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Report No.: T200825W02-RP3



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Rev.: 01

FCC 47 CFR PART 24 SUBPART E

TEST REPORT

For

SyncUP Kids Watch

Model No.: TMUS-SKW-1, TMUS-SKW-M

Trade Name: T-Mobile

Issued to

**T-mobile Usa, Inc.
12920 Se 38th Street , Bellevue, Washington, United States, 98006.**

Issued by

**Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City, Taiwan. (R.O.C.)
Issued Date: June 8, 2021**

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	March 25, 2021	Initial Issue	ALL	Mita Wu
01	June 8, 2021	See the following Note Rev. (01)	P.11, P.10, P.47, P.96-97	Doris Chu

Rev. (01)

1. Added FCC register lab number in section 6.1.
2. Revised equipment list in section 5.2.
3. Added how to Calculation the Offset in section 8.5.
4. Revised Test Configuration in section 8.7.

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1. TEST RESULT CERTIFICATION

Applicant: T-mobile Usa, Inc.
12920 Se 38th Street , Bellevue, Washington, United States,
98006.

Manufacturer: T-mobile Usa, Inc.
12920 Se 38th Street , Bellevue, Washington, United States,
98006.

Equipment Under Test: SyncUP Kids Watch

Trade Name: T-Mobile

Model No.: TMUS-SKW-1, TMUS-SKW-M

Date of Test: September 14, 2020; December 30, 2020

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR PART 24 SUBPART E	No non-compliance noted
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

We hereby certify that:

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

Approved by:



Kevin Tsai
Deputy Manager
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	SyncUP Kids Watch	
Model No.	TMUS-SKW-1, TMUS-SKW-M	
Model Discrepancy	Preload profiles in SIM IC are different, but the SIM IC is the same. TMUS-SKW-1 is T-Mobile SKU, TMUS-SKW-M is MPCS SKU.	
Trade	T-Mobile	
Received Date	August 25, 2020	
Power Supply	1. Power from Adapter. PHIHONG TECHNOLOGY / AN05A-050E I/P: 100-240VAC, 0.2A, 50-60Hz O/P: 5.0VDC, 1.0A 2. Power from Battery. EVE / P0963 Rated Capacity: 3.85V, 495mAh, 1.91Wh	
Frequency Range	LTE Band 2 Channel Bandwidth: 1.4MHz	1850.7MHz ~1909.2MHz
	LTE Band 2 Channel Bandwidth: 3MHz	1851.5 MHz ~ 1908.4 MHz
	LTE Band 2 Channel Bandwidth: 5MHz	1852.5MHz ~1907.5MHz
	LTE Band 2 Channel Bandwidth: 10MHz	1855MHz ~1905MHz
	LTE Band 2 Channel Bandwidth: 15MHz	1857.5 MHz ~ 1902.5 MHz
	LTE Band 2 Channel Bandwidth: 20MHz	1860MHz ~1900MHz
Modulation Technique	LTE Band 2	QPSK, 16QAM
Antenna Specification	PIFA Antenna Band 2: -6.22 dBi	
Transmit Power (EIRP Power)	LTE Band 2 Channel Bandwidth: 1.4MHz	QPSK: 16.16 dBm 16QAM: 14.94 dBm
	LTE Band 2 Channel Bandwidth: 3MHz	QPSK: 16.17 dBm 16QAM: 14.95 dBm
	LTE Band 2 Channel Bandwidth: 5MHz	QPSK: 16.23 dBm 16QAM: 15.00 dBm
	LTE Band 2 Channel Bandwidth: 10MHz	QPSK: 16.26 dBm 16QAM: 15.02 dBm
	LTE Band 2 Channel Bandwidth: 15MHz	QPSK: 16.27 dBm 16QAM: 15.03 dBm
	LTE Band 2 Channel Bandwidth: 20MHz	QPSK: 16.34 dBm 16QAM: 15.06 dBm

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
3. Disclaimer: The variant model numbers / trademarks are assessed as identical in hardware and software to each other, hence all variants are fully covered by the test results in this test report without further verification test.

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to TIA -603-E, FCC CFR 47, Part 2 and Part 24 Subpart E.

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: TMUS-SKW-1) had been tested under operating condition. The EUT be set in maximum power transmission via call box during testing.

LTE Band 2: 1850MHz ~ 1910MHz

Three channels had been tested for each channel bandwidth.

Channel	1.4MHz		3MHz		5MHz	
	Channel	Frequency(MHz)	Channel	Frequency(MHz)	Channel	Frequency(MHz)
Lowest	18607	1850.7	18615	1851.5	18625	1852.5
Middle	18900	1880.0	18900	1880.0	18900	1880.0
Highest	19193	1909.3	19184	1908.4	19175	1907.5
Channel	10MHz		15MHz		20MHz	
	Channel	Frequency(MHz)	Channel	Frequency(MHz)	Channel	Frequency(MHz)
Lowest	18650	1855.0	18675	1857.5	18700	1860.0
Middle	18900	1880.0	18900	1880.0	18900	1880.0
Highest	19150	1905.0	19125	1902.5	19100	1900.0

3.2.1 The worst mode of measurement

Radiated Emission Measurement	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Adapter Mode 2: EUT power by Battery
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	Mode 1: EUT power by Adapter Mode 2: EUT power by Battery
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(Y-Plane) were recorded in this report

4. TEST SUMMERY

FCC Standard Sec.	Report Section	Test Item	Result
-	2	Antenna Requirement	Pass
24.232(c)	8.1	EIRP Measurement	Pass
2.1055, 24.235	8.2	Frequency Stability v.s. temperature measurement	Pass
2.1049	8.3	Occupied Bandwidth Measurement	Pass
24.238(a)	8.4	Conducted Band Edge	Pass
24.232(d)	8.5	Peak to Average Ratio	Pass
24.238(a)	8.6	Conducted Spurious Emission	Pass
24.238(a)	8.7	Spurious Radiation Measurement	Pass

5. INSTRUMENT CALIBRATION

5.1 MEASURING INSTRUMENT CALIBRATION

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

5.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

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

Date of Test: September 14, 2020

RF Conducted Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
Coaxial Cable	Woken	WC12	CC001	06/29/2020	06/28/2021
Signal Analyzer	R&S	FSV 40	101073	09/25/2019	09/24/2020
Wideband Radio Communication Tester	R&S	CMW 500	116875	07/19/2020	07/18/2021
Software	N/A				

Date of Test: December 30, 2020

RF Conducted Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
Coaxial Cable	Woken	WC12	CC001	06/29/2020	06/28/2021
Radio Communication Analyzer	Anritsu	MT-8820C	6201240043	07/17/2020	07/16/2021
Signal Analyzer	R&S	FSV 40	101073	09/17/2020	09/16/2021
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	02/25/2020	02/24/2021
Bilog Antenna	Sunol Sciences	JB3	A030105	07/24/2020	07/23/2021
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/25/2020	02/24/2021
Coaxial Cable	EMCI	EMC105	190914+327109/4	09/19/2020	09/18/2021
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/15/2020	01/14/2021
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	09/30/2020	09/29/2021
Loop Ant	COM-POWER	AL-130	121051	03/27/2020	03/26/2021
Pre-Amplifier	EMEC	EM330	060609	02/25/2020	02/24/2021
Pre-Amplifier	HP	8449B	3008A00965	02/25/2020	02/24/2021
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	07/24/2020	07/23/2021
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
Horn Antenna	SCHWARZBECK	BBHA 9120D	779	03/09/2020	03/08/2021
Bilog Antenna	Sunol Sciences	JB1	A052609	02/23/2020	02/22/2021
S.G.	Agilent	E8257C	US42340383	07/21/2020	07/20/2021
K Type Cable	Huber+Suhner	SUCOFLEX 102	29406/2	12/09/2020	12/08/2021
K Type Cable	Huber+Suhner	SUCOFLEX 102	22470/2	12/09/2020	12/08/2021
Horn Antenna	ETS LINDGREN	3116	00026370	12/11/2020	12/10/2021
Radio Communication Analyzer	Anritsu	MT-8820C	6201240043	07/17/2020	07/16/2021
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: 886-2-2299-9721

Canada Regisrecreation number: 2324G

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC public Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

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 II for the actual connections between EUT and support equipment.

7.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID
1	NB(J)	TOSHIBA	PT345T-00L002	N/A	N/A
2	DC Power Supplies	GW Instek	SPS-3610	GPE880163	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 24 REQUIREMENTS

8.1 EIRP MEASUREMENT

LIMIT

According to FCC §2.1046

FCC 24.232(c):

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

TEST PROCEDURES

CONDUCTED POWER MEASUREMENT:

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

TEST RESULTS

No non-compliance noted.

Temperature: 24.1°C
Humidity: 50.5 % RH

Test Date: December 30, 2020
Tested by: Rick Lee

LTE Band 2

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	EIRP Power
Band 2	1.4M	18607	1850.7	QPSK	1	0	0	22.38	16.16
					1	2	0	22.06	15.84
					1	5	0	22.09	15.87
					3	0	1	21.12	14.90
					3	1	1	21.08	14.86
					3	2	1	21.08	14.86
					6	0	1	21.21	14.99
				16QAM	1	0	1	21.13	14.91
					1	2	1	21.07	14.85
					1	5	1	21.16	14.94
					3	0	2	20.11	13.89
					3	1	2	20.12	13.90
					3	2	2	20.12	13.90
					6	0	2	20.13	13.91
		18900	1880.0	QPSK	1	0	0	22.22	16.00
					1	2	0	22.01	15.79
					1	5	0	22.08	15.86
					3	0	1	21.00	14.78
					3	1	1	21.13	14.91
					3	2	1	21.08	14.86
					6	0	1	21.01	14.79
				16QAM	1	0	1	21.09	14.87
					1	2	1	21.11	14.89
					1	5	1	21.06	14.84
					3	0	2	20.15	13.93
					3	1	2	20.20	13.98
					3	2	2	20.08	13.86
					6	0	2	20.02	13.80
		19193	1909.3	QPSK	1	0	0	22.38	16.16
					1	2	0	22.14	15.92
					1	5	0	22.06	15.84
					3	0	1	21.12	14.90
					3	1	1	21.03	14.81
					3	2	1	21.01	14.79
					6	0	1	21.15	14.93
				16QAM	1	0	1	21.08	14.86
					1	2	1	21.11	14.89
					1	5	1	20.97	14.75
					3	0	2	20.04	13.82
					3	1	2	20.08	13.86
					3	2	2	20.03	13.81
					6	0	2	20.16	13.94

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	EIRP Power
Band 2	3M	18615	1851.5	QPSK	1	0	0	22.39	16.17
					1	7	0	22.07	15.85
					1	14	0	22.10	15.88
					8	0	1	21.13	14.91
					8	4	1	21.09	14.87
					8	7	1	21.09	14.87
					15	0	1	21.22	15.00
				16QAM	1	0	1	21.14	14.92
					1	7	1	21.08	14.86
					1	14	1	21.17	14.95
					8	0	2	20.12	13.90
					8	4	2	20.13	13.91
					8	7	2	20.13	13.91
					15	0	2	20.14	13.92
		18900	1880.0	QPSK	1	0	0	22.23	16.01
					1	7	0	22.02	15.80
					1	14	0	22.09	15.87
					8	0	1	21.01	14.79
					8	4	1	21.14	14.92
					8	7	1	21.09	14.87
					15	0	1	21.02	14.80
				16QAM	1	0	1	21.10	14.88
					1	7	1	21.12	14.90
					1	14	1	21.07	14.85
					8	0	2	20.16	13.94
					8	4	2	20.21	13.99
					8	7	2	20.09	13.87
					15	0	2	20.03	13.81
		19184	1908.4	QPSK	1	0	0	22.40	16.18
					1	7	0	22.16	15.94
					1	14	0	22.08	15.86
					8	0	1	21.14	14.92
					8	4	1	21.05	14.83
					8	7	1	21.03	14.81
					15	0	1	21.17	14.95
				16QAM	1	0	1	21.10	14.88
					1	7	1	21.13	14.91
					1	14	1	20.99	14.77
					8	0	2	20.06	13.84
					8	4	2	20.10	13.88
					8	7	2	20.05	13.83
					15	0	2	20.18	13.96

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	EIRP Power
Band 2	5M	18625	1852.5	QPSK	1	0	0	22.44	16.22
					1	12	0	22.12	15.90
					1	24	0	22.15	15.93
					12	0	1	21.18	14.96
					12	6	1	21.14	14.92
					12	11	1	21.14	14.92
					25	0	1	21.27	15.05
				16QAM	1	0	1	21.19	14.97
					1	12	1	21.13	14.91
					1	24	1	21.22	15.00
					12	0	2	20.17	13.95
					12	6	2	20.18	13.96
					12	11	2	20.18	13.96
		18900	1880.0	QPSK	25	0	2	20.19	13.97
					1	0	0	22.27	16.05
					1	12	0	22.06	15.84
					1	24	0	22.13	15.91
					12	0	1	21.05	14.83
					12	6	1	21.18	14.96
					12	11	1	21.13	14.91
					25	0	1	21.06	14.84
				16QAM	1	0	1	21.14	14.92
					1	12	1	21.16	14.94
					1	24	1	21.11	14.89
					12	0	2	20.20	13.98
					12	6	2	20.25	14.03
					12	11	2	20.13	13.91
		19175	1907.5	QPSK	25	0	2	20.07	13.85
					1	0	0	22.45	16.23
					1	12	0	22.21	15.99
					1	24	0	22.13	15.91
					12	0	1	21.19	14.97
					12	6	1	21.10	14.88
					12	11	1	21.08	14.86
					25	0	1	21.22	15.00
				16QAM	1	0	1	21.15	14.93
					1	12	1	21.18	14.96
					1	24	1	21.04	14.82
					12	0	2	20.11	13.89
					12	6	2	20.15	13.93
					12	11	2	20.10	13.88
					25	0	2	20.23	14.01

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	EIRP Power
Band 2	10M	18650	1855.0	QPSK	1	0	0	22.46	16.24
					1	24	0	22.14	15.92
					1	49	0	22.17	15.95
					25	0	1	21.20	14.98
					25	12	1	21.16	14.94
					25	24	1	21.16	14.94
					50	0	1	21.29	15.07
				16QAM	1	0	1	21.21	14.99
					1	24	1	21.15	14.93
					1	49	1	21.24	15.02
					25	0	2	20.19	13.97
					25	12	2	20.20	13.98
					25	24	2	20.20	13.98
					50	0	2	20.21	13.99
		18900	1880.0	QPSK	1	0	0	22.29	16.07
					1	24	0	22.08	15.86
					1	49	0	22.15	15.93
					25	0	1	21.07	14.85
					25	12	1	21.20	14.98
					25	24	1	21.15	14.93
					50	0	1	21.08	14.86
				16QAM	1	0	1	21.16	14.94
					1	24	1	21.18	14.96
					1	49	1	21.13	14.91
					25	0	2	20.22	14.00
					25	12	2	20.27	14.05
					25	24	2	20.15	13.93
					50	0	2	20.09	13.87
		19150	1905.0	QPSK	1	0	0	22.48	16.26
					1	24	0	22.24	16.02
					1	49	0	22.16	15.94
					25	0	1	21.22	15.00
					25	12	1	21.13	14.91
					25	24	1	21.11	14.89
					50	0	1	21.25	15.03
				16QAM	1	0	1	21.18	14.96
					1	24	1	21.21	14.99
					1	49	1	21.07	14.85
					25	0	2	20.14	13.92
					25	12	2	20.18	13.96
					25	24	2	20.13	13.91
					50	0	2	20.26	14.04

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	EIRP Power
Band 2	15M	18675	1857.5	QPSK	1	0	0	22.47	16.25
					1	37	0	22.15	15.93
					1	74	0	22.18	15.96
					36	0	1	21.21	14.99
					36	18	1	21.17	14.95
					36	35	1	21.17	14.95
					75	0	1	21.30	15.08
				16QAM	1	0	1	21.22	15.00
					1	37	1	21.16	14.94
					1	74	1	21.25	15.03
					36	0	2	20.20	13.98
					36	18	2	20.21	13.99
					36	35	2	20.21	13.99
					75	0	2	20.22	14.00
		18900	1880.0	QPSK	1	0	0	22.30	16.08
					1	37	0	22.09	15.87
					1	74	0	22.16	15.94
					36	0	1	21.08	14.86
					36	18	1	21.21	14.99
					36	35	1	21.16	14.94
					75	0	1	21.09	14.87
				16QAM	1	0	1	21.17	14.95
					1	37	1	21.19	14.97
					1	74	1	21.14	14.92
					36	0	2	20.23	14.01
					36	18	2	20.28	14.06
					36	35	2	20.16	13.94
					75	0	2	20.10	13.88
		19125	1902.5	QPSK	1	0	0	22.49	16.27
					1	37	0	22.25	16.03
					1	74	0	22.17	15.95
					36	0	1	21.23	15.01
					36	18	1	21.14	14.92
					36	35	1	21.12	14.90
					75	0	1	21.26	15.04
				16QAM	1	0	1	21.19	14.97
					1	37	1	21.22	15.00
					1	74	1	21.08	14.86
					36	0	2	20.15	13.93
					36	18	2	20.19	13.97
					36	35	2	20.14	13.92
					75	0	2	20.27	14.05

Band	BW (MHz)	Channel	Frequency (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Average power (dBm)	EIRP Power
Band 2	20M	18700	1860.0	QPSK	1	0	0	22.50	16.28
					1	49	0	22.18	15.96
					1	99	0	22.21	15.99
					50	0	1	21.24	15.02
					50	24	1	21.20	14.98
					50	49	1	21.20	14.98
				16QAM	100	0	1	21.33	15.11
					1	0	1	21.25	15.03
					1	49	1	21.19	14.97
					1	99	1	21.28	15.06
					50	0	2	20.23	14.01
					50	24	2	20.24	14.02
					50	49	2	20.24	14.02
					100	0	2	20.25	14.03
		18900	1880.0	QPSK	1	0	0	22.36	16.14
					1	49	0	22.15	15.93
					1	99	0	22.22	16.00
					50	0	1	21.14	14.92
					50	24	1	21.27	15.05
					50	49	1	21.22	15.00
				16QAM	100	0	1	21.15	14.93
					1	0	1	21.23	15.01
					1	49	1	21.25	15.03
					1	99	1	21.20	14.98
					50	0	2	20.29	14.07
					50	24	2	20.34	14.12
					50	49	2	20.22	14.00
					100	0	2	20.16	13.94
		19100	1900.0	QPSK	1	0	0	22.56	16.34
					1	49	0	22.32	16.10
					1	99	0	22.24	16.02
					50	0	1	21.30	15.08
					50	24	1	21.21	14.99
					50	49	1	21.19	14.97
				16QAM	100	0	1	21.33	15.11
					1	0	1	21.26	15.04
					1	49	1	21.29	15.07
					1	99	1	21.15	14.93
					50	0	2	20.22	14.00
					50	24	2	20.26	14.04
					50	49	2	20.21	13.99
					100	0	2	20.34	14.12

8.2 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

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

Frequency Tolerance: +/- 2.5ppm

Test Procedure

Use Anritsu 8820 with frequency Error measurement capability.

Temp = -35°C to +65°C

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

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

TEST RESULTS

No non-compliance noted.

Test Results

FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT:

Temperature: 24.1°C

Test Date: December 30, 2020

Humidity: 50.5 % RH

Tested by: Rick Lee

LTE Band 2 / QPSK

Reference Frequency: LTE Band 2, 1880 MHz at 20(°C)				
Limit: 2.5 ppm = 4700 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 10M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
3.8	55	0.01	0.000005	+/- 2.5
3.8	40	0.00	0.000000	
3.8	30	0.01	0.000005	
3.8	20	0.00	0.000000	
3.8	10	0.03	0.000016	
3.8	0	0.02	0.000011	
3.8	-10	0.02	0.000011	

LTE Band 2 / 16QAM

Reference Frequency: LTE Band 2, 1880 MHz at 20(°C)				
Limit: 2.5 ppm = 4700 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 10M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
3.8	55	0.01	0.000005	+/- 2.5
3.8	40	0.00	0.000000	
3.8	30	0.01	0.000005	
3.8	20	0.00	0.000000	
3.8	10	0.02	0.000011	
3.8	0	0.01	0.000005	
3.8	-10	0.02	0.000011	

Report No.: T200825W02-RP3

FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:

LTE Band 2 / QPSK

Reference Frequency: LTE Band 2, 1880 MHz at 20(°C)				
Limit: 2.5 ppm = 4700 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
3.23	20	0.01	0.000005	+/- 2.5
3.8		0.00	0.000000	
4.37		0.03	0.000016	

LTE Band 2 / 16QAM

Reference Frequency: LTE Band 2, 1880 MHz at 20(°C)				
Limit: 2.5 ppm = 4700 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
3.23	20	-0.01	-0.000003	+/- 2.5
3.8		0.00	0.000000	
4.37		0.01	0.000003	

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 $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max. hold

Report No.: T200825W02-RP3

Temperature: 24.2°C

Test Date: September 14, 2020

Humidity: 55.9 % RH

Tested by: Rick Lee

LTE Band 2

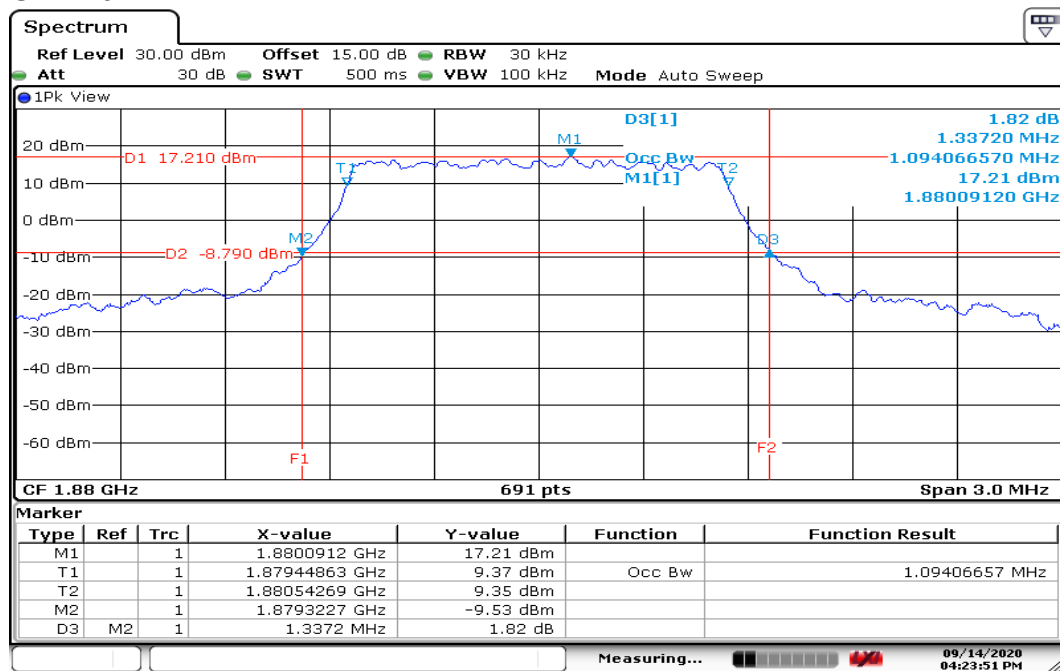
Band	BW (MHz)	Channel	Mode	UL RB Allocation	UL RB offset	OBW(99%)(MHz)	26 dB Bandwidth(MHz)
2	1.4	Middle	QPSK	6	0	1.0940	1.3372
		Middle	16QAM	6	0	1.0984	1.3372
	3	Middle	QPSK	15	0	2.6917	2.9869
		Middle	16QAM	15	0	2.6830	2.9349
	5	Middle	QPSK	25	0	4.5007	4.96
		Middle	16QAM	25	0	4.4717	4.961
	10	Middle	QPSK	50	0	8.9435	9.592
		Middle	16QAM	50	0	8.8856	9.563
	15	Middle	QPSK	75	0	13.3285	14.556
		Middle	16QAM	75	0	13.3285	14.512
	20	Middle	QPSK	100	0	17.9450	19.722
		Middle	16QAM	100	0	17.9450	19.838

Report No.: T200825W02-RP3

LTE Band 2

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

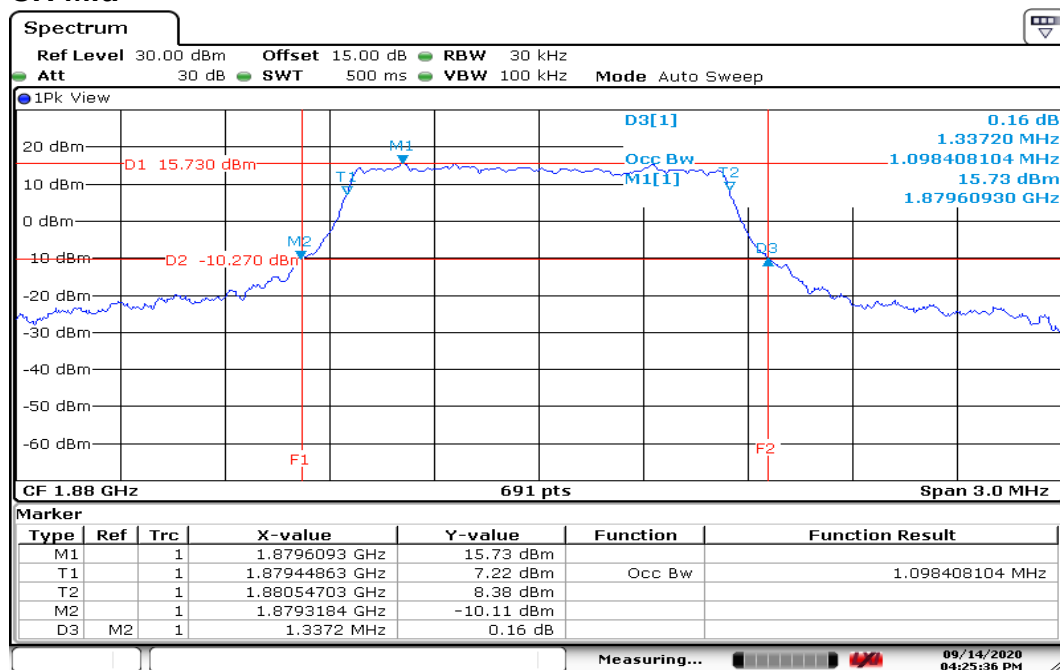
CH Mid



Date: 14 SEP 2020 16:23:52

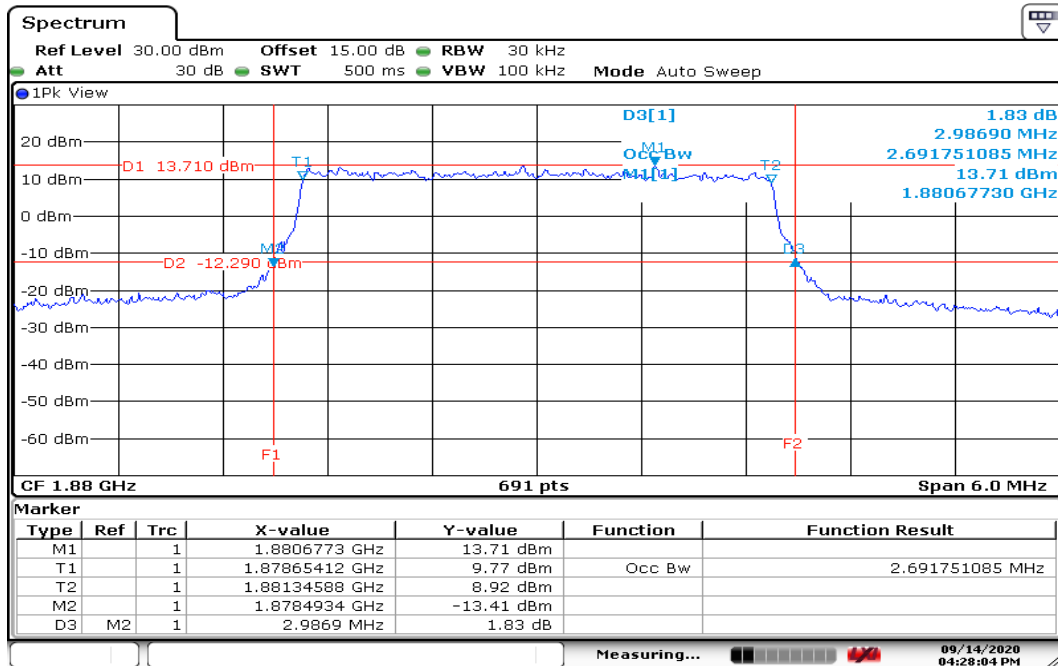
BW: 1.4MHz / 16QAM / RB =6, RB Offset = 0

CH Mid



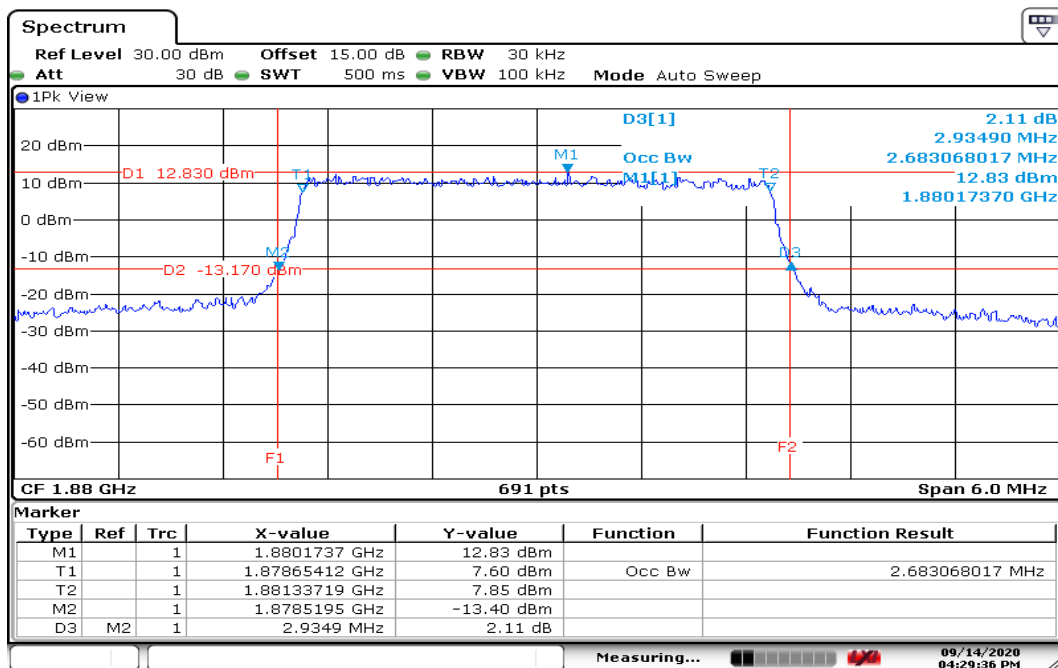
Date: 14 SEP 2020 16:25:37

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



Date: 14 SEP 2020 16:28:05

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

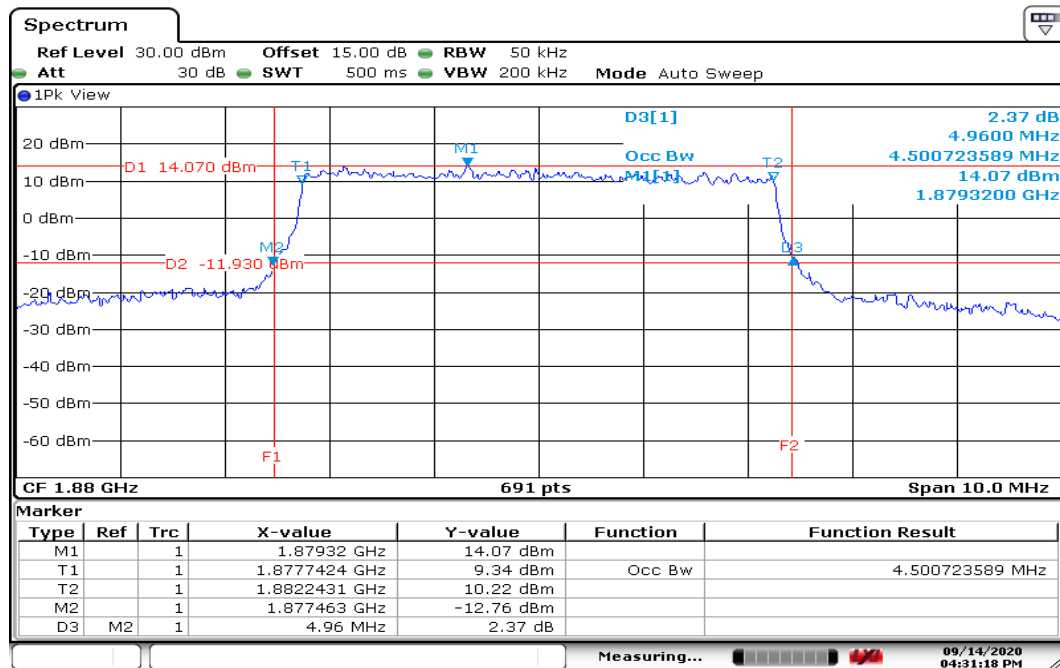


Date: 14 SEP 2020 16:29:37

Report No.: T200825W02-RP3

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

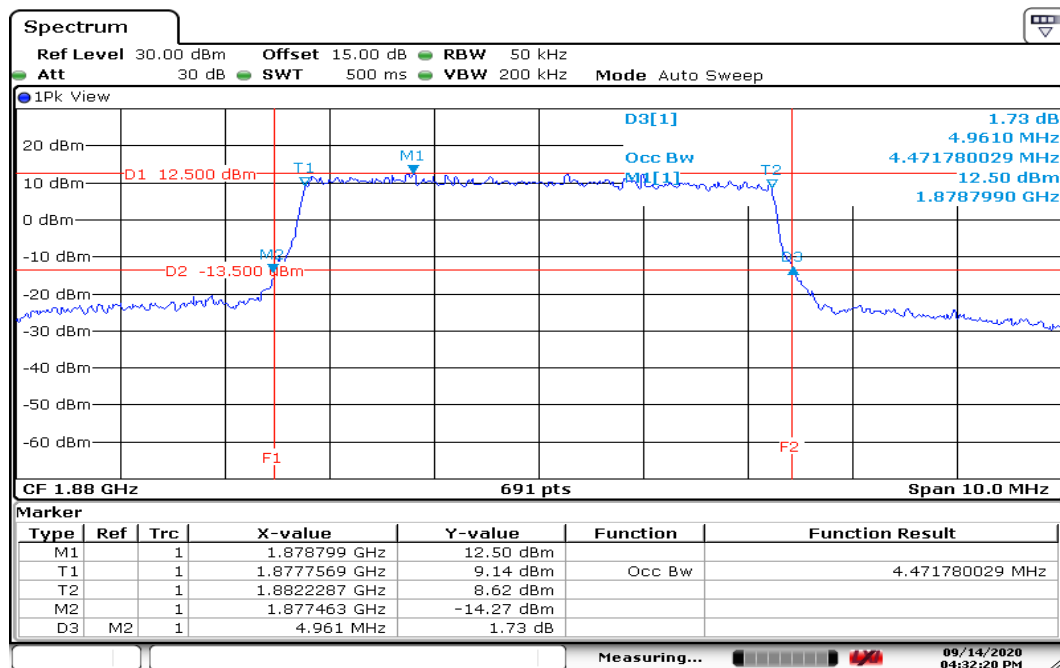
CH Mid



Date: 14 SEP 2020 16:31:18

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

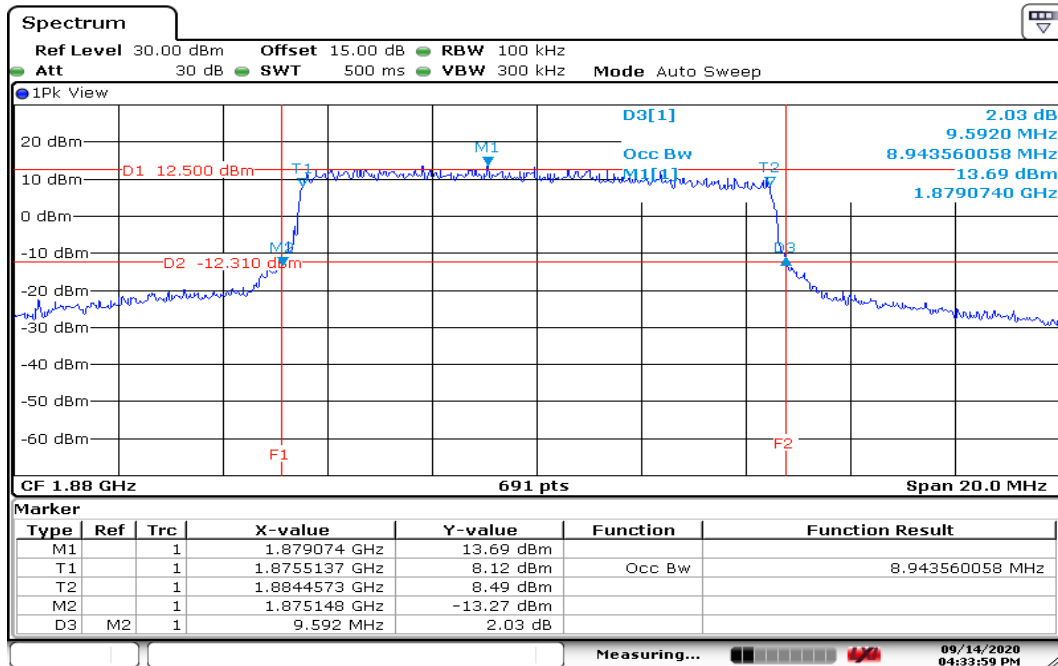
CH Mid



Date: 14 SEP 2020 16:32:20

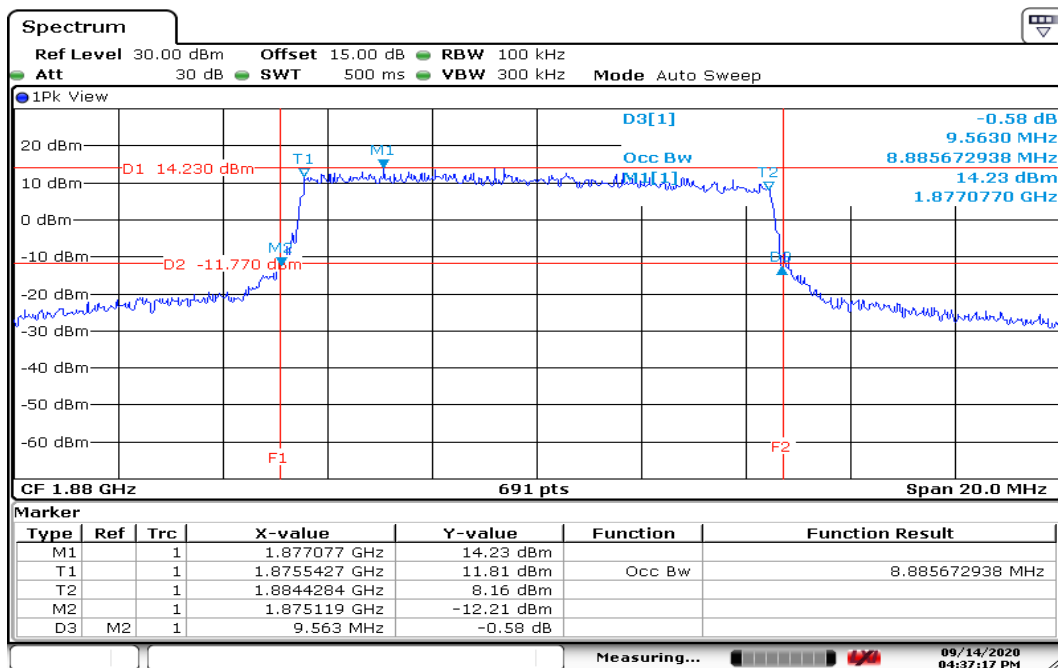
Report No.: T200825W02-RP3

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



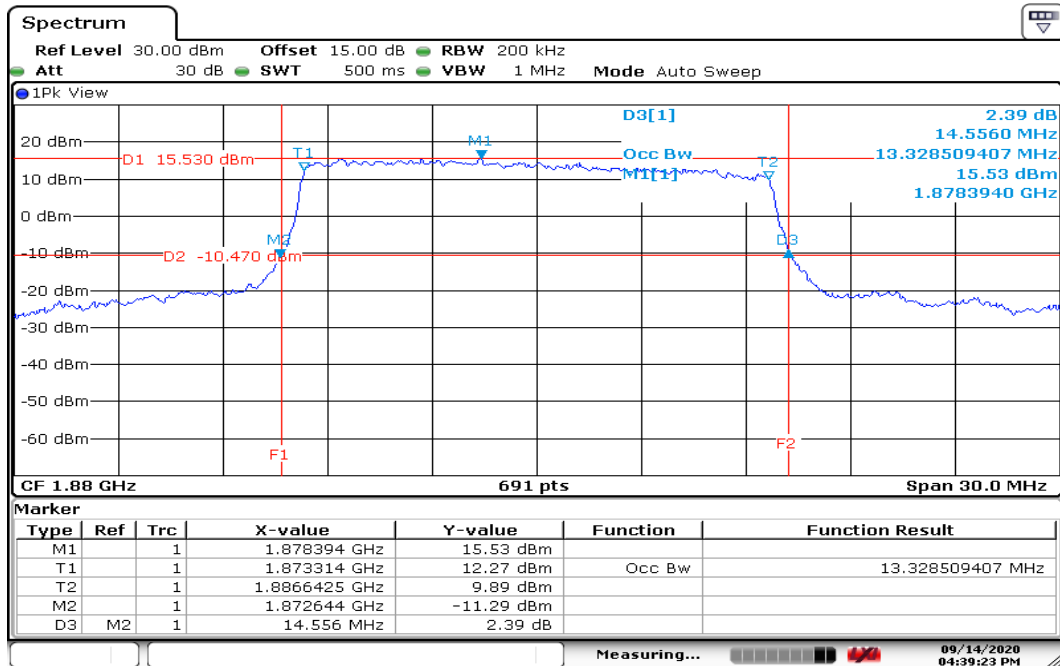
Date: 14 SEP 2020 16:33:59

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



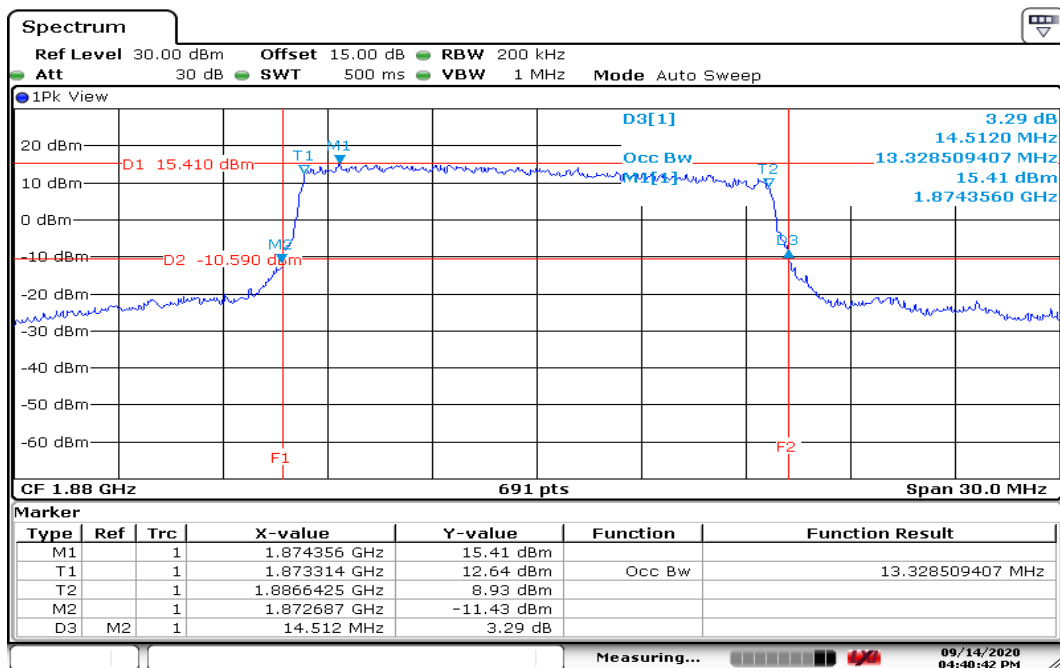
Date: 14 SEP 2020 16:37:17

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



Date: 14 SEP 2020 16:39:24

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

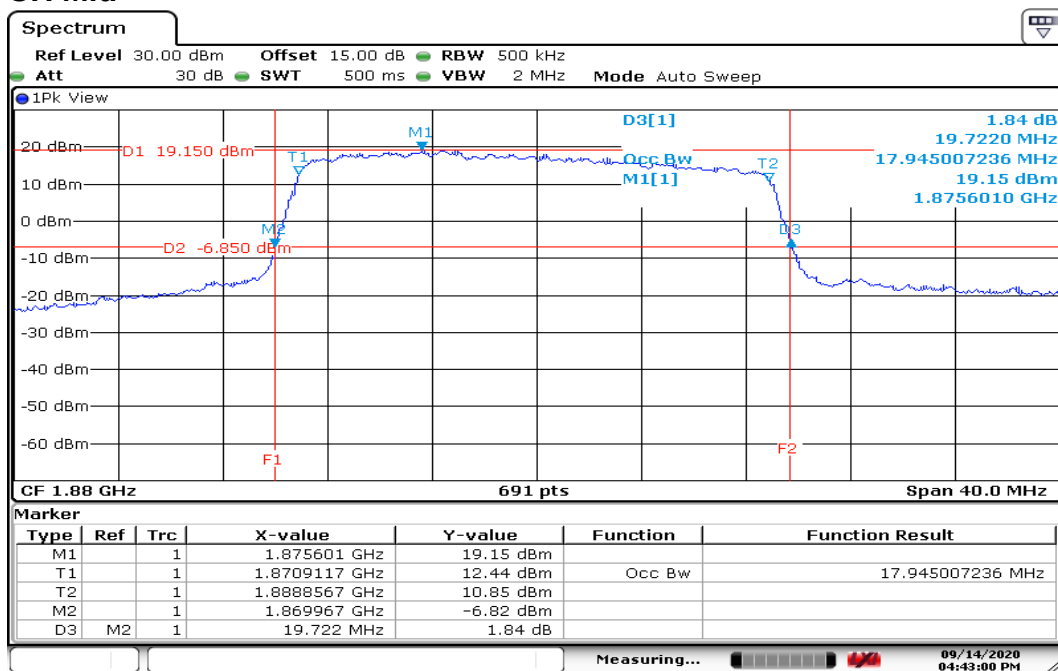


Date: 14 SEP 2020 16:40:43

Report No.: T200825W02-RP3

BW: 20MHz / QPSK / RB =100, RB Offset = 0

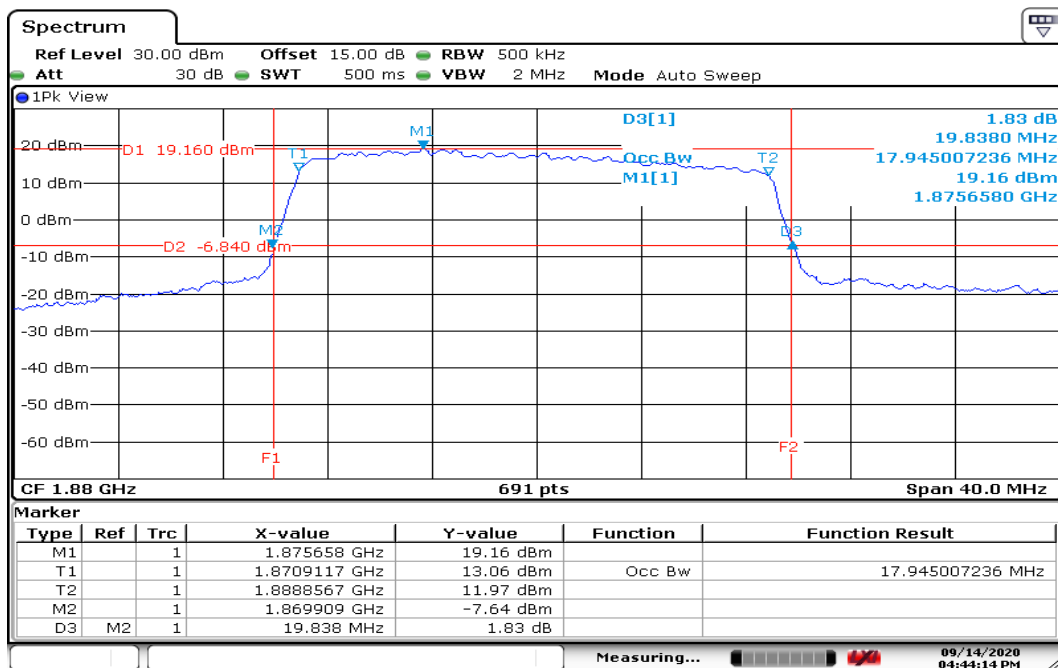
CH Mid



Date: 14.SEP.2020 16:43:01

BW: 20MHz / 16QAM / RB =100, RB Offset = 0

CH Mid



Date: 14 SEP 2020 16:44:14

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

Temperature: 24.2°C
Humidity: 55.9 % RH

Test Date: September 14, 2020
Tested by: Rick Lee

LTE Band 2

	Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
1.4MHz / QPSK / 1RB	18900	1880.00	2.55
1.4MHz / 16QAM / 1RB	18900	1880.00	3.30
3MHz / QPSK / 1RB	18900	1880.00	2.61
3MHz / 16QAM / 1RB	18900	1880.00	3.30
5MHz / QPSK / 1RB	18900	1880.00	3.48
5MHz / 16QAM / 1RB	18900	1880.00	3.10
10MHz / QPSK / 1RB	18900	1880.00	2.67
10MHz / 16QAM / 1RB	18900	1880.00	3.65
15MHz / QPSK / 1RB	18900	1880.00	2.81
15MHz / 16QAM / 1RB	18900	1880.00	3.51
20MHz / QPSK / 1RB	18900	1880.00	2.93
20MHz / 16QAM / 1RB	18900	1880.00	3.77

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

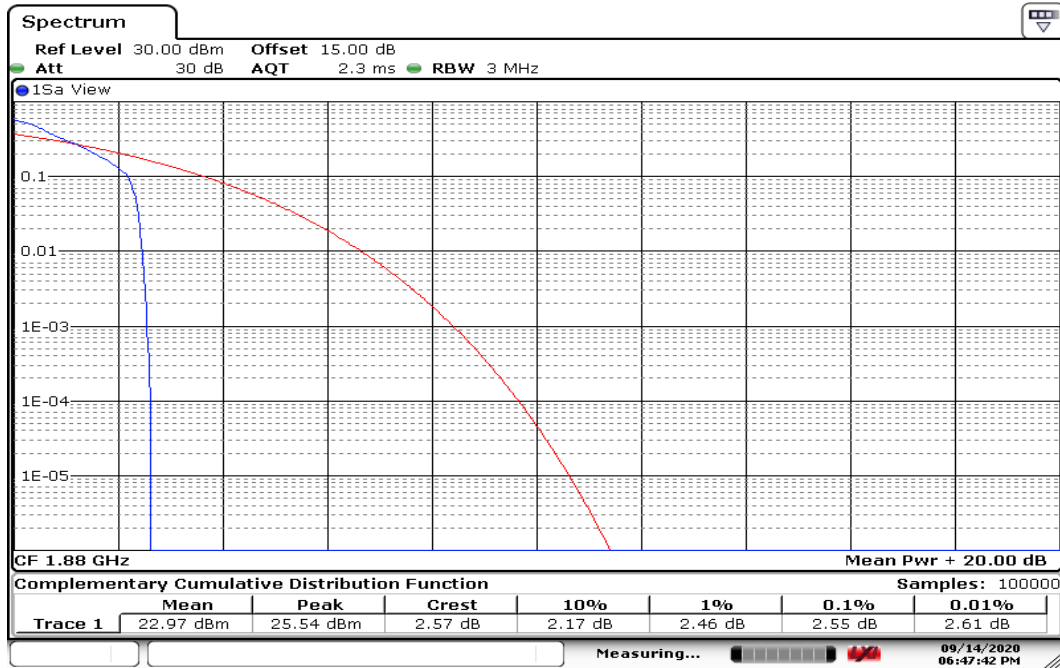
	Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
1.4MHz / QPSK / 100%RB	18900	1880.00	3.33
1.4MHz / 16QAM / 100%RB	18900	1880.00	4.14
3MHz / QPSK / 100%RB	18900	1880.00	3.42
3MHz / 16QAM / 100%RB	18900	1880.00	4.41
5MHz / QPSK / 100%RB	18900	1880.00	3.45
5MHz / 16QAM / 100%RB	18900	1880.00	4.41
10MHz / QPSK / 100%RB	18900	1880.00	3.57
10MHz / 16QAM / 100%RB	18900	1880.00	3.54
15MHz / QPSK / 100%RB	18900	1880.00	3.68
15MHz / 16QAM / 100%RB	18900	1880.00	4.12
20MHz / QPSK / 100%RB	18900	1880.00	3.77
20MHz / 16QAM / 100%RB	18900	1880.00	3.77

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

LTE Band 2

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

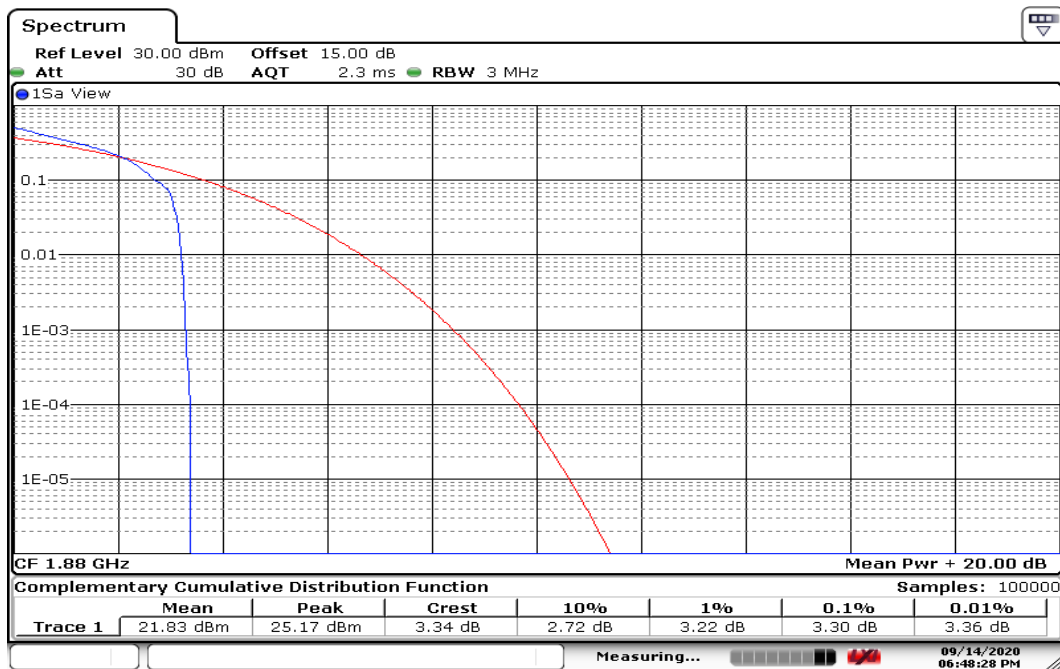
CH Mid



Date: 14 SEP 2020 18:47:42

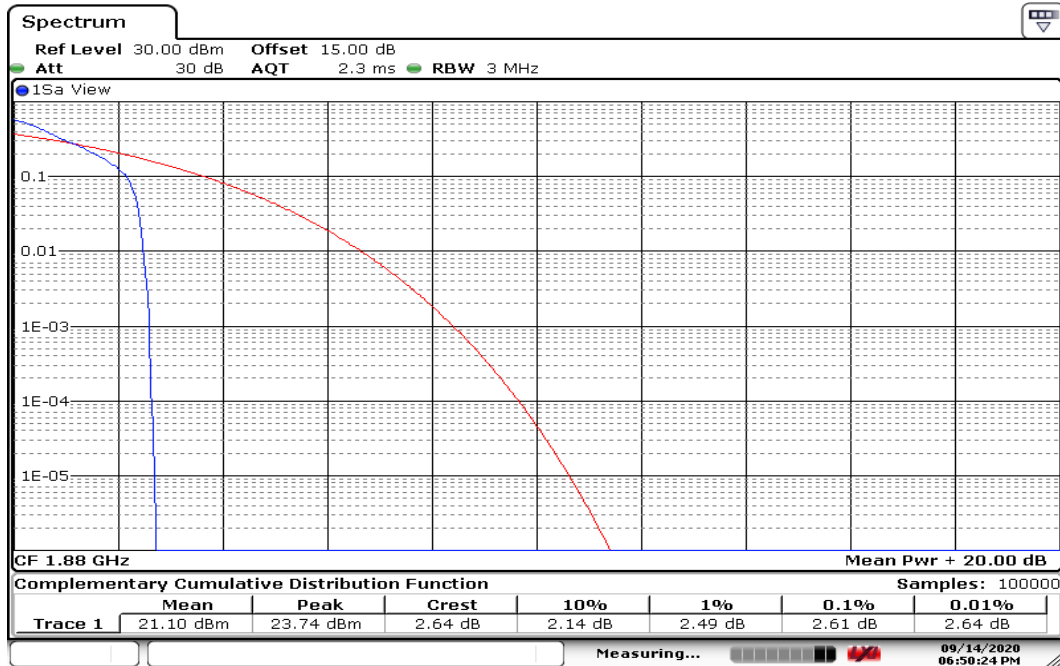
BW: 1.4MHz / 16QAM / RB =1, RB Offset = 0

CH Mid



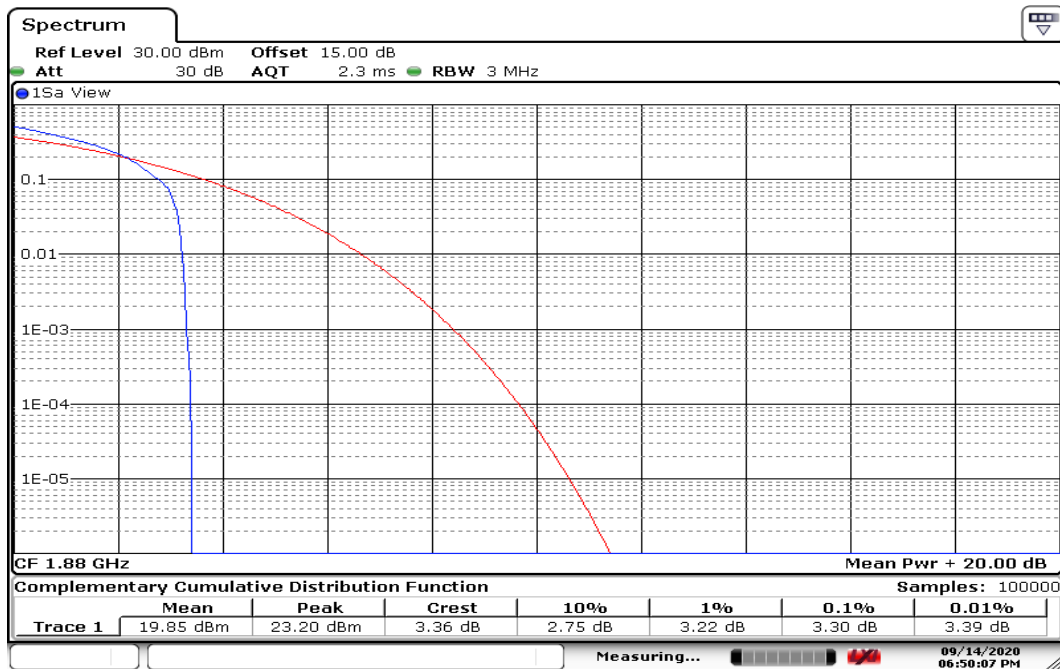
Date: 14 SEP 2020 18:48:29

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



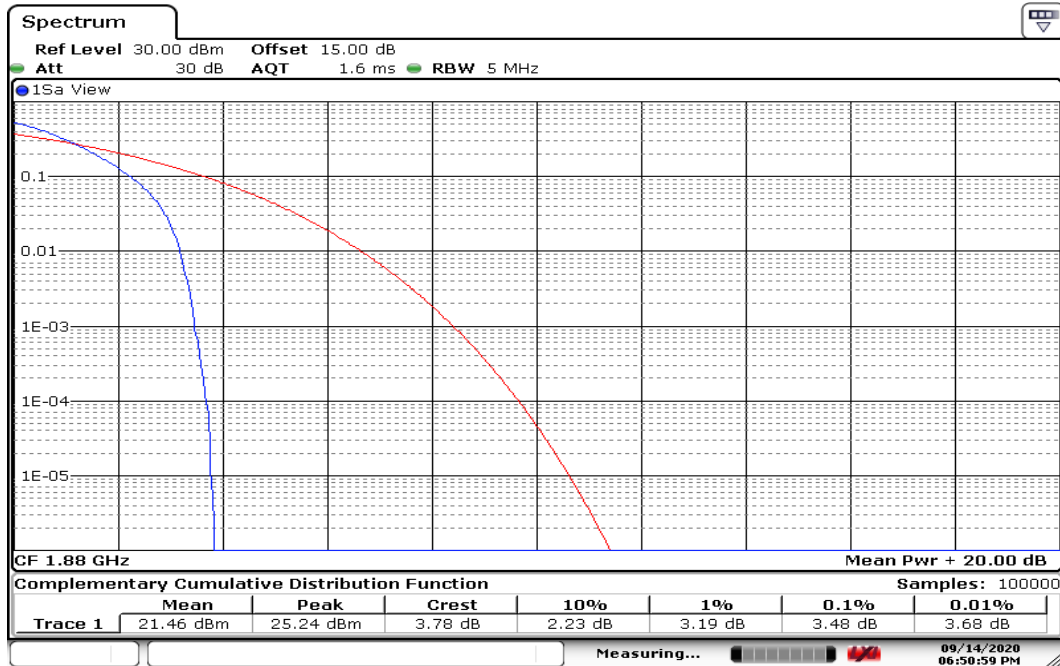
Date: 14 SEP 2020 18:50:24

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



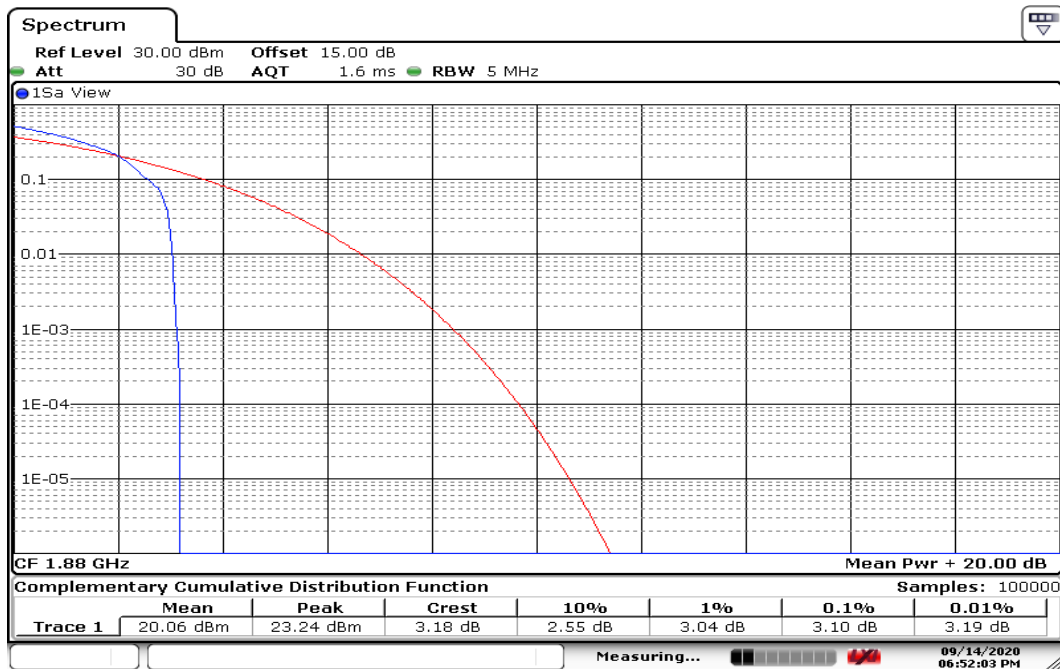
Date: 14 SEP 2020 18:50:07

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



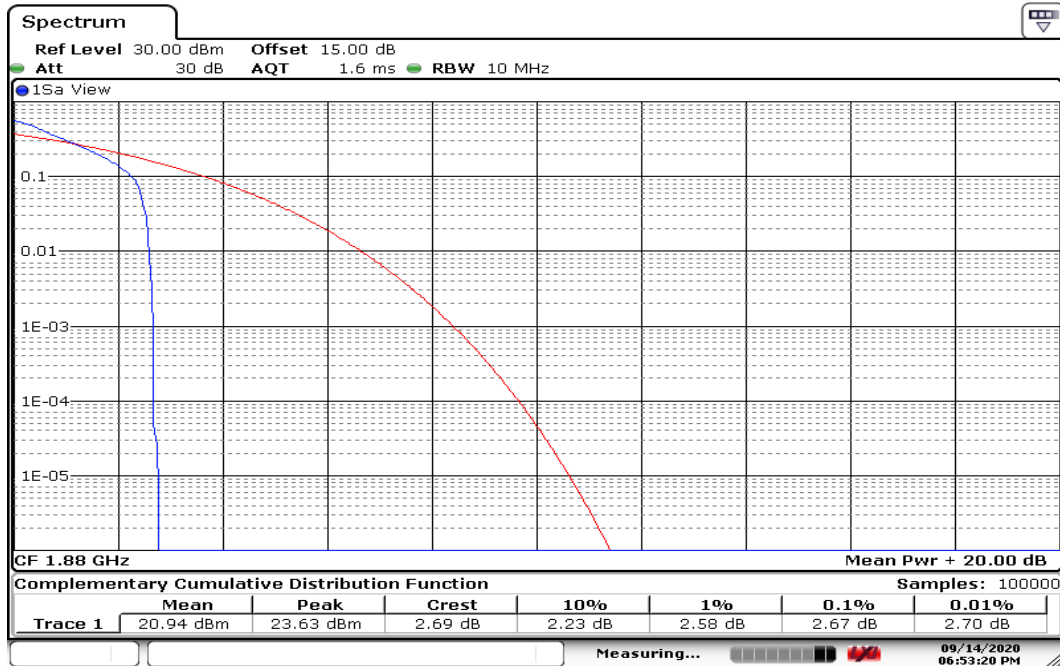
Date: 14 SEP 2020 18:51:00

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



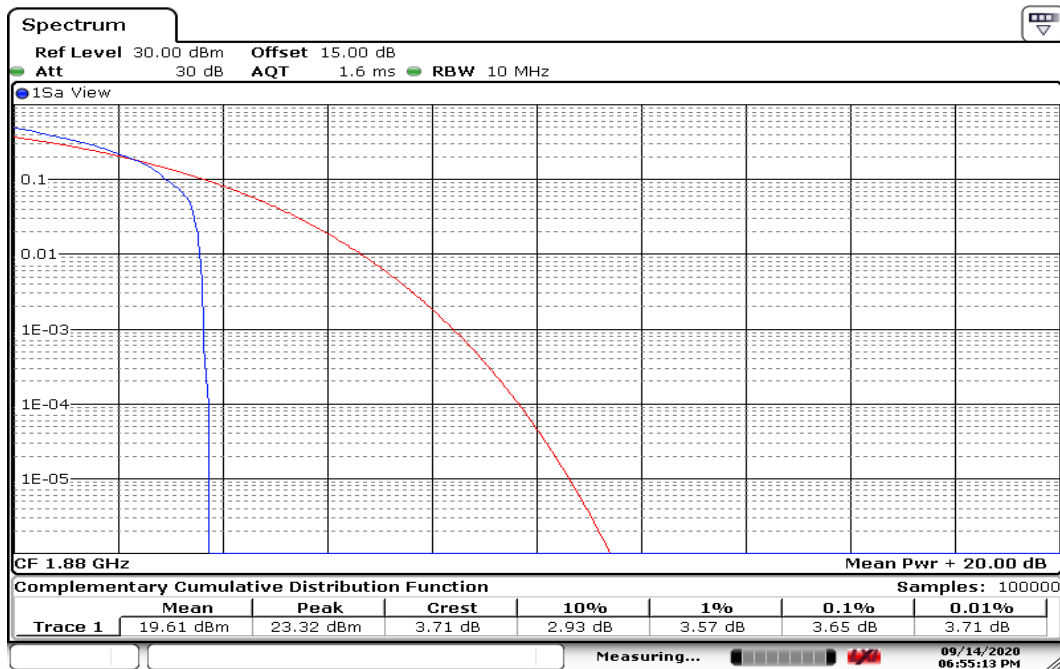
Date: 14 SEP 2020 18:52:04

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



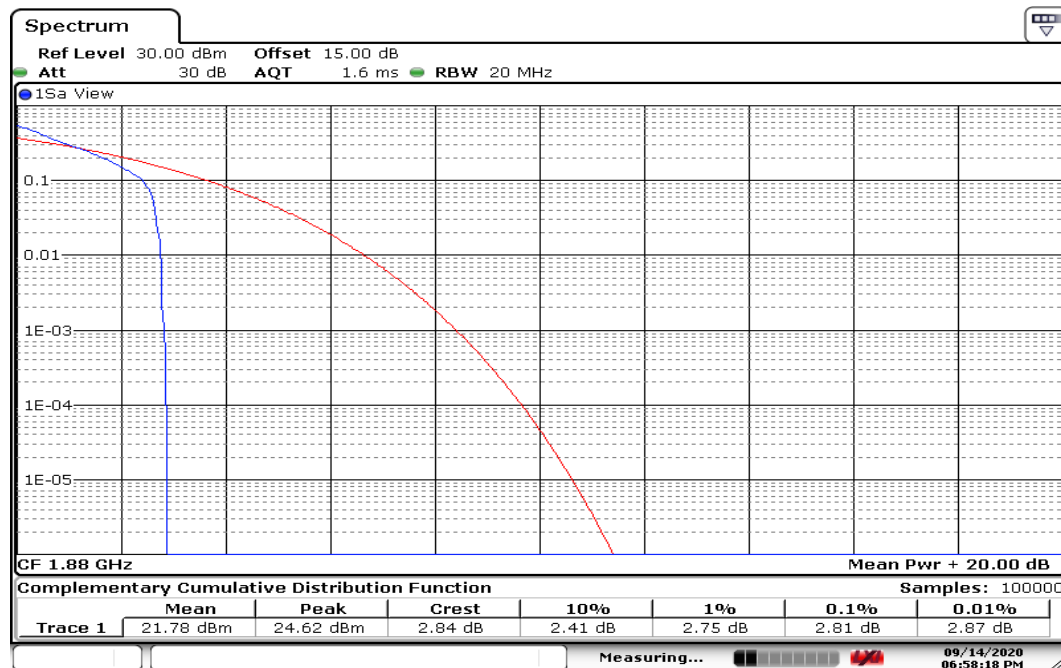
Date: 14 SEP 2020 18:53:20

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



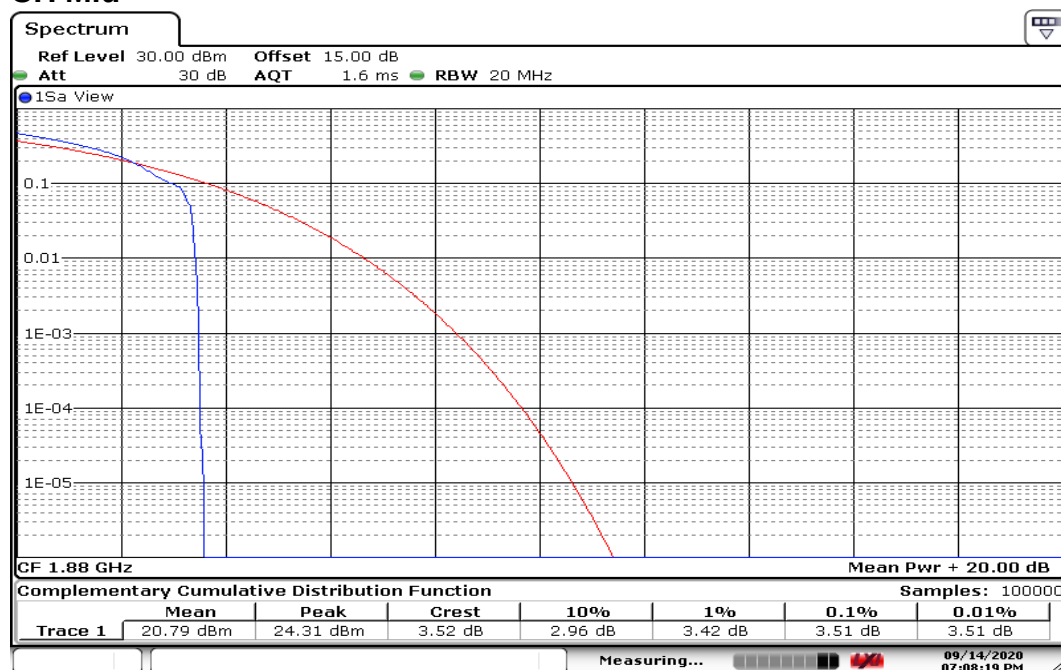
Date: 14 SEP 2020 18:55:13

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



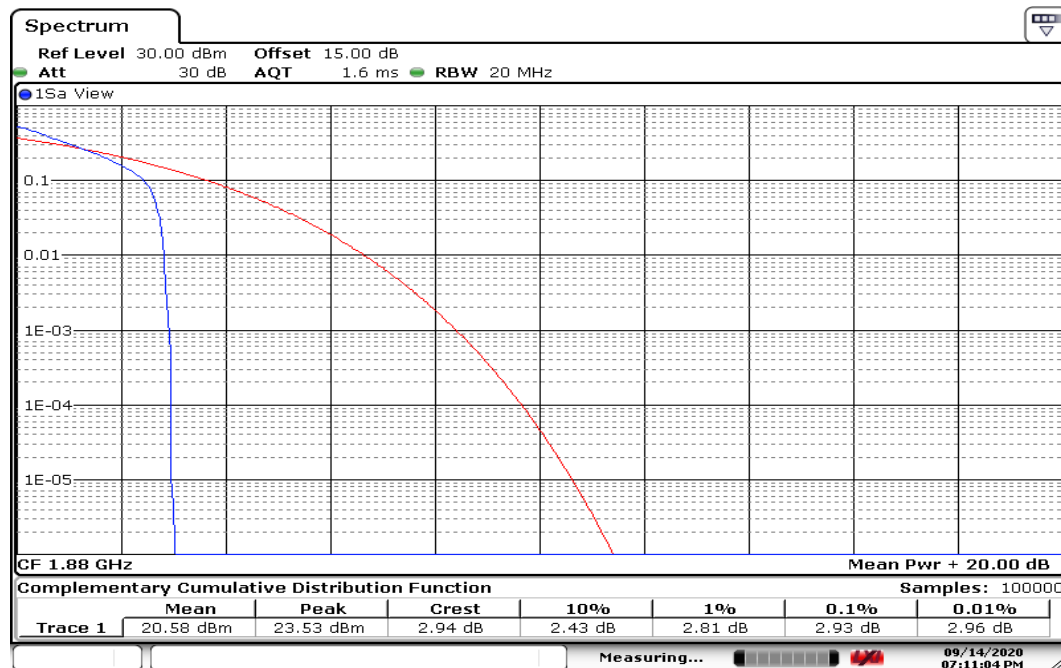
Date: 14 SEP 2020 18:58:18

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



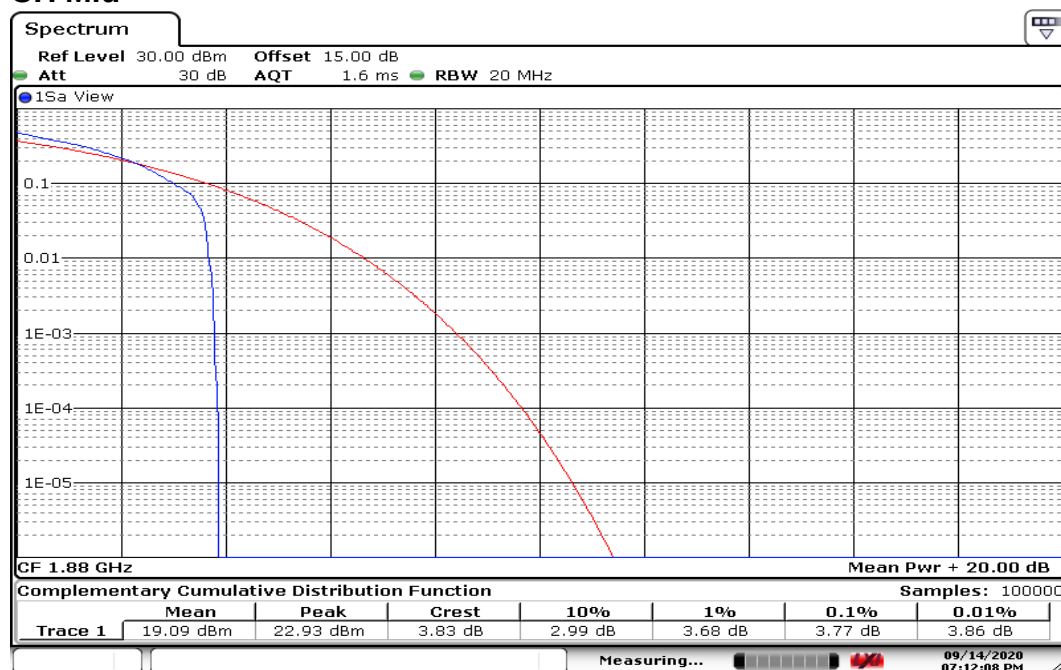
Date: 14 SEP 2020 19:08:19

BW: 20MHz / QPSK / RB =1, RB Offset = 0
CH Mid



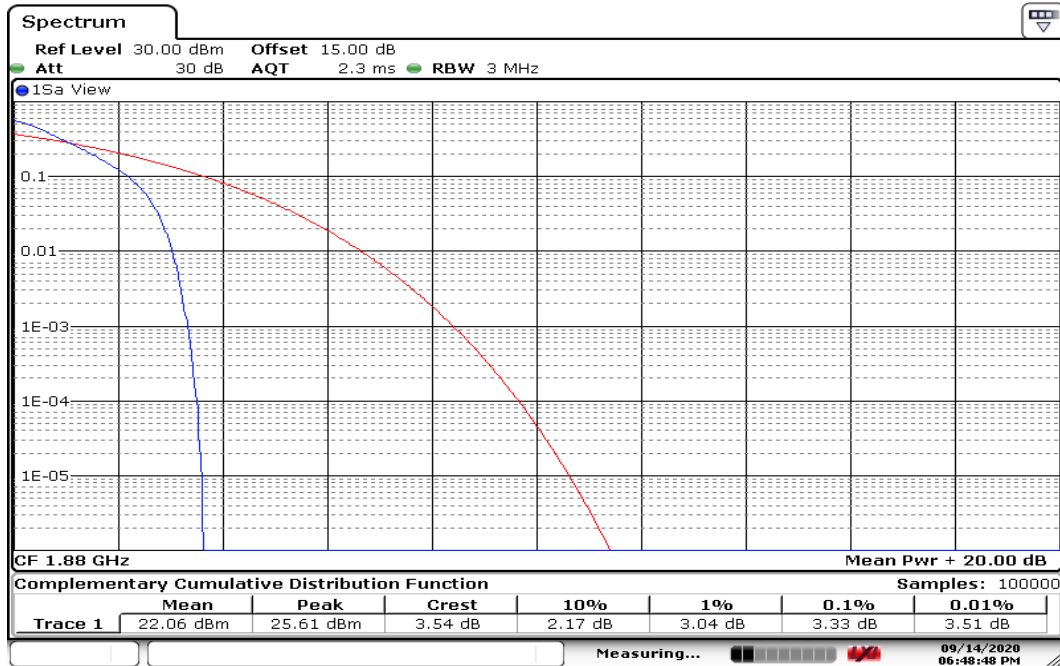
Date: 14 SEP 2020 19:11:05

BW: 20MHz / 16QAM / RB =1, RB Offset = 0
CH Mid



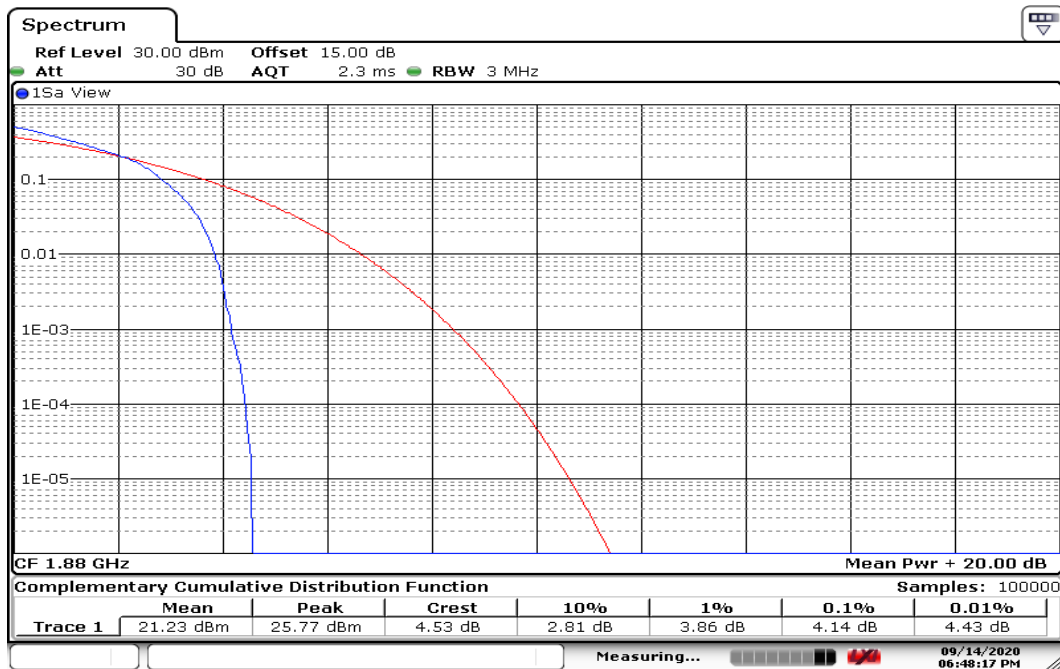
Date: 14 SEP 2020 19:12:09

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



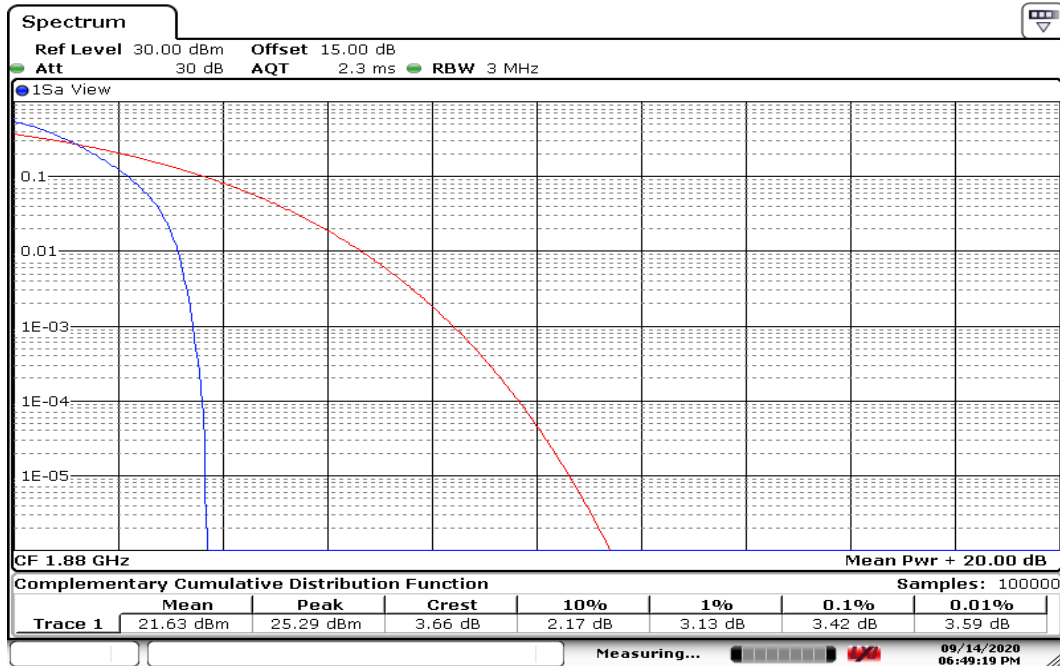
Date: 14 SEP 2020 18:48:48

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



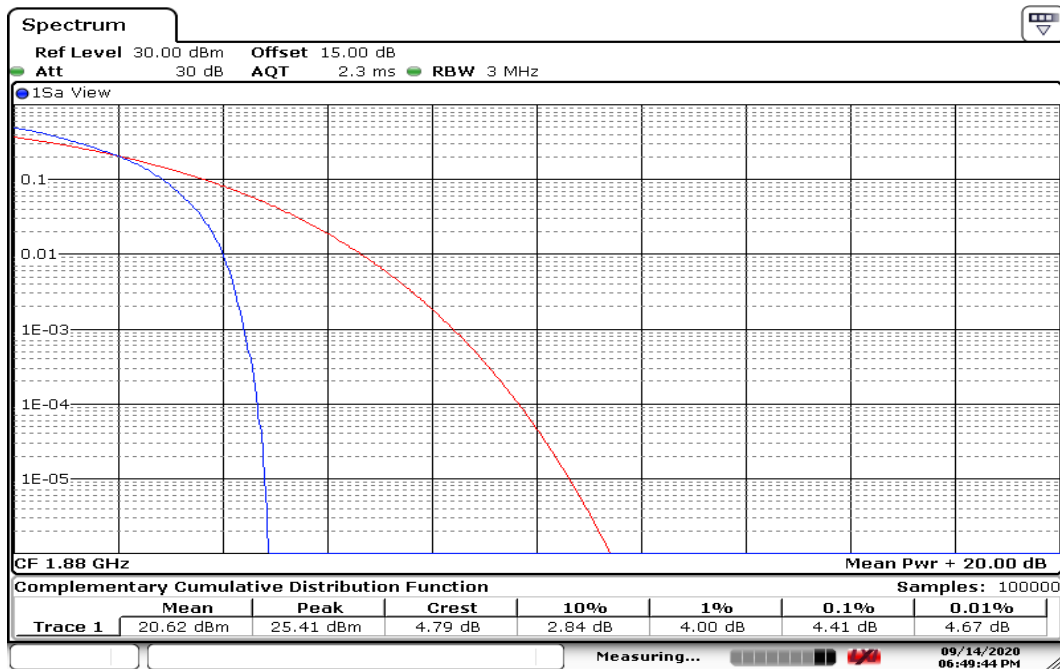
Date: 14 SEP 2020 18:48:18

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



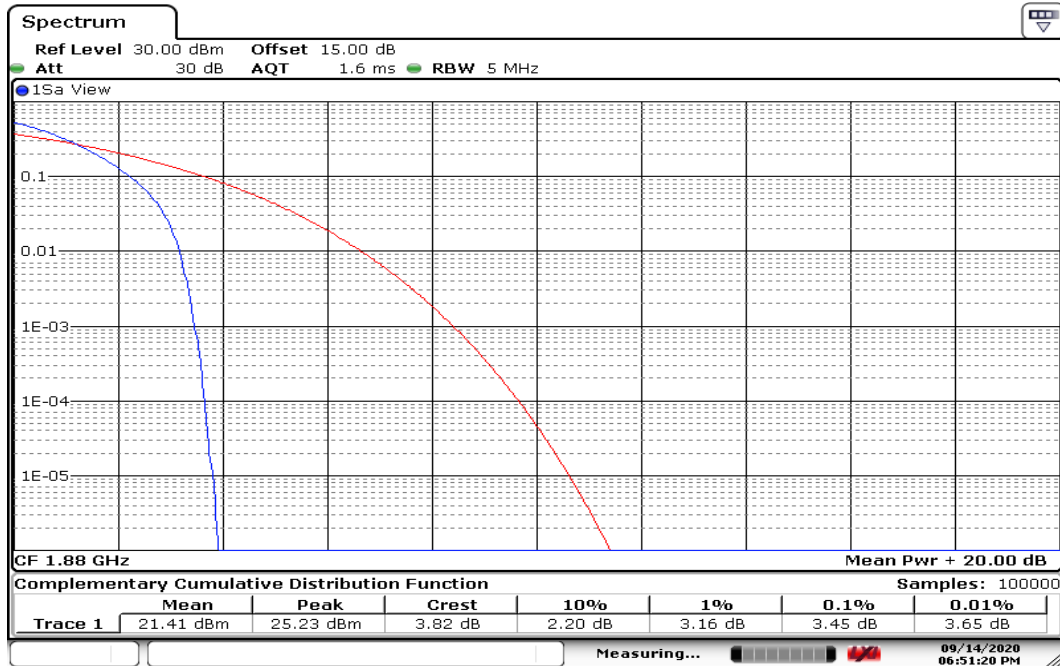
Date: 14 SEP 2020 18:49:20

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



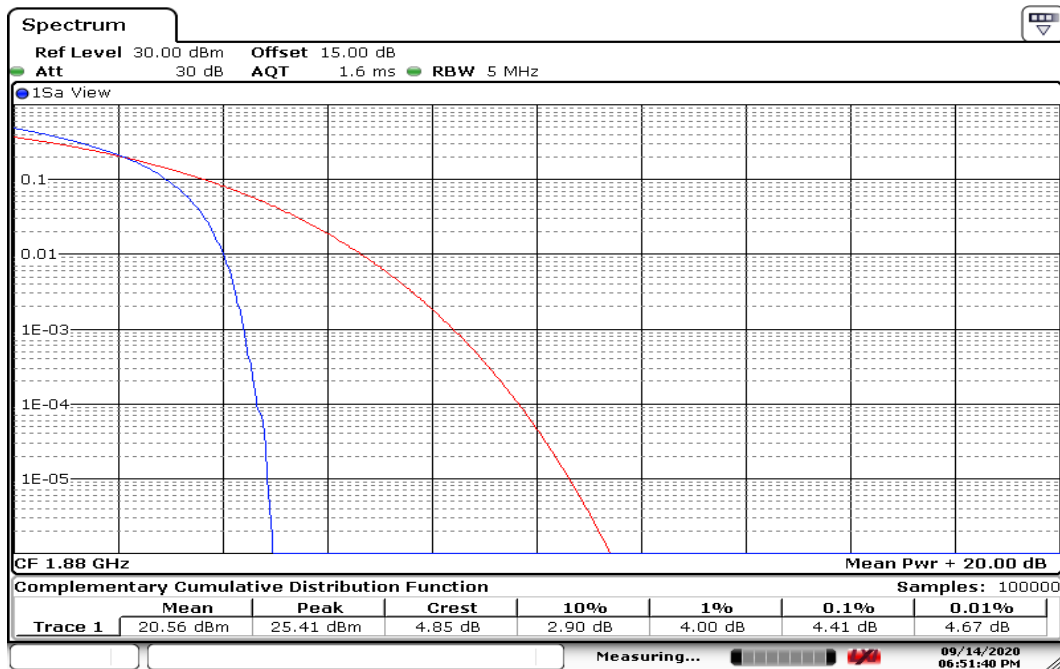
Date: 14 SEP 2020 18:49:44

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



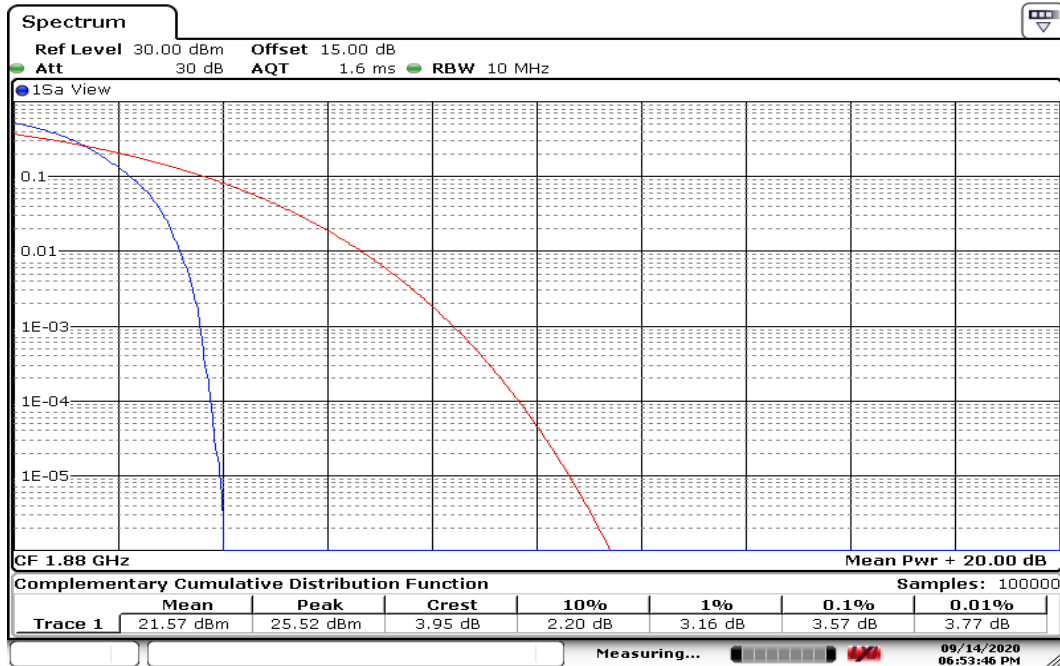
Date: 14 SEP 2020 18:51:20

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



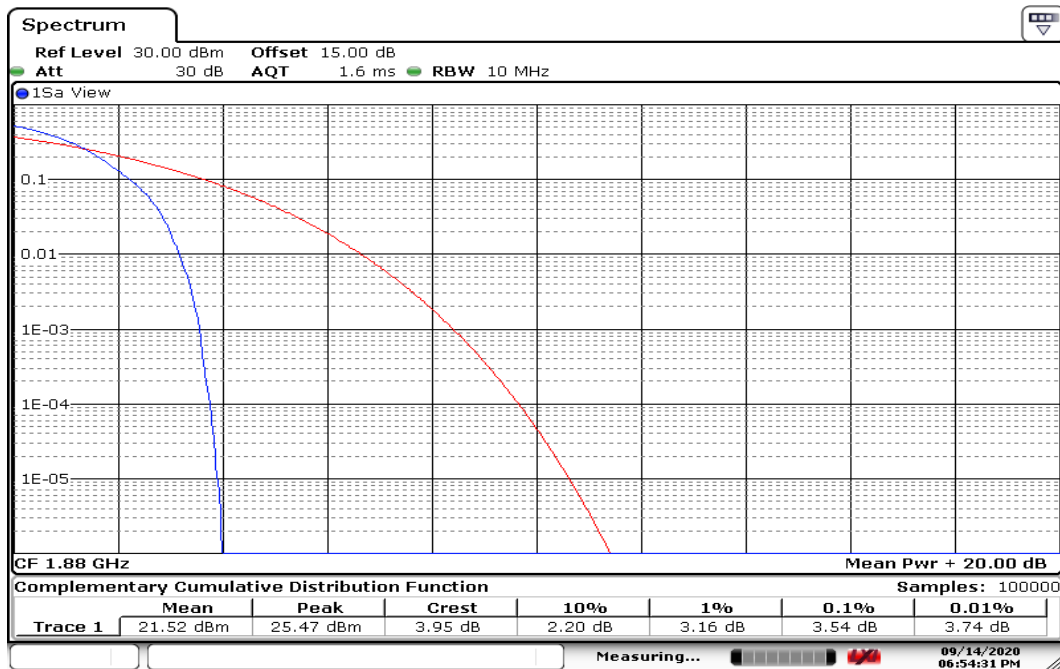
Date: 14 SEP 2020 18:51:41

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



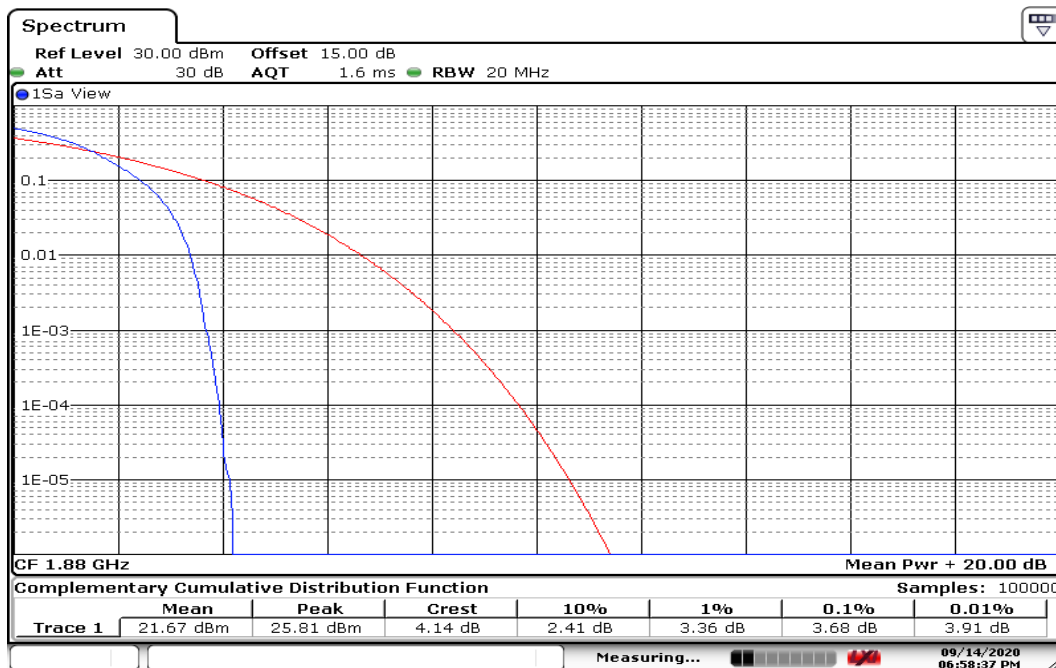
Date: 14 SEP 2020 18:53:47

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



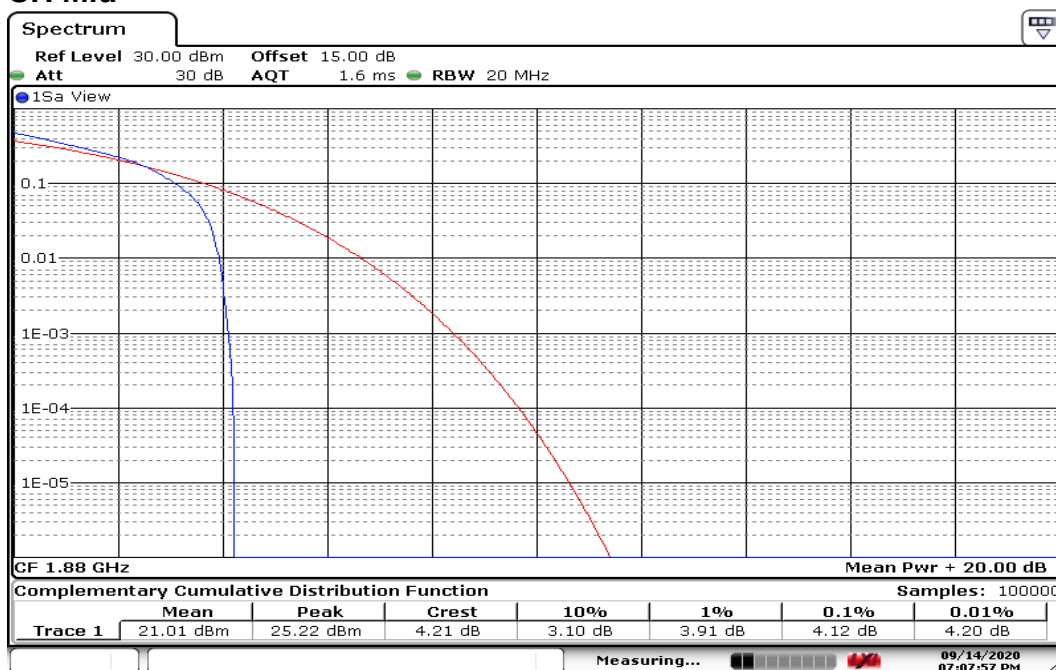
Date: 14 SEP 2020 18:54:31

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



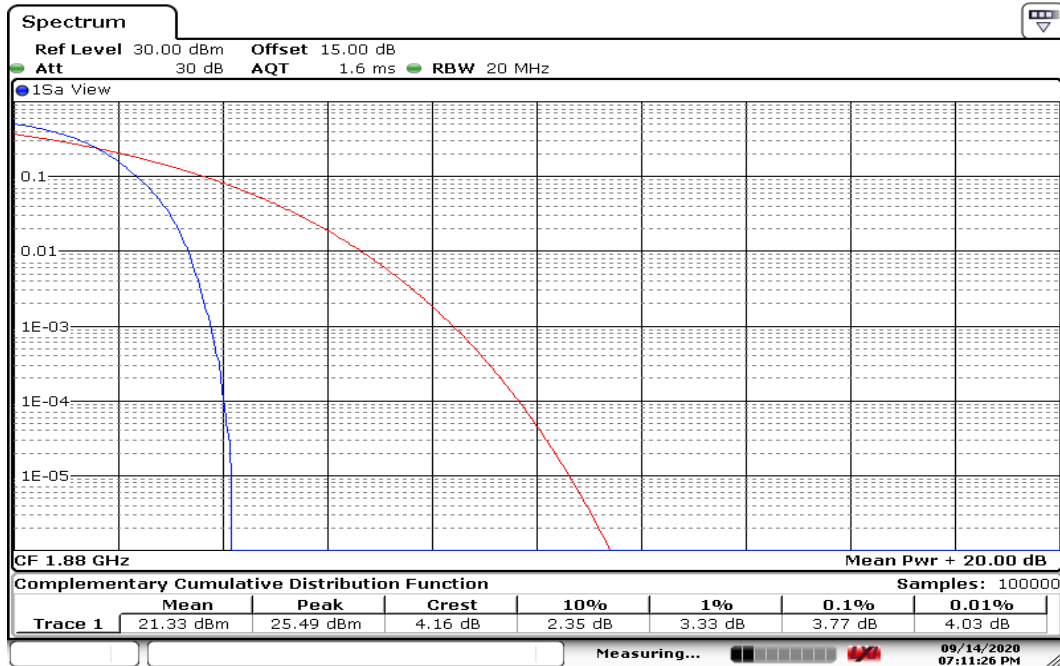
Date: 14 SEP 2020 18:58:38

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



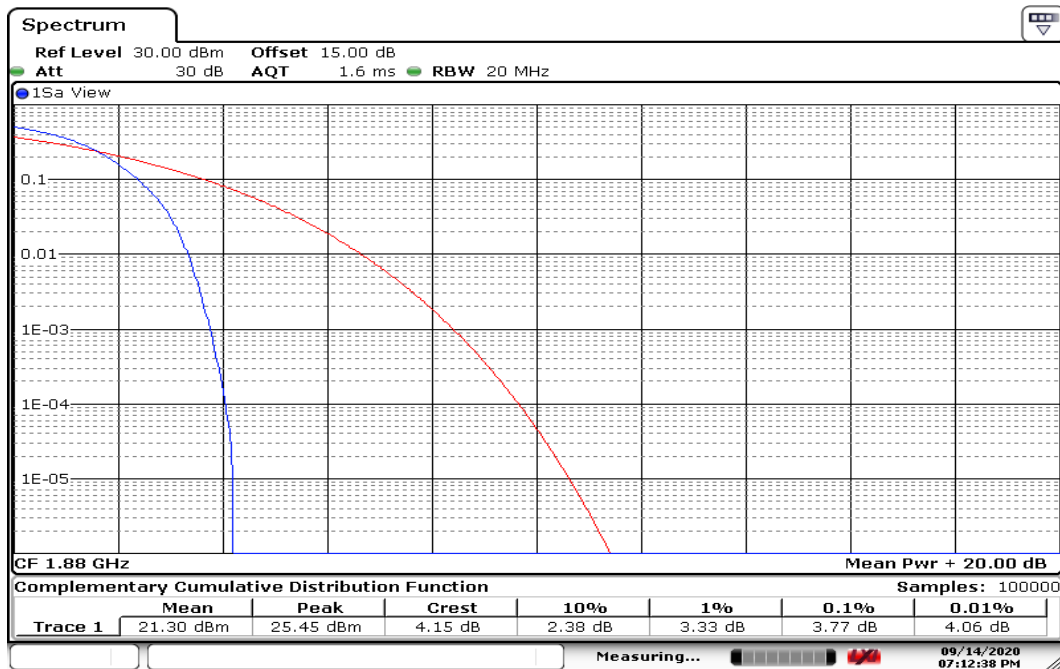
Date: 14 SEP 2020 19:07:57

BW: 20MHz / QPSK / RB =100%, RB Offset = 0
CH Mid



Date: 14 SEP 2020 19:11:27

BW: 20MHz / 16QAM / RB =100%, RB Offset = 0
CH Mid



Date: 14 SEP 2020 19:12:39

8.5 CONDUCTED BAND EDGE MEASUREMENT

Limit

FCC §24.238(a), Band 2

For operations in the 1850-1910 and 1930-1950 MHz band , Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Procedures

KDB 971168 D01,

1. RBW $\geq 1\%$ of the emission bandwidth
2. VBW $\geq 3 \times$ RBW
3. Span was set large enough so as to capture all out of emissions near the band edge.

Test Results:

Offset= cable loss+ splitter loss +attenuator
 $1.21+3.78+10=14.99$ (Rounding = 15)

* cable loss:1.21
 * splitter loss:3.78
 * attenuator:10

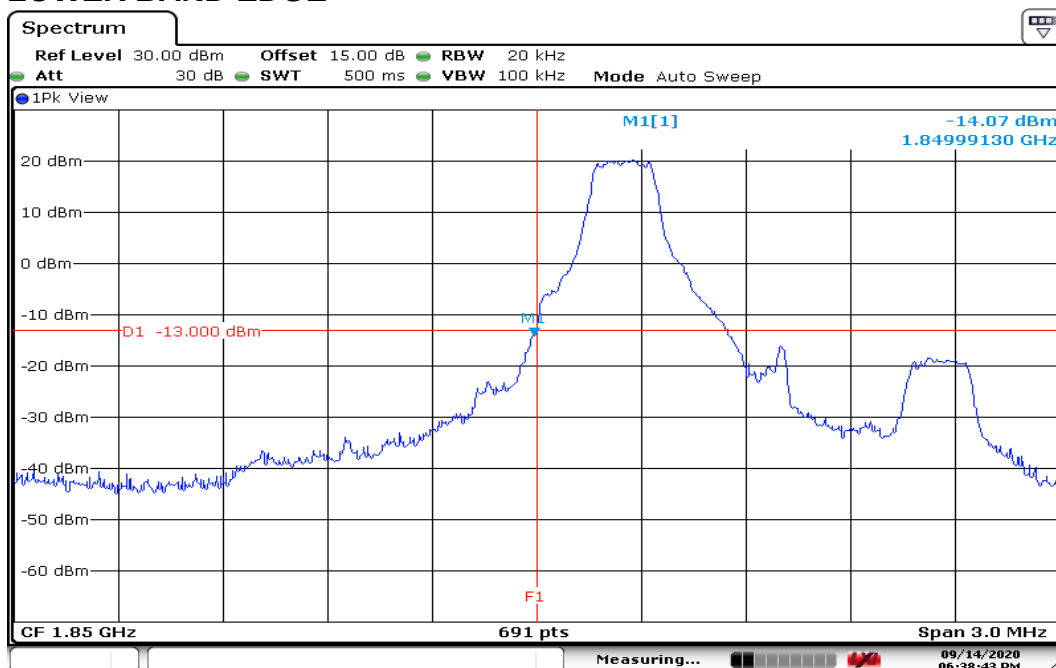
Temperature: 24.2°C
Humidity: 55.9 % RH

Test Date: September 14, 2020
Tested by: Rick Lee

LTE Band 2

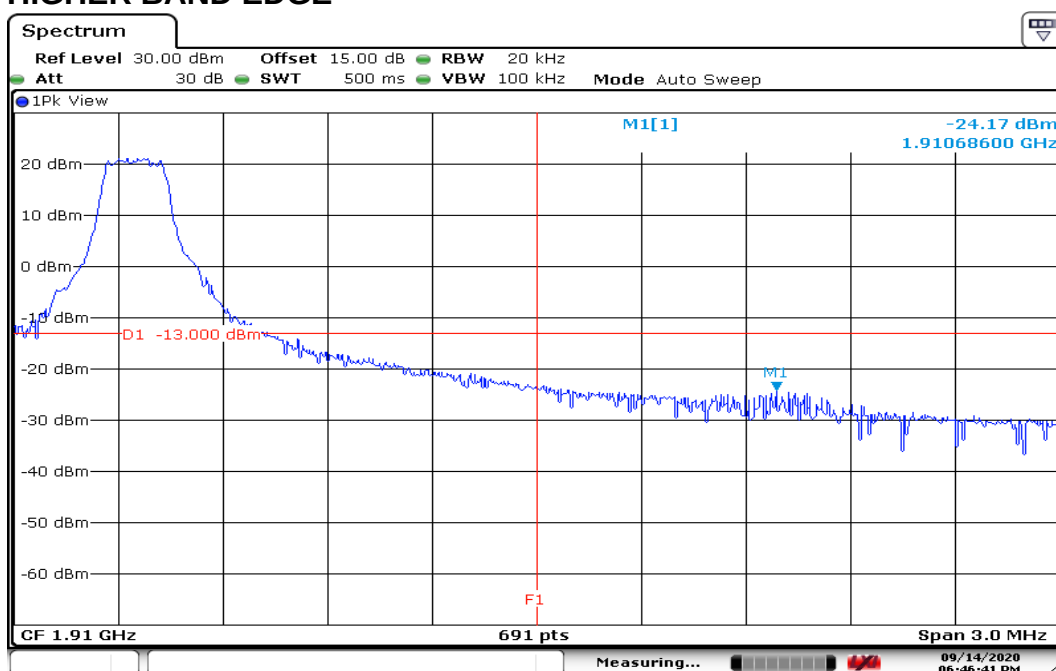
CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB ALLOCATED

LOWER BAND EDGE



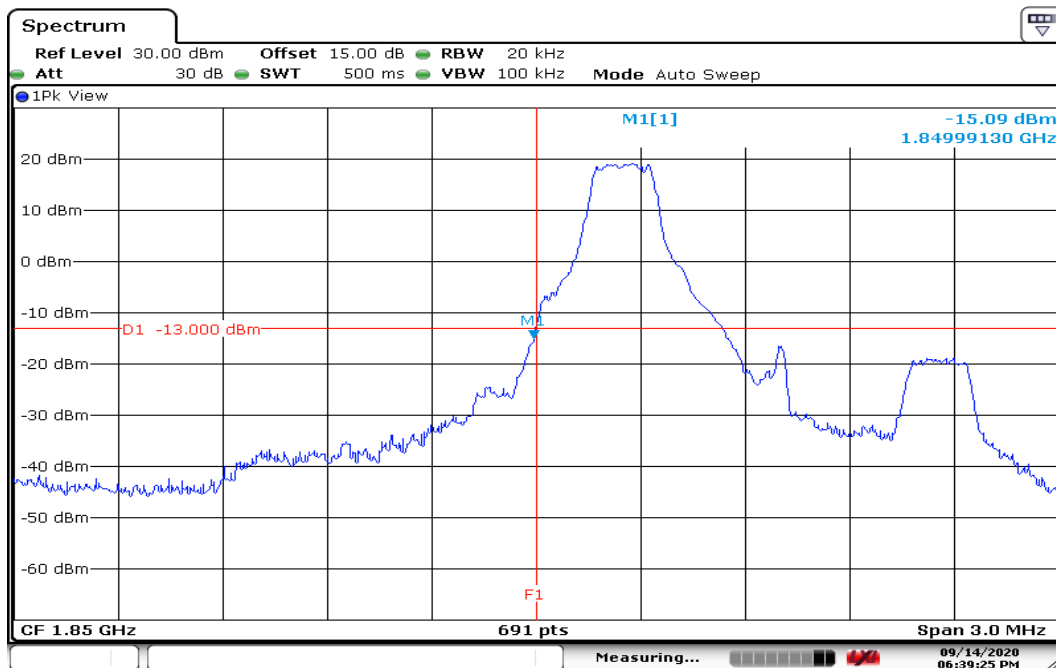
Date: 14 SEP 2020 18:38:43

HIGHER BAND EDGE



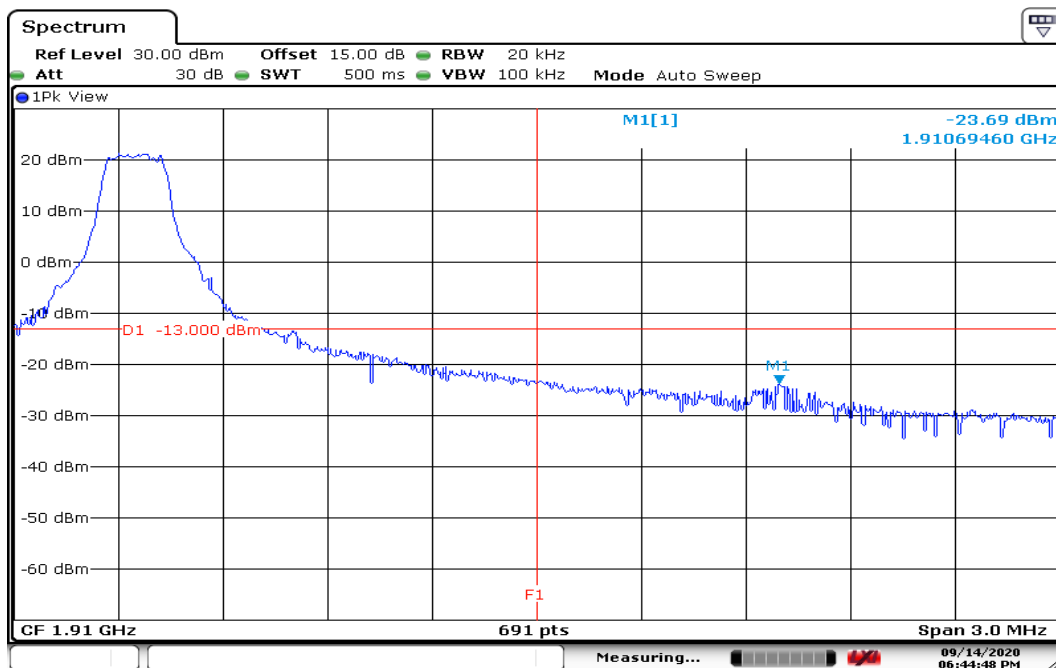
Date: 14 SEP 2020 18:46:41

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



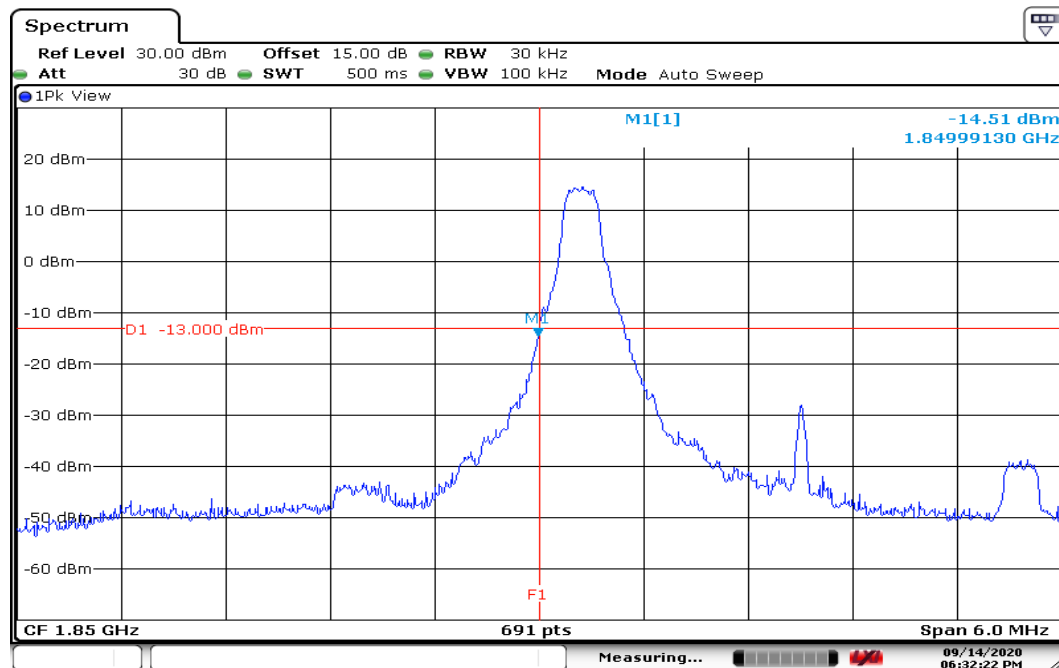
Date: 14 SEP 2020 18:39:25

HIGHER BAND EDGE



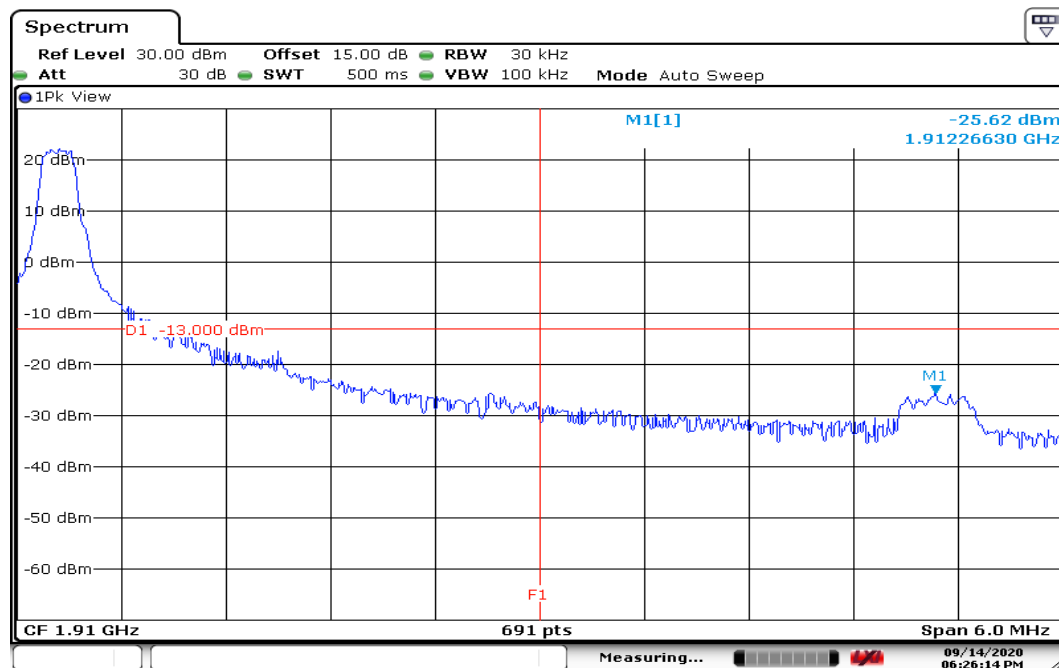
Date: 14 SEP 2020 18:44:49

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



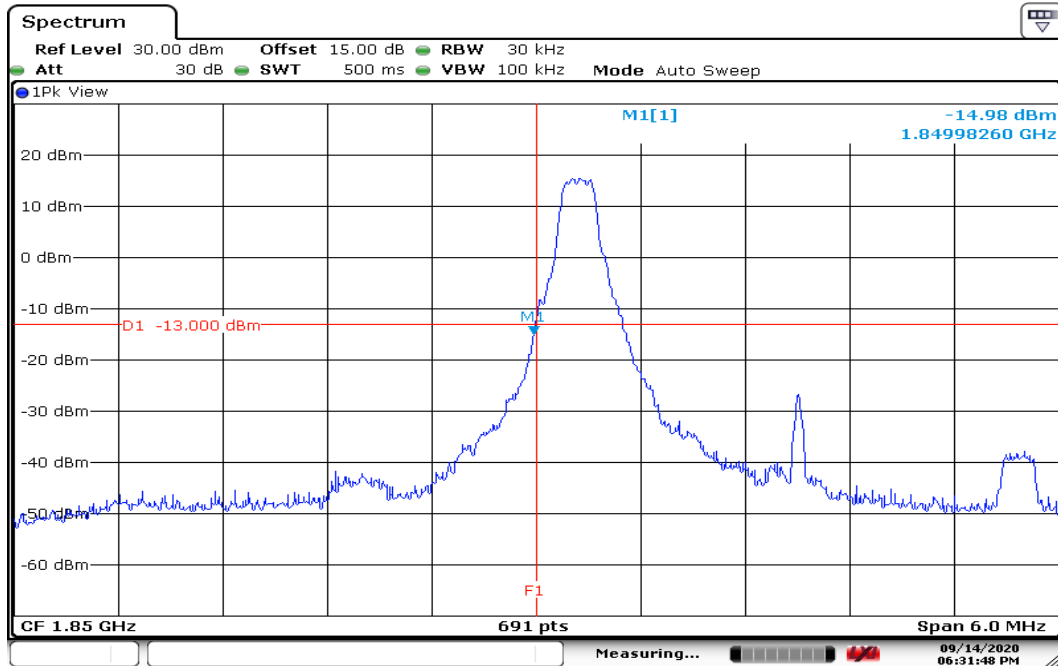
Date: 14 SEP 2020 18:32:22

HIGHER BAND EDGE



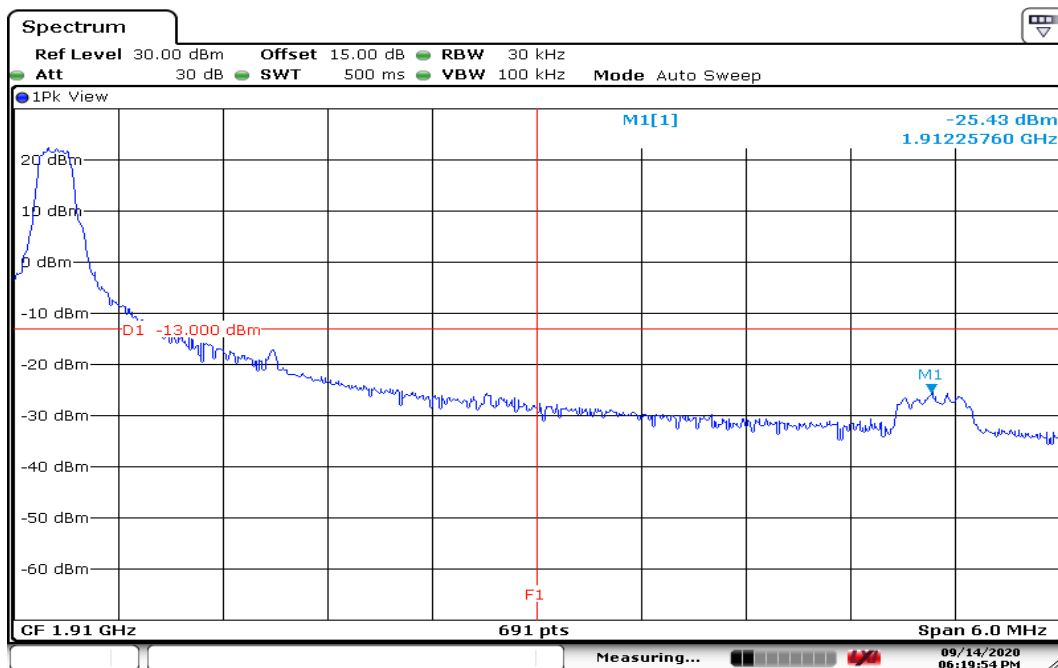
Date: 14 SEP 2020 18:26:14

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



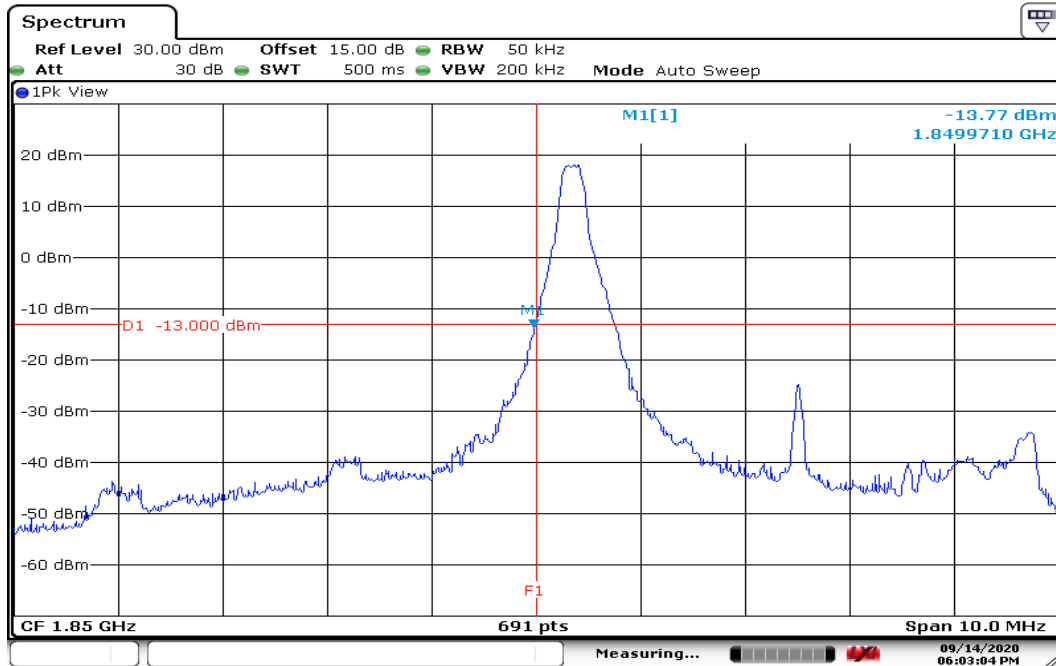
Date: 14 SEP 2020 18:31:47

HIGHER BAND EDGE



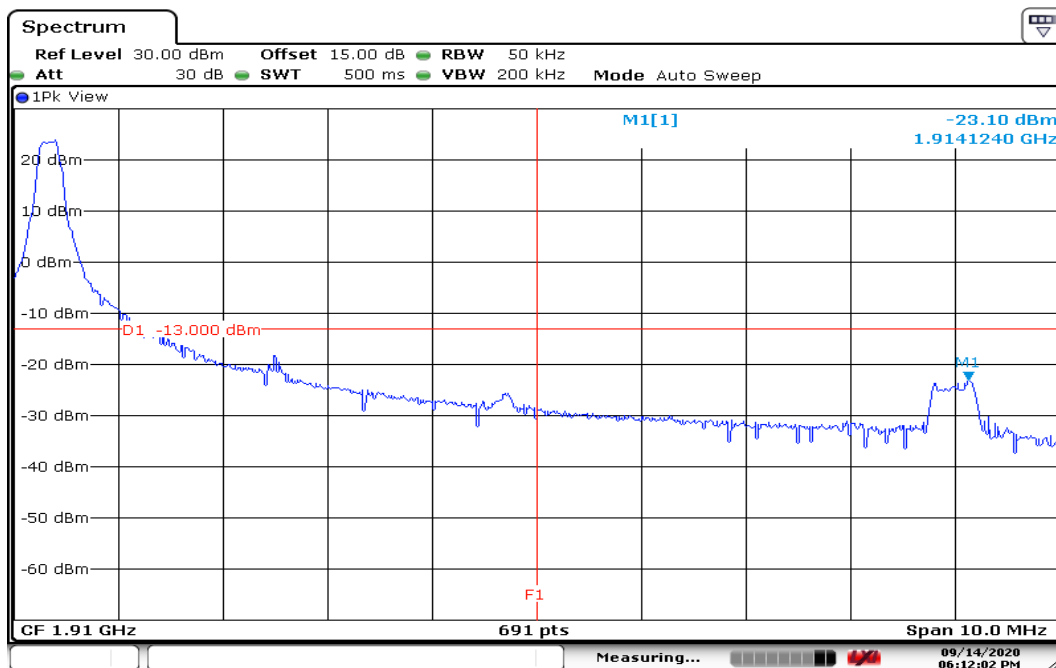
Date: 14 SEP 2020 18:19:54

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



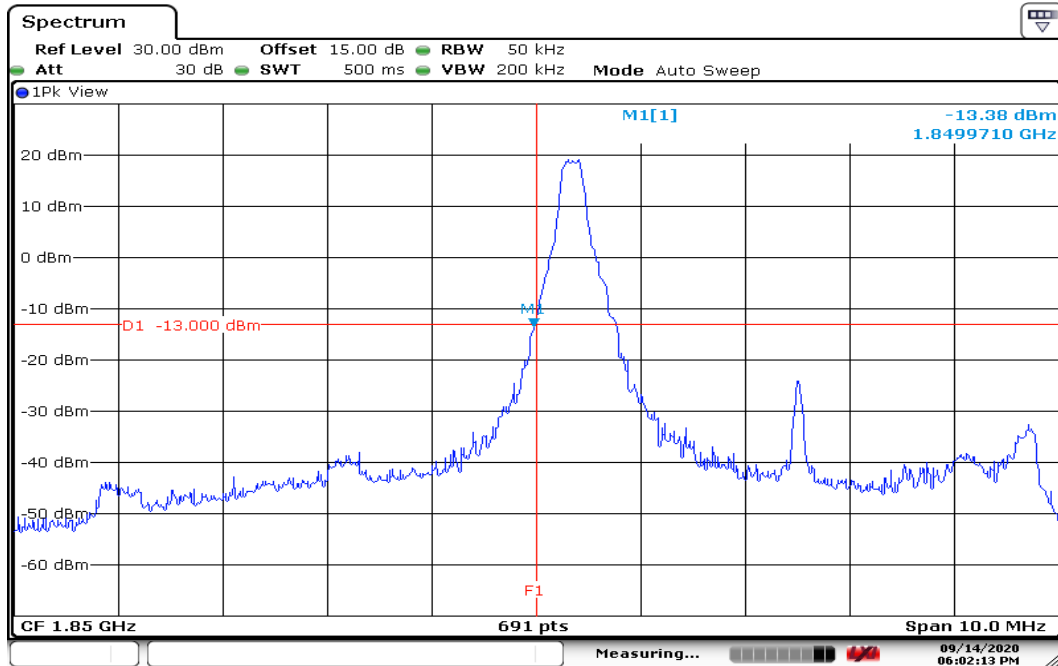
Date: 14 SEP 2020 18:03:04

HIGHER BAND EDGE



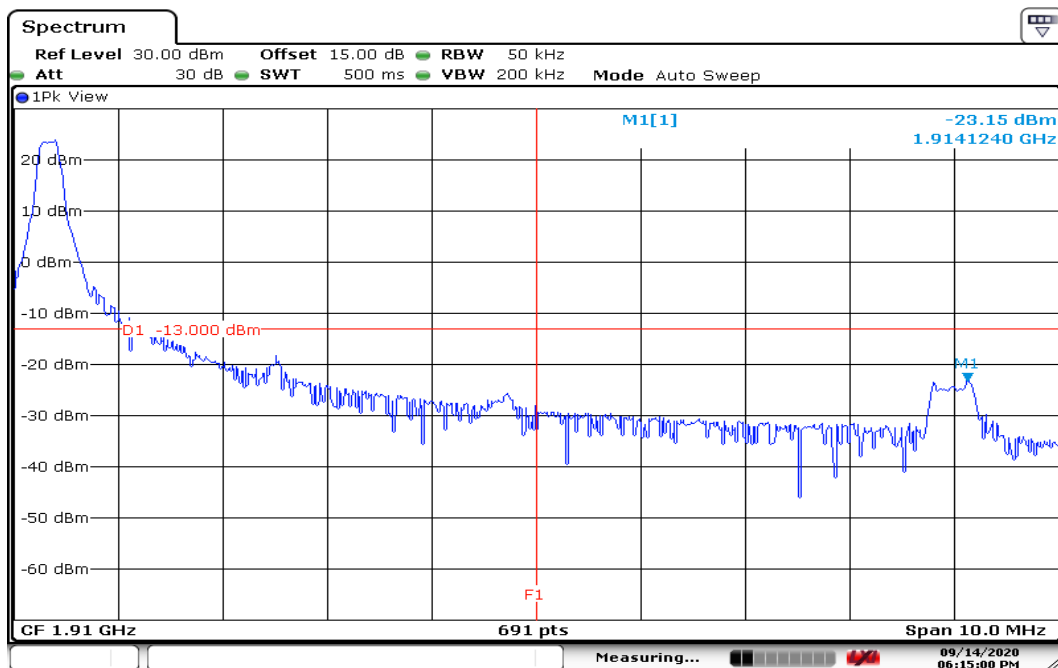
Date: 14 SEP 2020 18:12:03

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



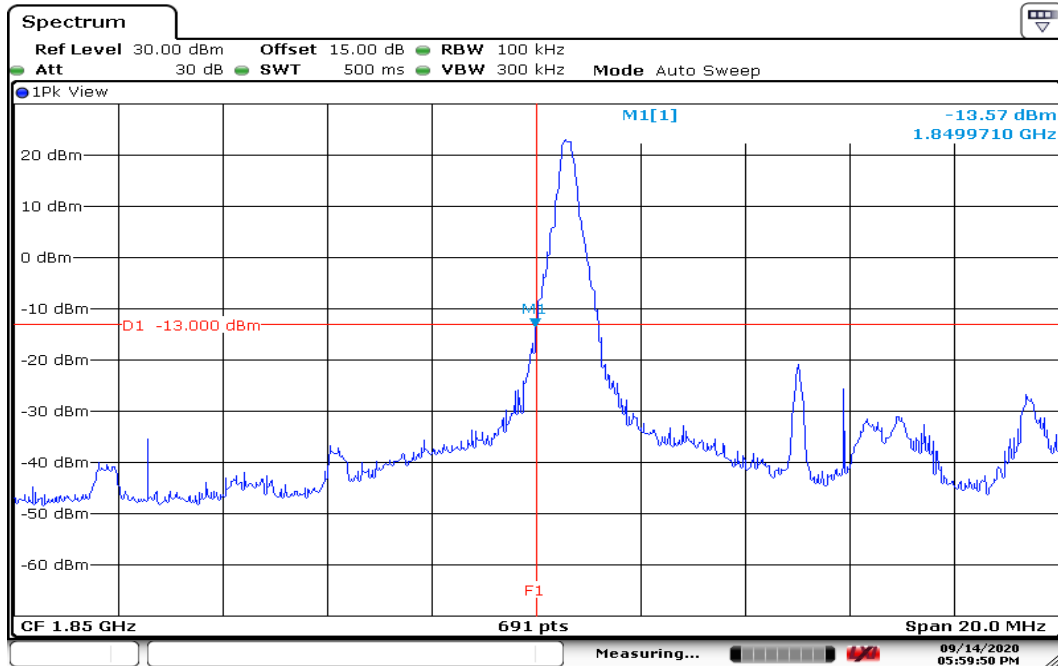
Date: 14 SEP 2020 18:02:13

HIGHER BAND EDGE



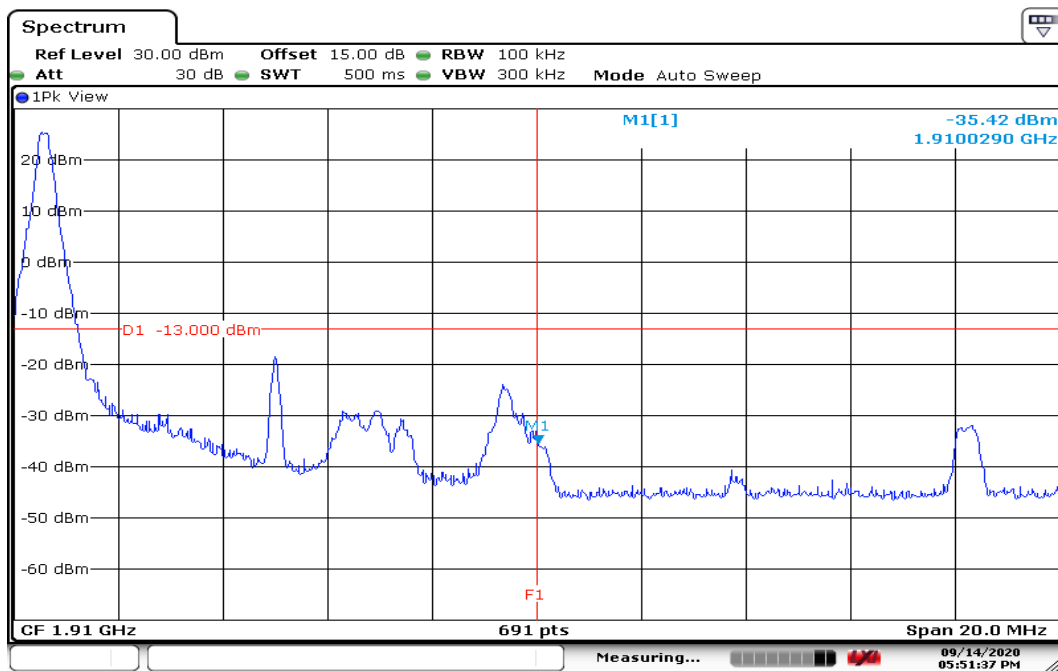
Date: 14 SEP 2020 18:15:00

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



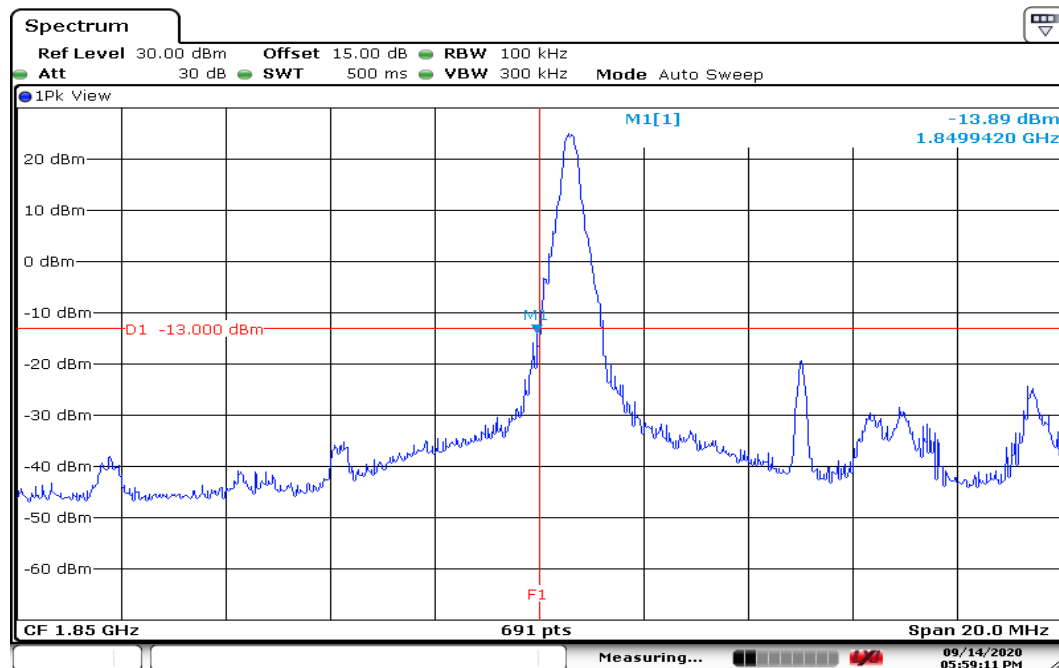
Date: 14 SEP 2020 17:59:51

HIGHER BAND EDGE



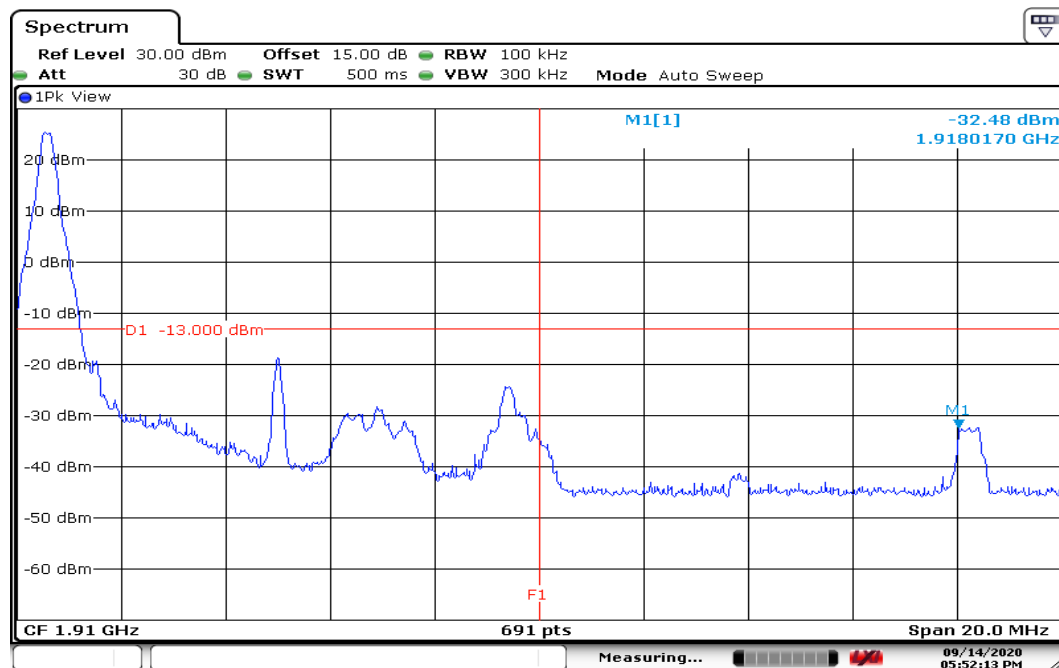
Date: 14 SEP 2020 17:51:38

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



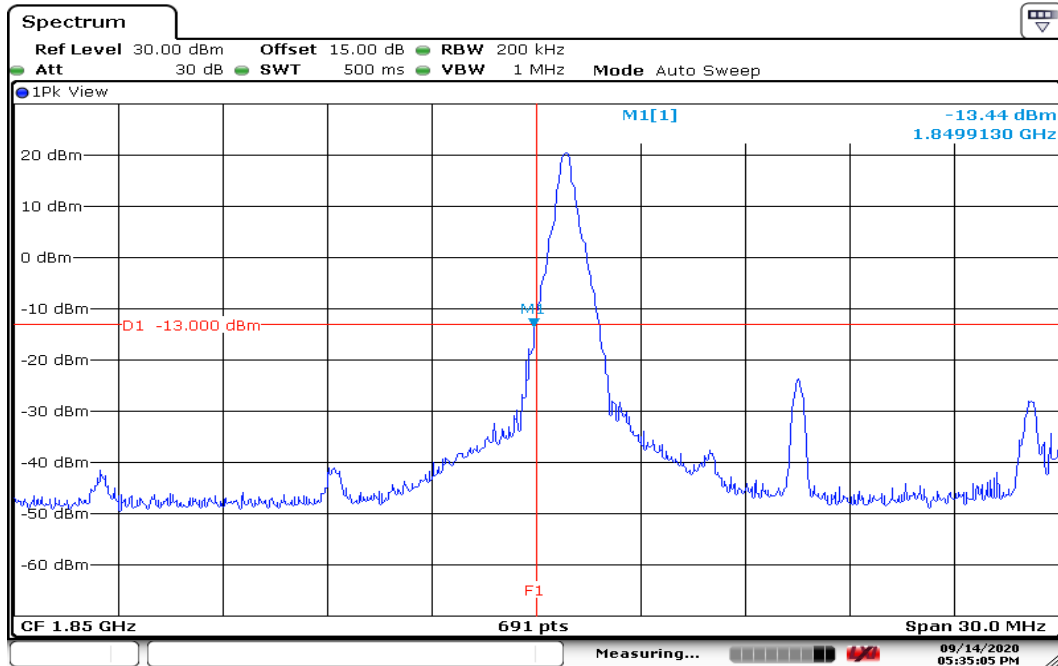
Date: 14 SEP 2020 17:59:11

HIGHER BAND EDGE



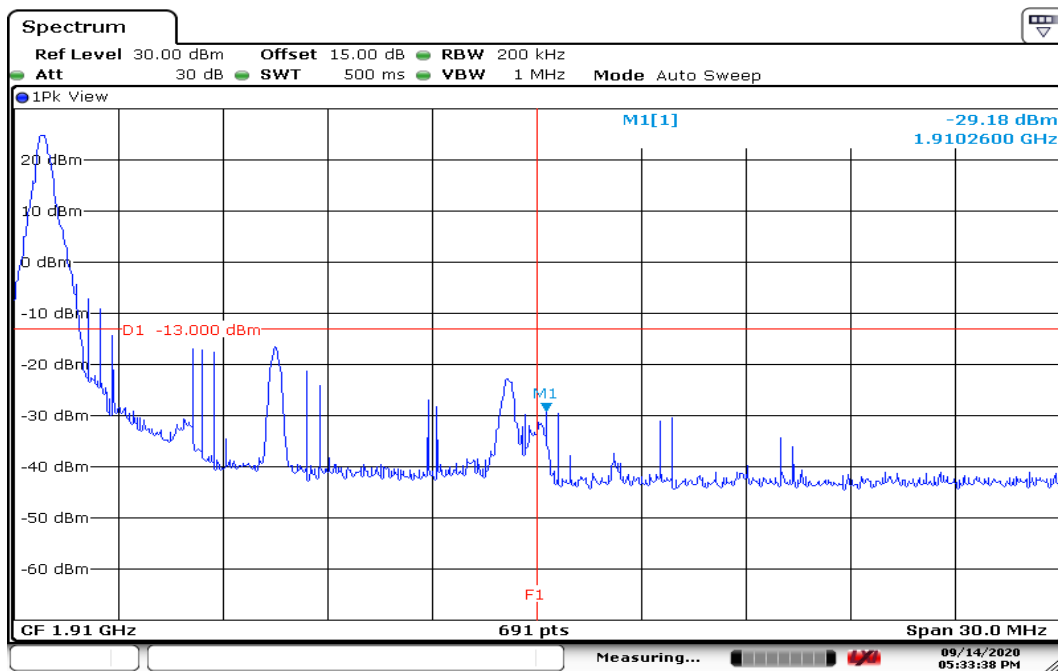
Date: 14 SEP 2020 17:52:13

CHANNEL BANDWIDTH: 15MHz / QPSK / 1RB ALLOCATED LOWER BAND EDGE



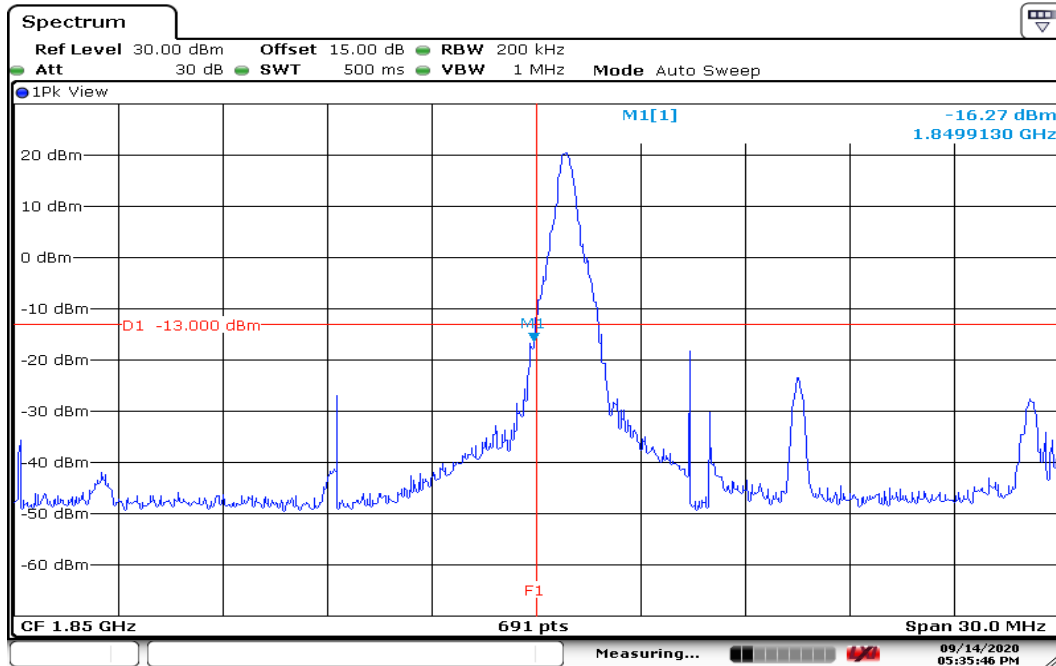
Date: 14 SEP 2020 17:35:05

HIGHER BAND EDGE



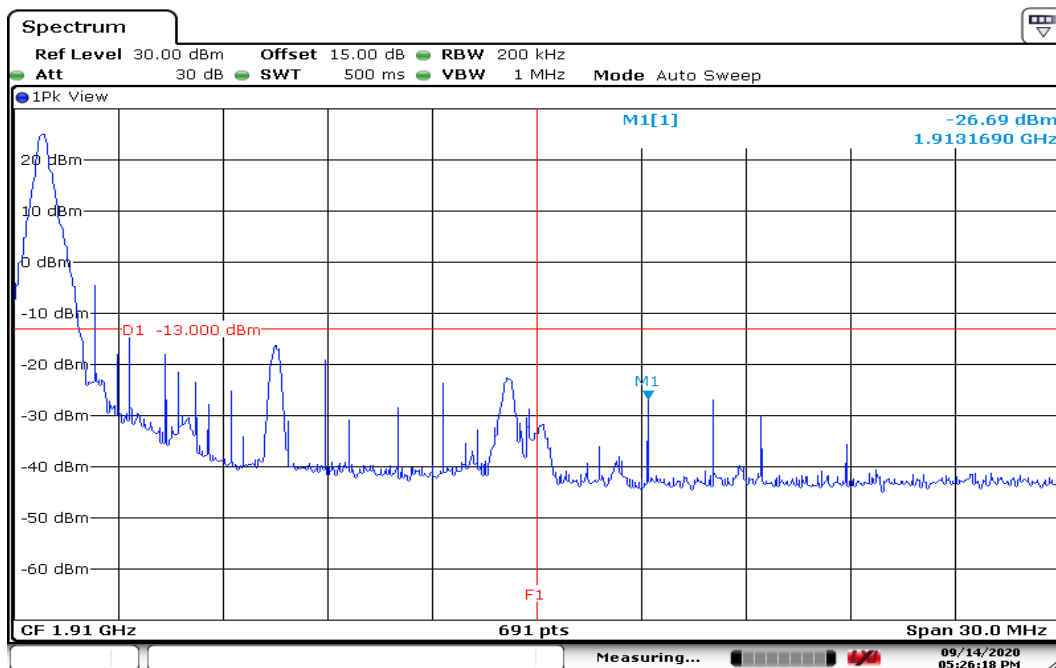
Date: 14 SEP 2020 17:33:39

CHANNEL BANDWIDTH: 15MHz / 16QAM / 1RB ALLOCATED LOWER BAND EDGE



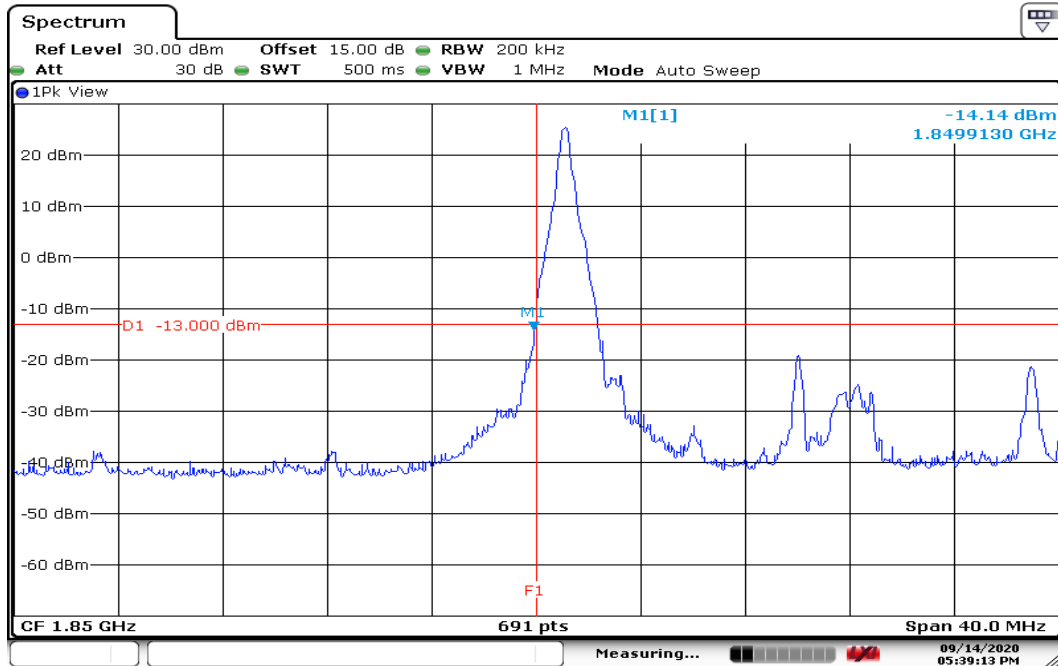
Date: 14 SEP 2020 17:35:47

HIGHER BAND EDGE



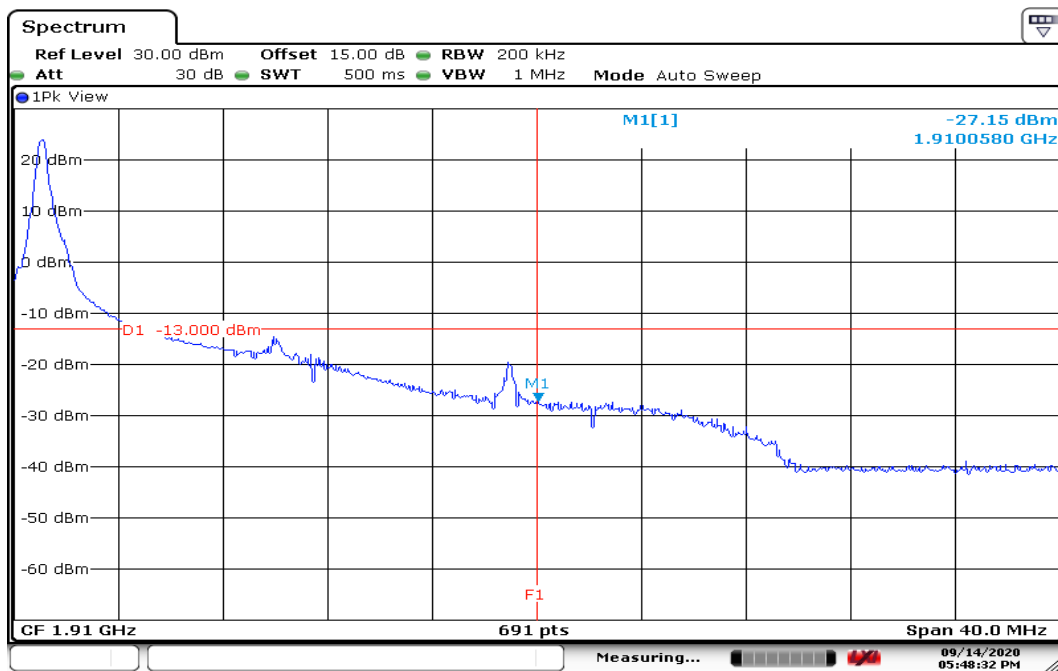
Date: 14 SEP 2020 17:26:19

CHANNEL BANDWIDTH: 20MHz / QPSK / 1RB ALLOCATED LOWER BAND EDGE



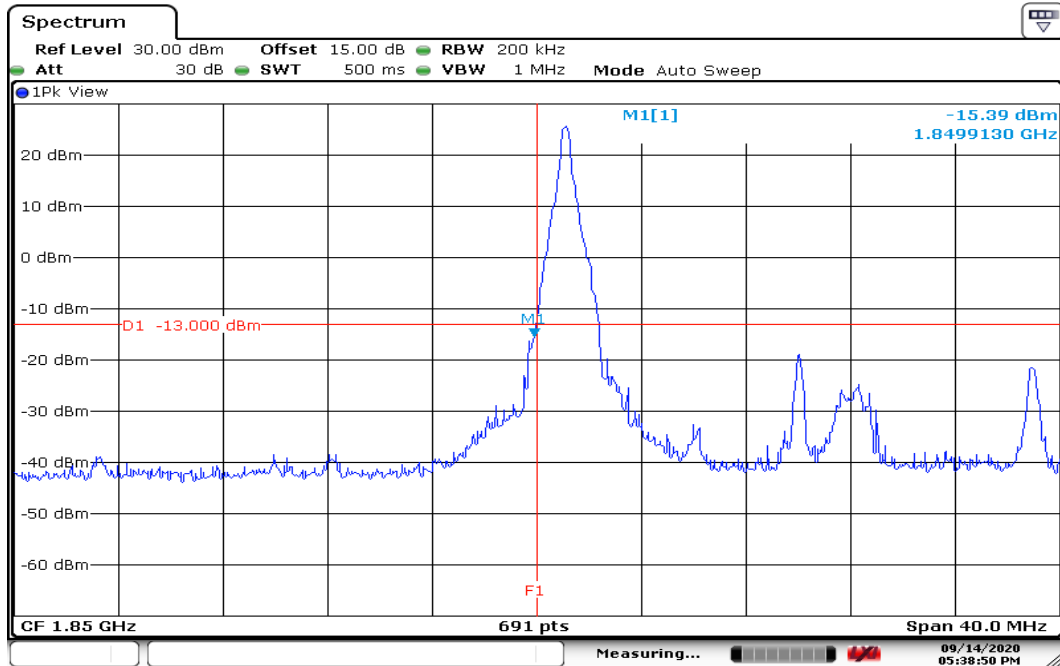
Date: 14 SEP 2020 17:39:14

HIGHER BAND EDGE



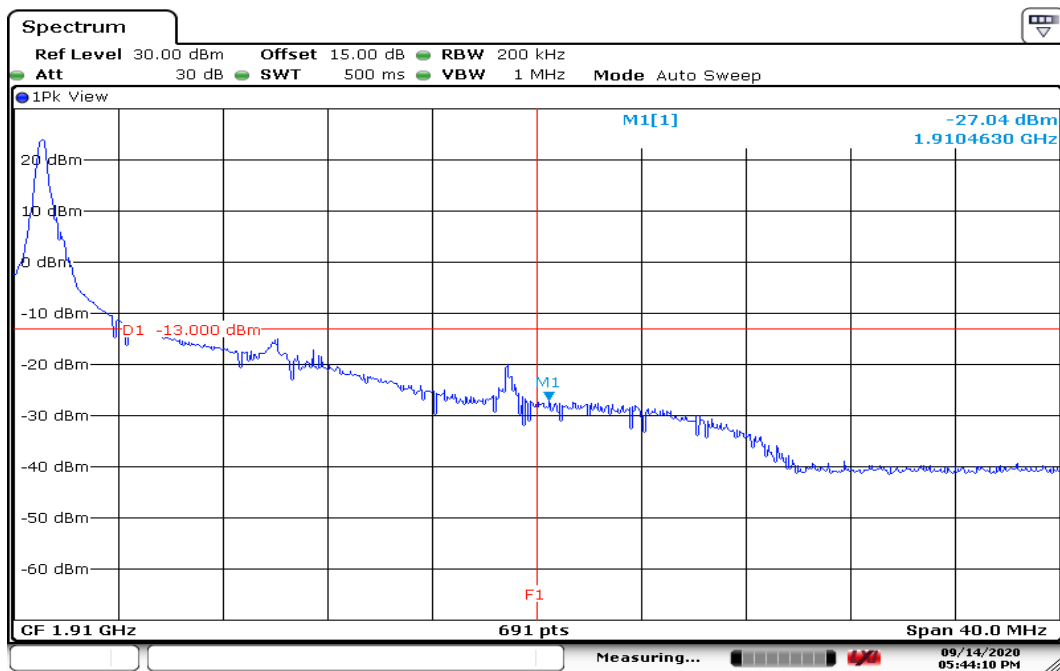
Date: 14 SEP 2020 17:48:32

CHANNEL BANDWIDTH: 20MHz / 16QAM / 1RB ALLOCATED LOWER BAND EDGE



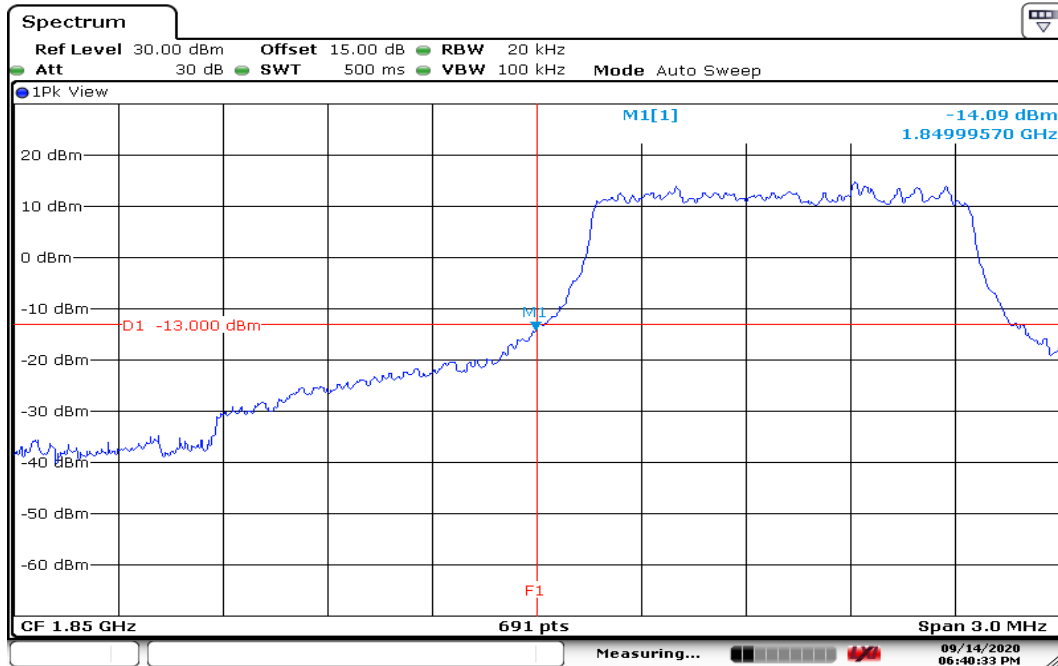
Date: 14 SEP 2020 17:38:50

HIGHER BAND EDGE



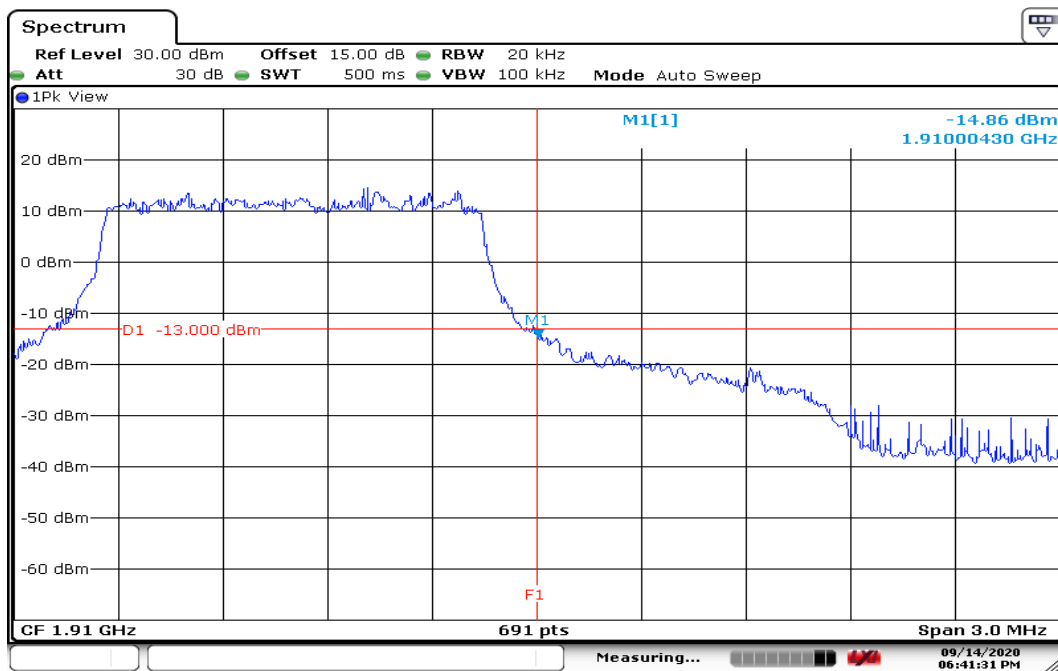
Date: 14 SEP 2020 17:44:10

CHANNEL BANDWIDTH: 1.4MHz / QPSK / 100% RB ALLOCATED LOWER BAND EDGE



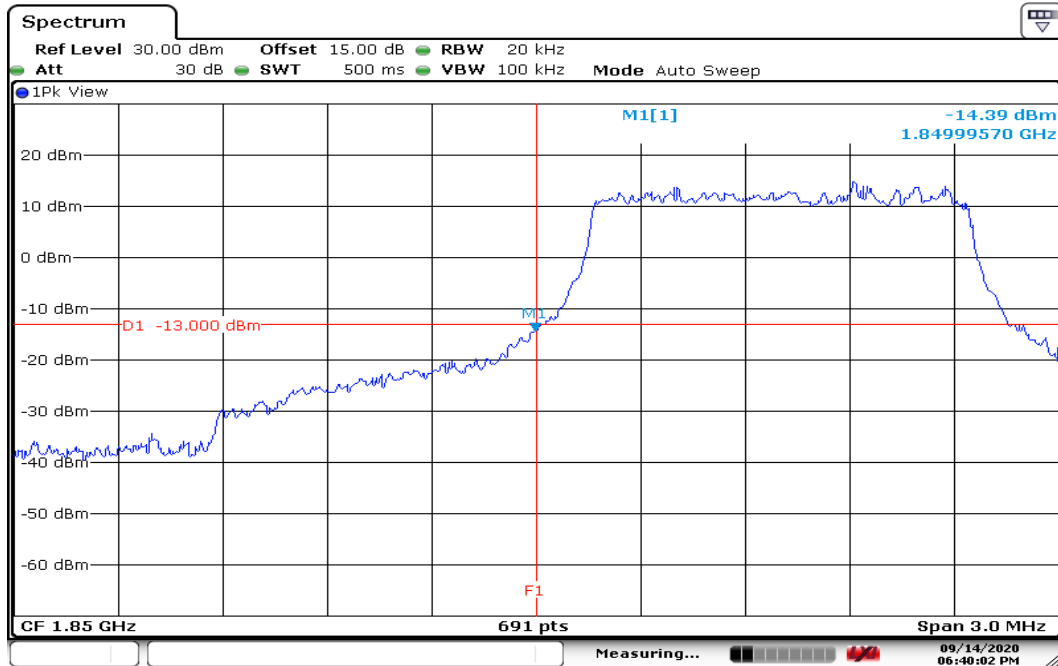
Date: 14 SEP 2020 18:40:33

HIGHER BAND EDGE



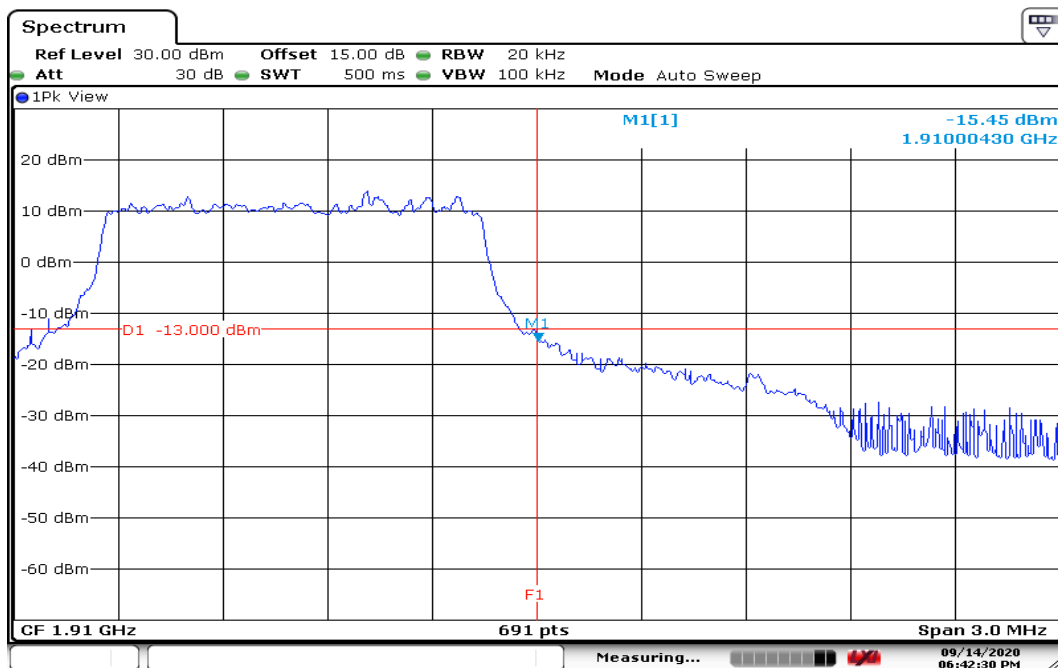
Date: 14 SEP 2020 18:41:31

CHANNEL BANDWIDTH: 1.4MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE



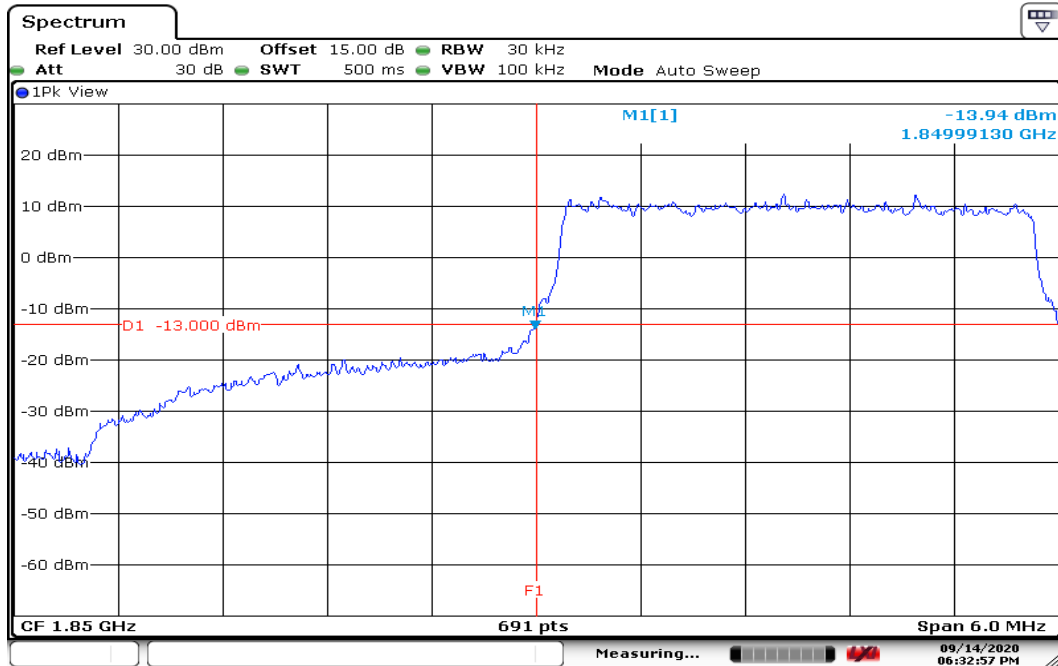
Date: 14 SEP 2020 18:40:03

HIGHER BAND EDGE



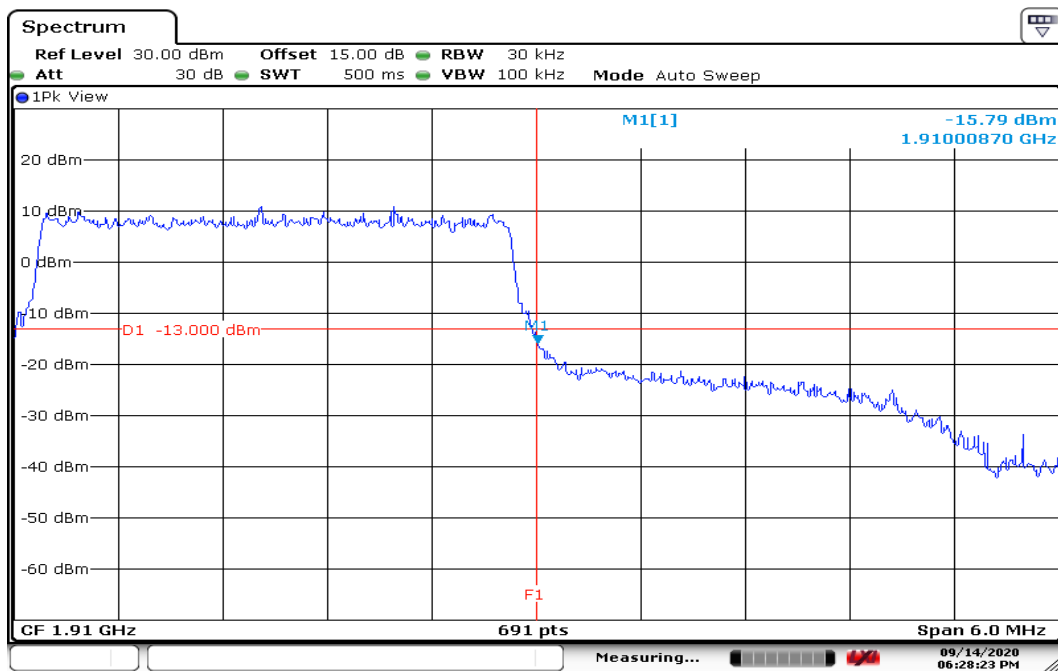
Date: 14 SEP 2020 18:42:31

CHANNEL BANDWIDTH: 3MHz / QPSK / 100% RB ALLOCATED LOWER BAND EDGE



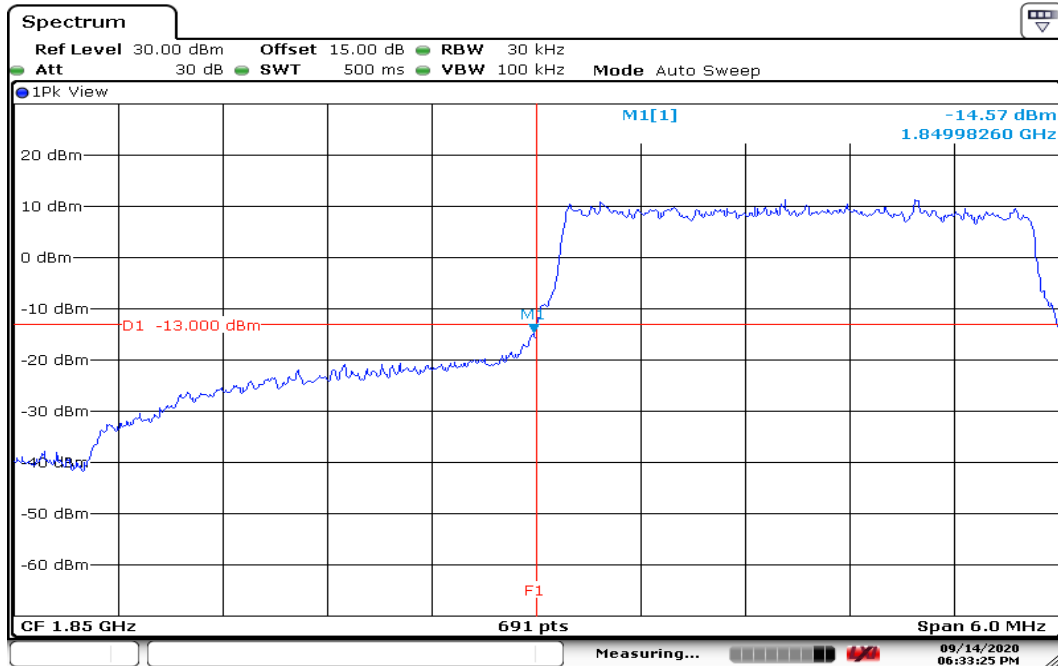
Date: 14 SEP 2020 18:32:57

HIGHER BAND EDGE



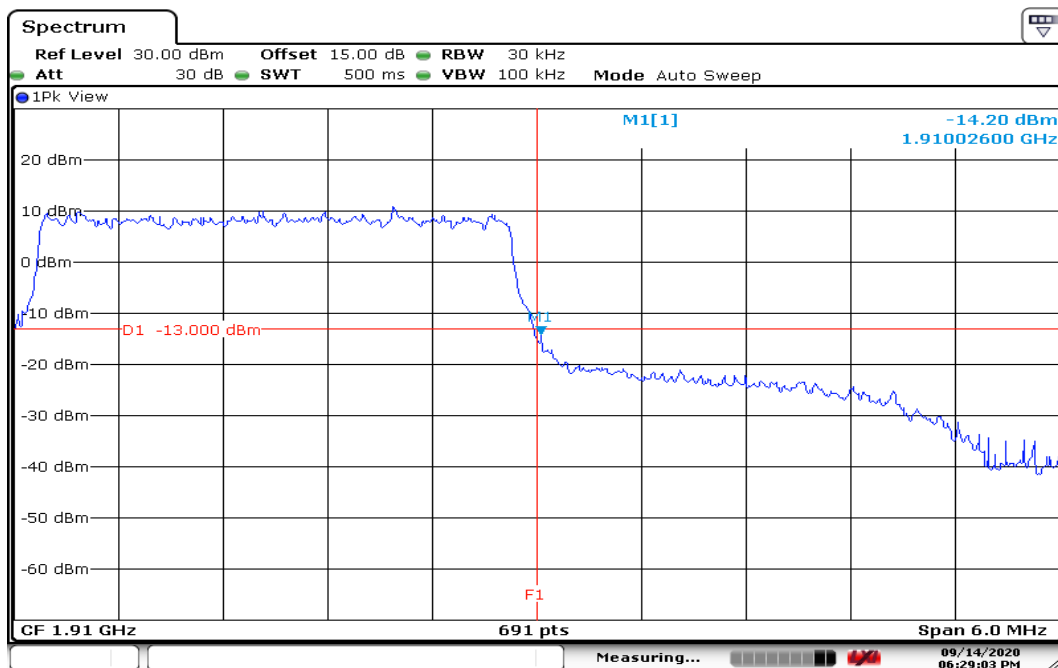
Date: 14 SEP 2020 18:28:23

CHANNEL BANDWIDTH: 3MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE



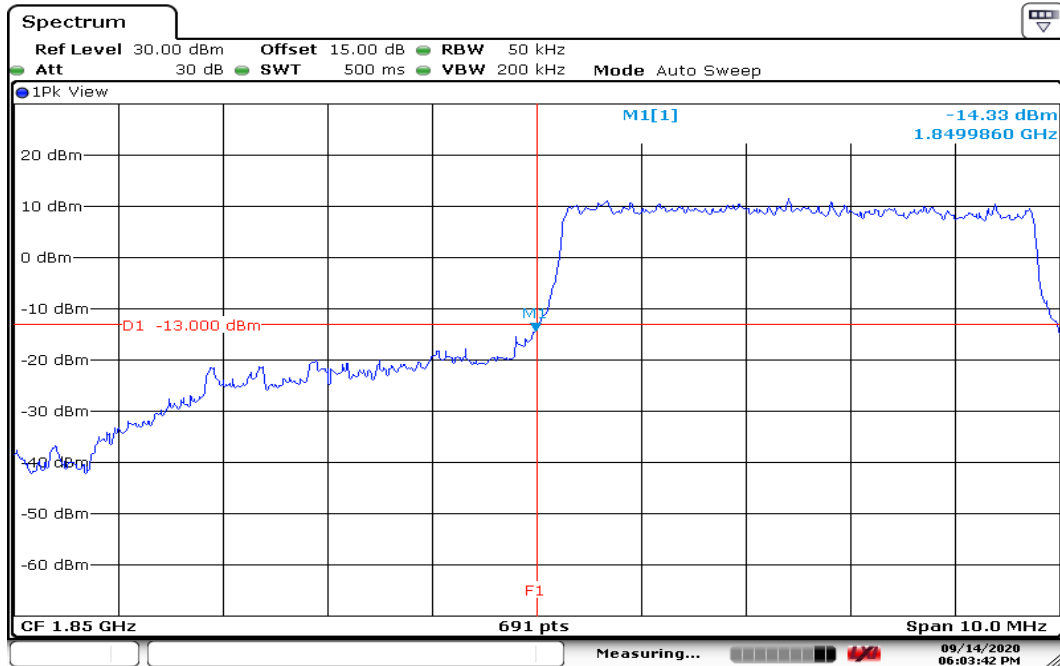
Date: 14 SEP 2020 18:33:26

HIGHER BAND EDGE



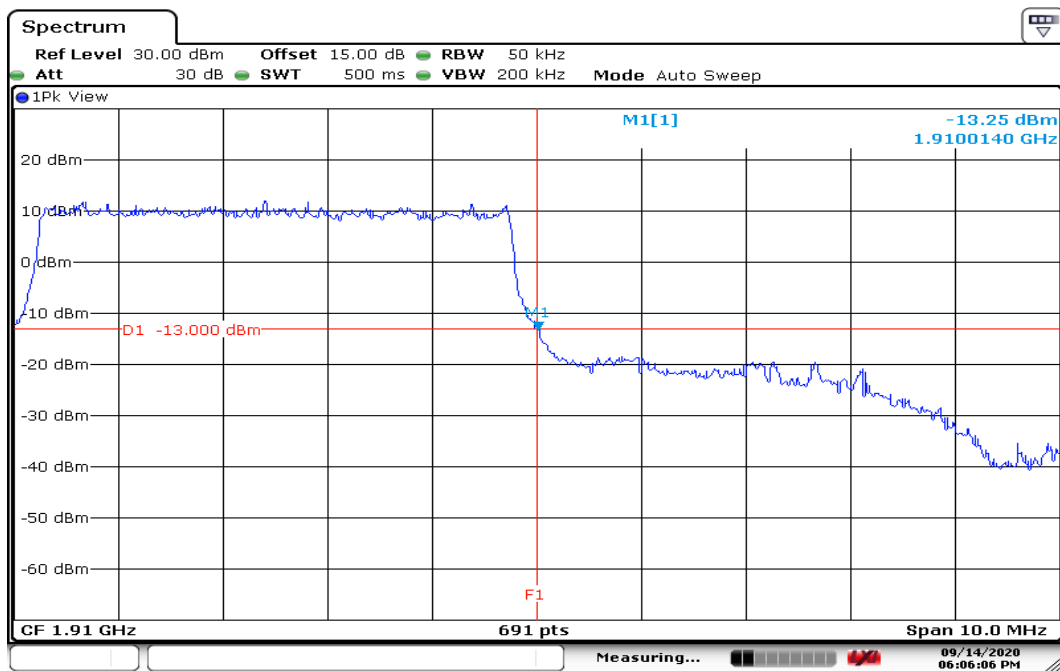
Date: 14 SEP 2020 18:29:04

CHANNEL BANDWIDTH: 5MHz / QPSK / 100% RB ALLOCATED LOWER BAND EDGE



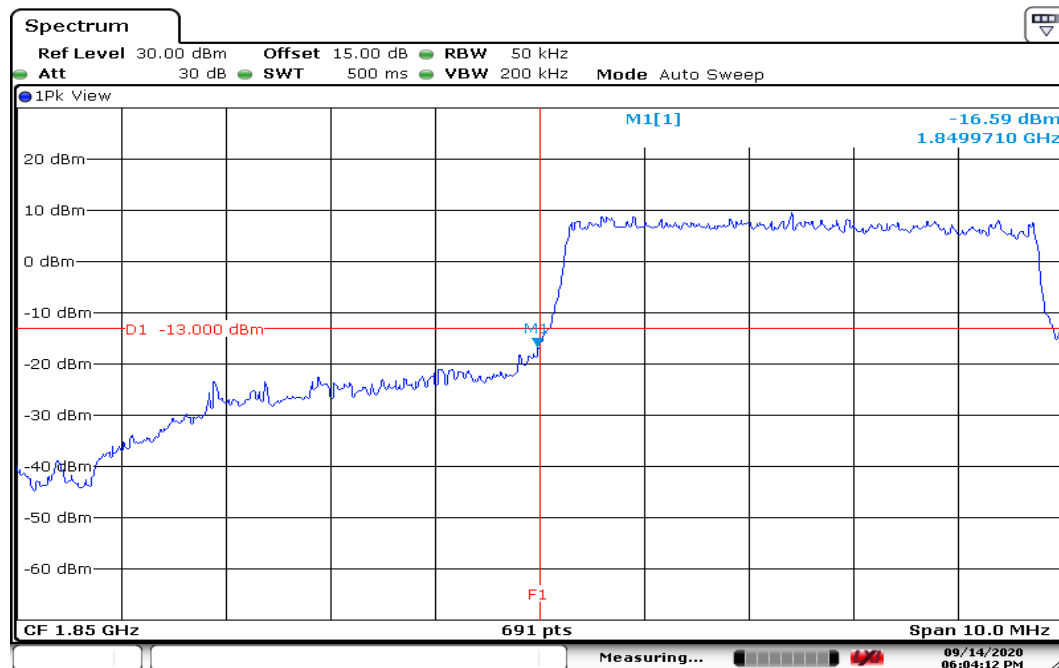
Date: 14 SEP 2020 18:03:43

HIGHER BAND EDGE



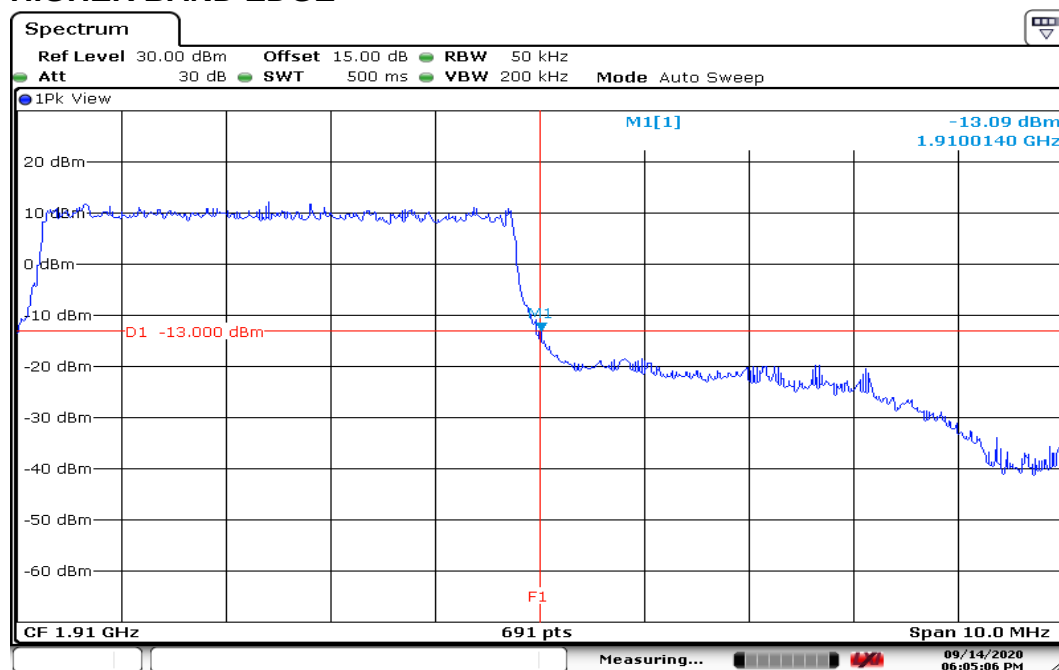
Date: 14 SEP 2020 18:06:07

CHANNEL BANDWIDTH: 5MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE



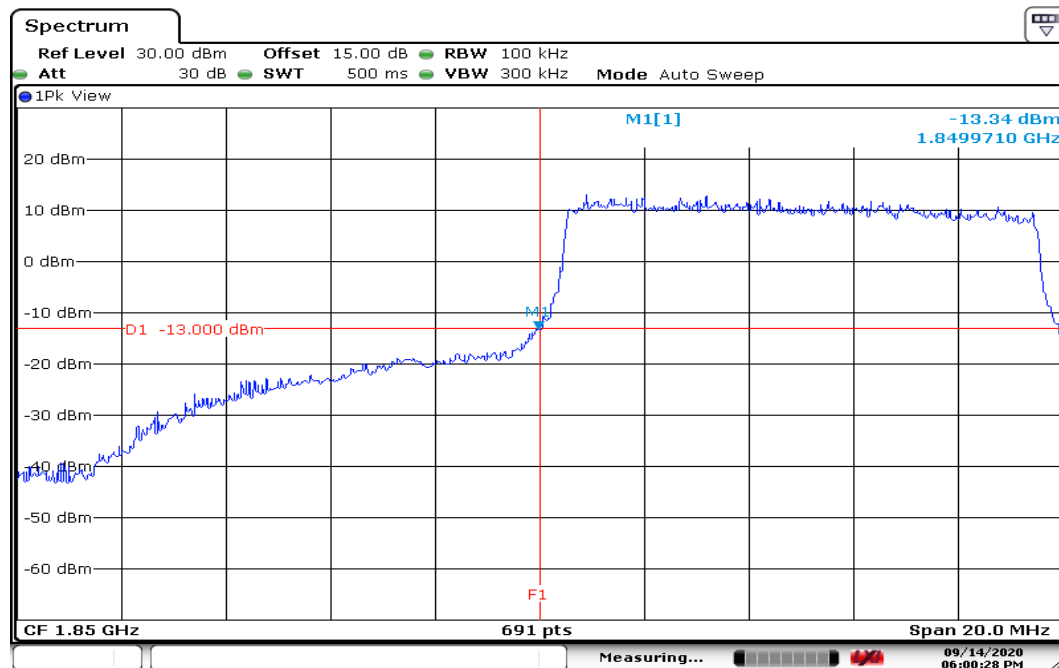
Date: 14 SEP 2020 18:04:13

HIGHER BAND EDGE



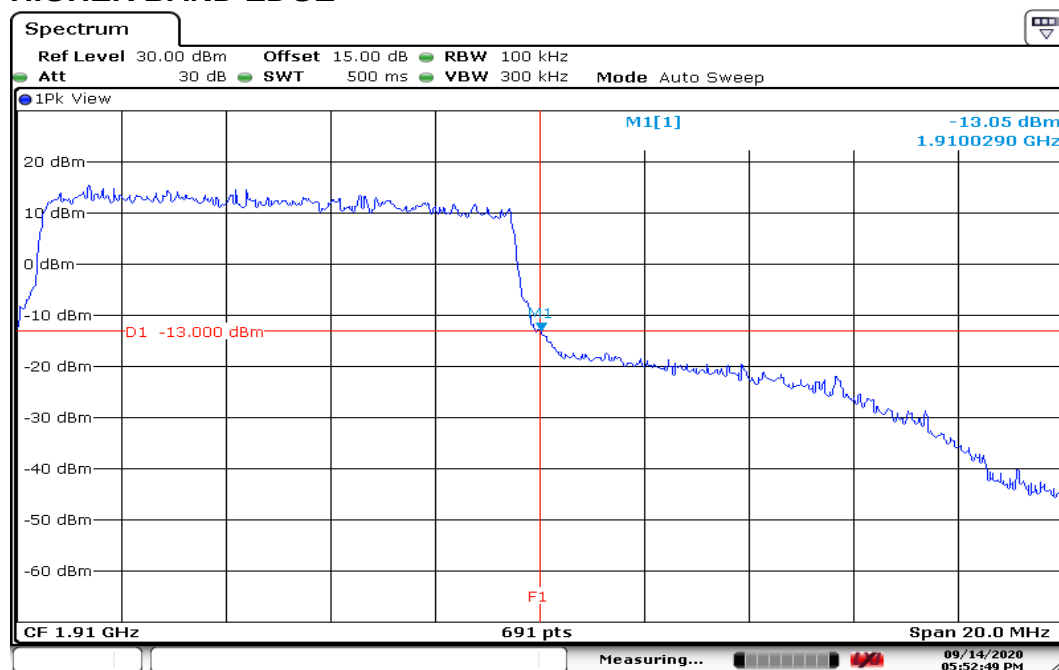
Date: 14 SEP 2020 18:05:07

CHANNEL BANDWIDTH: 10MHz / QPSK / 100% RB ALLOCATED LOWER BAND EDGE



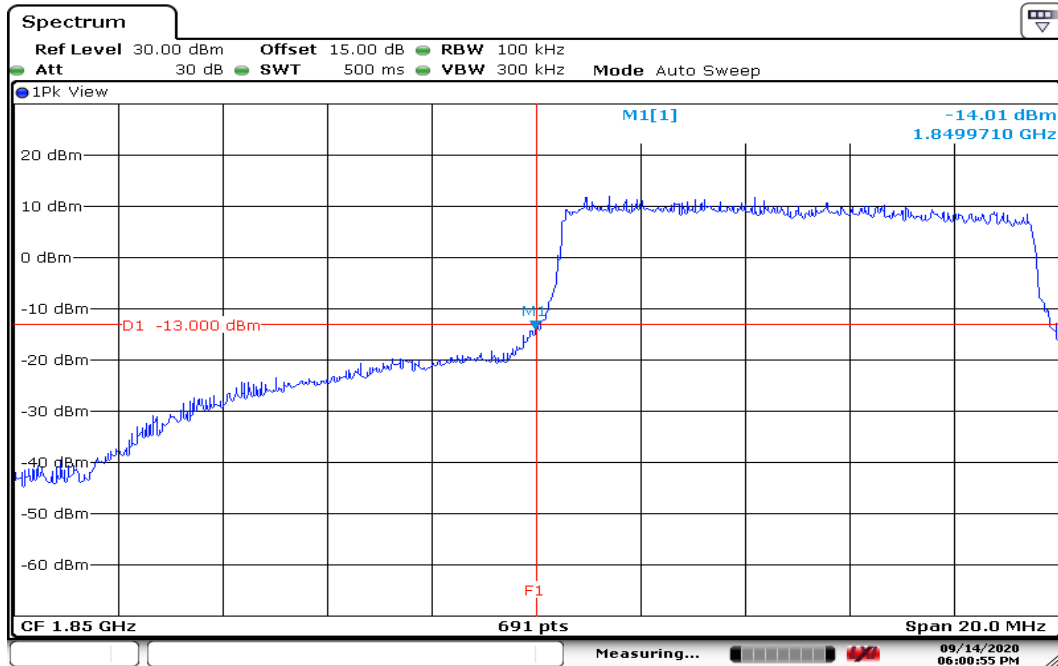
Date: 14 SEP 2020 18:00:28

HIGHER BAND EDGE



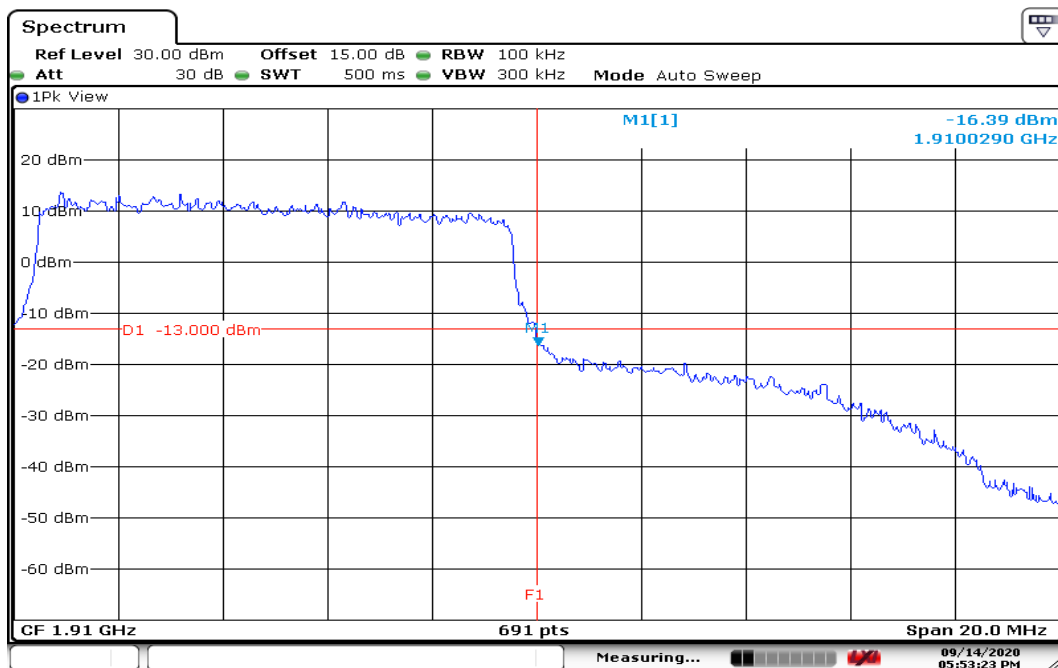
Date: 14 SEP 2020 17:52:50

CHANNEL BANDWIDTH: 10MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE



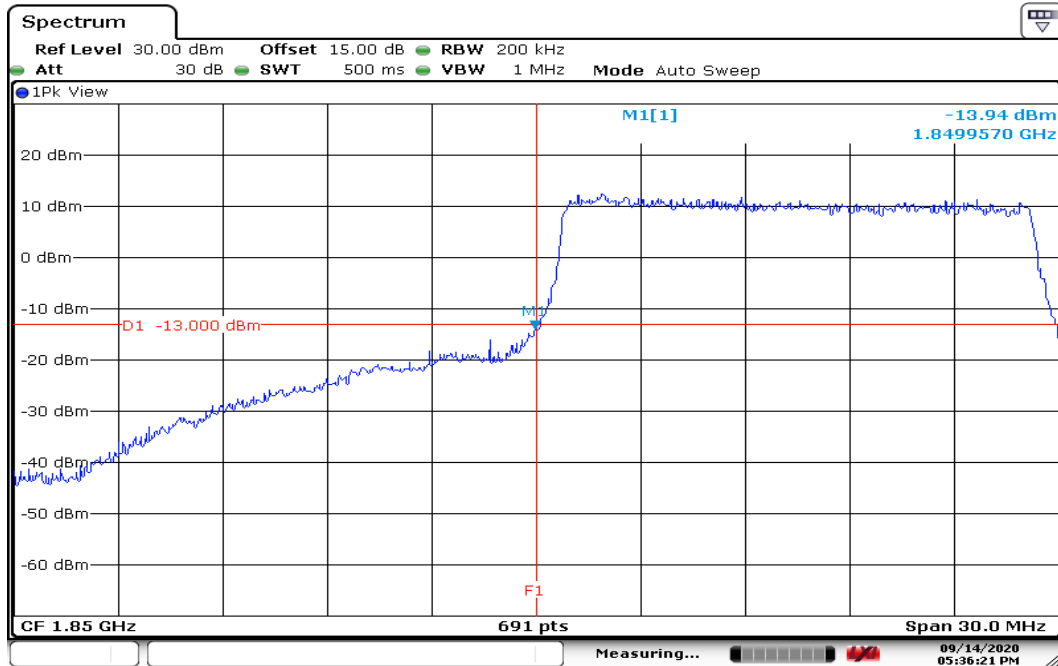
Date: 14 SEP 2020 18:00:56

HIGHER BAND EDGE



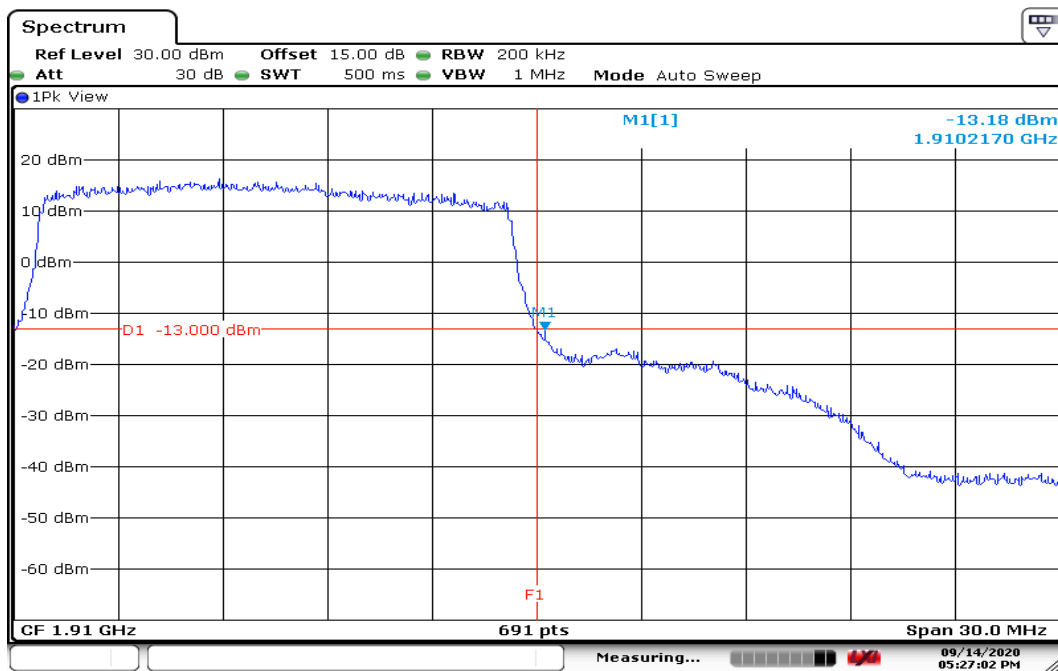
Date: 14 SEP 2020 17:53:23

CHANNEL BANDWIDTH: 15MHz / QPSK / 100% RB ALLOCATED LOWER BAND EDGE



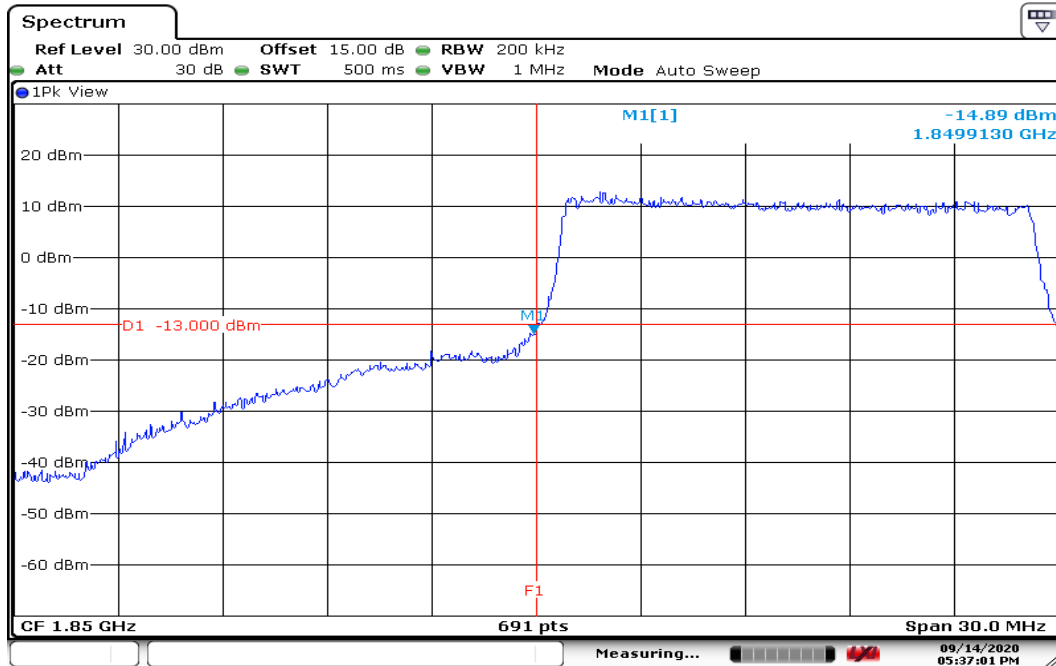
Date: 14 SEP 2020 17:36:21

HIGHER BAND EDGE



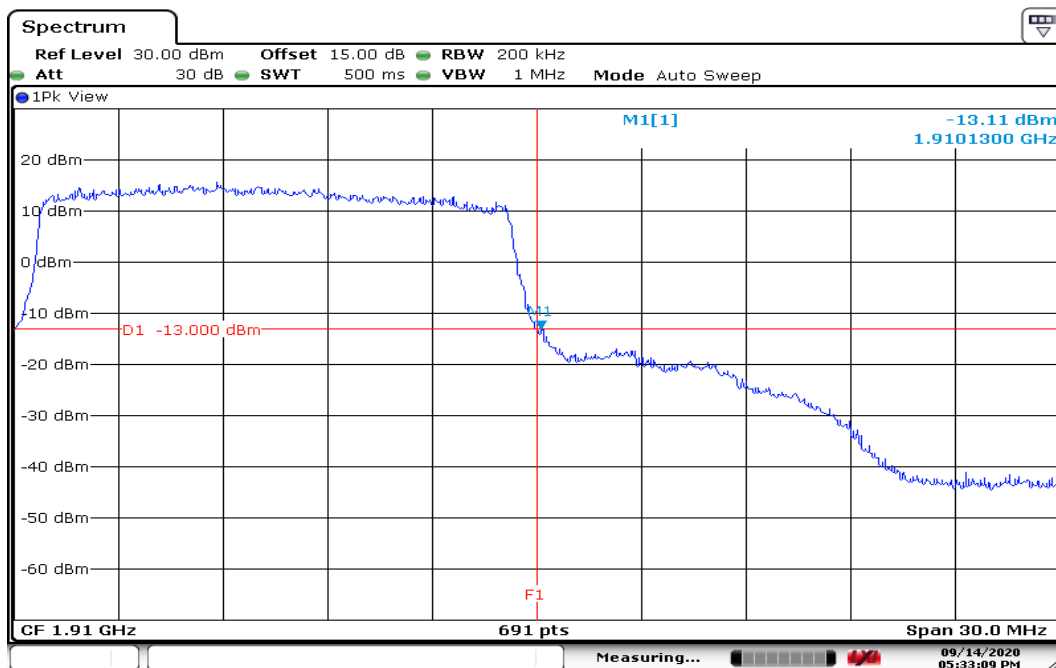
Date: 14 SEP 2020 17:27:03

CHANNEL BANDWIDTH: 15MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE



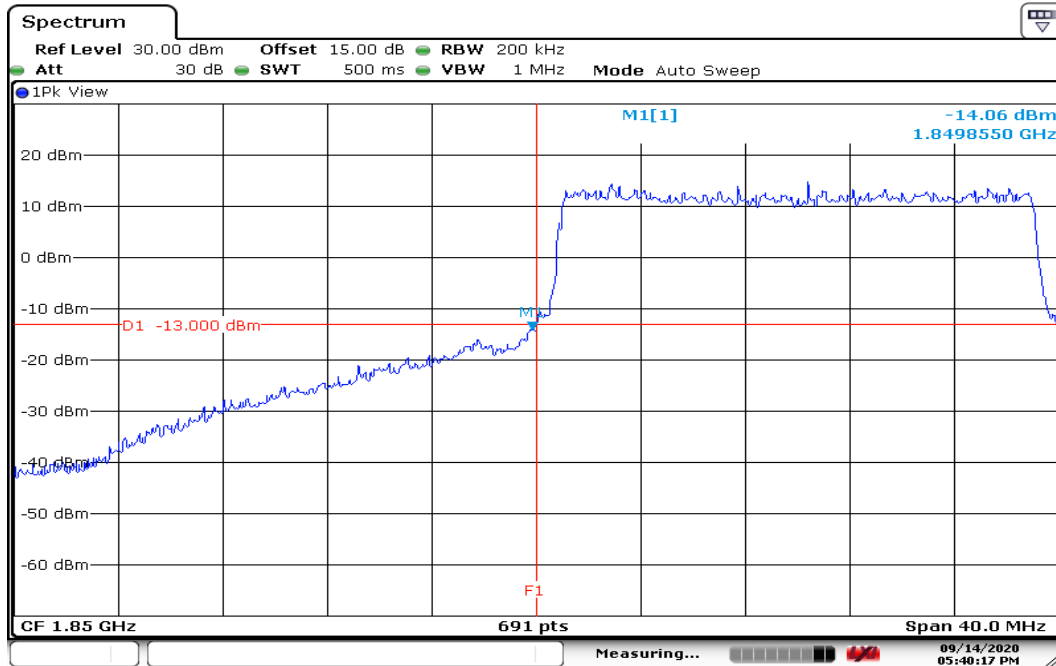
Date: 14 SEP 2020 17:37:02

HIGHER BAND EDGE



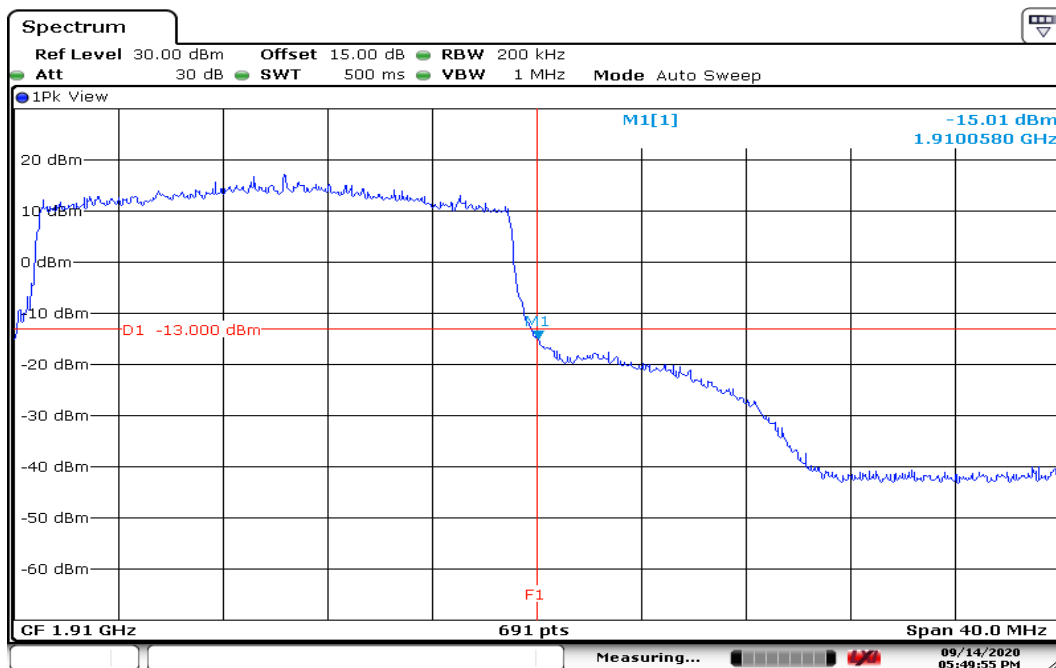
Date: 14 SEP 2020 17:33:10

CHANNEL BANDWIDTH: 20MHz / QPSK / 100% RB ALLOCATED LOWER BAND EDGE



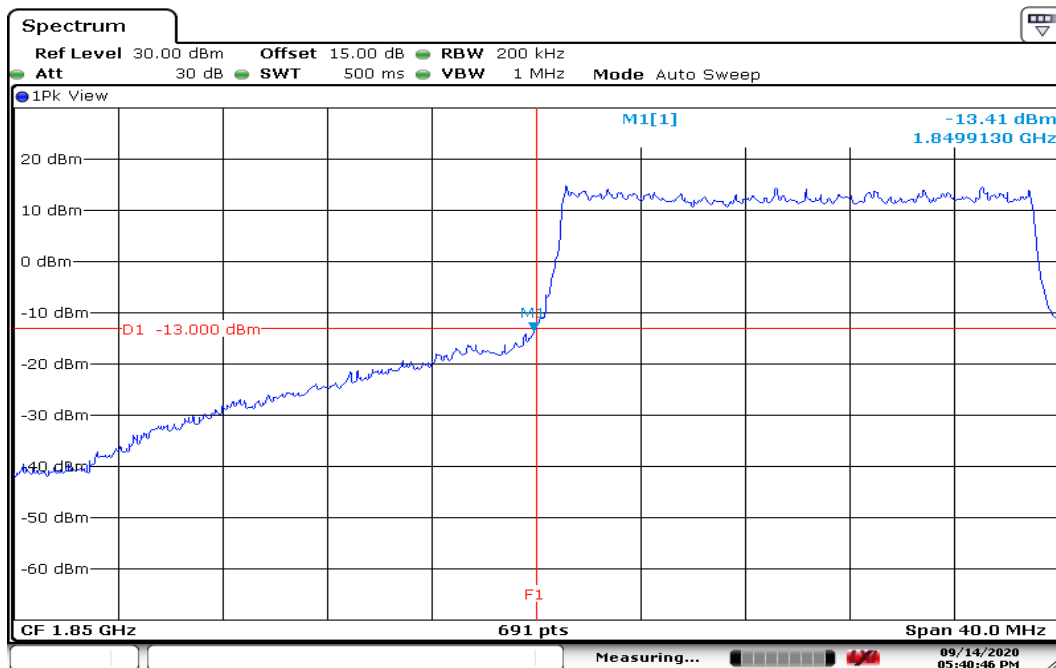
Date: 14 SEP 2020 17:40:18

HIGHER BAND EDGE



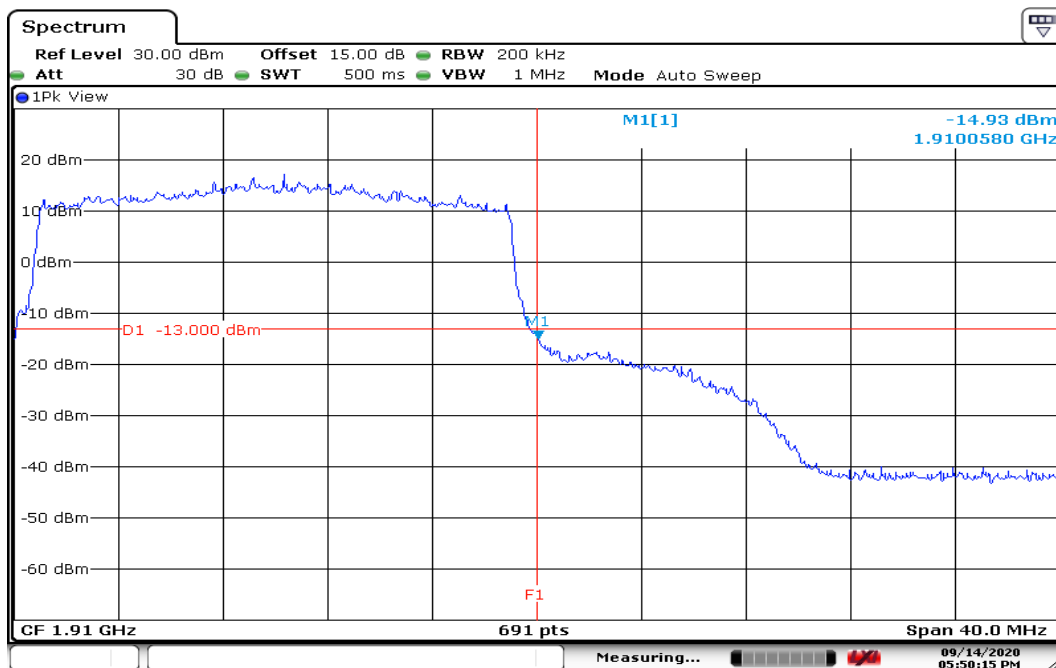
Date: 14 SEP 2020 17:49:55

CHANNEL BANDWIDTH: 20MHz / 16QAM / 100% RB ALLOCATED LOWER BAND EDGE



Date: 14 SEP 2020 17:40:47

HIGHER BAND EDGE



Date: 14 SEP 2020 17:50:15

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 $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

Test Procedures

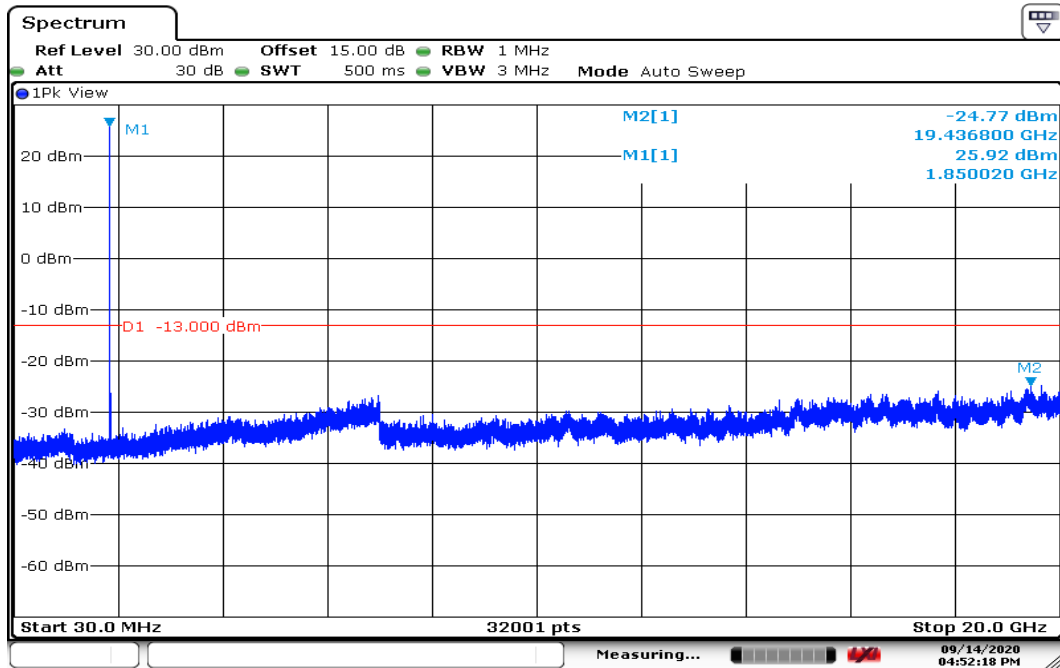
1. According to KDB 971168 D01,
2. The EUT was connect to spectrum analyzer and call box.
3. The RF output of EUT was connected to the spectrum analyzer.
4. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
5. Record the maximum spurious emission.
6. The fundamental frequency should be excluded against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

Test Results

LTE Band 2

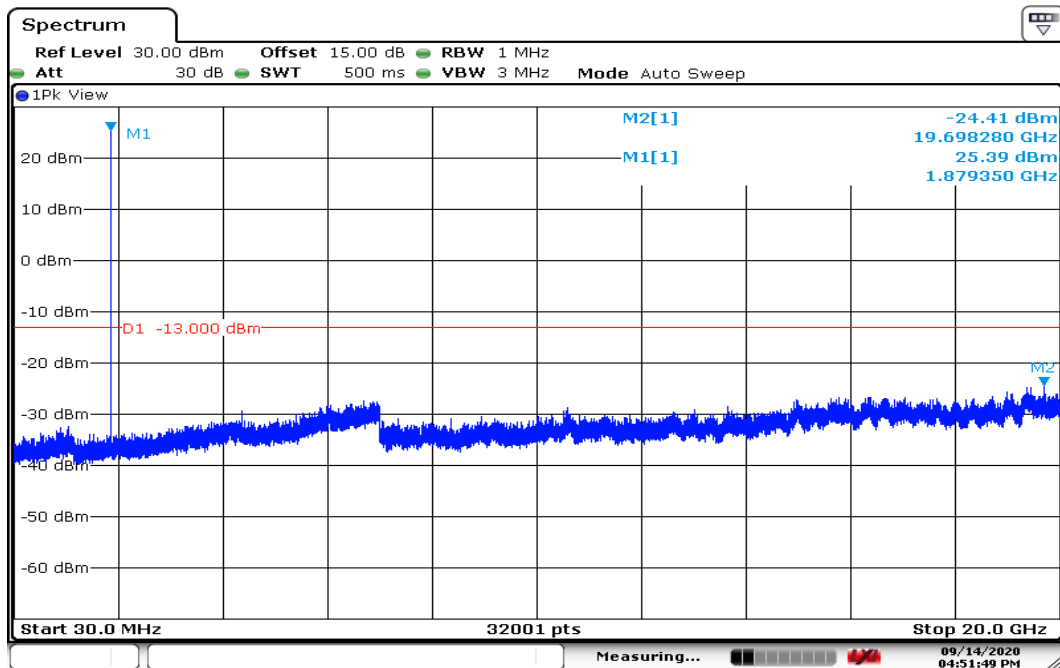
CHANNEL BANDWIDTH: 1.4MHz / QPSK

CH Low



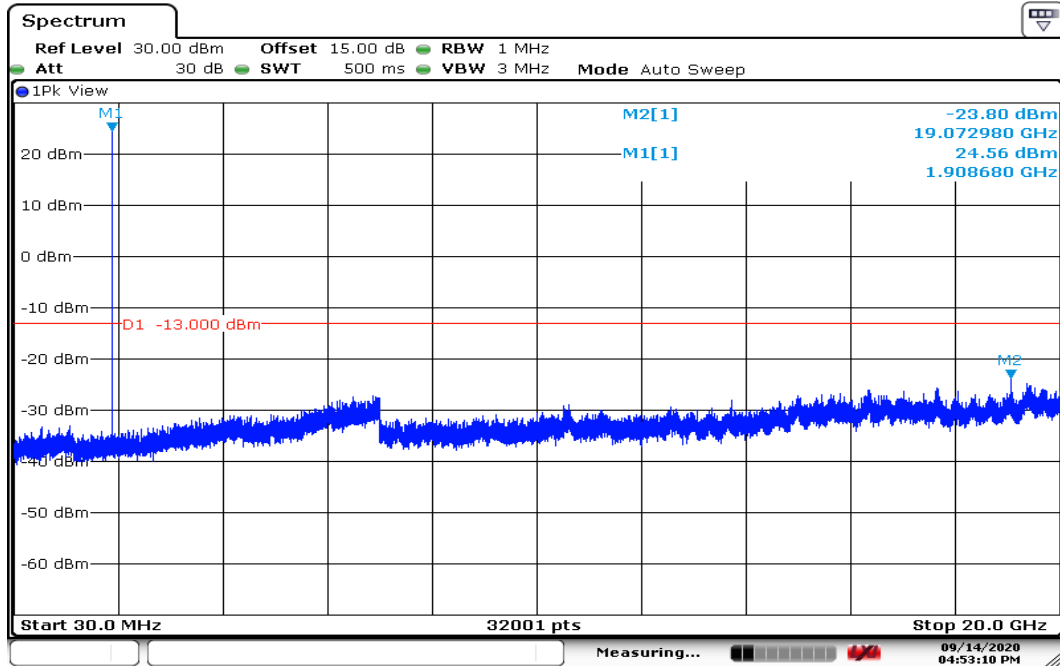
Date: 14 SEP 2020 16:52:18

CH Mid



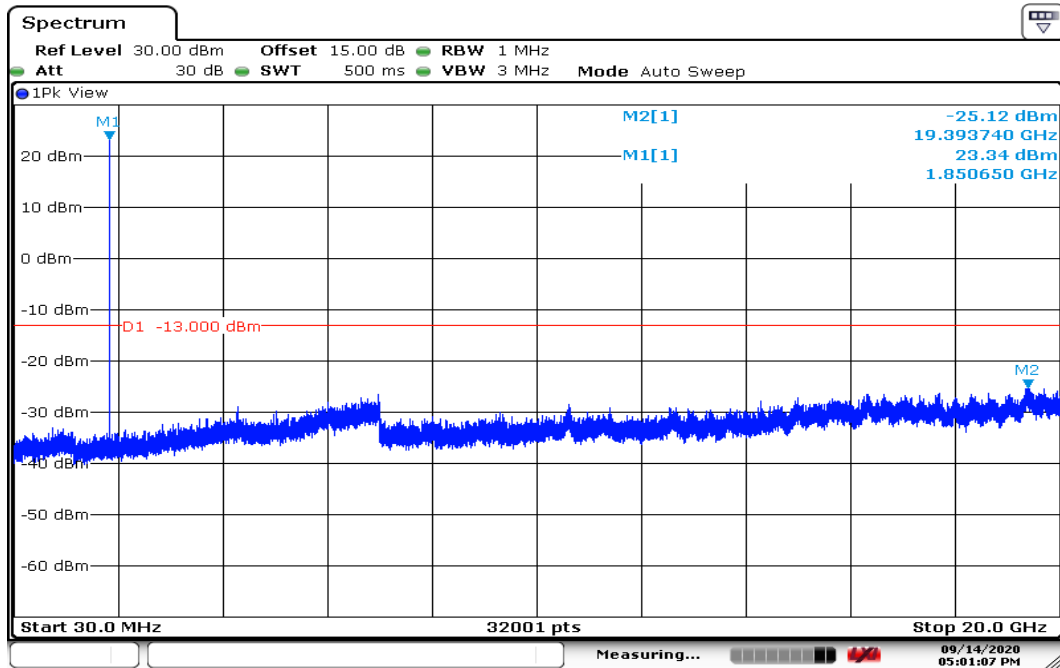
Date: 14 SEP 2020 16:51:49

CH High



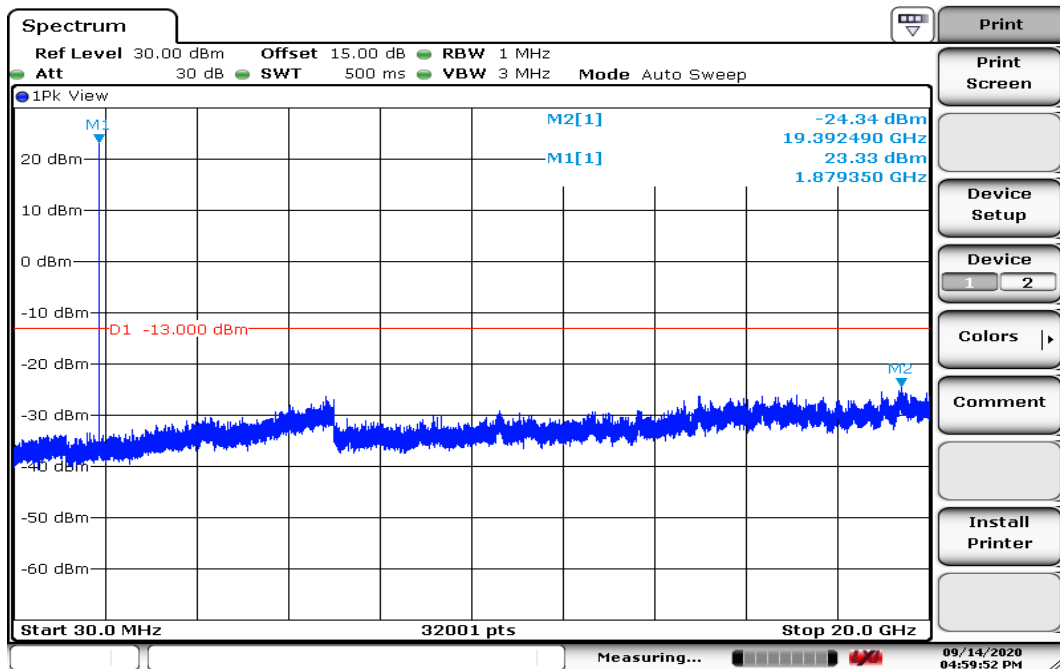
Date: 14 SEP 2020 16:53:10

CHANNEL BANDWIDTH: 3MHz / QPSK CH Low



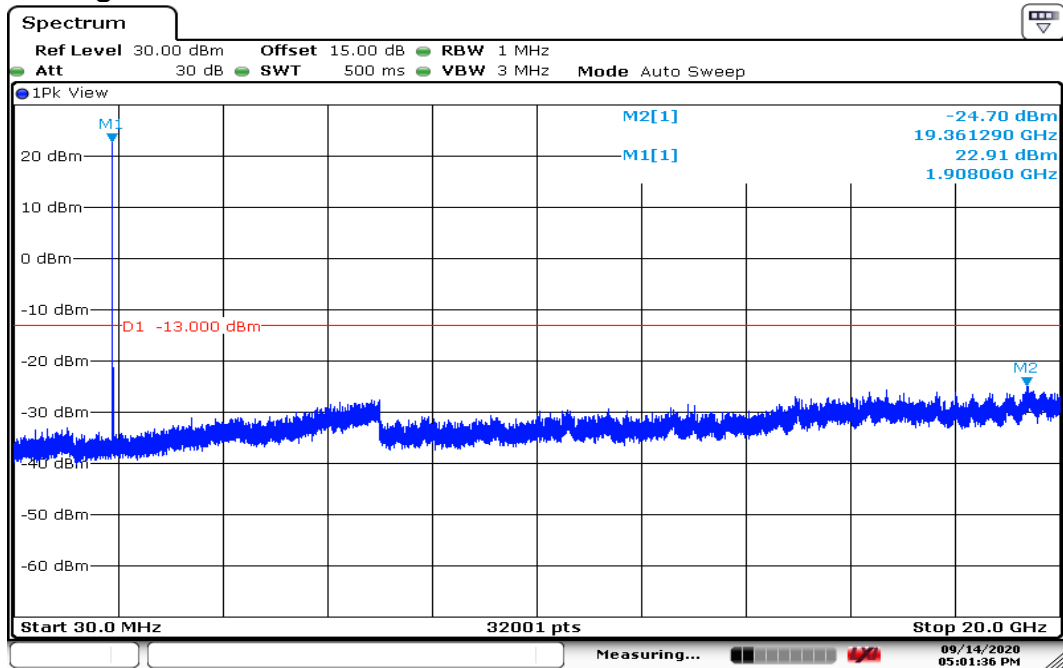
Date: 14 SEP 2020 17:01:08

CH Mid



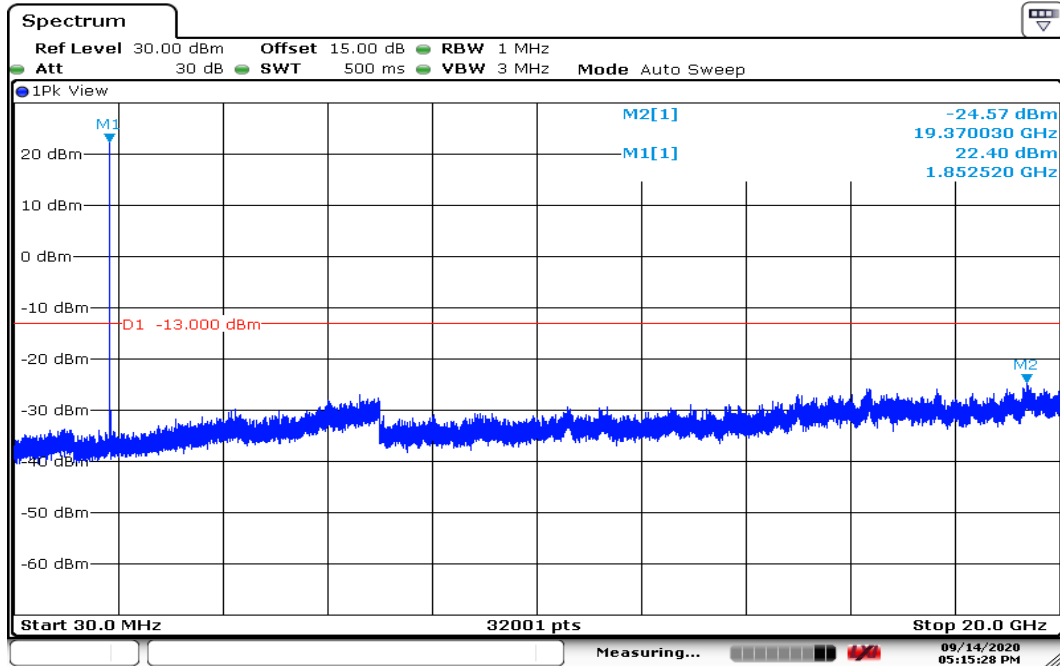
Date: 14 SEP 2020 16:59:53

CH High



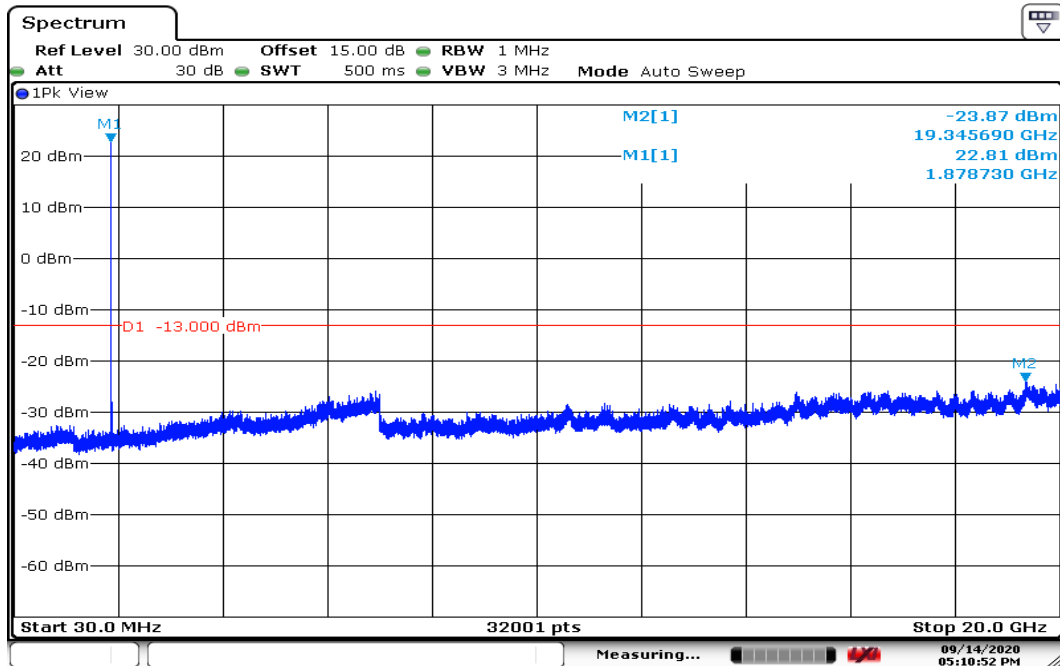
Date: 14 SEP 2020 17:01:36

CHANNEL BANDWIDTH: 5MHz / QPSK CH Low



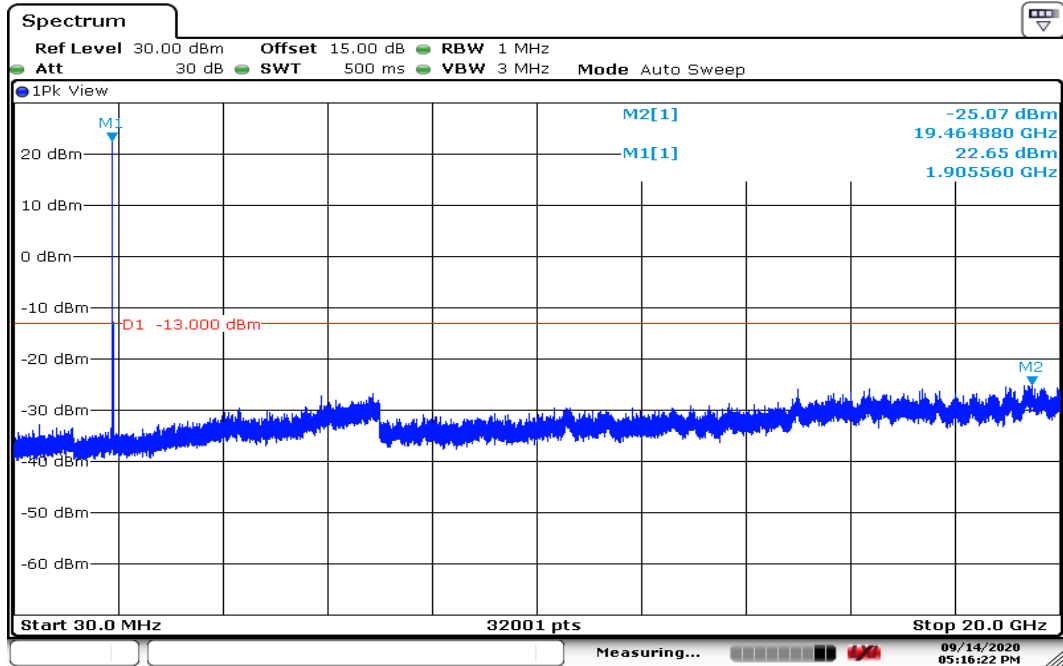
Date: 14 SEP 2020 17:15:29

CH Mid



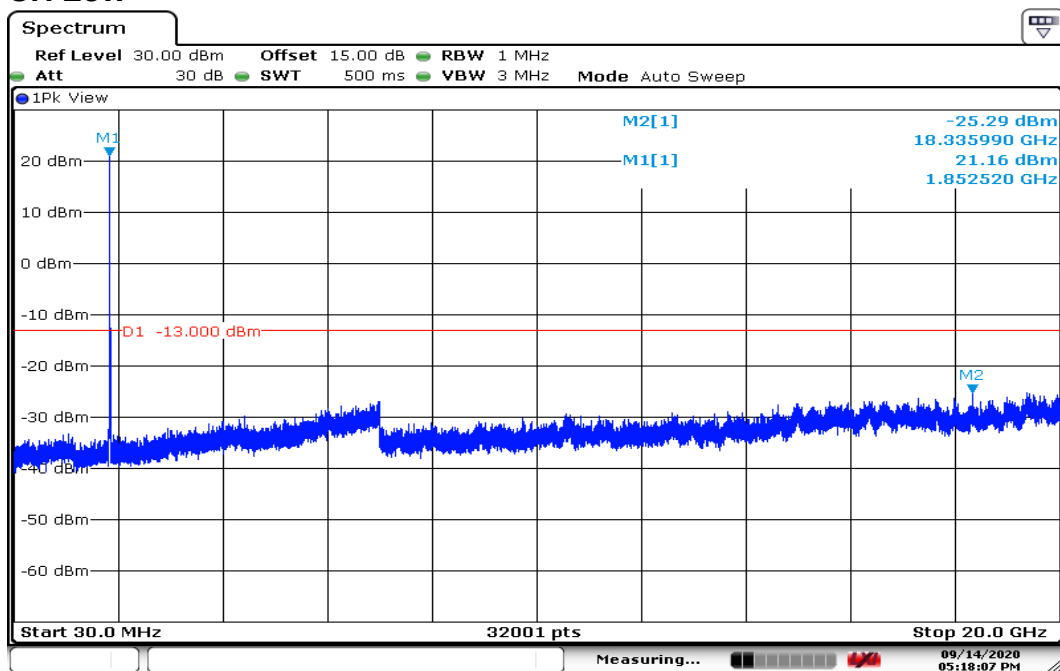
Date: 14 SEP 2020 17:10:53

CH High



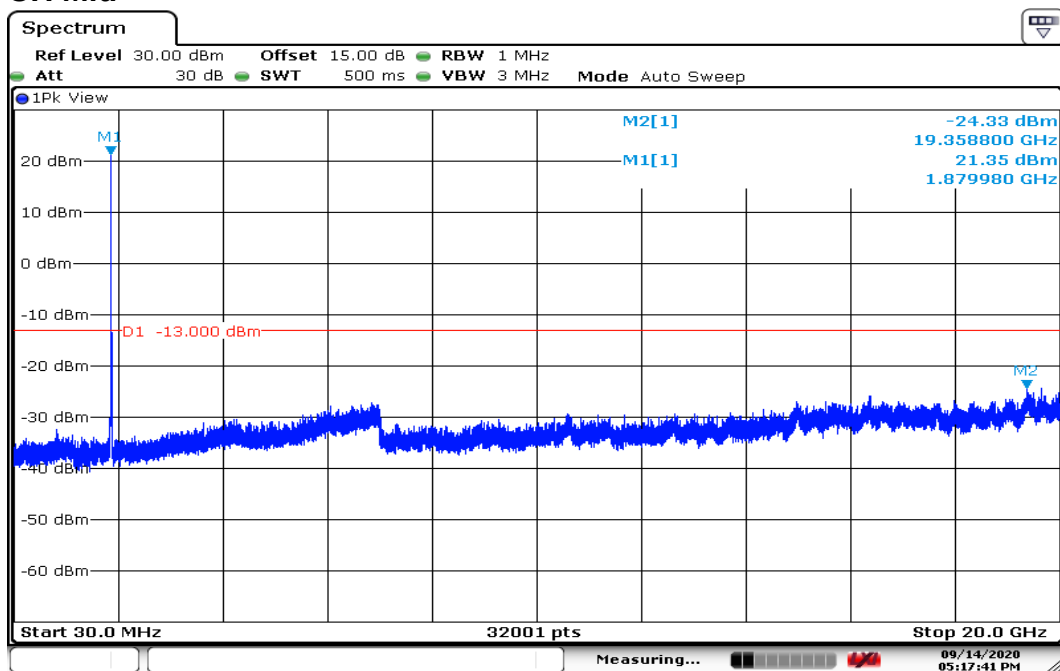
Date: 14 SEP 2020 17:16:23

CHANNEL BANDWIDTH: 10MHz / QPSK CH Low



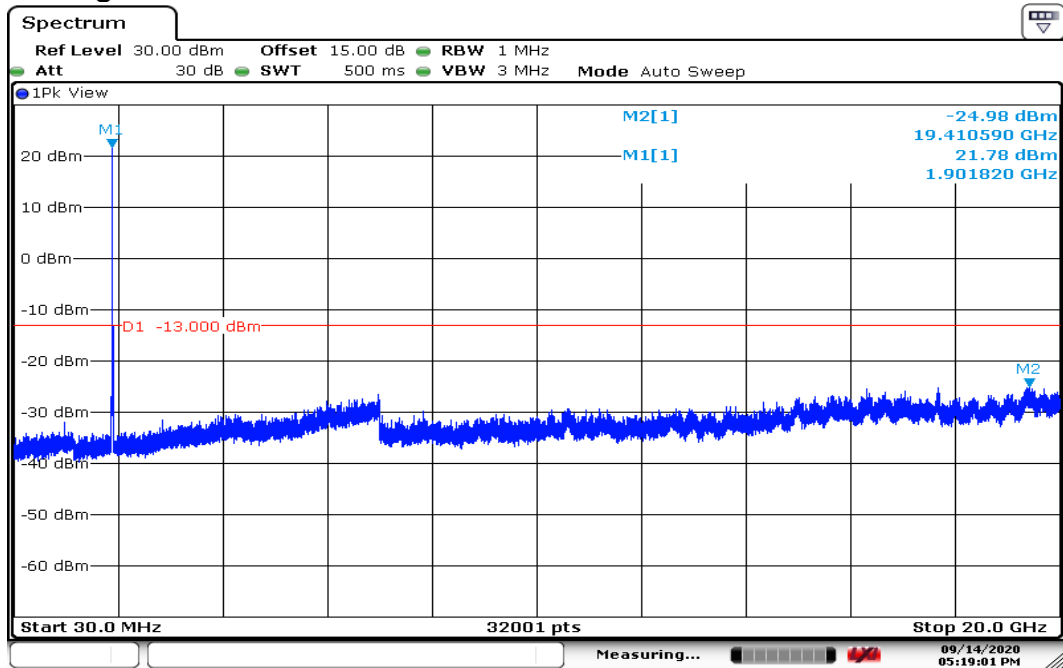
Date: 14 SEP 2020 17:18:08

CH Mid



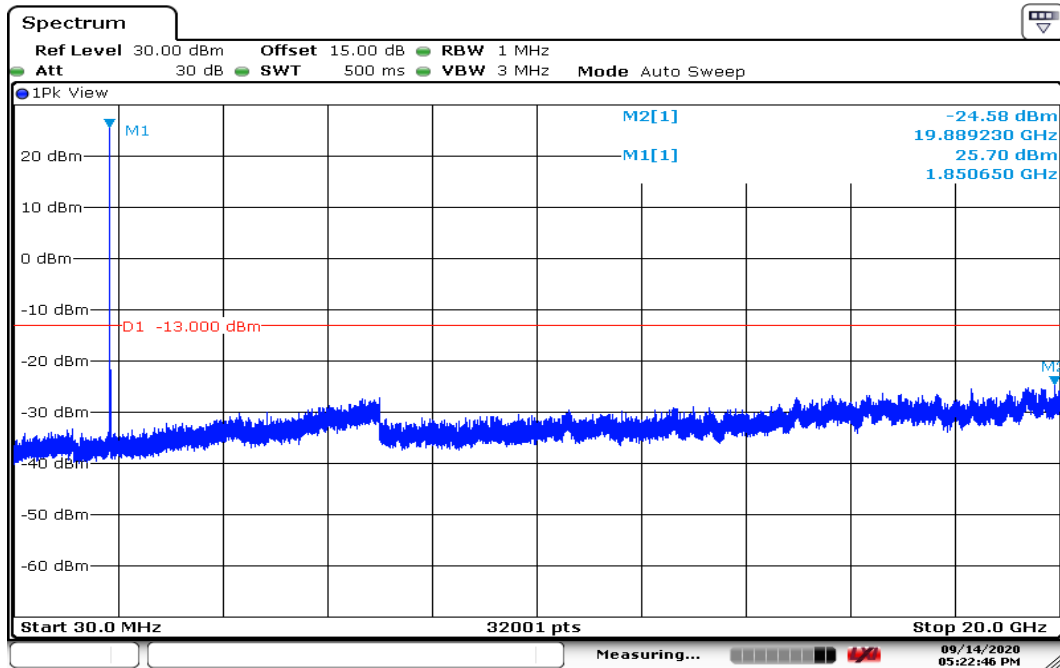
Date: 14 SEP 2020 17:17:42

CH High



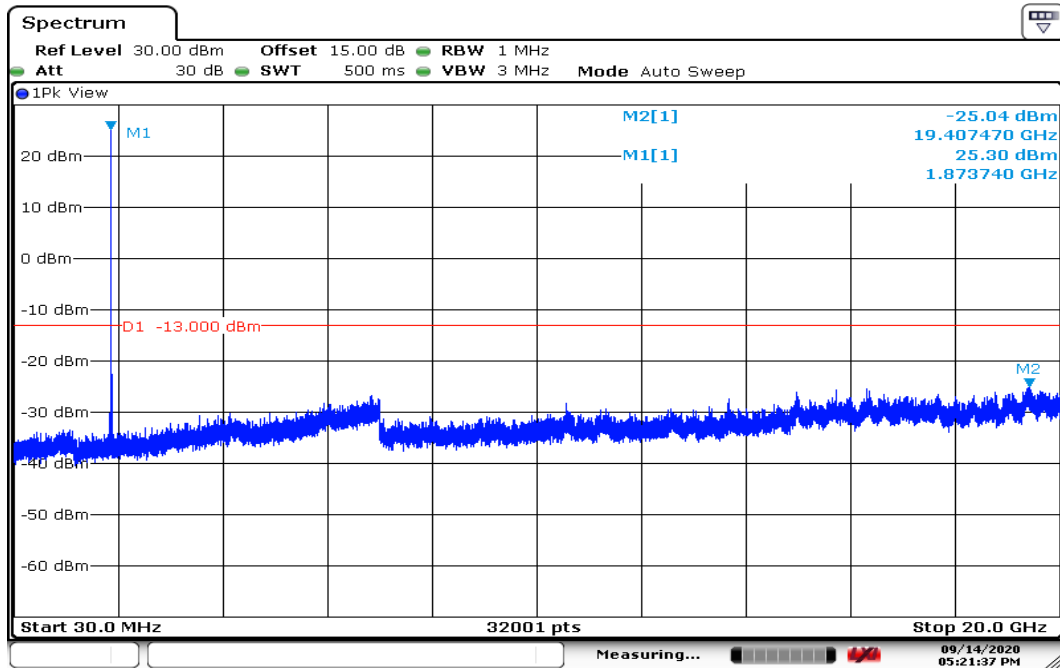
Date: 14 SEP 2020 17:19:01

CHANNEL BANDWIDTH: 15MHz / QPSK CH Low



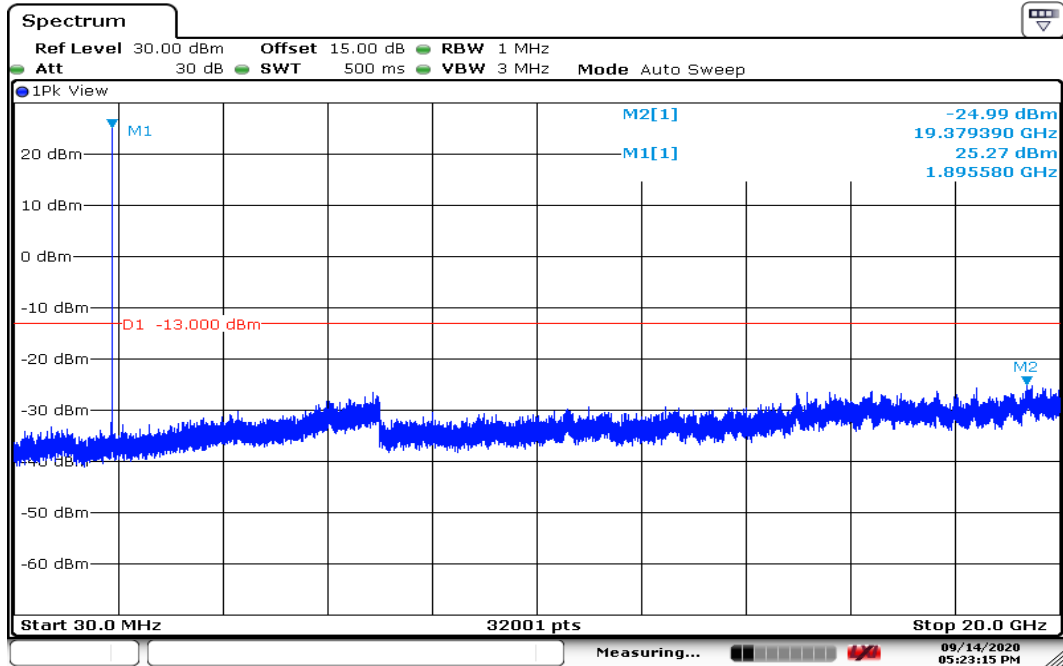
Date: 14 SEP 2020 17:22:47

CH Mid



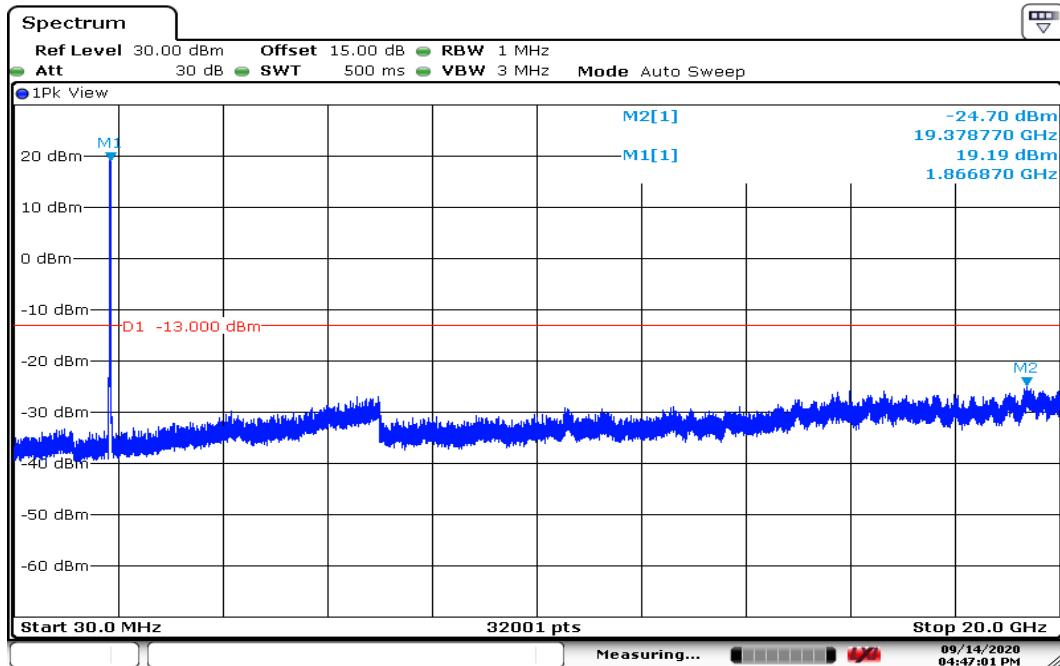
Date: 14 SEP 2020 17:21:37

CH High



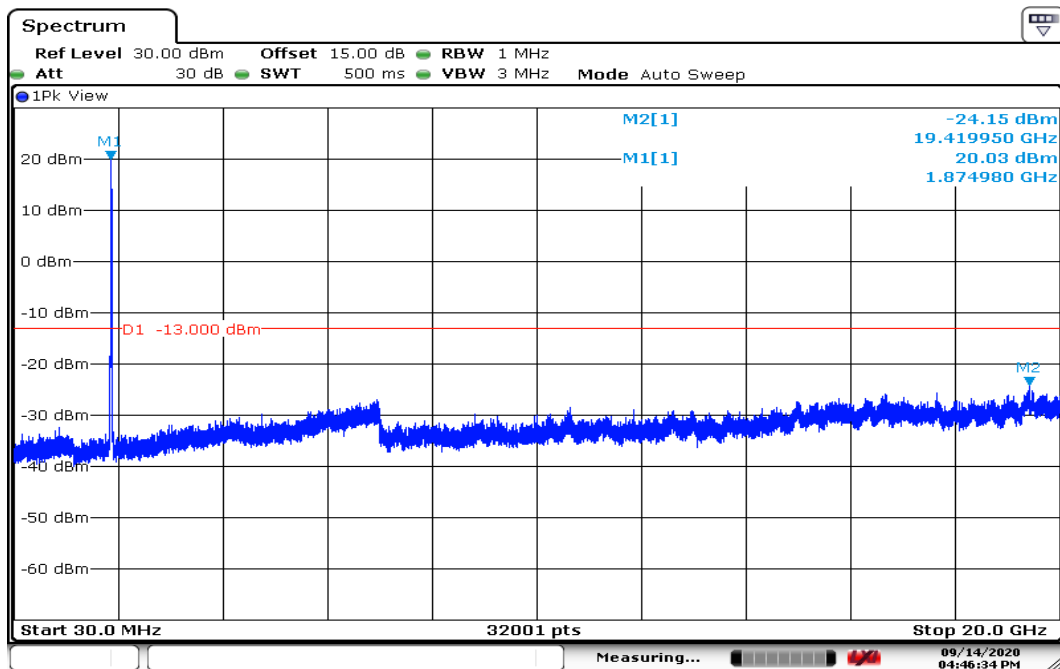
Date: 14 SEP 2020 17:23:15

CHANNEL BANDWIDTH: 20MHz / QPSK CH Low



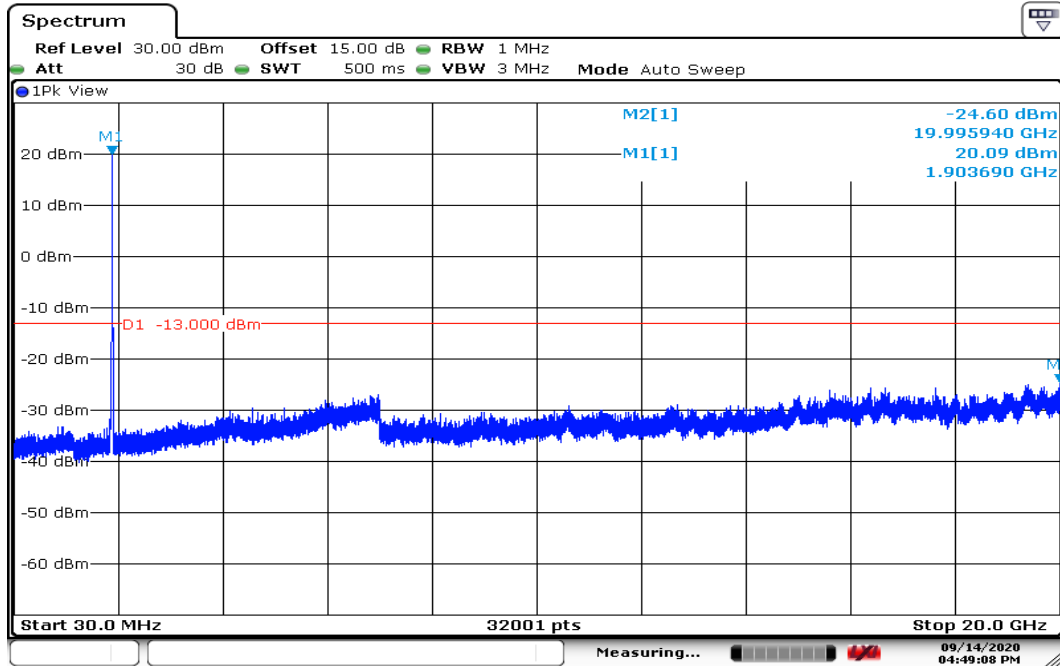
Date: 14 SEP 2020 16:47:01

CH Mid



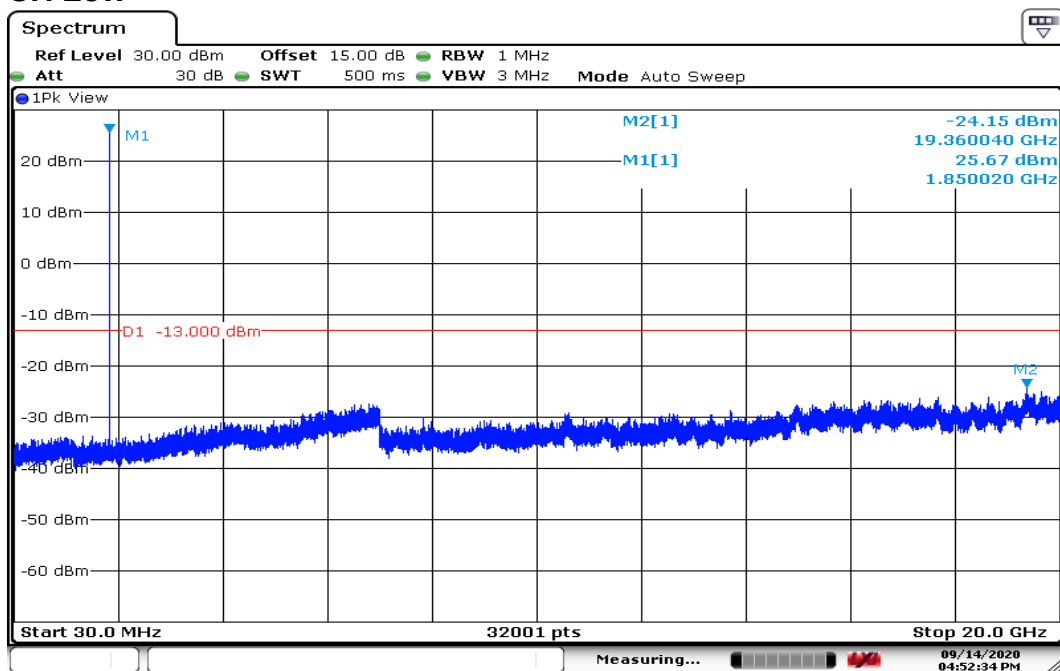
Date: 14 SEP 2020 16:46:34

CH High



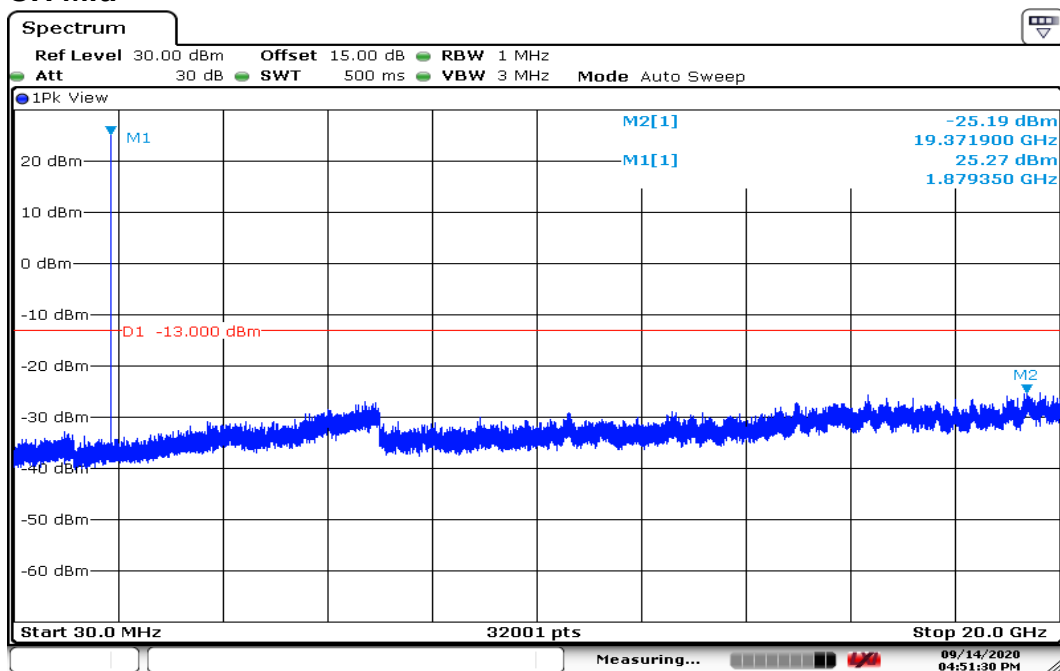
Date: 14 SEP 2020 16:49:09

CHANNEL BANDWIDTH: 1.4MHz / 16QAM CH Low



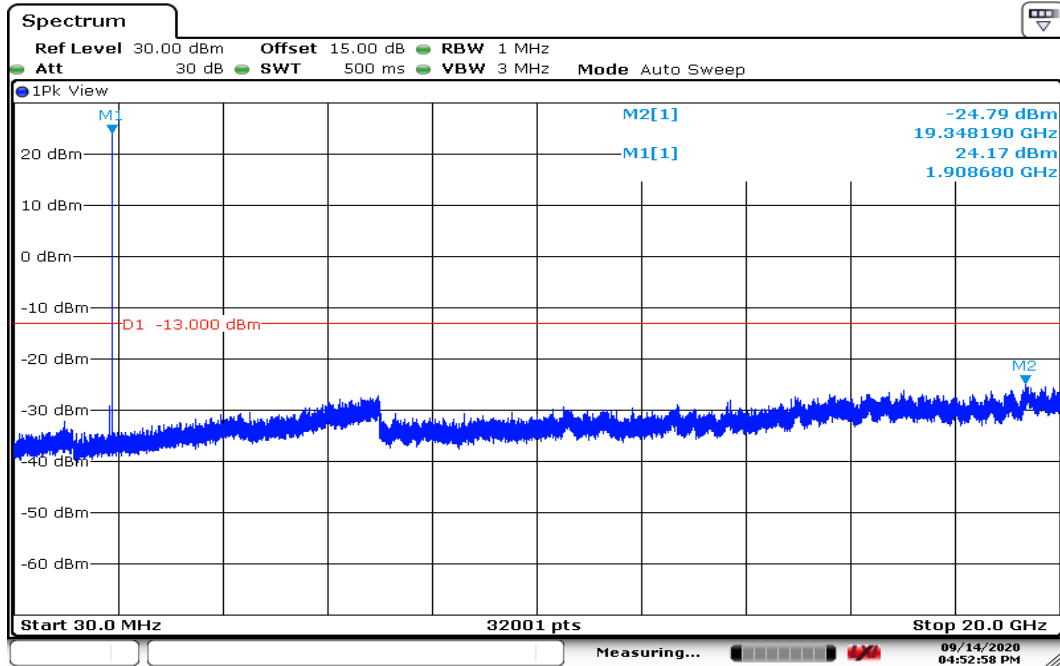
Date: 14 SEP 2020 16:52:35

CH Mid



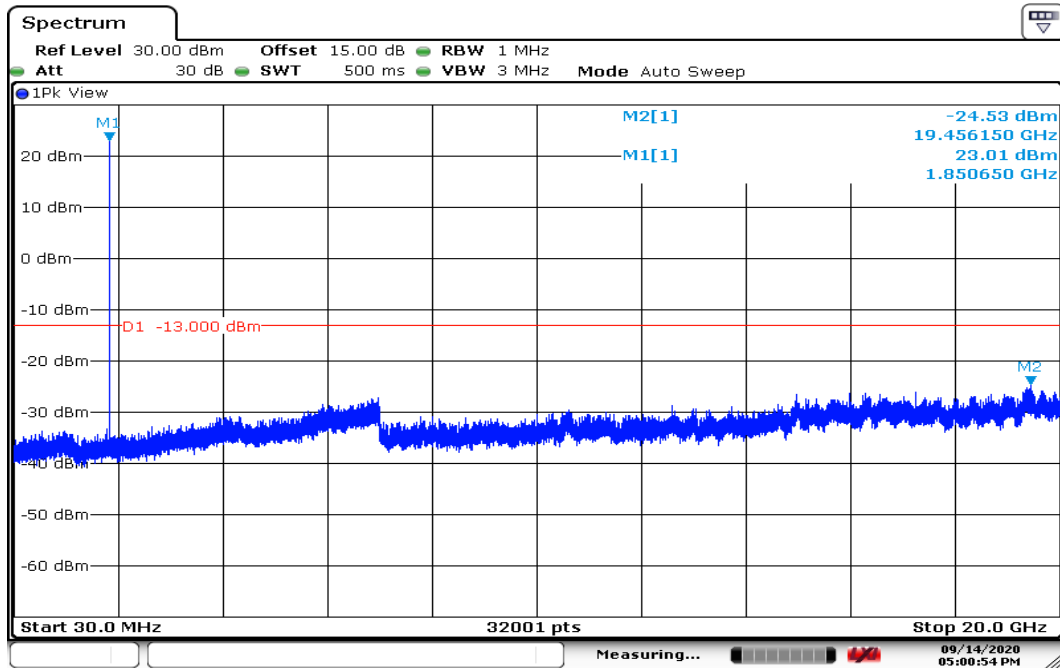
Date: 14 SEP 2020 16:51:30

CH High



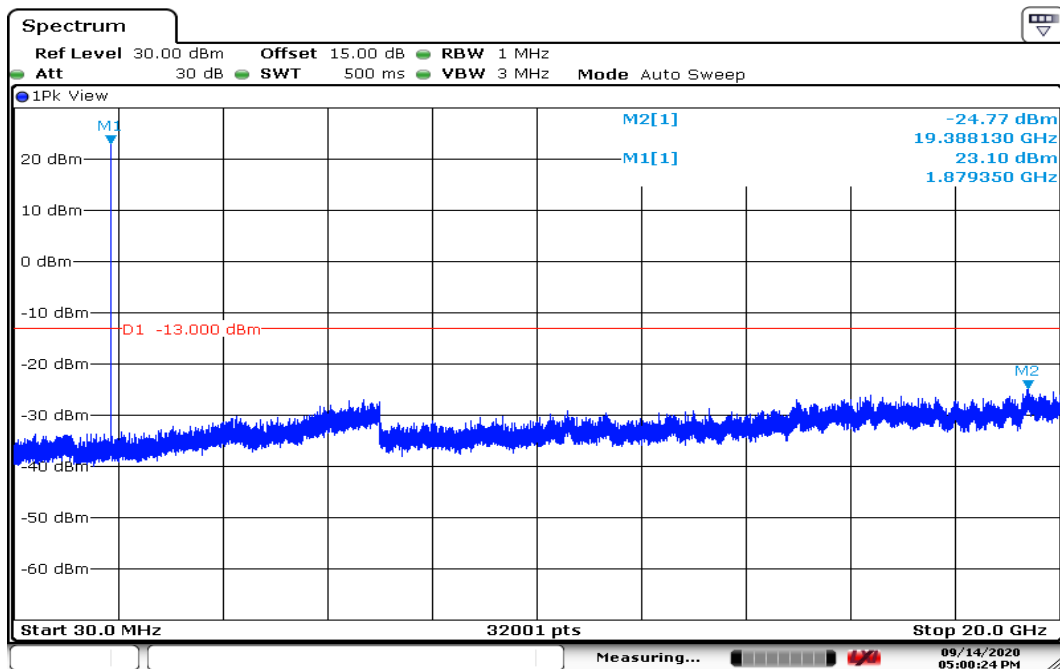
Date: 14 SEP 2020 16:52:58

CHANNEL BANDWIDTH: 3MHz / 16QAM CH Low



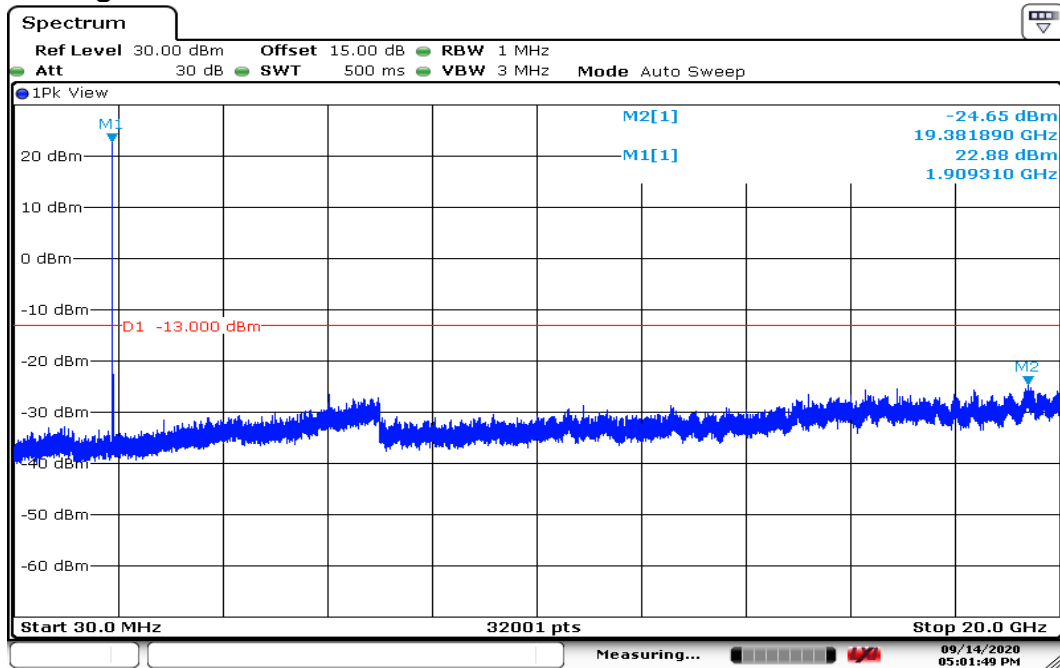
Date: 14 SEP 2020 17:00:55

CH Mid



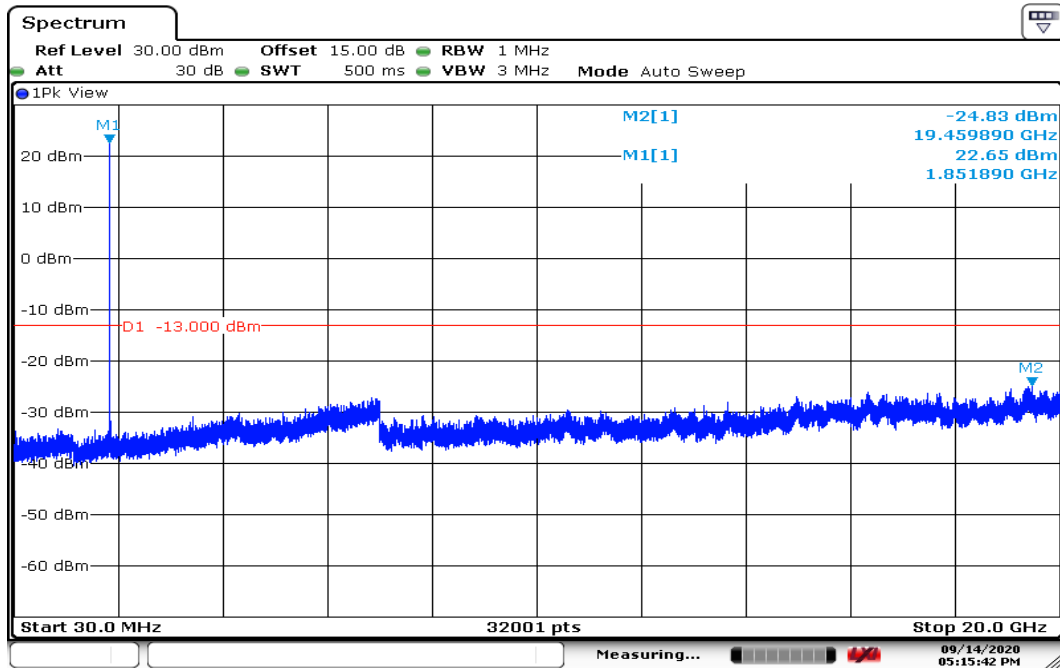
Date: 14 SEP 2020 17:00:25

CH High



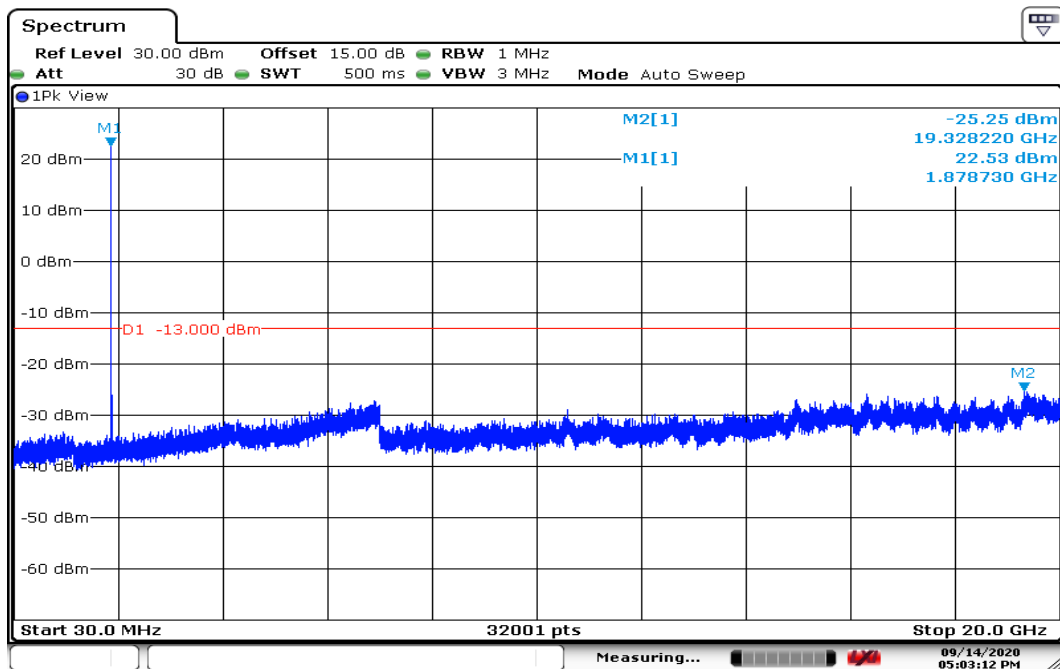
Date: 14 SEP 2020 17:01:49

CHANNEL BANDWIDTH: 5MHz / 16QAM CH Low



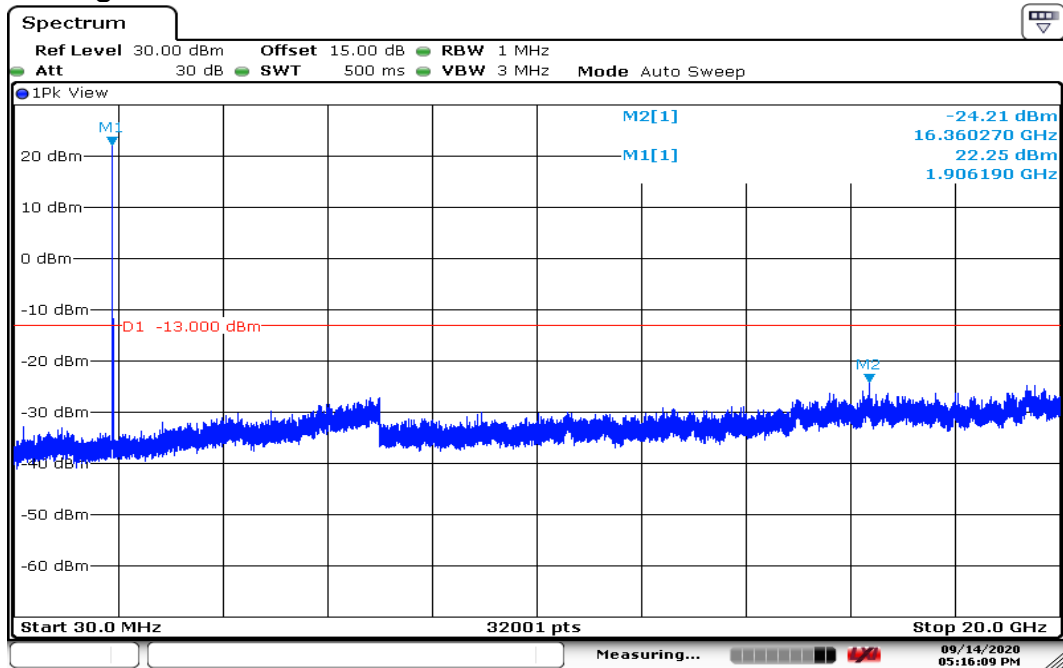
Date: 14 SEP 2020 17:15:43

CH Mid



Date: 14 SEP 2020 17:03:13

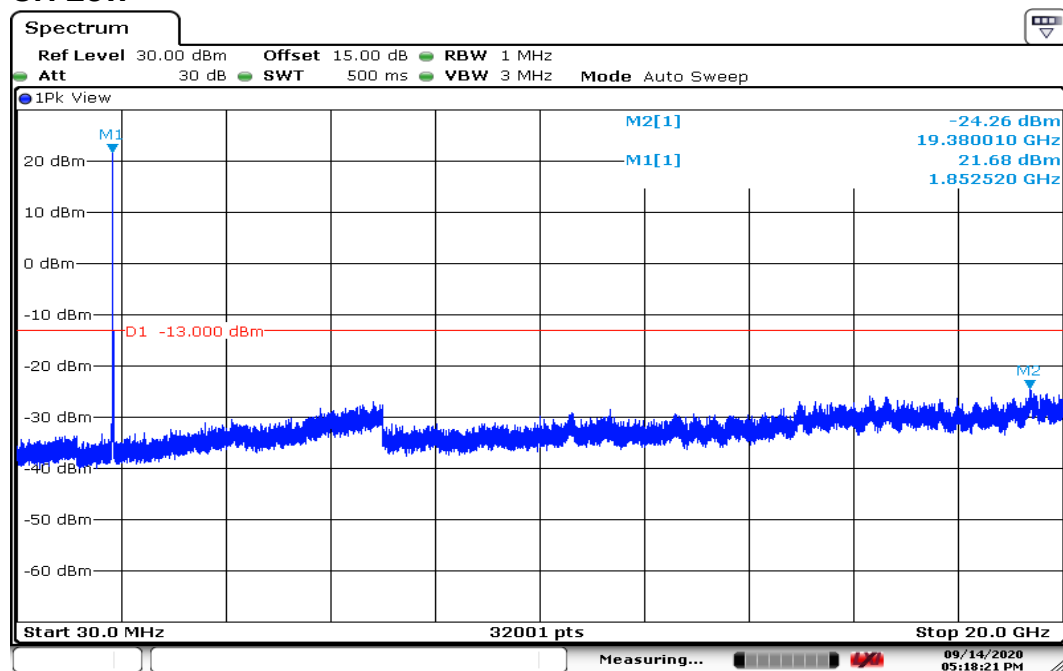
CH High



Date: 14 SEP 2020 17:16:09

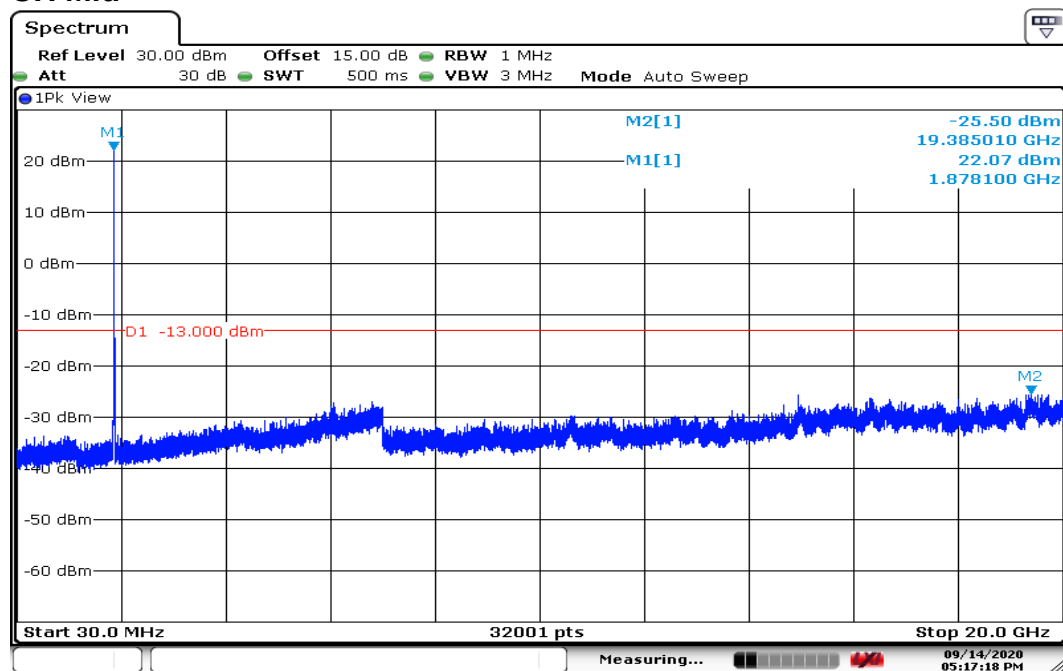
CHANNEL BANDWIDTH: 10MHz / 16QAM

CH Low



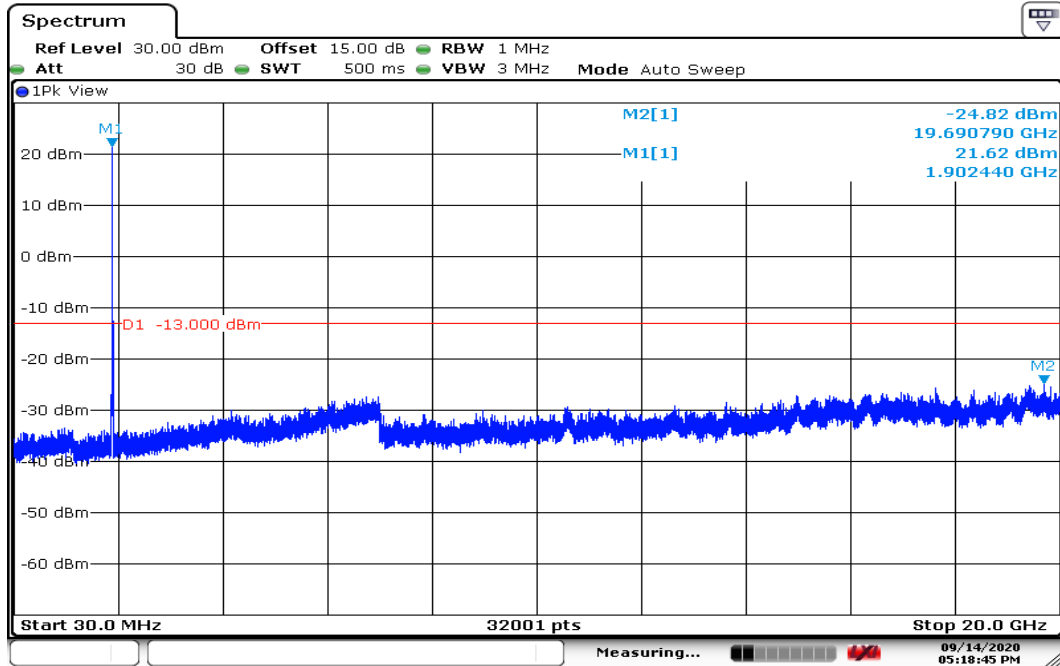
Date: 14 SEP 2020 17:18:21

CH Mid



Date: 14 SEP 2020 17:17:18

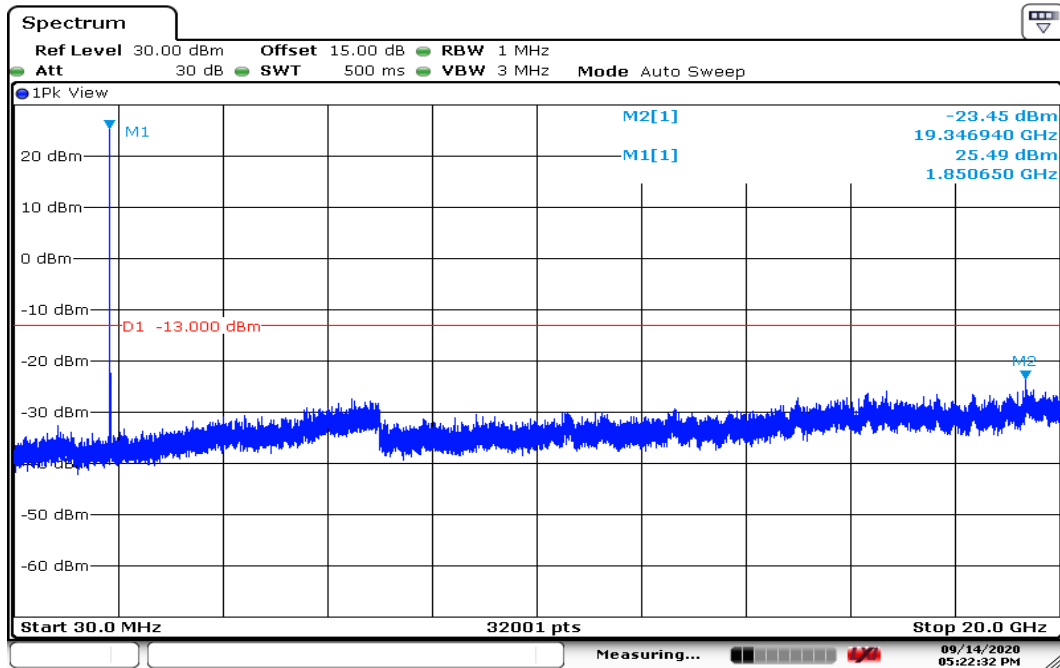
CH High



Date: 14 SEP 2020 17:18:45

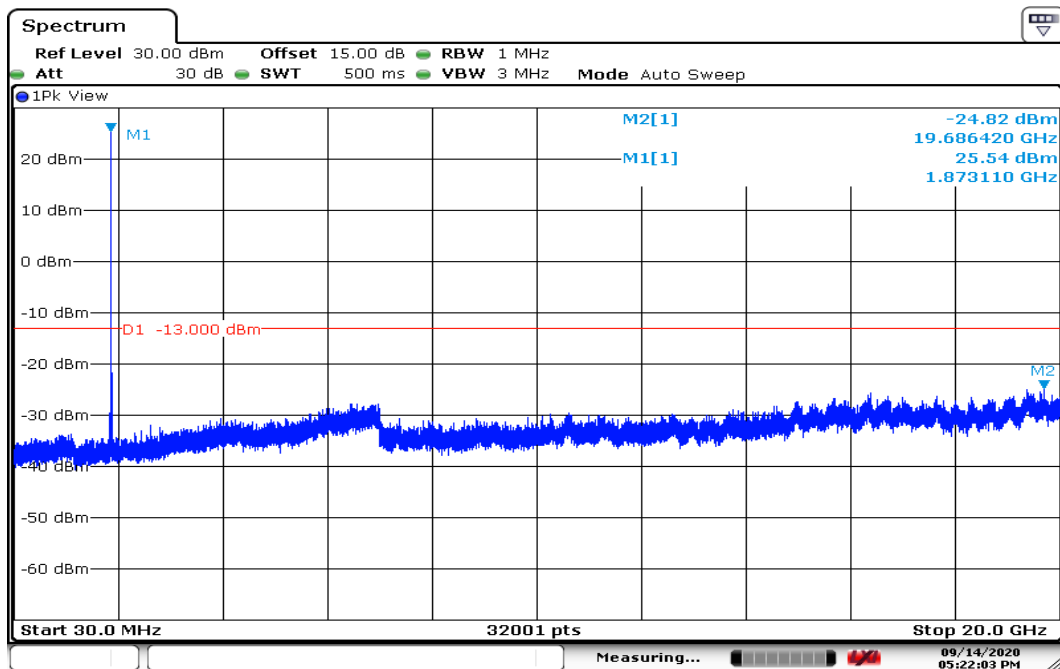
Report No.: T200825W02-RP3

CHANNEL BANDWIDTH: 15MHz / 16QAM CH Low



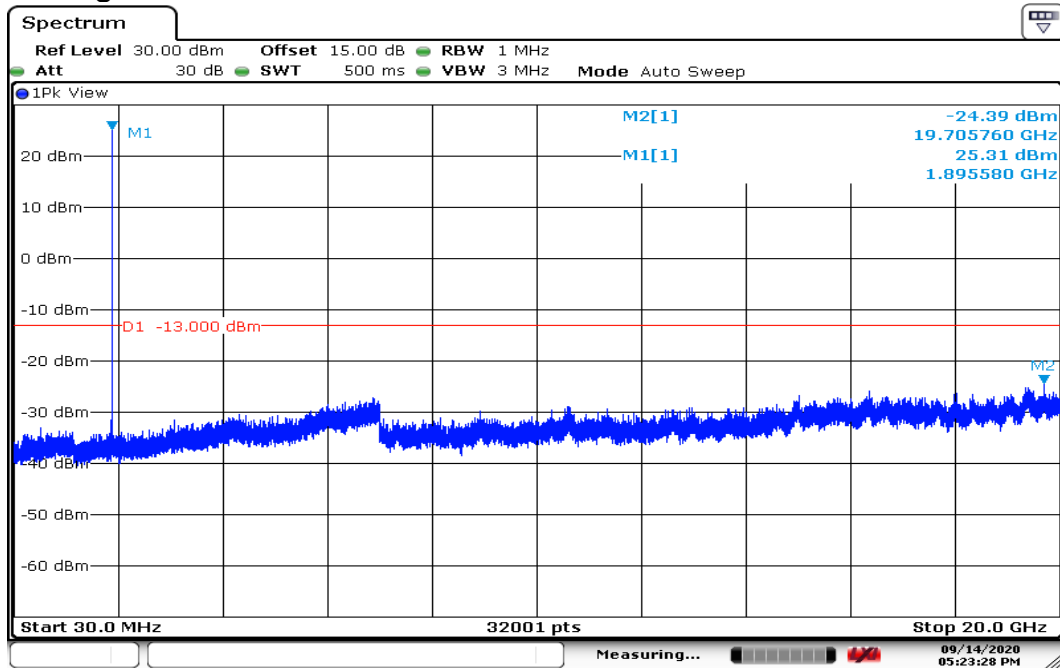
Date: 14 SEP 2020 17:22:32

CH Mid



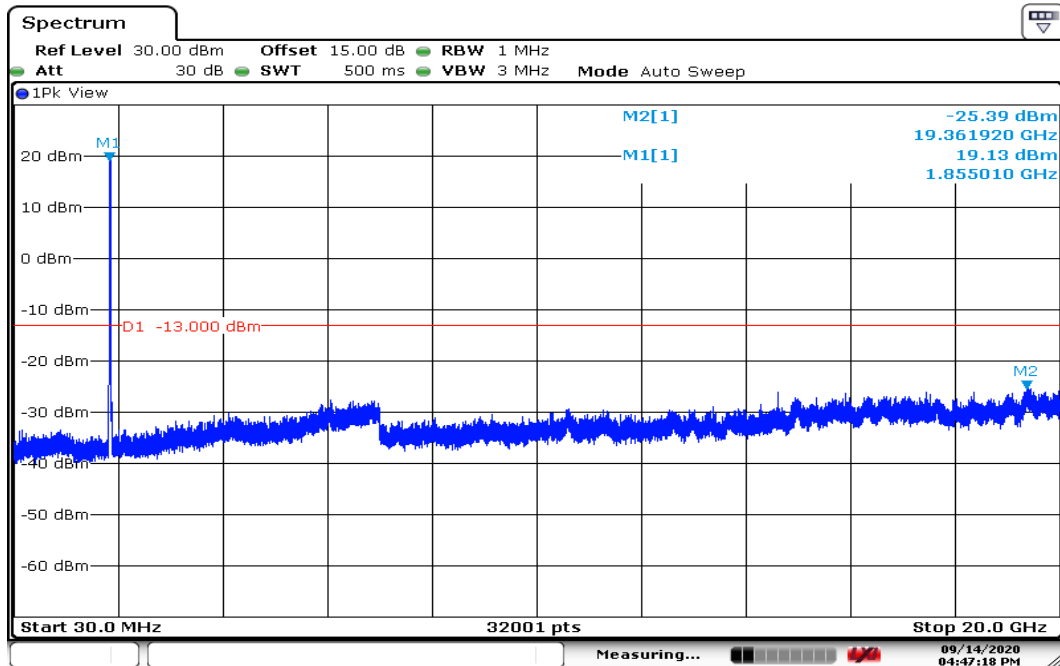
Date: 14 SEP 2020 17:22:03

CH High



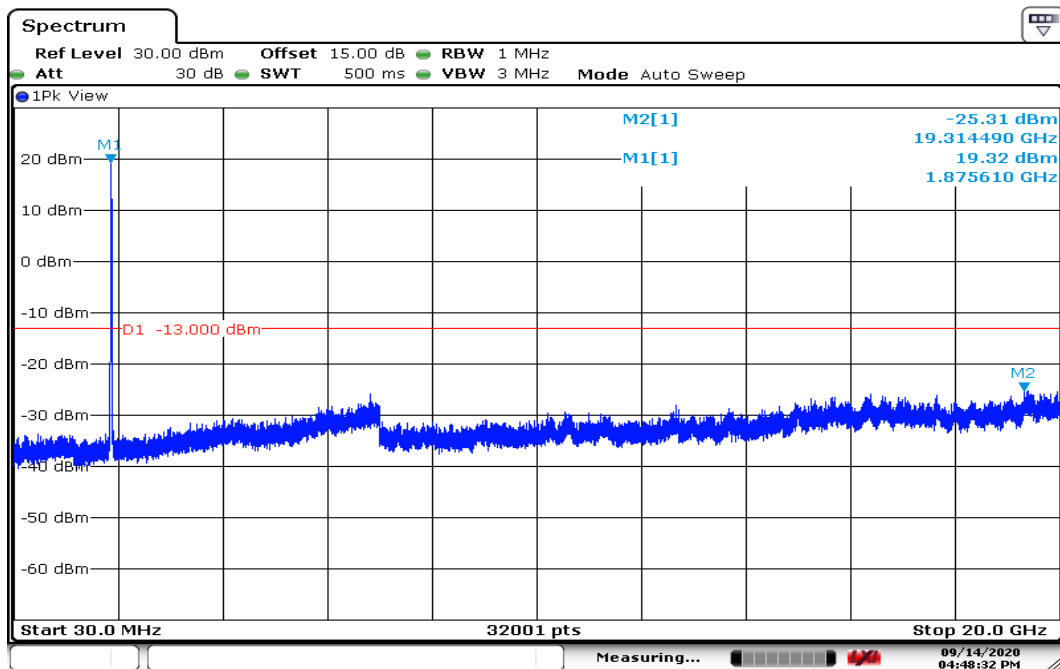
Date: 14 SEP 2020 17:23:28

CHANNEL BANDWIDTH: 20MHz / 16QAM CH Low



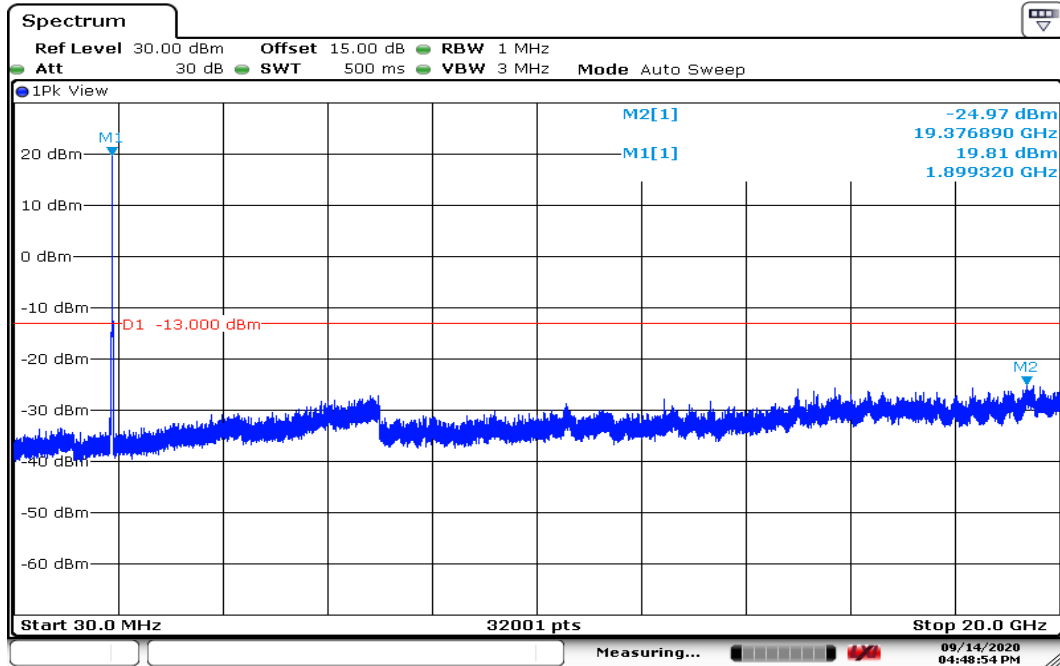
Date: 14 SEP 2020 16:47:19

CH Mid



Date: 14 SEP 2020 16:48:32

CH High



Date: 14 SEP 2020 16:48:55

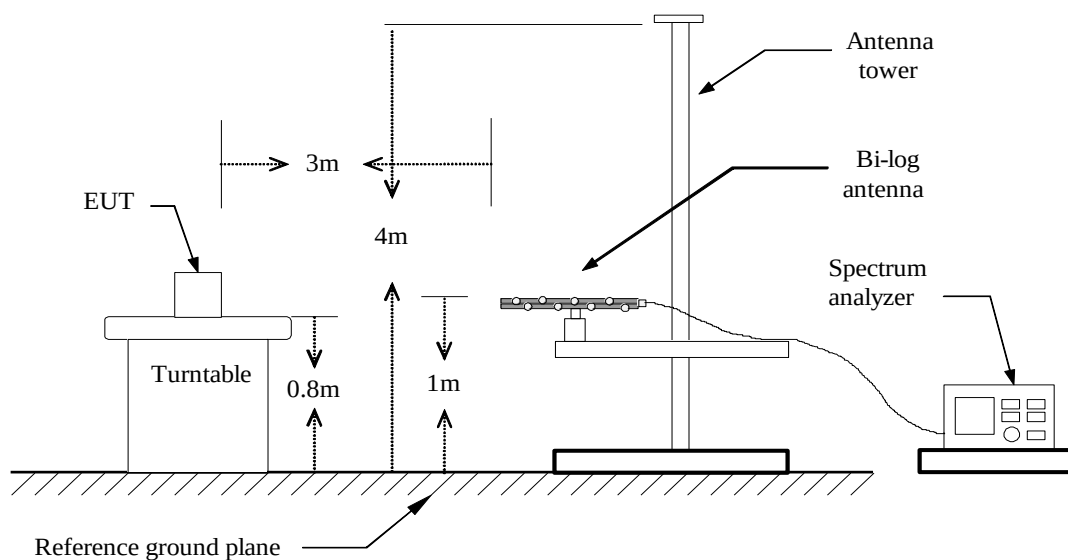
8.7 SPURIOUS RADIATION MEASUREMENT

LIMIT

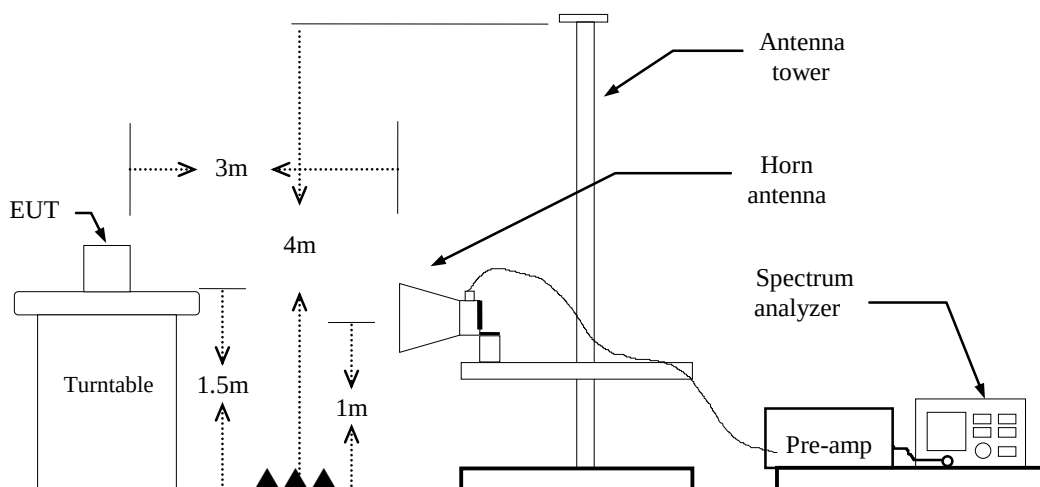
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

Test Configuration

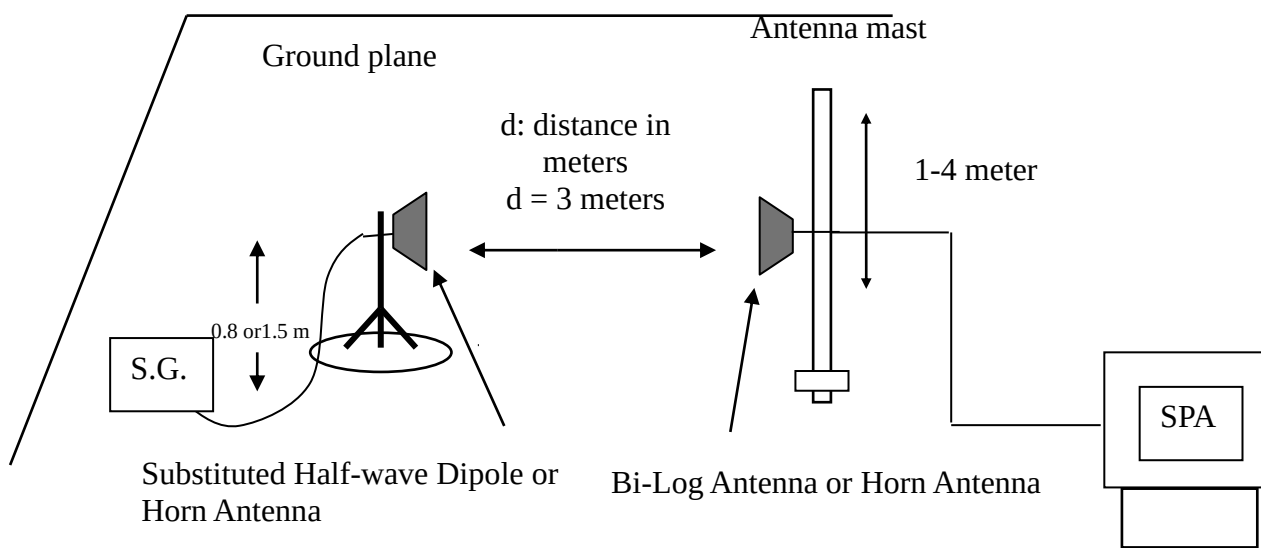
Below 1 GHz



Above 1 GHz



Substituted Method Test Set-up



TEST PROCEDURE

1. According to KDB 971168 D01 Power Meas License Digital Systems and TIA-603-E Section 2.2.12.
2. The EUT was placed on a turntable
 - (1) Below 1G : 0.8m
 - (2) Above 1G : 0.8m
 - (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

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

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

TEST RESULTS

Refer to the attached tabular data sheets.

Remark: Above 1GHz

Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Results

LTE Band 2 / BW: 20MHz / QPSK / RB =1, RB Offset = 0

Operation Mode: Tx / Low CH

Test Date:

December 29, 2020

Temperature: 20.4°C

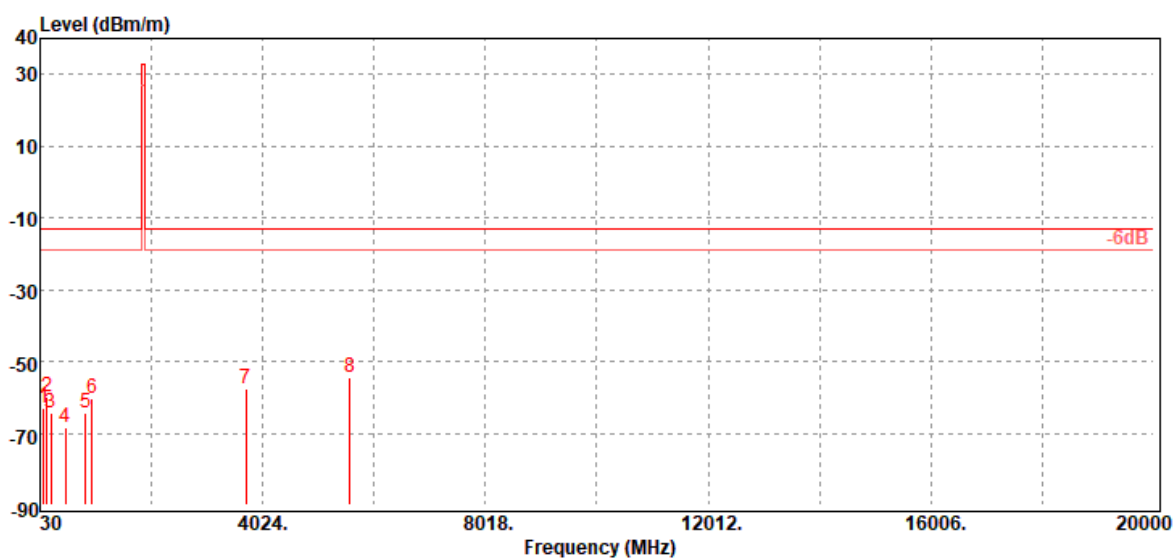
Tested by:

Jerry Chang

Humidity: 66% 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)
100.81	-63.04	-53.76	-8.46	-0.82	-13.00	-50.04	V
148.34	-60.05	-51.78	-7.27	-1.00	-13.00	-47.05	V
221.09	-64.38	-61.18	-1.98	-1.22	-13.00	-51.38	V
488.81	-68.33	-64.27	-2.22	-1.84	-13.00	-55.33	V
846.74	-64.34	-60.52	-1.37	-2.45	-13.00	-51.34	V
958.29	-60.14	-56.25	-1.27	-2.62	-13.00	-47.14	V
3720.00	-57.40	-64.13	12.46	-5.73	-13.00	-44.40	V
5580.00	-54.47	-60.50	13.14	-7.11	-13.00	-41.47	V

Operation Mode: Tx / Low CH

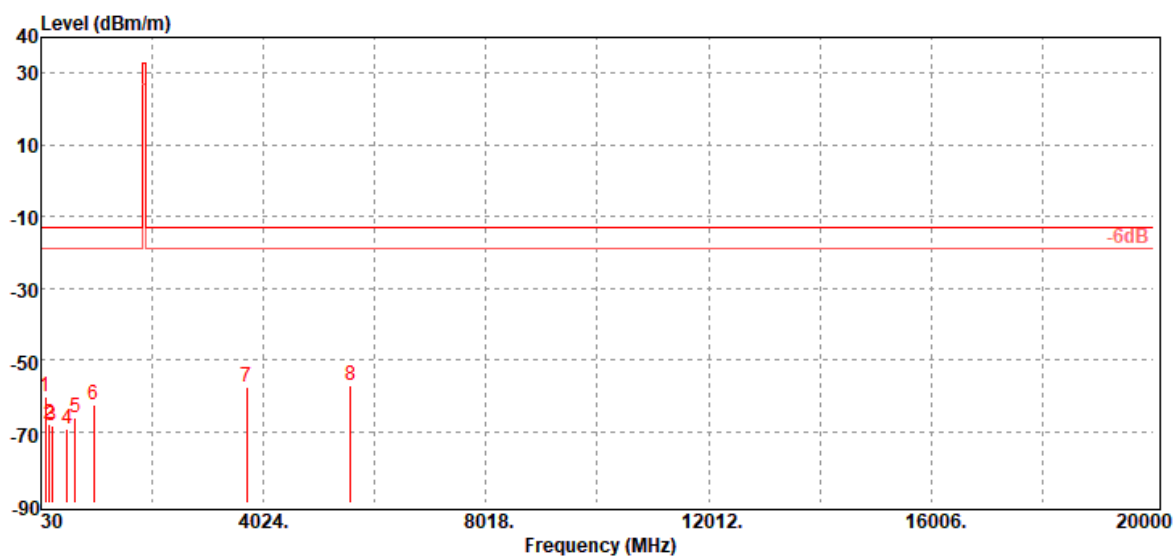
Test Date: December 29, 2020

Temperature: 20.4°C

Tested by: Jerry Chang

Humidity: 66% 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)
102.75	-60.14	-50.43	-8.88	-0.83	-13.00	-47.14	H
175.50	-67.88	-61.94	-4.85	-1.09	-13.00	-54.88	H
221.09	-68.27	-65.07	-1.98	-1.22	-13.00	-55.27	H
497.54	-69.38	-65.52	-2.00	-1.86	-13.00	-56.38	H
650.80	-66.02	-62.19	-1.68	-2.15	-13.00	-53.02	H
973.81	-62.68	-58.66	-1.38	-2.64	-13.00	-49.68	H
3720.00	-57.48	-64.21	12.46	-5.73	-13.00	-44.48	H
5580.00	-57.10	-63.13	13.14	-7.11	-13.00	-44.10	H

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Operation Mode: Tx / Mid CH

Test Date:

December 29, 2020

Temperature: 20.4°C

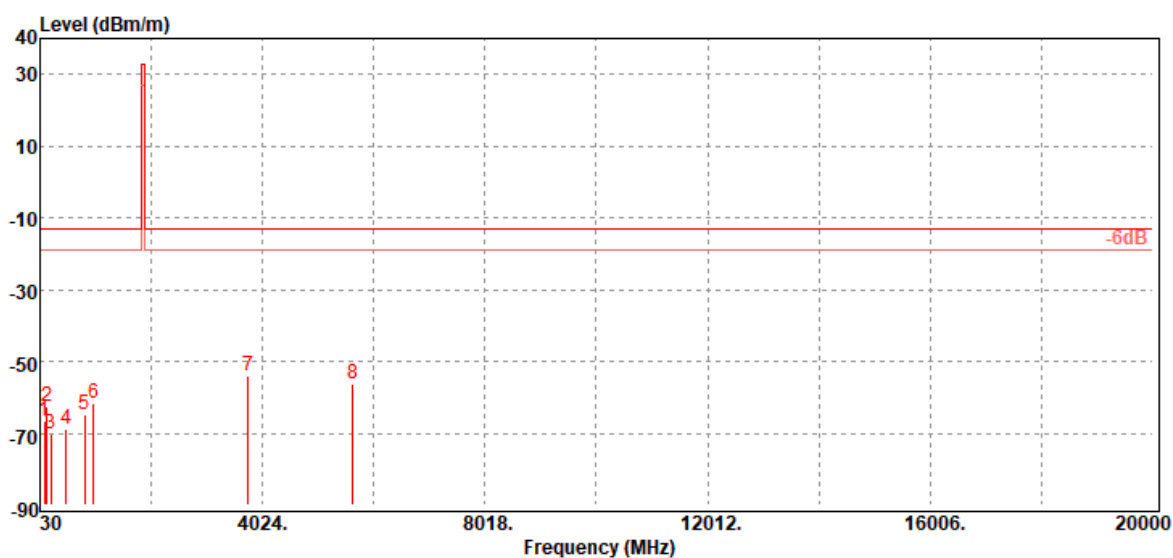
Tested by:

Jerry Chang

Humidity: 66% 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)
102.75	-66.56	-56.85	-8.88	-0.83	-13.00	-53.56	V
149.31	-62.54	-54.37	-7.17	-1.00	-13.00	-49.54	V
221.09	-70.04	-66.84	-1.98	-1.22	-13.00	-57.04	V
500.45	-68.88	-65.02	-1.99	-1.87	-13.00	-55.88	V
825.40	-64.65	-60.74	-1.50	-2.41	-13.00	-51.65	V
995.15	-61.71	-57.64	-1.40	-2.67	-13.00	-48.71	V
3760.00	-53.91	-60.57	12.42	-5.76	-13.00	-40.91	V
5640.00	-56.32	-62.44	13.26	-7.14	-13.00	-43.32	V

Operation Mode: Tx / Mid CH

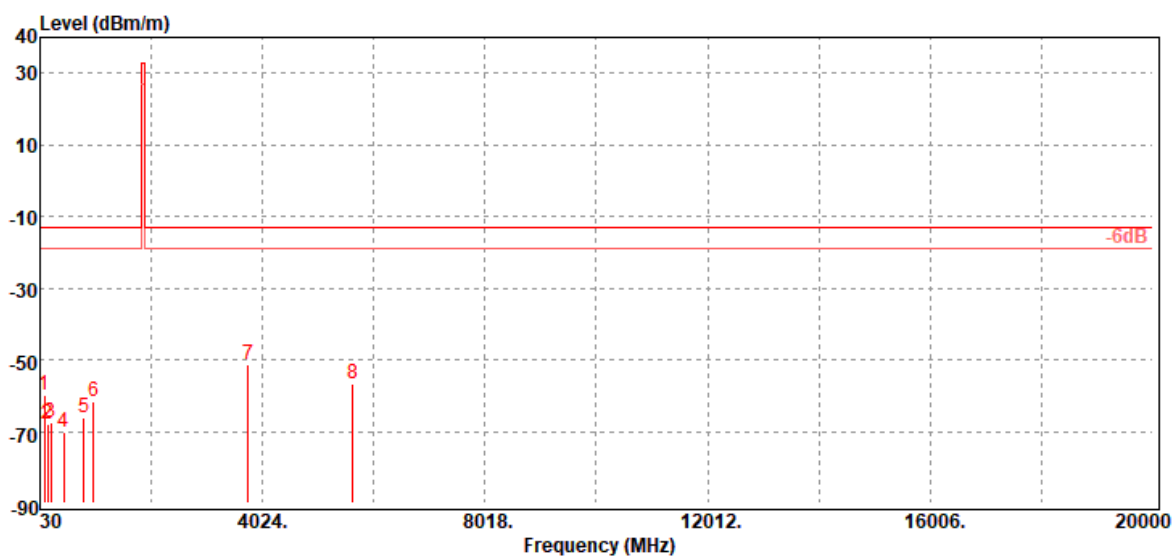
Test Date: December 29, 2020

Temperature: 20.4°C

Tested by: Jerry Chang

Humidity: 66% RH

Polarity: Hor.



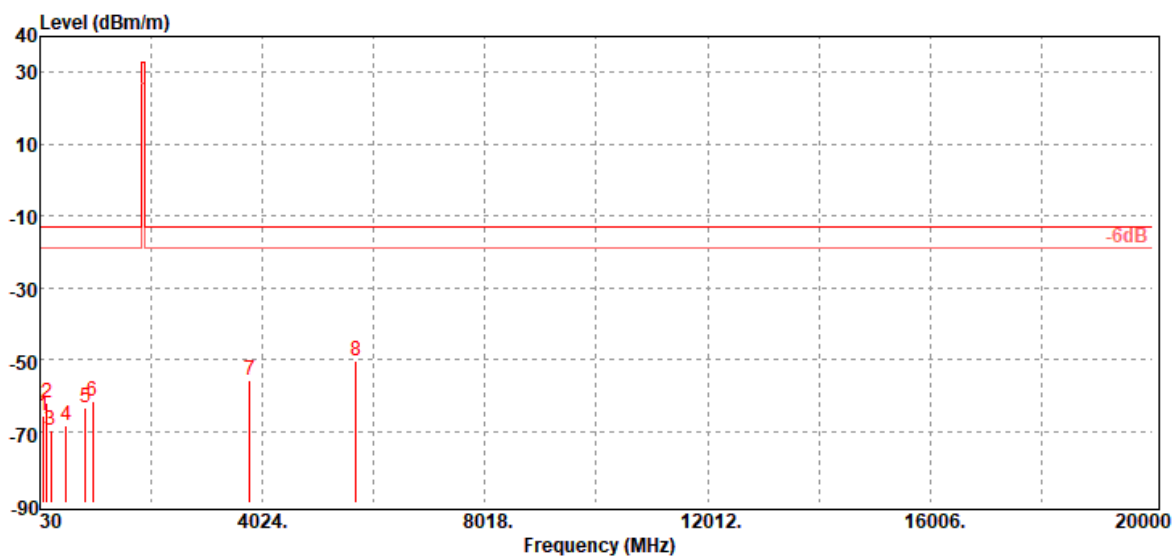
Freq. (MHz)	ERP/EIRP (dBm)	SG Output Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
102.75	-59.64	-49.93	-8.88	-0.83	-13.00	-46.64	H
173.56	-67.97	-61.90	-4.99	-1.08	-13.00	-54.97	H
219.15	-67.40	-64.16	-2.02	-1.22	-13.00	-54.40	H
453.89	-70.03	-66.16	-2.10	-1.77	-13.00	-57.03	H
817.64	-66.04	-62.13	-1.51	-2.40	-13.00	-53.04	H
985.45	-61.79	-57.73	-1.40	-2.66	-13.00	-48.79	H
3760.00	-51.17	-57.83	12.42	-5.76	-13.00	-38.17	H
5640.00	-56.50	-62.62	13.26	-7.14	-13.00	-43.50	H

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Operation Mode: Tx / High CH
Temperature: 20.4°C
Humidity: 66% RH

Test Date: December 29, 2020
Tested by: Jerry Chang
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)
100.81	-65.86	-56.58	-8.46	-0.82	-13.00	-52.86	V
149.31	-62.30	-54.13	-7.17	-1.00	-13.00	-49.30	V
221.09	-69.90	-66.70	-1.98	-1.22	-13.00	-56.90	V
498.51	-68.36	-64.49	-2.00	-1.87	-13.00	-55.36	V
842.86	-63.64	-59.80	-1.40	-2.44	-13.00	-50.64	V
972.84	-61.76	-57.76	-1.36	-2.64	-13.00	-48.76	V
3800.00	-55.66	-62.37	12.50	-5.79	-13.00	-42.66	V
5700.00	-50.27	-56.20	13.10	-7.17	-13.00	-37.27	V
100.81	-65.86	-56.58	-8.46	-0.82	-13.00	-52.86	V

Operation Mode: Tx / High CH

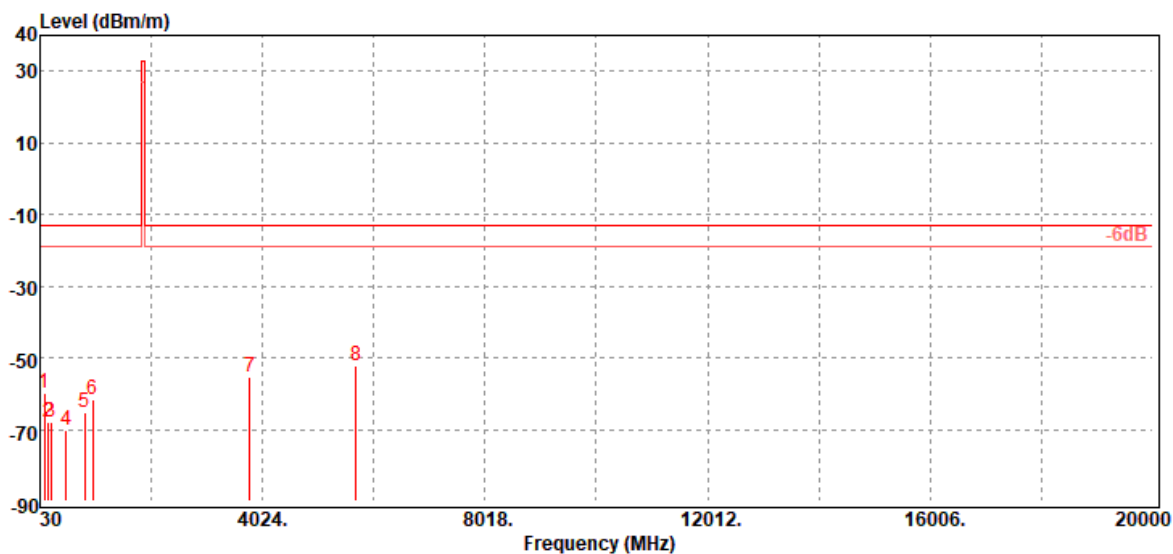
Test Date: December 29, 2020

Temperature: 20.4°C

Tested by: Jerry Chang

Humidity: 66% 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)
102.75	-59.99	-50.28	-8.88	-0.83	-13.00	-46.99	H
175.50	-67.81	-61.87	-4.85	-1.09	-13.00	-54.81	H
221.09	-67.94	-64.74	-1.98	-1.22	-13.00	-54.94	H
500.45	-70.19	-66.33	-1.99	-1.87	-13.00	-57.19	H
827.34	-65.28	-61.36	-1.50	-2.42	-13.00	-52.28	H
980.60	-61.82	-57.86	-1.31	-2.65	-13.00	-48.82	H
3800.00	-55.55	-62.26	12.50	-5.79	-13.00	-42.55	H
5700.00	-52.40	-58.33	13.10	-7.17	-13.00	-39.40	H
102.75	-59.99	-50.28	-8.88	-0.83	-13.00	-46.99	H

- End of Test Report -