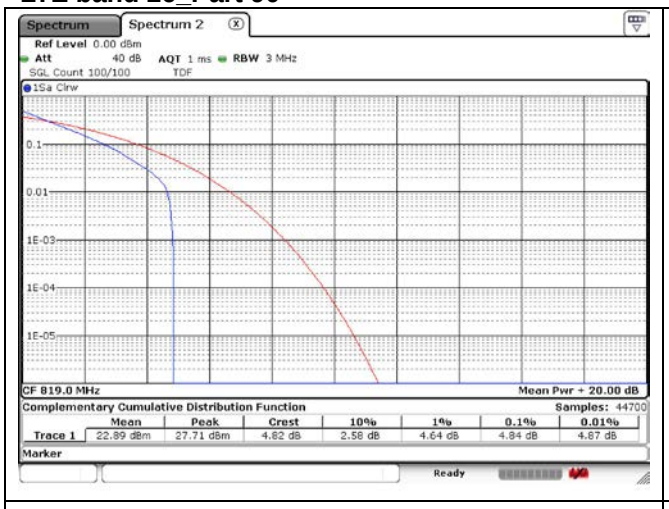
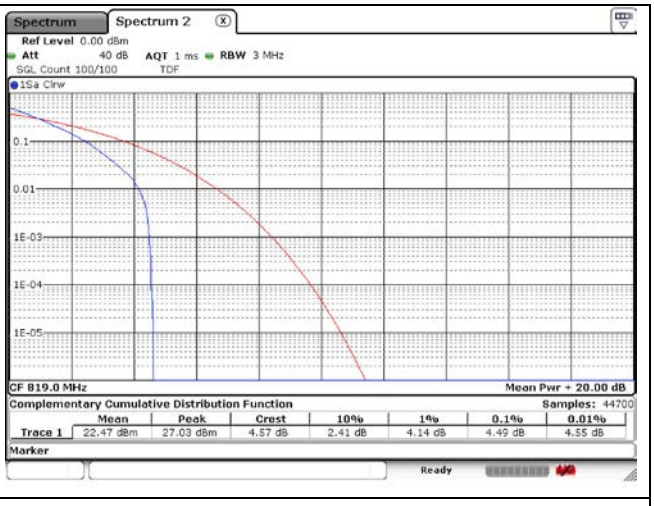
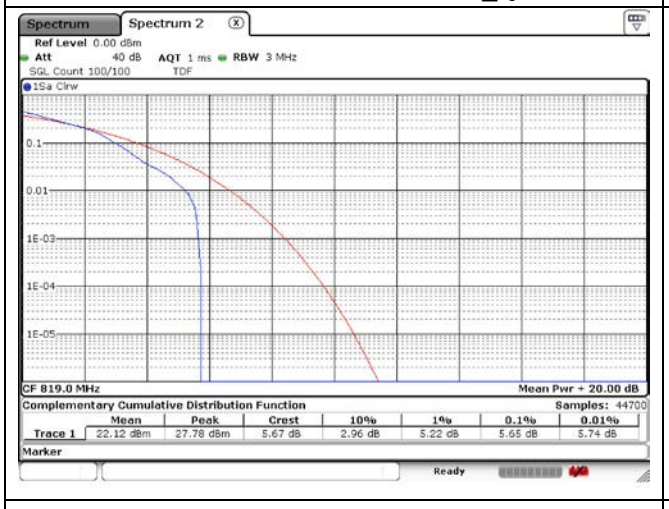
LTE band 26_Part 90



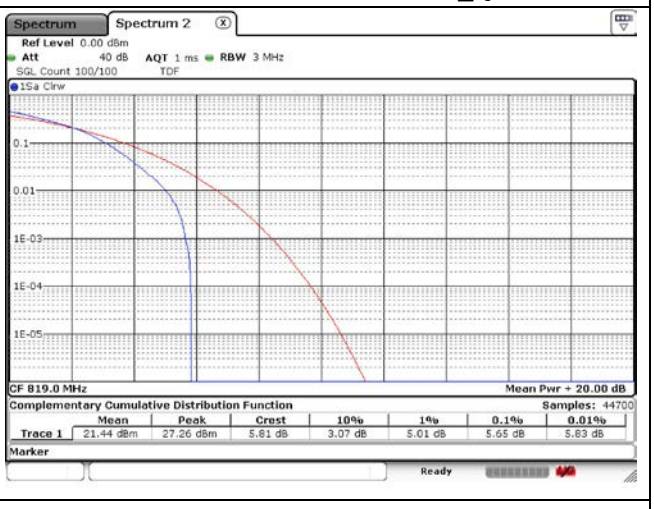
1.4 ㎒ Middle Channel - Full RB_QPSK



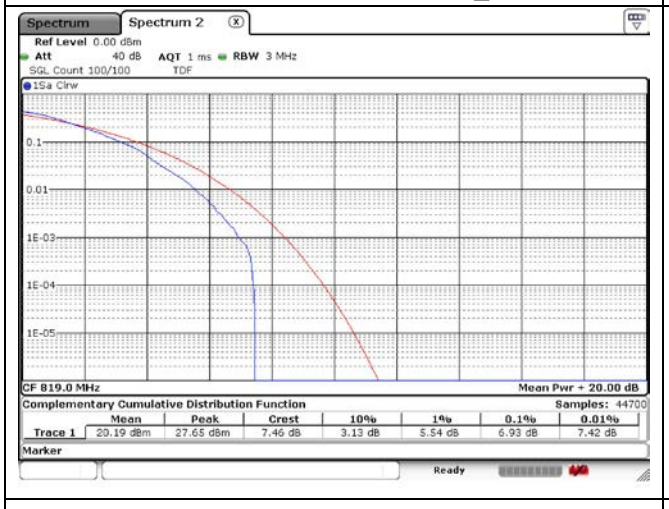
3 ㎒ Middle Channel - Full RB_QPSK



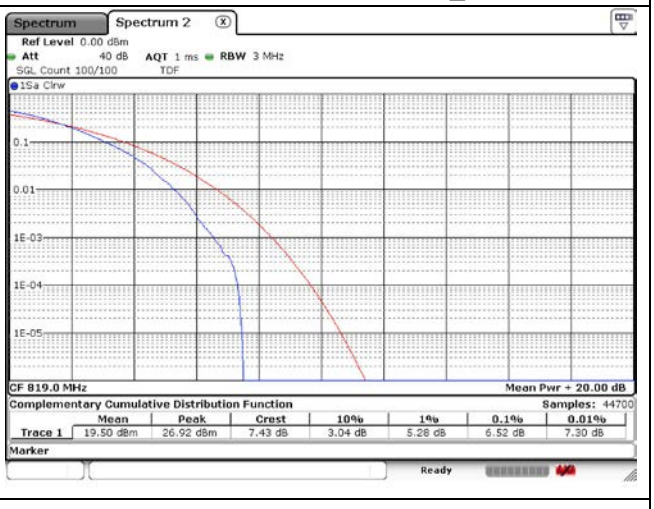
1.4 ㎒ Middle Channel - Full RB_16QAM



3 ㎒ Middle Channel - Full RB_16QAM

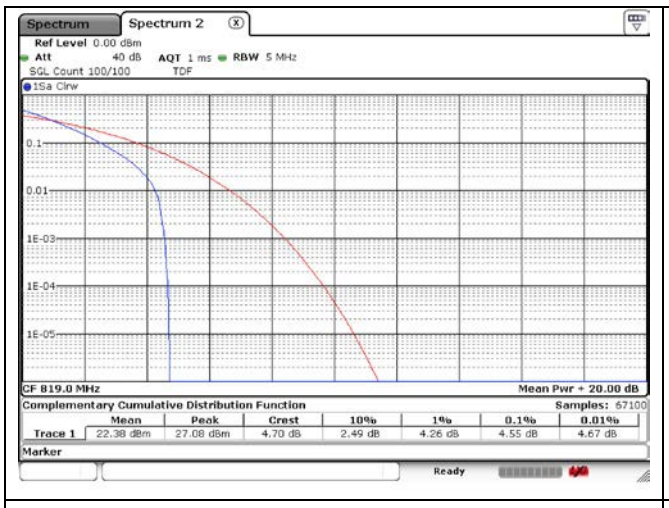


1.4 ㎒ Middle Channel - Full RB_64QAM

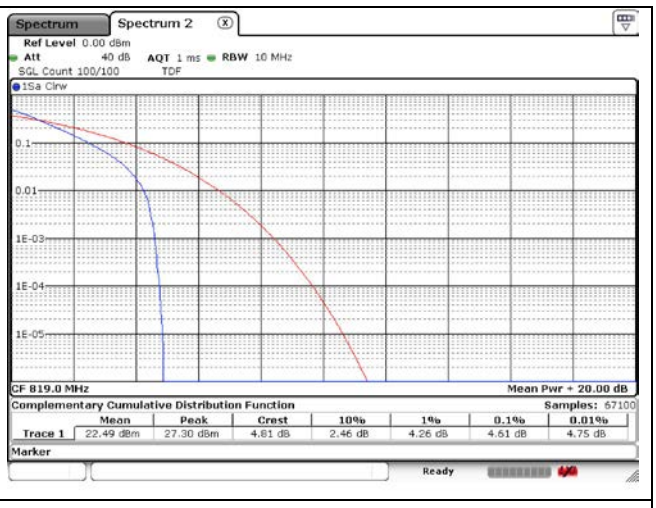


3 ㎒ Middle Channel - Full RB_64QAM

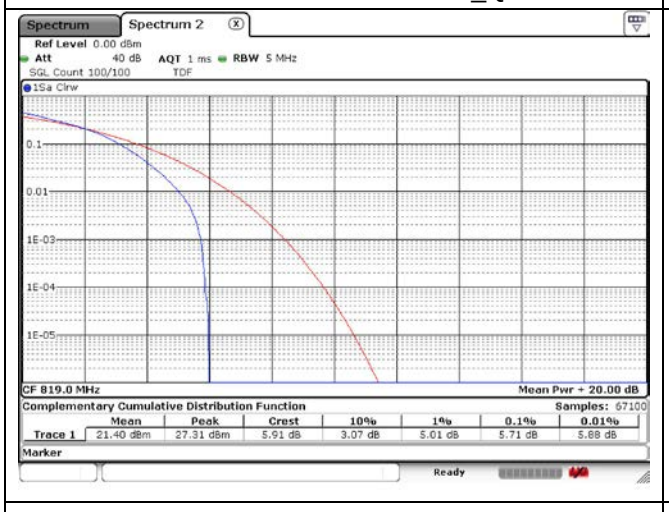
LTE band 26_Part 90



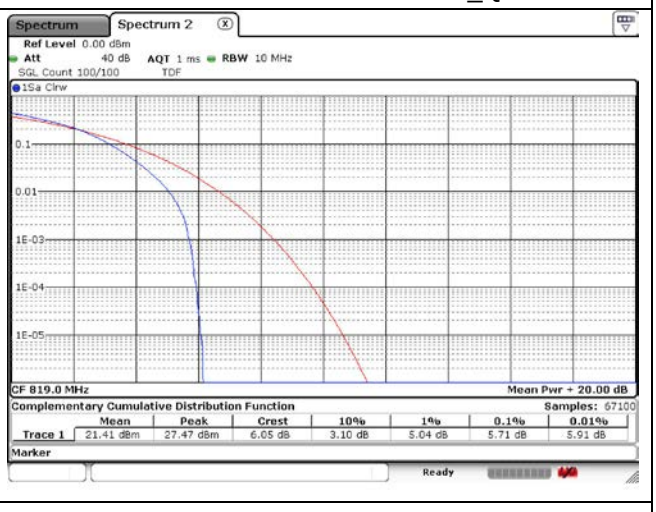
5 ㎒ Middle Channel - Full RB_QPSK



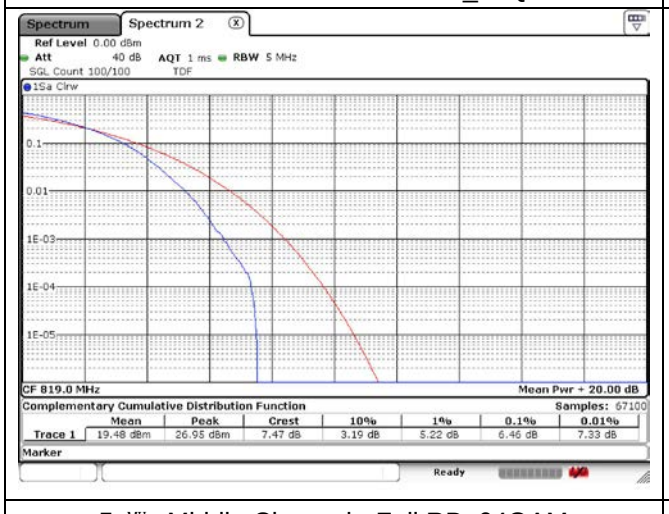
10 ㎒ Middle Channel - Full RB_QPSK



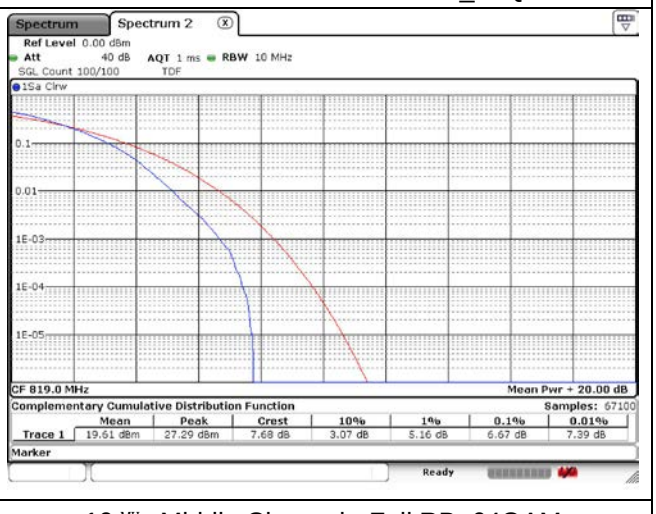
5 ㎒ Middle Channel - Full RB_16QAM



10 ㎒ Middle Channel - Full RB_16QAM

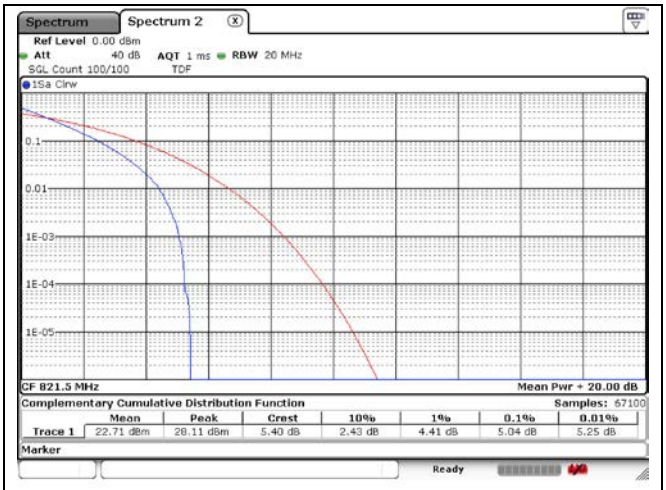


5 ㎒ Middle Channel - Full RB_64QAM

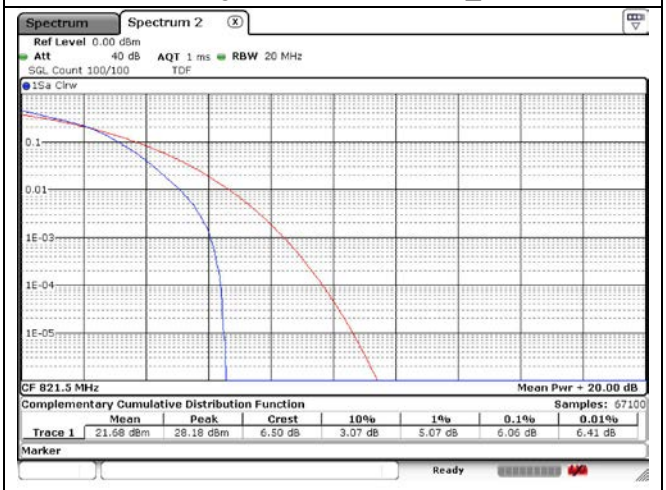


10 ㎒ Middle Channel - Full RB_64QAM

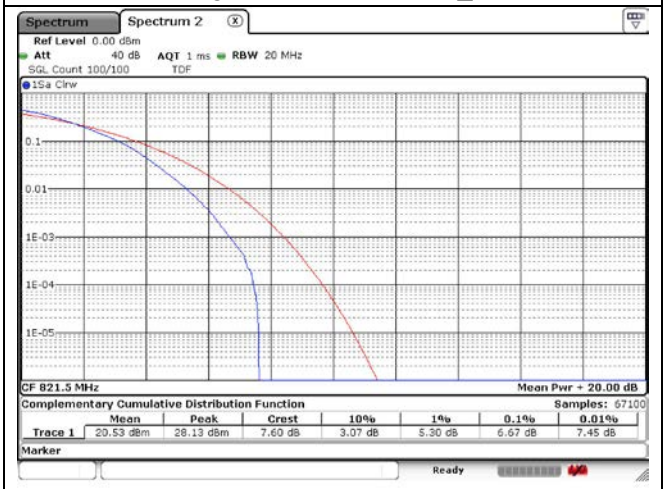
LTE band 26_Part 90



15 ㎒ High Channel - Full RB_QPSK



15 ㎒ High Channel - Full RB_16QAM



15 ㎒ High Channel - Full RB_64QAM

6. Spurious Emissions at Antenna Terminal

6.1. Limit

FCC
- §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) ㎥.

- §90.691(a), out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 ㎑, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log_{10} (f / 6.1) decibels or 50 + 10 Log_{10} (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 ㎑.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 ㎑, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 Log_{10} (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 ㎑.

IC
- RSS-132 Issue 4
5.5, Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

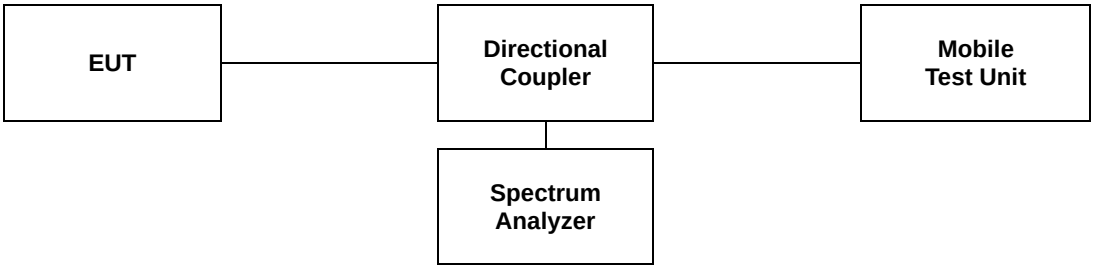
(i) In the first 1.0 ㎒ band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1 % of the occupied bandwidth shall be attenuated (in ㎥) below the transmitter output power P (㎥ W) by at least 43 + 10 log_{10} p (watts).

(ii) After the first 1.0 ㎒ immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 ㎑ bandwidth shall be attenuated (in ㎥) below the transmitter output power P (㎥ W) by at least 43 + 10 log_{10} p (watts). If the measurement is performed using 1 % of the occupied bandwidth, power integration over 100 ㎑ is required.

6.2. Test Procedure

The test follows section 5.7 of ANSI C63.26-2015.

1. Start frequency was set to 9 ㎑ and stop frequency was set to at least 10* the fundamental frequency.
2. Detector = Peak.
3. Trace mode = Max hold.
4. Sweep time = Auto couple.
5. The trace was allowed to stabilize.
6. Please see notes below for RBW and VBW settings.
7. For plots showing conducted spurious emissions from 9 ㎑ to 9 ㎓, all path loss of wide frequency range was investigated and compensated to spectrum analyzer as TDF function.



Note;

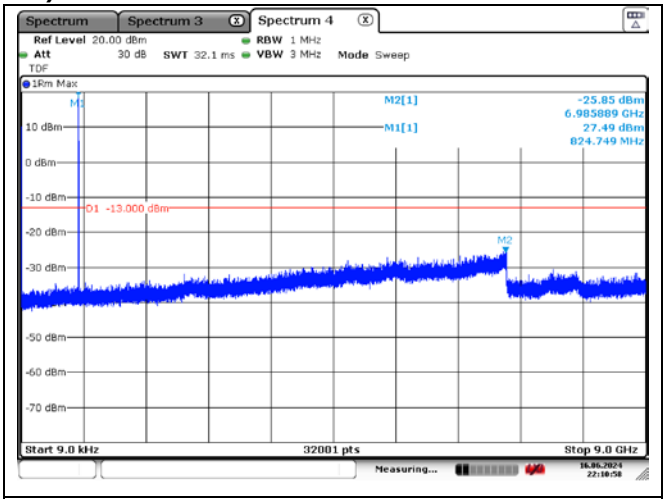
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 ㎑ or greater for frequencies less than 1 ㎓ and frequencies greater than 1 ㎓. However, in the 1 ㎒ bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two point, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 ㏈ below the transmitter power.

6.3. Test Results

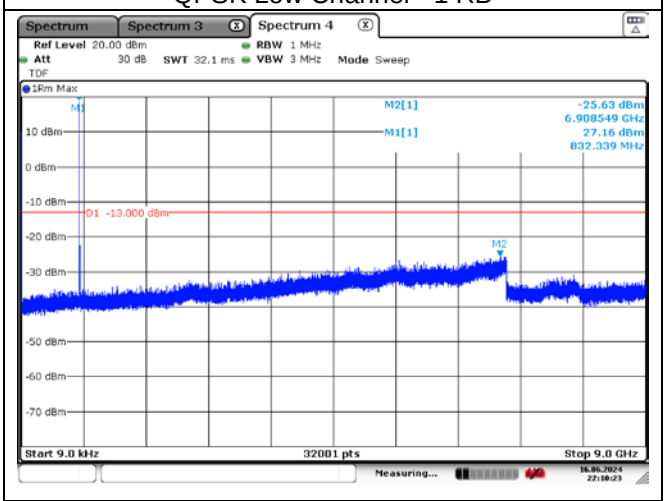
Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

- Test plots

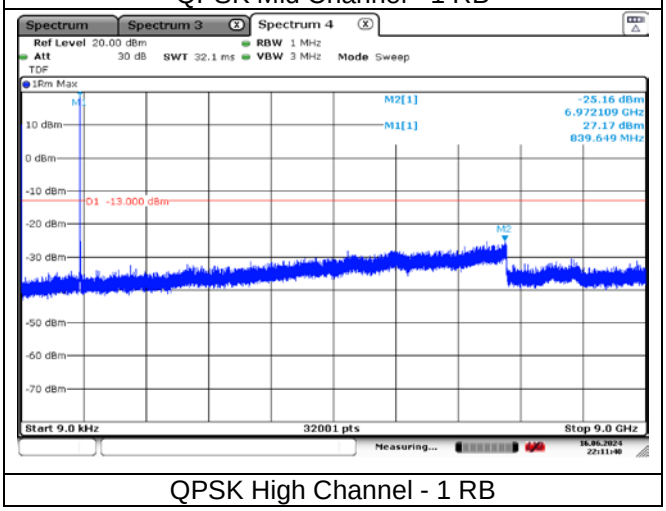
LTE band 26 (10 ㎒) (Part 22)



QPSK Low Channel - 1 RB

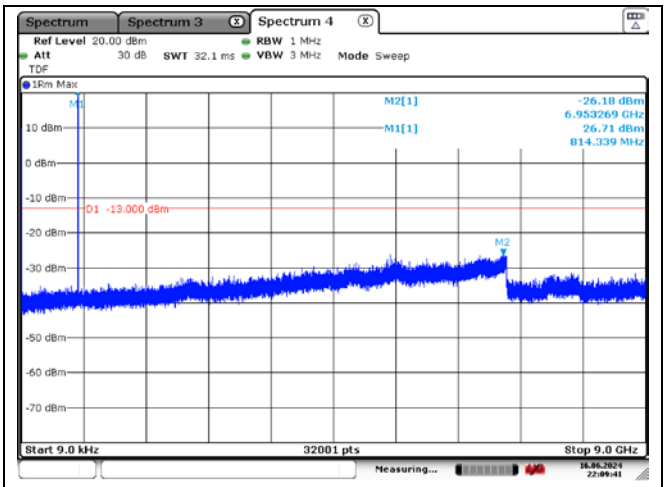


QPSK Mid Channel - 1 RB

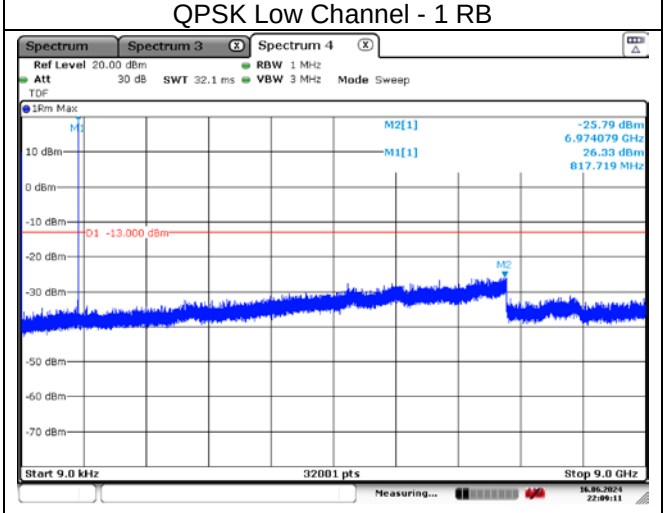


QPSK High Channel - 1 RB

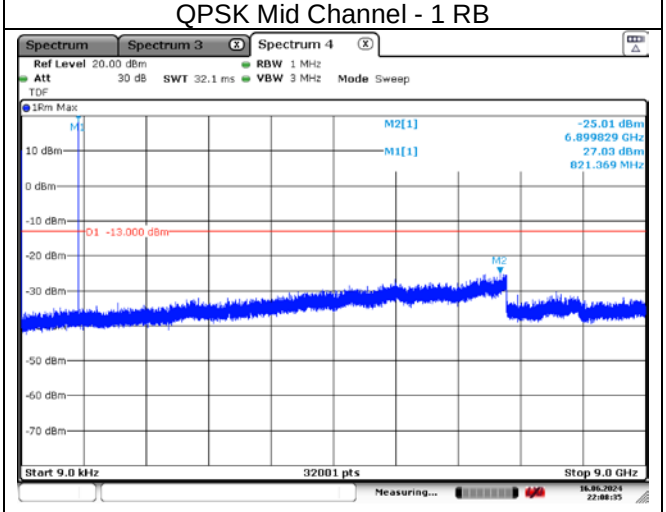
LTE band 26 (3 ㎒)
(Part 90)



QPSK Low Channel - 1 RB



QPSK Mid Channel - 1 RB



QPSK High Channel - 1 RB

7. Band Edge and Emission Mask

7.1. Limit

FCC
- §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) ㏈.

- §90.691(a), out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 ㎑, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log_{10} (f / 6.1) decibels or 50 + 10 Log_{10} (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 ㎑.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 ㎑, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 Log_{10} (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 ㎑.

IC
- RSS-132 Issue 4
5.5, Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

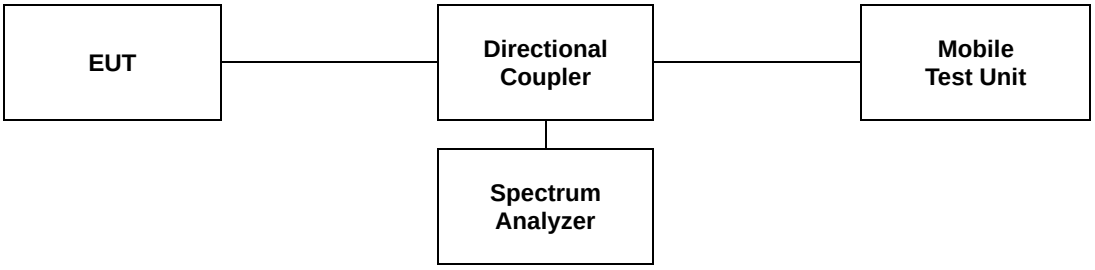
(i) In the first 1.0 ㎒ band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1 % of the occupied bandwidth shall be attenuated (in ㏈) below the transmitter output power P (㏈ W) by at least 43 + 10 log_{10} p (watts).

(ii) After the first 1.0 ㎒ immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 ㎑ bandwidth shall be attenuated (in ㏈) below the transmitter output power P (㏈ W) by at least 43 + 10 log_{10} p (watts). If the measurement is performed using 1 % of the occupied bandwidth, power integration over 100 ㎑ is required.

7.2. Test Procedure

The test follows section 5.7 of ANSI C63.26-2015.

a. Span was set large enough so as to capture all out of band emissions near the band edge.
b. RBW ≥ 1 % of OBW
c. VBW ≥ 3 x RBW.
d. Detector = RMS.
e. Trace mode = Average.
f. Sweep time = Auto.
g. The trace was allowed to stabilize.
h. All path loss of frequency range was investigated and compensated to spectrum analyzer as TDF function.

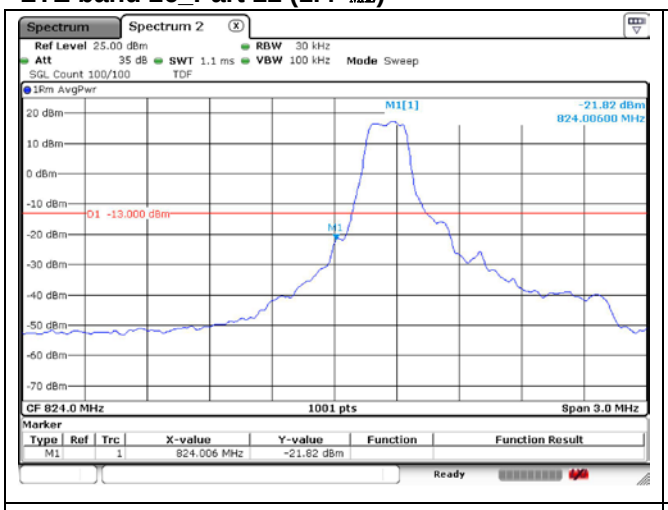


7.3. Test Results

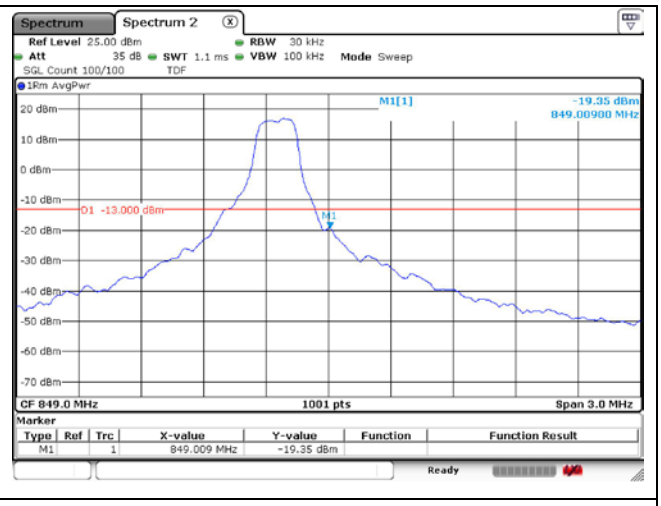
Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

- Test plots

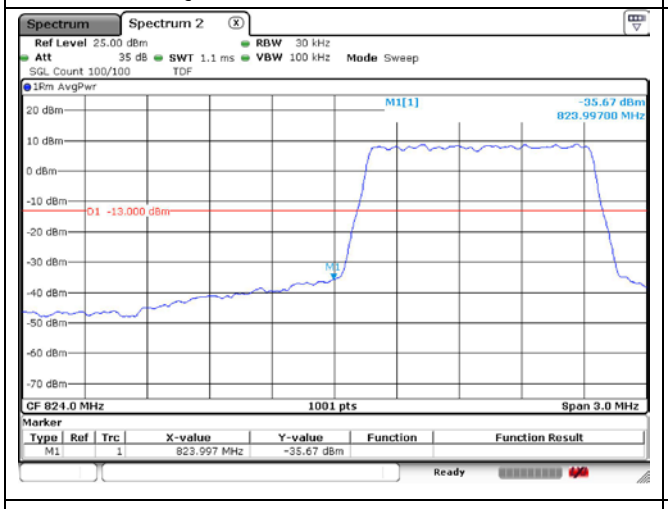
LTE band 26_Part 22 (1.4 ㎒)



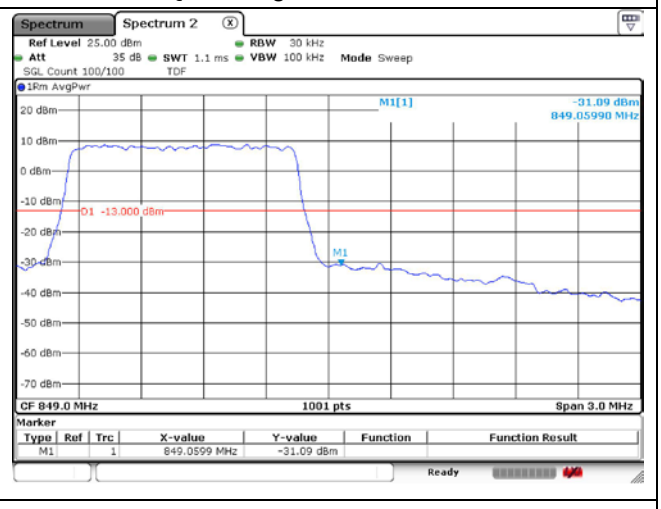
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB



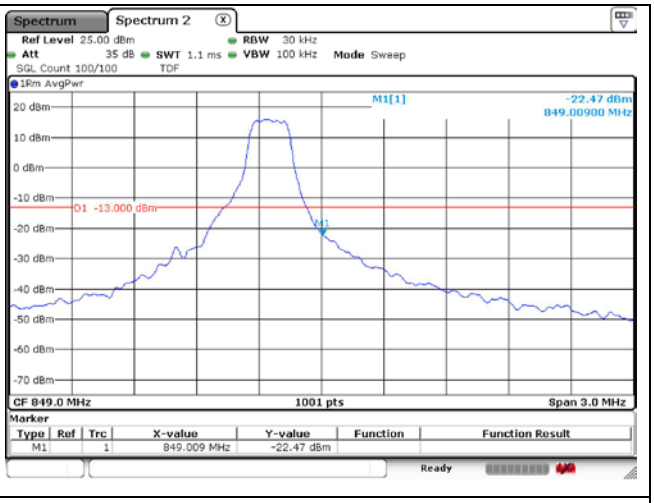
QPSK Low Channel - Full RB



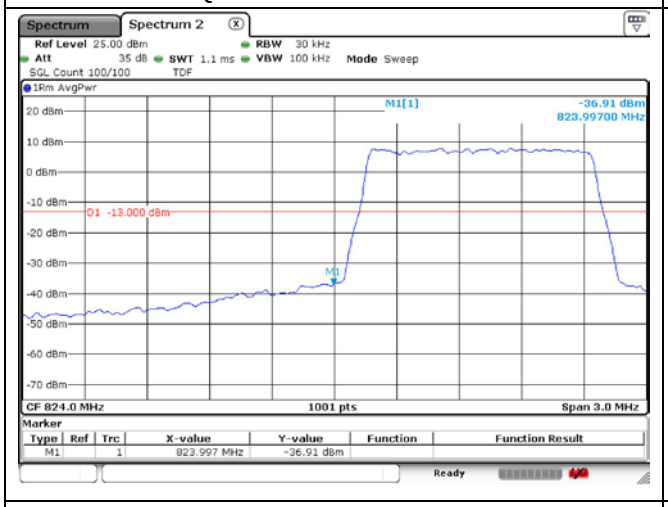
QPSK High Channel - Full RB

LTE band 26_Part 22 (1.4 ㎒)

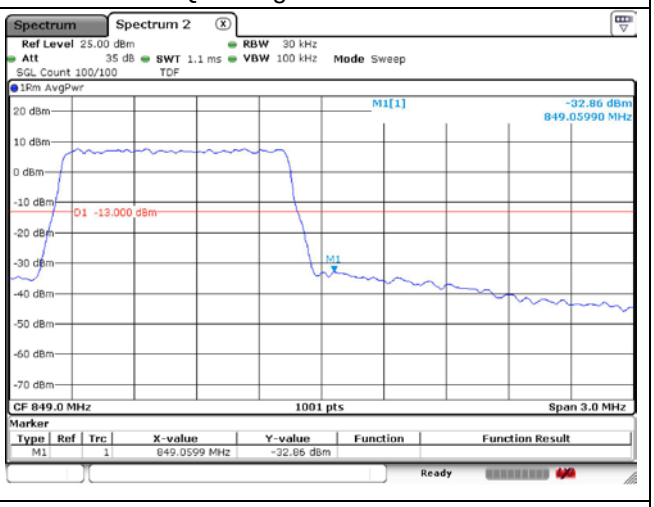
16QAM Low Channel - 1 RB



16QAM High Channel - 1 RB

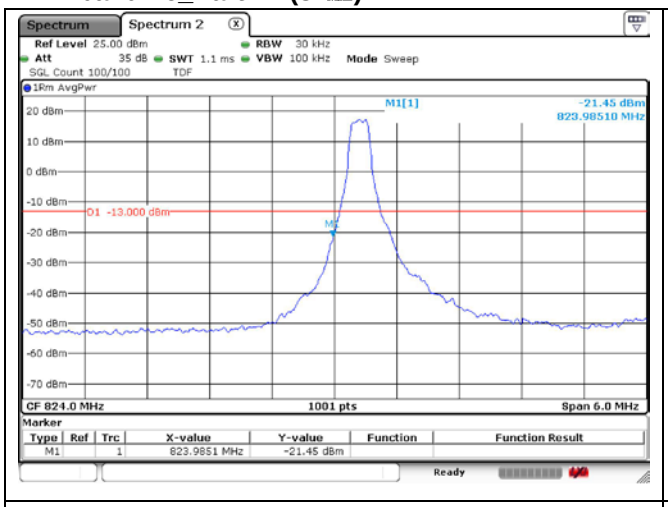


16QAM Low Channel - Full RB

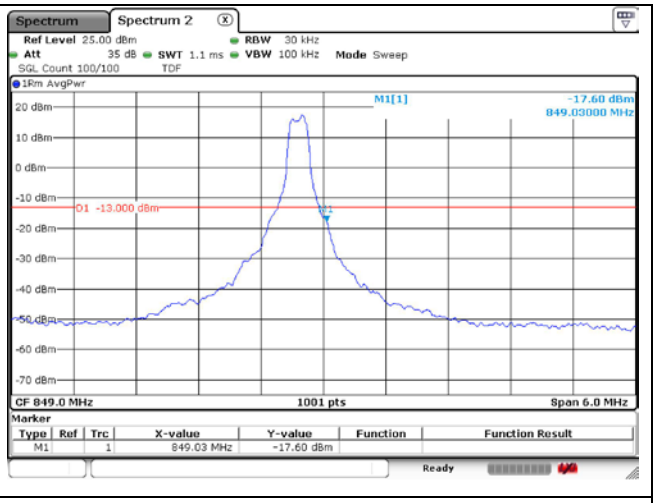


16QAM High Channel - Full RB

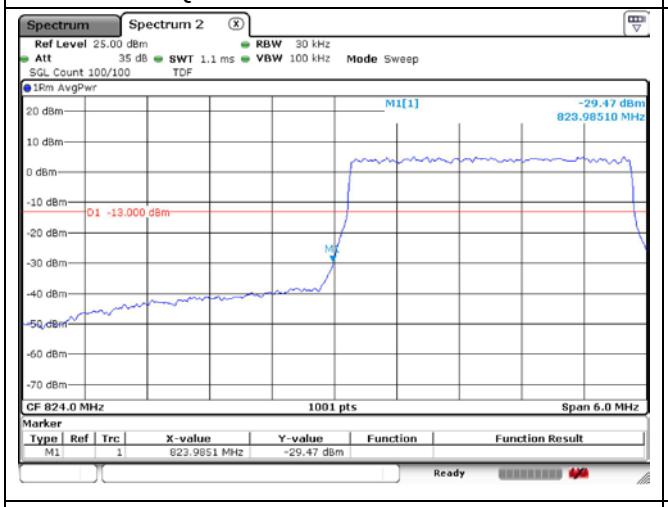
LTE band 26_Part 22 (3 ㎒)



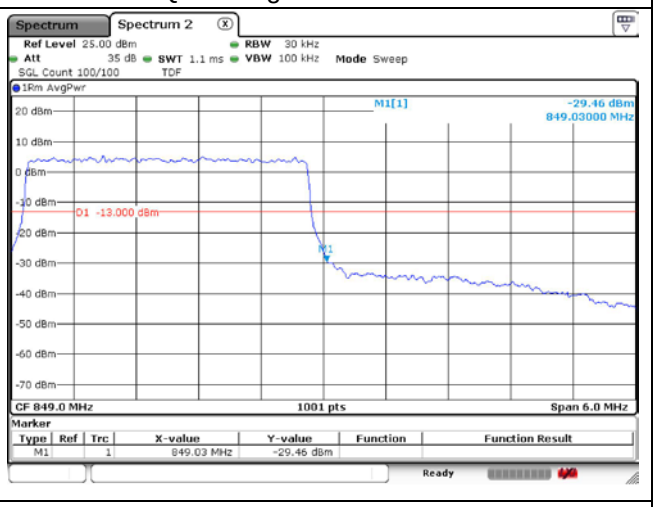
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB

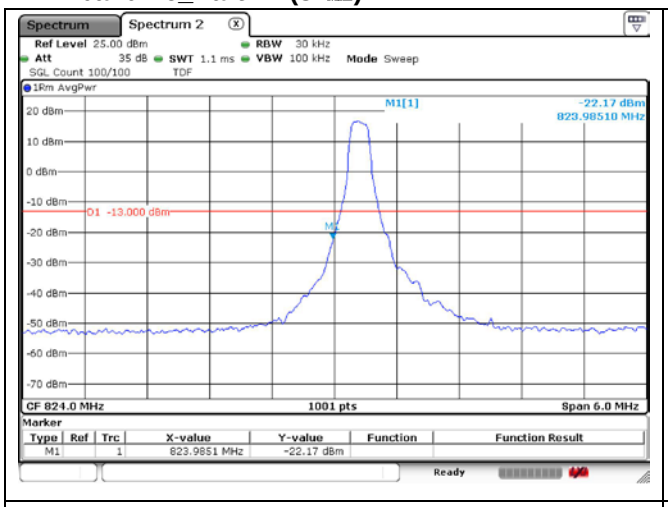


QPSK Low Channel - Full RB

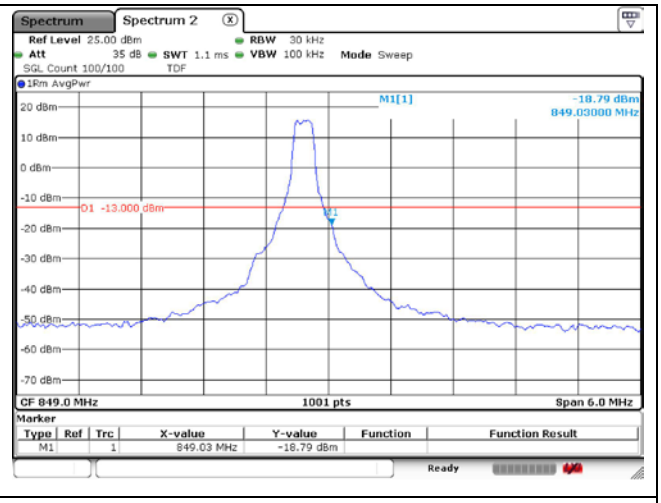


QPSK High Channel - Full RB

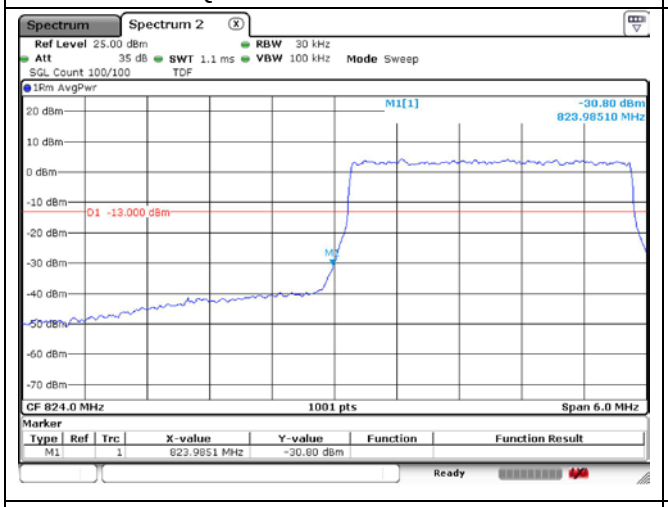
LTE band 26_Part 22 (3 ㎒)



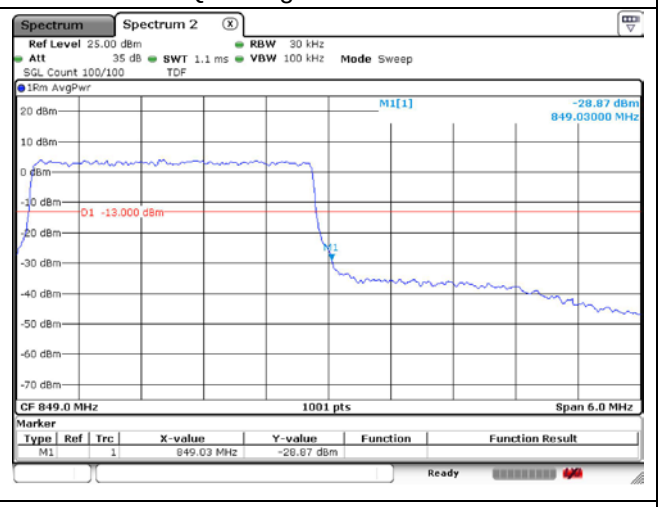
16QAM Low Channel - 1 RB



16QAM High Channel - 1 RB

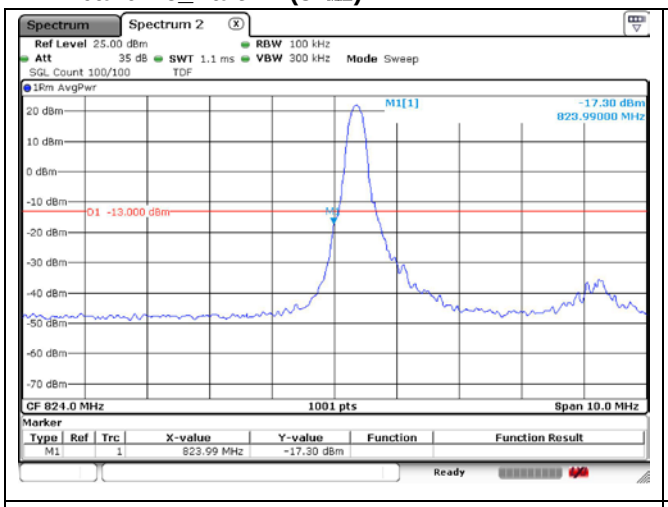


16QAM Low Channel - Full RB

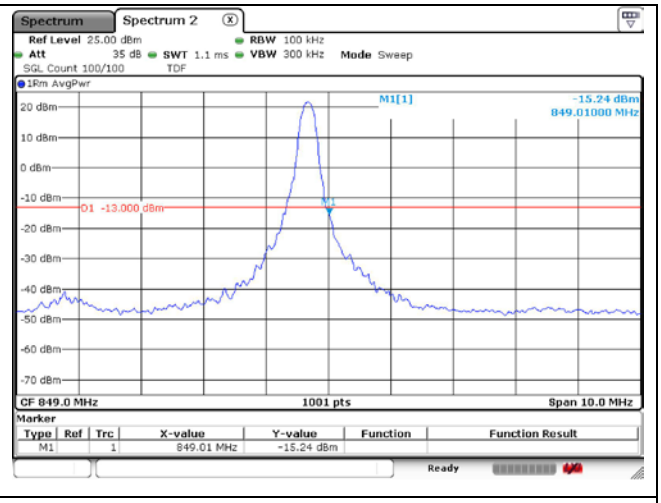


16QAM High Channel - Full RB

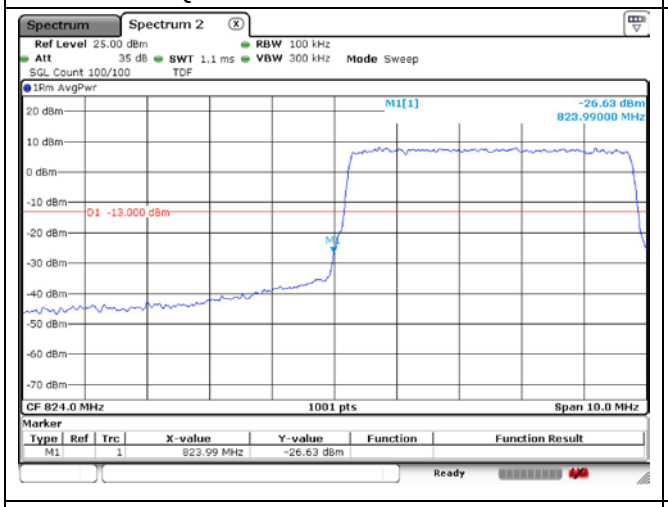
LTE band 26_Part 22 (5 ㎒)



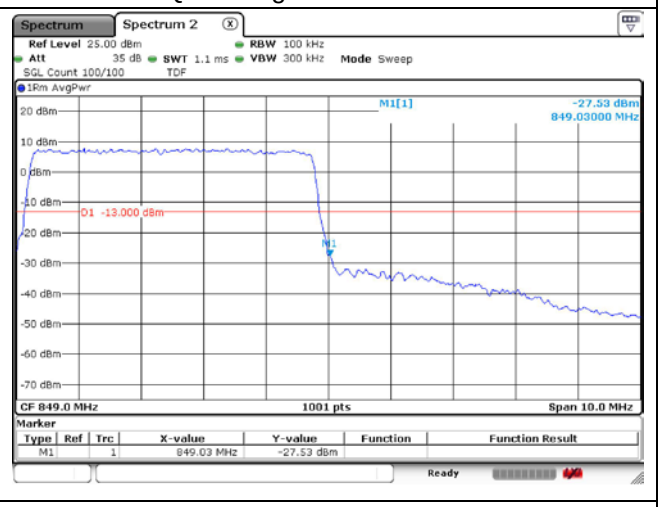
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB

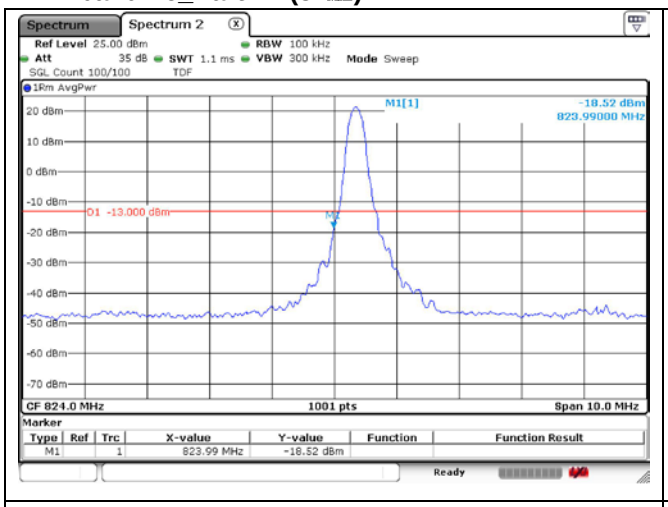


QPSK Low Channel - Full RB

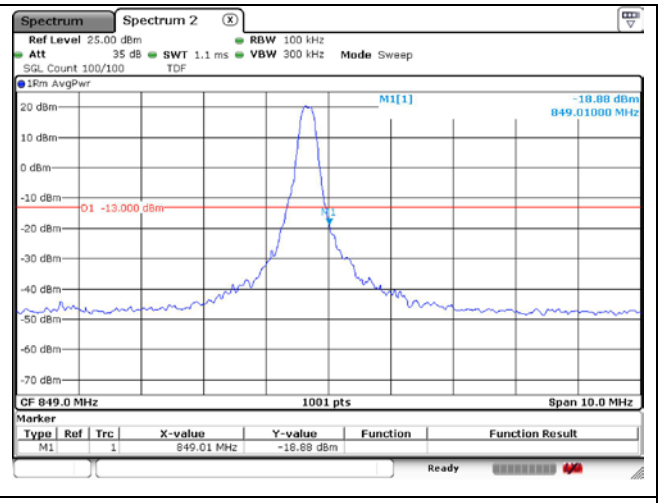


QPSK High Channel - Full RB

LTE band 26_Part 22 (5 ㎒)



16QAM Low Channel - 1 RB



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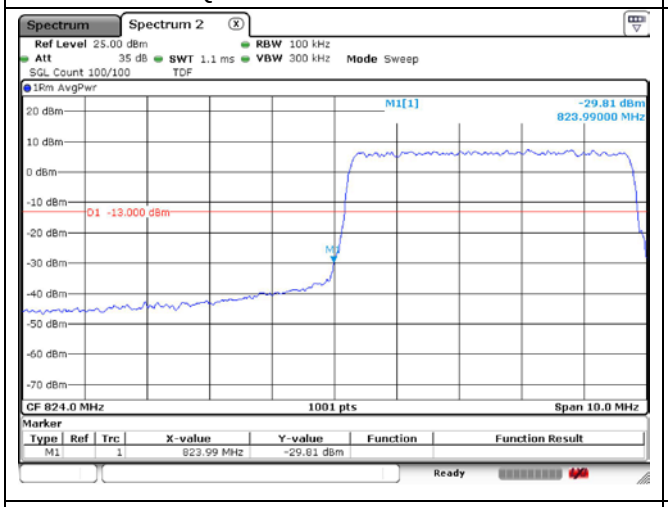

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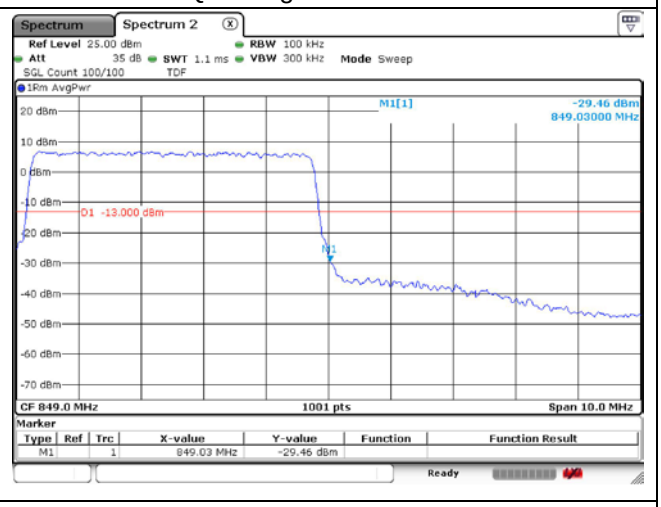
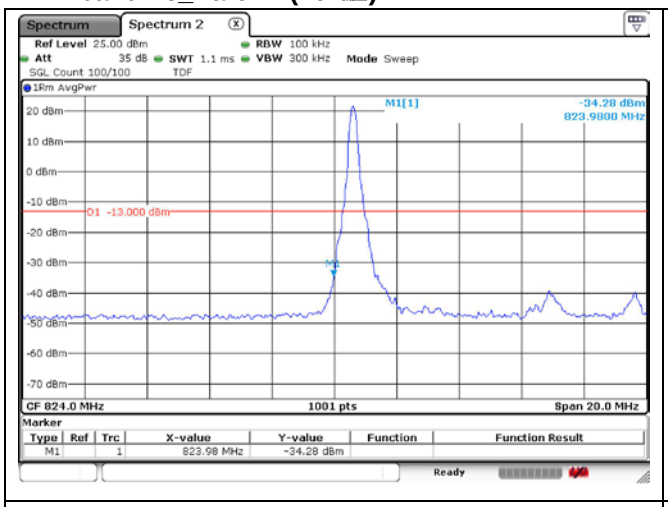
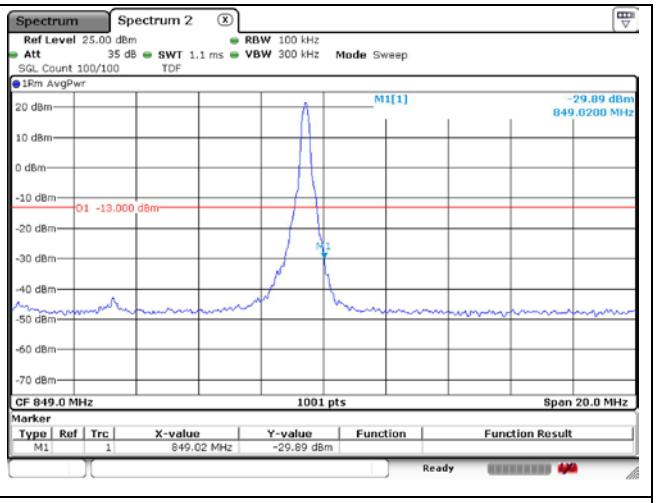


16QAM High Channel - Full RB

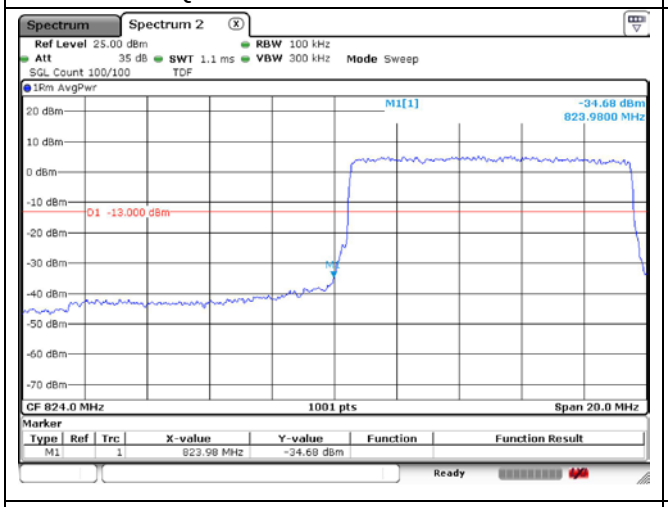
LTE band 26_Part 22 (10 ㎒)



QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB



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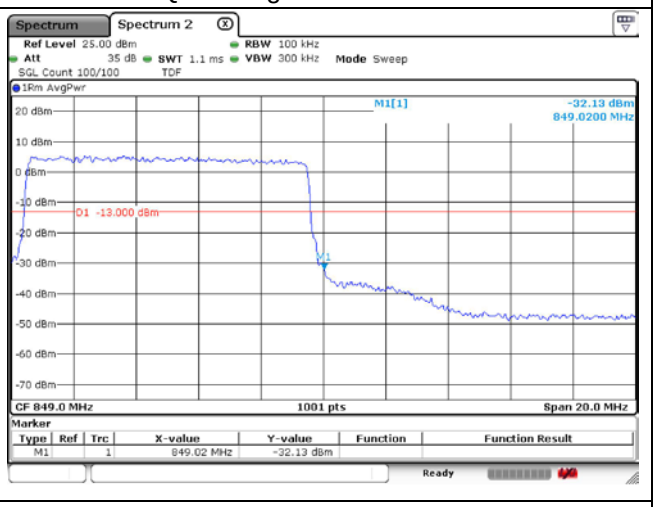
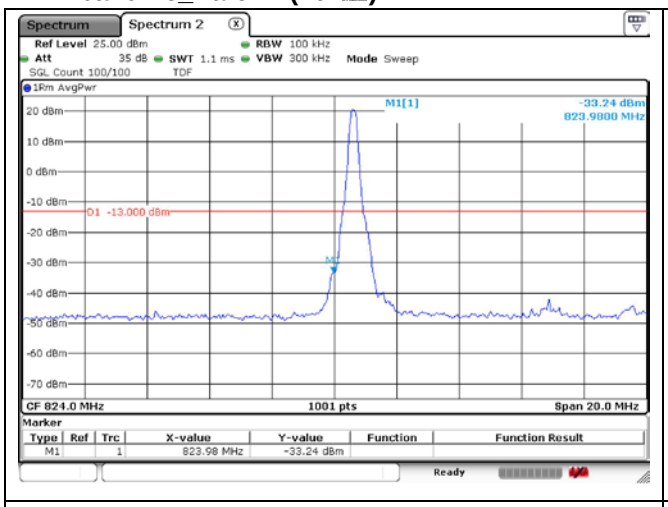


QPSK High Channel - Full RB

LTE band 26_Part 22 (10 ㎒)



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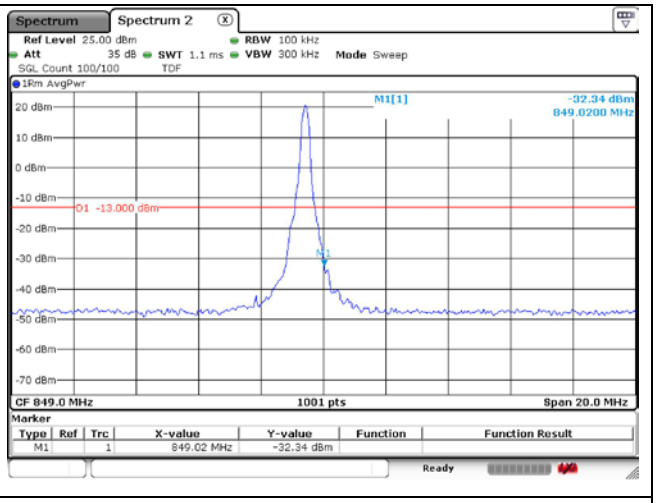

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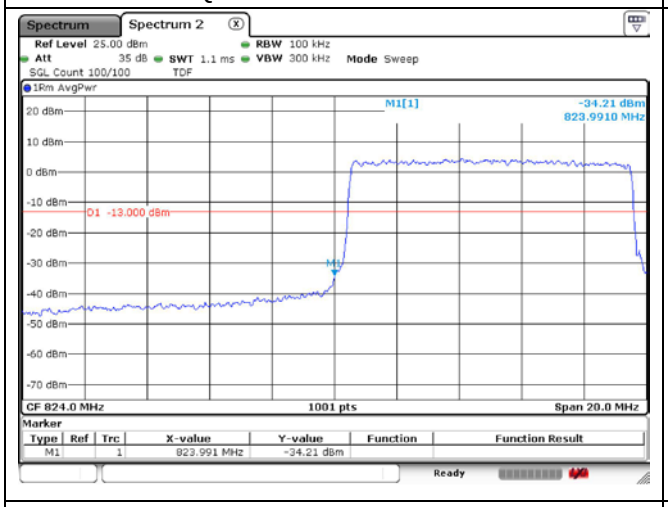
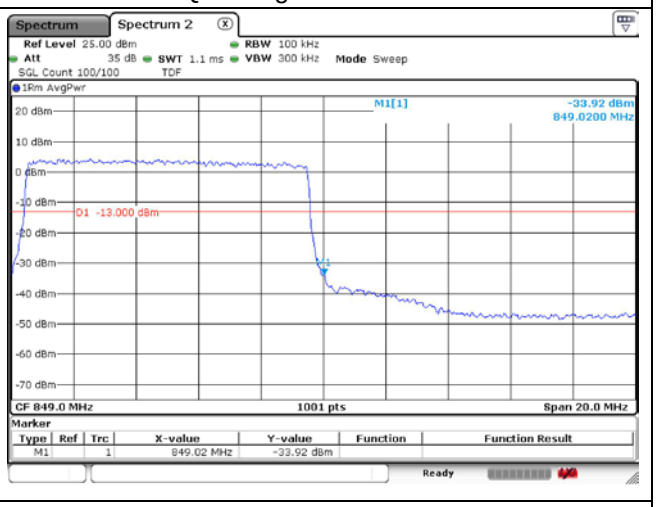
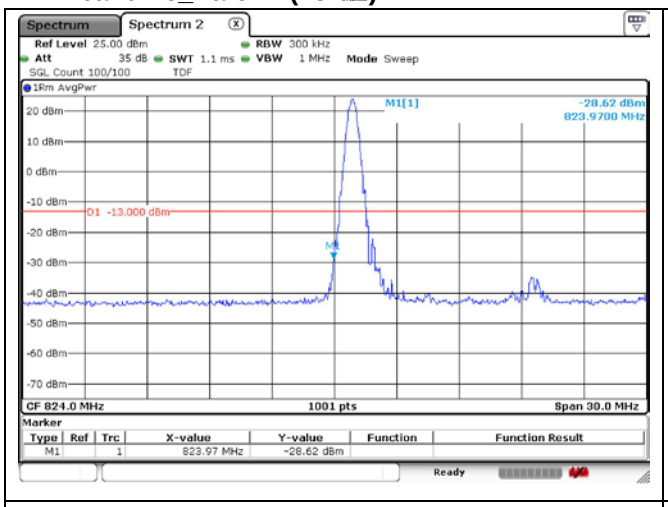


16QAM Low Channel - Full RB

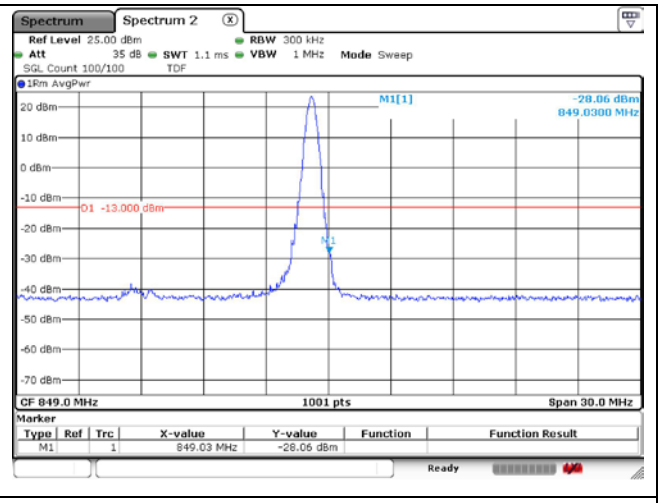


16QAM High Channel - Full RB

LTE band 26_Part 22 (15 ㎒)



QPSK Low Channel - 1 RB



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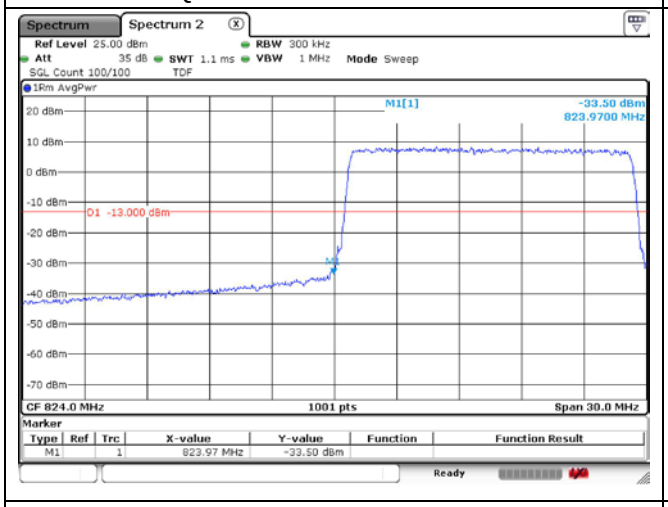
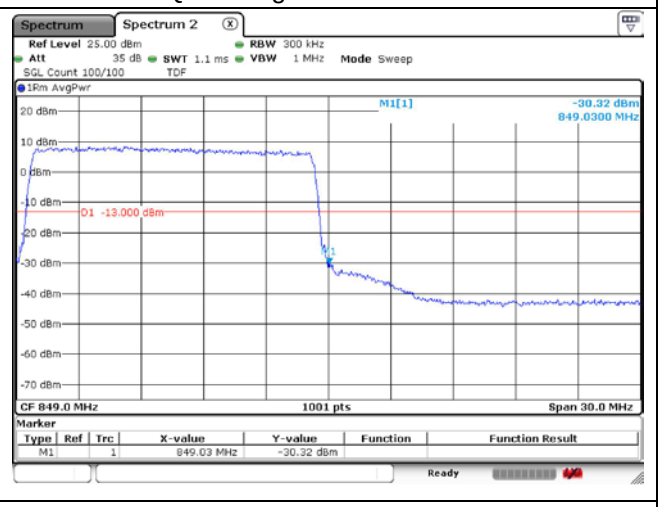
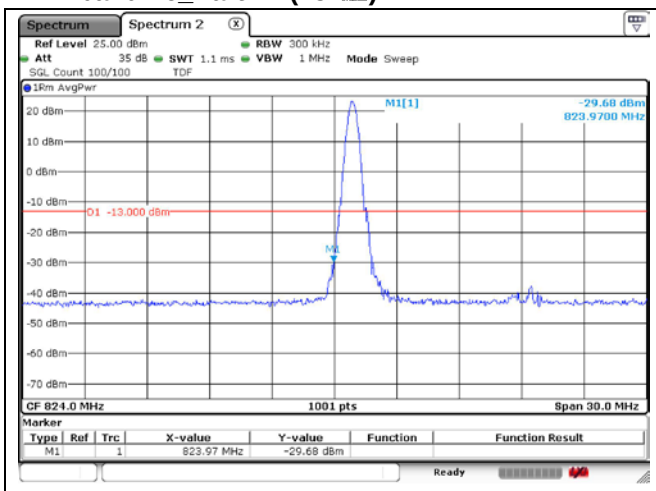


QPSK Low Channel - Full RB



QPSK High Channel - Full RB

LTE band 26_Part 22 (15 ㎒)



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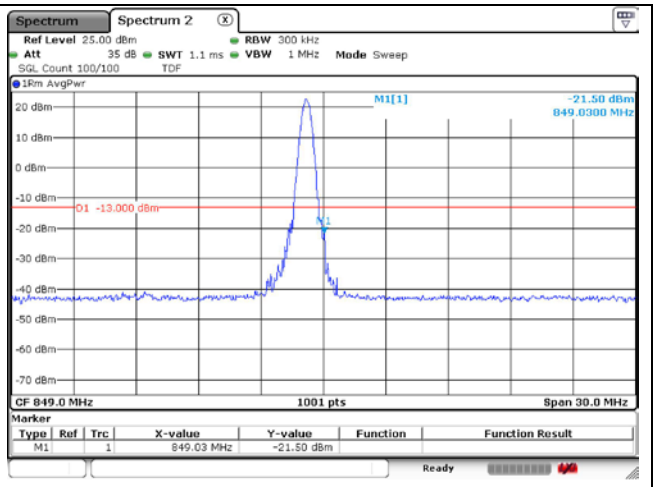

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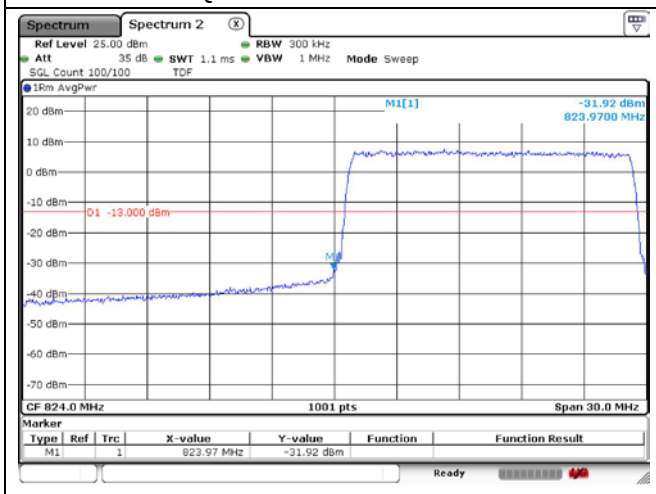

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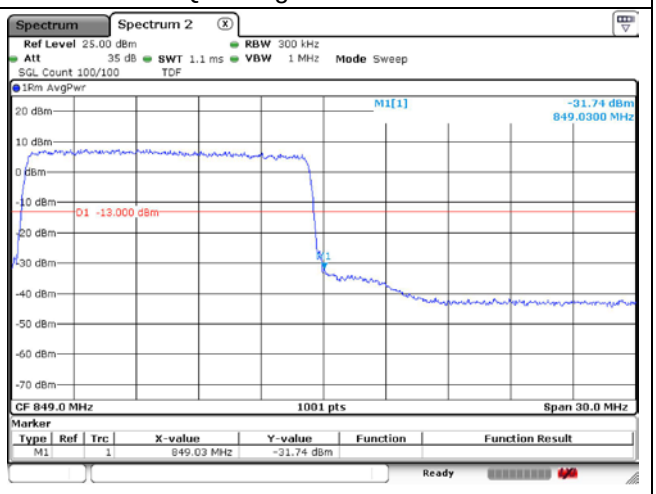
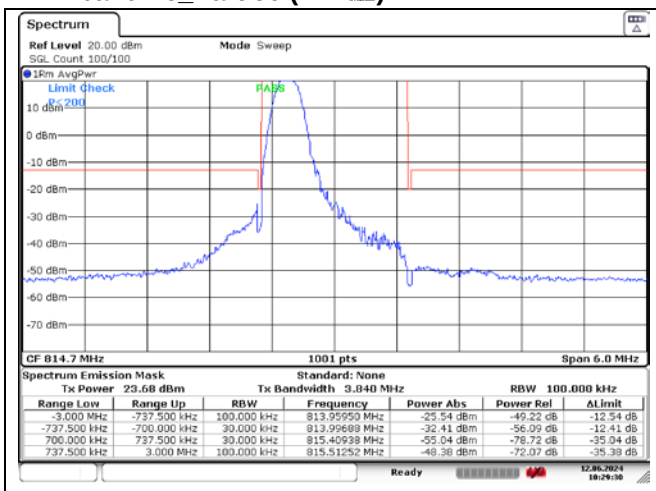
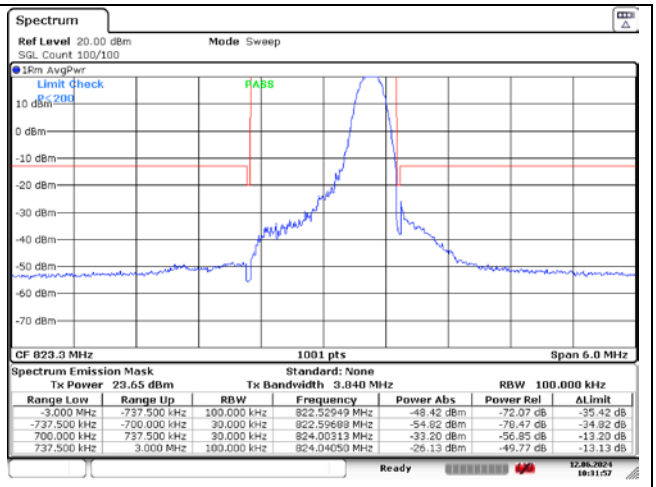


16QAM High Channel - Full RB

LTE band 26_Part 90 (1.4 ㎒)



QPSK Low Channel - 1 RB



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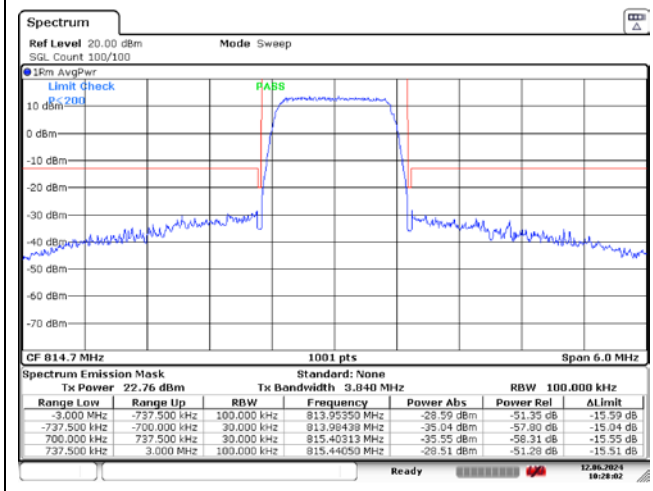
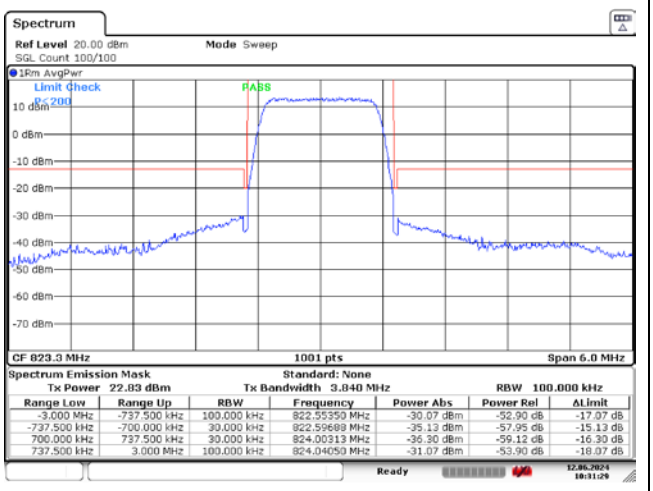
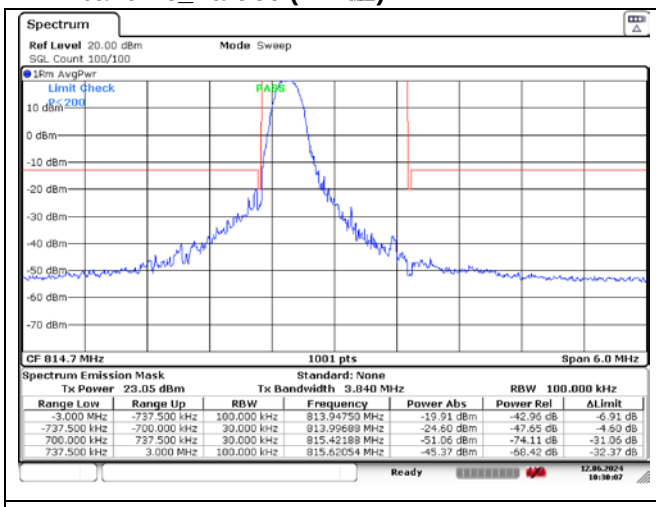


QPSK Low Channel - Full RB



QPSK High Channel - Full RB

LTE band 26_Part 90 (1.4 ㎒)



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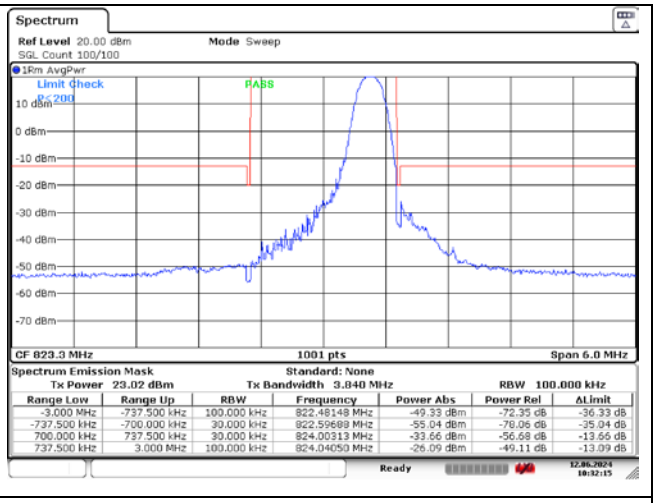

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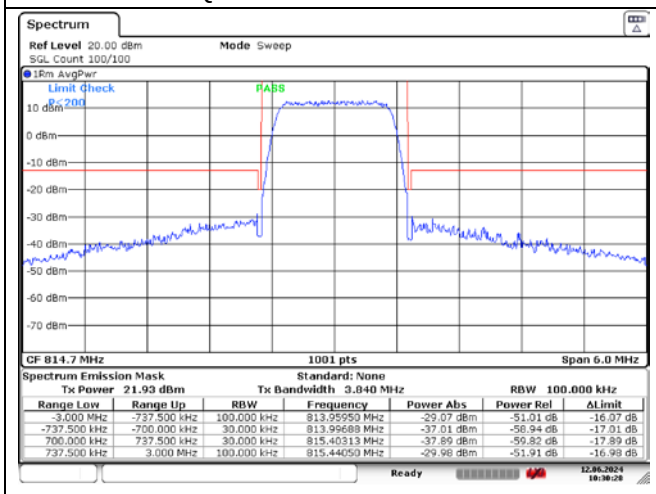
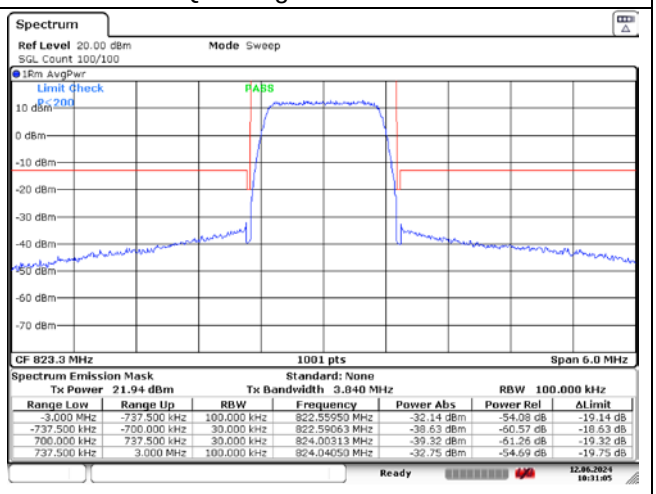
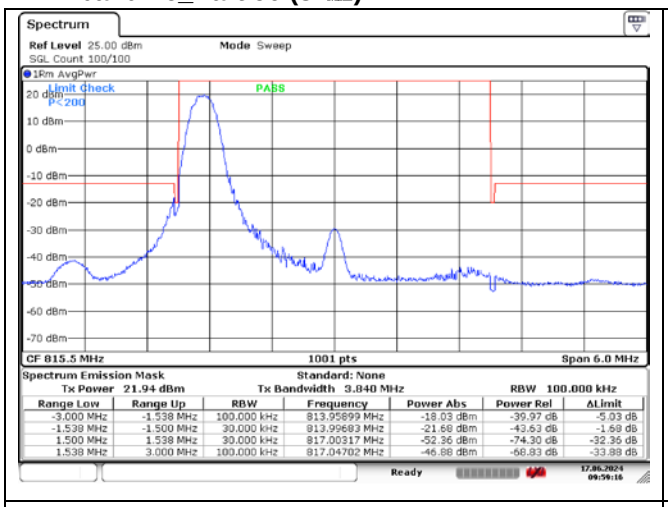


16QAM Low Channel - Full RB

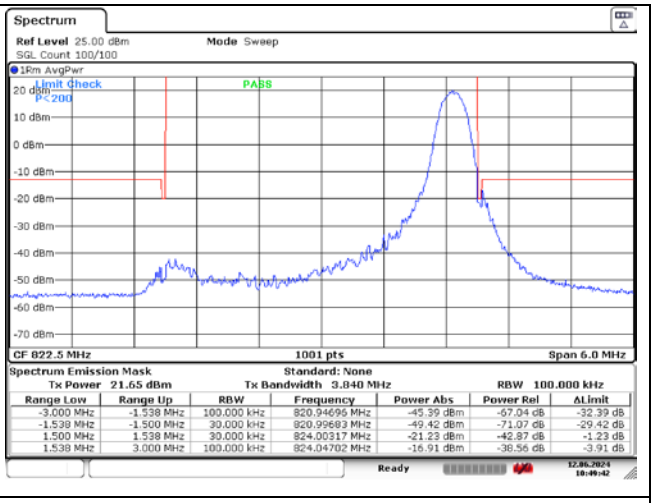


16QAM High Channel - Full RB

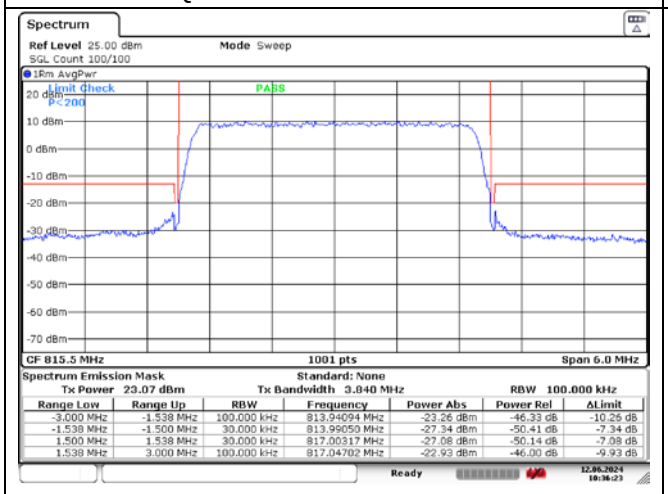
LTE band 26_Part 90 (3 ㎒)



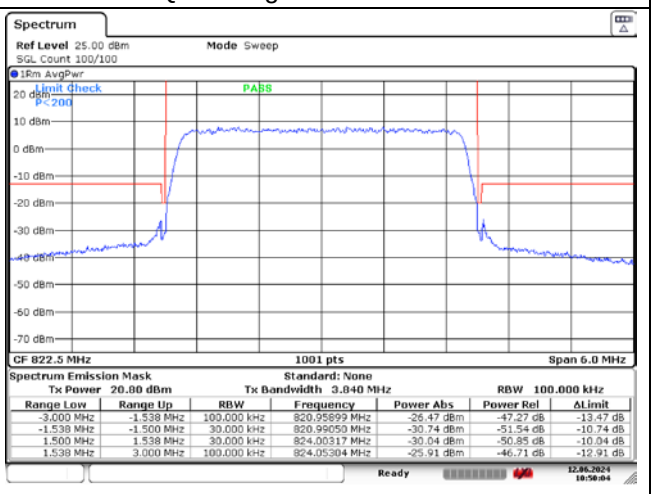
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB

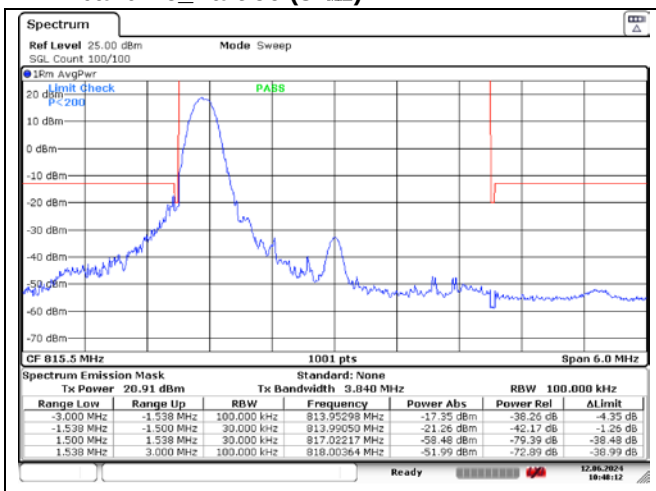


QPSK Low Channel - Full RB

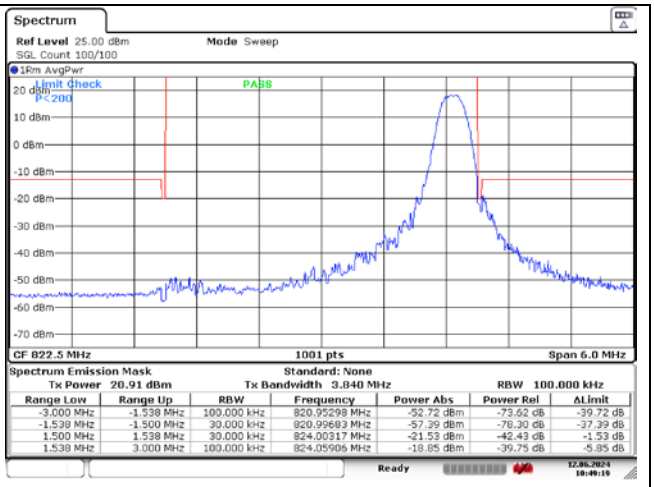


QPSK High Channel - Full RB

LTE band 26_Part 90 (3 ㎒)



16QAM Low Channel - 1 RB



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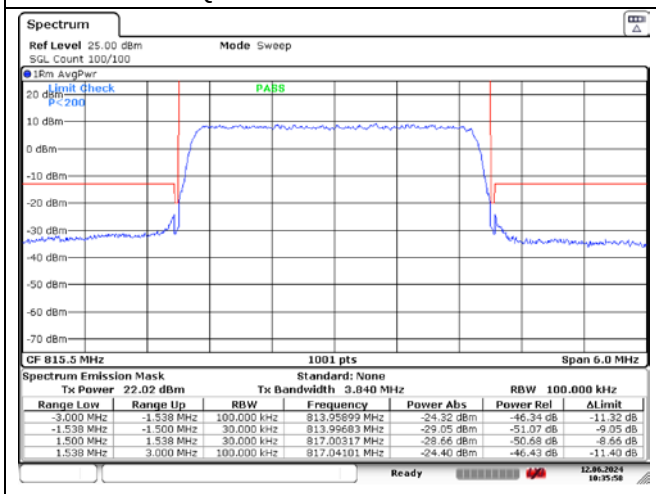
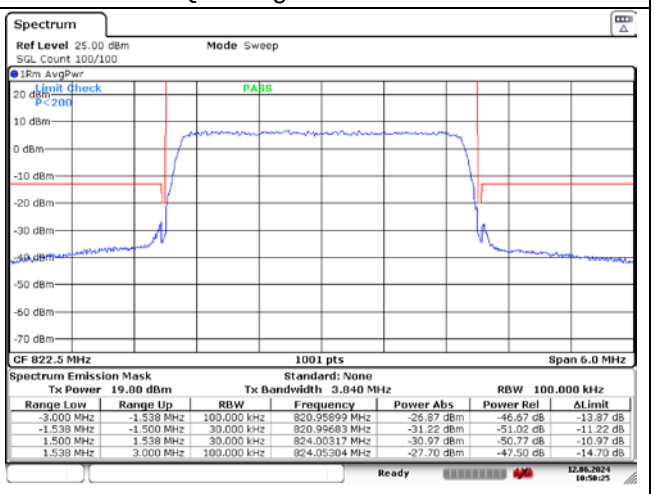
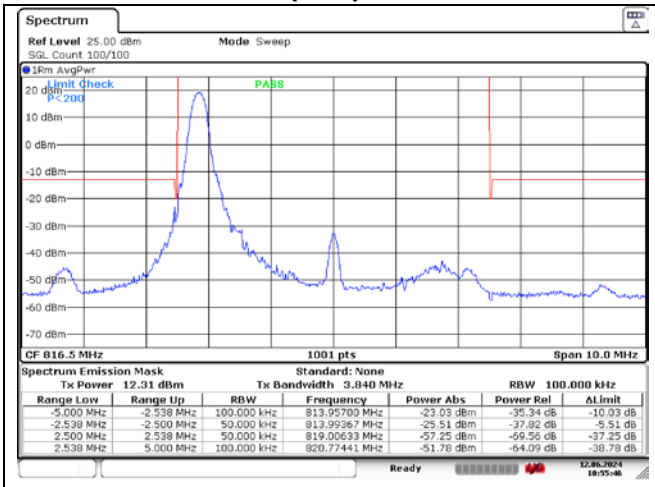


16QAM Low Channel - Full RB

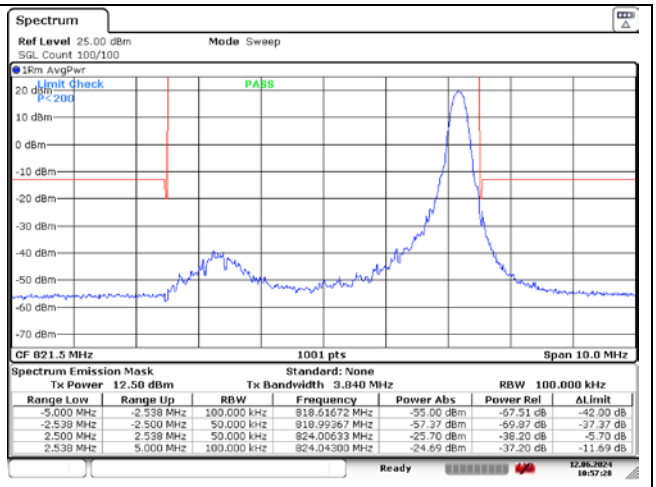


16QAM High Channel - Full RB

LTE band 26_Part 90 (5 ㎒)



QPSK Low Channel - 1 RB



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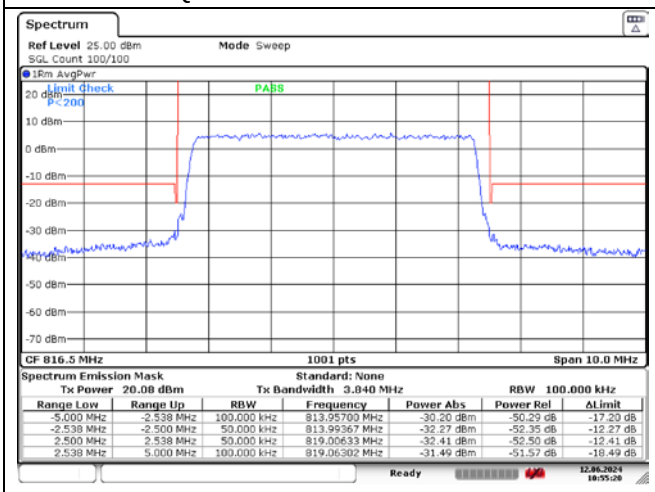
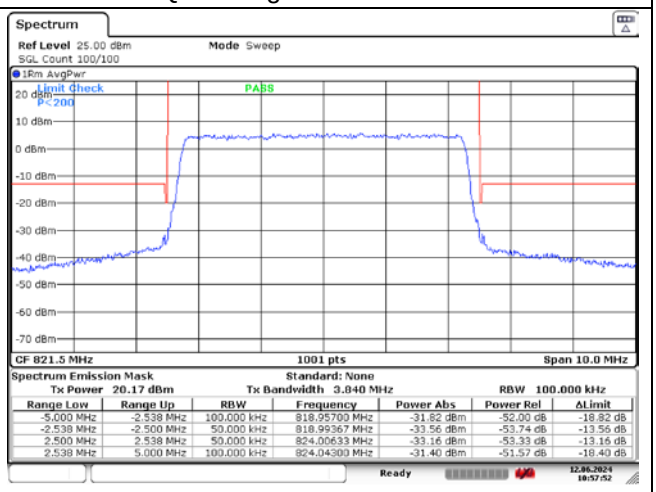
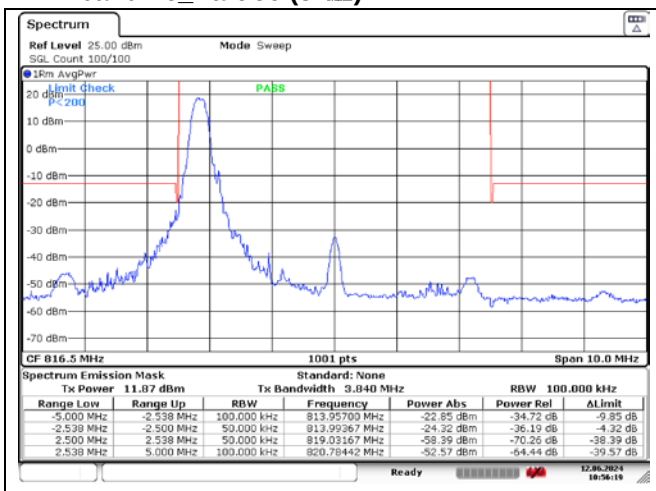


QPSK Low Channel - Full RB



QPSK High Channel - Full RB

LTE band 26_Part 90 (5 ㎒)



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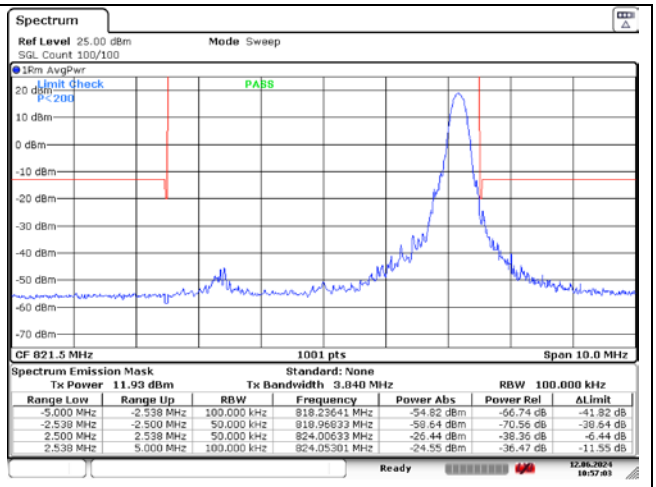

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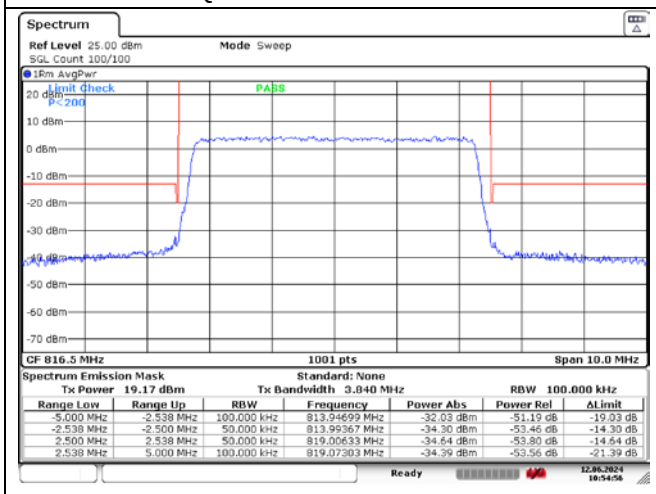
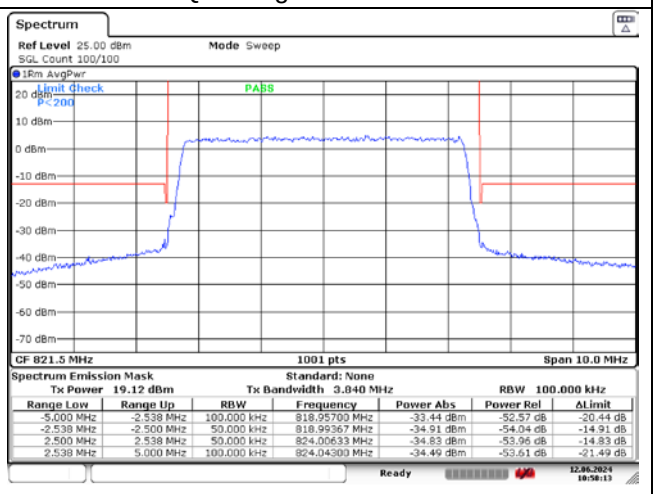
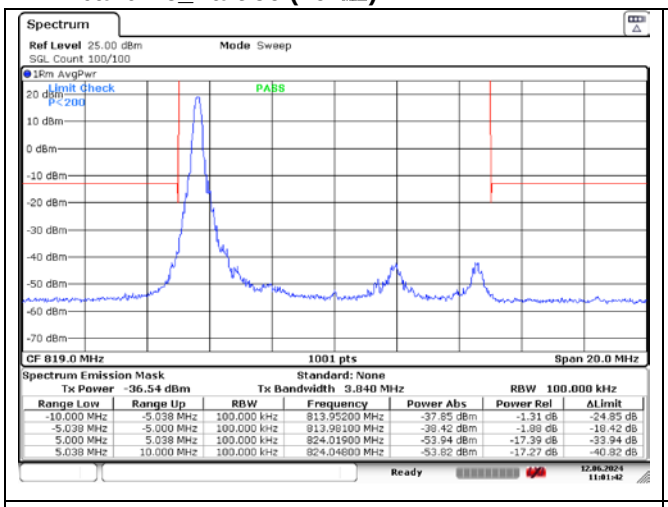


16QAM Low Channel - Full RB

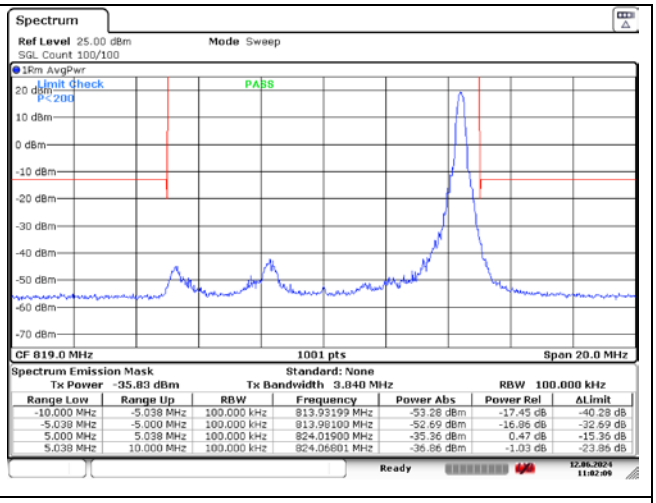


16QAM High Channel - Full RB

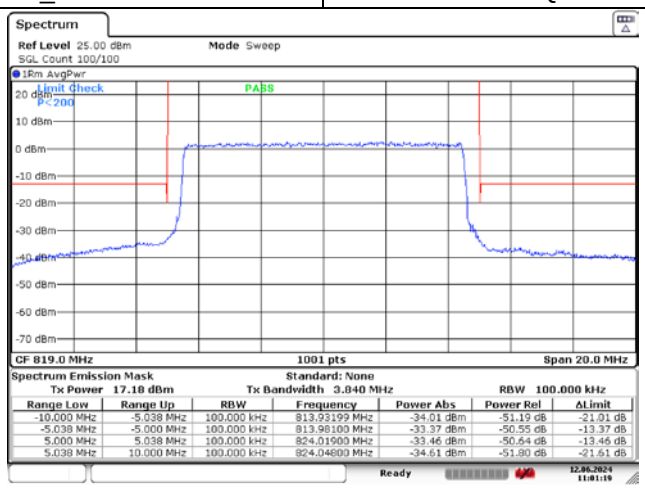
LTE band 26_Part 90 (10 ㎒)



QPSK - 1 RB_Low

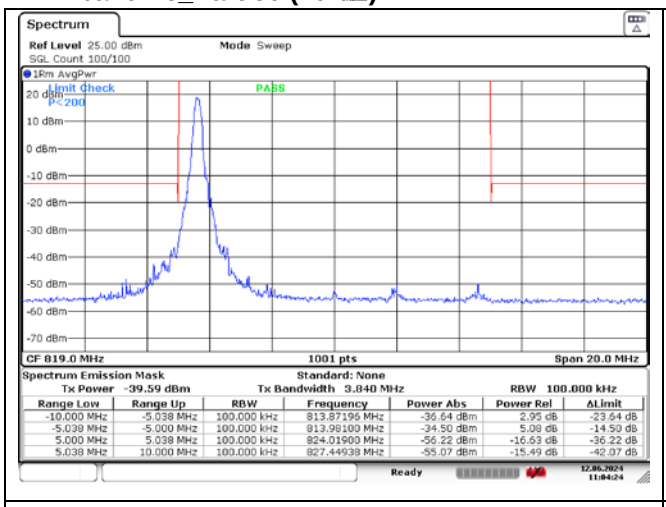


QPSK - 1 RB_High



QPSK - Full RB

LTE band 26_Part 90 (10 ㎒)



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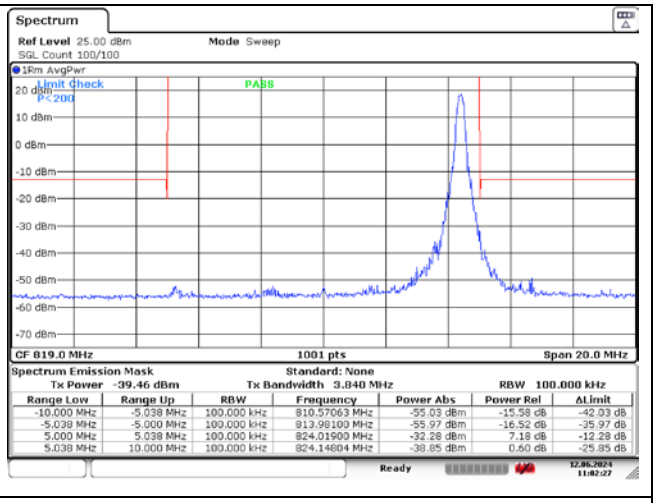
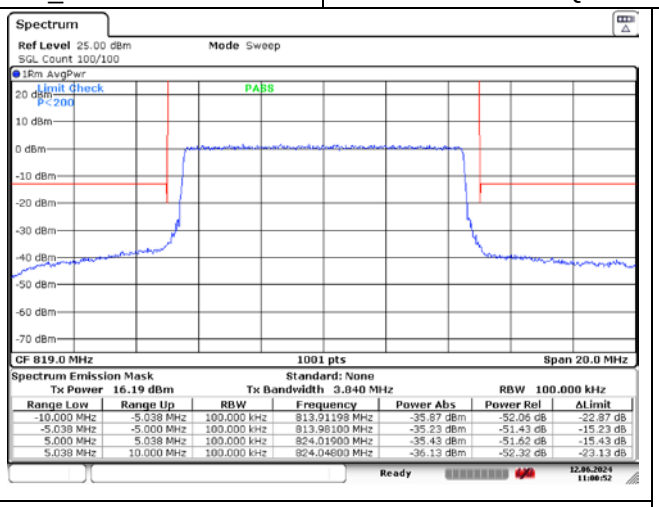
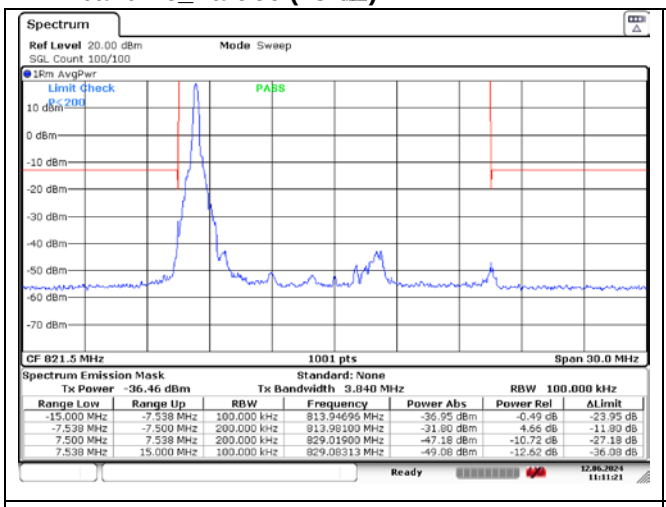


16QAM - 1 RB High

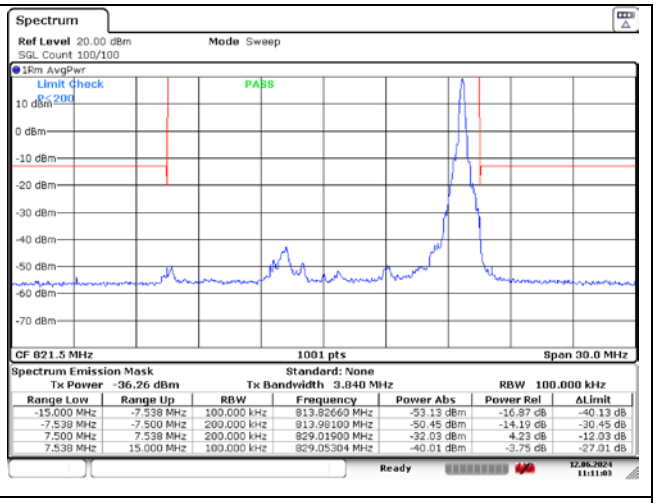


16QAM - Full RB

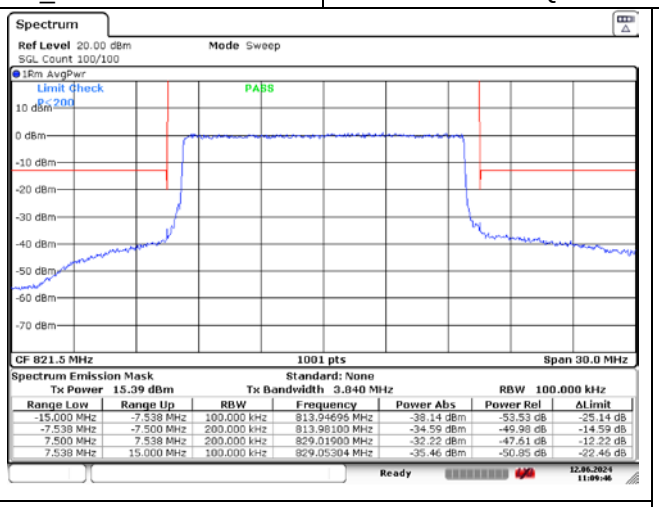
LTE band 26_Part 90 (15 ㎒)



QPSK - 1 RB_Low

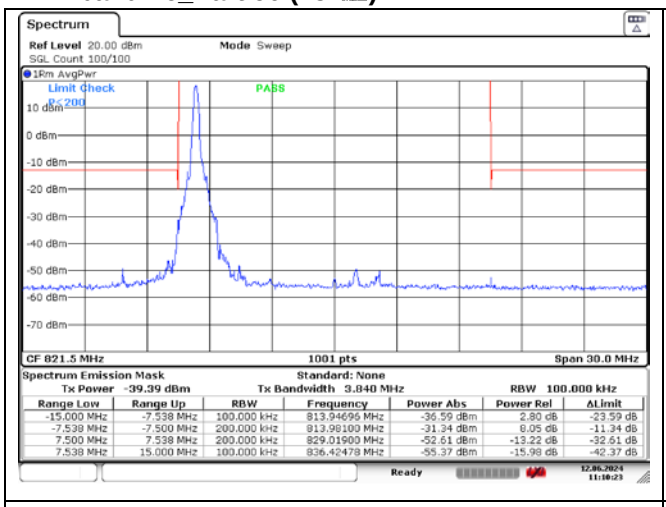


QPSK - 1 RB_High

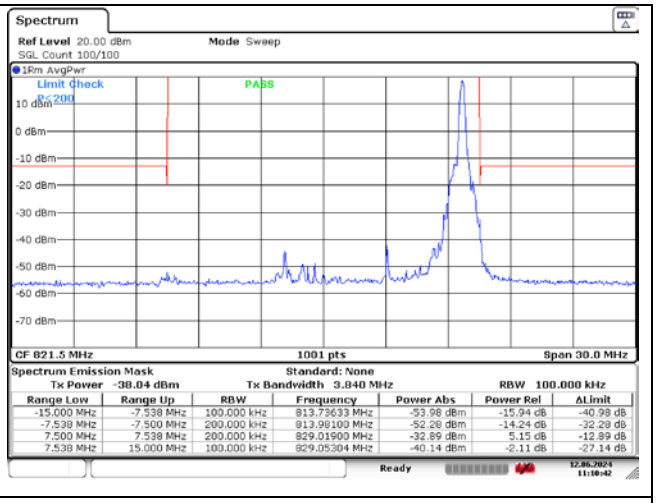


QPSK - Full RB

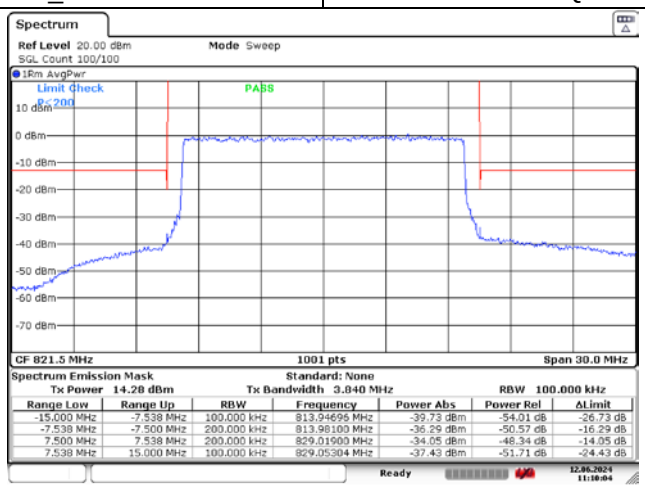
LTE band 26_Part 90 (15 ㎒)



16QAM - 1 RB_Low



16QAM - 1 RB High



16QAM Low Channel - Full RB

8. Frequency Stability

8.1. Limit

FCC
- § 2.1055 (a), § 2.1055 (d) & following:

- §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.
For Mobile devices operating in the 824 to 849 ㎒ band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 ppm.

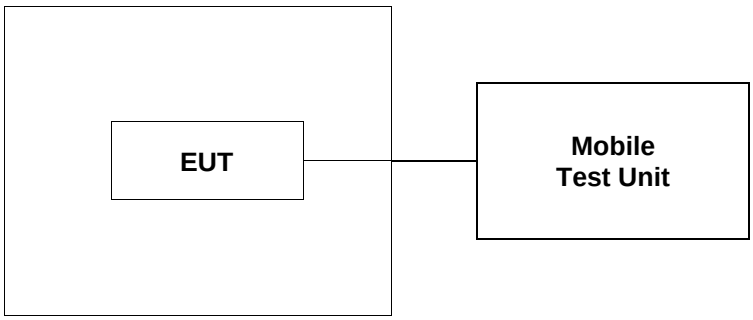
- §90.213, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.
For Mobile devices operating in the 809 to 824 ㎒ band at a power level 2 Watts or less, the limit specified in Table is +/- 2.5 ppm.

IC
- RSS-Gen Issue 5
6.11, for licensed devices, the following measurement conditions apply:
a. at the temperatures of -30°C (-22°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage

- RSS-132 Issue 4
5.3, The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within each of the sub-bands when tested at the temperature and supply voltage variations specified in RSS-Gen.

8.2. Test Procedure

1. Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Mobile Test Unit via feed-through attenuators.
2. The EUT was placed inside the temperature chamber.
3. After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from Mobile Test Unit.



Temperature Chamber

8.3. Test Results

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

LTE band 26_Part 22 at middle channel

Reference Frequency: 836.5 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	3.90	8.53	0.001 78
40		7.88	0.001 00
30		12.48	0.006 50
20(Ref.)		7.04	-
10		3.11	-0.004 70
0		7.19	0.000 18
-10		13.16	0.007 32
-20		8.14	0.001 32
-30		4.02	-0.003 61
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	3.315 (85%)	9.67	0.003 14
	4.485 (115%)	11.05	0.004 79

LTE band 26_Part 90 at middle channel

Reference Frequency: 819 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	3.90	6.79	0.002 92
40		6.95	0.003 11
30		9.45	0.006 17
20(Ref.)		4.40	-
10		4.45	0.000 06
0		7.95	0.004 33
-10		14.45	0.012 27
-20		5.82	0.001 73
-30		1.27	-0.003 82
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	3.315 (85%)	9.51	0.006 24
	4.485 (115%)	11.07	0.008 14

- End of the Test Report -