FCC 47 CFR PART 27 SUBPART C, L
&
INDUSTRY CANADA RSS-130

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 6 ~ 18, 2019

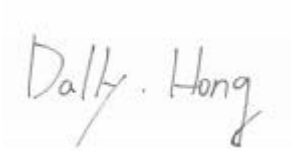
APPLICABLE STANDARDS	
Standard	**TEST RESULT**
FCC Part 27, Subpart C, L, FCC Part 2 & RSS-130 Issue 2 February 2019	No non-compliance noted
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

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	
Modulation Technology	LTE Band 12	QPSK, 16QAM
	LTE Band 17	QPSK, 16QAM
Frequency Range	LTE Band 12 Channel Bandwidth: 1.4MHz	669.7MHz ~ 715.3MHz
	LTE Band 12 Channel Bandwidth: 3MHz	700.5MHz ~ 714.5MHz
	LTE Band 12 Channel Bandwidth: 5MHz	701.5MHz ~ 713.5MHz
	LTE Band 12 Channel Bandwidth: 10MHz	704MHz ~ 711MHz
	LTE Band 17 Channel Bandwidth: 5MHz	706.5MHz ~ 713.5MHz
	LTE Band 17 Channel Bandwidth: 10MHz	709MHz ~ 711MHz
Transmit Power (ERP Power)	LTE Band 12 Channel Bandwidth: 1.4MHz	QPSK 18.54 dBm 16QAM 17.94 dBm
	LTE Band 12 Channel Bandwidth: 3MHz	QPSK 18.67 dBm 16QAM 18.02 dBm
	LTE Band 12 Channel Bandwidth: 5MHz	QPSK 18.87 dBm 16QAM 18.13 dBm
	LTE Band 12 Channel Bandwidth: 10MHz	QPSK 19.04 dBm 16QAM 18.23 dBm
	LTE Band 17 Channel Bandwidth: 5MHz	QPSK: 18.96 dBm 16QAM: 18.13 dBm
	LTE Band 17 Channel Bandwidth: 10MHz	QPSK: 19.04 dBm 16QAM: 18.23 dBm
Antenna Specification	Antenna type: Integral Band 12: -1.58 dBi Band 17: -1.58 dBi	

Note: *1. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.*

3. TEST METHODOLOGY

3.1 DESCRIPTION OF TEST TYPE

The EUT (model: N635) had been tested under operating condition.

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

LTE Band 12: 699 MHz ~ 716 MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	1.4MHz		3MHz		5MHz		10MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low CH	23017	699.7	23025	700.5	23035	701.5	23060	704
Middle CH	23095	707.5	23095	707.5	23095	707.5	23095	707.5
High CH	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 17: 704 MHz ~ 716 MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	5MHz		10MHz	
	Channel	Frequency(MHz)	Channel	Frequency(MHz)
Low channel (L)	23755	706.5	23780	709.0
Middle channel (M)	23790	710.0	23790	710.0
High channel (H)	23825	713.5	23800	711.0

3.2 THE WORST MODE OF MEASUREMENT

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 SUMMARY

FCC Standard Section	IC Standard Section	Report Section	Test Item	Result
-	-	2	Antenna Requirement	Pass
27.50(c)	RSS-130, section 4.6	8.1	ERP and EIRP Measurement	Pass
2.1055, 27.54	RSS-130 section 4.3	8.2	Frequency Stability v.s. temperature measurement	Pass
2.1049	RSS-GEN 6.7	8.3	Occupied Bandwidth Measurement	Pass
27.50(b)	RSS-130 section 4.4	8.4	Peak to Average Ratio	Pass
27.53(g)	RSS-130 section 4.6	8.5	Conducted Band Edge	Pass
27.53(g)	RSS-130 section 4.6	8.6	Conducted Spurious Emission	Pass
27.53(g)	RSS-130 section 4.6	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., Luchu Hsiang, Taoyuan Hsien 338, Taiwan
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.”

7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I 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. TEST PROCEDURE AND RESULT

8.1 ERP & EIRP MEASUREMENT

LIMIT

According to FCC §2.1046

FCC 27.50 (c) (10): The portable stations (hand-held devices) in the 600MHz uplink band and the 698-746MHz band, and fixed and mobile stations in the 600MHz uplink band are limited to 3 Watts ERP.

RSS-130 § 4.6,
The e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

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.

TEST RESULTS
LTE Band 12

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
10	QPSK	1 RB	0	704	23060	22.68	18.95
				707.5	23095	**22.77**	19.04
				711	23130	22.55	18.82
			25	704	23060	22.28	18.55
				707.5	23095	22.23	18.50
				711	23130	22.37	18.64
			49	704	23060	22.63	18.90
				707.5	23095	22.53	18.80
				711	23130	22.51	18.78
		25 RB	0	704	23060	21.63	17.90
				707.5	23095	21.41	17.68
				711	23130	21.53	17.80
			12	704	23060	21.55	17.82
				707.5	23095	21.37	17.64
				711	23130	21.55	17.82
			25	704	23060	21.5	17.77
				707.5	23095	**21.64**	17.91
				711	23130	21.44	17.71
		50RB		704	23060	21.56	17.83
				707.5	23095	**21.57**	17.84
				711	23130	21.46	17.73
10	16-QAM	1 RB	0	704	23060	21.94	18.21
				707.5	23095	21.92	18.19
				711	23130	21.96	18.23
			25	704	23060	21.79	18.06
				707.5	23095	21.66	17.93
				711	23130	21.79	18.06
			49	704	23060	21.94	18.21
				707.5	23095	21.89	18.16
				711	23130	21.88	18.15
		25 RB	0	704	23060	20.6	16.87
				707.5	23095	20.44	16.71
				711	23130	20.54	16.81
			12	704	23060	20.5	16.77
				707.5	23095	20.4	16.67
				711	23130	20.5	16.77
			25	704	23060	20.52	16.79
				707.5	23095	20.43	16.70
				711	23130	20.57	16.84
		50RB		704	23060	20.62	16.89
				707.5	23095	20.53	16.80
				711	23130	20.56	16.83

10	64-QAM	1 RB	0	704	23060	20.93	17.20
				707.5	23095	20.75	17.02
				711	23130	20.8	17.07
			25	704	23060	20.61	16.88
				707.5	23095	20.46	16.73
				711	23130	20.67	16.94
			49	704	23060	20.94	17.21
				707.5	23095	20.78	17.05
				711	23130	20.92	17.19
		25 RB	0	704	23060	19.59	15.86
				707.5	23095	19.44	15.71
				711	23130	19.56	15.83
			12	704	23060	19.5	15.77
				707.5	23095	19.4	15.67
				711	23130	19.5	15.77
			25	704	23060	19.55	15.82
				707.5	23095	19.48	15.75
				711	23130	19.59	15.86
		50RB		704	23060	19.52	15.79
				707.5	23095	19.5	15.77
				711	23130	19.53	15.80

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
5	QPSK	1 RB	0	701.5	23035	22.60	18.87
				707.5	23095	22.44	18.71
				713.5	23155	22.53	18.80
			12	701.5	23035	22.05	18.32
				707.5	23095	22.15	18.42
				713.5	23155	22.18	18.45
			24	701.5	23035	22.48	18.75
				707.5	23095	22.39	18.66
				713.5	23155	22.30	18.57
		12 RB	0	701.5	23035	21.43	17.70
				707.5	23095	21.29	17.56
				713.5	23155	21.41	17.68
			6	701.5	23035	21.44	17.71
				707.5	23095	21.23	17.50
				713.5	23155	21.43	17.70
			13	701.5	23035	21.29	17.56
				707.5	23095	21.20	17.47
				713.5	23155	21.55	17.82
		25RB		701.5	23035	21.49	17.76
				707.5	23095	21.41	17.68
				713.5	23155	21.48	17.75
5	16-QAM	1 RB	0	701.5	23035	21.86	18.13
				707.5	23095	21.77	18.04
				713.5	23155	21.83	18.10
			12	701.5	23035	21.70	17.97
				707.5	23095	21.52	17.79
				713.5	23155	21.65	17.92
			24	701.5	23035	21.86	18.13
				707.5	23095	21.84	18.11
				713.5	23155	21.67	17.94
		12 RB	0	701.5	23035	20.41	16.68
				707.5	23095	20.23	16.50
				713.5	23155	20.39	16.66
			6	701.5	23035	20.31	16.58
				707.5	23095	20.30	16.57
				713.5	23155	20.37	16.64
			13	701.5	23035	20.31	16.58
				707.5	23095	20.29	16.56
				713.5	23155	20.44	16.71
		25RB		701.5	23035	20.50	16.77
				707.5	23095	20.35	16.62
				713.5	23155	20.40	16.67

5	64-QAM	1 RB	0	701.5	23035	20.85	17.12
				707.5	23095	20.52	16.79
				713.5	23155	20.62	16.89
			12	701.5	23035	20.44	16.71
				707.5	23095	20.28	16.55
				713.5	23155	20.60	16.87
			24	701.5	23035	20.70	16.97
				707.5	23095	20.69	16.96
				713.5	23155	20.79	17.06
		12 RB	0	701.5	23035	19.38	15.65
				707.5	23095	19.34	15.61
				713.5	23155	19.44	15.71
			6	701.5	23035	19.37	15.64
				707.5	23095	19.16	15.43
				713.5	23155	19.43	15.70
			13	701.5	23035	19.40	15.67
				707.5	23095	19.42	15.69
				713.5	23155	19.45	15.72
		25RB		701.5	23035	19.42	15.69
				707.5	23095	19.30	15.57
				713.5	23155	19.46	15.73

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
3	QPSK	1 RB	0	700.5	23025	22.40	18.67
				707.5	23095	22.25	18.52
				714.5	23165	22.32	18.59
			7	700.5	23025	21.91	18.18
				707.5	23095	21.99	18.26
				714.5	23165	22.12	18.39
			14	700.5	23025	22.25	18.52
				707.5	23095	22.33	18.60
				714.5	23165	22.25	18.52
		8 RB	0	700.5	23025	21.24	17.51
				707.5	23095	21.23	17.50
				714.5	23165	21.35	17.62
			4	700.5	23025	21.28	17.55
				707.5	23095	21.17	17.44
				714.5	23165	21.24	17.51
			7	700.5	23025	21.06	17.33
				707.5	23095	21.03	17.30
				714.5	23165	21.36	17.63
		15RB		700.5	23025	21.28	17.55
				707.5	23095	21.29	17.56
				714.5	23165	21.28	17.55
3	16-QAM	1 RB	0	700.5	23025	21.63	17.90
				707.5	23095	21.66	17.93
				714.5	23165	21.68	17.95
			7	700.5	23025	21.65	17.92
				707.5	23095	21.40	17.67
				714.5	23165	21.54	17.81
			14	700.5	23025	21.75	18.02
				707.5	23095	21.62	17.89
				714.5	23165	21.48	17.75
		8 RB	0	700.5	23025	20.29	16.56
				707.5	23095	20.04	16.31
				714.5	23165	20.30	16.57
			4	700.5	23025	20.17	16.44
				707.5	23095	20.15	16.42
				714.5	23165	20.22	16.49
			7	700.5	23025	20.20	16.47
				707.5	23095	20.11	16.38
				714.5	23165	20.30	16.57
		15RB		700.5	23025	20.29	16.56
				707.5	23095	20.14	16.41
				714.5	23165	20.27	16.54

3	64-QAM	1 RB	0	700.5	23025	20.78	17.05
				707.5	23095	20.30	16.57
				714.5	23165	20.40	16.67
			7	700.5	23025	20.28	16.55
				707.5	23095	20.08	16.35
				714.5	23165	20.51	16.78
			14	700.5	23025	20.62	16.89
				707.5	23095	20.58	16.85
				714.5	23165	20.57	16.84
		8 RB	0	700.5	23025	19.27	15.54
				707.5	23095	19.20	15.47
				714.5	23165	19.31	15.58
			4	700.5	23025	19.32	15.59
				707.5	23095	18.94	15.21
				714.5	23165	19.19	15.46
			7	700.5	23025	19.33	15.60
				707.5	23095	19.37	15.64
				714.5	23165	19.24	15.51
		15RB		700.5	23025	19.32	15.59
				707.5	23095	19.25	15.52
				714.5	23165	19.33	15.60

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
1.4	QPSK	1 RB	0	699.7	23017	22.23	18.50
				707.5	23095	22.05	18.32
				715.3	23173	22.27	18.54
			2	699.7	23017	21.68	17.95
				707.5	23095	21.88	18.15
				715.3	23173	21.92	18.19
			5	699.7	23017	22.15	18.42
				707.5	23095	22.18	18.45
				715.3	23173	22.03	18.30
		3 RB	0	699.7	23017	21.16	17.43
				707.5	23095	21.18	17.45
				715.3	23173	21.21	17.48
			2	699.7	23017	21.14	17.41
				707.5	23095	20.97	17.24
				715.3	23173	21.11	17.38
			3	699.7	23017	20.99	17.26
				707.5	23095	20.81	17.08
				715.3	23173	21.16	17.43
		6RB		699.7	23017	21.21	17.48
				707.5	23095	21.24	17.51
				715.3	23173	21.15	17.42
1.4	16-QAM	1 RB	0	699.7	23017	21.53	17.80
				707.5	23095	21.52	17.79
				715.3	23173	21.46	17.73
			2	699.7	23017	21.49	17.76
				707.5	23095	21.35	17.62
				715.3	23173	21.36	17.63
			5	699.7	23017	21.67	17.94
				707.5	23095	21.42	17.69
				715.3	23173	21.30	17.57
		3 RB	0	699.7	23017	20.10	16.37
				707.5	23095	19.83	16.10
				715.3	23173	20.21	16.48
			2	699.7	23017	20.07	16.34
				707.5	23095	19.92	16.19
				715.3	23173	20.09	16.36
			3	699.7	23017	20.09	16.36
				707.5	23095	19.90	16.17
				715.3	23173	20.18	16.45
		6RB		699.7	23017	20.21	16.48
				707.5	23095	20.02	16.29
				715.3	23173	20.04	16.31

1.4	64-QAM	1 RB	0	699.7	23017	20.71	16.98
				707.5	23095	20.11	16.38
				715.3	23173	20.33	16.60
			2	699.7	23017	20.12	16.39
				707.5	23095	19.92	16.19
				715.3	23173	20.33	16.60
			5	699.7	23017	20.47	16.74
				707.5	23095	20.53	16.80
				715.3	23173	20.49	16.76
		3 RB	0	699.7	23017	19.10	15.37
				707.5	23095	19.06	15.33
				715.3	23173	19.09	15.36
			2	699.7	23017	19.08	15.35
				707.5	23095	19.15	15.42
				715.3	23173	19.14	15.41
			3	699.7	23017	19.10	15.37
				707.5	23095	19.21	15.48
				715.3	23173	19.04	15.31
		6RB		699.7	23017	19.13	15.40
				707.5	23095	19.02	15.29
				715.3	23173	19.18	15.45

LTE Band 17

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
10	QPSK	1 RB	0	709	23780	22.64	18.91
				710	23790	22.63	18.9
				711	23800	22.66	18.93
			25	709	23780	22.37	18.64
				710	23790	22.38	18.65
				711	23800	22.47	18.74
			49	709	23780	22.75	19.02
				710	23790	**22.77**	19.04
				711	23800	22.74	19.01
		25 RB	0	709	23780	21.49	17.76
				710	23790	21.49	17.76
				711	23800	21.47	17.74
			12	709	23780	21.47	17.74
				710	23790	21.45	17.72
				711	23800	21.54	17.81
			25	709	23780	21.51	17.78
				710	23790	**21.58**	17.85
				711	23800	21.55	17.82
		50RB		709	23780	21.42	17.69
				710	23790	21.43	17.7
				711	23800	**21.52**	17.79
10	16-QAM	1 RB	0	709	23780	21.91	18.18
				710	23790	21.91	18.18
				711	23800	21.92	18.19
			25	709	23780	21.7	17.97
				710	23790	21.72	17.99
				711	23800	21.72	17.99
			49	709	23780	21.92	18.19
				710	23790	21.93	18.2
				711	23800	21.96	18.23
		25 RB	0	709	23780	20.42	16.69
				710	23790	20.44	16.71
				711	23800	20.47	16.74
			12	709	23780	20.43	16.7
				710	23790	20.48	16.75
				711	23800	20.46	16.73
			25	709	23780	20.43	16.7
				710	23790	20.43	16.7
				711	23800	20.51	16.78
		50RB		709	23780	20.5	16.77
				710	23790	20.47	16.74
				711	23800	20.51	16.78

10	64-QAM	1 RB	0	709	23780	20.92	17.19
				710	23790	20.89	17.16
				711	23800	20.81	17.08
			25	709	23780	20.63	16.9
				710	23790	20.58	16.85
				711	23800	20.62	16.89
			49	709	23780	20.93	17.2
				710	23790	20.95	17.22
				711	23800	20.93	17.2
		25 RB	0	709	23780	19.48	15.75
				710	23790	19.49	15.76
				711	23800	19.48	15.75
			12	709	23780	19.42	15.69
				710	23790	19.49	15.76
				711	23800	19.49	15.76
			25	709	23780	19.5	15.77
				710	23790	19.5	15.77
				711	23800	19.56	15.83
		50RB		709	23780	19.43	15.7
				710	23790	19.43	15.7
				711	23800	19.48	15.75

BW(MHz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted power (dBm)	ERP (dBm)
5	QPSK	1 RB	0	706.5	23755	22.42	18.69
				710	23790	22.51	18.78
				713.5	23825	22.43	18.7
			12	706.5	23755	22.16	18.43
				710	23790	22.28	18.55
				713.5	23825	22.27	18.54
			24	706.5	23755	22.61	18.88
				710	23790	22.69	18.96
				713.5	23825	22.56	18.83
		12 RB	0	706.5	23755	21.38	17.65
				710	23790	21.44	17.71
				713.5	23825	21.32	17.59
			6	706.5	23755	21.40	17.67
				710	23790	21.22	17.49
				713.5	23825	21.32	17.59
			13	706.5	23755	21.34	17.61
				710	23790	21.39	17.66
				713.5	23825	21.51	17.78
		25RB		706.5	23755	21.37	17.64
				710	23790	21.38	17.65
				713.5	23825	21.28	17.55
5	16-QAM	1 RB	0	706.5	23755	21.83	18.1
				710	23790	21.69	17.96
				713.5	23825	21.84	18.11
			12	706.5	23755	21.63	17.9
				710	23790	21.55	17.82
				713.5	23825	21.52	17.79
			24	706.5	23755	21.69	17.96
				710	23790	21.86	18.13
				713.5	23825	21.81	18.08
		12 RB	0	706.5	23755	20.24	16.51
				710	23790	20.37	16.64
				713.5	23825	20.32	16.59
			6	706.5	23755	20.21	16.48
				710	23790	20.37	16.64
				713.5	23825	20.36	16.63
			13	706.5	23755	20.30	16.57
				710	23790	20.31	16.58
				713.5	23825	20.28	16.55
		25RB		706.5	23755	20.26	16.53
				710	23790	20.40	16.67
				713.5	23825	20.38	16.65

5	64-QAM	1 RB	0	706.5	23755	20.75	17.02
				710	23790	20.74	17.01
				713.5	23825	20.70	16.97
			12	706.5	23755	20.41	16.68
				710	23790	20.44	16.71
				713.5	23825	20.44	16.71
			24	706.5	23755	20.69	16.96
				710	23790	20.80	17.07
				713.5	23825	20.76	17.03
		12 RB	0	706.5	23755	19.24	15.51
				710	23790	19.41	15.68
				713.5	23825	19.28	15.55
			6	706.5	23755	19.26	15.53
				710	23790	19.30	15.57
				713.5	23825	19.28	15.55
			13	706.5	23755	19.30	15.57
				710	23790	19.27	15.54
				713.5	23825	19.49	15.76
		25RB		706.5	23755	19.22	15.49
				710	23790	19.19	15.46
				713.5	23825	19.28	15.55

8.2 FREQUENCY STABILITY MEASUREMENT

LIMIT

According to the FCC part 27.54 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to RSS -133 section 6.3,

The carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and ±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.

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

FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT: LTE Band 12

Reference Frequency: LTE Band 12 Max Bandwidth QPSK, 707.5 MHz				
Limit: ± 2.5 ppm = 1768.75 Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
120	65	0.03	0.000042	+/- 2.5
120	50	0.01	0.000014	
120	40	0.01	0.000014	
120	30	0.00	0.000000	
120	20	0.01	0.000014	
120	10	0.02	0.000028	
120	0	0.00	0.000000	
120	-10	-0.01	-0.000014	
120	-20	0.00	0.000000	
120	-35	0.01	0.000014	

Reference Frequency: LTE Band 12 Max Bandwidth 16QAM, 707.5 MHz				
Limit: ± 2.5 ppm = 1768.75 Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
120	65	0.02	0.000028	+/- 2.5
120	50	0.01	0.000014	
120	40	-0.01	-0.000014	
120	30	0.02	0.000028	
120	20	0.02	0.000028	
120	10	0.03	0.000042	
120	0	0.02	0.000028	
120	-10	0.01	0.000014	
120	-20	-0.01	-0.000014	
120	-35	0.00	0.000000	

LTE Band 17

Reference Frequency: LTE Band 17 Max Bandwidth QPSK, 710 MHz				
Limit: ± 2.5 ppm = 1775 Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
120	65	-0.01	-0.000014	+/- 2.5
120	50	0.01	0.000014	
120	40	0.00	0.000000	
120	30	0.01	0.000014	
120	20	0.02	0.000028	
120	10	0.00	0.000000	
120	0	-0.01	-0.000014	
120	-10	0.01	0.000014	
120	-20	0.00	0.000000	
120	-35	0.00	0.000000	

Reference Frequency: LTE Band 17 Max Bandwidth 16QAM, 710 MHz				
Limit: ± 2.5 ppm = 1775 Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
120	65	0.02	0.000028	+/- 2.5
120	50	0.01	0.000014	
120	40	0.01	0.000014	
120	30	0.02	0.000028	
120	20	0.01	0.000014	
120	10	0.02	0.000028	
120	0	0.01	0.000014	
120	-10	-0.01	-0.000014	
120	-20	0.01	0.000014	
120	-35	-0.01	-0.000014	

FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:
LTE Band 12

Reference Frequency: LTE Band 12 Max Bandwidth QPSK, 707.5 MHz				
Limit: ± 2.5 ppm = 1768.75 Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
102	20	0.00	0.000000	+/- 2.5
120	20	0.02	0.000028	
138	20	-0.01	-0.000014	

Reference Frequency: LTE Band 12 Max Bandwidth 16QAM, 707.5 MHz				
Limit: ± 2.5 ppm = 1768.75 Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
102	20	0.01	0.000014	+/- 2.5
120	20	-0.01	-0.000014	
138	20	0.01	0.000014	

LTE Band 17

Reference Frequency: LTE Band 17 Max Bandwidth QPSK, 710 MHz				
Limit: ± 2.5 ppm = 1775 Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
102	20	0.00	0.000000	+/- 2.5
120	20	0.01	0.000014	
138	20	0.02	0.000028	

Reference Frequency: LTE Band 17 Max Bandwidth 16QAM, 710 MHz				
Limit: ± 2.5 ppm = 1775 Hz				
Power Supply	Environment	Frequency Error	Frequency Error	Limit (ppm)
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
102	20	0.00	0.000000	+/- 2.5
120	20	-0.01	-0.000014	
138	20	0.01	0.000014	

8.3 OCCUPIED BANDWIDTH MEASUREMENT

LIMITS

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

TEST PROCEDURES

KDB 971168 D01 Power Meas License Digital Systems – 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 ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max. hold

TEST RESULTS

LTE Band 12

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	OBW(99%)(MHz)	26 dB Bandwidth(MHz)
12	1.4	Middle	707.5	QPSK	1.1027	1.3068
		Middle	707.5	16QAM	1.0940	1.3111
	3	Middle	707.5	QPSK	2.6830	2.9262
		Middle	707.5	16QAM	2.6830	2.9349
	5	Middle	707.5	QPSK	4.5007	4.923
		Middle	707.5	16QAM	4.4717	4.909
	10	Middle	707.5	QPSK	8.9435	9.713
		Middle	707.5	16QAM	8.9435	9.569

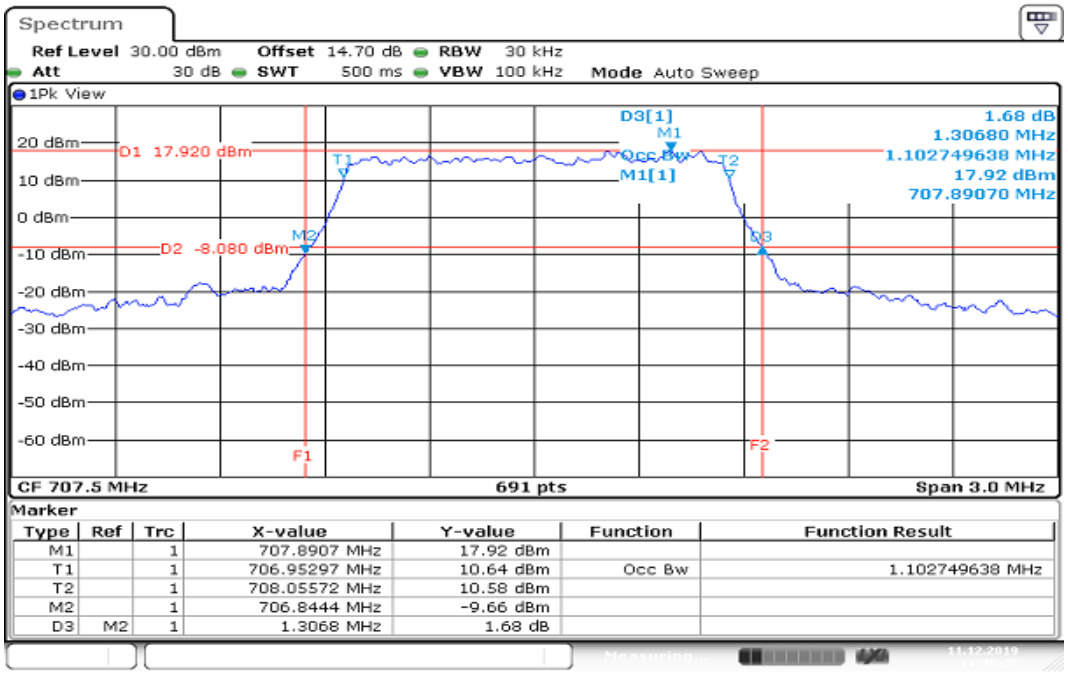
LTE Band 17

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	OBW(99%)(MHz)	26 dB Bandwidth(MHz)
17	5	Middle	710.0	QPSK	4.4862	4.92
		Middle	710.0	16QAM	4.4573	4.863
	10	Middle	710.0	QPSK	8.914	9.696
		Middle	710.0	16QAM	8.914	9.638

LTE Band 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK

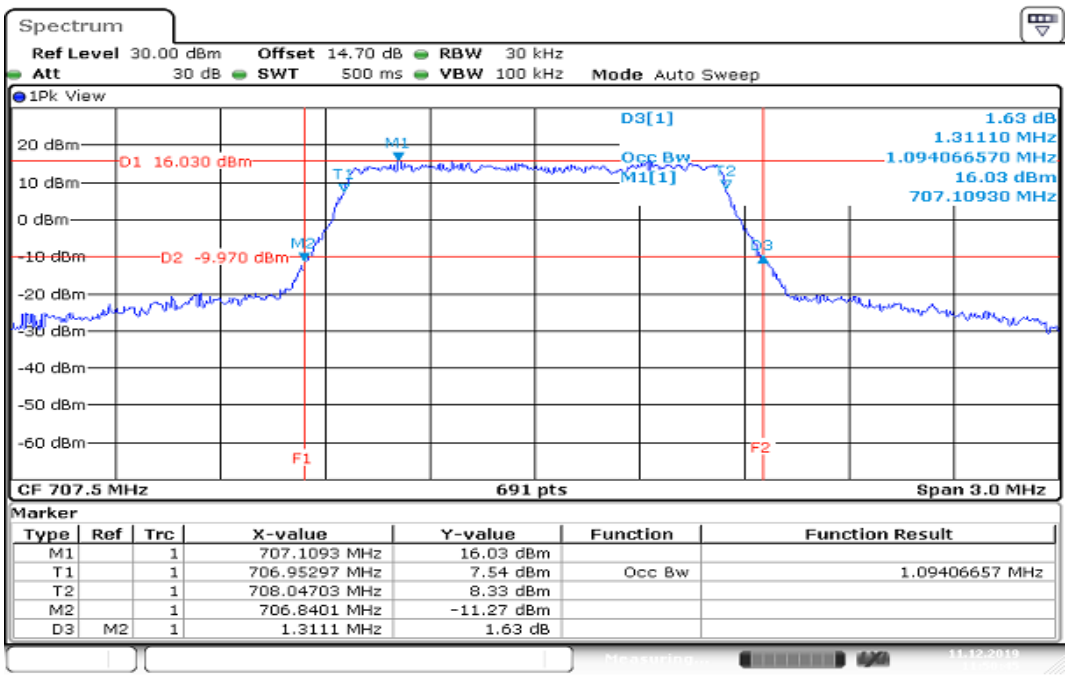
CH Mid



Date: 11.DEC.2019 11:49:27

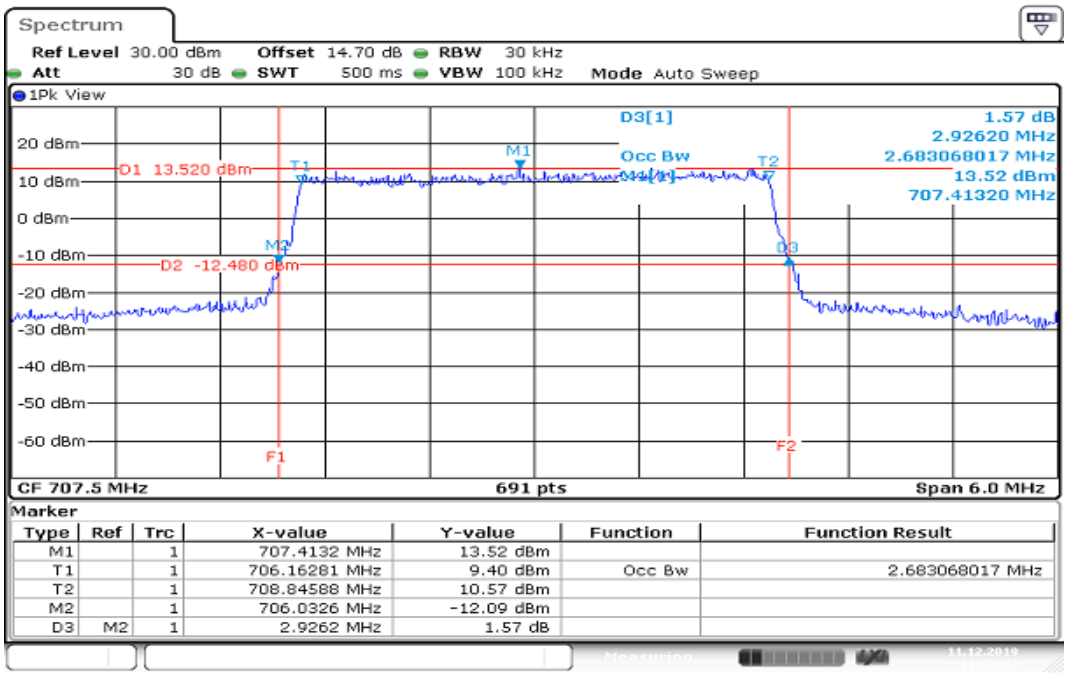
CHANNEL BANDWIDTH: 1.4MHz / 16QAM

CH Mid



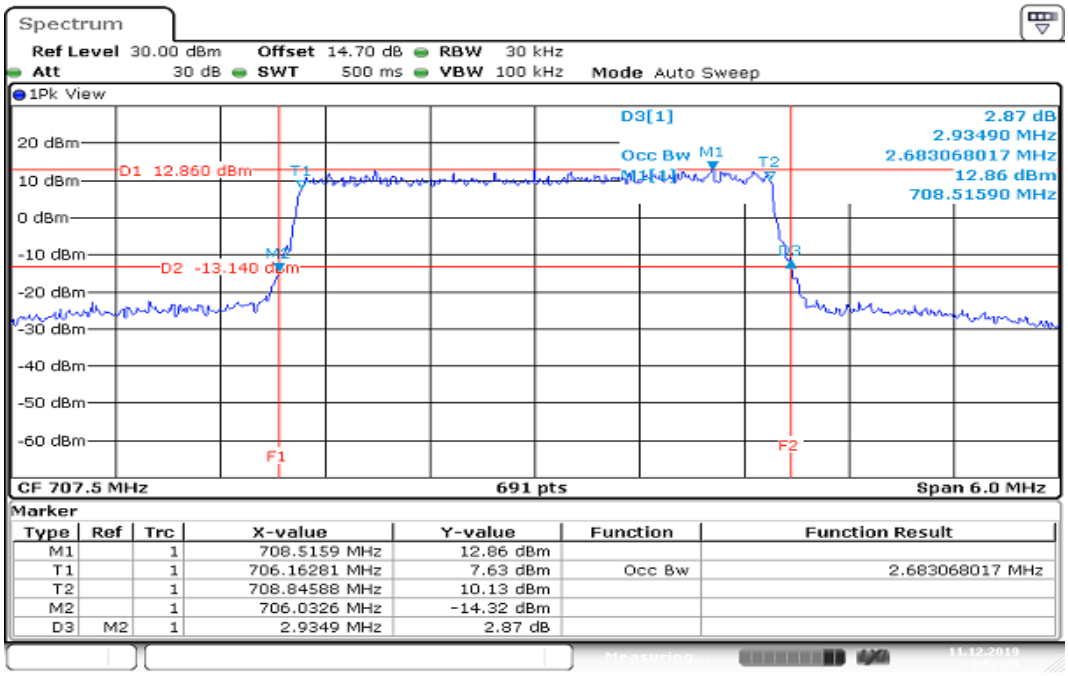
Date: 11.DEC.2019 11:50:46

CHANNEL BANDWIDTH: 3MHz / QPSK
CH Mid



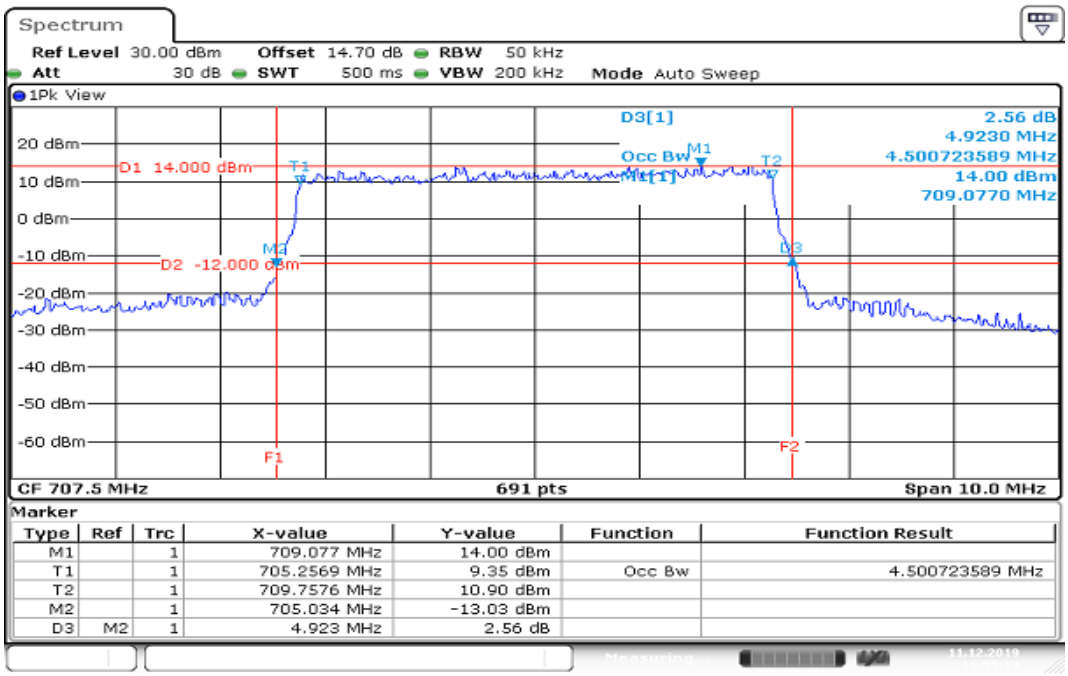
Date: 11.DEC.2019 11:53:43

CHANNEL BANDWIDTH: 3MHz / 16QAM
CH Mid



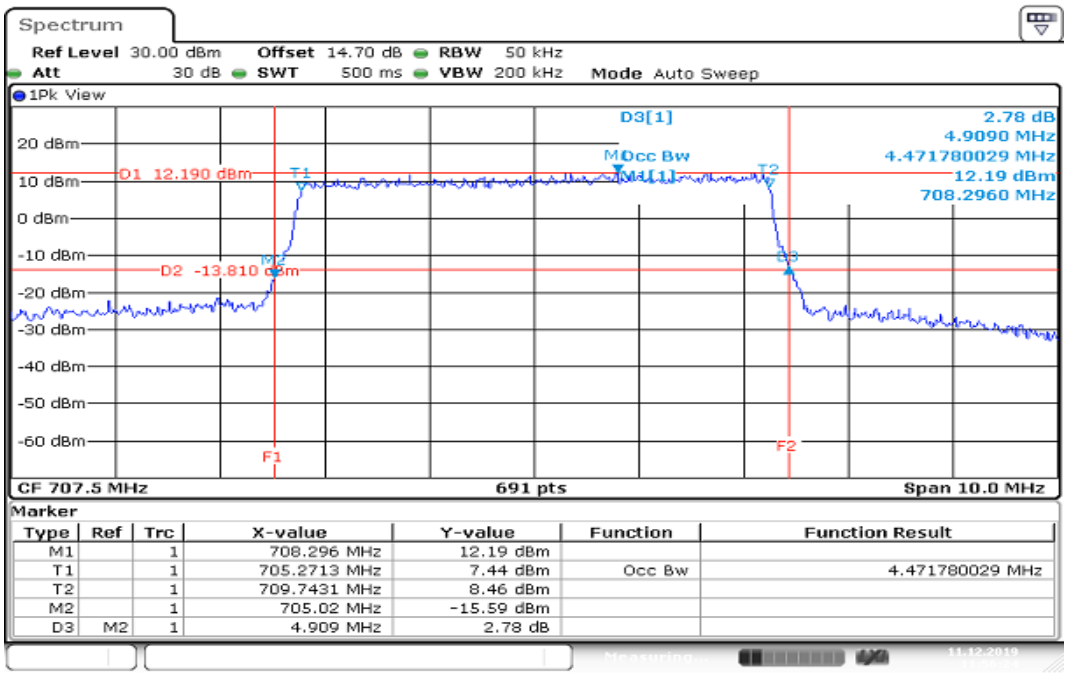
Date: 11.DEC.2019 11:52:29

CHANNEL BANDWIDTH: 5MHz / QPSK
CH Mid



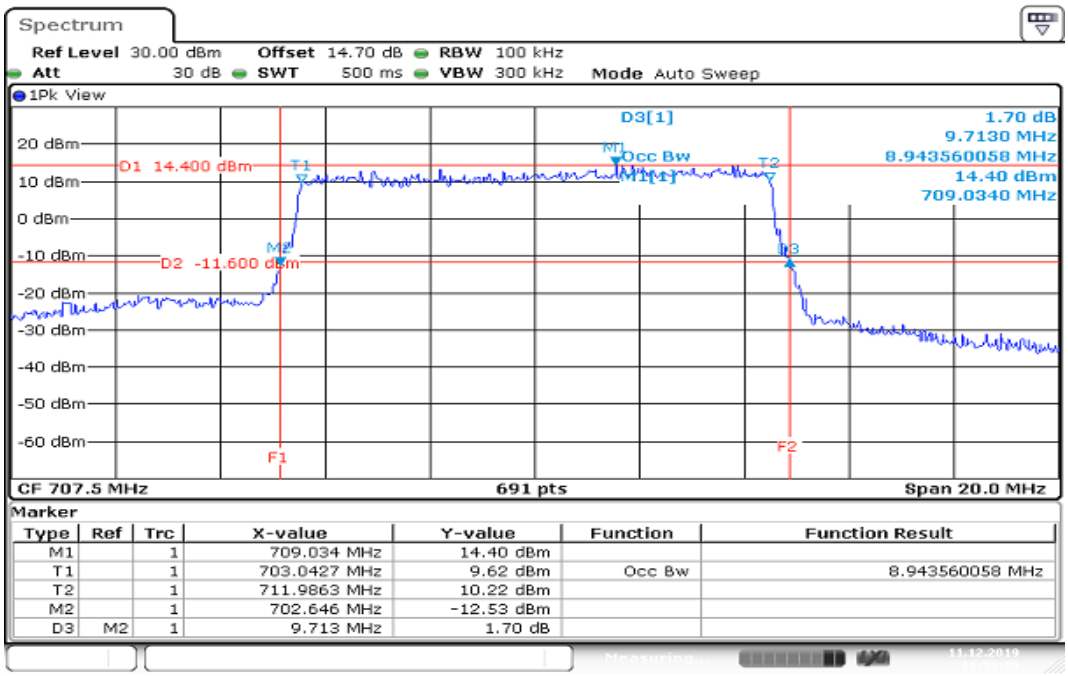
Date: 11.DEC.2019 11:55:14

CHANNEL BANDWIDTH: 5MHz / 16QAM
CH Mid



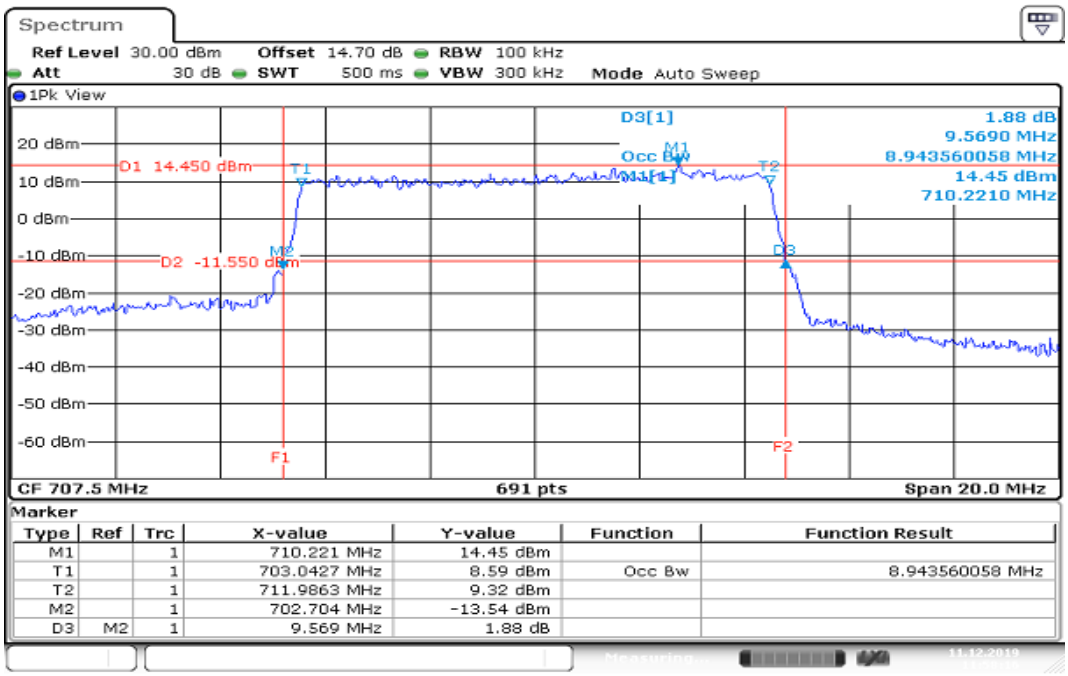
Date: 11.DEC.2019 11:56:24

CHANNEL BANDWIDTH: 10MHz / QPSK
CH Mid



Date: 11.DEC.2019 11:59:17

CHANNEL BANDWIDTH: 10MHz / 16QAM
CH Mid

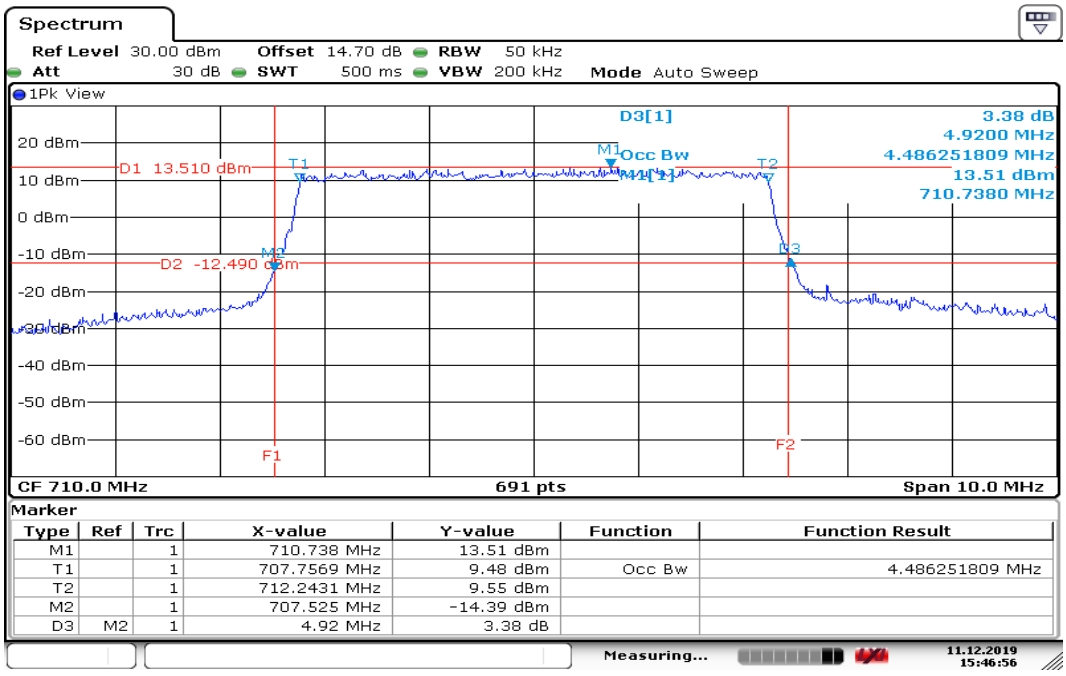


Date: 11.DEC.2019 11:58:17

LTE Band 17

CHANNEL BANDWIDTH: 5MHz / QPSK

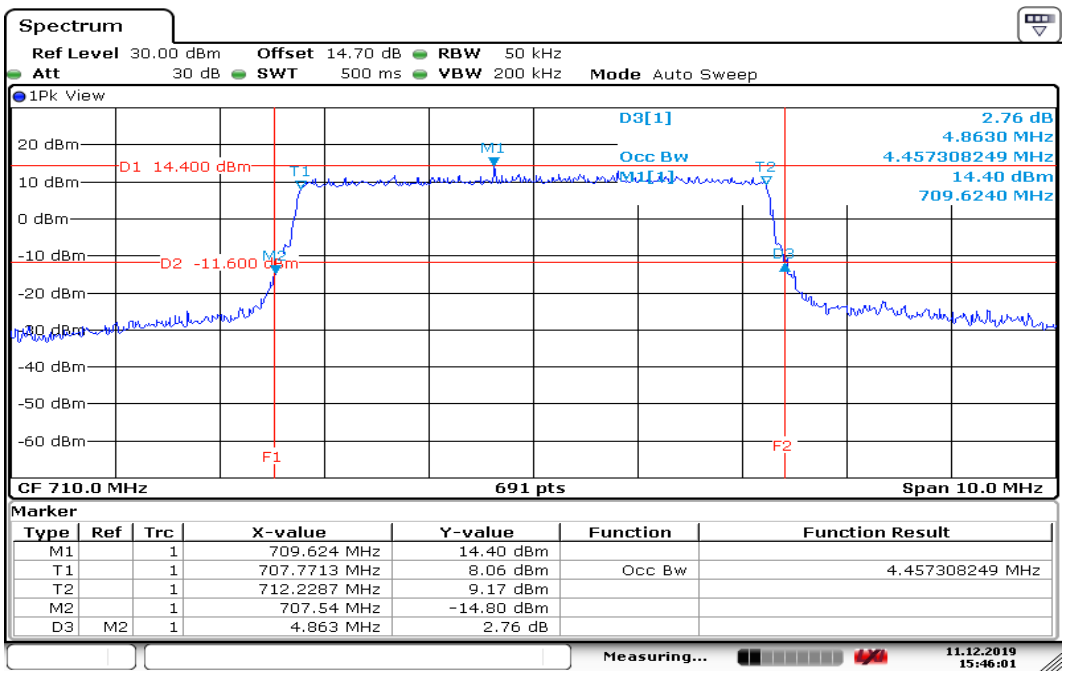
CH Mid



Date: 11.DEC.2019 15:46:57

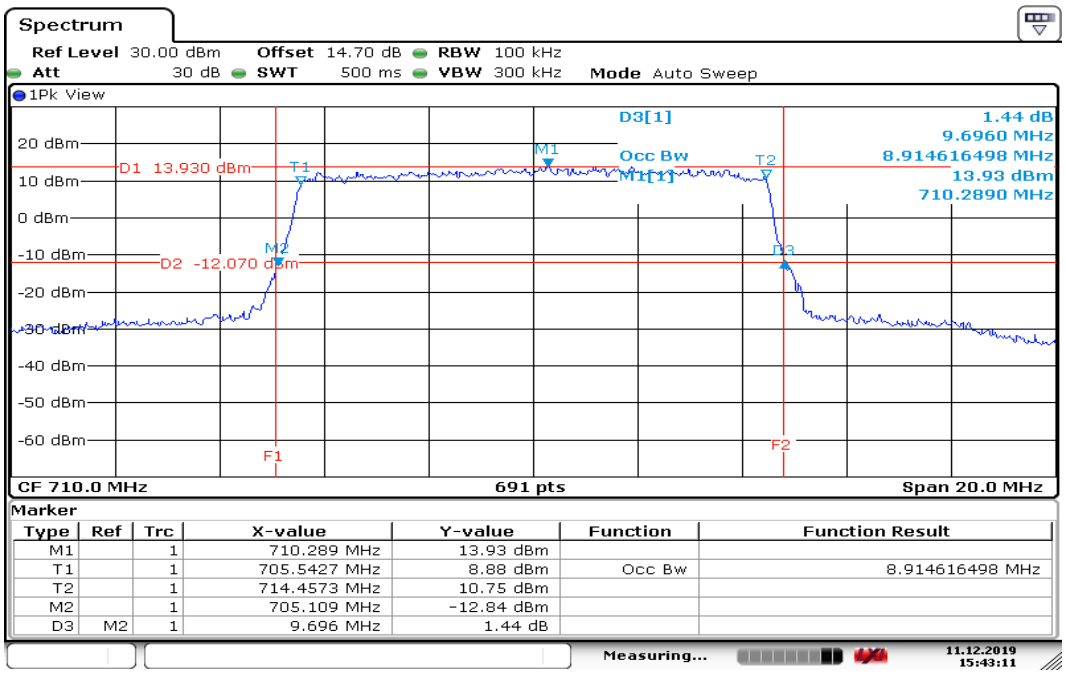
CHANNEL BANDWIDTH: 5MHz / 16QAM

CH Mid



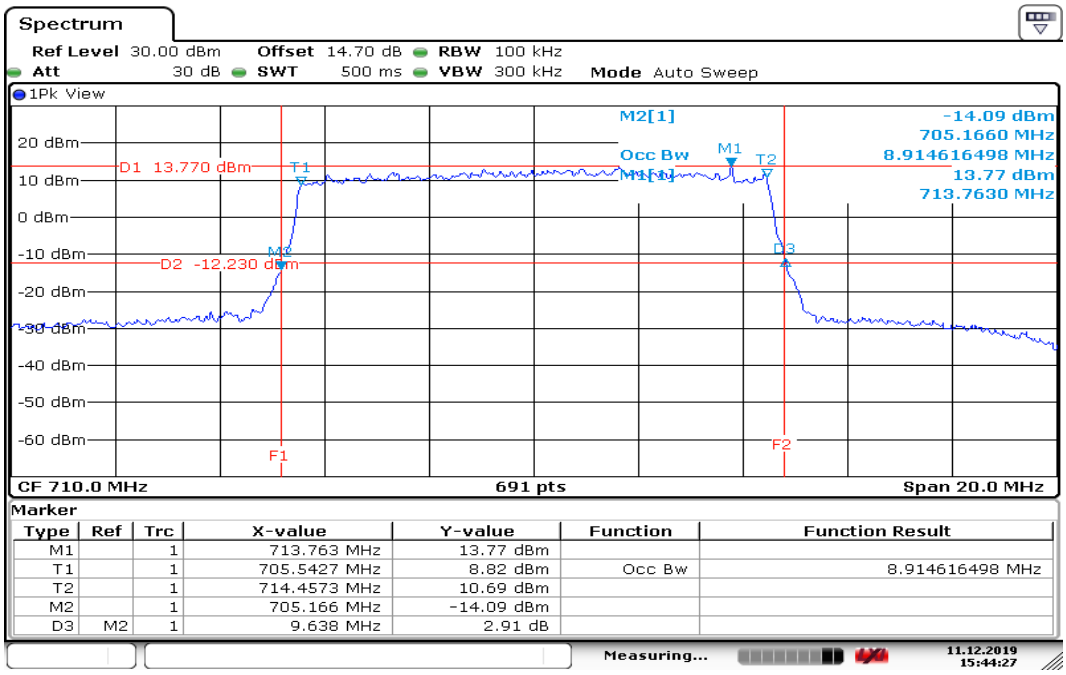
Date: 11.DEC.2019 15:46:02

CHANNEL BANDWIDTH: 10MHz / QPSK
CH Mid



Date: 11.DEC.2019 15:43:12

CHANNEL BANDWIDTH: 10MHz / 16QAM
CH Mid



Date: 11.DEC.2019 15:44:28

8.4 PEAK TO AVERAGE POWER RATIO

LIMIT

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

TEST PROCEDURES

1. According to KDB 971168D01.
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 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	4.87

CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	4.84

CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	4.06

CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	3.88

CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	5.45

CHANNEL BANDWIDTH: 3MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	5.07

CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	5.30

CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	5.16

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

CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	5.88

CHANNEL BANDWIDTH: 3MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	5.88

CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	4.96

CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	4.58

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	6.23

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	6.29

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	6.32

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23095	707.5	6.17

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

LTE Band 17

CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23790	710.0	4.78

CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23790	710.0	5.07

CHANNEL BANDWIDTH: 5MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23790	710.0	4.20

CHANNEL BANDWIDTH: 10MHz / QPSK / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23790	710.0	4.67

CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23790	710.0	5.48

CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23790	710.0	5.94

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

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23790	710.0	5.22

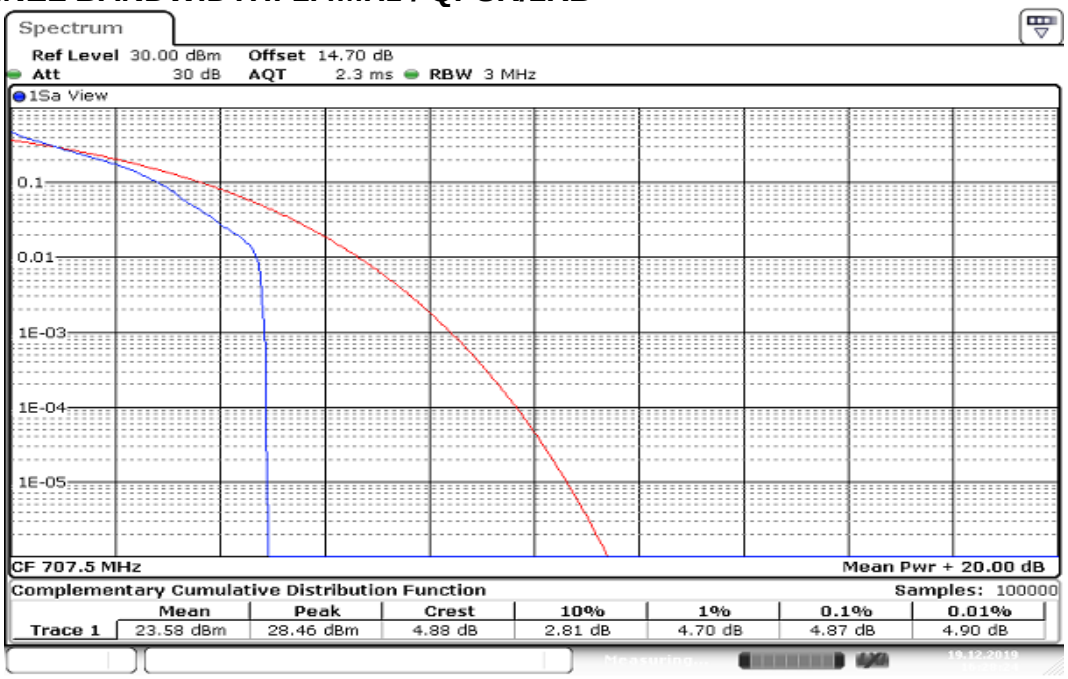
CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
23790	710.0	5.71

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

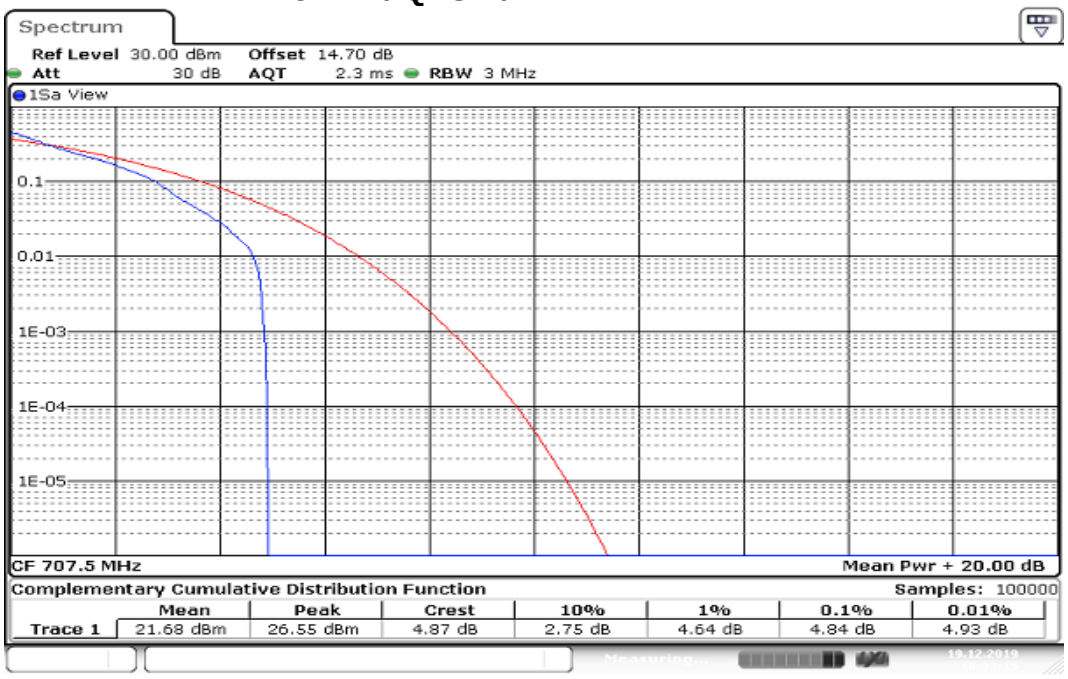
LTE Band 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK/1RB



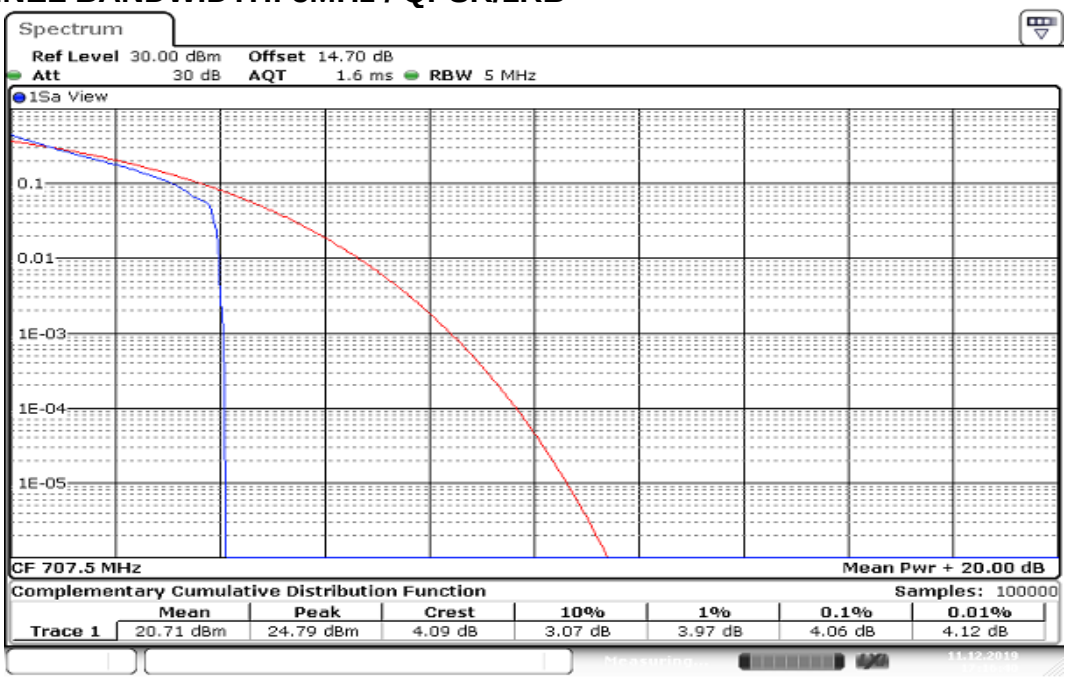
Date: 19.DEC.2019 16:28:24

CHANNEL BANDWIDTH: 3MHz / QPSK /1RB



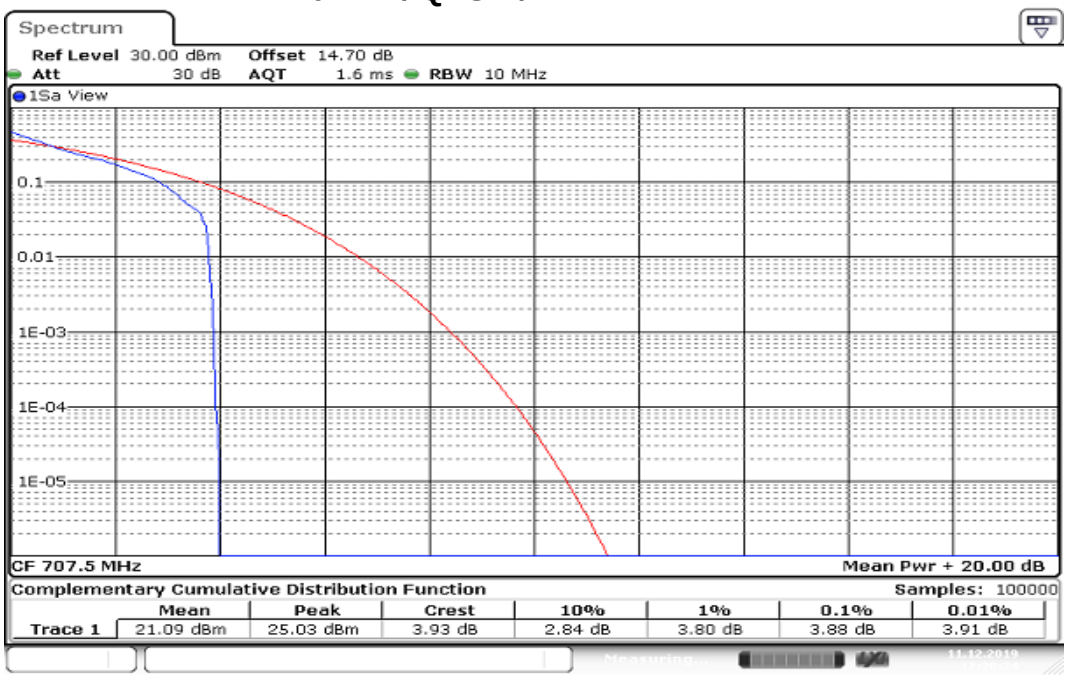
Date: 19.DEC.2019 16:33:15

CHANNEL BANDWIDTH: 5MHz / QPSK/1RB



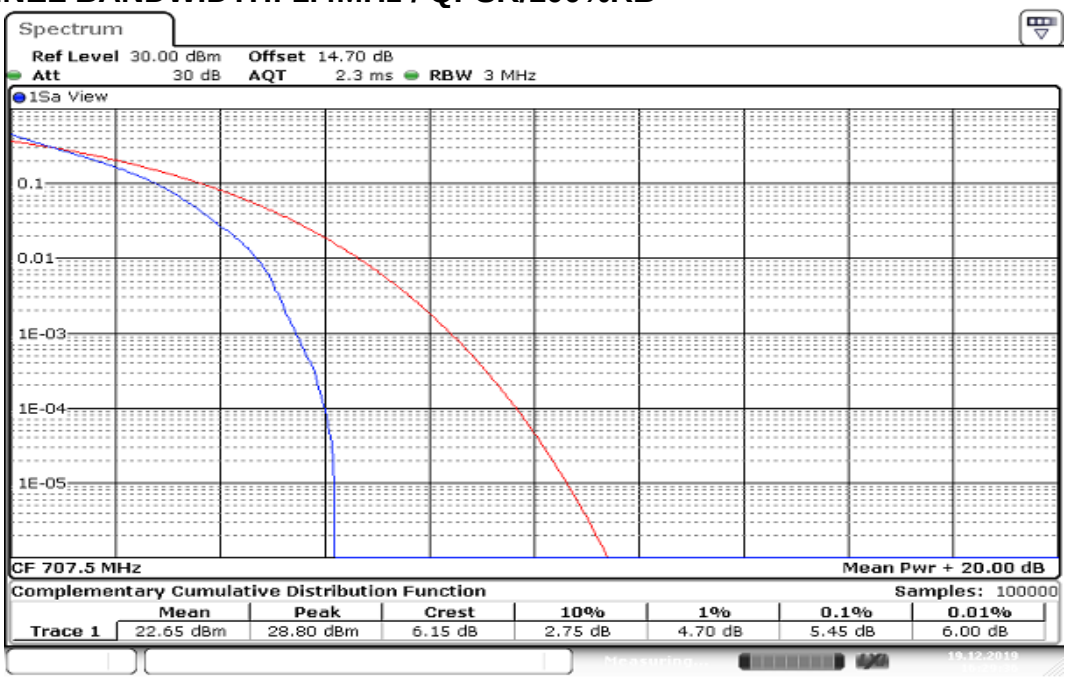
Date: 11.DEC.2019 17:16:40

CHANNEL BANDWIDTH: 10MHz / QPSK /1RB



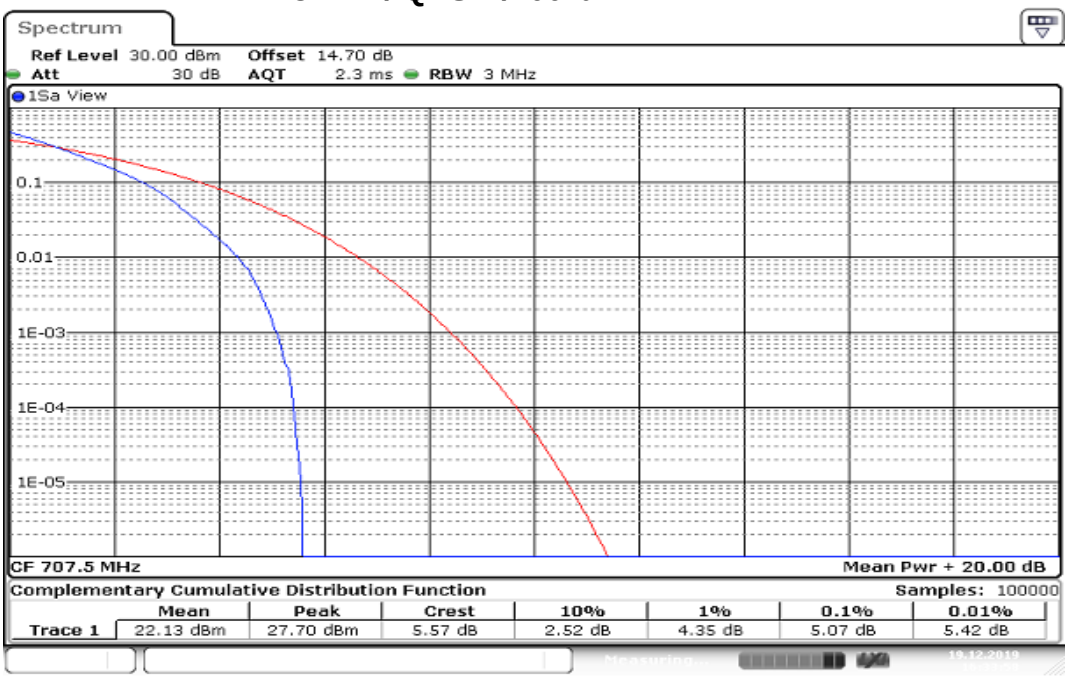
Date: 11.DEC.2019 17:20:24

CHANNEL BANDWIDTH: 1.4MHz / QPSK/100%RB



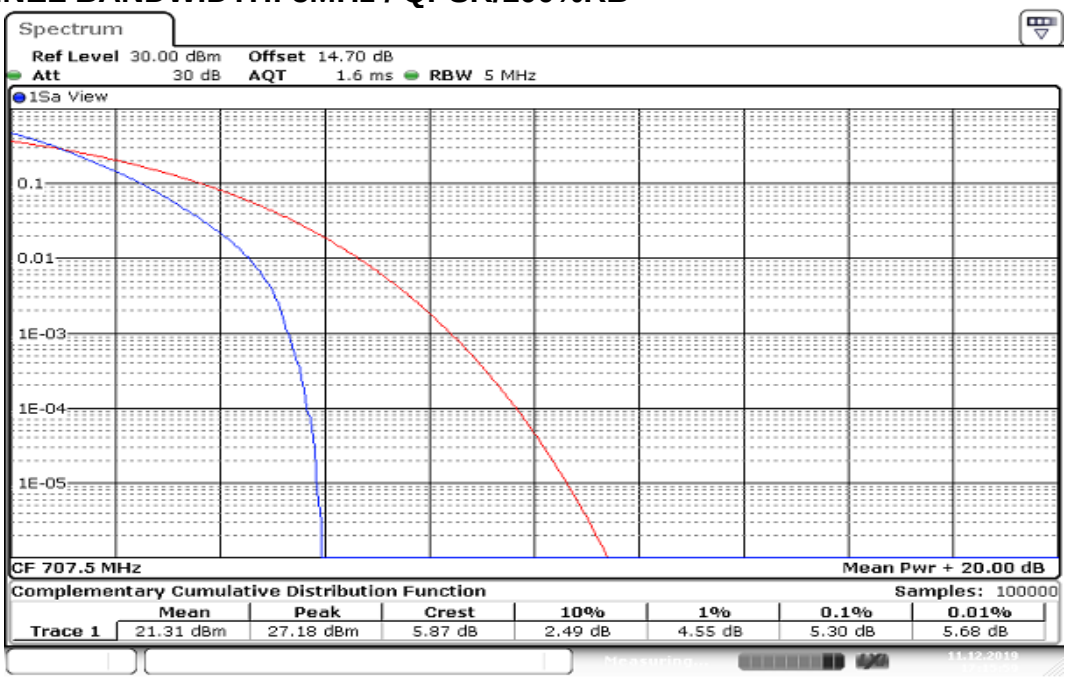
Date: 19.DEC.2019 16:29:37

CHANNEL BANDWIDTH: 3MHz / QPSK /100%RB



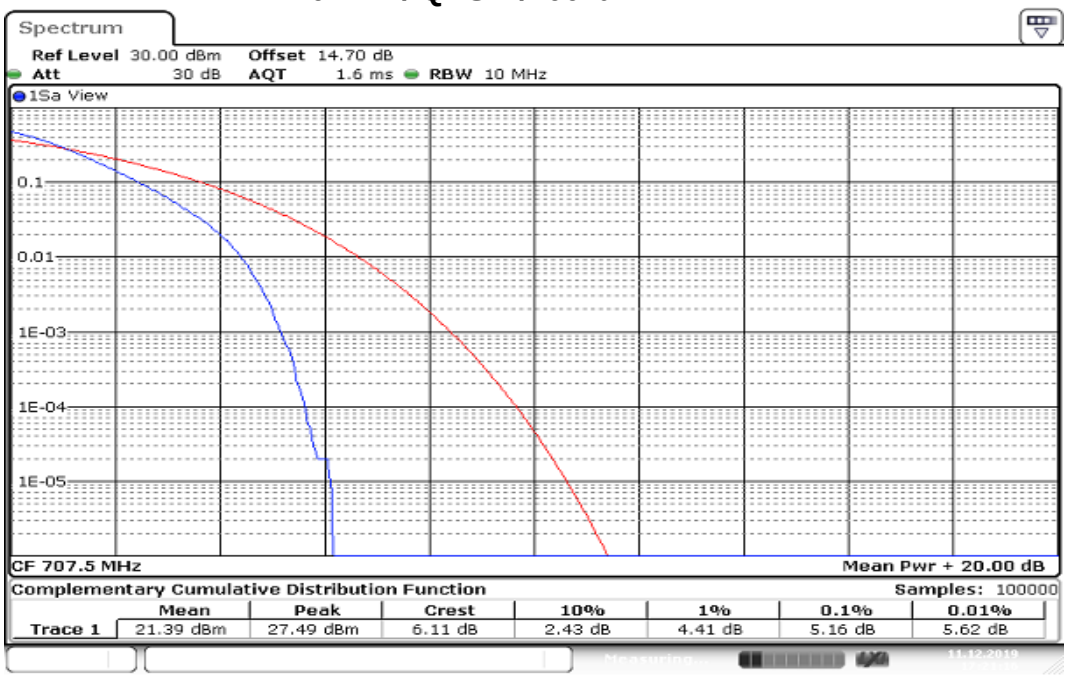
Date: 19.DEC.2019 16:33:59

CHANNEL BANDWIDTH: 5MHz / QPSK/100%RB



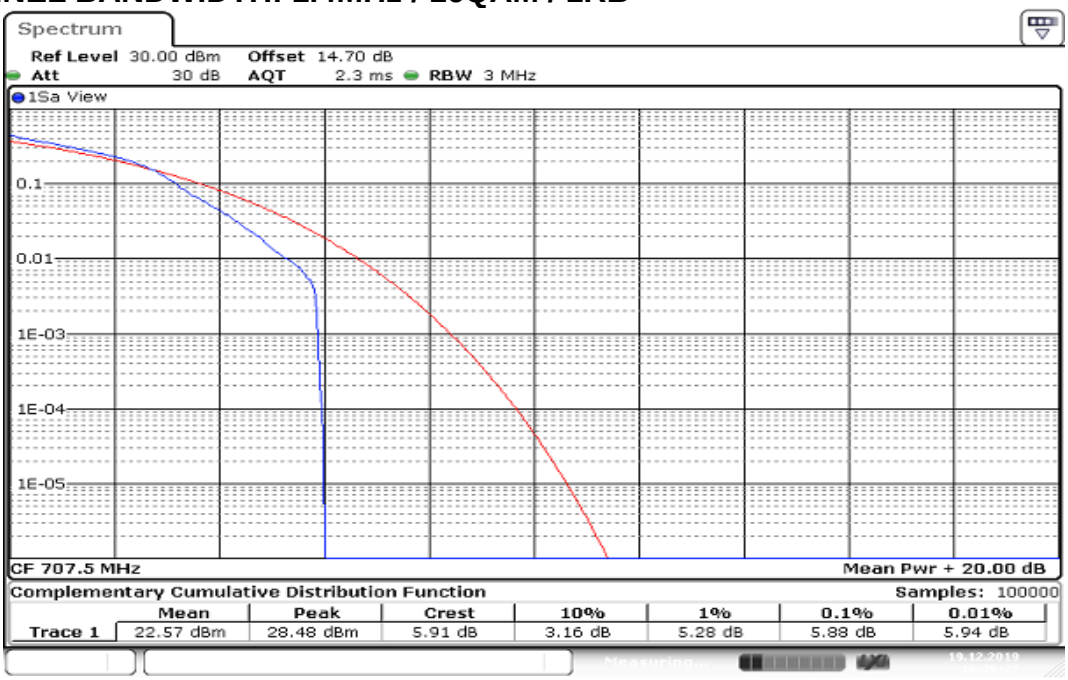
Date: 11.DEC.2019 17:15:59

CHANNEL BANDWIDTH: 10MHz / QPSK /100%RB



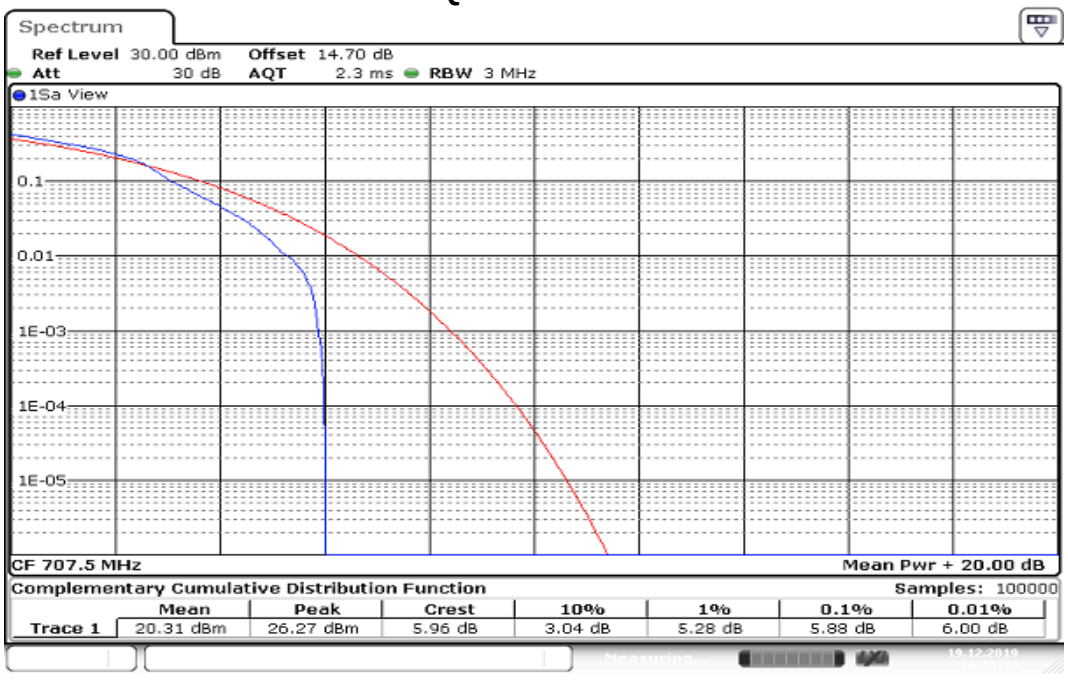
Date: 11.DEC.2019 17:21:16

CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 1RB



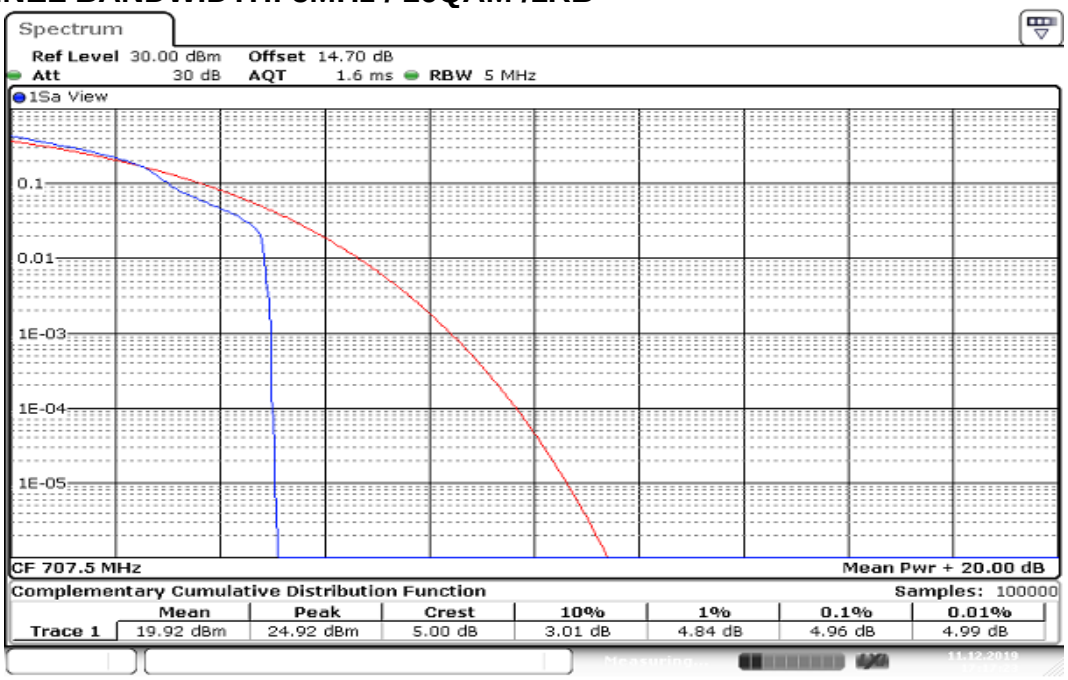
Date: 19.DEC.2019 16:26:27

CHANNEL BANDWIDTH: 3MHz / 16QAM /1RB



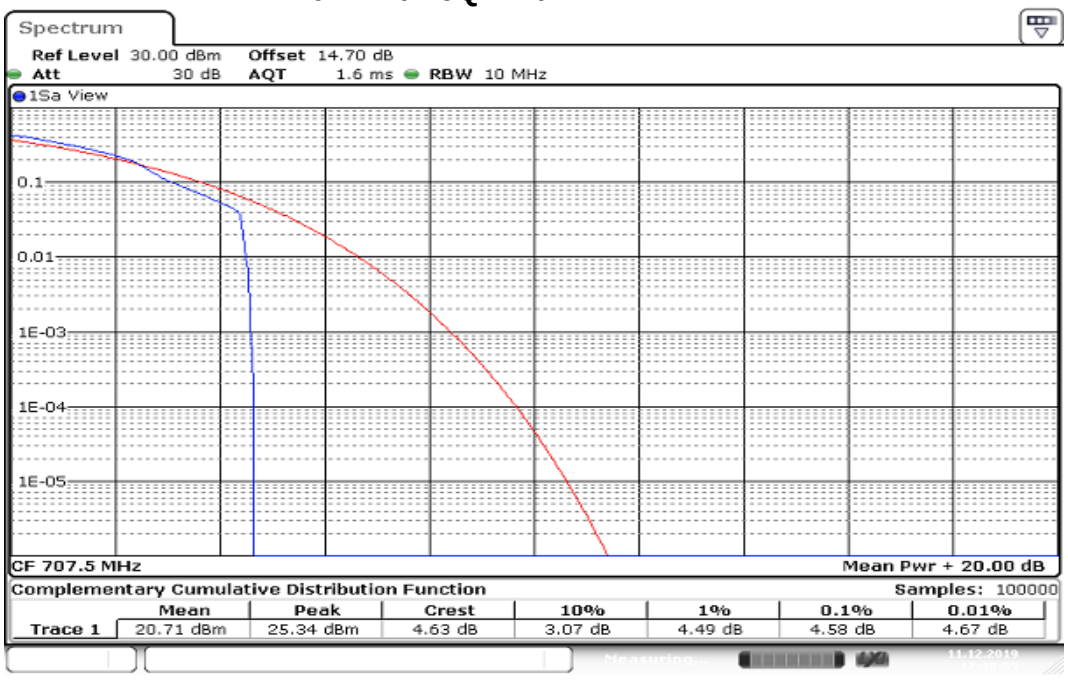
Date: 19.DEC.2019 16:35:40

CHANNEL BANDWIDTH: 5MHz / 16QAM /1RB



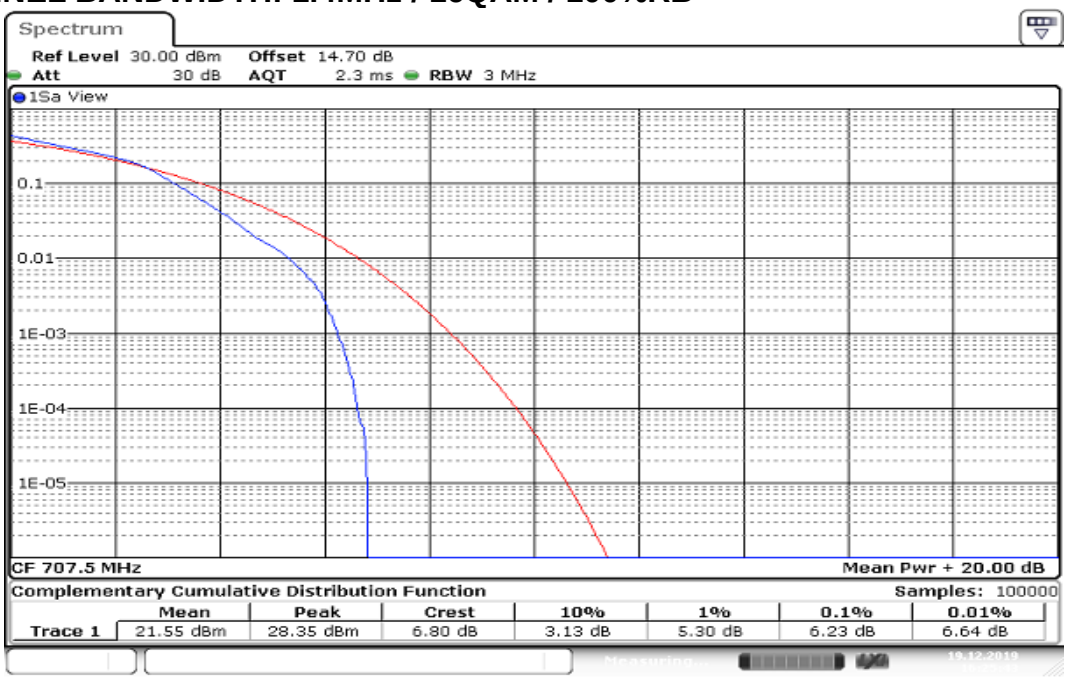
Date: 11.DEC.2019 17:17:23

CHANNEL BANDWIDTH: 10MHz / 16QAM /1RB



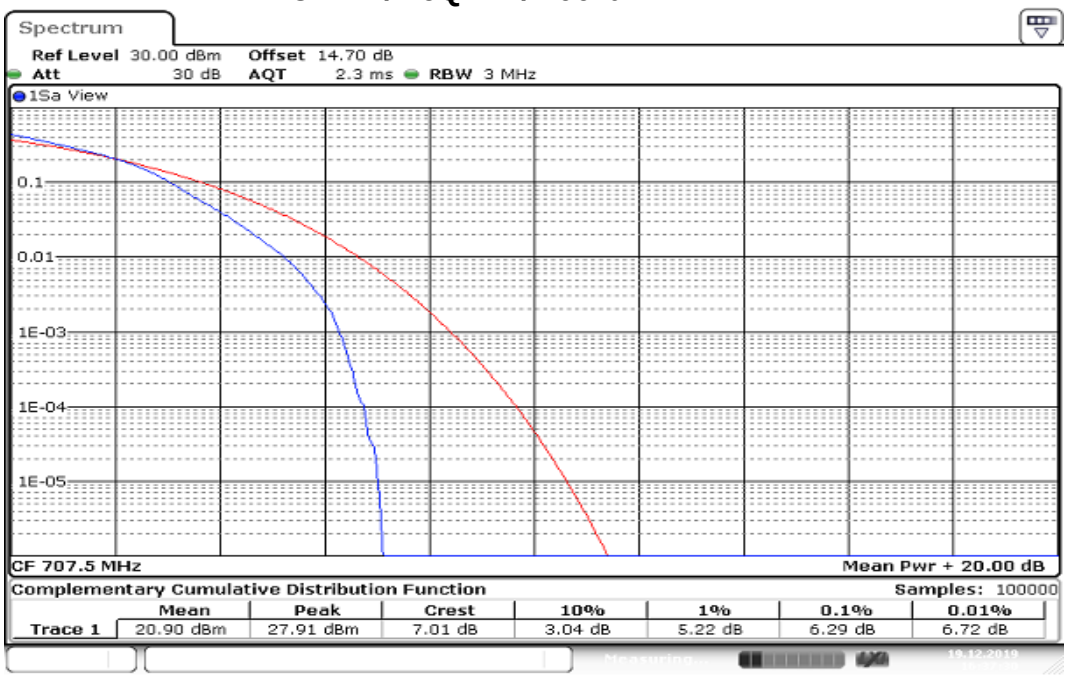
Date: 11.DEC.2019 17:18:55

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



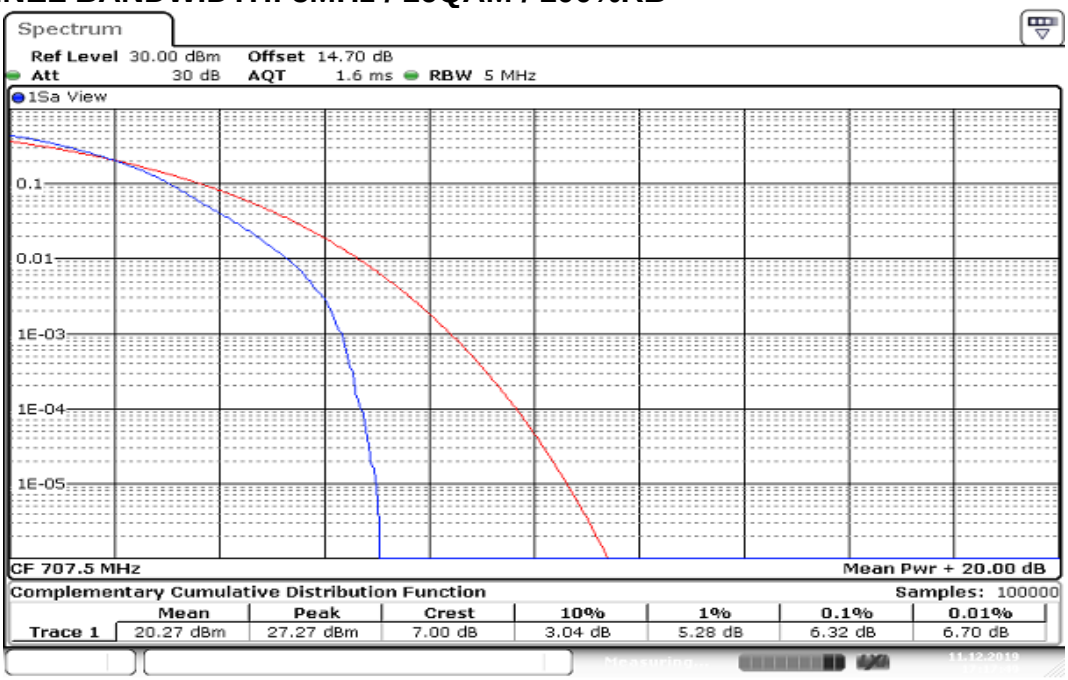
Date: 19.DEC.2019 16:25:43

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



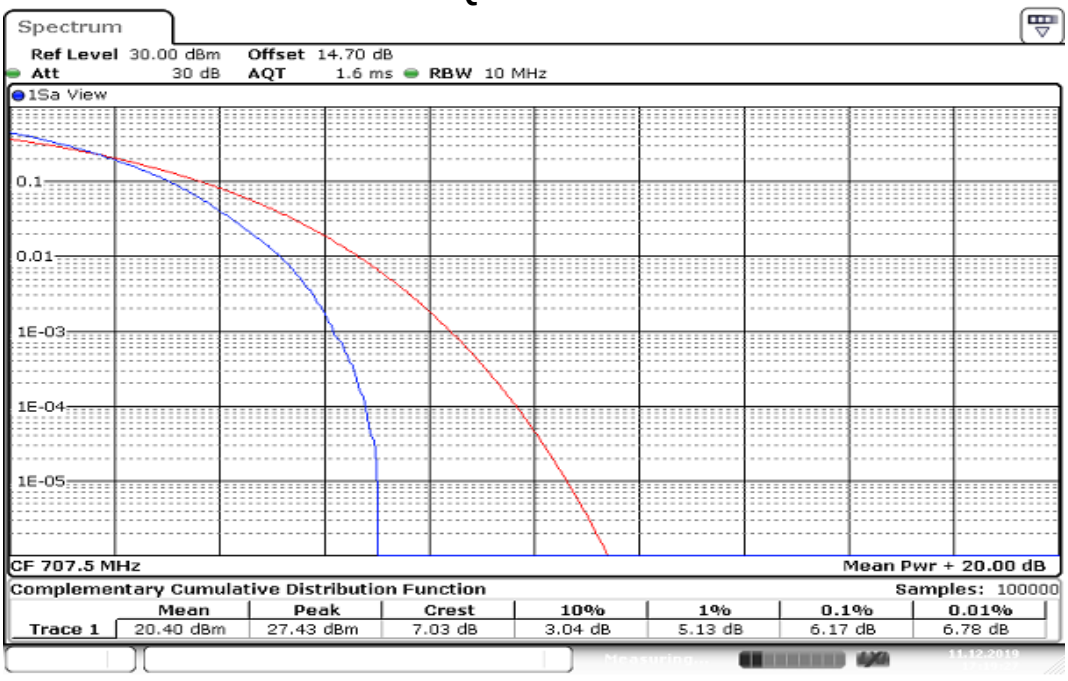
Date: 19.DEC.2019 16:37:30

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



Date: 11.DEC.2019 17:17:49

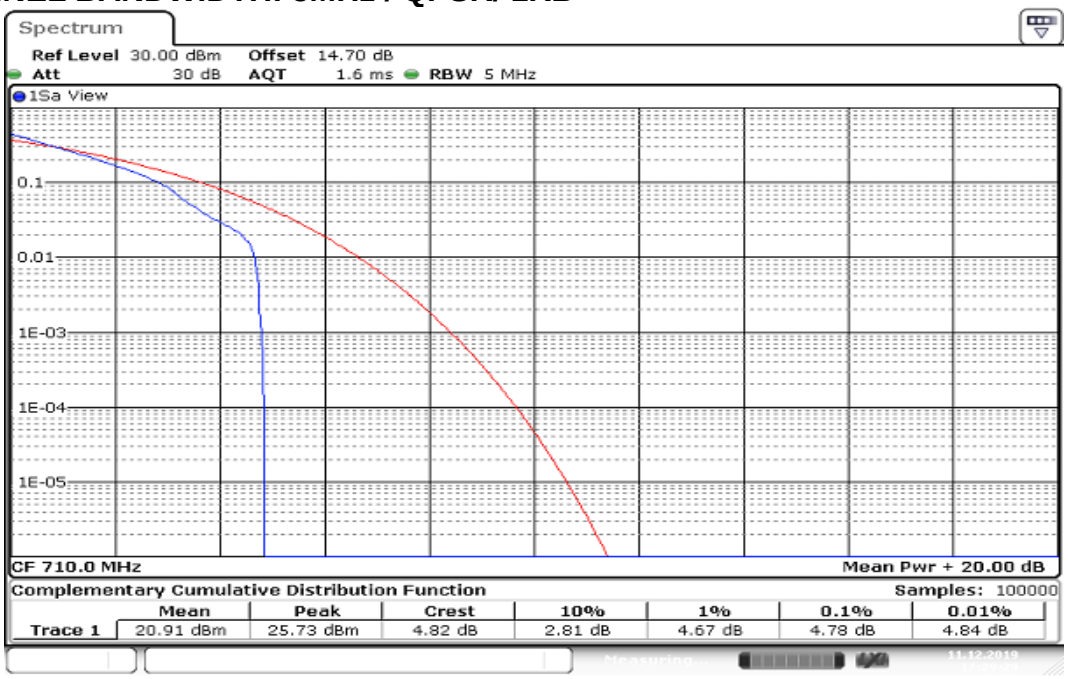
CHANNEL BANDWIDTH: 10MHz / 16QAM / 100%RB



Date: 11.DEC.2019 17:19:27

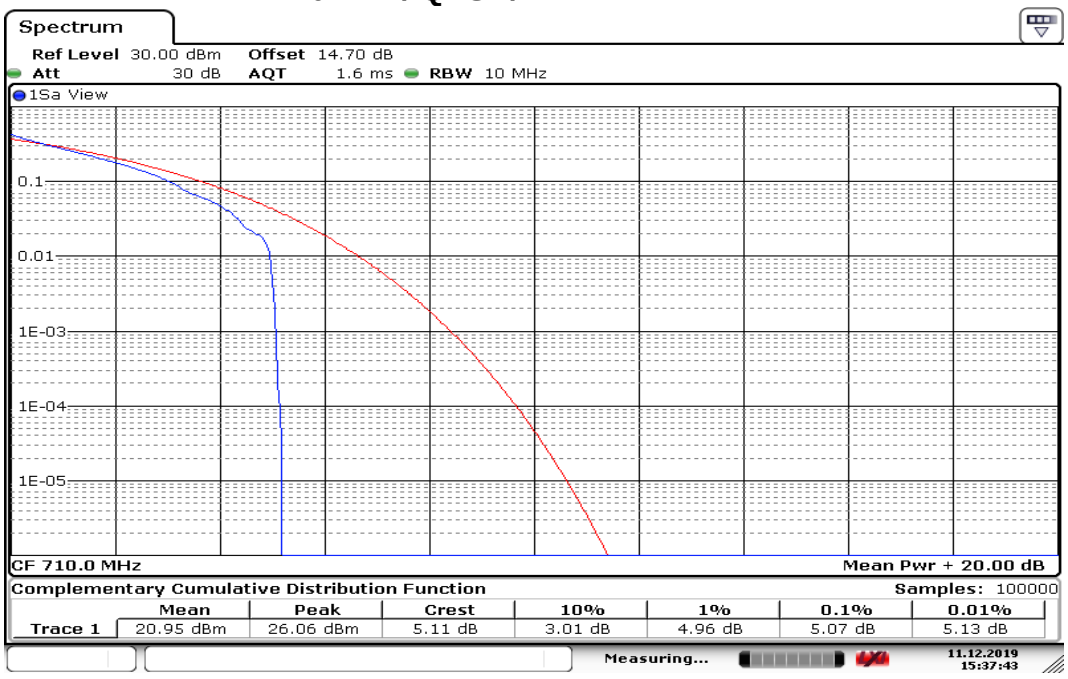
LTE Band 17

CHANNEL BANDWIDTH: 5MHz / QPSK/ 1RB



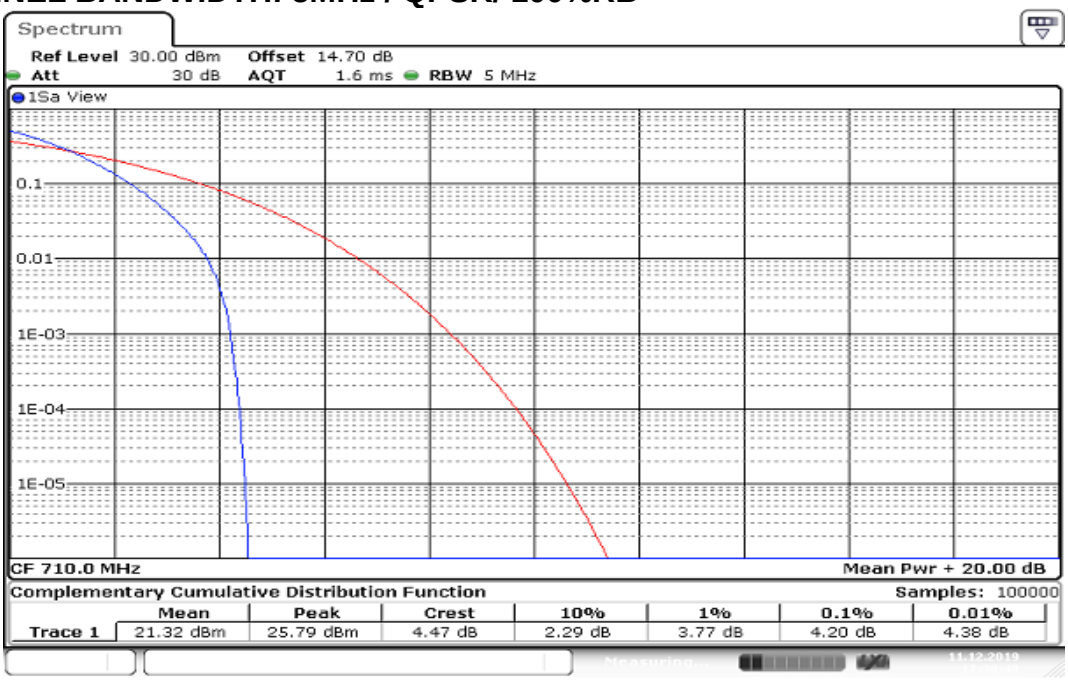
Date: 11.DEC.2019 17:29:29

CHANNEL BANDWIDTH: 10MHz / QPSK/ 1RB



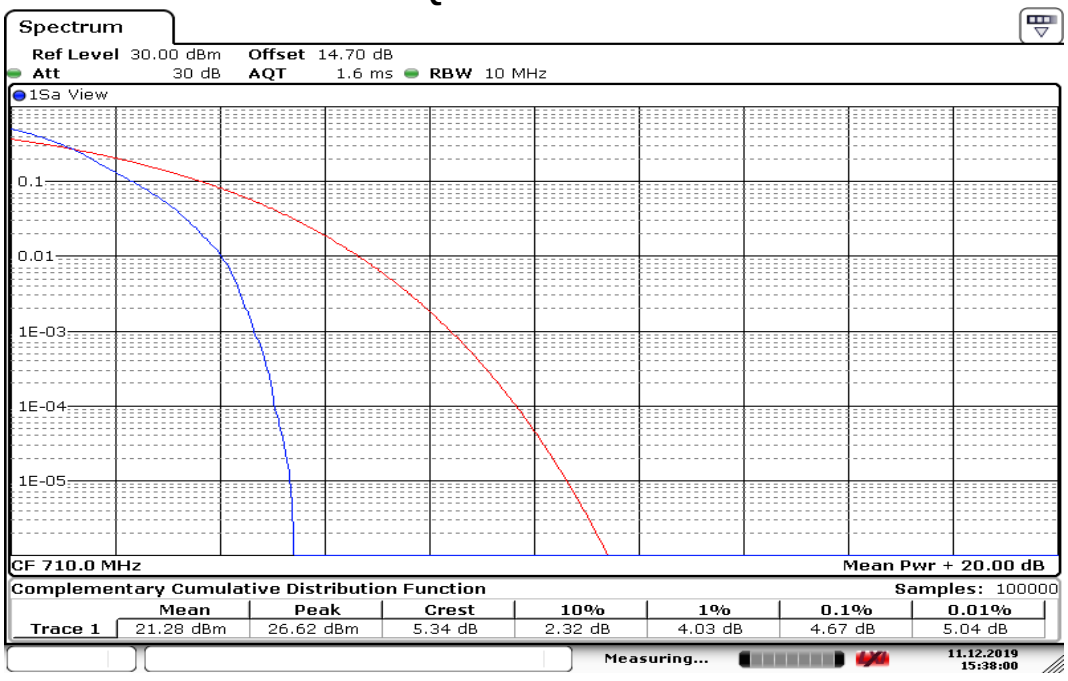
Date: 11.DEC.2019 15:37:44

CHANNEL BANDWIDTH: 5MHz / QPSK/ 100%RB



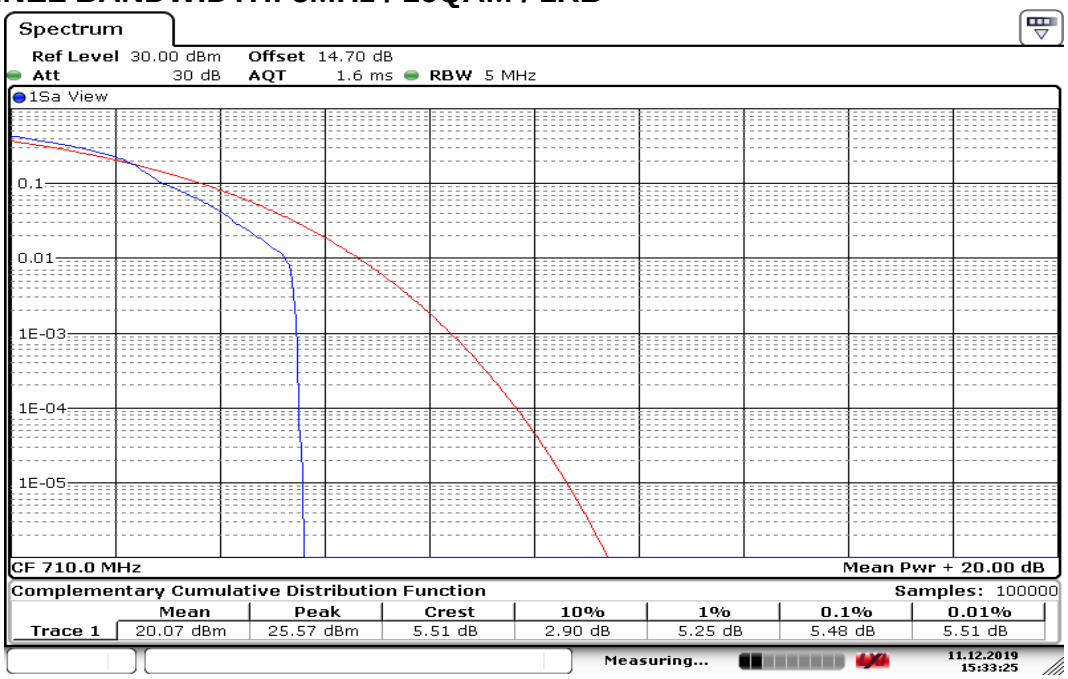
Date: 11.DEC.2019 17:30:48

CHANNEL BANDWIDTH: 10MHz / QPSK/ 100%RB



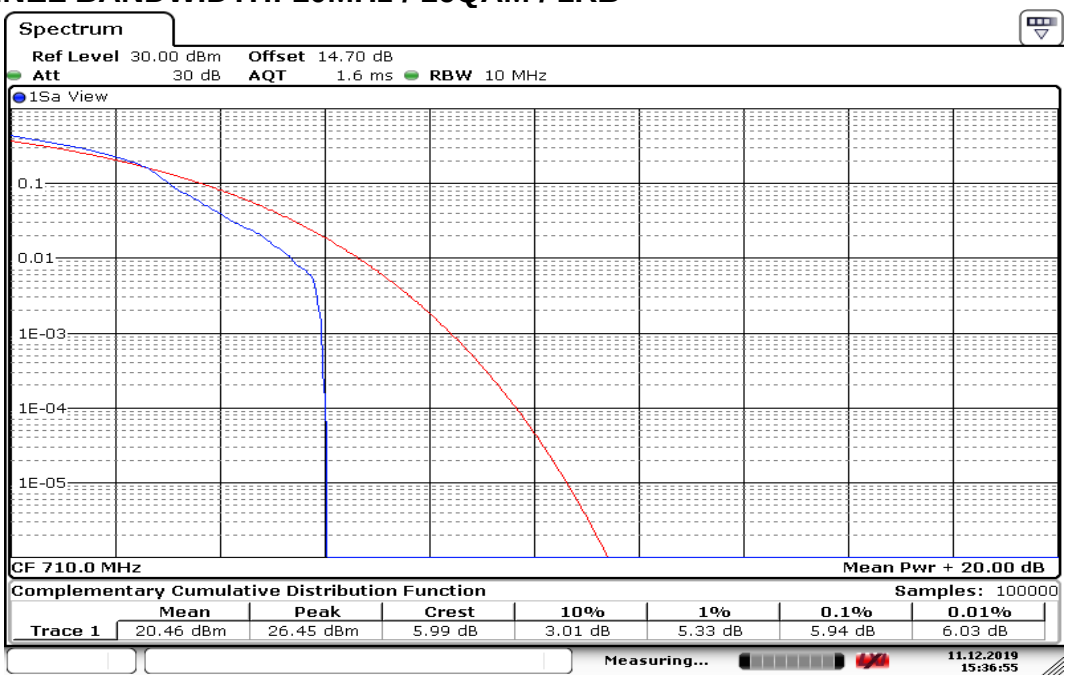
Date: 11.DEC.2019 15:38:00

CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB



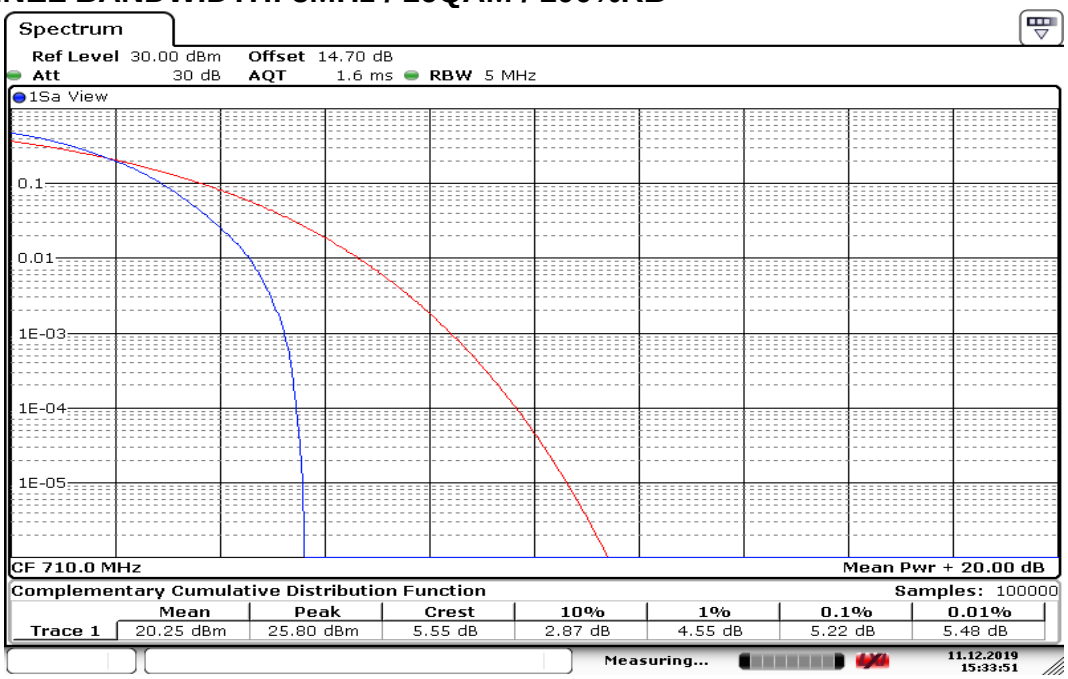
Date: 11.DEC.2019 15:33:25

CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB



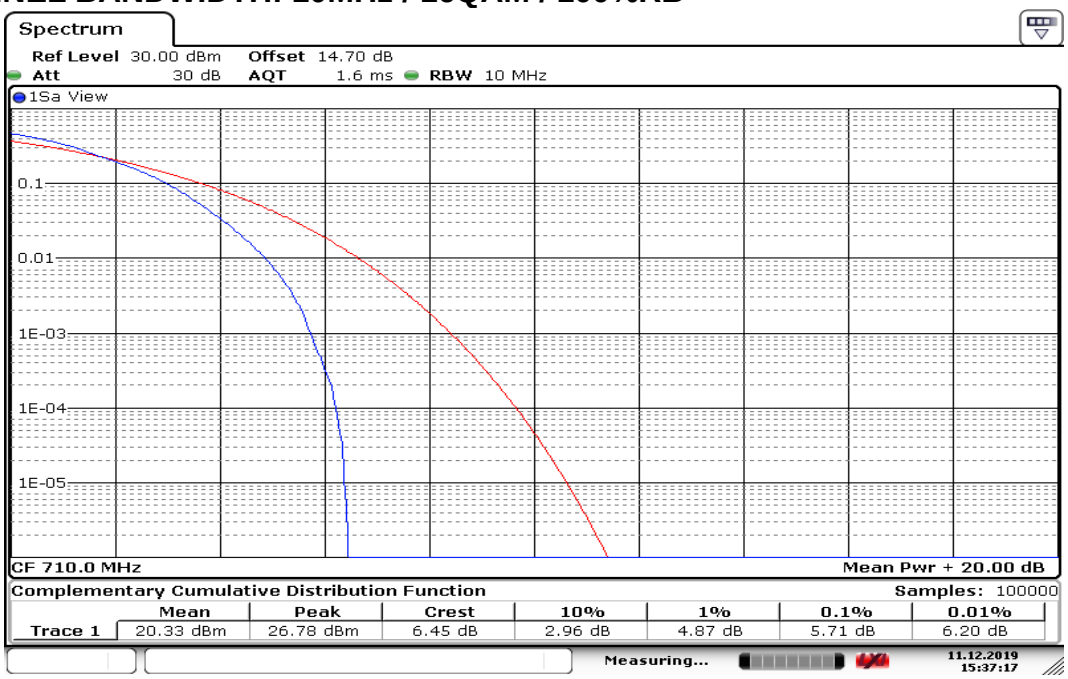
Date: 11.DEC.2019 15:36:56

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



Date: 11.DEC.2019 15:33:51

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



Date: 11.DEC.2019 15:37:18

8.5 BAND EDGE MEASUREMENT

LIMIT

Part 27.53 (g), Band 12 & Band 17
For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

According to RSS-130, Band 12 & Band 17
The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 log10 p (watts), dB. However, in the100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.

TEST PROCEDURES

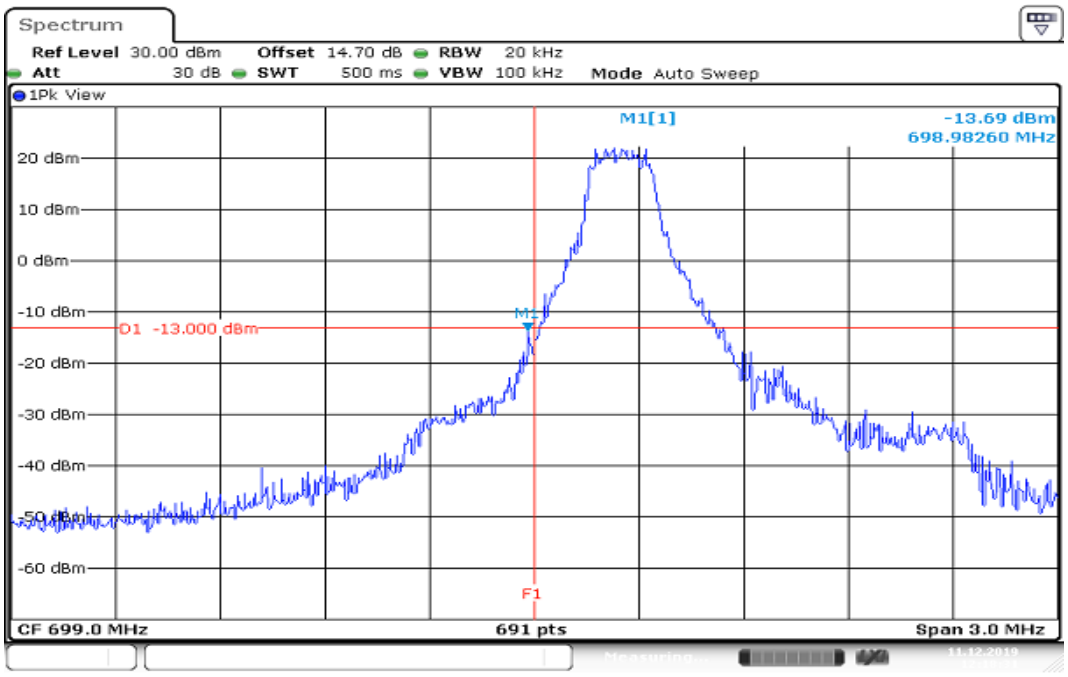
KDB 971168 D01 Power Meas License Digital Systems – Section 6.0
1. RBW ≥ 1% of the emission bandwidth
2. VBW ≥ 3 x RBW
3. Span was set large enough so as to capture all out of emissions near the band edge.

TEST RESULTS:

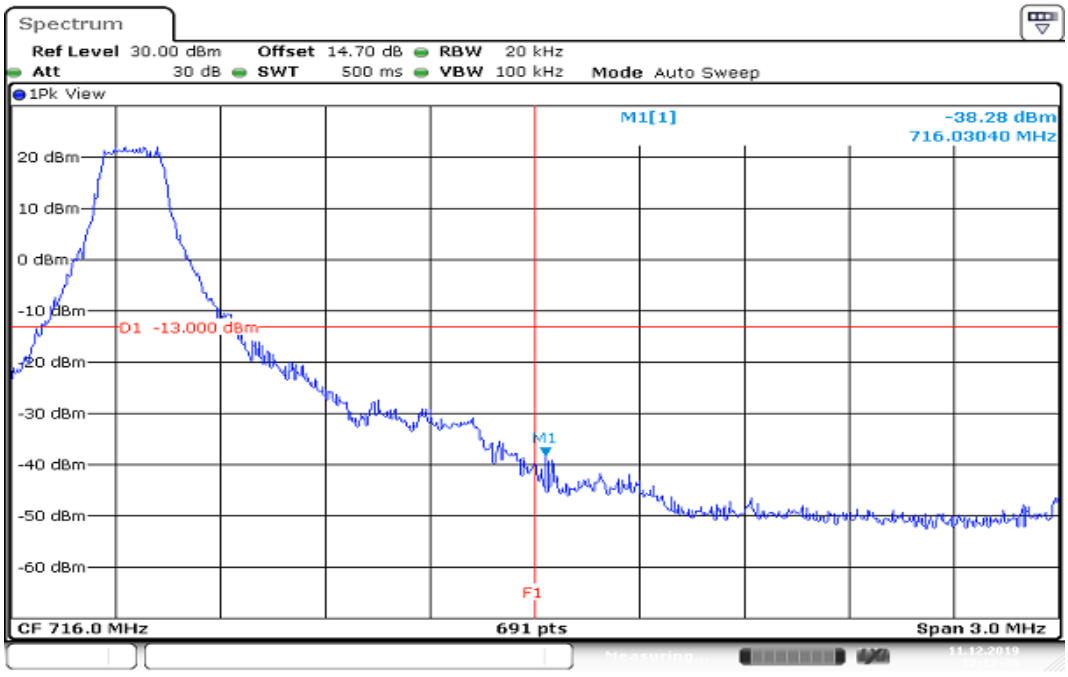
LTE Band 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB ALLOCATION

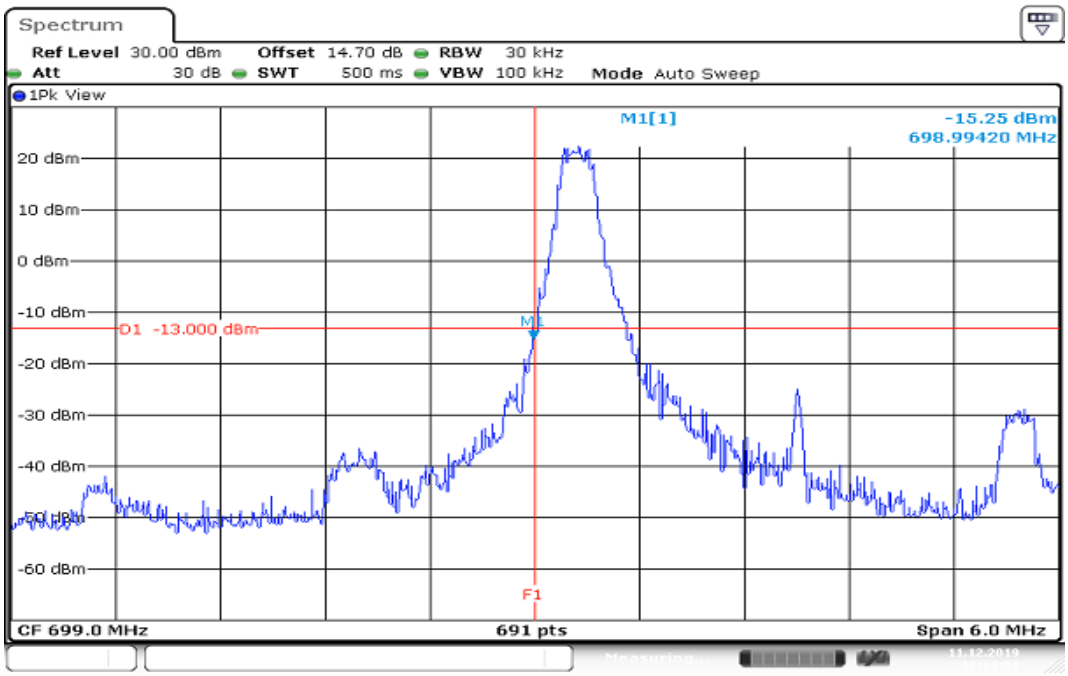
LOWER BAND EDGE



HIGHER BAND EDGE

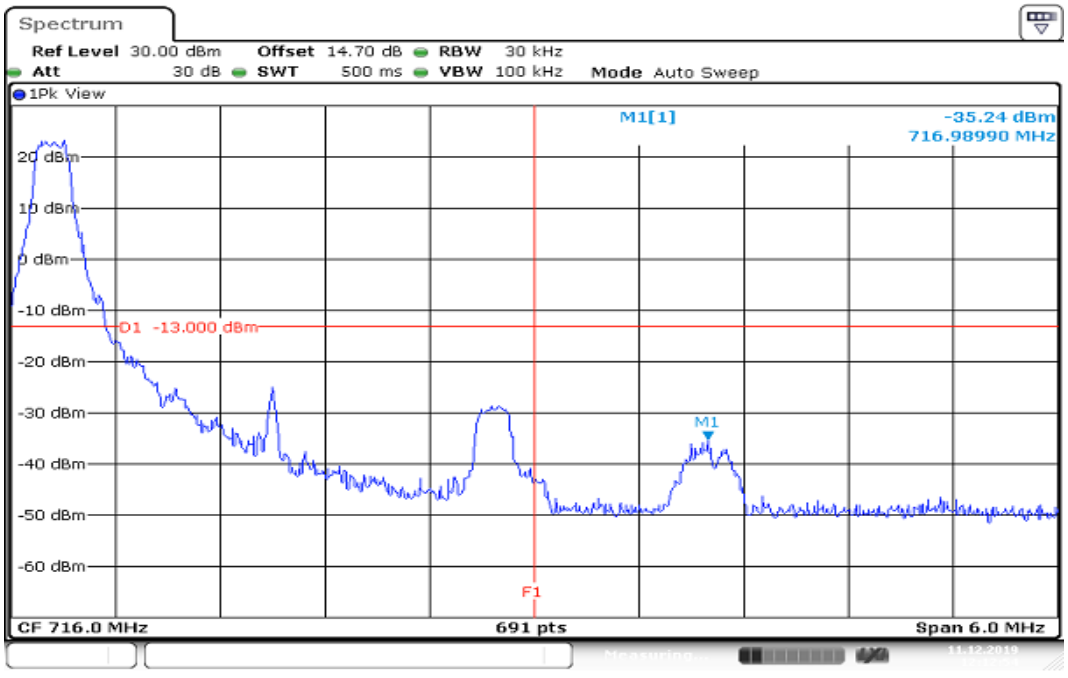


CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB ALLOCATION
LOWER BAND EDGE



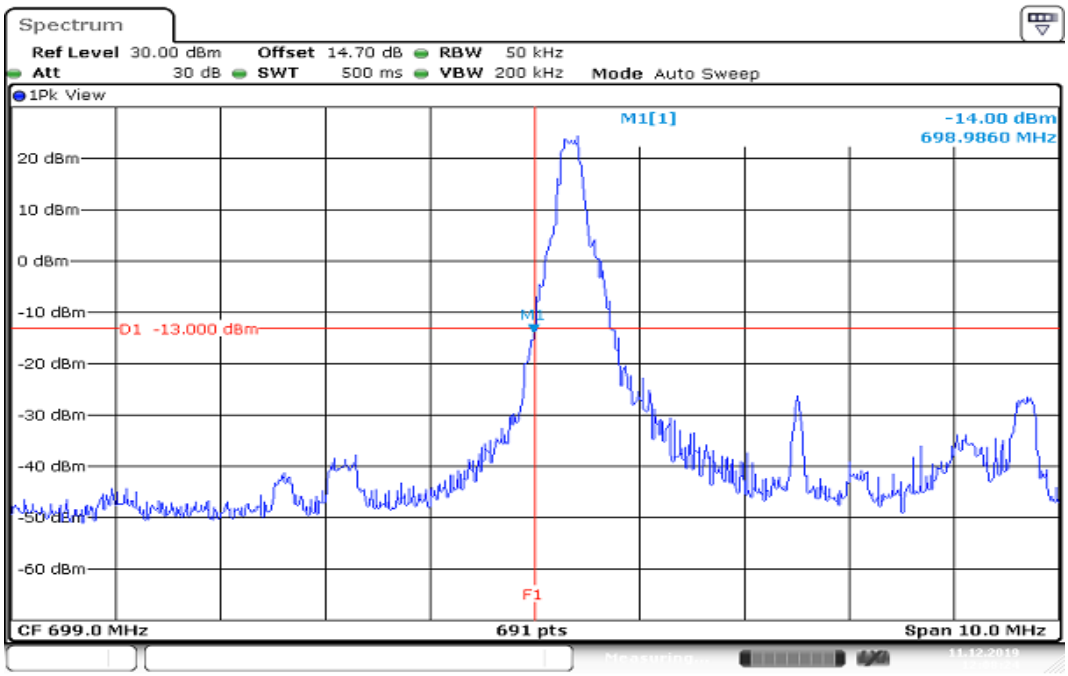
Date: 11.DEC.2019 12:11:51

HIGHER BAND EDGE



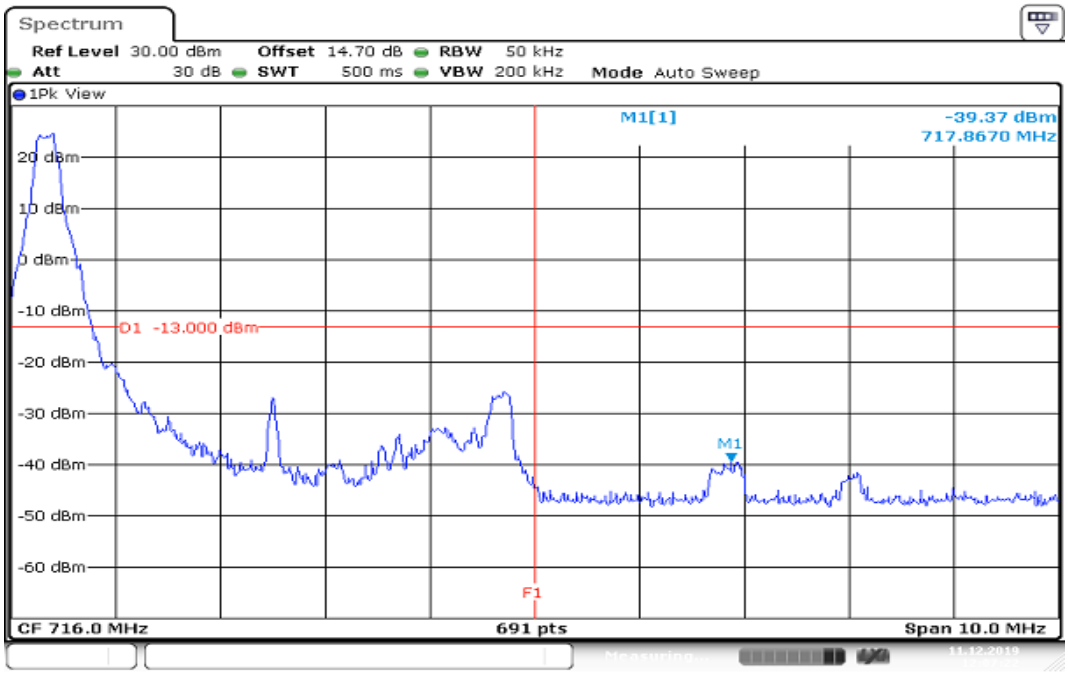
Date: 11.DEC.2019 12:12:55

CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB ALLOCATION
LOWER BAND EDGE



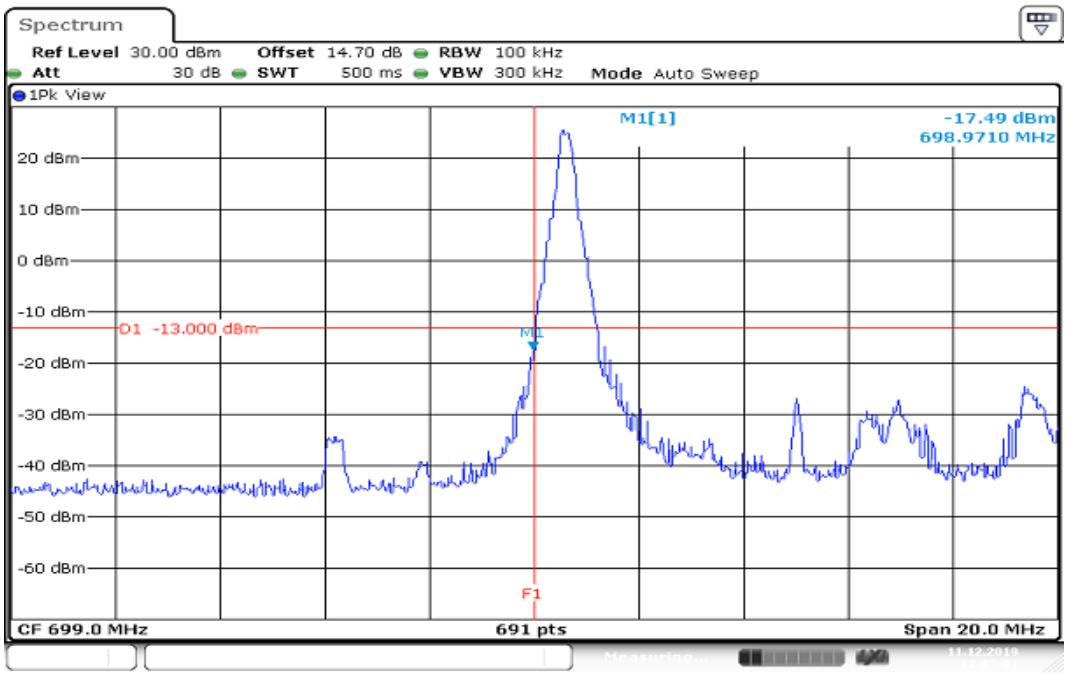
Date: 11.DEC.2019 12:08:25

HIGHER BAND EDGE



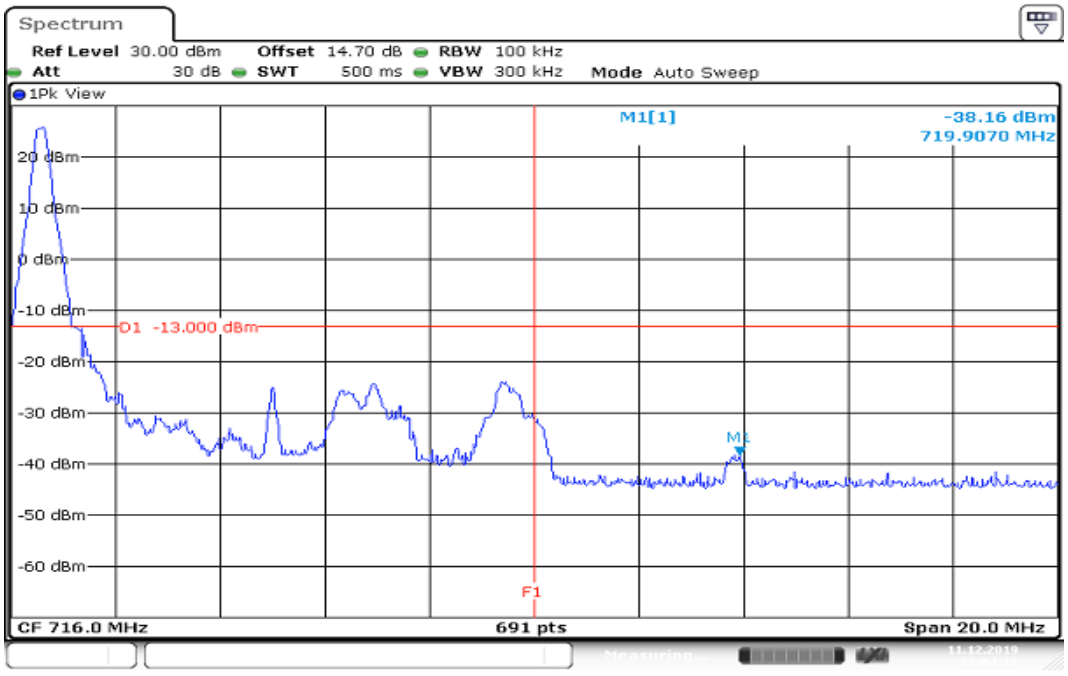
Date: 11.DEC.2019 12:07:23

CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB ALLOCATION
LOWER BAND EDGE



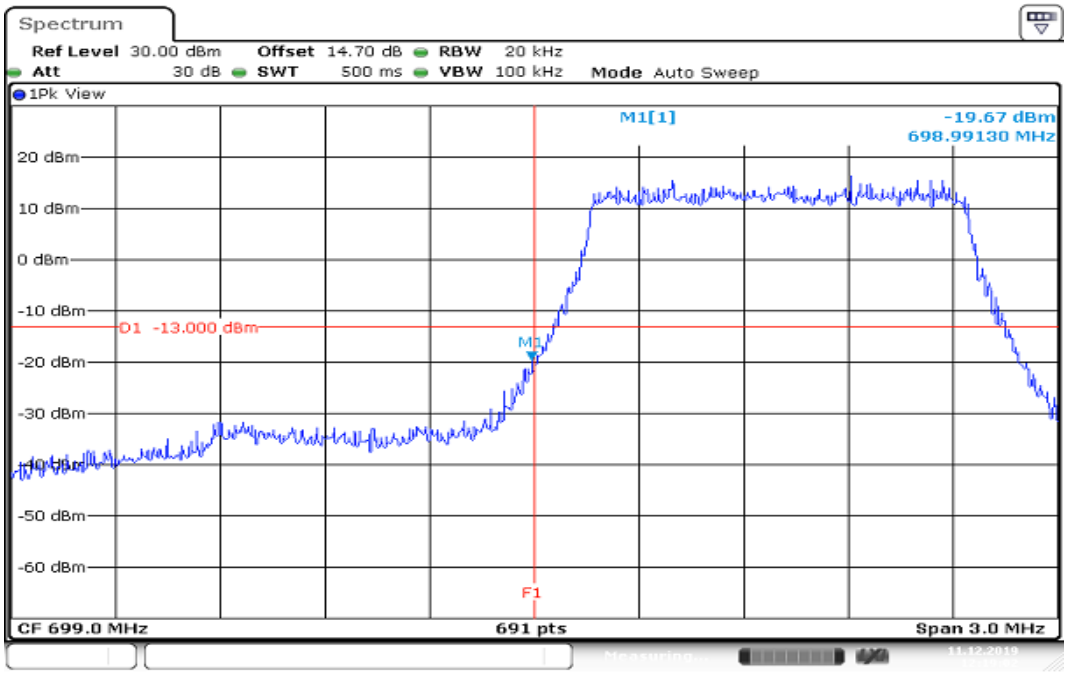
Date: 11.DEC.2019 12:03:02

HIGHER BAND EDGE



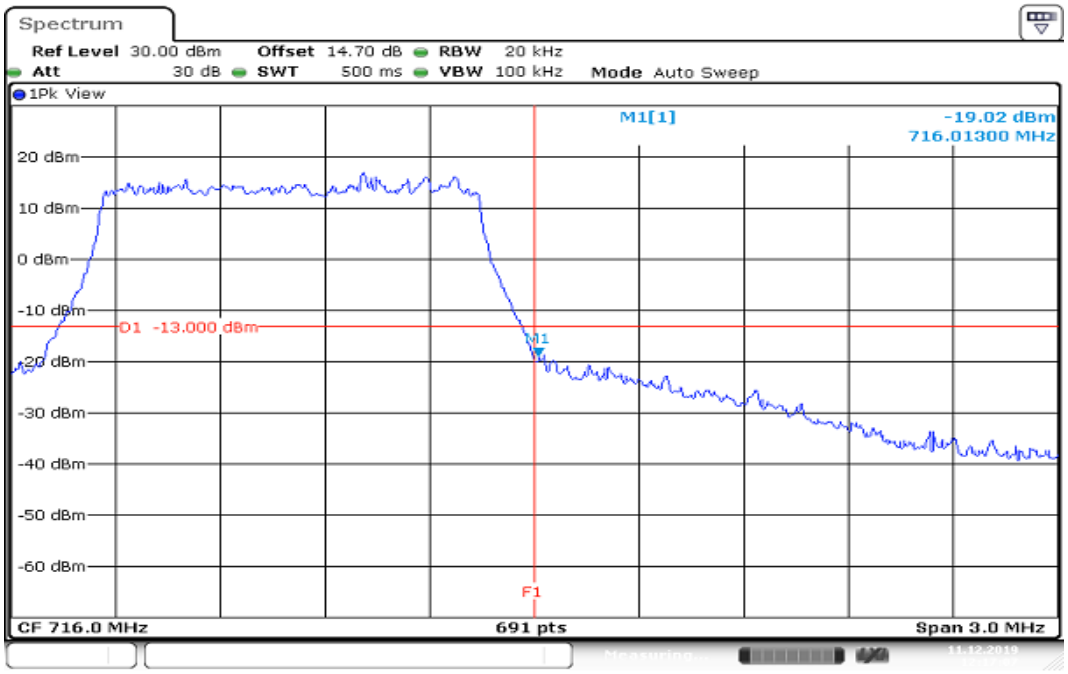
Date: 11.DEC.2019 12:04:18

CHANNEL BANDWIDTH: 1.4MHz / QPSK / FULLRB ALLOCATION
LOWER BAND EDGE



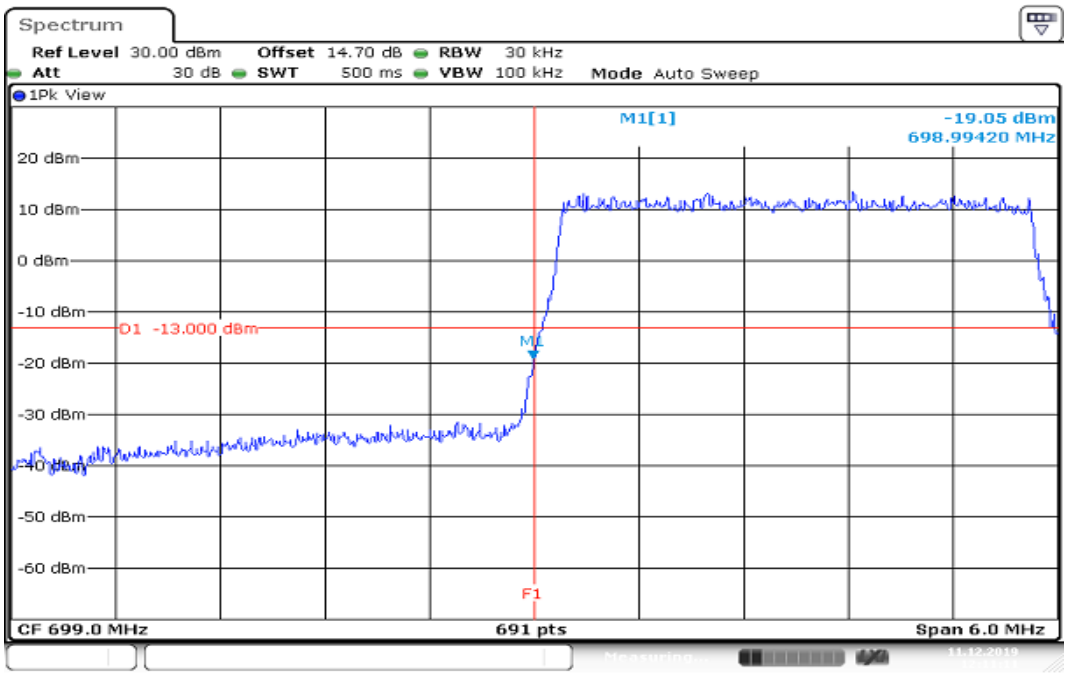
Date: 11.DEC.2019 12:19:03

HIGHER BAND EDGE



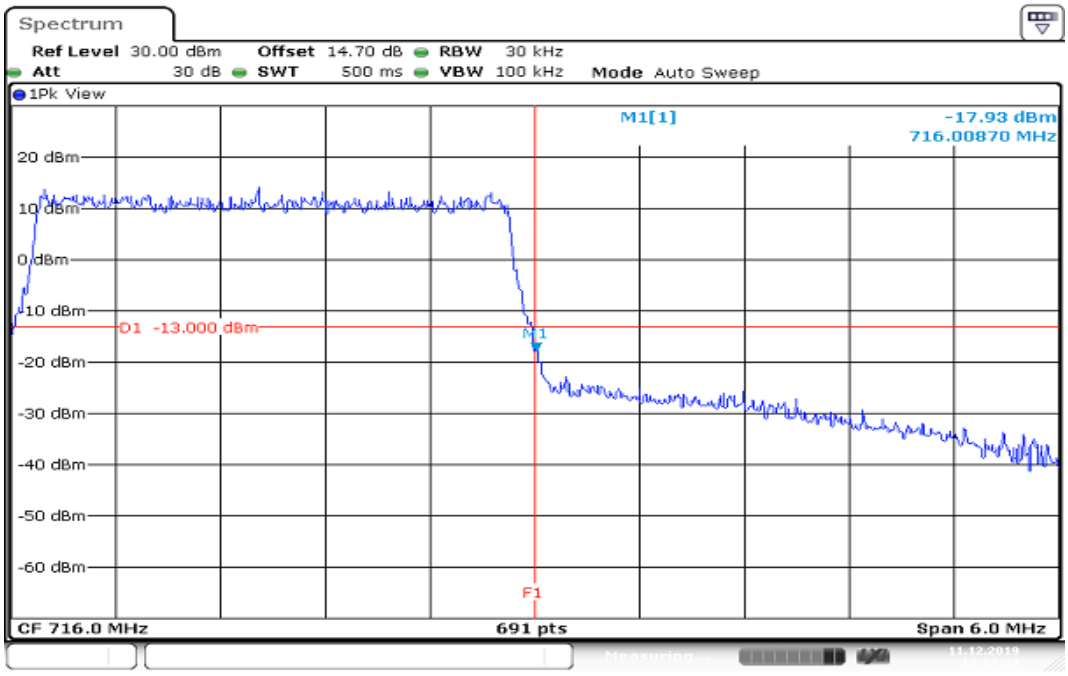
Date: 11.DEC.2019 12:17:07

CHANNEL BANDWIDTH: 3MHz / QPSK / FULLRB ALLOCATION
LOWER BAND EDGE



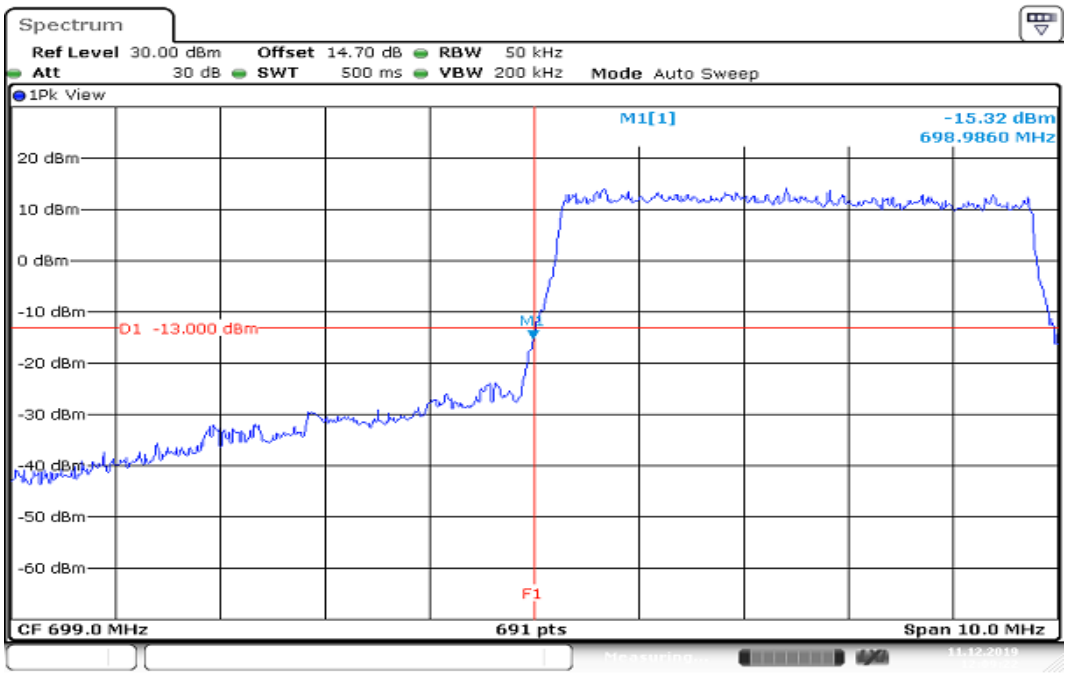
Date: 11.DEC.2019 12:11:12

HIGHER BAND EDGE



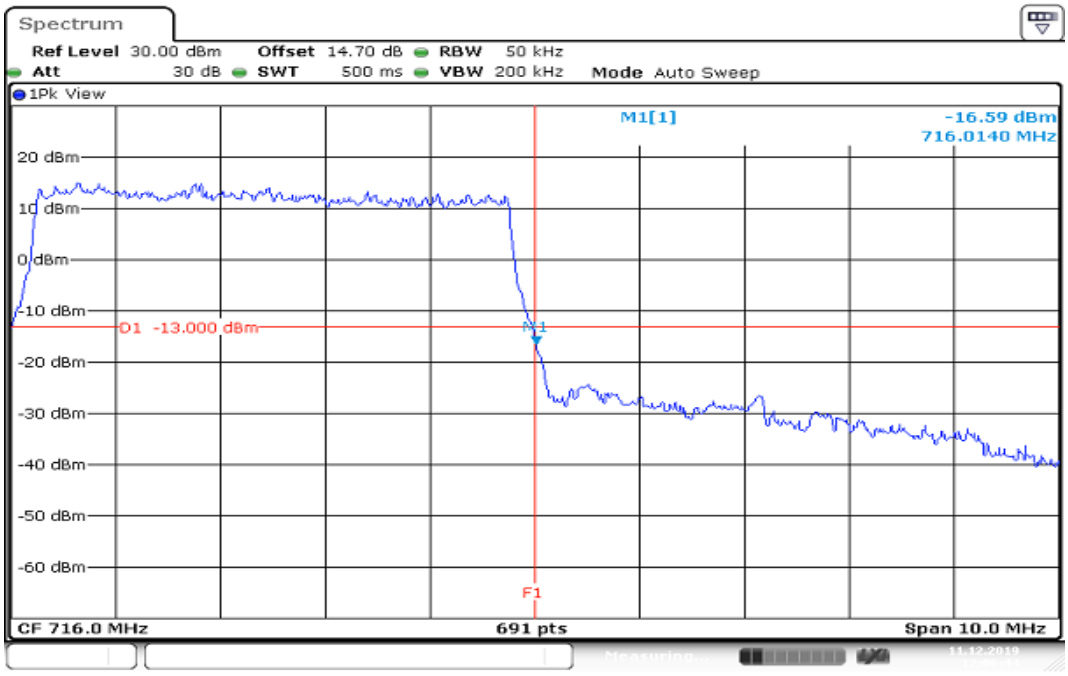
Date: 11.DEC.2019 12:13:33

CHANNEL BANDWIDTH: 5MHz / QPSK / FULLRB ALLOCATION
LOWER BAND EDGE



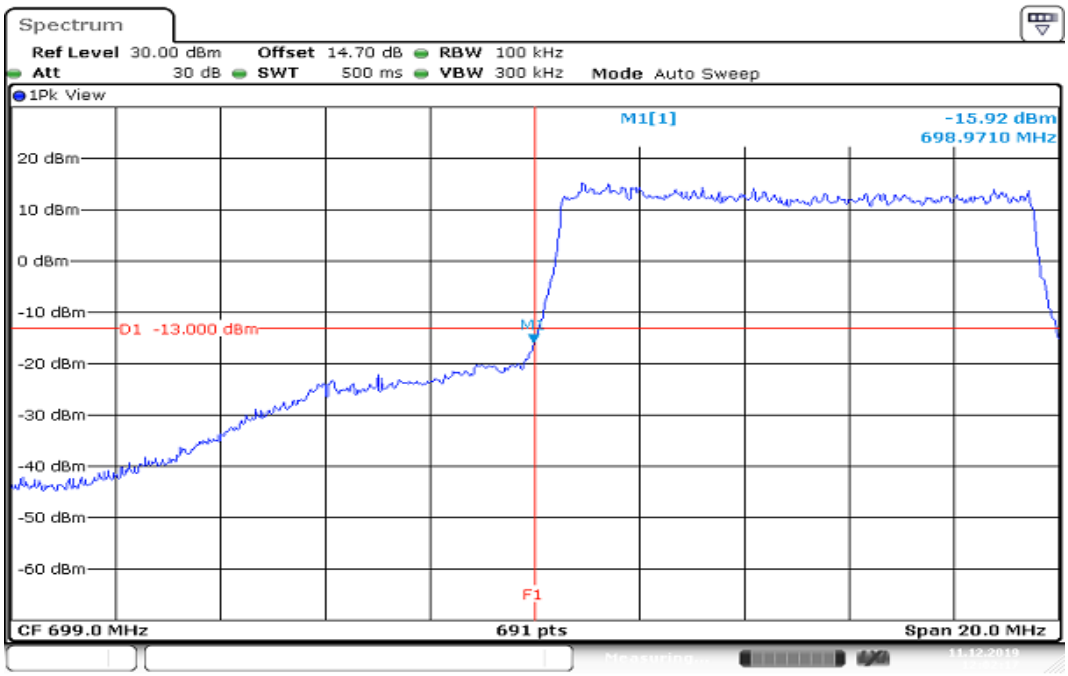
Date: 11.DEC.2019 12:09:23

HIGHER BAND EDGE



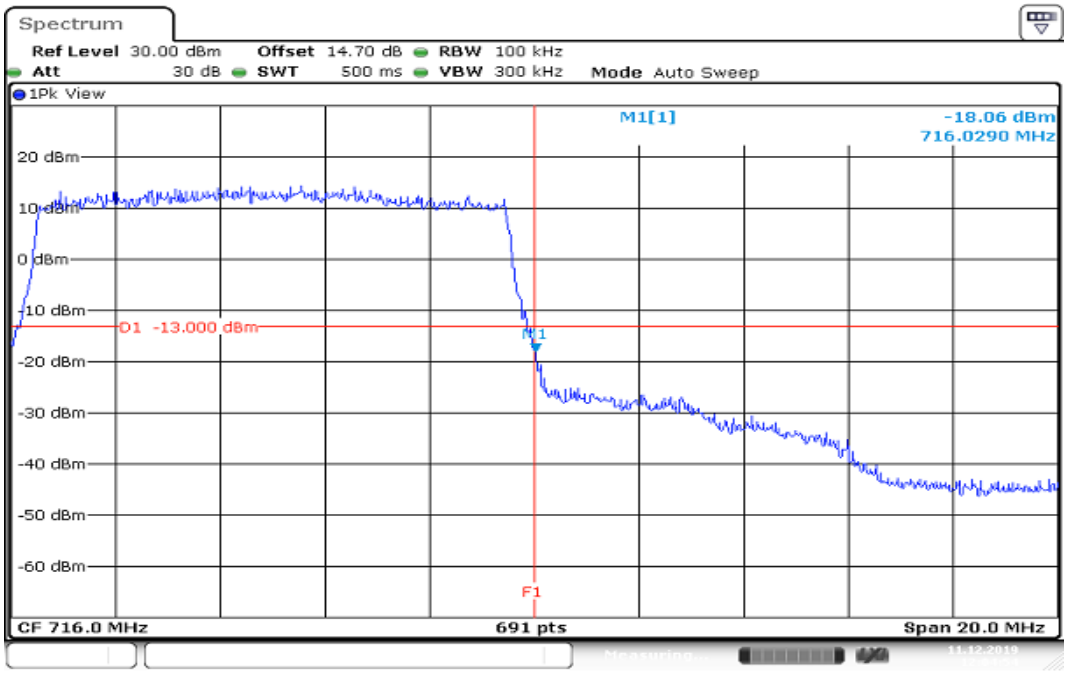
Date: 11.DEC.2019 12:06:45

CHANNEL BANDWIDTH: 10MHz / QPSK / FULLRB ALLOCATION
LOWER BAND EDGE



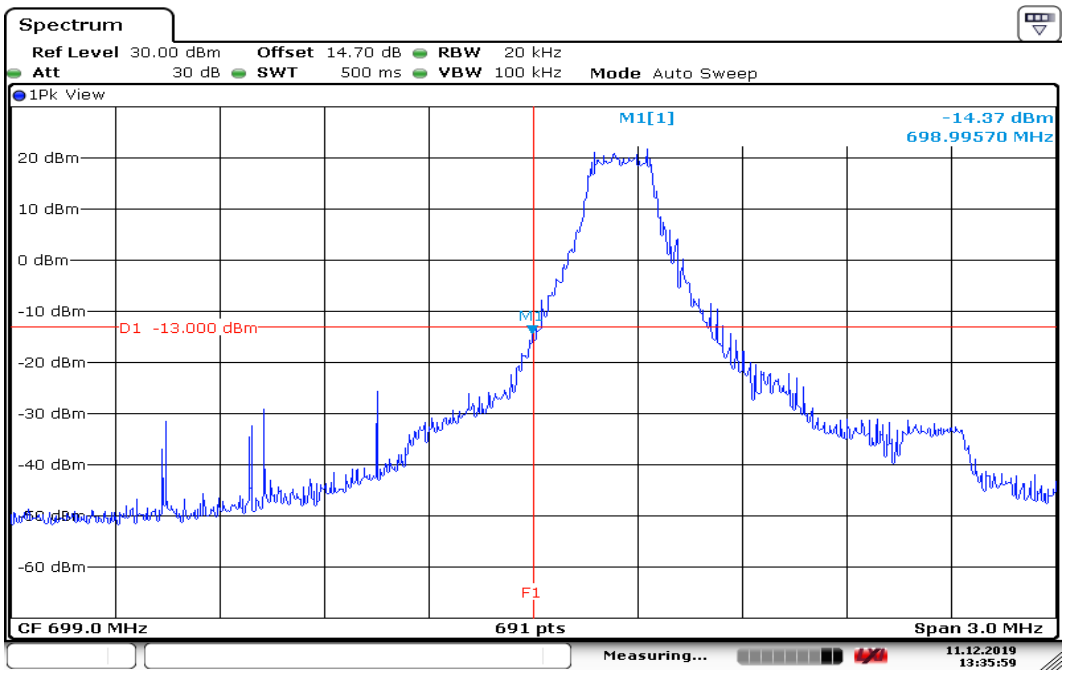
Date: 11.DEC.2019 12:02:18

HIGHER BAND EDGE



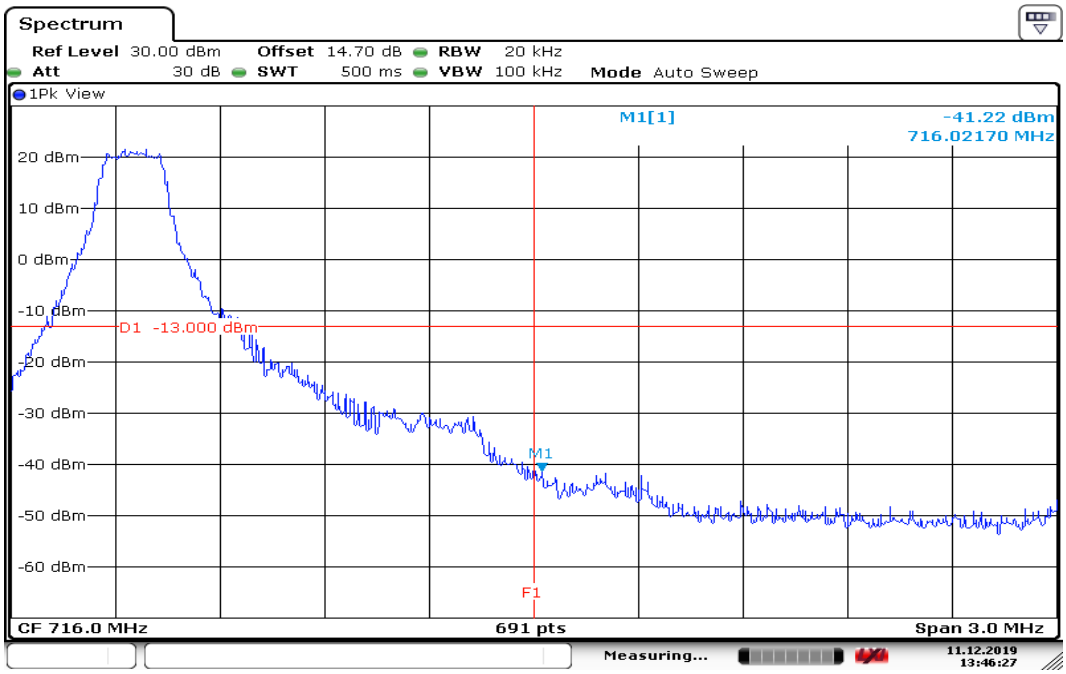
Date: 11.DEC.2019 12:04:54

CHANNEL BANDWIDTH: 1.4MHz / 16QAM/ 1RB ALLOCATION
LOWER BAND EDGE



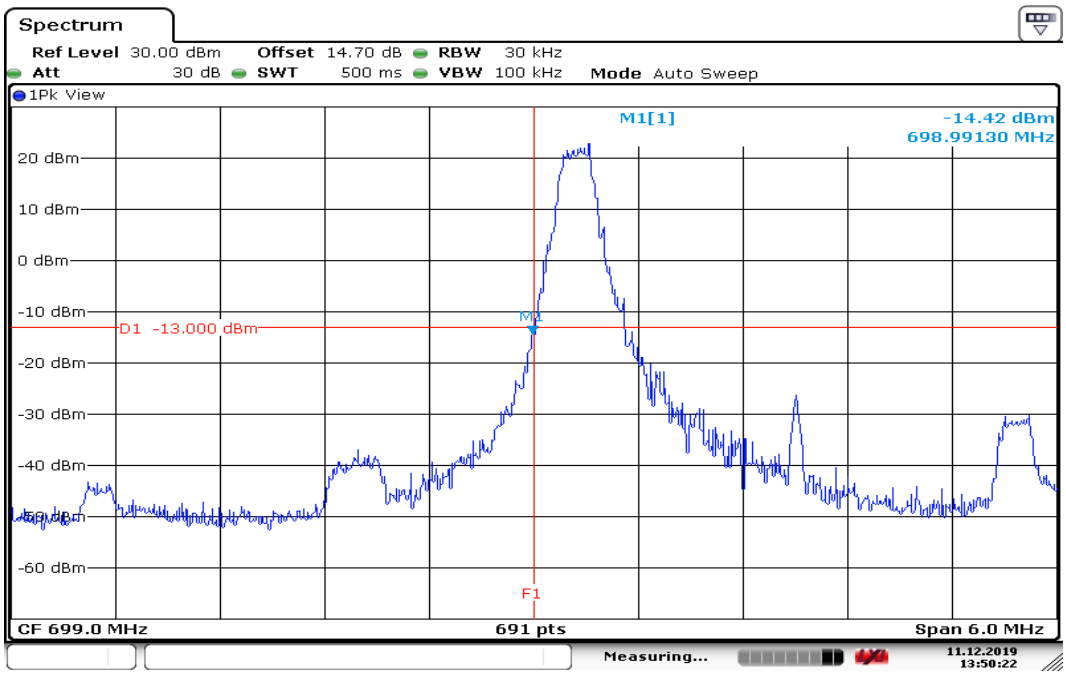
Date: 11.DEC.2019 13:36:00

HIGHER BAND EDGE



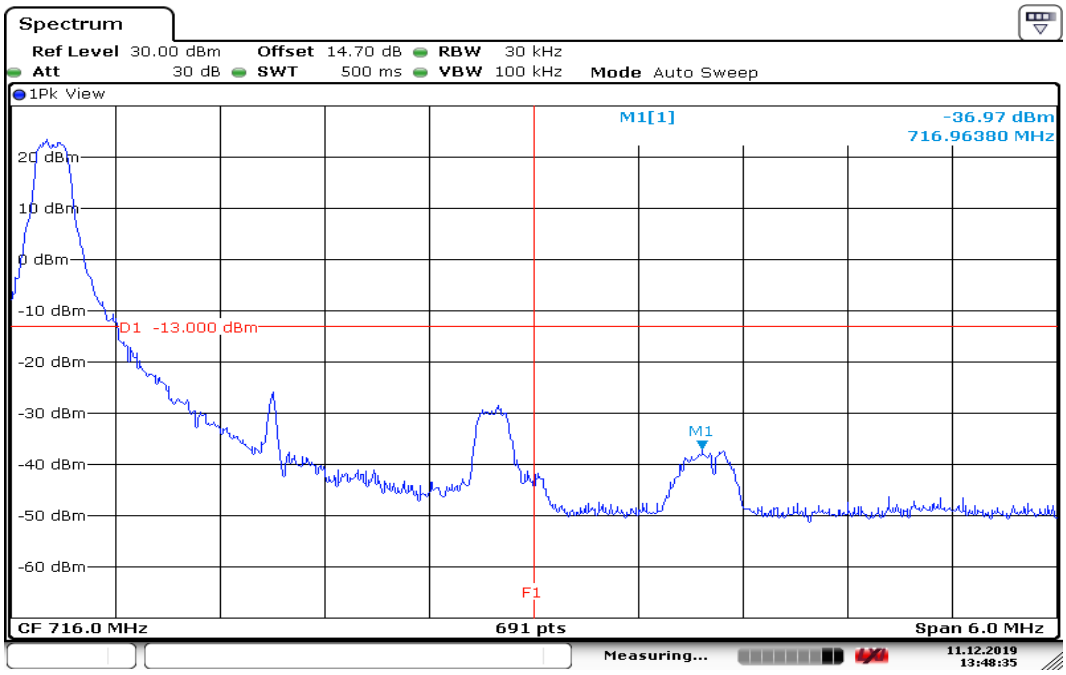
Date: 11.DEC.2019 13:46:27

CHANNEL BANDWIDTH: 3MHz / 16QAM/ 1RB ALLOCATION
LOWER BAND EDGE



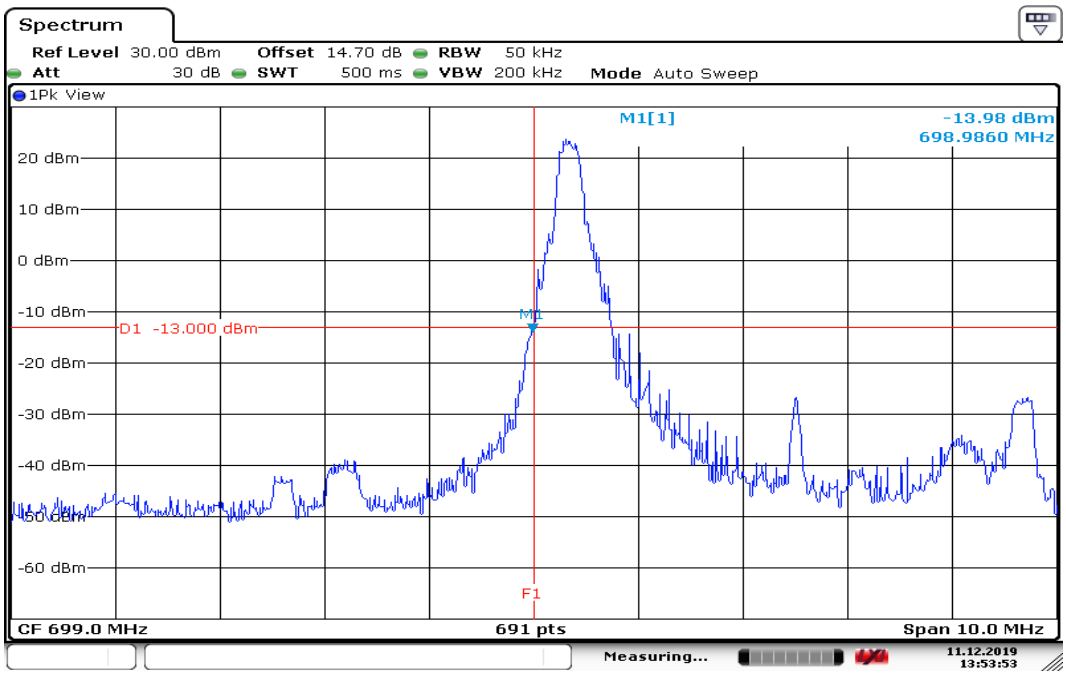
Date: 11.DEC.2019 13:50:23

HIGHER BAND EDGE



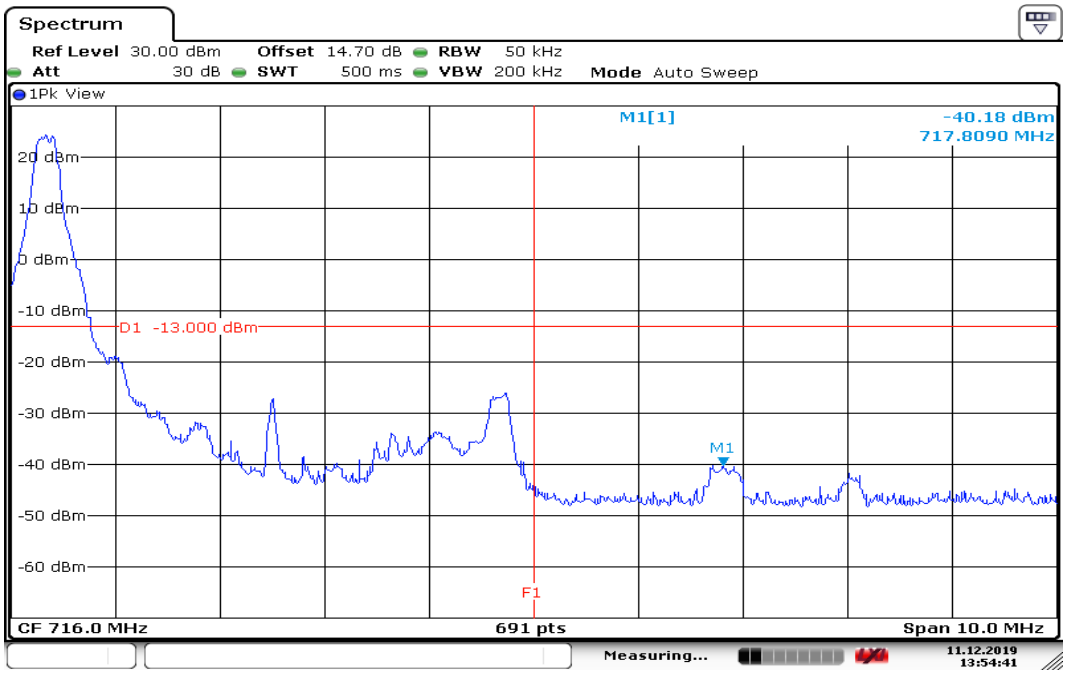
Date: 11.DEC.2019 13:48:35

CHANNEL BANDWIDTH: 5MHz / 16QAM/ 1RB ALLOCATION
LOWER BAND EDGE



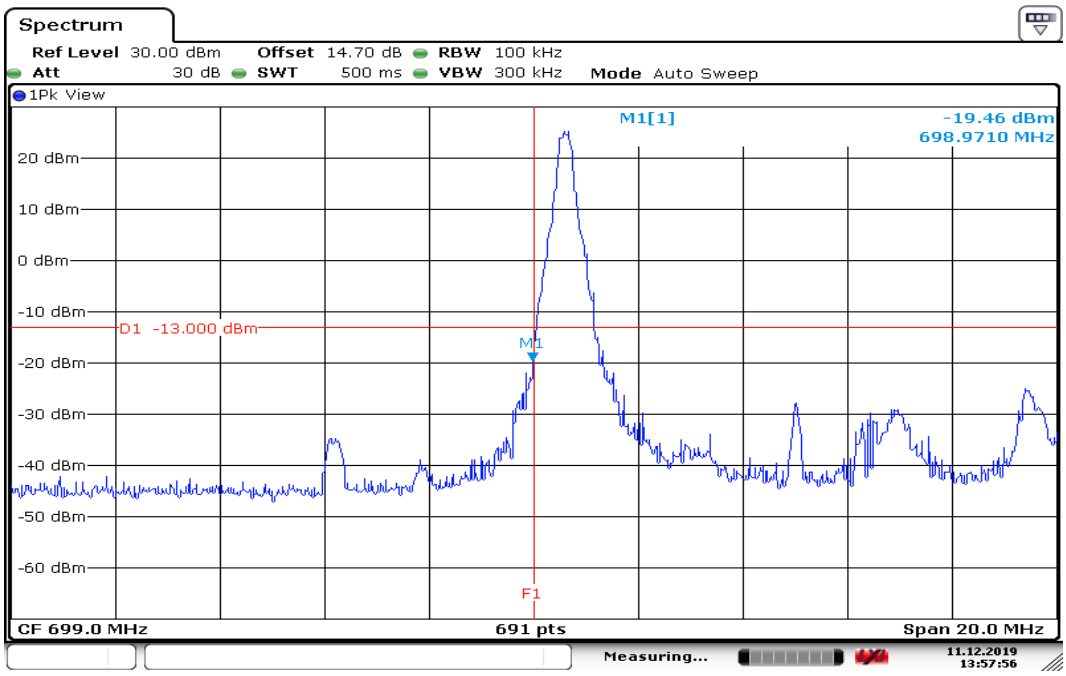
Date: 11.DEC.2019 13:53:53

HIGHER BAND EDGE



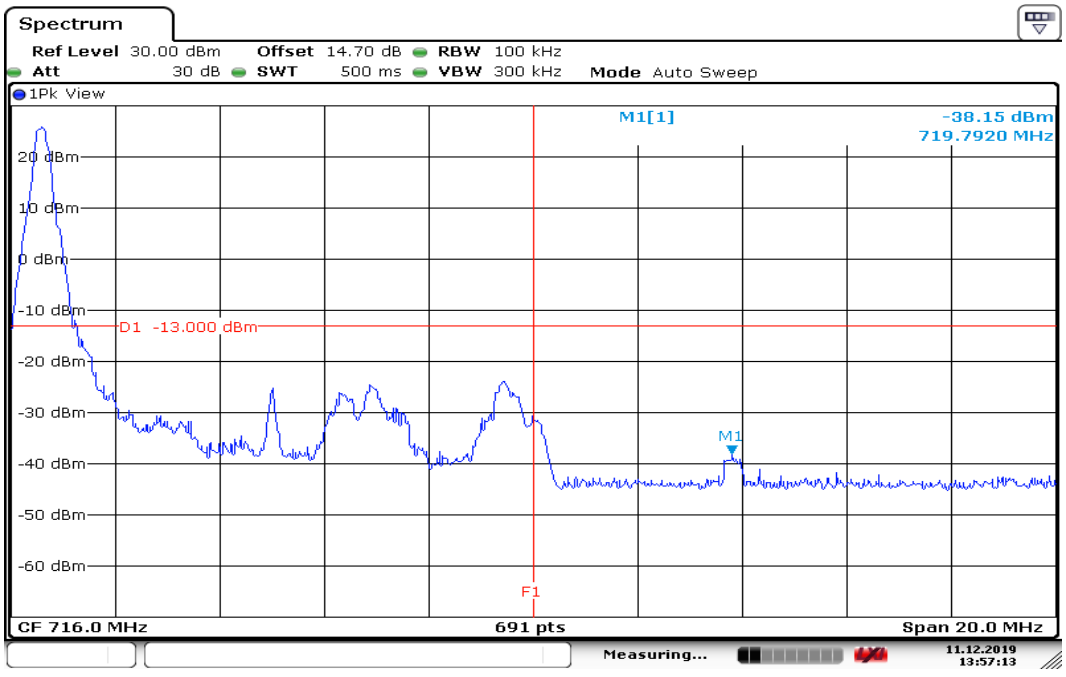
Date: 11.DEC.2019 13:54:42

CHANNEL BANDWIDTH: 10MHz / 16QAM/ 1RB ALLOCATION
LOWER BAND EDGE



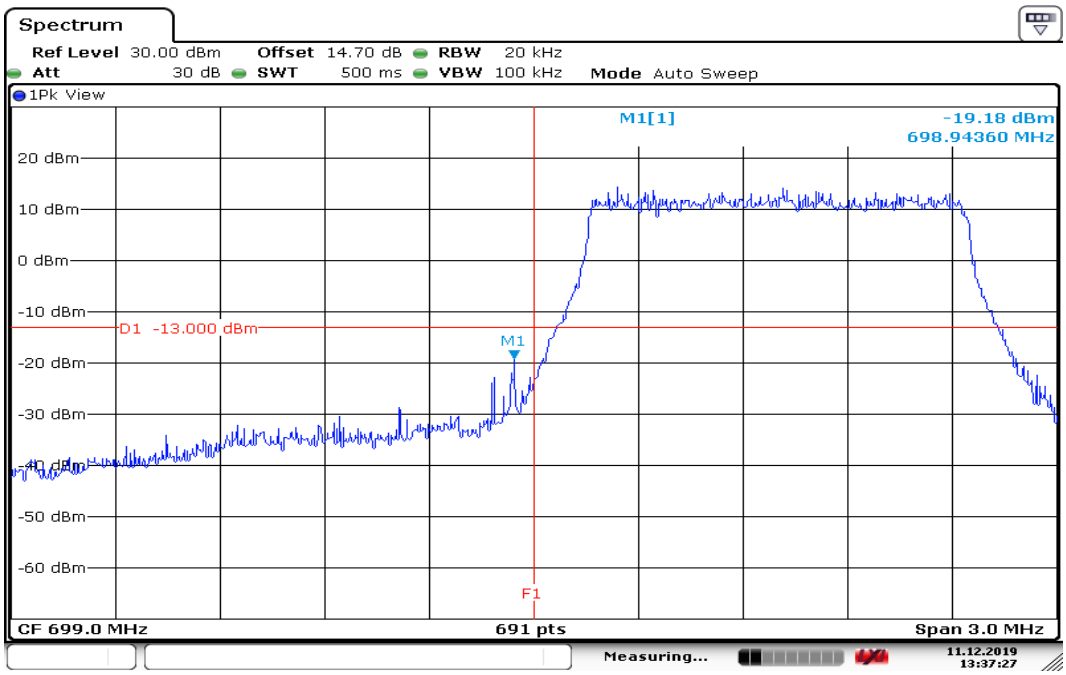
Date: 11.DEC.2019 13:57:56

HIGHER BAND EDGE



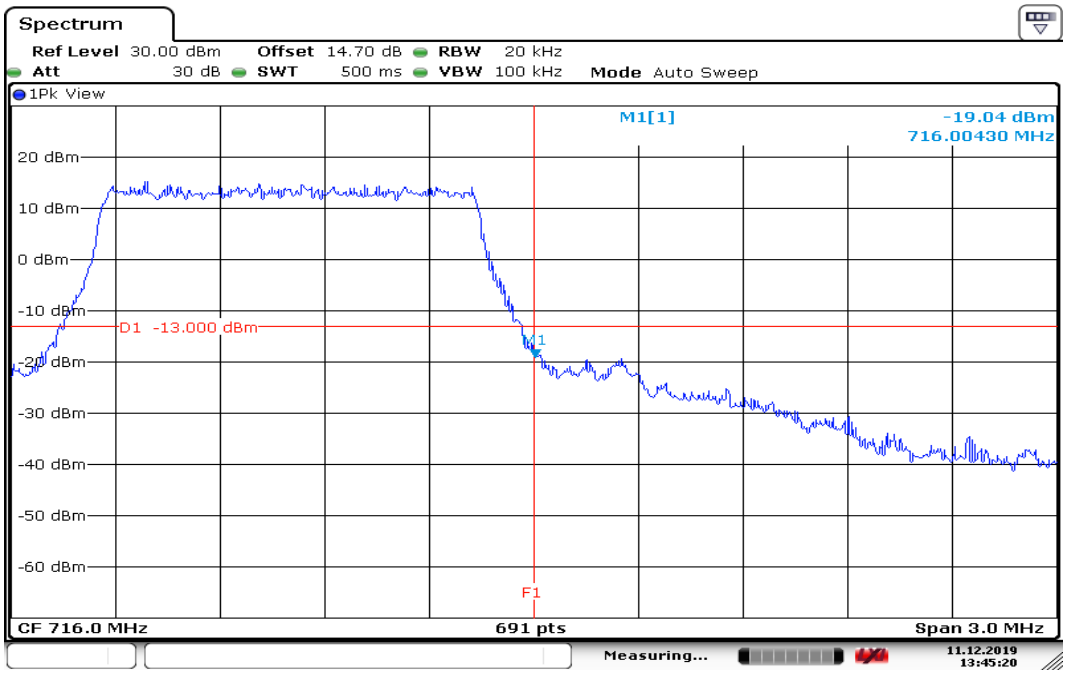
Date: 11.DEC.2019 13:57:14

CHANNEL BANDWIDTH: 1.4MHz / 16QAM/ FULLRB ALLOCATION
LOWER BAND EDGE



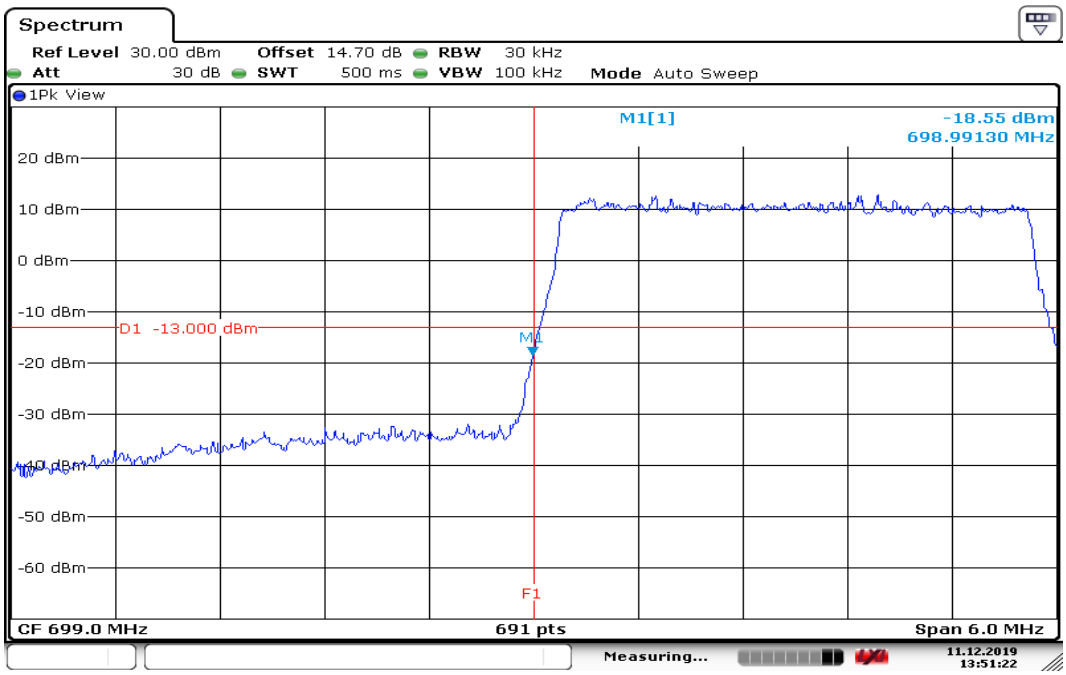
Date: 11.DEC.2019 13:37:27

HIGHER BAND EDGE



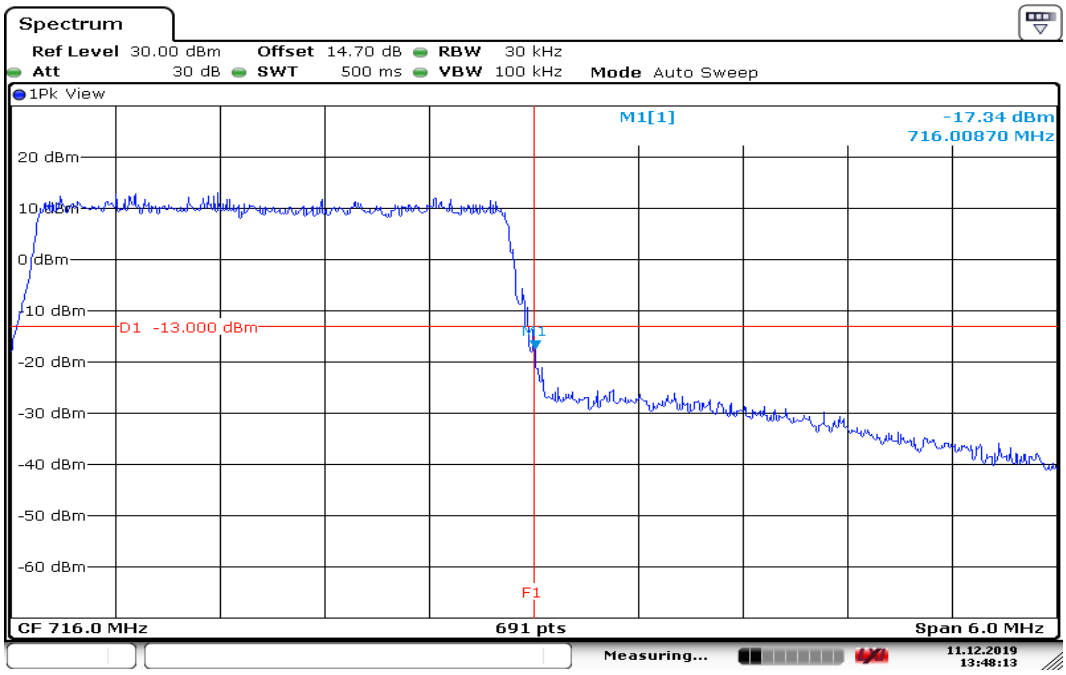
Date: 11.DEC.2019 13:45:20

CHANNEL BANDWIDTH: 3MHz / 16QAM/ FULLRB ALLOCATION
LOWER BAND EDGE



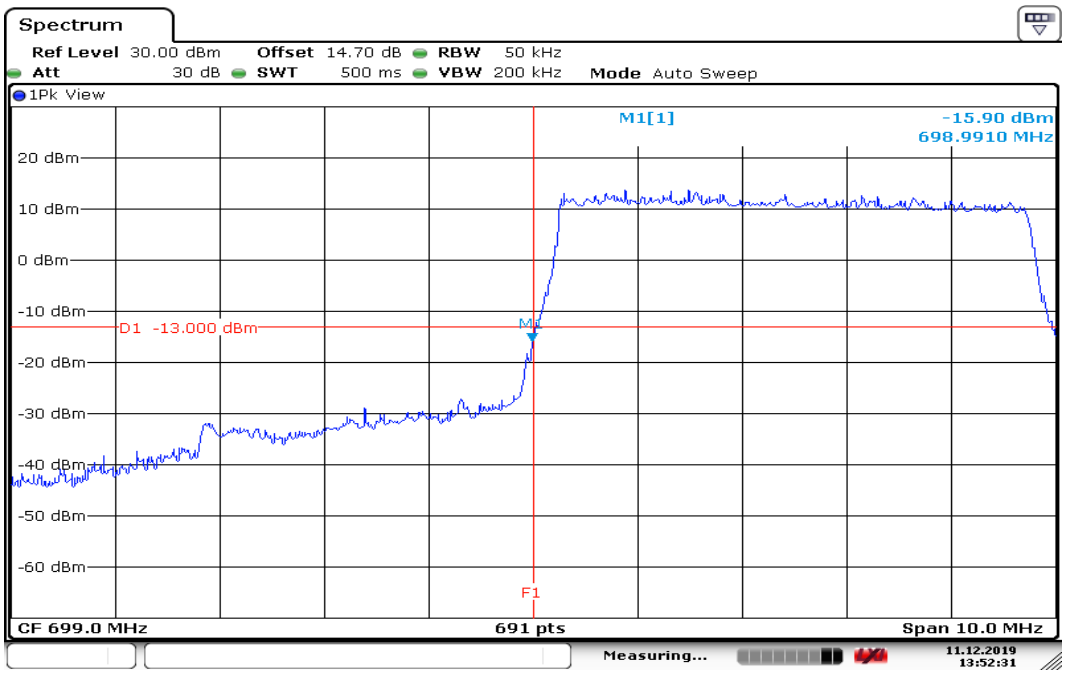
Date: 11.DEC.2019 13:51:22

HIGHER BAND EDGE



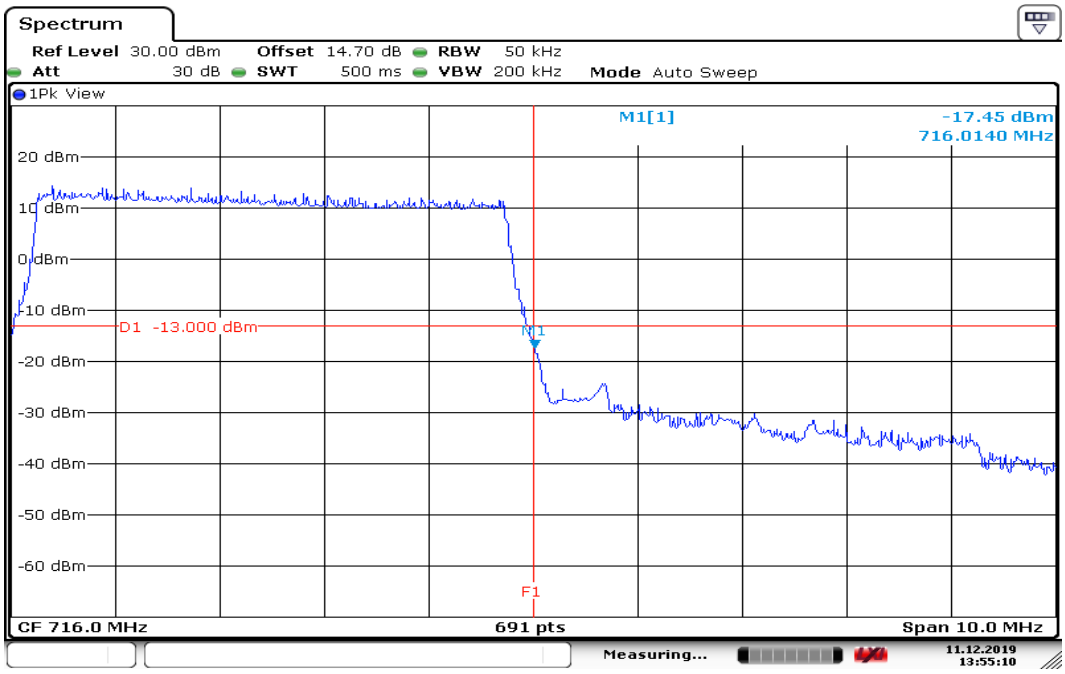
Date: 11.DEC.2019 13:48:13

CHANNEL BANDWIDTH: 5MHz / 16QAM/ FULLRB ALLOCATION
LOWER BAND EDGE



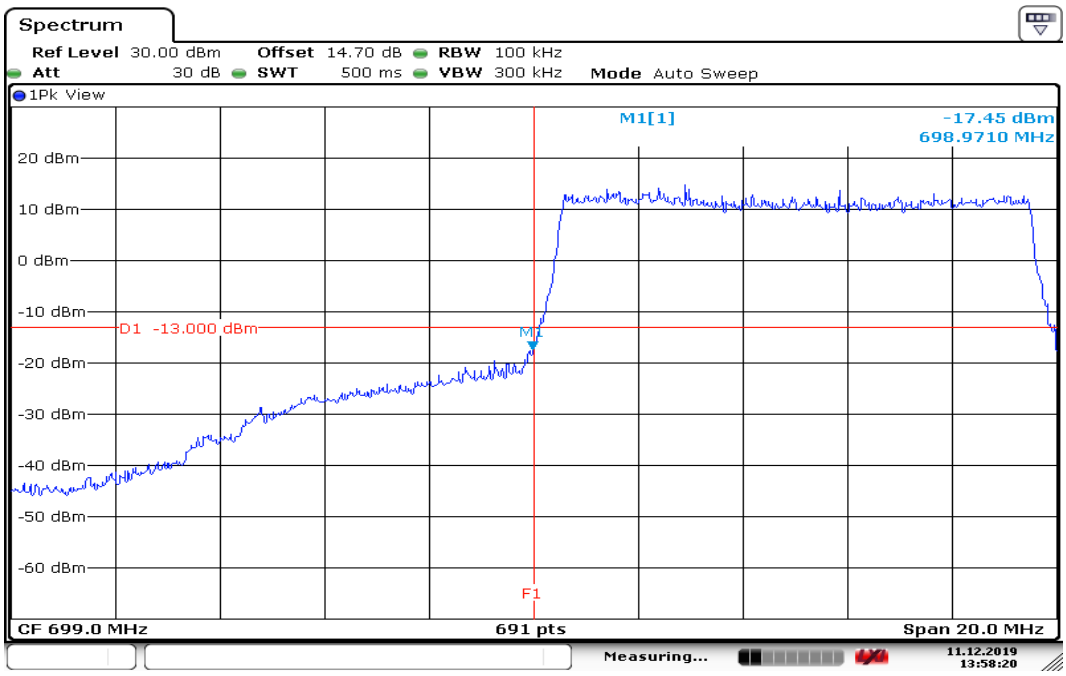
Date: 11.DEC.2019 13:52:31

HIGHER BAND EDGE



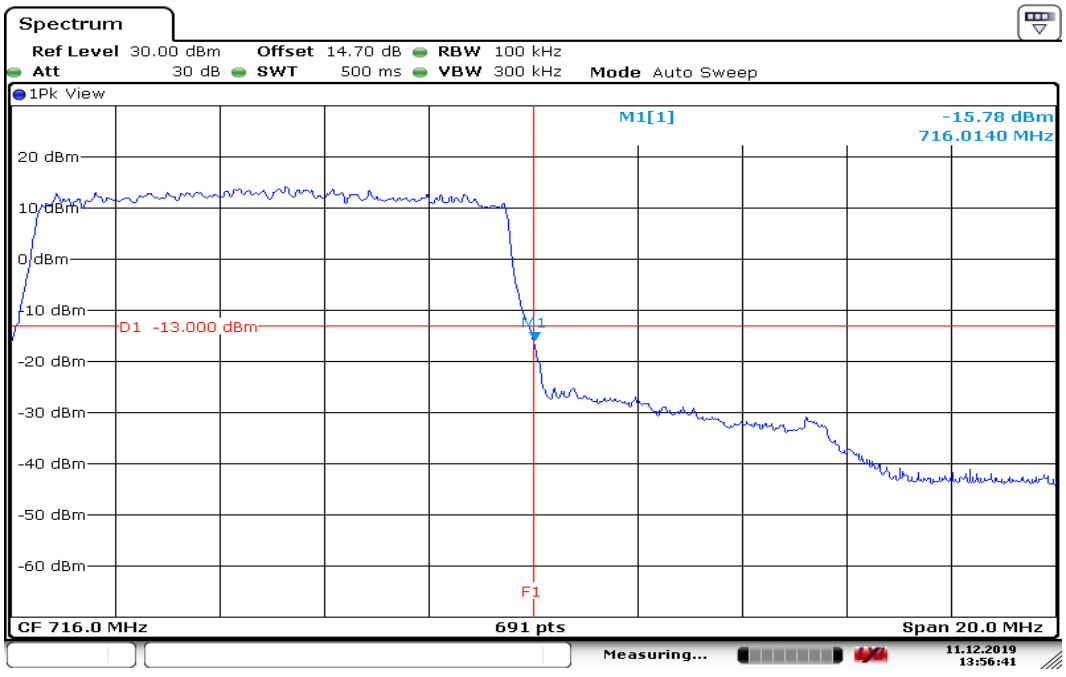
Date: 11.DEC.2019 13:55:11

CHANNEL BANDWIDTH: 10MHz / 16QAM/ FULLRB ALLOCATION
LOWER BAND EDGE



Date: 11.DEC.2019 13:58:20

HIGHER BAND EDGE

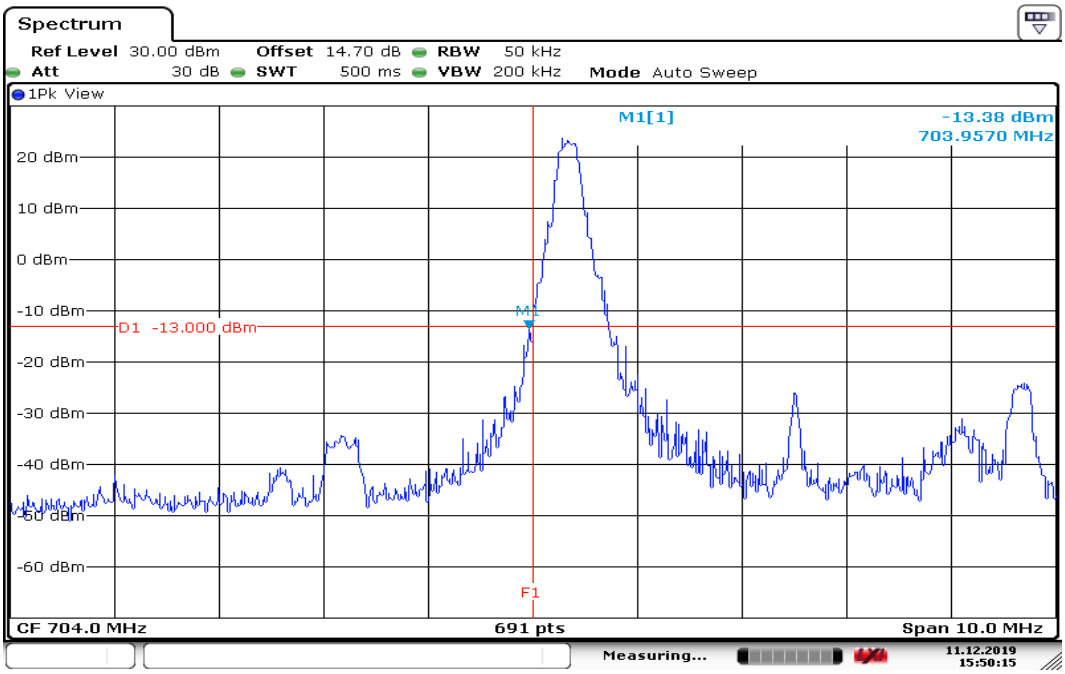


Date: 11.DEC.2019 13:56:41

LTE Band 17

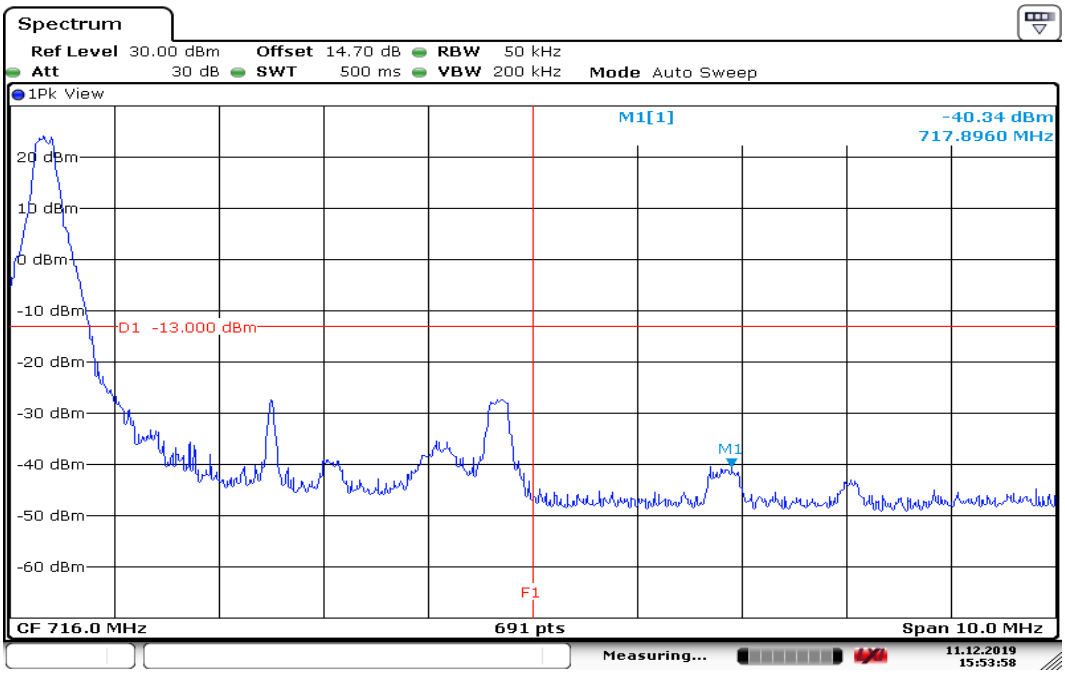
CHANNEL BANDWIDTH: 5MHz / QPSK / 1 RB ALLOCATED

LOWER BAND EDGE



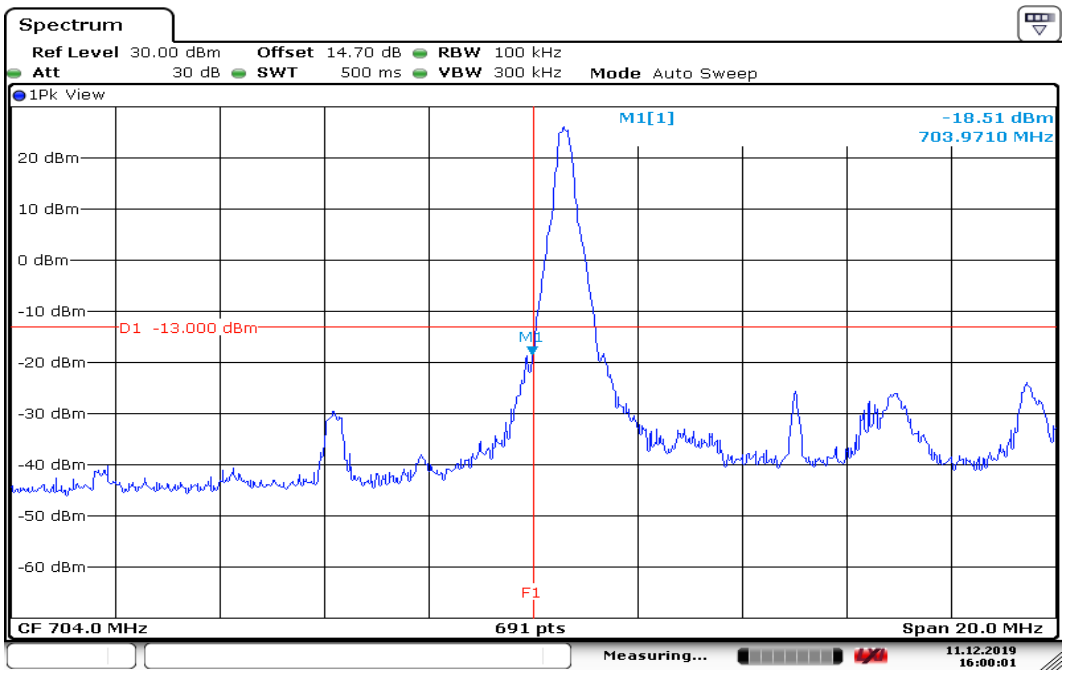
Date: 11.DEC.2019 15:50:16

HIGHER BAND EDGE



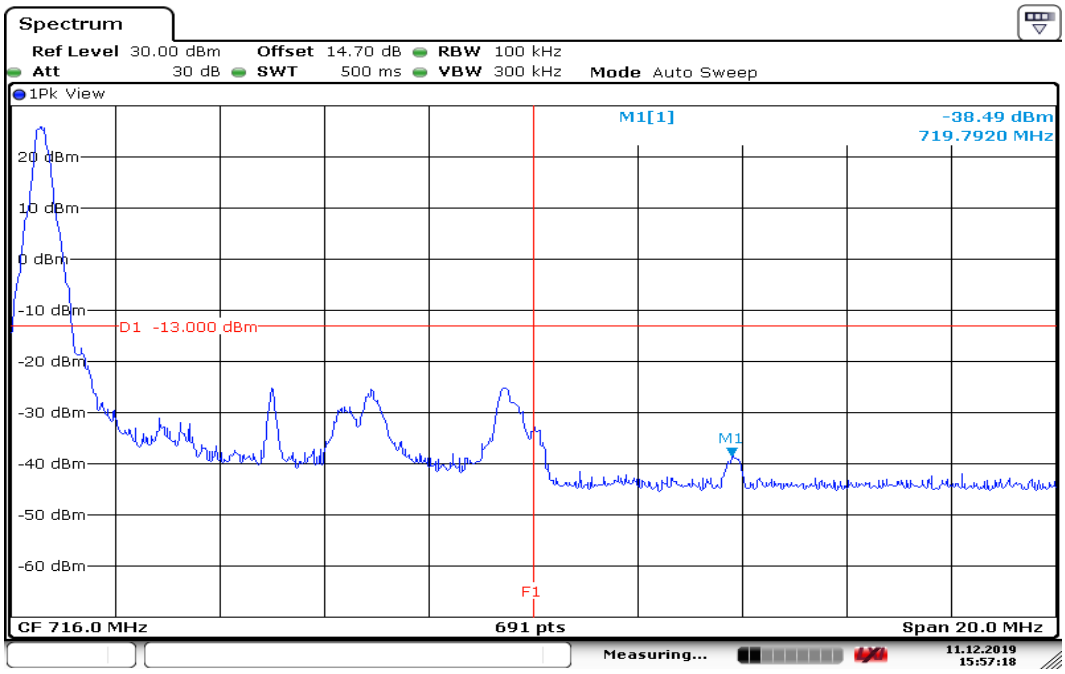
Date: 11.DEC.2019 15:53:59

CHANNEL BANDWIDTH: 10MHz / QPSK / 1 RB ALLOCATED
LOWER BAND EDGE



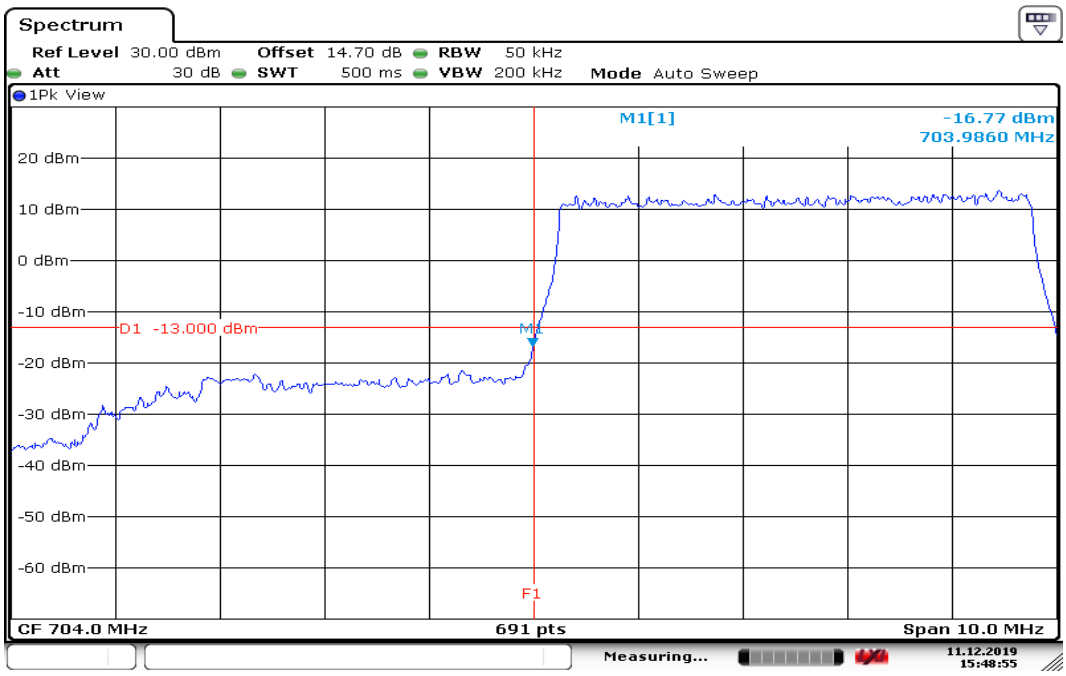
Date: 11.DEC.2019 16:00:02

HIGHER BAND EDGE



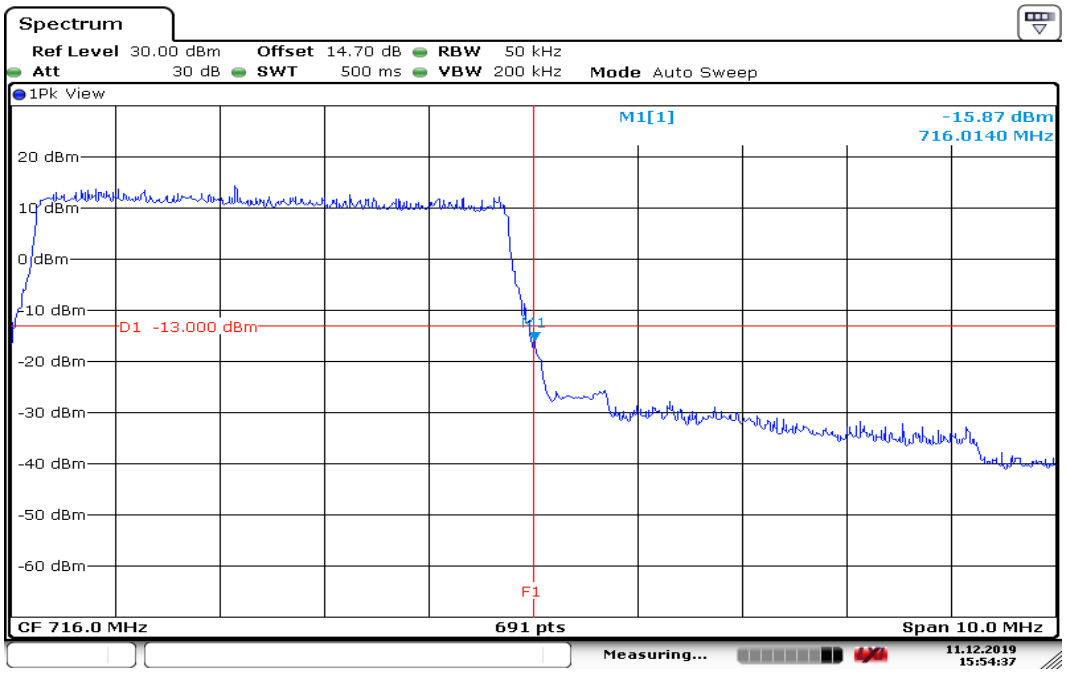
Date: 11.DEC.2019 15:57:19

CHANNEL BANDWIDTH: 5MHz / QPSK / FULL RB ALLOCATED
LOWER BAND EDGE



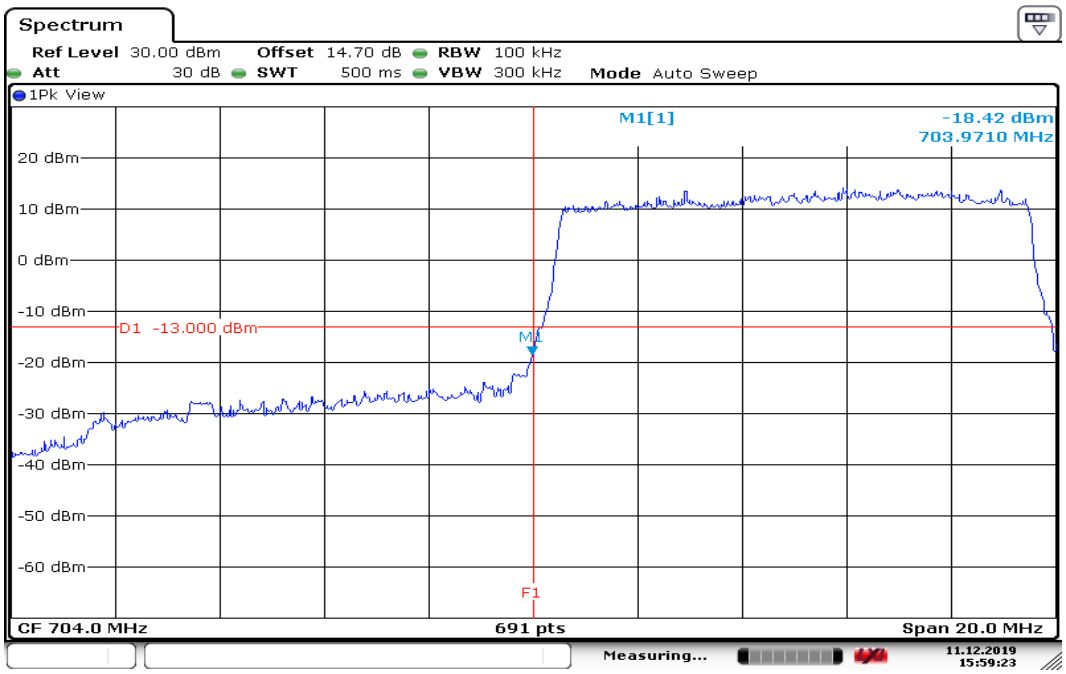
Date: 11.DEC.2019 15:48:55

HIGHER BAND EDGE



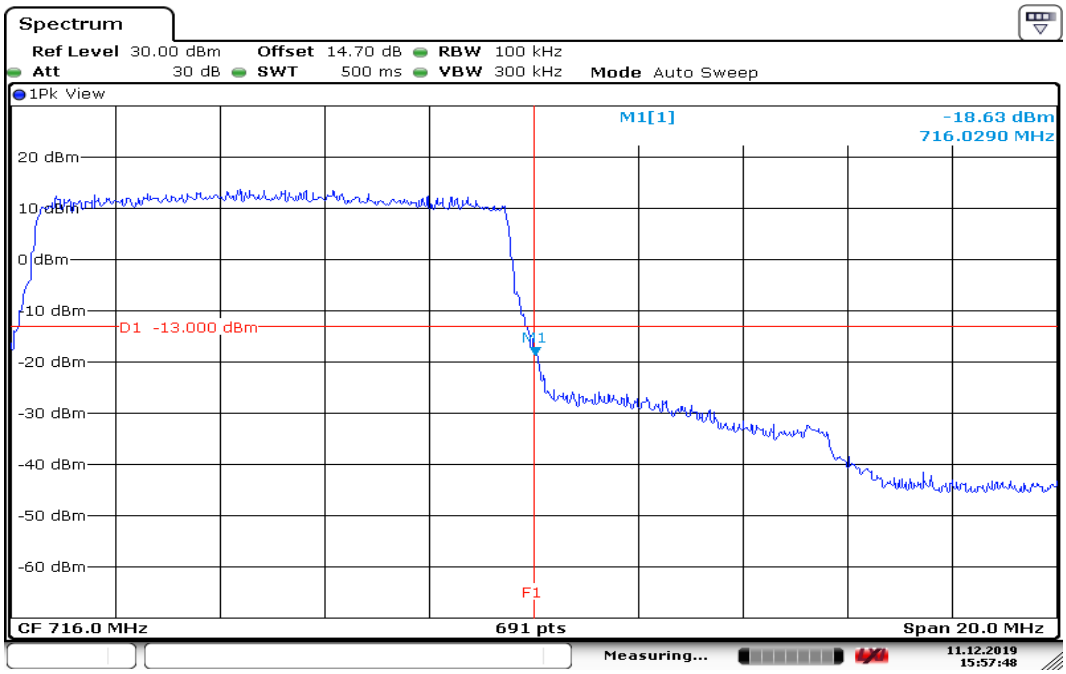
Date: 11.DEC.2019 15:54:38

CHANNEL BANDWIDTH: 10MHz / QPSK / FULL RB ALLOCATED
LOWER BAND EDGE



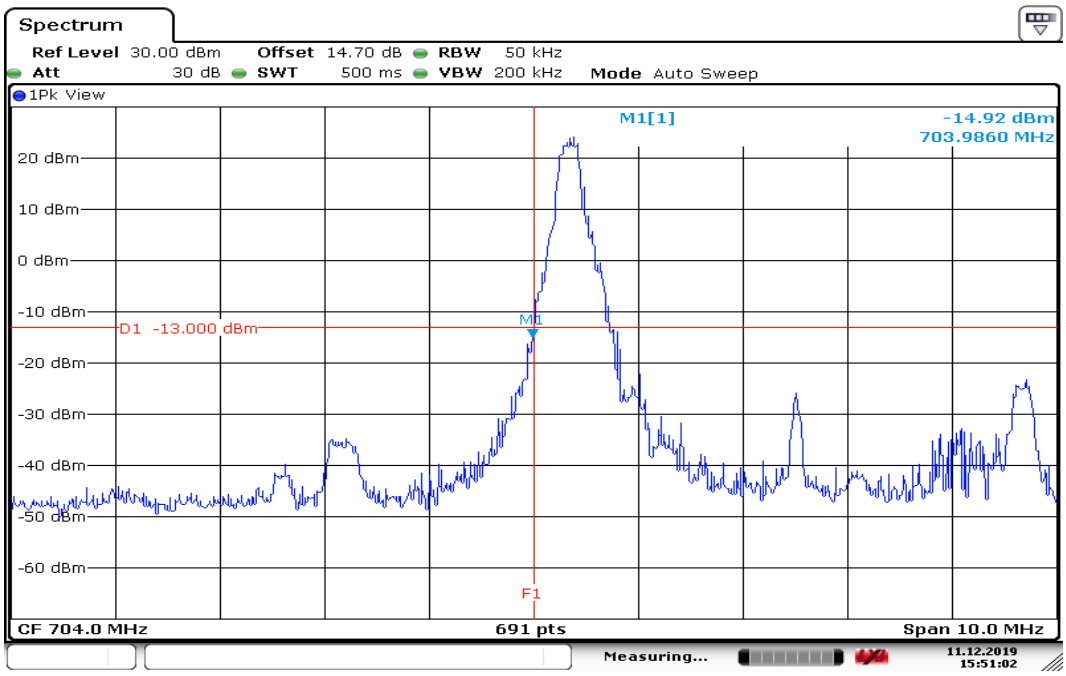
Date: 11.DEC.2019 15:59:24

HIGHER BAND EDGE



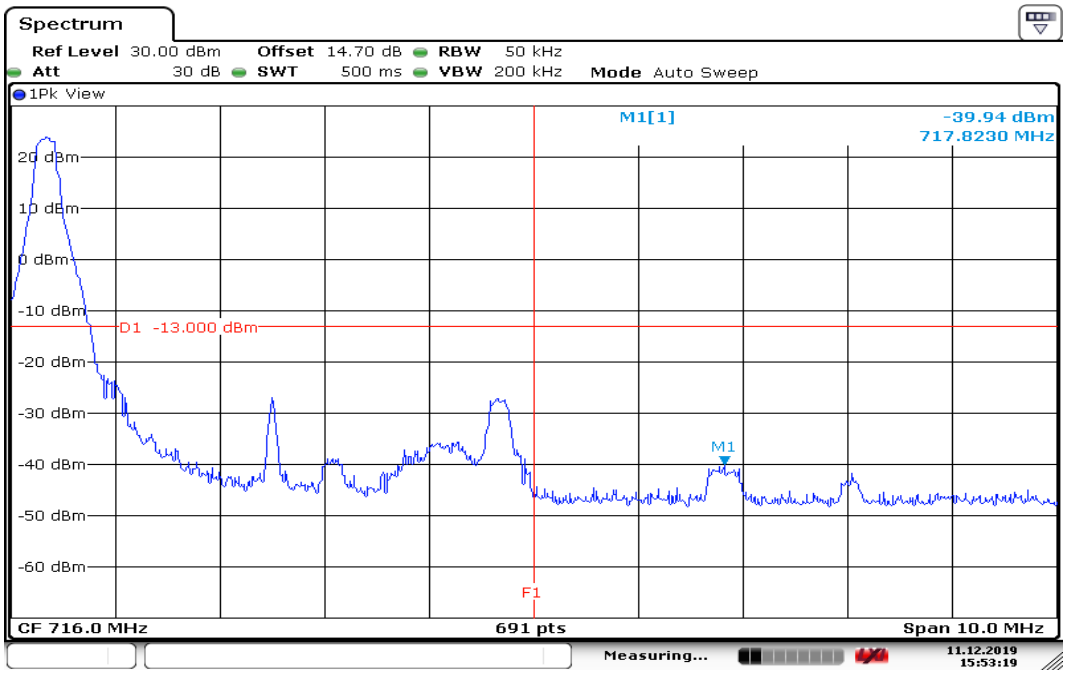
Date: 11.DEC.2019 15:57:48

CHANNEL BANDWIDTH: 5MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE



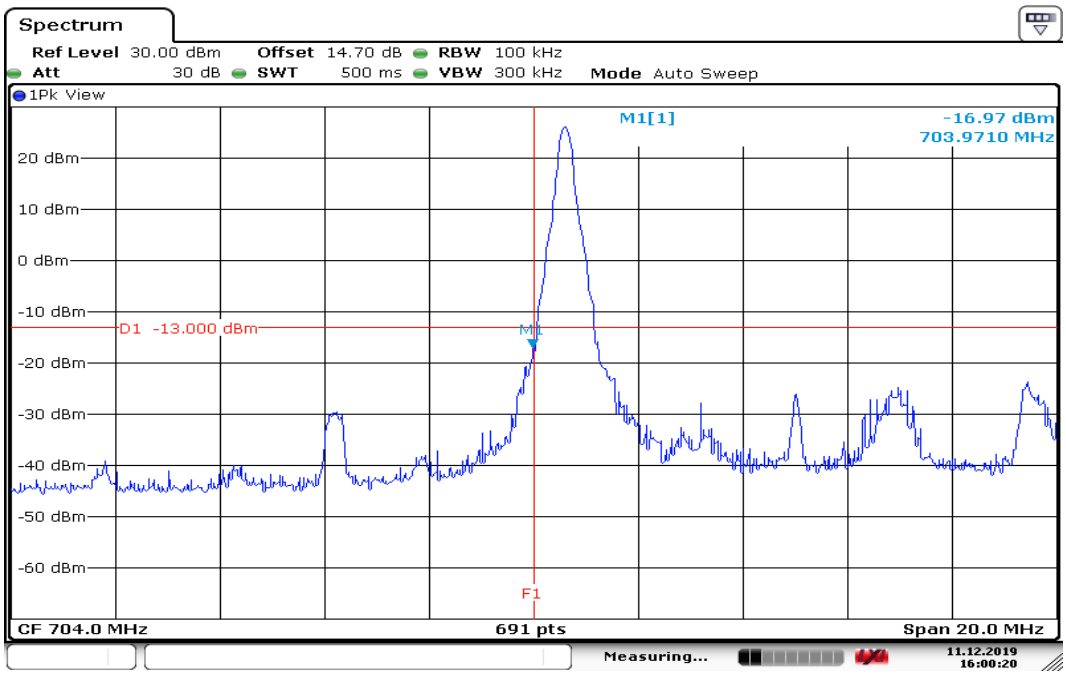
Date: 11.DEC.2019 15:51:03

HIGHER BAND EDGE



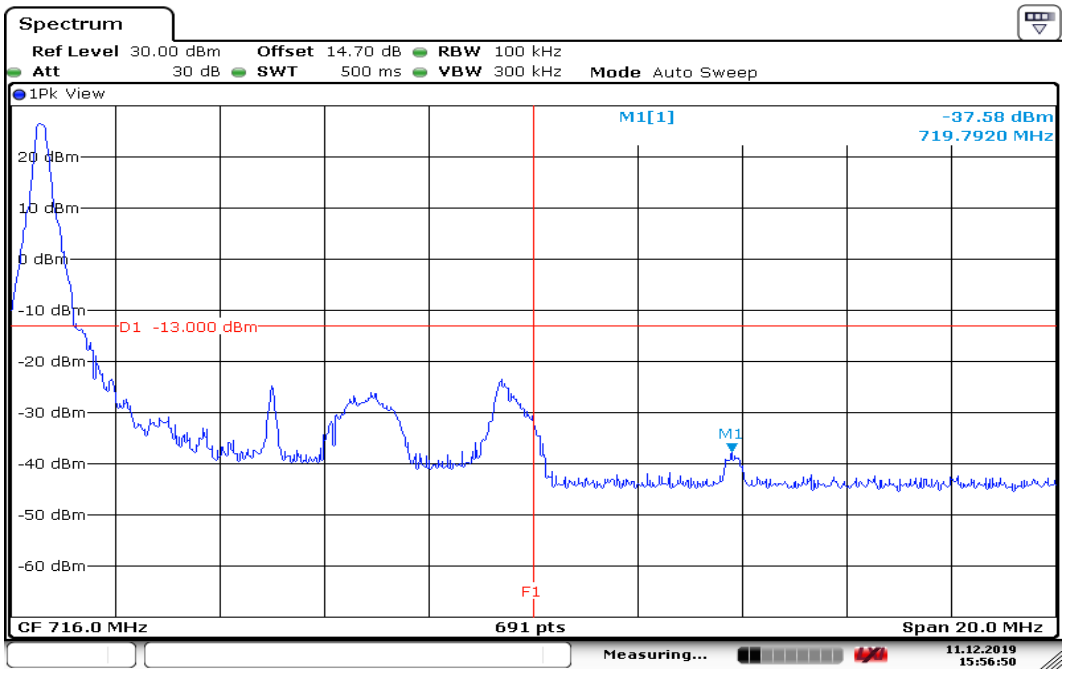
Date: 11.DEC.2019 15:53:20

CHANNEL BANDWIDTH: 10MHz / 16QAM / 1RB ALLOCATED
LOWER BAND EDGE



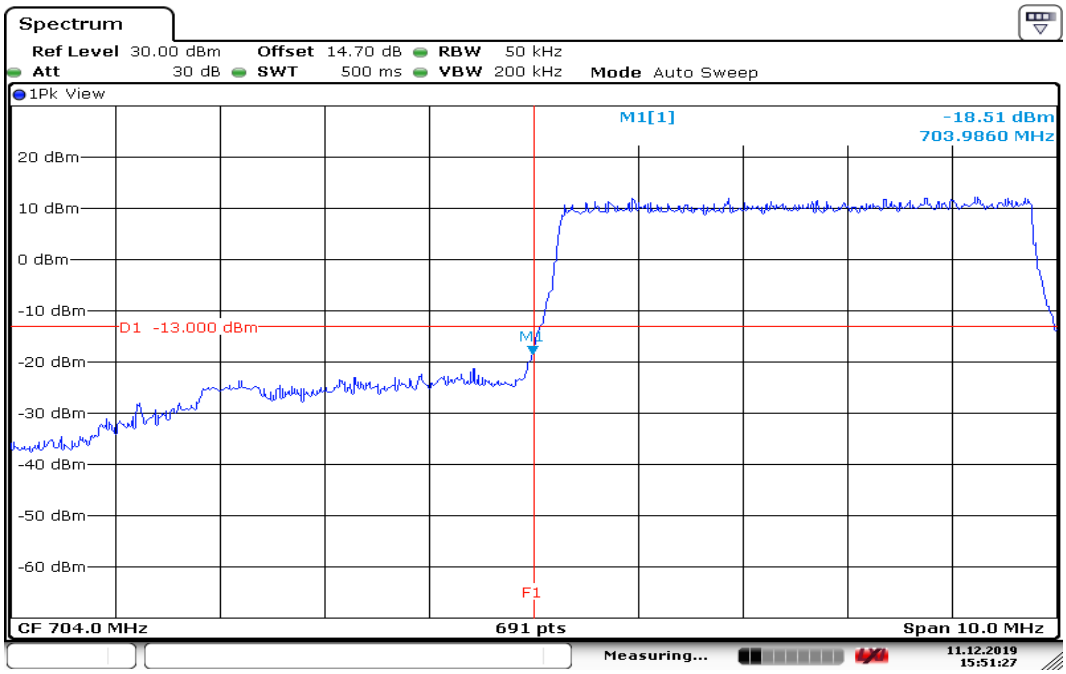
Date: 11.DEC.2019 16:00:21

HIGHER BAND EDGE



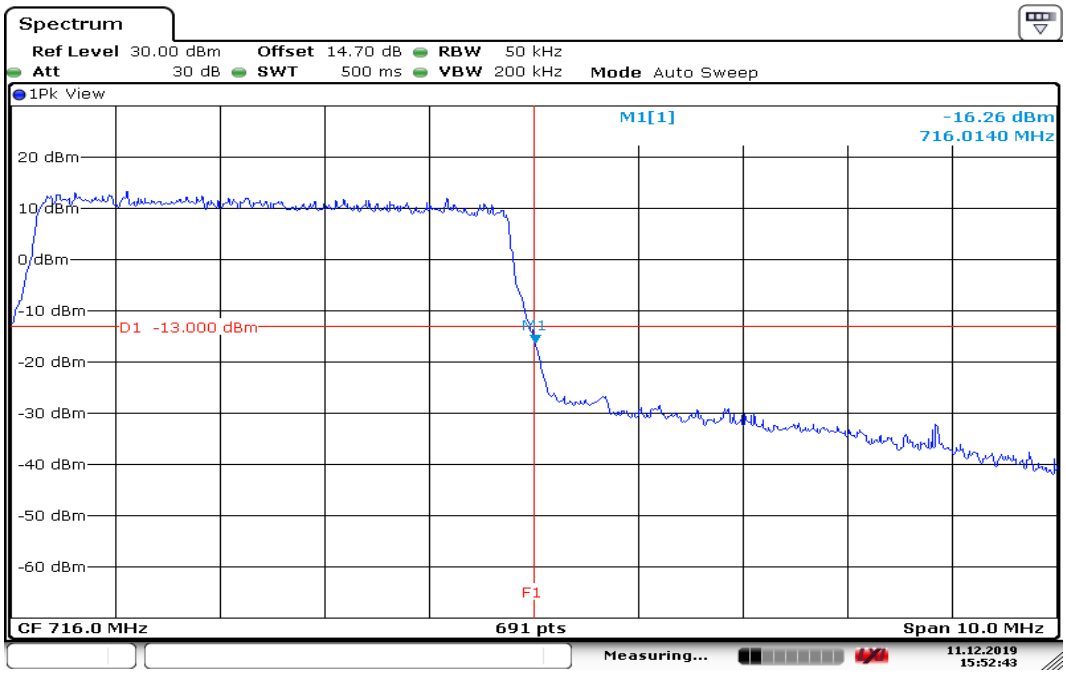
Date: 11.DEC.2019 15:56:51

CHANNEL BANDWIDTH: 5MHz / 16QAM / FULLRB ALLOCATED
LOWER BAND EDGE



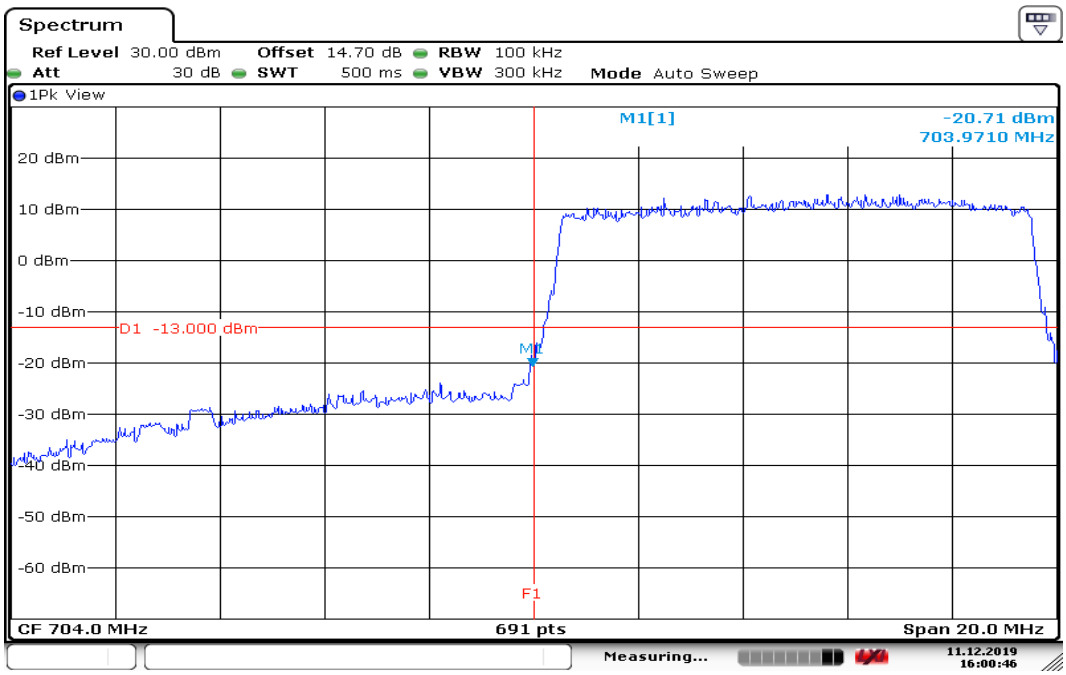
Date: 11.DEC.2019 15:51:28

HIGHER BAND EDGE



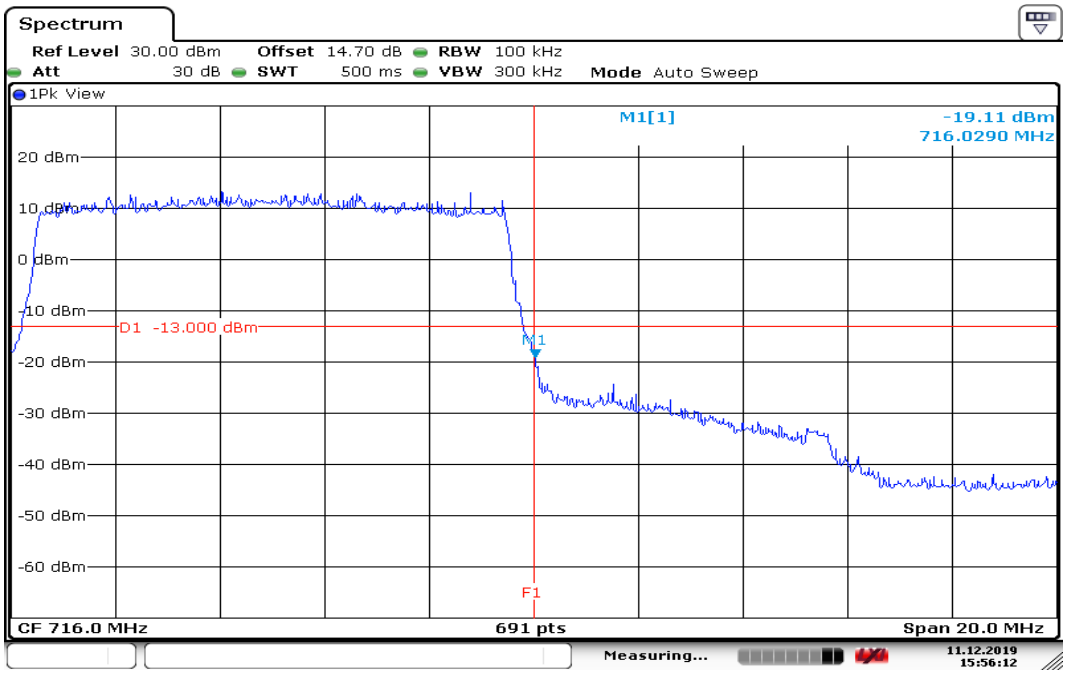
Date: 11.DEC.2019 15:52:43

CHANNEL BANDWIDTH: 10MHz / 16QAM / FULLRB ALLOCATED
LOWER BAND EDGE



Date: 11.DEC.2019 16:00:47

HIGHER BAND EDGE



Date: 11.DEC.2019 15:56:13

8.6 CONDUCTED SPURIOUS EMISSIONS

LIMITS

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission equal to –13dBm

TEST PROCEDURES

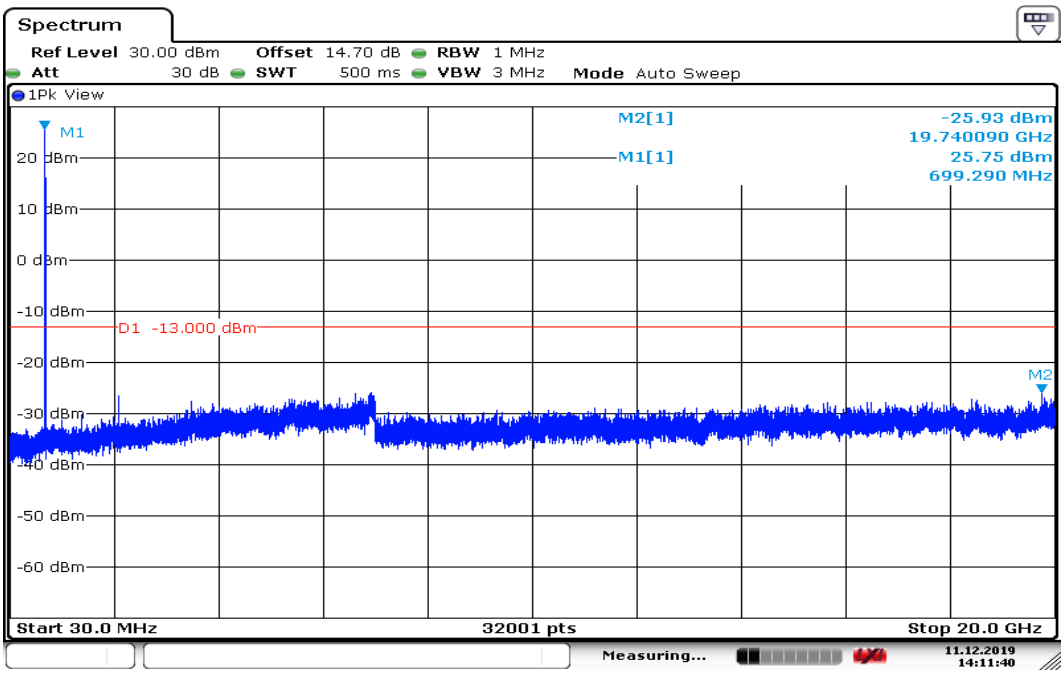
1. According to KDB 971168D01, photograph 6.0
2. The EUT was connect to spectrum analyzer and call box.
3. The RF output of EUT was connected to the spectrum analyzer.
4. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
5. Record the maximum spurious emission.
6. The fundamental frequency should be excluded against the limit in operating band.

TEST RESULTS

LTE Band 12

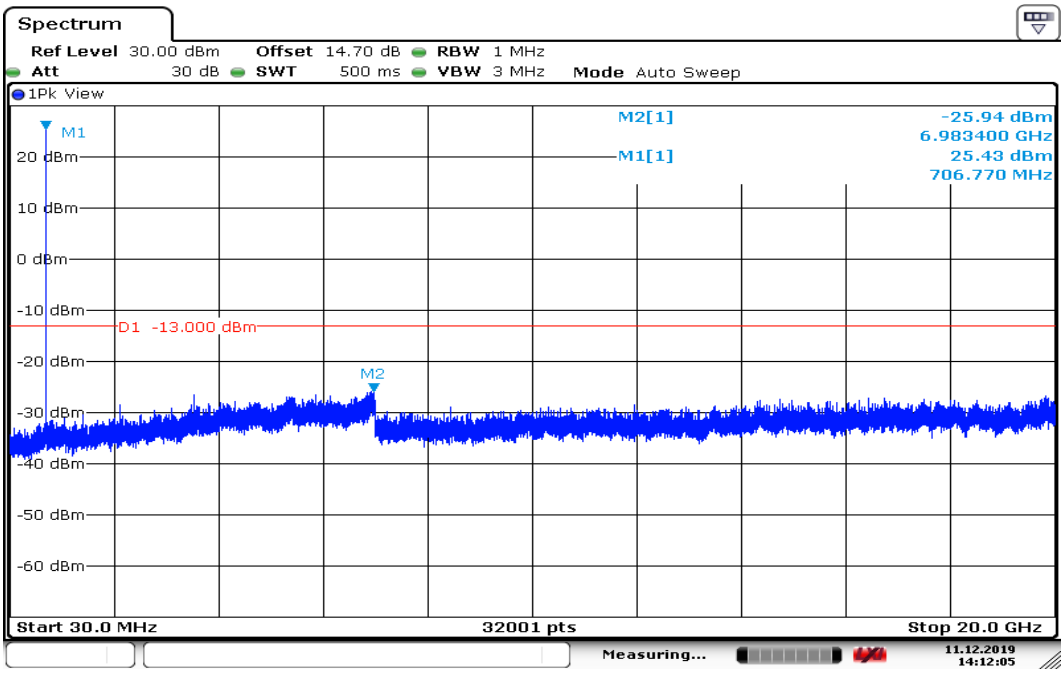
CHANNEL BANDWIDTH: 1.4MHz /QPSK

CH Low



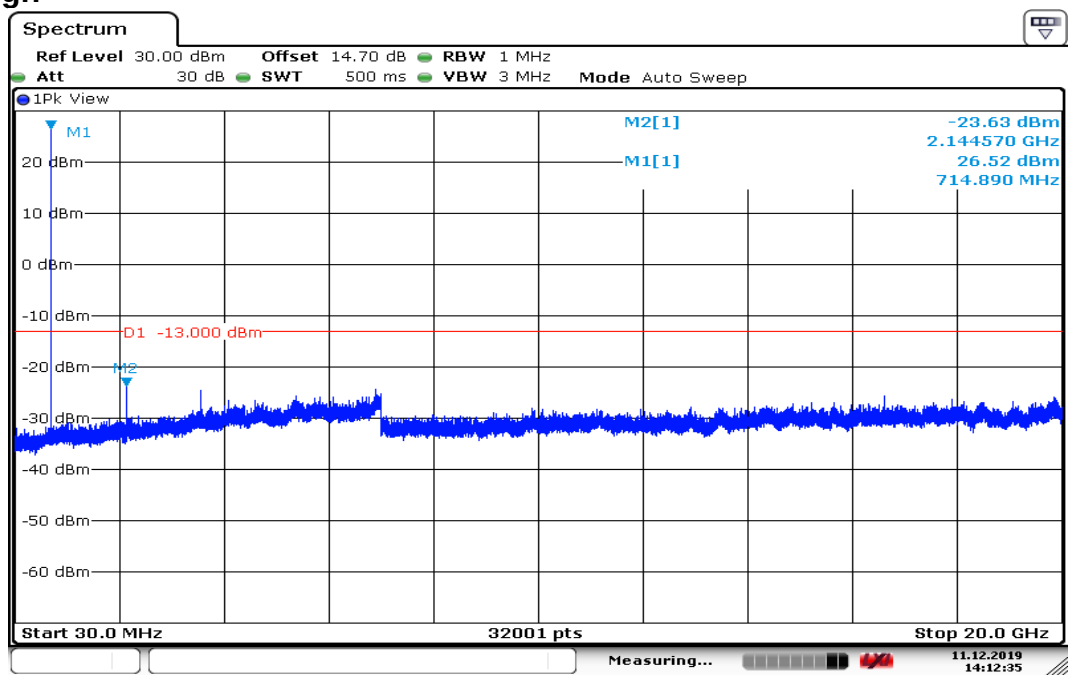
Date: 11.DEC.2019 14:11:41

CH Mid



Date: 11.DEC.2019 14:12:05

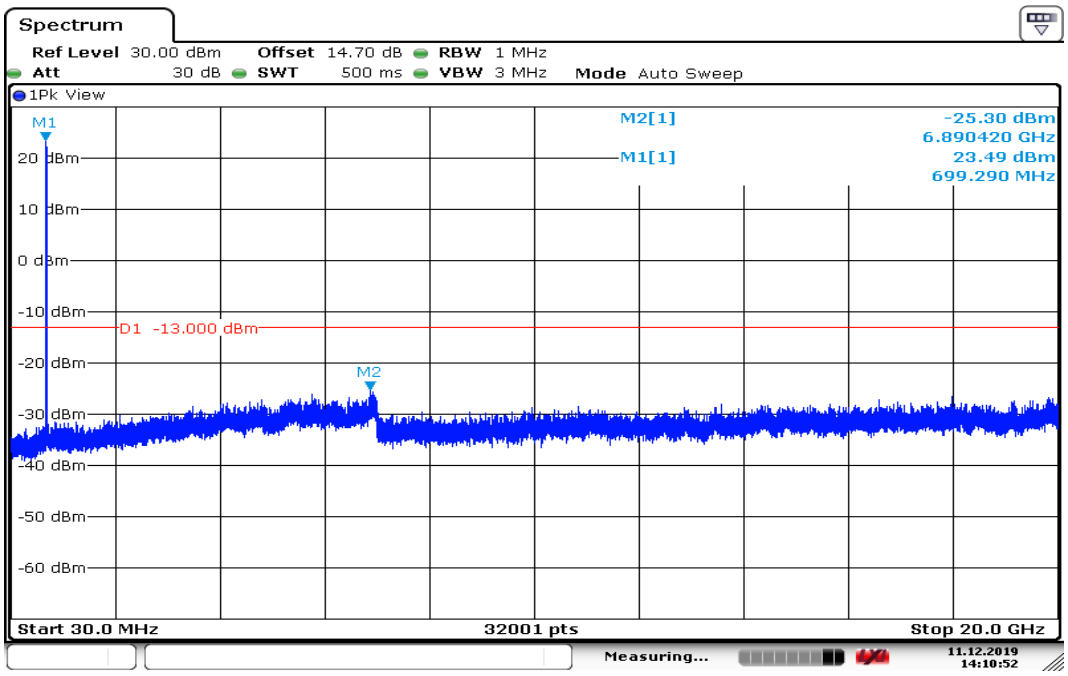
CH High



Date: 11.DEC.2019 14:12:36

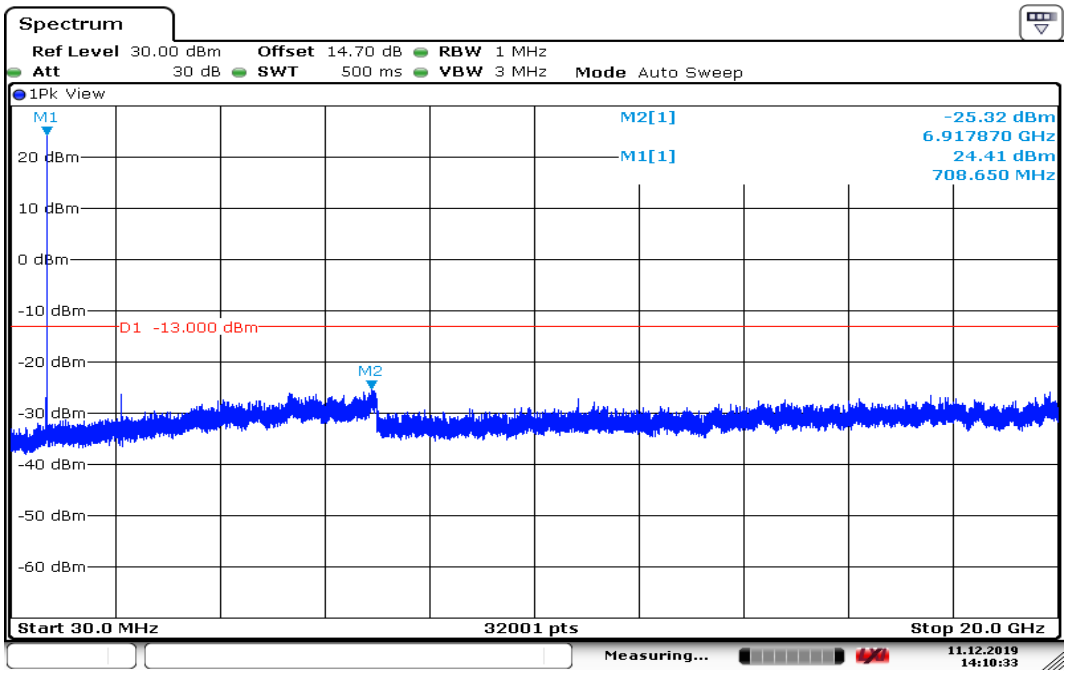
CHANNEL BANDWIDTH: 3MHz /QPSK

CH Low



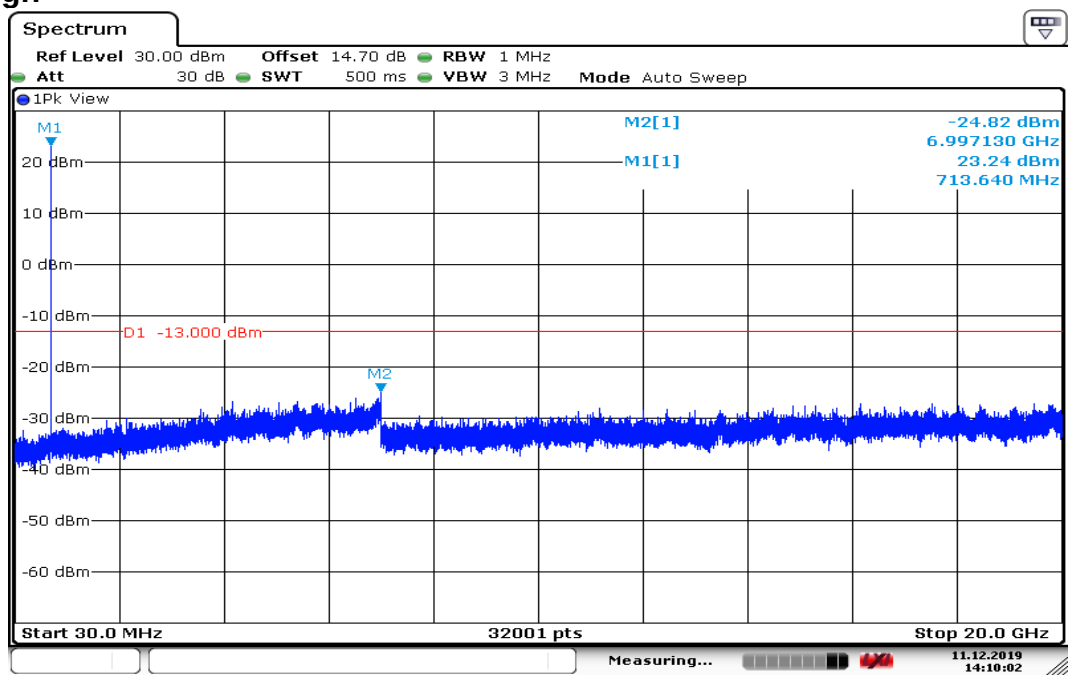
Date: 11.DEC.2019 14:10:52

CH Mid



Date: 11.DEC.2019 14:10:33

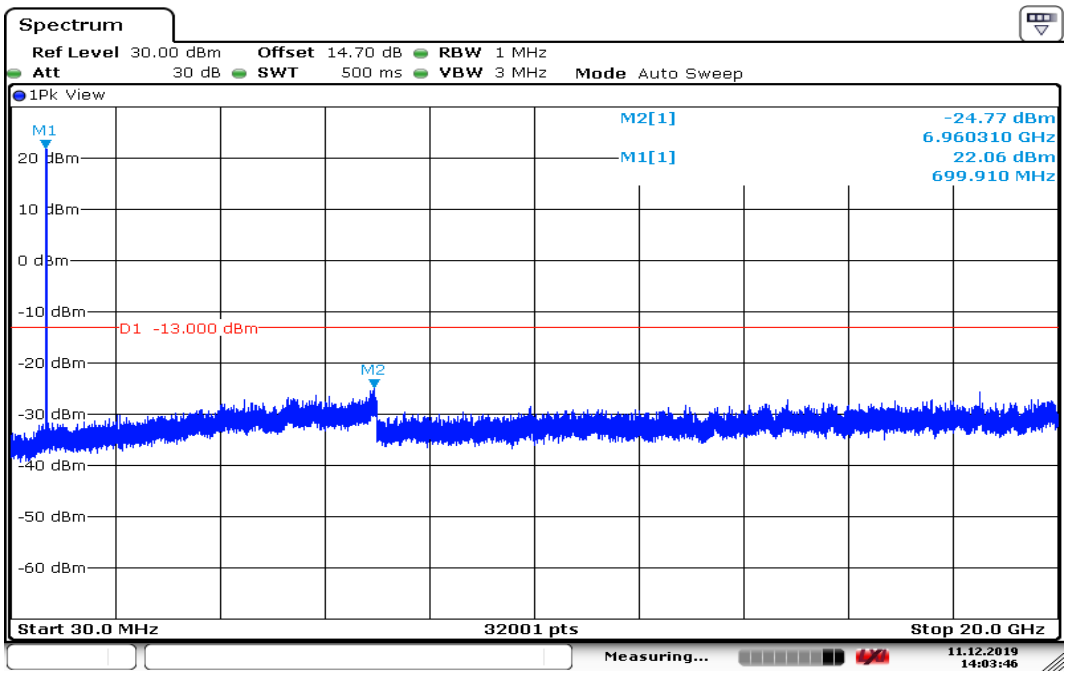
CH High



Date: 11.DEC.2019 14:10:02

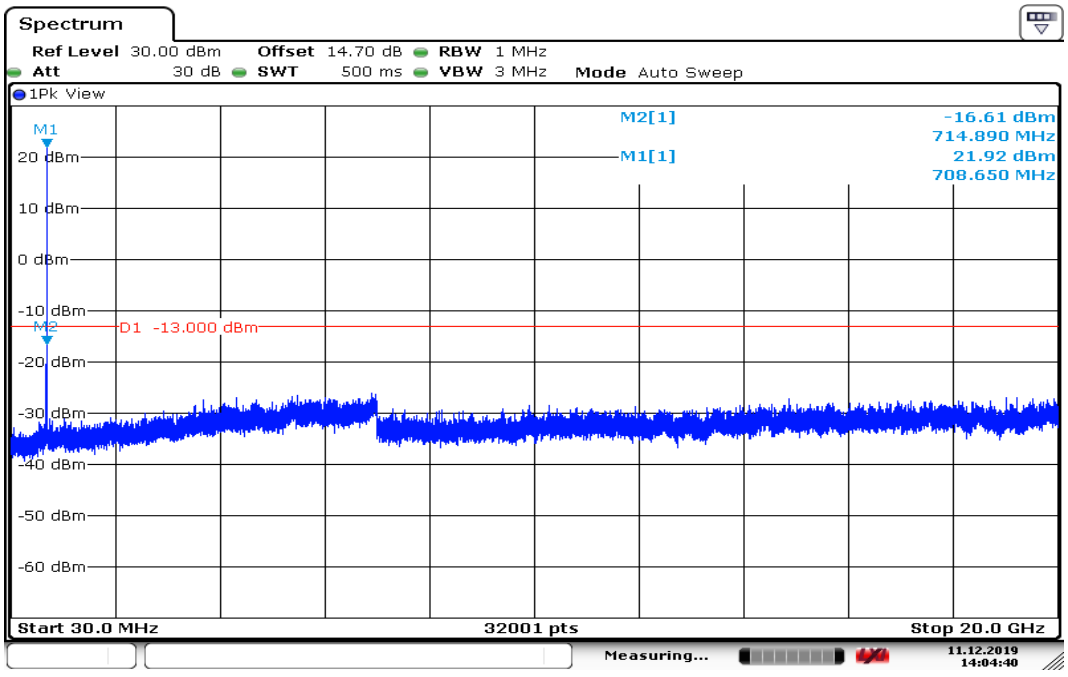
CHANNEL BANDWIDTH: 5MHz /QPSK

CH Low



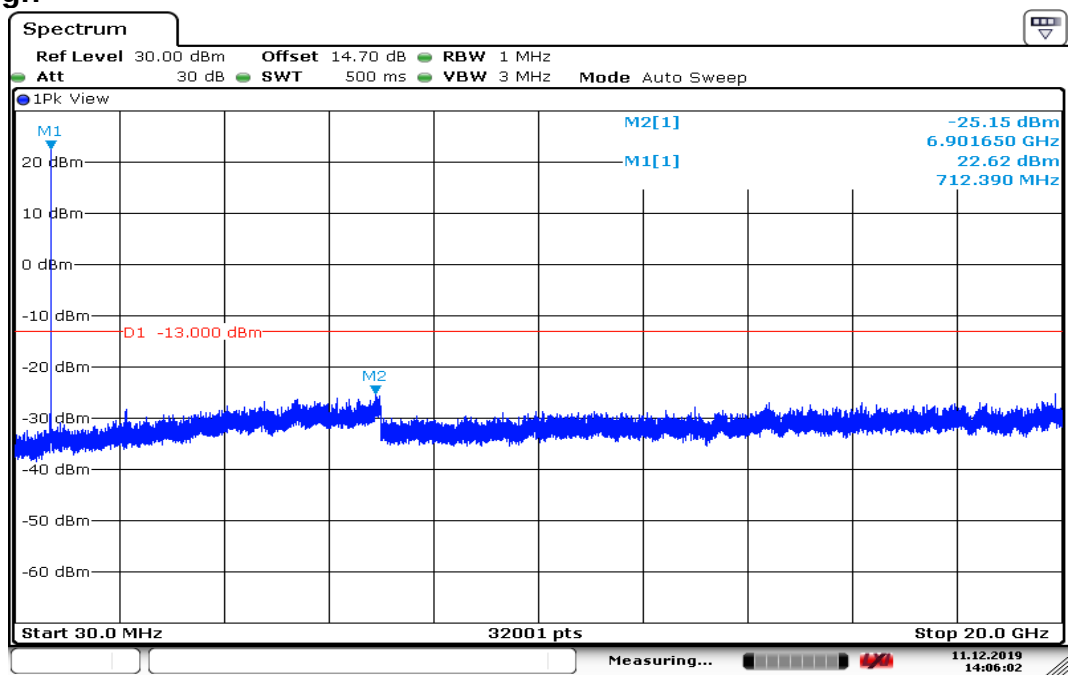
Date: 11.DEC.2019 14:03:46

CH Mid



Date: 11.DEC.2019 14:04:40

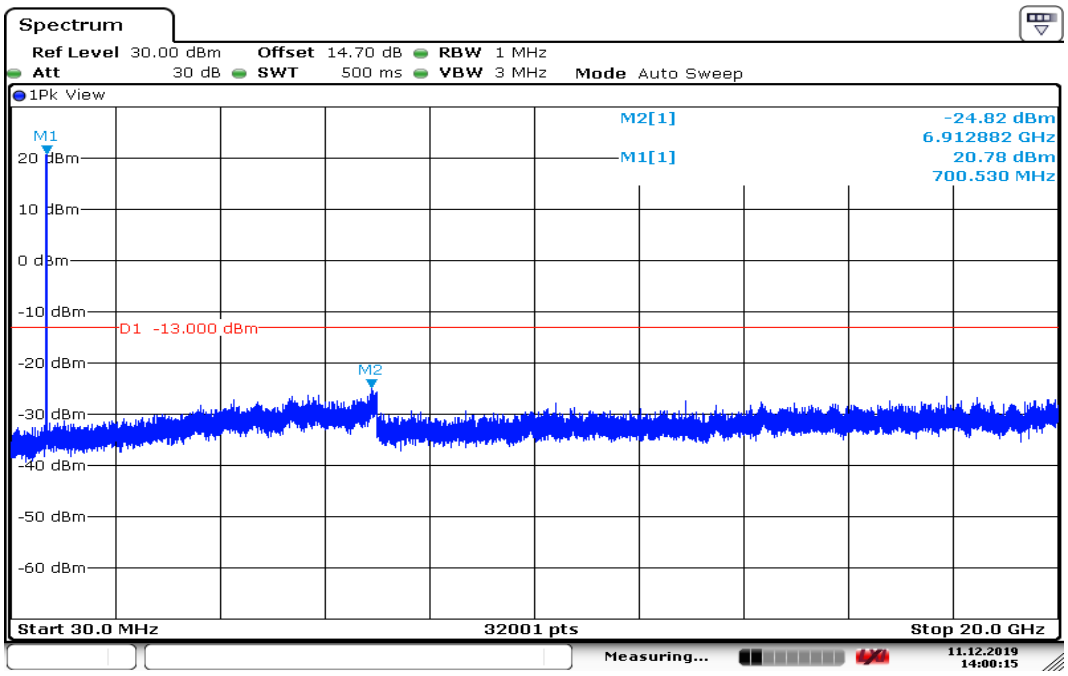
CH High



Date: 11.DEC.2019 14:06:03

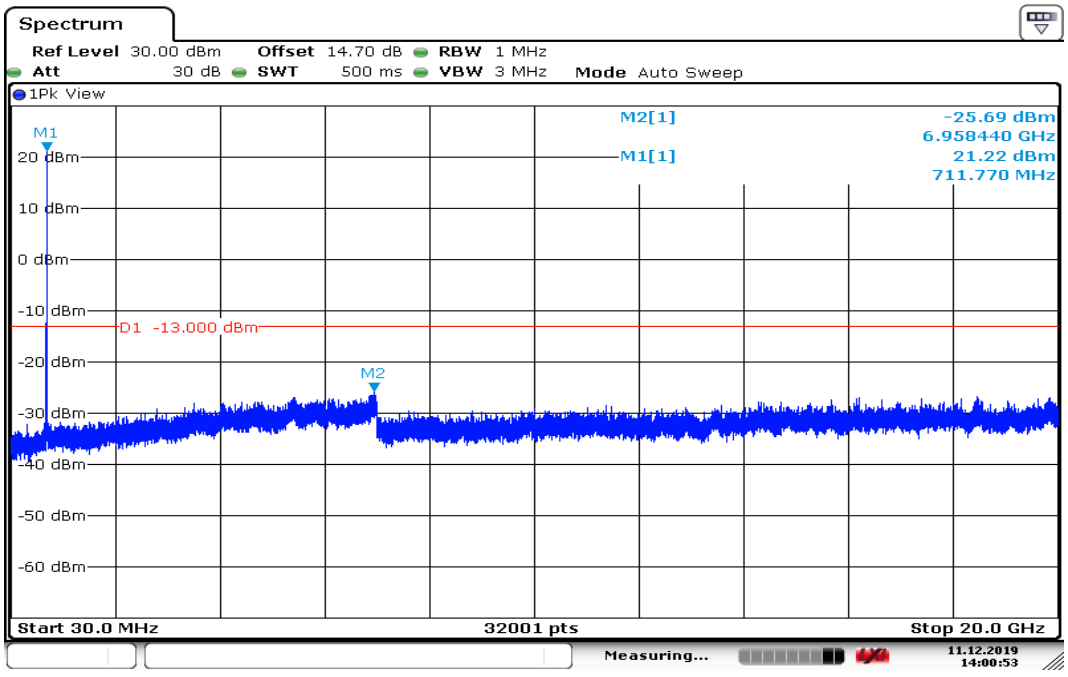
CHANNEL BANDWIDTH: 10MHz /QPSK

CH Low



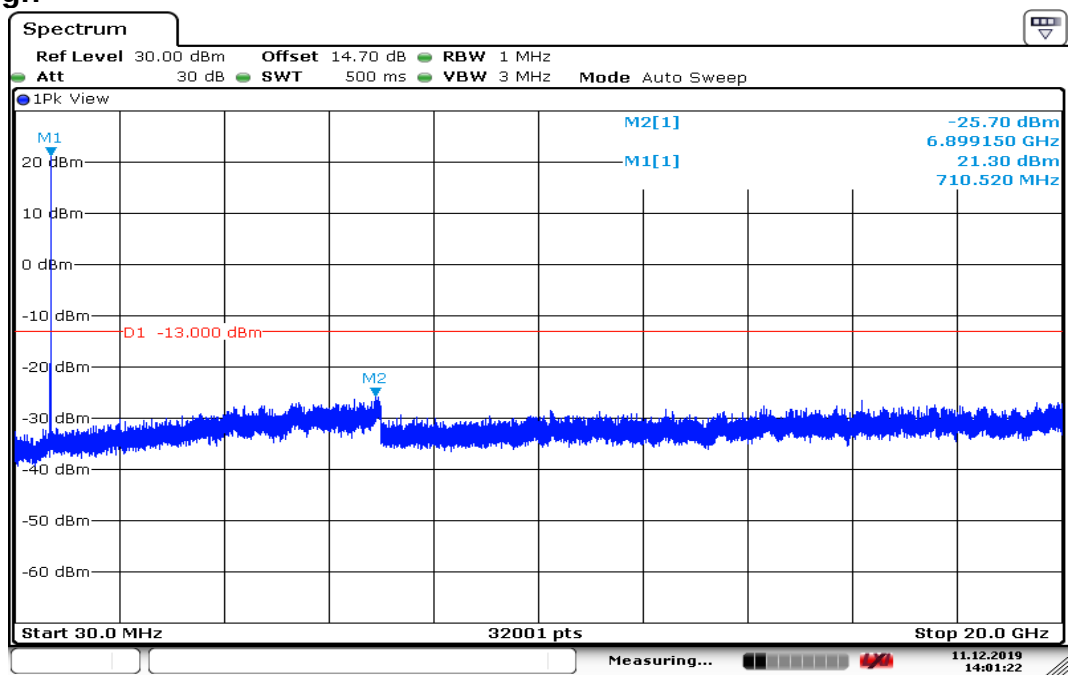
Date: 11.DEC.2019 14:00:15

CH Mid



Date: 11.DEC.2019 14:00:53

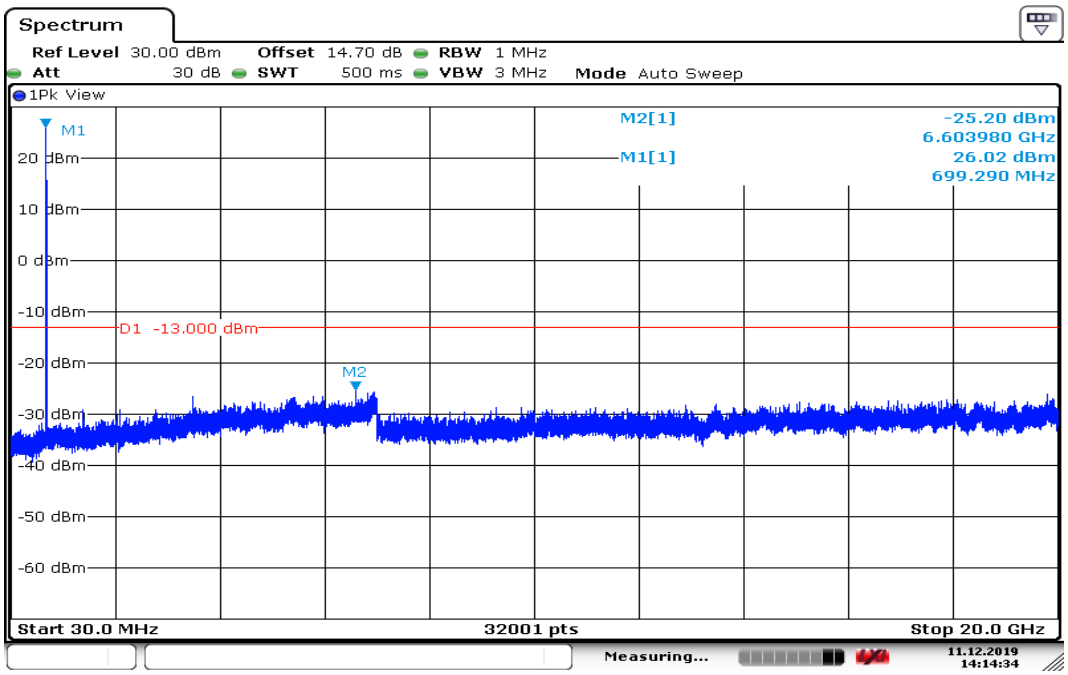
CH High



Date: 11.DEC.2019 14:01:22

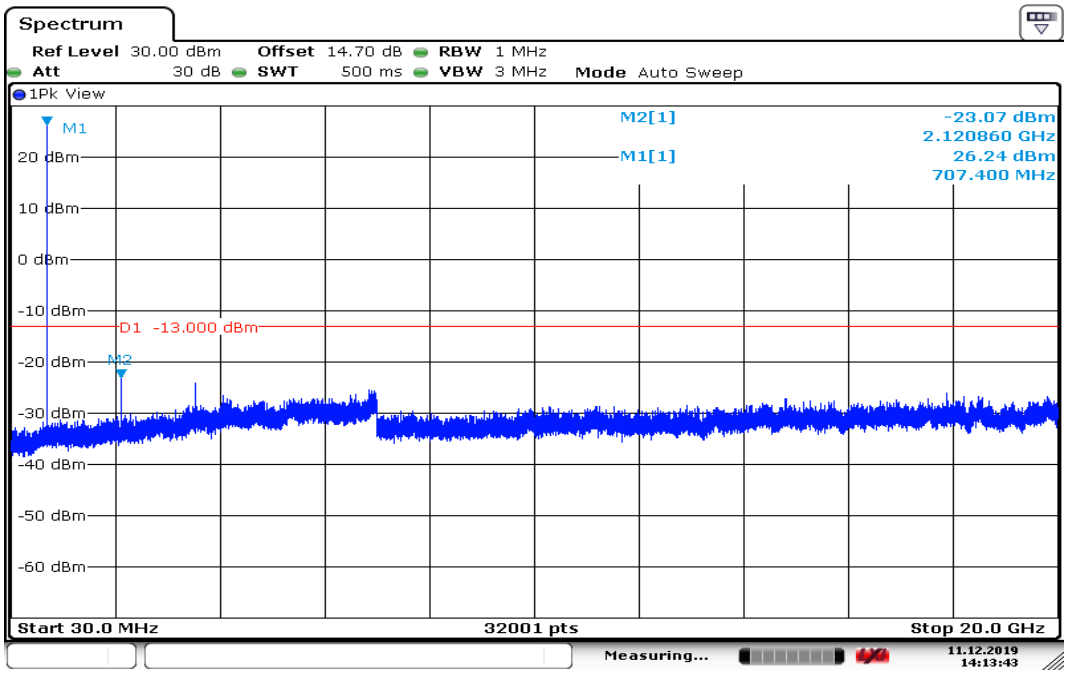
CHANNEL BANDWIDTH: 1.4MHz /16QAM

CH Low



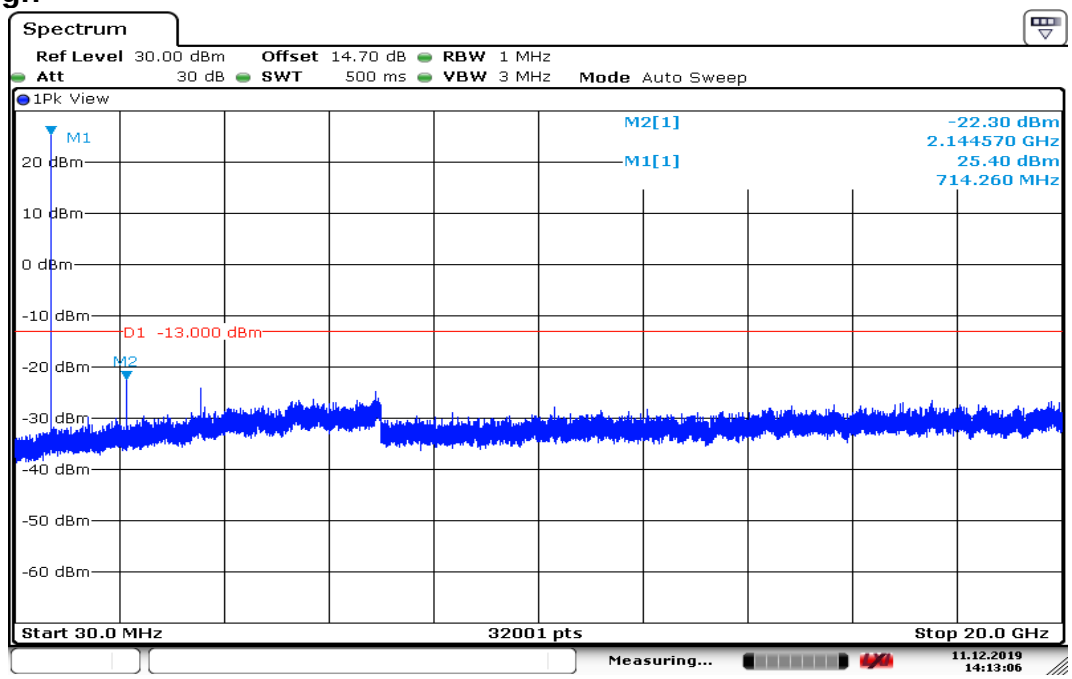
Date: 11.DEC.2019 14:14:35

CH Mid



Date: 11.DEC.2019 14:13:43

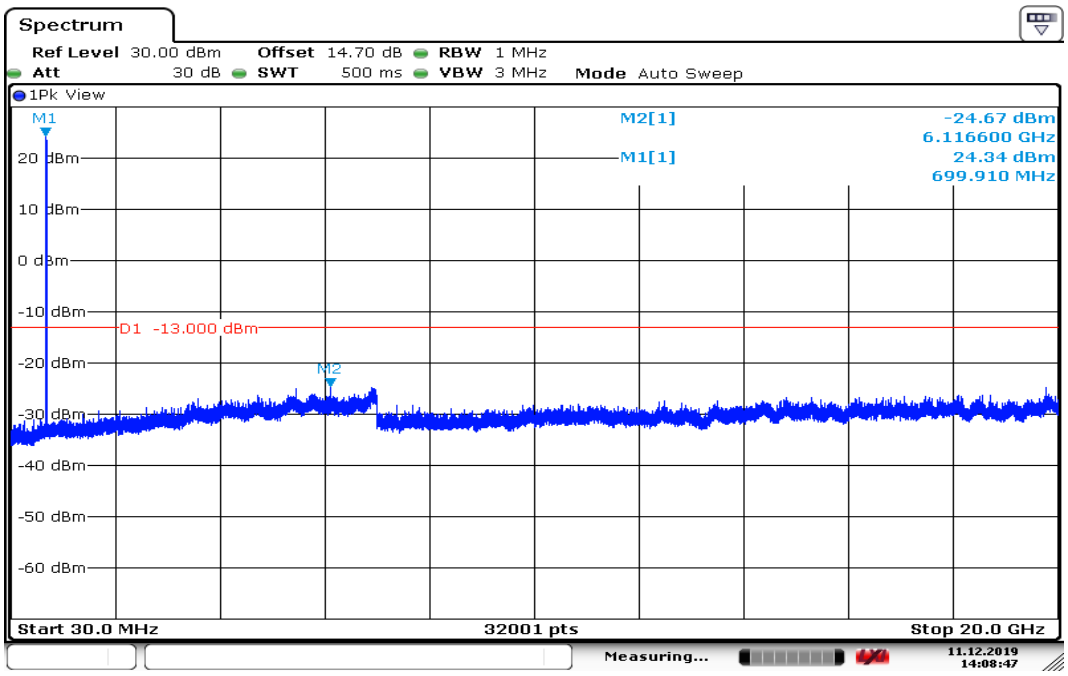
CH High



Date: 11.DEC.2019 14:13:06

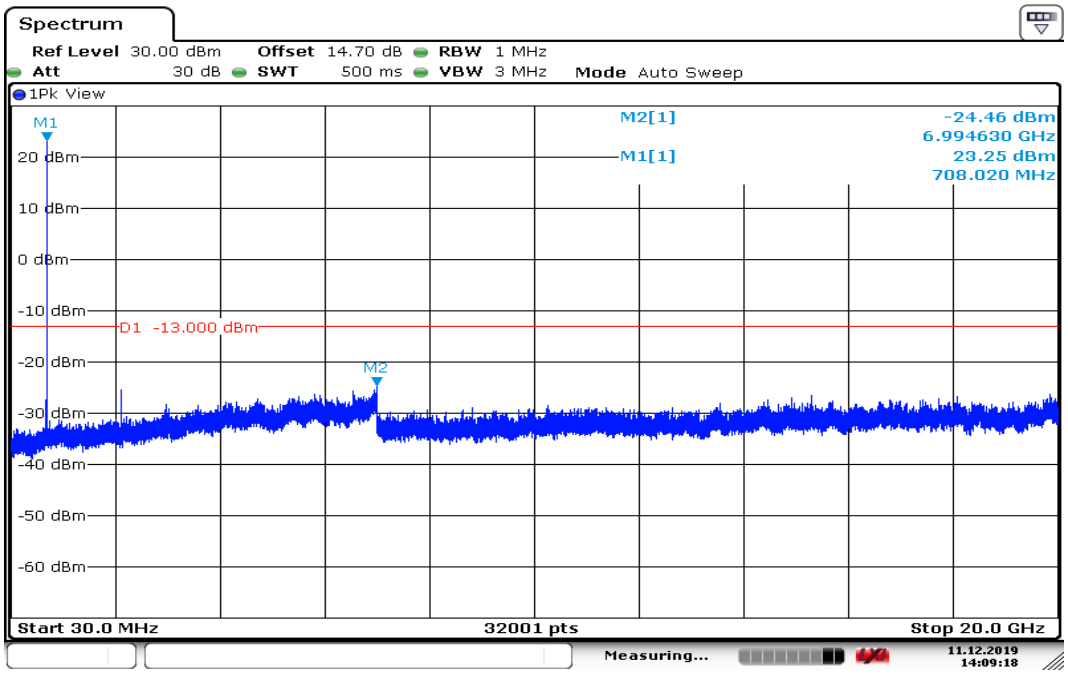
CHANNEL BANDWIDTH: 3MHz /16QAM

CH Low



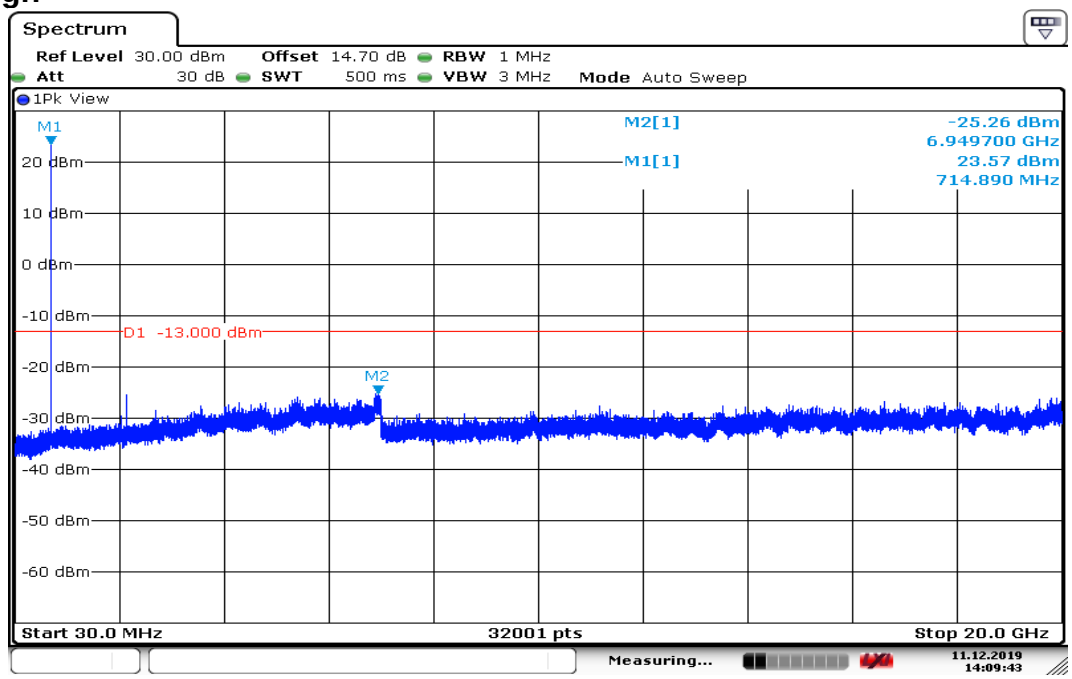
Date: 11.DEC.2019 14:08:47

CH Mid



Date: 11.DEC.2019 14:09:18

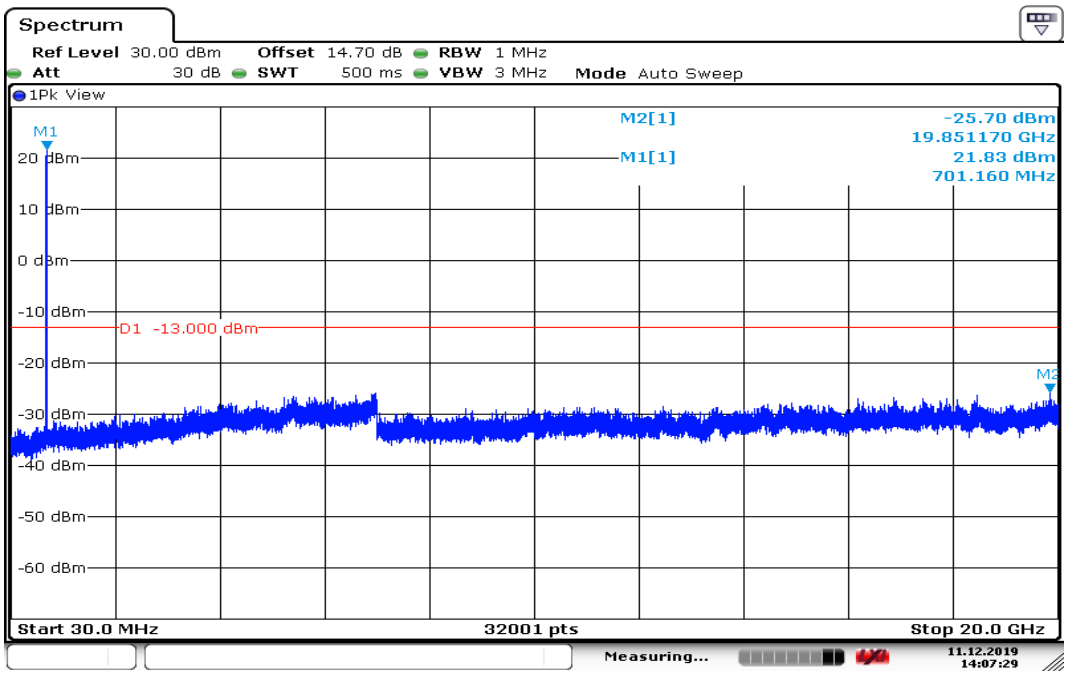
CH High



Date: 11.DEC.2019 14:09:43

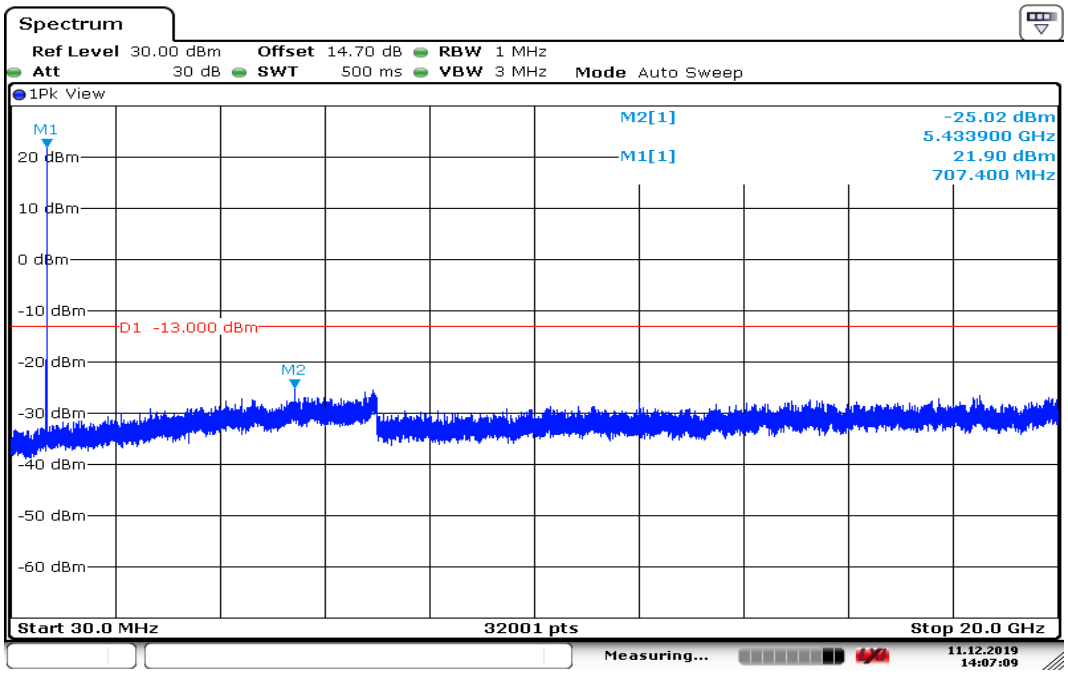
CHANNEL BANDWIDTH:5MHz /16QAM

CH Low



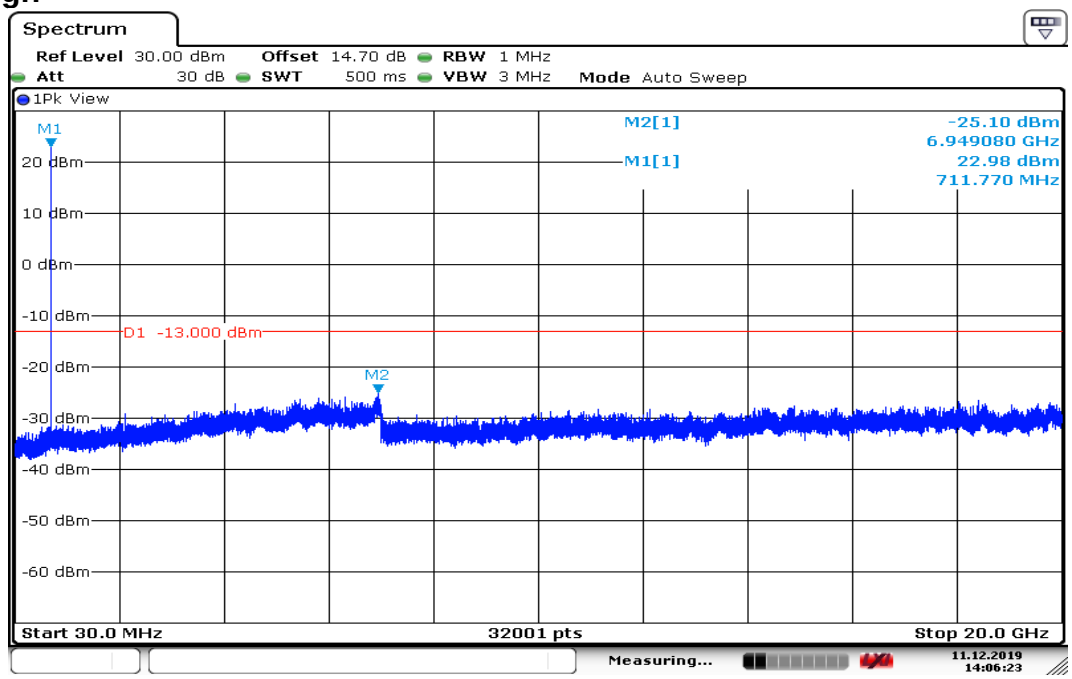
Date: 11.DEC.2019 14:07:29

CH Mid



Date: 11.DEC.2019 14:07:09

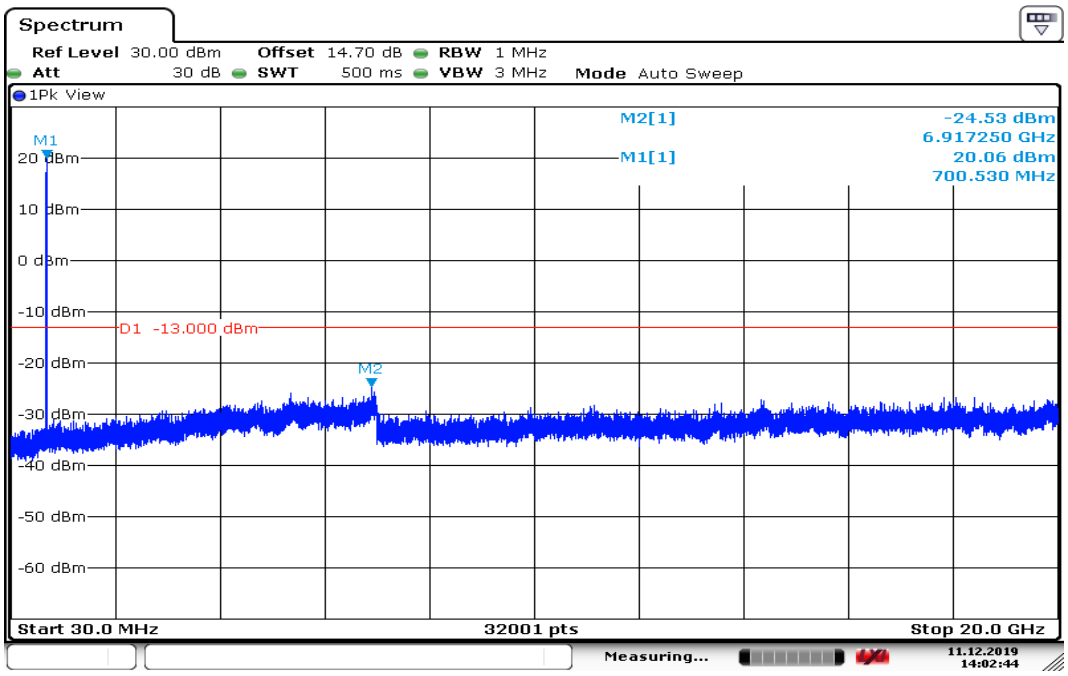
CH High



Date: 11.DEC.2019 14:06:23

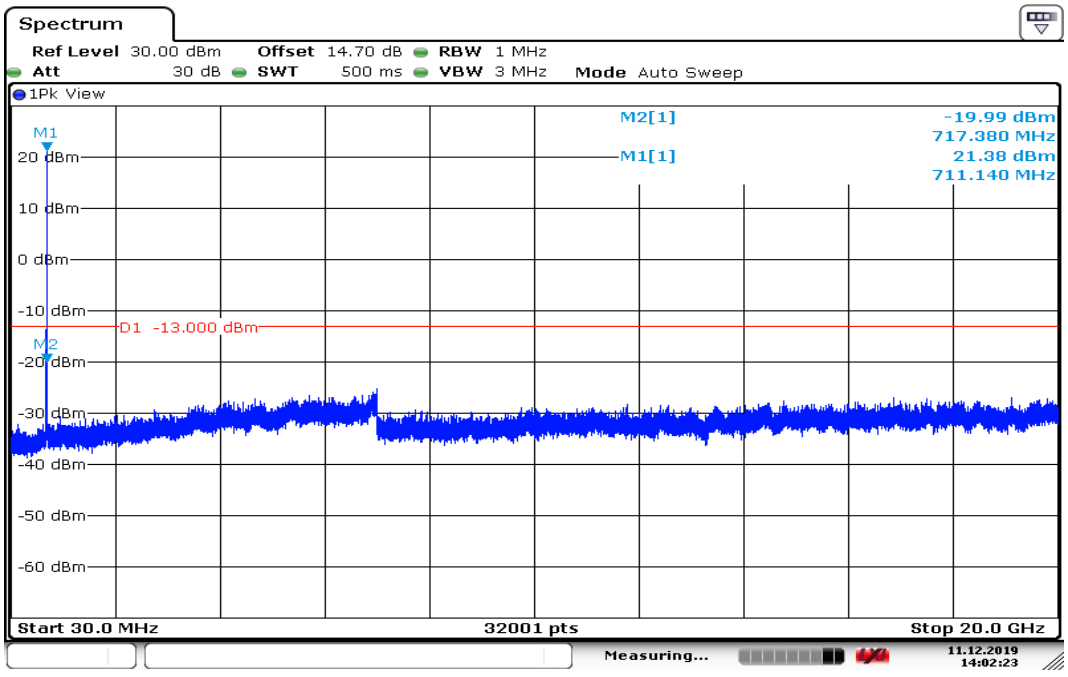
CHANNEL BANDWIDTH:10MHz /16QAM

CH Low



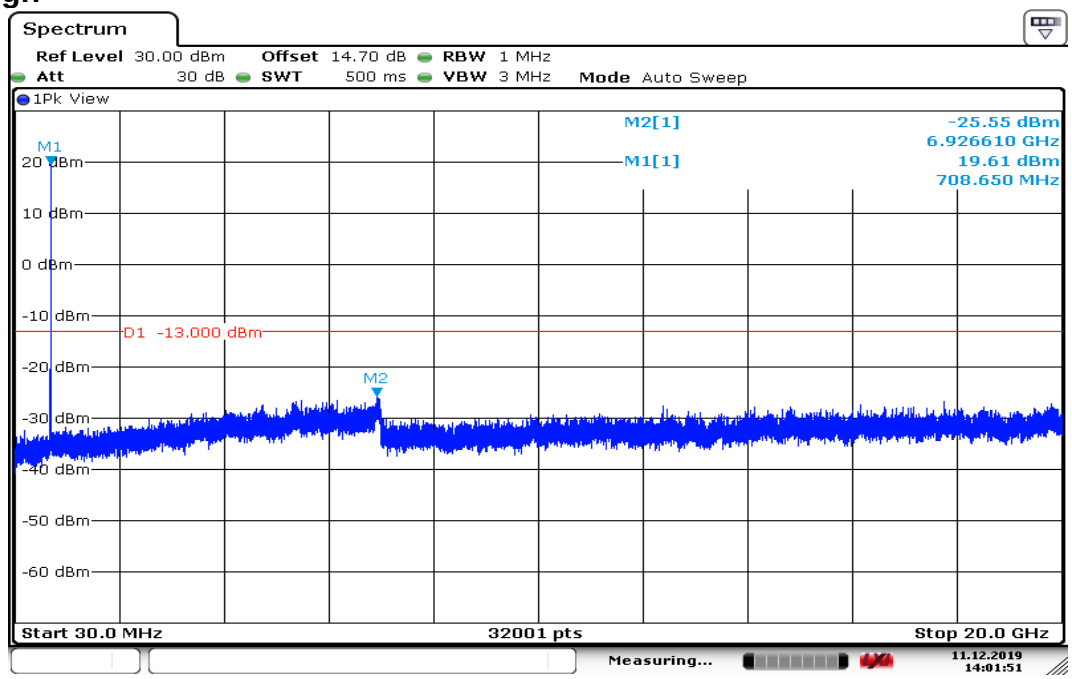
Date: 11.DEC.2019 14:02:45

CH Mid



Date: 11.DEC.2019 14:02:24

CH High

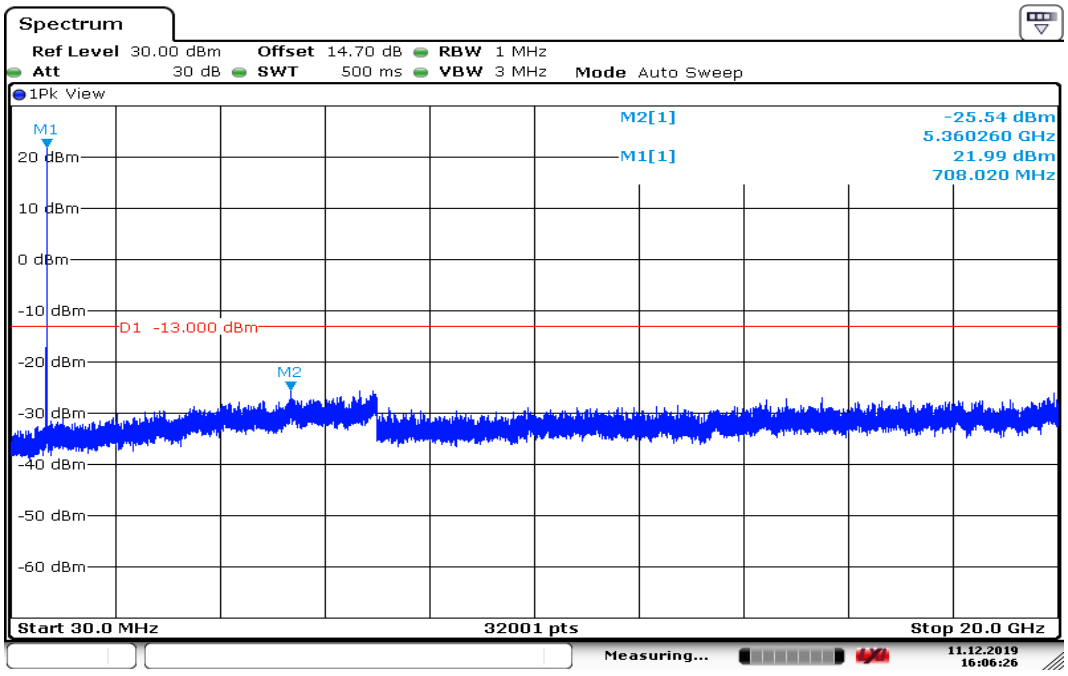


Date: 11.DEC.2019 14:01:51

LTE Band 17

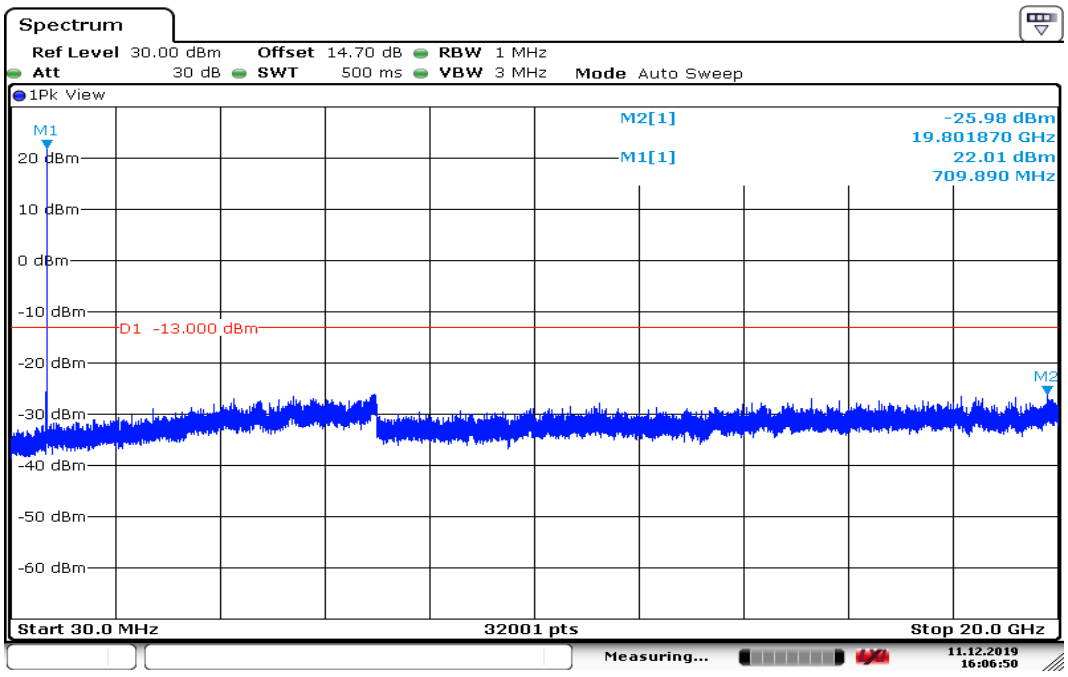
CHANNEL BANDWIDTH: 5MHz / QPSK

CH Low



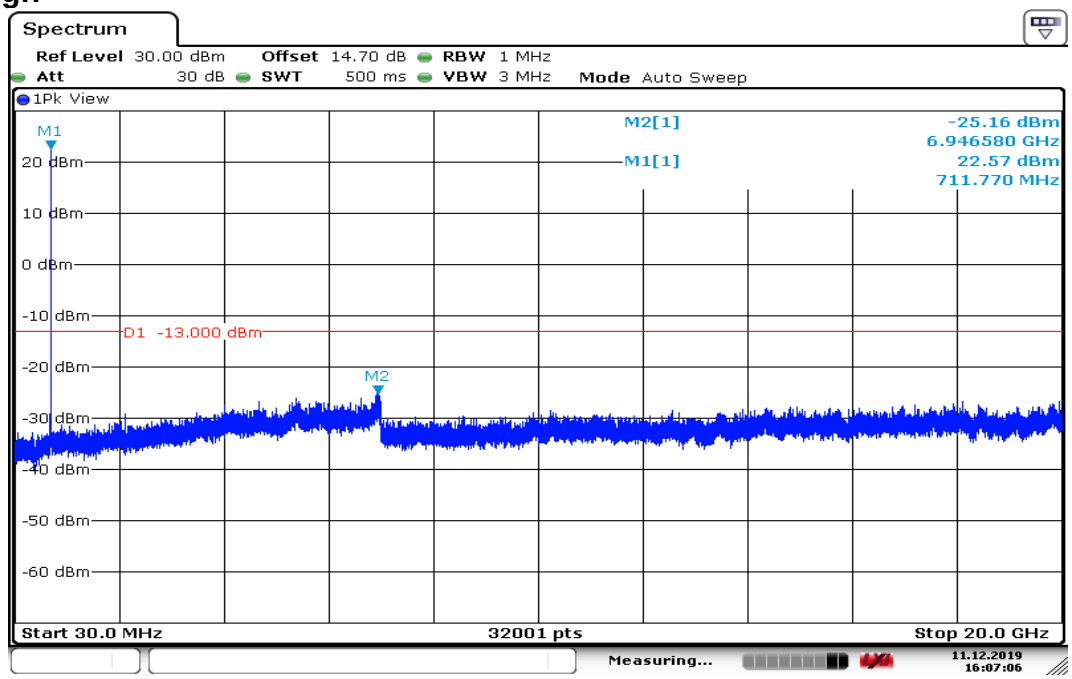
Date: 11.DEC.2019 16:06:27

CH Mid



Date: 11.DEC.2019 16:06:51

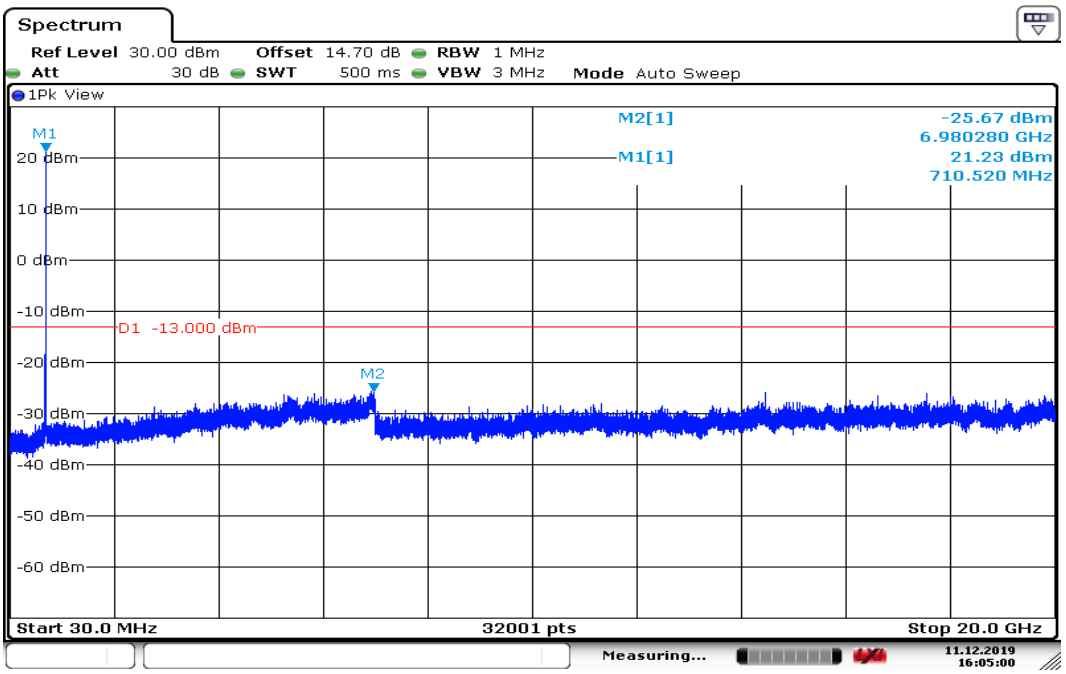
CH High



Date: 11.DEC.2019 16:07:07

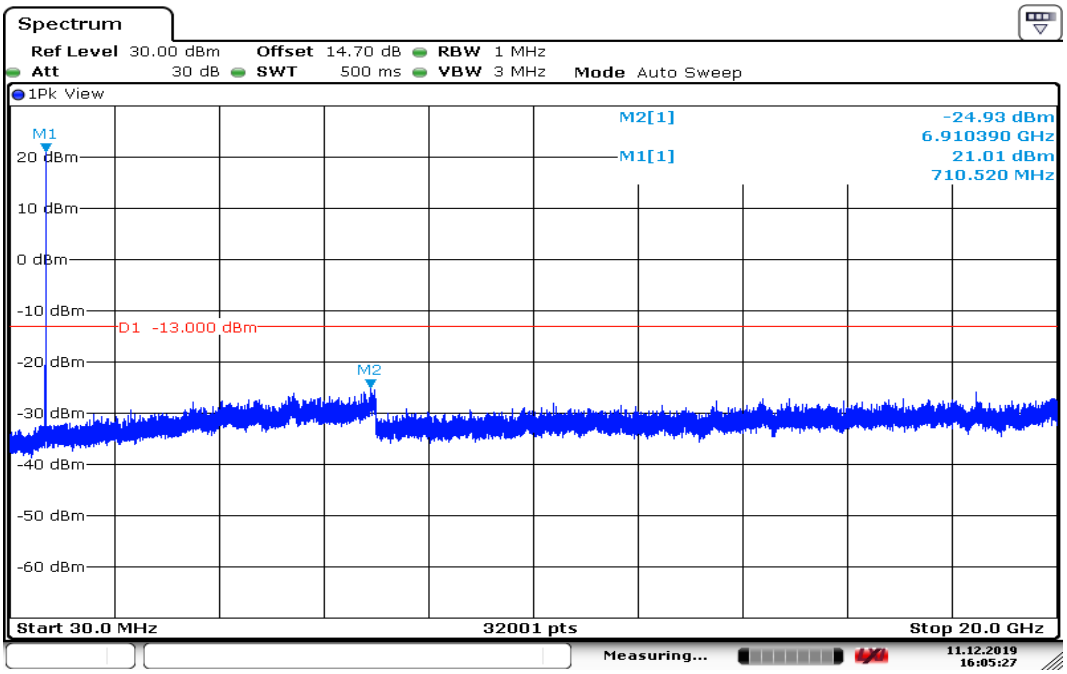
CHANNEL BANDWIDTH: 10MHz / QPSK

CH Low



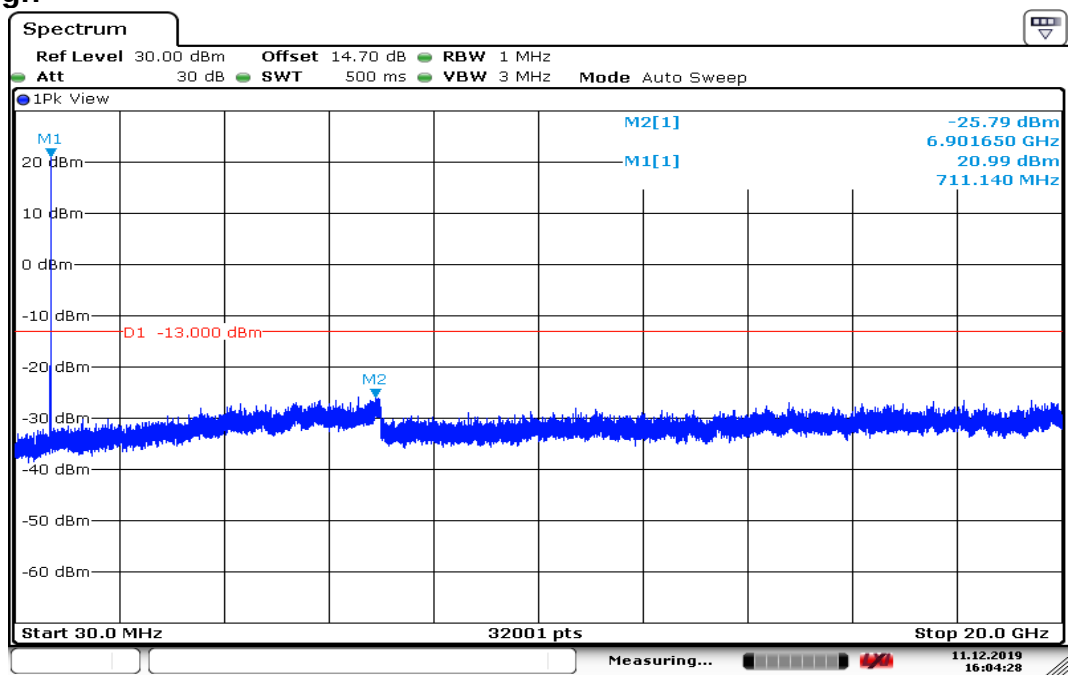
Date: 11.DEC.2019 16:05:01

CH Mid



Date: 11.DEC.2019 16:05:27

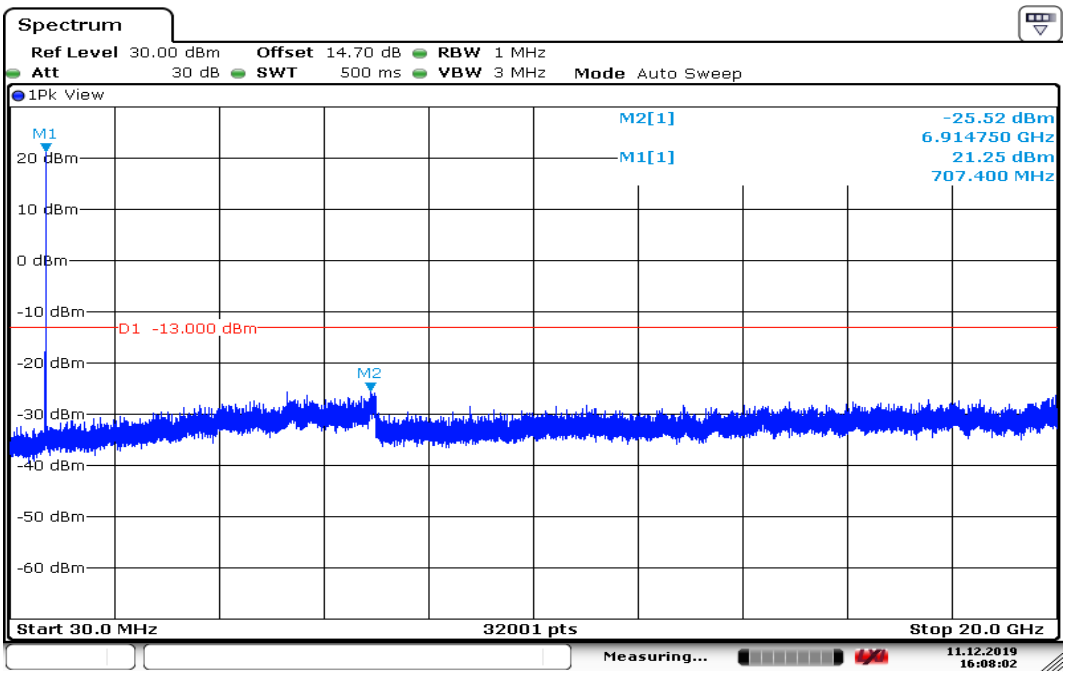
CH High



Date: 11.DEC.2019 16:04:29

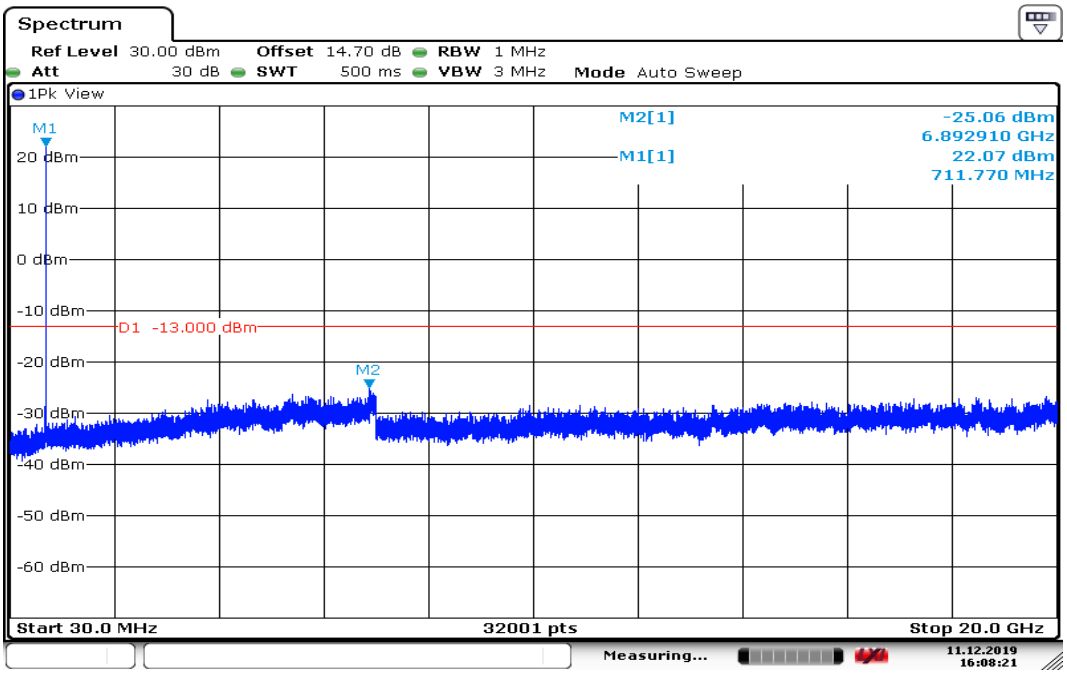
CHANNEL BANDWIDTH: 5MHz / 16QAM

CH Low



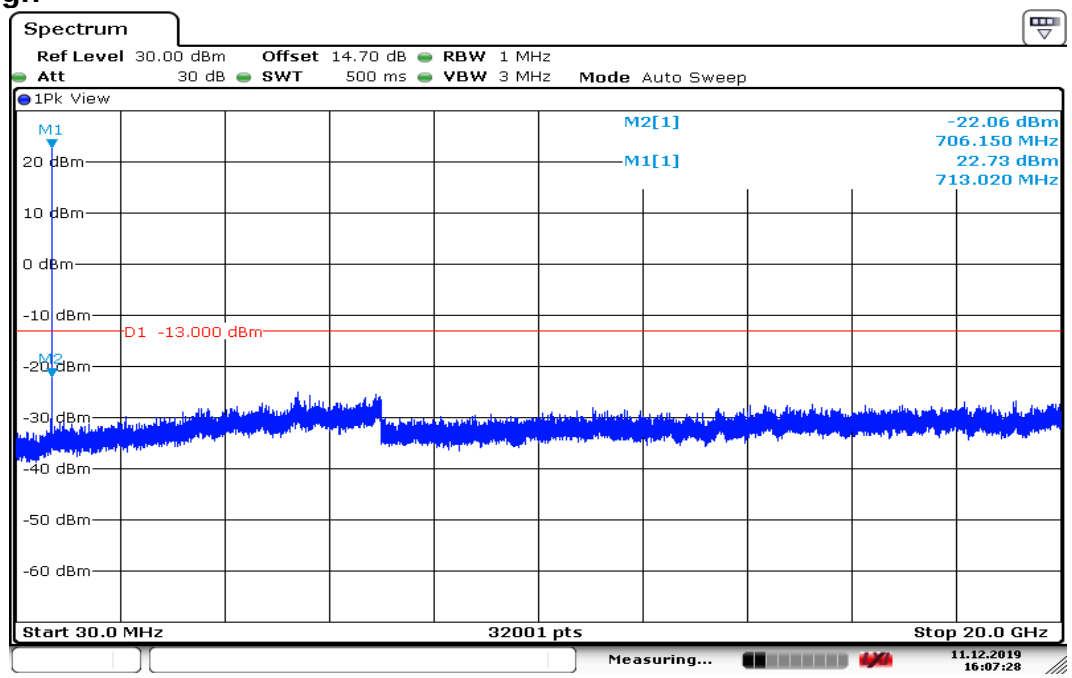
Date: 11.DEC.2019 16:08:03

CH Mid



Date: 11.DEC.2019 16:08:22

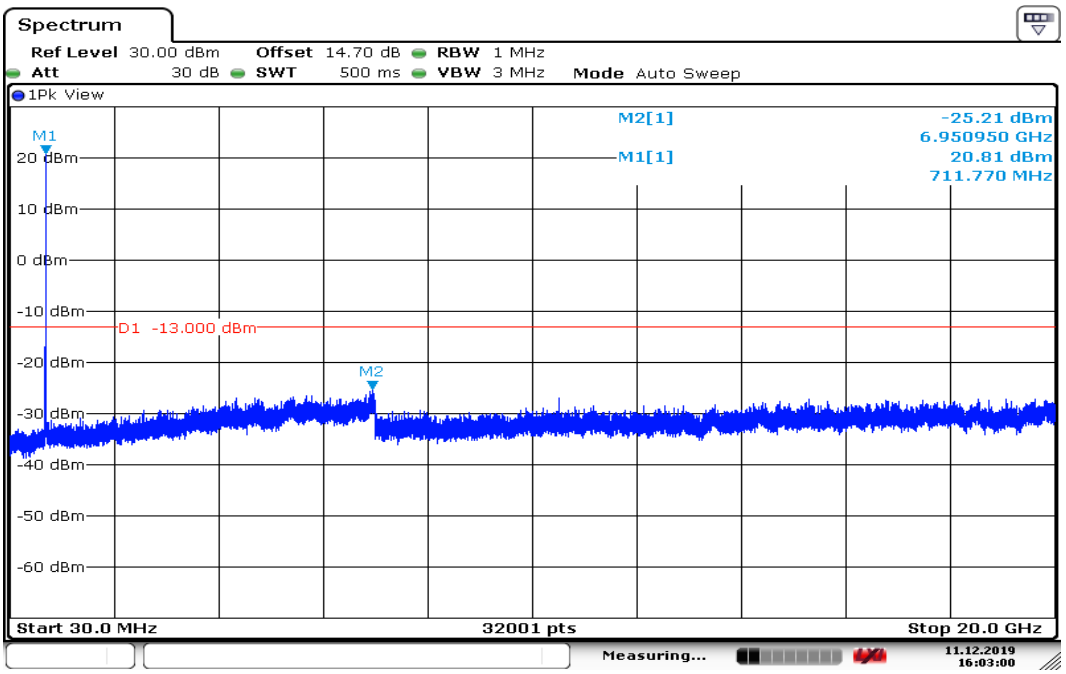
CH High



Date: 11.DEC.2019 16:07:29

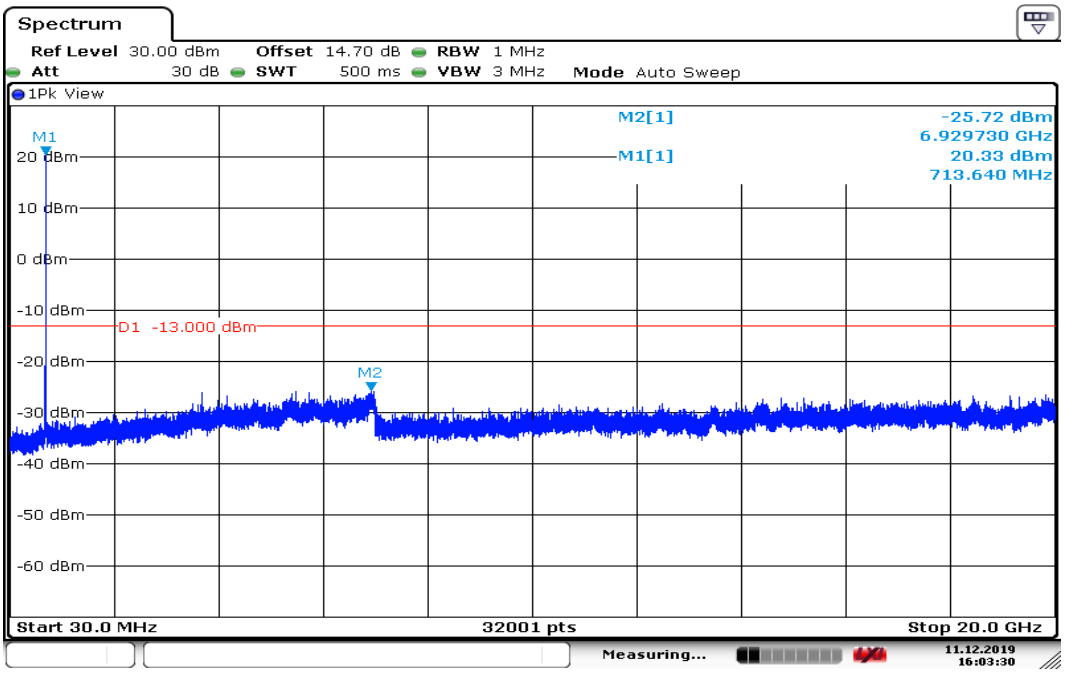
CHANNEL BANDWIDTH: 10MHz / 16QAM

CH Low



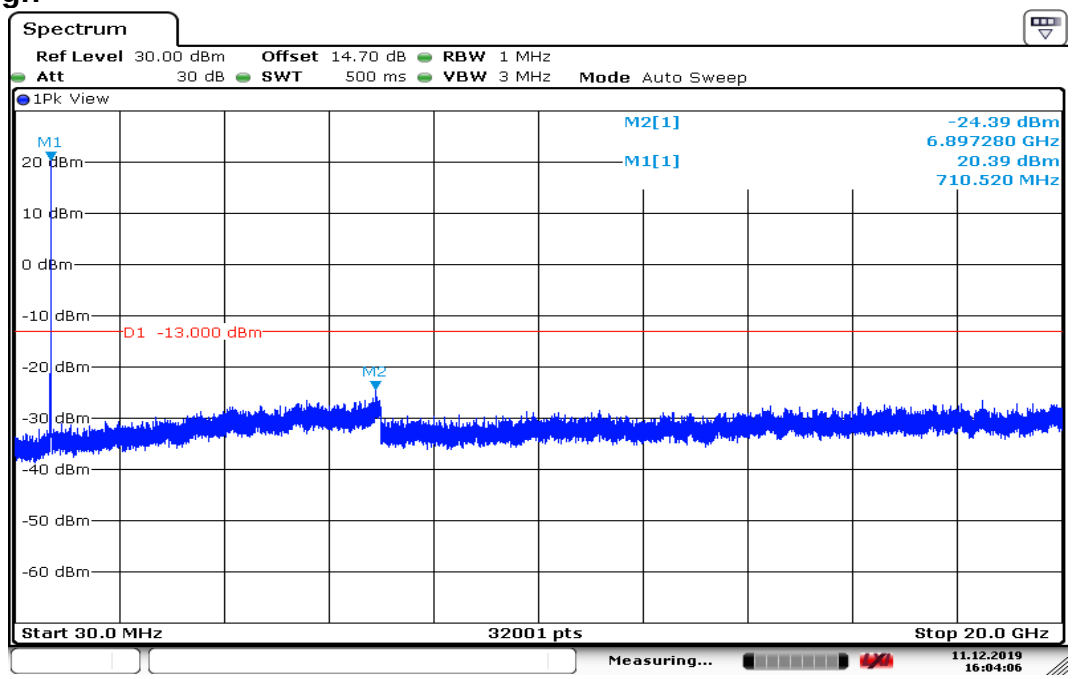
Date: 11.DEC.2019 16:03:01

CH Mid



Date: 11.DEC.2019 16:03:31

CH High



Date: 11.DEC.2019 16:04:07

8.7 RADIATED EMISSION MEASUREMENT

LIMITS

FCC §27.53(g), Band 12 & Band 17

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

According to RSS-130, Band 12 & Band 17

The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 log10 p (watts), dB. However, in the100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.

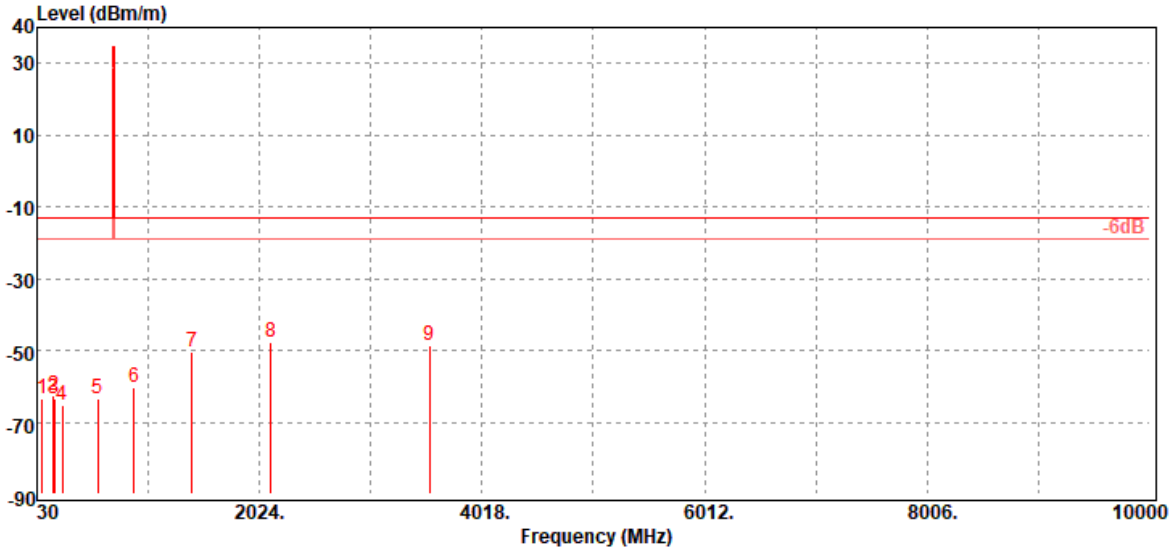
TEST PROCEDURES

1. According to KDB 971168 D01 and TIA-603-E.
2. The EUT was placed on a turntable
   (1) Below 1G : 0.8m
   (2) Above 1G : 1.5m
   (3) EUT set 3m from the receiving antenna
   (4) The table was rotated 360 degrees of the highest spurious emission to determine the position.
3. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
4. A horn antenna was driven by a signal generator.
5. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

Test Results

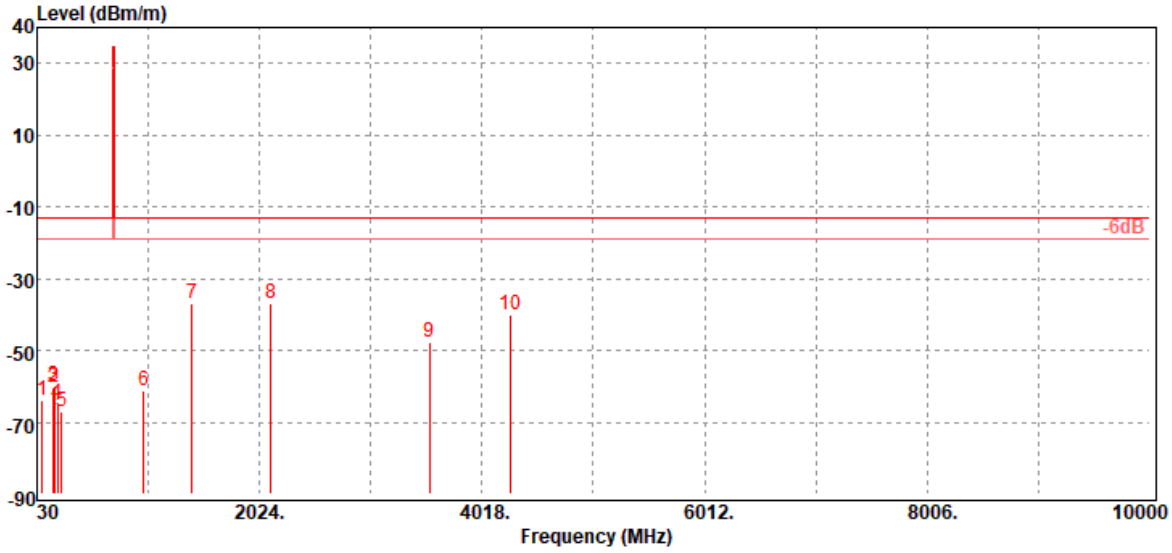
LTE Band 17 / BW: 10MHz / QPSK / RB =1, RB Offset = 0

Operation Mode:	Tx / Low CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Ver.



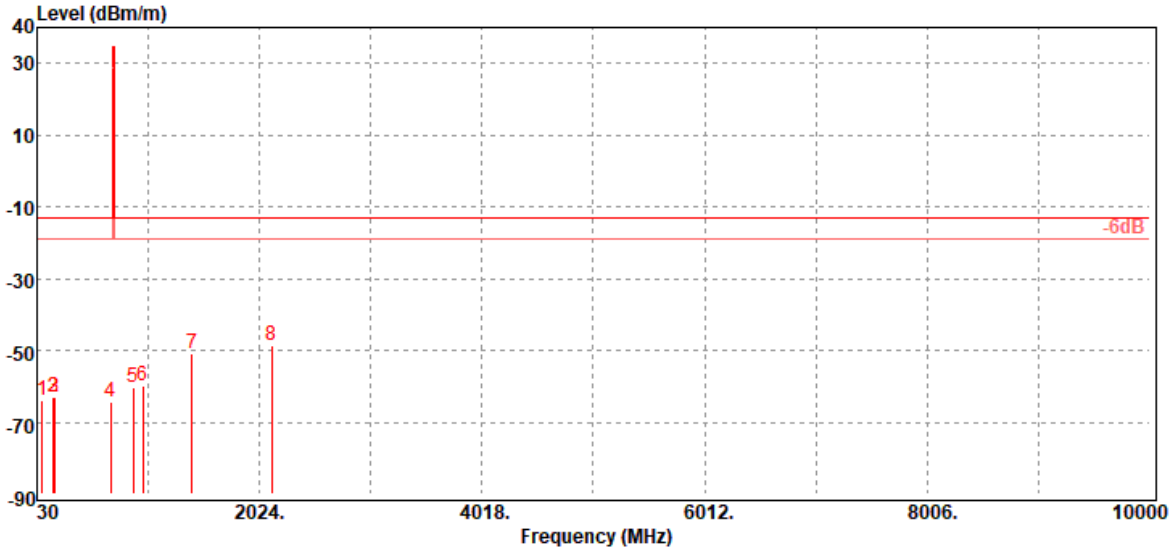
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
78.50	-63.58	-54.3	-8.55	-0.73	-13.00	-50.58	V
178.41	-62.69	-57.03	-4.56	-1.10	-13.00	-49.69	V
187.14	-63.37	-58.25	-3.99	-1.13	-13.00	-50.37	V
255.04	-65.28	-62.37	-1.60	-1.31	-13.00	-52.28	V
575.14	-63.50	-60.09	-1.40	-2.01	-13.00	-50.50	V
898.15	-60.26	-56.48	-1.24	-2.54	-13.00	-47.26	V
1418.00	-50.35	-55.2	8.11	-3.26	-13.00	-37.35	V
2127.00	-47.71	-53.16	9.58	-4.13	-13.00	-34.71	V
3545.00	-48.78	-55.6	12.41	-5.59	-13.00	-35.78	V

Operation Mode:	Tx / Low CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Hor.



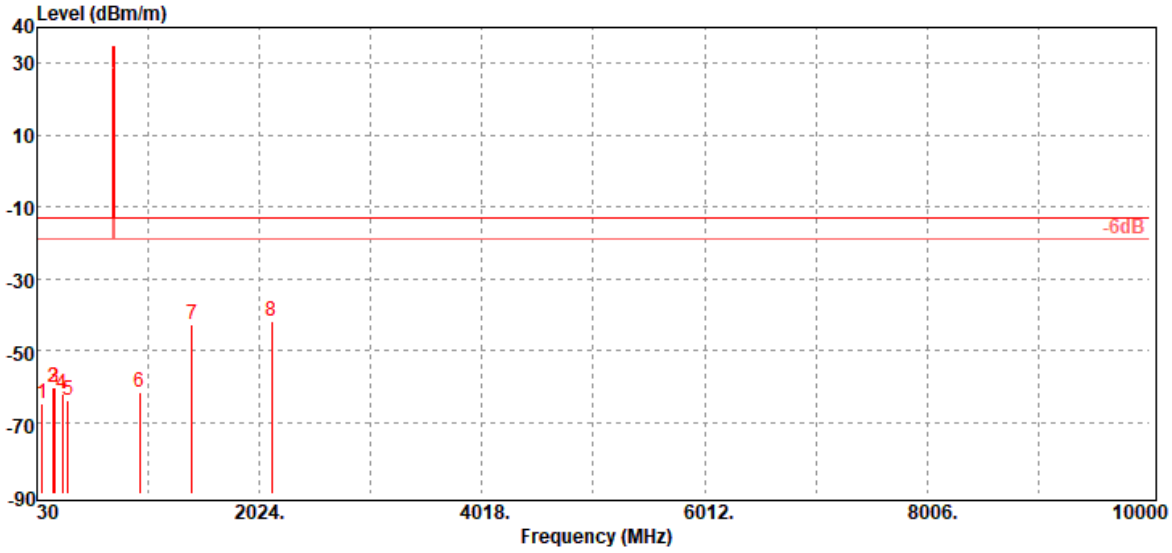
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
80.44	-64.09	-54.9	-8.46	-0.73	-13.00	-51.09	H
177.44	-60.36	-54.61	-4.66	-1.09	-13.00	-47.36	H
188.11	-59.95	-54.92	-3.90	-1.13	-13.00	-46.95	H
216.24	-64.71	-61.42	-2.08	-1.21	-13.00	-51.71	H
253.10	-67.07	-64.08	-1.68	-1.31	-13.00	-54.07	H
985.45	-61.01	-56.95	-1.40	-2.66	-13.00	-48.01	H
1418.00	-37.10	-41.95	8.11	-3.26	-13.00	-24.10	H
2127.00	-37.13	-42.58	9.58	-4.13	-13.00	-24.13	H
3545.00	-47.63	-54.45	12.41	-5.59	-13.00	-34.63	H
4276.00	-39.96	-46.62	12.80	-6.14	-13.00	-26.96	H

Operation Mode:	Tx / Mid CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Ver.



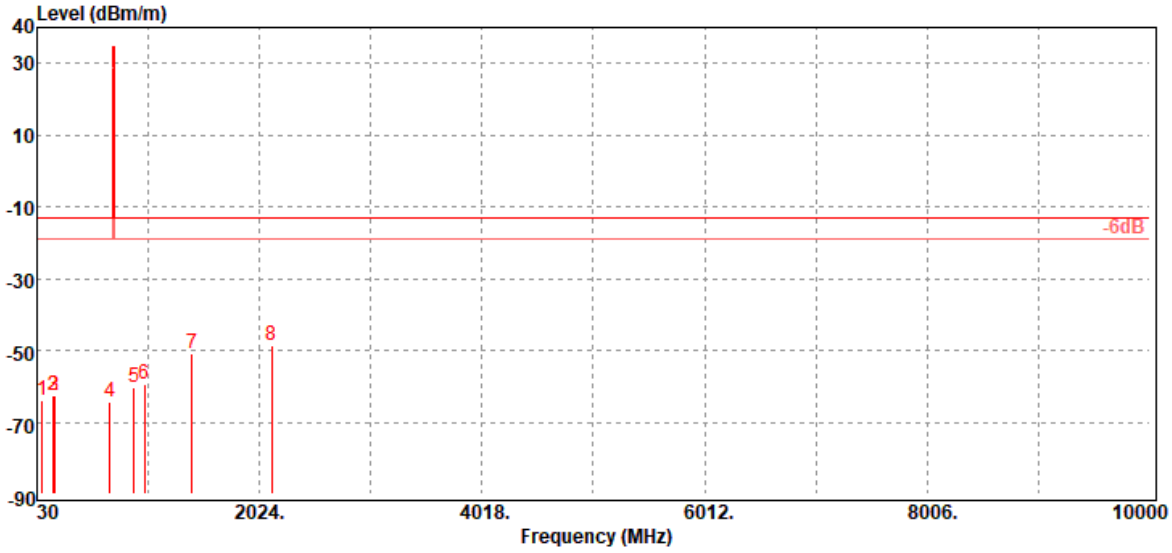
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
80.44	-64.11	-54.92	-8.46	-0.73	-13.00	-51.11	V
178.41	-62.94	-57.28	-4.56	-1.10	-13.00	-49.94	V
188.11	-62.86	-57.83	-3.90	-1.13	-13.00	-49.86	V
686.69	-64.39	-60.85	-1.33	-2.21	-13.00	-51.39	V
890.39	-60.15	-56.41	-1.21	-2.53	-13.00	-47.15	V
980.60	-59.88	-55.92	-1.31	-2.65	-13.00	-46.88	V
1420.00	-50.99	-55.85	8.12	-3.26	-13.00	-37.99	V
2130.00	-48.62	-54.05	9.56	-4.13	-13.00	-35.62	V

Operation Mode:	Tx / Mid CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Hor.



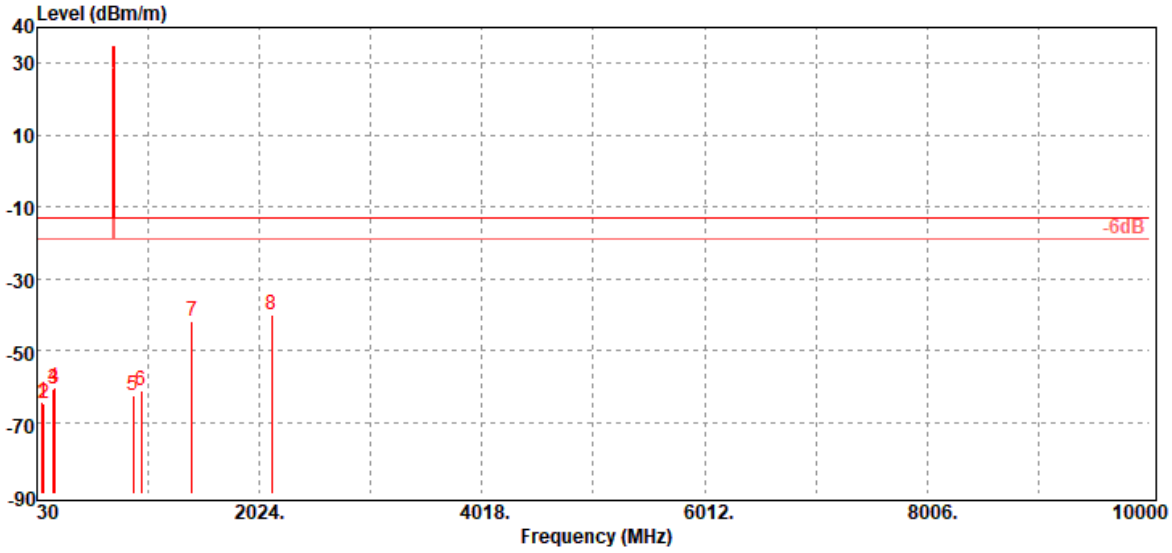
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
80.44	-64.71	-55.52	-8.46	-0.73	-13.00	-51.71	H
178.41	-60.37	-54.71	-4.56	-1.10	-13.00	-47.37	H
188.11	-60.20	-55.17	-3.90	-1.13	-13.00	-47.20	H
259.89	-62.17	-59.04	-1.80	-1.33	-13.00	-49.17	H
306.45	-63.96	-60.58	-1.93	-1.45	-13.00	-50.96	H
949.56	-61.62	-57.81	-1.20	-2.61	-13.00	-48.62	H
1420.00	-42.95	-47.81	8.12	-3.26	-13.00	-29.95	H
2130.00	-42.00	-47.43	9.56	-4.13	-13.00	-29.00	H

Operation Mode:	Tx / High CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Ver.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
78.50	-63.85	-54.57	-8.55	-0.73	-13.00	-50.85	V
177.44	-62.76	-57.01	-4.66	-1.09	-13.00	-49.76	V
188.11	-62.48	-57.45	-3.90	-1.13	-13.00	-49.48	V
679.90	-64.16	-60.66	-1.30	-2.20	-13.00	-51.16	V
896.21	-60.36	-56.54	-1.28	-2.54	-13.00	-47.36	V
995.15	-59.41	-55.34	-1.40	-2.67	-13.00	-46.41	V
1422.00	-50.85	-55.72	8.13	-3.26	-13.00	-37.85	V
2133.00	-48.67	-54.07	9.54	-4.14	-13.00	-35.67	V

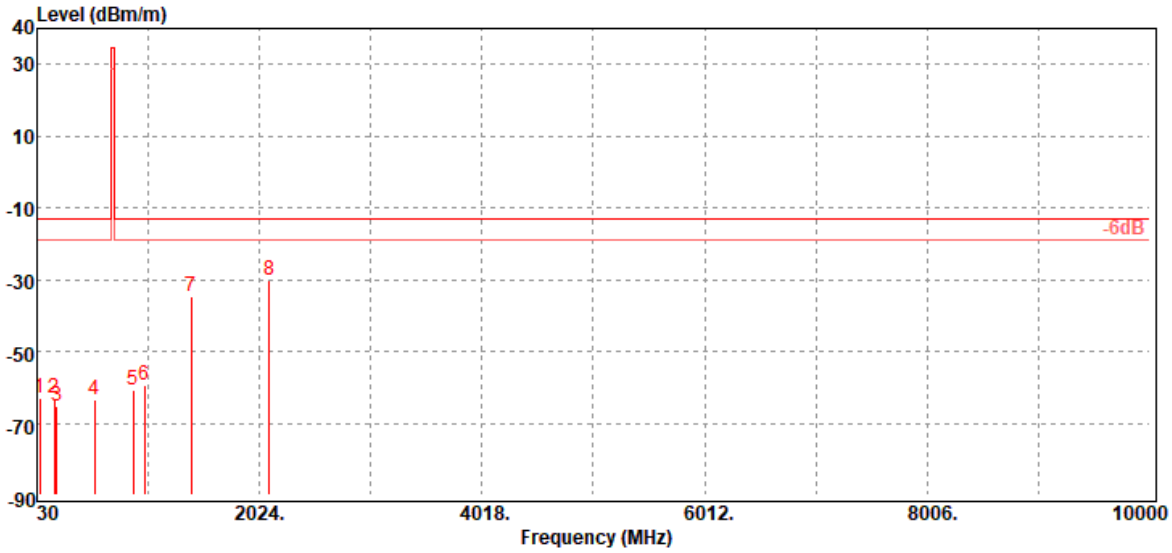
Operation Mode:	Tx / High CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Hor.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
80.44	-64.50	-55.31	-8.46	-0.73	-13.00	-51.50	H
91.11	-64.78	-57.09	-6.91	-0.78	-13.00	-51.78	H
178.41	-60.80	-55.14	-4.56	-1.10	-13.00	-47.80	H
187.14	-60.44	-55.32	-3.99	-1.13	-13.00	-47.44	H
890.39	-62.59	-58.85	-1.21	-2.53	-13.00	-49.59	H
966.05	-61.01	-57.08	-1.30	-2.63	-13.00	-48.01	H
1422.00	-41.67	-46.54	8.13	-3.26	-13.00	-28.67	H
2133.00	-40.15	-45.55	9.54	-4.14	-13.00	-27.15	H

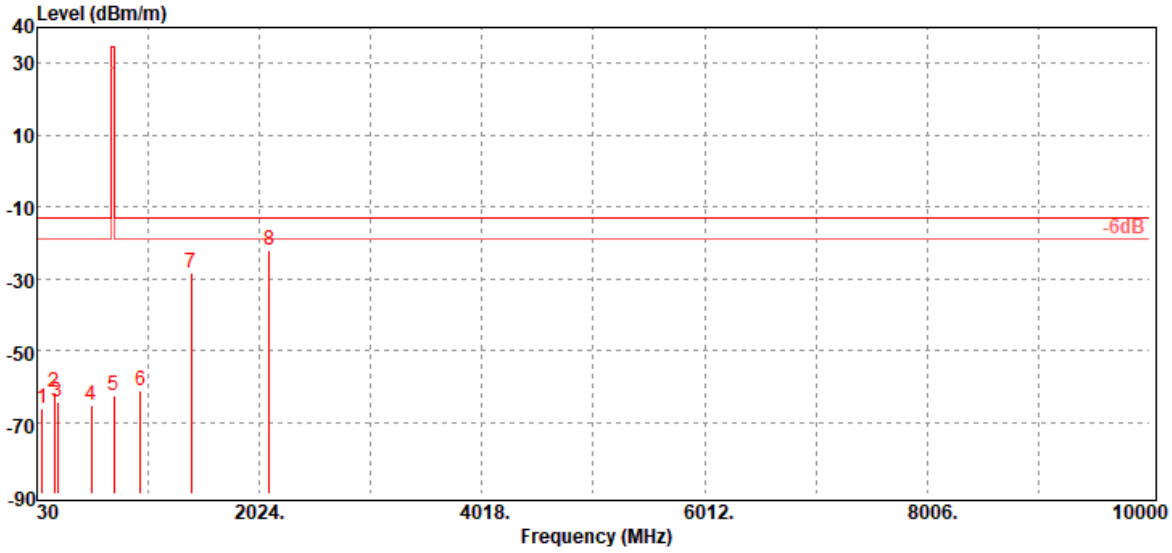
LTE Band 12 / BW: 20MHz / QPSK / RB =1, RB Offset = 0

Operation Mode:	Tx / Low CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Ver.



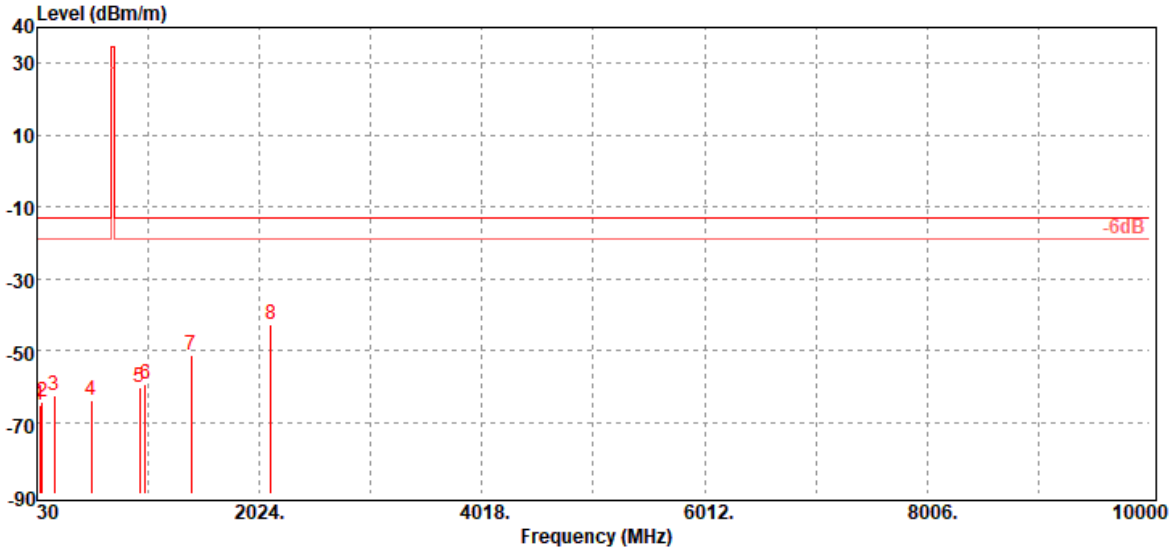
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
56.19	-63.03	-51.92	-10.50	-0.61	-13.00	-50.03	V
185.20	-63.19	-57.99	-4.08	-1.12	-13.00	-50.19	V
207.51	-65.21	-61.58	-2.45	-1.18	-13.00	-52.21	V
547.01	-63.41	-60.27	-1.20	-1.94	-13.00	-50.41	V
890.39	-60.76	-57.02	-1.21	-2.53	-13.00	-47.76	V
990.30	-59.25	-55.19	-1.40	-2.66	-13.00	-46.25	V
1408.00	-34.70	-39.5	8.05	-3.25	-13.00	-21.70	V
2112.00	-30.20	-35.79	9.70	-4.11	-13.00	-17.20	V

Operation Mode:	Tx / Low CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Hor.



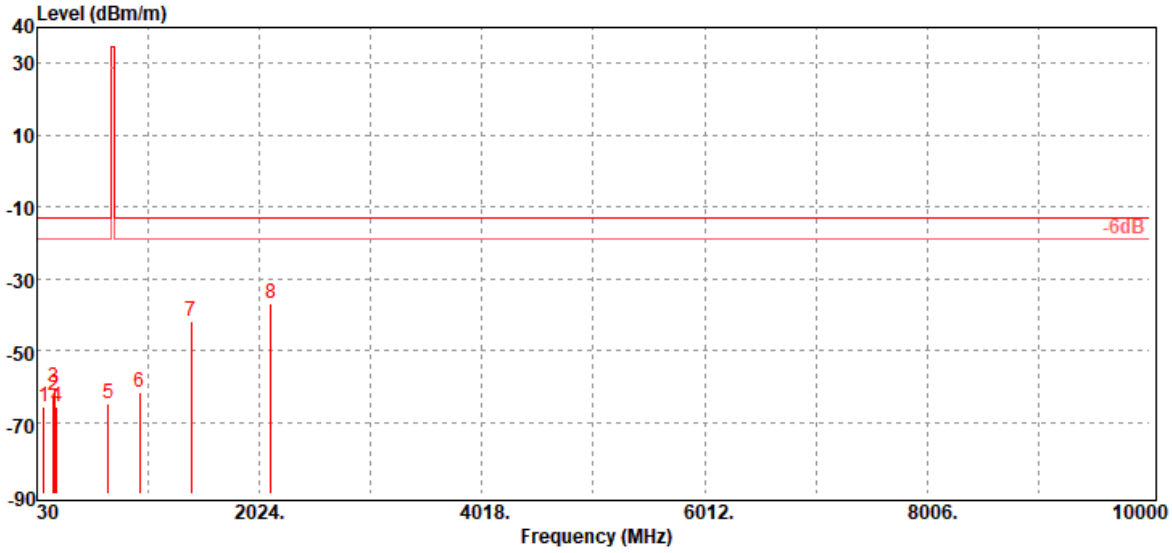
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
75.59	-65.97	-56.28	-8.98	-0.71	-13.00	-52.97	H
185.20	-61.88	-56.68	-4.08	-1.12	-13.00	-48.88	H
216.24	-64.56	-61.27	-2.08	-1.21	-13.00	-51.56	H
517.91	-65.48	-62.14	-1.44	-1.90	-13.00	-52.48	H
716.76	-62.65	-59	-1.40	-2.25	-13.00	-49.65	H
956.35	-61.35	-57.5	-1.23	-2.62	-13.00	-48.35	H
1408.00	-28.58	-33.38	8.05	-3.25	-13.00	-15.58	H
2112.00	-21.88	-27.47	9.70	-4.11	-13.00	-8.88	H

Operation Mode:	Tx / Mid CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Ver.



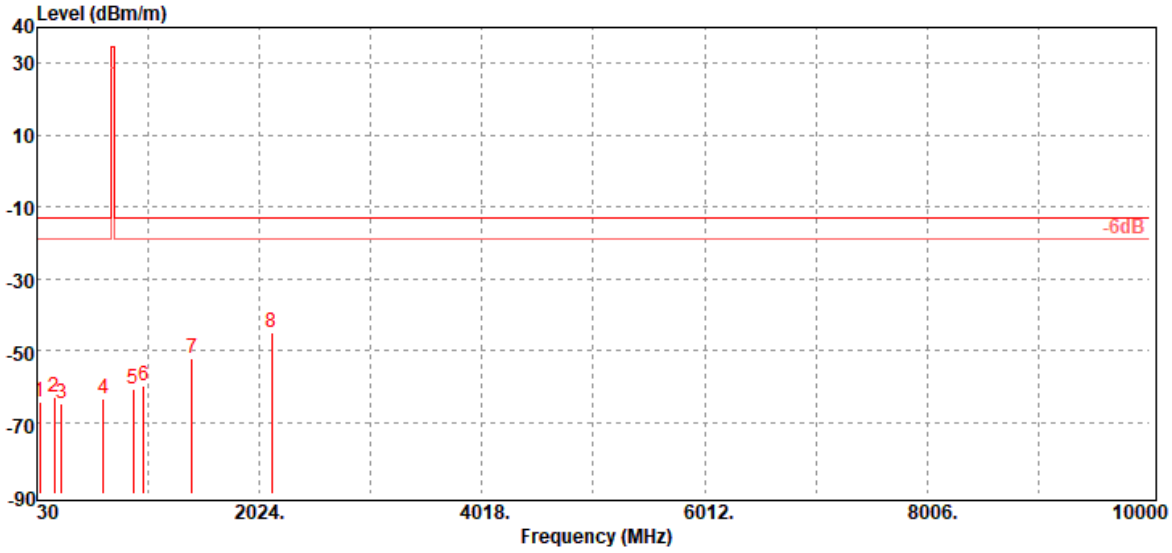
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
57.16	-65.08	-54	-10.47	-0.61	-13.00	-52.08	V
79.47	-64.56	-55.33	-8.50	-0.73	-13.00	-51.56	V
185.20	-62.65	-57.45	-4.08	-1.12	-13.00	-49.65	V
519.85	-63.95	-60.64	-1.40	-1.91	-13.00	-50.95	V
951.50	-60.09	-56.27	-1.20	-2.62	-13.00	-47.09	V
997.09	-59.56	-55.48	-1.40	-2.68	-13.00	-46.56	V
1415.00	-51.28	-56.12	8.09	-3.25	-13.00	-38.28	V
2122.50	-42.65	-48.15	9.62	-4.12	-13.00	-29.65	V

Operation Mode:	Tx / Mid CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Hor.



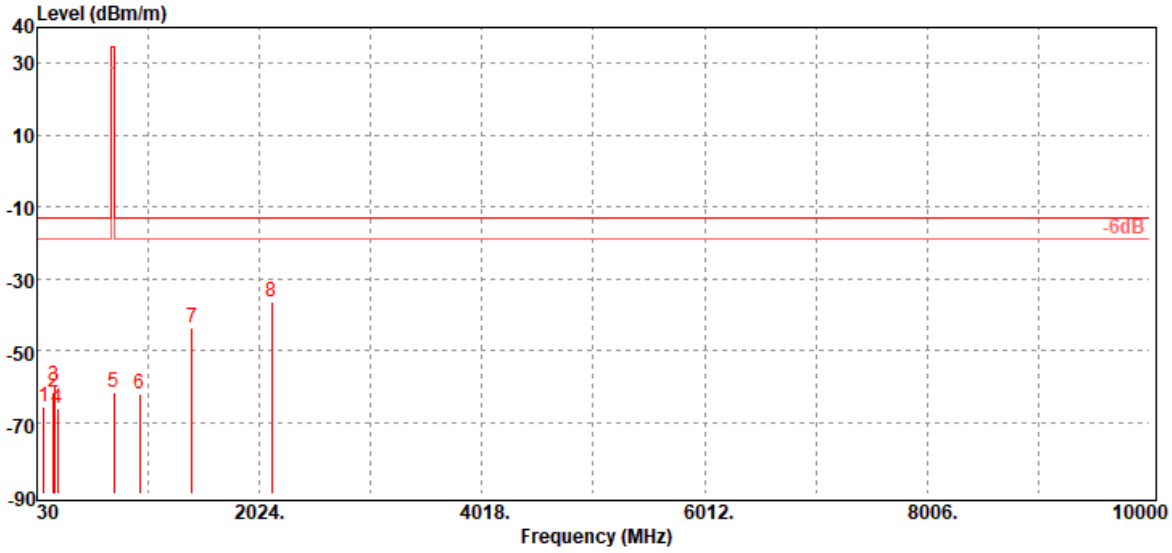
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
91.11	-65.71	-58.02	-6.91	-0.78	-13.00	-52.71	H
177.44	-62.60	-56.85	-4.66	-1.09	-13.00	-49.60	H
185.20	-60.09	-54.89	-4.08	-1.12	-13.00	-47.09	H
206.54	-65.66	-61.9	-2.58	-1.18	-13.00	-52.66	H
670.20	-64.95	-61.37	-1.40	-2.18	-13.00	-51.95	H
946.65	-61.66	-57.85	-1.20	-2.61	-13.00	-48.66	H
1415.00	-42.09	-46.93	8.09	-3.25	-13.00	-29.09	H
2122.50	-36.75	-42.25	9.62	-4.12	-13.00	-23.75	H

Operation Mode:	Tx / High CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Ver.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
56.19	-64.15	-53.04	-10.50	-0.61	-13.00	-51.15	V
188.11	-62.91	-57.88	-3.90	-1.13	-13.00	-49.91	V
248.25	-64.97	-61.84	-1.83	-1.30	-13.00	-51.97	V
621.70	-63.68	-60.18	-1.40	-2.10	-13.00	-50.68	V
890.39	-60.84	-57.1	-1.21	-2.53	-13.00	-47.84	V
988.36	-59.84	-55.78	-1.40	-2.66	-13.00	-46.84	V
1422.00	-52.31	-57.18	8.13	-3.26	-13.00	-39.31	V
2133.00	-44.82	-50.22	9.54	-4.14	-13.00	-31.82	V

Operation Mode:	Tx / High CH	**Test Date:**	December 18, 2019
Temperature:	18.6℃	**Tested by:**	Jerry Chang
Humidity:	59% RH	**Polarity:**	Hor.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
91.11	-65.73	-58.04	-6.91	-0.78	-13.00	-52.73	H
175.50	-61.70	-55.76	-4.85	-1.09	-13.00	-48.70	H
188.11	-59.69	-54.66	-3.90	-1.13	-13.00	-46.69	H
216.24	-65.98	-62.69	-2.08	-1.21	-13.00	-52.98	H
721.61	-61.76	-58.1	-1.40	-2.26	-13.00	-48.76	H
949.56	-61.92	-58.11	-1.20	-2.61	-13.00	-48.92	H
1422.00	-43.63	-48.5	8.13	-3.26	-13.00	-30.63	H
2133.00	-36.39	-41.79	9.54	-4.14	-13.00	-23.39	H

- End of Test Report -