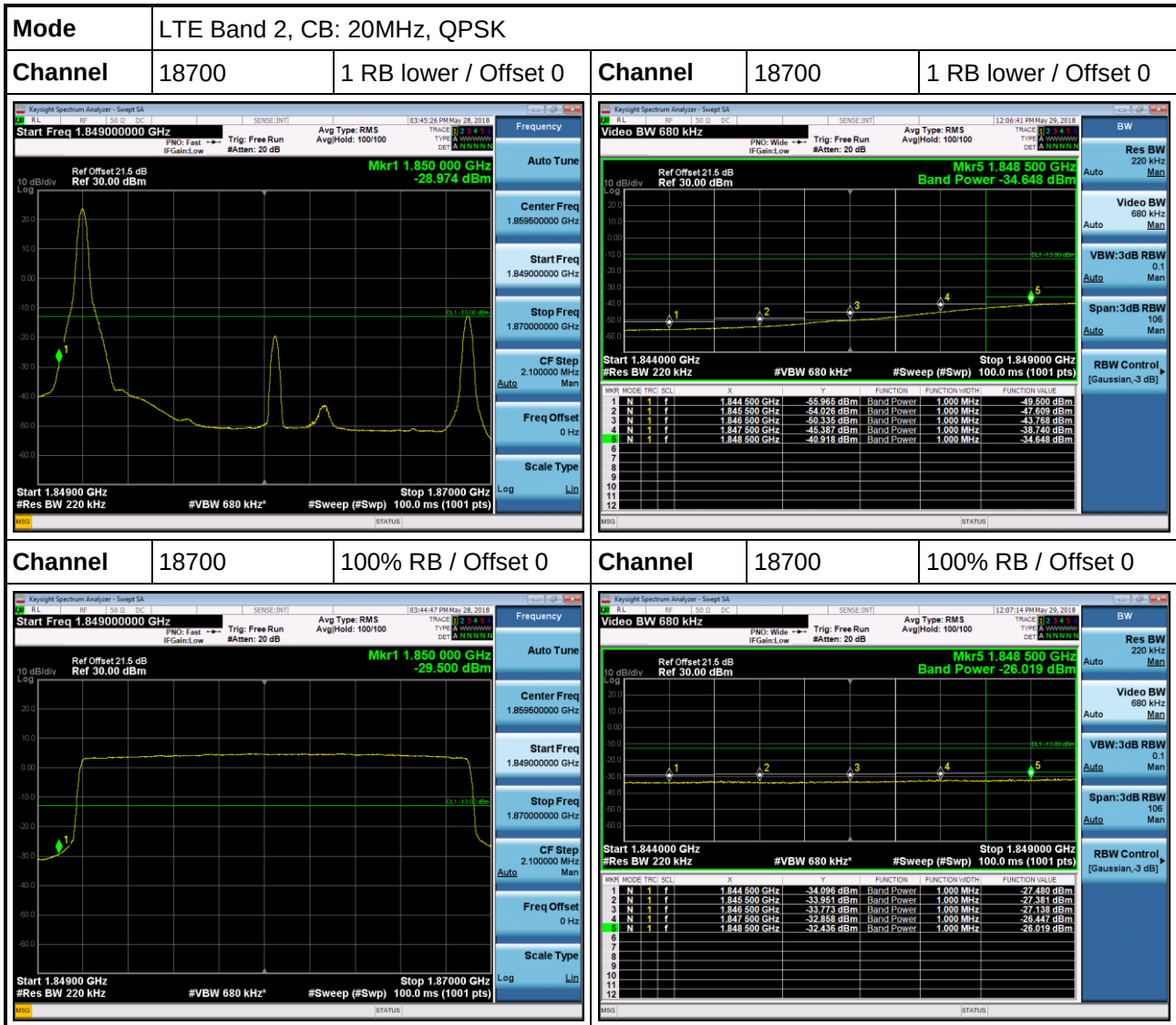
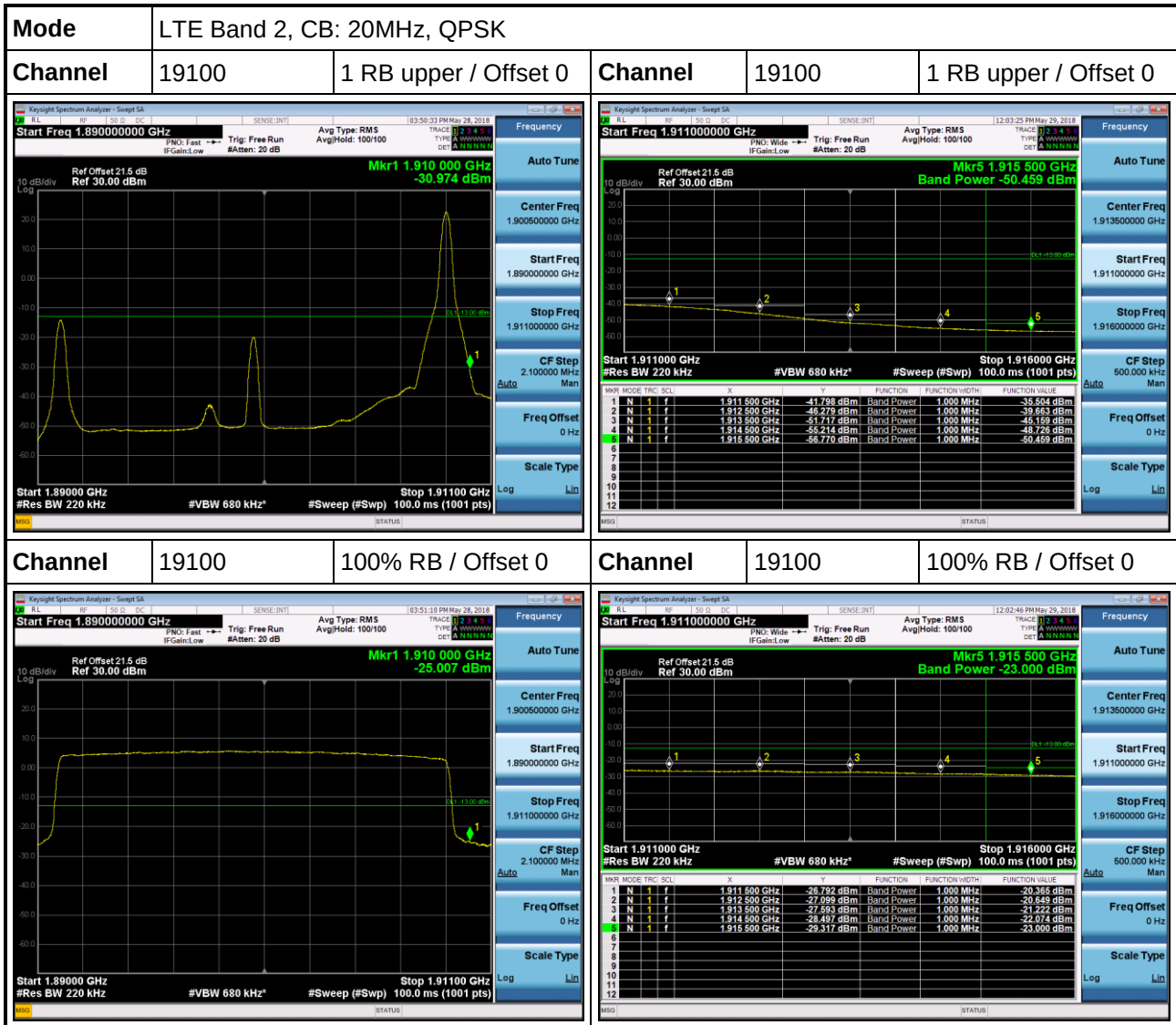
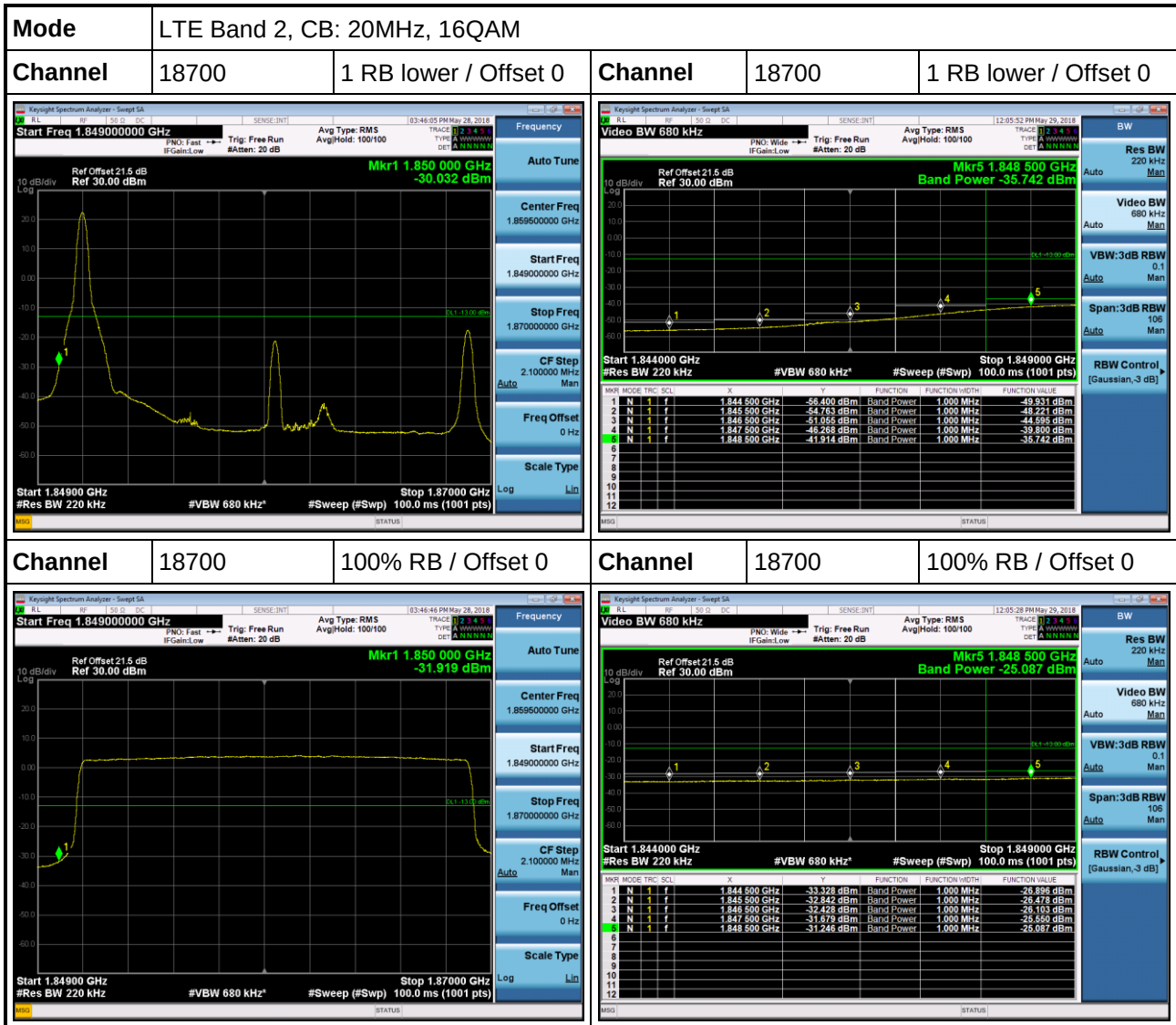
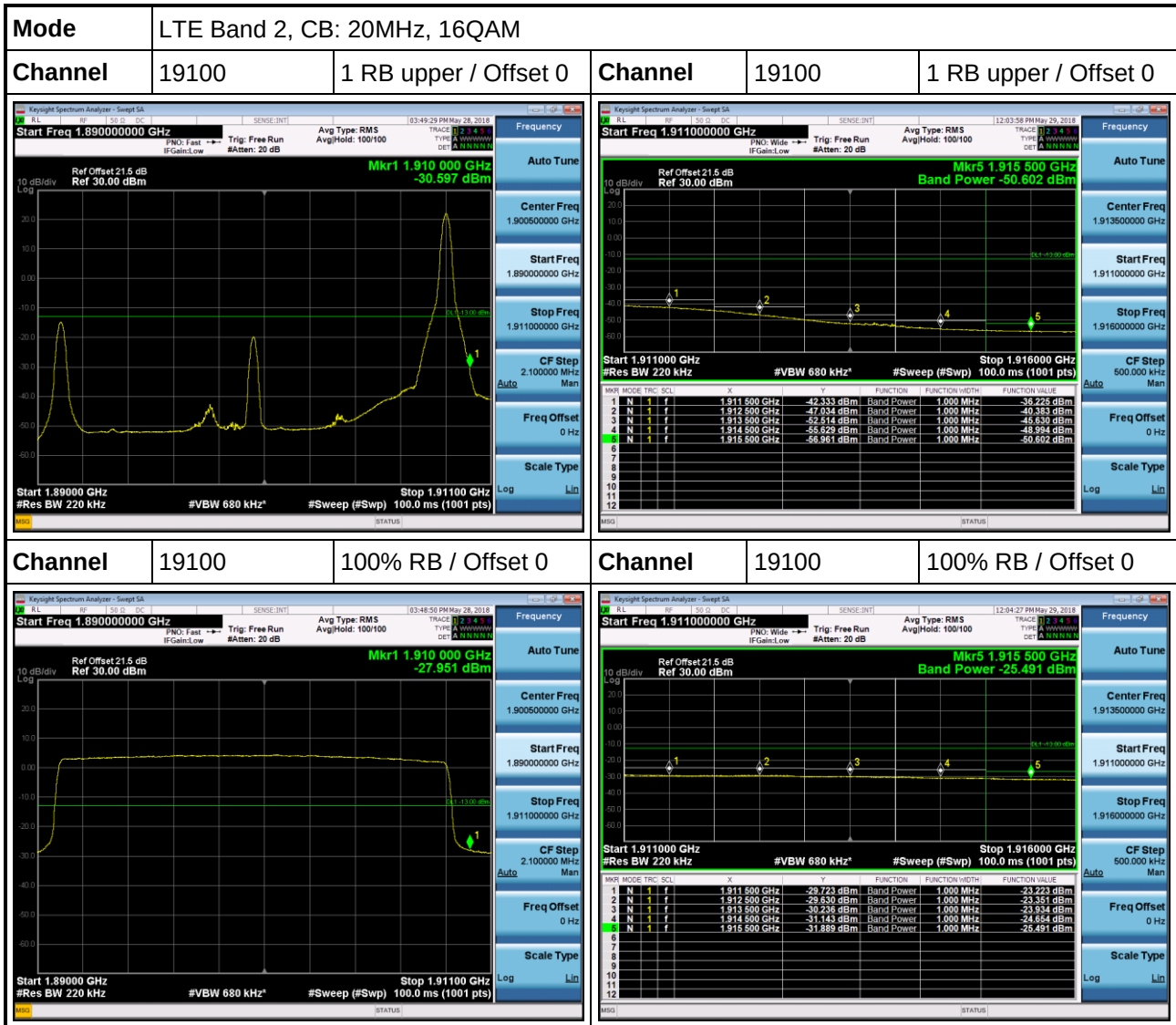








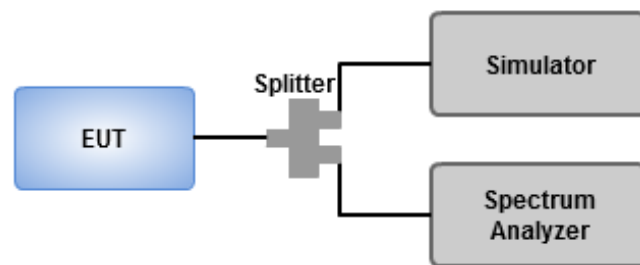


3.5 Occupied and 26 dB Bandwidth

3.5.1 Test Procedures

1. Set RBW = 20 / 30 / 51 / 100 / 200 / 200 kHz, VBW = 100 / 100 / 200 / 300 / 1000 / 1000 kHz for LTE channel bandwidth 1.4 / 3 / 5 / 10 / 15 / 20 MHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Using occupied bandwidth measurement function of spectrum analyzer to measure occupied bandwidth.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 26dB relative to the maximum level measured in the fundamental emission.

3.5.2 Test Setup



3.5.3 Test Result of Occupied Bandwidth

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
Band 2	-	-	-	-	-
Band 2_LTE_1.4MHz_(QPSK)_1TX	1.285M	1.09M	1M09G7D	1.26M	1.088M
Band 2_LTE_1.4MHz_(16QAM)_1TX	1.299M	1.092M	1M09W7D	1.271M	1.084M
Band 2_LTE_3MHz_(QPSK)_1TX	2.94M	2.689M	2M69G7D	2.903M	2.683M
Band 2_LTE_3MHz_(16QAM)_1TX	2.94M	2.688M	2M69W7D	2.918M	2.683M
Band 2_LTE_5MHz_(QPSK)_1TX	4.888M	4.492M	4M49G7D	4.85M	4.48M
Band 2_LTE_5MHz_(16QAM)_1TX	4.975M	4.482M	4M48W7D	4.85M	4.472M
Band 2_LTE_10MHz_(QPSK)_1TX	9.65M	8.955M	8M96G7D	9.525M	8.905M
Band 2_LTE_10MHz_(16QAM)_1TX	9.675M	8.939M	8M94W7D	9.525M	8.902M
Band 2_LTE_15MHz_(QPSK)_1TX	14.325M	13.422M	13M4G7D	14.175M	13.366M
Band 2_LTE_15MHz_(16QAM)_1TX	14.475M	13.446M	13M4W7D	14.288M	13.366M
Band 2_LTE_20MHz_(QPSK)_1TX	19M	17.87M	17M9G7D	18.75M	17.821M
Band 2_LTE_20MHz_(16QAM)_1TX	18.9M	17.835M	17M8W7D	18.85M	17.817M

Max-N dB = Maximum 26dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 26dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

Mode	Result	RB	RB Start	Limit	P1-N dB (Hz)	P1-OBW (Hz)
Band 2_LTE_1.4MHz_(QPSK)_1TX	-	-	-	-	-	-
1850.7MHz	Pass	6	0	Inf	1.285M	1.09M
1880MHz	Pass	6	0	Inf	1.26M	1.089M
1909.3MHz	Pass	6	0	Inf	1.285M	1.088M
Band 2_LTE_1.4MHz_(16QAM)_1TX	-	-	-	-	-	-
1850.7MHz	Pass	6	0	Inf	1.299M	1.088M
1880MHz	Pass	6	0	Inf	1.271M	1.092M
1909.3MHz	Pass	6	0	Inf	1.285M	1.084M
Band 2_LTE_3MHz_(QPSK)_1TX	-	-	-	-	-	-
1851.5MHz	Pass	15	0	Inf	2.903M	2.686M
1880MHz	Pass	15	0	Inf	2.918M	2.683M
1908.5MHz	Pass	15	0	Inf	2.94M	2.689M
Band 2_LTE_3MHz_(16QAM)_1TX	-	-	-	-	-	-
1851.5MHz	Pass	15	0	Inf	2.925M	2.687M
1880MHz	Pass	15	0	Inf	2.918M	2.688M
1908.5MHz	Pass	15	0	Inf	2.94M	2.683M
Band 2_LTE_5MHz_(QPSK)_1TX	-	-	-	-	-	-
1852.5MHz	Pass	25	0	Inf	4.85M	4.492M

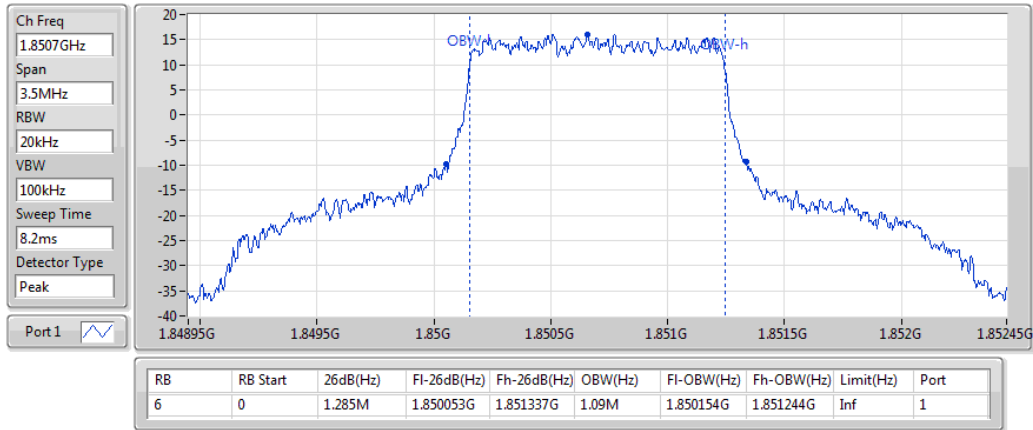
Mode	Result	RB	RB Start	Limit	P1-N dB (Hz)	P1-OBW (Hz)
1880MHz	Pass	25	0	Inf	4.888M	4.48M
1907.5MHz	Pass	25	0	Inf	4.875M	4.486M
Band 2_LTE_5MHz_(16QAM)_1TX	-	-	-	-	-	-
1852.5MHz	Pass	25	0	Inf	4.975M	4.472M
1880MHz	Pass	25	0	Inf	4.913M	4.482M
1907.5MHz	Pass	25	0	Inf	4.85M	4.479M
Band 2_LTE_10MHz_(QPSK)_1TX	-	-	-	-	-	-
1855MHz	Pass	50	0	Inf	9.525M	8.914M
1880MHz	Pass	50	0	Inf	9.525M	8.955M
1905MHz	Pass	50	0	Inf	9.65M	8.905M
Band 2_LTE_10MHz_(16QAM)_1TX	-	-	-	-	-	-
1855MHz	Pass	50	0	Inf	9.525M	8.939M
1880MHz	Pass	50	0	Inf	9.525M	8.914M
1905MHz	Pass	50	0	Inf	9.675M	8.902M
Band 2_LTE_15MHz_(QPSK)_1TX	-	-	-	-	-	-
1857.5MHz	Pass	75	0	Inf	14.325M	13.422M
1880MHz	Pass	75	0	Inf	14.213M	13.39M
1902.5MHz	Pass	75	0	Inf	14.175M	13.366M
Band 2_LTE_15MHz_(16QAM)_1TX	-	-	-	-	-	-
1857.5MHz	Pass	75	0	Inf	14.288M	13.446M
1880MHz	Pass	75	0	Inf	14.475M	13.39M
1902.5MHz	Pass	75	0	Inf	14.4M	13.366M
Band 2_LTE_20MHz_(QPSK)_1TX	-	-	-	-	-	-
1860MHz	Pass	100	0	Inf	19M	17.832M
1880MHz	Pass	100	0	Inf	18.75M	17.821M
1900MHz	Pass	100	0	Inf	18.85M	17.87M
Band 2_LTE_20MHz_(16QAM)_1TX	-	-	-	-	-	-
1860MHz	Pass	100	0	Inf	18.85M	17.824M
1880MHz	Pass	100	0	Inf	18.9M	17.835M
1900MHz	Pass	100	0	Inf	18.85M	17.817M

Port X-N dB = Port X 26dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

Band 2_LTE_1.4MHz_(QPSK)_1TX

EBW

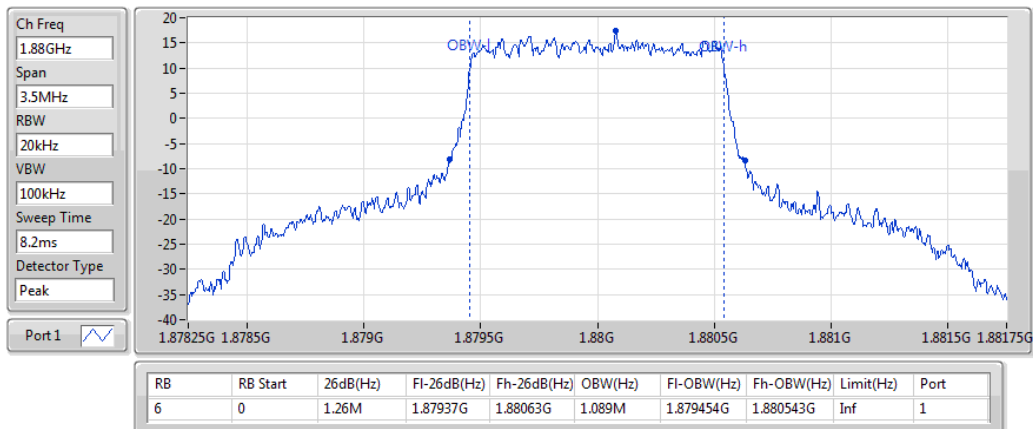
1850.7MHz



Band 2_LTE_1.4MHz_(QPSK)_1TX

EBW

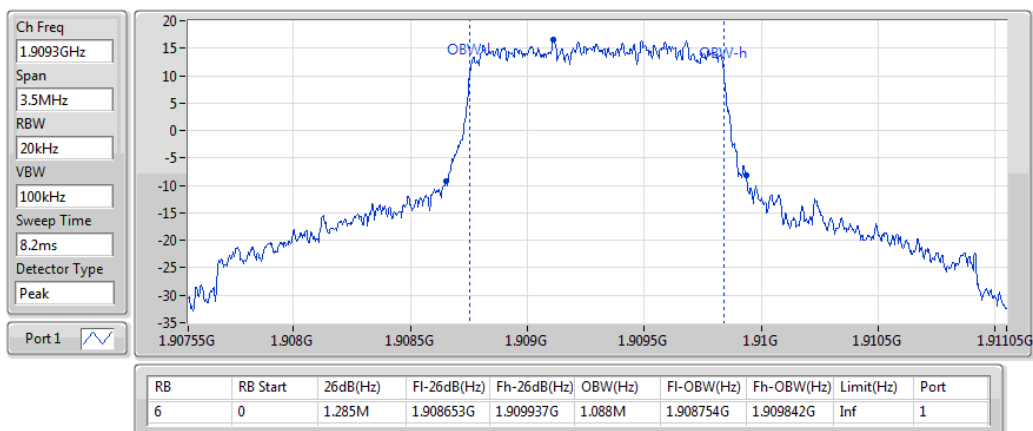
1880MHz



Band 2_LTE_1.4MHz_(QPSK)_1TX

EBW

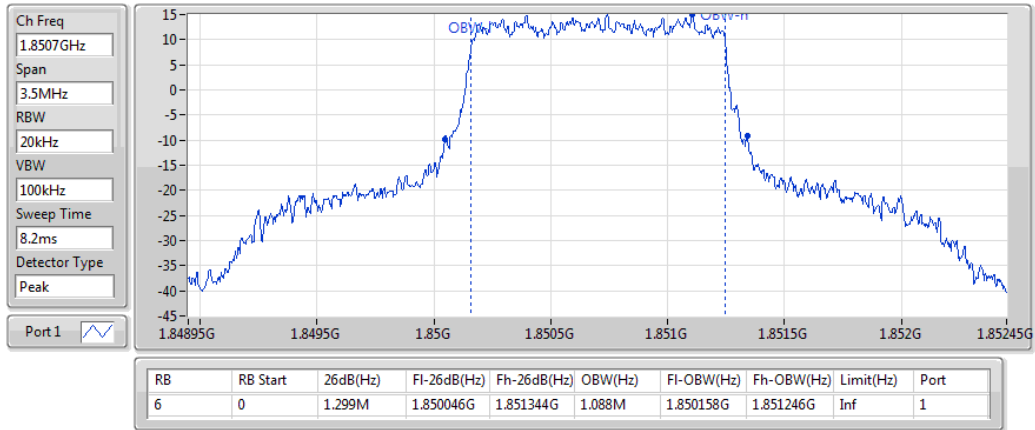
1909.3MHz



Band 2_LTE_1.4MHz_(16QAM)_1TX

EBW

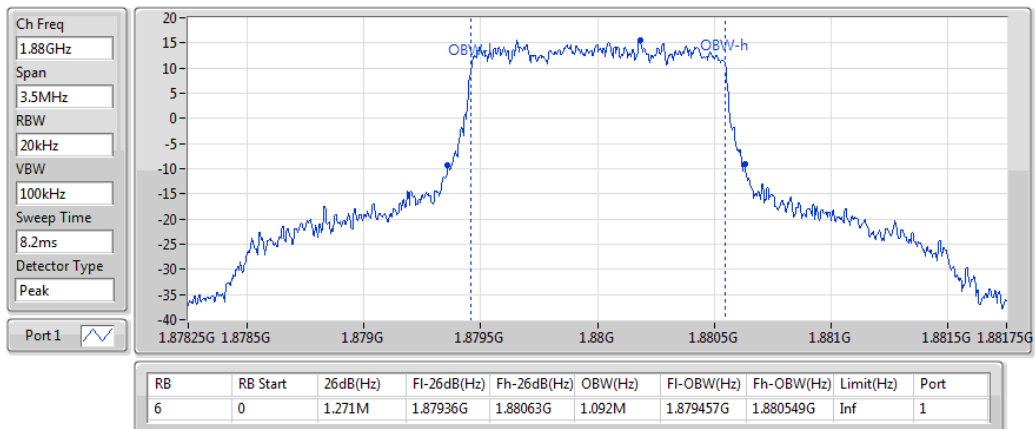
1850.7MHz



Band 2_LTE_1.4MHz_(16QAM)_1TX

EBW

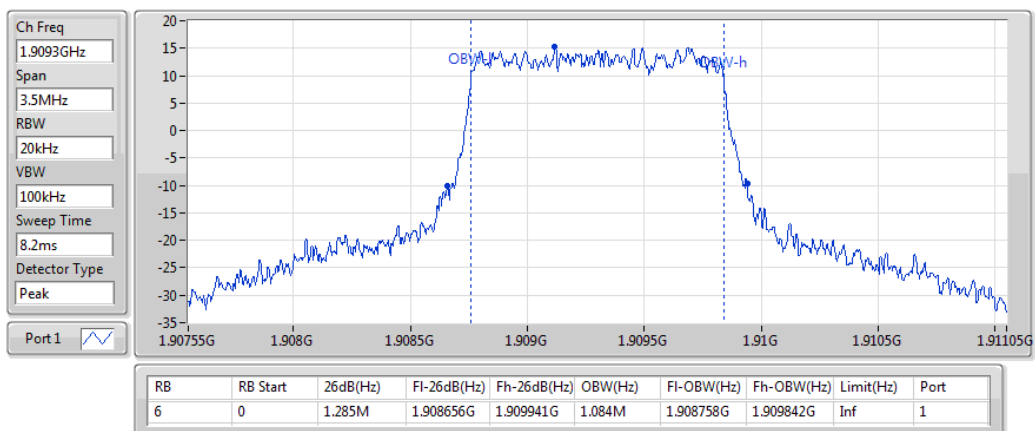
1880MHz



Band 2_LTE_1.4MHz_(16QAM)_1TX

EBW

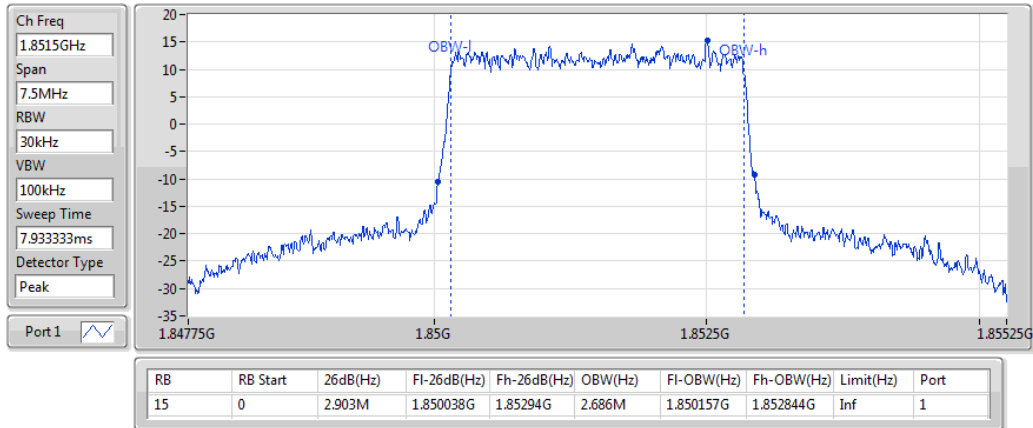
1909.3MHz



Band 2_LTE_3MHz_(QPSK)_1TX

EBW

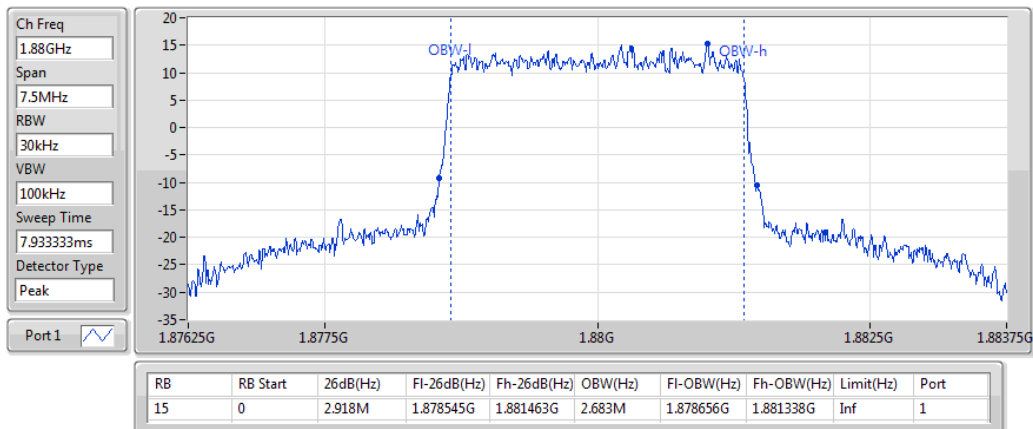
1851.5MHz



Band 2_LTE_3MHz_(QPSK)_1TX

EBW

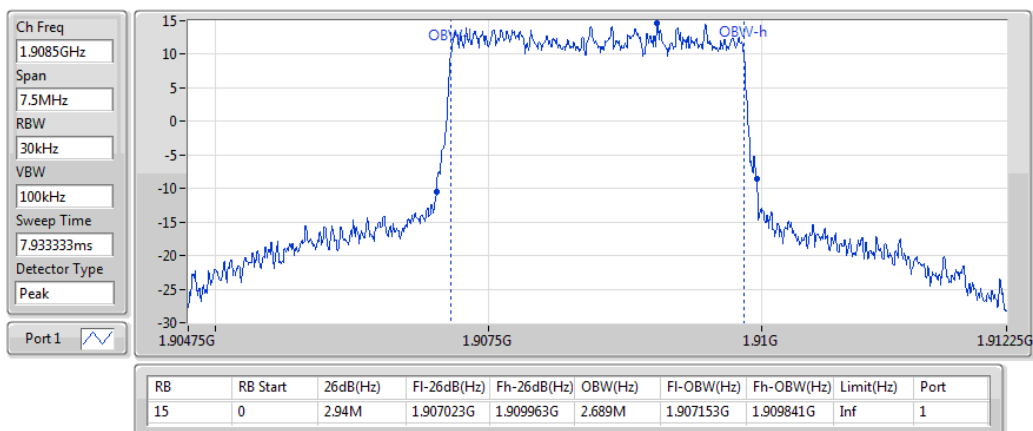
1880MHz



Band 2_LTE_3MHz_(QPSK)_1TX

EBW

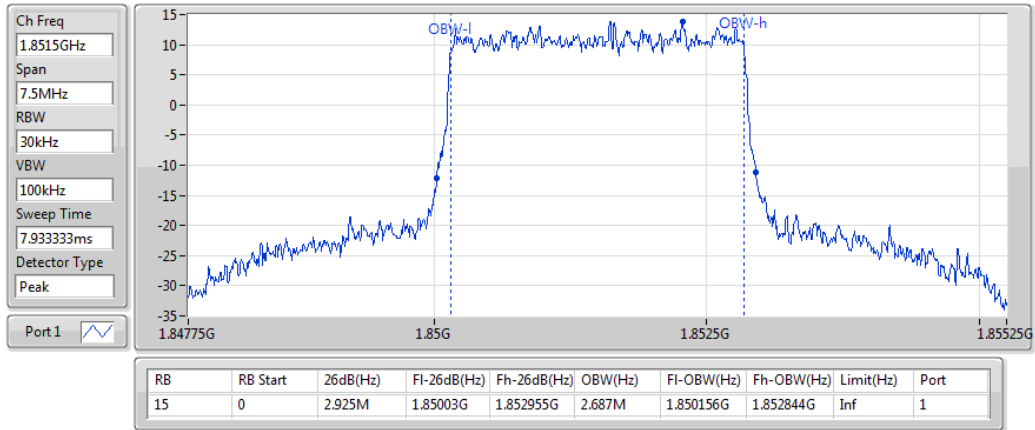
1908.5MHz



Band 2_LTE_3MHz_(16QAM)_1TX

EBW

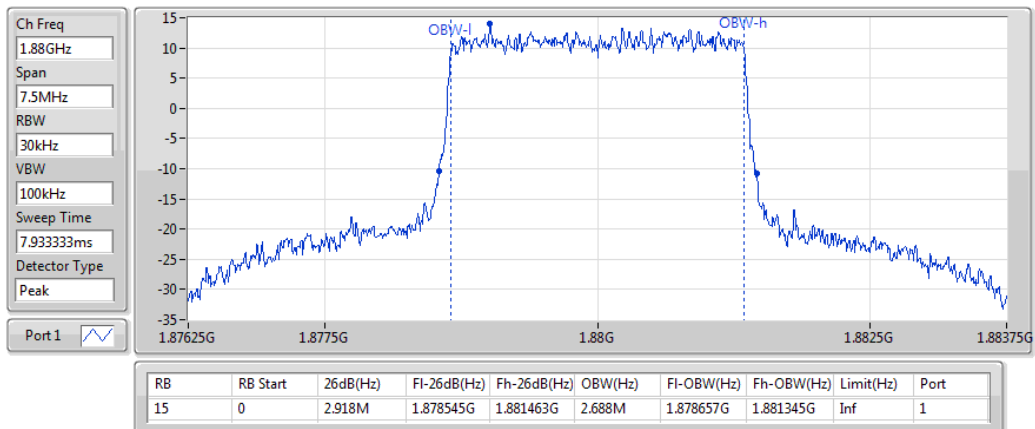
1851.5MHz



Band 2_LTE_3MHz_(16QAM)_1TX

EBW

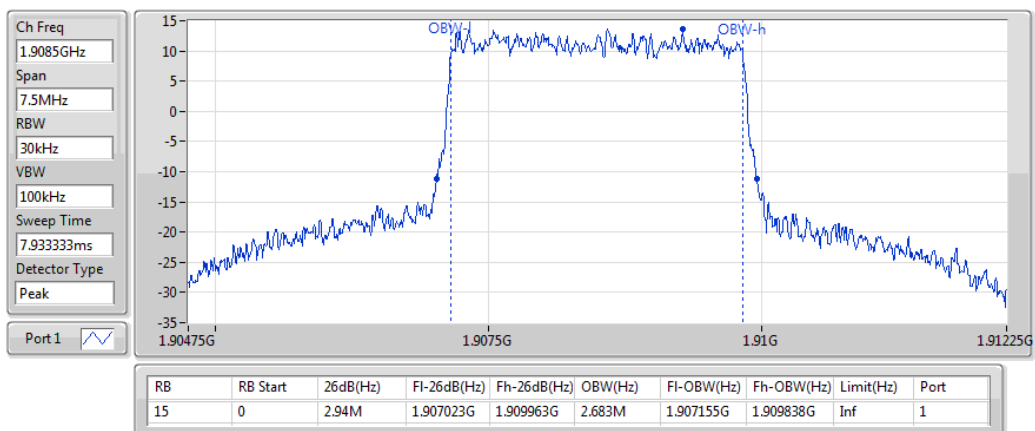
1880MHz



Band 2_LTE_3MHz_(16QAM)_1TX

EBW

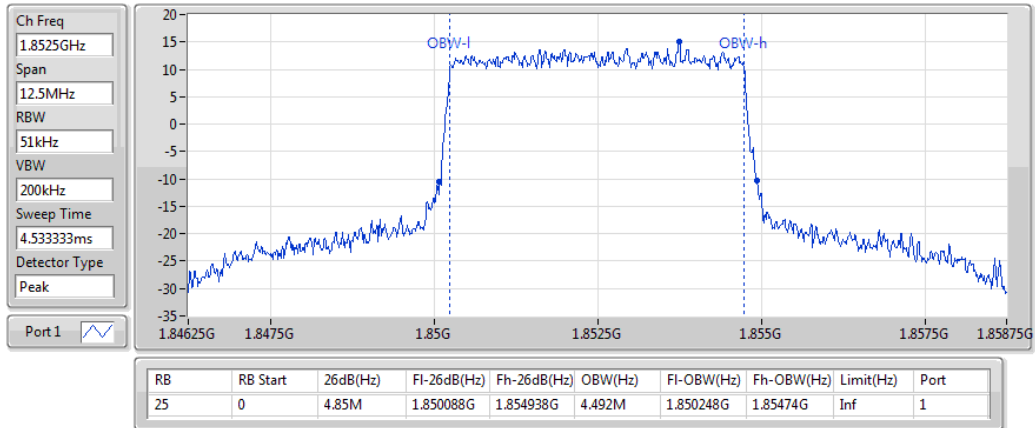
1908.5MHz



Band 2_LTE_5MHz_(QPSK)_1TX

EBW

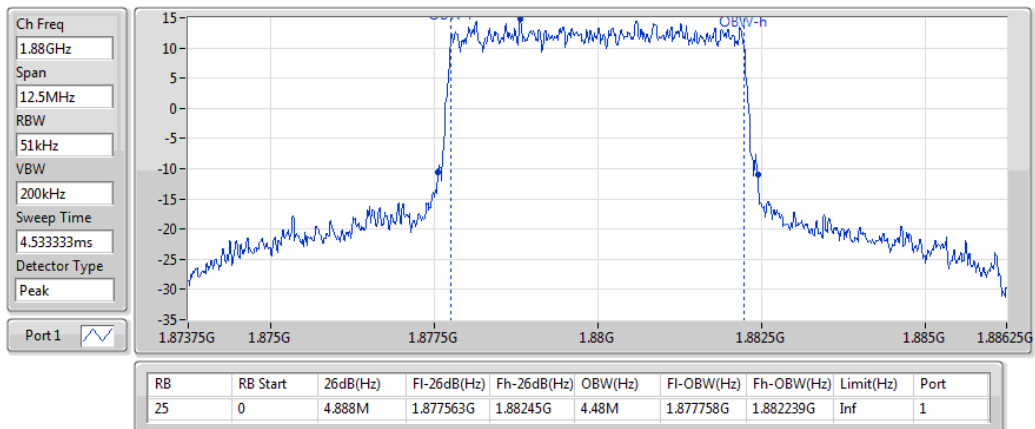
1852.5MHz



Band 2_LTE_5MHz_(QPSK)_1TX

EBW

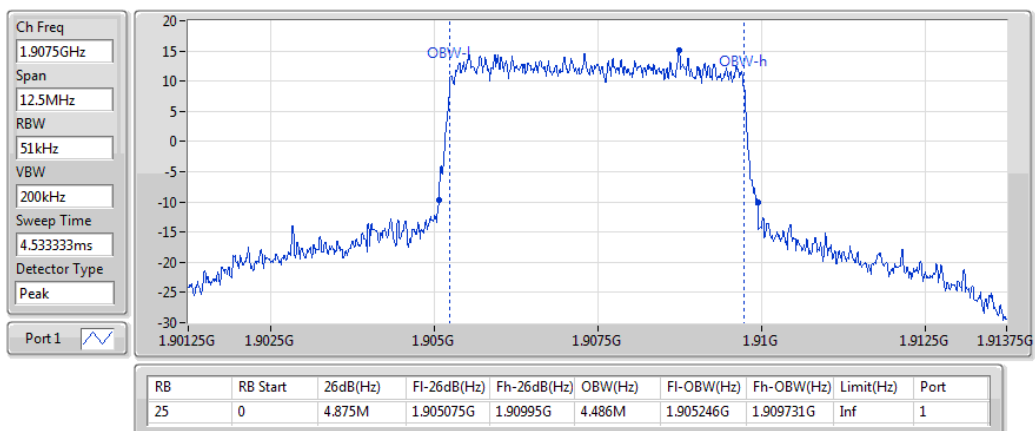
1880MHz



Band 2_LTE_5MHz_(QPSK)_1TX

EBW

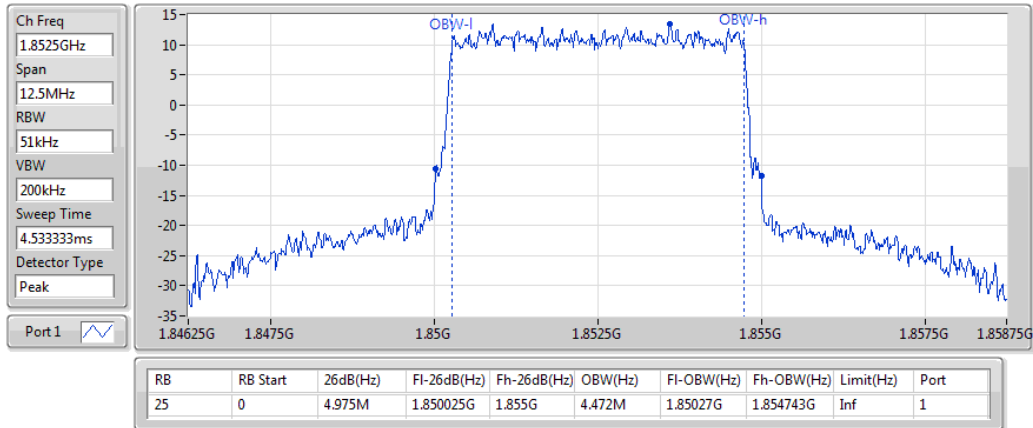
1907.5MHz



Band 2_LTE_5MHz_(16QAM)_1TX

EBW

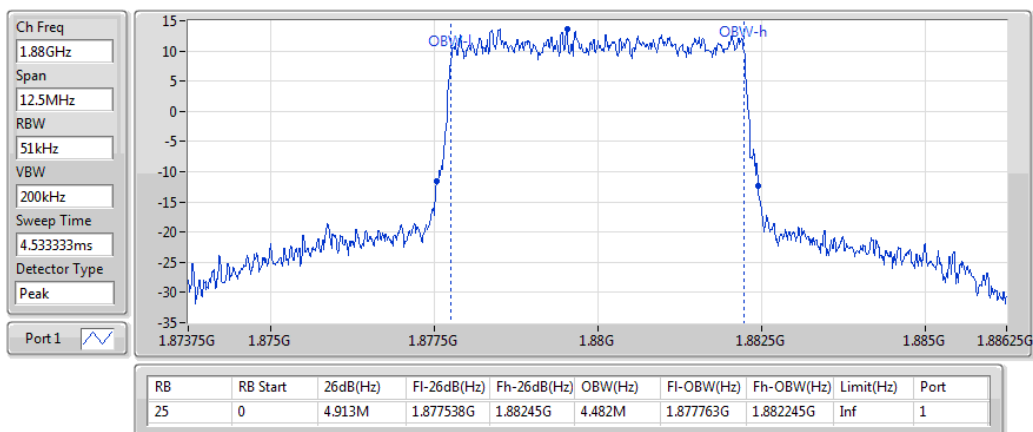
1852.5MHz



Band 2_LTE_5MHz_(16QAM)_1TX

EBW

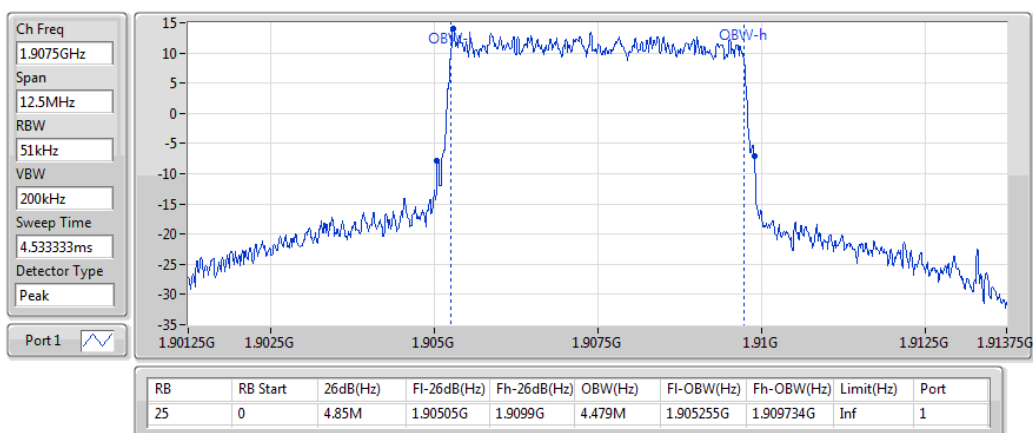
1880MHz



Band 2_LTE_5MHz_(16QAM)_1TX

EBW

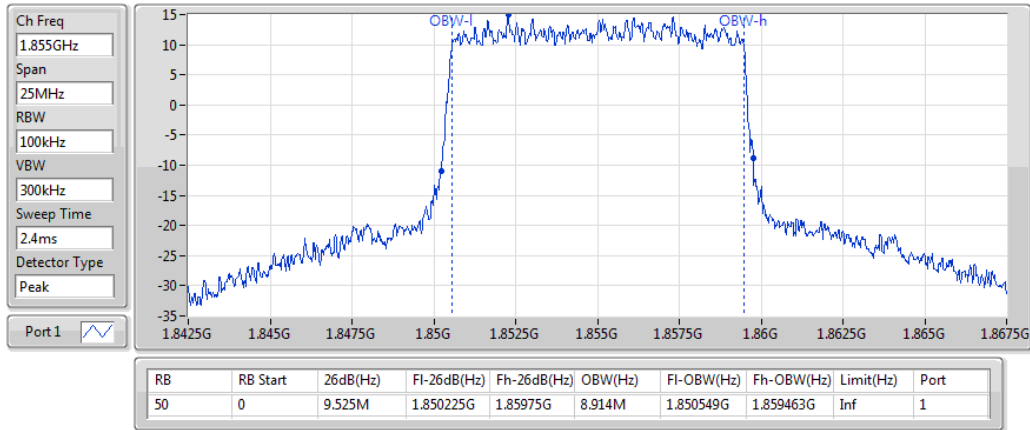
1907.5MHz



Band 2_LTE_10MHz_(QPSK)_1TX

EBW

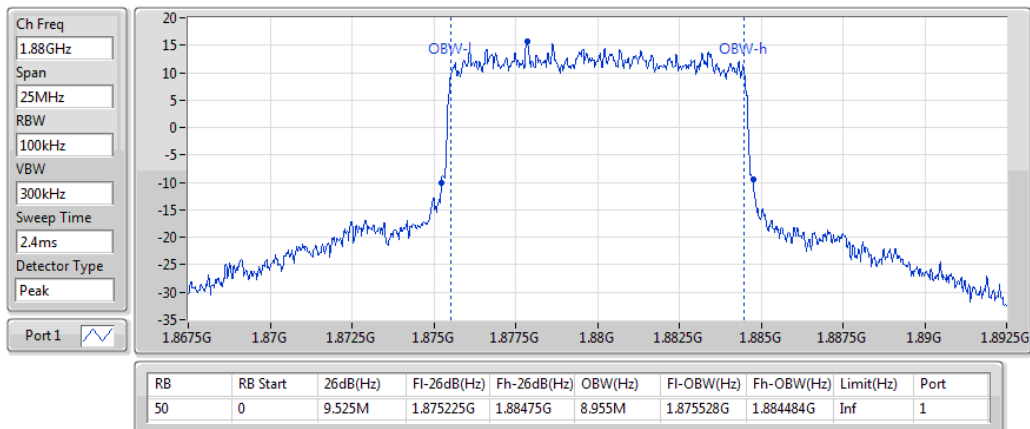
1855MHz



Band 2_LTE_10MHz_(QPSK)_1TX

EBW

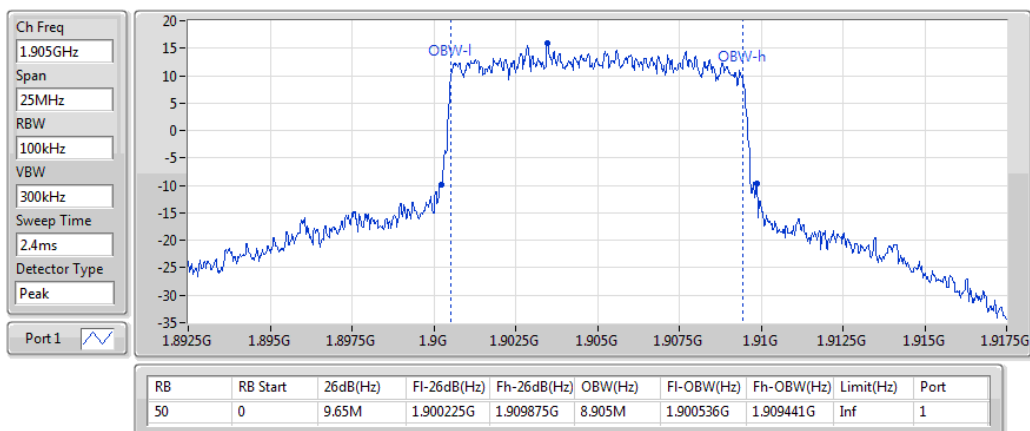
1880MHz



Band 2_LTE_10MHz_(QPSK)_1TX

EBW

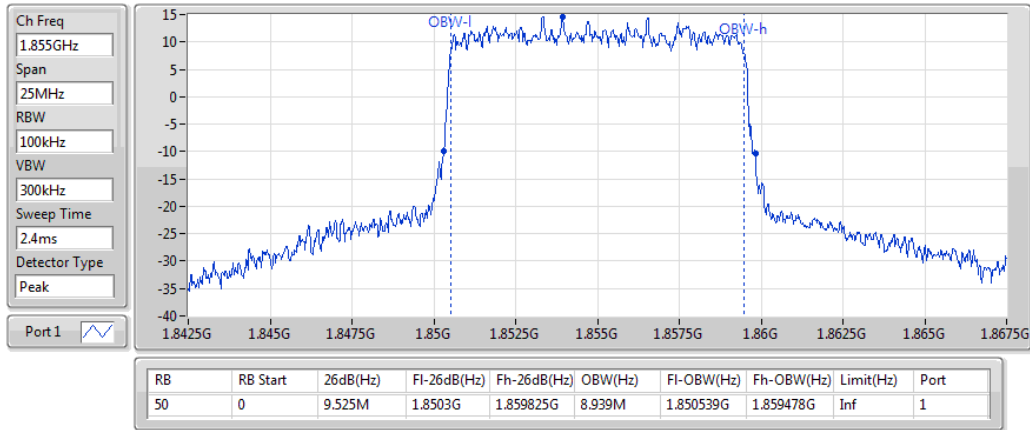
1905MHz



Band 2_LTE_10MHz_(16QAM)_1TX

EBW

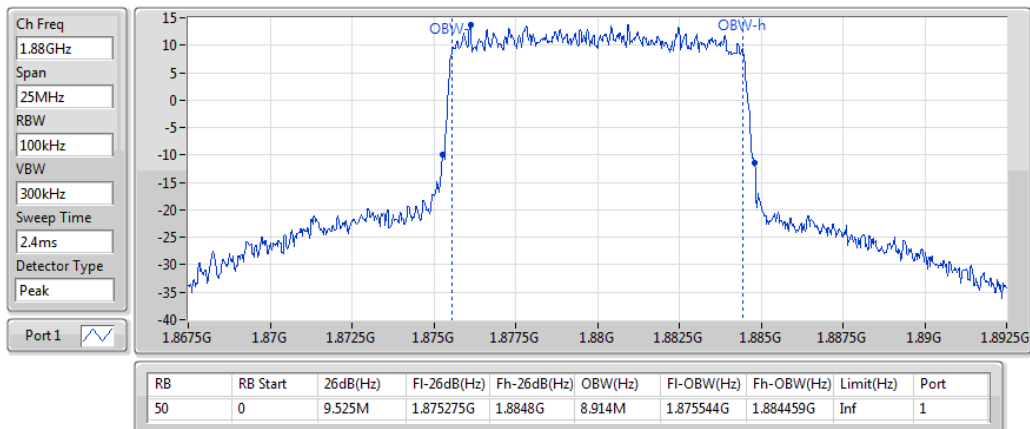
1855MHz



Band 2_LTE_10MHz_(16QAM)_1TX

EBW

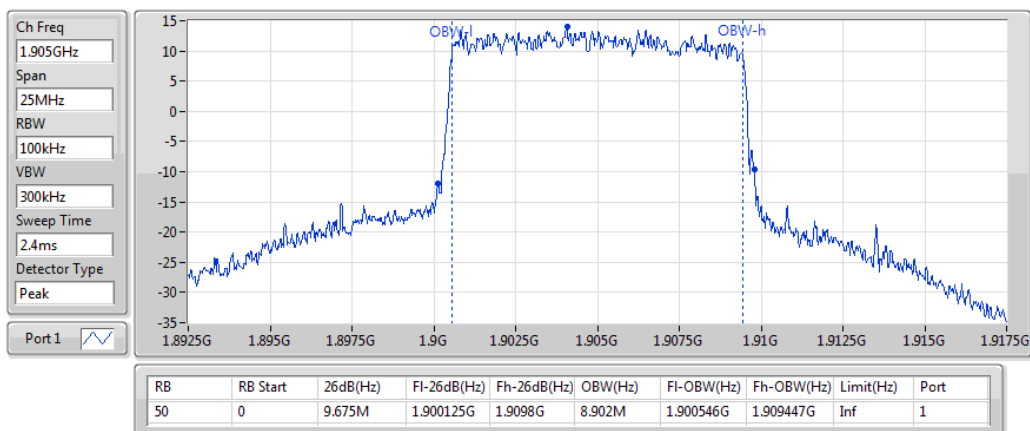
1880MHz



Band 2_LTE_10MHz_(16QAM)_1TX

EBW

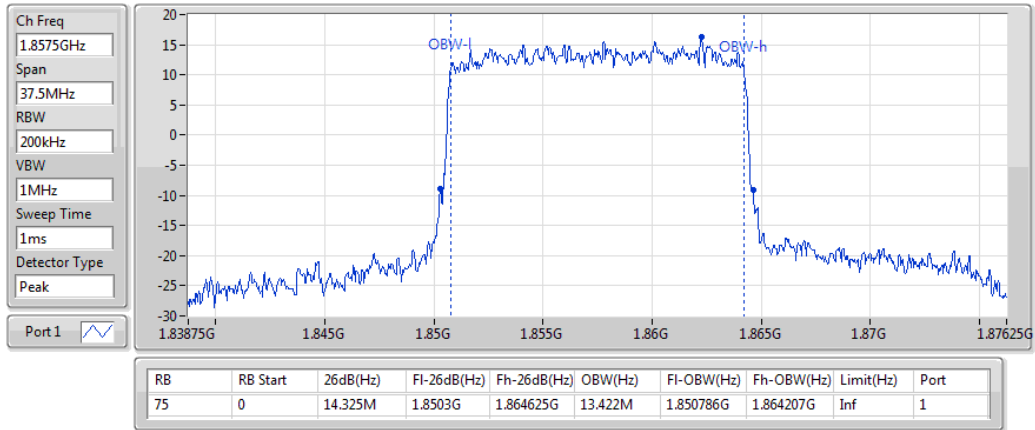
1905MHz



Band 2_LTE_15MHz_(QPSK)_1TX

EBW

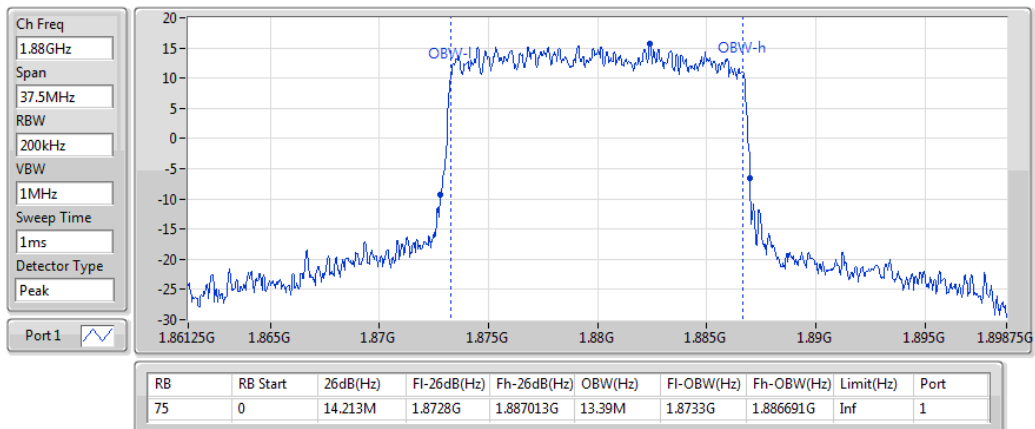
1857.5MHz



Band 2_LTE_15MHz_(QPSK)_1TX

EBW

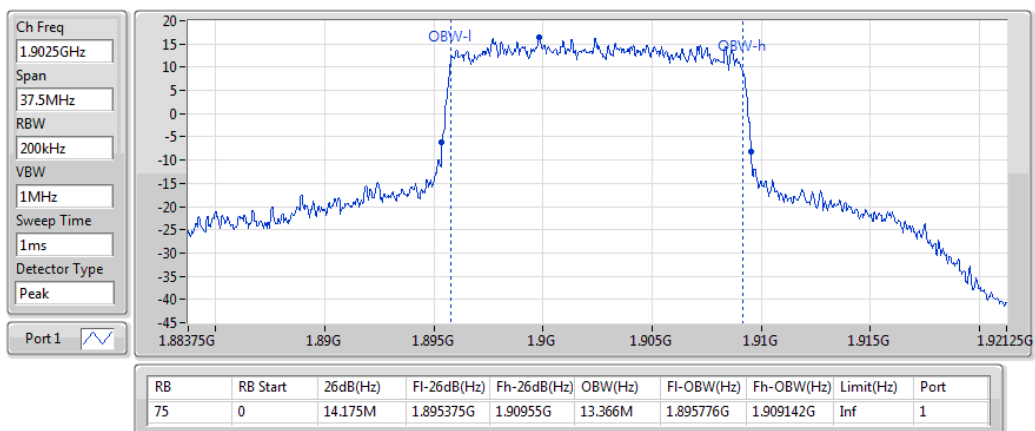
1880MHz



Band 2_LTE_15MHz_(QPSK)_1TX

EBW

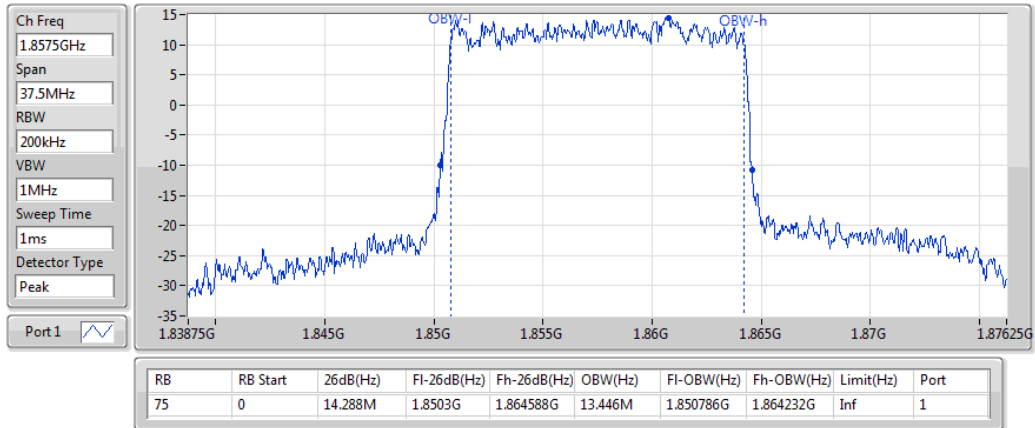
1902.5MHz



Band 2_LTE_15MHz_(16QAM)_1TX

EBW

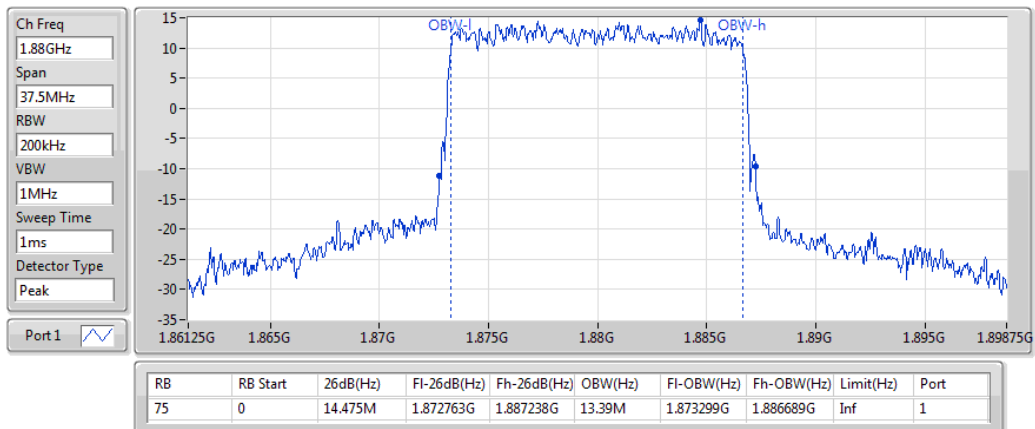
1857.5MHz



Band 2_LTE_15MHz_(16QAM)_1TX

EBW

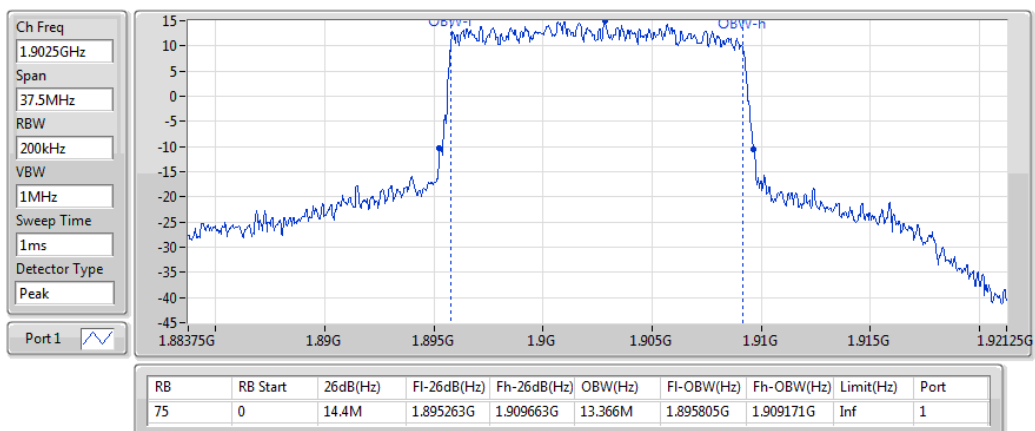
1880MHz



Band 2_LTE_15MHz_(16QAM)_1TX

EBW

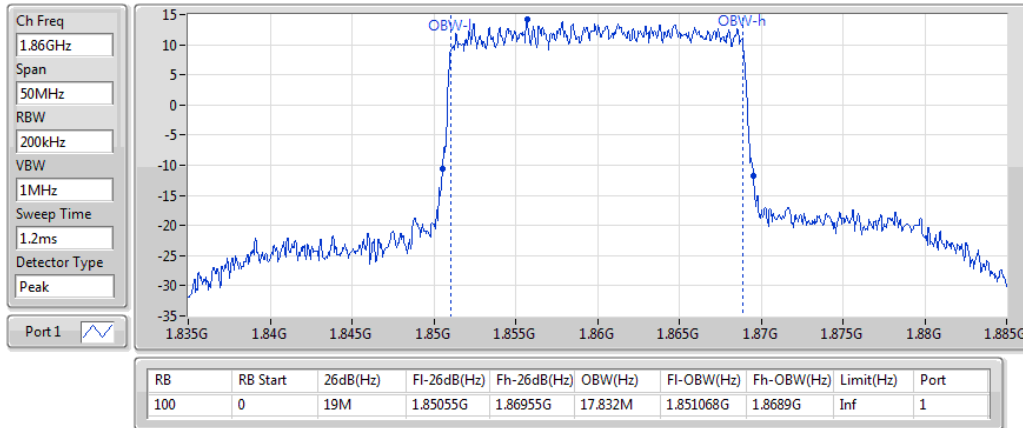
1902.5MHz



Band 2_LTE_20MHz_(QPSK)_1TX

EBW

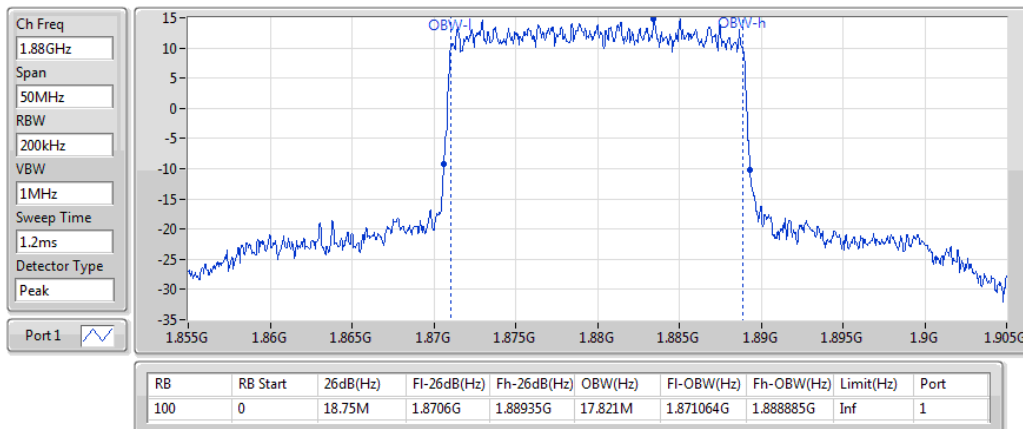
1860MHz



Band 2_LTE_20MHz_(QPSK)_1TX

EBW

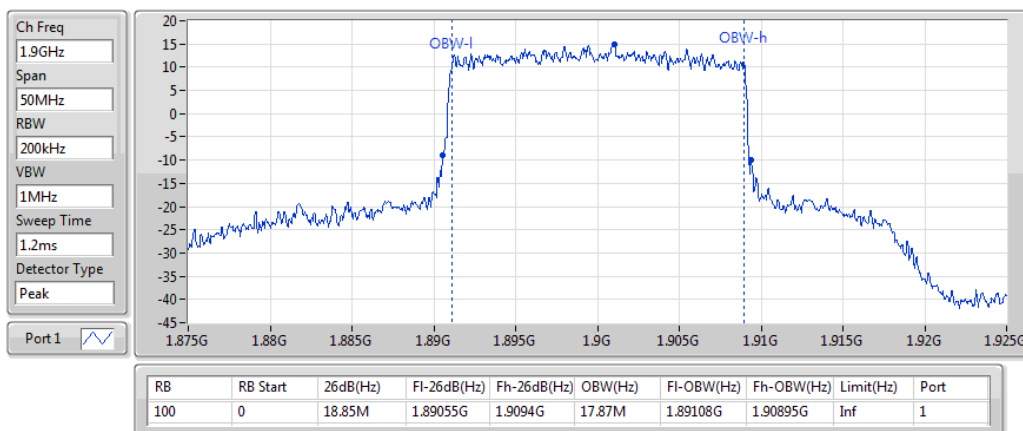
1880MHz



Band 2_LTE_20MHz_(QPSK)_1TX

EBW

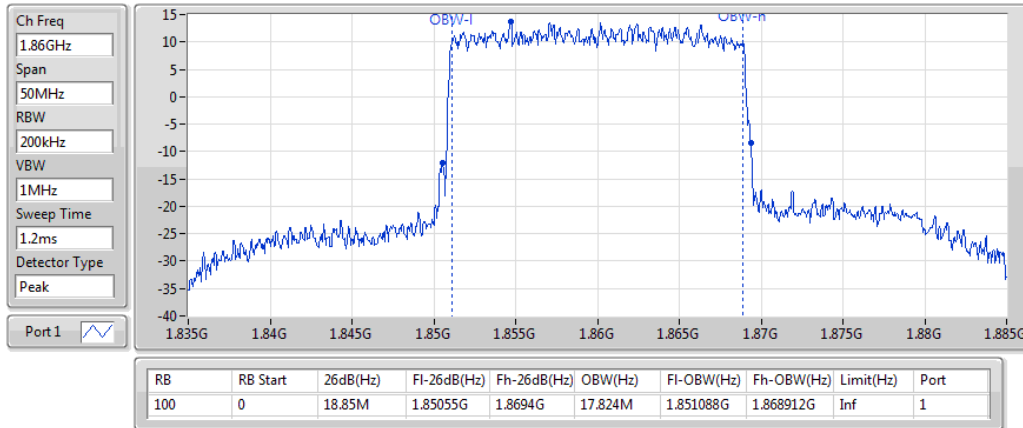
1900MHz



Band 2_LTE_20MHz_(16QAM)_1TX

EBW

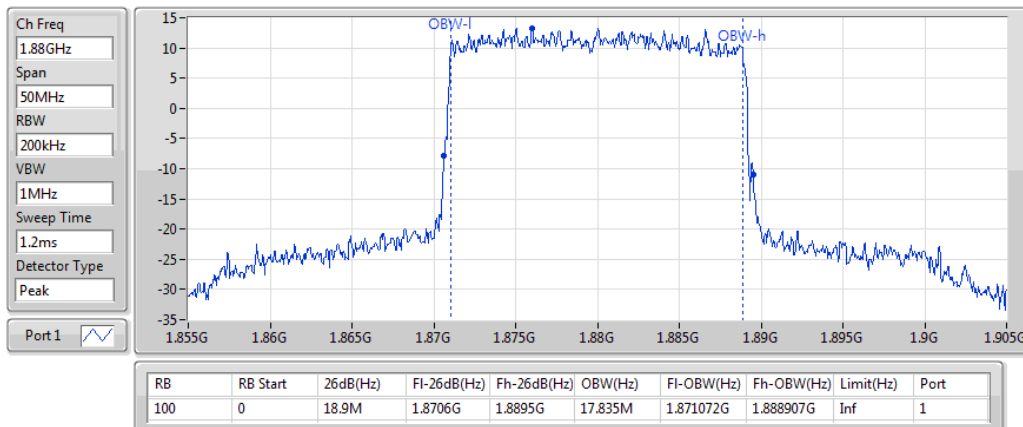
1860MHz



Band 2_LTE_20MHz_(16QAM)_1TX

EBW

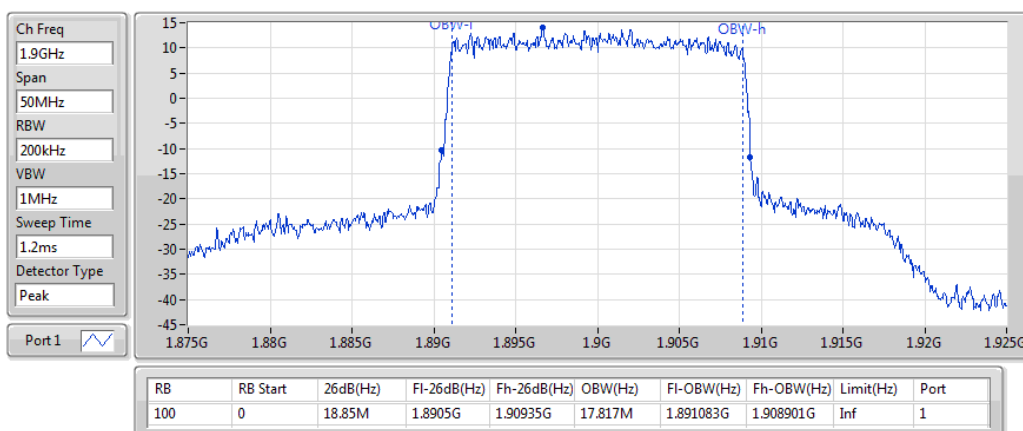
1880MHz



Band 2_LTE_20MHz_(16QAM)_1TX

EBW

1900MHz



3.6 Peak to Average Ratio

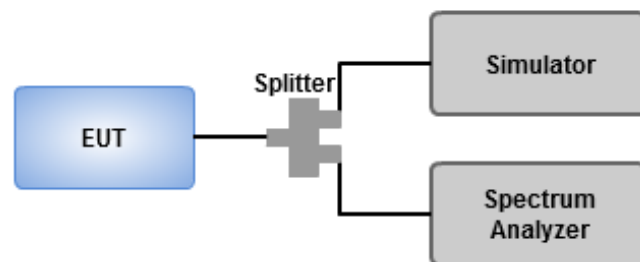
3.6.1 Limit of Peak to Average Ratio

Peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.6.2 Test Procedures

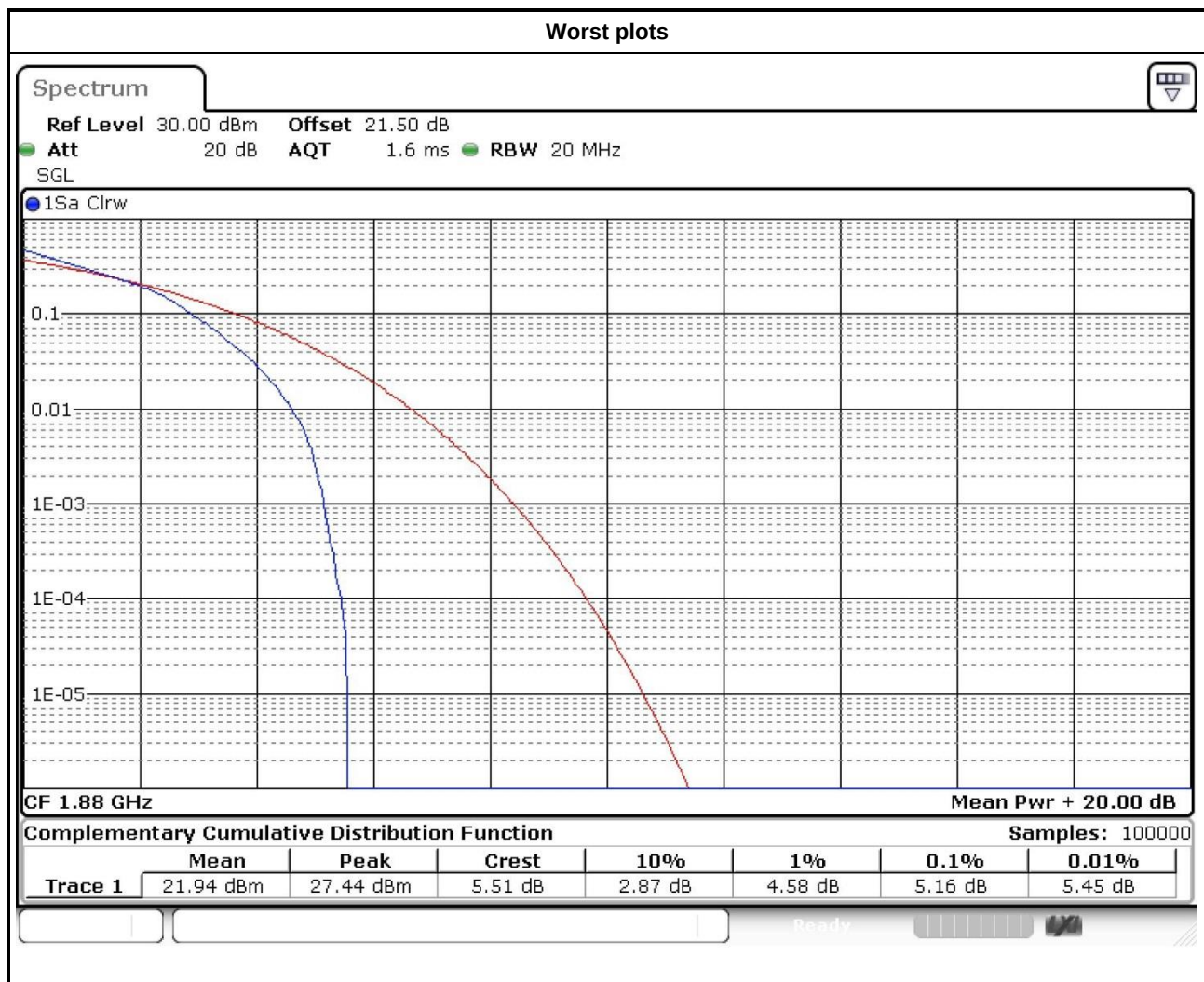
1. Enable CCDF function of spectrum analyzer and set RBW = 10MHz.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.6.3 Test Setup

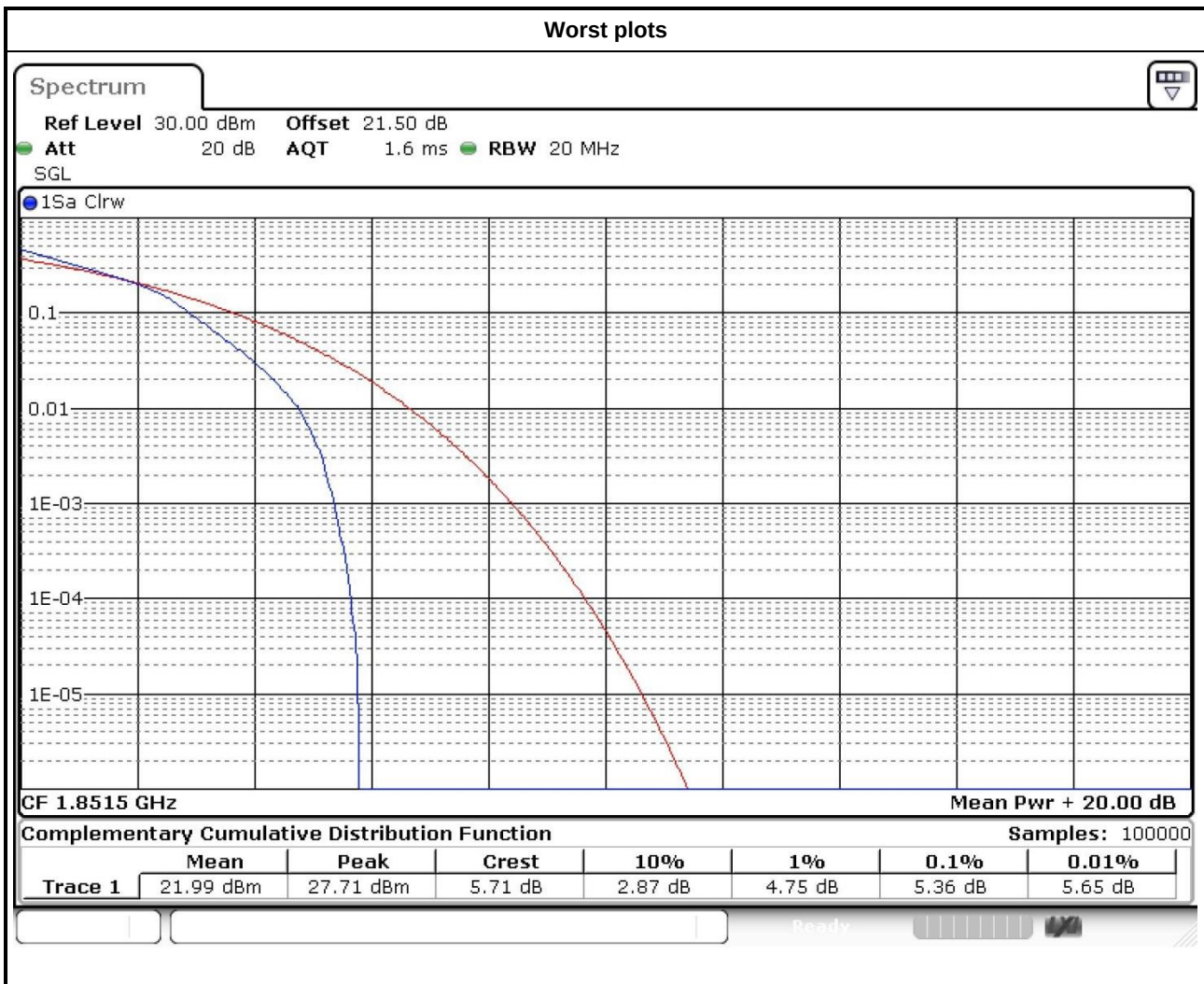


3.6.4 Test Result of Peak to Average ratio

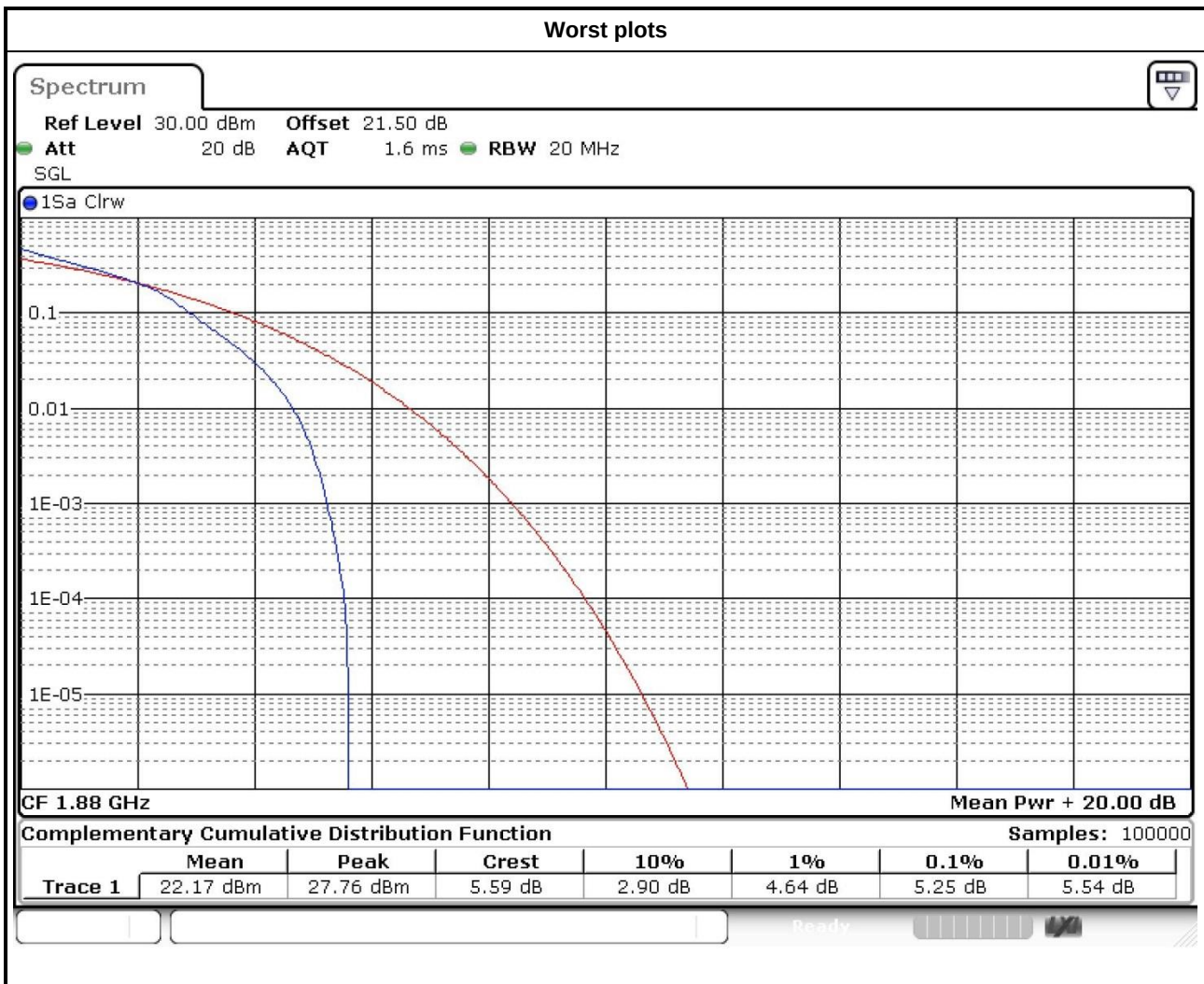
Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	1.4	QPSK	18607	1850.7	4.35
LTE Band 2	1.4	QPSK	18900	1880.0	4.29
LTE Band 2	1.4	QPSK	19193	1909.3	3.97
LTE Band 2	1.4	16QAM	18607	1850.7	5.07
LTE Band 2	1.4	16QAM	18900	1880.0	5.16
LTE Band 2	1.4	16QAM	19193	1909.3	4.75



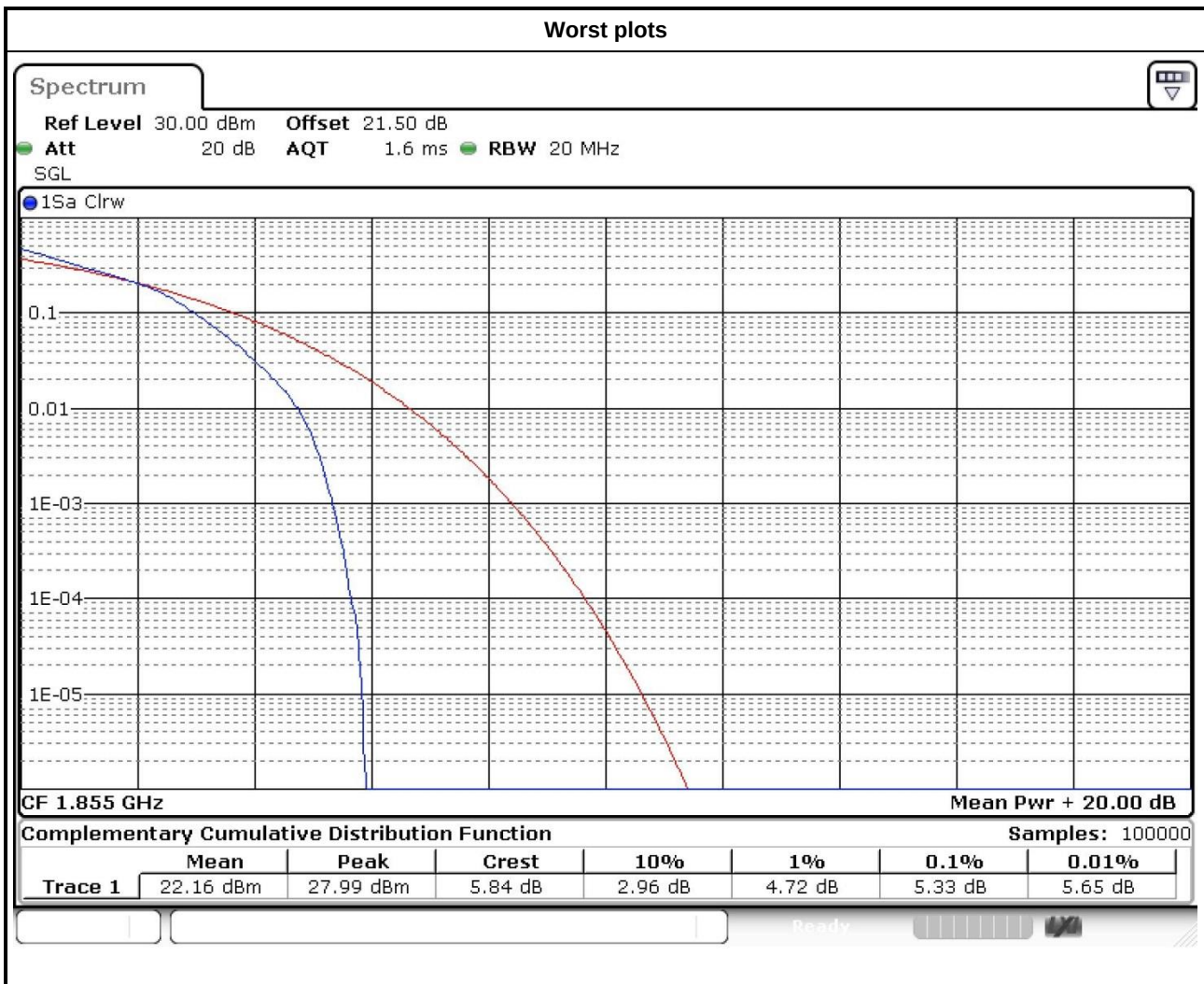
Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	3	QPSK	18615	1851.5	4.41
LTE Band 2	3	QPSK	18900	1880.0	4.38
LTE Band 2	3	QPSK	19185	1908.5	3.68
LTE Band 2	3	16QAM	18615	1851.5	5.36
LTE Band 2	3	16QAM	18900	1880.0	5.25
LTE Band 2	3	16QAM	19185	1908.5	4.55



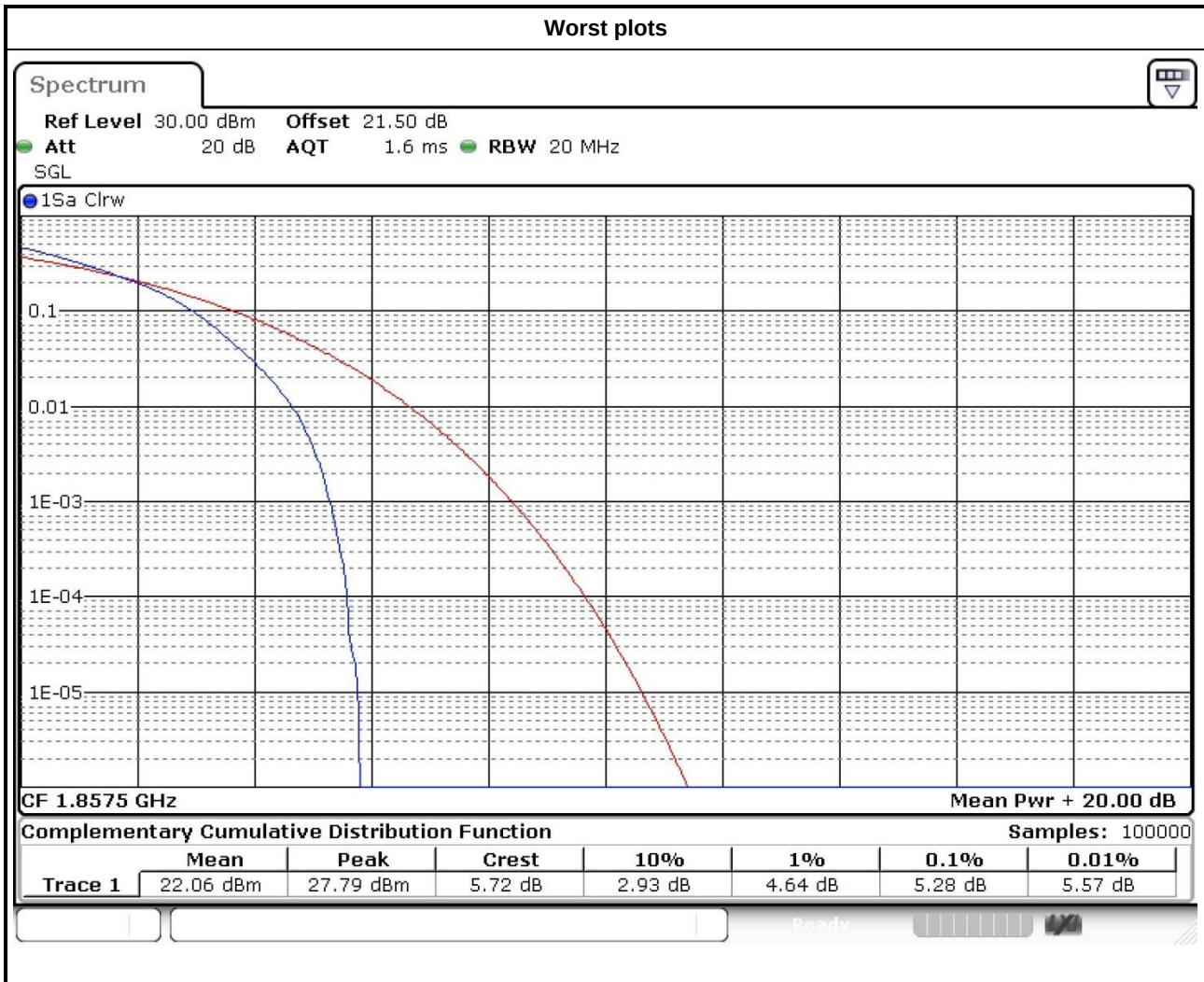
Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	5	QPSK	18625	1852.5	4.32
LTE Band 2	5	QPSK	18900	1880.0	4.38
LTE Band 2	5	QPSK	19175	1907.5	3.68
LTE Band 2	5	16QAM	18625	1852.5	5.13
LTE Band 2	5	16QAM	18900	1880.0	5.25
LTE Band 2	5	16QAM	19175	1907.5	4.52



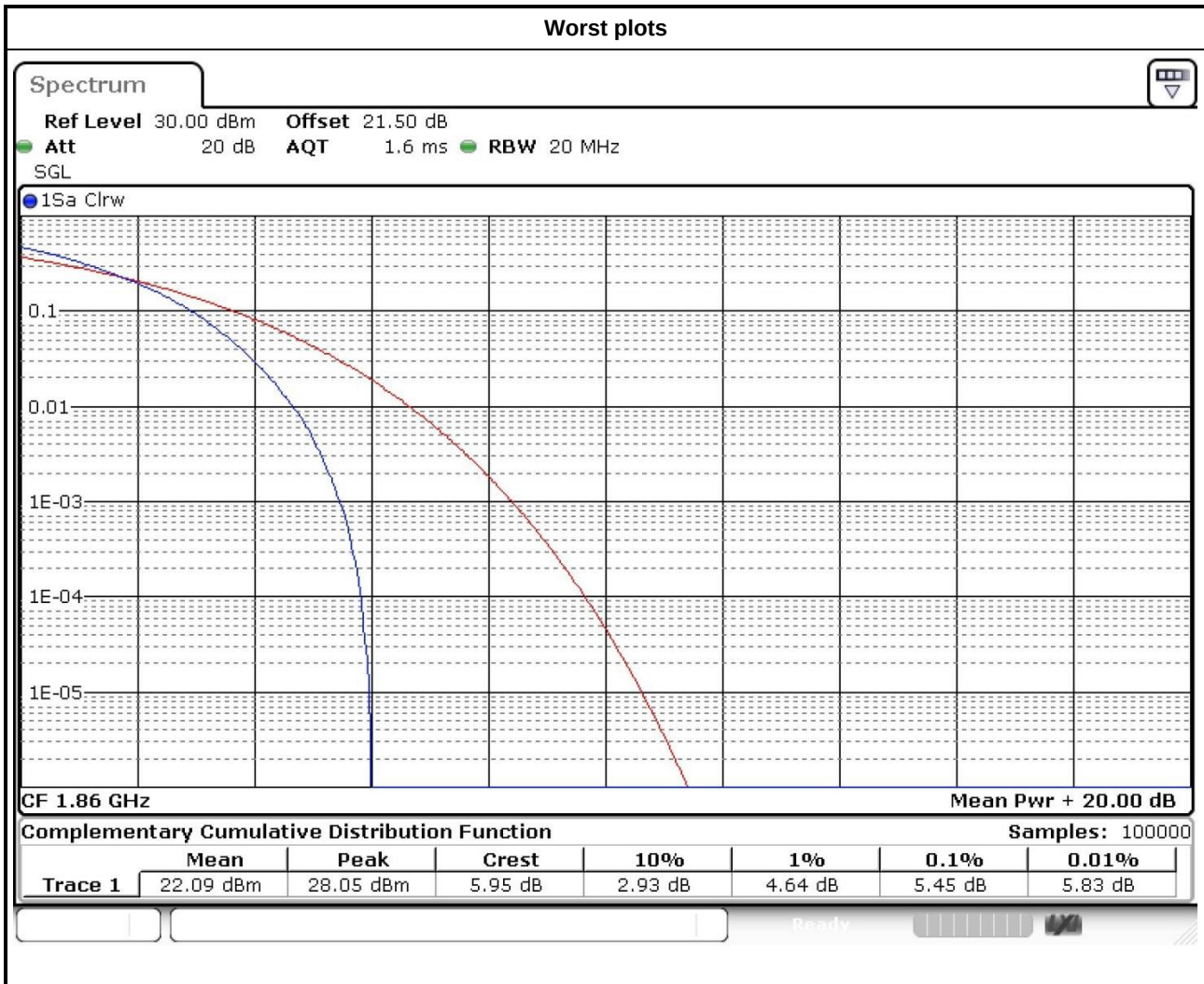
Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	10	QPSK	18650	1855.0	4.43
LTE Band 2	10	QPSK	18900	1880.0	4.38
LTE Band 2	10	QPSK	19150	1905.0	3.91
LTE Band 2	10	16QAM	18650	1855.0	5.33
LTE Band 2	10	16QAM	18900	1880.0	5.19
LTE Band 2	10	16QAM	19150	1905.0	4.75



Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	15	QPSK	18675	1857.5	4.41
LTE Band 2	15	QPSK	18900	1880.0	4.35
LTE Band 2	15	QPSK	19125	1902.5	4.09
LTE Band 2	15	16QAM	18675	1857.5	5.28
LTE Band 2	15	16QAM	18900	1880.0	5.25
LTE Band 2	15	16QAM	19125	1902.5	4.99



Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	20	QPSK	18700	1860.0	4.38
LTE Band 2	20	QPSK	18900	1880.0	4.35
LTE Band 2	20	QPSK	19100	1900.0	4.29
LTE Band 2	20	16QAM	18700	1860.0	5.45
LTE Band 2	20	16QAM	18900	1880.0	5.39
LTE Band 2	20	16QAM	19100	1900.0	5.33



3.7 Frequency Stability

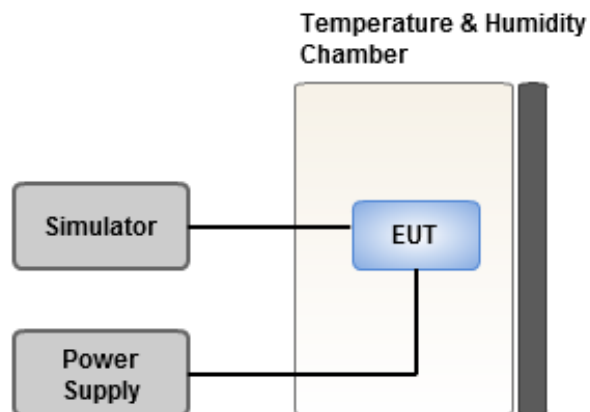
3.7.1 Limit of Frequency Stability

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.7.2 Test Procedures

1. EUT was placed at temperature chamber and connected to an external power supply.
2. Temperature and voltage condition shall be tested to confirm frequency stability.
3. The test shall be performed under normal and extreme condition for temperature and voltage.
4. Tem Link up EUT and simulator. Confirm frequency drift value of simulator and record it.

3.7.3 Test Setup



3.7.4 Test Result of Frequency Stability

LTE Band 2, CB: 1.4MHz			
Temperature (°C)	Voltage (ac)	Frequency Drift (ppm)	Limit (ppm)
T20°C Vmax	120	0.022	2.5
T20°C Vmin	120	0.023	2.5
T50°C Vnom	120	0.019	2.5
T40°C Vnom	120	0.018	2.5
T30°C Vnom	120	0.02	2.5
T20°C Vnom	120	0.021	2.5
T10°C Vnom	120	0.022	2.5
T0°C Vnom	120	0.023	2.5
T-10°C Vnom	120	0.021	2.5
T-20°C Vnom	120	0.024	2.5
T-30°C Vnom	120	0.022	2.5
Vnom [Vac]: 120		Vmax [Vac]: 138	Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50	Tmin [°C]: -30

LTE Band 2, CB: 3MHz			
Temperature (°C)	Voltage (ac)	Frequency Drift (ppm)	Limit (ppm)
T20°C Vmax	120	0.019	2.5
T20°C Vmin	120	0.016	2.5
T50°C Vnom	120	0.021	2.5
T40°C Vnom	120	0.019	2.5
T30°C Vnom	120	0.018	2.5
T20°C Vnom	120	0.018	2.5
T10°C Vnom	120	0.017	2.5
T0°C Vnom	120	0.016	2.5
T-10°C Vnom	120	0.018	2.5
T-20°C Vnom	120	0.02	2.5
T-30°C Vnom	120	0.019	2.5
Vnom [Vac]: 120		Vmax [Vac]: 138	Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50	Tmin [°C]: -30

LTE Band 2, CB: 5MHz			
Temperature (°C)	Voltage (ac)	Frequency Drift (ppm)	Limit (ppm)
T20°C Vmax	120	0.024	2.5
T20°C Vmin	120	0.023	2.5
T50°C Vnom	120	0.022	2.5
T40°C Vnom	120	0.018	2.5
T30°C Vnom	120	0.019	2.5
T20°C Vnom	120	0.02	2.5
T10°C Vnom	120	0.021	2.5
T0°C Vnom	120	0.022	2.5
T-10°C Vnom	120	0.022	2.5
T-20°C Vnom	120	0.023	2.5
T-30°C Vnom	120	0.021	2.5
Vnom [Vac]: 120		Vmax [Vac]: 138	Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50	Tmin [°C]: -30

LTE Band 2, CB: 10MHz			
Temperature (°C)	Voltage (ac)	Frequency Drift (ppm)	Limit (ppm)
T20°C Vmax	120	0.024	2.5
T20°C Vmin	120	0.023	2.5
T50°C Vnom	120	0.023	2.5
T40°C Vnom	120	0.021	2.5
T30°C Vnom	120	0.019	2.5
T20°C Vnom	120	0.018	2.5
T10°C Vnom	120	0.021	2.5
T0°C Vnom	120	0.022	2.5
T-10°C Vnom	120	0.023	2.5
T-20°C Vnom	120	0.021	2.5
T-30°C Vnom	120	0.019	2.5
Vnom [Vac]: 120		Vmax [Vac]: 138	Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50	Tmin [°C]: -30

LTE Band 2, CB: 15MHz			
Temperature (°C)	Voltage (ac)	Frequency Drift (ppm)	Limit (ppm)
T20°C Vmax	120	0.018	2.5
T20°C Vmin	120	0.016	2.5
T50°C Vnom	120	0.015	2.5
T40°C Vnom	120	0.016	2.5
T30°C Vnom	120	0.018	2.5
T20°C Vnom	120	0.019	2.5
T10°C Vnom	120	0.02	2.5
T0°C Vnom	120	0.021	2.5
T-10°C Vnom	120	0.019	2.5
T-20°C Vnom	120	0.022	2.5
T-30°C Vnom	120	0.024	2.5
Vnom [Vac]: 120		Vmax [Vac]: 138	Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50	Tmin [°C]: -30

LTE Band 2, CB: 20MHz			
Temperature (°C)	Voltage (ac)	Frequency Drift (ppm)	Limit (ppm)
T20°C Vmax	120	0.023	2.5
T20°C Vmin	120	0.024	2.5
T50°C Vnom	120	0.022	2.5
T40°C Vnom	120	0.021	2.5
T30°C Vnom	120	0.022	2.5
T20°C Vnom	120	0.019	2.5
T10°C Vnom	120	0.019	2.5
T0°C Vnom	120	0.021	2.5
T-10°C Vnom	120	0.022	2.5
T-20°C Vnom	120	0.023	2.5
T-30°C Vnom	120	0.021	2.5
Vnom [Vac]: 120		Vmax [Vac]: 138	Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50	Tmin [°C]: -30

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin
Kou District, New Taipei City,
Taiwan, R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St.,
Kwei Shan District, Tao Yuan City
333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd
St., Kwei Shan District, Tao Yuan
City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==