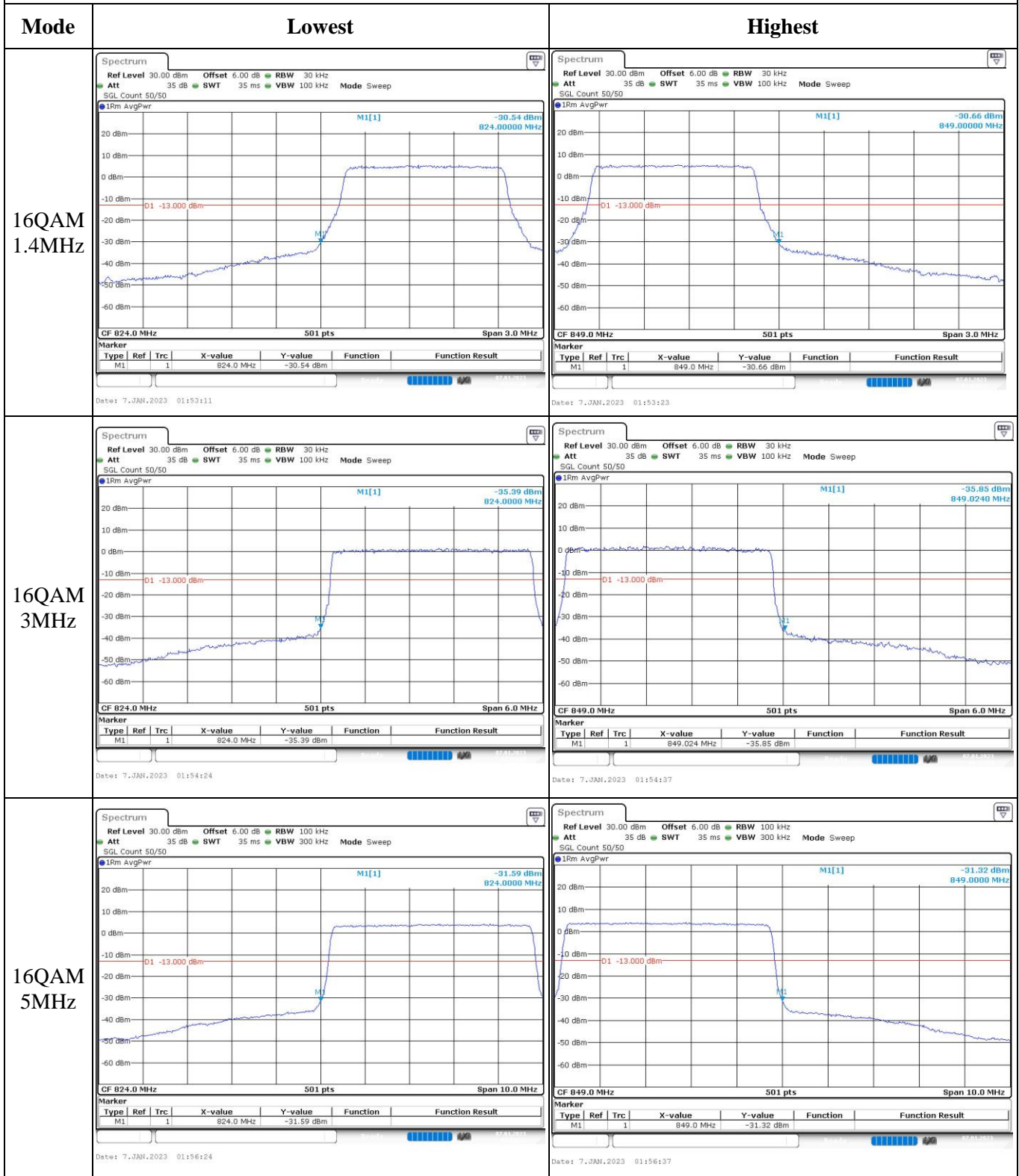
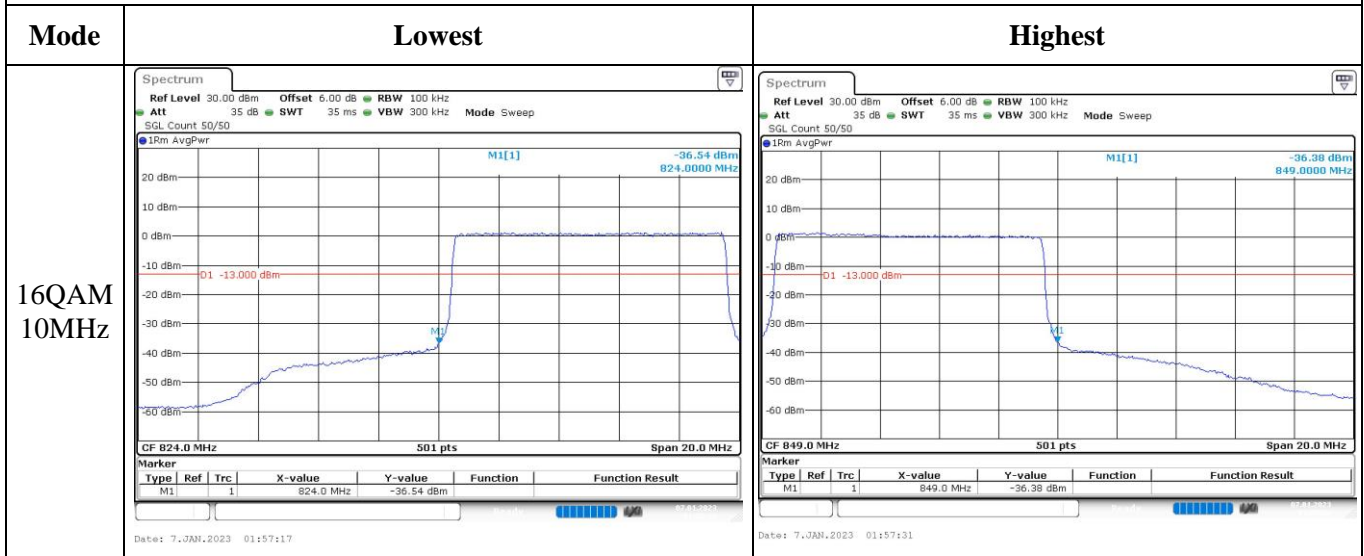


Out of band emission, Band Edge



Out of band emission, Band Edge



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

Serial Number:	1WP8	Test Date:	2023/1/7~2023/1/17
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rinka Li	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	21.4~23.7	Relative Humidity: (%)	45~55	ATM Pressure: (kPa)	101.4~101.6
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**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022/7/15	2023/7/14
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100002	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2022/7/15	2023/7/14
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022/4/6	2023/4/5
UNI-T	Multimeter	UT39A+	C210582554	2022/9/30	2023/9/29
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	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	20.06	19.78	19.4	19.7	33
	RB1#13	20.2	19.8	19.54		
	RB1#24	20.1	19.69	19.46		
	RB15#0	19.12	18.8	18.5		
	RB15#10	19.18	18.81	18.49		
	RB25#0	19.12	18.78	18.48		
5MHz 16QAM	RB1#0	19.44	18.87	18.29	19.06	33
	RB1#13	19.56	18.89	18.39		
	RB1#24	19.36	18.81	18.31		
	RB15#0	18.11	17.85	17.58		
	RB15#10	18.16	17.84	17.52		
	RB25#0	18.14	17.88	17.57		
10MHz QPSK	RB1#0	20.15	19.86	19.51	19.81	33
	RB1#25	20.31	19.89	19.66		
	RB1#49	20.14	19.69	19.5		
	RB25#0	19.15	18.9	18.6		
	RB25#25	19.22	18.81	18.59		
	RB50#0	19.18	18.88	18.58		
10MHz 16QAM	RB1#0	19.18	19.48	18.64	19.04	33
	RB1#25	19.36	19.54	18.76		
	RB1#49	19.18	19.31	18.71		
	RB25#0	18.29	17.98	17.63		
	RB25#25	18.33	17.93	17.65		
	RB50#0	18.25	17.9	17.6		
15MHz QPSK	RB1#0	20.06	19.75	19.46	19.7	33
	RB1#38	20.2	19.83	19.55		
	RB1#74	19.97	19.53	19.42		
	RB36#0	19.11	18.88	18.52		
	RB36#39	19.15	18.77	18.56		
	RB75#0	19.16	18.84	18.52		
15MHz 16QAM	RB1#0	19.53	19.45	18.6	19.09	33
	RB1#38	19.59	19.44	18.64		
	RB1#74	19.41	19.19	18.57		
	RB36#0	18.11	17.9	17.56		
	RB36#39	18.16	17.77	17.53		
	RB75#0	18.15	17.83	17.53		
20MHz QPSK	RB1#0	19.82	19.71	19.38	19.78	33

	RB1#50	20.28	19.93	19.7		
	RB1#99	19.8	19.44	19.3		
	RB50#0	19.04	18.85	18.57		
	RB50#50	19.13	18.71	18.5		
	RB100#0	19.08	18.79	18.52		
20MHz 16QAM	RB1#0	19.48	19.02	18.57	19.38	33
	RB1#50	19.88	19.26	18.95		
	RB1#99	19.41	18.71	18.49		
	RB50#0	18.06	17.87	17.58		
	RB50#50	18.12	17.71	17.5		
	RB100#0	18.13	17.8	17.52		
Note: EIRP=Conducted Power(dBm) - Lc(dB) + G <sub>T</sub> (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	3.77	4.84	4.55	13	
	RB100#0	4.09	3.83	4.09	13	
20MHz 16QAM	RB1#0	4.67	6.26	5.39	13	
	RB100#0	5.71	5.62	5.83	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	4.51	4.49	4.53	4.94	4.94	4.96
5MHz 16QAM	4.53	4.53	4.49	4.94	4.94	4.94
10MHz QPSK	8.94	8.94	8.94	9.6	9.6	9.68
10MHz 16QAM	8.94	8.94	8.94	9.68	9.68	9.52
15MHz QPSK	13.47	13.47	13.47	14.82	14.7	14.82
15MHz 16QAM	13.47	13.47	13.53	14.76	14.64	14.94
20MHz QPSK	17.96	17.96	17.96	19.28	19.36	19.52
20MHz 16QAM	17.96	17.96	17.96	19.36	19.68	19.36
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>

**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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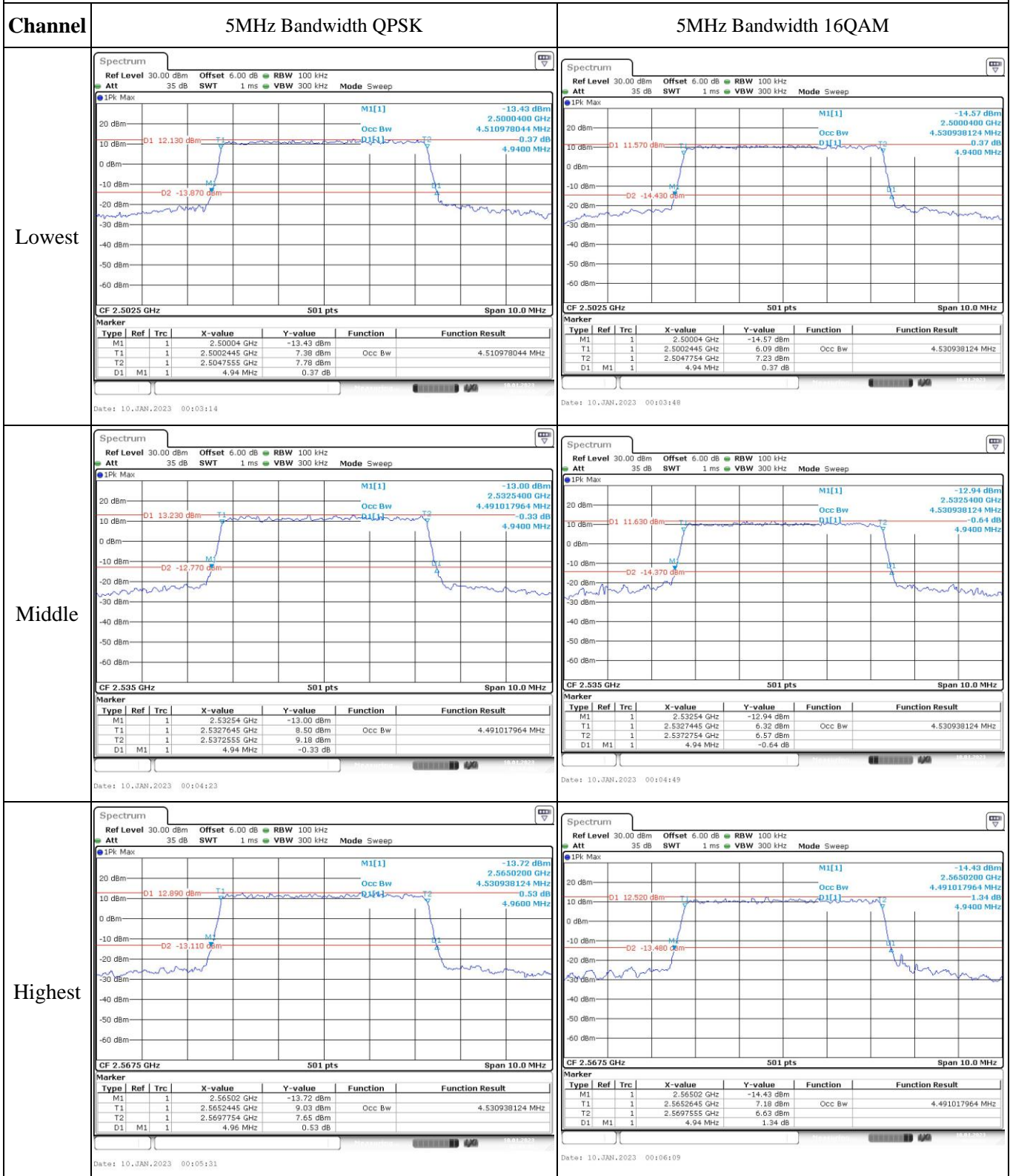
**FCC §2.1055, §27.54: Frequency Stability**

Test Mode:	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	2500.374	2500.00	2569.632	2570
	-20	3.85	2500.370	2500.00	2569.631	2570
	-10	3.85	2500.366	2500.00	2569.631	2570
	0	3.85	2500.363	2500.00	2569.631	2570
	10	3.85	2500.360	2500.00	2569.627	2570
	20	3.85	2500.358	2500.00	2569.622	2570
	30	3.85	2500.356	2500.00	2569.619	2570
	40	3.85	2500.351	2500.00	2569.618	2570
Frequency Stability vs. Voltage	20	3.4	2500.361	2500.00	2569.624	2570
	20	4.4	2500.356	2500.00	2569.620	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	2500.364	2500.00	2569.635	2570
	-20	3.85	2500.363	2500.00	2569.633	2570
	-10	3.85	2500.362	2500.00	2569.628	2570
	0	3.85	2500.362	2500.00	2569.626	2570
	10	3.85	2500.359	2500.00	2569.625	2570
	20	3.85	2500.358	2500.00	2569.622	2570
	30	3.85	2500.357	2500.00	2569.618	2570
	40	3.85	2500.353	2500.00	2569.614	2570
Frequency Stability vs. Voltage	20	3.4	2500.358	2500.00	2569.624	2570
	20	4.4	2500.356	2500.00	2569.620	2570
					<b>Result:</b>	<b>Pass</b>

**Test Plots**(Note: The 6.0 dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

**Occupied Bandwidth**



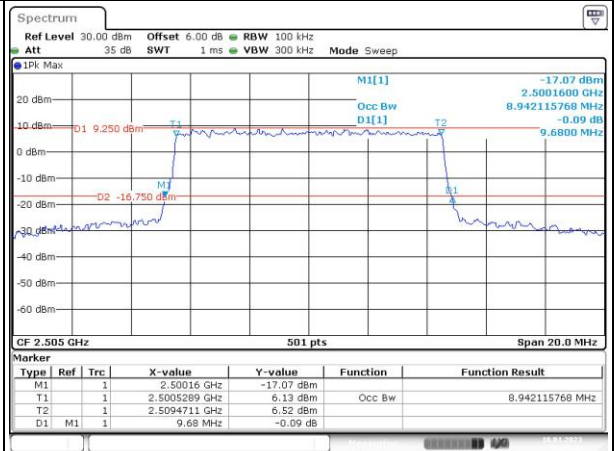
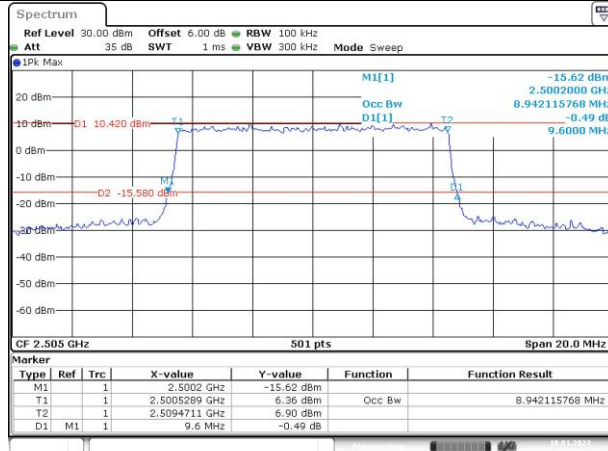
### Occupied Bandwidth

Channel

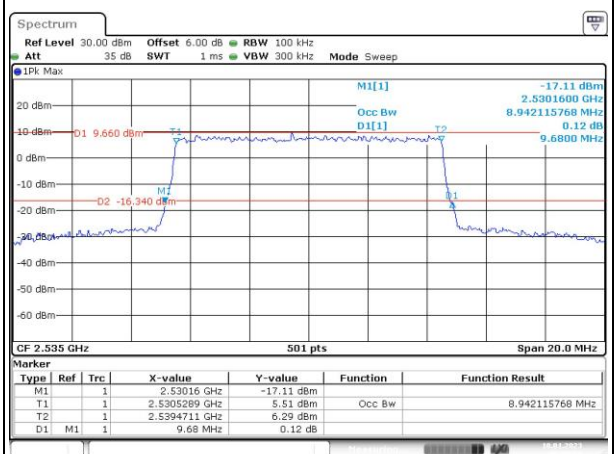
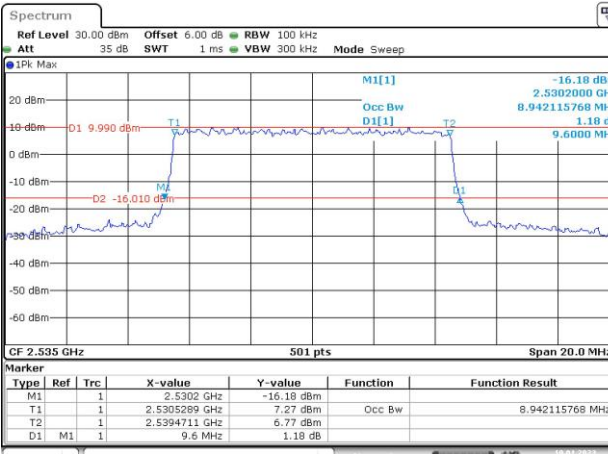
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

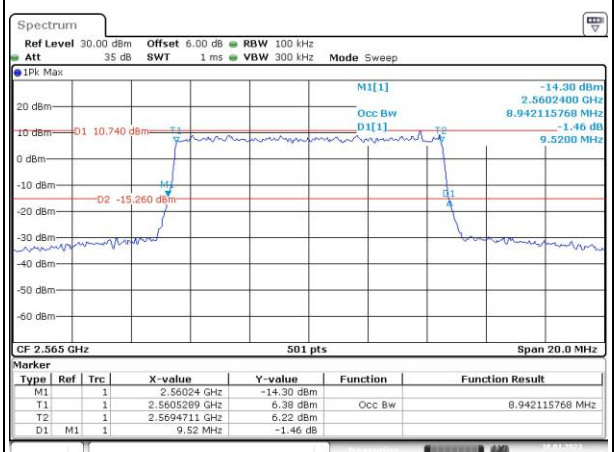
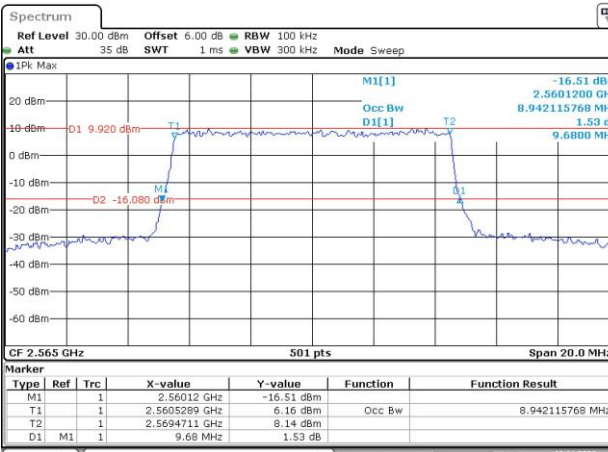
Lowest



Middle



Highest





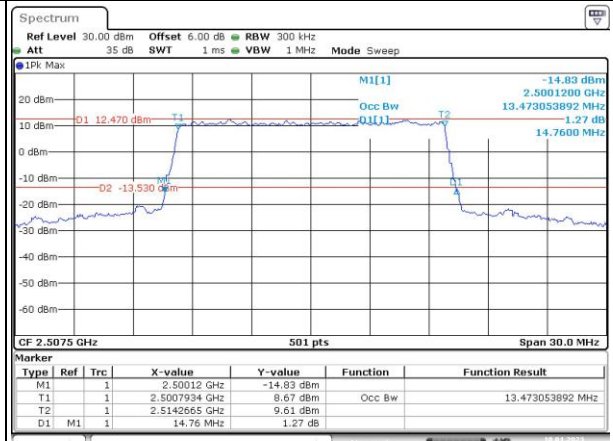
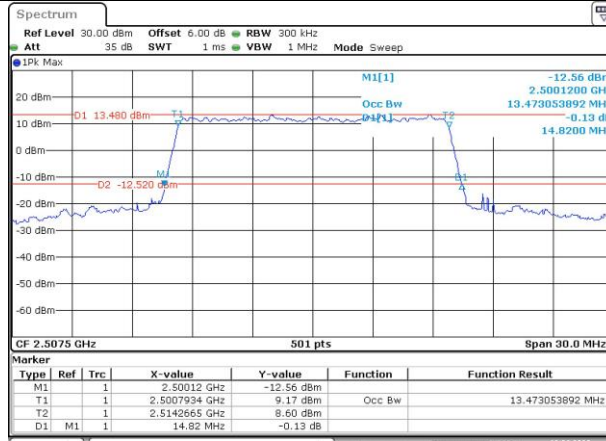
### Occupied Bandwidth

Channel

15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

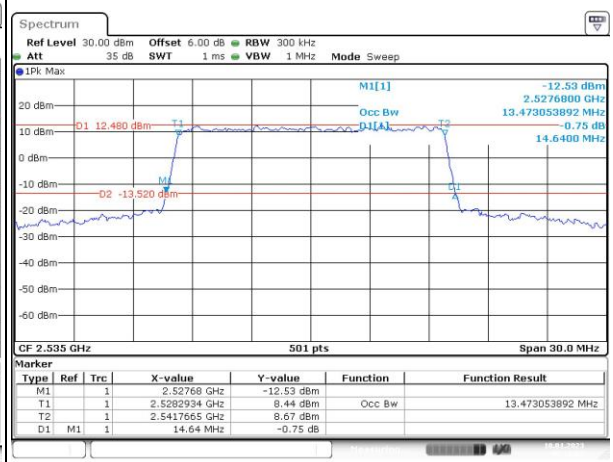
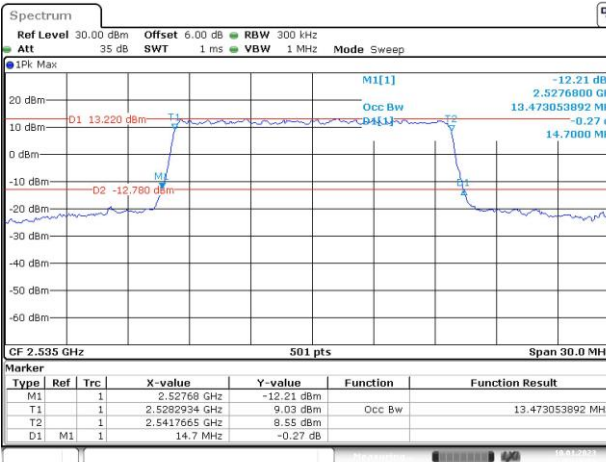
Lowest



Date: 10.JAN.2023 00:15:28

Date: 10.JAN.2023 00:16:00

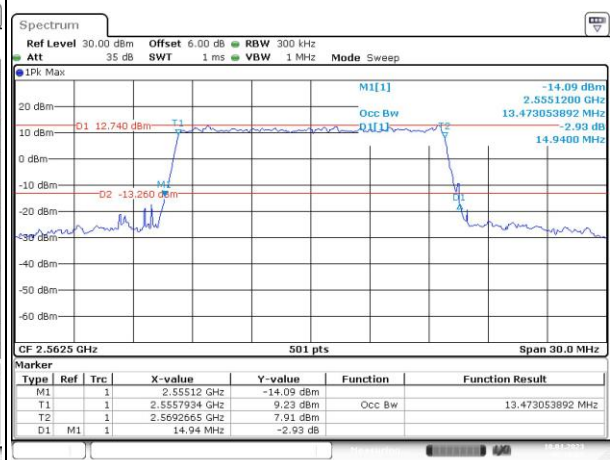
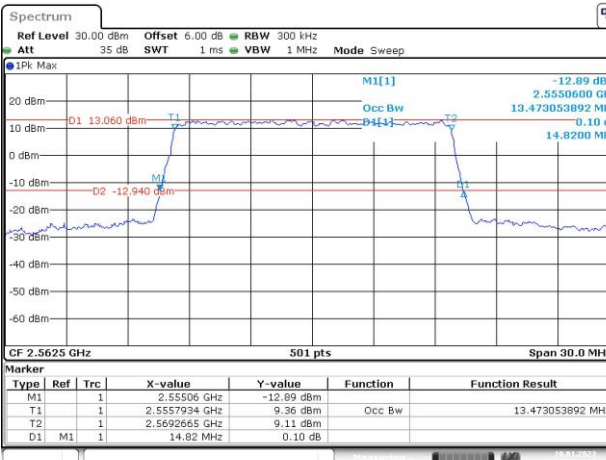
Middle



Date: 10.JAN.2023 00:16:29

Date: 10.JAN.2023 00:16:57

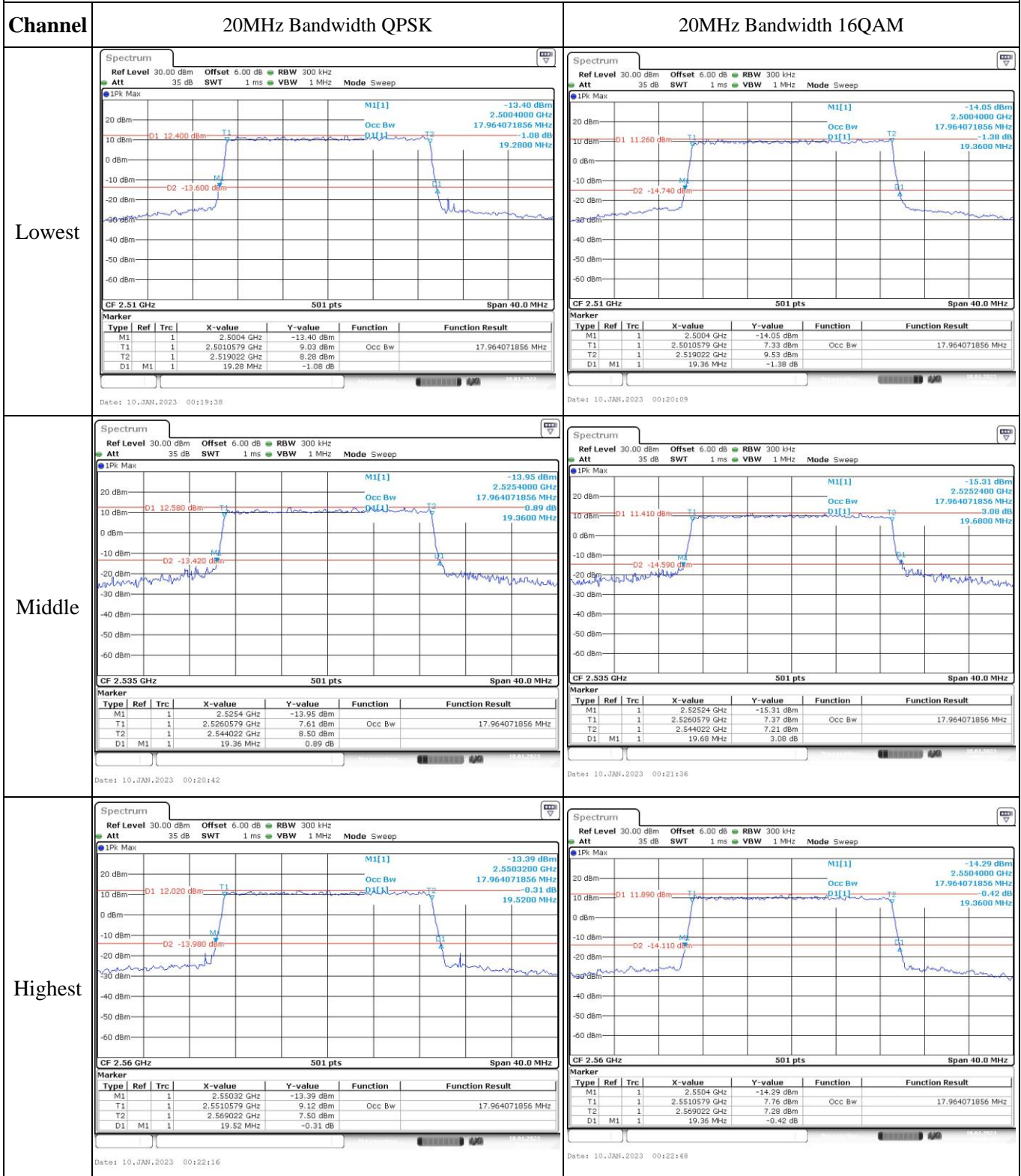
Highest



Date: 10.JAN.2023 00:17:34

Date: 10.JAN.2023 00:18:05

### Occupied Bandwidth

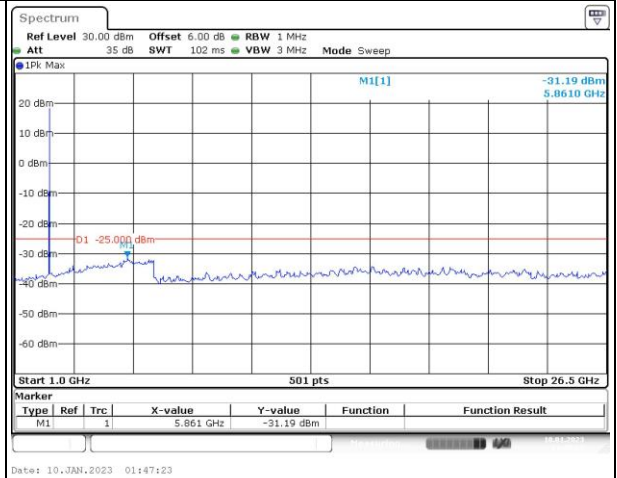
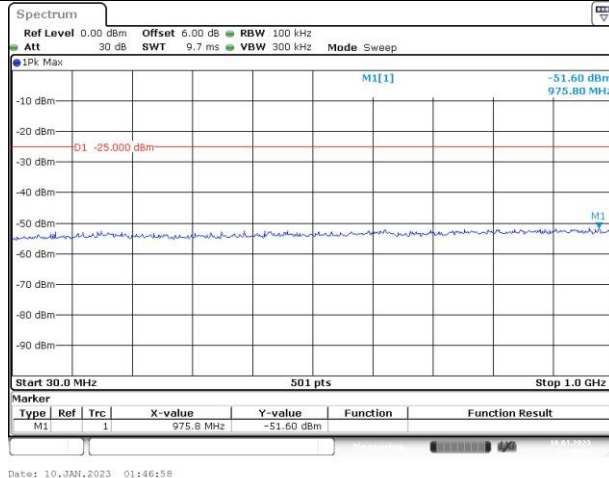


### Spurious Emissions at Antenna Terminal

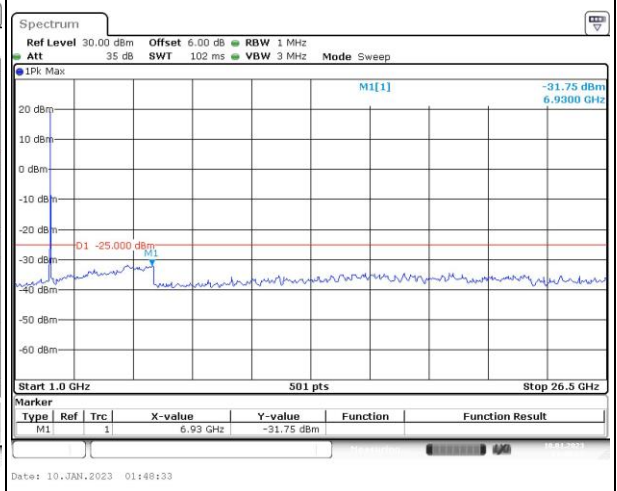
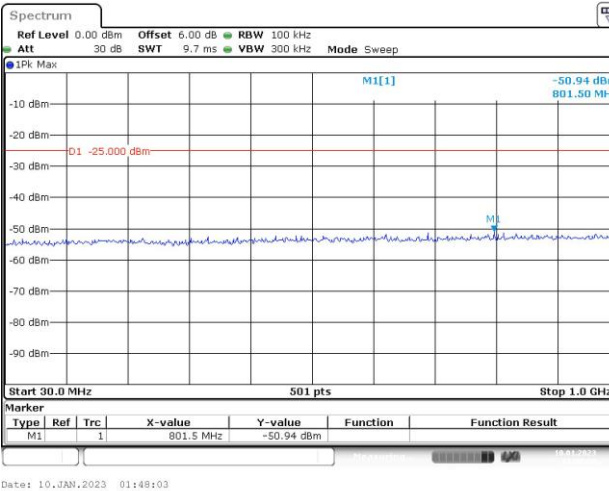
Channel

5MHz Bandwidth QPSK

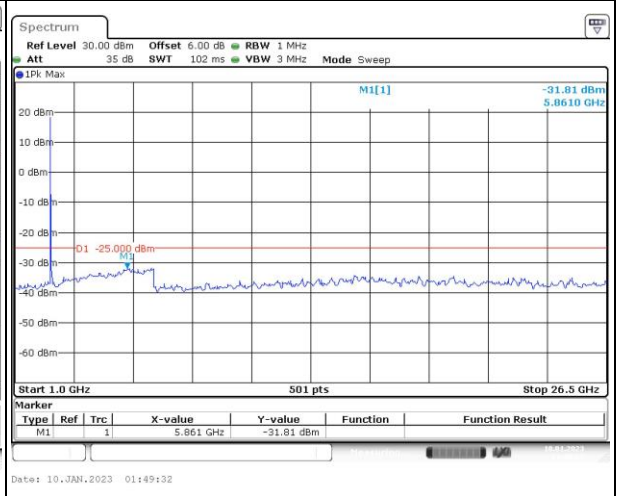
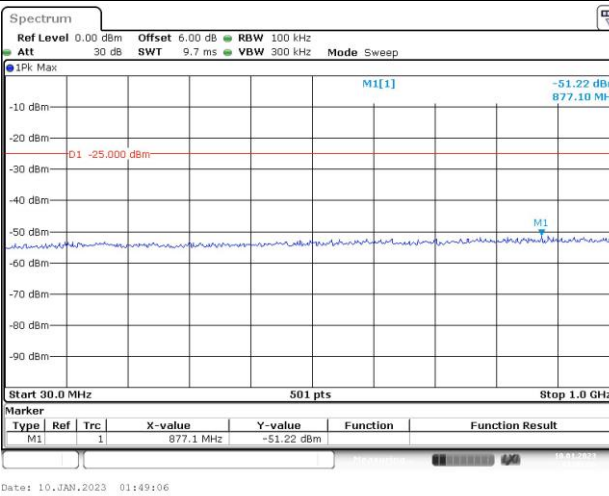
Lowest



Middle



Highest

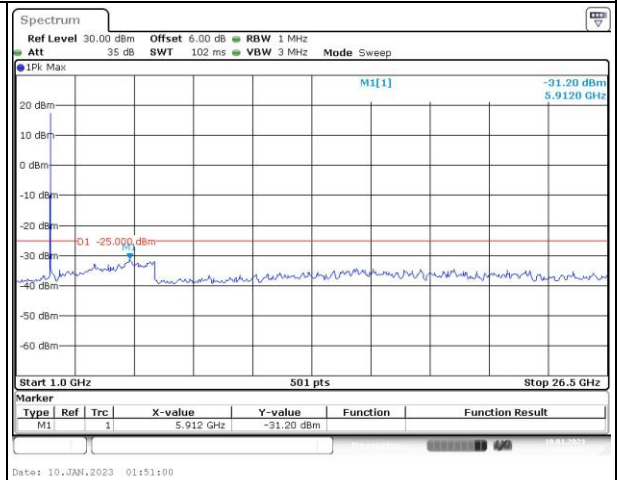
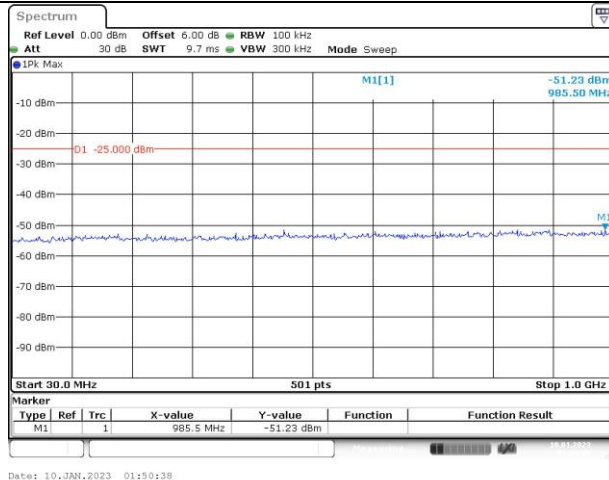


### Spurious Emissions at Antenna Terminal

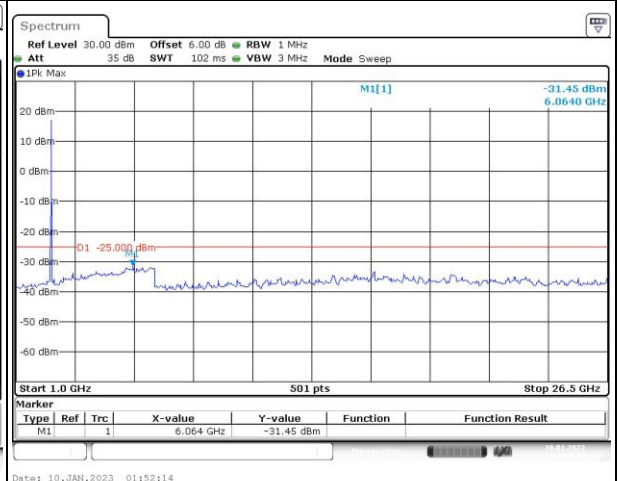
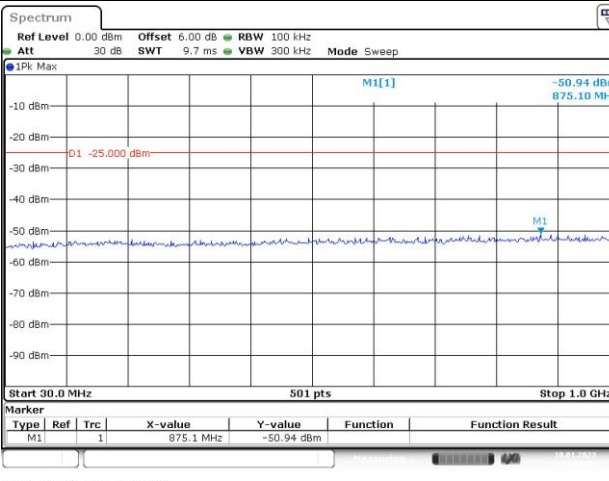
Channel

10MHz Bandwidth QPSK

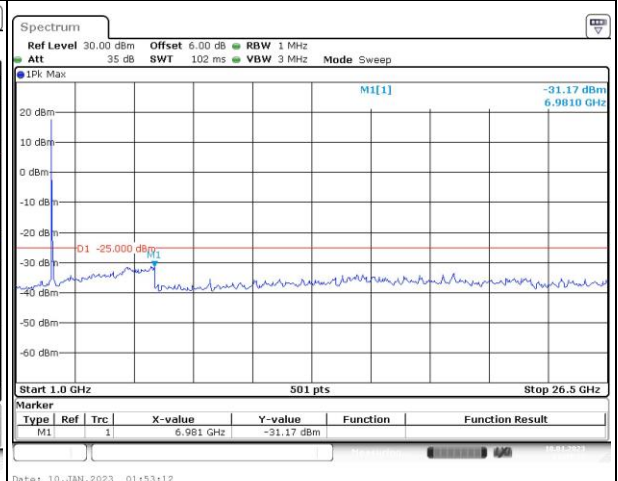
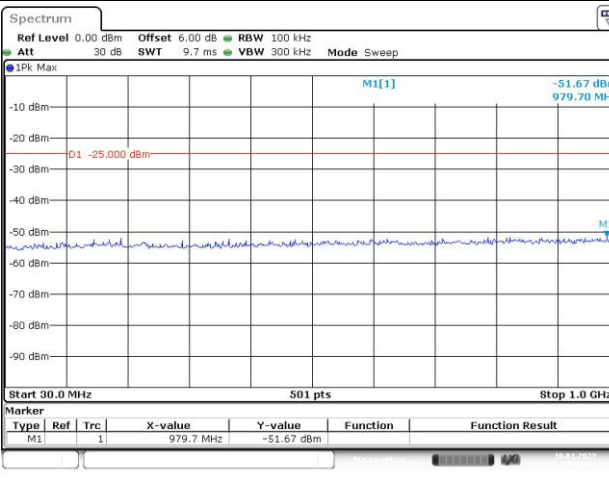
Lowest



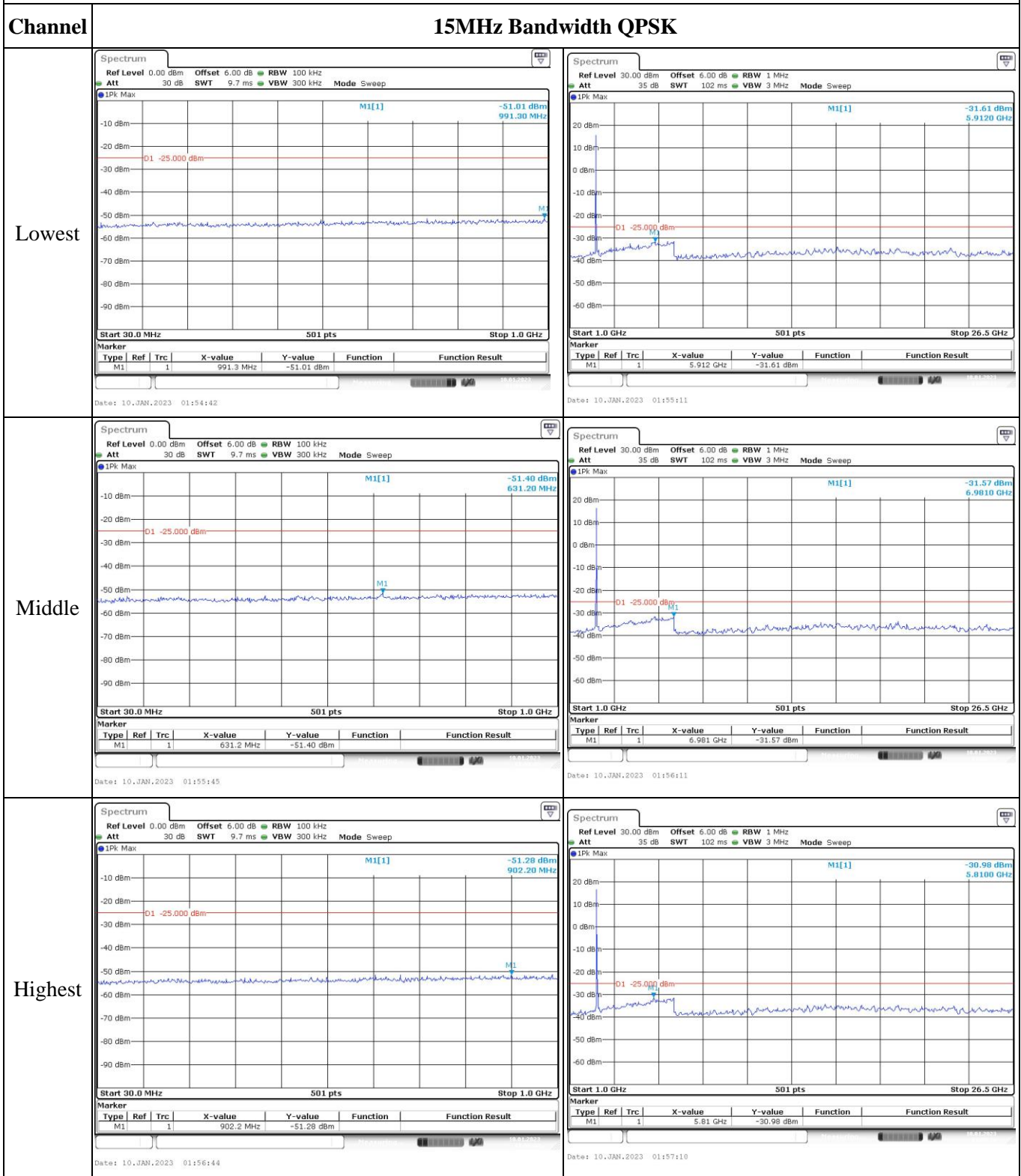
Middle



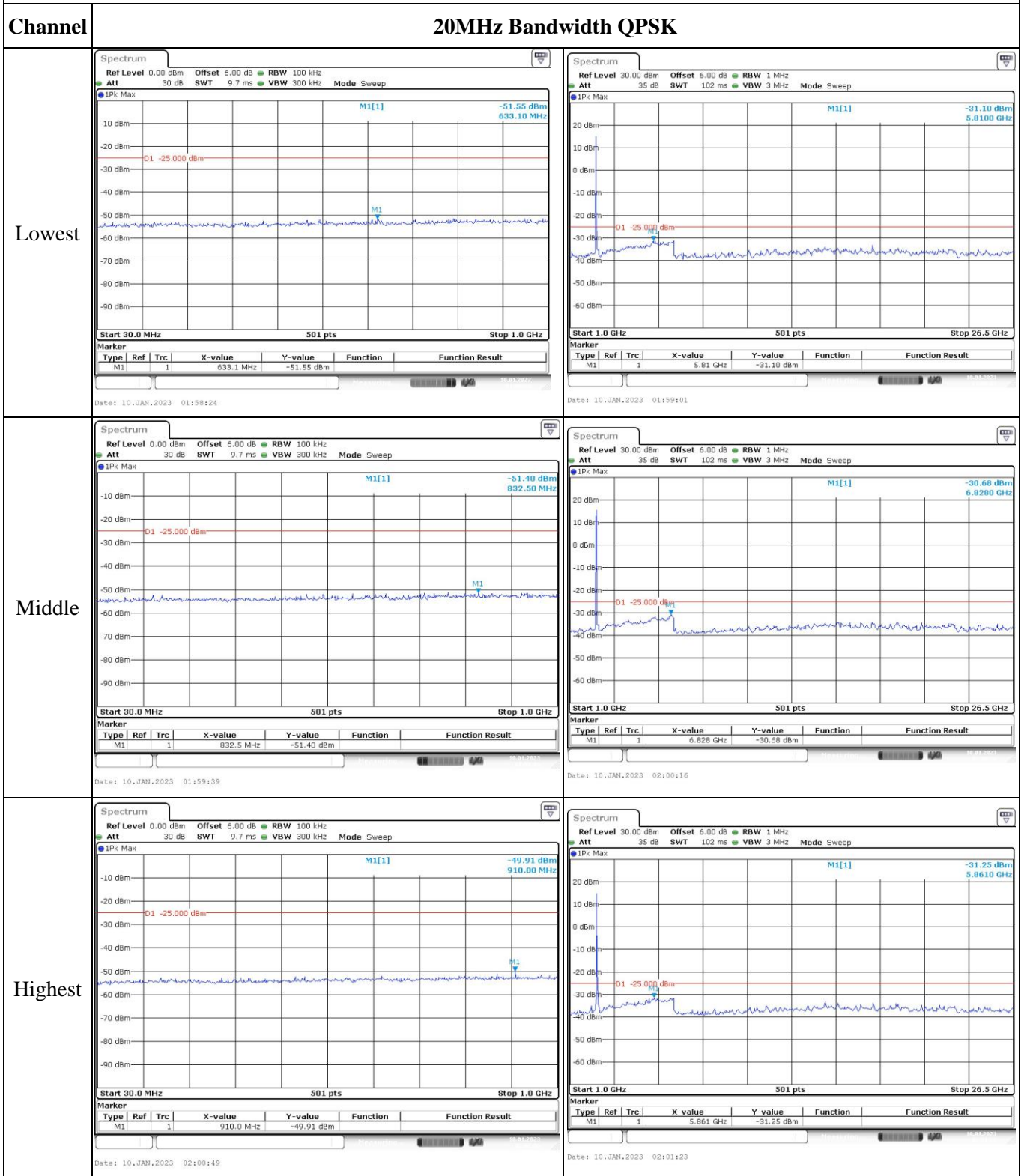
Highest



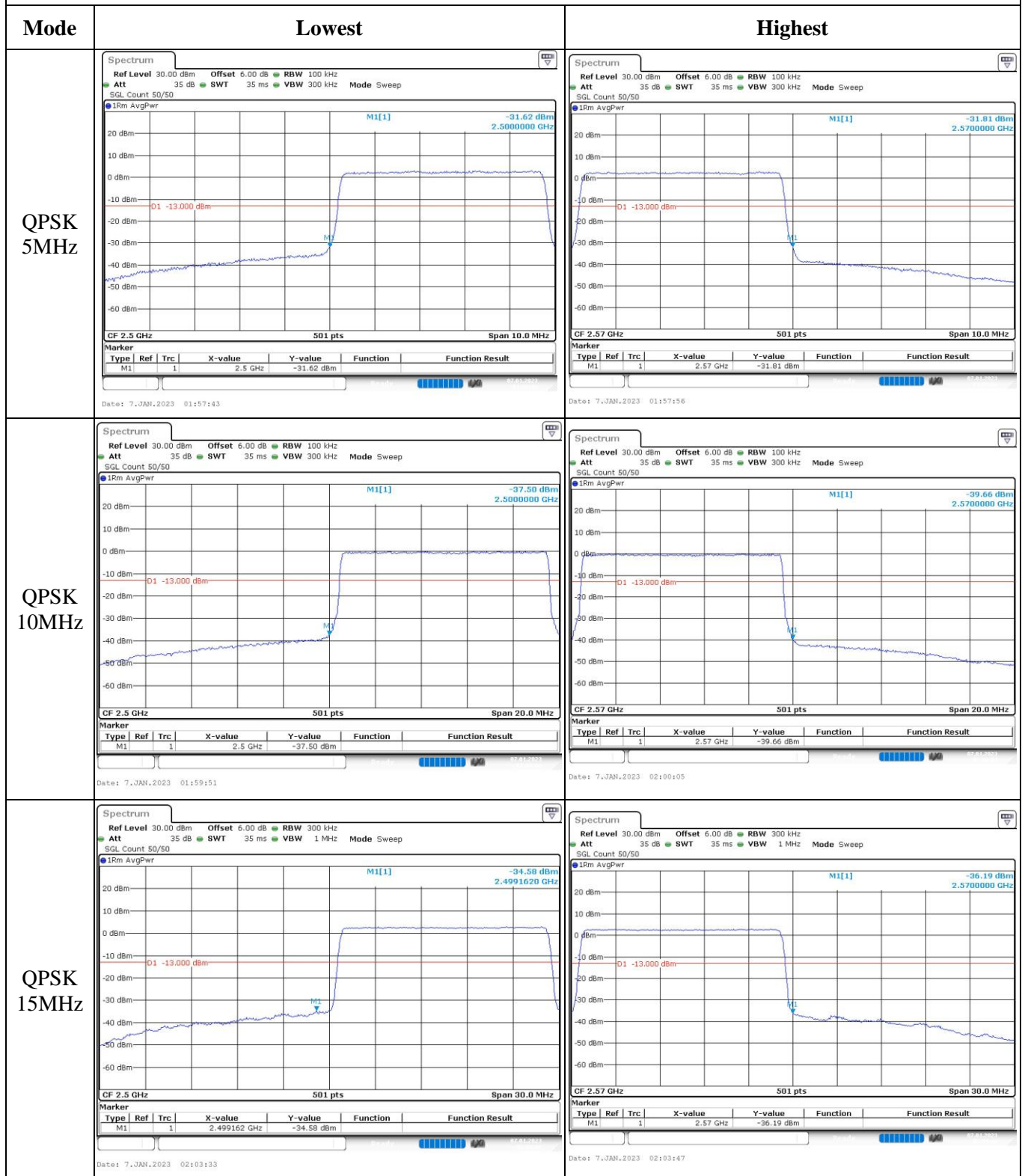
### Spurious Emissions at Antenna Terminal



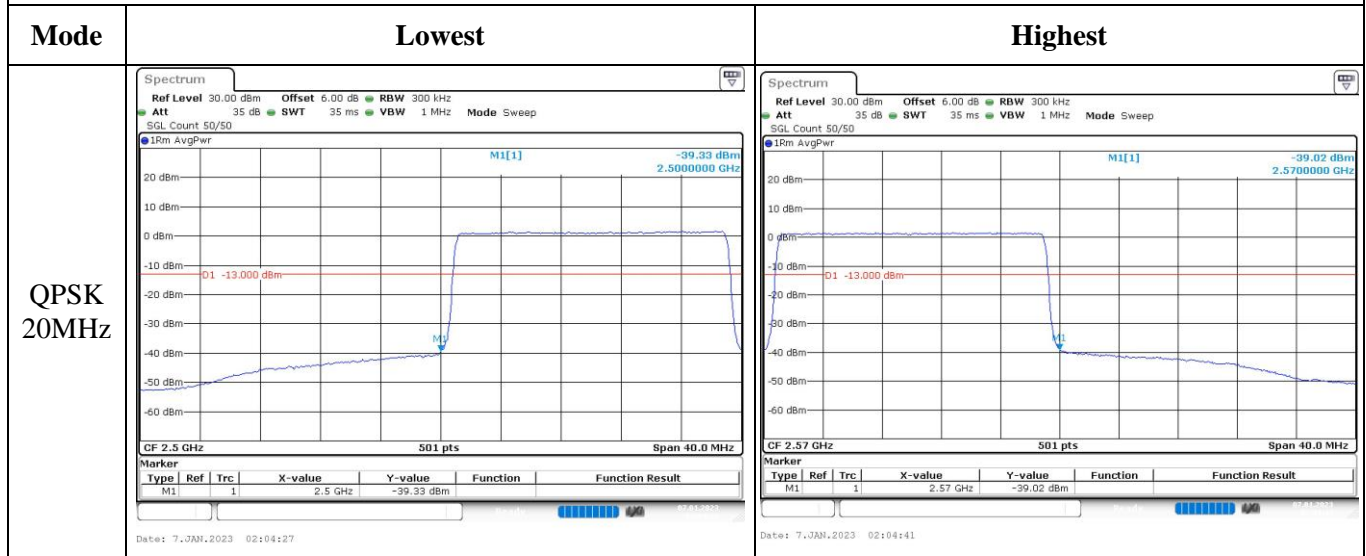
### Spurious Emissions at Antenna Terminal



### Out of band emission, Band Edge

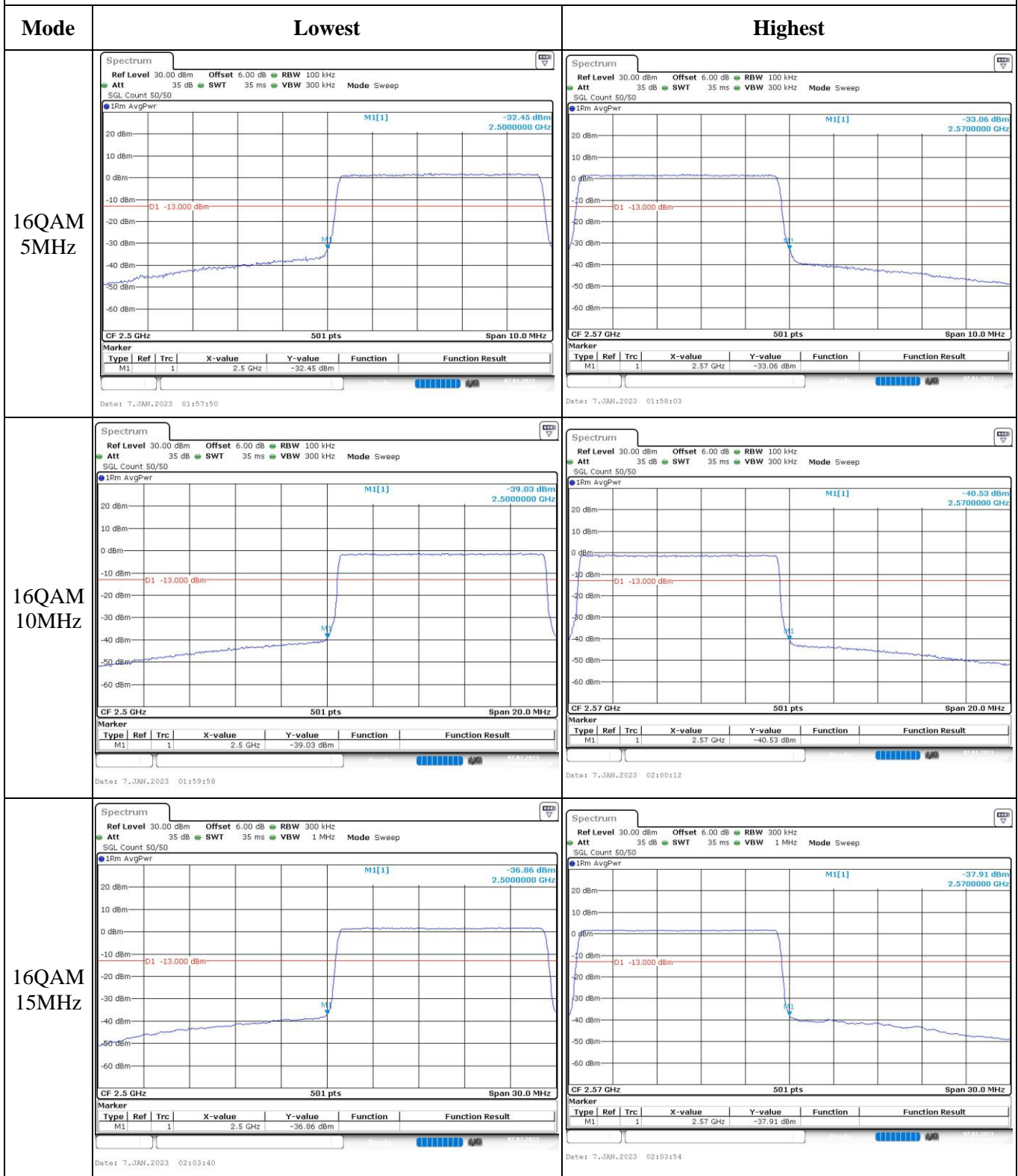


Out of band emission, Band Edge

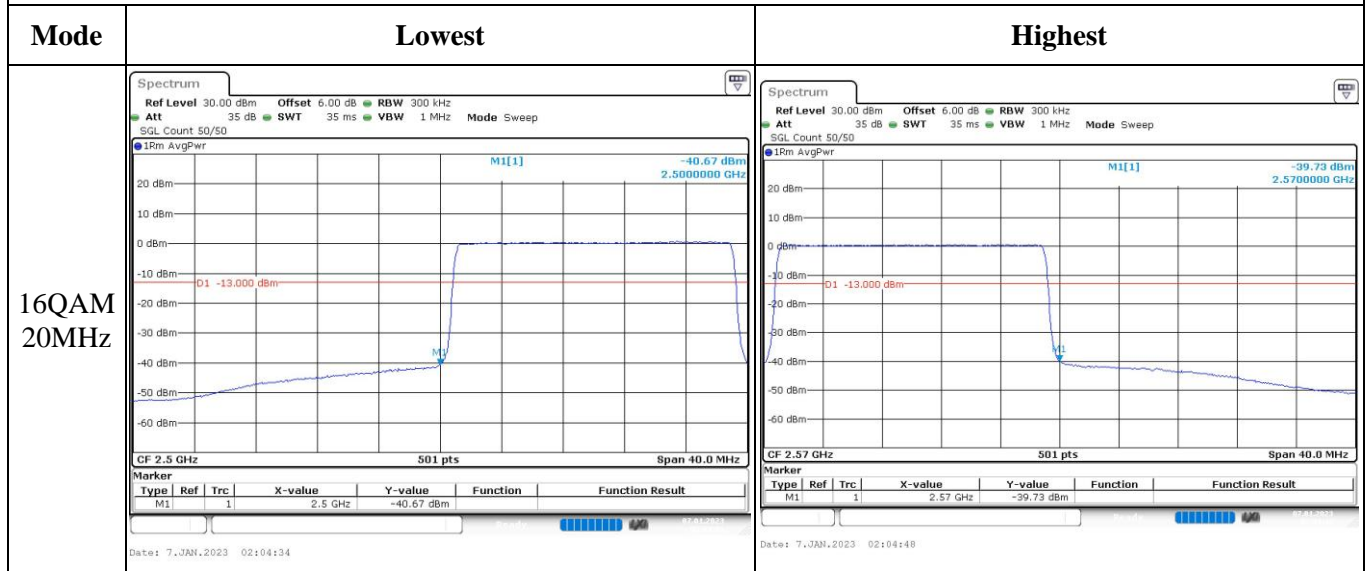




Out of band emission, Band Edge



### Out of band emission, Band Edge



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

Serial Number:	1WP8	Test Date:	2023/1/7~2023/1/17
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rinka Li	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	21.4~23.7	Relative Humidity: (%)	45~55	ATM Pressure: (kPa)	101.4~101.6
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**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022/7/15	2023/7/14
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100002	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2022/7/15	2023/7/14
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2022/4/6	2023/4/5
UNI-T	Multimeter	UT39A+	C210582554	2022/9/30	2023/9/29
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	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:**

<b>FCC §2.1046; § 27.50(h)(2)</b>						
<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	21.74	21.83	22.09	21.74	33
	RB1#13	21.84	21.99	22.24		
	RB1#24	21.73	21.86	22.15		
	RB15#0	20.75	20.93	21.19		
	RB15#10	20.76	20.97	21.18		
	RB25#0	20.78	20.93	21.17		
5MHz 16QAM	RB1#0	20.95	20.87	21.13	20.78	33
	RB1#13	21.06	21	21.28		
	RB1#24	21.01	20.9	21.19		
	RB15#0	19.77	19.86	20.2		
	RB15#10	19.78	19.84	20.2		
	RB25#0	19.76	19.94	20.21		
10MHz QPSK	RB1#0	21.83	21.97	22.09	21.94	33
	RB1#25	22.12	22.29	22.44		
	RB1#49	21.81	22.05	22.21		
	RB25#0	20.84	20.99	21.21		
	RB25#25	20.84	21.02	21.24		
	RB50#0	20.84	20.98	21.19		
10MHz 16QAM	RB1#0	20.73	21.05	21.28	21.14	33
	RB1#25	21	21.36	21.64		
	RB1#49	20.75	21.15	21.4		
	RB25#0	19.86	20.03	20.2		
	RB25#25	19.87	20.06	20.21		
	RB50#0	19.84	20.01	20.18		
15MHz QPSK	RB1#0	21.75	21.8	21.99	21.69	33
	RB1#38	21.86	21.97	22.19		
	RB1#74	21.78	21.92	22.14		
	RB36#0	20.82	20.94	21.16		
	RB36#39	20.88	21.04	21.22		
	RB75#0	20.84	21.02	21.2		
15MHz 16QAM	RB1#0	20.96	20.99	20.93	20.68	33
	RB1#38	21.05	21.18	21.12		
	RB1#74	20.96	21.08	21.07		
	RB36#0	19.85	19.92	20.07		
	RB36#39	19.89	20.01	20.1		
	RB75#0	19.86	19.93	20.12		
20MHz QPSK	RB1#0	21.59	21.6	21.82	21.9	33

	RB1#50	22.09	22.19	22.4		
	RB1#99	21.63	21.75	22.02		
	RB50#0	20.76	20.89	21.04		
	RB50#50	20.84	20.94	21.09		
	RB100#0	20.8	20.95	21.06		
20MHz 16QAM	RB1#0	20.63	20.61	21.01	21.11	33
	RB1#50	21.16	21.2	21.61		
	RB1#99	20.74	20.74	21.21		
	RB50#0	19.74	19.92	20.05		
	RB50#50	19.81	19.99	20.05		
	RB100#0	19.78	19.92	20.07		
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	8.49	8.61	8.52	13	
	RB100#0	8.38	8.55	8.46	13	
20MHz 16QAM	RB1#0	8.46	8.62	8.55	13	
	RB100#0	8.33	8.49	9.65	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	4.51	4.49	4.49	4.98	5.1	4.96
5MHz 16QAM	4.49	4.51	4.51	4.96	4.94	5.02
10MHz QPSK	8.94	8.94	8.94	9.68	9.76	9.68
10MHz 16QAM	8.94	8.94	8.94	9.52	10.08	9.52
15MHz QPSK	13.53	13.47	13.47	15.36	15.18	15.6
15MHz 16QAM	13.53	13.53	13.53	16.08	15.78	16.44
20MHz QPSK	17.96	17.96	17.88	19.6	19.68	20.08
20MHz 16QAM	17.96	17.96	17.88	19.68	20.4	19.52
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>

**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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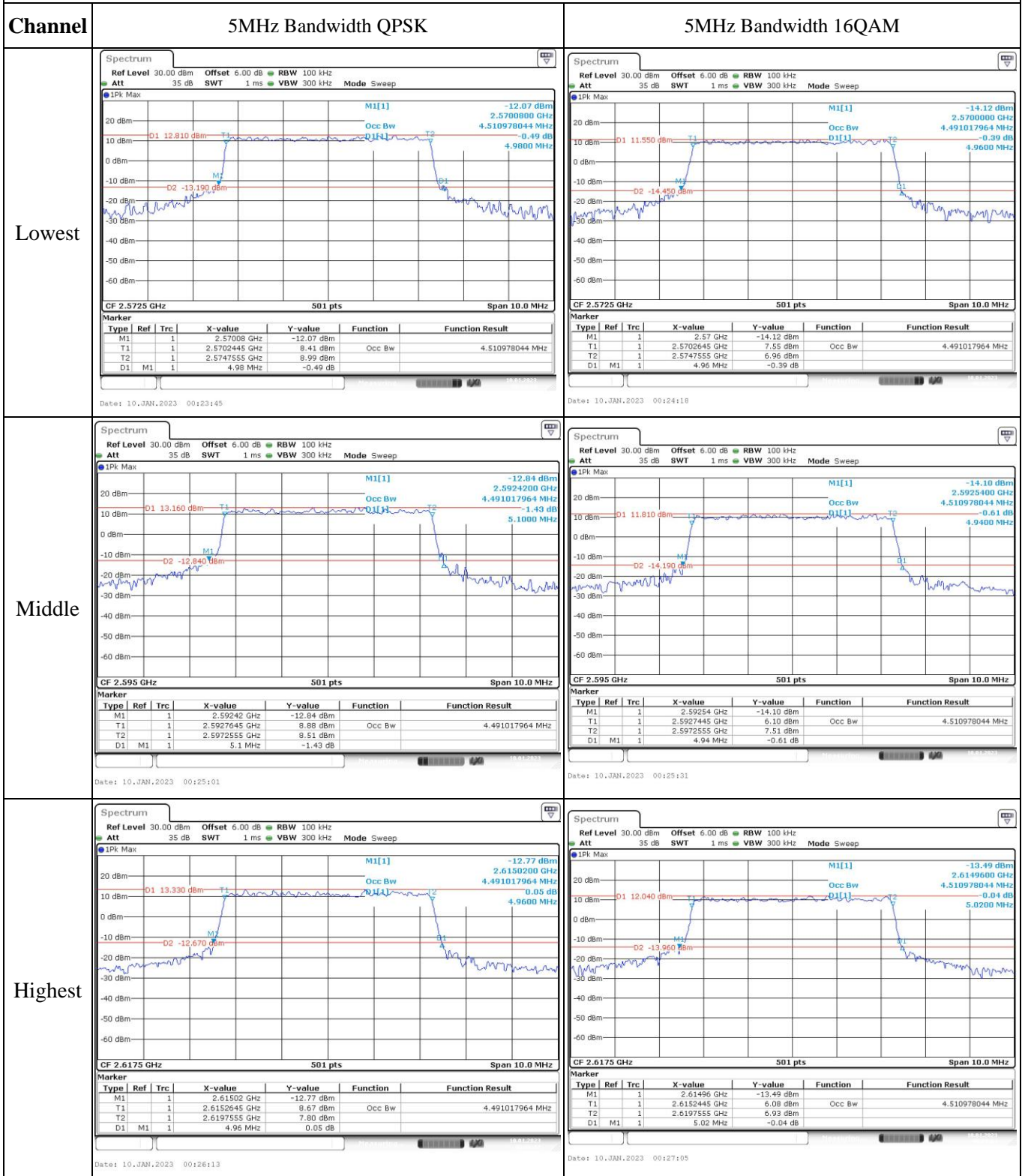
**FCC §2.1055, §27.54: Frequency Stability**

Test Mode:	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	2570.4075	2570.00	2619.6958	2620
	-20	3.85	2570.4071	2570.00	2619.6954	2620
	-10	3.85	2570.4069	2570.00	2619.6952	2620
	0	3.85	2570.4064	2570.00	2619.6948	2620
	10	3.85	2570.4061	2570.00	2619.6944	2620
	20	3.85	2570.4058	2570.00	2619.6942	2620
	30	3.85	2570.4057	2570.00	2619.6937	2620
	40	3.85	2570.4056	2570.00	2619.6937	2620
Frequency Stability vs. Voltage	20	3.4	2570.4059	2570.00	2619.6944	2620
	20	4.4	2570.4056	2570.00	2619.6942	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	2570.4070	2570.00	2619.6948	2620
	-20	3.85	2570.4068	2570.00	2619.6946	2620
	-10	3.85	2570.4064	2570.00	2619.6945	2620
	0	3.85	2570.4063	2570.00	2619.6944	2620
	10	3.85	2570.4060	2570.00	2619.6943	2620
	20	3.85	2570.4058	2570.00	2619.6942	2620
	30	3.85	2570.4055	2570.00	2619.6940	2620
	40	3.85	2570.4051	2570.00	2619.6939	2620
Frequency Stability vs. Voltage	20	3.4	2570.4060	2570.00	2619.6943	2620
	20	4.4	2570.4053	2570.00	2619.6940	2620
					<b>Result:</b>	<b>Pass</b>

**Test Plots**(Note: The 6.0 dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

**Occupied Bandwidth**



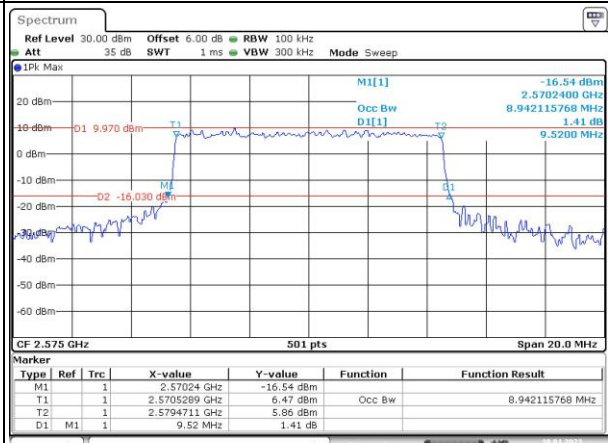
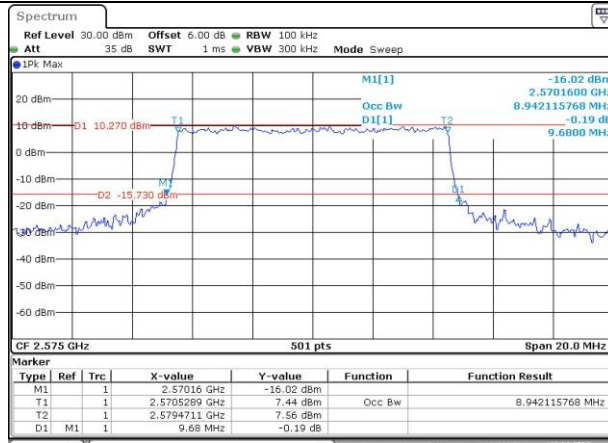
### Occupied Bandwidth

Channel

10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

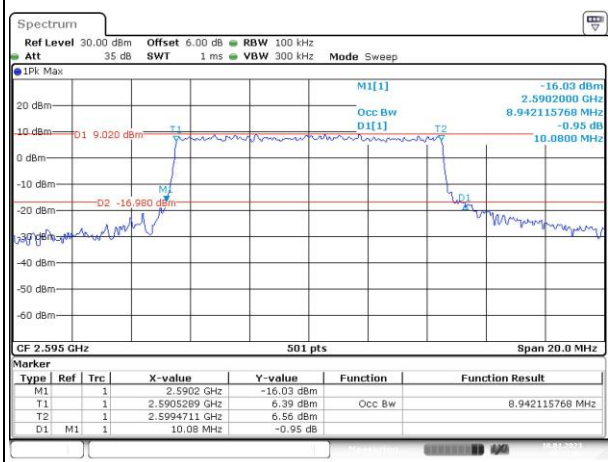
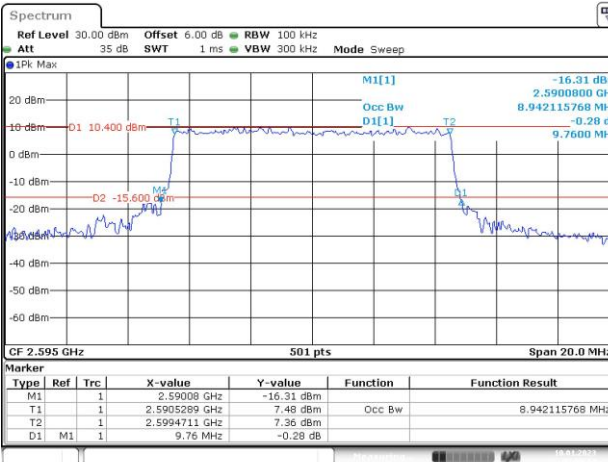
Lowest



Date: 10.JAN.2023 00:28:51

Date: 10.JAN.2023 00:29:32

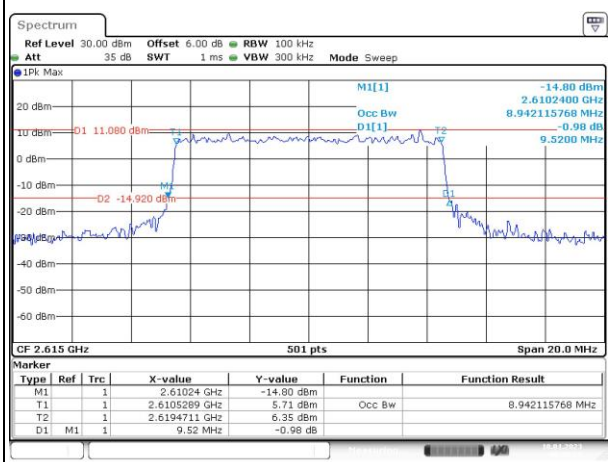
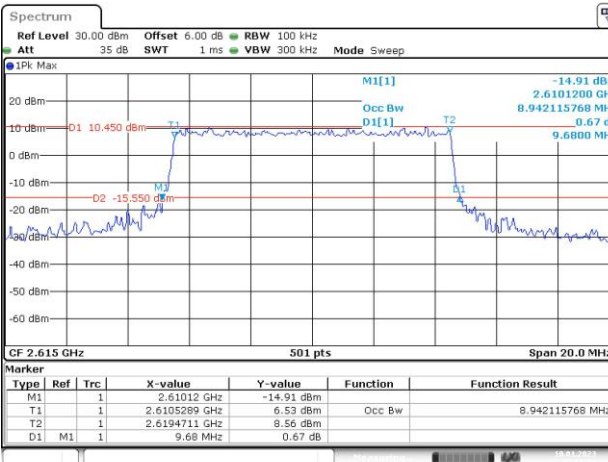
Middle



Date: 10.JAN.2023 00:13:14

Date: 10.JAN.2023 00:13:06

Highest



Date: 10.JAN.2023 00:13:14

Date: 10.JAN.2023 00:13:26



### Occupied Bandwidth

