FCC 47 CFR PART 22 SUBPART H

TEST REPORT

For

Chiron pro

Model No.: N635

Trade Name: Mitac, Mio, Navman, Magellan

Issued to

FCC:	**Mitac Digital Technology Corporation No.200, Wen Hwa 2nd Rd.,Kuei Shan Dist. Taoyuan, 33383 Taiwan**
IC:	**MiTAC Digital Technology Corporation No.200, Wenhua 2nd Rd., Guishan Dist. Taoyuan City 333 Taiwan**

Issued by

Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
Issued Date: January 17, 2020

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	January 17, 2020	Initial Issue	ALL	Allison Chen

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION

FCC Applicant:	Mitac Digital Technology Corporation No.200, Wen Hwa 2nd Rd.,Kuei Shan Dist. Taoyuan, 33383 Taiwan
IC Applicant:	MiTAC Digital Technology Corporation No.200, Wenhua 2nd Rd., Guishan Dist. Taoyuan City 333 Taiwan
Manufacturer:	MITAC COMPUTER (KUNSHAN) CO., LTD. No. 269, 2nd Avenue, District A, Comprehensive Free Trade Zone, Kunshan, Jiangsu, P.R. China
Equipment Under Test:	Chiron pro
Trade Name:	Mitac, Mio, Navman, Magellan
Model No.:	N635
Date of Test:	December 12 ~ 19, 2019

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR PART 22 SUBPART H	No non-compliance noted
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

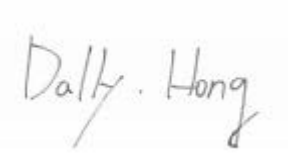
We hereby certify that:

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 -603-E 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.

Approved by:

Kevin Tsai
Deputy Manager
Compliance Certification Services Inc.

Tested by:



Dally Hong
Engineer
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	Chiron pro		
Model No.	N635		
Model Discrepancy	Difference of the three trade names (list on this report) are just for marketing purpose only.		
Trade	Mio, NAVMAN, MAGELLAN		
Received Date	November 5, 2019		
Power Supply	1. Power from Rechargeable Li-ion Polymer Battery. Rating: 3.7VDC, 4000mAh, 14.8Wh 2. Power from Adapter. I/P: 100-240VAC, 50/60Hz, 0.5A O/P: 5.0VDC, 2A		
Frequency Range	LTE Band 26 Channel Bandwidth: 1.4MHz	824.7MHz ~ 843.3MHz	
	LTE Band 26 Channel Bandwidth: 3MHz	825.5MHz ~ 847.5MHz	
	LTE Band 26 Channel Bandwidth: 5MHz	826.5MHz ~ 846.5MHz	
	LTE Band 26 Channel Bandwidth: 10MHz	829MHz ~ 841MHz	
	LTE Band 26 Channel Bandwidth: 15MHz	831.5MHz ~ 841.5MHz	
Modulation Technique	LTE Band 26	QPSK, 16QAM	
Antenna Specification	Antenna type: Integral Antenna gain: 1.84 dBi		
Transmit Power (ERP Power)	LTE Band 26 Channel Bandwidth: 1.4MHz	QPSK: 16QAM:	23.11 dBm 22.04 dBm
	LTE Band 26 Channel Bandwidth: 3MHz	QPSK: 16QAM:	23.14 dBm 22.27 dBm
	LTE Band 26 Channel Bandwidth: 5MHz	QPSK: 16QAM:	23.48 dBm 22.32 dBm
	LTE Band 26 Channel Bandwidth: 10MHz	QPSK: 16QAM:	23.56 dBm 22.46 dBm
	LTE Band 26 Channel Bandwidth: 15MHz	QPSK: 16QAM:	23.57 dBm 22.67 dBm

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 TIA-603-E and FCC CFR 47, Part 2 and Part 22 Subpart H, KDB 971168 D01 Power Meas License Digital Systems.

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.

3.2 DESCRIPTION OF TEST MODES

The EUT (Model: N635) had been tested under operating condition.
The EUT be set in maximum power transmission via call box during testing.

LTE Band 26: 824 MHz ~ 849 MHz
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)	26797	824.7	26805	825.5	26815	826.5
Middle channel (M)	26915	836.5	26915	836.5	26915	836.5
High channel (H)	27033	848.3	27025	847.5	27015	846.5

Channel Bandwidth	10MHz		15MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low channel (L)	26840	829	26865	831.5
Middle channel (M)	26915	836.5	26915	836.5
High channel (H)	26960	841	26965	841.5

3.2.1 The worst mode of measurement

Radiated Emission Measurement	
Test Condition	**Band edge, Emission for Unwanted and Fundamental**
Power supply Mode	**Mode1: EUT Power by Battery (DC 3V)** **Mode2: EUT Power by Adapter + Type C USB** **Mode3: EUT Power by Type C USB+ CarCharge (DC12V)** **Mode4: EUT Power by Cradle(N564)+Micro USB+Adapter** **Mode5: EUT Power by Cradle(N564)+Micro USB+ CarCharge (DC12V)** **Mode6: EUT Power by Cradle(N564) + Cable(DC 12V)** **Mode7: EUT Power by Cradle(N564_TN)+Micro USB+Adapter** **Mode8: EUT Power by Cradle(N564_TN)+Micro USB+ CarCharge (DC12V)** **Mode9: EUT Power by Cradle(N564_TN) + Cable(DC 12V)** **Mode10: EUT Power by Cradle(N635_V)+Micro USB+Adapter** **Mode11: EUT Power by Cradle(N635_V)+Micro USB+ CarCharge (DC12V)** **Mode12: EUT Power by Cradle(N635_V) + Cable(DC 12V)** **Mode13: EUT Power by Cradle(N635_VL)+Micro USB+Adapter** **Mode14: EUT Power by Cradle(N635_VL)+Micro USB+ CarCharge (DC12V)** **Mode15: EUT Power by Cradle(N635_VL) + Cable(DC 12V)** **Mode16: EUT Power by Cradle(N635_VHG) + Cable(DC 12V)**
Worst Mode	☒ **Mode 1** ☐ **Mode 2** ☐ **Mode 3** ☐ **Mode 4**
Worst Position	☐ **Placed in fixed position.** ☐ **Placed in fixed position at X-Plane (E2-Plane)** ☐ **Placed in fixed position at Y-Plane (E1-Plane)** ☒ **Placed in fixed position at Z-Plane (H-Plane)**

Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Power supply Mode	**Mode1: EUT Power by Battery (DC 3V)** **Mode2: EUT Power by Adapter + Type C USB** **Mode3: EUT Power by Type C USB+ CarCharge (DC12V)** **Mode4: EUT Power by Cradle(N564)+Micro USB+Adapter** **Mode5: EUT Power by Cradle(N564)+Micro USB+ CarCharge (DC12V)** **Mode6: EUT Power by Cradle(N564) + Cable(DC 12V)** **Mode7: EUT Power by Cradle(N564_TN)+Micro USB+Adapter** **Mode8: EUT Power by Cradle(N564_TN)+Micro USB+ CarCharge (DC12V)** **Mode9: EUT Power by Cradle(N564_TN) + Cable(DC 12V)** **Mode10: EUT Power by Cradle(N635_V)+Micro USB+Adapter** **Mode11: EUT Power by Cradle(N635_V)+Micro USB+ CarCharge (DC12V)** **Mode12: EUT Power by Cradle(N635_V) + Cable(DC 12V)** **Mode13: EUT Power by Cradle(N635_VL)+Micro USB+Adapter** **Mode14: EUT Power by Cradle(N635_VL)+Micro USB+ CarCharge (DC12V)** **Mode15: EUT Power by Cradle(N635_VL) + Cable(DC 12V)** **Mode16: EUT Power by Cradle(N635_VHG) + Cable(DC 12V)**
Worst Mode	☒ **Mode 1** ☐ **Mode 2** ☐ **Mode 3** ☐ **Mode 4**

Remark:

1. The worst mode was record in this test report.

2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(Z-Plane) were recorded in this report

4. TEST SUMMERY

FCC Standard Sec.	Report Section	Test Item	Result
-	2	Antenna Requirement	Pass
22.913(a)	8.1	ERP and EIRP Measurement	Pass
2.1055, 22.355	8.2	Frequency Stability v.s. temperature measurement	Pass
2.1049	8.3	Occupied Bandwidth Measurement	Pass
22.917(a)	8.4	Conducted Band Edge	Pass
22.913(d)	8.5	Peak to Average Ratio	Pass
22.917(a)	8.6	Conducted Spurious Emission	Pass
22.917(a)	8.7	Spurious Radiation Measurement	Pass

5. INSTRUMENT CALIBRATION

5.1 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.

5.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: *Each piece of equipment is scheduled for calibration once a year.*

RF Conducted Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Coaxial Cable	Woken	WC12	CC003	06/28/2019	06/27/2020
Power Divider	Solvang Technology	STI08-0015	008	08/06/2019	08/05/2020
Signal Analyzer	R&S	FSV 40	101073	09/25/2019	09/24/2020
Wideband Radio Communication Tester	R&S	CMW 500	116875	07/29/2019	07/28/2020
Software	N/A				

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/26/2019	02/25/2020
Bilog Antenna	Sunol Sciences	JB3	A030105	07/26/2019	07/25/2020
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/26/2019	02/25/2020
Coaxial Cable	EMCI	EMC105	190914+25111	09/20/2019	09/19/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	10/04/2019	10/03/2020
Loop Ant	COM-POWER	AL-130	121051	03/22/2019	03/21/2020
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020
Pre-Amplifier	HP	8449B	3008A00965	02/26/2019	02/25/2020
Wideband Radio Communication Tester	R&S	CMW 500	116875	07/29/2019	07/28/2020
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/29/2019	05/28/2020
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	e3 6.11-20180413				

5.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

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

6. FACILITIES AND ACCREDITATIONS

6.1 FACILITIES

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

☐ No.199, Chunghsen 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.

6.2 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.”

6.3 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.

7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

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

7.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID
	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.*

8. FCC PART 22 REQUIREMENTS

8.1 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.

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

No non-compliance noted.

LTE Band 26

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
15	QPSK	1 RB	0	831.5	26865	**23.88**	23.57
				836.5	26915	23.84	23.53
				841.5	26965	23.86	23.55
			36	831.5	26865	23.65	23.34
				836.5	26915	23.57	23.26
				841.5	26965	23.64	23.33
			74	831.5	26865	23.55	23.24
				836.5	26915	23.62	23.31
				841.5	26965	23.57	23.26
		36 RB	0	831.5	26865	**22.79**	22.48
				836.5	26915	22.76	22.45
				841.5	26965	22.76	22.45
			18	831.5	26865	22.57	22.26
				836.5	26915	22.41	22.10
				841.5	26965	22.56	22.25
			37	831.5	26865	22.44	22.13
				836.5	26915	22.34	22.03
				841.5	26965	22.47	22.16
		75RB		831.5	26865	**22.46**	22.15
				836.5	26915	22.4	22.09
				841.5	26965	22.45	22.14
15	16-QAM	1 RB	0	831.5	26865	22.98	22.67
				836.5	26915	22.88	22.57
				841.5	26965	22.83	22.52
			36	831.5	26865	22.64	22.33
				836.5	26915	22.75	22.44
				841.5	26965	22.81	22.50
			74	831.5	26865	22.92	22.61
				836.5	26915	22.82	22.51
				841.5	26965	22.85	22.54
		36 RB	0	831.5	26865	21.8	21.49
				836.5	26915	21.93	21.62
				841.5	26965	21.93	21.62
			18	831.5	26865	21.54	21.23
				836.5	26915	21.72	21.41
				841.5	26965	21.82	21.51
			37	831.5	26865	21.41	21.10
				836.5	26915	21.54	21.23
				841.5	26965	21.69	21.38
		75RB		831.5	26865	21.62	21.31
				836.5	26915	21.77	21.46
				841.5	26965	21.97	21.66

15	64-QAM	1 RB	0	831.5	26865	21.97	21.66
				836.5	26915	21.82	21.51
				841.5	26965	21.82	21.51
			36	831.5	26865	21.58	21.27
				836.5	26915	21.63	21.32
				841.5	26965	21.8	21.49
			74	831.5	26865	21.83	21.52
				836.5	26915	21.89	21.58
				841.5	26965	21.73	21.42
		36 RB	0	831.5	26865	20.8	20.49
				836.5	26915	20.92	20.61
				841.5	26965	20.87	20.56
			18	831.5	26865	20.54	20.23
				836.5	26915	20.68	20.37
				841.5	26965	20.81	20.50
			37	831.5	26865	20.33	20.02
				836.5	26915	20.47	20.16
				841.5	26965	20.61	20.30
		75RB		831.5	26865	20.63	20.32
				836.5	26915	20.77	20.46
				841.5	26965	20.94	20.63

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
10	QPSK	1 RB	0	829	26840	23.70	23.39
				836.5	26915	23.85	23.54
				844	26990	23.87	23.56
			25	829	26840	23.29	22.98
				836.5	26915	23.41	23.10
				844	26990	23.49	23.18
			49	829	26840	23.41	23.10
				836.5	26915	23.50	23.19
				844	26990	23.49	23.18
		25 RB	0	829	26840	22.61	22.30
				836.5	26915	22.82	22.51
				844	26990	22.80	22.49
			12	829	26840	22.49	22.18
				836.5	26915	22.57	22.26
				844	26990	22.69	22.38
			25	829	26840	22.20	21.89
				836.5	26915	22.59	22.28
				844	26990	22.54	22.23
		50RB		829	26840	22.35	22.04
				836.5	26915	22.65	22.34
				844	26990	22.84	22.53
10	16-QAM	1 RB	0	829	26840	22.77	22.46
				836.5	26915	22.68	22.37
				844	26990	22.77	22.46
			25	829	26840	22.52	22.21
				836.5	26915	22.52	22.21
				844	26990	22.59	22.28
			49	829	26840	22.80	22.49
				836.5	26915	22.65	22.34
				844	26990	22.78	22.47
		25 RB	0	829	26840	21.57	21.26
				836.5	26915	21.70	21.39
				844	26990	21.85	21.54
			12	829	26840	21.48	21.17
				836.5	26915	21.67	21.36
				844	26990	21.75	21.44
			25	829	26840	21.25	20.94
				836.5	26915	21.47	21.16
				844	26990	21.45	21.14
		50RB		829	26840	21.40	21.09
				836.5	26915	21.68	21.37
				844	26990	21.89	21.58

10	64-QAM	1 RB	0	829	26840	21.87	21.56
				836.5	26915	21.58	21.27
				844	26990	21.63	21.32
			25	829	26840	21.37	21.06
				836.5	26915	21.41	21.10
				844	26990	21.70	21.39
			49	829	26840	21.77	21.46
				836.5	26915	21.72	21.41
				844	26990	21.53	21.22
		25 RB	0	829	26840	20.62	20.31
				836.5	26915	20.74	20.43
				844	26990	20.79	20.48
			12	829	26840	20.48	20.17
				836.5	26915	20.55	20.24
				844	26990	20.71	20.40
			25	829	26840	20.12	19.81
				836.5	26915	20.37	20.06
				844	26990	20.55	20.24
		50RB		829	26840	20.47	20.16
				836.5	26915	20.67	20.36
				844	26990	20.79	20.48

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
5	QPSK	1 RB	0	826.5	26815	23.61	23.30
				836.5	26915	23.68	23.37
				846.5	27015	23.79	23.48
			12	826.5	26815	23.22	22.91
				836.5	26915	23.36	23.05
				846.5	27015	23.41	23.10
			24	826.5	26815	23.20	22.89
				836.5	26915	23.27	22.96
				846.5	27015	23.33	23.02
		12 RB	0	826.5	26815	22.53	22.22
				836.5	26915	22.73	22.42
				846.5	27015	22.56	22.25
			6	826.5	26815	22.34	22.03
				836.5	26915	22.44	22.13
				846.5	27015	22.48	22.17
			13	826.5	26815	21.99	21.68
				836.5	26915	22.51	22.20
				846.5	27015	22.45	22.14
		25RB		826.5	26815	22.17	21.86
				836.5	26915	22.41	22.10
				846.5	27015	22.74	22.43
5	16-QAM	1 RB	0	826.5	26815	22.63	22.32
				836.5	26915	22.46	22.15
				846.5	27015	22.54	22.23
			12	826.5	26815	22.43	22.12
				836.5	26915	22.42	22.11
				846.5	27015	22.49	22.18
			24	826.5	26815	22.66	22.35
				836.5	26915	22.58	22.27
				846.5	27015	22.65	22.34
		12 RB	0	826.5	26815	21.35	21.04
				836.5	26915	21.59	21.28
				846.5	27015	21.62	21.31
			6	826.5	26815	21.42	21.11
				836.5	26915	21.59	21.28
				846.5	27015	21.54	21.23
			13	826.5	26815	21.16	20.85
				836.5	26915	21.39	21.08
				846.5	27015	21.26	20.95
		25RB		826.5	26815	21.31	21.00
				836.5	26915	21.59	21.28
				846.5	27015	21.78	21.47

5	64-QAM	1 RB	0	826.5	26815	21.73	21.42
				836.5	26915	21.41	21.10
				846.5	27015	21.46	21.15
			12	826.5	26815	21.14	20.83
				836.5	26915	21.20	20.89
				846.5	27015	21.61	21.30
			24	826.5	26815	21.58	21.27
				836.5	26915	21.62	21.31
				846.5	27015	21.44	21.13
		12 RB	0	826.5	26815	20.54	20.23
				836.5	26915	20.52	20.21
				846.5	27015	20.72	20.41
			6	826.5	26815	20.39	20.08
				836.5	26915	20.39	20.08
				846.5	27015	20.56	20.25
			13	826.5	26815	20.02	19.71
				836.5	26915	20.20	19.89
				846.5	27015	20.31	20.00
		25RB		826.5	26815	20.30	19.99
				836.5	26915	20.46	20.15
				846.5	27015	20.58	20.27

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
3	QPSK	1 RB	0	825.5	26805	23.45	23.14
				836.5	26915	23.48	23.17
				847.5	27025	23.66	23.35
			7	825.5	26805	23.08	22.77
				836.5	26915	23.21	22.90
				847.5	27025	23.32	23.01
			14	825.5	26805	23.08	22.77
				836.5	26915	23.11	22.80
				847.5	27025	23.23	22.92
		8 RB	0	825.5	26805	22.33	22.02
				836.5	26915	22.53	22.22
				847.5	27025	22.33	22.02
			4	825.5	26805	22.29	21.98
				836.5	26915	22.34	22.03
				847.5	27025	22.31	22.00
			7	825.5	26805	21.85	21.54
				836.5	26915	22.37	22.06
				847.5	27025	22.37	22.06
		15RB		825.5	26805	21.95	21.64
				836.5	26915	22.18	21.87
				847.5	27025	22.51	22.20
3	16-QAM	1 RB	0	825.5	26805	22.58	22.27
				836.5	26915	22.30	21.99
				847.5	27025	22.44	22.13
			7	825.5	26805	22.36	22.05
				836.5	26915	22.34	22.03
				847.5	27025	22.28	21.97
			14	825.5	26805	22.50	22.19
				836.5	26915	22.52	22.21
				847.5	27025	22.60	22.29
		8 RB	0	825.5	26805	21.20	20.89
				836.5	26915	21.48	21.17
				847.5	27025	21.42	21.11
			4	825.5	26805	21.36	21.05
				836.5	26915	21.36	21.05
				847.5	27025	21.42	21.11
			7	825.5	26805	20.92	20.61
				836.5	26915	21.29	20.98
				847.5	27025	21.18	20.87
		15RB		825.5	26805	21.08	20.77
				836.5	26915	21.39	21.08
				847.5	27025	21.67	21.36

3	64-QAM	1 RB	0	825.5	26805	21.59	21.28
				836.5	26915	21.26	20.95
				847.5	27025	21.22	20.91
			7	825.5	26805	20.90	20.59
				836.5	26915	21.06	20.75
				847.5	27025	21.40	21.09
			14	825.5	26805	21.53	21.22
				836.5	26915	21.40	21.09
				847.5	27025	21.37	21.06
		8 RB	0	825.5	26805	20.48	20.17
				836.5	26915	20.44	20.13
				847.5	27025	20.60	20.29
			4	825.5	26805	20.32	20.01
				836.5	26915	20.22	19.91
				847.5	27025	20.34	20.03
			7	825.5	26805	19.94	19.63
				836.5	26915	20.13	19.82
				847.5	27025	20.16	19.85
		15RB		825.5	26805	20.11	19.80
				836.5	26915	20.28	19.97
				847.5	27025	20.45	20.14

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
1.4	QPSK	1 RB	0	824.7	26797	23.29	22.98
				836.5	26915	23.34	23.03
				848.3	27033	23.42	23.11
			2	824.7	26797	22.95	22.64
				836.5	26915	23.14	22.83
				848.3	27033	23.18	22.87
			5	824.7	26797	22.89	22.58
				836.5	26915	22.87	22.56
				848.3	27033	23.02	22.71
		3 RB	0	824.7	26797	22.23	21.92
				836.5	26915	22.43	22.12
				848.3	27033	22.21	21.90
			2	824.7	26797	22.09	21.78
				836.5	26915	22.24	21.93
				848.3	27033	22.12	21.81
			3	824.7	26797	21.61	21.30
				836.5	26915	22.17	21.86
				848.3	27033	22.30	21.99
		6RB		824.7	26797	21.83	21.52
				836.5	26915	22.12	21.81
				848.3	27033	22.35	22.04
1.4	16-QAM	1 RB	0	824.7	26797	22.35	22.04
				836.5	26915	22.07	21.76
				848.3	27033	22.30	21.99
			2	824.7	26797	22.14	21.83
				836.5	26915	22.27	21.96
				848.3	27033	22.17	21.86
			5	824.7	26797	22.27	21.96
				836.5	26915	22.44	22.13
				848.3	27033	22.55	22.24
		3 RB	0	824.7	26797	21.07	20.76
				836.5	26915	21.32	21.01
				848.3	27033	21.23	20.92
			2	824.7	26797	21.23	20.92
				836.5	26915	21.24	20.93
				848.3	27033	21.25	20.94
			3	824.7	26797	21.27	20.96
				836.5	26915	21.11	20.80
				848.3	27033	21.03	20.72
		6RB		824.7	26797	20.91	20.60
				836.5	26915	21.33	21.02
				848.3	27033	21.59	21.28

1.4	64-QAM	1 RB	0	824.7	26797	21.50	21.19
				836.5	26915	21.18	20.87
				848.3	27033	21.11	20.80
			2	824.7	26797	20.71	20.40
				836.5	26915	20.99	20.68
				848.3	27033	21.20	20.89
			5	824.7	26797	21.42	21.11
				836.5	26915	21.28	20.97
				848.3	27033	21.21	20.90
		3 RB	0	824.7	26797	20.24	19.93
				836.5	26915	20.32	20.01
				848.3	27033	20.40	20.09
			2	824.7	26797	20.24	19.93
				836.5	26915	20.02	19.71
				848.3	27033	20.18	19.87
			3	824.7	26797	20.34	20.03
				836.5	26915	20.05	19.74
				848.3	27033	20.34	20.03
		6RB		824.7	26797	19.87	19.56
				836.5	26915	20.20	19.89
				848.3	27033	20.39	20.08

8.2 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §22.355.

Frequency Tolerance: +/- 2.5ppm

TEST PROCEDURE

Use Anritsu 8820 with frequency Error measurement capability.

Temp = -35℃ to +65℃

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 26 / QPSK

Reference Frequency: LTE Band 26, 836.5 MHz at 20(°C)				
Limit: □ 2.5 ppm = 2091.25 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 10M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
120	65	0.00	0.000000	+/- 2.5
120	50	0.01	0.000012	
120	40	-0.01	-0.000012	
120	30	0.02	0.000024	
120	20	0.02	0.000024	
120	10	0.01	0.000012	
120	0	0.00	0.000000	
120	-10	0.01	0.000012	
120	-20	0.01	0.000012	
120	-35	0.00	0.000000	

LTE Band 26 / 16QAM

Reference Frequency: LTE Band 26, 836.5 MHz at 20(°C)				
Limit: □ 2.5 ppm = 2091.25 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 10M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
120	65	0.02	0.000024	+/- 2.5
120	50	0.01	0.000012	
120	40	0.01	0.000012	
120	30	0.02	0.000024	
120	20	-0.01	-0.000012	
120	10	0.00	0.000000	
120	0	-0.01	-0.000012	
120	-10	0.00	0.000000	
120	-20	0.01	0.000012	
120	-35	0.01	0.000012	

FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:

LTE Band 26 / QPSK

Reference Frequency: LTE Band 26, 836.5 MHz at 20(°C)				
Limit: □ 2.5 ppm = 2091.25 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
102	20	0.00	0.000000	+/- 2.5
120		0.02	0.000024	
138		0.01	0.000012	

LTE Band 26 / 16QAM

Reference Frequency: LTE Band 26, 836.5 MHz at 20(°C)				
Limit: □ 2.5 ppm = 2091.25 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
102	20	0.00	0.000000	+/- 2.5
120		0.01	0.000012	
138		-0.01	-0.000012	

8.3 OCCUPIED BANDWIDTH MEASUREMENT

Limits

For Reporting purposes only.

TEST PROCEDURES

KDB 971168 D01

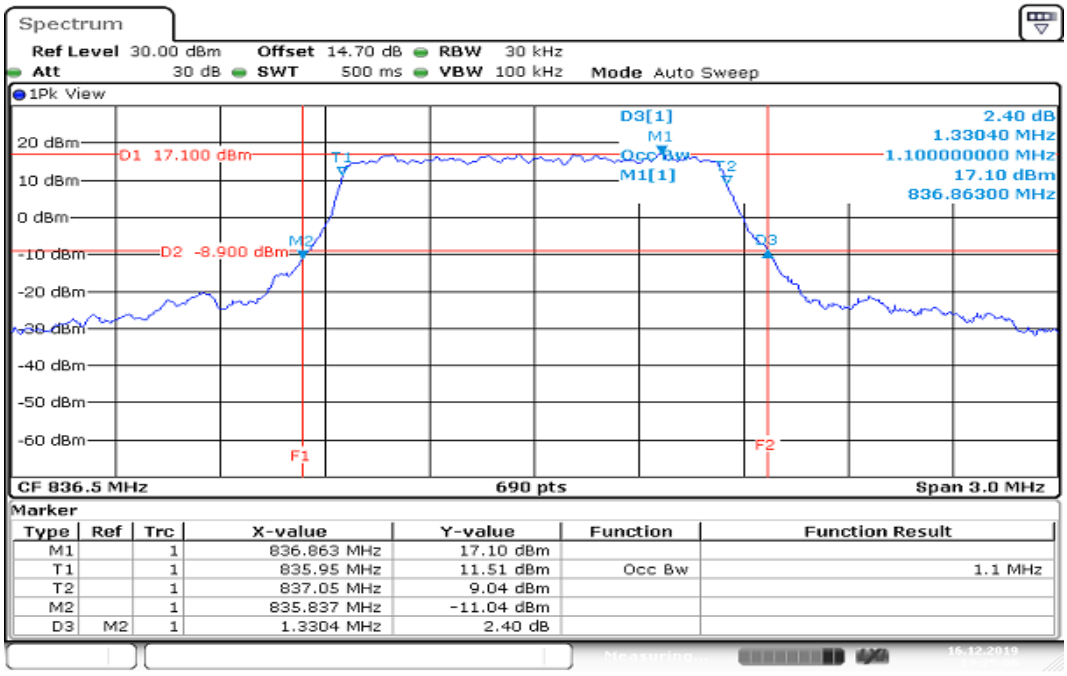
1. The occupied bandwidth was measured with the spectrum analyzer at the lowest, middle and highest channels in each band and different modulation. The 99% and -26dB bandwidth was measured and recorded.
2. RBW = 1-5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max. hold

LTE Band 26

Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	OBW(99%)(MHz)	26 dB Bandwidth(MHz)
26	1.4	Middle	QPSK	6	0	1.1	1.3304
		Middle	16QAM	6	0	1.0956	1.3261
	3	Middle	QPSK	15	0	2.6869	2.9174
		Middle	16QAM	15	0	2.6869	2.9174
	5	Middle	QPSK	25	0	4.4782	4.961
		Middle	16QAM	25	0	4.4782	4.932
	10	Middle	QPSK	50	0	8.9565	9.772
		Middle	16QAM	50	0	8.9565	9.859
	15	Middle	QPSK	75	0	13.4347	14.642
		Middle	16QAM	75	0	13.4347	14.642

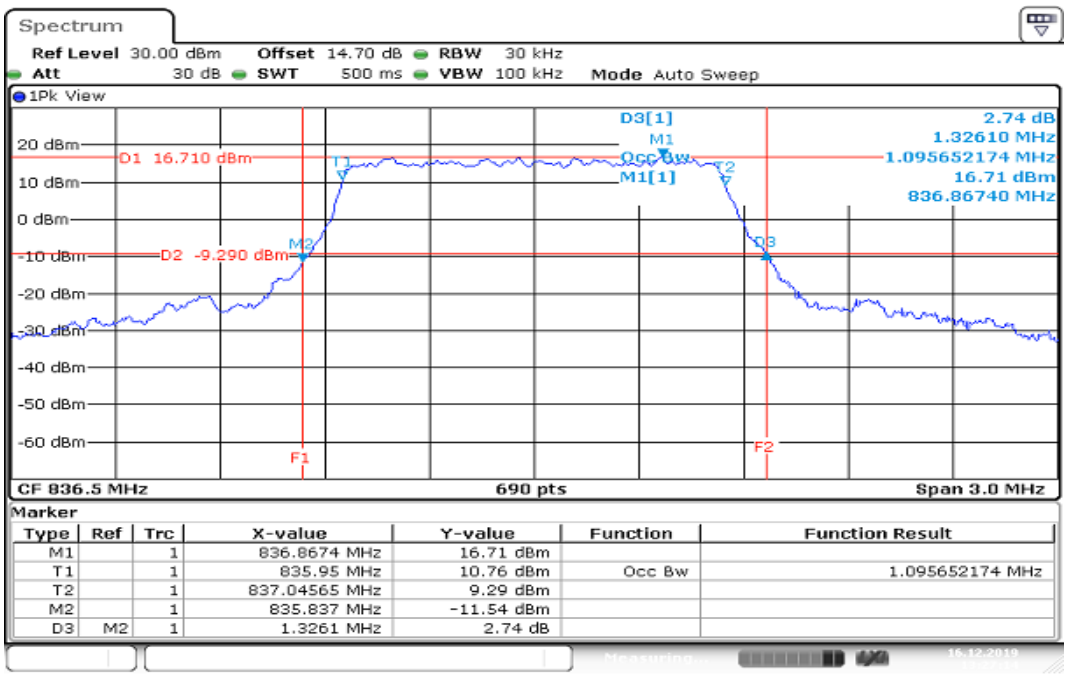
LTE Band 26

BW: 1.4MHz / QPSK / RB =6, RB Offset = 0
CH Mid



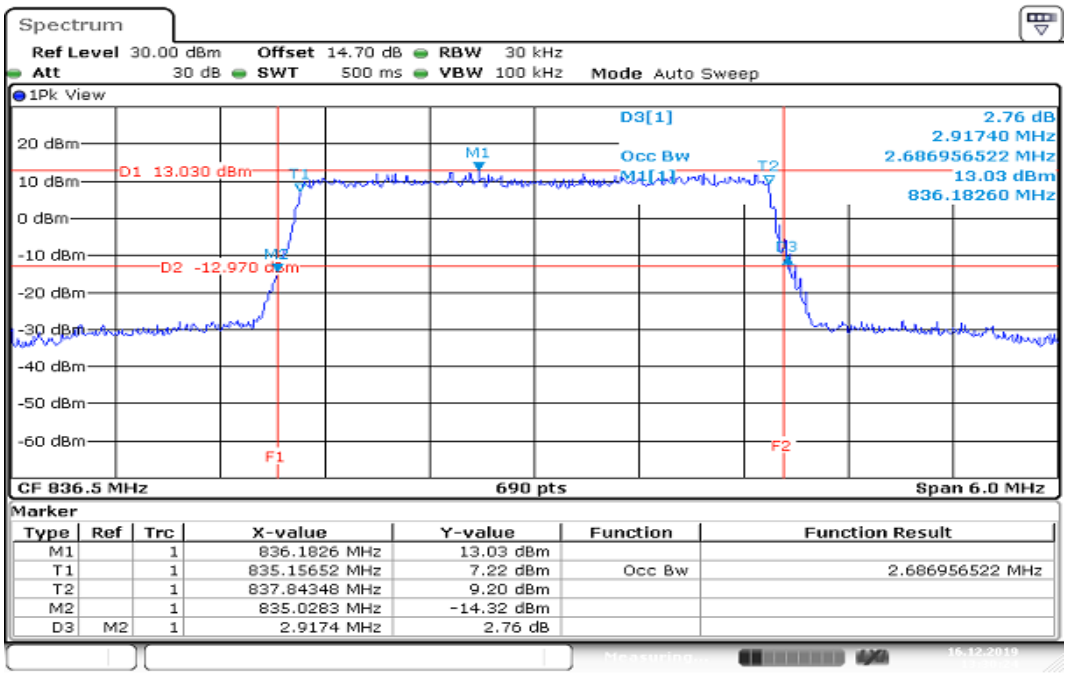
Date: 16.DEC.2019 13:25:06

BW: 1.4MHz / 16QAM / RB =6, RB Offset = 0
CH Mid



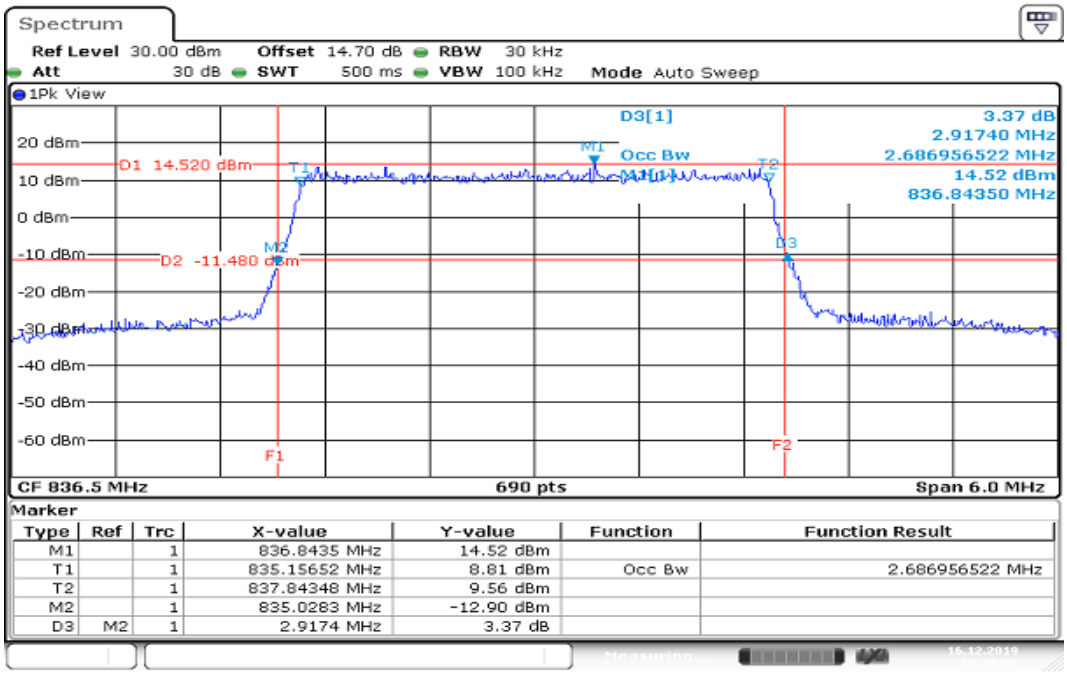
Date: 16.DEC.2019 13:27:14

BW: 3MHz / QPSK / RB =15, RB Offset = 0
CH Mid



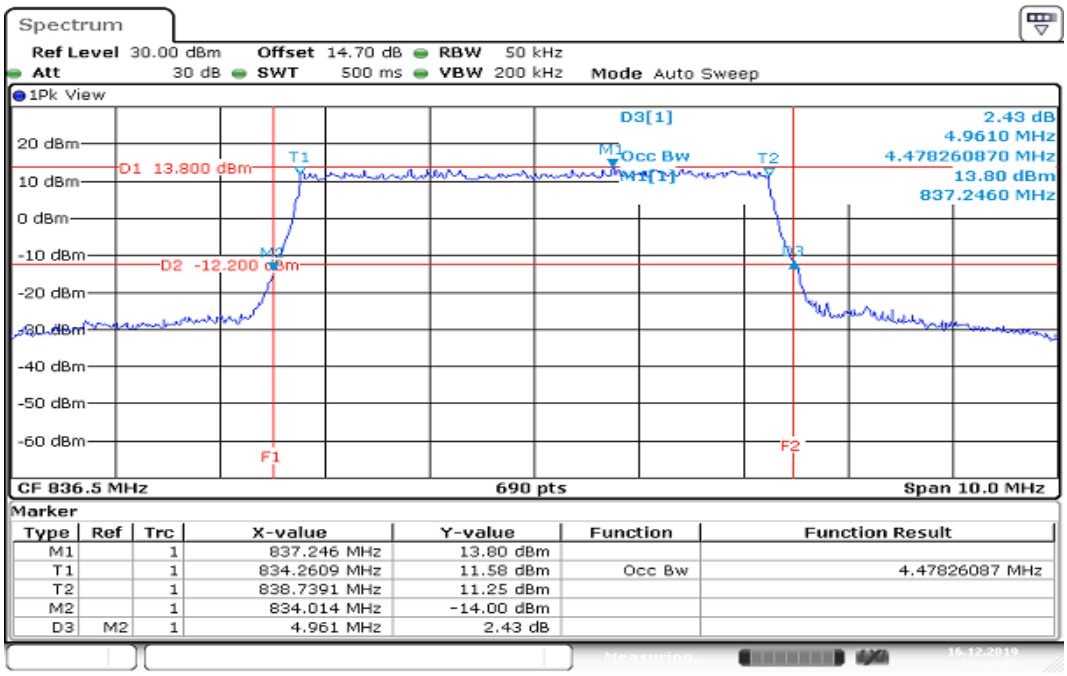
Date: 16.DEC.2019 13:30:24

BW: 3MHz / 16QAM / RB =15, RB Offset = 0
CH Mid



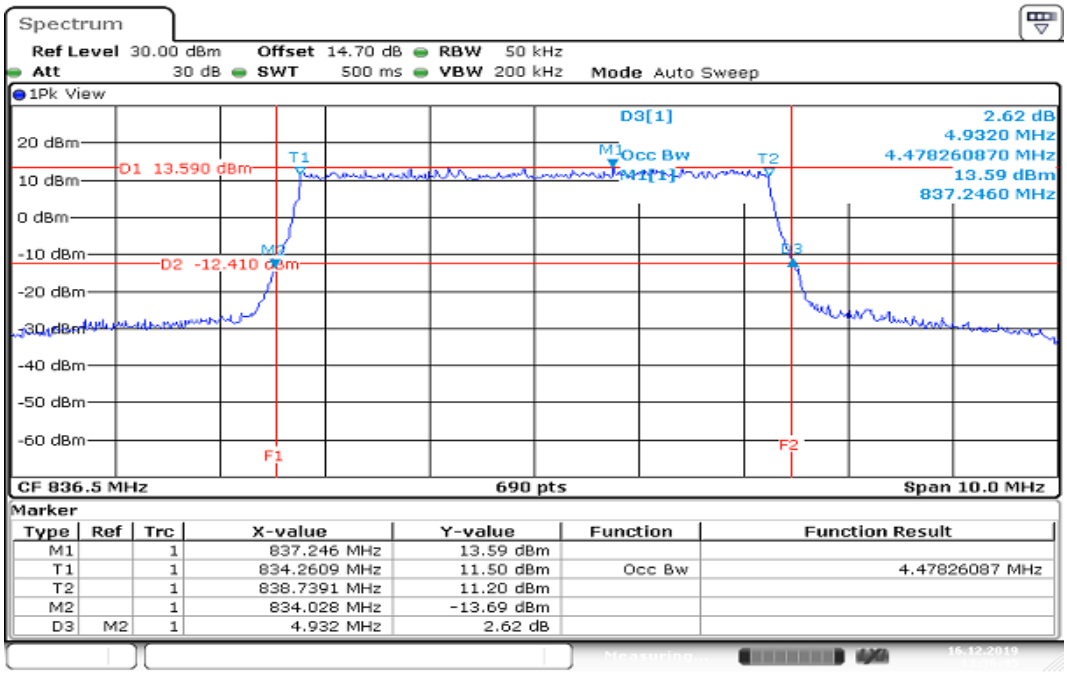
Date: 16.DEC.2019 13:28:57

BW: 5MHz / QPSK / RB =25, RB Offset = 0
CH Mid



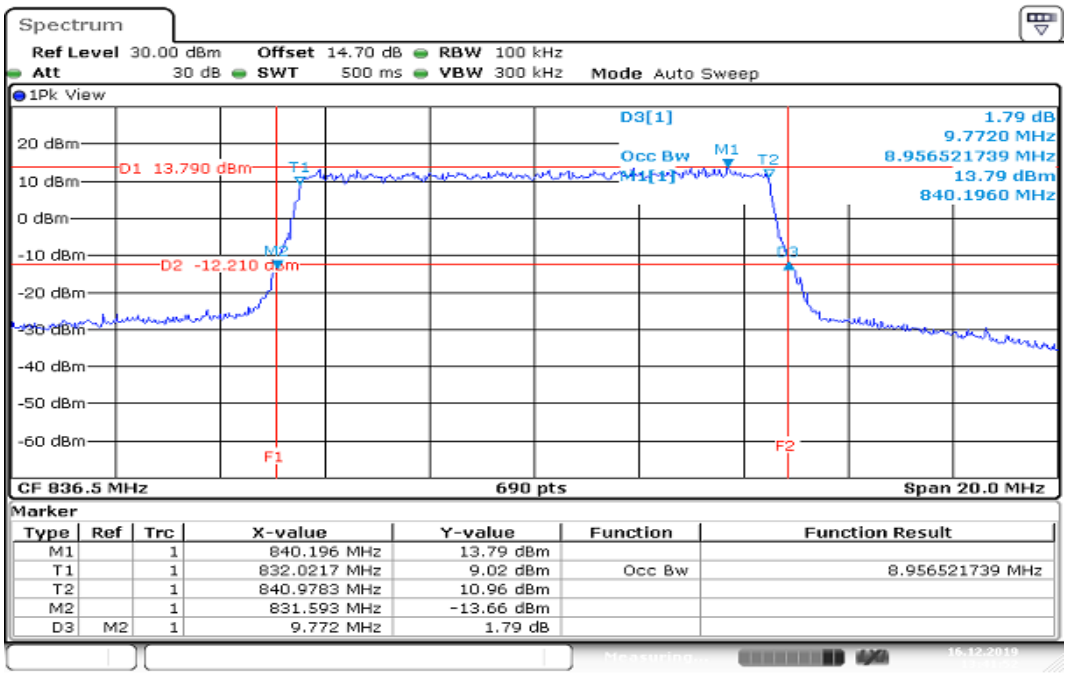
Date: 16.DEC.2019 13:32:13

BW: 5MHz / 16QAM / RB =25, RB Offset = 0
CH Mid



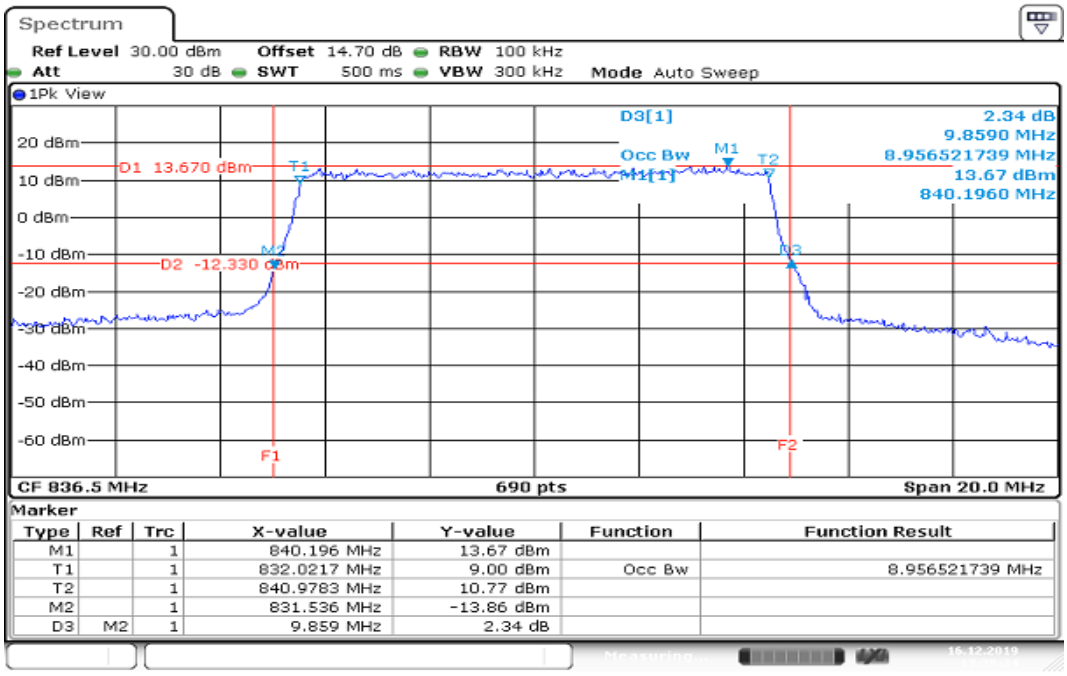
Date: 16.DEC.2019 13:36:45

BW: 10MHz / QPSK / RB =50, RB Offset = 0
CH Mid



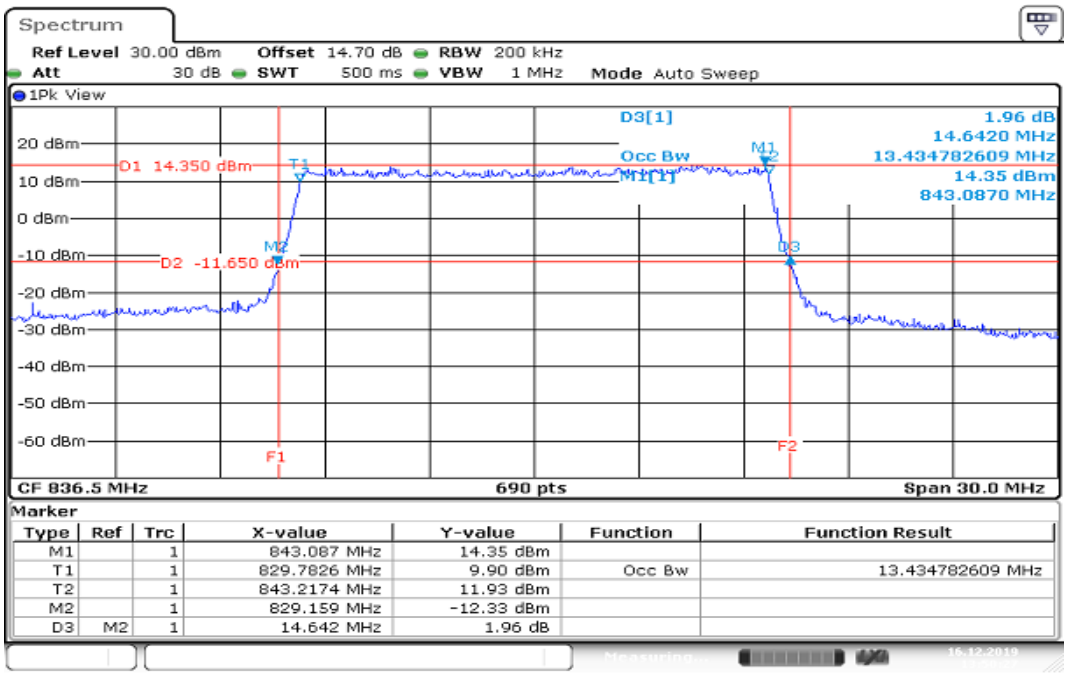
Date: 16.DEC.2019 13:41:52

BW: 10MHz / 16QAM / RB =50, RB Offset = 0
CH Mid



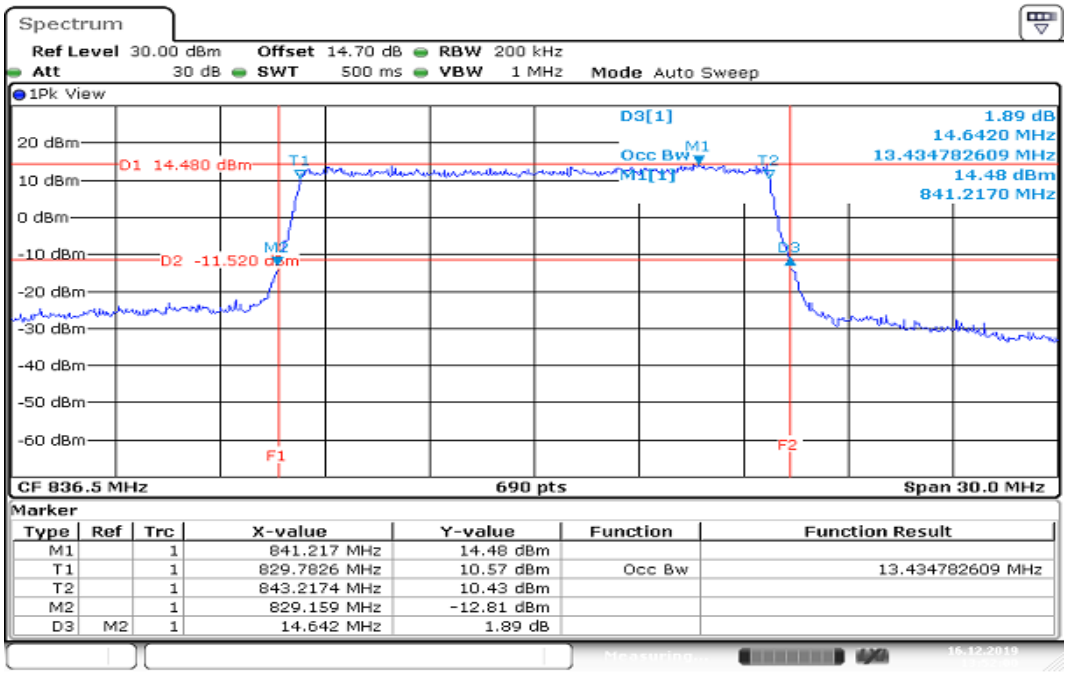
Date: 16.DEC.2019 13:38:24

BW: 15MHz / QPSK / RB =75, RB Offset = 0
CH Mid



Date: 16.DEC.2019 13:50:27

BW: 15MHz / 16QAM / RB =75, RB Offset = 0
CH Mid



Date: 16.DEC.2019 13:52:00

8.4 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 KDB 971168 D01,
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.

Note: We selected worst case to performed test in middle channel, the results can be meet other channel.

Test Results

LTE Band 26

CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	4.49

CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.54

CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	4.55

CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.16

CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	4.49

CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.25

CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	4.29

CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.01

CHANNEL BANDWIDTH: 15MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	3.68

CHANNEL BANDWIDTH: 15MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	4.29

Note: We selected worst case to performed test in middle channel, the results can be meet other channel.

CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	4.96

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.77

CHANNEL BANDWIDTH: 3MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	4.84

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.80

CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	4.78

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.65

CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	4.81

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.68

CHANNEL BANDWIDTH: 15MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.01

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

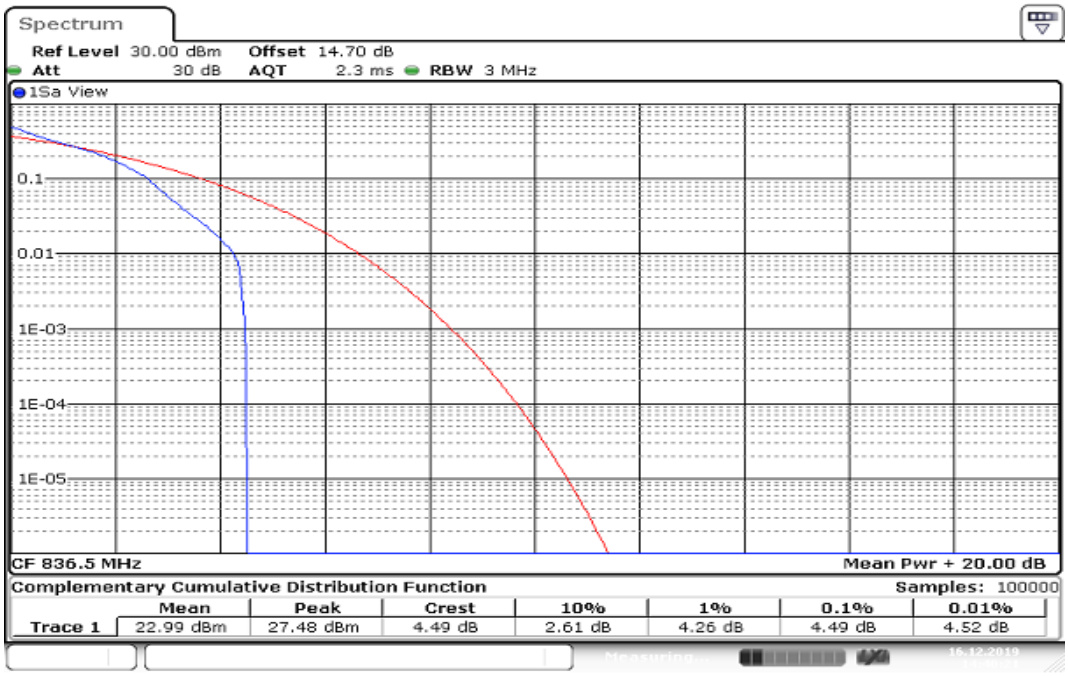
Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26915	836.5	5.80

Note: We selected worst case to performed test in middle channel, the results can be meet other channel.

LTE Band 26

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

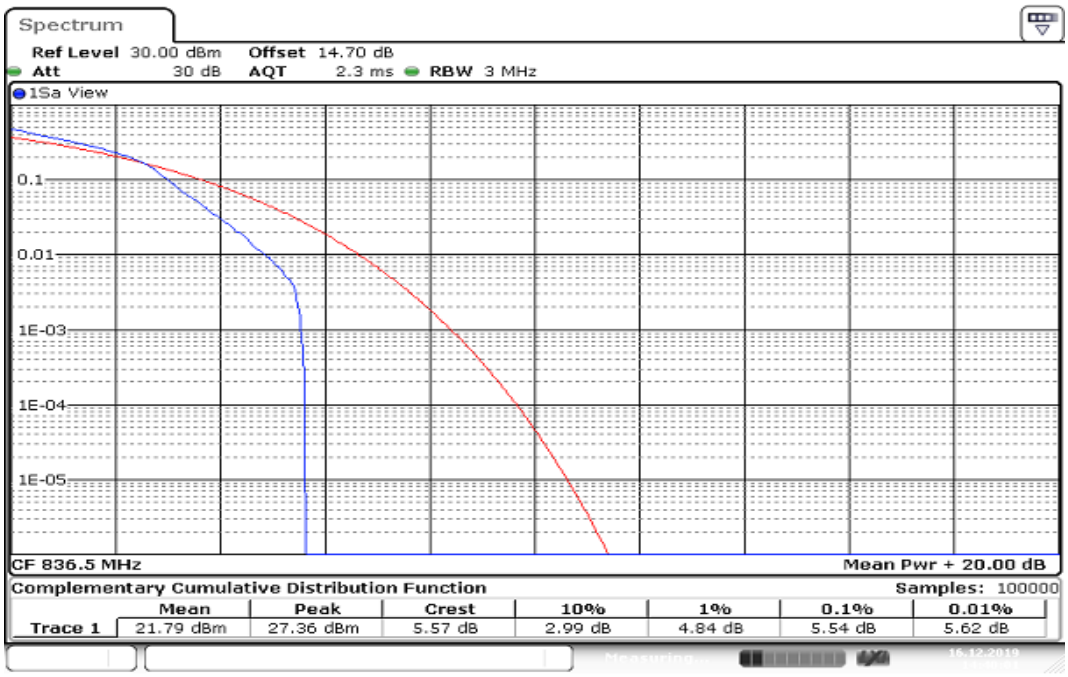
CH Mid



Date: 16.DEC.2019 14:40:21

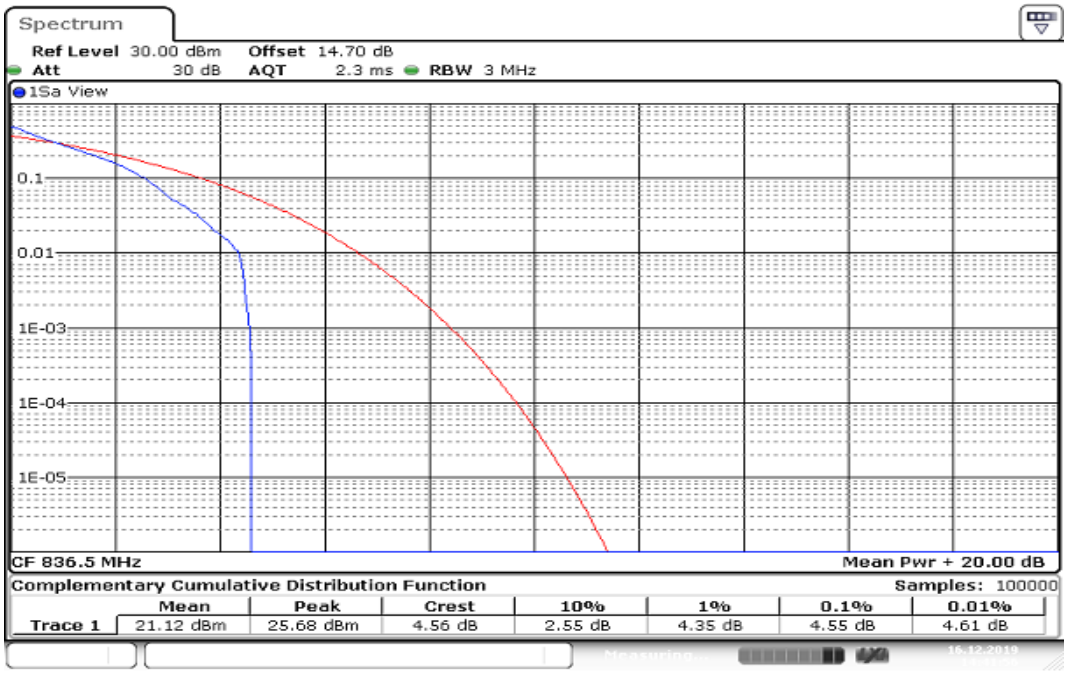
BW: 1.4MHz / 16QAM / RB =1, RB Offset = 0

CH Mid



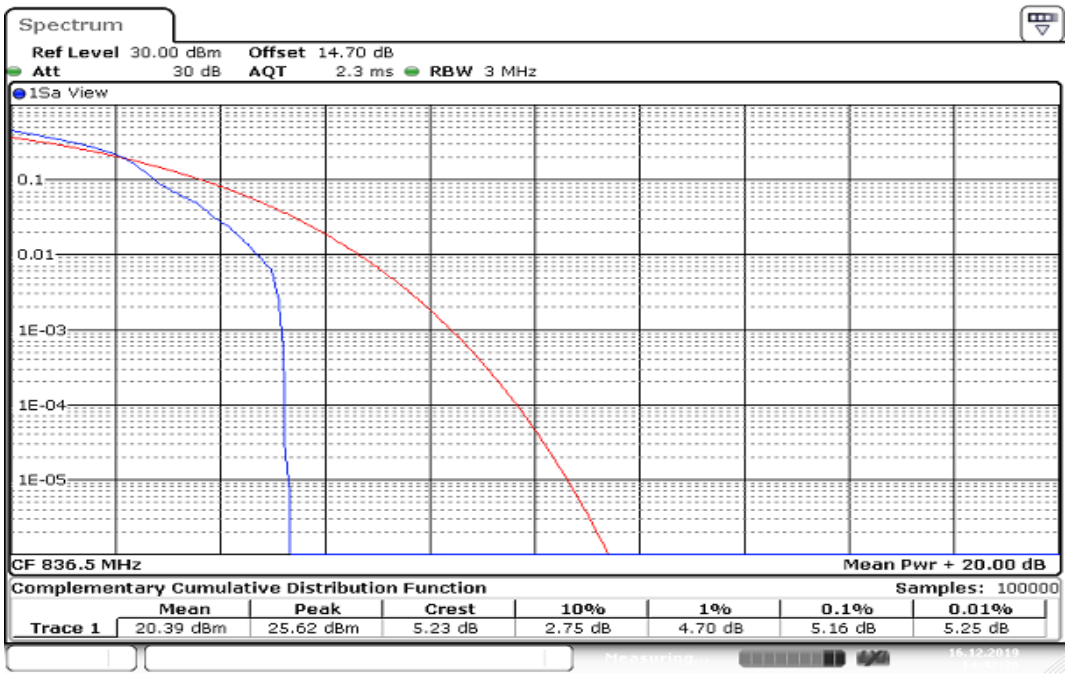
Date: 16.DEC.2019 14:40:01

BW: 3MHz / QPSK / RB =1, RB Offset = 0
CH Mid



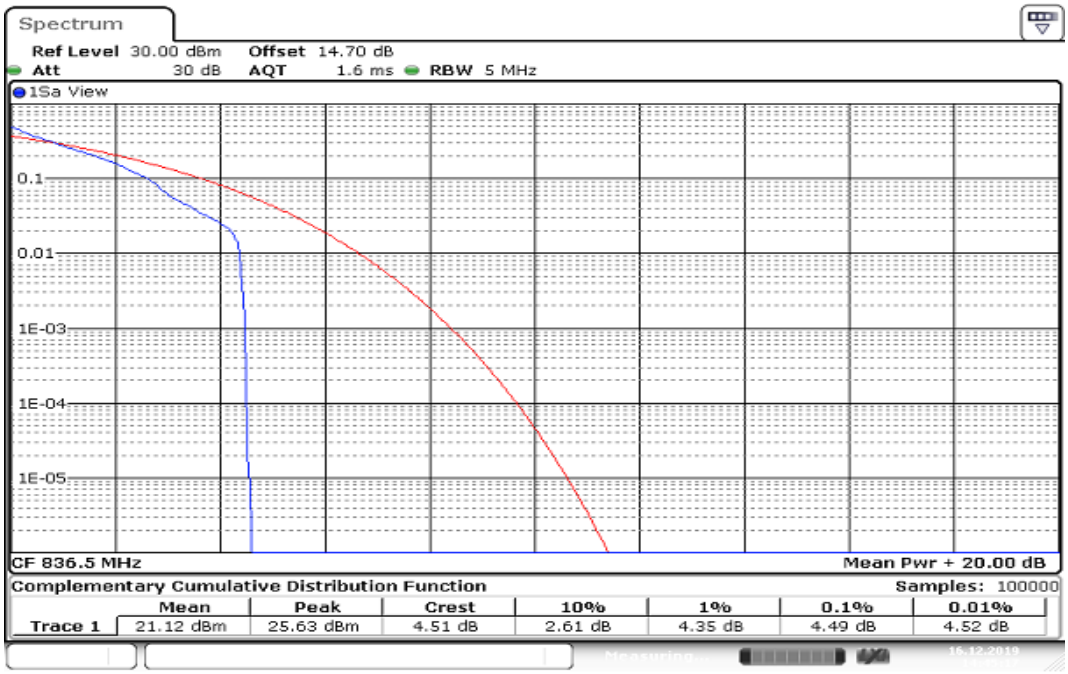
Date: 16.DEC.2019 14:41:56

BW: 3MHz / 16QAM / RB =1, RB Offset = 0
CH Mid



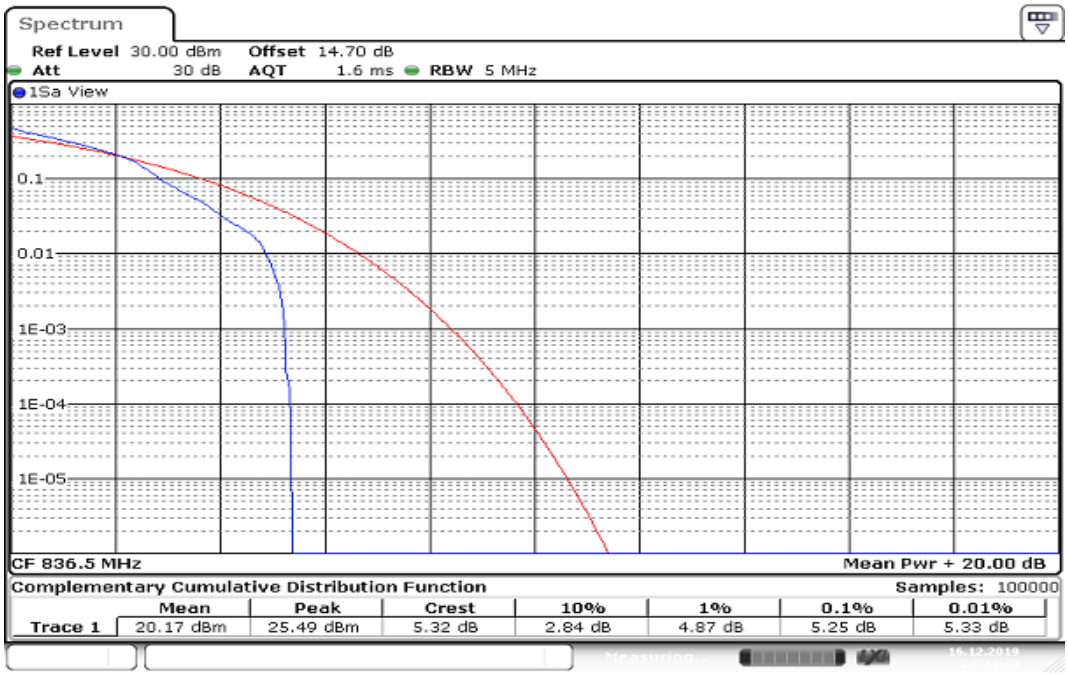
Date: 16.DEC.2019 14:42:26

BW: 5MHz / QPSK / RB =1, RB Offset = 0
CH Mid



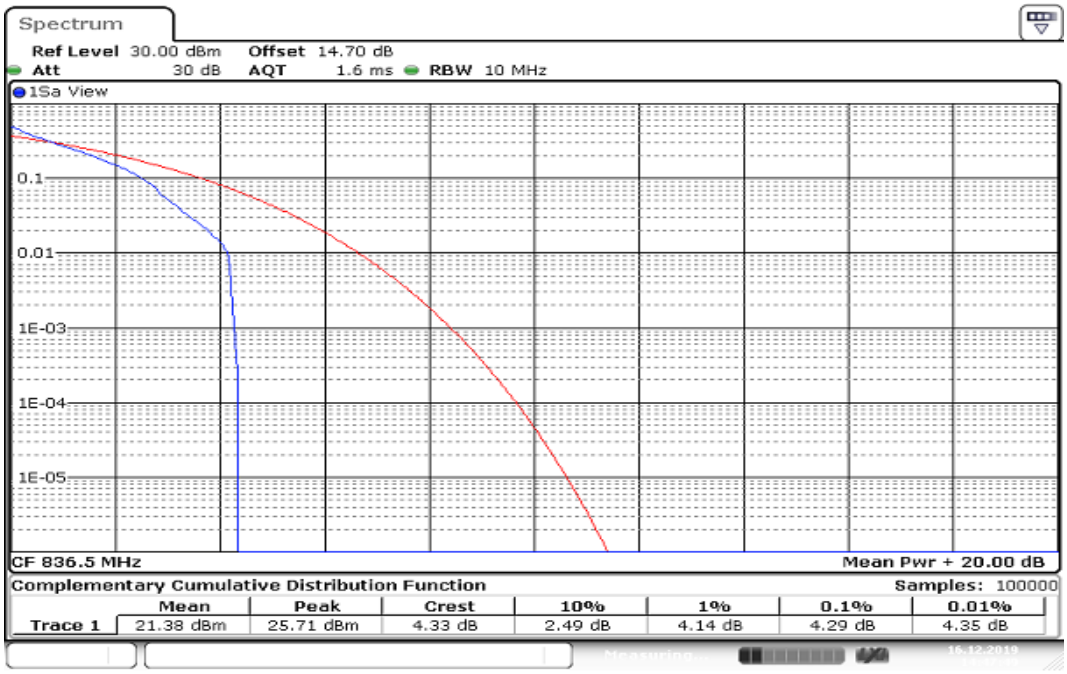
Date: 16.DEC.2019 14:45:18

BW: 5MHz / 16QAM / RB =1, RB Offset = 0
CH Mid



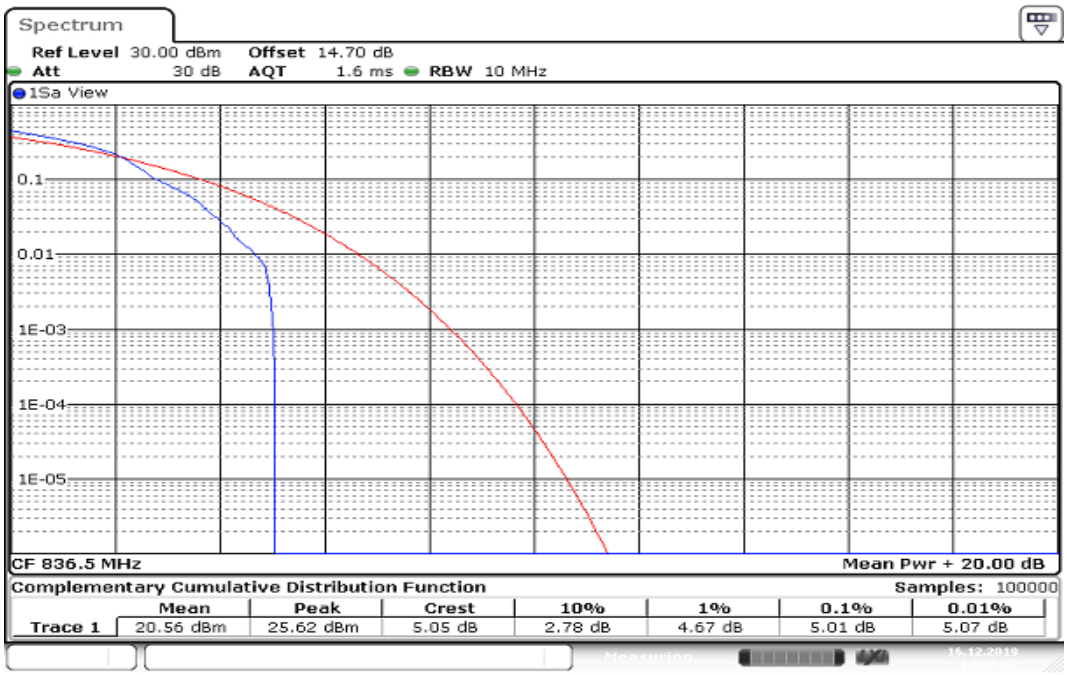
Date: 16.DEC.2019 14:44:50

BW: 10MHz / QPSK /RB =1, RB Offset = 0
CH Mid



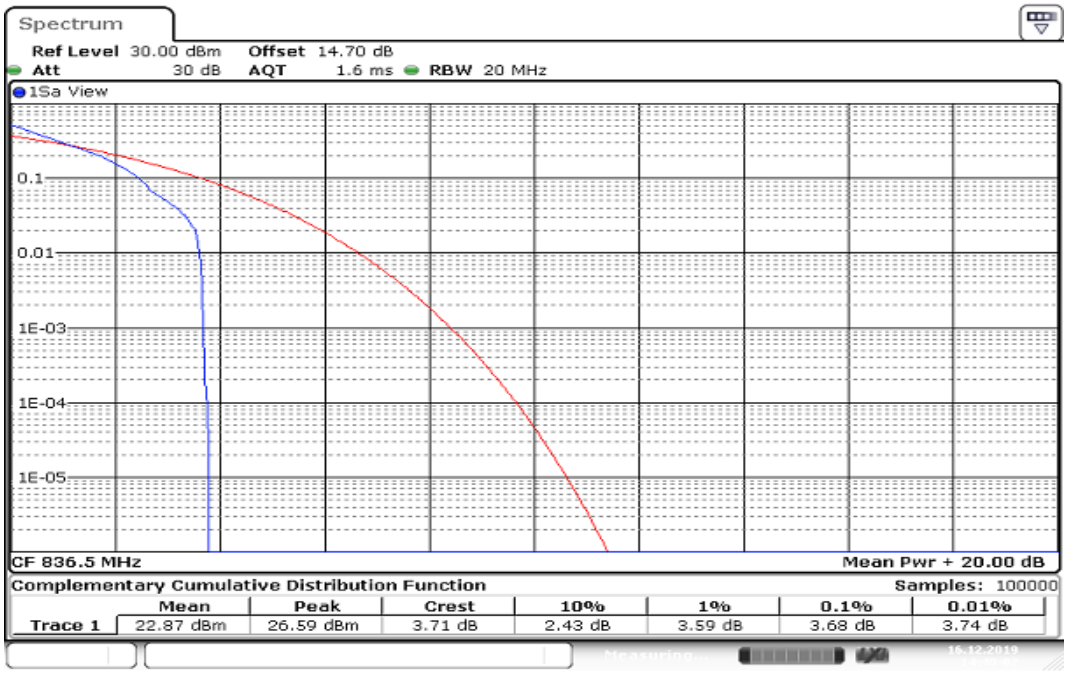
Date: 16.DEC.2019 14:47:49

BW: 10MHz / 16QAM /RB =1, RB Offset = 0
CH Mid



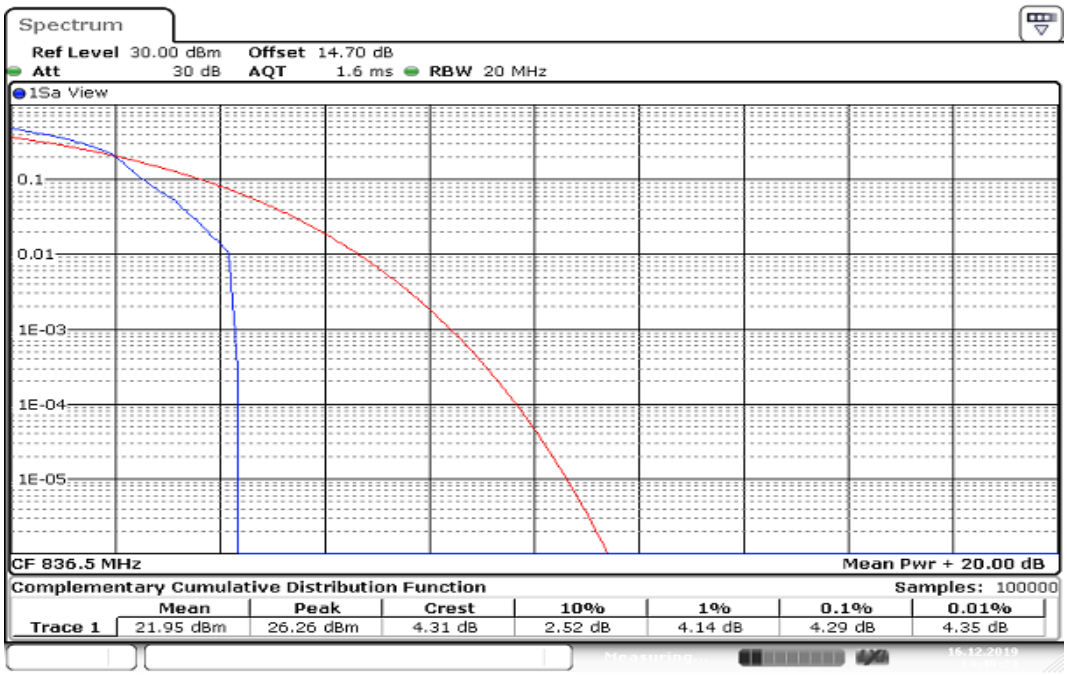
Date: 16.DEC.2019 14:47:22

BW: 15MHz / QPSK /RB =1, RB Offset = 0
CH Mid



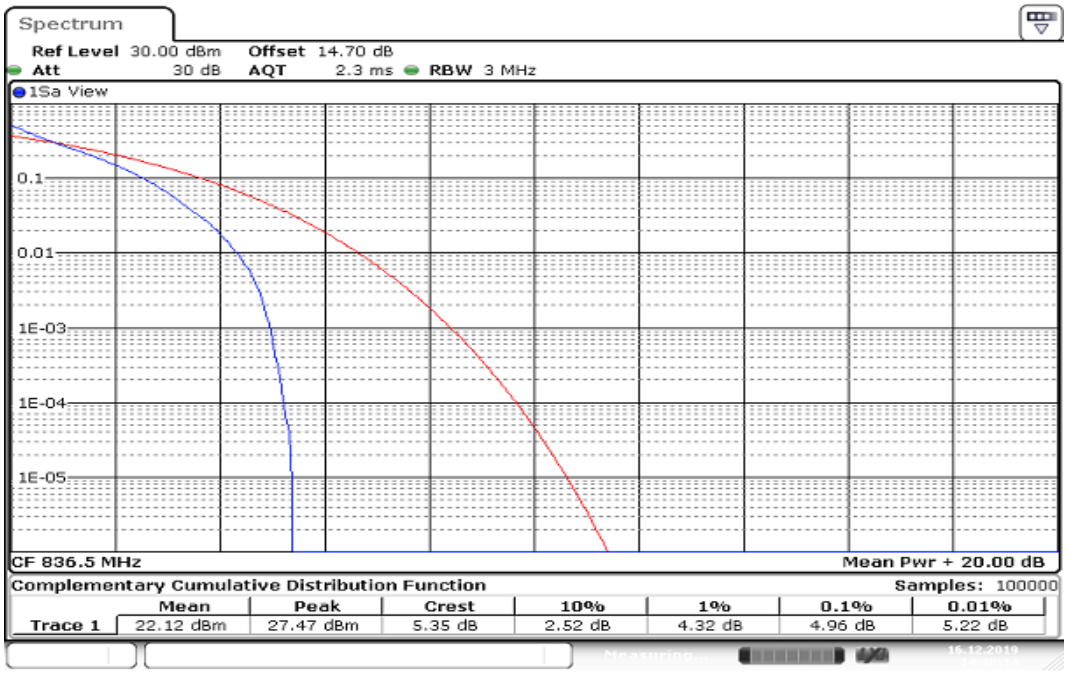
Date: 16.DEC.2019 14:49:02

BW: 15MHz / 16QAM /RB =1, RB Offset = 0
CH Mid



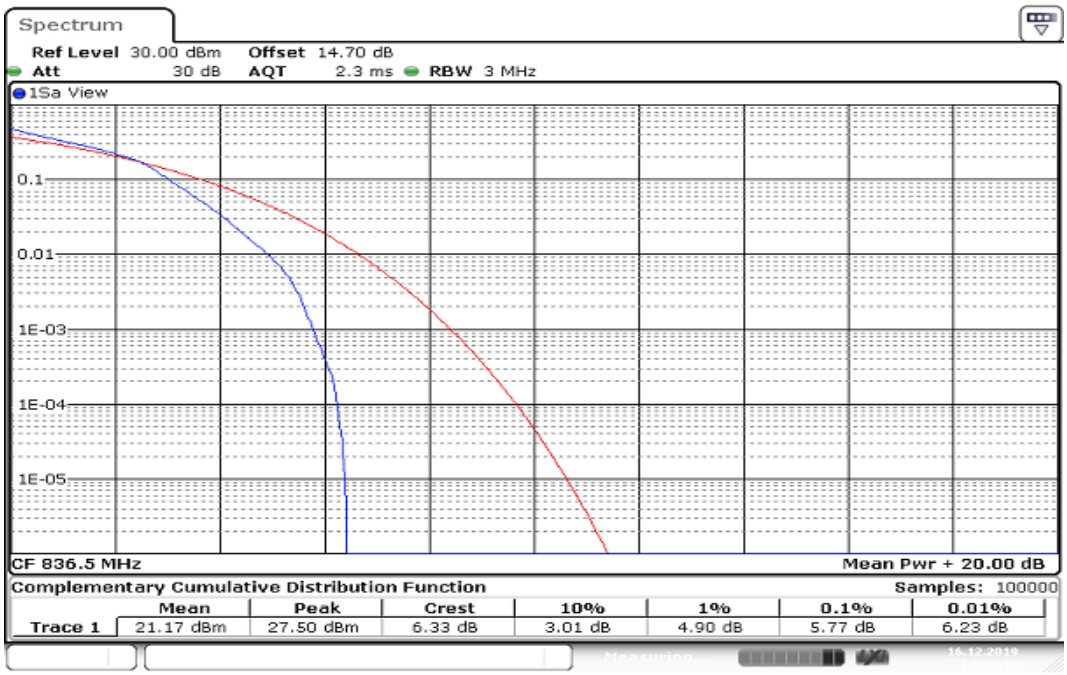
Date: 16.DEC.2019 14:49:23

BW: 1.4MHz / QPSK / RB =100%, RB Offset = 0
CH Mid



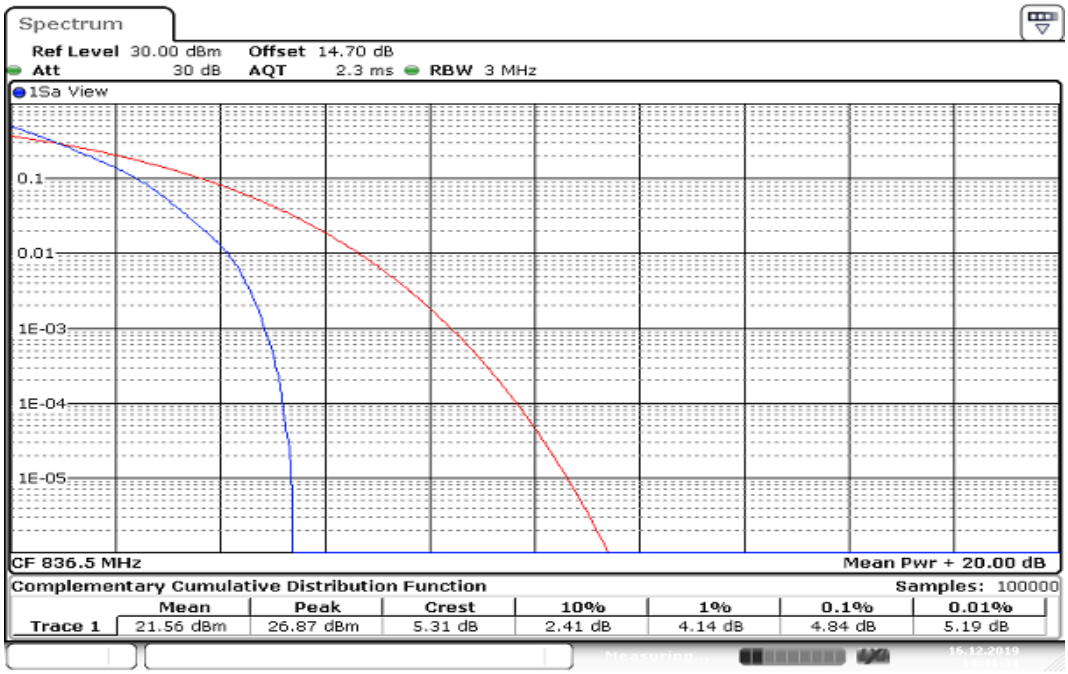
Date: 16.DEC.2019 14:38:14

BW: 1.4MHz / 16QAM / RB =100%, RB Offset = 0
CH Mid



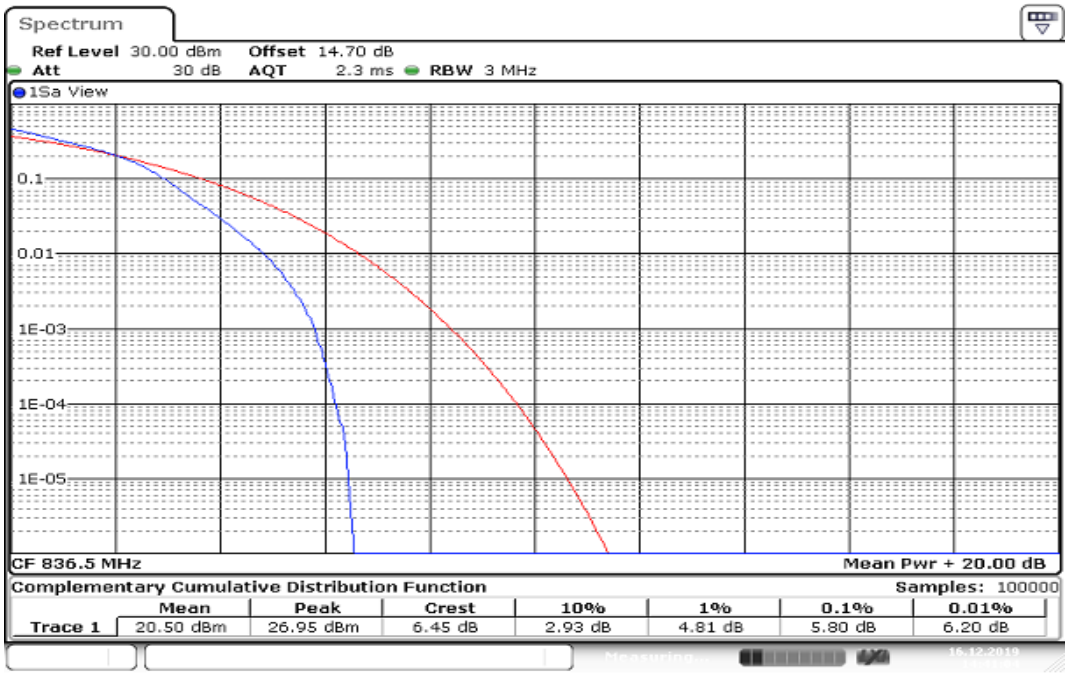
Date: 16.DEC.2019 14:39:16

BW: 3MHz / QPSK / RB =100%, RB Offset = 0
CH Mid



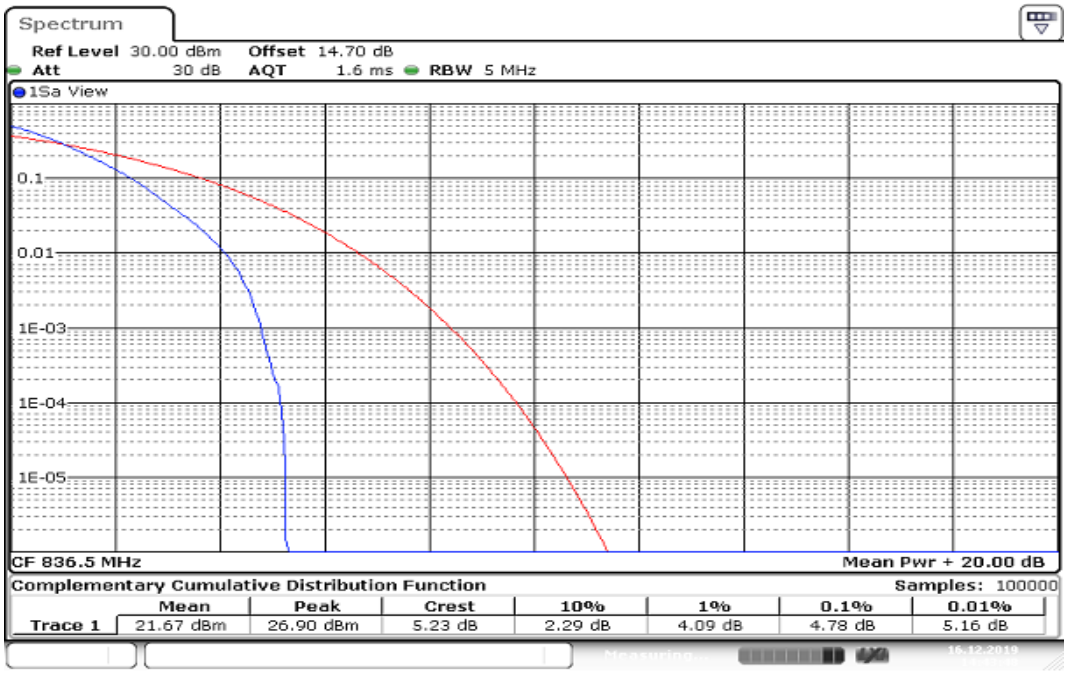
Date: 16.DEC.2019 14:41:31

BW: 3MHz / 16QAM / RB =100%, RB Offset = 0
CH Mid



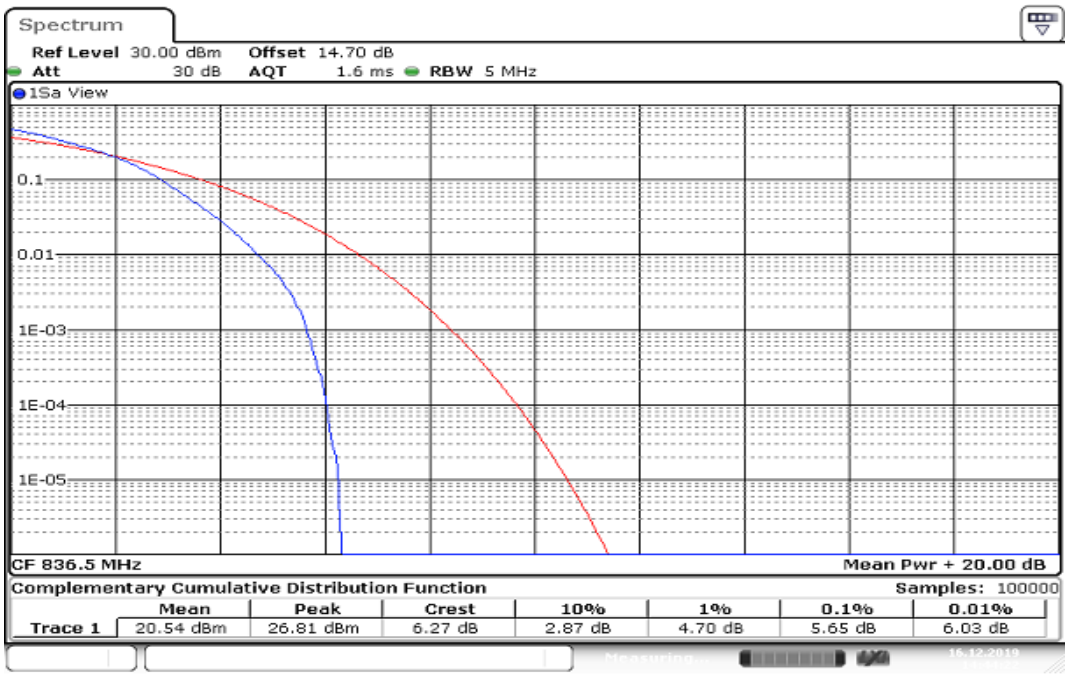
Date: 16.DEC.2019 14:41:04

BW: 5MHz / QPSK / RB =100%, RB Offset = 0
CH Mid



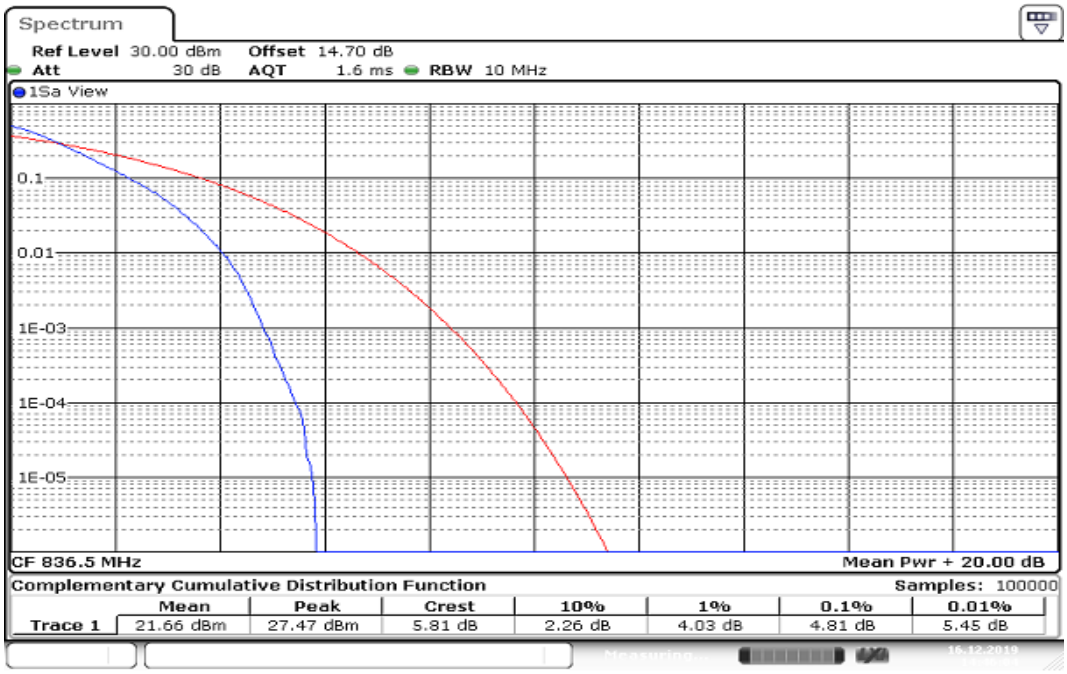
Date: 16.DEC.2019 14:43:48

BW: 5MHz / 16QAM / RB =100%, RB Offset = 0
CH Mid



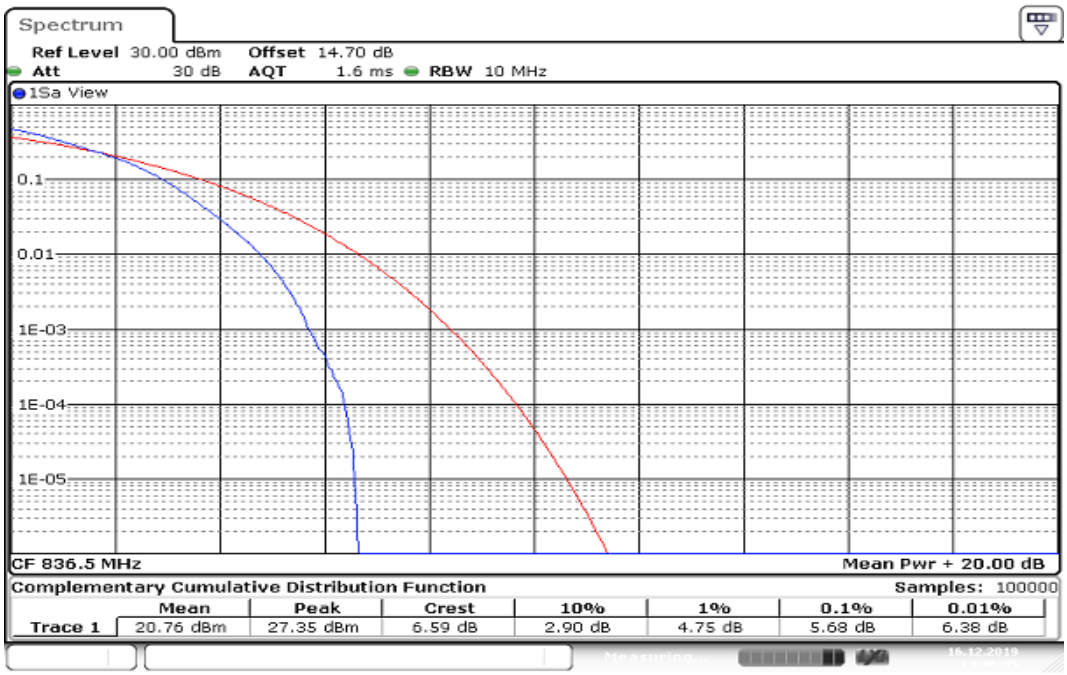
Date: 16.DEC.2019 14:44:23

BW: 10MHz / QPSK /RB =100%, RB Offset = 0
CH Mid



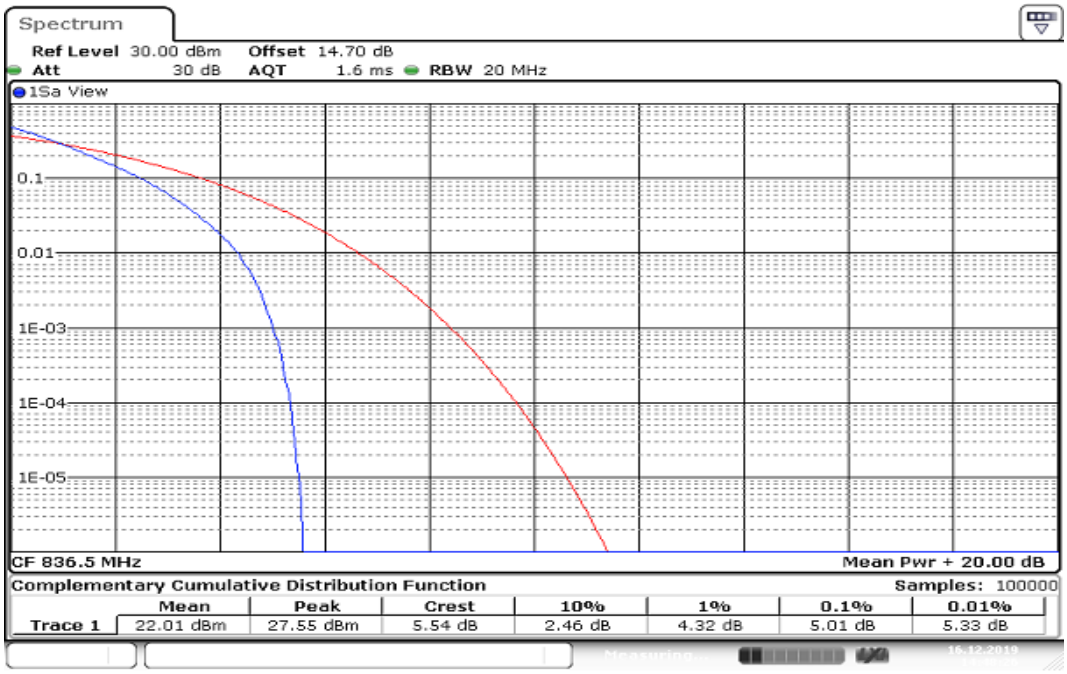
Date: 16.DEC.2019 14:46:04

BW: 10MHz / 16QAM /RB =100%, RB Offset = 0
CH Mid



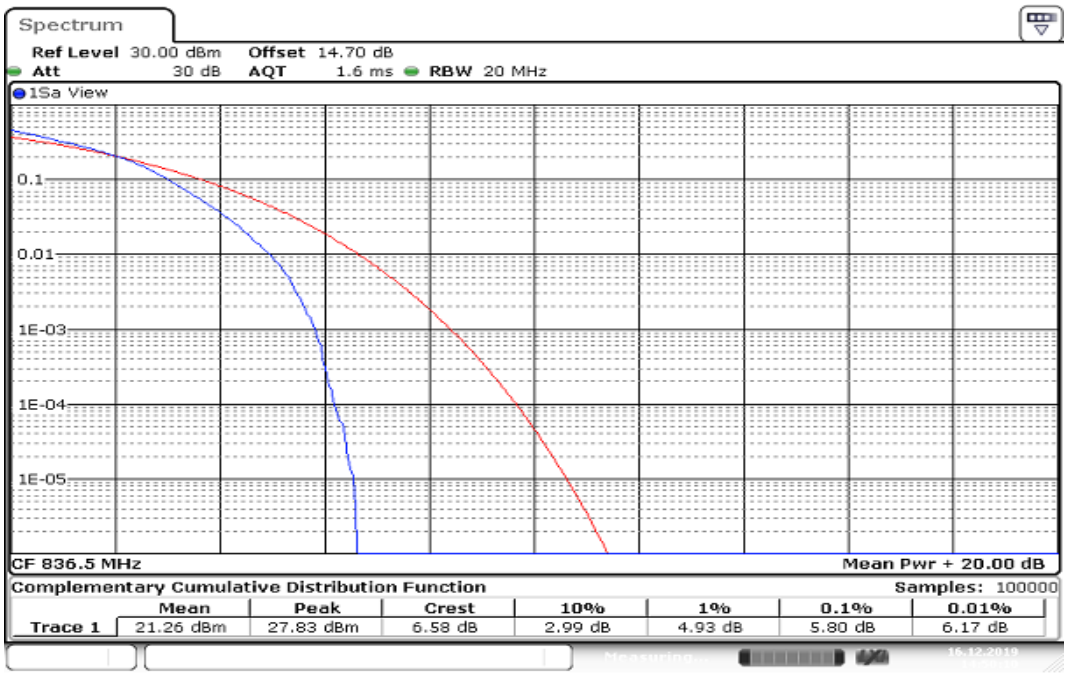
Date: 16.DEC.2019 14:46:45

BW: 15MHz / QPSK /RB =100%, RB Offset = 0
CH Mid



Date: 16.DEC.2019 14:48:26

BW: 15MHz / 16QAM /RB =100%, RB Offset = 0
CH Mid



Date: 16.DEC.2019 14:50:10