FCC 47 CFR PART 27 SUBPART L

TEST REPORT

For

ActiveHome

Model No.: AH11-22-11

Trade Name: Upstreem S.A

Issued to

UPSTREEM S.A
Rue de Gosselies 13/9 Jumet 6040 Belgium

Issued by

Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City, Taiwan. (R.O.C.)
Issued Date: July 22, 2021

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	July 22, 2021	Initial Issue	ALL	Doris Chu

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1. TEST RESULT CERTIFICATION

Applicant: UPSTREEM S.A
Rue de Gosselies 13/9 Jumet 6040 Belgium

Manufacturer: IMEC Taiwan Co.
4F. No.6-2, Dusing Rd., Hsinchu Science Park, Hsinchu, Taiwan

Equipment Under Test: ActiveHome

Trade Name: Upstreem S.A

Model No.: AH11-22-11

Date of Test: April 14 ~ 21, 2021

APPLICABLE STANDARDS	
Standard	**TEST RESULT**
FCC Part 27, Subpart C, L, FCC Part 2	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.

2. EUT DESCRIPTION

Product	ActiveHome	
Model No.	AH11-22-11	
Model Discrepancy	N/A	
Trade	Upstreem S.A	
Received Date	March 8, 2021	
Power Supply	1. Power from Rechargeable Li-ion Polymer Battery. Rating: 3.7VDC, 650mAh 2. Power from Adapter. I/P: 100-230VAC, 50/60Hz, 0.2A O/P: 5.0VDC, 1.0A	
Modulation Technology	Cat-M1 Band 4	QPSK, 16QAM
Frequency Range	Cat-M1 Band 4 Channel Bandwidth: 1.4MHz	1710.7MHz ~1754.2MHz
	Cat-M1 Band 4 Channel Bandwidth: 3MHz	1711.5MHz ~ 1753.4MHz
	Cat-M1 Band 4 Channel Bandwidth: 5MHz	1712.5MHz ~1752.5MHz
	Cat-M1 Band 4 Channel Bandwidth: 10MHz	1715.0MHz ~1750.0MHz
	Cat-M1 Band 4 Channel Bandwidth: 15MHz	1717.5MHz ~ 1747.5MHz
	Cat-M1 Band 4 Channel Bandwidth: 20MHz	1720MHz ~1745MHz
Antenna Specification	Antenna type: FPC Antenna / Gain: 4.6 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.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

3. TEST METHODOLOGY

3.1 DESCRIPTION OF TEST TYPE

The EUT (model: AH11-22-11) had been tested under operating condition.

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

LTE Band 4: 1710MHz ~ 1755MHz

Three channels had been tested for each channel bandwidth.

Channel Bandwidth	1.4MHz		3MHz		5MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low CH	19957	1710.7	19965	1711.5	19975	1712.5
Middle CH	20175	1732.5	20175	1732.5	20175	1732.5
High CH	20393	1754.3	20384	1753.4	20375	1752.5
Channel Bandwidth	**10MHz**		**15MHz**		**20MHz**	
	Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
Low CH	20000	1715.0	20025	1717.5	20050	1720.00
Middle CH	20175	1732.5	20175	1732.5	20175	1732.50
High CH	20350	1750.0	20325	1747.5	20300	1745.00

3.2 THE WORST MODE OF MEASUREMENT

3.2.1 The worst mode of measurement

Radiated Emission Measurement Above 1G	
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 at X-Plane (E2-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 axis X and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report

4. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
-	2	Antenna Requirement	Pass
27.50(d)	8.1	EIRP Measurement	Pass
2.1055, 27.54	8.2	Frequency Stability v.s. temperature measurement	Pass
2.1049	8.3	Occupied Bandwidth Measurement	Pass
27.50(d)	8.4	Peak to Average Ratio	Pass
27.53(h)	8.5	Conducted Band Edge	Pass
27.53(h)	8.6	Conducted Spurious Emission	Pass
27.53(h)	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

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/08/2021	02/07/2022
Bilog Antenna	Sunol Sciences	JB3	A030105	07/24/2020	07/23/2021
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/24/2021	02/23/2022
Coaxial Cable	EMCI	EMC105	190914+327109/4	09/19/2020	09/18/2021
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/06/2021	01/05/2022
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	09/30/2020	09/29/2021
Loop Ant	COM-POWER	AL-130	121051	04/07/2021	04/06/2022
Pre-Amplifier	EMEC	EM330	060609	02/24/2021	02/23/2022
Pre-Amplifier	HP	8449B	3008A00965	12/25/2020	12/24/2021
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
Software	e3 6.11-20180413				

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
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
Wideband Radio Communication Tester	R&S	CMW 500	116875	07/19/2020	07/18/2021
Software	e3 6.11-20180413				

RF Conducted Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Coaxial Cable	Woken	WC12	CC001	06/29/2020	06/28/2021
Coaxial Cable	Woken	WC12	CC003	06/29/2020	06/28/2021
Power Divider	Solvang Technology	STI08-0015	008	08/05/2020	08/04/2021
Signal Analyzer	R&S	FSV 40	101561	08/17/2020	08/16/2021
Thermostatic/Humidity Chamber	GWINSTEK	GTC-288MH-CC	TH160402	05/07/2020	05/06/2021
Radio Communication Analyzer	Anritsu	MT-8821C	6201300618	05/27/2020	05/26/2021
Software	N/A				

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

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, Taiwan. (R.O.C.)
Tel: 886-2-2299-9720 / Fax: 886-2-2299-9721:

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
1	DC Power Source	Agilent	E3640A	N/A	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 EIRP MEASUREMENT

LIMIT

According to FCC §2.1046

FCC 27.50 (d) (4): Fixed, mobile, and portable (handheld)stations operating in the 1710-1755MHz band and mobile and portable stations operating in the 1695-1710MHz and 1755-1780MHz bands are limited to 1 watt EIRP.

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

Temperature:	22.4℃	**Humidity:**	52.1% RH
Tested by:	Dally Hong	**Test Date:**	April 15, 2021

LTE Band 4

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			EIRP Power(dBm)		
						19957	20175	20393	19957	20175	20393
						1710.7 MHz	1732.5 MHz	1754.3 MHz	1710.7 MHz	1732.5 MHz	1754.3 MHz
LTE Band 4	1.4	QPSK	1	0	0	22.15	22.12	22.02	**26.75**	26.72	26.62
			1	2	0	22.06	22.03	21.99	26.66	26.63	26.59
			1	5	0	21.93	21.79	21.78	26.53	26.39	26.38
			3	0	0	21.03	20.80	20.63	25.63	25.40	25.23
			3	2	0	20.91	20.77	20.61	25.51	25.37	25.21
			3	3	0	20.90	20.75	20.60	25.50	25.35	25.20
			6	0	0	19.93	19.96	19.86	24.53	24.56	24.46
		16QAM	1	0	0	21.00	21.03	20.87	25.60	25.63	25.47
			1	2	0	20.94	20.90	20.80	25.54	25.50	25.40
			1	5	0	20.80	20.76	20.84	25.40	25.36	25.44
			3	0	0	19.87	19.93	20.07	24.47	24.53	24.67
			3	2	0	19.59	19.78	19.35	24.19	24.38	23.95
			3	3	0	19.73	19.48	19.23	24.33	24.08	23.83
			5	0	0	20.06	19.93	19.78	24.66	24.53	24.38

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			EIRP Power(dBm)		
						19965	20175	20385	19965	20175	20385
						1711.5 MHz	1732.5 MHz	1753.5 MHz	1711.5 MHz	1732.5 MHz	1753.5 MHz
LTE Band 4	3	QPSK	1	0	0	21.88	21.76	21.96	26.48	26.36	**26.56**
			1	2	0	21.82	21.71	21.58	26.42	26.31	26.18
			1	5	0	21.58	21.55	21.33	26.18	26.15	25.93
			3	0	0	20.76	20.56	20.42	25.36	25.16	25.02
			3	2	0	20.74	20.54	20.38	25.34	25.14	24.98
			3	3	0	20.65	20.53	20.28	25.25	25.13	24.88
			6	0	0	19.78	19.66	19.74	24.38	24.26	24.34
		16QAM	1	0	0	20.78	20.79	20.76	25.38	25.39	25.36
			1	2	0	20.75	20.77	20.53	25.35	25.37	25.13
			1	5	0	20.60	20.62	20.31	25.20	25.22	24.91
			3	0	0	19.87	19.71	19.36	24.47	24.31	23.96
			3	2	0	19.75	19.68	19.33	24.35	24.28	23.93
			3	3	0	19.63	19.56	19.21	24.23	24.16	23.81
			5	0	0	19.79	19.67	19.46	24.39	24.27	24.06

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			EIRP Power(dBm)		
						19975	20175	20375	19975	20175	20375
						1712.5 MHz	1732.5 MHz	1752.5 MHz	1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	21.66	21.78	21.61	26.26	26.38	26.21
			1	2	0	21.67	21.60	21.54	26.27	26.20	26.14
			1	5	0	21.43	21.44	21.30	26.03	26.04	25.90
			3	0	0	22.05	21.65	21.62	26.65	26.25	26.22
			3	2	0	21.71	21.62	21.59	26.31	26.22	26.19
			3	3	0	21.62	21.53	21.51	26.22	26.13	26.11
			6	0	0	20.71	20.81	20.71	25.31	25.41	25.31
		16QAM	1	0	0	22.41	21.89	21.85	**27.01**	26.49	26.45
			1	2	0	21.88	21.75	21.78	26.48	26.35	26.38
			1	5	0	21.61	21.56	21.59	26.21	26.16	26.19
			3	0	0	22.23	21.71	21.73	26.83	26.31	26.33
			3	2	0	22.19	21.65	21.61	26.79	26.25	26.21
			3	3	0	22.10	21.55	21.50	26.70	26.15	26.10
			5	0	0	20.76	20.72	20.69	25.36	25.32	25.29

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			EIRP Power(dBm)		
						20000	20175	20350	20000	20175	20350
						1715 MHz	1732.5 MHz	1750 MHz	1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	21.67	21.83	21.56	26.27	26.43	26.16
			1	2	0	21.68	21.70	21.57	26.28	26.30	26.17
			1	5	0	21.49	21.50	21.44	26.09	26.10	26.04
			3	0	0	21.72	21.67	21.62	26.32	26.27	26.22
			3	2	0	21.80	21.63	21.58	26.40	26.23	26.18
			3	3	0	21.73	21.56	21.50	26.33	26.16	26.10
			6	0	0	20.74	20.62	20.97	25.34	25.22	25.57
		16QAM	1	0	0	21.88	21.97	21.79	26.48	**26.57**	26.39
			1	2	0	21.83	21.84	21.80	26.43	26.44	26.40
			1	5	0	21.65	21.66	21.61	26.25	26.26	26.21
			3	0	0	21.82	21.81	21.64	26.42	26.41	26.24
			3	2	0	21.82	21.73	21.63	26.42	26.33	26.23
			3	3	0	21.76	21.66	21.58	26.36	26.26	26.18
			5	0	0	21.78	21.75	21.64	26.38	26.35	26.24

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			EIRP Power(dBm)		
						20025	20175	20325	20025	20175	20325
						1717.5 MHz	1732.5 MHz	1747.5 MHz	1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	21.75	21.80	21.78	26.35	26.40	26.38
			1	2	0	21.74	21.71	21.75	26.34	26.31	26.35
			1	5	0	21.52	21.41	21.52	26.12	26.01	26.12
			3	0	0	21.81	21.79	21.74	26.41	26.39	26.34
			3	2	0	21.76	21.73	21.68	26.36	26.33	26.28
			3	3	0	21.68	21.64	21.65	26.28	26.24	26.25
			6	0	0	21.81	21.79	21.71	26.41	26.39	26.31
		16QAM	1	0	0	22.01	21.93	22.19	26.61	26.53	26.79
			1	2	0	21.95	21.87	21.96	26.55	26.47	26.56
			1	5	0	21.77	21.67	21.75	26.37	26.27	26.35
			3	0	0	21.82	21.82	21.82	26.42	26.42	26.42
			3	2	0	21.77	21.77	21.85	26.37	26.37	26.45
			3	3	0	21.68	21.67	21.74	26.28	26.27	26.34
			5	0	0	21.77	21.78	21.87	26.37	26.38	26.47

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Max. Meas. Avg Pwr (dBm)			EIRP Power(dBm)		
						20050	20175	20300	20050	20175	20300
						1720 MHz	1732.5 MHz	1745 MHz	1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0	21.75	21.68	21.71	26.35	26.28	26.31
			1	2	0	21.60	21.61	21.52	26.20	26.21	26.12
			1	5	0	21.44	21.45	21.48	26.04	26.05	26.08
			3	0	0	21.71	21.65	21.71	26.31	26.25	26.31
			3	2	0	21.68	21.63	21.68	26.28	26.23	26.28
			3	3	0	21.71	21.63	21.59	26.31	26.23	26.19
			6	0	0	21.73	21.66	21.63	26.33	26.26	26.23
		16QAM	1	0	0	21.95	21.98	21.96	26.55	**26.58**	26.56
			1	2	0	21.54	21.74	21.38	26.14	26.34	25.98
			1	5	0	21.51	21.62	21.17	26.11	26.22	25.77
			3	0	0	21.82	21.79	21.83	26.42	26.39	26.43
			3	2	0	21.82	21.77	21.79	26.42	26.37	26.39
			3	3	0	21.68	21.63	21.77	26.28	26.23	26.37
			5	0	0	21.71	21.73	21.72	26.31	26.33	26.32

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.

TEST PROCEDURE

Use Anritsu 8821 with frequency Error measurement capability.
Temp = -20 to +50℃
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

Temperature: 22.4℃ **Humidity:** 52.1% RH

Tested by: Dally Hong **Test Date:** April 15, 2021

LTE Band 4

FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT:

Band2_10M_QPSK_Full RB																									
Channel	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	
Freq. (MHz)	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	
Test Time	**0 Minutes**			**2 Minutes**			**5 Minutes**			**10 Minutes**			**0 Minutes**			**2 Minutes**			**5 Minutes**			**10 Minutes**			
Temp.	Deviation																								Limit
(℃)	(Hz)												(ppm)												
-20	9.2	8.6	6.9	7.1	11.5	7.3	9.4	4.4	6.7	10.7	6.9	8.8	0.005	0.005	0.004	0.004	0.007	0.004	0.005	0.003	0.004	0.006	0.004	0.005	0.1
-10	-5.2	8.9	6.3	12.5	7.7	-0.7	1.3	-6.2	5.7	9.1	6.7	11.0	-0.003	0.005	0.004	0.007	0.004	0.000	0.001	-0.004	0.003	0.005	0.004	0.006	0.1
0	-3.3	5.7	6.1	14.4	3.5	-2.7	8.5	6.4	-4.7	-13.2	-8.8	-8.3	-0.002	0.003	0.003	0.008	0.002	-0.002	0.005	0.004	-0.003	-0.008	-0.005	-0.005	0.1
10	3.3	1.4	-0.8	3.7	2.6	2.6	7.3	5.0	5.6	9.1	7.7	11.6	0.002	0.001	0.000	0.002	0.002	0.001	0.004	0.003	0.003	0.005	0.004	0.007	0.1
20	6.4	5.2	2.8	7.5	4.9	8.2	5.6	9.8	4.1	13.5	12.8	17.7	0.004	0.003	0.002	0.004	0.003	0.005	0.003	0.006	0.002	0.008	0.007	0.010	0.1
30	6.0	8.6	4.4	9.2	6.7	6.5	8.0	7.6	12.1	8.8	16.4	19.5	0.003	0.005	0.003	0.005	0.004	0.004	0.005	0.004	0.007	0.005	0.009	0.011	0.1
40	4.7	3.8	7.2	10.8	6.9	4.3	15.2	5.2	6.7	9.4	5.7	-4.2	0.003	0.002	0.004	0.006	0.004	0.002	0.009	0.003	0.004	0.005	0.003	-0.002	0.1
50	3.4	5.5	8.4	6.2	3.3	8.5	4.1	2.0	5.6	-4.9	-2.1	3.4	0.002	0.003	0.005	0.004	0.002	0.005	0.002	0.001	0.003	-0.003	-0.001	0.002	0.1

FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:

Band2_10M_QPSK_Full RB																									
Channel	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	18650	18900	19150	
Freq. (MHz)	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	1855	1880	1905	
Test Time	**0 Minutes**			**2 Minutes**			**5 Minutes**			**10 Minutes**			**0 Minutes**			**2 Minutes**			**5 Minutes**			**10 Minutes**			
Voltage	Deviation																								Limit
[V]	(Hz)												(ppm)												
5.75	-3.1	0.3	5.2	2.7	6.6	-4.5	3.9	1.4	7.5	8.3	-3.4	5.9	-0.002	0.000	0.003	0.002	0.004	-0.003	0.002	0.001	0.004	0.005	-0.002	0.003	0.1
5	8.1	9.3	2.4	7.8	6.0	4.8	2.5	3.1	3.7	-4.8	5.5	6.4	0.005	0.005	0.001	0.005	0.003	0.003	0.001	0.002	0.002	-0.003	0.003	0.004	0.1
4.25	-6.4	7.3	5.8	14.3	12.8	8.8	7.4	5.5	8.1	6.0	8.6	3.9	-0.004	0.004	0.003	0.008	0.007	0.005	0.004	0.003	0.005	0.003	0.005	0.002	0.1

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

Temperature: 23.1℃ **Humidity:** 52.5% RH

Tested by: Dally Hong **Test Date:** April 14, 2021

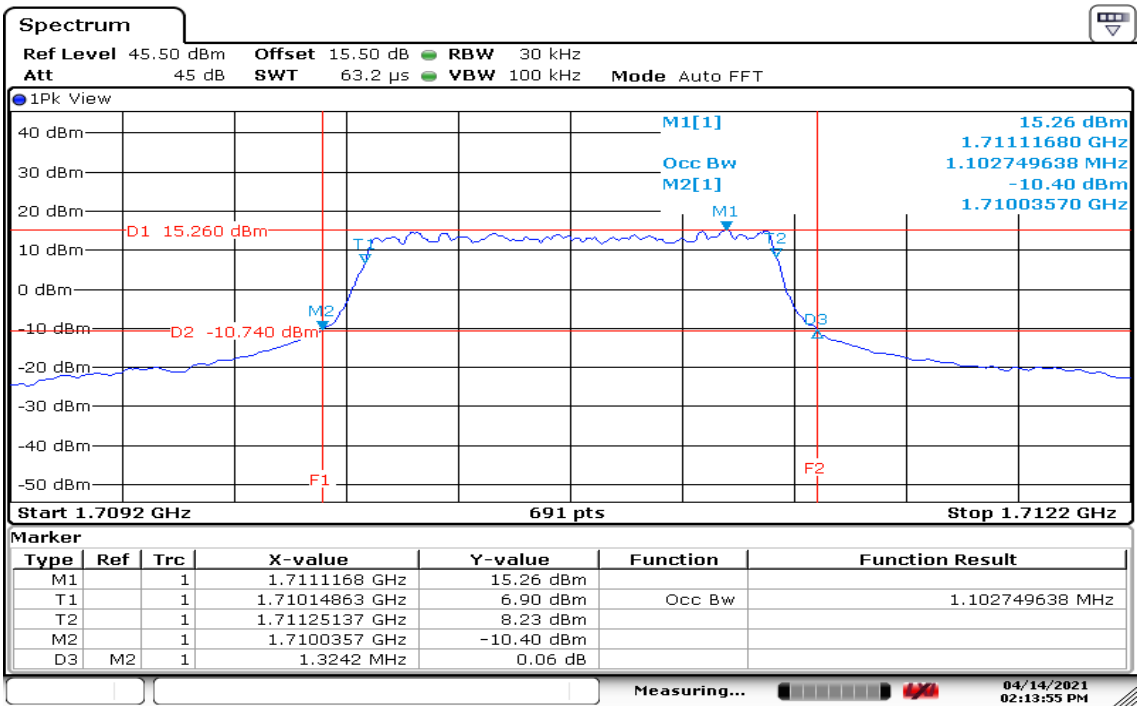
Frequency (MHz)	Channel	99%BW(MHz)		26dB BW(MHz)	
		QPSK	16QAM	QPSK	16QAM
Band 4 Channel Bandwidth 1.4MHz					
1710.7	19957	1.1027	0.9334	1.3242	1.1418
1732.5	20175	1.1027	0.9334	1.3155	1.1288
1754.3	20393	1.1027	0.9378	1.3285	1.1331
Band 4 Channel Bandwidth 3MHz					
1711.5	19965	1.1027	0.9291	1.3068	1.1331
1732.5	20175	1.1027	0.9291	1.3150	1.1196
1753.5	20385	1.0984	0.9334	1.3072	1.1205
Band 4 Channel Bandwidth 5MHz					
1712.5	19975	1.0941	0.9334	1.2200	1.1635
1732.5	20175	1.0984	0.9334	1.3285	1.1852
1752.5	20375	1.0984	0.9334	1.3202	1.1639
Band 4 Channel Bandwidth 10MHz					
1715	20000	1.0941	0.9465	1.3068	1.3589
1732.5	20175	1.0941	0.9378	1.3068	1.2764
1750	20350	1.0941	0.9421	1.3068	1.3198
Band 4 Channel Bandwidth 15MHz					
1717.5	20025	1.1071	0.9378	1.3459	1.4327
1732.5	20175	1.1071	0.9378	1.3415	1.4284
1747.5	20325	1.1071	0.9334	1.3459	1.1505
Band 4 Channel Bandwidth 20MHz					
1720	20050	1.0984	0.9421	1.3329	1.3502
1732.5	20175	1.0984	0.9465	1.3415	1.3589
1745	20300	1.0984	0.9421	1.3285	1.2938

LTE Band 4

26dB & OBW (99%) / QPSK

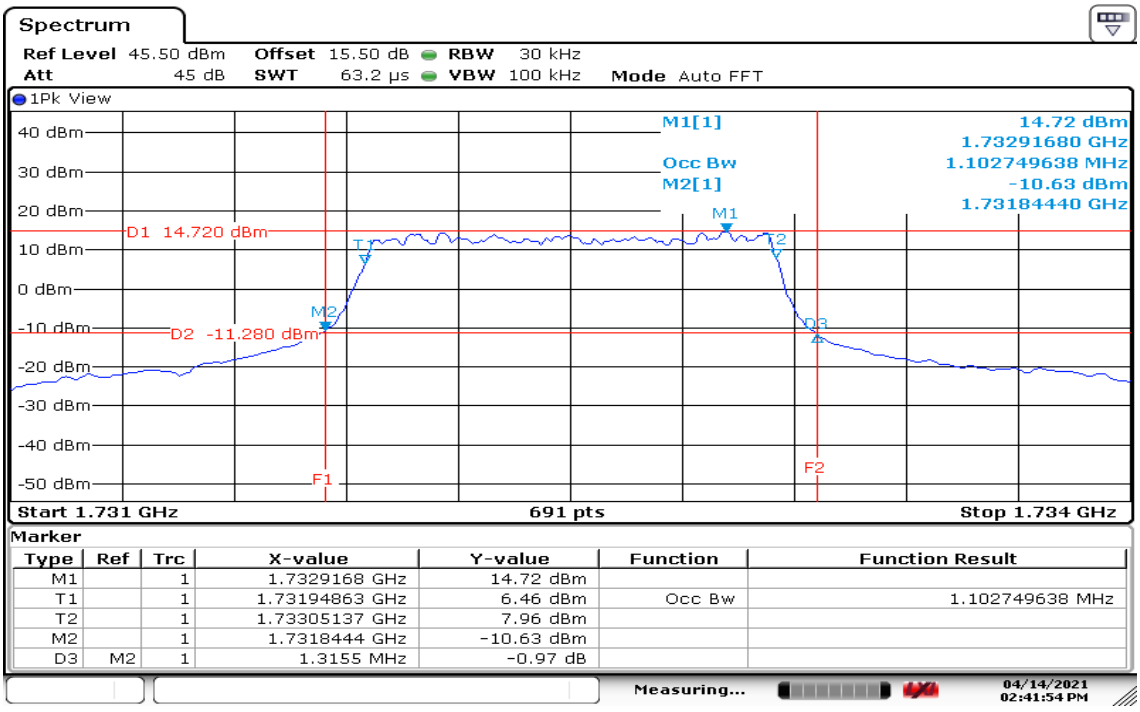
BW: 1.4MHz

CH Low



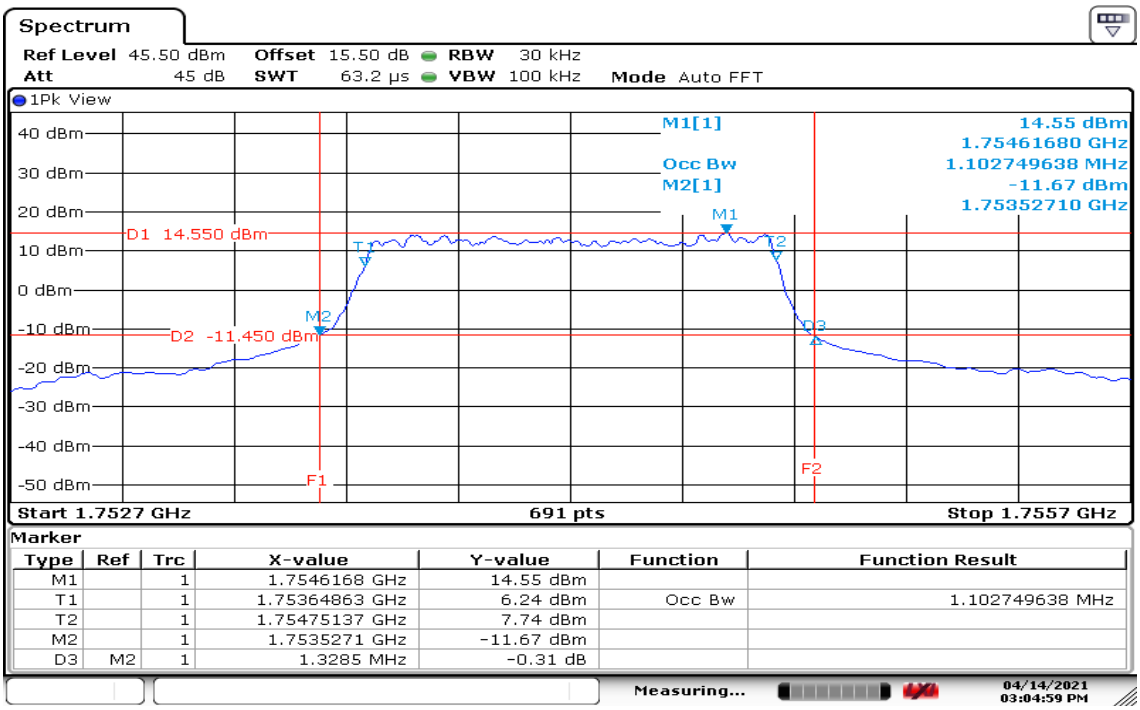
Date: 14.APR.2021 14:13:55

CH Mid



Date: 14.APR.2021 14:41:54

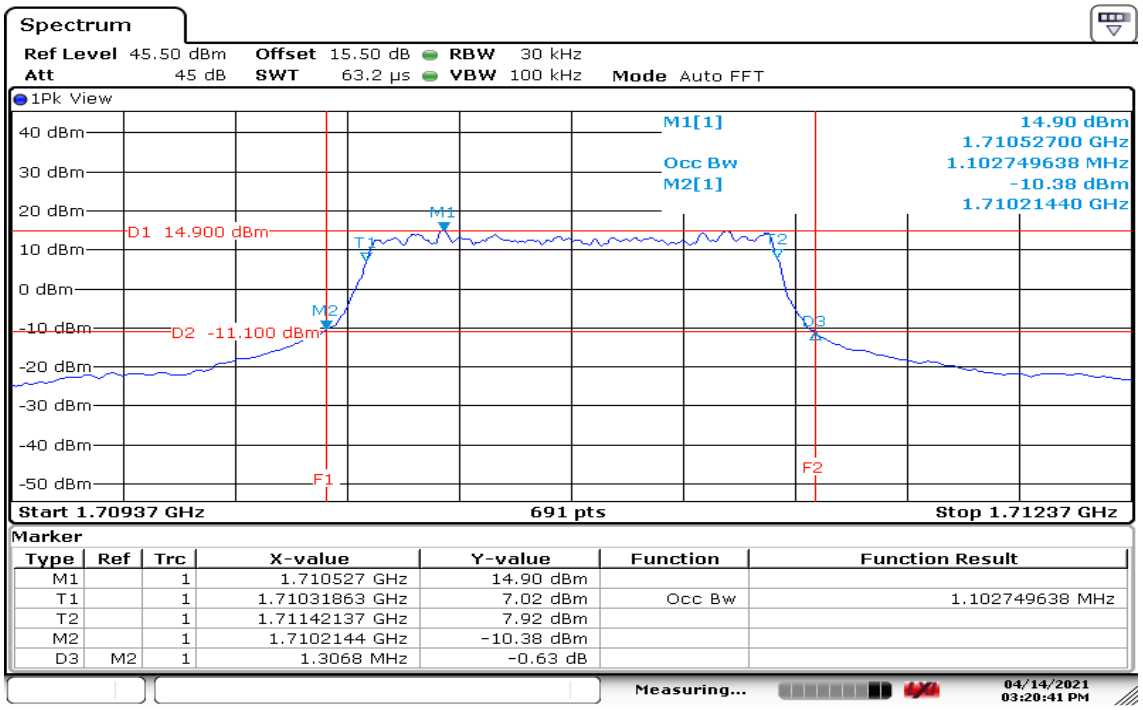
CH High



Date: 14.APR.2021 15:04:59

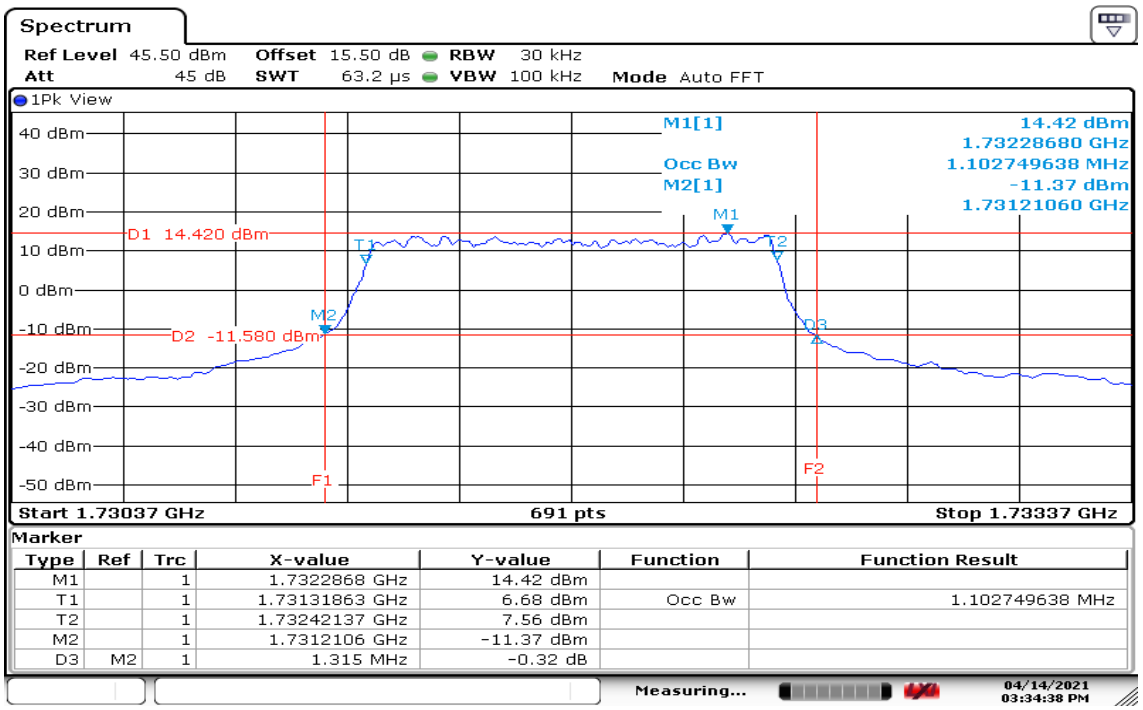
BW: 3MHz

CH Low



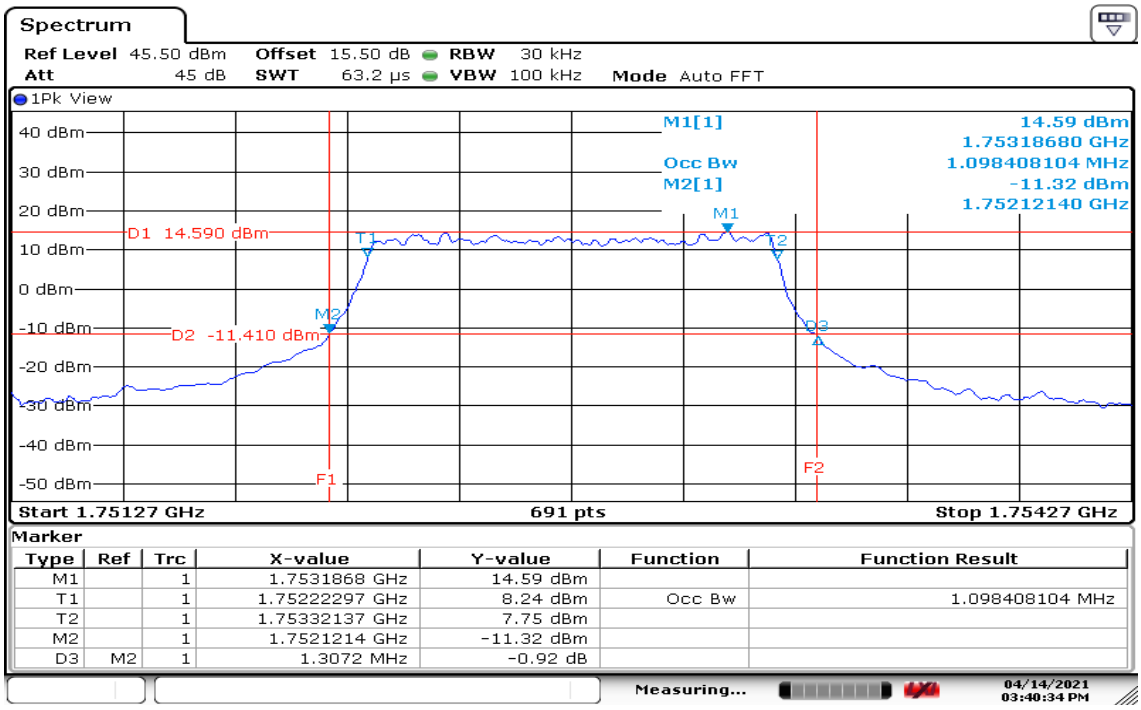
Date: 14.APR.2021 15:20:42

CH Mid



Date: 14.APR.2021 15:34:38

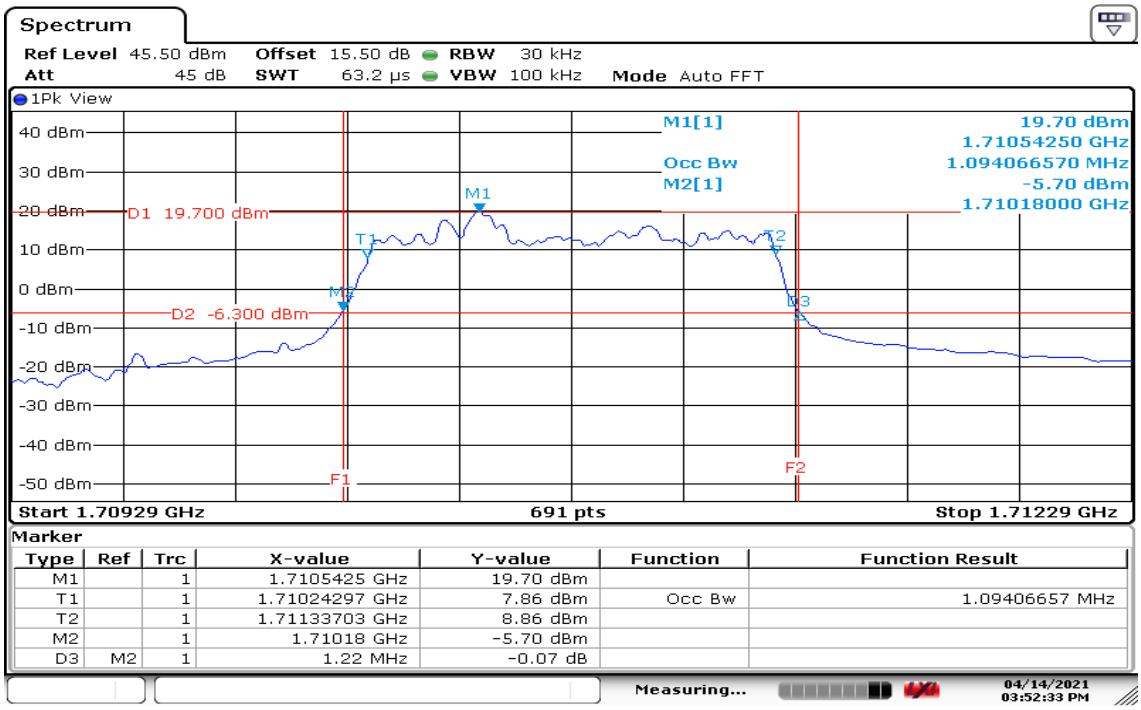
CH High



Date: 14.APR.2021 15:40:34

BW: 5MHz

CH Low

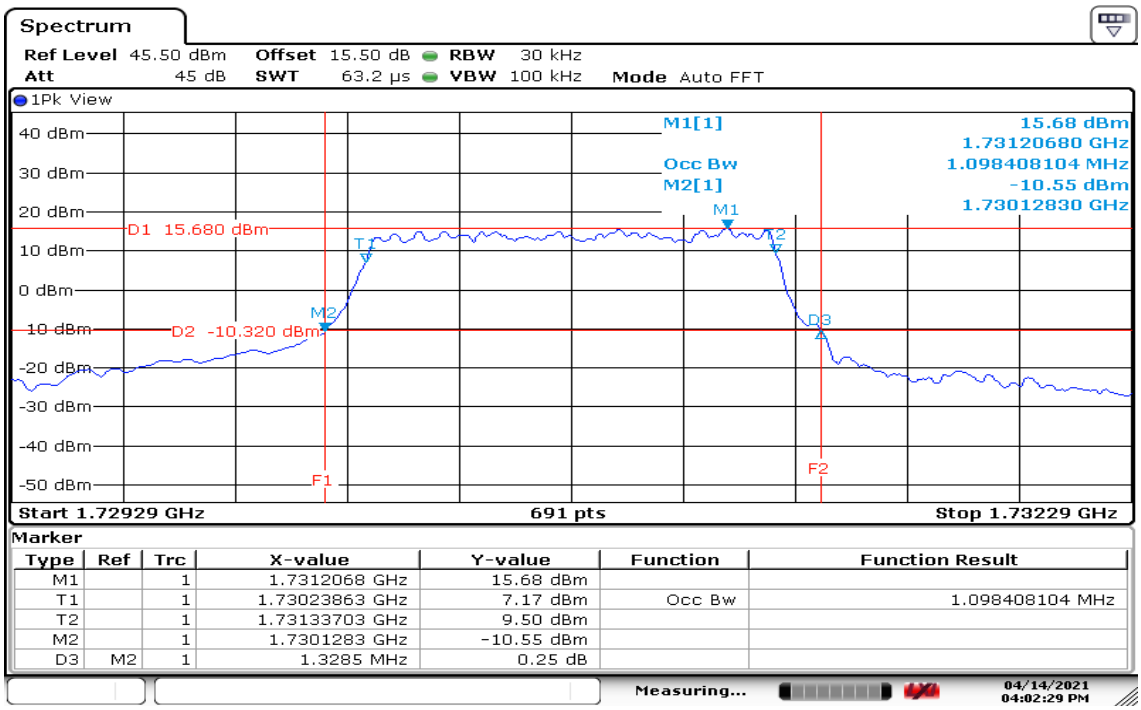


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7105425 GHz	19.70 dBm		
T1		1	1.71024297 GHz	7.86 dBm	Occ Bw	1.09406657 MHz
T2		1	1.71133703 GHz	8.86 dBm		
M2		1	1.71018 GHz	-5.70 dBm		
D3	M2	1	1.22 MHz	-0.07 dB		

Date: 14.APR.2021 15:52:33

CH Mid

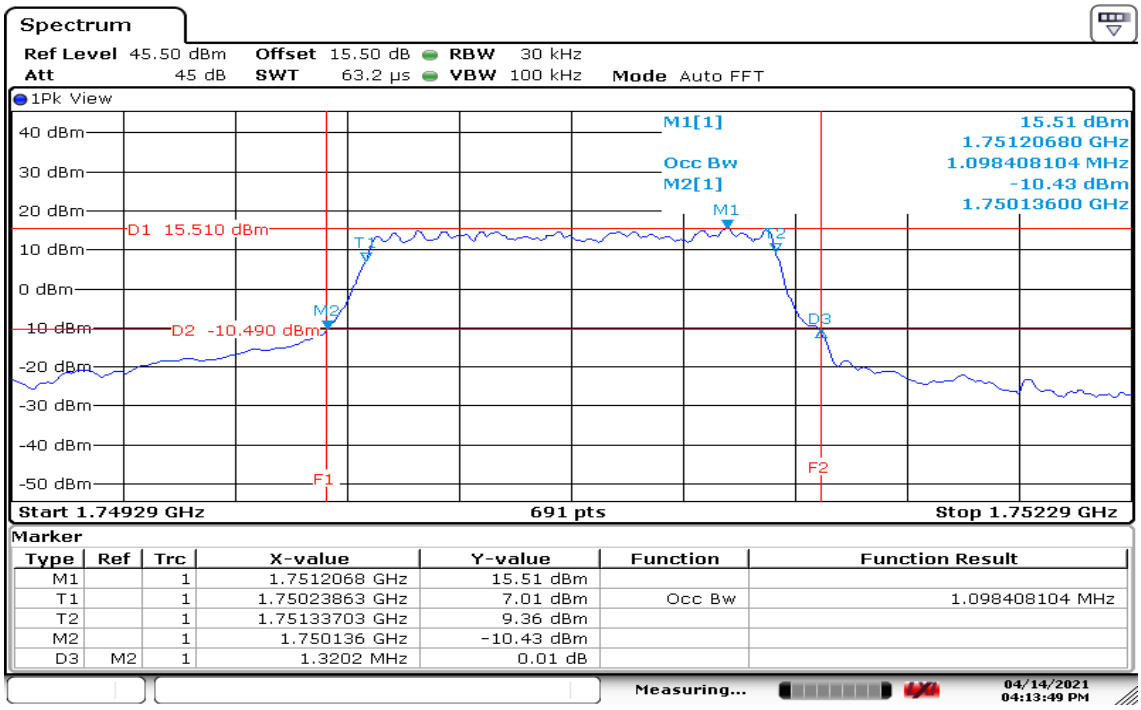


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7312068 GHz	15.68 dBm		
T1		1	1.73023863 GHz	7.17 dBm	Occ Bw	1.098408104 MHz
T2		1	1.73133703 GHz	9.50 dBm		
M2		1	1.7301283 GHz	-10.55 dBm		
D3	M2	1	1.3285 MHz	0.25 dB		

Date: 14.APR.2021 16:02:29

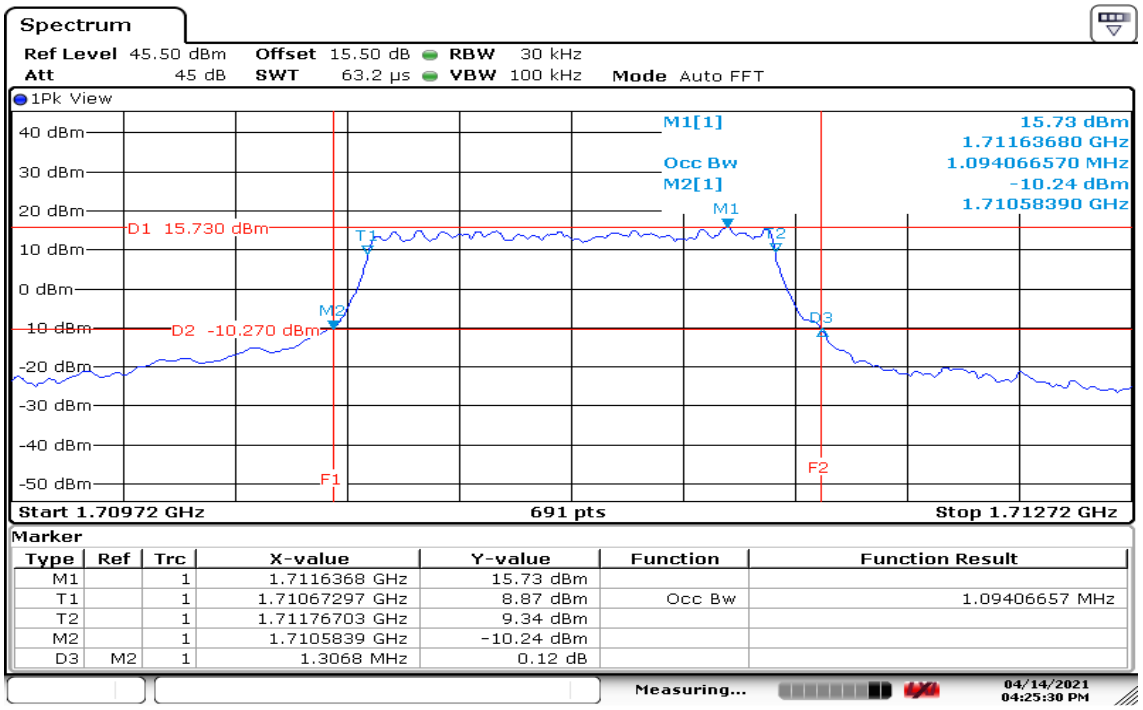
CH High



Date: 14.APR.2021 16:13:49

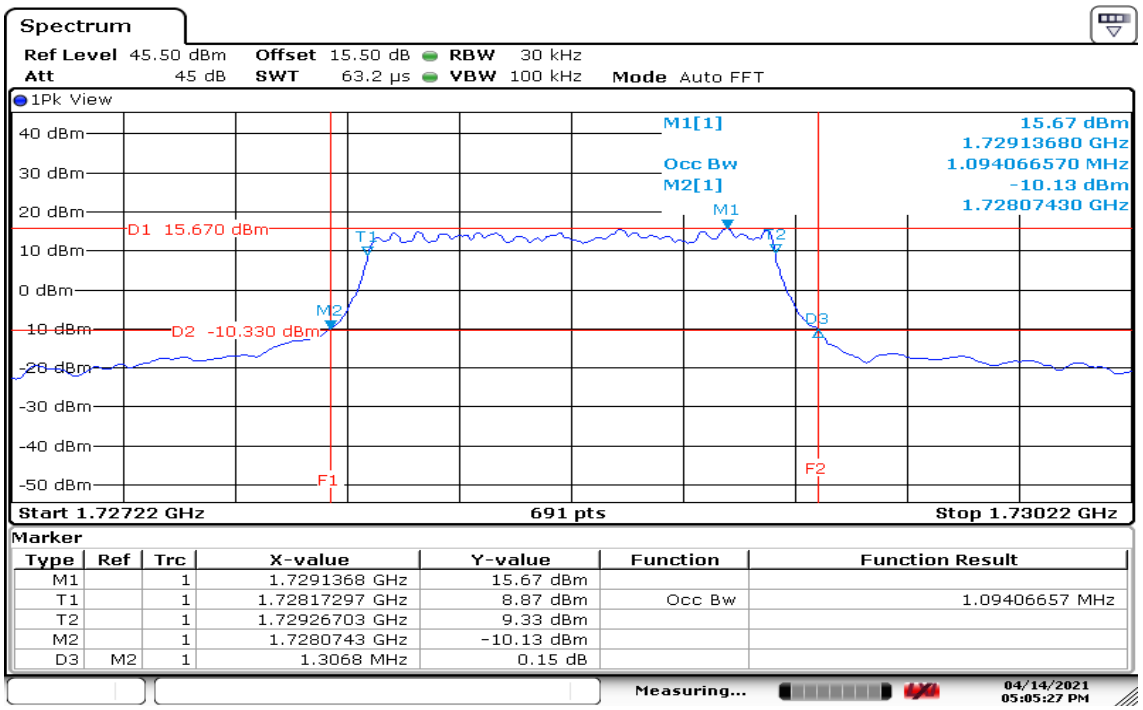
BW: 10MHz

CH Low



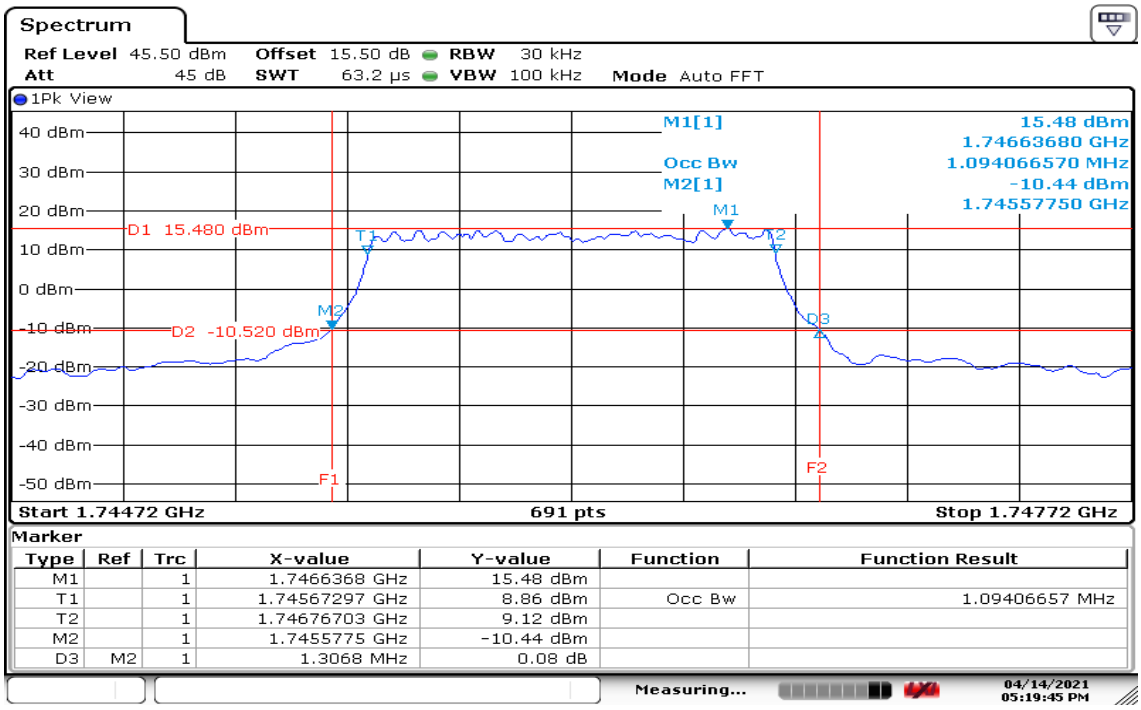
Date: 14.APR.2021 16:25:30

CH Mid



Date: 14.APR.2021 17:05:27

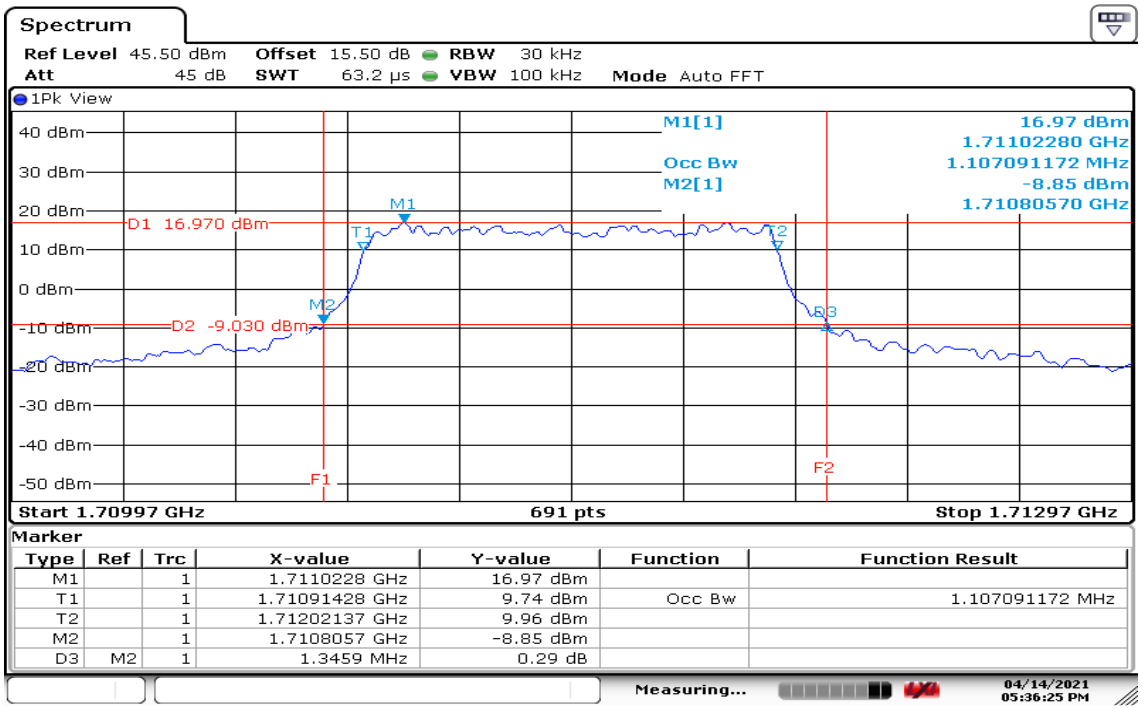
CH High



Date: 14.APR.2021 17:19:45

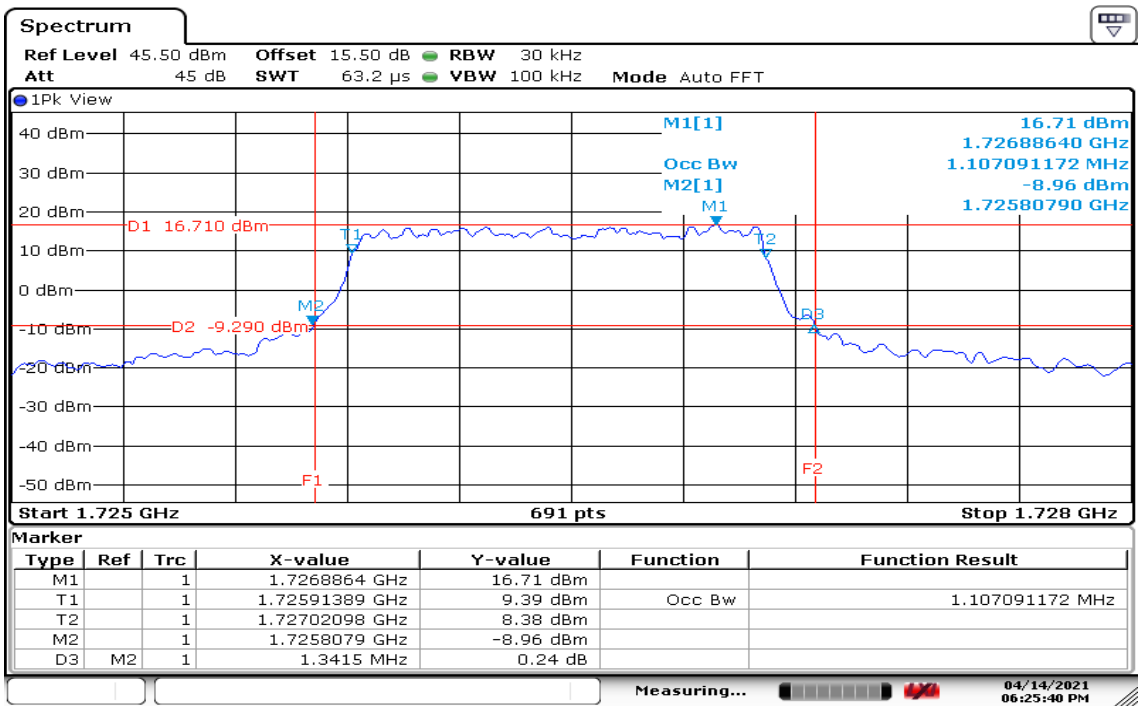
BW: 15MHz

CH Low



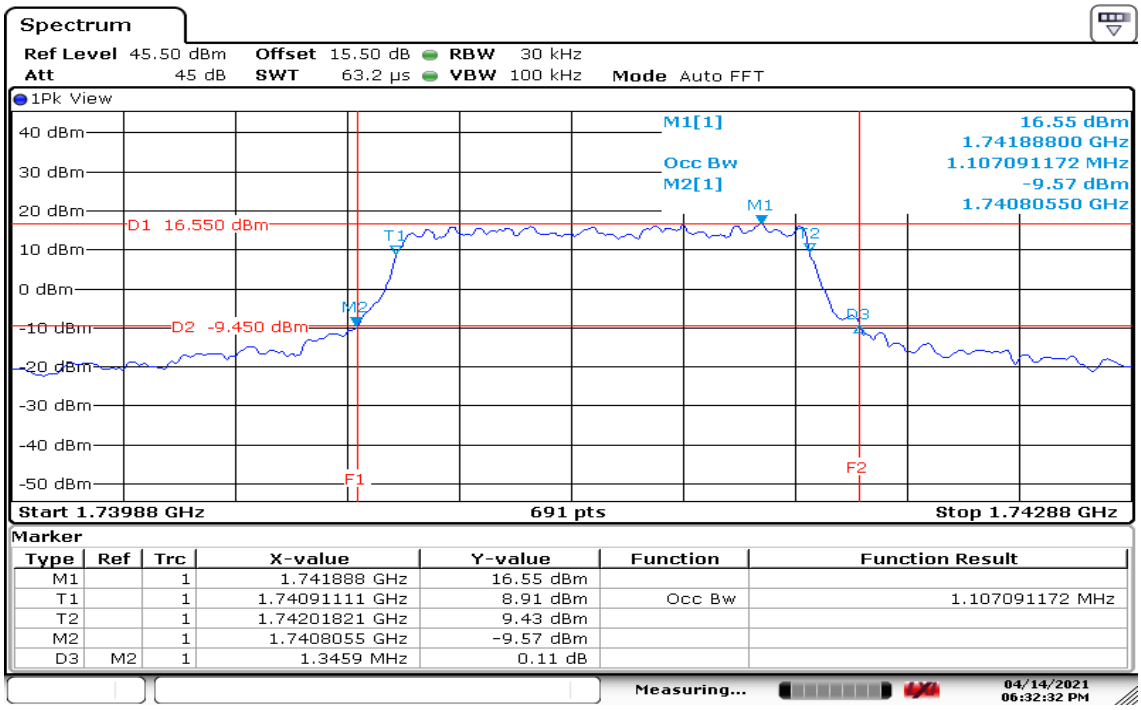
Date: 14.APR.2021 17:36:25

CH Mid



Date: 14.APR.2021 18:25:41

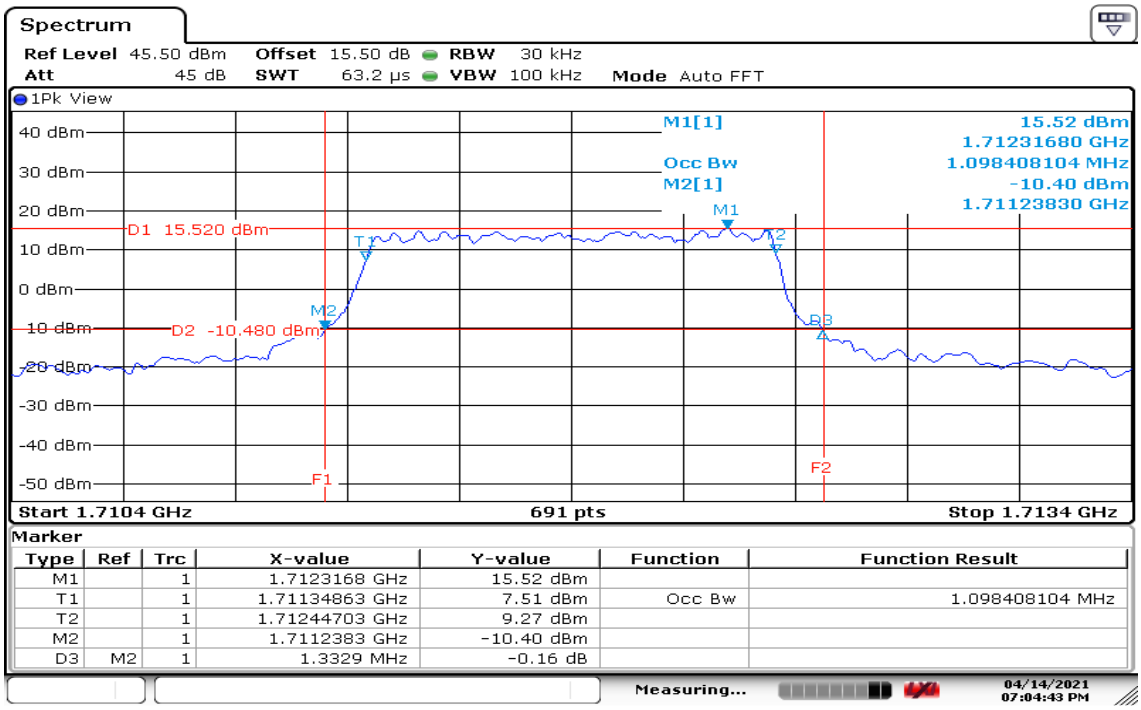
CH High



Date: 14.APR.2021 18:32:33

BW: 20MHz

CH Low

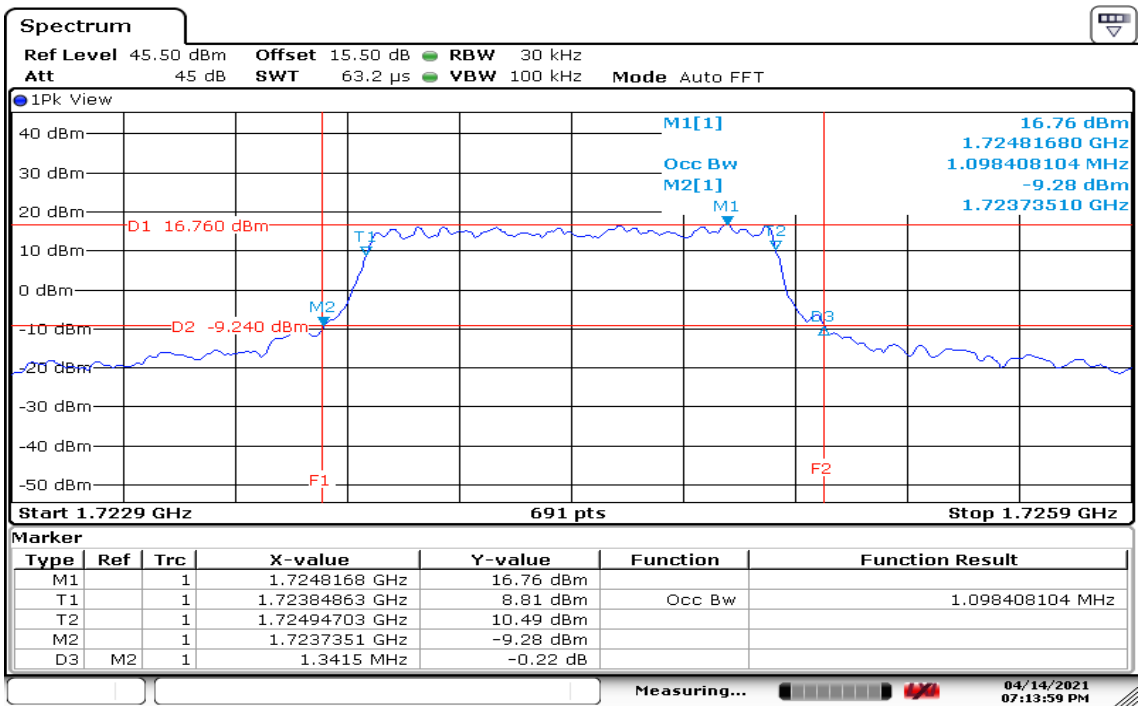


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7123168 GHz	15.52 dBm		
T1		1	1.71134863 GHz	7.51 dBm	Occ Bw	1.098408104 MHz
T2		1	1.71244703 GHz	9.27 dBm		
M2		1	1.7112383 GHz	-10.40 dBm		
D3	M2	1	1.3329 MHz	-0.16 dB		

Date: 14.APR.2021 19:04:44

CH Mid

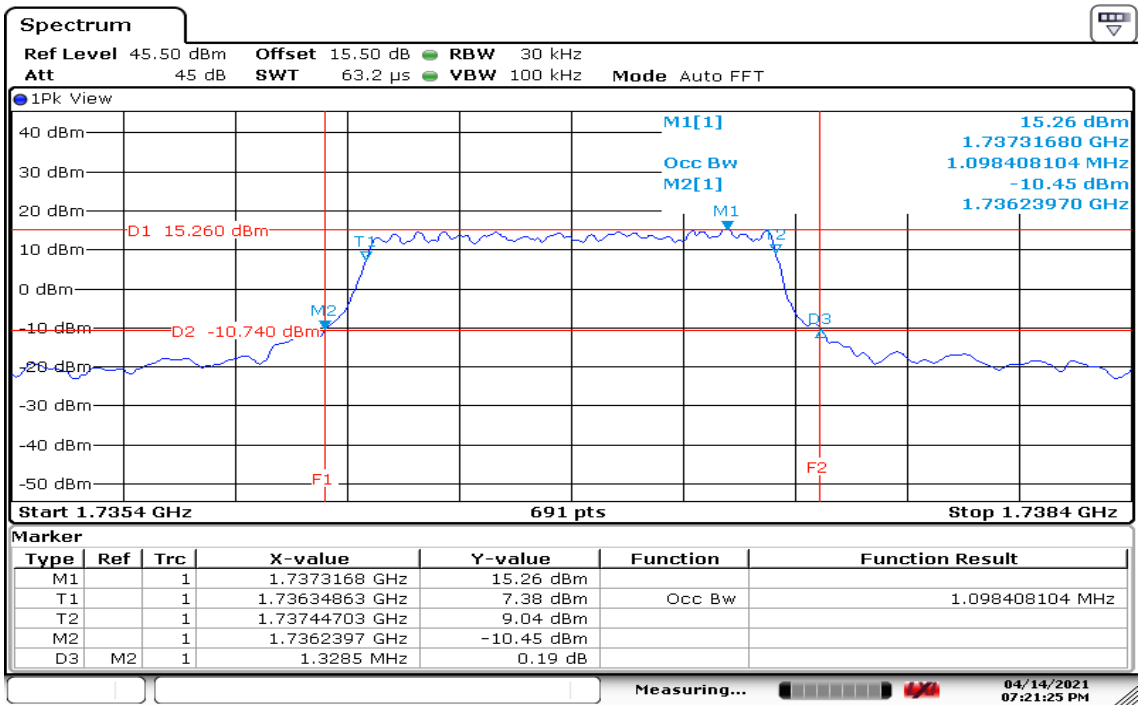


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7248168 GHz	16.76 dBm		
T1		1	1.72384863 GHz	8.81 dBm	Occ Bw	1.098408104 MHz
T2		1	1.72494703 GHz	10.49 dBm		
M2		1	1.7237351 GHz	-9.28 dBm		
D3	M2	1	1.3415 MHz	-0.22 dB		

Date: 14.APR.2021 19:13:59

CH High

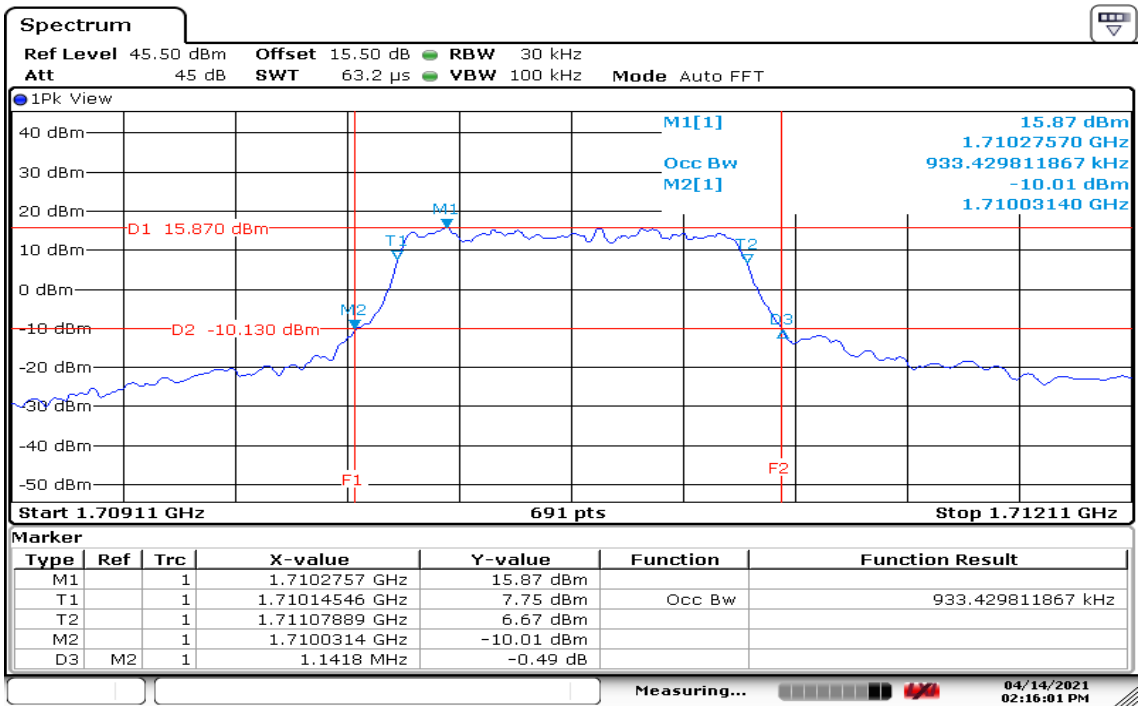


Date: 14.APR.2021 19:21:25

26dB & OBW (99%) / 16QAM

BW: 1.4MHz

CH Low

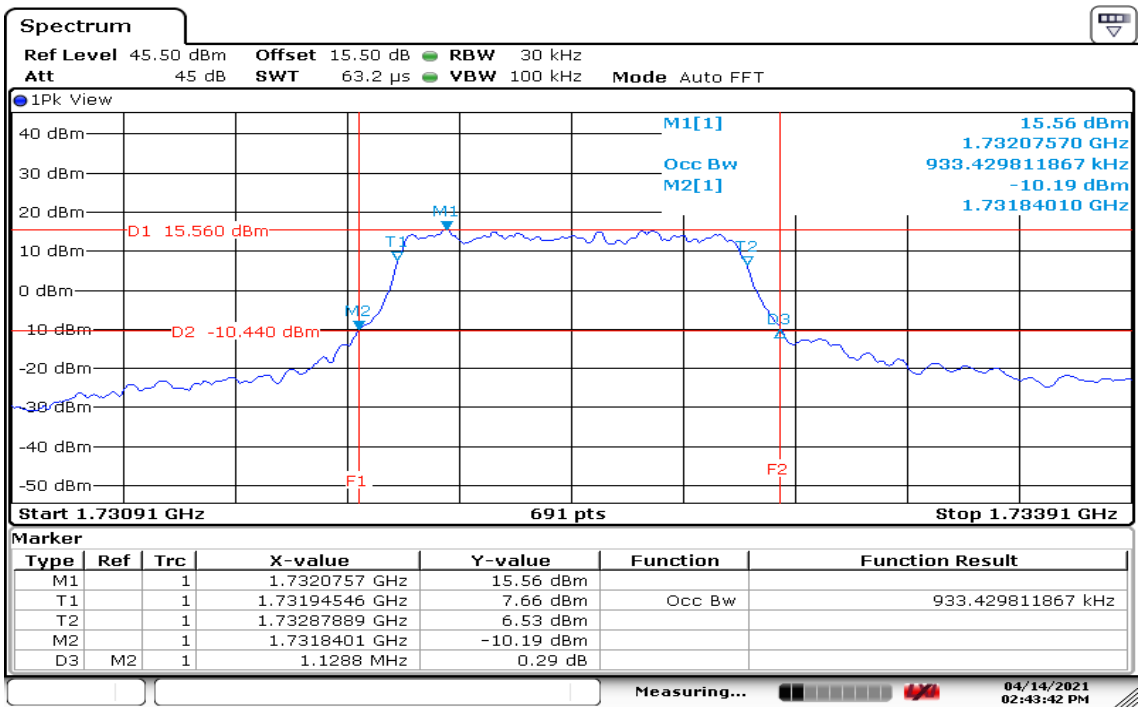


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7102757 GHz	15.87 dBm		
T1		1	1.71014546 GHz	7.75 dBm	Occ Bw	933.429811867 kHz
T2		1	1.71107889 GHz	6.67 dBm		
M2		1	1.7100314 GHz	-10.01 dBm		
D3	M2	1	1.1418 MHz	-0.49 dB		

Date: 14.APR.2021 14:16:01

CH Mid

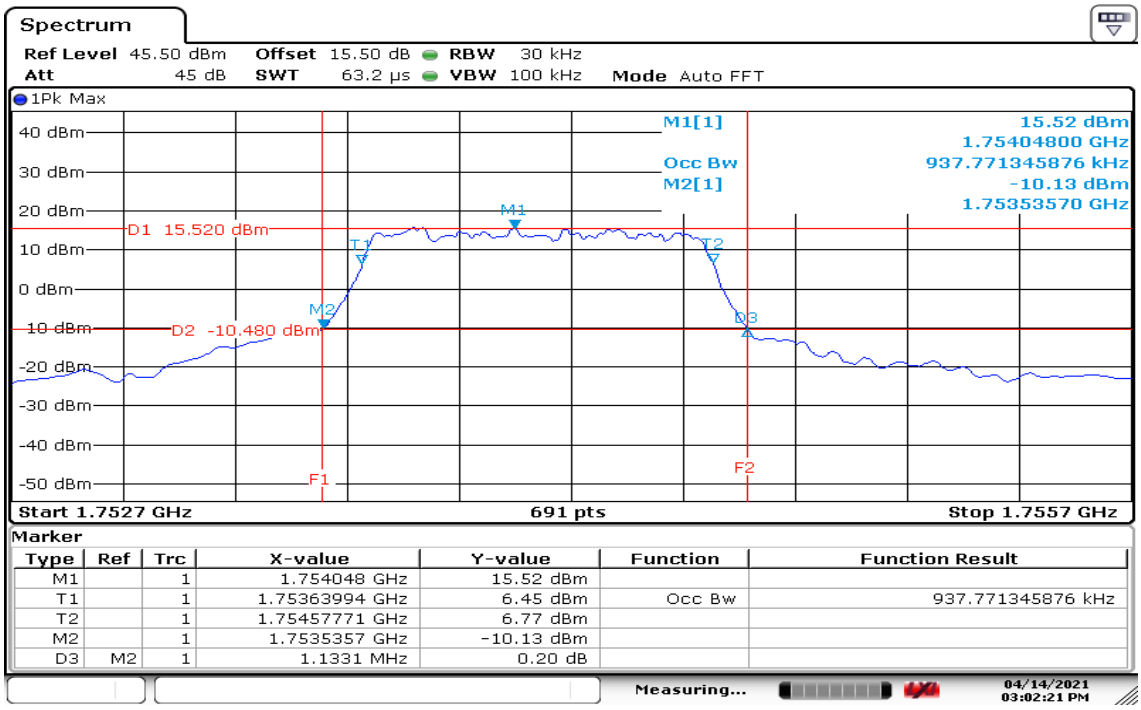


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7320757 GHz	15.56 dBm		
T1		1	1.73194546 GHz	7.66 dBm	Occ Bw	933.429811867 kHz
T2		1	1.73287889 GHz	6.53 dBm		
M2		1	1.7318401 GHz	-10.19 dBm		
D3	M2	1	1.1288 MHz	0.29 dB		

Date: 14.APR.2021 14:43:41

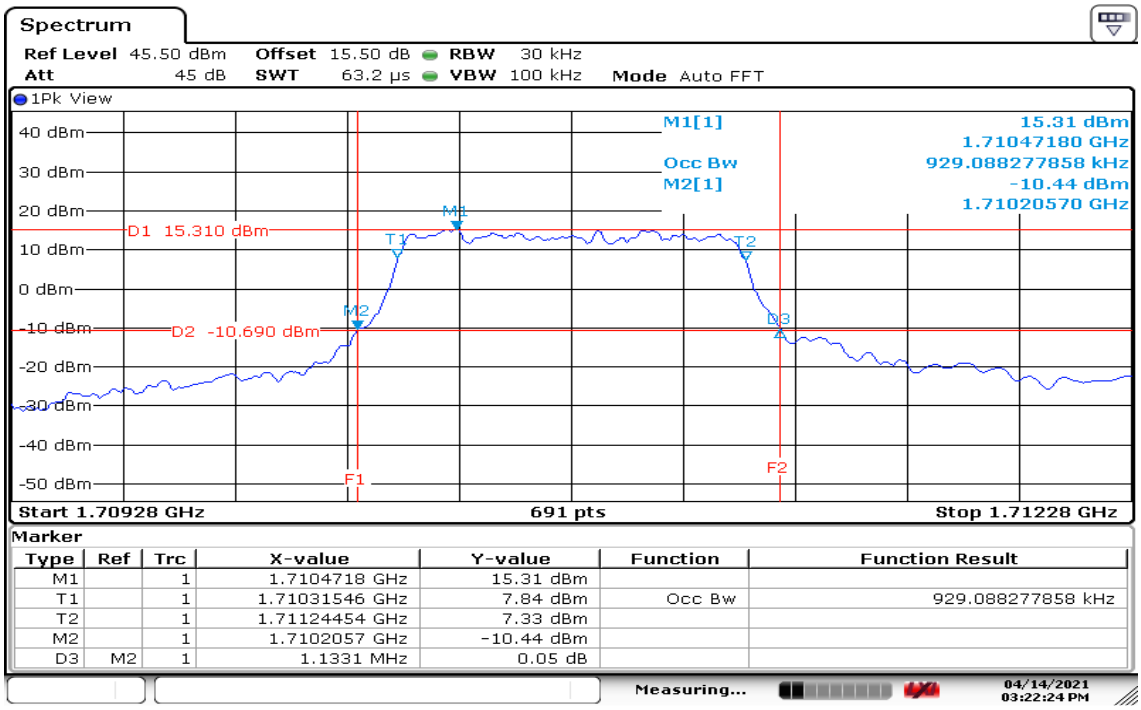
CH High



Date: 14.APR.2021 15:02:21

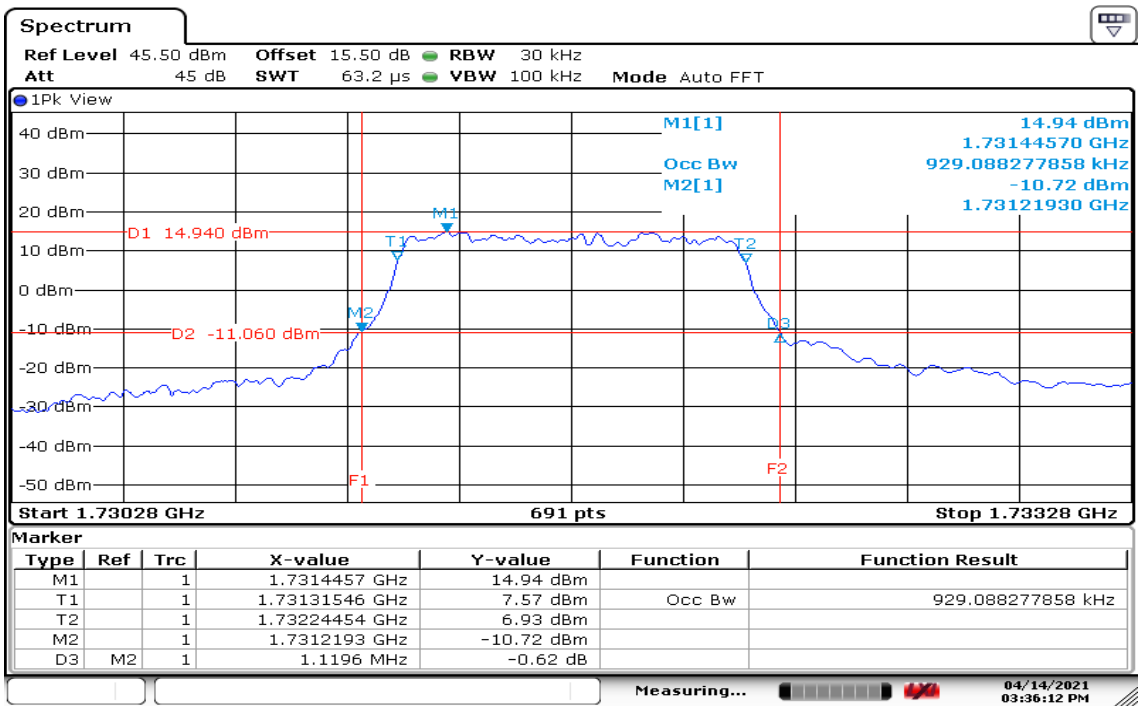
BW: 3MHz

CH Low



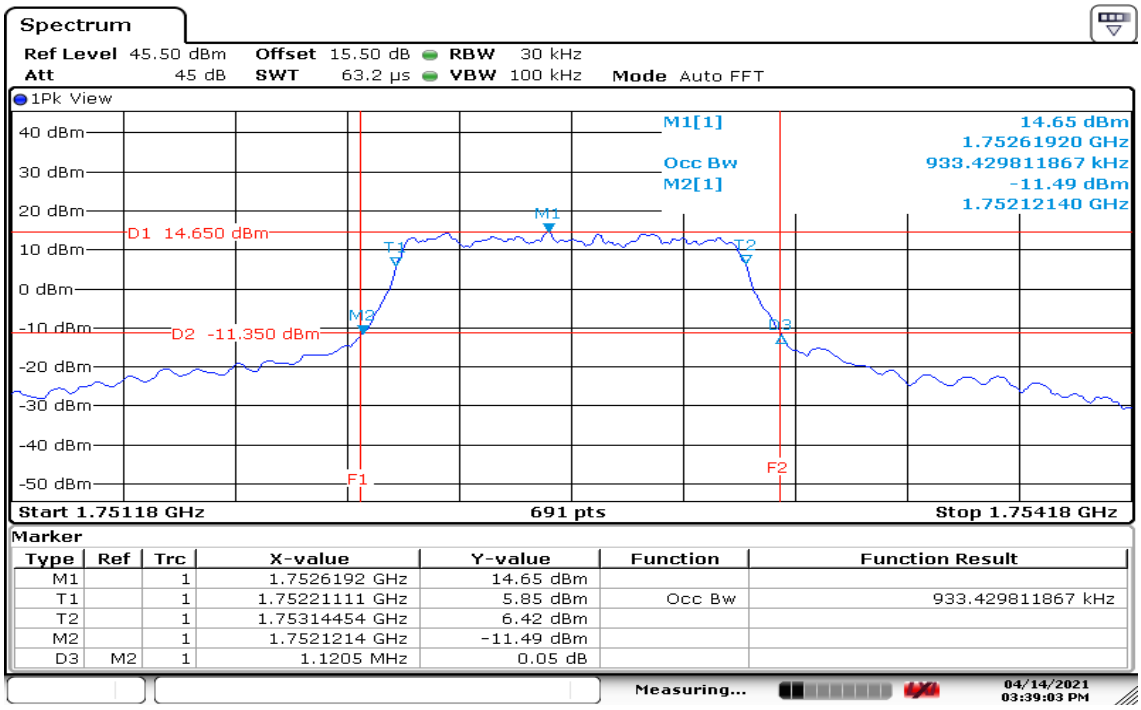
Date: 14.APR.2021 15:22:23

CH Mid



Date: 14.APR.2021 15:36:13

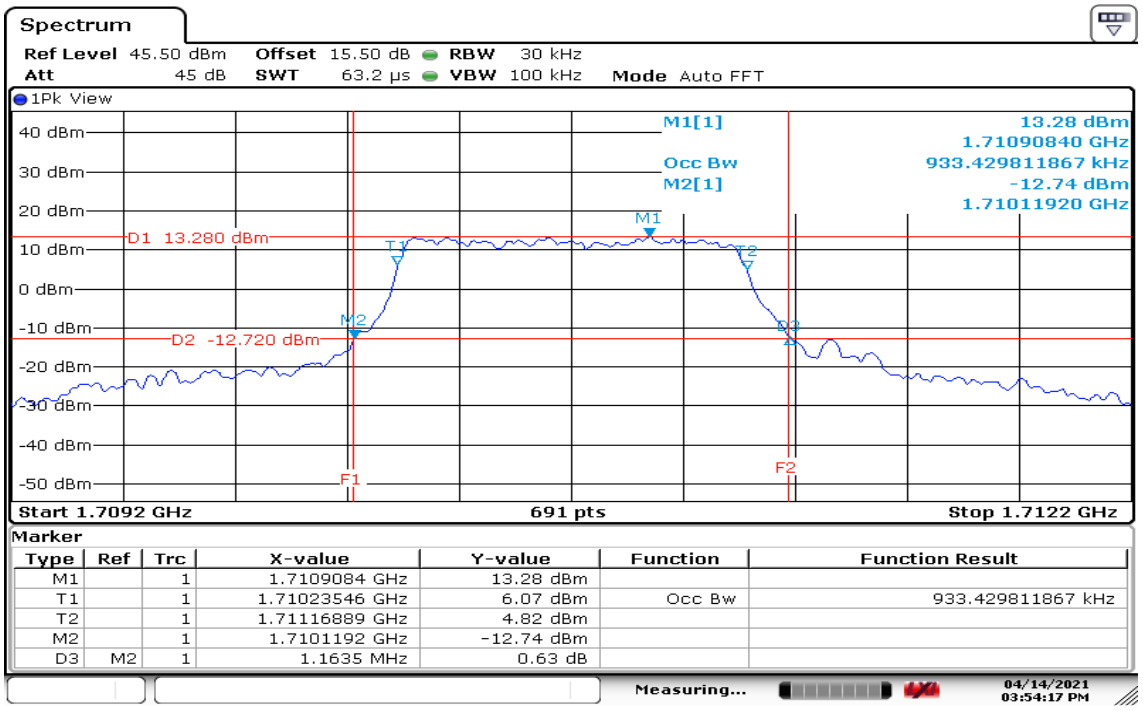
CH High



Date: 14.APR.2021 15:39:04

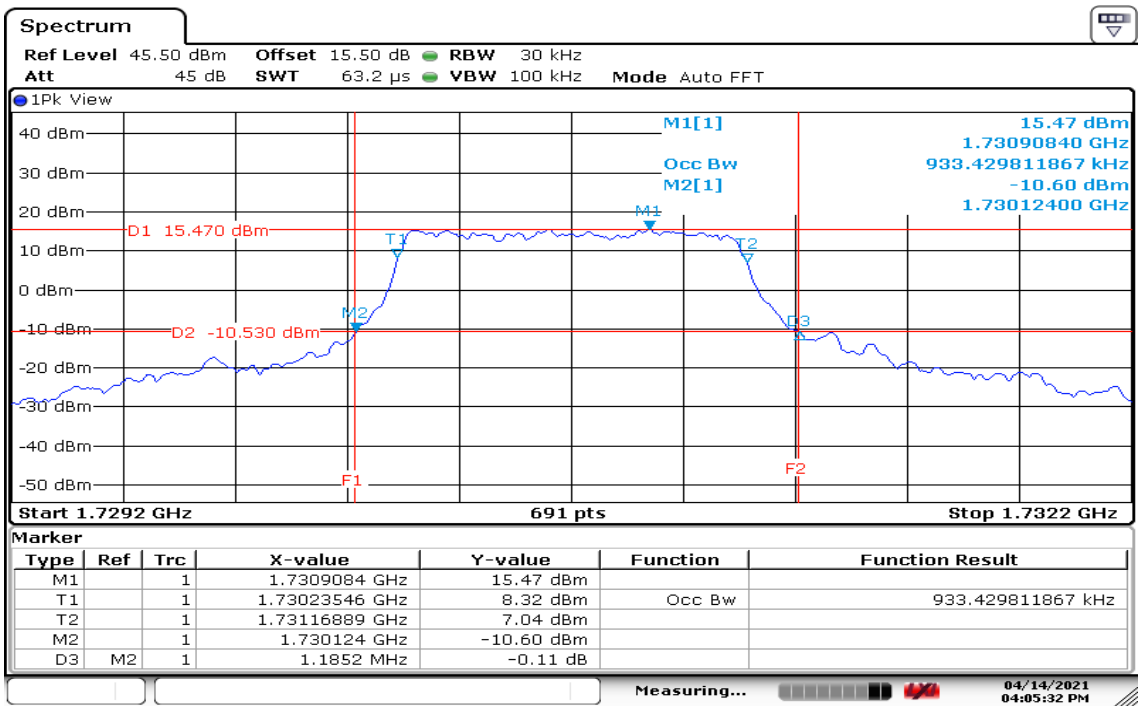
BW: 5MHz

CH Low



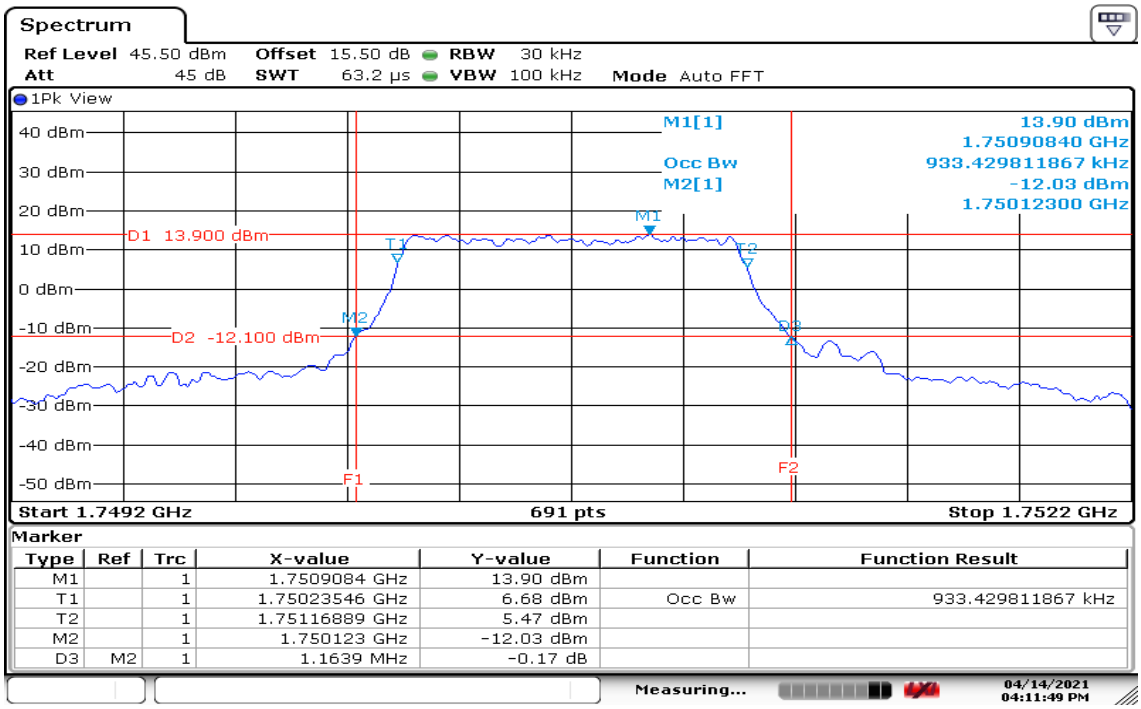
Date: 14.APR.2021 15:54:18

CH Mid



Date: 14.APR.2021 16:05:33

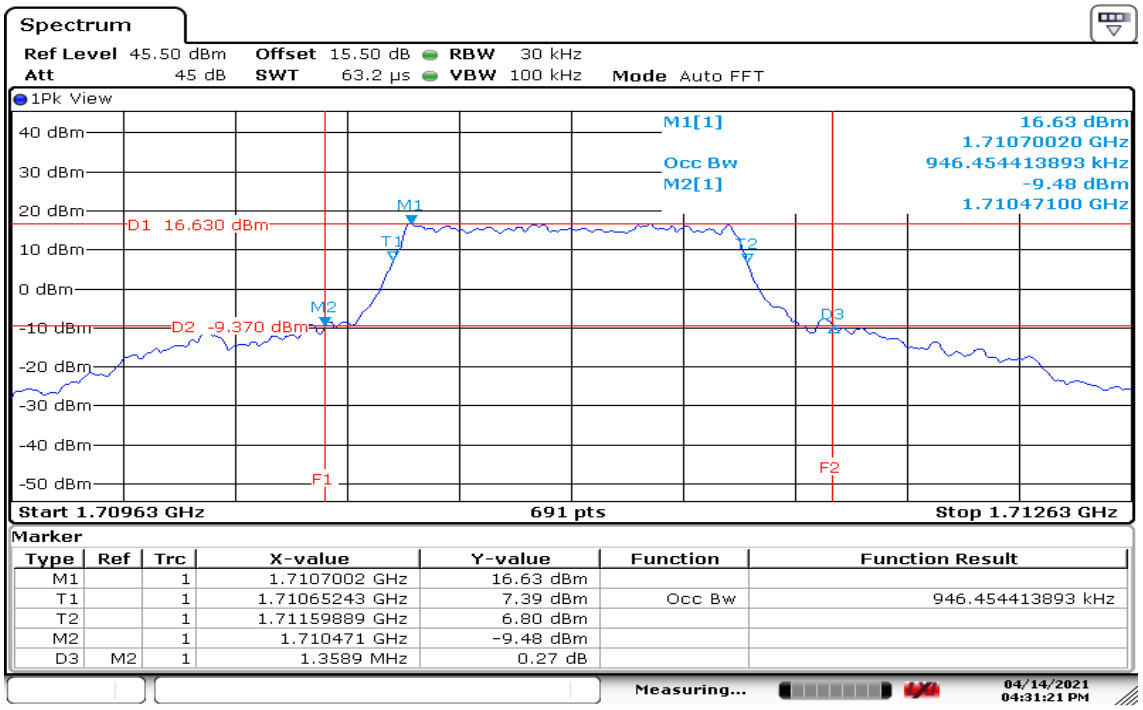
CH High



Date: 14.APR.2021 16:11:49

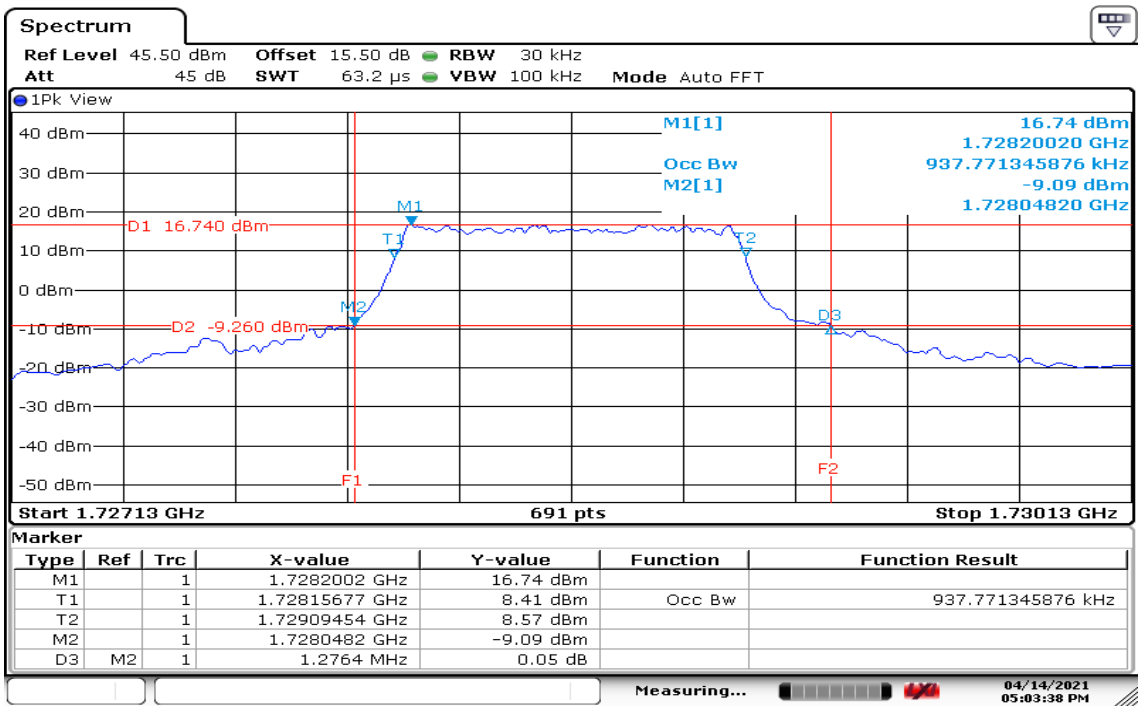
BW: 10MHz

CH Low



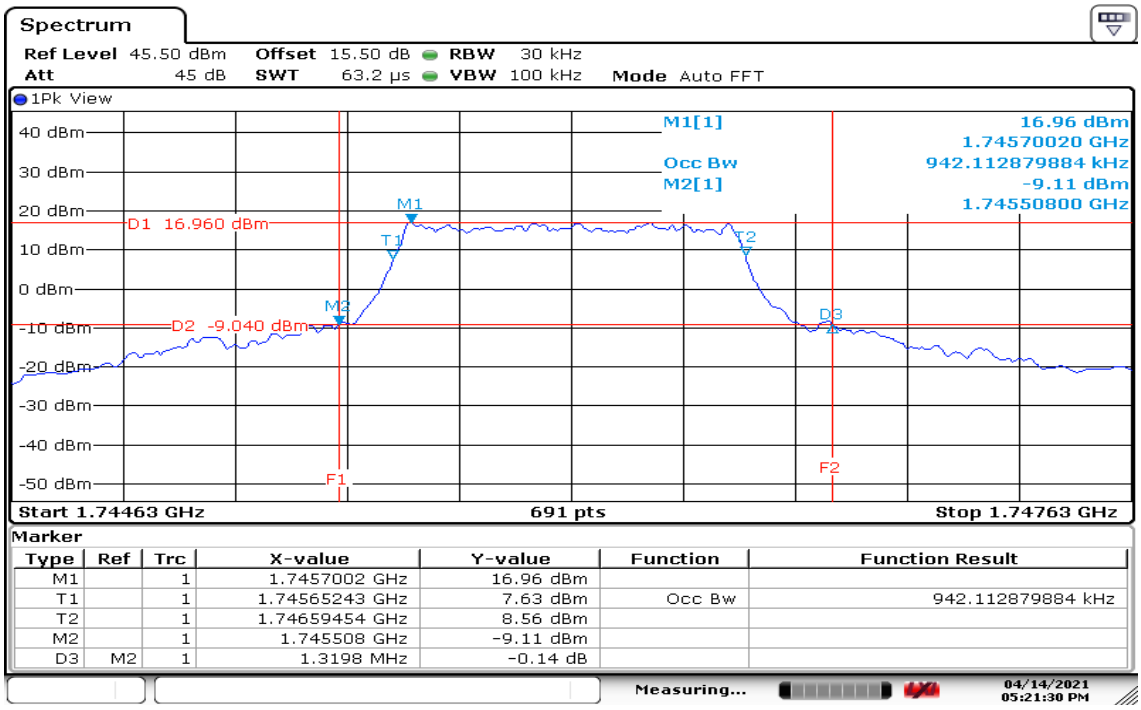
Date: 14.APR.2021 16:31:21

CH Mid



Date: 14.APR.2021 17:03:39

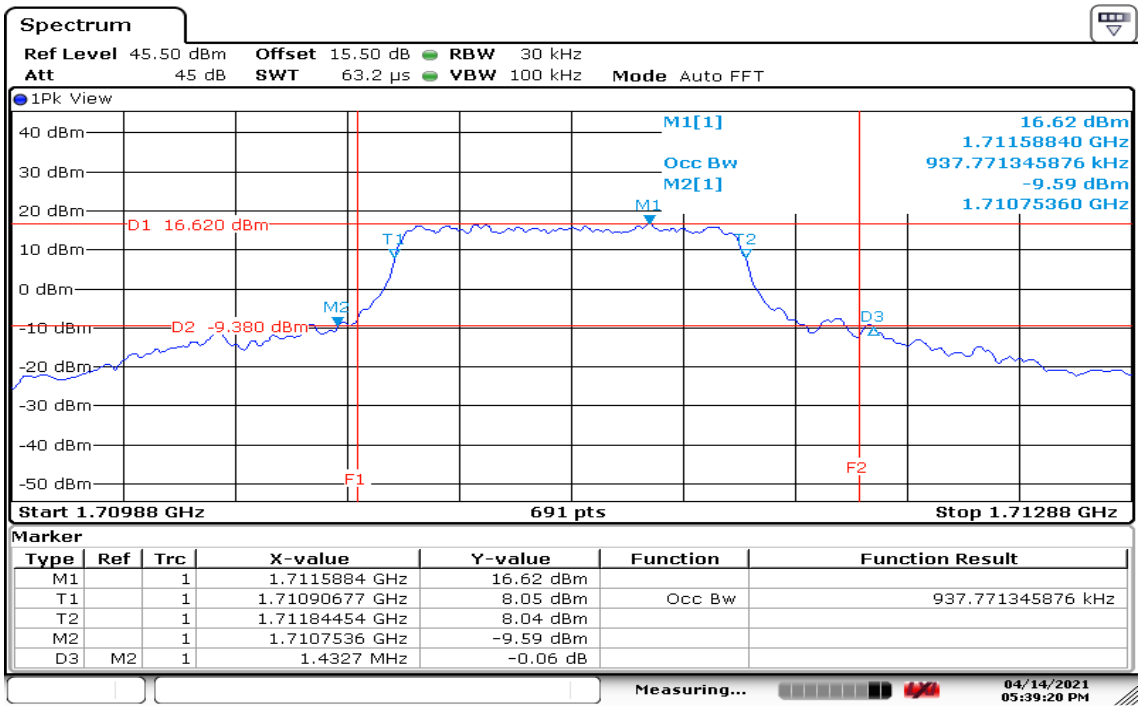
CH High



Date: 14.APR.2021 17:21:30

BW: 15MHz

CH Low



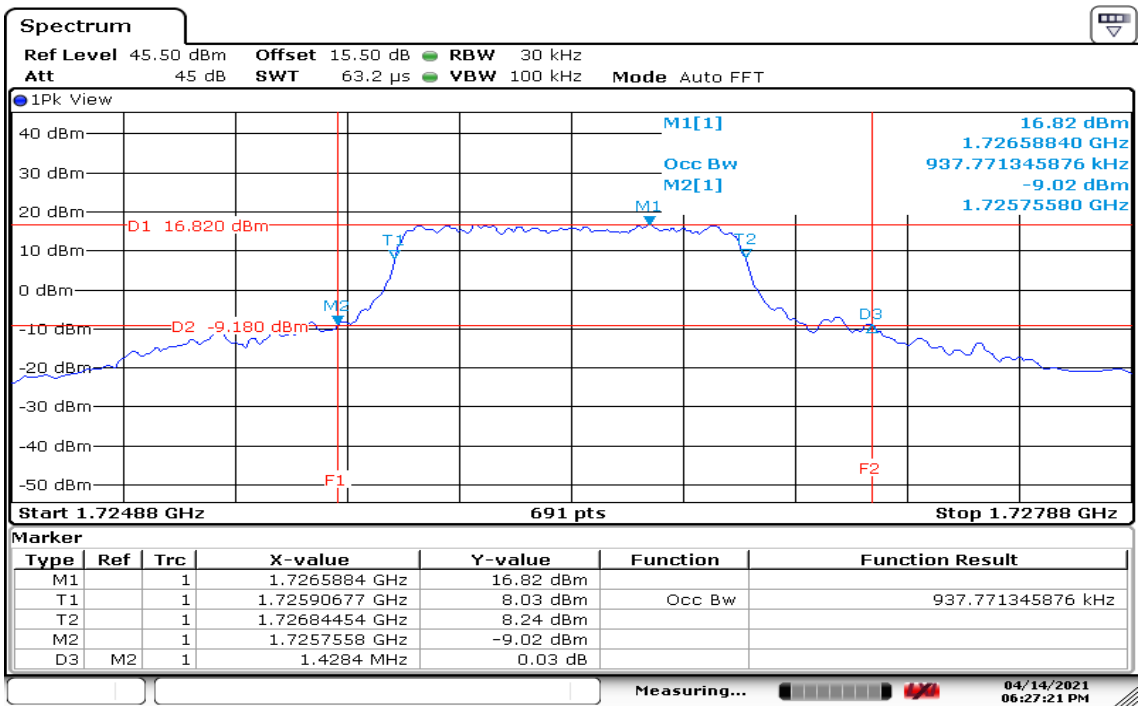
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7115884 GHz	16.62 dBm		
T1		1	1.71090677 GHz	8.05 dBm	Occ Bw	937.771345876 kHz
T2		1	1.71184454 GHz	8.04 dBm		
M2		1	1.7107536 GHz	-9.59 dBm		
D3	M2	1	1.4327 MHz	-0.06 dB		

Measuring... 04/14/2021 05:39:20 PM

Date: 14.APR.2021 17:39:20

CH Mid



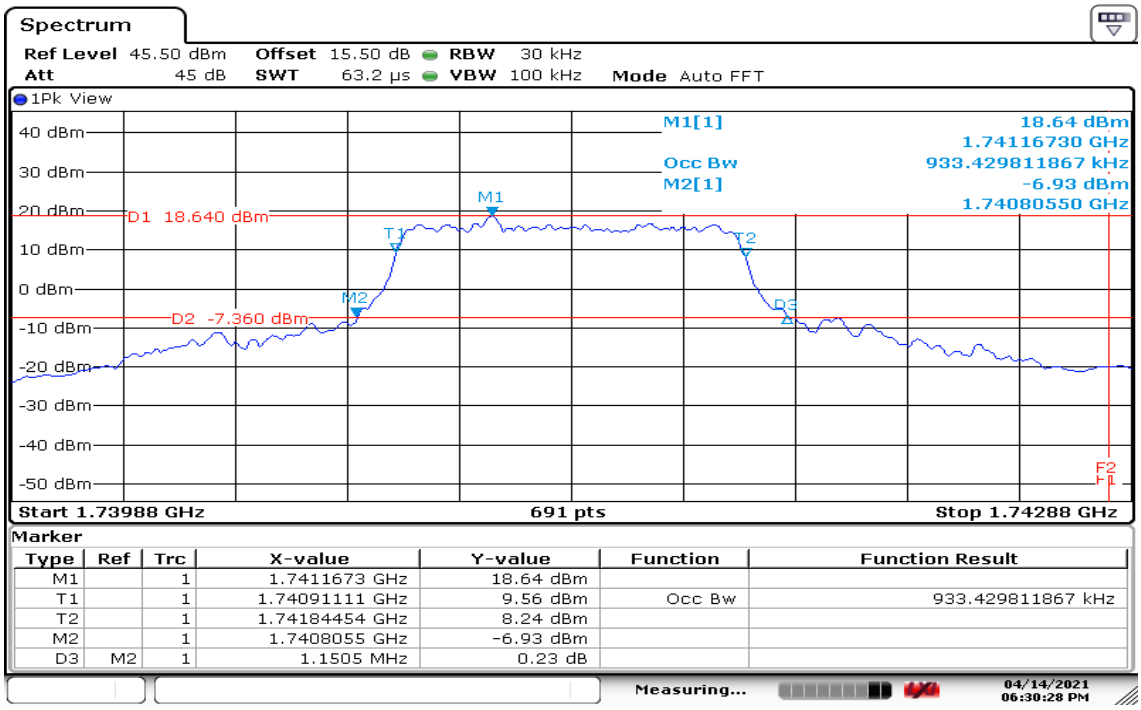
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7265884 GHz	16.82 dBm		
T1		1	1.72590677 GHz	8.03 dBm	Occ Bw	937.771345876 kHz
T2		1	1.72684454 GHz	8.24 dBm		
M2		1	1.7257558 GHz	-9.02 dBm		
D3	M2	1	1.4284 MHz	0.03 dB		

Measuring... 04/14/2021 06:27:21 PM

Date: 14.APR.2021 18:27:21

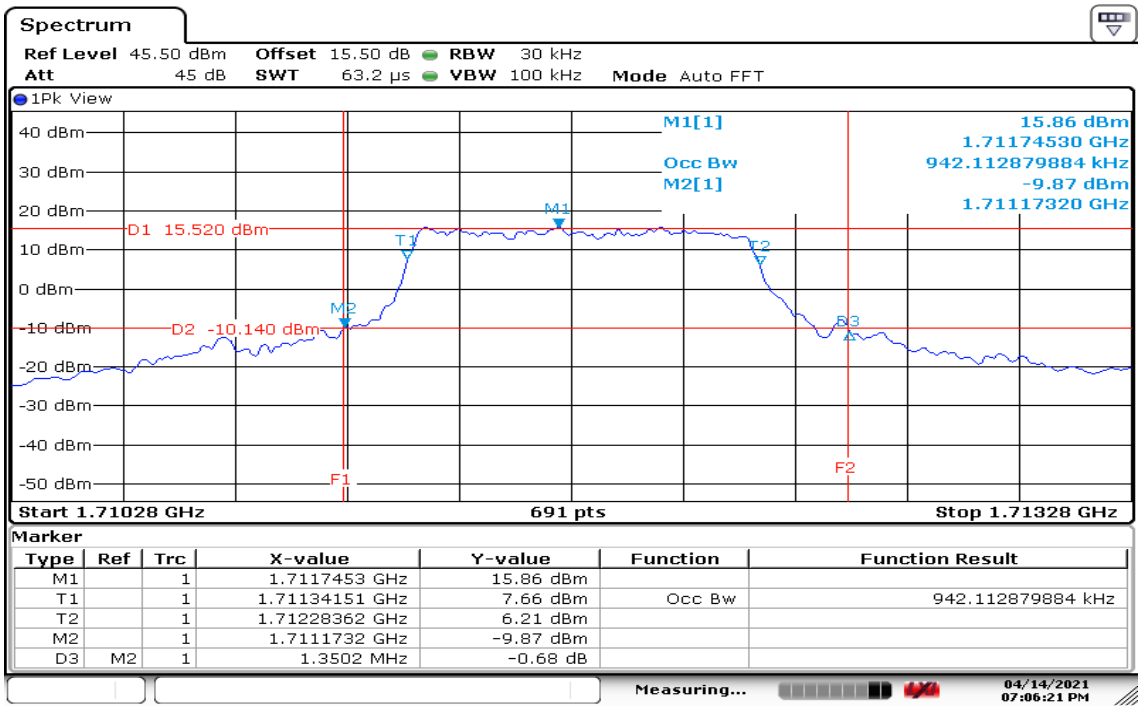
CH High



Date: 14.APR.2021 18:30:29

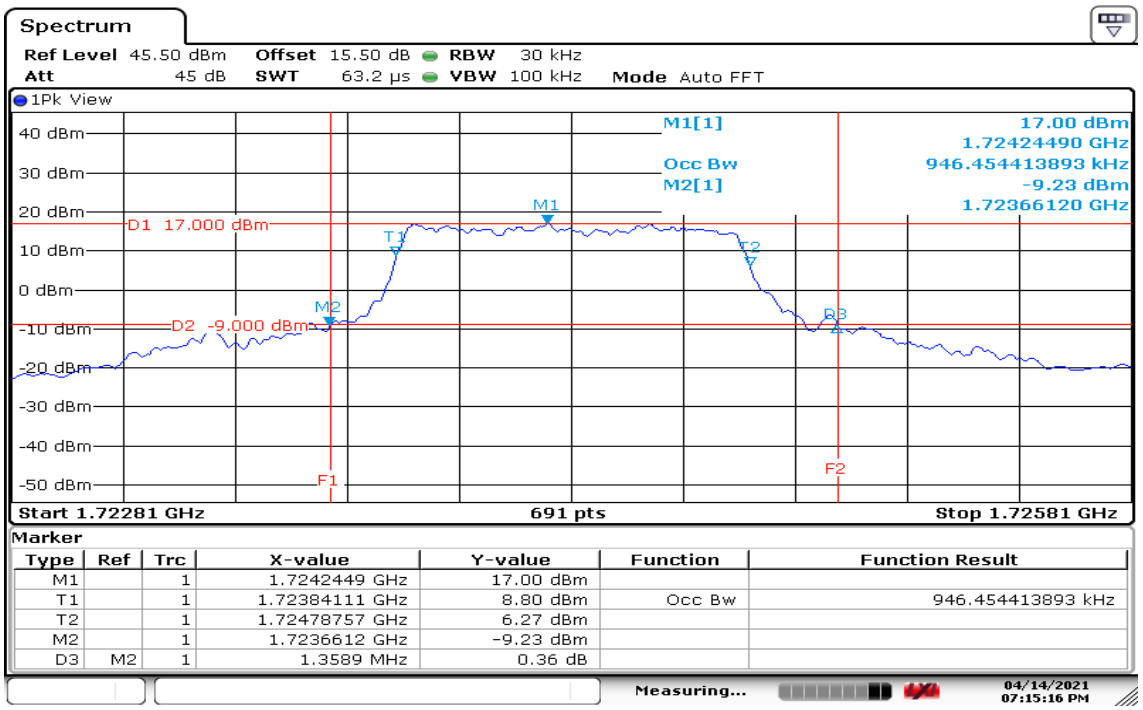
BW: 20MHz

CH Low



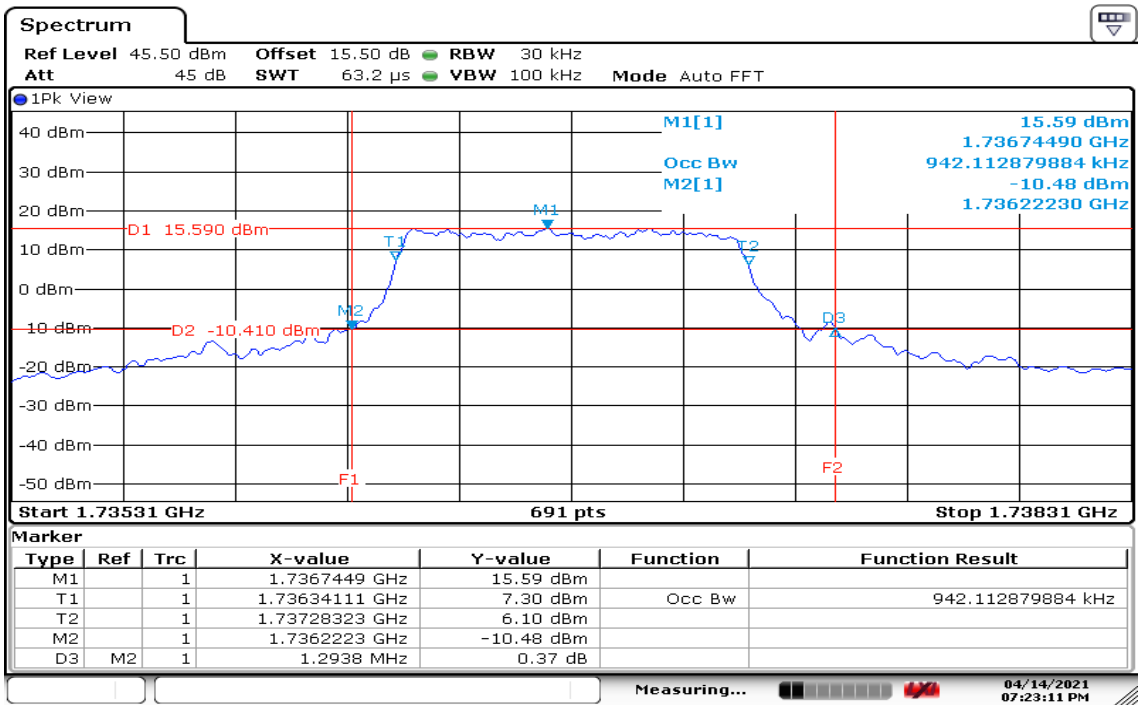
Date: 14.APR.2021 19:06:22

CH Mid



Date: 14.APR.2021 19:15:16

CH High



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7367449 GHz	15.59 dBm		
T1		1	1.73634111 GHz	7.30 dBm	Occ Bw	942.112879884 kHz
T2		1	1.73728323 GHz	6.10 dBm		
M2		1	1.7362223 GHz	-10.48 dBm		
D3	M2	1	1.2938 MHz	0.37 dB		

Date: 14.APR.2021 19:23:11

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 4

Temperature:	23.1℃	**Humidity:**	52.5% RH
Tested by:	Dally Hong	**Test Date:**	April 14, 2021

CHANNEL BANDWIDTH: 1.4MHz / QPSK / Full RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
19957	1710.7	8.00
20175	1732.5	8.41
20393	1754.3	5.36

CHANNEL BANDWIDTH: 3MHz / QPSK / Full RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
19957	1710.7	8.06
20175	1732.5	4.75
20393	1754.3	6.75

CHANNEL BANDWIDTH: 5MHz / QPSK / Full RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
19957	1710.7	8.17
20175	1732.5	8.49
20393	1754.3	5.74

CHANNEL BANDWIDTH: 10MHz / QPSK / Full RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
19957	1710.7	8.49
20175	1732.5	8.26
20393	1754.3	8.70

CHANNEL BANDWIDTH: 15MHz / QPSK / Full RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
19957	1710.7	8.55
20175	1732.5	6.26
20393	1754.3	8.29

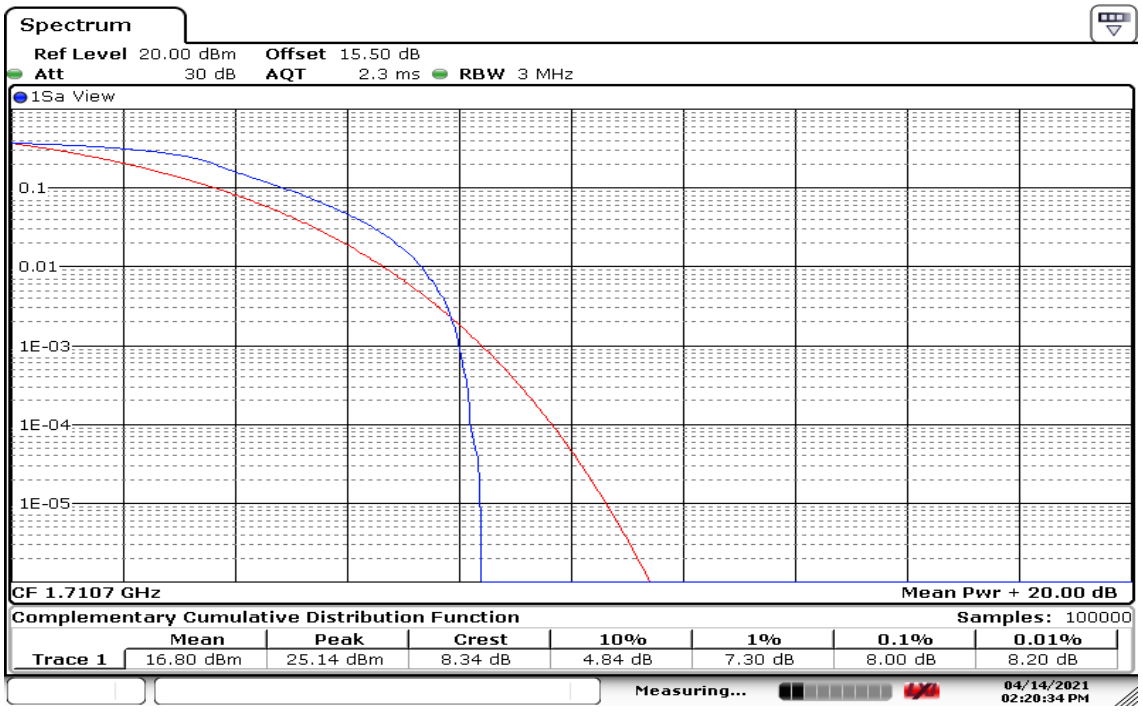
CHANNEL BANDWIDTH: 20MHz / QPSK / Full RB

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
19957	1710.7	8.55
20175	1732.5	8.49
20393	1754.3	8.58

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

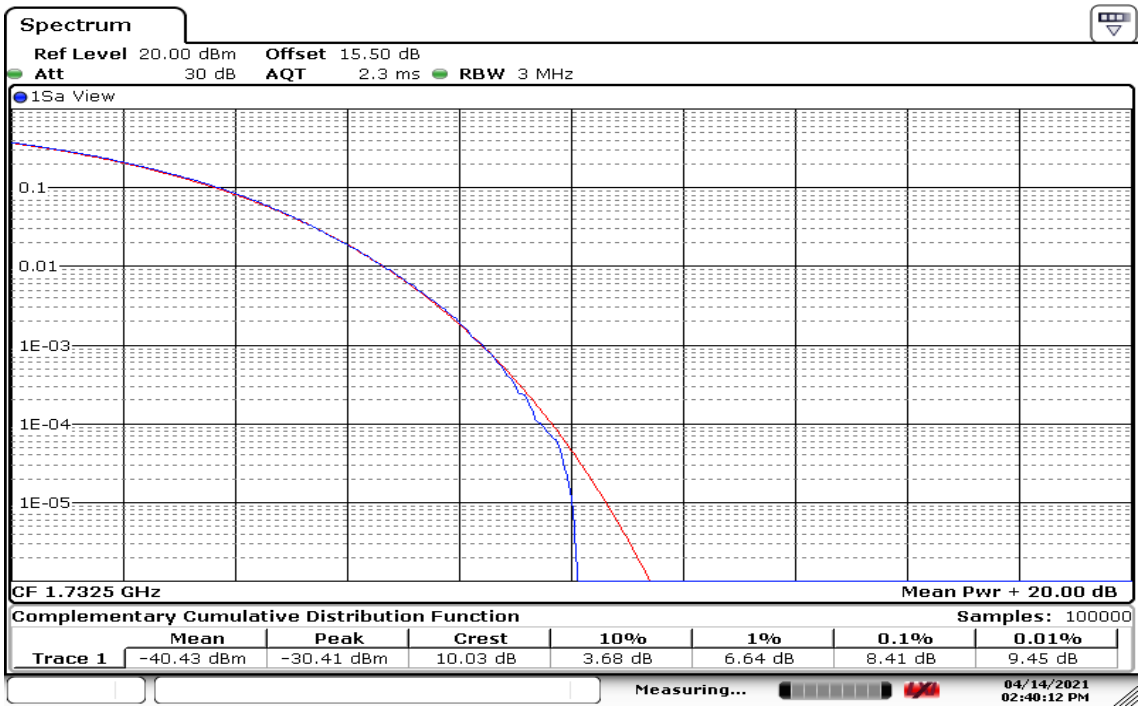
LTE Band 4

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



Date: 14.APR.2021 14:20:34

CH Mid



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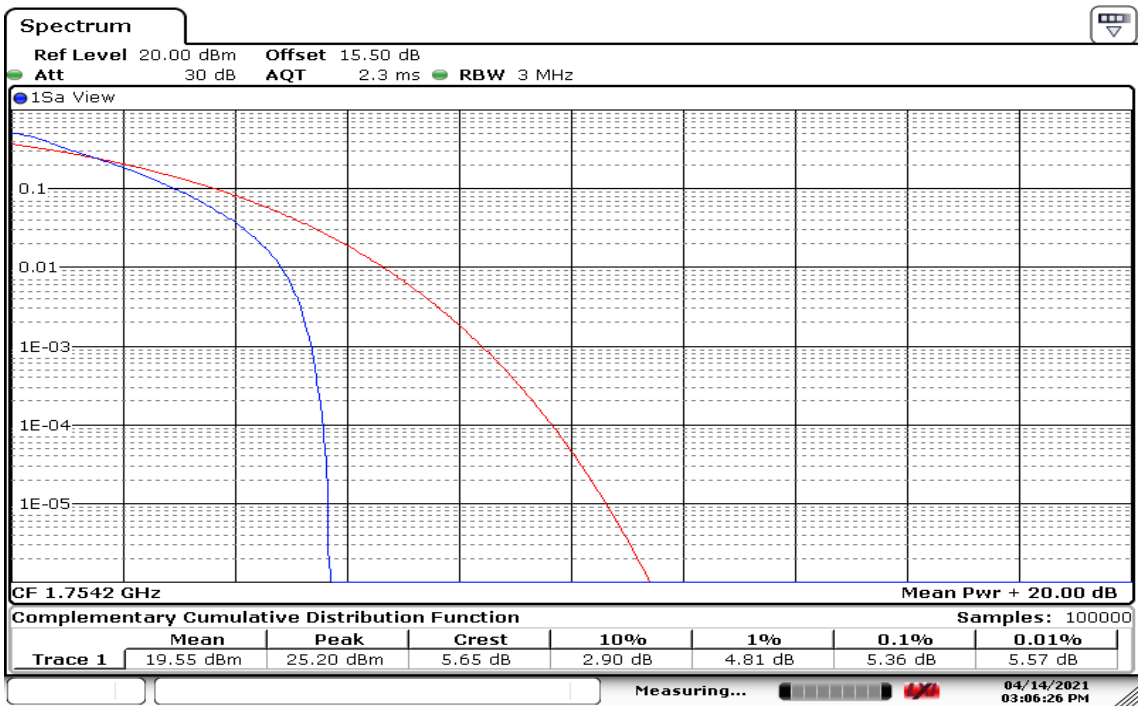
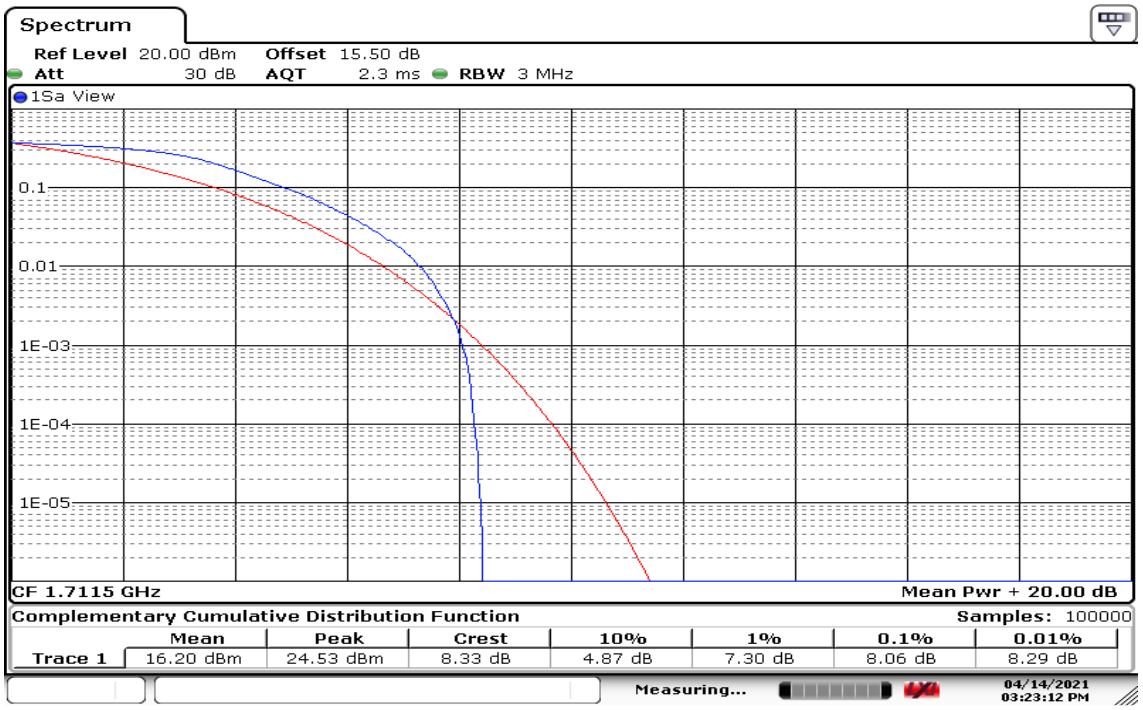
CH High



Date: 14.APR.2021 15:06:27

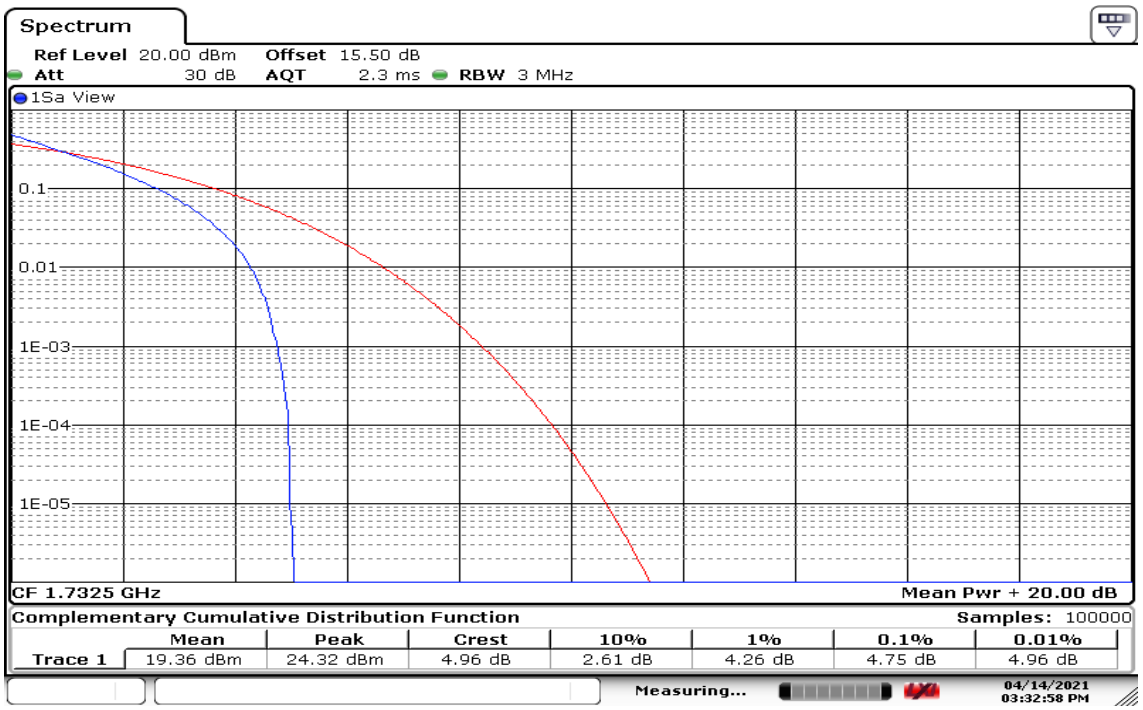
BW: 3MHz

CH Low



Date: 14.APR.2021 15:23:13

CH Mid



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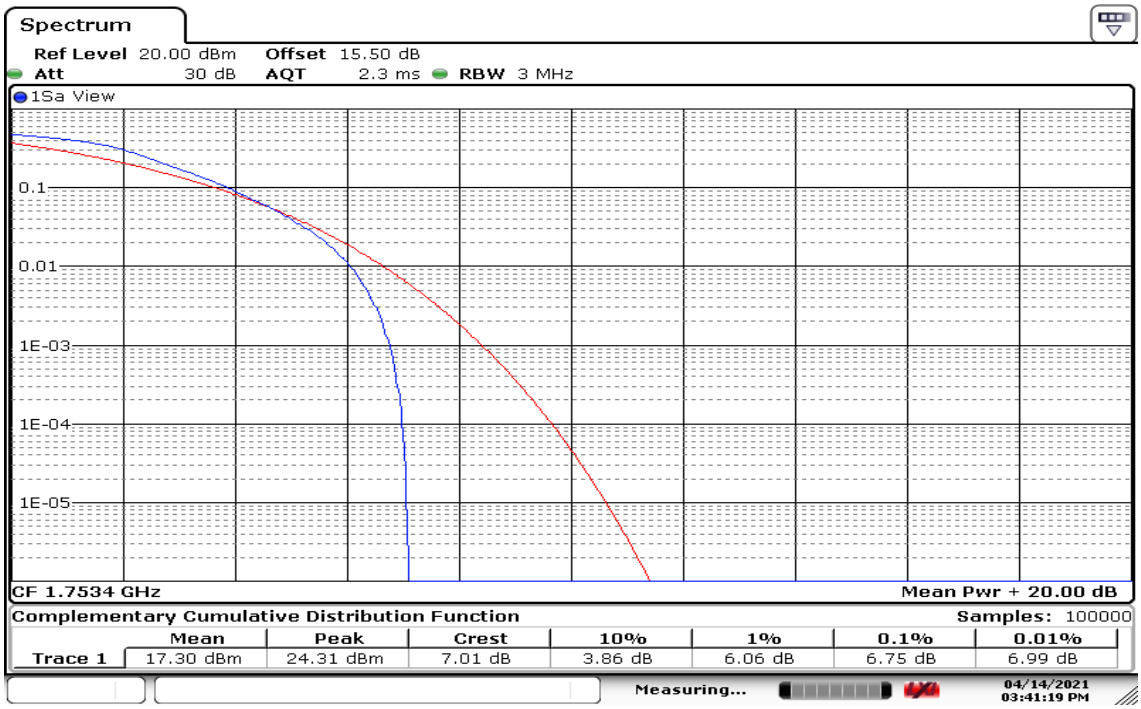
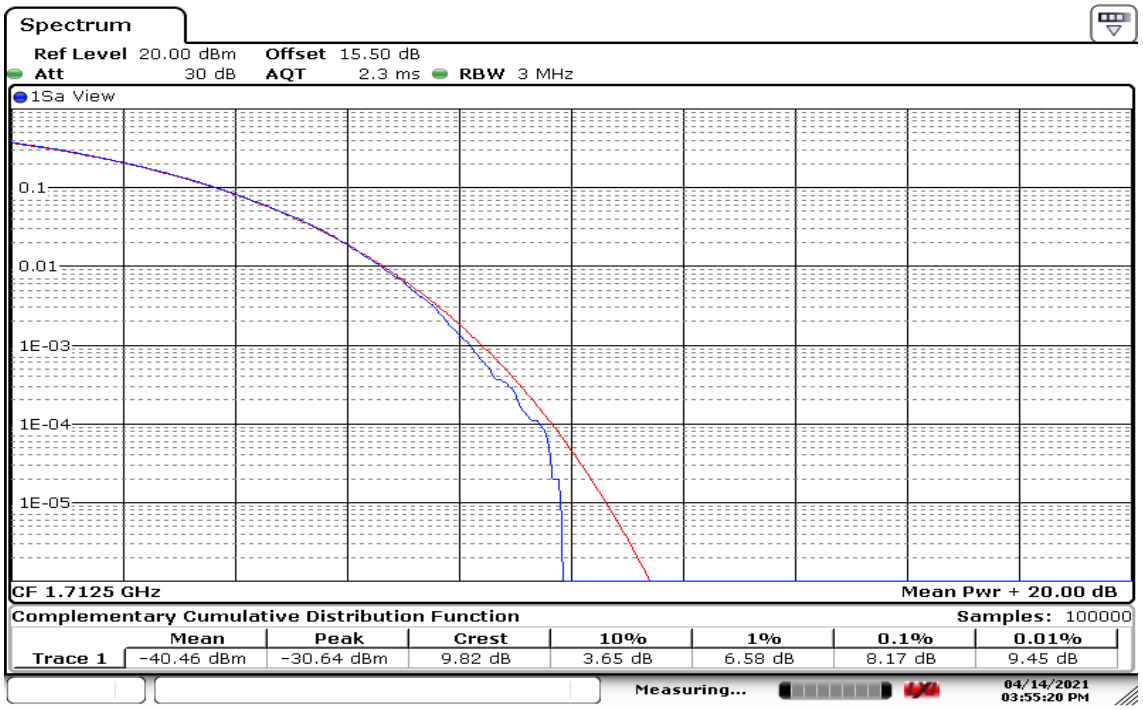
CH High



Date: 14.APR.2021 15:41:19

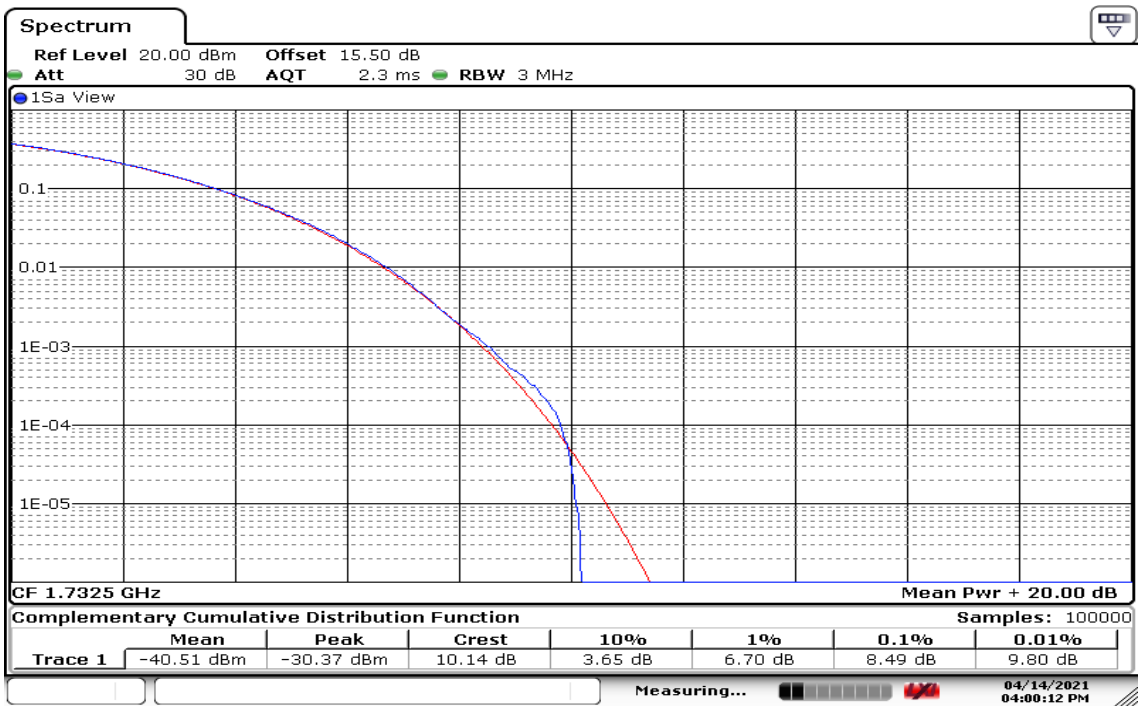
BW: 5MHz

CH Low



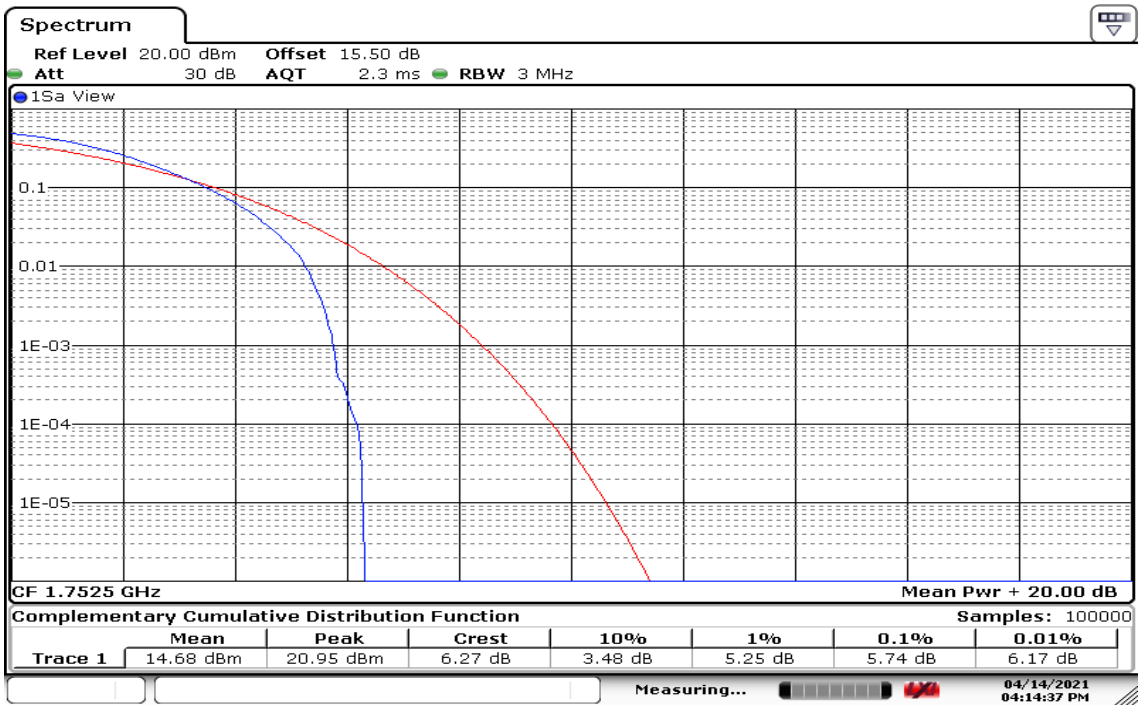
Date: 14.APR.2021 15:55:21

CH Mid



Date: 14.APR.2021 16:00:12

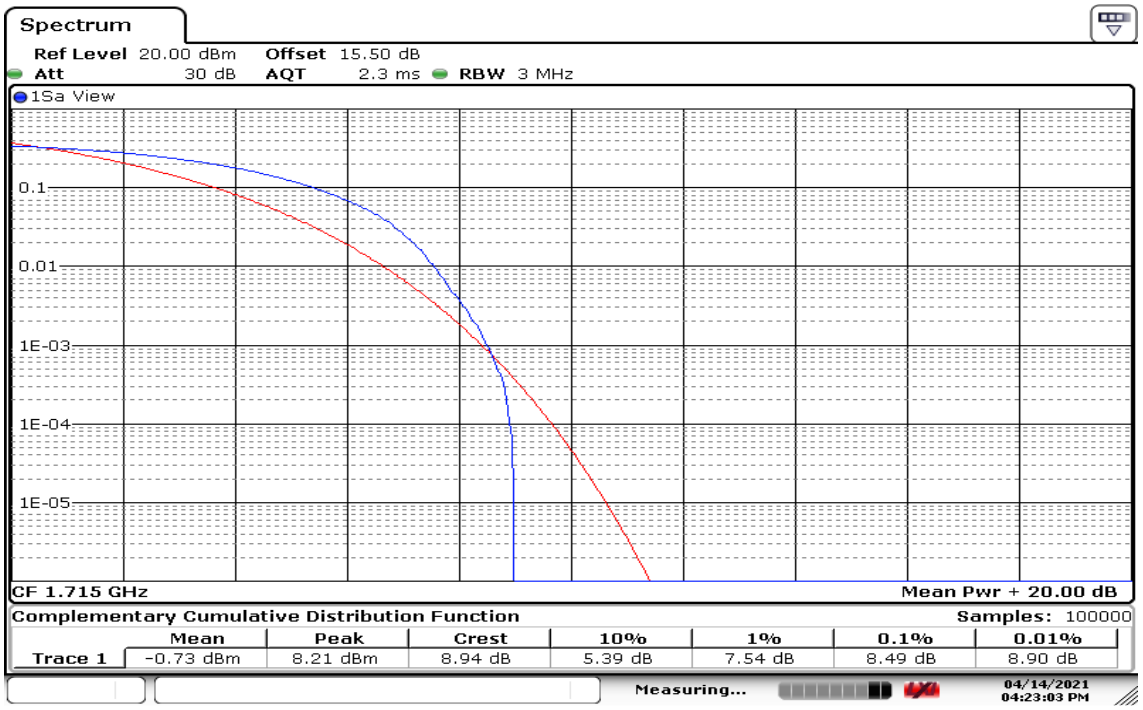
CH High



Date: 14.APR.2021 16:14:37

BW: 10MHz

CH Low



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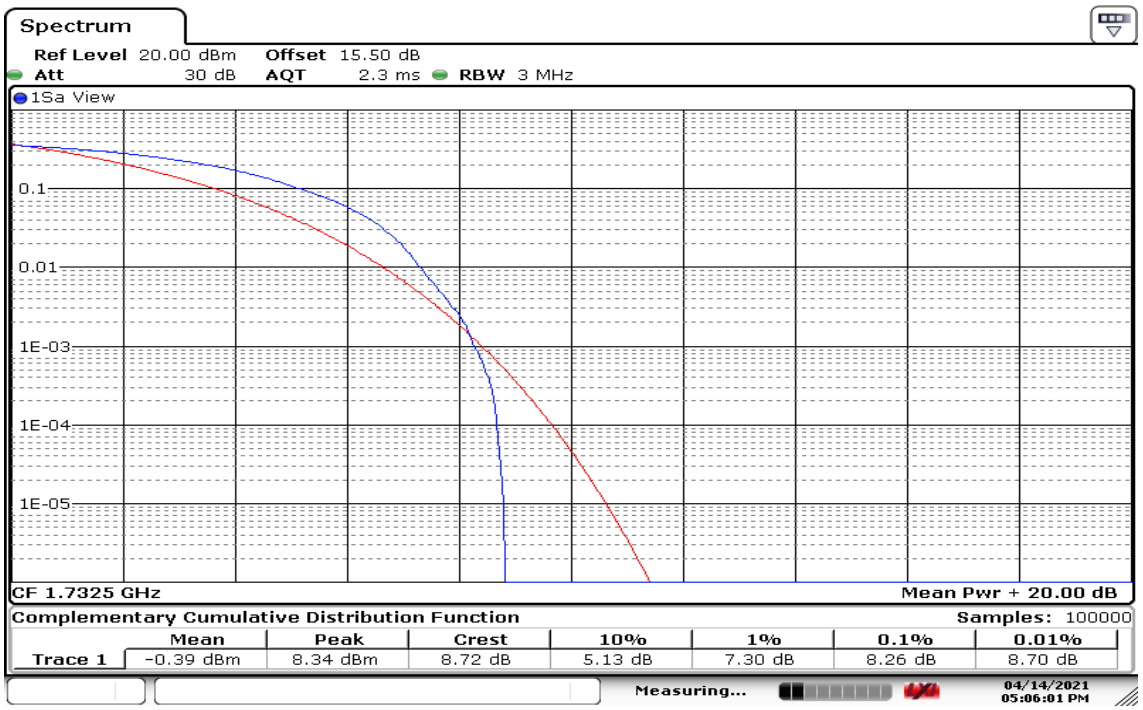
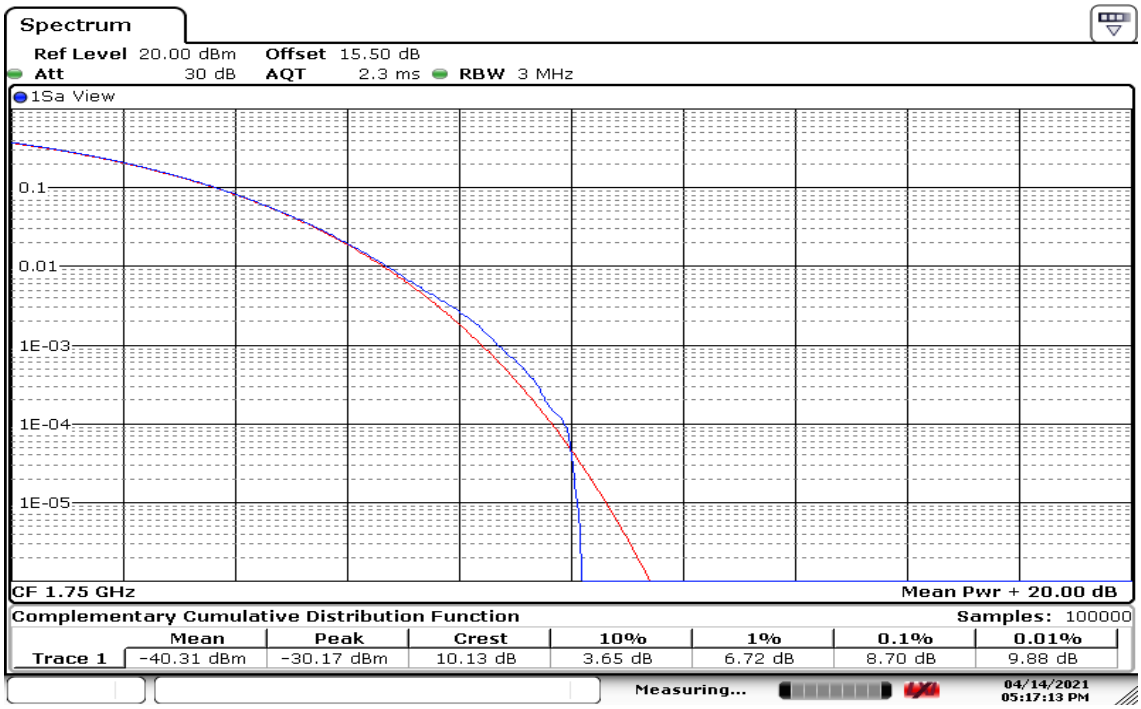
CH Mid



Date: 14.APR.2021 17:06:02

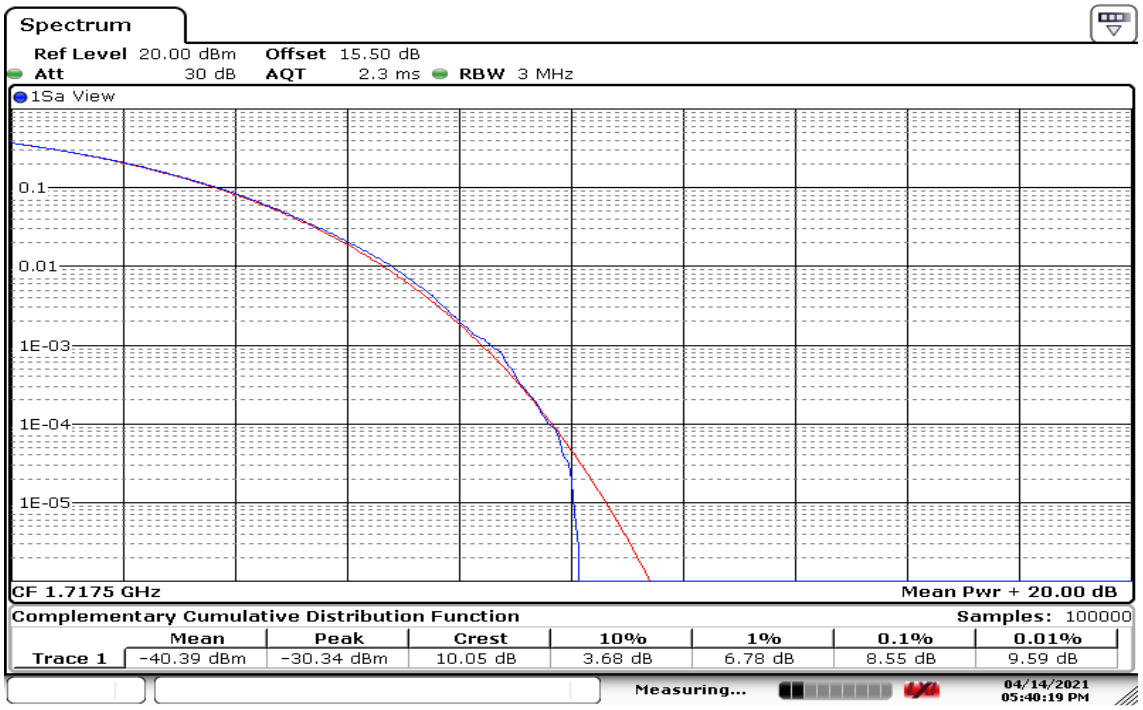
CH High



Date: 14.APR.2021 17:17:13

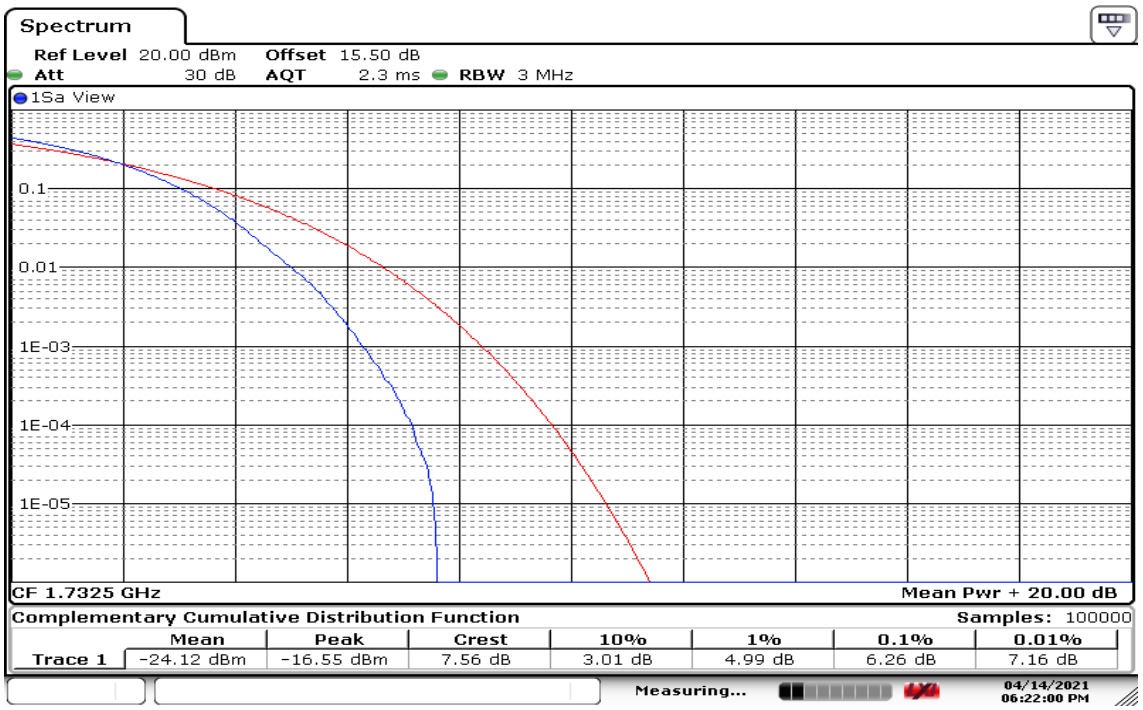
BW: 15MHz

CH Low



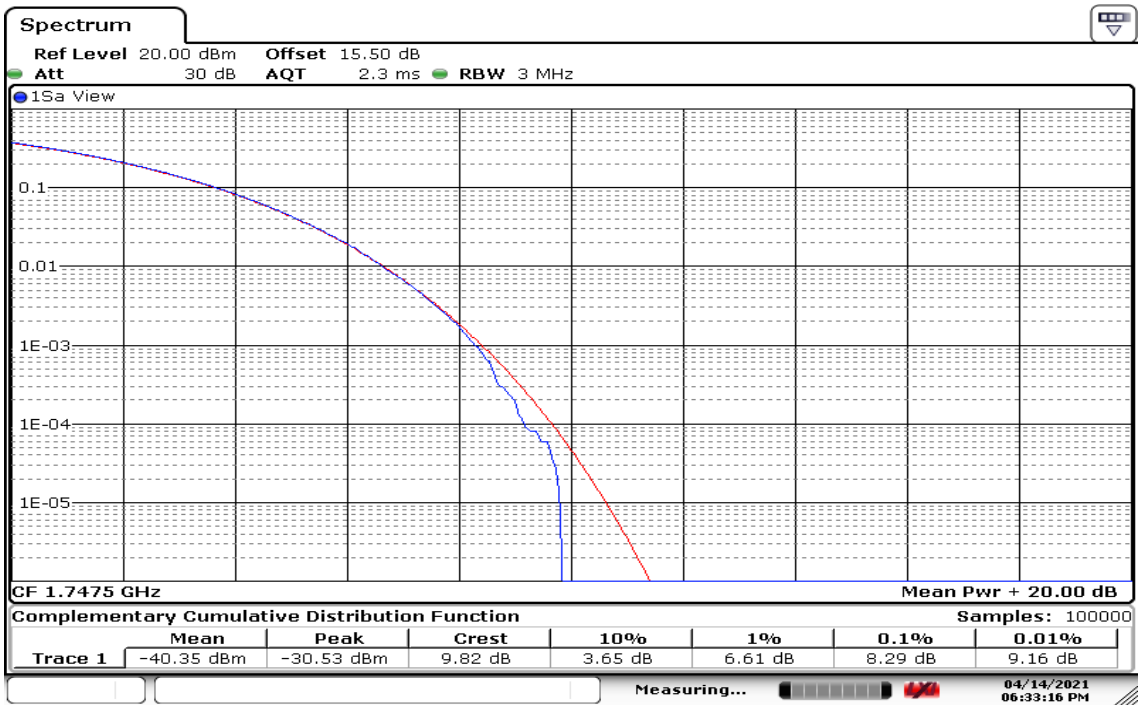
Date: 14.APR.2021 17:40:19

CH Mid



Date: 14.APR.2021 18:22:01

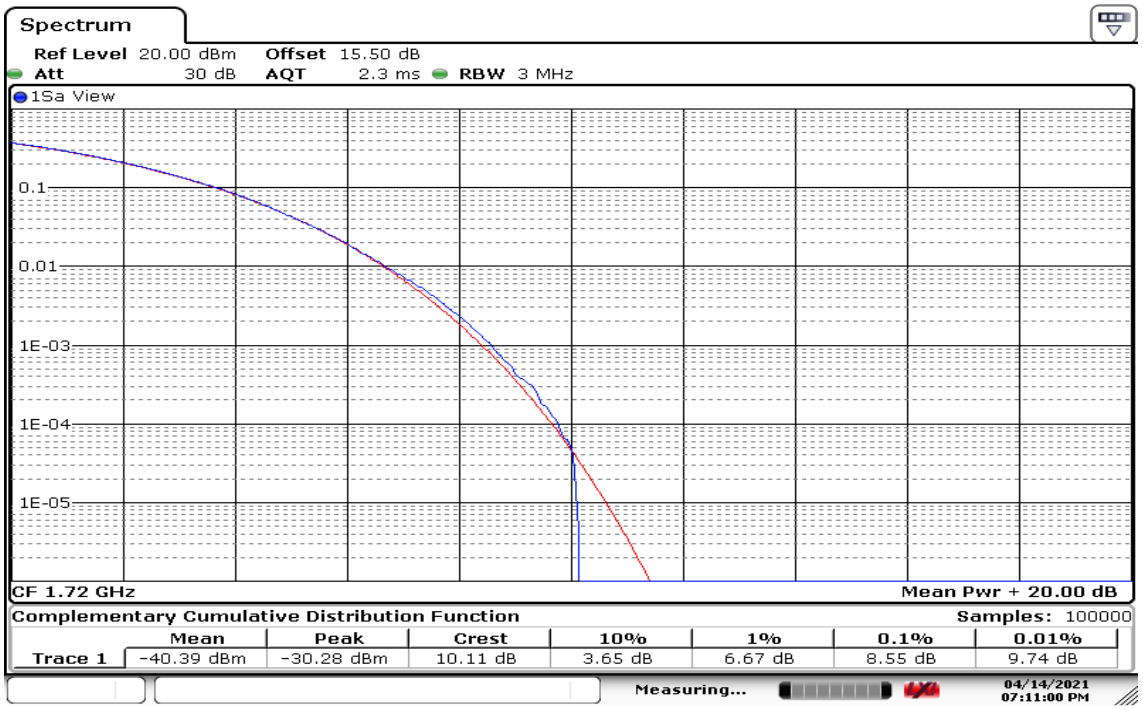
CH High



Date: 14.APR.2021 18:33:16

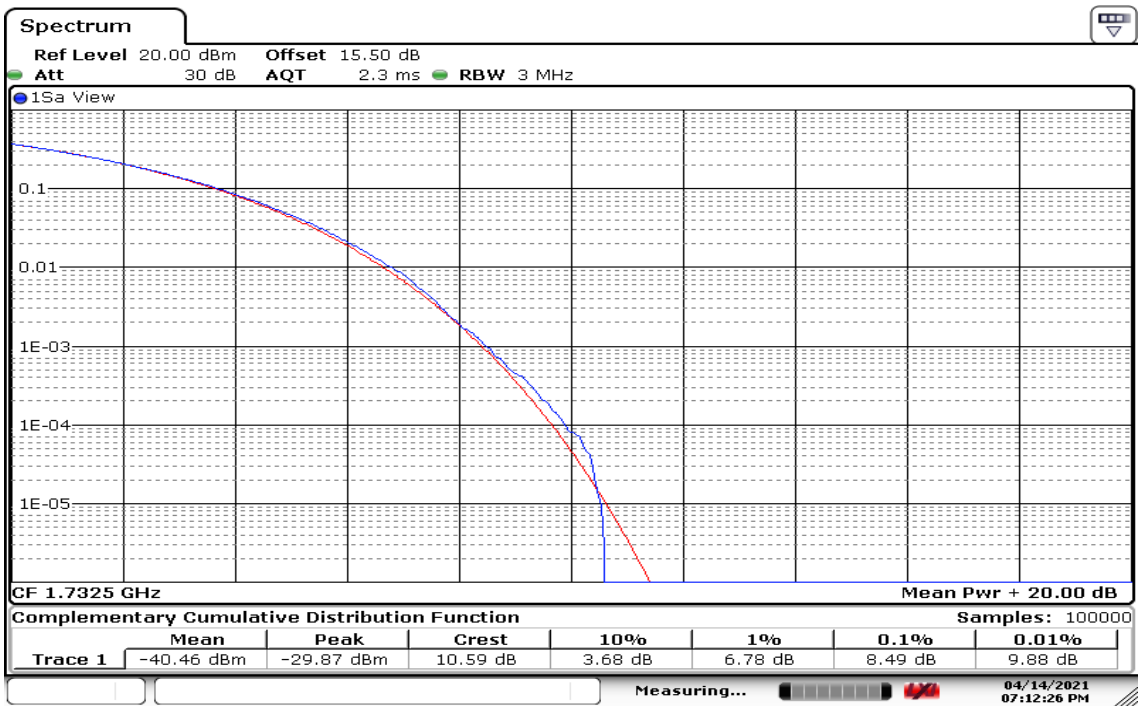
BW: 20MHz

CH Low



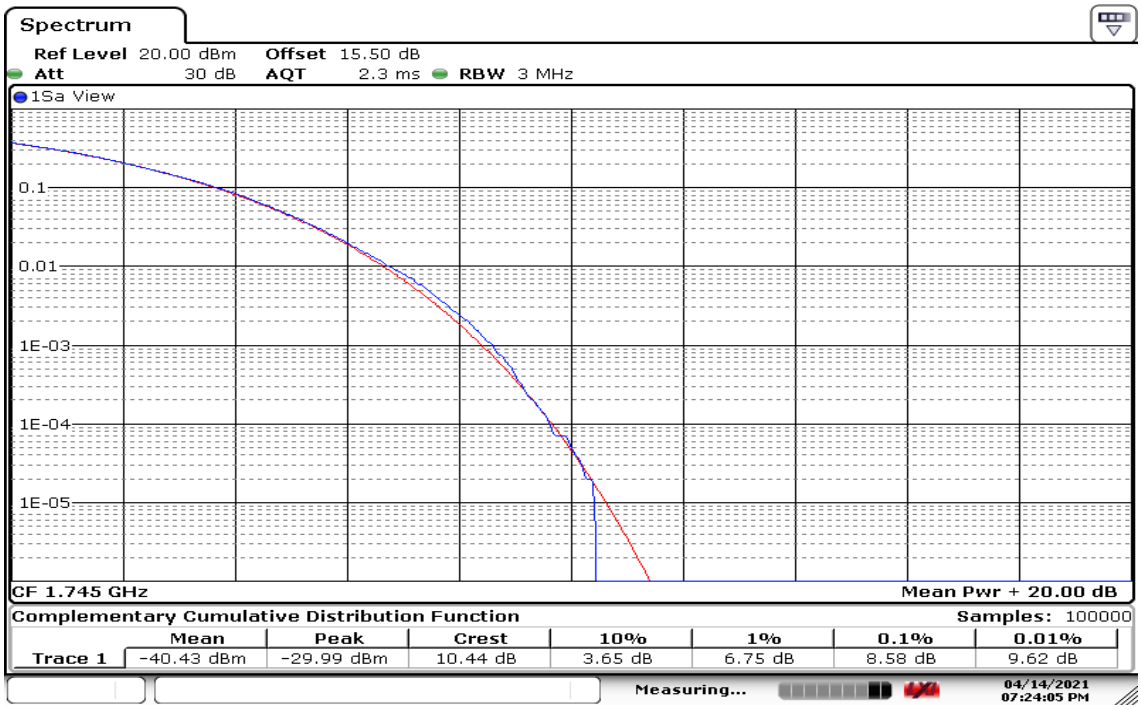
Date: 14.APR.2021 19:11:00

CH Mid



Date: 14.APR.2021 19:12:26

CH High



Date: 14.APR.2021 19:24:05

8.5 BAND EDGE MEASUREMENT

LIMIT

Part 27.53(h), Band 4
General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

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.

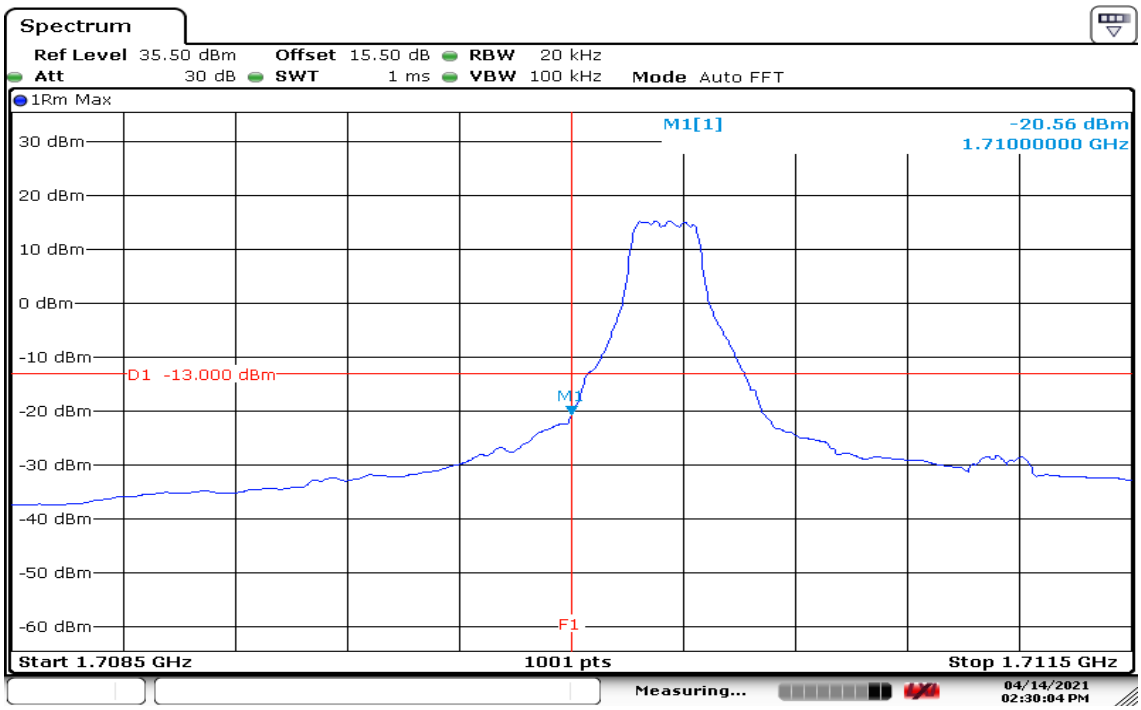
TEST RESULTS:

Temperature:	23.1℃	**Humidity:**	52.5% RH
Tested by:	Dally Hong	**Test Date:**	April 14, 2021

LTE Band 4

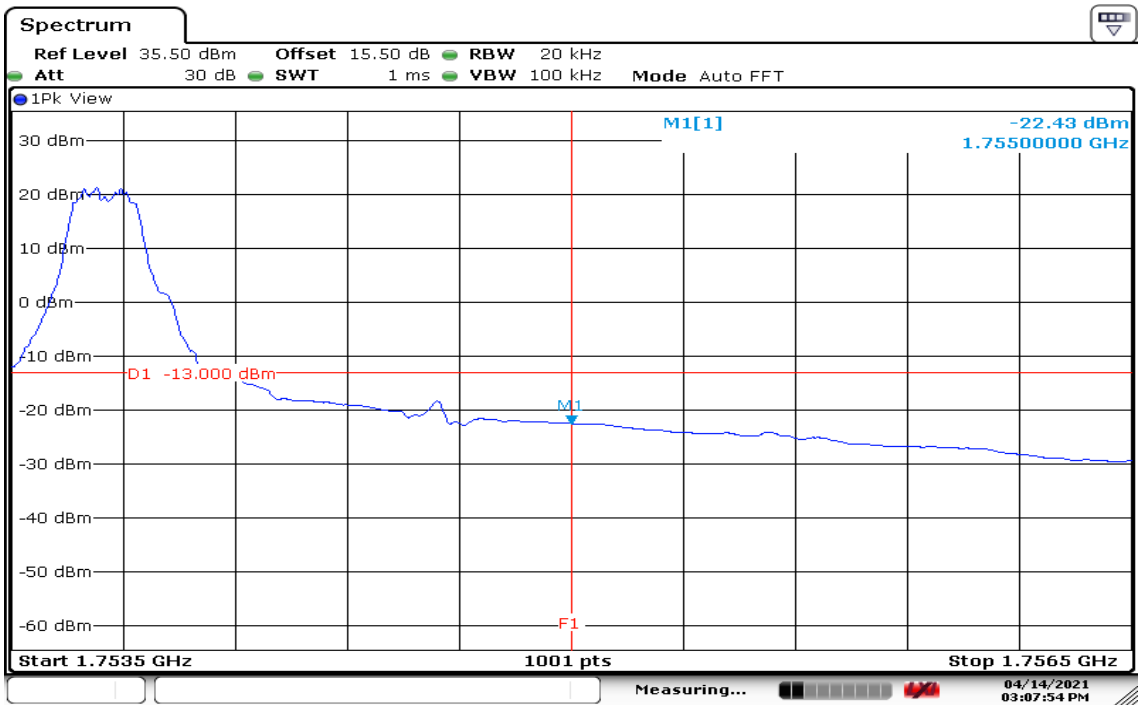
CHANNEL BANDWIDTH: 1.4MHz / QPSK / 1RB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 14:30:04

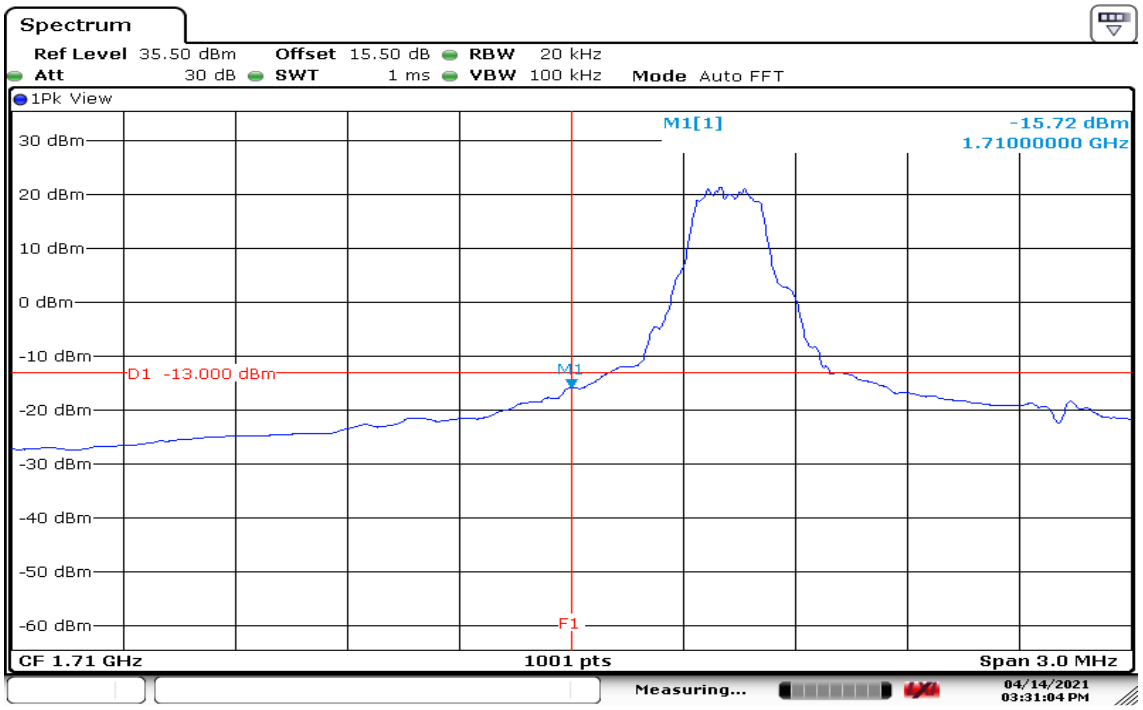
HIGHER BAND EDGE



Date: 14.APR.2021 15:07:54

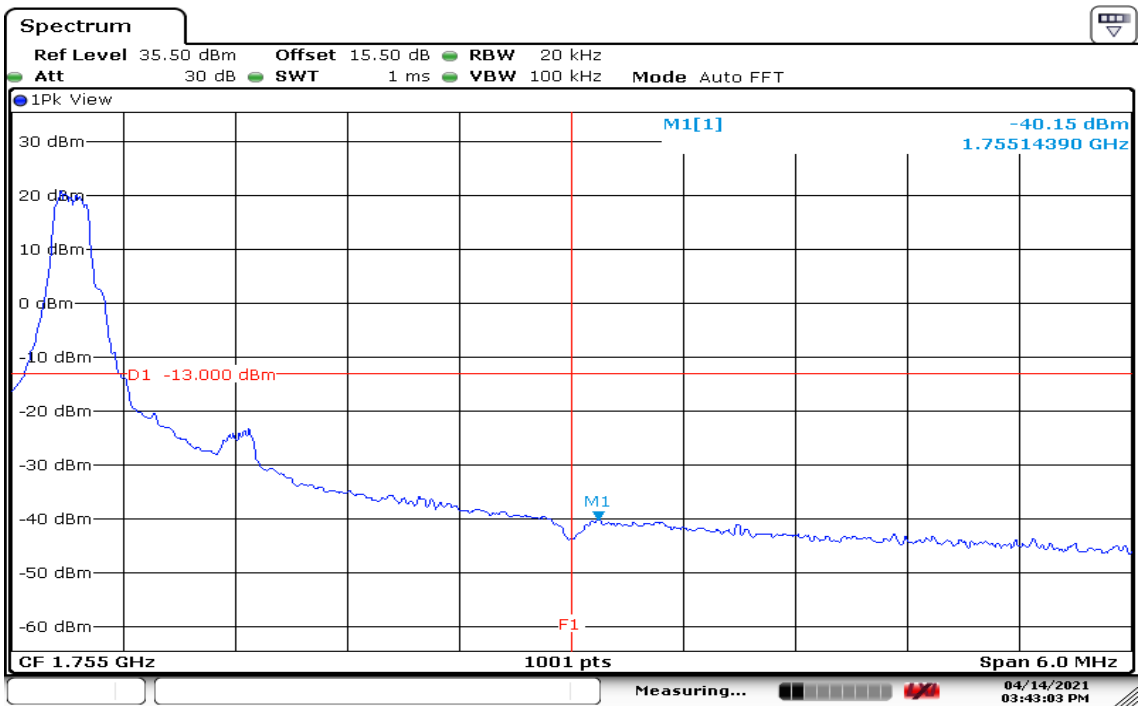
CHANNEL BANDWIDTH: 3MHz / QPSK / 1RB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 15:31:05

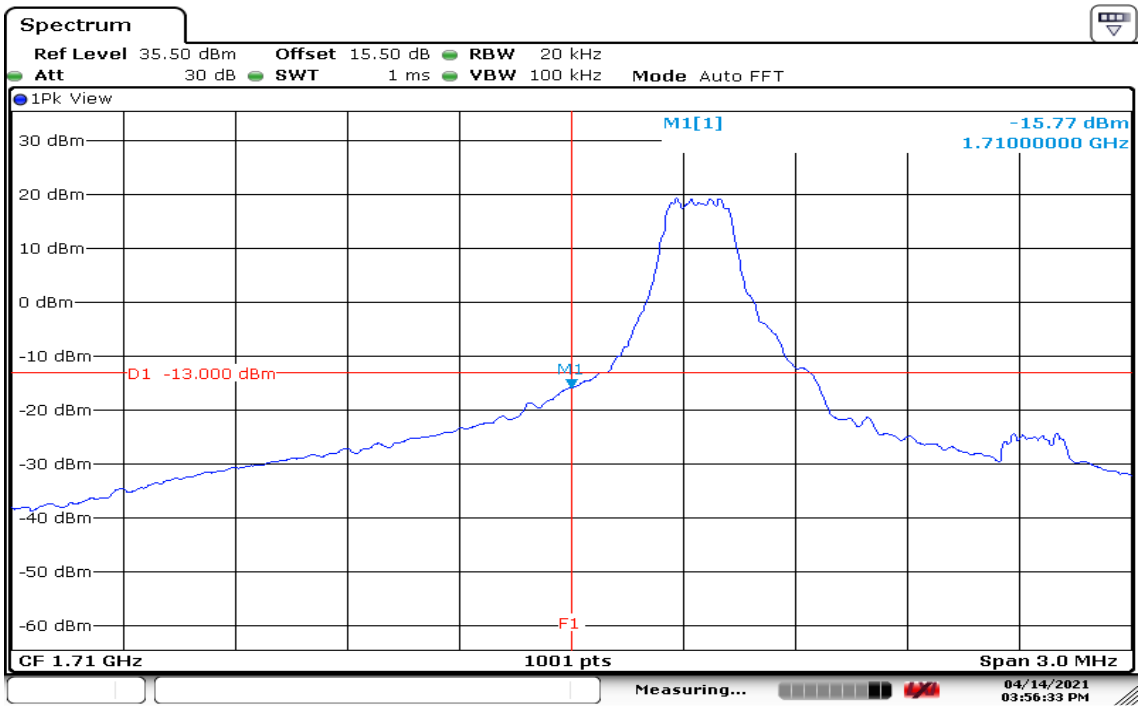
HIGHER BAND EDGE



Date: 14.APR.2021 15:43:03

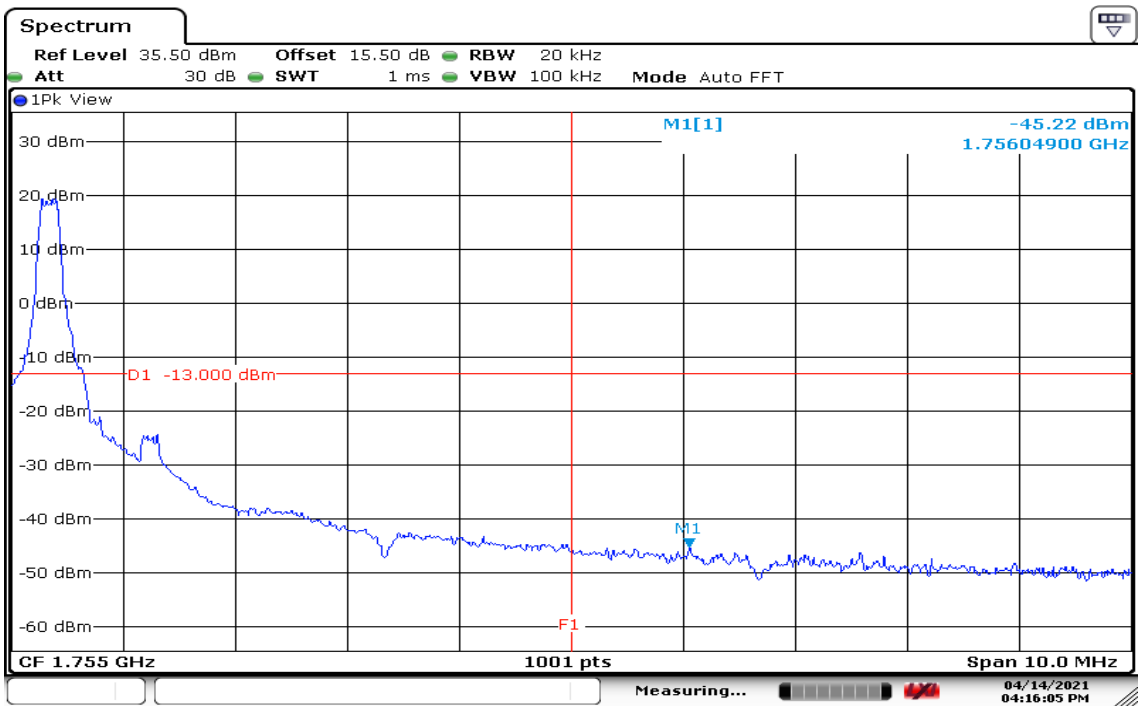
CHANNEL BANDWIDTH: 5MHz / QPSK / 1RB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 15:56:34

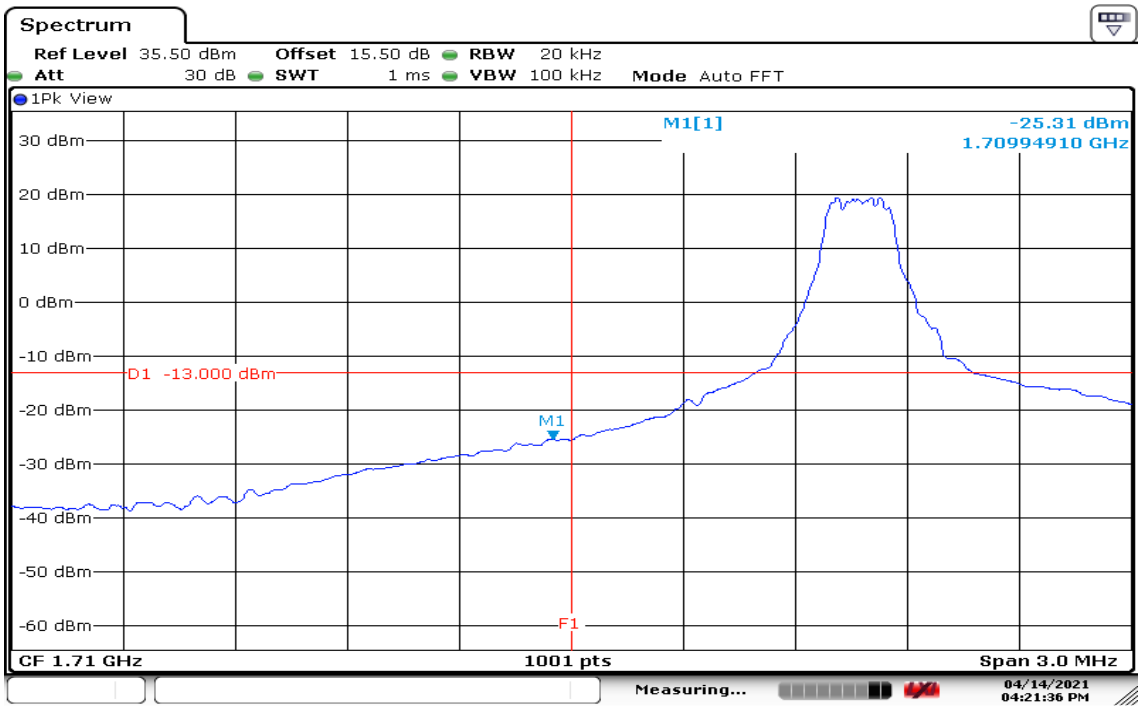
HIGHER BAND EDGE



Date: 14.APR.2021 16:16:05

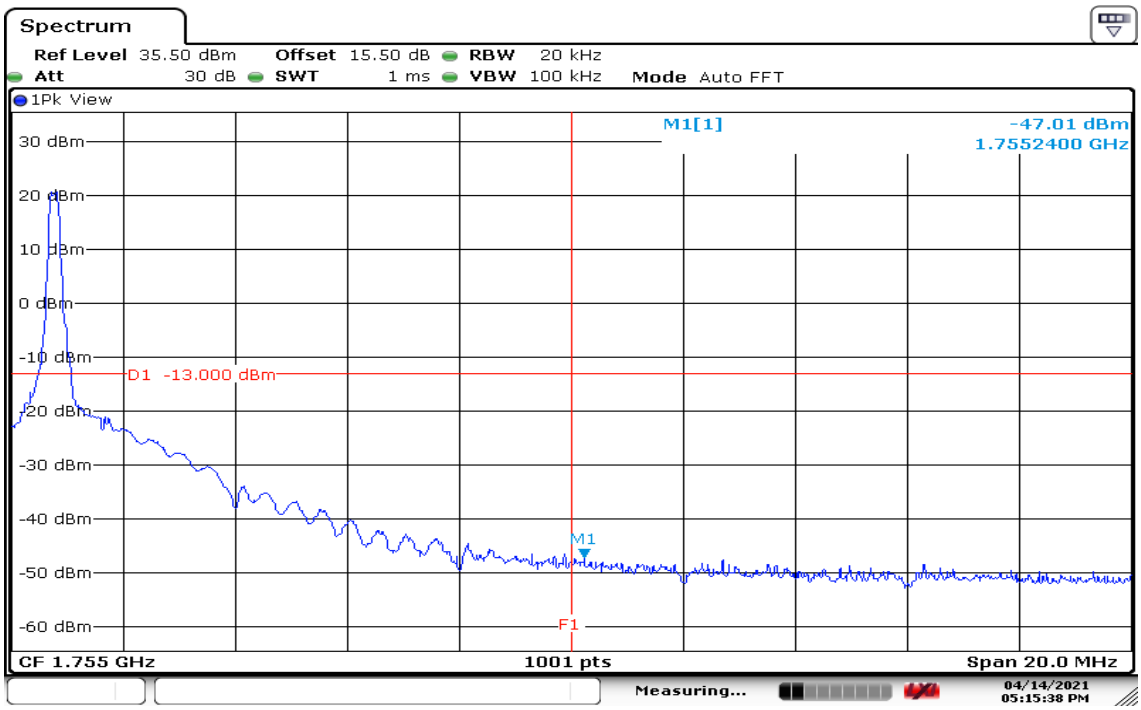
CHANNEL BANDWIDTH: 10MHz / QPSK / 1RB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 16:21:36

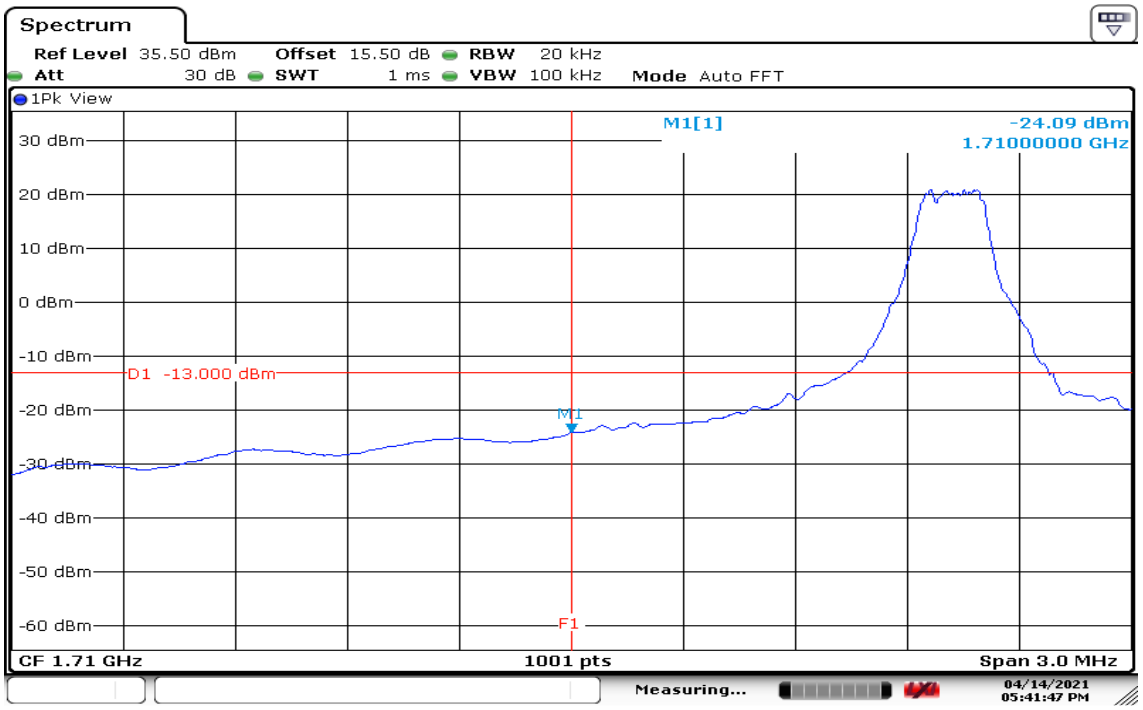
HIGHER BAND EDGE



Date: 14.APR.2021 17:15:39

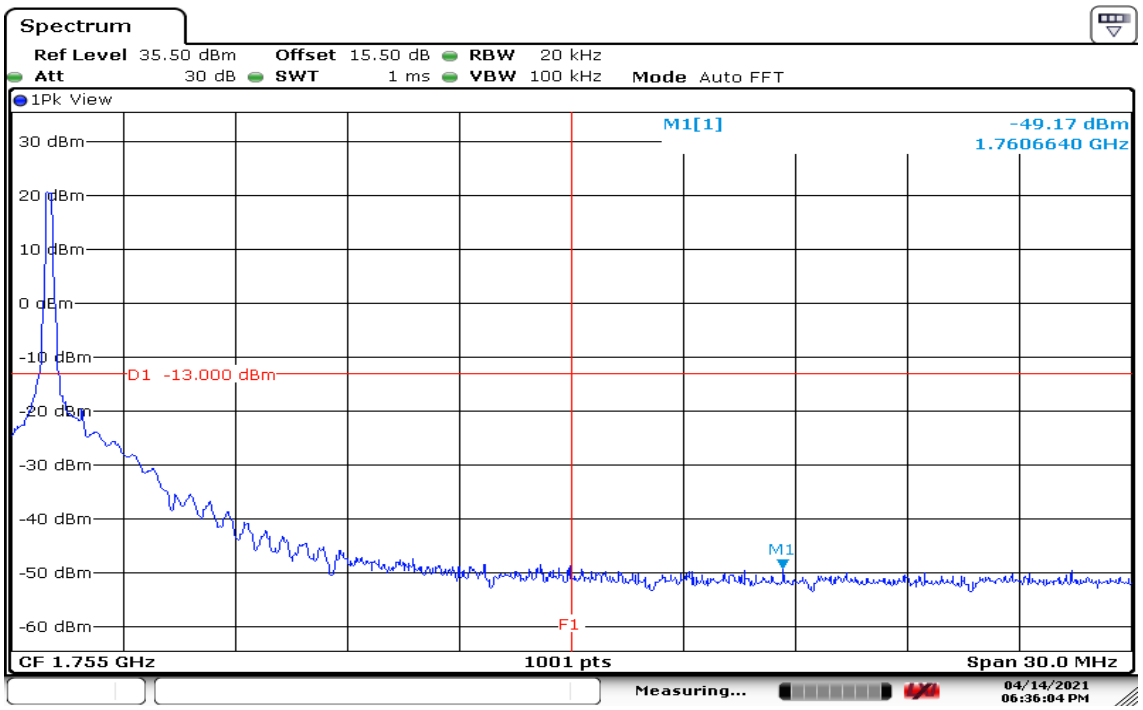
CHANNEL BANDWIDTH: 15MHz / QPSK / 1RB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 17:41:47

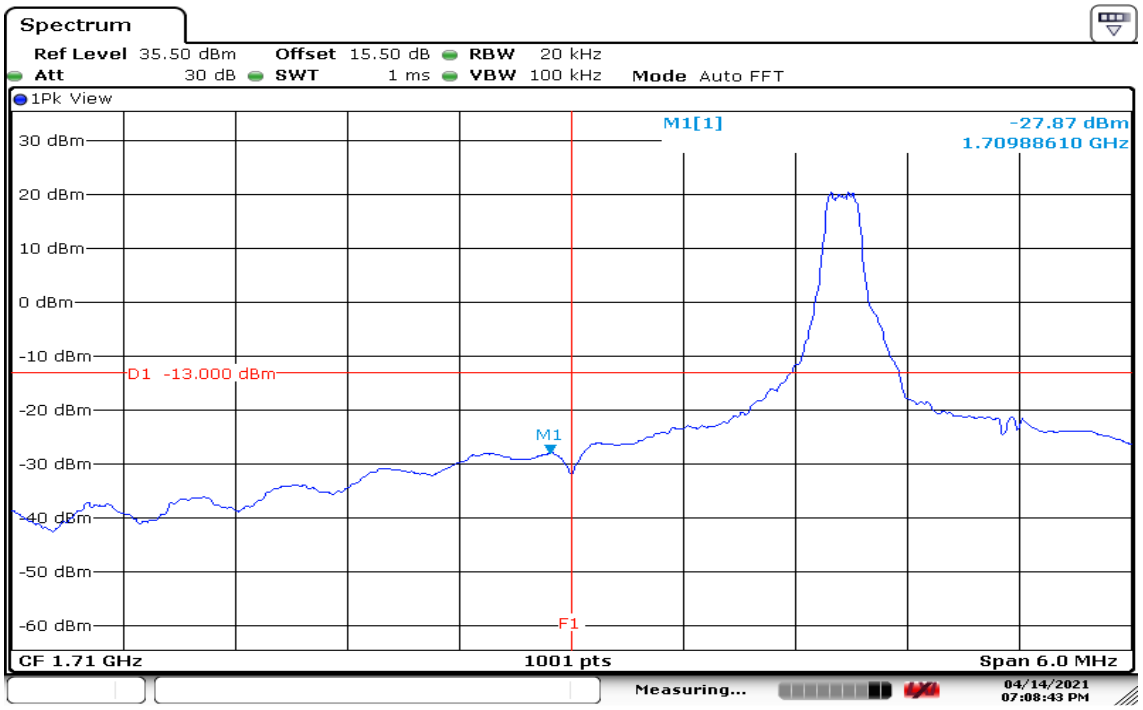
HIGHER BAND EDGE



Date: 14.APR.2021 18:36:05

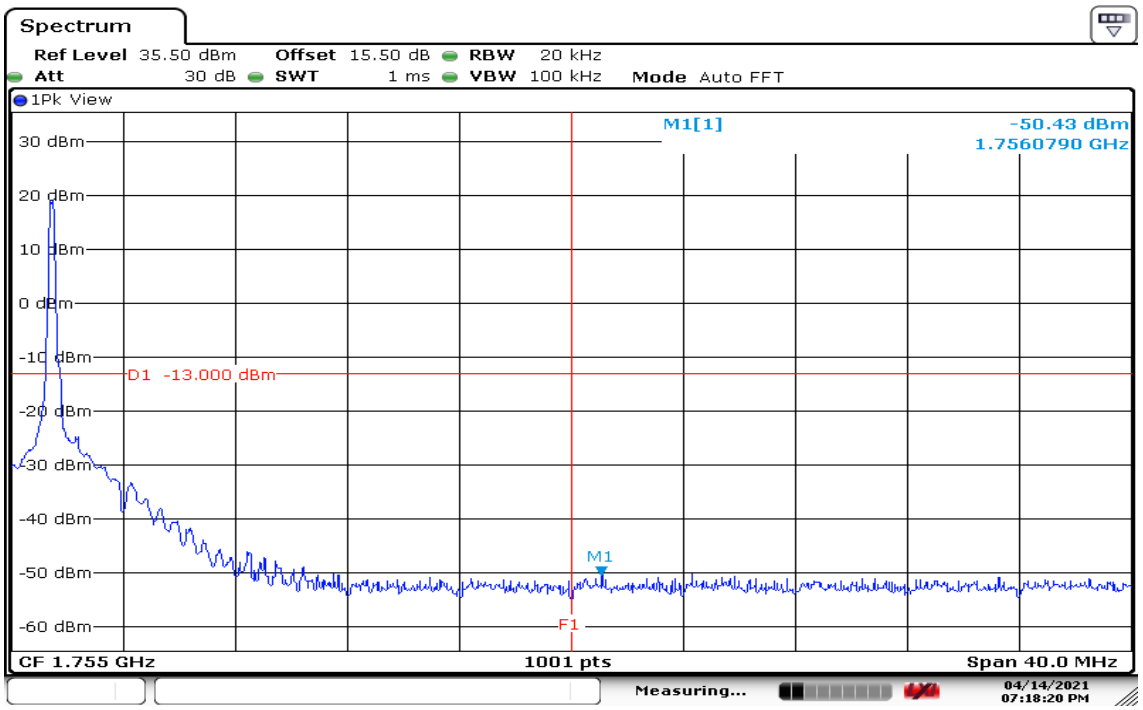
CHANNEL BANDWIDTH: 20MHz / QPSK / 1RB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 19:08:44

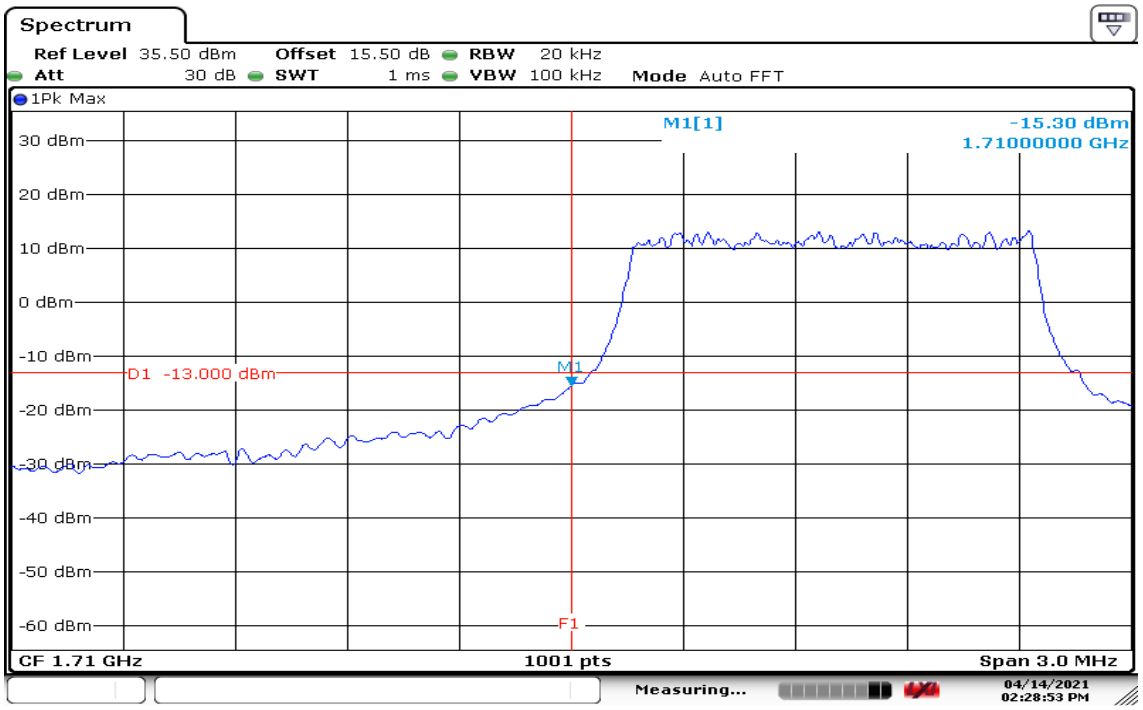
HIGHER BAND EDGE



Date: 14.APR.2021 19:18:21

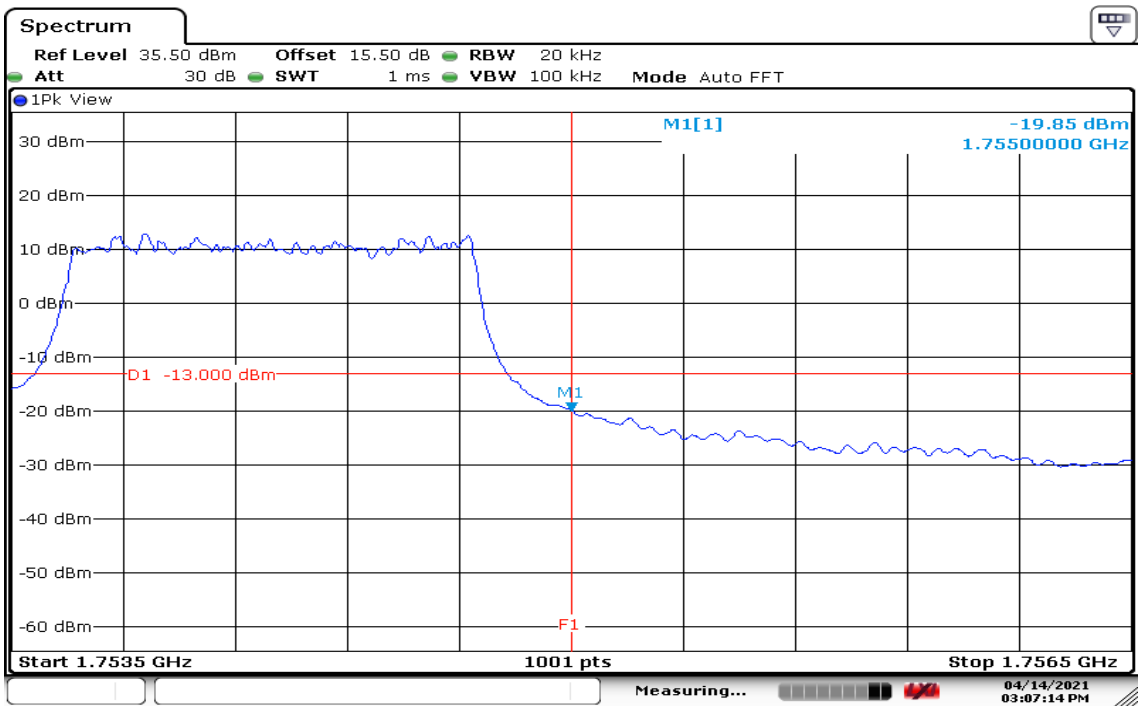
CHANNEL BANDWIDTH: 1.4MHz / QPSK / FULLRB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 14:28:53

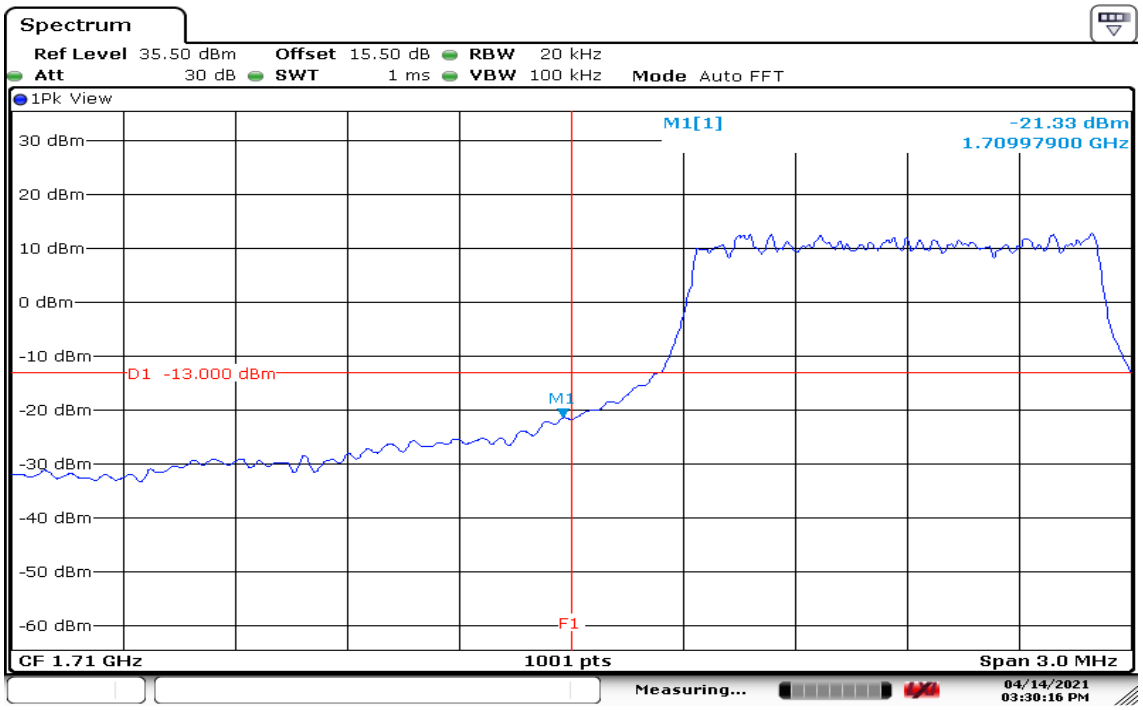
HIGHER BAND EDGE



Date: 14.APR.2021 15:07:14

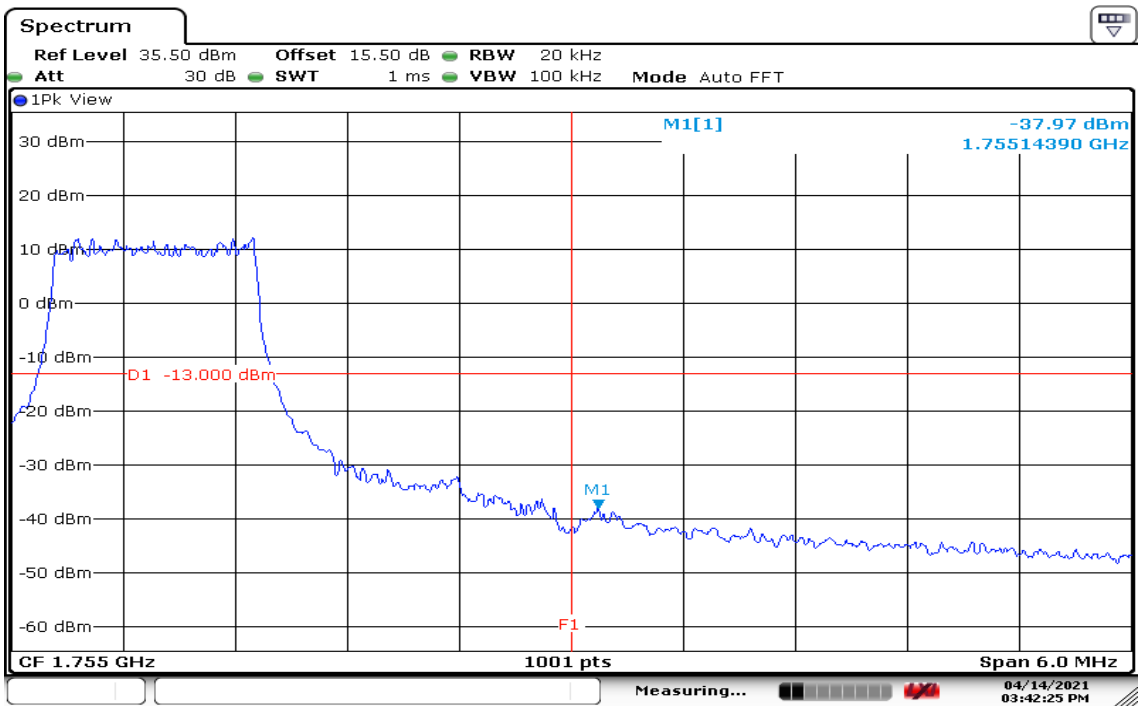
CHANNEL BANDWIDTH: 3MHz / QPSK / FULLRB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 15:30:16

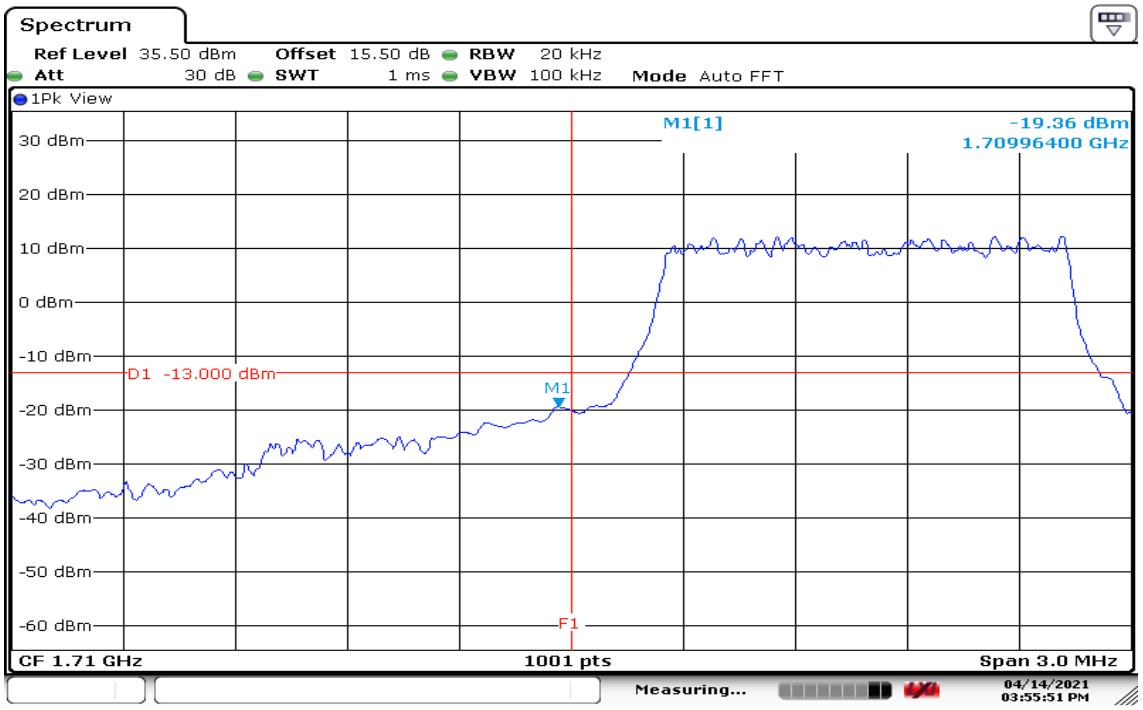
HIGHER BAND EDGE



Date: 14.APR.2021 15:42:25

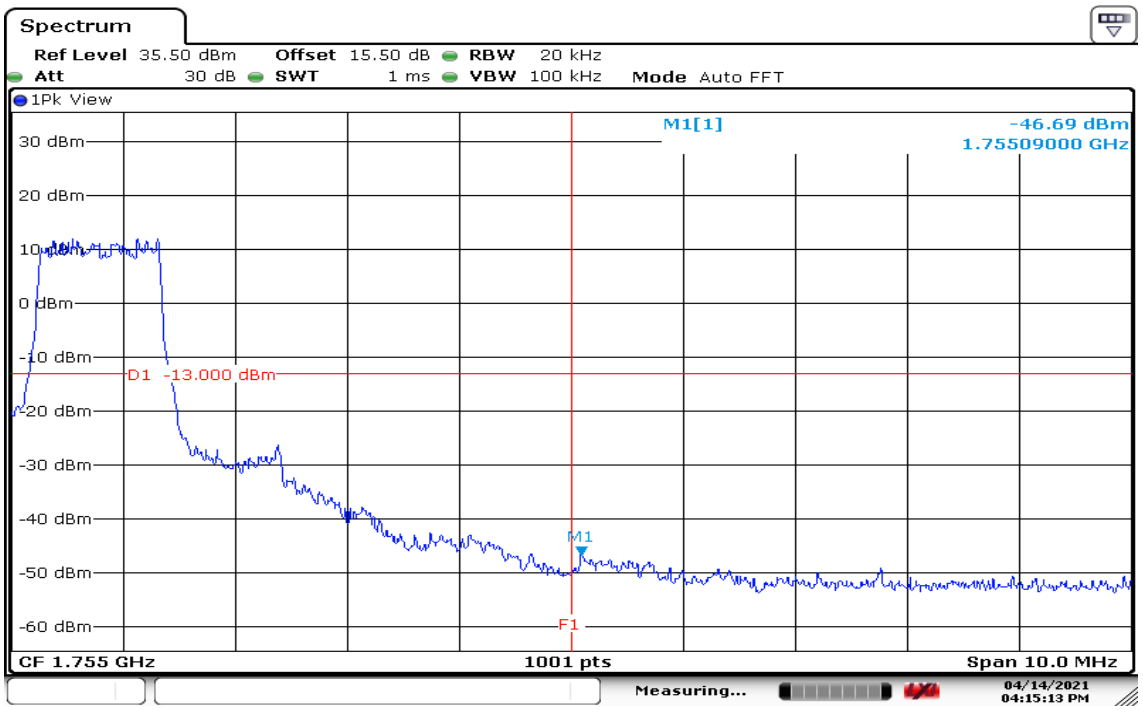
CHANNEL BANDWIDTH: 5MHz / QPSK / FULLRB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 15:55:52

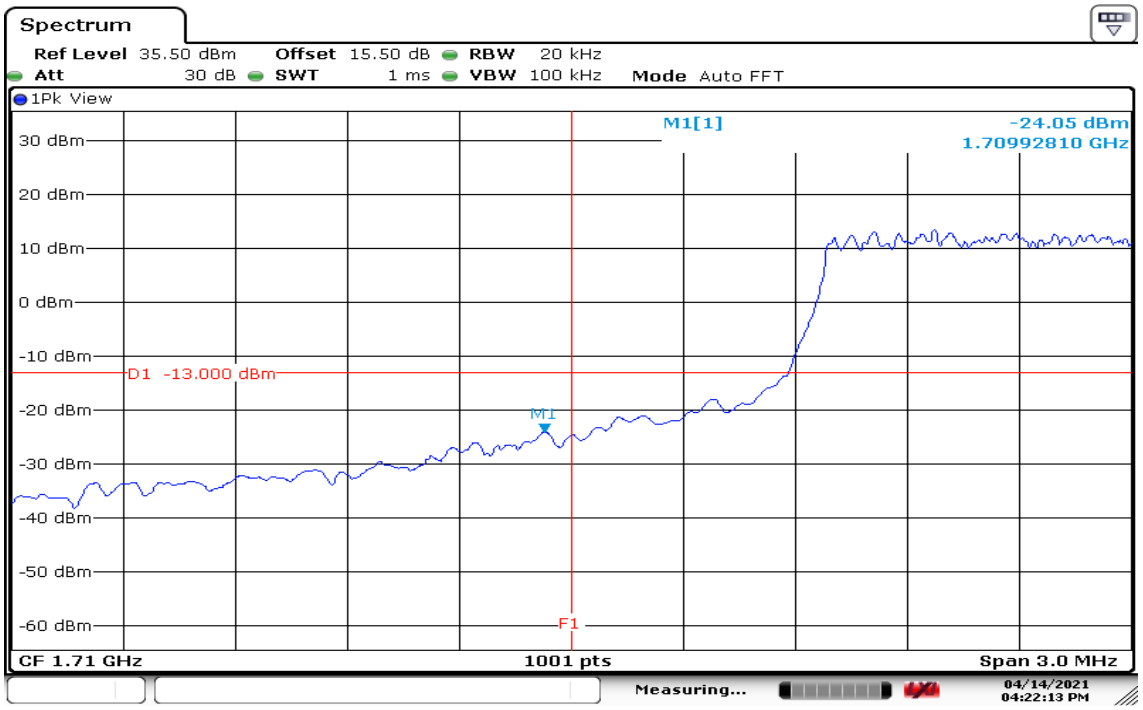
HIGHER BAND EDGE



Date: 14.APR.2021 16:15:14

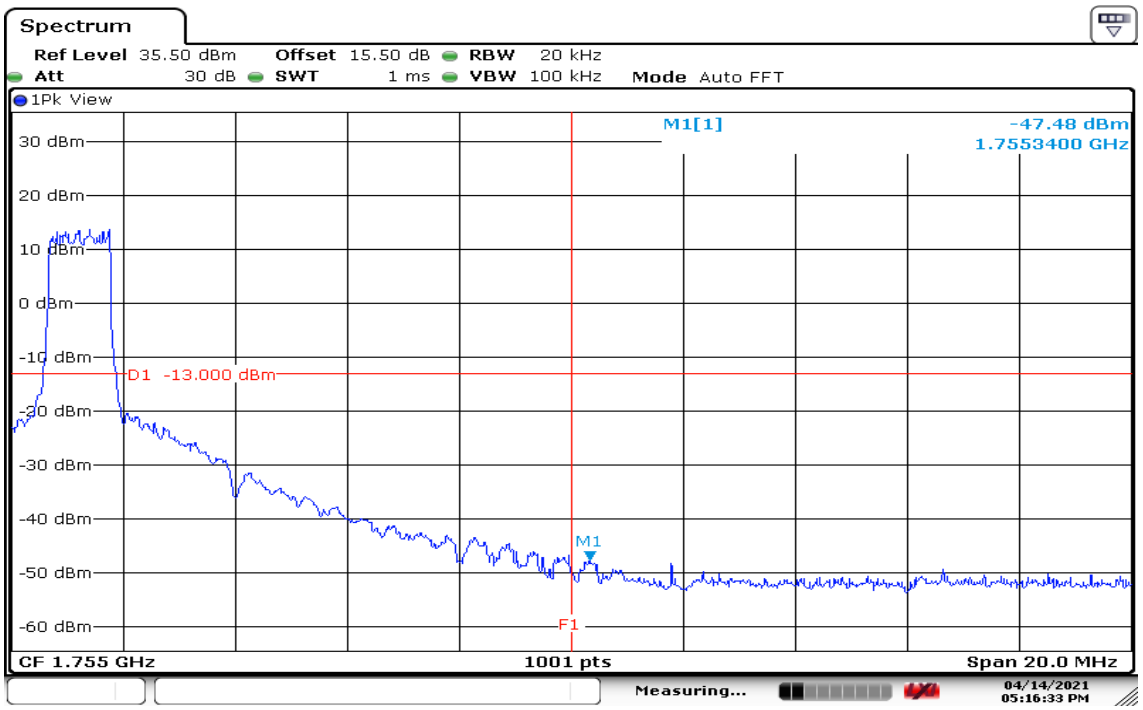
CHANNEL BANDWIDTH: 10MHz / QPSK / FULLRB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 16:22:14

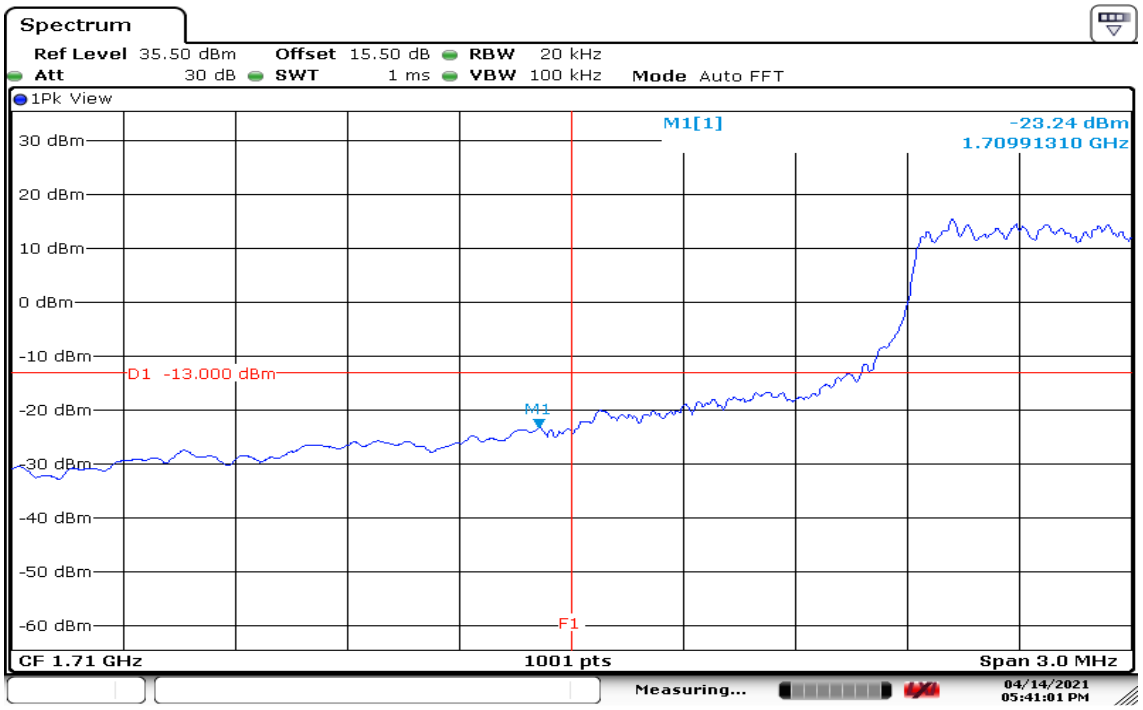
HIGHER BAND EDGE



Date: 14.APR.2021 17:16:33

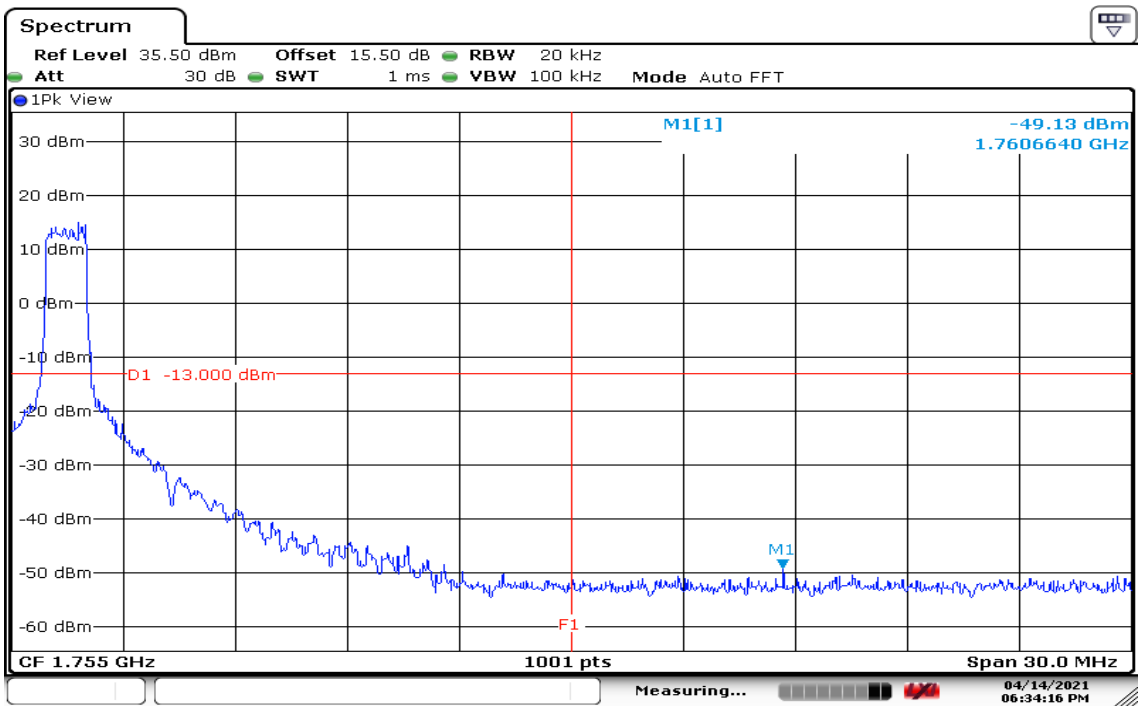
CHANNEL BANDWIDTH: 15MHz / QPSK / FULLRB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 17:41:02

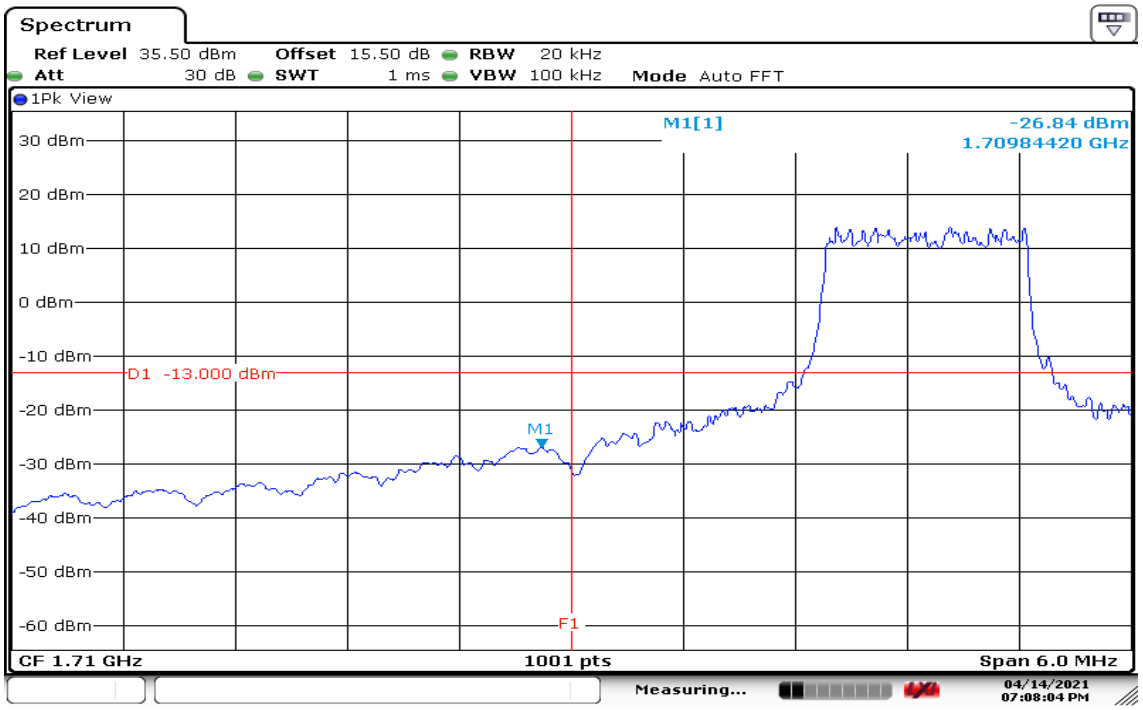
HIGHER BAND EDGE



Date: 14.APR.2021 18:34:16

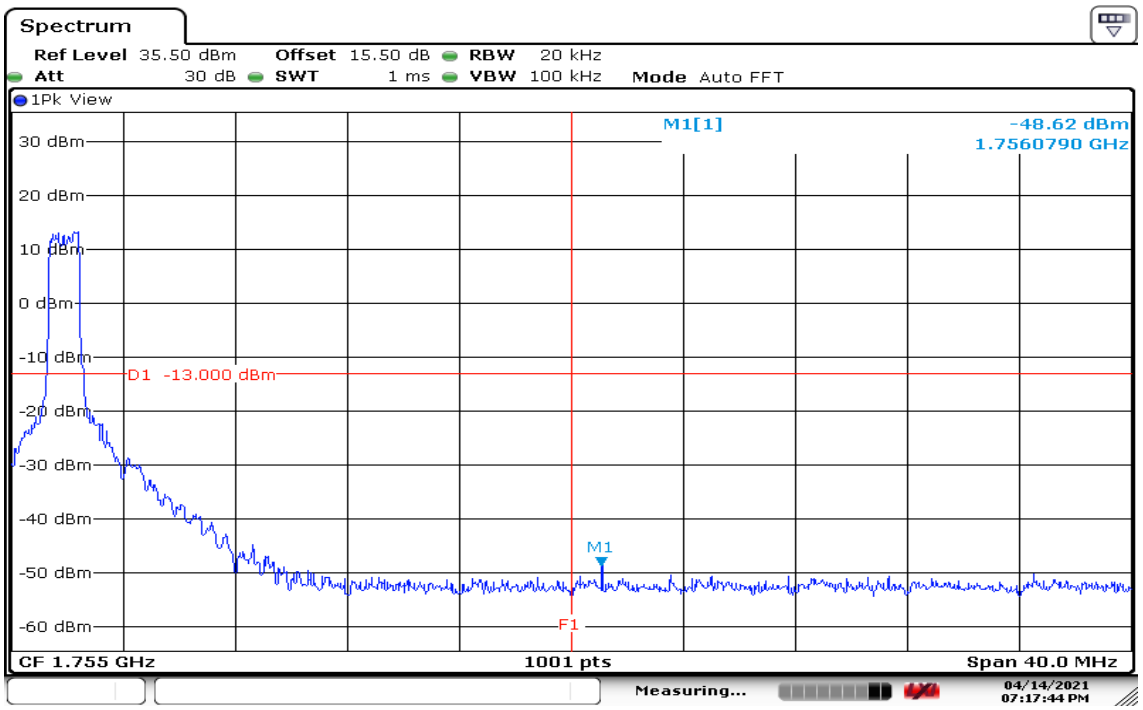
CHANNEL BANDWIDTH: 20MHz / QPSK / FULLRB ALLOCATION

LOWER BAND EDGE



Date: 14.APR.2021 19:08:04

HIGHER BAND EDGE



Date: 14.APR.2021 19:17:44

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

Temperature:	22.7℃	**Humidity:**	54.3% RH
Tested by:	Dally Hong	**Test Date:**	March 30, 2021

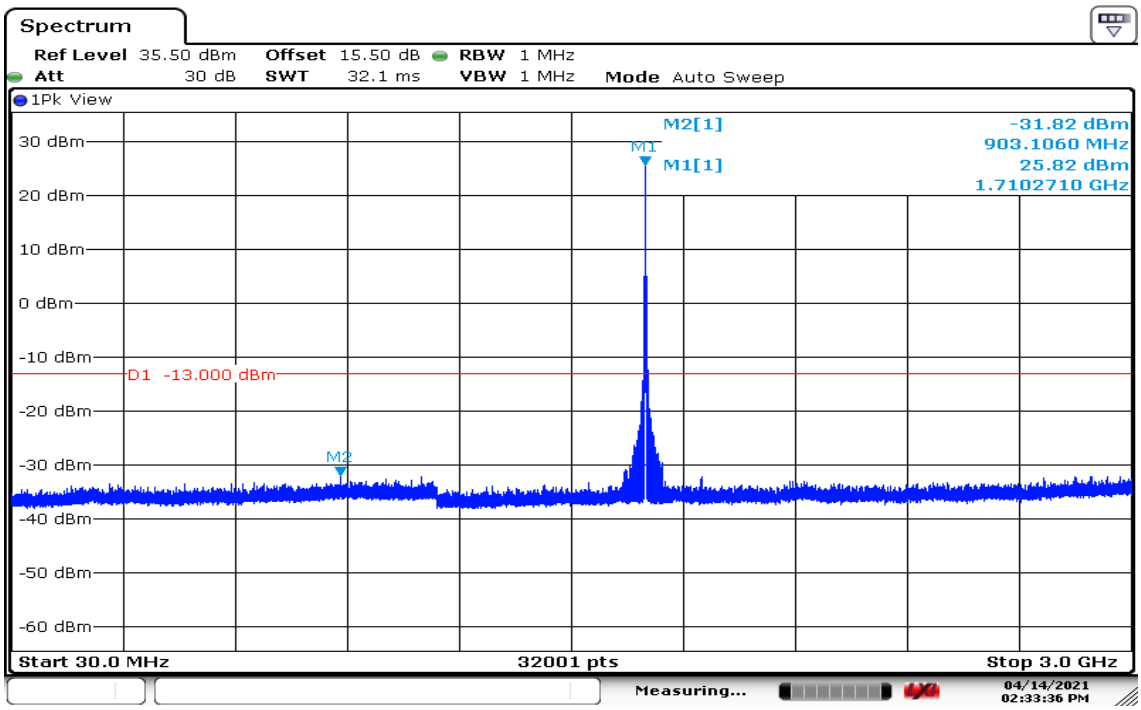
Temperature:	23.1℃	**Humidity:**	52.5% RH
Tested by:	Dally Hong	**Test Date:**	April 14, 2021

LTE Band 4

QPSK / 1RB

CHANNEL BANDWIDTH: 1.4MHz / 30MHz-3GHz

CH Low



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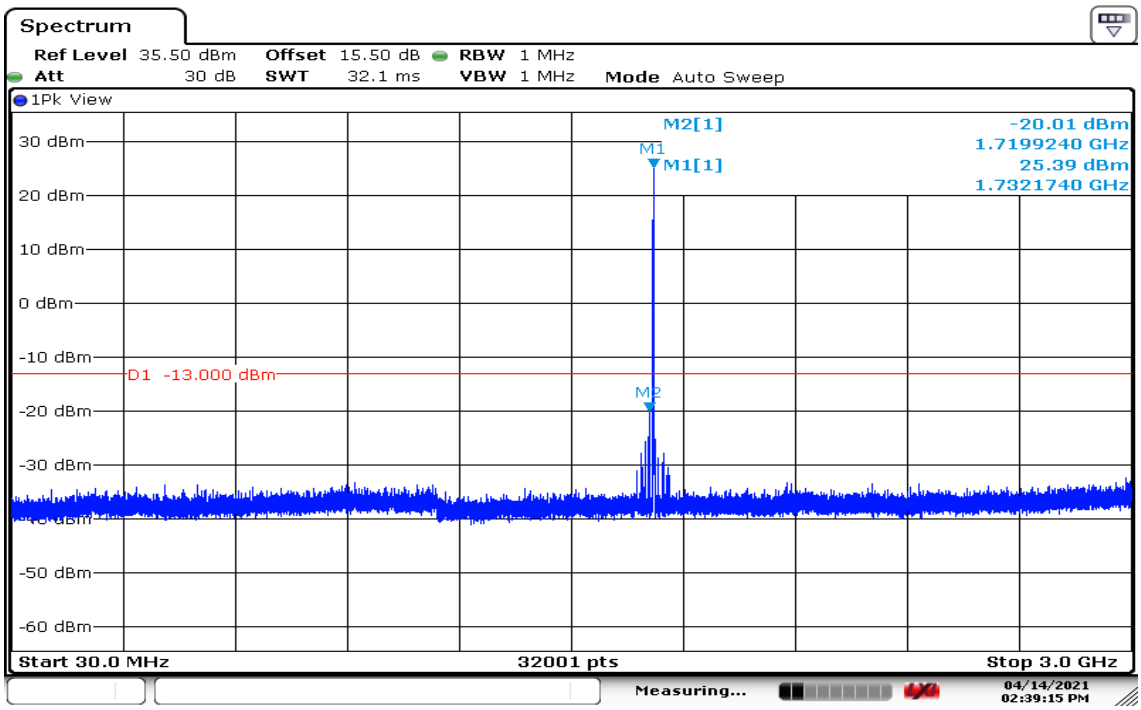
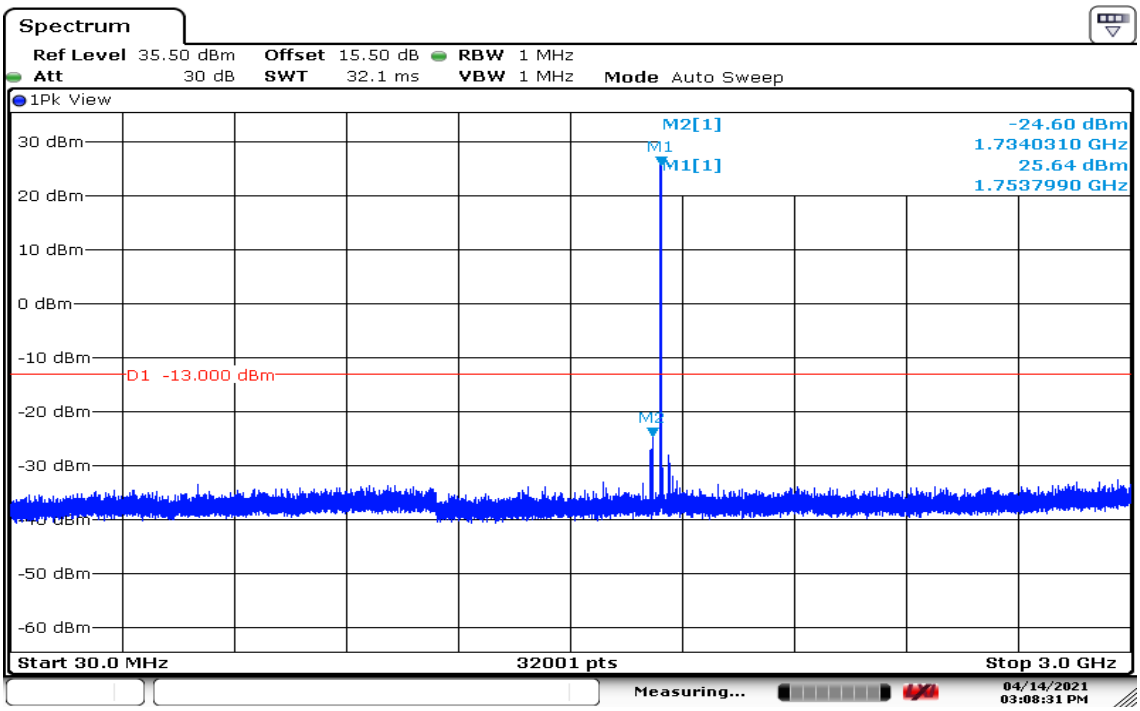
CH Mid



Date: 14.APR.2021 14:39:15

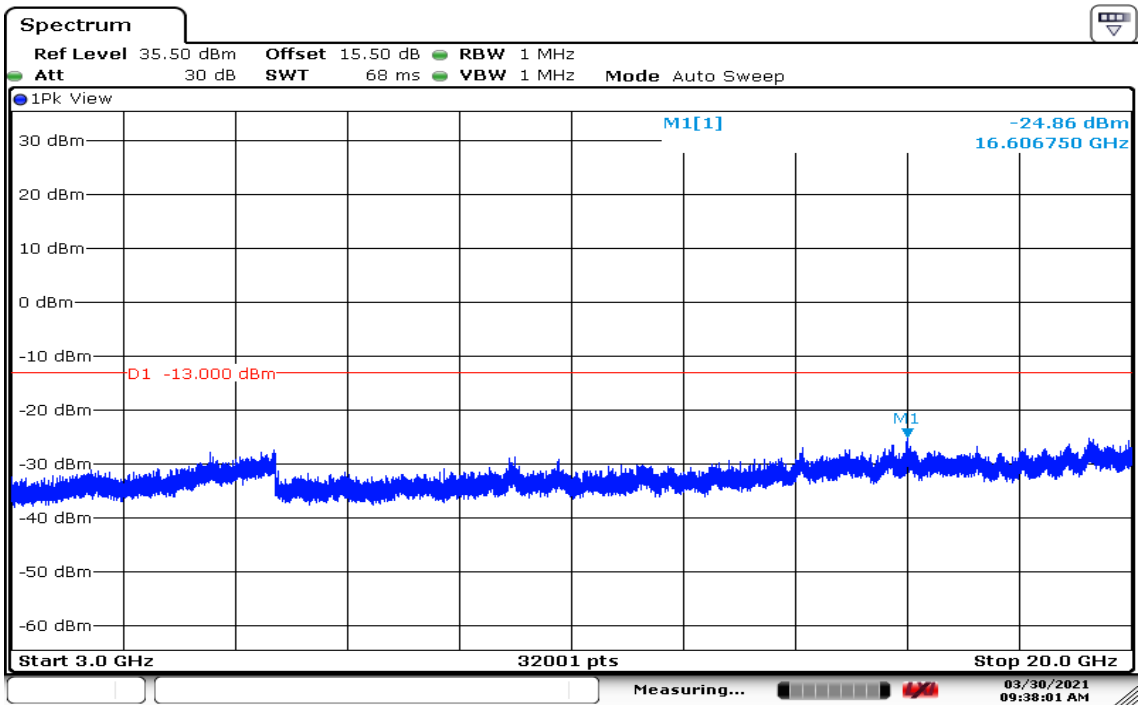
CH High



Date: 14.APR.2021 15:08:31

CHANNEL BANDWIDTH: 1.4MHz / 3GHz-20GHz

CH Low



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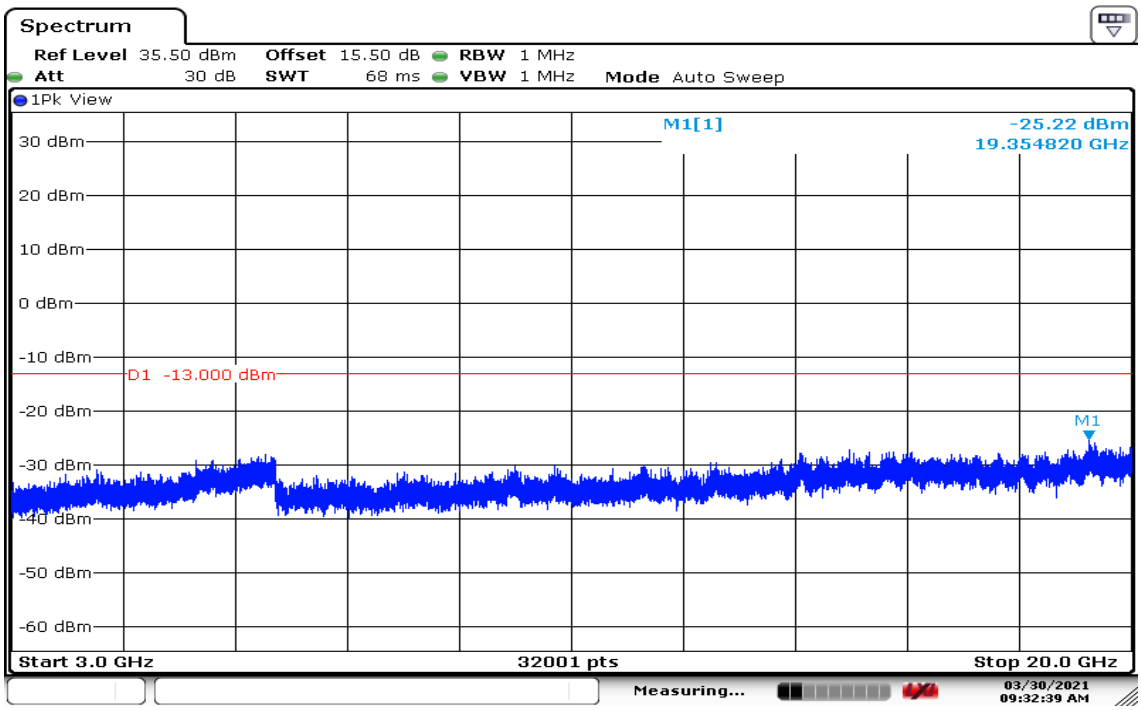
CH Mid



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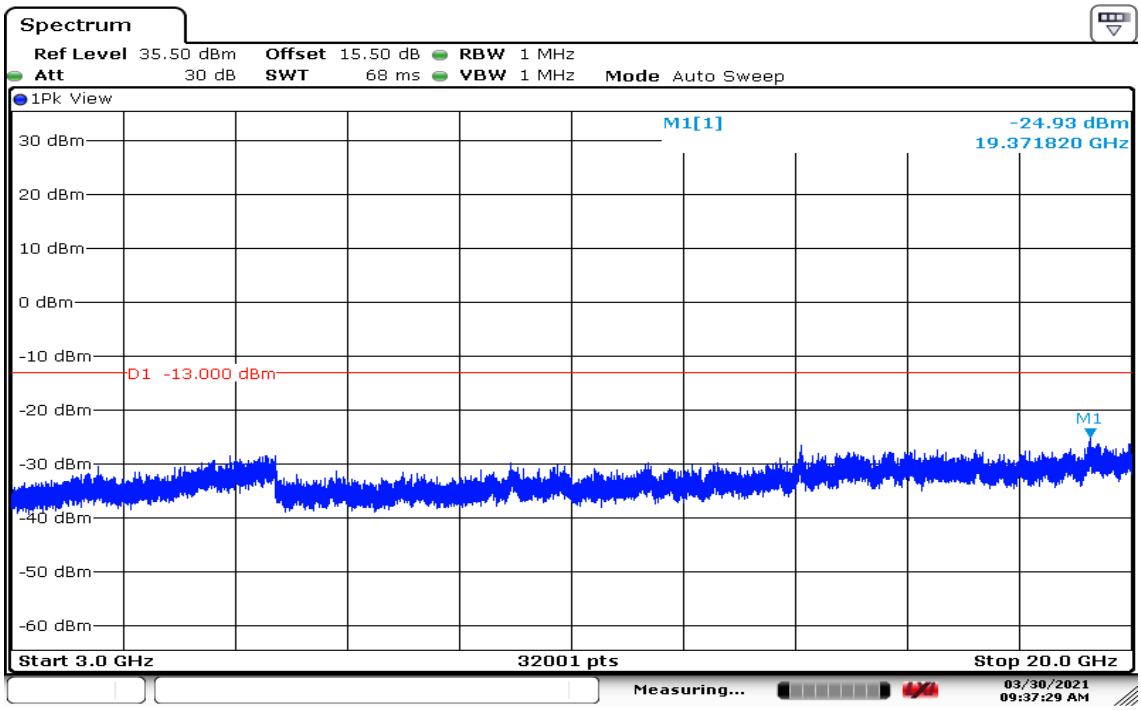
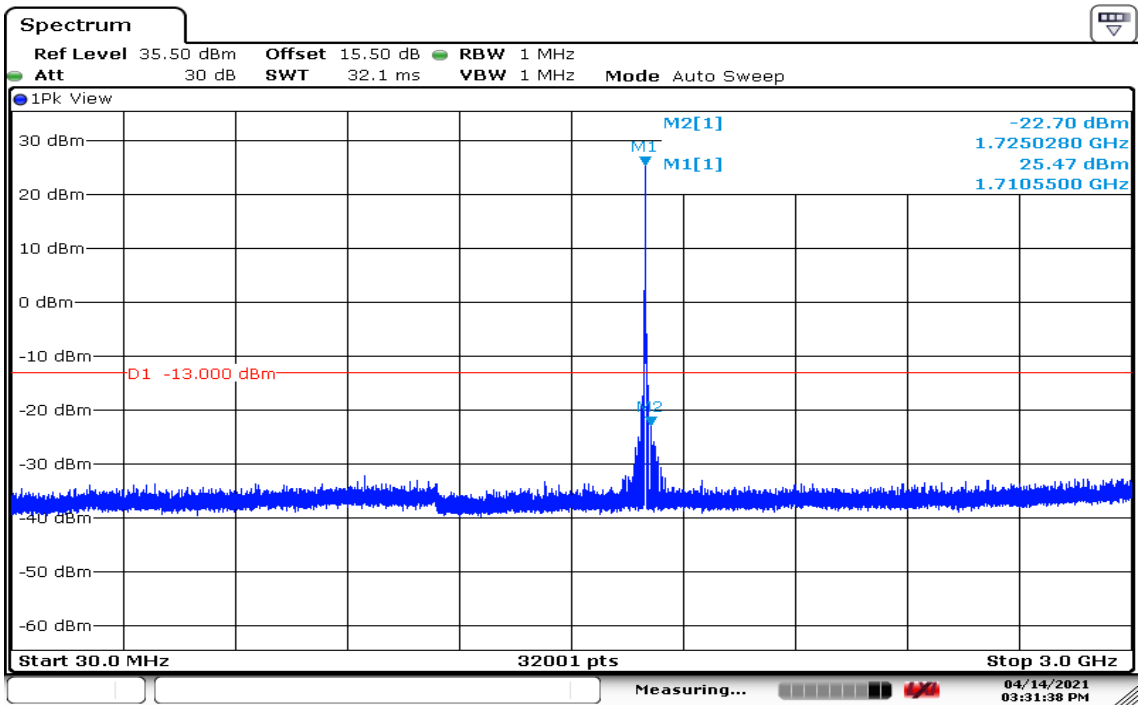
CH High



Date: 30.MAR.2021 09:37:29

CHANNEL BANDWIDTH: 3MHz / 30MHz-3GHz

CH Low



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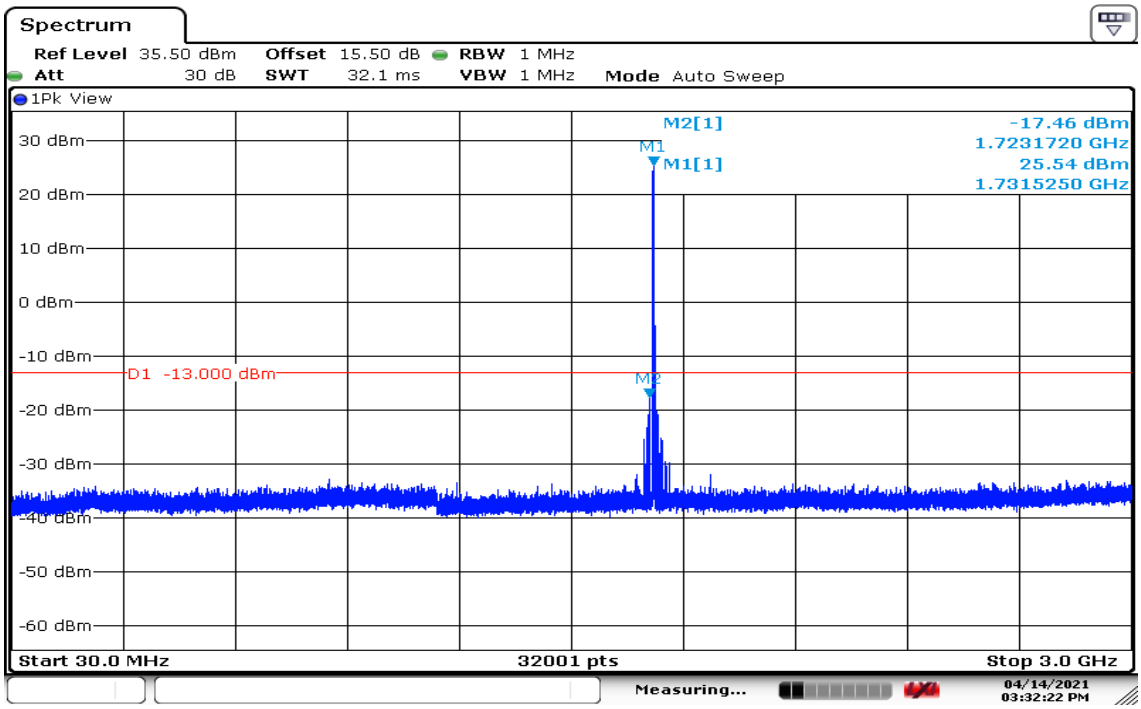
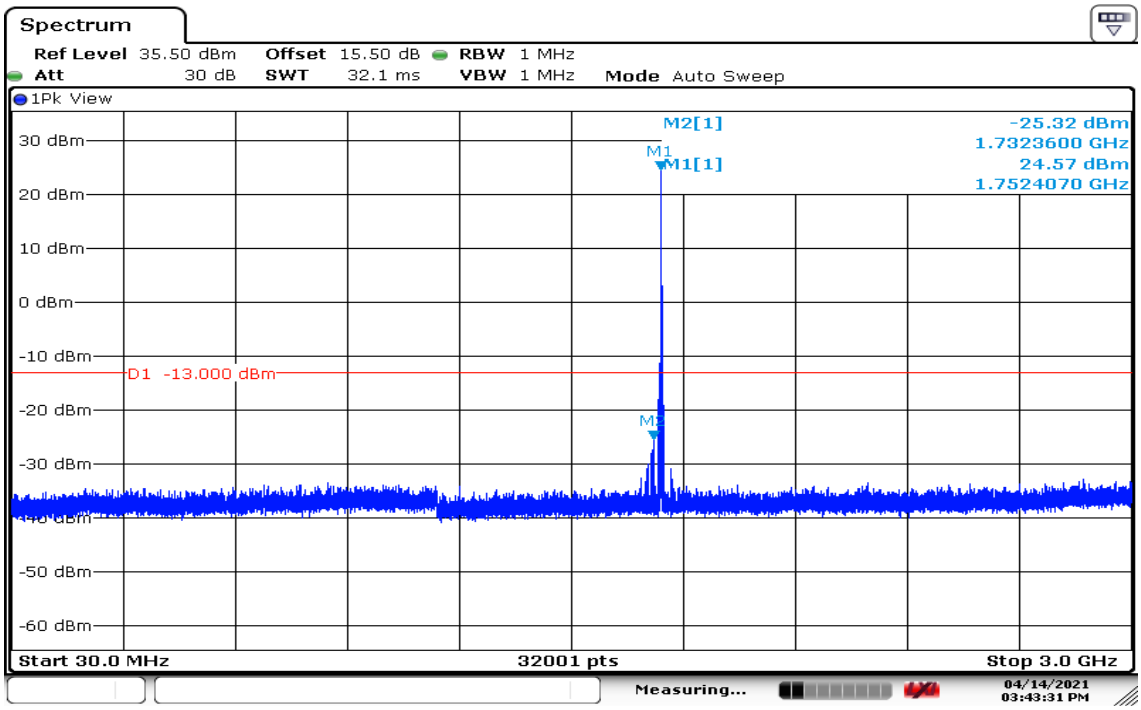
CH Mid



Date: 14.APR.2021 15:32:22

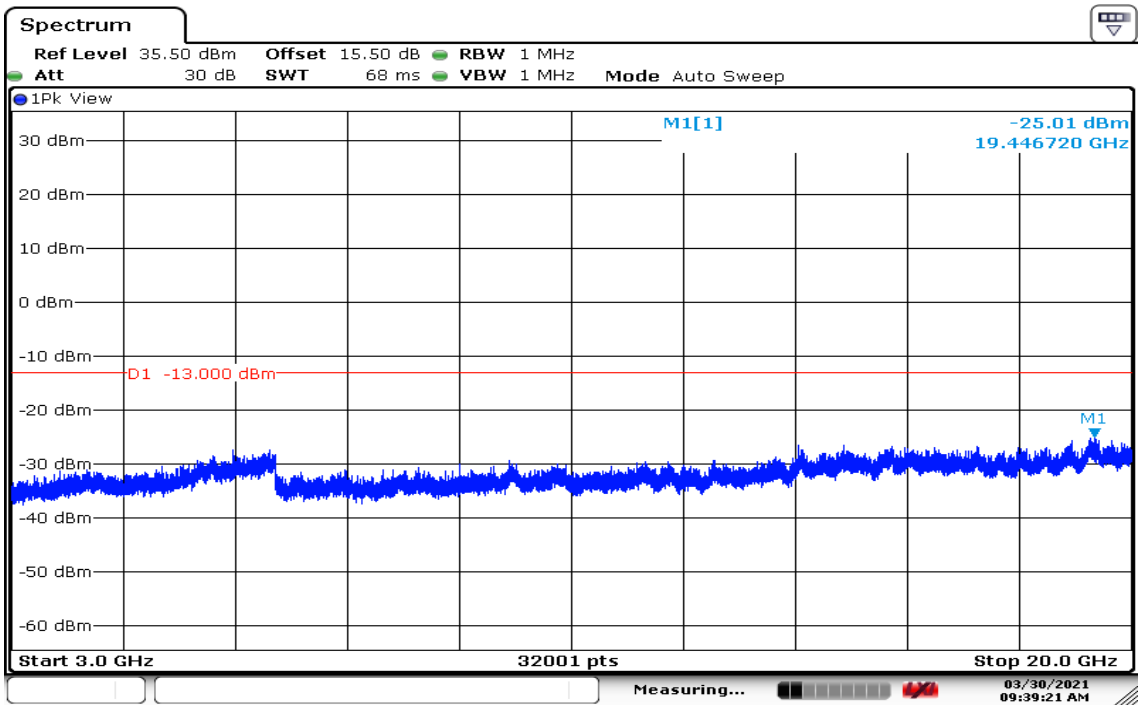
CH High



Date: 14.APR.2021 15:43:32

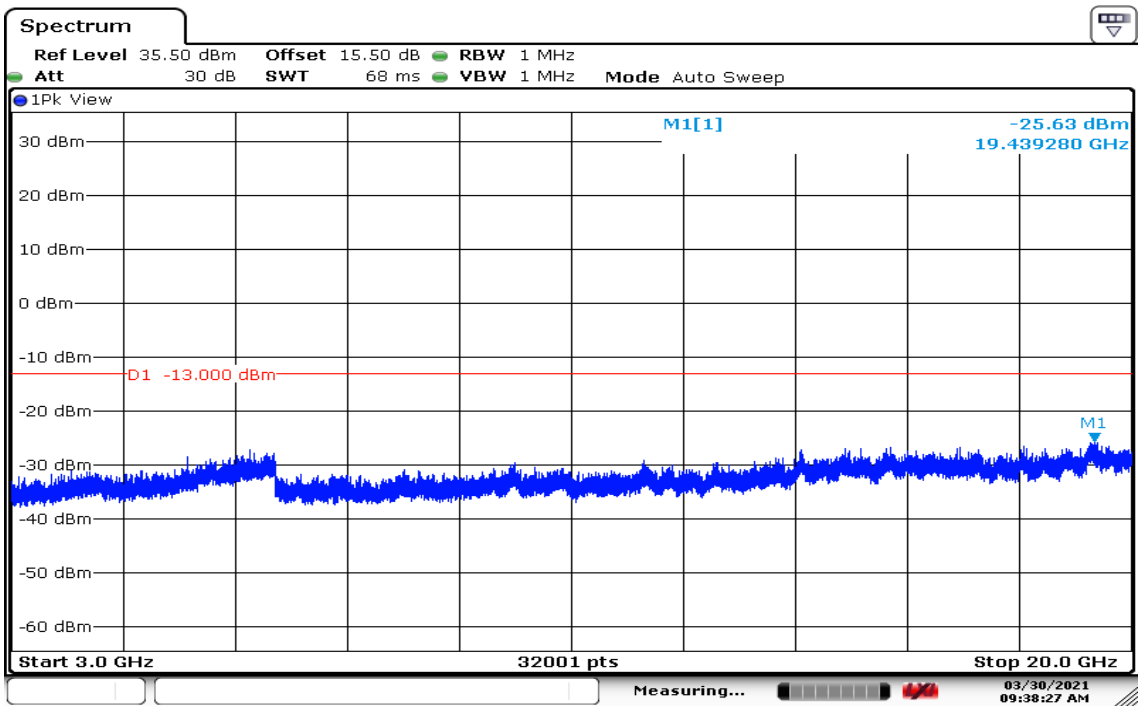
CHANNEL BANDWIDTH: 3MHz / 3GHz-20GHz

CH Low



Date: 30.MAR.2021 09:39:22

CH Mid



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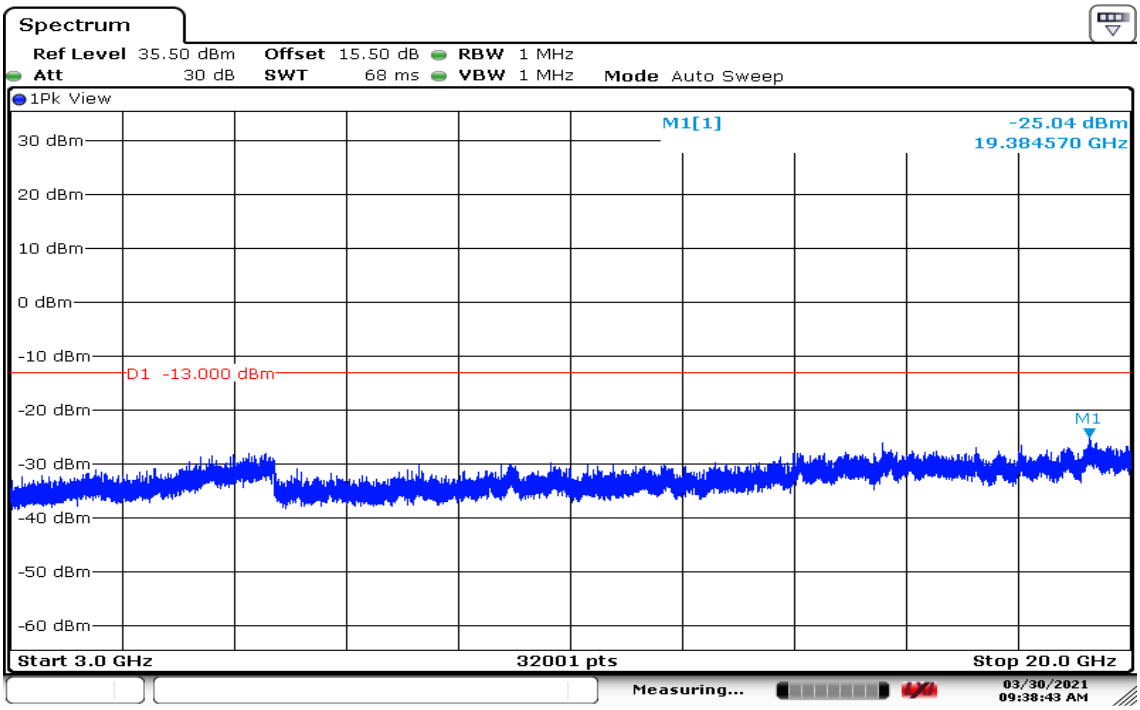
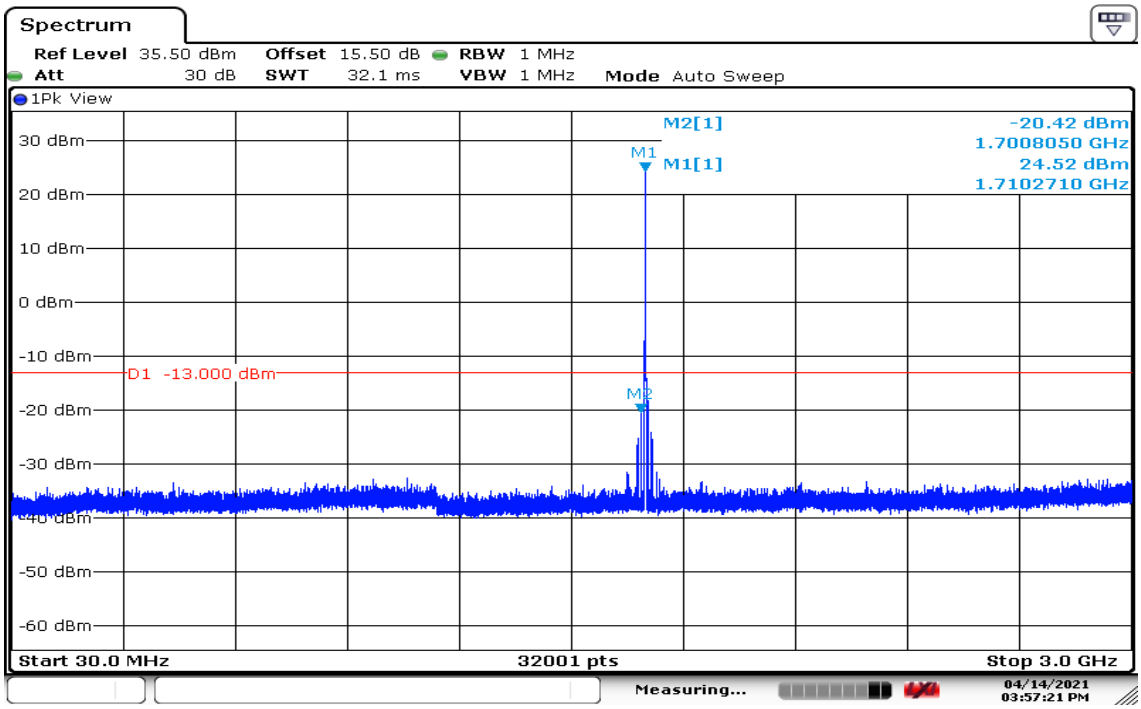
CH High



Date: 30.MAR.2021 09:38:44

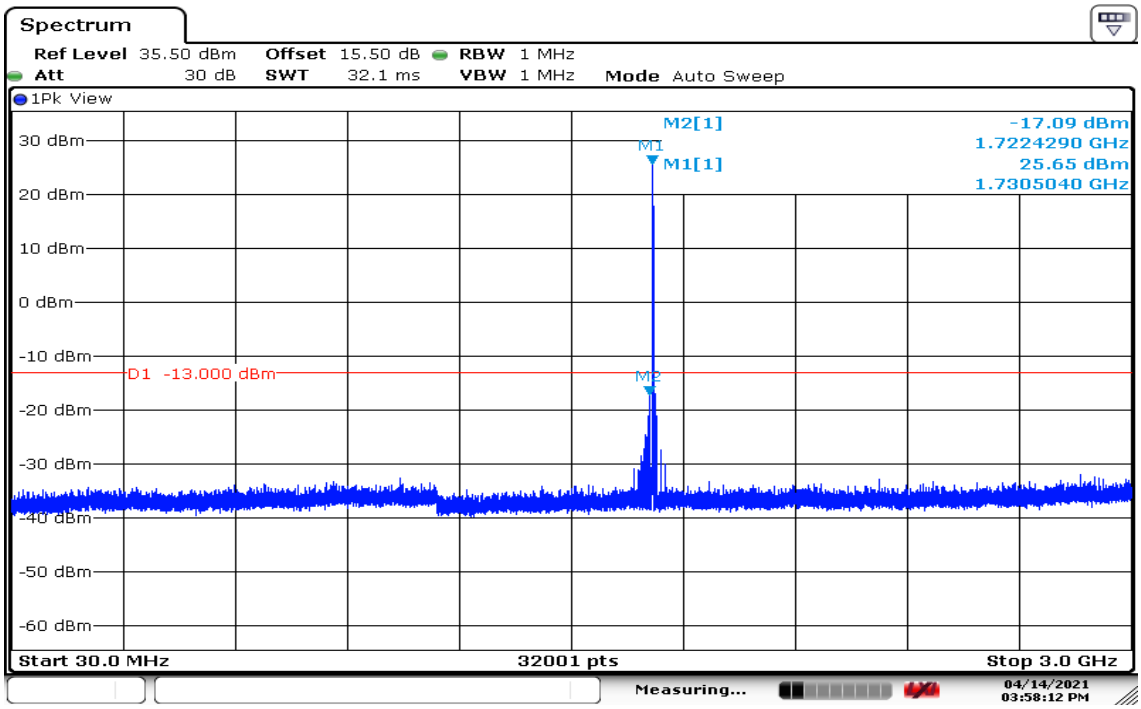
CHANNEL BANDWIDTH: 5MHz / 30MHz-3GHz

CH Low



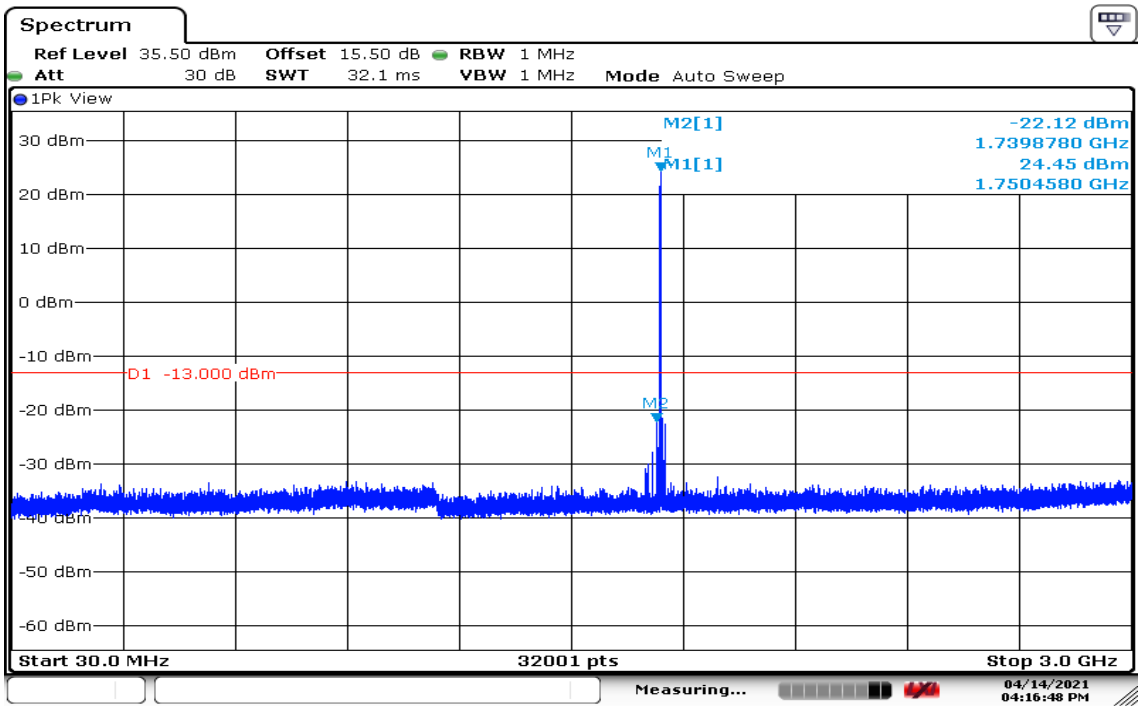
Date: 14.APR.2021 15:57:21

CH Mid



Date: 14.APR.2021 15:58:12

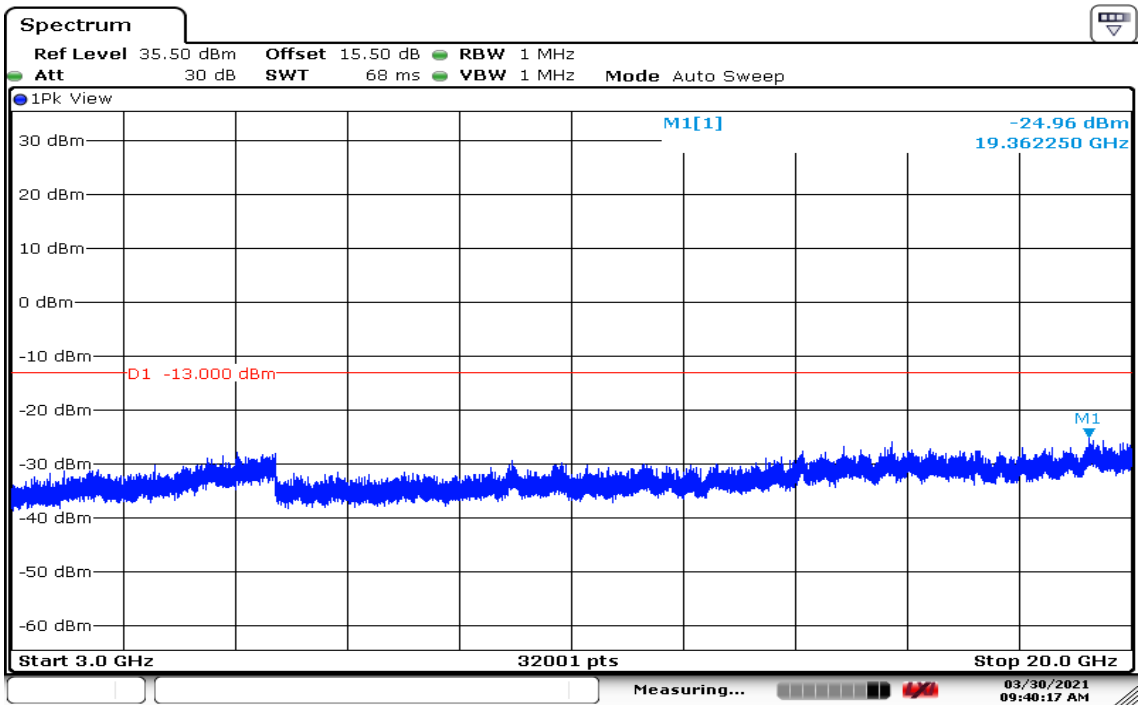
CH High



Date: 14.APR.2021 16:16:48

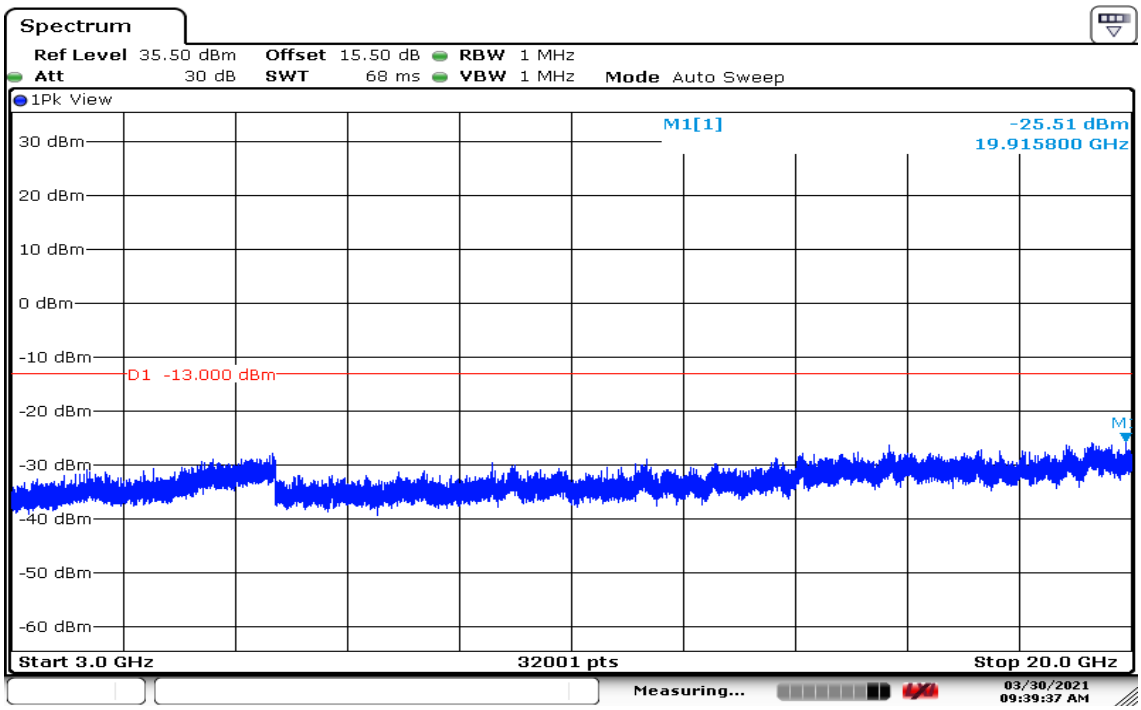
CHANNEL BANDWIDTH: 5MHz / 3GHz-20GHz

CH Low



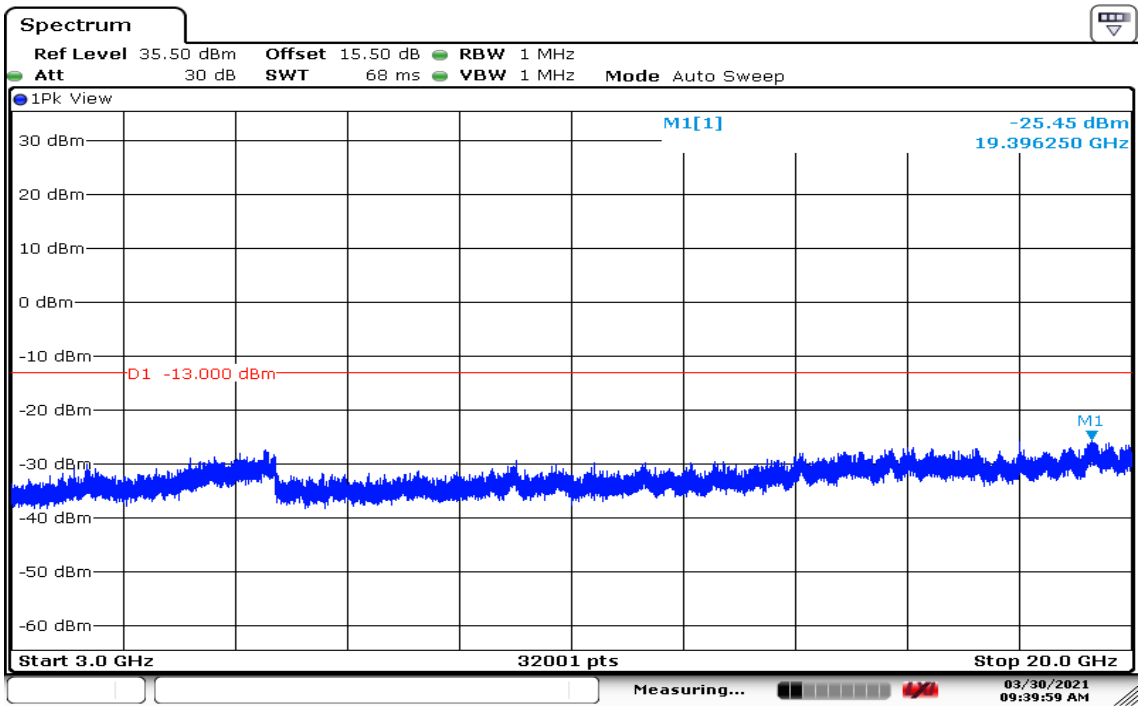
Date: 30.MAR.2021 09:40:18

CH Mid



Date: 30.MAR.2021 09:39:37

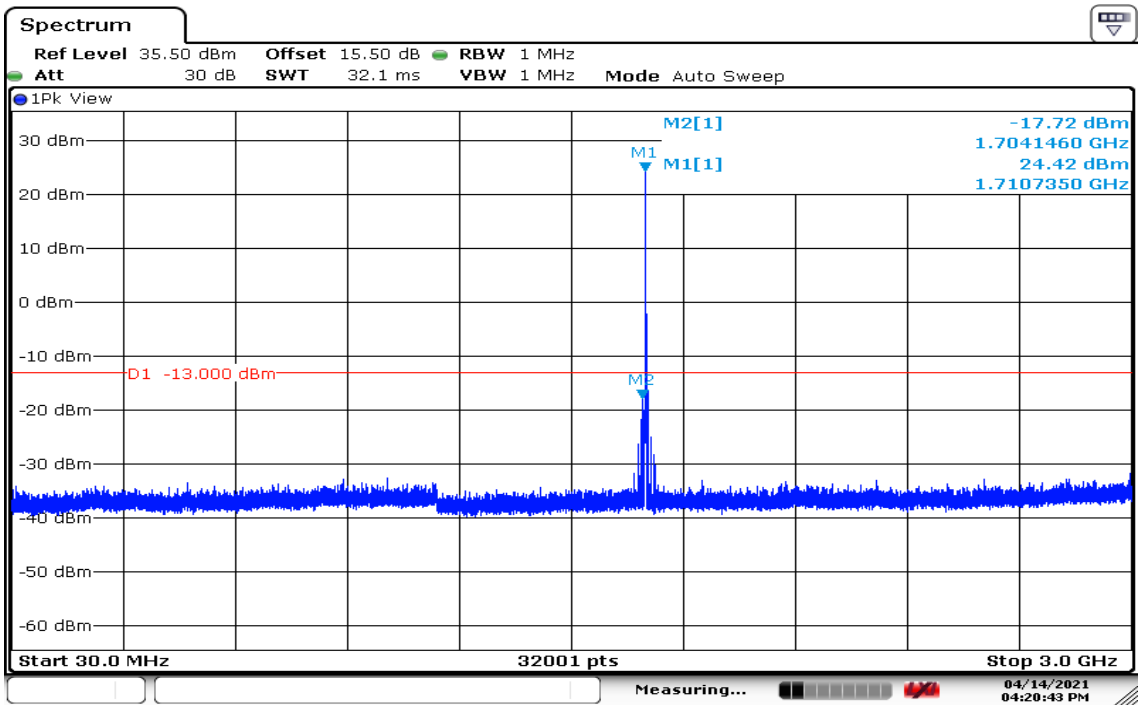
CH High



Date: 30.MAR.2021 09:39:59

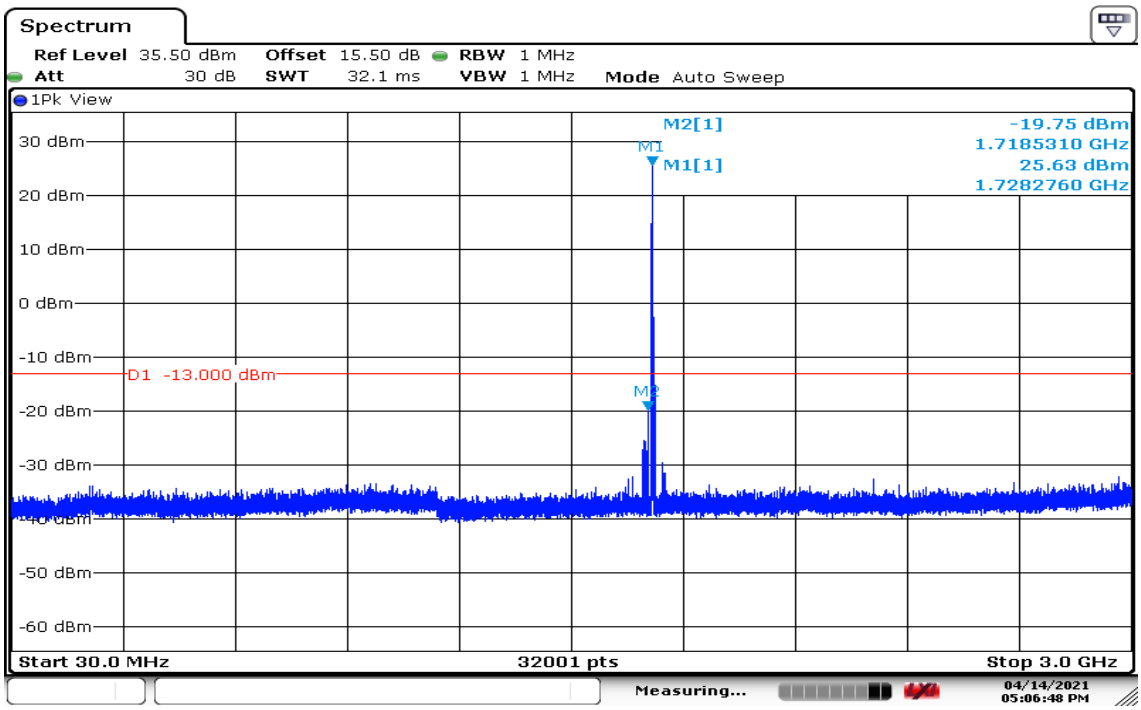
CHANNEL BANDWIDTH: 10MHz / 30MHz-3GHz

CH Low



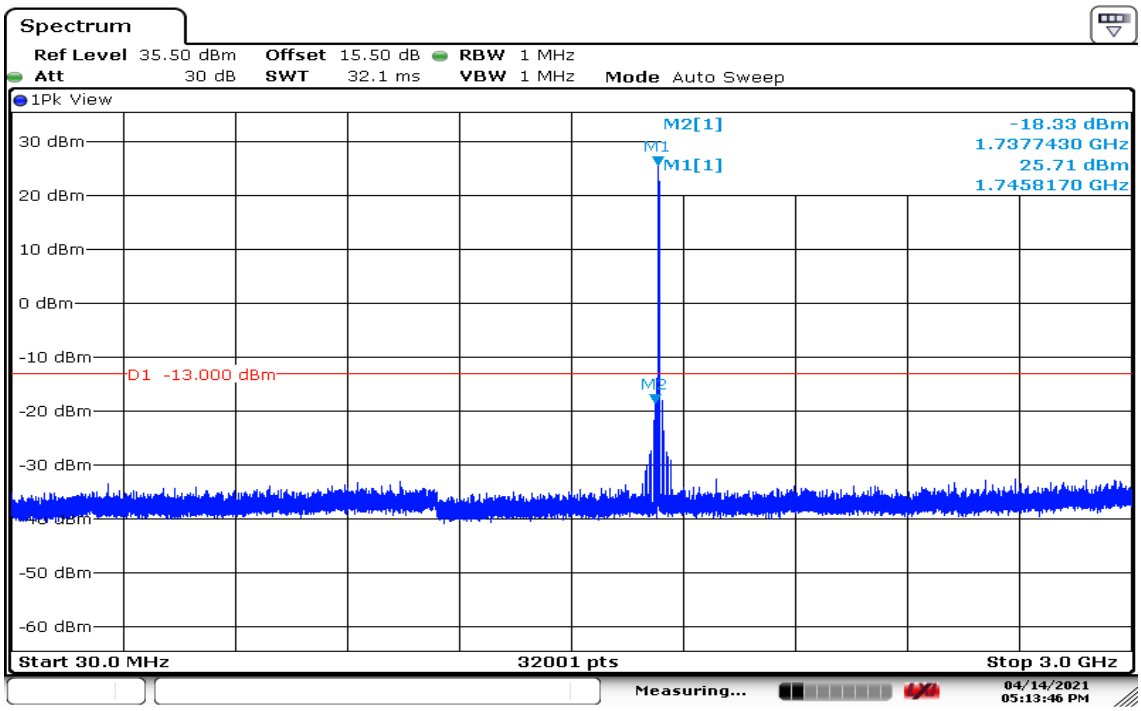
Date: 14.APR.2021 16:20:43

CH Mid



Date: 14.APR.2021 17:06:49

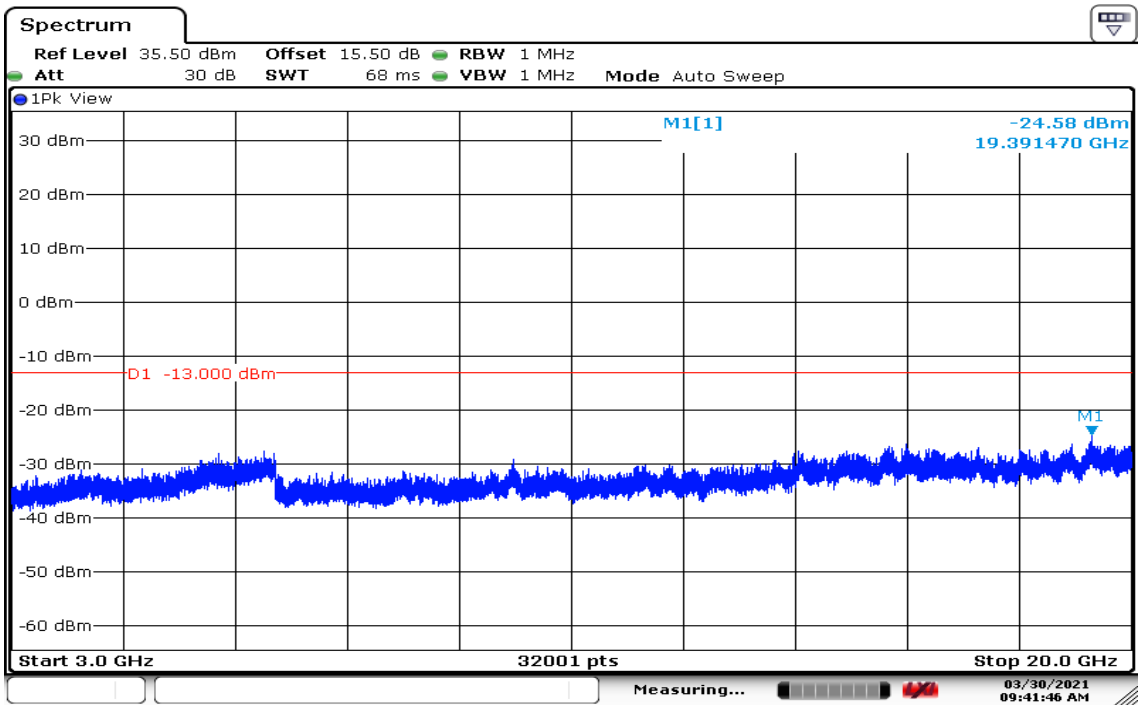
CH High



Date: 14.APR.2021 17:13:46

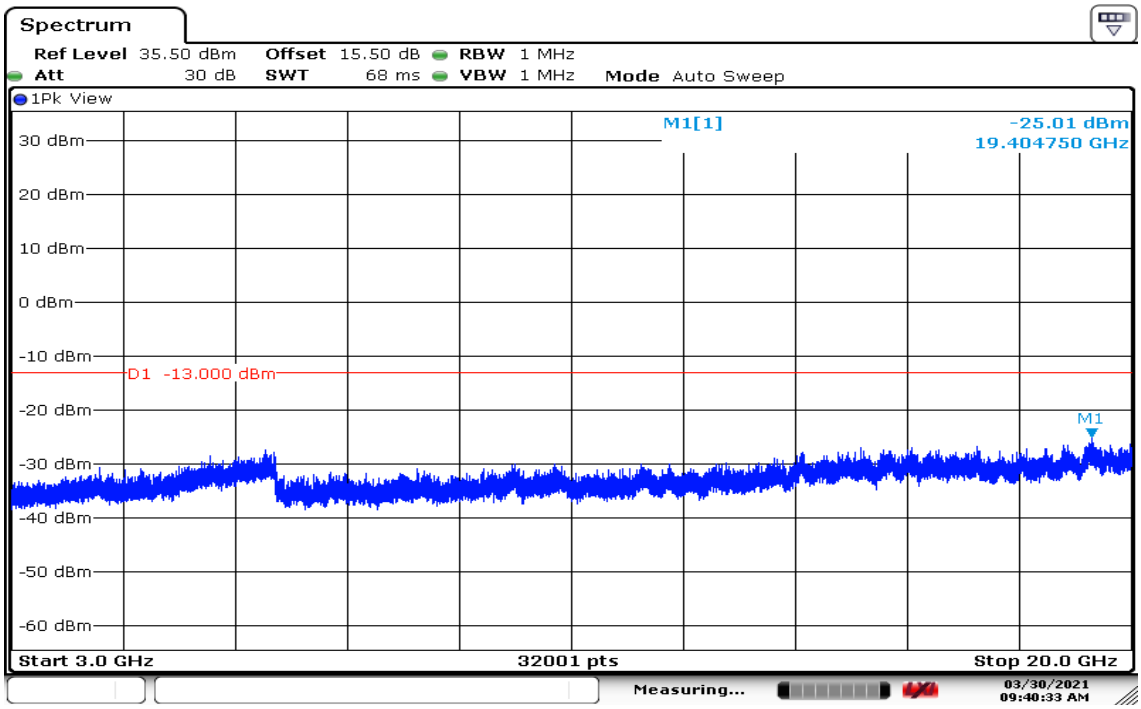
CHANNEL BANDWIDTH: 10MHz / 3GHz-20GHz

CH Low



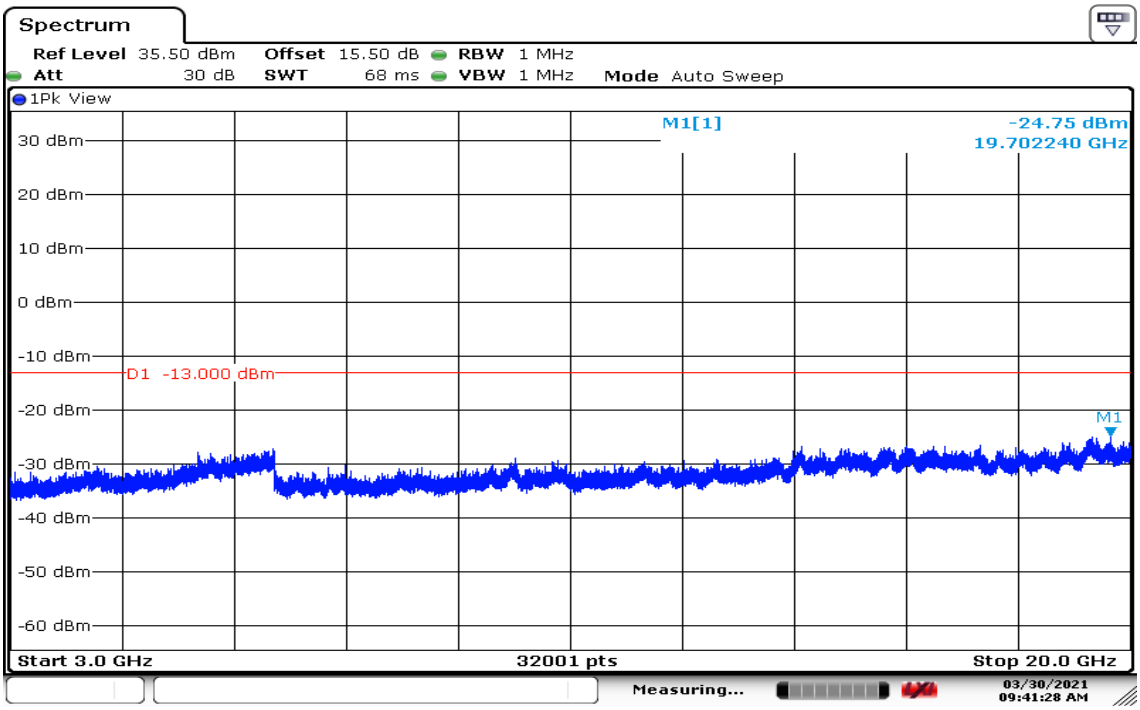
Date: 30.MAR.2021 09:41:47

CH Mid



Date: 30.MAR.2021 09:40:34

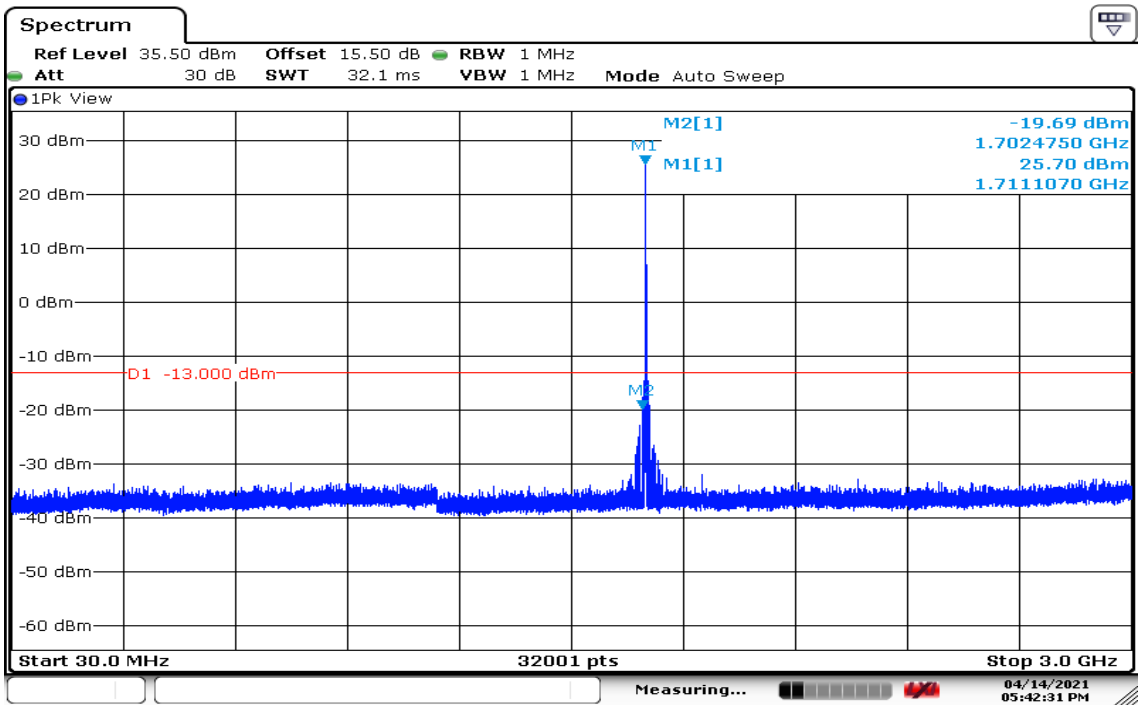
CH High



Date: 30.MAR.2021 09:41:28

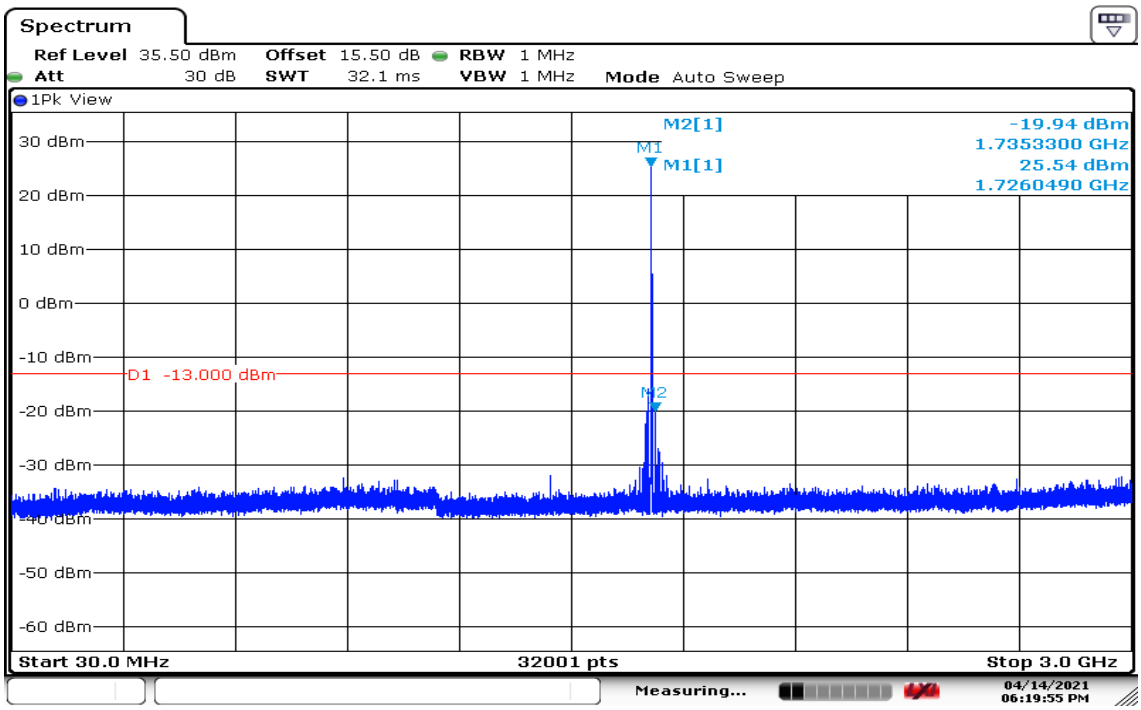
CHANNEL BANDWIDTH: 15MHz / 30MHz-3GHz

CH Low



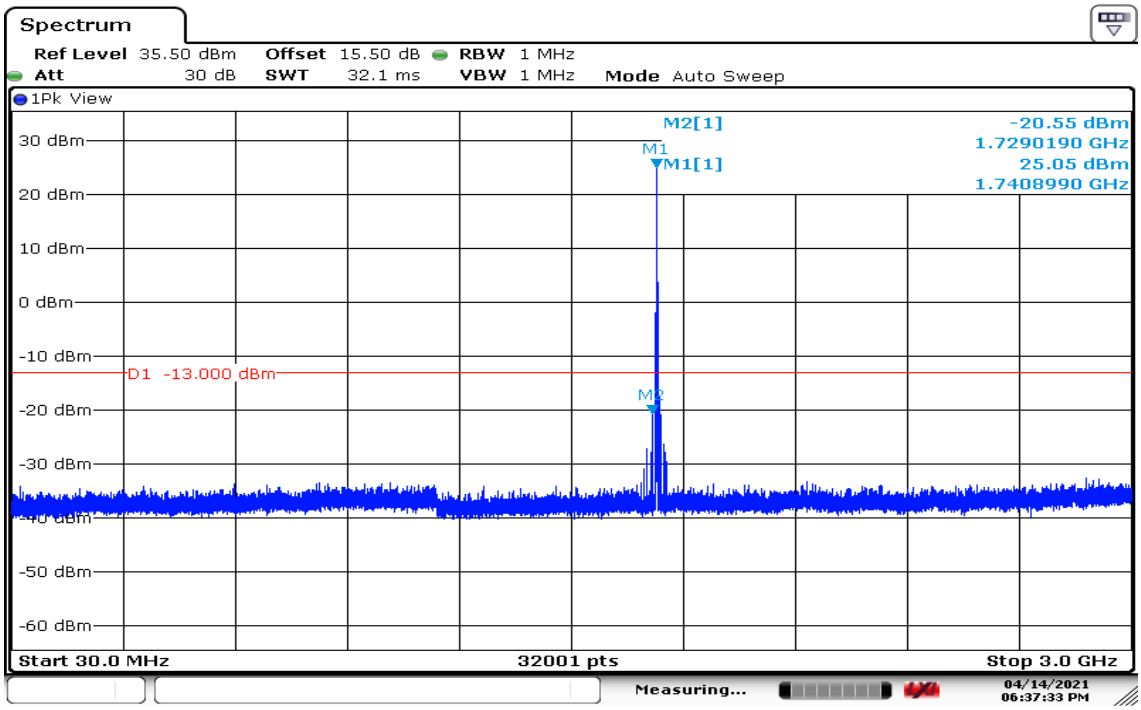
Date: 14.APR.2021 17:42:31

CH Mid



Date: 14.APR.2021 18:19:55

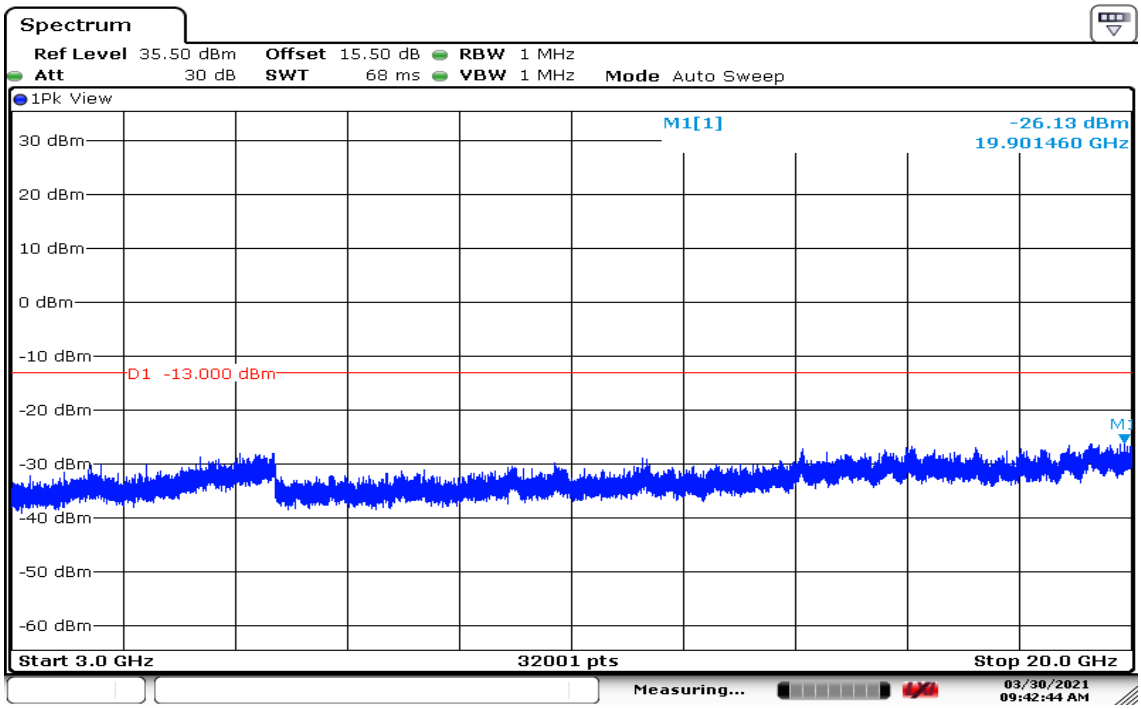
CH High



Date: 14.APR.2021 18:37:34

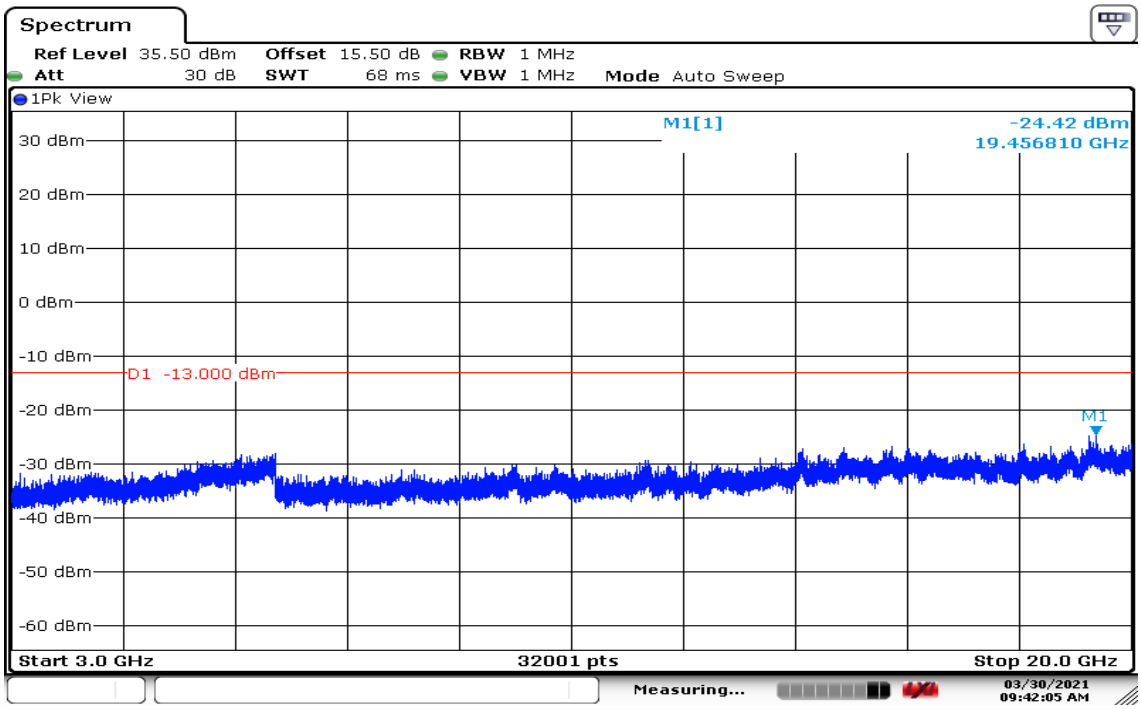
CHANNEL BANDWIDTH: 15MHz / 3GHz-20GHz

CH Low



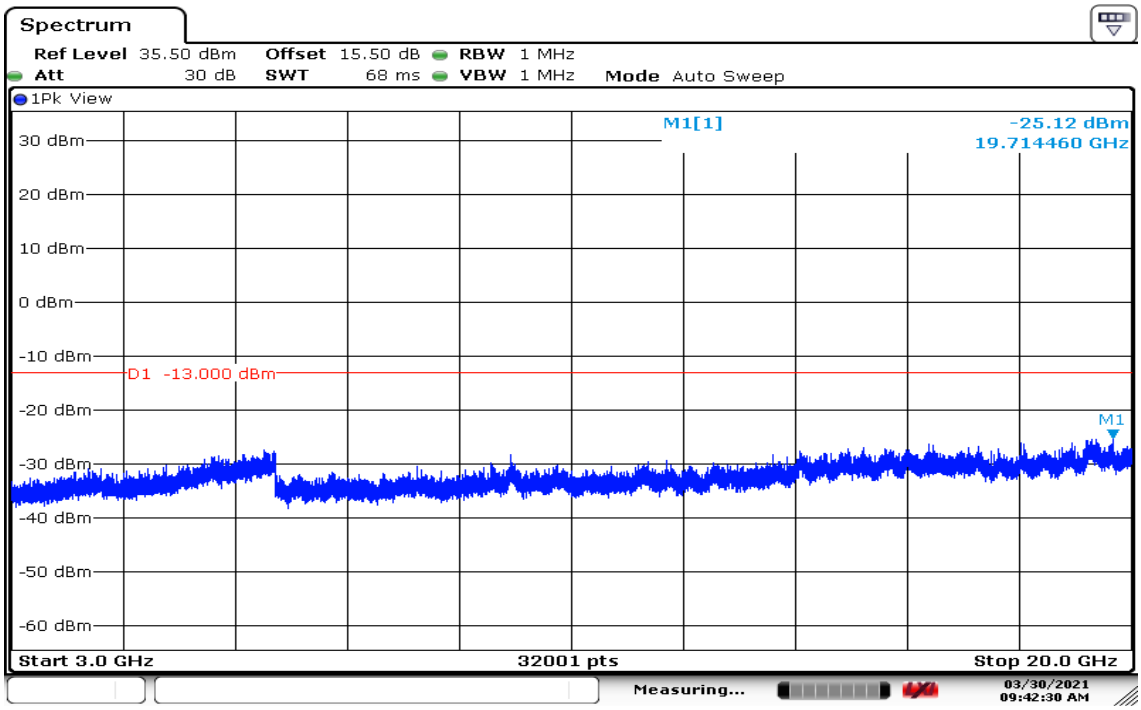
Date: 30.MAR.2021 09:42:45

CH Mid



Date: 30.MAR.2021 09:42:05

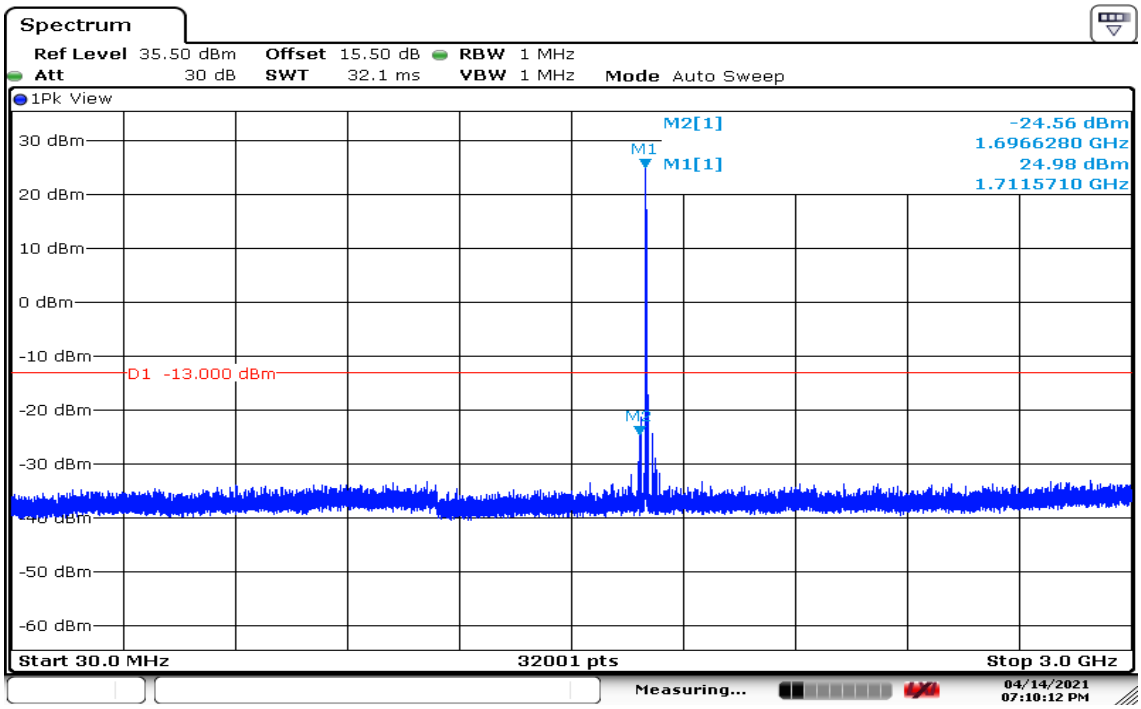
CH High



Date: 30.MAR.2021 09:42:30

CHANNEL BANDWIDTH: 20MHz / 30MHz-3GHz

CH Low



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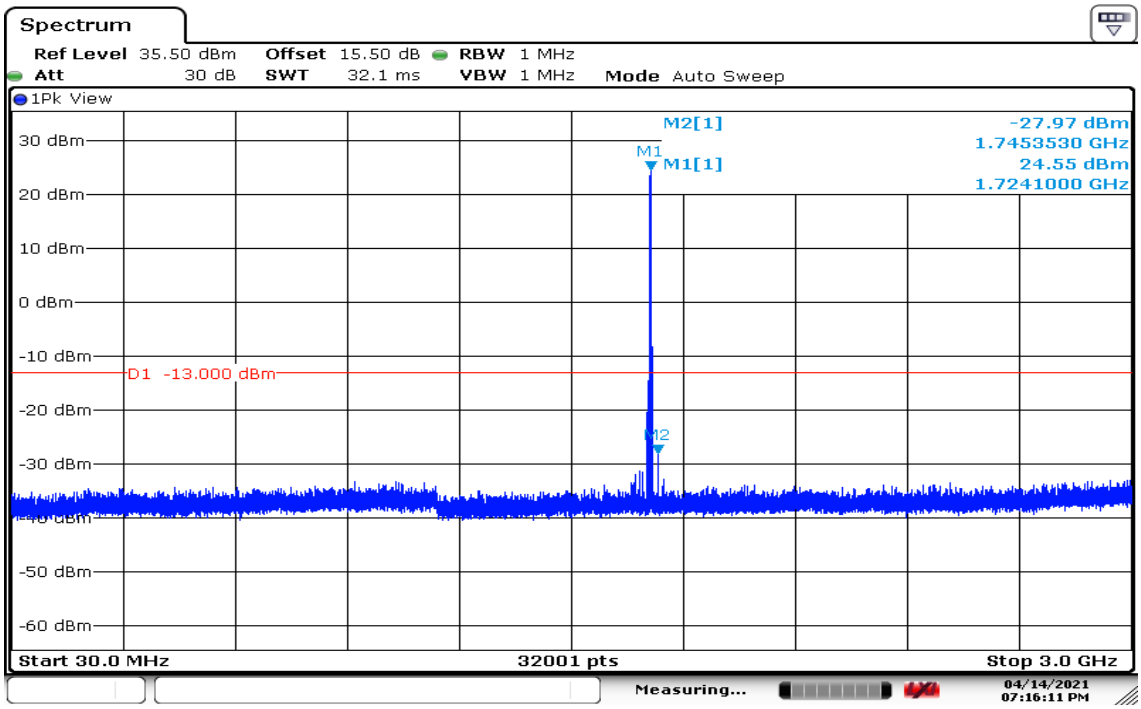
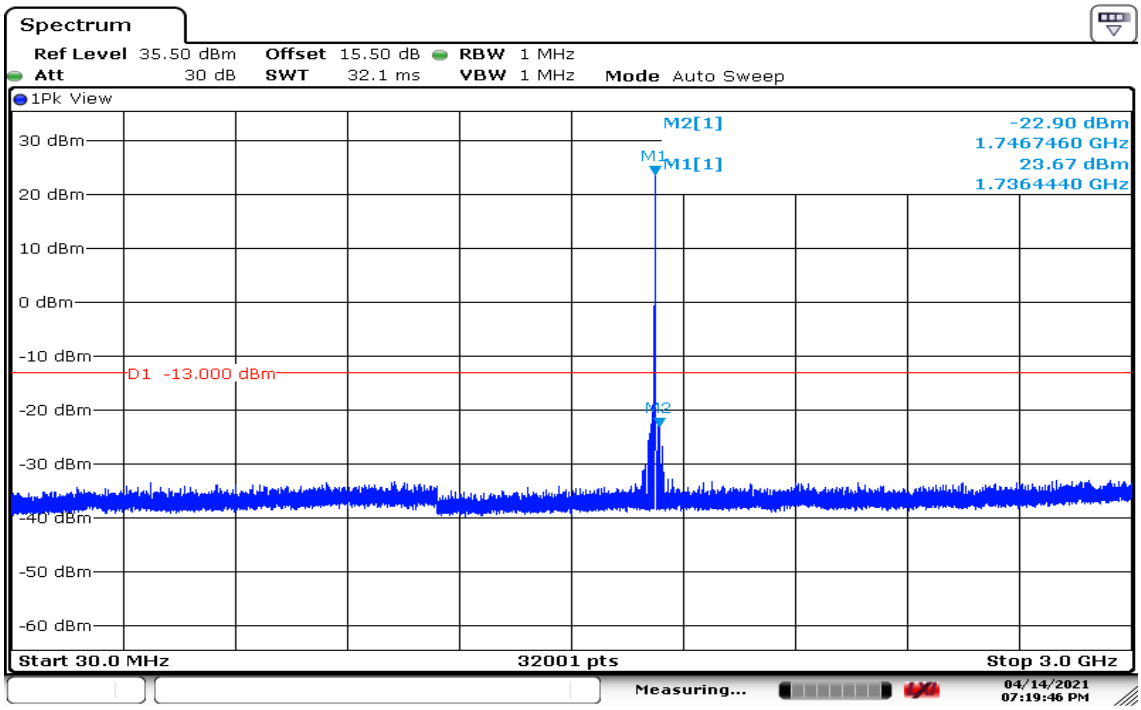
CH Mid



Date: 14.APR.2021 19:16:11

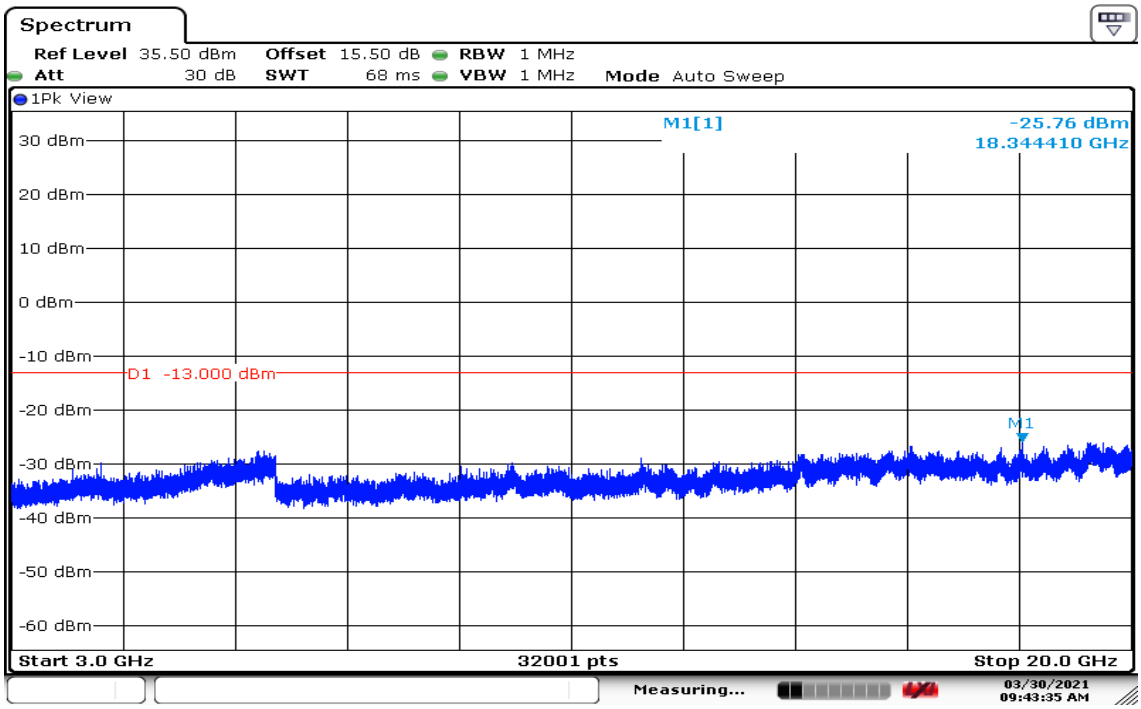
CH High



Date: 14.APR.2021 19:19:46

CHANNEL BANDWIDTH: 20MHz / 3GHz-20GHz

CH Low



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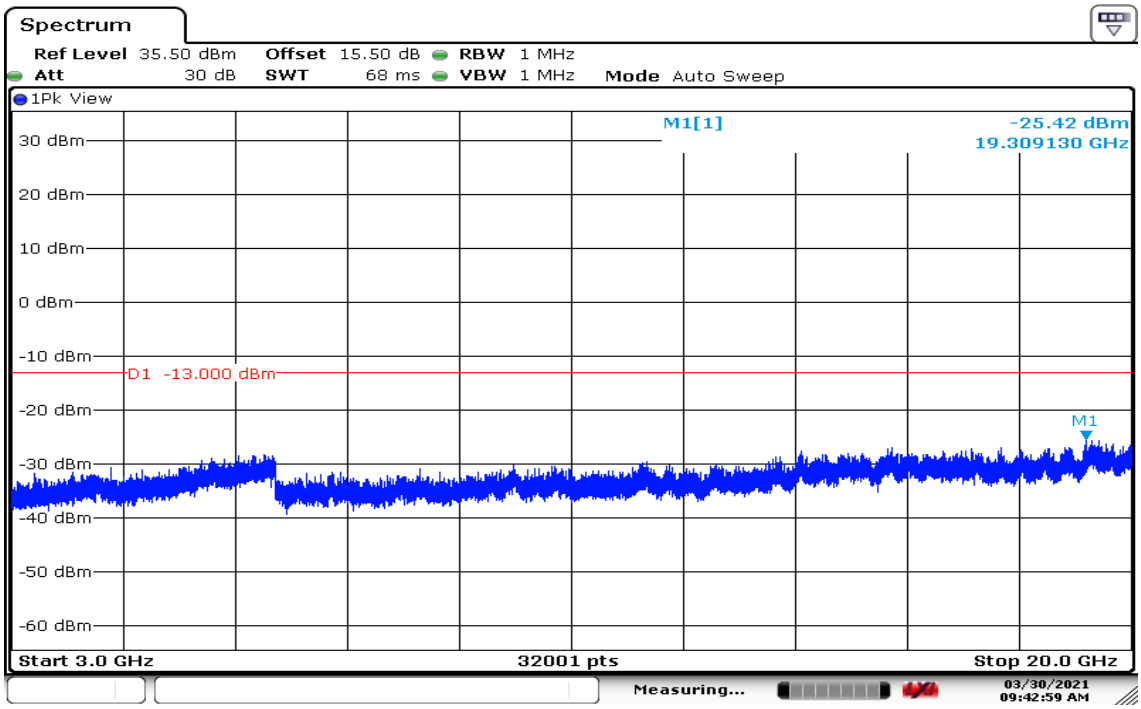
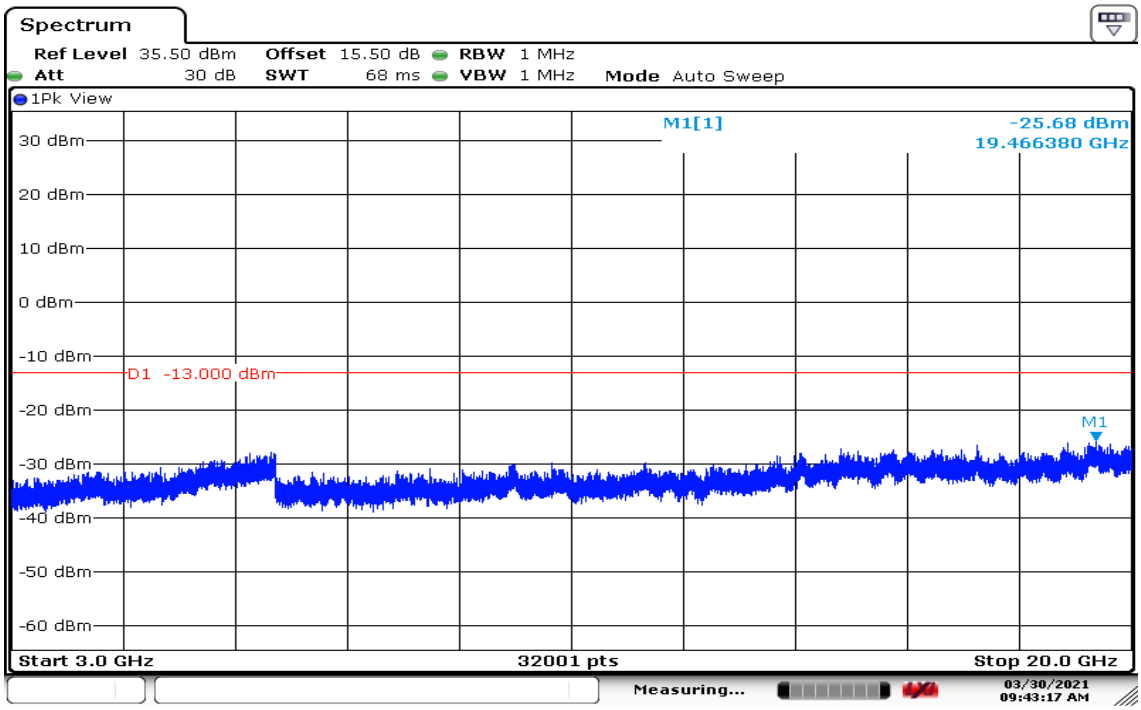
CH Mid



Date: 30.MAR.2021 09:43:00

CH High



Date: 30.MAR.2021 09:43:17

8.7 RADIATED EMISSION MEASUREMENT

LIMITS

FCC §27.53(h), Band 4

General protection levels. Except as otherwise specified below, for operations in the 1710-1755MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

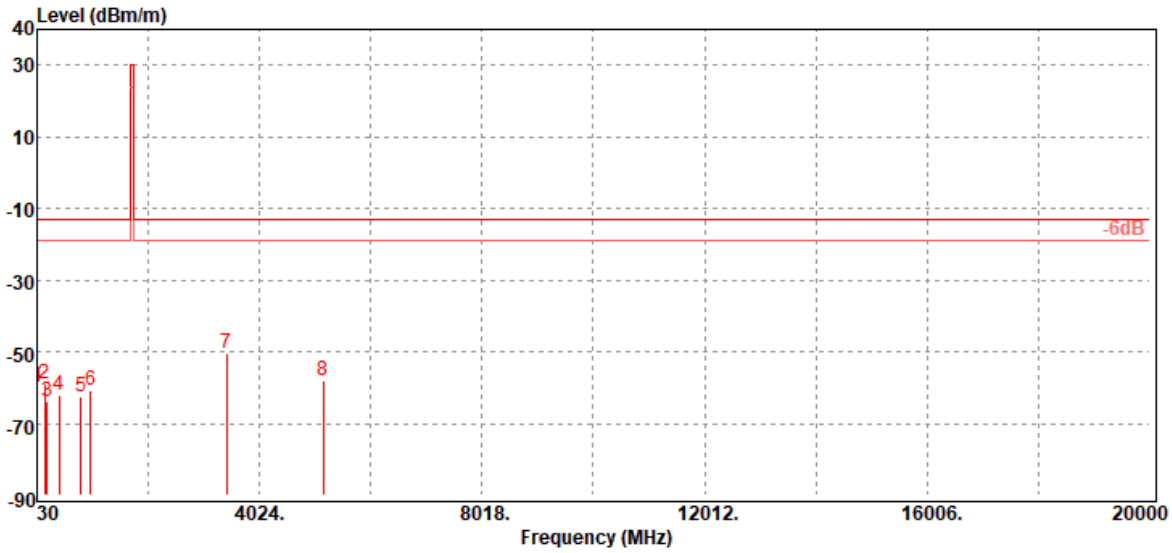
TEST PROCEDURES

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

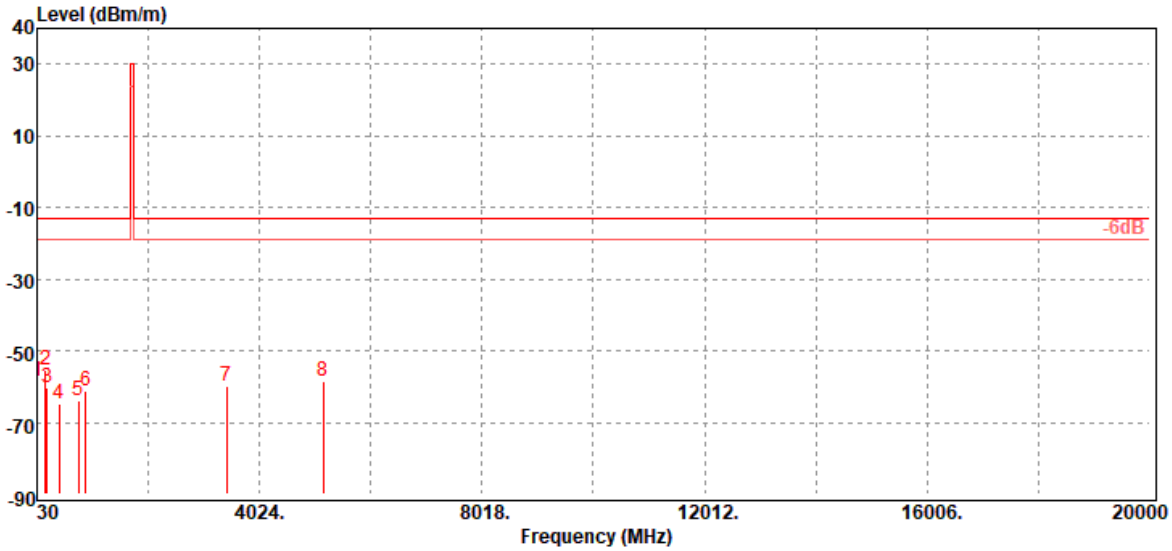
LTE Band 4 / BW: 20MHz / QPSK / RB =1, RB Offset = 0

Operation Mode:	Tx / Low CH	**Test Date:**	April 21, 2021
Temperature:	22.4℃	**Tested by:**	Ray Li
Humidity:	53% RH	**Polarity:**	Ver.



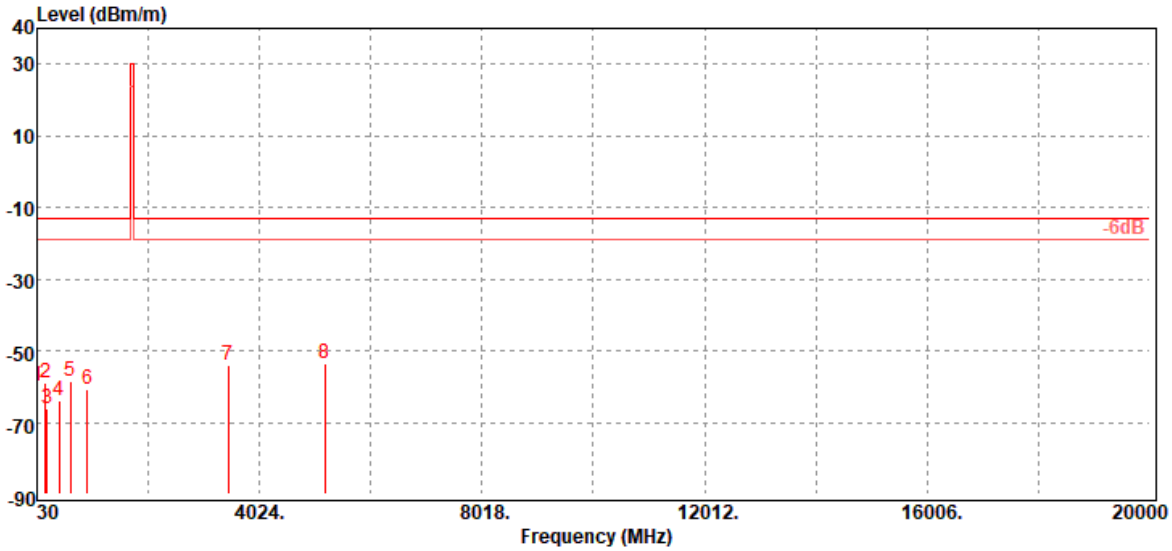
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
34.85	-60.06	-34.26	-25.32	-0.48	-13.00	-47.06	V
162.89	-59.06	-52.00	-6.01	-1.05	-13.00	-46.06	V
211.39	-64.08	-60.79	-2.10	-1.19	-13.00	-51.08	V
427.70	-62.13	-58.52	-1.90	-1.71	-13.00	-49.13	V
810.85	-62.48	-58.61	-1.48	-2.39	-13.00	-49.48	V
993.21	-60.79	-56.72	-1.40	-2.67	-13.00	-47.79	V
3440.00	-50.50	-57.71	12.72	-5.51	-13.00	-37.50	V
5160.00	-58.22	-64.27	12.76	-6.71	-13.00	-45.22	V

Operation Mode:	Tx / Low CH	**Test Date:**	April 21, 2021
Temperature:	22.4℃	**Tested by:**	Ray Li
Humidity:	53% RH	**Polarity:**	Hor.



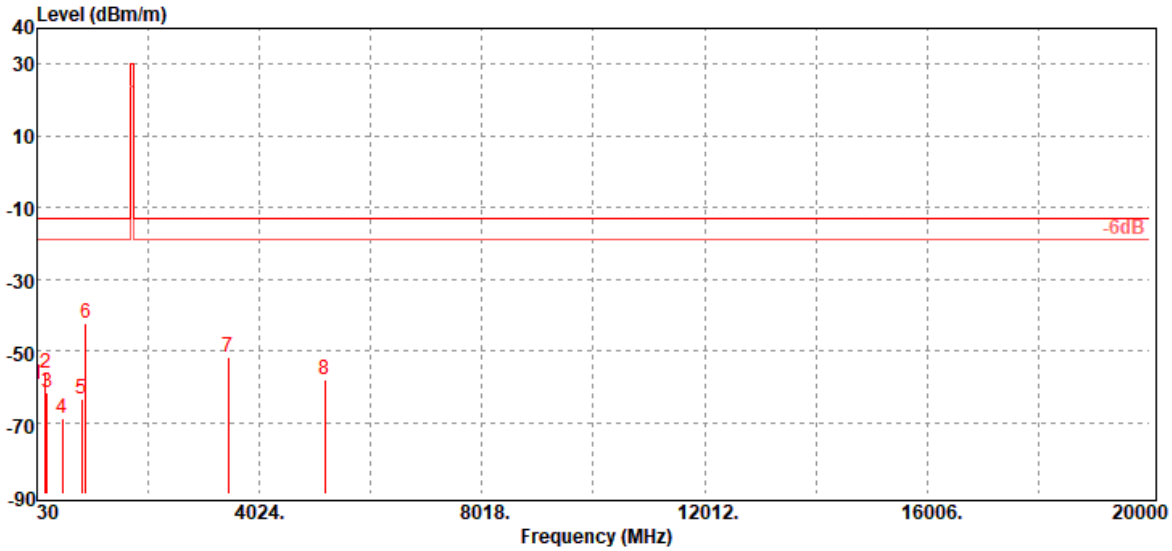
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
31.94	-58.64	-30.01	-28.16	-0.47	-13.00	-45.64	H
187.14	-55.27	-50.15	-3.99	-1.13	-13.00	-42.27	H
209.45	-60.39	-57.02	-2.18	-1.19	-13.00	-47.39	H
427.70	-64.82	-61.21	-1.90	-1.71	-13.00	-51.82	H
772.05	-63.95	-60.22	-1.40	-2.33	-13.00	-50.95	H
903.00	-61.42	-57.61	-1.26	-2.55	-13.00	-48.42	H
3440.00	-59.82	-67.03	12.72	-5.51	-13.00	-46.82	H
5160.00	-58.41	-64.46	12.76	-6.71	-13.00	-45.41	H

Operation Mode:	Tx / Mid CH	**Test Date:**	April 21, 2021
Temperature:	22.4℃	**Tested by:**	Ray Li
Humidity:	53% RH	**Polarity:**	Ver.



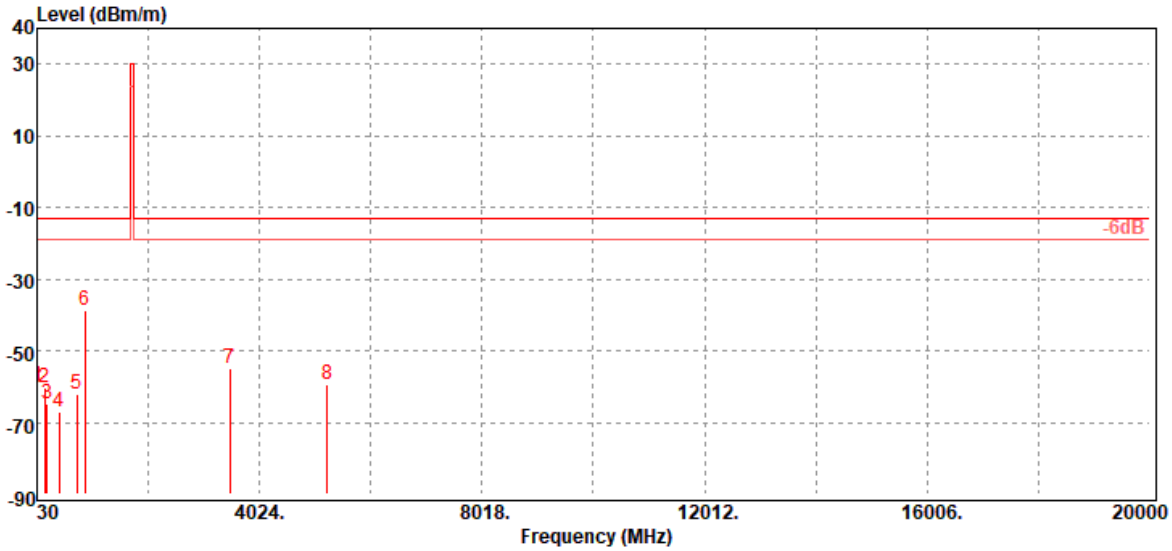
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
34.85	-60.07	-34.27	-25.32	-0.48	-13.00	-47.07	V
187.14	-59.04	-53.92	-3.99	-1.13	-13.00	-46.04	V
216.24	-65.95	-62.66	-2.08	-1.21	-13.00	-52.95	V
427.70	-63.70	-60.09	-1.90	-1.71	-13.00	-50.70	V
626.55	-58.38	-54.84	-1.43	-2.11	-13.00	-45.38	V
932.10	-60.62	-56.73	-1.30	-2.59	-13.00	-47.62	V
3465.00	-53.79	-60.90	12.64	-5.53	-13.00	-40.79	V
5197.50	-53.50	-59.73	12.98	-6.75	-13.00	-40.50	V

Operation Mode:	Tx / Mid CH	**Test Date:**	April 21, 2021
Temperature:	22.4℃	**Tested by:**	Ray Li
Humidity:	53% RH	**Polarity:**	Hor.



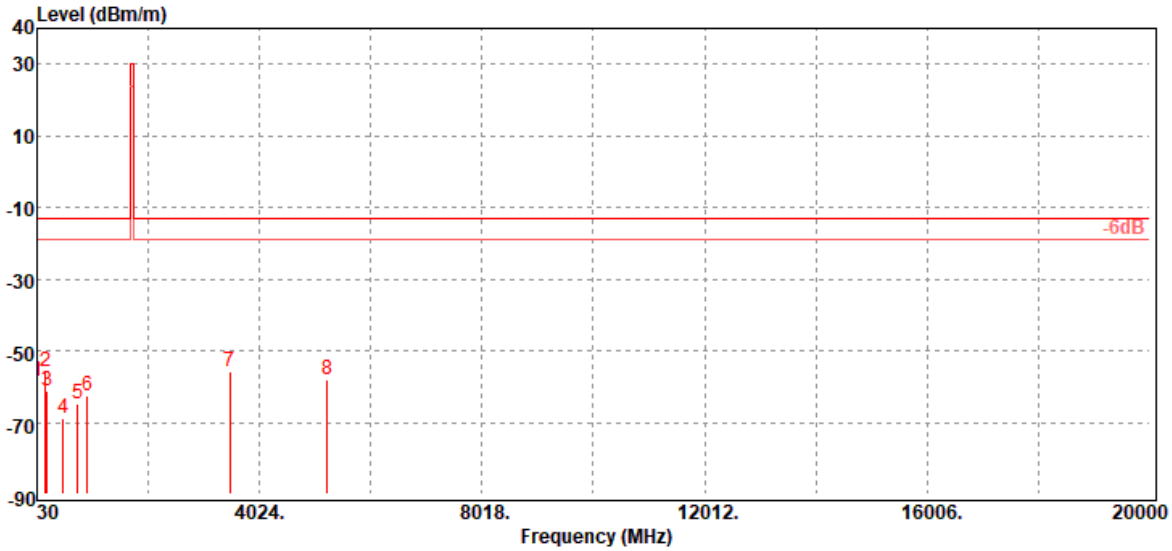
Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
34.85	-59.39	-33.59	-25.32	-0.48	-13.00	-46.39	H
187.14	-56.13	-51.01	-3.99	-1.13	-13.00	-43.13	H
212.36	-61.49	-58.19	-2.10	-1.20	-13.00	-48.49	H
487.84	-68.66	-64.58	-2.24	-1.84	-13.00	-55.66	H
830.25	-63.31	-59.39	-1.50	-2.42	-13.00	-50.31	H
904.94	-42.34	-38.49	-1.30	-2.55	-13.00	-29.34	H
3465.00	-51.75	-58.86	12.64	-5.53	-13.00	-38.75	H
5197.50	-58.04	-64.27	12.98	-6.75	-13.00	-45.04	H

Operation Mode:	Tx / High CH	**Test Date:**	April 21, 2021
Temperature:	22.4℃	**Tested by:**	Ray Li
Humidity:	53% 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)
34.85	-59.95	-34.15	-25.32	-0.48	-13.00	-46.95	V
160.95	-60.23	-53.08	-6.11	-1.04	-13.00	-47.23	V
209.45	-64.95	-61.58	-2.18	-1.19	-13.00	-51.95	V
432.55	-67.12	-63.45	-1.95	-1.72	-13.00	-54.12	V
747.80	-62.15	-58.44	-1.40	-2.31	-13.00	-49.15	V
896.21	-38.77	-34.95	-1.28	-2.54	-13.00	-25.77	V
3490.00	-54.76	-61.75	12.54	-5.55	-13.00	-41.76	V
5235.00	-59.29	-65.64	13.14	-6.79	-13.00	-46.29	V

Operation Mode:	Tx / High CH	**Test Date:**	April 21, 2021
Temperature:	22.4℃	**Tested by:**	Ray Li
Humidity:	53% 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)
32.91	-58.50	-30.84	-27.19	-0.47	-13.00	-45.50	H
187.14	-55.70	-50.58	-3.99	-1.13	-13.00	-42.70	H
209.45	-61.16	-57.79	-2.18	-1.19	-13.00	-48.16	H
500.45	-69.07	-65.21	-1.99	-1.87	-13.00	-56.07	H
764.29	-65.03	-61.30	-1.40	-2.33	-13.00	-52.03	H
927.25	-62.66	-58.78	-1.30	-2.58	-13.00	-49.66	H
3490.00	-55.85	-62.84	12.54	-5.55	-13.00	-42.85	H
5235.00	-58.23	-64.58	13.14	-6.79	-13.00	-45.23	H

- End of Test Report -