Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.30	-22.49	-0.012981	Within authorized band for Band 4	Pass
	3.85	-32.60	-0.018817		
	4.42	-19.31	-0.011146		
16QAM					
25	3.30	8.08	0.004664	Within authorized band for Band 4	Pass
	3.85	-11.56	-0.006672		
	4.42	7.10	0.004098		
64QAM					
25	3.30	-16.77	-0.009680	Within authorized band for Band 4	Pass
	3.85	-10.54	-0.006084		
	4.42	-13.59	-0.007844		
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					
3.85	-30	-5.68	-0.006790	±2.5	Pass
	-20	-10.64	-0.012720		
	-10	-12.12	-0.014489		
	0	-8.83	-0.010556		
	10	-7.34	-0.008775		
	20	-13.36	-0.015971		
	30	-13.48	-0.016115		
	40	-10.97	-0.013114		
	50	-3.73	-0.004459		
16QAM					
3.85	-30	-8.07	-0.009647	±2.5	Pass
	-20	-11.34	-0.013556		
	-10	-10.46	-0.012504		
	0	-8.10	-0.009683		
	10	-7.85	-0.009384		
	20	-14.78	-0.017669		
	30	-8.33	-0.009958		
	40	-12.03	-0.014381		
	50	-10.90	-0.013030		
64QAM					
3.85	-30	2.52	0.003013	±2.5	Pass
	-20	-15.49	-0.018518		
	-10	-9.58	-0.011452		
	0	-12.77	-0.015266		
	10	-11.79	-0.014094		
	20	-8.50	-0.010161		
	30	3.79	0.004531		
	40	-10.80	-0.012911		
	50	-7.62	-0.009109		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.30	-6.15	-0.007352	±2.5	Pass
	3.85	-16.25	-0.019426		
	4.42	-4.71	-0.005631		
16QAM					
25	3.30	-9.61	-0.011488	±2.5	Pass
	3.85	-9.00	-0.010759		
	4.42	6.42	0.007675		
64QAM					
25	3.30	7.00	0.008368	±2.5	Pass
	3.85	3.23	0.003861		
	4.42	-5.34	-0.006384		
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 (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.85	-30	-21.13	-0.008335	Within authorized band for Band 7	Pass
	-20	-17.95	-0.007081		
	-10	-16.85	-0.006647		
	0	-27.11	-0.010694		
	10	-7.78	-0.003069		
	20	-18.20	-0.007179		
	30	-23.43	-0.009243		
	40	-14.05	-0.005542		
	50	-16.89	-0.006663		
16QAM					
3.85	-30	-15.62	-0.006162	Within authorized band for Band 7	Pass
	-20	-15.64	-0.006170		
	-10	8.41	0.003318		
	0	-15.48	-0.006107		
	10	-11.90	-0.004694		
	20	4.25	0.001677		
	30	15.18	0.005988		
	40	-25.05	-0.009882		
	50	2.92	0.001152		
64QAM					
3.85	-30	-20.38	-0.008039	Within authorized band for Band 7	Pass
	-20	-23.25	-0.009172		
	-10	-17.82	-0.007030		
	0	-14.79	-0.005834		
	10	-17.44	-0.006880		
	20	-16.16	-0.006375		
	30	-19.88	-0.007842		
	40	-15.48	-0.006107		
	50	-18.32	-0.007227		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.30	-16.34	-0.006446	Within authorized band for Band 7	Pass
	3.85	-19.56	-0.007716		
	4.42	-19.94	-0.007866		
16QAM					
25	3.30	-16.24	-0.006406	Within authorized band for Band 7	Pass
	3.85	-21.46	-0.008465		
	4.42	-18.24	-0.007195		
64QAM					
25	3.30	-23.57	-0.009298	Within authorized band for Band 7	Pass
	3.85	-9.94	-0.003921		
	4.42	-16.84	-0.006643		
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					
3.85	-30	-12.69	-0.017936	Within authorized band for Band 12	Pass
	-20	-12.17	-0.017201		
	-10	3.65	0.005159		
	0	-5.29	-0.007477		
	10	-15.11	-0.021357		
	20	-8.54	-0.012071		
	30	-14.92	-0.021088		
	40	-11.29	-0.015958		
	50	-13.05	-0.018445		
16QAM					
3.85	-30	-7.52	-0.010629	Within authorized band for Band 12	Pass
	-20	-14.86	-0.021004		
	-10	-9.06	-0.012806		
	0	-3.58	-0.005060		
	10	-6.55	-0.009258		
	20	-7.88	-0.011138		
	30	-9.57	-0.013527		
	40	-3.46	-0.004890		
	50	3.38	0.004777		
64QAM					
3.85	-30	-6.97	-0.009852	Within authorized band for Band 12	Pass
	-20	7.32	0.010346		
	-10	49.80	0.070389		
	0	-12.75	-0.018021		
	10	-8.91	-0.012594		
	20	-12.32	-0.017413		
	30	-4.62	-0.006530		
	40	-11.33	-0.016014		
	50	-4.08	-0.005767		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.30	-7.38	-0.010431	Within authorized band for Band 12	Pass
	3.85	-65.83	-0.093046		
	4.42	-7.93	-0.011208		
16QAM					
25	3.30	-2.60	-0.003675	Within authorized band for Band 12	Pass
	3.85	-14.23	-0.020113		
	4.42	-17.58	-0.024848		
64QAM					
25	3.30	-5.78	-0.008170	Within authorized band for Band 12	Pass
	3.85	-10.90	-0.015406		
	4.42	-10.96	-0.015491		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

LTE Band 38 part:

Reference Frequency: LTE Band 38(10MHz) Middle channel=38000 Frequency=2595.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.85	-30	-13.13	-0.005060	Within authorized band for Band 38	Pass
	-20	-12.93	-0.004983		
	-10	-11.04	-0.004254		
	0	-18.67	-0.007195		
	10	-16.94	-0.006528		
	20	-12.87	-0.004960		
	30	-13.45	-0.005183		
	40	-5.42	-0.002089		
	50	4.23	0.001630		
16QAM					
3.85	-30	-18.65	-0.007187	Within authorized band for Band 38	Pass
	-20	-18.68	-0.007198		
	-10	3.08	0.001187		
	0	-14.48	-0.005580		
	10	-13.29	-0.005121		
	20	-10.07	-0.003881		
	30	-4.72	-0.001819		
	40	-5.01	-0.001931		
	50	-3.42	-0.001318		
64QAM					
3.85	-30	-9.47	-0.003649	Within authorized band for Band 38	Pass
	-20	-15.78	-0.006081		
	-10	-17.81	-0.006863		
	0	-19.34	-0.007453		
	10	-11.37	-0.004382		
	20	-2.92	-0.001125		
	30	-12.12	-0.004671		
	40	-12.77	-0.004921		
	50	-15.11	-0.005823		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.30	6.85	0.002640	Within authorized band for Band 38	Pass
	3.85	-29.80	-0.011484		
	4.42	-14.33	-0.005522		
16QAM					
25	3.30	-19.13	-0.007372	Within authorized band for Band 38	Pass
	3.85	-16.55	-0.006378		
	4.42	-22.03	-0.008489		
64QAM					
25	3.30	-9.34	-0.003599	Within authorized band for Band 38	Pass
	3.85	-15.29	-0.005892		
	4.42	-16.62	-0.006405		
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					
3.85	-30	-11.64	-0.006670	Within authorized band for Band 66	Pass
	-20	16.28	0.009330		
	-10	-17.38	-0.009960		
	0	-9.64	-0.005524		
	10	-18.44	-0.010567		
	20	13.10	0.007507		
	30	-25.28	-0.014487		
	40	-14.83	-0.008499		
	50	7.85	0.004499		
16QAM					
3.85	-30	-15.36	-0.008802	Within authorized band for Band 66	Pass
	-20	-21.73	-0.012453		
	-10	-14.16	-0.008115		
	0	14.45	0.008281		
	10	-14.56	-0.008344		
	20	-7.42	-0.004252		
	30	-18.22	-0.010441		
	40	7.72	0.004424		
	50	-19.54	-0.011198		
64QAM					
3.85	-30	21.37	0.012246	Within authorized band for Band 66	Pass
	-20	-18.22	-0.010441		
	-10	-13.03	-0.007467		
	0	-22.22	-0.012734		
	10	-11.30	-0.006476		
	20	-18.20	-0.010430		
	30	9.51	0.005450		
	40	25.52	0.014625		
	50	-18.38	-0.010533		

Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.30	11.23	0.006436	Within authorized band for Band 66	Pass
	3.85	-30.83	-0.017668		
	4.42	-23.50	-0.013467		
16QAM					
25	3.30	10.70	0.006132	Within authorized band for Band 66	Pass
	3.85	-15.61	-0.008946		
	4.42	-19.86	-0.011381		
64QAM					
25	3.30	-17.40	-0.009971	Within authorized band for Band 66	Pass
	3.85	-14.09	-0.008074		
	4.42	-17.02	-0.009754		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

Appendix G: Modulation Characteristics

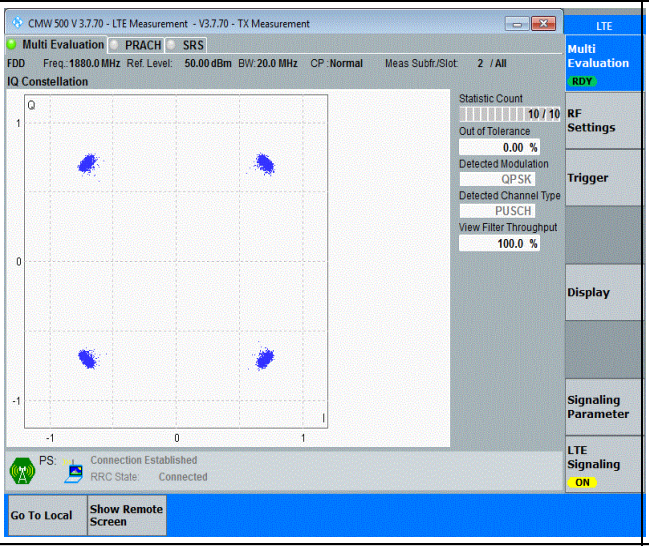
Test Result

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
Band7	20MHz	QPSK	21100	100RB#0	PASS	PASS
Band7	20MHz	16QAM	21100	100RB#0	PASS	PASS
Band7	20MHz	64QAM	21100	100RB#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
Band38	20MHz	QPSK	38000	100RB#0	PASS	PASS
Band38	20MHz	16QAM	38000	100RB#0	PASS	PASS
Band38	20MHz	64QAM	38000	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

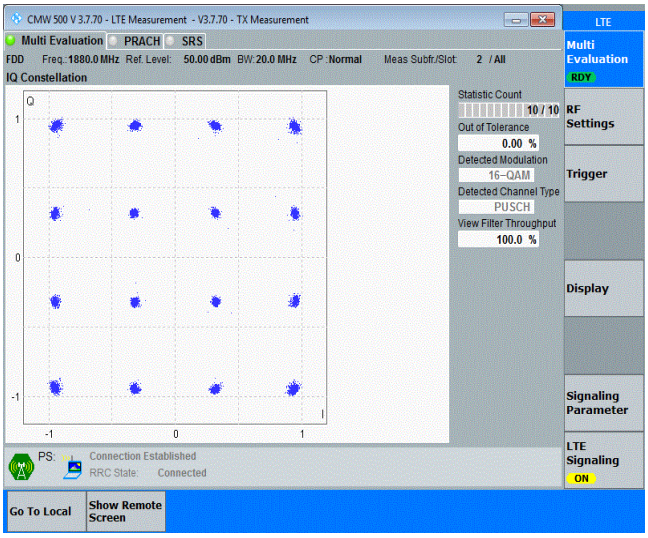
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.

Test Graphs

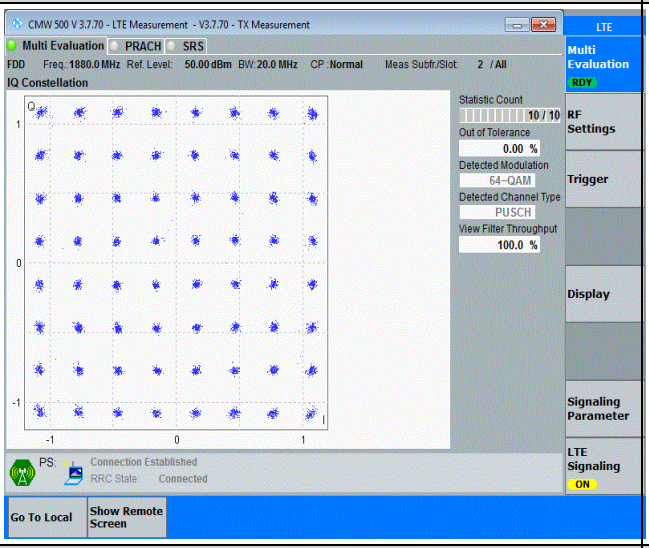
Band2-20MHz-QPSK-18900-100RB#0



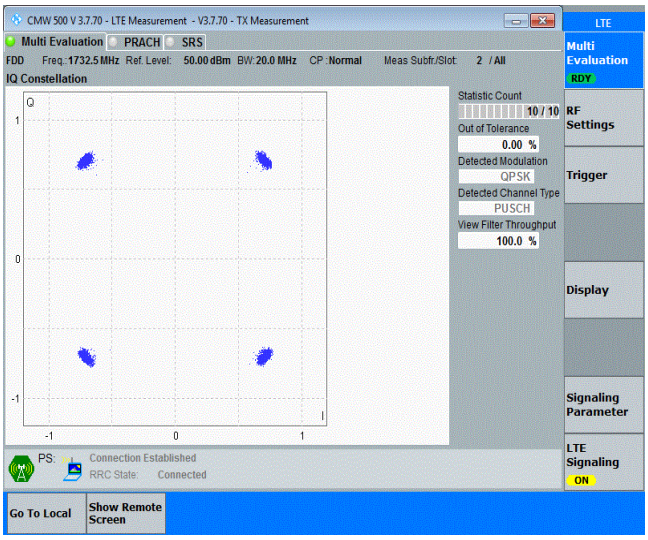
Band2-20MHz-16QAM-18900-100RB#0



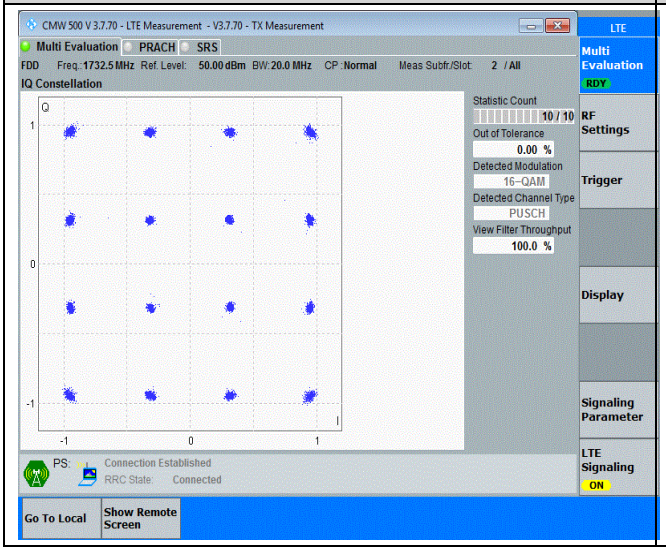
Band2-20MHz-64QAM-18900-100RB#0



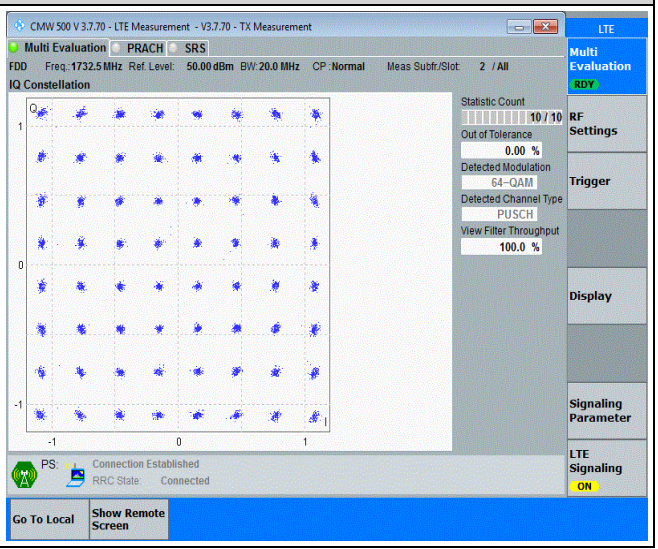
Band4-20MHz-QPSK-20175-100RB#0



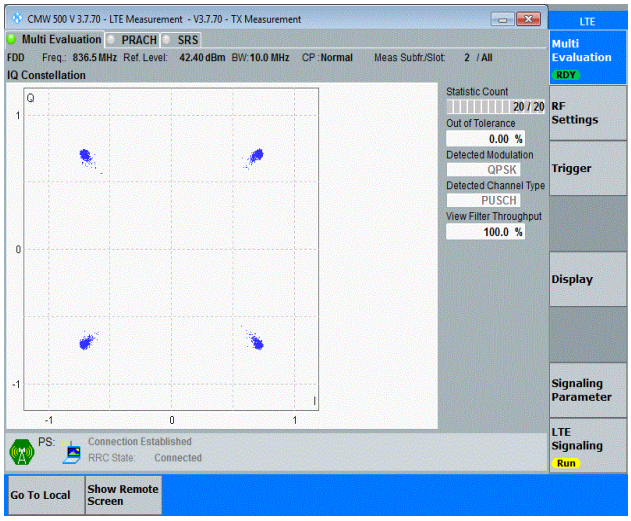
Band4-20MHz-16QAM-20175-100RB#0



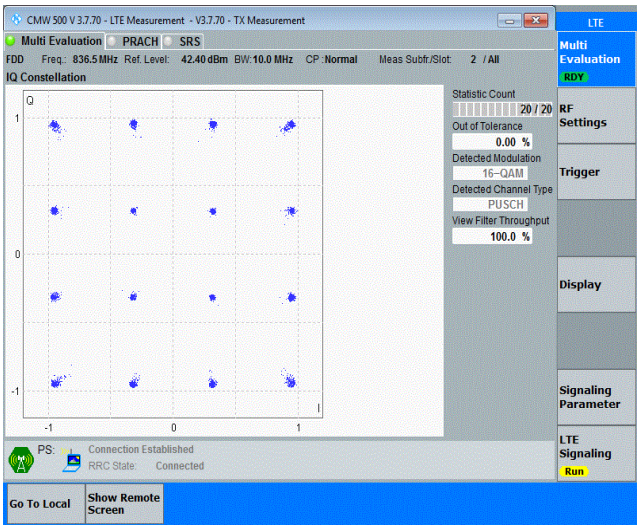
Band4-20MHz-64QAM-20175-100RB#0



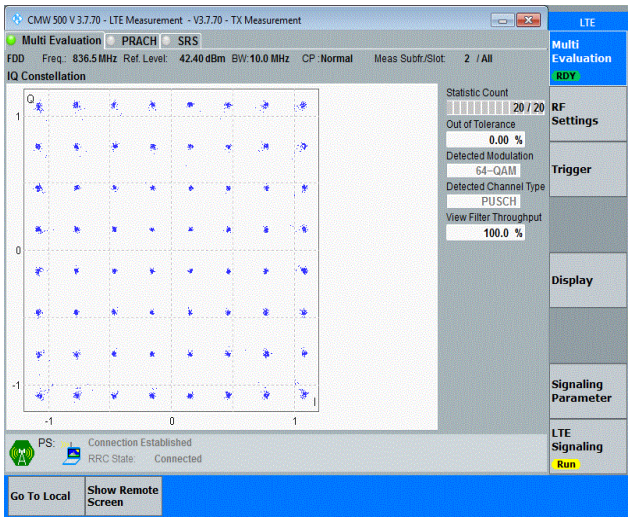
Band5-10MHz-QPSK-20525-50RB#0



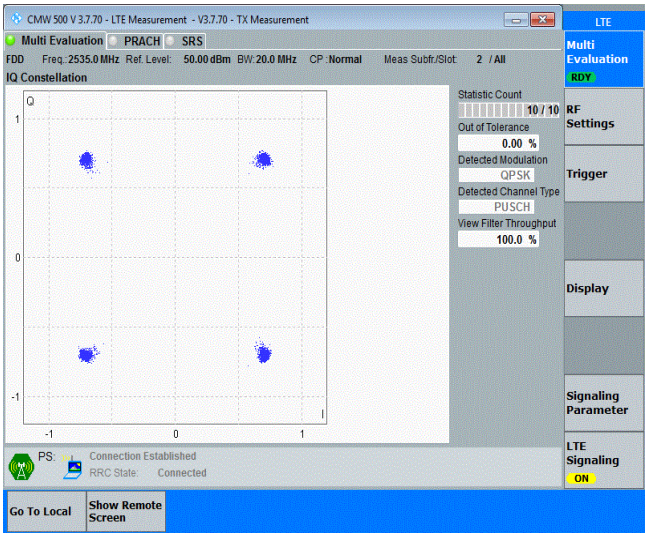
Band5-10MHz-16QAM-20525-50RB#0



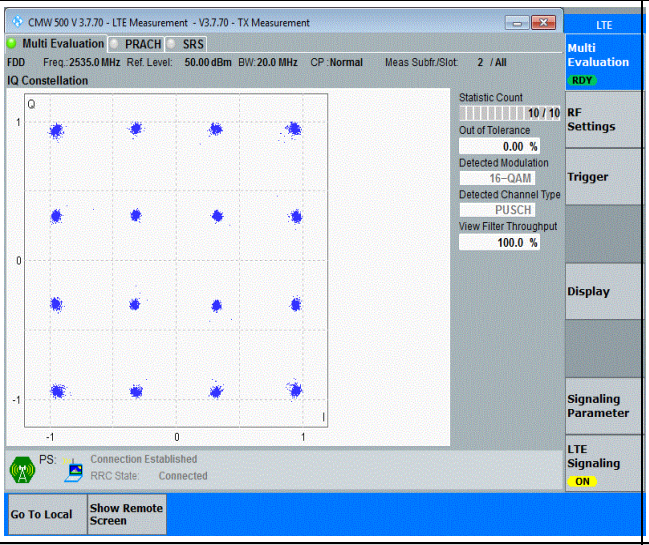
Band5-10MHz-64QAM-20525-50RB#0



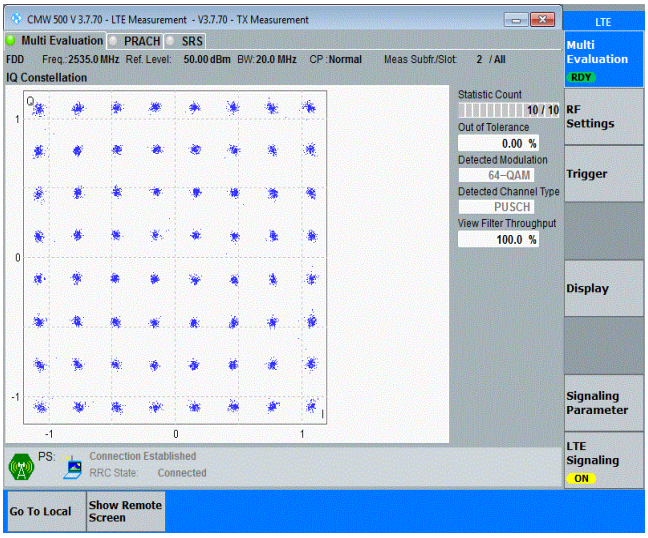
Band7-20MHz-QPSK-21100-100RB#0



Band7-20MHz-16QAM-21100-100RB#0

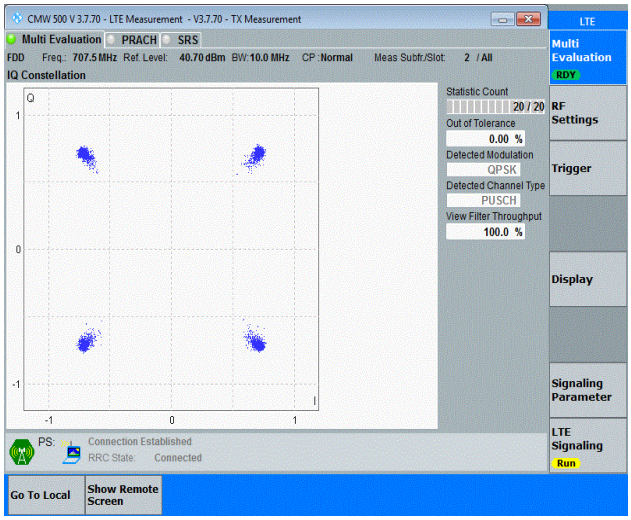


Band7-20MHz-64QAM-21100-100RB#0

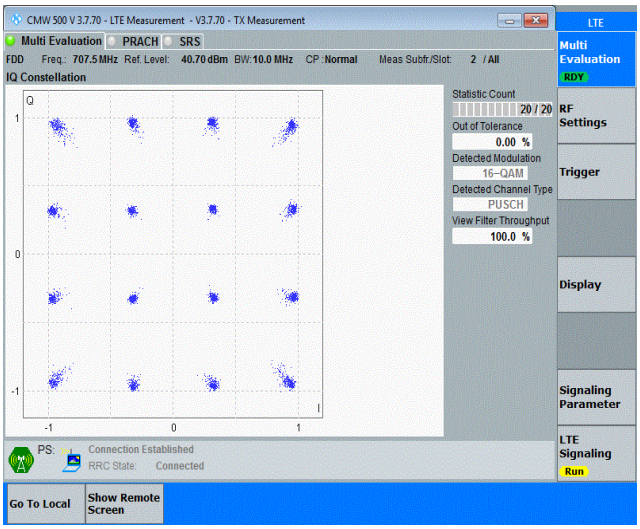


Band12-10MHz-QPSK-23095-50RB#0

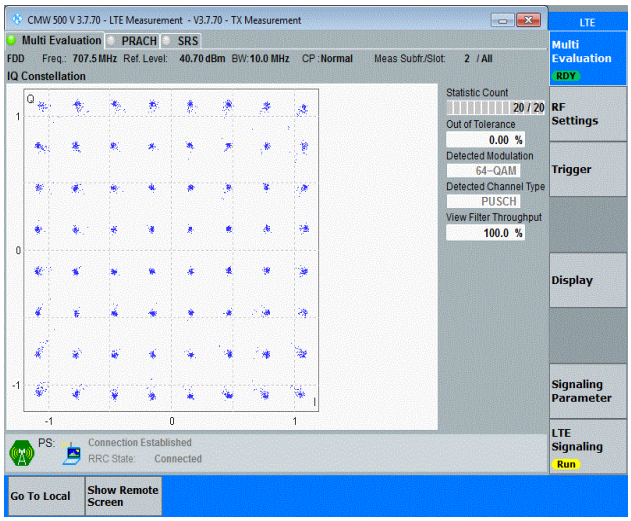
Band12-10MHz-16QAM-23095-50RB#0



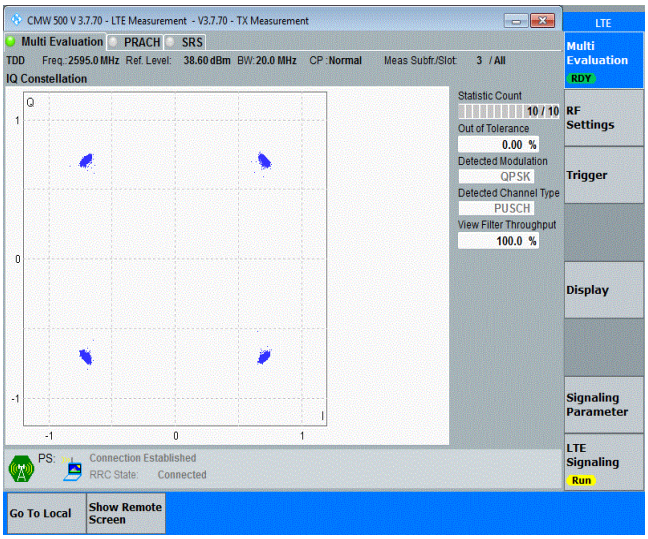
Band12-10MHz-64QAM-23095-50RB#0



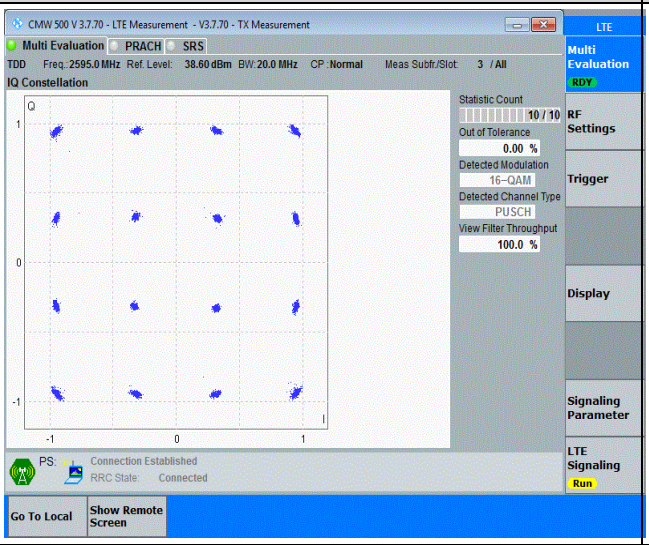
Band38-20MHz-QPSK-38000-100RB#0



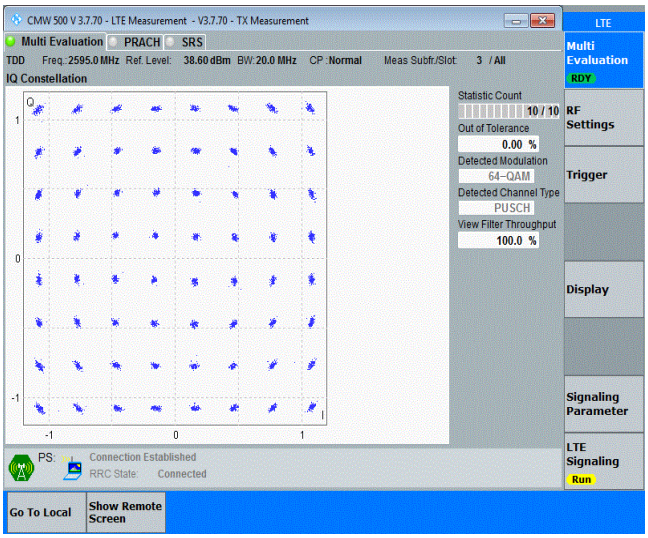
Band38-20MHz-16QAM-38000-100RB#0



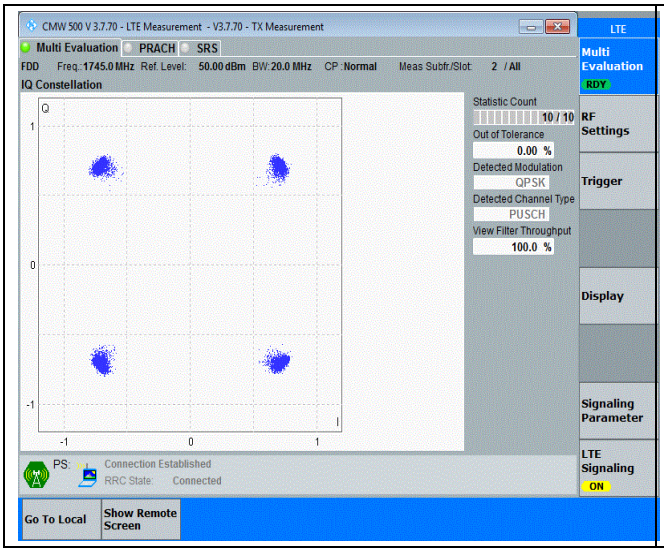
Band38-20MHz-64QAM-38000-100RB#0

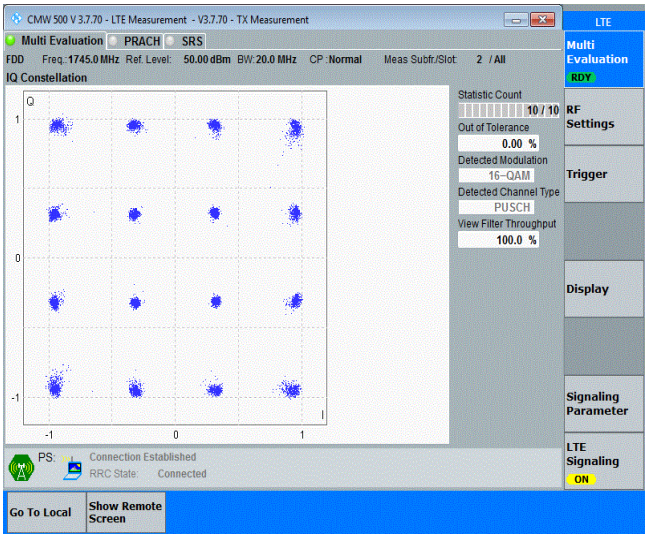
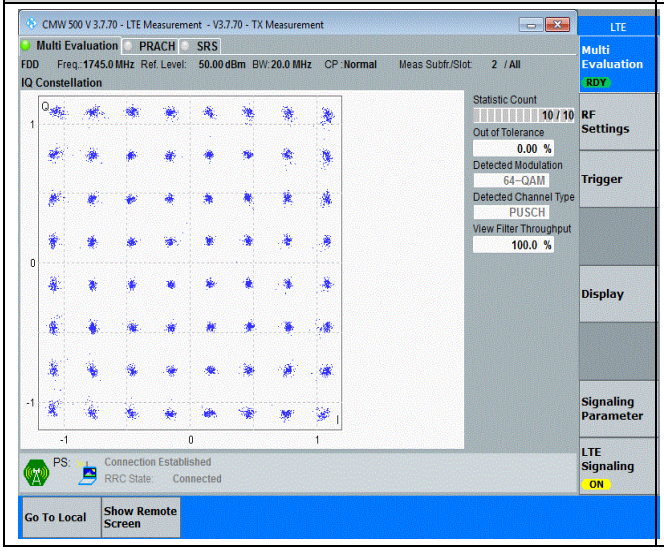


Band66-20MHz-QPSK-132322-100RB#0



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

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