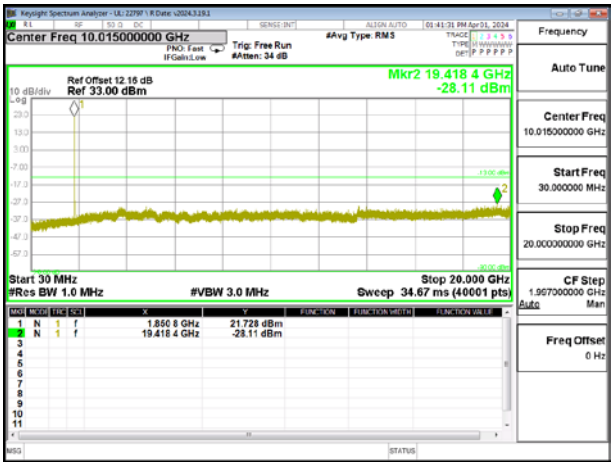
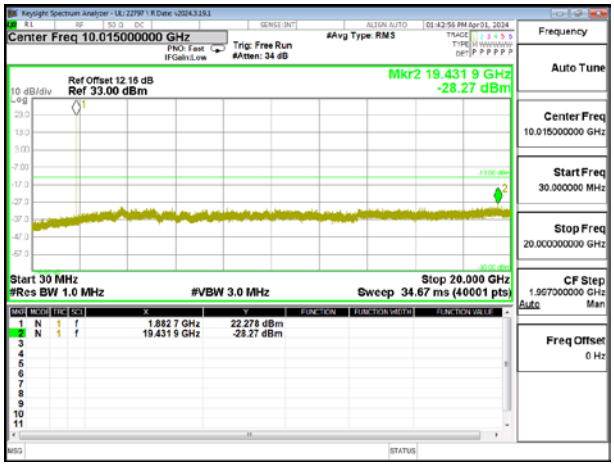
9.2.9. LTE25

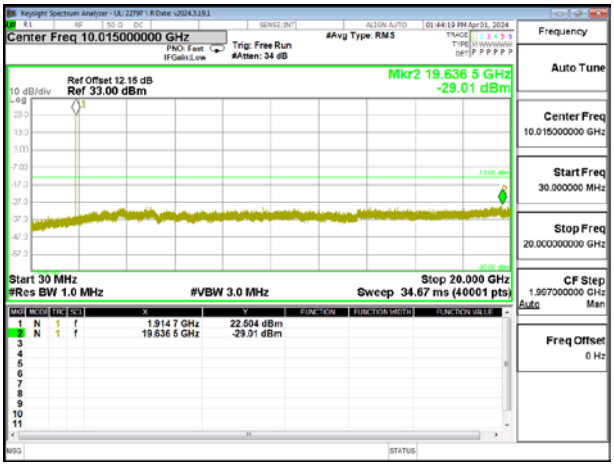
Test Engineer ID:	22797/85502	Test Date:	04-01-24	Sample SN:	QV77004EL3



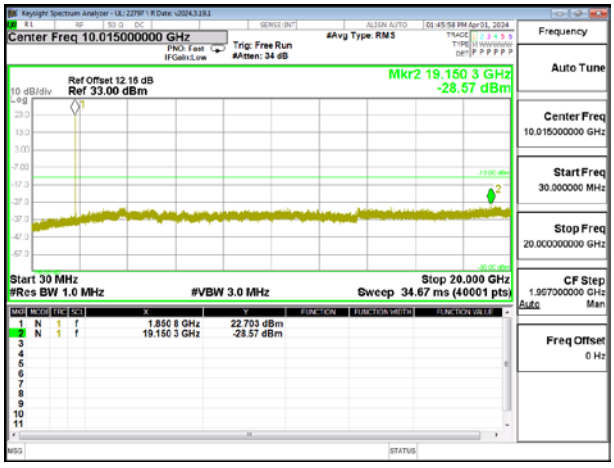
LTE25 1.4MHz 16QAM LOW Ch RB1-0



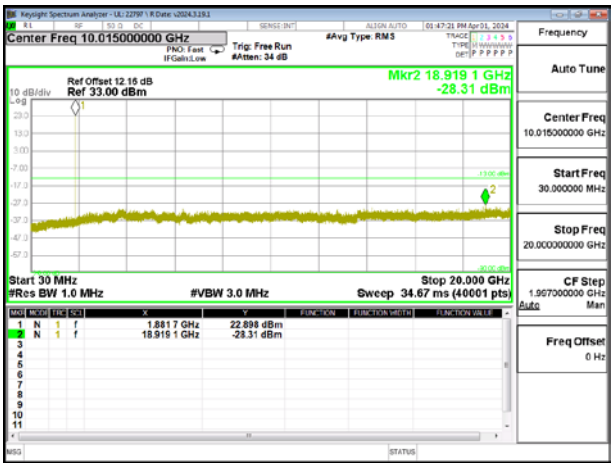
LTE25 1.4MHz 16QAM MID Ch RB1-0



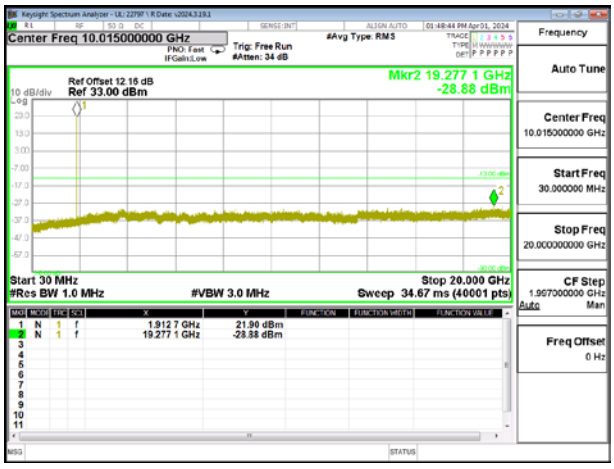
LTE25 1.4MHz 16QAM HIGH Ch RB1-0



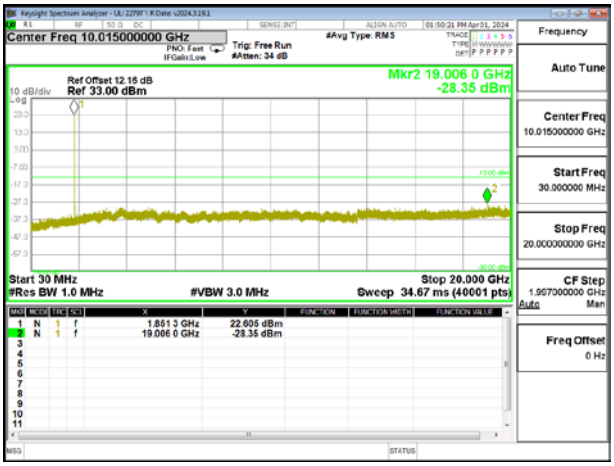
LTE25 3MHz 16QAM LOW Ch RB1-0



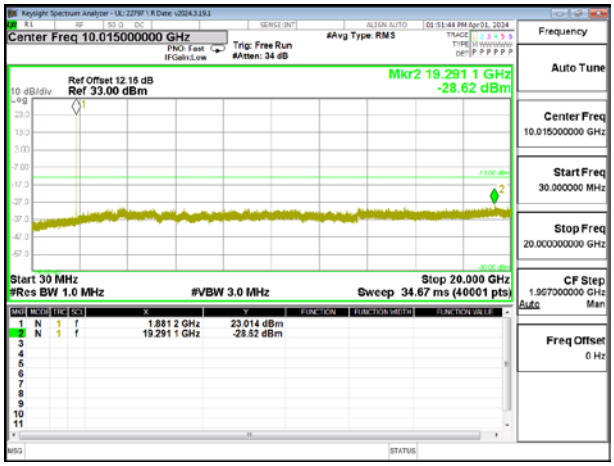
LTE25 3MHz 16QAM MID Ch RB1-0



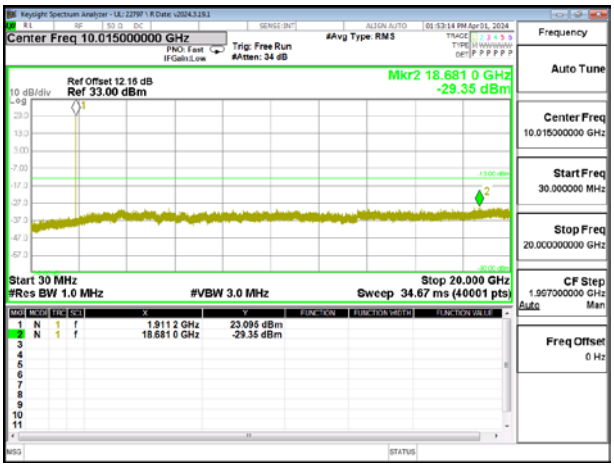
LTE25 3MHz 16QAM HIGH Ch RB1-0



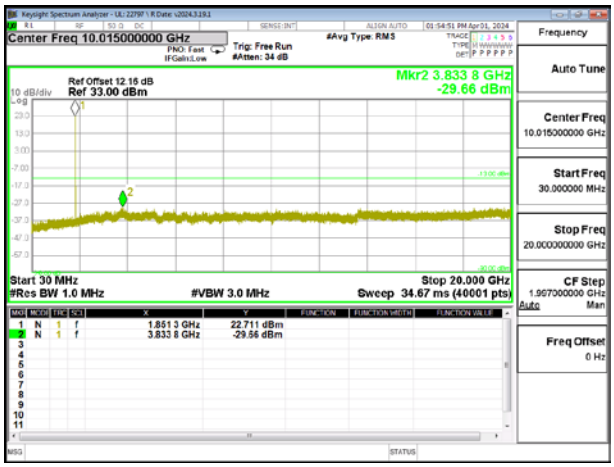
LTE25 5MHz 16QAM LOW Ch RB1-0



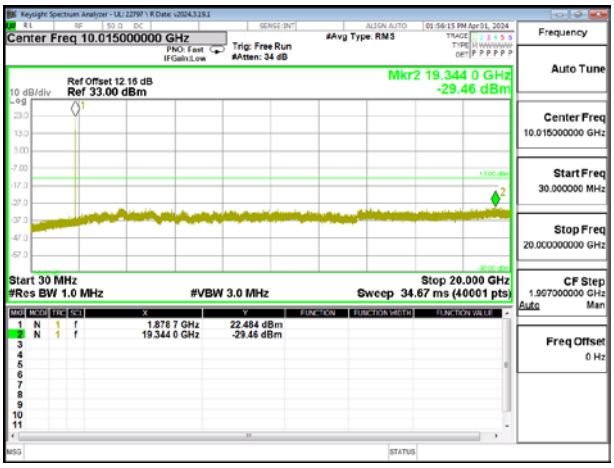
LTE25 5MHz 16QAM MID Ch RB1-0



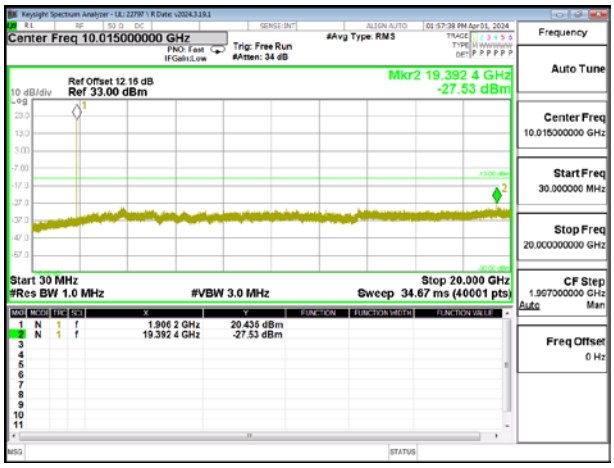
LTE25 5MHz 16QAM HIGH Ch RB1-0



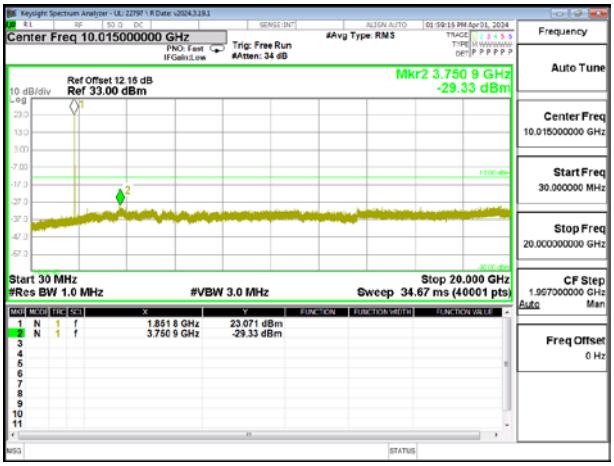
LTE25 10MHz 16QAM LOW Ch RB1-0



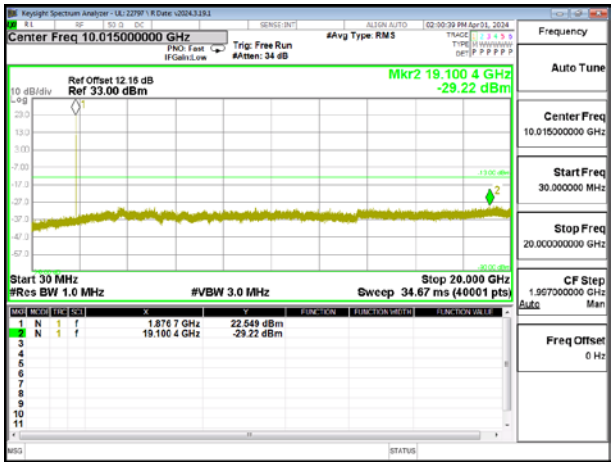
LTE25 10MHz 16QAM MID Ch RB1-0



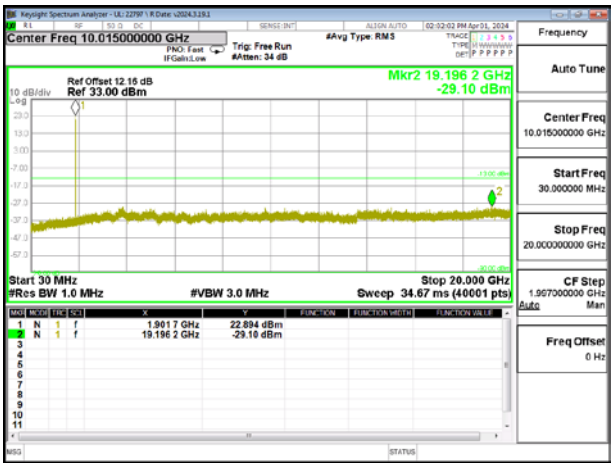
LTE25 10MHz 16QAM HIGH Ch RB1-0



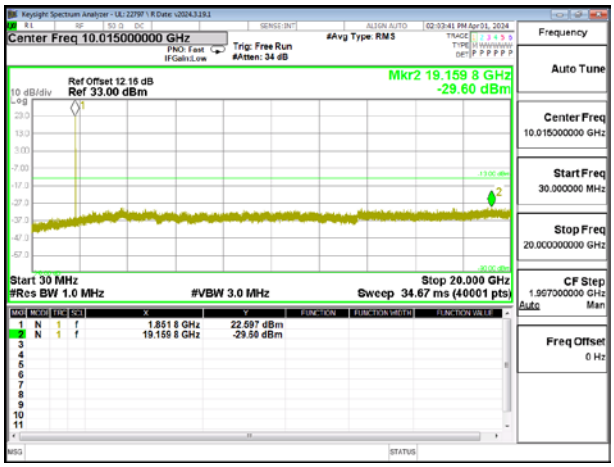
LTE25 15MHz 16QAM LOW Ch RB1-0



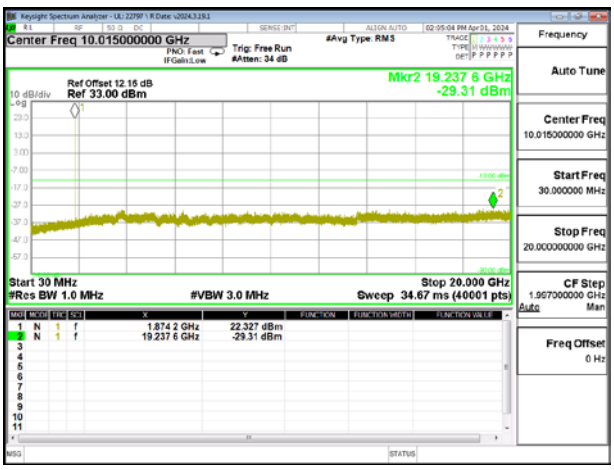
LTE25 15MHz 16QAM MID Ch RB1-0



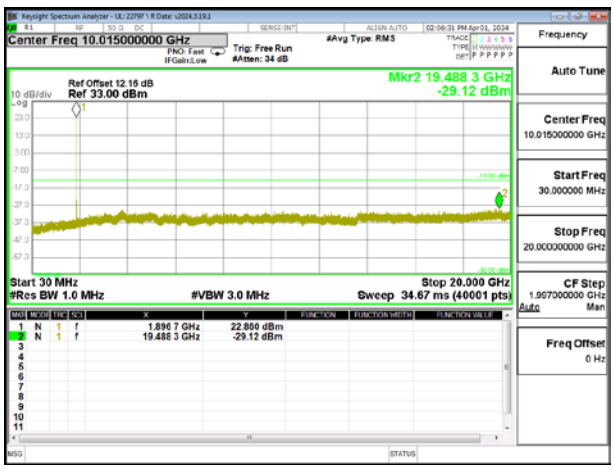
LTE25 15MHz 16QAM HIGH Ch RB1-0



LTE25 20MHz 16QAM LOW Ch RB1-0



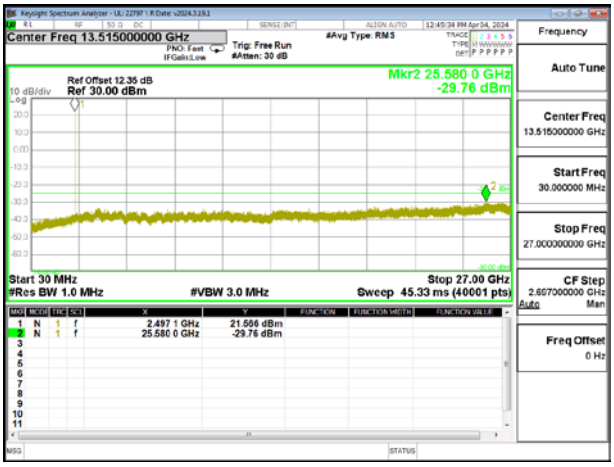
LTE25 20MHz 16QAM MID Ch RB1-0



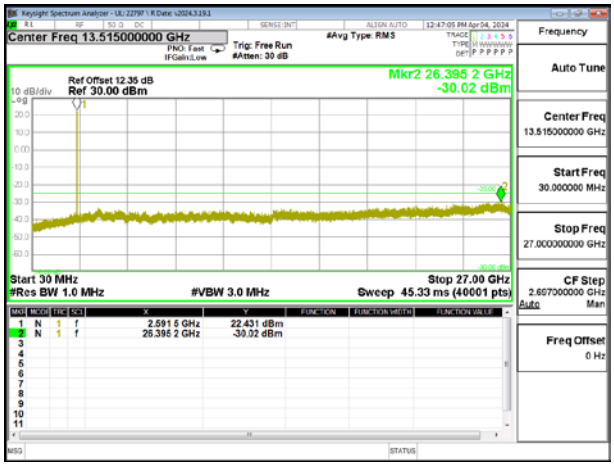
LTE25 20MHz 16QAM HIGH Ch RB1-0

9.2.10. LTE41

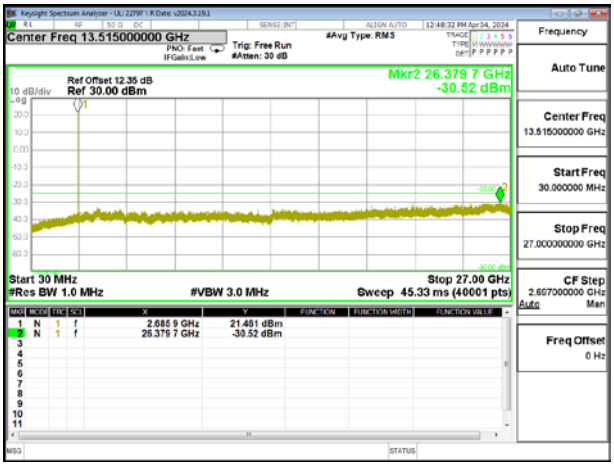
Test Engineer ID:	22797/85502	Test Date:	04-04-24	Sample SN:	QV77004EL3



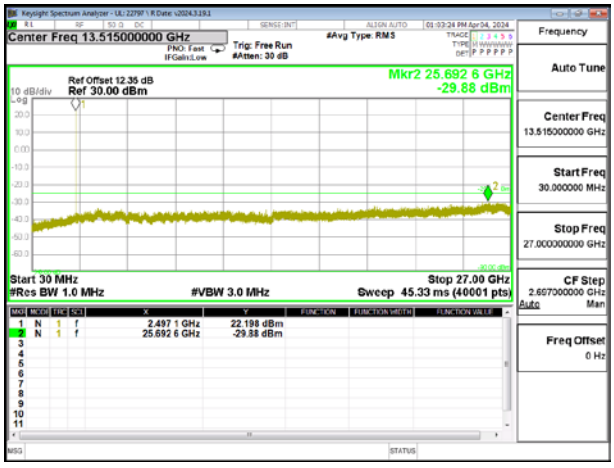
LTE41 5MHz 16QAM LOW Ch RB1-0



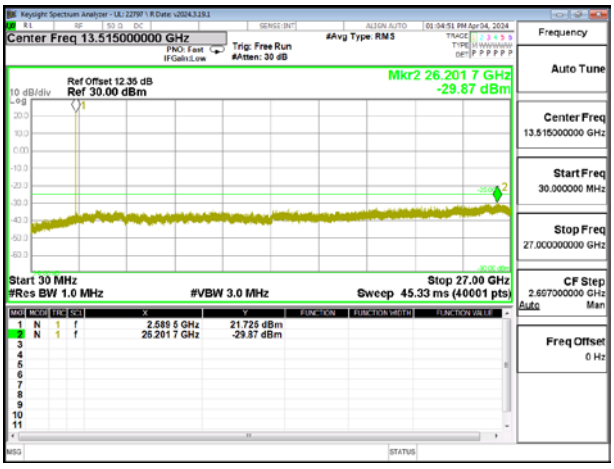
LTE41 5MHz 16QAM MID Ch RB1-0



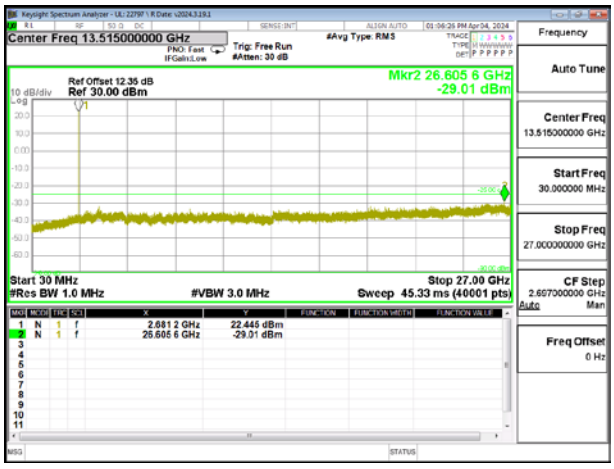
LTE41 5MHz 16QAM HIGH Ch RB1-0



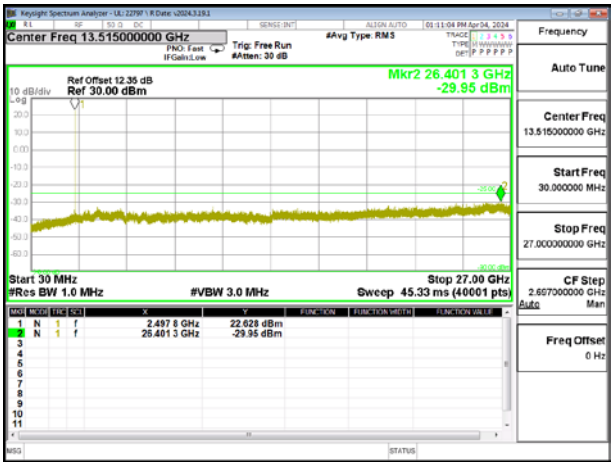
LTE41 10MHz 16QAM LOW Ch RB1-0



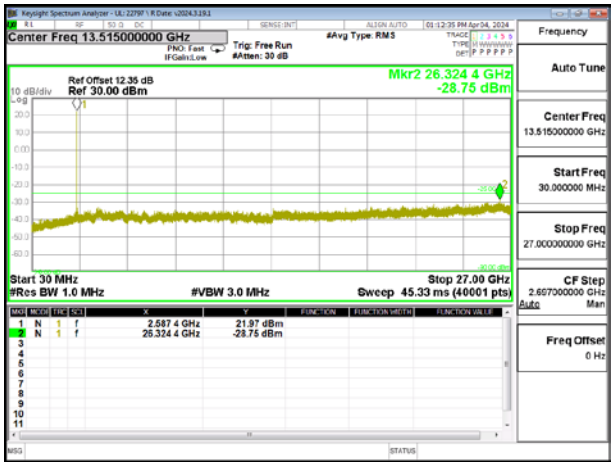
LTE41 10MHz 16QAM MID Ch RB1-0



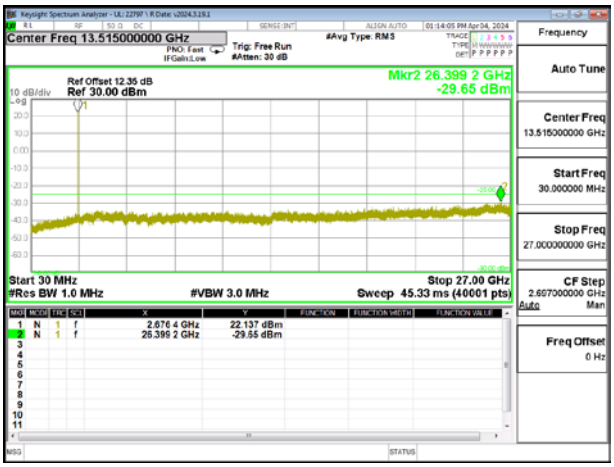
LTE41 10MHz 16QAM HIGH Ch RB1-0



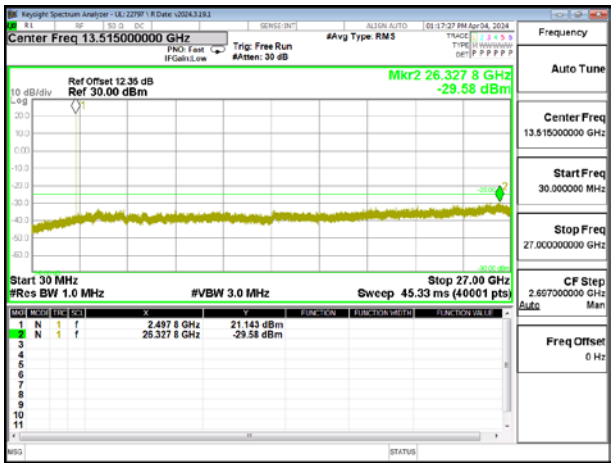
LTE41 15MHz 16QAM LOW Ch RB1-0



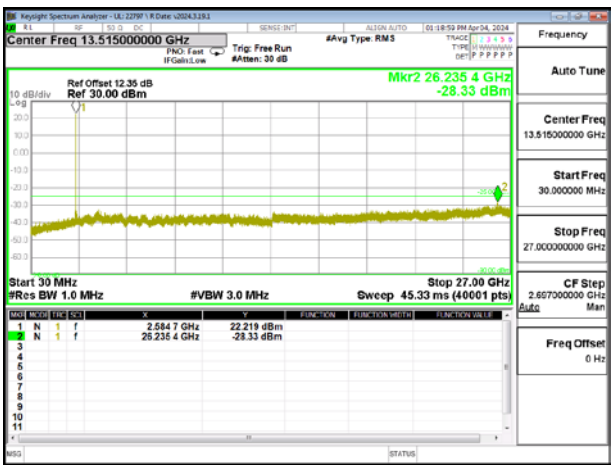
LTE41 15MHz 16QAM MID Ch RB1-0



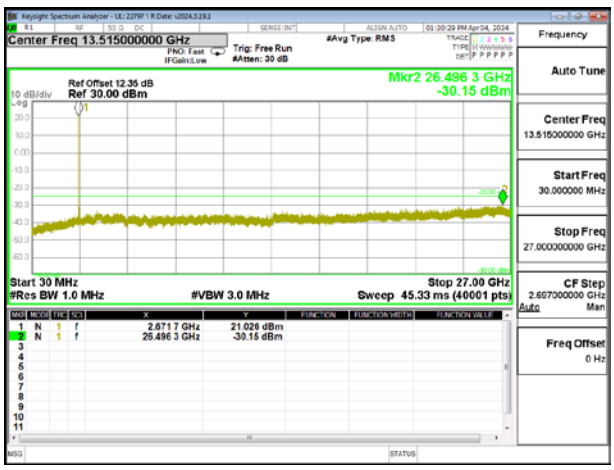
LTE41 15MHz 16QAM HIGH Ch RB1-0



LTE41 20MHz 16QAM LOW Ch RB1-0



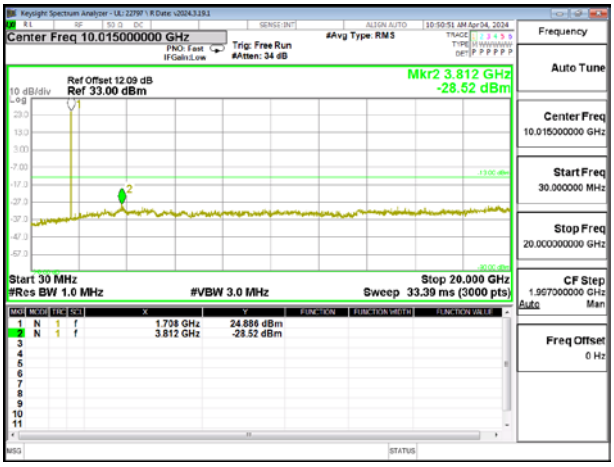
LTE41 20MHz 16QAM MID Ch RB1-0



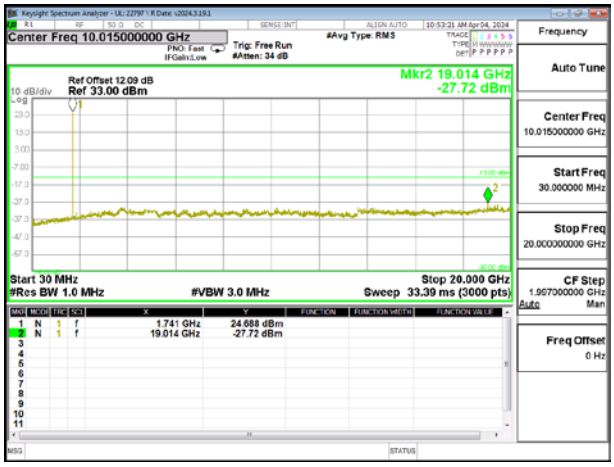
LTE41 20MHz 16QAM HIGH Ch RB1-0

9.2.11. LTE66

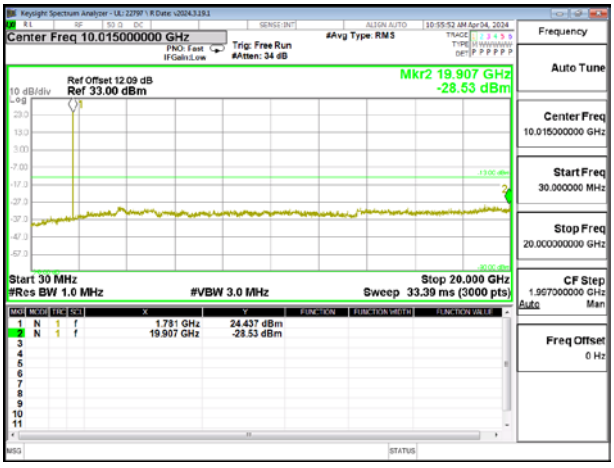
Test Engineer ID:	22797/85502	Test Date:	04-04-24	Sample SN:	QV77004EL3



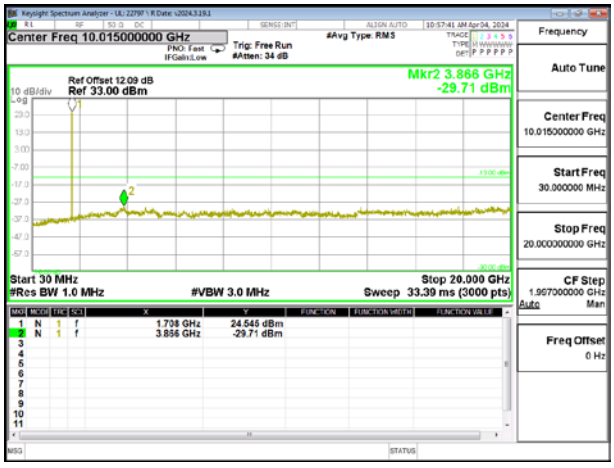
LTE66 1.4MHz 16QAM LOW Ch RB1-0



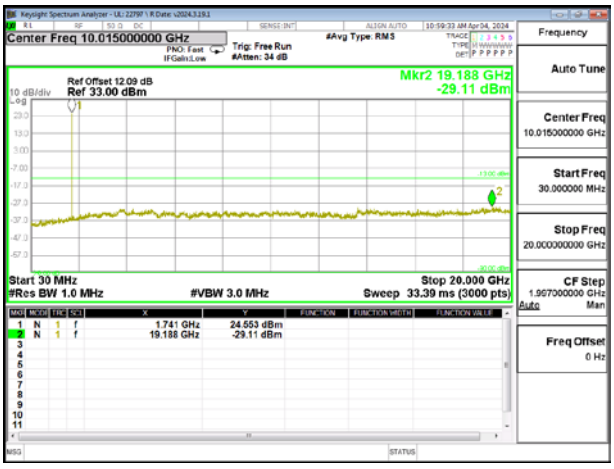
LTE66 1.4MHz 16QAM MID Ch RB1-0



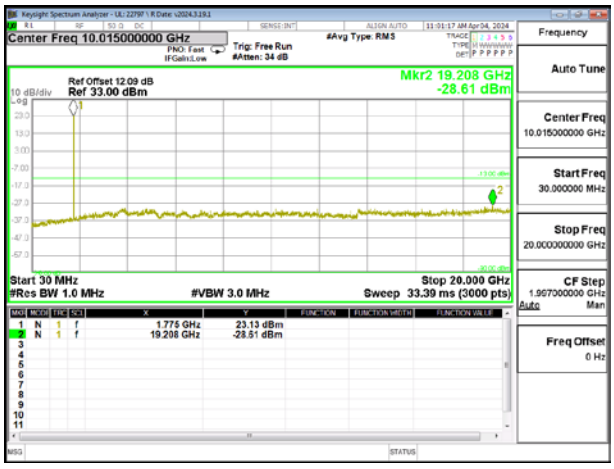
LTE66 1.4MHz 16QAM HIGH Ch RB1-0



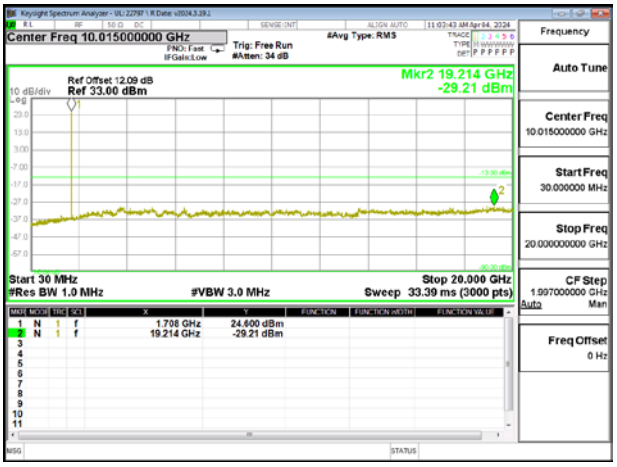
LTE66 3MHz 16QAM LOW Ch RB1-0



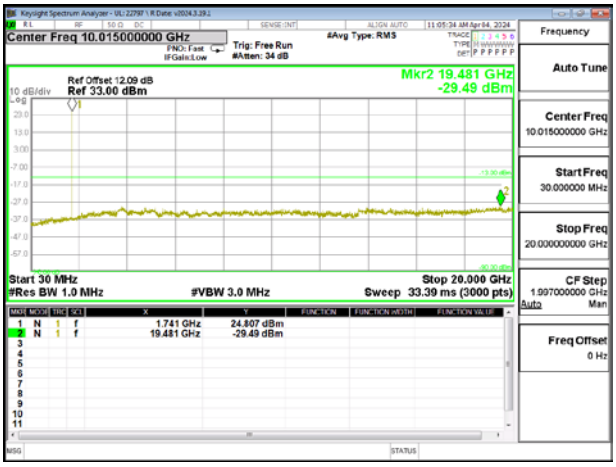
LTE66 3MHz 16QAM MID Ch RB1-0



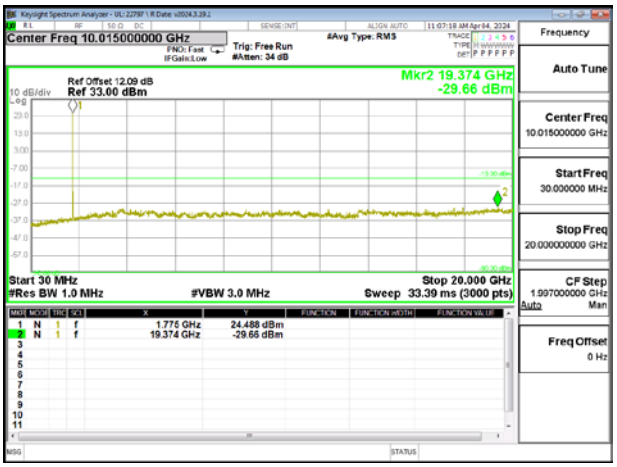
LTE66 3MHz 16QAM HIGH Ch RB1-0



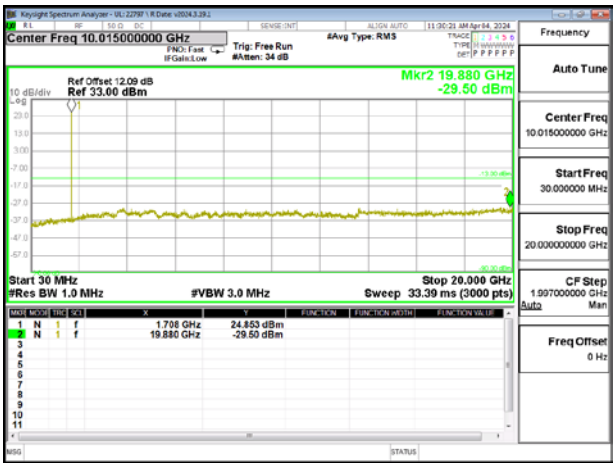
LTE66 5MHz 16QAM LOW Ch RB1-0



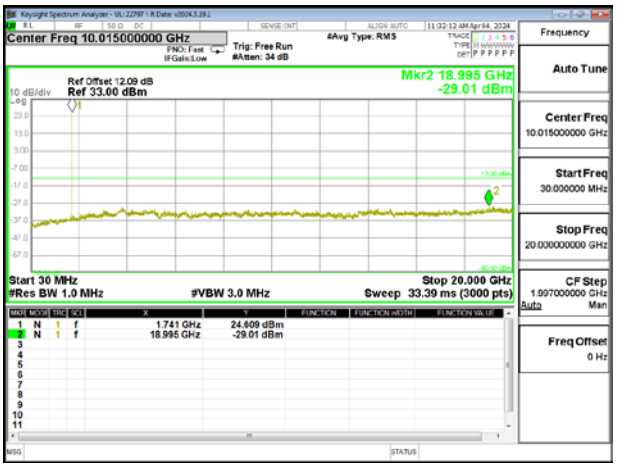
LTE66 5MHz 16QAM MID Ch RB1-0



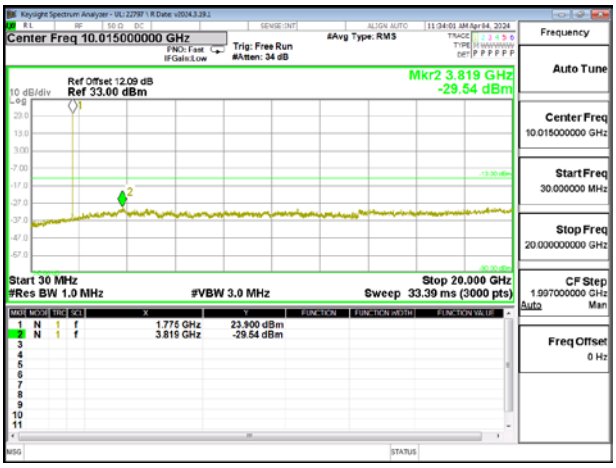
LTE66 5MHz 16QAM HIGH Ch RB1-0



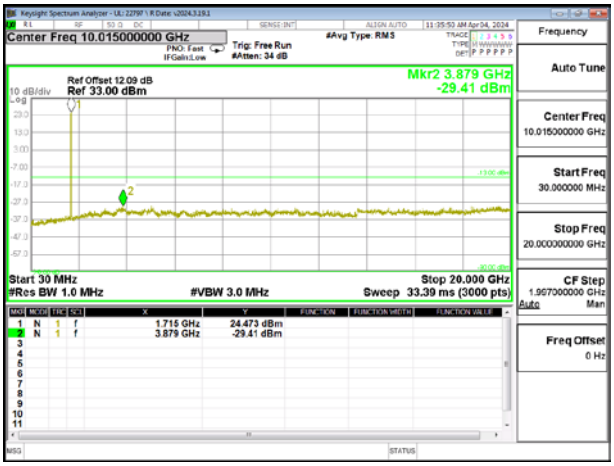
LTE66 10MHz 16QAM LOW Ch RB1-0



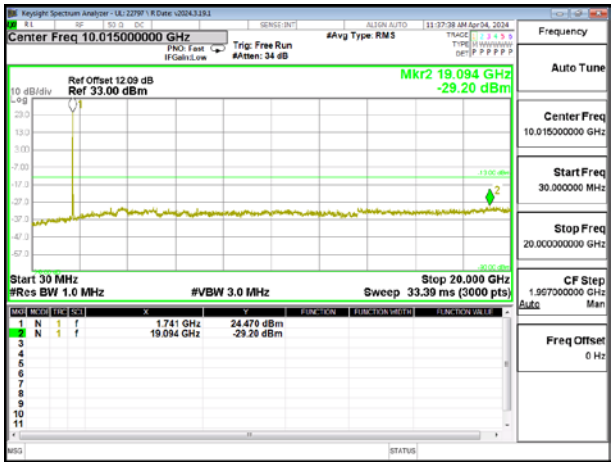
LTE66 10MHz 16QAM MID Ch RB1-0



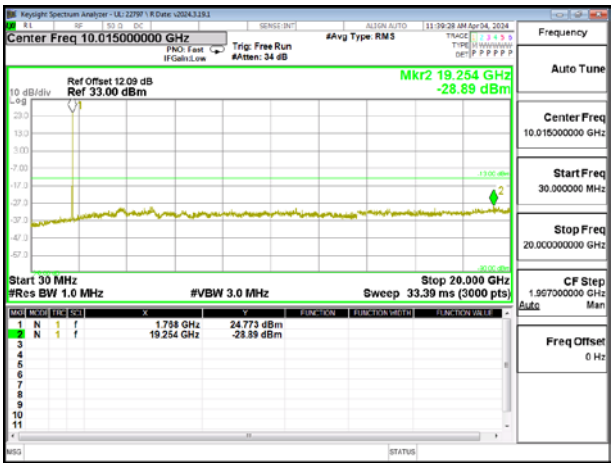
LTE66 10MHz 16QAM HIGH Ch RB1-0



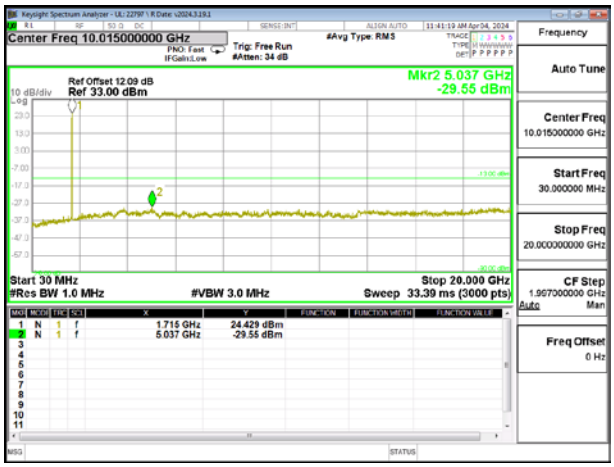
LTE66 15MHz 16QAM LOW Ch RB1-0



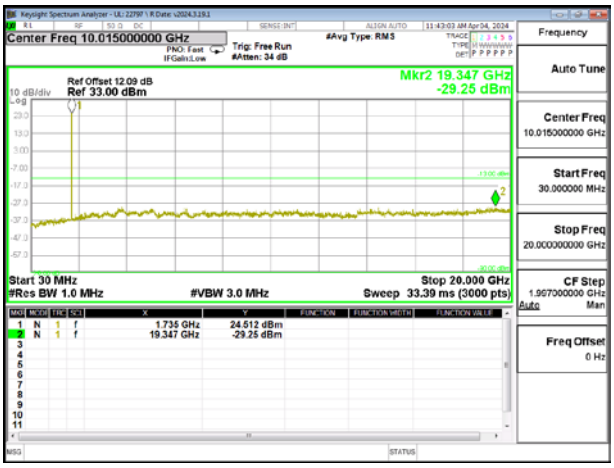
LTE66 15MHz 16QAM MID Ch RB1-0



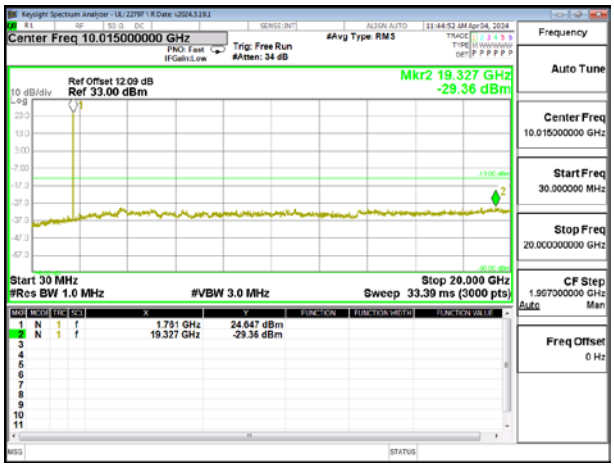
LTE66 15MHz 16QAM HIGH Ch RB1-0



LTE66 20MHz 16QAM LOW Ch RB1-0



LTE66 20MHz 16QAM MID Ch RB1-0



LTE66 20MHz 16QAM HIGH Ch RB1-0

9.3. PEAK TO AVERAGE RATIO

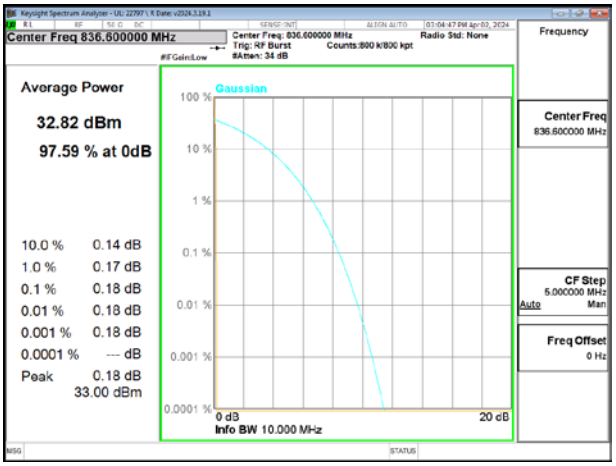
LIMIT

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

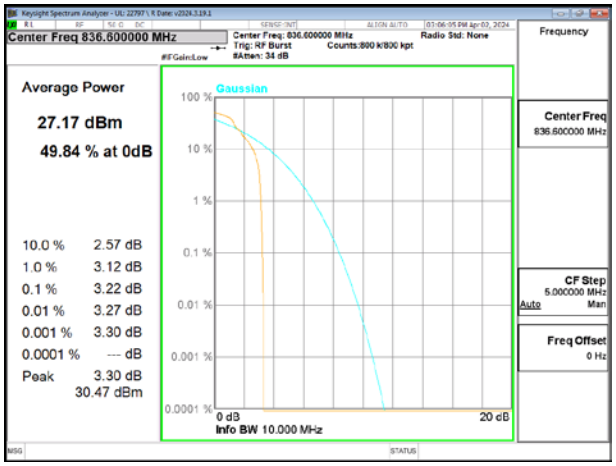
RESULTS

9.3.1. GSM

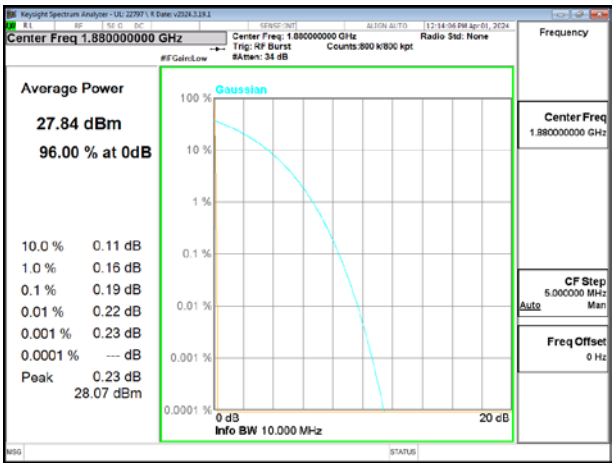
Test Engineer ID:	22797/85502	Test Date:	04-01-24 04-02-24	EUT Serial Number:	QV77004EL3



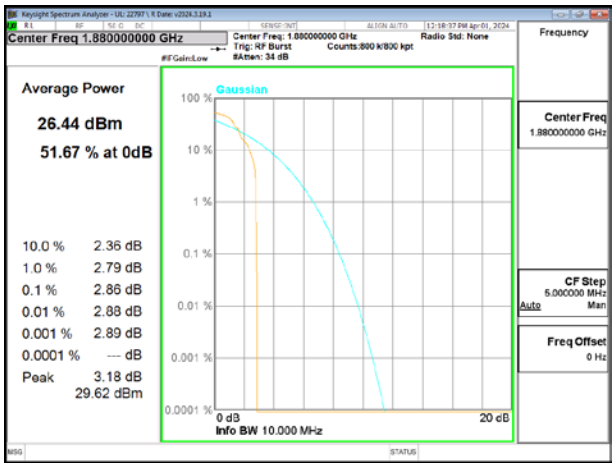
GSM850 GPRS MID Channel



GSM850 EGPRS MID Channel



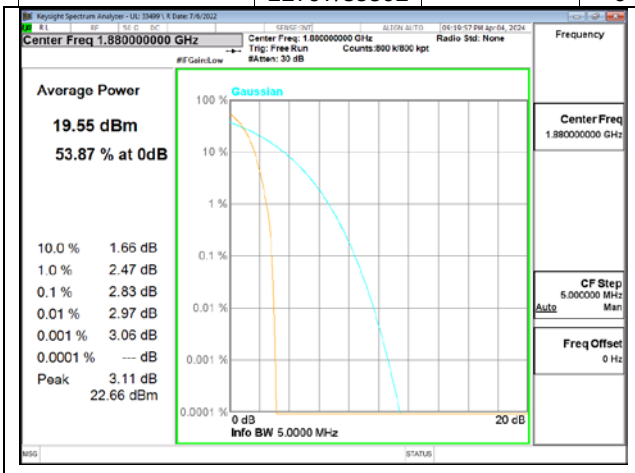
GSM1900 GPRS MID Channel



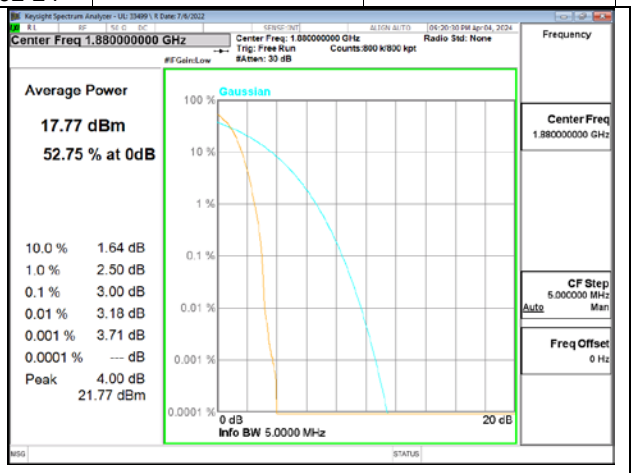
GSM1900 EGPRS MID Channel

9.3.2. WCDMA

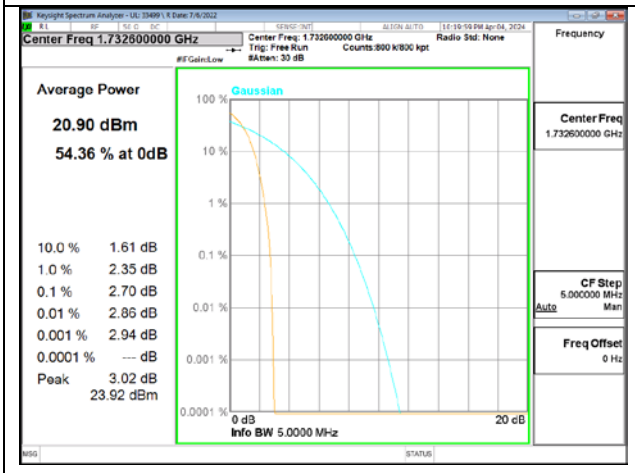
Test Engineer ID:	33499/84740 22797/85502	Test Date:	04-04-24 04-02-24	EUT Serial Number:	QV77004EL3



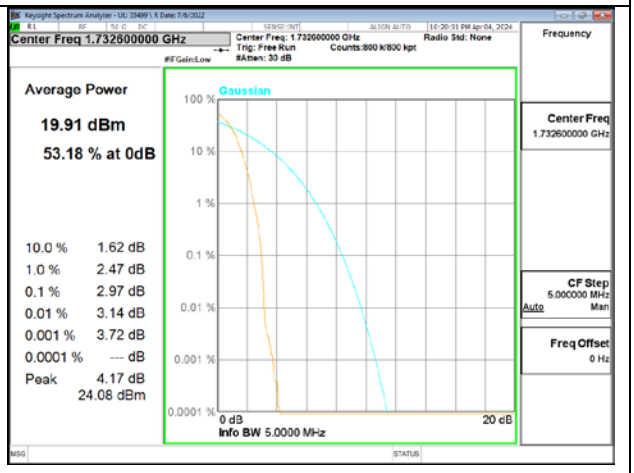
BAND 2 Rel 99 MID Channel



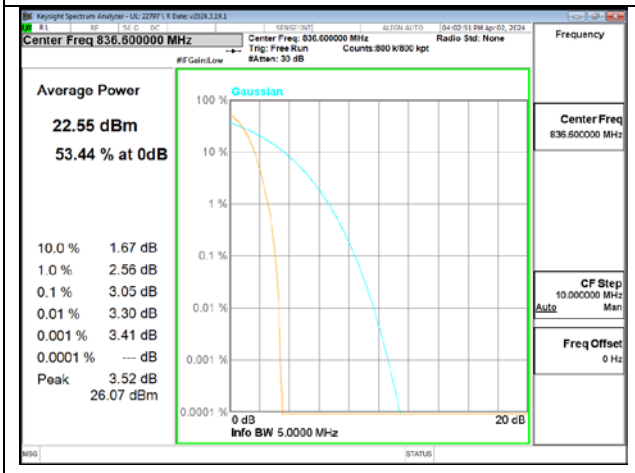
BAND 2 HSDPA MID Channel



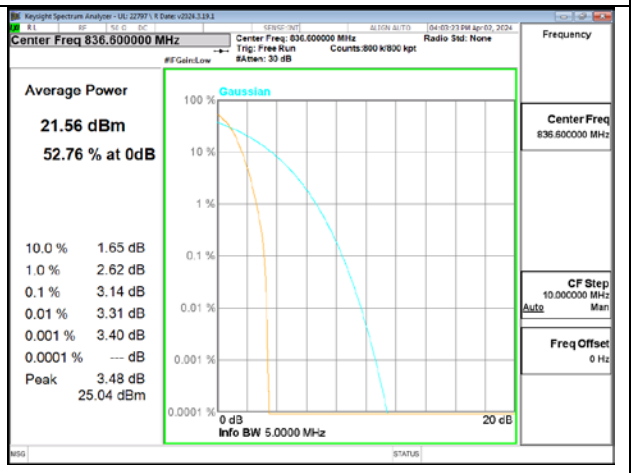
BAND 4 Rel 99 MID Channel



BAND 4 HSDPA MID Channel



BAND 5 Rel 99 MID Channel



BAND 5 HSDPA MID Channel

9.3.3. LTE5

Test Engineer ID:	33499/84740	Test Date:	3/27/2024	Sample SN:	QV7700BLLD

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
LTE Band 5	1.4MHz	836.5	6	0	QPSK	25.71	21.22	4.49
					16QAM	26.81	21.33	5.48
	3MHz		15	0	QPSK	25.91	21.31	4.60
					16QAM	26.91	21.35	5.56
	5MHz		25	0	QPSK	25.94	21.28	4.66
					16QAM	27.14	21.37	5.77
	10MHz		50	0	QPSK	25.96	21.29	4.67
					16QAM	27.02	21.32	5.70
Duty Cycle Correction Factor (dB) =			0.00					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

9.3.4. LTE25

Test Engineer ID:	22797/85502	Test Date:	04/01/2024	Sample SN:	QV77004EL3

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
LTE Band 25	1.4MHz	1882.5	6	0	QPSK	22.40	18.00	4.40
					16QAM	23.52	18.11	5.41
	3MHz		15	0	QPSK	22.56	18.01	4.55
					16QAM	23.54	18.02	5.52
	5MHz		25	0	QPSK	22.63	18.02	4.61
					16QAM	23.86	18.05	5.81
	10MHz		50	0	QPSK	22.76	18.08	4.68
					16QAM	23.86	18.04	5.82
	15MHz		75	0	QPSK	22.79	18.02	4.77
					16QAM	23.87	18.03	5.84
	20MHz		100	0	QPSK	22.87	18.04	4.83
					16QAM	24.02	18.06	5.96
Duty Cycle Correction Factor (dB) =			0.00					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

9.3.5. LTE66

Test Engineer ID:	33499/84740 22797/85502	Test Date:	3/28/2024 4/5/2024	Sample SN:	QV77004EL3

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
LTE Band 66	1.4MHz	1747.5	6	0	QPSK	24.49	20.06	4.43
					16QAM	25.54	20.12	5.42
	3MHz		15	0	QPSK	24.65	20.09	4.56
					16QAM	25.66	20.14	5.52
	5MHz		25	0	QPSK	25.40	19.92	5.48
					16QAM	25.67	19.97	5.70
	10MHz		50	0	QPSK	24.62	19.94	4.68
					16QAM	25.77	19.98	5.79
	15MHz		75	0	QPSK	24.64	19.88	4.76
					16QAM	25.79	19.95	5.84
	20MHz		100	0	QPSK	24.73	19.92	4.81
					16QAM	25.90	19.95	5.95
Duty Cycle Correction Factor (dB) =			0.00					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

9.4. BAND EDGE AND EMISSION MASK

TEST PROCEDURE

The transmitter output was connected to a CMW500Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

(iii) Set the spectrum analyzer span to include the block edge frequency.
(iv) Set a marker to point the corresponding band edge frequency in each test case.
(v) Set display line at -13 dBm
(vi) Set resolution bandwidth to at least 1% of emission bandwidth.

TEST PROCEDURE (FCC LTE BAND 41)

(m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz 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; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

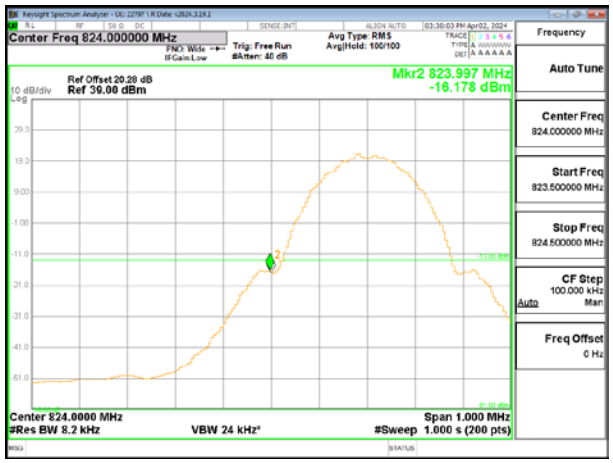
RESULTS

9.4.1. GSM850

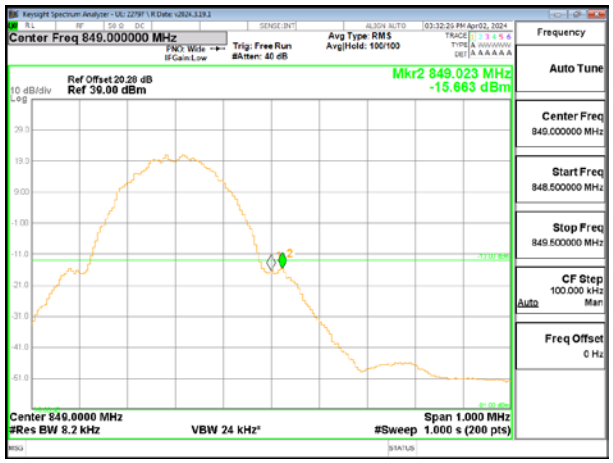
LIMITS

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 + 10 log (P) dB.

Test Engineer ID:	22797/85502	Test Date:	04-02-24	EUT Serial Number:	QV77004EL3



GSM850 GPRS LOW Channel



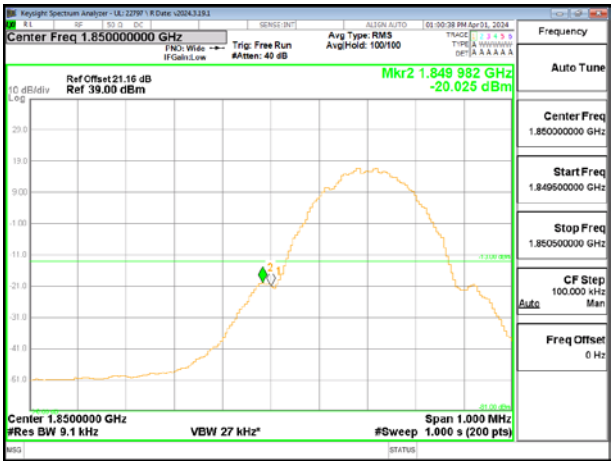
GSM850 GPRS HIGH Channel

9.4.2. GSM1900

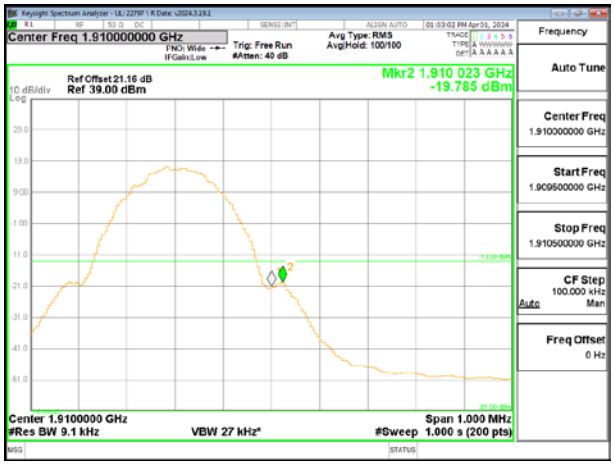
LIMITS

FCC: §24.238 (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 + 10 log (P) dB.

Test Engineer ID:	22797/85502	Test Date:	04-01-24	EUT Serial Number:	QV77004EL3



GSM1900 GPRS LOW Channel



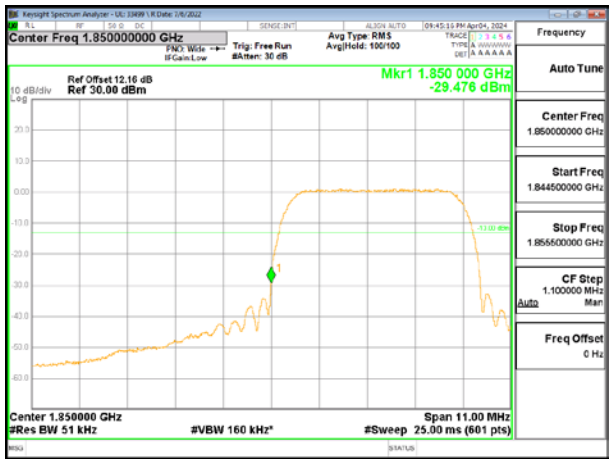
GSM1900 GPRS HIGH Channel

9.4.3. WCDMA BAND 2

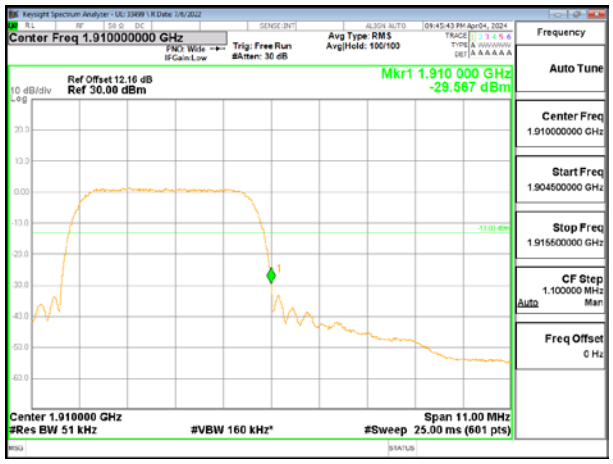
LIMITS

FCC: §24.238 (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 + 10 log (P) dB.

Test Engineer ID:	33499/84740	Test Date:	04-04-24	EUT Serial Number:	QV77004EL3



BAND 2 Rel 99 LOW Channel



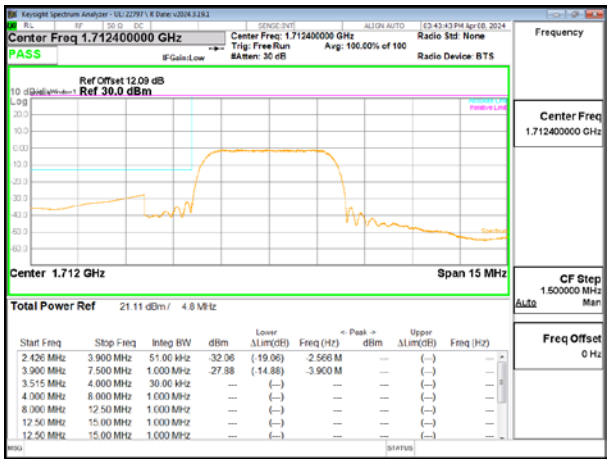
BAND 2 Rel 99 HIGH Channel

9.4.4. WCDMA BAND 4

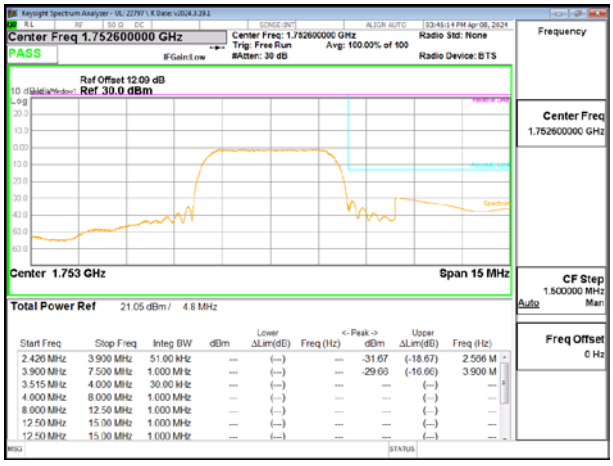
LIMITS

FCC: §27.53(h)
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 + 10 log (P) dB.

Test Engineer ID:	22797/85502	Test Date:	04-08-24	EUT Serial Number:	QV77004EL3



BAND 4 Rel 99 LOW Channel



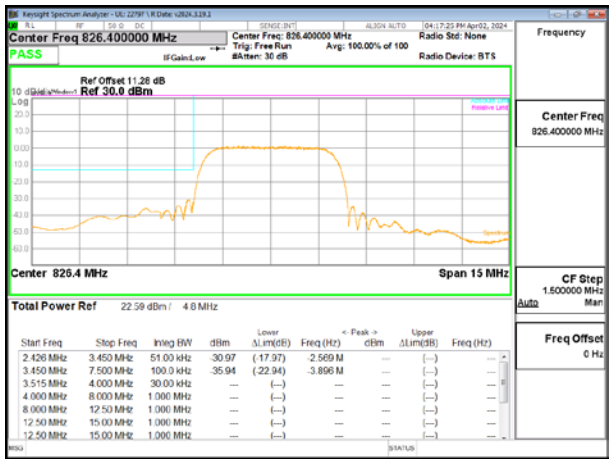
BAND 4 Rel 99 HIGH Channel

9.4.5. WCDMA BAND 5

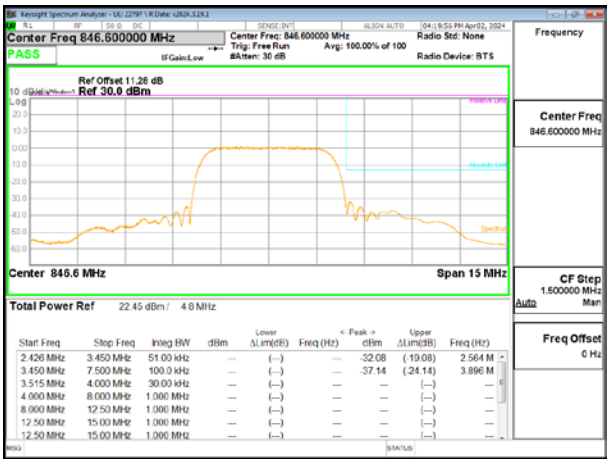
LIMITS

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 + 10 log (P) dB.

Test Engineer ID:	33499/84740	Test Date:	04-04-24	EUT Serial Number:	QV77004EL3



BAND 5 Rel 99 LOW Channel



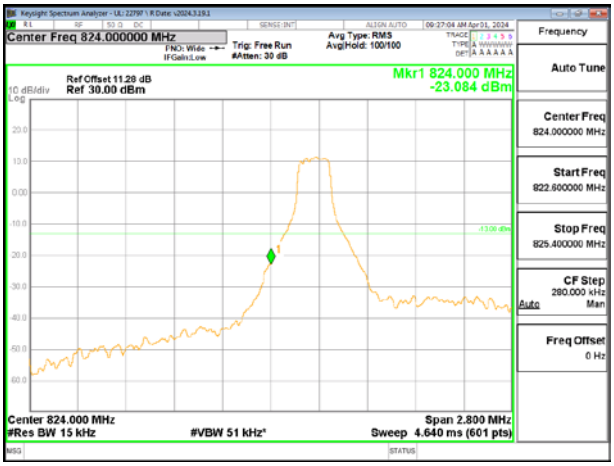
BAND 5 Rel 99 HIGH Channel

9.4.6. LTE5

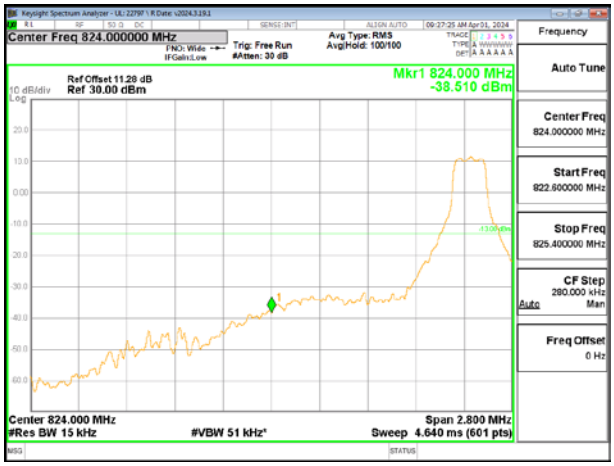
LIMITS

FCC: §22.917
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 + 10 log (P) dB.

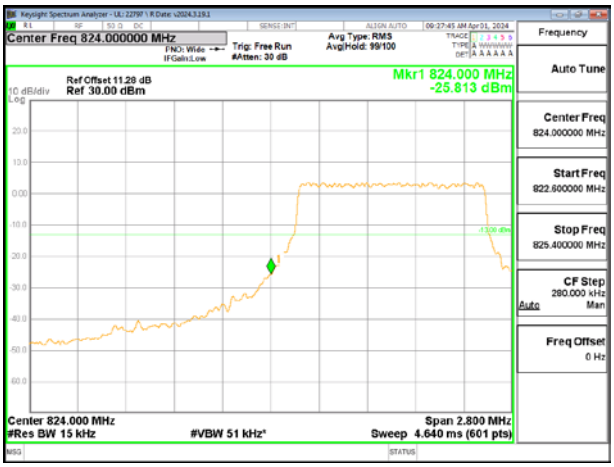
Test Engineer ID:	22797/85502	Test Date:	04-01-24	Sample SN:	QV77004EL3



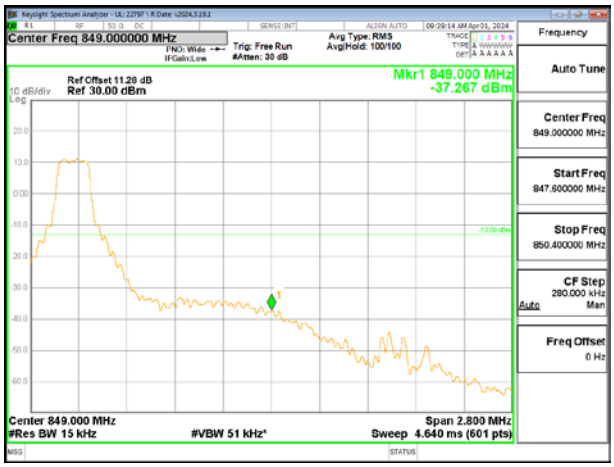
LTE5 1.4MHz 16QAM LOW Ch RB1-0



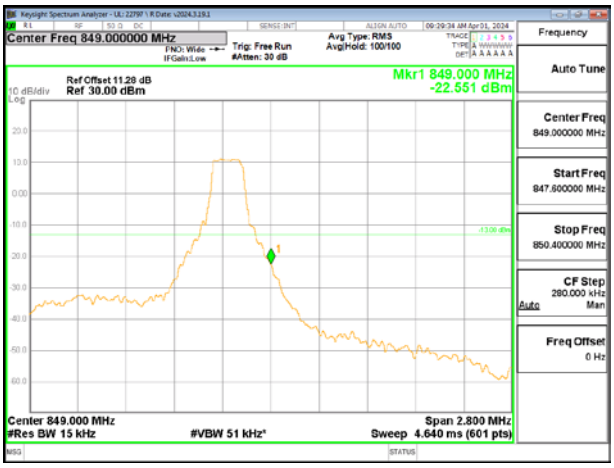
LTE5 1.4MHz 16QAM LOW Ch RB1-5



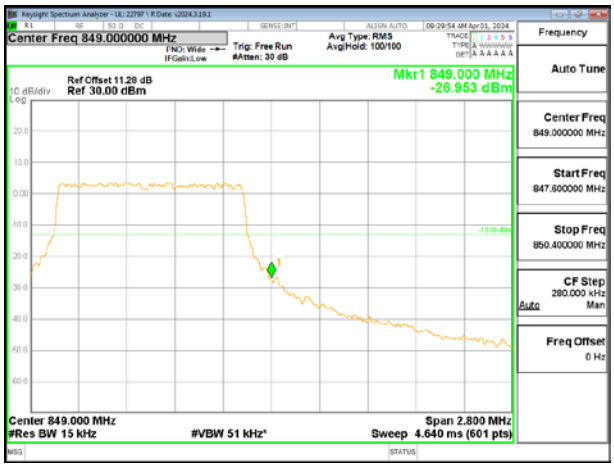
LTE5 1.4MHz 16QAM LOW Ch RB6-0



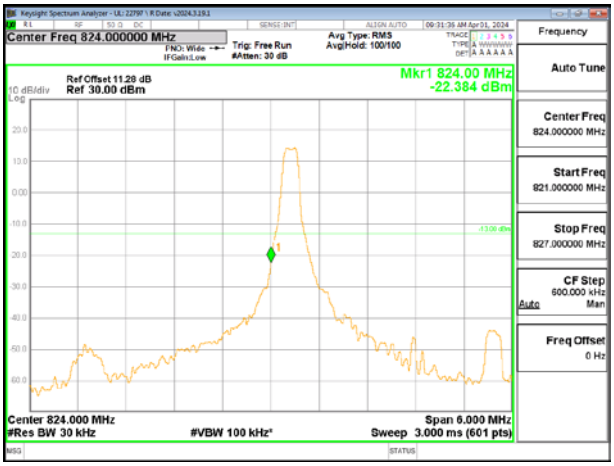
LTE5 1.4MHz 16QAM HIGH Ch RB1-0



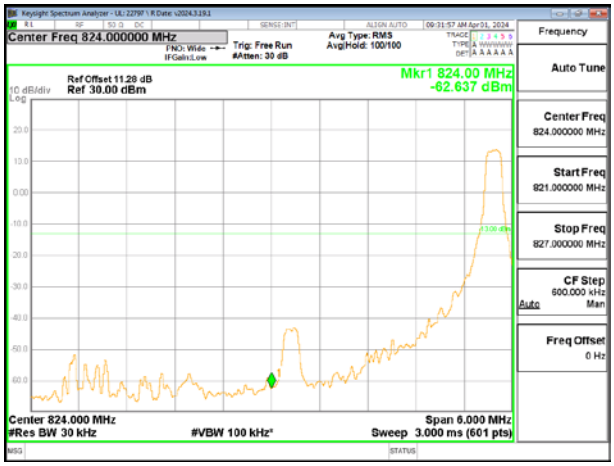
LTE5 1.4MHz 16QAM HIGH Ch RB1-5



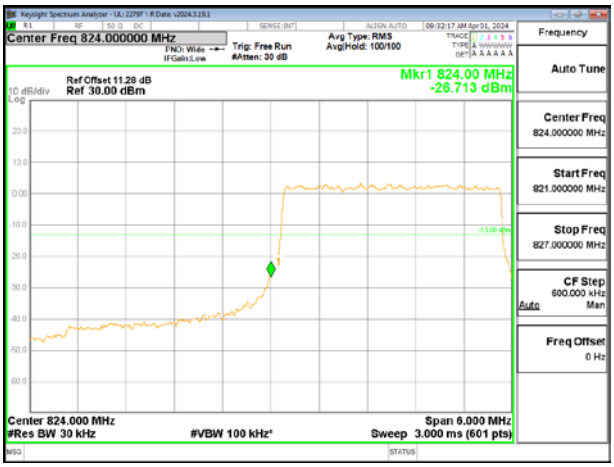
LTE5 1.4MHz 16QAM HIGH Ch RB6-0



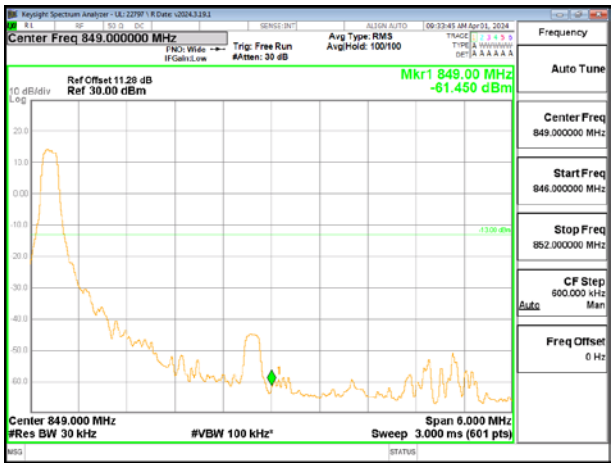
LTE5 3MHz 16QAM LOW Ch RB1-0



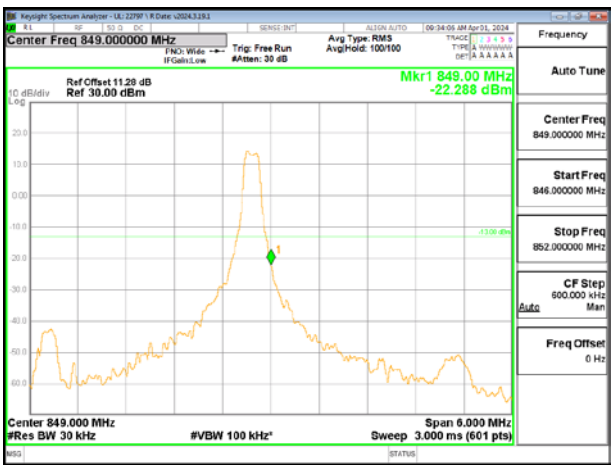
LTE5 3MHz 16QAM LOW Ch RB1-14



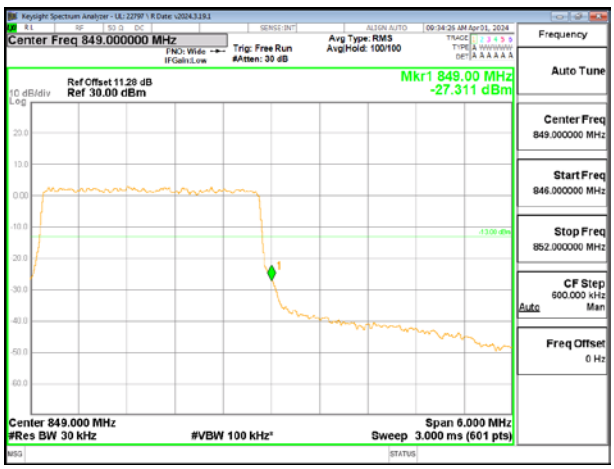
LTE5 3MHz 16QAM LOW Ch RB15-0



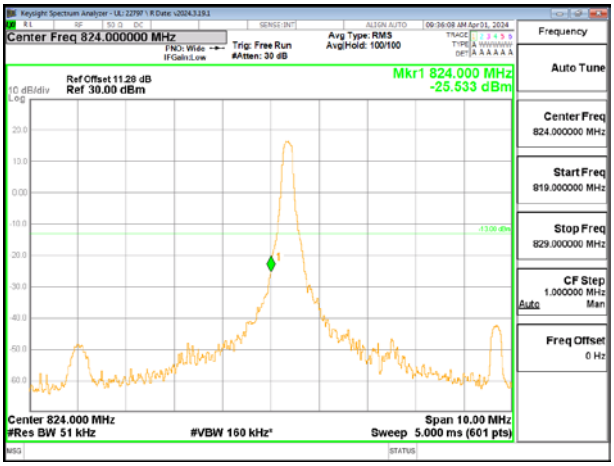
LTE5 3MHz 16QAM HIGH Ch RB1-0



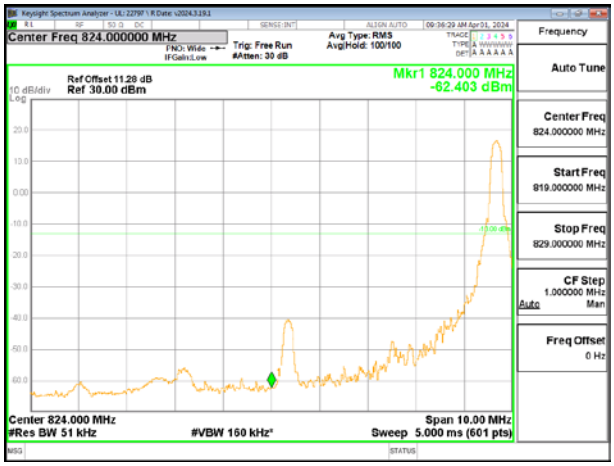
LTE5 3MHz 16QAM HIGH Ch RB1-14



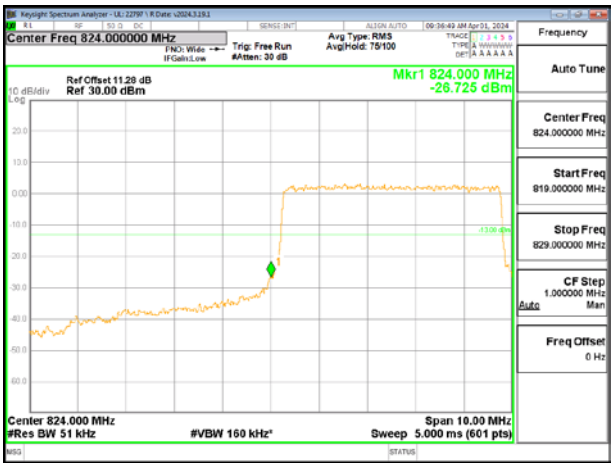
LTE5 3MHz 16QAM HIGH Ch RB15-0



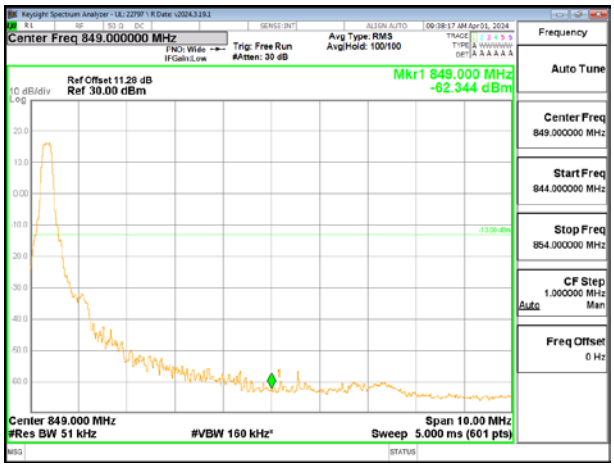
LTE5 5MHz 16QAM LOW Ch RB1-0



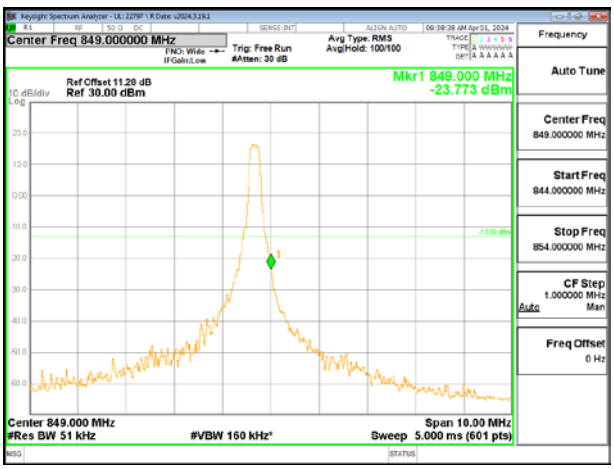
LTE5 5MHz 16QAM LOW Ch RB1-24



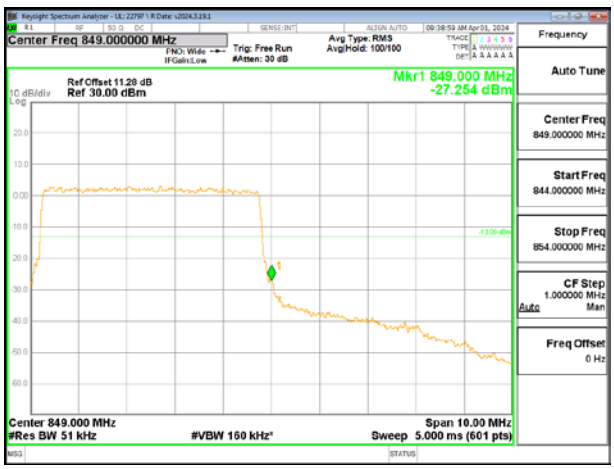
LTE5 5MHz 16QAM LOW Ch RB25-0



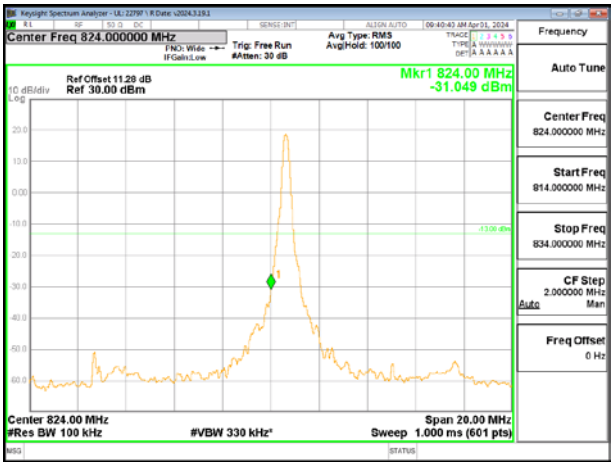
LTE5 5MHz 16QAM HIGH Ch RB1-0



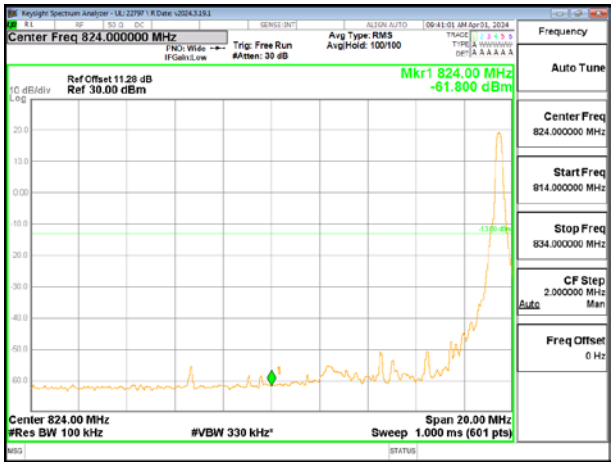
LTE5 5MHz 16QAM HIGH Ch RB1-24



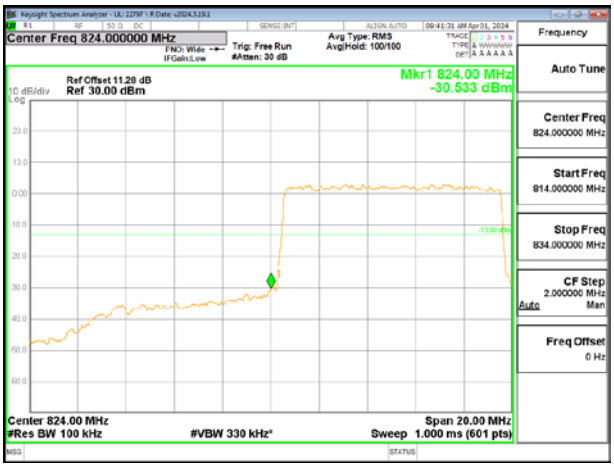
LTE5 5MHz 16QAM HIGH Ch RB25-0



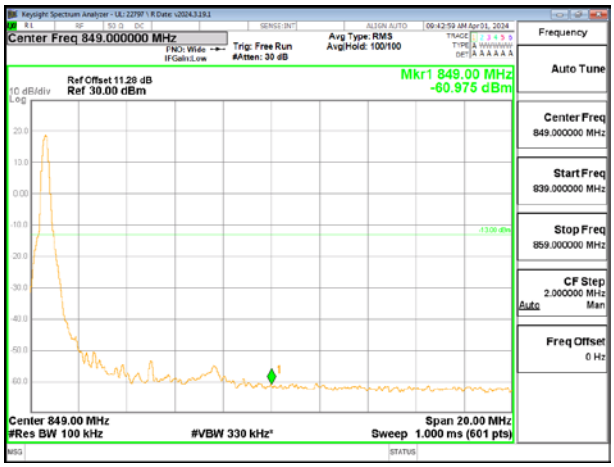
LTE5 10MHz 16QAM LOW Ch RB1-0



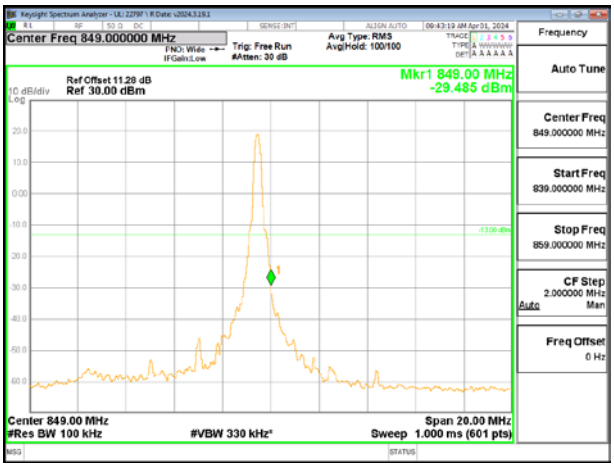
LTE5 10MHz 16QAM LOW Ch RB1-49



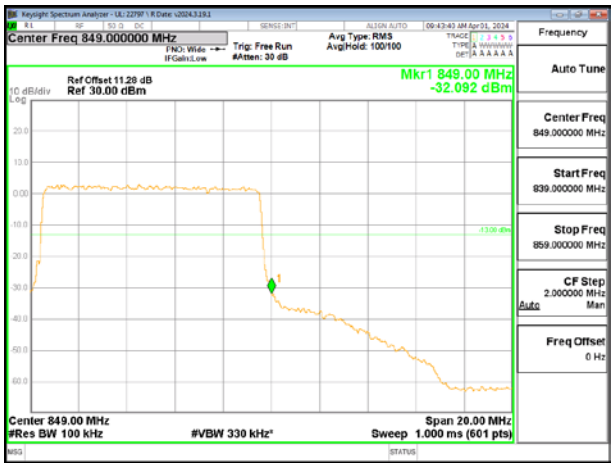
LTE5 10MHz 16QAM LOW Ch RB50-0



LTE5 10MHz 16QAM HIGH Ch RB1-0



LTE5 10MHz 16QAM HIGH Ch RB1-49



LTE5 10MHz 16QAM HIGH Ch RB50-0

9.4.7. LTE12

LIMITS

FCC: §27.53

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Test Engineer ID:	22797/85502	Test Date:	04-10-24	Sample SN:	QV77004EL3