



# FCC REPORT

Report Reference No..... : **TRE1510017001** R/C.....: 32128

FCC ID..... : 2AEHF-SMARTLITE

Applicant's name..... : **NOBUX, LLC**

Address..... : 8600 NW SOUTH RIVER DR #103 MIAMI, FLORIDA 33166

Manufacturer..... : NOBUX, LLC

Address..... : 8600 NW SOUTH RIVER DR #103 MIAMI, FLORIDA 33166

Test item description ..... : **Smart Lite**

Trade Mark ..... : NOBUX

Model/Type reference..... : S3501

Listed Model(s) ..... : --

Standard ..... : **FCC Part 22: PUBLIC MOBILE SERVICES**  
**FCC Part 24: PERSONAL COMMUNICATIONS SERVICES**

Date of receipt of test sample.....: Oct 28,2015

Date of testing.....: Oct 29,2015- Nov 08,2015

Date of issue.....: Nov 10,2015

Result.....: **Pass**

Compiled by  
( position+printed name+signature)...: File administrators Candy Liu

Candy Liu

Supervised by  
( position+printed name+signature)...: Project Engineer Lion Cai

Lion Cai

Approved by  
( position+printed name+signature)...: Manager Hans Hu

Hans Hu

Testing Laboratory Name ..... : **Shenzhen Huatongwei International Inspection Co., Ltd**

Address.....: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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# 1. TEST STANDARDS AND TEST DESCRIPTION

## 1.1. Test Standards

The tests were performed according to following standards:

[FCC Part 22 \(10-1-13 Edition\)](#): PRIVATE LAND MOBILE RADIO SERVICES.

[FCC Part 24\(10-1-13 Edition\)](#): PUBLIC MOBILE SERVICES

[TIA/EIA 603 D June 2010](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[47 CFR FCC Part 15 Subpart B](#): - Unintentional Radiators

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[KDB971168 D01:2013-06-07](#): Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems

[ANSI C63.4:2009](#): Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

## 1.2. Test Description

Test Item	Section in CFR 47	Result
AC Power Conducted Emission	Part 15.207	Pass
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c)	Pass
Modulation Characteristics	Part 2.1047	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 vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Remark: The measurement uncertainty is not included in the test result.

## 2. SUMMARY

### 2.1. Client Information

Applicant:	NOBUX, LLC
Address:	8600 NW SOUTH RIVER DR #103 MIAMI, FLORIDA 33166
Manufacturer:	NOBUX, LLC
Address:	8600 NW SOUTH RIVER DR #103 MIAMI, FLORIDA 33166

### 2.2. Product Description

Name of EUT	Smart Lite
Trade Mark:	NOBUX
Model No.:	S3501
Listed Model(s):	--
Power supply:	DC 5V From internal battery
Adapter information:	Input:AC 100-240V 50/60Hz 0.15A Output:5Vd.c., 500mA
<b>2G:</b>	
Support Network:	GSM, GPRS
Support Band:	GSM850, DCS1900
Modulation:	GSM/GPRS: GMSK
Transmit Frequency:	GSM850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz
Receive Frequency:	GSM850: 869.20MHz-893.80MHz PCS1900: 1930.20MHz-1989.80MHz
GPRS Class:	12
EGPRS Class:	12
Antenna type:	Intergal Antenna
Antenna gain:	GSM850:-3.5dBi,PCS1900:-3.8dBi
Hardware version:	F2_MB_V4.0
Software version:	S3501_B_F2_HC01V02_20151022
<b>3G:</b>	
Operation Band:	FDD Band II and FDD Band V
Power Class:	Power Class 3
Modulation Type:	QPSK for WCDMA/HSUPA/HSDPA
WCDMA Release Version:	Release 7
HSDPA Release Version:	Category 14
HSUPA Release Version:	Category 6
DC-HSUPA Release Version:	Not Supported
Antenna type:	Intergal Antenna
Antenna gain:	Band II:-3.3dBi, Band V: -4.1dBi

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

### 2.3. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides software to control the EUT for staying in continuous transmitting and receiving mode for testing.

### 2.4. EUT configuration

**The following peripheral devices and interface cables were connected during the measurement:**

● - supplied by the manufacturer

○ - supplied by the lab

<input type="radio"/>	Power Cable	Length (m) :	/
<input type="radio"/>		Shield :	/
<input type="radio"/>		Detachable :	/
<input type="radio"/>	Multimeter	Manufacturer :	/
<input type="radio"/>		Model No. :	/

### 2.5. Modifications

No modifications were implemented to meet testing criteria.

### **3. TEST ENVIRONMENT**

#### **3.1. Address of the test laboratory**

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Phone: 86-755-26748019 Fax: 86-755-26748089

#### **3.2. Test Facility**

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

##### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

##### **A2LA-Lab Cert. No. 3902.01**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until December 31, 2016.

##### **FCC-Registration No.: 317478**

Shenzhen Huatongwei International Inspection 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 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

##### **IC-Registration No.: 5377A&5377B**

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Dec. 31, 2013, valid time is until Dec. 31, 2016.

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B on Dec.03, 2014, valid time is until Dec.03, 2017.

##### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

##### **VCCI**

The 3m Semi-

anechoic chamber (12.2m×7.95m×6.7m) of Shenzhen Huatongwei International Inspection Co., Ltd.

has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2484. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 29, 2015.

Radiated disturbance above 1GHz measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2013. Valid time is until Dec. 23, 2016.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 19, 2015.

Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2013. Valid time is until May 06, 2016.

##### **DNV**

Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2016.

### 3.3. Environmental conditions

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

Normal Temperature/Tnor:	15~35°C
Relative Humidity	30~60 %
Air Pressure	950-1050 hPa

### 3.4. 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 according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system according 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 Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Frequency stability	25 Hz	(1)
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-12.75 GHz	1.60 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emission 1~18GHz	5.16 dB	(1)
Radiated Emission 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	-----	(1)
Emission Mask	-----	(1)
Modulation Characteristic	-----	(1)
Transmitter Frequency Behavior	-----	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

### 3.5. Equipments Used during the Test

AC Power Conducted Emission					
No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Artificial Mains	Rohde&Schwarz	ESH2-Z5	100028	2015/11/2
2	EMI Test Receiver	Rohde&Schwarz	ESCS 30	100038	2015/11/2
3	Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	2015/11/2
4	EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	N/
5	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	112012	2015/11/2

Output Power(Conducted) & Occupied Bandwidth & Emission Bandwidth & Band Edge Compliance & Conducted Spurious Emission					
No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	112012	2015/11/2
2	Spectrum Analyzer	Rohde&Schwarz	FSU26	201141	2015/11/2
3	Splitter	Mini-Circuit	ZAPD-4	400059	2015/11/2

Frequency Stability					
No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	112012	2015/11/2
2	Spectrum Analyzer	Rohde&Schwarz	FSU26	201141	2015/11/2
3	Climate Chamber	ESPEC	EL-10KA	05107008	2015/11/2
4	Splitter	Mini-Circuit	ZAPD-4	400059	2015/11/2

Output Power (Radiated) & Radiated Spurious Emission					
No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	112012	2015/11/2
2	Spectrum Analyzer	Rohde&Schwarz	FSU26	201141	2015/11/2
3	HORN ANTENNA	ShwarzBeck	9120D	1012	2015/11/2
4	HORN ANTENNA	ShwarzBeck	9120D	1011	2015/11/2
5	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2015/11/2
6	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	2015/11/2
7	TURNTABLE	MATURO	TT2.0	----	N/A
8	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A
9	EMI Test Software	Audix	E3	N/A	N/A
10	EMI Test Receiver	Rohde&Schwarz	ESIB 26	100009	2015/11/2
11	RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	2015/11/2
12	High pass filter	Compliance Direction systems	BSU-6	34202	2015/11/2
13	Splitter	Mini-Circuit	ZAPD-4	400059	2015/11/2
14	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2015/11/2
15	Horn Antenna	SCHWARZBECK	BBHA9170	25842	2015/11/2
16	Preamplifier	ShwarzBeck	BBV 9718	BBV 9718	2015/11/2
17	Broadband Preamplifier	ShwarzBeck	BBV743	9743-0079	2015/11/2
18	Signal Generator	Rohde&Schwarz	SMF100A	101932	2015/11/2
19	Amplifier	Compliance Direction systems	PAP1-4060	120	2015/11/2
20	TURNTABLE	ETS	2088	2149	2015/11/2
21	ANTENNA MAST	ETS	2075	2346	2015/11/2
22	HORN ANTENNA	Rohde&Schwarz	HF906	100068	2015/11/2
23	HORN ANTENNA	Rohde&Schwarz	HF906	100039	2015/11/2

The calibration interval was one year.



## 4. TEST CONDITIONS AND RESULTS

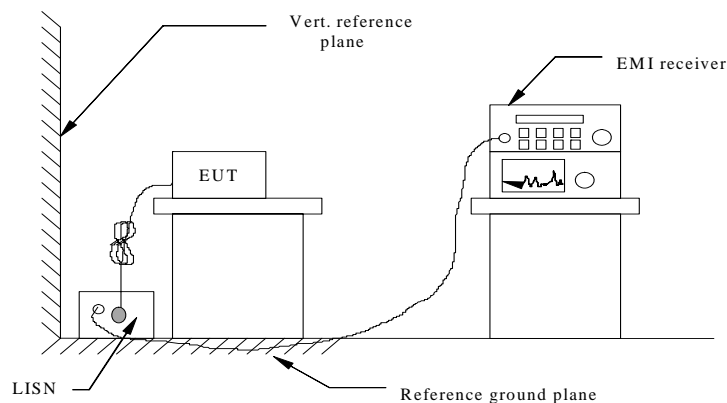
### 4.1. Conducted Emissions Test

#### LIMIT:

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

\* Decreasing linearly with the logarithm of the frequency

#### TEST CONFIGURATION



#### TEST PROCEDURE

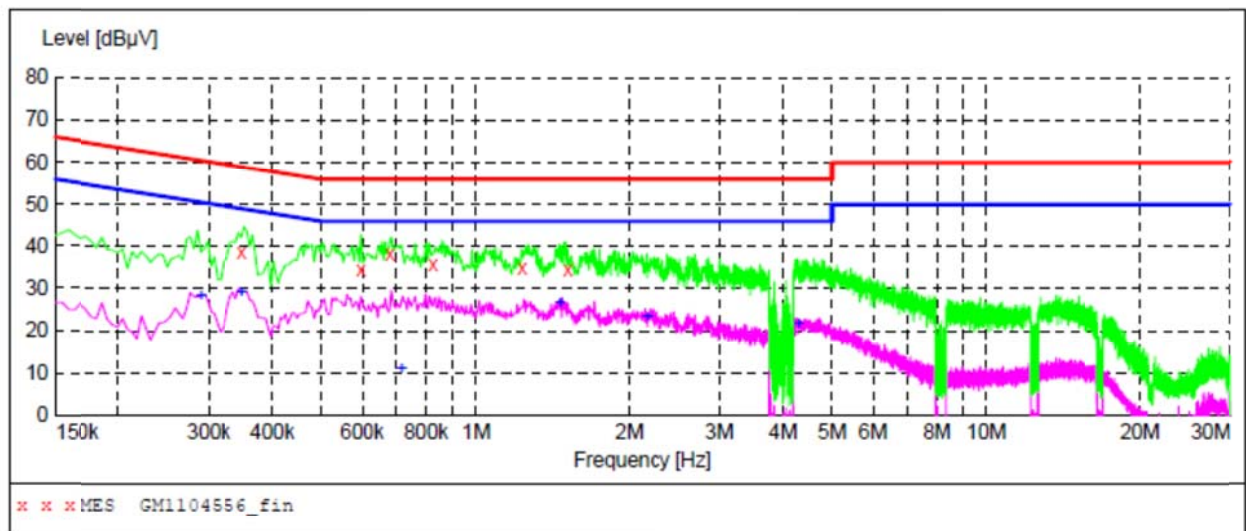
- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2009.
- 2 Support equipment, if needed, was placed as per ANSI C63.4-2009.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2009.
- 4 If a EUT received DC power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

#### TEST RESULTS

**Note:** We tested all modes and recorded the worst case at GSM900

**GSM850**

Test mode:	GSM850	Polarization	L
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**MEASUREMENT RESULT: "GM1104556\_fin"**

11/4/2015 9:02PM

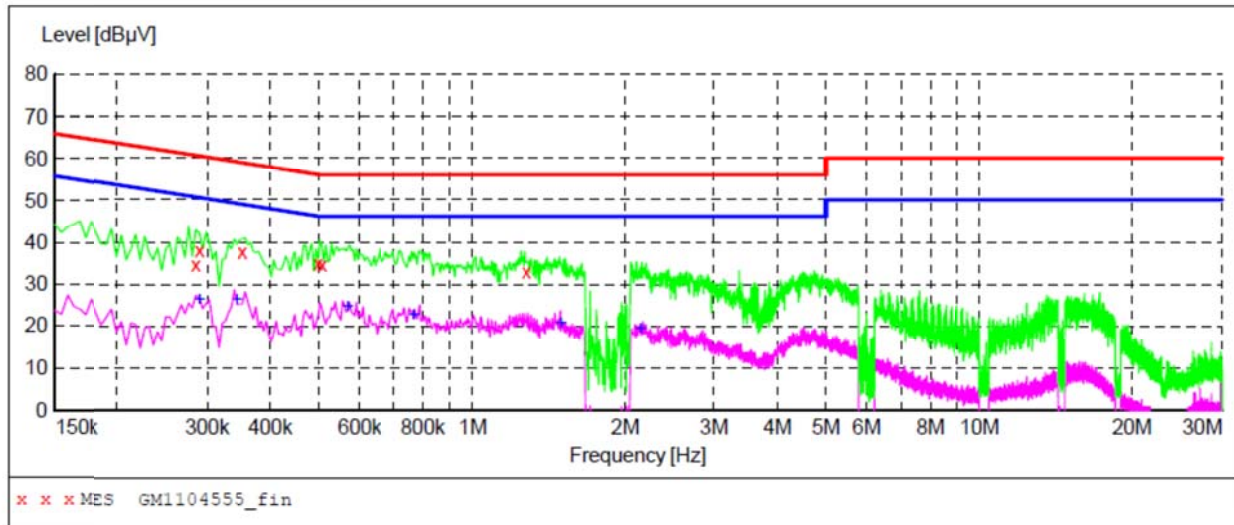
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.348000	38.70	10.2	59	20.3	QP	L1	GND
0.595500	34.50	10.2	56	21.5	QP	L1	GND
0.681000	38.30	10.2	56	17.7	QP	L1	GND
0.825000	35.70	10.2	56	20.3	QP	L1	GND
1.234500	35.10	10.2	56	20.9	QP	L1	GND
1.513500	34.40	10.2	56	21.6	QP	L1	GND

**MEASUREMENT RESULT: "GM1104556\_fin2"**

11/4/2015 9:02PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.289500	28.30	10.2	51	22.2	AV	L1	GND
0.348000	29.20	10.2	49	19.8	AV	L1	GND
0.717000	11.10	10.2	46	34.9	AV	L1	GND
1.464000	26.60	10.2	46	19.4	AV	L1	GND
2.161500	23.40	10.2	46	22.6	AV	L1	GND
4.303500	21.70	10.3	46	24.3	AV	L1	GND

Test mode:	GSM850	Polarization	N
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### MEASUREMENT RESULT: "GM1104555\_fin"

11/4/2015 8:58PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.285000	34.80	10.2	61	25.9	QP	N	GND
0.289500	38.00	10.2	61	22.5	QP	N	GND
0.352500	37.80	10.2	59	21.1	QP	N	GND
0.496500	35.10	10.2	56	21.0	QP	N	GND
0.505500	34.70	10.2	56	21.3	QP	N	GND
1.275000	33.10	10.2	56	22.9	QP	N	GND

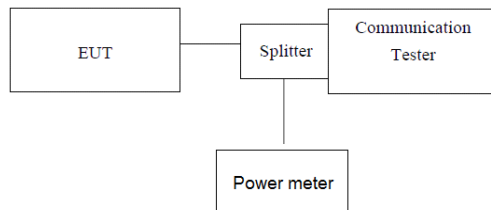
### MEASUREMENT RESULT: "GM1104555\_fin2"

11/4/2015 8:58PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.289500	26.40	10.2	51	24.1	AV	N	GND
0.343500	26.30	10.2	49	22.8	AV	N	GND
0.568500	24.70	10.2	46	21.3	AV	N	GND
0.766500	22.80	10.2	46	23.2	AV	N	GND
1.495500	20.90	10.2	46	25.1	AV	N	GND
2.143500	19.40	10.2	46	26.6	AV	N	GND

## 4.2. Conducted Peak Output Power

### TEST CONFIGURATION



*Note: Measurement setup for testing on Antenna connector*

### TEST PROCEDURE

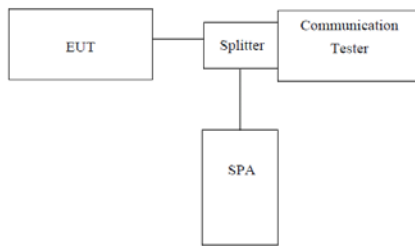
1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum burst average power.

### TEST RESULTS

EUT Mode	Channel	Frequency (MHz)	Power (dBm)
GSM 850 (GMSK)	128	824.20	33.15
	190	836.60	32.76
	251	848.80	33.28
GPRS850 (GMSK,1Slot)	128	824.20	33.24
	190	836.60	32.47
	251	848.80	33.32
PCS1900 (GMSK)	512	1850.20	29.68
	661	1880.00	29.17
	810	1909.80	29.74
GPRS1900 (GMSK,1Slot)	512	1850.20	29.85
	661	1880.00	29.64
	810	1909.80	29.25
WCDMA Band II	9262	1852.40	20.82
	9400	1880.00	20.29
	9538	1907.60	20.45
WCDMA Band V	4132	826.40	22.77
	4183	836.60	22.59
	4233	846.60	22.43

### 4.3. Occupy Bandwidth

#### TEST CONFIGURATION



*Note: Measurement setup for testing on Antenna connector*

#### 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.

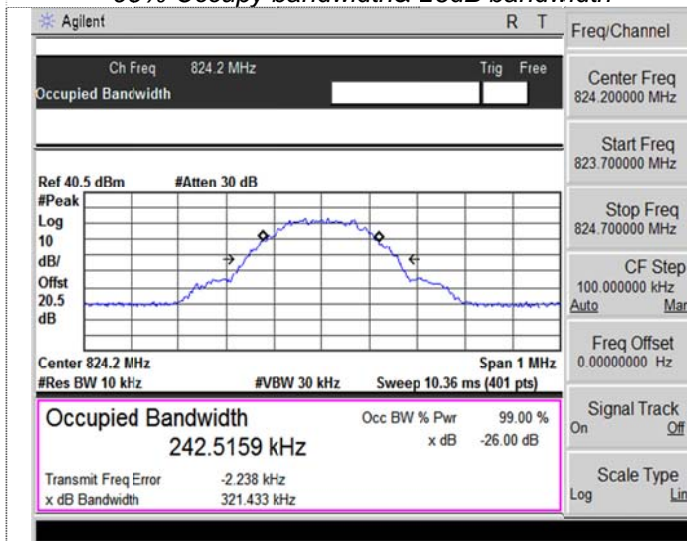
#### TEST RESULTS

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GMSK)	128	824.20	242.51	321.43
	190	836.60	246.99	317.09
	251	848.80	246.02	316.14
GPRS850 (GMSK,1Slot)	128	824.20	244.61	316.31
	190	836.60	245.57	317.38
	251	848.80	247.97	313.95
PCS1900 (GMSK)	512	1850.20	244.08	309.63
	661	1880.00	253.08	324.34
	810	1909.80	242.35	314.84
GPRS1900 (GMSK,1Slot)	512	1850.20	241.55	307.02
	661	1880.00	248.27	302.78
	810	1909.80	242.52	314.84
WCDMA Band II	9262	1852.4	4196.5	4819
	9400	1880.0	4191.9	4751
	9538	1907.6	4200.8	4798
WCDMA Band V	4132	826.4	4155	4691
	4183	836.6	4156.6	4697
	4233	846.6	4122.9	4698



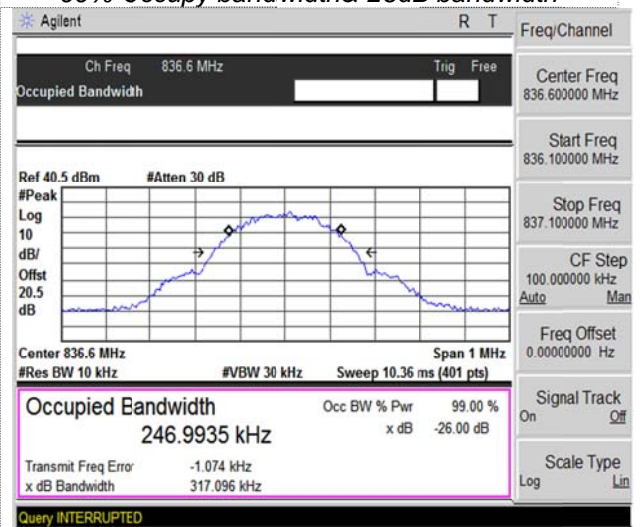
## GSM850 For GMSK Moudlation

99% Occupy bandwidth&amp;-26dB bandwidth

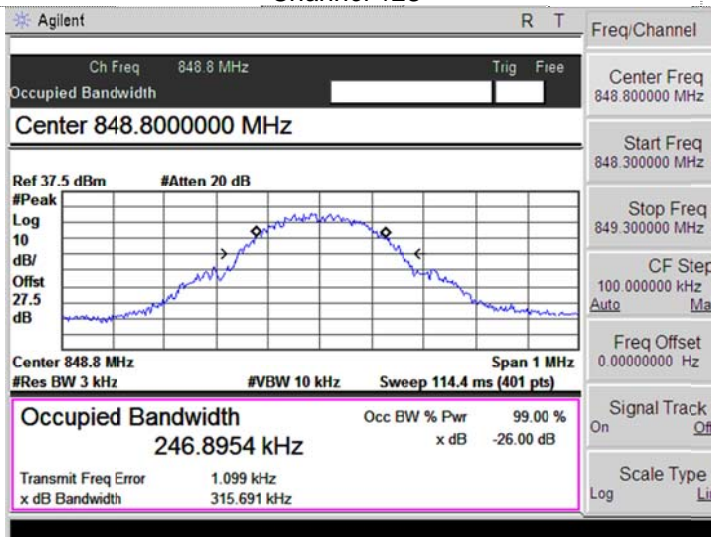


Channel 128

99% Occupy bandwidth&amp;-26dB bandwidth



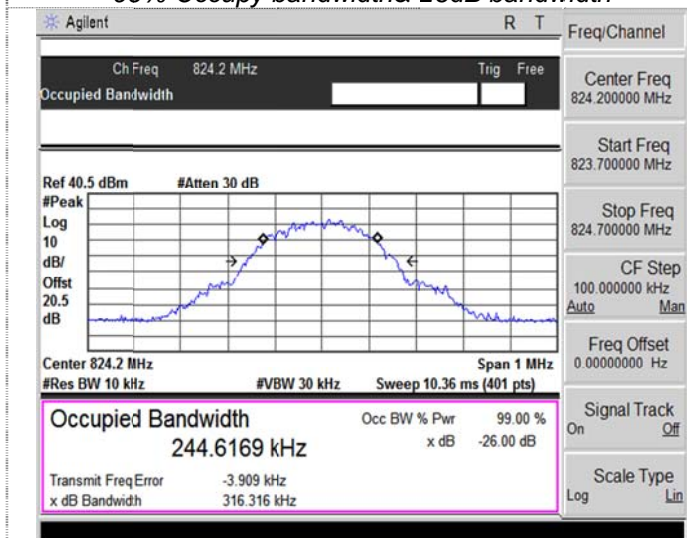
Channel 190



Channel 251

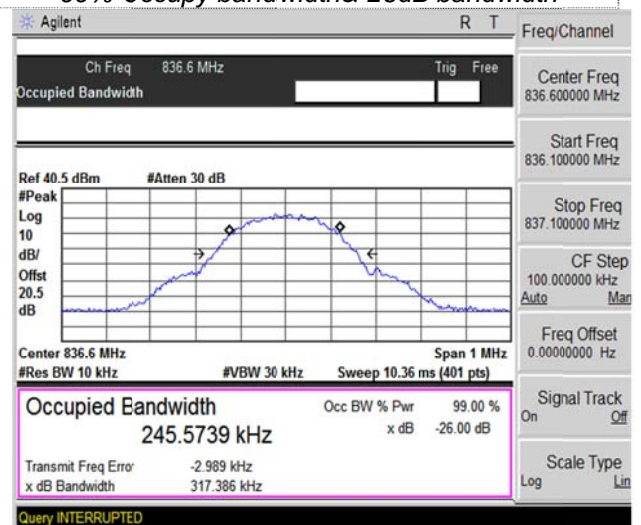
## GPRS850 For GMSK Moudlation

99% Occupy bandwidth&amp;-26dB bandwidth

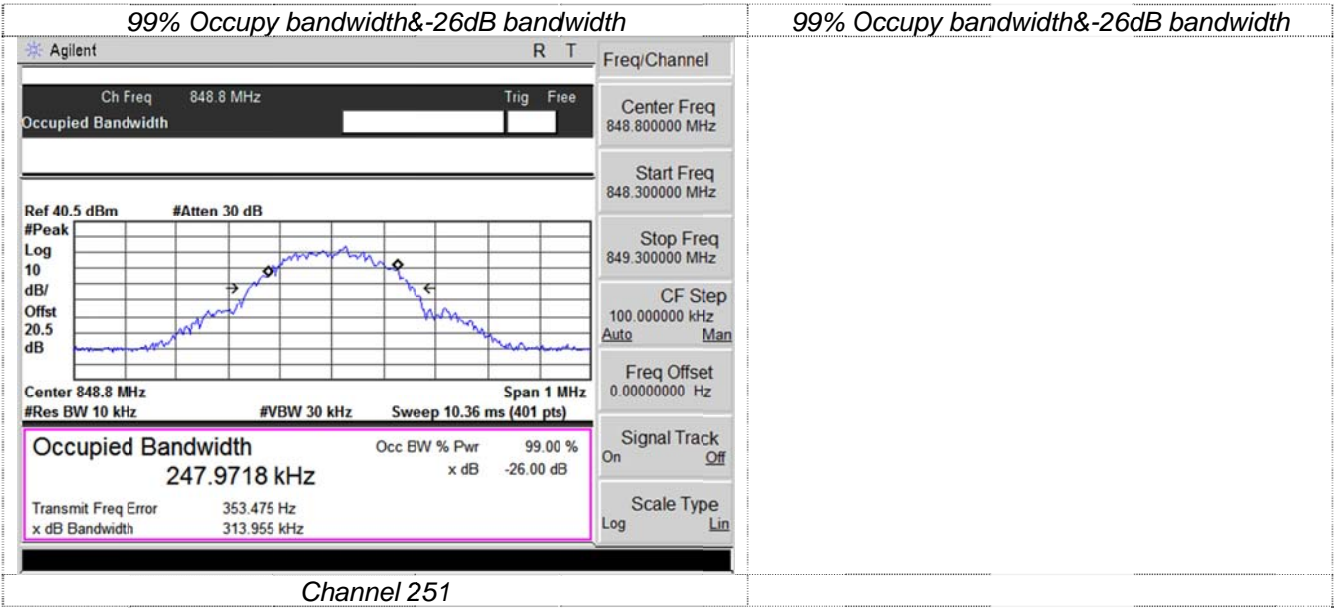


Channel 128

99% Occupy bandwidth&amp;-26dB bandwidth

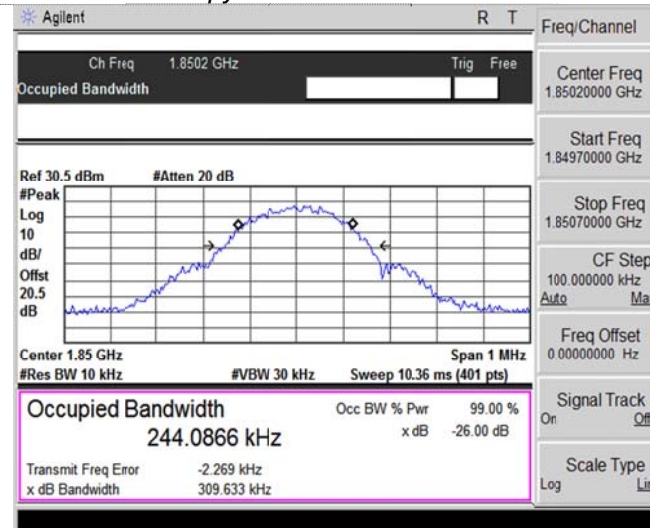


Channel 190



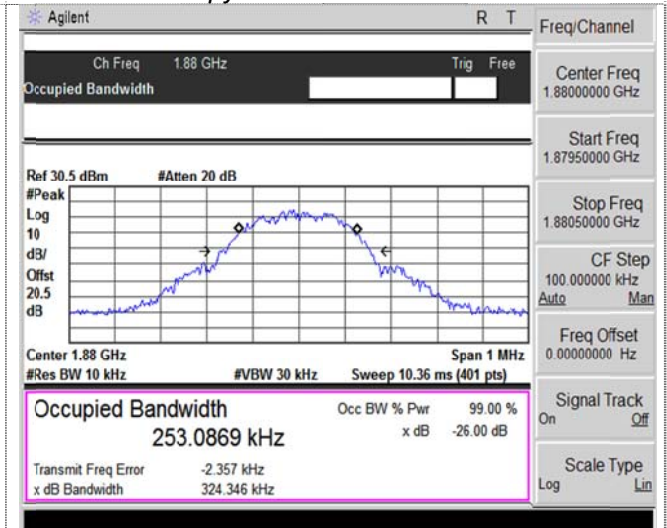
## PCS1900 For GMSK Modulation

## 99% Occupancy bandwidth &amp; -26dB bandwidth

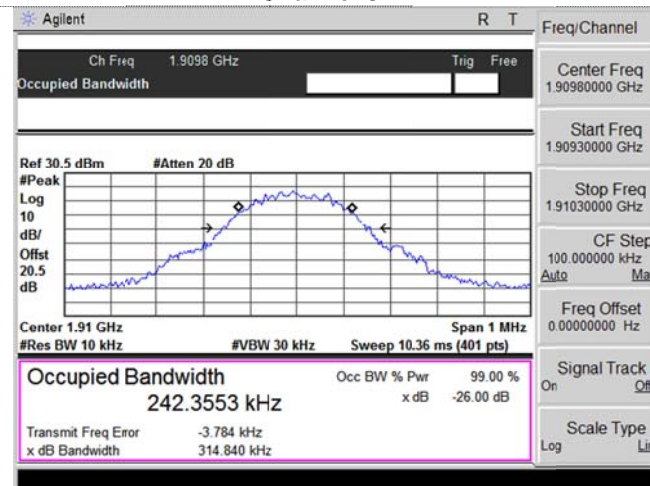


Channel 512

## 99% Occupancy bandwidth &amp; -26dB bandwidth



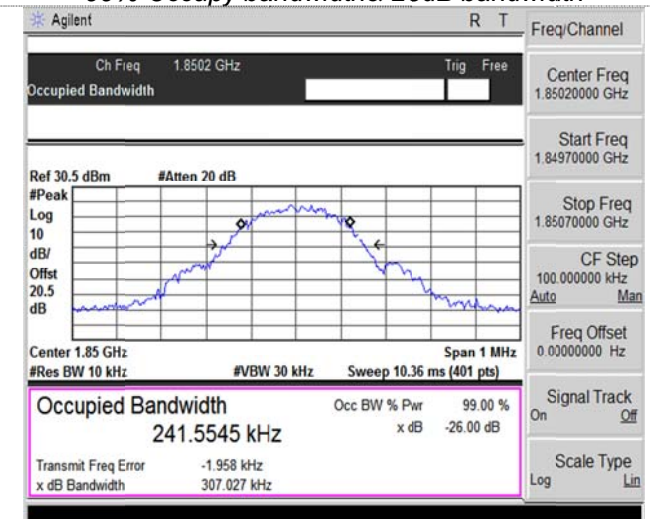
Channel 661



Channel 810

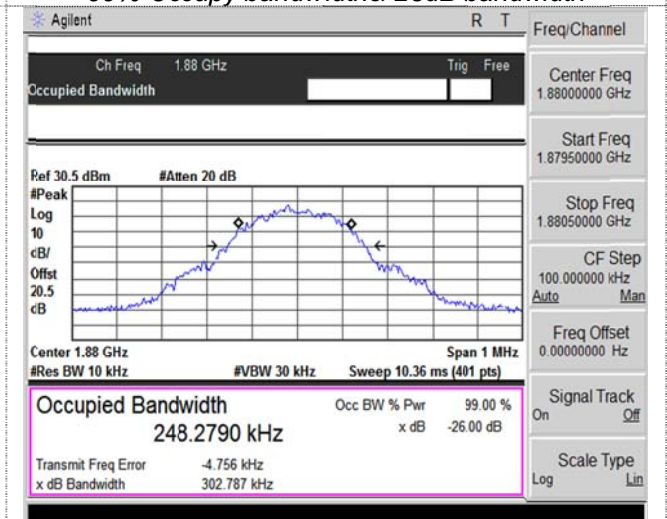
## GPRS1900 For GMSK Modulation

## 99% Occupancy bandwidth &amp; -26dB bandwidth



Channel 512

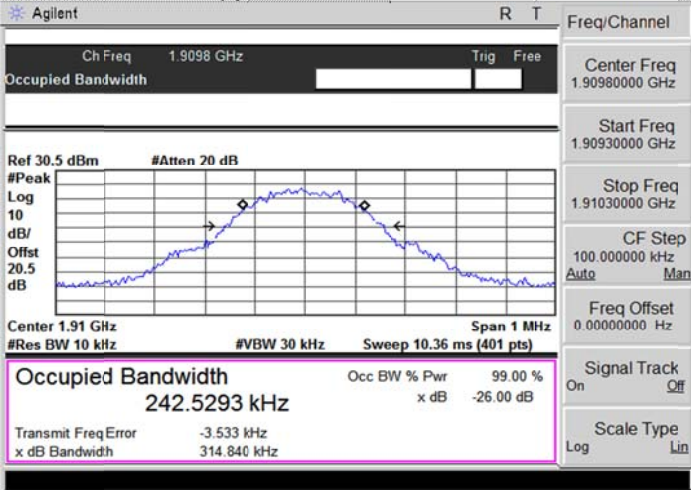
## 99% Occupancy bandwidth &amp; -26dB bandwidth



Channel 661



99% Occupy bandwidth&-26dB bandwidth

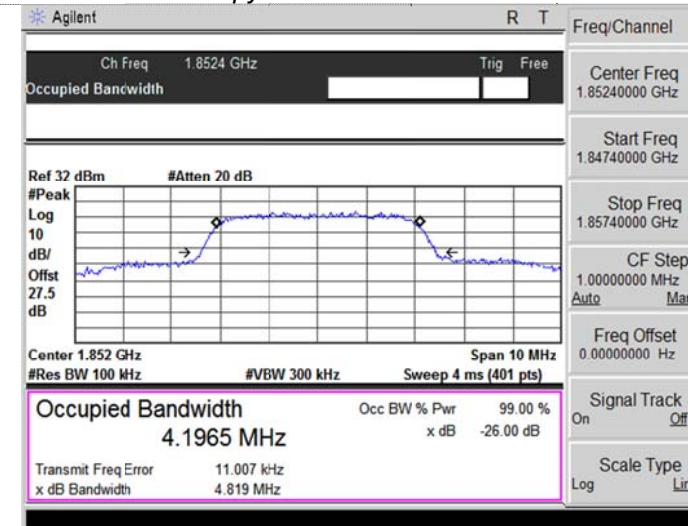


Channel 810

99% Occupy bandwidth&-26dB bandwidth

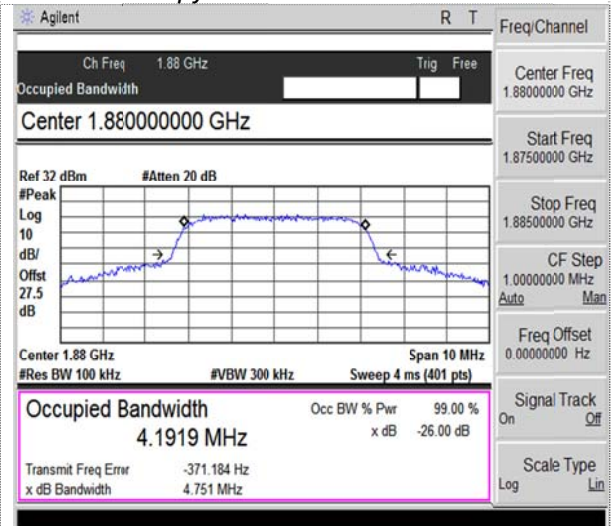
## WCDMA Band II

## 99% Occupy bandwidth&amp;-26dB bandwidth

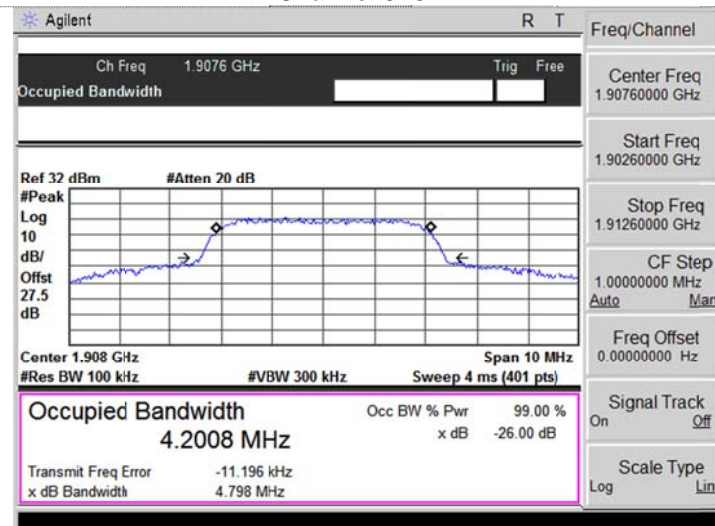


Channel 9262

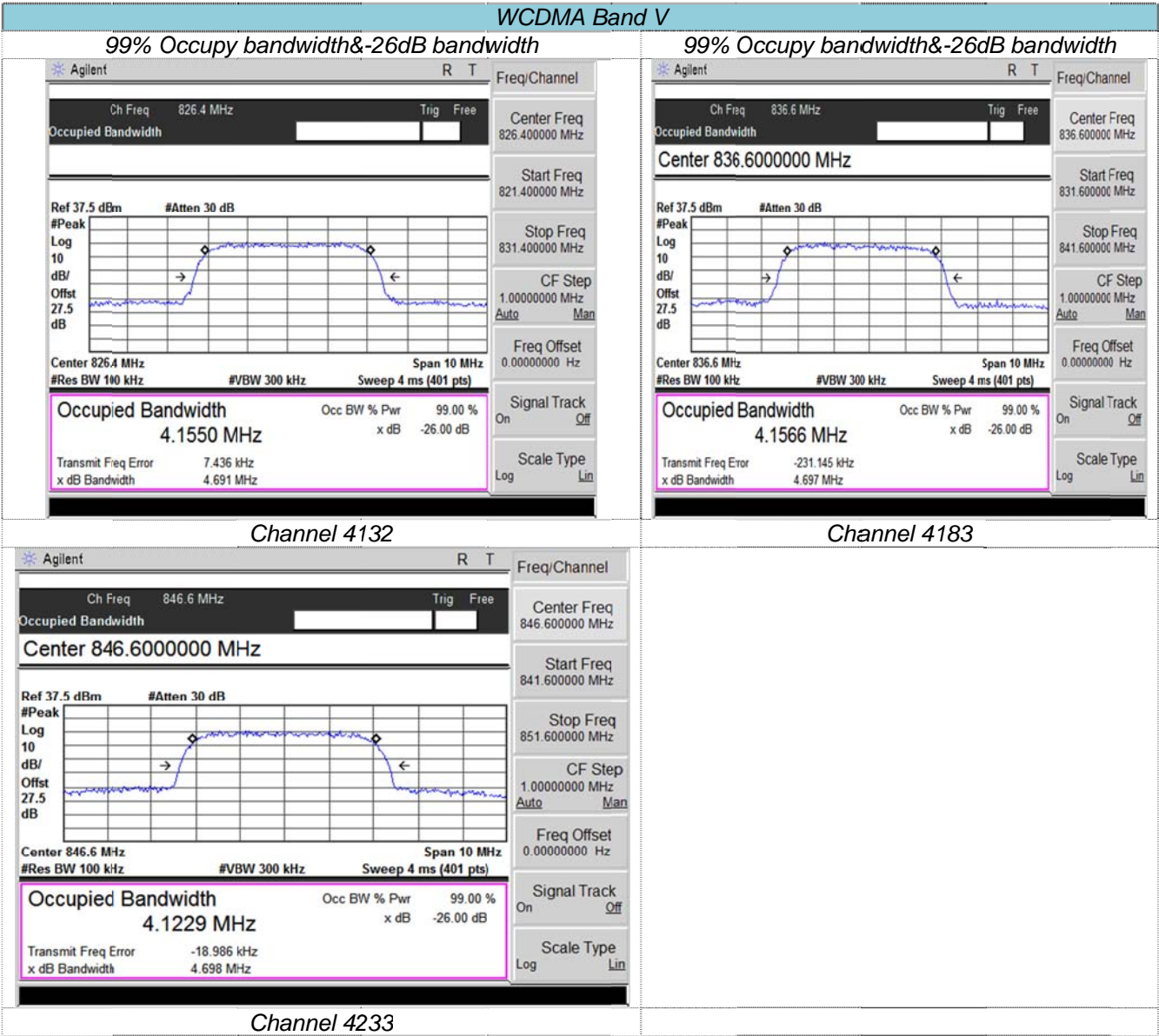
## 99% Occupy bandwidth&amp;-26dB bandwidth



Channel 9400



Channel 9538



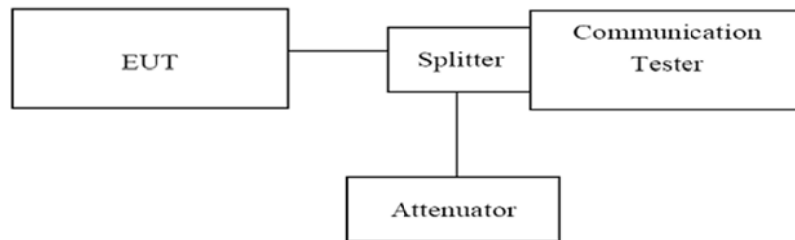
#### 4.4. Out of band emission at antenna terminals

##### LIMIT

Part 24.238 and Part 22.917 specify that 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.

The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

##### TEST CONFIGURATION



##### TEST PROCEDURE

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. For the out of band: Set the RBW= 1MHz, VBW = 3MHz, Start=30MHz, Stop= 10th harmonic.

##### TEST RESULTS

