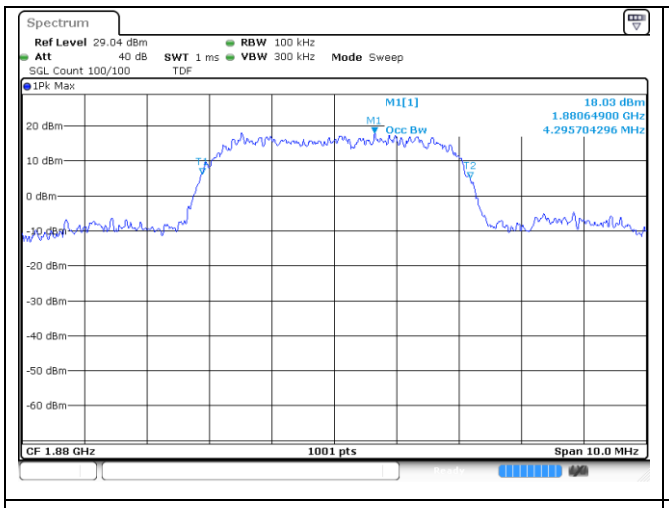
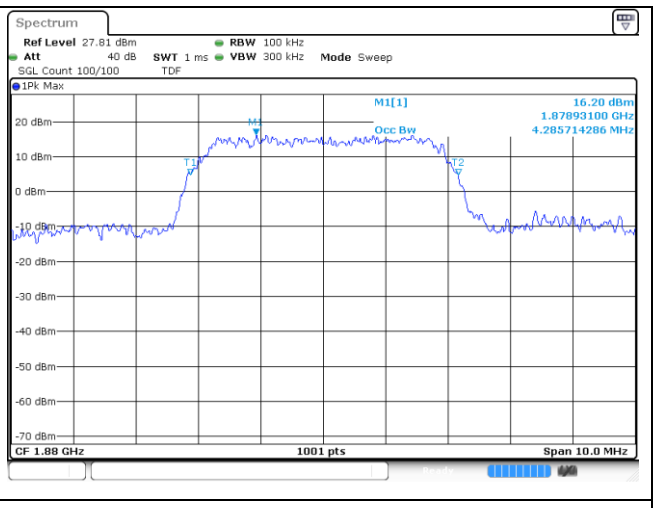
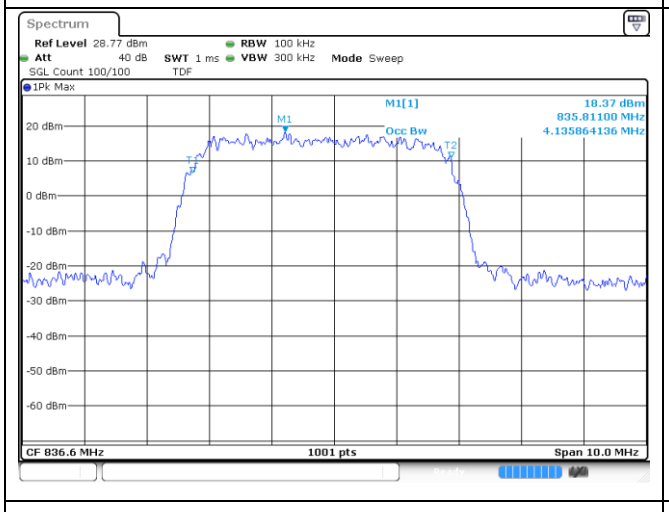
- Test plots



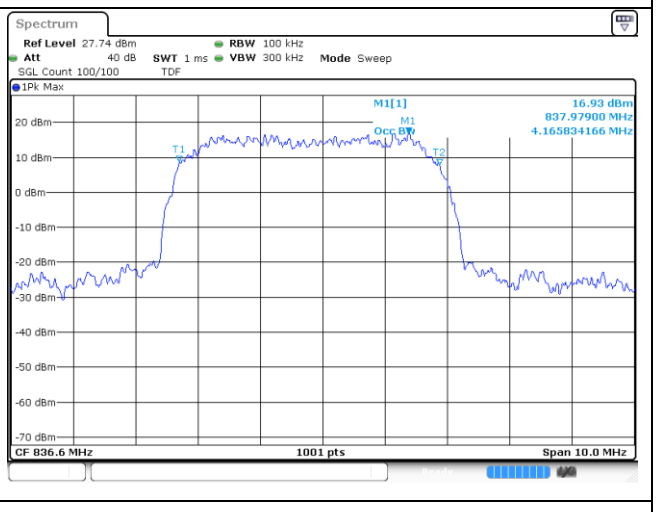
WCDMA Ⅱ RMC Middle Channel



WCDMA Ⅱ HSDPA Middle Channel

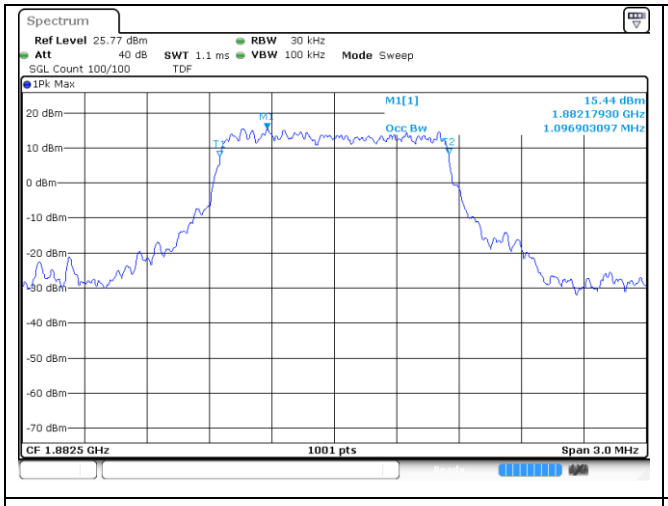


WCDMA Ⅴ RMC Middle Channel

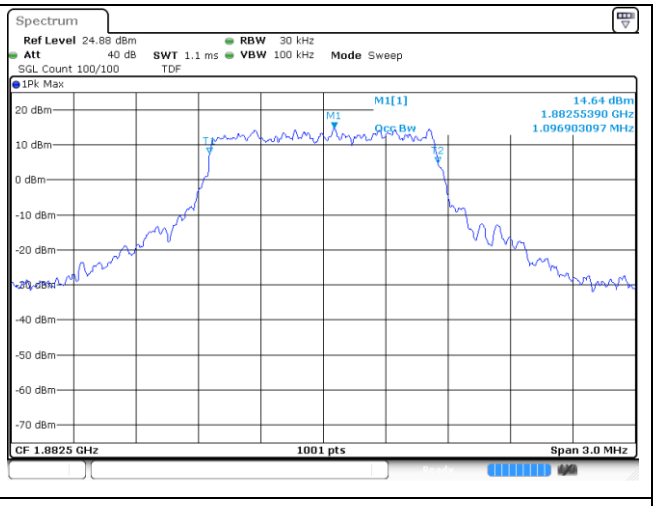


WCDMA Ⅴ HSDPA Middle Channel

LTE band 25/2



1.4 ㎒ QPSK Middle Channel - Full RB



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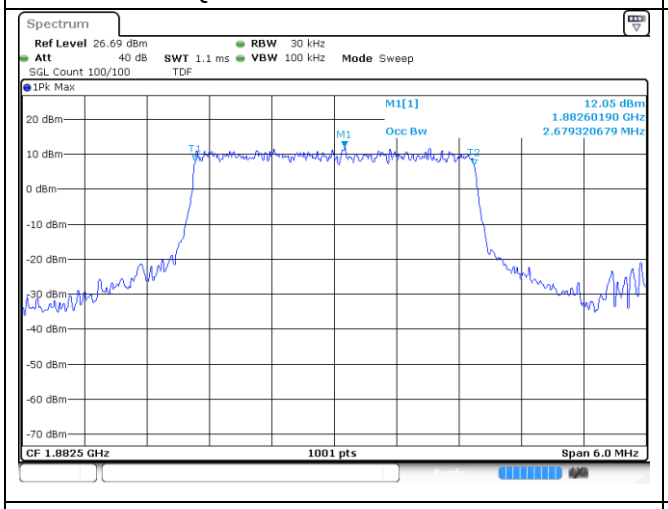
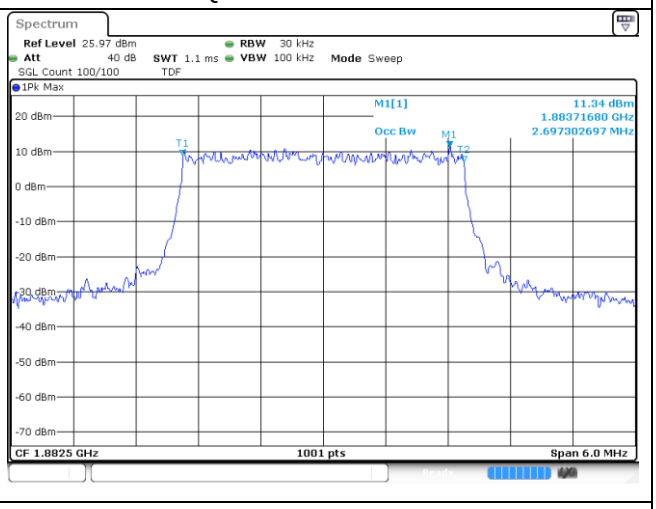
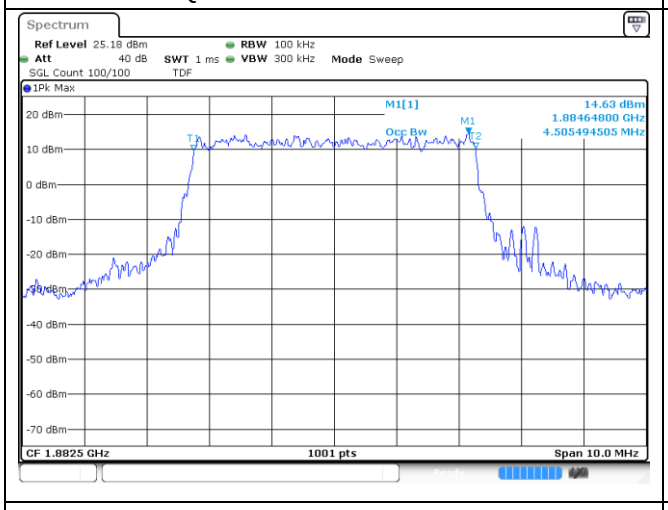


3 ㎒ QPSK Middle Channel - Full RB



3 ㎒ 16QAM Middle Channel - Full RB



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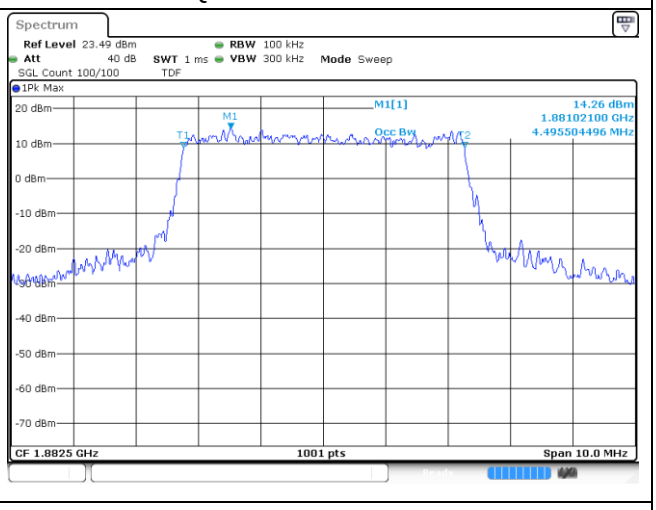

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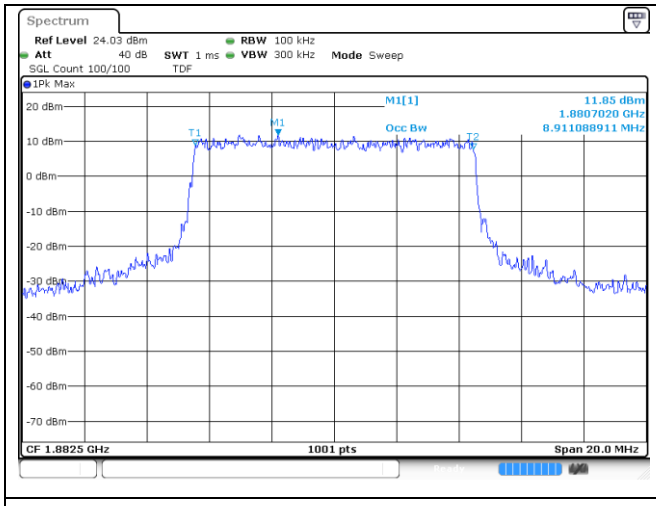
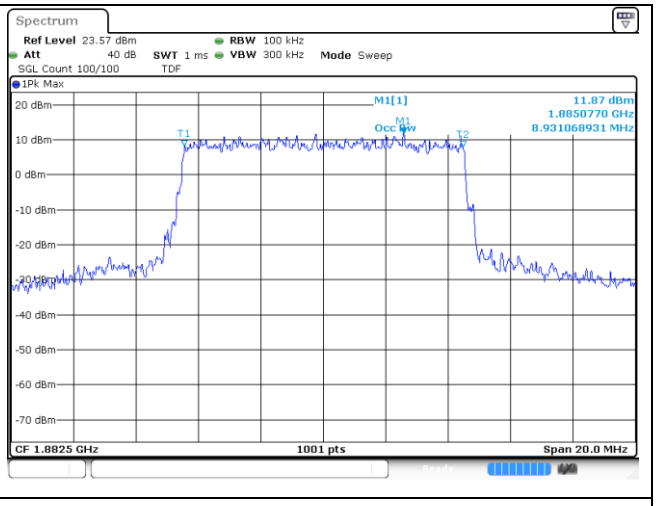


10 ㎒ QPSK Middle Channel - Full RB



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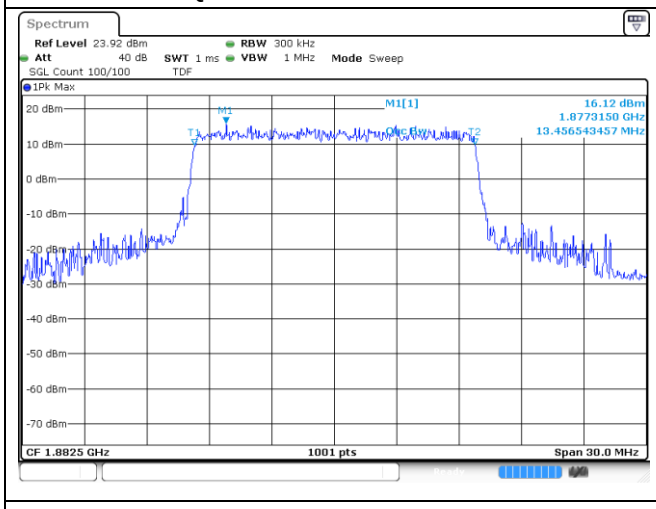

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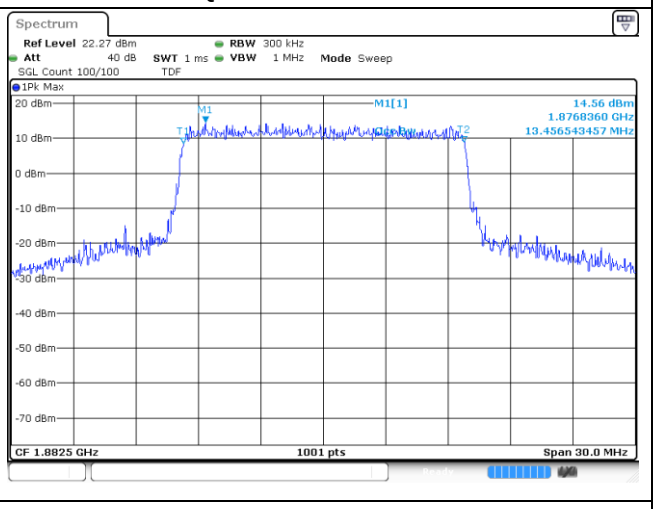

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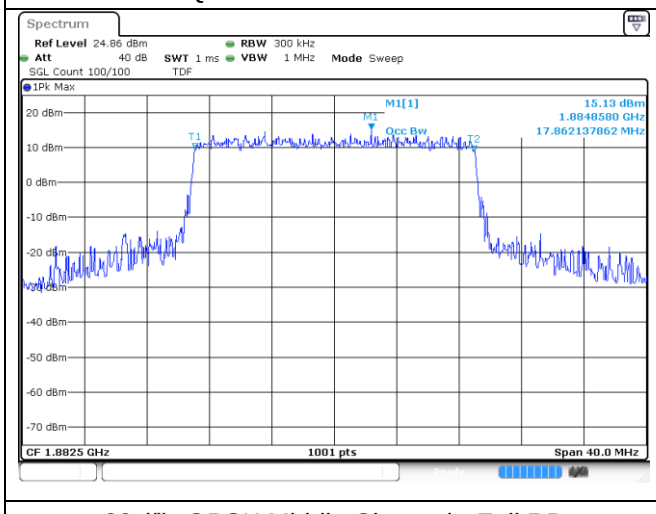

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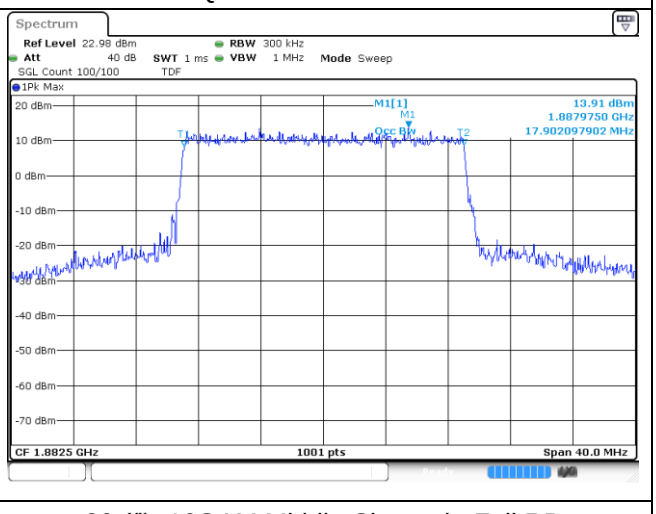
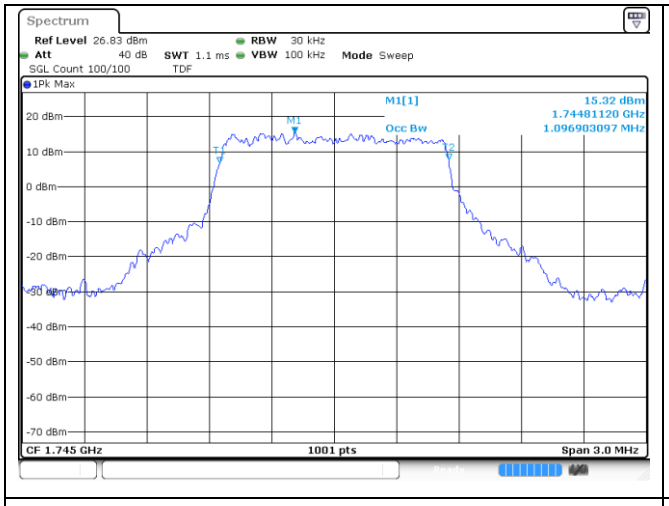
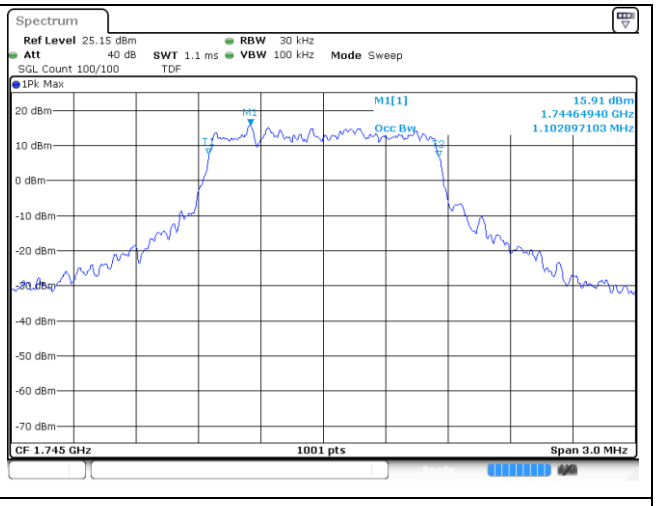


20 ㎒ 16QAM Middle Channel - Full RB

LTE band 66/4



1.4 ㎒ QPSK Middle Channel - Full RB



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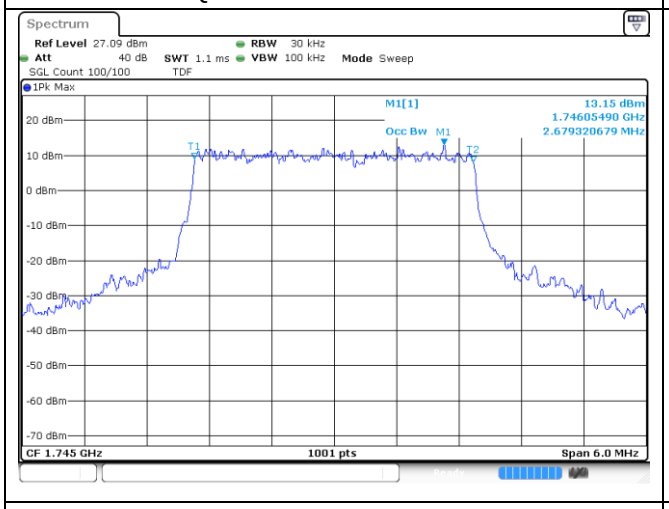

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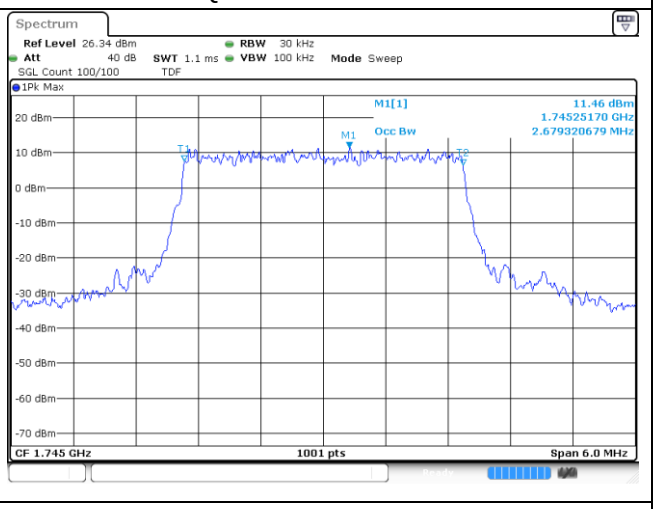

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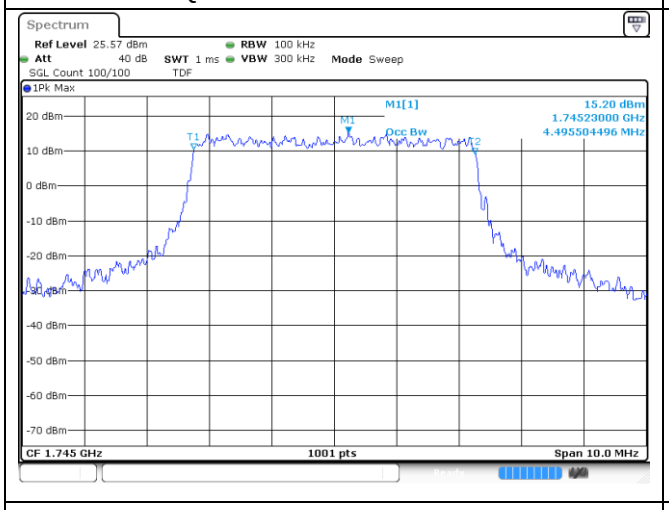
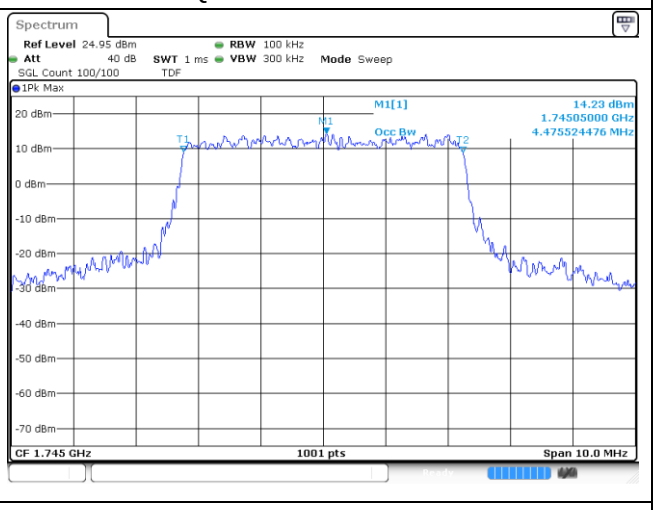


5 ㎒ QPSK Middle Channel - Full RB



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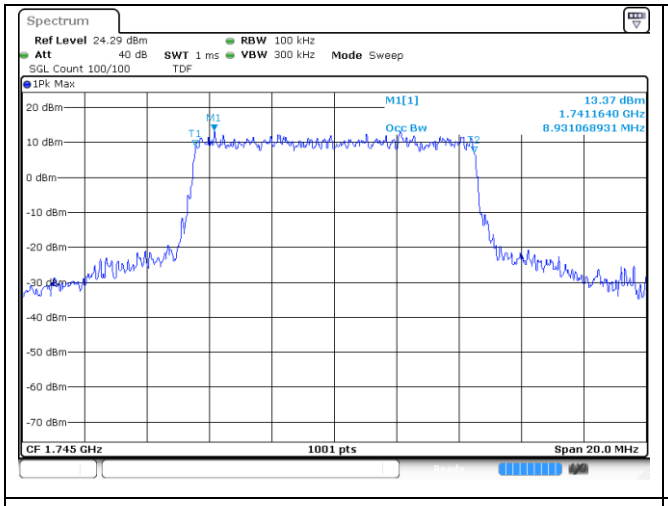

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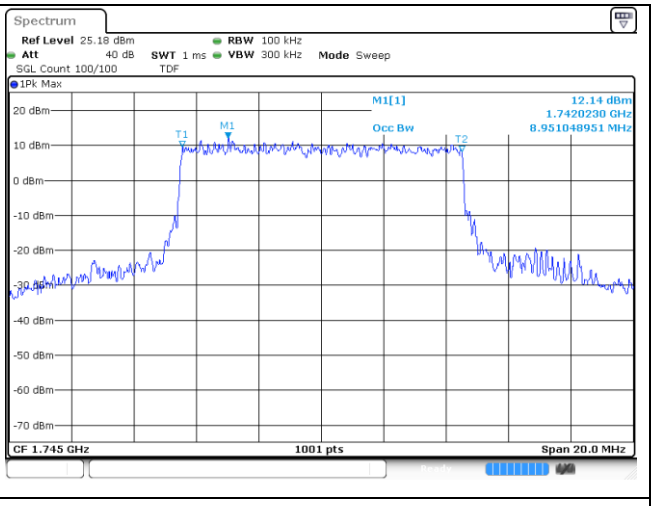

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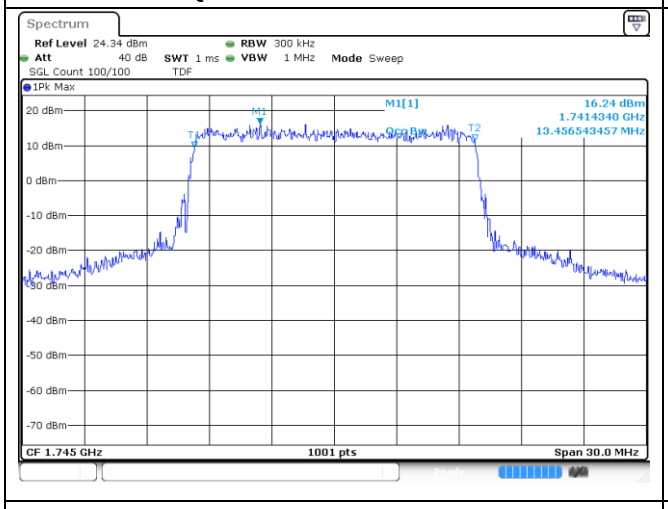

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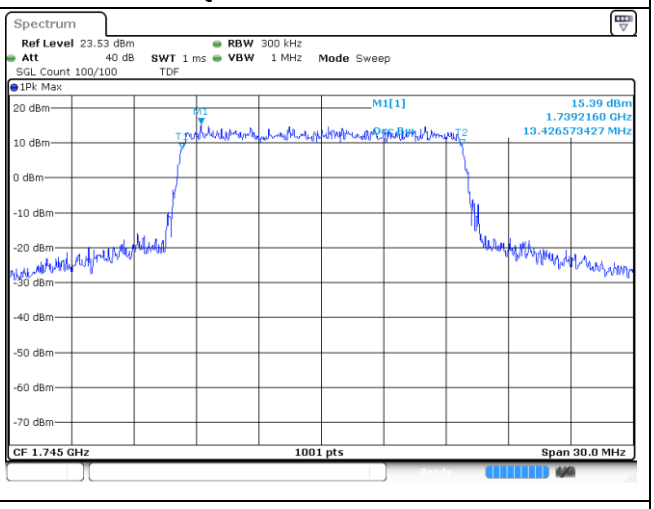

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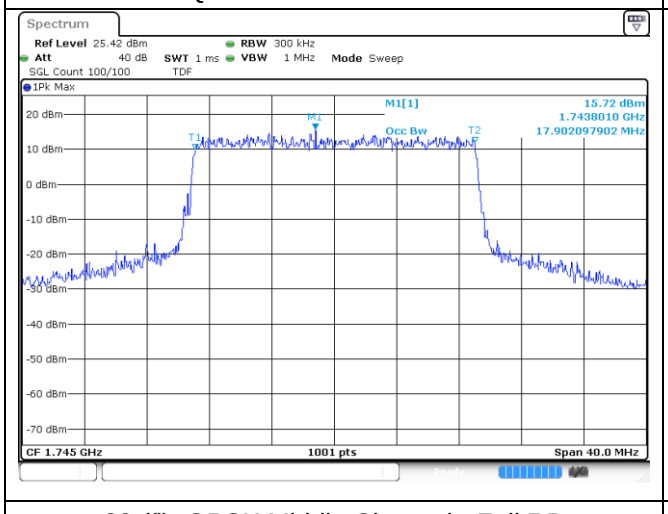

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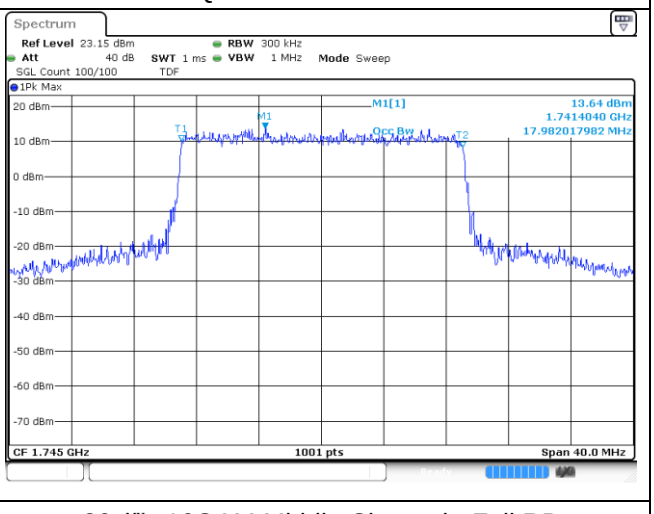
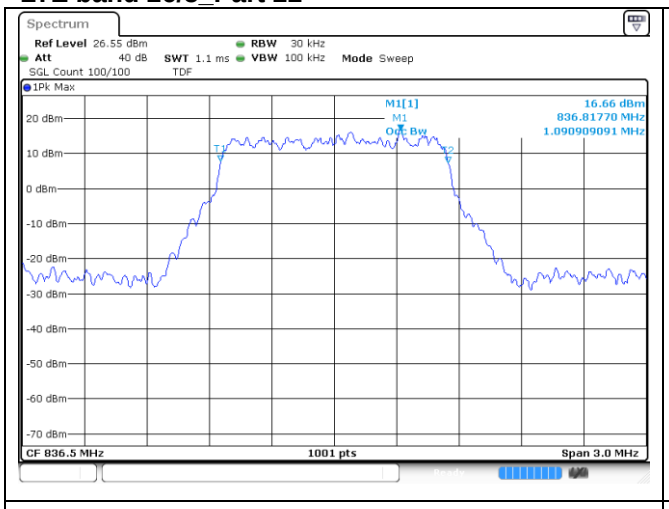
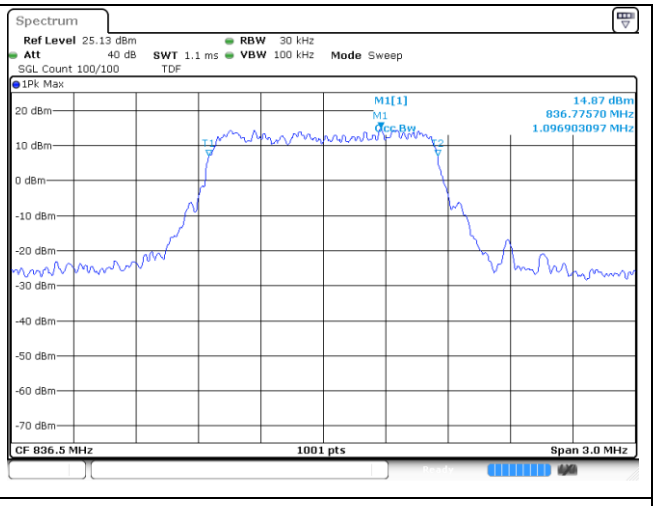


20 ㎒ 16QAM Middle Channel - Full RB

LTE band 26/5_Part 22



1.4 ㎒ QPSK Middle Channel - Full RB



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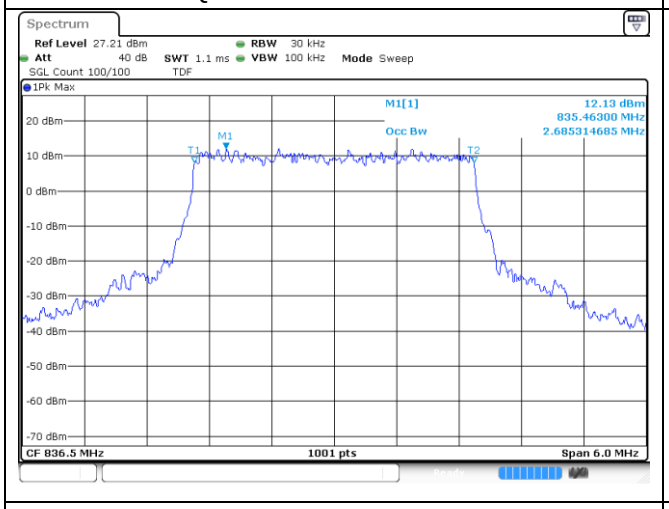
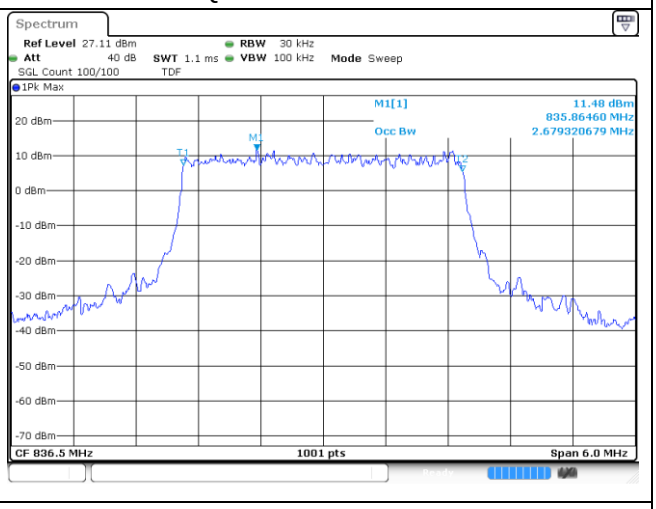
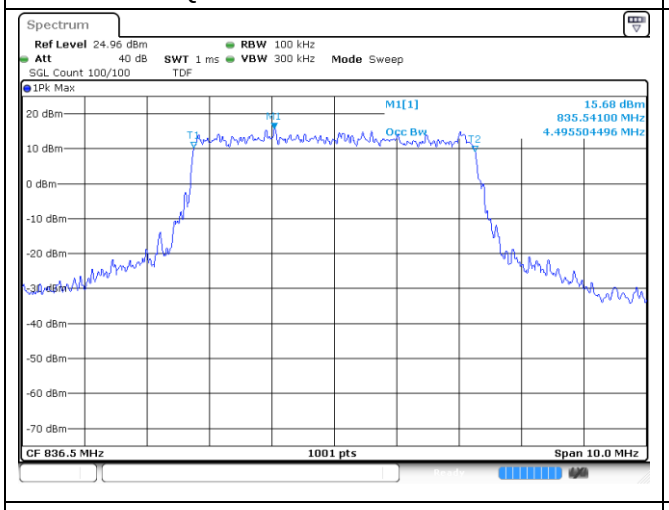


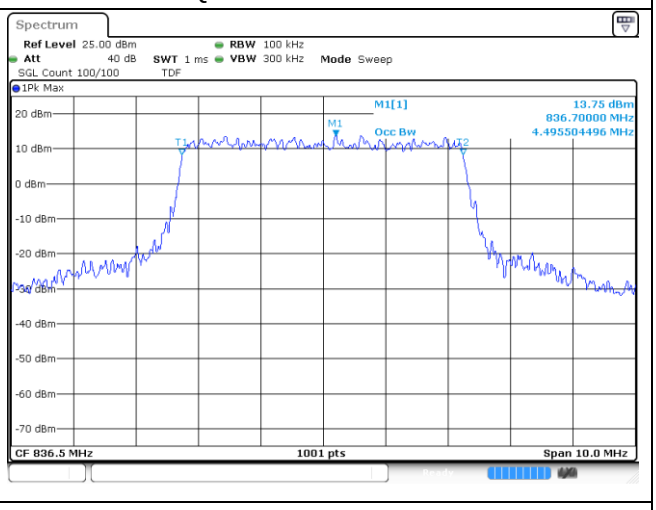
3 ㎒ QPSK Middle Channel - Full RB



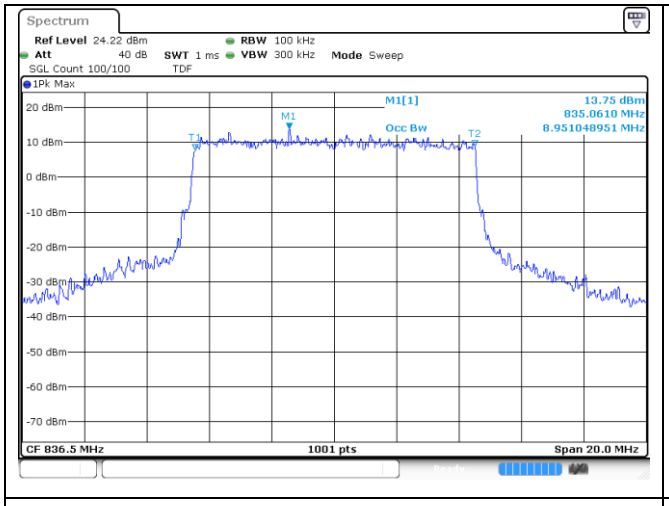
3 ㎒ 16QAM Middle Channel - Full RB



5 ㎒ QPSK Middle Channel - Full RB



5 ㎒ 16QAM Middle Channel - Full RB



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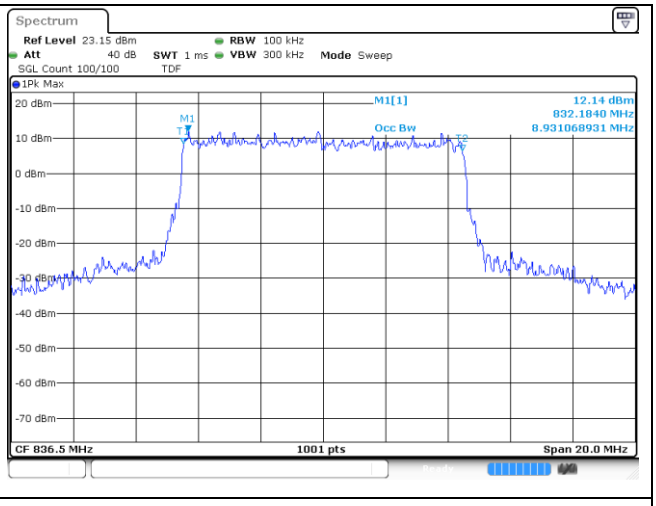

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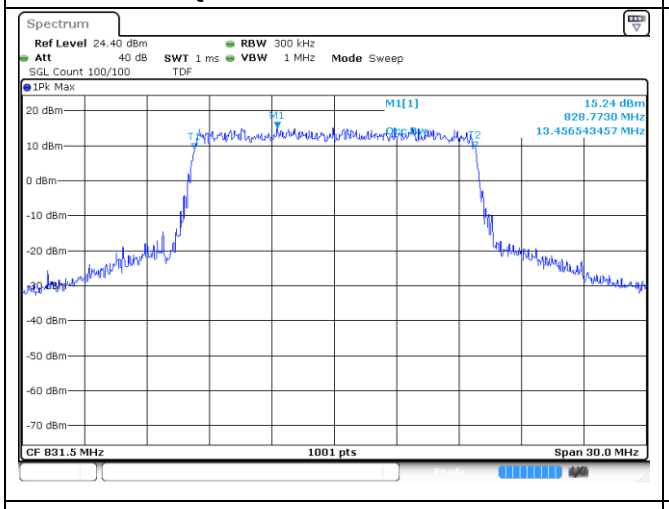

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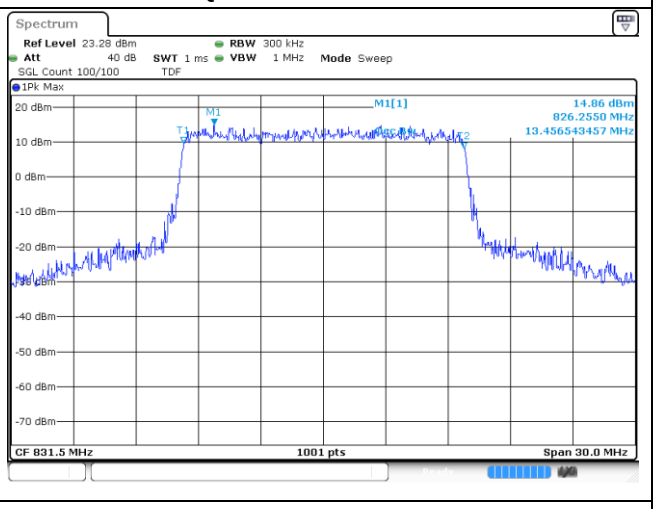
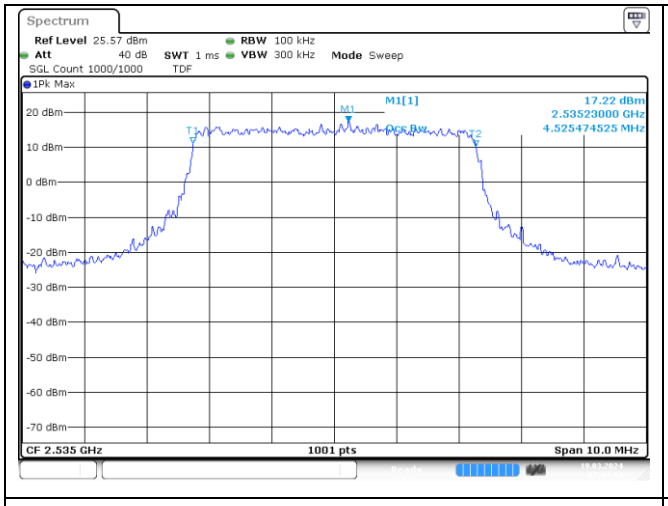


15 ㎒ 16QAM Middle Channel - Full RB

LTE band 7



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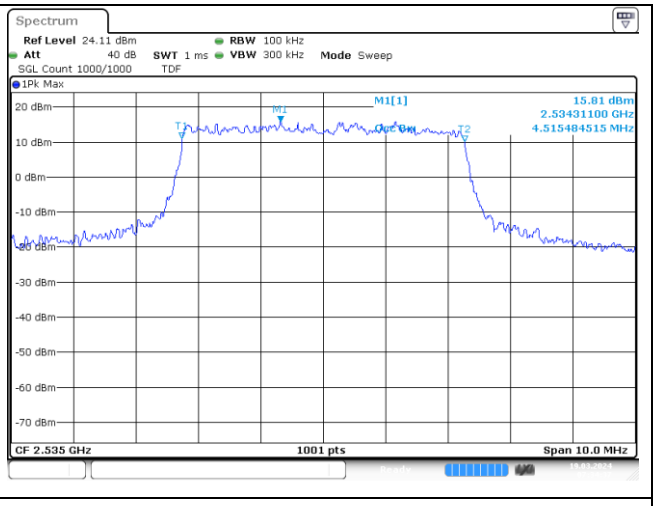

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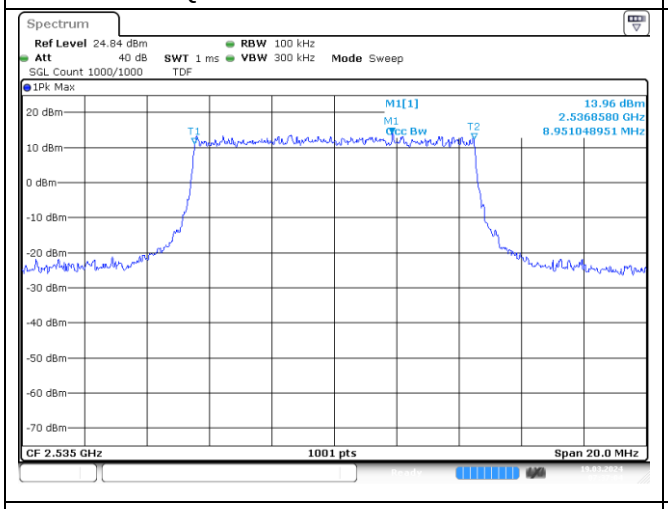

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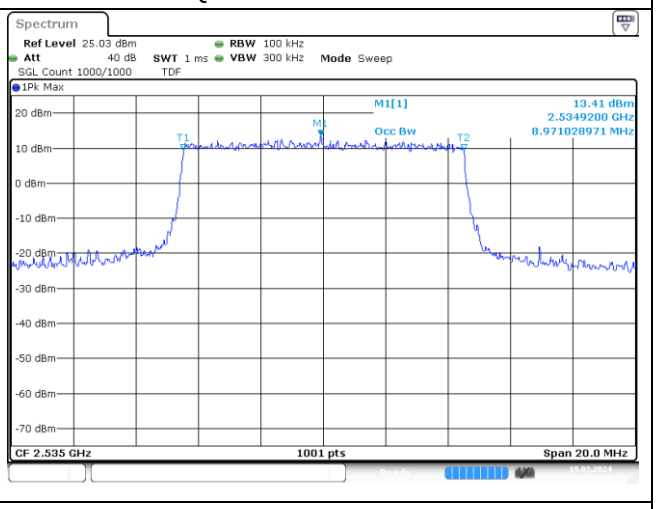

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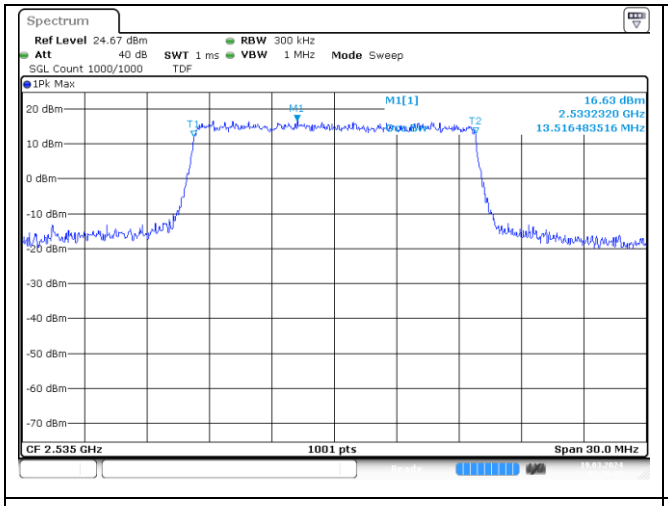

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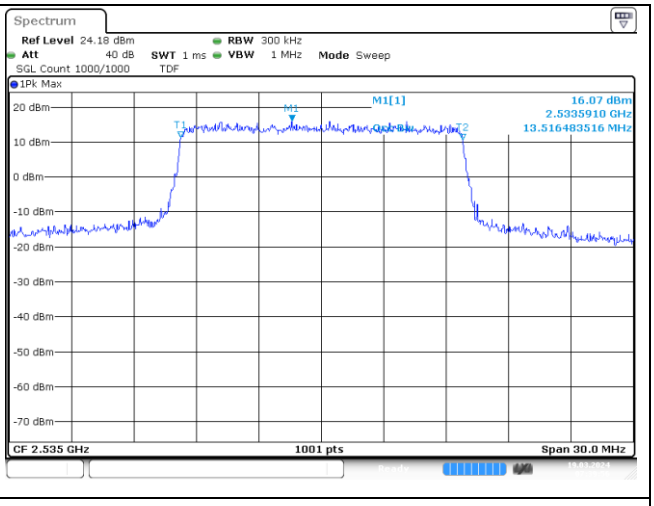
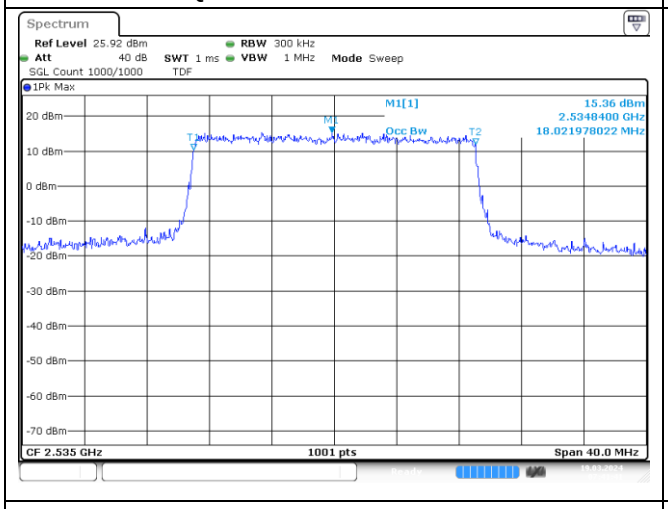
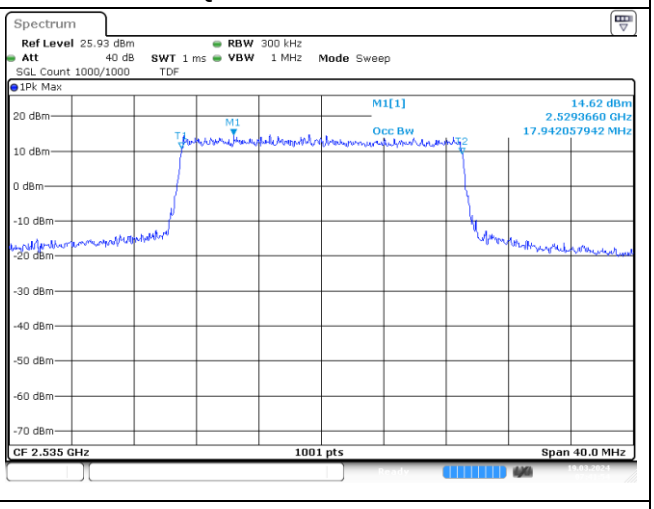


15 ㎒ 16QAM Middle Channel - Full RB

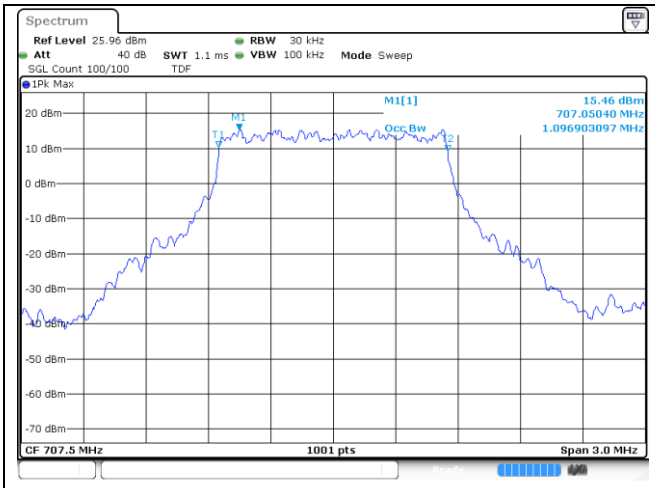


20 ㎒ QPSK Middle Channel - Full RB

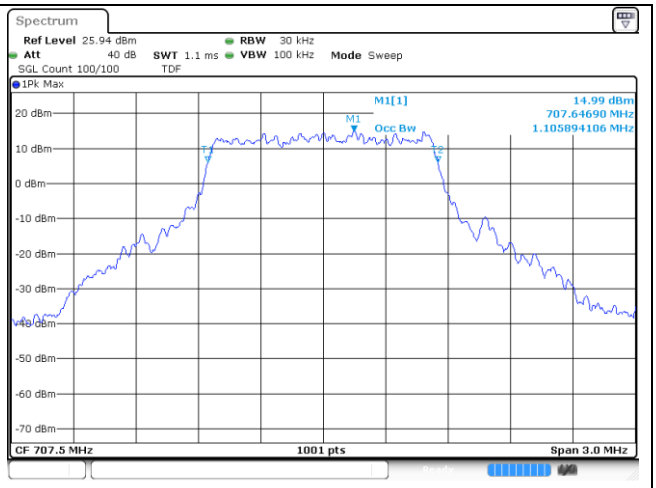


20 ㎒ 16QAM Middle Channel - Full RB

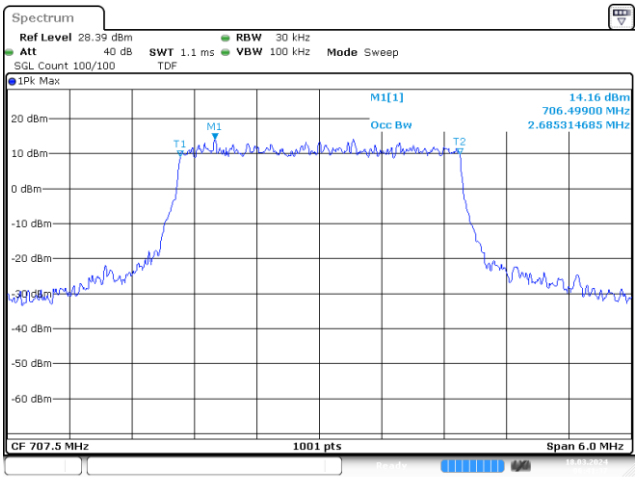
LTE band 12



1.4 ㎒ QPSK Middle Channel - Full RB

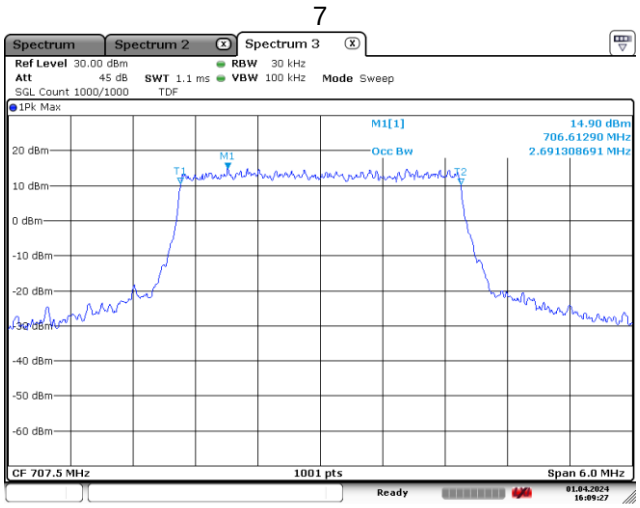


1.4 ㎒ 16QAM Middle Channel - Full RB



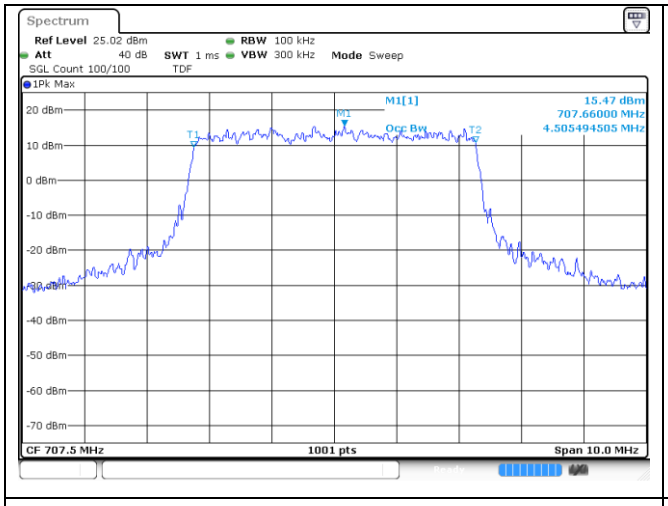
3 ㎒ QPSK Middle Channel - Full RB

7

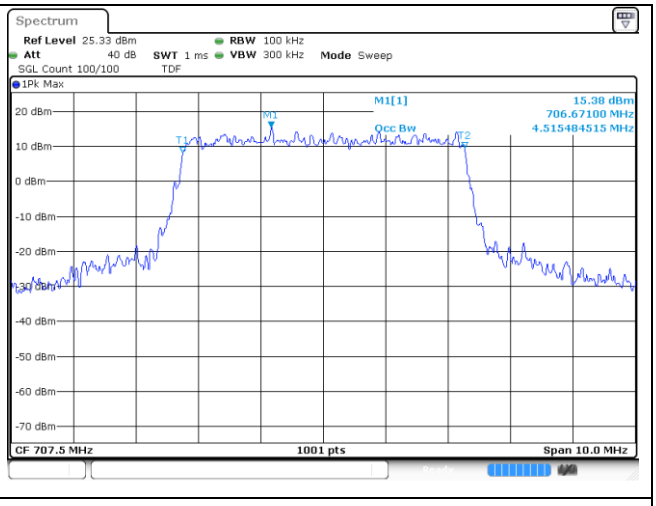


3 ㎒ 16QAM Middle Channel - Full RB

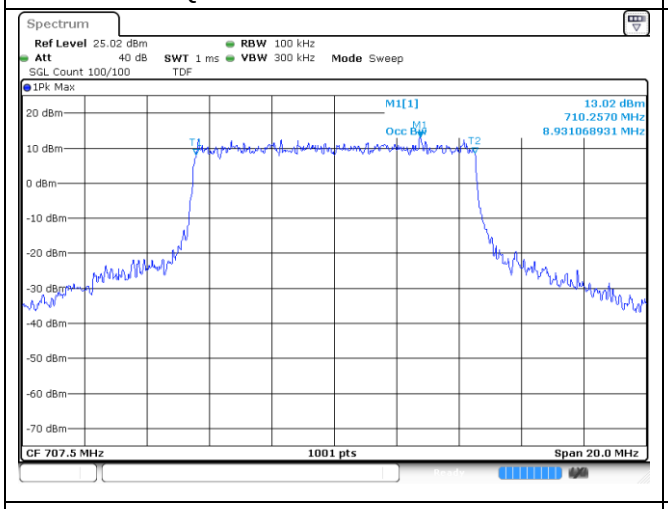
LTE band 12/17



5 ㎒ QPSK Middle Channel - Full RB



5 ㎒ 16QAM Middle Channel - Full RB



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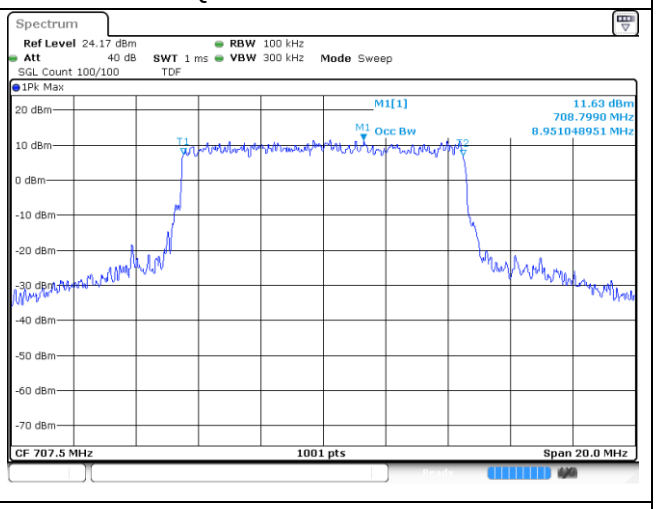
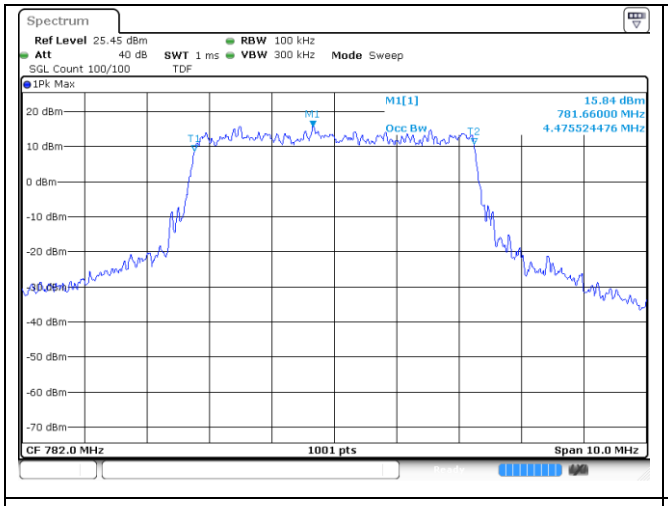


10 ㎒ 16QAM Middle Channel - Full RB

LTE band 13



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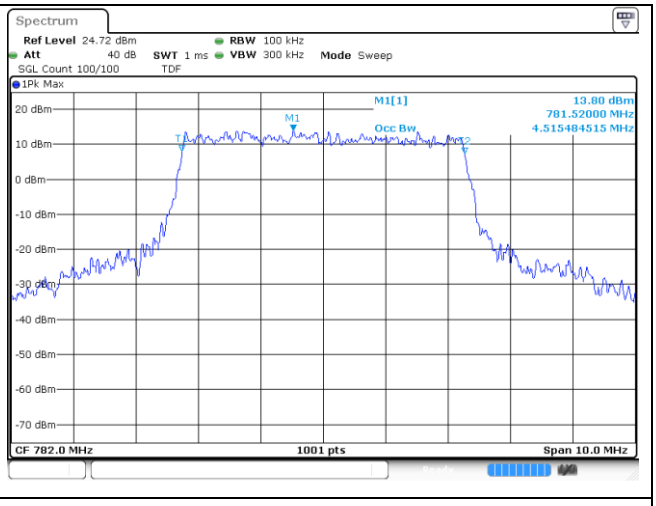

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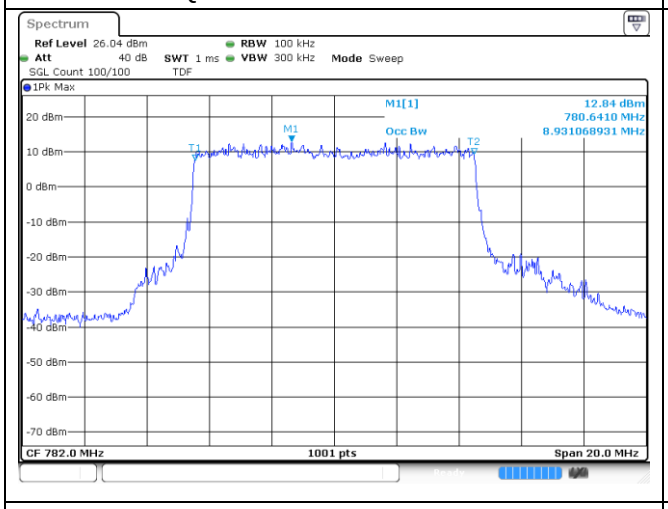

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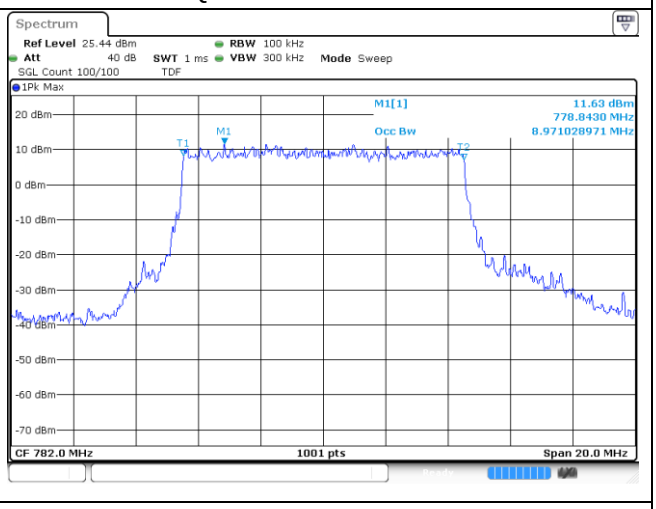
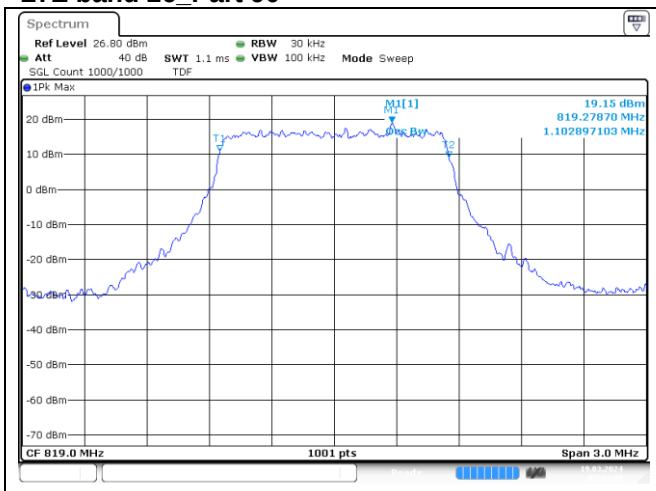


10 ㎒ 16QAM Middle Channel - Full RB

LTE band 26_Part 90



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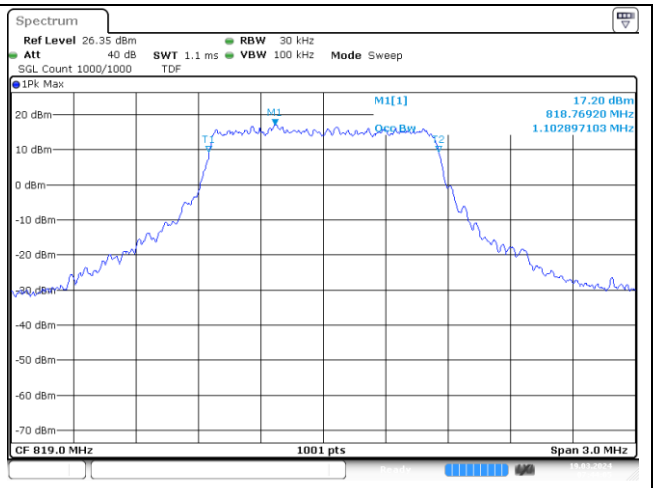

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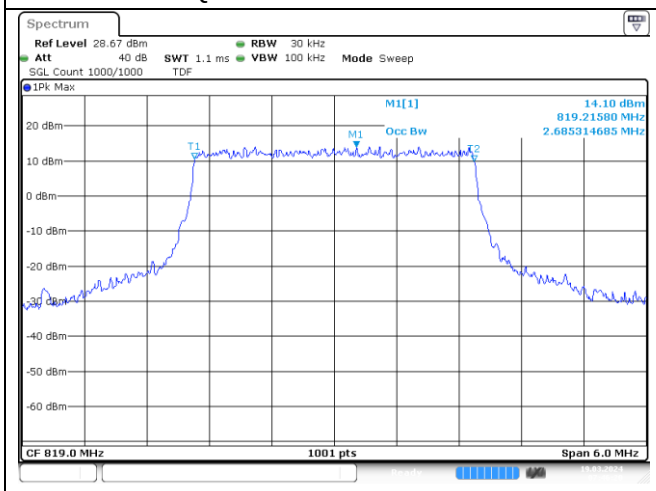
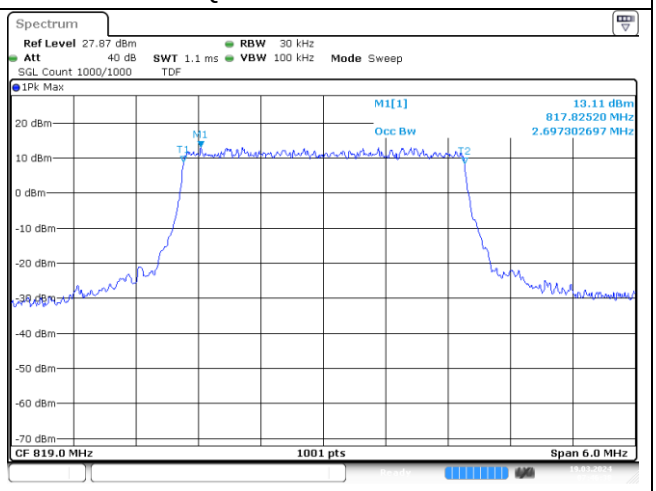


3 ㎒ QPSK Middle Channel - Full RB



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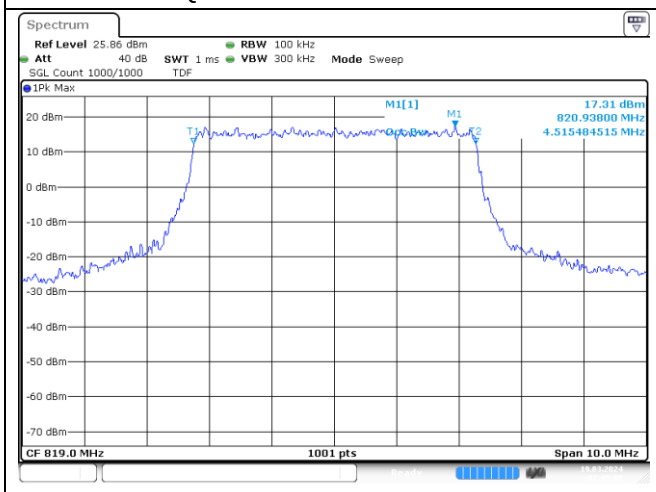
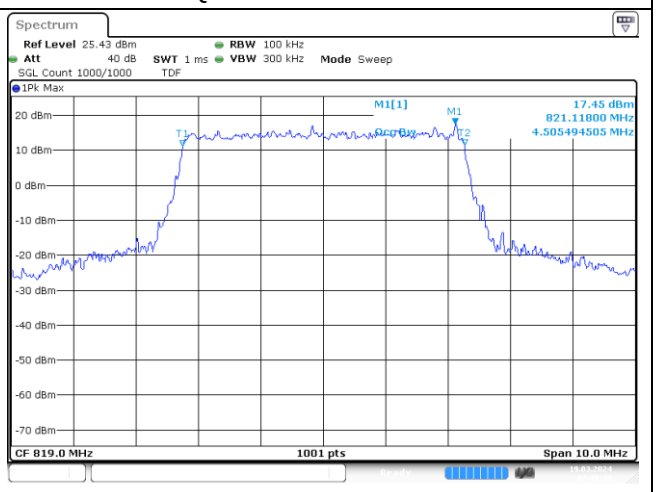


5 ㎒ QPSK Middle Channel - Full RB



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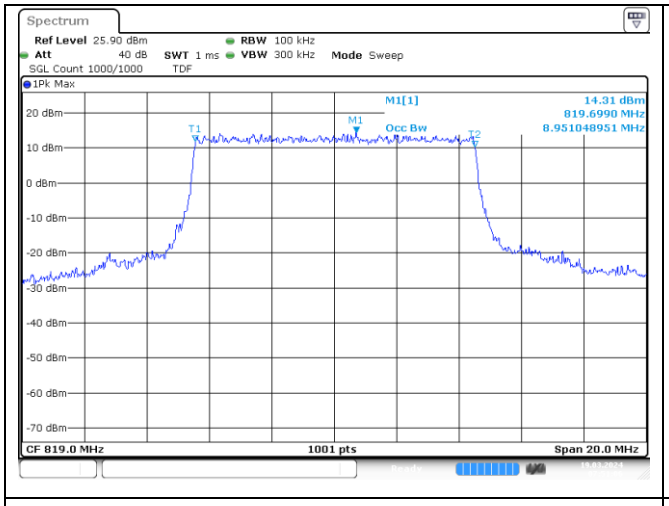

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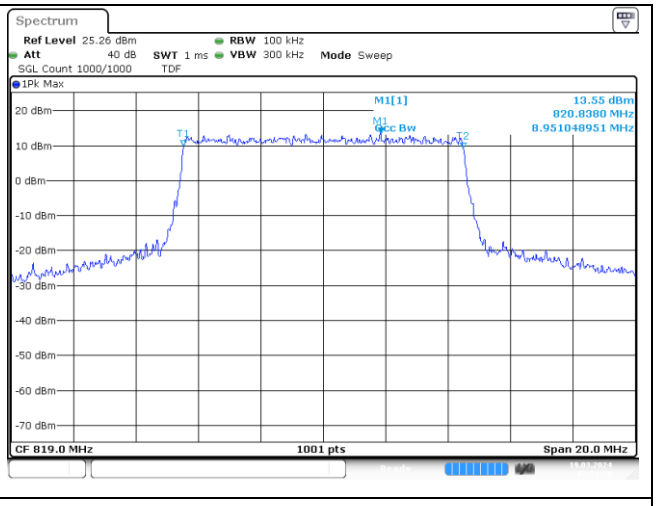

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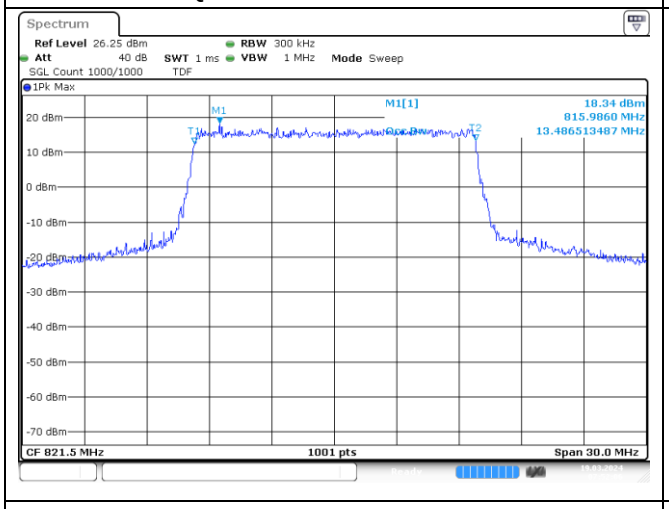

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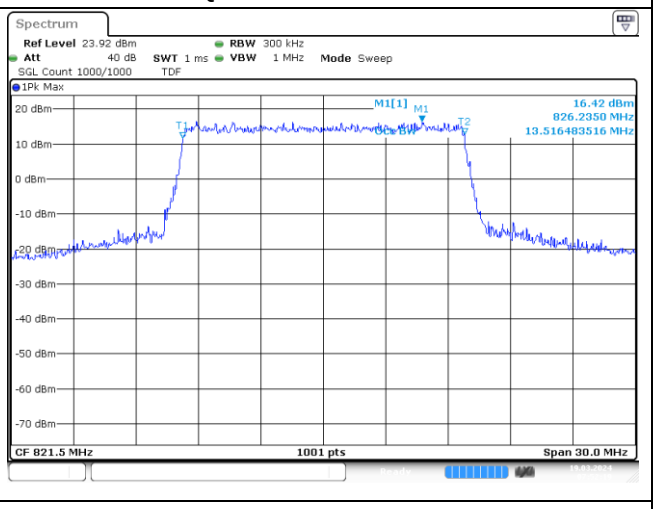
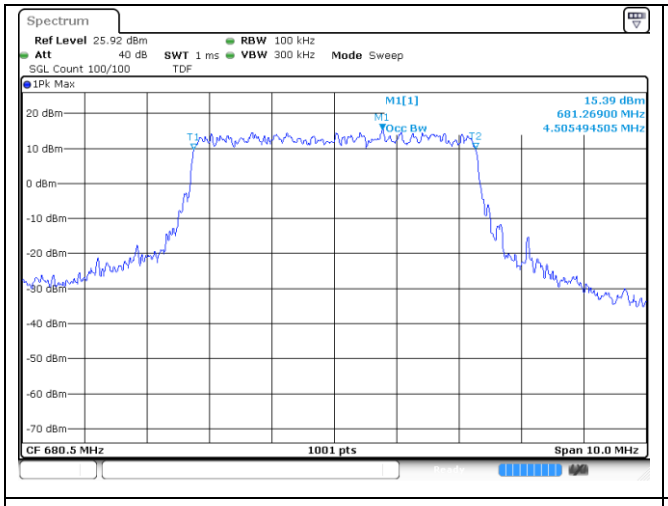
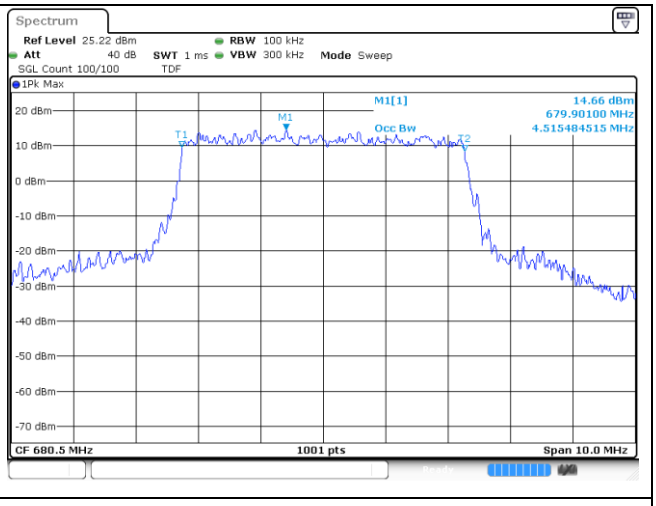


15 ㎒ 16QAM Middle Channel - Full RB

LTE band 71



5 ㎒ QPSK Middle Channel - Full RB



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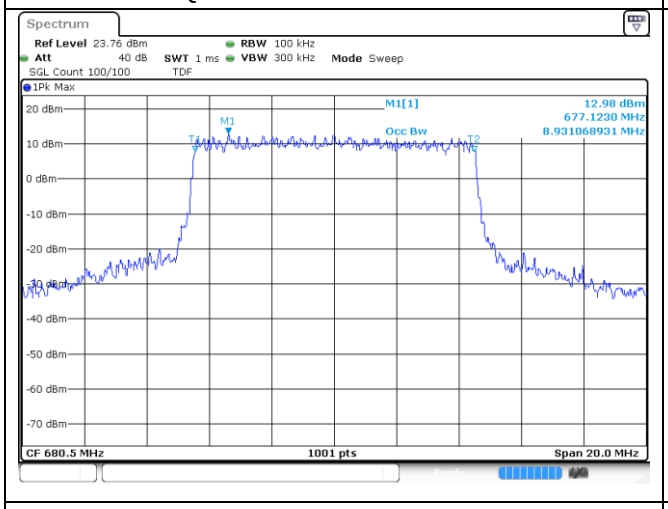

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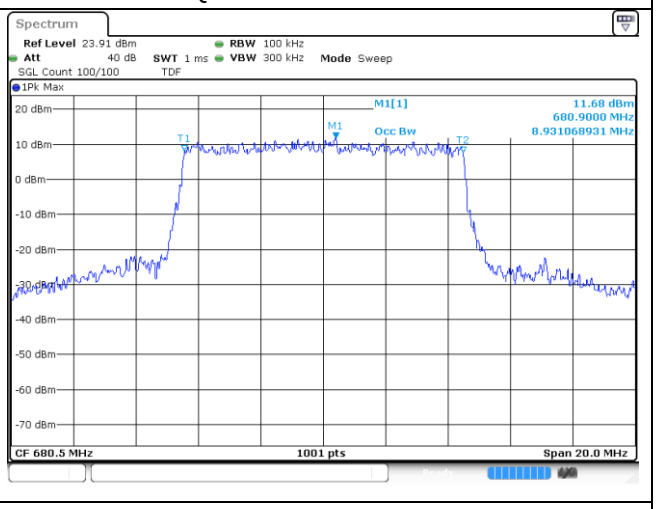

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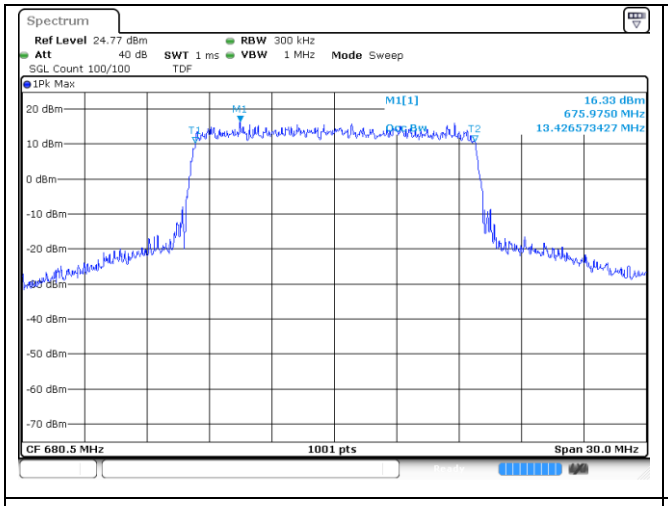

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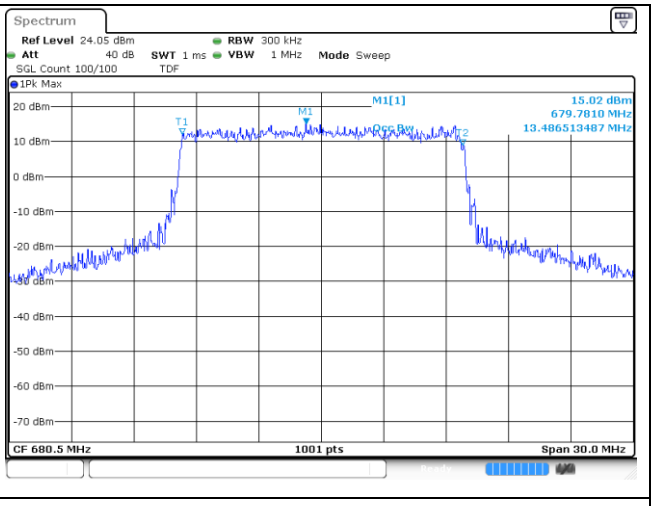

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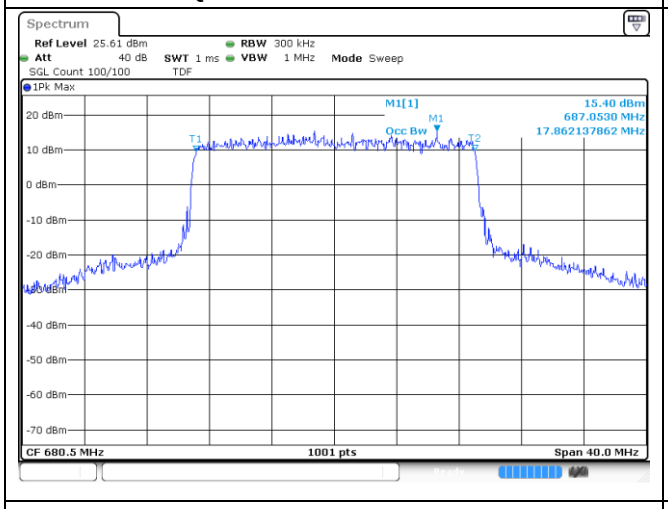
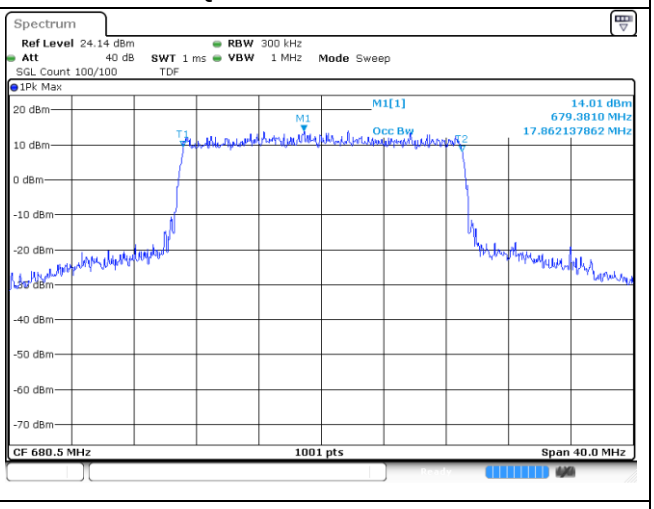


20 ㎒ QPSK Middle Channel - Full RB



20 ㎒ 16QAM Middle Channel - Full RB

5. Peak-Average Ratio

5.1. Limit

FCC

- §22.913(d) Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 ㎧.

- §24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 ㎧.

- §27.50(d)(5), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 ㎧.

IC

- RSS-130 Issue 2

4.6.1, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 ㎧ for more than 0.1 % of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

- RSS-132 Issue 4

5.4, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 ㎧ for more than 0.1 % of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

- RSS-133 Issue 6

6.4, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 ㎧ for more than 0.1 % of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

- RSS-139 Issue 4

5.5, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 ㎧ for more than 0.1 % of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

- RSS-199 Issue 4

5.5, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 ㎧ for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

5.2. Test Procedure

The test follows section 5.2.3.4 of ANSI C63.26-2015.

See instrumentation-specific application literature for further guidance regarding use of the CCDF capability. The following guidelines are offered for performing a CCDF measurement.

a. Set resolution/measurement bandwidth ≥ OBW or specified reference bandwidth.

b. Set the number of counts to a value that stabilizes the measured CCDF curve.

c. Set the measurement interval as follows:

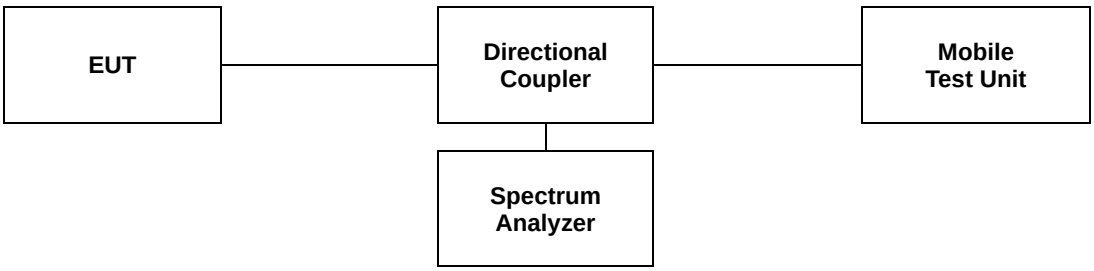
1) For continuous transmissions, set to greater of [10 x (number of points in sweep) x (transmission symbol period)] or 1 ㎳.

2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.

3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.

d. Record the maximum PAPR level associated with a probability of 0.1 %.

e. The peak power level is calculated form the sum of the PAPR value from step d) to the measured average power.



5.3 Test Results

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

WCDMA

Band	Mode	Frequency (㎒)	PAR (㏈)
WCDMA Ⅱ	RMC	1 852.4	2.70
		1 880.0	2.35
		1 907.6	2.41
	HSDPA	1 852.4	2.55
		1 880.0	2.70
		1 907.6	2.52
WCDMA Ⅴ	RMC	826.4	3.04
		836.6	3.33
		846.6	2.99
	HSDPA	826.4	3.33
		836.6	3.25
		846.6	3.28

LTE

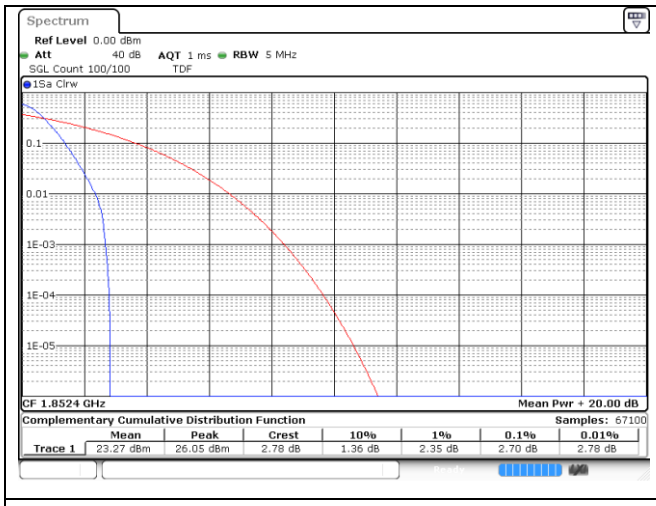
Band	Bandwidth (㎒)	Mode	Frequency (㎒)	PAR (dB)
25/2	1.4	256QAM	1 850.7	6.96
			1 882.5	6.43
			1 914.3	6.70
	3		1 851.5	6.70
			1 882.5	6.81
			1 913.5	6.41
	5		1 852.5	6.29
			1 882.5	6.70
			1 912.5	6.41
	10		1 855.0	6.35
			1 882.5	6.43
			1 910.0	6.35
	15		1 857.5	6.49
			1 882.5	6.72
			1 907.5	6.67
	20		1 860.0	6.29
			1 882.5	6.43
			1 905.0	6.43
66/4	1.4	256QAM	1 710.7	6.61
			1 745.0	6.38
			1 779.3	6.64
	3		1 711.5	6.61
			1 745.0	6.81
			1 778.5	6.81
	5		1 712.5	6.90
			1 745.0	6.93
			1 777.5	6.93
	10		1 715.0	6.81
			1 745.0	6.61
			1 775.0	6.81
	15		1 717.5	6.81
			1 745.0	6.61
			1 772.5	6.55
	20		1 720.0	6.72
			1 745.0	6.70
			1 770.0	6.32

Band	Bandwidth (㎒)	Mode	Frequency (㎒)	PAR (㏈)
26/5 Part 22	1.4	256QAM	824.7	6.75
			836.5	6.55
			848.3	6.64
	3		825.5	6.78
			836.5	6.43
			847.5	6.35
	5		826.5	6.49
			836.5	6.43
			846.5	6.52
	10		829.0	6.55
			836.5	6.55
			844.0	6.58
	15		831.5	6.58
			841.5	6.46
7	5	256QAM	2 502.5	5.22
			2 535.0	5.28
			2 567.5	5.28
	10		2 505.0	5.33
			2 535.0	5.28
			2 565.0	5.51
	15		2 507.5	5.30
			2 535.0	5.30
			2 562.5	5.42
	20		2 510.0	5.54
			2 535.0	5.36
			2 560.0	6.43
12	1.4	256QAM	699.7	6.75
			707.5	6.75
			715.3	6.46
	3		700.5	6.58
			707.5	6.41
			714.5	6.49
12/17	5		701.5	6.78
			707.5	6.46
			713.5	6.32
	10		704.0	6.46
			707.5	6.49
			711.0	6.49
13	5	256QAM	779.5	6.55
			782.0	6.49
			784.5	6.49
	10		782.0	6.46

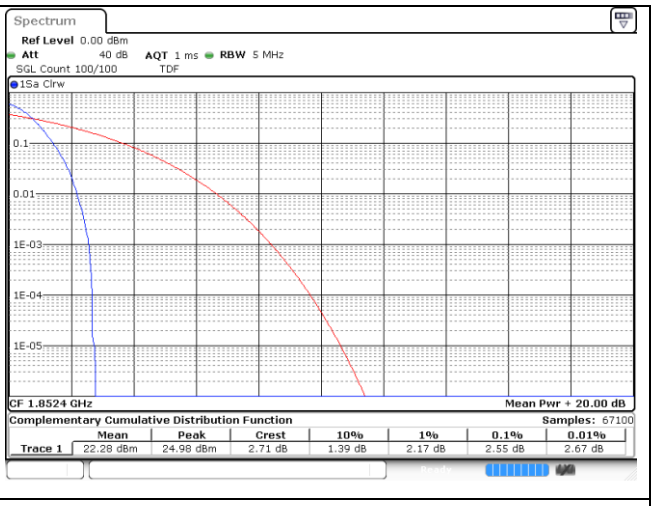
Band	Bandwidth (㎒)	Mode	Frequency (㎒)	PAR (dB)
26 Part 90	1.4	256QAM	814.7	6.70
			819.0	6.55
			823.3	6.58
	3		815.5	6.81
			819.0	6.46
			822.5	6.29
	5		816.5	6.43
			819.0	6.38
			821.5	6.70
	10		819.0	6.52
	15		821.5	6.55
71	5	256QAM	665.5	6.81
			680.5	6.26
			695.5	6.46
	10		668.0	6.58
			680.5	6.35
			693.0	6.46
	15		670.5	6.64
			680.5	6.52
			690.5	6.38
	20		673.0	6.49
			680.5	6.43
			688.0	6.52

- Test plots

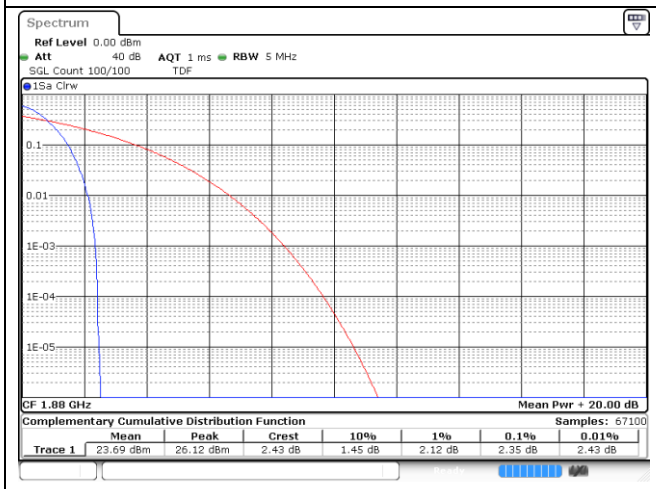
WCDMA Ⅱ



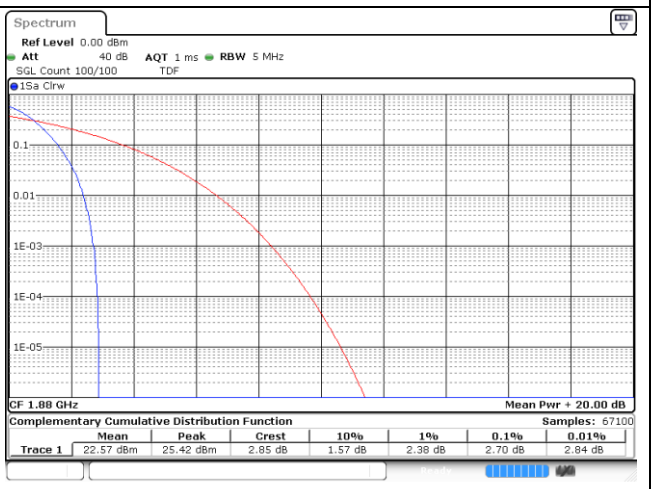
WCDMA Ⅱ RMC Low Channel



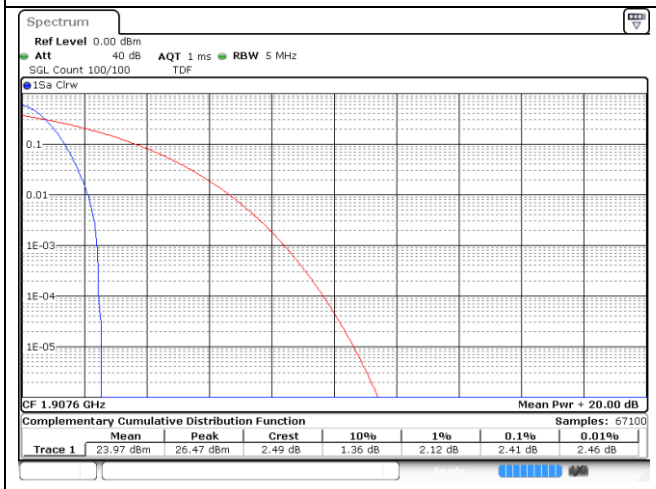
WCDMA Ⅱ HSDPA Low Channel



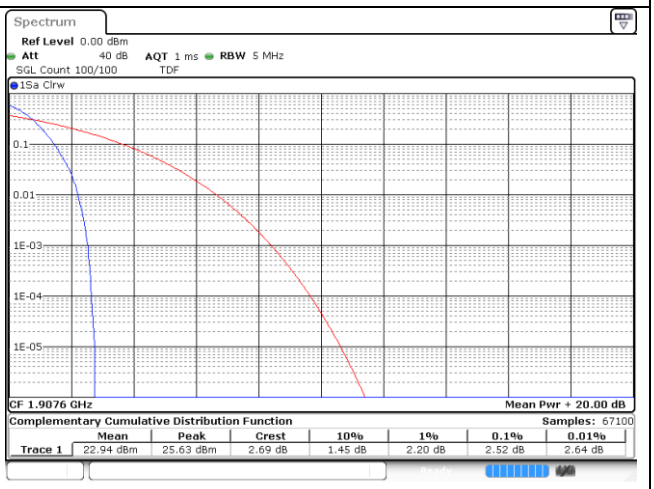
WCDMA Ⅱ RMC Middle Channel



WCDMA Ⅱ HSDPA Middle Channel

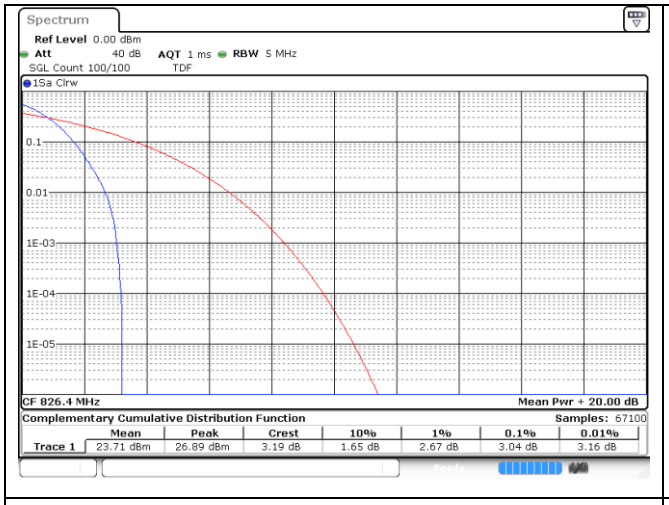


WCDMA Ⅱ RMC High Channel

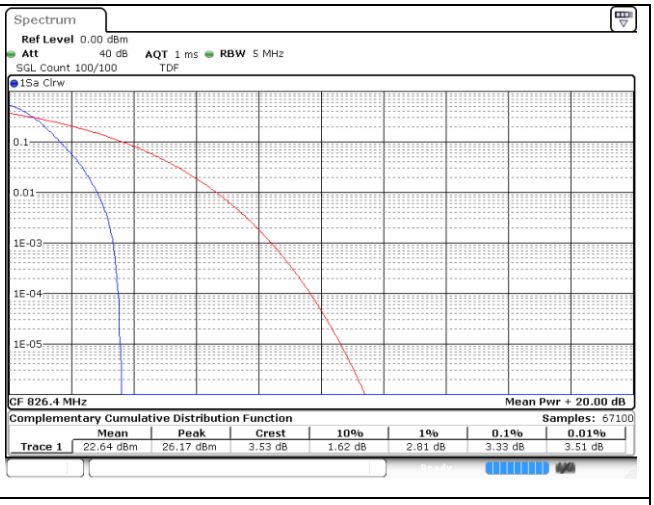


WCDMA Ⅱ HSDPA High Channel

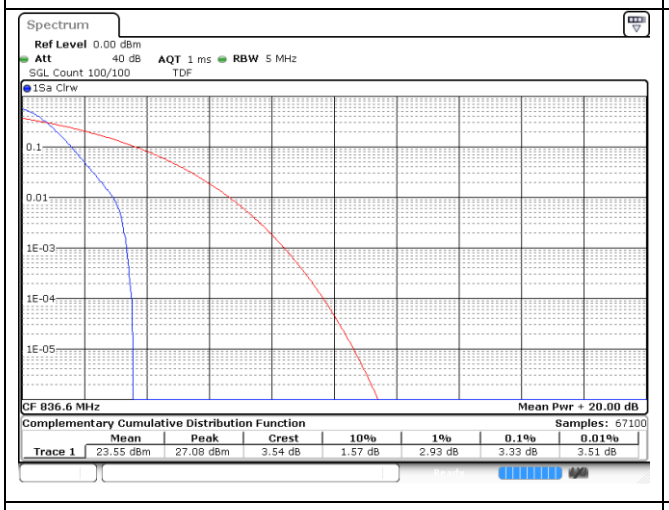
WCDMA Ⅴ



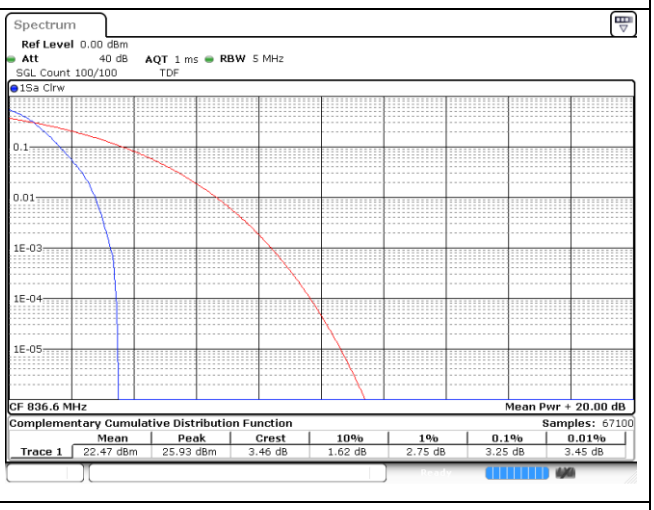
WCDMA Ⅴ RMC Low Channel



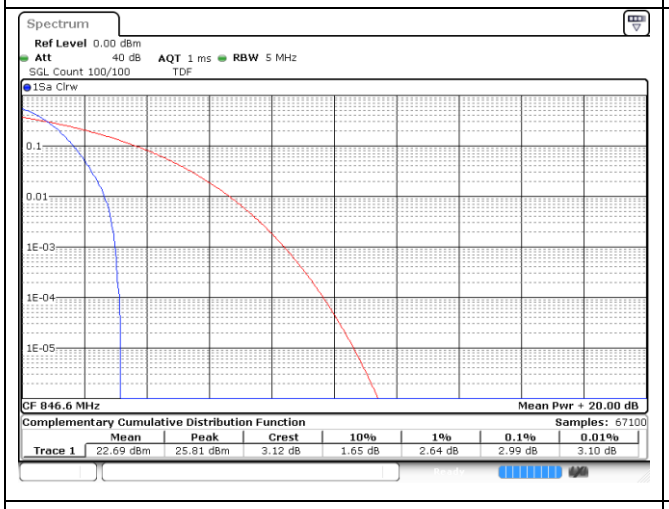
WCDMA Ⅴ HSDPA Low Channel



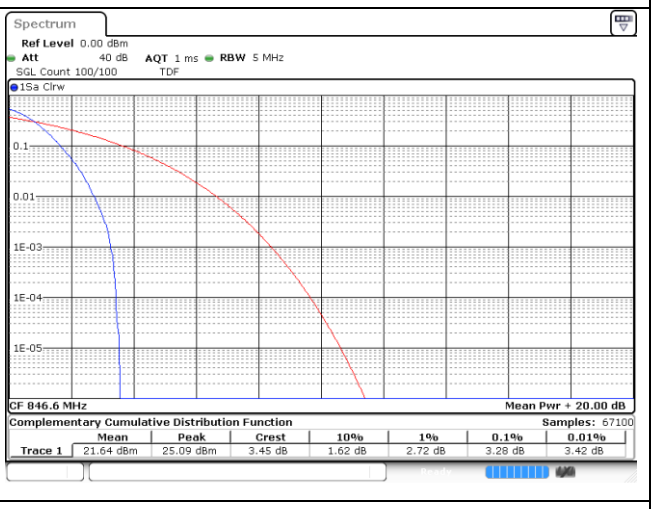
WCDMA Ⅴ RMC Middle Channel



WCDMA Ⅴ HSDPA Middle Channel

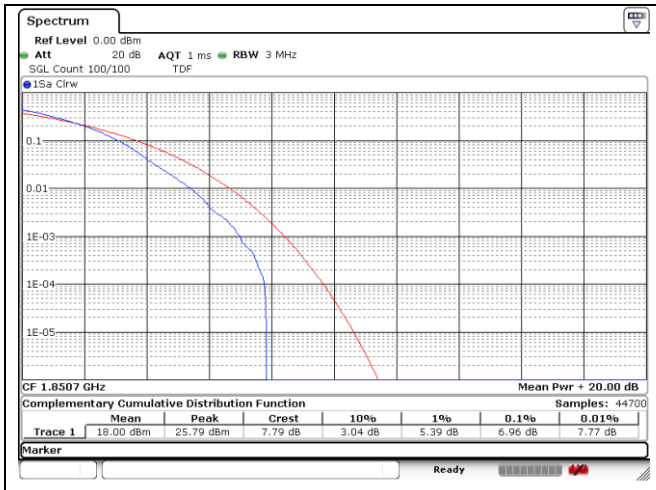


WCDMA Ⅴ RMC High Channel

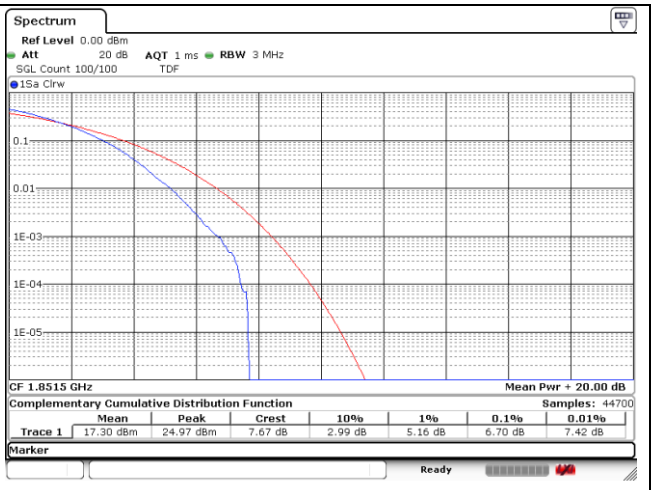


WCDMA Ⅴ HSDPA High Channel

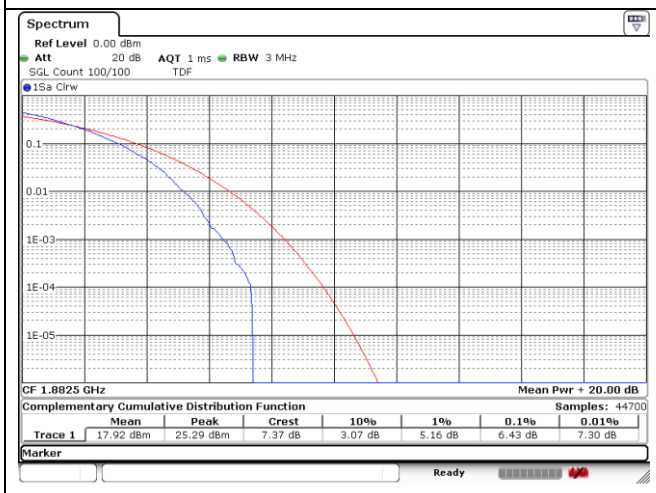
LTE band 25/2



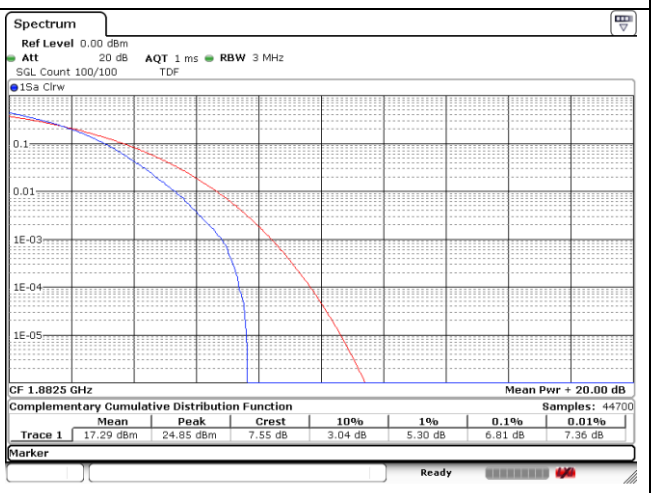
1.4 ㎒ Low Channel - Full RB



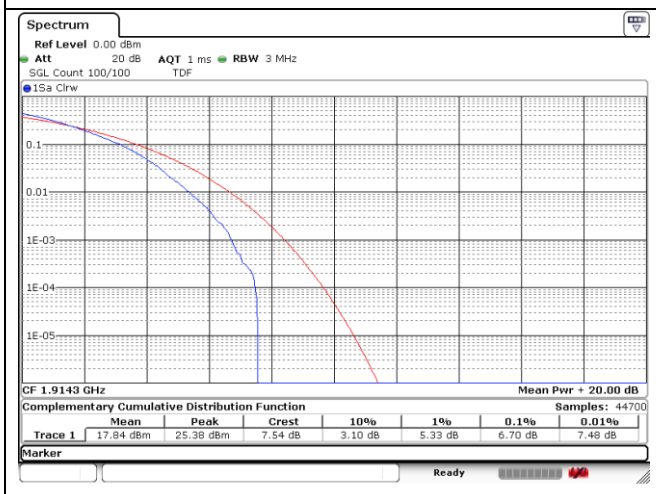
3 ㎒ Low Channel - Full RB



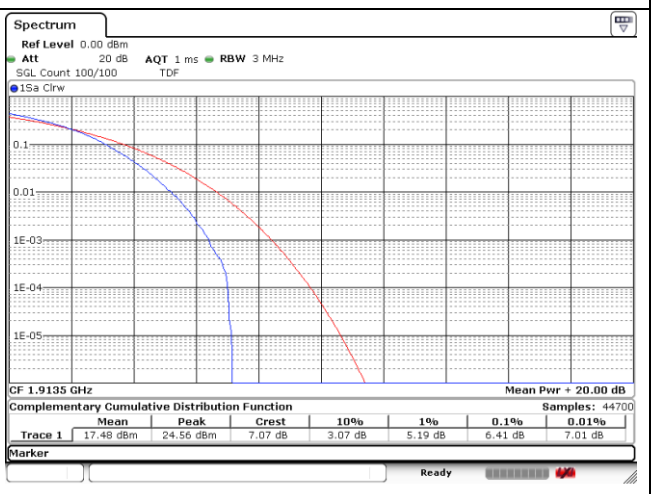
1.4 ㎒ Middle Channel - Full RB



3 ㎒ Middle Channel - Full RB

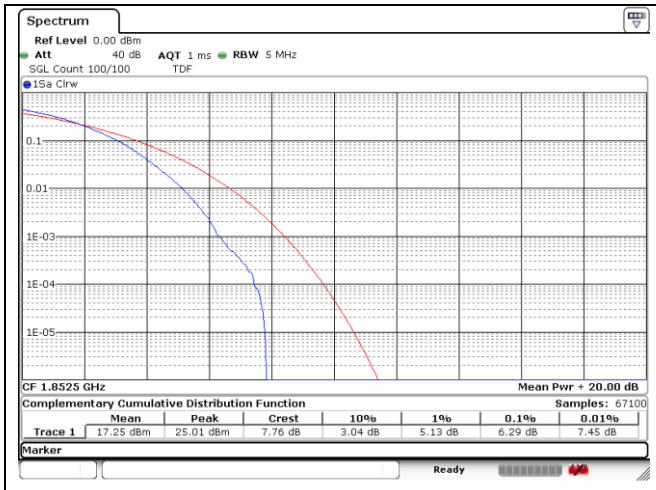


1.4 ㎒ High Channel - Full RB

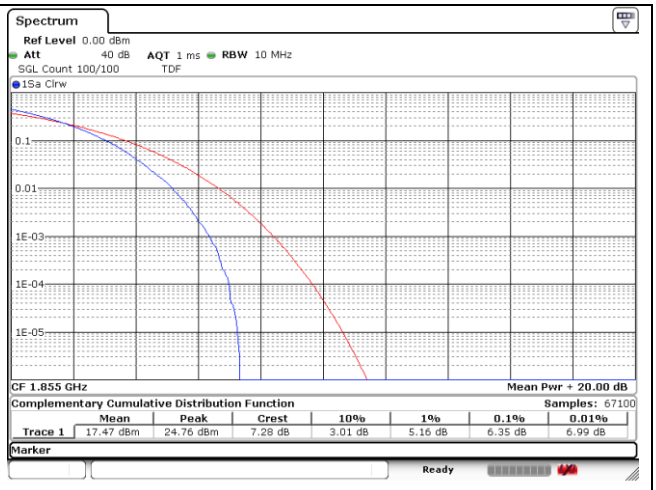


3 ㎒ High Channel - Full RB

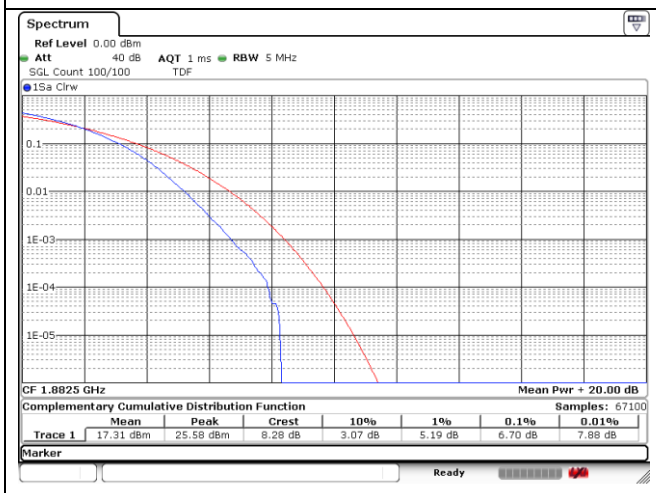
LTE band 25/2



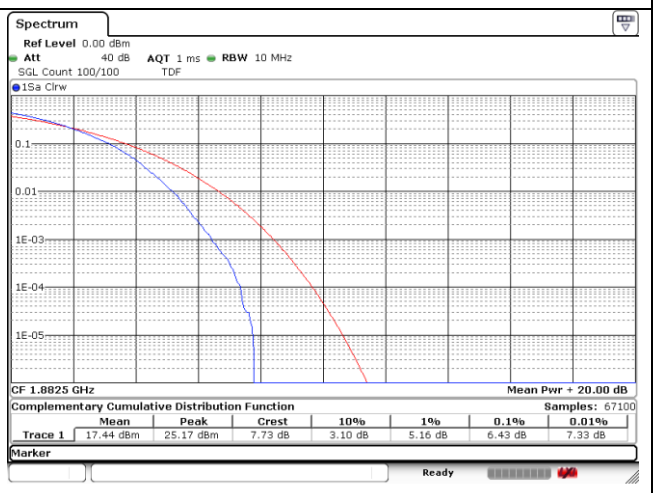
5 ㎒ Low Channel - Full RB



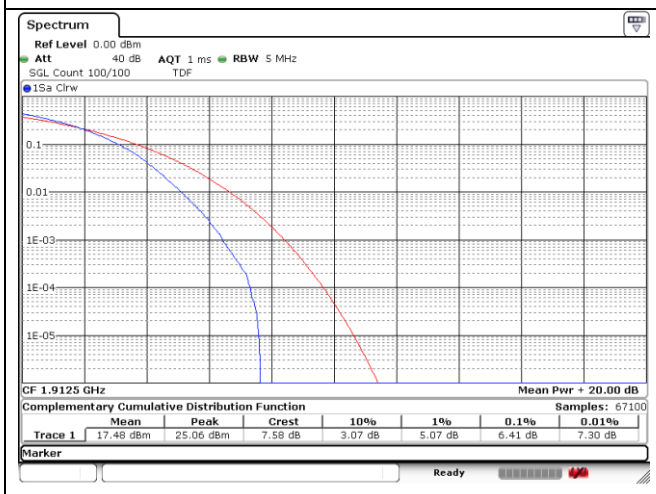
10 ㎒ Low Channel - Full RB



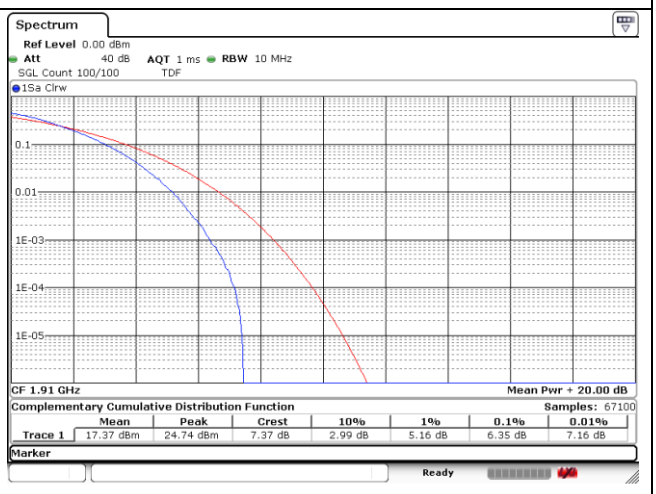
5 ㎒ Middle Channel - Full RB



10 ㎒ Middle Channel - Full RB

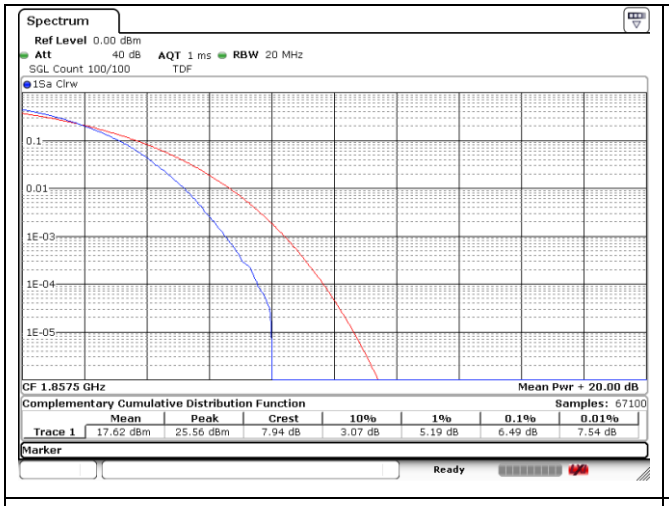


5 ㎒ High Channel - Full RB

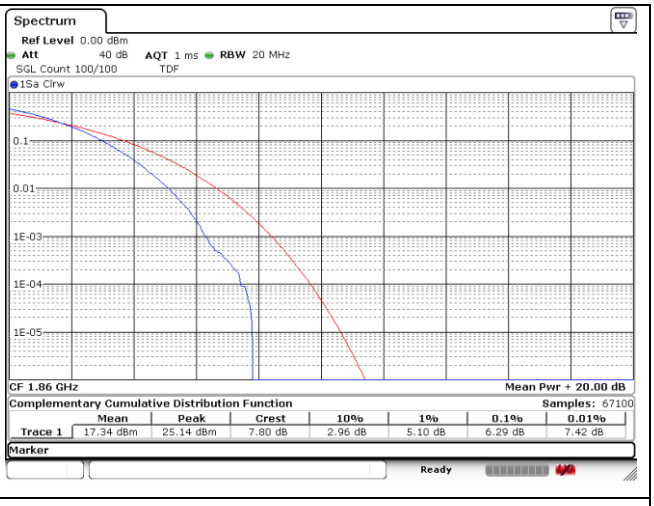


10 ㎒ High Channel - Full RB

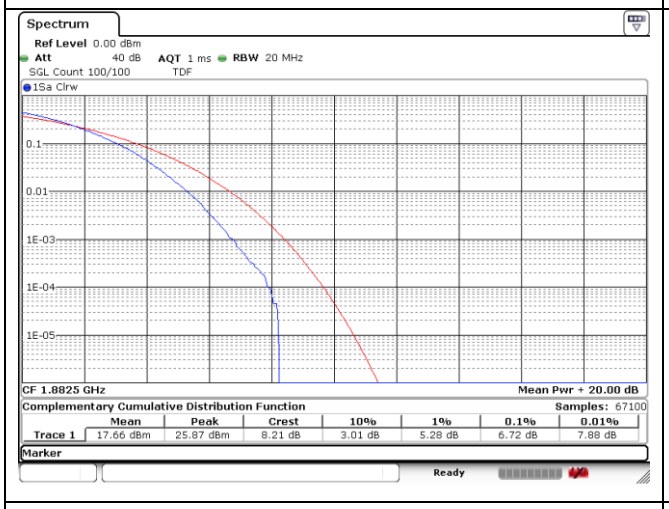
LTE band 25/2



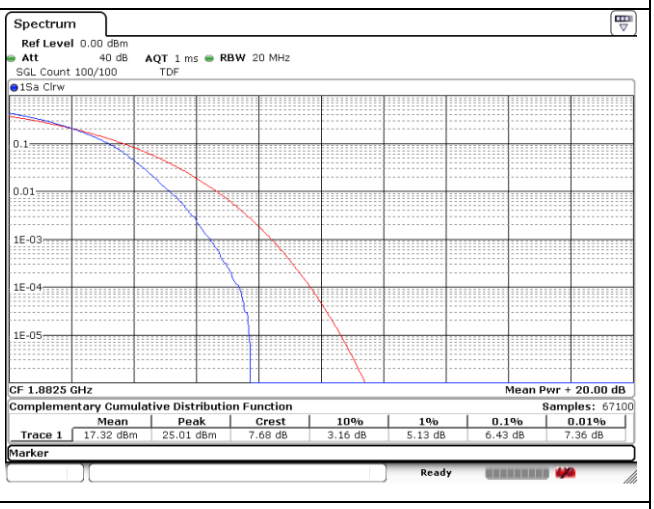
15 ㎒ Low Channel - Full RB



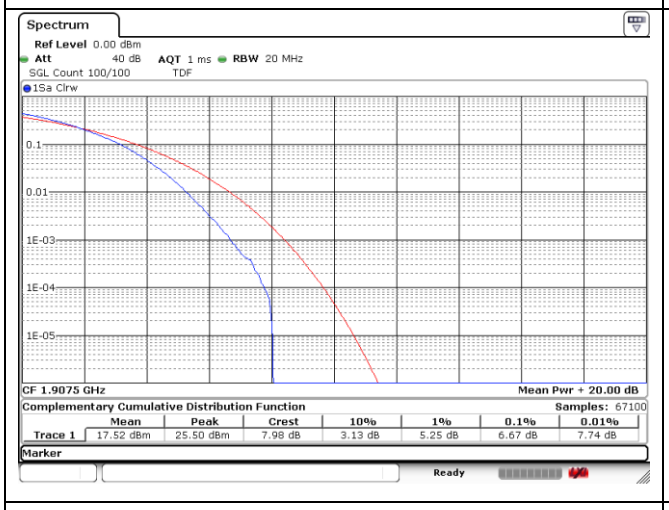
20 ㎒ Low Channel - Full RB



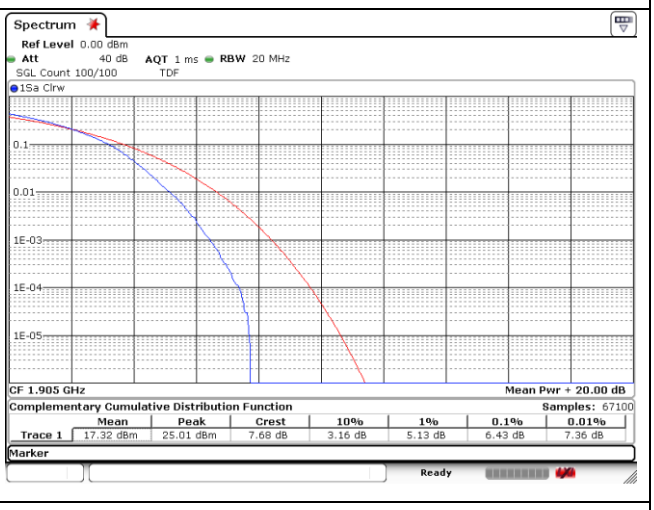
15 ㎒ Middle Channel - Full RB



20 ㎒ Middle Channel - Full RB

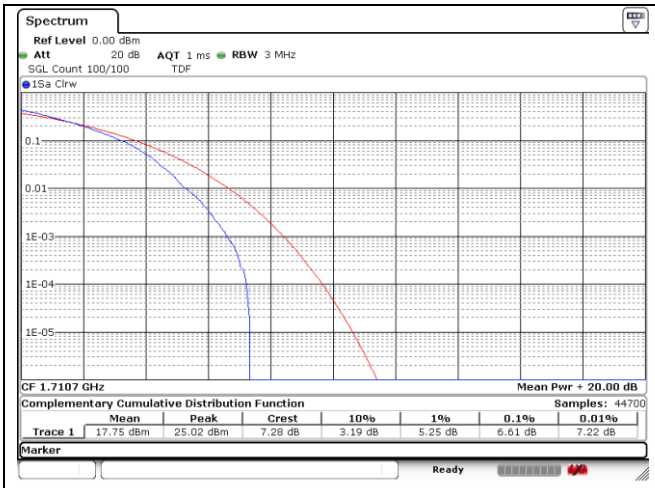


15 ㎒ High Channel - Full RB

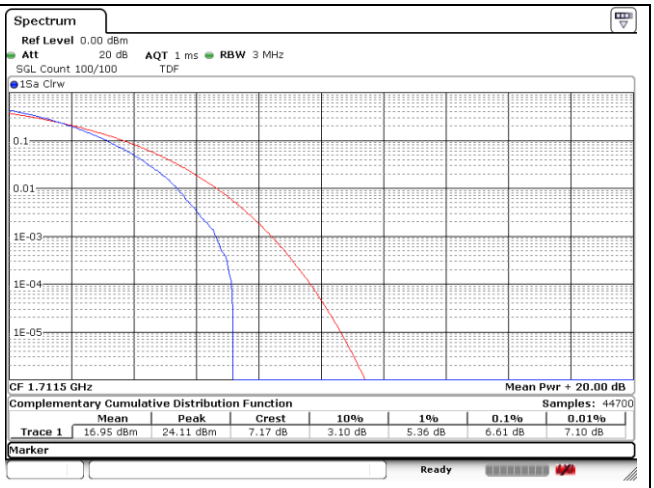


20 ㎒ High Channel - Full RB

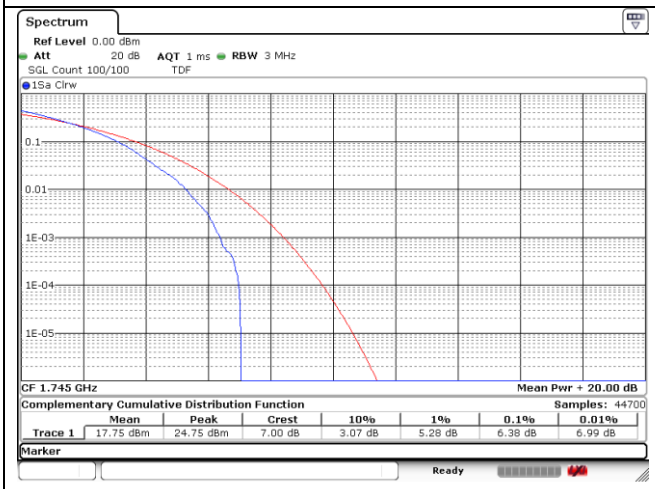
LTE band 66/4



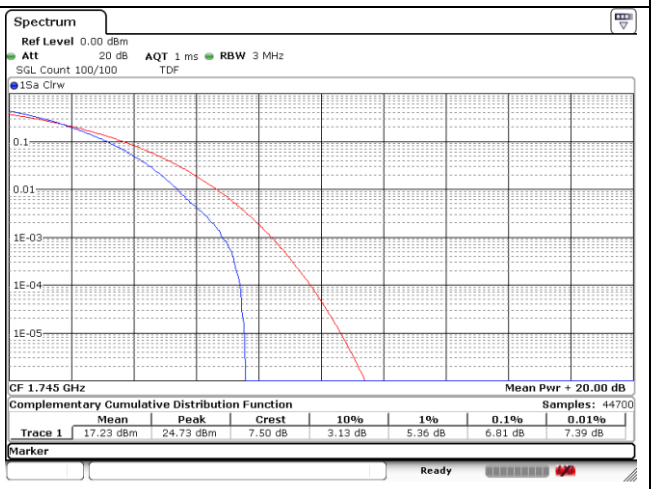
1.4 ㎒ Low Channel - Full RB



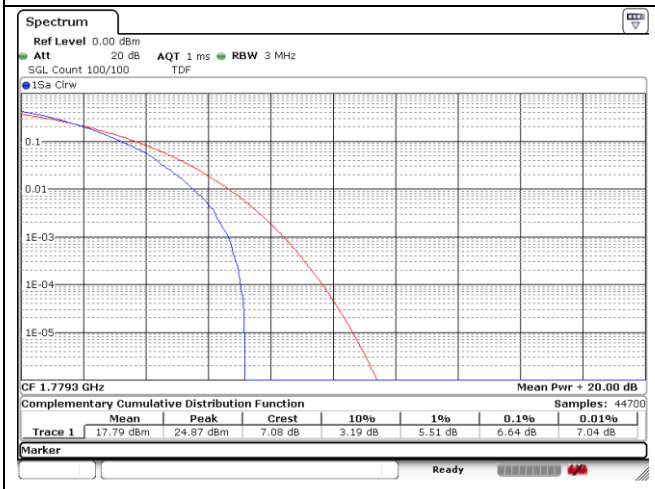
3 ㎒ Low Channel - Full RB



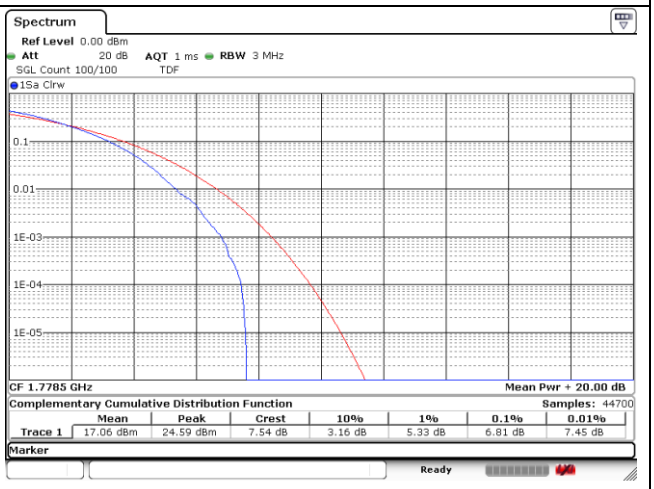
1.4 ㎒ Middle Channel - Full RB



3 ㎒ Middle Channel - Full RB



1.4 ㎒ High Channel - Full RB



3 ㎒ High Channel - Full RB