

Appendix F: Frequency Stability Test Result

Test Result

LTE Band 2 part:

Reference Frequency: LTE Band 2 (10MHz) Middle channel=18900 Frequency=1880.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	9.23	0.004910	Within authorized band for Band 2	Pass
	-20	7.52	0.004000		
	-10	3.05	0.001622		
	0	-8.40	-0.004468		
	10	3.42	0.001819		
	20	-5.94	-0.003160		
	30	8.23	0.004378		
	40	-5.25	-0.002793		
	50	-3.71	-0.001973		
16QAM					
3.87	-30	-8.03	-0.004271	Within authorized band for Band 2	Pass
	-20	-9.26	-0.004926		
	-10	11.74	0.006245		
	0	-9.56	-0.005085		
	10	5.59	0.002973		
	20	4.68	0.002489		
	30	-10.06	-0.005351		
	40	3.38	0.001798		
	50	5.45	0.002899		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	6.11	0.003250	Within authorized band for Band 2	Pass
	3.87	-10.14	-0.005394		
	4.45	5.82	0.003096		
16QAM					
25	3.45	-9.67	-0.005144	Within authorized band for Band 2	Pass
	3.87	-2.69	-0.001431		
	4.45	6.08	0.003234		

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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	-8.40	-0.010042	±2.5	Pass
	-20	-10.17	-0.012158		
	-10	-4.53	-0.005415		
	0	-5.42	-0.006479		
	10	-6.72	-0.008033		
	20	-8.50	-0.010161		
	30	-9.84	-0.011763		
	40	-3.99	-0.004770		
	50	-5.44	-0.006503		
16QAM					
3.87	-30	-3.05	-0.003646	±2.5	Pass
	-20	-12.97	-0.015505		
	-10	-7.25	-0.008667		
	0	-7.93	-0.009480		
	10	-7.21	-0.008619		
	20	-8.21	-0.009815		
	30	-6.52	-0.007794		
	40	-8.27	-0.009886		
	50	-3.60	-0.004304		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-2.93	-0.003503	±2.5	Pass
	3.87	-16.81	-0.020096		
	4.45	-8.27	-0.009886		
16QAM					
25	3.45	-6.47	-0.007735	±2.5	Pass
	3.87	-6.02	-0.007197		
	4.45	-2.93	-0.003503		

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

LTE Band 7 part:

Reference Frequency: LTE Band 7(10MHz) Middle channel=21100 Frequency=2535.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	-8.83	-0.003483	Within authorized band for Band 7	Pass
	-20	-9.78	-0.003858		
	-10	5.58	0.002201		
	0	-10.53	-0.004154		
	10	-12.17	-0.004801		
	20	-16.99	-0.006702		
	30	-8.63	-0.003404		
	40	4.01	0.001582		
	50	-13.80	-0.005444		
16QAM					
3.87	-30	-17.45	-0.006884	Within authorized band for Band 7	Pass
	-20	-8.44	-0.003329		
	-10	-13.42	-0.005294		
	0	-12.85	-0.005069		
	10	5.75	0.002268		
	20	-14.31	-0.005645		
	30	-12.09	-0.004769		
	40	-10.09	-0.003980		
	50	-16.82	-0.006635		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-5.78	-0.002280	Within authorized band for Band 7	Pass
	3.87	-10.29	-0.004059		
	4.45	-10.24	-0.004039		
16QAM					
25	3.45	-10.19	-0.004020	Within authorized band for Band 7	Pass
	3.87	-3.22	-0.001270		
	4.45	-9.98	-0.003937		

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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	3.15	0.004452	±2.5	Pass
	-20	-2.95	-0.004170		
	-10	-3.86	-0.005456		
	0	-4.72	-0.006671		
	10	2.29	0.003237		
	20	-2.76	-0.003901		
	30	1.73	0.002445		
	40	-4.53	-0.006403		
	50	-1.87	-0.002643		
16QAM					
3.87	-30	-5.29	-0.007477	±2.5	Pass
	-20	3.86	0.005456		
	-10	2.39	0.003378		
	0	-5.68	-0.008028		
	10	-5.32	-0.007519		
	20	-5.29	-0.007477		
	30	-4.33	-0.006120		
	40	-3.79	-0.005357		
	50	-3.03	-0.004283		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-3.95	-0.005583	±2.5	Pass
	3.87	9.70	0.013710		
	4.45	-6.44	-0.009102		
16QAM					
25	3.45	-4.62	-0.006530	±2.5	Pass
	3.87	-5.04	-0.007124		
	4.45	3.03	0.004283		

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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	-1.59	-0.002239	±2.5	Pass
	-20	3.20	0.004507		
	-10	2.22	0.003127		
	0	-3.56	-0.005014		
	10	-5.45	-0.007676		
	20	2.33	0.003282		
	30	-2.96	-0.004169		
	40	-6.85	-0.009648		
	50	-6.17	-0.008690		
16QAM					
3.87	-30	-7.97	-0.011225	±2.5	Pass
	-20	-4.89	-0.006887		
	-10	-4.39	-0.006183		
	0	-2.32	-0.003268		
	10	2.10	0.002958		
	20	-5.06	-0.007127		
	30	2.45	0.003451		
	40	-3.56	-0.005014		
	50	-2.80	-0.003944		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-7.64	-0.010761	±2.5	Pass
	3.87	8.64	0.012169		
	4.45	-4.59	-0.006465		
16QAM					
25	3.45	-4.31	-0.006070	±2.5	Pass
	3.87	-6.42	-0.009042		
	4.45	-4.05	-0.005704		

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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	3.55	0.001368	Within authorized band for Band 41	Pass
	-20	-6.68	-0.002574		
	-10	-4.98	-0.001919		
	0	-8.61	-0.003318		
	10	-6.81	-0.002624		
	20	-7.95	-0.003064		
	30	3.18	0.001225		
	40	-1.70	-0.000655		
	50	-7.67	-0.002956		
16QAM					
3.87	-30	-9.26	-0.003568	Within authorized band for Band 41	Pass
	-20	5.39	0.002077		
	-10	-7.18	-0.002767		
	0	-11.49	-0.004428		
	10	-11.47	-0.004420		
	20	4.61	0.001776		
	30	-6.14	-0.002366		
	40	-5.56	-0.002143		
	50	-5.25	-0.002023		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-8.85	-0.003410	Within authorized band for Band 41	Pass
	3.87	-5.91	-0.002277		
	4.45	-4.41	-0.001699		
16QAM					
25	3.45	-11.12	-0.004285	Within authorized band for Band41	Pass
	3.87	-7.61	-0.002933		
	4.45	-11.40	-0.004393		

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 (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.87	-30	7.47	0.004281	Within authorized band for Band 66	Pass
	-20	5.65	0.003238		
	-10	4.52	0.002590		
	0	6.29	0.003605		
	10	5.06	0.002900		
	20	-2.30	-0.001318		
	30	5.35	0.003066		
	40	6.39	0.003662		
	50	5.35	0.003066		
16QAM					
3.87	-30	5.92	0.003393	Within authorized band for Band 66	Pass
	-20	-6.67	-0.003822		
	-10	-7.72	-0.004424		
	0	-4.51	-0.002585		
	10	-6.22	-0.003564		
	20	2.25	0.001289		
	30	-4.55	-0.002607		
	40	-3.50	-0.002006		
	50	-7.54	-0.004321		
Voltage					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.45	-2.06	-0.001181	Within authorized band for Band 66	Pass
	3.87	-6.07	-0.003479		
	4.45	-2.80	-0.001605		
16QAM					
25	3.45	-4.53	-0.002596	Within authorized band for Band 66	Pass
	3.87	5.34	0.003060		
	4.45	-9.86	-0.005650		

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

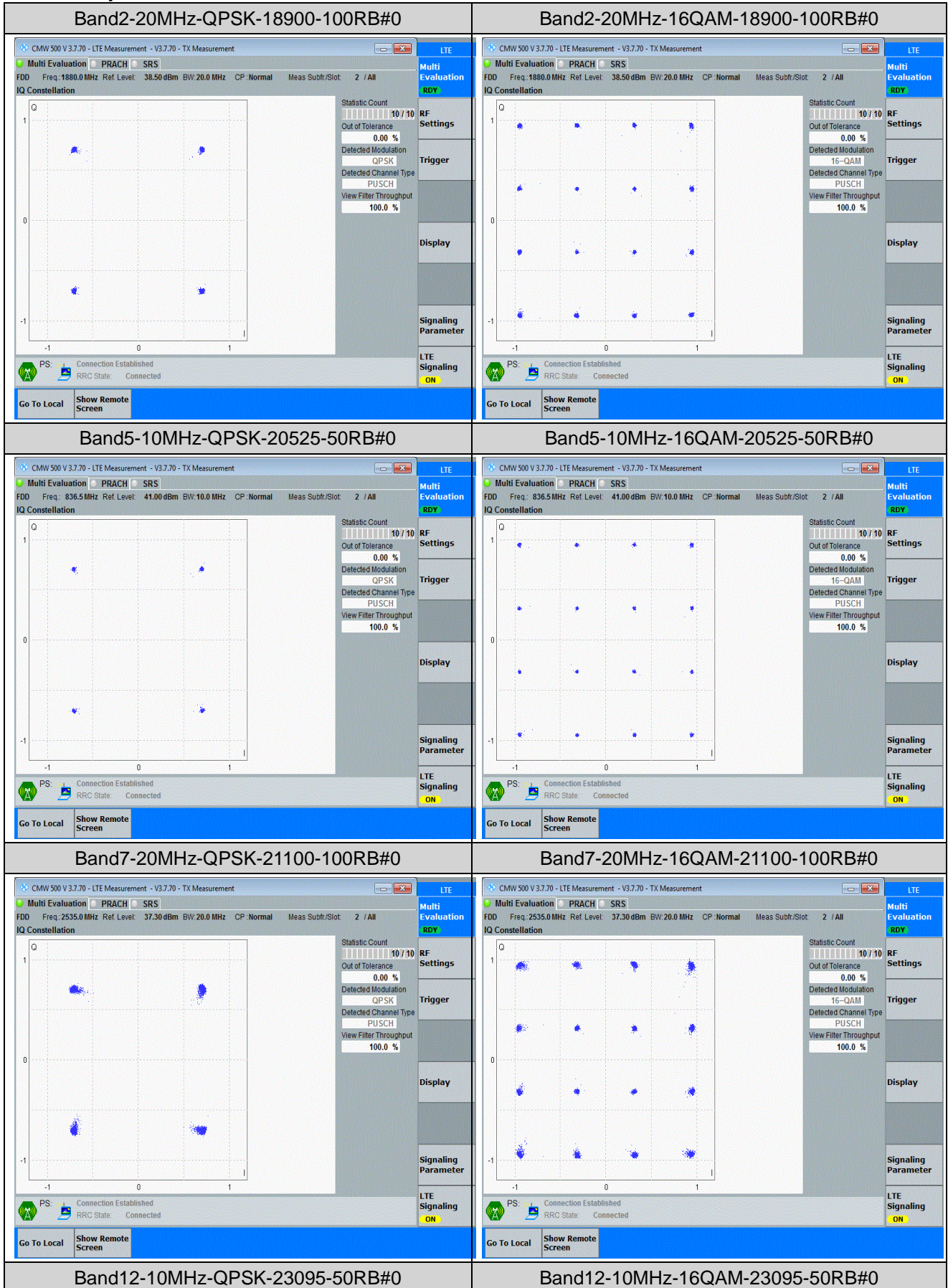
Appendix G: Modulation Characteristics

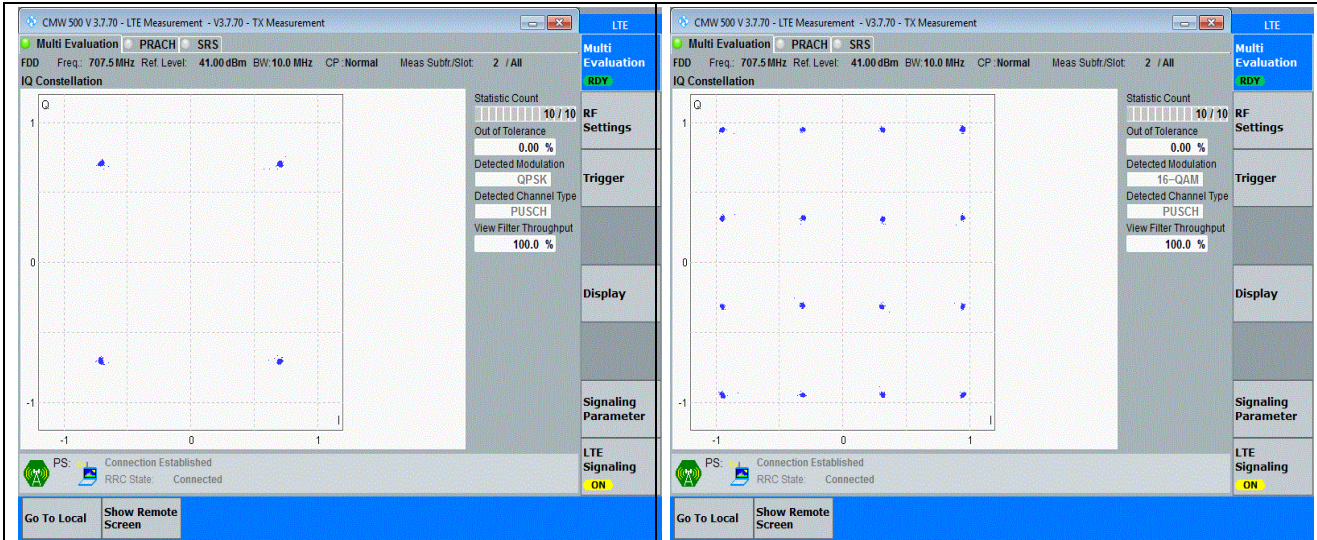
Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result	Verdict
Band2	20MHz	QPSK	18900	100RB#0	PASS	PASS
Band2	20MHz	16QAM	18900	100RB#0	PASS	PASS
Band5	10MHz	QPSK	20525	50RB#0	PASS	PASS
Band5	10MHz	16QAM	20525	50RB#0	PASS	PASS
Band7	20MHz	QPSK	21100	100RB#0	PASS	PASS
Band7	20MHz	16QAM	21100	100RB#0	PASS	PASS
Band12	10MHz	QPSK	23095	50RB#0	PASS	PASS
Band12	10MHz	16QAM	23095	50RB#0	PASS	PASS
Band17	10MHz	QPSK	23790	50RB#0	PASS	PASS
Band17	10MHz	16QAM	23790	50RB#0	PASS	PASS
Band41	20MHz	QPSK	40640	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40640	100RB#0	PASS	PASS
Band66	20MHz	QPSK	132322	100RB#0	PASS	PASS
Band66	20MHz	16QAM	132322	100RB#0	PASS	PASS

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

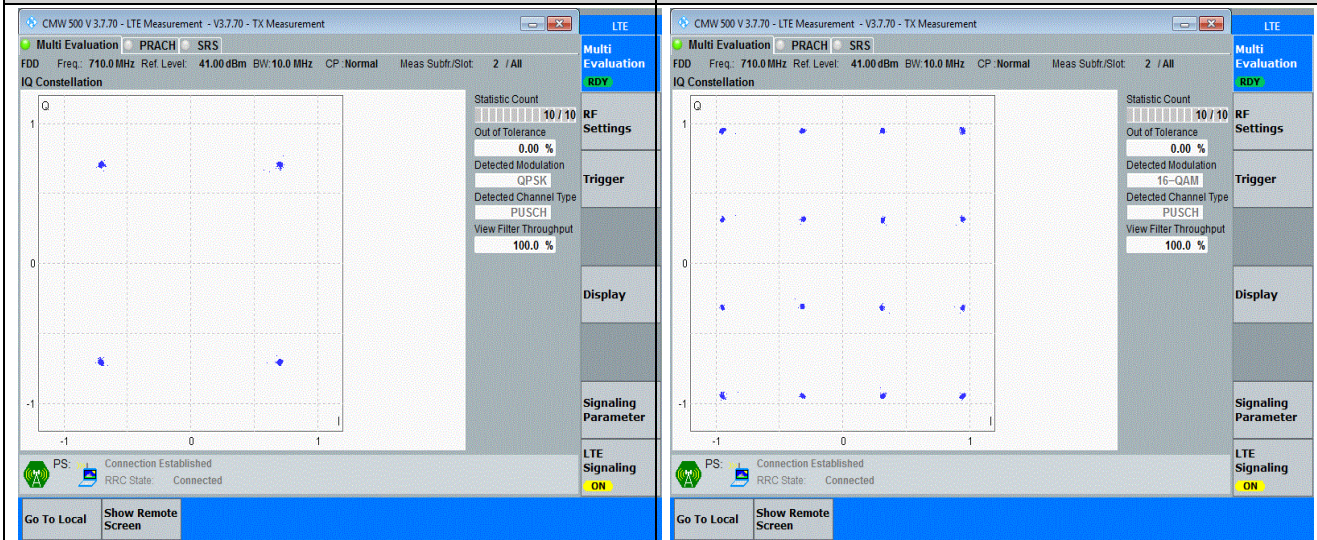
Test Graphs





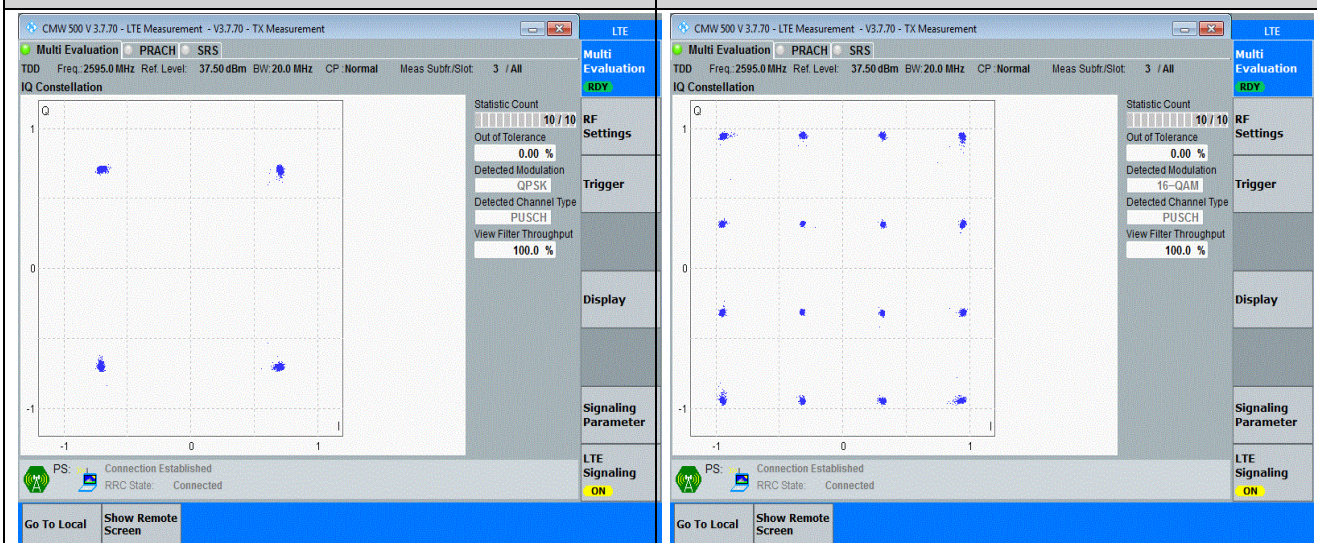
Band17-10MHz-QPSK-23790-50RB#0

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



Band41-20MHz-QPSK-40640-100RB#0

Band41-20MHz-16QAM-40640-100RB#0



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

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

