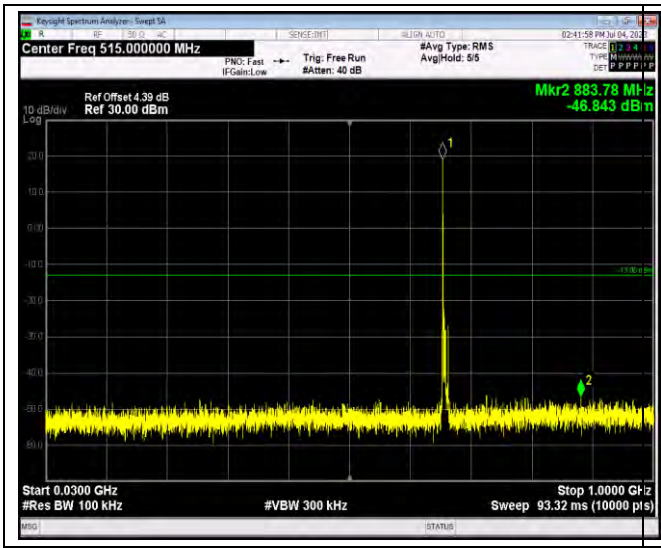
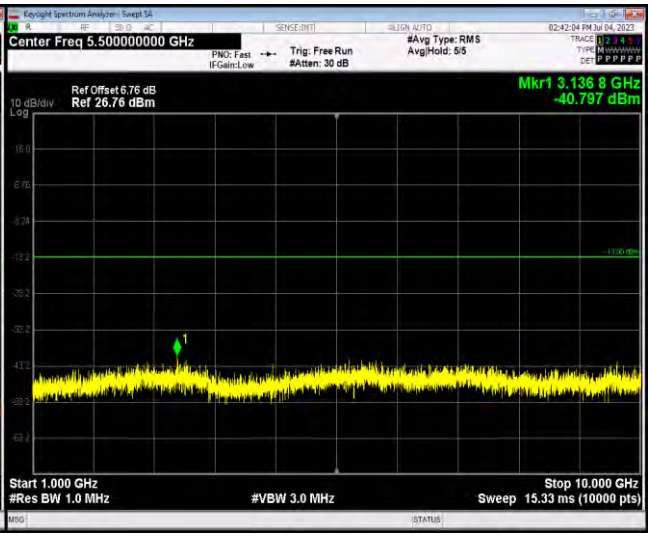
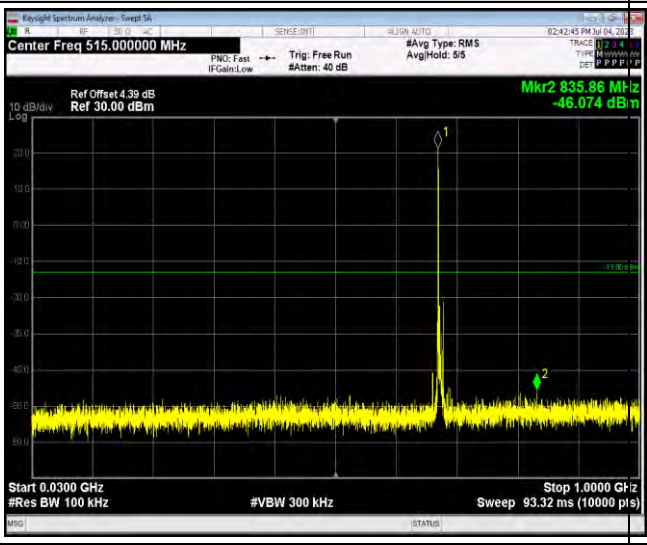


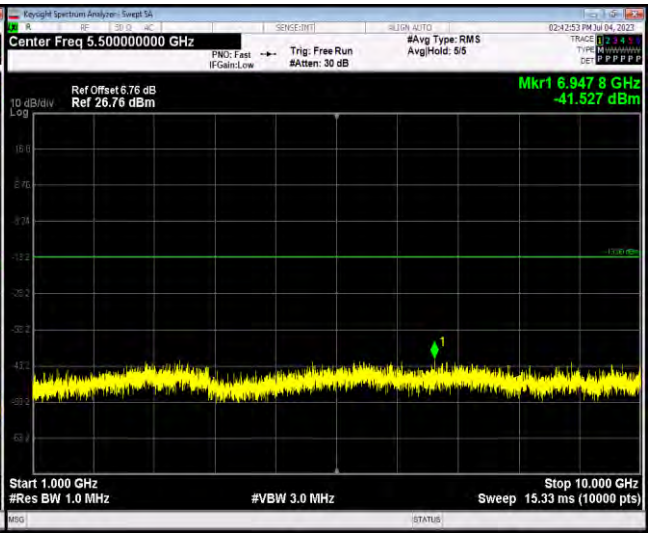
Band71-5MHz-64QAM-133297-1RB#0-Range1:30 ~1000MHz



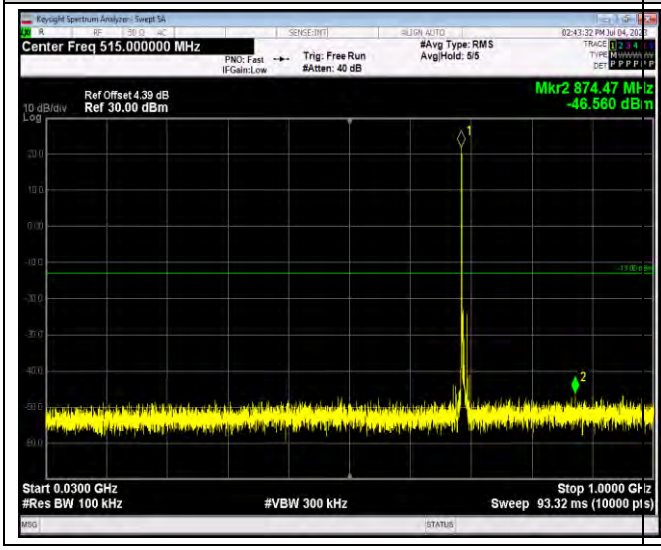
Band71-5MHz-64QAM-133297-1RB#0-Range2:1000~10000MHz

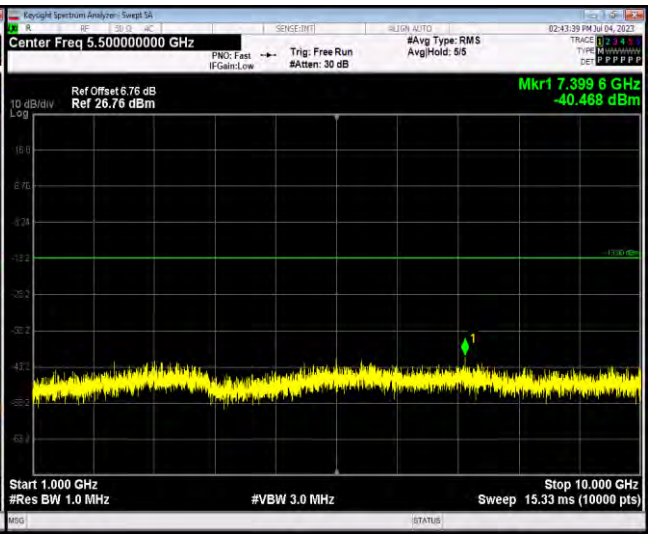


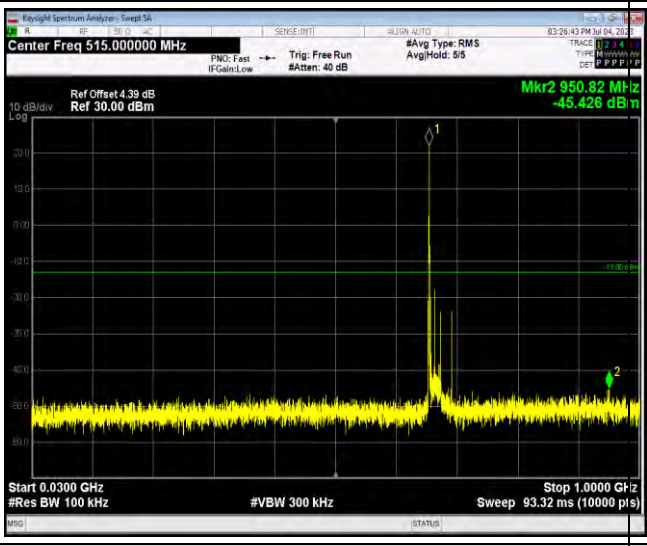
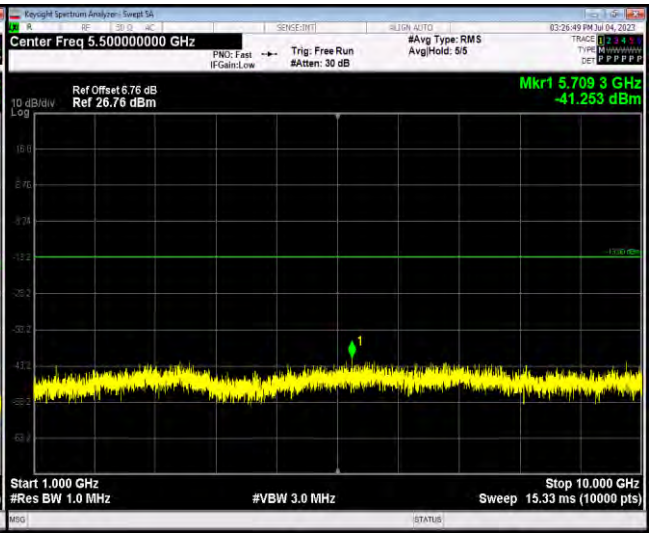
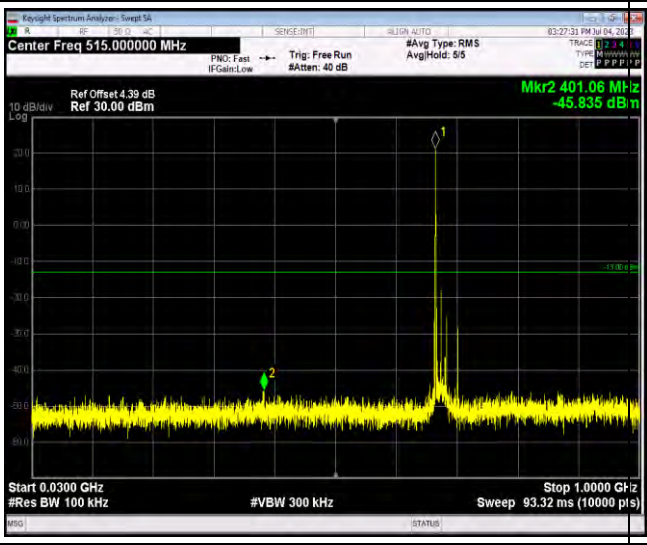
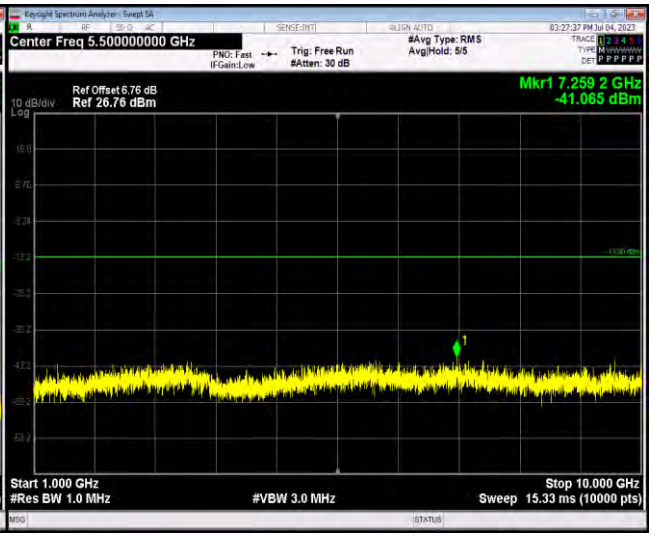
Band71-5MHz-64QAM-133447-1RB#0-Range1:30 ~1000MHz

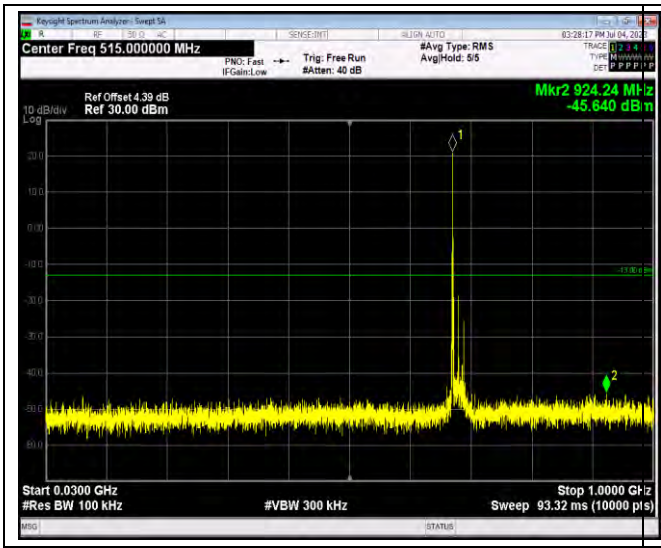


Band71-5MHz-64QAM-133447-1RB#0-Range2:1000~10000MHz

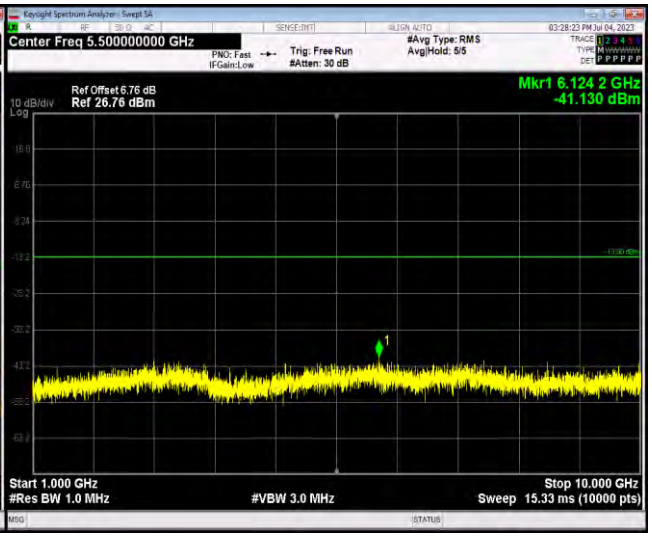




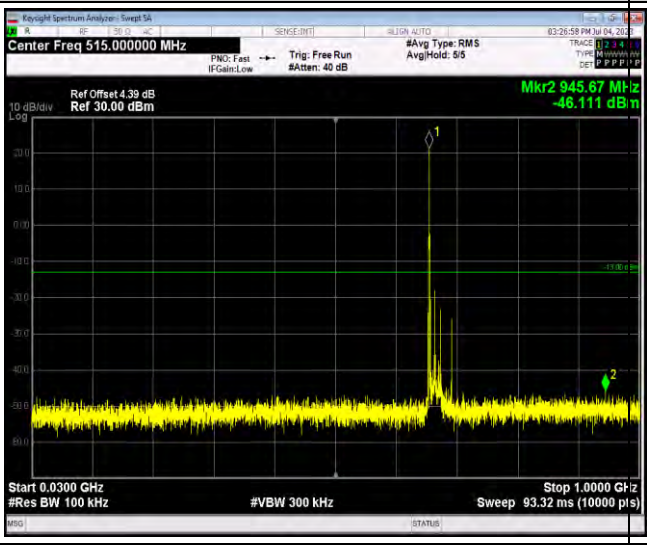
Band71-20MHz-QPSK-133222-1RB#0-Range1:30~1000MHz	Band71-20MHz-QPSK-133222-1RB#0-Range2:1000~10000MHz
	
Band71-20MHz-QPSK-133322-1RB#0-Range1:30~1000MHz	Band71-20MHz-QPSK-133322-1RB#0-Range2:1000~10000MHz
	
Band71-20MHz-QPSK-133372-1RB#0-Range1:30~1000MHz	Band71-20MHz-QPSK-133372-1RB#0-Range2:1000~10000MHz



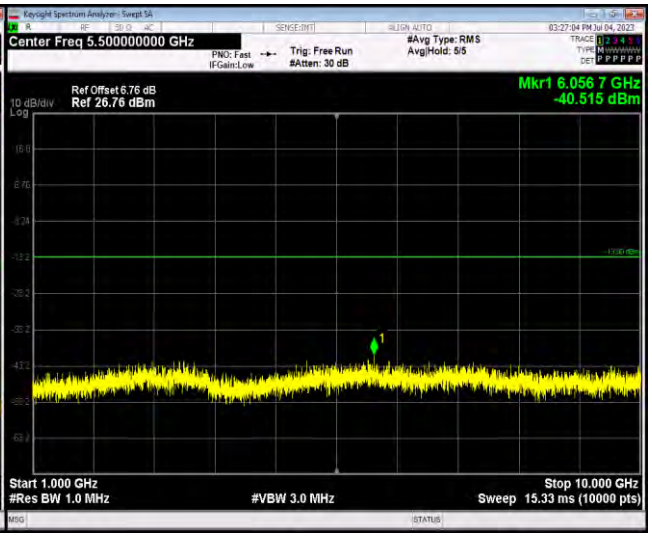
Band71-20MHz-16QAM-133222-1RB#0-Range1:30~1000MHz



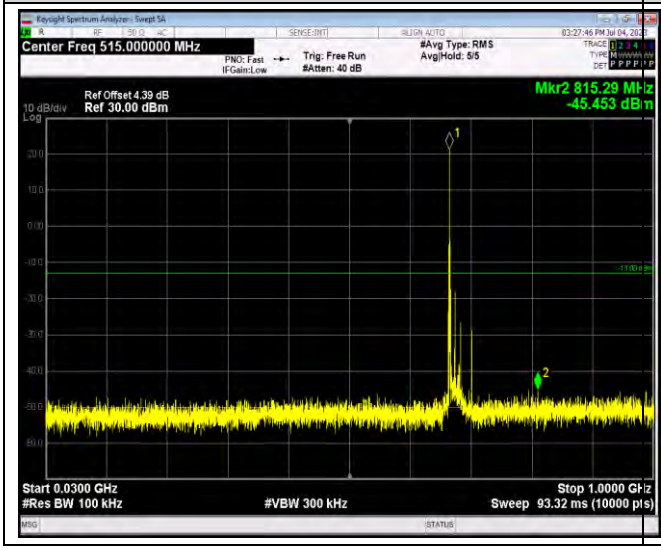
Band71-20MHz-16QAM-133222-1RB#0-Range2:1000~10000MHz

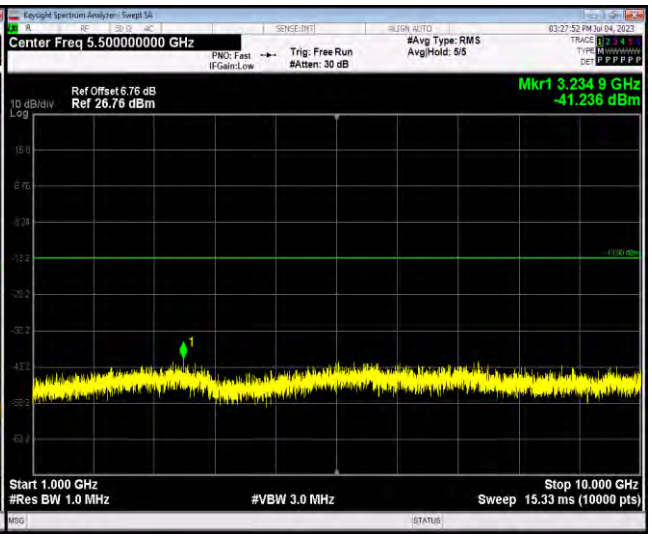


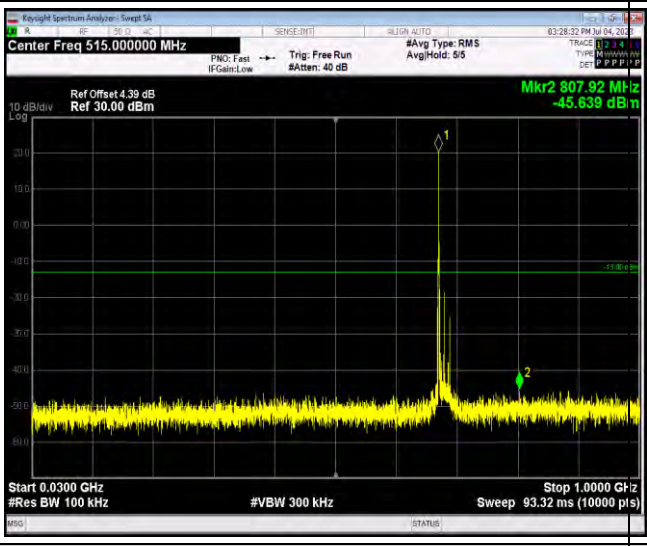
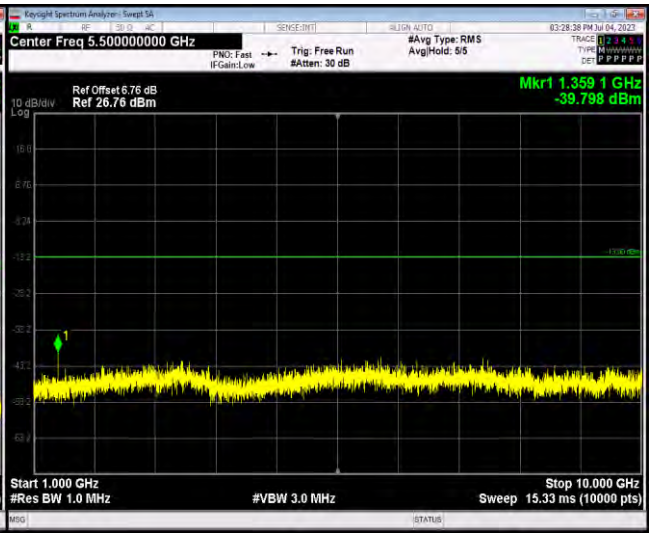
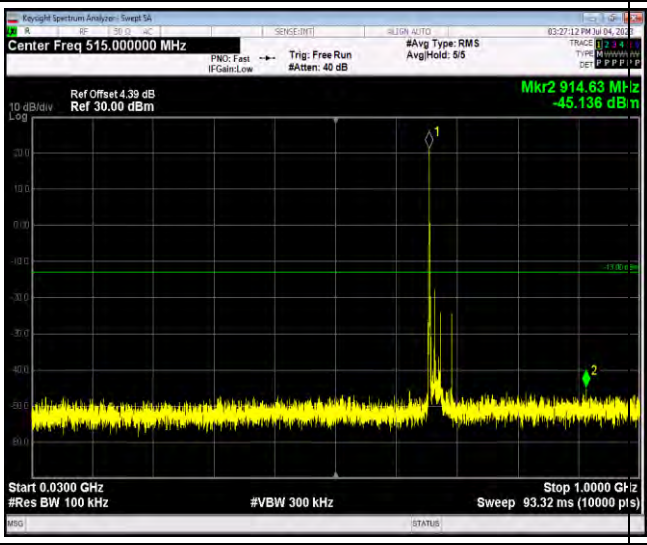
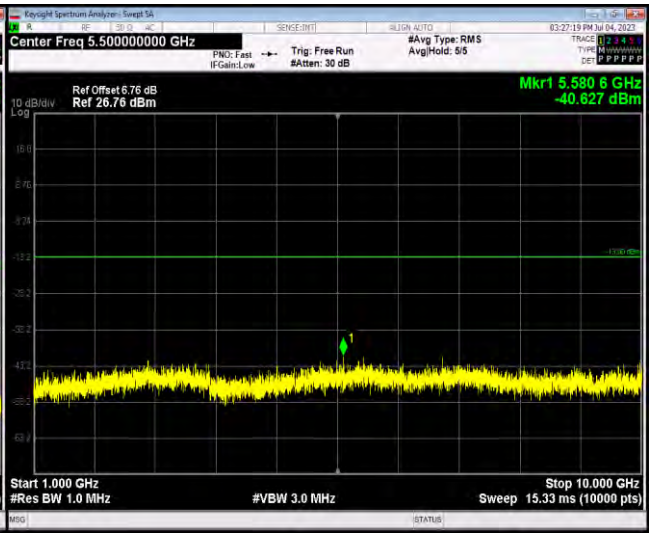
Band71-20MHz-16QAM-133322-1RB#0-Range1:30~1000MHz

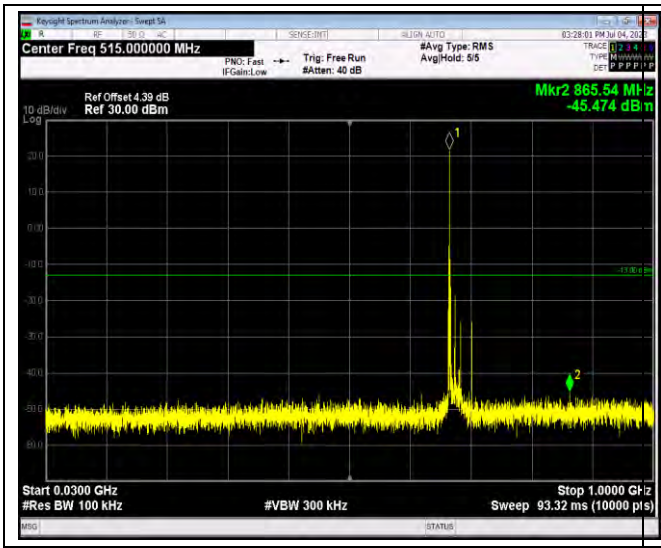


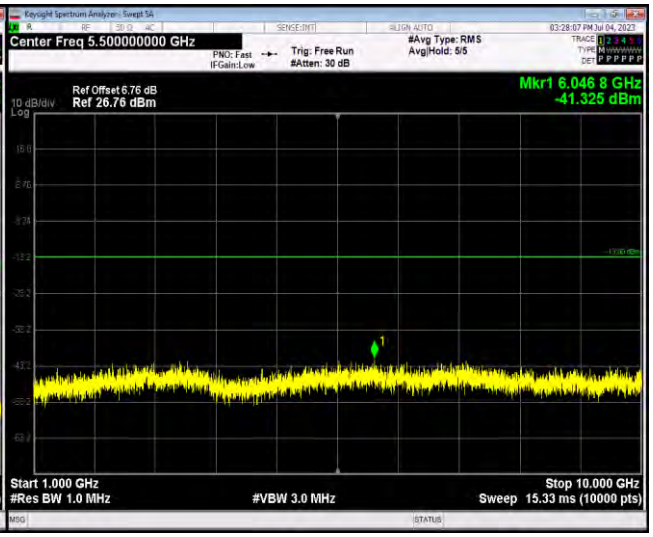
Band71-20MHz-16QAM-133322-1RB#0-Range2:1000~10000MHz





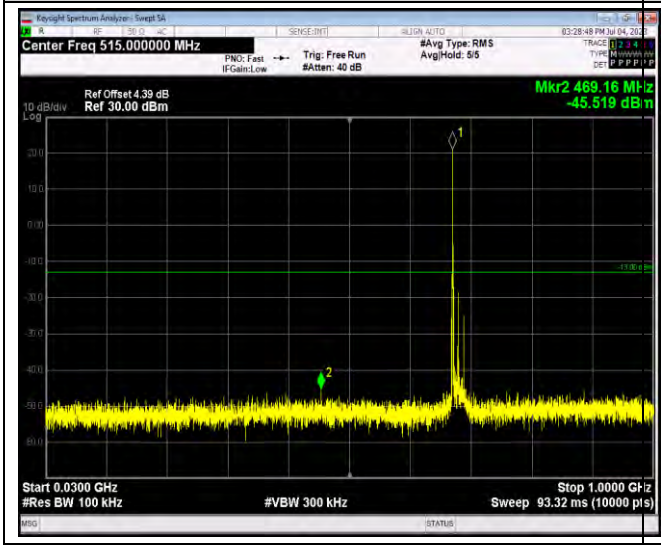
Band71-20MHz-16QAM-133372-1RB#0-Range1:30~1000MHz	Band71-20MHz-16QAM-133372-1RB#0-Range2:1000~10000MHz
	
Band71-20MHz-64QAM-133222-1RB#0-Range1:30~1000MHz	Band71-20MHz-64QAM-133222-1RB#0-Range2:1000~10000MHz
	
Band71-20MHz-64QAM-133322-1RB#0-Range1:30~1000MHz	Band71-20MHz-64QAM-133322-1RB#0-Range2:1000~10000MHz

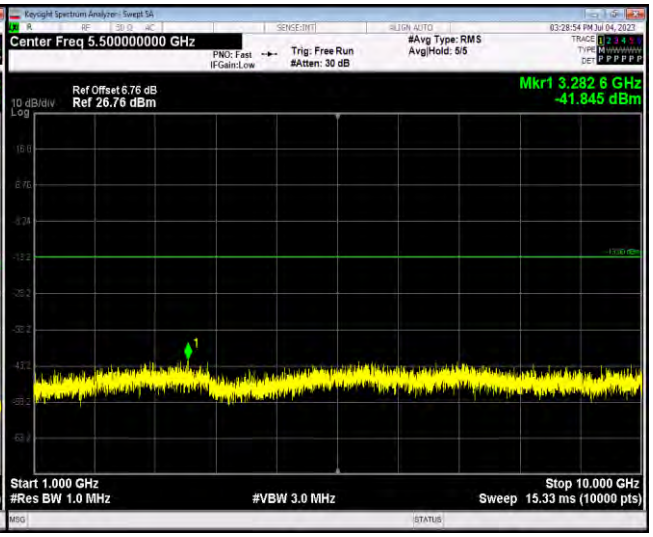




Band71-20MHz-64QAM-133372-1RB#0-Range1:30~1000MHz

Band71-20MHz-64QAM-133372-1RB#0-Range2:1000~10000MHz





Appendix F: Frequency Stability

Test Result

LTE Band 2 part:

Reference Frequency: LTE Band 2 (10MHz) Middle channel=18900 Frequency=1880.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-19.01	-0.010112	Within authorized band for Band 2	Pass
	-20	-17.11	-0.009101		
	-10	-17.52	-0.009319		
	0	-8.55	-0.004548		
	10	-21.76	-0.011574		
	20	-22.77	-0.012112		
	30	-14.79	-0.007867		
	40	-7.30	-0.003883		
	50	-13.48	-0.007170		
16QAM					
3.70	-30	4.98	0.002649	Within authorized band for Band 2	Pass
	-20	-4.38	-0.002330		
	-10	-5.89	-0.003133		
	0	-11.82	-0.006287		
	10	-2.88	-0.001532		
	20	-18.21	-0.009686		
	30	-2.53	-0.001346		
	40	-3.26	-0.001734		
	50	-7.28	-0.003872		
64QAM					
3.70	-30	4.32	0.002298	Within authorized band for Band 2	Pass
	-20	-19.97	-0.010622		
	-10	-17.90	-0.009521		
	0	-16.49	-0.008771		
	10	-16.77	-0.008920		
	20	-13.39	-0.007122		
	30	-18.01	-0.009580		
	40	-21.99	-0.011697		
	50	-13.82	-0.007351		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-18.21	-0.009686	Within authorized band for Band 2	Pass
	3.70	-17.41	-0.009261		
	4.20	-17.65	-0.009388		
16QAM					
25	3.50	-19.77	-0.010516	Within authorized band for Band 2	Pass
	3.70	-22.69	-0.012069		
	4.20	-5.98	-0.003181		
64QAM					
25	3.50	-15.48	-0.008234	Within authorized band for Band 2	Pass
	3.70	-14.91	-0.007931		
	4.20	-16.58	-0.008819		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 4 part:

Reference Frequency: LTE Band 4(10MHz) Middle channel=20175 Frequency=1732.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-15.78	-0.009108	Within authorized band for Band 4	Pass
	-20	-16.48	-0.009512		
	-10	-14.96	-0.008635		
	0	-15.89	-0.009172		
	10	-15.49	-0.008941		
	20	-20.87	-0.012046		
	30	-13.92	-0.008035		
	40	4.46	0.002574		
	50	-13.39	-0.007729		
16QAM					
3.70	-30	-17.27	-0.009968	Within authorized band for Band 4	Pass
	-20	-13.79	-0.007960		
	-10	-13.58	-0.007838		
	0	-15.55	-0.008975		
	10	-15.84	-0.009143		
	20	-16.61	-0.009587		
	30	-17.42	-0.010055		
	40	4.02	0.002320		
	50	-20.40	-0.011775		
64QAM					
3.70	-30	5.58	0.003221	Within authorized band for Band 4	Pass
	-20	-20.61	-0.011896		
	-10	-16.14	-0.009316		
	0	-17.94	-0.010355		
	10	-19.24	-0.011105		
	20	-9.74	-0.005622		
	30	-14.10	-0.008139		
	40	-8.84	-0.005102		
	50	-16.31	-0.009414		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-16.39	-0.009460	Within authorized band for Band 4	Pass
	3.70	-17.87	-0.010315		
	4.20	-20.21	-0.011665		
16QAM					
25	3.50	-17.68	-0.010205	Within authorized band for Band 4	Pass
	3.70	-19.27	-0.011123		
	4.20	6.44	0.003717		
64QAM					
25	3.50	-6.52	-0.003763	Within authorized band for Band 4	Pass
	3.70	-9.28	-0.005356		
	4.20	-20.31	-0.011723		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 5 part:

Reference Frequency: LTE Band 5(10MHz) Middle channel=20525 Frequency=836.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-3.32	-0.003969	±2.5	Pass
	-20	-11.20	-0.013389		
	-10	-11.96	-0.014298		
	0	-14.52	-0.017358		
	10	-11.56	-0.013819		
	20	-11.32	-0.013533		
	30	-11.14	-0.013317		
	40	-9.87	-0.011799		
	50	-7.67	-0.009169		
16QAM					
3.70	-30	-7.40	-0.008846	±2.5	Pass
	-20	-9.83	-0.011751		
	-10	-4.88	-0.005834		
	0	-10.80	-0.012911		
	10	-9.53	-0.011393		
	20	-3.26	-0.003897		
	30	-9.07	-0.010843		
	40	-7.88	-0.009420		
	50	-14.35	-0.017155		
64QAM					
3.70	-30	-9.41	-0.011249	±2.5	Pass
	-20	-9.73	-0.011632		
	-10	-6.90	-0.008249		
	0	-10.19	-0.012182		
	10	-11.44	-0.013676		
	20	-4.41	-0.005272		
	30	-10.71	-0.012803		
	40	-8.00	-0.009564		
	50	-4.38	-0.005236		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-1.72	-0.002056	±2.5	Pass
	3.70	-8.38	-0.010018		
	4.20	-9.60	-0.011476		
16QAM					
25	3.50	-11.49	-0.013736	±2.5	Pass
	3.70	-12.17	-0.014549		
	4.20	-7.47	-0.008930		
64QAM					
25	3.50	-13.22	-0.015804	±2.5	Pass
	3.70	-7.32	-0.008751		
	4.20	-9.90	-0.011835		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 12 part:

Reference Frequency: LTE Band 12(10MHz) Middle channel=23095 Frequency=707.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-5.06	-0.007152	Within authorized band for Band 12	Pass
	-20	-10.27	-0.014516		
	-10	-7.22	-0.010205		
	0	-14.16	-0.020014		
	10	-6.85	-0.009682		
	20	-11.23	-0.015873		
	30	-6.84	-0.009668		
	40	-7.15	-0.010106		
	50	-10.13	-0.014318		
16QAM					
3.70	-30	-9.11	-0.012876	Within authorized band for Band 12	Pass
	-20	-13.76	-0.019449		
	-10	-8.24	-0.011647		
	0	-10.64	-0.015039		
	10	-10.24	-0.014473		
	20	-11.30	-0.015972		
	30	-3.56	-0.005032		
	40	-11.33	-0.016014		
	50	-6.71	-0.009484		
64QAM					
3.70	-30	4.63	0.006544	Within authorized band for Band 12	Pass
	-20	-11.14	-0.015746		
	-10	-11.99	-0.016947		
	0	-11.57	-0.016353		
	10	-7.85	-0.011095		
	20	-10.09	-0.014261		
	30	-10.40	-0.014700		
	40	-9.71	-0.013724		
	50	-11.16	-0.015774		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-6.51	-0.009201	Within authorized band for Band 12	Pass
	3.70	-12.30	-0.017385		
	4.20	-6.35	-0.008975		
16QAM					
25	3.50	-10.27	-0.014516	Within authorized band for Band 12	Pass
	3.70	-9.94	-0.014049		
	4.20	-13.10	-0.018516		
64QAM					
25	3.50	-13.07	-0.018473	Within authorized band for Band 12	Pass
	3.70	-3.15	-0.004452		
	4.20	-8.91	-0.012594		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 17 part:

Reference Frequency: LTE Band 17(10MHz) Middle channel=23790 Frequency=710.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-8.24	-0.011606	Within authorized band for Band 17	Pass
	-20	-11.12	-0.015662		
	-10	-10.39	-0.014634		
	0	-7.27	-0.010239		
	10	-12.75	-0.017958		
	20	-8.78	-0.012366		
	30	-10.17	-0.014324		
	40	2.70	0.003803		
	50	-5.82	-0.008197		
16QAM					
3.70	-30	-13.62	-0.019183	Within authorized band for Band 17	Pass
	-20	-10.09	-0.014211		
	-10	-9.77	-0.013761		
	0	-8.35	-0.011761		
	10	-6.17	-0.008690		
	20	-8.91	-0.012549		
	30	-7.72	-0.010873		
	40	-8.05	-0.011338		
	50	-10.84	-0.015268		
64QAM					
3.70	-30	-3.53	-0.004972	Within authorized band for Band 17	Pass
	-20	-9.07	-0.012775		
	-10	-8.88	-0.012507		
	0	-12.36	-0.017408		
	10	-9.47	-0.013338		
	20	-11.19	-0.015761		
	30	-7.62	-0.010732		
	40	-11.34	-0.015972		
	50	-4.91	-0.006915		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-12.03	-0.016944	Within authorized band for Band 17	Pass
	3.70	-9.81	-0.013817		
	4.20	-4.49	-0.006324		
16QAM					
25	3.50	-8.71	-0.012268	Within authorized band for Band 17	Pass
	3.70	-5.99	-0.008437		
	4.20	-12.50	-0.017606		
64QAM					
25	3.50	-9.41	-0.013254	Within authorized band for Band 17	Pass
	3.70	-8.05	-0.011338		
	4.20	-8.54	-0.012028		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 41 part:

Reference Frequency: LTE Band 41 (10MHz) Middle channel=40640 Frequency=2595.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-23.16	-0.008932	Within authorized band for Band 41	Pass
	-20	-20.99	-0.008095		
	-10	-25.91	-0.009992		
	0	-23.35	-0.009005		
	10	-24.00	-0.009256		
	20	-21.87	-0.008434		
	30	-19.28	-0.007435		
	40	-21.29	-0.008211		
	50	-21.26	-0.008199		
16QAM					
3.70	-30	-20.24	-0.007806	Within authorized band for Band 41	Pass
	-20	-23.69	-0.009136		
	-10	-22.19	-0.008558		
	0	-18.10	-0.006980		
	10	-17.84	-0.006880		
	20	-20.34	-0.007844		
	30	-20.64	-0.007960		
	40	-23.92	-0.009225		
	50	2.32	0.000895		
64QAM					
3.70	-30	-21.36	-0.008238	Within authorized band for Band 41	Pass
	-20	-21.73	-0.008380		
	-10	-17.54	-0.006764		
	0	-19.60	-0.007559		
	10	-19.88	-0.007667		
	20	-19.41	-0.007486		
	30	-21.37	-0.008241		
	40	-2.53	-0.000976		
	50	-21.83	-0.008419		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-21.39	-0.008249	Within authorized band for Band 41	Pass
	3.70	-22.22	-0.008569		
	4.20	-23.12	-0.008916		
16QAM					
25	3.50	-22.07	-0.008511	Within authorized band for Band41	Pass
	3.70	-23.42	-0.009032		
	4.20	-21.46	-0.008276		
64QAM					
25	3.50	-14.05	-0.005418	Within authorized band for Band41	Pass
	3.70	-22.02	-0.008492		
	4.20	-22.87	-0.008820		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 66 part:

Reference Frequency: LTE Band 66 (10MHz) Middle channel=132322 Frequency=1745.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-15.32	-0.008779	Within authorized band for Band 66	Pass
	-20	-14.45	-0.008281		
	-10	12.15	0.006963		
	0	-10.49	-0.006011		
	10	-8.85	-0.005072		
	20	-5.06	-0.002900		
	30	11.37	0.006516		
	40	-11.40	-0.006533		
	50	-14.28	-0.008183		
16QAM					
3.70	-30	-12.59	-0.007215	Within authorized band for Band 66	Pass
	-20	6.69	0.003834		
	-10	-19.14	-0.010968		
	0	-11.60	-0.006648		
	10	-18.28	-0.010476		
	20	-12.32	-0.007060		
	30	5.81	0.003330		
	40	-4.35	-0.002493		
	50	2.93	0.001679		
64QAM					
3.70	-30	-11.34	-0.006499	Within authorized band for Band 66	Pass
	-20	-12.13	-0.006951		
	-10	-14.36	-0.008229		
	0	-17.04	-0.009765		
	10	-6.78	-0.003885		
	20	-12.67	-0.007261		
	30	16.25	0.009312		
	40	8.97	0.005140		
	50	-15.09	-0.008648		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-12.83	-0.007352	Within authorized band for Band 66	Pass
	3.70	-12.73	-0.007295		
	4.20	-16.14	-0.009249		
16QAM					
25	3.50	6.62	0.003794	Within authorized band for Band 66	Pass
	3.70	-13.39	-0.007673		
	4.20	-13.48	-0.007725		
64QAM					
25	3.50	-14.91	-0.008544	Within authorized band for Band 66	Pass
	3.70	-10.10	-0.005788		
	4.20	4.15	0.002378		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 71 part:

Reference Frequency: LTE Band 71 (10MHz) Middle channel=133297 Frequency=680.5MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.70	-30	-12.37	-0.018178	Within authorized band for Band 71	Pass
	-20	-9.27	-0.013622		
	-10	-7.82	-0.011492		
	0	-8.60	-0.012638		
	10	-10.54	-0.015489		
	20	-10.04	-0.014754		
	30	-7.17	-0.010536		
	40	-10.31	-0.015151		
	50	-10.36	-0.015224		
16QAM					
3.70	-30	-7.60	-0.011168	Within authorized band for Band 71	Pass
	-20	-9.41	-0.013828		
	-10	-10.00	-0.014695		
	0	-12.37	-0.018178		
	10	3.48	0.005114		
	20	-9.31	-0.013681		
	30	-11.26	-0.016547		
	40	-5.18	-0.007612		
	50	-11.63	-0.017090		
64QAM					
3.70	-30	-8.71	-0.012799	Within authorized band for Band 71	Pass
	-20	-16.88	-0.024805		
	-10	-12.87	-0.018913		
	0	-9.24	-0.013578		
	10	3.38	0.004967		
	20	-15.49	-0.022763		
	30	-11.37	-0.016708		
	40	-9.03	-0.013270		
	50	-9.16	-0.013461		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-11.89	-0.017472	Within authorized band for Band 71	Pass
	3.70	-12.00	-0.017634		
	4.20	-10.94	-0.016076		
16QAM					
25	3.50	-10.10	-0.014842	Within authorized band for Band 71	Pass
	3.70	-9.84	-0.014460		
	4.20	-8.51	-0.012506		
64QAM					
25	3.50	-9.54	-0.014019	Within authorized band for Band 71	Pass
	3.70	-13.88	-0.020397		
	4.20	-4.11	-0.006040		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

Appendix G: Modulation Characteristics

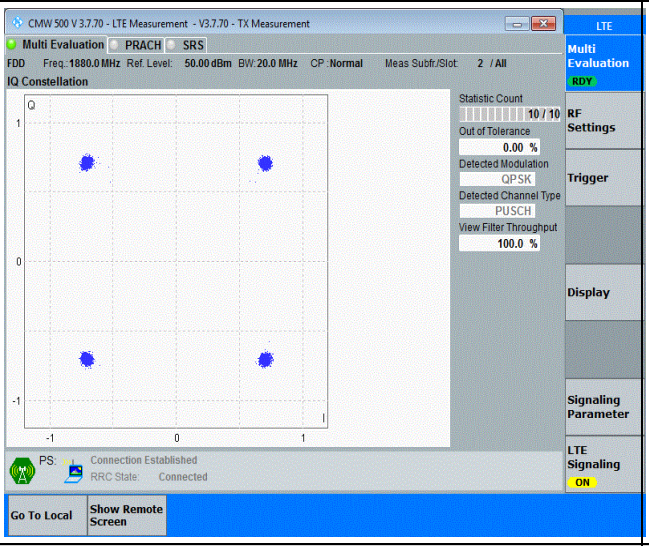
Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result	Verdict
Band2	20MHz	QPSK	18900	100RB#0	PASS	PASS
Band2	20MHz	16QAM	18900	100RB#0	PASS	PASS
Band2	20MHz	64QAM	18900	100RB#0	PASS	PASS
Band4	20MHz	QPSK	20175	100RB#0	PASS	PASS
Band4	20MHz	16QAM	20175	100RB#0	PASS	PASS
Band4	20MHz	64QAM	20175	100RB#0	PASS	PASS
Band5	10MHz	QPSK	20525	50RB#0	PASS	PASS
Band5	10MHz	16QAM	20525	50RB#0	PASS	PASS
Band5	10MHz	64QAM	20525	50RB#0	PASS	PASS
Band12	10MHz	QPSK	23095	50RB#0	PASS	PASS
Band12	10MHz	16QAM	23095	50RB#0	PASS	PASS
Band12	10MHz	64QAM	23095	50RB#0	PASS	PASS
Band17	10MHz	QPSK	23790	50RB#0	PASS	PASS
Band17	10MHz	16QAM	23790	50RB#0	PASS	PASS
Band17	10MHz	64QAM	23790	50RB#0	PASS	PASS
Band41	20MHz	QPSK	40620	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40620	100RB#0	PASS	PASS
Band41	20MHz	64QAM	40620	100RB#0	PASS	PASS
Band66	20MHz	QPSK	132322	100RB#0	PASS	PASS
Band66	20MHz	16QAM	132322	100RB#0	PASS	PASS
Band66	20MHz	64QAM	132322	100RB#0	PASS	PASS
Band71	20MHz	QPSK	133322	100RB#0	PASS	PASS
Band71	20MHz	16QAM	133322	100RB#0	PASS	PASS
Band71	20MHz	64QAM	133322	100RB#0	PASS	PASS

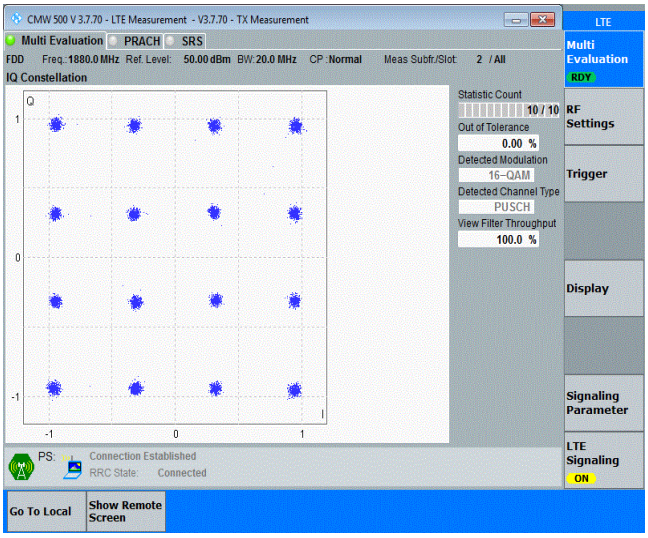
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.

Test Graphs

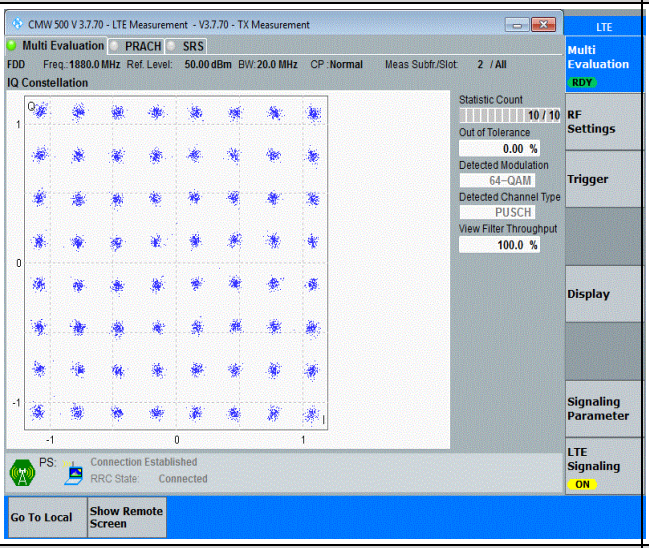
Band2-20MHz-QPSK-18900-100RB#0



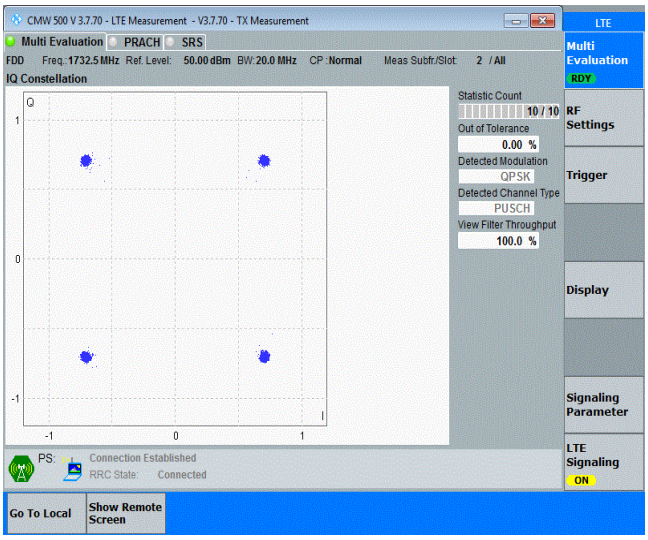
Band2-20MHz-16QAM-18900-100RB#0



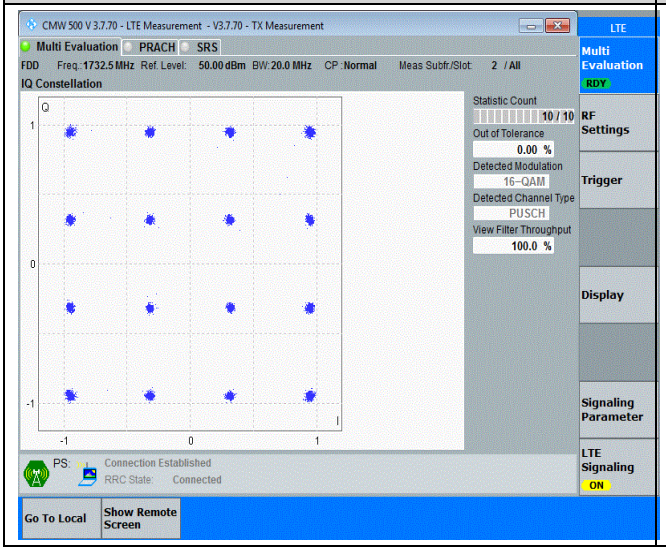
Band2-20MHz-64QAM-18900-100RB#0



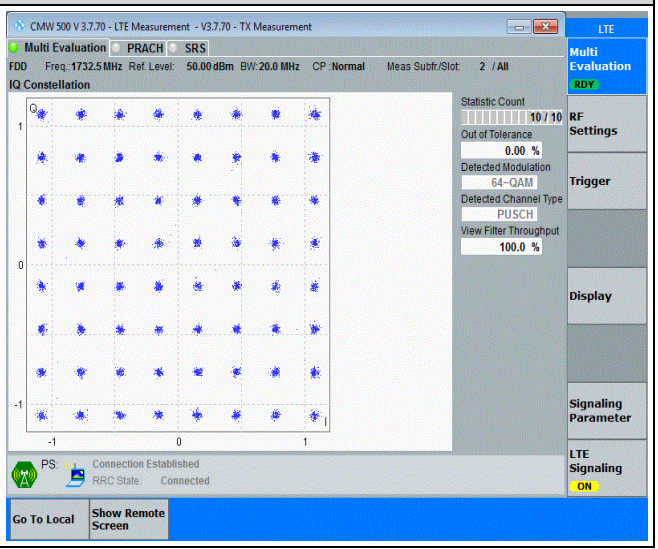
Band4-20MHz-QPSK-20175-100RB#0



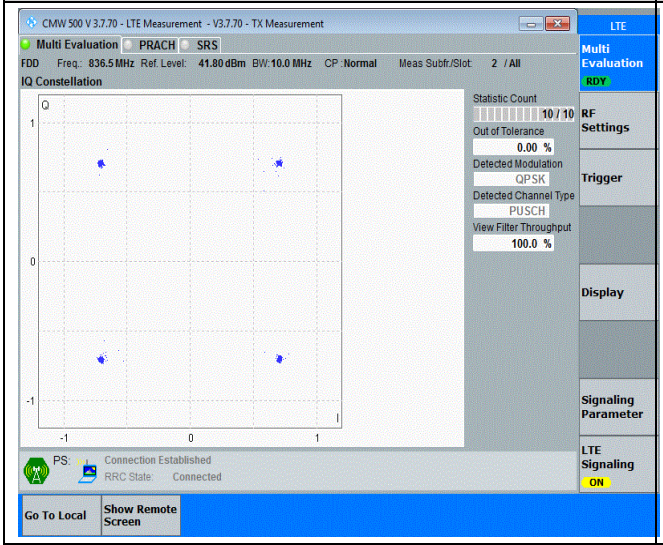
Band4-20MHz-16QAM-20175-100RB#0



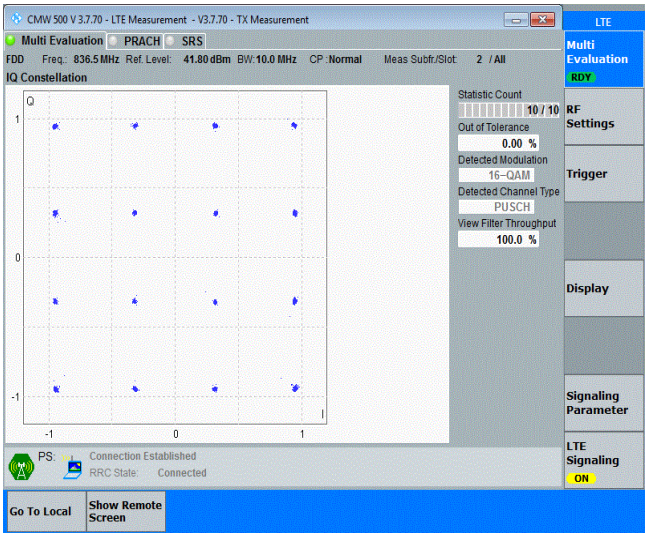
Band4-20MHz-64QAM-20175-100RB#0



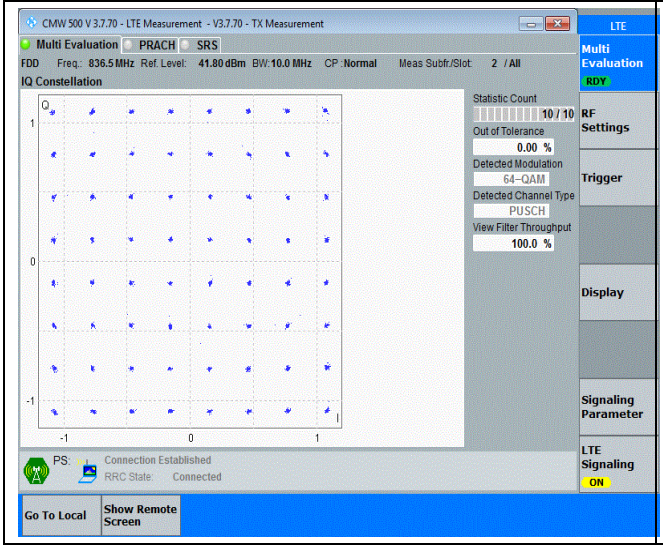
Band5-10MHz-QPSK-20525-50RB#0



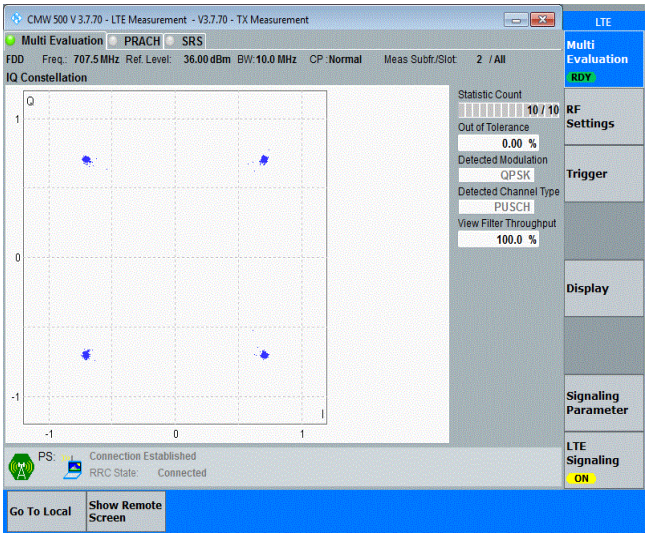
Band5-10MHz-16QAM-20525-50RB#0



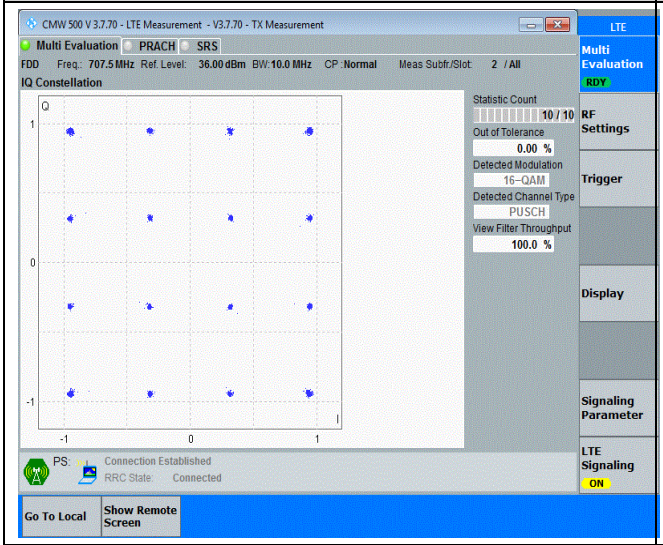
Band5-10MHz-64QAM-20525-50RB#0



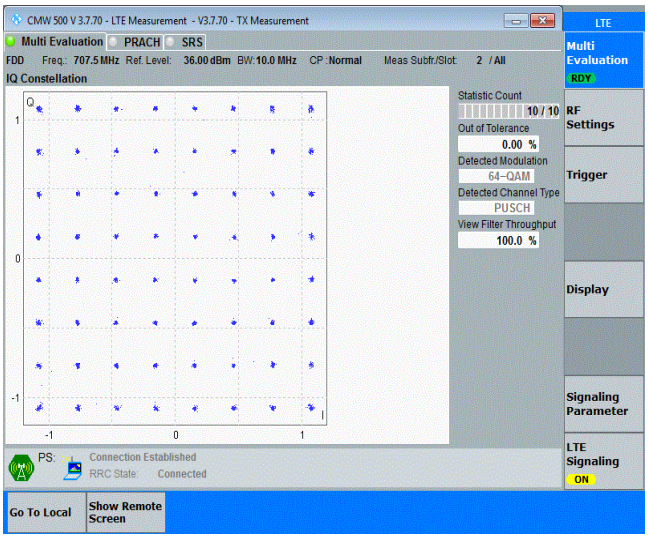
Band12-10MHz-QPSK-23095-50RB#0



Band12-10MHz-16QAM-23095-50RB#0

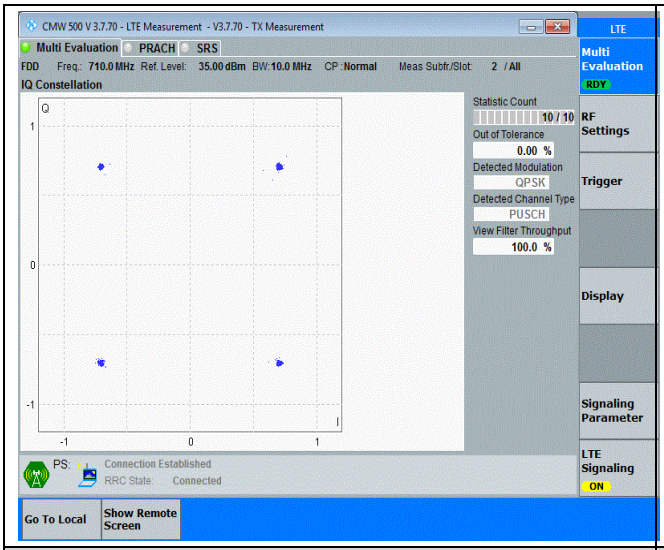


Band12-10MHz-64QAM-23095-50RB#0

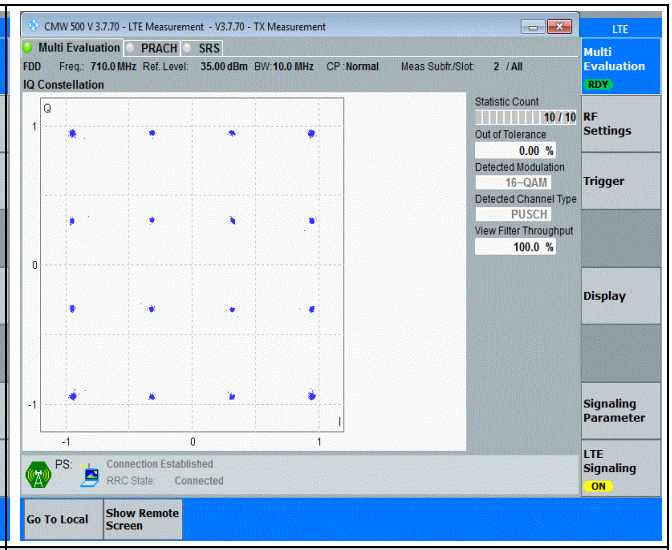


Band17-10MHz-QPSK-23790-50RB#0

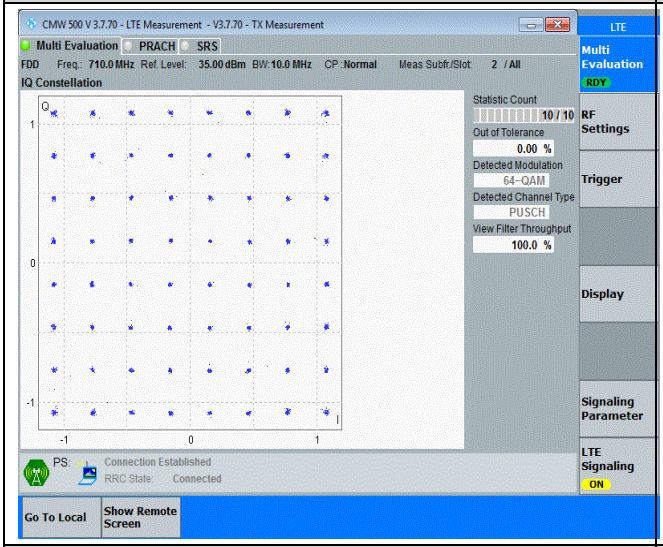
Band17-10MHz-16QAM-23790-50RB#0



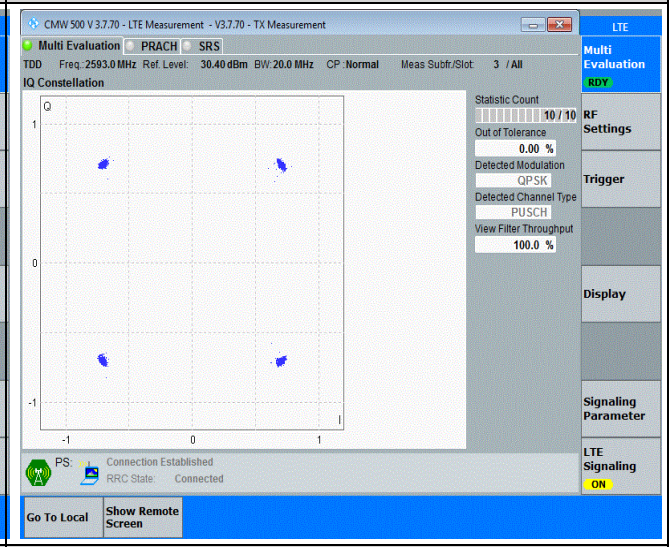
Band17-10MHz-64QAM-23790-50RB#0



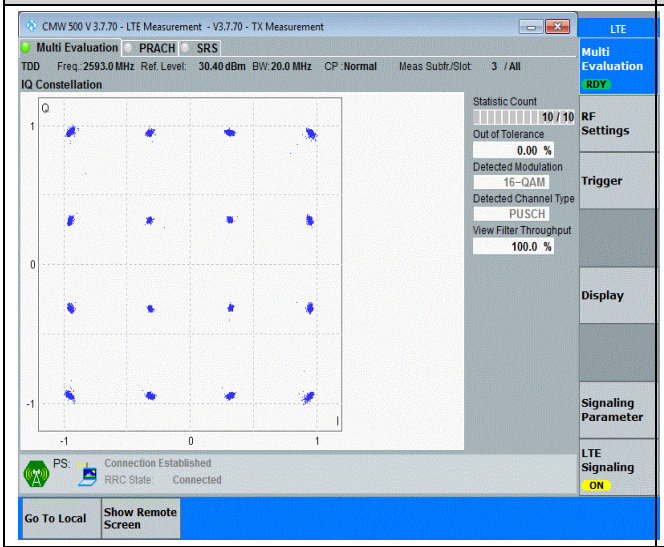
Band41-20MHz-QPSK-40620-100RB#0



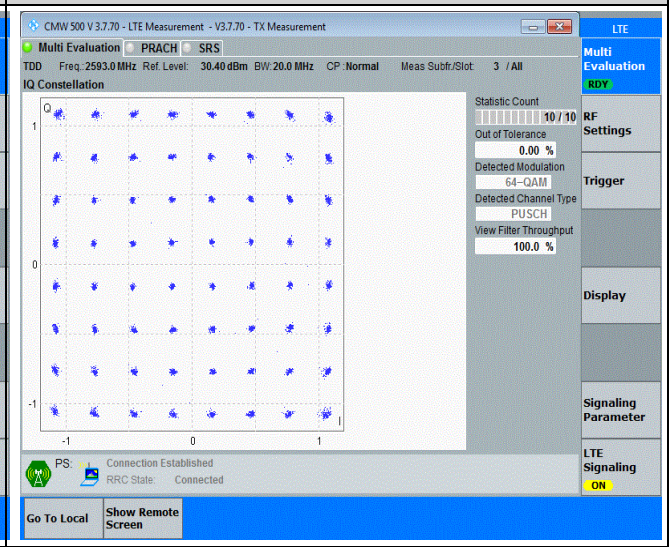
Band41-20MHz-16QAM-40620-100RB#0



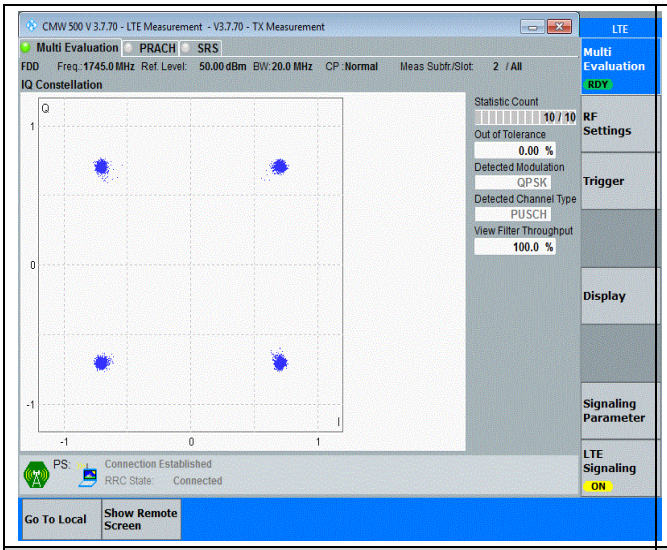
Band41-20MHz-64QAM-40620-100RB#0



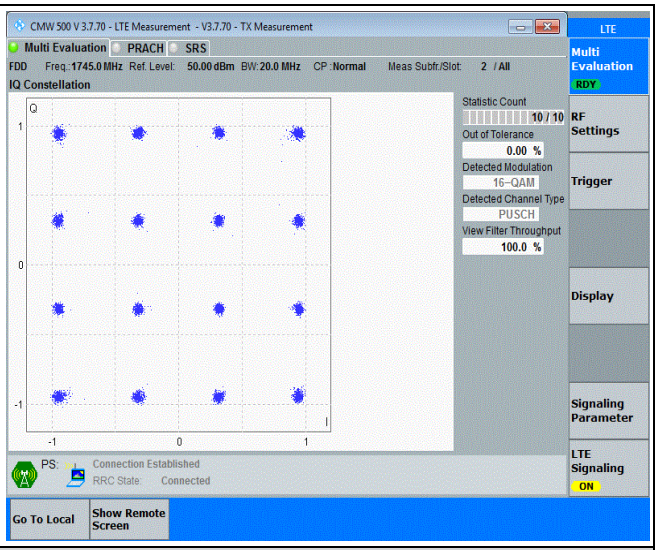
Band66-20MHz-QPSK-132322-100RB#0



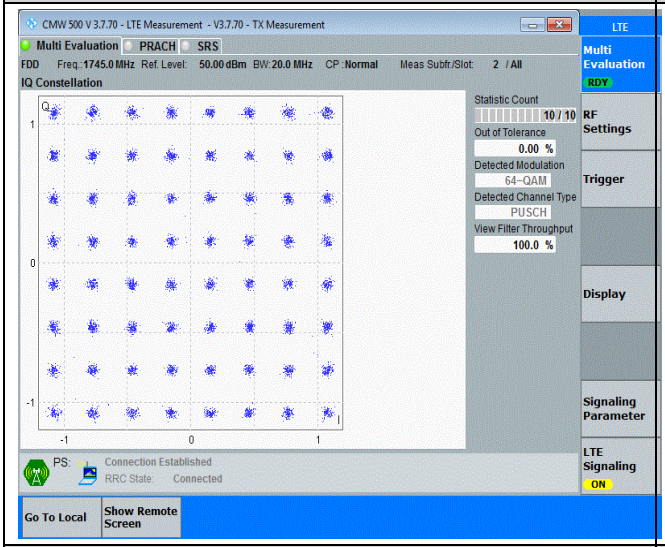
Band66-20MHz-16QAM-132322-100RB#0



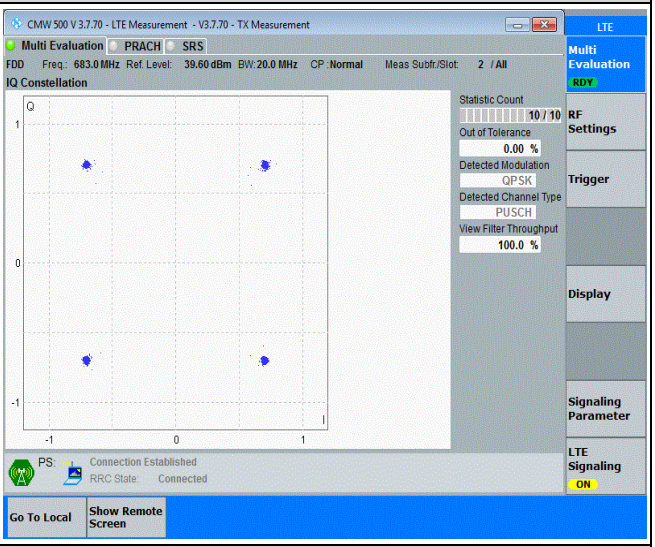
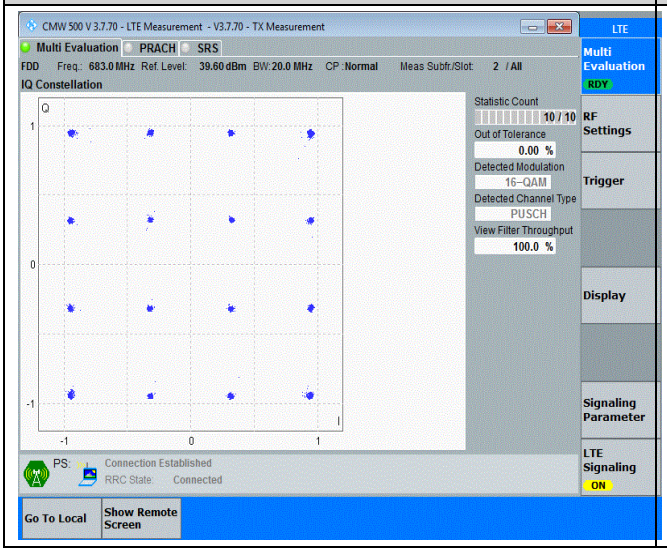
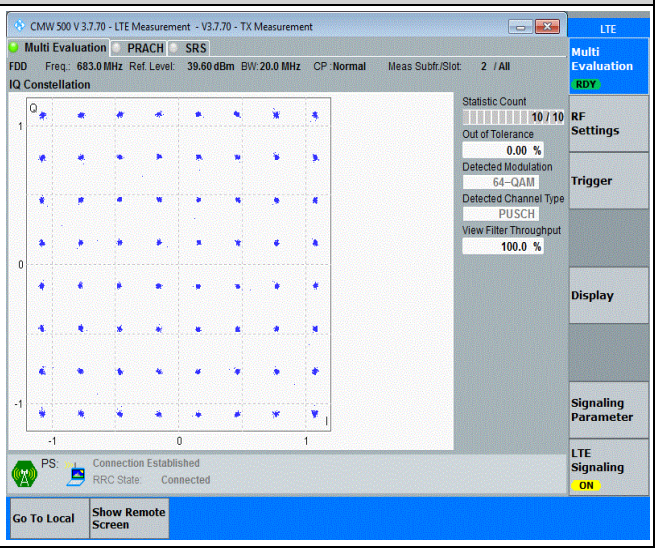
Band66-20MHz-64QAM-132322-100RB#0



Band71-20MHz-QPSK-133322-100RB#0



Band71-20MHz-16QAM-133322-100RB#0



Band71-20MHz-64QAM-133322-100RB#0