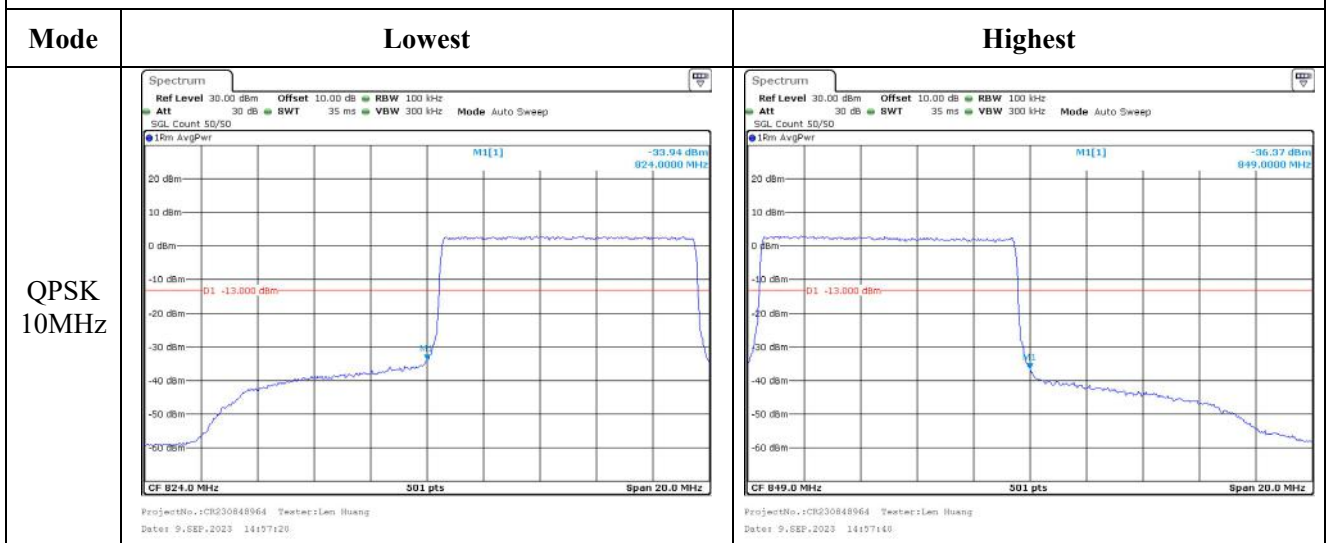


Out of band emission, Band Edge

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		
16QAM 3MHz		
16QAM 5MHz		

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 10MHz	<p>ProjectNo.:CR230848964 Testee:Len Huang Date: 9.SEP.2023 14:57:30</p>	<p>ProjectNo.:CR230848964 Testee:Len Huang Date: 9.SEP.2023 14:57:30</p>

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

Serial Number:	2A93-1	Test Date:	2023/9/9
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	28.3	Relative Humidity: (%)	46	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	FSV40-N	102259	2023/4/18	2024/4/17
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
Weinschel	Power Splitter	1515	RA914	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	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).

**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:****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	18.70	17.05	17.29	18.43	33
	RB1#13	18.83	17.21	17.39		
	RB1#24	18.65	17.06	17.37		
	RB15#0	17.72	17.07	17.38		
	RB15#10	17.81	17.13	17.36		
	RB25#0	17.73	17.12	17.35		
5MHz 16QAM	RB1#0	17.79	17.00	17.62	17.44	33
	RB1#13	17.84	17.08	17.76		
	RB1#24	17.75	16.94	17.64		
	RB15#0	16.75	17.16	17.39		
	RB15#10	16.83	17.18	17.36		
	RB25#0	16.79	17.19	17.36		
10MHz QPSK	RB1#0	18.75	17.07	17.31	18.56	33
	RB1#25	18.96	17.22	17.52		
	RB1#49	18.71	17.07	17.43		
	RB25#0	17.71	17.12	17.39		
	RB25#25	17.76	17.16	17.35		
	RB50#0	17.73	17.15	17.38		
10MHz 16QAM	RB1#0	17.78	17.74	17.43	17.53	33
	RB1#25	17.93	17.92	17.64		
	RB1#49	17.71	17.72	17.60		
	RB25#0	16.79	17.23	17.45		
	RB25#25	16.87	17.23	17.39		
	RB50#0	16.77	17.21	17.42		
15MHz QPSK	RB1#0	18.70	16.98	17.14	18.35	33
	RB1#38	18.75	17.22	17.30		
	RB1#74	18.68	16.99	17.26		
	RB36#0	17.70	17.10	17.32		
	RB36#39	17.72	17.15	17.33		
	RB75#0	17.71	17.15	17.29		
15MHz 16QAM	RB1#0	17.93	17.41	17.81	17.54	33
	RB1#38	17.91	17.58	17.94		
	RB1#74	17.78	17.46	17.92		
	RB36#0	16.70	17.08	17.34		
	RB36#39	16.76	17.12	17.33		
	RB75#0	16.71	17.09	17.33		

20MHz QPSK	RB1#0	18.58	16.70	16.75	18.46	33
	RB1#50	18.86	16.94	17.12		
	RB1#99	18.57	16.48	16.93		
	RB50#0	17.63	16.84	17.01		
	RB50#50	17.71	16.87	16.96		
	RB100#0	17.66	16.87	17.00		
20MHz 16QAM	RB1#0	17.82	17.09	17.03	17.70	33
	RB1#50	18.10	17.55	17.54		
	RB1#99	17.79	17.09	17.30		
	RB50#0	16.65	16.86	17.01		
	RB50#50	16.70	16.86	16.96		
	RB100#0	16.70	16.85	17.04		

Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gr(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	6.17	6.09	6.23	13
	RB100#0	5.57	5.65	5.54	13
20MHz 16QAM	RB1#0	7.65	6.55	7.13	13
	RB100#0	6.38	6.52	6.41	13
<b>Result:</b>					<b>Pass</b>

#### 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	4.491	4.511	4.491	4.940	4.960	4.920
5MHz 16QAM	4.491	4.511	4.511	4.960	4.940	4.960
10MHz QPSK	8.942	8.942	8.942	9.640	9.640	9.560
10MHz 16QAM	8.942	8.942	8.942	9.560	9.560	9.560
15MHz QPSK	13.413	13.473	13.473	14.640	14.640	14.820
15MHz 16QAM	13.473	13.473	13.473	14.580	14.580	14.640
20MHz QPSK	17.884	17.884	17.884	19.360	19.280	19.280
20MHz 16QAM	17.884	17.964	17.964	19.120	19.280	19.280

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

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

<b>Result:</b>	<b>Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.</b>
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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.**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 <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	2500.251	2500.00	2569.804	2570
	-20	3.85	2500.307	2500.00	2569.828	2570
	-10	3.85	2500.321	2500.00	2569.764	2570
	0	3.85	2500.116	2500.00	2569.880	2570
	10	3.85	2500.155	2500.00	2569.720	2570
	20	3.85	2500.136	2500.00	2569.837	2570
	30	3.85	2500.127	2500.00	2569.746	2570
	40	3.85	2500.244	2500.00	2569.871	2570
Frequency Stability vs. Voltage	20	3.35	2500.135	2500.00	2569.805	2570
	20	4.4	2500.271	2500.00	2569.842	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	3.85	2500.335	2500.00	2569.890	2570
	-20	3.85	2500.315	2500.00	2569.823	2570
	-10	3.85	2500.328	2500.00	2569.762	2570
	0	3.85	2500.140	2500.00	2569.885	2570
	10	3.85	2500.323	2500.00	2569.808	2570
	20	3.85	2500.259	2500.00	2569.784	2570
	30	3.85	2500.220	2500.00	2569.783	2570
	40	3.85	2500.223	2500.00	2569.726	2570
Frequency Stability vs. Voltage	20	3.35	2500.151	2500.00	2569.772	2570
	20	4.4	2500.151	2500.00	2569.759	2570
<b>Result:</b>					<b>Pass</b>	



**Test Plots**(Note: The 10.5dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

**Occupied Bandwidth**

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:18:46</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:19:13</p>
Middle	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:19:47</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:20:12</p>
Highest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:20:38</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:20:59</p>

Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:21:54</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:22:26</p>
Middle	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:22:55</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:23:17</p>
Highest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:23:47</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:24:21</p>

Occupied Bandwidth

Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:25:28</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:25:19</p>
Middle	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:26:21</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:26:55</p>
Highest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:27:33</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 09:28:07</p>

Occupied Bandwidth

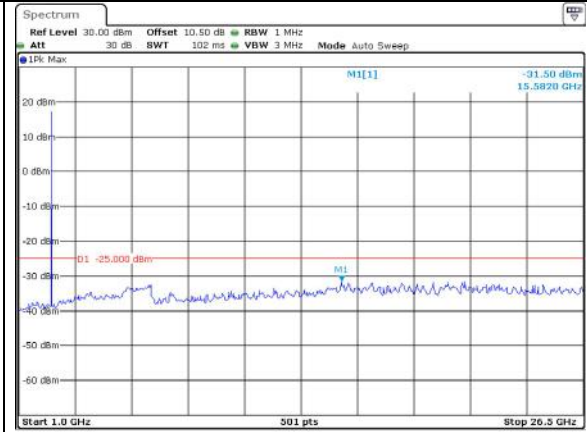
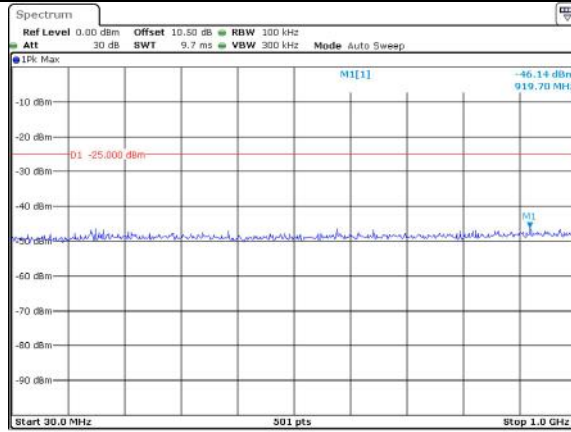
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

### Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK

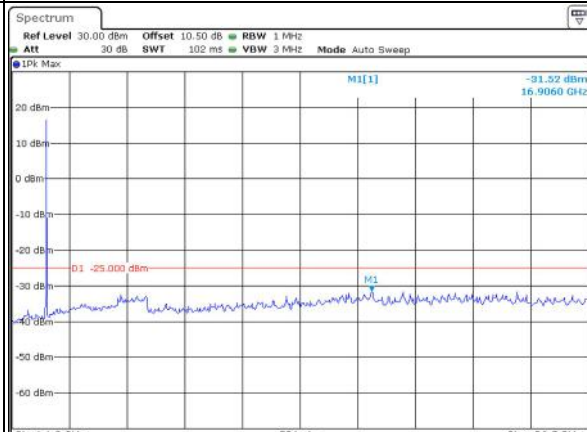
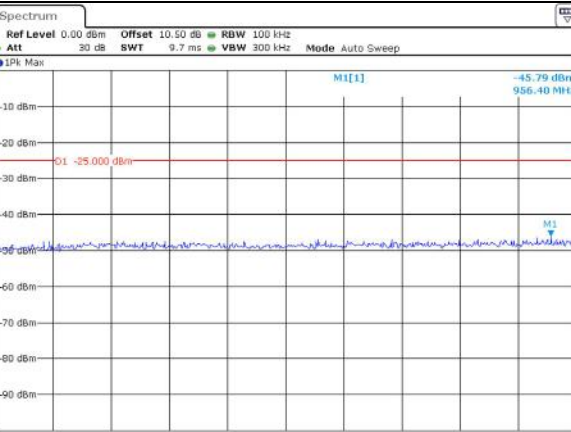
Lowest



ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 11:39:45

ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 11:40:11

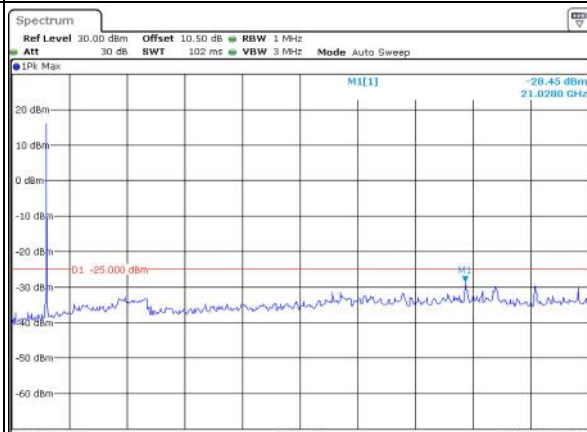
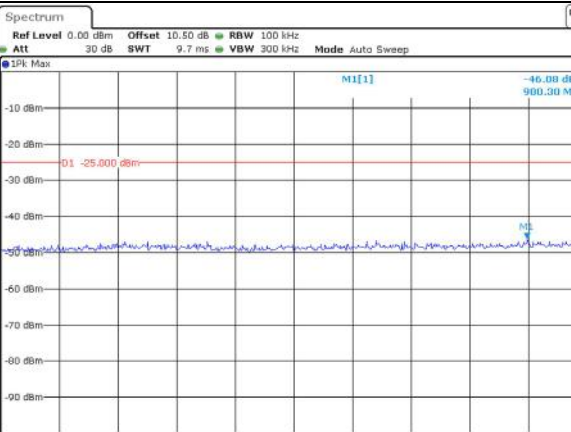
Middle



ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 11:41:00

ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 11:41:26

Highest



ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 11:42:03

ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 11:42:29

Spurious Emissions at Antenna Terminal

Channel	10MHz Bandwidth QPSK	
Lowest	<p>Ref Level 0.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>IPk Max M1[1] -45.96 dBm 933.20 MHz</p> <p>D1 -25.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:43:33</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep</p> <p>IPk Max M1[1] -31.55 dBm 26.1120 GHz</p> <p>D1 -25.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 26.5 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:44:50</p>
Middle	<p>Ref Level 0.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>IPk Max M1[1] -46.56 dBm 979.70 MHz</p> <p>D1 -25.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:44:24</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep</p> <p>IPk Max M1[1] -31.65 dBm 16.6000 GHz</p> <p>D1 -25.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 26.5 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:44:44</p>
Highest	<p>Ref Level 0.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>IPk Max M1[1] -46.33 dBm 900.30 MHz</p> <p>D1 -25.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:46:50</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep</p> <p>IPk Max M1[1] -31.87 dBm 6.5220 GHz</p> <p>D1 -25.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 26.5 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:47:13</p>

### Spurious Emissions at Antenna Terminal

Channel	15MHz Bandwidth QPSK	
Lowest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:46:10</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:47:13</p>
Middle	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:47:44</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:48:10</p>
Highest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:48:47</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:49:10</p>

### Spurious Emissions at Antenna Terminal

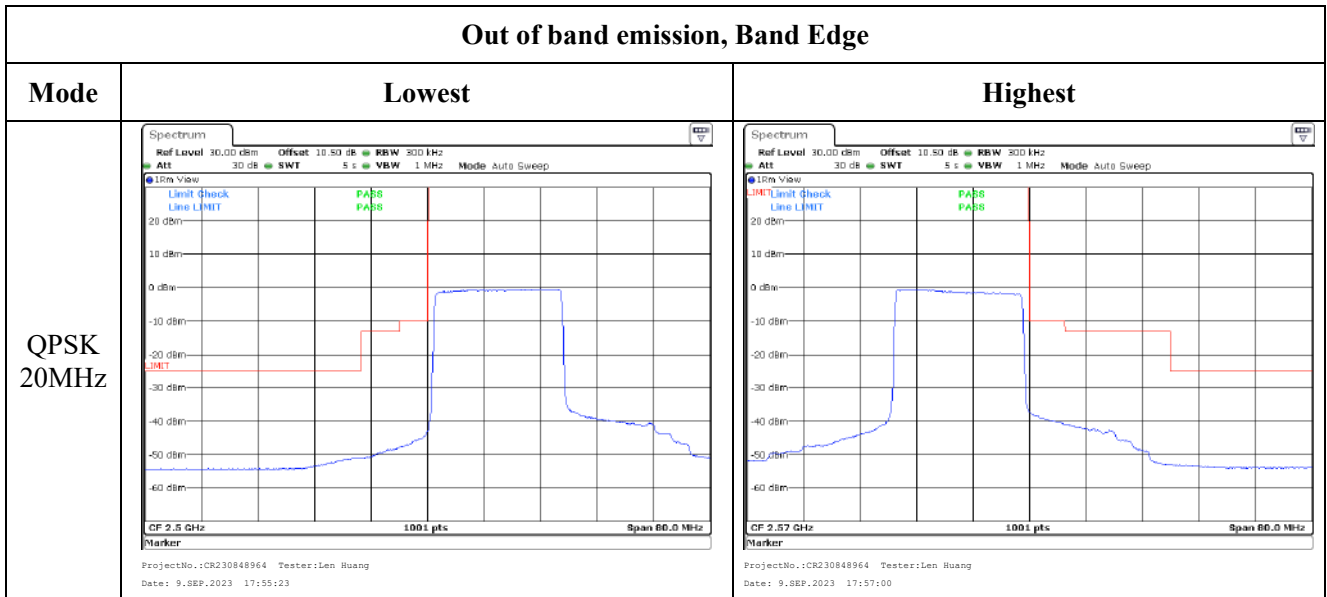
Channel	20MHz Bandwidth QPSK	
Lowest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:50:06</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:50:26</p>
Middle	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:51:12</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:51:35</p>
Highest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:52:13</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 11:52:42</p>



Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 5MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:40:44</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:42:02</p>
QPSK 10MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:36:59</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:33:07</p>
QPSK 15MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:48:18</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:50:31</p>

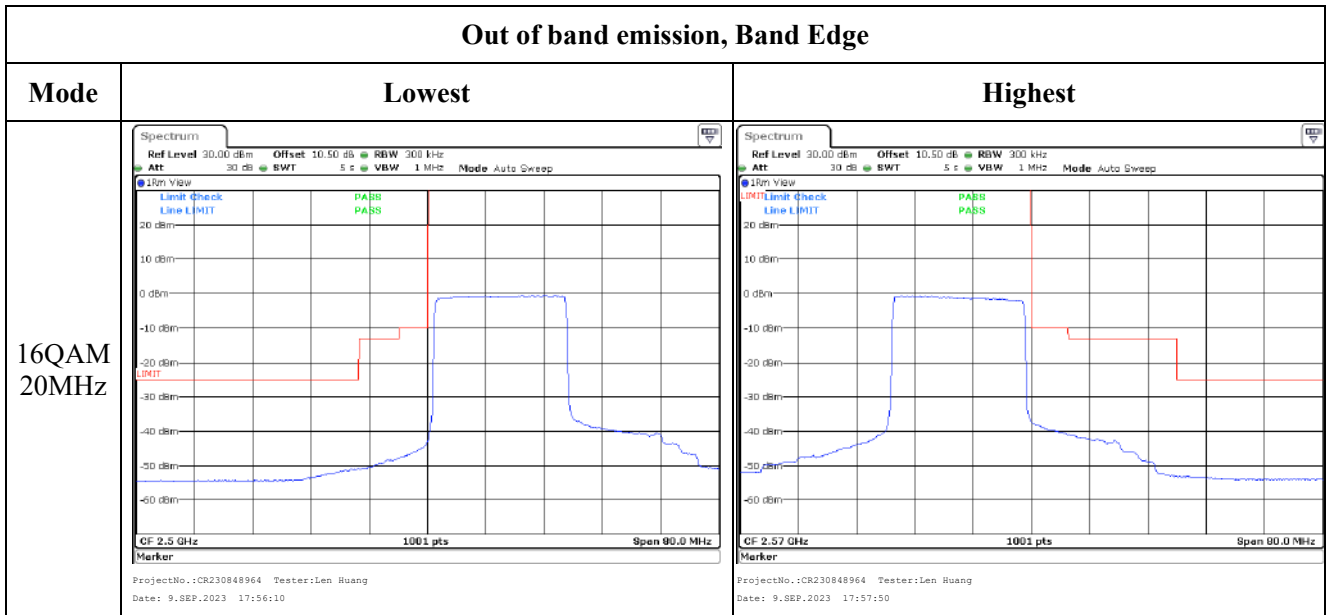
Out of band emission, Band Edge



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 5MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:42:57</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:43:55</p>
16QAM 10MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:34:22</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:35:20</p>
16QAM 15MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:49:24</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 17:51:36</p>

Out of band emission, Band Edge



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

Serial Number:	2A93-1	Test Date:	2023/9/9
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	28.3	Relative Humidity: (%)	46	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	FSV40-N	102259	2023/4/18	2024/4/17
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
Weinschel	Power Splitter	1515	RA914	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	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).

**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	22.89	22.79	22.73	<b>15.28</b>	34.77
	RB1#3	23.03	22.97	22.89		
	RB1#5	22.83	22.78	22.72		
	RB3#0	22.91	22.86	22.80		
	RB3#3	22.94	22.90	22.71		
	RB6#0	21.85	21.90	21.82		
1.4MHz 16QAM	RB1#0	21.83	21.82	21.84	14.31	34.77
	RB1#3	22.03	21.97	22.00		
	RB1#5	21.83	21.78	21.76		
	RB3#0	21.97	21.99	21.70		
	RB3#3	21.93	22.06	21.73		
	RB6#0	20.85	20.92	20.80		
3MHz QPSK	RB1#0	22.97	22.88	22.82	15.22	34.77
	RB1#8	22.92	22.87	22.84		
	RB1#14	22.82	22.83	22.81		
	RB6#0	21.85	21.86	21.74		
	RB6#9	21.82	21.84	21.75		
	RB15#0	21.88	21.84	21.79		
3MHz 16QAM	RB1#0	21.94	22.01	21.78	14.26	34.77
	RB1#8	21.89	21.99	21.81		
	RB1#14	21.87	21.96	21.75		
	RB6#0	20.79	20.86	20.74		
	RB6#9	20.86	20.88	20.64		
	RB15#0	20.90	20.84	20.84		
5MHz QPSK	RB1#0	22.78	22.77	22.72	15.16	34.77
	RB1#13	22.86	22.91	22.84		
	RB1#24	22.75	22.72	22.71		
	RB15#0	21.85	21.90	21.77		
	RB15#10	21.87	21.82	21.77		
	RB25#0	21.85	21.82	21.78		
5MHz 16QAM	RB1#0	21.85	21.65	22.01	14.33	34.77
	RB1#13	21.93	21.81	22.08		
	RB1#24	21.79	21.63	21.95		
	RB15#0	20.84	20.92	20.75		
	RB15#10	20.92	20.88	20.77		
	RB25#0	20.84	20.89	20.77		

10MHz QPSK	RB1#0	22.88	22.89	22.84	15.26	34.77
	RB1#25	22.97	23.01	22.91		
	RB1#49	22.86	22.88	22.80		
	RB25#0	21.77	21.90	21.89		
	RB25#25	21.87	21.84	21.82		
	RB50#0	21.86	21.87	21.86		
10MHz 16QAM	RB1#0	22.01	21.86	22.43	14.68	34.77
	RB1#25	22.10	21.98	22.41		
	RB1#49	21.97	21.87	22.25		
	RB25#0	20.81	20.96	20.96		
	RB25#25	20.88	20.90	20.85		
	RB50#0	20.83	20.90	20.90		

Note: ERP= Conducted Power(dBm) - Lc(dB) + G<sub>T</sub>(dBd)G<sub>r</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	4.58	4.72	4.99	13
	RB50#0	5.07	5.13	5.13	13
10MHz 16QAM	RB1#0	5.48	5.51	6.00	13
	RB50#0	6.17	6.09	6.00	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	1.102	1.096	1.102	1.290	1.296	1.302
1.4MHz 16QAM	1.090	1.096	1.090	1.290	1.314	1.284
3MHz QPSK	2.683	2.683	2.683	2.856	2.880	2.880
3MHz 16QAM	2.683	2.683	2.683	2.868	2.868	2.892
5MHz QPSK	4.511	4.551	4.531	5.200	5.200	5.220
5MHz 16QAM	4.551	4.511	4.531	5.320	5.140	5.200
10MHz QPSK	8.942	8.982	8.942	9.960	9.960	9.840
10MHz 16QAM	8.982	8.942	8.942	9.880	9.800	9.760

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

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

<b>Result:</b>	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**

<b>Result:</b>	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 <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	699.150	699.00	715.880	716.00
	-20	3.85	699.147	699.00	715.826	716.00
	-10	3.85	699.232	699.00	715.853	716.00
	0	3.85	699.188	699.00	715.808	716.00
	10	3.85	699.128	699.00	715.751	716.00
	20	3.85	699.146	699.00	715.844	716.00
	30	3.85	699.282	699.00	715.826	716.00
	40	3.85	699.152	699.00	715.827	716.00
Frequency Stability vs. Voltage	20	3.35	699.251	699.00	715.744	716.00
	20	4.4	699.148	699.00	715.797	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	3.85	699.173	699.00	715.851	716.00
	-20	3.85	699.246	699.00	715.850	716.00
	-10	3.85	699.113	699.00	715.836	716.00
	0	3.85	699.229	699.00	715.793	716.00
	10	3.85	699.265	699.00	715.843	716.00
	20	3.85	699.258	699.00	715.723	716.00
	30	3.85	699.120	699.00	715.778	716.00
	40	3.85	699.241	699.00	715.725	716.00
Frequency Stability vs. Voltage	20	3.35	699.123	699.00	715.846	716.00
	20	4.4	699.224	699.00	715.835	716.00
					<b>Result:</b>	<b>Pass</b>



**Test Plots** (Note: The 10 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):

<b>Occupied Bandwidth</b>		
<b>Channel</b>	<b>1.4MHz Bandwidth QPSK</b>	<b>1.4MHz Bandwidth 16QAM</b>
Lowest		
Middle		
Highest		

Occupied Bandwidth

Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9,SEP,2023 13:50:36</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9,SEP,2023 13:50:37</p>
Middle	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9,SEP,2023 13:51:16</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9,SEP,2023 13:51:41</p>
Highest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9,SEP,2023 13:52:03</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9,SEP,2023 13:52:16</p>

Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth

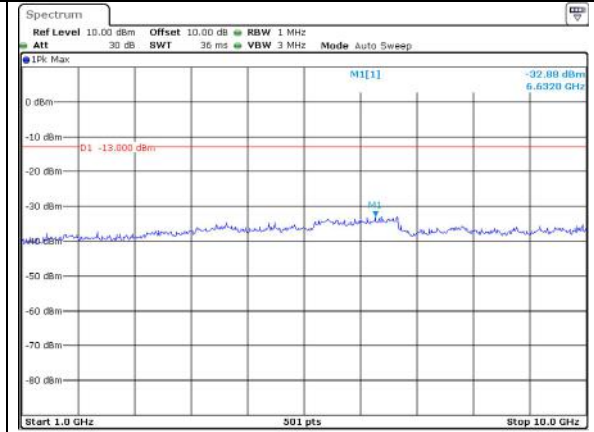
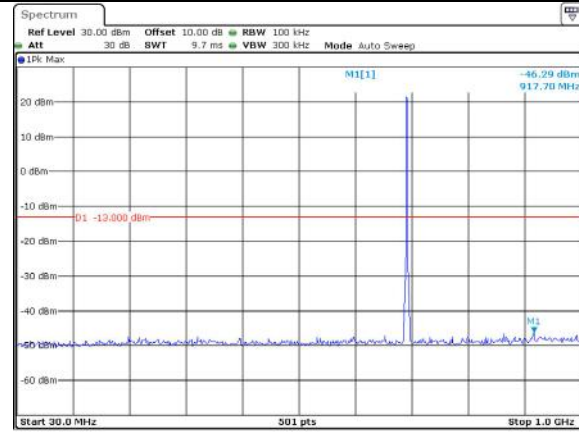
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal

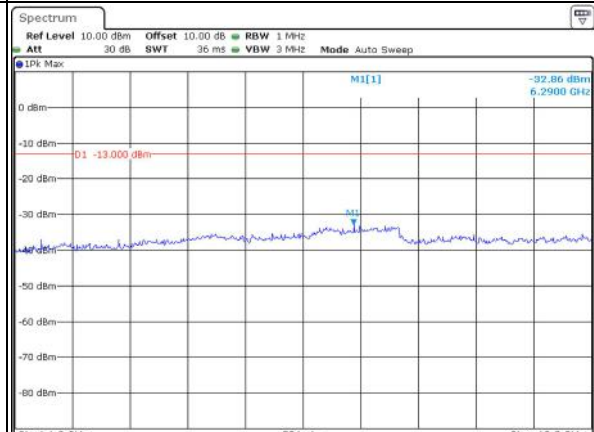
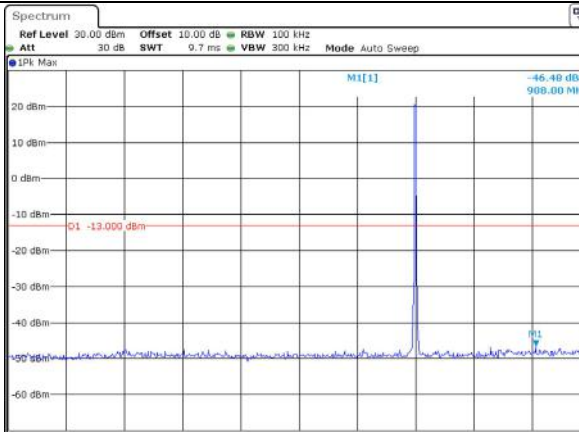
Channel

1.4MHz Bandwidth QPSK

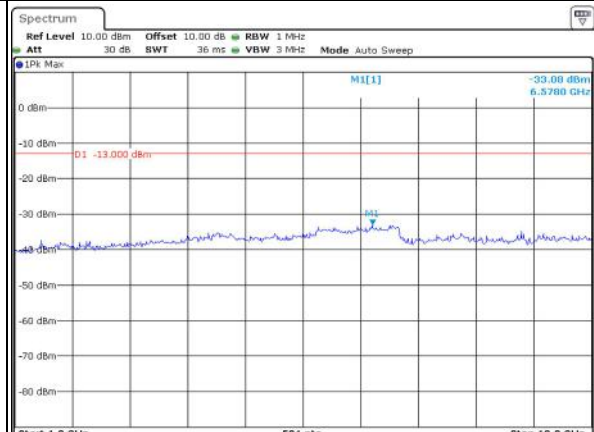
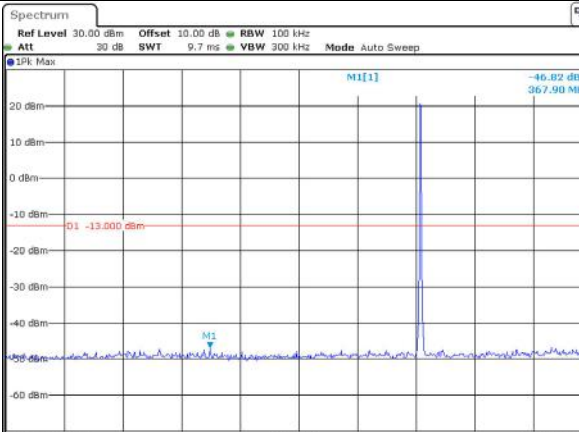
Lowest



Middle



Highest

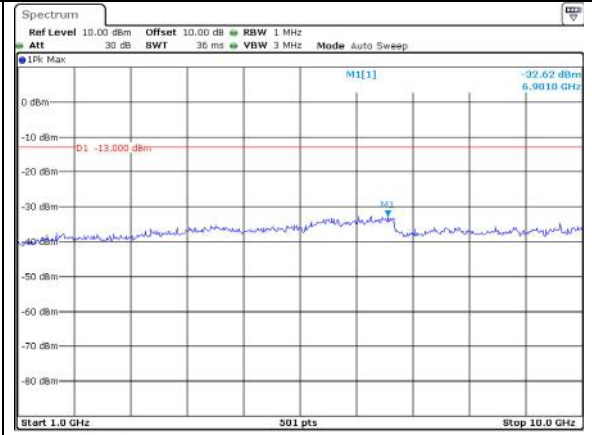
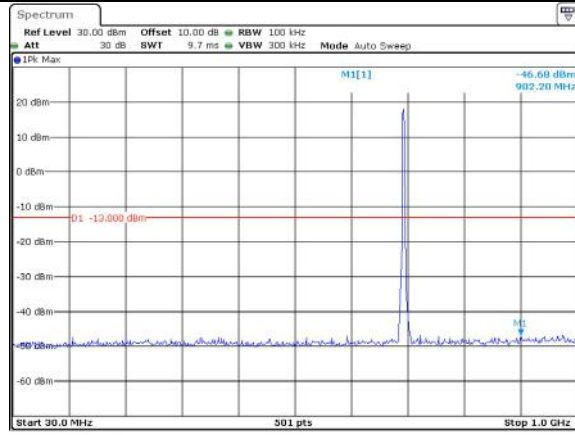


Spurious Emissions at Antenna Terminal

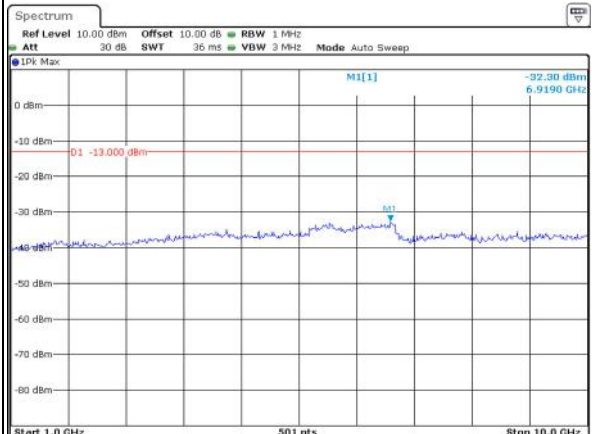
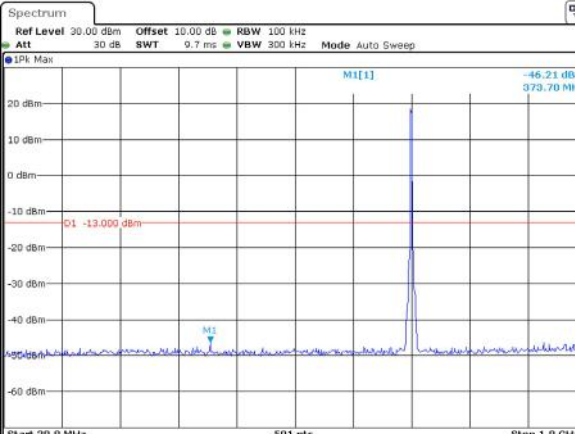
Channel

3MHz Bandwidth QPSK

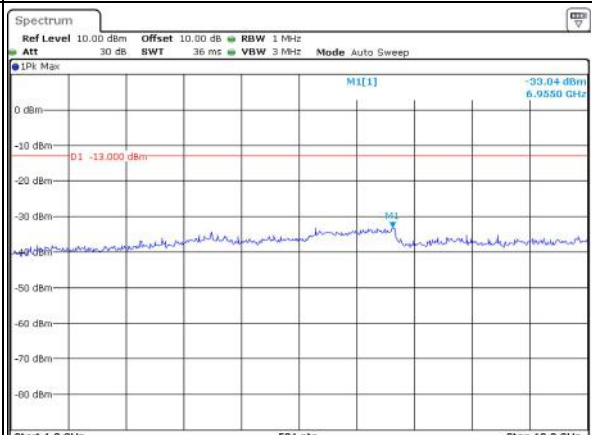
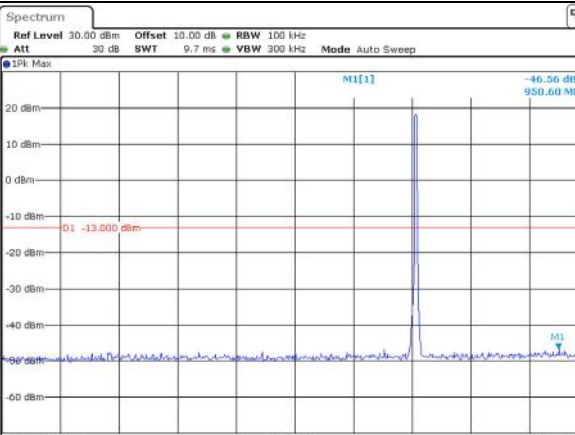
Lowest



Middle



Highest

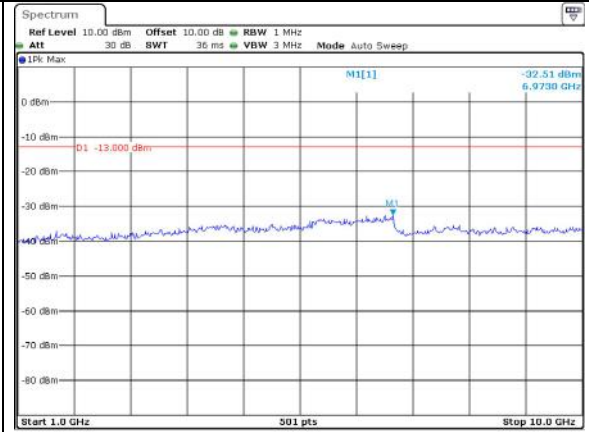
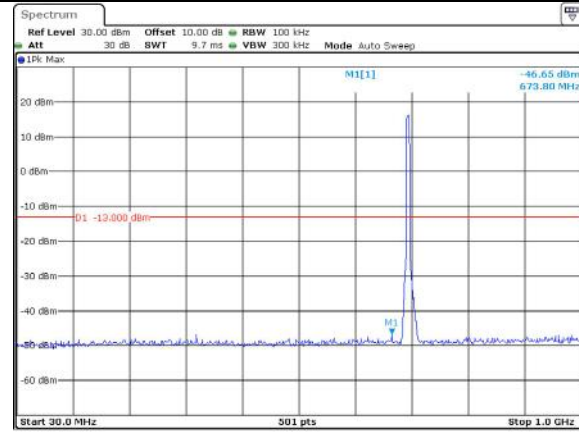


Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK

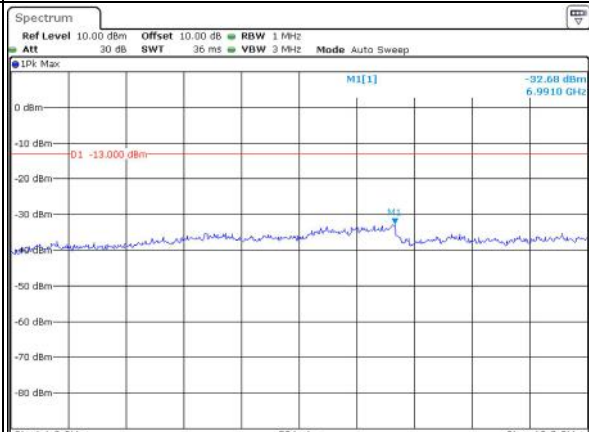
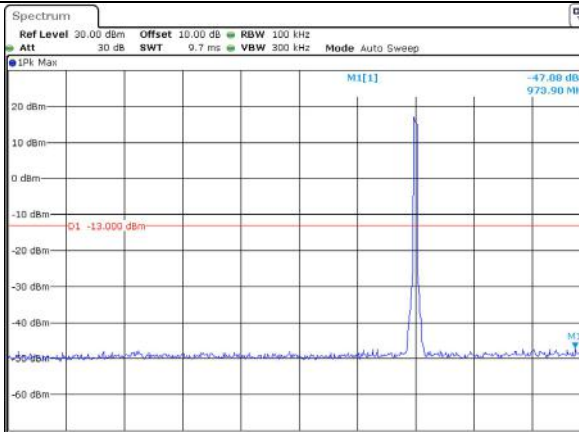
Lowest



ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:40:24

ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:40:53

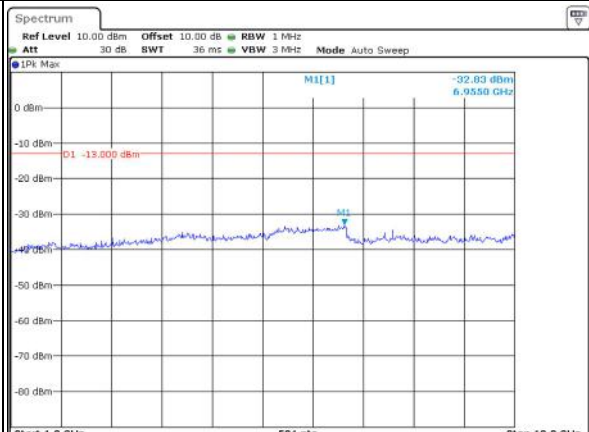
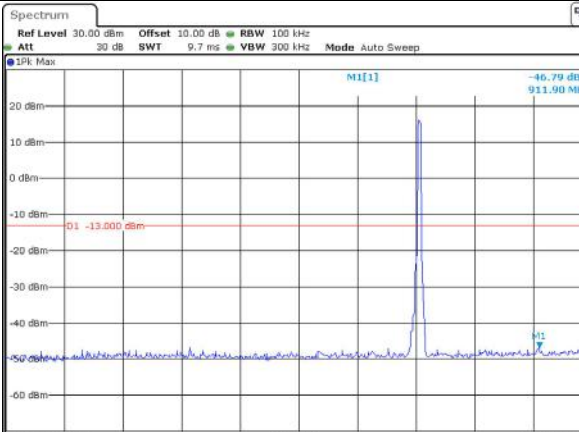
Middle



ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:41:21

ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:41:44

Highest



ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:42:15

ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:42:41

Spurious Emissions at Antenna Terminal

Channel	10MHz Bandwidth QPSK	
Lowest	<p>Ref Level 30.00 dBm Offset 10.00 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>Peak: M1[1] -46.99 dBm @ 964.20 MHz</p> <p>Reference: D1 -13.000 dBm</p> <p>Start 30.0 MHz Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 14:43:36</p>	<p>Ref Level 10.00 dBm Offset 10.00 dB RBW 1 MHz Att 30 dB SWT 36 ms VBW 3 MHz Mode Auto Sweep</p> <p>Peak: M1[1] -32.84 dBm @ 6.5600 GHz</p> <p>Reference: D1 -13.000 dBm</p> <p>Start 1.0 GHz Stop 10.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 14:44:02</p>
Middle	<p>Ref Level 30.00 dBm Offset 10.00 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>Peak: M1[1] -46.80 dBm @ 968.10 MHz</p> <p>Reference: D1 -13.000 dBm</p> <p>Start 30.0 MHz Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 14:44:30</p>	<p>Ref Level 10.00 dBm Offset 10.00 dB RBW 1 MHz Att 30 dB SWT 36 ms VBW 3 MHz Mode Auto Sweep</p> <p>Peak: M1[1] -32.52 dBm @ 6.8650 GHz</p> <p>Reference: D1 -13.000 dBm</p> <p>Start 1.0 GHz Stop 10.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 14:44:50</p>
Highest	<p>Ref Level 30.00 dBm Offset 10.00 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>Peak: M1[1] -46.57 dBm @ 911.90 MHz</p> <p>Reference: D1 -13.000 dBm</p> <p>Start 30.0 MHz Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 14:45:24</p>	<p>Ref Level 10.00 dBm Offset 10.00 dB RBW 1 MHz Att 30 dB SWT 36 ms VBW 3 MHz Mode Auto Sweep</p> <p>Peak: M1[1] -32.46 dBm @ 6.9370 GHz</p> <p>Reference: D1 -13.000 dBm</p> <p>Start 1.0 GHz Stop 10.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 14:45:48</p>



Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:59:26</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:59:42</p>
QPSK 3MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:00:25</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:00:42</p>
QPSK 5MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:01:27</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:01:45</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 10MHz	<p>ProjectNo.:CR230848964 Testee:Len Huang Date: 9.SEP.2023 15:02:32</p>	<p>ProjectNo.:CR230848964 Testee:Len Huang Date: 9.SEP.2023 15:02:33</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:59:33</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:59:30</p>
16QAM 3MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:00:33</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:00:50</p>
16QAM 5MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:01:36</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:01:54</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 10MHz	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:02:43</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 15:03:03</p>

**4.11 Antenna Port Test Data and Results for LTE Band 17**

Serial Number:	2A93-1	Test Date:	2023/9/9
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	28.3	Relative Humidity: (%)	46	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	FSV40-N	102259	2023/4/18	2024/4/17
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
Weinschel	Power Splitter	1515	RA914	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	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).

**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	22.76	22.77	22.73	15.10	34.77
	RB1#13	22.79	22.85	22.83		
	RB1#24	22.72	22.70	22.68		
	RB15#0	21.82	21.83	21.76		
	RB15#10	21.82	21.82	21.73		
	RB25#0	21.79	21.81	21.75		
5MHz 16QAM	RB1#0	21.81	21.64	21.98	14.35	34.77
	RB1#13	21.91	21.73	22.10		
	RB1#24	21.81	21.58	21.90		
	RB15#0	20.87	20.86	20.75		
	RB15#10	20.83	20.84	20.70		
	RB25#0	20.80	20.84	20.74		
10MHz QPSK	RB1#0	22.82	22.83	22.79	15.23	34.77
	RB1#25	22.98	22.95	22.92		
	RB1#49	22.78	22.77	22.74		
	RB25#0	21.84	21.87	21.86		
	RB25#25	21.83	21.78	21.80		
	RB50#0	21.85	21.82	21.87		
10MHz 16QAM	RB1#0	21.96	21.81	22.35	14.70	34.77
	RB1#25	22.04	21.94	22.45		
	RB1#49	21.85	21.74	22.24		
	RB25#0	20.85	20.96	20.92		
	RB25#25	20.80	20.83	20.85		
	RB50#0	20.87	20.86	20.86		

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	4.99	4.75	4.93	13
	RB50#0	5.13	5.10	5.07	13
10MHz 16QAM	RB1#0	6.00	5.45	6.00	13
	RB50#0	6.14	6.06	6.03	13
				<b>Result:</b>	<b>Pass</b>

**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	4.551	5.200	5.180	5.220
5MHz 16QAM	4.531	4.551	4.531	5.160	5.220	5.180
10MHz QPSK	8.982	8.982	8.942	9.880	9.960	9.800
10MHz 16QAM	8.982	8.942	8.942	9.960	9.880	9.800

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

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

<b>Result:</b>	<b>Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.</b>
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**FCC §2.1051, §27.53: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>
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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 <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	704.296	704.00	715.851	716.00
	-20	3.85	704.252	704.00	715.763	716.00
	-10	3.85	704.299	704.00	715.875	716.00
	0	3.85	704.205	704.00	715.875	716.00
	10	3.85	704.254	704.00	715.791	716.00
	20	3.85	704.122	704.00	715.750	716.00
	30	3.85	704.250	704.00	715.808	716.00
	40	3.85	704.245	704.00	715.839	716.00
Frequency Stability vs. Voltage	20	3.35	704.338	704.00	715.877	716.00
	20	4.4	704.339	704.00	715.826	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	3.85	704.193	704.00	715.864	716.00
	-20	3.85	704.120	704.00	715.843	716.00
	-10	3.85	704.271	704.00	715.760	716.00
	0	3.85	704.161	704.00	715.809	716.00
	10	3.85	704.313	704.00	715.761	716.00
	20	3.85	704.137	704.00	715.787	716.00
	30	3.85	704.327	704.00	715.861	716.00
	40	3.85	704.247	704.00	715.872	716.00
	50	3.85	704.198	704.00	715.832	716.00
Frequency Stability vs. Voltage	20	3.35	704.210	704.00	715.742	716.00
	20	4.4	704.333	704.00	715.838	716.00
					<b>Result:</b>	<b>Pass</b>



**Test Plots** (Note: The 10 dB is the Insertion loss of the RF cable and Power Splitter, 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.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:00:17</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:00:35</p>
<b>Middle</b>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:01:00</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:01:19</p>
<b>Highest</b>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:01:44</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:02:12</p>

Occupied Bandwidth

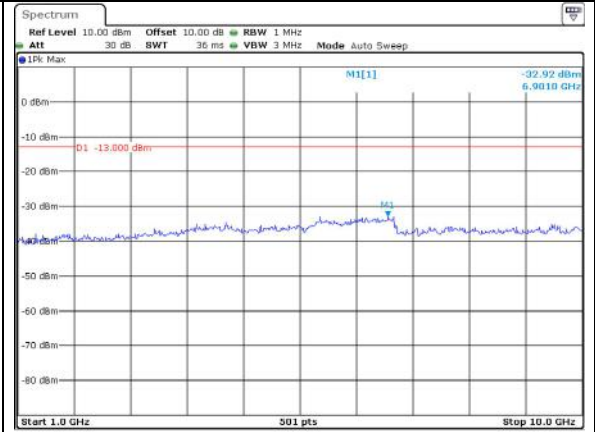
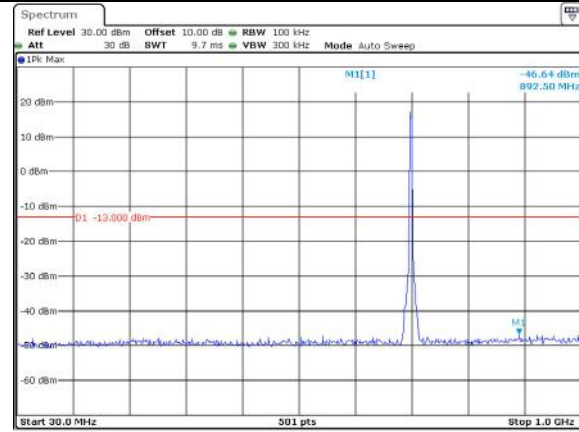
Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK

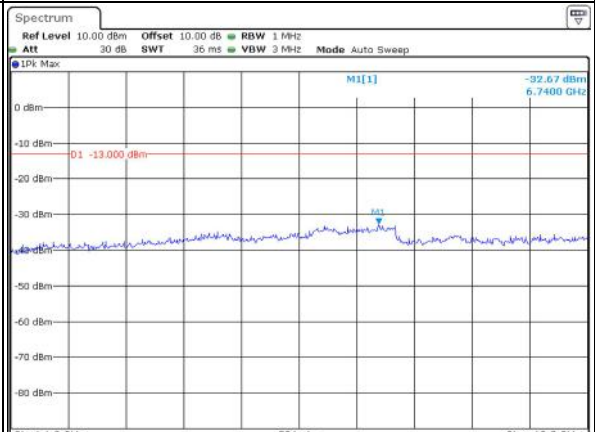
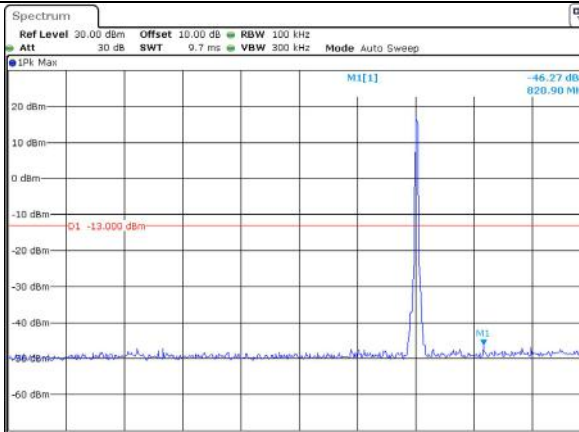
Lowest



ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:46:14

ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:47:17

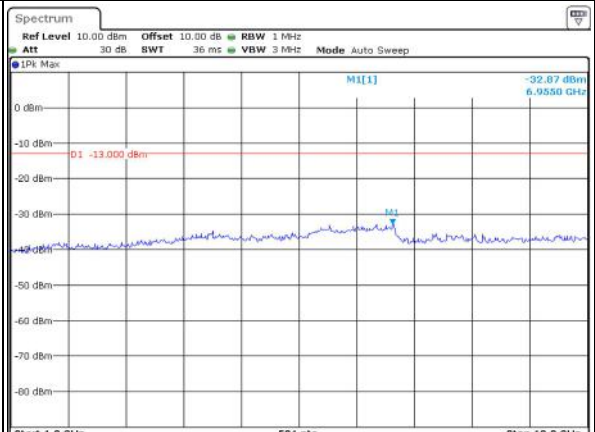
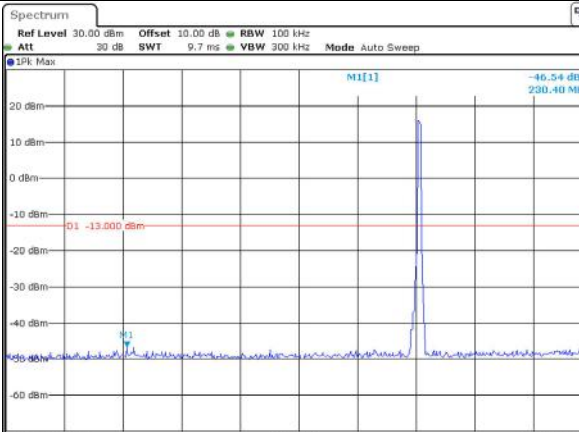
Middle



ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:47:45

ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:48:00

Highest



ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:48:45

ProjectNo.:CR230848964 Tester:Len Huang  
Date: 9.SEP.2023 14:49:11

Spurious Emissions at Antenna Terminal

Channel	10MHz Bandwidth QPSK	
Lowest	<p>Ref Level 30.00 dBm Offset 10.00 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -47.25 dBm 795.70 MHz</p> <p>D1 -13.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:50:07</p>	<p>Ref Level 10.00 dBm Offset 10.00 dB RBW 1 MHz Att 30 dB SWT 36 ms VBW 3 MHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -33.01 dBm 6.9730 GHz</p> <p>D1 -13.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 10.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:50:33</p>
Middle	<p>Ref Level 30.00 dBm Offset 10.00 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -47.04 dBm 625.40 MHz</p> <p>D1 -13.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:51:04</p>	<p>Ref Level 10.00 dBm Offset 10.00 dB RBW 1 MHz Att 30 dB SWT 36 ms VBW 3 MHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -32.29 dBm 6.4520 GHz</p> <p>D1 -13.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 10.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:51:27</p>
Highest	<p>Ref Level 30.00 dBm Offset 10.00 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -45.66 dBm 964.20 MHz</p> <p>D1 -13.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:52:05</p>	<p>Ref Level 10.00 dBm Offset 10.00 dB RBW 1 MHz Att 30 dB SWT 36 ms VBW 3 MHz Mode Auto Sweep</p> <p>1Pk Max M1[1] -32.29 dBm 6.4520 GHz</p> <p>D1 -13.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 10.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 14:52:31</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 5MHz		
QPSK 10MHz		
16QAM 5MHz		

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 10MHz		

**4.12 Antenna Port Test Data and Results for LTE Band 38**

Serial Number:	2A93-1	Test Date:	2023/9/9~2023/9/11
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	28.3~29	Relative Humidity: (%)	43~46	ATM Pressure: (kPa)	100.2~101
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**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40-N	102259	2023/4/18	2024/4/17
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
Weinschel	Power Splitter	1515	RA914	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	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).

**Test Frequency For Each Mode:**

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
5MHz	2572.5	2595	2617.5
10MHz	2575	2595	2615
15MHz	2577.5	2595	2612.5
20MHz	2580	2595	2610

**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	23.51	23.61	23.36	23.30	33
	RB1#13	23.61	23.70	23.45		
	RB1#24	23.53	23.54	23.35		
	RB15#0	22.55	22.66	22.40		
	RB15#10	22.62	22.67	22.42		
	RB25#0	22.57	22.63	22.40		
5MHz 16QAM	RB1#0	22.50	22.64	22.61	22.36	33
	RB1#13	22.60	22.76	22.69		
	RB1#24	22.53	22.59	22.61		
	RB15#0	21.48	21.64	21.42		
	RB15#10	21.53	21.65	21.45		
	RB25#0	21.58	21.64	21.35		
10MHz QPSK	RB1#0	23.65	23.66	23.48	23.55	33
	RB1#25	23.92	23.95	23.76		
	RB1#49	23.67	23.61	23.50		
	RB25#0	22.64	22.67	22.54		
	RB25#25	22.63	22.71	22.50		
	RB50#0	22.64	22.71	22.49		
10MHz 16QAM	RB1#0	22.74	22.86	22.41	22.77	33
	RB1#25	23.00	23.17	22.65		
	RB1#49	22.75	22.81	22.43		
	RB25#0	21.63	21.66	21.52		
	RB25#25	21.64	21.69	21.51		
	RB50#0	21.66	21.66	21.48		
15MHz QPSK	RB1#0	23.54	23.58	23.42	23.30	33
	RB1#38	23.70	23.68	23.49		
	RB1#74	23.56	23.51	23.43		
	RB36#0	22.69	22.68	22.53		
	RB36#39	22.69	22.74	22.57		
	RB75#0	22.71	22.73	22.57		
15MHz 16QAM	RB1#0	22.74	22.78	22.33	22.47	33
	RB1#38	22.87	22.86	22.48		
	RB1#74	22.75	22.72	22.31		
	RB36#0	21.64	21.65	21.46		
	RB36#39	21.75	21.64	21.46		
	RB75#0	21.64	21.65	21.50		



20MHz QPSK	RB1#0	23.31	23.51	23.27	23.57	33
	RB1#50	23.83	23.97	23.78		
	RB1#99	23.29	23.42	23.26		
	RB50#0	22.55	22.57	22.45		
	RB50#50	22.58	22.61	22.44		
	RB100#0	22.56	22.58	22.46		
20MHz 16QAM	RB1#0	22.32	22.71	22.29	22.80	33
	RB1#50	22.84	23.20	22.83		
	RB1#99	22.29	22.64	22.33		
	RB50#0	21.59	21.57	21.46		
	RB50#50	21.62	21.60	21.43		
	RB100#0	21.54	21.57	21.45		

Note: EIRP=Conducted Power(dBm) - Lc(dB) + G<sub>T</sub>(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	8.61	8.81	8.61	13
	RB100#0	8.20	8.81	8.67	13
20MHz 16QAM	RB1#0	8.58	8.41	8.87	13
	RB100#0	8.32	8.81	8.55	13
<b>Result:</b>					<b>Pass</b>

#### 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	4.491	5.000	4.960	5.260
5MHz 16QAM	4.491	4.491	4.511	4.920	4.940	4.940
10MHz QPSK	8.942	8.942	8.942	9.760	9.600	9.680
10MHz 16QAM	8.942	8.942	8.942	9.840	9.480	9.520
15MHz QPSK	13.473	13.413	13.473	14.580	14.640	14.640
15MHz 16QAM	13.533	13.533	13.473	15.000	14.760	14.700
20MHz QPSK	17.964	18.044	17.884	19.280	19.440	19.200
20MHz 16QAM	17.884	17.964	17.884	19.200	19.280	19.520

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

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

<b>Result:</b>	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.**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 <sub>DC</sub> )	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	2570.152	2570.00	2619.734	2620
	-20	3.85	2570.180	2570.00	2619.773	2620
	-10	3.85	2570.254	2570.00	2619.784	2620
	0	3.85	2570.177	2570.00	2619.797	2620
	10	3.85	2570.291	2570.00	2619.828	2620
	20	3.85	2570.136	2570.00	2619.782	2620
	30	3.85	2570.216	2570.00	2619.839	2620
	40	3.85	2570.245	2570.00	2619.828	2620
Frequency Stability vs. Voltage	20	3.35	2570.182	2570.00	2619.746	2620
	20	4.4	2570.250	2570.00	2619.732	2620
<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	3.85	2570.175	2570.00	2619.730	2620
	-20	3.85	2570.149	2570.00	2619.854	2620
	-10	3.85	2570.281	2570.00	2619.773	2620
	0	3.85	2570.302	2570.00	2619.753	2620
	10	3.85	2570.232	2570.00	2619.723	2620
	20	3.85	2570.140	2570.00	2619.849	2620
	30	3.85	2570.297	2570.00	2619.830	2620
	40	3.85	2570.189	2570.00	2619.776	2620
Frequency Stability vs. Voltage	20	3.35	2570.170	2570.00	2619.851	2620
	20	4.4	2570.304	2570.00	2619.738	2620
<b>Result:</b>					<b>Pass</b>	

**Test Plots**(Note: The 10.5dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

**Occupied Bandwidth**

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth

Channel	15MHz Bandwidth QPSK	15MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Occupied Bandwidth

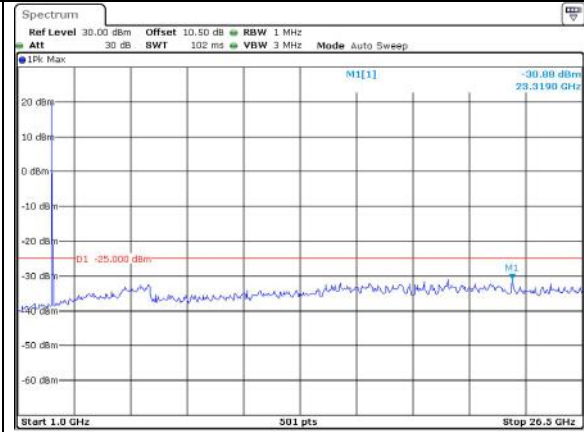
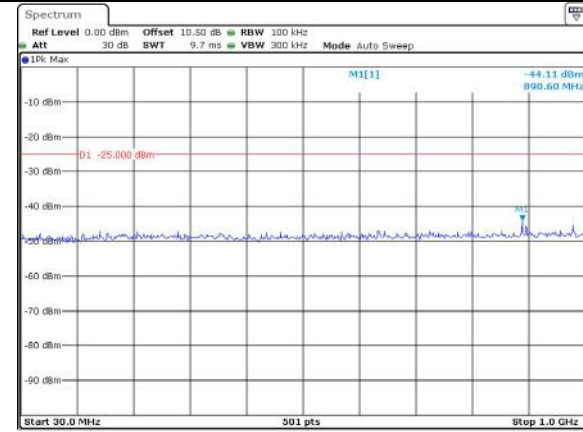
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal

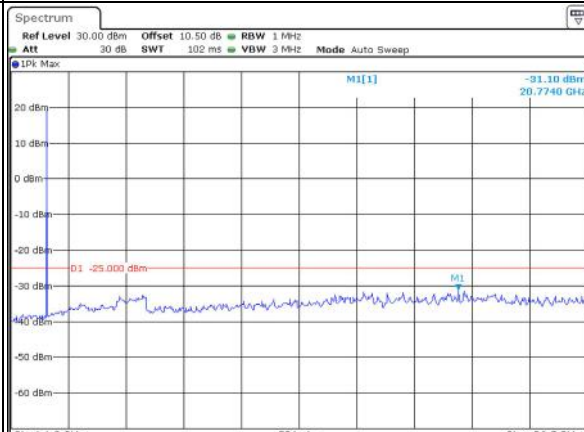
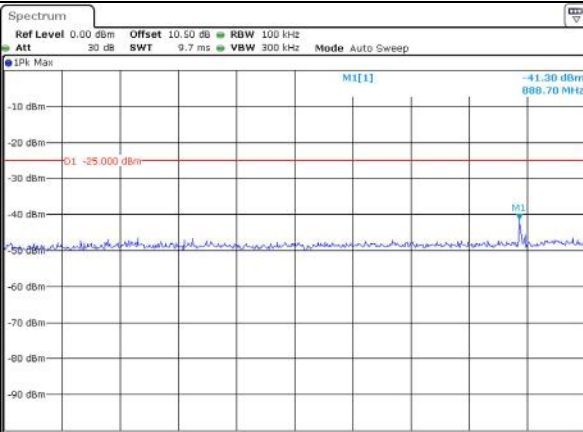
Channel

5MHz Bandwidth QPSK

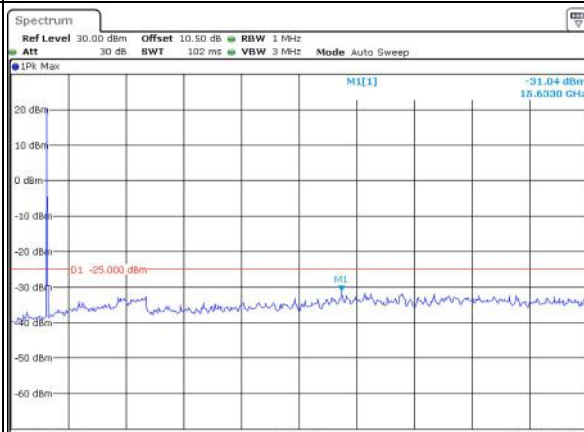
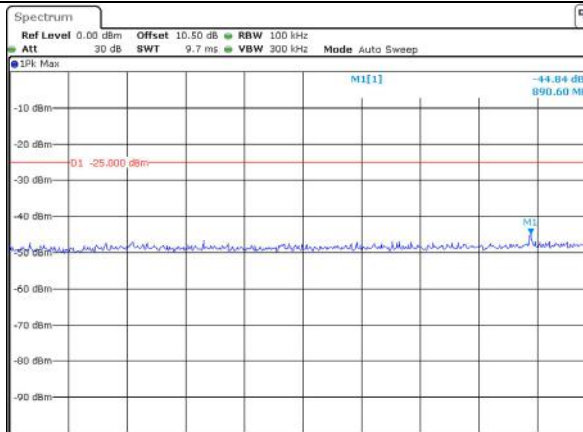
Lowest



Middle



Highest



Spurious Emissions at Antenna Terminal

Channel	10MHz Bandwidth QPSK	
Lowest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 11:56:16</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 11:57:19</p>
Middle	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 11:57:47</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 11:58:10</p>
Highest	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 11:58:48</p>	<p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9_SEP.2023 11:59:11</p>



### Spurious Emissions at Antenna Terminal

Channel	15MHz Bandwidth QPSK	
Lowest	<p>Ref Level 0.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>IPk Max M1[1] -46.62 dBm 915.80 MHz</p> <p>-25.00 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:09:27</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep</p> <p>IPk Max M1[1] -31.57 dBm 22.6579 GHz</p> <p>-25.00 dBm</p> <p>Start 1.0 GHz 501 pts Stop 26.5 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:09:53</p>
Middle	<p>Ref Level 0.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>IPk Max M1[1] -45.92 dBm 933.20 MHz</p> <p>-25.00 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:01:27</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep</p> <p>IPk Max M1[1] -31.78 dBm 18.2290 GHz</p> <p>-25.00 dBm</p> <p>Start 1.0 GHz 501 pts Stop 26.5 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:01:53</p>
Highest	<p>Ref Level 0.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>IPk Max M1[1] -46.16 dBm 728.00 MHz</p> <p>-25.00 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:02:30</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep</p> <p>IPk Max M1[1] -31.03 dBm 18.3310 GHz</p> <p>-25.00 dBm</p> <p>Start 1.0 GHz 501 pts Stop 26.5 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:02:50</p>

### Spurious Emissions at Antenna Terminal

Channel	20MHz Bandwidth QPSK	
Lowest	<p>Ref Level 0.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max MI[1] -46.10 dBm 401.80 MHz</p> <p>D1 -25.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:03:50</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep</p> <p>1Pk Max MI[1] -31.46 dBm 18.2889 GHz</p> <p>D1 -25.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 26.5 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:04:13</p>
Middle	<p>Ref Level 0.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max MI[1] -46.51 dBm 993.50 MHz</p> <p>D1 -25.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:04:50</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep</p> <p>1Pk Max MI[1] -31.99 dBm 15.1750 GHz</p> <p>D1 -25.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 26.5 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:05:19</p>
Highest	<p>Ref Level 0.00 dBm Offset 10.50 dB RBW 100 kHz Att 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep</p> <p>1Pk Max MI[1] -46.09 dBm 973.90 MHz</p> <p>D1 -25.000 dBm</p> <p>Start 30.0 MHz 501 pts Stop 1.0 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:05:56</p>	<p>Ref Level 30.00 dBm Offset 10.50 dB RBW 1 MHz Att 30 dB SWT 102 ms VBW 3 MHz Mode Auto Sweep</p> <p>1Pk Max MI[1] -31.39 dBm 16.9570 GHz</p> <p>D1 -25.000 dBm</p> <p>Start 1.0 GHz 501 pts Stop 26.5 GHz</p> <p>ProjectNo.:CR230848964 Tester:Len Huang Date: 9.SEP.2023 12:06:19</p>

Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 5MHz		
QPSK 10MHz		
QPSK 15MHz		

Out of band emission, Band Edge

