

**FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E  
&  
INDUSTRY CANADA RSS-132 & RSS-133**

**TEST REPORT**

**For**

**Computer**

**FCC Model: AIM8Q, AIM8Qxxxxxxxxxxxxxxxxx,  
AIM-x5BTxxxxxxxxxxxxx(where "x" may be any alphanumeric character,  
"-" or blank for marketing purpose and no impact safety related critical  
components and constructions)**

**IC Model: AIM8Q, AIM-25BT, AIM-35BT, AIM-55BT, AIM-65BT, AIM-75BT**

**Trade Name: ADVANTECH**

*Issued to*

**Advantech Co.Ltd.**

**No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114,  
Taiwan, R.O.C.**

*Issued by*

**Compliance Certification Services Inc.**

**No.11, Wugong 6th Rd., Wugu Dist.,  
New Taipei City 24891, Taiwan. (R.O.C.)**

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**Issued Date: June 8, 2017**



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**Revision History**

Rev.	Issue Date	Revisions	Effect Page	Revised By
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# 1. TEST RESULT CERTIFICATION

**Applicant:** Advantech Co.Ltd.  
 No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District,  
 Taipei 114, Taiwan, R.O.C.

**Manufacturer:** Advantech Co.Ltd.  
 No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District,  
 Taipei 114, Taiwan, R.O.C.

**Equipment Under Test:** Computer

**Trade Name:** ADVANTECH

**FCC Model:** AIM8Q, AIM8Qxxxxxxxxxxxxxxxxx,  
 AIM-x5BTxxxxxxxxxxxxx(where "x" may be any alphanumeric  
 character, "-" or blank for marketing purpose and no impact  
 safety related critical components and constructions)

**IC Model:** AIM8Q, AIM-25BT, AIM-35BT, AIM-55BT, AIM-65BT, AIM-75BT

**Date of Test:** April 12 ~ May 16, 2017

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E & IC RSS-132 Issue 3: January, 2013 and IC RSS-133 Issue 6: January, 2013	No non-compliance noted

**We hereby certify that:**

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rule FCC PART 22 Subpart H, PART 24 Subpart E and IC RSS-132 Issue 3 and IC RSS-133 Issue 6.

The test results of this report relate only to the tested sample identified in this report.

Approved by:




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Sam Chuang  
 Manager  
 Compliance Certification Services Inc.

Tested by:




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Timmy Wang  
 Engineer  
 Compliance Certification Services Inc.

## 2. EUT DESCRIPTION

<b>Product</b>	Computer	
<b>FCC Model No.</b>	AIM8Q, AIM8Qxxxxxxxxxxxxxxxx, AIM-x5BTxxxxxxxxxxxxx(where "x" may be any alphanumeric character, "-" or blank for marketing purpose and no impact safety related critical components and constructions)	
<b>IC Model No.</b>	AIM8Q, AIM-25BT, AIM-35BT, AIM-55BT, AIM-65BT, AIM-75BT	
<b>Model Discrepancy</b>	All models are electrically identical, different model names are for marketing purpose	
<b>Trade Name</b>	ADVANTECH	
<b>Received Date</b>	April 6, 2017	
<b>Power Supply</b>	1. VDC from Power Adapter Chicony / A16-018N1A I/P: 100-240Vac, 1A, 50-60Hz O/P: 5.15Vdc, 3A, 9.1Vdc, 2A, 18W 2. Battery ADVANTECH / AIM-BAT-8 Rating: 3.8V, 4900mAh, 18.62Wh	
<b>Frequency Range</b>	LTE Band 2 Channel Bandwidth: 1.4MHz	1850.7MHz ~1909.2MHz
	LTE Band 2 Channel Bandwidth: 3MHz	1851.5MHz ~ 1908.4MHz
	LTE Band 2 Channel Bandwidth: 5MHz	1852.5MHz ~1907.5MHz
	LTE Band 2 Channel Bandwidth: 10MHz	1855MHz ~1905MHz
	LTE Band 2 Channel Bandwidth: 15MHz	1857.5MHz ~1902.5MHz
	LTE Band 2 Channel Bandwidth: 20MHz	1860MHz ~1900MHz
	LTE Band 5 Channel Bandwidth: 1.4MHz	824.7MHz ~848.2MHz
	LTE Band 5 Channel Bandwidth: 3MHz	825.5MHz ~ 847.4MHz
	LTE Band 5 Channel Bandwidth: 5MHz	826.5MHz ~846.5MHz
	LTE Band 5 Channel Bandwidth: 10MHz	829MHz ~844MHz
<b>Modulation Technique</b>	LTE Band 2	QPSK, 16QAM
	LTE Band 5	QPSK, 16QAM
<b>Maximum EIRP Power</b>	LTE Band 2 Channel Bandwidth: 1.4MHz	QPSK: 28.06 dBm 16QAM: 28.30 dBm
	LTE Band 2 Channel Bandwidth: 3MHz	QPSK : 28.11 dBm 16QAM: 28.61 dBm
	LTE Band 2 Channel Bandwidth: 5MHz	QPSK: 28.07 dBm 16QAM: 28.75 dBm
	LTE Band 2 Channel Bandwidth: 10MHz	QPSK: 27.84 dBm 16QAM: 28.73 dBm

	LTE Band 2 Channel Bandwidth: 15MHz	QPSK: 28.06 dBm 16QAM: 28.42 dBm
	LTE Band 2 Channel Bandwidth: 20MHz	QPSK: 28.05 dBm 16QAM: 28.00 dBm
<b>Maximum EIRP Power</b>	LTE Band 5 Channel Bandwidth: 1.4MHz	QPSK: 27.45m 16QAM: 27.95 dBm
	LTE Band 5 Channel Bandwidth: 3MHz	QPSK: 26.81 dBm 16QAM: 27.92 dBm
	LTE Band 5 Channel Bandwidth: 5MHz	QPSK: 27.21 dBm 16QAM: 28.23 dBm
	LTE Band 5 Channel Bandwidth: 10MHz	QPSK: 26.99 dBm 16QAM: 27.05 dBm
<b>Antenna Specification</b>	PIFA Antenna LTE Band 2: Gain: -1.98dBi LTE Band 5: Gain: -1.91dBi	

**Remark:** *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

### **3. TEST METHODOLOGY**

Both conducted and radiated testing were performed according to the procedures document on chapter 13 of ANSI C63.10: 2013, TIA/EIA-603-C: 2004 and FCC CFR 47, Part 2 and Part 22 Subpart H & Part 24 Subpart E.

The tests documented in this report were performed in accordance with IC RSS-132, SPSR503, RSS-133, SPSR510 and ANSI C63.10: 2013 for IC, ANSI C63.10: 2009 for FCC and TIA/EIA-603-C.

#### **3.1 EUT CONFIGURATION**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

### 3.3 DESCRIPTION OF TEST MODES

The EUT (model: AIM8Q) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

#### LTE Band 2: 1850MHz ~ 1910MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	1.4MHz		3MHz		5MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low channel (L)	18607	1850.7	18615	1851.5	18625	1852.5
Middle channel (M)	18900	1880	18900	1880.0	18900	1880
High channel (H)	19192	1909.2	19184	1908.4	19175	1907.5
Channel Bandwidth	10MHz		15MHz		20MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low channel (L)	18650	1855	18675	1857.5	18700	1860
Middle channel (M)	18900	1880	18900	1880.0	18900	1880
High channel (H)	19150	1905	19125	1902.5	19100	1900

#### LTE Band 5: 824MHz ~ 849MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	1.4MHz		3MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low channel (L)	20407	824.7	20415	825.5
Middle channel (M)	20525	836.5	20525	836.5
High channel (H)	20642	848.2	20634	847.4
Channel Bandwidth	5MHz		10MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low channel (L)	20425	826.5	20450	829
Middle channel (M)	20525	836.5	20525	836.5
High channel (H)	20625	846.5	20600	844

For test mode:

The conducted power be measured in 1, 50% and 100% RB allocation, offset to upper edge, centered and lower edge of the channel bandwidth of each required channel.

	QPSK	Worst Mode	16QAM	Worst Mode
Band2	1.4M	1 RB ALLOCATED AT THE UPPER EDGE	1.4M	1 RB ALLOCATED AT THE UPPER EDGE
	5M	1 RB ALLOCATED AT THE UPPER EDGE	5M	1 RB ALLOCATED AT THE UPPER EDGE
	10M	1 RB ALLOCATED AT THE UPPER EDGE	10M	1 RB ALLOCATED AT THE CENTERED
	20M	1 RB ALLOCATED AT THE UPPER EDGE	20M	1 RB ALLOCATED AT THE UPPER EDGE
Band5	1.4M	1 RB ALLOCATED AT THE UPPER EDGE	1.4M	1 RB ALLOCATED AT THE CENTERED
	5M	1 RB ALLOCATED AT THE LOWER EDGE	5M	1 RB ALLOCATED AT THE LOWER EDGE
	10M	1 RB ALLOCATED AT THE LOWER EDGE	10M	1 RB ALLOCATED AT THE LOWER EDGE



### 3.4 THE WORST MODE OF MEASUREMENT

For LTE Band 2

AC Power Line Conducted Emission	
Test Condition	AC Power line conducted emission for line and neutral
Voltage/Hz	120V/60Hz
Test Mode	Mode 1:EUT power by AC adapter via power cable. Mode 2:EUT power by Battery.
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

Radiated Emission Measurement	
Test Condition	Band edge, Emission for Unwanted and Fundamental
Voltage/Hz	120V/60Hz
Test Mode	Mode 1:EUT power by AC adapter via power cable. Mode 2:EUT power by Battery.
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4
Position	<input type="checkbox"/> Placed in fixed position. <input checked="" type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane) <input type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane) <input type="checkbox"/> Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Voltage/Hz	120V/60Hz
Test Mode	Mode 1:EUT power by AC adapter via power cable. Mode 2:EUT power by Battery.
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

Remark:

1. The worst mode was record in this test report.
2. The EUT pre-scanned in three axis ,X,Y, Z for radiated measurement. The worst cases (X-Plane) were recorded in this report.
3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

**For LTE Band 5**

<b>AC Power Line Conducted Emission</b>	
<b>Test Condition</b>	<b>AC Power line conducted emission for line and neutral</b>
<b>Voltage/Hz</b>	<b>120V/60Hz</b>
<b>Test Mode</b>	<b>Mode 1:EUT power by AC adapter via power cable. Mode 2:EUT power by Battery.</b>
<b>Worst Mode</b>	<input checked="" type="checkbox"/> <b>Mode 1</b> <input type="checkbox"/> <b>Mode 2</b> <input type="checkbox"/> <b>Mode 3</b> <input type="checkbox"/> <b>Mode 4</b>

<b>Radiated Emission Measurement</b>	
<b>Test Condition</b>	<b>Band edge, Emission for Unwanted and Fundamental</b>
<b>Voltage/Hz</b>	<b>120V/60Hz</b>
<b>Test Mode</b>	<b>Mode 1:EUT power by AC adapter via power cable. Mode 2:EUT power by Battery.</b>
<b>Worst Mode</b>	<input checked="" type="checkbox"/> <b>Mode 1</b> <input type="checkbox"/> <b>Mode 2</b> <input type="checkbox"/> <b>Mode 3</b> <input type="checkbox"/> <b>Mode 4</b>
<b>Position</b>	<input type="checkbox"/> Placed in fixed position. <input type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane) <input checked="" type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane) <input type="checkbox"/> Placed in fixed position at Z-Plane (H-Plane)

<b>Radiated Emission Measurement Below 1G</b>	
<b>Test Condition</b>	<b>Radiated Emission Below 1G</b>
<b>Voltage/Hz</b>	<b>120V/60Hz</b>
<b>Test Mode</b>	<b>Mode 1:EUT power by AC adapter via power cable. Mode 2:EUT power by Battery.</b>
<b>Worst Mode</b>	<input checked="" type="checkbox"/> <b>Mode 1</b> <input type="checkbox"/> <b>Mode 2</b> <input type="checkbox"/> <b>Mode 3</b> <input type="checkbox"/> <b>Mode 4</b>

*Remark:*

1. The worst mode was record in this test report.
2. The EUT pre-scanned in three axis ,X,Y, Z for radiated measurement. The worst cases (Y-Plane) were recorded in this report.
3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

**Remark:** Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.

Conducted Emissions Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power Meter	Anritsu	ML2495A	1012009	07/04/2016	07/03/2017
Power Sensor	Anritsu	MA2411B	917072	07/04/2016	07/03/2017
Base Station	R&S	CMU 200	101245	07/29/2016	07/28/2017
Base Station	Anritsu	MT-8820C	6200938900	07/26/2016	07/25/2017
Spectrum Analyzer	R&S	FSV 40	101073	10/05/2016	10/04/2017

Wugu 966 Chamber A					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Bilog Antenna	Sunol Sciences	JB3	A030105	07/03/2016	07/02/2017
Horn Antenna	EMCO	3117	00055165	02/20/2017	02/19/2018
Pre-Amplifier	EMCI	EMC 012635	980151	06/23/2016	06/22/2017
Pre-Amplifier	EMEC	EM330	060609	06/08/2016	06/07/2017
Spectrum Analyzer	Agilent	E4446A	US42510252	12/05/2016	12/04/2017
Loop Ant	COM-POWER	AL-130	121051	03/02/2017	03/1/2018
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	EZ-EMC (CCS-3A1RE)				

### 4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

**Remark:** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- No.199, Chungshen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.  
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029
- No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)  
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045
- No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.  
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10: 2013 and CISPR Publication 22.

### 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.




Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 5.3 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, 2324G-2 for 3M Semi Anechoic Chamber B.

**5.4 TABLE OF ACCREDITATIONS AND LISTINGS**

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

*\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*

## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A						

**Remark:**

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

## **7. FCC PART 22 & 24 REQUIREMENTS & INDUSTRY CANADA RSS-132 & RSS-133**

### **7.1 OUTPUT POWER MEASUREMENT**

#### **Test Procedures**

##### **CONDUCTED POWER MEASUREMENT:**

1. The transmitter output power was connected to the call box.
2. Set EUT at maximum output power via call box.
3. Set Call box at lowest, middle and highest channels for each band and modulation.

## TEST RESULTS

### LTE Band 5

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)
5	10	20450	829.0	QPSK	1	0	0	23.0	0.19953
					1	24	0	22.9	0.19498
					1	49	0	22.7	0.18621
					25	0	1	22.1	0.16218
					25	12	1	22.0	0.15849
					25	24	1	21.8	0.15136
					50	0	1	22.0	0.15849
				16QAM	1	0	1	22.1	0.16218
					1	24	1	21.9	0.15488
					1	49	1	21.8	0.15136
					25	0	2	21.0	0.12589
					25	12	2	21.0	0.12589
					25	24	2	20.9	0.12303
					50	0	2	21.1	0.12882
		20525	836.5	QPSK	1	0	0	23.1	0.20417
					1	24	0	23.0	0.19953
					1	49	0	23.0	0.19953
					25	0	1	22.2	0.16596
					25	12	1	22.0	0.15849
					25	24	1	22.1	0.16218
					50	0	1	22.1	0.16218
				16QAM	1	0	1	22.1	0.16218
					1	24	1	22.0	0.15849
					1	49	1	22.0	0.15849
					25	0	2	21.2	0.13183
					25	12	2	21.0	0.12589
					25	24	2	21.0	0.12589
					50	0	2	21.1	0.12882
		20600	844.0	QPSK	1	0	0	23.0	0.19953
					1	24	0	22.9	0.19498
1	49				0	22.8	0.19055		
25	0				1	22.0	0.15849		
25	12				1	22.0	0.15849		
25	24				1	21.8	0.15136		
50	0				1	22.0	0.15849		
16QAM	1			0	1	22.0	0.15849		
	1			24	1	21.9	0.15488		
	1			49	1	21.9	0.15488		
	25			0	2	21.0	0.12589		
	25			12	2	21.0	0.12589		
	25			24	2	20.9	0.12303		
	50			0	2	20.9	0.12303		



Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)
5	5	20425	826.5	QPSK	1	0	0	23.0	0.19724
					1	12	0	22.9	0.19275
					1	24	0	22.7	0.18408
					12	0	1	22.1	0.16032
					12	6	1	22.0	0.15668
					12	11	1	21.8	0.14962
					25	0	1	22.0	0.15668
				16QAM	1	0	1	22.1	0.16032
					1	12	1	21.9	0.15311
					1	24	1	21.8	0.14962
					12	0	2	21.0	0.12445
					12	6	2	21.0	0.12445
					12	11	2	20.9	0.12162
					25	0	2	21.1	0.12735
		20525	836.5	QPSK	1	0	0	23.1	0.20184
					1	12	0	23.0	0.19724
					1	24	0	23.0	0.19724
					12	0	1	22.2	0.16406
					12	6	1	22.0	0.15668
					12	11	1	22.1	0.16032
					25	0	1	22.1	0.16032
				16QAM	1	0	1	22.1	0.16032
					1	12	1	22.0	0.15668
					1	24	1	22.0	0.15668
					12	0	2	21.2	0.13032
					12	6	2	21.0	0.12445
					12	11	2	21.0	0.12445
					25	0	2	21.1	0.12735
		20625	846.5	QPSK	1	0	0	23.0	0.19724
					1	12	0	22.9	0.19275
1	24				0	22.8	0.18836		
12	0				1	22.0	0.15668		
12	6				1	22.0	0.15668		
12	11				1	21.8	0.14962		
25	0				1	22.0	0.15668		
16QAM	1			0	1	22.0	0.15668		
	1			12	1	21.9	0.15311		
	1			24	1	21.9	0.15311		
	12			0	2	21.0	0.12445		
	12			6	2	21.0	0.12445		
	12			11	2	20.9	0.12162		
	25			0	2	20.9	0.12162		

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)
5	3	20415	825.5	QPSK	1	0	0	22.9	0.19498
					1	7	0	22.8	0.19055
					1	14	0	22.6	0.18197
					8	0	1	22.0	0.15849
					8	4	1	21.9	0.15488
					8	7	1	21.7	0.14791
		15	0	1	21.9	0.15488			
		16QAM	1	0	1	22.0	0.15849		
			1	7	1	21.8	0.15136		
			1	14	1	21.7	0.14791		
			8	0	2	20.9	0.12303		
			8	4	2	20.9	0.12303		
			8	7	2	20.8	0.12023		
		15	0	2	21.0	0.12589			
		20525	836.5	QPSK	1	0	0	23.0	0.19953
					1	7	0	22.9	0.19498
					1	14	0	22.9	0.19498
					8	0	1	22.1	0.16218
	8				4	1	21.9	0.15488	
	8				7	1	22.0	0.15849	
	15	0	1	22.0	0.15849				
	16QAM	1	0	1	22.0	0.15849			
		1	7	1	21.9	0.15488			
		1	14	1	21.9	0.15488			
		8	0	2	21.1	0.12882			
		8	4	2	20.9	0.12303			
		8	7	2	20.9	0.12303			
	15	0	2	21.0	0.12589				
	20634	847.4	QPSK	1	0	0	22.9	0.19498	
				1	7	0	22.8	0.19055	
				1	14	0	22.7	0.18621	
				8	0	1	21.9	0.15488	
				8	4	1	21.9	0.15488	
				8	7	1	21.7	0.14791	
		15	0	1	21.9	0.15488			
		16QAM	1	0	1	21.9	0.15488		
1			7	1	21.8	0.15136			
1			14	1	21.8	0.15136			
8			0	2	20.9	0.12303			
8			4	2	20.9	0.12303			
8	7		2	20.8	0.12023				
15	0	2	20.8	0.12023					

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)
5	1.4	20407	824.7	QPSK	1	0	0	22.9	0.19275
					1	2	0	22.8	0.18836
					1	5	0	22.6	0.17989
					3	0	1	22.0	0.15668
					3	1	1	21.9	0.15311
					3	2	1	21.7	0.14622
		6	0	1	21.9	0.15311			
		16QAM	1	0	1	22.0	0.15668		
			1	2	1	21.8	0.14962		
			1	5	1	21.7	0.14622		
			3	0	2	20.9	0.12162		
			3	1	2	20.9	0.12162		
			3	2	2	20.8	0.11885		
		QPSK	6	0	2	21.0	0.12445		
			1	0	0	23.0	0.19724		
			1	2	0	22.9	0.19275		
			1	5	0	22.9	0.19275		
			3	0	1	22.1	0.16032		
	3		1	1	21.9	0.15311			
	16QAM	3	2	1	22.0	0.15668			
		6	0	1	22.0	0.15668			
		1	0	1	22.0	0.15668			
		1	2	1	21.9	0.15311			
		1	5	1	21.9	0.15311			
		3	0	2	21.1	0.12735			
	QPSK	3	1	2	20.9	0.12162			
		3	2	2	20.9	0.12162			
		6	0	2	21.0	0.12445			
		1	0	0	22.9	0.19275			
		1	2	0	22.8	0.18836			
		1	5	0	22.7	0.18408			
	16QAM	3	0	1	21.9	0.15311			
		3	1	1	21.9	0.15311			
		3	2	1	21.7	0.14622			
		6	0	1	21.9	0.15311			
		1	0	1	21.9	0.15311			
1		2	1	21.8	0.14962				
QPSK	1	5	1	21.8	0.14962				
	3	0	2	20.9	0.12162				
	3	1	2	20.9	0.12162				
	3	2	2	20.8	0.11885				
	6	0	2	20.8	0.11885				

## LTE Band 2

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)				
2	20	18700	1860.0	QPSK	1	0	0	23.0	0.19953				
					1	49	0	22.9	0.19498				
					1	99	0	22.8	0.19055				
					50	0	1	22.0	0.15849				
					50	24	1	22.0	0.15849				
					50	49	1	21.8	0.15136				
				16QAM	100	0	1	22.0	0.15849				
					1	0	1	22.0	0.15849				
					1	49	1	21.9	0.15488				
					1	99	1	21.9	0.15488				
					50	0	2	21.1	0.12882				
					50	24	2	20.9	0.12303				
		18900	1880.0	QPSK	1880.0	QPSK	50	49	2	20.9	0.12303		
							100	0	2	21.0	0.12589		
							1	0	0	23.3	0.21380		
							1	49	0	23.1	0.20417		
							1	99	0	23.0	0.19953		
							50	0	1	22.4	0.17378		
				16QAM	16QAM	16QAM	16QAM	50	24	1	22.1	0.16218	
								50	49	1	22.0	0.15849	
								100	0	1	22.3	0.16982	
								1	0	1	22.3	0.16982	
								1	49	1	22.2	0.16596	
								1	99	1	22.0	0.15849	
				19100	1900.0	QPSK	1900.0	QPSK	50	0	2	21.4	0.13804
									50	24	2	21.1	0.12882
									50	49	2	21.1	0.12882
									100	0	2	21.4	0.13804
									1	0	0	22.9	0.19498
									1	49	0	22.8	0.19055
16QAM	16QAM	16QAM	16QAM			1	99	0	22.8	0.19055			
						50	0	1	21.9	0.15488			
						50	24	1	21.8	0.15136			
						50	49	1	21.8	0.15136			
						100	0	1	21.9	0.15488			
						1	0	1	22.0	0.15849			
16QAM	16QAM	16QAM	16QAM	1	49	1	21.9	0.15488					
				1	99	1	21.8	0.15136					
				50	0	2	21.0	0.12589					
				50	24	2	20.9	0.12303					
				50	49	2	20.8	0.12023					
				100	0	2	21.0	0.12589					

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)
2	15	18675	1857.5	QPSK	1	0	0	22.9	0.19275
					1	37	0	22.8	0.18836
					1	74	0	22.7	0.18408
					36	0	1	21.9	0.15311
					36	18	1	21.9	0.15311
					36	35	1	21.7	0.14622
					75	0	1	21.9	0.15311
				16QAM	1	0	1	21.9	0.15311
					1	37	1	21.8	0.14962
					1	74	1	21.8	0.14962
					36	0	2	21.0	0.12445
					36	18	2	20.8	0.11885
					36	35	2	20.8	0.11885
					75	0	2	20.9	0.12162
		18900	1880.0	QPSK	1	0	0	23.2	0.20654
					1	37	0	23.0	0.19724
					1	74	0	22.9	0.19275
					36	0	1	22.3	0.16788
					36	18	1	22.0	0.15668
					36	35	1	21.9	0.15311
					75	0	1	22.2	0.16406
				16QAM	1	0	1	22.2	0.16406
					1	37	1	22.1	0.16032
					1	74	1	21.9	0.15311
					36	0	2	21.3	0.13335
					36	18	2	21.0	0.12445
					36	35	2	21.0	0.12445
					75	0	2	21.3	0.13335
		19125	1902.5	QPSK	1	0	0	22.8	0.18836
					1	37	0	22.7	0.18408
1	74				0	22.7	0.18408		
36	0				1	21.8	0.14962		
36	18				1	21.7	0.14622		
36	35				1	21.7	0.14622		
75	0				1	21.8	0.14962		
16QAM	1			0	1	21.9	0.15311		
	1			37	1	21.8	0.14962		
	1			74	1	21.7	0.14622		
	36			0	2	20.9	0.12162		
	36			18	2	20.8	0.11885		
	36			35	2	20.7	0.11614		
	75			0	2	20.9	0.12162		

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)
2	10	18650	1855.0	QPSK	1	0	0	22.8	0.19055
					1	24	0	22.7	0.18621
					1	49	0	22.6	0.18197
					25	0	1	21.8	0.15136
					25	12	1	21.8	0.15136
					25	24	1	21.6	0.14454
				50	0	1	21.8	0.15136	
				16QAM	1	0	1	21.8	0.15136
					1	24	1	21.7	0.14791
					1	49	1	21.7	0.14791
					25	0	2	20.9	0.12303
					25	12	2	20.7	0.11749
		25	24		2	20.7	0.11749		
		50	0	2	20.8	0.12023			
		18900	1880.0	QPSK	1	0	0	23.1	0.20417
					1	24	0	22.9	0.19498
					1	49	0	22.8	0.19055
					25	0	1	22.2	0.16596
					25	12	1	21.9	0.15488
					25	24	1	21.8	0.15136
				50	0	1	22.1	0.16218	
				16QAM	1	0	1	22.1	0.16218
					1	24	1	22.0	0.15849
					1	49	1	21.8	0.15136
					25	0	2	21.2	0.13183
					25	12	2	20.9	0.12303
		25	24		2	20.9	0.12303		
		50	0	2	21.2	0.13183			
		19150	1905.0	QPSK	1	0	0	22.7	0.18621
					1	24	0	22.6	0.18197
1	49				0	22.6	0.18197		
25	0				1	21.7	0.14791		
25	12				1	21.6	0.14454		
25	24				1	21.6	0.14454		
50	0			1	21.7	0.14791			
16QAM	1			0	1	21.8	0.15136		
	1			24	1	21.7	0.14791		
	1			49	1	21.6	0.14454		
	25			0	2	20.8	0.12023		
	25			12	2	20.7	0.11749		
	25	24	2	20.6	0.11482				
50	0	2	20.8	0.12023					

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)
2	5	18625	1852.5	QPSK	1	0	0	22.8	0.18836
					1	12	0	22.7	0.18408
					1	24	0	22.6	0.17989
					12	0	1	21.8	0.14962
					12	6	1	21.8	0.14962
					12	11	1	21.6	0.14289
					25	0	1	21.8	0.14962
				16QAM	1	0	1	21.8	0.14962
					1	12	1	21.7	0.14622
					1	24	1	21.7	0.14622
					12	0	2	20.9	0.12162
					12	6	2	20.7	0.11614
					12	11	2	20.7	0.11614
					25	0	2	20.8	0.11885
		18900	1880.0	QPSK	1	0	0	23.1	0.20184
					1	12	0	22.9	0.19275
					1	24	0	22.8	0.18836
					12	0	1	22.2	0.16406
					12	6	1	21.9	0.15311
					12	11	1	21.8	0.14962
					25	0	1	22.1	0.16032
				16QAM	1	0	1	22.1	0.16032
					1	12	1	22.0	0.15668
					1	24	1	21.8	0.14962
					12	0	2	21.2	0.13032
					12	6	2	20.9	0.12162
					12	11	2	20.9	0.12162
					25	0	2	21.2	0.13032
		19175	1907.5	QPSK	1	0	0	22.7	0.18408
					1	12	0	22.6	0.17989
1	24				0	22.6	0.17989		
12	0				1	21.7	0.14622		
12	6				1	21.6	0.14289		
12	11				1	21.6	0.14289		
25	0				1	21.7	0.14622		
16QAM	1			0	1	21.8	0.14962		
	1			12	1	21.7	0.14622		
	1			24	1	21.6	0.14289		
	12			0	2	20.8	0.11885		
	12			6	2	20.7	0.11614		
	12			11	2	20.6	0.11350		
	25			0	2	20.8	0.11885		

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)
2	3	18615	1851.5	QPSK	1	0	0	22.7	0.18621
					1	7	0	22.6	0.18197
					1	14	0	22.5	0.17783
					8	0	1	21.7	0.14791
					8	4	1	21.7	0.14791
					8	7	1	21.5	0.14125
					15	0	1	21.7	0.14791
				16QAM	1	0	1	21.7	0.14791
					1	7	1	21.6	0.14454
					1	14	1	21.6	0.14454
					8	0	2	20.8	0.12023
					8	4	2	20.6	0.11482
					8	7	2	20.6	0.11482
					15	0	2	20.7	0.11749
					18900	1880.0	QPSK	1	0
		1	7	0				22.8	0.19055
		1	14	0				22.7	0.18621
		8	0	1				22.1	0.16218
		8	4	1				21.8	0.15136
		8	7	1				21.7	0.14791
		15	0	1				22.0	0.15849
		16QAM	1	0			1	22.0	0.15849
			1	7			1	21.9	0.15488
			1	14			1	21.7	0.14791
			8	0			2	21.1	0.12882
			8	4			2	20.8	0.12023
			8	7			2	20.8	0.12023
			15	0			2	21.3	0.13490
			19184	1908.4			QPSK	1	0
		1			7	0		22.5	0.17783
1	14	0			22.5	0.17783			
8	0	1			21.6	0.14454			
8	4	1			21.5	0.14125			
8	7	1			21.5	0.14125			
15	0	1			21.6	0.14454			
16QAM	1	0			1	21.7	0.14791		
	1	7			1	21.6	0.14454		
	1	14			1	21.5	0.14125		
	8	0			2	20.7	0.11749		
	8	4			2	20.6	0.11482		
	8	7			2	20.5	0.11220		
	15	0			2	21.4	0.13804		



Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power(dBm)	Output Power (W)	
2	1.4	18607	1850.7	QPSK	1	0	0	22.7	0.18408	
					1	2	0	22.6	0.17989	
					1	5	0	22.5	0.17579	
					3	0	1	21.7	0.14622	
					3	1	1	21.7	0.14622	
					3	2	1	21.5	0.13964	
				6	0	1	21.7	0.14622		
				16QAM	1	0	1	21.7	0.14622	
					1	2	1	21.6	0.14289	
					1	5	1	21.6	0.14289	
					3	0	2	20.8	0.11885	
					3	1	2	20.6	0.11350	
		3	2		2	20.6	0.11350			
		18900	1880.0	QPSK	1880.0	1	0	0	23.0	0.19724
						1	2	0	22.8	0.18836
						1	5	0	22.7	0.18408
						3	0	1	22.1	0.16032
						3	1	1	21.8	0.14962
						3	2	1	21.7	0.14622
				6	0	1	22.0	0.15668		
				16QAM	1	0	1	22.0	0.15668	
					1	2	1	21.9	0.15311	
					1	5	1	21.7	0.14622	
					3	0	2	21.1	0.12735	
					3	1	2	20.8	0.11885	
		3	2		2	20.8	0.11885			
		19192	1909.2	QPSK	1909.2	1	0	0	22.6	0.17989
						1	2	0	22.5	0.17579
						1	5	0	22.5	0.17579
						3	0	1	21.6	0.14289
3	1					1	21.5	0.13964		
3	2					1	21.5	0.13964		
6	0			1	21.6	0.14289				
16QAM	1			0	1	21.7	0.14622			
	1			2	1	21.6	0.14289			
	1			5	1	21.5	0.13964			
	3			0	2	20.7	0.11614			
	3			1	2	20.6	0.11350			
	3	2	2	20.5	0.11092					
6	0	2	21.3	0.13490						

## **7.2 ERP & EIRP MEASUREMENT**

### **LIMIT**

#### **According to FCC §2.1046**

##### **FCC 22.913(b):**

The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

##### **FCC 24.232(b):**

The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

#### **According to RSS-132, section 5.4**

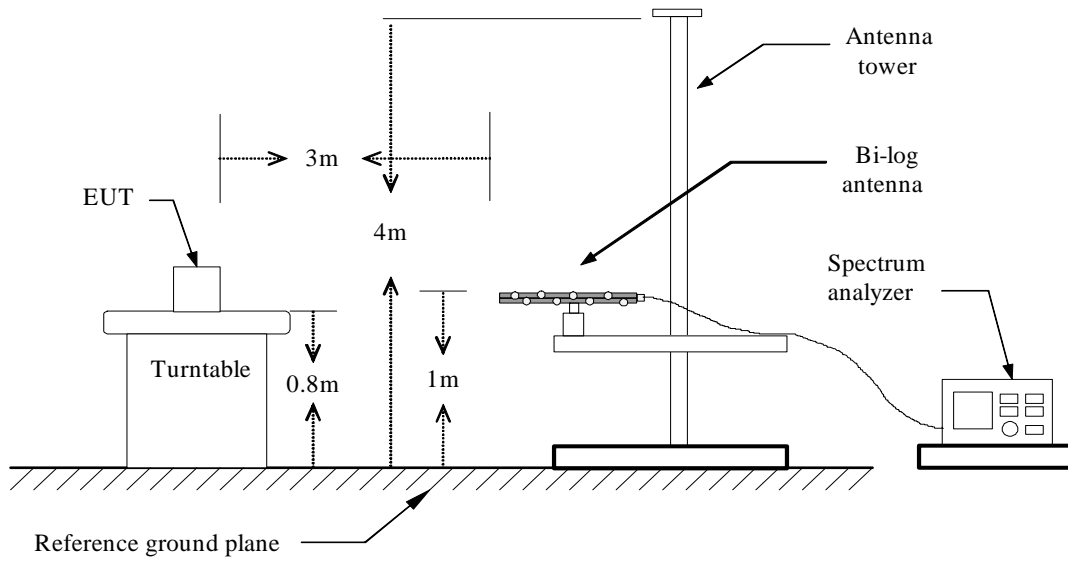
The transmitter output power shall be measured in terms of average power. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts. Refer to SRSP-503 for base station e.i.r.p. limits.

#### **According to RSS-133, section 6.4**

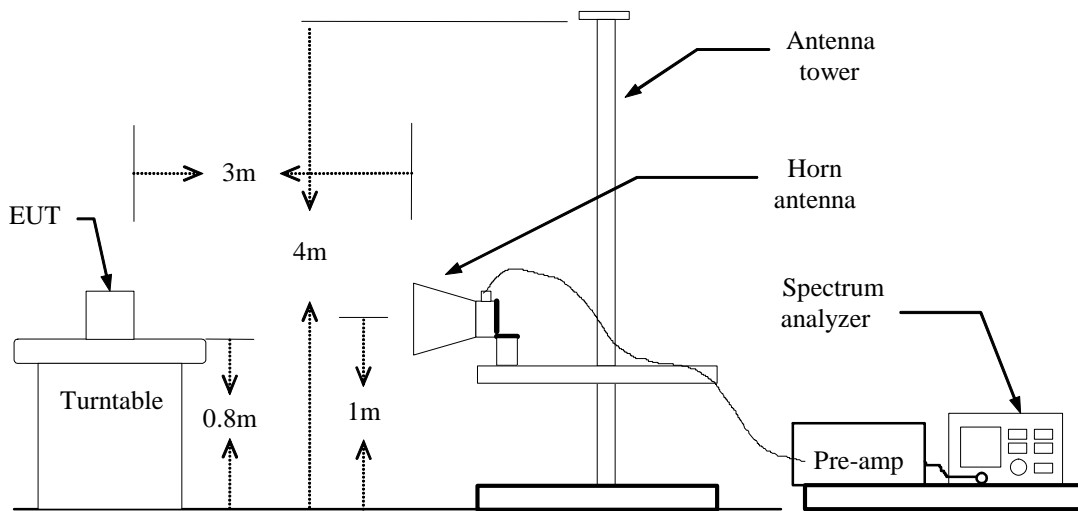
The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Moreover, base station transmitters operating in the band 1930-1995 MHz shall not have output power exceeding 100 watts.

**Test Configuration**

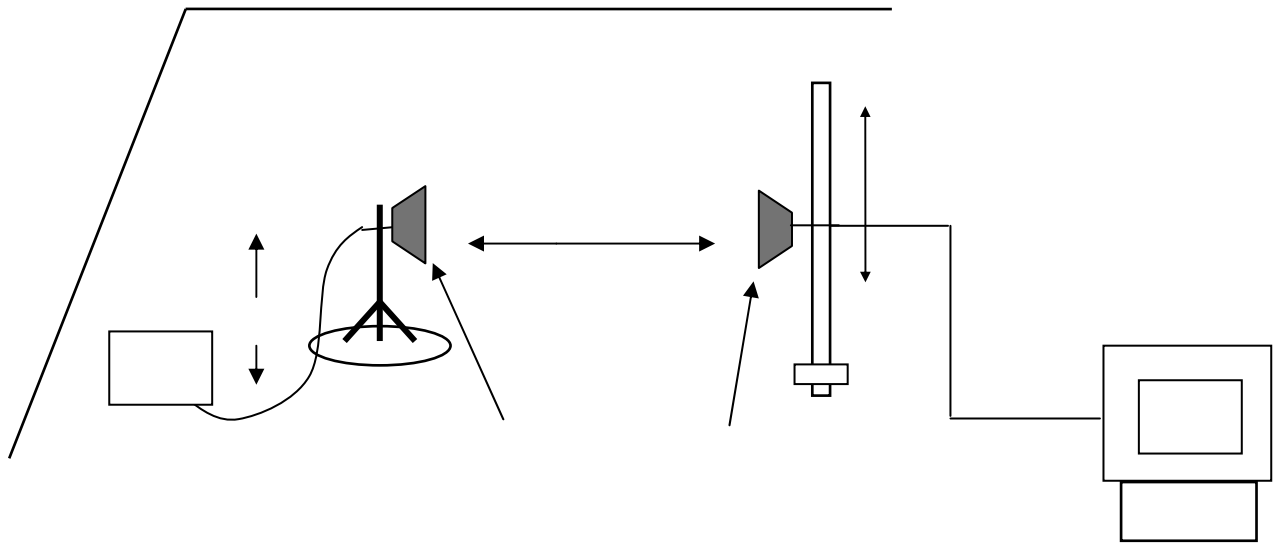
**Below 1 GHz**



**Above 1 GHz**



## For Substituted Method Test Set-UP



## TEST PROCEDURE

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement of the EUT, the resolution bandwidth was set to 5MHz and the average bandwidth was set to 50MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)} - 2.15$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

## TEST RESULTS

*No non-compliance noted.*

**LTE Band 2**

**BW: 1.4MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						EIRP (dBm)	EIRP (W)	EIRP (dBm)	EIRP (W)
2	1.4	Lowest	QPSK	1	0	15.63	0.036	28.06	0.639
		Middle		1	0	16.22	0.041	29.83	0.961
		Highest		1	0	16.77	0.047	27.88	0.613
		Lowest	16 QAM	1	0	17.00	0.050	28.27	0.671
		Middle		1	0	16.98	0.049	28.02	0.633
		Highest		1	0	16.82	0.048	28.30	0.676

**BW: 3MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						EIRP (dBm)	EIRP (W)	EIRP (dBm)	EIRP (W)
2	3	Lowest	QPSK	1	0	16.49	0.044	28.11	0.647
		Middle		1	0	16.67	0.046	27.61	0.576
		Highest		1	0	16.86	0.048	27.85	0.609
		Lowest	16 QAM	1	0	16.00	0.039	28.02	0.633
		Middle		1	0	16.21	0.041	27.85	0.609
		Highest		1	0	16.98	0.049	28.61	0.726

**BW: 5MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						EIRP (dBm)	EIRP (W)	EIRP (dBm)	EIRP (W)
2	5	Lowest	QPSK	1	0	16.03	0.040	28.07	0.641
		Middle		1	0	15.63	0.036	27.30	0.537
		Highest		1	0	16.19	0.041	27.58	0.572
		Lowest	16 QAM	1	0	15.98	0.039	28.75	0.749
		Middle		1	0	16.36	0.043	27.68	0.586
		Highest		1	0	16.38	0.043	27.85	0.609

**BW: 10MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						EIRP (dBm)	EIRP (W)	EIRP (dBm)	EIRP (W)
2	10	Lowest	QPSK	1	0	15.75	0.037	27.84	0.608
		Middle		1	0	15.00	0.031	26.54	0.450
		Highest		1	0	15.91	0.038	27.16	0.519
		Lowest	16 QAM	1	0	16.12	0.040	28.73	0.746
		Middle		1	0	16.82	0.048	28.01	0.632
		Highest		1	0	16.50	0.044	27.65	0.582

**BW: 15MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						EIRP (dBm)	EIRP (W)	EIRP (dBm)	EIRP (W)
2	15	Lowest	QPSK	1	0	15.78	0.037	28.06	0.639
		Middle		1	0	15.02	0.031	27.10	0.512
		Highest		1	0	16.63	0.046	27.91	0.618
		Lowest	16 QAM	1	0	16.12	0.040	27.99	0.629
		Middle		1	0	15.57	0.036	27.22	0.527
		Highest		1	0	16.75	0.047	28.42	0.695

**BW: 20MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						EIRP (dBm)	EIRP (W)	EIRP (dBm)	EIRP (W)
2	20	Lowest	QPSK	1	0	15.65	0.036	27.94	0.622
		Middle		1	0	15.15	0.032	25.13	0.325
		Highest		1	0	15.94	0.039	28.05	0.638
		Lowest	16 QAM	1	0	16.03	0.040	27.91	0.618
		Middle		1	0	15.57	0.036	27.36	0.544
		Highest		1	0	16.56	0.045	28.00	0.630

**LTE Band 5**

**BW: 1.4MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						ERP (dBm)	ERP (W)	ERP (dBm)	ERP (W)
5	1.4	Lowest	QPSK	1	0	24.60	0.288	25.83	0.382
		Middle		1	0	26.12	0.409	27.45	0.555
		Highest		1	0	24.85	0.305	26.83	0.481
		Lowest	16 QAM	1	0	25.37	0.344	26.02	0.399
		Middle		1	0	26.83	0.481	27.95	0.623
		Highest		1	0	25.69	0.370	27.31	0.538

**BW: 3MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						ERP (dBm)	ERP (W)	ERP (dBm)	ERP (W)
5	3	Lowest	QPSK	1	0	24.74	0.297	25.41	0.347
		Middle		1	0	25.74	0.374	26.81	0.479
		Highest		1	0	24.75	0.298	26.57	0.453
		Lowest	16 QAM	1	0	25.39	0.345	25.98	0.396
		Middle		1	0	26.86	0.485	27.92	0.619
		Highest		1	0	24.72	0.296	26.77	0.475

**BW: 5MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						ERP (dBm)	ERP (W)	ERP (dBm)	ERP (W)
5	5	Lowest	QPSK	1	0	24.80	0.301	25.46	0.351
		Middle		1	0	26.12	0.409	27.21	0.526
		Highest		1	0	23.80	0.239	25.52	0.356
		Lowest	16 QAM	1	0	25.24	0.334	26.36	0.432
		Middle		1	0	26.57	0.453	28.23	0.665
		Highest		1	0	24.09	0.256	25.54	0.358

**BW: 10MHz / RB=1, RB Offset=0**

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	Vertical		Horizontal	
						ERP (dBm)	ERP (W)	ERP (dBm)	ERP (W)
5	10	Lowest	QPSK	1	0	24.74	0.297	25.57	0.360
		Middle		1	0	25.95	0.393	26.99	0.500
		Highest		1	0	24.71	0.295	26.20	0.416
		Lowest	16 QAM	1	0	25.25	0.334	25.95	0.393
		Middle		1	0	26.48	0.444	27.05	0.506
		Highest		1	0	25.54	0.358	26.29	0.425



## 7.3 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235.

Frequency Tolerance: +/- 2.5ppm\_

According to RSS-132 section 5.3 ,

The carrier frequency shall not depart from the reference frequency, in excess of  $\pm 2.5$  ppm for mobile stations and  $\pm 1.0$  ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

According to RSS -133 section 6.3

The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations and  $\pm 1.5$  ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the occupied bandwidth stays within each of the sub-bands (see Section 5.1) when tested to the temperature and supply voltage variations specified in RSS-Gen.

### Test Procedure

Use Anritsu 8820 with frequency Error measurement capability.

Temp = -30 to +50°C

Voltage= 85% to 115% of the nominal value for AC powered equipment.

*NOTE: The frequency error was recorded frequency error from the communication simulator.*

### TEST RESULTS

*No non-compliance noted.*

**Test Results**

**FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT:**

**LTE Band 5**

<b>Reference Frequency: LTE Band 5 Max Bandwidth QPSK, 836.5 MHz</b>				
<b>Limit: ± 2.5 ppm = 2091.25Hz</b>				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
120	50	0.02	0.000024	+/- 2.5
120	40	0.00	0.000000	
120	30	0.03	0.000036	
120	20	0.00	0.000006	
120	10	0.01	0.000012	
120	0	0.01	0.000012	
120	-10	0.04	0.000048	
120	-20	0.02	0.000024	

<b>Reference Frequency: LTE Band 5 Max Bandwidth 16QAM, 836.5 MHz</b>				
<b>Limit: ± 2.5 ppm = 2091.25Hz</b>				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
120	50	0.01	0.000011	+/- 2.5
120	40	-0.02	-0.000023	
120	30	-0.01	-0.000012	
120	20	0.01	0.000012	
120	10	0.02	0.000024	
120	0	0.02	0.000024	
120	-10	0.01	0.000012	
120	-20	0.03	0.000036	

**LTE Band 2**

<b>Reference Frequency: LTE Band 2 Max Bandwidth QPSK, 1880 MHz</b>				
Limit: $\pm 2.5$ ppm = 4700Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
120	50	0.03	0.000016	<b>+/- 2.5</b>
120	40	0.04	0.000021	
120	30	0.03	0.000016	
120	20	0.01	0.000005	
120	10	0.04	0.000021	
120	0	0.02	0.000011	
120	-10	0.00	0.000000	
120	-20	0.01	0.000005	

<b>Reference Frequency: LTE Band 2 Max Bandwidth 16QAM, 1880 MHz</b>				
Limit: $\pm 2.5$ ppm = 4700Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
120	50	0.05	0.000027	<b>+/- 2.5</b>
120	40	0.03	0.000016	
120	30	0.02	0.000011	
120	20	0.03	0.000016	
120	10	0.04	0.000021	
120	0	0.01	0.000005	
120	-10	0.02	0.000011	
120	-20	0.01	0.000005	

**FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:**

**LTE Band 5**

<b>Reference Frequency: LTE Band 5 Max Bandwidth QPSK, 836.5 MHz</b>				
Limit: $\pm 2.5$ ppm = 2091.25Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
102	20	0.00	0.000004	+/- 2.5
120	20	0.00	0.000006	
138	20	0.01	0.000008	

<b>Reference Frequency: LTE Band 5 Max Bandwidth 16QAM, 836.5 MHz</b>				
Limit: $\pm 2.5$ ppm = 2091.25Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
102	20	-0.01	-0.000008	+/- 2.5
120	20	0.01	0.000012	
138	20	0.01	0.000008	

**LTE Band 2**

<b>Reference Frequency: LTE Band 2 Max Bandwidth QPSK, 1880 MHz</b>				
Limit: $\pm 2.5$ ppm = 4700Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
102	20	0.02	0.000011	+/- 2.5
120	20	0.01	0.000005	
138	20	0.04	0.000021	

<b>Reference Frequency: LTE Band 2 Max Bandwidth 16QAM, 1880 MHz</b>				
Limit: $\pm 2.5$ ppm = 4700Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
102	20	0.01	0.000005	+/- 2.5
120	20	0.03	0.000016	
138	20	0.04	0.000021	

## **7.4 OCCUPIED BANDWIDTH MEASUREMENT**

### **LIMIT**

For Reporting purposes only.

### **TEST PROCEDURES**

KDB 971168 D01 v02r02 - Section 4.2

1. The occupied bandwidth was measured with the spectrum analyzer at the lowest, middle and highest channels in each band and different modulation. The 99% and -26dB bandwidth was measured and recorded.
2. RBW = 1-5% of the expected OBW
3. VBW  $\geq$  3 x RBW
4. Detector = Peak
5. Trace mode = max. hold

### **TEST RESULTS**

*No non-compliance noted*

**LTE Band 5****CHANNEL BANDWIDTH: 1.4MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
20525	836.5	1.0984

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
20525	836.5	1.0984

**CHANNEL BANDWIDTH: 3MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
20525	836.50	2.6743

**CHANNEL BANDWIDTH: 3MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
20525	836.50	2.6830

**CHANNEL BANDWIDTH: 5MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
20525	836.50	4.4573

**CHANNEL BANDWIDTH: 5MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
20525	836.50	4.4717

**CHANNEL BANDWIDTH: 10MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
20525	836.50	8.9435

**CHANNEL BANDWIDTH: 10MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
20525	836.50	8.9146



**LTE Band 2****CHANNEL BANDWIDTH: 1.4MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880	1.0984

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880	1.0984

**CHANNEL BANDWIDTH: 3MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	2.6830

**CHANNEL BANDWIDTH: 3MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	2.6830

**CHANNEL BANDWIDTH: 5MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	4.4717

**CHANNEL BANDWIDTH: 5MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	4.4717

**CHANNEL BANDWIDTH: 10MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	8.9435

**CHANNEL BANDWIDTH: 10MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	8.9435

**CHANNEL BANDWIDTH: 15MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	13.4587

**CHANNEL BANDWIDTH: 15MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	13.5021

**CHANNEL BANDWIDTH: 20MHz / QPSK**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	18.0607

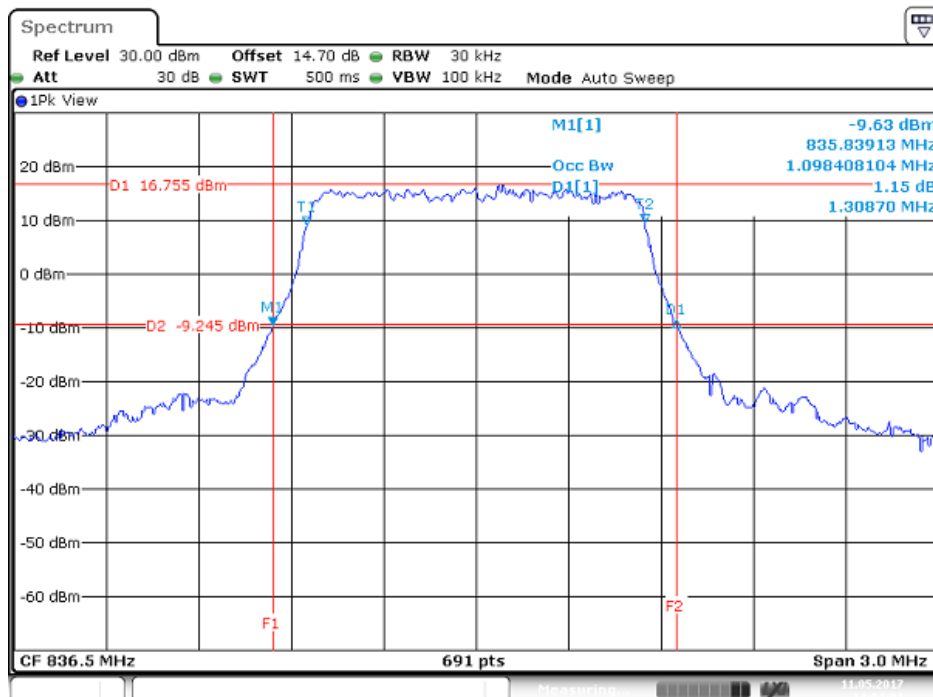
**CHANNEL BANDWIDTH: 20MHz / 16QAM**

Channel	FREQUENCY (MHz)	Occupied bandwidth (MHz)
18900	1880.00	18.1186

## LTE Band 5

**CHANNEL BANDWIDTH: 1.4MHz / QPSK**

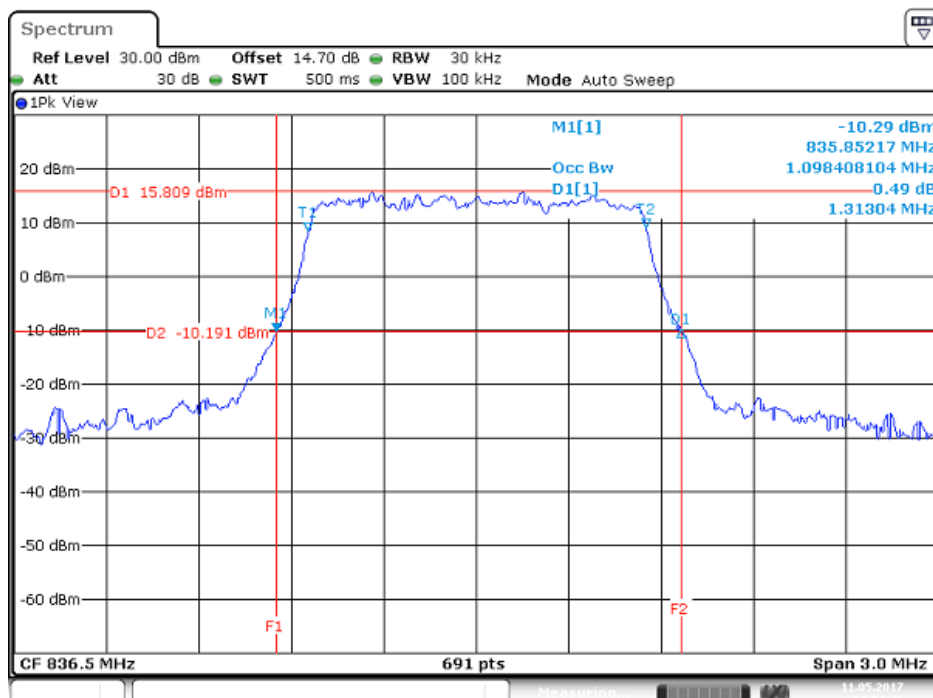
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Date: 11.MAY.2017 14:04:00

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM**

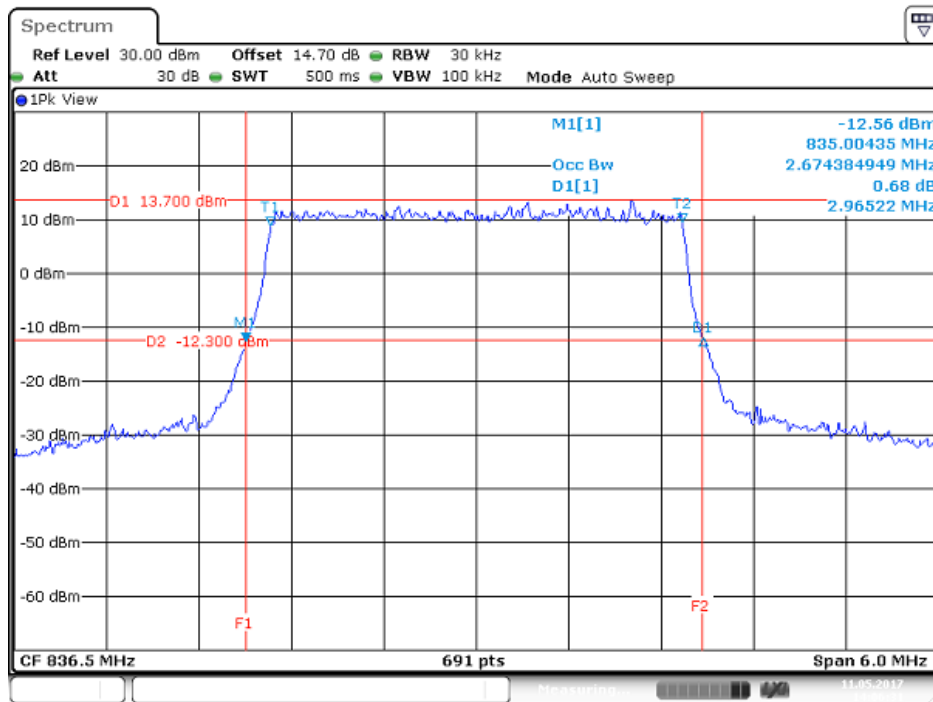
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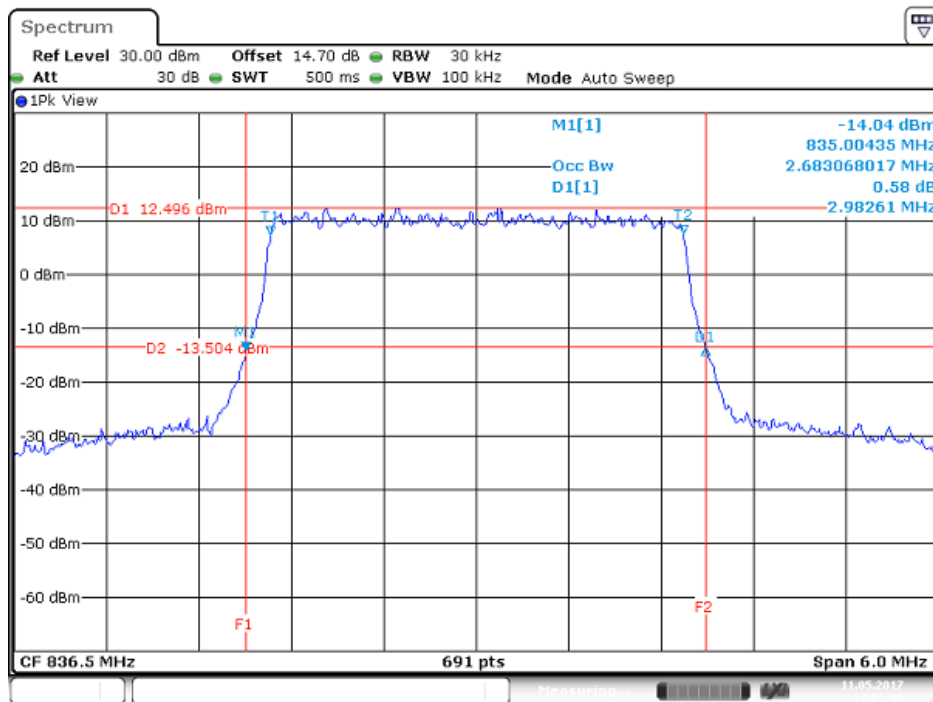
**CHANNEL BANDWIDTH: 3MHz / QPSK**

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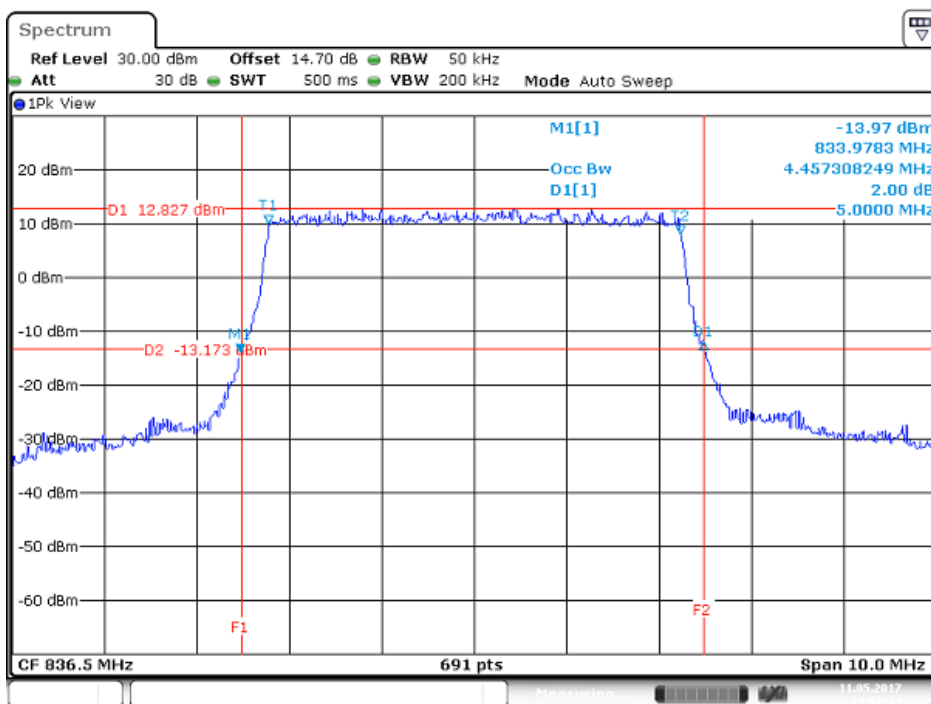
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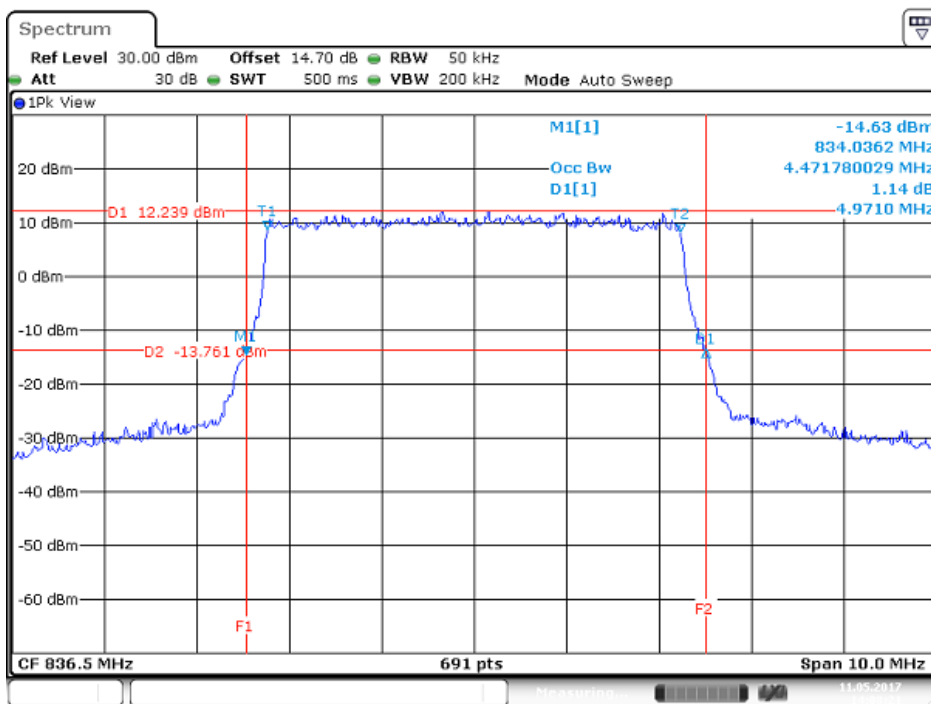
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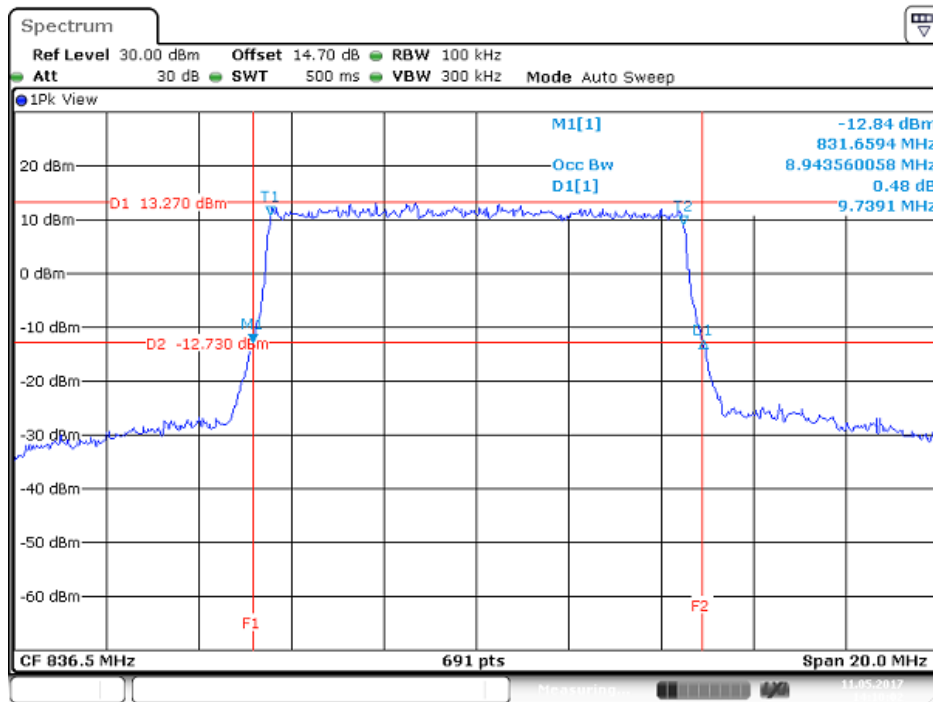
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**CH Mid**



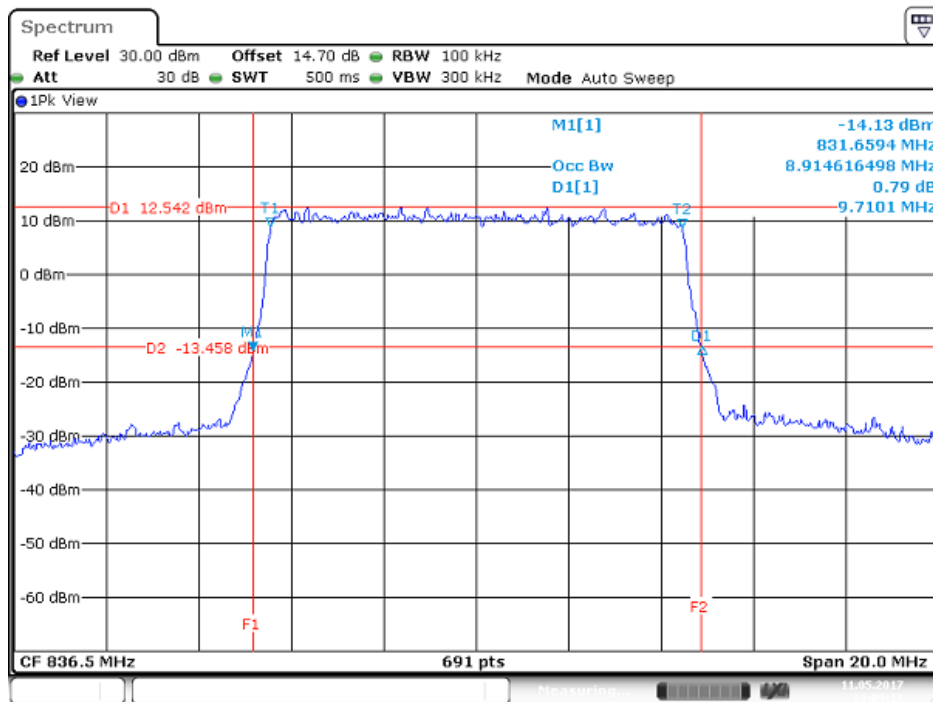
**CHANNEL BANDWIDTH: 10MHz / QPSK**

**CH Mid**

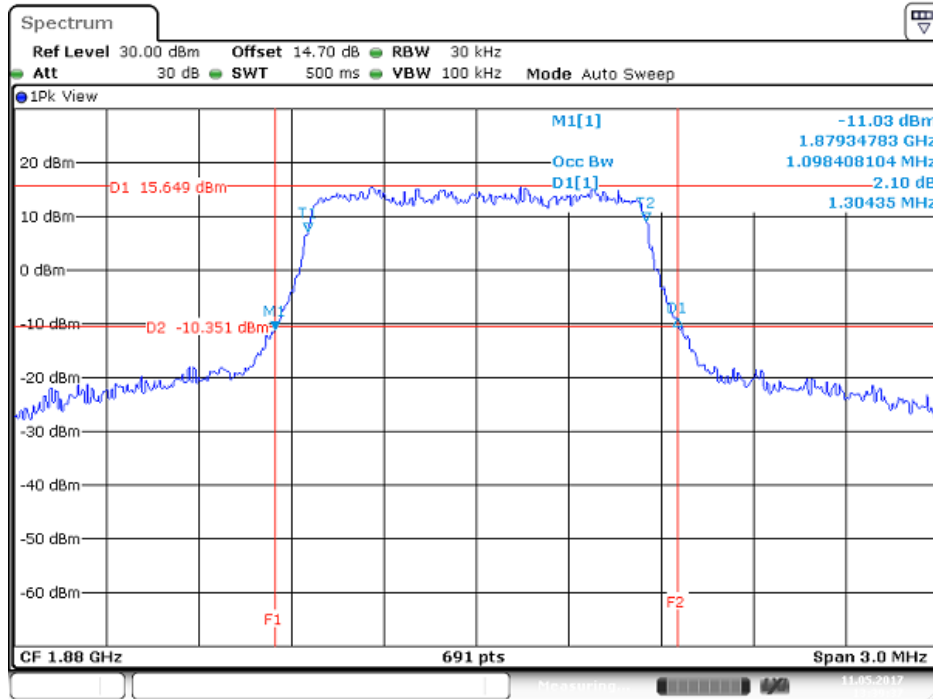


**CHANNEL BANDWIDTH: 10MHz / 16QAM**

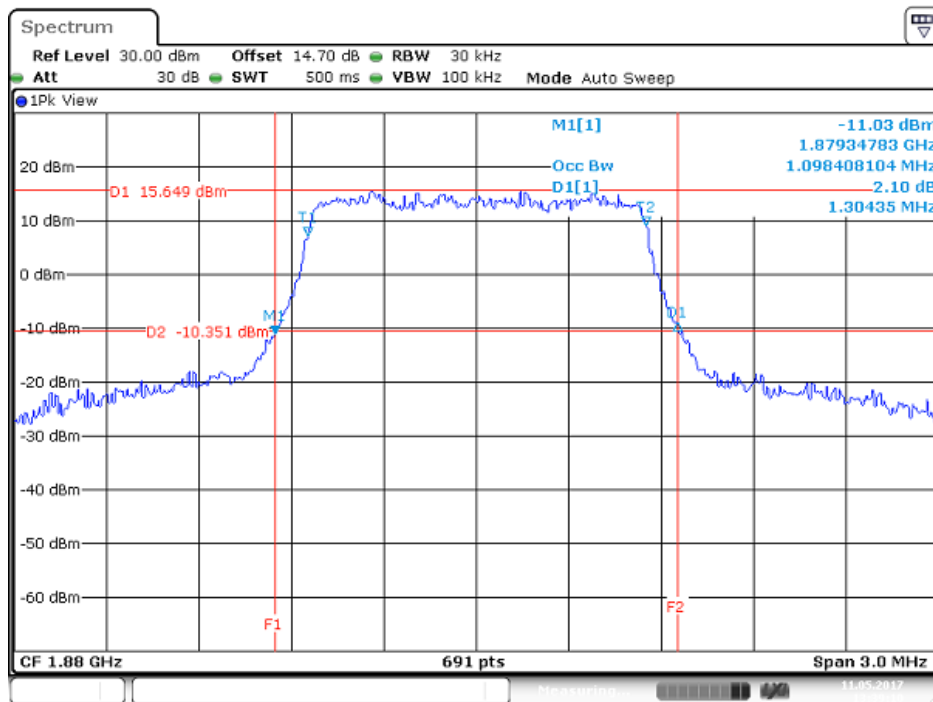
**CH Mid**



**LTE Band 2**  
**CHANNEL BANDWIDTH: 1.4MHz / QPSK**  
**CH Mid**



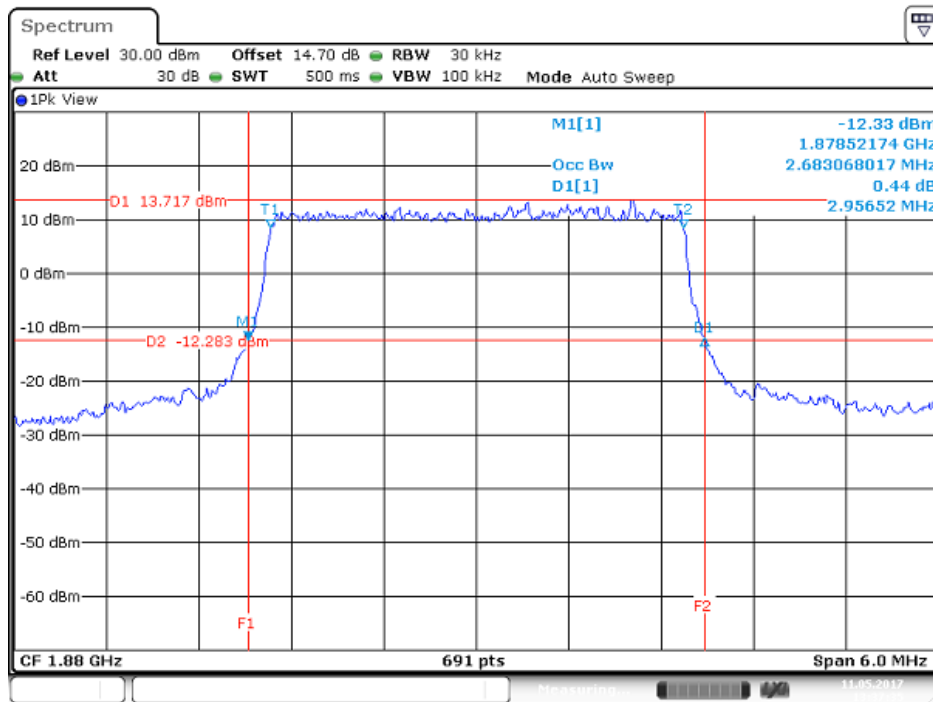
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**CH Mid**





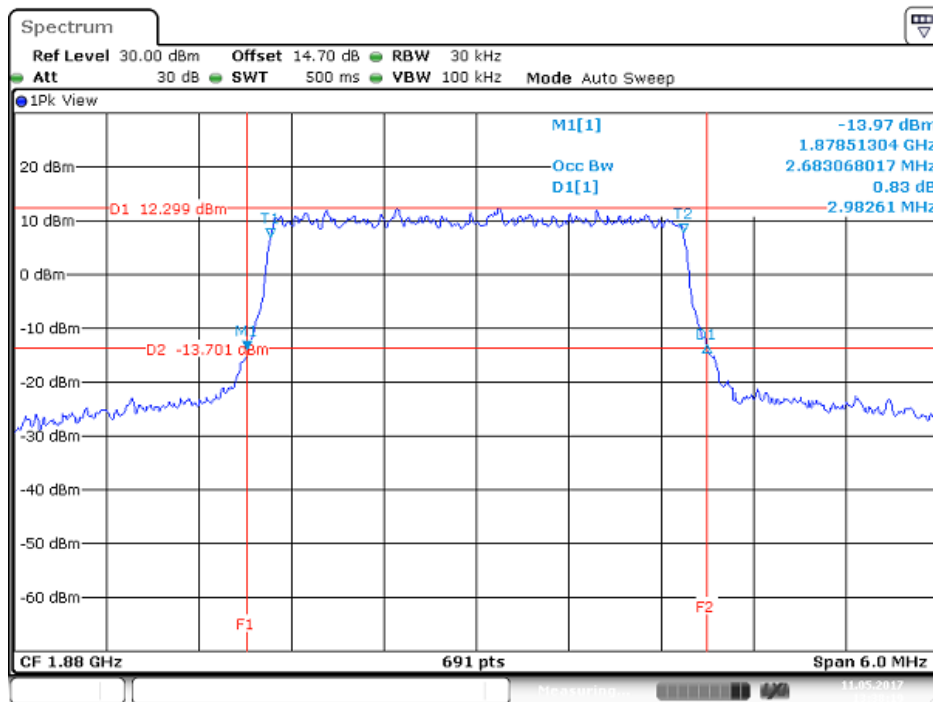
**CHANNEL BANDWIDTH: 3MHz / QPSK**

**CH Mid**



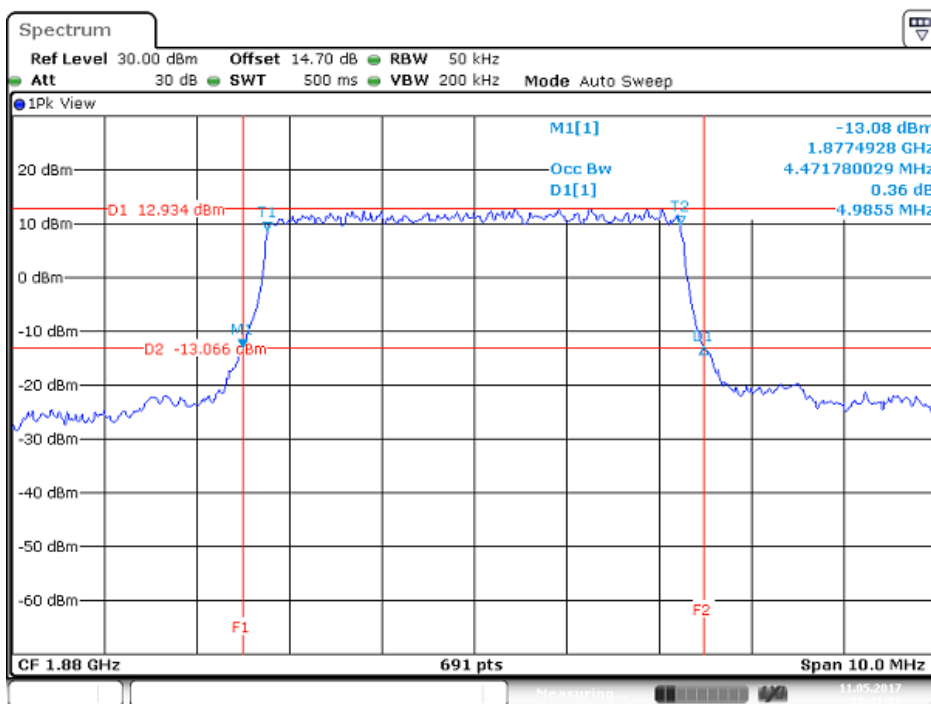
**CHANNEL BANDWIDTH: 3MHz / 16QAM**

**CH Mid**



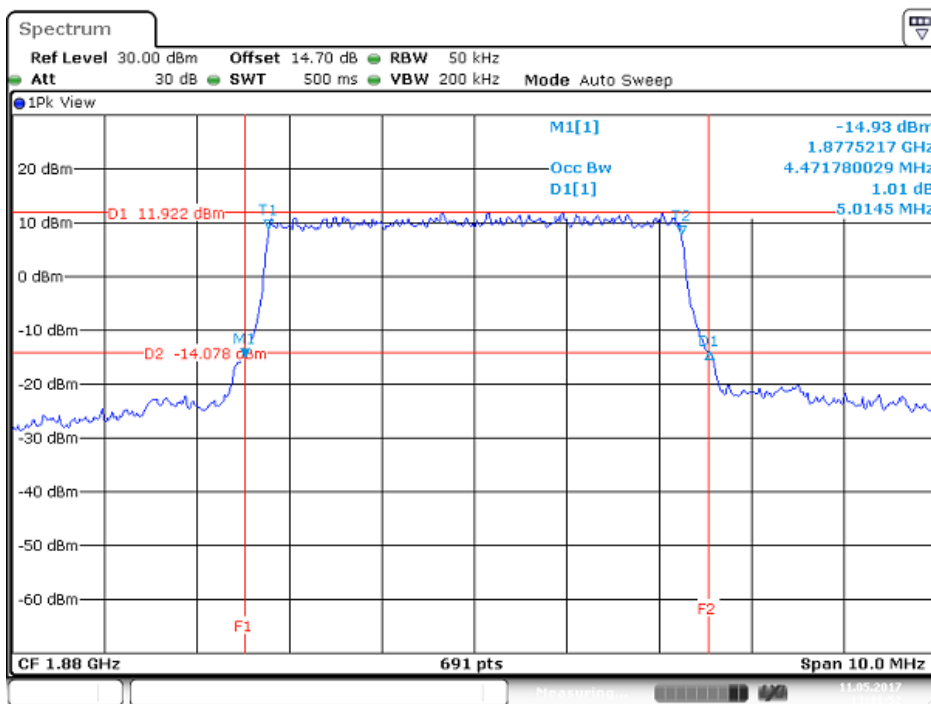
**CHANNEL BANDWIDTH: 5MHz / QPSK**

**CH Mid**



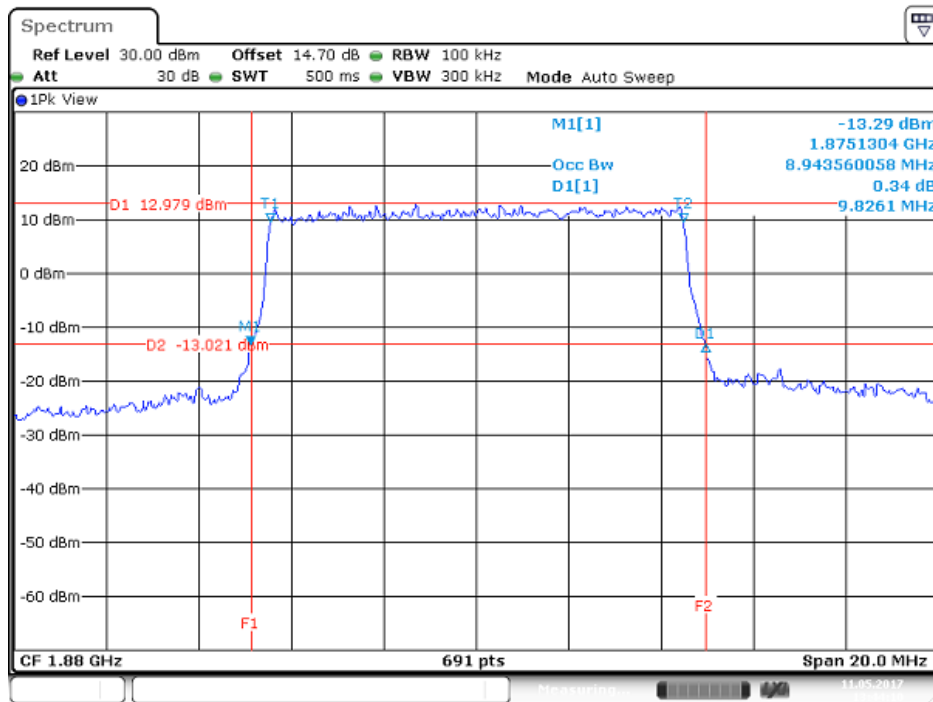
**CHANNEL BANDWIDTH: 5MHz / 16QAM**

**CH Mid**



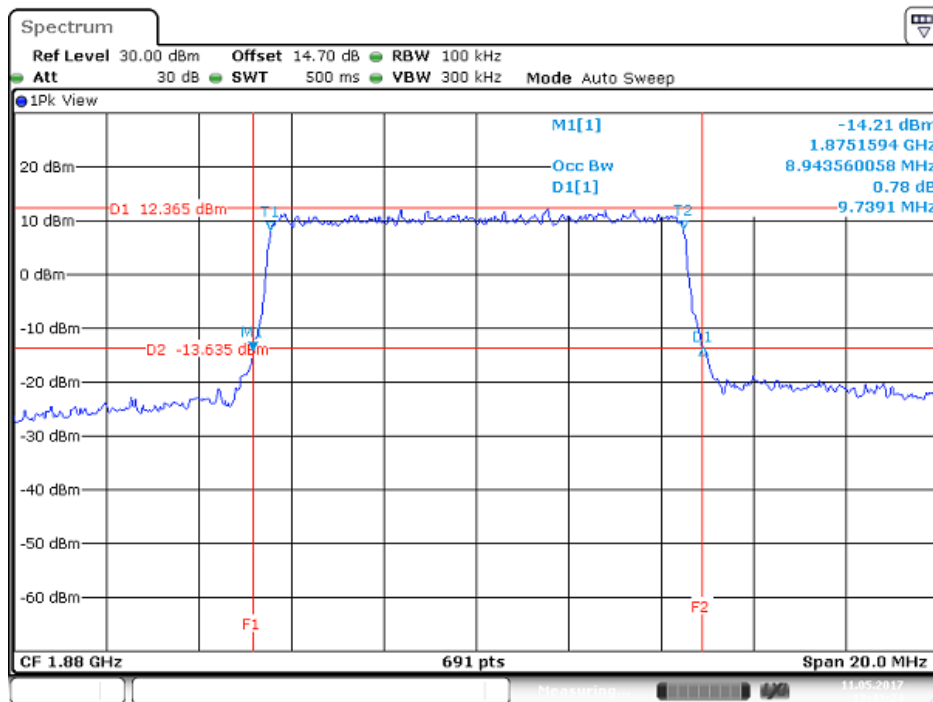
**CHANNEL BANDWIDTH: 10MHz / QPSK**

**CH Mid**



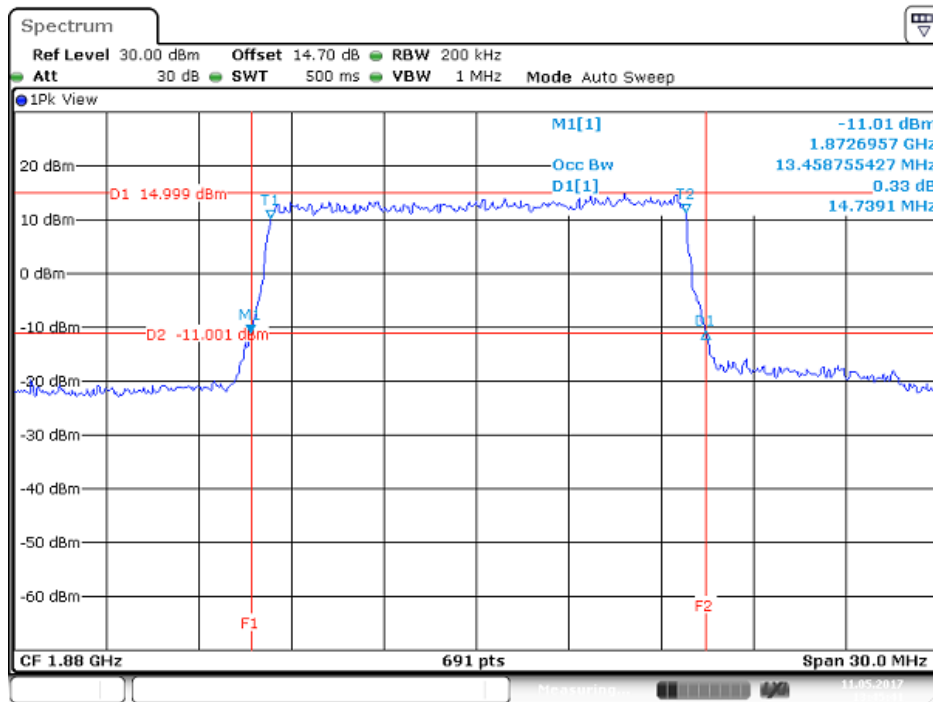
**CHANNEL BANDWIDTH: 10MHz / 16QAM**

**CH Mid**



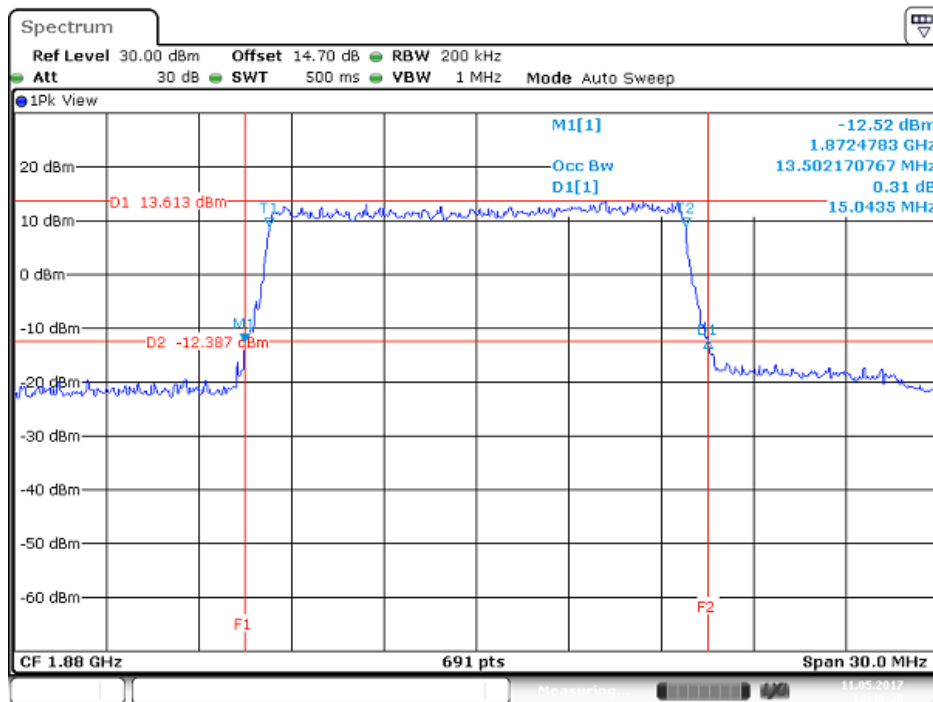
**CHANNEL BANDWIDTH: 15MHz / QPSK**

**CH Mid**



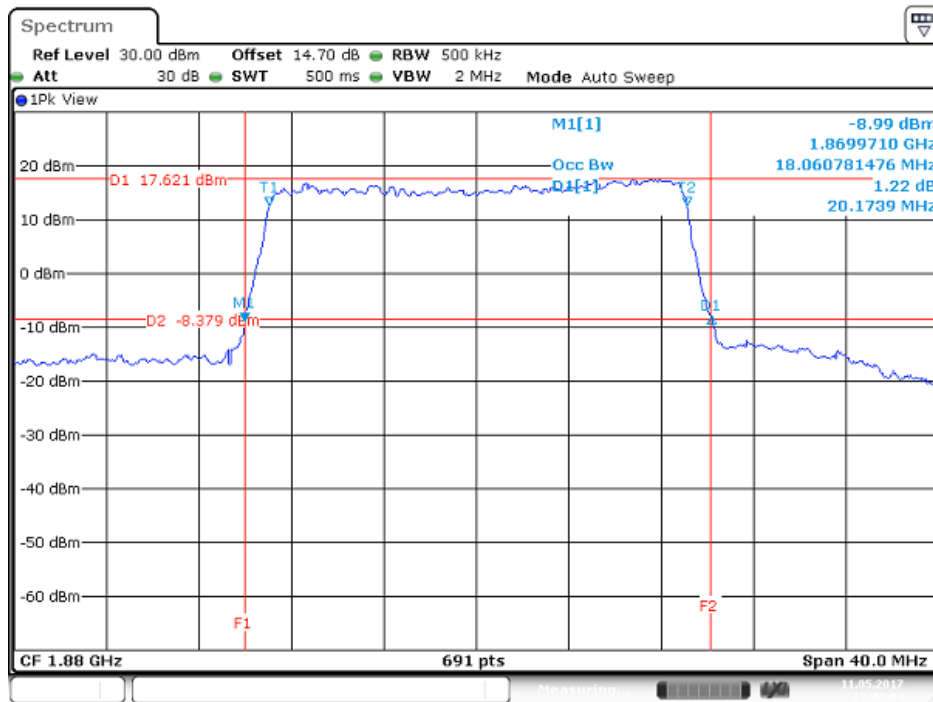
**CHANNEL BANDWIDTH: 15MHz / 16QAM**

**CH Mid**



**CHANNEL BANDWIDTH: 20MHz / QPSK**

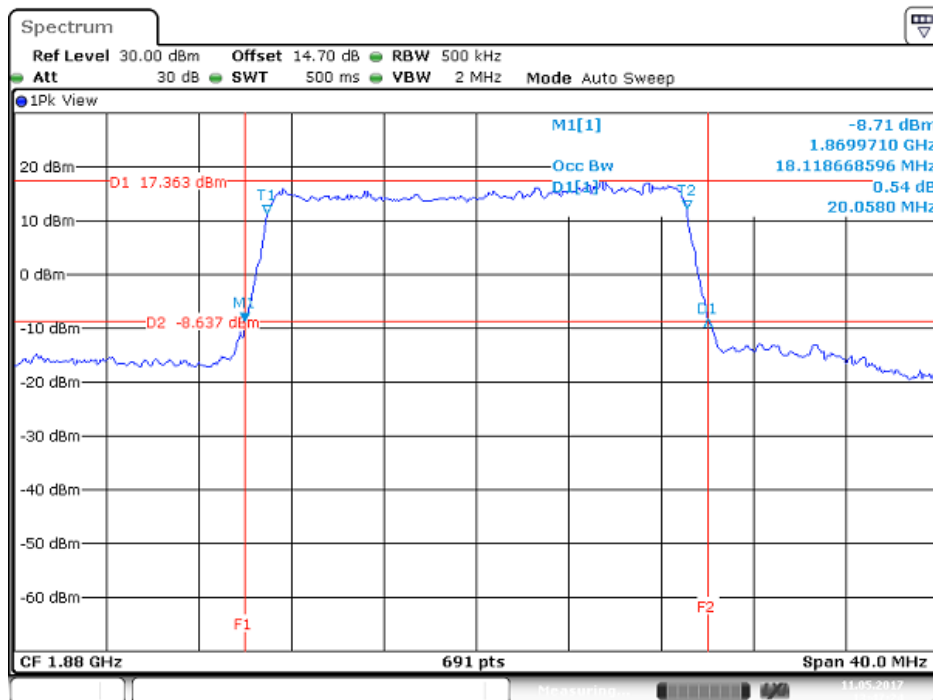
**CH Mid**



Date: 11.MAY.2017 13:46:04

**CHANNEL BANDWIDTH: 20MHz / 16QAM**

**CH Mid**



Date: 11.MAY.2017 13:47:24

## **7.5 PEAK TO AVERAGE POWER RATIO**

### **Limit**

In measuring transmissions in this band using an average power technique, the peak to average power ratio (PAPR) of the transmission may not exceed 13 dB.

### **Test Procedures**

1. According to RSS-132 section 5.4 and RSS-133 section 6.4
2. The EUT was connect to spectrum analyzer and call box.
3. Set the CCDF function in spectrum analyzer.
4. The highest RF output power were measured and recorded the maximum PAPR level associated with a probability of 0.1%.
5. Record the Peak to Average Power Ratio.

## Test Results

### LTE Band 5

#### CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.5	5.22

#### CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.5	6.41

#### CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	5.30

#### CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	6.52

**CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	5.10

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	6.46

**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	5.07

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	6.00



**CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.5	6.09

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.5	6.72

**CHANNEL BANDWIDTH: 3MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	5.59

**CHANNEL BANDWIDTH: 3MHz / 16QAM / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	6.70

**CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	5.68

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	6.55

**CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	5.48

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
20525	836.50	6.41

**LTE Band 2****CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880	6.12

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880	6.72

**CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.20

**CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	7.10

**CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.12

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.49

**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.09

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	5.59

**CHANNEL BANDWIDTH: 15MHz / QPSK / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	5.91

**CHANNEL BANDWIDTH: 15MHz / 16QAM / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.49

**CHANNEL BANDWIDTH: 20MHz / QPSK / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	5.94

**CHANNEL BANDWIDTH: 20MHz / 16QAM / 1RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	5.25

**CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880	6.32

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880	6.70

**CHANNEL BANDWIDTH: 3MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	5.86

**CHANNEL BANDWIDTH: 3MHz / 16QAM / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.64

**CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	5.71

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.72

**CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.03

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.46

**CHANNEL BANDWIDTH: 15MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.14

**CHANNEL BANDWIDTH: 15MHz / 16QAM / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.75

**CHANNEL BANDWIDTH: 20MHz / QPSK / 100%RB**

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.00

**CHANNEL BANDWIDTH: 20MHz / 16QAM / 100%RB**

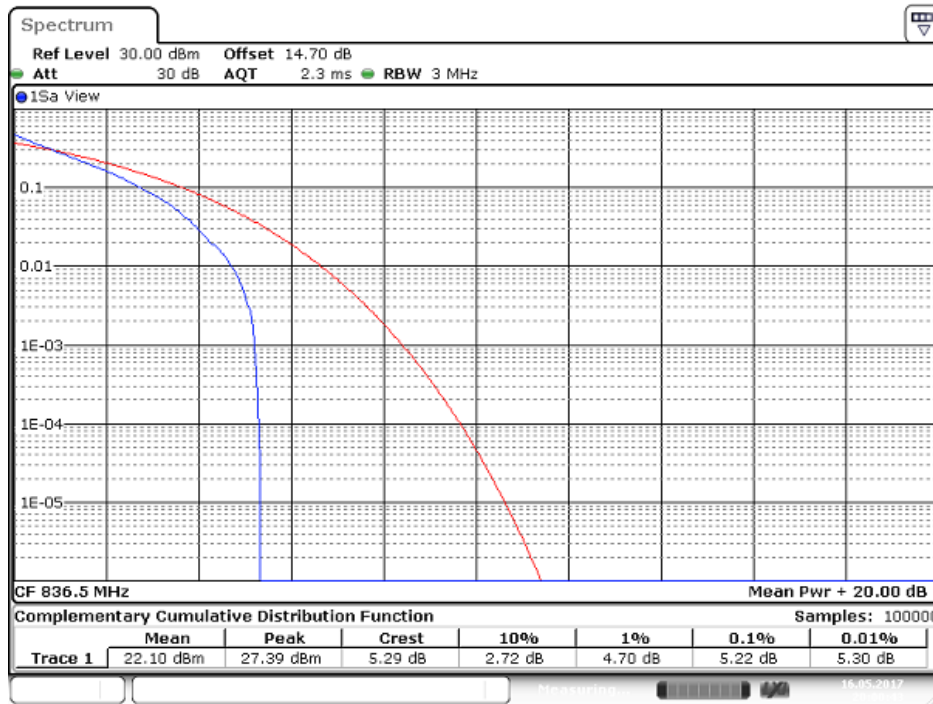
Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
18900	1880.00	6.78



## LTE Band 5

CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB

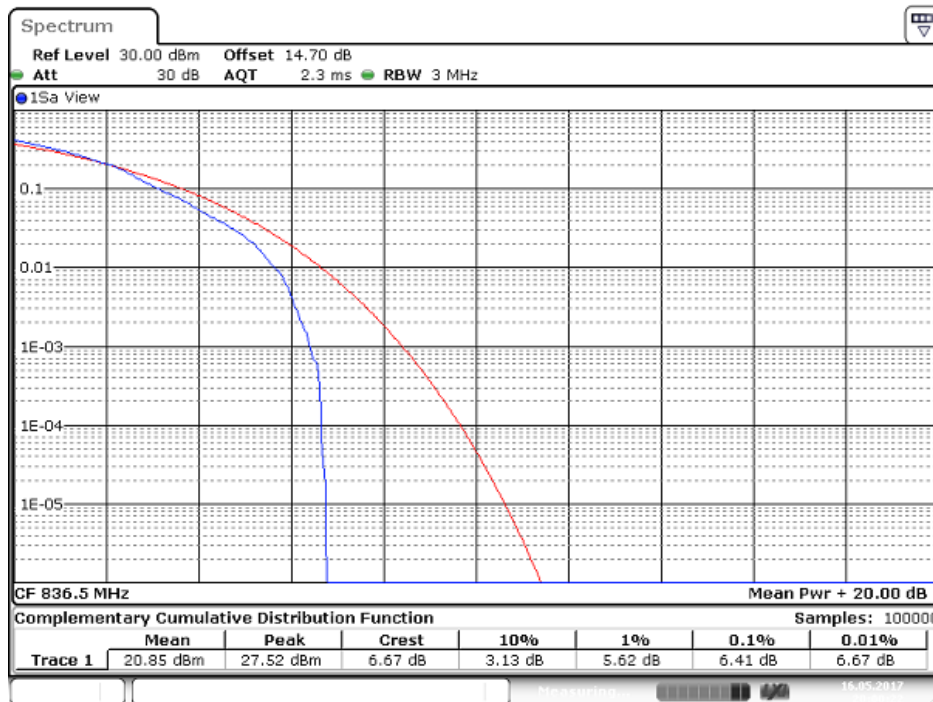
CH Mid



Date: 16 MAY 2017 20:00:43

CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB

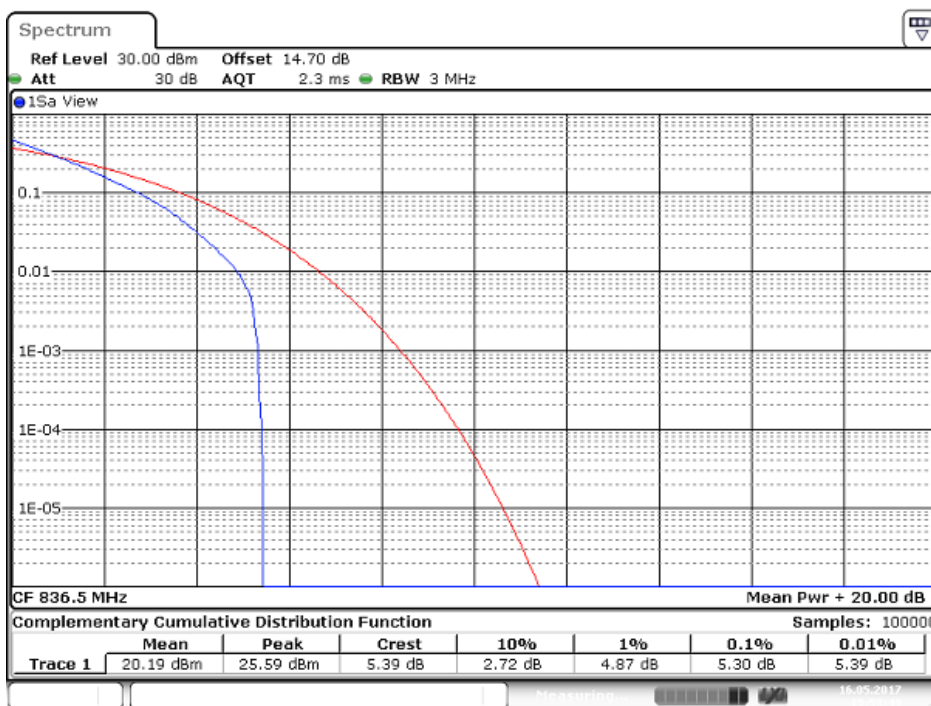
CH Mid



Date: 16 MAY 2017 20:00:23

**CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB**

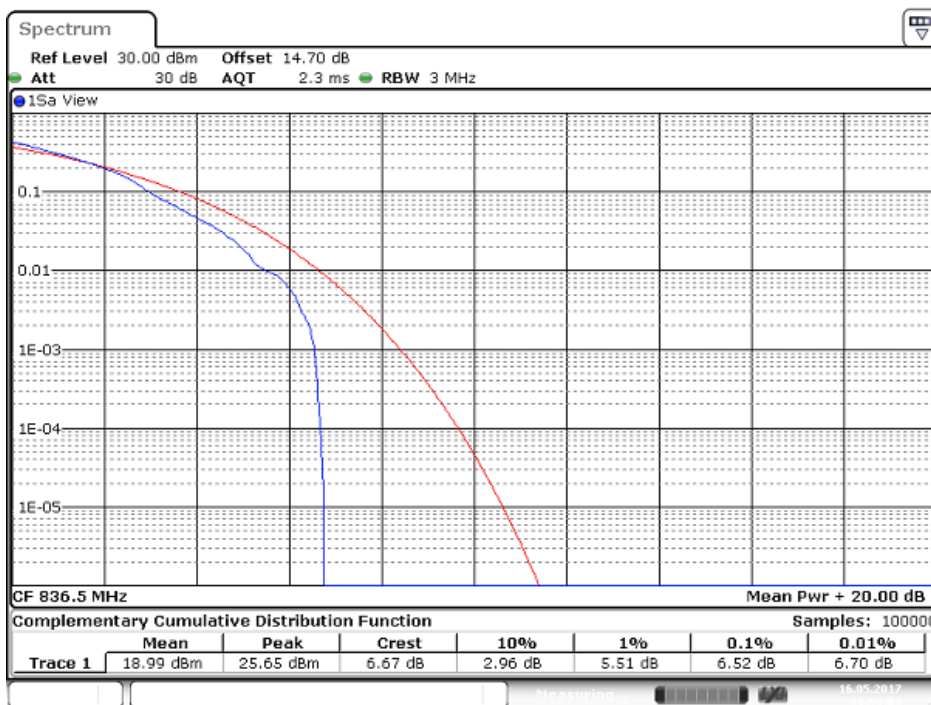
**CH Mid**



Date: 16MAY 2017 19:58:49

**CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB**

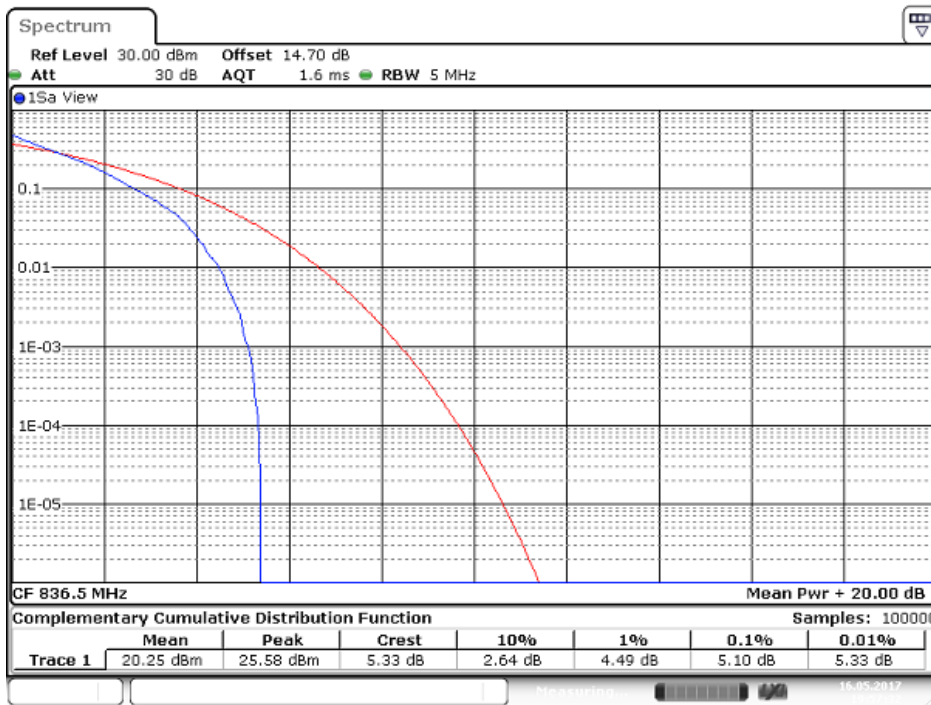
**CH Mid**



Date: 16MAY 2017 19:59:10

**CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB**

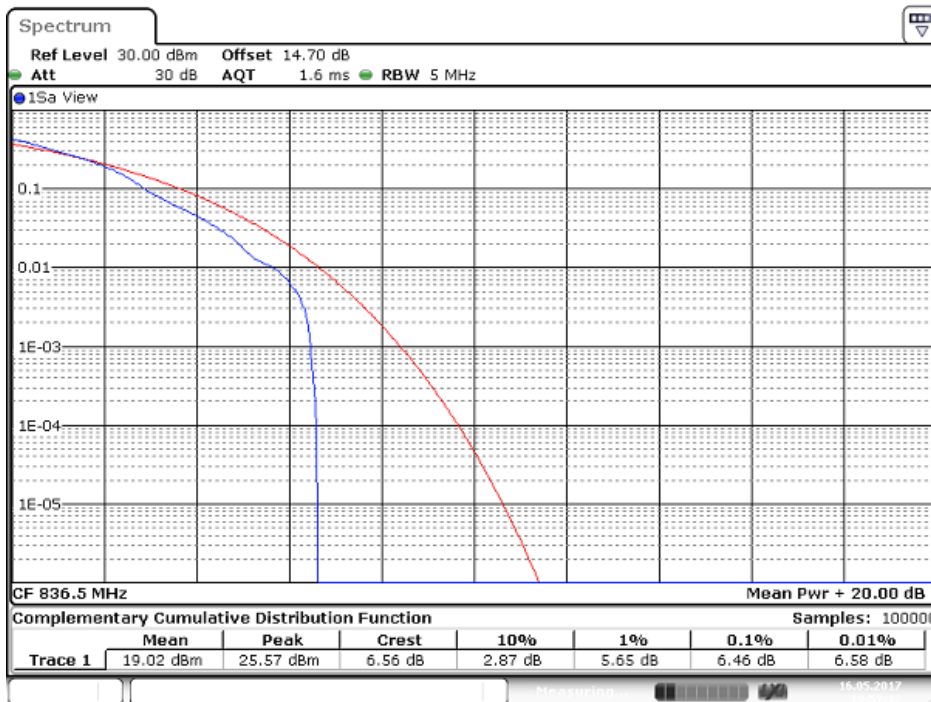
**CH Mid**



Date: 16MAY 2017 19:57:32

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB**

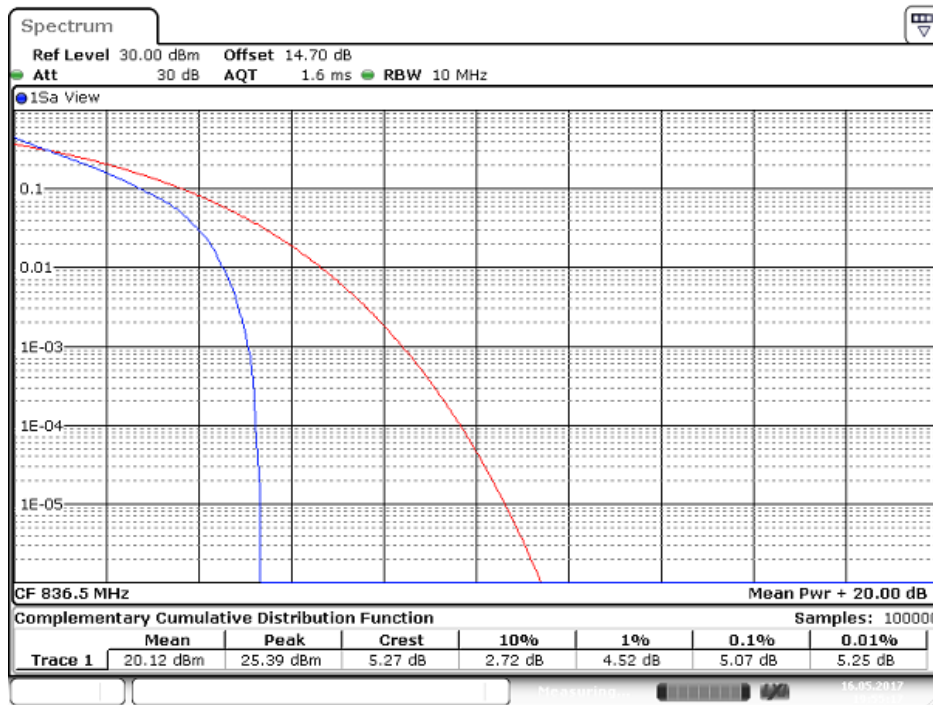
**CH Mid**



Date: 16MAY 2017 19:57:11

**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB**

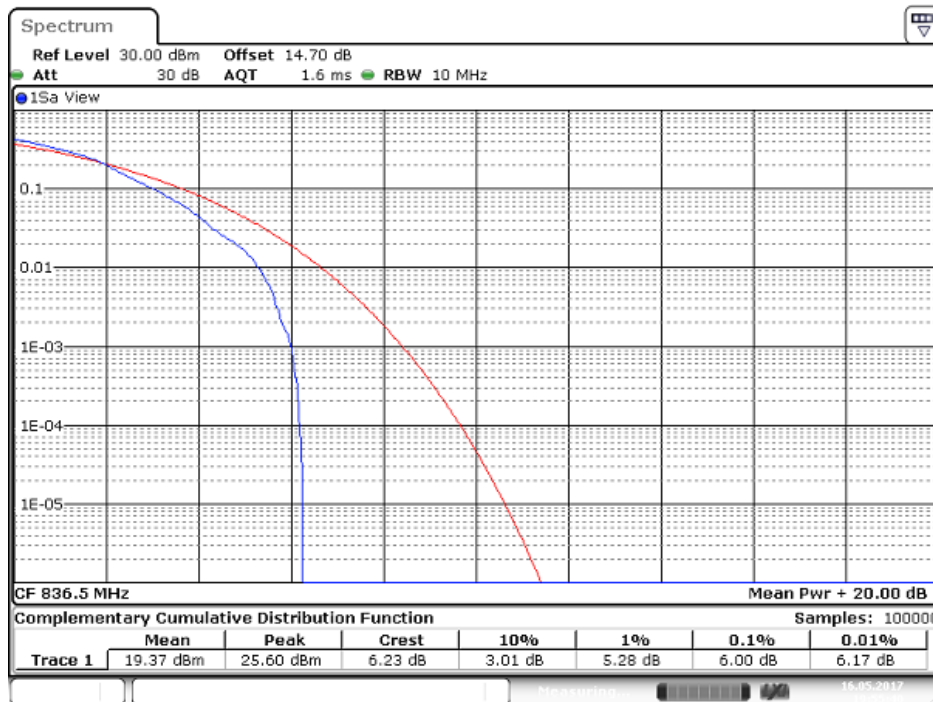
**CH Mid**



Date: 16MAY 2017 19:55:17

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB**

**CH Mid**

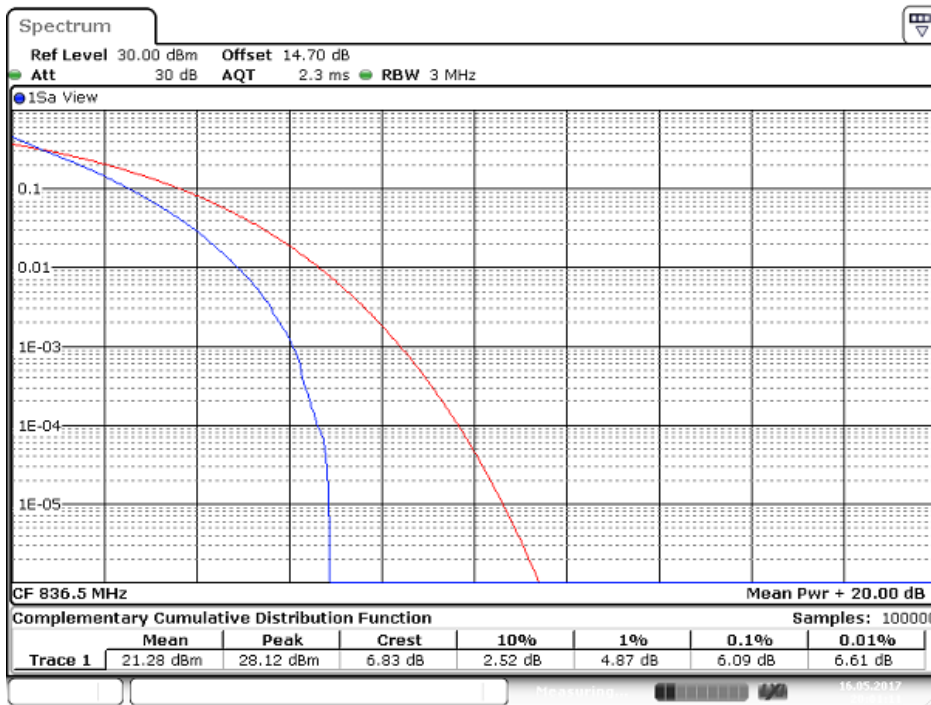


Date: 16MAY 2017 19:55:40



**CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100%RB**

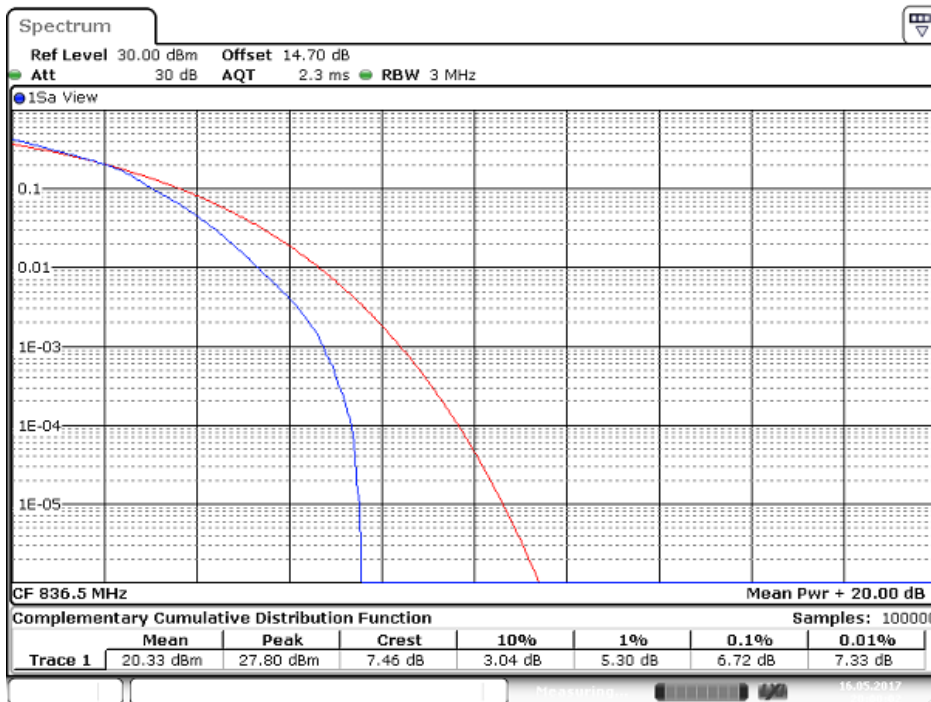
**CH Mid**



Date: 16MAY 2017 20:01:11

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100%RB**

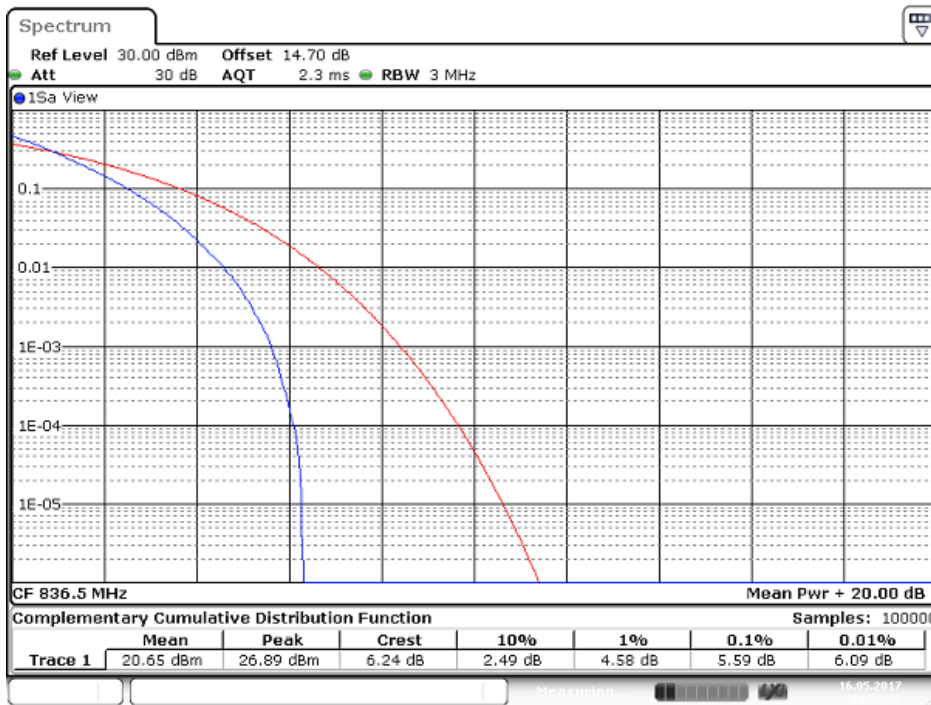
**CH Mid**



Date: 16MAY 2017 20:00:02

**CHANNEL BANDWIDTH: 3MHz / QPSK / 100%RB**

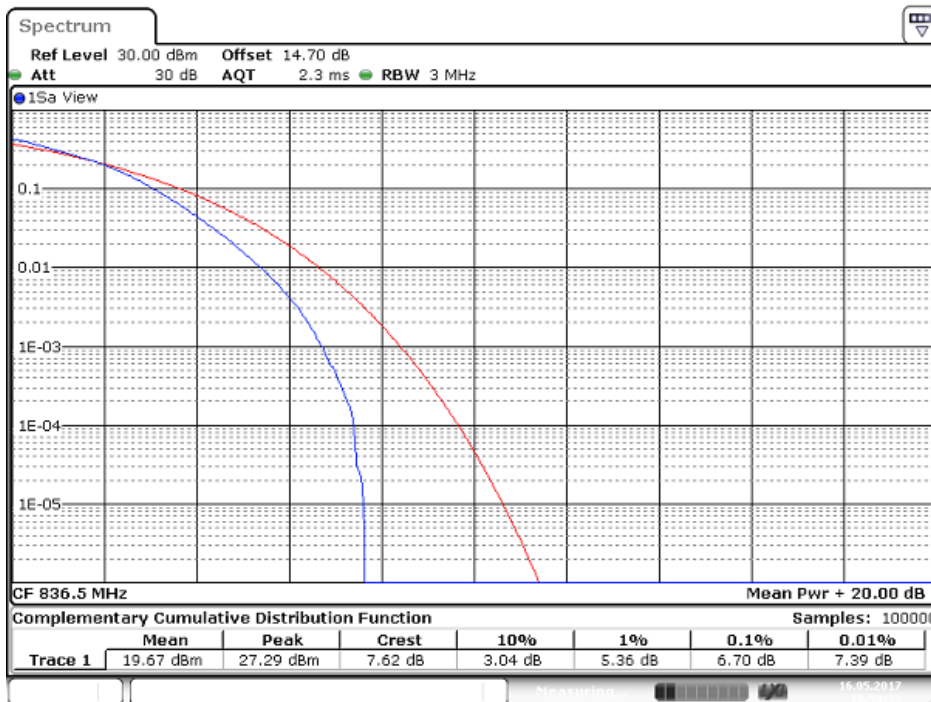
**CH Mid**



Date: 16MAY 2017 19:58:27

**CHANNEL BANDWIDTH: 3MHz / 16QAM / 100%RB**

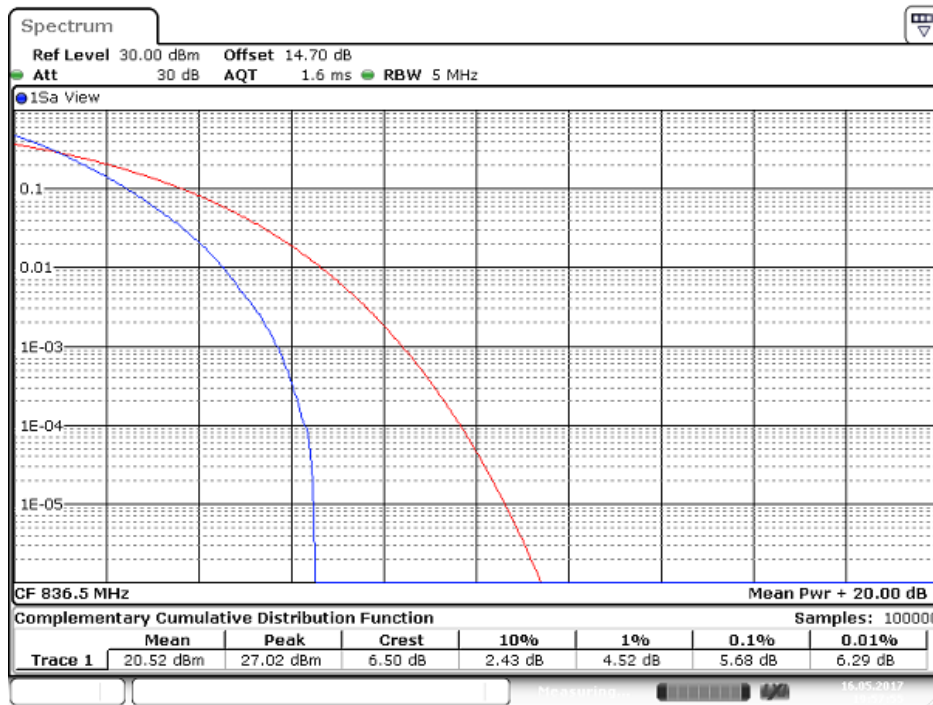
**CH Mid**



Date: 16MAY 2017 19:59:34

**CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB**

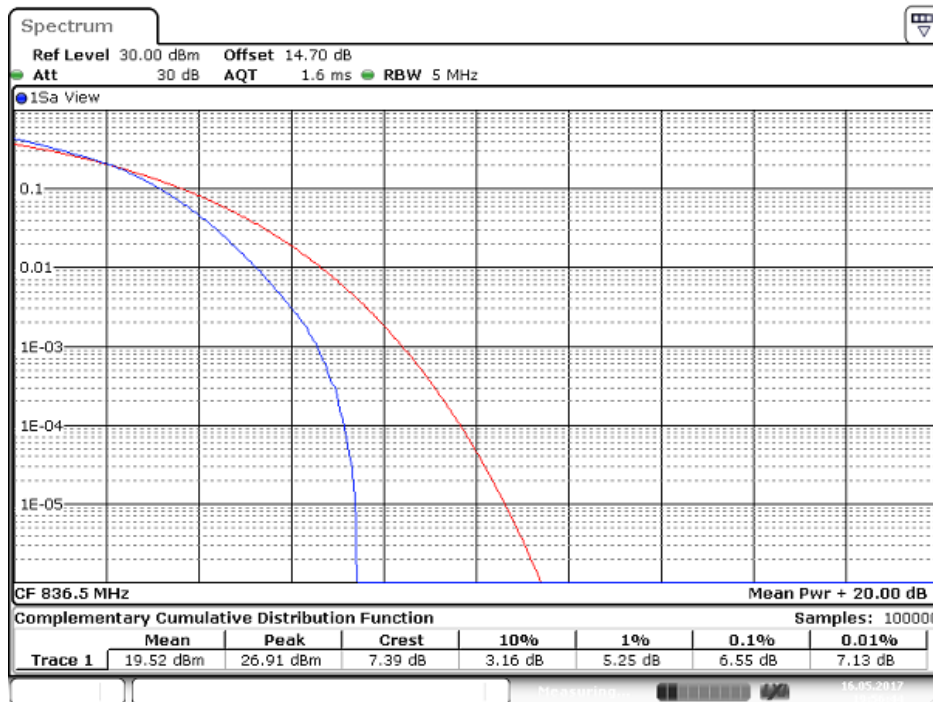
**CH Mid**



Date: 16MAY 2017 19:57:55

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB**

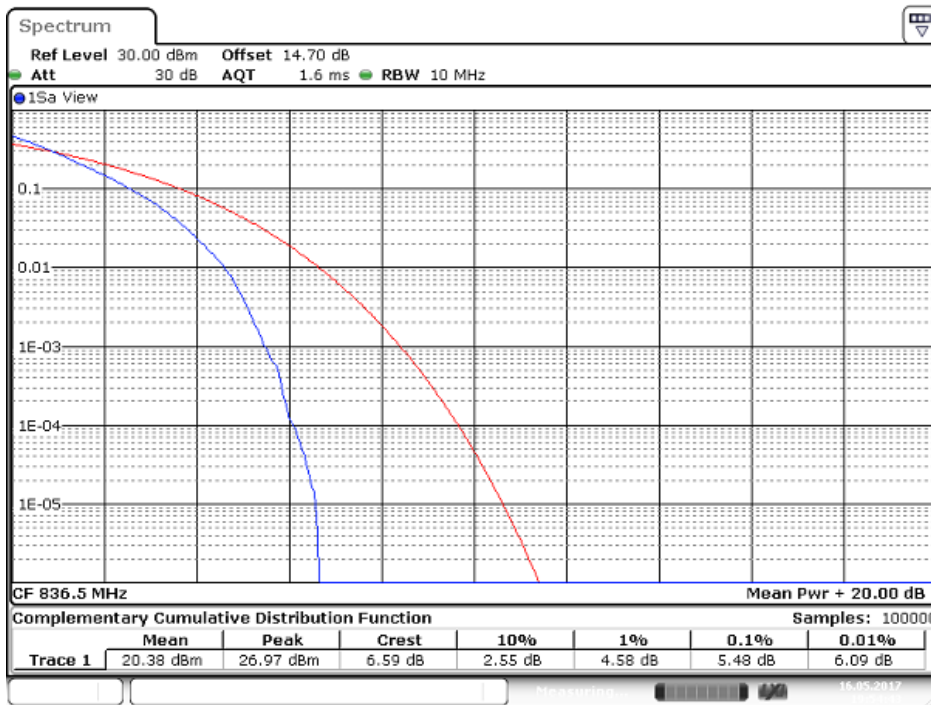
**CH Mid**



Date: 16MAY 2017 19:56:44

**CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB**

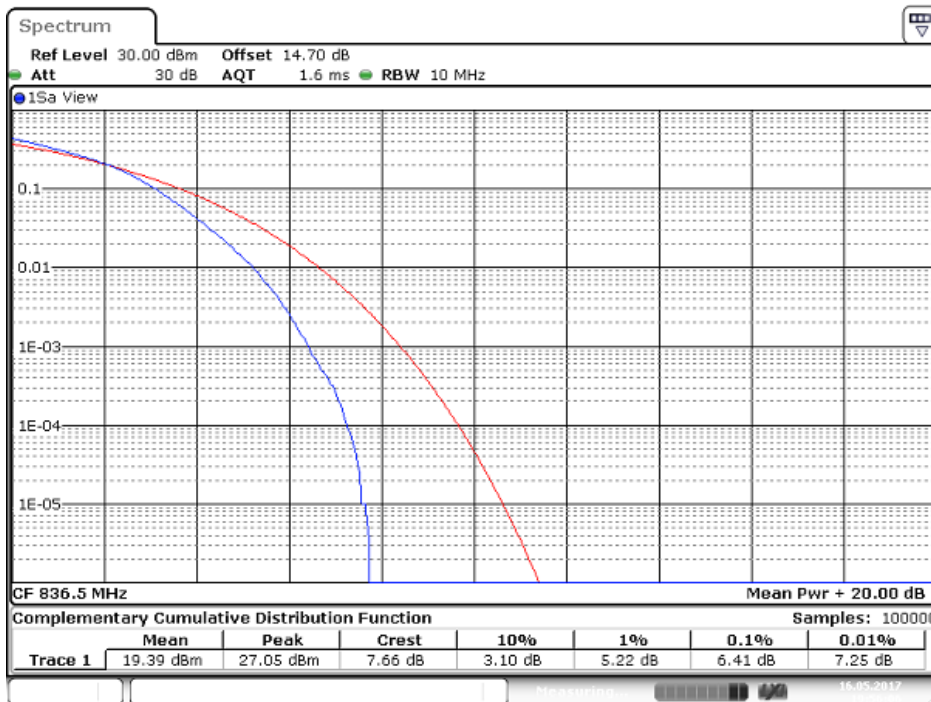
**CH Mid**



Date: 16MAY 2017 19:54:44

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB**

**CH Mid**



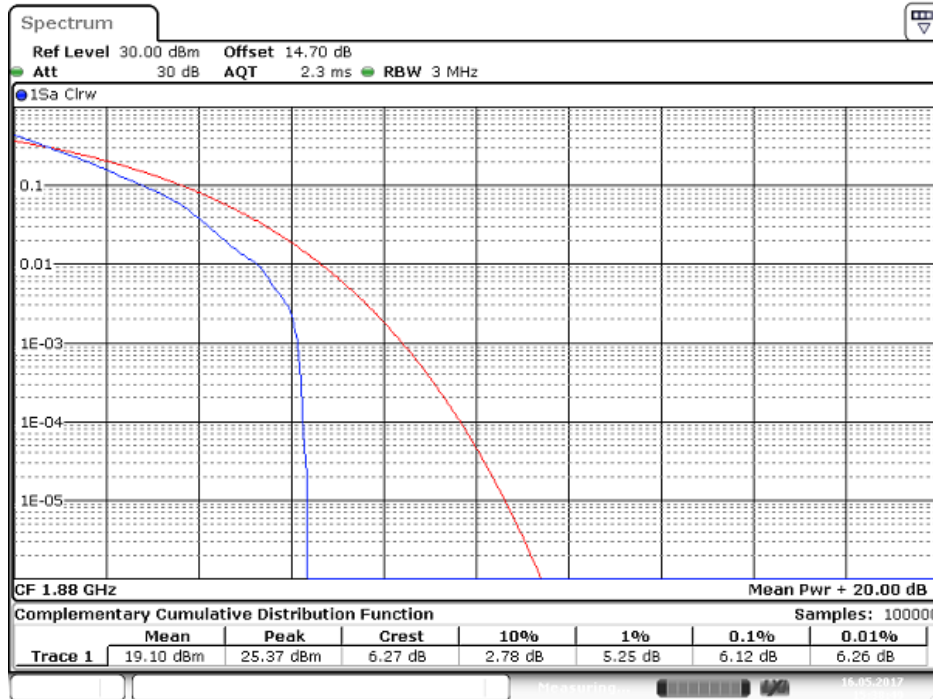
Date: 16MAY 2017 19:56:06



## LTE Band 2

CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB

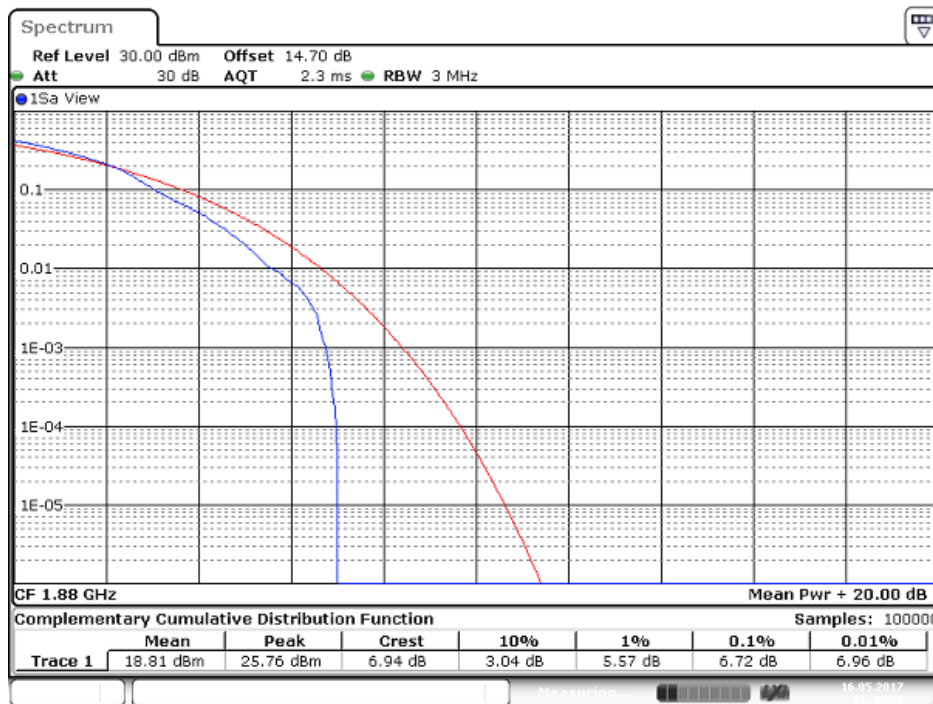
CH Mid



Date: 16MAY 2017 15:28:50

CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB

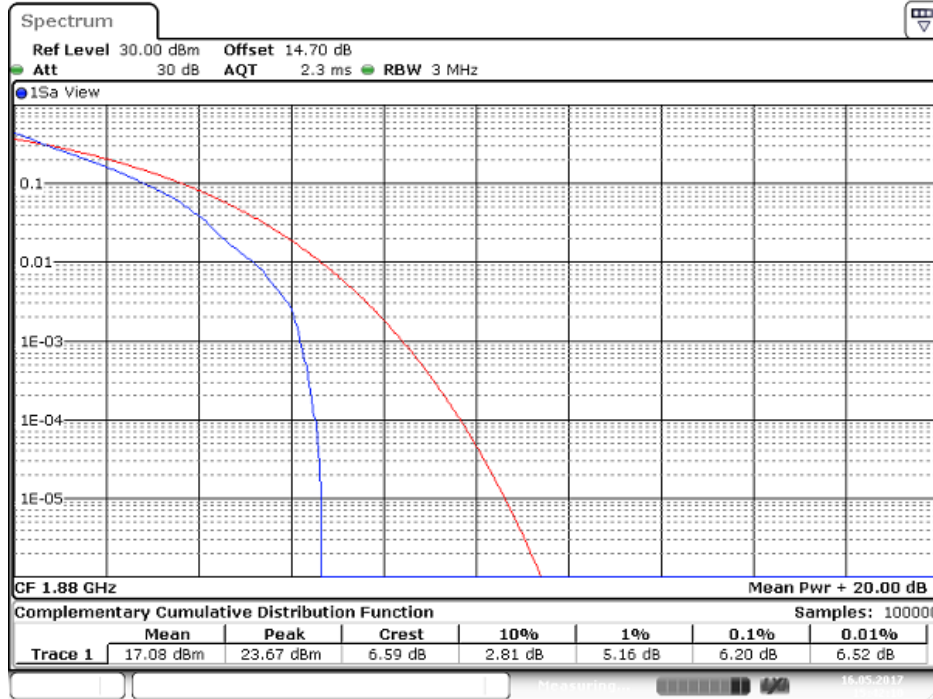
CH Mid



Date: 16MAY 2017 15:40:33

**CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB**

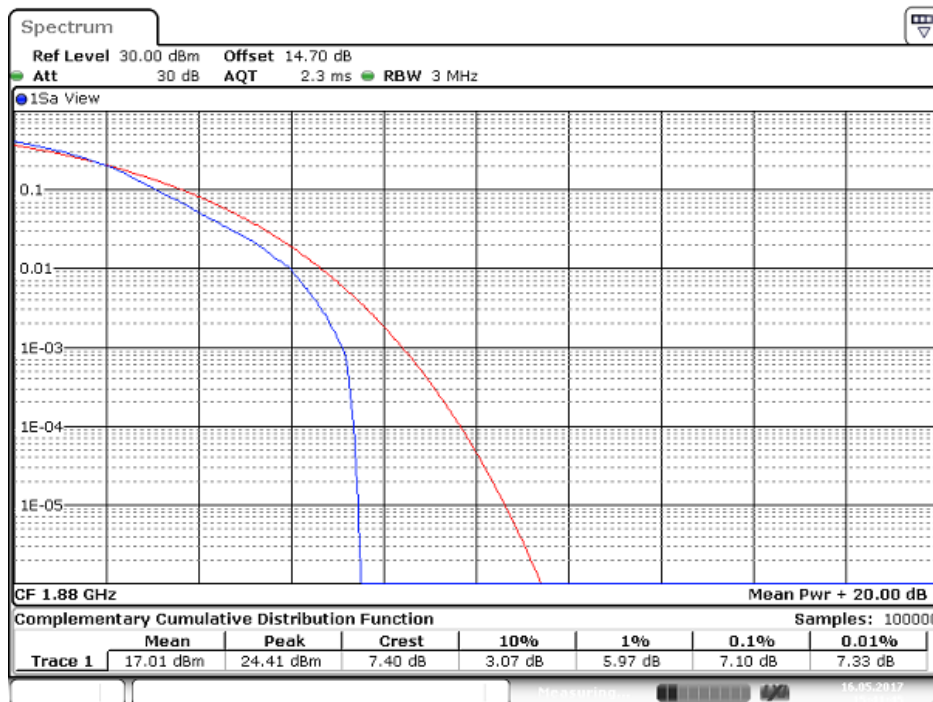
**CH Mid**



Date: 16 MAY 2017 15:42:11

**CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB**

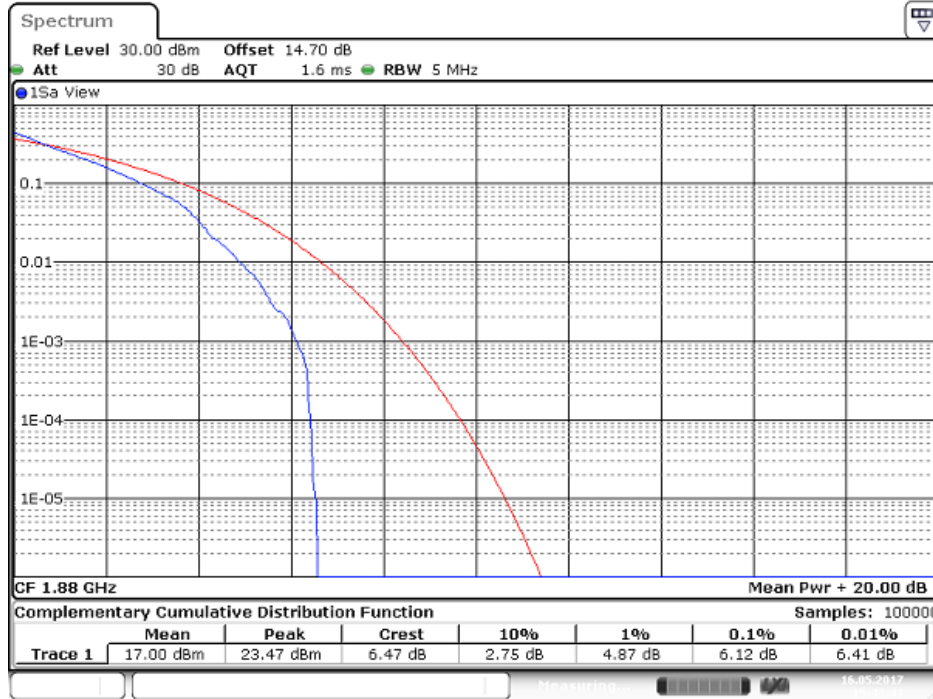
**CH Mid**



Date: 16 MAY 2017 15:41:46

**CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB**

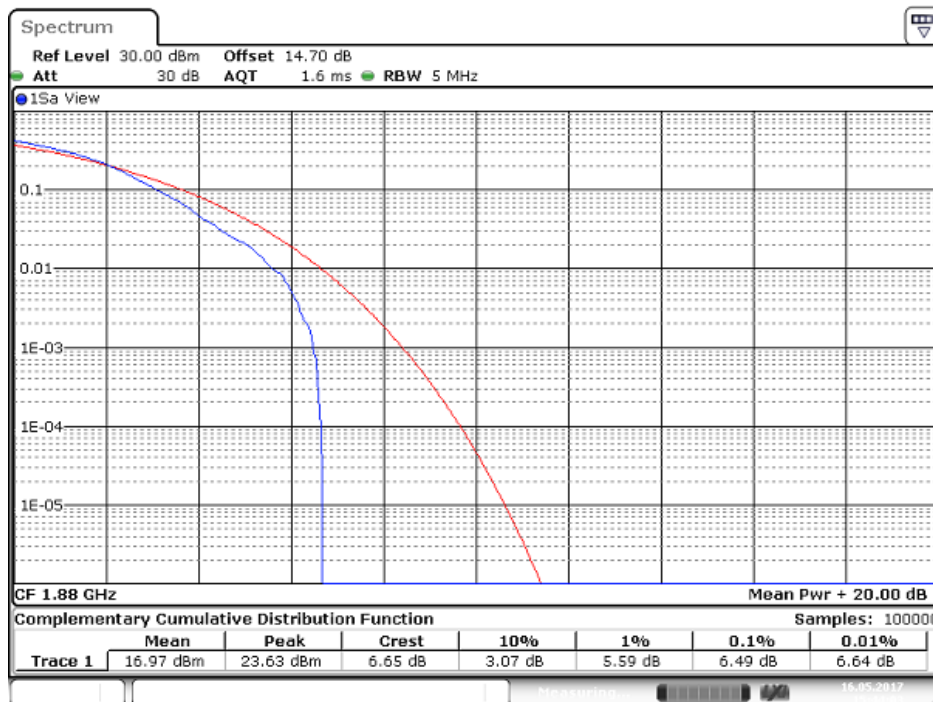
**CH Mid**



Date: 16 MAY 2017 15:43:42

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB**

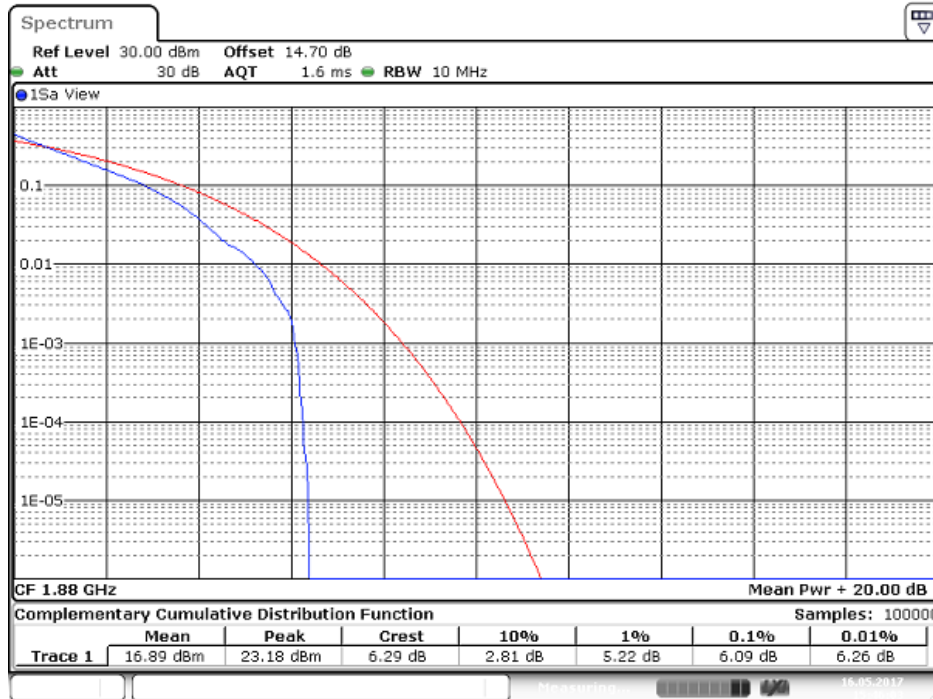
**CH Mid**



Date: 16 MAY 2017 15:44:03

**CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB**

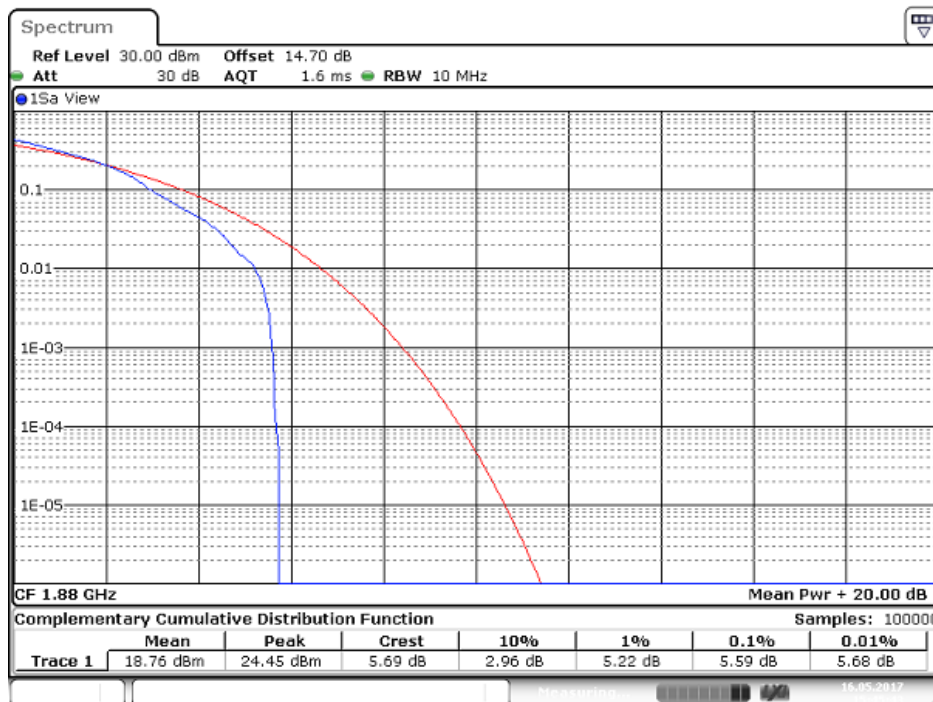
**CH Mid**



Date: 16 MAY 2017 15:46:04

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB**

**CH Mid**

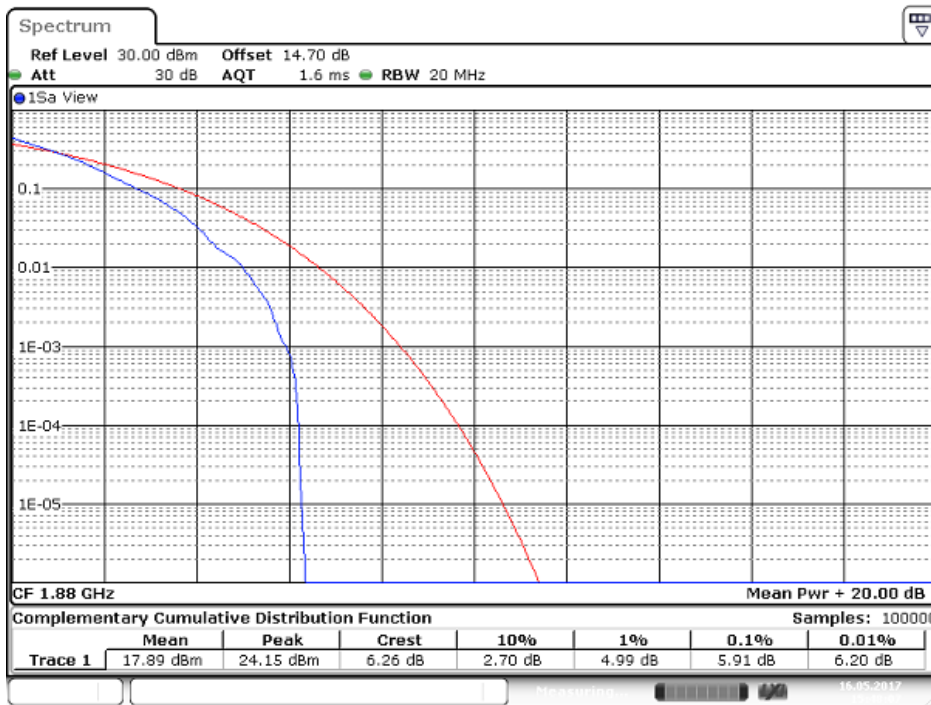


Date: 16 MAY 2017 15:45:44



**CHANNEL BANDWIDTH: 15MHz / QPSK / 1RB**

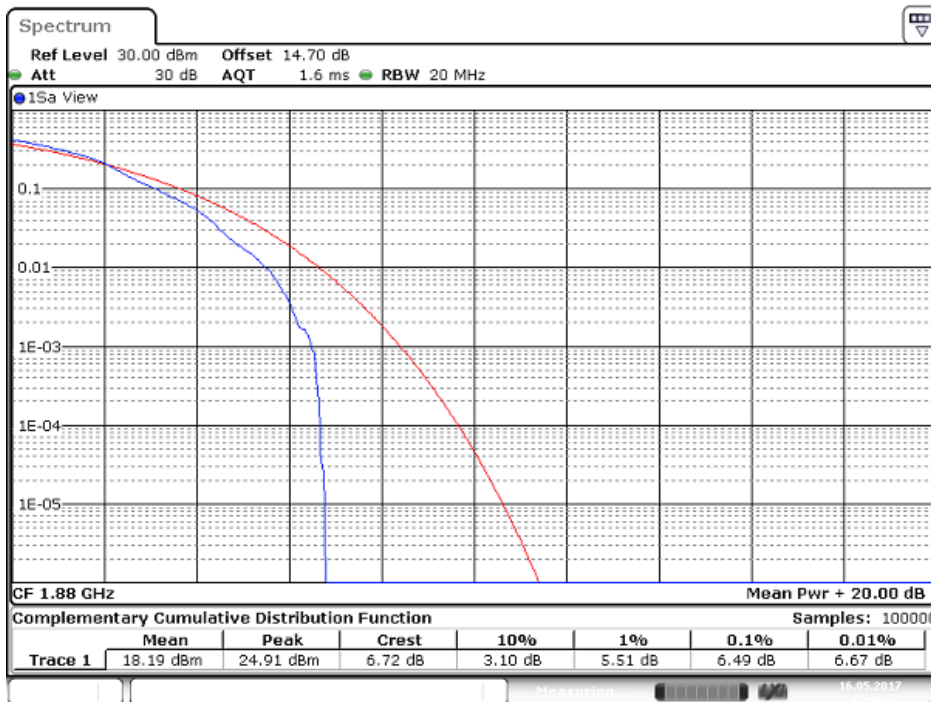
**CH Mid**



Date: 16MAY 2017 15:48:08

**CHANNEL BANDWIDTH: 15MHz / 16QAM / 1RB**

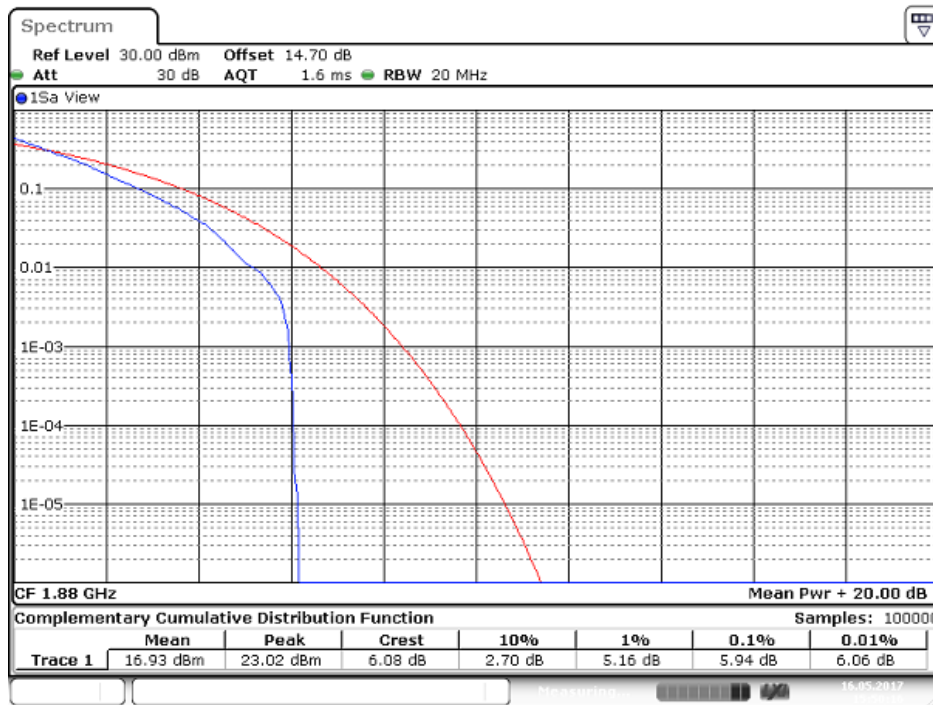
**CH Mid**



Date: 16MAY 2017 15:48:33

**CHANNEL BANDWIDTH: 20MHz / QPSK / 1RB**

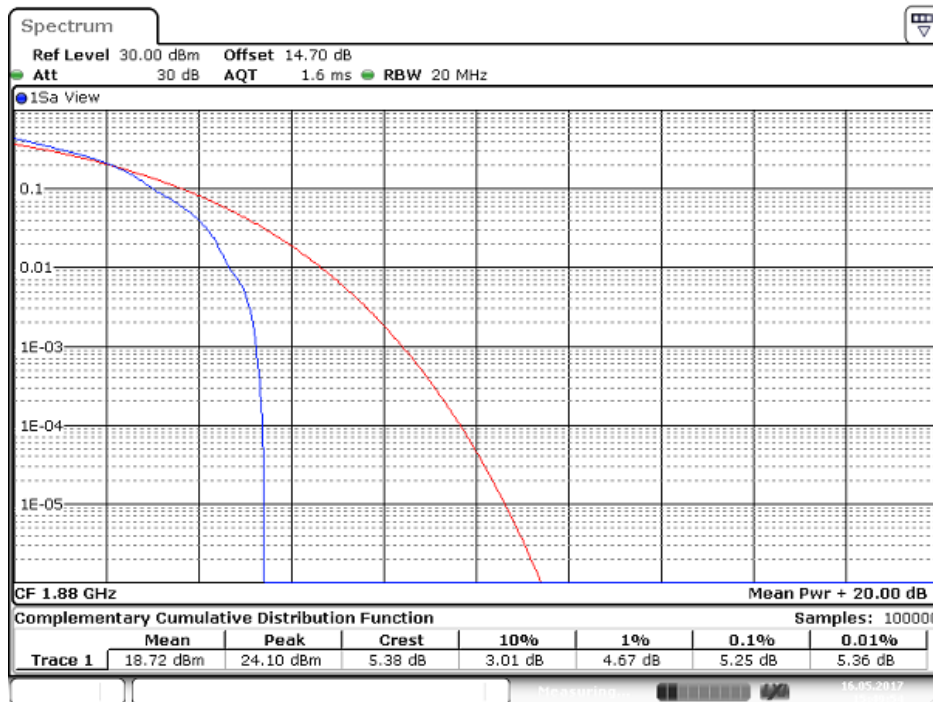
**CH Mid**



Date: 16MAY 2017 15:50:16

**CHANNEL BANDWIDTH: 20MHz / 16QAM / 1RB**

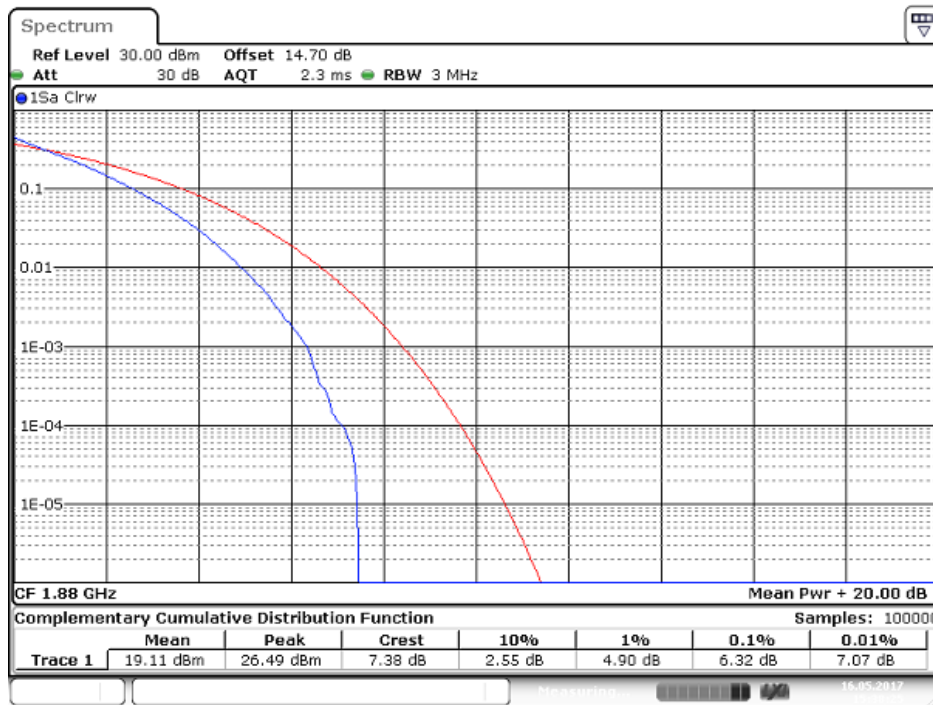
**CH Mid**



Date: 16MAY 2017 15:49:54

**CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100%RB**

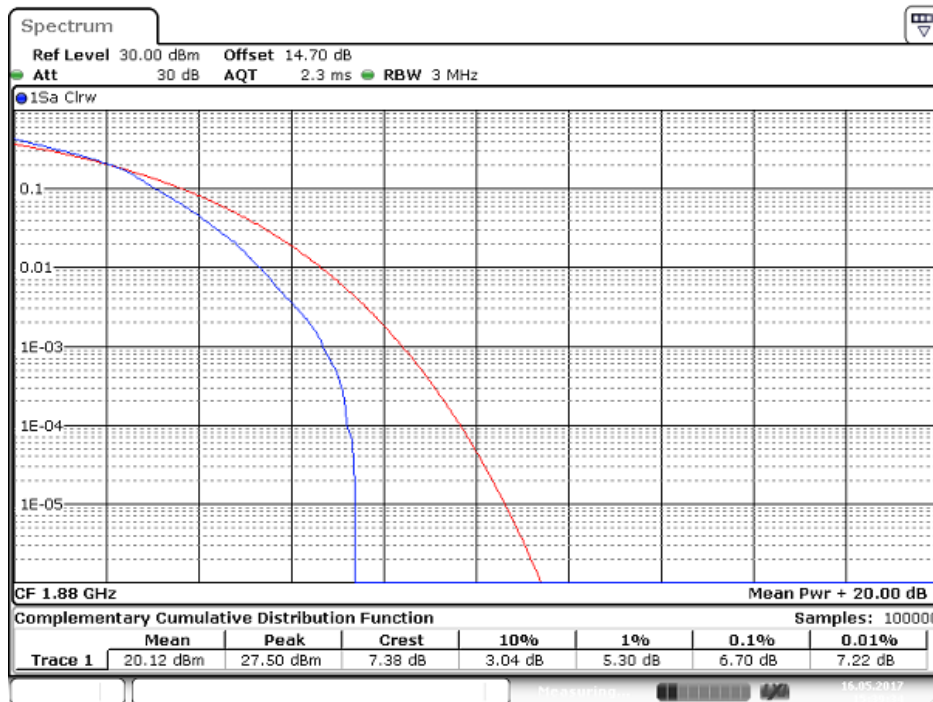
**CH Mid**



Date: 16MAY 2017 15:28:25

**CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100%RB**

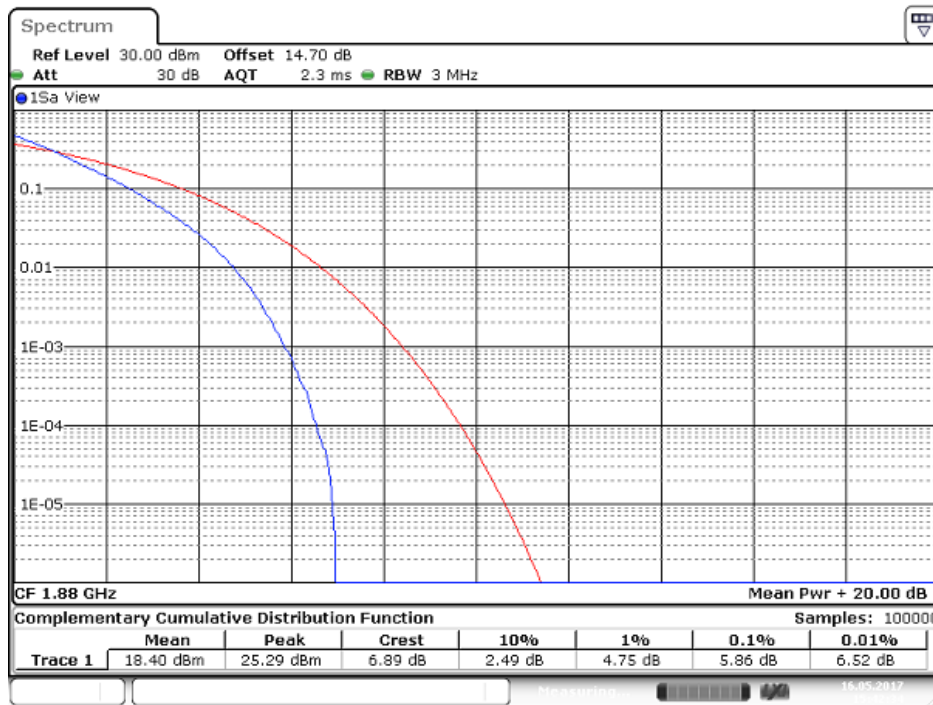
**CH Mid**



Date: 16MAY 2017 15:29:34

**CHANNEL BANDWIDTH: 3MHz / QPSK / 100%RB**

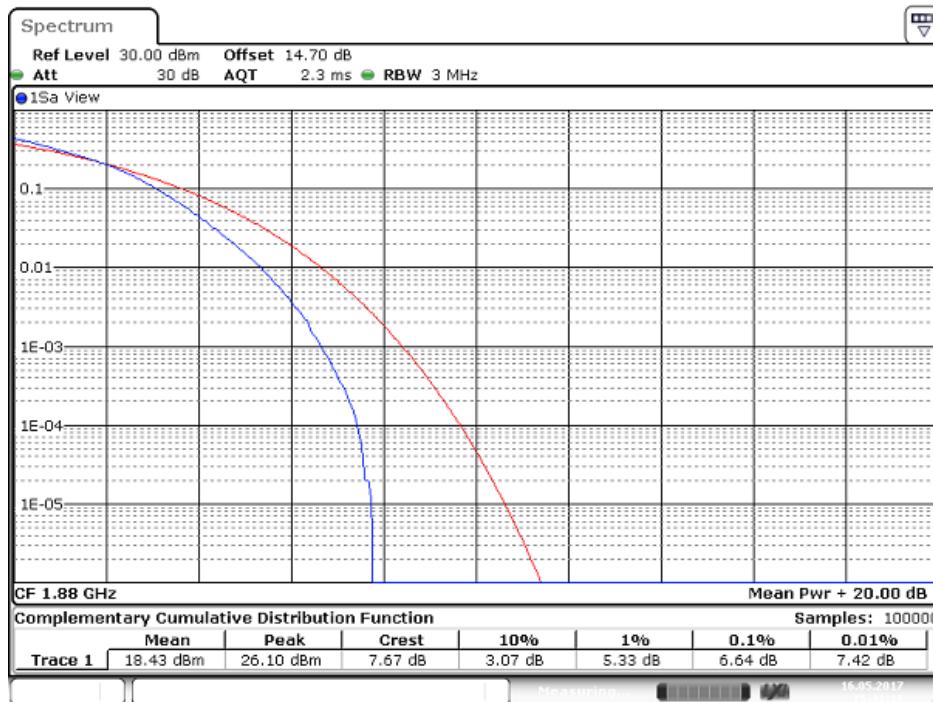
**CH Mid**



Date: 16MAY 2017 15:42:35

**CHANNEL BANDWIDTH: 3MHz / 16QAM / 100%RB**

**CH Mid**

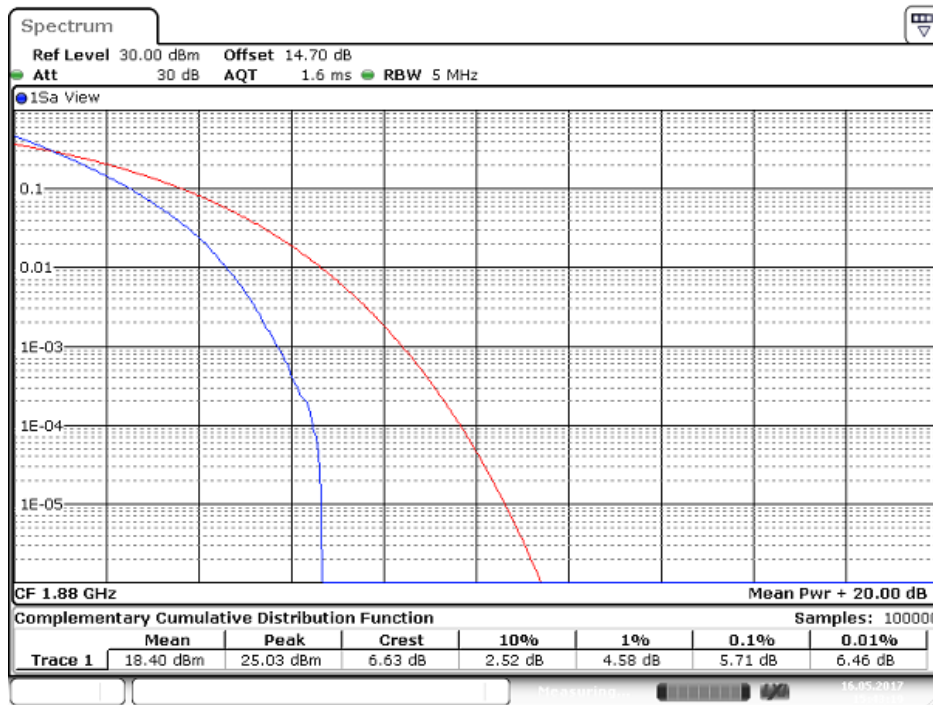


Date: 16MAY 2017 15:41:18



**CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB**

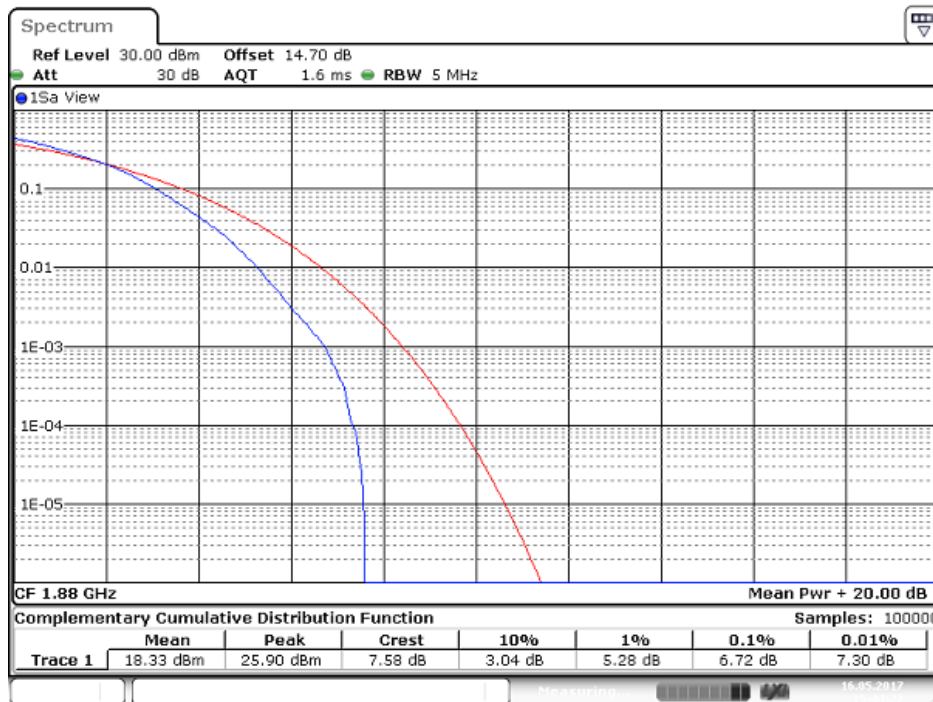
**CH Mid**



Date: 16MAY 2017 15:43:20

**CHANNEL BANDWIDTH: 5MHz / 16QAM / 100%RB**

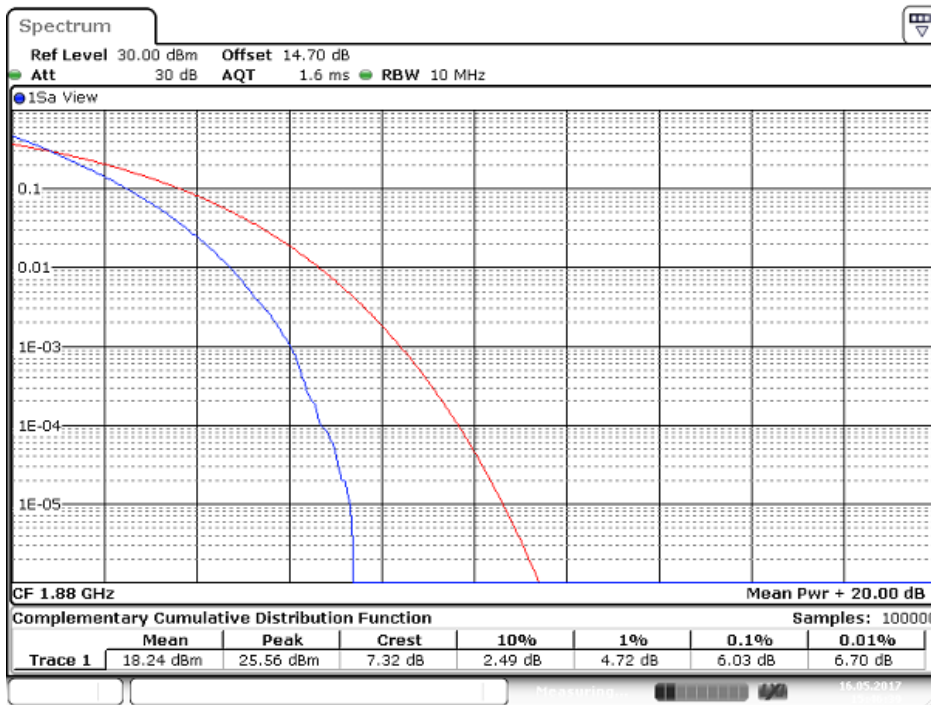
**CH Mid**



Date: 16MAY 2017 15:44:28

**CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB**

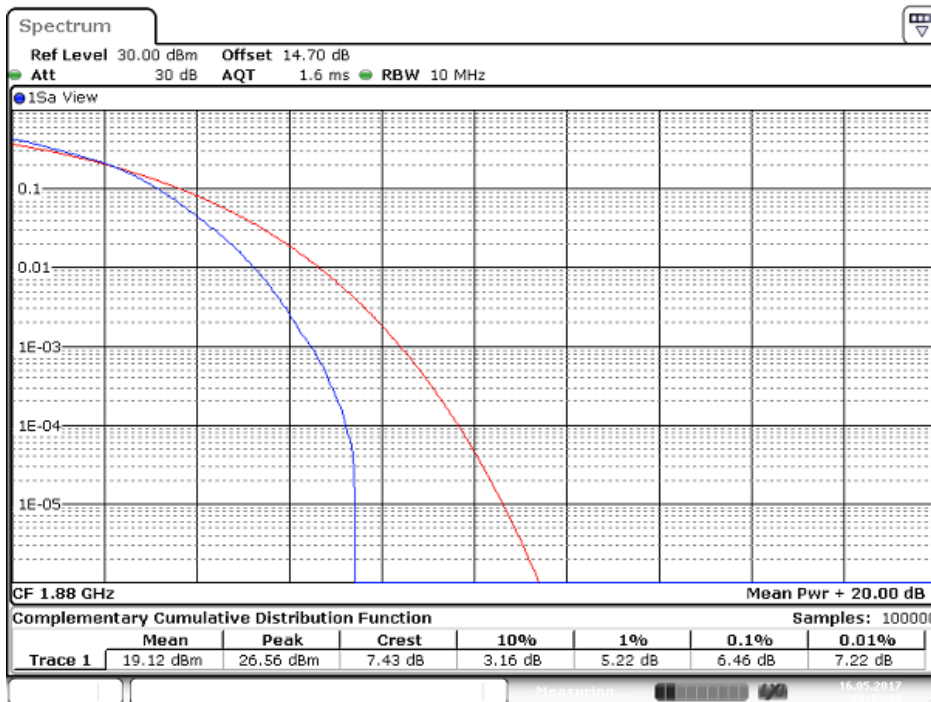
**CH Mid**



Date: 16MAY 2017 15:46:39

**CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB**

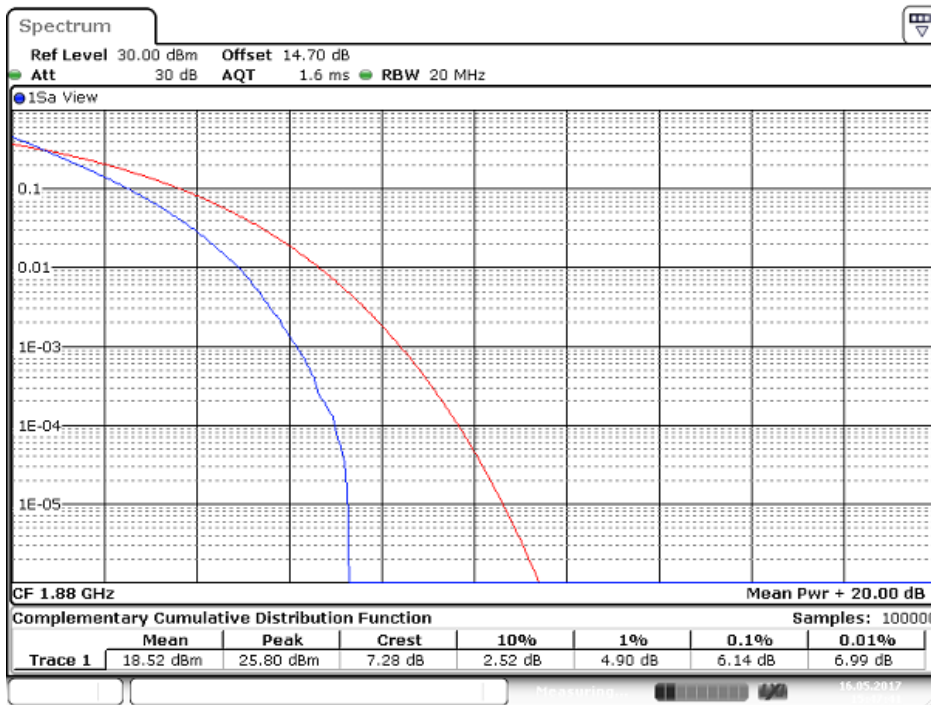
**CH Mid**



Date: 16MAY 2017 15:45:19

**CHANNEL BANDWIDTH: 15MHz / QPSK / 100%RB**

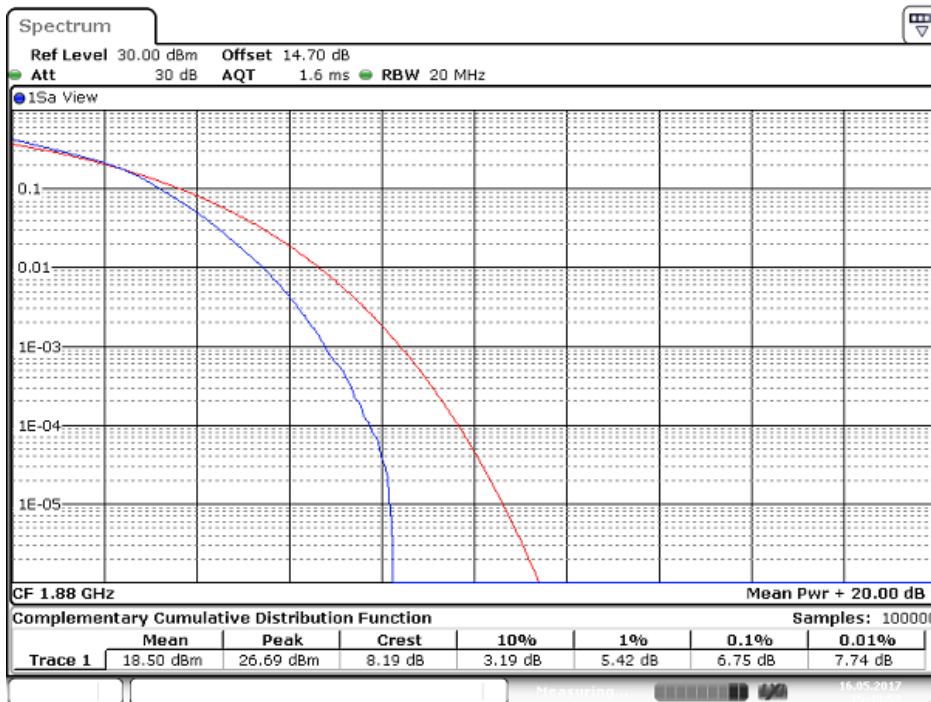
**CH Mid**



Date: 16MAY 2017 15:47:41

**CHANNEL BANDWIDTH: 15MHz / 16QAM / 100%RB**

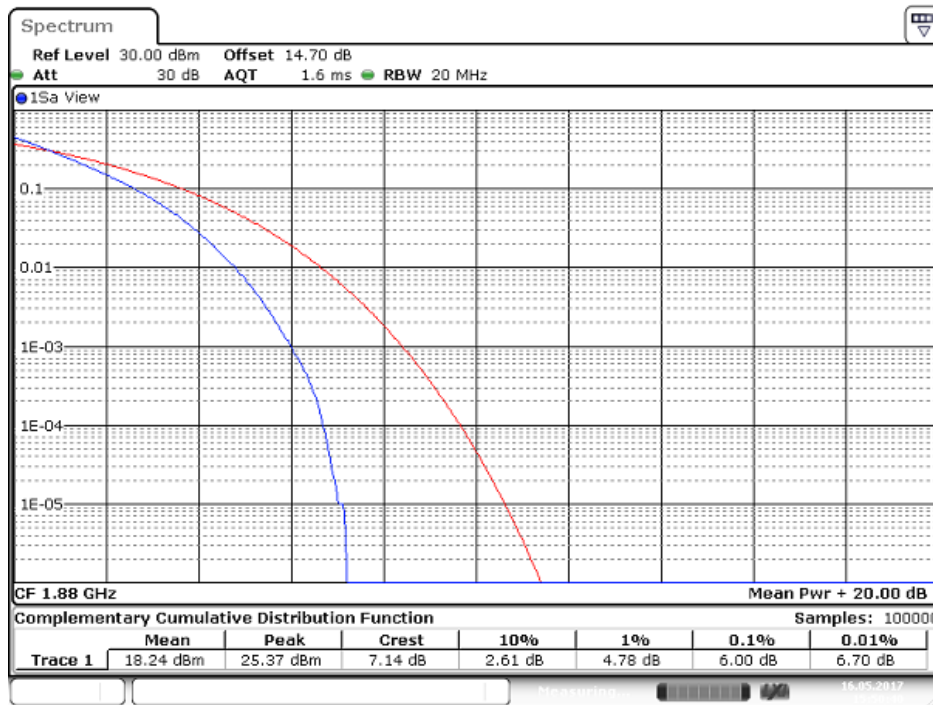
**CH Mid**



Date: 16MAY 2017 15:49:00

**CHANNEL BANDWIDTH: 20MHz / QPSK / 100%RB**

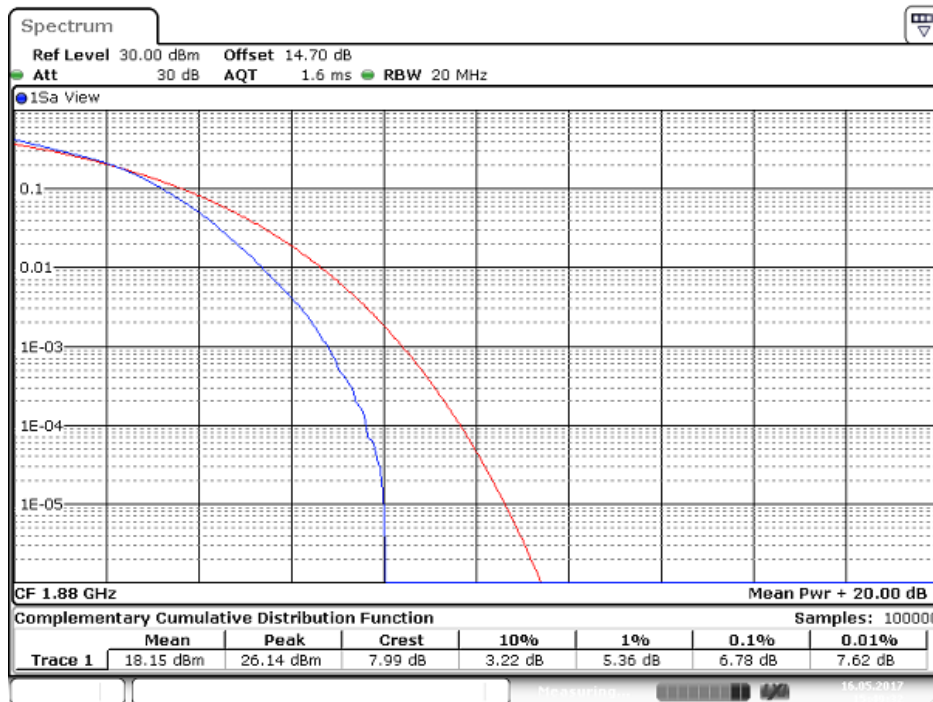
**CH Mid**



Date: 16MAY 2017 15:50:41

**CHANNEL BANDWIDTH: 20MHz / 16QAM / 100%RB**

**CH Mid**



Date: 16MAY 2017 15:49:33