

TEST REPORT

APPLICANT : BLU Products, Inc.

PRODUCT NAME **Smart Phone**

MODEL NAME : Studio X9 HD

BRAND NAME : BLU

FCC ID : YHLBLUSTX9HD

47 CFR Part 22 Subpart H STANDARD(S) 47 CFR Part 24 Subpart E

: 2019-11-28 RECEIPT DATE

TEST DATE : 2019-12-04 to 2019-12-10

ISSUE DATE : 2019-12-26

Edited by:

Approved by:

Peng Huarui (Supervisor)

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Change History				
Version Date Reason for change				
1.0	2019-12-26	First edition		



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

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

1.2. Equipment Under Test (EUT) Description

Product Name:	Smart Phone		
Serial No:	(N/A, marked #1 by test site)		
Hardware Version:	S2609D_MAIN_PCB_V1.0		
Software Version:	S2609D_BLU_S7_80_GO_	V0.3.2_S191112	
	GSM/GPRS Mode with GMS	SK Modulation	
	EDGE Mode with 8PSK Mod	dulation	
Modulation Type:	WCDMA Mode with QPSK N	Modulation	
	HSDPA Mode with QPSK M	odulation	
	HSUPA Mode with QPSK M	odulation	
	GSM 850MHz:		
	Tx: 824.20 - 848.80MHz		
	Rx: 869.20 - 893.80MHz		
	GSM 1900MHz:		
	Tx: 1850.20 - 1909.80MHz		
Operating Fraguency Banger	Rx: 1930.20 - 1989.80MHz		
Operating Frequency Range:	WCDMA Band V		
	Tx: 826.4 - 846.6MHz		
	Rx: 871.4 - 891.6MHz		
	WCDMA Band II		
	Tx: 1852.4 - 1907.6MHz		
	Rx: 1932.4 - 1987.6MHz		
Antenna Type:	Fixed Internal		
Antonno Coin:	GSM 850:	-3.50 dBi	
Antenna Gain:	GSM1900:	-2.00 dBi	



	WCDMA Band V:	-3.50 dBi	
	WCDMA Band II:	-2.00 dBi	
	Battery		
	Brand Name:	UTILITY	
	Model No.:	C795344200L	
	Serial No.:	(N/A, marked #1 by test site)	
	Capacity:	2000mAh	
	Rated Voltage:	3.80V	
Accessory Information:	Charge Limit:	4.35V	
	AC Adapter 1		
	Brand Name:	TIANYIN	
	Model No.:	US-WT-1000	
	Serial No.:	(N/A, marked #1 by test site)	
	Rated Input:	100-240V~50/60Hz 0.2A	
	Rated Output:	5V=1.0A	

- **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:** 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 4:** The transmitter (Tx) frequency arrangement of the WCDMA Band II used by the EUT can be represented with the formula F(n)=1852.4+0.2*(n-9262), 9262<=n<=9538; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).
- **Note 5:** All 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:

GPRS mode and EDGE mode for GSM 850;

GPRS mode and EDGE mode for GSM 1900;

WCDMA mode for WCDMA band V;

WCDMA mode for WCDMA band II:



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



1.3. Maximum ERP/EIRP and Emission Designator

System	Maximum ERP/EIRP (W)	Emission Designator
GSM850	0.582	247KGXW
EDGE850	0.568	251KG7W
GSM1900	0.692	251KGXW
EDGE1900	0.338	250KG7W
WCDMA Band V	0.053	4M16F9W
WCDMA Band II	0.121	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 24for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 2(10-1-12 Edition)	Frequency Allocations and Radio Treaty Matters;
'	47 Of ICT art 2(10-1-12 Edition)	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	Test Date	Test Engineer	Result	Method determination/ Remark
1	2.1046	Conducted RF Output Power	Dec04, 2019	Gao Mingzhou	PASS	No deviation
2	24.232(d)	Peak -Average Ratio	Dec05 - 09, 2019	Gao Mingzhou	PASS	No deviation
3	2.1049	99% Occupied Bandwidth	Dec05 - 09, 2019	Gao Mingzhou	PASS	No deviation
4	2.1055,22. 355, 24.235,	Frequency Stability	Dec05 - 09, 2019	Gao Mingzhou	PASS	No deviation
5	2.1051,22. 917(a),24. 238(a),	Conducted Out of Band Emissions	Dec05 - 09, 2019	Gao Mingzhou	PASS	No deviation
6	2.1051,22. 917(a),24. 238(a),	Band Edge	Dec05 - 09, 2019	Gao Mingzhou	PASS	No deviation
7	22.913(a), 24.232(a)	Transmitter Radiated Power (EIPR/ERP)	Dec10, 2019	PengXuewei	PASS	No deviation
8	2.1051,22. 917(a),24. 238(a)	Radiated Out of Band Emissions	Dec 10, 2019	PengXuewei	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 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 26.5dB contains two parts that cable loss 16.5dB and Attenuator 10dB.



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

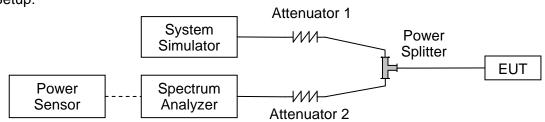
2.1. Conducted RF Output Power

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 EUTis 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 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.



2.1.3. Test Results

GSM850	Average Power (dBm)			
TX Channel	128	128 190 251		
Frequency (MHz)	824.2	836.6	848.8	
GSM 1 Tx slot	33.29	33.30	33.26	
GPRS 1 Tx slot	33.27	33.28	33.25	
GPRS 2 Tx slots	32.27	32.29	32.34	
GPRS 3 Tx slots	30.45	30.44	30.48	
GPRS 4 Tx slots	27.41	27.44	27.39	
EDGE 1 Tx slot	33.18	33.19	33.17	
EDGE 2 Tx slots	32.17	32.19	32.25	
EDGE 3 Tx slots	30.35	30.39	30.41	
EDGE 4 Tx slots	27.38	27.46	27.50	

GSM1900	Average Power (dBm)		
TX Channel	512	661	810
Frequency (MHz)	1850.2	1880	1909.8
GSM 1 Tx slot	30.40	30.37	30.26
GPRS 1 Tx slot	30.39	30.35	30.24
GPRS 2 Tx slots	29.55	29.51	29.43
GPRS 3 Tx slots	27.85	27.80	27.65
GPRS 4 Tx slots	26.92	26.89	26.78
EDGE 1 Tx slot	27.29	27.25	27.11
EDGE 2 Tx slots	27.20	27.15	27.03
EDGE 3 Tx slots	27.10	27.03	26.86
EDGE 4 Tx slots	26.94	26.88	26.75

WCDMA Band V	Average Power (dBm)		
TX Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2Kbps	22.86	22.63	22.70
HSDPA Subtest-1	21.23	21.13	21.21
HSDPA Subtest-2	21.2	21.11	21.23
HSDPA Subtest-3	20.73	20.64	20.76
HSDPA Subtest-4	20.71	20.63	20.75
HSUPA Subtest-1	19.76	19.71	19.73
HSUPA Subtest-2	19.25	19.2	19.27
HSUPA Subtest-3	20.23	20.18	20.23
HSUPA Subtest-4	18.76	18.66	18.72
HSUPA Subtest-5	21.24	21.17	21.22

WCDMA Band II		Average Power (dBm	1)
TX Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2Kbps	22.82	22.70	22.69
HSDPA Subtest-1	21.36	21.26	21.34
HSDPA Subtest-2	21.32	21.23	21.33
HSDPA Subtest-3	20.86	20.75	20.85
HSDPA Subtest-4	20.83	20.57	20.82
HSUPA Subtest-1	19.90	19.76	19.85
HSUPA Subtest-2	19.37	18.75	19.32
HSUPA Subtest-3	20.39	20.20	20.28
HSUPA Subtest-4	18.85	18.75	18.79
HSUPA Subtest-5	21.37	21.20	21.32

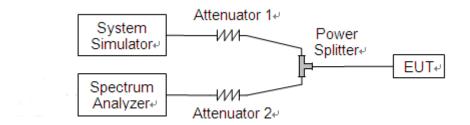
2.2. Peak to Average Ratio

2.2.1. Requirement

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

2.2.2. Test Description

Test Setup:



The EUTis 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 500hm; 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:

Pond	Channal	Frequency	Peak to Average ratio	Limit	Vordict
Band	Channel	(MHz)	dB	dB	Verdict
GSM	512	1850.2	0.026		PASS
1900MHz	661	1880.0	0.023		PASS
1900101112	810	1909.8	0.009	13	PASS
EDGE	512	1850.2	0.020	13	PASS
1900MHz	661	1880.0	0.003		PASS
I SOUMINZ	810	1909.8	0.008		PASS

Band Channel		Frequency	Peak to Average ratio	Limit	Verdict
		(MHz)	dB	dB	verdict
WCDMA	9262	1852.4	2.86		PASS
Band II	9400	1880.0	3.00	13	PASS
Danu II	9538	1907.6	2.61		PASS

GSM 1900MHz CH512 1850.2MHz



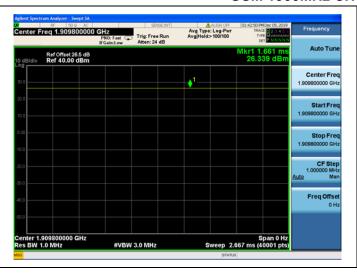


GSM 1900MHz CH661 1880.0MHz





GSM 1900MHz CH810 1909.8MHz







EDGE 1900MHz CH512 1850.2MHz





EDGE 1900MHz CH661 1880.0MHz



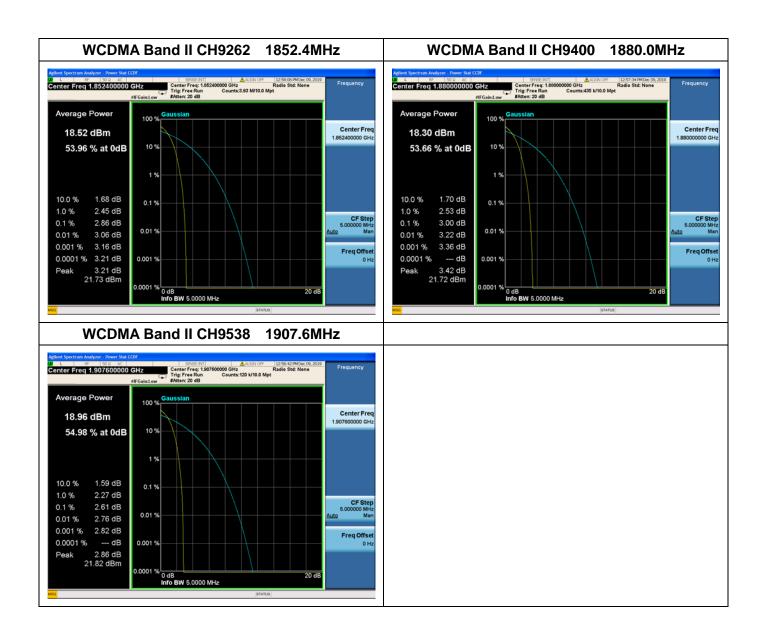


EDGE 1900MHz CH810 1909.8MHz











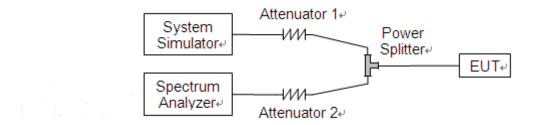
2.3.99% Occupied Bandwidth

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 EUTis 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 500hm; 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

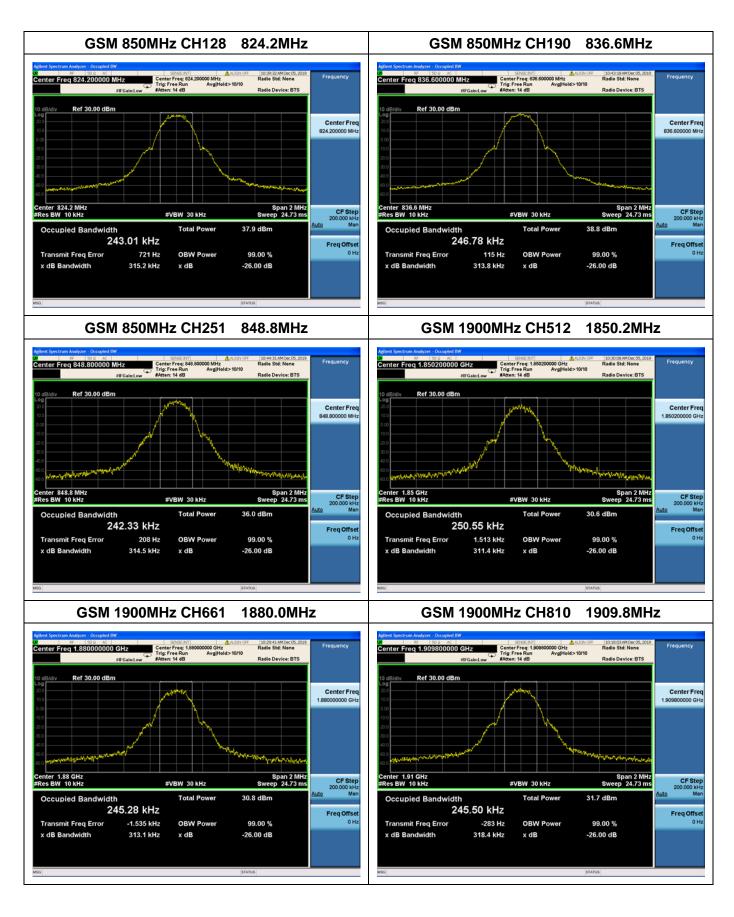
The lowest, middle and highest channels are selected to perform testing to record the 99% occupied bandwidth.

GSM Test Verdict:

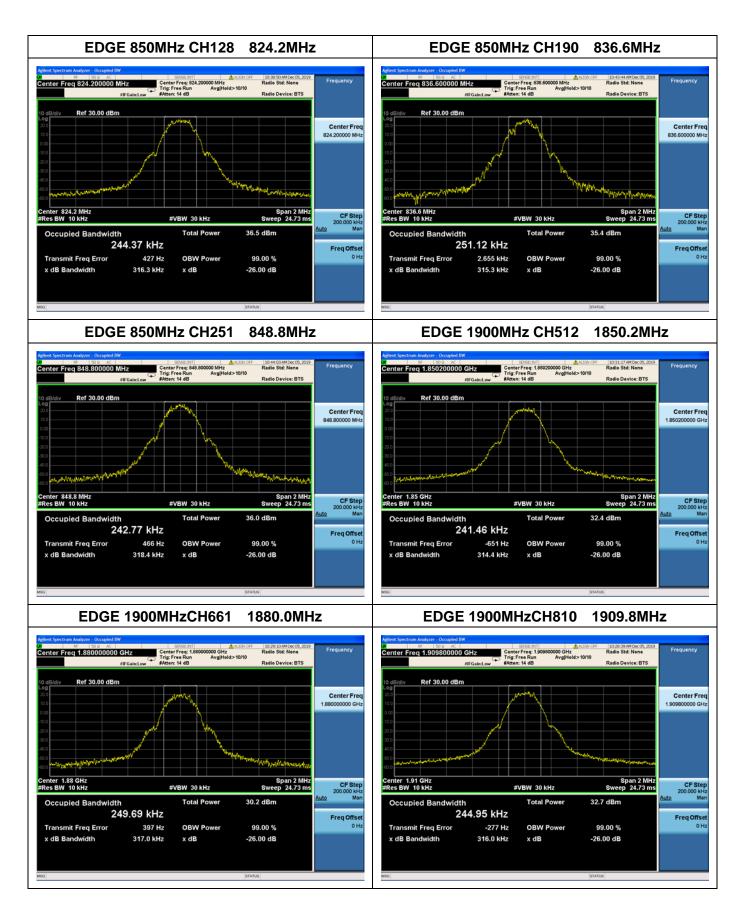
Band	Channel	Frequency	99% Occupied Bandwidth	26dB Bandwidth
Danu	Channel	(MHz)	(kHz)	(kHz)
CCM	128	824.2	243.01	315.2
GSM 850MHz	190	836.6	246.78	313.8
OSUMINZ	251	848.8	242.33	314.5
GSM	512	1850.2	250.55	311.4
1900MHz	661	1880.0	245.28	313.1
THOUNTE	810	1909.8	245.50	318.4
EDGE	128	824.2	244.37	316.3
850MHz	190	836.6	251.12	315.3
OSUMINZ	251	848.8	242.77	318.4
EDCE	512	1850.2	241.46	314.4
EDGE 1900MHz	661	1880.0	249.69	317.0
I SOUIVITIZ	810	1909.8	244.95	316.0

WCDMA Test Verdict:

Band	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
\/\(\OD\/\)	4132	826.4	4.164	4.686
WCDMA Band V	4183	836.4	4.158	4.650
Band v	4233	846.6	4.154	4.665
MCDMA	9262	1852.4	4.155	4.682
WCDMA Band II	9400	1880.0	4.156	4.672
Danu II	9538	1907.6	4.166	4.681













2.4. Frequency Stability

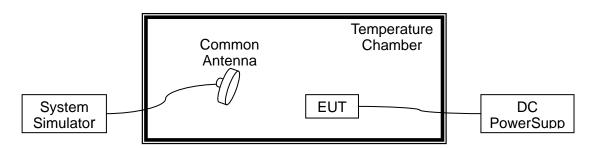
2.4.1. Requirement

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 0°C to +55°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.

2.4.3. Test Result

A. Test Verdict:

	GSM 850MHz, Channel 190, Frequency 836.6MHz						
Limit =±2.5ppm							
Voltage(%)	Power(V DC)	Temp(°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result		
100		+20(Ref)	41	0.049			
100		0	-35	-0.042			
100		+10	-58	-0.069			
100	2.05	+20	37	0.044			
100	3.85	+30	25	0.030	PASS		
100		+40	26	0.031	PASS		
100		+50	57	0.068			
100		+55	14	0.017			
115	4.40	+20	-48	-0.057			
85	3.80	+20	-16	-0.019			

	GSM 1900MHz, Channel 661, Frequency 1880.0MHz						
		Limit =	Within Authorized Bar	nd			
Voltage(%)	Power(V DC)	Temp(°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result		
100		+20(Ref)	53	0.028			
100		0	34	0.018			
100		+10	-48	-0.026			
100	3.85	+20	-73	-0.039			
100	3.00	+30	54	0.029	PASS		
100		+40	62	0.033	PASS		
100		+50	41	0.022			
100		+55	34	0.018			
115	4.40	+20	-17	-0.009			
85	3.80	+20	15	0.008			

	EDG	SE 850MHz, Ch	nannel 190, Frequenc	cy 836.6MHz	
		I	Limit =±2.5ppm		
Voltage(%)	Power(V DC)	Temp(°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result
100		+20(Ref)	47	0.056	
100		0	-63	-0.075	
100		+10	-43	-0.051	
100	2.05	+20	41	0.049	
100	3.85	+30	35	0.042	DACC
100		+40	26	0.031	PASS
100	1	+50	74	0.088	
100	4.40	+55	35	0.042	
115		+20	-76	-0.091	
85	3.80	+20	-33	-0.039	

	EDGE 1900MHz, Channel 661, Frequency 1880.0MHz							
	Limit =Within Authorized Band							
Voltage(%)	Power(V	Temp(°C)	Fre. Dev.	Deviation	Result			
5 ()	DC)	1 ()	(Hz)	(ppm)				
100		+20(Ref)	42	0.022				
100		0	-88	-0.047				
100		+10	63	0.034				
100	3.85	+20	-63	-0.034				
100	3.00	+30	-73	-0.039	PASS			
100		+40	42	0.022	PASS			
100		+50	23	0.012				
100		+55	34	0.018				
115	4.40	+20	15	0.008				
85	3.80	+20	-17	-0.009				



	WCDMA Band V, Channel 4182, Frequency 836.4MHz							
	Limit =±2.5ppm							
Voltage(%)	Power(V DC)	Temp(°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result			
100		+20(Ref)	32	0.038				
100		0	-17	-0.020				
100		+10	-58	-0.069				
100	2.05	+20	31	0.037				
100	3.85	+30	65	0.078	DACC			
100		+40	32	0.038	PASS			
100		+50	13	0.016				
100		+55	56	0.067				
115	4.40	+20	-76	-0.091				
85	3.80	+20	-59	-0.071				

	WCDMA Band II, Channel 9400, Frequency 1880.0MHz							
	Limit =Within Authorized Band							
Voltage(%)	Power(V	Temp(°C)	Fre. Dev.	Deviation	Result			
Voltage(70)	DC)	Temp(0)	(Hz)	(ppm)	Result			
100		+20(Ref)	34	0.018				
100		0	15	0.008				
100		+10	-63	-0.034				
100	3.85	+20	-58	-0.031				
100	3.65	+30	31	0.016	PASS			
100		+40	23	0.012	PASS			
100		+50	24	0.013				
100		+55	15	0.008				
115	4.40	+20	-69	-0.037				
85	3.80	+20	24	0.013				

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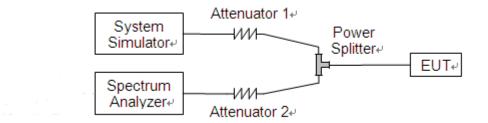
2.5. Conducted Out of Band Emissions

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.

2.5.2. Test Description

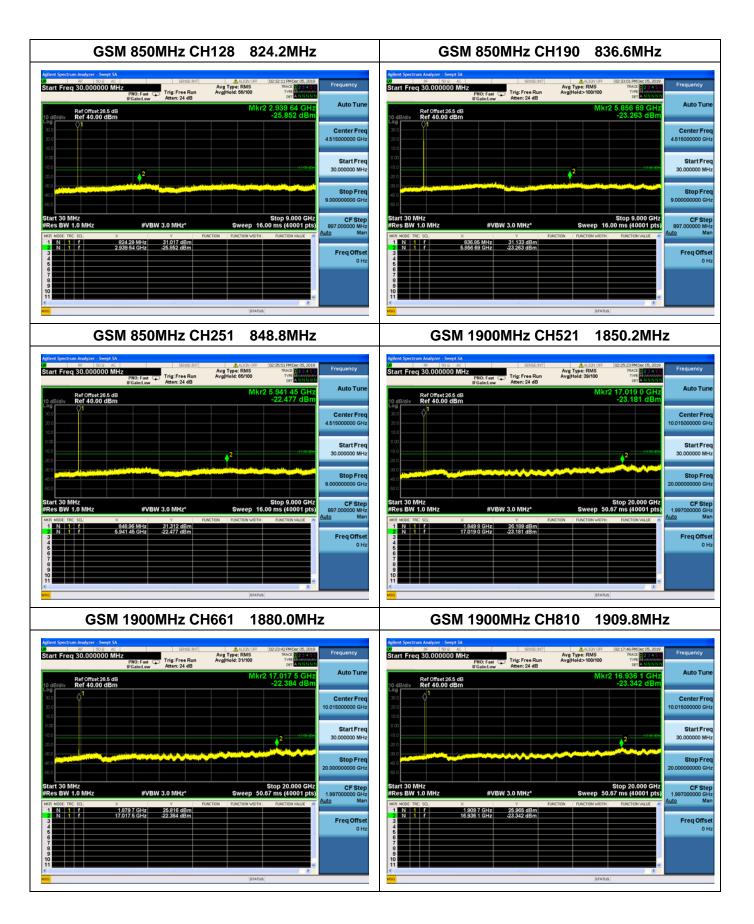
Test Setup:



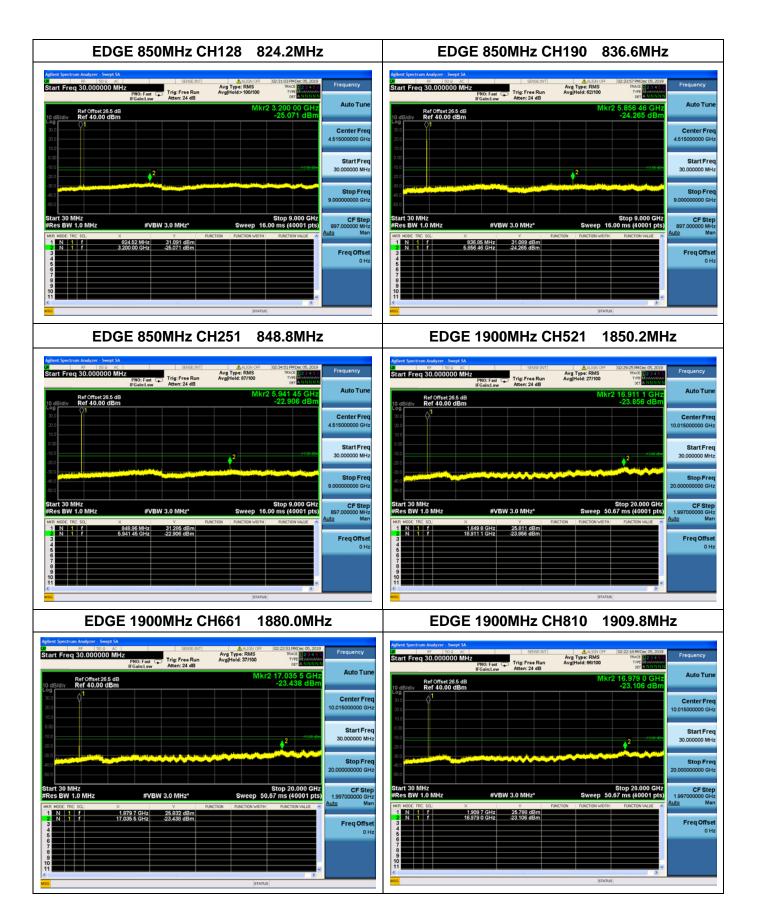
The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum 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

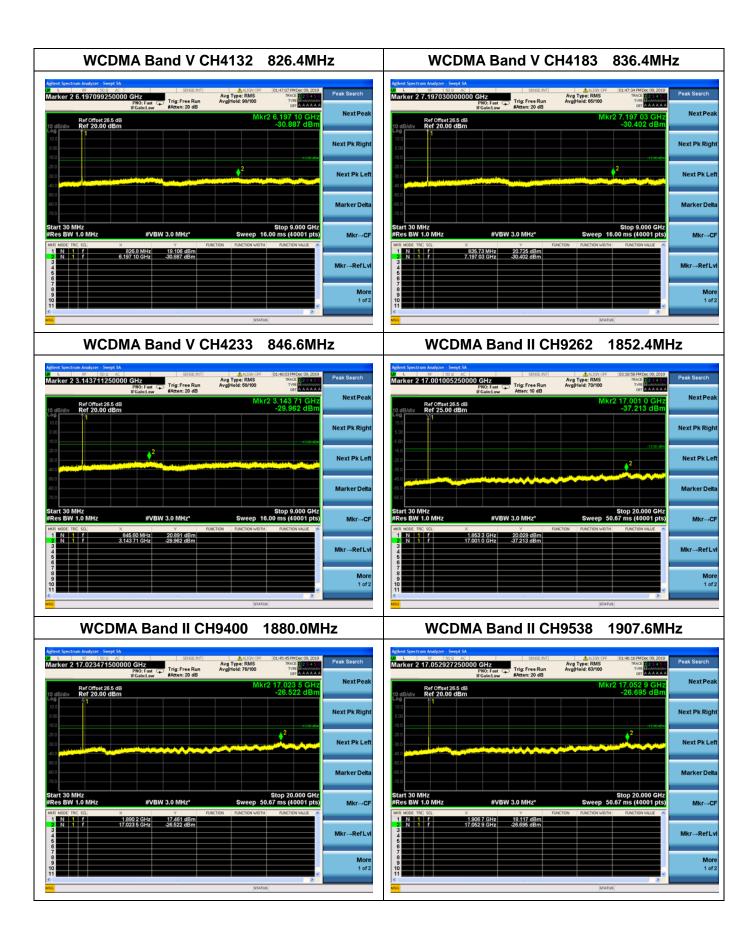
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.













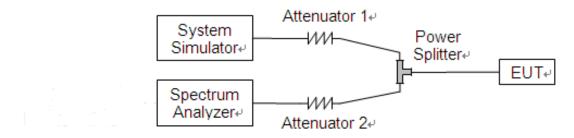
2.6. Band Edge

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 EUTis 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 500hm; 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.

