Shenzhen CTL Testing Technology Co., Ltd.
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TEST REPORT

FCC Part 22 Subpart H / Part 24 Subpart E

Report Reference No. .....: **CTL1705052031-WF**

Compiled by: (position+printed name+signature)	Allen Wang (File administrators)	Allen Wang
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Approved by: (position+printed name+signature)	Ivan Xie (Manager)	Ivan Xie

Product Name.....:	GPS watch
Model/Type reference .....:	GATOR 1
List Model(s).....:	GATOR 2, GATOR 3, GATOR 4, GATOR 5, GATOR 6, GATOR 7, GATOR 8, GATOR 9
Trade Mark.....:	Gator
FCC ID .....:	2AA2S-GATORX
Applicant's name .....:	**Gator Group Co.,Ltd**
Address of applicant .....:	8 Floor, Huichao Technology Building, No 12 Jinhai Road, Baoan District, Shenzhen ,China
Test Firm .....:	**Shenzhen CTL Testing Technology Co., Ltd.**
Address of Test Firm .....:	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Test specification.....:	
Standard.....:	**FCC CFR Title 47 Part 2, Part 22H and Part 24E** **EIA/TIA 603-D: 2010** **KDB 971168 D01** **ANSI C63.26-2015**
TRF Originator .....:	Shenzhen CTL Testing Technology Co., Ltd.
Master TRF .....:	Dated 2011-01
Date of Receipt.....:	May 12, 2017
Date of Test Date.....:	May 13, 2017–May 23, 2017
Data of Issue.....:	May 24, 2017
Result.....:	Pass

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TEST REPORT

Test Report No. :	CTL1705052031-WF	May 24, 2017
		Date of issue

Equipment under Test	:	GPS watch
Model /Type	:	GATOR 2, GATOR 3, GATOR 4, GATOR 5, GATOR 6, GATOR 7, GATOR 8, GATOR 9
Listed Models	:	N/A
Applicant	:	**Gator Group Co.,Ltd**
Address	:	8 Floor, Huichao Technology Building, No 12 Jinhai Road, Baoan District, Shenzhen ,China
Manufacturer	:	**Gator Group Co.,Ltd**
Address	:	8 Floor, Huichao Technology Building, No 12 Jinhai Road, Baoan District, Shenzhen ,China

Test result	**Pass ***

* In the configuration tested, the EUT complied with the standards specified page 5.

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

** Modified History **

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2017-05-24	CTL1705052031-WF	Tracy Qi

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Shenzhen CTL Testing Technology Co.,Ltd.

1 SUMMARY

1.1 TEST STANDARDS

The tests were performed according to following standards:
FCC Part 22: PRIVATE LAND MOBILE RADIO SERVICES.
FCC Part 24: PUBLIC MOBILE SERVICES
TIA/EIA 603 D June 2010: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
FCC Part 2: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
KDB971168 D01:v02r02 MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS
ANSI C63.26-2015 American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

1.2 Test Description

Test Item	Section in CFR 47	Result
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c)	Pass
Peak-to-Average Ratio	Part 24.232 (d)	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917 Part 24.238	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability	Part 2.1055 Part 22.355 Part 24.235	Pass

1.3 Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, December 19, 2013.

1.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

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

2 GENERAL INFORMATION

2.1 Environmental conditions

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

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2 General Description of EUT

Product Name:	GPS watch
Model/Type reference:	GATOR 1
Power supply:	DC 3.7V from battery
2G	
Operation Band:	GSM850, PCS1900
Supported Type:	GSM/GPRS/EGPRS
Power Class:	GSM850:Power Class 4 PCS1900:Power Class 1
Modulation Type:	GMSK for GSM/GPRS, 8PSK for EGPRS
GSM Release Version	R99
GPRS Multislot Class	12
EGPRS Multislot Class	12
WCDMA	
Operation Band:	FDD Band II & Band V
Power Class:	Power Class 3
Modulation Type:	QPSK for WCDMA/HSUPA/HSDPA
WCDMA Release Version:	R99
HSDPA Release Version:	Release 7, CAT14
HSUPA Release Version:	Release 6, CAT6
DC-HSUPA Release Version:	Not Supported

Note: For more details, refer to the user's manual of the EUT.

2.3 Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The CUM200 used to control the EUT staying in continuous transmitting and receiving mode for testing. Regards to the frequency band operation: the lowest、middle and highest frequency of channel were selected to perform the test, then shown on this report.

Test Frequency:

GSM 850		PCS1900	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20
190	836.60	661	1880.00
251	848.80	810	1909.80

FDD Band II		FDD Band V	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
9262	1852.4	4132	826.40
9400	1880.0	4182	836.60
9538	1907.6	4233	846.60

Test Modes:

The test mode(s) are selected according to relevant radio technology specifications.

Test Mode	Test Modes Description
Mode 1	GSM system, GSM, GMSK modulation
Mode 2	GSM system, GPRS, GMSK modulation
Mode 3	GSM system, EDGE, GMSK modulation
Mode 4	WCDMA system, QPSK modulation
Mode 5	HSDPA system, QPSK modulation
Mode 6	HSUPA system, QPSK modulation

Note:

1. As GSM and GPRS with the same emission designator, test result recorded in this report at the worst case Mode 1 only after exploratory scan.
2. As WCDMA, HSDPA and HSUPA with the same emission designator, test result recorded in this report at the worst case Mode 4 only after exploratory scan.

2.4 Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2016/06/02	2017/06/01
Bilog Antenna	Sunol Sciences Corp.	JB1	A061714	2016/06/02	2017/06/01
EMI Test Receiver	R&S	ESCI	103710	2016/06/02	2017/06/01
Spectrum Analyzer	Agilent	N9020	US46220290	2017/01/16	2018/01/17
Controller	EM Electronics	Controller EM 1000	N/A	2016/06/02	2017/06/01
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2016/06/02	2017/06/01
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062014	2016/06/02	2017/06/01
Active Loop Antenna	SCHWARZBECK	FMZB1519	1519-037	2016/06/02	2017/06/01
Amplifier	Agilent	8349B	3008A02306	2016/06/02	2017/06/01
Amplifier	Agilent	8447D	2944A10176	2016/06/02	2017/06/01
Temperature/Humidity Meter	Gangxing	CTH-608	02	2016/06/02	2017/06/01
Radio Communication Tester	R&S	CMU200	115419	2016/06/02	2017/06/01
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2016/06/02	2017/06/01
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2016/06/02	2017/06/01
RF Cable	HUBER+SUHNER	RG214	N/A	2016/06/02	2017/06/01
Climate Chamber	ESPEC	EL-10KA	A20120523	2016/06/02	2017/06/01
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2016/06/02	2017/06/01
Directional Coupler	Agilent	87300B	3116A03638	2016/06/02	2017/06/01

2.5 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AA2S-GATORX filing to comply with of the FCC Part 22 and Part 24 Rules.

2.6 Modifications

No modifications were implemented to meet testing criteria.

3 TEST CONDITIONS AND RESULTS

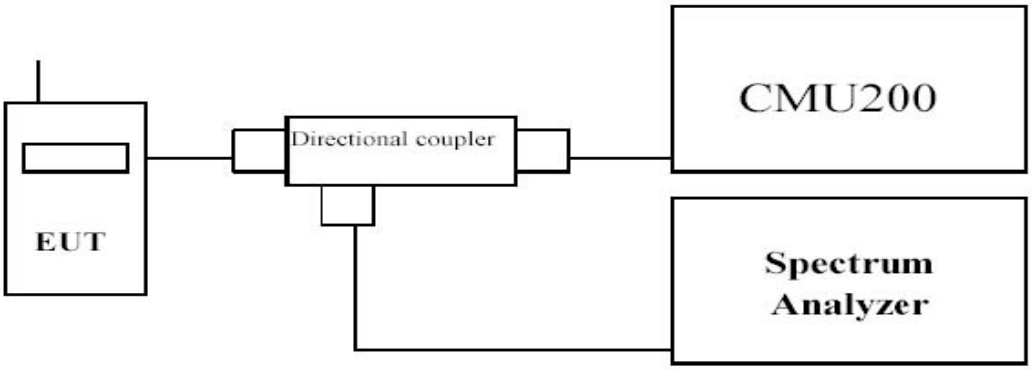
3.1 Output Power

LIMIT

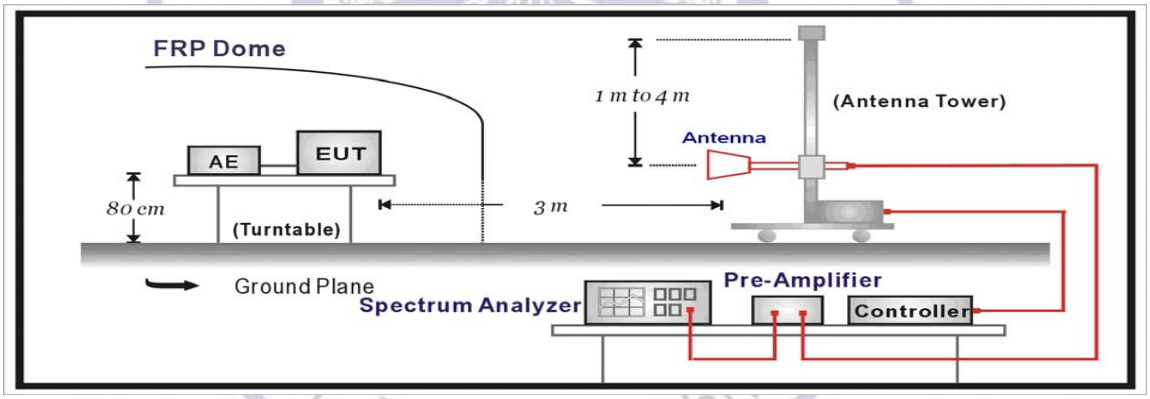
GSM850/WCDMA Band V: 7W
PCS1900/WCDMA Band II: 2W
The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

TEST CONFIGURATION

Conducted Power Measurement



Radiated Power Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

Conducted Power Measurement:

a) Place the EUT on a bench and set it in transmitting mode.

b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.

c) EUT Communicate with CMU200 then selects a channel for testing.

d) Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:

a) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.

b) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter

c) The output of the test antenna shall be connected to the measuring receiver.

d) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.

e) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

f) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

g) The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.

h) The maximum signal level detected by the measuring receiver shall be noted.

i) The transmitter shall be replaced by a substitution antenna.

j) The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.

k) The substitution antenna shall be connected to a calibrated signal generator.

l) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

m) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.

n) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.

o) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

p) The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

TEST RESULTS

Conducted Measurement:

EUT Mode	Channel	Frequency (MHz)	Avg.Burst Power (dBm)	Peak-to-Average Ratio (dB)	Limit (dBm)	Result
GSM 850 (GMSK)	128	824.20	32.66	/	38.45	Pass
	190	836.60	32.71	/		
	251	848.80	32.54	/		
GPRS850 (GMSK,1Slot)	128	824.20	32.57	/	38.45	Pass
	190	836.60	32.69	/		
	251	848.80	32.56	/		
PCS1900 (GMSK)	512	1850.20	29.82	0.54	33.01	Pass
	661	1880.00	29.85	0.66		
	810	1909.80	29.80	0.69		
GPRS1900 (GMSK,1Slot)	512	1850.20	29.66	0.41	33.01	Pass
	661	1880.00	29.73	0.48		
	810	1909.80	29.71	0.52		
WCDMA Band II (QPSK)	9262	1852.40	22.70	3.44	33.01	Pass
	9400	1880.00	22.75	3.56		
	9538	1907.60	22.73	3.69		
WCDMA Band V (QPSK)	4132	826.40	22.81	/	38.45	Pass
	4183	836.60	22.84	/		
	4233	846.60	22.80	/		
EGPRS850 (8PSK,1Slot)	128	824.20	27.52	/	38.45	Pass
	190	836.60	27.65	/		
	251	848.80	27.41	/		
EGPRS1900 (8PSK,1Slot)	512	1850.20	25.63	0.78	33.01	Pass
	661	1880.00	25.78	0.62		
	810	1909.80	25.65	0.97		

Note: 1. Peak-to-Average Ratio= maximum PK burst power-maximum Avg. burst power.

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Radiated Measurement:

Note: 1. The field strength of radiation emission was measured in the following position: EUT stand-up position (Zaxis), lie-down position (X, Y axis). The data show in this report only with the worst case setup. After exploratory measurement the worst case of Z axis was reported.

Note: 2. We test the H direction and V direction and V direction is worse.

GSM850

Channel	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
128	-10.18	2.42	8.45	2.15	36.82	30.52	38.45	7.93	V
190	-9.88	2.46	8.45	2.15	36.82	30.78	38.45	7.67	V
251	-9.86	2.53	8.36	2.15	36.82	30.64	38.45	7.81	V

EGPRS850

Channel	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
128	-14.04	2.42	8.45	2.15	36.82	26.66	38.45	11.79	V
190	-13.79	2.46	8.45	2.15	36.82	26.87	38.45	11.58	V
251	-13.76	2.53	8.36	2.15	36.82	26.74	38.45	11.71	V

GSM1900

Channel	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
512	-11.99	3.41	10.24	33.6	28.44	33.01	4.57	V
661	-11.66	3.49	10.24	33.6	28.69	33.01	4.32	V
810	-11.77	3.55	10.23	33.6	28.51	33.01	4.50	V

EGPRS1900

Channel	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
512	-17.32	3.41	10.24	33.6	23.11	33.01	9.90	V
661	-16.94	3.49	10.24	33.6	23.41	33.01	9.60	V
810	-17.03	3.55	10.23	33.6	23.25	33.01	9.76	V

WCDMA BAND II

Channel	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
9262	-19.53	3.42	10.24	33.6	20.89	33.01	12.12	V
9400	-18.95	3.49	10.24	33.6	21.40	33.01	11.61	V
9538	-19.16	3.54	10.23	33.6	21.13	33.01	11.88	V

WCDMA BAND V

Channel	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	Correction (dB)	P_{Ag} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
4132	-20.03	2.43	8.45	2.15	36.82	20.66	38.45	17.79	V
4183	-19.21	2.46	8.45	2.15	36.82	21.45	38.45	17.00	V
4233	-19.67	2.52	8.36	2.15	36.82	20.84	38.45	17.61	V

Remark:

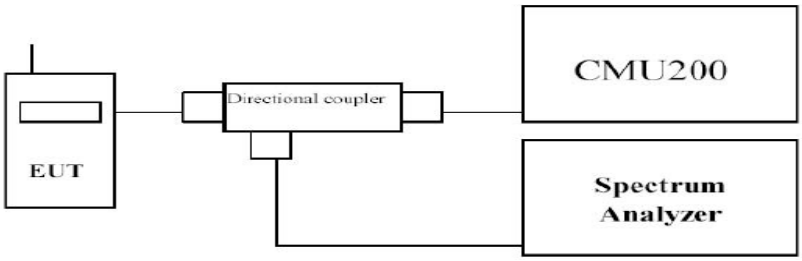
1. *$EIRP=P_{Mea}(dBm)-P_{cl}(dB)+P_{Ag}(dB)+G_a(dBi)$*
2. *ERP = EIRP – 2.15dBi as EIRP by subtracting the gain of the dipole.*

3.2 Occupied Bandwidth

LIMIT

N/A

TEST CONFIGURATION



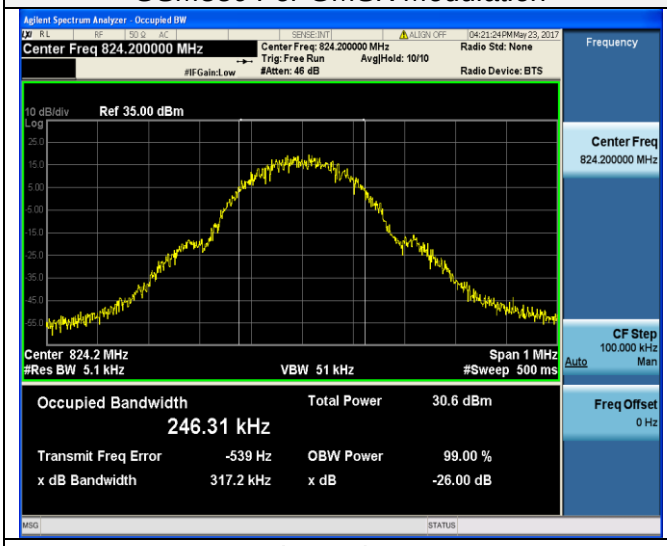
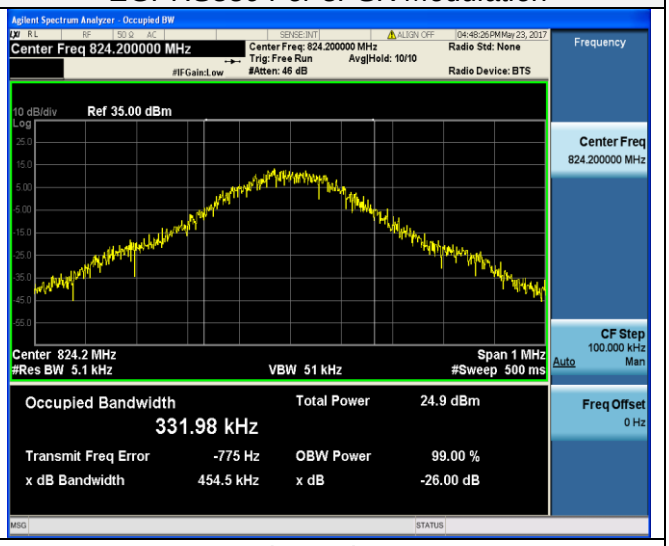
TEST PROCEDURE

1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBW was set to about 1% of emission BW, VBW≥3 times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

TEST RESULTS

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GMSK)	128	824.20	246.31	317.20
	190	836.60	245.71	306.30
	251	848.80	248.21	316.30
EGPRS850 (8PSK,1Slot)	128	824.20	331.98	454.50
	190	836.60	331.44	471.40
	251	848.80	324.88	440.60
PCS1900 (GMSK)	512	1850.20	249.09	313.60
	661	1880.00	243.97	313.60
	810	1909.80	245.20	309.50
EGPRS1900 (8PSK,1Slot)	512	1850.20	325.70	447.30
	661	1880.00	316.57	429.40
	810	1909.80	322.28	454.00
WCDMA Band II (QPSK)	9262	1852.4	4203.50	4878.00
	9400	1880.0	4206.50	4824.00
	9538	1907.6	4210.20	4840.00
WCDMA Band V (QPSK)	4132	826.4	4210.00	4845.00
	4183	836.6	4200.50	4848.00
	4233	846.6	4214.50	4842.00

Test plots as follow:

GSM850 For GMSK Modulation	EGPRS850 For 8PSK Modulation
	
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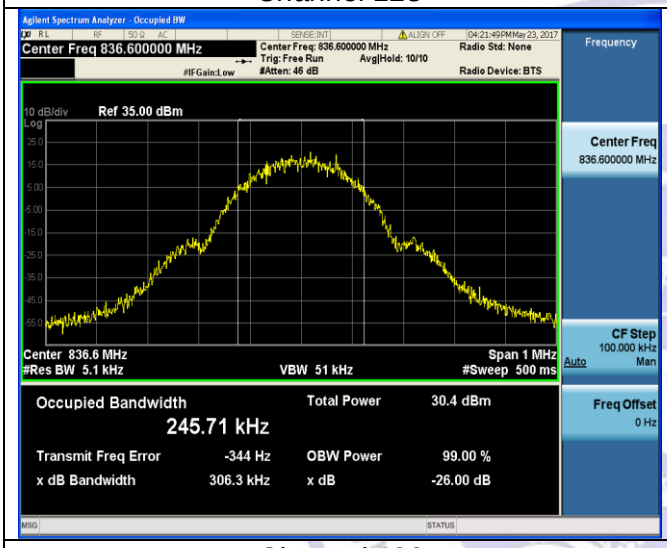	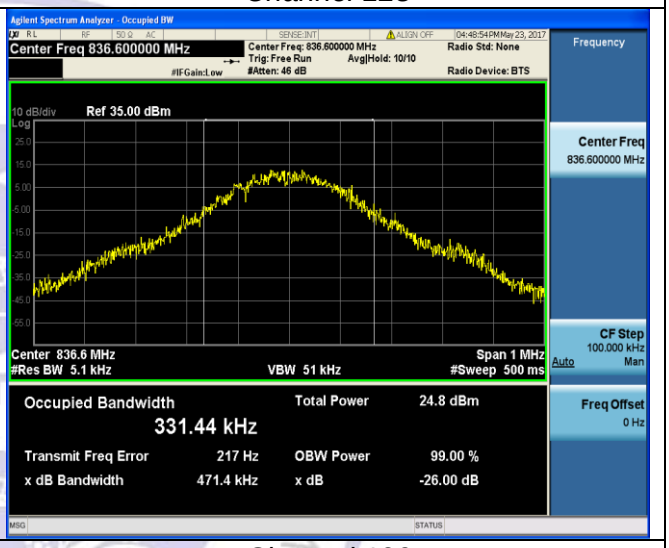
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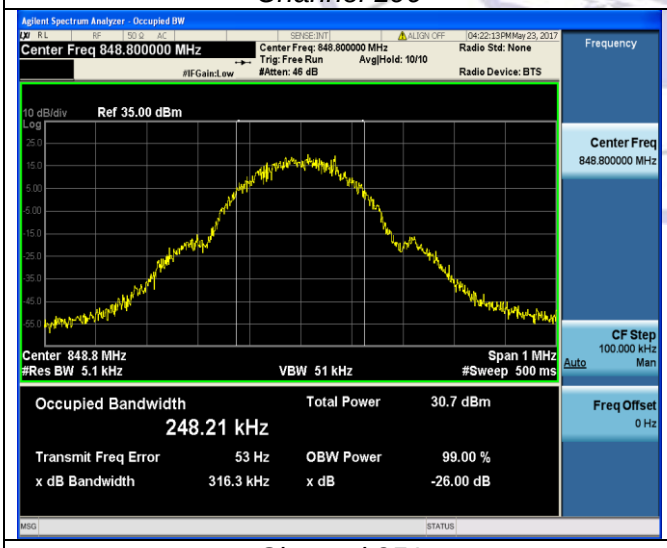
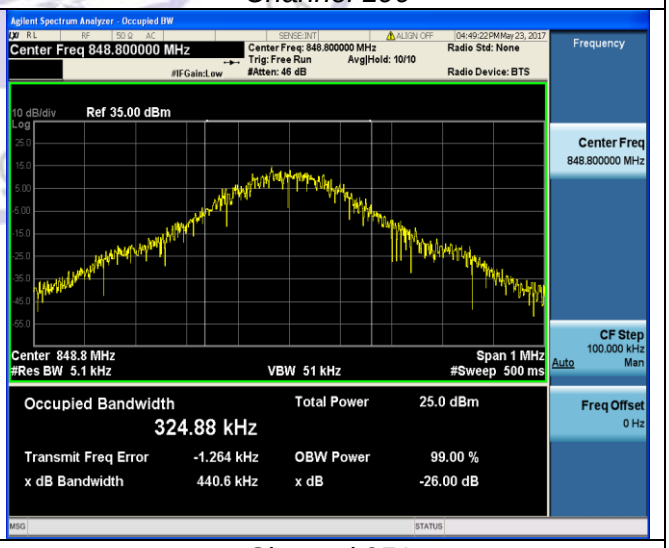
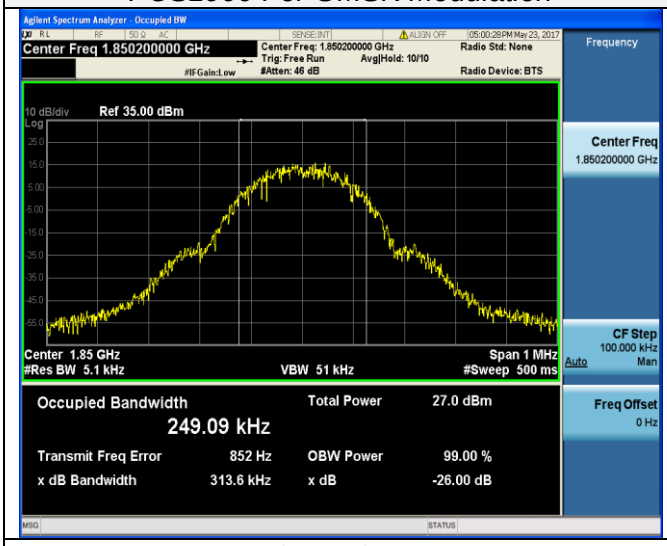
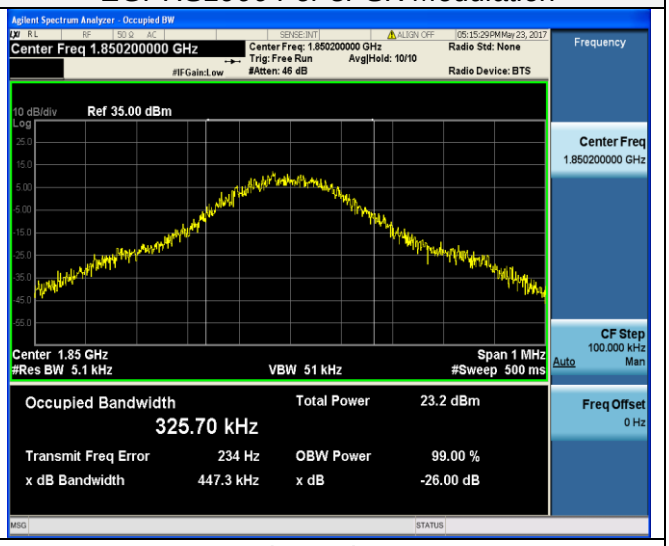
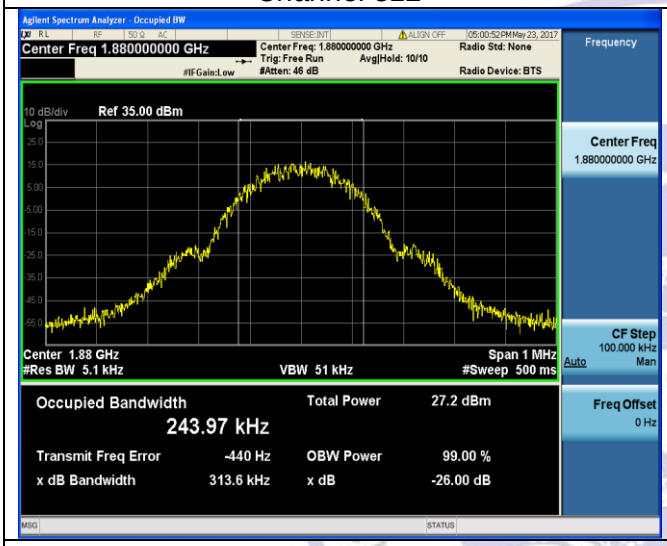
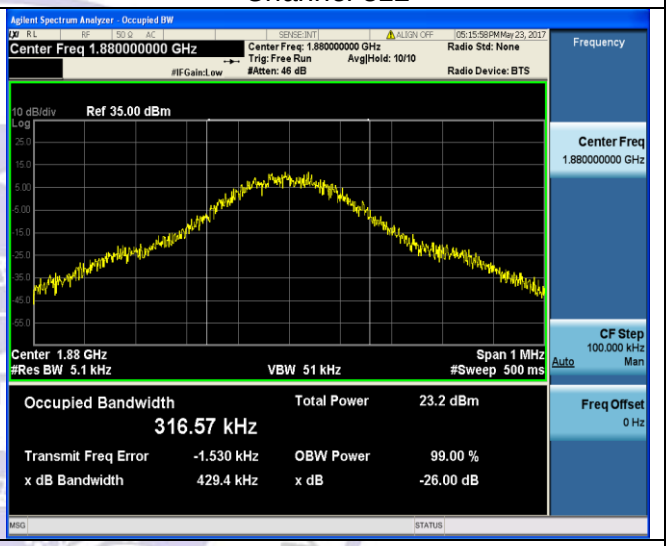
	
Channel 251	Channel 251

PCS1900 For GMSK Modulation	EGPRS1900 For 8PSK Modulation
	
Channel 512	Channel 512
	
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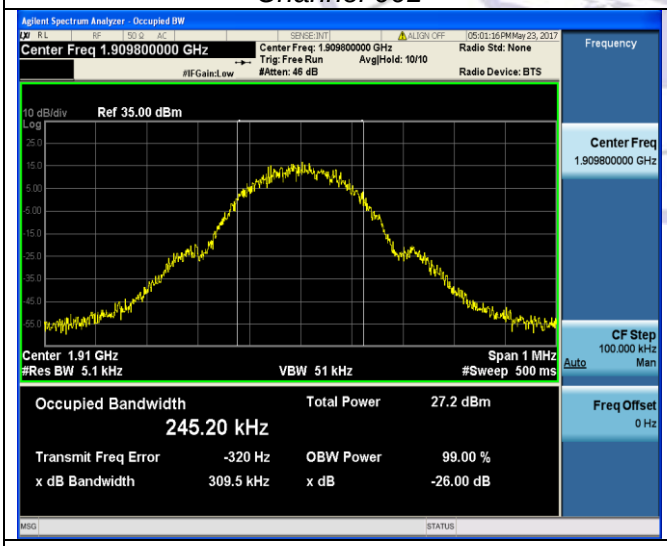
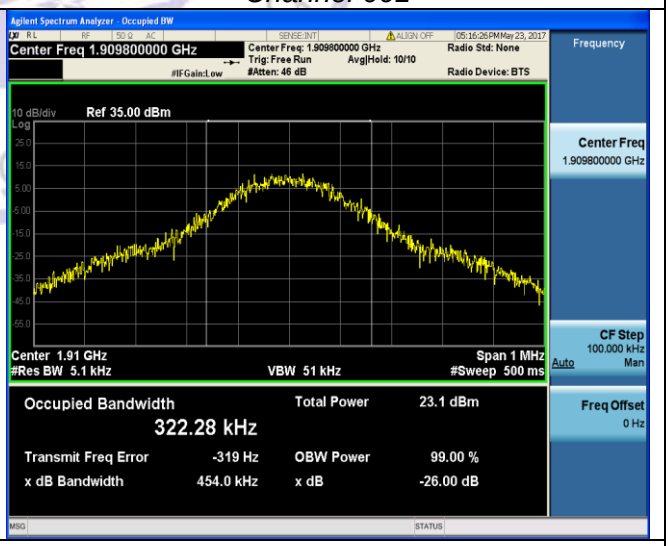
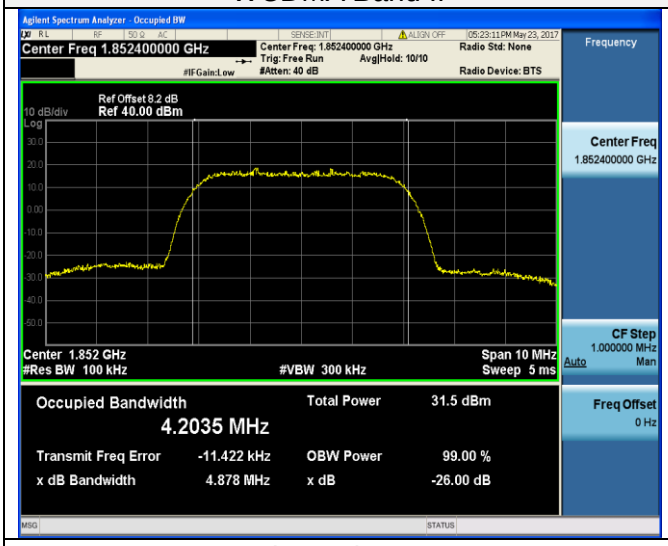
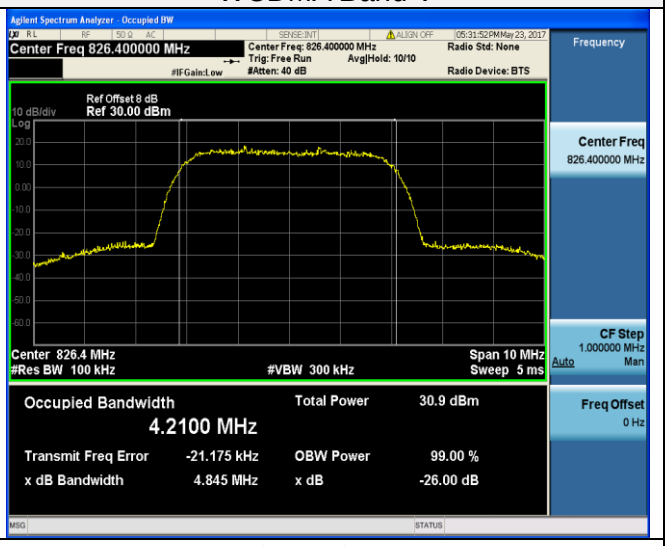
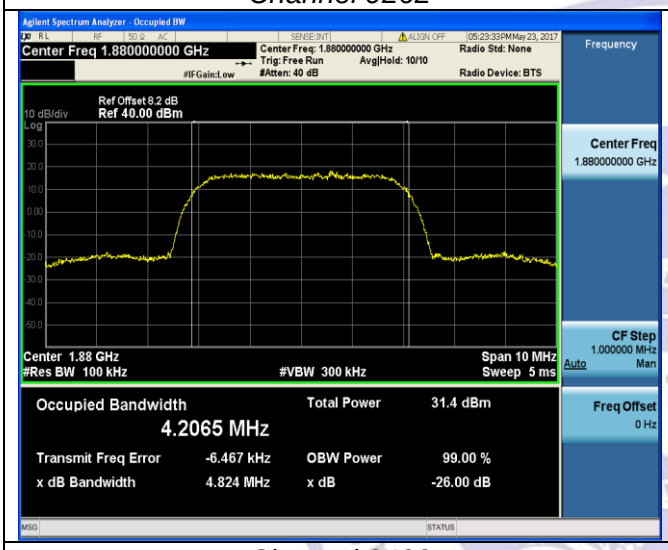
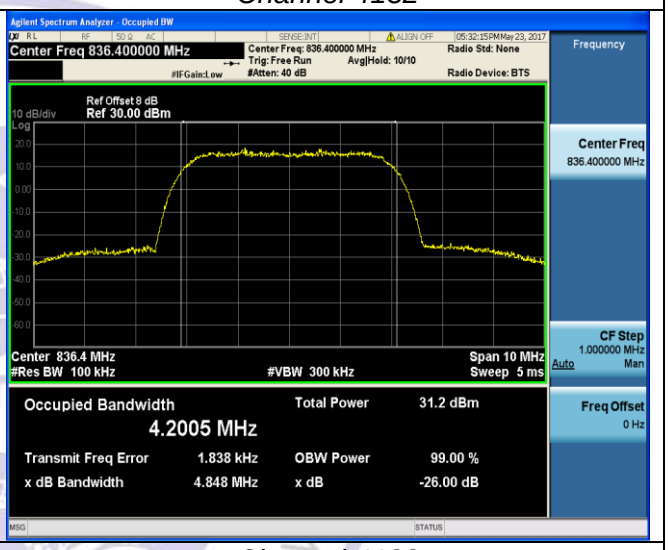
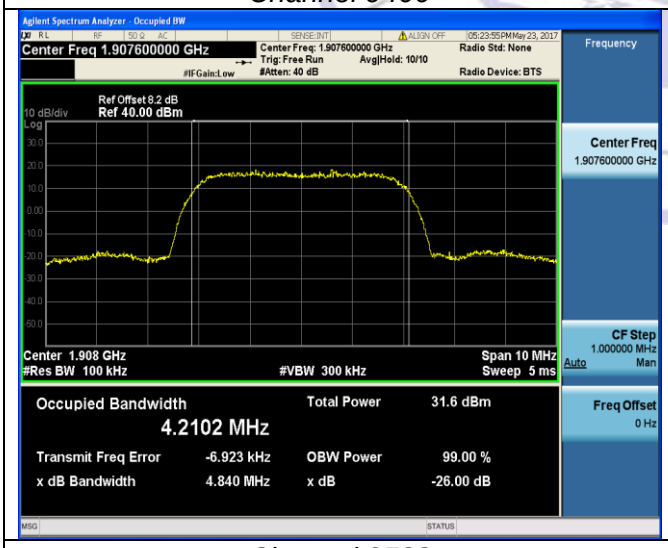
	
Channel 810	Channel 810

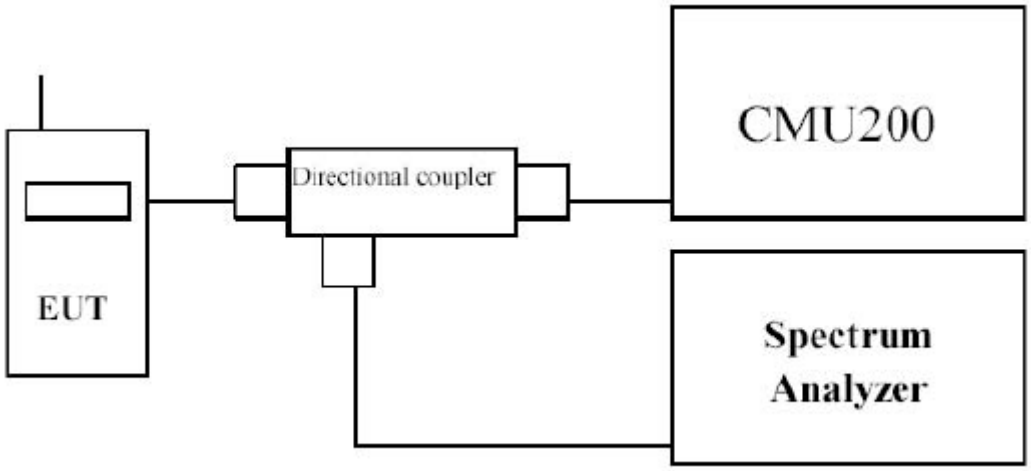
WCDMA Band II	WCDMA Band V
	
Channel 9262	Channel 4132
	
Channel 9400	Channel 4183
	
Channel 9538	Channel 4233

3.3 Band Edge compliance

LIMIT

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 + 10log (P) dB.

TEST CONFIGURATION

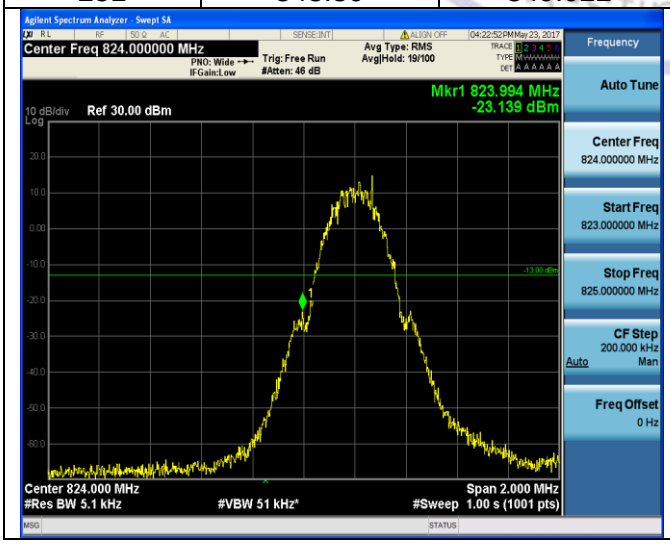


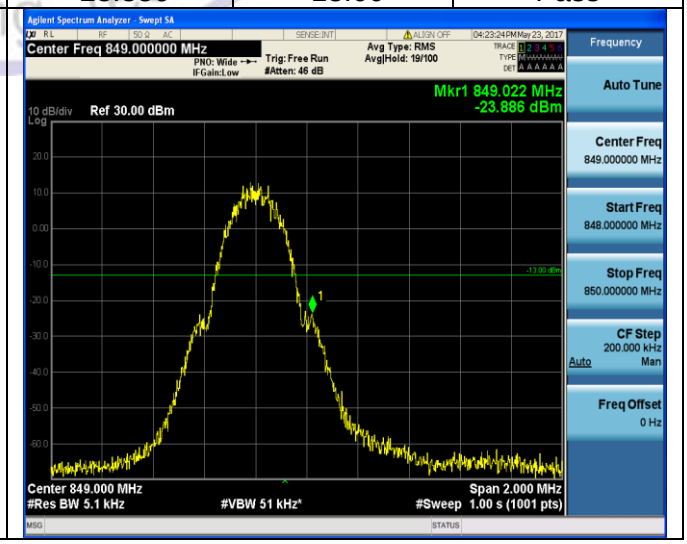
TEST PROCEDURE

In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

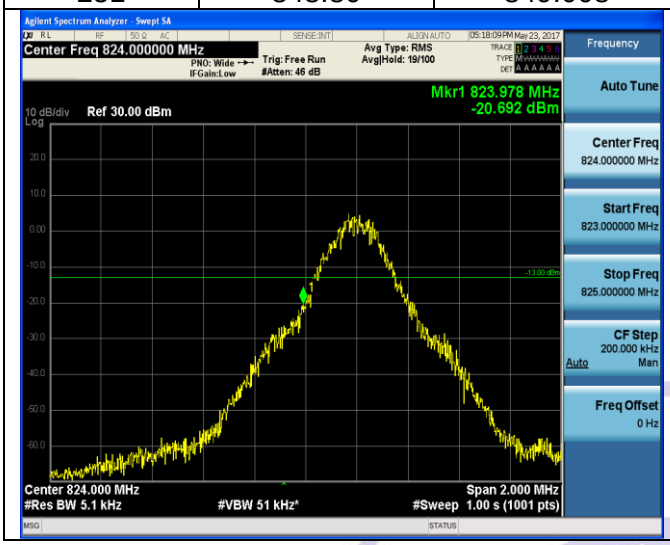
TEST RESULTS

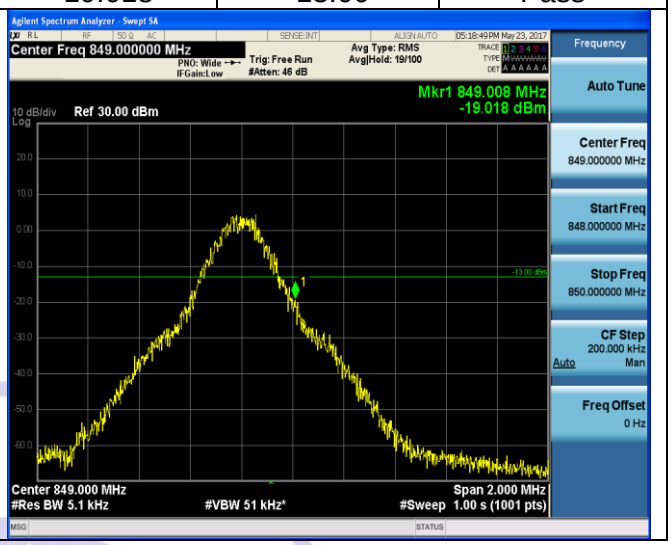
GSM850					
Channel Number	Frequency (MHz)	Max Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
128	824.20	823.994	-23.139	-13.00	Pass
251	848.80	849.022	-23.886	-13.00	Pass



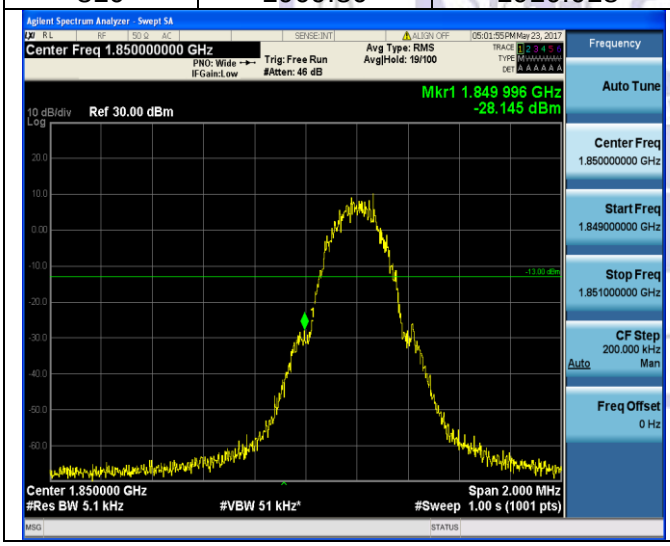


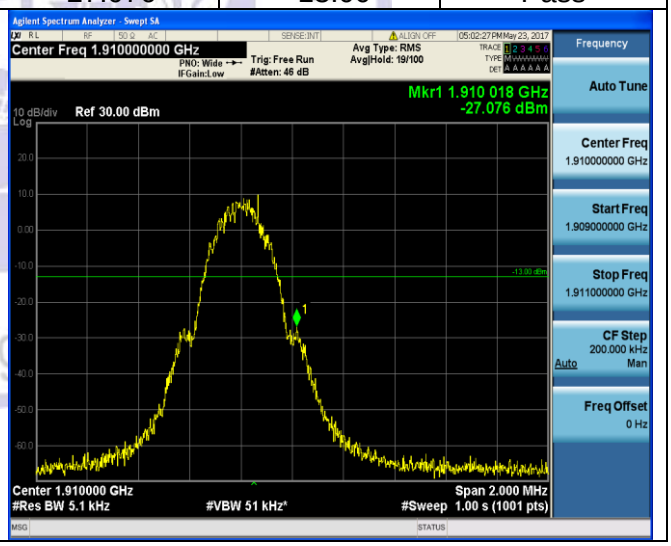
EGPRS850					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
128	824.20	823.978	-20.692	-13.00	Pass
251	848.80	849.008	-19.018	-13.00	Pass



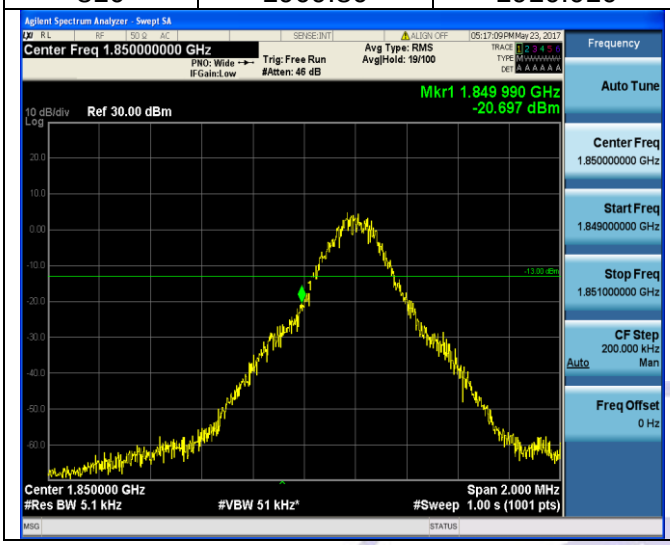


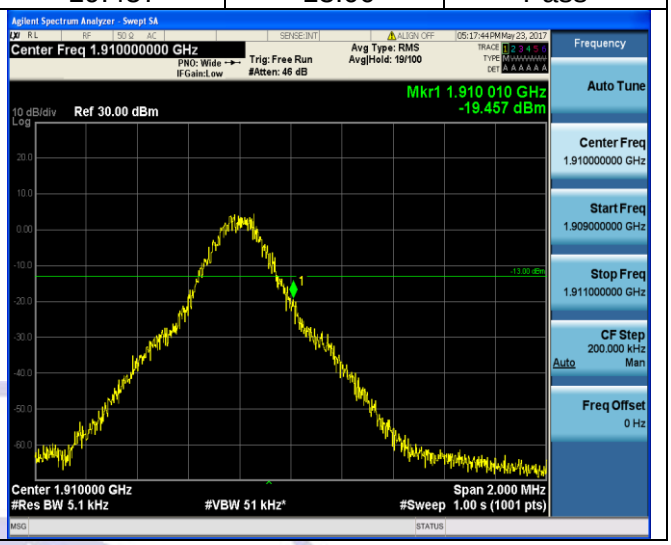
PCS1900					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
512	1850.20	1849.996	-28.145	-13.00	Pass
810	1909.80	1910.018	-27.076	-13.00	Pass





EGPRS1900					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
512	1850.20	1849.990	-20.697	-13.00	Pass
810	1909.80	1910.010	-19.457	-13.00	Pass





WCDMA Band II					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
9262	1852.4	1849.875	-20.755	-13.00	Pass
9538	1907.6	1910.170	-19.997	-13.00	Pass