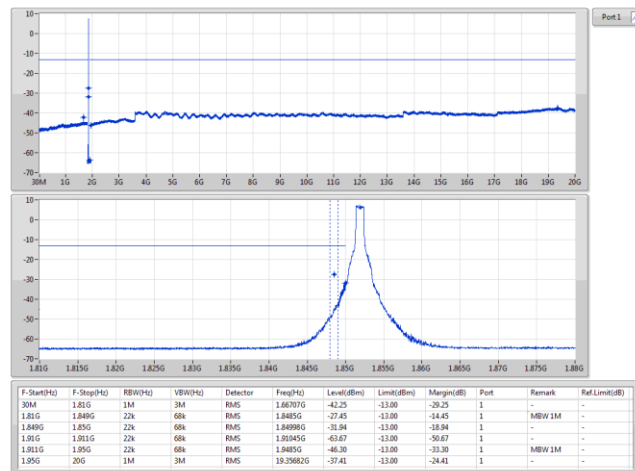


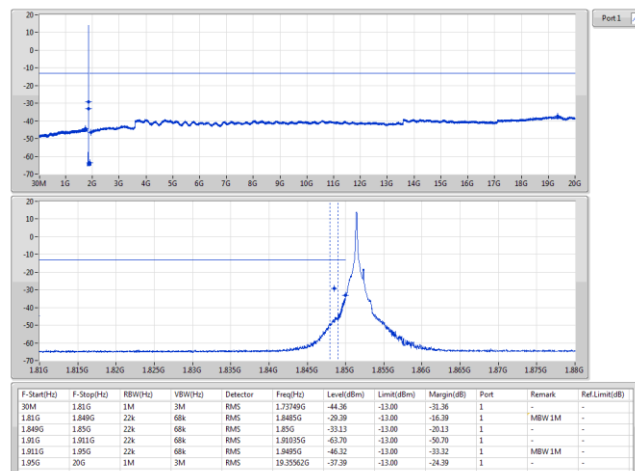
Band 2 LTE-M1_20MHz_Nss1_1TX
1860MHz_16QAM_RB 6,#RB 0,NB 0

CSE-TX



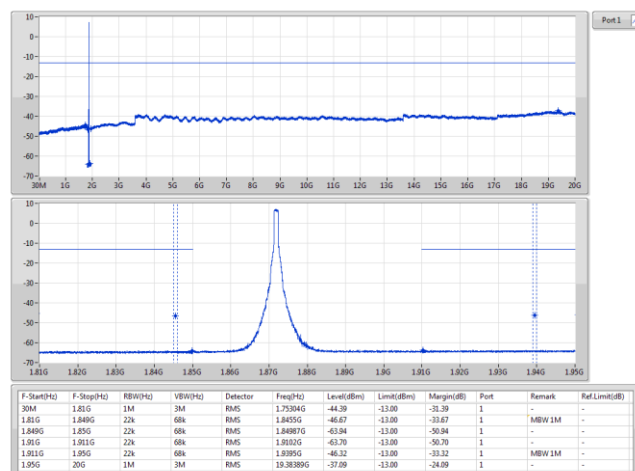
Band 2 LTE-M1_20MHz_Nss1_1TX
1860MHz_16QAM_RB 1,#RB 0,NB 0

CSE-TX



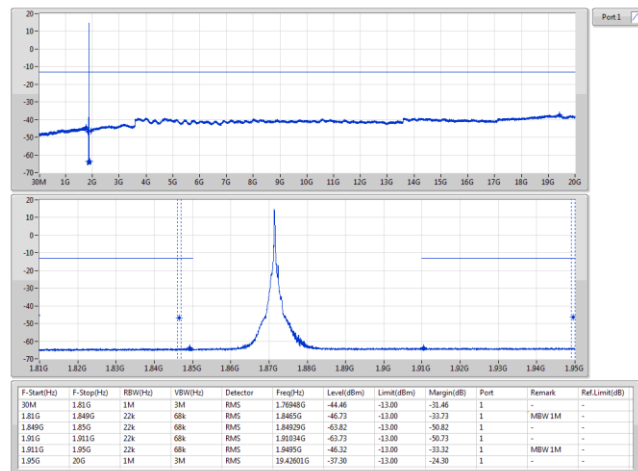
Band 2 LTE-M1_20MHz_Nss1_1TX
1880MHz_16QAM_RB 6,#RB 0,NB 0

CSE-TX



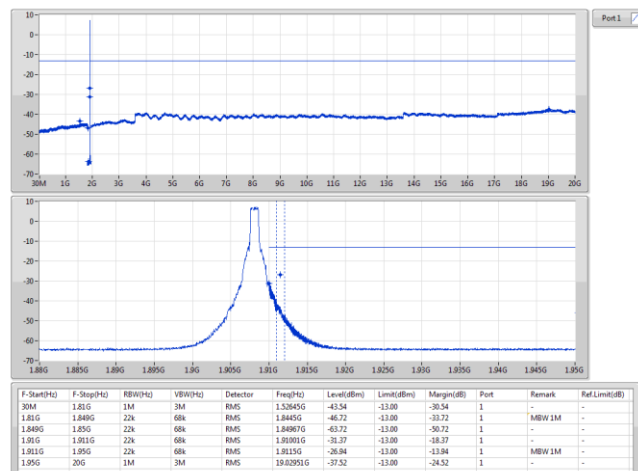
Band 2 LTE-M1_20MHz_Nss1_1TX
1880MHz_16QAM_RB 1,#RB 0,NB 0

CSE-TX



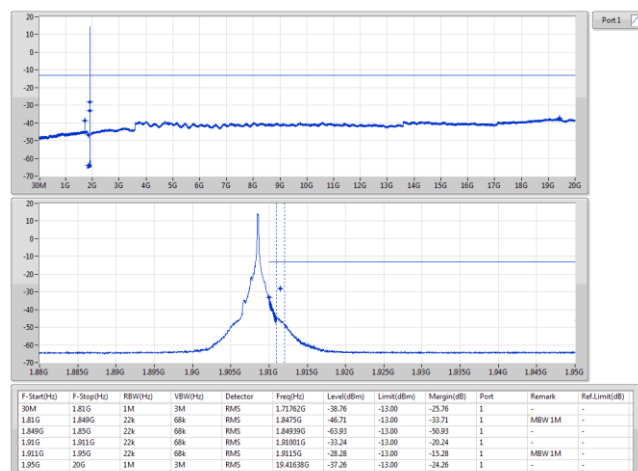
Band 2 LTE-M1_20MHz_Nss1_1TX
1900MHz_16QAM_RB 6,#RB 0,NB 15

CSE-TX



Band 2 LTE-M1_20MHz_Nss1_1TX
1900MHz_16QAM_RB 1,#RB 5,NB 15

CSE-TX

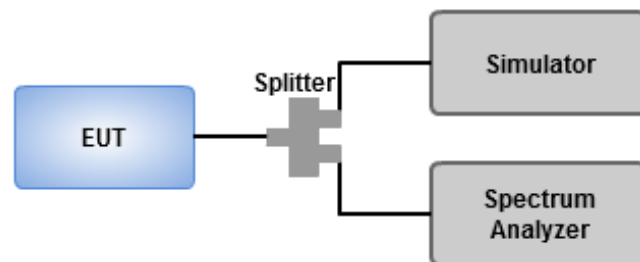


3.4 Occupied and 26 dB Bandwidth

3.4.1 Test Procedures

1. Set RBW = 22 kHz, VBW = 68 kHz
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.

3.4.2 Test Setup



3.4.3 Test Result of Occupied Bandwidth

Summary

Mode	Max-OBW (Hz)	ITU-Code	Min-OBW (Hz)
Band 2_LTE-M1_1.4MHz_Nss1_1TX_RB 6	1.117M	1M12-	1.09M
Band 2_LTE-M1_3MHz_Nss1_1TX_RB 6	1.197M	1M20	1.095M
Band 2_LTE-M1_5MHz_Nss1_1TX_RB 6	1.217M	1M22	1.087M
Band 2_LTE-M1_10MHz_Nss1_1TX_RB 6	1.232M	1M23	1.111M
Band 2_LTE-M1_15MHz_Nss1_1TX_RB 6	1.298M	1M30	1.109M
Band 2_LTE-M1_20MHz_Nss1_1TX_RB 6	1.252M	1M25	1.148M

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

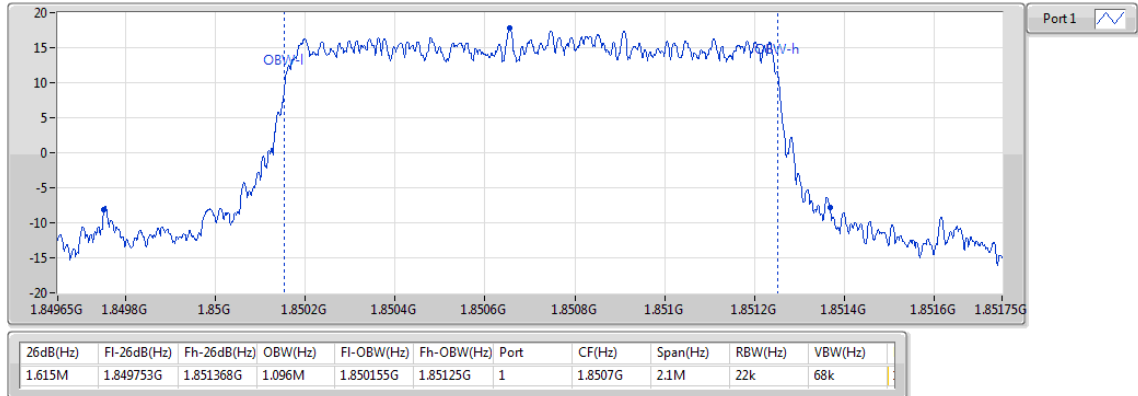
Mode	Result	Limit (Hz)	Port 1-NdB (Hz)	Port 1-OBW (Hz)
LTE-M1_1.4MHz_Nss1_1TX	-	-	-	-
1850.7MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.615M	1.096M
1880MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.432M	1.099M
1909.3MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.421M	1.09M
1850.7MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	1.856M	1.098M
1880MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	2.029M	1.1M
1909.3MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	2.031M	1.117M
LTE-M1_3MHz_Nss1_1TX	-	-	-	-
1851.5MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.449M	1.095M
1880MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.411M	1.1M
1908.5MHz_QPSK_RB 6,#RB 0,NB 1	Pass	Inf	2.054M	1.129M
1851.5MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	1.778M	1.106M
1880MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	1.946M	1.114M
1908.5MHz_16QAM_RB 6,#RB 0,NB 1	Pass	Inf	2.165M	1.197M
LTE-M1_5MHz_Nss1_1TX	-	-	-	-
1852.5MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.365M	1.087M
1880MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.714M	1.113M
1907.5MHz_QPSK_RB 6,#RB 0,NB 3	Pass	Inf	1.778M	1.109M
1852.5MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	1.924M	1.127M
1880MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	2.171M	1.142M
1907.5MHz_16QAM_RB 6,#RB 0,NB 3	Pass	Inf	2.051M	1.217M
LTE-M1_10MHz_Nss1_1TX	-	-	-	-
1855MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.74M	1.111M
1880MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.688M	1.127M
1905MHz_QPSK_RB 6,#RB 0,NB 7	Pass	Inf	1.785M	1.16M

Mode	Result	Limit (Hz)	Port 1-NdB (Hz)	Port 1-OBW (Hz)
1855MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	1.853M	1.161M
1880MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	1.943M	1.162M
1905MHz_16QAM_RB 6,#RB 0,NB 7	Pass	Inf	2.093M	1.232M
LTE-M1_15MHz_Nss1_1TX	-	-	-	-
1857.5MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.575M	1.109M
1880MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.913M	1.151M
1902.5MHz_QPSK_RB 6,#RB 0,NB 11	Pass	Inf	1.901M	1.133M
1857.5MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	2.014M	1.156M
1880MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	2.036M	1.19M
1902.5MHz_16QAM_RB 6,#RB 0,NB 11	Pass	Inf	2.093M	1.298M
LTE-M1_20MHz_Nss1_1TX	-	-	-	-
1860MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.755M	1.148M
1880MHz_QPSK_RB 6,#RB 0,NB 0	Pass	Inf	1.845M	1.156M
1900MHz_QPSK_RB 6,#RB 0,NB 15	Pass	Inf	2.16M	1.176M
1860MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	2.19M	1.205M
1880MHz_16QAM_RB 6,#RB 0,NB 0	Pass	Inf	2.025M	1.212M
1900MHz_16QAM_RB 6,#RB 0,NB 15	Pass	Inf	2.145M	1.252M

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

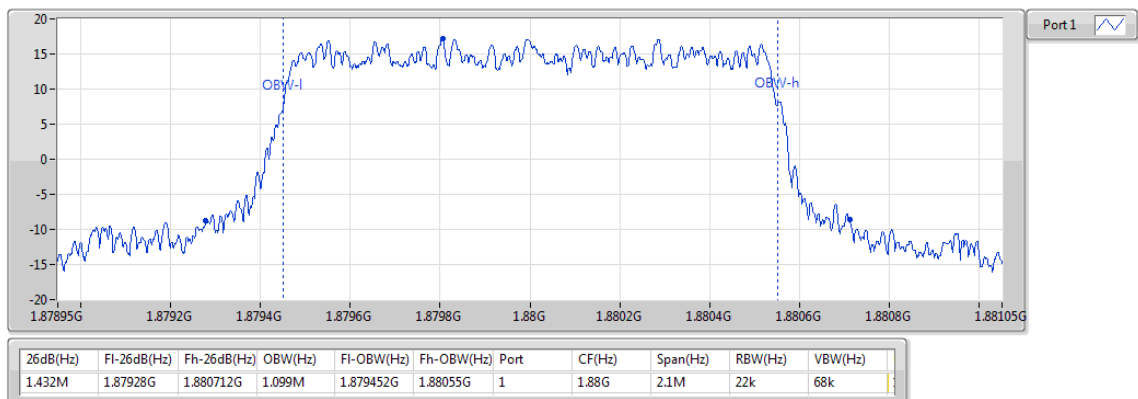
Band 2_LTE-M1_1.4MHz_Nss1_1TX
1850.7MHz_QPSK_RB 6,#RB 0,NB 0

EBW



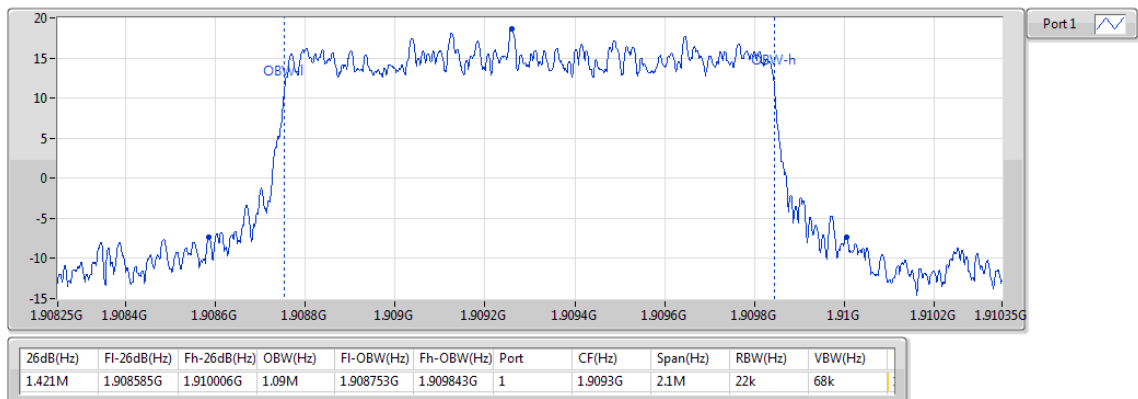
Band 2_LTE-M1_1.4MHz_Nss1_1TX
1880MHz_QPSK_RB 6,#RB 0,NB 0

EBW



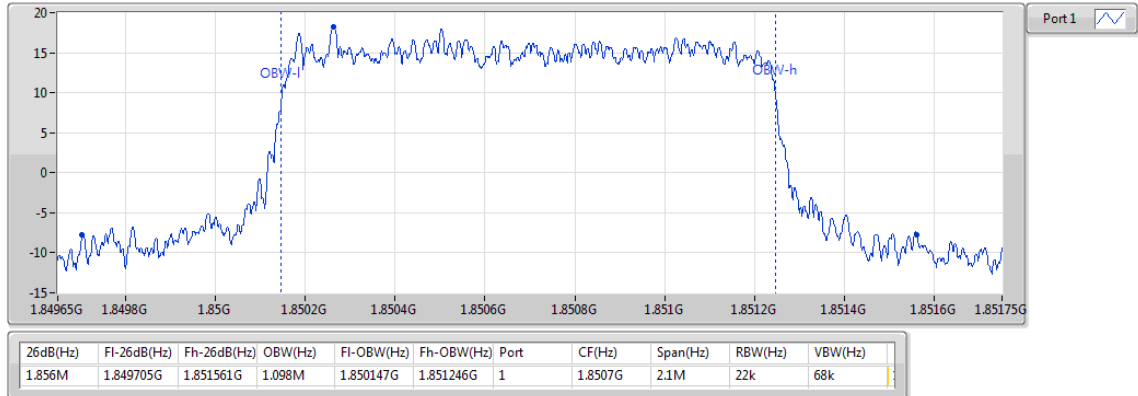
Band 2_LTE-M1_1.4MHz_Nss1_1TX
1909.3MHz_QPSK_RB 6,#RB 0,NB 0

EBW



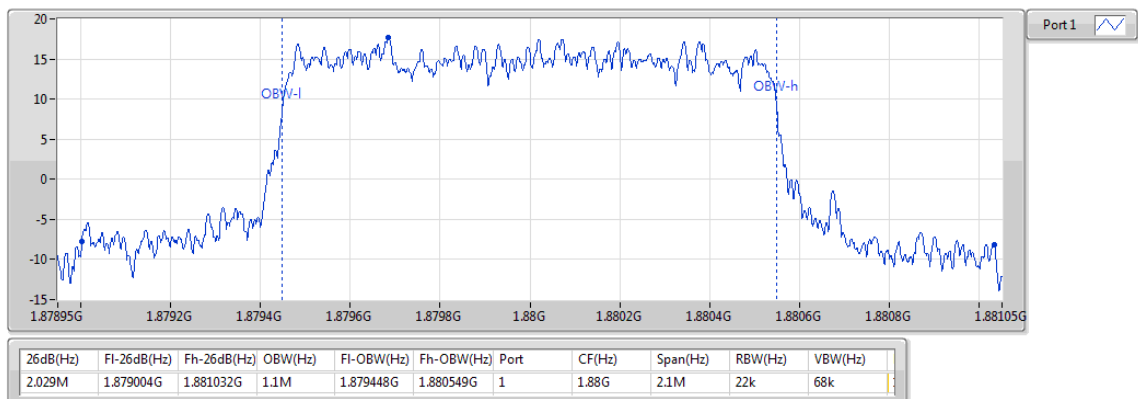
Band 2_LTE-M1_1.4MHz_Nss1_1TX
1850.7MHz_16QAM_RB 6,#RB 0,NB 0

EBW



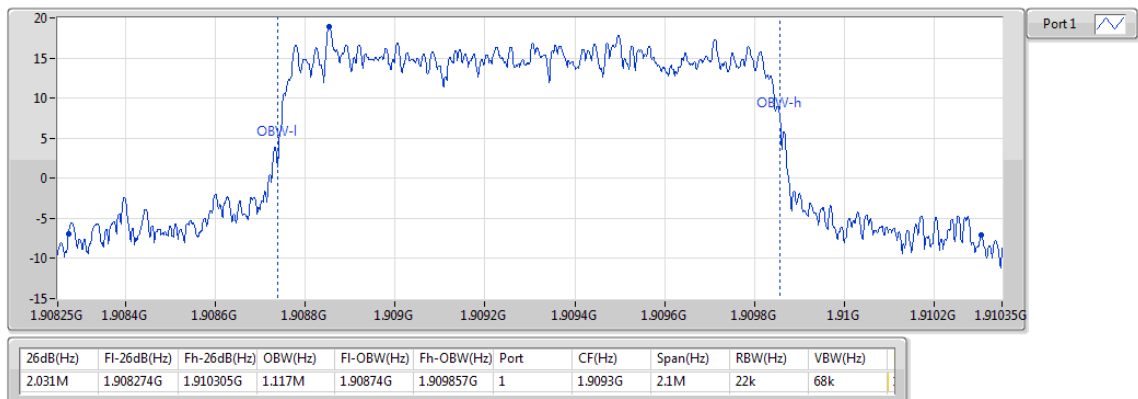
Band 2_LTE-M1_1.4MHz_Nss1_1TX
1880MHz_16QAM_RB 6,#RB 0,NB 0

EBW



Band 2_LTE-M1_1.4MHz_Nss1_1TX
1909.3MHz_16QAM_RB 6,#RB 0,NB 0

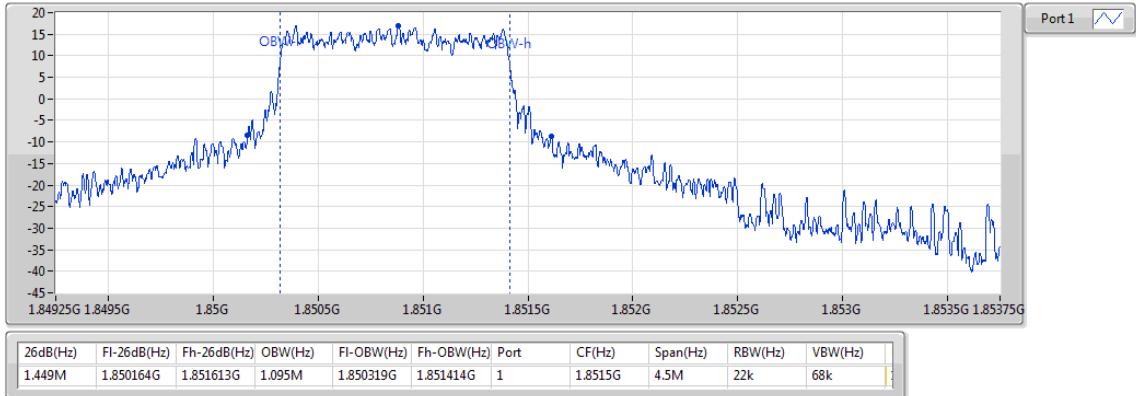
EBW



Band 2_LTE-M1_3MHz_Nss1_1TX

EBW

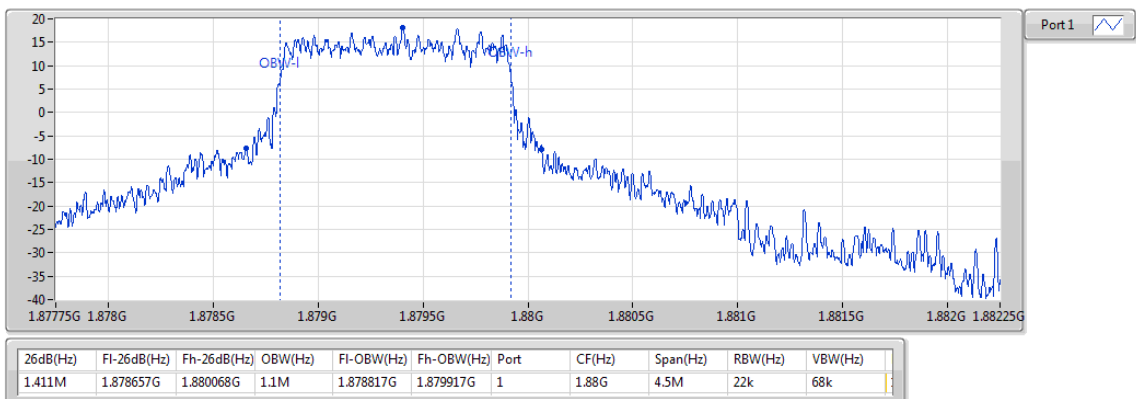
1851.5MHz_QPSK_RB 6,#RB 0,NB 0



Band 2_LTE-M1_3MHz_Nss1_1TX

EBW

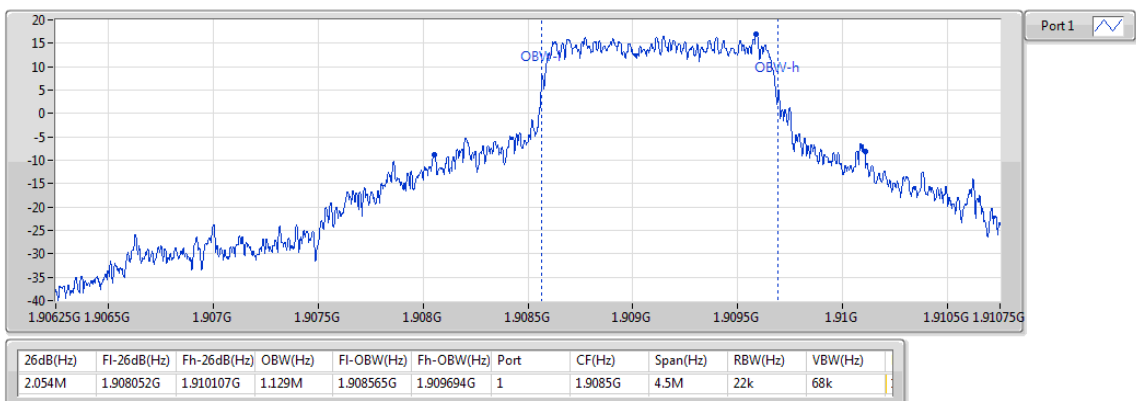
1880MHz_QPSK_RB 6,#RB 0,NB 0



Band 2_LTE-M1_3MHz_Nss1_1TX

EBW

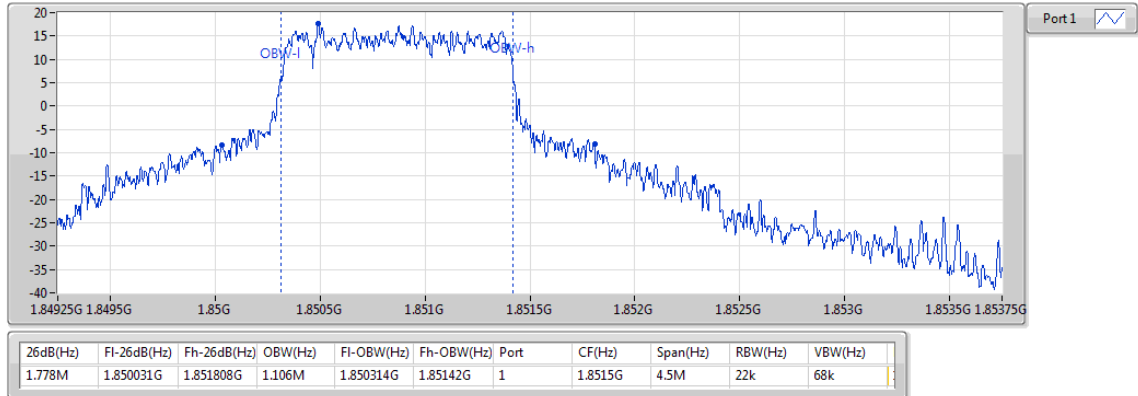
1908.5MHz_QPSK_RB 6,#RB 0,NB 1



Band 2_LTE-M1_3MHz_Nss1_1TX

EBW

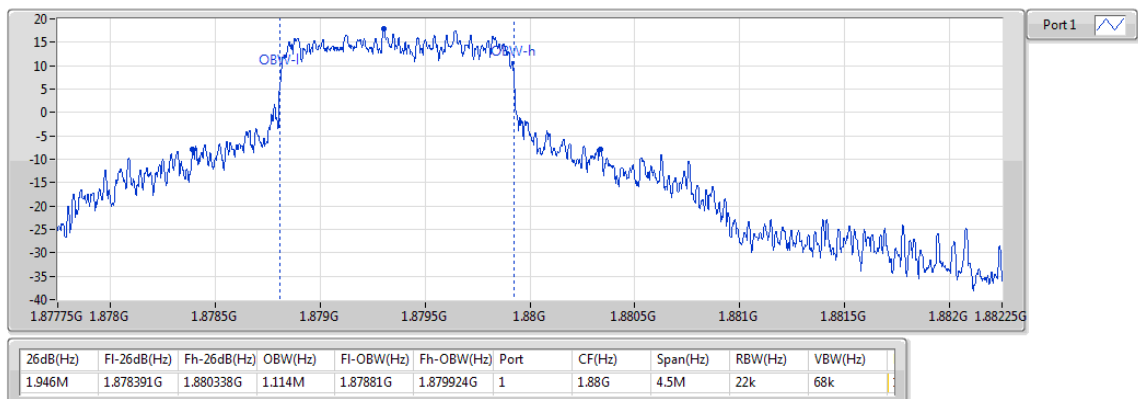
1851.5MHz_16QAM_RB 6,#RB 0,NB 0



Band 2_LTE-M1_3MHz_Nss1_1TX

EBW

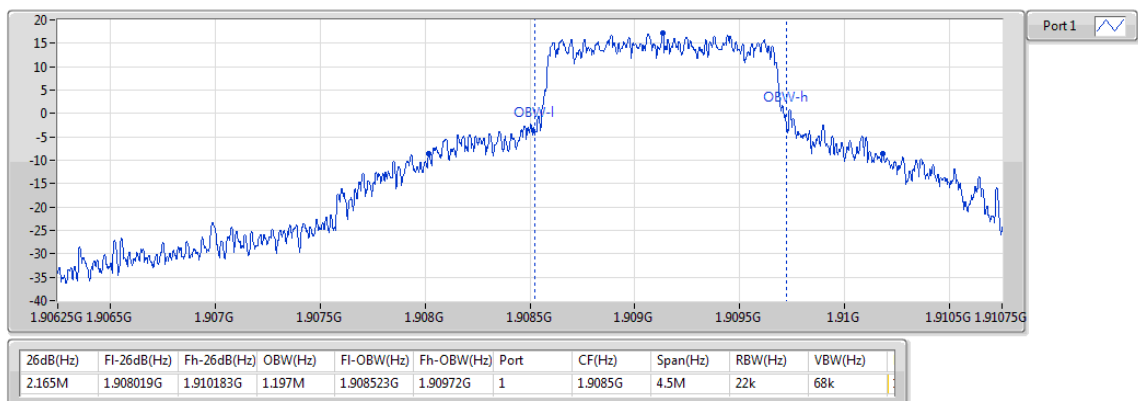
1880MHz_16QAM_RB 6,#RB 0,NB 0



Band 2_LTE-M1_3MHz_Nss1_1TX

EBW

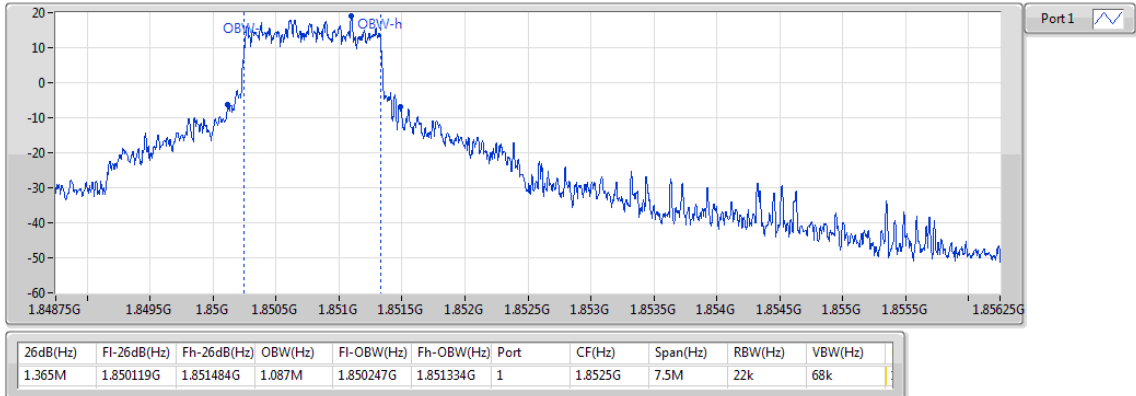
1908.5MHz_16QAM_RB 6,#RB 0,NB 1



Band 2_LTE-M1_5MHz_Nss1_1TX

EBW

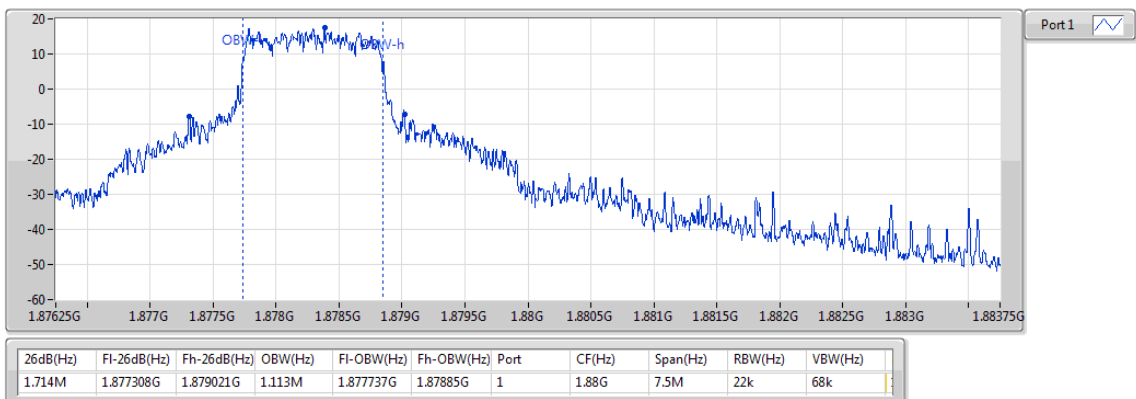
1852.5MHz_QPSK_RB 6,#RB 0,NB 0



Band 2_LTE-M1_5MHz_Nss1_1TX

EBW

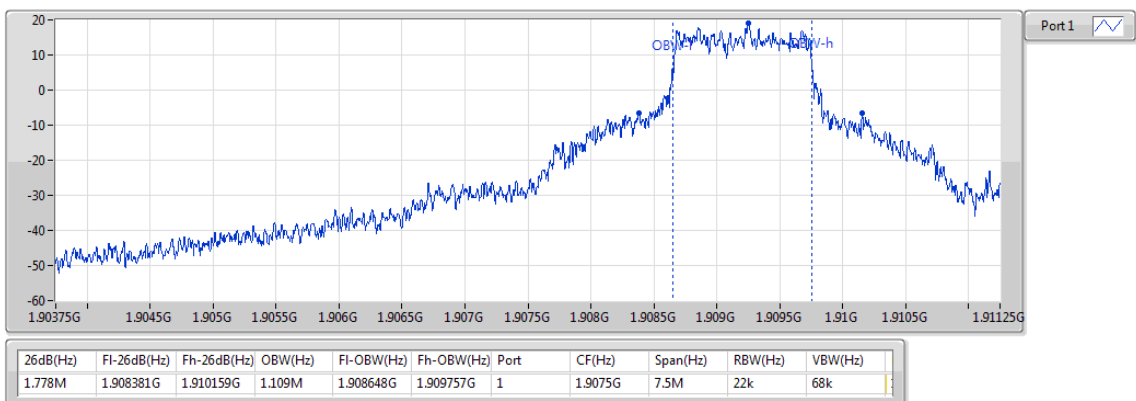
1880MHz_QPSK_RB 6,#RB 0,NB 0



Band 2_LTE-M1_5MHz_Nss1_1TX

EBW

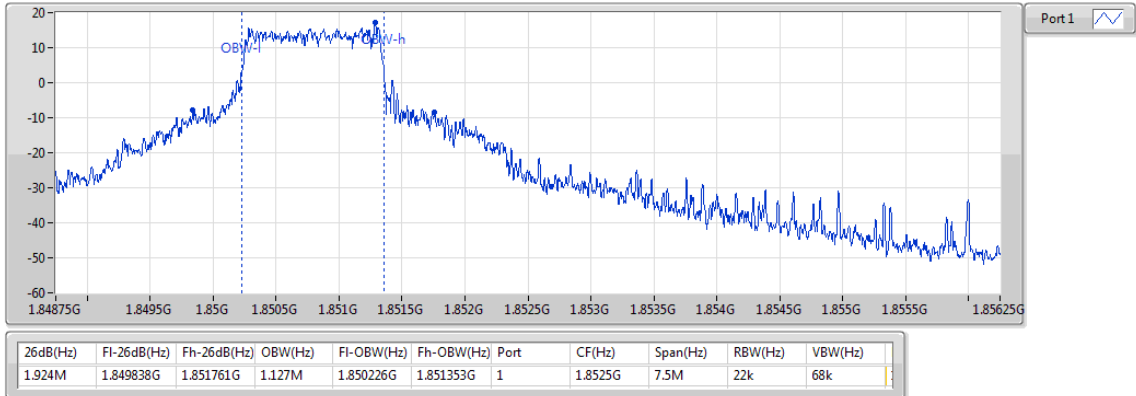
1907.5MHz_QPSK_RB 6,#RB 0,NB 3



Band 2_LTE-M1_5MHz_Nss1_1TX

EBW

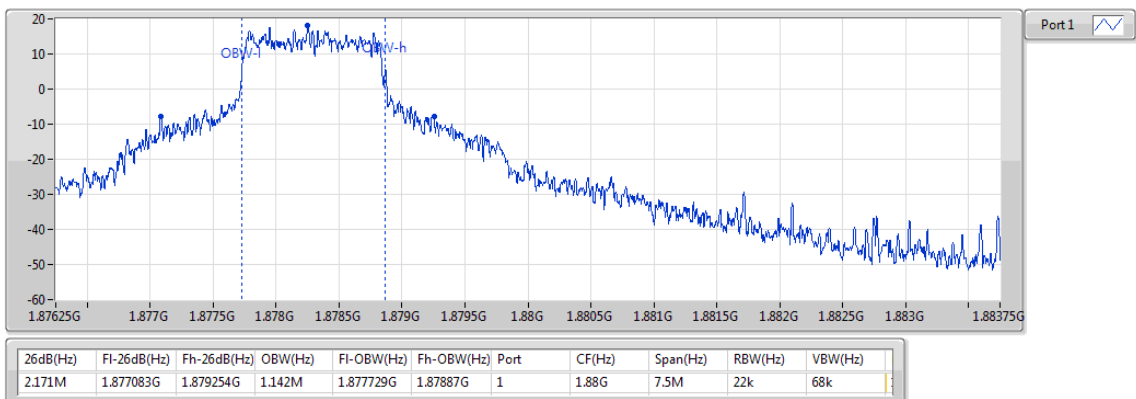
1852.5MHz_16QAM_RB 6,#RB 0,NB 0



Band 2_LTE-M1_5MHz_Nss1_1TX

EBW

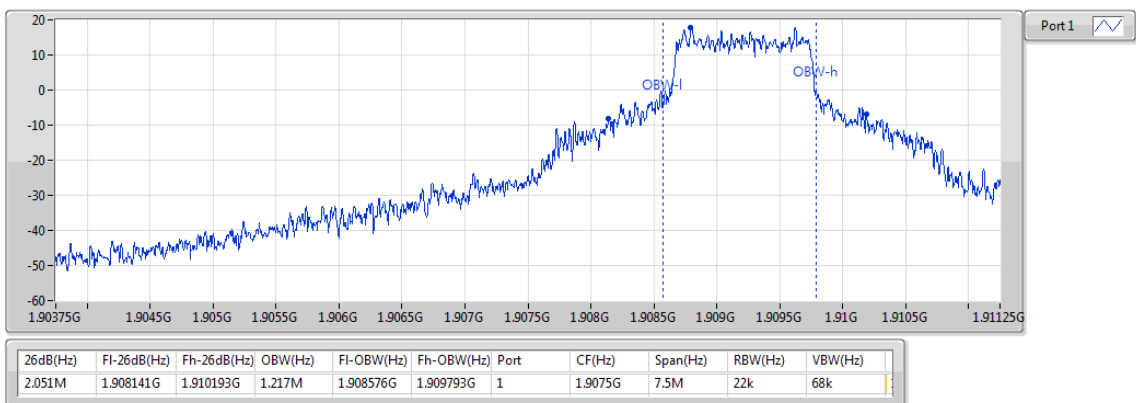
1880MHz_16QAM_RB 6,#RB 0,NB 0



Band 2_LTE-M1_5MHz_Nss1_1TX

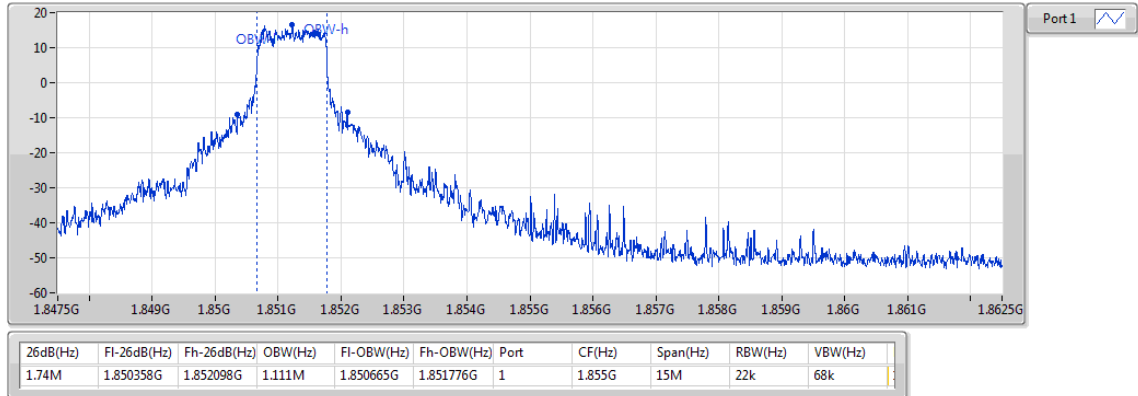
EBW

1907.5MHz_16QAM_RB 6,#RB 0,NB 3



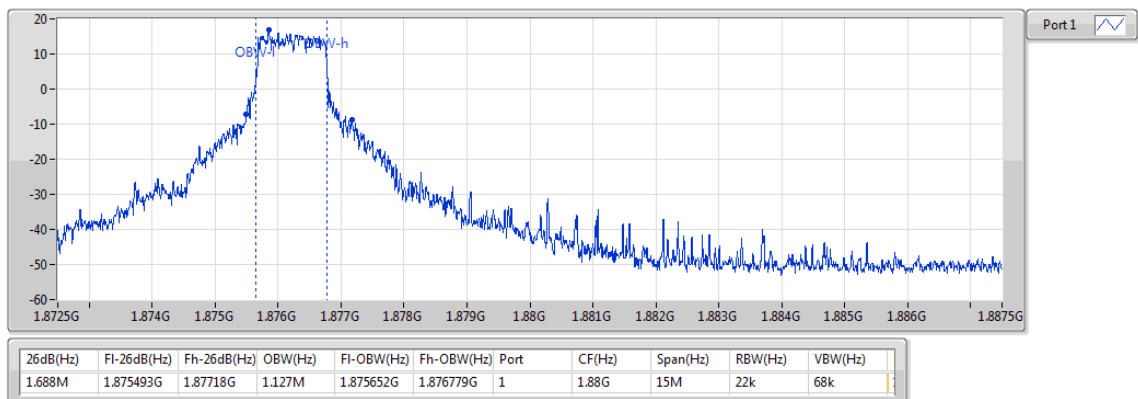
Band 2_LTE-M1_10MHz_Nss1_1TX
1855MHz_QPSK_RB 6,#RB 0,NB 0

EBW



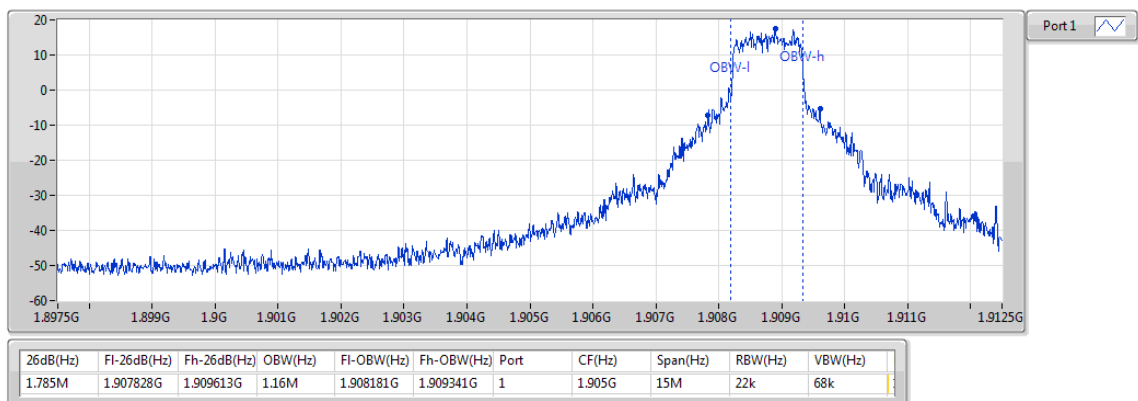
Band 2_LTE-M1_10MHz_Nss1_1TX
1880MHz_QPSK_RB 6,#RB 0,NB 0

EBW



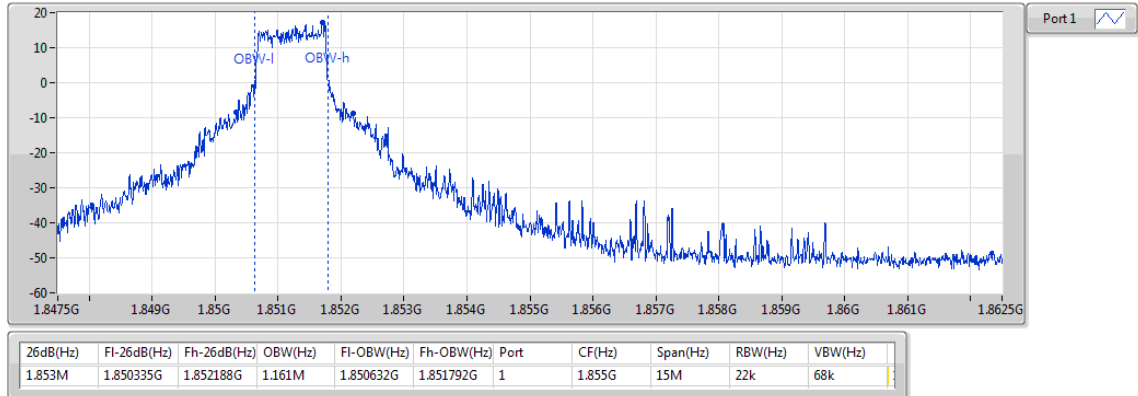
Band 2_LTE-M1_10MHz_Nss1_1TX
1905MHz_QPSK_RB 6,#RB 0,NB 7

EBW



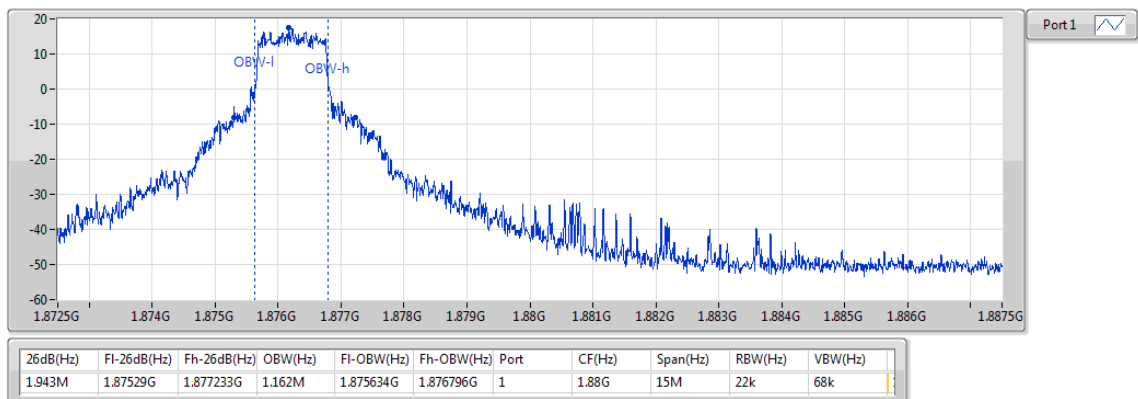
Band 2_LTE-M1_10MHz_Nss1_1TX
1855MHz_16QAM_RB 6,#RB 0,NB 0

EBW



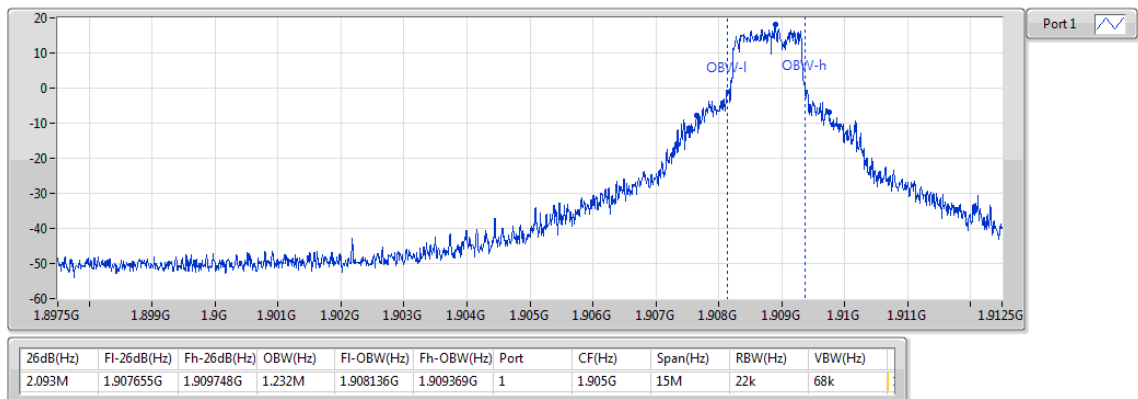
Band 2_LTE-M1_10MHz_Nss1_1TX
1880MHz_16QAM_RB 6,#RB 0,NB 0

EBW



Band 2_LTE-M1_10MHz_Nss1_1TX
1905MHz_16QAM_RB 6,#RB 0,NB 7

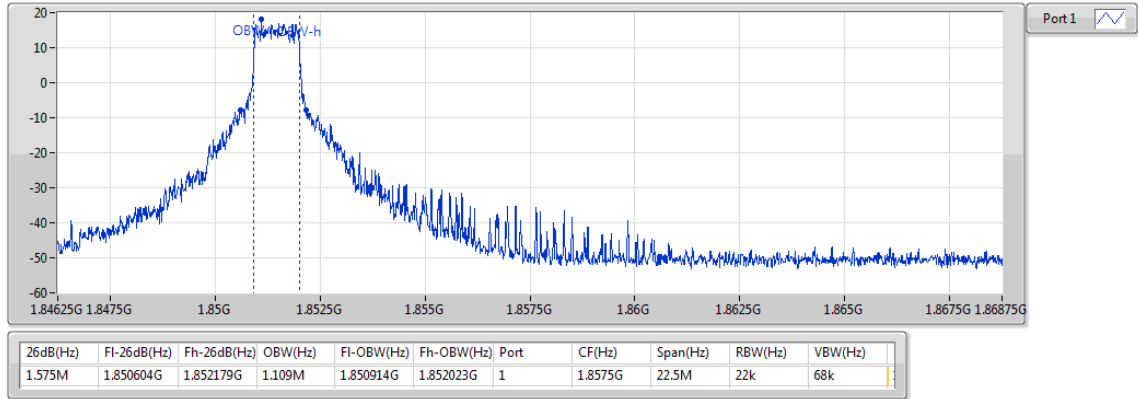
EBW



Band 2_LTE-M1_15MHz_Nss1_1TX

EBW

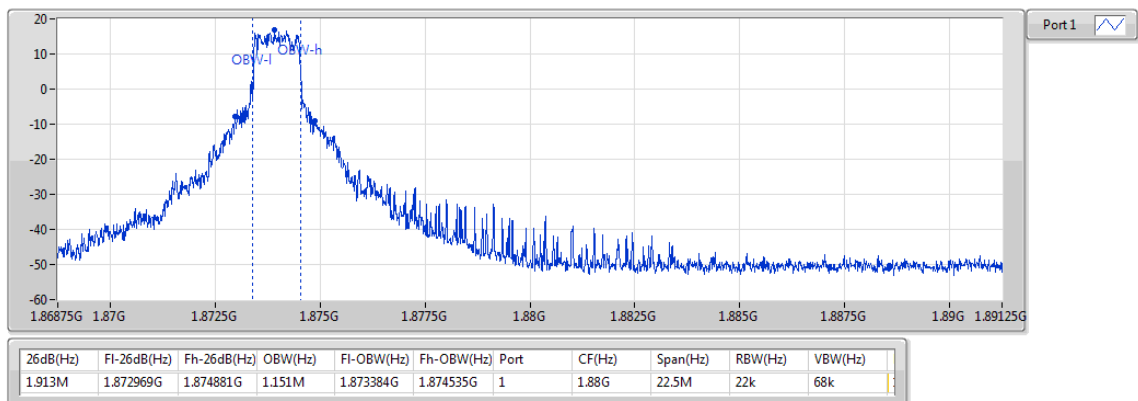
1857.5MHz_QPSK_RB 6,#RB 0,NB 0



Band 2_LTE-M1_15MHz_Nss1_1TX

EBW

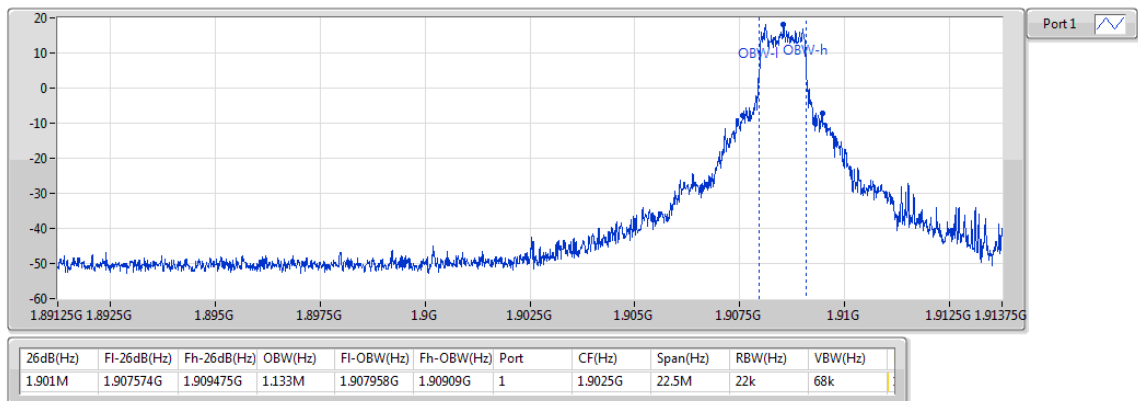
1880MHz_QPSK_RB 6,#RB 0,NB 0



Band 2_LTE-M1_15MHz_Nss1_1TX

EBW

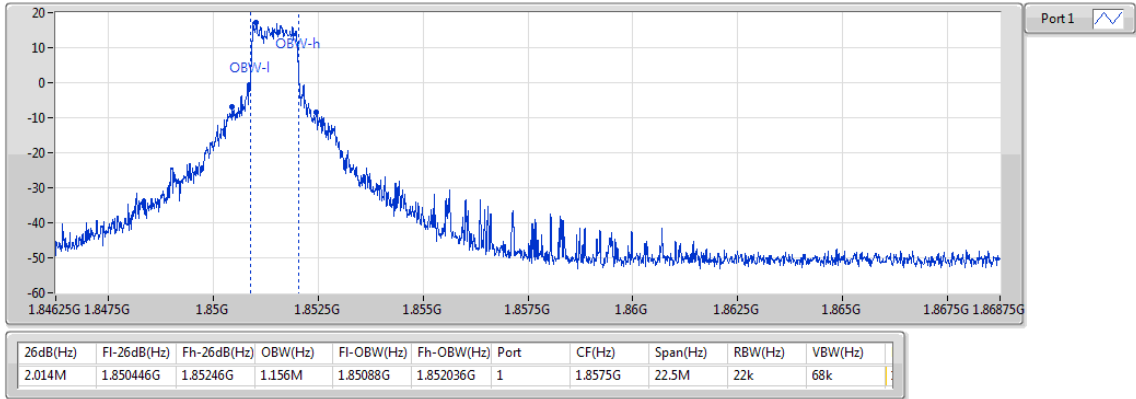
1902.5MHz_QPSK_RB 6,#RB 0,NB 11



Band 2_LTE-M1_15MHz_Nss1_1TX

EBW

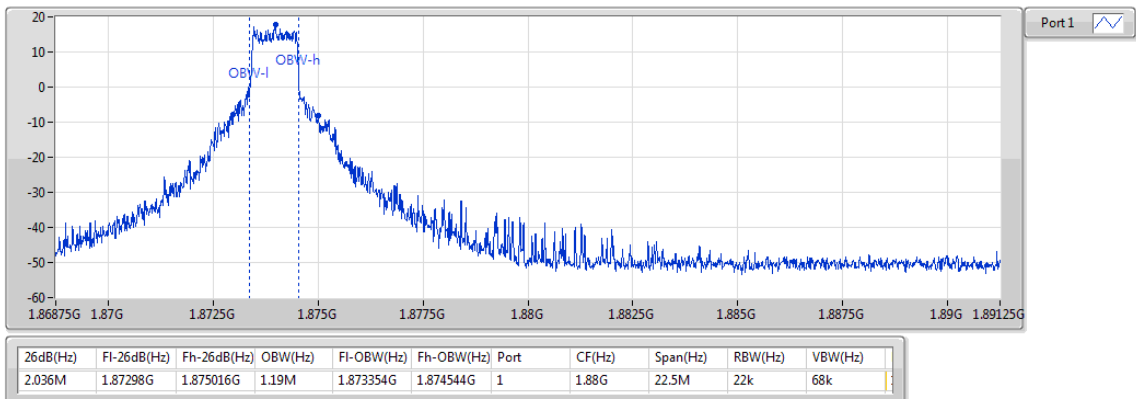
1857.5MHz_16QAM_RB 6,#RB 0,NB 0



Band 2_LTE-M1_15MHz_Nss1_1TX

EBW

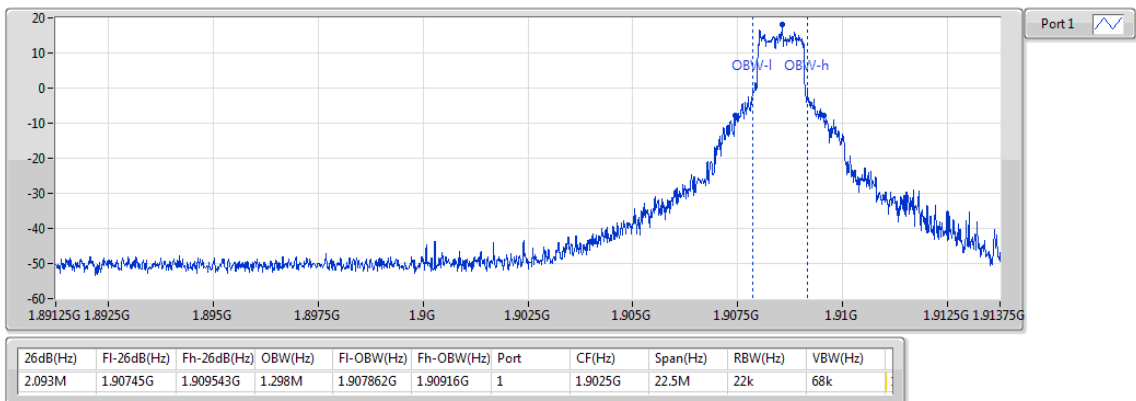
1880MHz_16QAM_RB 6,#RB 0,NB 0



Band 2_LTE-M1_15MHz_Nss1_1TX

EBW

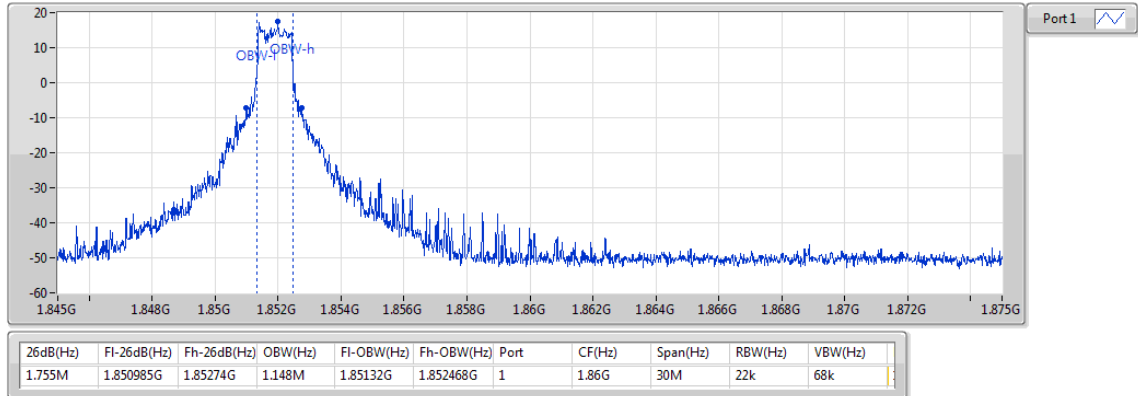
1902.5MHz_16QAM_RB 6,#RB 0,NB 11



Band 2_LTE-M1_20MHz_Nss1_1TX

EBW

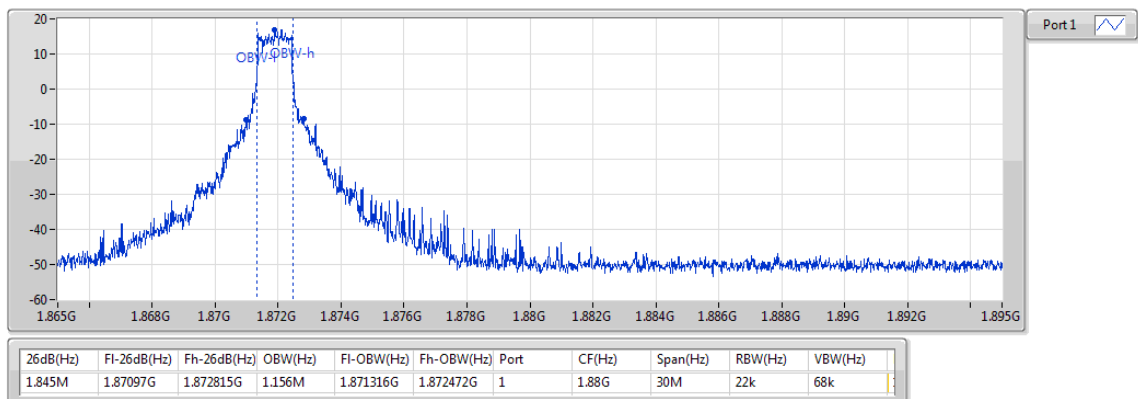
1860MHz_QPSK_RB 6,#RB 0,NB 0



Band 2_LTE-M1_20MHz_Nss1_1TX

EBW

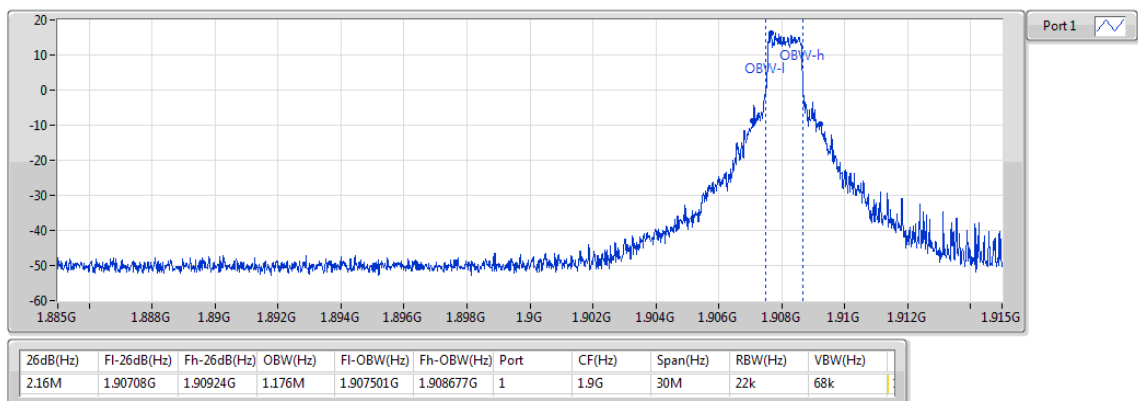
1880MHz_QPSK_RB 6,#RB 0,NB 0



Band 2_LTE-M1_20MHz_Nss1_1TX

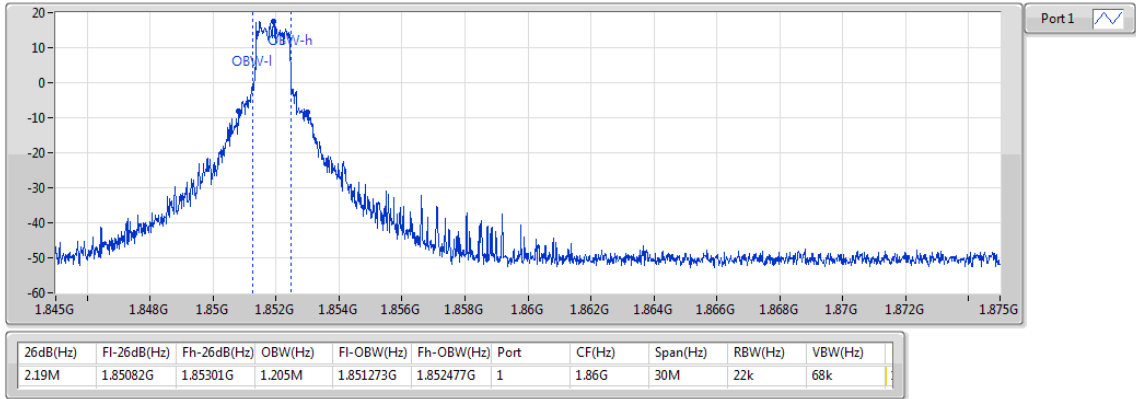
EBW

1900MHz_QPSK_RB 6,#RB 0,NB 15



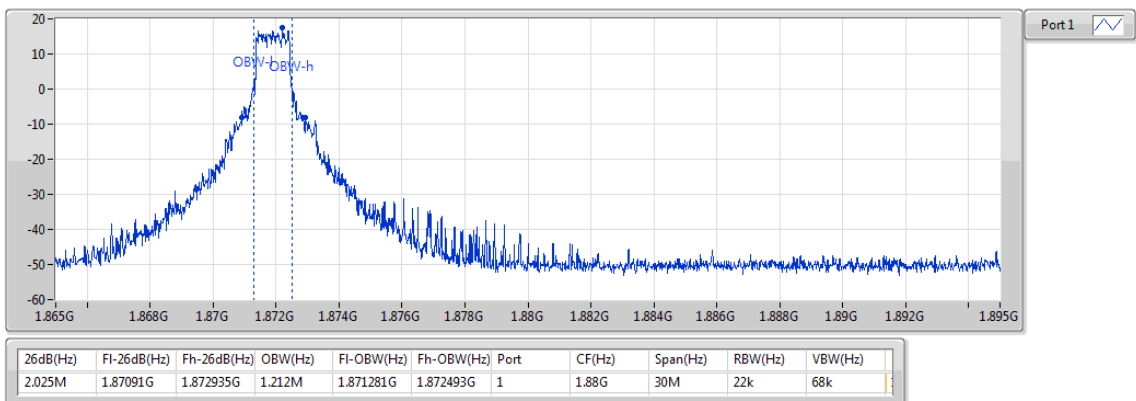
Band 2_LTE-M1_20MHz_Nss1_1TX
1860MHz_16QAM_RB 6,#RB 0,NB 0

EBW



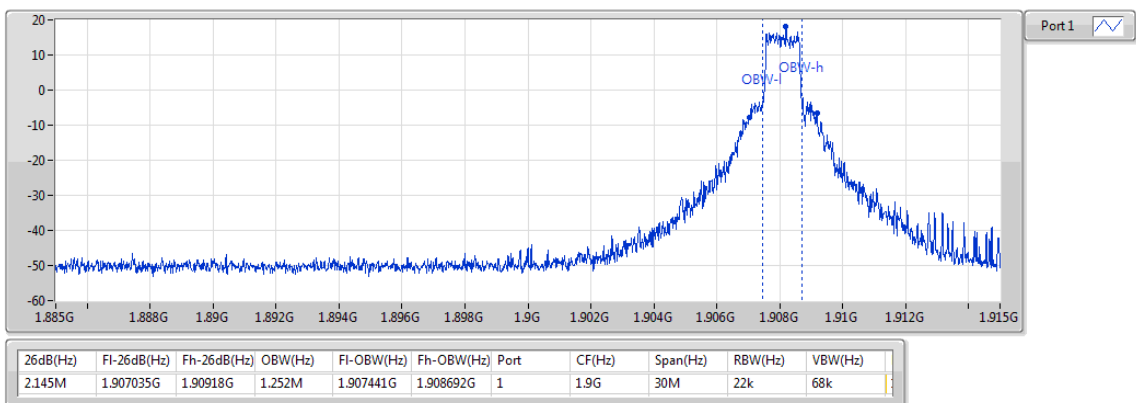
Band 2_LTE-M1_20MHz_Nss1_1TX
1880MHz_16QAM_RB 6,#RB 0,NB 0

EBW



Band 2_LTE-M1_20MHz_Nss1_1TX
1900MHz_16QAM_RB 6,#RB 0,NB 15

EBW



3.5 Peak to Average Ratio

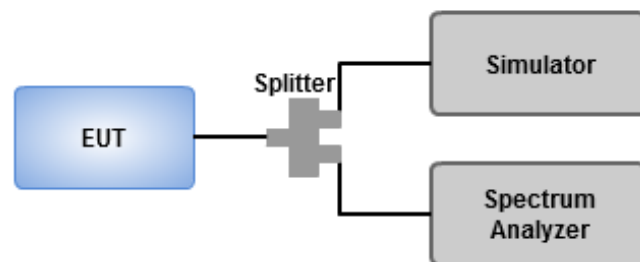
3.5.1 Limit of Peak to Average Ratio

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

3.5.2 Test Procedures

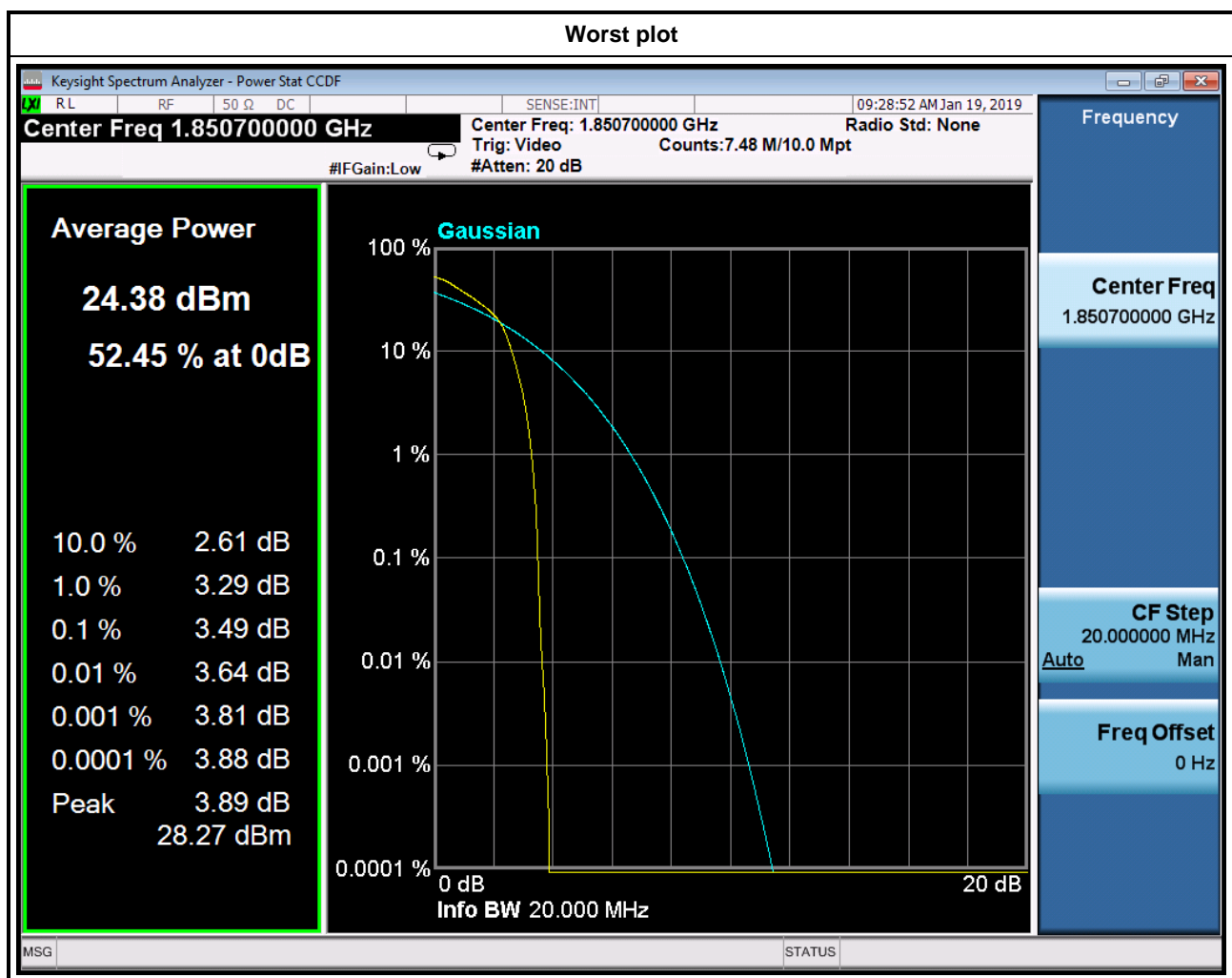
1. Enable CCDF function of spectrum analyzer and set RBW = 10MHz.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.5.3 Test Setup

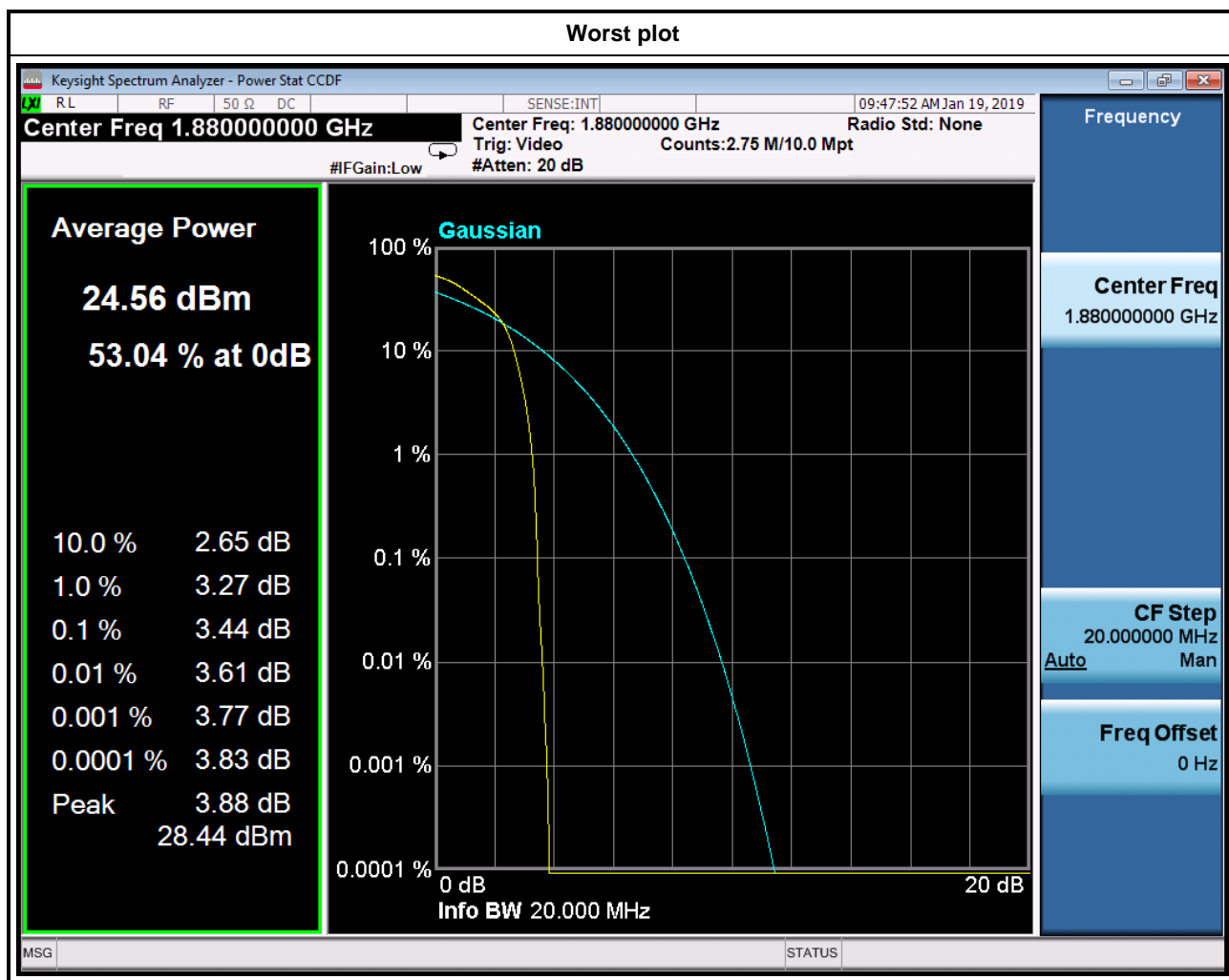


3.5.4 Test Result of Peak to Average ratio

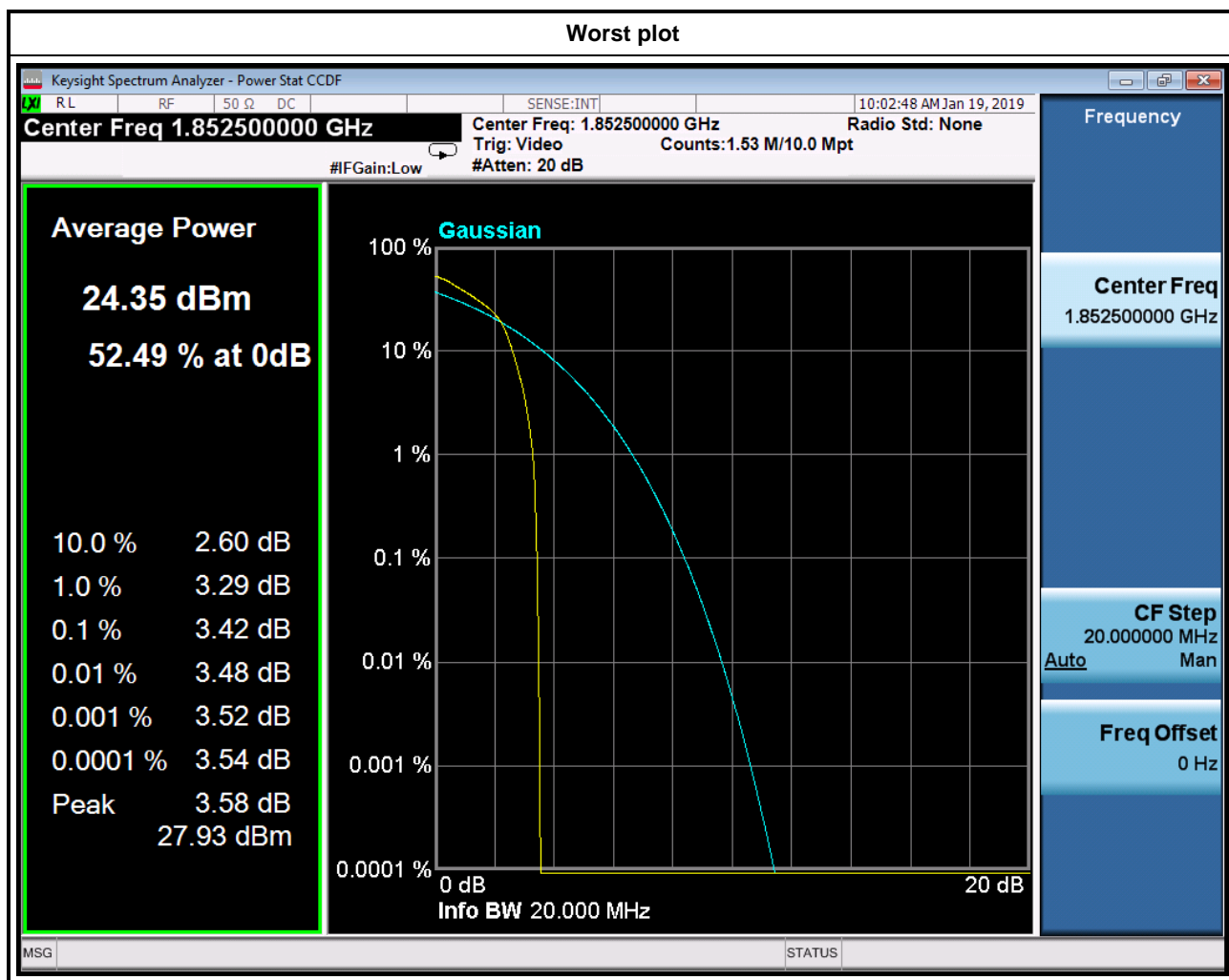
Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	1.4	QPSK	18607	1850.7	3.49
LTE Band 2	1.4	QPSK	18900	1880.0	3.31
LTE Band 2	1.4	QPSK	19193	1909.3	3.19
LTE Band 2	1.4	16QAM	18607	1850.7	3.49
LTE Band 2	1.4	16QAM	18900	1880.0	3.33
LTE Band 2	1.4	16QAM	19193	1909.3	3.33



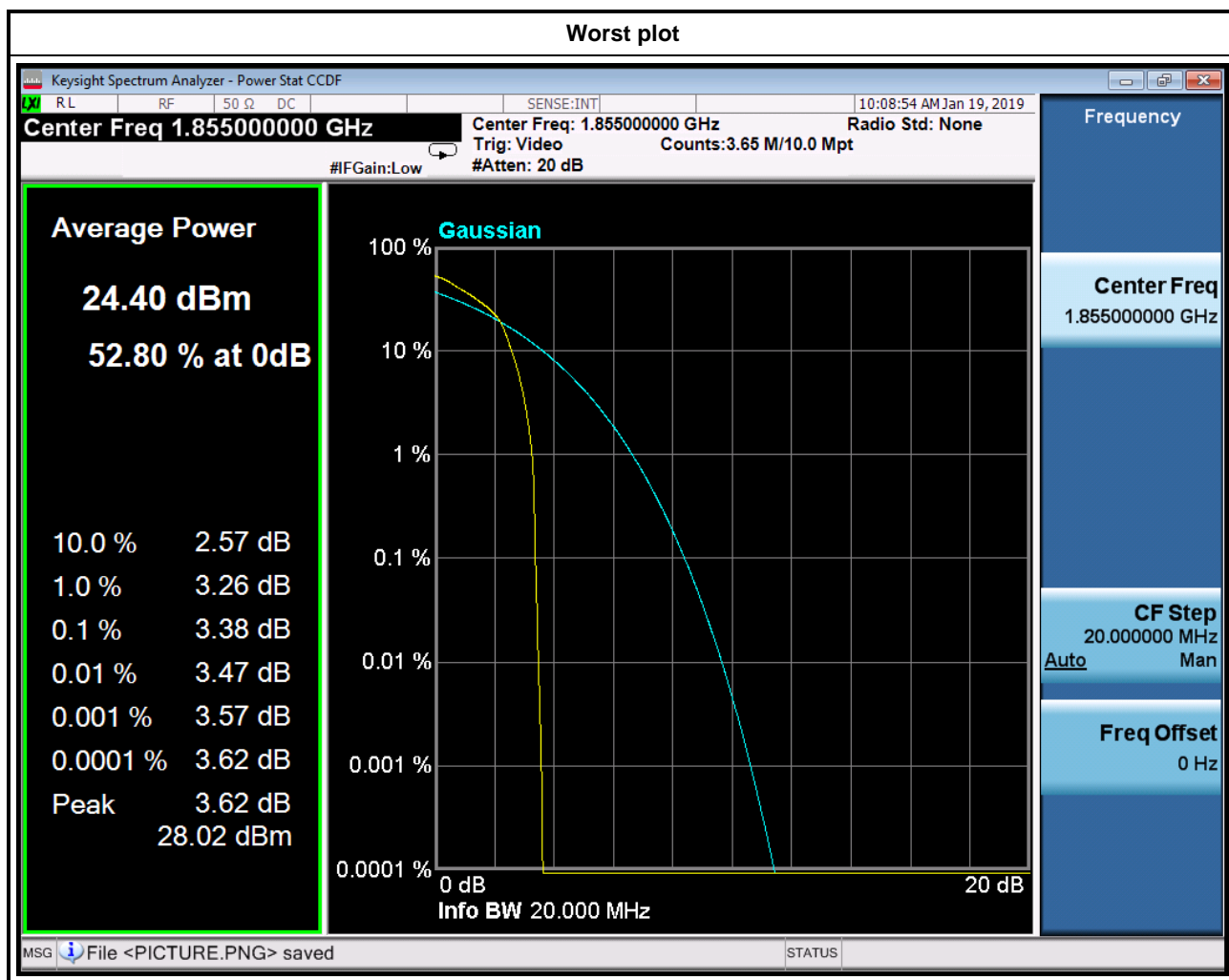
Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	3	QPSK	18615	1851.5	3.26
LTE Band 2	3	QPSK	18900	1880.0	3.23
LTE Band 2	3	QPSK	19185	1908.5	3.04
LTE Band 2	3	16QAM	18615	1851.5	3.42
LTE Band 2	3	16QAM	18900	1880.0	3.44
LTE Band 2	3	16QAM	19185	1908.5	3.21



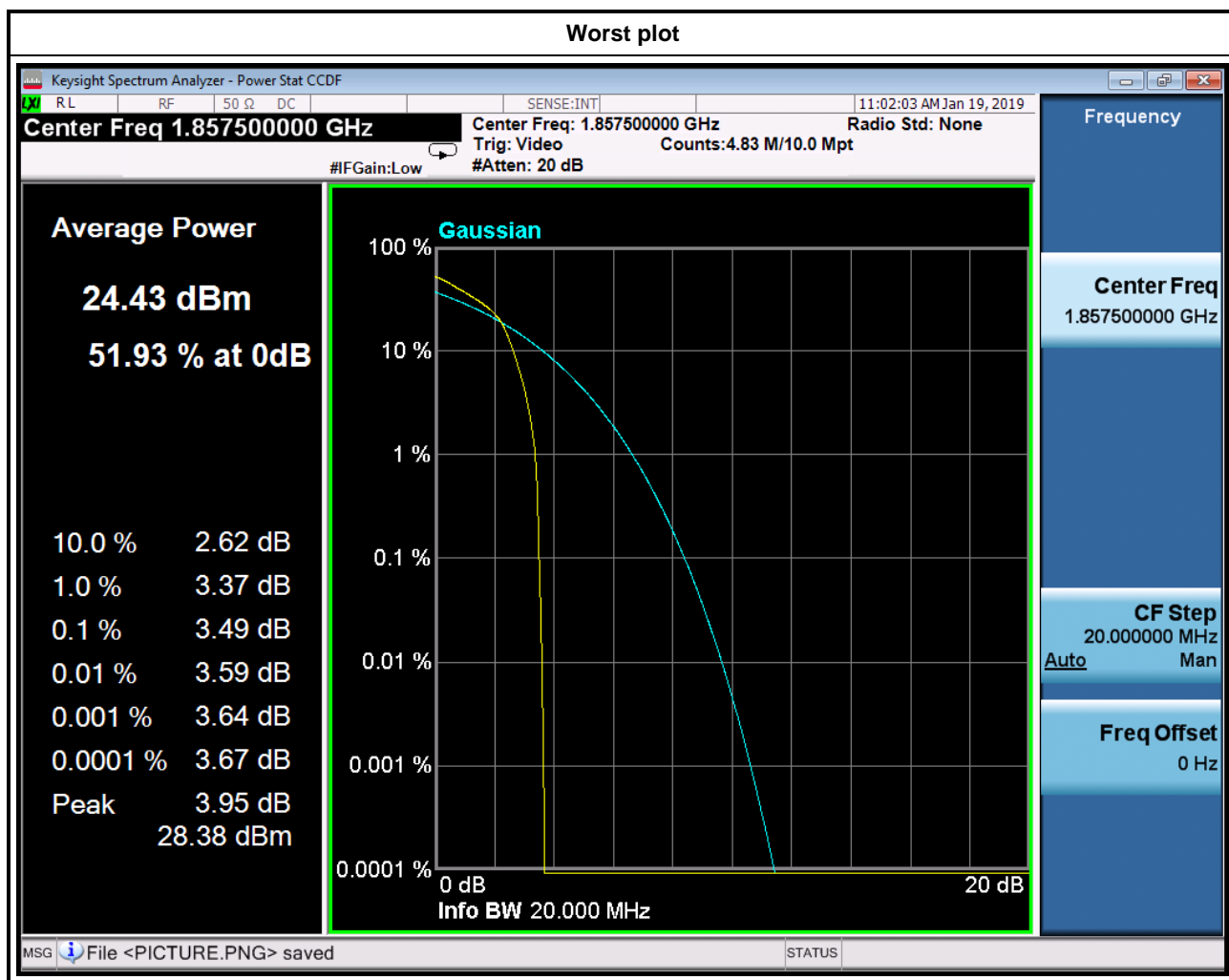
Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	5	QPSK	18625	1852.5	3.23
LTE Band 2	5	QPSK	18900	1880.0	3.09
LTE Band 2	5	QPSK	19175	1907.5	3.06
LTE Band 2	5	16QAM	18625	1852.5	3.42
LTE Band 2	5	16QAM	18900	1880.0	3.25
LTE Band 2	5	16QAM	19175	1907.5	3.28



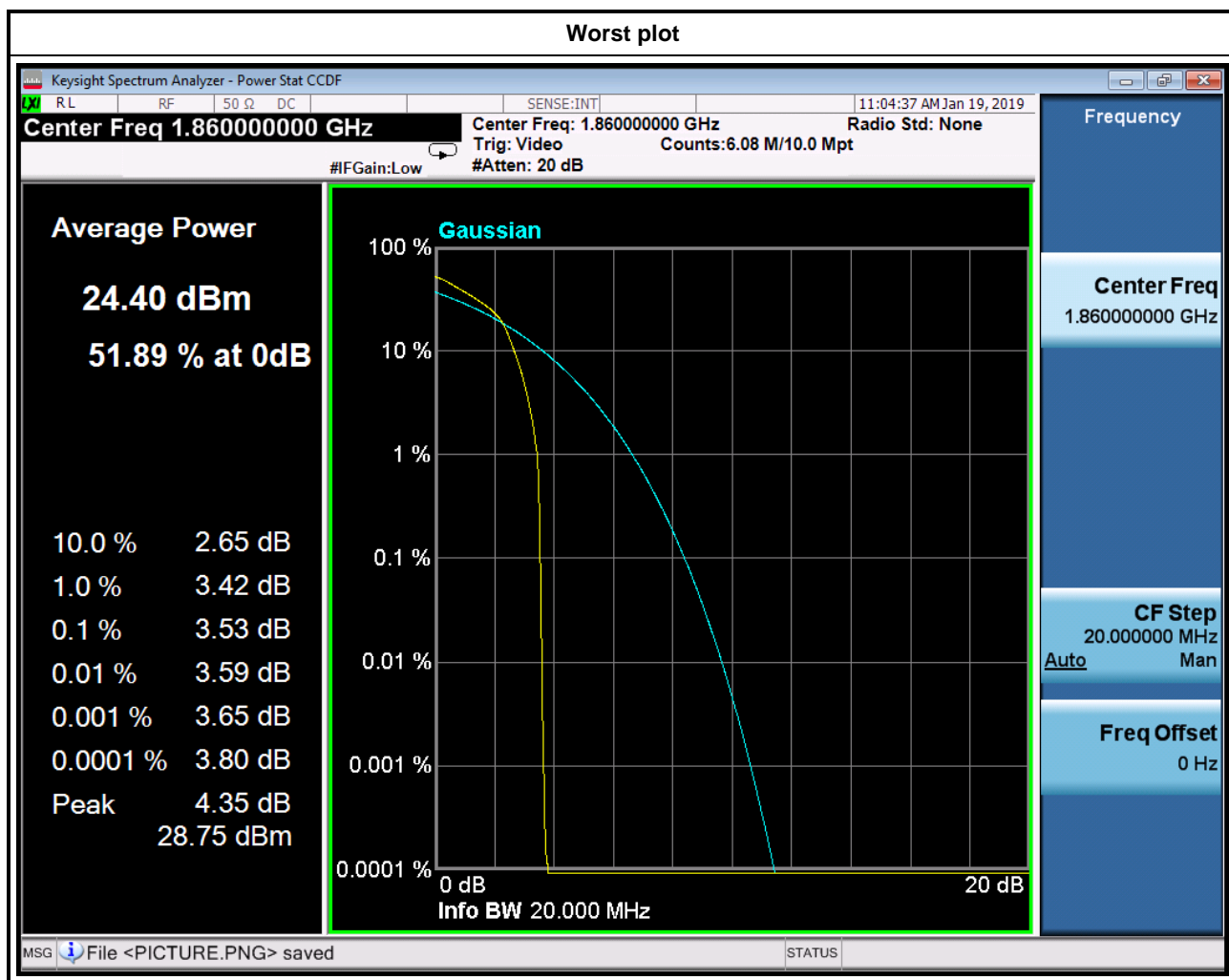
Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	10	QPSK	18650	1855.0	3.17
LTE Band 2	10	QPSK	18900	1880.0	3.07
LTE Band 2	10	QPSK	19150	1905.0	3.12
LTE Band 2	10	16QAM	18650	1855.0	3.38
LTE Band 2	10	16QAM	18900	1880.0	3.29
LTE Band 2	10	16QAM	19150	1905.0	3.31



Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	15	QPSK	18675	1857.5	3.23
LTE Band 2	15	QPSK	18900	1880.0	3.21
LTE Band 2	15	QPSK	19125	1902.5	3.12
LTE Band 2	15	16QAM	18675	1857.5	3.49
LTE Band 2	15	16QAM	18900	1880.0	3.25
LTE Band 2	15	16QAM	19125	1902.5	3.31



Mode	CB (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 2	20	QPSK	18700	1860.0	3.31
LTE Band 2	20	QPSK	18900	1880.0	3.32
LTE Band 2	20	QPSK	19100	1900.0	3.12
LTE Band 2	20	16QAM	18700	1860.0	3.53
LTE Band 2	20	16QAM	18900	1880.0	3.48
LTE Band 2	20	16QAM	19100	1900.0	3.30



3.6 Frequency Stability

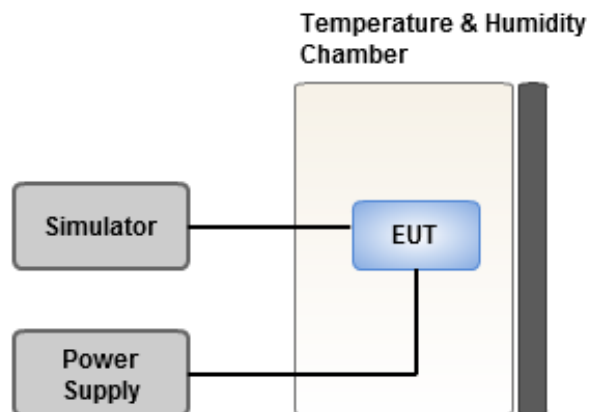
3.6.1 Limit of Frequency Stability

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

3.6.2 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.

3.6.3 Test Setup



3.6.4 Test Result of Frequency Stability

Temperature (°C)	Frequency Drift (ppm)					
	CB: 1.4MHz	CB: 3MHz	CB: 5MHz	CB: 10MHz	CB: 15MHz	CB: 20MHz
T20°CVmax	-0.018	-0.019	-0.18	-0.019	-0.017	-0.019
T20°CVmin	-0.019	-0.018	-0.18	-0.018	-0.018	-0.018
T75°CVnom	0.041	0.043	0.043	0.043	0.045	0.045
T70°CVnom	0.041	0.038	0.038	0.042	0.038	0.043
T60°CVnom	0.039	0.035	0.037	0.038	0.037	0.041
T50°CVnom	0.035	0.034	0.036	0.031	0.031	0.038
T40°CVnom	0.034	0.033	0.035	0.028	0.31	0.031
T30°CVnom	0.022	0.021	0.018	0.018	0.25	0.026
T20°CVnom	-0.019	-0.018	-0.018	-0.018	-0.18	-0.018
T10°CVnom	-0.018	-0.017	-0.017	-0.017	-0.017	-0.017
T0°CVnom	-0.014	-0.013	-0.013	-0.015	-0.016	-0.013
T-10°CVnom	-0.013	-0.012	-0.013	-0.012	-0.015	-0.013
T-20°CVnom	-0.012	-0.011	-0.012	-0.011	-0.014	-0.013
T-30°CVnom	-0.012	-0.011	-0.011	-0.011	-0.013	-0.012
T-35°CVnom	-0.011	-0.01	-0.009	-0.01	-0.012	-0.011
Vnom [V]: 3.6		Vmax [V]: 3.7		Vmin [V]: 2.45		
Tnom [°C]: 20		Tmax [°C]: 75		Tmin [°C]: -35		

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>.

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