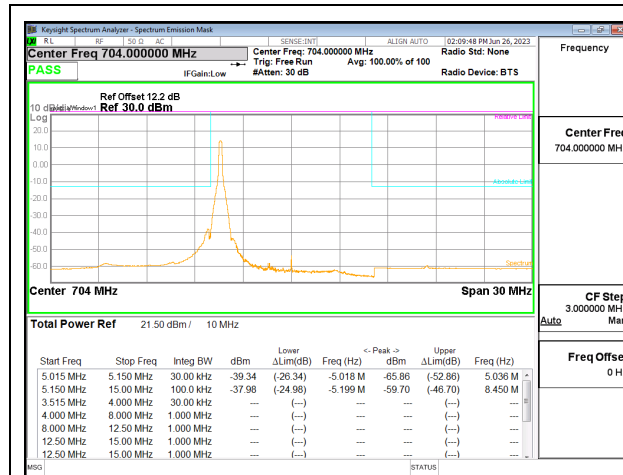
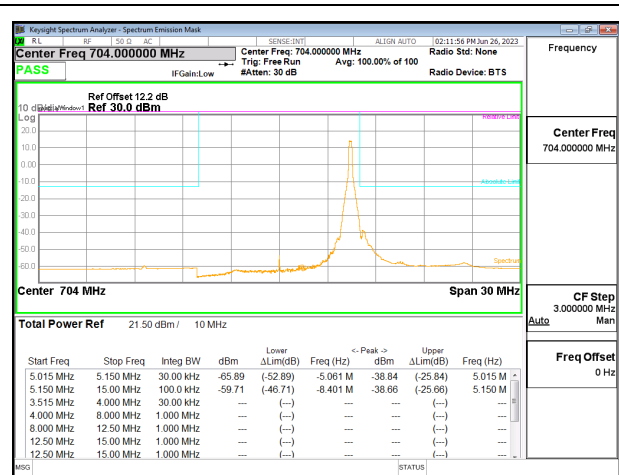
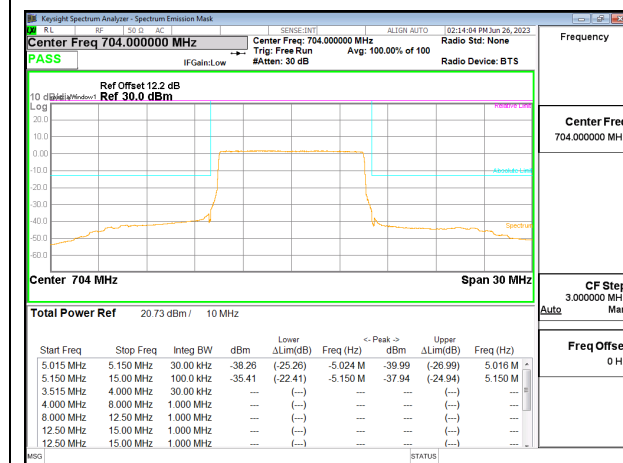




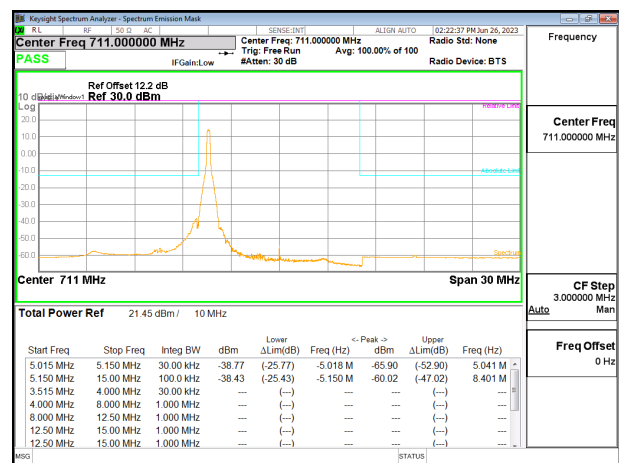
LTE12 10MHz 64QAM LOW Ch RB1-0



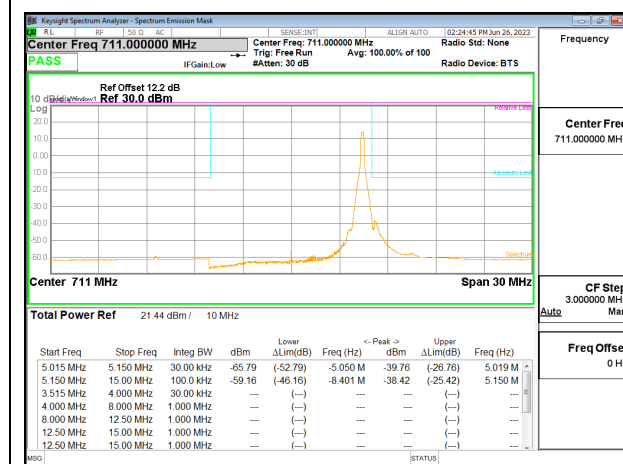
LTE12 10MHz 64QAM LOW Ch RB1-49



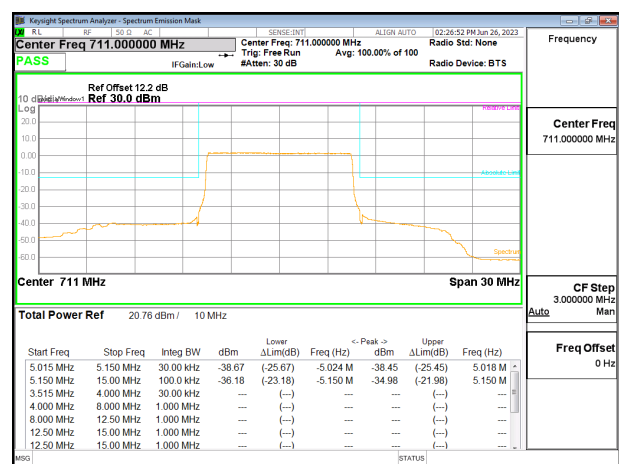
LTE12 10MHz 64QAM LOW Ch RB50-0



LTE12 10MHz 64QAM HIGH Ch RB1-0



LTE12 10MHz 64QAM HIGH Ch RB1-49



LTE12 10MHz 64QAM HIGH Ch RB50-0

9.4.8. LTE13**LIMITS**

FCC: §27.53

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the 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, in accordance with the following:

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

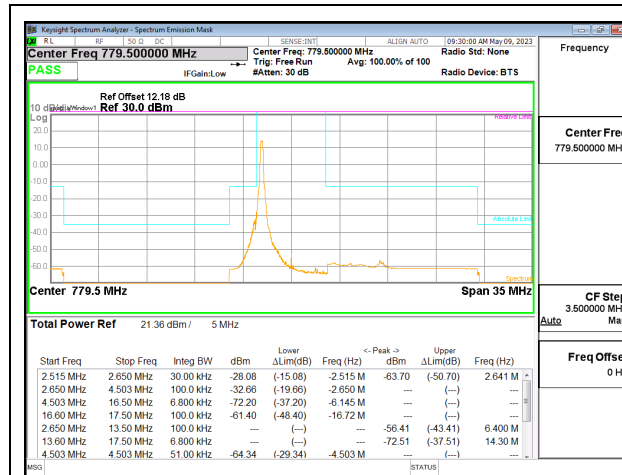
(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

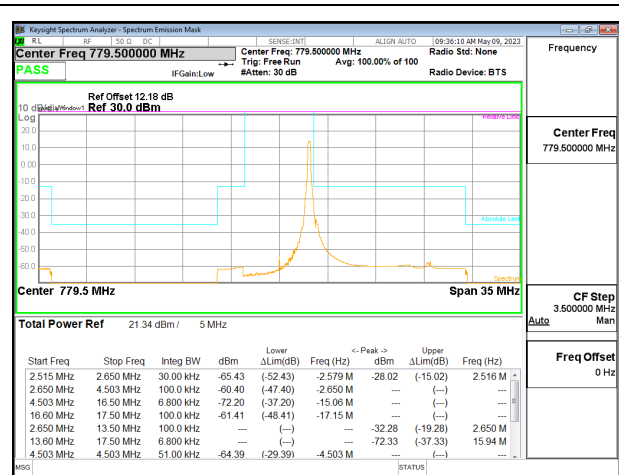
(6) Compliance with the provisions of paragraphs (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) Emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals. (-70 dBW/MHz = -40dBm/MHz).

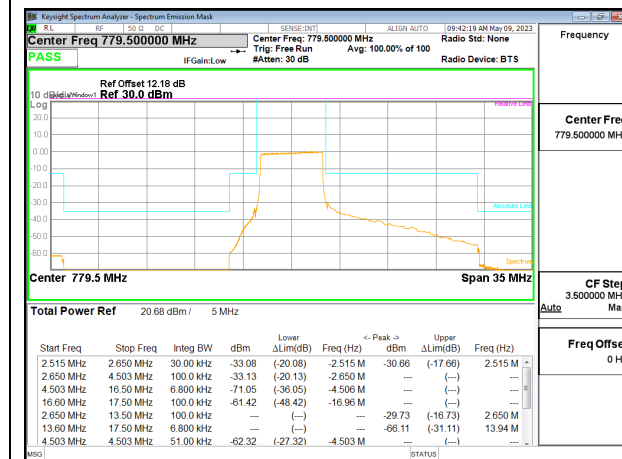
Test Engineer ID:	27465/44389	Test Date:	2023-05-09	EUT Serial Number:	QV77007YG9
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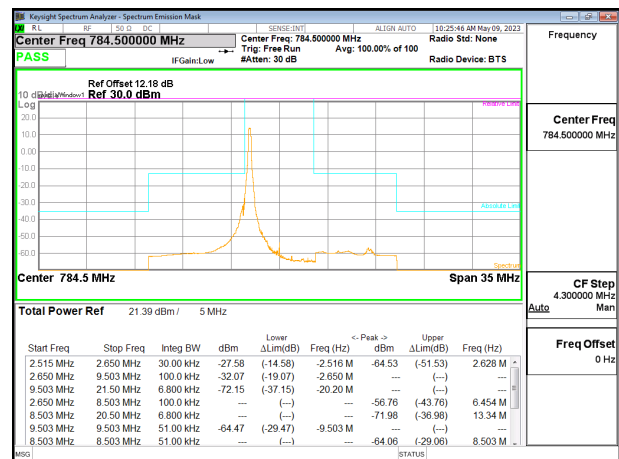
LTE13 5MHz 64QAM LOW Ch RB1-0



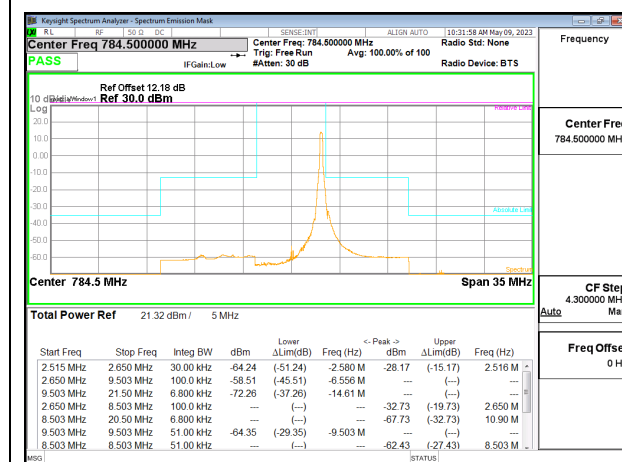
LTE13 5MHz 64QAM LOW Ch RB1-24



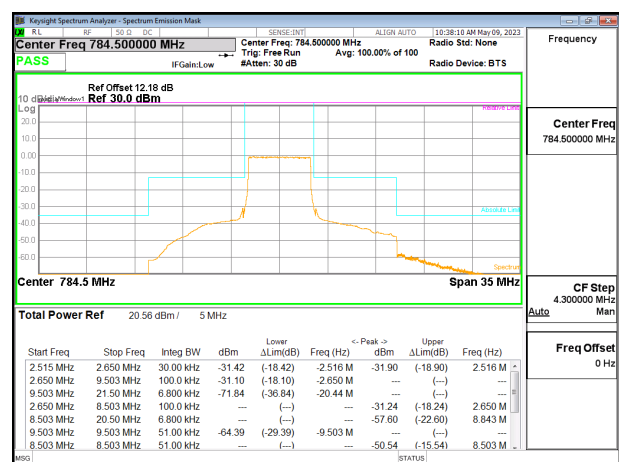
LTE13 5MHz 64QAM LOW Ch RB25-0



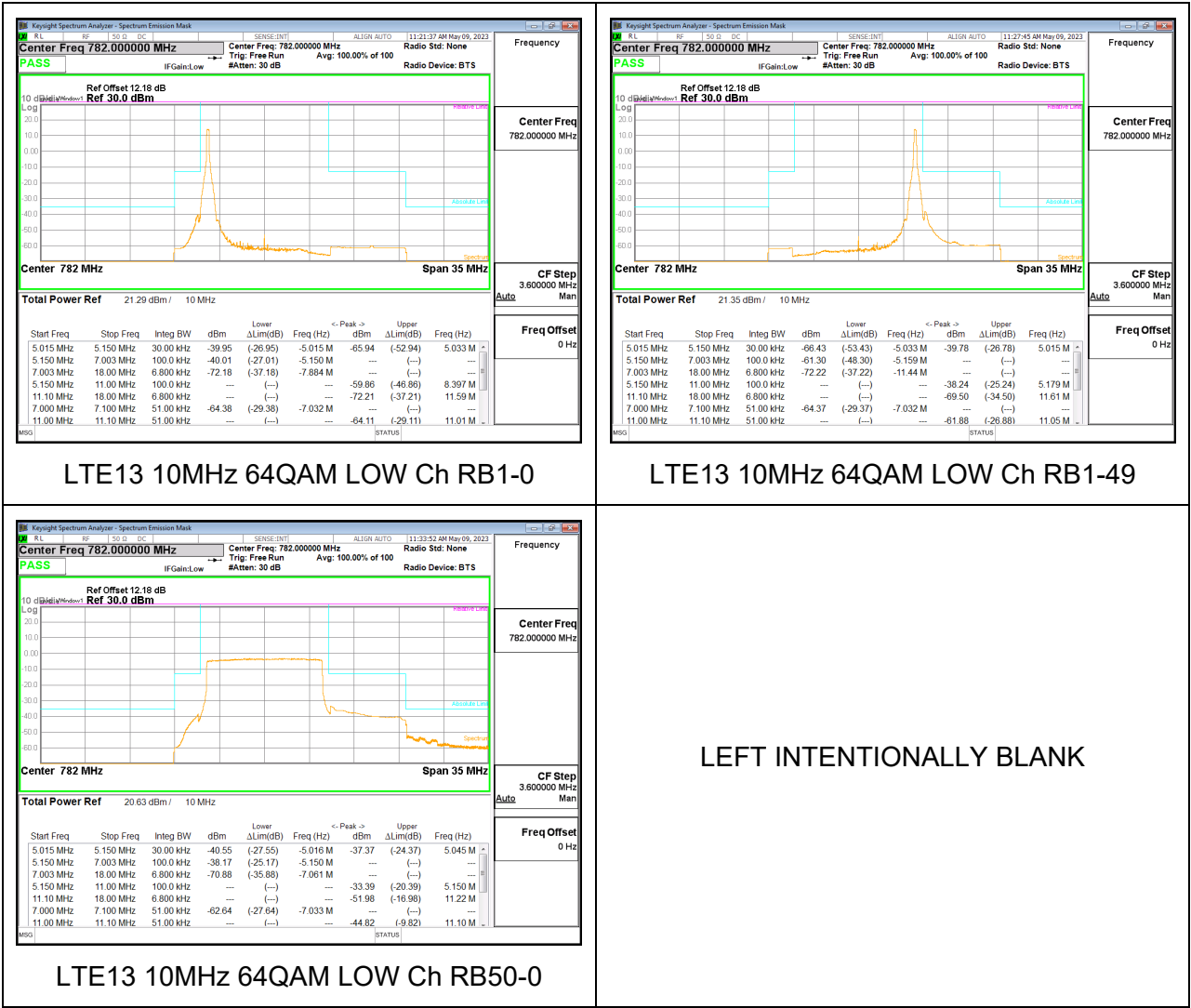
LTE13 5MHz 64QAM HIGH Ch RB1-0



LTE13 5MHz 64QAM HIGH Ch RB1-24



LTE13 5MHz 64QAM HIGH Ch RB25-0

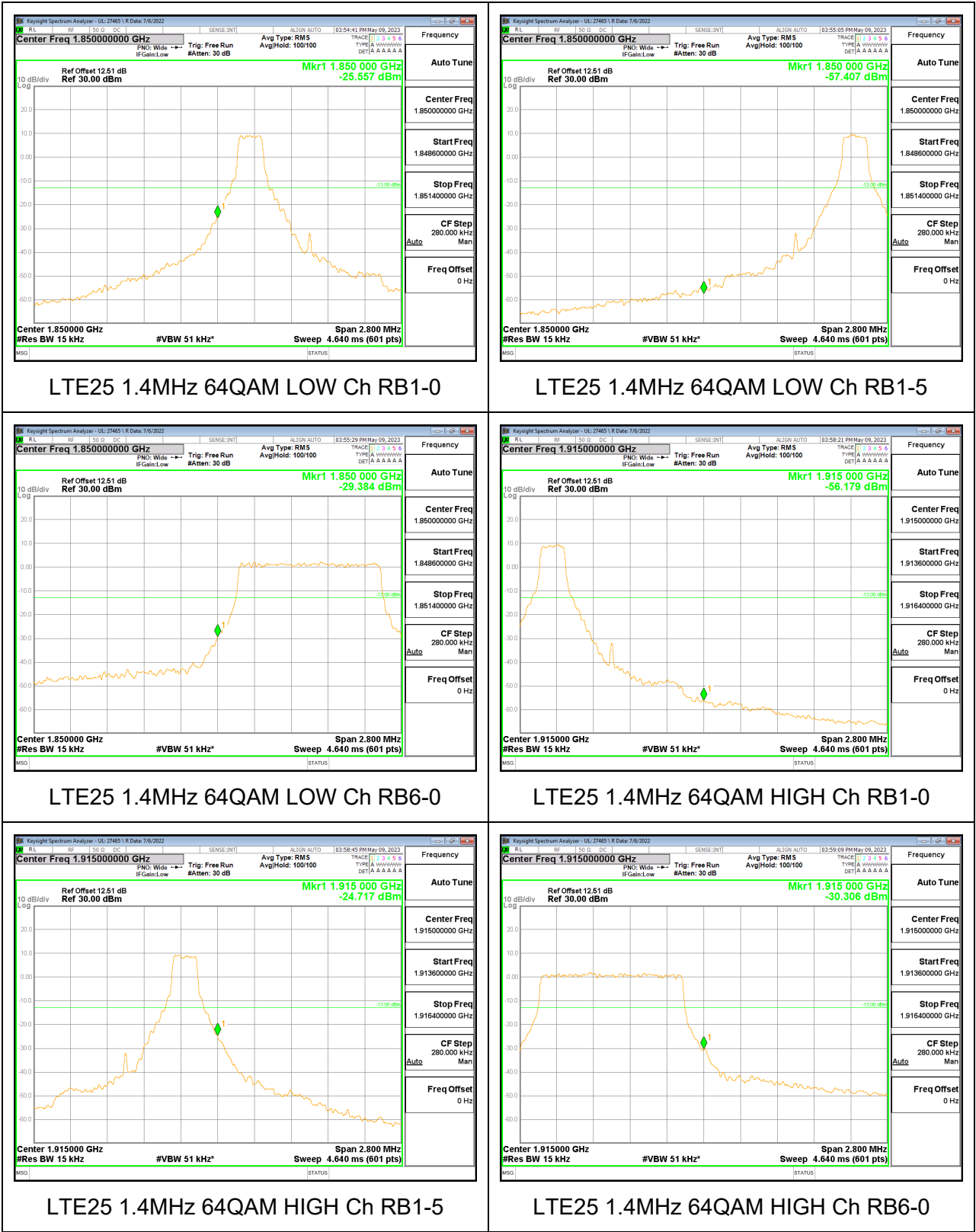


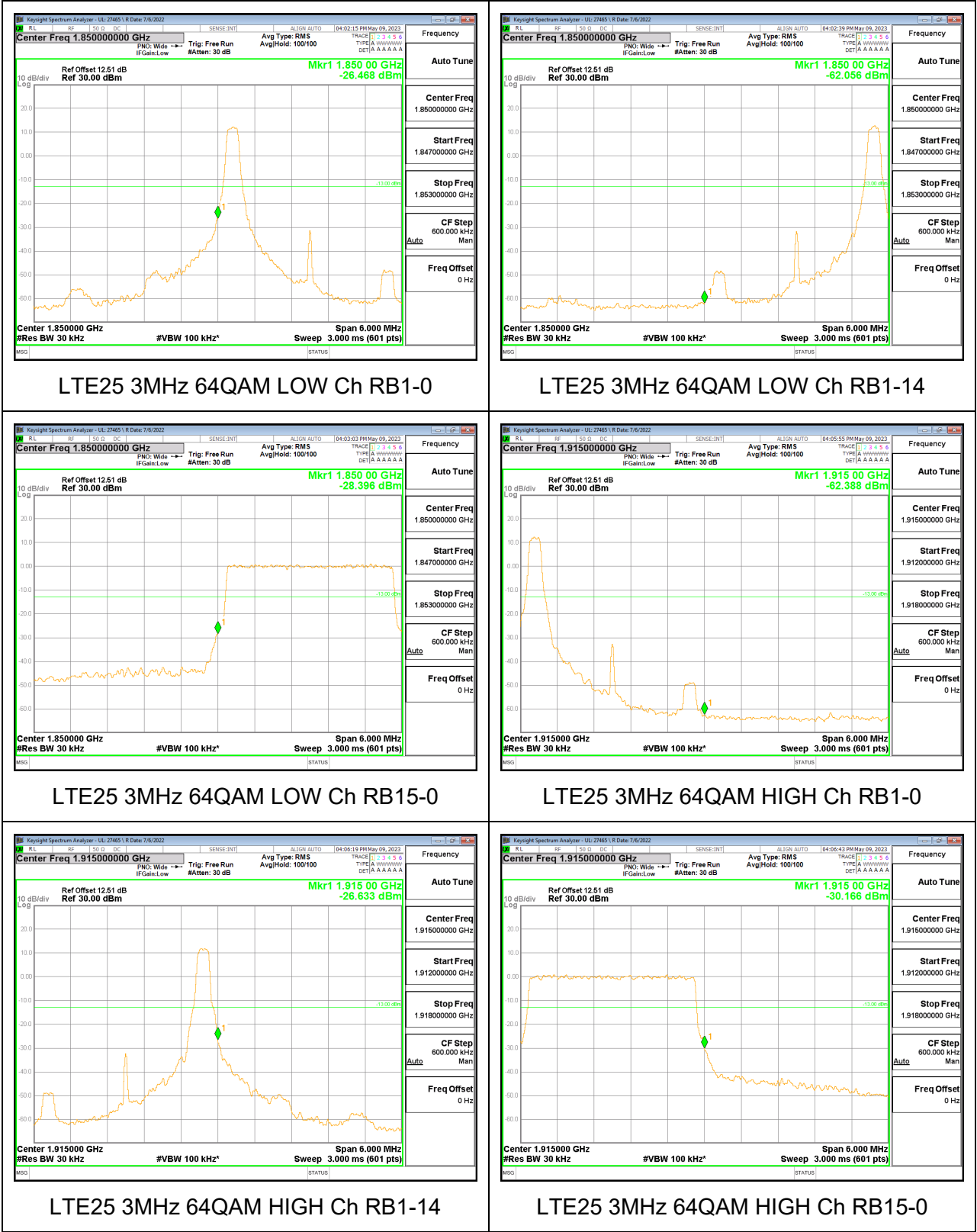
9.4.9. LTE25

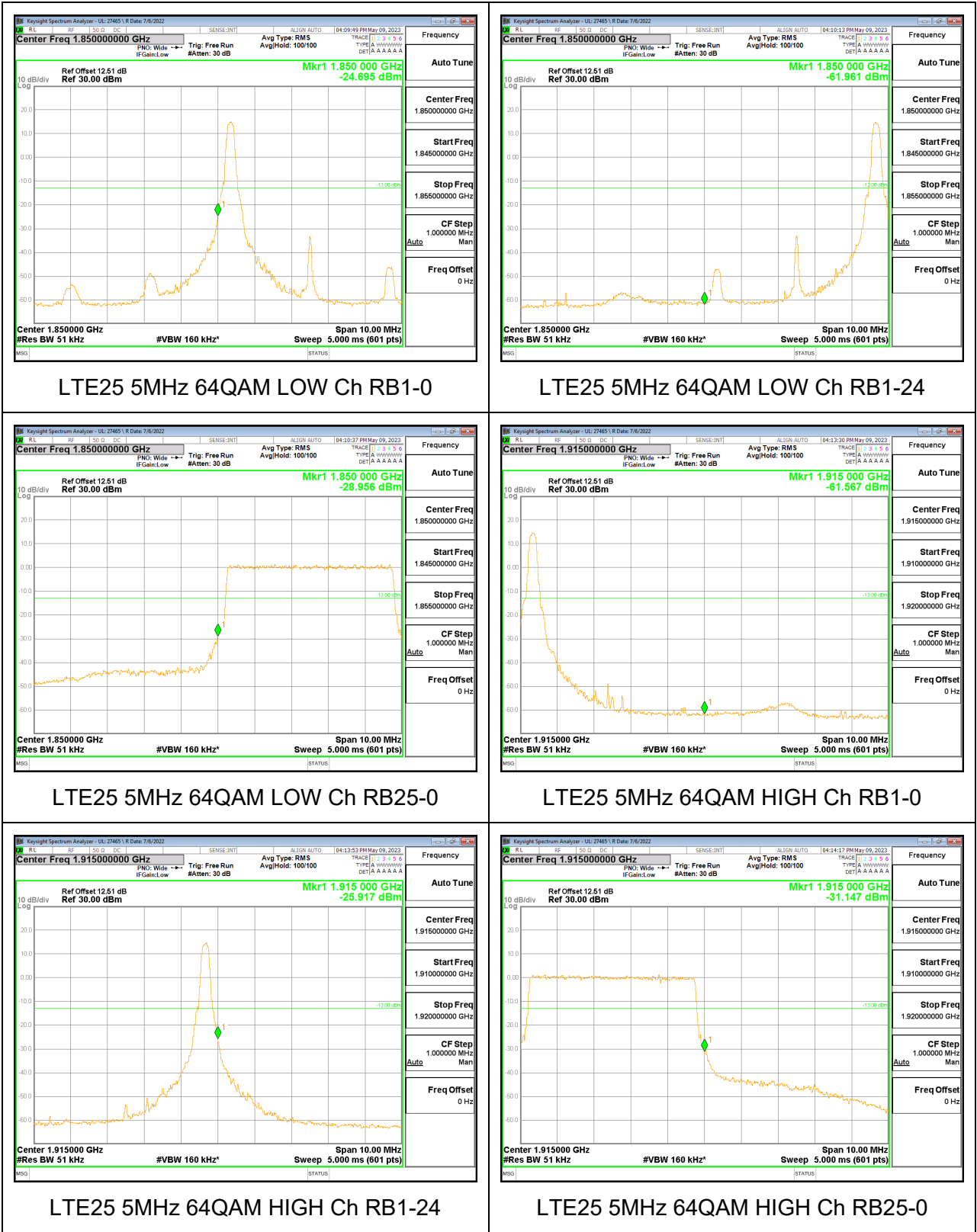
LIMITS

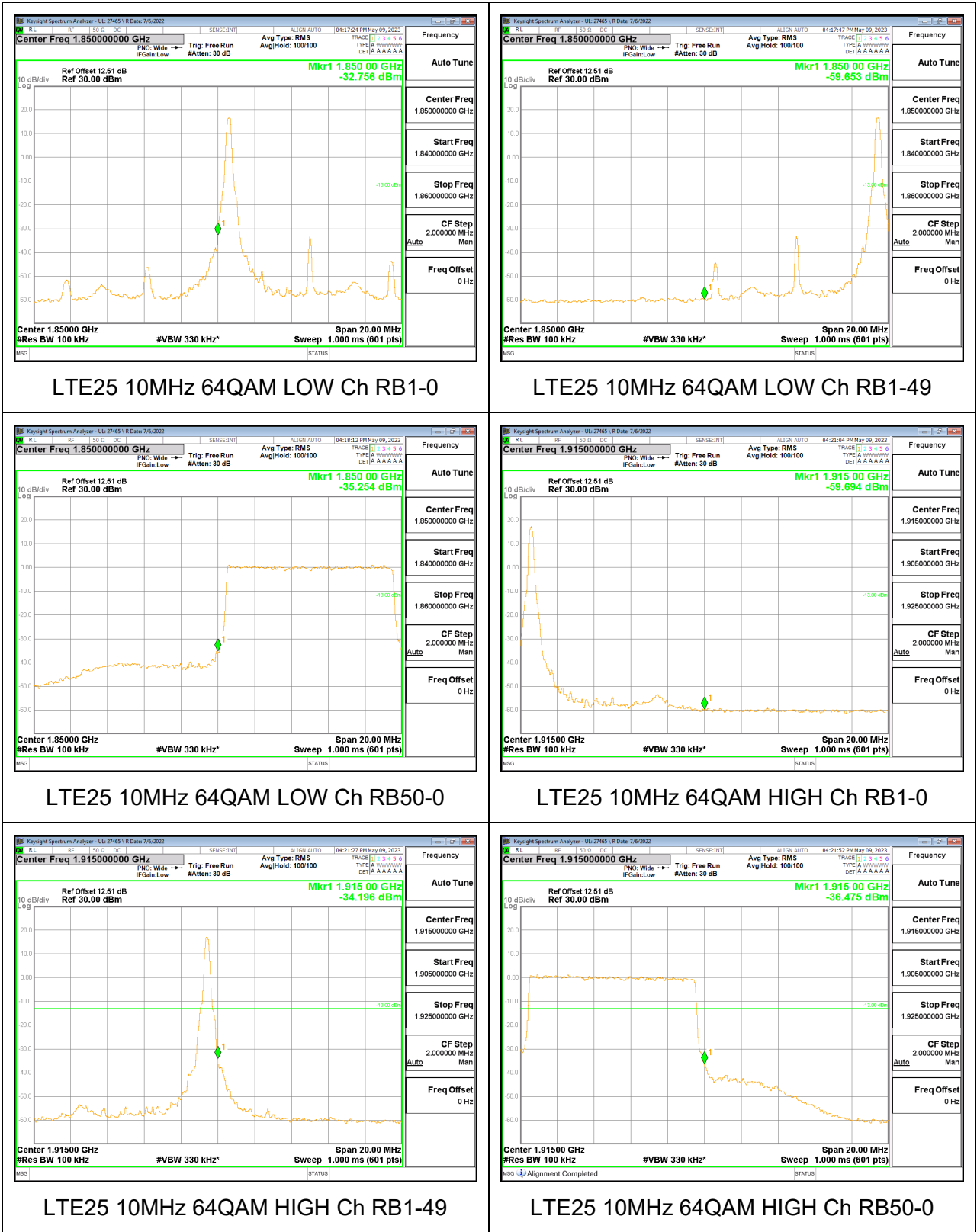
FCC: §24.238
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

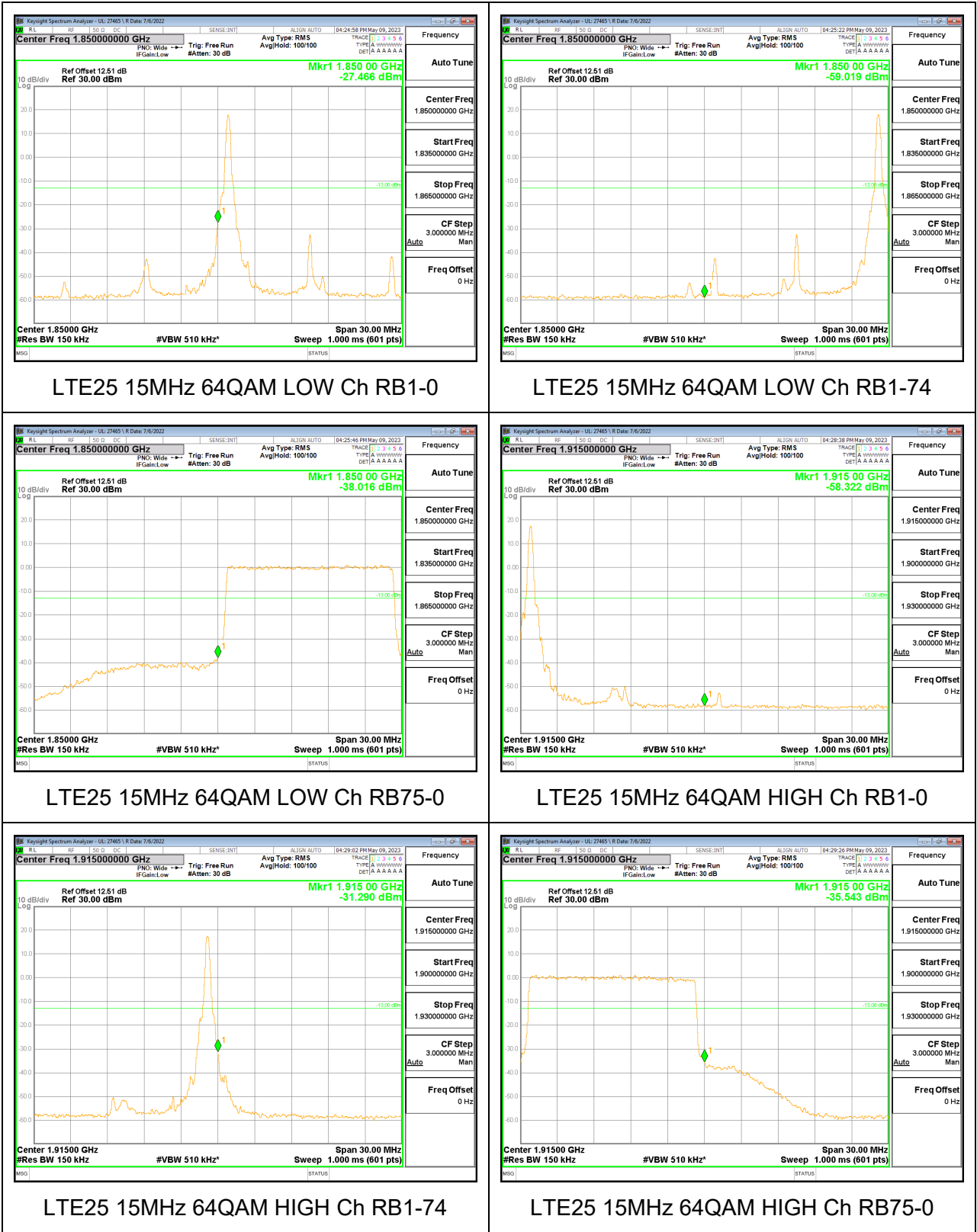
Test Engineer ID:	27465/44389	Test Date:	2023-05-09	EUT Serial Number:	QV77008AG9
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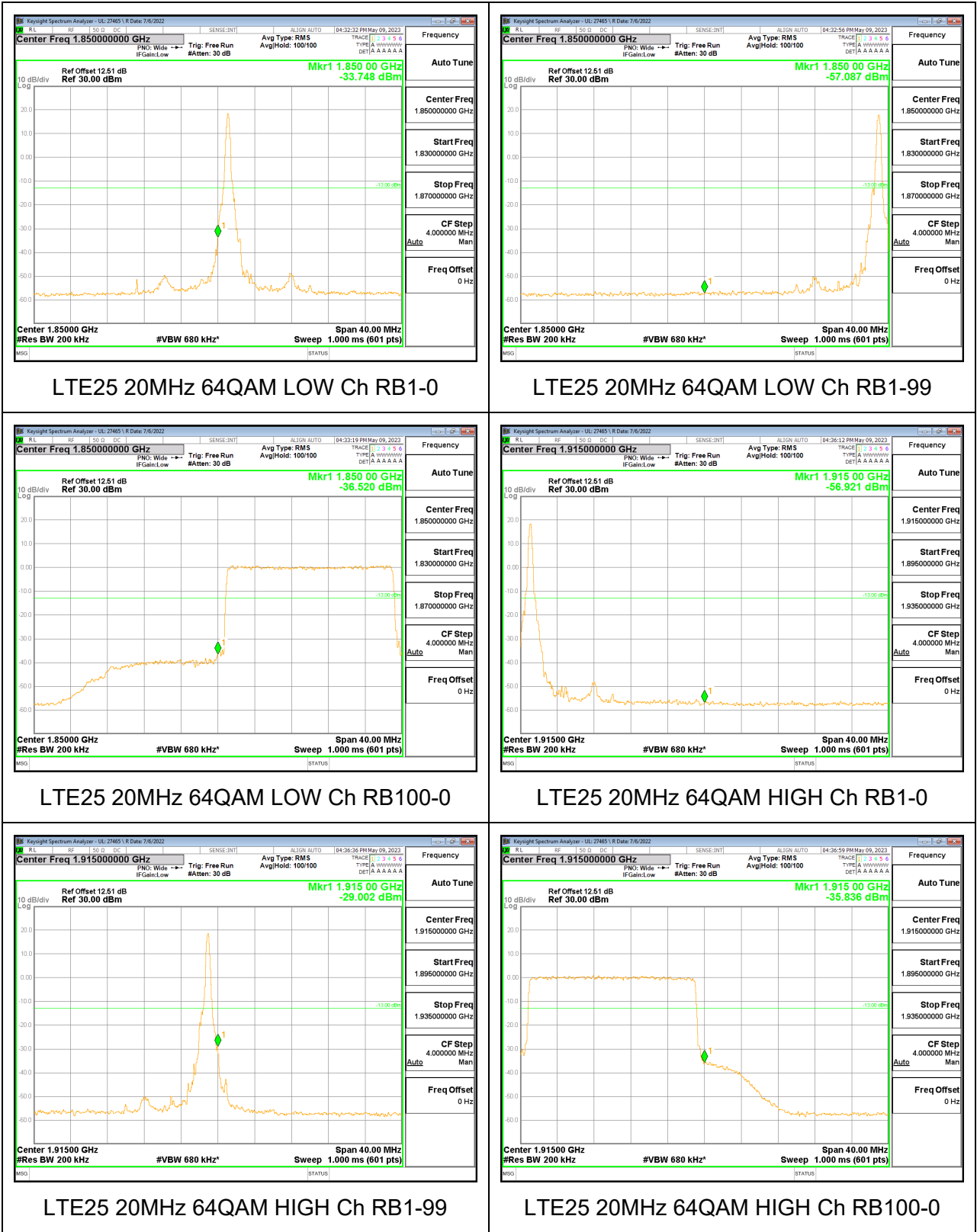












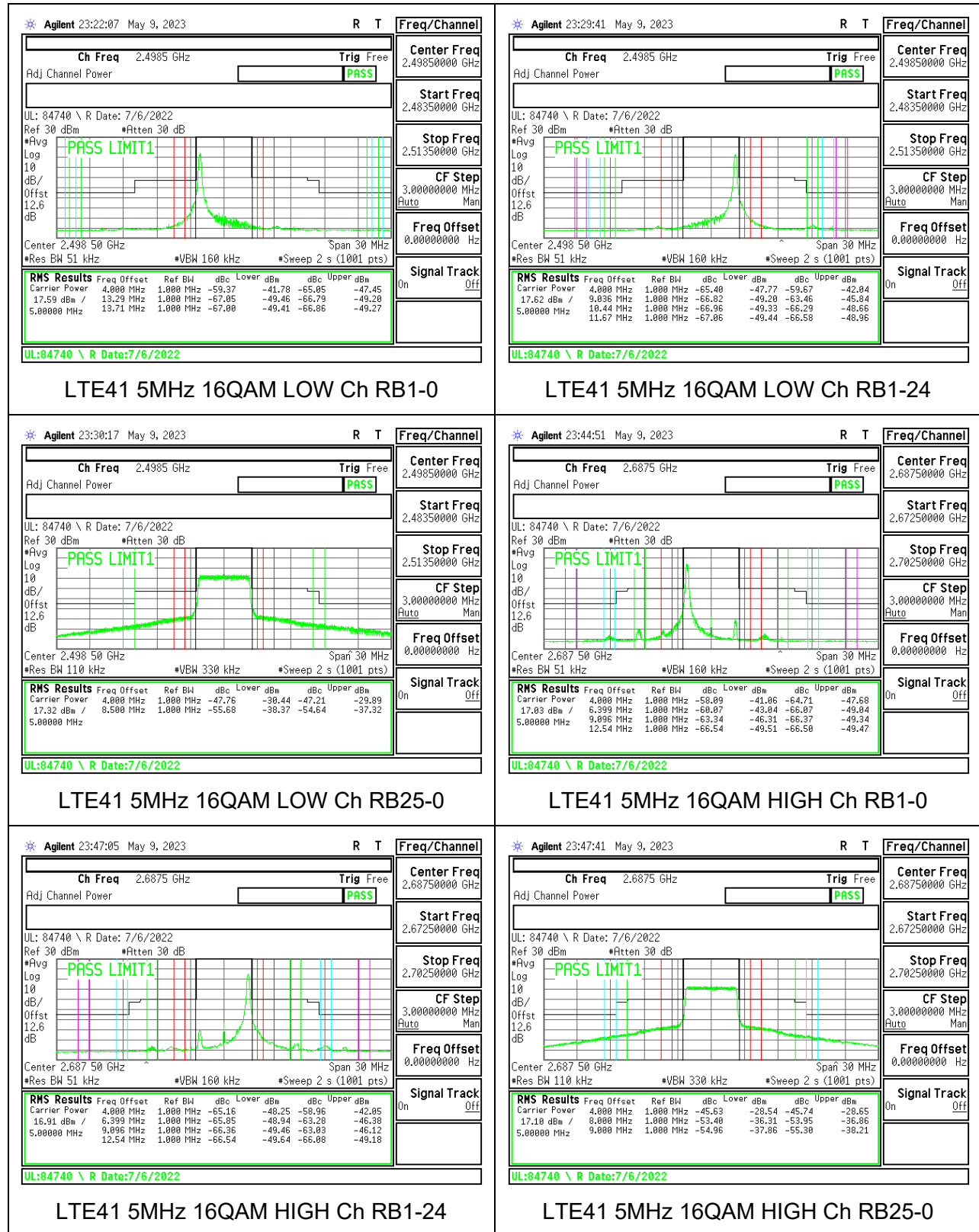
9.4.10. **LTE41**

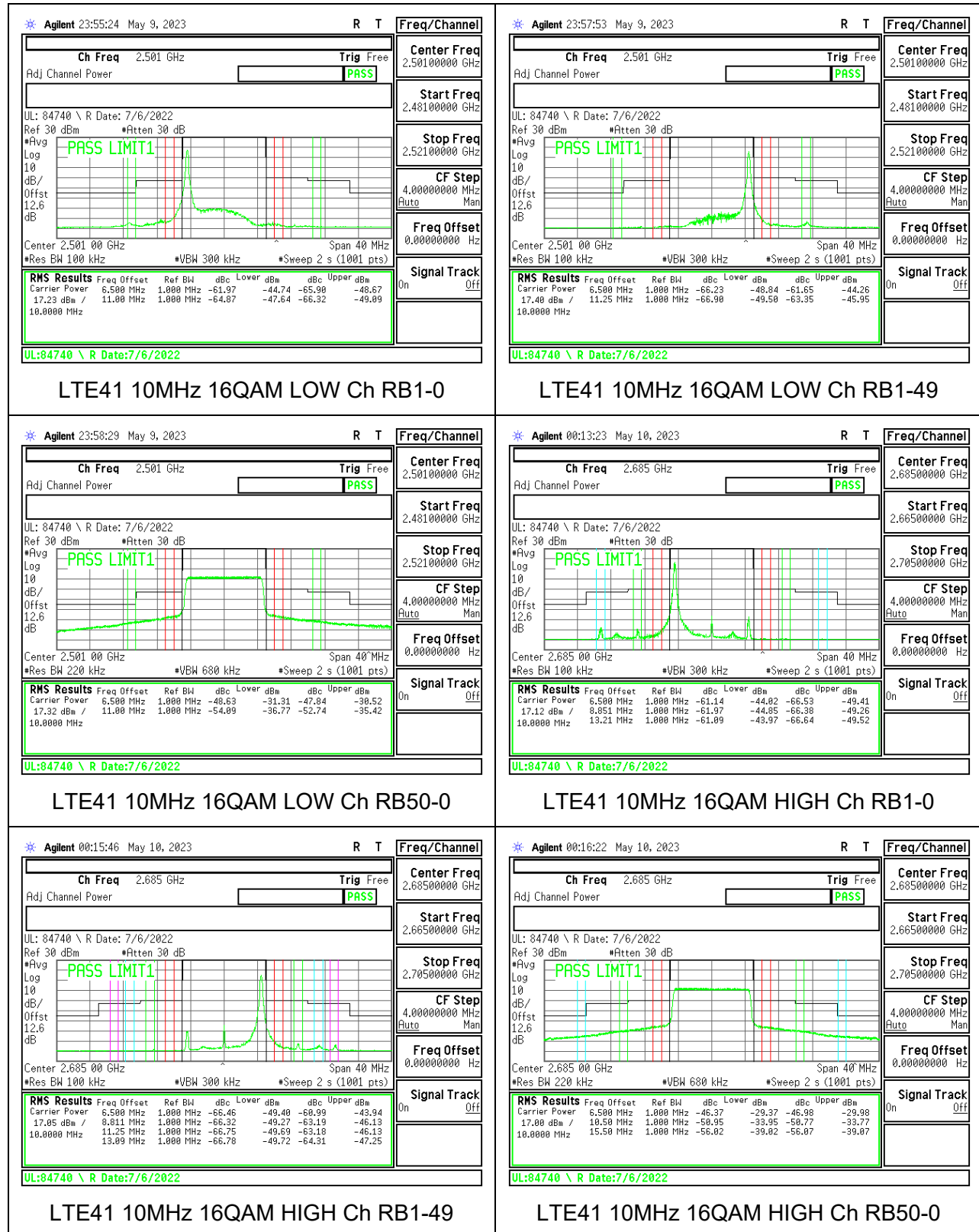
LIMITS

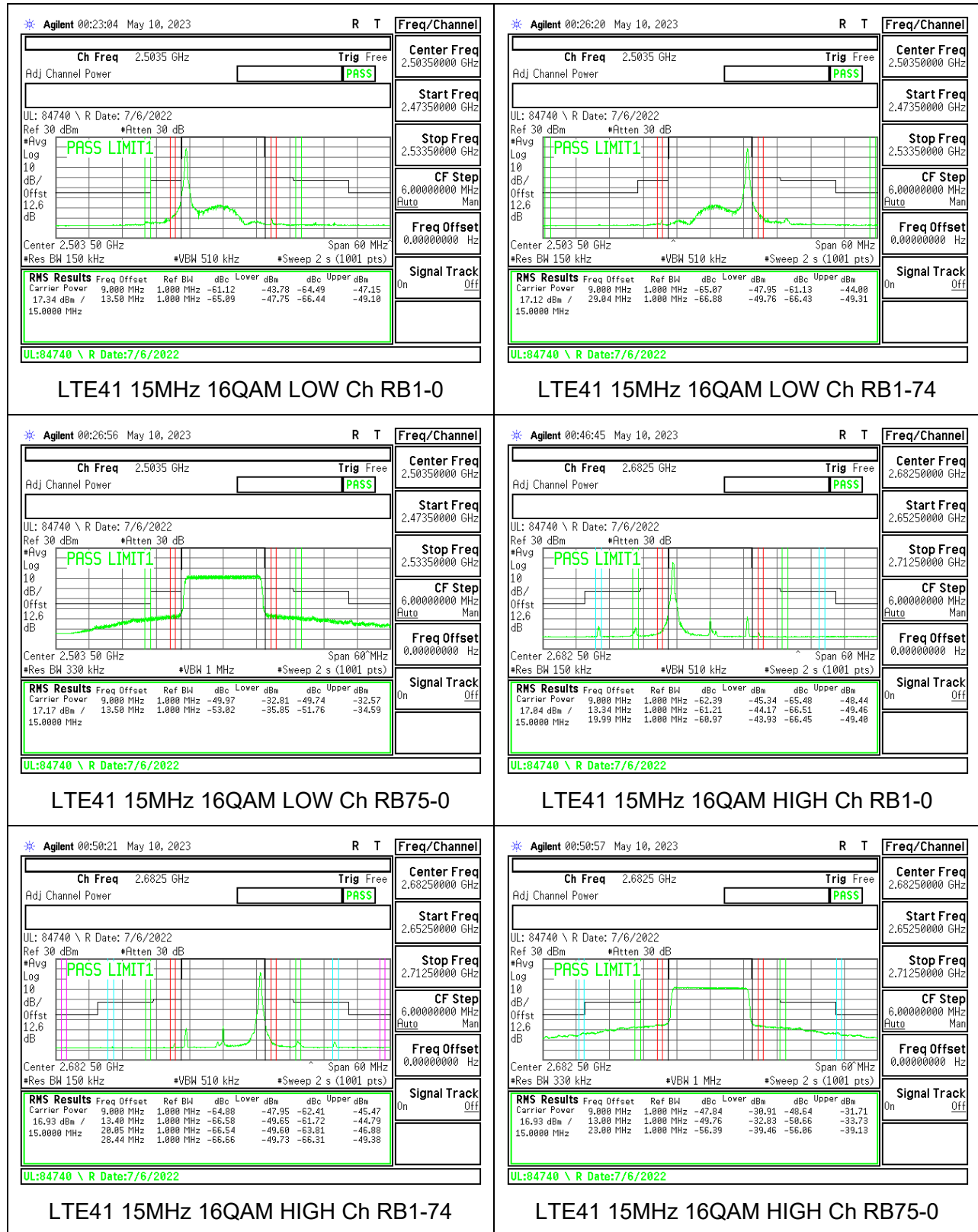
FCC: §27.53

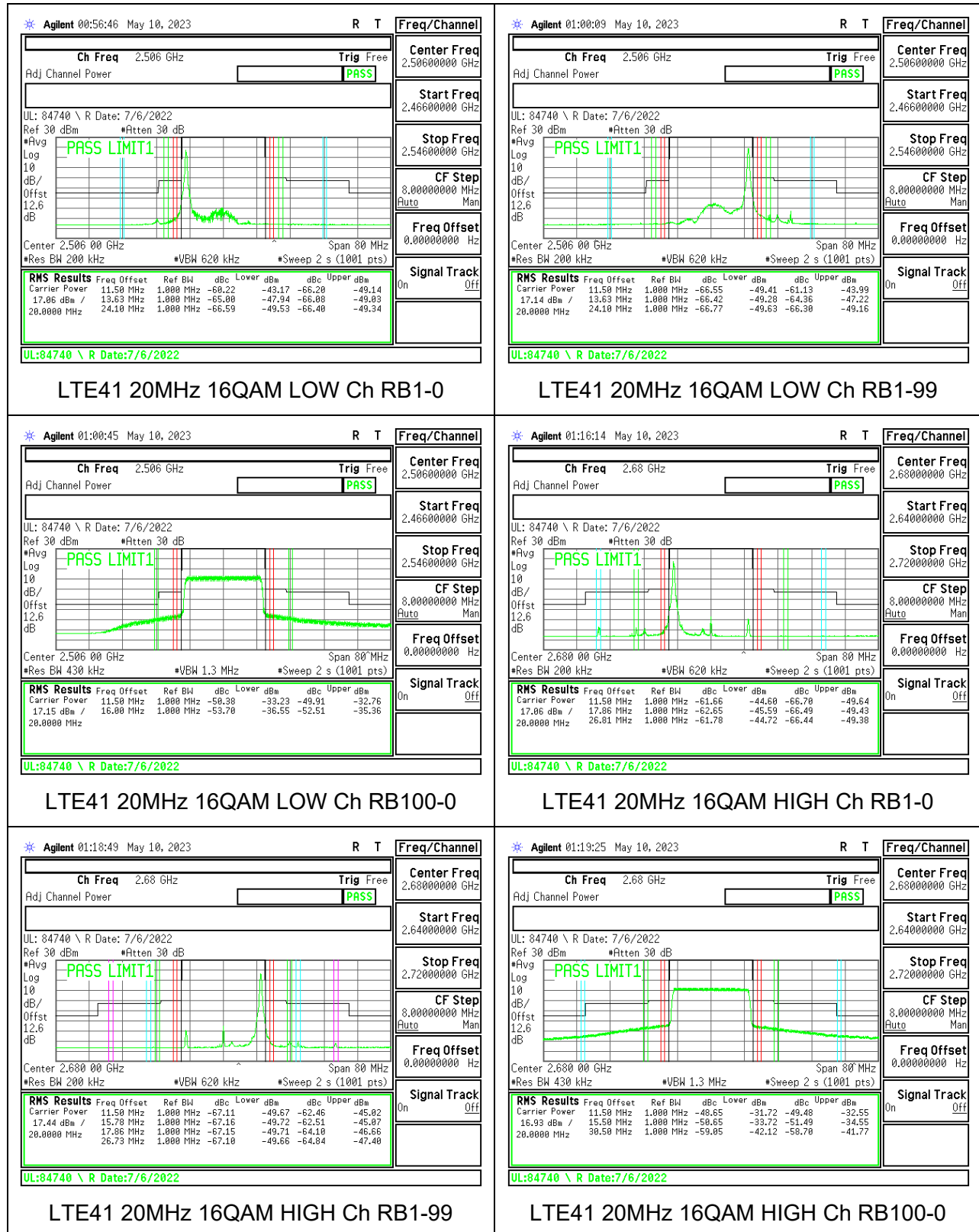
(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Test Engineer ID:	27465/44389	Test Date:	2023-05-09	EUT Serial Number:	QV77008AG9
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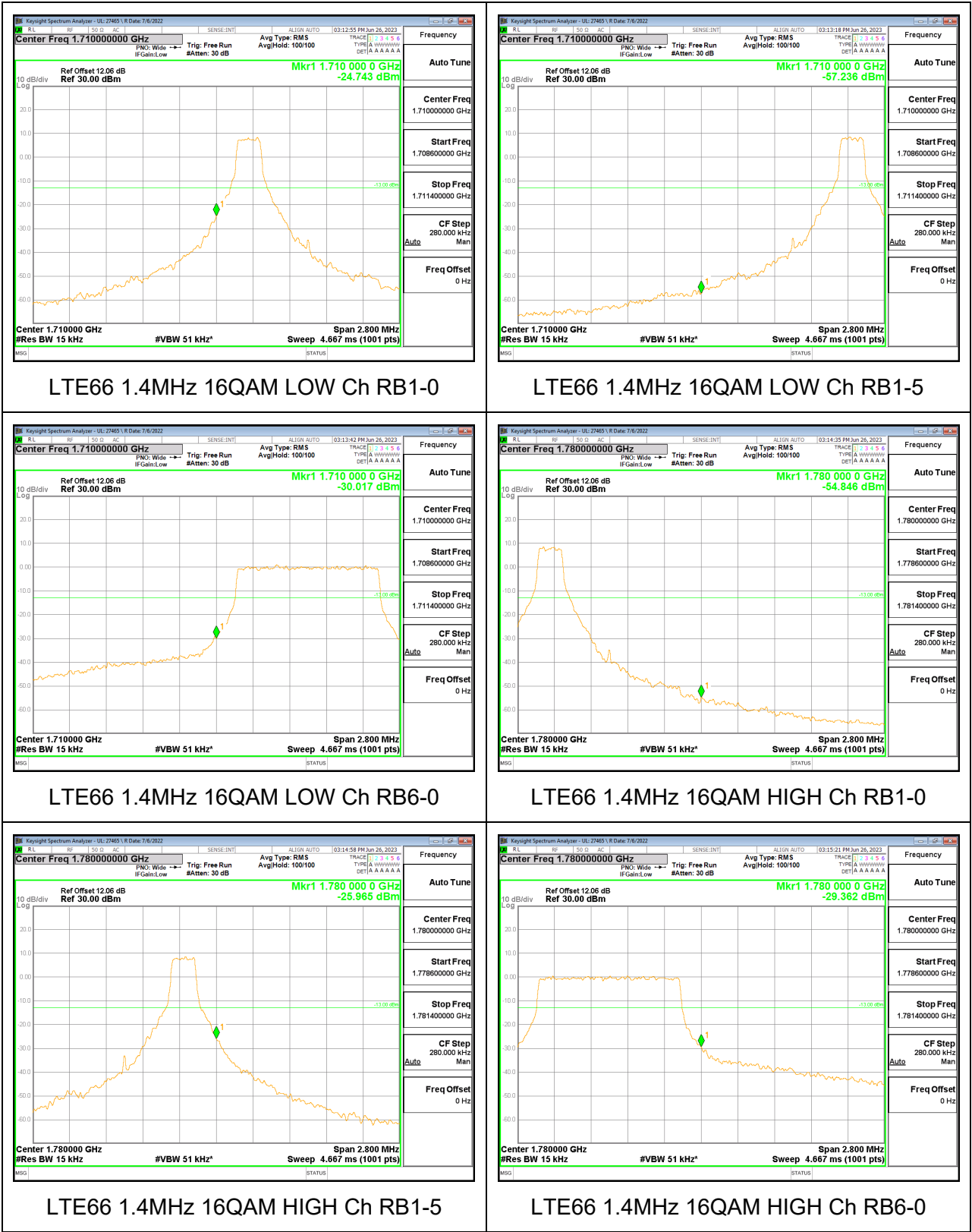


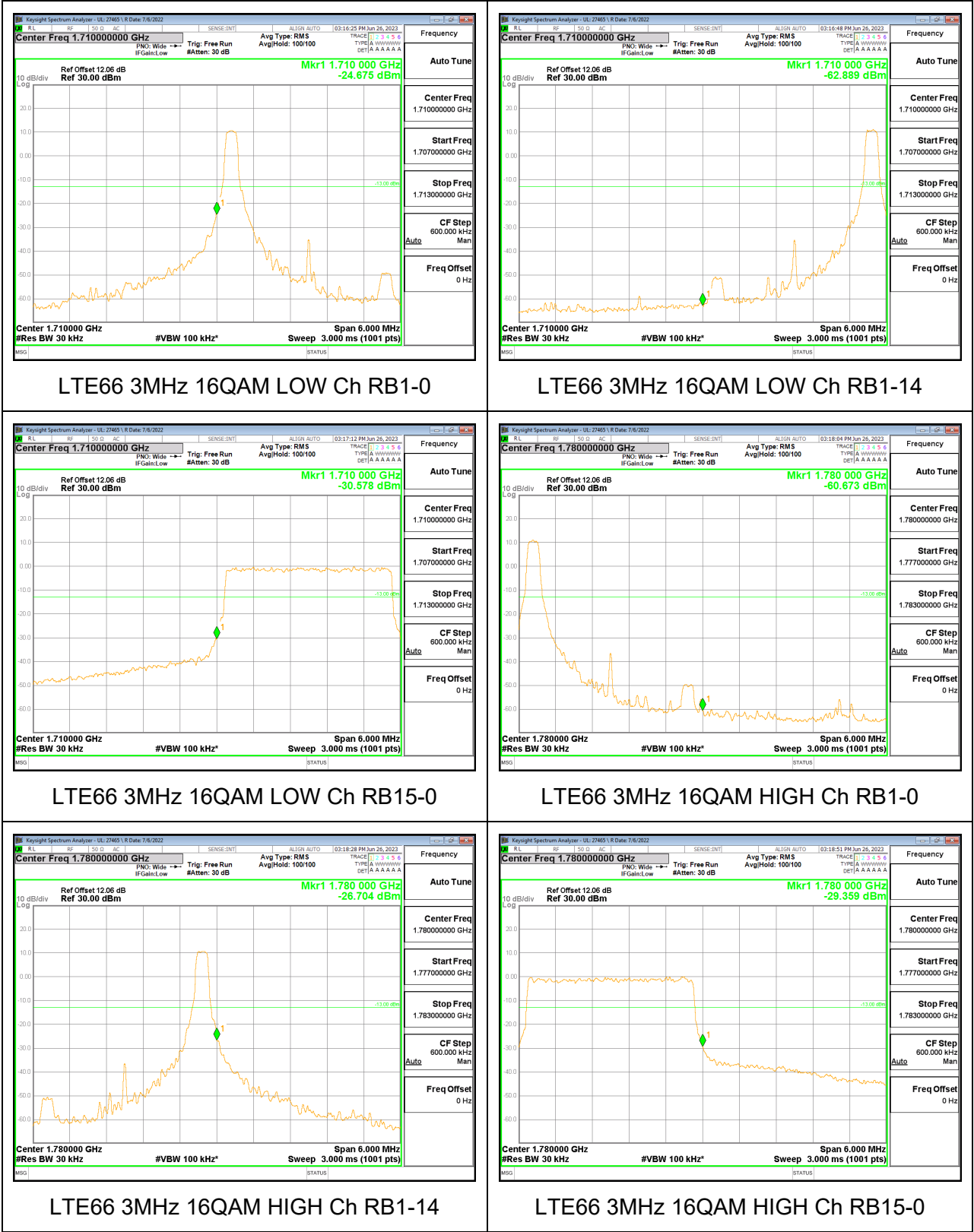
9.4.11. LTE66**LIMITS**

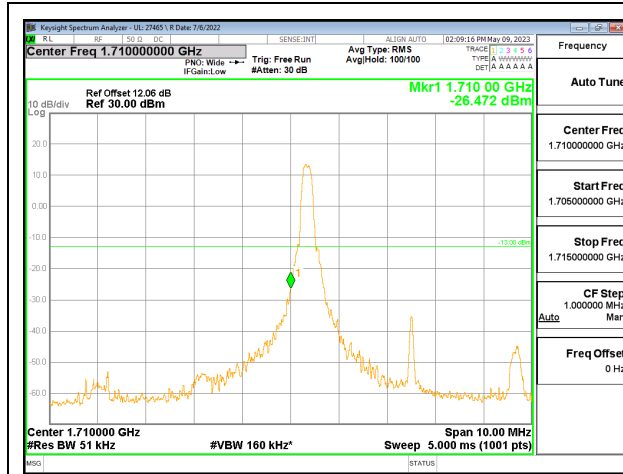
FCC: §27.53(h)

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.

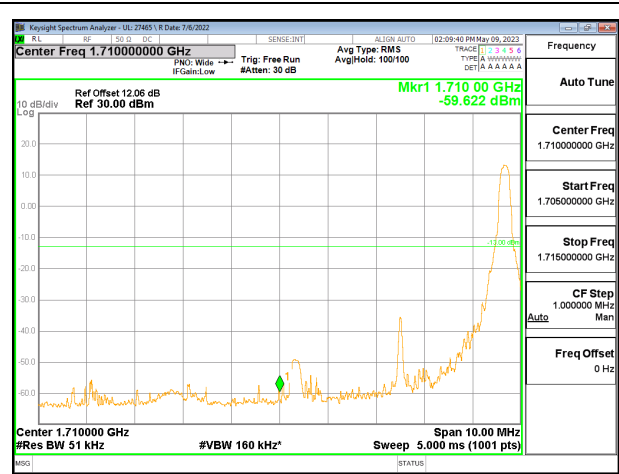
Test Engineer ID:	27465/44389	Test Date:	2023-05-09 2023-06-26	EUT Serial Number:	QV77008AG9
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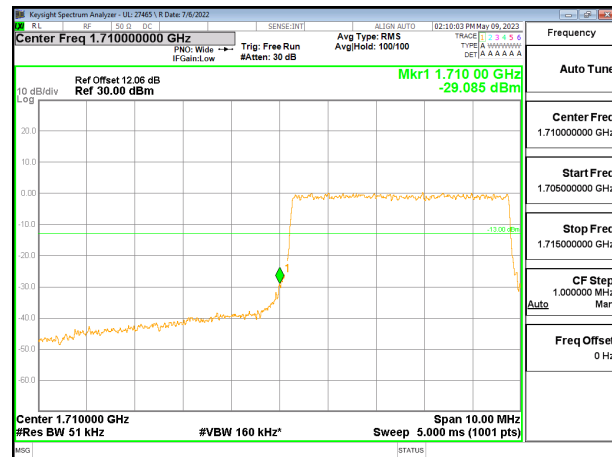




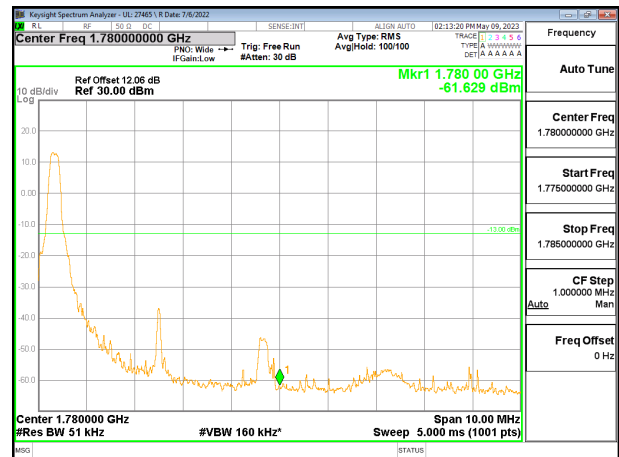
LTE66 5MHz 16QAM LOW Ch RB1-0



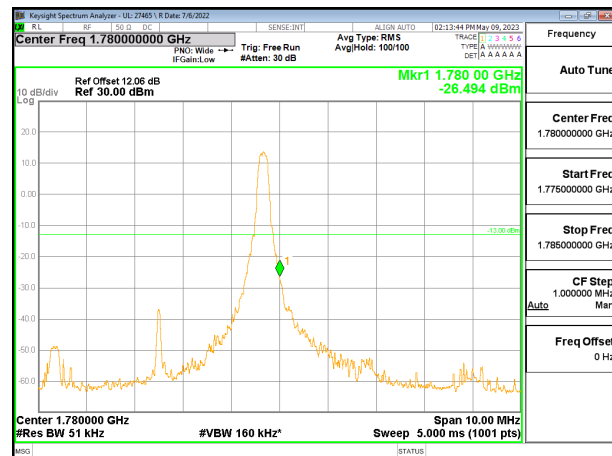
LTE66 5MHz 16QAM LOW Ch RB1-24



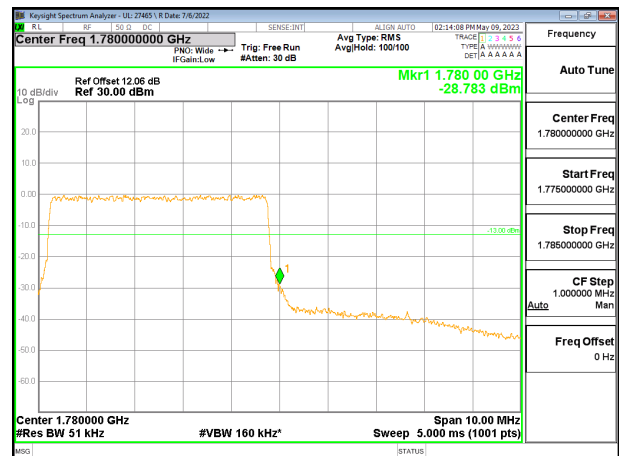
LTE66 5MHz 16QAM LOW Ch RB25-0



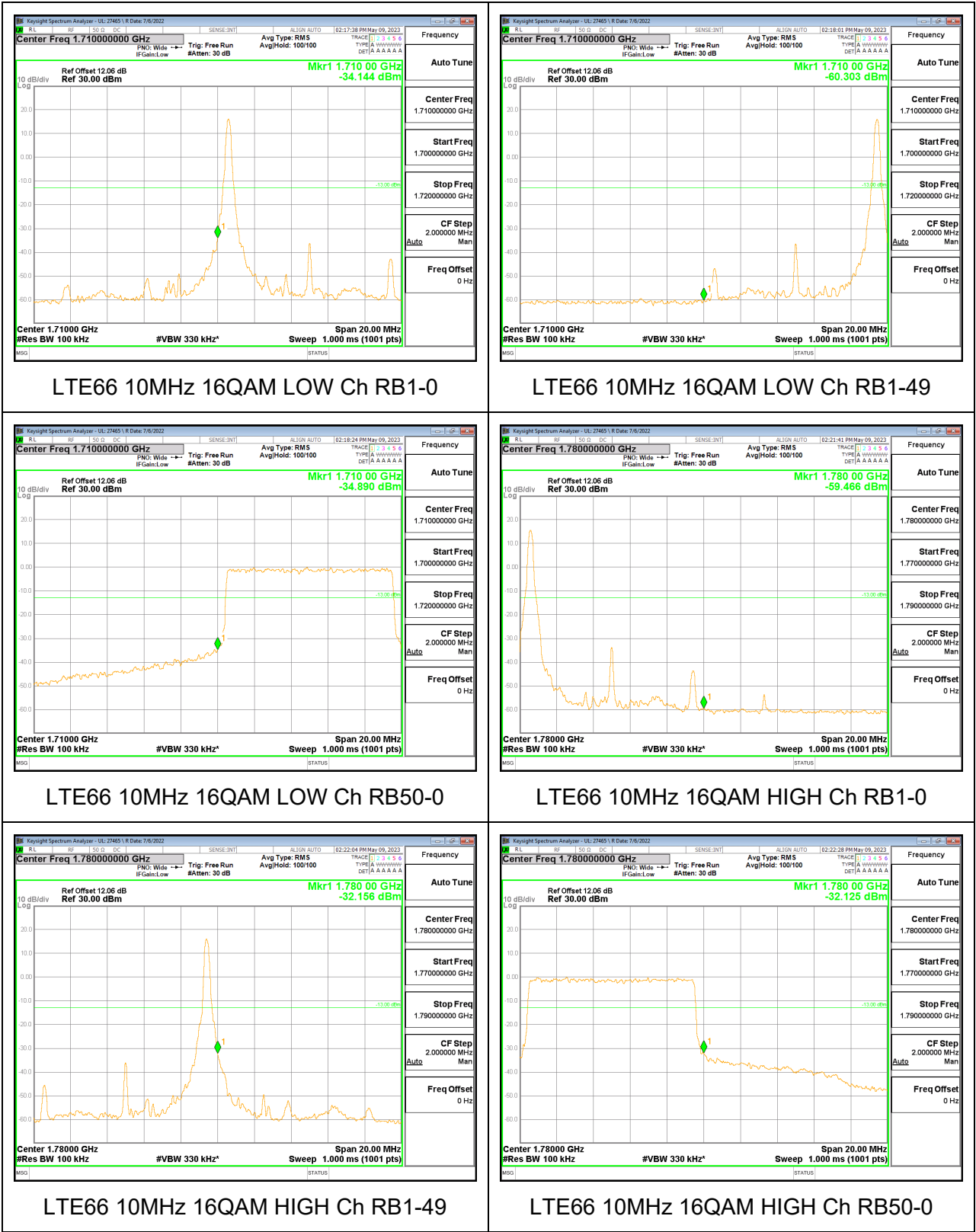
LTE66 5MHz 16QAM HIGH Ch RB1-0

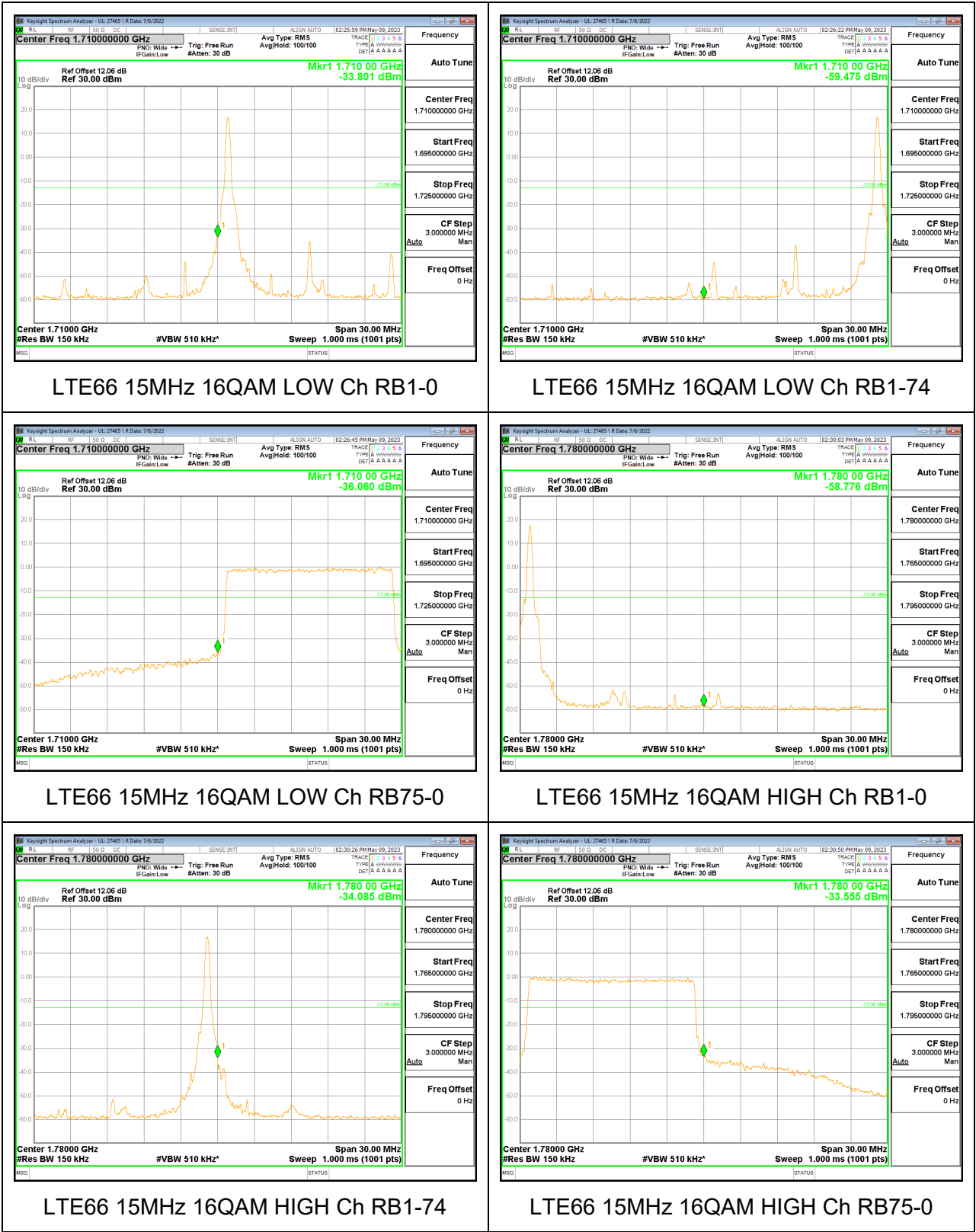


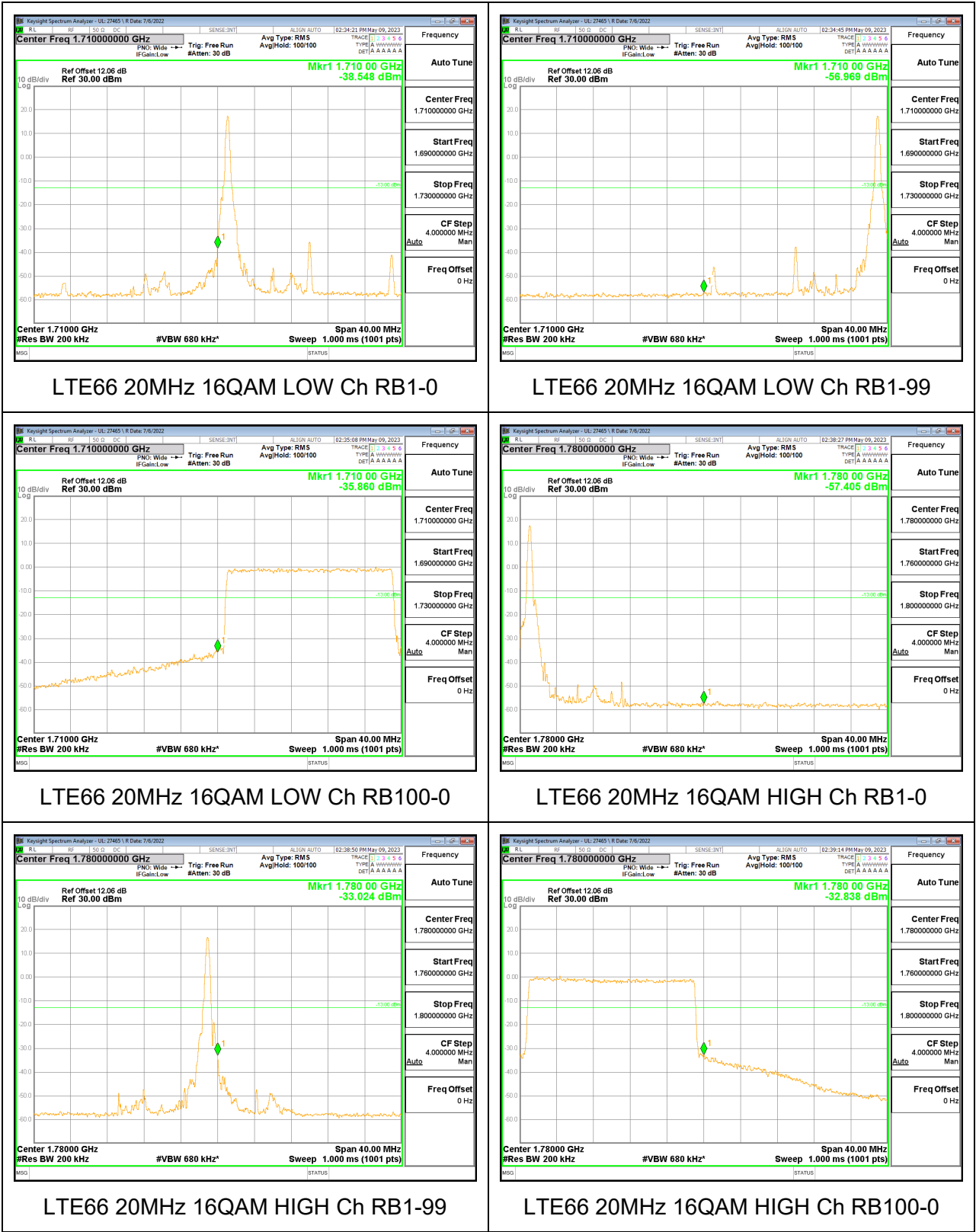
LTE66 5MHz 16QAM HIGH Ch RB1-24



LTE66 5MHz 16QAM HIGH Ch RB25-0







9.5. FREQUENCY STABILITY

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

(vii) Temp. = -30°C to +50°C

(viii) Voltage = (85% - 115%)

Normal, 3.89VDC

End Voltage, 3.69VDC.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize, and soak, and then the measurement is repeated. This is repeated until +50°C is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

RESULTS

9.5.1. GSM850

Test Engineer ID:	84740/44389	Test Date:	2023-05-09	EUT Serial Number:	QV77002SG9
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Band	GSM850	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		824	849		2.5	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	824.2000	848.8000			
Extreme (50°C)		824.2000	848.8000	23.72	0.028	Yes
Extreme (40°C)		824.2000	848.8000	25.57	0.031	Yes
Extreme (30°C)		824.2000	848.8000	31.54	0.038	Yes
Extreme (10°C)		824.2000	848.8000	31.09	0.037	Yes
Extreme (0°C)		824.2000	848.8000	29.73	0.036	Yes
Extreme (-10°C)		824.2000	848.8000	32.14	0.038	Yes
Extreme (-20°C)		824.2000	848.8000	29.65	0.035	Yes
Extreme (-30°C)		824.2000	848.8000	28	0.033	Yes
20°C	End Point Voltage	824.2000	848.8000	29.85	0.036	Yes

9.5.2. GSM1900

Test Engineer ID:	84740/44389	Test Date:	2023-05-09	EUT Serial Number:	QV77002SG9
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Band	GSM1900	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1850	1910		2.5	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	1850.2000	1909.8000			
Extreme (50°C)		1850.2000	1909.8000	26.41	0.014	Yes
Extreme (40°C)		1850.2000	1909.8000	29.65	0.016	Yes
Extreme (30°C)		1850.2000	1909.8000	25.73	0.014	Yes
Extreme (10°C)		1850.2000	1909.8000	32.81	0.017	Yes
Extreme (0°C)		1850.2000	1909.8000	30.51	0.016	Yes
Extreme (-10°C)		1850.2000	1909.8000	29.65	0.016	Yes
Extreme (-20°C)		1850.2000	1909.8000	28.61	0.015	Yes
Extreme (-30°C)		1850.2000	1909.8000	27.07	0.014	Yes
20°C	End Point Voltage	1850.2000	1909.8000	22.12	0.012	Yes

9.5.3. WCDMA BAND 2

Test Engineer ID:	84740/44389	Test Date:	2023-05-12	EUT Serial Number:	QV77002SG9
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Band	2	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1850	1910		2.5	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	1852.4000	1907.6000			
Extreme (50°C)		1852.4000	1907.6000	11.82	0.006	Yes
Extreme (40°C)		1852.4000	1907.6000	11.19	0.006	Yes
Extreme (30°C)		1852.4000	1907.6000	9.35	0.005	Yes
Extreme (10°C)		1852.4000	1907.6000	8.16	0.004	Yes
Extreme (0°C)		1852.4000	1907.6000	12.13	0.006	Yes
Extreme (-10°C)		1852.4000	1907.6000	14.29	0.008	Yes
Extreme (-20°C)		1852.4000	1907.6000	12.78	0.007	Yes
Extreme (-30°C)		1852.4000	1907.6000	8.94	0.005	Yes
20°C	End Point Voltage	1852.4000	1907.6000	-8.29	-0.004	Yes

9.5.4. WCDMA BAND 4

Test Engineer ID:	84740/44389	Test Date:	2023-05-12	EUT Serial Number:	QV77002SG9
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Band	4	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1710	1755		N/A	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	1712.4000	1752.6000			
Extreme (50°C)		1712.4000	1752.6000	-30.25	-0.017	Yes
Extreme (40°C)		1712.4000	1752.6000	-27.57	-0.016	Yes
Extreme (30°C)		1712.4000	1752.6000	21.08	0.012	Yes
Extreme (10°C)		1712.4000	1752.6000	6.82	0.004	Yes
Extreme (0°C)		1712.4000	1752.6000	16.1	0.009	Yes
Extreme (-10°C)		1712.4000	1752.6000	21.53	0.012	Yes
Extreme (-20°C)		1712.4000	1752.6000	19.37	0.011	Yes
Extreme (-30°C)		1712.4000	1752.6000	9.82	0.006	Yes
20°C	End Point Voltage	1712.4000	1752.6000	7.15	0.004	Yes

9.5.5. WCDMA BAND 5

Test Engineer ID:	84740/44389	Test Date:	2023-05-12	EUT Serial Number:	QV77002SG9
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Band	5	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		824	849		2.5	Within Authorized Frequency Block (Hz)
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	
Normal (20°C)	Normal	826.4000	846.6000			
Extreme (50°C)		826.4000	846.6000	-6.31	-0.008	Yes
Extreme (40°C)		826.4000	846.6000	-7.99	-0.010	Yes
Extreme (30°C)		826.4000	846.6000	-4.59	-0.005	Yes
Extreme (10°C)		826.4000	846.6000	-3.47	-0.004	Yes
Extreme (0°C)		826.4000	846.6000	4.1	0.005	Yes
Extreme (-10°C)		826.4000	846.6000	4.65	0.006	Yes
Extreme (-20°C)		826.4000	846.6000	4.7	0.006	Yes
Extreme (-30°C)		826.4000	846.6000	3.96	0.005	Yes
20°C	End Point Voltage	826.4000	846.6000	-3.67	-0.004	Yes

9.5.6. LTE5

Test Engineer ID:	85502/44389	Test Date:	2023-05-09	EUT Serial Number:	QV77007YG9
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Band	5	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		824	849		2.5	Within Authorized Frequency Block (Hz)
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	
Normal (20°C)	Normal	829.0000	844.0000			
Extreme (50°C)		829.0000	844.0000	2.01	0.002	Yes
Extreme (40°C)		829.0000	844.0000	1.16	0.001	Yes
Extreme (30°C)		829.0000	844.0000	2.48	0.003	Yes
Extreme (10°C)		829.0000	844.0000	4.24	0.005	Yes
Extreme (0°C)		829.0000	844.0000	1.98	0.002	Yes
Extreme (-10°C)		829.0000	844.0000	1.25	0.001	Yes
Extreme (-20°C)		829.0000	844.0000	4.05	0.005	Yes
Extreme (-30°C)		829.0000	844.0000	1.82	0.002	Yes
20°C	End Point Voltage	829.0000	844.0000	-2.13	-0.003	Yes

9.5.7. LTE12

Test Engineer ID:	85502/44389	Test Date:	2023-05-09	EUT Serial Number:	QV77007YG9
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Band	12	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		699	716		N/A	Within Authorized Frequency Block (Hz)
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	
Normal (20°C)	Normal	700.0000	711.0000			
Extreme (50°C)		700.0000	711.0000	-0.57	-0.001	Yes
Extreme (40°C)		700.0000	711.0000	1.24	0.002	Yes
Extreme (30°C)		700.0000	711.0000	0.51	0.001	Yes
Extreme (10°C)		700.0000	711.0000	1.59	0.002	Yes
Extreme (0°C)		700.0000	711.0000	2.42	0.003	Yes
Extreme (-10°C)		700.0000	711.0000	3.17	0.004	Yes
Extreme (-20°C)		700.0000	711.0000	1.16	0.002	Yes
Extreme (-30°C)		700.0000	711.0000	1.49	0.002	Yes
20°C	End Point Voltage	700.0000	711.0000	2.35	0.003	Yes

9.5.8. LTE13

Test Engineer ID:	85502/44389	Test Date:	2023-05-09	EUT Serial Number:	QV77007YG9
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Band	13	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		777	787		N/A	
		Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage					
Normal (20°C)	Normal	779.5000	784.5000			
Extreme (50°C)		779.5000	784.5000	2.43	0.003	Yes
Extreme (40°C)		779.5000	784.5000	1.09	0.001	Yes
Extreme (30°C)		779.5000	784.5000	1.48	0.002	Yes
Extreme (10°C)		779.5000	784.5000	3.53	0.005	Yes
Extreme (0°C)		779.5000	784.5000	1.53	0.002	Yes
Extreme (-10°C)		779.5000	784.5000	2.56	0.003	Yes
Extreme (-20°C)		779.5000	784.5000	4.22	0.005	Yes
Extreme (-30°C)		779.5000	784.5000	5.57	0.007	Yes
20°C	End Point Voltage	779.5000	784.5000	3.79	0.005	Yes

9.5.9. LTE25

Test Engineer ID:	27465/44389	Test Date:	2023-05-10	EUT Serial Number:	QV77008AG9
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Band	25	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1850	1915		2.5	
		Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage					
Normal (20°C)	Normal	1860.0000	1905.0000			
Extreme (50°C)		1860.0000	1905.0000	-8.17	-0.004	Yes
Extreme (40°C)		1860.0000	1905.0000	-6.81	-0.004	Yes
Extreme (30°C)		1860.0000	1905.0000	-8.04	-0.004	Yes
Extreme (10°C)		1860.0000	1905.0000	-5.13	-0.003	Yes
Extreme (0°C)		1860.0000	1905.0000	-5.89	-0.003	Yes
Extreme (-10°C)		1860.0000	1905.0000	-6.85	-0.004	Yes
Extreme (-20°C)		1860.0000	1905.0000	-5.82	-0.003	Yes
Extreme (-30°C)		1860.0000	1905.0000	-6.44	-0.003	Yes
20°C	End Point Voltage	1860.0000	1905.0000	-8.1	-0.004	Yes

9.5.10. LTE41

Test Engineer ID:	27465/44389	Test Date:	2023-05-10	EUT Serial Number:	QV77008AG9
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Band	41	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		2500	2690			
		Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage					
Normal (20°C)	Normal	2506.0000	2680.0000			
Extreme (50°C)		2506.0000	2680.0000	-9.61	-0.004	Yes
Extreme (40°C)		2506.0000	2680.0000	-12.53	-0.005	Yes
Extreme (30°C)		2506.0000	2680.0000	-11.97	-0.005	Yes
Extreme (10°C)		2506.0000	2680.0000	-10.42	-0.004	Yes
Extreme (0°C)		2506.0000	2680.0000	-10.02	-0.004	Yes
Extreme (-10°C)		2506.0000	2680.0000	-10.86	-0.004	Yes
Extreme (-20°C)		2506.0000	2680.0000	-11.97	-0.005	Yes
Extreme (-30°C)		2506.0000	2680.0000	-12.67	-0.005	Yes
20°C	End Point Voltage	2506.0000	2680.0000	-11.72	-0.005	Yes

9.5.11. LTE66

Test Engineer ID:	27465/44389	Test Date:	2023-05-10	EUT Serial Number:	QV77008AG9
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Band	66	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1710	1780			
		Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage					
Normal (20°C)	Normal	1720.0000	1770.0000			
Extreme (50°C)		1720.0000	1770.0000	-5.94	-0.003	Yes
Extreme (40°C)		1720.0000	1770.0000	-5.81	-0.003	Yes
Extreme (30°C)		1720.0000	1770.0000	-5.81	-0.003	Yes
Extreme (10°C)		1720.0000	1770.0000	-5.87	-0.003	Yes
Extreme (0°C)		1720.0000	1770.0000	-5.62	-0.003	Yes
Extreme (-10°C)		1720.0000	1770.0000	-5.69	-0.003	Yes
Extreme (-20°C)		1720.0000	1770.0000	-5.18	-0.003	Yes
Extreme (-30°C)		1720.0000	1770.0000	-5.23	-0.003	Yes
20°C	End Point Voltage	1720.0000	1770.0000	-6.27	-0.004	Yes

10. RADIATED TEST RESULTS

Radiated measurement using the Field Strength Method

Using the test configuration shown in Figure 6 below, We measure the radiated emissions directly from the EUT and convert the measured field strength or received power to ERP or EIRP, as required, for comparison to the applicable limits. As stated in 5.5.1 of ANSI C63.26-2015, the field strength measurement method using a test site validated to the requirements of ANSI C63.4 is an alternative to the substitution measurement method.

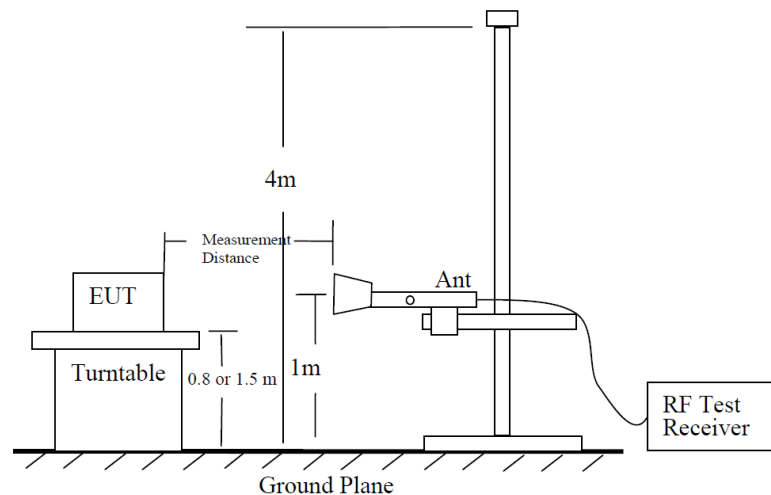


Figure 6 —Test site-up for radiated ERP and/or EIRP measurements

Radiated Power Measurement Calculation According to ANSI C63.26-2015

- a) $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}.$
- b) $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}.$
- c) $E \text{ (dB}\mu\text{V/m)} = \text{EIRP (dBm)} - 20\log(D) + 104.8$; where D is the measurement distance (in the far field region) in m.
- d) $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.

So, from d)

The measuring distance is usually at 3m, then $20 \cdot \log(3) = 9.5424$

Then, $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 9.5424 - 104.8 = E \text{ (dB}\mu\text{V/m)} - 95.2576$

Note: Confidence check of each chamber is performed daily to see if any degradation from expected/normal reading reference data. Ambient check of each chamber is performed monthly.

10.1. FIELD STRENGTH OF SPURIOUS RADIATION, ABOVE 1GHz

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz

RESULTS

Note: GPRS/EGPRS, REL99/HSDPA, QPSK/16QAM modes were tested for all bands, but only the worst-case mode is reported.

10.1.1. 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.

EUT Serial Number: QV77007DHJ