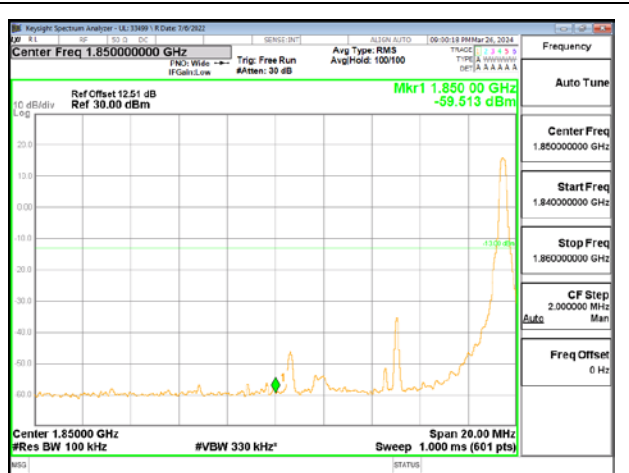
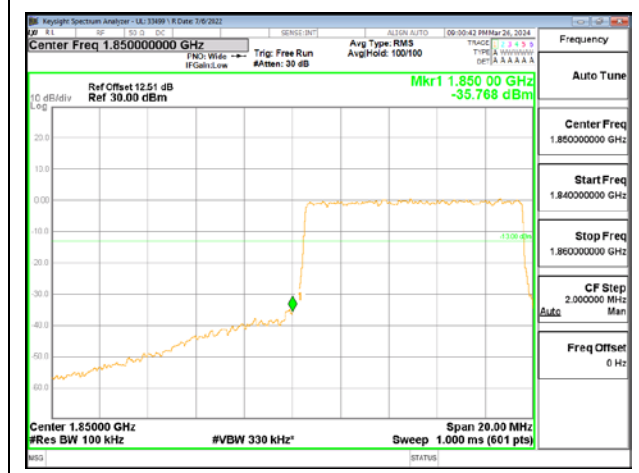


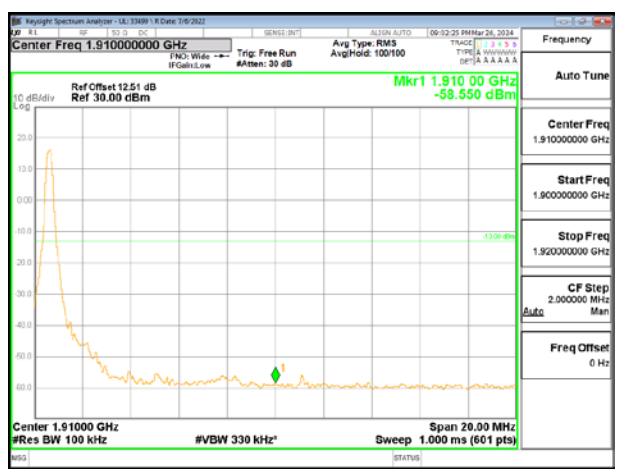
LTE2 10MHz 16QAM LOW Ch RB1-0



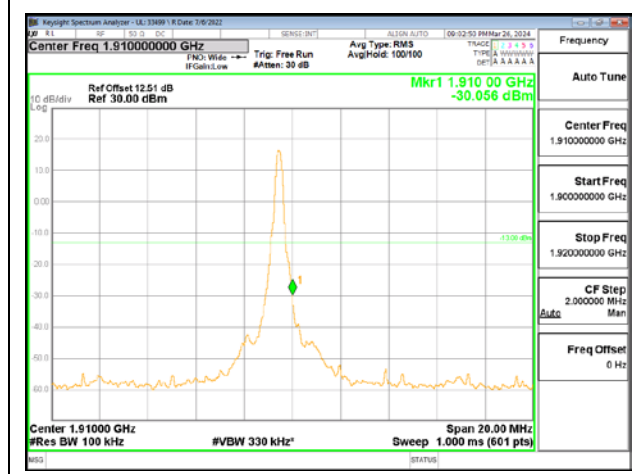
LTE2 10MHz 16QAM LOW Ch RB1-49



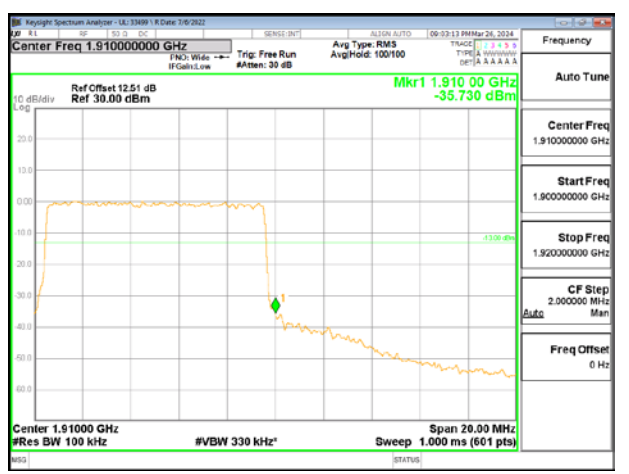
LTE2 10MHz 16QAM LOW Ch RB50-0



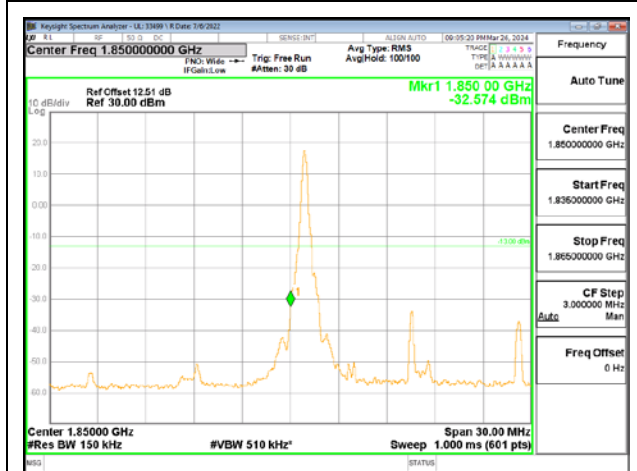
LTE2 10MHz 16QAM HIGH Ch RB1-0



LTE2 10MHz 16QAM HIGH Ch RB1-49



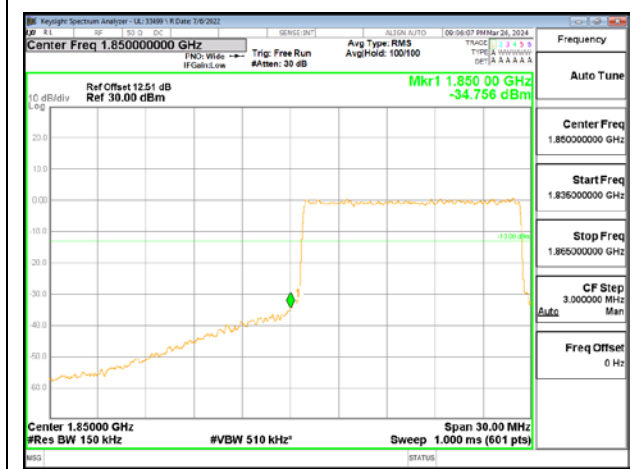
LTE2 10MHz 16QAM HIGH Ch RB50-0



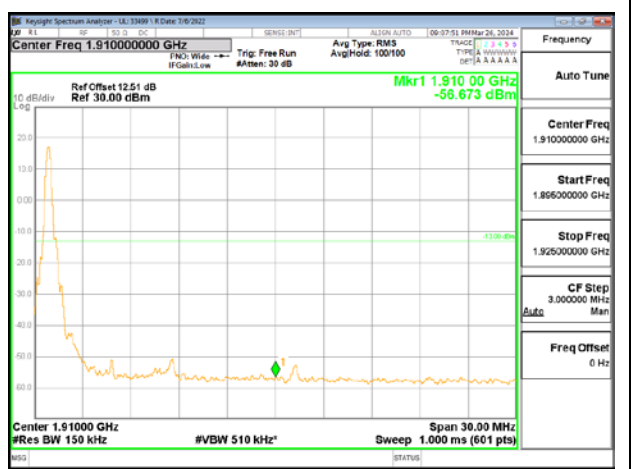
LTE2 15MHz 16QAM LOW Ch RB1-0



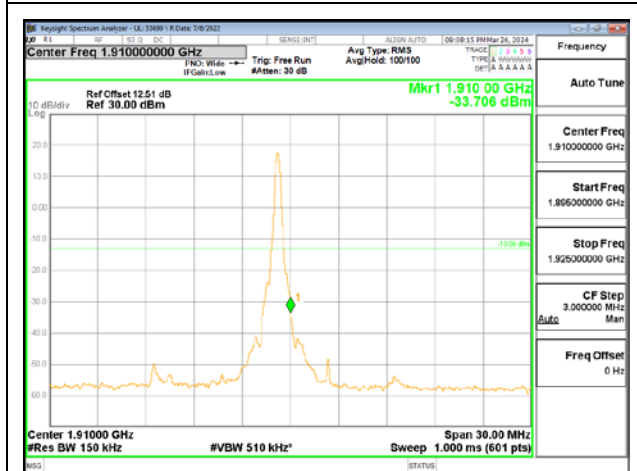
LTE2 15MHz 16QAM LOW Ch RB1-74



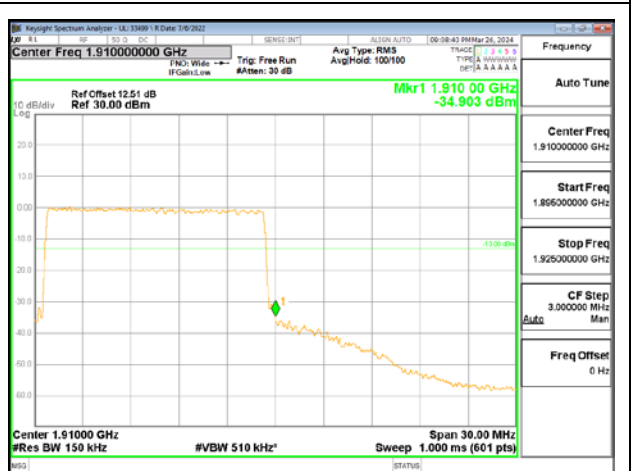
LTE2 15MHz 16QAM LOW Ch RB75-0



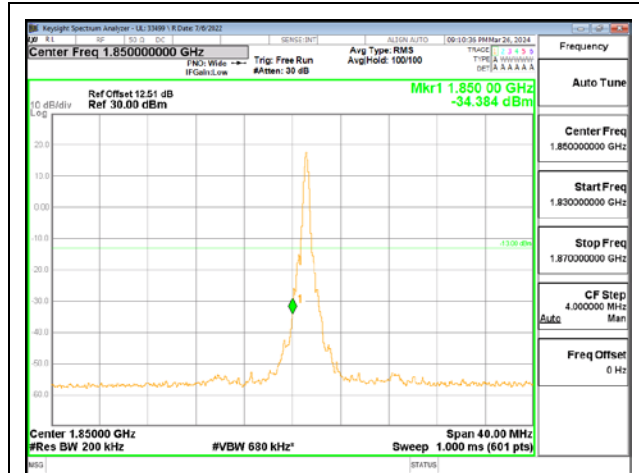
LTE2 15MHz 16QAM HIGH Ch RB1-0



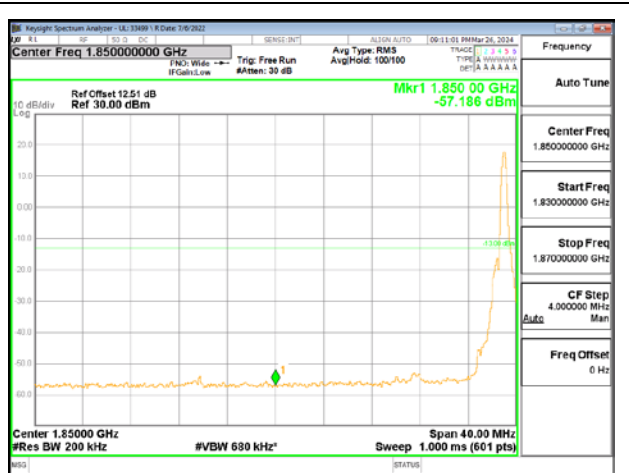
LTE2 15MHz 16QAM HIGH Ch RB1-74



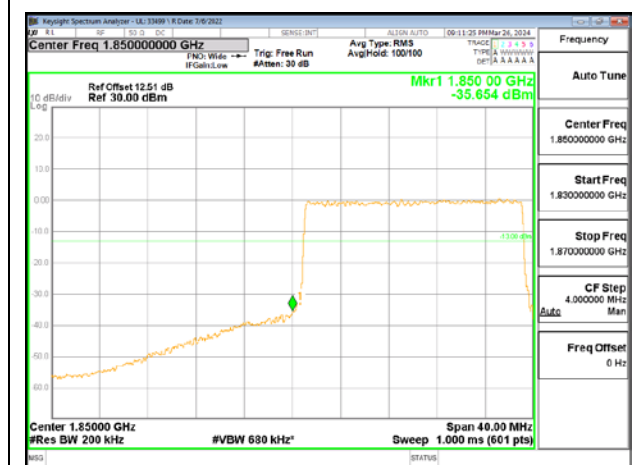
LTE2 15MHz 16QAM HIGH Ch RB75-0



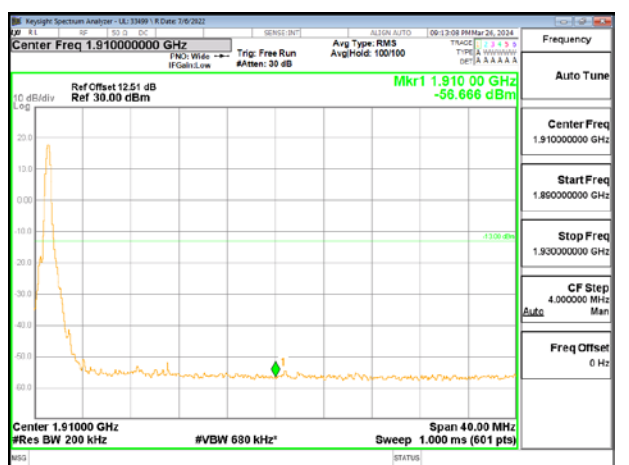
LTE2 20MHz 16QAM LOW Ch RB1-0



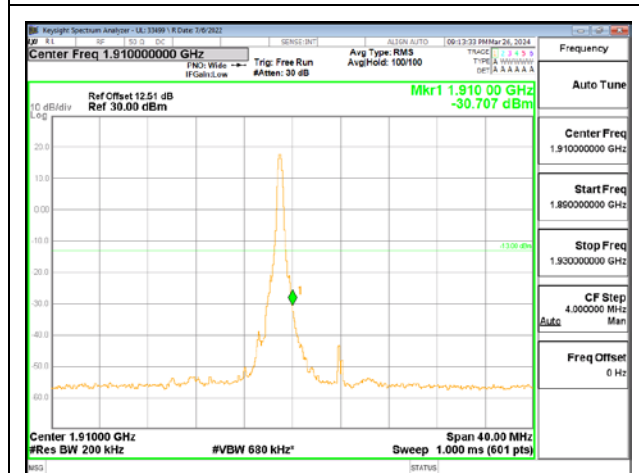
LTE2 20MHz 16QAM LOW Ch RB1-99



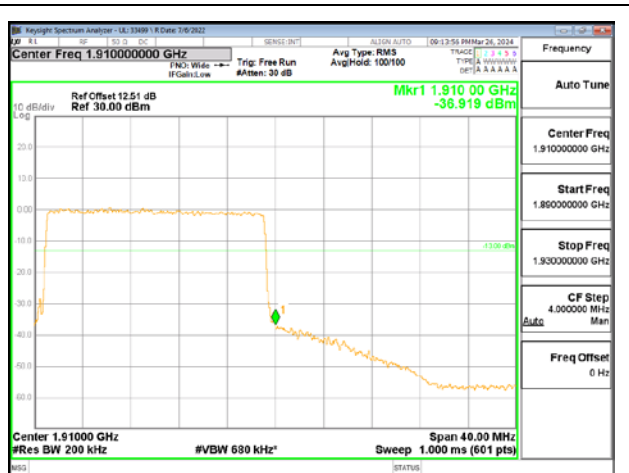
LTE2 20MHz 16QAM LOW Ch RB100-0



LTE2 20MHz 16QAM HIGH Ch RB1-0



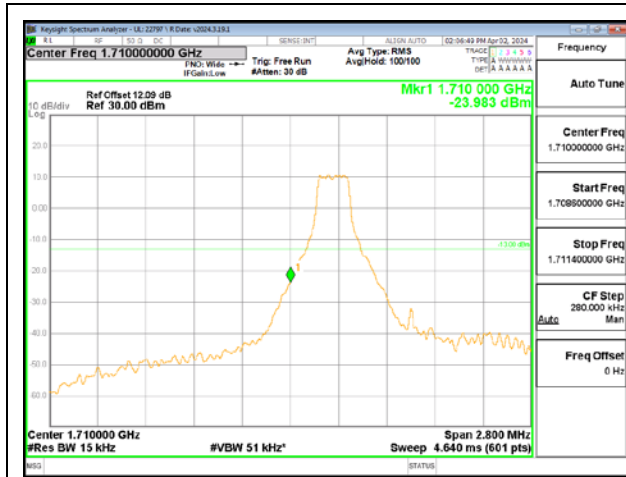
LTE2 20MHz 16QAM HIGH Ch RB1-99



LTE2 20MHz 16QAM HIGH Ch RB100-0

9.3.4. LTE4

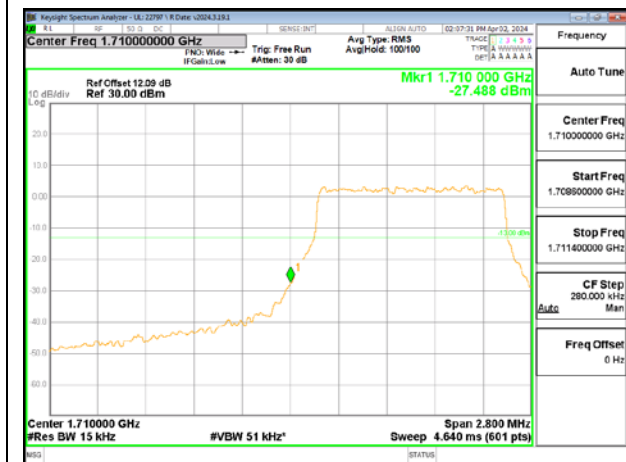
Test Engineer ID:	22797/85502	Test Date:	2024-04-02	EUT Serial Number:	QV7700R9LQ
-------------------	-------------	------------	------------	--------------------	------------



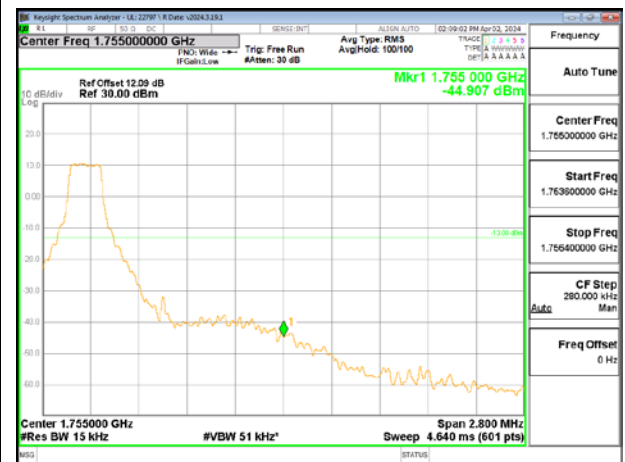
LTE4 1.4MHz 64QAM LOW Ch RB1-0



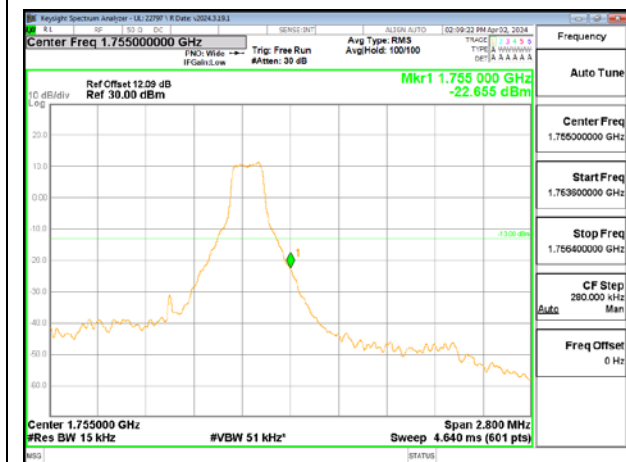
LTE4 1.4MHz 64QAM LOW Ch RB1-5



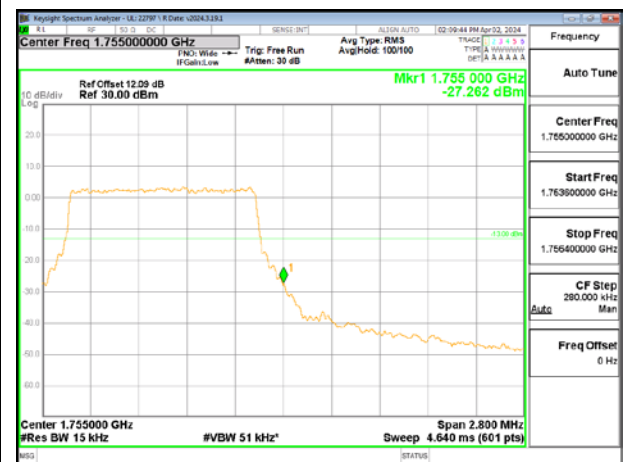
LTE4 1.4MHz 64QAM LOW Ch RB6-0



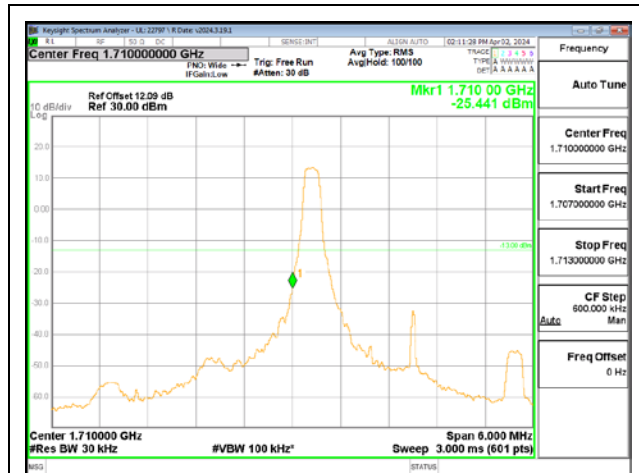
LTE4 1.4MHz 64QAM HIGH Ch RB1-0



LTE4 1.4MHz 64QAM HIGH Ch RB1-5



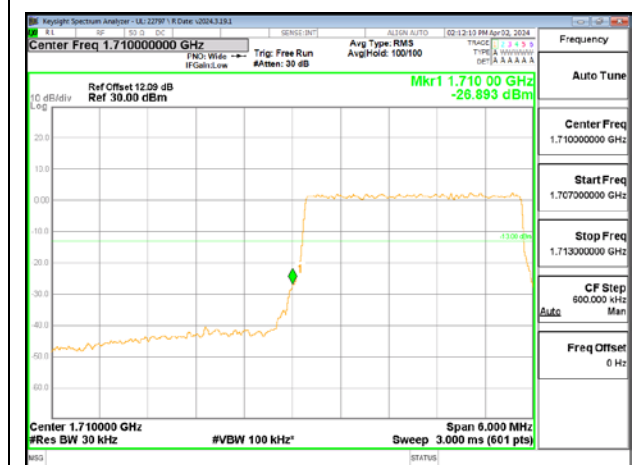
LTE4 1.4MHz 64QAM HIGH Ch RB6-0



LTE4 3MHz 64QAM LOW Ch RB1-0



LTE4 3MHz 64QAM LOW Ch RB1-14



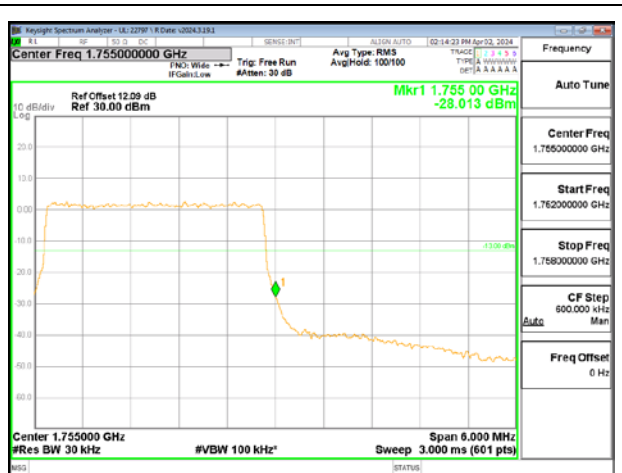
LTE4 3MHz 64QAM LOW Ch RB15-0



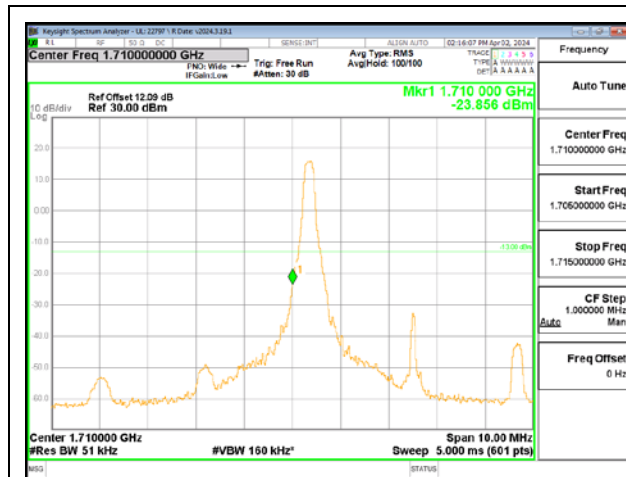
LTE4 3MHz 64QAM HIGH Ch RB1-0



LTE4 3MHz 64QAM HIGH Ch RB1-14



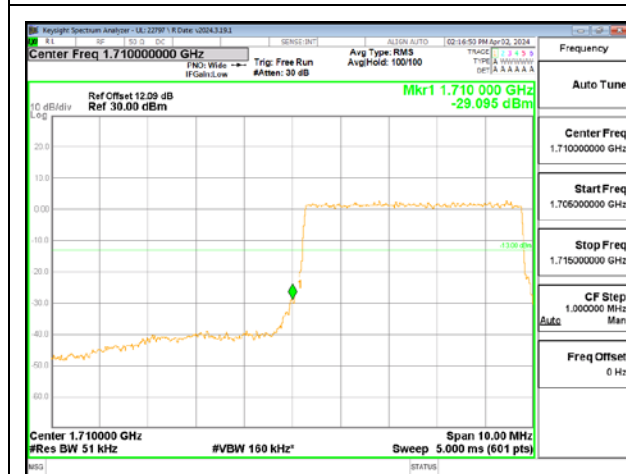
LTE4 3MHz 64QAM HIGH Ch RB15-0



LTE4 5MHz 64QAM LOW Ch RB1-0



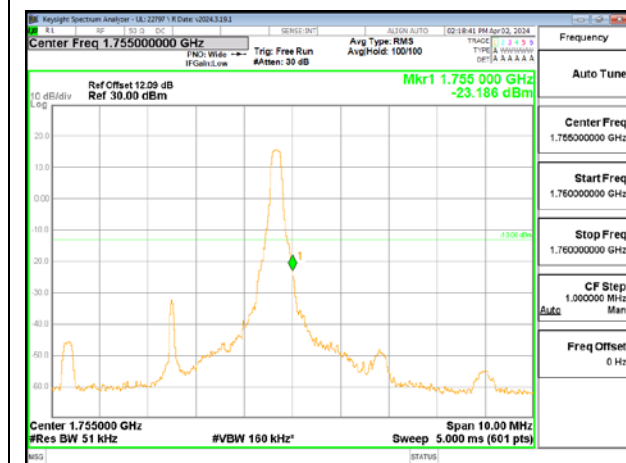
LTE4 5MHz 64QAM LOW Ch RB1-24



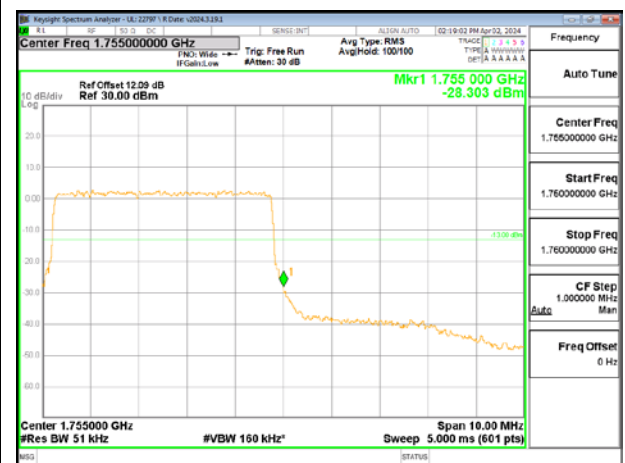
LTE4 5MHz 64QAM LOW Ch RB25-0



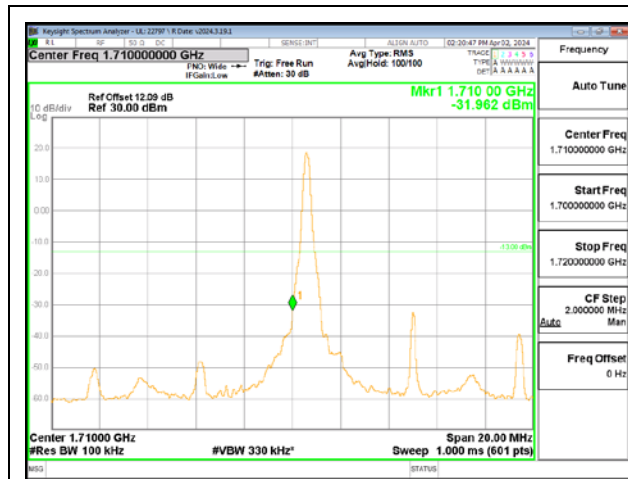
LTE4 5MHz 64QAM HIGH Ch RB1-0



LTE4 5MHz 64QAM HIGH Ch RB1-24



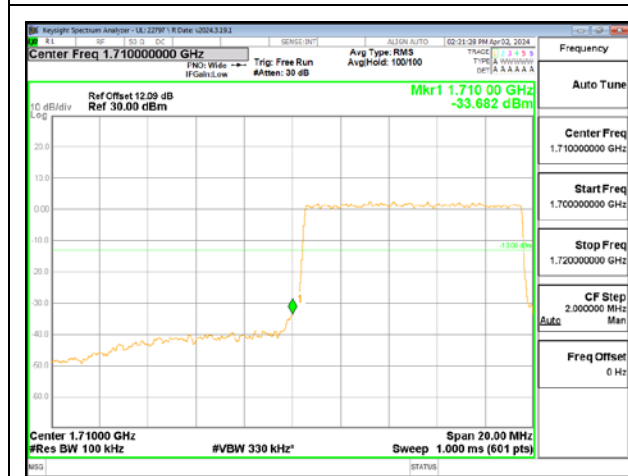
LTE4 5MHz 64QAM HIGH Ch RB25-0



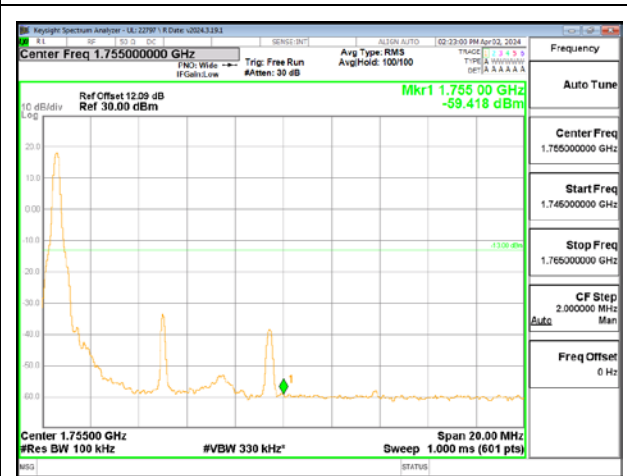
LTE4 10MHz 64QAM LOW Ch RB1-0



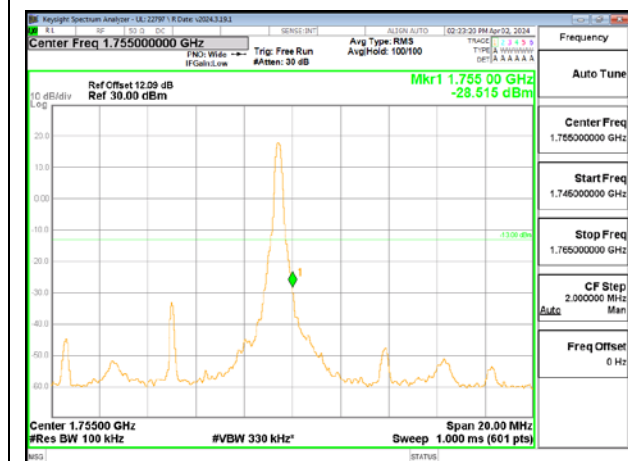
LTE4 10MHz 64QAM LOW Ch RB1-49



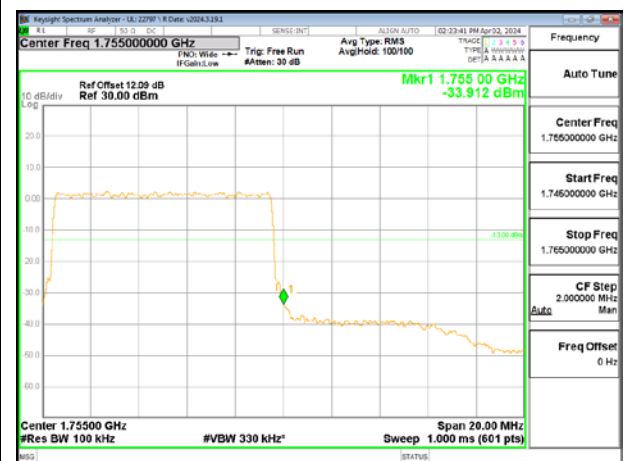
LTE4 10MHz 64QAM LOW Ch RB50-0



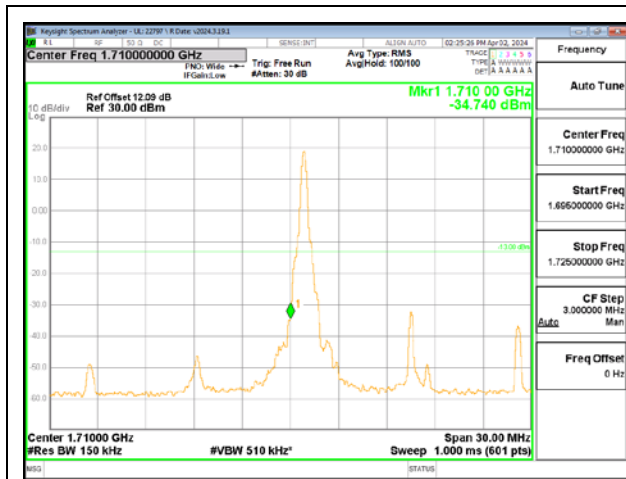
LTE4 10MHz 64QAM HIGH Ch RB1-0



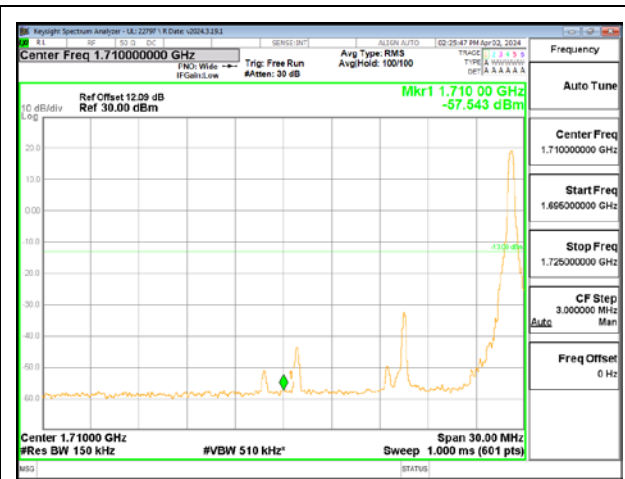
LTE4 10MHz 64QAM HIGH Ch RB1-49



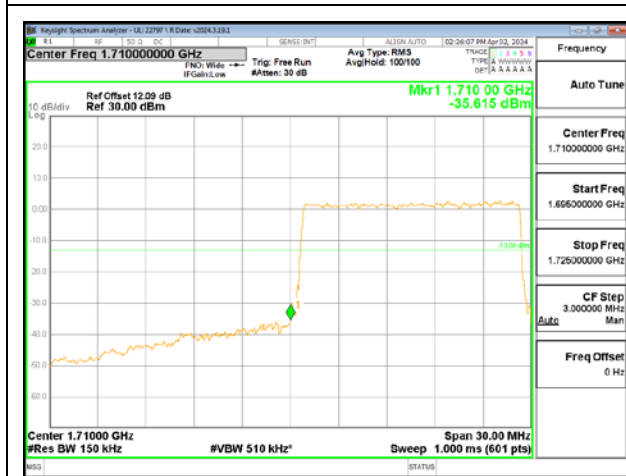
LTE4 10MHz 64QAM HIGH Ch RB50-0



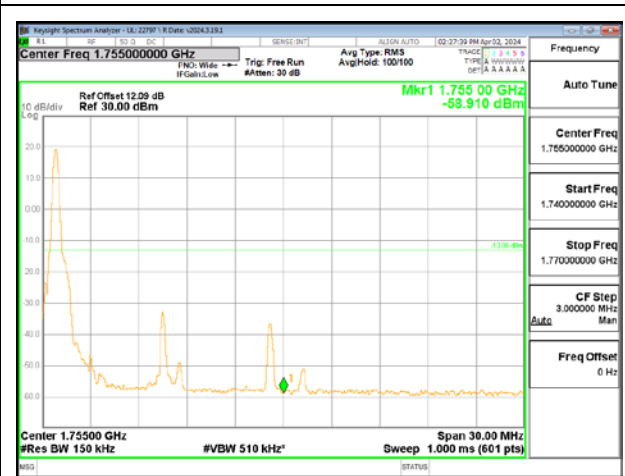
LTE4 15MHz 64QAM LOW Ch RB1-0



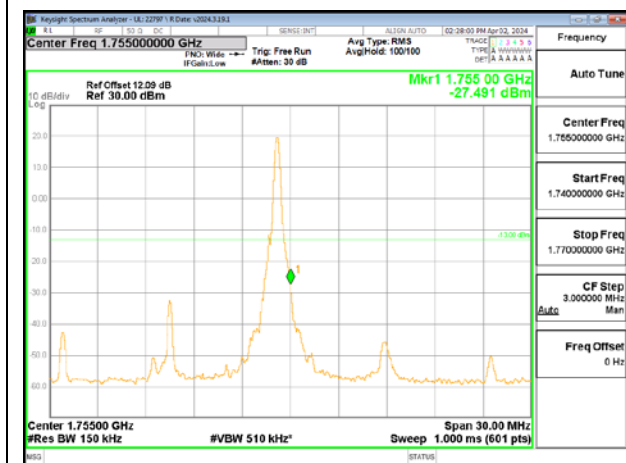
LTE4 15MHz 64QAM LOW Ch RB1-74



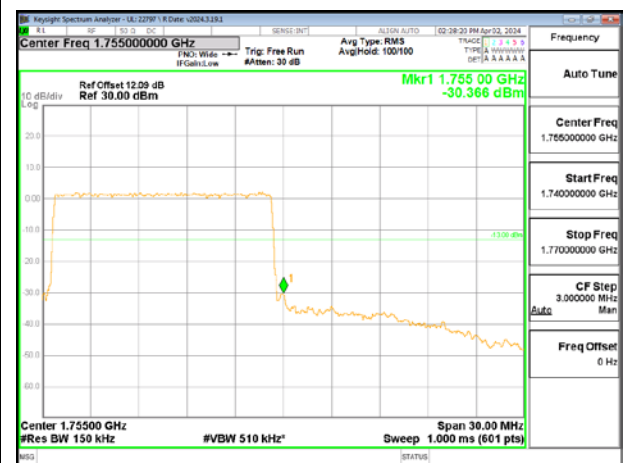
LTE4 15MHz 64QAM LOW Ch RB75-0



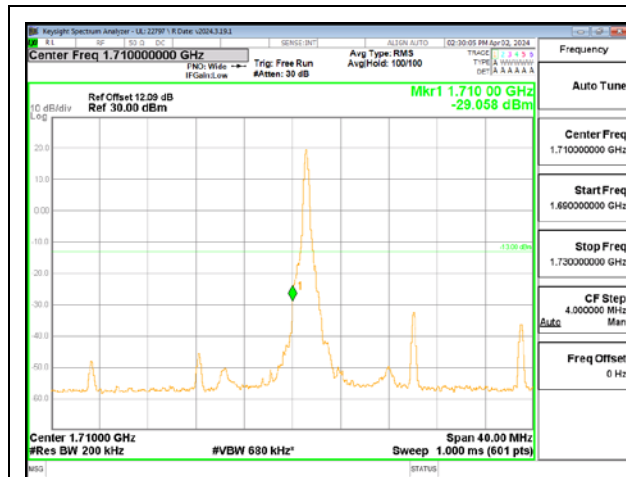
LTE4 15MHz 64QAM HIGH Ch RB1-0



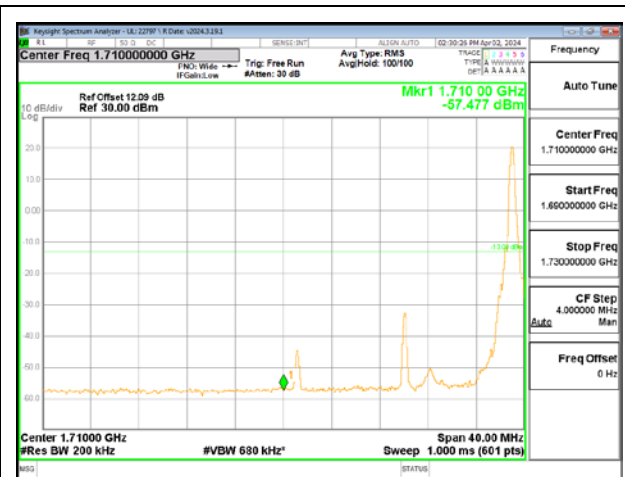
LTE4 15MHz 64QAM HIGH Ch RB1-74



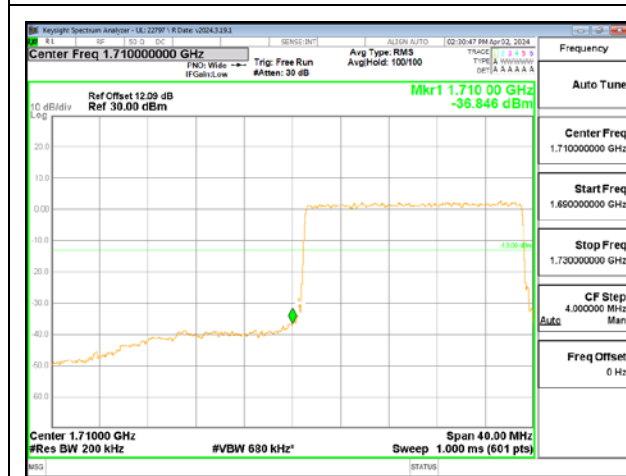
LTE4 15MHz 64QAM HIGH Ch RB75-0



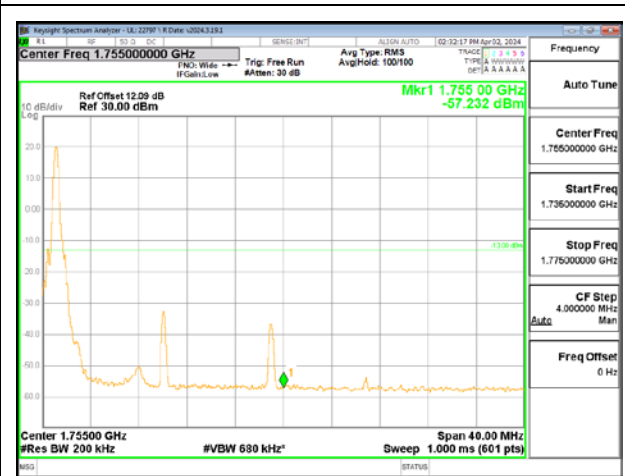
LTE4 20MHz 64QAM LOW Ch RB1-0



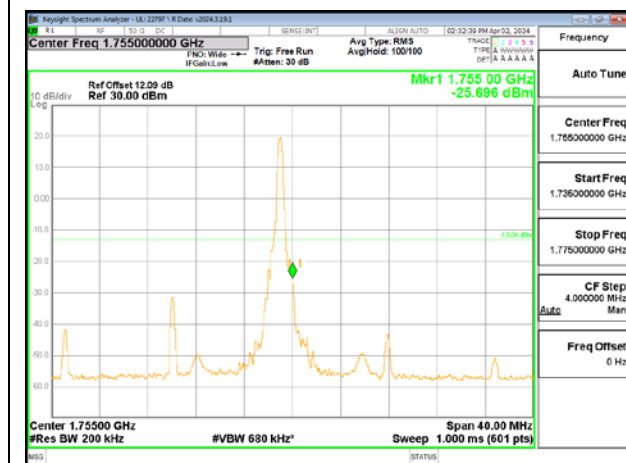
LTE4 20MHz 64QAM LOW Ch RB1-99



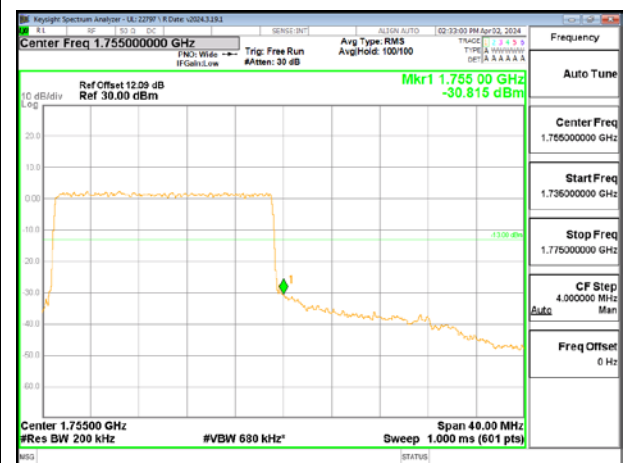
LTE4 20MHz 64QAM LOW Ch RB100-0



LTE4 20MHz 64QAM HIGH Ch RB1-0



LTE4 20MHz 64QAM HIGH Ch RB1-99



LTE4 20MHz 64QAM HIGH Ch RB100-0

9.4. PEAK TO AVERAGE RATIO

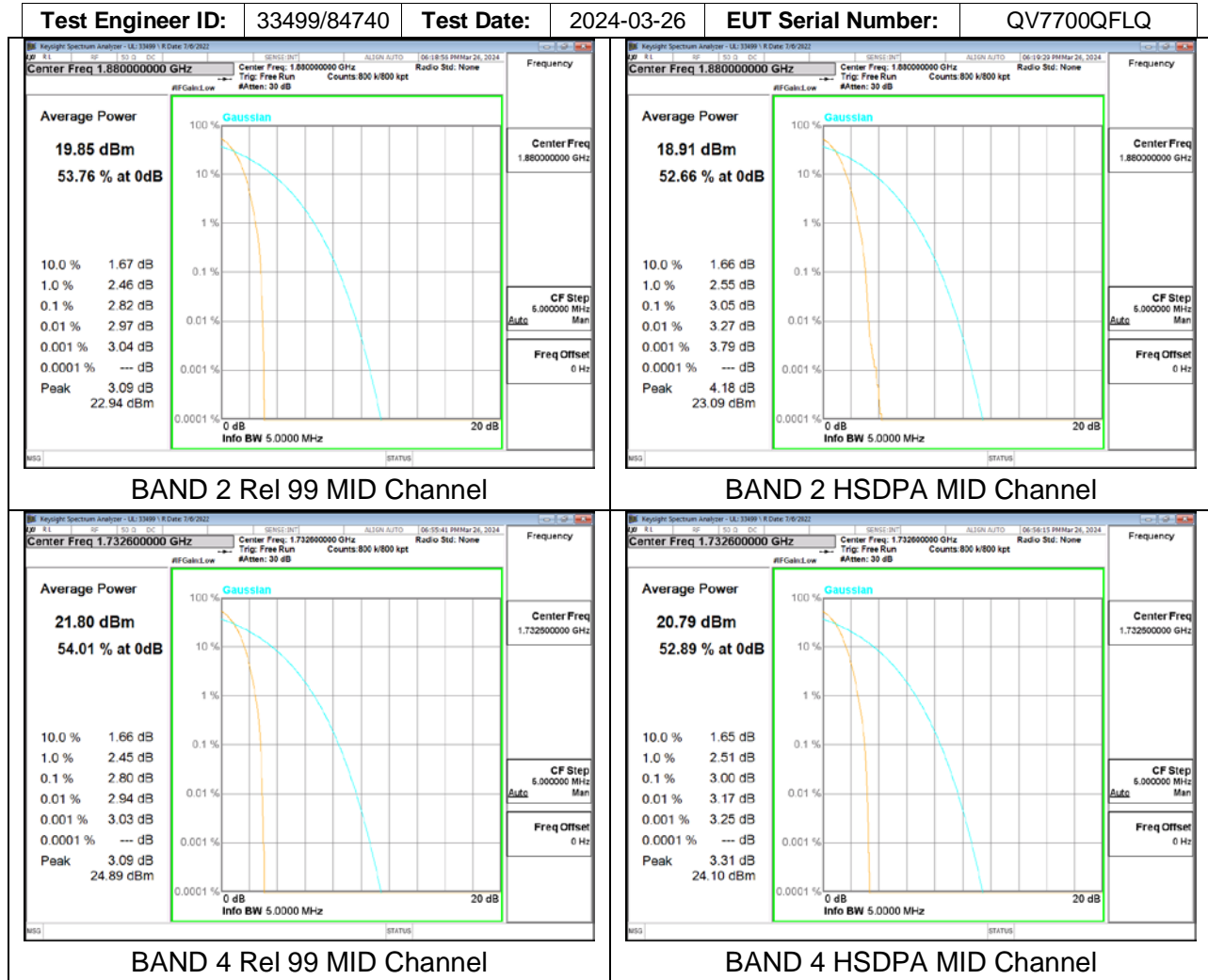
LIMIT

FCC: 27.50(d)(5)

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB

RESULTS

9.4.1. WCDMA



9.4.2. LTE4

Test Engineer ID:	104412/21193 33499/84740	Test Date:	03-25-24 04-03-24	Sample SN:	QV7700QFLQ
--------------------------	-----------------------------	-------------------	----------------------	-------------------	------------

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
LTE Band 4	1.4MHz	1745.0	6	0	QPSK	24.94	20.38	4.56
					64QAM	26.93	20.44	6.49
	3MHz		15	0	QPSK	25.25	20.44	4.81
					64QAM	27.39	20.47	6.92
	5MHz		25	0	QPSK	25.23	20.40	4.83
					64QAM	27.79	20.37	7.42
	10MHz		50	0	QPSK	25.40	20.32	5.08
					64QAM	27.62	20.46	7.16
	15MHz		75	0	QPSK	25.46	20.34	5.12
					64QAM	27.75	20.33	7.42
	20MHz		100	0	QPSK	25.42	20.35	5.07
					64QAM	27.78	20.42	7.36
Duty Cycle Correction Factor (dB) =			0.00					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

9.5. FREQUENCY STABILITY

LIMITS – BAND 2

FCC: §24.235

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

LIMITS – BAND 4

FCC: §27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

(v) Temp. = -30°C to $+50^{\circ}\text{C}$

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

Normal, 3.89VDC

End Voltage, 3.69VDC.

The radio was set to Max Bandwidth, and the lowest order modulation for testing. (Rel.99 and QPSK for 3G and 4G respectively). Frequency error was read directly off of the CMW 500.

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 $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

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

RESULTS

9.5.1. WCDMA BAND 2

Test Engineer ID:	33499/84740 85502 22797/85502	Test Date:	2024-03-26 2024-03-27 2024-04-04	EUT Serial Number:	QV7700QFLQ
--------------------------	-------------------------------------	-------------------	--	---------------------------	------------

Band		2		Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1850	1910	2.5	Within Authorized Frequency Block (Hz)			
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)					
Normal (20°C)	Normal	1850.1110	1909.8780					
Extreme (50°C)		1850.1110	1909.8780	-6.11	-0.003	Yes		
Extreme (40°C)		1850.1110	1909.8780	9.26	0.005	Yes		
Extreme (30°C)		1850.1110	1909.8780	8.56	0.005	Yes		
Extreme (10°C)		1850.1110	1909.8780	7.05	0.004	Yes		
Extreme (0°C)		1850.1110	1909.8780	11.38	0.006	Yes		
Extreme (-10°C)		1850.1110	1909.8780	14.06	0.007	Yes		
Extreme (-20°C)		1850.1110	1909.8780	15.38	0.008	Yes		
Extreme (-30°C)		1850.1110	1909.8780	12.95	0.007	Yes		
20°C		End Point Voltage	1850.1110	1909.8780	5.62	0.003	Yes	

9.5.2. WCDMA BAND 4

Test Engineer ID:	33499/84740 85502 22797/85502	Test Date:	2024-03-26 2024-03-27 2024-04-04	EUT Serial Number:	QV7700QFLQ
--------------------------	-------------------------------------	-------------------	--	---------------------------	------------

Band		4		Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1710	1755	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage							
Normal (20°C)	Normal	1710.1200	1754.8930					
Extreme (50°C)		1710.1200	1754.8930	18.86	0.011	Yes		
Extreme (40°C)		1710.1200	1754.8930	-19.44	-0.011	Yes		
Extreme (30°C)		1710.1200	1754.8930	-15.7	-0.009	Yes		
Extreme (10°C)		1710.1200	1754.8930	6.31	0.004	Yes		
Extreme (0°C)		1710.1200	1754.8930	19.53	0.011	Yes		
Extreme (-10°C)		1710.1200	1754.8930	27.59	0.016	Yes		
Extreme (-20°C)		1710.1200	1754.8930	30.13	0.017	Yes		
Extreme (-30°C)		1710.1200	1754.8930	25.4	0.015	Yes		
20°C		End Point Voltage	1710.1200	1754.8930	6.35	0.004	Yes	

9.5.3. LTE2

Test Engineer ID:	33499/84740 85502 22797/85502	Test Date:	2024-03-26 2024-03-27 2024-04-04	EUT Serial Number:	QV7700QFLQ
--------------------------	-------------------------------------	-------------------	--	---------------------------	------------

Main 2 Antenna

Band	2	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1850	1910		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	1850.8850	1909.1600			
Extreme (50°C)		1850.8850	1909.1600	-3.9	-0.002	Yes
Extreme (40°C)		1850.8850	1909.1600	-7.2	-0.004	Yes
Extreme (30°C)		1850.8850	1909.1600	-5	-0.003	Yes
Extreme (10°C)		1850.8850	1909.1600	-7.2	-0.004	Yes
Extreme (0°C)		1850.8850	1909.1600	-4.5	-0.002	Yes
Extreme (-10°C)		1850.8850	1909.1600	-6.4	-0.003	Yes
Extreme (-20°C)		1850.8850	1909.1600	-6.9	-0.004	Yes
Extreme (-30°C)		1850.8850	1909.1600	3.8	0.002	Yes
20°C		End Point Voltage	1850.8850	1909.1600	-4.73	-0.003

Sub Antenna

Band	2	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1850	1910		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	1850.8850	1909.1350			
Extreme (50°C)		1850.8850	1909.1350	-4.36	-0.002	Yes
Extreme (40°C)		1850.8850	1909.1350	-4.4	-0.002	Yes
Extreme (30°C)		1850.8850	1909.1350	-3.92	-0.002	Yes
Extreme (10°C)		1850.8850	1909.1350	-5.32	-0.003	Yes
Extreme (0°C)		1850.8850	1909.1350	-5.49	-0.003	Yes
Extreme (-10°C)		1850.8850	1909.1350	-3.78	-0.002	Yes
Extreme (-20°C)		1850.8850	1909.1350	-5.43	-0.003	Yes
Extreme (-30°C)		1850.8850	1909.1350	-6.69	-0.004	Yes
20°C		End Point Voltage	1850.8850	1909.1350	-7.29	-0.004

9.5.4. LTE4

Test Engineer ID:	33499/84740	Test Date:	2024-04-03	EUT Serial Number:	QV7700QFLQ
--------------------------	-------------	-------------------	------------	---------------------------	------------

Band		4		Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1710	1755	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage							
Normal (20°C)	Normal	1710.87700000	1754.19900000					
Extreme (50°C)		1710.87699522	1754.19899522	-4.78	-0.003	Yes		
Extreme (40°C)		1710.87699314	1754.19899314	-6.86	-0.004	Yes		
Extreme (30°C)		1710.87699406	1754.19899406	-5.94	-0.003	Yes		
Extreme (10°C)		1710.87699493	1754.19899493	-5.07	-0.003	Yes		
Extreme (0°C)		1710.87699266	1754.19899266	-7.34	-0.004	Yes		
Extreme (-10°C)		1710.87699486	1754.19899486	-5.14	-0.003	Yes		
Extreme (-20°C)		1710.87699480	1754.19899480	-5.2	-0.003	Yes		
Extreme (-30°C)		1710.87699502	1754.19899502	-4.98	-0.003	Yes		
20°C		End Point Voltage	1710.87699534	1754.19899534	-4.66	-0.003	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.

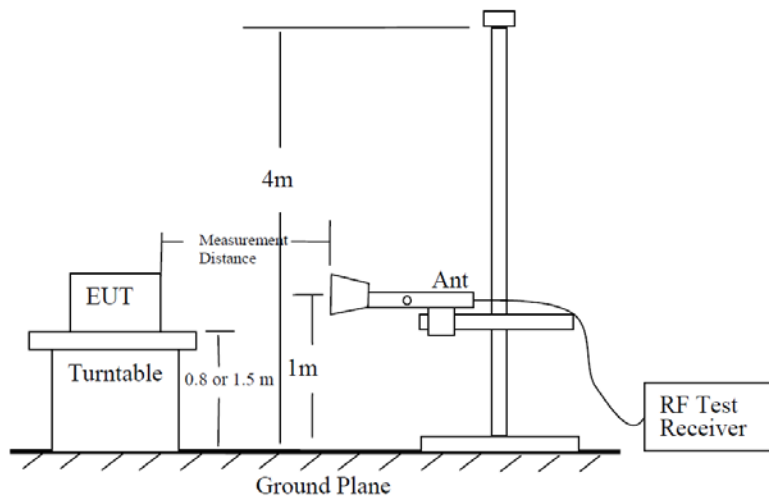


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

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

LIMITS - BAND 2

FCC: §24.238

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts

LIMITS – BAND 4

FCC: §27.53 (m),

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r02

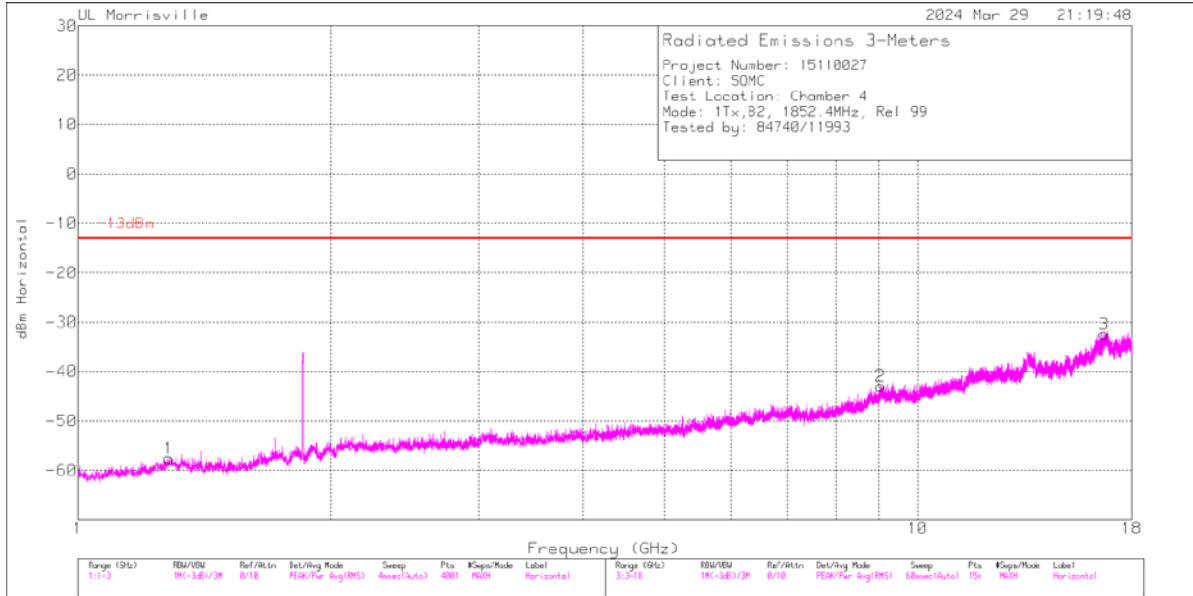
All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz

RESULTS

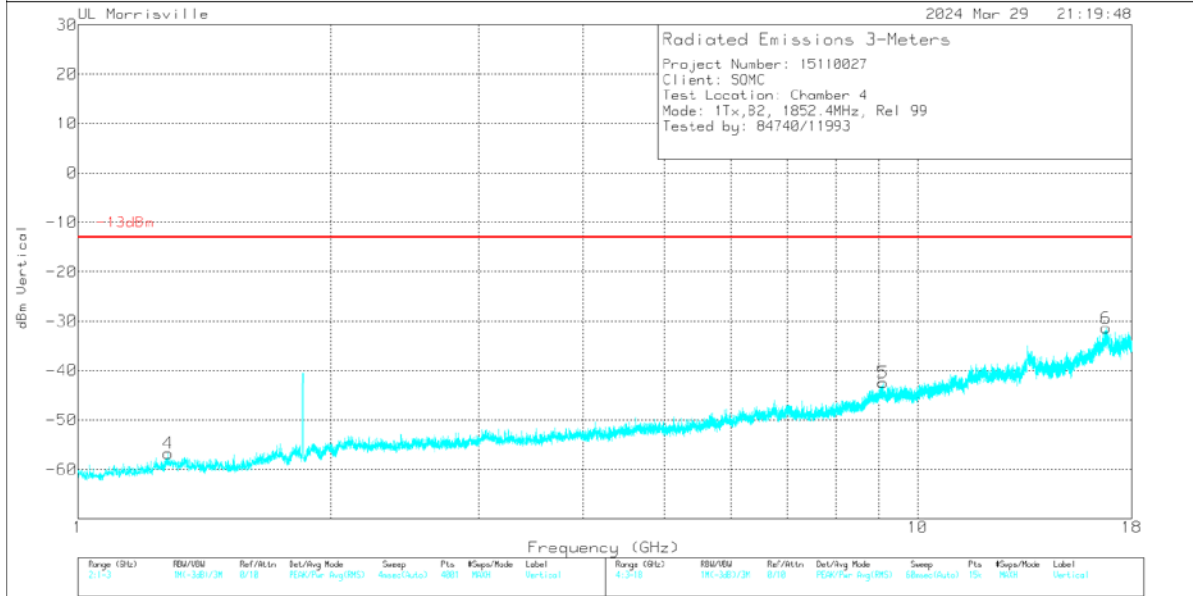
WWAN Band Tested	S/N of EUT
WCDMA2, WCDMA4, LTE2(Main 2), LTE4	QV7700GJLQ
LTE2 (Sub Antenna)	QV770051L2

10.1.1. WCDMA2

REL 99 Low Channel



Rev 9.5 18 Oct 2021

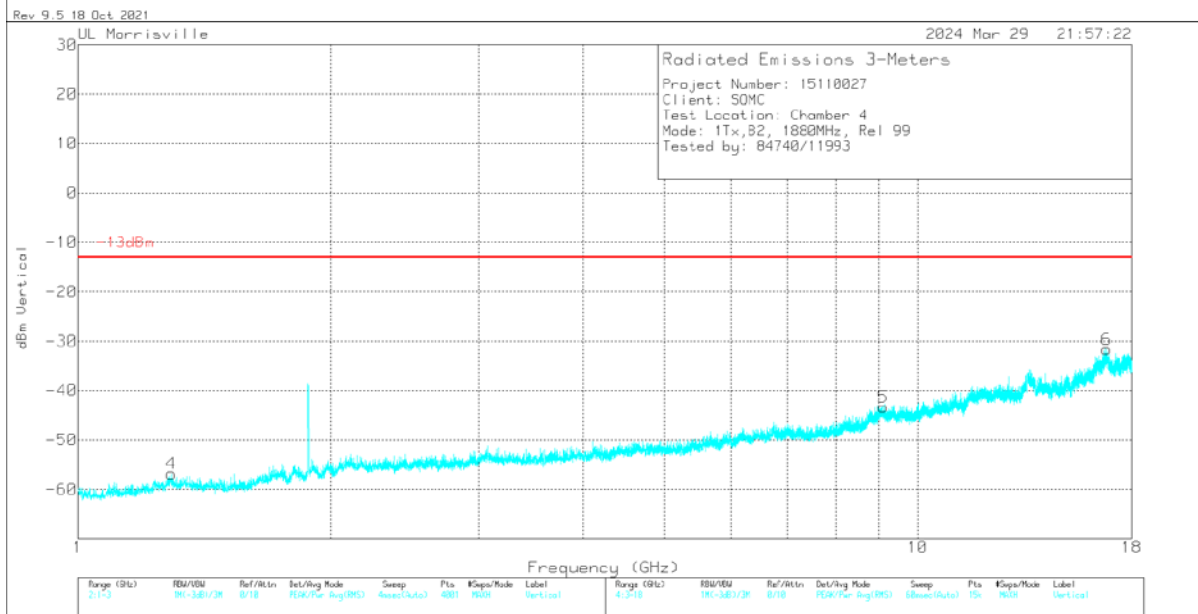
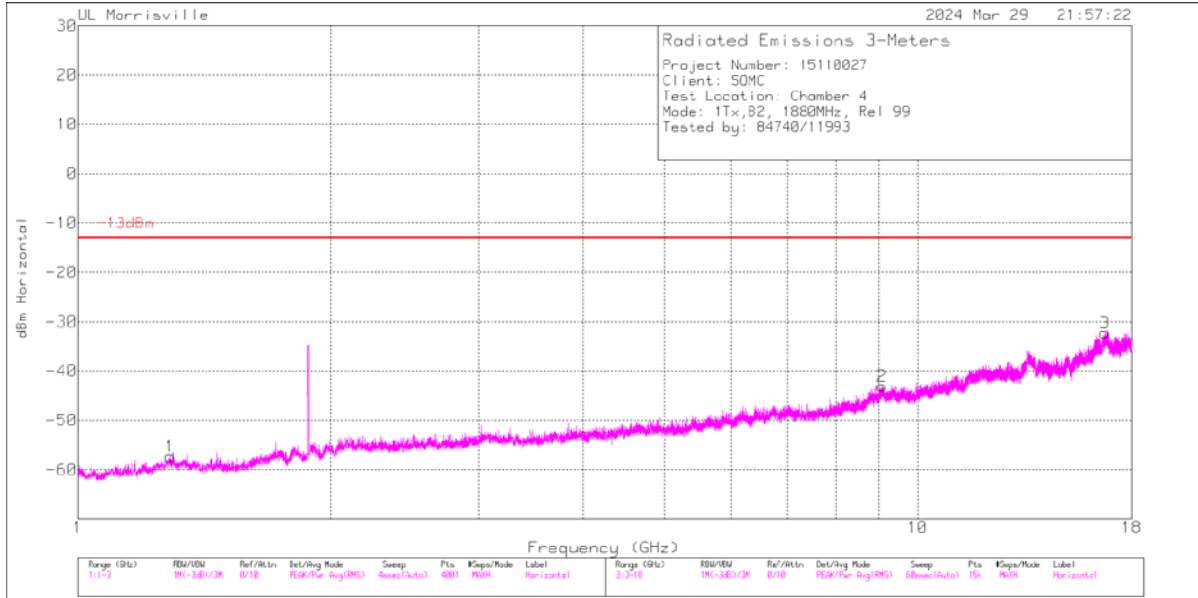


Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	1.281	-62.33	Pk	29.2	-35.9	11.8	.5	-56.73	-13	-43.73	0-360	200	V
1	1.2815	-63.13	Pk	29.2	-35.9	11.8	.5	-57.53	-13	-44.53	0-360	100	H
2	9.037	-66.36	Pk	36.2	-24.6	11.8	0	-42.96	-13	-29.96	0-360	100	H
5	9.094	-65.81	Pk	36.3	-24.7	11.8	0	-42.41	-13	-29.41	0-360	300	V
3	16.677	-65.67	Pk	41.8	-20.3	11.8	0	-32.37	-13	-19.37	0-360	100	H
6	16.779	-64.86	Pk	41.9	-20.3	11.8	0	-31.46	-13	-18.46	0-360	200	V

Pk - Peak detector

REL 99 Mid Channel

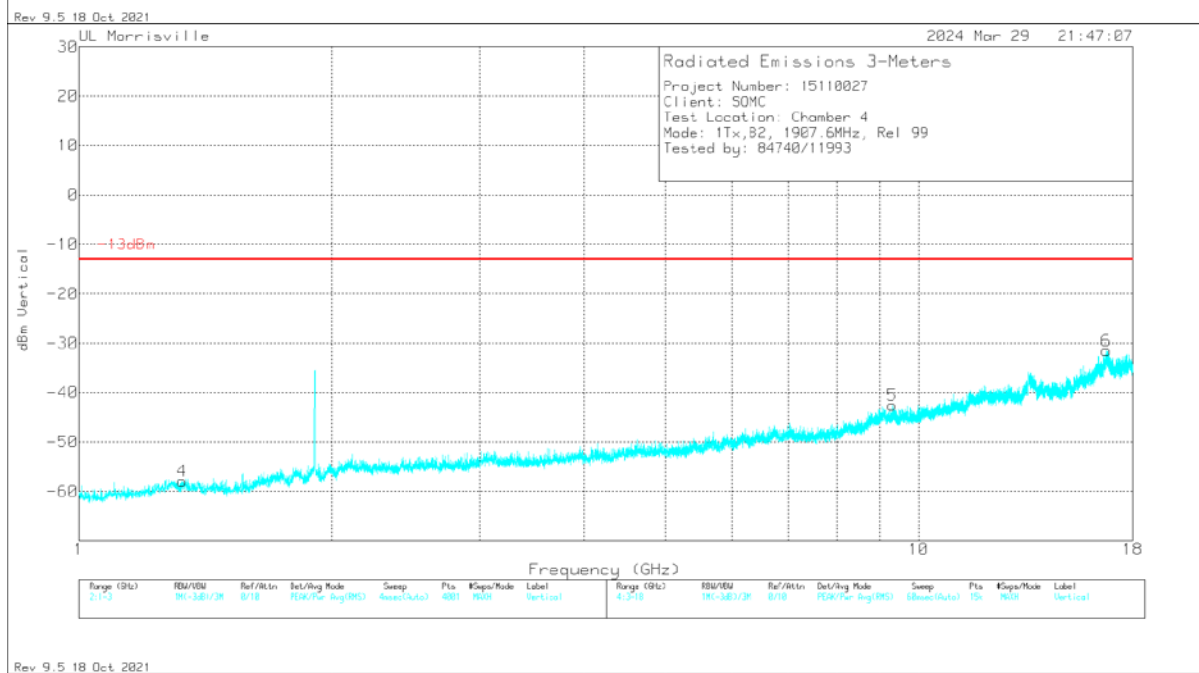
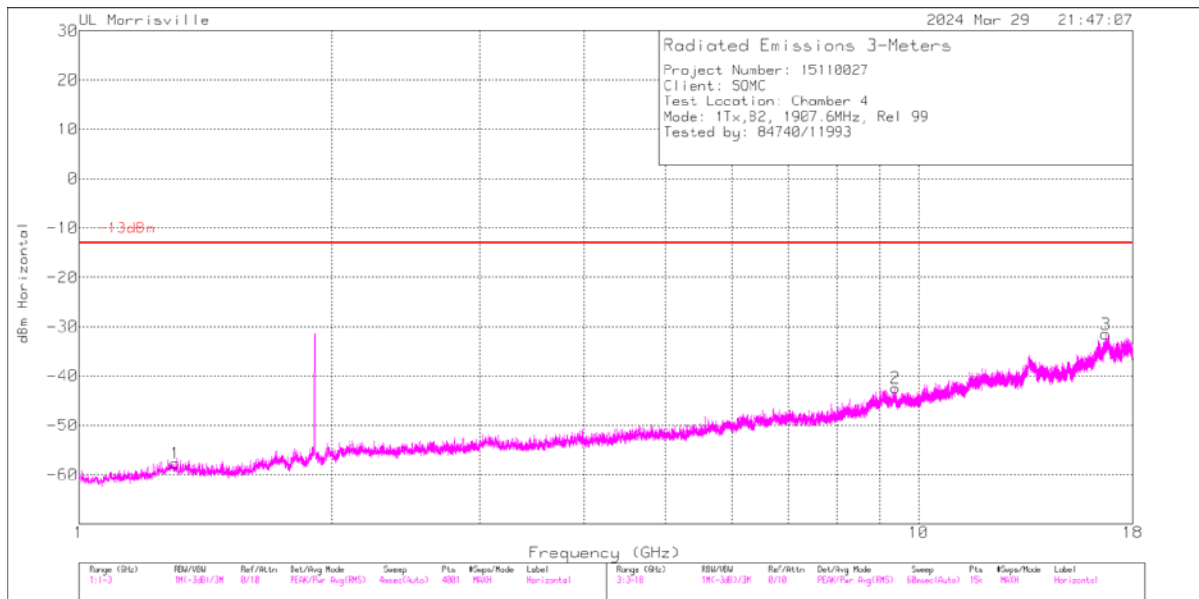


Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.287	-62.74	Pk	29.2	-36	11.8	.5	-57.24	-13	-44.24	0-360	100	H
4	1.2915	-62.45	Pk	29.2	-35.9	11.8	.5	-56.85	-13	-43.85	0-360	300	V
2	9.069	-66.51	Pk	36.2	-24.6	11.8	0	-43.11	-13	-30.11	0-360	100	H
5	9.097	-66.6	Pk	36.3	-24.8	11.8	0	-43.3	-13	-30.3	0-360	200	V
3	16.728	-66.04	Pk	41.9	-19.9	11.8	0	-32.24	-13	-19.24	0-360	100	H
6	16.807	-65.35	Pk	41.9	-20	11.8	0	-31.65	-13	-18.65	0-360	300	V

Pk - Peak detector

REL 99 High Channel

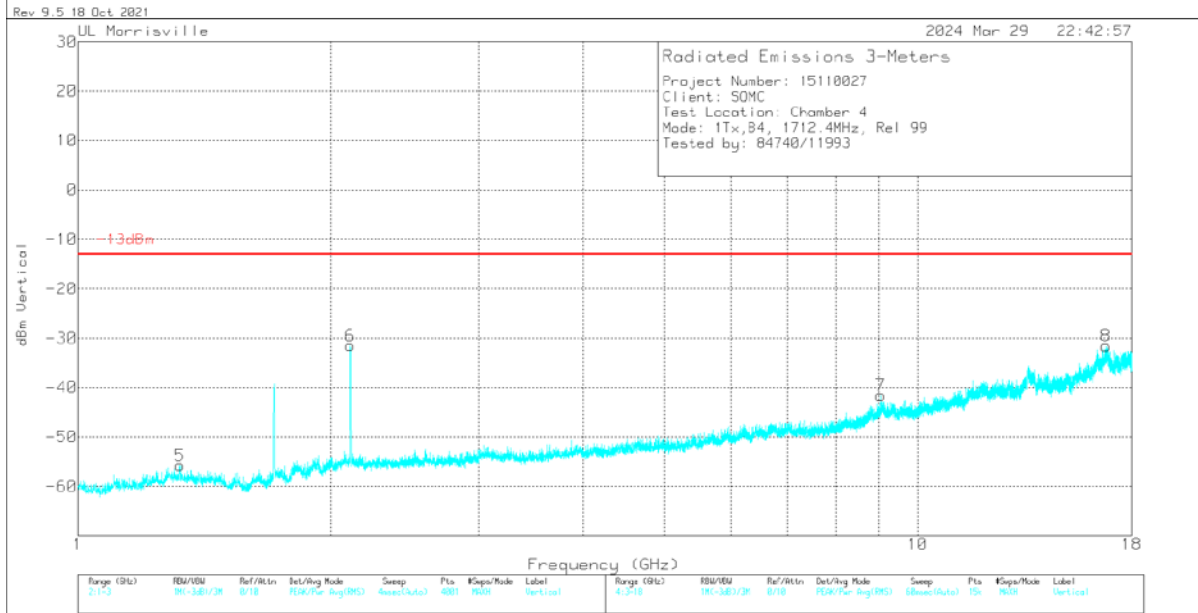
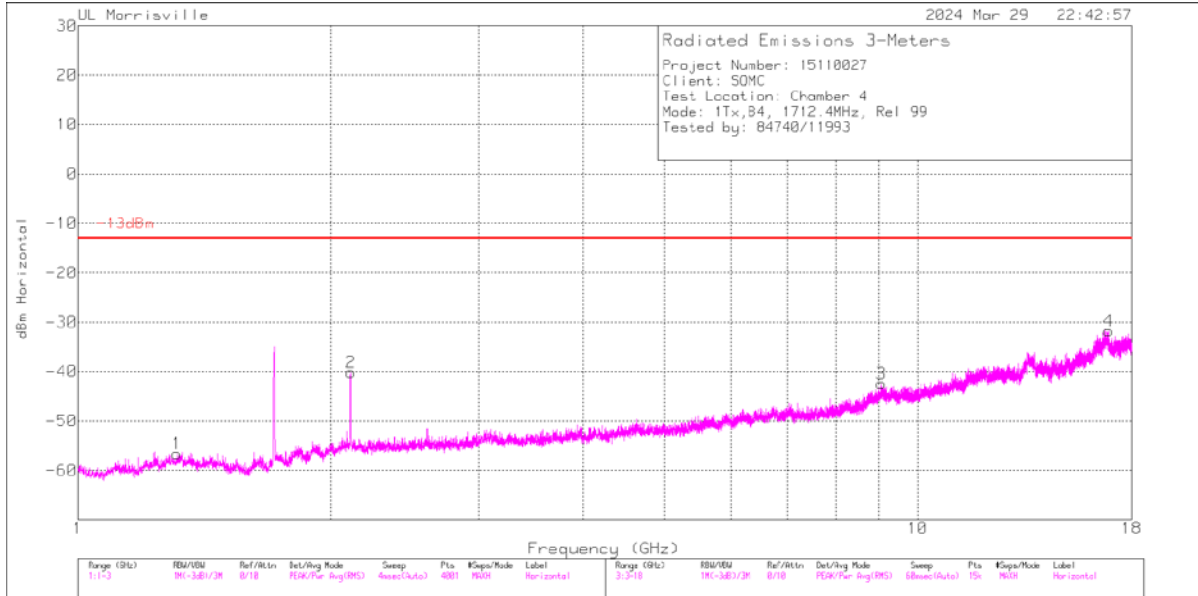


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.3025	-63.23	Pk	29.2	-36	11.8	.5	-57.73	-13	-44.73	0-360	100	H
4	1.327	-63.18	Pk	29	-36.1	11.8	.5	-57.98	-13	-44.98	0-360	200	V
5	9.303	-65.71	Pk	36.4	-25.1	11.8	0	-42.61	-13	-29.61	0-360	300	V
2	9.38	-65.94	Pk	36.6	-24.9	11.8	0	-42.44	-13	-29.44	0-360	200	H
3	16.723	-65.98	Pk	41.8	-19.2	11.8	0	-31.58	-13	-18.58	0-360	200	H
6	16.751	-66.06	Pk	41.9	-19.2	11.8	0	-31.56	-13	-18.56	0-360	300	V

Pk - Peak detector

10.1.2. WCDMA4

REL 99 Low Channel

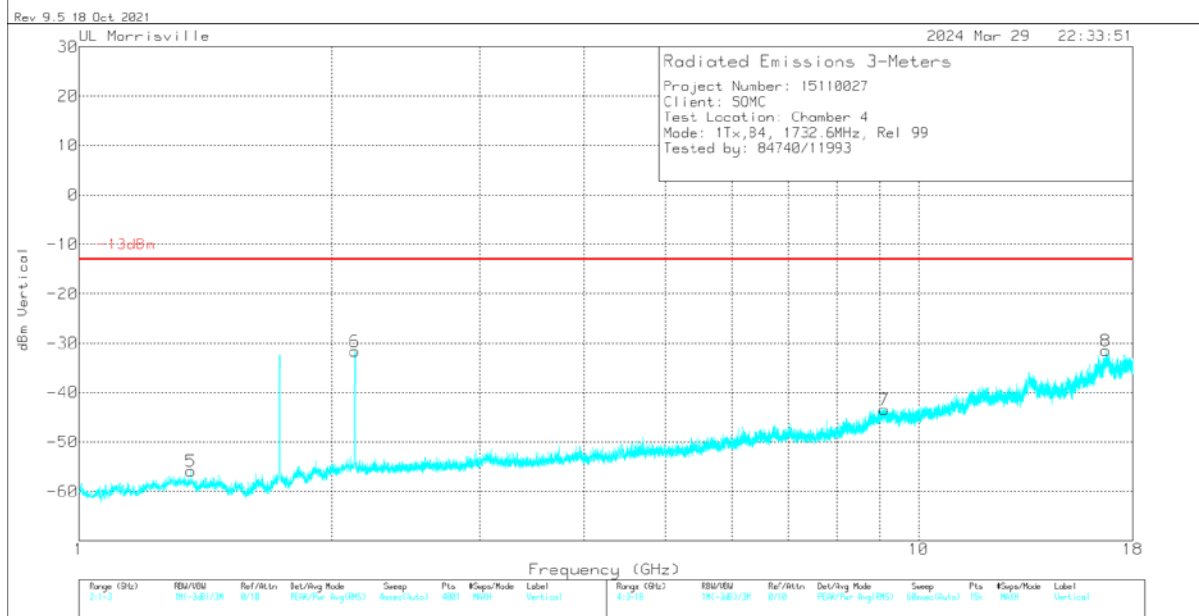
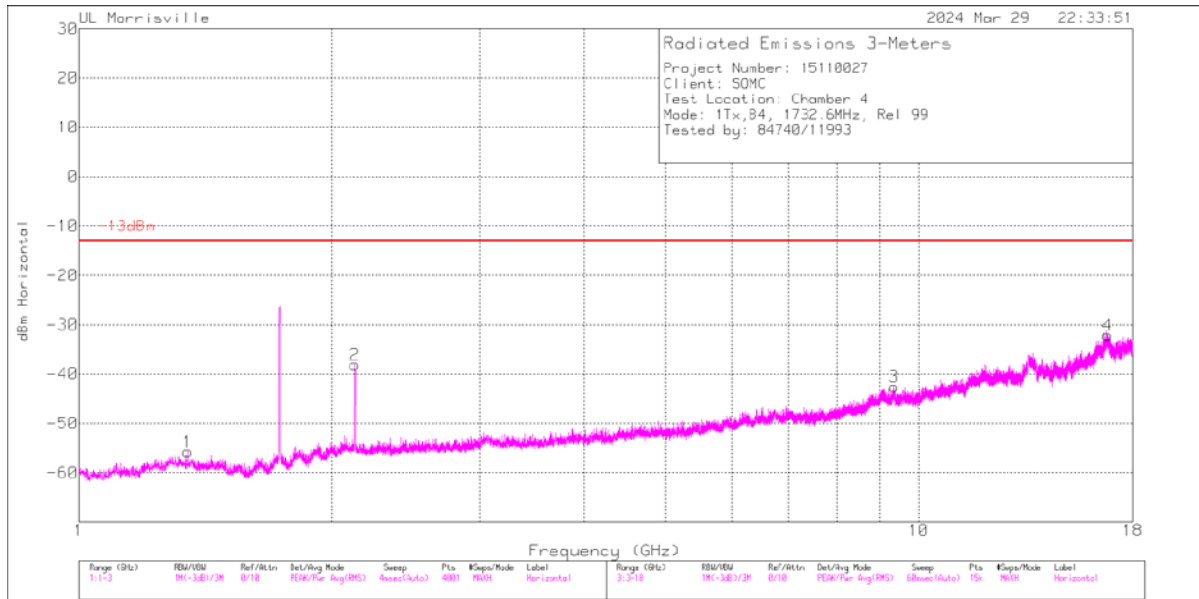


Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.312	-62.7	Pk	29.1	-35.9	11.8	1.1	-56.6	-13	-43.6	0-360	100	H
5	1.323	-61.76	Pk	29	-36	11.8	1.2	-55.76	-13	-42.76	0-360	300	V
6	2.1115	-40.16	Pk	31.6	-36.2	11.8	1.4	-31.56	-13	-18.56	0-360	300	V
2	2.113	-48.75	Pk	31.6	-36.2	11.8	1.4	-40.15	-13	-27.15	0-360	200	H
7	9.039	-64.92	Pk	36.2	-24.6	11.8	0	-41.52	-13	-28.52	0-360	200	V
3	9.056	-65.91	Pk	36.2	-24.5	11.8	0	-42.41	-13	-29.41	0-360	100	H
8	16.782	-65.29	Pk	41.9	-20	11.8	0	-31.59	-13	-18.59	0-360	300	V
4	16.888	-65.74	Pk	41.8	-19.6	11.8	0	-31.74	-13	-18.74	0-360	200	H

Pk - Peak detector

REL 99 Mid Channel

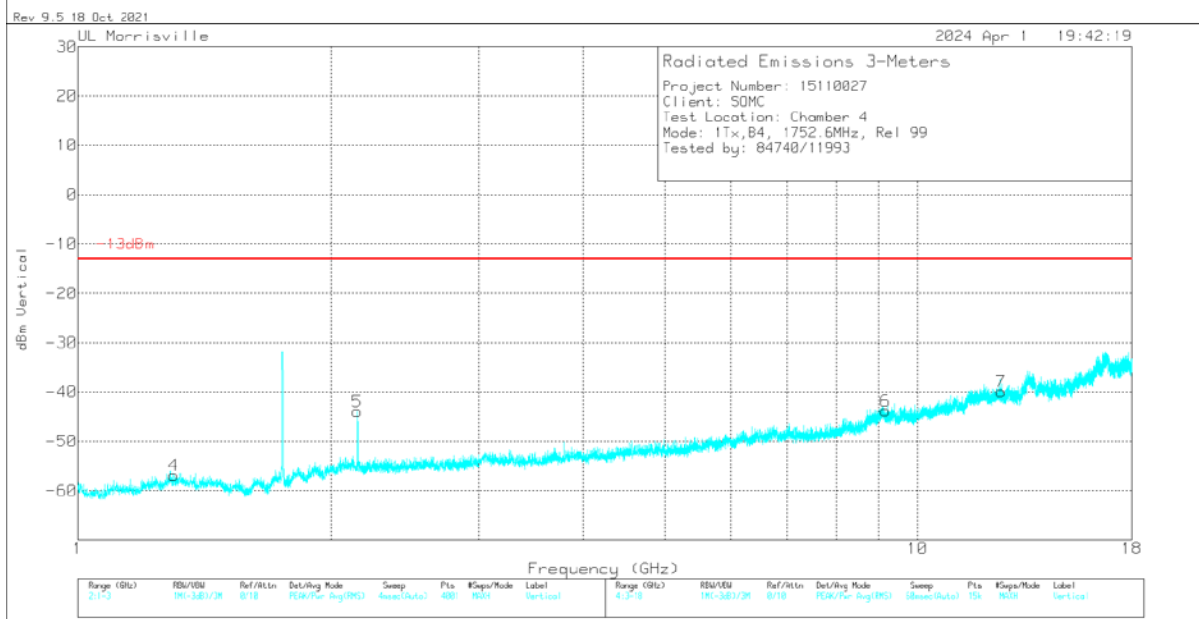
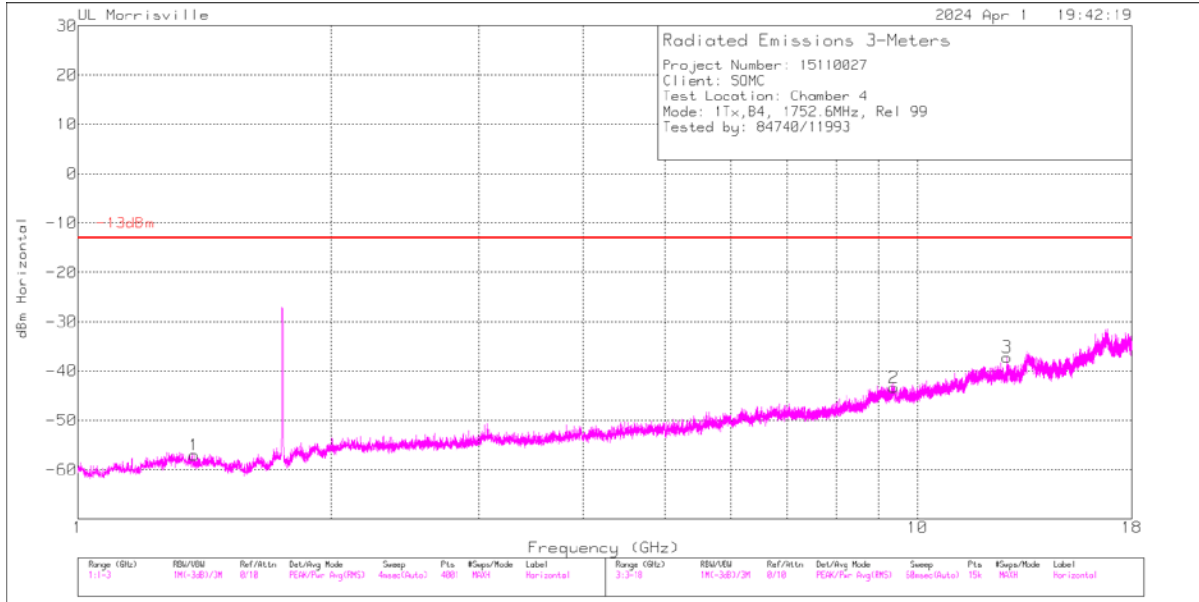


Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.348	-61.63	Pk	28.9	-36.1	11.8	1.3	-55.73	-13	-42.73	0-360	100	H
5	1.36	-61.65	Pk	28.7	-36.2	11.8	1.4	-55.95	-13	-42.95	0-360	300	V
2	2.1335	-46.67	Pk	31.6	-36.2	11.8	1.3	-38.17	-13	-25.17	0-360	100	H
6	2.13375	-40.25	Pk	31.6	-36.1	11.8	1.3	-31.65	-13	-18.65	0-360	300	V
7	9.097	-66.76	Pk	36.3	-24.8	11.8	0	-43.46	-13	-30.46	0-360	200	V
3	9.363	-66.16	Pk	36.5	-24.7	11.8	0	-42.56	-13	-29.56	0-360	200	H
8	16.722	-66.09	Pk	41.8	-19	11.8	0	-31.49	-13	-18.49	0-360	300	V
4	16.805	-66.4	Pk	41.9	-19.5	11.8	0	-32.2	-13	-19.2	0-360	100	H

Pk - Peak detector

REL 99 High Channel



Rev 9.5 18 Oct 2021

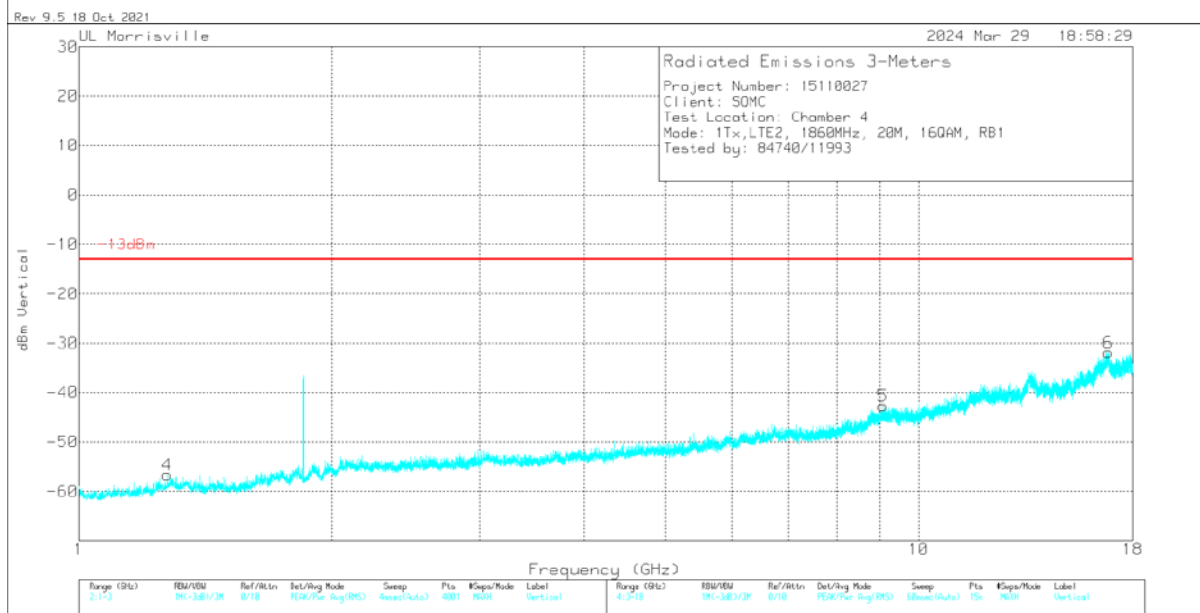
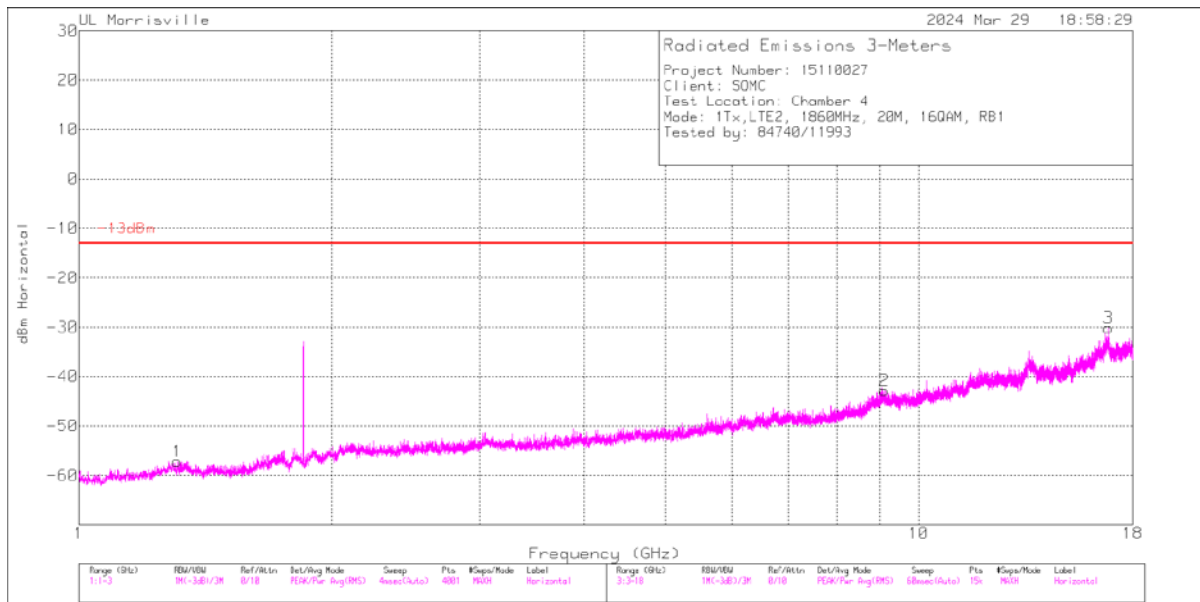
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	1.3	-63.06	Pk	29.2	-35.9	11.8	1.1	-56.86	-13	-43.86	0-360	200	V
1	1.3765	-62.6	Pk	28.4	-36.1	11.8	1.4	-57.1	-13	-44.1	0-360	200	H
5	2.1515	-52.42	Pk	31.6	-36.2	11.8	1.2	-44.02	-13	-31.02	0-360	200	V
6	9.169	-66.47	Pk	36.3	-25.5	11.8	0	-43.87	-13	-30.87	0-360	100	V
2	9.379	-66.71	Pk	36.6	-25	11.8	0	-43.31	-13	-30.31	0-360	300	H
7	12.581	-67.49	Pk	39.1	-23.3	11.8	0	-39.89	-13	-26.89	0-360	100	V
3	12.782	-65.38	Pk	39.2	-22.8	11.8	0	-37.18	-13	-24.18	0-360	300	H

Pk - Peak detector

10.1.3. LTE BAND 2

Main Antenna

16QAM LTE2 (20MHz, Low Channel)

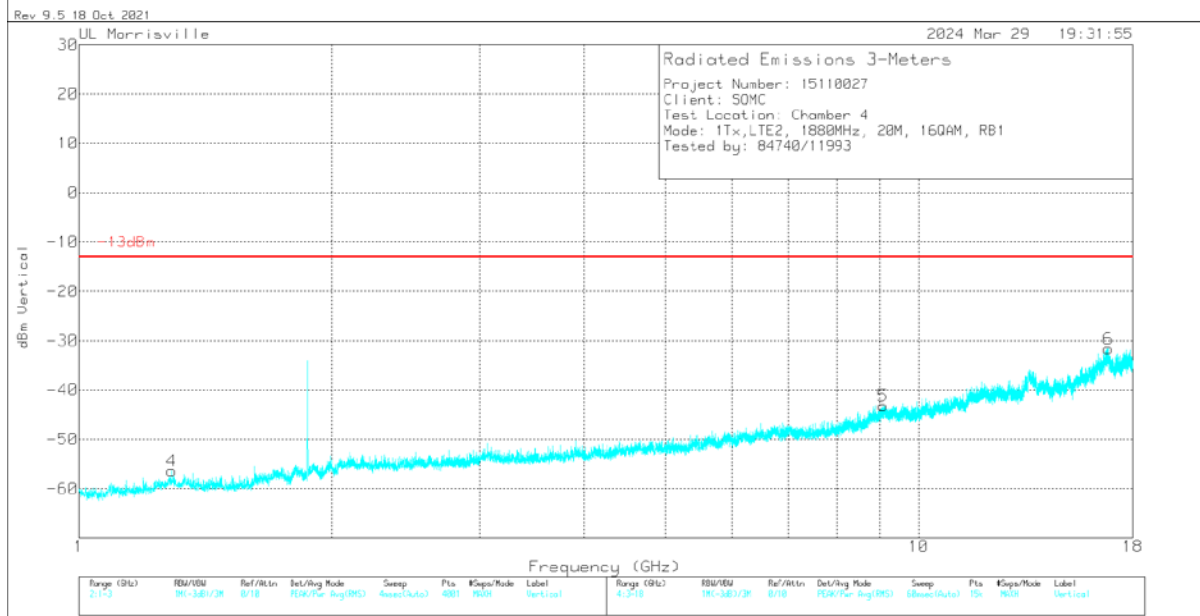
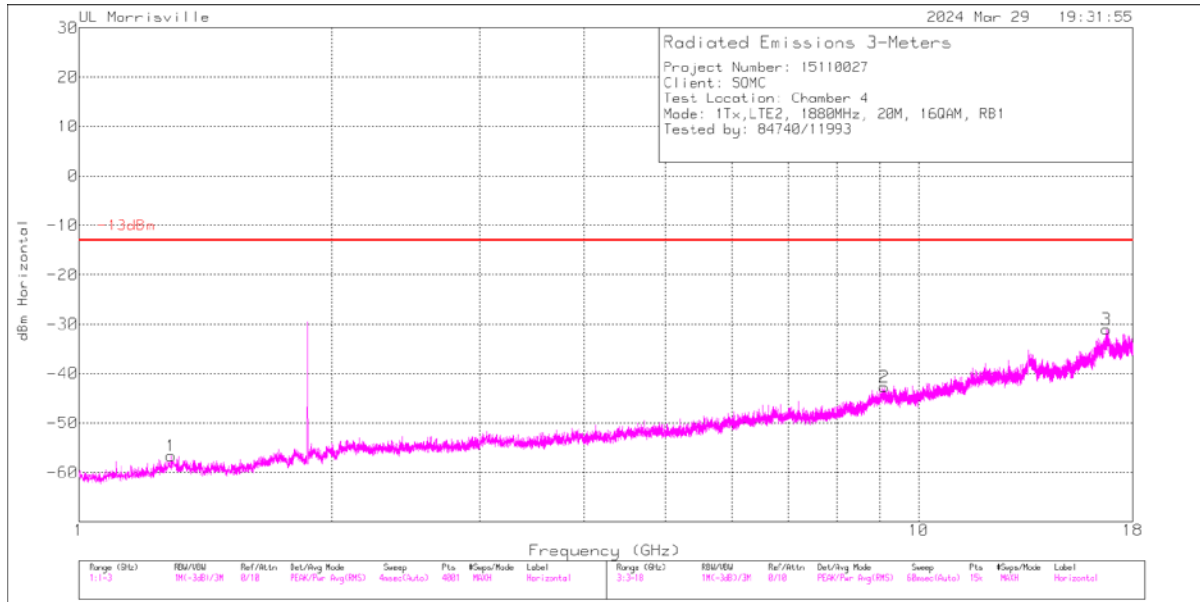


Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	1.2735	-62.12	Pk	29.1	-35.9	11.8	.5	-56.62	-13	-43.62	0-360	100	V
1	1.3085	-62.68	Pk	29.1	-35.9	11.8	.5	-57.18	-13	-44.18	0-360	300	H
5	9.068	-65.99	Pk	36.2	-24.7	11.8	0	-42.69	-13	-29.69	0-360	200	V
2	9.096	-66.14	Pk	36.3	-24.8	11.8	0	-42.84	-13	-29.84	0-360	300	H
6	16.822	-66.86	Pk	41.9	-18.7	11.8	0	-31.86	-13	-18.86	0-360	100	V
3	16.825	-64.68	Pk	41.9	-19.1	11.8	0	-30.08	-13	-17.08	0-360	300	H

Pk - Peak detector

16QAM LTE2 (20MHz, Mid Channel)

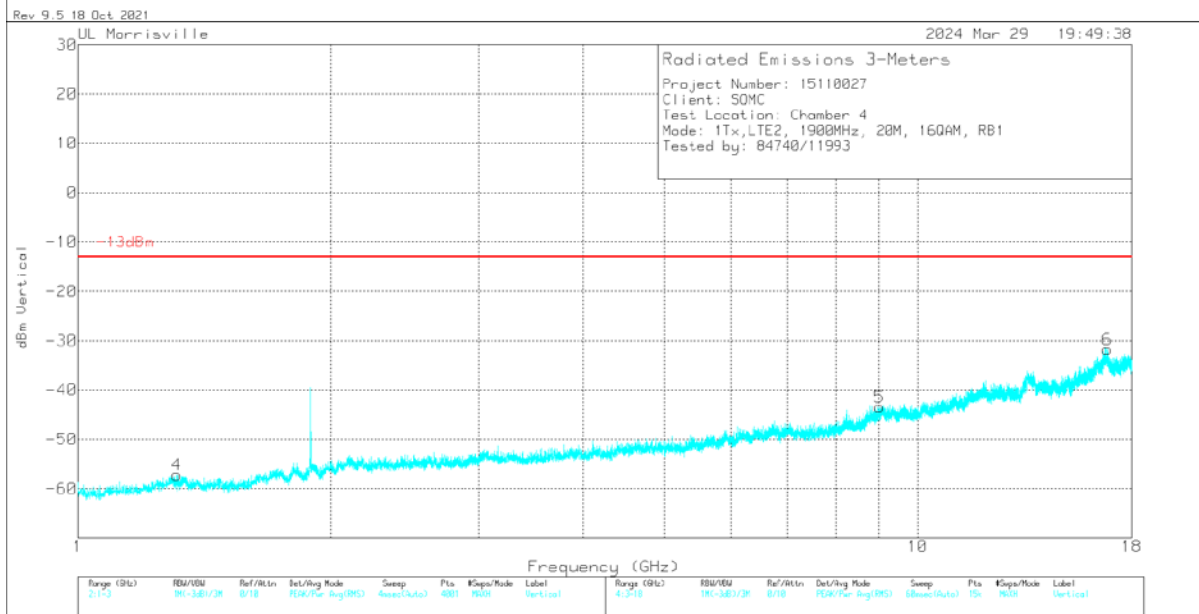
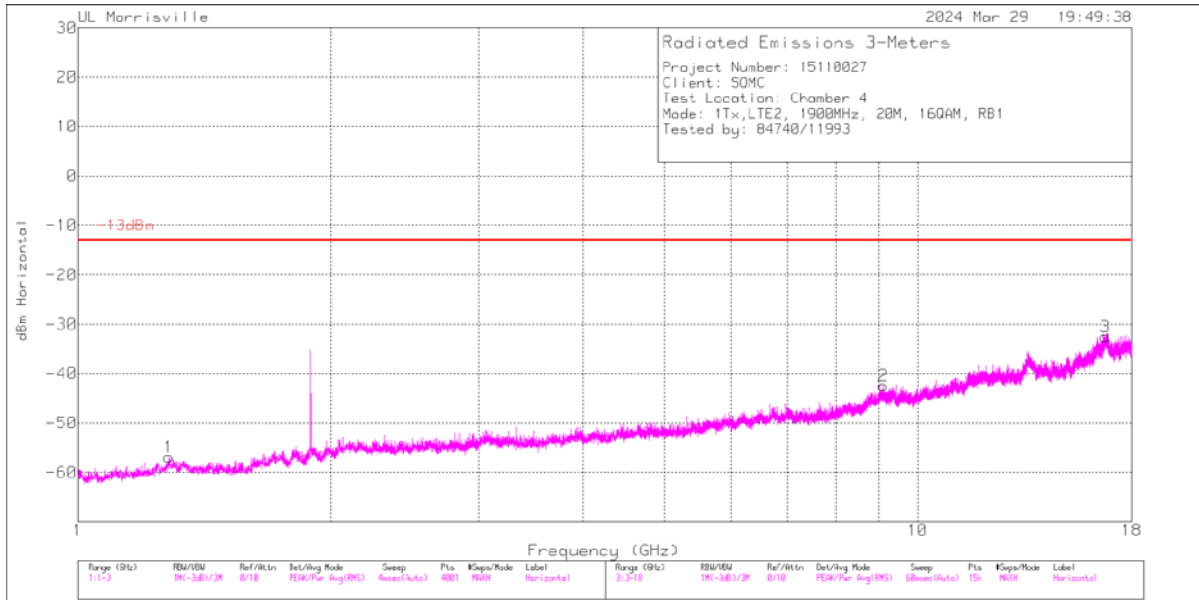


Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.2865	-62.21	Pk	29.2	-36	11.8	.5	-56.71	-13	-43.71	0-360	100	H
4	1.2895	-61.92	Pk	29.2	-36	11.8	.5	-56.42	-13	-43.42	0-360	300	V
5	9.067	-66.52	Pk	36.2	-24.7	11.8	0	-43.22	-13	-30.22	0-360	200	V
2	9.095	-66.08	Pk	36.3	-24.7	11.8	0	-42.68	-13	-29.68	0-360	200	H
3	16.751	-65.51	Pk	41.9	-19.2	11.8	0	-31.01	-13	-18.01	0-360	100	H
6	16.822	-66.64	Pk	41.9	-18.7	11.8	0	-31.64	-13	-18.64	0-360	300	V

Pk - Peak detector

16QAM LTE2 (20MHz, High Channel)



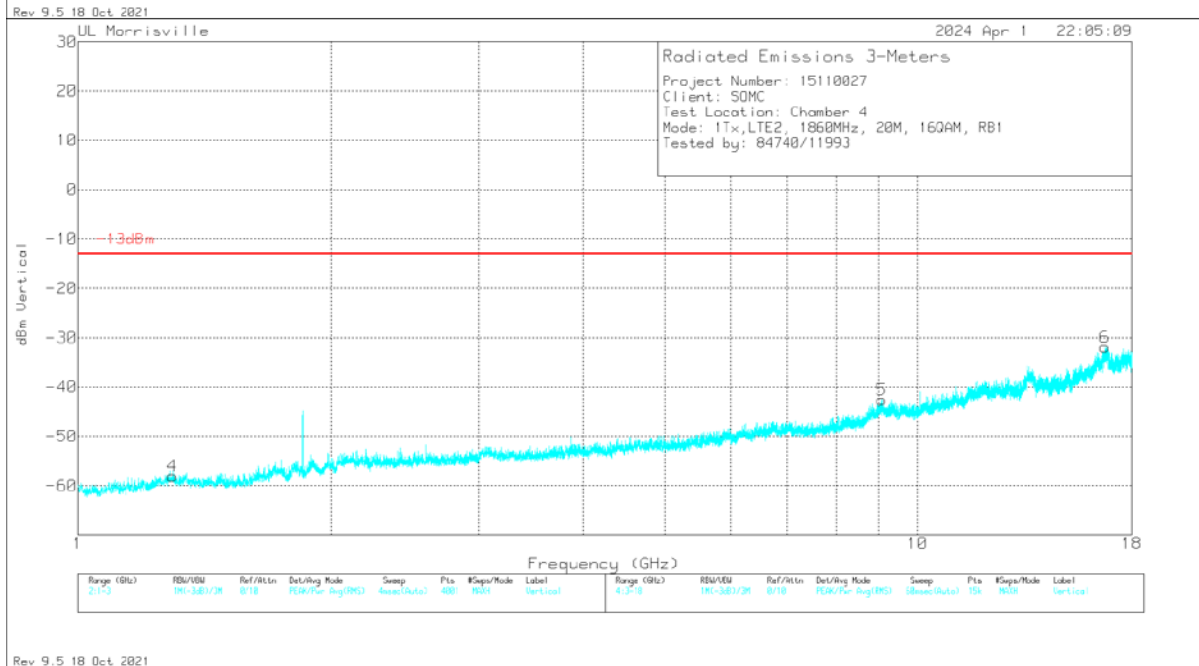
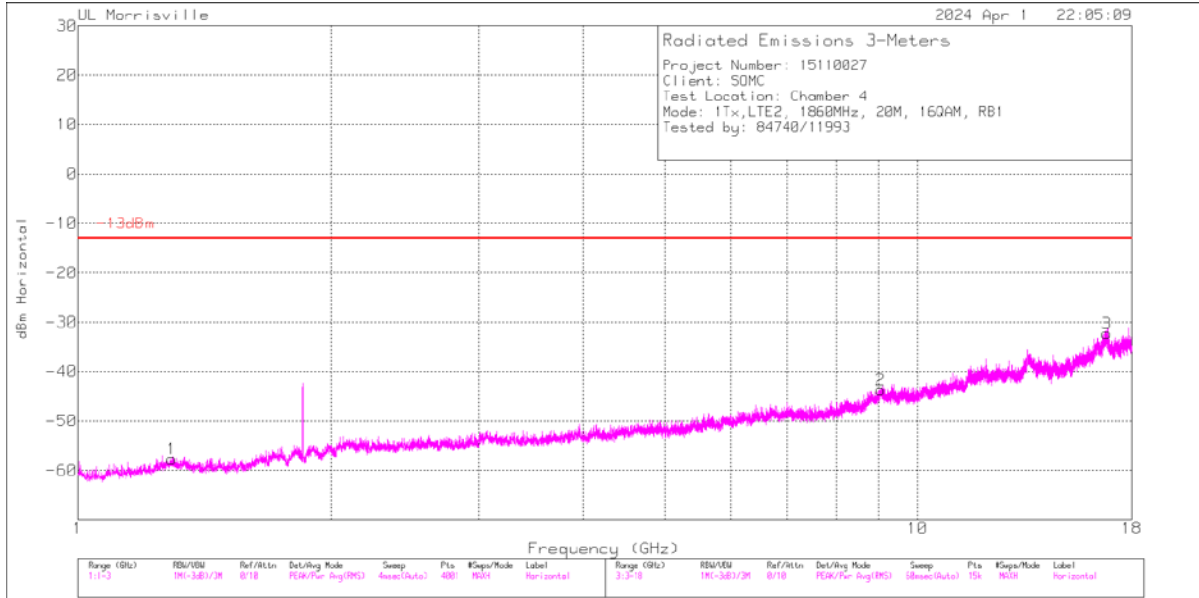
Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.2835	-62.49	Pk	29.2	-35.9	11.8	.5	-56.89	-13	-43.89	0-360	100	H
4	1.3105	-62.73	Pk	29.1	-35.9	11.8	.5	-57.23	-13	-44.23	0-360	300	V
5	9.009	-66.24	Pk	36.2	-25.2	11.8	0	-43.44	-13	-30.44	0-360	300	V
2	9.104	-65.63	Pk	36.3	-24.9	11.8	0	-42.43	-13	-29.43	0-360	100	H
3	16.741	-66.55	Pk	41.9	-19.7	11.8	0	-32.55	-13	-19.55	0-360	100	H
6	16.823	-66.57	Pk	41.9	-18.9	11.8	0	-31.77	-13	-18.77	0-360	200	V

Pk - Peak detector

Sub Antenna

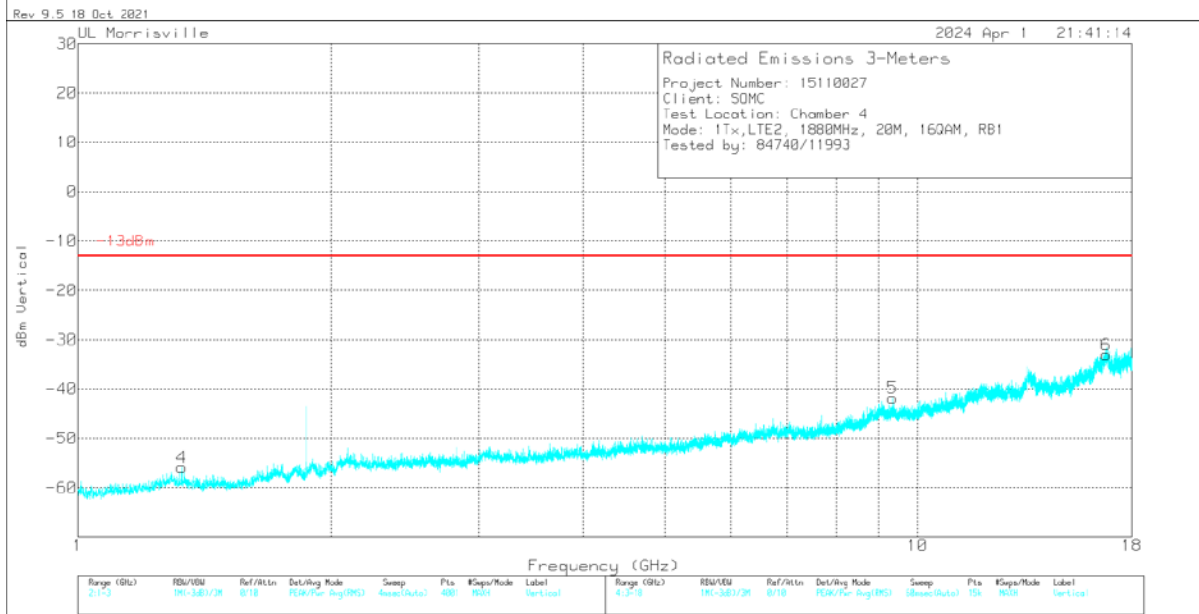
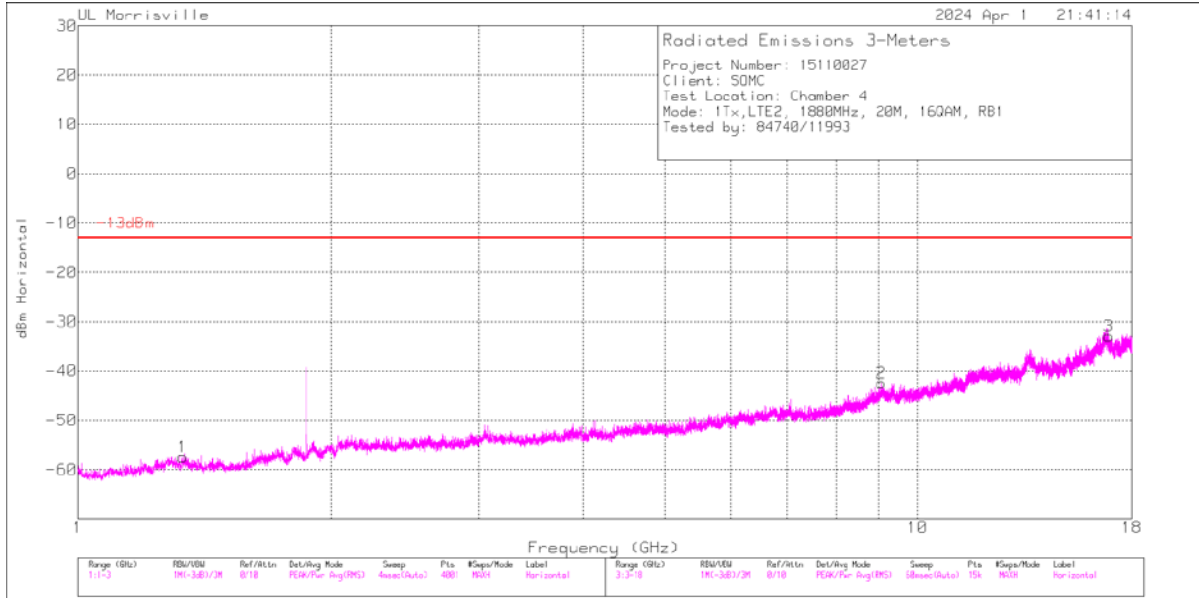
16QAM LTE2 (20MHz, Low Channel)



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.294	-63.27	Pk	29.2	-35.9	11.8	.5	-57.67	-13	-44.67	0-360	200	H
4	1.295	-63.55	Pk	29.2	-36	11.8	.5	-58.05	-13	-45.05	0-360	300	V
2	9.046	-66.76	Pk	36.2	-24.9	11.8	0	-43.66	-13	-30.66	0-360	100	H
5	9.066	-65.8	Pk	36.2	-24.8	11.8	0	-42.6	-13	-29.6	0-360	200	V
6	16.726	-65.76	Pk	41.9	-19.8	11.8	0	-31.86	-13	-18.86	0-360	300	V
3	16.799	-66.98	Pk	41.9	-19	11.8	0	-32.28	-13	-19.28	0-360	100	H

Pk - Peak detector

16QAM LTE2 (20MHz, Mid Channel)

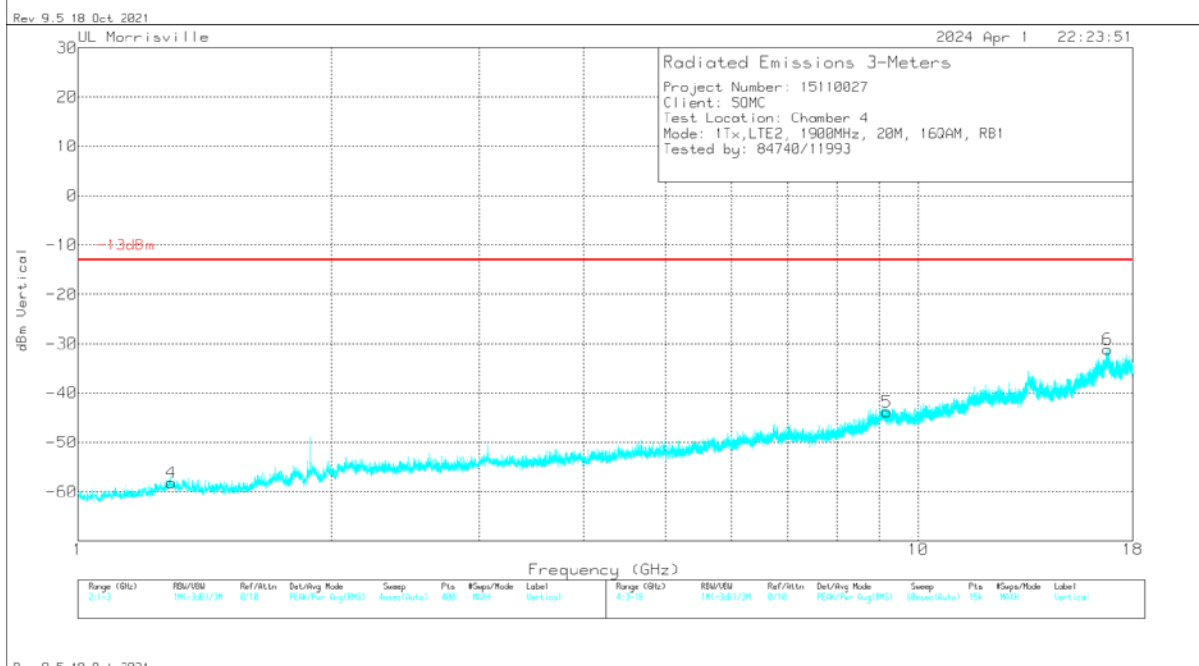
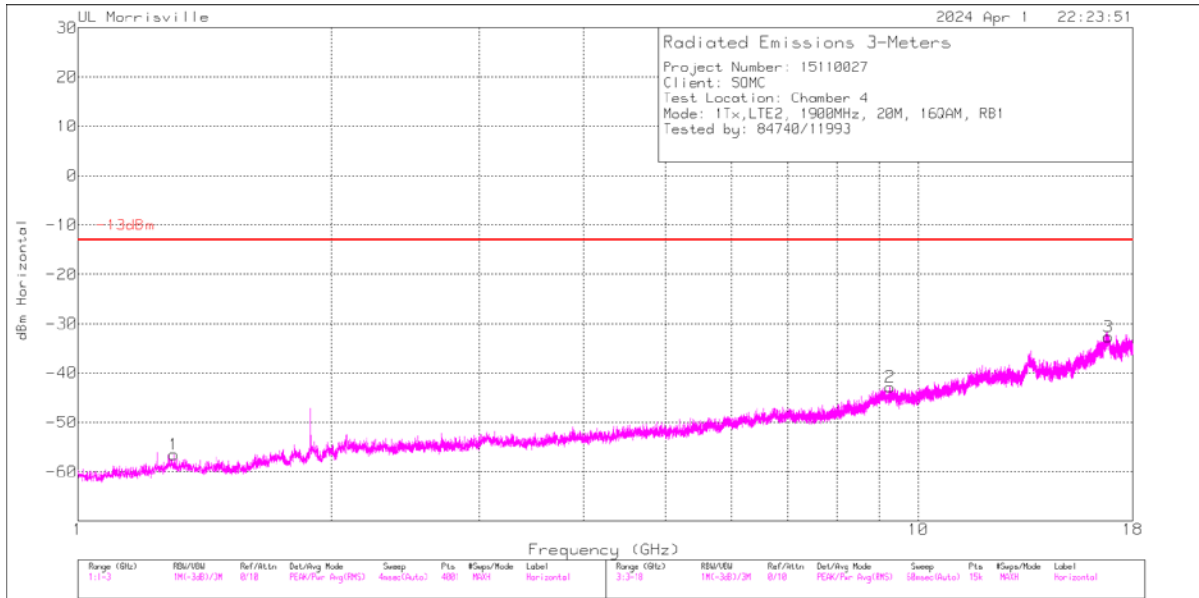


Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	1.3285	-61.24	Pk	29	-36	11.8	.5	-55.94	-13	-42.94	0-360	300	V
1	1.332	-62.74	Pk	29	-36	11.8	.5	-57.44	-13	-44.44	0-360	100	H
2	9.058	-65.8	Pk	36.2	-24.6	11.8	0	-42.4	-13	-29.4	0-360	100	H
5	9.347	-65.05	Pk	36.5	-25.1	11.8	0	-41.85	-13	-28.85	0-360	200	V
6	16.785	-67.12	Pk	41.9	-19.6	11.8	0	-33.02	-13	-20.02	0-360	200	V
3	16.888	-66.9	Pk	41.8	-19.6	11.8	0	-32.9	-13	-19.9	0-360	100	H

Pk - Peak detector

16QAM LTE2 (20MHz, High Channel)

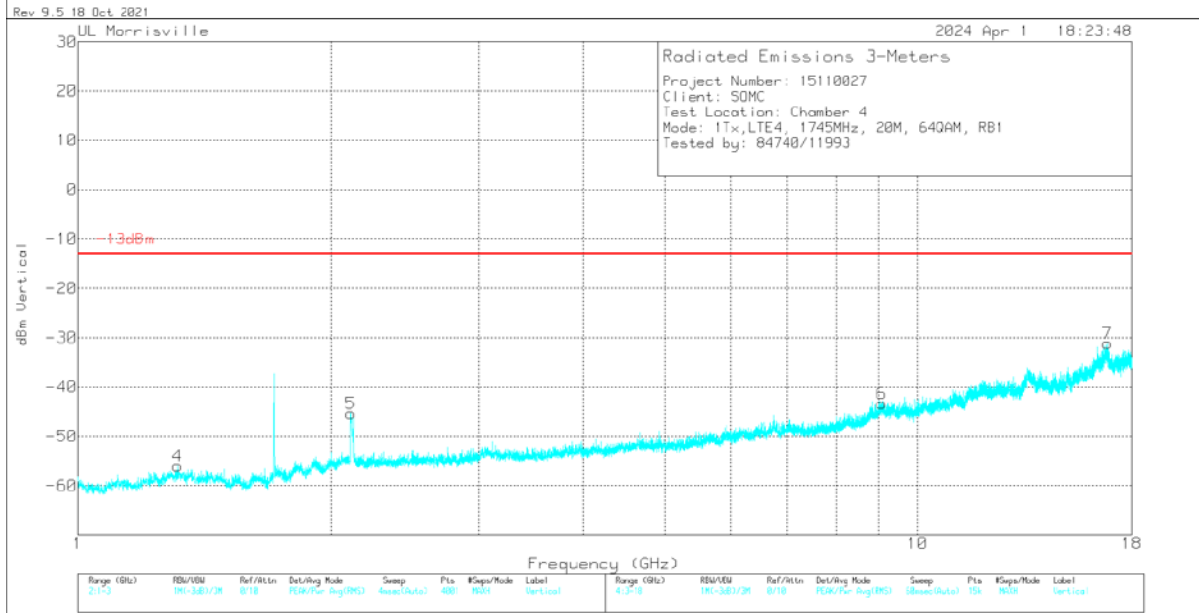
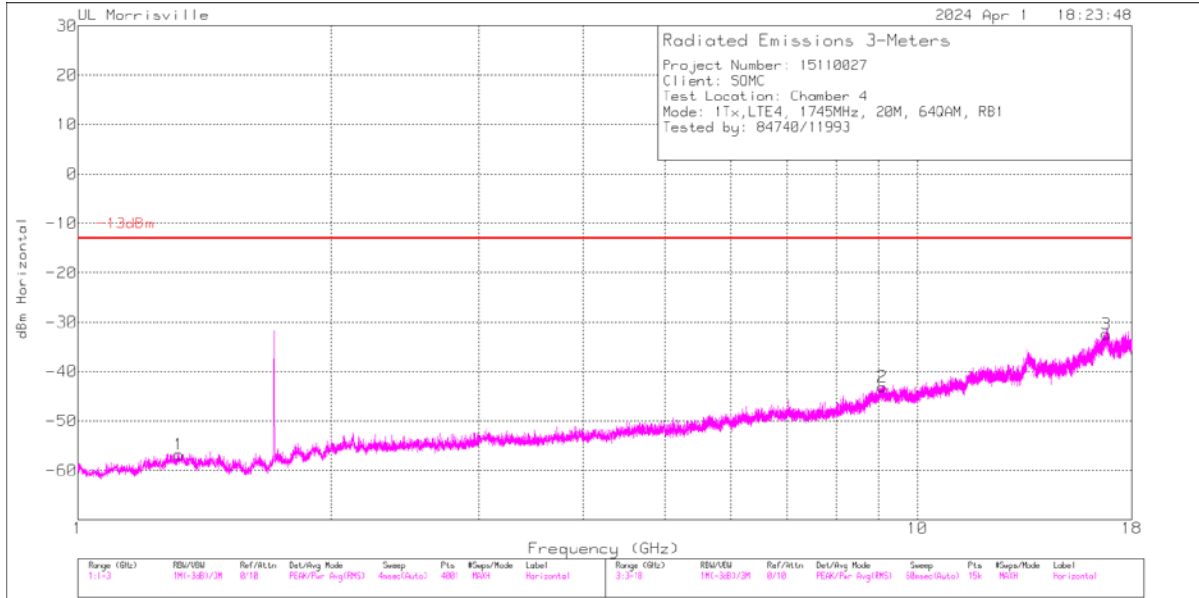


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	1.292	-63.74	Pk	29.2	-35.9	11.8	.5	-58.14	-13	-45.14	0-360	200	V
1	1.3005	-62.11	Pk	29.2	-35.9	11.8	.5	-56.51	-13	-43.51	0-360	100	H
5	9.173	-66.06	Pk	36.3	-25.9	11.8	0	-43.86	-13	-30.86	0-360	300	V
2	9.264	-65.1	Pk	36.4	-25.9	11.8	0	-42.8	-13	-29.8	0-360	100	H
6	16.807	-64.83	Pk	41.9	-20	11.8	0	-31.13	-13	-18.13	0-360	300	V
3	16.829	-67.01	Pk	41.9	-19.4	11.8	0	-32.71	-13	-19.71	0-360	100	H

Pk - Peak detector

10.1.4. LTE BAND 4

64QAM LTE4 (20MHz, Low Channel)

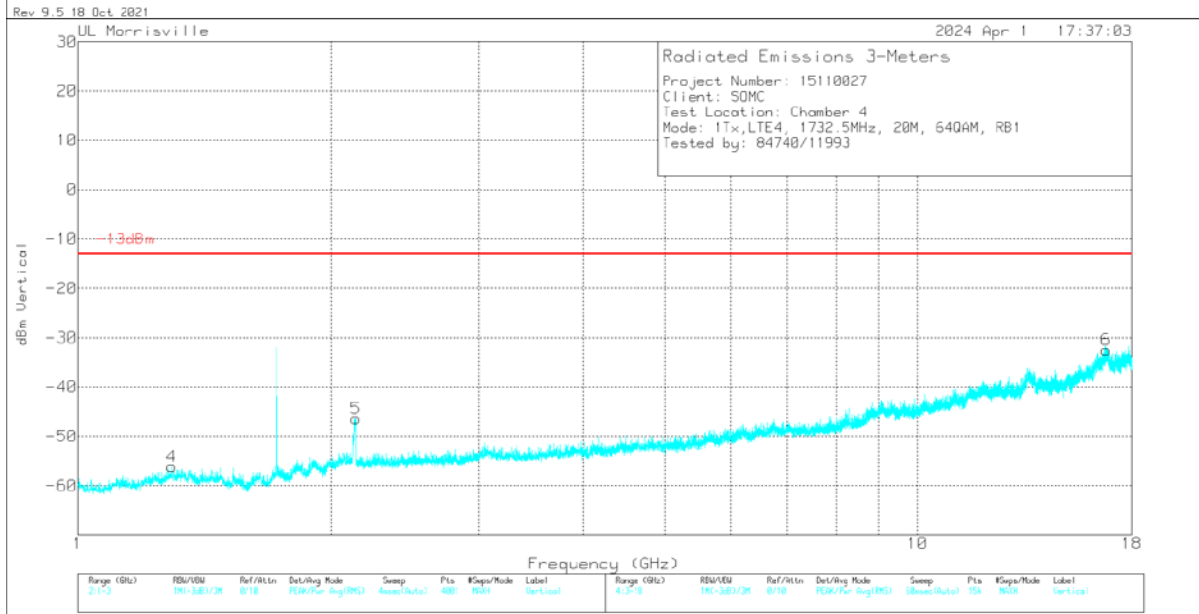
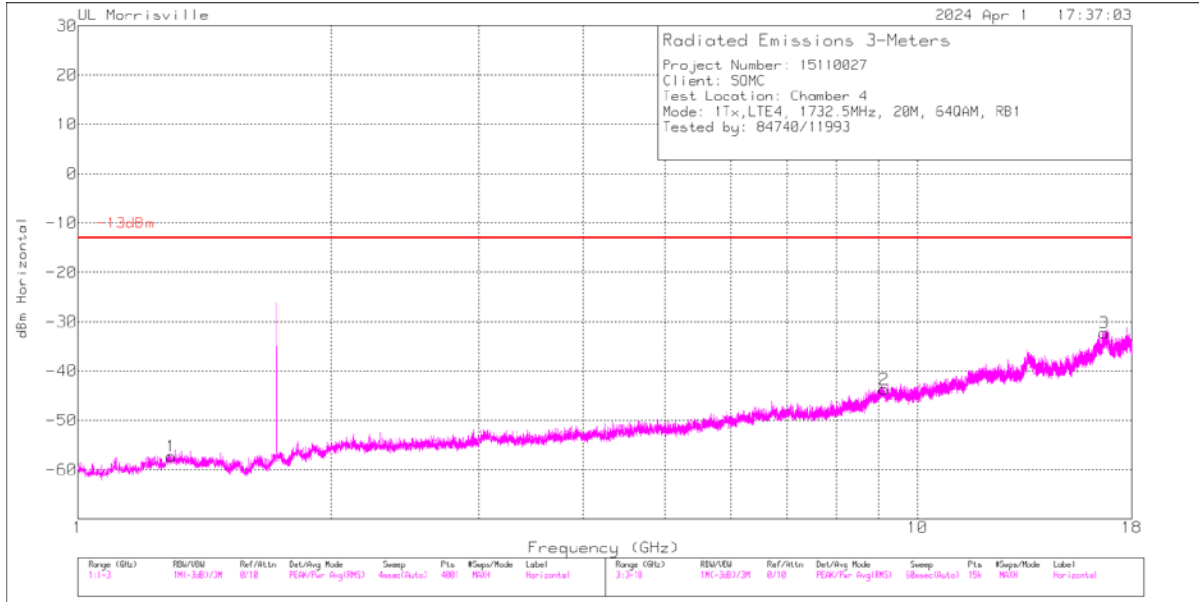


Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	1.3145	-62.05	Pk	29.1	-36	11.8	1.1	-56.05	-13	-43.05	0-360	300	V
1	1.3185	-62.81	Pk	29	-35.9	11.8	1.1	-56.81	-13	-43.81	0-360	200	H
5	2.1125	-53.96	Pk	31.6	-36.2	11.8	1.4	-45.36	-13	-32.36	0-360	200	V
6	9.074	-66.35	Pk	36.2	-25	11.8	0	-43.35	-13	-30.35	0-360	300	V
2	9.083	-66.38	Pk	36.3	-24.8	11.8	0	-43.08	-13	-30.08	0-360	100	H
3	16.779	-65.79	Pk	41.9	-20.3	11.8	0	-32.39	-13	-19.39	0-360	100	H
7	16.819	-65.99	Pk	41.9	-18.8	11.8	0	-31.09	-13	-18.09	0-360	300	V

Pk - Peak detector

64QAM LTE4 (20MHz, Mid Channel)

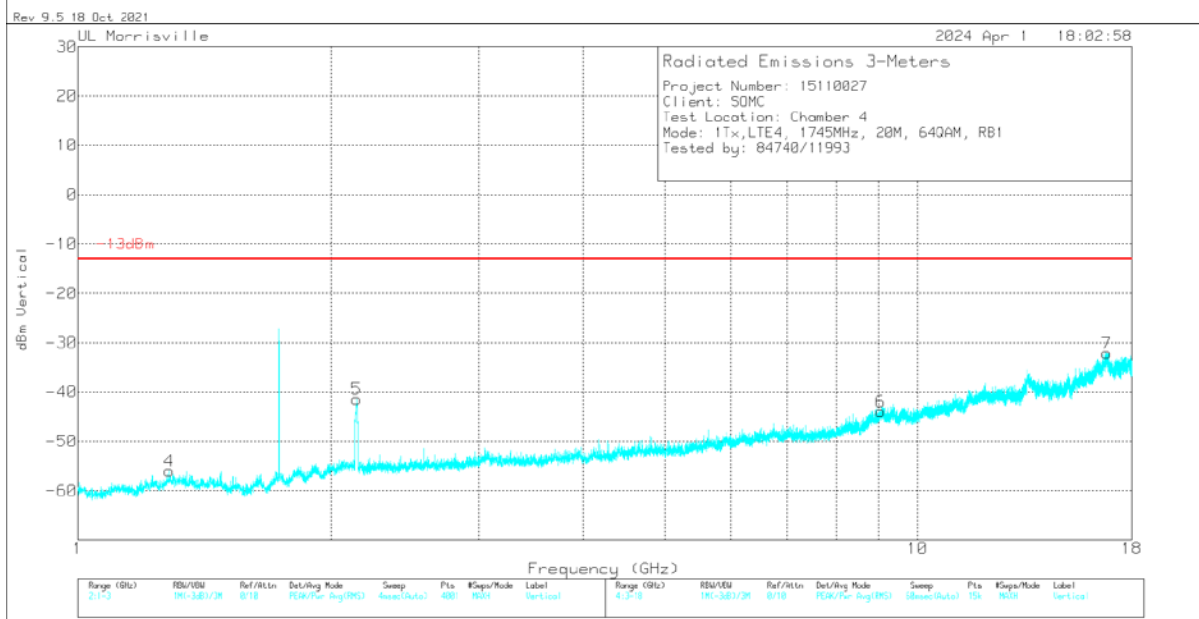
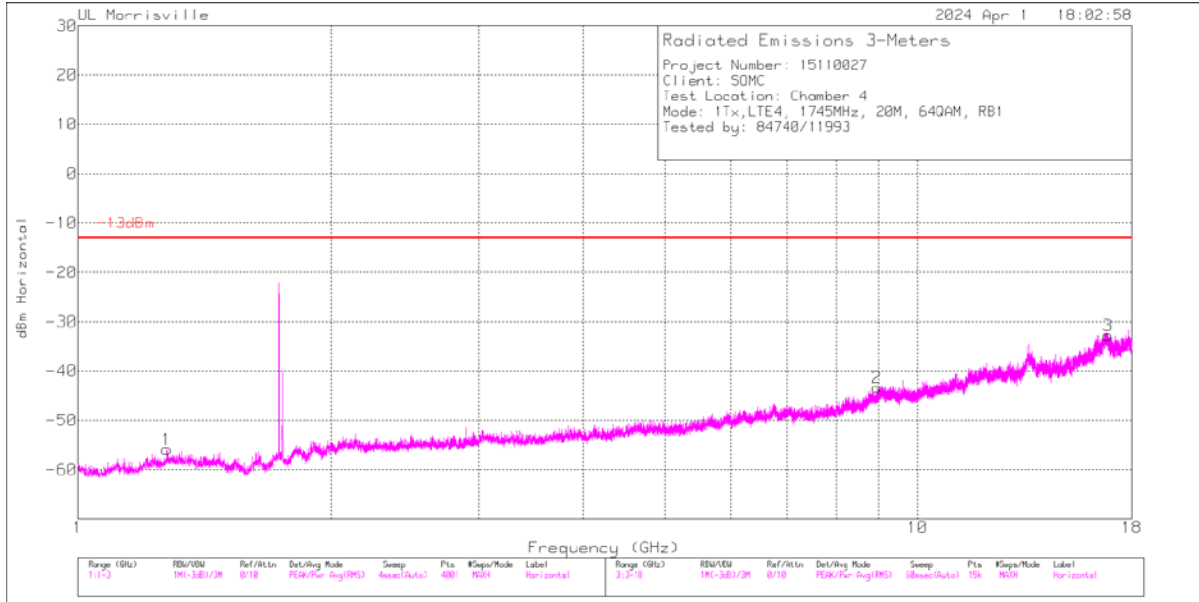


Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.291	-63.45	Pk	29.2	-35.9	11.8	1.1	-57.25	-13	-44.25	0-360	100	H
4	1.294	-62.34	Pk	29.2	-35.9	11.8	1.1	-56.14	-13	-43.14	0-360	300	V
5	2.142	-54.6	Pk	31.5	-36.3	11.8	1.2	-46.4	-13	-33.4	0-360	200	V
2	9.128	-66.67	Pk	36.3	-25.1	11.8	0	-43.67	-13	-30.67	0-360	100	H
3	16.693	-65.84	Pk	41.8	-20.1	11.8	0	-32.34	-13	-19.34	0-360	100	H
6	16.766	-65.88	Pk	41.9	-20.3	11.8	0	-32.48	-13	-19.48	0-360	200	V

Pk - Peak detector

64QAM LTE4 (20MHz, High Channel)



Rev 9.5 18 Oct 2021

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.277	-61.86	Pk	29.1	-35.9	11.8	1	-55.86	-13	-42.86	0-360	200	H
4	1.2845	-62.11	Pk	29.2	-35.9	11.8	1	-56.01	-13	-43.01	0-360	300	V
5	2.1465	-49.73	Pk	31.6	-36.3	11.8	1.2	-41.43	-13	-28.43	0-360	200	V
2	8.945	-65.49	Pk	36.2	-25.9	11.8	0	-43.39	-13	-30.39	0-360	100	H
6	9.042	-67.39	Pk	36.2	-24.6	11.8	0	-43.99	-13	-30.99	0-360	300	V
7	16.799	-66.88	Pk	41.9	-19	11.8	0	-32.18	-13	-19.18	0-360	300	V
3	16.859	-66.18	Pk	41.9	-20.3	11.8	0	-32.78	-13	-19.78	0-360	100	H

Pk - Peak detector

10.2. WORST CASE EMISSIONS

LIMITS - BAND 2

FCC: §24.238

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts

LIMITS – BAND 4

FCC: §27.53 (m),

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.

TEST PROCEDURE

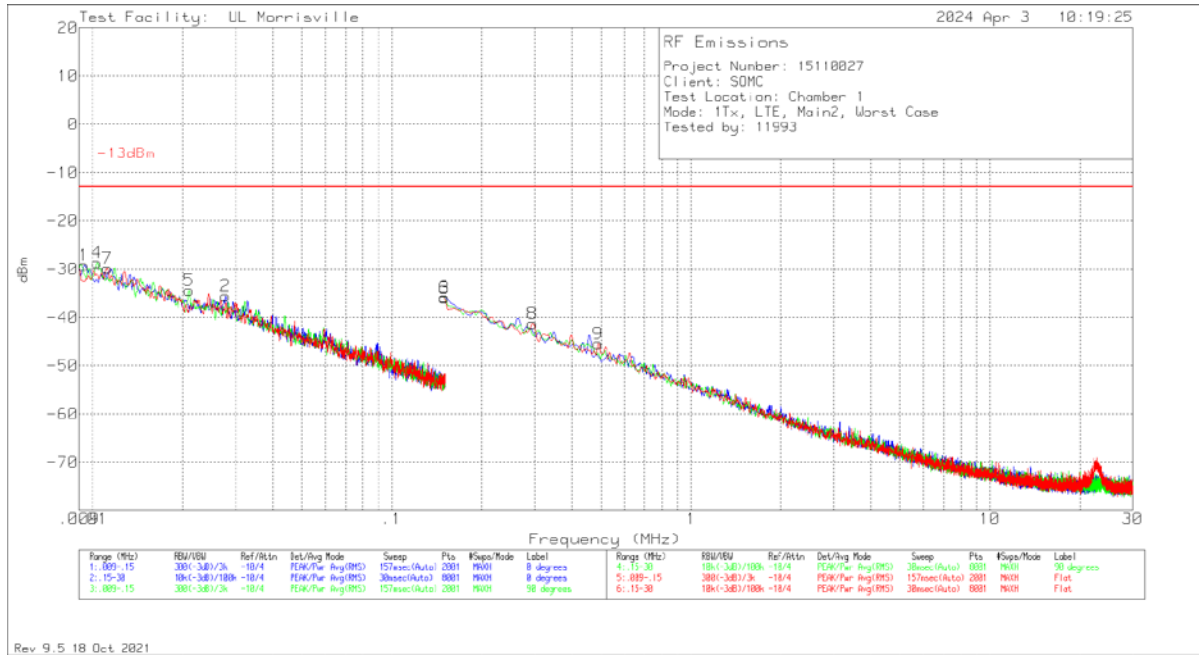
KDB 971168 D01 v02r02/D02 v02

RESULTS

Antenna being tested	S/N of EUT
Main 2 Worst-Case	QV7700GJLQ
Sub Antenna Worst-Case	QV770051L2

10.2.1. Main 2

9kHz – 30MHz Worst-Case Emissions

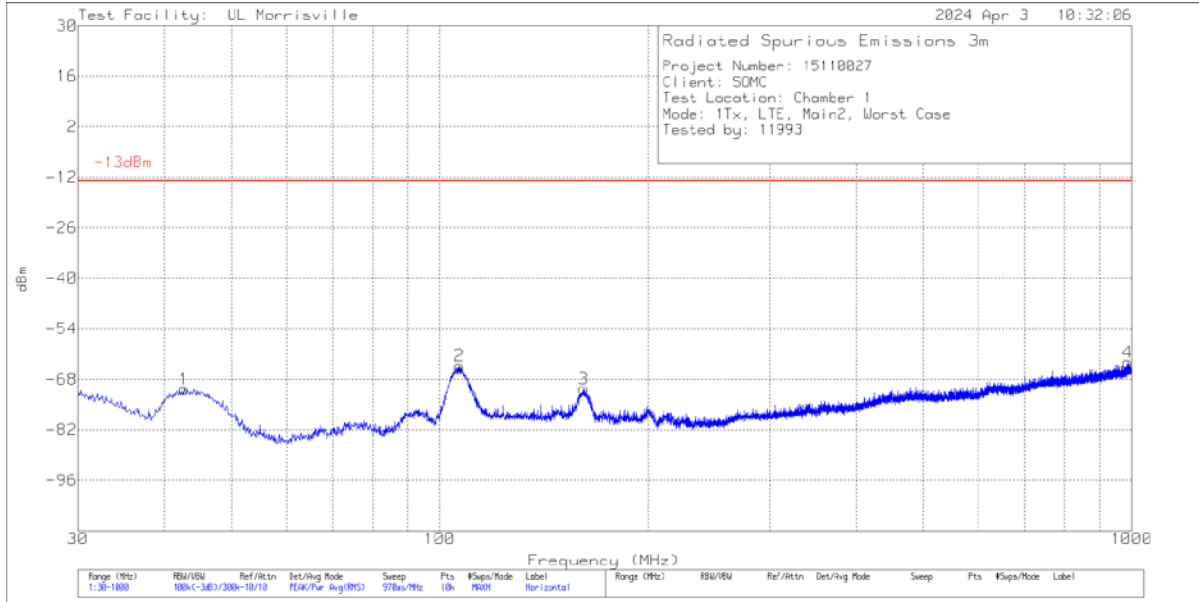


Rev 9.5 18 Oct 2021

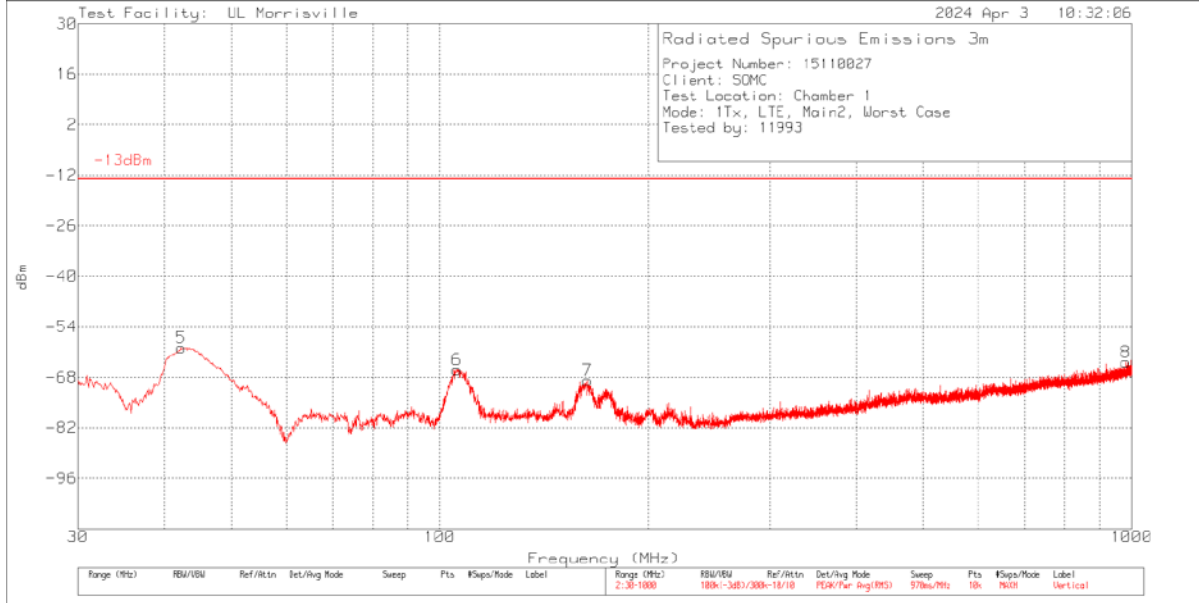
Marker	Frequency (MHz)	Meter Reading (dBm)	Det	135144 (dBuV/m)	Gain/Loss (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Loop Angle
1	.00936	-59.84	Pk	18.8	.1	11.8	-29.14	-13	-16.14	0-360	0 degs
4	.01035	-58.89	Pk	18.3	.1	11.8	-28.69	-13	-15.69	0-360	90 degs
7	.0112	-59.62	Pk	17.9	.1	11.8	-29.82	-13	-16.82	0-360	Flat
5	.021	-60.16	Pk	13.9	.1	11.8	-34.36	-13	-21.36	0-360	90 degs
2	.02782	-61.01	Pk	13.6	.1	11.8	-35.51	-13	-22.51	0-360	0 degs
3	.15	-58.92	Pk	11.1	.1	11.8	-35.92	-13	-22.92	0-360	0 degs
6	.15	-58.74	Pk	11.1	.1	11.8	-35.74	-13	-22.74	0-360	90 degs
8	.29551	-64.21	Pk	11.1	.1	11.8	-41.21	-13	-28.21	0-360	Flat
9	.48952	-68.4	Pk	11.1	.1	11.8	-45.4	-13	-32.4	0-360	Flat

Pk - Peak detector

30MHz – 1000MHz Worst-Case Emissions



Rev 9.5 18 Oct 2021

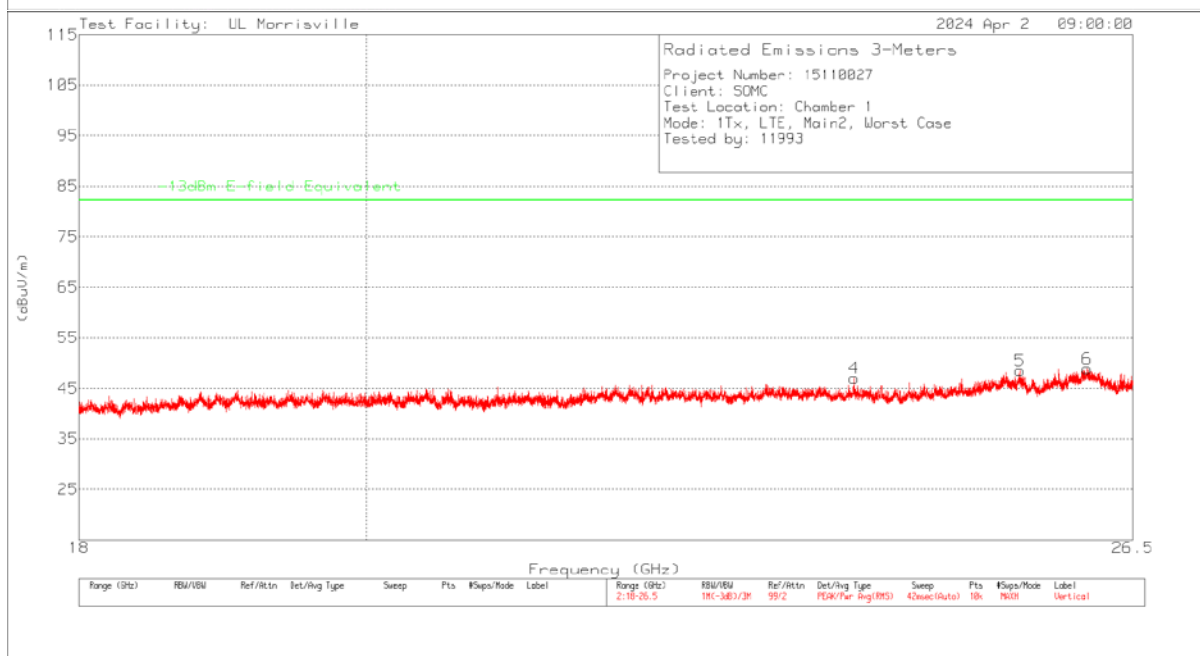
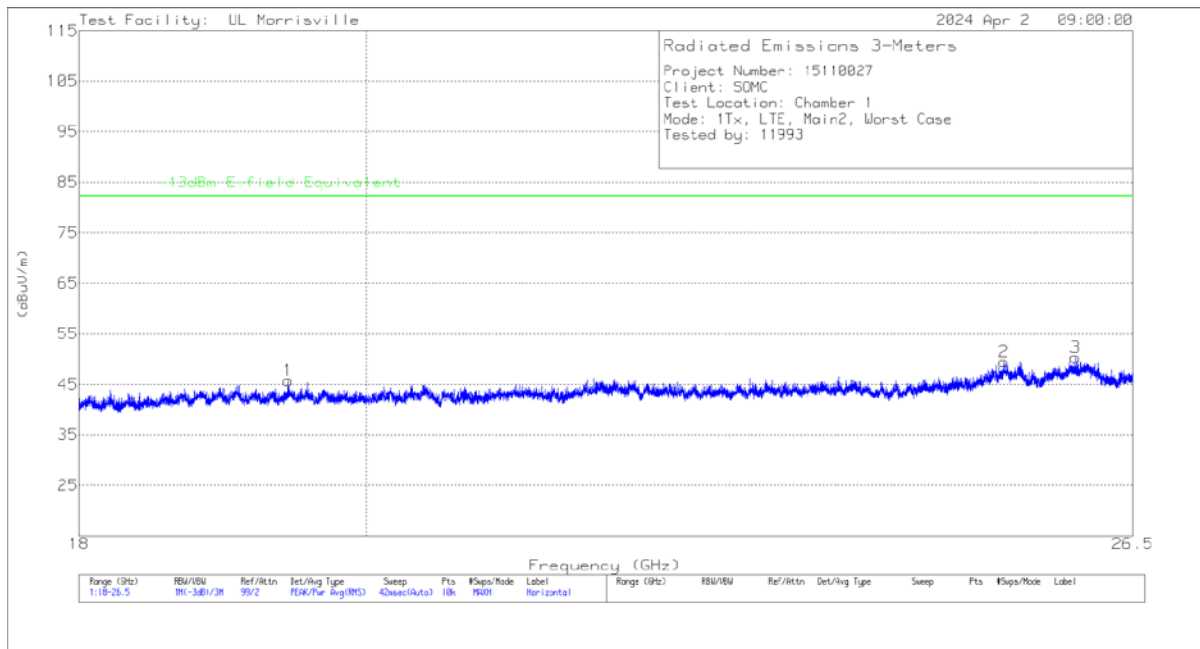


Rev 9.5 18 Oct 2021

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	90629 (dB/m)	Gain/Loss (dB)	Filter (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	42.319	-58.29	Pk	18.1	-31.5	.1	11.8	-59.79	-13	-46.79	0-360	100	V
1	42.707	-68.97	Pk	17.8	-31.5	.1	11.8	-70.77	-13	-57.77	0-360	399	H
6	105.854	-65.08	PK	18.2	-30.9	.1	11.8	-65.88	-13	-52.88	0-360	100	V
2	106.63	-63.65	Pk	18.3	-30.8	.1	11.8	-64.25	-13	-51.25	0-360	299	H
3	161.629	-71.13	Pk	18.5	-30.2	.4	11.8	-70.63	-13	-57.63	0-360	199	H
7	163.666	-69.19	Pk	18.4	-30.3	.4	11.8	-68.89	-13	-55.89	0-360	100	V
8	981.085	-80.36	Pk	29.2	-25	.6	11.8	-63.76	-13	-50.76	0-360	100	V
4	986.711	-79.64	Pk	29.4	-25.4	.6	11.8	-63.24	-13	-50.24	0-360	99	H

Pk - Peak detector

18GHz – 26.5GHz Worst-Case Emissions

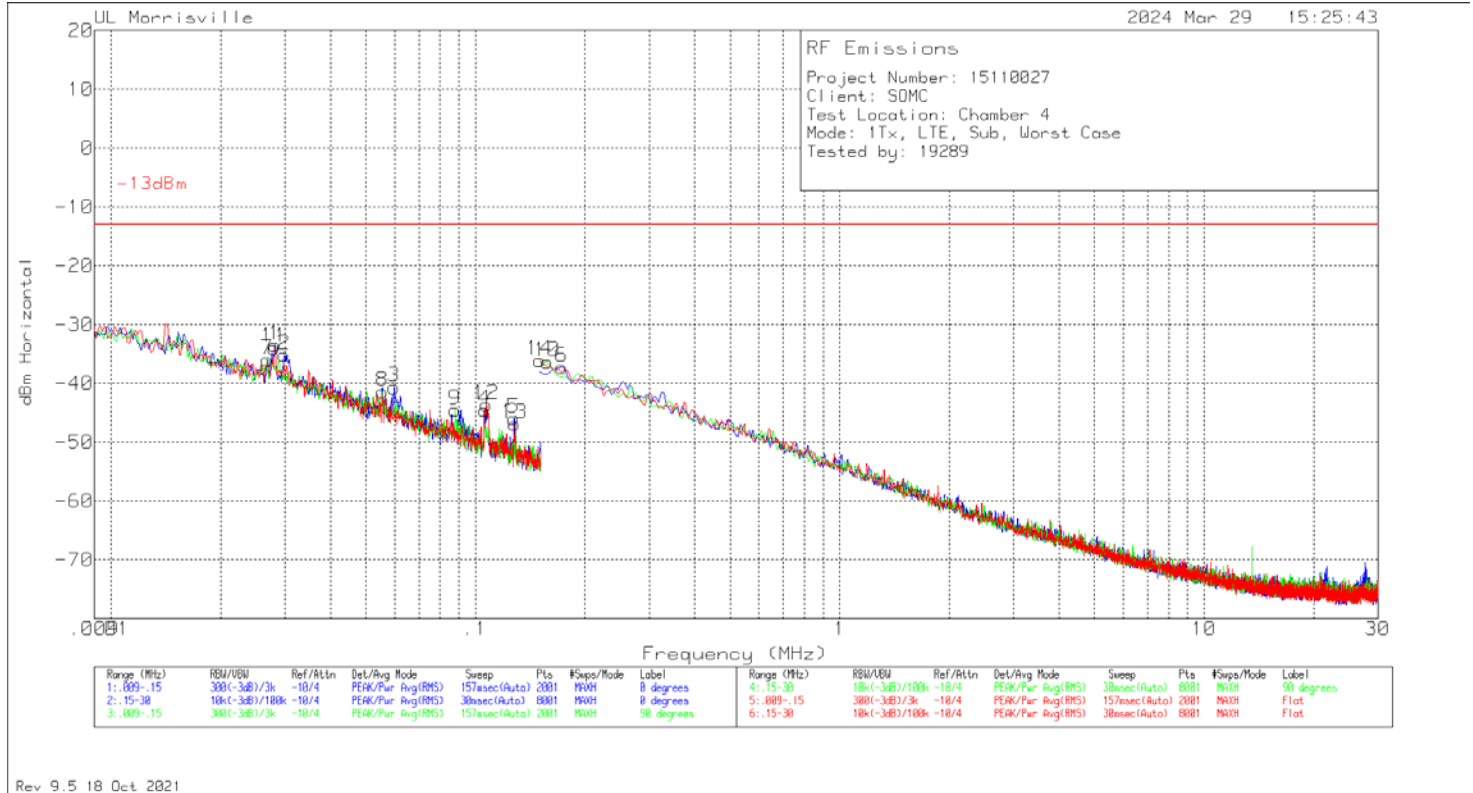


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	204704 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	-13dBm E-field Equivalent	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	19.43721	50.59	Pk	33.3	-38.1	45.79	82.2	-36.41	0-360	300	H
4	23.92476	49.66	Pk	34.4	-37.1	46.96	82.2	-35.24	0-360	200	V
2	25.27357	50.16	Pk	35.7	-36.4	49.46	82.2	-32.74	0-360	101	H
5	25.42571	49.14	Pk	35.5	-36.1	48.54	82.2	-33.66	0-360	250	V
3	25.94841	51.22	Pk	35.3	-36.2	50.32	82.2	-31.88	0-360	199	H
6	26.05719	49.61	Pk	35.2	-35.9	48.91	82.2	-33.29	0-360	250	V

Pk - Peak detector

10.2.2. Sub Antenna

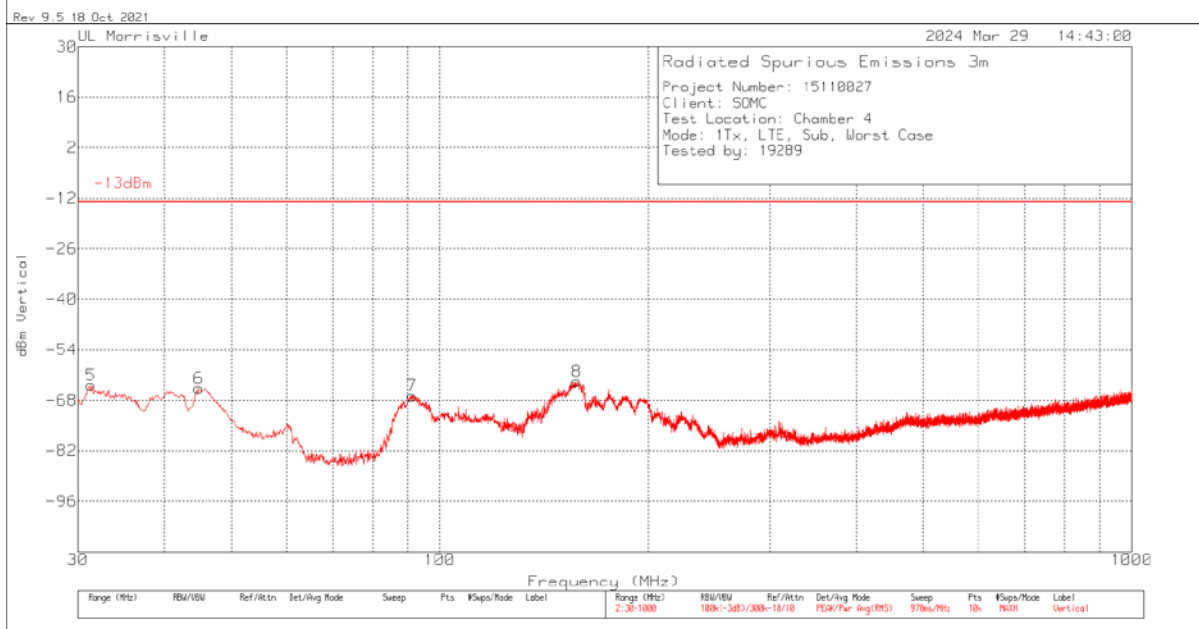
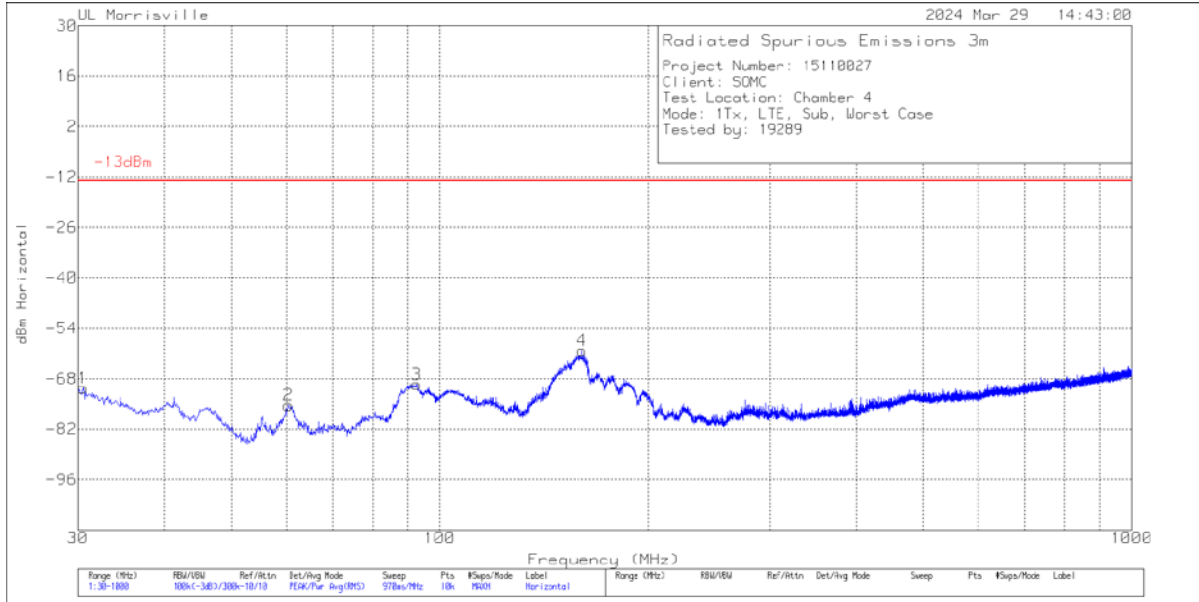
9kHz – 30MHz Worst-Case Emissions



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	135144 (dBUV/m)	Gain/Loss (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Loop Angle
7	.02682	-61.33	Pk	13.6	0	11.8	-35.93	-13	-22.93	0-360	90 degs
11	.0281	-59.31	Pk	13.6	0	11.8	-33.91	-13	-20.91	0-360	Flat
1	.02821	-58.9	Pk	13.6	0	11.8	-33.5	-13	-20.5	0-360	0 degs
2	.02984	-60.45	Pk	13.5	0	11.8	-35.15	-13	-22.15	0-360	0 degs
8	.05558	-64.8	Pk	11.6	0	11.8	-41.4	-13	-28.4	0-360	90 degs
3	.05991	-64.16	Pk	11.7	0	11.8	-40.66	-13	-27.66	0-360	0 degs
9	.08795	-67.79	Pk	11.5	0	11.8	-44.49	-13	-31.49	0-360	90 degs
4	.10613	-67.35	Pk	11.1	0	11.8	-44.45	-13	-31.45	0-360	0 degs
12	.10734	-66.53	Pk	11.1	0	11.8	-43.63	-13	-30.63	0-360	Flat
5	.12771	-68.8	Pk	11.1	0	11.8	-45.9	-13	-32.9	0-360	0 degs
13	.128	-69.77	Pk	11.1	0	11.8	-46.87	-13	-33.87	0-360	Flat
14	.15	-59.01	Pk	11.1	0	11.8	-36.11	-13	-23.11	0-360	Flat
10	.15746	-59.24	Pk	11.1	0	11.8	-36.34	-13	-23.34	0-360	90 degs
6	.17239	-60.15	Pk	11.1	0	11.8	-37.25	-13	-24.25	0-360	0 degs

Pk - Peak detector

30MHz – 1000MHz Worst-Case Emissions



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	90628 (dB/m)	Gain/Loss (dB)	Filter (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.485	-76.89	Pk	26.5	-32.1	.1	11.8	-70.59	-13	-57.59	0-360	300	H
5	31.358	-69.47	Pk	25.9	-32.1	.1	11.8	-63.77	-13	-50.77	0-360	100	V
6	44.841	-61.18	Pk	16.6	-32	.1	11.8	-64.68	-13	-51.68	0-360	100	V
2	60.458	-69.27	Pk	13.8	-31.8	.1	11.8	-75.37	-13	-62.37	0-360	300	H
7	91.304	-61.1	Pk	14	-31.5	.1	11.8	-66.7	-13	-53.7	0-360	100	V
3	92.662	-64.28	Pk	14.4	-31.5	.1	11.8	-69.48	-13	-56.48	0-360	100	H
8	157.846	-62.4	Pk	18.4	-31	.4	11.8	-62.8	-13	-49.8	0-360	100	V
4	160.465	-59.75	Pk	18.4	-31	.4	11.8	-60.15	-13	-47.15	0-360	100	H

Pk - Peak detector