FCC 47 CFR PART 90

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

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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, 2019 ~ January 15, 2020

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR PART 90	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.	

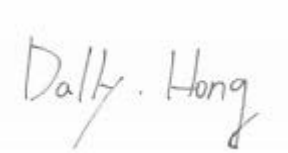
We hereby certify that:

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

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 those trade names (list on this report) are just for marketing purpose only.		
Trade	Mitac, 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 14 Channel Bandwidth: 5MHz	790.5MHz ~ 795.5MHz	
	LTE Band 14 Channel Bandwidth: 10MHz	793MHz	
	LTE Band 26 Channel Bandwidth: 1.4MHz	814.7MHz ~ 823.3MHz	
	LTE Band 26 Channel Bandwidth: 3MHz	815.5MHz ~ 822.5MHz	
	LTE Band 26 Channel Bandwidth: 5MHz	816.5MHz ~ 821.5MHz	
	LTE Band 26 Channel Bandwidth: 10MHz	819MHz	
Modulation Technique	LTE Band 14	QPSK, 16QAM	
	LTE Band 26	QPSK, 16QAM	
Antenna Specification	Antenna type: Integral Band 14: 0.03 dBi Band 26: 1.62 dBi		
Transmit Power (ERP Power)	LTE Band 14 Channel Bandwidth: 5MHz	QPSK: 20.35 dBm 16QAM: 19.57 dBm	
	LTE Band 14 Channel Bandwidth: 10MHz	QPSK: 20.50 dBm 16QAM: 19.73 dBm	
	LTE Band 26 Channel Bandwidth: 1.4MHz	QPSK: 22.77 dBm 16QAM: 21.73 dBm	
	LTE Band 26 Channel Bandwidth: 3MHz	QPSK: 22.83 dBm 16QAM: 21.92 dBm	
	LTE Band 26 Channel Bandwidth: 5MHz	QPSK: 22.99 dBm 16QAM: 22.03 dBm	
	LTE Band 26 Channel Bandwidth: 10MHz	QPSK: 22.76 dBm 16QAM: 22.03 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 90, 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: 814 MHz ~ 824 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)	26697	814.7	26705	815.5	26715	816.5
Middle channel (M)	26740	819	26740	819	26740	819
High channel (H)	26783	823.3	26775	822.5	26765	821.5

Channel Bandwidth	10MHz	
	Channel	Frequency (MHz)
Low channel (L)	-	-
Middle channel (M)	26740	819
High channel (H)	-	-

LTE Band 14: 790.5 MHz ~ 795.5 MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	5MHz		10MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low channel (L)	23305	790.5	-	-
Middle channel (M)	23330	793.0	23330	793.0
High channel (H)	23355	795.5	-	-

3.3 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
2.1046, 90.635(b), 90.542 (a)(7)	8.1	ERP Measurement	Pass
2.1055, 90.213	8.2	Frequency Stability v.s. temperature measurement	Pass
2.1049, 90.209	8.3	Occupied Bandwidth Measurement	Pass
90.691, 90.543	8.4	Conducted Band Edge	Pass
90.691, 90.543	8.5	Peak to Average Ratio	Pass
90.691, 90.543	8.6	Conducted Spurious Emission	Pass
2.1053, 90.691	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 MEASUREMENT

LIMIT

According to FCC §2.1046

FCC 90.635(b): The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

FCC 90.542 (a)(7): Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

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 14

BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
10	QPSK	1 RB	0	793	23330	22.58	20.46
			25	793	23330	22.35	20.23
			49	793	23330	**22.62**	20.50
		25 RB	0	793	23330	**21.48**	19.36
			12	793	23330	21.43	19.31
			25	793	23330	21.46	19.34
		50RB		793	23330	**21.36**	19.24
	16-QAM	1 RB	0	793	23330	21.85	19.73
			25	793	23330	21.65	19.53
			49	793	23330	21.82	19.70
		25 RB	0	793	23330	20.47	18.35
			12	793	23330	20.38	18.26
			25	793	23330	20.44	18.32
		50RB		793	23330	20.48	18.36
	64-QAM	1 RB	0	793	23330	20.98	18.86
			25	793	23330	20.69	18.57
			49	793	23330	20.92	18.80
		25 RB	0	793	23330	19.67	17.55
			12	793	23330	19.57	17.45
			25	793	23330	19.62	17.50
		50RB		793	23330	19.6	17.48

BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
5	QPSK	1 RB	0	790.5	23305	22.47	20.35
				793	23330	22.30	20.18
				795.5	23355	22.44	20.32
			12	790.5	23305	21.41	19.29
				793	23330	21.19	19.07
				795.5	23355	21.23	19.11
			24	790.5	23305	21.31	19.19
				793	23330	21.78	19.66
				795.5	23355	21.53	19.41
		12 RB	0	790.5	23305	21.63	19.51
				793	23330	20.31	18.19
				795.5	23355	20.25	18.13
			6	790.5	23305	20.37	18.25
				793	23330	20.31	18.19
				795.5	23355	20.89	18.77
			13	790.5	23305	20.48	18.36
				793	23330	20.75	18.63
				795.5	23355	21.42	19.30
		25RB		790.5	23305	21.41	19.29
				793	23330	20.12	18.00
				795.5	23355	20.17	18.05
5	16-QAM	1 RB	0	790.5	23305	21.48	19.36
				793	23330	21.45	19.33
				795.5	23355	21.55	19.43
			12	790.5	23305	21.32	19.20
				793	23330	20.97	18.85
				795.5	23355	21.01	18.89
			24	790.5	23305	21.13	19.01
				793	23330	21.69	19.57
				795.5	23355	21.29	19.17
		12 RB	0	790.5	23305	20.54	18.42
				793	23330	20.22	18.10
				795.5	23355	20.16	18.04
			6	790.5	23305	20.31	18.19
				793	23330	20.12	18.00
				795.5	23355	20.67	18.55
			13	790.5	23305	20.39	18.27
				793	23330	20.62	18.50
				795.5	23355	20.32	18.20
		25RB		790.5	23305	20.26	18.14
				793	23330	20.07	17.95
				795.5	23355	19.95	17.83

5	64-QAM	1 RB	0	790.5	23305	20.81	18.69
				793	23330	20.73	18.61
				795.5	23355	20.81	18.69
			12	790.5	23305	20.62	18.50
				793	23330	20.26	18.14
				795.5	23355	20.47	18.35
			24	790.5	23305	20.41	18.29
				793	23330	20.89	18.77
				795.5	23355	20.59	18.47
		12 RB	0	790.5	23305	19.83	17.71
				793	23330	19.64	17.52
				795.5	23355	19.43	17.31
			6	790.5	23305	19.68	17.56
				793	23330	19.47	17.35
				795.5	23355	19.78	17.66
			13	790.5	23305	19.78	17.66
				793	23330	19.89	17.77
				795.5	23355	19.73	17.61
		25RB		790.5	23305	19.54	17.42
				793	23330	19.46	17.34
				795.5	23355	19.30	17.18

LTE Band 26

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
10	QPSK	1 RB	0	819	26740	23.29	22.76
			25	819	26740	22.74	22.21
			49	819	26740	23.14	22.61
		25 RB	0	819	26740	22.42	21.89
			12	819	26740	22.03	21.50
			25	819	26740	21.71	21.18
		50RB		819	26740	21.92	21.39
10	16-QAM	1 RB	0	819	26740	22.37	21.84
			25	819	26740	22.00	21.47
			49	819	26740	22.56	22.03
		25 RB	0	819	26740	21.28	20.75
			12	819	26740	21.09	20.56
			25	819	26740	20.82	20.29
		50RB		819	26740	20.97	20.44
10	64-QAM	1 RB	0	819	26740	21.28	20.75
			25	819	26740	20.76	20.23
			49	819	26740	21.45	20.92
		25 RB	0	819	26740	20.31	19.78
			12	819	26740	20.03	19.50
			25	819	26740	19.80	19.27
		50RB		819	26740	19.95	19.42

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
5	QPSK	1 RB	0	816.5	26715	23.12	22.59
				819	26740	23.52	22.99
				821.5	26765	23.44	22.91
			12	816.5	26715	22.56	22.03
				819	26740	22.89	22.36
				821.5	26765	23.10	22.57
			24	816.5	26715	23.05	22.52
				819	26740	23.10	22.57
				821.5	26765	23.01	22.48
		12 RB	0	816.5	26715	22.18	21.65
				819	26740	22.31	21.78
				821.5	26765	22.39	21.86
			6	816.5	26715	21.98	21.45
				819	26740	22.21	21.68
				821.5	26765	22.42	21.89
			13	816.5	26715	21.65	21.12
				819	26740	22.01	21.48
				821.5	26765	22.20	21.67
		25RB		816.5	26715	21.77	21.24
				831.5	26740	22.08	21.55
				846.5	26765	22.43	21.90
5	16-QAM	1 RB	0	816.5	26715	22.21	21.68
				819	26740	22.56	22.03
				821.5	26765	22.37	21.84
			7	816.5	26715	21.86	21.33
				819	26740	22.20	21.67
				821.5	26765	22.31	21.78
			14	816.5	26715	22.42	21.89
				819	26740	22.41	21.88
				821.5	26765	22.51	21.98
		8 RB	0	816.5	26715	21.15	20.62
				819	26740	21.21	20.68
				821.5	26765	21.53	21.00
			4	816.5	26715	21.00	20.47
				819	26740	21.03	20.50
				821.5	26765	21.31	20.78
			7	816.5	26715	20.64	20.11
				819	26740	20.90	20.37
				821.5	26765	21.25	20.72
		15RB		816.5	26715	20.77	20.24
				819	26740	21.05	20.52
				821.5	26765	21.41	20.88

5	64-QAM	1 RB	0	816.5	26715	21.21	20.68
				819	26740	21.37	20.84
				821.5	26765	21.31	20.78
			7	816.5	26715	20.71	20.18
				819	26740	21.11	20.58
				821.5	26765	21.20	20.67
			14	816.5	26715	21.29	20.76
				819	26740	21.48	20.95
				821.5	26765	21.33	20.80
		8 RB	0	816.5	26715	20.23	19.70
				819	26740	20.29	19.76
				821.5	26765	20.39	19.86
			4	816.5	26715	19.85	19.32
				819	26740	20.20	19.67
				821.5	26765	20.44	19.91
			7	816.5	26715	19.60	19.07
				819	26740	19.82	19.29
				821.5	26765	20.26	19.73
		15RB		816.5	26715	19.73	19.20
				819	26740	20.05	19.52
				821.5	26765	20.58	20.05

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
3	QPSK	1 RB	0	815.5	26705	22.90	22.37
				819	26740	23.36	22.83
				822.5	26775	23.31	22.78
			7	815.5	26705	22.48	21.95
				819	26740	22.82	22.29
				822.5	26775	23.02	22.49
			14	815.5	26705	22.85	22.32
				819	26740	22.87	22.34
				822.5	26775	22.90	22.37
		8 RB	0	815.5	26705	22.01	21.48
				819	26740	22.17	21.64
				822.5	26775	22.15	21.62
			4	815.5	26705	21.93	21.40
				819	26740	22.07	21.54
				822.5	26775	22.33	21.80
			7	815.5	26705	21.52	20.99
				819	26740	21.77	21.24
				822.5	26775	22.14	21.61
		15RB		815.5	26705	21.56	21.03
				819	26740	21.92	21.39
				822.5	26775	22.23	21.70
3	16-QAM	1 RB	0	815.5	26705	22.07	21.54
				819	26740	22.34	21.81
				822.5	26775	22.20	21.67
			7	815.5	26705	21.62	21.09
				819	26740	22.10	21.57
				822.5	26775	22.16	21.63
			14	815.5	26705	22.32	21.79
				819	26740	22.18	21.65
				822.5	26775	22.45	21.92
		8 RB	0	815.5	26705	21.07	20.54
				819	26740	21.02	20.49
				822.5	26775	21.44	20.91
			4	815.5	26705	20.84	20.31
				819	26740	20.89	20.36
				822.5	26775	21.25	20.72
			7	815.5	26705	20.48	19.95
				819	26740	20.72	20.19
				822.5	26775	21.04	20.51
		15RB		815.5	26705	20.53	20.00
				819	26740	21.00	20.47
				822.5	26775	21.20	20.67

3	64-QAM	1 RB	0	815.5	26705	21.13	20.60
				819	26740	21.30	20.77
				822.5	26775	21.15	20.62
			7	815.5	26705	20.66	20.13
				819	26740	21.03	20.50
				822.5	26775	21.00	20.47
			14	815.5	26705	21.09	20.56
				819	26740	21.24	20.71
				822.5	26775	21.11	20.58
		8 RB	0	815.5	26705	20.10	19.57
				819	26740	20.15	19.62
				822.5	26775	20.25	19.72
			4	815.5	26705	19.64	19.11
				819	26740	20.05	19.52
				822.5	26775	20.21	19.68
			7	815.5	26705	19.46	18.93
				819	26740	19.64	19.11
				822.5	26775	20.08	19.55
		15RB		815.5	26705	19.68	19.15
				819	26740	19.87	19.34
				822.5	26775	20.38	19.85

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
1.4	QPSK	1 RB	0	814.7	26697	22.82	22.29
				819	26740	23.30	22.77
				823.3	26783	23.22	22.69
			2	814.7	26697	22.35	21.82
				819	26740	22.64	22.11
				823.3	26783	22.96	22.43
			5	814.7	26697	22.67	22.14
				819	26740	22.80	22.27
				823.3	26783	22.75	22.22
		3 RB	0	814.7	26697	21.90	21.37
				819	26740	22.08	21.55
				823.3	26783	22.00	21.47
			2	814.7	26697	21.81	21.28
				819	26740	21.90	21.37
				823.3	26783	22.27	21.74
			3	814.7	26697	21.40	20.87
				819	26740	21.71	21.18
				823.3	26783	21.90	21.37
		6RB		814.7	26697	21.48	20.95
				819	26740	21.80	21.27
				823.3	26783	22.15	21.62
1.4	16-QAM	1 RB	0	814.7	26697	21.99	21.46
				819	26740	22.15	21.62
				823.3	26783	22.09	21.56
			2	814.7	26697	21.48	20.95
				819	26740	21.92	21.39
				823.3	26783	22.09	21.56
			5	814.7	26697	22.25	21.72
				819	26740	22.10	21.57
				823.3	26783	22.26	21.73
		3 RB	0	814.7	26697	20.97	20.44
				819	26740	20.87	20.34
				823.3	26783	21.23	20.70
			2	814.7	26697	20.72	20.19
				819	26740	20.75	20.22
				823.3	26783	21.01	20.48
			3	814.7	26697	20.31	19.78
				819	26740	20.60	20.07
				823.3	26783	20.93	20.40
		6RB		814.7	26697	20.47	19.94
				819	26740	20.91	20.38
				823.3	26783	21.06	20.53

1.4	64-QAM	1 RB	0	814.7	26697	20.91	20.38
				819	26740	21.07	20.54
				823.3	26783	20.93	20.40
			2	814.7	26697	20.56	20.03
				819	26740	20.85	20.32
				823.3	26783	20.85	20.32
			5	814.7	26697	20.99	20.46
				819	26740	21.19	20.66
				823.3	26783	20.96	20.43
		3 RB	0	814.7	26697	20.03	19.50
				819	26740	20.03	19.50
				823.3	26783	20.18	19.65
			2	814.7	26697	20.12	19.59
				819	26740	20.21	19.68
				823.3	26783	20.11	19.58
			3	814.7	26697	20.26	19.73
				819	26740	20.45	19.92
				823.3	26783	20.22	19.69
		6RB		814.7	26697	19.52	18.99
				819	26740	19.77	19.24
				823.3	26783	20.26	19.73

8.2 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §90.213.

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 14 / QPSK

Reference Frequency: LTE Band 14, 793 MHz at 20(°C)				
Limit: □ 2.5 ppm = 1982.5 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 10M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
120	65	0.02	0.000025	+/- 2.5
120	50	0.02	0.000025	
120	40	0.01	0.000013	
120	30	0.00	0.000000	
120	20	0.01	0.000013	
120	10	0.02	0.000025	
120	0	-0.01	-0.000013	
120	-10	0.01	0.000013	
120	-20	0.01	0.000013	
120	-35	0.00	0.000000	

LTE Band 14 / 16QAM

Reference Frequency: LTE Band 14, 793 MHz at 20(°C)				
Limit: □ 2.5 ppm = 1982.5 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 10M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
120	65	0.04	0.000050	+/- 2.5
120	50	0.01	0.000013	
120	40	0.01	0.000013	
120	30	0.02	0.000025	
120	20	0.01	0.000013	
120	10	0.03	0.000038	
120	0	0.02	0.000025	
120	-10	0.01	0.000013	
120	-20	0.00	0.000000	
120	-35	-0.01	-0.000013	

LTE Band 26 / QPSK

Reference Frequency: LTE Band 26, 819 MHz at 20(°C)				
Limit: □ 2.5 ppm = 2078.75 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 10M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
120	65	0.01	0.000012	+/- 2.5
120	50	0.02	0.000024	
120	40	0.00	0.000000	
120	30	0.00	0.000000	
120	20	0.01	0.000012	
120	10	0.01	0.000012	
120	0	-0.01	-0.000012	
120	-10	0.01	0.000012	
120	-20	0.01	0.000012	
120	-35	-0.01	-0.000012	

LTE Band 26 / 16QAM

Reference Frequency: LTE Band 26, 819 MHz at 20(°C)				
Limit: □ 2.5 ppm = 2078.75 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	0.00	0.000000	
120	20	0.01	0.000012	
120	10	0.02	0.000024	
120	0	-0.01	-0.000012	
120	-10	-0.01	-0.000012	
120	-20	0.01	0.000012	
120	-35	-0.01	-0.000012	

FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:

LTE Band 14 / QPSK

Reference Frequency: LTE Band 14, 793 MHz at 20(°C)				
Limit: □ 2.5 ppm = 1982.5 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
102	20	-0.01	-0.000013	+/- 2.5
120		0.00	0.000000	
138		0.01	0.000018	

LTE Band 14 / 16QAM

Reference Frequency: LTE Band 14, 793 MHz at 20(°C)				
Limit: □ 2.5 ppm = 1982.5 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	0.000013	
138		0.01	0.000013	

LTE Band 26 / QPSK

Reference Frequency: LTE Band 26, 819 MHz at 20(°C)				
Limit: □ 2.5 ppm = 2078.75 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
102	20	0.01	0.000012	+/- 2.5
120		-0.01	-0.000012	
138		0.02	0.000024	

LTE Band 26 / 16QAM

Reference Frequency: LTE Band 26, 819 MHz at 20(°C)				
Limit: □ 2.5 ppm = 2078.75 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
102	20	0.01	0.000012	+/- 2.5
120		0.00	0.000000	
138		0.00	0.000000	

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 14

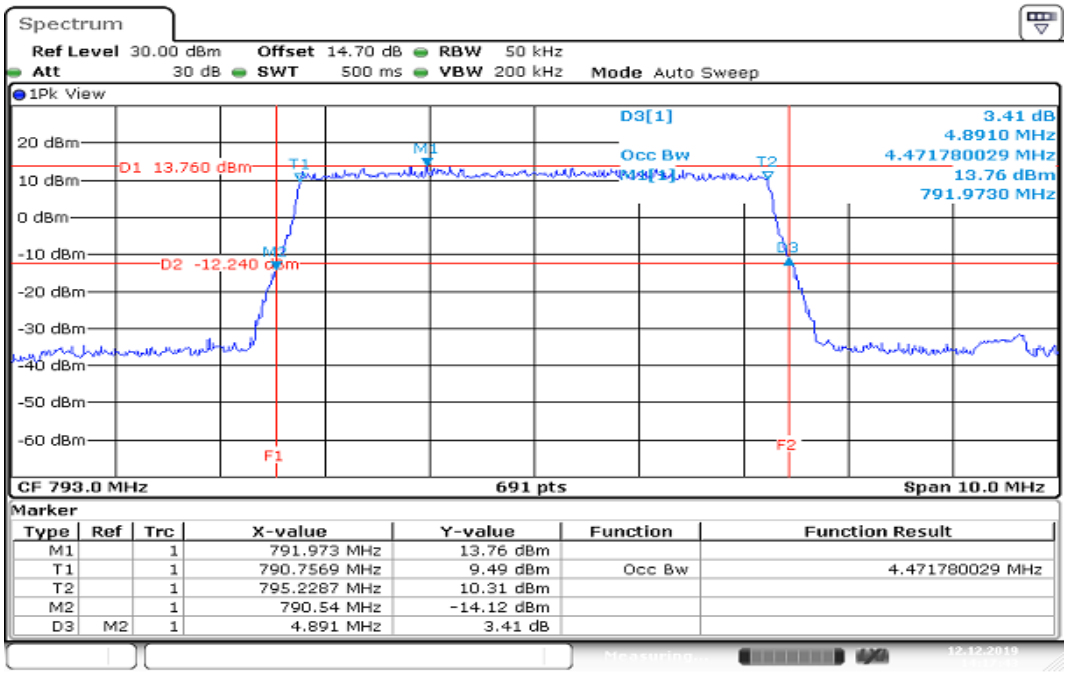
Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	OBW(99%)(MHz)	26 dB Bandwidth(MHz)
14	5	Middle	QPSK	25	0	4.4717	4.891
		Middle	16QAM	25	0	4.4717	4.834
	10	Middle	QPSK	50	0	8.9146	9.725
		Middle	16QAM	50	0	8.9146	9.609

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	1.0984	1.2981
		Middle	16QAM	6	0	1.0984	1.3068
	3	Middle	QPSK	15	0	2.6830	2.9132
		Middle	16QAM	15	0	2.6830	2.9653
	5	Middle	QPSK	25	0	4.4862	4.962
		Middle	16QAM	25	0	4.4862	4.89
	10	Middle	QPSK	50	0	8.9725	9.81
		Middle	16QAM	50	0	8.9435	9.608

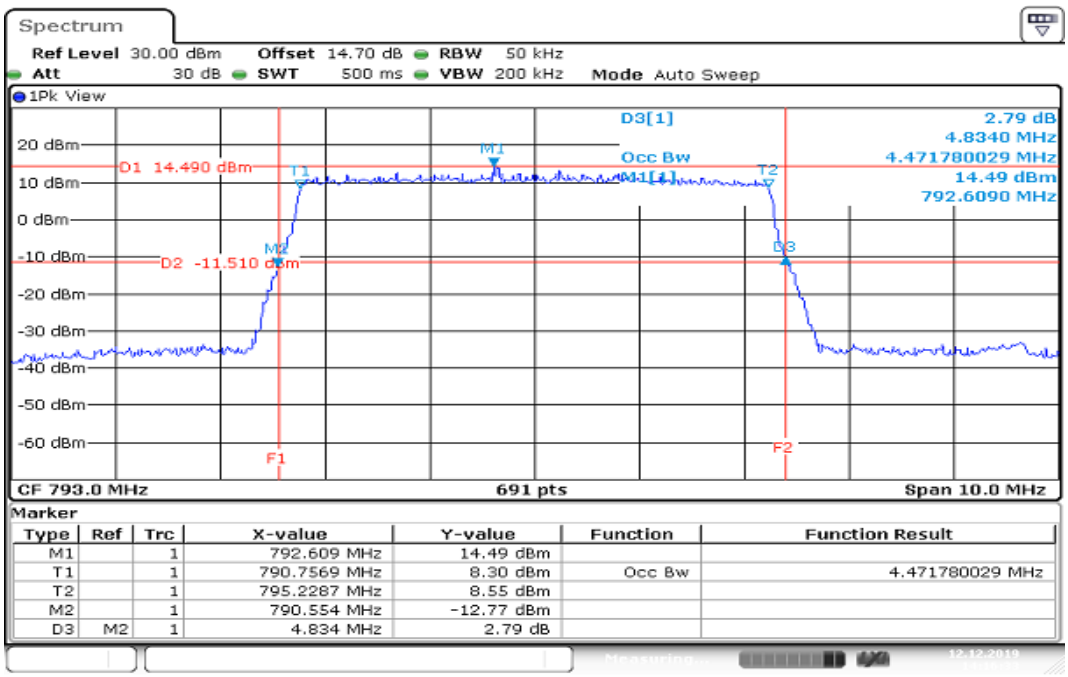
LTE Band 14

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



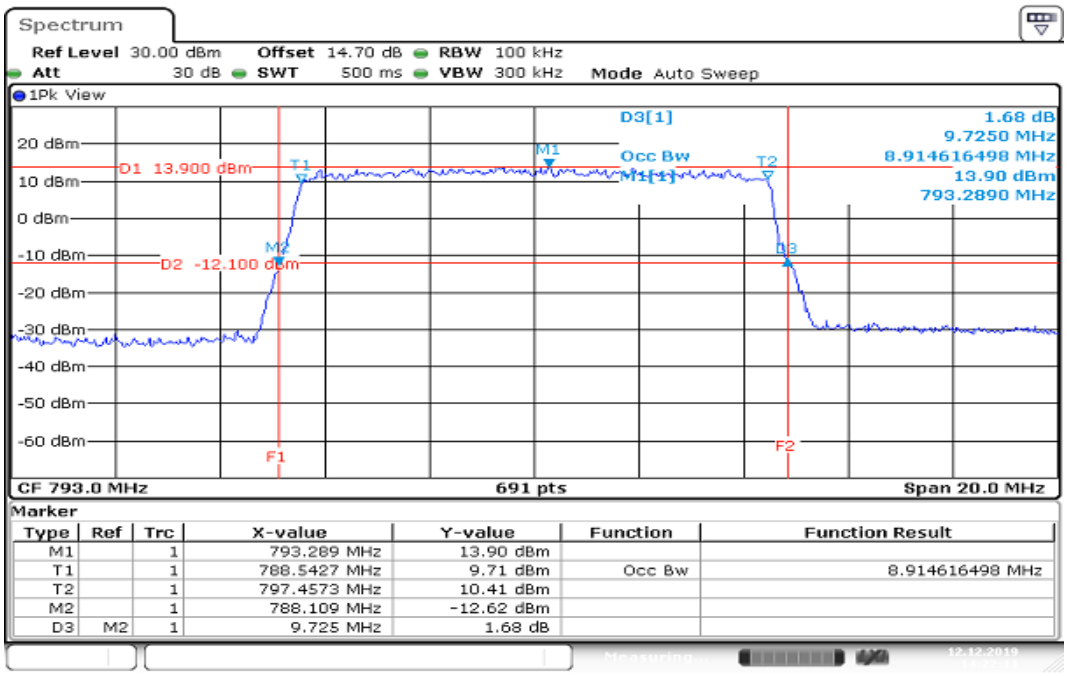
Date: 12.DEC.2019 14:17:43

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



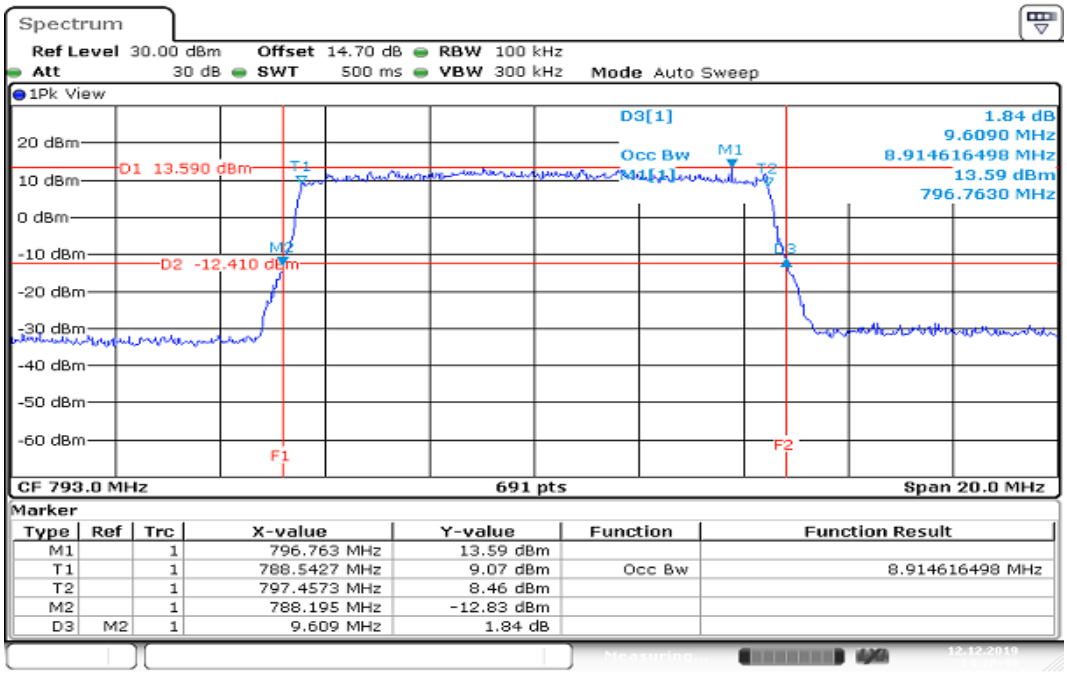
Date: 12.DEC.2019 14:16:33

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



Date: 12.DEC.2019 14:22:11

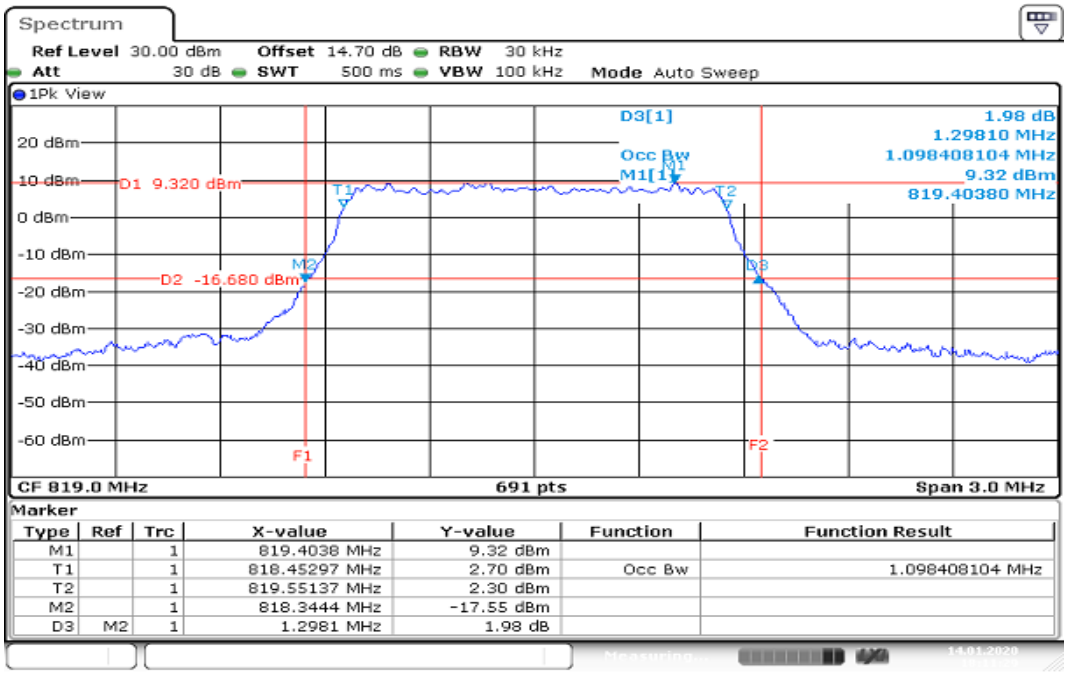
BW: 10MHz / 16QAM / RB =50, RB Offset = 0
CH Mid



Date: 12.DEC.2019 14:20:48

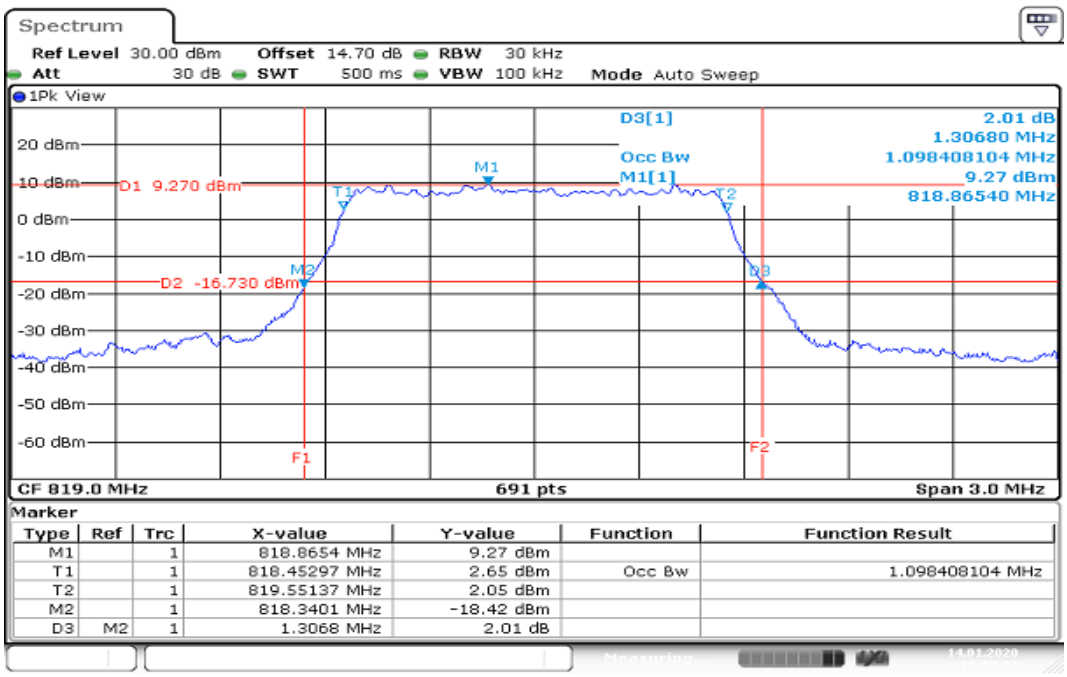
LTE Band 26

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



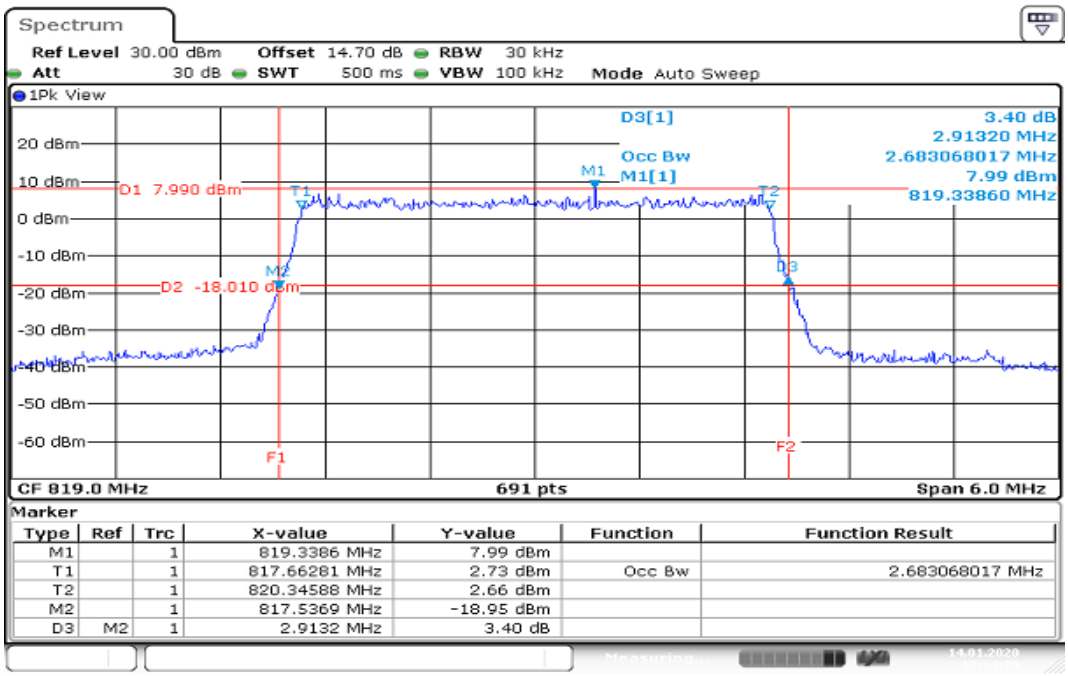
Date: 14.JAN.2020 18:11:29

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



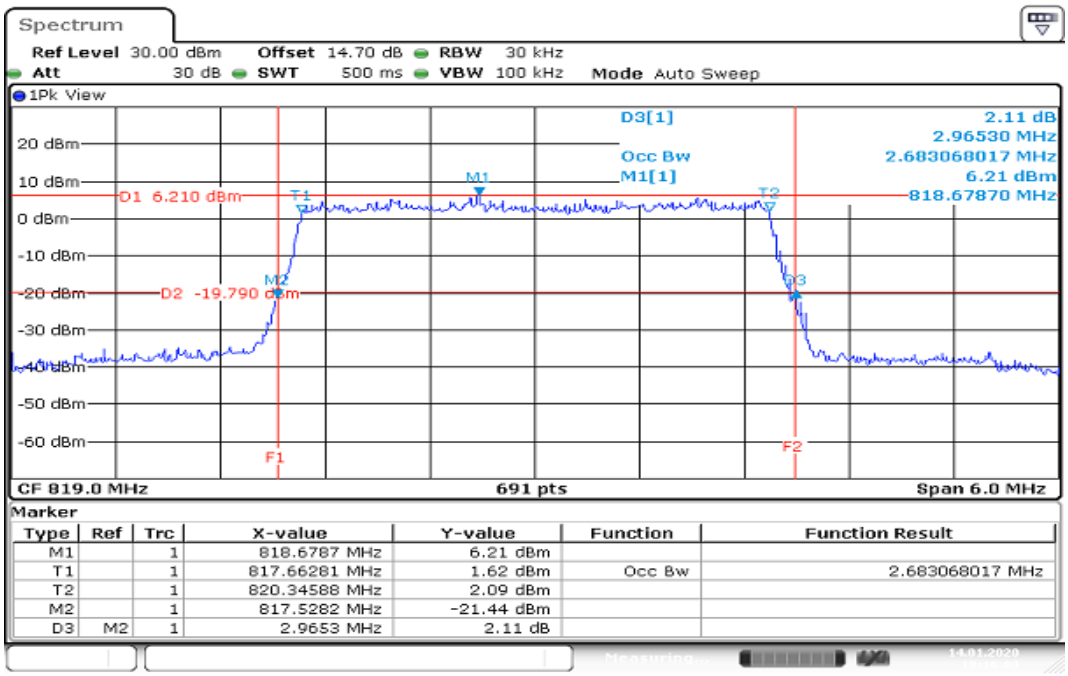
Date: 14.JAN.2020 18:09:57

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



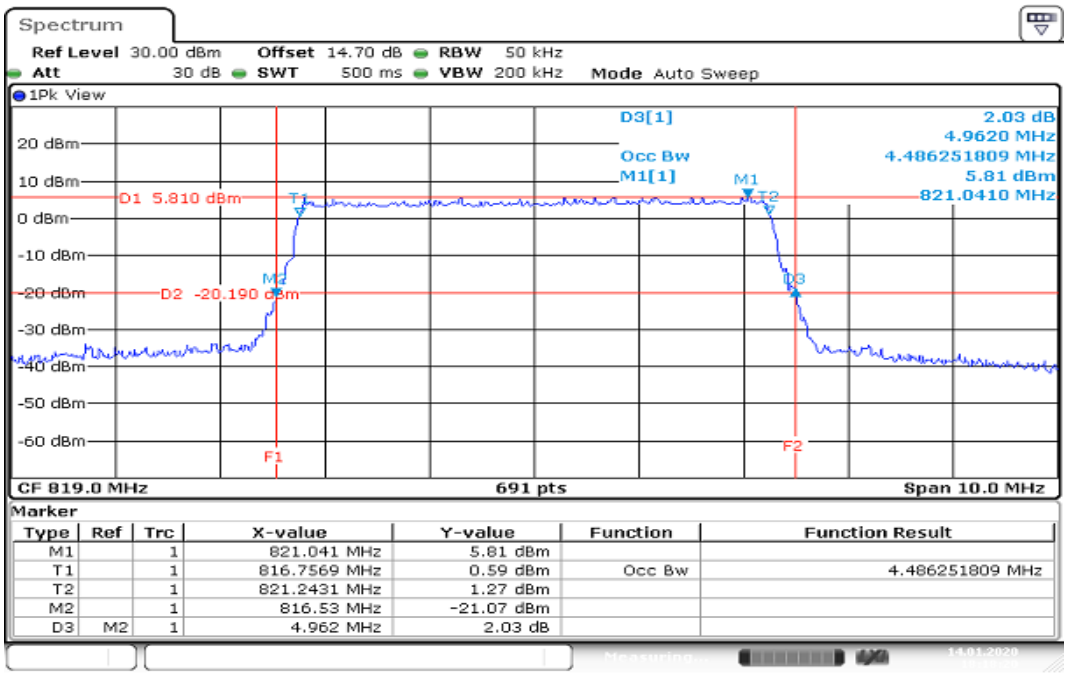
Date: 14.JAN.2020 18:14:35

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



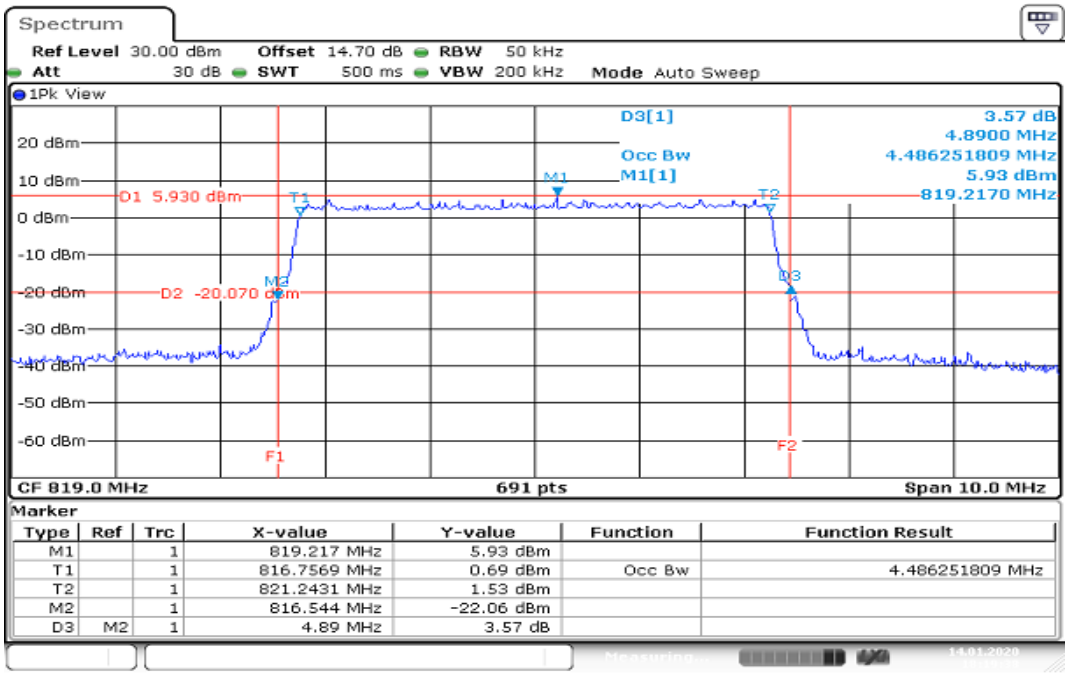
Date: 14.JAN.2020 18:16:00

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



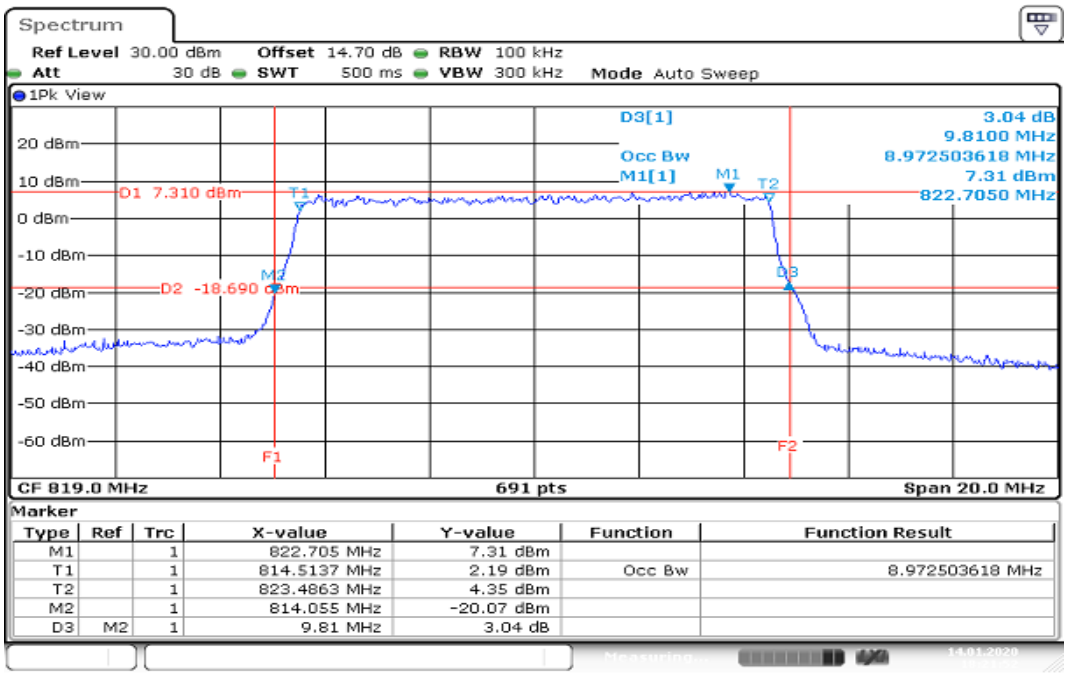
Date: 14.JAN.2020 18:18:20

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



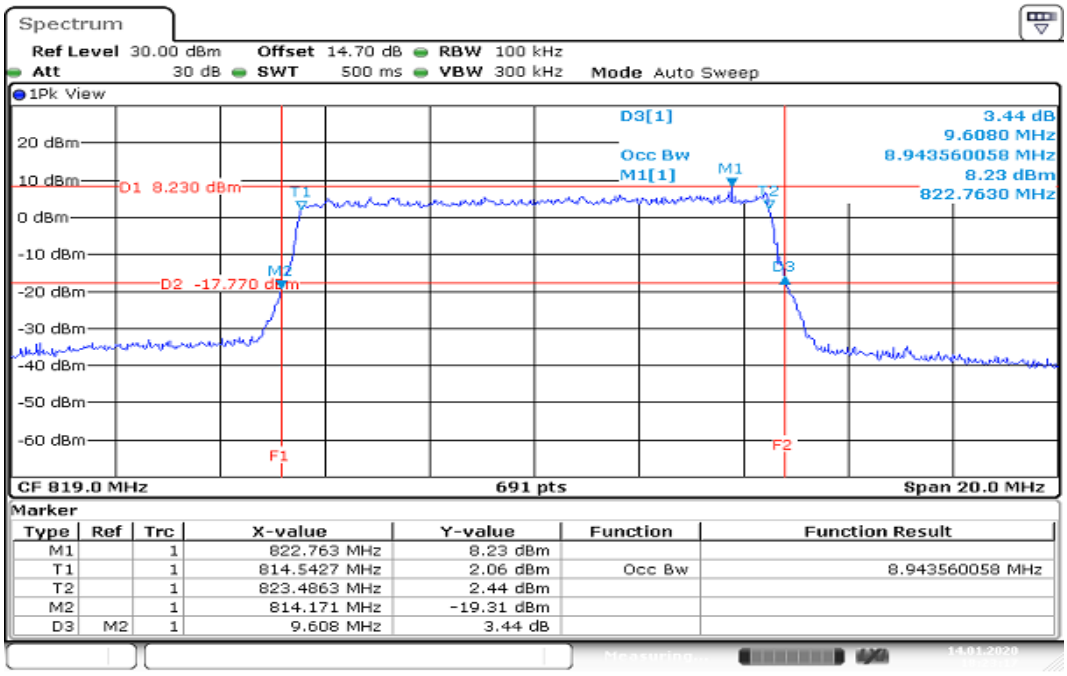
Date: 14.JAN.2020 18:19:38

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



Date: 14.JAN.2020 18:21:52

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



Date: 14.JAN.2020 18:23:17

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 14

CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23330	793.0	4.64

CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23330	793.0	5.51

CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23330	793.0	4.87

CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23330	793.0	5.77

CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23330	793.0	4.84

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23330	793.0	5.80

CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23330	793.0	4.84

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23330	793.0	5.80

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

LTE Band 26

CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	4.52

CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	5.39

CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	4.58

CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	5.16

CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	4.52

CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	5.45

CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	4.20

CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	4.81

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)
26740	819	5.04

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	5.80

CHANNEL BANDWIDTH: 3MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	4.78

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	5.59

CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	4.78

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	5.65

CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	4.78

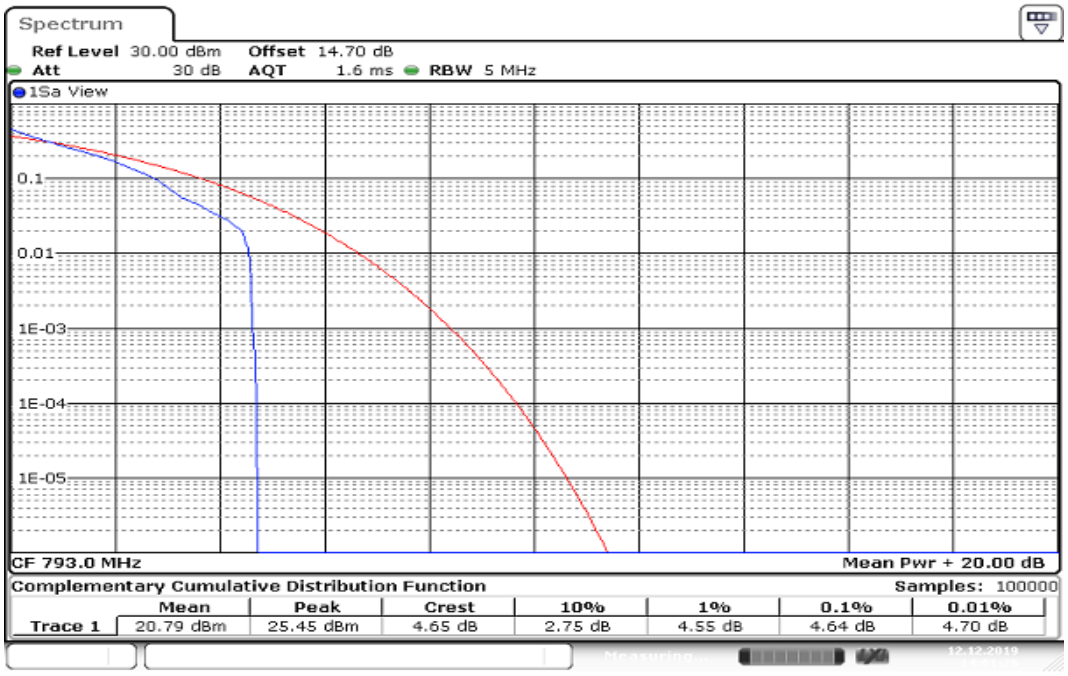
CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
26740	819	5.74

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

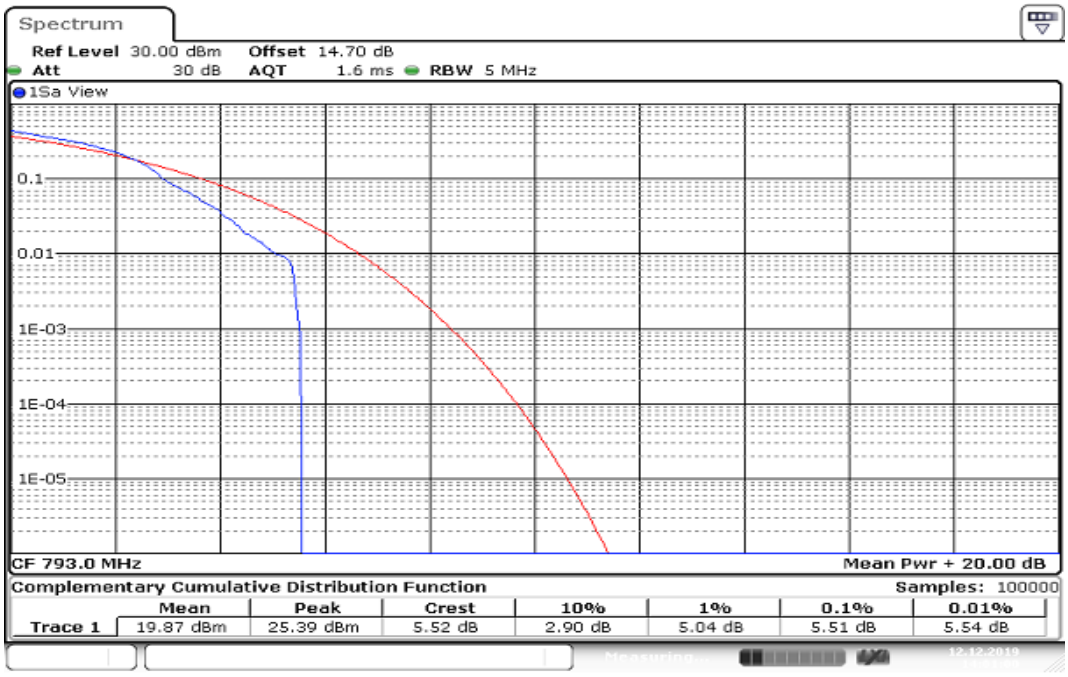
LTE Band 14

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



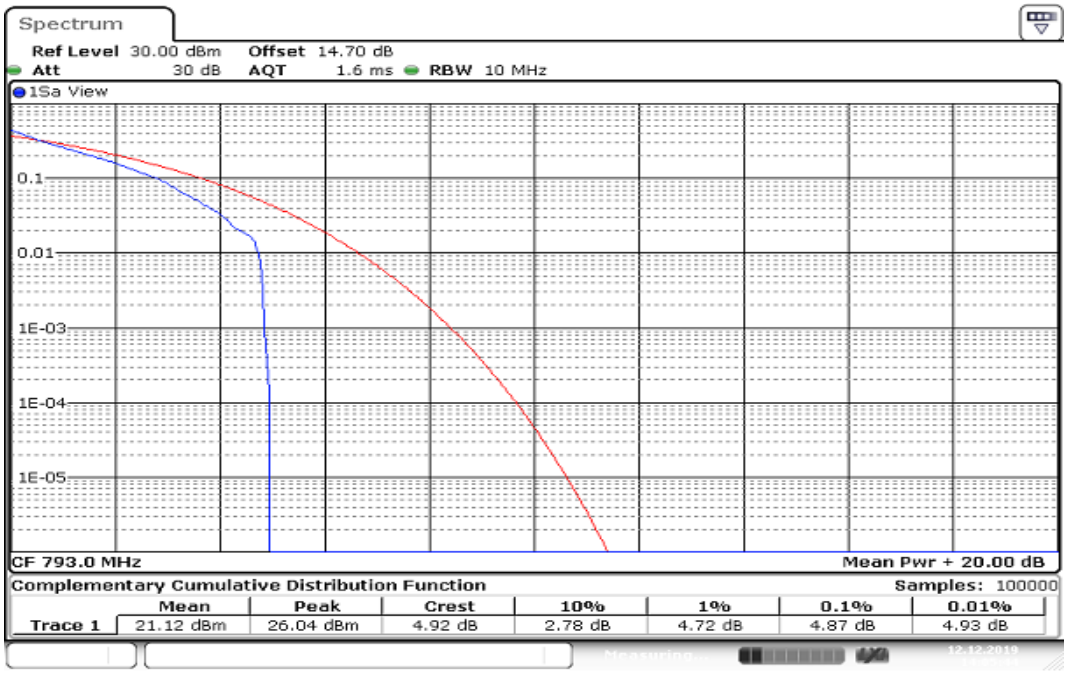
Date: 12.DEC.2019 14:01:26

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



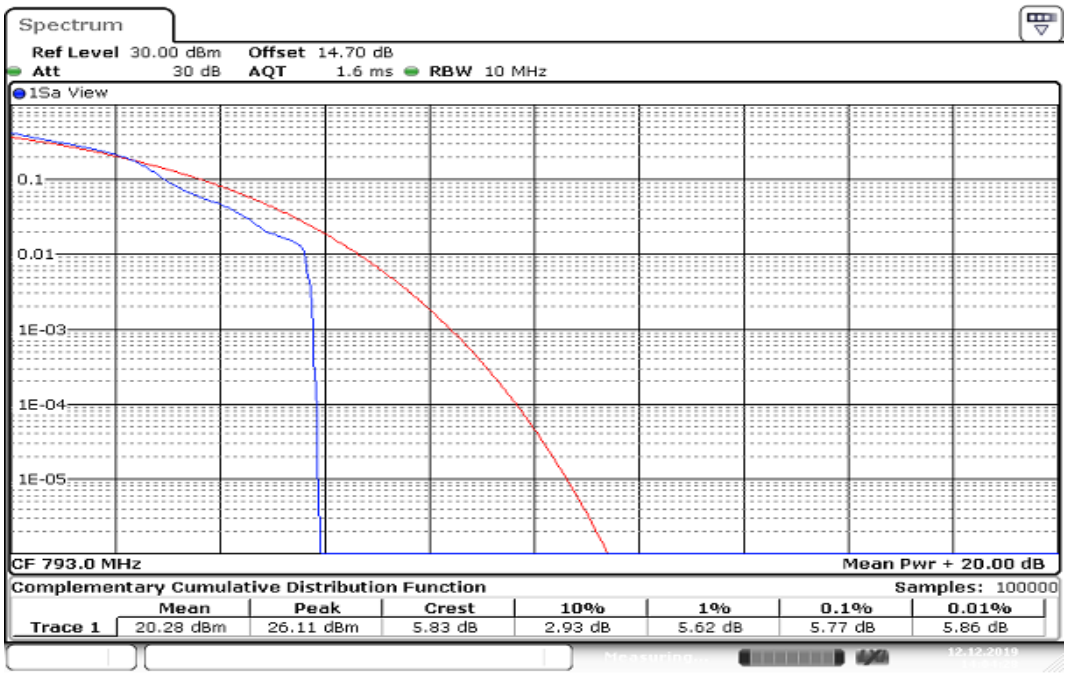
Date: 12.DEC.2019 14:01:00

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



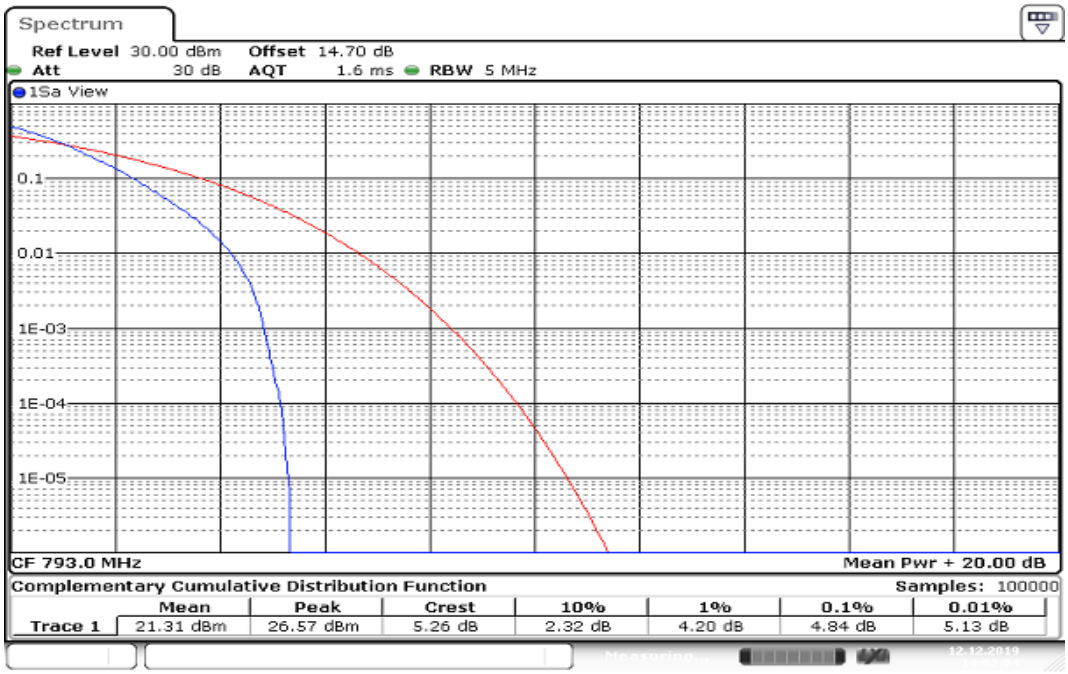
Date: 12.DEC.2019 14:05:44

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



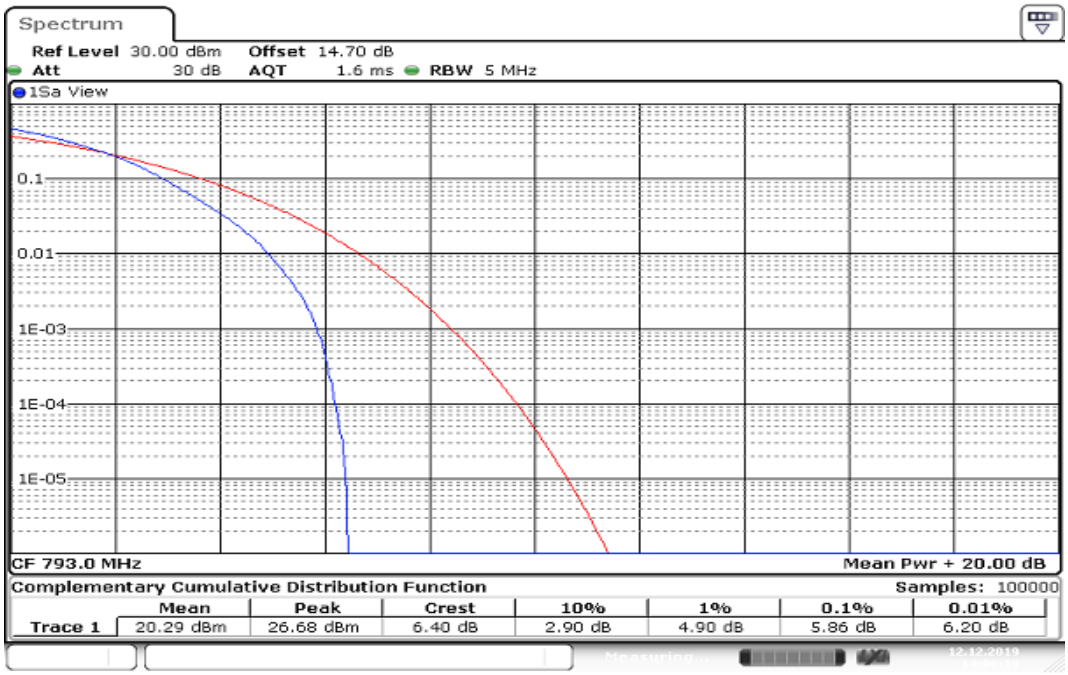
Date: 12.DEC.2019 14:04:28

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



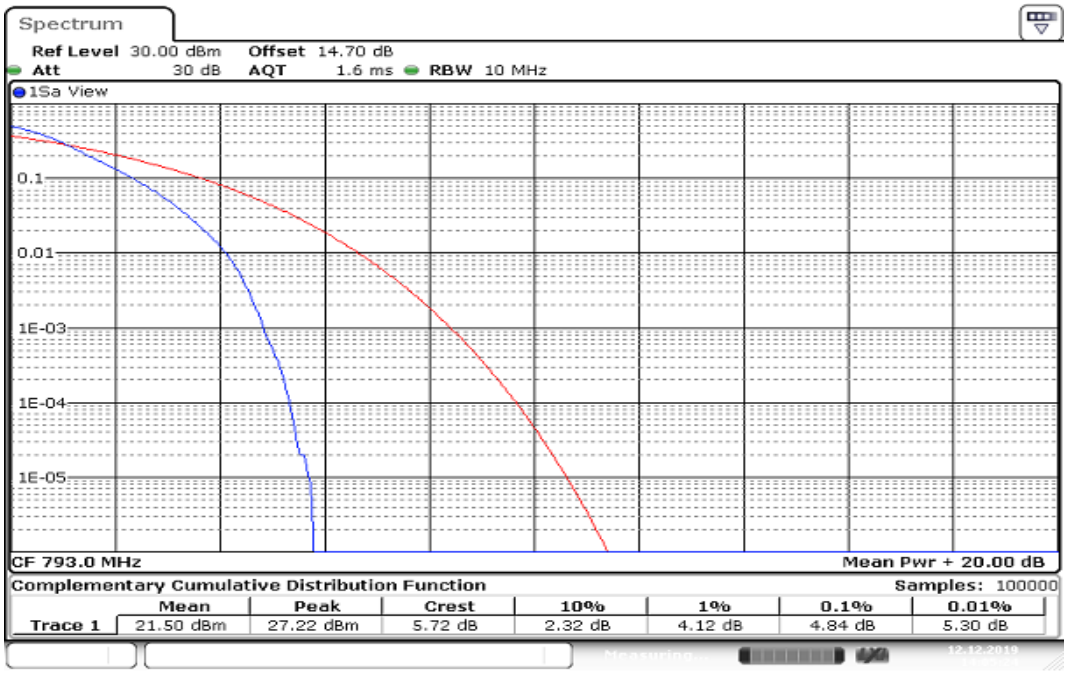
Date: 12.DEC.2019 14:02:04

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



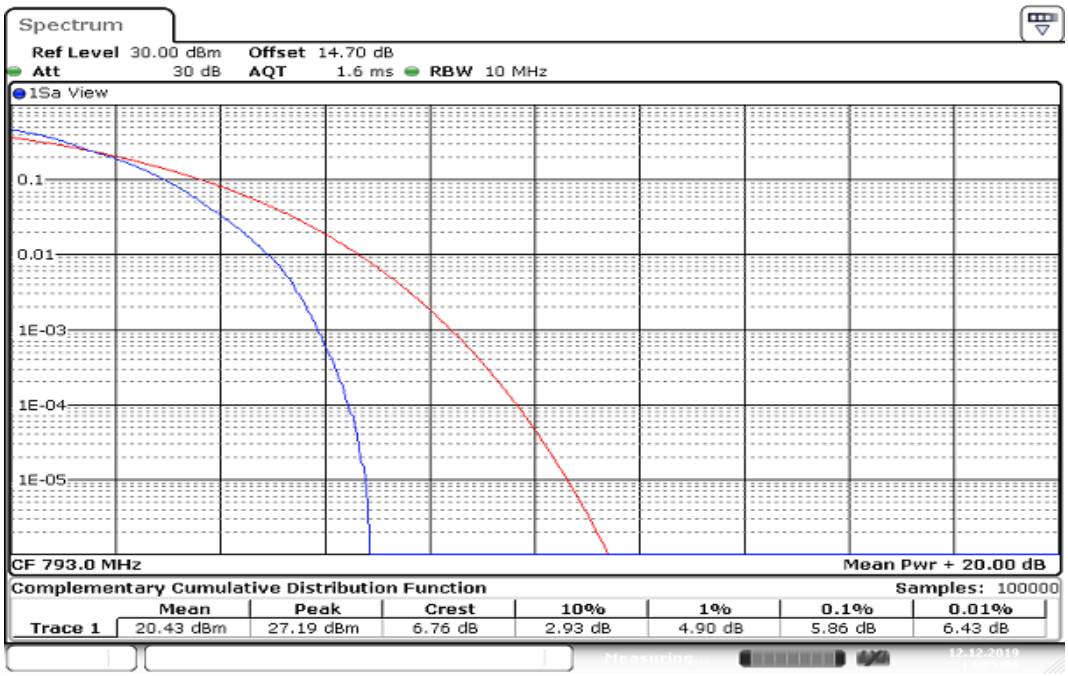
Date: 12.DEC.2019 14:00:18

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



Date: 12.DEC.2019 14:05:24

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

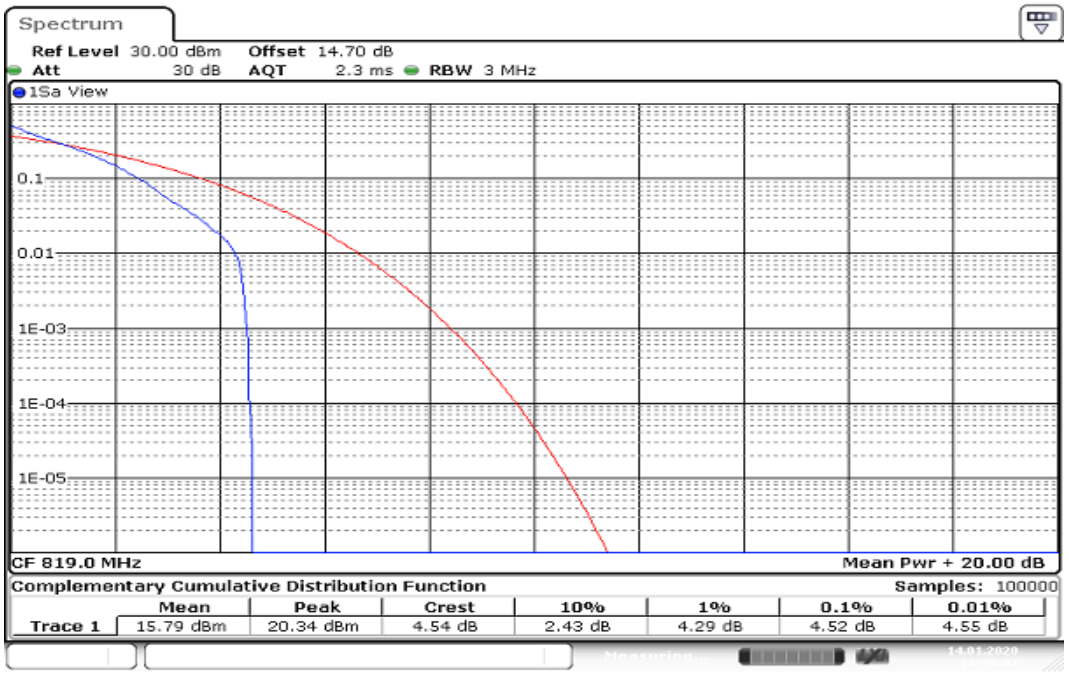


Date: 12.DEC.2019 14:05:06

LTE Band 26

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

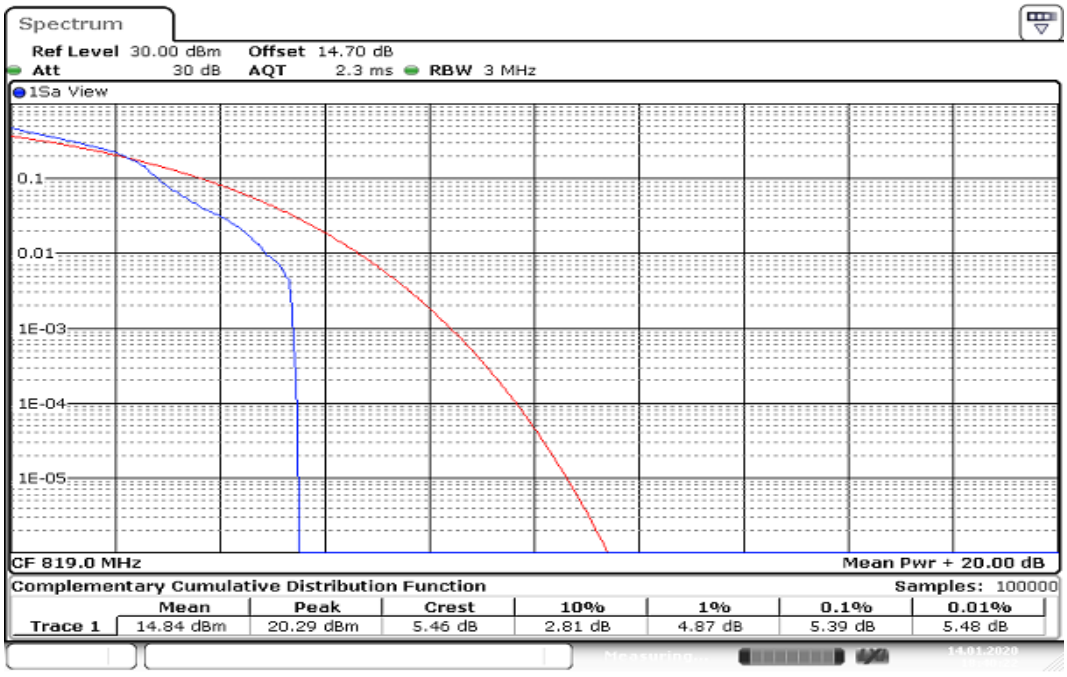
CH Mid



Date: 14.JAN.2020 18:39:42

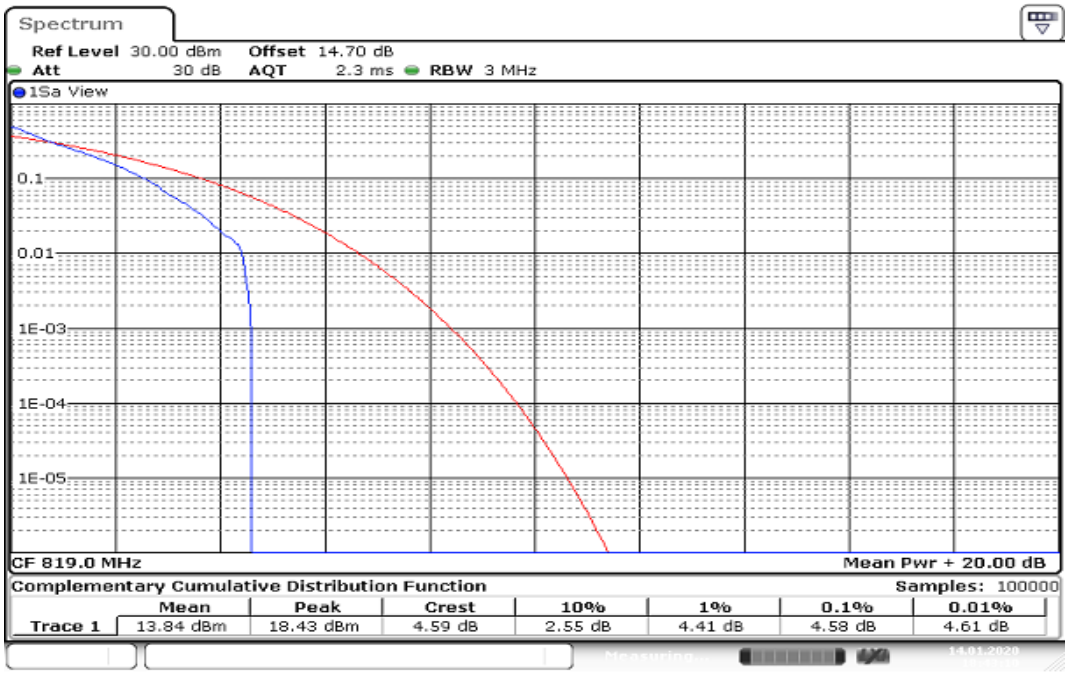
BW: 1.4MHz / 16QAM / RB =1, RB Offset = 0

CH Mid



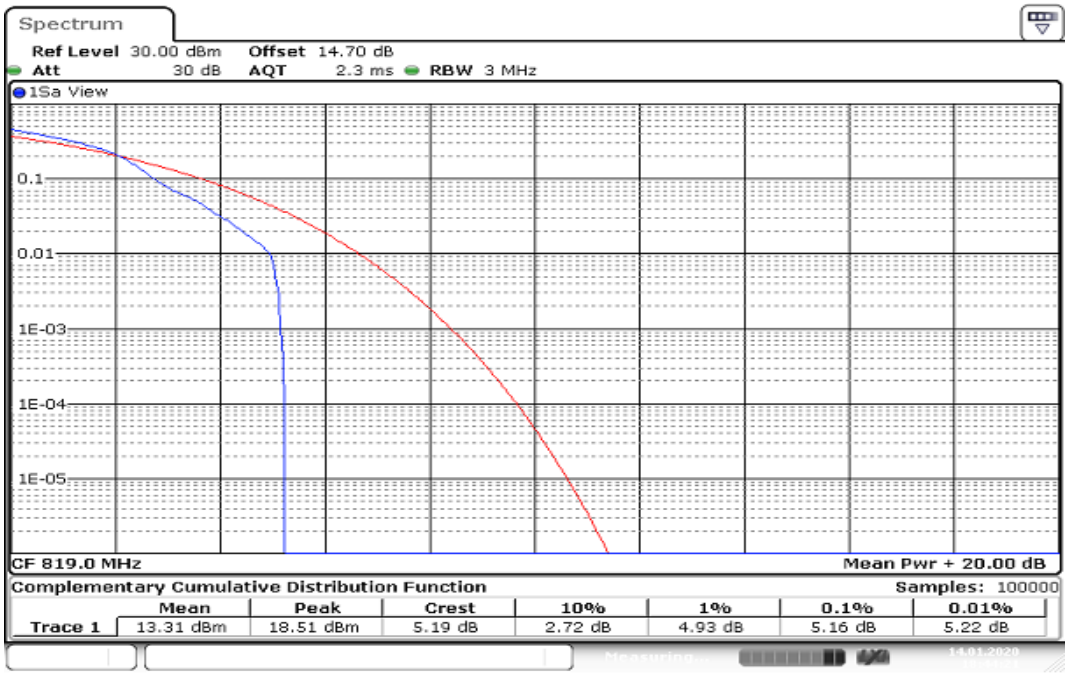
Date: 14.JAN.2020 18:40:22

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



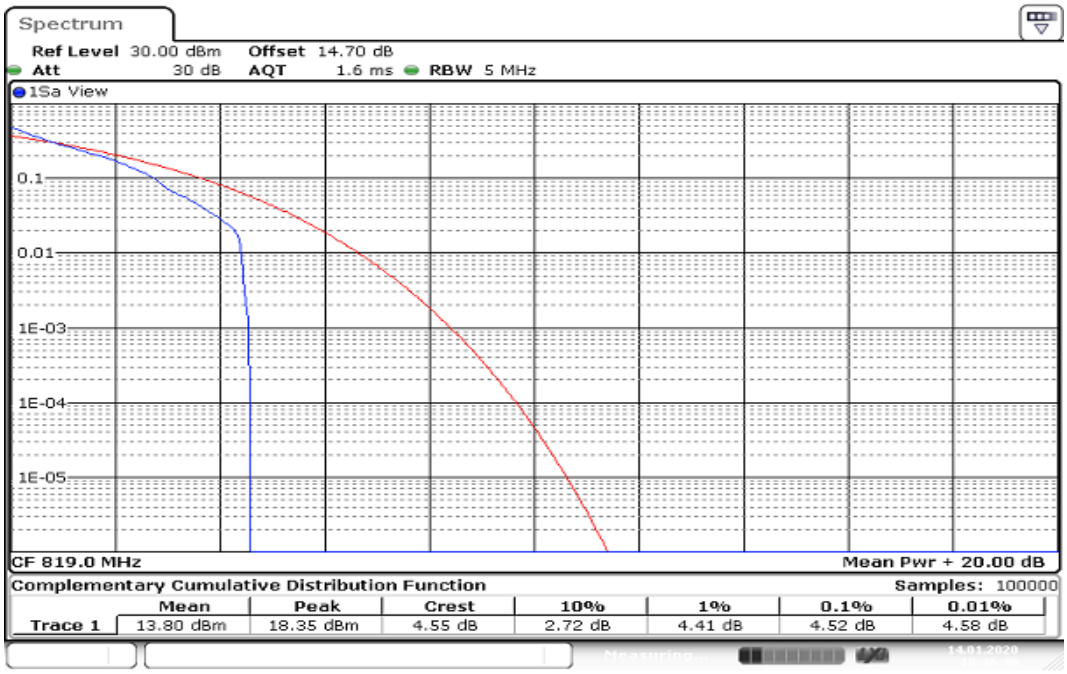
Date: 14.JAN.2020 18:43:10

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



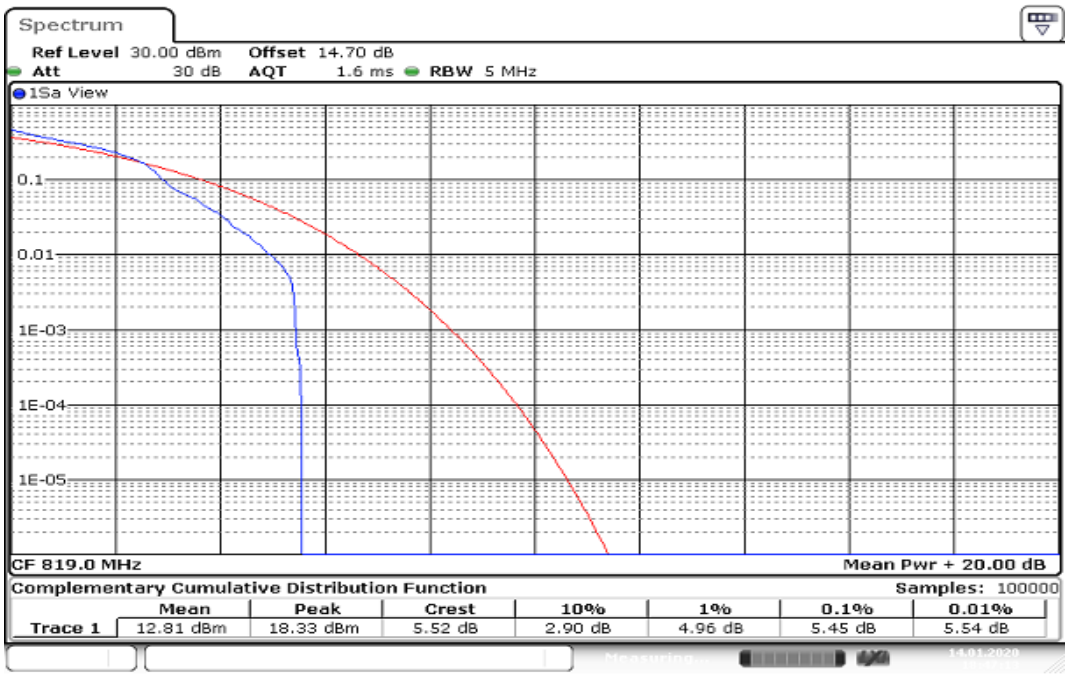
Date: 14.JAN.2020 18:44:21

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



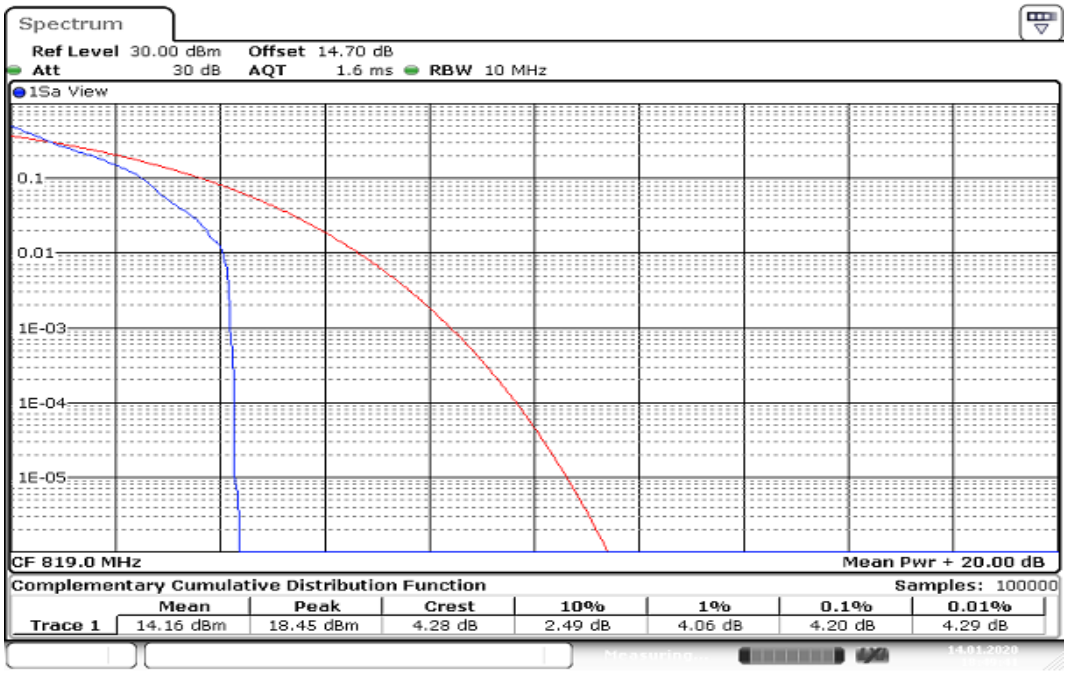
Date: 14.JAN.2020 18:46:36

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



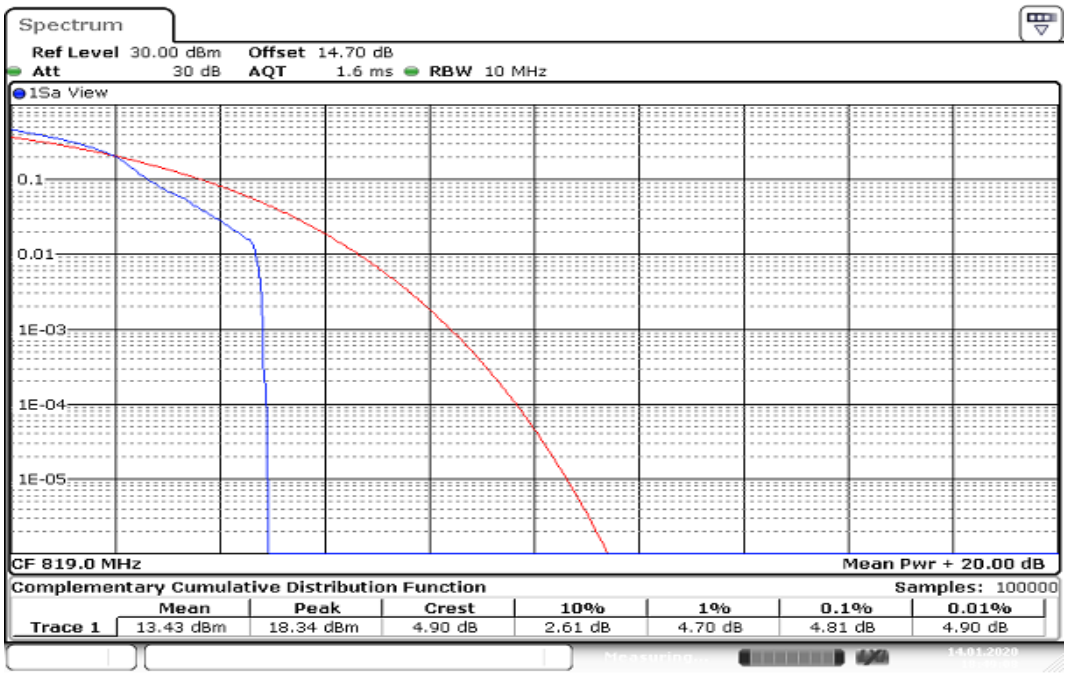
Date: 14.JAN.2020 18:47:13

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



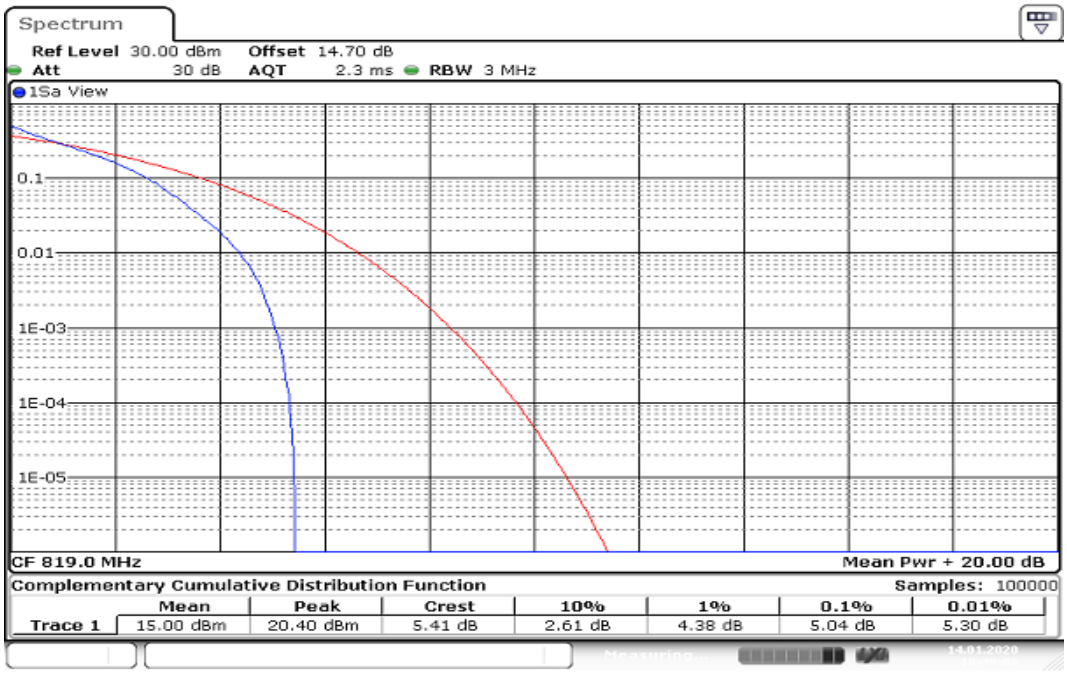
Date: 14.JAN.2020 18:49:41

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



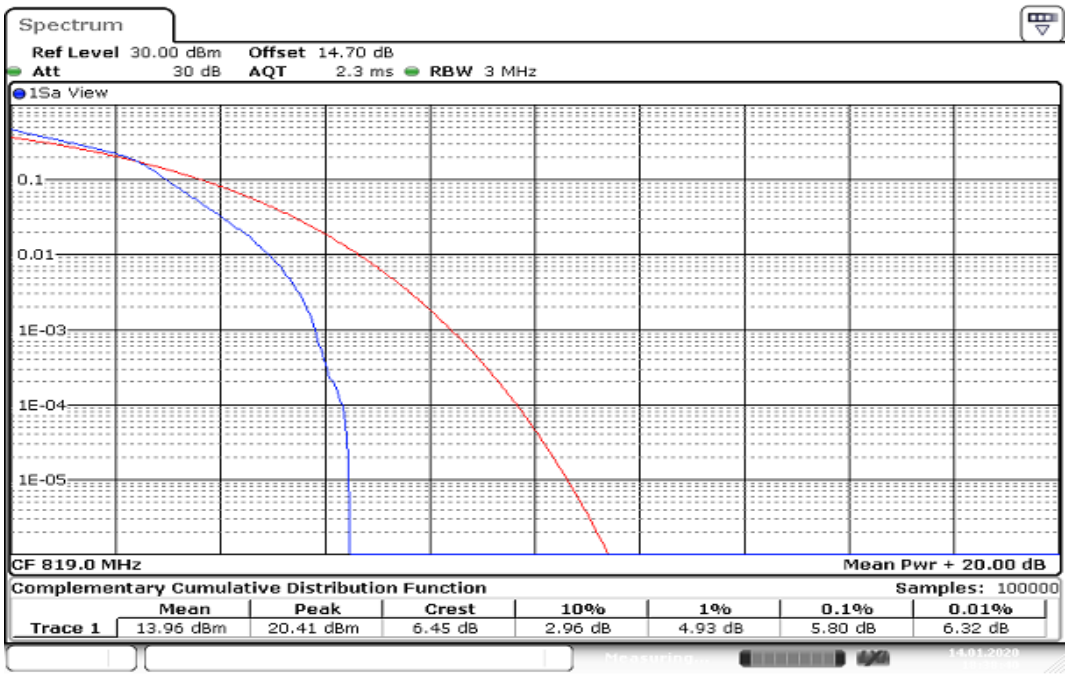
Date: 14.JAN.2020 18:49:08

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



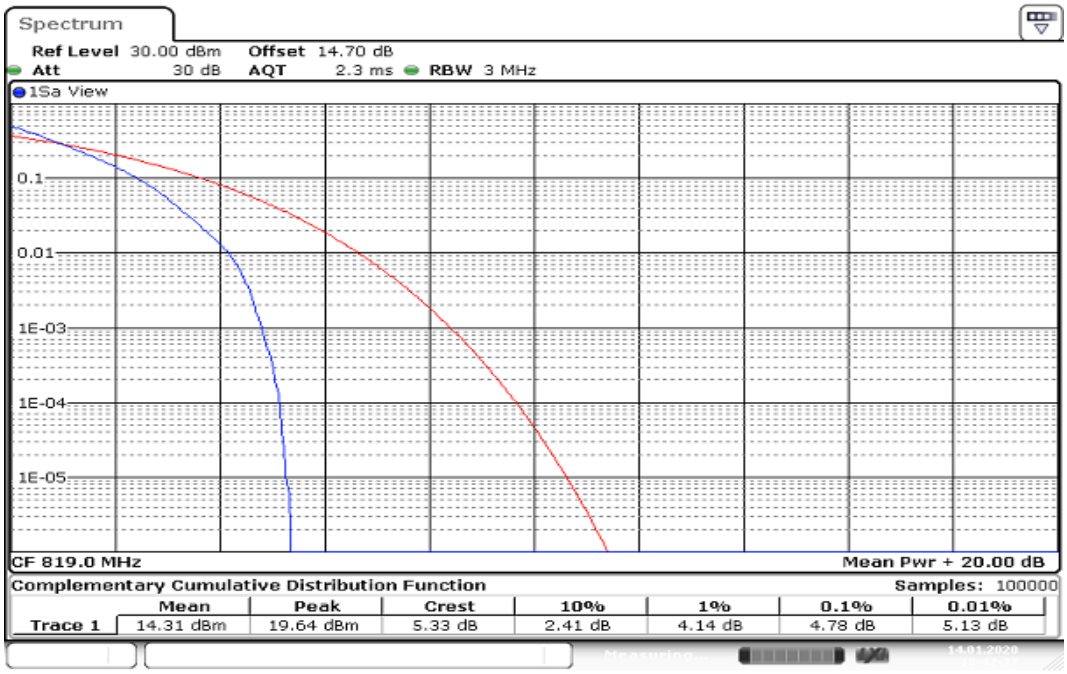
Date: 14.JAN.2020 18:39:08

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



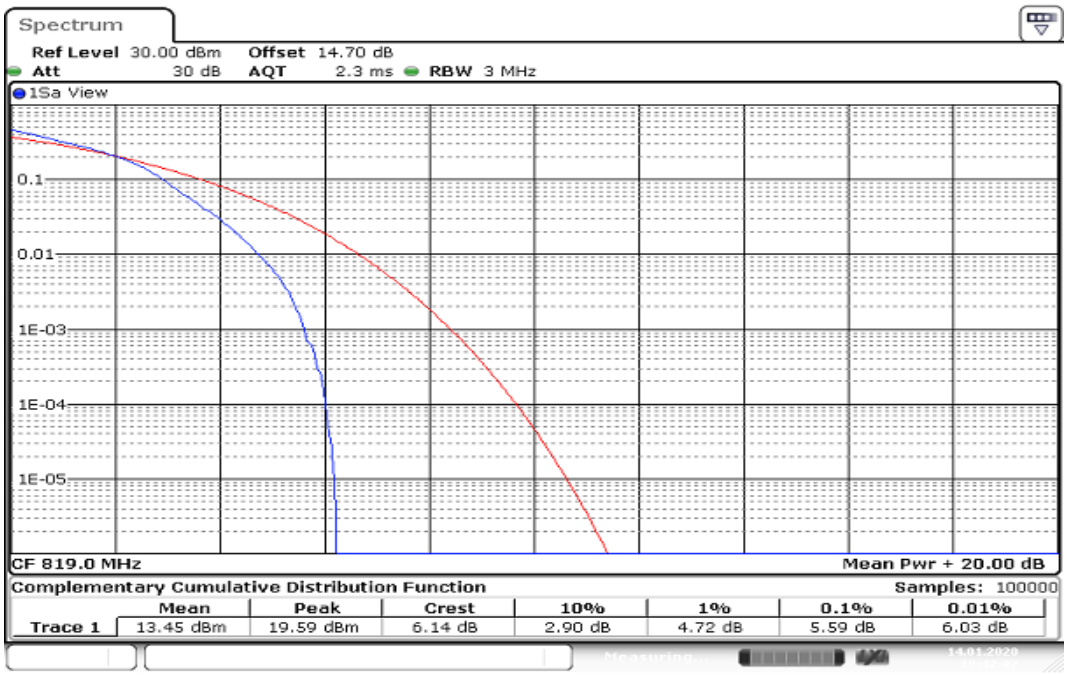
Date: 14.JAN.2020 18:38:40

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



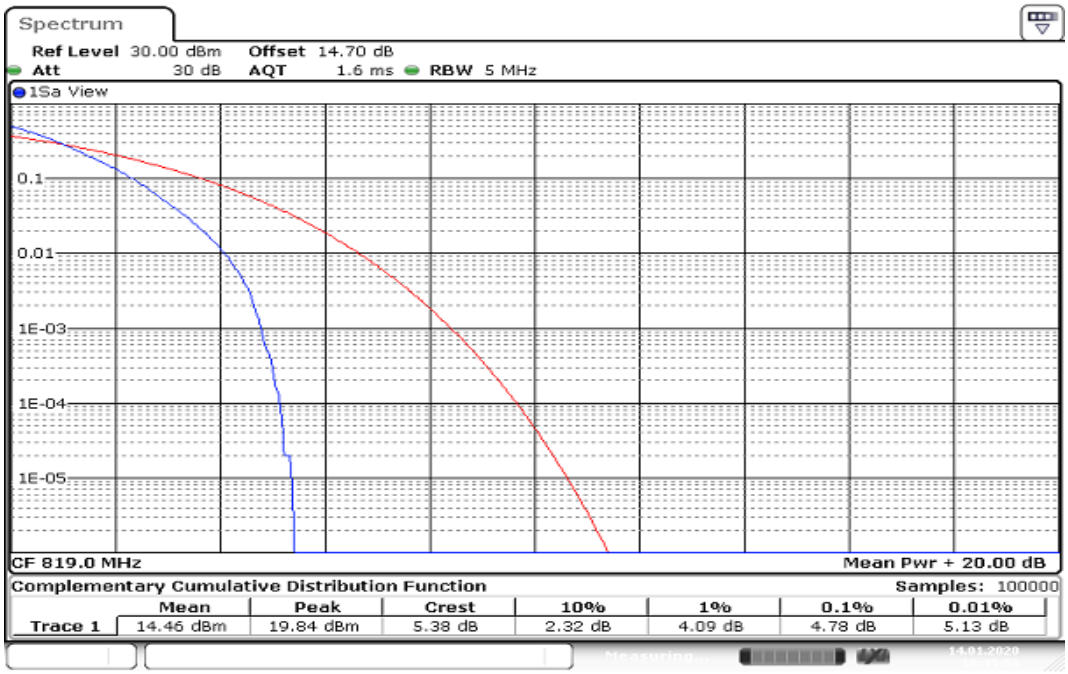
Date: 14.JAN.2020 18:42:37

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



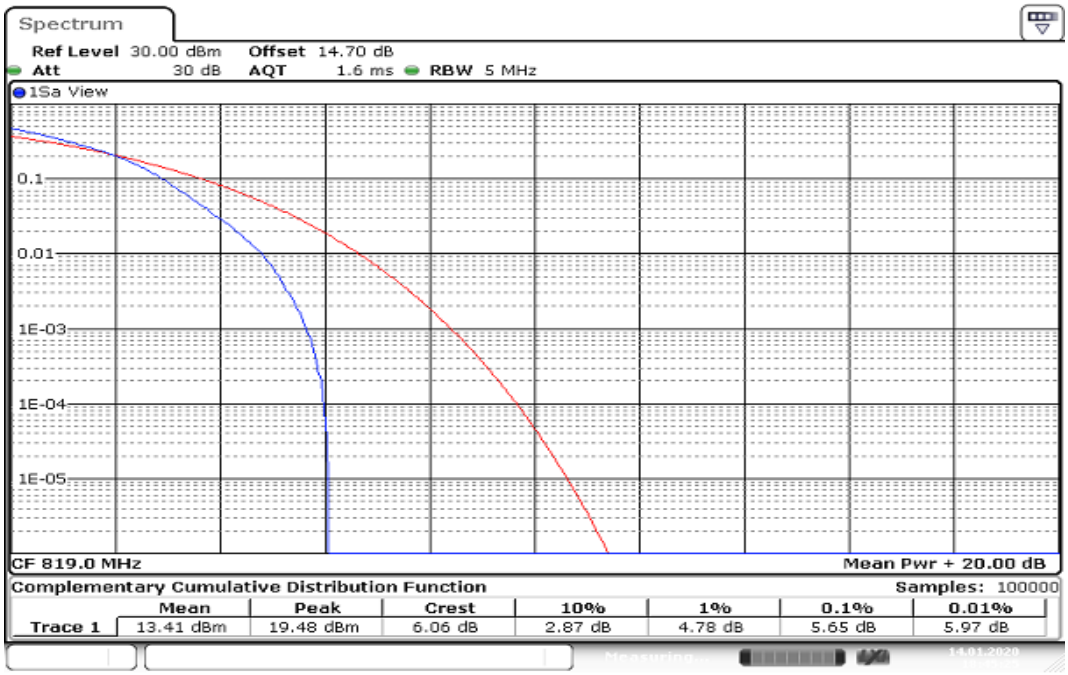
Date: 14.JAN.2020 18:42:02

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



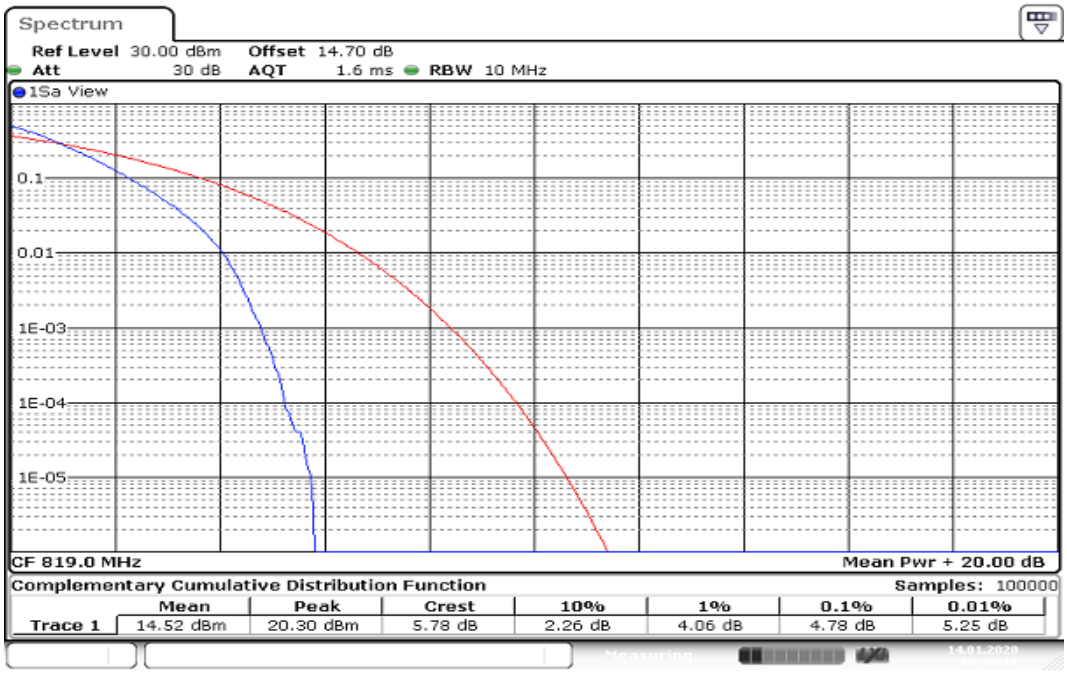
Date: 14.JAN.2020 18:45:58

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



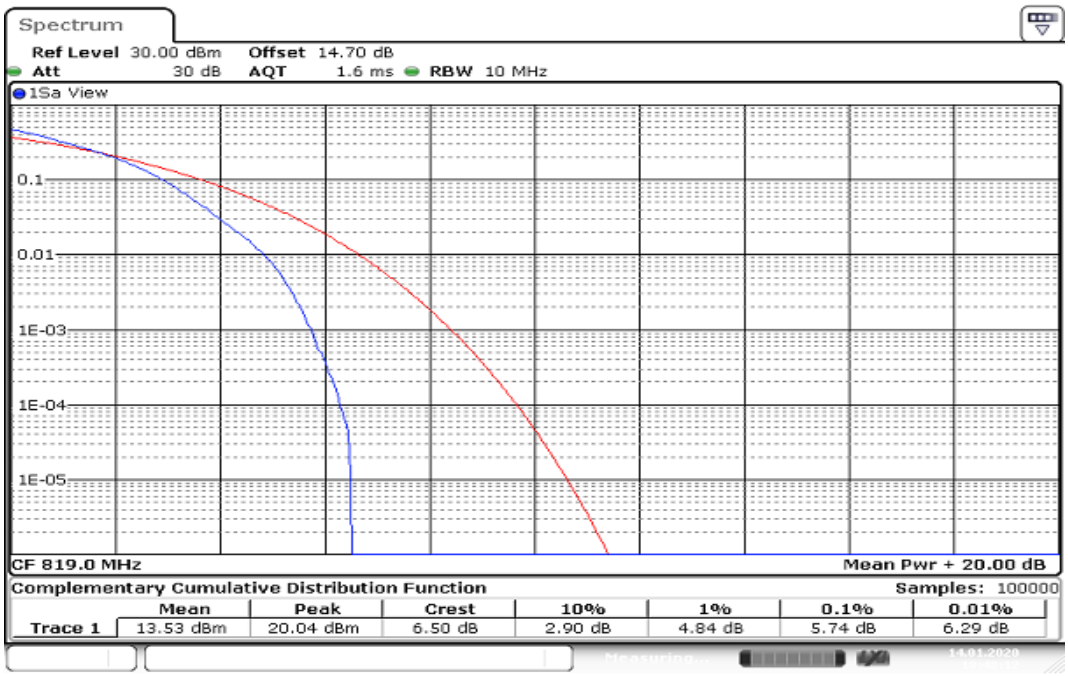
Date: 14.JAN.2020 18:45:25

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



Date: 14.JAN.2020 18:50:17

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



Date: 14.JAN.2020 18:48:12