

## **5.7. Conducted Spurious Emission Measurement**

### **5.7.1. Test Limit**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least  $43 + 10 \log (P)$  dB.

### **5.7.2. Test Procedure**

ANSI C63.26-2015 - Section 5.7

### **5.7.3. Test Setting**

1. Set the analyzer frequency to low, mid, high channel.
2. RBW = 1MHz
3. VBW  $\geq 3 \cdot$ RBW
4. Sweep time = auto
5. Detector = power averaging (rms)
6. Set sweep trigger to "free run."
7. User gate triggered such that the analyzer only sweeps when the device is transmitting at full power.
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.

### 5.7.4.Test Setup

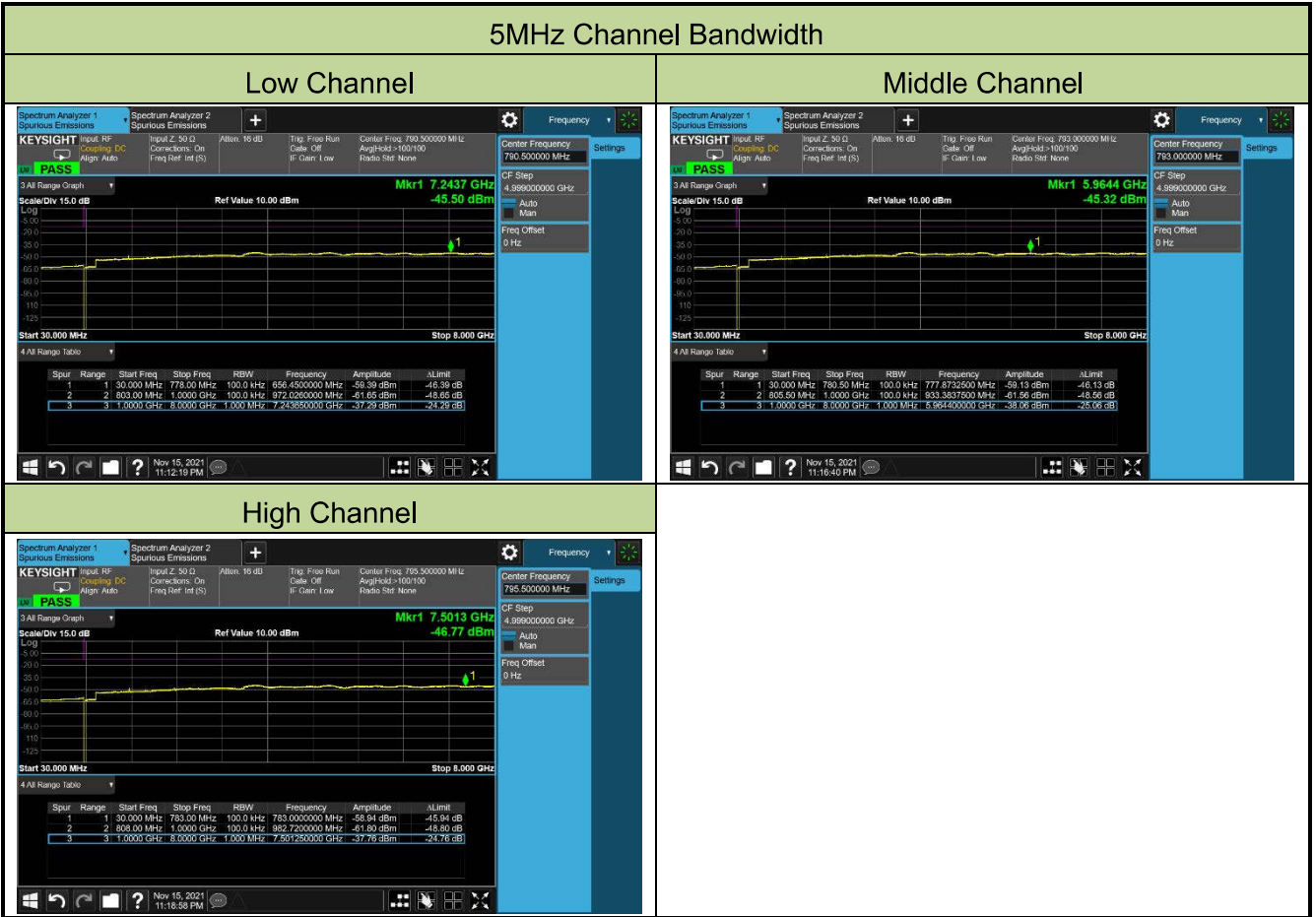


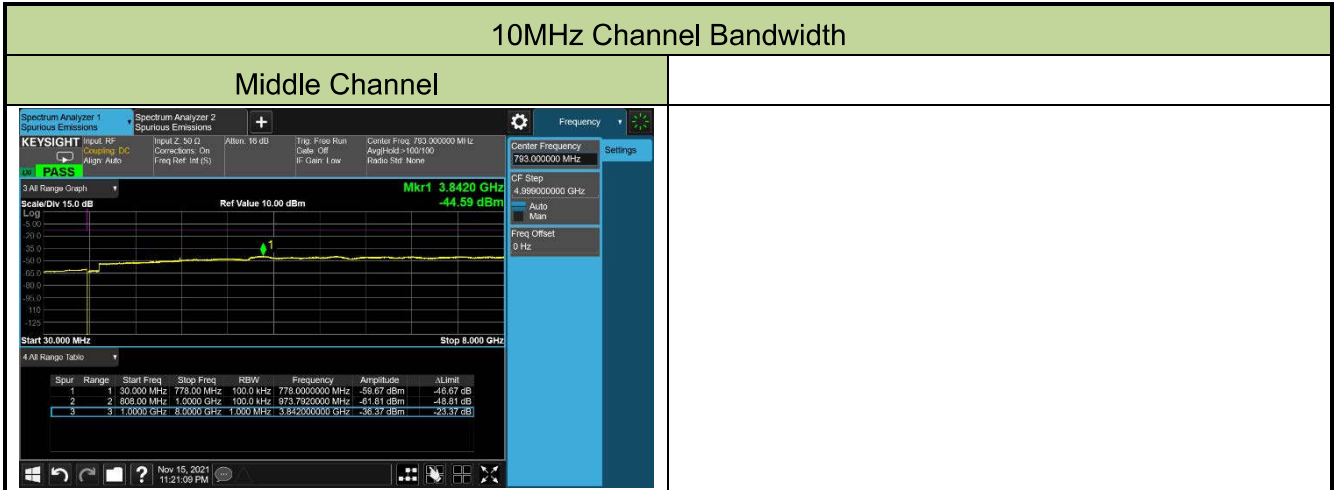
### 5.7.5.Test Result

Product	LTE Module	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2021/11/15
Test Band	LTE Band 14_QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
5305	760.5	5	30 ~ 8000	-37.29	≤ -13.00	Pass
5330	763.0	5	30 ~ 8000	-38.06	≤ -13.00	Pass
5355	765.5	5	30 ~ 8000	-37.76	≤ -13.00	Pass
5330	763.0	10	30 ~ 8000	-36.37	≤ -13.00	Pass

Note: Spurious emissions within 9kHz – 30MHz were found more than 20dB below limit line.





## **5.8. Radiated Spurious Emission Measurement**

### **5.8.1. Test Limit**

Out of band emissions: 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. The emission limit equal to -13dBm.

For operations in the 758 ~ 775 MHz and 788 ~ 805 MHz bands, all emissions including harmonics in the band 1559 ~ 1610 MHz shall be limited to -70 dBW/MHz (-40dBm/MHz) equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW (-50dBm) EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

$E$  (dB $\mu$ V/m) = EIRP (dBm) - 20 log D + 104.8; where D is the measurement distance in meters. The emission limit equal to 82.3dB $\mu$ V/m or 55.3dB $\mu$ V/m.

### **5.8.2. Test Procedure**

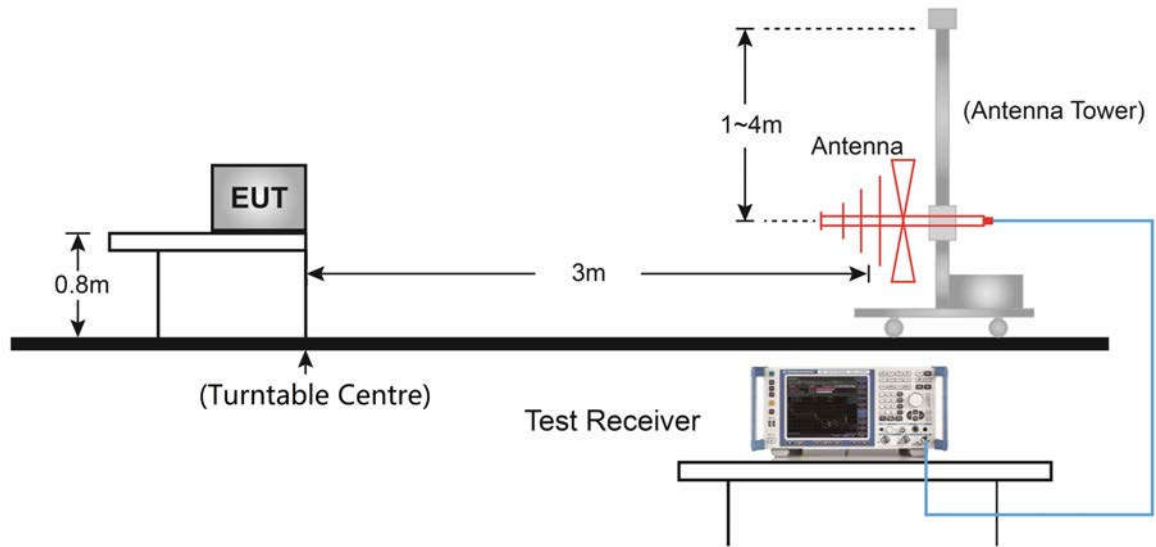
ANSI C63.26-2015 - Section 5.2.7 & 5.5

### **5.8.3. Test Setting**

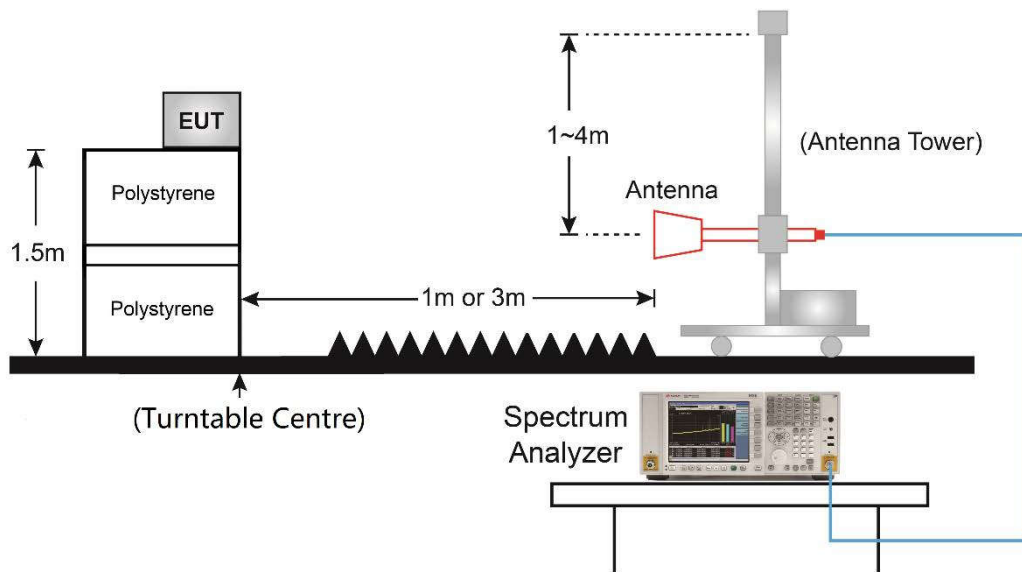
1. RBW = 1MHz
2. VBW  $\geq$  3\*RBW
3. Sweep time  $\geq$  10  $\times$  (number of points in sweep)  $\times$  (transmission symbol period)
4. Detector = Peak
5. Trace mode = max hold
6. The trace was allowed to stabilize

### 5.8.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:





**5.8.5.Test Result**

Product	LTE Module	Test Site	WZ-AC1
Test Engineer	Allen Zou	Test Date	2021/11/12
Test Band	LTE Band 14_5MHz_1RB_QPSK		

Frequency (MHz)	Reading Level (dB $\mu$ V)	Factor (dB/m)	Measure Level(dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
<b>Low Channel</b>							
890.88	21.93	29.16	51.09	82.30	-31.21	Peak	Horizontal
960.72	22.65	30.04	52.69	82.30	-29.61	Peak	Horizontal
924.34	22.12	29.86	51.98	82.30	-30.32	Peak	Vertical
987.88	22.44	29.81	52.25	82.30	-30.05	Peak	Vertical
1578.00	48.90	-18.60	30.30	55.30	-25.00	Peak	Horizontal
17677.00	45.50	5.60	51.10	82.30	-31.20	Peak	Horizontal
1595.00	48.50	-18.60	29.90	55.30	-25.40	Peak	Vertical
3941.00	54.40	-10.20	44.20	82.30	-38.10	Peak	Vertical
<b>Middle Channel</b>							
876.81	22.05	29.07	51.12	82.30	-31.18	Peak	Horizontal
969.93	22.38	29.94	52.32	82.30	-29.98	Peak	Horizontal
876.33	22.36	29.05	51.41	82.30	-30.89	Peak	Vertical
968.48	22.00	29.95	51.95	82.30	-30.35	Peak	Vertical
1586.50	48.02	-18.61	29.41	55.30	-25.89	Peak	Horizontal
17396.50	45.29	4.89	50.18	82.30	-32.12	Peak	Horizontal
1586.50	48.40	-18.61	29.79	55.30	-25.51	Peak	Vertical
17677.00	44.83	5.61	50.44	82.30	-31.86	Peak	Vertical
<b>High Channel</b>							
889.91	22.45	29.15	51.60	82.30	-30.70	Peak	Horizontal
951.50	21.75	30.16	51.91	82.30	-30.39	Peak	Horizontal
875.84	21.80	29.04	50.84	82.30	-31.46	Peak	Vertical
949.56	22.21	30.18	52.39	82.30	-29.91	Peak	Vertical
1586.50	48.31	-18.61	29.70	55.30	-25.60	Peak	Horizontal
16810.00	44.95	4.50	49.45	82.30	-32.85	Peak	Horizontal
1578.00	49.65	-18.64	31.01	55.30	-24.29	Peak	Vertical
17609.00	44.91	4.94	49.85	82.30	-32.45	Peak	Vertical

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)

## 6. CONCLUSION

The data collected relate only the item(s) tested and show that unit is compliance with FCC Rules.

## **Appendix A - Test Setup Photograph**

Refer to "2110RSU053-UT" file.

## **Appendix B - EUT Photograph**

Refer to "2110RSU053-UE" file.