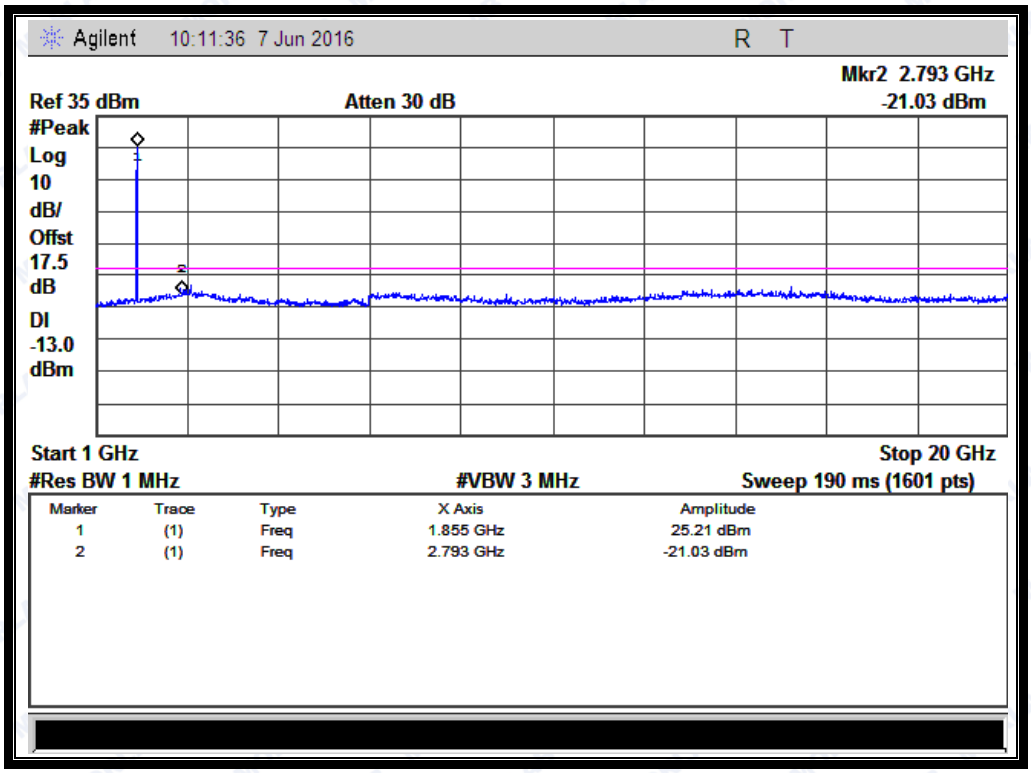
(Plot B2: GSM 1900MHz Channel = 661, 30MHz to 1GHz)



(Plot B2.1: GSM 1900MHz Channel = 661, 1GHz to 20GHz)



(Plot B3: GSM 1900MHz Channel = 810, 30MHz to 1GHz)



(Plot B3.1: GSM 1900MHz Channel = 810, 1GHz to 20GHz)

2.6 Band Edge

2.6.1 Requirement

According to FCC section 22.917(b) and FCC section 24.238(b) 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

See section 2.1.2 of this report.

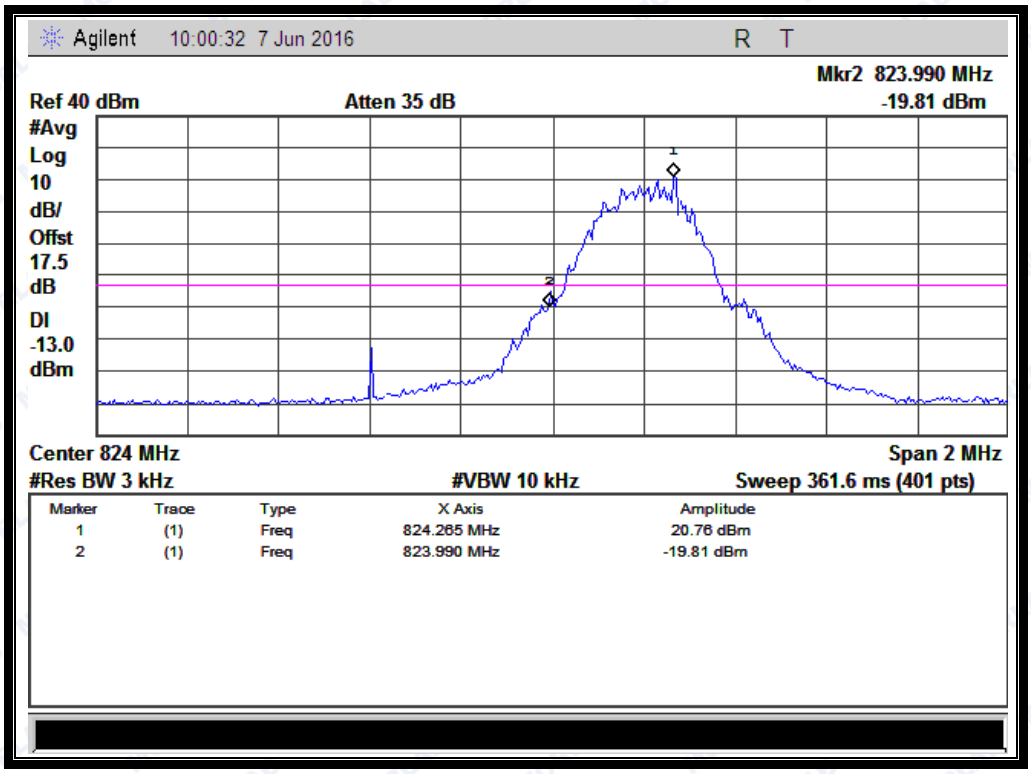
2.6.3 Test Result

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

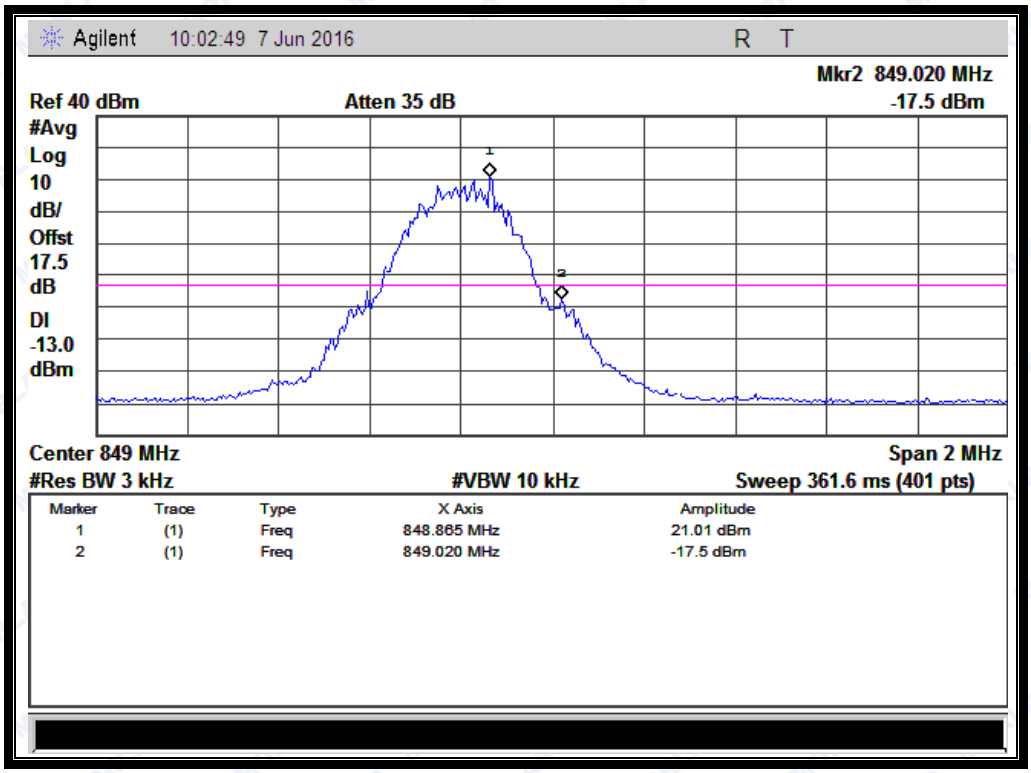
Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-19.81	Plat A1	-13	PASS
	251	848.8	-17.50	Plot A2		PASS
GSM 1900MHz	512	1850.2	-26.12	Plat B1	-13	PASS
	810	1909.8	-27.76	Plot B2		PASS

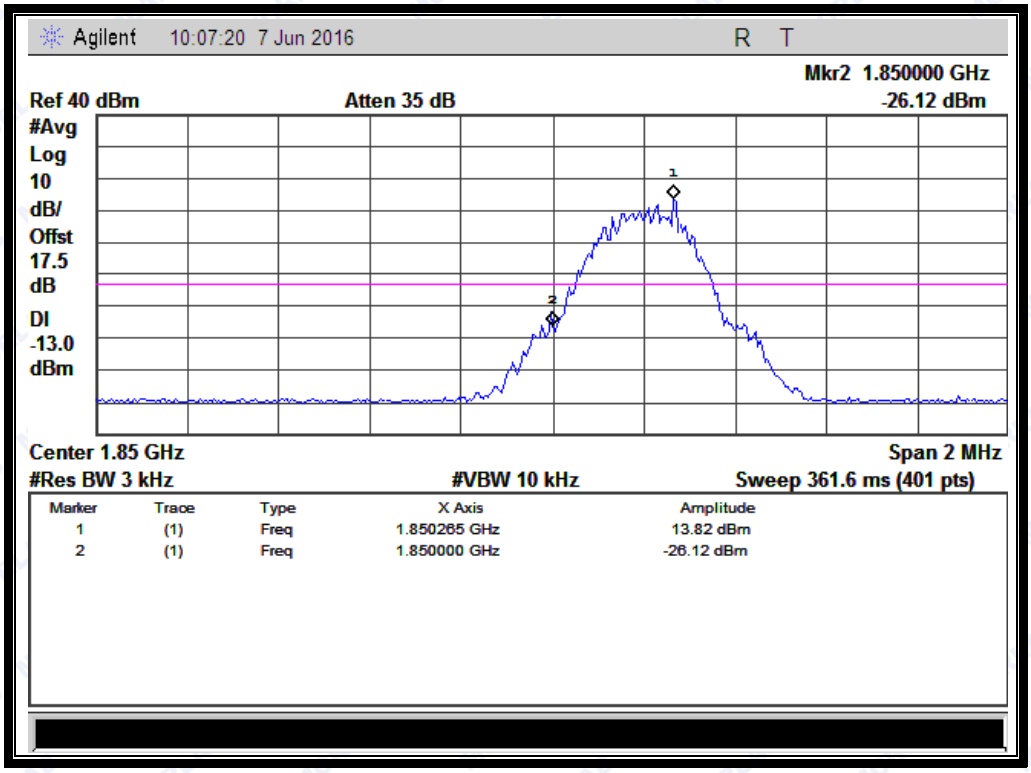
Test Plots:



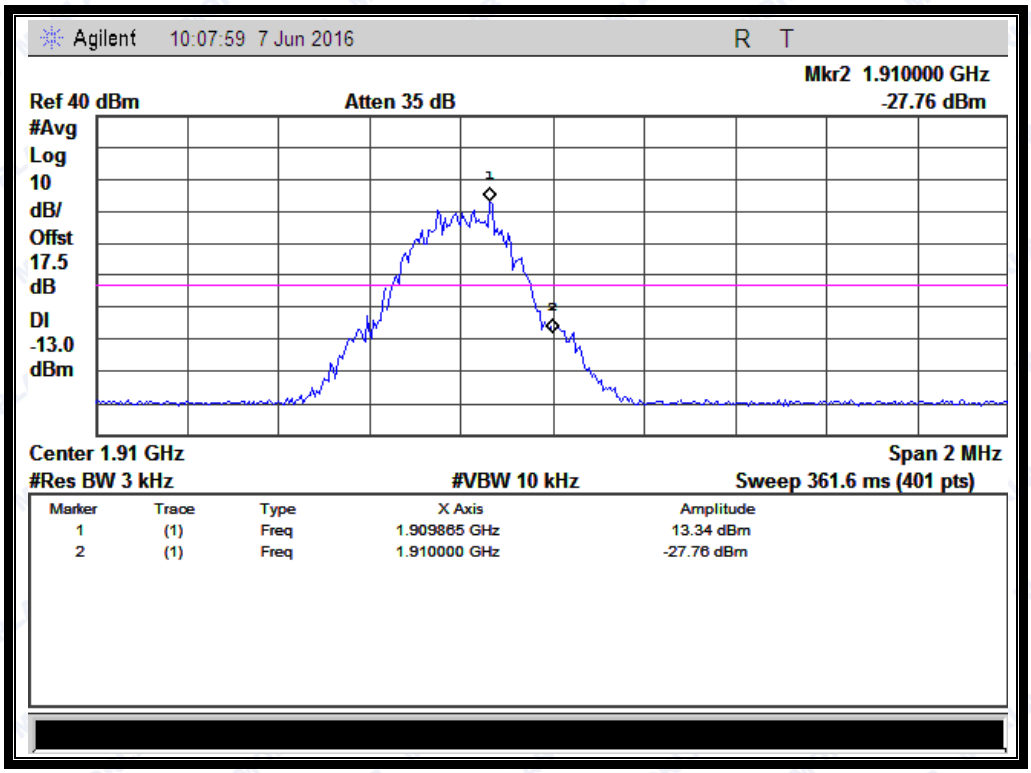
(Plot A1: GSM 850 Channel = 128)



(Plot A2: GSM 850 Channel = 251)



(Plot B1: GSM 1900 Channel = 512)



(Plot B2: GSM 1900 Channel = 810)

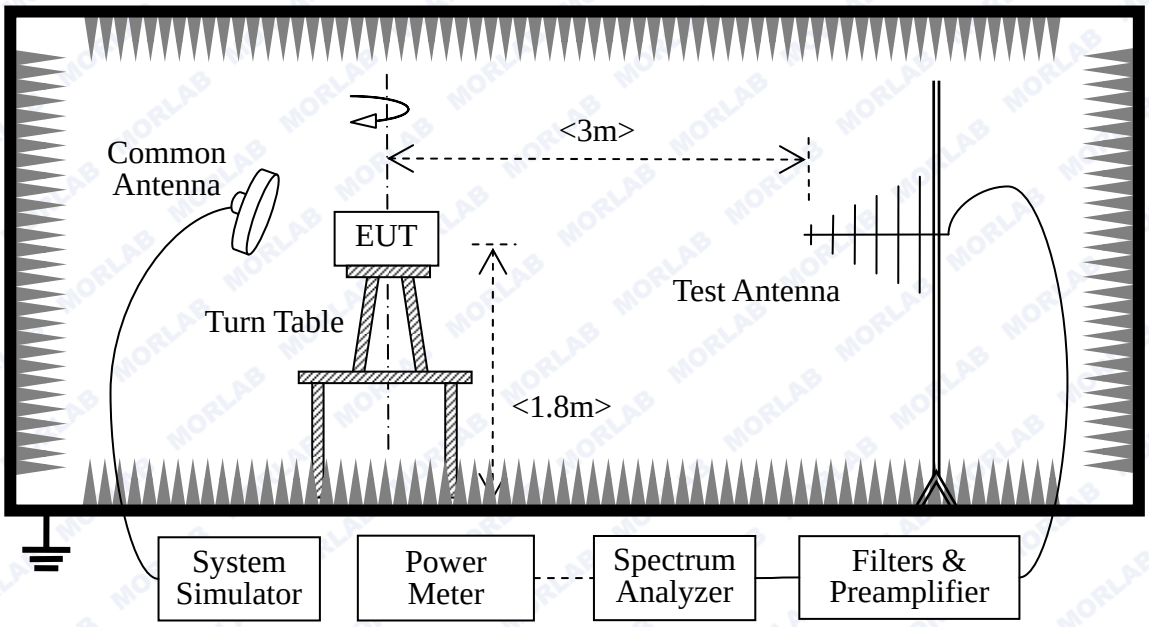
2.7 Transmitter Radiated Power (EIRP/ERP)

2.7.1 Requirement

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

2.7.2 Test Description

Test Setup:



The EUT, which is powered by the Battery charged with the AC Adapter, 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.

- GSM Maximum RF output power: GSM 850 33.03dBm, GSM 1900 29.35dBm. WCDMA 850 24.77 dBm, WCDMA 1900 24.44 dBm .Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

- Minimum RF power: GSM 850 2.6dBm, GSM 1900 1.1dBm, WCDMA 850 0.50dBm, WCDMA 1900 0.61dBm.

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

Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2016.03.02	2017.03.01
Spectrum Analyzer	Agilent	E7405A	US44210471	2016.03.02	2017.03.01
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2016.03.02	2017.03.01
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2016.03.02	2017.03.01
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2016.03.02	2017.03.01
Substitution Antenna	Schwarzbeck	BBHA 9120C	9120C-384	2016.03.02	2017.03.01
Pre-AMPs	lucix	S10M100L3802	S020180L3203	2016.03.02	2017.03.01
Notch Filter	COM-MW	ZBSF-C836.5-25-X	NA	2016.03.02	2017.03.01
Notch Filter	COM-MW	ZBSF-C1747.5-75-X2	NA	2016.03.02	2017.03.01
Notch Filter	COM-MW	ZBSF-C1880-60-X2	NA	2016.03.02	2017.03.01

2.7.3 Test Result

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.

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

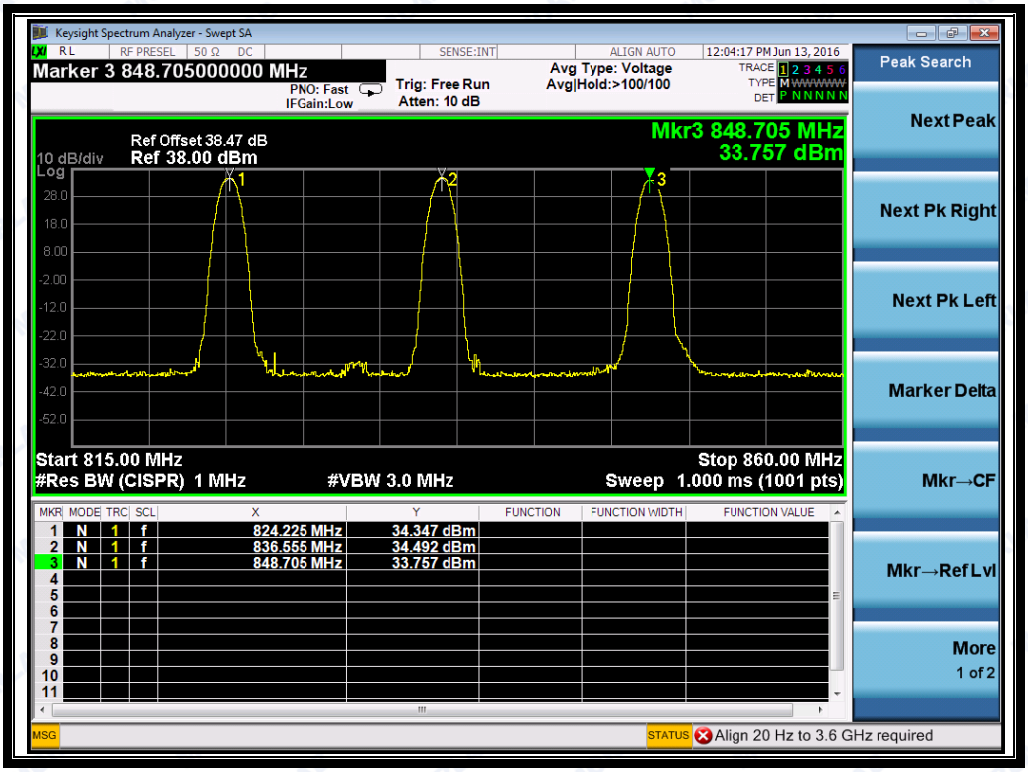
During the test, the data of A_{TOT} was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of A_{TOT}.

GSM Model Test Verdict:

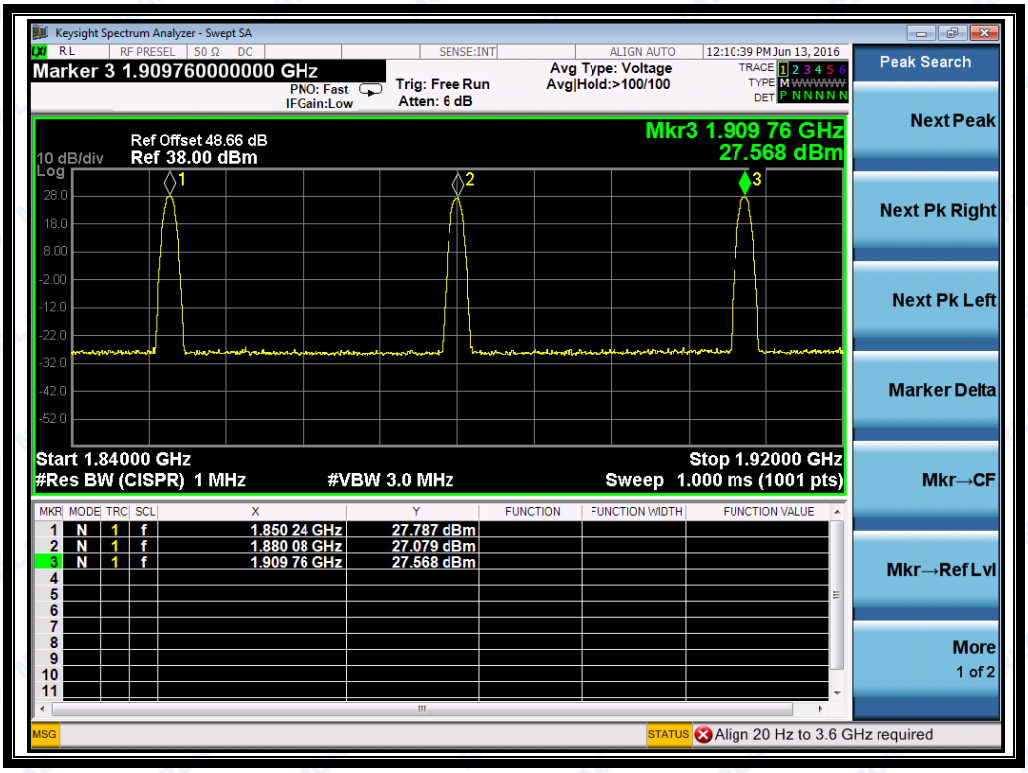
Band	Channel	Frequency (MHz)	PCL	Measured ERP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GSM 850MHz	128	824.20	5	34.35	2.723	Plot A	38.5	7	PASS
	190	836.60	5	34.49	2.812				PASS
	251	848.80	5	33.76	2.377				PASS

Band	Channel	Frequency (MHz)	PCL	Measured EIRP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GSM 1900MHz	512	1850.2	0	27.79	0.601	Plot D	33	2	PASS
	661	1880.0	0	27.08	0.511				PASS
	810	1909.8	0	27.57	0572				PASS

Test Plots:



(Plot A: GSM 850MHz Channel = 128, 190, 251)



(Plot D: GSM 1900MHz Channel = 512, 661, 810)

2.8 Radiated Out of Band Emissions

2.8.1 Requirement

According to FCC section 22.917(a) and section 24.238(a) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

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

2.8.2 Test Description

See section 2.7.2 of this report.

Equipment List:

Description	Manufacturer	Model	Serial No.	Cal.Date	Cal.Due
System Simulator	Agilent	E5515C	GB43130131	2016.03.02	2017.03.01
Spectrum Analyzer	Agilent	E7405A	US44210471	2016.03.02	2017.03.01
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2016.03.02	2017.03.01
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2016.03.02	2017.03.01
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2016.03.02	2017.03.01
Substitution Antenna	Schwarzbeck	BBHA 9120C	9120C-384	2016.03.02	2017.03.01
Pre-AMPs	lucix	S10M100L3802	S020180L3203	2016.03.02	2017.03.01
Notch Filter	COM-MW	ZBSF-C836.5-25-X	NA	2016.03.02	2017.03.01
Notch Filter	COM-MW	ZBSF-C1747.5-75-X2	NA	2016.03.02	2017.03.01
Notch Filter	COM-MW	ZBSF-C1880-60-X2	NA	2016.03.02	2017.03.01

Note: when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

2.8.3 Test 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.

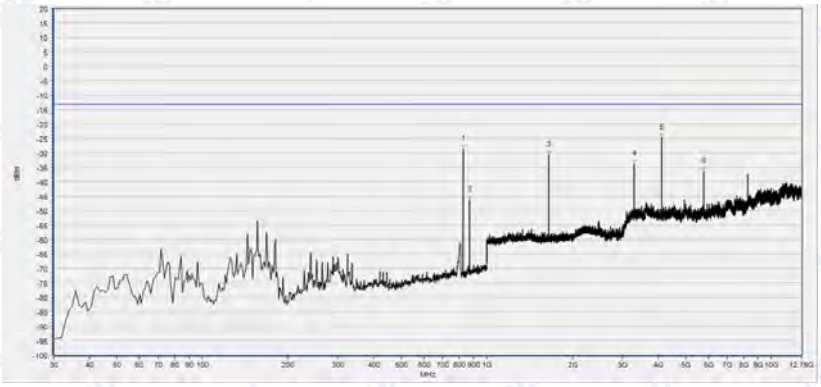
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
GSM 850MHz	128	824.2	< -25	< -25	Plot A1/A2	-13	PASS
	190	836.6	< -25	< -25	Plot A3/A4		PASS
	251	848.8	< -25	< -25	Plot A5/A6		PASS
GSM 1900MHz	512	1850.2	< -25	< -25	Plot B1/B2	-13	PASS
	661	1880.0	< -25	< -25	Plot B3/B4		PASS
	810	1909.8	< -25	< -25	Plot B5/B6		PASS

2. Test Plots for the Whole Measurement Frequency Range:

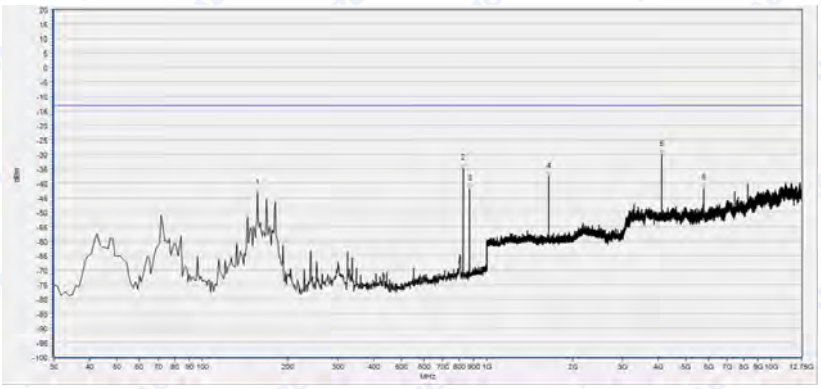
Note1: the power of the EUT transmitting frequency should be ignored.

Note2: 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.



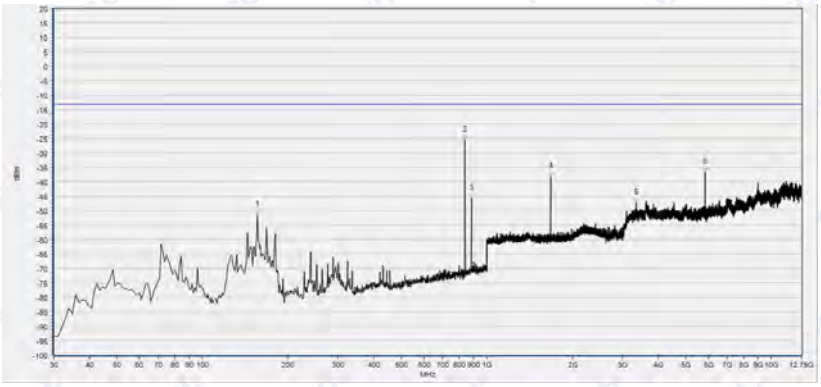
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	824.430	-28.62	-13.00	Horizontal	PASS
2	869.050	-46.23	-13.00	Horizontal	PASS
3	1649.220	-30.80	-13.00	Horizontal	PASS
4	3297.709	-33.82	-13.00	Horizontal	PASS
5	4120.931	-24.77	-13.00	Horizontal	PASS
6	5771.067	-36.35	-13.00	Horizontal	PASS

(Plot A1: GSM 850MHz Channel = 128, Test Antenna Horizontal)



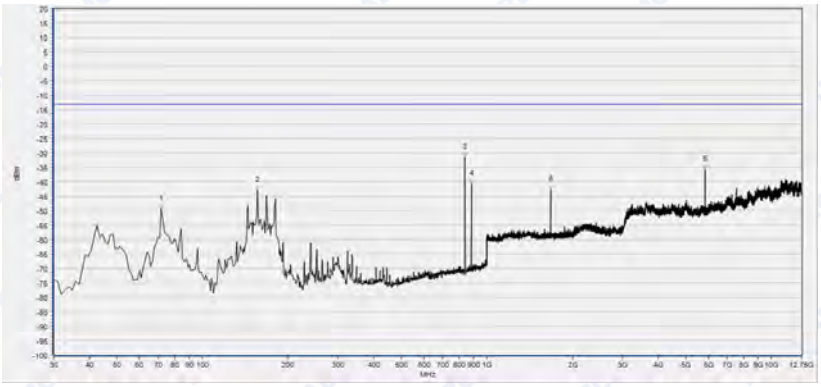
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	156.100	-43.28	-13.00	Vertical	PASS
2	824.430	-34.77	-13.00	Vertical	PASS
3	869.050	-41.87	-13.00	Vertical	PASS
4	1648.579	-37.59	-13.00	Vertical	PASS
5	4120.931	-29.99	-13.00	Vertical	PASS
6	5771.067	-41.74	-13.00	Vertical	PASS

(Plot A2: GSM 850MHz Channel = 128, Test Antenna Vertical)



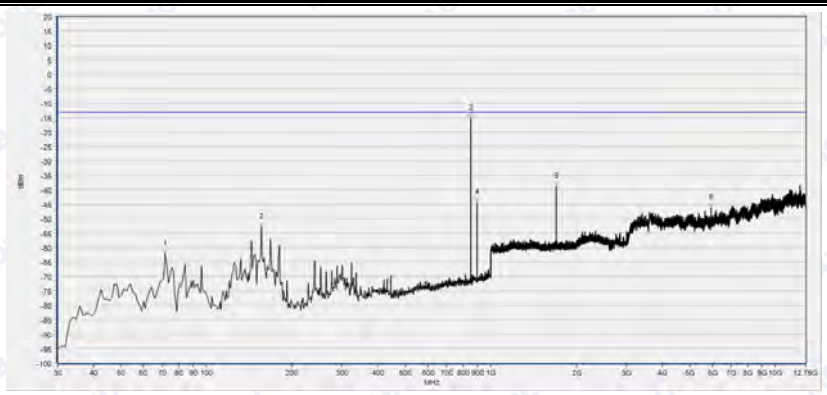
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	156.100	-51.42	-13.00	Horizontal	PASS
2	836.070	-25.38	-13.00	Horizontal	PASS
3	881.660	-45.75	-13.00	Horizontal	PASS
4	1673.549	-38.21	-13.00	Horizontal	PASS
5	3347.545	-47.10	-13.00	Horizontal	PASS
6	5857.820	-36.73	-13.00	Horizontal	PASS

(Plot A3: GSM850MHz Channel = 190, Test Antenna Horizontal)



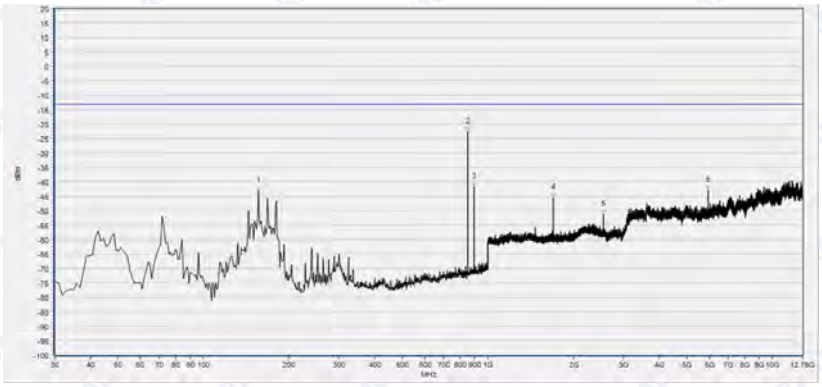
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	71.710	-49.35	-13.00	Vertical	PASS
2	156.100	-42.95	-13.00	Vertical	PASS
3	837.040	-31.39	-13.00	Vertical	PASS
4	881.660	-40.81	-13.00	Vertical	PASS
5	1673.549	-42.55	-13.00	Vertical	PASS
6	5855.974	-35.68	-13.00	Vertical	PASS

(Plot A4: GSM 850MHz Channel = 190, Test Antenna Vertical)



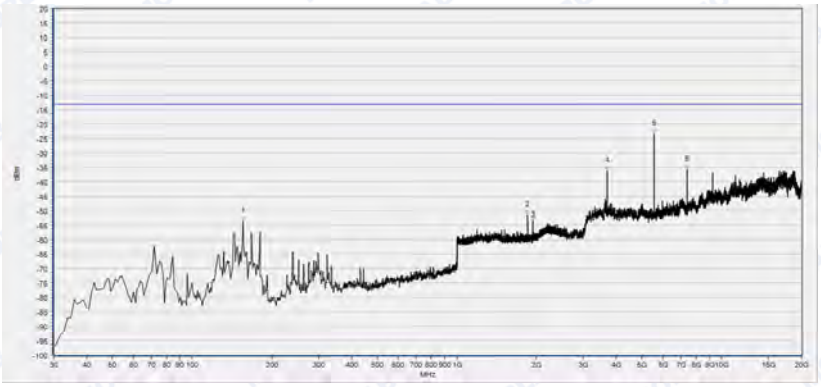
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	71.710	-62.21	-13.00	Horizontal	PASS
2	156.100	-52.75	-13.00	Horizontal	PASS
3	848.680	-15.31	-13.00	Horizontal	PASS
4	894.270	-44.17	-13.00	Horizontal	PASS
5	1697.879	-38.93	-13.00	Horizontal	PASS
6	5942.726	-46.28	-13.00	Horizontal	PASS

(Plot A5: GSM 850MHz Channel = 251, Test Antenna Horizontal)



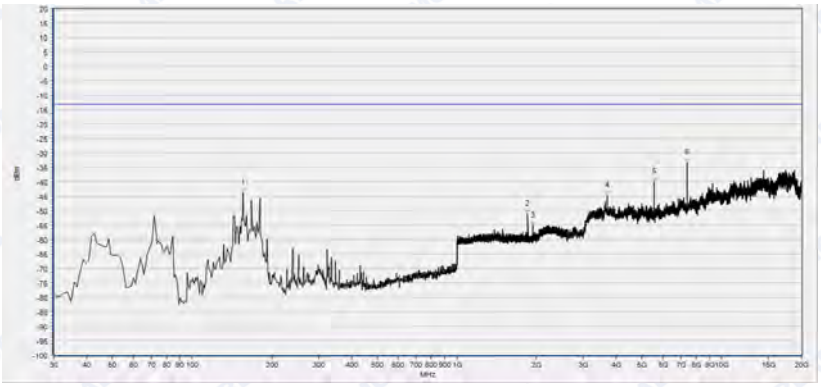
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	156.100	-43.14	-13.00	Vertical	PASS
2	848.680	-22.64	-13.00	Vertical	PASS
3	894.270	-41.60	-13.00	Vertical	PASS
4	1697.879	-45.59	-13.00	Vertical	PASS
5	2546.859	-51.09	-13.00	Vertical	PASS
6	5940.880	-42.94	-13.00	Vertical	PASS

(Plot A6: GSM 850MHz Channel = 251, Test Antenna Vertical)



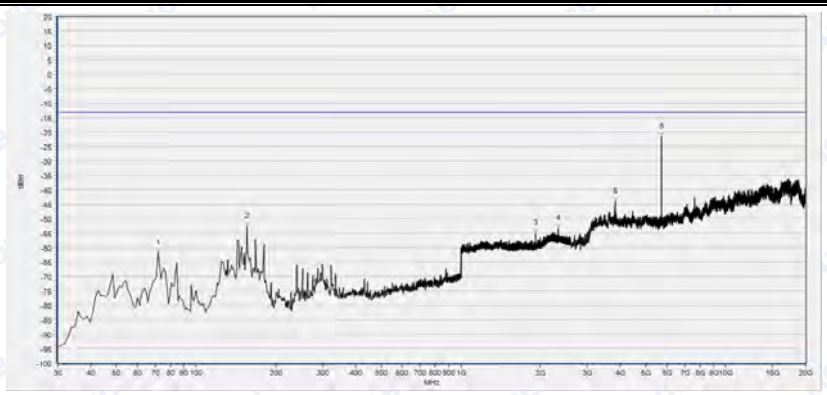
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	156.100	-53.53	-13.00	Horizontal	PASS
2	1850.900	-52.37	-13.00	Horizontal	PASS
3	1930.292	-54.25	-13.00	Horizontal	PASS
4	3701.146	-36.09	-13.00	Horizontal	PASS
5	5552.209	-23.31	-13.00	Horizontal	PASS
6	7400.109	-35.75	-13.00	Horizontal	PASS

(Plot B1: GSM 1900MHz Channel = 512, Test Antenna Horizontal)



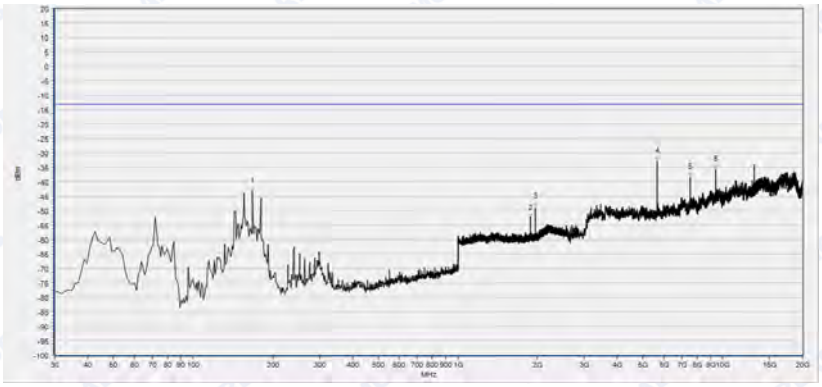
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	156.100	-43.91	-13.00	Vertical	PASS
2	1850.260	-51.13	-13.00	Vertical	PASS
3	1930.292	-55.26	-13.00	Vertical	PASS
4	3701.146	-44.76	-13.00	Vertical	PASS
5	5552.209	-40.10	-13.00	Vertical	PASS
6	7400.109	-33.37	-13.00	Vertical	PASS

(Plot B2: GSM 1900MHz Channel = 512, Test Antenna Vertical)



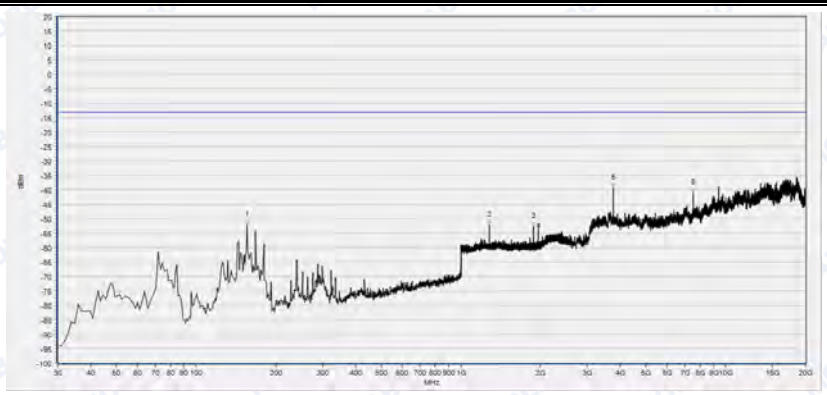
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	71.710	-61.86	-13.00	Horizontal	PASS
2	156.100	-52.72	-13.00	Horizontal	PASS
3	1910.444	-54.93	-13.00	Horizontal	PASS
4	2324.050	-53.34	-13.00	Horizontal	PASS
5	3821.386	-44.02	-13.00	Horizontal	PASS
6	5729.405	-21.70	-13.00	Horizontal	PASS

(Plot B3: GSM 1900MHz Channel = 661, Test Antenna Horizontal)



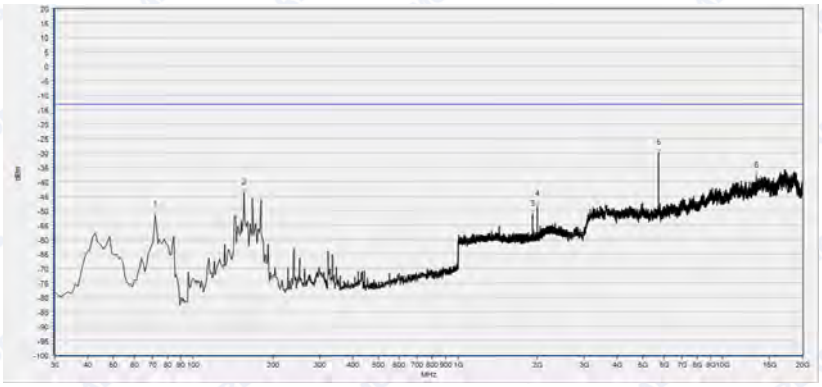
Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	167.740	-43.28	-13.00	Vertical	PASS
2	1879.072	-21.54	-13.00	Vertical	PASS
3	1960.384	-49.15	-13.00	Vertical	PASS
4	5640.807	-32.89	-13.00	Vertical	PASS
5	7520.349	-38.37	-13.00	Vertical	PASS
6	9399.891	-35.60	-13.00	Vertical	PASS

(Plot B4: GSM 1900MHz Channel = 661, Test Antenna Vertical)



Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	156.100	-52.25	-13.00	Horizontal	PASS
2	1280.432	-52.24	-13.00	Horizontal	PASS
3	1880.352	-52.62	-13.00	Horizontal	PASS
4	1960.384	-53.05	-13.00	Horizontal	PASS
5	3761.266	-39.37	-13.00	Horizontal	PASS
6	7520.349	-40.91	-13.00	Horizontal	PASS

(Plot B5: GSM 1900MHz Channel = 810, Test Antenna Horizontal)



Num	Freq(MHz)	PK	limit PK	Antenna	Verdict
1	71.710	-51.48	-13.00	Vertical	PASS
2	156.100	-43.85	-13.00	Vertical	PASS
3	1908.523	-41.25	-13.00	Vertical	PASS
4	1990.476	-48.66	-13.00	Vertical	PASS
5	5729.405	-29.95	-13.00	Vertical	PASS
6	13370.977	-37.89	-13.00	Vertical	PASS

(Plot B6: GSM 1900MHz Channel = 810, Test Antenna Vertical)

***** END OF REPORT *****