

4.6. Conducted Spurious Emission Measurement

4.6.1. 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 10th 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.

The conducted power of any emissions below 3530MHz or above 3720MHz shall not exceed -40dBm/MHz.

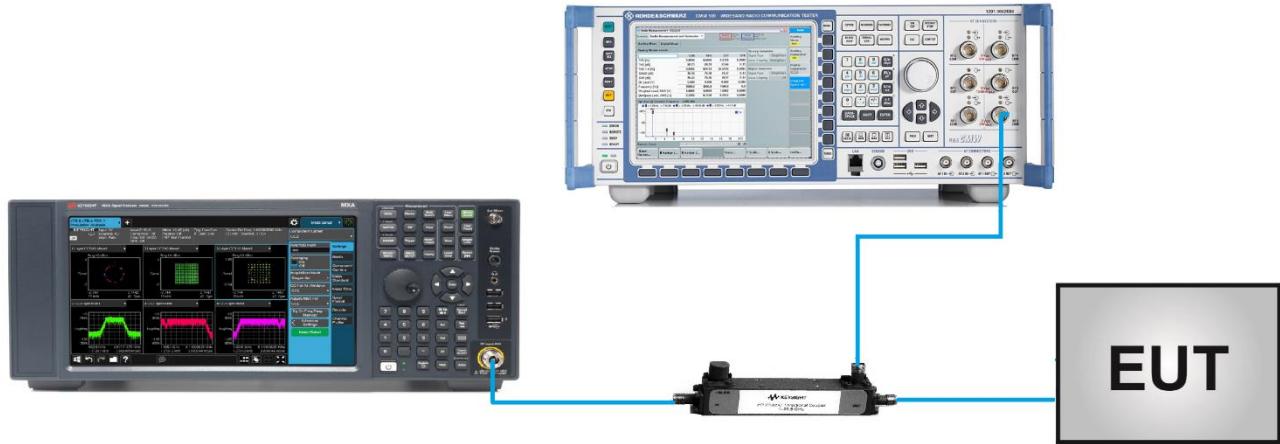
4.6.2. Test Procedure

ANSI C63.26-2015 - Section 5.7

4.6.3. Test Setting

1. Set the analyzer frequency to low, mid, high channel.
2. RBW = 1MHz
3. VBW \geq 3*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.

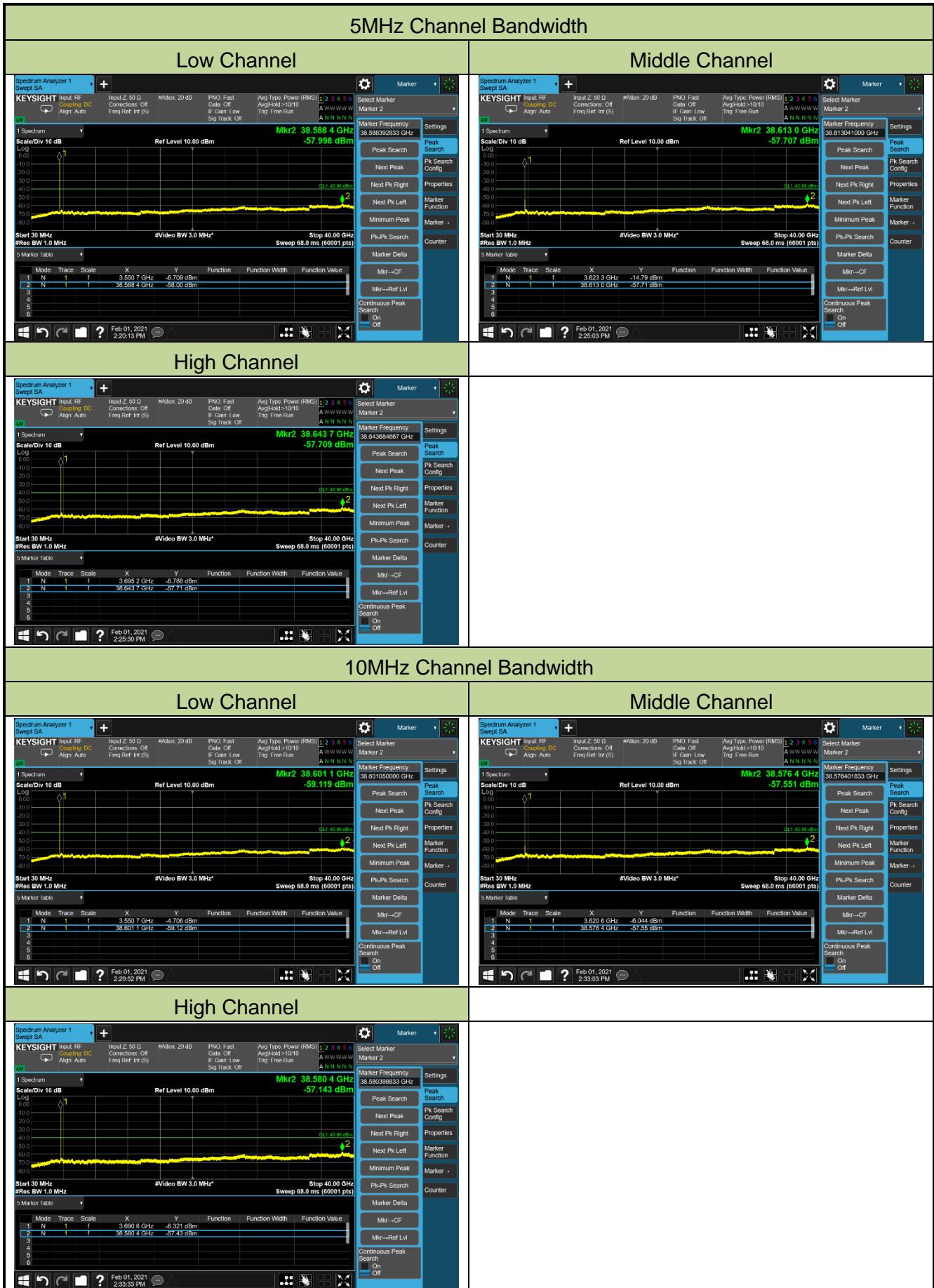
4.6.4. Test Setup



4.6.5. Test Result

Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Candy Luo	Test Date	2021/02/01
Test Band	LTE Band 48_QPSK		

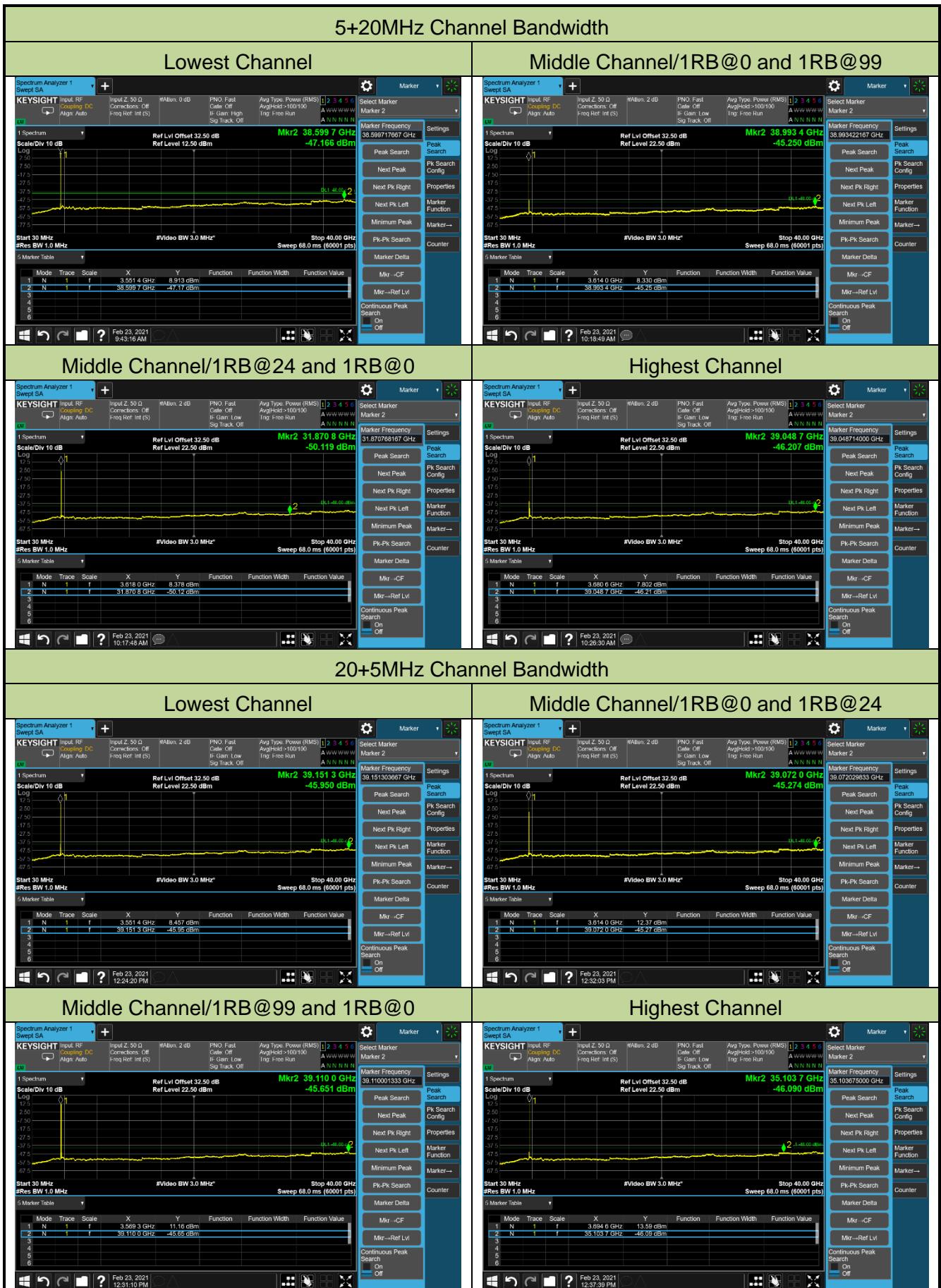
Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm/MHz)	Limit (dBm/MHz)	Result
55265	3552.5	5	30 ~ 40000	-58.00	≤ -40.00	Pass
55900	3625.0	5	30 ~ 40000	-57.71	≤ -40.00	Pass
56715	3697.5	5	30 ~ 40000	-57.71	≤ -40.00	Pass
55290	3555.0	10	30 ~ 40000	-59.12	≤ -40.00	Pass
55900	3625.0	10	30 ~ 40000	-57.55	≤ -40.00	Pass
56690	3695.0	10	30 ~ 40000	-57.14	≤ -40.00	Pass
55315	3557.5	15	30 ~ 40000	-58.40	≤ -40.00	Pass
55900	3625.0	15	30 ~ 40000	-57.20	≤ -40.00	Pass
56665	3692.5	15	30 ~ 40000	-58.16	≤ -40.00	Pass
55340	3550.0	20	30 ~ 40000	-57.95	≤ -40.00	Pass
55900	3625.0	20	30 ~ 40000	-57.44	≤ -40.00	Pass
56640	3690.0	20	30 ~ 40000	-57.67	≤ -40.00	Pass

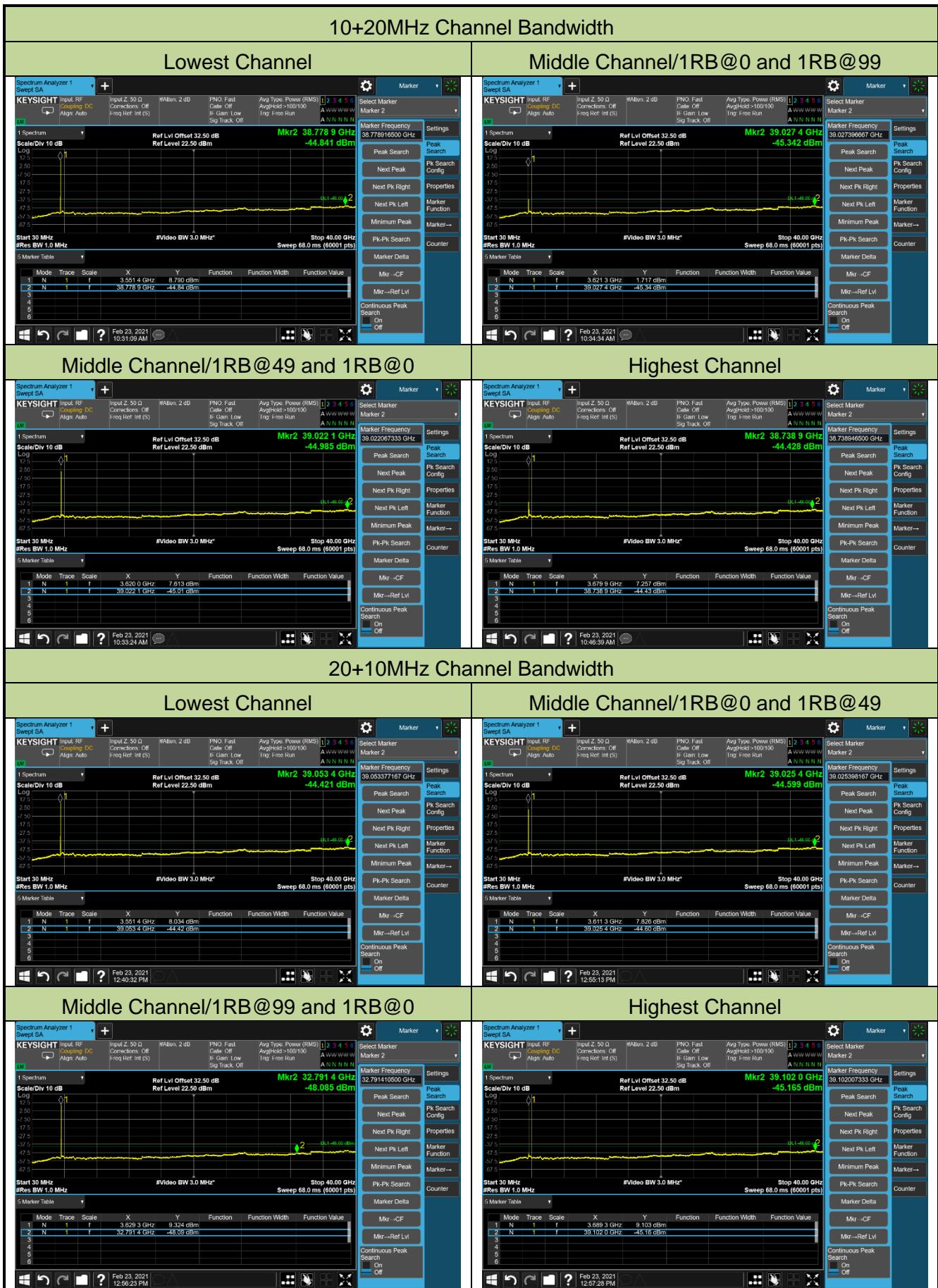


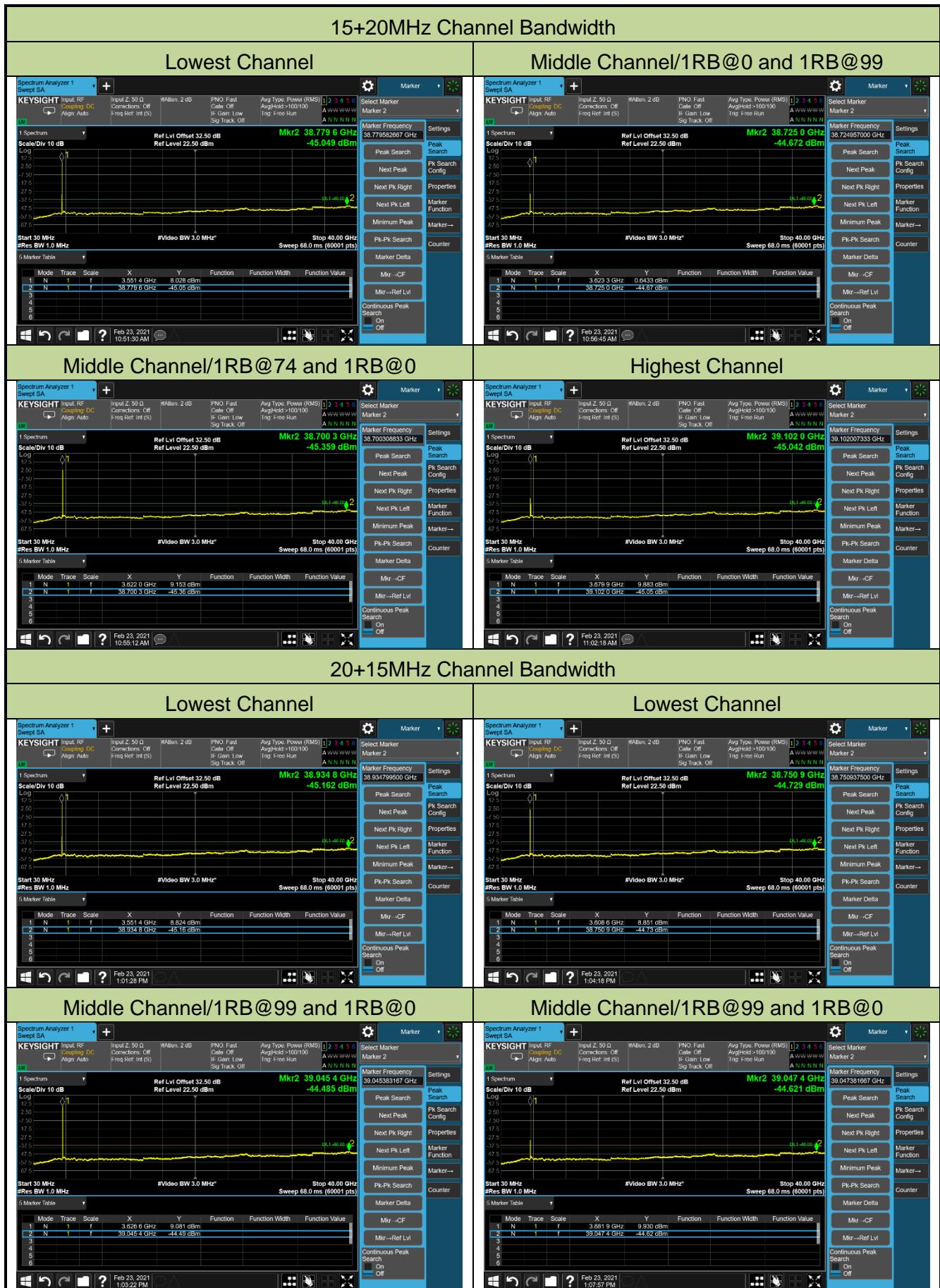


Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Candy Luo	Test Date	2021/02/23
Test Band	Intra-Band CA_48C_QPSK		

Frequency (MHz)		Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
PCC	SCC					
3553.3	3565.0	5+20	30 ~ 40000	-47.17	≤ -40.00	Pass
3615.8	3627.5	5+20	30 ~ 40000	-45.25	≤ -40.00	Pass
3678.3	3690.0	5+20	30 ~ 40000	-46.21	≤ -40.00	Pass
3560.0	3571.7	20+5	30 ~ 40000	-45.95	≤ -40.00	Pass
3622.5	3634.2	20+5	30 ~ 40000	-45.27	≤ -40.00	Pass
3685.0	3696.7	20+5	30 ~ 40000	-46.09	≤ -40.00	Pass
3555.5	3569.9	10+20	30 ~ 40000	-44.84	≤ -40.00	Pass
3615.6	3630.0	10+20	30 ~ 40000	-44.99	≤ -40.00	Pass
3675.6	3690.0	10+20	30 ~ 40000	-44.43	≤ -40.00	Pass
3560.0	3574.4	20+10	30 ~ 40000	-44.42	≤ -40.00	Pass
3620.1	3634.5	20+10	30 ~ 40000	-44.60	≤ -40.00	Pass
3680.1	3694.5	20+10	30 ~ 40000	-45.17	≤ -40.00	Pass
3557.8	3574.9	15+20	30 ~ 40000	-45.05	≤ -40.00	Pass
3615.3	3632.4	15+20	30 ~ 40000	-44.67	≤ -40.00	Pass
3672.9	3690.0	15+20	30 ~ 40000	-45.04	≤ -40.00	Pass
3560.0	3577.1	20+15	30 ~ 40000	-45.16	≤ -40.00	Pass
3617.6	3634.7	20+15	30 ~ 40000	-44.49	≤ -40.00	Pass
3675.1	3692.2	20+15	30 ~ 40000	-44.62	≤ -40.00	Pass
3560.0	3579.8	20+20	30 ~ 40000	-44.73	≤ -40.00	Pass
3615.1	3634.9	20+20	30 ~ 40000	-44.77	≤ -40.00	Pass
3670.2	3690.0	20+20	30 ~ 40000	-44.90	≤ -40.00	Pass









4.7. Radiated Spurious Emission Measurement

4.7.1. Test Limit

Out of band emissions: The power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

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

4.7.2. Test Procedure

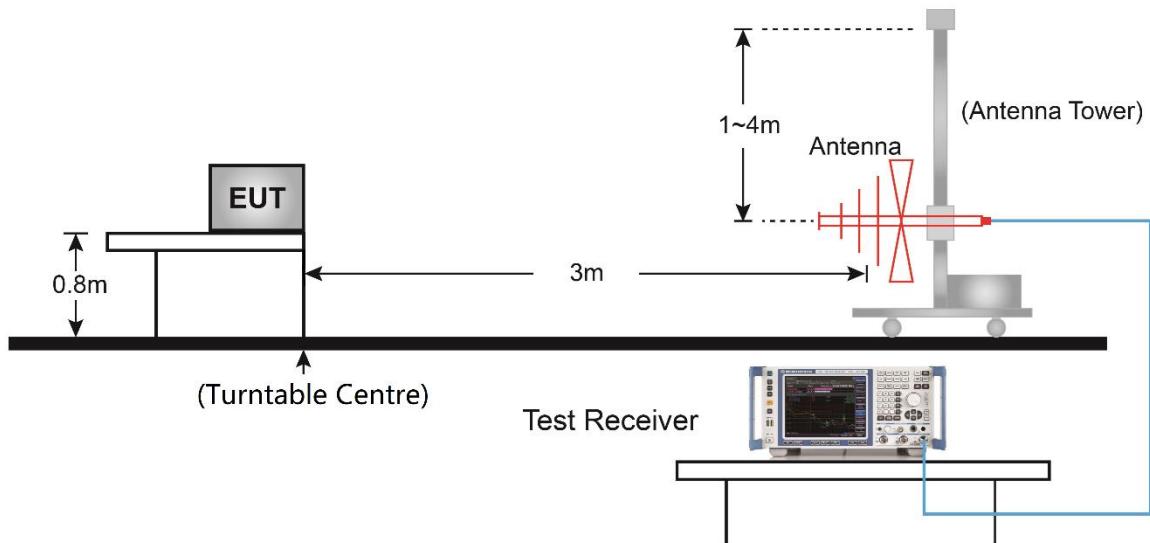
ANSI C63.26-2015 - Section 5.2.7 & 5.5

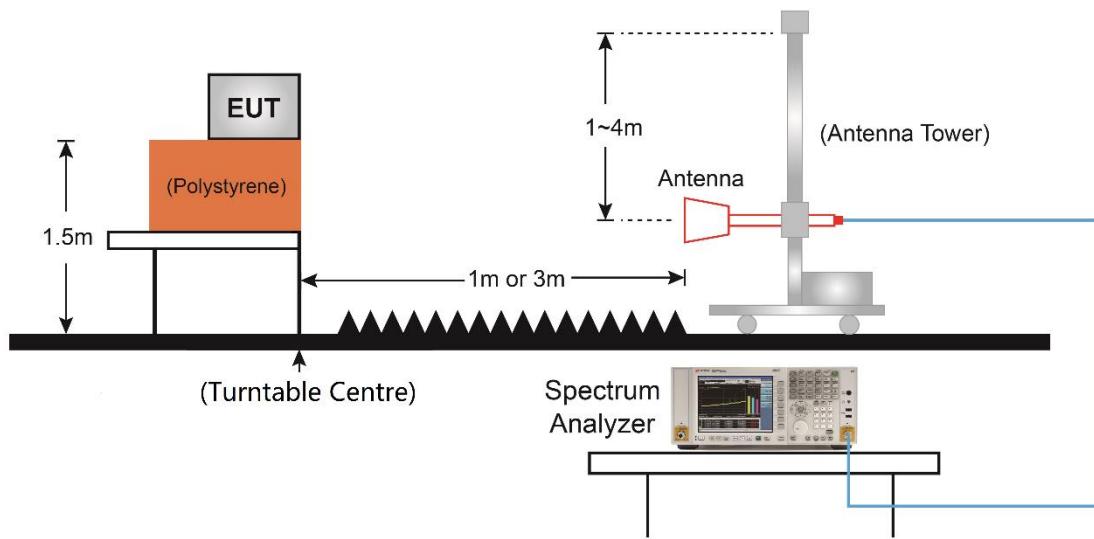
4.7.3. Test Setting

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

4.7.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:

4.7.5. Test Result

Product	5G Sub-6 GHz M.2 Module	Test Site	WZ-AC2
Test Engineer	Tommy Tang	Test Date	2021/02/09
Test Mode	LTE Band 48_5MHz_1RB_QPSK		

Frequency (MHz)	Reading Level (dB μ V)	Factor (dB)	Measure Level(dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Polarization
Bottom Channel							
259.4	31.1	17.1	48.2	55.3	-7.1	Peak	Horizontal
427.2	27.4	21.9	49.3	55.3	-6.0	Peak	Horizontal
258.4	26.3	17.1	43.4	55.3	-11.9	Peak	Vertical
362.7	30.6	20.2	50.8	55.3	-4.5	Peak	Vertical
8123.0	39.1	10.3	49.4	55.3	-5.9	Peak	Horizontal
9024.0	37.8	11.8	49.6	55.3	-5.7	Peak	Horizontal
7298.5	37.7	9.4	47.1	55.3	-8.2	Peak	Vertical
8514.0	37.6	10.5	48.1	55.3	-7.2	Peak	Vertical
Middle Channel							
200.7	28.4	15.0	43.4	55.3	-11.9	Peak	Horizontal
427.7	23.2	22.0	45.2	55.3	-10.1	Peak	Horizontal
260.4	27.1	17.1	44.2	55.3	-11.1	Peak	Vertical
448.1	20.4	22.7	43.1	55.3	-12.2	Peak	Vertical
8097.5	38.1	10.5	48.6	55.3	-6.7	Peak	Horizontal
8803.0	38.2	11.5	49.7	55.3	-5.6	Peak	Horizontal
7978.5	40.3	10.2	50.5	55.3	-4.8	Peak	Vertical
8956.0	38.7	11.4	50.1	55.3	-5.2	Peak	Vertical
Top Channel							
200.2	27.5	15.0	42.5	55.3	-12.8	Peak	Horizontal
399.6	25.0	21.2	46.2	55.3	-9.1	Peak	Horizontal
259.4	27.0	17.1	44.1	55.3	-11.2	Peak	Vertical
403.5	25.5	21.2	46.7	55.3	-8.6	Peak	Vertical
7128.5	39.2	9.5	48.7	55.3	-6.6	Peak	Horizontal
8174.0	39.2	10.2	49.4	55.3	-5.9	Peak	Horizontal
7111.5	37.8	9.4	47.2	55.3	-8.1	Peak	Vertical
8089.0	38.5	10.4	48.9	55.3	-6.4	Peak	Vertical

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB).

4.8. End User Device Additional Requirement (CBSD Protocol)

4.8.1. Test Limit

End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by aCBSD, including the frequencies and power limits for their operation.

An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD

4.8.2. Test Procedure

KDB 940660 D01 v02, WINNF-TS-0122 V1.0.0

4.8.3. Test Setting

The EUT was connected via an RF cable to a certified CBSD (Ruckus Wireless, Inc. FCC ID: S9GQ910US00) and spectrum analyzer. The following procedure is performed by applying WINNF-TS-0122 CBRS CBSD Test Specification.

Step 1:

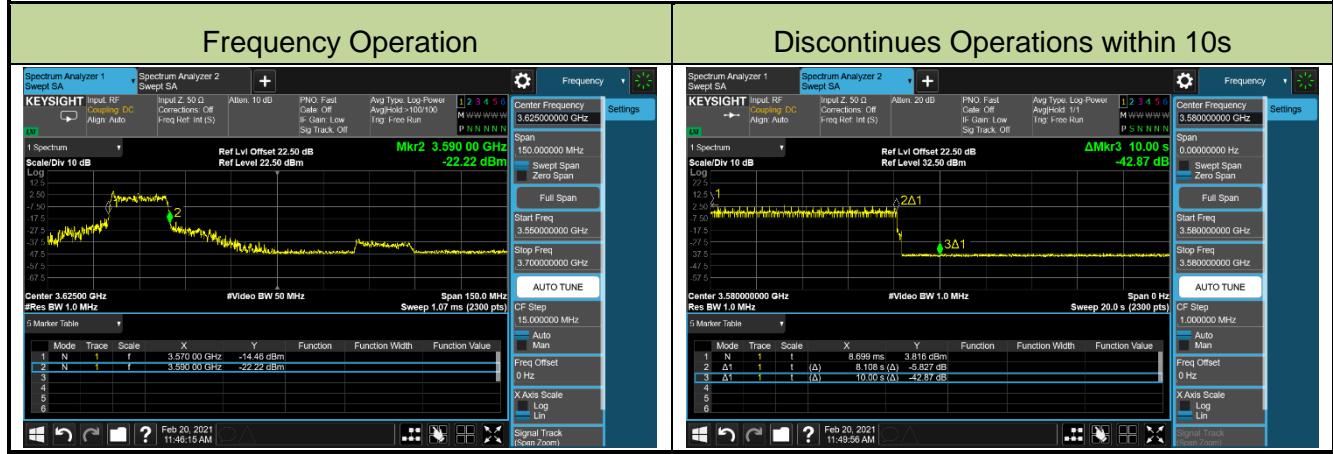
- a. Setup WINNF.PT.C.HBT.1 with 3570 ~ 3590MHz and power level at 13 dBm/MHz.
- b. Enable AP service from Ruckus LTE Cloud management.
- c. Check EUT Tx frequency and power.
- d. Disable AP service from Ruckus LTE Cloud management and check EUT stop transmission within 10s.

Step 2:

- a. Setup WINNF.PT.C.HBT.1 with 3670 ~ 3690MHz and power level at 8 dBm/MHz.
- b. Enable AP service from Ruckus LTE Cloud management.
- c. Check EUT Tx frequency and power.
- d. Disable AP service from Ruckus LTE Cloud management and check EUT stop transmission within 10s.

4.8.4. Test Result

Product	5G Sub-6 GHz M.2 Module	Test Site	WZ-SR6
Test Engineer	Larry Yan	Test Date	2021/02/20
Test Mode	CBSD transmit at 3560MHz (20MHz BW), 13dBm/MHz		

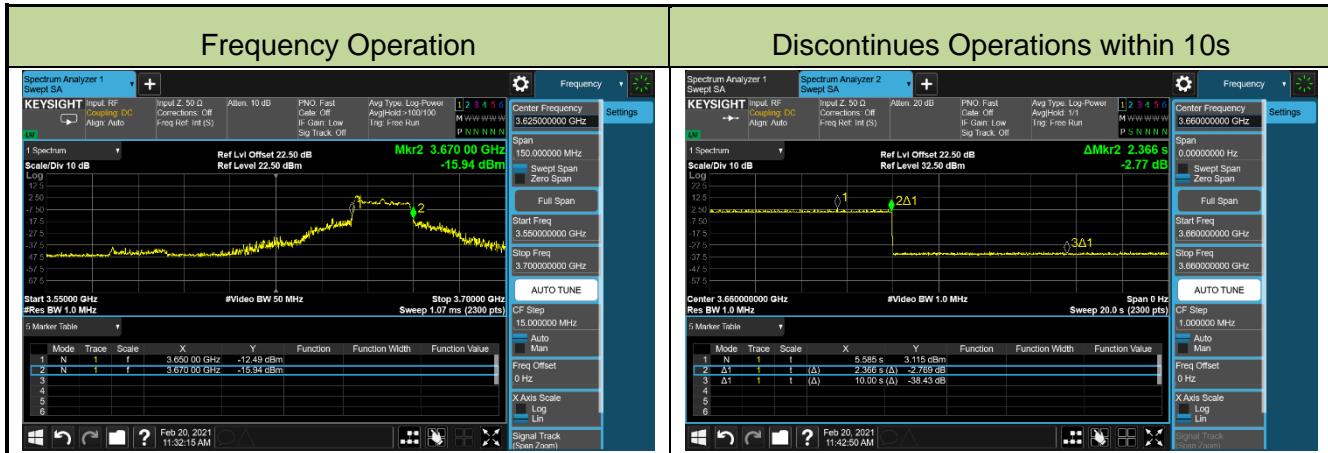


Marker 1: CBSD sends instructions to discontinue LTE operations.

Marker 2: EUT discontinues operation.

Marker 3: 10 seconds elapsed time from CBSD sending instructions to EUT.

Product	5G Sub-6 GHz M.2 Module	Test Site	WZ-SR6
Test Engineer	Larry Yan	Test Date	2021/02/20
Test Mode	CBSD transmit at 3680MHz (20MHz BW), 8dBm/MHz		



Marker 1: CBSD sends instructions to discontinue LTE operations.

Marker 2: EUT discontinues operation.

Marker 3: 10 seconds elapsed time from CBSD sending instructions to EUT.

5. CONCLUSION

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

Appendix A - Test Setup Photograph

Refer to "2101RSU049-UT" file.

Appendix B - EUT Photograph

Refer to "2101RSU049-UE" file.