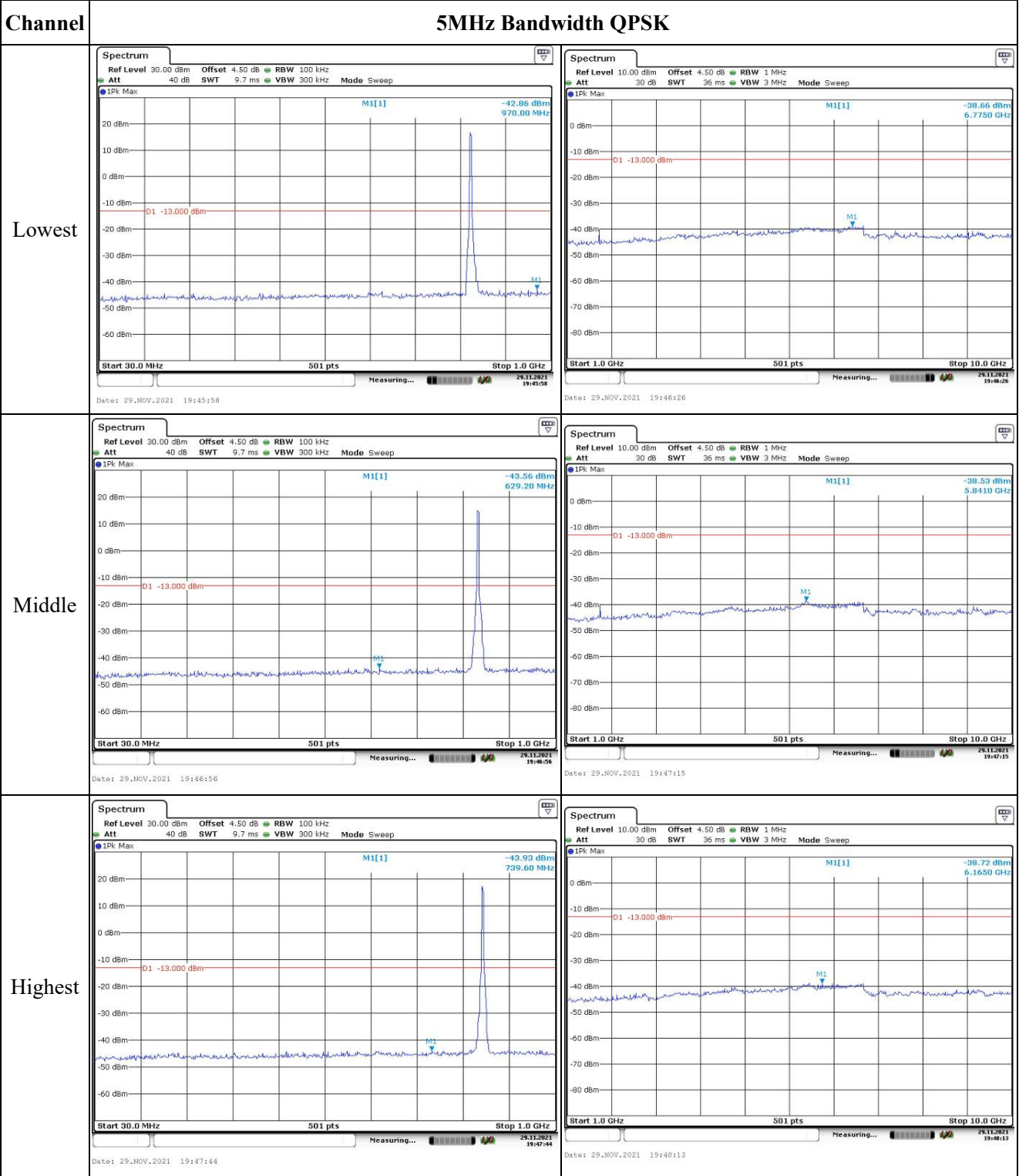
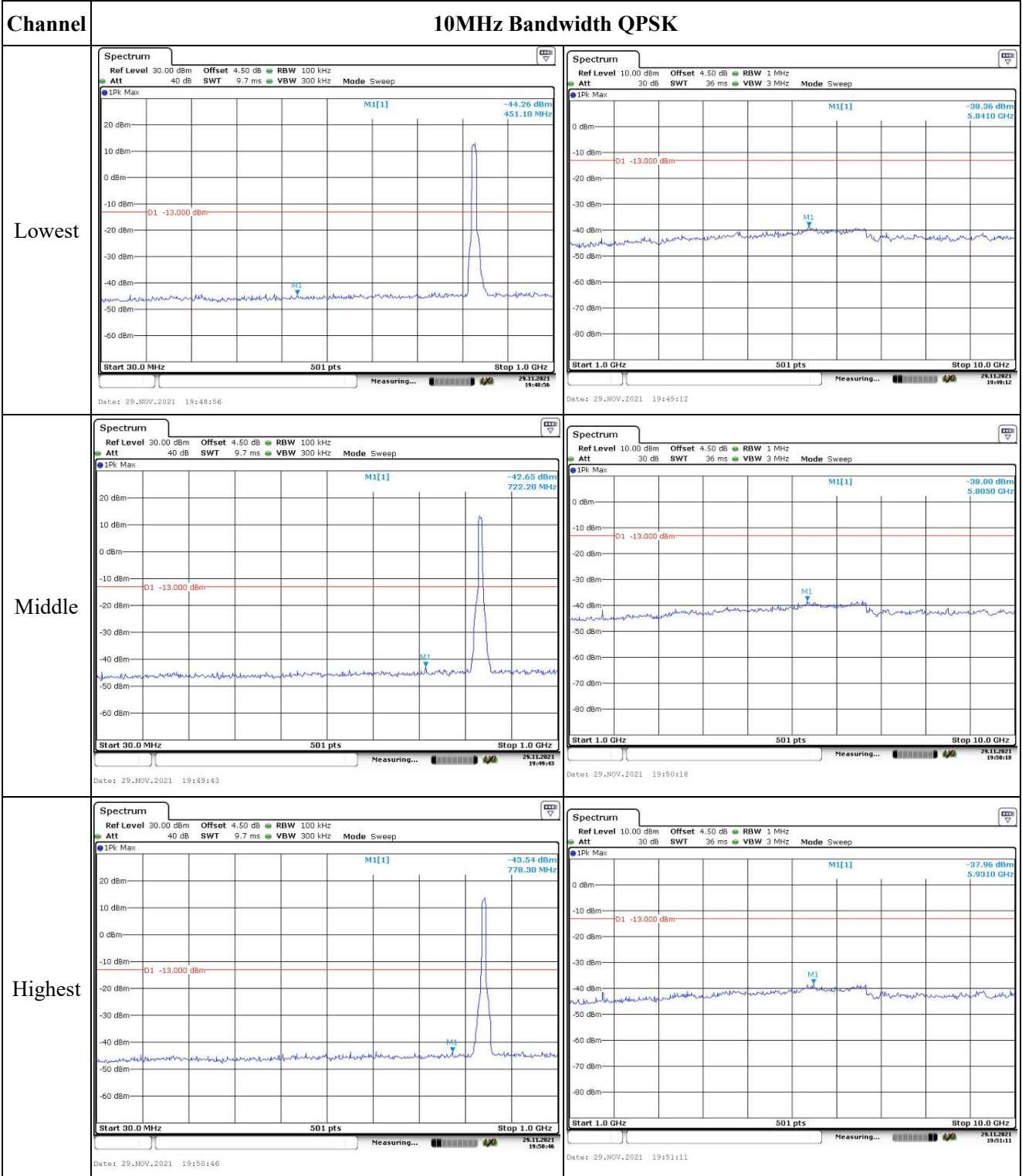


Spurious Emissions at Antenna Terminal



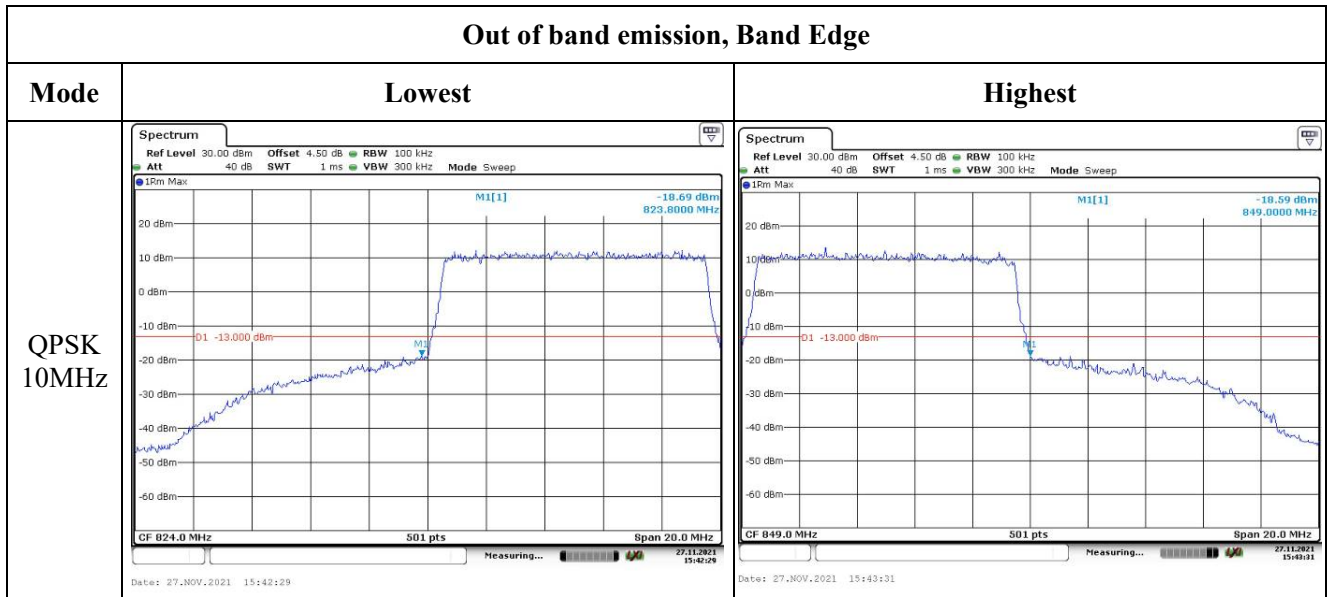
Spurious Emissions at Antenna Terminal



Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz		
QPSK 3MHz		
QPSK 5MHz		

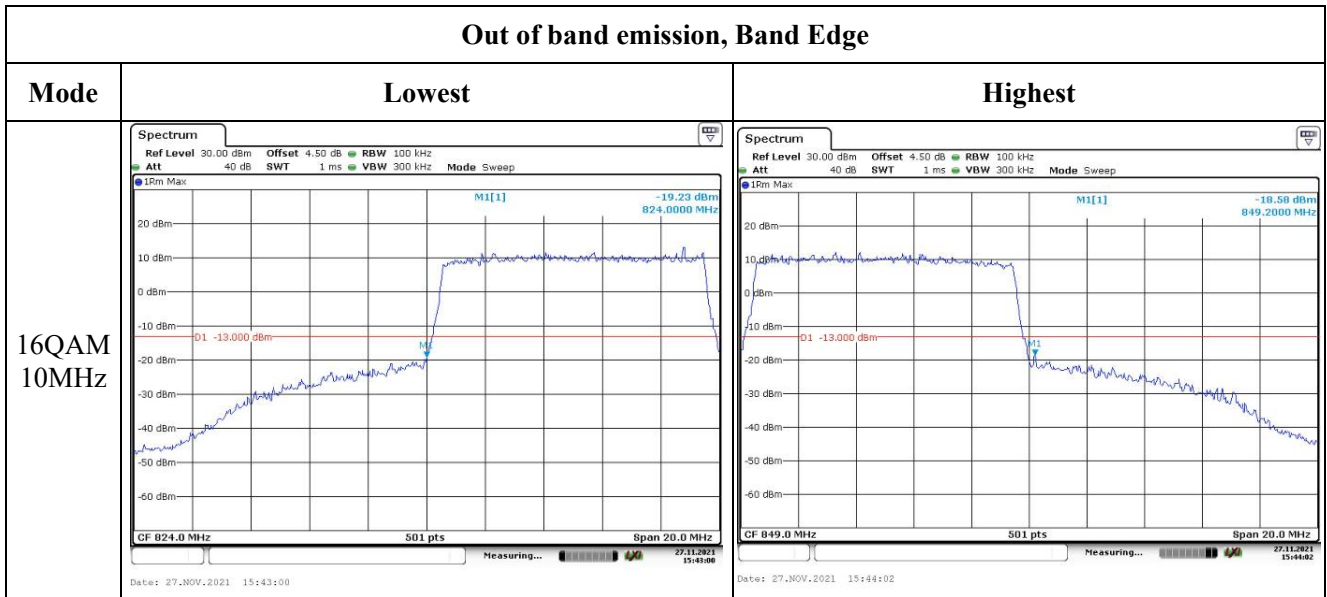
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -17.82 dBm 823.88620 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 824.0 MHz 501 pts Span 3.0 MHz</p> <p>Date: 27.NOV.2021 15:37:42</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 10 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -13.62 dBm 849.01850 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 849.0 MHz 501 pts Span 3.0 MHz</p> <p>Date: 30.NOV.2021 19:50:15</p>
16QAM 3MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -14.09 dBm 824.00000 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 824.0 MHz 501 pts Span 6.0 MHz</p> <p>Date: 27.NOV.2021 15:39:05</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -14.97 dBm 849.00000 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 849.0 MHz 501 pts Span 6.0 MHz</p> <p>Date: 27.NOV.2021 15:39:49</p>
16QAM 5MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Rm Max M1[1] -13.17 dBm 824.00000 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 824.0 MHz 501 pts Span 10.0 MHz</p> <p>Date: 27.NOV.2021 15:40:55</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Rm Max M1[1] -15.04 dBm 849.7222 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 849.0 MHz 501 pts Span 10.0 MHz</p> <p>Date: 30.NOV.2021 19:56:10</p>

Out of band emission, Band Edge



4.9 Antenna Port Test Data and Results for LTE Band 12

Serial Number:	CR21110024-RF-S4	Test Date:	2021-11-27~2022-01-06
Test Site:	RF	Test Mode:	Transmitting
Tester:	Le Qiao	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.1~22.9	Relative Humidity: (%)	40~66	ATM Pressure: (kPa)	101.4~101.7
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	Spectrum Analyzer	101474	2021/7/22	2022/7/21
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2021/7/22	2022/7/21
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021/7/22	2022/7/22
UNI-T	Multimeter	UT39A+	C210582554	2021/9/30	2022/9/30
E-Microwave	Two-way Splitter	ODP-1-6	OE0120176	Each Time	N/A

* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

EUT Information@ LTE Band 12▲:

Antenna Gain (dBi):	3	Antenna Gain (dBd):	0.85	Cable Loss (dB):	0.1
Operation Voltage(V _{DC}):					
Lowest:	3.5	Normal:	3.8	Highest:	4.35

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	699.7	707.5	715.3
3MHz	700.5	707.5	714.5
5MHz	701.5	707.5	713.5
10MHz	704	707.5	711

Test Data:

FCC§2.1046;§ 27.50(c) (10)						
RF Output Power:						
Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	23.30	23.05	23.42	24.2	34.77
	RB1#3	23.32	23.01	23.41		
	RB1#5	23.33	23.14	23.45		
	RB3#0	23.28	23.19	23.15		
	RB3#3	23.28	23.24	23.31		
	RB6#0	22.29	22.27	22.17		
1.4MHz 16QAM	RB1#0	22.68	23.07	21.97	23.82	34.77
	RB1#3	22.67	23.02	21.90		
	RB1#5	22.63	22.88	22.00		
	RB3#0	22.08	22.20	22.00		
	RB3#3	22.05	22.24	21.98		
	RB6#0	21.29	21.36	21.28		
3MHz QPSK	RB1#0	23.22	23.03	23.41	24.21	34.77
	RB1#8	23.29	23.19	23.38		
	RB1#14	23.19	23.17	23.46		
	RB6#0	22.25	22.20	22.21		
	RB6#9	22.21	22.21	22.17		
	RB15#0	22.28	22.27	22.31		
3MHz 16QAM	RB1#0	22.45	22.34	21.80	23.21	34.77
	RB1#8	22.38	22.33	21.68		
	RB1#14	22.46	22.38	21.82		
	RB6#0	21.40	21.30	21.33		
	RB6#9	21.22	21.42	21.33		
	RB15#0	21.38	21.26	21.26		
5MHz QPSK	RB1#0	23.20	23.19	23.05	24.04	34.77
	RB1#13	23.15	23.23	23.09		
	RB1#24	23.11	23.26	23.29		
	RB15#0	22.30	22.20	22.26		
	RB15#10	22.26	22.31	22.28		
	RB25#0	22.27	22.36	22.39		
5MHz 16QAM	RB1#0	21.59	21.97	22.11	22.92	34.77
	RB1#13	21.69	21.89	22.17		
	RB1#24	21.62	21.93	22.17		
	RB15#0	21.25	21.05	21.14		
	RB15#10	21.19	21.16	21.20		
	RB25#0	21.26	21.22	21.39		

10MHz QPSK	RB1#0	23.12	23.09	23.13	24.16	34.77
	RB1#25	23.13	23.16	23.23		
	RB1#49	23.19	23.20	23.41		
	RB25#0	22.26	22.19	22.09		
	RB25#25	22.32	22.17	22.34		
	RB50#0	22.16	22.24	22.03		
10MHz 16QAM	RB1#0	22.49	22.74	21.81	23.66	34.77
	RB1#25	22.41	22.83	21.82		
	RB1#49	22.56	22.91	21.97		
	RB25#0	21.09	21.24	21.38		
	RB25#25	21.19	21.21	21.51		
	RB50#0	21.24	21.42	21.11		

Note: ERP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBd)

Result:**Pass****Peak-to-average Ratio(PAR)**

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
10MHz QPSK	RB1#0	4.20	3.83	4.72	13
	RB50#0	5.19	5.22	4.67	13
10MHz 16QAM	RB1#0	4.67	4.90	5.71	13
	RB50#0	6.09	6.14	5.83	13
Result:					Pass

FCC §2.1049, §27.53:Occupied Bandwidth

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.096	1.102	1.102	1.254	1.260	1.254
1.4MHz 16QAM	1.108	1.096	1.102	1.260	1.254	1.260
3MHz QPSK	2.695	2.695	2.707	3.000	3.000	3.024
3MHz 16QAM	2.695	2.695	2.695	3.000	3.000	3.048
5MHz QPSK	4.511	4.511	4.531	4.980	5.000	5.020
5MHz 16QAM	4.511	4.531	4.531	5.000	5.020	5.020
10MHz QPSK	9.022	8.942	8.901	9.800	9.720	9.640
10MHz 16QAM	9.022	8.942	8.901	9.760	9.800	9.680

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, §27.53:Out of band emission, Band Edge

Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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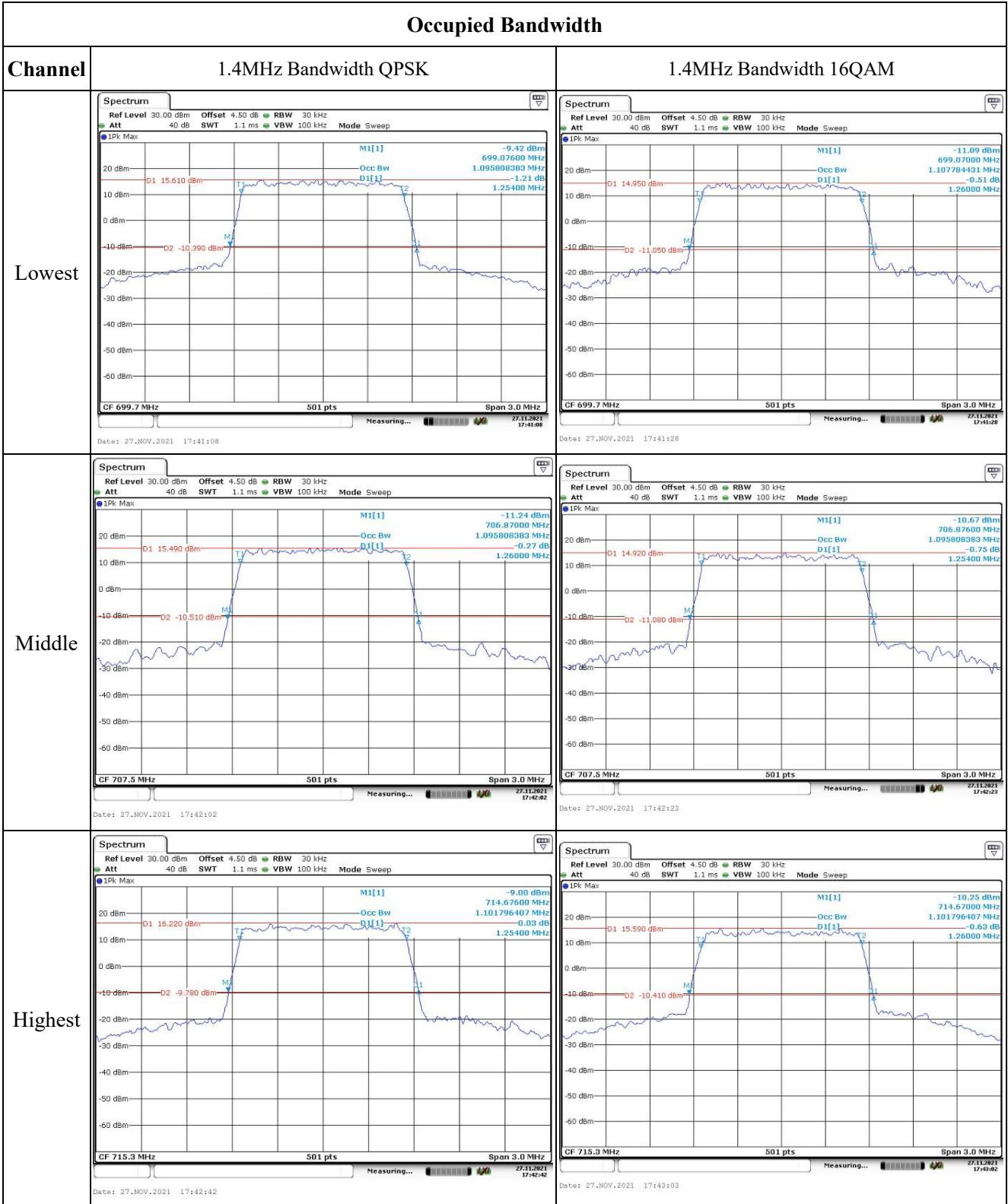
FCC §2.1055, §27.54: Frequency Stability

Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	699.488	699.00	715.471	716.00
	-20	3.8	699.487	699.00	715.472	716.00
	-10	3.8	699.485	699.00	715.473	716.00
	0	3.8	699.487	699.00	715.473	716.00
	10	3.8	699.483	699.00	715.474	716.00
	20	3.8	699.489	699.00	715.471	716.00
	30	3.8	699.484	699.00	715.475	716.00
	40	3.8	699.483	699.00	715.476	716.00
Frequency Stability vs. Voltage	20	3.5	699.485	699.00	715.478	716.00
	20	4.35	699.489	699.00	715.471	716.00
					Result:	Pass

Test Mode:	10M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	699.483	699.00	715.471	716.00
	-20	3.8	699.484	699.00	715.472	716.00
	-10	3.8	699.482	699.00	715.474	716.00
	0	3.8	699.484	699.00	715.475	716.00
	10	3.8	699.487	699.00	715.476	716.00
	20	3.8	699.489	699.00	715.471	716.00
	30	3.8	699.485	699.00	715.477	716.00
	40	3.8	699.487	699.00	715.476	716.00
Frequency Stability vs. Voltage	20	3.5	699.487	699.00	715.478	716.00
	20	4.35	699.489	699.00	715.471	716.00
					Result:	Pass

Test Plots:

Occupied Bandwidth



Occupied Bandwidth

Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBV 300 kHz Mode Sweep 1Pk Max M1[1] -9.36 dBm Occ Bw 4.510978044 MHz D1[1] -1.24 dB 4.9800 MHz O1 15.980 dBm O2 -10.020 dBm CF 701.5 MHz 501 pts Span 10.0 MHz Date: 27.NOV.2021 17:46:02</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBV 300 kHz Mode Sweep 1Pk Max M1[1] -11.25 dBm Occ Bw 4.510978044 MHz D1[1] -1.07 dB 5.0000 MHz O1 15.520 dBm O2 -10.480 dBm CF 701.5 MHz 501 pts Span 10.0 MHz Date: 27.NOV.2021 17:46:39</p>
Middle	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBV 300 kHz Mode Sweep 1Pk Max M1[1] -9.92 dBm Occ Bw 4.510978044 MHz D1[1] -1.26 dB 5.0000 MHz O1 15.940 dBm O2 -10.060 dBm CF 707.5 MHz 501 pts Span 10.0 MHz Date: 27.NOV.2021 17:47:13</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBV 300 kHz Mode Sweep 1Pk Max M1[1] -11.42 dBm Occ Bw 4.530938124 MHz D1[1] 0.20 dB 5.0200 MHz O1 15.030 dBm O2 -10.970 dBm CF 707.5 MHz 501 pts Span 10.0 MHz Date: 27.NOV.2021 17:47:43</p>
Highest	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBV 300 kHz Mode Sweep 1Pk Max M1[1] -9.25 dBm Occ Bw 4.530938124 MHz D1[1] -0.46 dB 5.0200 MHz O1 16.730 dBm O2 -9.270 dBm CF 713.5 MHz 501 pts Span 10.0 MHz Date: 27.NOV.2021 17:48:14</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBV 300 kHz Mode Sweep 1Pk Max M1[1] -11.34 dBm Occ Bw 4.530938124 MHz D1[1] 0.09 dB 5.0200 MHz O1 14.890 dBm O2 -11.110 dBm CF 713.5 MHz 501 pts Span 10.0 MHz Date: 27.NOV.2021 17:48:38</p>

Occupied Bandwidth

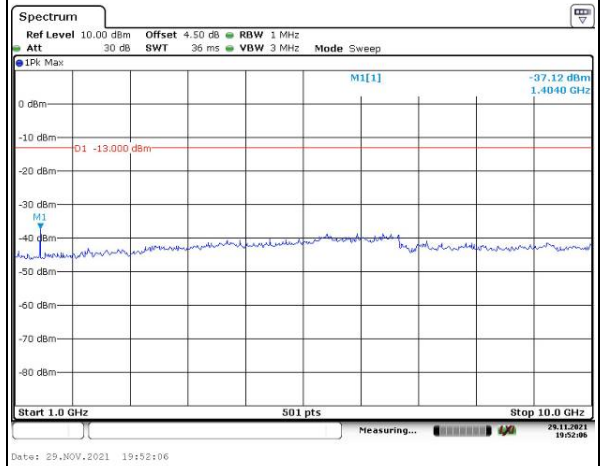
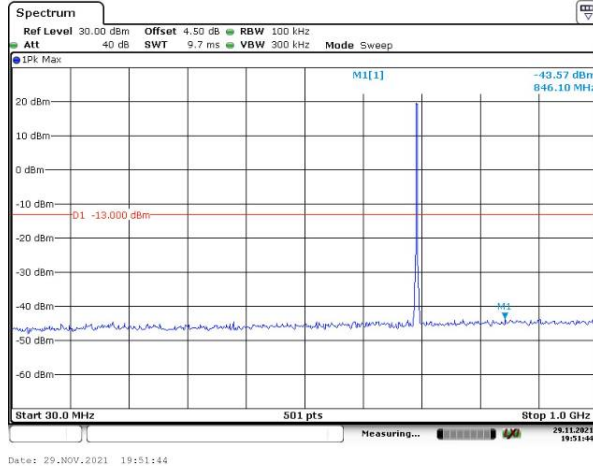
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -12.48 dBm Occ Bw 9.021956089 MHz D1[1] 1.40 dB 9.8000 MHz CF 704.0 MHz 501 pts Span 20.0 MHz Date: 27.NOV.2021 17:49:13</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -12.22 dBm Occ Bw 9.021956089 MHz D1[1] -1.01 dB 9.7600 MHz CF 704.0 MHz 501 pts Span 20.0 MHz Date: 27.NOV.2021 17:49:41</p>
Middle	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -11.39 dBm Occ Bw 8.942115768 MHz D1[1] -1.03 dB 9.7200 MHz CF 707.5 MHz 501 pts Span 20.0 MHz Date: 27.NOV.2021 17:50:16</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -13.15 dBm Occ Bw 8.942115768 MHz D1[1] -0.29 dB 9.8000 MHz CF 707.5 MHz 501 pts Span 20.0 MHz Date: 27.NOV.2021 17:50:53</p>
Highest	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -12.18 dBm Occ Bw 8.902195609 MHz D1[1] 1.20 dB 9.6400 MHz CF 711.0 MHz 501 pts Span 20.0 MHz Date: 27.NOV.2021 17:51:22</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -12.97 dBm Occ Bw 8.902195609 MHz D1[1] 0.81 dB 9.6800 MHz CF 711.0 MHz 501 pts Span 20.0 MHz Date: 27.NOV.2021 17:51:57</p>

Spurious Emissions at Antenna Terminal

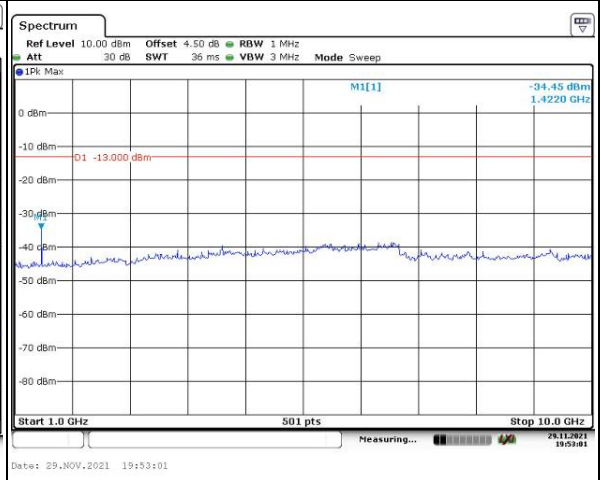
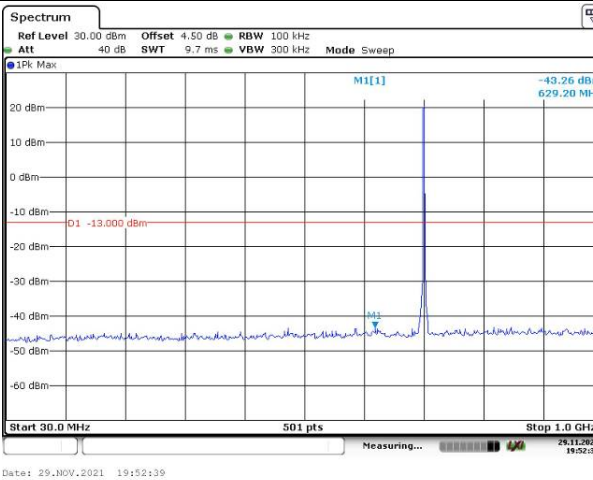
Channel

1.4MHz Bandwidth QPSK

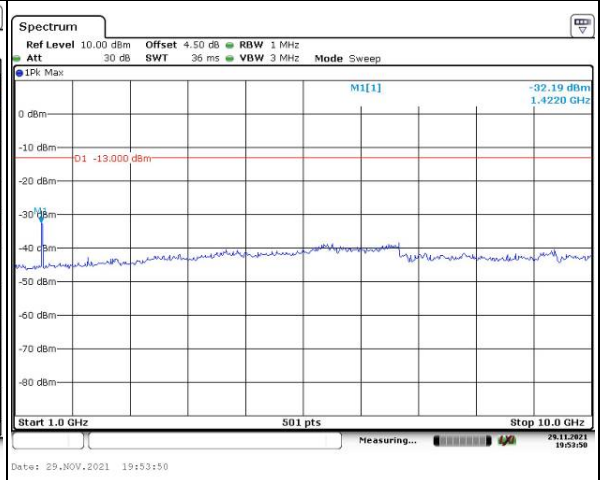
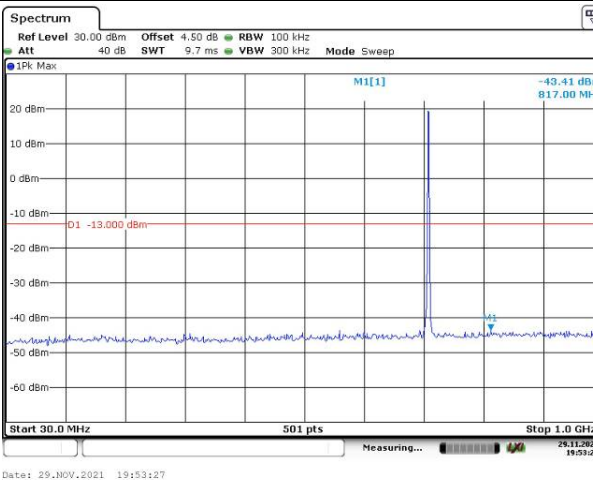
Lowest



Middle



Highest

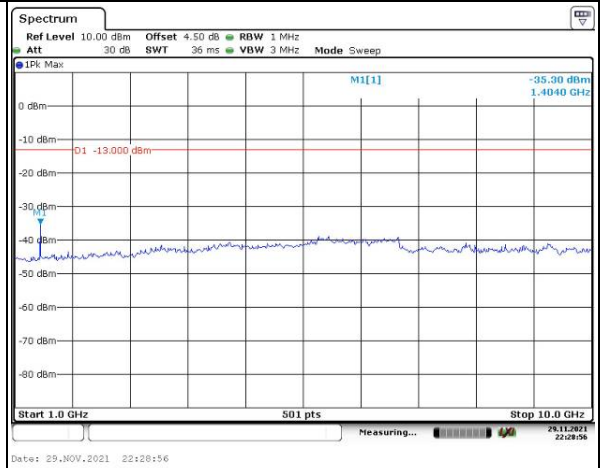


Spurious Emissions at Antenna Terminal

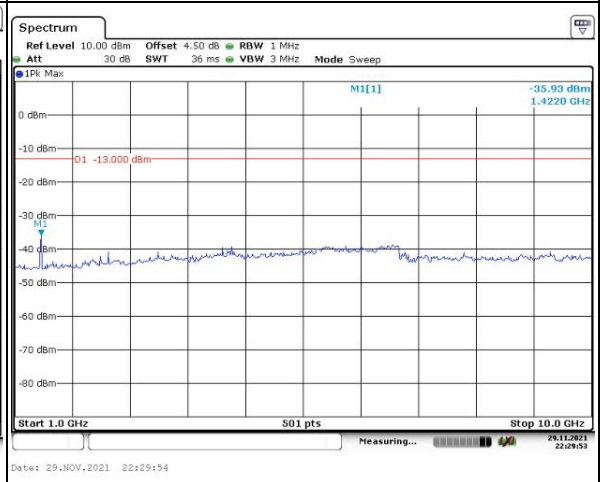
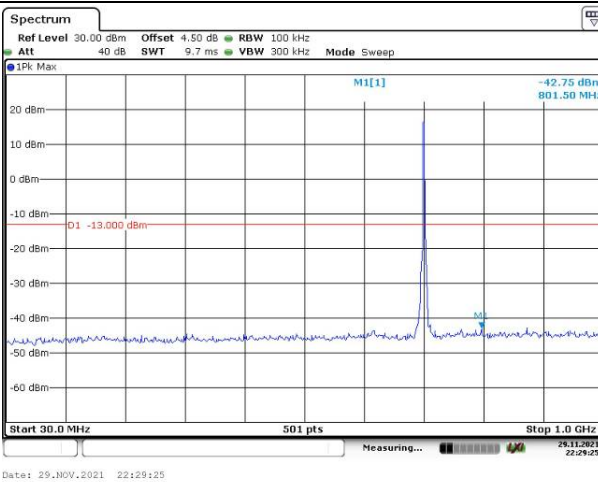
Channel

3MHz Bandwidth QPSK

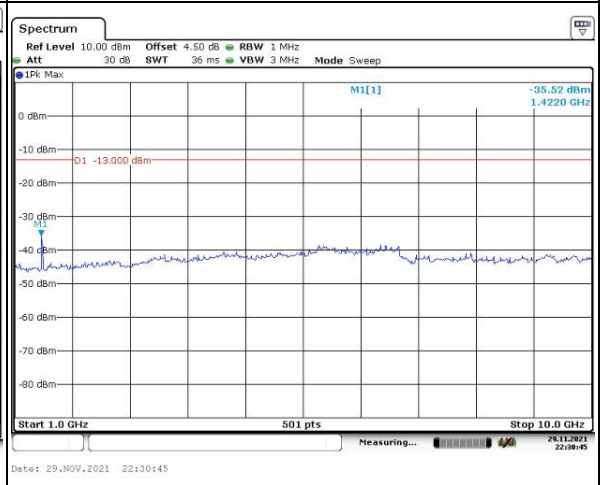
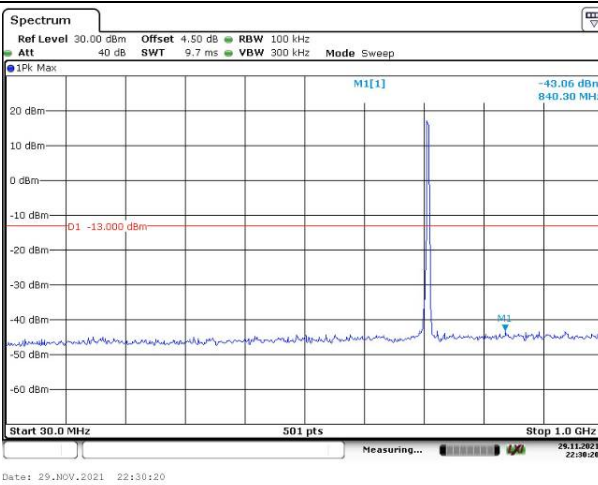
Lowest



Middle



Highest

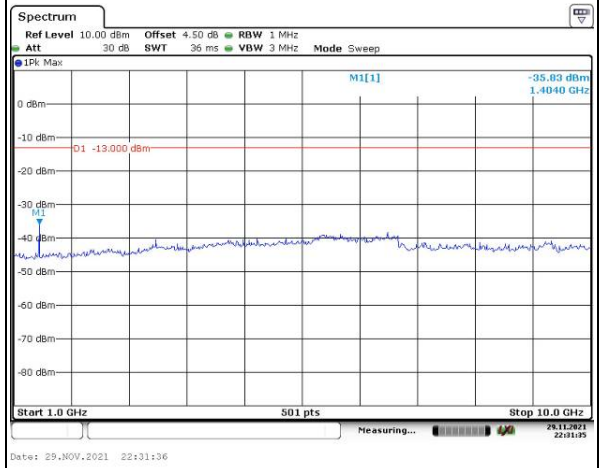
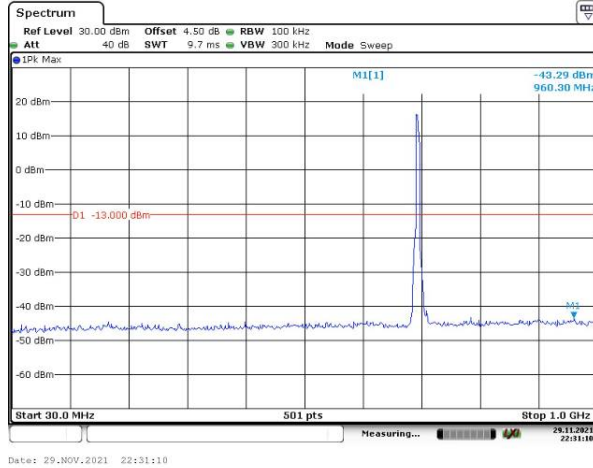


Spurious Emissions at Antenna Terminal

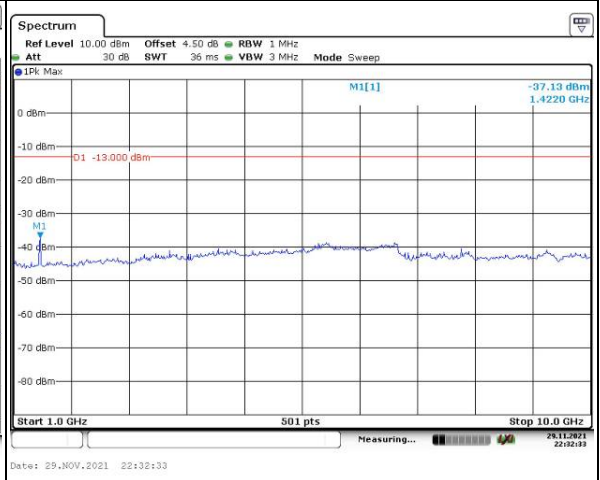
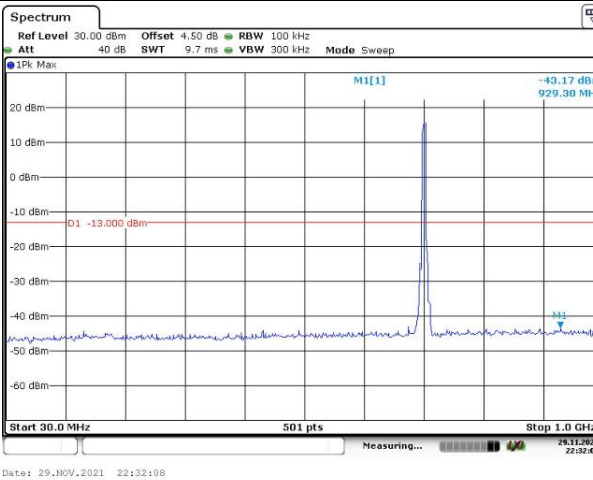
Channel

5MHz Bandwidth QPSK

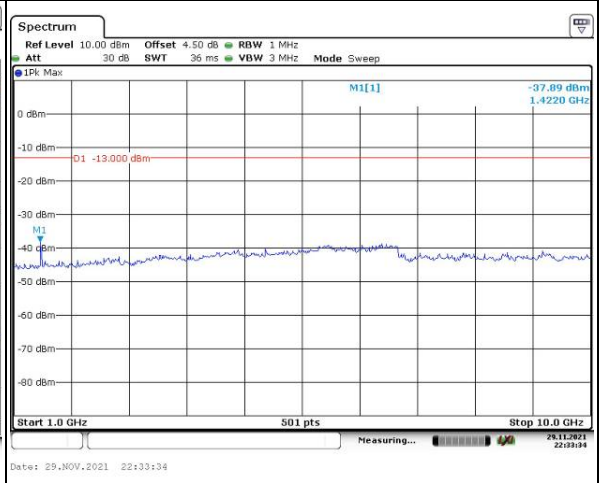
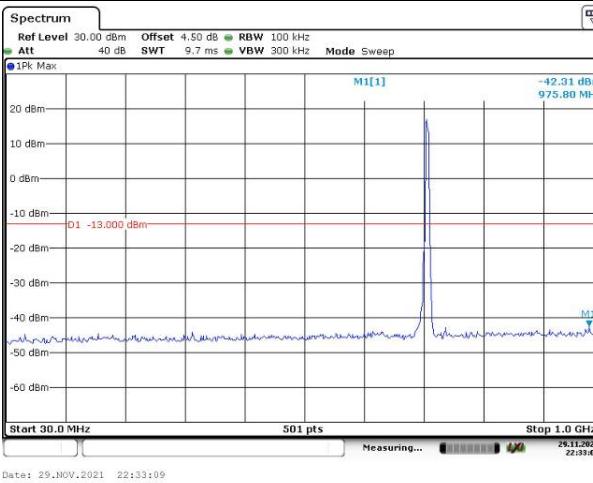
Lowest



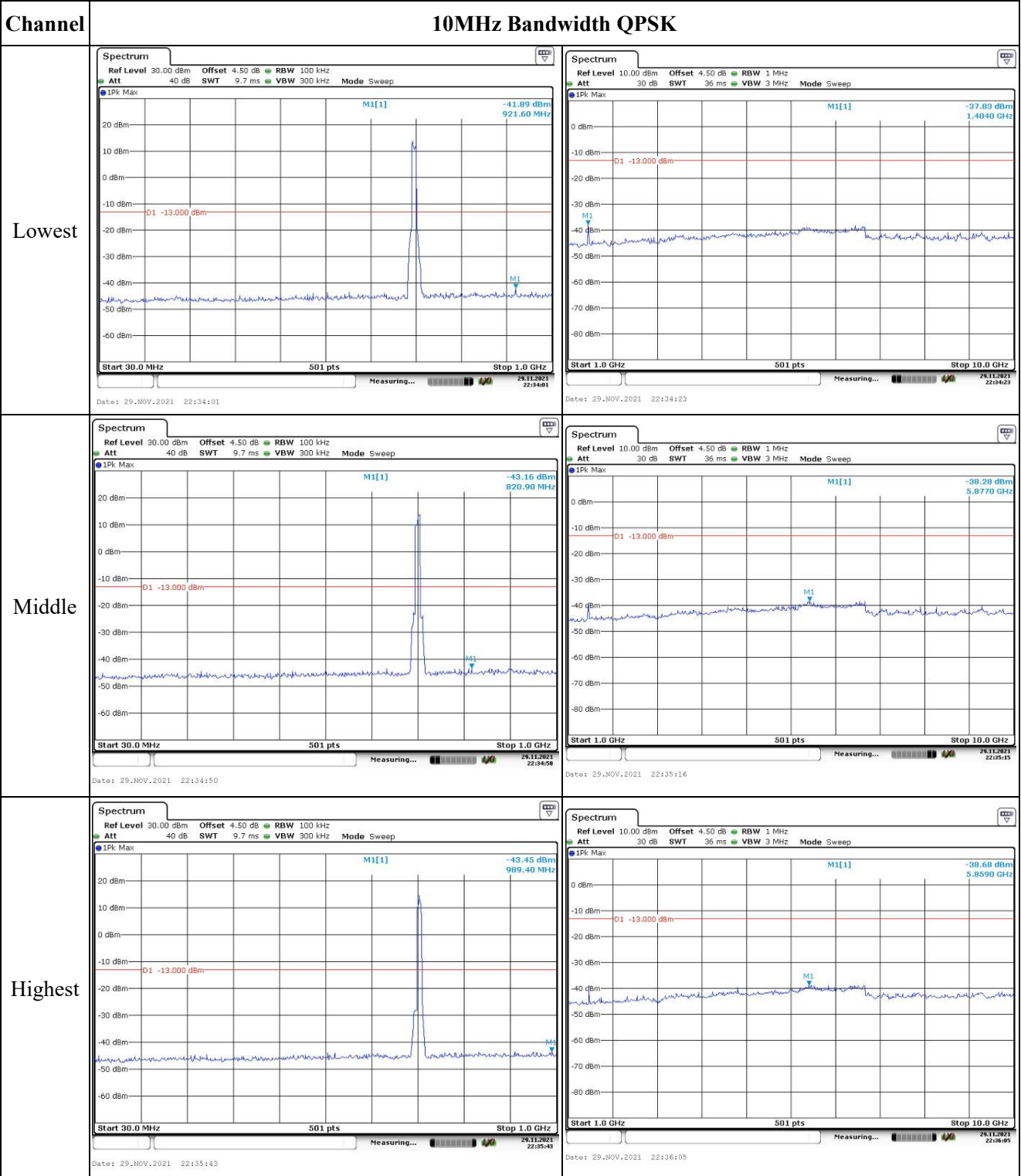
Middle



Highest



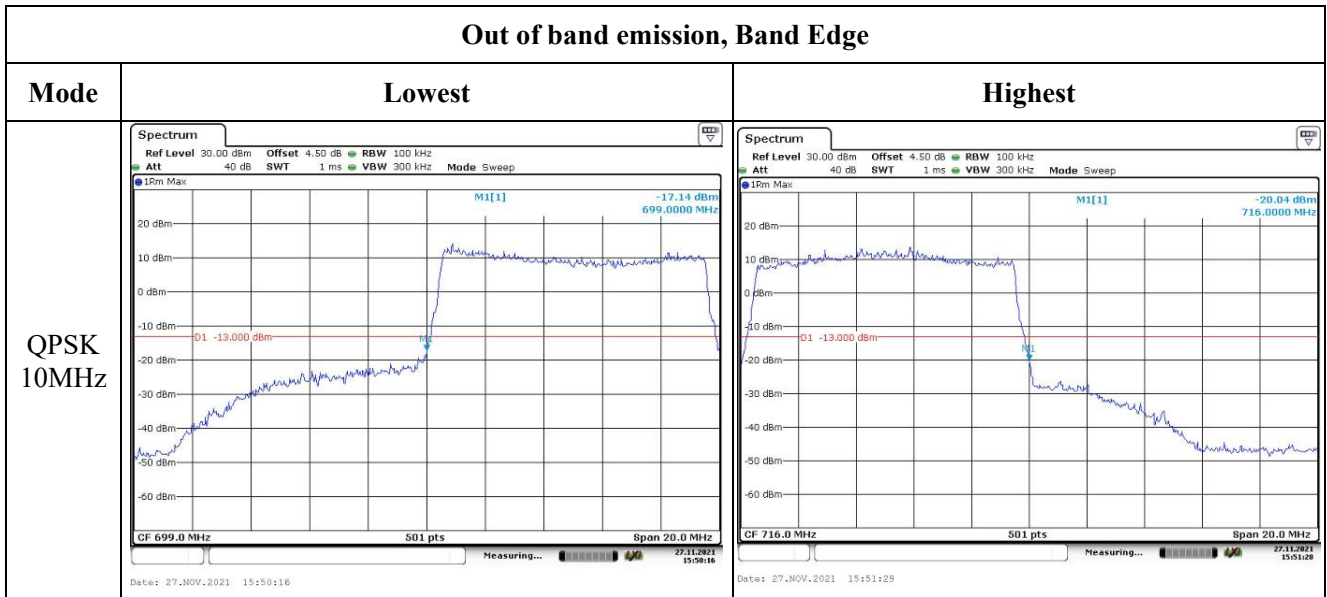
Spurious Emissions at Antenna Terminal



Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Fm Max M1[1] -15.35 dBm 698.95810 MHz D1 -13.000 dBm CF 699.0 MHz 501 pts Span 3.0 MHz Date: 27.NOV.2021 15:44:23</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Fm Max M1[1] -16.93 dBm 716.34130 MHz D1 -13.000 dBm CF 716.0 MHz 501 pts Span 3.0 MHz Date: 27.NOV.2021 15:45:05</p>
QPSK 3MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Fm Max M1[1] -13.57 dBm 698.9880 MHz D1 -13.000 dBm CF 699.0 MHz 501 pts Span 6.0 MHz Date: 30.NOV.2021 19:57:51</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep 1Fm Max M1[1] -14.91 dBm 716.0000 MHz D1 -13.000 dBm CF 716.0 MHz 501 pts Span 6.0 MHz Date: 27.NOV.2021 15:46:56</p>
QPSK 5MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Fm Max M1[1] -13.19 dBm 698.9880 MHz D1 -13.000 dBm CF 699.0 MHz 501 pts Span 10.0 MHz Date: 30.NOV.2021 19:59:49</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Fm Max M1[1] -18.32 dBm 717.0848 MHz D1 -13.000 dBm CF 716.0 MHz 501 pts Span 10.0 MHz Date: 30.NOV.2021 20:01:54</p>

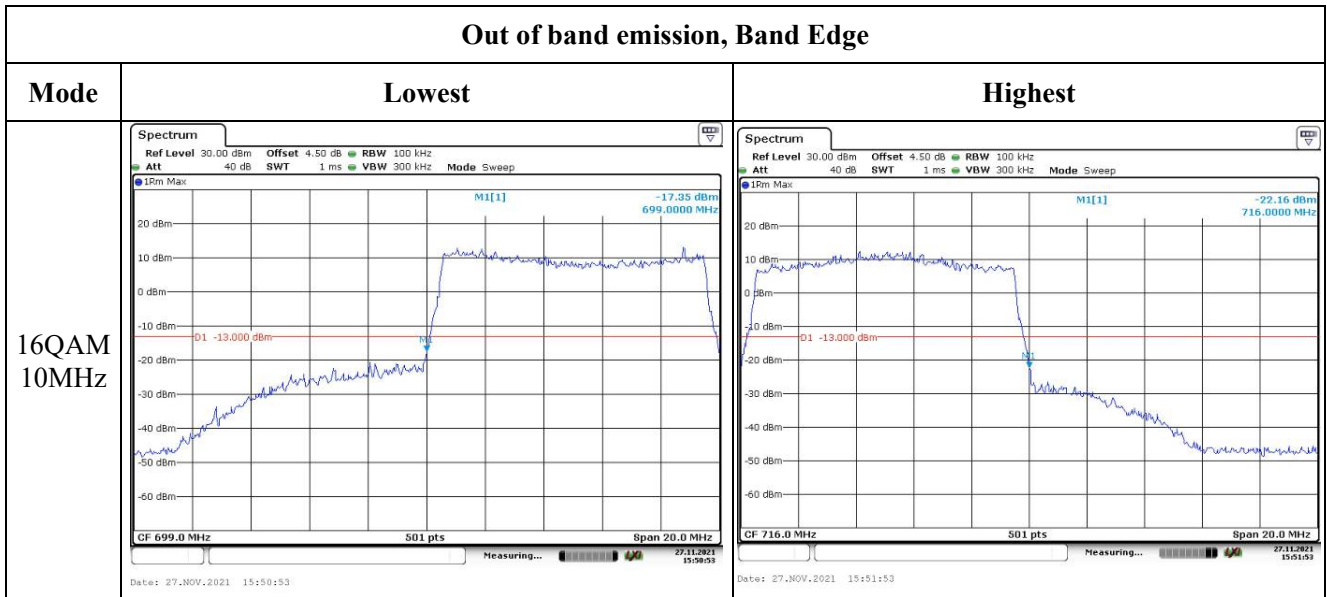
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -16.46 dBm 698.74850 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 699.0 MHz 501 pts Span 3.0 MHz</p> <p>Date: 27.NOV.2021 15:44:44</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -17.02 dBm 716.05990 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 716.0 MHz 501 pts Span 3.0 MHz</p> <p>Date: 27.NOV.2021 15:45:25</p>
16QAM 3MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -13.49 dBm 699.00000 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 699.0 MHz 501 pts Span 6.0 MHz</p> <p>Date: 27.NOV.2021 15:46:19</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 30 kHz Att 40 dB SWT 1.1 ms VBW 100 kHz Mode Sweep</p> <p>1Rm Max M1[1] -14.73 dBm 716.00000 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 716.0 MHz 501 pts Span 6.0 MHz</p> <p>Date: 27.NOV.2021 15:47:29</p>
16QAM 5MHz	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Rm Max M1[1] -13.35 dBm 698.98800 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 699.0 MHz 501 pts Span 10.0 MHz</p> <p>Date: 30.NOV.2021 20:00:13</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep</p> <p>1Rm Max M1[1] -18.20 dBm 717.0414 MHz</p> <p>D1 -13.000 dBm</p> <p>CF 716.0 MHz 501 pts Span 10.0 MHz</p> <p>Date: 30.NOV.2021 20:02:18</p>

Out of band emission, Band Edge



4.10 Antenna Port Test Data and Results for LTE Band 17

Serial Number:	CR21110024-RF	Test Date:	2021/1/5
Test Site:	RF	Test Mode:	Transmitting
Tester:	LE Qiao	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24	Relative Humidity: (%)	60	ATM Pressure: (kPa)	100.2
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	Spectrum Analyzer	101474	2021/7/22	2022/7/21
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2021/7/22	2022/7/21
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021/7/22	2022/7/22
UNI-T	Multimeter	UT39A+	C210582554	2021/9/30	2022/9/30
E-Microwave	Two-way Splitter	ODP-1-6	OE0120176	Each Time	N/A

* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

EUT Information@LTE Band 17▲:

Antenna Gain (dBi):	3	Antenna Gain (dBd):	0.85	Cable Loss (dB):	0.1
Operation Voltage(V _{DC}):					
Lowest:	3.5	Normal:	3.8	Highest:	4.35

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
5MHz	706.5	710	713.5
10MHz	709	710	711

Test Data:**FCC§2.1046;§ 27.50(c) (10)****RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
5MHz QPSK	RB1#0	23.14	22.84	22.96	23.89	34.77
	RB1#13	22.88	23.03	23.02		
	RB1#24	23.02	22.91	22.85		
	RB15#0	21.79	21.90	21.79		
	RB15#10	22.34	22.05	22.10		
	RB25#0	21.84	21.93	22.10		
5MHz 16QAM	RB1#0	21.10	22.31	20.83	23.06	34.77
	RB1#13	20.99	21.86	21.09		
	RB1#24	21.42	21.68	20.97		
	RB15#0	21.37	20.95	20.98		
	RB15#10	21.36	20.98	21.43		
	RB25#0	21.37	21.20	21.41		
10MHz QPSK	RB1#0	22.89	22.73	22.90	23.89	34.77
	RB1#25	22.81	23.02	23.14		
	RB1#49	23.02	23.00	23.10		
	RB25#0	21.88	22.34	22.17		
	RB25#25	21.93	21.83	22.21		
	RB50#0	22.26	21.91	21.91		
10MHz 16QAM	RB1#0	22.35	21.97	21.23	23.33	34.77
	RB1#25	22.58	22.11	21.45		
	RB1#49	22.38	22.49	21.54		
	RB25#0	21.26	21.36	21.41		
	RB25#25	21.01	21.18	21.46		
	RB50#0	21.23	21.19	21.06		

Note: ERP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBd)

Result:**Pass****Peak-to-average Ratio(PAR)**

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
10MHz QPSK	RB1#0	5.59	5.68	5.36	13
	RB50#0	5.97	6.00	6.00	13
10MHz 16QAM	RB1#0	6.41	6.70	6.20	13
	RB50#0	6.64	6.84	6.81	13
Result:					Pass

FCC §2.1049, §27.53:Occupied Bandwidth

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
5MHz QPSK	4.531	4.531	4.511	4.980	5.020	5.000
5MHz 16QAM	4.511	4.531	4.551	4.980	5.040	5.040
10MHz QPSK	8.981	8.981	9.022	9.800	9.840	9.880
10MHz 16QAM	8.942	9.022	9.022	9.800	9.880	9.880

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, §27.53:Out of band emission, Band Edge

Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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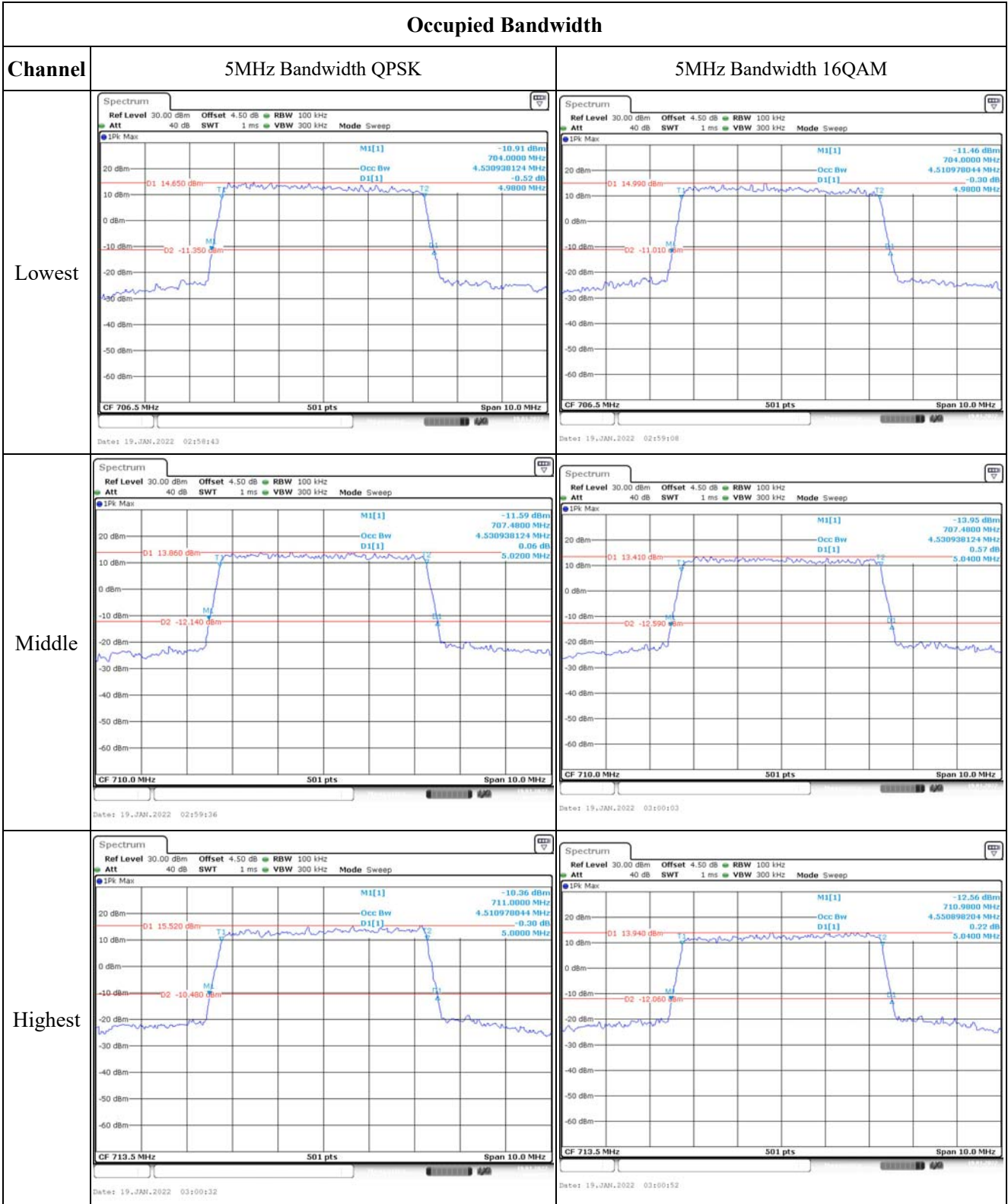
FCC §2.1055, §27.54: Frequency Stability

Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	704.489	704.00	715.511	716.00
	-20	3.8	704.482	704.00	715.512	716.00
	-10	3.8	704.489	704.00	715.511	716.00
	0	3.8	704.483	704.00	715.513	716.00
	10	3.8	704.487	704.00	715.514	716.00
	20	3.8	704.489	704.00	715.511	716.00
	30	3.8	704.482	704.00	715.515	716.00
	40	3.8	704.489	704.00	715.511	716.00
Frequency Stability vs. Voltage	20	3.5	704.489	704.00	715.511	716.00
	20	4.35	704.483	704.00	715.517	716.00
Result:					Pass	

Test Mode:	10M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	704.489	704.00	715.511	716.00
	-20	3.8	704.485	704.00	715.515	716.00
	-10	3.8	704.489	704.00	715.511	716.00
	0	3.8	704.483	704.00	715.513	716.00
	10	3.8	704.487	704.00	715.512	716.00
	20	3.8	704.489	704.00	715.511	716.00
	30	3.8	704.485	704.00	715.513	716.00
	40	3.8	704.489	704.00	715.511	716.00
Frequency Stability vs. Voltage	20	3.5	704.489	704.00	715.511	716.00
	20	4.35	704.481	704.00	715.516	716.00
Result:					Pass	

Test Plots:

Occupied Bandwidth



Occupied Bandwidth

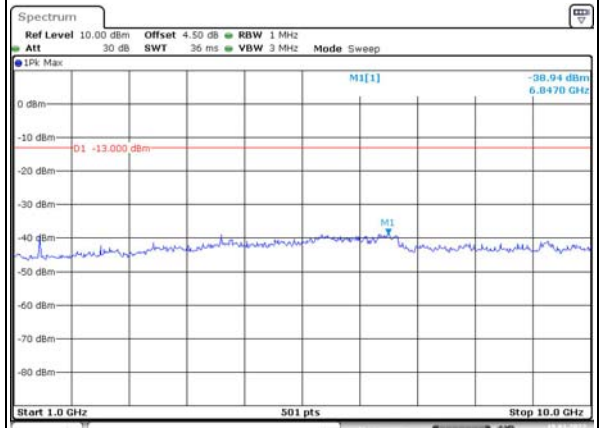
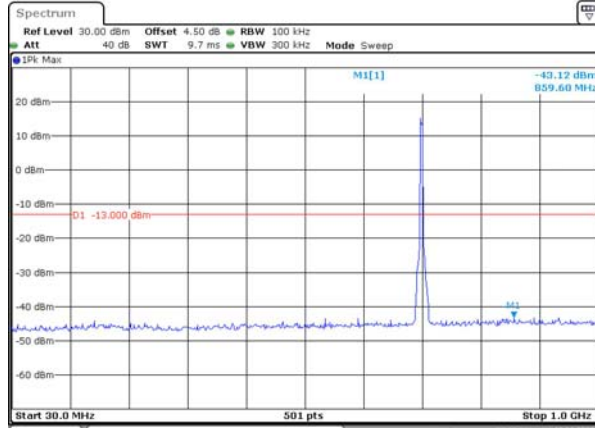
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -13.95 dBm Occ Bw 9.8800 MHz D1[1] 1.51 dB CF 709.0 MHz 501 pts Span 20.0 MHz Date: 19.JAN.2022 03:01:24</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -13.18 dBm Occ Bw 9.942115768 MHz D1[1] -0.15 dB CF 709.0 MHz 501 pts Span 20.0 MHz Date: 19.JAN.2022 03:01:59</p>
Middle	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -14.06 dBm Occ Bw 9.982035928 MHz D1[1] -0.08 dB CF 710.0 MHz 501 pts Span 20.0 MHz Date: 19.JAN.2022 03:02:25</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -13.57 dBm Occ Bw 9.021956088 MHz D1[1] -1.20 dB CF 710.0 MHz 501 pts Span 20.0 MHz Date: 19.JAN.2022 03:02:53</p>
Highest	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -13.81 dBm Occ Bw 9.021956088 MHz D1[1] 0.17 dB CF 711.0 MHz 501 pts Span 20.0 MHz Date: 19.JAN.2022 03:03:22</p>	<p>Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep 1Pk Max M1[1] -14.42 dBm Occ Bw 9.021956088 MHz D1[1] 0.00 dB CF 711.0 MHz 501 pts Span 20.0 MHz Date: 19.JAN.2022 03:03:47</p>

Spurious Emissions at Antenna Terminal

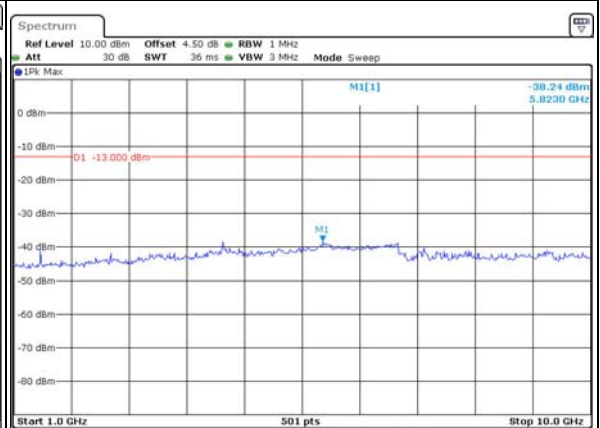
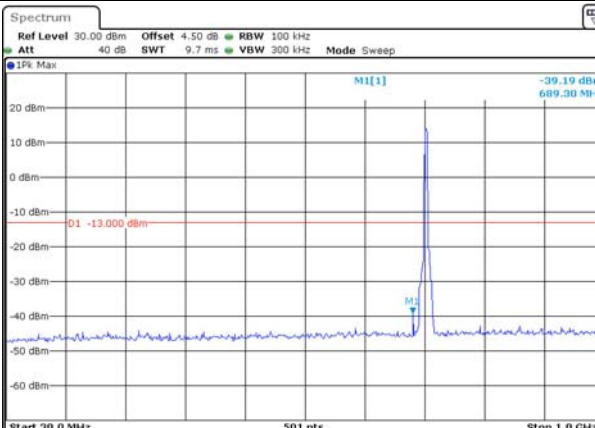
Channel

5MHz Bandwidth QPSK

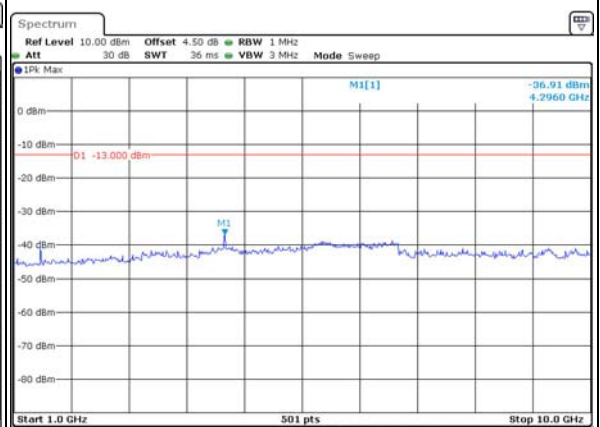
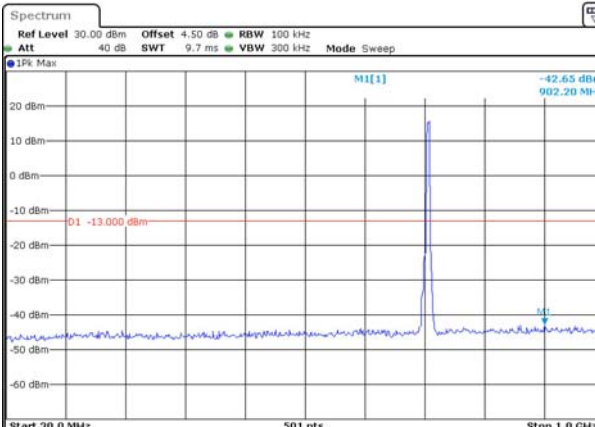
Lowest



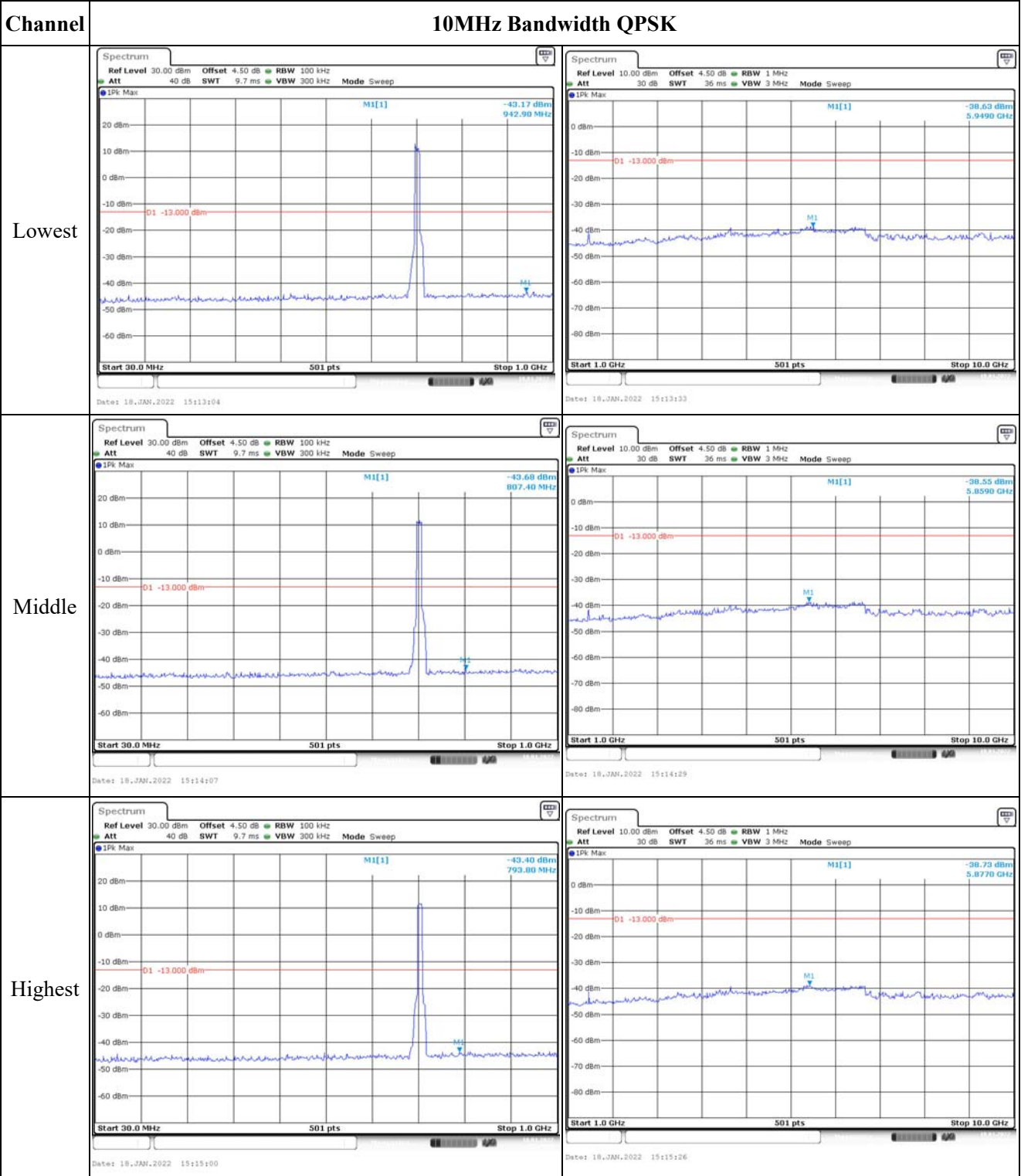
Middle



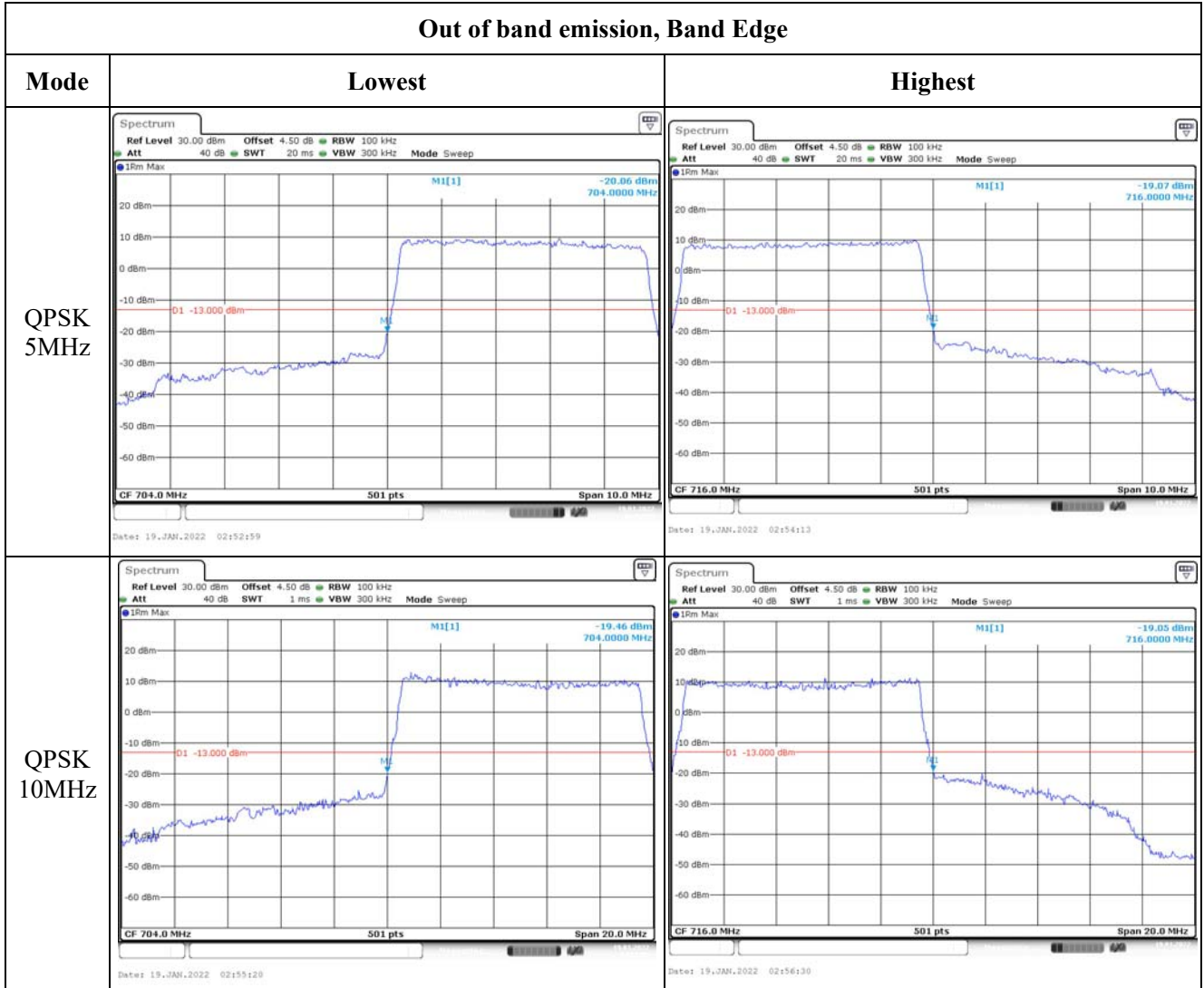
Highest



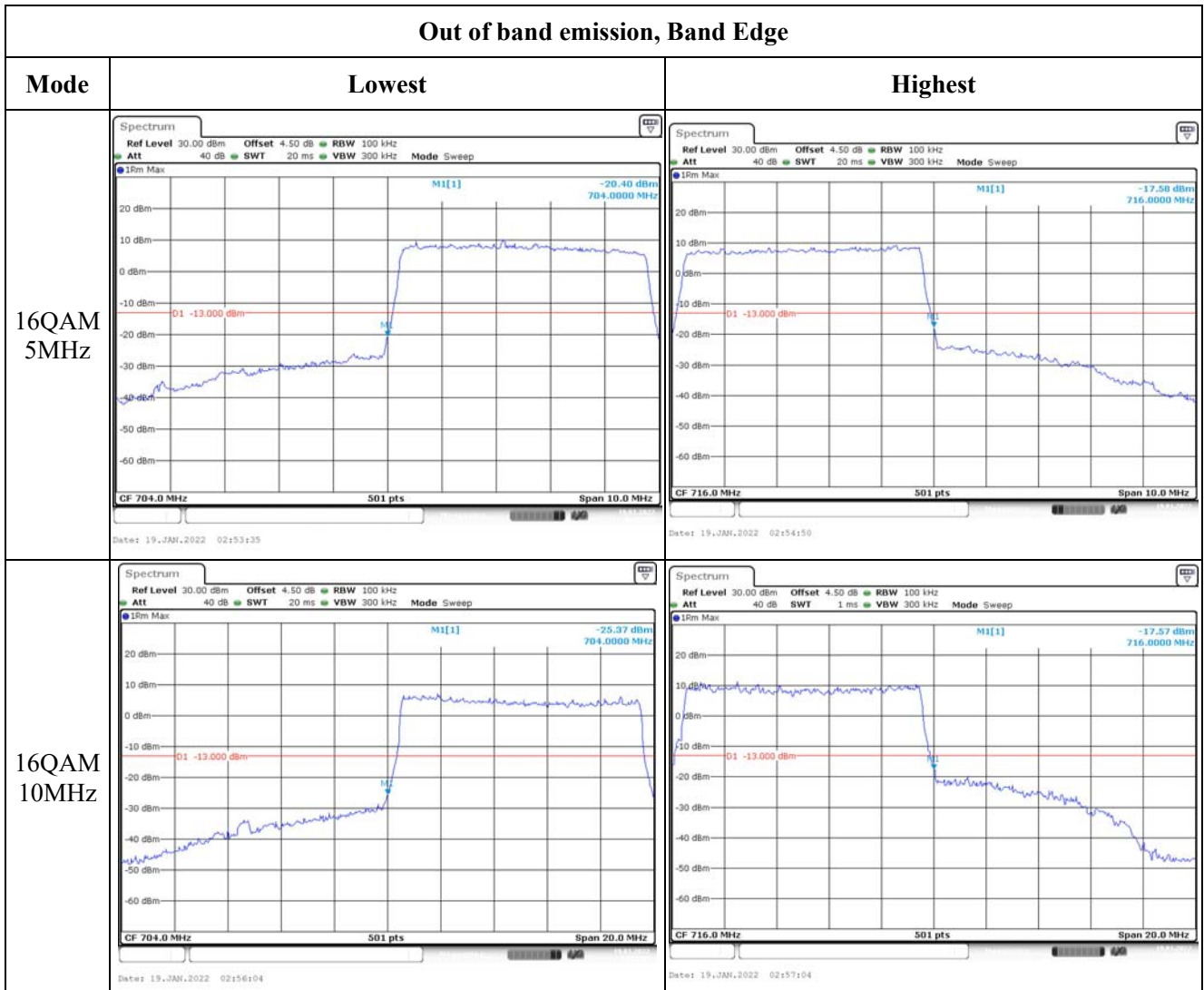
Spurious Emissions at Antenna Terminal



Out of band emission, Band Edge



Out of band emission, Band Edge



4.10 Antenna Port Test Data and Results for LTE Band 41:

Serial Number:	CR21110024-RF-S4	Test Date:	2021-11-27~2022-01-06
Test Site:	RF	Test Mode:	Transmitting
Tester:	LE Qiao	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	22.1~22.9	Relative Humidity: (%)	40~66	ATM Pressure: (kPa)	101.4~101.7
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	Spectrum Analyzer	101474	2021/7/22	2022/7/21
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Coaxial Attenuators	53-20-34	LN751	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2021/7/22	2022/7/21
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021/7/22	2022/7/22
UNI-T	Multimeter	UT39A+	C210582554	2021/9/30	2022/9/30
E-Microwave	Two-way Splitter	ODP-1-6	OE0120176	Each Time	N/A

* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

EUT Information@LTE Band 41▲:

Antenna Gain (dBi):	1	Cable Loss (dB):	0.3
Operation Voltage(V _{DC}):			
Lowest:	3.5	Normal:	3.8
		Highest:	4.35

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
5MHz	2557.5	2605	2652.5
10MHz	2560	2605	2650
15MHz	2562.5	2605	2647.5
20MHz	2565	2605	2645

Test Data:

FCC§2.1046;§ 27.50(h)(2)						
RF Output Power:						
Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
5MHz QPSK	RB1#0	22.55	22.54	22.27	23.25	33
	RB1#13	22.41	22.50	22.49		
	RB1#24	22.54	22.52	21.83		
	RB15#0	21.56	21.43	21.28		
	RB15#10	21.64	21.35	21.19		
	RB25#0	21.57	21.38	21.19		
5MHz 16QAM	RB1#0	21.31	21.41	21.70	22.58	33
	RB1#13	21.62	21.88	21.63		
	RB1#24	21.54	21.60	21.59		
	RB15#0	20.88	20.68	20.61		
	RB25#0	20.68	20.69	20.63		
10MHz QPSK	RB1#0	22.71	22.31	22.22	23.41	33
	RB1#25	22.61	22.33	22.30		
	RB1#49	22.66	22.34	22.24		
	RB25#0	21.61	21.25	21.19		
	RB25#25	21.54	21.24	21.16		
	RB50#0	21.52	21.26	21.16		
10MHz 16QAM	RB1#0	21.84	21.74	22.12	22.82	33
	RB1#25	21.72	21.77	22.02		
	RB1#49	21.82	21.70	21.77		
	RB25#0	20.70	20.60	20.47		
	RB25#25	20.74	20.58	20.46		
	RB50#0	20.76	20.47	20.29		
15MHz QPSK	RB1#0	22.74	22.32	22.01	23.44	33
	RB1#38	22.60	22.41	22.09		
	RB1#74	22.66	22.37	21.90		
	RB36#0	21.66	21.41	21.22		
	RB36#39	21.46	21.22	21.14		
	RB75#0	21.47	21.28	21.12		
15MHz 16QAM	RB1#0	21.82	21.86	21.44	22.66	33
	RB1#38	21.96	21.65	21.45		
	RB1#74	21.70	21.84	21.35		
	RB36#0	20.74	20.60	20.32		
	RB36#39	20.84	20.49	20.25		
	RB75#0	20.77	20.61	20.31		

20MHz QPSK	RB1#0	22.48	22.42	22.53	23.35	33
	RB1#50	22.61	22.46	22.50		
	RB1#99	22.65	22.60	22.54		
	RB50#0	21.45	21.56	21.43		
	RB50#50	21.56	21.53	21.41		
	RB100#0	21.43	21.57	21.39		
20MHz 16QAM	RB1#0	21.83	21.33	22.24	22.94	33
	RB1#50	21.81	21.38	22.17		
	RB1#99	22.04	21.40	22.21		
	RB50#0	20.86	20.77	20.66		
	RB50#50	20.97	20.77	20.57		
	RB100#0	20.80	20.76	20.61		

Note: EIRP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBi)

Result:**Pass****Peak-to-average Ratio(PAR)**

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	6.90	5.74	6.43	13
	RB100#0	7.68	6.52	5.91	13
20MHz 16QAM	RB1#0	5.25	6.29	6.43	13
	RB100#0	5.30	5.54	7.48	13
Result:					Pass

FCC §2.1049, §27.53:Occupied Bandwidth

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
5MHz QPSK	4.511	4.511	4.511	4.940	5.160	5.120
5MHz 16QAM	4.511	4.511	4.511	4.980	4.960	5.120
10MHz QPSK	8.981	8.942	8.942	9.840	9.880	9.920
10MHz 16QAM	8.981	8.942	8.981	9.800	9.800	10.040
15MHz QPSK	13.593	13.473	13.473	16.260	15.180	15.420
15MHz 16QAM	13.533	13.593	13.593	15.540	16.860	16.200
20MHz QPSK	17.964	17.964	17.964	19.600	19.600	19.680
20MHz 16QAM	17.964	17.964	17.964	19.680	19.680	20.000

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, § 27.53:Spurious Emissions at Antenna Terminal**Result: Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.****FCC §2.1051, § 27.53:Out of band emission, Band Edge****Result: Pass, Please refer to the test plots of Out of band emission, Band Edge.****FCC §2.1055, §27.54: Frequency Stability**

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	2555.522	2555.00	2654.477	2655
	-20	3.8	2555.521	2555.00	2654.474	2655
	-10	3.8	2555.524	2555.00	2654.475	2655
	0	3.8	2555.528	2555.00	2654.471	2655
	10	3.8	2555.523	2555.00	2654.473	2655
	20	3.8	2555.529	2555.00	2654.471	2655
	30	3.8	2555.527	2555.00	2654.477	2655
	40	3.8	2555.522	2555.00	2654.471	2655
Frequency Stability vs. Voltage	20	3.5	2555.523	2555.00	2654.476	2655
	20	4.35	2555.529	2555.00	2654.471	2655
					Result:	Pass

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.8	2555.527	2555.00	2654.472	2655
	-20	3.8	2555.529	2555.00	2654.471	2655
	-10	3.8	2555.528	2555.00	2654.475	2655
	0	3.8	2555.529	2555.00	2654.471	2655
	10	3.8	2555.523	2555.00	2654.477	2655
	20	3.8	2555.529	2555.00	2654.471	2655
	30	3.8	2555.527	2555.00	2654.471	2655
	40	3.8	2555.529	2555.00	2654.473	2655
Frequency Stability vs. Voltage	20	3.5	2555.529	2555.00	2654.477	2655
	20	4.35	2555.527	2555.00	2654.471	2655
					Result:	Pass