

3.14 Test Data - LTE Band 66

Max Power: 23.45dBm

Test Band: 66 1.4MHz Bandwidth													
Modulation	RB Allocation		Conducted Power (dBm)			Antenna gain		EIRP(dBm)			Limit (dBm)	Verdict	
	Size	Offset	LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	HCH			
QPSK	1	0	22.93	23.22	23.06	/	0.7	23.63	23.92	23.76	30	PASS	
		2	22.91	23.23	23.14	/	0.7	23.61	23.93	23.84	30	PASS	
		5	22.84	23.15	23.21	/	0.7	23.54	23.85	23.91	30	PASS	
	3	0	22.83	23.29	22.97	/	0.7	23.53	23.99	23.67	30	PASS	
		2	22.88	23.27	23.07	/	0.7	23.58	23.97	23.77	30	PASS	
		3	22.83	23.19	22.98	/	0.7	23.53	23.89	23.68	30	PASS	
	6	0	21.92	22.27	21.99	/	0.7	22.62	22.97	22.69	30	PASS	
	22.47		22.73	22.02	/	0.7	23.17	23.43	22.72	30	PASS		
16QAM	1	2	22.64	22.69	22.26	/	0.7	23.34	23.39	22.96	30	PASS	
		5	22.41	22.63	22.1	/	0.7	23.11	23.33	22.8	30	PASS	
		0	22.06	22.38	21.87	/	0.7	22.76	23.08	22.57	30	PASS	
	3	2	22.12	22.27	21.94	/	0.7	22.82	22.97	22.64	30	PASS	
		3	22.07	22.2	21.86	/	0.7	22.77	22.9	22.56	30	PASS	
		6	0	20.74	21.28	20.92	/	0.7	21.44	21.98	21.62	30	PASS
	Note:												23.29
	1) dBd = dBi - 2.15												
2) EIRP = Conducted output power + Antenna gain (dBi)													

Test Band: 66 _ 3MHz Bandwidth													
Modulation	RB Allocation		Conducted Power (dBm)			Antenna gain		EIRP(dBm)			Limit (dBm)	Verdict	
	Size	Offset	LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	HCH			
QPSK	1	0	23.02	23.28	22.96	/	0.7	23.72	23.98	23.66	30	PASS	
		7	23.14	23.24	22.84	/	0.7	23.84	23.94	23.54	30	PASS	
		14	23.13	23.12	22.85	/	0.7	23.83	23.82	23.55	30	PASS	
	8	0	22	22.35	22.03	/	0.7	22.7	23.05	22.73	30	PASS	
		4	21.99	22.32	21.92	/	0.7	22.69	23.02	22.62	30	PASS	
		7	21.95	22.21	21.87	/	0.7	22.65	22.91	22.57	30	PASS	
	15	0	21.96	22.31	22.01	/	0.7	22.66	23.01	22.71	30	PASS	
	22.24		22.48	21.86	/	0.7	22.94	23.18	22.56	30	PASS		
16QAM	1	7	22.25	22.41	21.75	/	0.7	22.95	23.11	22.45	30	PASS	
		14	22.13	22.33	21.21	/	0.7	22.83	23.03	21.91	30	PASS	
		8	0	20.87	21.5	20.8	/	0.7	21.57	22.2	21.5	30	PASS
	4		20.88	21.29	20.68	/	0.7	21.58	21.99	21.38	30	PASS	
	7		20.82	21.27	20.95	/	0.7	21.52	21.97	21.65	30	PASS	
	15	0	21.02	21.23	21.01	/	0.7	21.72	21.93	21.71	30	PASS	
	Note:												23.28
	1) dBd = dBi - 2.15												
2) EIRP = Conducted output power + Antenna gain (dBi)													

Test Band: 66 _ 5MHz Bandwidth												
Modulation	RB Allocation		Conducted Power (dBm)			Antenna gain		EIRP(dBm)			Limit (dBm)	Verdict
	Size	Offset	LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	HCH		
QPSK	1	0	22.68	23.29	22.85	/	0.7	23.38	23.99	23.55	30	PASS
		13	22.72	23.28	22.76	/	0.7	23.42	23.98	23.46	30	PASS
		24	22.72	23.11	22.7	/	0.7	23.42	23.81	23.4	30	PASS
	12	0	21.99	22.32	22.11	/	0.7	22.69	23.02	22.81	30	PASS
		6	21.98	22.25	22	/	0.7	22.68	22.95	22.7	30	PASS
		13	22.01	22.19	21.9	/	0.7	22.71	22.89	22.6	30	PASS
16QAM	25	0	21.96	22.32	22.06	/	0.7	22.66	23.02	22.76	30	PASS
			21.56	22.84	21.94	/	0.7	22.26	23.54	22.64	30	PASS
			21.68	22.83	21.82	/	0.7	22.38	23.53	22.52	30	PASS
	1	13	21.99	22.71	21.5	/	0.7	22.69	23.41	22.2	30	PASS
			21.04	21.32	21.16	/	0.7	21.74	22.02	21.86	30	PASS
			21.04	21.25	21.06	/	0.7	21.74	21.95	21.76	30	PASS
	12	13	21.06	21.2	20.95	/	0.7	21.76	21.9	21.65	30	PASS
			21.13	21.17	20.97	/	0.7	21.83	21.87	21.67	30	PASS

23.29

Note:

1) dBd = dBi - 2.15

2) EIRP = Conducted output power + Antenna gain (dBi)

Test Band: 66 _ 10MHz Bandwidth												
Modulation	RB Allocation		Conducted Power (dBm)			Antenna gain		EIRP(dBm)			Limit (dBm)	Verdict
	Size	Offset	LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	HCH		
QPSK	1	0	23	23.11	23.06	/	0.7	23.7	23.81	23.76	30	PASS
		25	23.27	23.41	23.1	/	0.7	23.97	24.11	23.8	30	PASS
		49	22.96	23.07	22.8	/	0.7	23.66	23.77	23.5	30	PASS
	25	0	21.95	22.32	22.29	/	0.7	22.65	23.02	22.99	30	PASS
		13	22.03	22.26	22.14	/	0.7	22.73	22.96	22.84	30	PASS
		25	21.87	22.13	21.91	/	0.7	22.57	22.83	22.61	30	PASS
16QAM	50	0	21.91	22.26	22.13	/	0.7	22.61	22.96	22.83	30	PASS
			22.23	22.75	22.02	/	0.7	22.93	23.45	22.72	30	PASS
			23.11	22.67	22.2	/	0.7	23.81	23.37	22.9	30	PASS
	1	49	22.31	22.76	21.23	/	0.7	23.01	23.46	21.93	30	PASS
			20.96	21.48	21.14	/	0.7	21.66	22.18	21.84	30	PASS
			21.02	21.39	21.07	/	0.7	21.72	22.09	21.77	30	PASS
	25	25	20.96	21.1	20.92	/	0.7	21.66	21.8	21.62	30	PASS
			20.9	21.12	21.05	/	0.7	21.6	21.82	21.75	30	PASS

23.41

Note:

1) dBd = dBi - 2.15

2) EIRP = Conducted output power + Antenna gain (dBi)

Test Band: 66 15MHz Bandwidth												
Modulation	RB Allocation		Conducted Power (dBm)			Antenna gain		EIRP(dBm)			Limit (dBm)	Verdict
	Size	Offset	LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	HCH		
QPSK	1	0	22.8	23.14	22.93	/	0.7	23.5	23.84	23.63	30	PASS
		38	22.88	23.43	23.14	/	0.7	23.58	24.13	23.84	30	PASS
		74	22.74	23.2	22.77	/	0.7	23.44	23.9	23.47	30	PASS
	36	0	21.87	22.27	22.26	/	0.7	22.57	22.97	22.96	30	PASS
		18	22.04	22.29	22.18	/	0.7	22.74	22.99	22.88	30	PASS
		39	21.96	22.09	21.93	/	0.7	22.66	22.79	22.63	30	PASS
16QAM	1	0	21.93	22.23	22.23	/	0.7	22.63	22.93	22.93	30	PASS
			21.9	21.74	21.86	/	0.7	22.6	22.44	22.56	30	PASS
		38	21.56	22.26	22.73	/	0.7	22.26	22.96	23.43	30	PASS
		74	21.15	22.58	21.85	/	0.7	21.85	23.28	22.55	30	PASS
	36	0	20.79	21.56	21.02	/	0.7	21.49	22.26	21.72	30	PASS
		18	21.14	21.29	21.07	/	0.7	21.84	21.99	21.77	30	PASS
		39	21.06	20.94	20.97	/	0.7	21.76	21.64	21.67	30	PASS
	75	0	21.03	21.23	21.25	/	0.7	21.73	21.93	21.95	30	PASS

Note:

1) dBd = dBi - 2.15

2) EIRP = Conducted output power + Antenna gain (dBi)

23.43

Test Band: 66_20MHz Bandwidth												
Modulation	RB Allocation		Conducted Power (dBm)			Antenna gain		EIRP(dBm)			Limit (dBm)	Verdict
	Size	Offset	LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	HCH		
QPSK	1	0	22.67	23.45	22.9	/	0.7	23.37	24.15	23.6	30	PASS
		50	23.26	23.41	23.27	/	0.7	23.96	24.11	23.97	30	PASS
		99	22.67	23.21	22.78	/	0.7	23.37	23.91	23.48	30	PASS
	50	0	21.9	22.31	22.19	/	0.7	22.6	23.01	22.89	30	PASS
		25	22.16	22.24	22.21	/	0.7	22.86	22.94	22.91	30	PASS
		50	22.17	22.21	22	/	0.7	22.87	22.91	22.7	30	PASS
	100	0	22.03	22.25	22.2	/	0.7	22.73	22.95	22.9	30	PASS
22.21	21.97		22.66	/	0.7	22.91	22.67	23.36	30	PASS		
16QAM	1	50	22.97	22.09	23.13	/	0.7	23.67	22.79	23.83	30	PASS
		99	22.46	21.39	22.48	/	0.7	23.16	22.09	23.18	30	PASS
		50	0	20.75	21.26	21.2	/	0.7	21.45	21.96	21.9	30
	25		21.02	21.22	21.19	/	0.7	21.72	21.92	21.89	30	PASS
	50		21	21.07	21.02	/	0.7	21.7	21.77	21.72	30	PASS
	100	0	21.13	21.26	21.18	/	0.7	21.83	21.96	21.88	30	PASS

Note:

1) dBd = dBi - 2.15

2) EIRP = Conducted output power + Antenna gain (dBi)

23.45

4 Peak to Average Ratio

4.1 Test Result

Test Description	Specification		Test Result
	FCC	ISED	
Peak to Average Ratio	22.913(a) 24.232(d) 27.50(d)(5)	RSS-130 (4.6) RSS-132 (5.4) RSS-133 (6.4) RSS-139 (6.5) RSS-199 (4.4)	Compliant

4.2 Test Method

KDB document 971168 D01 Power Meas License Digital Systems v03r01 was used to determine peak-to-average ratio. For the LTE measurements, Clause 5.7.2 was used which defined the measurement method using the CCDF function of the spectrum analyzer. Measurements were recorded at the lowest, middle, and highest channels.

4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.2 °C

Relative Humidity: 32.1 %

Atmospheric Pressure: 97.9 kPa

4.4 Test Equipment

Test End Date:

2/23/2022

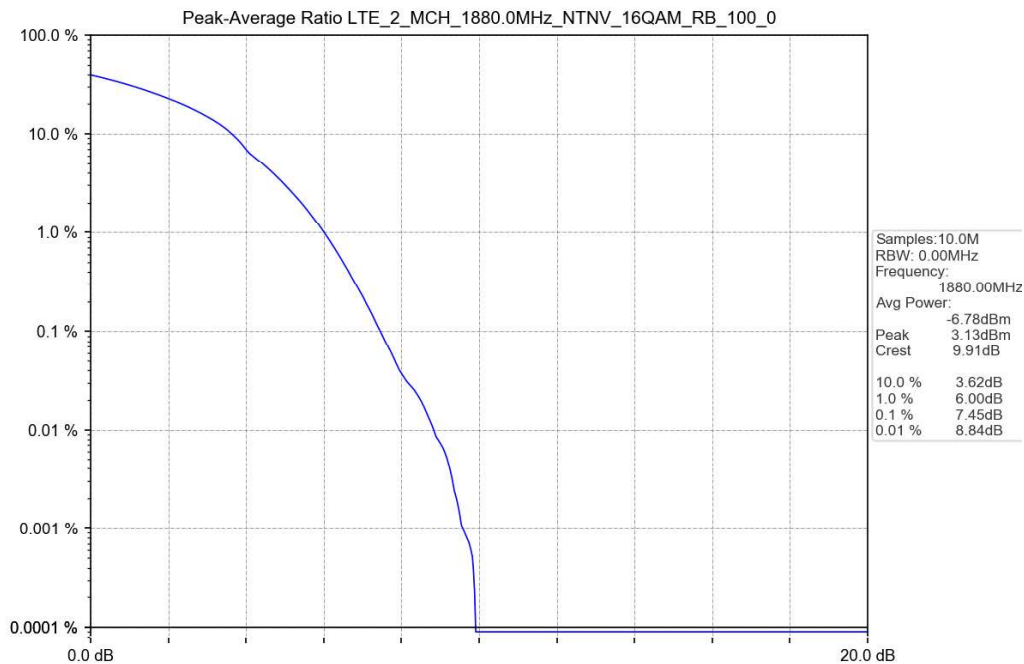
Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
ATTENUATOR, 10DB	BW-S10W2	MINI-CIRCUITS	15034	7-Oct-2021	7-Oct-2022
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM	20108	16-Mar-2022	16-Mar-2023
SIGNAL ANALYZER (TS8997)	FSV30	ROHDE & SCHWARZ	B085749	4-Jan-2022	4-Jan-2024
WIDEBAND RADIO COMMUNICATION	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	1-Jul-2021	1-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022

4.5 Test Data – LTE Band 2

Test Band: 2 _ 1.4MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	6	0	4.12	4.43	4.38	13	PASS
16QAM	6	0	4.96	5.25	5.22	13	PASS
Test Band: 2 _ 3MHz Bandwidth							
QPSK	15	0	4	4.29	4.35	13	PASS
16QAM	15	0	4.93	5.25	5.28	13	PASS
Test Band: 2 _ 5MHz Bandwidth							
QPSK	25	0	3.51	3.68	3.77	13	PASS
16QAM	25	0	5.01	5.22	5.3	13	PASS
Test Band: 2 _ 10MHz Bandwidth							
QPSK	50	0	4.84	4.84	4.87	13	PASS
16QAM	50	0	6.41	6.46	6.64	13	PASS
Test Band: 2 _ 15MHz Bandwidth							
QPSK	75	0	6.23	6.26	6.26	13	PASS
16QAM	75	0	7.07	7.13	7.1	13	PASS
Test Band: 2 _ 20MHz Bandwidth							
QPSK	100	0	6.9	6.99	6.99	13	PASS
16QAM	100	0	7.39	7.45	7.42	13	PASS

Sample Graph



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4.6 Test Data – LTE Band 4

Test Band: 4 _ 1.4MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	6	0	4.03	4.26	4.32	13	PASS
16QAM	6	0	4.84	5.1	5.13	13	PASS
Test Band: 4 _ 3MHz Bandwidth							
QPSK	15	0	3.97	4.14	4.2	13	PASS
16QAM	15	0	4.93	5.13	5.16	13	PASS
Test Band: 4 _ 5MHz Bandwidth							
QPSK	25	0	3.57	3.59	3.65	13	PASS
16QAM	25	0	5.07	5.13	5.19	13	PASS
Test Band: 4 _ 10MHz Bandwidth							
QPSK	50	0	4.81	4.81	4.87	13	PASS
16QAM	50	0	6.46	6.46	6.61	13	PASS
Test Band: 4 _ 15MHz Bandwidth							
QPSK	75	0	6.23	6.26	6.26	13	PASS
16QAM	75	0	7.1	7.07	7.07	13	PASS
Test Band: 4 _ 20MHz Bandwidth							
QPSK	100	0	6.87	6.99	6.99	13	PASS
16QAM	100	0	7.39	7.42	7.39	13	PASS

4.7 Test Data – LTE Band 5

Test Band: 5 _ 1.4MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	6	0	5.3	5.1	4.49	13	PASS
16QAM	6	0	6.23	5.97	5.51	13	PASS
Test Band: 5 _ 3MHz Bandwidth							
QPSK	15	0	5.22	4.87	4.81	13	PASS
16QAM	15	0	6.17	5.88	5.88	13	PASS
Test Band: 5 _ 5MHz Bandwidth							
QPSK	25	0	4.64	4.26	4.43	13	PASS
16QAM	25	0	6.09	5.71	6.03	13	PASS
Test Band: 5 _ 10MHz Bandwidth							
QPSK	50	0	4.64	4.67	4.72	13	PASS
16QAM	50	0	6.43	6.29	6.7	13	PASS

4.8 Test Data – LTE Band 7

Test Band: 7 _ 5MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	25	0	4.49	4.7	4.58	13	PASS
16QAM	25	0	5.91	6.12	5.97	13	PASS
Test Band: 7 _ 10MHz Bandwidth							
QPSK	50	0	4.84	4.84	4.84	13	PASS
16QAM	50	0	6.52	6.61	6.67	13	PASS
Test Band: 7 _ 15MHz Bandwidth							
QPSK	75	0	6.17	6.17	6.17	13	PASS
16QAM	75	0	7.13	7.16	7.07	13	PASS
Test Band: 7 _ 20MHz Bandwidth							
QPSK	100	0	6.81	6.93	6.9	13	PASS
16QAM	100	0	7.39	7.54	7.42	13	PASS

4.9 Test Data – LTE Band 12

Test Band: 12 _ 1.4MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	6	0	5.25	4.99	4.72	13	PASS
16QAM	6	0	6.2	5.86	5.71	13	PASS
Test Band: 12 _ 3MHz Bandwidth							
QPSK	15	0	5.01	4.81	4.7	13	PASS
16QAM	15	0	6.03	5.8	5.8	13	PASS
Test Band: 12 _ 5MHz Bandwidth							
QPSK	25	0	4.35	4.23	4.2	13	PASS
16QAM	25	0	5.88	5.77	5.74	13	PASS
Test Band: 12 _ 10MHz Bandwidth							
QPSK	50	0	4.7	4.72	4.72	13	PASS
16QAM	50	0	6.46	6.46	6.55	13	PASS

4.10 Test Data – LTE Band 13

Test Band: 13 _ 5MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	25	0	4.52	4.29	4.14	13	PASS
16QAM	25	0	5.94	5.86	5.57	13	PASS
Test Band: 13 _ 10MHz Bandwidth							
QPSK	50	0	/	4.93	/	13	PASS
16QAM	50	0	/	6.67	/	13	PASS

4.11 Test Data – LTE Band 26a

Test Band: 26a _ 1.4MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	6	0	5.54	4.58	4.9	13	PASS
16QAM	6	0	6.41	5.54	5.77	13	PASS
Test Band: 26a _ 3MHz Bandwidth							
QPSK	15	0	5.01	4.49	4.7	13	PASS
16QAM	15	0	6	5.48	5.71	13	PASS
Test Band: 26a _ 5MHz Bandwidth							
QPSK	25	0	4.2	4	4.06	13	PASS
16QAM	25	0	5.65	5.42	5.54	13	PASS
Test Band: 26a _ 10MHz Bandwidth							
QPSK	50	0	/	4.7	/	13	PASS
16QAM	50	0	/	6.35	/	13	PASS

4.12 Test Data – LTE Band 38

Test Band: 38 _ 5MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	25	0	7.8	7.74	7.8	13	PASS
16QAM	25	0	9.01	9.1	9.1	13	PASS
Test Band: 38 _ 10MHz Bandwidth							
QPSK	50	0	8.81	8.75	8.81	13	PASS
16QAM	50	0	10	9.97	10.09	13	PASS
Test Band: 38 _ 15MHz Bandwidth							
QPSK	75	0	9.91	9.91	10	13	PASS
16QAM	75	0	10.55	10.7	10.58	13	PASS
Test Band: 38 _ 20MHz Bandwidth							
QPSK	100	0	10.38	10.52	10.52	13	PASS
16QAM	100	0	10.84	10.84	10.78	13	PASS

4.13 Test Data – LTE Band 41

Test Band: 41 _ 5MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	25	0	7.42	7.65	7.8	13	PASS
16QAM	25	0	8.67	9.04	9.19	13	PASS
Test Band: 41 _ 10MHz Bandwidth							
QPSK	50	0	8.81	8.72	8.75	13	PASS
16QAM	50	0	9.88	9.94	10.14	13	PASS
Test Band: 41 _ 15MHz Bandwidth							
QPSK	75	0	9.97	9.94	9.97	13	PASS
16QAM	75	0	10.41	10.7	10.58	13	PASS
Test Band: 41 _ 20MHz Bandwidth							
QPSK	100	0	10.46	10.49	10.52	13	PASS
16QAM	100	0	10.84	10.81	10.78	13	PASS

4.14 Test Data – LTE Band 66

Test Band: 66 _ 1.4MHz Bandwidth							
Test Mode	RB Allocation		Test result (dB)			Limit (dB)	Verdict
	Size	Offset	LCH	MCH	HCH		
QPSK	6	0	4.84	5.1	4.78	13	PASS
16QAM	6	0	5.77	6	5.65	13	PASS
Test Band: 66 _ 3MHz Bandwidth							
QPSK	15	0	4.72	4.93	4.67	13	PASS
16QAM	15	0	5.77	6.03	5.74	13	PASS
Test Band: 66 _ 5MHz Bandwidth							
QPSK	25	0	4.23	4.35	4.14	13	PASS
16QAM	25	0	5.77	5.83	5.62	13	PASS
Test Band: 66 _ 10MHz Bandwidth							
QPSK	50	0	4.7	4.72	4.78	13	PASS
16QAM	50	0	6.46	6.49	6.61	13	PASS
Test Band: 66 _ 15MHz Bandwidth							
QPSK	75	0	6.12	6.14	6.17	13	PASS
16QAM	75	0	7.1	7.1	7.07	13	PASS
Test Band: 66 _ 20MHz Bandwidth							
QPSK	100	0	6.78	6.9	6.9	13	PASS
16QAM	100	0	7.39	7.45	7.39	13	PASS

5 Occupied Bandwidth

5.1 Test Result

Test Description	Specification		Test Result
	FCC	ISED	
Occupied Bandwidth	2.1049(h) 22.917(a) 24.238(b) 27.53(g) / (h)	RSS-GEN (6.7) RSS-199 (4.2)	Reported

5.2 Test Method

KDB document 971168 D01 Power Meas License Digital Systems v03r01, Clause 4 was used to determine the bandwidth measurements.

The 99% measurement function of the spectrum analyzer was used for occupied bandwidth and the ndB down function was used for the 26dB emission bandwidth measurements.

The measurement was conducted at the lowest, middle, and highest channel of each band. All channel bandwidths were explored.

5.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.2 °C

Relative Humidity: 32.1 %

Atmospheric Pressure: 97.9 kPa

5.4 Test Equipment

Test End Date:

2/23/2022

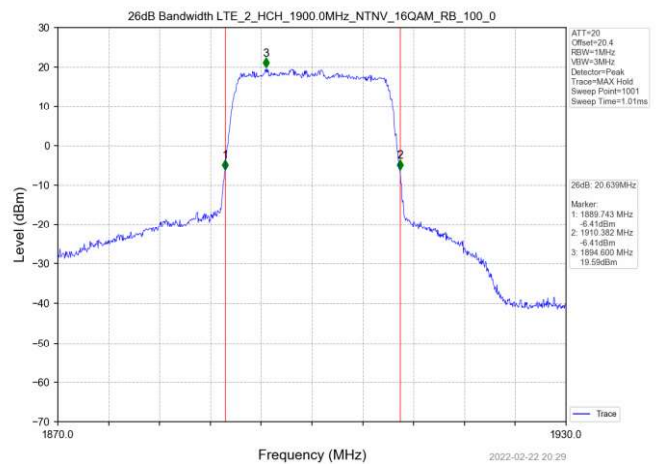
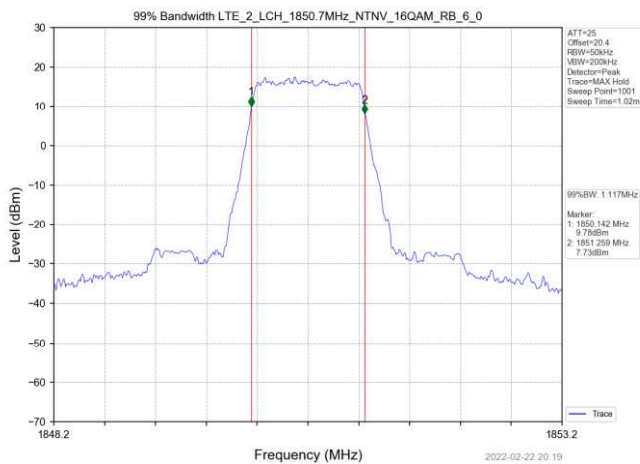
Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
ATTENUATOR, 10DB	BW-S10W2	MINI-CIRCUITS	15034	7-Oct-2021	7-Oct-2022
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM	20108	16-Mar-2022	16-Mar-2023
SIGNAL ANALYZER (TS8997)	FSV30	ROHDE & SCHWARZ	B085749	4-Jan-2022	4-Jan-2024
WIDEBAND RADIO COMMUNICATION	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	1-Jul-2021	1-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022

5.5 Test Data – LTE Band 2

Test Band: 2 _ 1.4MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	6	0	1.123	1.126	1.117	1.362	1.363	1.353
16QAM	6	0	1.117	1.114	1.126	1.359	1.331	1.354
Test Band: 2 _ 3MHz Bandwidth								
QPSK	15	0	2.738	2.748	2.741	3.057	3.052	3.066
16QAM	15	0	2.729	2.736	2.756	3.07	3.067	3.054
Test Band: 2 _ 5MHz Bandwidth								
QPSK	25	0	4.591	4.593	4.603	5.2	5.178	5.136
16QAM	25	0	4.605	4.605	4.588	5.189	5.127	5.11
Test Band: 2 _ 10MHz Bandwidth								
QPSK	50	0	9.054	9.023	9.057	10.125	10.069	10.204
16QAM	50	0	9.052	9.024	9.041	10.12	10.009	10.062
Test Band: 2 _ 15MHz Bandwidth								
QPSK	75	0	13.591	13.53	13.618	15.12	15.09	15.243
16QAM	75	0	13.607	13.541	13.632	15.079	15.098	15.148
Test Band: 2 _ 20MHz Bandwidth								
QPSK	100	0	18.475	18.356	18.447	20.688	20.522	20.551
16QAM	100	0	18.447	18.238	18.499	20.452	20.378	20.639

Sample Plots



5.6 Test Data – LTE Band 4

Test Band: 4 _ 1.4MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	6	0	1.127	1.119	1.115	1.351	1.375	1.341
16QAM	6	0	1.119	1.113	1.127	1.371	1.317	1.333
Test Band: 4 _ 3MHz Bandwidth								
QPSK	15	0	2.744	2.744	2.746	3.065	3.026	3.061
16QAM	15	0	2.738	2.742	2.768	3.071	3.055	3.043
Test Band: 4 _ 5MHz Bandwidth								
QPSK	25	0	4.587	4.582	4.599	5.176	5.151	5.188
16QAM	25	0	4.602	4.593	4.59	5.201	5.153	5.174
Test Band: 4 _ 10MHz Bandwidth								
QPSK	50	0	9.063	9.022	9.061	10.078	10.145	10.17
16QAM	50	0	9.054	9.03	9.053	10.129	10.03	10.055
Test Band: 4 _ 15MHz Bandwidth								
QPSK	75	0	13.589	13.533	13.598	15.223	15.103	15.19
16QAM	75	0	13.61	13.561	13.621	15.042	15.082	15.104
Test Band: 4 _ 20MHz Bandwidth								
QPSK	100	0	18.415	18.373	18.378	20.741	20.443	20.44
16QAM	100	0	18.44	18.287	18.411	20.471	20.351	20.465

5.7 Test Data – LTE Band 5

Test Band: 5 _ 1.4MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	6	0	1.131	1.127	1.117	1.34	1.366	1.349
16QAM	6	0	1.126	1.114	1.13	1.332	1.324	1.338
Test Band: 5 _ 3MHz Bandwidth								
QPSK	15	0	2.745	2.745	2.746	3.058	3.056	3.053
16QAM	15	0	2.738	2.737	2.744	3.064	3.062	3.039
Test Band: 5 _ 5MHz Bandwidth								
QPSK	25	0	4.6	4.581	4.589	5.181	5.182	5.153
16QAM	25	0	4.59	4.61	4.568	5.211	5.187	5.128
Test Band: 5 _ 10MHz Bandwidth								
QPSK	50	0	9.068	9.019	9.066	10.063	10.083	10.145
16QAM	50	0	9.063	9.017	9.057	10.105	10.032	10.117

5.8 Test Data – LTE Band 7

Test Band: 7 _ 5MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	25	0	4.599	4.583	4.589	5.184	5.193	5.182
16QAM	25	0	4.573	4.594	4.585	5.182	5.196	5.19
Test Band: 7 _ 10MHz Bandwidth								
QPSK	50	0	9.058	9.038	9.067	10.127	10.138	10.17
16QAM	50	0	9.046	9.058	9.047	10.11	10.052	10.048
Test Band: 7 _ 15MHz Bandwidth								
QPSK	75	0	13.593	13.598	13.605	15.044	15.132	15.224
16QAM	75	0	13.603	13.616	13.597	15.093	15.094	15.184
Test Band: 7 _ 15MHz Bandwidth								
QPSK	75	0	13.593	13.598	13.605	15.044	15.132	15.224
16QAM	75	0	13.603	13.616	13.597	15.093	15.094	15.184
Test Band: 7 _ 20MHz Bandwidth								
QPSK	100	0	18.354	18.481	18.393	20.741	20.611	20.471
16QAM	100	0	18.371	18.365	18.439	20.451	20.356	20.481

5.9 Test Data – LTE Band 12

Test Band: 12 _ 1.4MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	6	0	1.126	1.131	1.118	1.343	1.356	1.339
16QAM	6	0	1.122	1.116	1.126	1.347	1.325	1.331
Test Band: 12 _ 3MHz Bandwidth								
QPSK	15	0	2.744	2.753	2.743	3.062	3.055	3.073
16QAM	15	0	2.738	2.738	2.737	3.055	3.037	3.044
Test Band: 12 _ 5MHz Bandwidth								
QPSK	25	0	4.595	4.577	4.598	5.129	5.167	5.162
16QAM	25	0	4.578	4.584	4.582	5.193	5.172	5.141
Test Band: 12 _ 10MHz Bandwidth								
QPSK	50	0	9.057	9.03	9.044	10.111	10.076	10.12
16QAM	50	0	9.049	9.018	9.042	10.098	10.068	10.058

5.10 Test Data – LTE Band 13

Test Band: 13 _ 5MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	25	0	4.596	4.576	4.582	5.141	5.138	5.163
16QAM	25	0	4.587	4.579	4.58	5.208	5.149	5.139
Test Band: 13 _ 10MHz Bandwidth								
QPSK	50	0	/	9.036	/	/	10.098	/
16QAM	50	0	/	9.012	/	/	9.932	/

5.11 Test Data – LTE Band 26a

Test Band: 26a _ 1.4MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	6	0	1.131	1.129	1.121	1.343	1.347	1.336
16QAM	6	0	1.121	1.112	1.13	1.347	1.334	1.335
Test Band: 26a _ 3MHz Bandwidth								
QPSK	15	0	2.747	2.76	2.746	3.061	3.095	3.062
16QAM	15	0	2.731	2.741	2.749	3.055	3.055	3.046
Test Band: 26a _ 5MHz Bandwidth								
QPSK	25	0	4.571	4.592	4.601	5.196	5.185	5.169
16QAM	25	0	4.576	4.597	4.592	5.164	5.219	5.145
Test Band: 26a _ 10MHz Bandwidth								
QPSK	50	0	/	9.04	/	/	10.099	/
16QAM	50	0	/	9.031	/	/	10.004	/

5.12 Test Data – LTE Band 38

Test Band: 38 _ 5MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	25	0	4.631	4.605	4.603	5.933	5.323	5.353
16QAM	25	0	4.583	4.626	4.687	5.194	6.814	7.177
Test Band: 38 _ 10MHz Bandwidth								
QPSK	50	0	9.209	9.273	9.472	10.315	10.015	10.51
16QAM	50	0	9.352	9.182	9.299	9.97	10.195	9.985
Test Band: 38 _ 15MHz Bandwidth								
QPSK	75	0	14.486	14.373	14.163	14.948	14.818	14.918
16QAM	75	0	13.568	14.13	15.012	15.022	15.142	15.067
Test Band: 38 _ 20MHz Bandwidth								
QPSK	100	0	18.896	19.049	18.884	20.315	20.24	20.165
16QAM	100	0	18.921	19.251	18.941	20.265	20.29	20.465

5.13 Test Data – LTE Band 41

Test Band: 41 _ 5MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	25	0	4.613	4.604	4.591	5.45	5.316	5.137
16QAM	25	0	4.603	4.622	4.58	5.315	5.267	5.168
Test Band: 41 _ 10MHz Bandwidth								
QPSK	50	0	9.109	9.156	9.065	10.483	11.461	10.148
16QAM	50	0	9.056	9.112	9.058	11.413	10.678	10.055
Test Band: 41 _ 15MHz Bandwidth								
QPSK	75	0	13.612	13.943	13.616	14.668	14.868	15.055
16QAM	75	0	13.722	13.919	13.602	14.968	14.968	15.162
Test Band: 41 _ 20MHz Bandwidth								
QPSK	100	0	18.359	18.709	18.405	20.49	28.442	20.449
16QAM	100	0	18.444	18.727	18.359	20.115	20.14	20.383

5.14 Test Data – LTE Band 66

Test Band: 66 _ 1.4MHz Bandwidth								
Test Mode	RB Allocation		99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
	Size	Offset	LCH	MCH	HCH	LCH	MCH	HCH
QPSK	6	0	1.131	1.131	1.118	1.344	1.358	1.339
16QAM	6	0	1.125	1.116	1.127	1.348	1.326	1.315
Test Band: 66 _ 3MHz Bandwidth								
QPSK	15	0	2.745	2.739	2.745	3.065	3.07	3.066
16QAM	15	0	2.731	2.741	2.755	3.077	3.049	3.069
Test Band: 66 _ 5MHz Bandwidth								
QPSK	25	0	4.597	4.596	4.613	5.164	5.139	5.187
16QAM	25	0	4.607	4.606	4.594	5.216	5.195	5.173
Test Band: 66 _ 10MHz Bandwidth								
QPSK	50	0	9.068	9.026	9.051	10.111	10.088	10.12
16QAM	50	0	9.059	9.045	9.033	10.046	10.026	10.045
Test Band: 66 _ 15MHz Bandwidth								
QPSK	75	0	13.593	13.558	13.567	15.161	15.053	15.023
16QAM	75	0	13.634	13.594	13.569	15.135	15.131	15.065
Test Band: 66 _ 20MHz Bandwidth								
QPSK	100	0	18.445	18.437	18.3	20.587	20.482	20.267
16QAM	100	0	18.436	18.355	18.315	20.491	20.413	20.451

6 Band Edge and Conducted Spurious Emissions

6.1 Test Result

Test Description	Specification		Test Result
	FCC	ISED	
Conducted spurious emissions and Band Edge	2.1051 22.917(a) / (b) 24.238(a) / (b) 27.53(c)(2) 27.53(g) / (h) 27.53(m)(4) 90.691	RSS-130 (4.7) RSS-132 (5.5) RSS-133 (6.5) RSS-139 (6.6) RSS-199 (4.5)	Compliant

6.2 Test Method

KDB document 971168 D01 Power Meas License Digital Systems v03r01, Clause 6 was used to measure spurious emissions at the antenna terminals.

Lowest, middle, and highest channels were evaluated for each band and channel bandwidth. For band edges, the worst case was with maximum resource blocks. For conducted spurious emissions, worst-case was with a single resource block. Worst-case data is reported.

6.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.2 °C

Relative Humidity: 32.1 %

Atmospheric Pressure: 97.9 kPa

6.4 Test Equipment

Test End Date: 2/23/2022

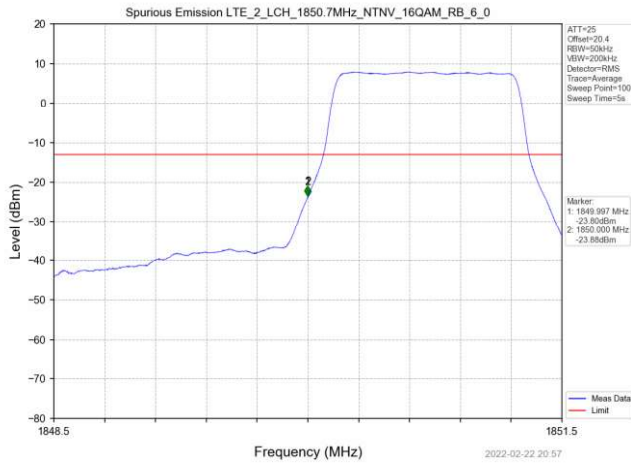
Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
ATTENUATOR, 10DB	BW-S10W2	MINI-CIRCUITS	15034	7-Oct-2021	7-Oct-2022
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM	20108	16-Mar-2022	16-Mar-2023
SIGNAL ANALYZER (TS8997)	FSV30	ROHDE & SCHWARZ	B085749	4-Jan-2022	4-Jan-2024
WIDEBAND RADIO COMMUNICATION	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	1-Jul-2021	1-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022

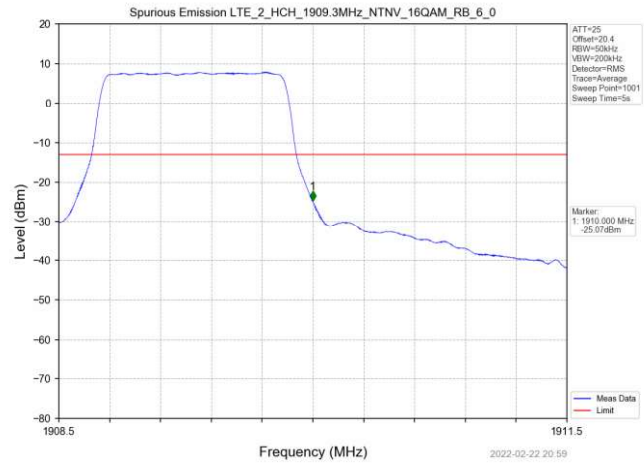
6.5 Test Data - Band Edge – LTE Band 2

1.4 MHz Cell Bandwidth

Lower Band Edge (16-QAM)



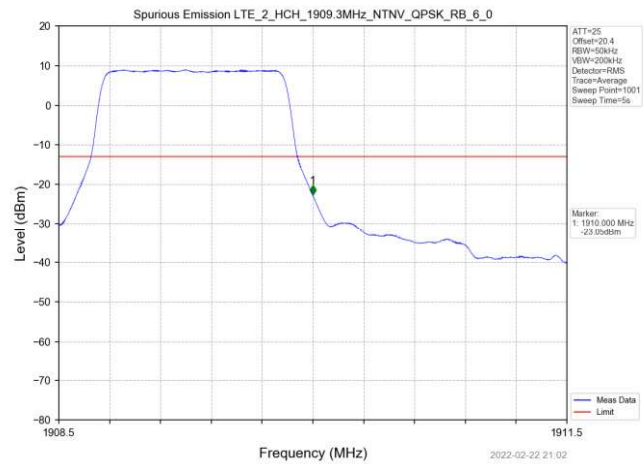
Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)

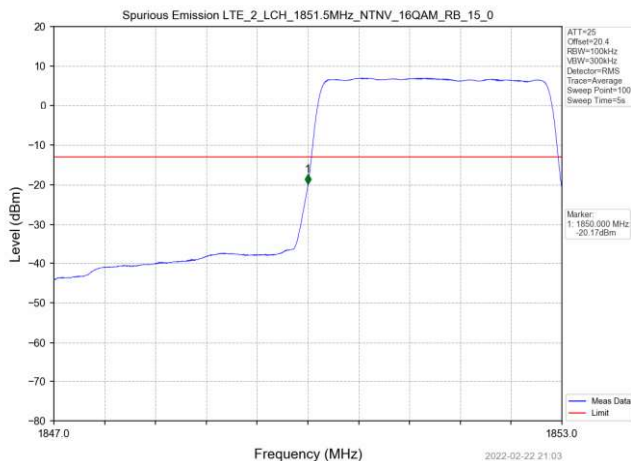


Upper Band Edge (QPSK)

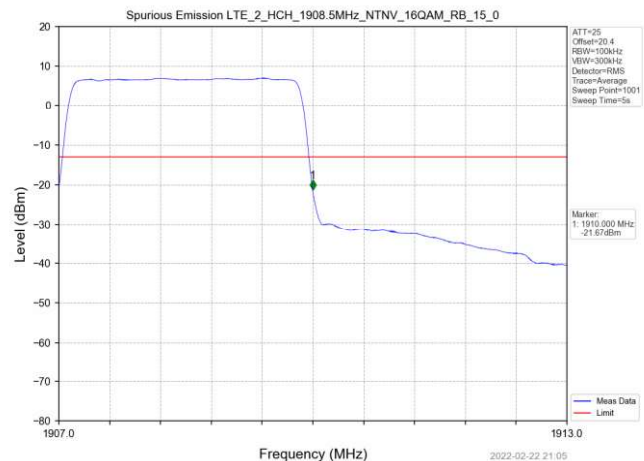


3 MHz Cell Bandwidth

Lower Band Edge (16-QAM)

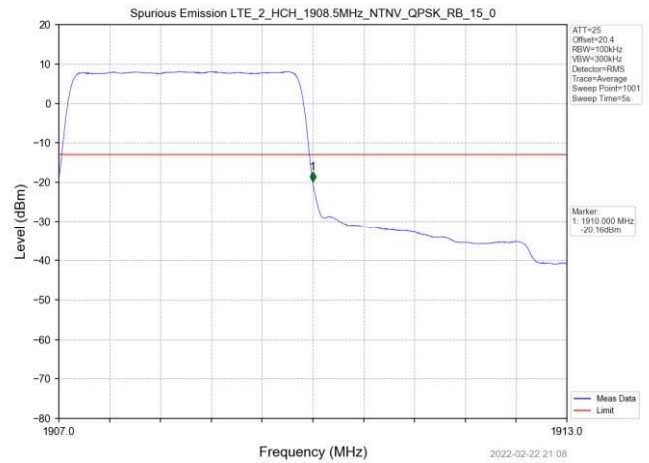
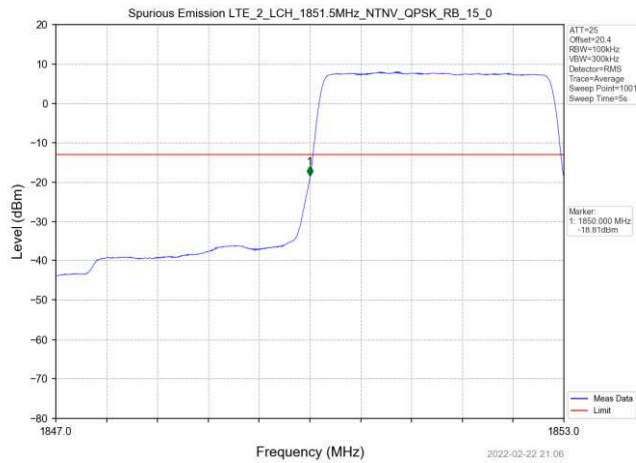


Upper Band Edge (16-QAM)



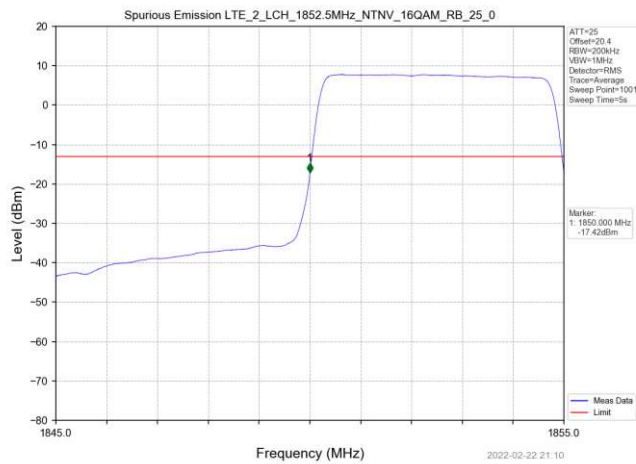
Lower Band Edge (QPSK)

Upper Band Edge (QPSK)

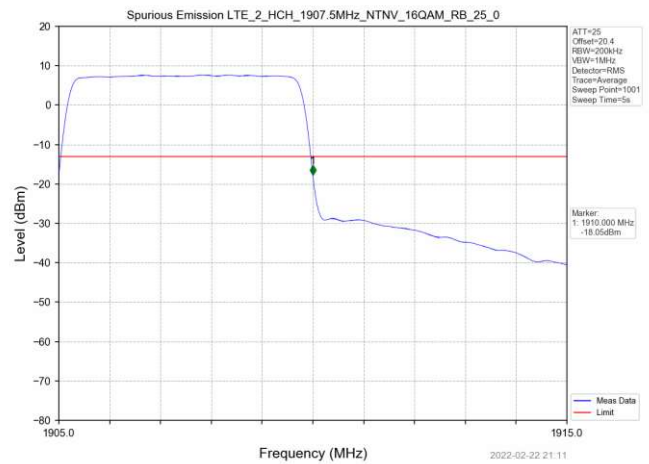


5 MHz Cell Bandwidth

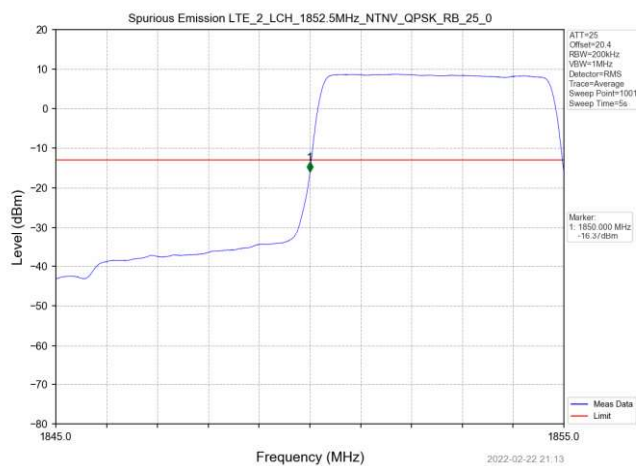
Lower Band Edge (16-QAM)



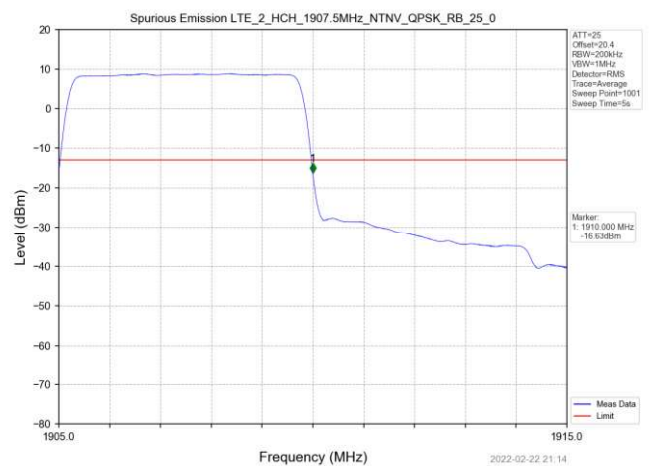
Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)



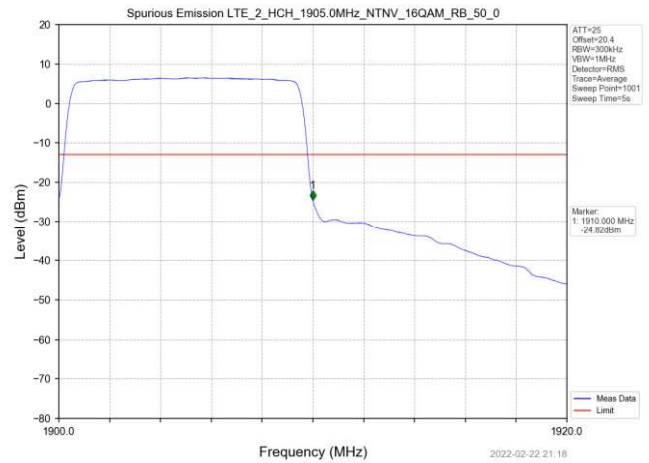
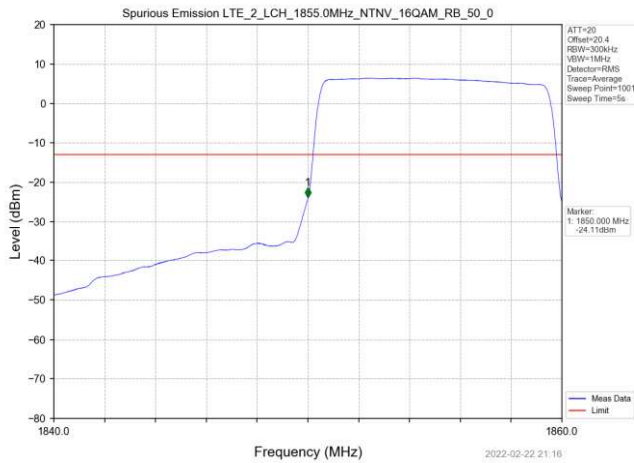
Upper Band Edge (QPSK)



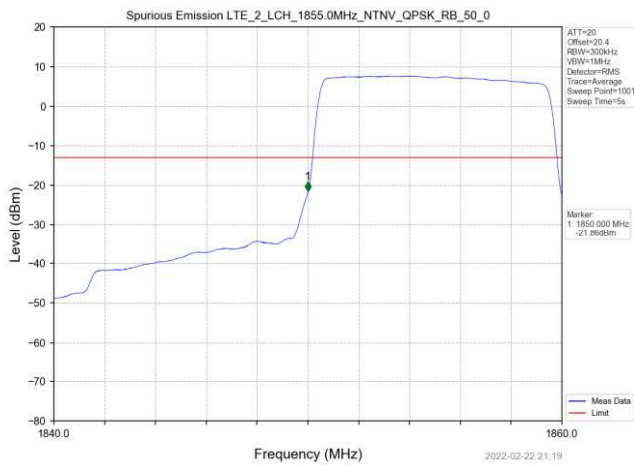
10 MHz Cell Bandwidth

Lower Band Edge (16-QAM)

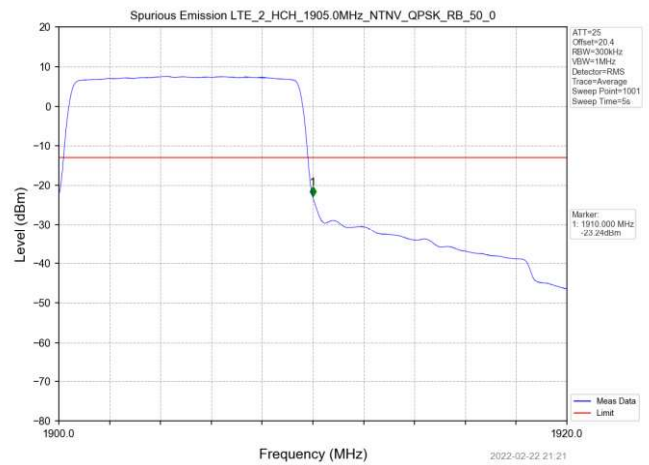
Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)

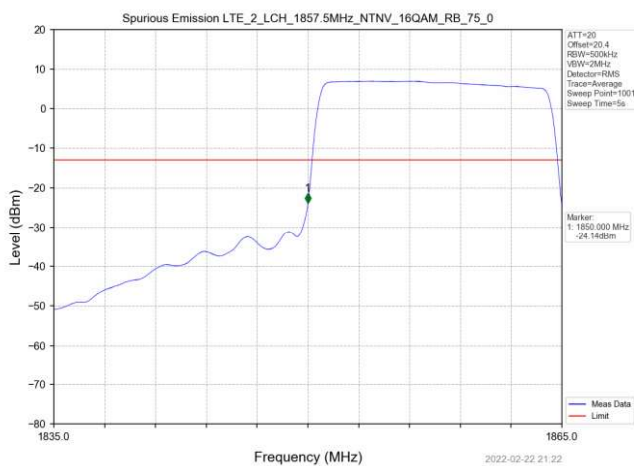


Upper Band Edge (QPSK)

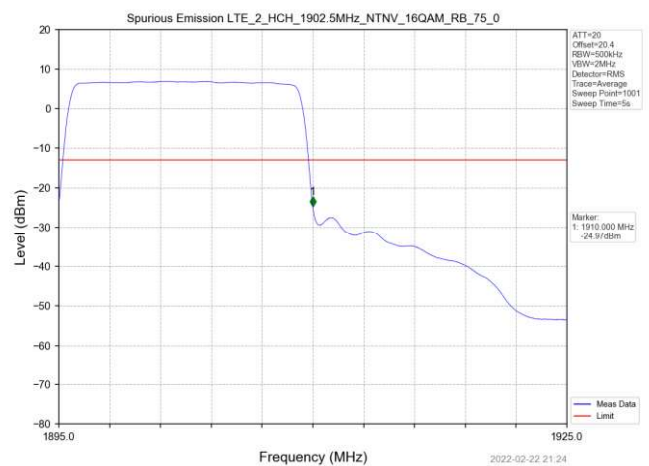


15 MHz Cell Bandwidth

Lower Band Edge (16-QAM)

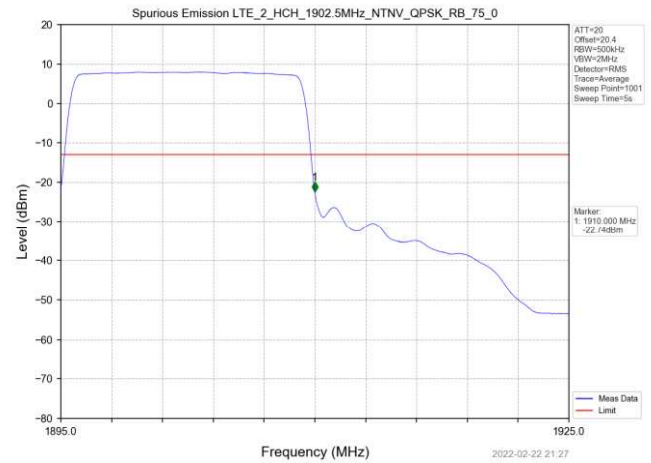
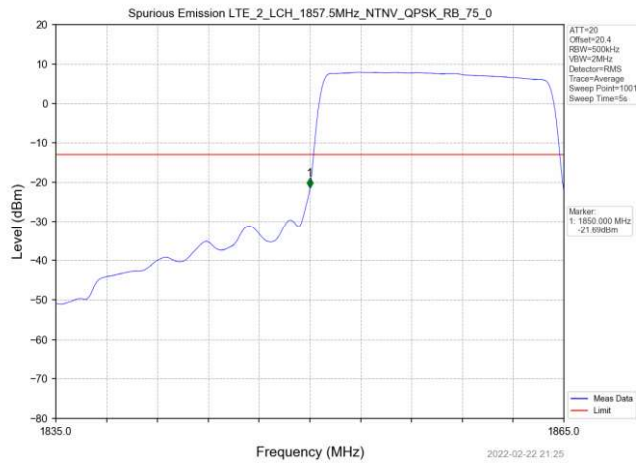


Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)

Upper Band Edge (QPSK)



20 MHz Cell Bandwidth

Lower Band Edge (16-QAM)



Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)



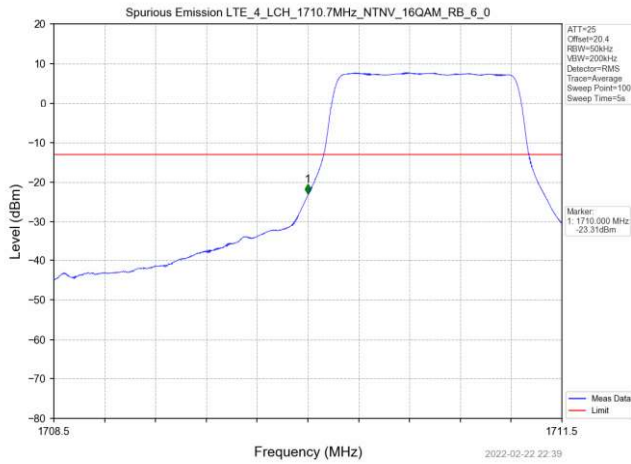
Upper Band Edge (QPSK)



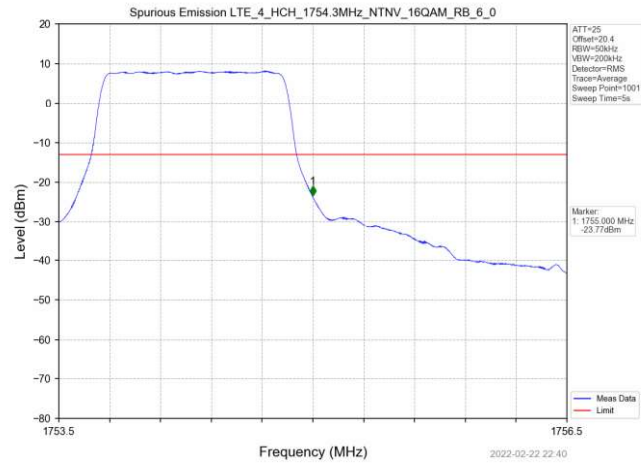
6.6 Test Data - Band Edge – LTE Band 4

1.4 MHz Cell Bandwidth

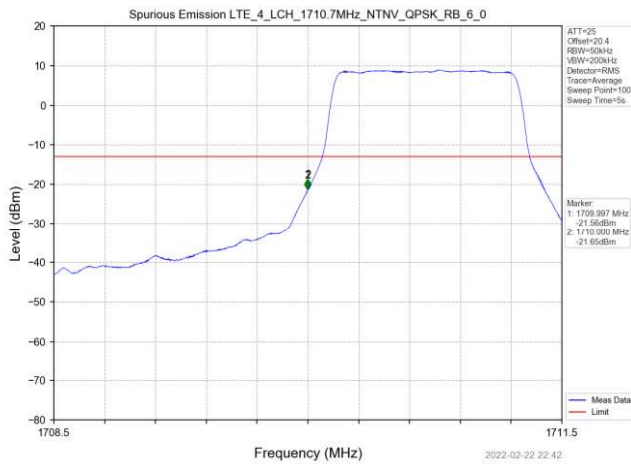
Lower Band Edge (16-QAM)



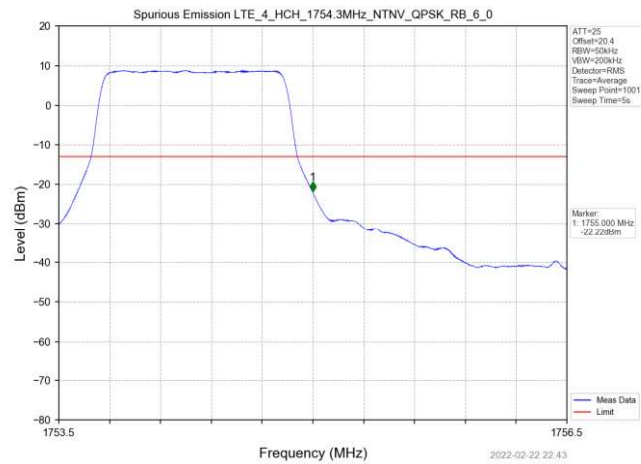
Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)

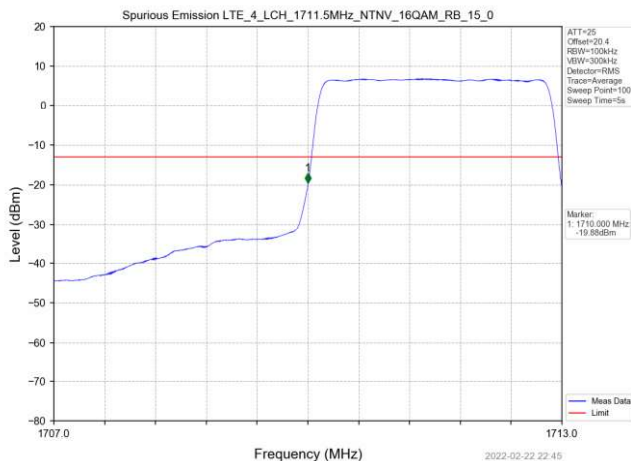


Upper Band Edge (QPSK)

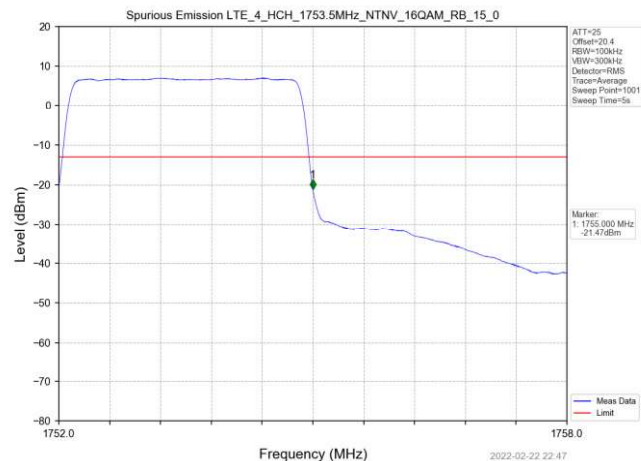


3 MHz Cell Bandwidth

Lower Band Edge (16-QAM)

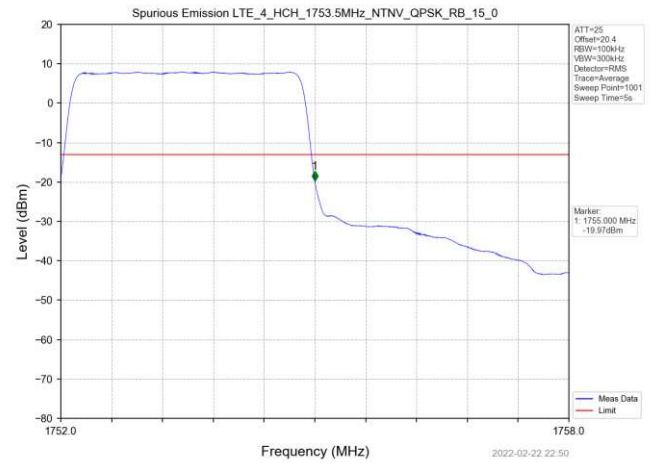
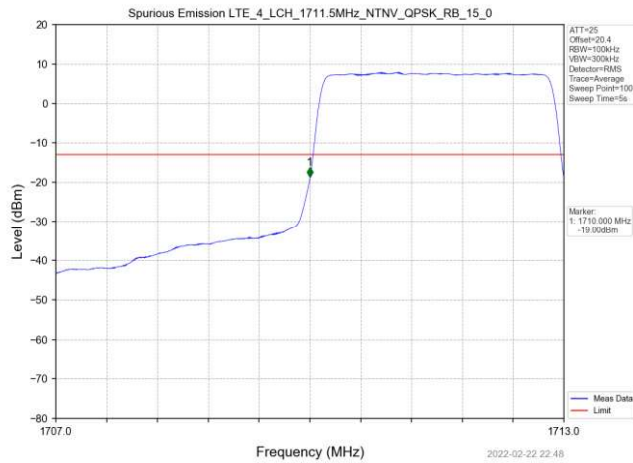


Upper Band Edge (16-QAM)



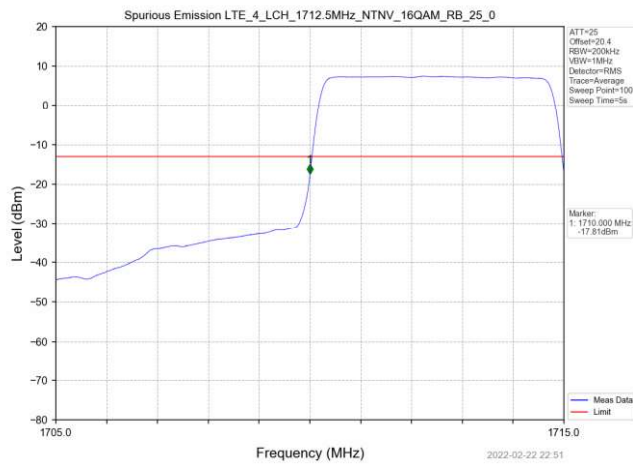
Lower Band Edge (QPSK)

Upper Band Edge (QPSK)

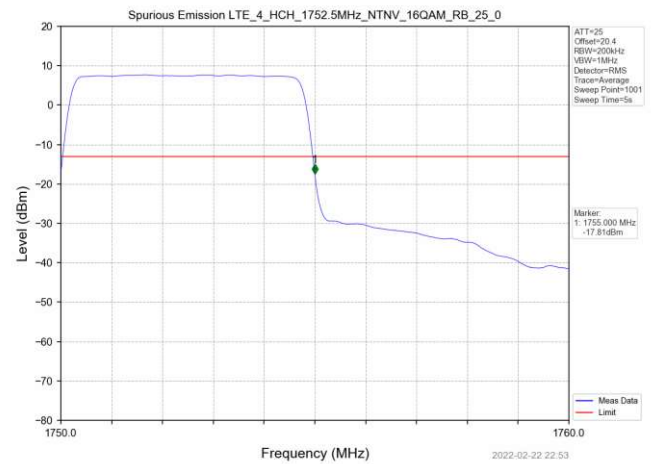


5 MHz Cell Bandwidth

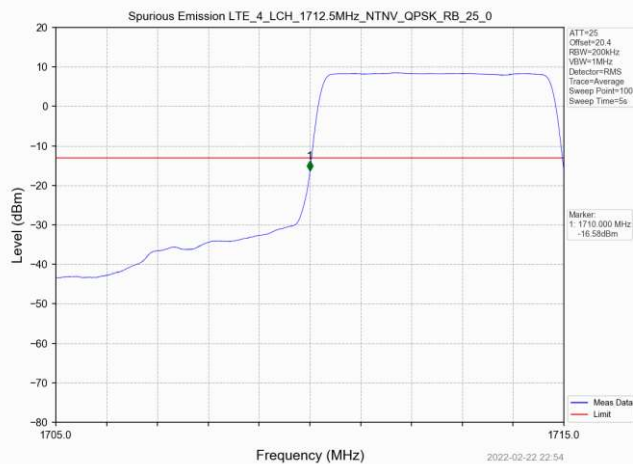
Lower Band Edge (16-QAM)



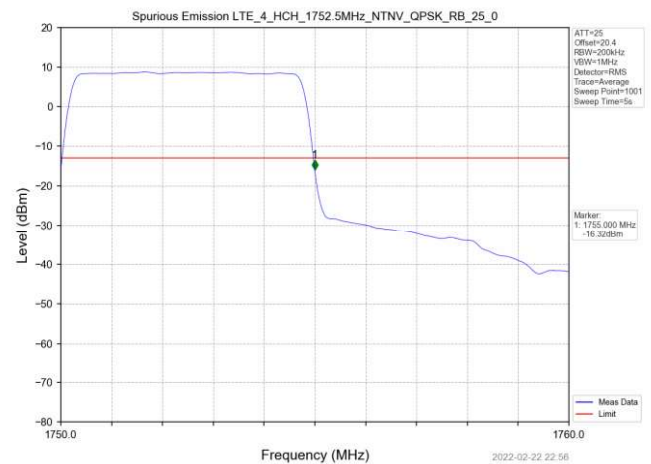
Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)



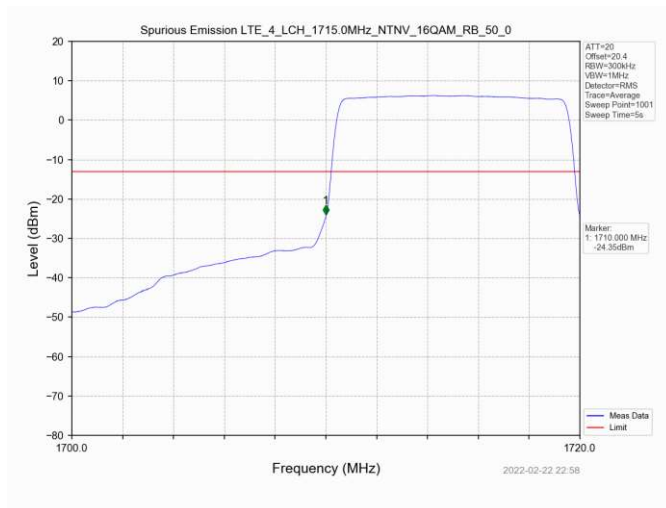
Upper Band Edge (QPSK)



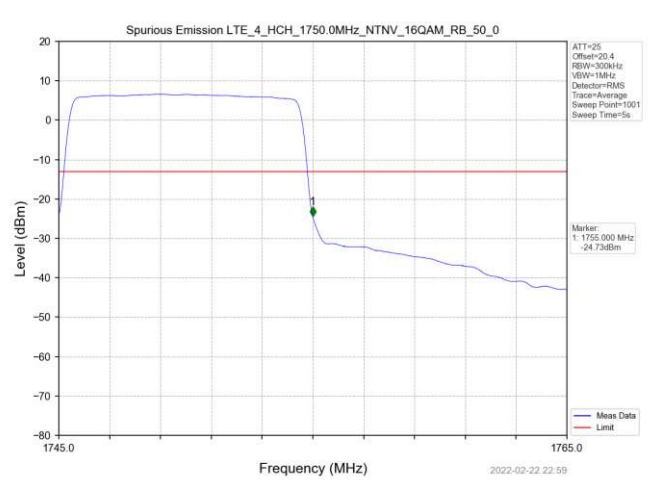
10 MHz Cell Bandwidth

Lower Band Edge (16-QAM)

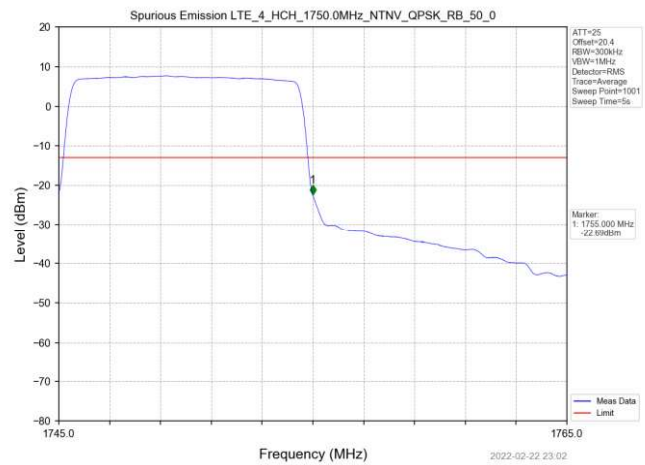
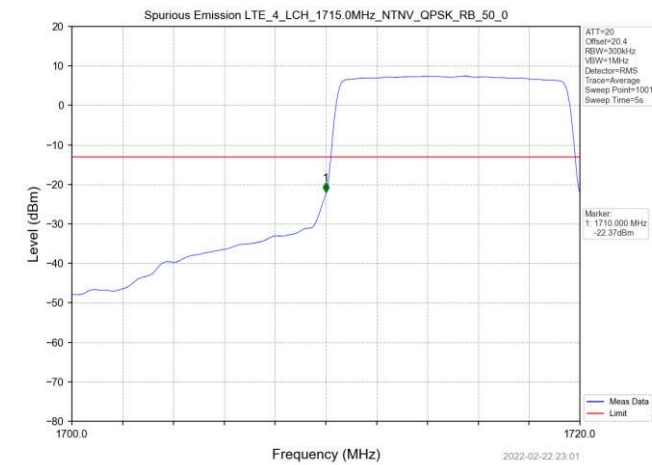
Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)



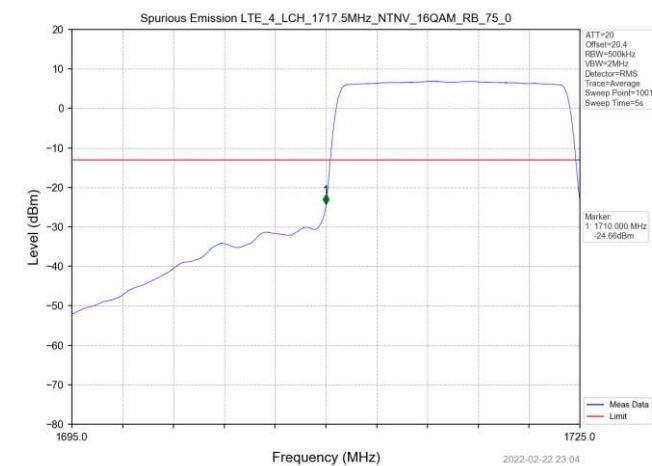
Upper Band Edge (QPSK)



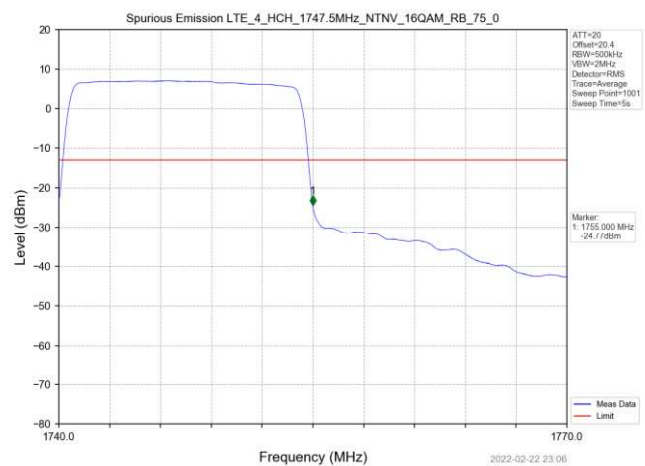
15 MHz Cell Bandwidth

Lower Band Edge (16-QAM)

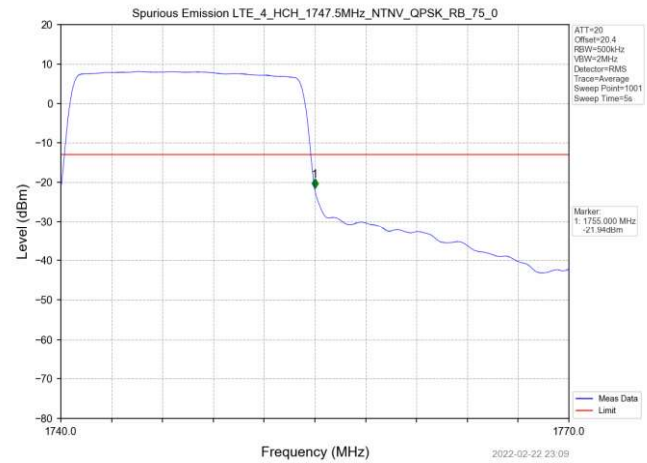
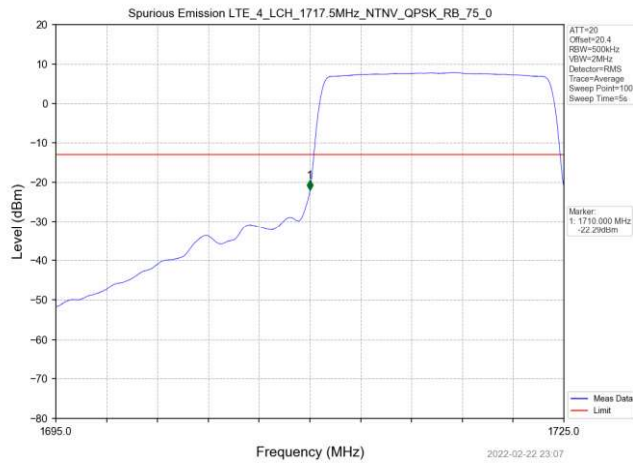
Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)

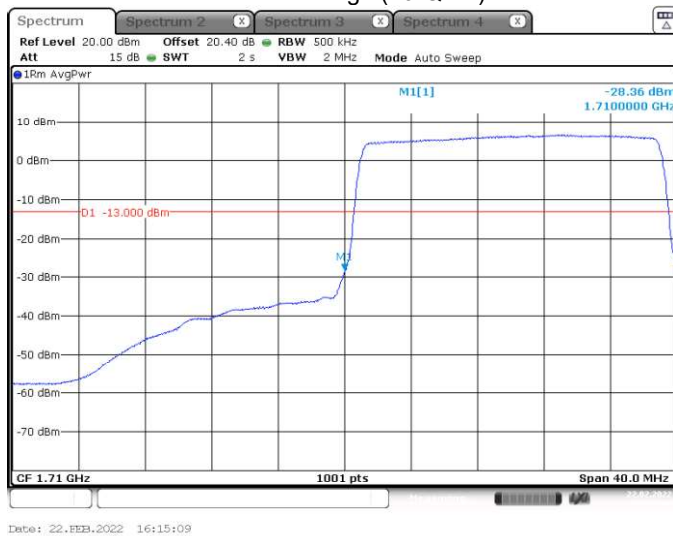


Upper Band Edge (QPSK)

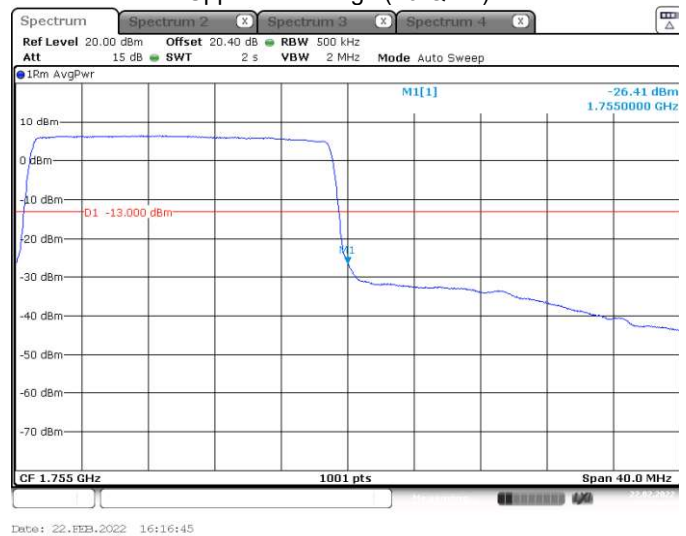


20 MHz Cell Bandwidth

Lower Band Edge (16-QAM)



Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)



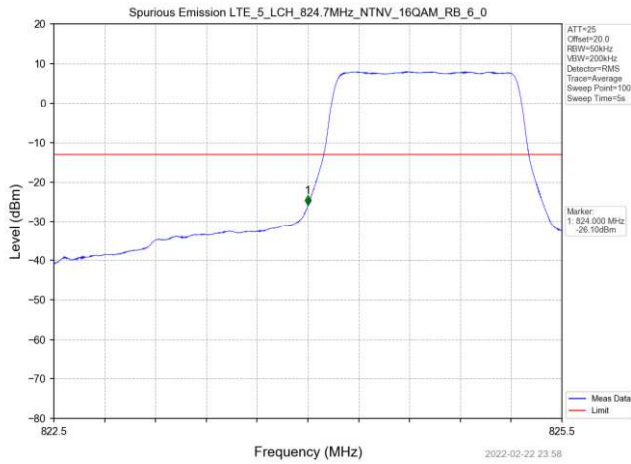
Upper Band Edge (QPSK)



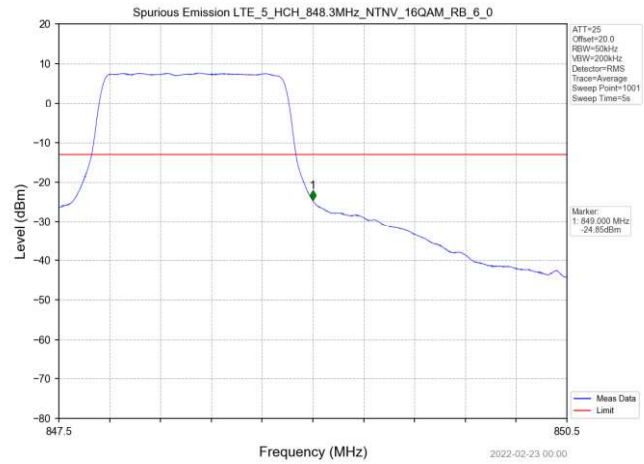
6.7 Test Data - Band Edge – LTE Band 5

1.4 MHz Cell Bandwidth

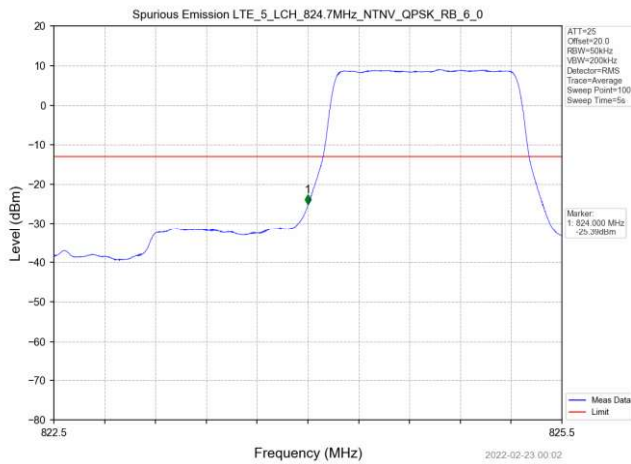
Lower Band Edge (16-QAM)



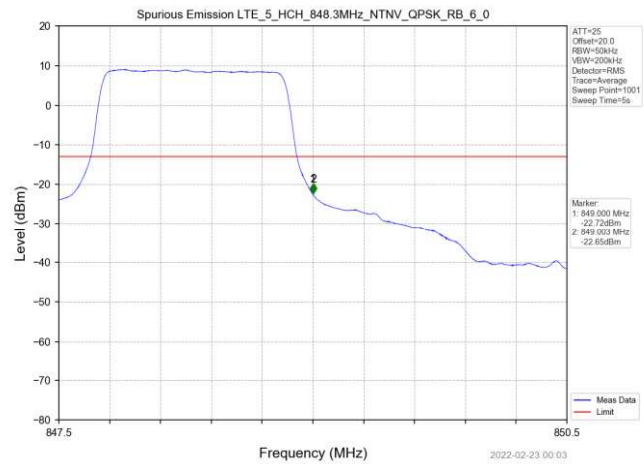
Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)

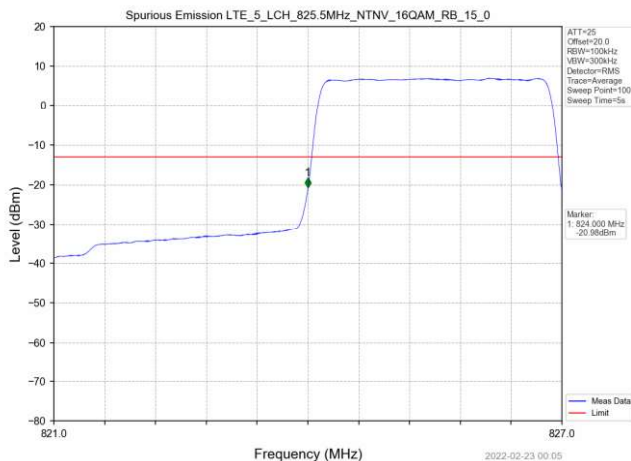


Upper Band Edge (QPSK)

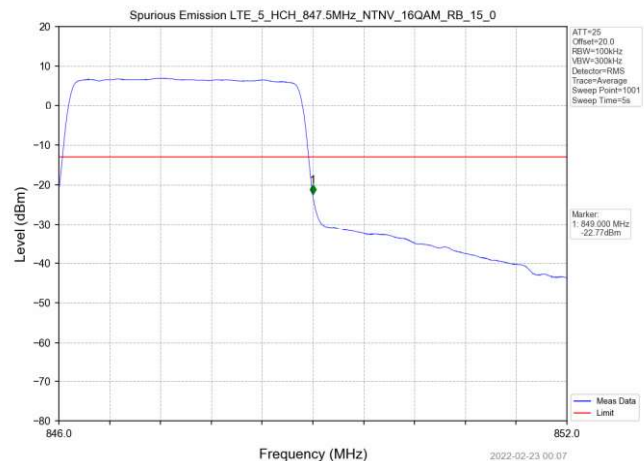


3 MHz Cell Bandwidth

Lower Band Edge (16-QAM)



Upper Band Edge (16-QAM)



Lower Band Edge (QPSK)

Upper Band Edge (QPSK)