

Occupied Bandwidth

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

Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 10.NOV.2023 17:18:23</p>	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 10.NOV.2023 17:18:43</p>
Middle	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 10.NOV.2023 17:19:02</p>	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 10.NOV.2023 17:19:20</p>
Highest	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 10.NOV.2023 17:19:35</p>	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 10.NOV.2023 17:19:59</p>

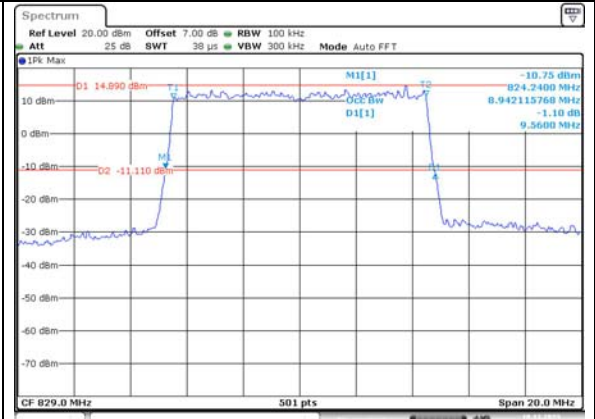
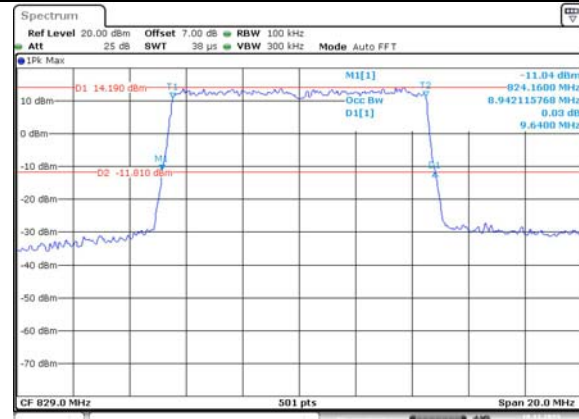
**Occupied Bandwidth**

**Channel**

10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

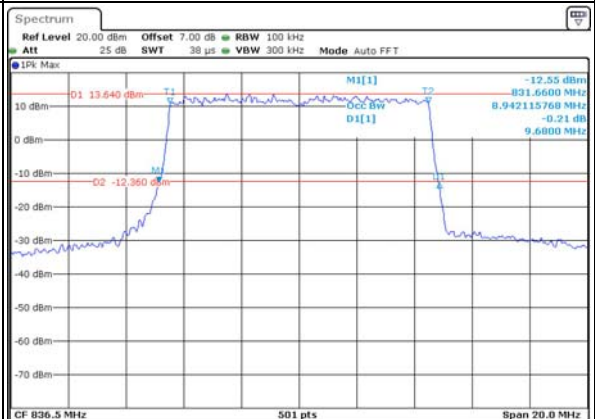
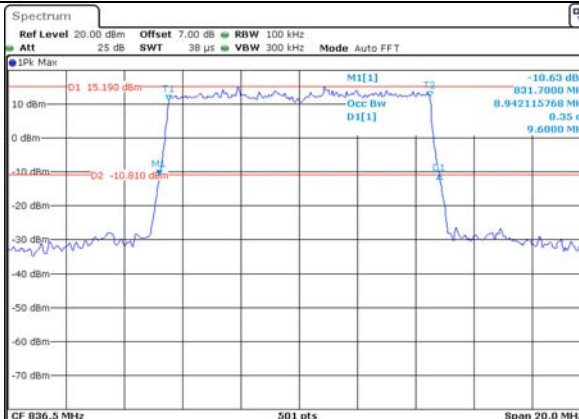
Lowest



ProjectNo.:CR231061510-RF Testers:Claire Liu  
Date: 10.NOV.2023 17:21:33

ProjectNo.:CR231061510-RF Testers:Claire Liu  
Date: 10.NOV.2023 17:21:54

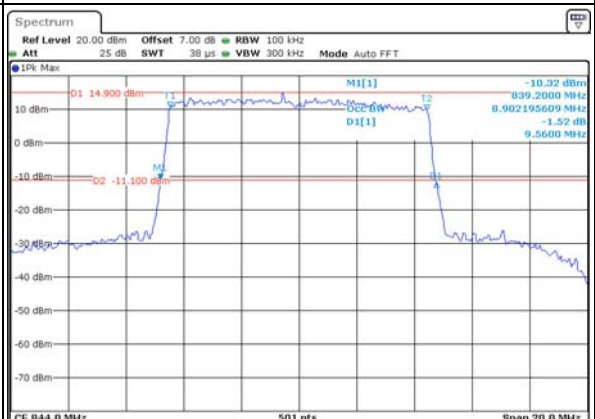
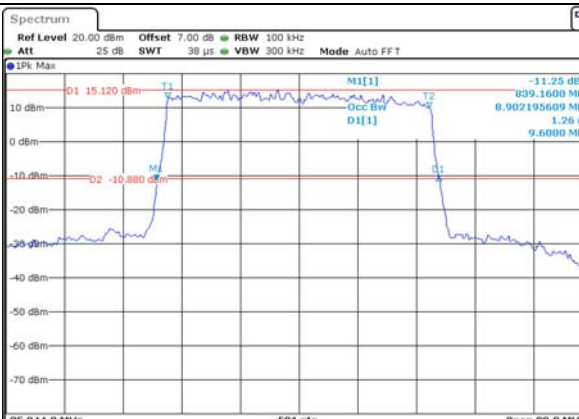
Middle



ProjectNo.:CR231061510-RF Testers:Claire Liu  
Date: 10.NOV.2023 17:22:16

ProjectNo.:CR231061510-RF Testers:Claire Liu  
Date: 10.NOV.2023 17:22:43

Highest



ProjectNo.:CR231061510-RF Testers:Claire Liu  
Date: 10.NOV.2023 17:23:05

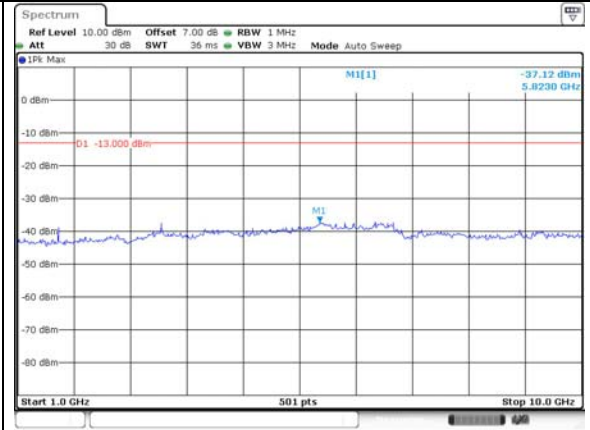
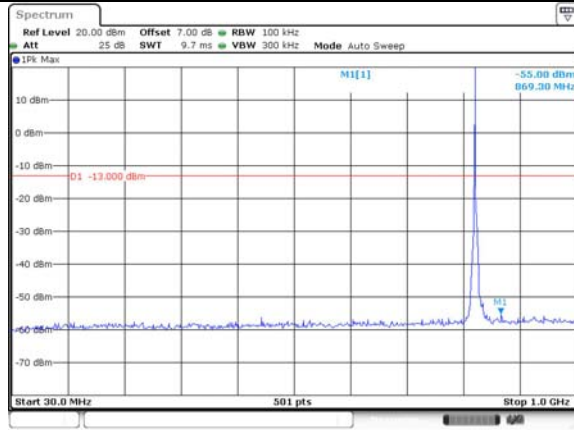
ProjectNo.:CR231061510-RF Testers:Claire Liu  
Date: 10.NOV.2023 17:23:22

Spurious Emissions at Antenna Terminal

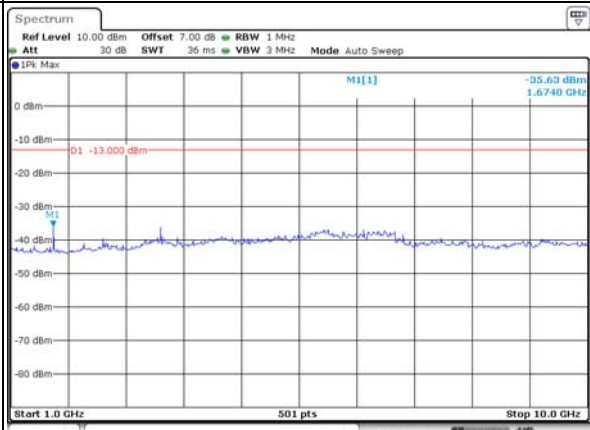
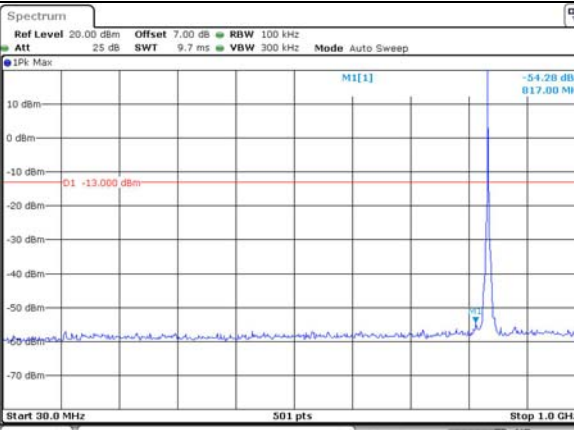
Channel

1.4MHz Bandwidth QPSK

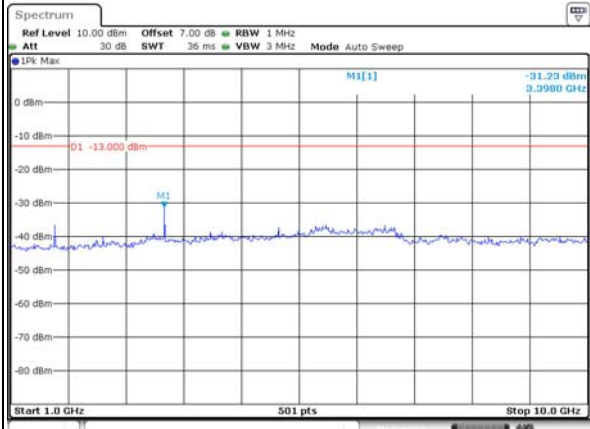
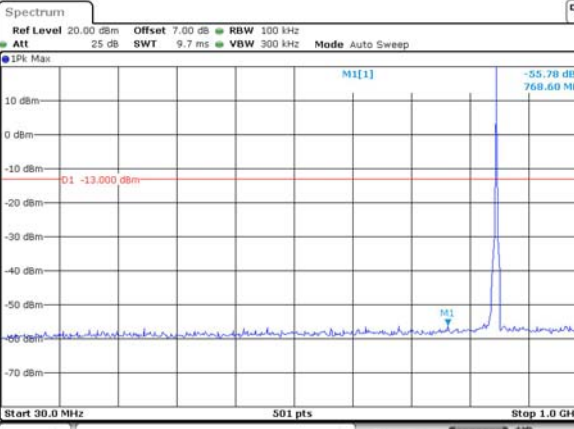
Lowest



Middle



Highest



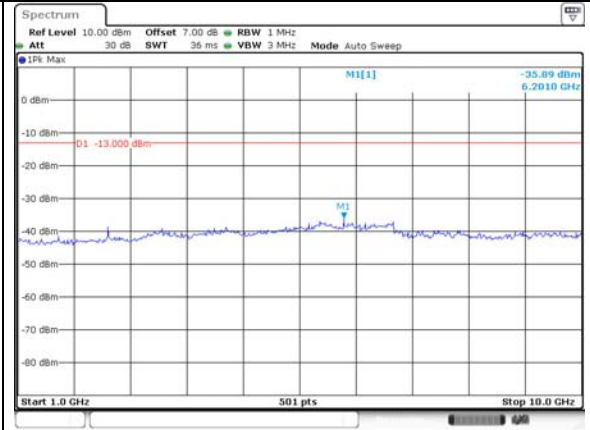
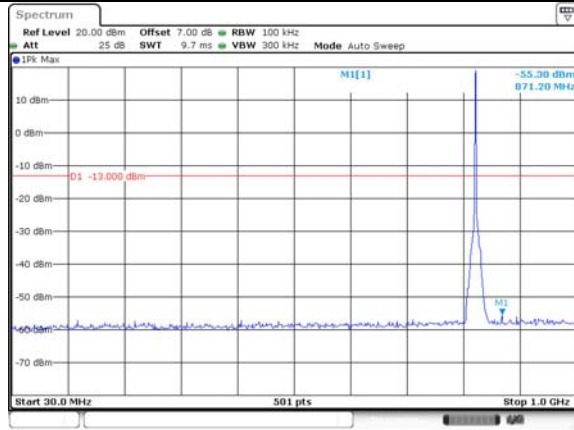


Spurious Emissions at Antenna Terminal

Channel

3MHz Bandwidth QPSK

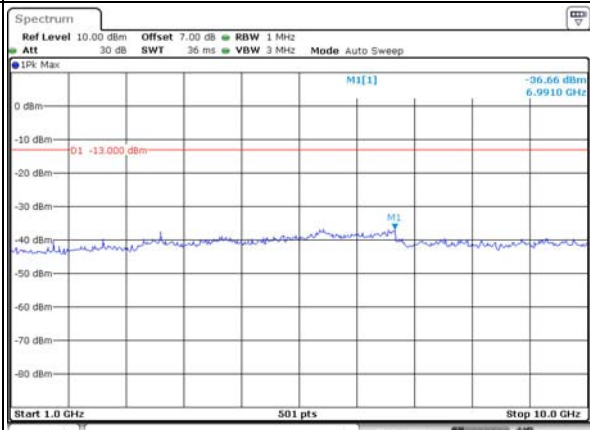
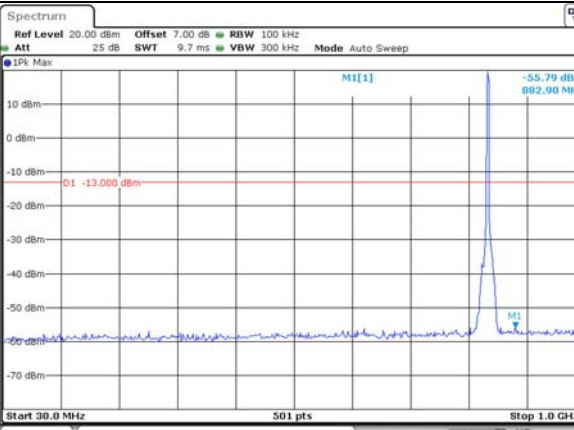
Lowest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:15:09

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:15:31

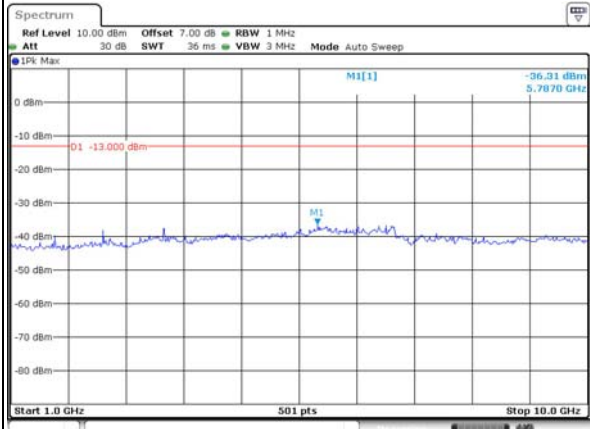
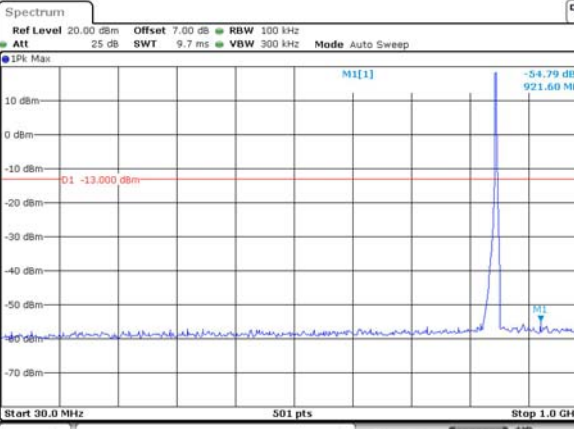
Middle



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:16:07

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:16:29

Highest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:16:55

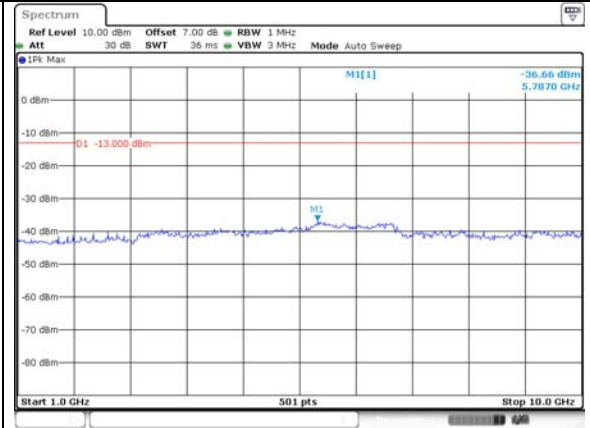
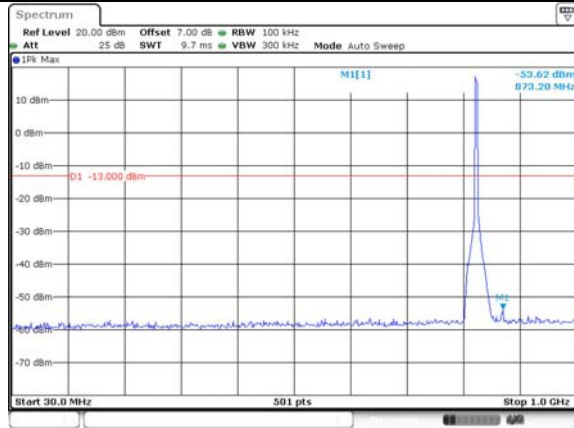
ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:17:23

Spurious Emissions at Antenna Terminal

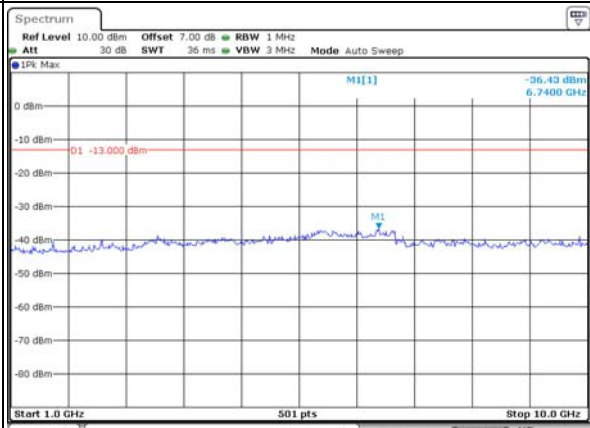
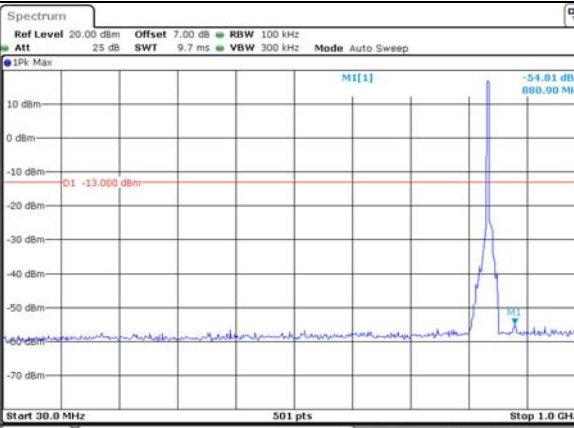
Channel

5MHz Bandwidth QPSK

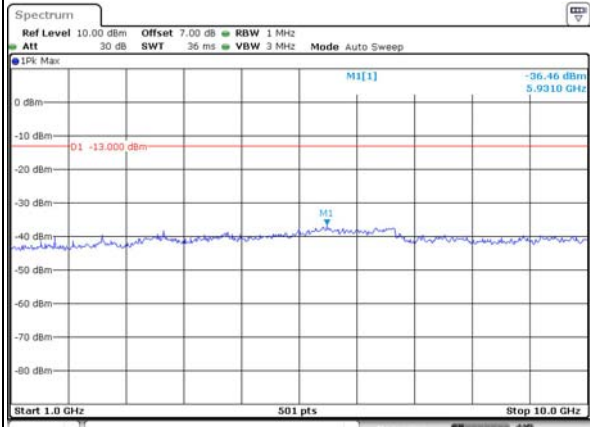
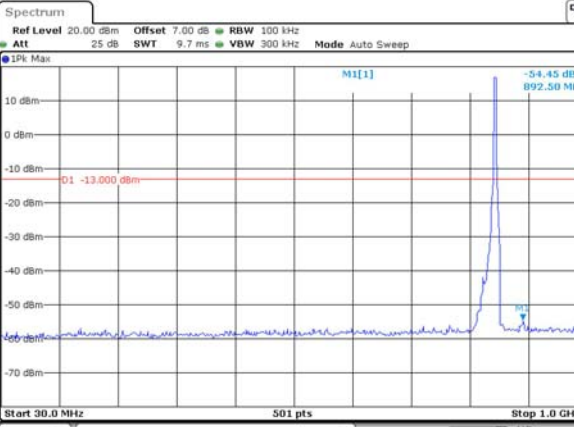
Lowest



Middle



Highest

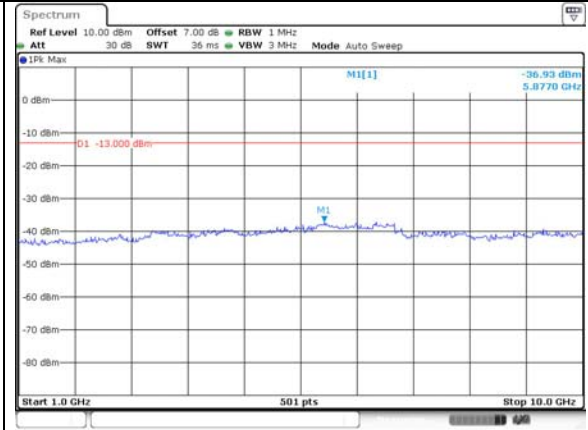
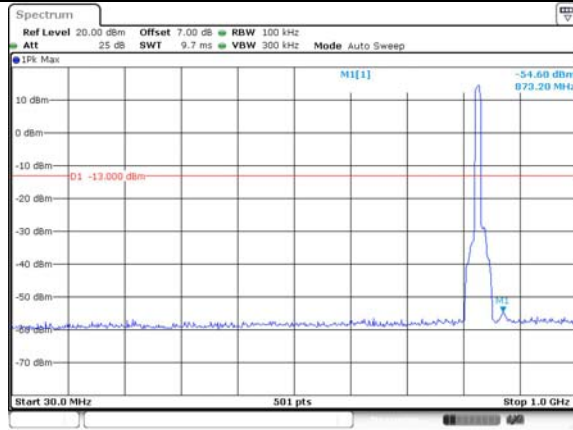


Spurious Emissions at Antenna Terminal

Channel

10MHz Bandwidth QPSK

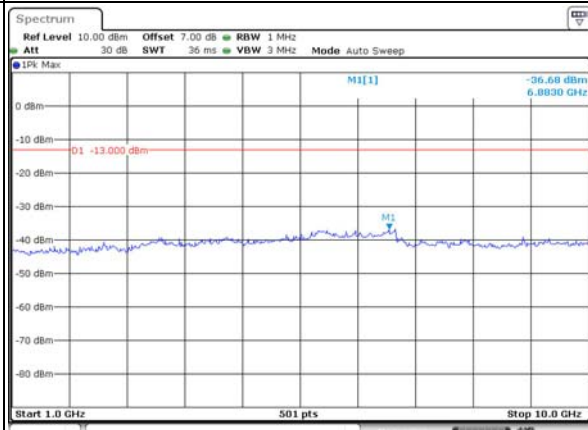
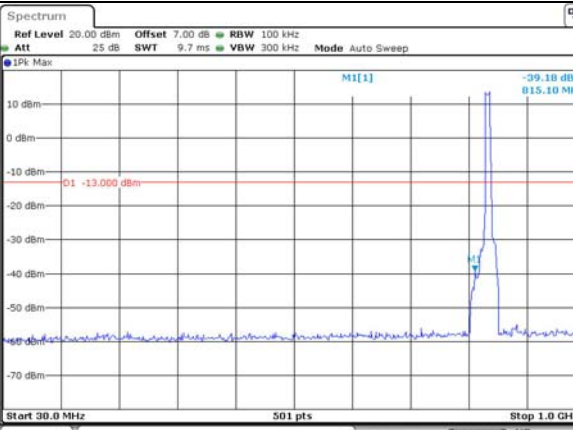
Lowest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:23:45

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:24:11

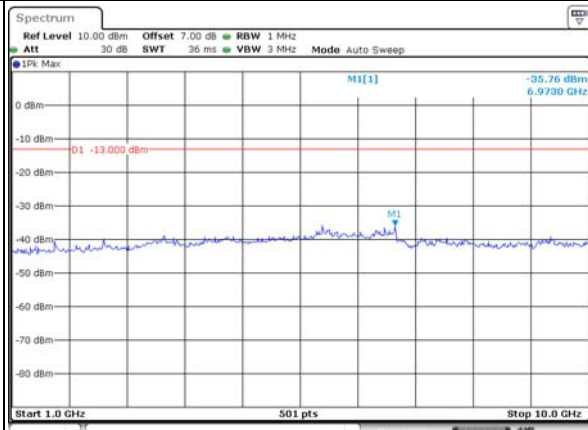
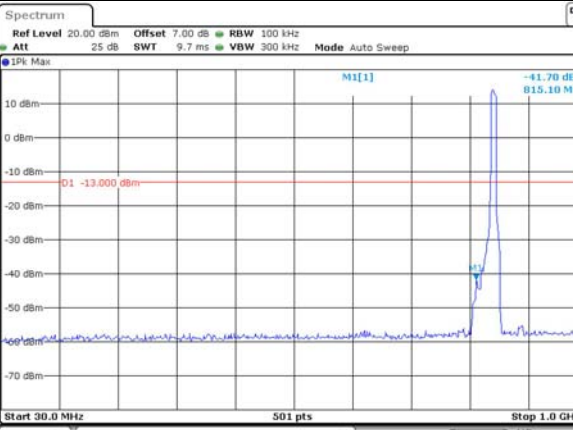
Middle



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:24:35

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:24:57

Highest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:25:24

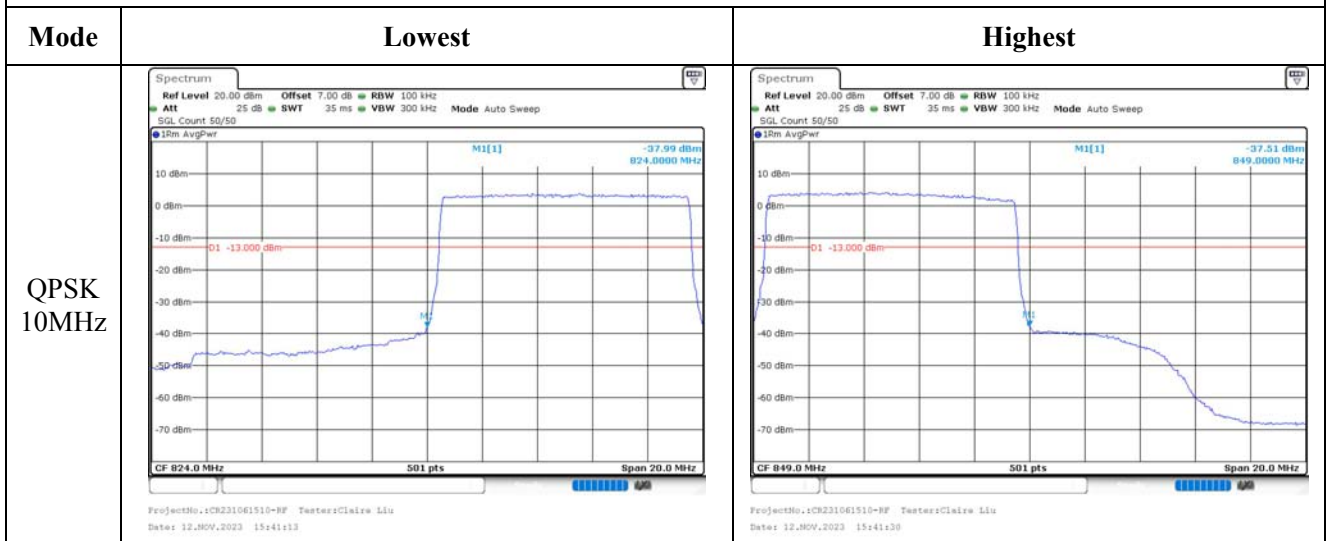
ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:25:43

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	<p>ProjectNo.:CR231061510-RF Tester:Clairé Liu Date: 12.NOV.2023 15:34:24</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairé Liu Date: 12.NOV.2023 15:34:38</p>
QPSK 3MHz	<p>ProjectNo.:CR231061510-RF Tester:Clairé Liu Date: 12.NOV.2023 15:35:28</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairé Liu Date: 12.NOV.2023 15:35:43</p>
QPSK 5MHz	<p>ProjectNo.:CR231061510-RF Tester:Clairé Liu Date: 12.NOV.2023 15:39:03</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairé Liu Date: 12.NOV.2023 15:39:18</p>



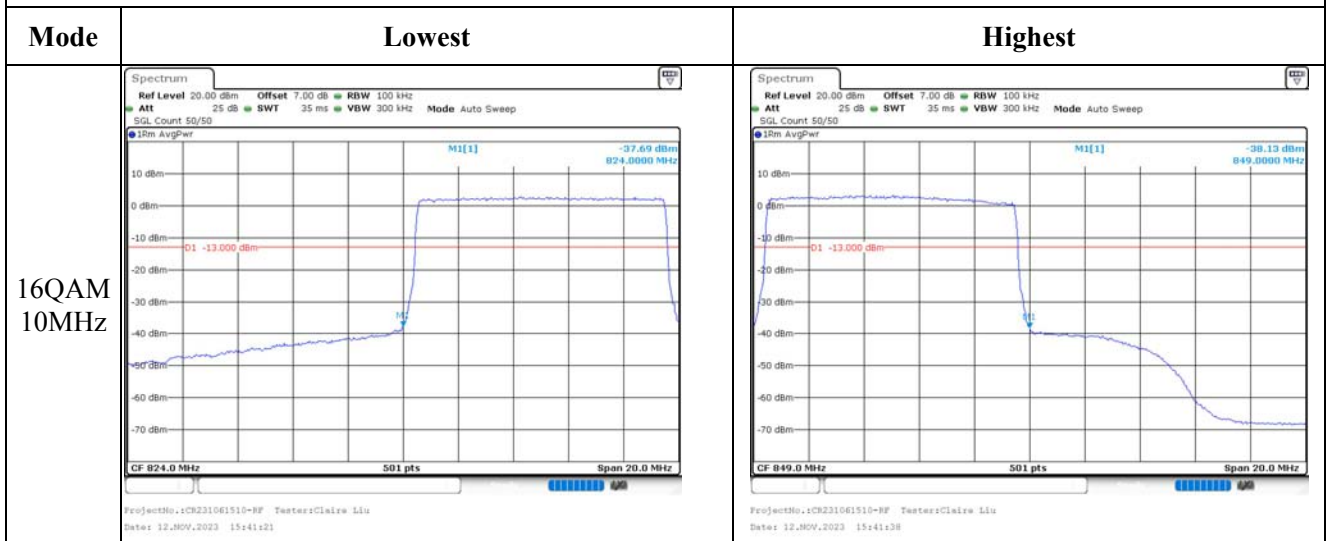
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz		
16QAM 3MHz		
16QAM 5MHz		

Out of band emission, Band Edge



**4.9 Antenna Port Test Data and Results for LTE Band 7**

Serial Number:	2CIM-1	Test Date:	2023/11/12~2023/12/9
Test Site:	RF	Test Mode:	Transmitting
Tester:	Claire Liu	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	24.7~25.5	Relative Humidity: (%)	53~62	ATM Pressure: (kPa)	100.1~102
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**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101590	2022/11/25	2023/11/24
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/28	2024/9/27
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	2023/9/28	2024/9/27
R&S	Spectrum Analyzer	FSV40	101590	2023/11/16	2024/11/15

\* 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).

**Test Frequency For Each Mode:**

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
5MHz	2502.5	2535	2567.5
10MHz	2505	2535	2565
15MHz	2507.5	2535	2562.5
20MHz	2510	2535	2560

**Test Data:**

<b>RF Output Power</b>						
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	15.43	15.25	15.08	14.65	33
	RB1#13	15.53	15.35	15.2		
	RB1#24	15.38	15.26	15.1		
	RB15#0	14.33	14.19	14.1		
	RB15#10	14.45	14.31	14.08		
	RB25#0	14.42	14.24	14.06		
5MHz 16QAM	RB1#0	14.3	14.51	14.17	13.76	33
	RB1#13	14.4	14.64	14.3		
	RB1#24	14.3	14.54	14.16		
	RB15#0	13.45	13.18	13.14		
	RB15#10	13.58	13.29	13.13		
	RB25#0	13.55	13.26	13.12		
10MHz QPSK	RB1#0	15.45	15.3	15.14	14.64	33
	RB1#25	15.52	15.36	15.2		
	RB1#49	15.49	15.32	15.18		
	RB25#0	14.34	14.2	14.18		
	RB25#25	14.46	14.36	14.16		
	RB50#0	14.45	14.29	14.2		
10MHz 16QAM	RB1#0	14.63	14.35	14.8	13.95	33
	RB1#25	14.64	14.38	14.83		
	RB1#49	14.63	14.31	14.83		
	RB25#0	13.43	13.3	13.27		
	RB25#25	13.57	13.49	13.26		
	RB50#0	13.49	13.35	13.24		
15MHz QPSK	RB1#0	15.39	15.23	15.13	14.63	33
	RB1#38	15.51	15.36	15.26		
	RB1#74	15.38	15.25	15.24		
	RB36#0	14.34	14.19	14.17		
	RB36#39	14.42	14.33	14.16		
	RB75#0	14.39	14.26	14.19		
15MHz 16QAM	RB1#0	14.87	14.91	14.3	14.12	33
	RB1#38	14.98	15	14.39		
	RB1#74	14.85	14.92	14.34		
	RB36#0	13.34	13.2	13.21		
	RB36#39	13.43	13.36	13.19		
	RB75#0	13.38	13.29	13.19		
20MHz QPSK	RB1#0	15.27	15.21	15.07	14.58	33
	RB1#50	15.46	15.4	15.27		
	RB1#99	15.3	15.22	15.2		
	RB50#0	14.29	14.14	14.23		



	RB50#50	14.38	14.37	14.1		
	RB100#0	14.35	14.26	14.18		
20MHz 16QAM	RB1#0	14.91	14.54	14.31	14.24	33
	RB1#50	15.12	14.73	14.5		
	RB1#99	14.92	14.51	14.37		
	RB50#0	13.3	13.13	13.23		
	RB50#50	13.42	13.36	13.14		
	RB100#0	13.38	13.33	13.2		
Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gr(dBi)						
					<b>Result:</b>	<b>Pass</b>

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	6.2	6.38	5.91	13	
	RB100#0	4.29	4.38	4.41	13	
20MHz 16QAM	RB1#0	6.87	7.51	6.32	13	
	RB100#0	6.12	6	6	13	
					<b>Result:</b>	<b>Pass</b>

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	4.491	4.940	4.531	4.940	4.511	4.940
5MHz 16QAM	4.531	4.960	4.491	4.920	4.531	4.960
10MHz QPSK	8.942	9.600	8.982	9.680	8.942	9.600
10MHz 16QAM	8.942	9.640	8.942	9.560	8.942	9.680
15MHz QPSK	13.473	14.640	13.473	14.580	13.413	14.580
15MHz 16QAM	13.473	14.580	13.473	14.580	13.533	14.520
20MHz QPSK	17.804	19.120	17.884	19.360	17.884	19.200
20MHz 16QAM	17.884	19.280	17.884	19.200	17.964	19.360
Note: The test plots please refer to the Plots of Occupied Bandwidth						

Spurious Emissions at Antenna Terminal	
<b>Result:</b>	<b>Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.</b>

Out of band emission, Band Edge	
<b>Result:</b>	<b>Pass, Please refer to the test plots of Out of band emission, Band Edge.</b>

<b>Frequency Stability</b>						
Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	2500.573	2500.00	2569.512	2570
	-20	3.91	2500.518	2500.00	2569.555	2570
	-10	3.91	2500.525	2500.00	2569.583	2570
	0	3.91	2500.574	2500.00	2569.555	2570
	10	3.91	2500.498	2500.00	2569.584	2570
	20	3.91	2500.480	2500.00	2569.600	2570
	30	3.91	2500.484	2500.00	2569.591	2570
	40	3.91	2500.554	2500.00	2569.529	2570
	50	3.91	2500.516	2500.00	2569.516	2570
Frequency Stability vs. Voltage	20	3.45	2500.497	2500.00	2569.544	2570
	20	4.5	2500.522	2500.00	2569.560	2570
					<b>Result:</b>	<b>Pass</b>

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	2500.343	2500.00	2569.626	2570
	-20	3.91	2500.328	2500.00	2569.671	2570
	-10	3.91	2500.333	2500.00	2569.629	2570
	0	3.91	2500.360	2500.00	2569.668	2570
	10	3.91	2500.370	2500.00	2569.672	2570
	20	3.91	2500.320	2500.00	2569.680	2570
	30	3.91	2500.379	2500.00	2569.603	2570
	40	3.91	2500.322	2500.00	2569.617	2570
	50	3.91	2500.380	2500.00	2569.616	2570
Frequency Stability vs. Voltage	20	3.45	2500.346	2500.00	2569.626	2570
	20	4.5	2500.395	2500.00	2569.649	2570
					<b>Result:</b>	<b>Pass</b>

**Test Plots**(Note: The 7.0dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

<b>Occupied Bandwidth</b>		
<b>Channel</b>	<b>5MHz Bandwidth QPSK</b>	<b>5MHz Bandwidth 16QAM</b>
<b>Lowest</b>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:39:31</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:39:52</p>
<b>Middle</b>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:31:23</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:31:47</p>
<b>Highest</b>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:32:18</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:32:39</p>

Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR231061510-RF Testers:Claira Liu Date: 12.NOV.2023 14:33:42</p>	<p>ProjectNo.:CR231061510-RF Testers:Claira Liu Date: 12.NOV.2023 14:34:06</p>
Middle	<p>ProjectNo.:CR231061510-RF Testers:Claira Liu Date: 12.NOV.2023 14:34:31</p>	<p>ProjectNo.:CR231061510-RF Testers:Claira Liu Date: 12.NOV.2023 14:34:55</p>
Highest	<p>ProjectNo.:CR231061510-RF Testers:Claira Liu Date: 12.NOV.2023 14:35:20</p>	<p>ProjectNo.:CR231061510-RF Testers:Claira Liu Date: 12.NOV.2023 14:35:47</p>

Occupied Bandwidth

Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:37:06</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:37:37</p>
Middle	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:38:10</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:38:44</p>
Highest	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:39:16</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:39:47</p>



Occupied Bandwidth

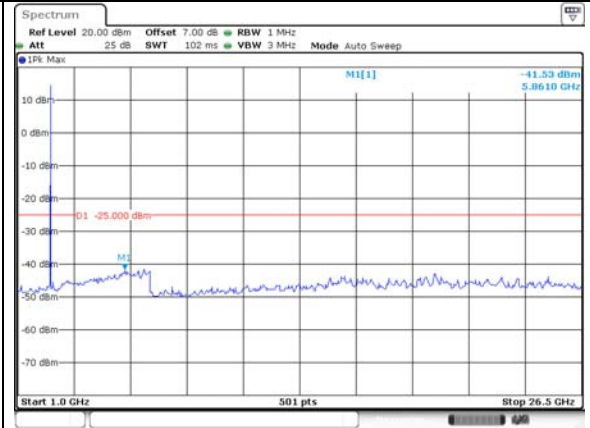
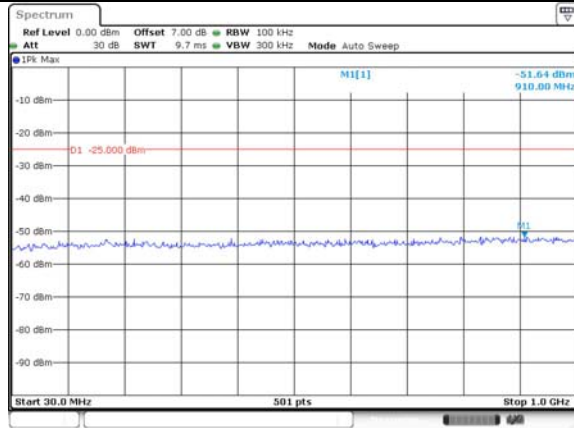
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:41:10</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:41:59</p>
Middle	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:42:29</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:43:03</p>
Highest	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:43:35</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 14:44:13</p>

Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK

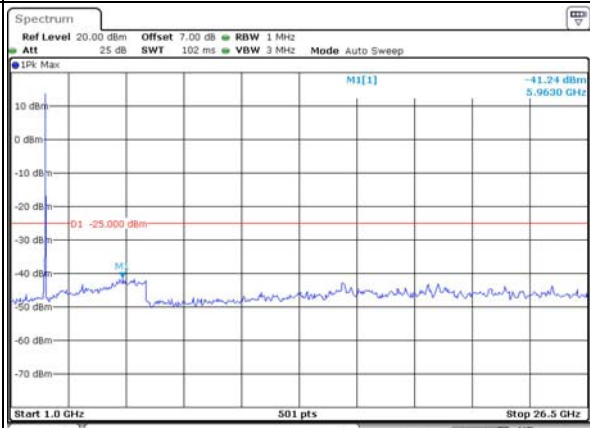
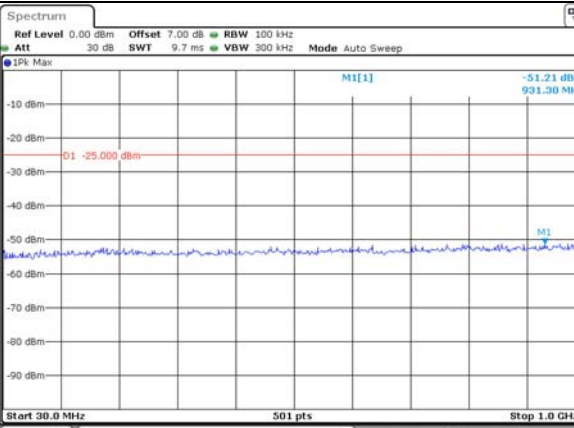
Lowest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:27:54

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:28:19

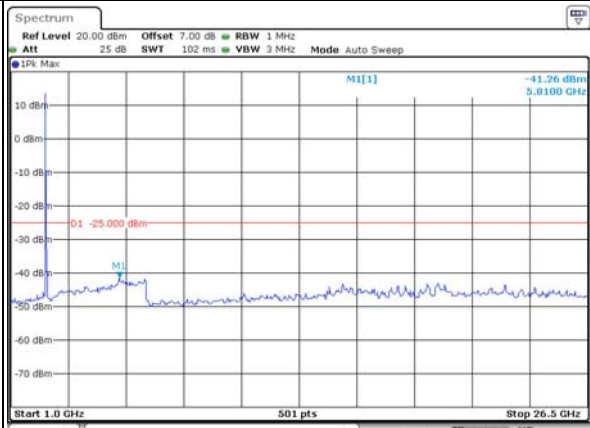
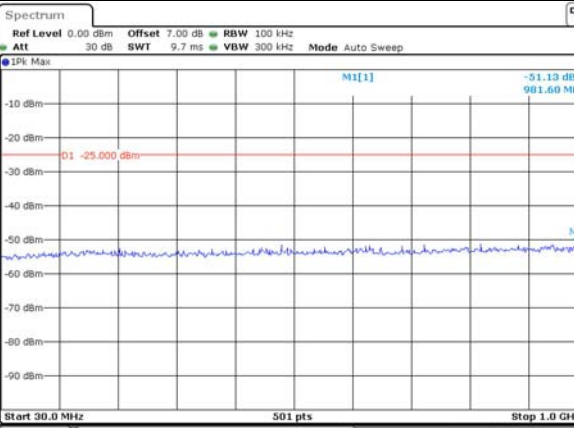
Middle



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:28:51

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:29:20

Highest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:29:43

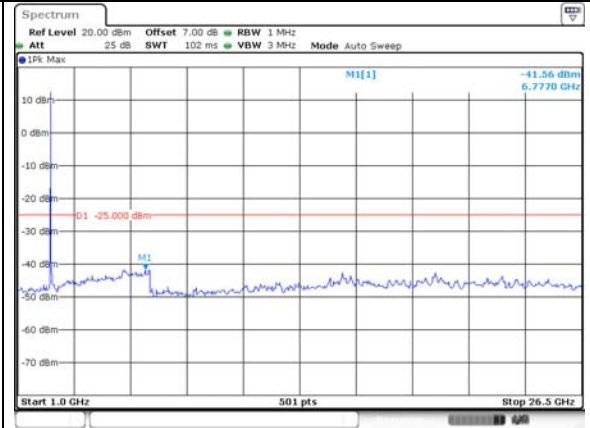
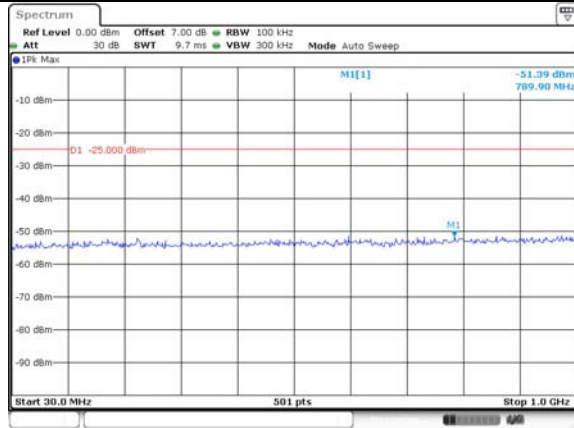
ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:30:08

Spurious Emissions at Antenna Terminal

Channel

10MHz Bandwidth QPSK

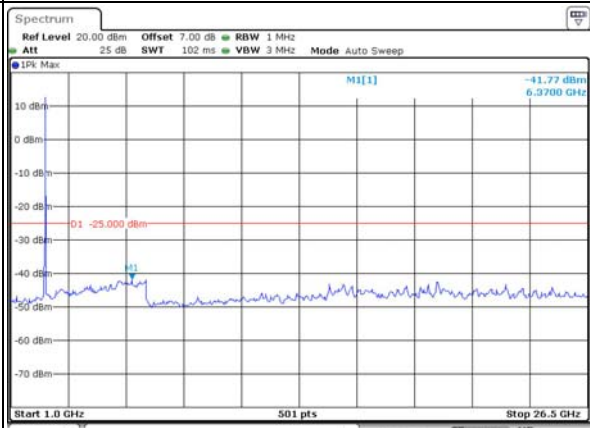
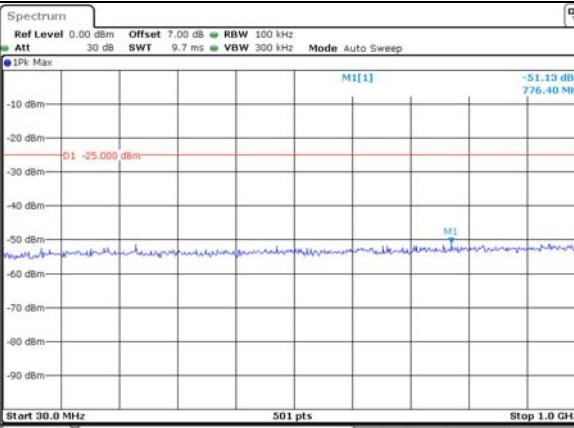
Lowest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:31:47

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:32:12

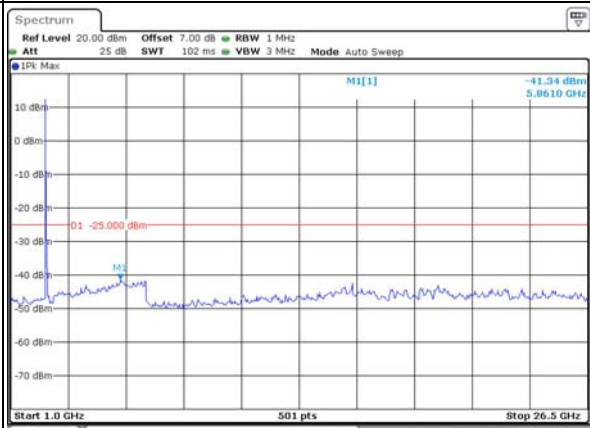
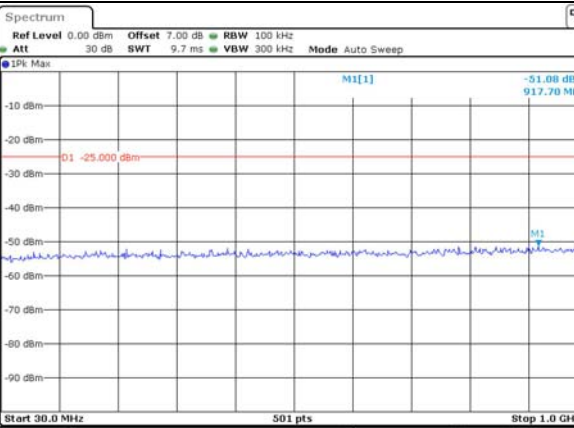
Middle



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:32:42

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:33:04

Highest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:33:34

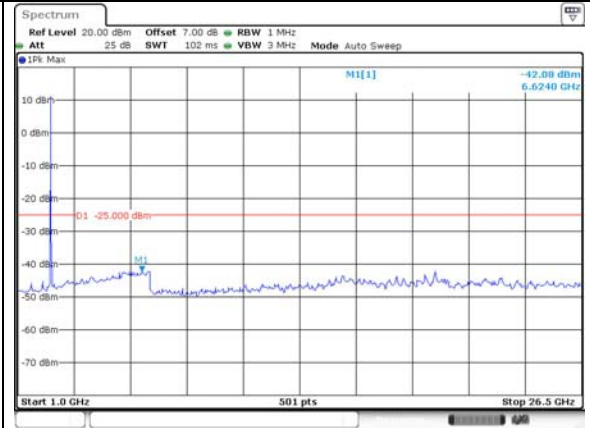
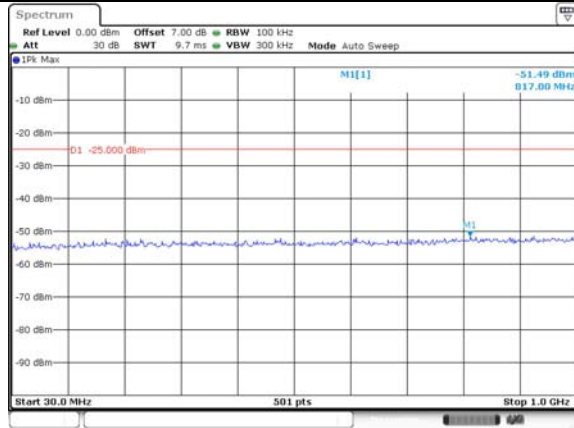
ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:34:06

Spurious Emissions at Antenna Terminal

Channel

15MHz Bandwidth QPSK

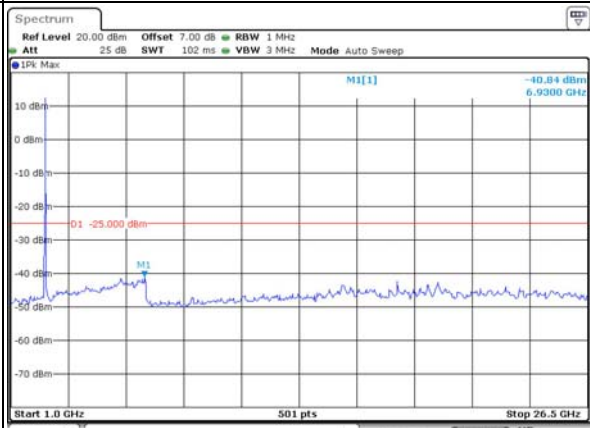
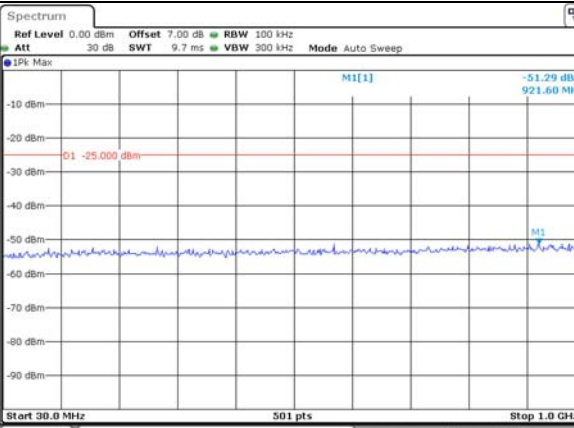
Lowest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:16:04

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:16:16

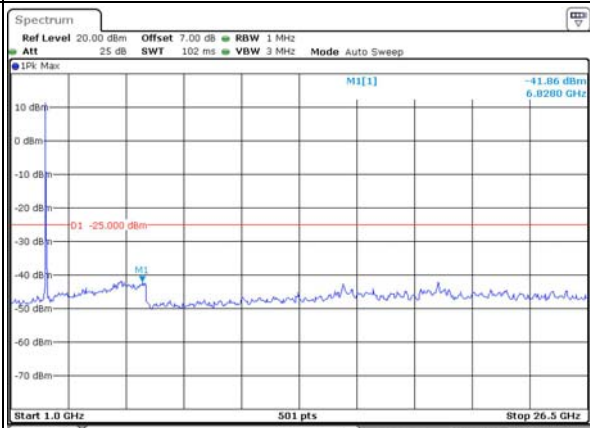
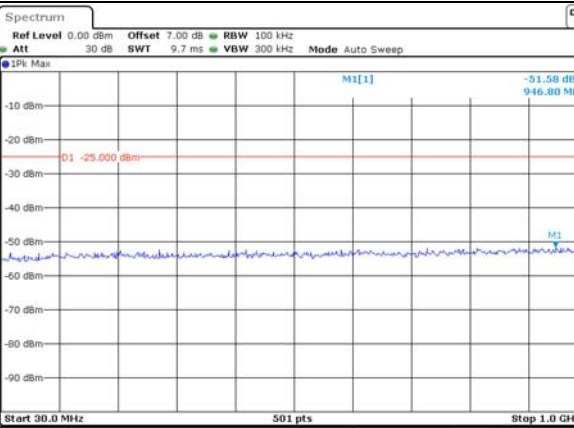
Middle



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:17:09

ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:17:14

Highest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:18:03

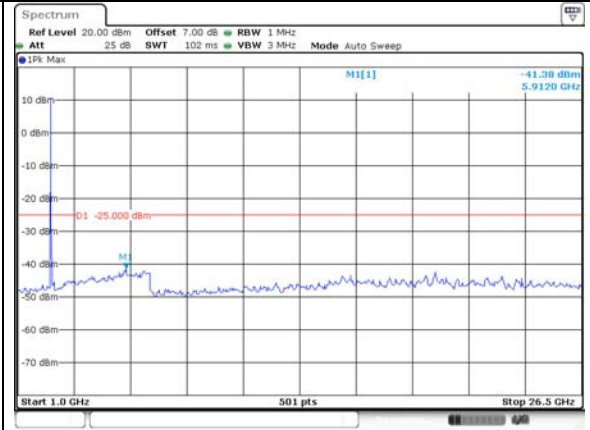
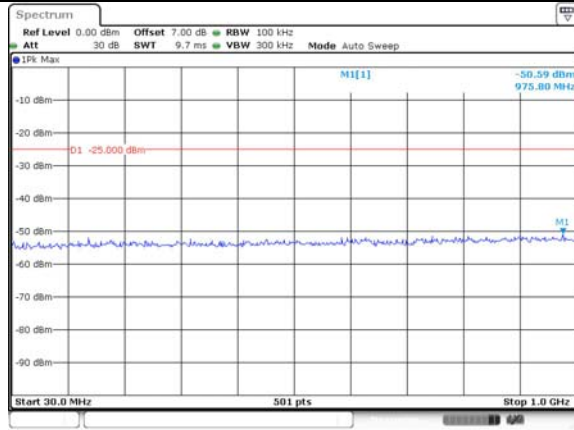
ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 13.NOV.2023 09:18:16

Spurious Emissions at Antenna Terminal

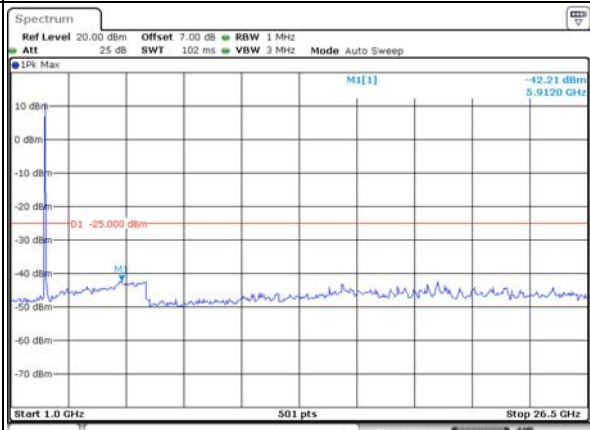
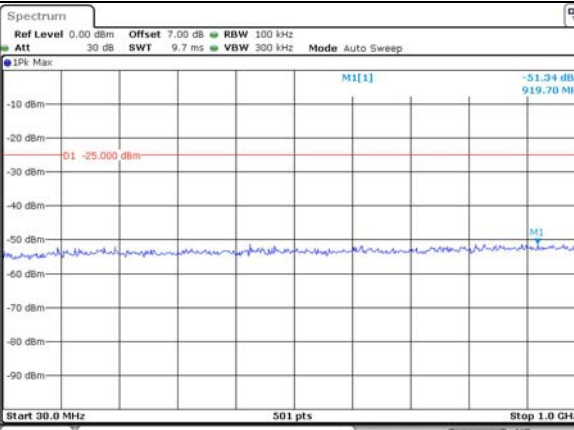
Channel

20MHz Bandwidth QPSK

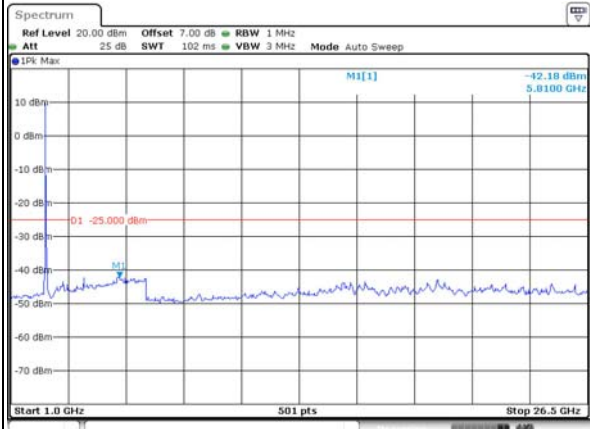
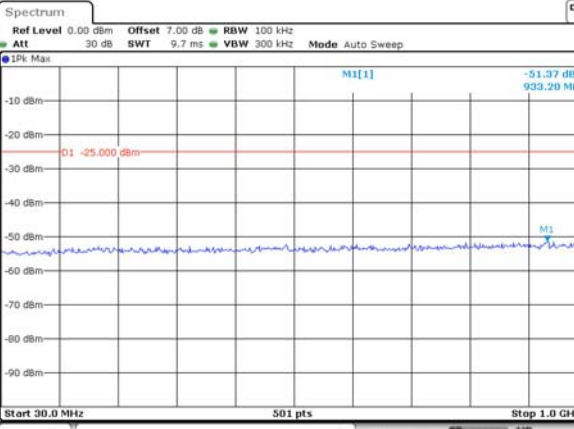
Lowest



Middle



Highest

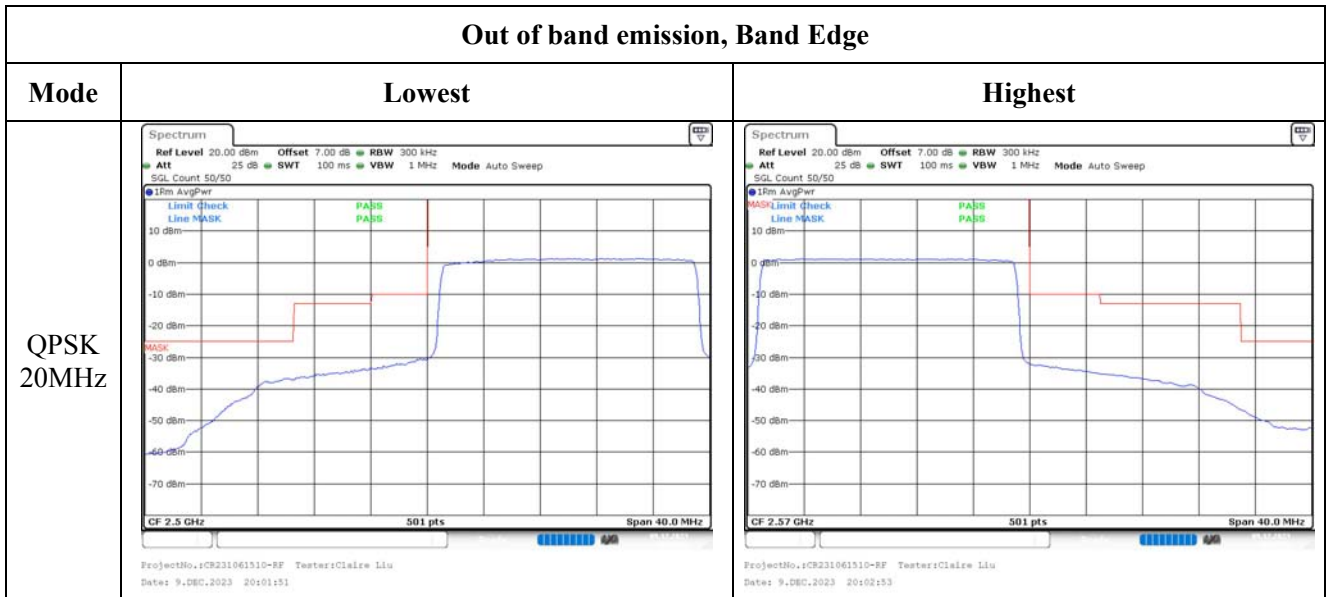




Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 5MHz	<p>ProjectNo.:CR231061510-RF Testers:Clairé Liu Date: 9.DEC.2023 19:46:29</p>	<p>ProjectNo.:CR231061510-RF Testers:Clairé Liu Date: 9.DEC.2023 19:57:18</p>
QPSK 10MHz	<p>ProjectNo.:CR231061510-RF Testers:Clairé Liu Date: 9.DEC.2023 19:53:14</p>	<p>ProjectNo.:CR231061510-RF Testers:Clairé Liu Date: 9.DEC.2023 19:54:11</p>
QPSK 15MHz	<p>ProjectNo.:CR231061510-RF Testers:Clairé Liu Date: 9.DEC.2023 19:59:12</p>	<p>ProjectNo.:CR231061510-RF Testers:Clairé Liu Date: 9.DEC.2023 20:00:23</p>

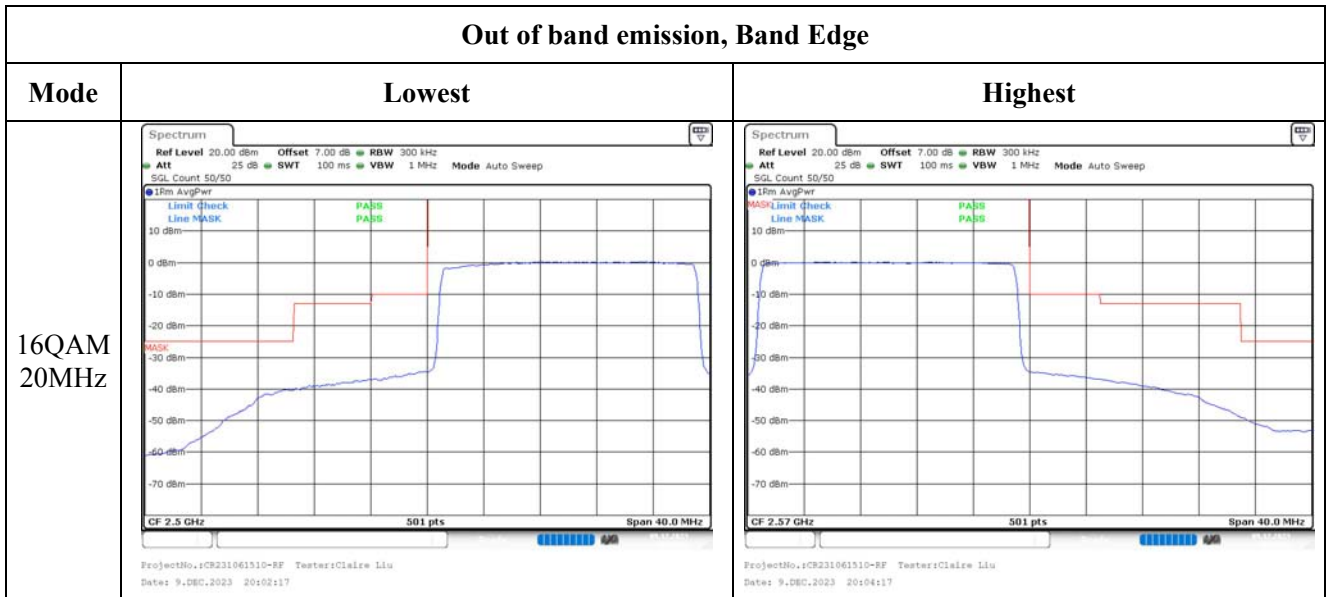
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 5MHz	<p>ProjectNo.:CR231061510-RF Testers:Clairu Liu Date: 9.DEC.2023 19:47:17</p>	<p>ProjectNo.:CR231061510-RF Testers:Clairu Liu Date: 9.DEC.2023 19:50:48</p>
16QAM 10MHz	<p>ProjectNo.:CR231061510-RF Testers:Clairu Liu Date: 9.DEC.2023 19:53:46</p>	<p>ProjectNo.:CR231061510-RF Testers:Clairu Liu Date: 9.DEC.2023 19:56:06</p>
16QAM 15MHz	<p>ProjectNo.:CR231061510-RF Testers:Clairu Liu Date: 9.DEC.2023 19:59:35</p>	<p>ProjectNo.:CR231061510-RF Testers:Clairu Liu Date: 9.DEC.2023 20:00:43</p>

Out of band emission, Band Edge



**4.10 Antenna Port Test Data and Results for LTE Band 12**

Serial Number:	2CIM-1	Test Date:	2023/11/12~2023/12/9
Test Site:	RF	Test Mode:	Transmitting
Tester:	Claire Liu	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	24.7~25.5	Relative Humidity: (%)	53~62	ATM Pressure: (kPa)	100.1~102
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**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101590	2022/11/25	2023/11/24
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/28	2024/9/27
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	2023/9/28	2024/9/27
R&S	Spectrum Analyzer	FSV40	101590	2023/11/16	2024/11/15

\* 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).

**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:**

<b>RF Output Power</b>						
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	23.23	23.1	23.03	12.77	34.77
	RB1#3	23.28	23.18	23.09		
	RB1#5	23.2	23.09	23.04		
	RB3#0	23.37	23.25	23.19		
	RB3#3	23.37	23.26	23.18		
	RB6#0	22.37	22.33	22.22		
1.4MHz 16QAM	RB1#0	22.19	22.17	22.13	11.87	34.77
	RB1#3	22.29	22.18	22.23		
	RB1#5	22.26	22.13	22.15		
	RB3#0	22.42	22.47	22.1		
	RB3#3	22.41	22.47	22.1		
	RB6#0	21.37	21.44	21.29		
3MHz QPSK	RB1#0	23.06	23.08	22.95	12.58	34.77
	RB1#8	23.18	23.15	23.03		
	RB1#14	23.07	22.98	22.92		
	RB6#0	22.28	22.25	22.1		
	RB6#9	22.29	22.2	22.16		
	RB15#0	22.3	22.2	22.12		
3MHz 16QAM	RB1#0	22.68	22.17	21.94	12.12	34.77
	RB1#8	22.72	22.28	22.01		
	RB1#14	22.56	22.18	21.94		
	RB6#0	21.47	21.29	21.18		
	RB6#9	21.43	21.33	21.13		
	RB15#0	21.43	21.28	21.21		
5MHz QPSK	RB1#0	23.31	23.28	23.14	12.84	34.77
	RB1#13	23.44	23.36	23.28		
	RB1#24	23.32	23.25	23.14		
	RB15#0	22.4	22.22	22.25		
	RB15#10	22.36	22.34	22.2		
	RB25#0	22.35	22.29	22.23		
5MHz 16QAM	RB1#0	22.18	22.61	22.21	12.11	34.77
	RB1#13	22.35	22.71	22.32		
	RB1#24	22.23	22.55	22.17		
	RB15#0	21.54	21.29	21.4		
	RB15#10	21.46	21.34	21.26		
	RB25#0	21.53	21.36	21.33		
10MHz QPSK	RB1#0	23.4	23.33	23.32	12.8	34.77
	RB1#25	23.4	23.4	23.35		
	RB1#49	23.32	23.31	23.31		



	RB25#0	22.4	22.18	22.25		
	RB25#25	22.46	22.27	22.16		
	RB50#0	22.46	22.25	22.18		
10MHz 16QAM	RB1#0	22.88	22.52	22.37	12.43	34.77
	RB1#25	23.03	22.53	22.3		
	RB1#49	22.92	22.43	22.26		
	RB25#0	21.46	21.36	21.39		
	RB25#25	21.6	21.33	21.32		
	RB50#0	21.48	21.37	21.29		

Note:

ERP= Conducted Power(dBm) - Lc(dB) + G<sub>T</sub>(dBd)G<sub>T</sub>(dBd)=G<sub>T</sub>(dBi)-2.15**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	4.43	4.84	4.84	13
	RB50#0	5.36	5.22	5.16	13
10MHz 16QAM	RB1#0	5.33	5.8	5.62	13
	RB50#0	6.32	6.26	6.17	13

**Result:****Pass****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	1.102	1.278	1.096	1.278	1.102	1.296
1.4MHz 16QAM	1.096	1.284	1.102	1.302	1.096	1.272
3MHz QPSK	2.683	2.928	2.671	2.916	2.683	2.928
3MHz 16QAM	2.683	2.940	2.671	2.940	2.683	2.952
5MHz QPSK	4.491	4.920	4.511	4.920	4.511	4.940
5MHz 16QAM	4.511	4.960	4.491	4.940	4.531	4.920
10MHz QPSK	8.942	9.640	8.942	9.640	8.942	9.600
10MHz 16QAM	8.942	9.760	8.942	9.560	8.942	9.600

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

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

<b>Frequency Stability</b>						
Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	699.169	699.00	715.789	716.00
	-20	3.91	699.184	699.00	715.705	716.00
	-10	3.91	699.165	699.00	715.775	716.00
	0	3.91	699.252	699.00	715.796	716.00
	10	3.91	699.259	699.00	715.776	716.00
	20	3.91	699.160	699.00	715.800	716.00
	30	3.91	699.221	699.00	715.773	716.00
	40	3.91	699.230	699.00	715.713	716.00
	50	3.91	699.222	699.00	715.765	716.00
Frequency Stability vs. Voltage	20	3.45	699.240	699.00	715.775	716.00
	20	4.5	699.244	699.00	715.800	716.00
					<b>Result:</b>	<b>Pass</b>

Test Mode:	10M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	699.182	699.00	715.744	716.00
	-20	3.91	699.214	699.00	715.754	716.00
	-10	3.91	699.228	699.00	715.724	716.00
	0	3.91	699.257	699.00	715.702	716.00
	10	3.91	699.255	699.00	715.747	716.00
	20	3.91	699.160	699.00	715.800	716.00
	30	3.91	699.231	699.00	715.723	716.00
	40	3.91	699.227	699.00	715.791	716.00
	50	3.91	699.169	699.00	715.728	716.00
Frequency Stability vs. Voltage	20	3.45	699.224	699.00	715.707	716.00
	20	4.5	699.198	699.00	715.700	716.00
					<b>Result:</b>	<b>Pass</b>

**Test Plots**(Note: The 7.0dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

<b>Occupied Bandwidth</b>		
<b>Channel</b>	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR231061510-RF Tester:Clairie Liu Date: 12.NOV.2023 15:09:25</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairie Liu Date: 12.NOV.2023 15:09:39</p>
Middle	<p>ProjectNo.:CR231061510-RF Tester:Clairie Liu Date: 12.NOV.2023 15:10:57</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairie Liu Date: 12.NOV.2023 15:10:14</p>
Highest	<p>ProjectNo.:CR231061510-RF Tester:Clairie Liu Date: 12.NOV.2023 15:10:32</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairie Liu Date: 12.NOV.2023 15:10:49</p>

Occupied Bandwidth

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

Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:13:57</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:14:21</p>
Middle	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:14:46</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:15:06</p>
Highest	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:15:25</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:15:46</p>

Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:16:34</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:17:01</p>
Middle	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:17:29</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:17:50</p>
Highest	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:18:15</p>	<p>ProjectNo.:CR231061510-RF Tester:Clair Liu Date: 12.NOV.2023 15:18:36</p>



Spurious Emissions at Antenna Terminal

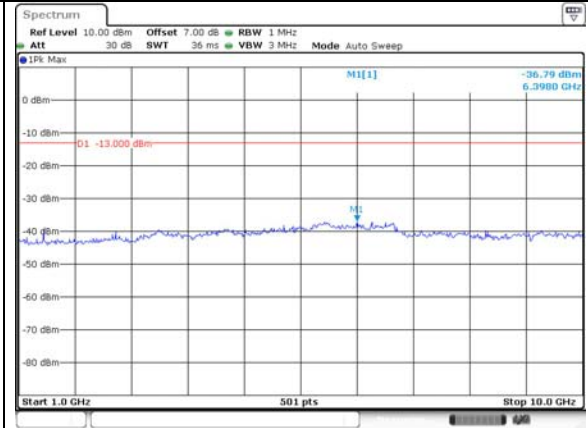
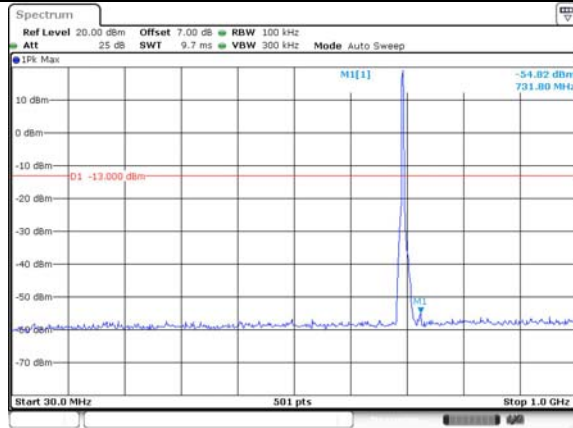
Channel	1.4MHz Bandwidth QPSK	
Lowest	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 09:47:12</p>	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 09:47:37</p>
Middle	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 09:48:03</p>	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 09:48:28</p>
Highest	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 09:48:57</p>	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 09:49:29</p>

Spurious Emissions at Antenna Terminal

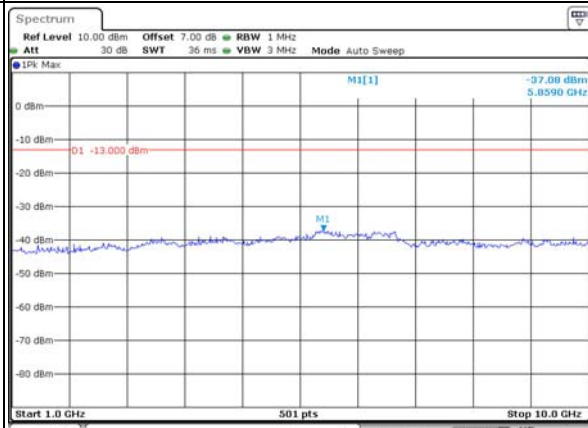
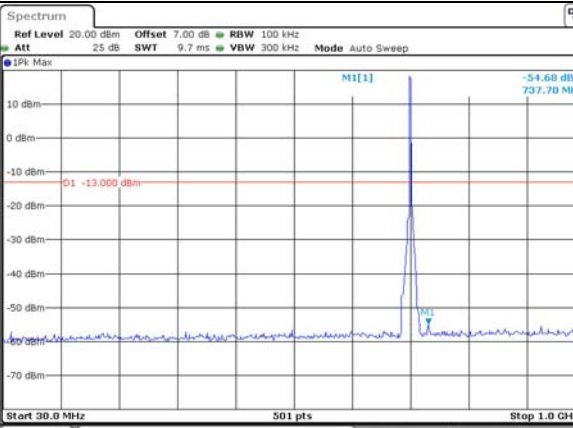
Channel

3MHz Bandwidth QPSK

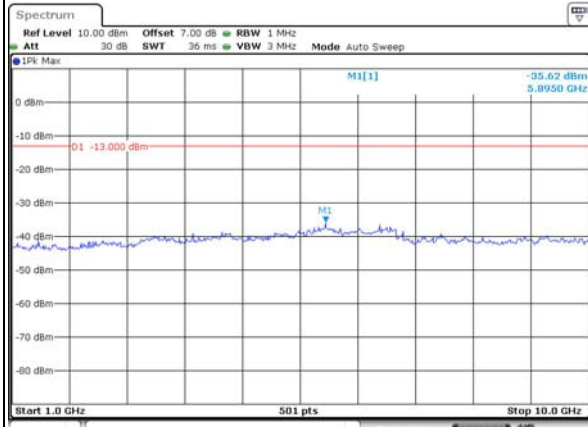
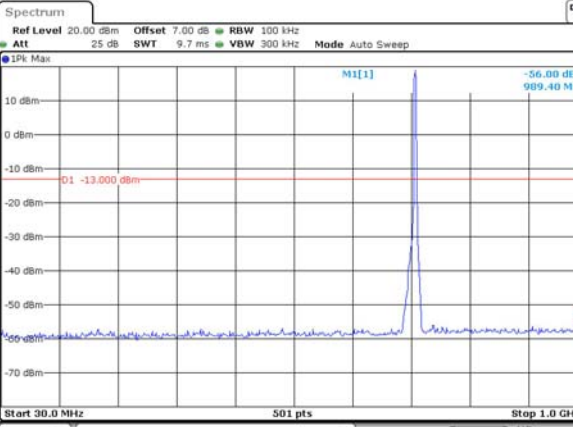
Lowest



Middle



Highest

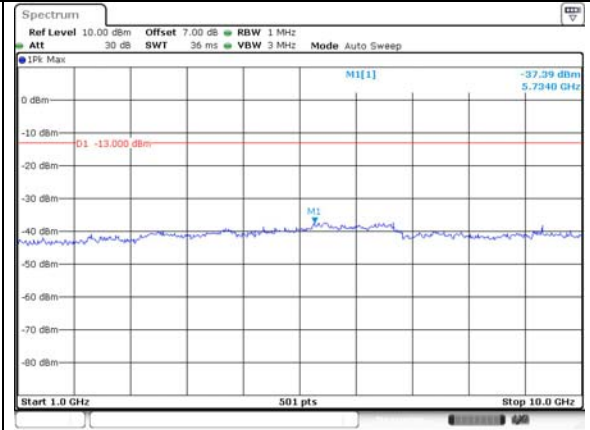
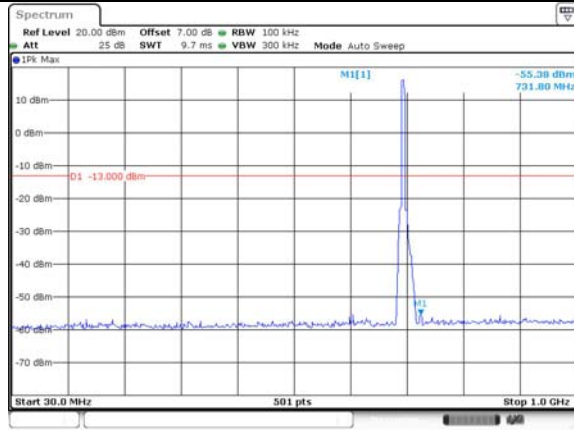


Spurious Emissions at Antenna Terminal

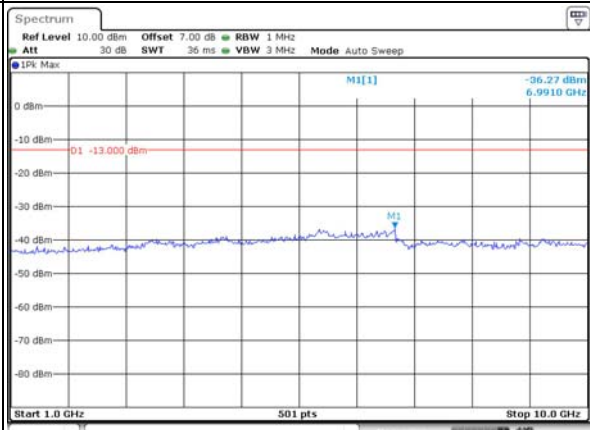
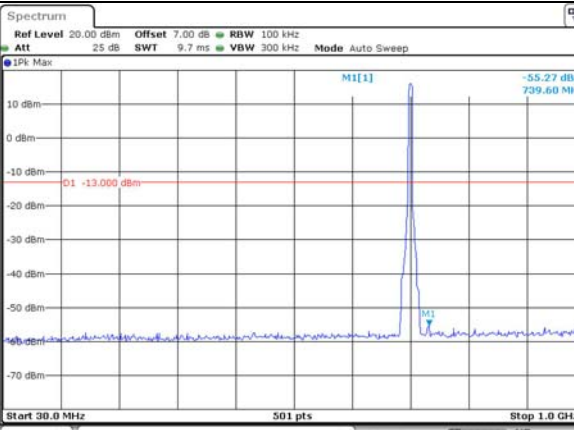
Channel

5MHz Bandwidth QPSK

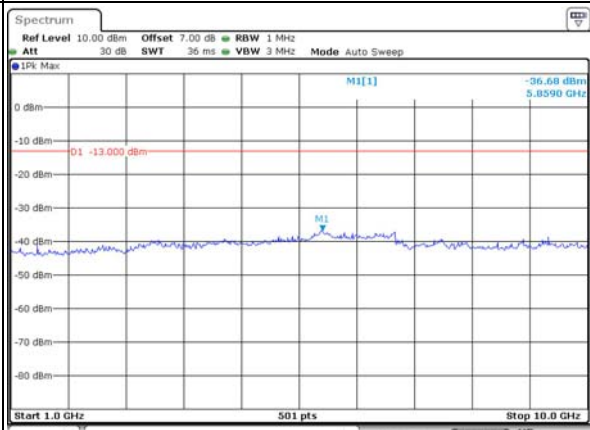
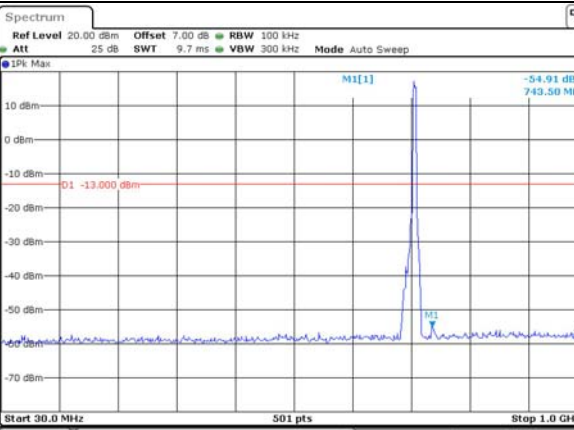
Lowest



Middle



Highest



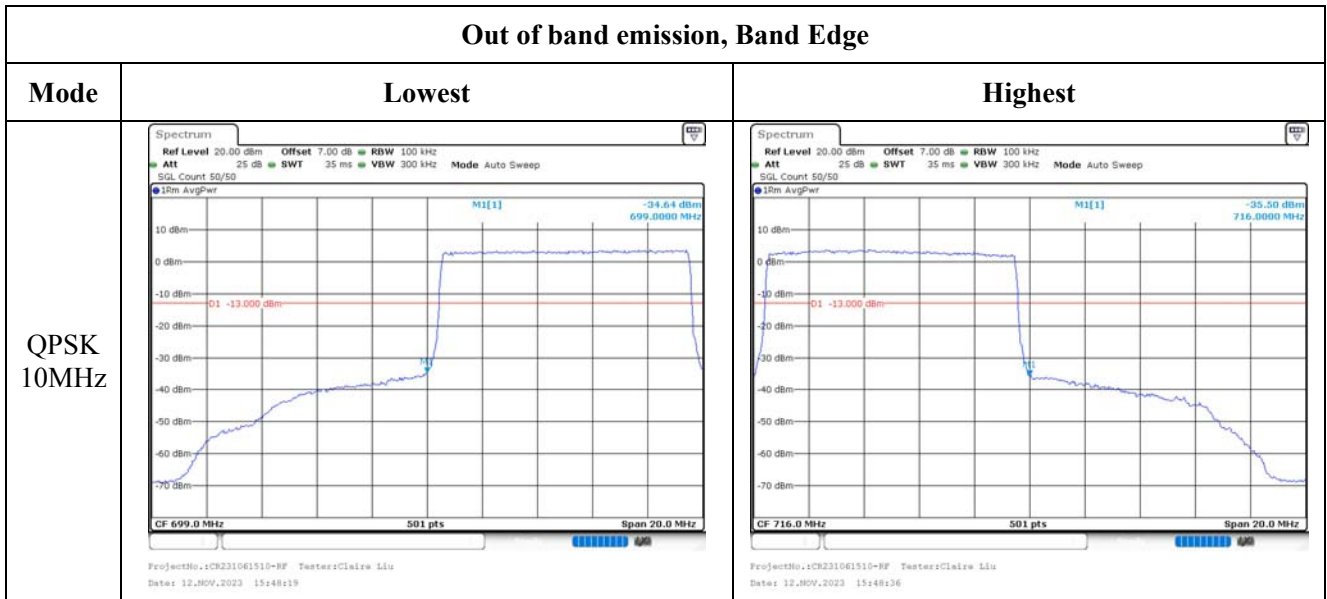
Spurious Emissions at Antenna Terminal

Channel	10MHz Bandwidth QPSK	
Lowest	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 09:59:18</p>	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 09:59:46</p>
Middle	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 10:00:19</p>	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 10:00:38</p>
Highest	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 10:01:06</p>	<p>ProjectNo.:CR231061510-RF Tester: Claire Liu Date: 13.NOV.2023 10:01:28</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	<p>ProjectNo.:CR231061510-RF Testter:Clairé Liu Date: 12.NOV.2023 15:45:32</p>	<p>ProjectNo.:CR231061510-RF Testter:Clairé Liu Date: 12.NOV.2023 15:45:46</p>
QPSK 3MHz	<p>ProjectNo.:CR231061510-RF Testter:Clairé Liu Date: 12.NOV.2023 15:46:26</p>	<p>ProjectNo.:CR231061510-RF Testter:Clairé Liu Date: 12.NOV.2023 15:46:41</p>
QPSK 5MHz	<p>ProjectNo.:CR231061510-RF Testter:Clairé Liu Date: 12.NOV.2023 15:47:21</p>	<p>ProjectNo.:CR231061510-RF Testter:Clairé Liu Date: 12.NOV.2023 15:47:37</p>

Out of band emission, Band Edge





Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	<p>ProjectNo.:CR231061510-RF Tester:Clairu Liu Date: 12.NOV.2023 15:45:39</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairu Liu Date: 12.NOV.2023 15:45:53</p>
16QAM 3MHz	<p>ProjectNo.:CR231061510-RF Tester:Clairu Liu Date: 12.NOV.2023 15:46:33</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairu Liu Date: 12.NOV.2023 15:46:47</p>
16QAM 5MHz	<p>ProjectNo.:CR231061510-RF Tester:Clairu Liu Date: 12.NOV.2023 15:47:29</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairu Liu Date: 12.NOV.2023 15:47:44</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 10MHz	<p>ProjectNo.:CR231061510-RF Tester:Clairw Liu Date: 12,NOV,2023 15:48:27</p>	<p>ProjectNo.:CR231061510-RF Tester:Clairw Liu Date: 12,NOV,2023 15:48:44</p>

**4.11 Antenna Port Test Data and Results for LTE Band 13**

Serial Number:	2CIM-1	Test Date:	2023/11/12~2023/12/9
Test Site:	RF	Test Mode:	Transmitting
Tester:	Claire Liu	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	24.7~25.5	Relative Humidity: (%)	53~62	ATM Pressure: (kPa)	100.1~102
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**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101590	2022/11/25	2023/11/24
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/28	2024/9/27
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	2023/9/28	2024/9/27
R&S	Spectrum Analyzer	FSV40	101590	2023/11/16	2024/11/15

\* 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).

**Test Frequency For Each Mode:**

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
5MHz	779.5	/	784.5
10MHz	/	782	/

**Test Data:**

<b>RF Output Power</b>						
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	23.5	23.56	23.57	13.16	34.77
	RB1#13	23.76	23.73	23.72		
	RB1#24	23.6	23.57	23.6		
	RB15#0	22.57	22.61	22.6		
	RB15#10	22.6	22.59	22.66		
	RB25#0	22.51	22.57	22.59		
5MHz 16QAM	RB1#0	22.48	22.32	22.76	12.37	34.77
	RB1#13	22.69	22.5	22.97		
	RB1#24	22.6	22.42	22.84		
	RB15#0	21.57	21.62	21.57		
	RB15#10	21.55	21.56	21.65		
	RB25#0	21.56	21.65	21.66		
10MHz QPSK	RB1#0	/	23.74	/	13.26	34.77
	RB1#25	/	23.82	/		
	RB1#49	/	23.86	/		
	RB25#0	/	22.67	/		
	RB25#25	/	22.75	/		
	RB50#0	/	22.72	/		
10MHz 16QAM	RB1#0	/	23.11	/	12.75	34.77
	RB1#25	/	23.22	/		
	RB1#49	/	23.35	/		
	RB25#0	/	21.71	/		
	RB25#25	/	21.78	/		
	RB50#0	/	21.69	/		

Note:

ERP= Conducted Power(dBm) - Lc(dB) + Gr(dBd)

Gr(dBd)=Gr(dBi)-2.15

**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	/	3.65	/	13
	RB50#0	/	4.58	/	13
10MHz 16QAM	RB1#0	/	4.49	/	13
	RB50#0	/	5.54	/	13
<b>Result:</b>				<b>Pass</b>	

<b>Occupied Bandwidth</b>						
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	4.491	4.920	4.511	4.920	4.511	4.920
5MHz 16QAM	4.511	4.940	4.511	4.920	4.511	4.940
10MHz QPSK	/	8.942	/	/	9.720	/
10MHz 16QAM	/	8.942	/	/	9.600	/

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

<b>Spurious Emissions at Antenna Terminal</b>	
<b>Result:</b>	<b>Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.</b>

<b>Out of band emission, Band Edge</b>	
<b>Result:</b>	<b>Pass, Please refer to the test plots of Out of band emission, Band Edge.</b>

<b>Frequency Stability</b>						
Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge, Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	777.293	777.00	786.795	787.00
	-20	3.91	777.252	777.00	786.795	787.00
	-10	3.91	777.241	777.00	786.797	787.00
	0	3.91	777.252	777.00	786.794	787.00
	10	3.91	777.282	777.00	786.796	787.00
	20	3.91	777.200	777.00	786.795	787.00
	30	3.91	777.300	777.00	786.799	787.00
	40	3.91	777.235	777.00	786.798	787.00
	50	3.91	777.255	777.00	786.798	787.00
Frequency Stability vs. Voltage	20	3.45	777.268	777.00	786.793	787.00
	20	4.5	777.235	777.00	786.794	787.00
					<b>Result:</b>	<b>Pass</b>

Test Mode:	10M 16QAM	Test Channel: Lowest for Lower Edge, Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.91	777.276	777.00	786.797	787.00
	-20	3.91	777.255	777.00	786.799	787.00
	-10	3.91	777.263	777.00	786.794	787.00

	0	3.91	777.299	777.00	786.800	787.00
	10	3.91	777.292	777.00	786.796	787.00
	20	3.91	777.200	777.00	786.794	787.00
	30	3.91	777.264	777.00	786.794	787.00
	40	3.91	777.250	777.00	786.800	787.00
	50	3.91	777.267	777.00	786.794	787.00
Frequency Stability vs. Voltage	20	3.45	777.221	777.00	786.799	787.00
	20	4.5	777.257	777.00	786.799	787.00
<b>Result:</b>						<b>Pass</b>



**Test Plots**(Note: The 7.0dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

<b>Occupied Bandwidth</b>		
<b>Channel</b>	<b>5MHz Bandwidth QPSK</b>	<b>5MHz Bandwidth 16QAM</b>
<b>Lowest</b>		
<b>Middle</b>		
<b>Highest</b>		

**Occupied Bandwidth**

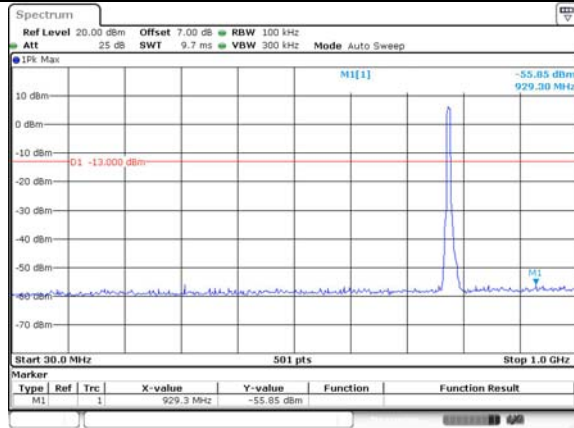
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Middle	<p>ProjectNo.:CR231061510-RF Testee:Claira Liu Date: 12.NOV.2023 15:22:25</p>	<p>ProjectNo.:CR231061510-RF Testee:Claira Liu Date: 12.NOV.2023 15:22:49</p>

Spurious Emissions at Antenna Terminal

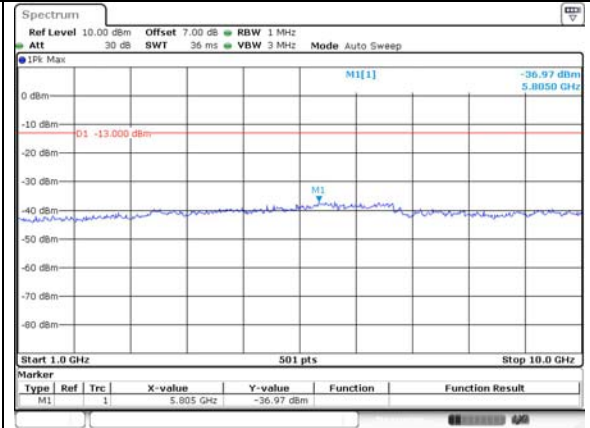
Channel

5MHz Bandwidth QPSK

Lowest

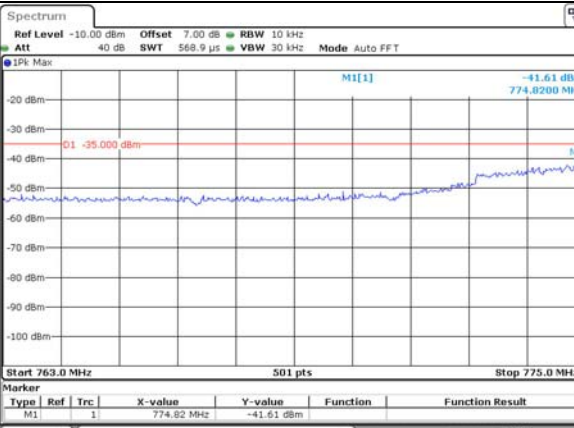


ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 15.NOV.2023 19:56:58

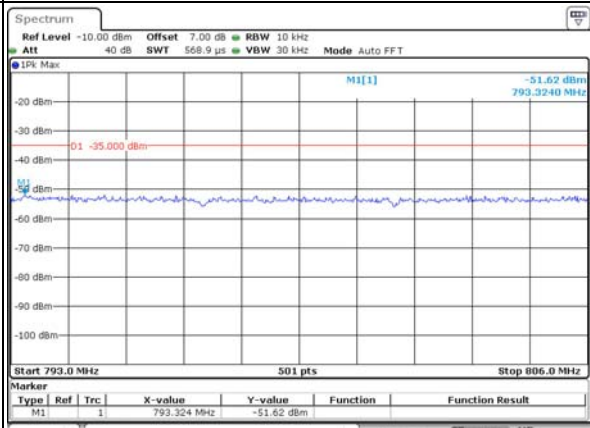


ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 15.NOV.2023 19:57:24

Lowest

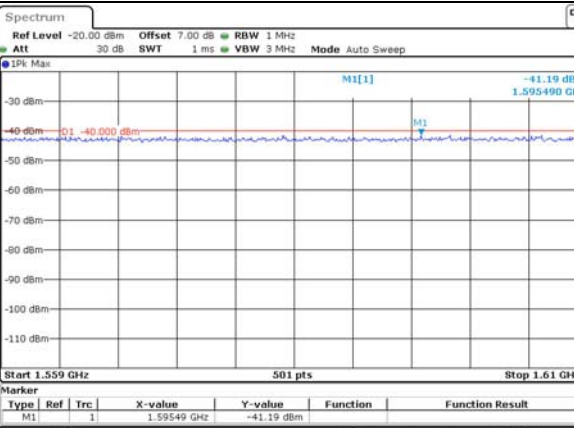


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Date: 15.NOV.2023 19:57:49



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 15.NOV.2023 19:58:08

Lowest



ProjectNo.:CR231061510-RF Tester: Claire Liu  
Date: 15.NOV.2023 19:58:36