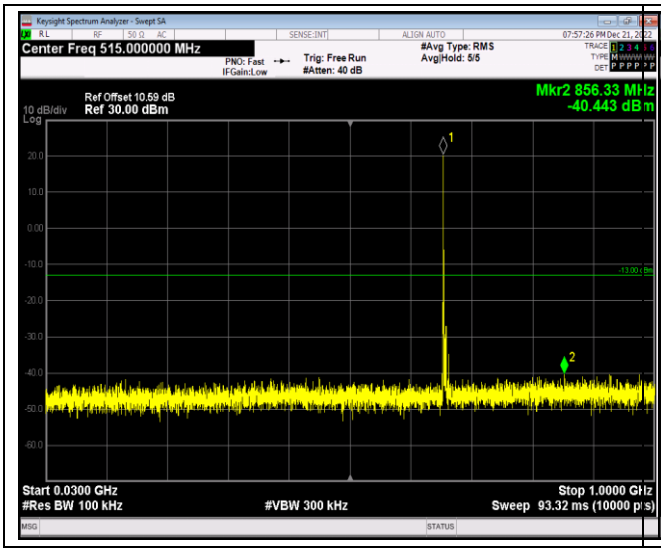
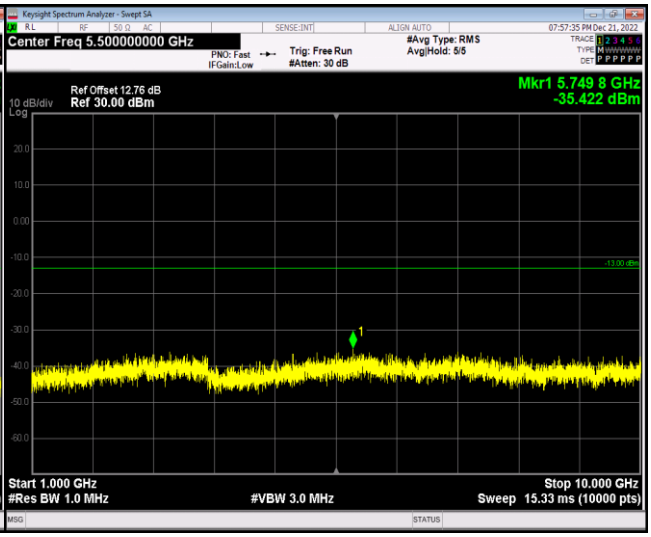
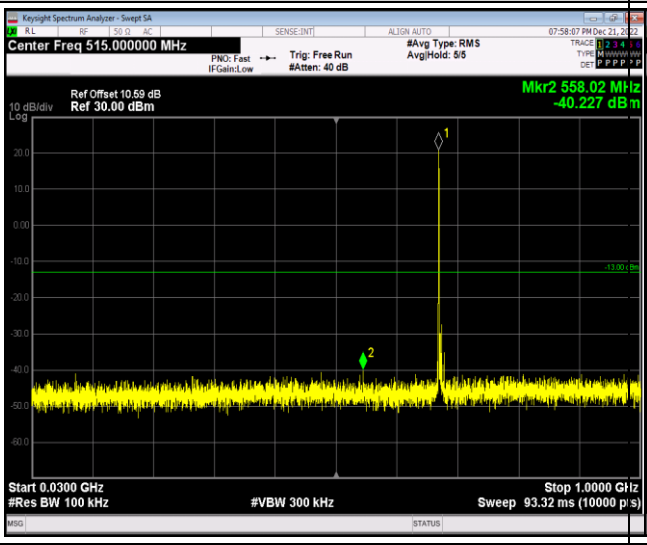


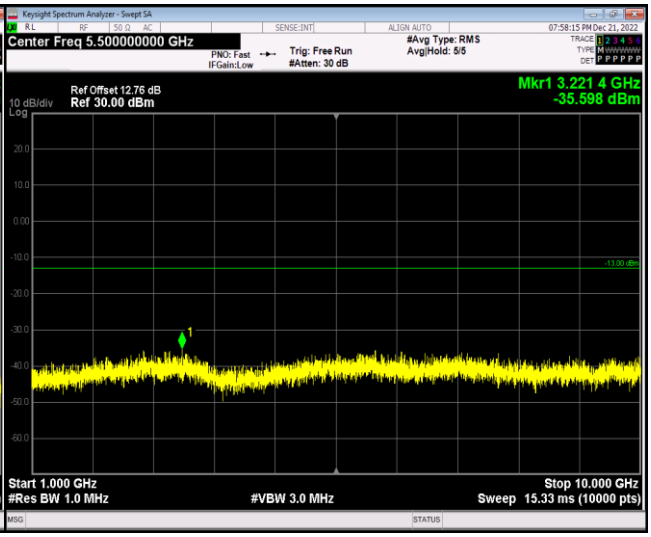
Band71-5MHz-QPSK-133297-1RB#0-Range1:30~1000MHz



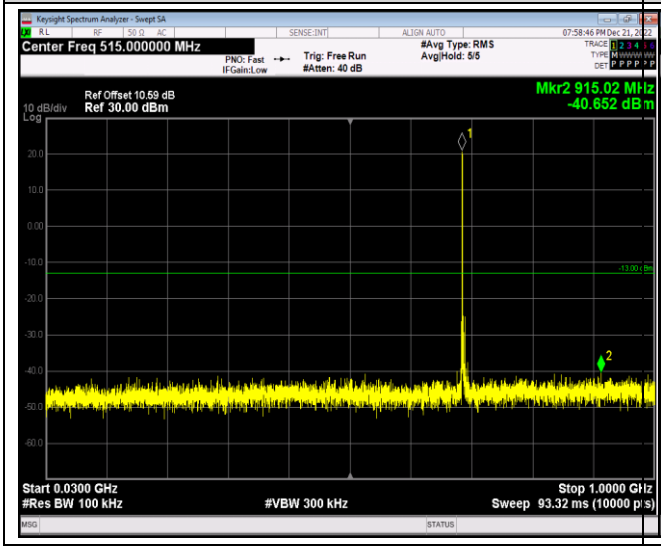
Band71-5MHz-QPSK-133297-1RB#0-Range2:1000~10000MHz

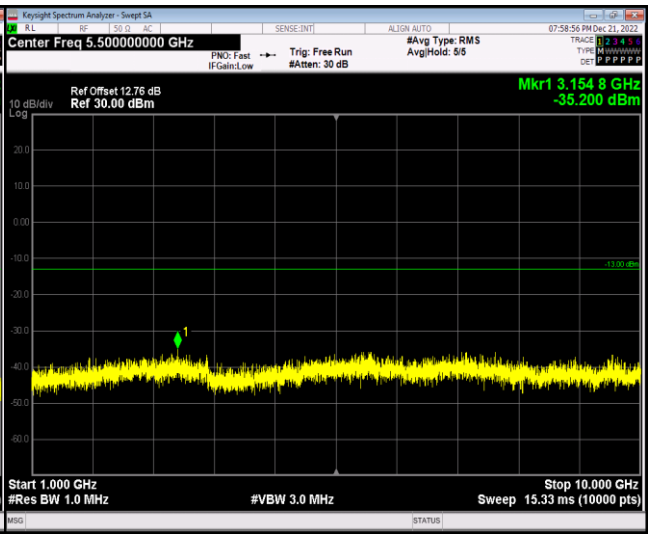


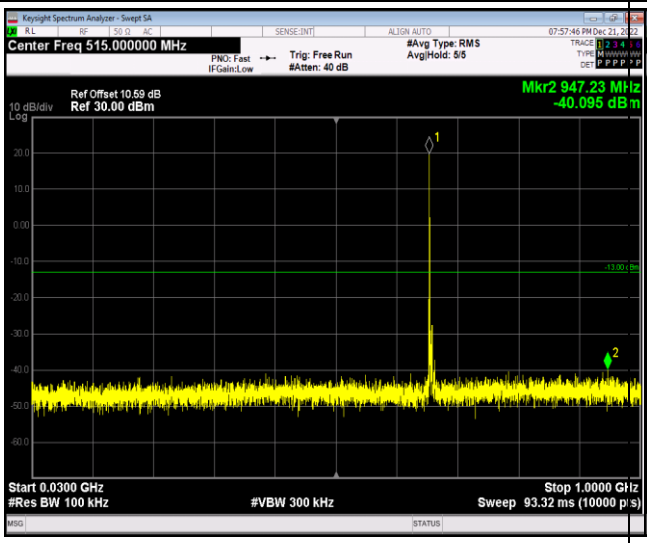
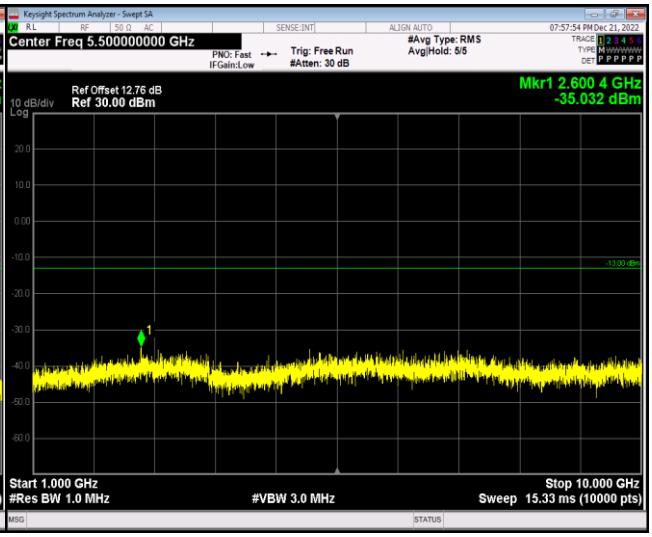
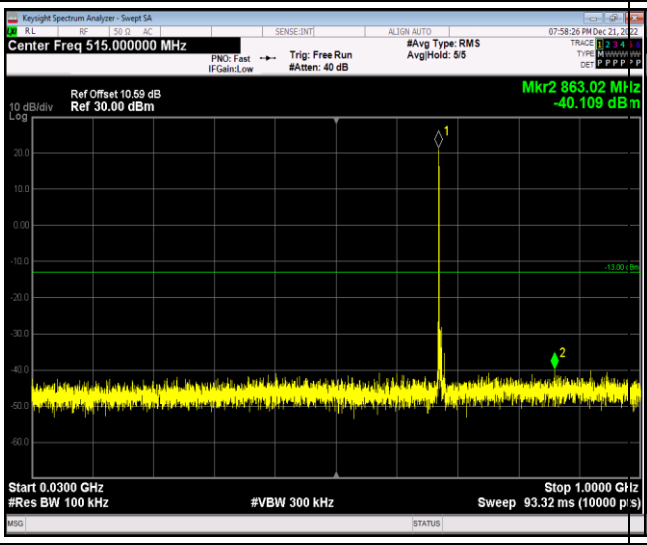
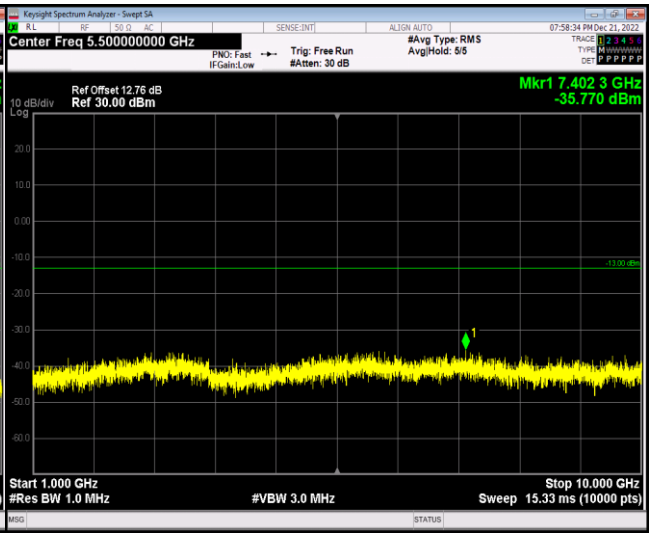
Band71-5MHz-QPSK-133447-1RB#0-Range1:30~1000MHz

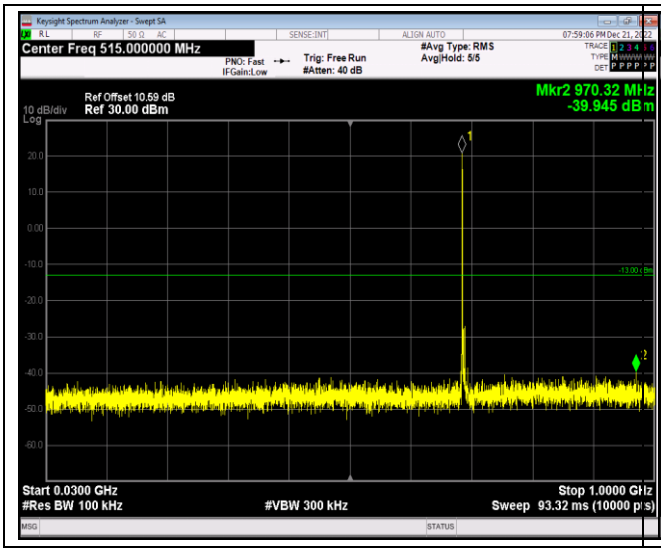


Band71-5MHz-QPSK-133447-1RB#0-Range2:1000~10000MHz

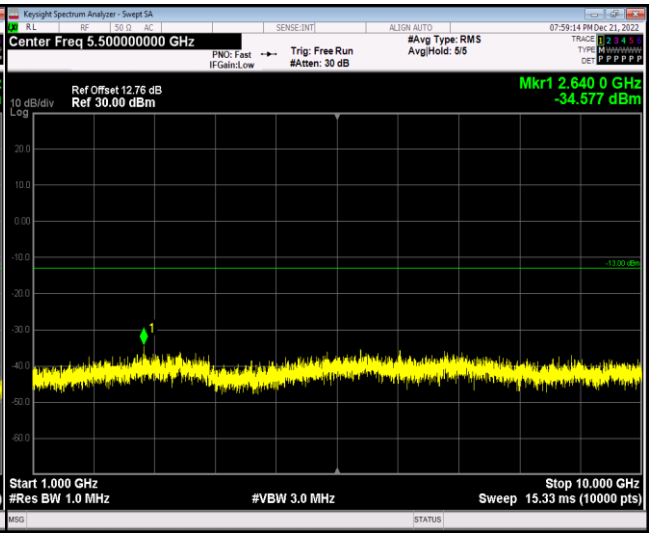




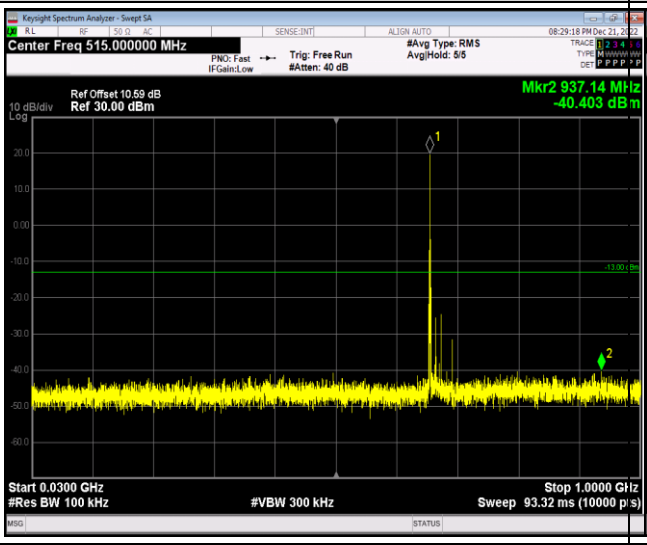
Band71-5MHz-16QAM-133147-1RB#0-Range1:30~1000MHz	Band71-5MHz-16QAM-133147-1RB#0-Range2:1000~10000MHz
	
Band71-5MHz-16QAM-133297-1RB#0-Range1:30~1000MHz	Band71-5MHz-16QAM-133297-1RB#0-Range2:1000~10000MHz
	
Band71-5MHz-16QAM-133447-1RB#0-Range1:30~1000MHz	Band71-5MHz-16QAM-133447-1RB#0-Range2:1000~10000MHz



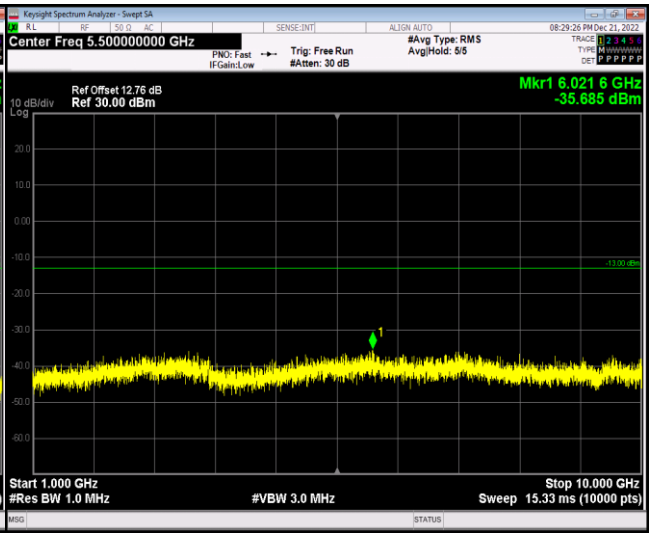
Band71-20MHz-QPSK-133222-1RB#0-Range1:30~1000MHz



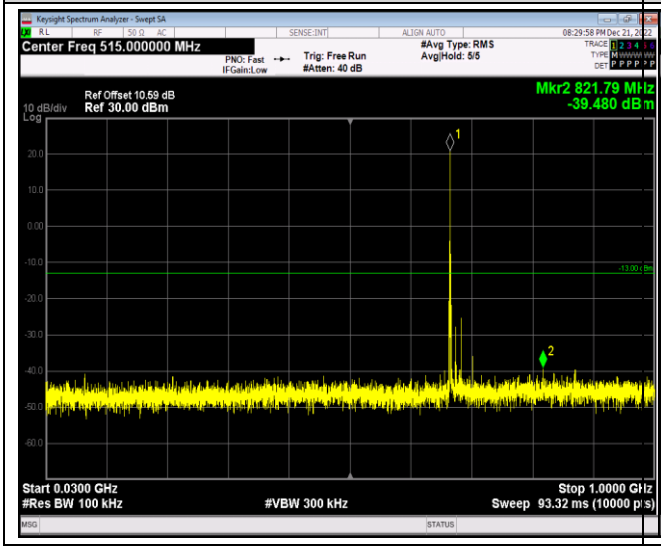
Band71-20MHz-QPSK-133222-1RB#0-Range2:1000~10000MHz

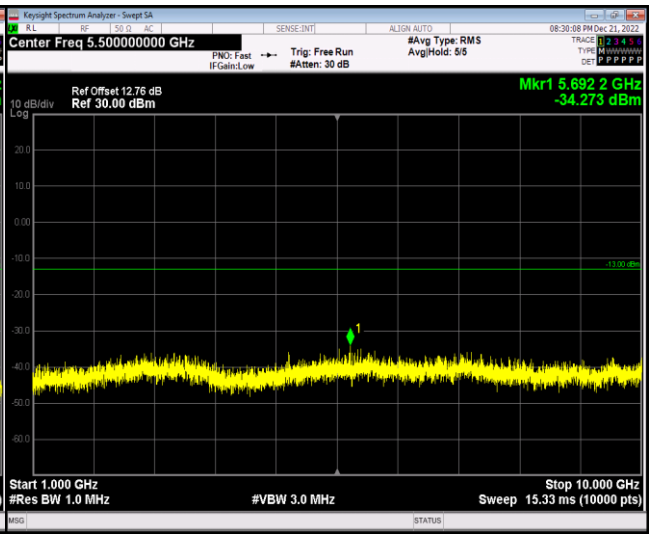


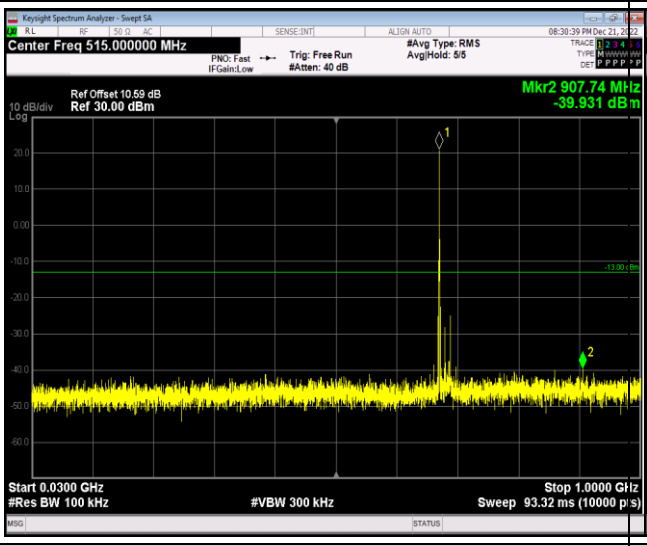
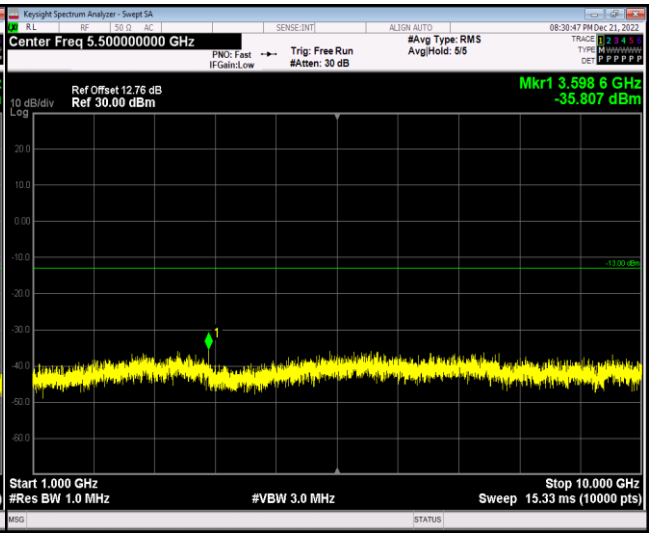
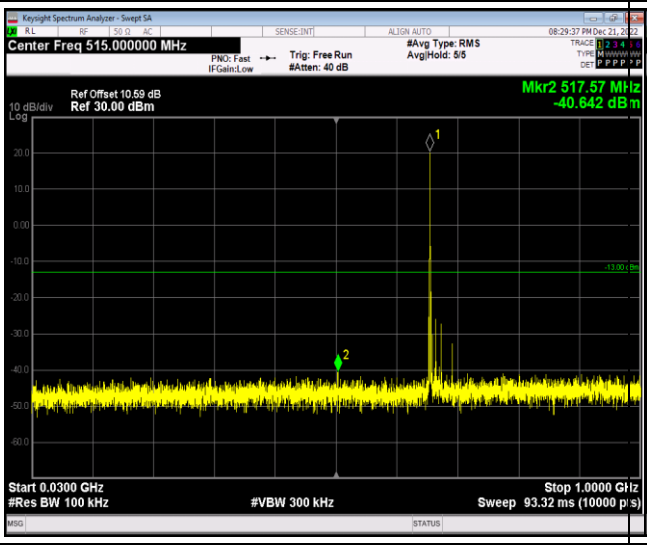
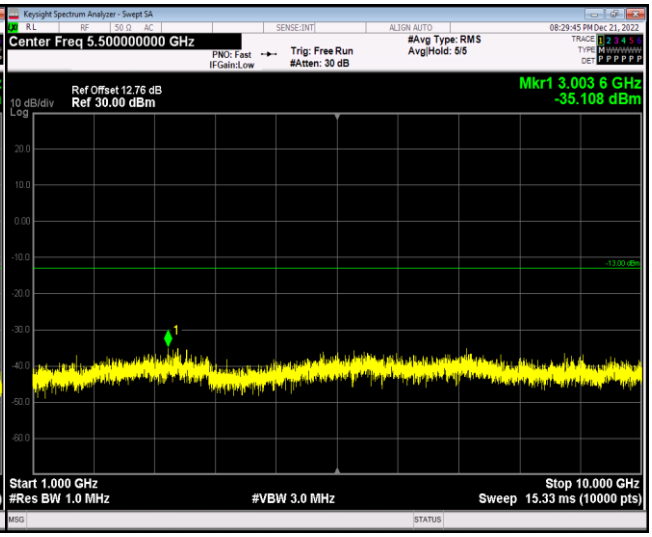
Band71-20MHz-QPSK-133322-1RB#0-Range1:30~1000MHz

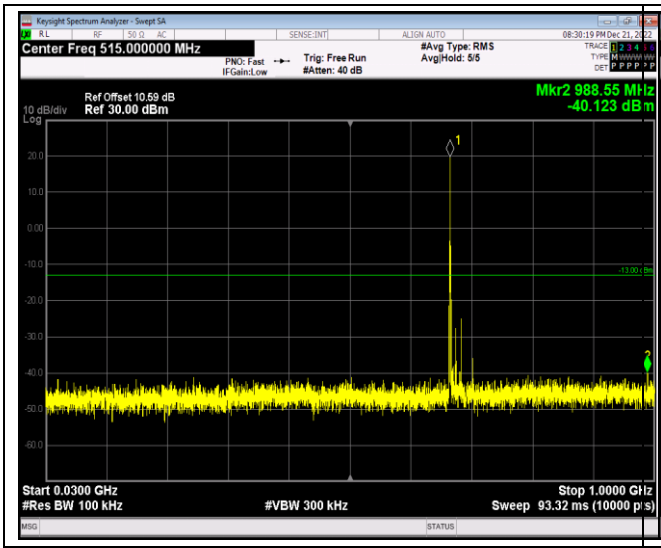


Band71-20MHz-QPSK-133322-1RB#0-Range2:1000~10000MHz

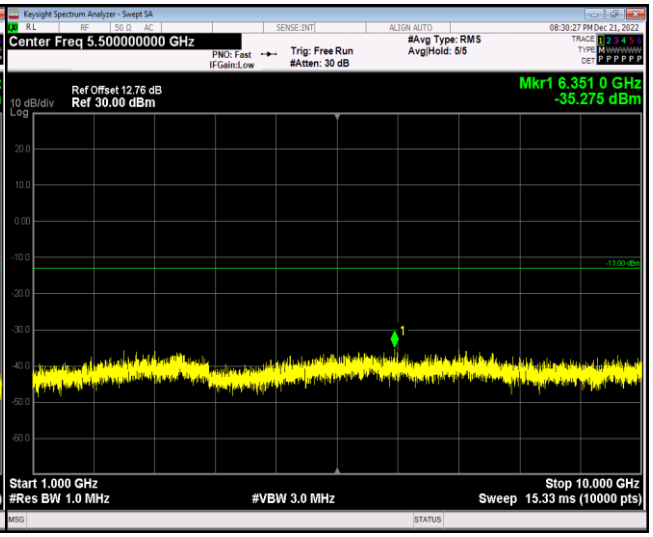




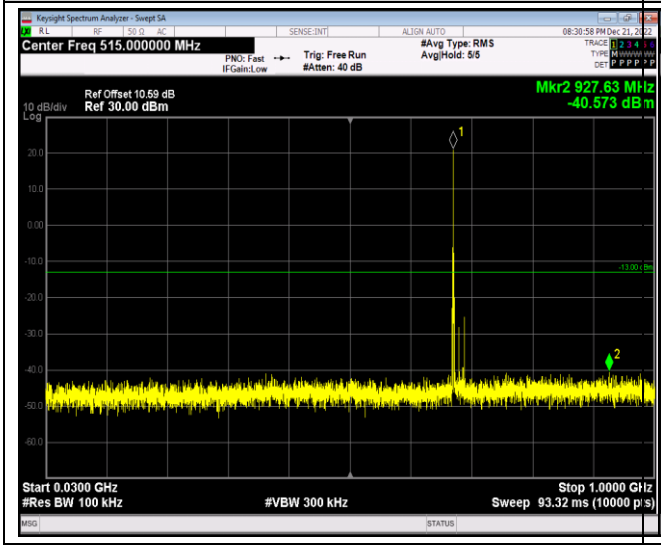
Band71-20MHz-QPSK-133372-1RB#0-Range1:30~1000MHz	Band71-20MHz-QPSK-133372-1RB#0-Range2:1000~10000MHz
	
Band71-20MHz-16QAM-133222-1RB#0-Range1:30~1000MHz	Band71-20MHz-16QAM-133222-1RB#0-Range2:1000~10000MHz
	
Band71-20MHz-16QAM-133322-1RB#0-Range1:30~1000MHz	Band71-20MHz-16QAM-133322-1RB#0-Range2:1000~10000MHz

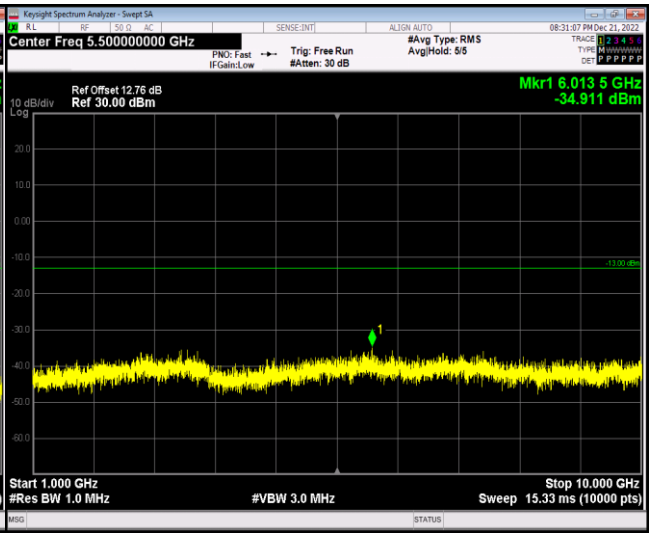


Band71-20MHz-16QAM-133372-1RB#0-Range1:30~1000MHz



Band71-20MHz-16QAM-133372-1RB#0-Range2:1000~10000MHz





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					
3.80	-30	-16.21	-0.008622	Within authorized band for Band 2	Pass
	-20	-8.54	-0.004543		
	-10	-12.36	-0.006574		
	0	-15.46	-0.008223		
	10	-10.97	-0.005835		
	20	-13.20	-0.007021		
	30	-16.61	-0.008835		
	40	-15.98	-0.008500		
	50	-16.92	-0.009000		
16QAM					
3.80	-30	-10.70	-0.005691	Within authorized band for Band 2	Pass
	-20	-12.04	-0.006404		
	-10	-15.11	-0.008037		
	0	-16.84	-0.008957		
	10	-10.97	-0.005835		
	20	-5.78	-0.003074		
	30	-15.52	-0.008255		
	40	-12.29	-0.006537		
	50	-13.45	-0.007154		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-6.29	-0.003346	Within authorized band for Band 2	Pass
	3.80	-21.60	-0.011489		
	4.35	-14.92	-0.007936		
16QAM					
25	3.50	-19.35	-0.010293	Within authorized band for Band 2	Pass
	3.80	-12.62	-0.006713		
	4.35	-7.44	-0.003957		
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					
3.80	-30	-8.54	-0.010209	±2.5	Pass
	-20	-6.32	-0.007555		
	-10	-8.94	-0.010687		
	0	-8.78	-0.010496		
	10	-6.94	-0.008296		
	20	-6.75	-0.008069		
	30	-2.22	-0.002654		
	40	-4.43	-0.005296		
	50	-7.61	-0.009097		
16QAM					
3.80	-30	-6.87	-0.008213	±2.5	Pass
	-20	-8.80	-0.010520		
	-10	-3.62	-0.004328		
	0	-6.05	-0.007233		
	10	-7.08	-0.008464		
	20	-5.51	-0.006587		
	30	-5.62	-0.006718		
	40	-8.73	-0.010436		
	50	-9.68	-0.011572		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-7.71	-0.009217	±2.5	Pass
	3.80	-5.48	-0.006551		
	4.35	-8.03	-0.009600		
16QAM					
25	3.50	-6.35	-0.007591	±2.5	Pass
	3.85	-4.94	-0.005906		
	4.40	-5.89	-0.007041		
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					
3.80	-30	-8.71	-0.012311	Within authorized band for Band 12	Pass
	-20	-10.43	-0.014742		
	-10	-11.30	-0.015972		
	0	-12.25	-0.017314		
	10	-6.81	-0.009625		
	20	-6.95	-0.009823		
	30	-11.39	-0.016099		
	40	-5.74	-0.008113		
	50	-7.98	-0.011279		
16QAM					
3.80	-30	-11.09	-0.015675	Within authorized band for Band 12	Pass
	-20	-2.98	-0.004212		
	-10	-4.94	-0.006982		
	0	-7.31	-0.010332		
	10	-12.56	-0.017753		
	20	-10.71	-0.015138		
	30	-9.44	-0.013343		
	40	-6.49	-0.009173		
	50	-11.12	-0.015717		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-5.16	-0.007293	Within authorized band for Band 12	Pass
	3.80	-8.10	-0.011449		
	4.35	-6.39	-0.009032		
16QAM					
25	3.50	-9.37	-0.013244	Within authorized band for Band 12	Pass
	3.80	-2.66	-0.003760		
	4.35	-8.98	-0.012693		
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					
3.80	-30	-8.61	-0.012127	Within authorized band for Band 17	Pass
	-20	-11.06	-0.015577		
	-10	-13.59	-0.019141		
	0	-9.86	-0.013887		
	10	-9.94	-0.014000		
	20	-11.14	-0.015690		
	30	-11.70	-0.016479		
	40	-5.46	-0.007690		
	50	-8.74	-0.012310		
16QAM					
3.80	-30	-8.00	-0.011268	Within authorized band for Band 17	Pass
	-20	-4.29	-0.006042		
	-10	-10.40	-0.014648		
	0	-13.83	-0.019479		
	10	-7.87	-0.011085		
	20	-7.64	-0.010761		
	30	-4.01	-0.005648		
	40	-11.39	-0.016042		
	50	-9.77	-0.013761		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-6.08	-0.008563	Within authorized band for Band 17	Pass
	3.80	-10.53	-0.014831		
	4.35	-5.11	-0.007197		
16QAM					
25	3.50	-6.97	-0.009817	Within authorized band for Band 17	Pass
	3.80	-8.54	-0.012028		
	4.35	-8.74	-0.012310		
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=40740 Frequency=2605.0MHz					
Temperature					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.80	-30	17.42	0.006687	Within authorized band for Band 41	Pass
	-20	14.29	0.005486		
	-10	13.59	0.005217		
	0	12.86	0.004937		
	10	13.63	0.005232		
	20	13.66	0.005244		
	30	-10.36	-0.003977		
	40	11.00	0.004223		
	50	8.31	0.003190		
16QAM					
3.80	-30	13.28	0.005098	Within authorized band for Band 41	Pass
	-20	11.12	0.004269		
	-10	-16.62	-0.006380		
	0	8.25	0.003167		
	10	-8.78	-0.003370		
	20	14.02	0.005382		
	30	-4.51	-0.001731		
	40	13.86	0.005321		
	50	7.51	0.002883		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-13.35	-0.005125	Within authorized band for Band 41	Pass
	3.80	-20.90	-0.008023		
	4.35	12.20	0.004683		
16QAM					
25	3.50	12.09	0.004641	Within authorized band for Band41	Pass
	3.80	17.62	0.006764		
	4.35	10.14	0.003893		
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					
3.80	-30	-5.38	-0.003083	Within authorized band for Band 66	Pass
	-20	-5.25	-0.003009		
	-10	-7.91	-0.004533		
	0	9.10	0.005215		
	10	-9.14	-0.005238		
	20	-6.97	-0.003994		
	30	-9.18	-0.005261		
	40	-9.30	-0.005330		
	50	-9.43	-0.005404		
16QAM					
3.80	-30	-7.58	-0.004344	Within authorized band for Band 66	Pass
	-20	9.90	0.005673		
	-10	-9.21	-0.005278		
	0	-15.01	-0.008602		
	10	-6.44	-0.003691		
	20	-9.56	-0.005479		
	30	6.81	0.003903		
	40	5.42	0.003106		
	50	-8.34	-0.004779		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	11.79	0.006756	Within authorized band for Band 66	Pass
	3.80	-8.97	-0.005140		
	4.35	4.22	0.002418		
16QAM					
25	3.50	-5.11	-0.002928	Within authorized band for Band 66	Pass
	3.80	-7.41	-0.004246		
	4.35	-8.80	-0.005043		
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					
3.80	-30	-4.19	-0.006157	Within authorized band for Band 71	Pass
	-20	5.24	0.007700		
	-10	-5.08	-0.007465		
	0	-9.36	-0.013755		
	10	-10.11	-0.014857		
	20	-10.66	-0.015665		
	30	-8.24	-0.012109		
	40	-8.07	-0.011859		
	50	-6.97	-0.010242		
16QAM					
3.80	-30	-11.47	-0.016855	Within authorized band for Band 71	Pass
	-20	-9.73	-0.014298		
	-10	-8.17	-0.012006		
	0	-6.34	-0.009317		
	10	-5.29	-0.007774		
	20	-8.05	-0.011830		
	30	-7.90	-0.011609		
	40	-3.00	-0.004409		
	50	-7.14	-0.010492		
Voltage					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	3.50	-6.87	-0.010096	Within authorized band for Band 71	Pass
	3.80	-6.47	-0.009508		
	4.35	-7.08	-0.010404		
16QAM					
25	3.50	-5.59	-0.008215	Within authorized band for Band 71	Pass
	3.80	3.20	0.004702		
	4.35	-7.55	-0.011095		
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.					

Appendix G: Modulation Characteristics

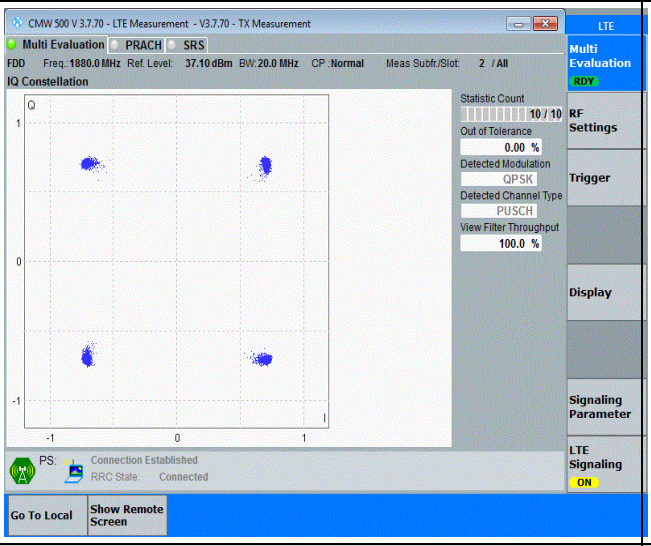
Test Result

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
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	40740	100RB#0	PASS	PASS
Band41	20MHz	16QAM	40740	100RB#0	PASS	PASS
Band66	20MHz	QPSK	132322	100RB#0	PASS	PASS
Band66	20MHz	16QAM	132322	100RB#0	PASS	PASS
Band71	20MHz	QPSK	133322	100RB#0	PASS	PASS
Band71	20MHz	16QAM	133322	100RB#0	PASS	PASS

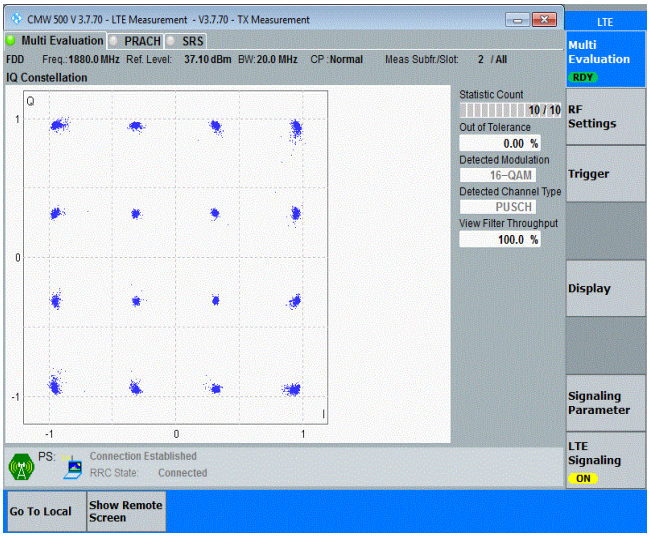
Remark: All bandwidth and all modulation had been tested, but only the worst case data displayed in this report.

Test Graphs

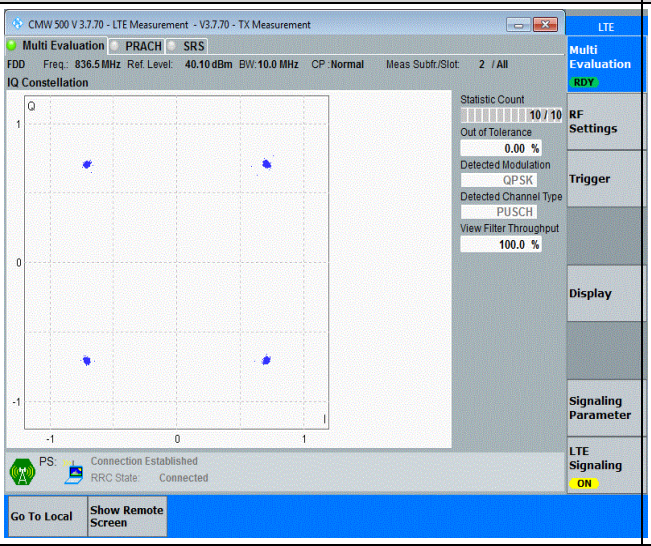
Band2-20MHz-QPSK-18900-100RB#0



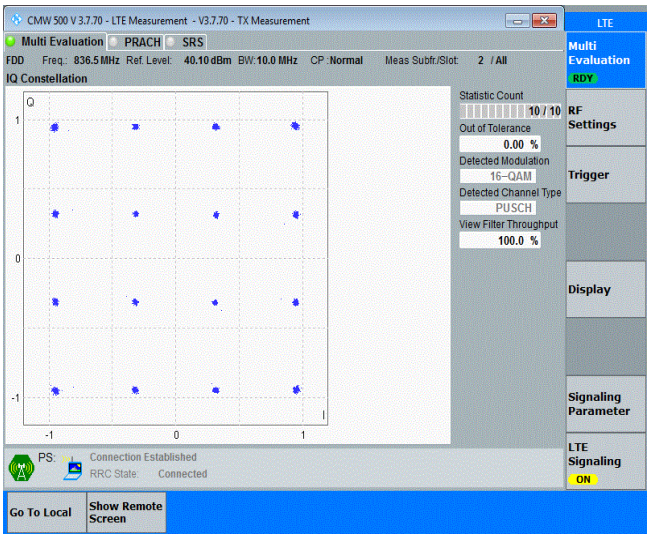
Band2-20MHz-16QAM-18900-100RB#0



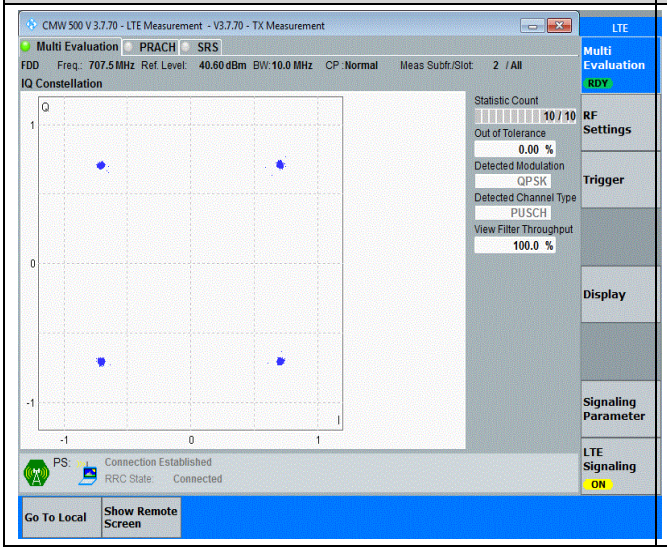
Band5-10MHz-QPSK-20525-50RB#0



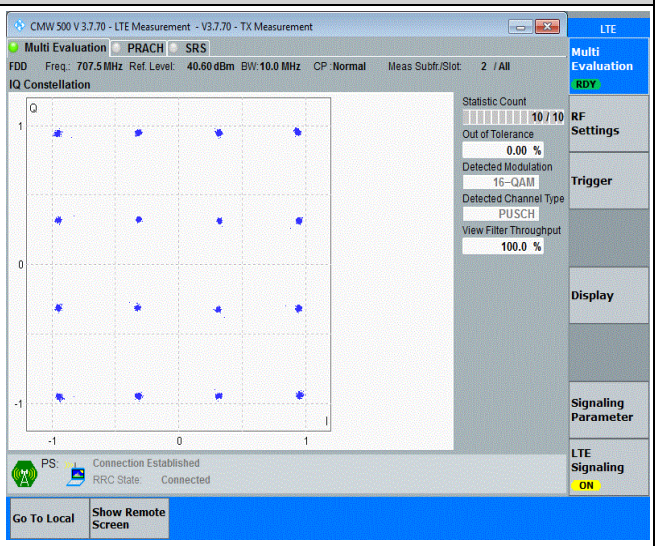
Band5-10MHz-16QAM-20525-50RB#0



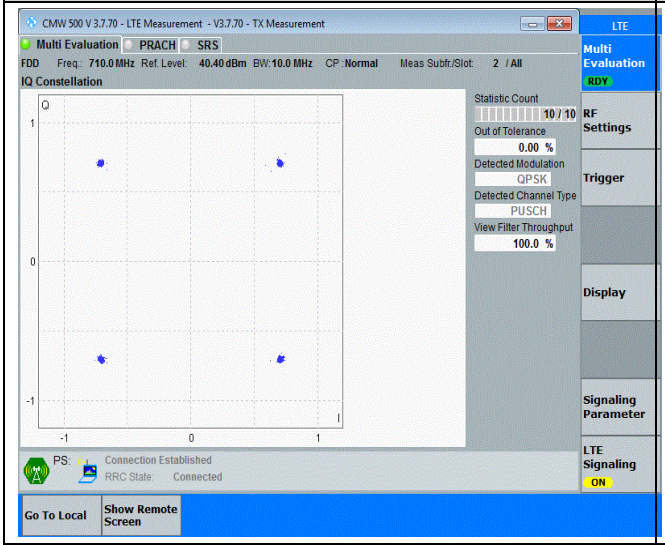
Band12-10MHz-QPSK-23095-50RB#0



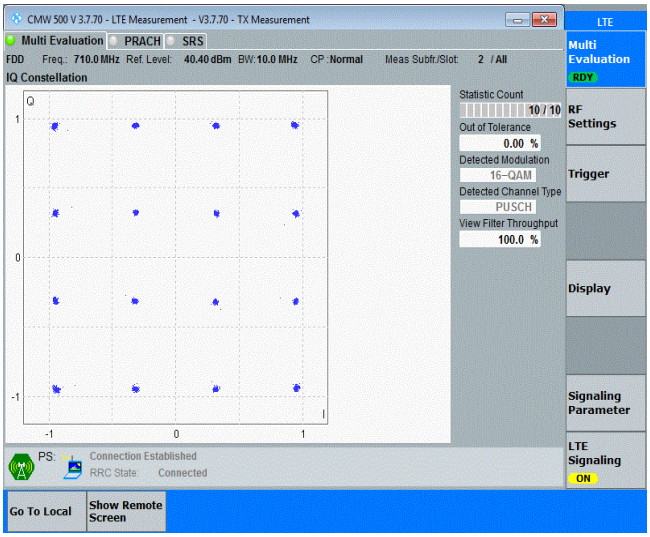
Band12-10MHz-16QAM-23095-50RB#0



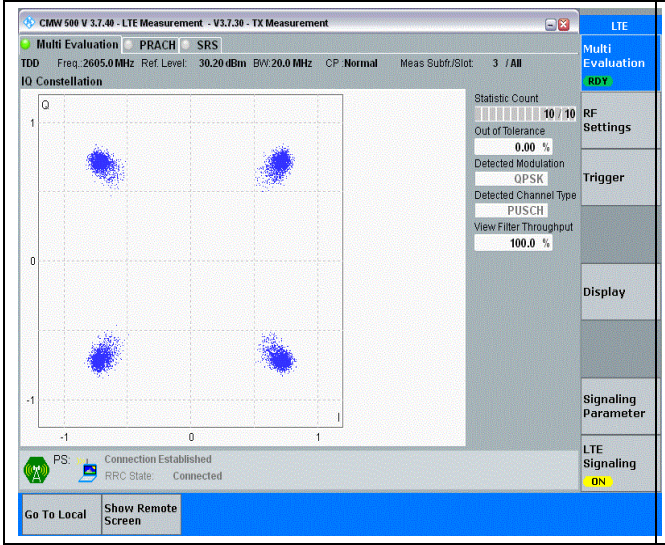
Band17-10MHz-QPSK-23790-50RB#0



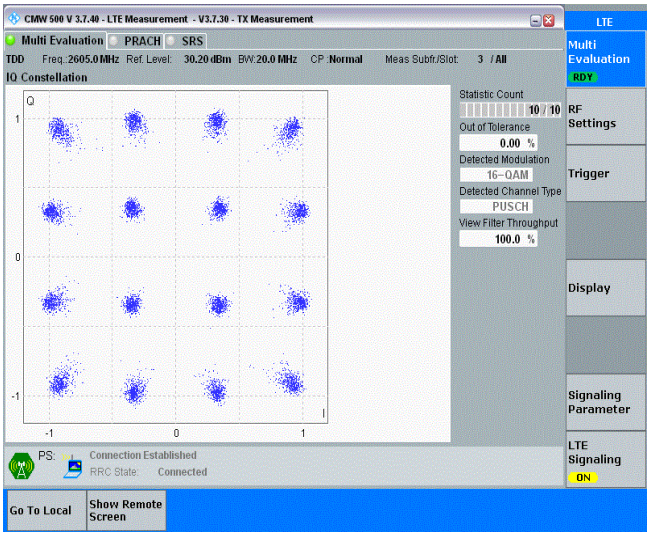
Band17-10MHz-16QAM-23790-50RB#0



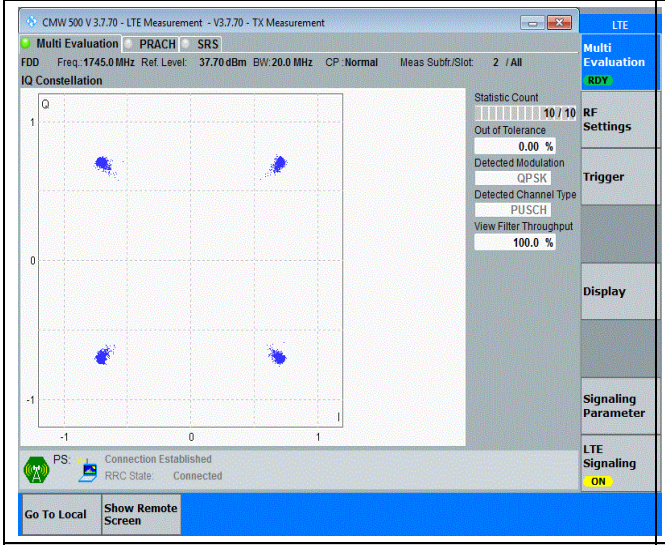
Band41-20MHz-QPSK-40740-100RB#0



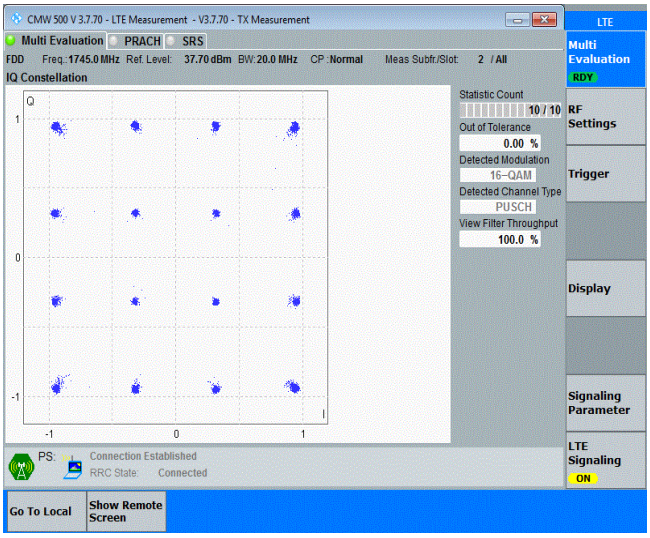
Band41-20MHz-16QAM-40740-100RB#0



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

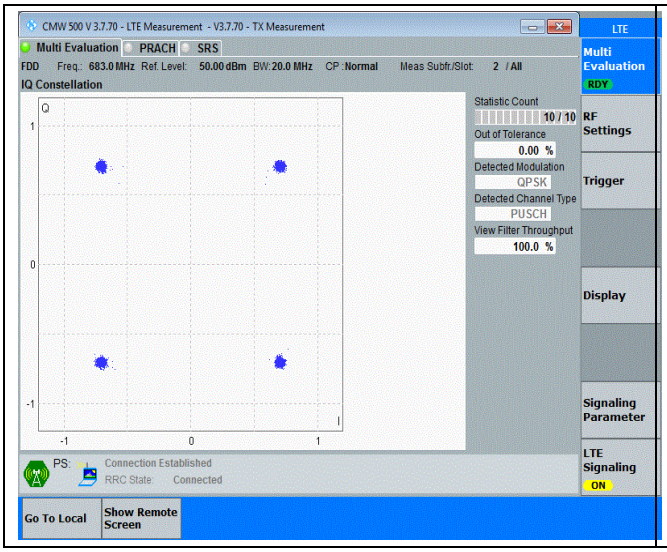


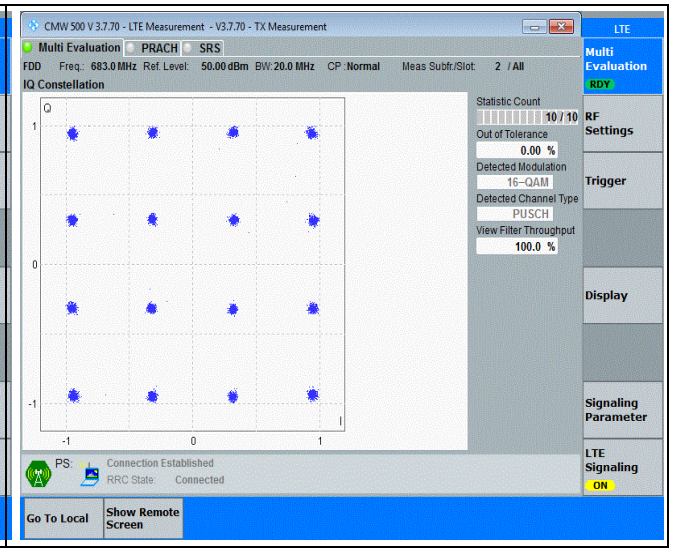
Band66-20MHz-16QAM-132322-100RB#0



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

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


CMW 500 V 3.7.70 - LTE Measurement - V3.7.70 - TX Measurement
Multi Evaluation
PRACH
SRS
FDD Freq.: 683.0 MHz Ref. Level: 50.00 dBm BW: 20.0 MHz CP: Normal Meas Subfr./Slot: 2 / All
IQ Constellation
Statistic Count
10 / 10
Out of Tolerance
0.00 %
Detected Modulation
QPSK
Detected Channel Type
PUSCH
View Filter Throughput
100.0 %
LTE
Multi Evaluation
RDY
RF Settings
Trigger
Display
Signaling Parameter
LTE Signaling
ON
PS:
Connection Established
RRC State: Connected
Go To Local
Show Remote Screen


CMW 500 V 3.7.70 - LTE Measurement - V3.7.70 - TX Measurement
Multi Evaluation
PRACH
SRS
FDD Freq.: 683.0 MHz Ref. Level: 50.00 dBm BW: 20.0 MHz CP: Normal Meas Subfr./Slot: 2 / All
IQ Constellation
Statistic Count
10 / 10
Out of Tolerance
0.00 %
Detected Modulation
16-QAM
Detected Channel Type
PUSCH
View Filter Throughput
100.0 %
LTE
Multi Evaluation
RDY
RF Settings
Trigger
Display
Signaling Parameter
LTE Signaling
ON
PS:
Connection Established
RRC State: Connected
Go To Local
Show Remote Screen