



# FCC RF Test Report

**APPLICANT** : TCL Communication Ltd.  
**EQUIPMENT** : LTE Tablet  
**BRAND NAME** : ALCATEL ONETOUCH  
**MODEL NAME** : 9021A  
**MARKETING NAME** : ONETOUCH POP™ 8 LTE  
**FCC** : 2ACCJB023  
**STANDARD** : 47 CFR Part 2, 22(H), 24(E), 27(L), 27(H), 27(M)  
**CLASSIFICATION** : PCS Licensed Transmitter (PCB)

The product was received on Dec. 08, 2014 and testing was completed on Jan. 23, 2015. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and the testing has shown the tested sample to be in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



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## REVISION HISTORY



## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	Reporting Only	PASS	-
3.2	§24.232(d)	Peak-to-Average Ratio	<13 dB	PASS	-
3.3	§22.913(a)(2)	Effective Radiated Power (Band 5)	ERP < 7 Watt	PASS	-
	§27.50(c)(10)	Equivalent Isotropic Radiated Power (Band 17)	ERP < 3 Watt		
	§24.232(c) §27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 2) (Band 7)	EIRP < 2Watt		
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt		
3.4	§2.1049 §22.917(b) §24.238(b) §27.53(h)(3) §27.53(m)(6)	Occupied Bandwidth & 26dB Bandwidth	Reporting Only	PASS	-



Report Section	FCC Rule	Description	Limit	Result	Remark
3.5	§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 17)	< 43+10log <sub>10</sub> (P[Watt])	PASS	-
	§2.1051 §27.53(m)(4)	Conducted Band Edge Measurement (Band 7)	< 5MHz: -10 dBm 5 MHz~6MHz or 26dB(BW): -13 dBm ≥6MHz or 26dB(BW): -25 dBm		
3.6	§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 17)	< 43+10log <sub>10</sub> (P[Watts])	PASS	-
	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (Band 7)	< 55+10log <sub>10</sub> (P[Watts])		
3.7	§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 17)	< 43+10log <sub>10</sub> (P[Watts])	PASS	Under limit 5.03 dB at 5061.180 MHz
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (Band 7)	< 55+10log <sub>10</sub> (P[Watts])		
3.8	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	-
	§2.1055 §24.235 §27.54		within authorized band		



## 1 General Description

### 1.1 Applicant

**TCL Communication Ltd.**

5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P. R. China. 201203

### 1.2 Manufacturer

**TCL Communication Ltd.**

5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P. R. China. 201203

### 1.3 Product Feature of Equipment Under Test

Product Feature	
<b>Equipment</b>	LTE Tablet
<b>Brand Name</b>	ALCATEL ONETOUCH
<b>Model Name</b>	9021A
<b>Marketing Name</b>	ONETOUCH POP™ 8 LTE
<b>FCC</b>	2ACCJB023
<b>EUT supports Radios application</b>	WCDMA/HSPA/HSPA+(Downlink Only)/LTE/ WLAN 2.4GHz 802.11b/g/n HT20/ WLAN 5GHz 802.11a/n HT20/HT40/ Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
<b>HW Version</b>	V05
<b>SW Version</b>	C43
<b>EUT Stage</b>	Production Unit

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



## 1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
<b>Tx Frequency</b>	LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz
<b>Rx Frequency</b>	LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 7 : 2622.5MHz ~ 2687.5 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz
<b>Bandwidth</b>	LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 7 : 5MHz/ 10MHz / 15MHz / 20MHz LTE Band 17 : 5MHz / 10MHz
<b>Maximum Output Power to Antenna</b>	LTE Band 2 : 22.51 dBm LTE Band 4 : 22.77 dBm LTE Band 5 : 22.63 dBm LTE Band 7 : 21.66 dBm LTE Band 17 : 22.39 dBm
<b>Antenna Type</b>	IFA Antenna
<b>Type of Modulation</b>	QPSK / 16QAM



## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	BW	Maximum ERP/EIRP (W)	Frequency Tolerance	Emission Designator
Part 24E	LTE Band 2	QPSK	1.4MHz	0.25 W	-	1M10G7D
Part 24E	LTE Band 2	16QAM	1.4MHz	0.19 W	-	1M10W7D
Part 24E	LTE Band 2	QPSK	3MHz	0.23 W	-	2M73G7D
Part 24E	LTE Band 2	16QAM	3MHz	0.18 W	-	2M73W7D
Part 24E	LTE Band 2	QPSK	5MHz	0.23 W	-	4M50G7D
Part 24E	LTE Band 2	16QAM	5MHz	0.17 W	-	4M50W7D
Part 24E	LTE Band 2	QPSK	10MHz	0.24 W	0.0122 ppm	9M07G7D
Part 24E	LTE Band 2	16QAM	10MHz	0.17 W	-	9M03W7D
Part 24E	LTE Band 2	QPSK	15MHz	0.24 W	-	13M5G7D
Part 24E	LTE Band 2	16QAM	15MHz	0.17 W	-	13M5W7D
Part 24E	LTE Band 2	QPSK	20MHz	0.23 W	-	18M4G7D
Part 24E	LTE Band 2	16QAM	20MHz	0.18 W	-	18M3W7D
Part 27L	LTE Band 4	QPSK	1.4MHz	0.28 W	-	1M10G7D
Part 27L	LTE Band 4	16QAM	1.4MHz	0.23 W	-	1M10W7D
Part 27L	LTE Band 4	QPSK	3MHz	0.28 W	-	2M73G7D
Part 27L	LTE Band 4	16QAM	3MHz	0.22 W	-	2M74W7D
Part 27L	LTE Band 4	QPSK	5MHz	0.30 W	-	4M50G7D
Part 27L	LTE Band 4	16QAM	5MHz	0.21 W	-	4M50W7D
Part 27L	LTE Band 4	QPSK	10MHz	0.31 W	0.0017 ppm	9M07G7D
Part 27L	LTE Band 4	16QAM	10MHz	0.23 W	-	9M05W7D
Part 27L	LTE Band 4	QPSK	15MHz	0.30 W	-	13M5G7D
Part 27L	LTE Band 4	16QAM	15MHz	0.23 W	-	13M5W7D
Part 27L	LTE Band 4	QPSK	20MHz	0.29 W	-	18M6G7D
Part 27L	LTE Band 4	16QAM	20MHz	0.22 W	-	18M5W7D



FCC Rule	System	Type of Modulation	BW	Maximum ERP/EIRP (W)	Frequency Tolerance	Emission Designator
Part 22H	LTE Band 5	QPSK	1.4 MHz	0.07 W	-	1M10G7D
Part 22H	LTE Band 5	16QAM	1.4 MHz	0.05 W	-	1M10W7D
Part 22H	LTE Band 5	QPSK	3 MHz	0.07 W	-	2M72G7D
Part 22H	LTE Band 5	16QAM	3 MHz	0.05 W	-	2M73W7D
Part 22H	LTE Band 5	QPSK	5 MHz	0.06 W	-	4M49G7D
Part 22H	LTE Band 5	16QAM	5 MHz	0.05 W	-	4M49W7D
Part 22H	LTE Band 5	QPSK	10 MHz	0.06 W	0.0036 ppm	9M11G7D
Part 22H	LTE Band 5	16QAM	10 MHz	0.05 W	-	9M03W7D
Part 27M	LTE Band 7	QPSK	5MHz	0.36 W	-	4M50G7D
Part 27M	LTE Band 7	16QAM	5MHz	0.27 W	-	4M50W7D
Part 27M	LTE Band 7	QPSK	10MHz	0.38 W	0.0126 ppm	9M07G7D
Part 27M	LTE Band 7	16QAM	10MHz	0.28 W	-	9M03W7D
Part 27M	LTE Band 7	QPSK	15MHz	0.38 W	-	13M5G7D
Part 27M	LTE Band 7	16QAM	15MHz	0.28 W	-	13M5W7D
Part 27M	LTE Band 7	QPSK	20MHz	0.36 W	-	18M4G7D
Part 27M	LTE Band 7	16QAM	20MHz	0.27 W	-	18M4W7D
Part 27H	LTE Band 17	QPSK	5MHz	0.06 W	-	4M50G7D
Part 27H	LTE Band 17	16QAM	5MHz	0.04 W	-	4M50W7D
Part 27H	LTE Band 17	QPSK	10MHz	0.06 W	0.0042 ppm	9M13G7D
Part 27H	LTE Band 17	16QAM	10MHz	0.05 W	-	9M01W7D



## 1.7 Testing Location

<b>Test Site</b>	SPORTON INTERNATIONAL (SHENZHEN) INC.	
<b>Test Site Location</b>	1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
<b>Test Site No.</b>	<b>Sporton Site No.</b> TH01-SZ      OTA02-SZ	
<b>Test Site</b>	SPORTON INTERNATIONAL (SHENZHEN) INC.	
<b>Test Site Location</b>	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
<b>Test Site No.</b>	<b>Sporton Site No.</b> 03CH01-SZ	<b>FCC Registration No.</b> 831040

## 1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 22(H), 24(E), 27(L), 27(H), 27(M)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

### Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

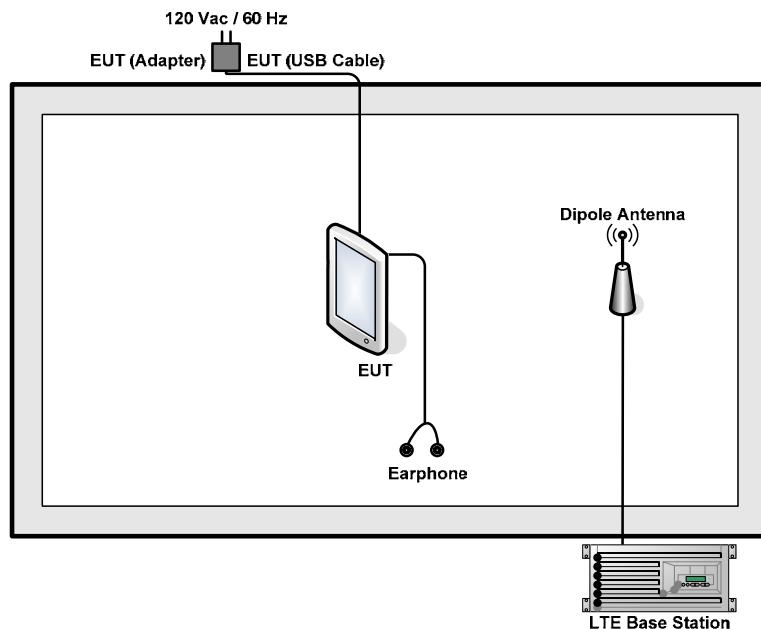
Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	7	-	-	v	v	v	v	v	v	v	v	v	v	v	v
	17	-	-	v	v	-	-	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	2						v	v	v	v		v	v	v	v
	4						v	v	v	v		v	v	v	v
	5				v	-	-	v	v	v		v	v	v	v
	7	-	-				v	v	v	v		v	v	v	v
	17	-	-	v	-	-	v	v	v	v		v	v	v	v
26dB and 99% Bandwidth	2	v	v	v	v	v	v	v	v			v	v	v	v
	4	v	v	v	v	v	v	v	v			v	v	v	v
	5	v	v	v	v	-	-	v	v			v	v	v	v
	7	-	-	v	v	v	v	v	v			v	v	v	v
	17	-	-	v	v	-	-	v	v			v	v	v	v
Conducted Band Edge	2	v	v	v	v	v	v	v	v	v	v	v	v		v
	4	v	v	v	v	v	v	v	v	v	v	v	v		v
	5	v	v	v	v	-	-	v	v	v		v	v		v
	7	-	-	v	v	v	v	v	v	v		v	v		v
	17	-	-	v	v	-	-	v	v	v		v	v		v



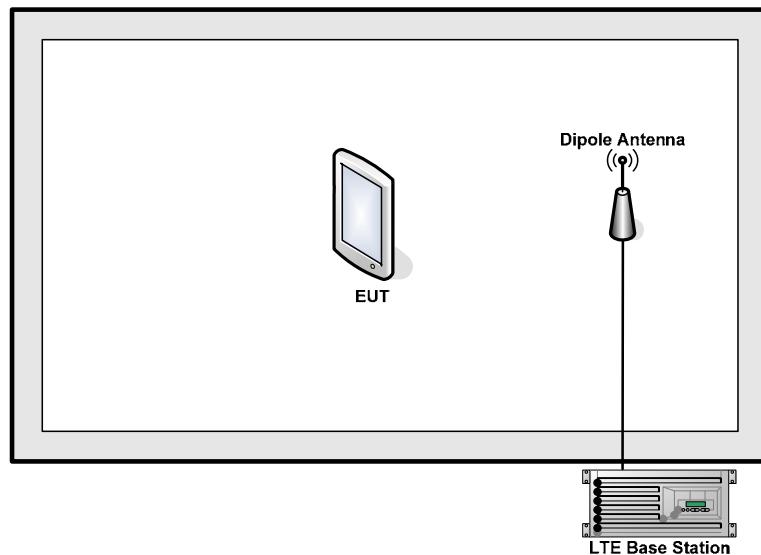
Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Conducted Spurious Emission	2	v	v	v	v	v	v	v	v	v	v		v	v	v
	4	v	v	v	v	v	v	v	v	v	v		v	v	v
	5	v	v	v	v	-	-	v	v	v	v		v	v	v
	7	-	-	v	v	v	v	v	v	v	v		v	v	v
	17	-	-	v	v	-	-	v	v	v	v		v	v	v
Frequency Stability	2				v			v					v		v
	4				v			v					v		v
	5				v	-	-	v					v		v
	7	-	-	v				v					v		v
	17	-	-	v	v	-	-	v					v		v
E.R.P./E.I.R.P.	2	v	v	v	v	v	v	v	v	v	v		v	v	v
	4	v	v	v	v	v	v	v	v	v	v		v	v	v
	5	v	v	v	v	-	-	v	v	v	v		v	v	v
	7	-	-	v	v	v	v	v	v	v	v		v	v	v
	17	-	-	v	v	-	-	v	v	v	v		v	v	v
Radiated Spurious Emission	2	v	v	v	v	v	v	v		v			v	v	v
	4	v	v	v	v	v	v	v		v			v	v	v
	5	v	v	v	v	-	-	v		v			v	v	v
	7	-	-	v	v	v	v	v		v			v	v	v
	17	-	-	v	v	-	-	v		v			v	v	v
Note	<ol style="list-style-type: none"> <li>The mark "v" means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>For E. R.P./E.I.R.P. measurement, the widest bandwidth of each band is chosen for testing due to highest conducted power. Besides, the lowest bandwidth of each band is also measured for reporting only.</li> <li>The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.</li> </ol>														

## 2.2 Connection Diagram of Test System

<Part22H/27H Tx Mode>



<Part24E/27L/27M Tx Mode>





## 2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	TOPWORD	3303DR	N/A	N/A	Unshielded, 1.8 m
3.	Earphone	Lenovo	SH100	N/A	Unshielded, 1.2 m	N/A

## 2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

$$\text{Offset} = \text{RF cable loss} + \text{attenuator factor}.$$

Following shows an offset computation example with cable loss 5 dB and 10dB attenuator.

Example :

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 5 + 10 = 15 \text{ (dB)}\end{aligned}$$

### 3 Test Result

#### 3.1 Conducted Output Power Measurement

##### 3.1.1 Description of the Conducted Output Power Measurement

A LTE base station was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

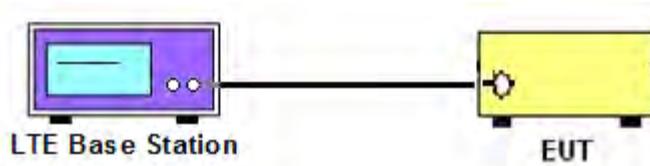
##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

##### 3.1.3 Test Procedures

1. The transmitter output port was connected to the LTE base station.
2. Set EUT at maximum power through the LTE base station.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the LTE base station.

##### 3.1.4 Test Setup





### 3.1.5 Test Result of Conducted Output Power

#### <LTE Band 2 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>18700</b>	<b>18900</b>	<b>19100</b>
<b>Frequency (MHz)</b>				<b>1860</b>	<b>1880</b>	<b>1900</b>
20	QPSK	1	0	22.08	21.82	22.40
20	QPSK	1	49	22.32	<b>22.51</b>	22.45
20	QPSK	1	99	22.05	22.21	22.07
20	QPSK	50	0	20.92	21.16	21.29
20	QPSK	50	24	20.97	21.25	21.28
20	QPSK	50	49	21.00	21.33	21.30
20	QPSK	100	0	20.92	21.20	21.15
20	16QAM	1	0	20.68	20.85	21.27
20	16QAM	1	49	20.81	21.18	21.70
20	16QAM	1	99	20.68	21.89	21.41
20	16QAM	50	0	19.88	20.02	20.27
20	16QAM	50	24	19.89	20.10	20.14
20	16QAM	50	49	19.80	20.17	19.97
20	16QAM	100	0	19.80	20.03	20.07
<b>Channel</b>				<b>18675</b>	<b>18900</b>	<b>19125</b>
<b>Frequency (MHz)</b>				<b>1857.5</b>	<b>1880</b>	<b>1902.5</b>
15	QPSK	1	0	21.96	22.24	22.44
15	QPSK	1	37	21.78	22.08	22.25
15	QPSK	1	74	21.83	22.06	22.00
15	QPSK	36	0	20.91	21.15	21.34
15	QPSK	36	18	21.02	21.21	21.18
15	QPSK	36	37	20.85	21.32	20.89
15	QPSK	75	0	21.03	21.06	21.24
15	16QAM	1	0	20.85	20.98	21.24
15	16QAM	1	37	20.77	20.88	21.10
15	16QAM	1	74	20.75	20.68	20.79
15	16QAM	36	0	19.80	20.07	20.19
15	16QAM	36	18	19.91	20.11	20.15
15	16QAM	36	37	19.75	20.22	19.88
15	16QAM	75	0	19.93	19.98	20.16



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>18650</b>	<b>18900</b>	<b>19150</b>
<b>Frequency (MHz)</b>				<b>1855</b>	<b>1880</b>	<b>1905</b>
10	QPSK	1	0	22.24	22.32	22.24
10	QPSK	1	24	21.81	22.25	21.81
10	QPSK	1	49	22.00	22.08	22.00
10	QPSK	25	0	21.22	21.20	21.22
10	QPSK	25	12	21.11	21.17	21.11
10	QPSK	25	24	20.95	21.20	20.95
10	QPSK	50	0	21.05	21.14	21.05
10	16QAM	1	0	20.91	20.91	20.91
10	16QAM	1	24	20.74	20.88	20.74
10	16QAM	1	49	20.63	20.77	20.63
10	16QAM	25	0	20.16	20.08	20.16
10	16QAM	25	12	19.89	20.17	19.89
10	16QAM	25	24	19.94	20.09	19.94
10	16QAM	50	0	19.98	19.99	19.98
<b>Channel</b>				<b>18625</b>	<b>18900</b>	<b>19175</b>
<b>Frequency (MHz)</b>				<b>1852.5</b>	<b>1880</b>	<b>1907.5</b>
5	QPSK	1	0	22.11	22.23	22.11
5	QPSK	1	12	22.08	22.11	21.95
5	QPSK	1	24	21.98	22.10	21.99
5	QPSK	12	0	20.93	21.17	21.05
5	QPSK	12	6	20.97	21.14	20.87
5	QPSK	12	11	20.94	21.18	20.80
5	QPSK	25	0	20.95	21.12	20.90
5	16QAM	1	0	21.10	21.44	21.20
5	16QAM	1	12	21.01	20.95	21.13
5	16QAM	1	24	21.02	21.27	21.02
5	16QAM	12	0	19.90	20.11	20.10
5	16QAM	12	6	19.84	20.18	19.91
5	16QAM	12	11	19.92	20.11	19.85
5	16QAM	25	0	20.03	20.11	19.89



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>18615</b>	<b>18900</b>	<b>19185</b>
<b>Frequency (MHz)</b>				<b>1851.5</b>	<b>1880</b>	<b>1908.5</b>
3	QPSK	1	0	22.05	22.31	22.10
3	QPSK	1	7	21.95	22.13	21.92
3	QPSK	1	14	22.01	22.10	22.04
3	QPSK	8	0	21.01	21.13	20.89
3	QPSK	8	4	20.98	21.20	21.19
3	QPSK	8	7	21.03	21.18	20.97
3	QPSK	15	0	20.98	21.14	21.15
3	16QAM	1	0	20.68	20.97	20.63
3	16QAM	1	7	20.58	20.66	20.60
3	16QAM	1	14	20.47	20.95	20.60
3	16QAM	8	0	19.91	20.02	19.90
3	16QAM	8	4	19.89	20.08	19.78
3	16QAM	8	7	19.84	20.06	20.07
3	16QAM	15	0	19.86	19.96	20.11
<b>Channel</b>				<b>18607</b>	<b>18900</b>	<b>19193</b>
<b>Frequency (MHz)</b>				<b>1850.7</b>	<b>1880</b>	<b>1909.3</b>
1.4	QPSK	1	0	22.11	22.34	21.94
1.4	QPSK	1	2	21.71	21.94	21.98
1.4	QPSK	1	5	22.06	22.24	21.97
1.4	QPSK	3	0	22.16	22.37	22.01
1.4	QPSK	3	1	22.04	22.31	21.97
1.4	QPSK	3	2	22.08	22.35	21.99
1.4	QPSK	6	0	21.04	21.18	20.97
1.4	16QAM	1	0	21.06	20.85	20.83
1.4	16QAM	1	2	21.09	21.36	20.77
1.4	16QAM	1	5	21.08	21.19	20.77
1.4	16QAM	3	0	21.59	21.41	20.97
1.4	16QAM	3	1	21.19	21.03	20.95
1.4	16QAM	3	2	21.08	21.26	20.89
1.4	16QAM	6	0	19.95	20.18	19.82



## &lt;LTE Band 4 Conducted Power&gt;

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20050</b>	<b>20175</b>	<b>20300</b>
<b>Frequency (MHz)</b>				<b>1720</b>	<b>1732.5</b>	<b>1745</b>
20	QPSK	1	0	22.63	22.57	22.63
20	QPSK	1	49	22.76	<b>22.77</b>	22.75
20	QPSK	1	99	22.57	22.40	22.56
20	QPSK	50	0	21.74	21.71	21.74
20	QPSK	50	24	21.59	21.64	21.59
20	QPSK	50	49	21.77	21.82	21.75
20	QPSK	100	0	21.79	21.80	21.75
20	16QAM	1	0	21.49	21.35	21.49
20	16QAM	1	49	21.50	21.62	21.50
20	16QAM	1	99	21.37	21.37	21.33
20	16QAM	50	0	20.59	20.60	20.59
20	16QAM	50	24	20.57	20.55	20.57
20	16QAM	50	49	20.66	20.53	20.66
20	16QAM	100	0	20.68	20.56	20.68
<b>Channel</b>				<b>20025</b>	<b>20175</b>	<b>20325</b>
<b>Frequency (MHz)</b>				<b>1717.5</b>	<b>1732.5</b>	<b>1747.5</b>
15	QPSK	1	0	22.71	22.75	22.58
15	QPSK	1	37	22.72	22.62	22.63
15	QPSK	1	74	22.63	22.57	22.70
15	QPSK	36	0	21.72	21.73	21.59
15	QPSK	36	18	21.72	21.52	21.62
15	QPSK	36	37	21.74	21.59	21.82
15	QPSK	75	0	21.77	21.62	21.72
15	16QAM	1	0	21.89	22.12	21.74
15	16QAM	1	37	21.87	21.70	21.82
15	16QAM	1	74	21.84	21.66	21.91
15	16QAM	36	0	20.70	20.58	20.56
15	16QAM	36	18	20.71	20.49	20.61
15	16QAM	36	37	20.73	20.57	20.73
15	16QAM	75	0	20.75	20.58	20.68



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20000</b>	<b>20175</b>	<b>20350</b>
<b>Frequency (MHz)</b>				<b>1715</b>	<b>1732.5</b>	<b>1750</b>
10	QPSK	1	0	22.72	22.73	22.49
10	QPSK	1	24	22.73	22.53	22.52
10	QPSK	1	49	22.70	22.64	22.67
10	QPSK	25	0	21.79	21.58	21.64
10	QPSK	25	12	21.74	21.53	21.75
10	QPSK	25	24	21.70	21.51	21.81
10	QPSK	50	0	21.76	21.64	21.81
10	16QAM	1	0	21.84	21.57	21.62
10	16QAM	1	24	21.79	21.45	21.59
10	16QAM	1	49	21.79	21.44	21.73
10	16QAM	25	0	20.69	20.47	20.60
10	16QAM	25	12	20.67	20.55	20.69
10	16QAM	25	24	20.59	20.54	20.74
10	16QAM	50	0	20.73	20.60	20.78
<b>Channel</b>				<b>19975</b>	<b>20175</b>	<b>20375</b>
<b>Frequency (MHz)</b>				<b>1712.5</b>	<b>1732.5</b>	<b>1752.5</b>
5	QPSK	1	0	22.74	22.52	22.72
5	QPSK	1	12	22.75	22.50	22.70
5	QPSK	1	24	22.72	22.50	22.73
5	QPSK	12	0	21.77	21.57	21.86
5	QPSK	12	6	21.71	21.60	21.79
5	QPSK	12	11	21.70	21.55	21.92
5	QPSK	25	0	21.75	21.58	21.84
5	16QAM	1	0	21.35	21.34	21.52
5	16QAM	1	12	21.28	21.25	21.44
5	16QAM	1	24	21.34	21.07	21.42
5	16QAM	12	0	20.77	20.53	20.85
5	16QAM	12	6	20.71	20.58	20.81
5	16QAM	12	11	20.66	20.52	20.90
5	16QAM	25	0	20.73	20.59	20.79



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>19965</b>	<b>20175</b>	<b>20385</b>
<b>Frequency (MHz)</b>				<b>1711.5</b>	<b>1732.5</b>	<b>1753.5</b>
3	QPSK	1	0	22.72	22.51	22.73
3	QPSK	1	7	22.65	22.50	22.74
3	QPSK	1	14	22.73	22.49	22.72
3	QPSK	8	0	21.77	21.59	21.86
3	QPSK	8	4	21.73	21.49	21.87
3	QPSK	8	7	21.66	21.51	21.77
3	QPSK	15	0	21.79	21.55	21.93
3	16QAM	1	0	21.81	21.94	21.61
3	16QAM	1	7	21.75	21.80	21.60
3	16QAM	1	14	21.70	21.29	21.63
3	16QAM	8	0	20.79	20.56	20.85
3	16QAM	8	4	20.76	20.49	20.82
3	16QAM	8	7	20.69	20.52	20.76
3	16QAM	15	0	20.67	20.46	20.85
<b>Channel</b>				<b>19957</b>	<b>20175</b>	<b>20393</b>
<b>Frequency (MHz)</b>				<b>1710.7</b>	<b>1732.5</b>	<b>1754.3</b>
1.4	QPSK	1	0	22.72	22.58	22.72
1.4	QPSK	1	2	22.74	22.62	22.74
1.4	QPSK	1	5	22.73	22.61	22.73
1.4	QPSK	3	0	22.70	22.63	22.72
1.4	QPSK	3	1	22.72	22.55	22.70
1.4	QPSK	3	2	22.71	22.56	22.73
1.4	QPSK	6	0	21.74	21.64	21.86
1.4	16QAM	1	0	21.81	21.58	21.50
1.4	16QAM	1	2	21.61	21.57	21.59
1.4	16QAM	1	5	21.65	21.44	21.70
1.4	16QAM	3	0	21.73	21.65	21.81
1.4	16QAM	3	1	21.68	21.59	21.85
1.4	16QAM	3	2	21.69	21.51	21.80
1.4	16QAM	6	0	20.70	20.46	20.63



## &lt;LTE Band 5 Conducted Power&gt;

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20450</b>	<b>20525</b>	<b>20600</b>
<b>Frequency (MHz)</b>				<b>829</b>	<b>836.5</b>	<b>844</b>
10	QPSK	1	0	22.15	22.11	22.31
10	QPSK	1	24	22.12	22.19	22.36
10	QPSK	1	49	22.29	22.33	<b>22.63</b>
10	QPSK	25	0	21.16	21.14	21.29
10	QPSK	25	12	21.21	21.19	21.41
10	QPSK	25	24	21.17	21.16	21.33
10	QPSK	50	0	21.22	21.17	21.35
10	16QAM	1	0	21.30	21.47	21.36
10	16QAM	1	24	21.03	21.41	21.49
10	16QAM	1	49	21.37	21.54	21.72
10	16QAM	25	0	20.21	20.22	20.36
10	16QAM	25	12	20.27	20.19	20.30
10	16QAM	25	24	20.24	20.25	20.33
10	16QAM	50	0	20.17	20.24	20.34
<b>Channel</b>				<b>20425</b>	<b>20525</b>	<b>20625</b>
<b>Frequency (MHz)</b>				<b>826.5</b>	<b>836.5</b>	<b>846.5</b>
5	QPSK	1	0	22.06	22.01	22.25
5	QPSK	1	12	21.98	22.08	22.26
5	QPSK	1	24	22.07	21.99	22.48
5	QPSK	12	0	21.26	21.16	21.38
5	QPSK	12	6	21.19	21.21	21.41
5	QPSK	12	11	21.25	21.23	21.49
5	QPSK	25	0	21.16	21.12	21.53
5	16QAM	1	0	21.14	21.05	21.25
5	16QAM	1	12	20.96	21.05	21.20
5	16QAM	1	24	21.15	21.11	21.48
5	16QAM	12	0	20.08	20.23	20.26
5	16QAM	12	6	20.13	20.30	20.50
5	16QAM	12	11	20.09	20.23	20.53
5	16QAM	25	0	20.18	20.15	20.52



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20415</b>	<b>20525</b>	<b>20635</b>
<b>Frequency (MHz)</b>				<b>825.5</b>	<b>836.5</b>	<b>847.5</b>
3	QPSK	1	0	22.25	22.16	22.61
3	QPSK	1	7	22.06	22.15	22.48
3	QPSK	1	14	22.12	22.09	22.45
3	QPSK	8	0	21.23	21.25	21.37
3	QPSK	8	4	21.09	21.20	21.59
3	QPSK	8	7	21.23	21.17	21.60
3	QPSK	15	0	21.20	21.20	21.60
3	16QAM	1	0	21.34	21.44	21.95
3	16QAM	1	7	21.22	21.38	21.66
3	16QAM	1	14	21.32	21.25	21.50
3	16QAM	8	0	20.20	20.22	20.37
3	16QAM	8	4	20.21	20.29	20.60
3	16QAM	8	7	20.32	20.26	20.62
3	16QAM	15	0	20.02	20.05	20.38
<b>Channel</b>				<b>20407</b>	<b>20525</b>	<b>20643</b>
<b>Frequency (MHz)</b>				<b>824.7</b>	<b>836.5</b>	<b>848.3</b>
1.4	QPSK	1	0	22.23	22.11	22.50
1.4	QPSK	1	2	22.17	22.23	22.53
1.4	QPSK	1	5	22.11	22.22	22.61
1.4	QPSK	3	0	22.22	22.20	22.62
1.4	QPSK	3	1	22.27	22.26	22.56
1.4	QPSK	3	2	22.26	22.23	22.54
1.4	QPSK	6	0	21.33	21.25	21.60
1.4	16QAM	1	0	21.10	21.10	21.43
1.4	16QAM	1	2	21.05	21.23	21.50
1.4	16QAM	1	5	20.87	21.11	21.44
1.4	16QAM	3	0	21.28	21.22	21.58
1.4	16QAM	3	1	21.33	21.25	21.79
1.4	16QAM	3	2	21.24	21.24	21.75
1.4	16QAM	6	0	20.03	20.01	20.45



## &lt;LTE Band 7 Conducted Power&gt;

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20850</b>	<b>21100</b>	<b>21350</b>
<b>Frequency (MHz)</b>				<b>2510</b>	<b>2535</b>	<b>2560</b>
20	QPSK	1	0	21.58	21.20	21.43
20	QPSK	1	49	21.64	21.47	<b>21.66</b>
20	QPSK	1	99	21.20	21.19	21.40
20	QPSK	50	0	20.26	20.20	20.18
20	QPSK	50	24	20.40	20.39	20.43
20	QPSK	50	49	20.28	20.22	20.28
20	QPSK	100	0	20.18	20.08	20.19
20	16QAM	1	0	20.54	19.77	20.31
20	16QAM	1	49	20.60	20.42	20.38
20	16QAM	1	99	20.20	20.00	20.02
20	16QAM	50	0	19.47	19.30	19.20
20	16QAM	50	24	19.37	19.47	19.28
20	16QAM	50	49	19.30	19.91	19.29
20	16QAM	100	0	19.34	19.74	19.26
<b>Channel</b>				<b>20825</b>	<b>21100</b>	<b>21375</b>
<b>Frequency (MHz)</b>				<b>2507.5</b>	<b>2535</b>	<b>2562.5</b>
15	QPSK	1	0	21.63	21.20	21.09
15	QPSK	1	37	21.38	21.21	21.05
15	QPSK	1	74	21.36	21.25	21.32
15	QPSK	36	0	20.66	20.14	20.26
15	QPSK	36	18	20.50	20.22	20.29
15	QPSK	36	37	20.36	20.65	20.18
15	QPSK	75	0	20.46	20.52	20.22
15	16QAM	1	0	20.62	20.20	20.04
15	16QAM	1	37	20.24	20.26	20.03
15	16QAM	1	74	20.52	20.29	20.23
15	16QAM	36	0	19.41	19.26	19.29
15	16QAM	36	18	19.39	19.34	19.39
15	16QAM	36	37	19.38	19.23	19.23
15	16QAM	75	0	19.52	19.50	19.29



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>20800</b>	<b>21100</b>	<b>21400</b>
<b>Frequency (MHz)</b>				<b>2505</b>	<b>2535</b>	<b>2565</b>
10	QPSK	1	0	21.58	20.00	21.25
10	QPSK	1	24	21.41	20.07	21.24
10	QPSK	1	49	21.30	20.66	20.89
10	QPSK	25	0	20.55	19.11	20.25
10	QPSK	25	12	20.53	19.18	20.24
10	QPSK	25	24	20.64	19.58	20.04
10	QPSK	50	0	20.47	19.31	20.16
10	16QAM	1	0	20.74	19.21	20.13
10	16QAM	1	24	20.31	19.02	20.08
10	16QAM	1	49	20.24	19.83	19.62
10	16QAM	25	0	19.58	18.39	19.36
10	16QAM	25	12	19.51	18.35	19.36
10	16QAM	25	24	19.40	18.72	19.22
10	16QAM	50	0	19.34	18.53	19.20
<b>Channel</b>				<b>20775</b>	<b>21100</b>	<b>21425</b>
<b>Frequency (MHz)</b>				<b>2502.5</b>	<b>2535</b>	<b>2567.5</b>
5	QPSK	1	0	21.45	20.10	21.19
5	QPSK	1	12	21.59	20.08	21.09
5	QPSK	1	24	21.34	20.52	20.86
5	QPSK	12	0	20.40	19.15	20.12
5	QPSK	12	6	20.60	19.19	19.99
5	QPSK	12	11	20.54	19.35	19.93
5	QPSK	25	0	20.46	19.18	19.92
5	16QAM	1	0	20.52	19.09	20.32
5	16QAM	1	12	20.65	19.34	20.25
5	16QAM	1	24	20.51	19.73	19.86
5	16QAM	12	0	19.55	18.33	19.17
5	16QAM	12	6	19.66	18.36	19.10
5	16QAM	12	11	19.57	18.54	19.09
5	16QAM	25	0	19.55	18.34	19.07



## &lt;LTE Band 17 Conducted Power&gt;

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
<b>Channel</b>				<b>23780</b>	<b>23790</b>	<b>23800</b>
<b>Frequency (MHz)</b>				<b>709</b>	<b>710</b>	<b>711</b>
10	QPSK	1	0	22.29	22.10	22.31
10	QPSK	1	24	22.28	22.18	22.27
10	QPSK	1	49	22.35	22.29	22.39
10	QPSK	25	0	21.13	21.34	21.37
10	QPSK	25	12	21.21	21.25	21.39
10	QPSK	25	24	21.29	21.38	21.40
10	QPSK	50	0	21.25	21.30	21.32
10	16QAM	1	0	20.87	21.11	20.85
10	16QAM	1	24	20.91	21.20	20.98
10	16QAM	1	49	21.02	21.28	21.01
10	16QAM	25	0	20.24	20.25	20.24
10	16QAM	25	12	20.21	20.27	20.39
10	16QAM	25	24	20.31	20.32	20.24
10	16QAM	50	0	20.18	20.28	20.23
<b>Channel</b>				<b>23755</b>	<b>23790</b>	<b>23825</b>
<b>Frequency (MHz)</b>				<b>706.5</b>	<b>710</b>	<b>713.5</b>
5	QPSK	1	0	21.93	22.18	22.18
5	QPSK	1	12	22.30	22.09	22.31
5	QPSK	1	24	22.27	22.25	22.28
5	QPSK	12	0	21.15	21.33	21.30
5	QPSK	12	6	21.27	21.30	21.36
5	QPSK	12	11	21.17	21.30	21.27
5	QPSK	25	0	21.24	21.32	21.36
5	16QAM	1	0	20.90	20.85	20.97
5	16QAM	1	12	21.14	20.92	21.02
5	16QAM	1	24	20.94	21.13	20.98
5	16QAM	12	0	20.16	20.26	20.27
5	16QAM	12	6	20.25	20.24	20.35
5	16QAM	12	11	20.29	20.24	20.27
5	16QAM	25	0	20.18	20.27	20.29

Note: Maximum average power for LTE.

## 3.2 Peak-to-Average Ratio

### 3.2.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

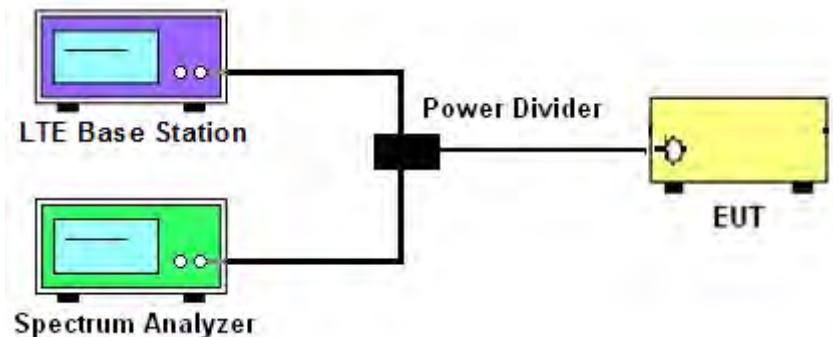
### 3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.2.3 Test Procedures

1. The EUT was connected to spectrum and LTE base station via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

### 3.2.4 Test Setup





## 3.2.5 Test Result of Peak-to-Average Ratio

LTE Band 2						
BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				18700	18900	19100
Frequency (MHz)				1860	1880	1900
20	QPSK	1	0	5.57	5.13	5.42
20	QPSK	100	0	5.28	5.07	5.30
20	16QAM	1	0	7.19	6.81	7.13
20	16QAM	100	0	6.12	5.94	6.38

LTE Band 4						
BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20050	20175	20300
Frequency (MHz)				1720	1732.5	1745
20	QPSK	1	0	4.38	6.20	5.97
20	QPSK	100	0	5.36	5.68	5.04
20	16QAM	1	0	5.30	7.57	7.57
20	16QAM	100	0	6.38	6.72	6.14

LTE Band 5						
BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20450	20525	20600
Frequency (MHz)				829	836.5	844
10	QPSK	1	0	6.29	6.32	5.80
10	QPSK	50	0	5.91	5.94	5.88
10	16QAM	1	0	7.10	6.93	7.25
10	16QAM	50	0	6.70	6.81	6.81



LTE Band 7						
BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20850	21100	21350
Frequency (MHz)				2510	2535	2560
20	QPSK	1	0	3.71	4.70	4.72
20	QPSK	100	0	5.10	5.07	5.13
20	16QAM	1	0	5.07	6.14	6.20
20	16QAM	100	0	5.88	5.91	6.12

LTE Band 17						
BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				23780	23790	23800
Frequency (MHz)				709	710	711
10	QPSK	1	0	5.83	5.97	5.80
10	QPSK	50	0	5.42	5.28	5.30
10	16QAM	1	0	6.87	7.45	7.28
10	16QAM	50	0	6.23	6.17	6.12

### 3.2.6 Peak to Average Power Ratio

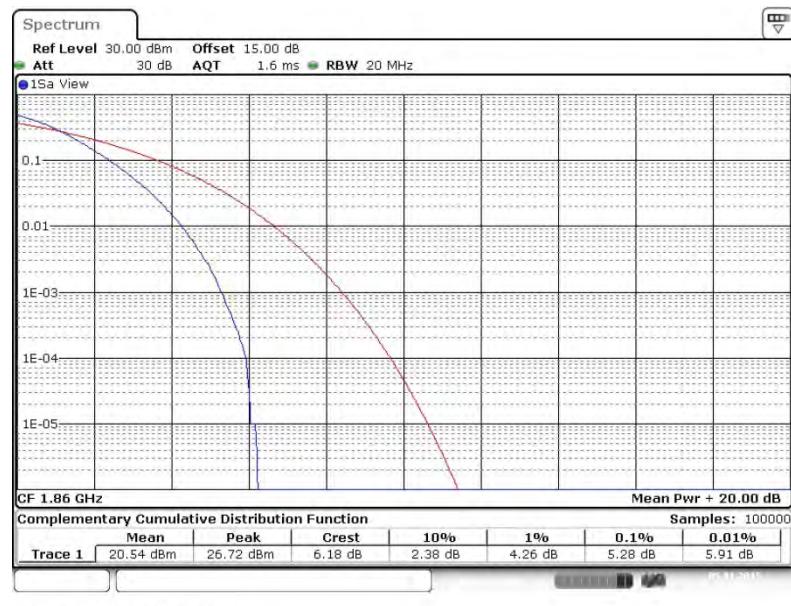
#### Peak-to-Average Ratio on LTE Band 2

##### 20MHz / QPSK in Ch. 18700 (1RB Size)



#### Peak-to-Average Ratio on LTE Band 2

##### 20MHz / QPSK in Ch. 18700 (100RB Size)





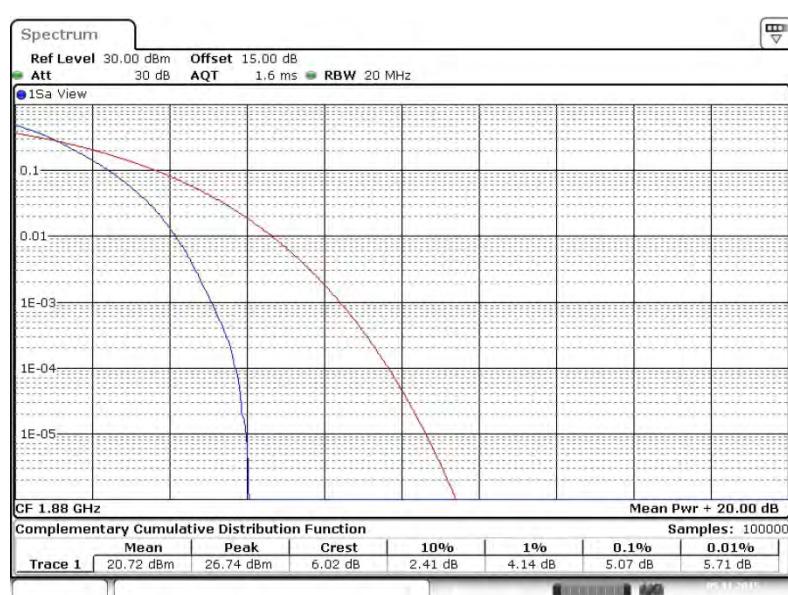
## Peak-to-Average Ratio on LTE Band 2

20MHz / QPSK in Ch. 18900 (1RB Size)



## Peak-to-Average Ratio on LTE Band 2

20MHz / QPSK in Ch. 18900 (100RB Size)





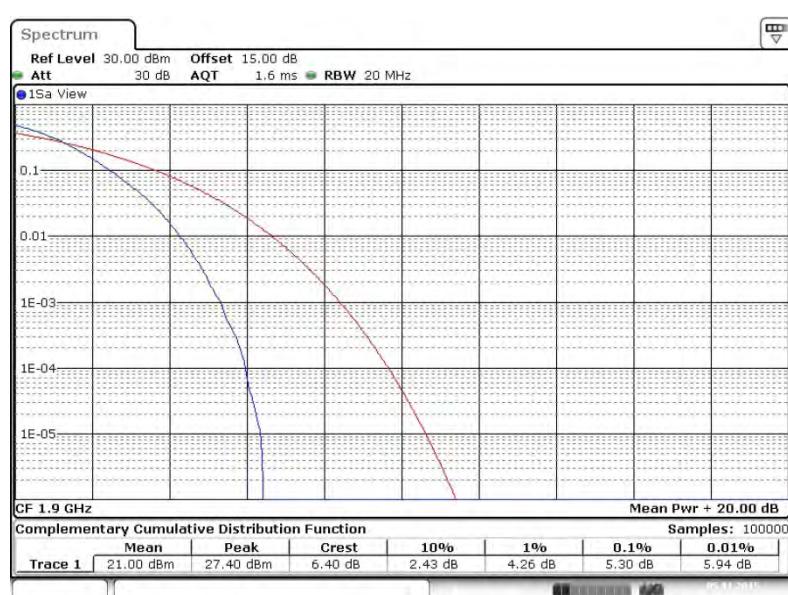
## Peak-to-Average Ratio on LTE Band 2

20MHz / QPSK in Ch. 19100 (1RB Size)



## Peak-to-Average Ratio on LTE Band 2

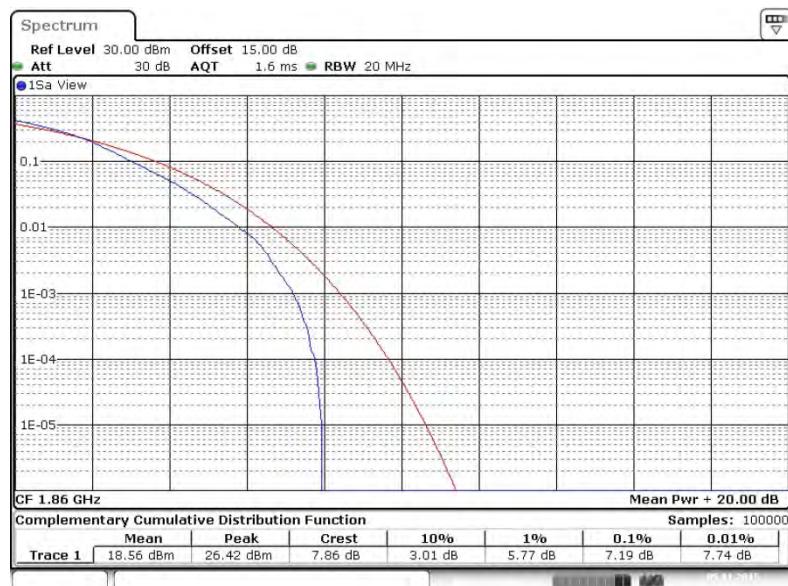
20MHz / QPSK in Ch. 19100 (100RB Size)





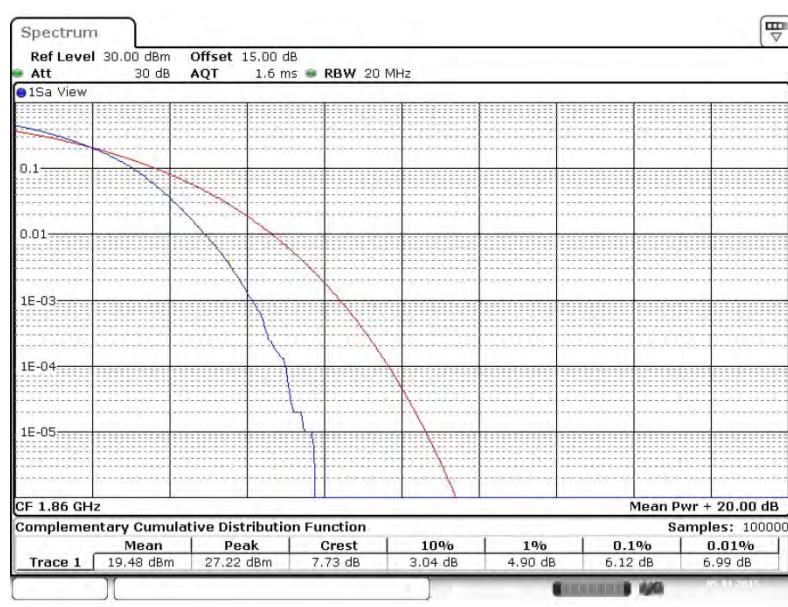
## Peak-to-Average Ratio on LTE Band 2

20MHz / 16QAM in Ch. 18700 (1RB Size)



## Peak-to-Average Ratio on LTE Band 2

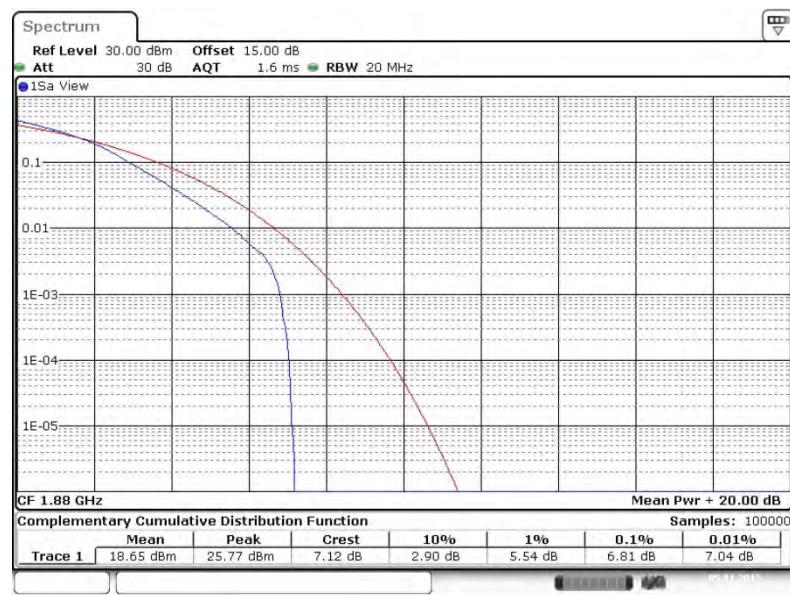
20MHz / 16QAM in Ch. 18700 (100RB Size)





## Peak-to-Average Ratio on LTE Band 2

20MHz / 16QAM in Ch. 18900 (1RB Size)



Date: 5.JAN.2015 10:03:15

## Peak-to-Average Ratio on LTE Band 2

20MHz / 16QAM in Ch. 18900 (100RB Size)

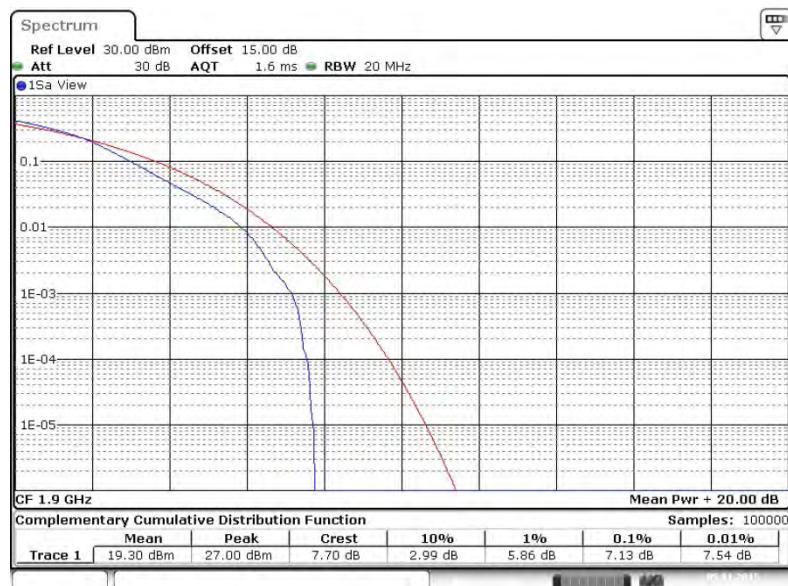


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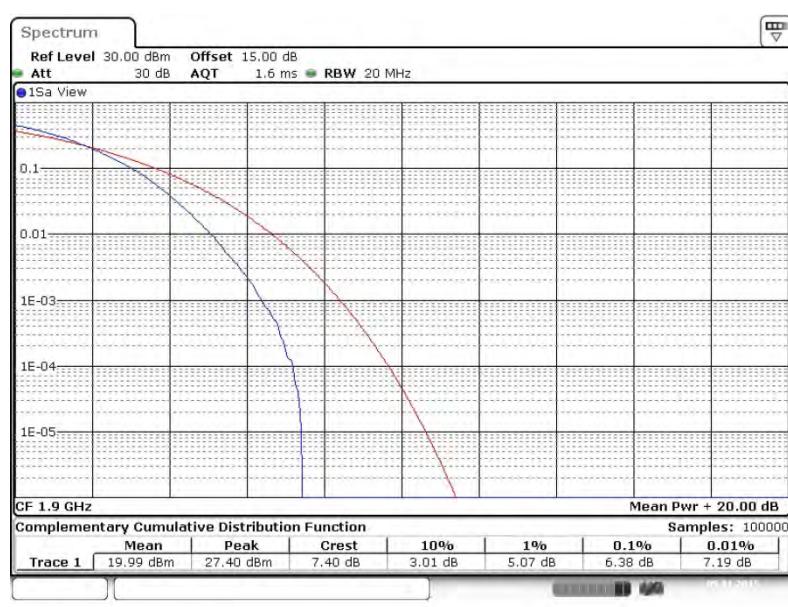
## Peak-to-Average Ratio on LTE Band 2

20MHz / 16QAM in Ch. 19100 (1RB Size)



## Peak-to-Average Ratio on LTE Band 2

20MHz / 16QAM in Ch. 19100 (100RB Size)





## Peak-to-Average Ratio on LTE Band 4

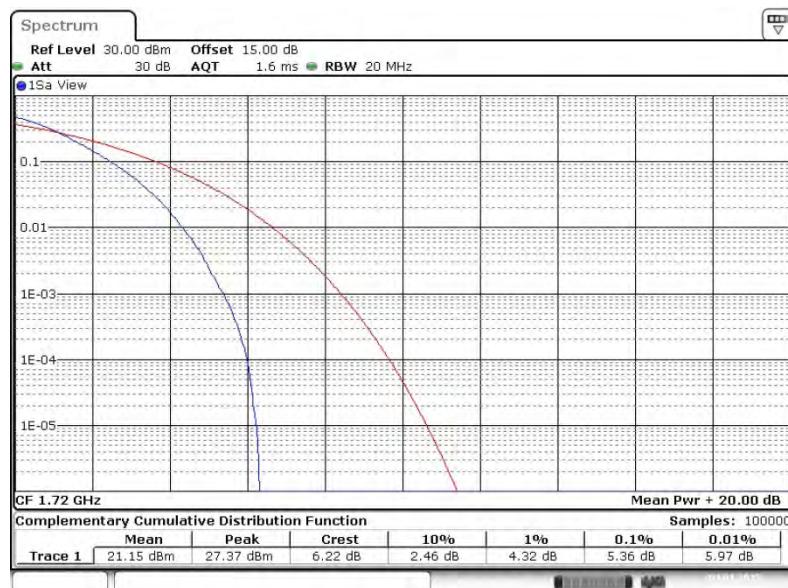
20MHz / QPSK in Ch. 20050 (1RB Size)



Date: 4.JAN.2015 16:44:09

## Peak-to-Average Ratio on LTE Band 4

20MHz / QPSK in Ch. 20050 (100RB Size)



Date: 4.JAN.2015 16:37:39



## Peak-to-Average Ratio on LTE Band 4

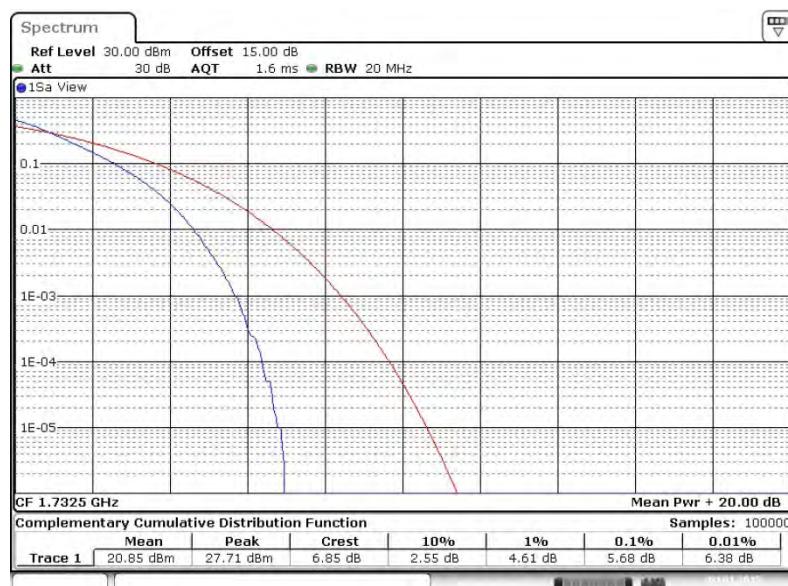
20MHz / QPSK in Ch. 20175 (1RB Size)



Date: 4.JAN.2015 16:43:17

## Peak-to-Average Ratio on LTE Band 4

20MHz / QPSK in Ch. 20175 (100RB Size)



Date: 4.JAN.2015 16:37:53



## Peak-to-Average Ratio on LTE Band 4

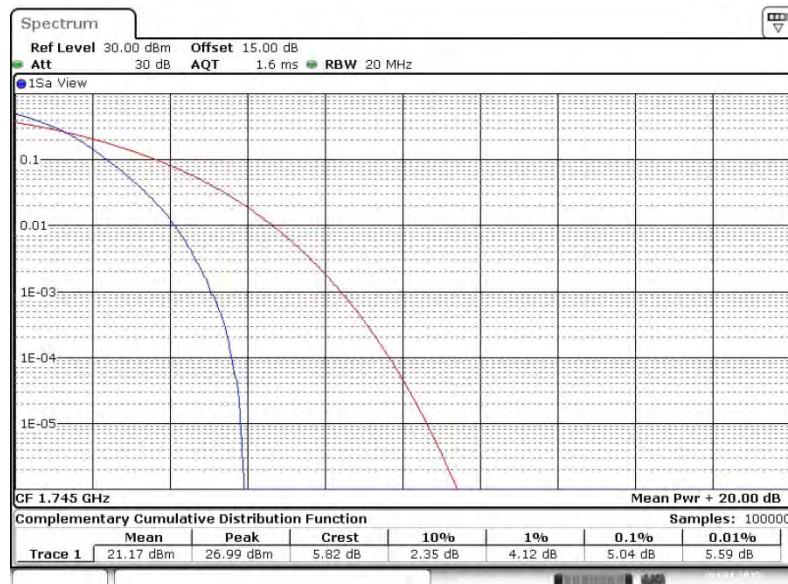
20MHz / QPSK in Ch. 20300 (1RB Size)



Date: 4.JAN.2015 16:42:53

## Peak-to-Average Ratio on LTE Band 4

20MHz / QPSK in Ch. 20300 (100RB Size)



Date: 4.JAN.2015 16:38:14



## Peak-to-Average Ratio on LTE Band 4

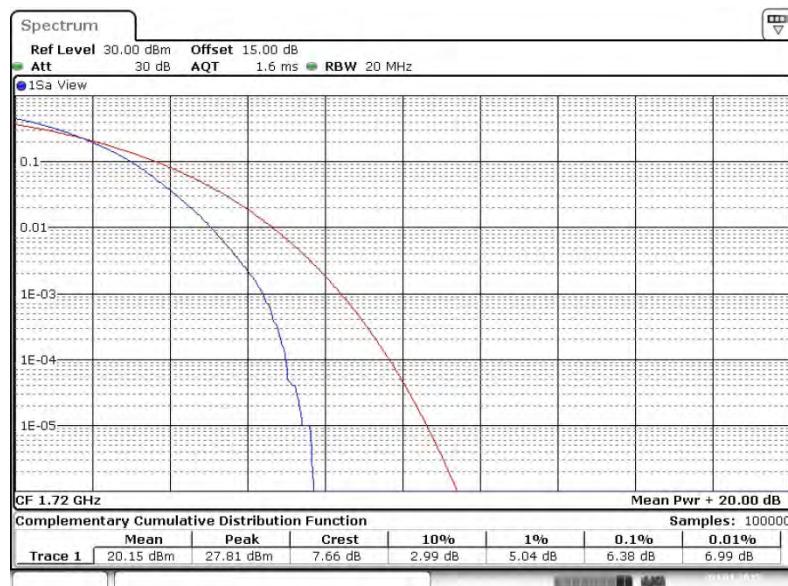
20MHz / 16QAM in Ch. 20050 (1RB Size)



Date: 4.JAN.2015 16:40:19

## Peak-to-Average Ratio on LTE Band 4

20MHz / 16QAM in Ch. 20050 (100RB Size)

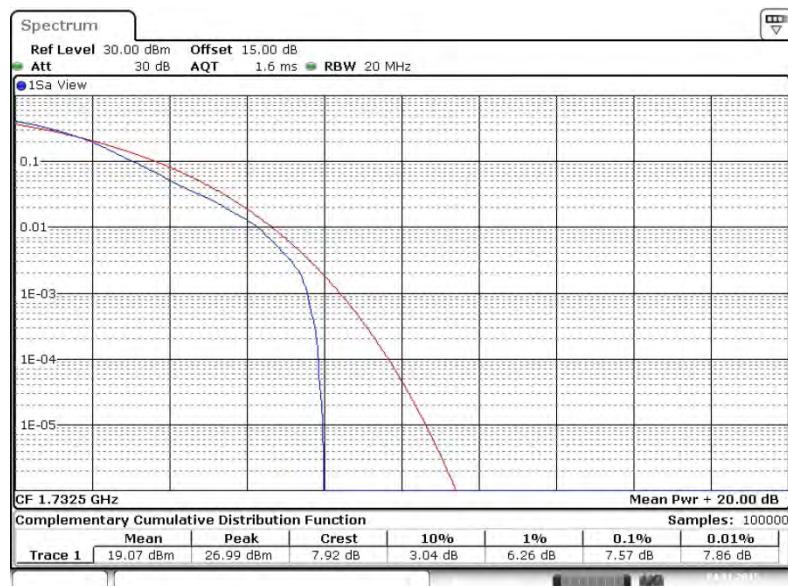


Date: 4.JAN.2015 16:39:04



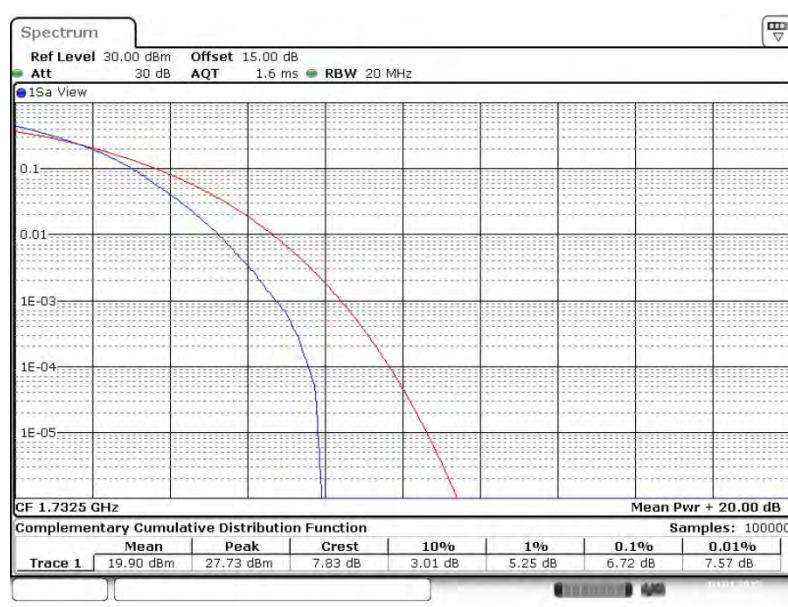
## Peak-to-Average Ratio on LTE Band 4

20MHz / 16QAM in Ch. 20175 (1RB Size)



## Peak-to-Average Ratio on LTE Band 4

20MHz / 16QAM in Ch. 20175 (100RB Size)





## Peak-to-Average Ratio on LTE Band 4

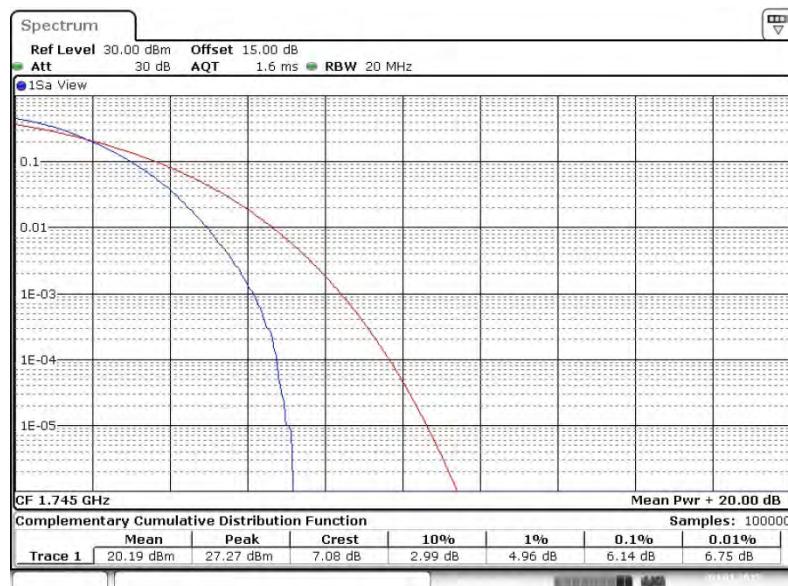
20MHz / 16QAM in Ch. 20300 (1RB Size)



Date: 4.JAN.2015 16:41:08

## Peak-to-Average Ratio on LTE Band 4

20MHz / 16QAM in Ch. 20300 (100RB Size)



Date: 4.JAN.2015 16:38:31



## Peak-to-Average Ratio on LTE Band 5

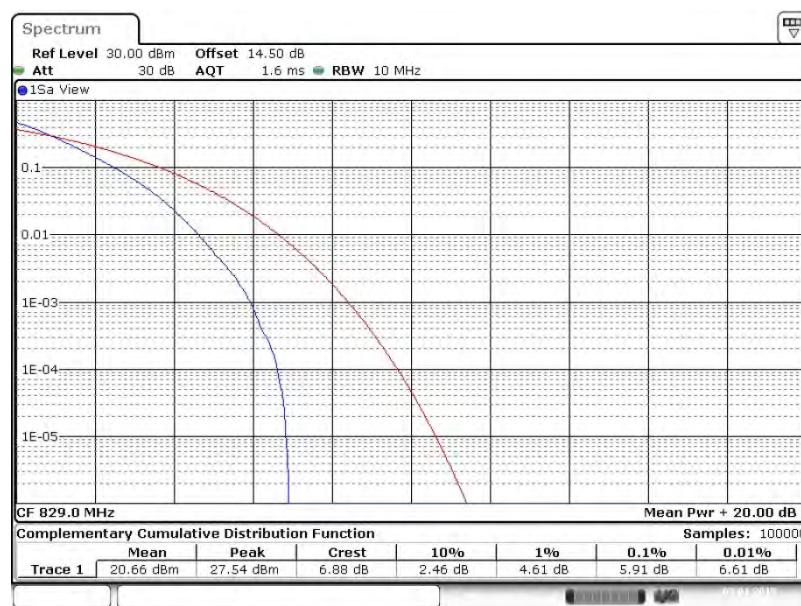
10MHz / QPSK in Ch. 20450 (1RB Size)



Date: 5.JAN.2015 10:13:05

## Peak-to-Average Ratio on LTE Band 5

10MHz / QPSK in Ch. 20450 (50RB Size)



Date: 5.JAN.2015 10:09:12



## Peak-to-Average Ratio on LTE Band 5

## 10MHz / QPSK in Ch. 20525 (1RB Size)



## Peak-to-Average Ratio on LTE Band 5

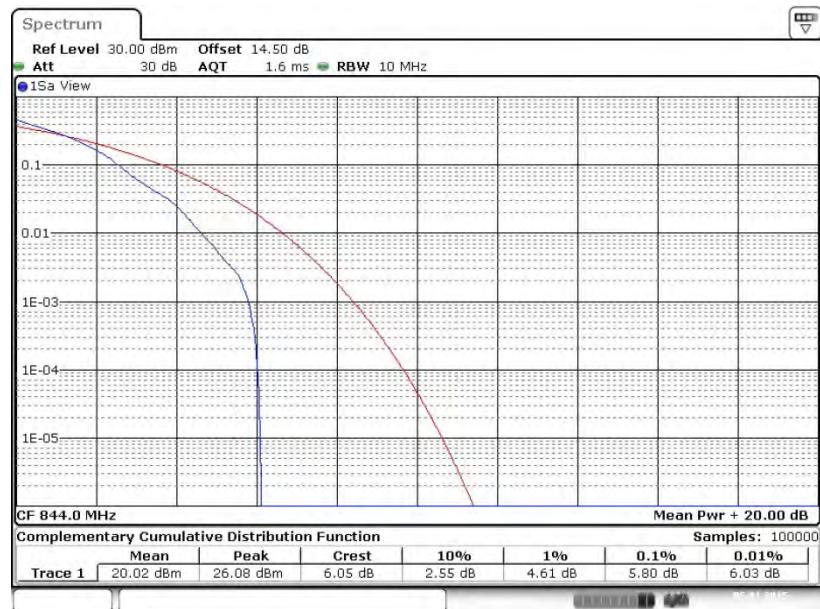
## 10MHz / QPSK in Ch. 20525 (50RB Size)





## Peak-to-Average Ratio on LTE Band 5

10MHz / QPSK in Ch. 20600 (1RB Size)



## Peak-to-Average Ratio on LTE Band 5

10MHz / QPSK in Ch. 20600 (50RB Size)





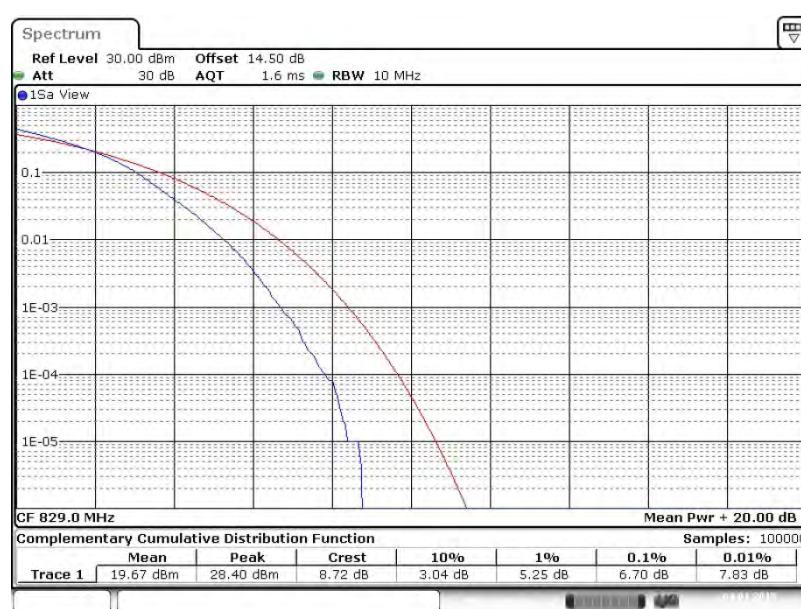
## Peak-to-Average Ratio on LTE Band 5

## 10MHz / 16QAM in Ch. 20450 (1RB Size)



## Peak-to-Average Ratio on LTE Band 5

## 10MHz / 16QAM in Ch. 20450 (50RB Size)





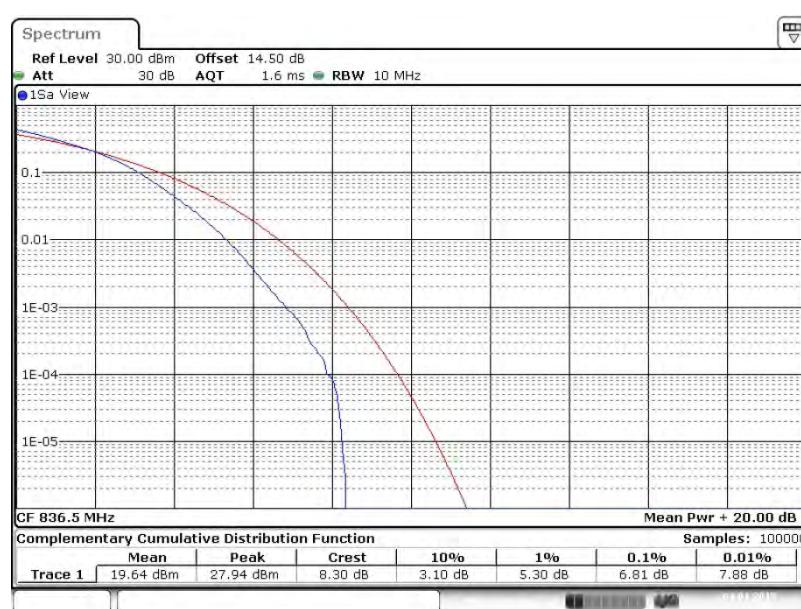
## Peak-to-Average Ratio on LTE Band 5

## 10MHz / 16QAM in Ch. 20525 (1RB Size)



## Peak-to-Average Ratio on LTE Band 5

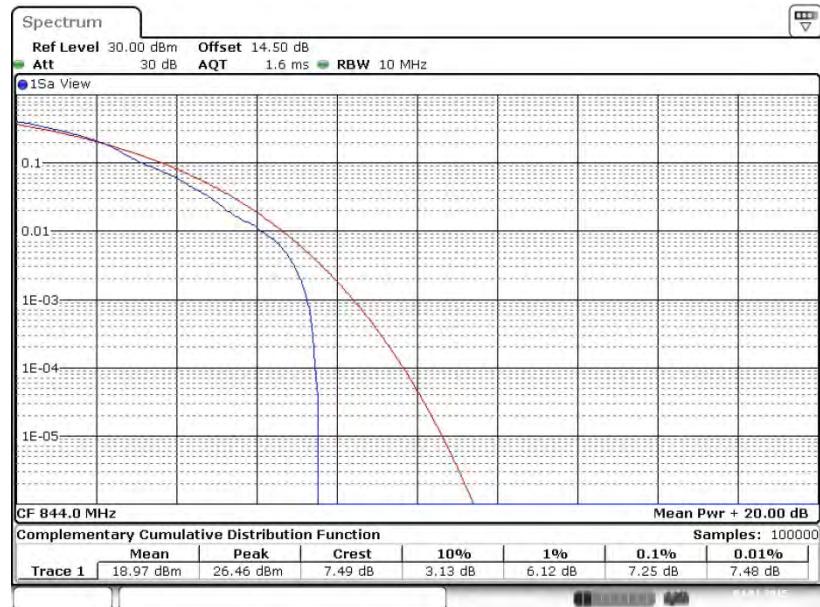
## 10MHz / 16QAM in Ch. 20525 (50RB Size)





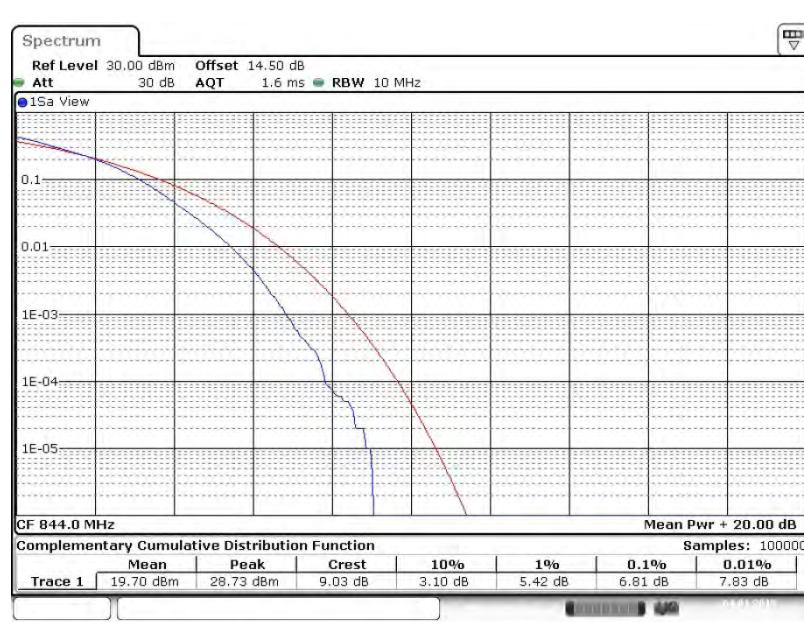
## Peak-to-Average Ratio on LTE Band 5

10MHz / 16QAM in Ch. 20600 (1RB Size)



## Peak-to-Average Ratio on LTE Band 5

10MHz / 16QAM in Ch. 20600 (50RB Size)





## Peak-to-Average Ratio on LTE Band 7

20MHz / QPSK in Ch. 20850 (1RB Size)



Date: 4.JAN.2015 11:59:45

## Peak-to-Average Ratio on LTE Band 7

20MHz / QPSK in Ch. 20850 (100RB Size)



Date: 4.JAN.2015 11:59:54



## Peak-to-Average Ratio on LTE Band 7

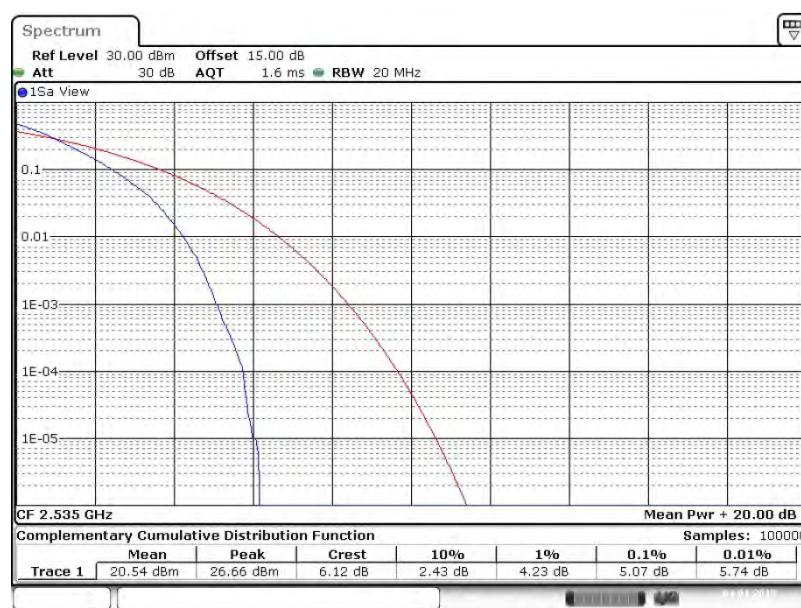
20MHz / QPSK in Ch. 21100 (1RB Size)



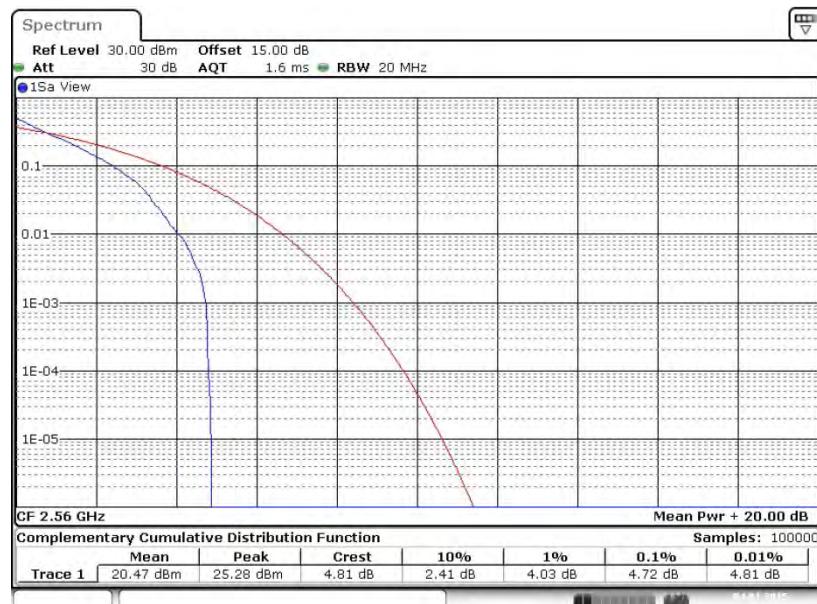
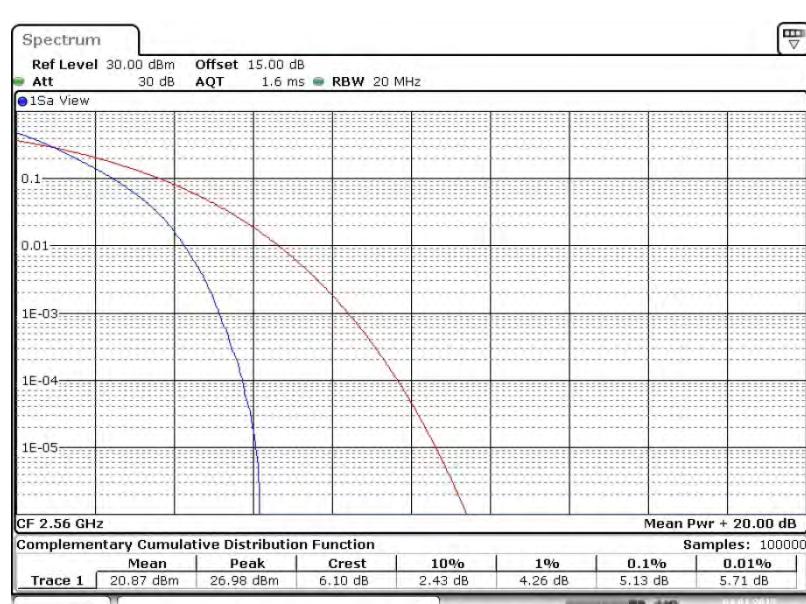
Date: 4.JAN.2015 12:00:03

## Peak-to-Average Ratio on LTE Band 7

20MHz / QPSK in Ch. 21100 (100RB Size)



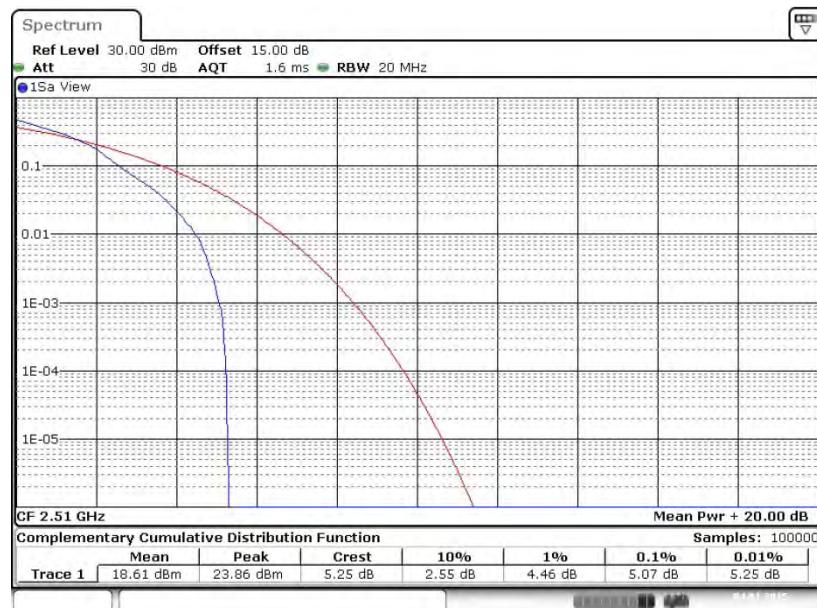
Date: 4.JAN.2015 12:00:13

**Peak-to-Average Ratio on LTE Band 7**
**20MHz / QPSK in Ch. 21350 (1RB Size)**

**Peak-to-Average Ratio on LTE Band 7**
**20MHz / QPSK in Ch. 21350 (100RB Size)**




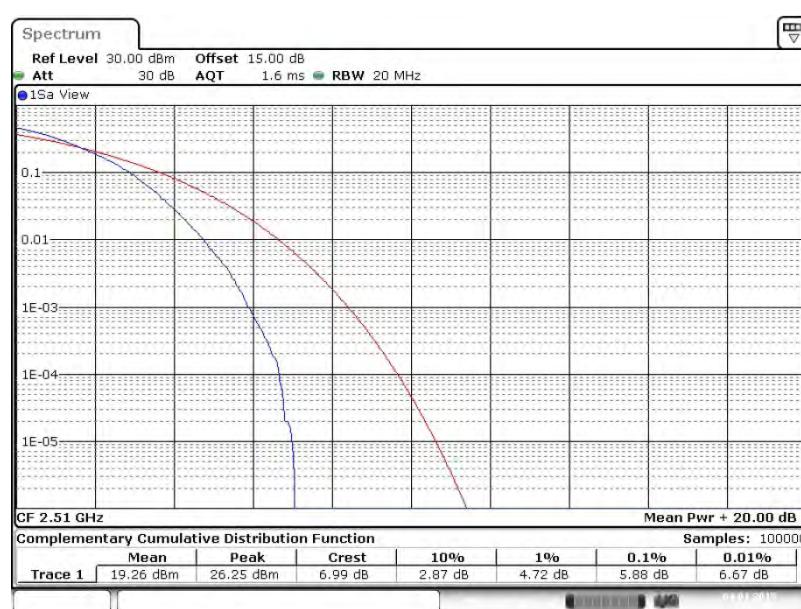
## Peak-to-Average Ratio on LTE Band 7

## 20MHz / 16QAM in Ch. 20850 (1RB Size)



## Peak-to-Average Ratio on LTE Band 7

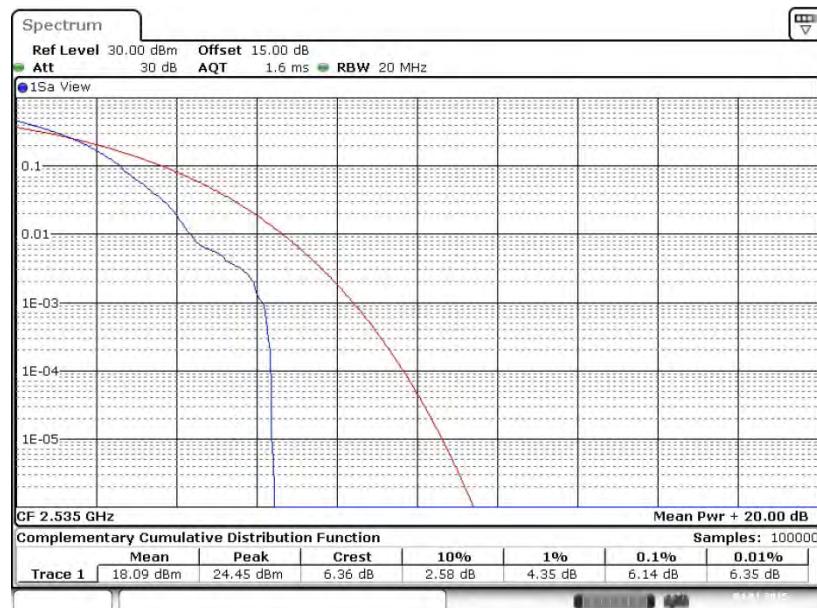
## 20MHz / 16QAM in Ch. 20850 (100RB Size)





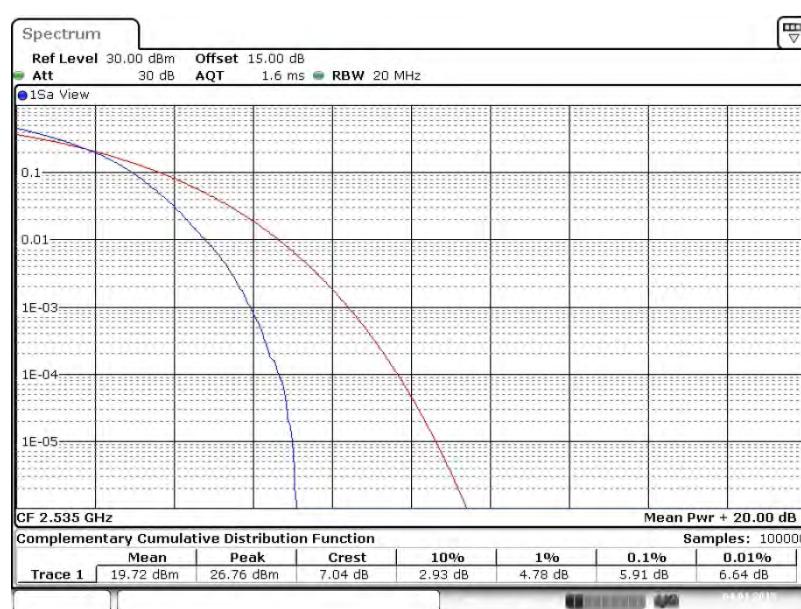
## Peak-to-Average Ratio on LTE Band 7

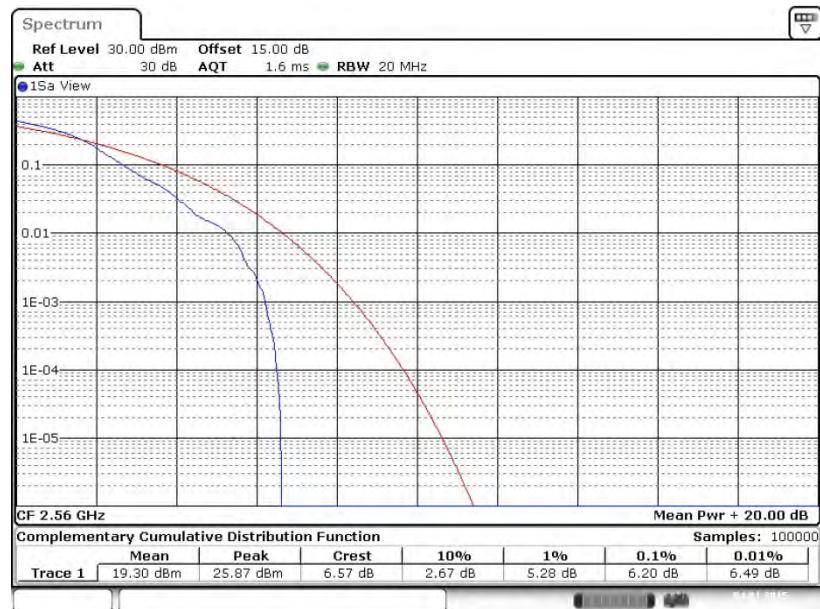
## 20MHz / 16QAM in Ch. 21100 (1RB Size)



## Peak-to-Average Ratio on LTE Band 7

## 20MHz / 16QAM in Ch. 21100 (100RB Size)

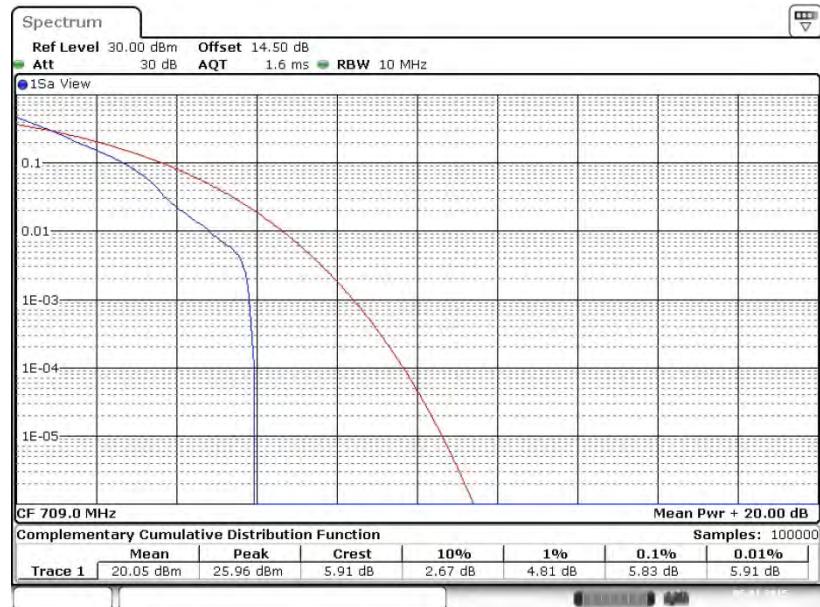


**Peak-to-Average Ratio on LTE Band 7**
**20MHz / 16QAM in Ch. 21350 (1RB Size)**

**Peak-to-Average Ratio on LTE Band 7**
**20MHz / 16QAM in Ch. 21350 (100RB Size)**




## Peak-to-Average Ratio on LTE Band 17

10MHz / QPSK in Ch. 23780 (1RB Size)



## Peak-to-Average Ratio on LTE Band 17

10MHz / QPSK in Ch. 23780 (50RB Size)





## Peak-to-Average Ratio on LTE Band 17

## 10MHz / QPSK in Ch. 23790 (1RB Size)



Date: 5.JAN.2015 10:55:31

## Peak-to-Average Ratio on LTE Band 17

## 10MHz / QPSK in Ch. 23790 (50RB Size)

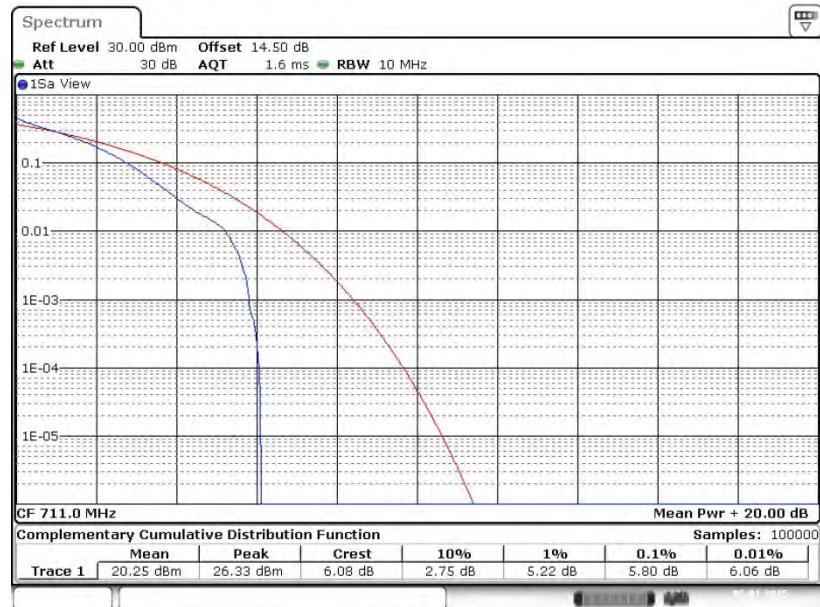


Date: 5.JAN.2015 10:54:28



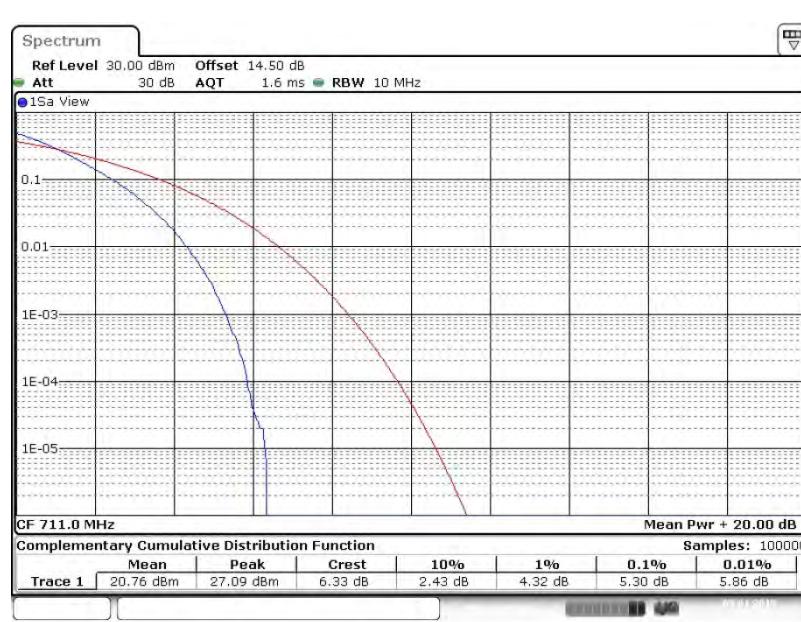
## Peak-to-Average Ratio on LTE Band 17

10MHz / QPSK in Ch. 23800 (1RB Size)



## Peak-to-Average Ratio on LTE Band 17

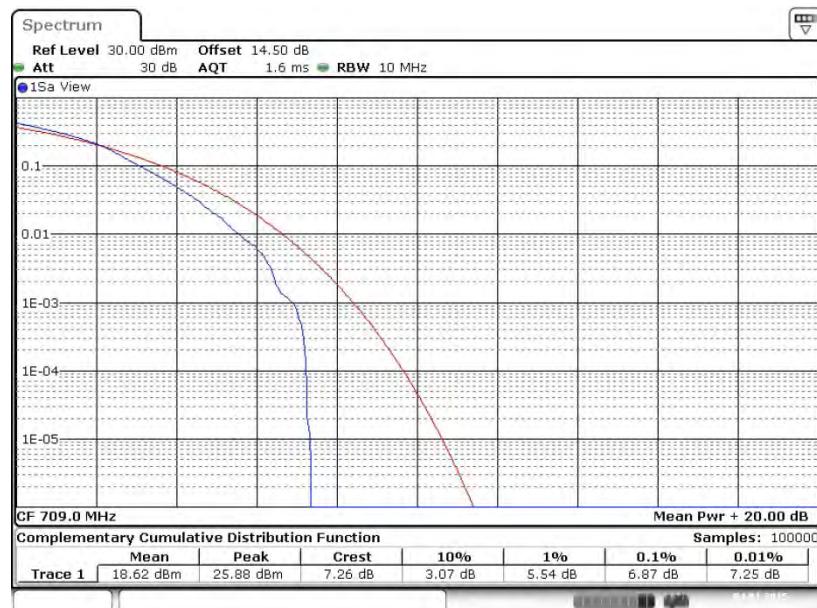
10MHz / QPSK in Ch. 23800 (50RB Size)





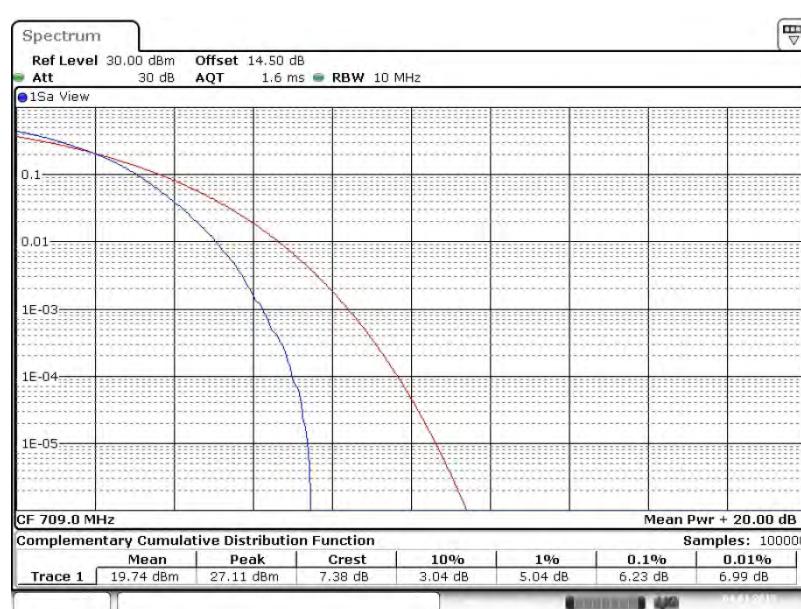
## Peak-to-Average Ratio on LTE Band 17

## 10MHz / 16QAM in Ch. 23780 (1RB Size)



## Peak-to-Average Ratio on LTE Band 17

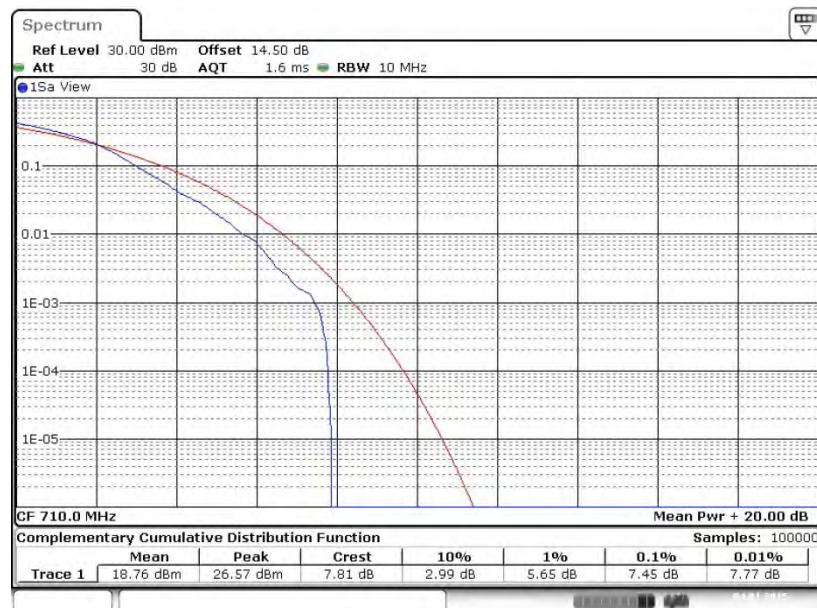
## 10MHz / 16QAM in Ch. 23780 (50RB Size)





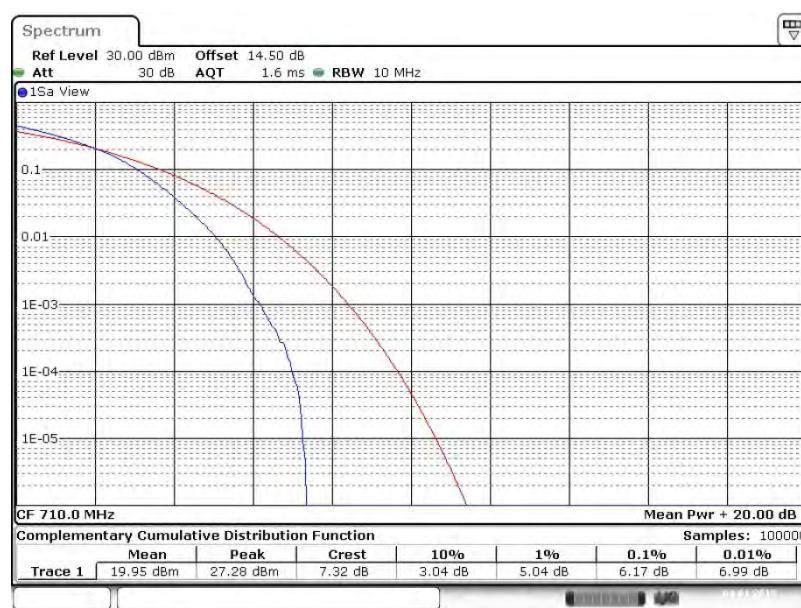
## Peak-to-Average Ratio on LTE Band 17

## 10MHz / 16QAM in Ch. 23790 (1RB Size)



## Peak-to-Average Ratio on LTE Band 17

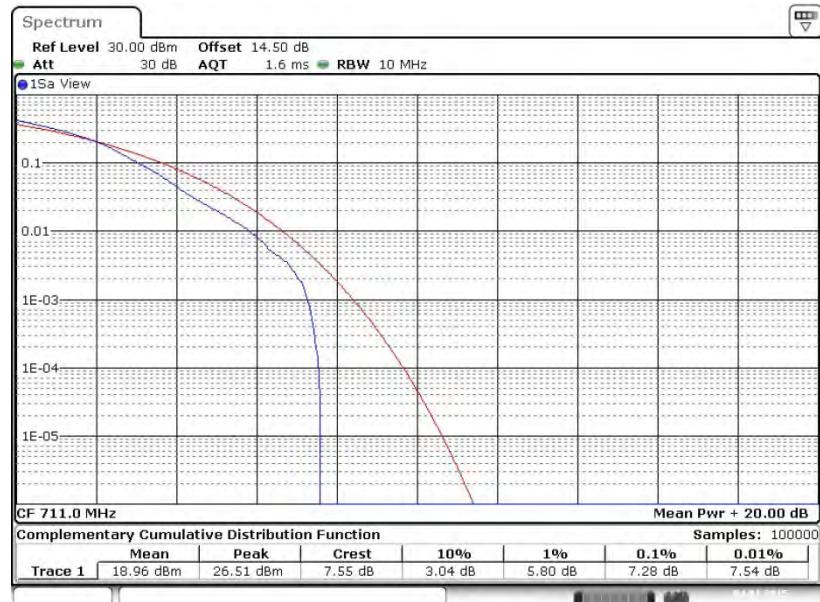
## 10MHz / 16QAM in Ch. 23790 (50RB Size)





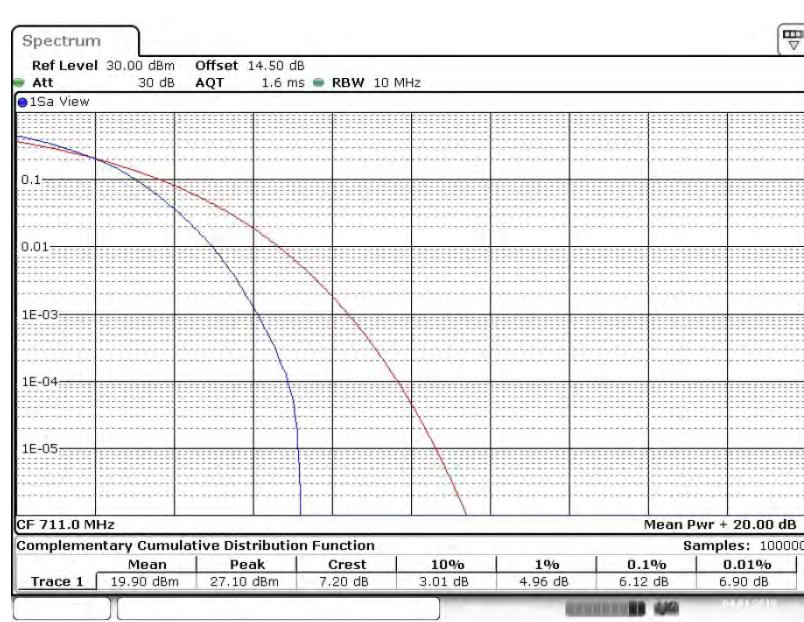
## Peak-to-Average Ratio on LTE Band 17

10MHz / 16QAM in Ch. 23800 (1RB Size)



## Peak-to-Average Ratio on LTE Band 17

10MHz / 16QAM in Ch. 23800 (50RB Size)





### 3.3 Effective Radiated Power and Equivalent Isotropic Radiated Power Measurement

#### 3.3.1 Description of the ERP/EIRP Measurement

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts with LTE band 5 and 3 watts with LTE band 17.

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 2 / 7 and 1 watt with LTE band 4.

#### 3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.3.3 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer which used a channel power option across EUT's signal bandwidth per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10.  $\text{ERP/EIRP} = \text{Ps} + \text{Et} - \text{Es} + \text{Gs} = \text{Ps} + \text{Rt} - \text{Rs} + \text{Gs}$

Ps (dBm) : Input power to substitution antenna.

Gs (dBi or dBd) : Substitution antenna Gain.

$\text{Et} = \text{Rt} + \text{AF}$

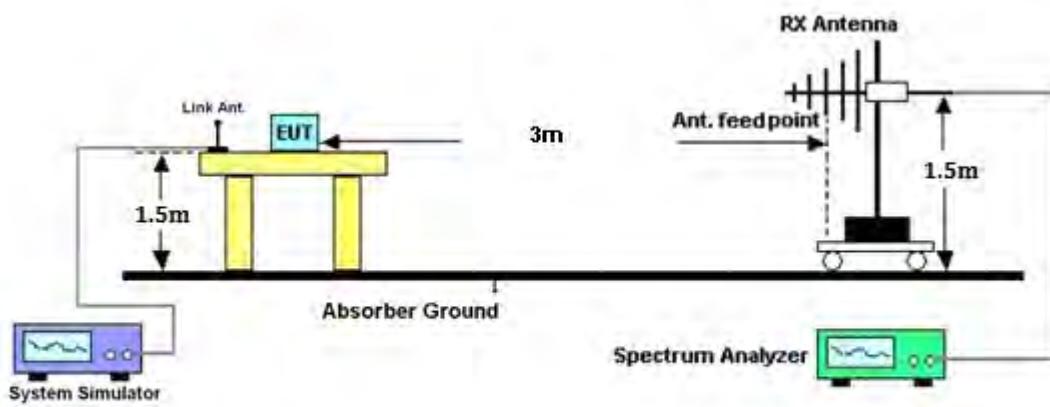
$\text{Es} = \text{Rs} + \text{AF}$

AF (dB/m) : Receive antenna factor

Rt : The highest received signal in spectrum analyzer for EUT.

Rs : The highest received signal in spectrum analyzer for substitution antenna.

### 3.3.4 Test Setup





## 3.3.5 Test Result of ERP/EIRP

LTE Band 2 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
2	1.4	QPSK	3	0	1850.7	19.80	0.10	H
2	1.4	QPSK	3	0	1880	20.60	0.11	H
2	1.4	QPSK	3	0	1909.3	21.05	0.13	H
2	1.4	QPSK	3	0	1850.7	24.04	0.25	V
2	1.4	QPSK	3	0	1880	23.89	0.24	V
2	1.4	QPSK	3	0	1909.3	23.45	0.22	V
2	1.4	16QAM	3	0	1850.7	18.58	0.07	H
2	1.4	16QAM	3	0	1880	19.42	0.09	H
2	1.4	16QAM	3	0	1909.3	19.94	0.10	H
2	1.4	16QAM	3	0	1850.7	22.82	0.19	V
2	1.4	16QAM	3	0	1880	22.64	0.18	V
2	1.4	16QAM	3	0	1909.3	22.35	0.17	V
2	3	QPSK	1	0	1851.5	19.60	0.09	H
2	3	QPSK	1	0	1880	20.22	0.11	H
2	3	QPSK	1	0	1908.5	20.72	0.12	H
2	3	QPSK	1	0	1851.5	23.68	0.23	V
2	3	QPSK	1	0	1880	23.53	0.23	V
2	3	QPSK	1	0	1908.5	23.23	0.21	V
2	3	16QAM	1	0	1851.5	18.31	0.07	H
2	3	16QAM	1	0	1880	19.02	0.08	H
2	3	16QAM	1	0	1908.5	19.44	0.09	H
2	3	16QAM	1	0	1851.5	22.57	0.18	V
2	3	16QAM	1	0	1880	22.31	0.17	V
2	3	16QAM	1	0	1908.5	21.92	0.16	V



LTE Band 2 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
2	5	QPSK	1	0	1852.5	19.54	0.09	H
2	5	QPSK	1	0	1880	19.67	0.09	H
2	5	QPSK	1	0	1907.5	20.27	0.11	H
2	5	QPSK	1	0	1852.5	23.66	0.23	V
2	5	QPSK	1	0	1880	23.57	0.23	V
2	5	QPSK	1	0	1907.5	23.47	0.22	V
2	5	16QAM	1	0	1852.5	18.28	0.07	H
2	5	16QAM	1	0	1880	18.99	0.08	H
2	5	16QAM	1	0	1907.5	19.45	0.09	H
2	5	16QAM	1	0	1852.5	22.42	0.17	V
2	5	16QAM	1	0	1880	22.23	0.17	V
2	5	16QAM	1	0	1907.5	21.91	0.16	V
2	10	QPSK	1	0	1855	19.54	0.09	H
2	10	QPSK	1	0	1880	19.56	0.09	H
2	10	QPSK	1	0	1905	20.37	0.11	H
2	10	QPSK	1	0	1855	23.64	0.23	V
2	10	QPSK	1	0	1880	23.52	0.22	V
2	10	QPSK	1	0	1905	23.83	0.24	V
2	10	16QAM	1	0	1855	18.31	0.07	H
2	10	16QAM	1	0	1880	18.76	0.08	H
2	10	16QAM	1	0	1905	19.55	0.09	H
2	10	16QAM	1	0	1855	22.42	0.17	V
2	10	16QAM	1	0	1880	22.22	0.17	V
2	10	16QAM	1	0	1905	22.33	0.17	V



LTE Band 2 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
2	15	QPSK	1	0	1857.5	19.55	0.09	H
2	15	QPSK	1	0	1880	19.45	0.09	H
2	15	QPSK	1	0	1902.5	20.33	0.11	H
2	15	QPSK	1	0	1857.5	23.64	0.23	V
2	15	QPSK	1	0	1880	23.51	0.22	V
2	15	QPSK	1	0	1902.5	23.86	0.24	V
2	15	16QAM	1	0	1857.5	18.32	0.07	H
2	15	16QAM	1	0	1880	18.63	0.07	H
2	15	16QAM	1	0	1902.5	19.50	0.09	H
2	15	16QAM	1	0	1857.5	22.39	0.17	V
2	15	16QAM	1	0	1880	22.23	0.17	V
2	15	16QAM	1	0	1902.5	22.37	0.17	V
2	20	QPSK	1	49	1860	19.41	0.09	H
2	20	QPSK	1	49	1880	19.69	0.09	H
2	20	QPSK	1	49	1900	20.26	0.11	H
2	20	QPSK	1	49	1860	23.52	0.22	V
2	20	QPSK	1	49	1880	23.47	0.22	V
2	20	QPSK	1	49	1900	23.71	0.23	V
2	20	16QAM	1	49	1860	18.47	0.07	H
2	20	16QAM	1	49	1880	19.45	0.09	H
2	20	16QAM	1	49	1900	19.48	0.09	H
2	20	16QAM	1	49	1860	22.30	0.17	V
2	20	16QAM	1	49	1880	22.56	0.18	V
2	20	16QAM	1	49	1900	22.23	0.17	V



LTE Band 4 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
4	1.4	QPSK	1	2	1710.7	21.11	0.13	H
4	1.4	QPSK	3	0	1732.5	21.32	0.14	H
4	1.4	QPSK	1	2	1754.3	21.56	0.14	H
4	1.4	QPSK	1	2	1710.7	24.14	0.26	V
4	1.4	QPSK	3	0	1732.5	24.38	0.27	V
4	1.4	QPSK	1	2	1754.3	24.50	0.28	V
4	1.4	16QAM	1	0	1710.7	19.95	0.10	H
4	1.4	16QAM	3	0	1732.5	19.95	0.10	H
4	1.4	16QAM	3	1	1754.3	20.70	0.12	H
4	1.4	16QAM	1	0	1710.7	22.99	0.20	V
4	1.4	16QAM	3	0	1732.5	23.07	0.20	V
4	1.4	16QAM	3	1	1754.3	23.65	0.23	V
4	3	QPSK	1	14	1711.5	21.21	0.13	H
4	3	QPSK	1	0	1732.5	21.17	0.13	H
4	3	QPSK	1	7	1753.5	21.50	0.14	H
4	3	QPSK	1	14	1711.5	24.29	0.27	V
4	3	QPSK	1	0	1732.5	24.32	0.27	V
4	3	QPSK	1	7	1753.5	24.47	0.28	V
4	3	16QAM	1	0	1711.5	19.96	0.10	H
4	3	16QAM	1	0	1732.5	20.01	0.10	H
4	3	16QAM	1	14	1753.5	20.43	0.11	H
4	3	16QAM	1	0	1711.5	22.95	0.20	V
4	3	16QAM	1	0	1732.5	23.12	0.21	V
4	3	16QAM	1	14	1753.5	23.42	0.22	V



LTE Band 4 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
4	5	QPSK	1	12	1712.5	21.40	0.14	H
4	5	QPSK	1	0	1732.5	21.13	0.13	H
4	5	QPSK	1	24	1752.5	21.55	0.14	H
4	5	QPSK	1	12	1712.5	24.61	0.29	V
4	5	QPSK	1	0	1732.5	24.56	0.29	V
4	5	QPSK	1	24	1752.5	24.83	0.30	V
4	5	16QAM	1	0	1712.5	19.96	0.10	H
4	5	16QAM	1	0	1732.5	19.87	0.10	H
4	5	16QAM	1	0	1752.5	20.17	0.10	H
4	5	16QAM	1	0	1712.5	23.02	0.20	V
4	5	16QAM	1	0	1732.5	22.95	0.20	V
4	5	16QAM	1	0	1752.5	23.15	0.21	V
4	10	QPSK	1	24	1715	21.45	0.14	H
4	10	QPSK	1	0	1732.5	21.32	0.14	H
4	10	QPSK	1	49	1750	21.57	0.14	H
4	10	QPSK	1	24	1715	24.68	0.29	V
4	10	QPSK	1	0	1732.5	24.65	0.29	V
4	10	QPSK	1	49	1750	24.85	0.31	V
4	10	16QAM	1	0	1715	20.03	0.10	H
4	10	16QAM	1	0	1732.5	20.05	0.10	H
4	10	16QAM	1	49	1750	20.51	0.11	H
4	10	16QAM	1	0	1715	23.07	0.20	V
4	10	16QAM	1	0	1732.5	23.11	0.20	V
4	10	16QAM	1	49	1750	23.53	0.23	V



LTE Band 4 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
4	15	QPSK	1	37	1717.5	21.23	0.13	H
4	15	QPSK	1	0	1732.5	21.32	0.14	H
4	15	QPSK	1	74	1747.5	21.70	0.15	H
4	15	QPSK	1	37	1717.5	24.59	0.29	V
4	15	QPSK	1	0	1732.5	24.50	0.28	V
4	15	QPSK	1	74	1747.5	24.84	0.30	V
4	15	16QAM	1	0	1717.5	20.23	0.11	H
4	15	16QAM	1	0	1732.5	20.28	0.11	H
4	15	16QAM	1	74	1747.5	20.61	0.12	H
4	15	16QAM	1	0	1717.5	23.31	0.21	V
4	15	16QAM	1	0	1732.5	23.29	0.21	V
4	15	16QAM	1	74	1747.5	23.64	0.23	V
4	20	QPSK	1	49	1720	21.26	0.13	H
4	20	QPSK	1	49	1732.5	21.29	0.13	H
4	20	QPSK	1	49	1745	21.40	0.14	H
4	20	QPSK	1	49	1720	24.55	0.29	V
4	20	QPSK	1	49	1732.5	24.52	0.28	V
4	20	QPSK	1	49	1745	24.63	0.29	V
4	20	16QAM	1	49	1720	20.29	0.11	H
4	20	16QAM	1	49	1732.5	20.20	0.10	H
4	20	16QAM	1	49	1745	20.39	0.11	H
4	20	16QAM	1	49	1720	23.39	0.22	V
4	20	16QAM	1	49	1732.5	23.39	0.22	V
4	20	16QAM	1	49	1745	23.49	0.22	V



LTE Band 5 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
5	1.4	QPSK	3	1	824.7	18.48	0.07	H
5	1.4	QPSK	3	1	836.5	17.88	0.06	H
5	1.4	QPSK	3	0	848.3	17.99	0.06	H
5	1.4	QPSK	3	1	824.7	18.42	0.07	V
5	1.4	QPSK	3	1	836.5	17.82	0.06	V
5	1.4	QPSK	3	0	848.3	17.96	0.06	V
5	1.4	16QAM	3	1	824.7	17.39	0.05	H
5	1.4	16QAM	3	1	836.5	16.86	0.05	H
5	1.4	16QAM	3	1	848.3	16.86	0.05	H
5	1.4	16QAM	3	1	824.7	17.32	0.05	V
5	1.4	16QAM	3	1	836.5	16.79	0.05	V
5	1.4	16QAM	3	1	848.3	16.80	0.05	V
5	3	QPSK	1	0	825.5	18.40	0.07	H
5	3	QPSK	1	0	836.5	17.86	0.06	H
5	3	QPSK	1	0	847.5	17.65	0.06	H
5	3	QPSK	1	0	825.5	18.32	0.07	V
5	3	QPSK	1	0	836.5	17.77	0.06	V
5	3	QPSK	1	0	847.5	17.57	0.06	V
5	3	16QAM	1	0	825.5	17.13	0.05	H
5	3	16QAM	1	0	836.5	16.67	0.05	H
5	3	16QAM	1	0	847.5	16.41	0.04	H
5	3	16QAM	1	0	825.5	17.08	0.05	V
5	3	16QAM	1	0	836.5	16.59	0.05	V
5	3	16QAM	1	0	847.5	16.41	0.04	V



LTE Band 5 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
5	5	QPSK	1	24	826.5	18.01	0.06	H
5	5	QPSK	1	12	836.5	17.73	0.06	H
5	5	QPSK	1	24	846.5	17.74	0.06	H
5	5	QPSK	1	24	826.5	17.97	0.06	V
5	5	QPSK	1	12	836.5	17.65	0.06	V
5	5	QPSK	1	24	846.5	17.69	0.06	V
5	5	16QAM	1	24	826.5	16.78	0.05	H
5	5	16QAM	1	24	836.5	16.40	0.04	H
5	5	16QAM	1	24	846.5	16.55	0.05	H
5	5	16QAM	1	24	826.5	16.82	0.05	V
5	5	16QAM	1	24	836.5	16.34	0.04	V
5	5	16QAM	1	24	846.5	16.51	0.04	V
5	10	QPSK	1	49	829	17.85	0.06	H
5	10	QPSK	1	49	836.5	17.72	0.06	H
5	10	QPSK	1	49	844	17.74	0.06	H
5	10	QPSK	1	49	829	17.77	0.06	V
5	10	QPSK	1	49	836.5	17.64	0.06	V
5	10	QPSK	1	49	844	17.69	0.06	V
5	10	16QAM	1	49	829	16.59	0.05	H
5	10	16QAM	1	49	836.5	16.51	0.04	H
5	10	16QAM	1	49	844	16.51	0.04	H
5	10	16QAM	1	49	829	16.54	0.05	V
5	10	16QAM	1	49	836.5	16.45	0.04	V
5	10	16QAM	1	49	844	16.44	0.04	V



LTE Band 7 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
7	5	QPSK	1	12	2502.5	22.80	0.19	H
7	5	QPSK	1	24	2535	22.21	0.17	H
7	5	QPSK	1	0	2567.5	22.78	0.19	H
7	5	QPSK	1	12	2502.5	25.53	0.36	V
7	5	QPSK	1	24	2535	25.08	0.32	V
7	5	QPSK	1	0	2567.5	25.62	0.36	V
7	5	16QAM	1	12	2502.5	21.47	0.14	H
7	5	16QAM	1	24	2535	20.50	0.11	H
7	5	16QAM	1	0	2567.5	20.84	0.12	H
7	5	16QAM	1	12	2502.5	24.26	0.27	V
7	5	16QAM	1	24	2535	23.70	0.23	V
7	5	16QAM	1	0	2567.5	23.96	0.25	V
7	10	QPSK	1	0	2505	23.11	0.20	H
7	10	QPSK	1	49	2535	22.47	0.18	H
7	10	QPSK	1	0	2565	22.76	0.19	H
7	10	QPSK	1	0	2505	25.82	0.38	V
7	10	QPSK	1	49	2535	25.28	0.34	V
7	10	QPSK	1	0	2565	25.68	0.37	V
7	10	16QAM	1	0	2505	21.65	0.15	H
7	10	16QAM	1	49	2535	20.79	0.12	H
7	10	16QAM	1	0	2565	20.97	0.13	H
7	10	16QAM	1	0	2505	24.48	0.28	V
7	10	16QAM	1	49	2535	23.97	0.25	V
7	10	16QAM	1	0	2565	24.18	0.26	V



LTE Band 7 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
7	15	QPSK	1	0	2507.5	23.09	0.20	H
7	15	QPSK	1	74	2535	22.56	0.18	H
7	15	QPSK	1	74	2562.5	22.27	0.17	H
7	15	QPSK	1	0	2507.5	25.83	0.38	V
7	15	QPSK	1	74	2535	25.44	0.35	V
7	15	QPSK	1	74	2562.5	25.07	0.32	V
7	15	16QAM	1	0	2507.5	21.58	0.14	H
7	15	16QAM	1	74	2535	20.91	0.12	H
7	15	16QAM	1	74	2562.5	20.43	0.11	H
7	15	16QAM	1	0	2507.5	24.44	0.28	V
7	15	16QAM	1	74	2535	24.17	0.26	V
7	15	16QAM	1	74	2562.5	23.49	0.22	V
7	20	QPSK	1	49	2510	22.49	0.18	H
7	20	QPSK	1	49	2535	21.55	0.14	H
7	20	QPSK	1	49	2560	22.63	0.18	H
7	20	QPSK	1	49	2510	25.58	0.36	V
7	20	QPSK	1	49	2535	24.68	0.29	V
7	20	QPSK	1	49	2560	25.61	0.36	V
7	20	16QAM	1	49	2510	21.42	0.14	H
7	20	16QAM	1	49	2535	20.34	0.11	H
7	20	16QAM	1	49	2560	21.42	0.14	H
7	20	16QAM	1	49	2510	24.28	0.27	V
7	20	16QAM	1	49	2535	23.46	0.22	V
7	20	16QAM	1	49	2560	24.36	0.27	V



LTE Band 17 Radiated Power ERP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	ERP (W)	H/V
			RB Size	RB Offset				
17	5	QPSK	1	12	706.5	17.16	0.05	H
17	5	QPSK	1	24	710	17.51	0.06	H
17	5	QPSK	1	12	713.5	17.51	0.06	H
17	5	QPSK	1	12	706.5	17.19	0.05	V
17	5	QPSK	1	24	710	17.34	0.05	V
17	5	QPSK	1	12	713.5	17.35	0.05	V
17	5	16QAM	1	12	706.5	16.14	0.04	H
17	5	16QAM	1	24	710	16.46	0.04	H
17	5	16QAM	1	12	713.5	16.49	0.04	H
17	5	16QAM	1	12	706.5	16.13	0.04	V
17	5	16QAM	1	24	710	16.29	0.04	V
17	5	16QAM	1	12	713.5	16.33	0.04	V
17	10	QPSK	1	49	709	17.53	0.06	H
17	10	QPSK	1	49	710	17.68	0.06	H
17	10	QPSK	1	49	711	17.61	0.06	H
17	10	QPSK	1	49	709	17.35	0.05	V
17	10	QPSK	1	49	710	17.51	0.06	V
17	10	QPSK	1	49	711	17.58	0.06	V
17	10	16QAM	1	49	709	16.71	0.05	H
17	10	16QAM	1	49	710	16.85	0.05	H
17	10	16QAM	1	49	711	16.87	0.05	H
17	10	16QAM	1	49	709	16.55	0.05	V
17	10	16QAM	1	49	710	16.70	0.05	V
17	10	16QAM	1	49	711	16.74	0.05	V

### 3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

#### 3.4.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

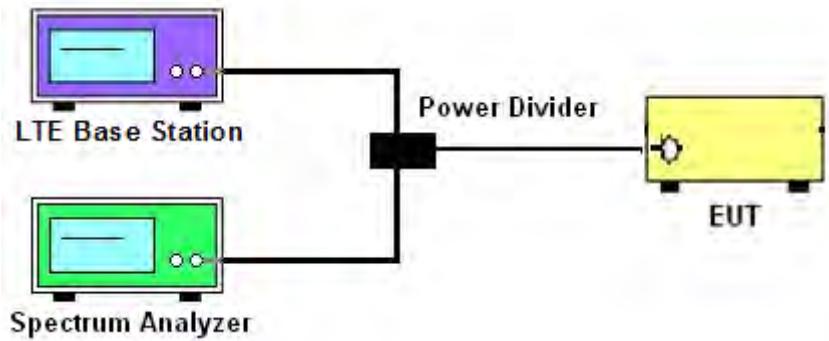
#### 3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.4.3 Test Procedures

1. The EUT was connected to spectrum analyzer and LTE base station via a power divider.
2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF power with full RB sizes were measured.

#### 3.4.4 Test Setup





### 3.4.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

Modes	LTE Band 2											
	1.4MHz / QPSK			1.4MHz / 16QAM			3MHz / QPSK			3MHz / 16QAM		
BW / Mod.	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	1.097	1.099	1.099	1.099	1.097	1.099	2.727	2.721	2.721	2.733	2.715	2.721
26dB BW (MHz)	1.320	1.304	1.309	1.295	1.309	1.306	3.069	3.075	3.051	3.051	3.045	3.051
BW / Mod.	5MHz / QPSK			5MHz / 16QAM			10MHz / QPSK			10MHz / 16QAM		
	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	4.486	4.496	4.496	4.496	4.486	4.486	9.031	9.071	9.011	9.031	9.011	8.991
26dB BW (MHz)	5.055	5.035	5.025	5.015	5.025	5.035	10.010	10.010	9.890	9.930	9.990	9.890
BW / Mod.	15MHz / QPSK			15MHz / 16QAM			20MHz / QPSK			20MHz / 16QAM		
	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	13.427	13.487	13.397	13.487	13.487	13.457	18.382	18.342	18.302	18.302	18.342	18.222
26dB BW (MHz)	14.625	14.595	14.655	14.655	14.685	14.655	20.300	20.340	20.220	20.340	20.220	20.220

Modes	LTE Band 4											
	1.4MHz / QPSK			1.4MHz / 16QAM			3MHz / QPSK			3MHz / 16QAM		
BW / Mod.	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	1.097	1.105	1.102	1.097	1.102	1.097	2.721	2.733	2.727	2.721	2.739	2.727
26dB BW (MHz)	1.295	1.334	1.318	1.301	1.329	1.315	3.045	3.063	3.057	3.057	3.093	3.045
BW / Mod.	5MHz / QPSK			5MHz / 16QAM			10MHz / QPSK			10MHz / 16QAM		
	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	4.496	4.496	4.496	4.486	4.496	4.496	9.031	9.031	9.071	8.991	9.051	8.971
26dB BW (MHz)	5.015	5.035	5.025	4.995	5.085	5.025	9.910	10.190	9.910	9.930	10.030	9.950
BW / Mod.	15MHz / QPSK			15MHz / 16QAM			20MHz / QPSK			20MHz / 16QAM		
	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	13.397	13.516	13.427	13.427	13.487	13.367	18.302	18.581	18.222	18.382	18.462	18.222
26dB BW (MHz)	14.505	14.805	14.565	14.535	14.895	14.535	20.260	20.420	20.140	20.180	20.340	20.140



Modes	LTE Band 5											
	1.4MHz / QPSK			1.4MHz / 16QAM			3MHz / QPSK			3MHz / 16QAM		
	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	1.094	1.094	1.097	1.094	1.097	1.097	2.709	2.721	2.721	2.721	2.721	2.727
26dB BW (MHz)	1.295	1.304	1.304	1.295	1.290	1.287	3.039	3.033	3.039	3.039	3.039	3.045
BW / Mod.	5MHz / QPSK			5MHz / 16QAM			10MHz / QPSK			10MHz / 16QAM		
	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	4.486	4.486	4.486	4.476	4.486	4.486	9.111	9.051	9.071	9.011	9.031	9.031
26dB BW (MHz)	5.005	5.015	5.005	4.995	5.005	4.995	10.030	9.990	10.010	9.990	9.930	9.990

Modes	LTE Band 7											
	5MHz / QPSK			5MHz / 16QAM			10MHz / QPSK			10MHz / 16QAM		
	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	4.496	4.496	4.496	4.486	4.496	4.496	9.051	9.071	9.071	8.971	9.031	9.011
26dB BW (MHz)	5.035	5.065	5.065	5.025	5.035	5.025	9.950	9.930	9.950	9.950	9.970	9.970
BW / Mod.	15MHz / QPSK			15MHz / 16QAM			20MHz / QPSK			20MHz / 16QAM		
	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	13.427	13.457	13.487	13.427	13.457	13.457	18.342	18.422	18.382	18.302	18.262	18.382
26dB BW (MHz)	14.595	14.565	14.835	14.805	14.775	14.505	20.340	20.340	20.340	20.260	20.260	20.300

Modes	LTE Band 17											
	5MHz / QPSK			5MHz / 16QAM			10MHz / QPSK			10MHz / 16QAM		
	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High	Low	Mid.	High
99% OBW (MHz)	4.496	4.486	4.496	4.496	4.486	4.486	9.131	9.031	9.051	9.011	8.991	9.011
26dB BW (MHz)	5.035	5.025	5.015	5.045	5.025	5.025	10.050	9.990	9.890	9.950	10.050	9.910

**Note:**

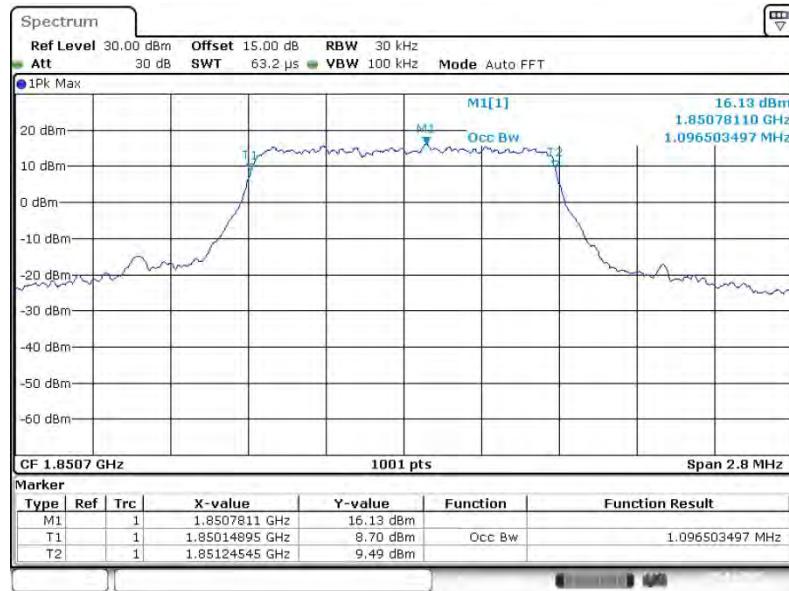
The maximum RB configurations of the 99% Occupied Bandwidth and 26dB Bandwidth summary as below:

- BW1.4MHz RB setting : RB Size 6, RB offset 0
- BW3.0MHz RB setting : RB Size 15, RB offset 0
- BW5.0MHz RB setting : RB Size 25, RB offset 0
- BW10MHz RB setting : RB Size 50, RB offset 0
- BW15MHz RB setting : RB Size 75, RB offset 0
- BW20MHz RB setting : RB Size 100, RB offset 0

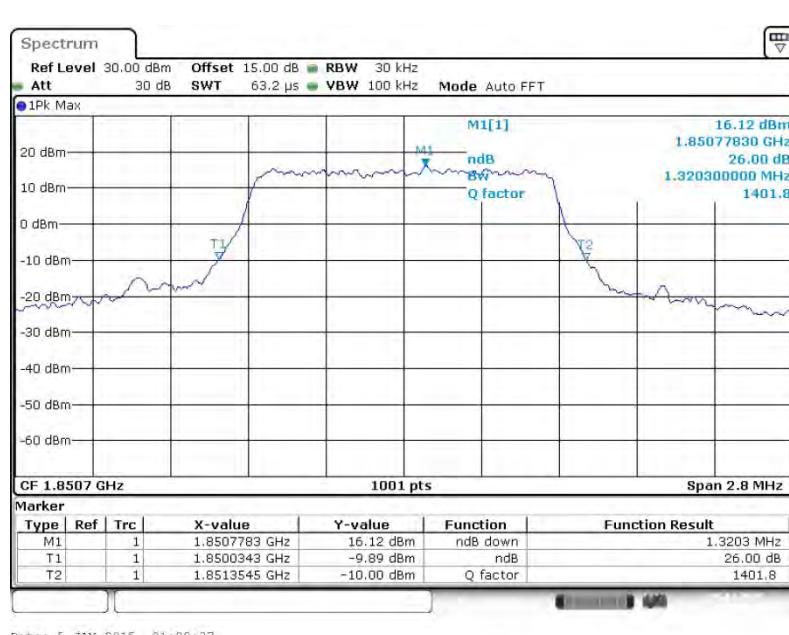
### 3.4.6 Test Result (Plots) of 99% Occupied Bandwidth and 26dB Bandwidth

<b>Band :</b>	LTE Band 2	<b>BW / Mod. :</b>	1.4MHz / QPSK
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**99% Occupied Bandwidth Plot on Channel 18607**

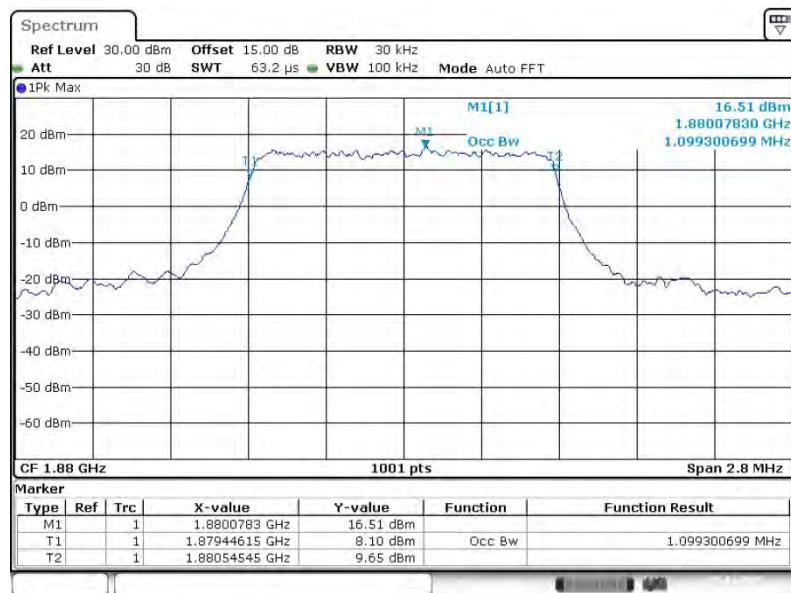


**26dB Bandwidth Plot on Channel 18607**

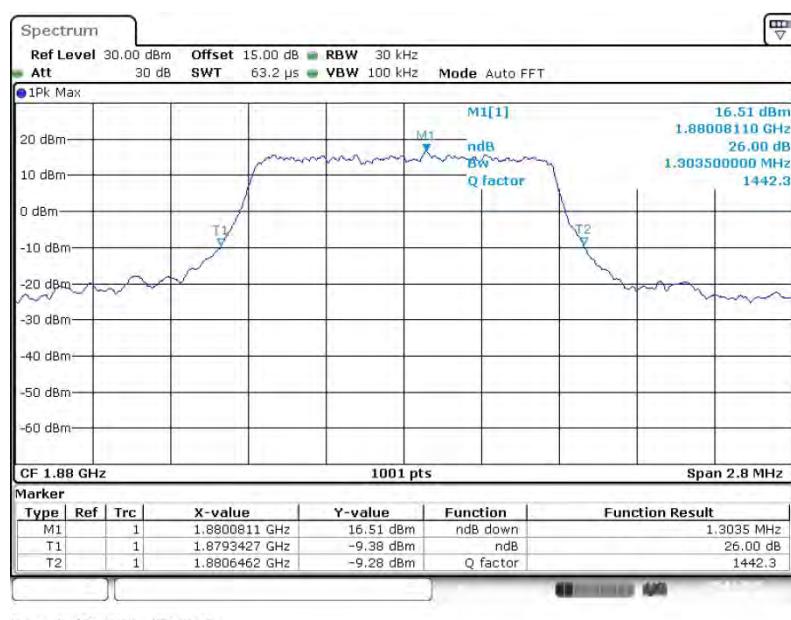




## 99% Occupied Bandwidth Plot on Channel 18900

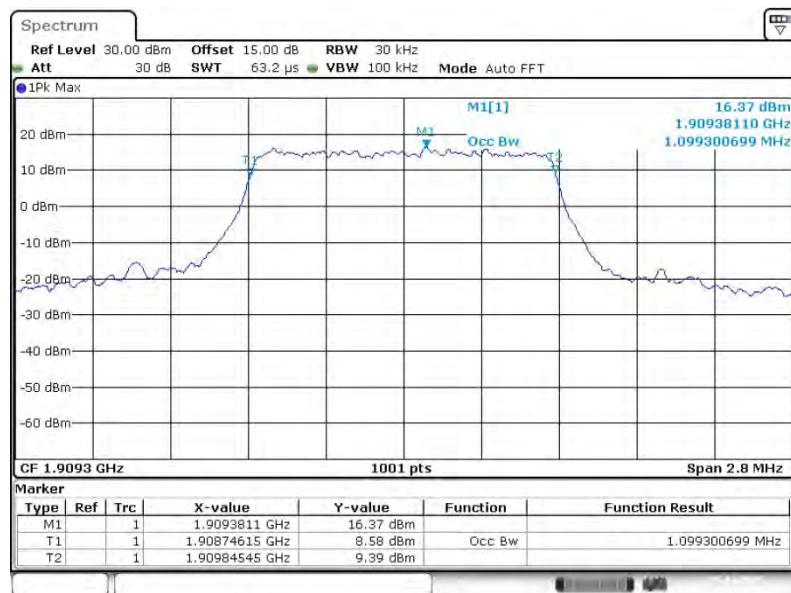


## 26dB Bandwidth Plot on Channel 18900

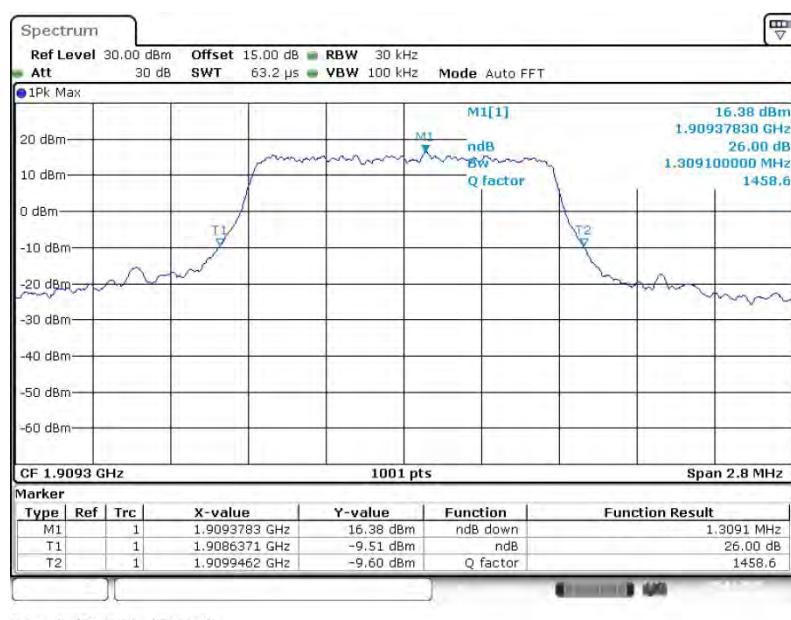




## 99% Occupied Bandwidth Plot on Channel 19193



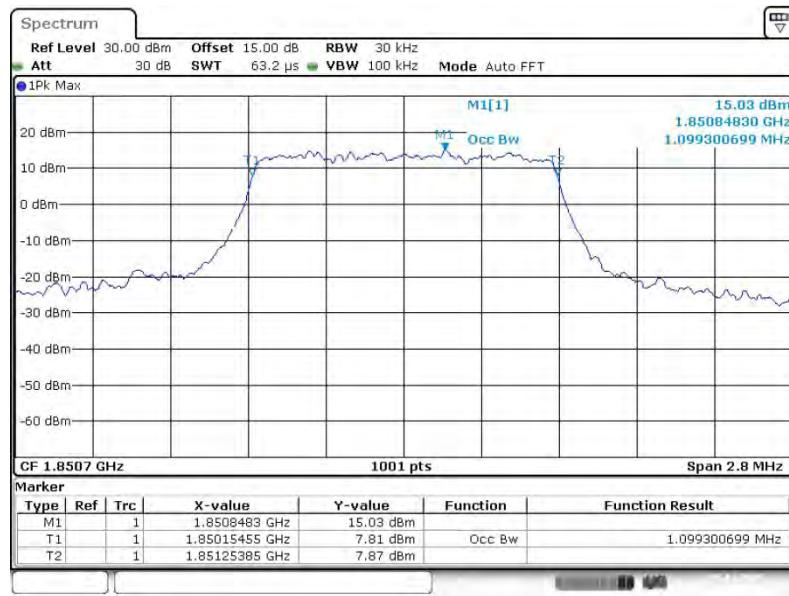
## 26dB Bandwidth Plot on Channel 19193



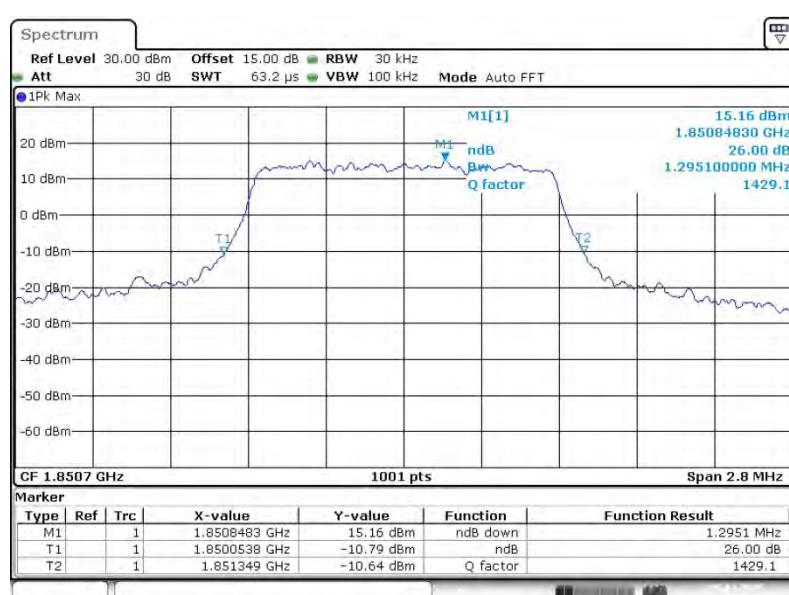


Band :	LTE Band 2	BW / Mod. :	1.4MHz / 16QAM
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## 99% Occupied Bandwidth Plot on Channel 18607

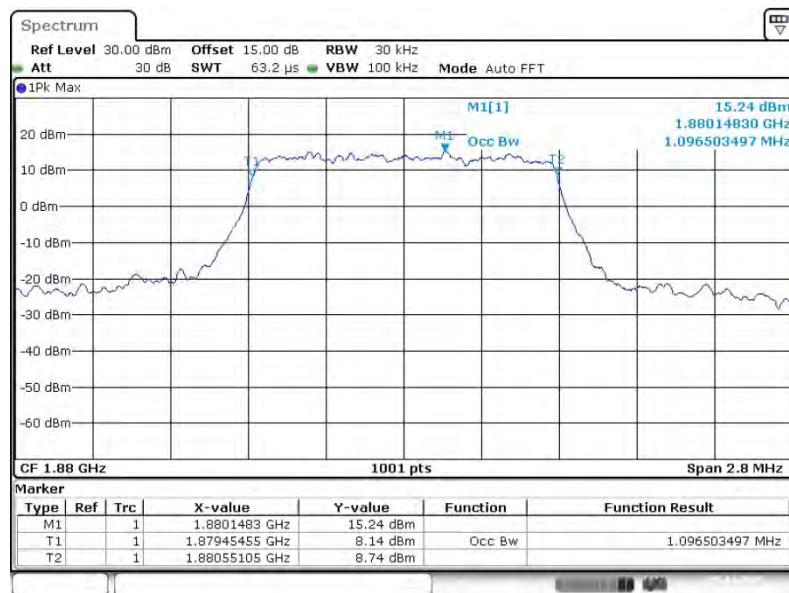


## 26dB Bandwidth Plot on Channel 18607

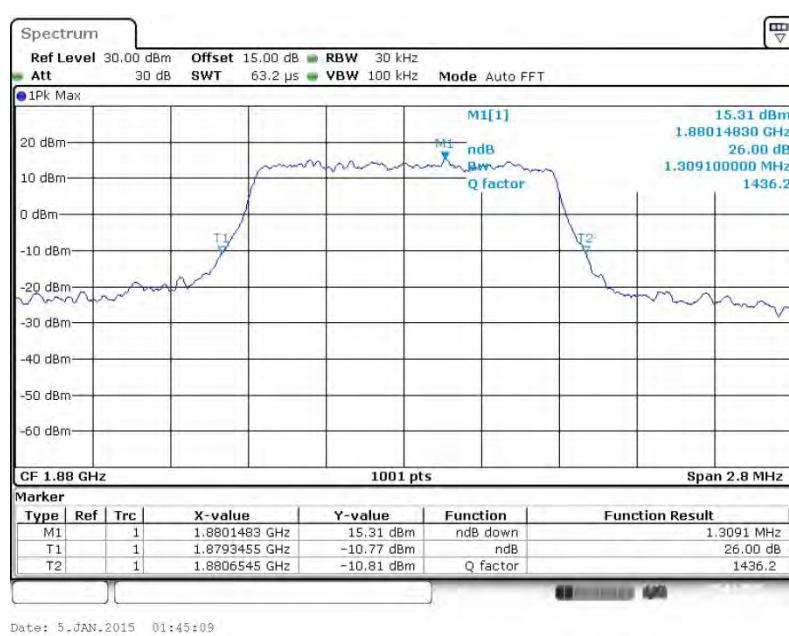




## 99% Occupied Bandwidth Plot on Channel 18900

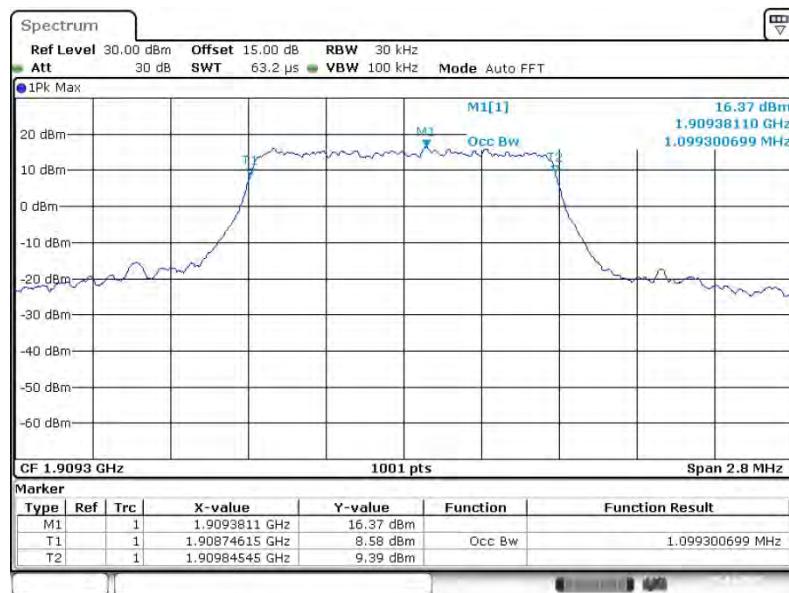


## 26dB Bandwidth Plot on Channel 18900

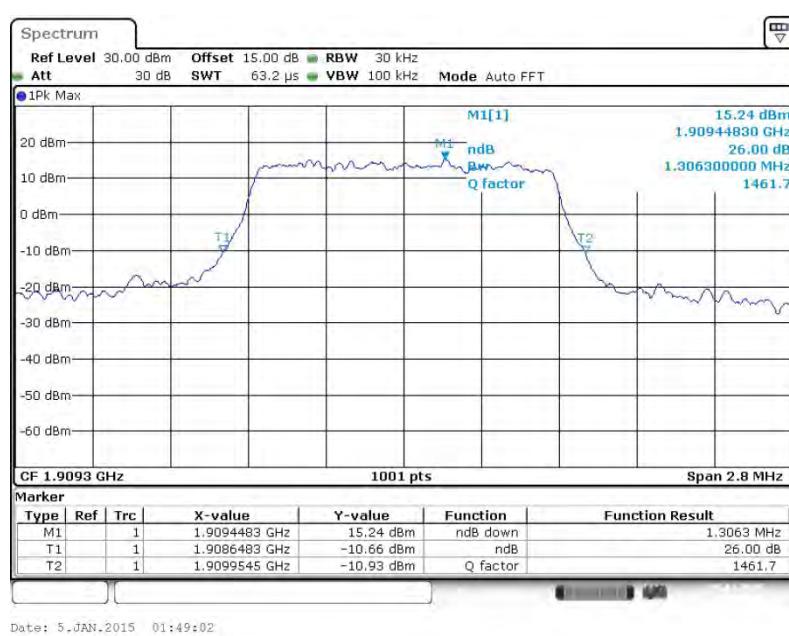




## 99% Occupied Bandwidth Plot on Channel 19193



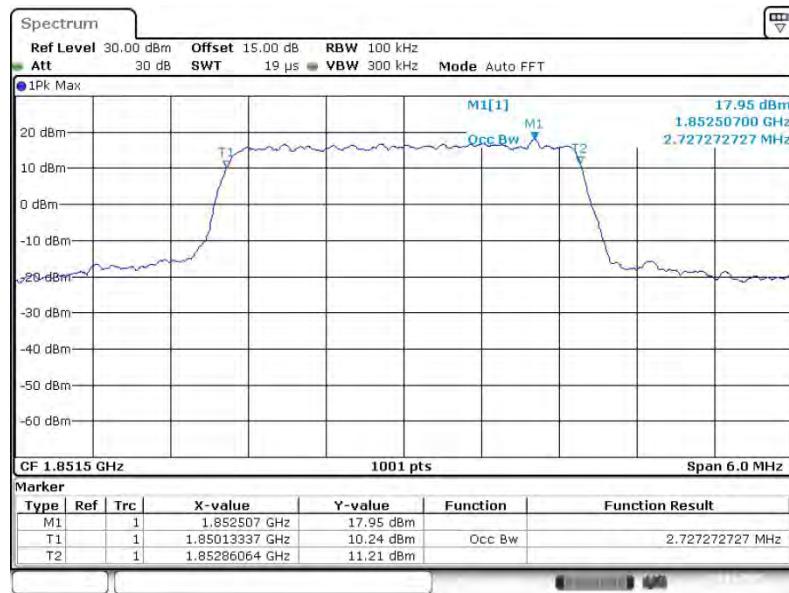
## 26dB Bandwidth Plot on Channel 19193



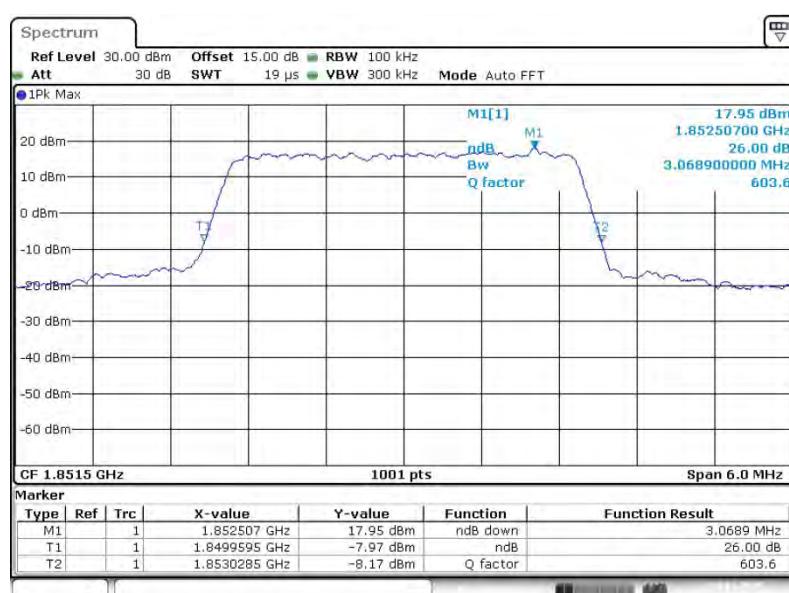


Band :	LTE Band 2	BW / Mod. :	3MHz / QPSK
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## 99% Occupied Bandwidth Plot on Channel 18615

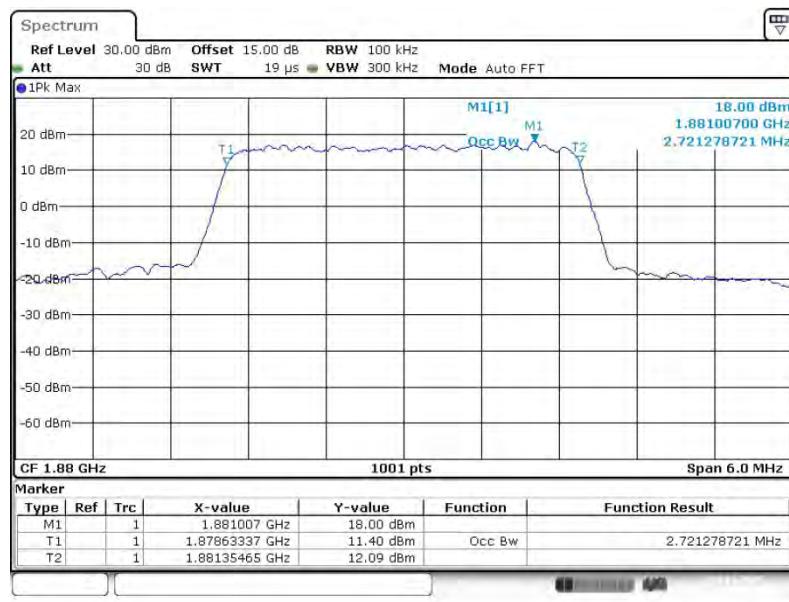


## 26dB Bandwidth Plot on Channel 18615

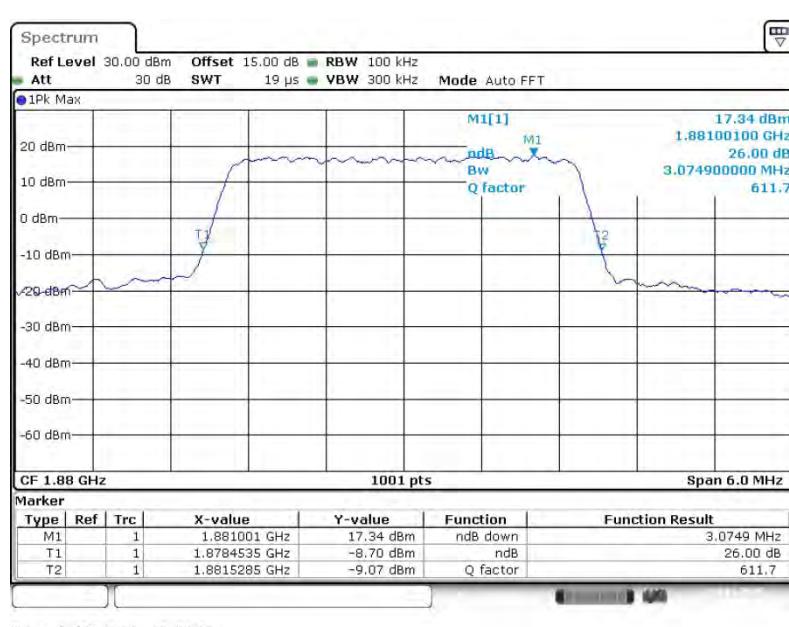




## 99% Occupied Bandwidth Plot on Channel 18900

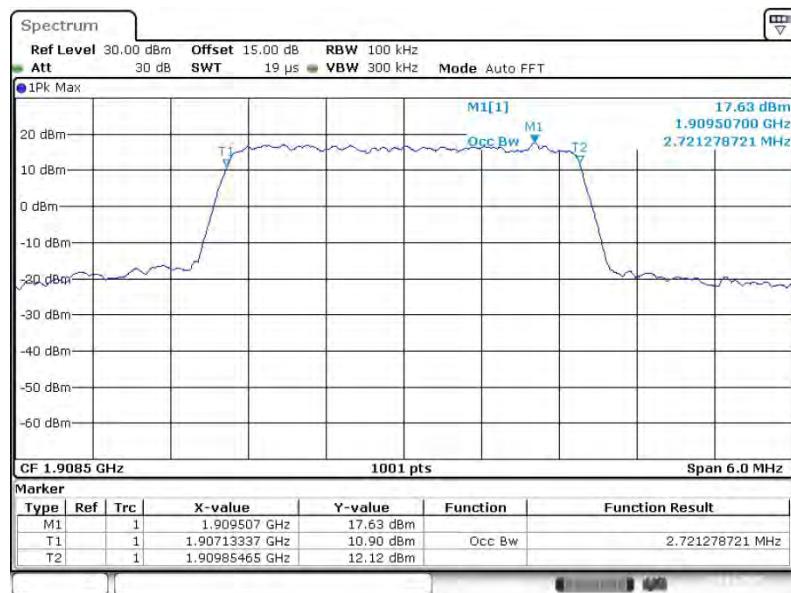


## 26dB Bandwidth Plot on Channel 18900

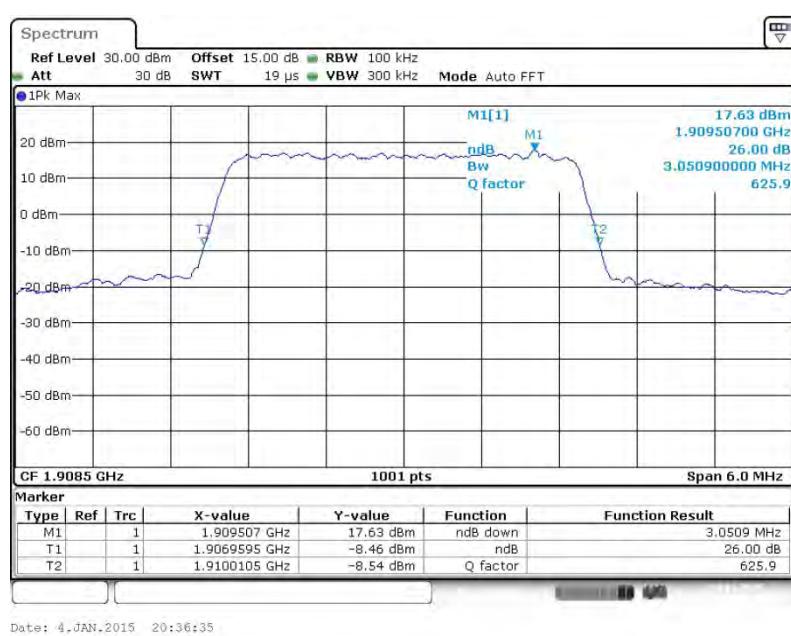




## 99% Occupied Bandwidth Plot on Channel 19185

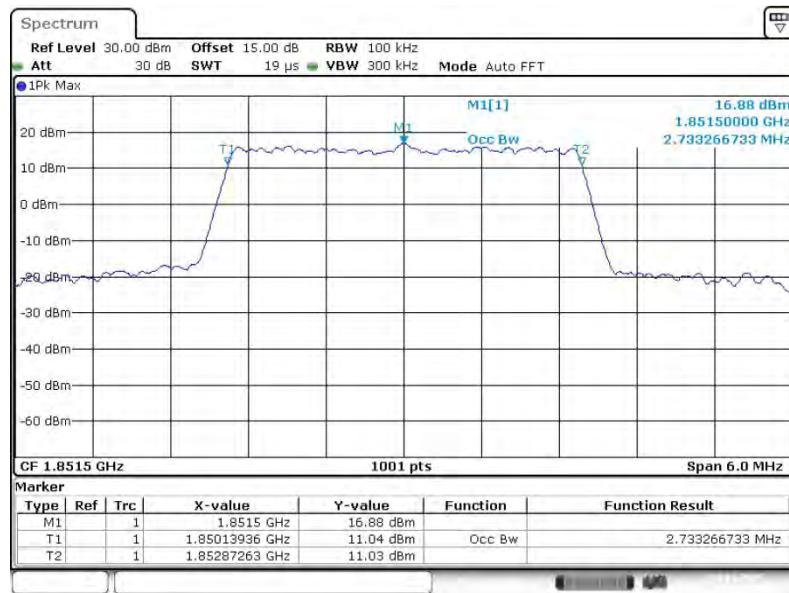
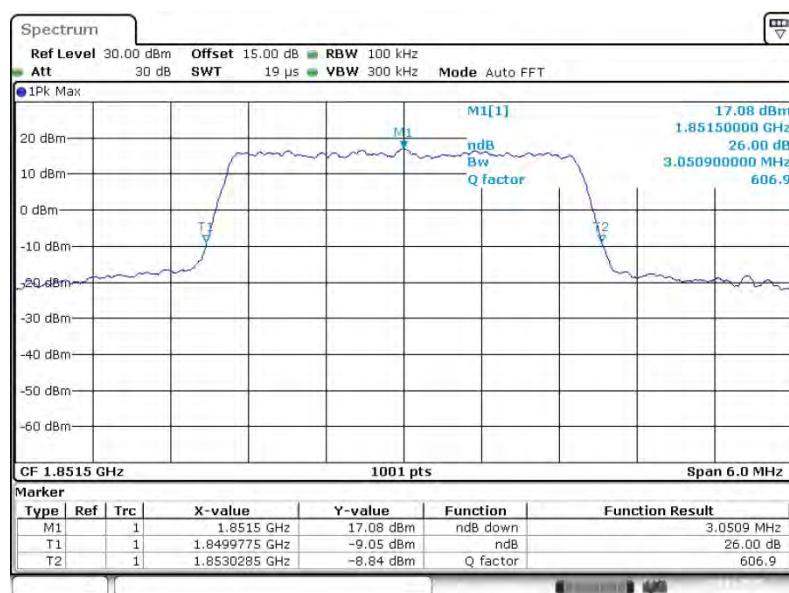


## 26dB Bandwidth Plot on Channel 19185



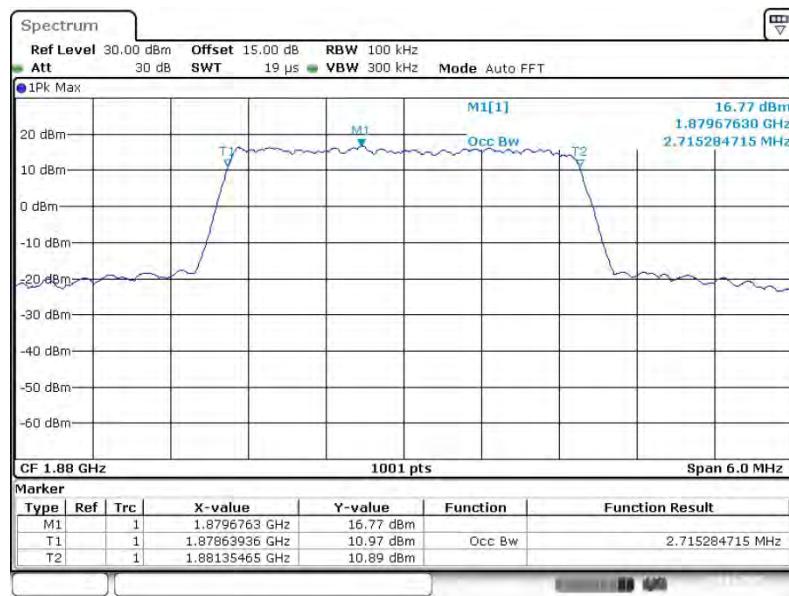


Band :	LTE Band 2	BW / Mod. :	3MHz / 16QAM
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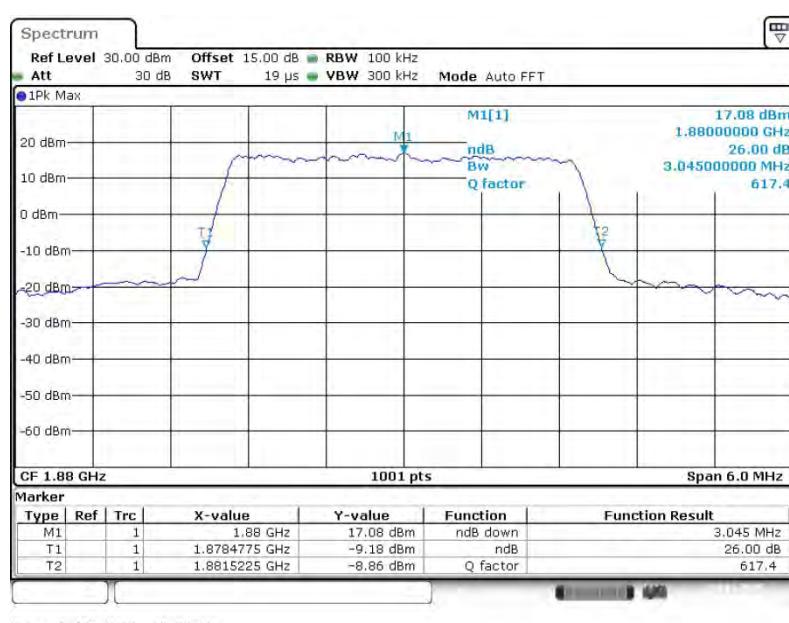
**99% Occupied Bandwidth Plot on Channel 18615****26dB Bandwidth Plot on Channel 18615**



## 99% Occupied Bandwidth Plot on Channel 18900

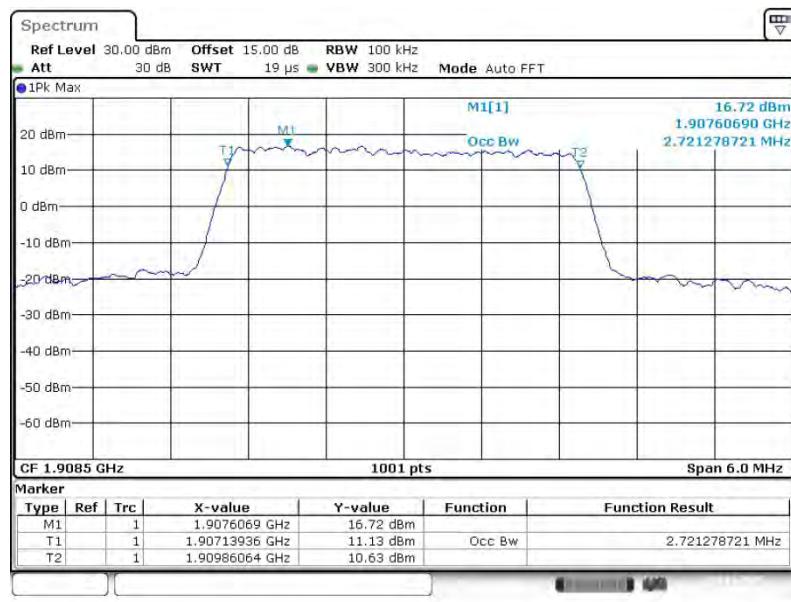


## 26dB Bandwidth Plot on Channel 18900

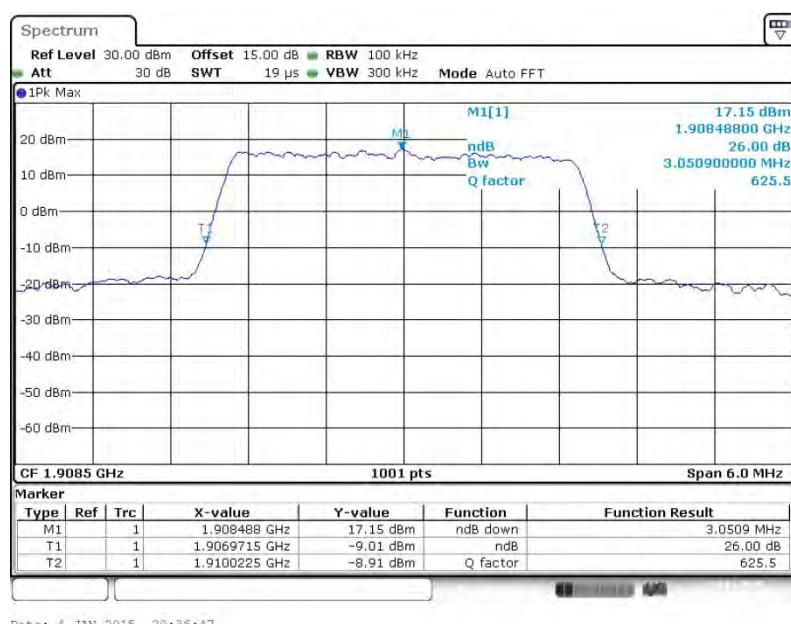




## 99% Occupied Bandwidth Plot on Channel 19185

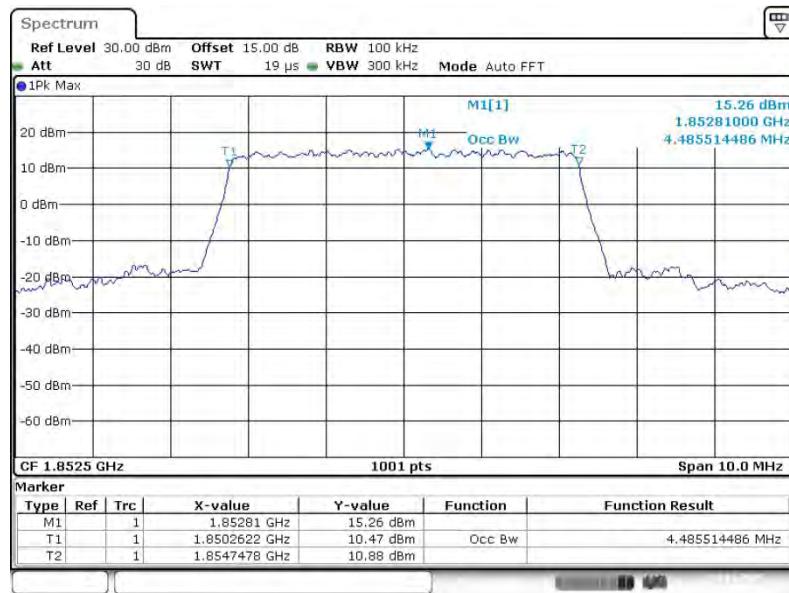
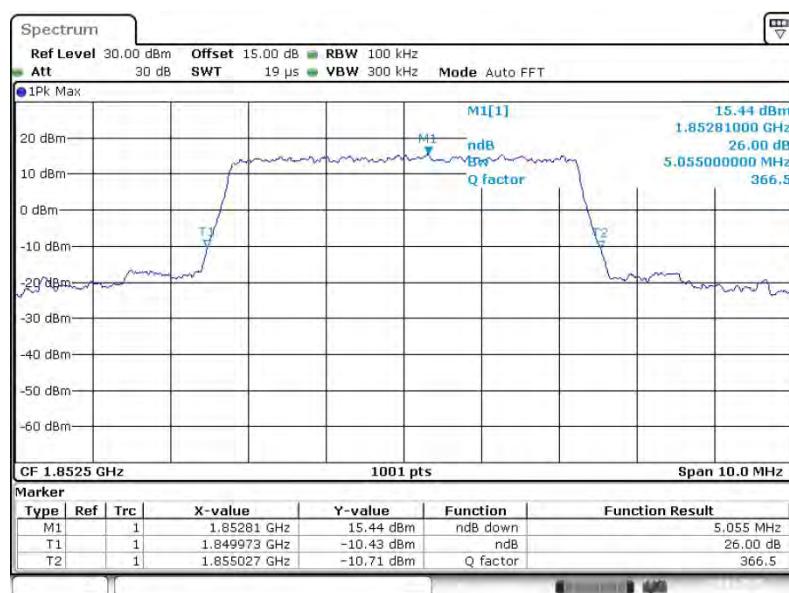


## 26dB Bandwidth Plot on Channel 19185



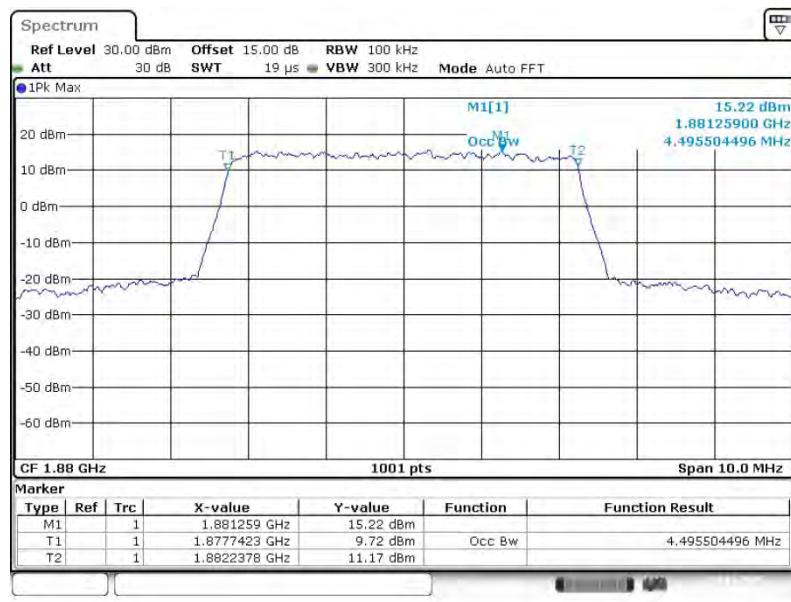


Band :	LTE Band 2	BW / Mod. :	5MHz / QPSK
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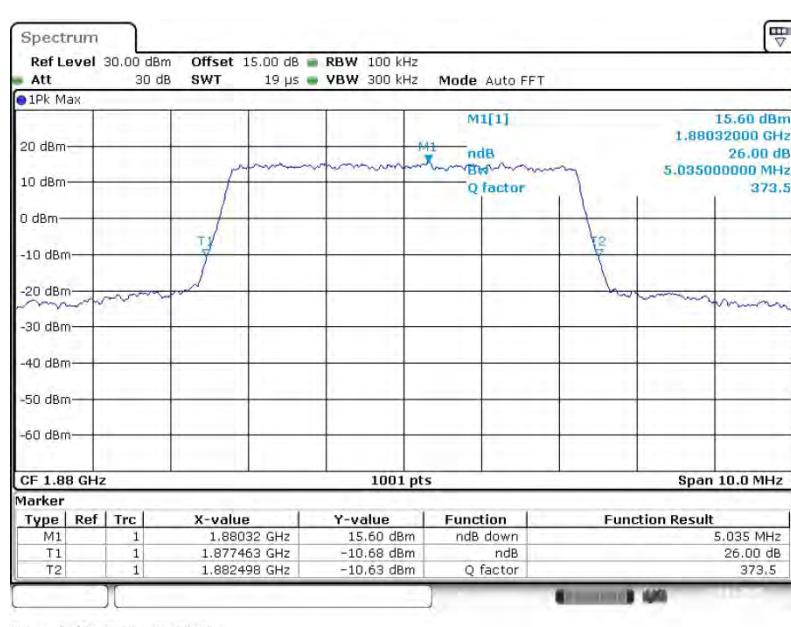
**99% Occupied Bandwidth Plot on Channel 18625****26dB Bandwidth Plot on Channel 18625**



## 99% Occupied Bandwidth Plot on Channel 18900

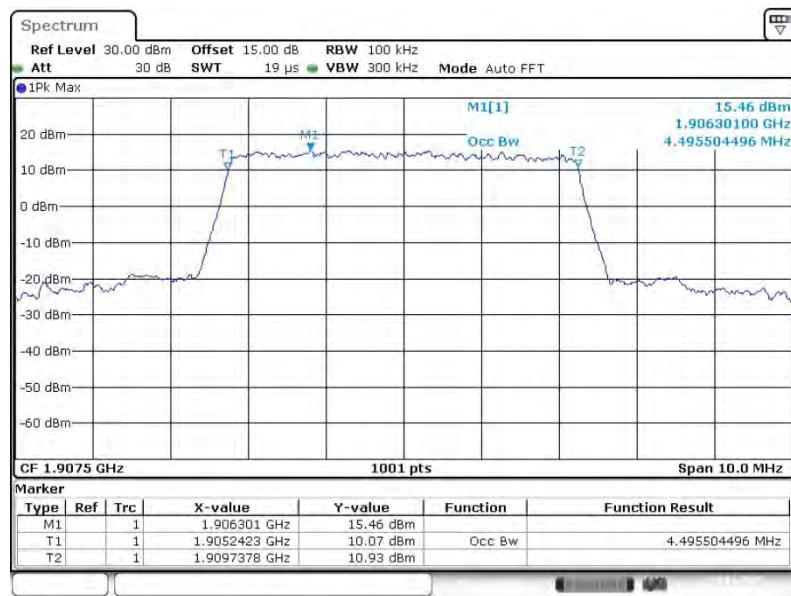


## 26dB Bandwidth Plot on Channel 18900

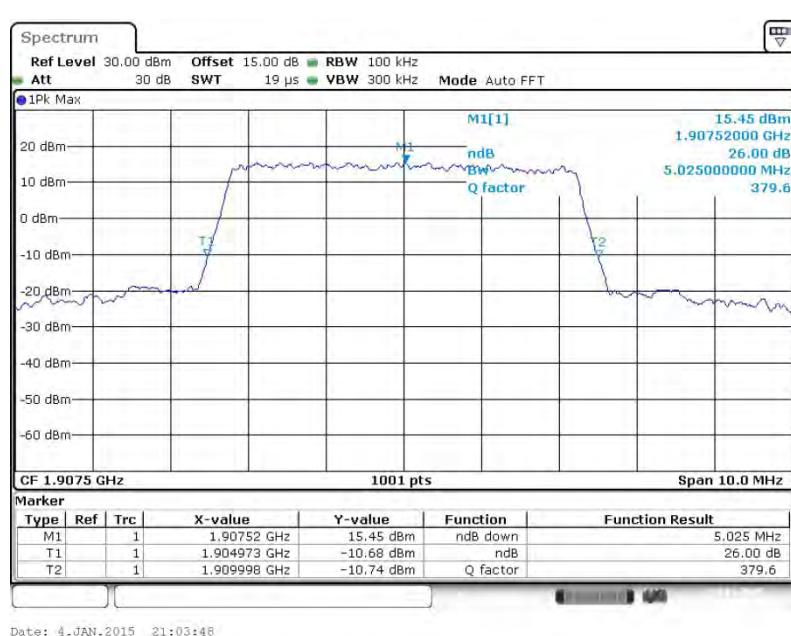




## 99% Occupied Bandwidth Plot on Channel 19175

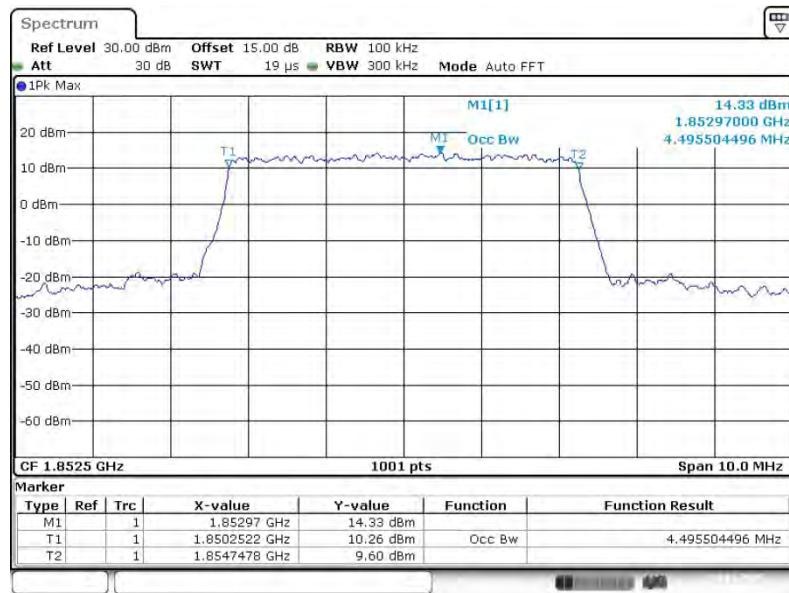
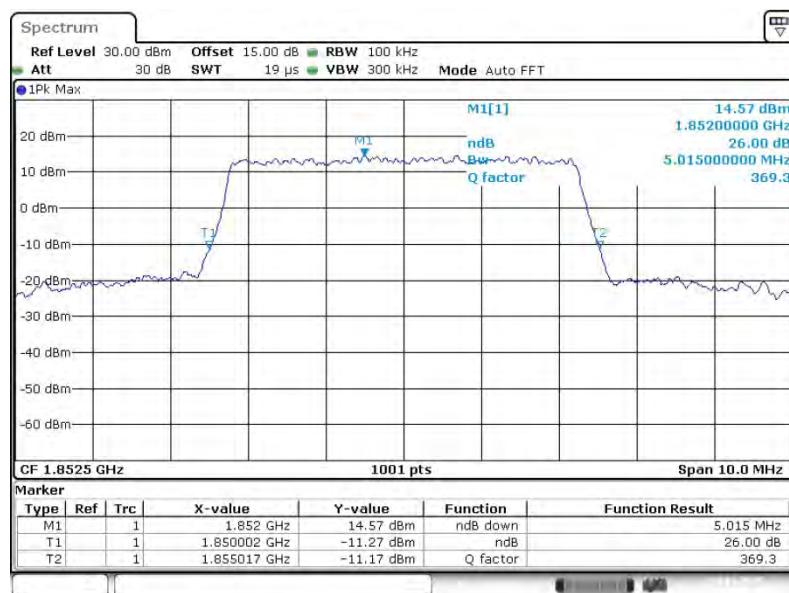


## 26dB Bandwidth Plot on Channel 19175



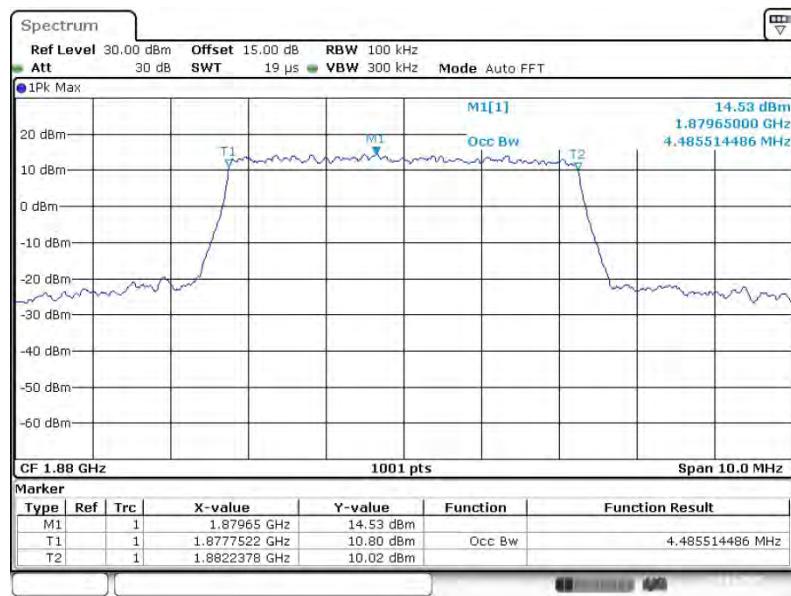


Band :	LTE Band 2	BW / Mod. :	5MHz / 16QAM
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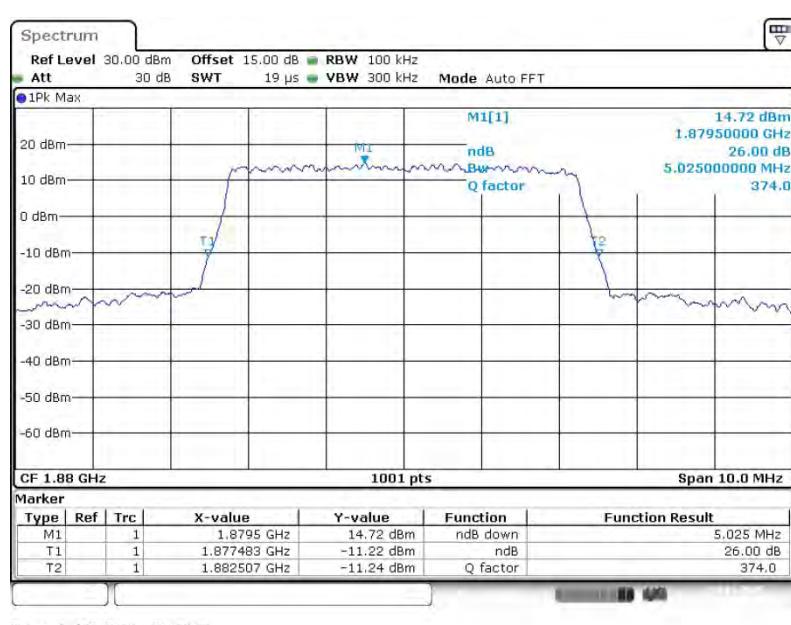
**99% Occupied Bandwidth Plot on Channel 18625****26dB Bandwidth Plot on Channel 18625**



## 99% Occupied Bandwidth Plot on Channel 18900

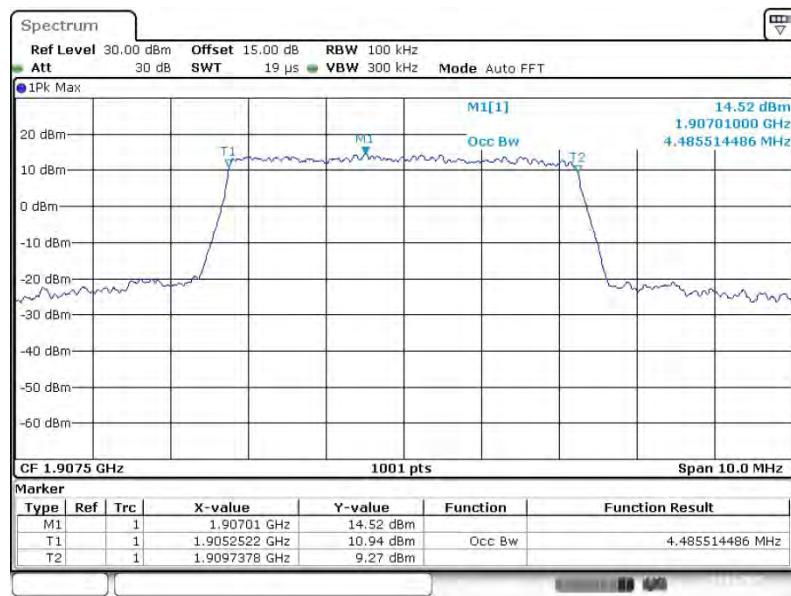


## 26dB Bandwidth Plot on Channel 18900

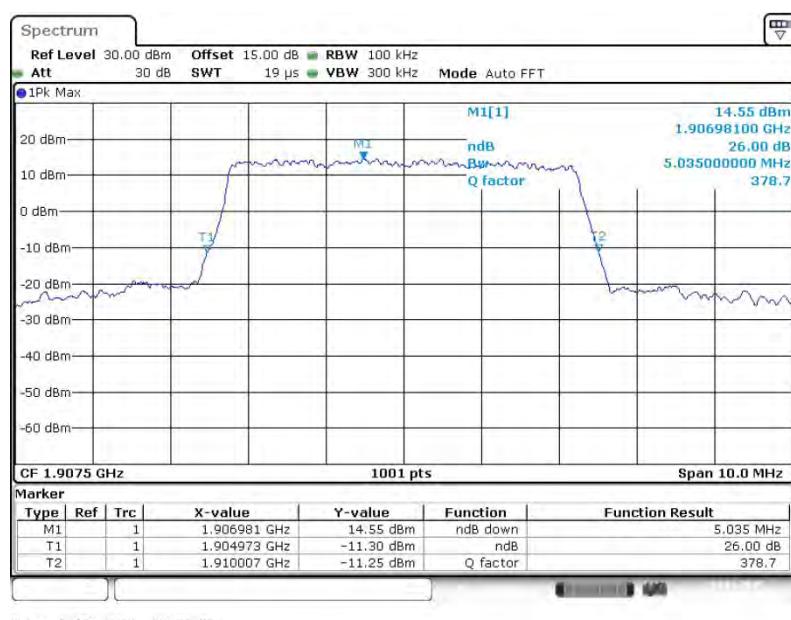




## 99% Occupied Bandwidth Plot on Channel 19175

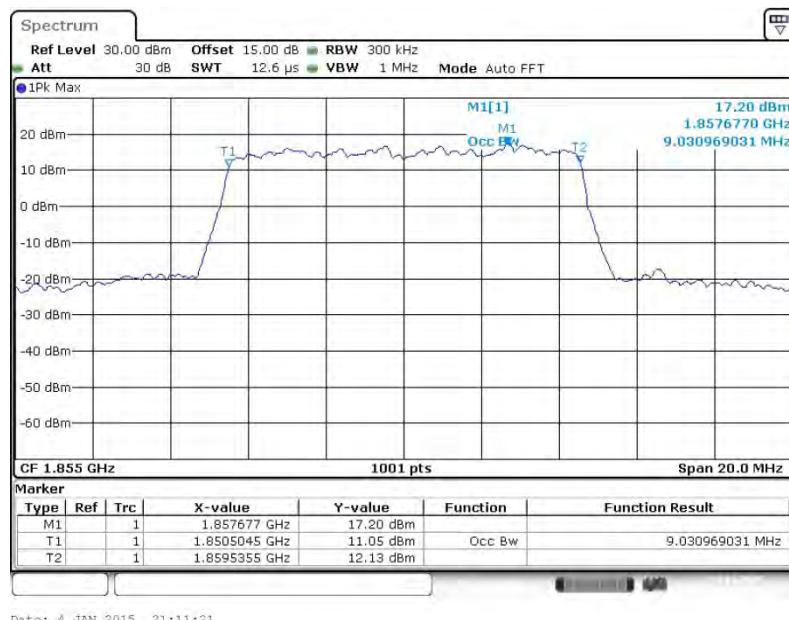
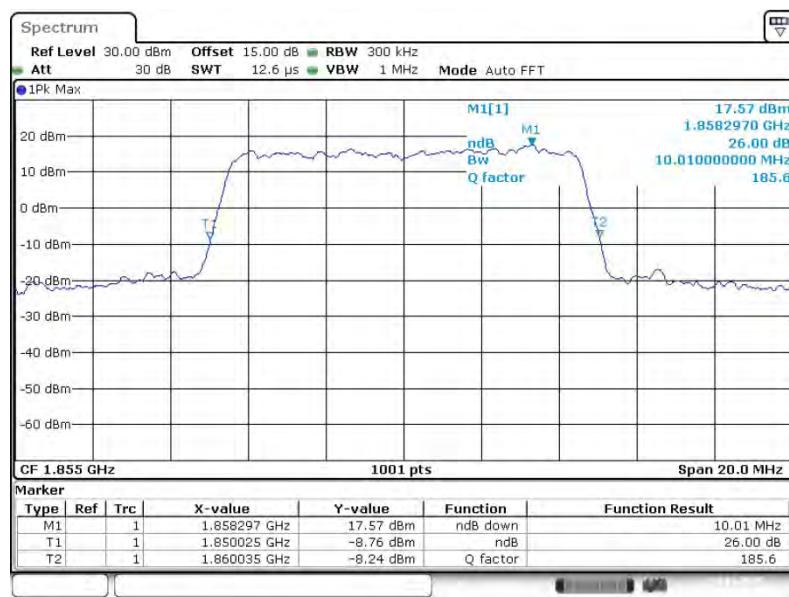


## 26dB Bandwidth Plot on Channel 19175



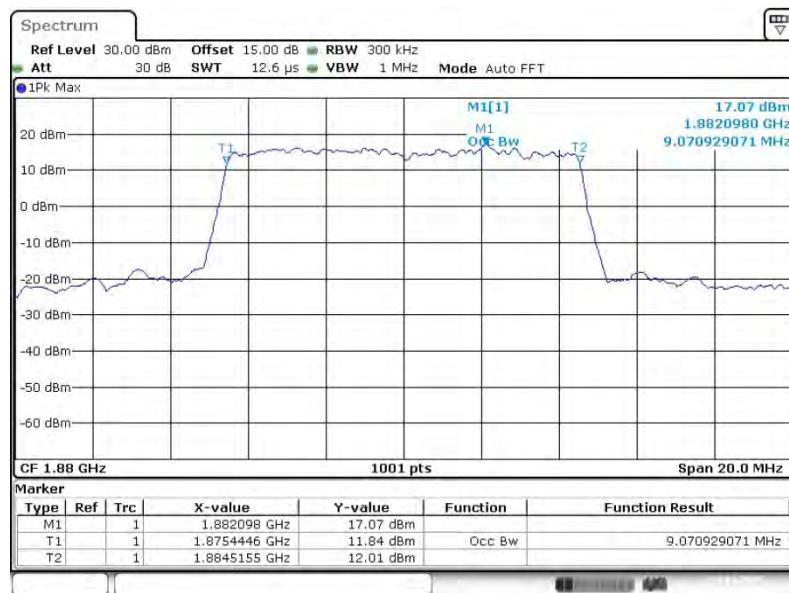


Band :	LTE Band 2	BW / Mod. :	10MHz / QPSK
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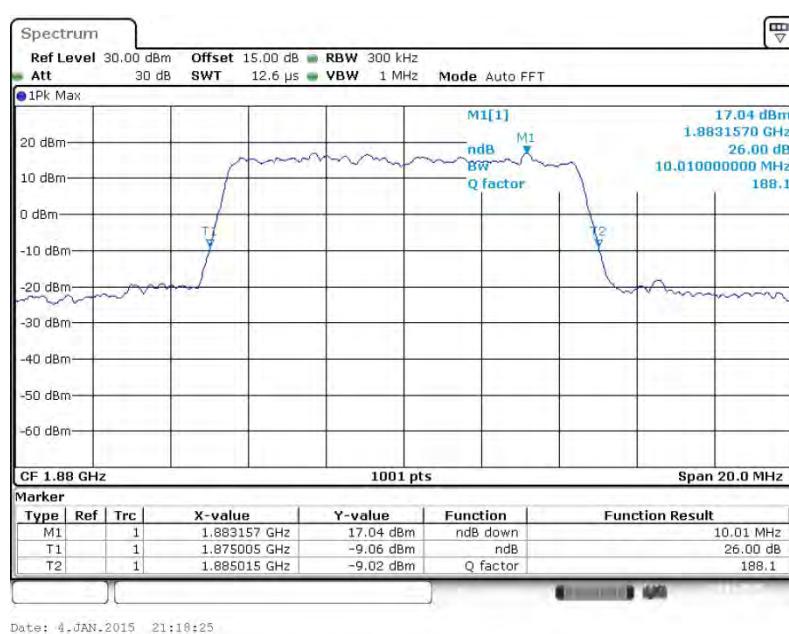
**99% Occupied Bandwidth Plot on Channel 18650****26dB Bandwidth Plot on Channel 18650**



## 99% Occupied Bandwidth Plot on Channel 18900

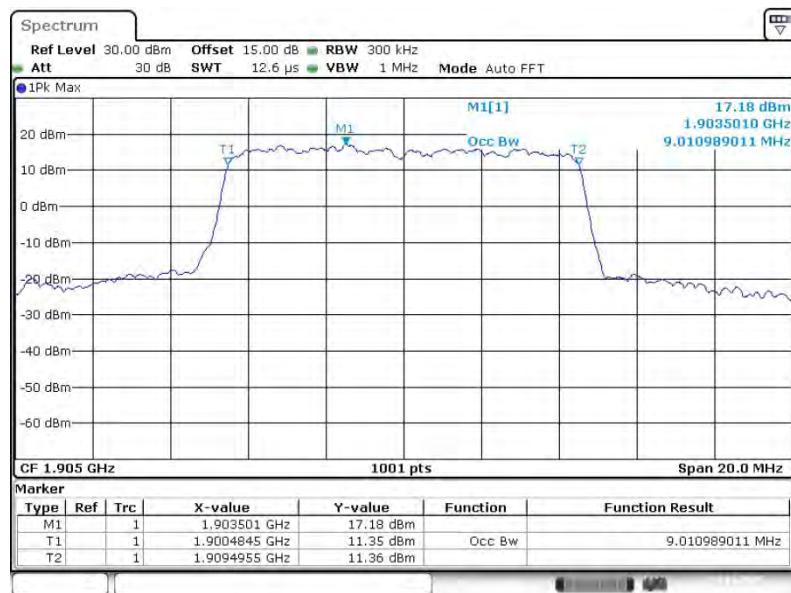


## 26dB Bandwidth Plot on Channel 18900

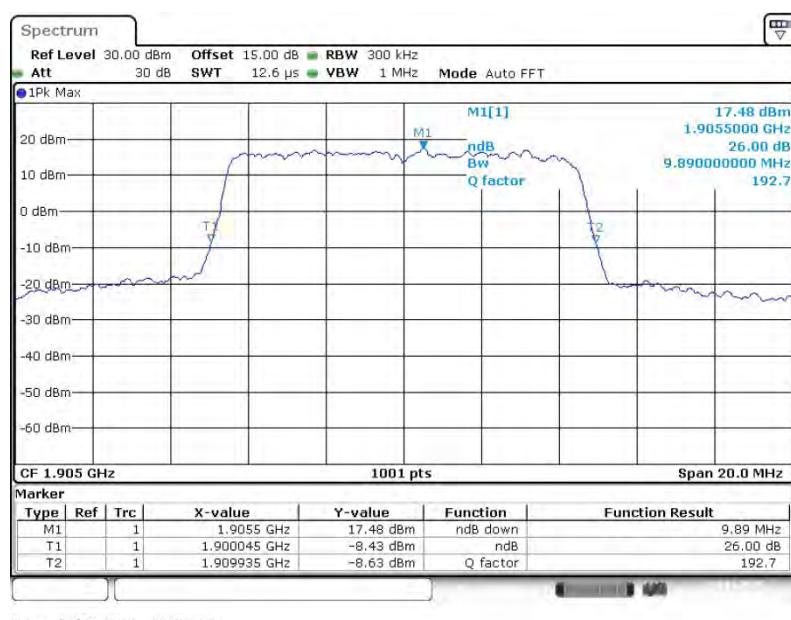




## 99% Occupied Bandwidth Plot on Channel 19150

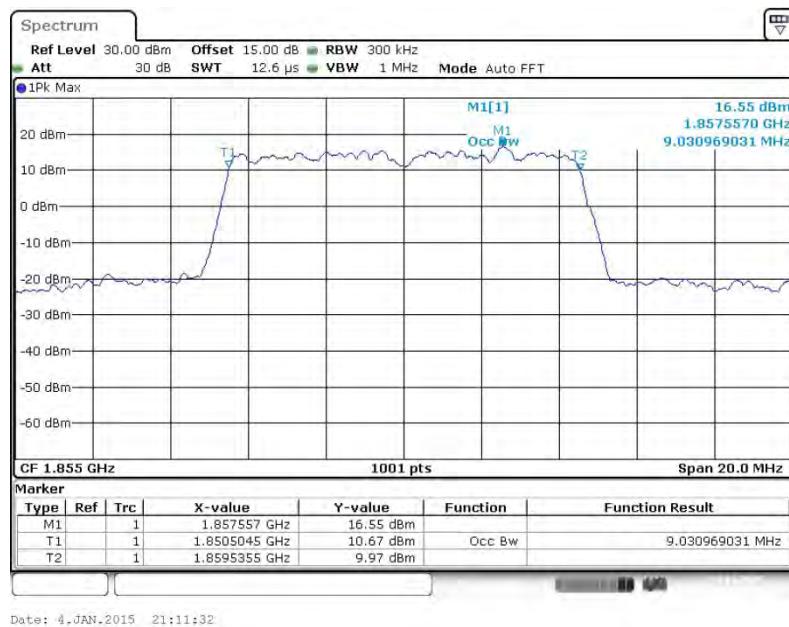
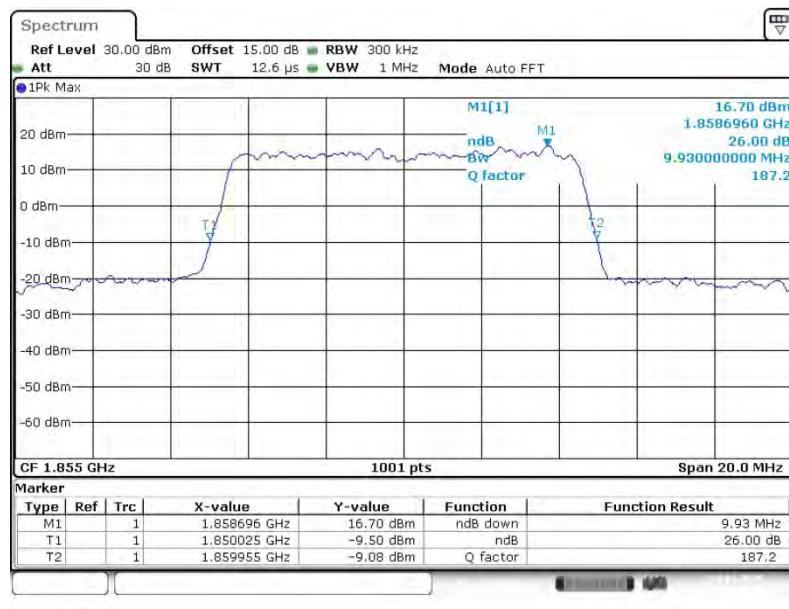


## 26dB Bandwidth Plot on Channel 19150



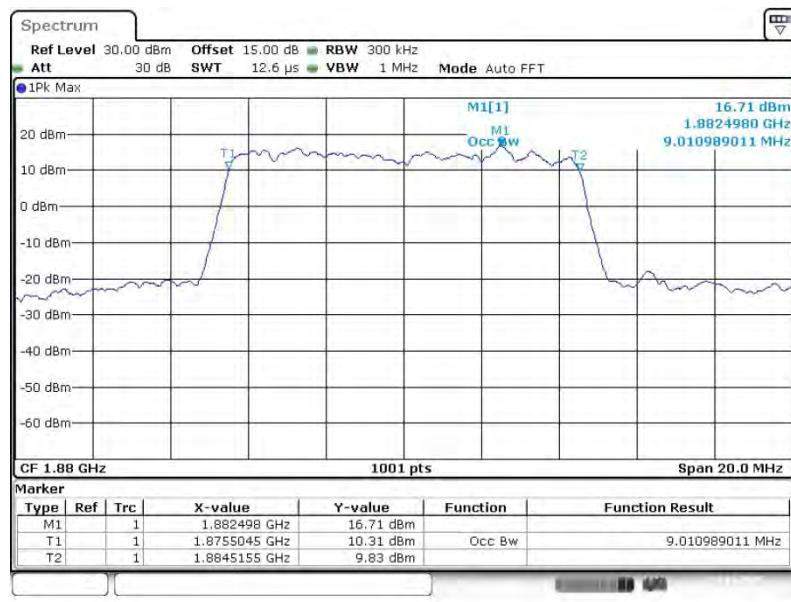


Band :	LTE Band 2	BW / Mod. :	10MHz / 16QAM
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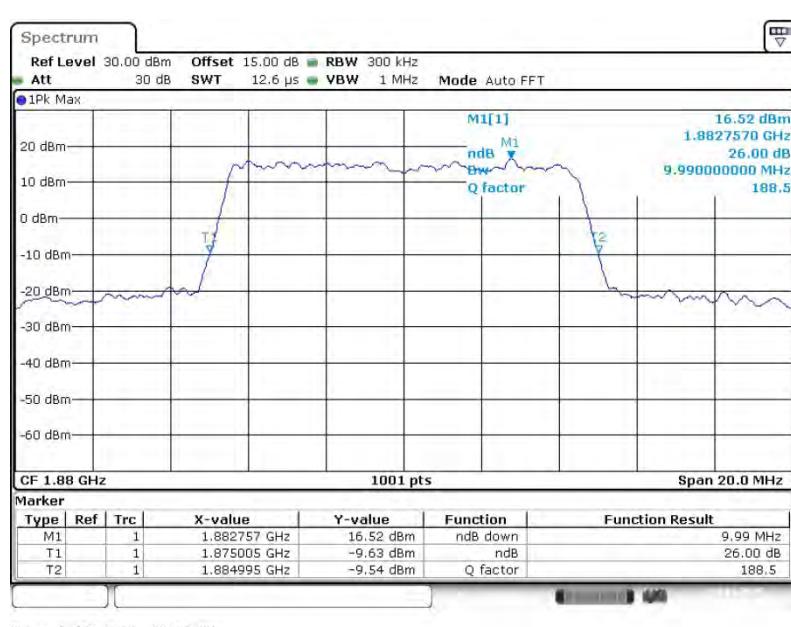
**99% Occupied Bandwidth Plot on Channel 18650****26dB Bandwidth Plot on Channel 18650**



## 99% Occupied Bandwidth Plot on Channel 18900

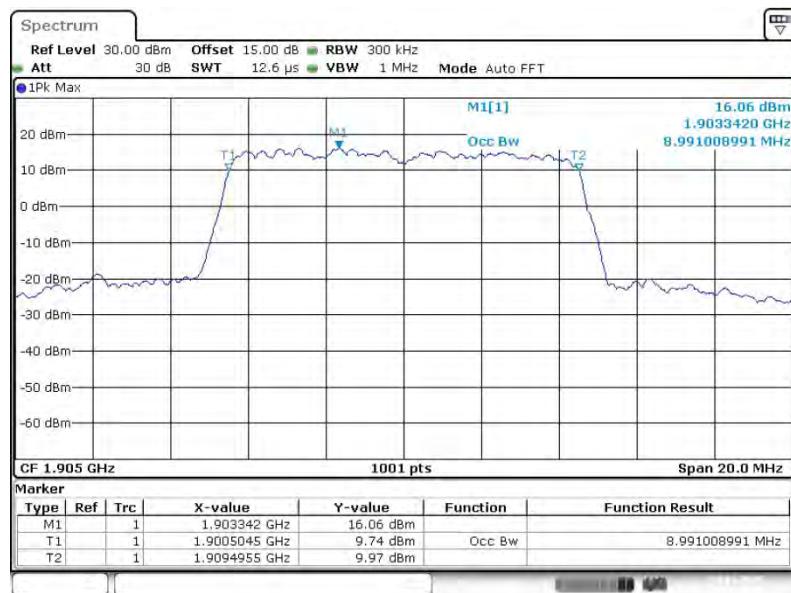


## 26dB Bandwidth Plot on Channel 18900

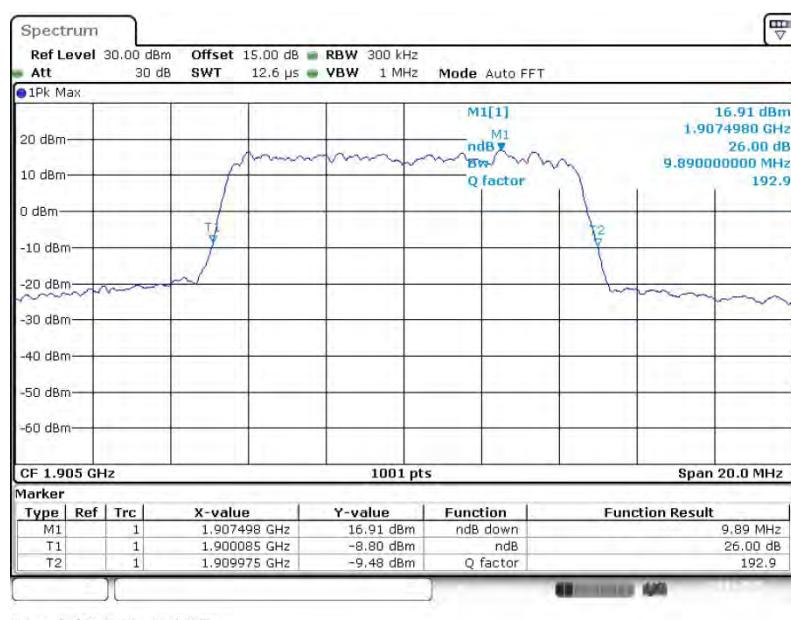




## 99% Occupied Bandwidth Plot on Channel 19150

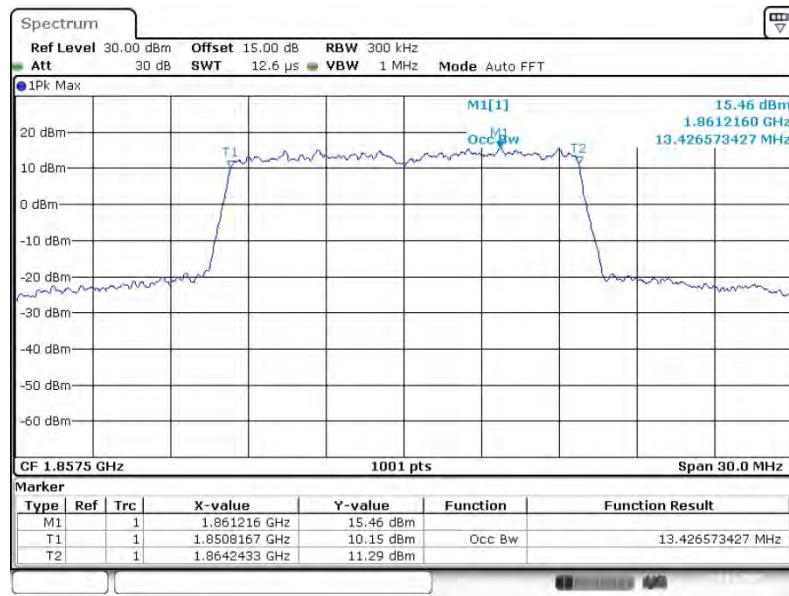
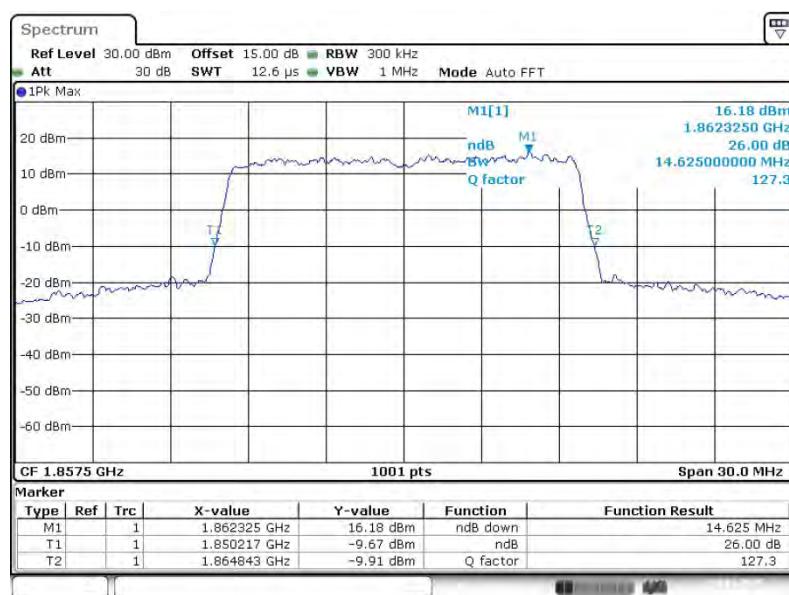


## 26dB Bandwidth Plot on Channel 19150



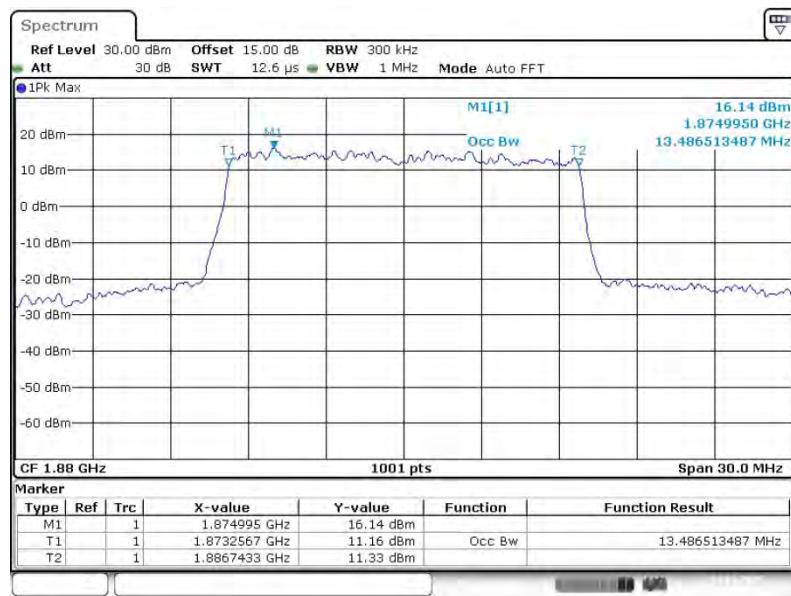


Band :	LTE Band 2	BW / Mod. :	15MHz / QPSK
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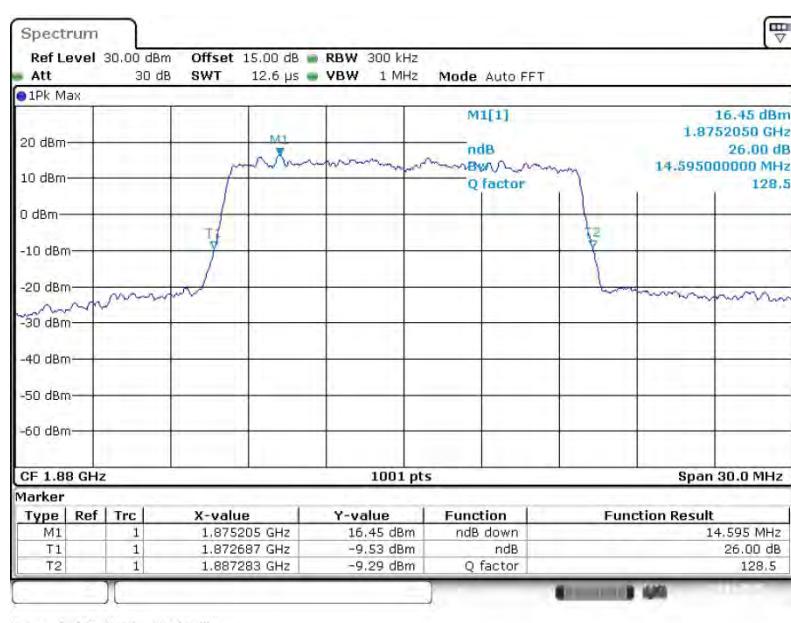
**99% Occupied Bandwidth Plot on Channel 18675****26dB Bandwidth Plot on Channel 18675**



## 99% Occupied Bandwidth Plot on Channel 18900

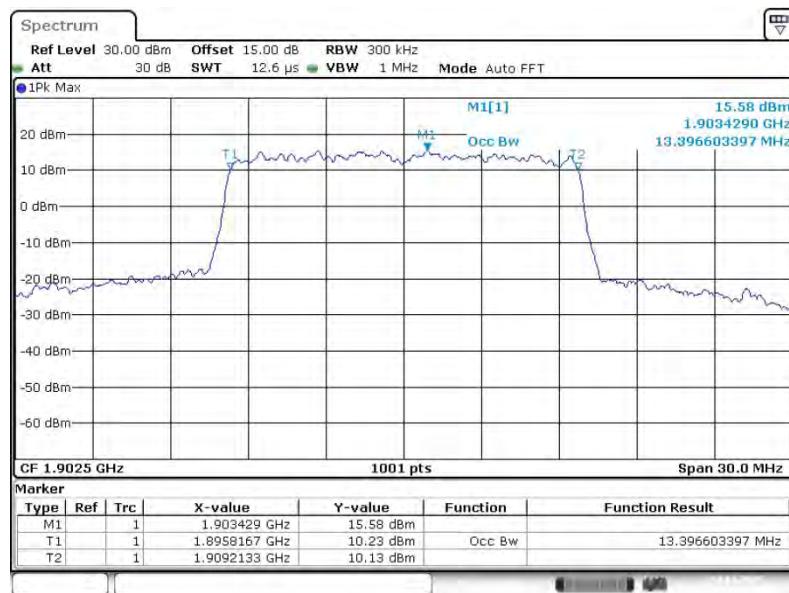


## 26dB Bandwidth Plot on Channel 18900

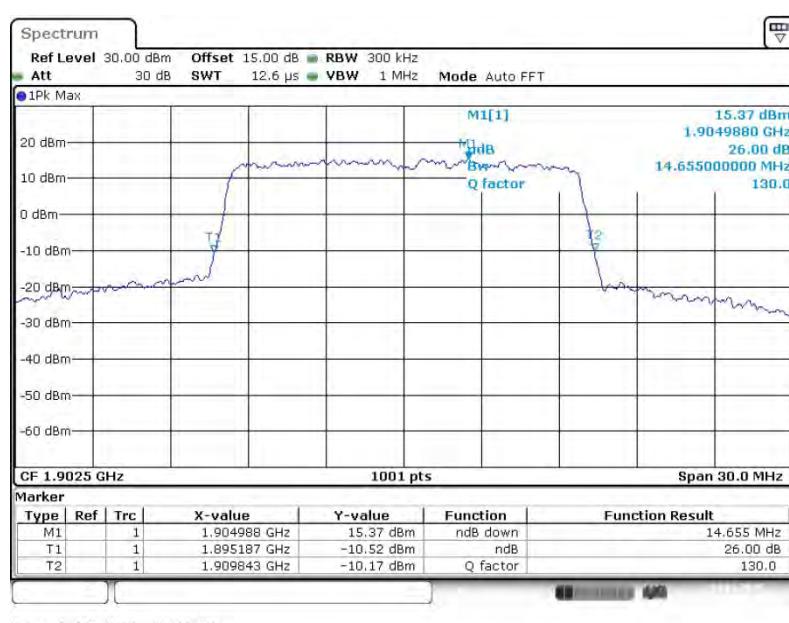




## 99% Occupied Bandwidth Plot on Channel 19125

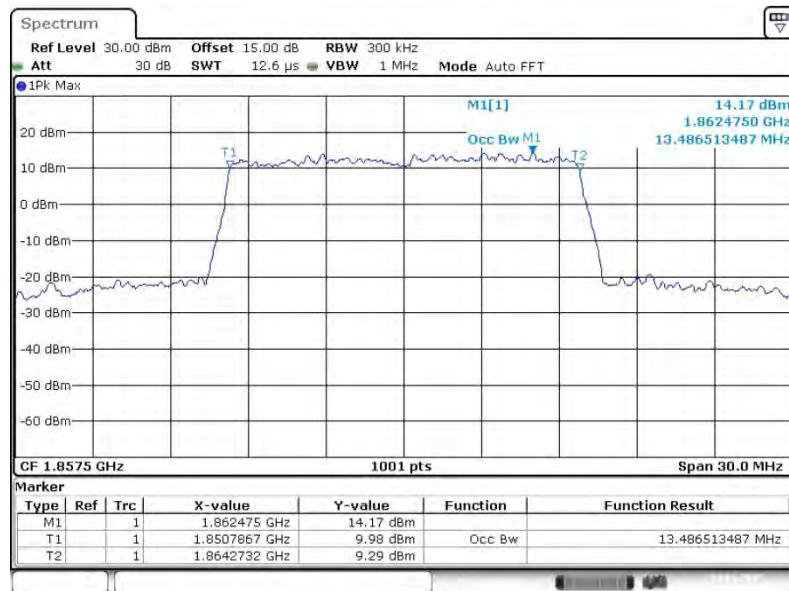
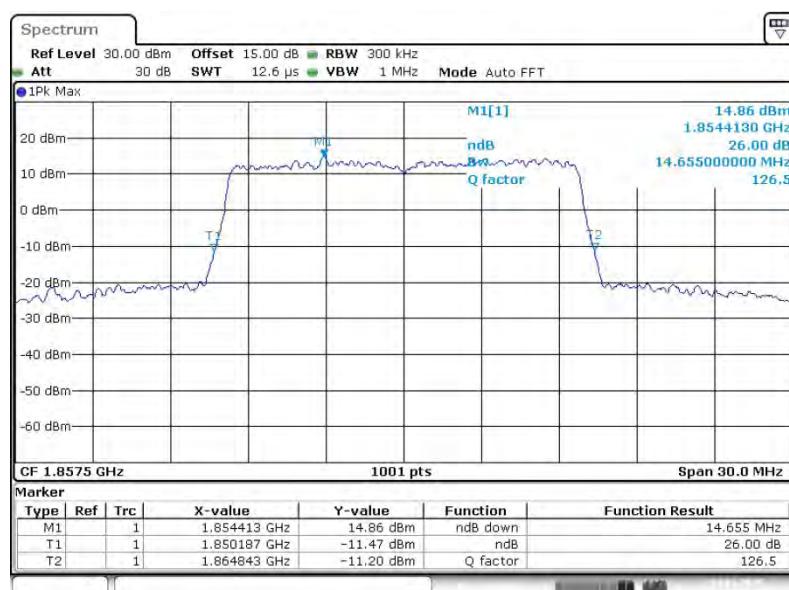


## 26dB Bandwidth Plot on Channel 19125



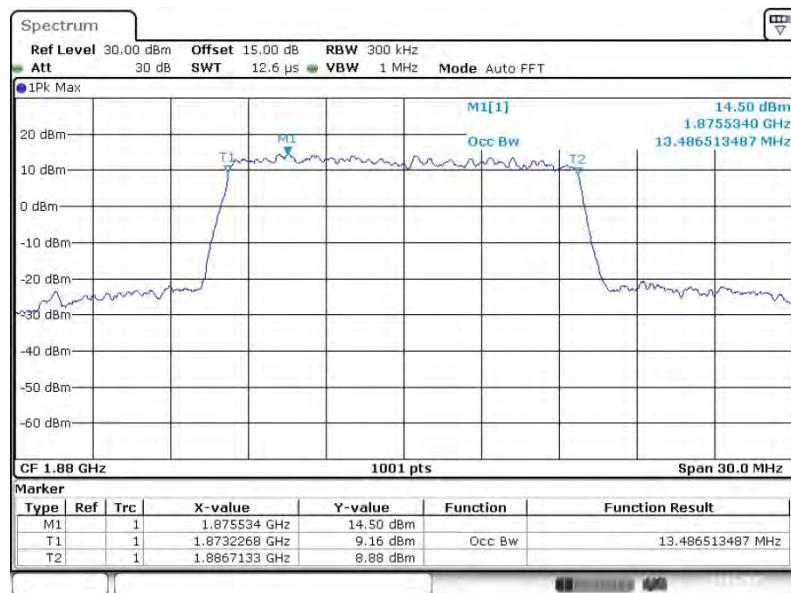


Band :	LTE Band 2	BW / Mod. :	15MHz / 16QAM
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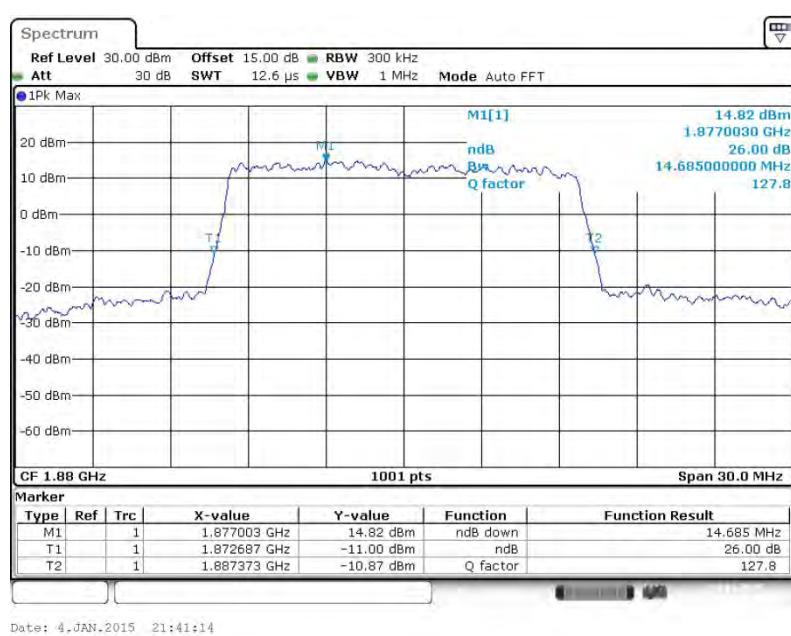
**99% Occupied Bandwidth Plot on Channel 18675****26dB Bandwidth Plot on Channel 18675**



## 99% Occupied Bandwidth Plot on Channel 18900

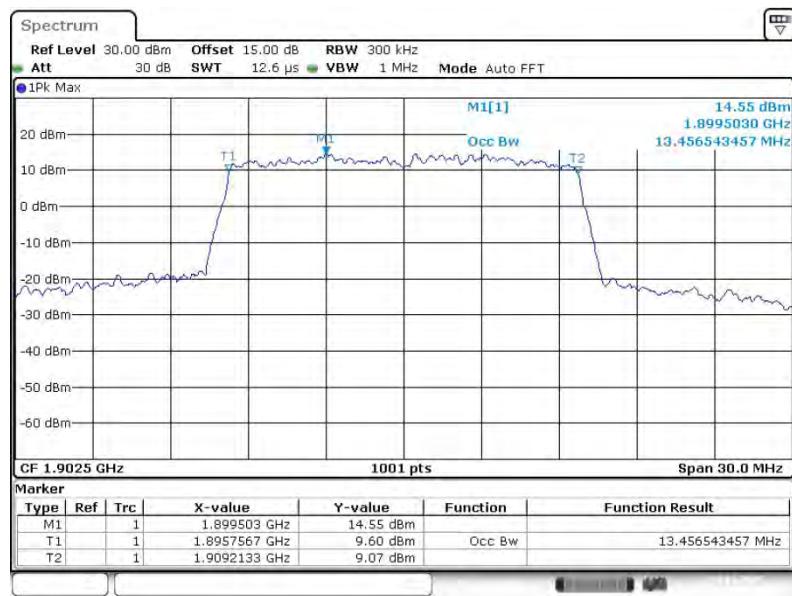


## 26dB Bandwidth Plot on Channel 18900

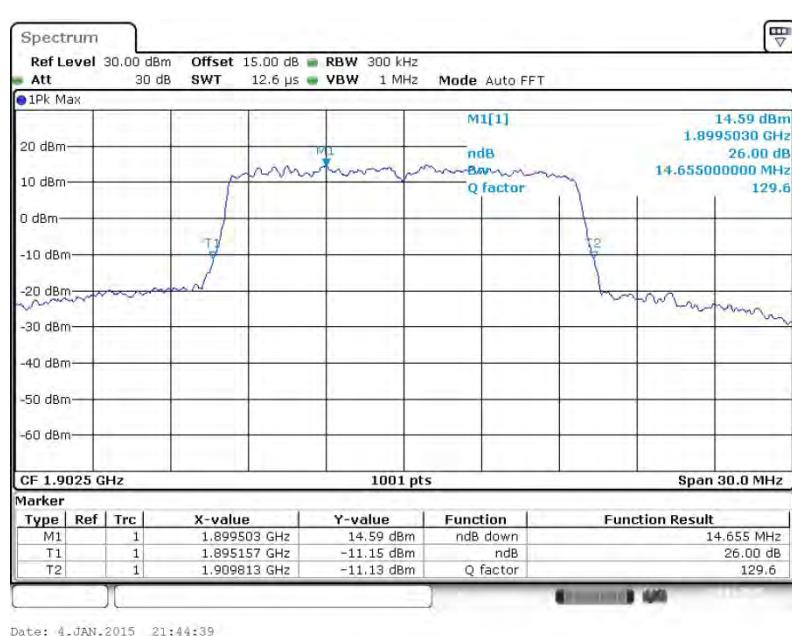




## 99% Occupied Bandwidth Plot on Channel 19125

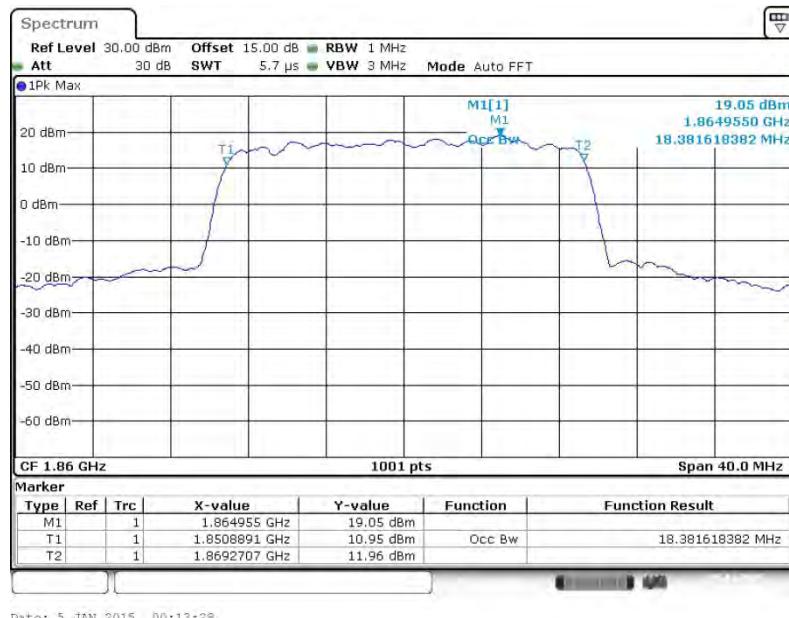
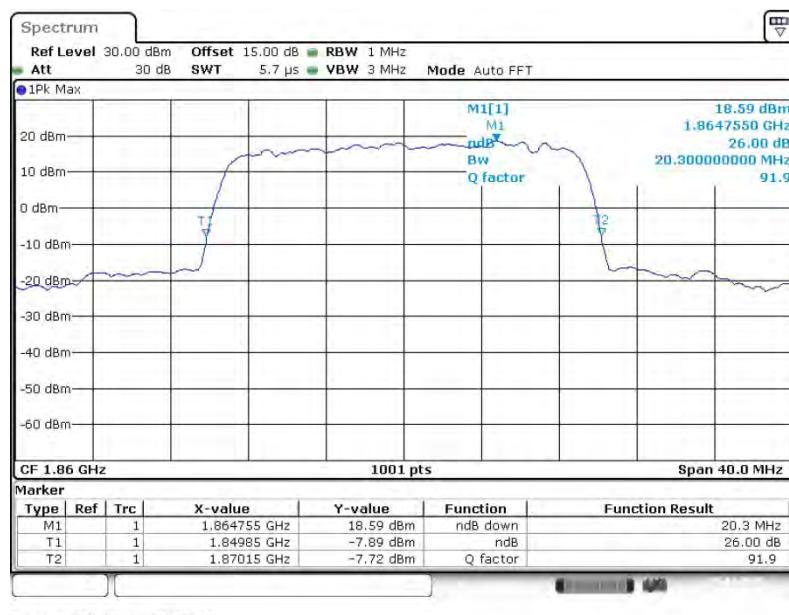


## 26dB Bandwidth Plot on Channel 19125



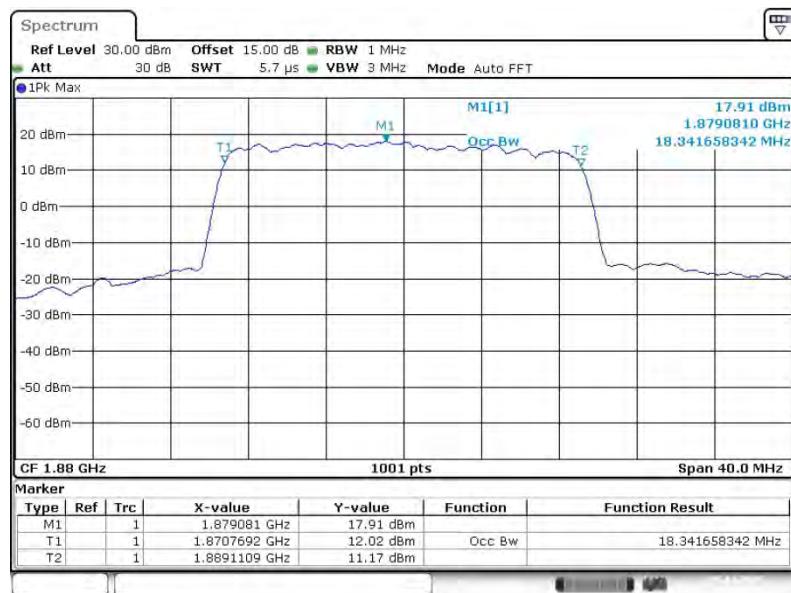


Band :	LTE Band 2	BW / Mod. :	20MHz / QPSK
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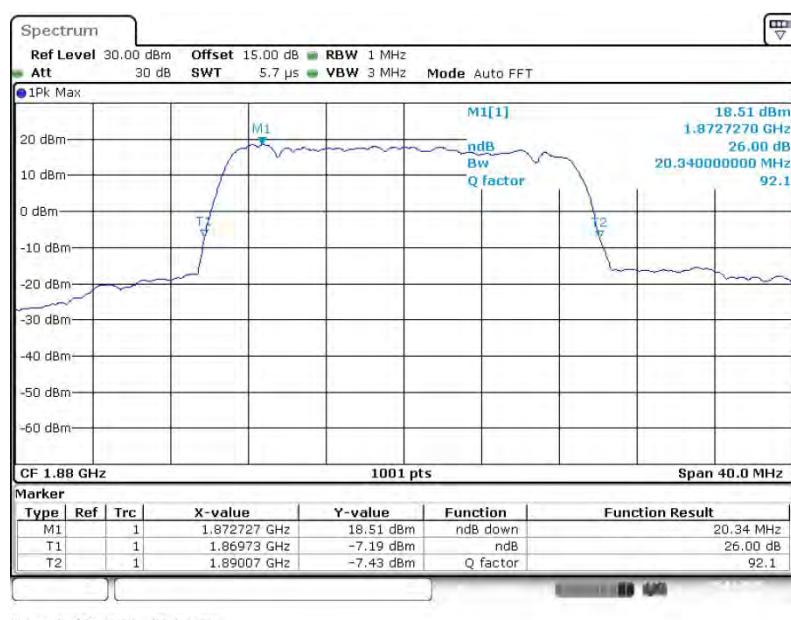
**99% Occupied Bandwidth Plot on Channel 18700****26dB Bandwidth Plot on Channel 18700**



## 99% Occupied Bandwidth Plot on Channel 18900

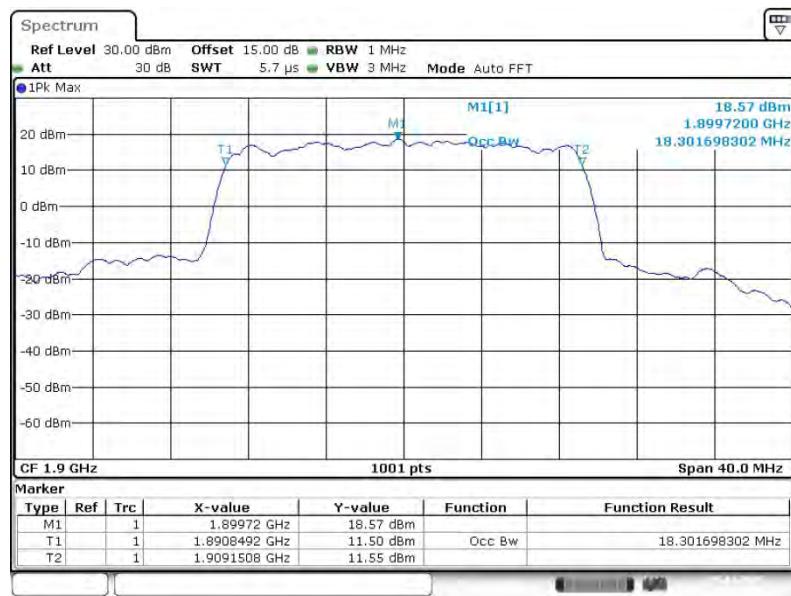


## 26dB Bandwidth Plot on Channel 18900

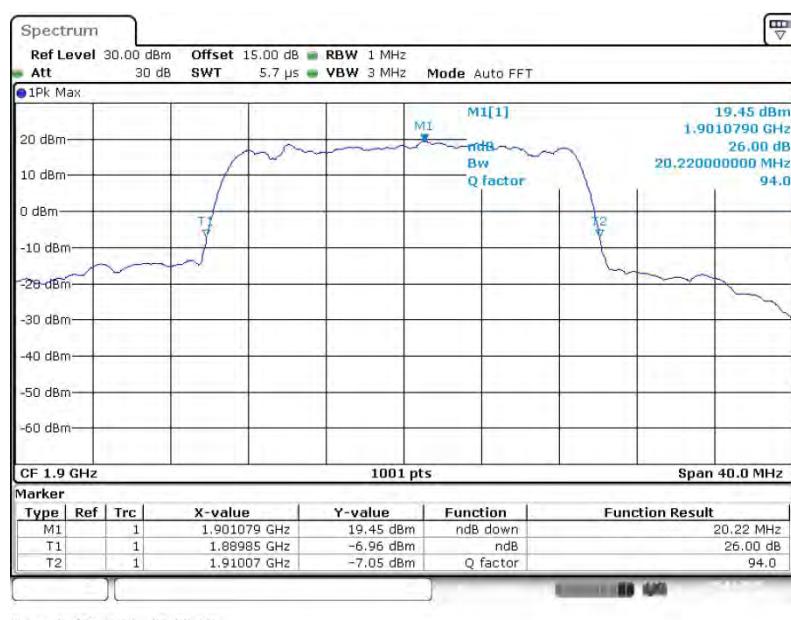




## 99% Occupied Bandwidth Plot on Channel 19100

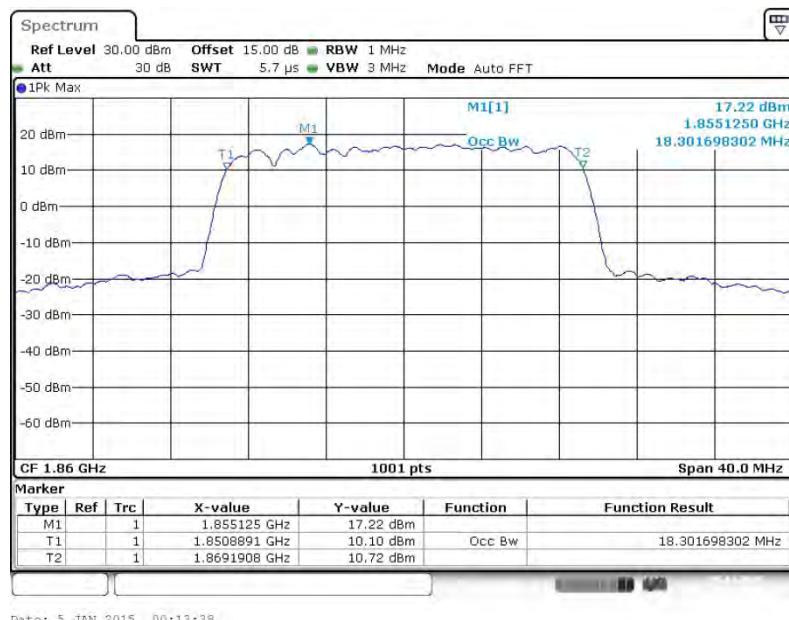
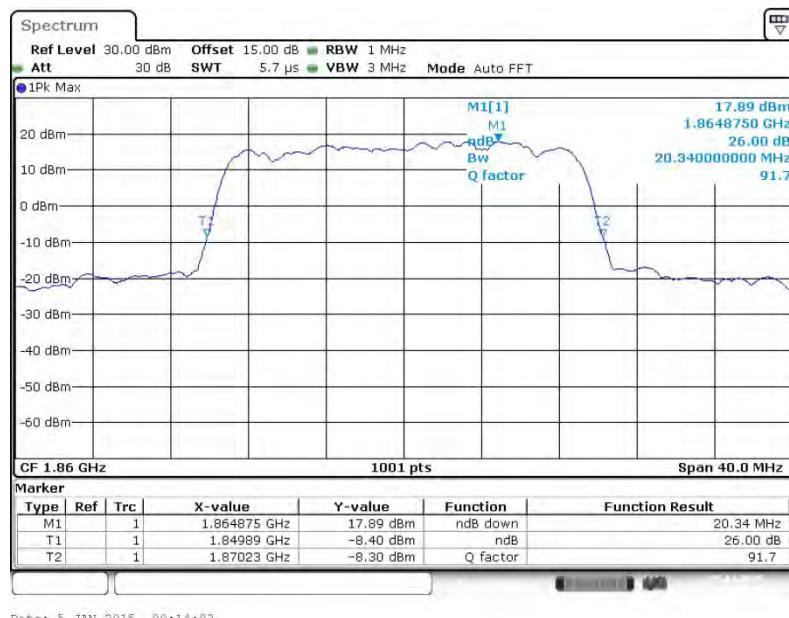


## 26dB Bandwidth Plot on Channel 19100



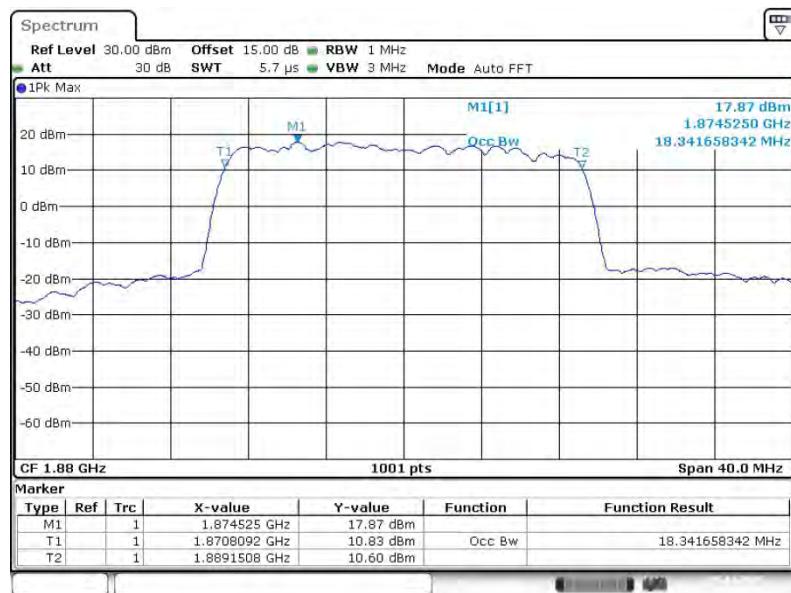


Band :	LTE Band 2	BW / Mod. :	20MHz / 16QAM
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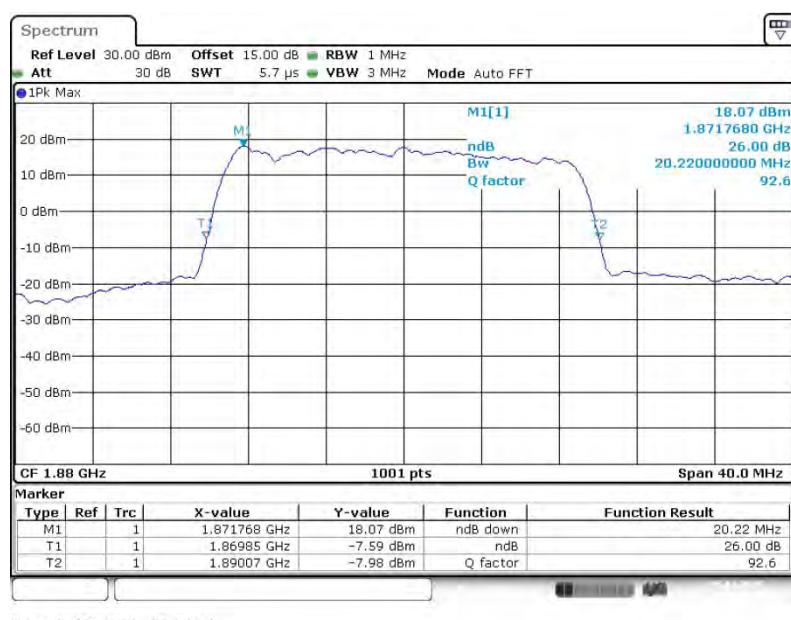
**99% Occupied Bandwidth Plot on Channel 18700****26dB Bandwidth Plot on Channel 18700**



## 99% Occupied Bandwidth Plot on Channel 18900

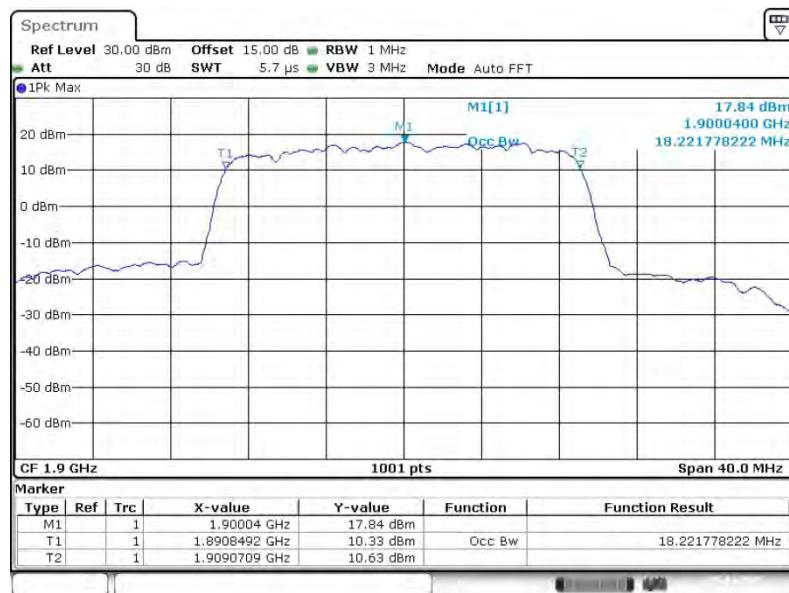


## 26dB Bandwidth Plot on Channel 18900





## 99% Occupied Bandwidth Plot on Channel 19100



## 26dB Bandwidth Plot on Channel 19100

