



Frequency Stability

Test Conditions		LTE Band 4 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0024	PASS
40	Normal Voltage	0.0029	
30	Normal Voltage	0.0002	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0001	
0	Normal Voltage	0.0034	
-10	Normal Voltage	0.0010	
-20	Normal Voltage	0.0041	
-30	Normal Voltage	0.0077	
20	Maximum Voltage	0.0008	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0013	

Note:

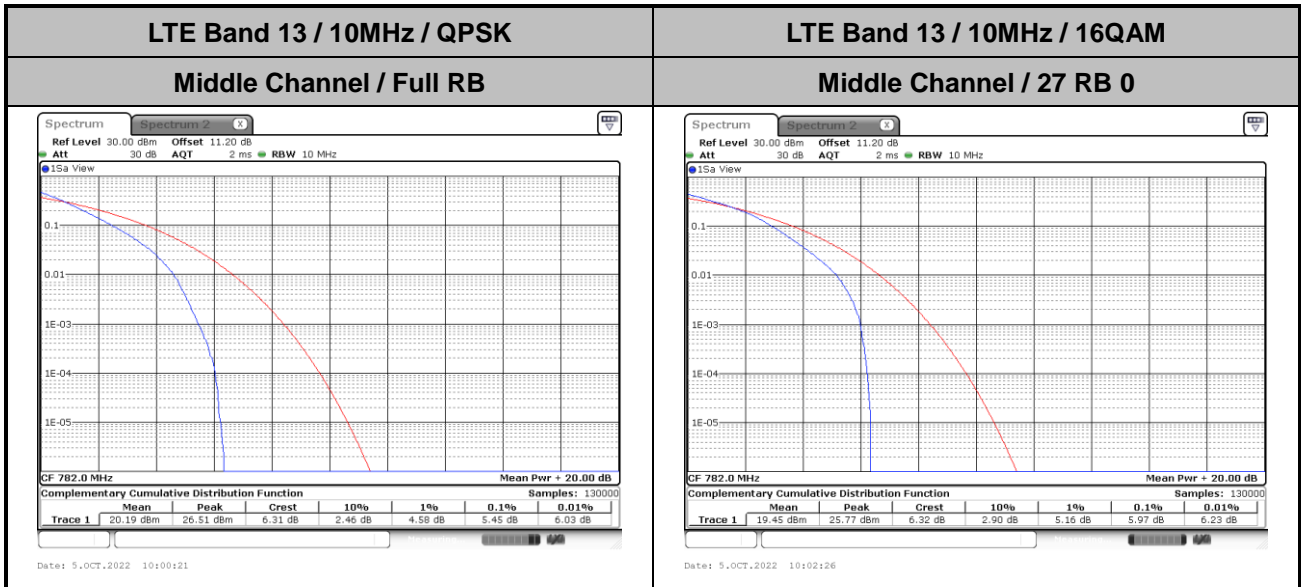
- 1. Normal Voltage = 12 V. ; Battery End Point (BEP) = 10 V. ; Maximum Voltage = 35 V.
- 2. The frequency fundamental emissions stay within the authorized frequency block.



LTE Band 13

Peak-to-Average Ratio

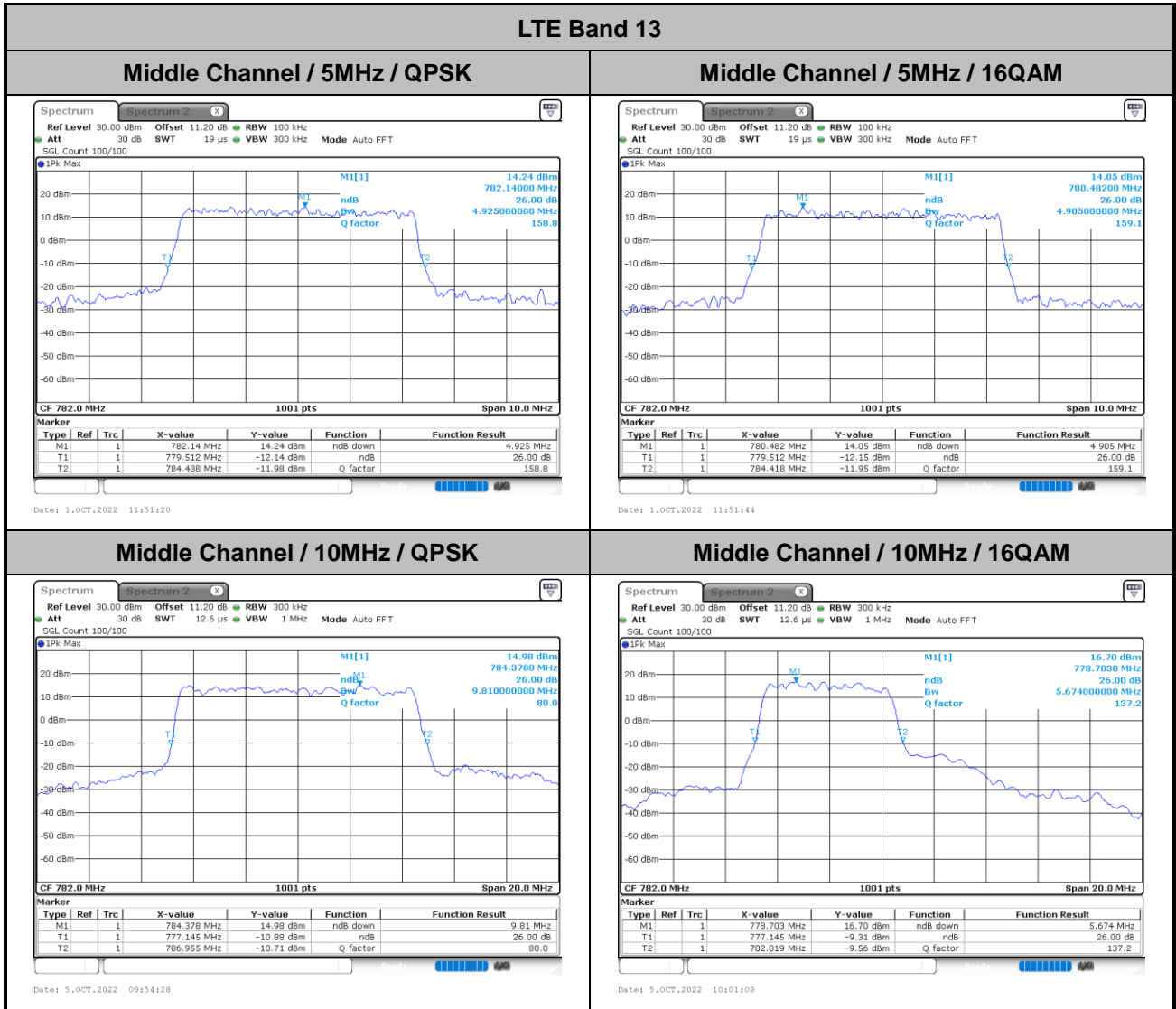
Mode	LTE Band 13 / 10MHz				
Mod.	QPSK	16QAM	64QAM	256QAM	Limit: 13dB
RB Size	Full RB	27 RB 0	Full RB	Full RB	Result
Middle CH	5.45	5.97	-	-	PASS





26dB Bandwidth

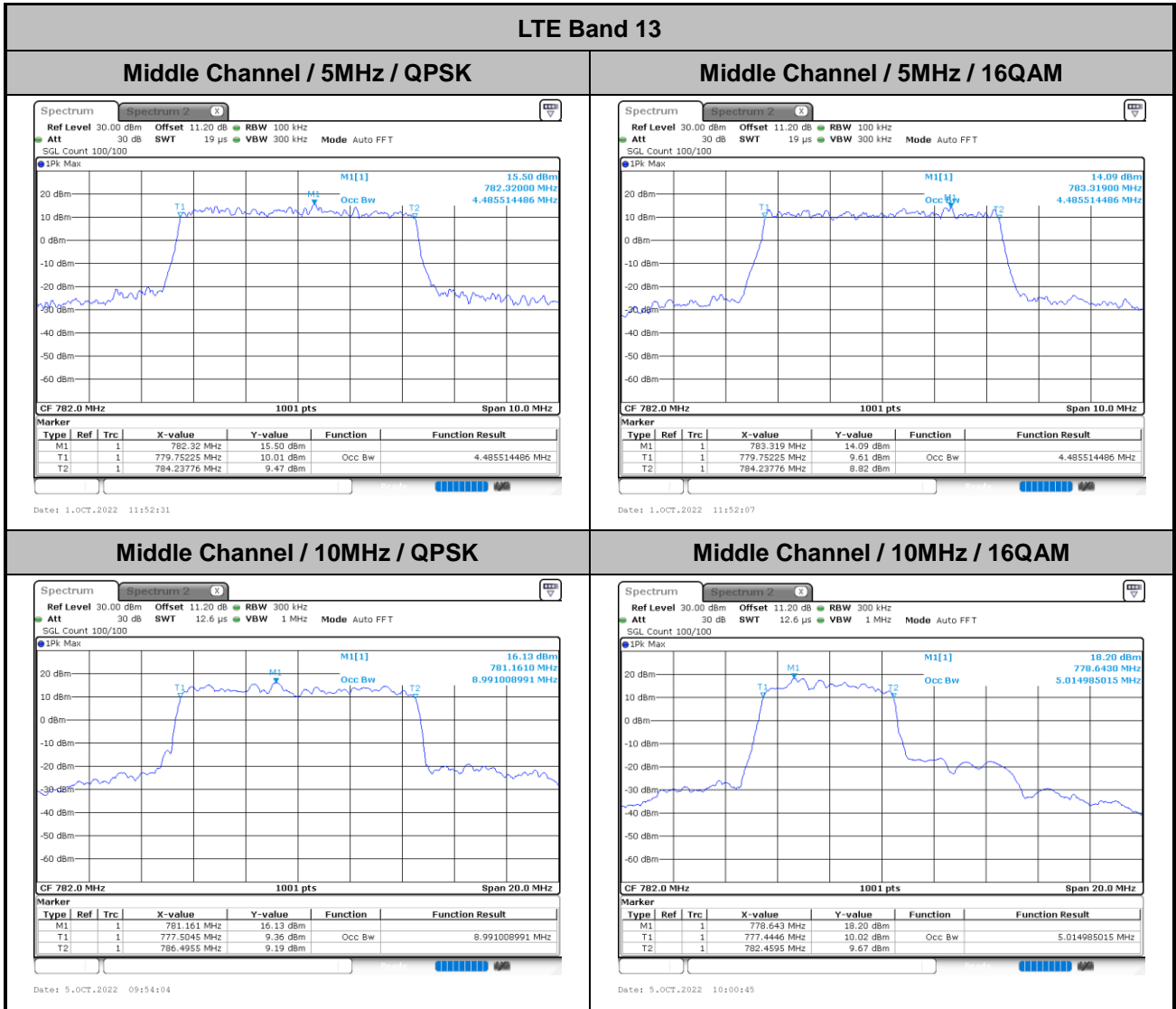
Mode	LTE Band 13 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	-	-	-	-	4.93	4.91	9.81	5.67	-	-	-	-





Occupied Bandwidth

Mode	LTE Band 13 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	-	-	-	-	4.49	4.49	8.99	5.01	-	-	-	-

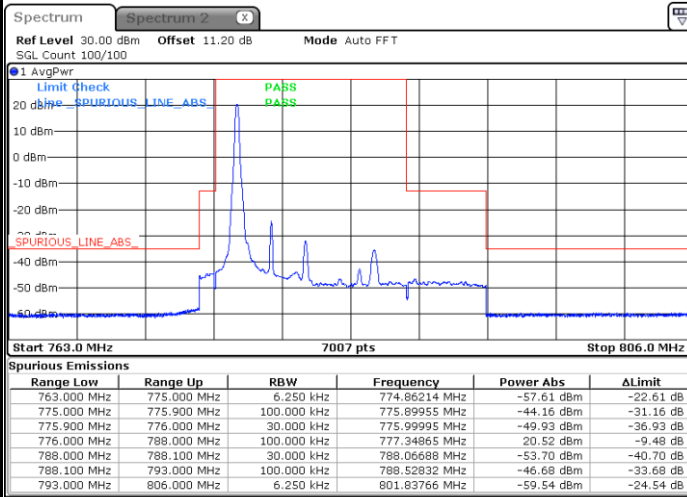




Conducted Band Edge

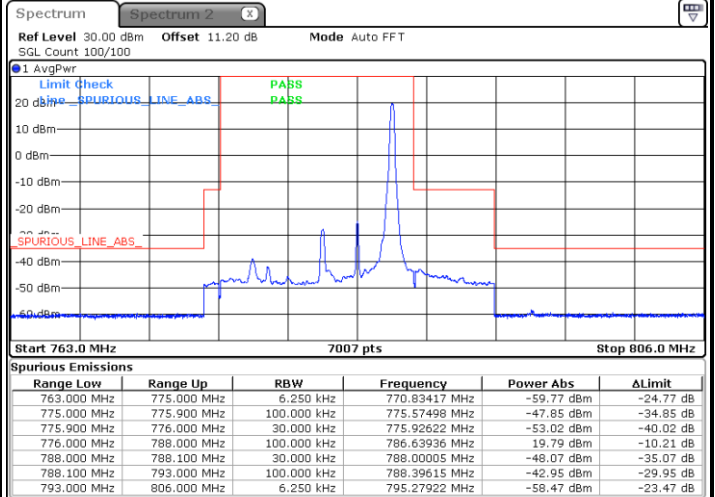
LTE Band 13 / 5MHz / QPSK

Lowest Band Edge / 1 RB



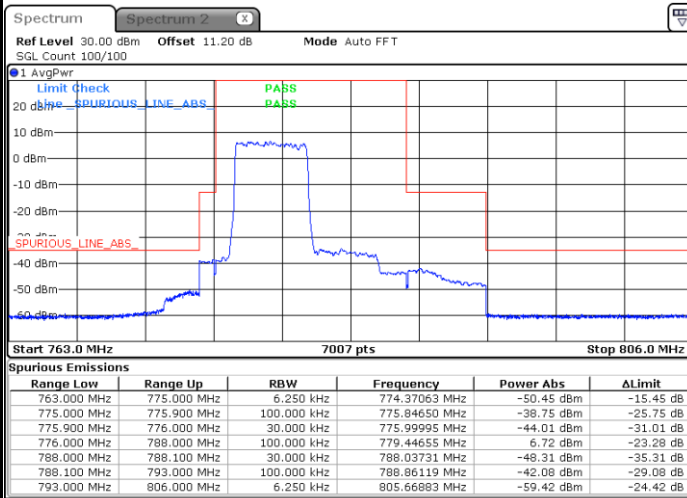
Date: 1.OCT.2022 11:48:50

Highest Band Edge / 1 RB



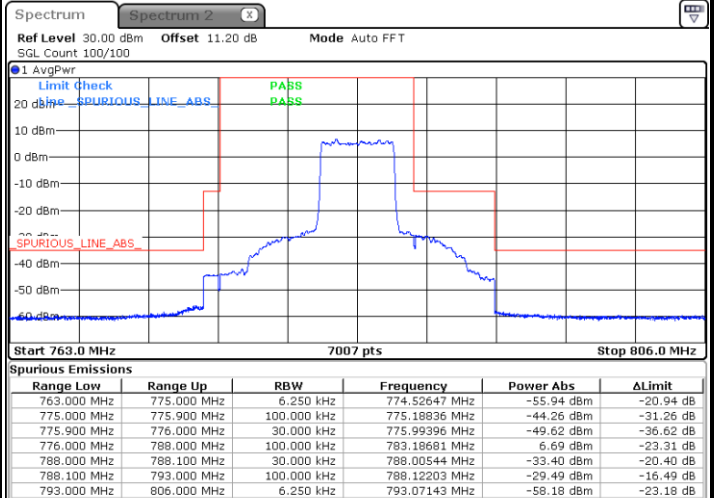
Date: 1.OCT.2022 11:56:05

Lowest Band Edge / Full RB



Date: 1.OCT.2022 11:46:09

Highest Band Edge / Full RB

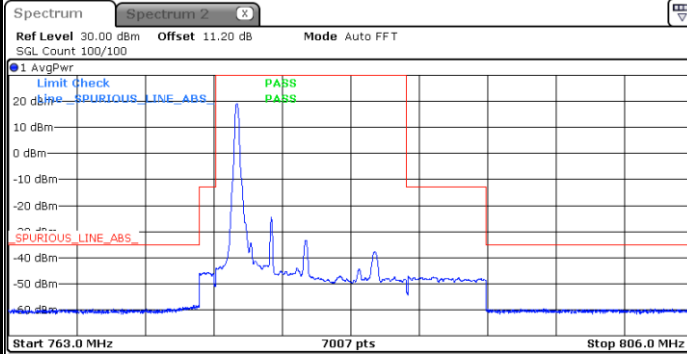


Date: 1.OCT.2022 11:53:24



LTE Band 13 / 5MHz / 16QAM

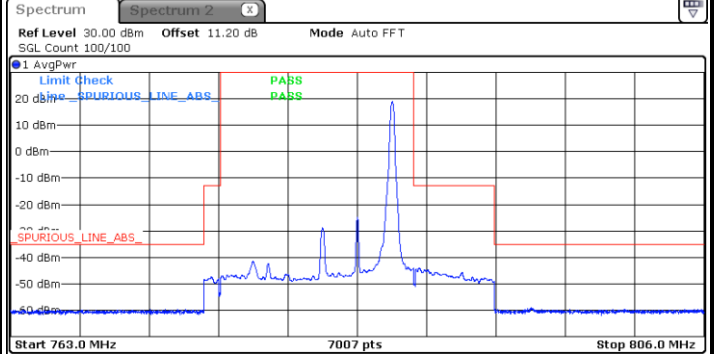
Lowest Band Edge / 1 RB



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
763.000 MHz	775.000 MHz	6.250 kHz	774.94605 MHz	-58.28 dBm	-23.28 dB
775.000 MHz	775.900 MHz	100.000 kHz	775.52373 MHz	-45.80 dBm	-32.80 dB
775.900 MHz	776.000 MHz	30.000 kHz	775.94500 MHz	-50.32 dBm	-37.32 dB
776.000 MHz	788.000 MHz	100.000 kHz	777.32468 MHz	19.11 dBm	-10.89 dB
788.000 MHz	788.100 MHz	30.000 kHz	788.00554 MHz	-53.27 dBm	-40.27 dB
788.100 MHz	793.000 MHz	100.000 kHz	788.10245 MHz	-47.23 dBm	-34.23 dB
793.000 MHz	806.000 MHz	6.250 kHz	796.62987 MHz	-59.62 dBm	-24.62 dB

Date: 1.OCT.2022 11:47:57

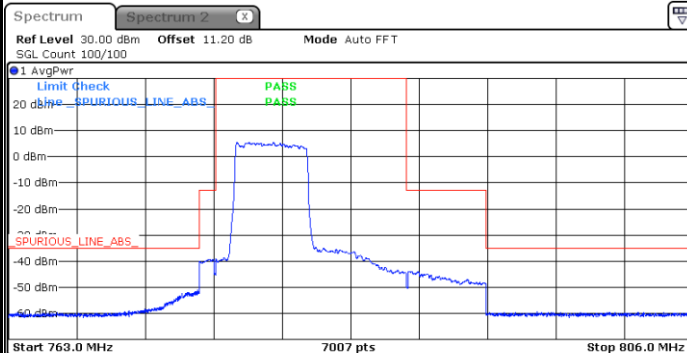
Highest Band Edge / 1 RB



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
763.000 MHz	775.000 MHz	6.250 kHz	773.35165 MHz	-59.82 dBm	-24.82 dB
775.000 MHz	775.900 MHz	100.000 kHz	775.45450 MHz	-47.41 dBm	-34.41 dB
775.900 MHz	776.000 MHz	30.000 kHz	775.97957 MHz	-53.33 dBm	-40.33 dB
776.000 MHz	788.000 MHz	100.000 kHz	786.66334 MHz	18.90 dBm	-11.10 dB
788.000 MHz	788.100 MHz	30.000 kHz	788.02093 MHz	-50.14 dBm	-37.14 dB
788.100 MHz	793.000 MHz	100.000 kHz	788.32273 MHz	-44.14 dBm	-31.14 dB
793.000 MHz	806.000 MHz	6.250 kHz	795.27922 MHz	-59.08 dBm	-24.08 dB

Date: 1.OCT.2022 11:55:11

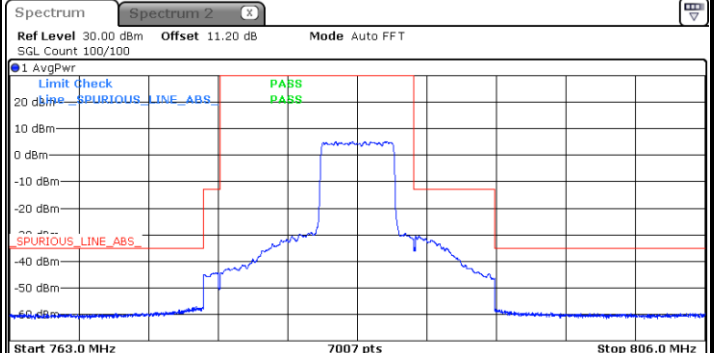
Lowest Band Edge / Full RB



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
763.000 MHz	775.000 MHz	6.250 kHz	774.86214 MHz	-51.01 dBm	-16.01 dB
775.000 MHz	775.900 MHz	100.000 kHz	775.63971 MHz	-39.38 dBm	-26.38 dB
775.900 MHz	776.000 MHz	30.000 kHz	775.94441 MHz	-44.60 dBm	-31.60 dB
776.000 MHz	788.000 MHz	100.000 kHz	779.62637 MHz	5.41 dBm	-24.59 dB
788.000 MHz	788.100 MHz	30.000 kHz	788.07917 MHz	-49.79 dBm	-36.79 dB
788.100 MHz	793.000 MHz	100.000 kHz	788.18077 MHz	-43.98 dBm	-30.98 dB
793.000 MHz	806.000 MHz	6.250 kHz	796.21429 MHz	-59.39 dBm	-24.39 dB

Date: 1.OCT.2022 11:47:03

Highest Band Edge / Full RB



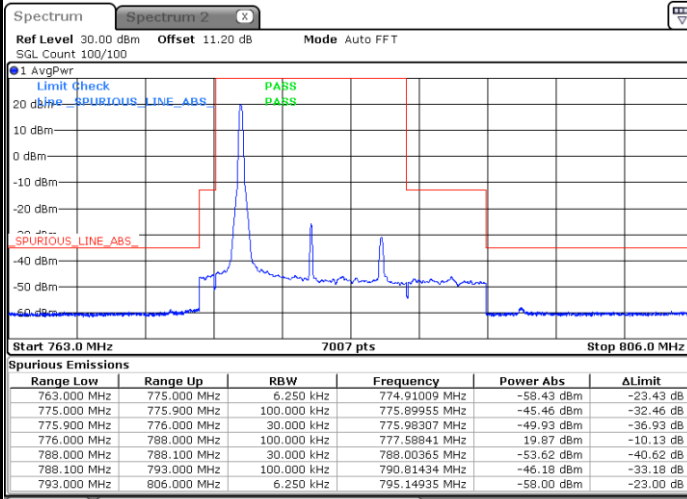
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
763.000 MHz	775.000 MHz	6.250 kHz	774.56244 MHz	-56.99 dBm	-21.99 dB
775.000 MHz	775.900 MHz	100.000 kHz	775.75390 MHz	-44.27 dBm	-31.27 dB
775.900 MHz	776.000 MHz	30.000 kHz	775.99995 MHz	-49.49 dBm	-36.49 dB
776.000 MHz	788.000 MHz	100.000 kHz	784.19381 MHz	5.18 dBm	-24.82 dB
788.000 MHz	788.100 MHz	30.000 kHz	788.06638 MHz	-34.79 dBm	-21.79 dB
788.100 MHz	793.000 MHz	100.000 kHz	788.31294 MHz	-30.61 dBm	-17.61 dB
793.000 MHz	806.000 MHz	6.250 kHz	793.05844 MHz	-58.09 dBm	-23.09 dB

Date: 1.OCT.2022 11:54:17



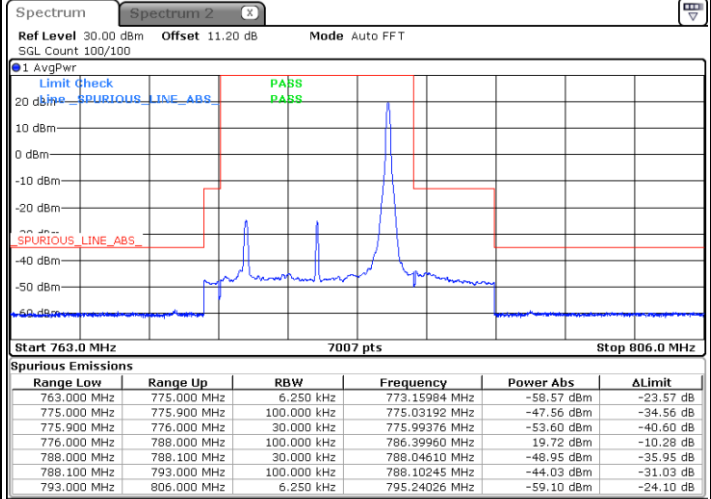
LTE Band 13 / 10MHz / QPSK

Lowest Band Edge / 1 RB



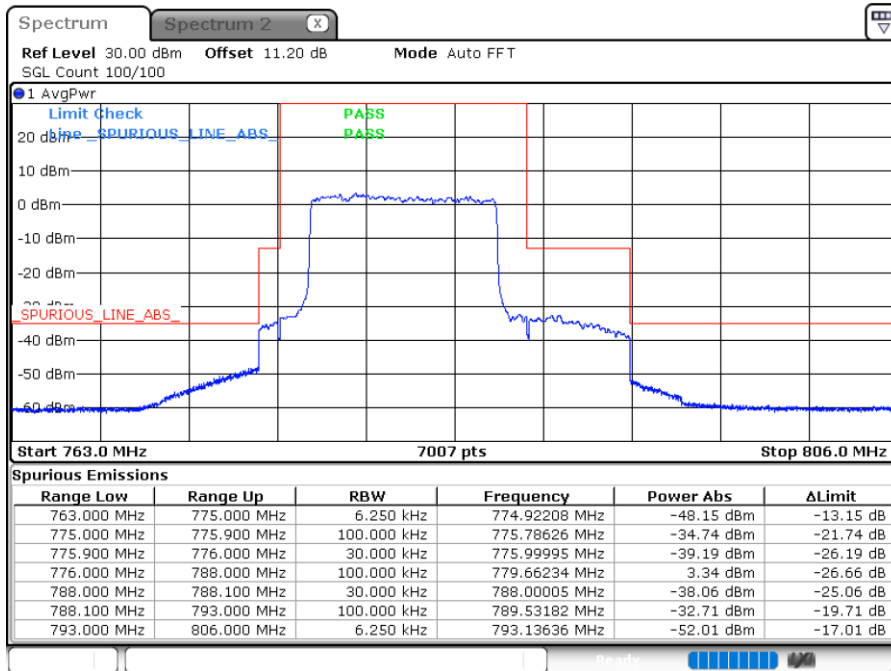
Date: 5.OCT.2022 09:57:06

Highest Band Edge / 1 RB



Date: 5.OCT.2022 09:58:00

Band Edge / Full RB

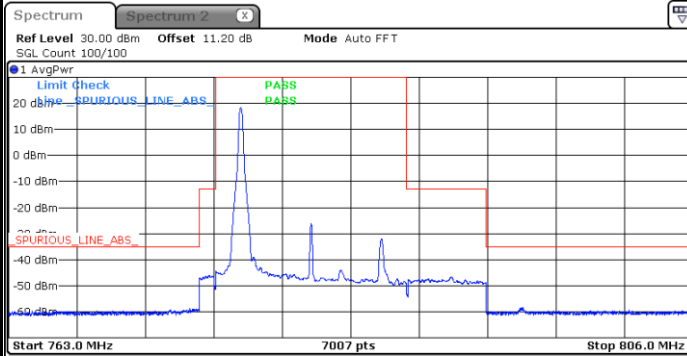


Date: 5.OCT.2022 09:55:20



LTE Band 13 / 10MHz / 16QAM

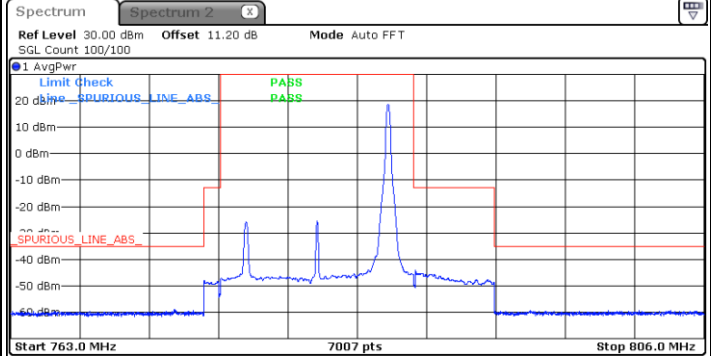
Lowest Band Edge / 1 RB



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
763.000 MHz	775.000 MHz	6.250 kHz	774.37063 MHz	-58.84 dBm	-23.84 dB
775.000 MHz	775.900 MHz	100.000 kHz	775.59296 MHz	-46.22 dBm	-33.22 dB
775.900 MHz	776.000 MHz	30.000 kHz	775.92542 MHz	-50.54 dBm	-37.54 dB
776.000 MHz	788.000 MHz	100.000 kHz	777.57642 MHz	18.39 dBm	-11.61 dB
788.000 MHz	788.100 MHz	30.000 kHz	788.00005 MHz	-53.40 dBm	-40.40 dB
788.100 MHz	793.000 MHz	100.000 kHz	790.81434 MHz	-46.77 dBm	-33.77 dB
793.000 MHz	806.000 MHz	6.250 kHz	795.22727 MHz	-58.39 dBm	-23.39 dB

Date: 5.OCT.2022 09:56:13

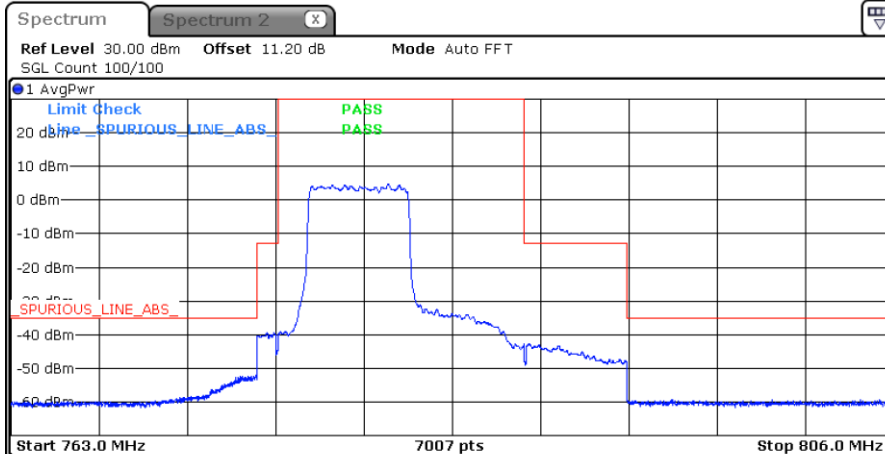
Highest Band Edge / 1 RB



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
763.000 MHz	775.000 MHz	6.250 kHz	773.14785 MHz	-58.93 dBm	-23.93 dB
775.000 MHz	775.900 MHz	100.000 kHz	775.00045 MHz	-48.08 dBm	-35.08 dB
775.900 MHz	776.000 MHz	30.000 kHz	775.98806 MHz	-53.10 dBm	-40.10 dB
776.000 MHz	788.000 MHz	100.000 kHz	786.41159 MHz	18.79 dBm	-11.21 dB
788.000 MHz	788.100 MHz	30.000 kHz	788.00924 MHz	-49.81 dBm	-36.81 dB
788.100 MHz	793.000 MHz	100.000 kHz	788.10245 MHz	-44.24 dBm	-31.24 dB
793.000 MHz	806.000 MHz	6.250 kHz	801.99351 MHz	-59.36 dBm	-24.36 dB

Date: 5.OCT.2022 09:58:53

Band Edge / 27 RB 0

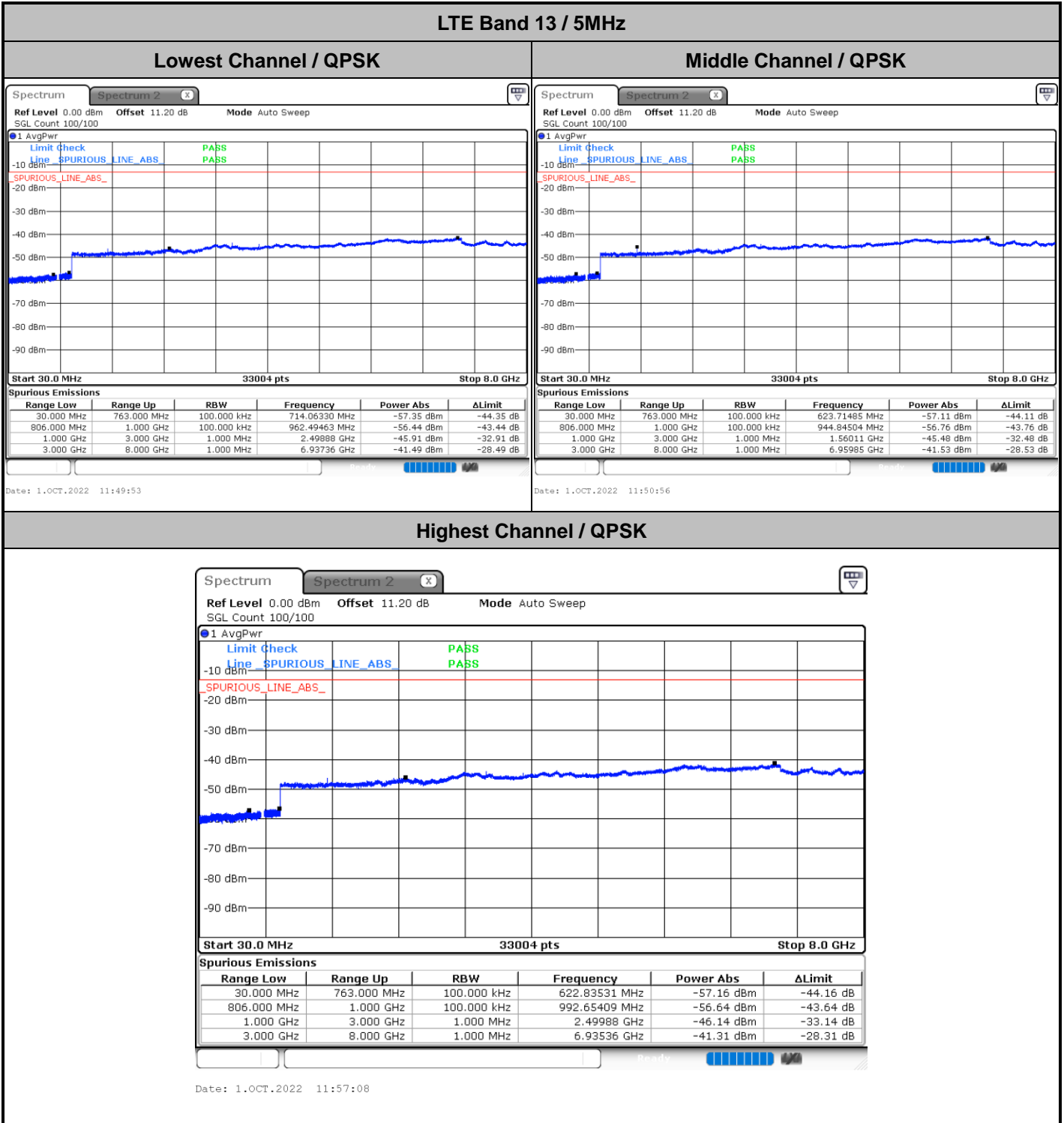


Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
763.000 MHz	775.000 MHz	6.250 kHz	774.92208 MHz	-52.13 dBm	-17.13 dB
775.000 MHz	775.900 MHz	100.000 kHz	775.46169 MHz	-39.53 dBm	-26.53 dB
775.900 MHz	776.000 MHz	30.000 kHz	775.99635 MHz	-44.67 dBm	-31.67 dB
776.000 MHz	788.000 MHz	100.000 kHz	781.36464 MHz	4.73 dBm	-25.27 dB
788.000 MHz	788.100 MHz	30.000 kHz	788.09555 MHz	-47.92 dBm	-34.92 dB
788.100 MHz	793.000 MHz	100.000 kHz	788.23951 MHz	-42.83 dBm	-29.83 dB
793.000 MHz	806.000 MHz	6.250 kHz	804.37013 MHz	-59.37 dBm	-24.37 dB

Date: 5.OCT.2022 10:02:01



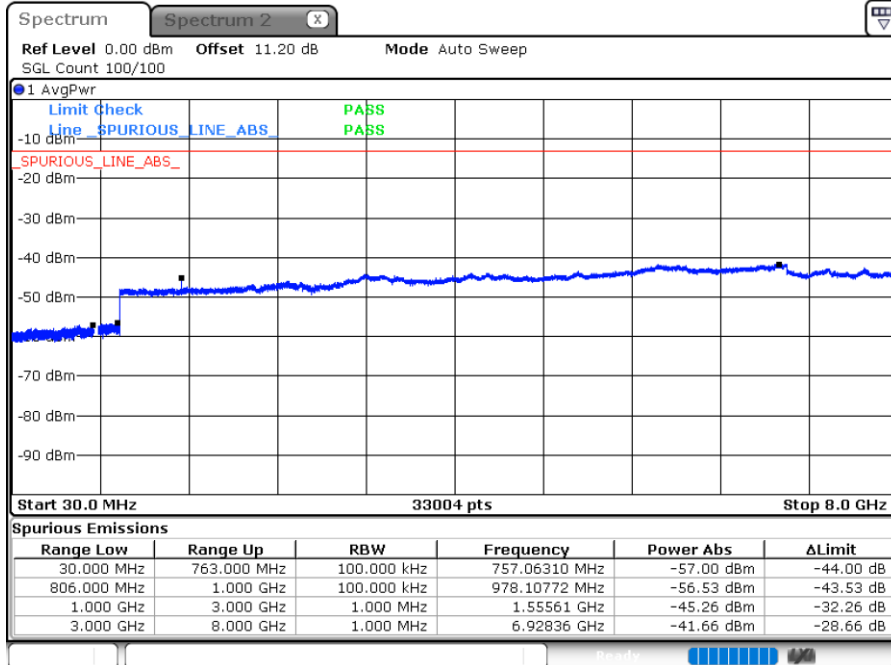
Conducted Spurious Emission





LTE Band 13 / 10MHz

Middle Channel / QPSK



Date: 5.OCT.2022 09:59:56



Frequency Stability

Test Conditions		LTE Band 13 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0005	PASS
40	Normal Voltage	0.0020	
30	Normal Voltage	0.0081	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0050	
0	Normal Voltage	0.0004	
-10	Normal Voltage	0.0120	
-20	Normal Voltage	0.0113	
-30	Normal Voltage	0.0017	
20	Maximum Voltage	0.0102	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0086	

Note:

1. Normal Voltage =12 V. ; Battery End Point (BEP) =10 V. ; Maximum Voltage =35 V.
2. Note: The frequency fundamental emissions stay within the authorized frequency block.



Appendix B. Test Results of Radiated Test

LTE Band 4

LTE Band 4 / 20MHz / QPSK									
Channel	Frequency (MHz)	ERIP (dBm)	Limit (dBm)	Margin (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3422	-47.45	-13	-34.45	-66.49	-58.42	1.35	12.31	H
	5133	-43.06	-13	-30.06	-65.94	-54.20	1.64	12.79	H
	6844	-44.08	-13	-31.08	-72.4	-54.46	1.74	12.12	H
									H
									H
									H
									H
	3422	-51.06	-13	-38.06	-70.25	-62.03	1.35	12.31	V
	5133	-40.04	-13	-27.04	-63.74	-51.18	1.64	12.79	V
	6844	-43.16	-13	-30.16	-72.23	-53.54	1.74	12.12	V
									V
									V
									V
									V



Middle	3447	-51.80	-13	-38.80	-71.22	-62.82	1.35	12.37	H
	5171	-45.78	-13	-32.78	-68.73	-56.96	1.65	12.84	H
	6894	-43.14	-13	-30.14	-71.55	-53.45	1.73	12.05	H
									H
									H
									H
									H
	3447	-51.80	-13	-38.80	-71.16	-62.82	1.35	12.37	V
	5171	-44.31	-13	-31.31	-68.19	-55.49	1.65	12.84	V
	6894	-42.70	-13	-29.70	-71.65	-53.01	1.73	12.05	V
									V
									V
									V
									V
Highest	3472	-51.68	-13	-38.68	-71.47	-62.76	1.35	12.43	H
	5208	-43.29	-13	-30.29	-66.37	-54.52	1.66	12.89	H
	6944	-43.47	-13	-30.47	-71.95	-53.72	1.73	11.98	H
									H
									H
									H
									H
	3472	-51.50	-13	-38.50	-71.03	-62.58	1.35	12.43	V
	5208	-41.04	-13	-28.04	-65.14	-52.27	1.66	12.89	V
	6944	-43.03	-13	-30.03	-71.83	-53.28	1.73	11.98	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 13

LTE Band 13 / 5MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1555	-55.16	-13	-42.16	-66.57	-60.92	0.80	8.71	H
	2332	-56.08	-13	-43.08	-70.88	-62.60	0.99	9.66	H
	3109	-53.58	-13	-40.58	-70.82	-61.66	1.09	11.32	H
									H
									H
									H
									H
	1555	-53.94	-13.00	-40.94	-65.37	-59.70	0.80	8.71	V
	2332	-55.27	-13	-42.27	-70.37	-61.79	0.99	9.66	V
	3109	-53.47	-13	-40.47	-70.93	-61.55	1.09	11.32	V
									V
									V
									V
									V



Middle	1559	-55.24	-42.15	-13.09	-66.68	-61.04	0.80	8.75	H
	2339	-55.56	-13	-42.56	-70.35	-62.12	0.99	9.70	H
	3119	-53.44	-13	-40.44	-70.73	-61.53	1.09	11.34	H
									H
									H
									H
									H
	1559	-49.95	-42.15	-7.80	-61.39	-55.75	0.80	8.75	V
	2339	-55.12	-13	-42.12	-70.18	-61.68	0.99	9.70	V
	3119	-52.98	-13	-39.98	-70.50	-61.07	1.09	11.34	V
									V
									V
									V
									V
Highest	1565	-55.91	-42.15	-13.76	-67.37	-61.78	0.80	8.82	H
	2347	-55.76	-13	-42.76	-70.55	-62.36	0.99	9.74	H
	3129	-53.08	-13	-40.08	-70.43	-61.19	1.10	11.36	H
									H
									H
									H
									H
	1565	-52.22	-42.15	-10.07	-63.67	-58.09	0.80	8.82	V
	2347	-55.35	-13	-42.35	-70.38	-61.95	0.99	9.74	V
	3129	-52.80	-13	-39.80	-70.38	-60.91	1.10	11.36	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 13 / 10MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1555	-55.12	-13	-42.12	-66.53	-60.88	0.80	8.71	H
	2333	-56.06	-13	-43.06	-70.86	-62.59	0.99	9.67	H
	3110	-53.93	-13	-40.93	-71.17	-62.01	1.09	11.32	H
									H
									H
									H
									H
	1555	-50.73	-13	-37.73	-62.16	-56.49	0.80	8.71	V
	2333	-55.17	-13	-42.17	-70.27	-61.70	0.99	9.67	V
	3110	-53.48	-13	-40.48	-70.95	-61.56	1.09	11.32	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.