

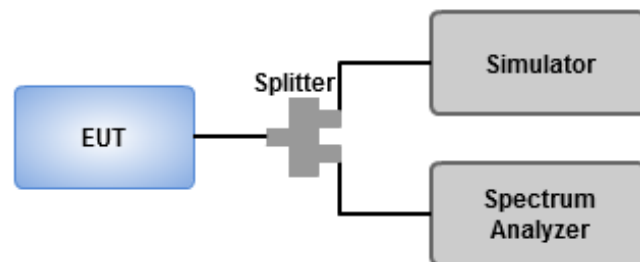


## 3.5 Occupied and 26 dB Bandwidth

### 3.5.1 Test Procedures

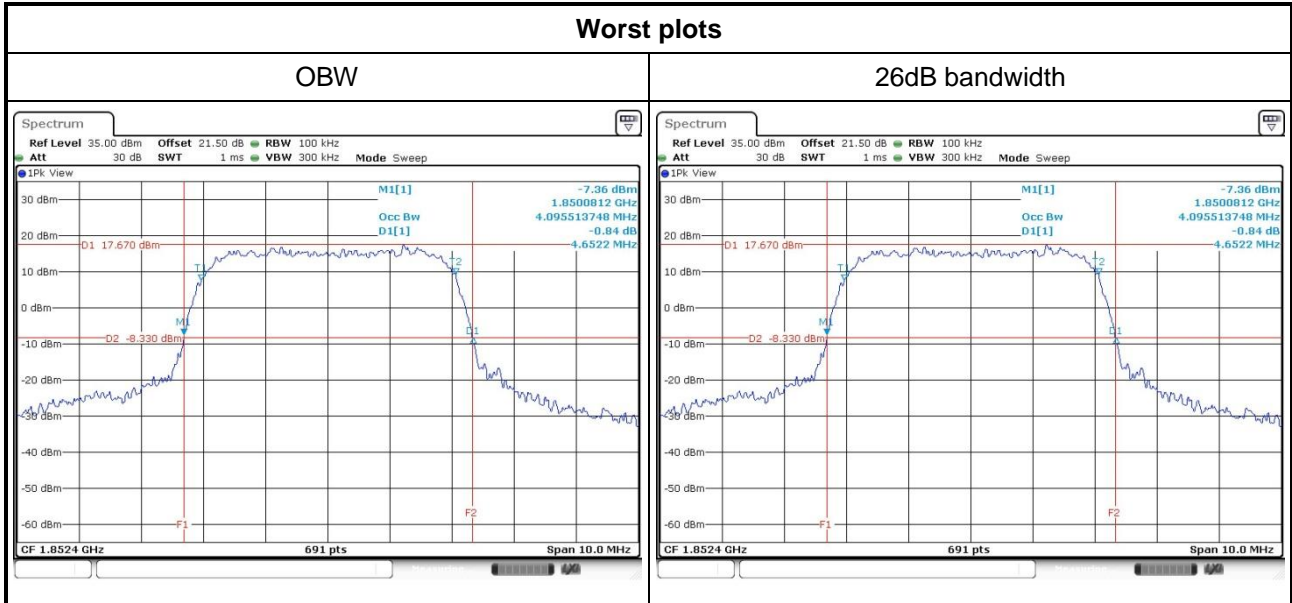
1. Set RBW = 100 kHz, VBW = 300 kHz for WCDMA  
Set RBW = 20 / 50 / 100 / 200 / 200 / 300 KHz , VBW = 100 / 200 / 300 / 1000 / 1000 / 1000 kHz, for channel bandwidth 1.4 / 3 / 5 / 10 / 15 / 20 ,for LTE channel bandwidth 3 / 5 / 10 MHz
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, 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

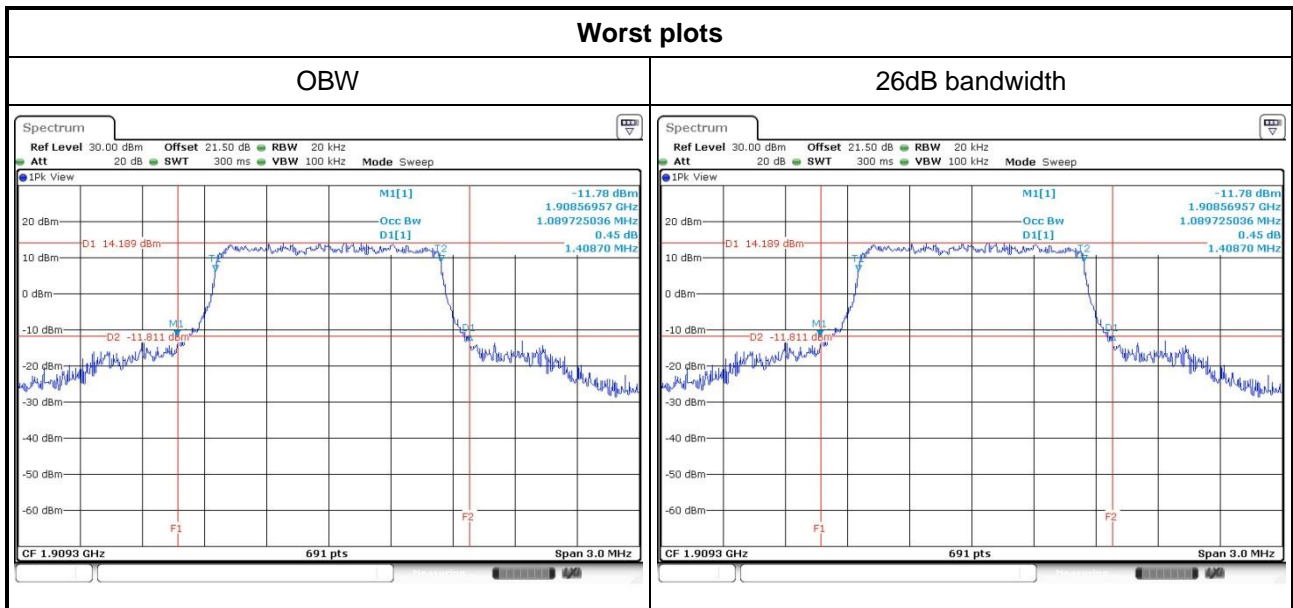


### 3.5.3 Test Result of Occupied Bandwidth

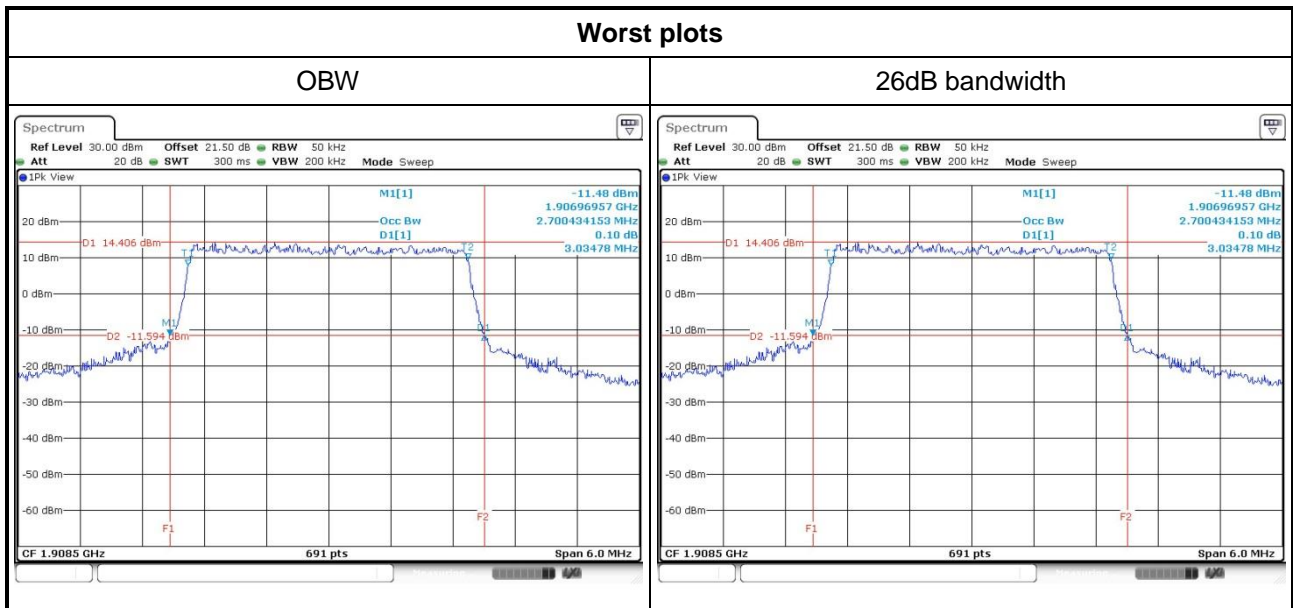
MODE	Channel	Frequency (MHz)	OBW (MHz)	26dB BW (MHz)
WCDMA BAND II	9262	1852.4	4.10	4.6522
WCDMA BAND II	9400	1880.0	4.08	4.6377
WCDMA BAND II	9538	1907.6	4.07	4.6377



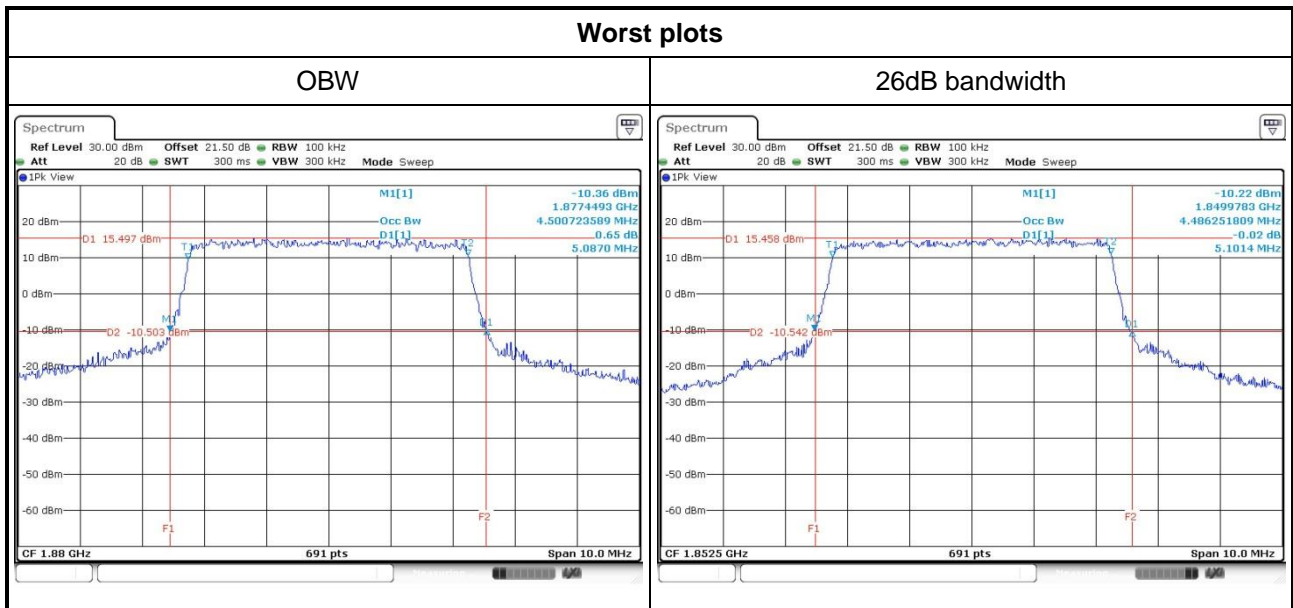
Mode	BW (MHz)	Modulation	Channel	Frequency (MHz)	26dB BW (MHz)	99% OBW (MHz)
LTE Band 2	1.4	QPSK	18607	1850.7	1.3000	1.09
LTE Band 2	1.4	QPSK	18900	1880	1.3478	1.09
LTE Band 2	1.4	QPSK	19193	1909.3	1.4087	1.09
LTE Band 2	1.4	16QAM	18607	1850.7	1.31739	1.09
LTE Band 2	1.4	16QAM	18900	1880	1.33478	1.09
LTE Band 2	1.4	16QAM	19193	1909.3	1.32609	1.09



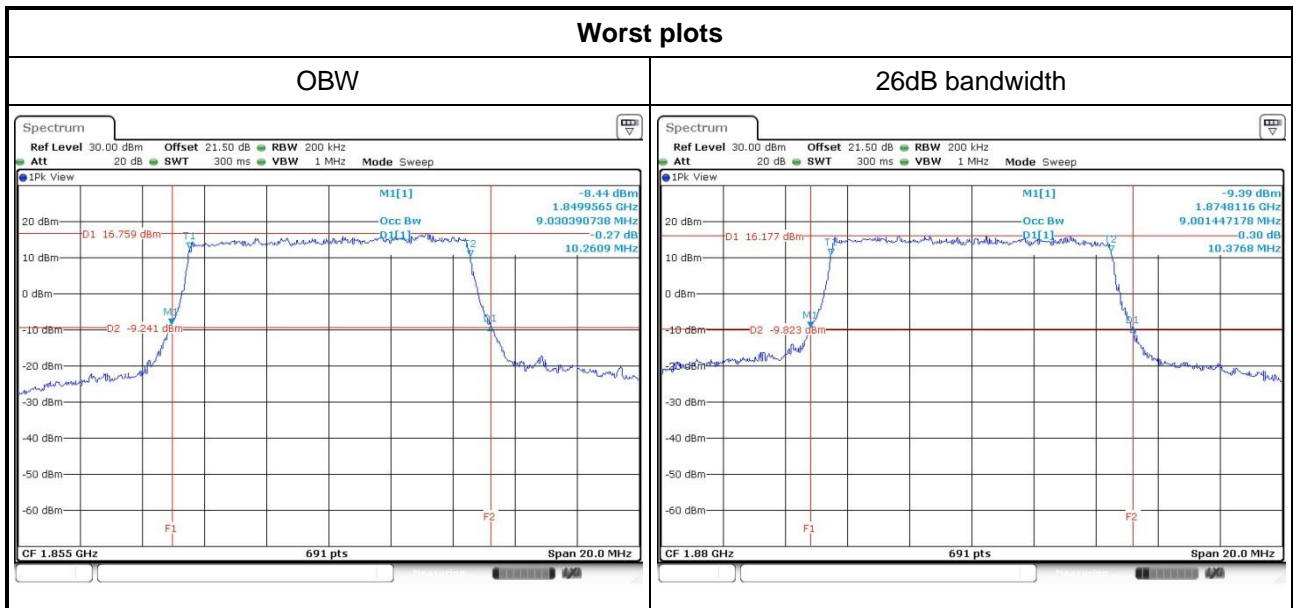
Mode	BW (MHz)	Modulation	Channel	Frequency (MHz)	26dB BW (MHz)	99% OBW (MHz)
LTE Band 2	3	QPSK	18615	1851.5	2.97	2.69
LTE Band 2	3	QPSK	18900	1880	2.97	2.69
LTE Band 2	3	QPSK	19185	1908.5	2.97	2.69
LTE Band 2	3	16QAM	18615	1851.5	2.99	2.69
LTE Band 2	3	16QAM	18900	1880	2.99	2.69
LTE Band 2	3	16QAM	19185	1908.5	3.03	2.70



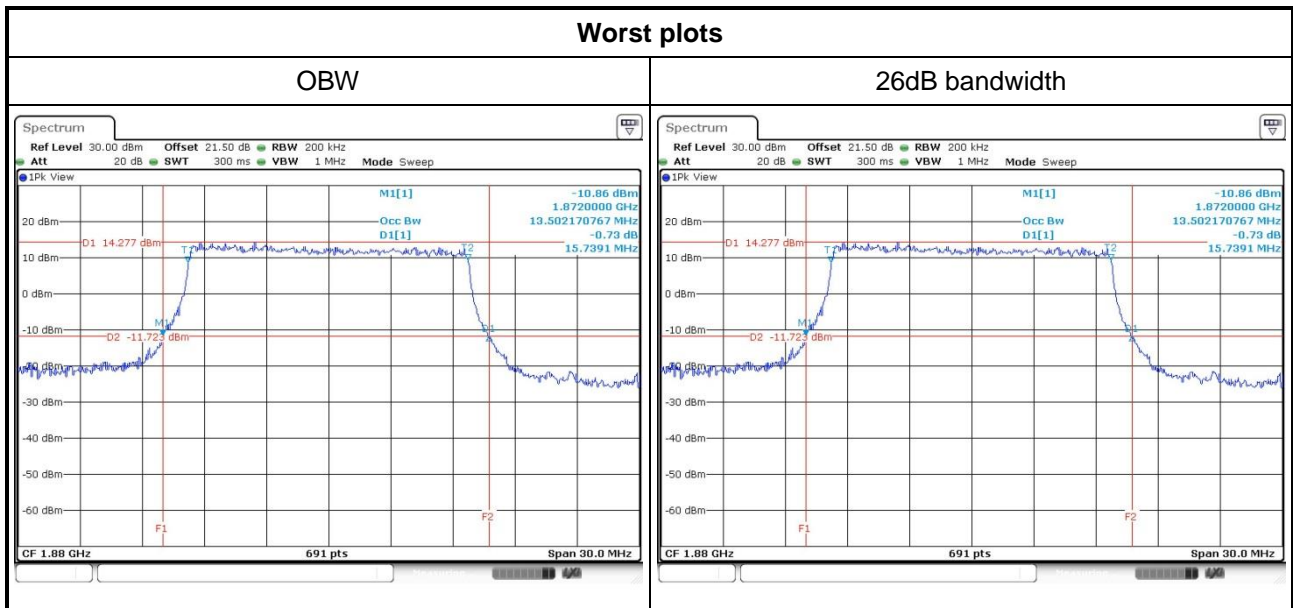
Mode	BW (MHz)	Modulation	Channel	Frequency (MHz)	26dB BW (MHz)	99% OBW (MHz)
LTE Band 2	5	QPSK	18625	1852.5	5.1014	4.49
LTE Band 2	5	QPSK	18900	1880	5.087	4.50
LTE Band 2	5	QPSK	19175	1907.5	5.087	4.49
LTE Band 2	5	16QAM	18625	1852.5	5.0435	4.49
LTE Band 2	5	16QAM	18900	1880	5.058	4.49
LTE Band 2	5	16QAM	19175	1907.5	5.087	4.49



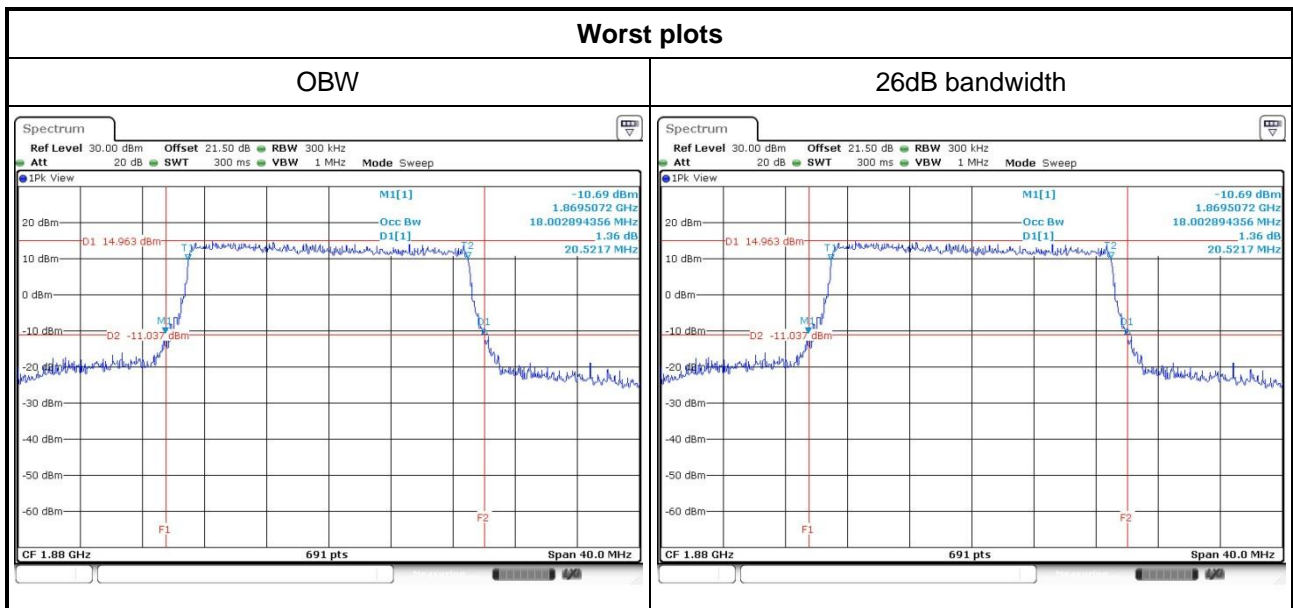
Mode	BW (MHz)	Modulation	Channel	Frequency (MHz)	26dB BW (MHz)	99% OBW (MHz)
LTE Band 2	10	QPSK	18650	1855	10.2609	9.03
LTE Band 2	10	QPSK	18900	1880	10.3768	9.00
LTE Band 2	10	QPSK	19150	1905	10.3478	9.03
LTE Band 2	10	16QAM	18650	1855	10.1449	8.97
LTE Band 2	10	16QAM	18900	1880	10.2029	8.97
LTE Band 2	10	16QAM	19150	1905	10.2609	8.97



Mode	BW (MHz)	Modulation	Channel	Frequency (MHz)	26dB BW (MHz)	99% OBW (MHz)
LTE Band 2	15	QPSK	18675	1857.5	15.3043	13.46
LTE Band 2	15	QPSK	18900	1880	15.4348	13.50
LTE Band 2	15	QPSK	19125	1902.5	15.3478	13.46
LTE Band 2	15	16QAM	18675	1857.5	15.6957	13.46
LTE Band 2	15	16QAM	18900	1880	15.7391	13.50
LTE Band 2	15	16QAM	19125	1902.5	15.6522	13.42



Mode	BW (MHz)	Modulation	Channel	Frequency (MHz)	26dB BW (MHz)	99% OBW (MHz)
LTE Band 2	20	QPSK	18700	1860	20.2319	17.89
LTE Band 2	20	QPSK	18900	1880	20.5217	18.00
LTE Band 2	20	QPSK	19100	1900	20.1159	17.89
LTE Band 2	20	16QAM	18700	1860	20.4058	17.95
LTE Band 2	20	16QAM	18900	1880	20.3478	18.00
LTE Band 2	20	16QAM	19100	1900	20.2899	17.89





## 3.6 Peak to Average Ratio

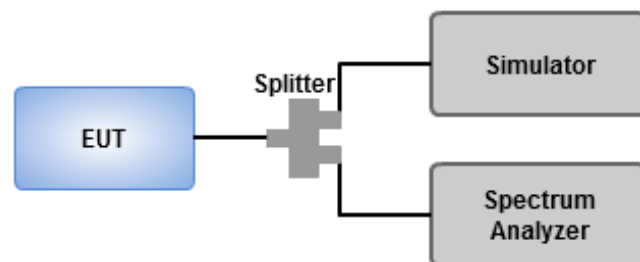
### 3.6.1 Limit of Peak to Average Ratio

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

### 3.6.2 Test Procedures

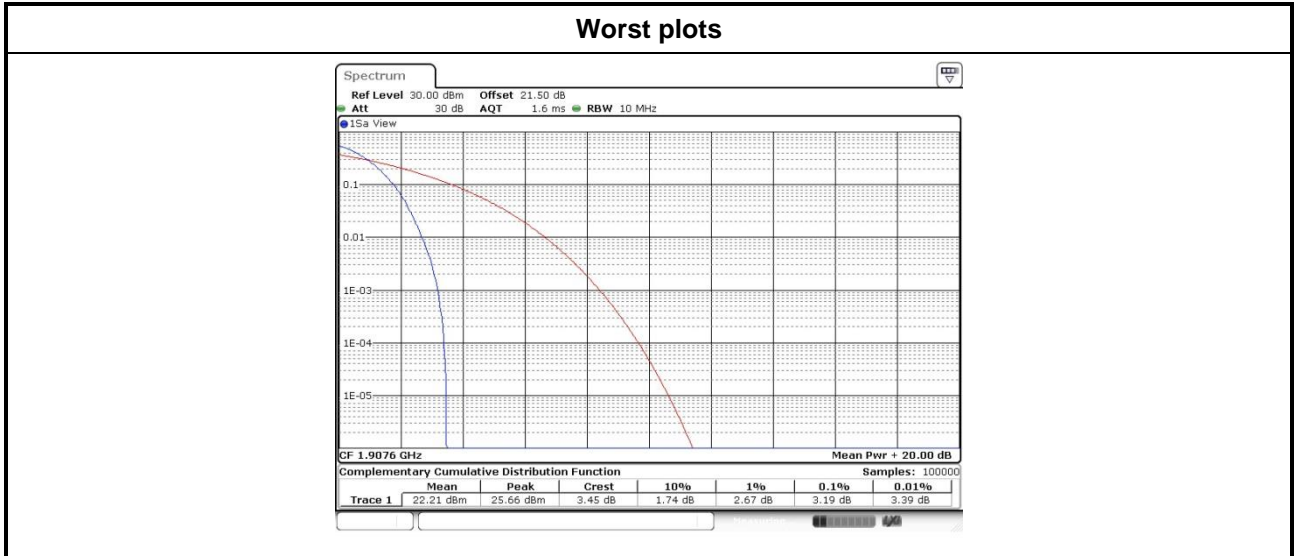
1. Enable CCDF function of spectrum analyzer and set RBW=10MHz
2. Set the number of counts to a value that stabilizes the measured CCDF curve
3. Record the maximum PAPR level associated with a probability of 0.1%.

### 3.6.3 Test Setup

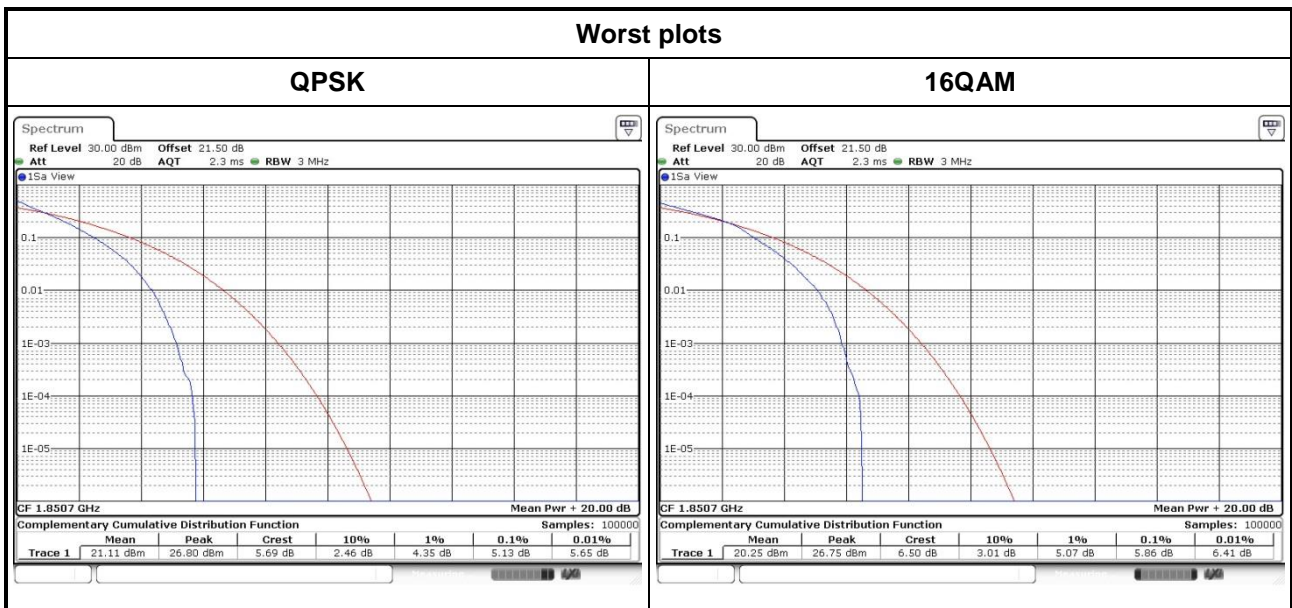


### 3.6.4 Test Result of Peak to Average ratio

MODE	Channel	Frequency (MHz)	Peak to Average ratio (dB)
WCDMA BAND II	9262	1852.4	3.16
WCDMA BAND II	9400	1880.0	2.96
WCDMA BAND II	9538	1907.6	3.19



MODE	BW (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 5	1.4	QPSK	18607	1850.7	5.13
LTE Band 5	1.4	QPSK	18900	1880	4.64
LTE Band 5	1.4	QPSK	19193	1909.3	4.72
LTE Band 5	1.4	16QAM	18607	1850.7	5.86
LTE Band 5	1.4	16QAM	18900	1880	5.51
LTE Band 5	1.4	16QAM	19193	1909.3	5.57



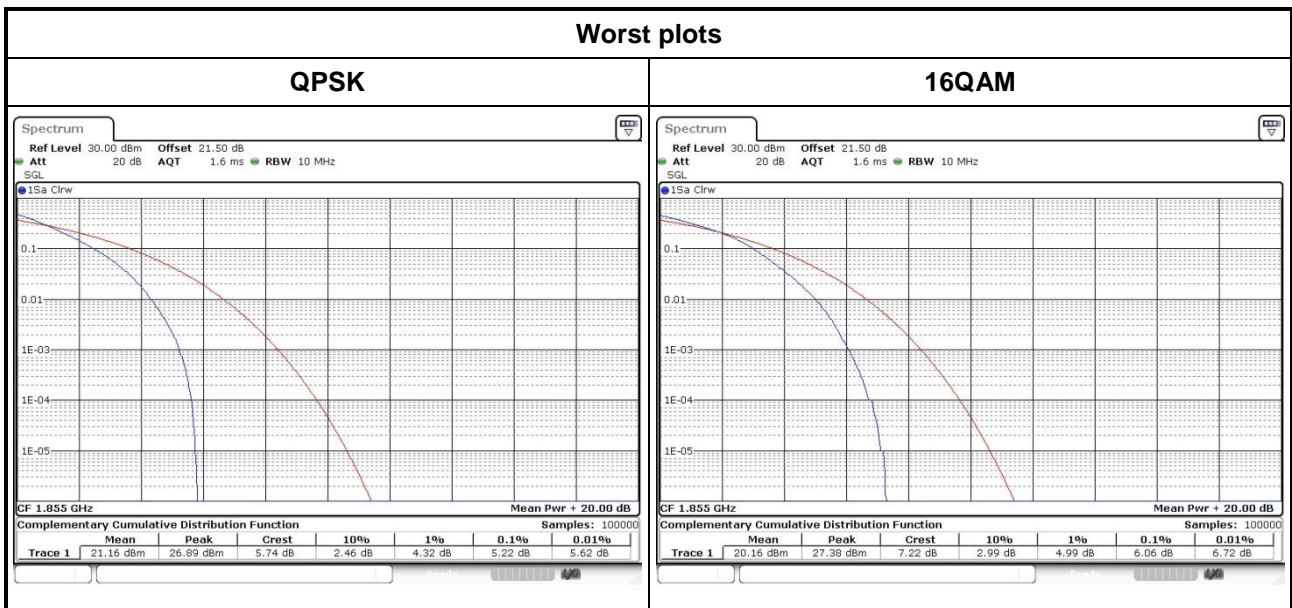
MODE	BW (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 5	3	QPSK	18615	1851.5	5.07
LTE Band 5	3	QPSK	18900	1880	4.43
LTE Band 5	3	QPSK	19185	1908.5	4.75
LTE Band 5	3	16QAM	18615	1851.5	6.23
LTE Band 5	3	16QAM	18900	1880	5.42
LTE Band 5	3	16QAM	19185	1908.5	5.39



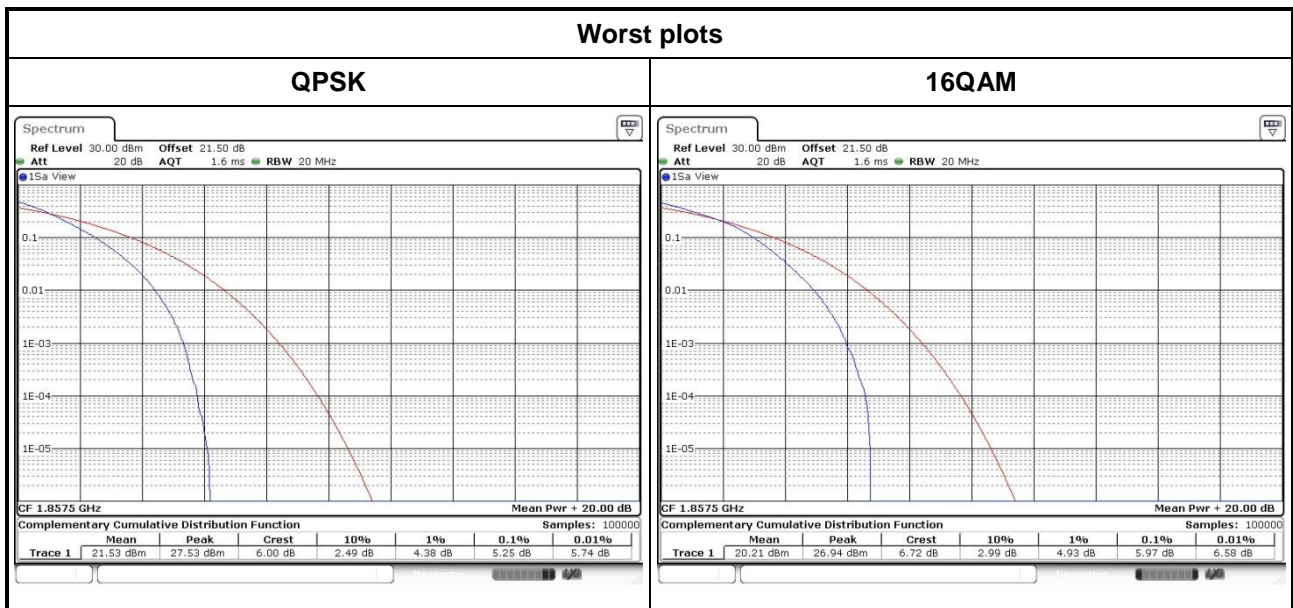
MODE	BW (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 5	5	QPSK	18625	1852.5	5.07
LTE Band 5	5	QPSK	18900	1880	4.64
LTE Band 5	5	QPSK	19175	1907.5	4.49
LTE Band 5	5	16QAM	18625	1852.5	6.03
LTE Band 5	5	16QAM	18900	1880	5.39
LTE Band 5	5	16QAM	19175	1907.5	5.51



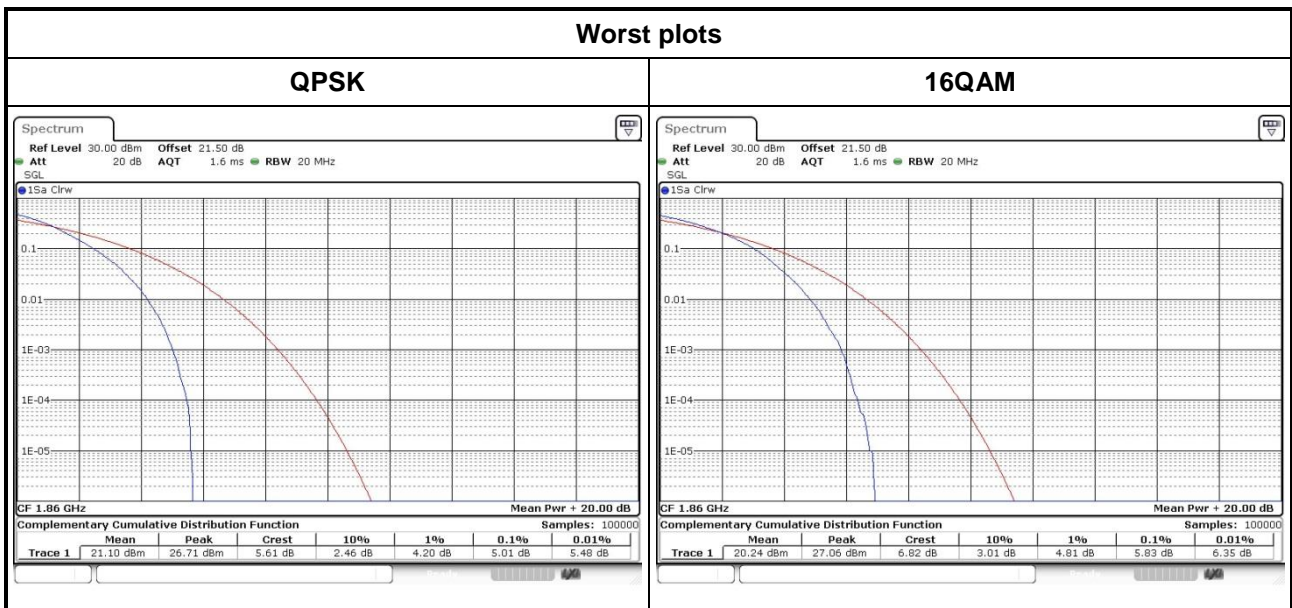
MODE	BW (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 5	10	QPSK	18650	1855	5.22
LTE Band 5	10	QPSK	18900	1880	4.72
LTE Band 5	10	QPSK	19150	1905	4.64
LTE Band 5	10	16QAM	18650	1855	6.06
LTE Band 5	10	16QAM	18900	1880	5.42
LTE Band 5	10	16QAM	19150	1905	5.45



MODE	BW (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 5	15	QPSK	18675	1857.5	5.25
LTE Band 5	15	QPSK	18900	1880	4.64
LTE Band 5	15	QPSK	19125	1902.5	4.81
LTE Band 5	15	16QAM	18675	1857.5	5.97
LTE Band 5	15	16QAM	18900	1880	5.59
LTE Band 5	15	16QAM	19125	1902.5	5.48



MODE	BW (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average ratio (dB)
LTE Band 5	20	QPSK	18700	1860	5.01
LTE Band 5	20	QPSK	18900	1880	4.75
LTE Band 5	20	QPSK	19100	1900	4.96
LTE Band 5	20	16QAM	18700	1860	5.83
LTE Band 5	20	16QAM	18900	1880	5.45
LTE Band 5	20	16QAM	19100	1900	5.68





## 3.7 Frequency Stability

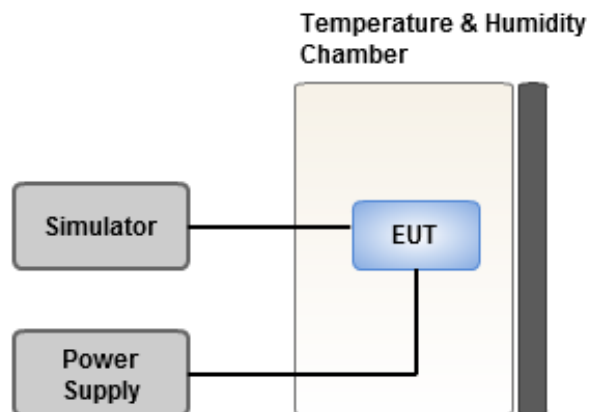
### 3.7.1 Limit of Frequency Stability

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. Temperature range is from -30~55°C and voltage range is from lowest to highest working 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

WCDMA Band II			
Temperature (°C)	Voltage (ac)	Frequency Drift (ppm)	Limit (ppm)
55	7.40	0.011	2.5
50	7.40	0.012	2.5
40	7.40	0.011	2.5
30	7.40	0.012	2.5
20	7.40	0.011	2.5
10	7.40	0.009	2.5
0	7.40	0.009	2.5
-10	7.40	0.010	2.5
-20	7.40	0.008	2.5
-30	7.40	0.009	2.5
20	8.14	0.012	2.5
20	6.66	0.009	2.5

LTE Band 2, CB: 1.4MHz			
Temperature (°C)	Voltage (ac)	Frequency Drift (ppm)	Limit (ppm)
55	7.40	0.013	2.5
50	7.40	0.013	2.5
40	7.40	0.011	2.5
30	7.40	0.011	2.5
20	7.40	0.009	2.5
10	7.40	0.008	2.5
0	7.40	0.006	2.5
-10	7.40	0.010	2.5
-20	7.40	0.010	2.5
-30	7.40	0.009	2.5
20	8.14	0.012	2.5
20	6.66	0.012	2.5

<b>LTE Band 2, CB: 3MHz</b>			
<b>Temperature (°C)</b>	<b>Voltage (ac)</b>	<b>Frequency Drift (ppm)</b>	<b>Limit (ppm)</b>
55	7.40	0.012	2.5
50	7.40	0.011	2.5
40	7.40	0.012	2.5
30	7.40	0.011	2.5
20	7.40	0.011	2.5
10	7.40	0.013	2.5
0	7.40	0.010	2.5
-10	7.40	0.010	2.5
-20	7.40	0.009	2.5
-30	7.40	0.009	2.5
20	8.14	0.013	2.5
20	6.66	0.011	2.5

<b>LTE Band 2, CB: 5MHz</b>			
<b>Temperature (°C)</b>	<b>Voltage (ac)</b>	<b>Frequency Drift (ppm)</b>	<b>Limit (ppm)</b>
55	7.40	0.012	2.5
50	7.40	0.013	2.5
40	7.40	0.010	2.5
30	7.40	0.011	2.5
20	7.40	0.012	2.5
10	7.40	0.007	2.5
0	7.40	0.010	2.5
-10	7.40	0.009	2.5
-20	7.40	0.007	2.5
-30	7.40	0.010	2.5
20	8.14	0.013	2.5
20	6.66	0.010	2.5

<b>LTE Band 2, CB: 10MHz</b>			
<b>Temperature (°C)</b>	<b>Voltage (ac)</b>	<b>Frequency Drift (ppm)</b>	<b>Limit (ppm)</b>
55	7.40	0.015	2.5
50	7.40	0.013	2.5
40	7.40	0.012	2.5
30	7.40	0.012	2.5
20	7.40	0.011	2.5
10	7.40	0.013	2.5
0	7.40	0.012	2.5
-10	7.40	0.011	2.5
-20	7.40	0.010	2.5
-30	7.40	0.010	2.5
20	8.14	0.013	2.5
20	6.66	0.012	2.5

<b>LTE Band 2, CB: 15MHz</b>			
<b>Temperature (°C)</b>	<b>Voltage (ac)</b>	<b>Frequency Drift (ppm)</b>	<b>Limit (ppm)</b>
55	7.40	0.013	2.5
50	7.40	0.011	2.5
40	7.40	0.012	2.5
30	7.40	0.014	2.5
20	7.40	0.013	2.5
10	7.40	0.010	2.5
0	7.40	0.010	2.5
-10	7.40	0.013	2.5
-20	7.40	0.011	2.5
-30	7.40	0.010	2.5
20	8.14	0.014	2.5
20	6.66	0.011	2.5

<b>LTE Band 2, CB: 20MHz</b>			
<b>Temperature (°C)</b>	<b>Voltage (ac)</b>	<b>Frequency Drift (ppm)</b>	<b>Limit (ppm)</b>
55	7.40	0.013	2.5
50	7.40	0.012	2.5
40	7.40	0.014	2.5
30	7.40	0.015	2.5
20	7.40	0.013	2.5
10	7.40	0.012	2.5
0	7.40	0.012	2.5
-10	7.40	0.015	2.5
-20	7.40	0.013	2.5
-30	7.40	0.014	2.5
20	8.14	0.014	2.5
20	6.66	0.013	2.5

## 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, 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 Hsiang. Location map can be found on our website <http://www.icertifi.com.tw>.

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