RF MEASUREMENT REPORT

FCC ID:	XMR2022EM120KGL
Application:	Quectel Wireless Solutions Company Limited
Product:	LTE-A Cat 12 M.2 Module
Model No.:	EM120K-GL
Brand Name:	Quectel
FCC Rule Part(s):	Part 90 Subpart R
Result:	Complies
Test Date:	2022-03-22 ~ 2022-05-12

Reviewed By: Sunny Sun

Approved By: Robin Wu

Revision History

Report No.	Version	Description	Issue Date	Note
2203RSU046-U3	Rev. 01	Initial Report	2022-05-28	Valid

CONTENTS

Description Page

1. General Information 5

1.1. Applicant 5
1.2. Manufacturer 5
1.3. Testing Facility 5
1.4. Product Information 6
1.5. Product Specification under Test 6
1.6. Description of Available Antennas 7
1.7. Test Methodology 7
1.8. Configuration of Tested System 8
1.9. Test Environment Condition 8

2. Test Equipment Calibration Date 9

3. Measurement Uncertainty 11

4. Test Result 12

4.1. Summary 12
4.2. Occupied Bandwidth Measurement 13
4.2.1. Test Limit 13
4.2.2. Test Procedure 13
4.2.3. Test Setting 13
4.2.4. Test Setup 13
4.2.5. Test Result 13
4.3. Frequency Stability Measurement 14
4.3.1. Test Limit 14
4.3.2. Test Procedure 14
4.3.3. Test Setting 14
4.3.4. Test Setup 15
4.3.5. Test Result 15
4.4. Equivalent Isotropically Radiated Power Measurement 16
4.4.1. Test Limit 16
4.4.2. Test Procedure 16
4.4.3. Test Setting 16
4.4.4. Test Setup 16
4.4.5. Test Result 17
4.5. Band Edge Measurement 18
4.5.1. Test Limit 18
4.5.2. Test Procedure 18

4.5.3. Test Setting 18
4.5.4. Test Setup 19
4.5.5. Test Result 19
4.6. Emisson Mask Measurement 20
4.6.1. Test Limit 20
4.6.2. Test Procedure 20
4.6.3. Test Setting 20
4.6.4. Test Setup 21
4.6.5. Test Result 21
4.7. Conducted Spurious Emissions Measurement 22
4.7.1. Test Limit 22
4.7.2. Test Procedure 22
4.7.3. Test Setting 22
4.7.4. Test Setup 23
4.7.5. Test Result 23
4.8. Radiated Spurious Emissions Measurement 24
4.8.1. Test Limit 24
4.8.2. Test Procedure 24
4.8.3. Test Setting 24
4.8.4. Test Setup 25
4.8.5. Test Result 25

Appendix A - Test Result 26

A.1 Occupied Bandwidth Test Result 26
A.2 Frequency Stability Test Result 28
A.3 Equivalent Isotropically Radiated Power Test Result 29
A.4 Band Edge Test Result 32
A.5 Emisson Mask Test Result 34
A.6 Conducted Supurious Emissions Test Result 37
A.7 Radiated Spurious Emissions Test Result 39

Appendix B - Test Setup Photograph 40

Appendix C - EUT Photograph 41

1. General Information

1.1. Applicant

Quectel Wireless Solutions Company Limited

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

1.2. Manufacturer

Quectel Wireless Solutions Company Limited

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

1.3. Testing Facility

☒	**Test Site – MRT Suzhou Laboratory**				
	Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China **Laboratory Location (Suzhou - SIP)** 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China				
	Laboratory Accreditations				
	A2LA: 3628.01		CNAS: L10551		
	FCC: CN1166		ISED: CN0001		
	VCCI:	☐R-20025	☐G-20034	☐C-20020	☐T-20020
		☐R-20141	☐G-20134	☐C-20103	☐T-20104
☐	**Test Site – MRT Shenzhen Laboratory**				
	Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China				
	Laboratory Accreditations				
	A2LA: 3628.02		CNAS: L10551		
	FCC: CN1284		ISED: CN0105		
☐	**Test Site – MRT Taiwan Laboratory**				
	Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)				
	Laboratory Accreditations				
	TAF: L3261-190725				
	FCC: 291082, TW3261		ISED: TW3261		

1.4. Product Information

Product Name	LTE-A Cat 12 M.2 Module
Model No.	EM120K-GL
Brand Name	Quectel
IMEI	861293060003570
UTRA Specification	Band 2, 4, 5
E-UTRA Specification	FDD Band: 2, 4, 5, 7, 12, 13, 14, 17, 25, 26, 30, 66, 71 TDD Band: 38, 41, 46
GNSS Specification	GPS, GLONASS, Bei Dou, Galileo
Supply Voltage	3.135 ~ 4.4Vdc, typical 3.7Vdc
Operating Temperature:	-25 ~ 75 °C
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Product Specification under Test

E-UTRA Specification	
Single Band	FDD Band: 14
Modulation	UL up to 64QAM, DL up to 256QAM
FDD T_X Frequency Range	Band 14: 788 ~ 798 MHz
FDD R_X Frequency Range	Band 14: 758 ~ 768 MHz

1.6. Description of Available Antennas

Technology	Frequency Range (MHz)	Antenna Type	MaxPeak Gain (dBi)
LTE Band 2	1850 ~ 1910	Dipole	0.25
LTE Band 4	1710 ~ 1755		1.47
LTE Band 5	824 ~ 849		2.68
LTE Band 7	2500 ~ 2570		0.55
LTE Band 12	699 ~ 716		-0.20
LTE Band 13	777 ~ 787		1.54
LTE Band 14	788 ~ 798		2.42
LTE Band 17	704~ 716		-0.20
LTE Band 25	1850 ~ 1915		0.25
LTE Band 26	814~849		2.87
LTE Band 30	2305 ~ 2315		-3.06
LTE Band 38	2570 ~ 2620		-0.23
LTE Band 41	2496 ~ 2690		0.78
LTE Band 66	1710 ~ 1780		1.47
LTE Band 71	663 ~ 698		1.22

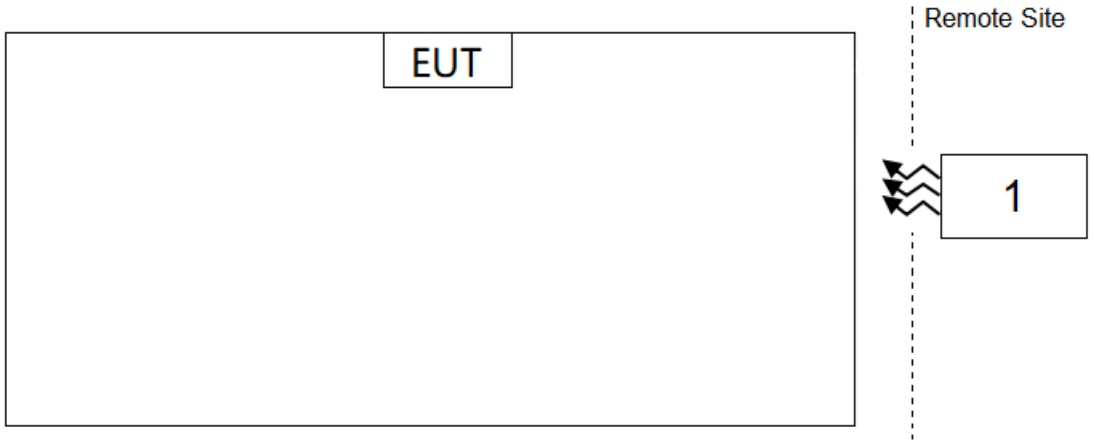
Note: The typical antennas use to calculate the ERP (EIRP).

1.7. Test Methodology

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC CFR 47 Part 90
- ANSI C63.26: 2015
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01: Determining ERP and EIRP

1.8. Configuration of Tested System



Product		Manufacturer	Model No.
1	Wideband Radio Communication Tester	R&S	CMW 500

1.9. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20% ~ 75%RH

2. Test Equipment Calibration Date

Instrument	Manufacturer	Model No.	Asset No.	Last Cali. Date	Cali. Due Date	Test Site
Communication Tester	R&S	CMU 200	MRTSUE06009	1 year	2022/9/7	SIP-SR1
Temperature Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2022/10/10	WZ-TR3
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2022/12/29	SIP-AC1
Vibration Test System	DongLing	ES-1-150	MRTSUE06206	1 year	2022/8/8	WZ-TR3
Communication Tester	R&S	CMW500	MRTSUE06243	1 year	2022/10/10	SIP-SR1
Thermohygrometer	testo	608-H1	MRTSUE06362	1 year	2023/2/15	WZ-SR6
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2022/6/28	WZ-TR3
Shielding Room	HUAMING	WZ-SR6	MRTSUE06443	/	/	WZ-SR6
Signal Generator	Keysight	E8257D	MRTSUE06453	1 year	2022/6/24	SIP-SR1
Anechoic Chamber	RIKEN	SIP-AC1	MRTSUE06554	1 year	2022/12/23	SIP-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2022/6/24	SIP-AC1
Signal Analyzer	Keysight	N9020B	MRTSUE06583	1 year	2022/10/10	WZ-SR6
Preamplifier	EMCI	EMC051845SE	MRTSUE06600	1 year	2022/11/8	SIP-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06603	1 year	2022/10/31	SIP-AC1
Signal Analyzer	Keysight	N9020B	MRTSUE06604	1 year	2022/9/7	SIP-AC1
Signal Generator	Keysight	N5173B	MRTSUE06606	1 year	2022/11/29	WZ-SR6
Horn Antenna	R&S	HF907	MRTSUE06610	1 year	2022/8/5	SIP-AC1
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2022/6/24	SIP-AC1
Thermohygrometer	testo	608-H1	MRTSUE06616	1 year	2022/11/2	SIP-AC1
Thermohygrometer	testo	608-H1	MRTSUE06620	1 year	2022/11/28	SIP-AC1
Thermohygrometer	testo	622	MRTSUE06629	1 year	2023/1/6	SIP-SR1
Preamplifier	EMCI	EMC001330	MRTSUE06643	1 year	2023/1/13	SIP-AC1
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06645	1 year	2022/8/26	SIP-AC1
5G Wireless Test Platform	Keysight	E7515B	MRTSUE06903	1 year	2022/11/23	SIP-SR1
Signal Generator	Keysight	E8257D	MRTSUE06904	1 year	2022/11/23	SIP-SR1
DC POWER MODULE	Keysight	N6743B	MRTSUE06905	/	/	SIP-SR1
DC POWER MODULE	Keysight	N6743B	MRTSUE06906	/	/	SIP-SR1
Low-Profile Modular Power System Mainframe	Keysight	N6700C	MRTSUE06907	/	/	SIP-SR1
FR1 Switching Unit	Keysight	C8880A	MRTSUE06908	/	/	SIP-SR1
Signal Analyzer	Keysight	N9021B	MRTSUE06915	1 year	2022/12/29	SIP-SR1
Temperature Chamber	BAOYT	BYG-80CL	MRTSUE06932	1 year	2023/2/27	SIP-SR1
Loop Antenna	Schwarzbeck	FMZB 1519 B	MRTSUE06937	1 year	2023/3/14	SIP-AC1
5G Wireless Test Platform	Keysight	E7515B	MRTSUE06942	1 year	2023/3/3	WZ-SR6
Shielding Room	MIX-BEP	SIP-SR1	MRTSUE06948	/	/	SIP-SR1

Millimeter-Wave Transceiver for 5G	Keysight	M1740A	MRTSUE06954	1 year	2022/6/2	SIP-SR1
Millimeter-Wave Transceiver for 5G	Keysight	M1740A	MRTSUE06955	1 year	2022/6/2	SIP-SR1
5G Wireless Test Platform	Keysight	E7515B	MRTSUE06956	1 year	2022/6/10	SIP-SR1
Common Interface Unit	Keysight	E7770A	MRTSUE06957	/	/	SIP-SR1
USB Power Sensor	Keysight	U8488A	MRTSUE06958	1 year	2022/7/8	SIP-SR1
Radio Communication Analyzer	Anritsu	MT8821C	MRTSUE06960	1 year	2022/7/1	WZ-SR6
Radio Communication Test Station	Anritsu	MT8000A	MRTSUE06961	1 year	2022/7/1	WZ-SR6
Signal Analyzer	Keysight	N9010B	MRTSUE07028	1 year	2022/12/9	SIP-SR1

Software	Version	Function
EMI Software	V3.0.0	EMI Test Software

3. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Radiated Spurious Emissions
Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 9kHz ~ 300MHz: 5.04dB 300MHz ~ 1GHz: 4.95dB 1GHz ~ 40GHz: 6.40dB Vertical: 9kHz ~ 300MHz: 5.24dB 300MHz ~ 1GHz: 6.03dB 1GHz ~ 40GHz: 6.40dB
Conducted Spurious Emissions
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.13dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.28%
Frequency Stability
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 76.2Hz

4. Test Result

4.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Verdict
2.1049	Occupied Bandwidth	Conducted	Pass
2.1055, 90.539(e)	Frequency Stability		Pass
90.542(a)(7)	Equivalent Radiated Power		Pass
2.1051, 90.543(e)(2)(3)	Band Edge		Pass
2.1051, 90.210(n)	Emission Mask		
2.1051, 90.543(e)(3)	Spurious Emission		
2.1053, 90.543(e)(3) 90.543(f)	Spurious Emissions	Radiated	Pass

Notes:

1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part ofthe system to connect the EUT to the analyzer at all frequencies of interest.

2) All supported modulation types were evaluated. The worst-case emission of modulation was selected. Therefore, the Frequency Stability, Channel Band Edge, Radiated & Conducted Spurious Emission were presented worst-case in the test report.

4.2. Occupied Bandwidth Measurement

4.2.1. Test Limit

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

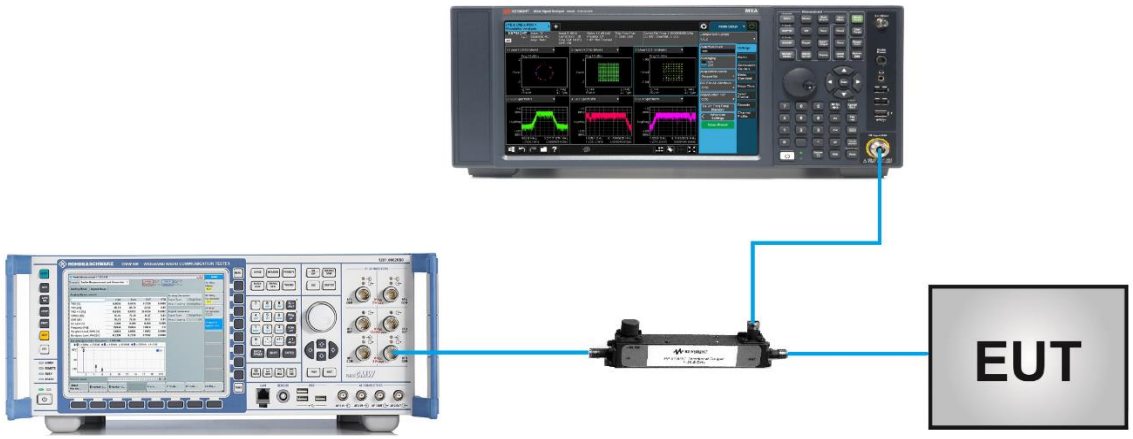
4.2.2. Test Procedure

ANSI C63.26-2015 - Section 5.4

4.2.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency
2. RBW = The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace to stabilize
8. Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

4.2.4. Test Setup



4.2.5. Test Result

Refer to Appendix A.1.

4.3. Frequency Stability Measurement

4.3.1. Test Limit

The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked

4.3.2. Test Procedure

ANSI C63.26-2015 - Section 5.6

4.3.3. Test Setting

Frequency Stability Under Temperature Variations:

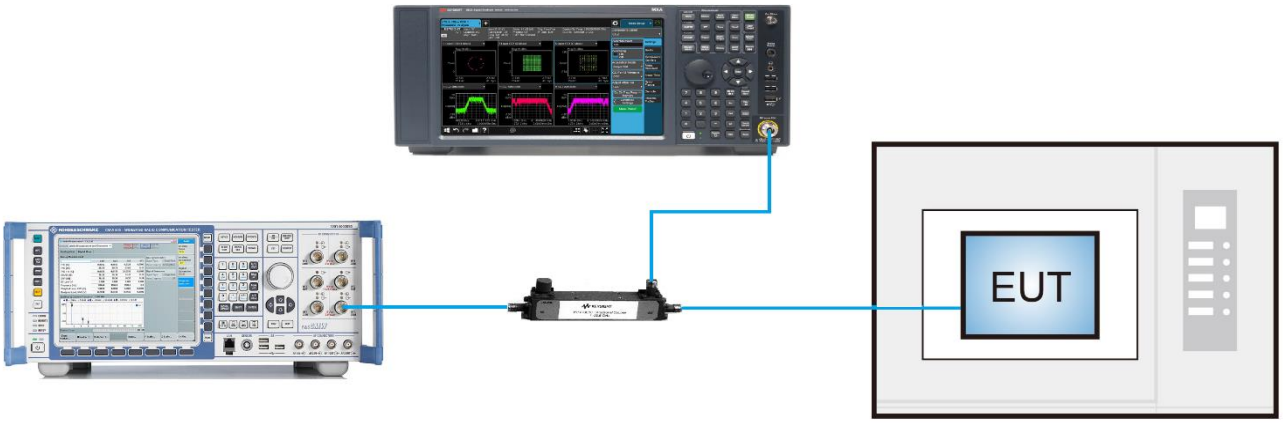
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the inputvoltage to specify extreme voltage variation (±15%) and end point, record the maximum frequency change.

4.3.4. Test Setup



4.3.5. Test Result

Refer to Appendix A.2.

4.4. Equivalent Isotropically Radiated Power Measurement

4.4.1. Test Limit

Control stations and mobile stations transmitting in the 758-768 MHz band and the788-798 MHz band are limited to 30 watts ERP.

4.4.2. Test Procedure

ANSI C63.26-2015 - Section 5.2

4.4.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation (1) as follows:

ERP or EIRP = P_{Meas} + G_T

where

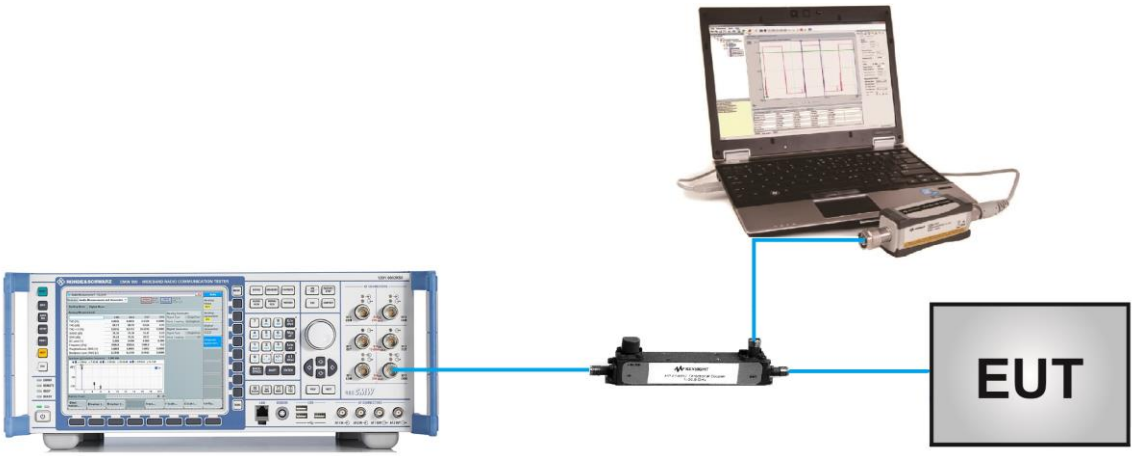
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

ERP = EIRP -2.15

4.4.4. Test Setup



4.4.5. Test Result

Refer to Appendix A.3.

4.5. Band Edge Measurement

4.5.1. Test Limit

For operations in the 758-768 MHz and the 788-798 MHz bands, 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:

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

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

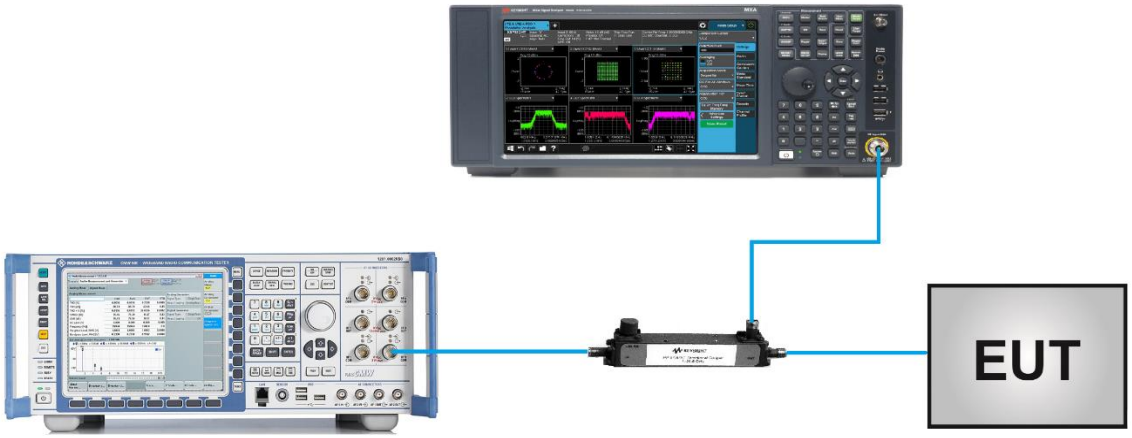
4.5.2. Test Procedure

ANSI C63.26-2015 - Section5.7

4.5.3. Test Setting

1. Set the analyzer frequency to low or high channel
2. RBW ≥ The nominal RBW shall be in the range of 1% of the anticipated OBW (in the 1MHz band immediately outside and adjacent to the band edge). For improvement of the accuracy in the measurement of the average power of a noise-like emission, a RBW narrower than the specified reference bandwidth can be used (generally limited to no less than 1% of the OBW), provided that a subsequent integration is performed over the full required measurement bandwidth. This integration should be performed using the spectrum analyzer’s band power functions.
3. VBW ≥ 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.

4.5.4. Test Setup



4.5.5. Test Result

Refer to Appendix A.4.

4.6. Emisson Mask Measurement

4.6.1. Test Limit

Emission Mask B.For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

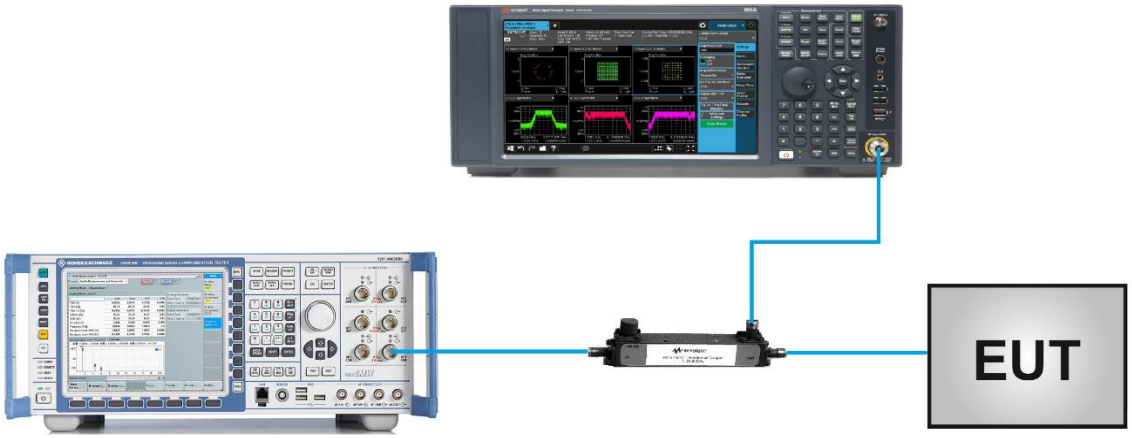
4.6.2. Test Procedure

ANSI C63.26-2015 - Section5.7

4.6.3. Test Setting

1. Set the analyzer frequency to low or high channel
2. RBW ≥ The nominal RBW shall be in the range of 1% of the anticipated OBW (in the 1MHz band immediately outside and adjacent to the band edge). For improvement of the accuracy in the measurement of the average power of a noise-like emission, a RBW narrower than the specified reference bandwidth can be used (generally limited to no less than 1% of the OBW), provided that a subsequent integration is performed over the full required measurement bandwidth. This integration should be performed using the spectrum analyzer’s band power functions.
3. VBW ≥ 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

Refer to Appendix A.5.

4.7. Conducted Spurious Emissions Measurement

4.7.1. 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 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.

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

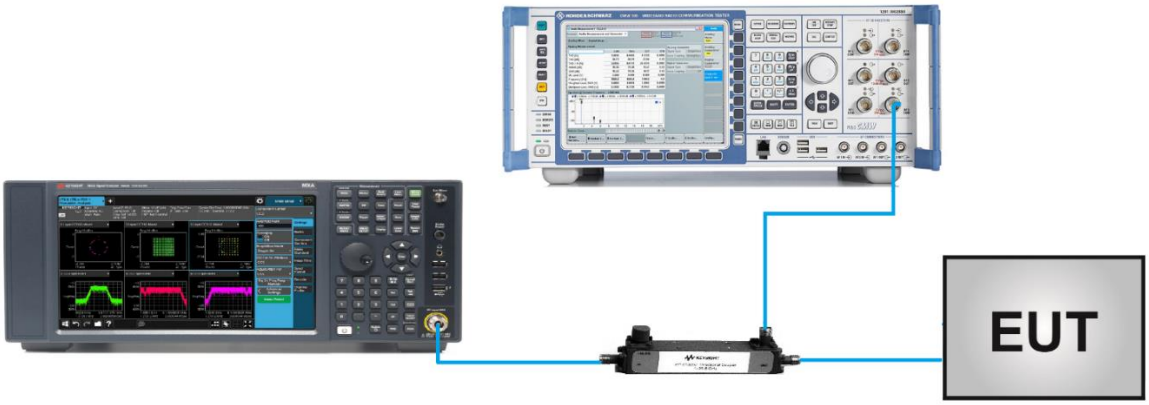
4.7.2. Test Procedure

ANSI C63.26-2015 - Section 5.7

4.7.3. Test Setting

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

4.7.4. Test Setup



4.7.5. Test Result

Refer to Appendix A.6.

4.8. Radiated Spurious Emissions Measurement

4.8.1. Test Limit

Out of band emissions: The powerof any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factorof 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, atransmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

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

4.8.2. Test Procedure

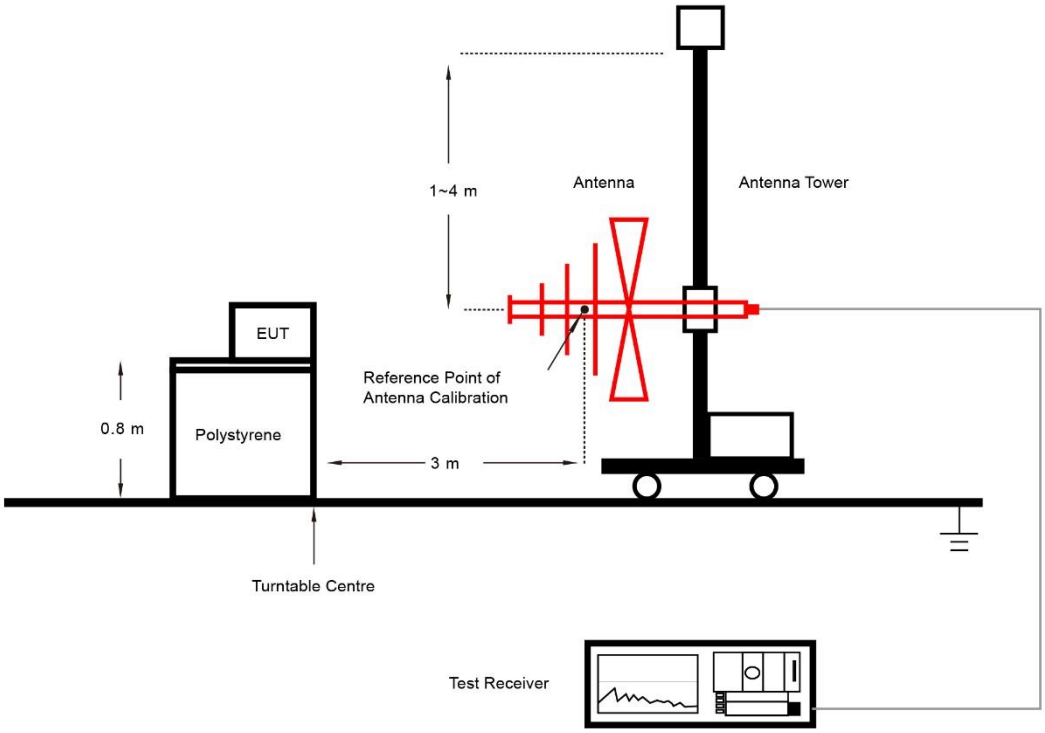
ANSI C63.26-2015 - Section 5.2.7 & 5.5

4.8.3. Test Setting

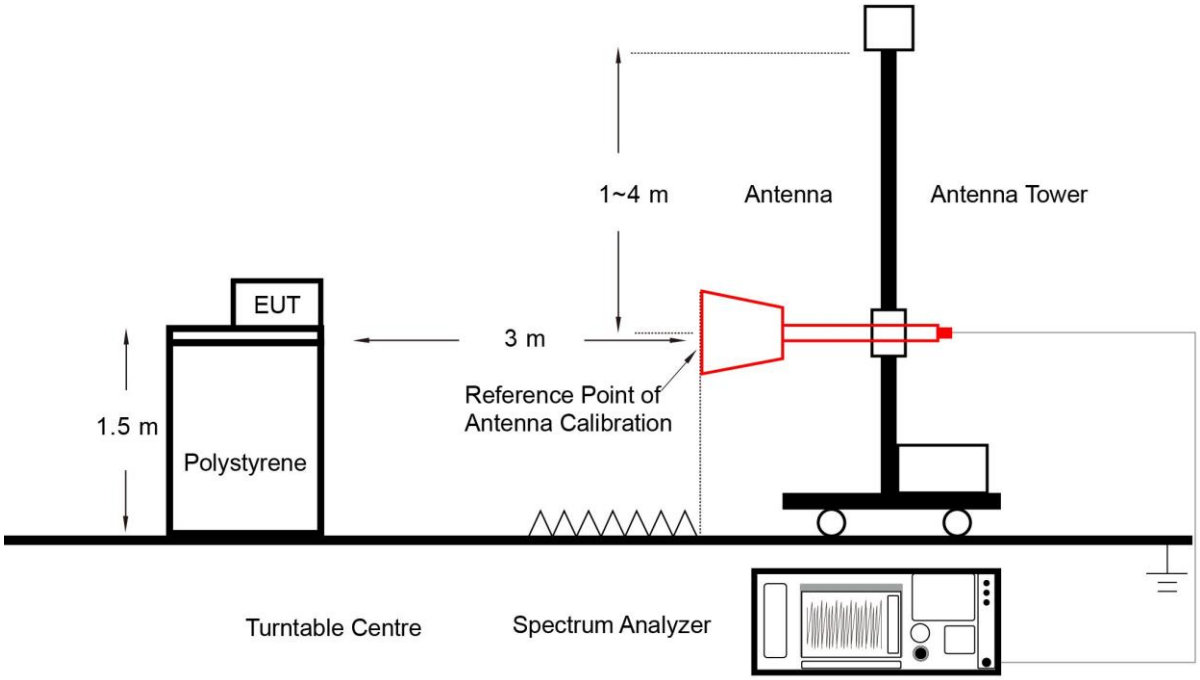
1. RBW = 1MHz
2. VBW ≥ 3*RBW
3. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period)
4. Detector = Peak
5. Trace mode = max hold
6. The trace was allowed to stabilize

4.8.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.8.5. Test Result

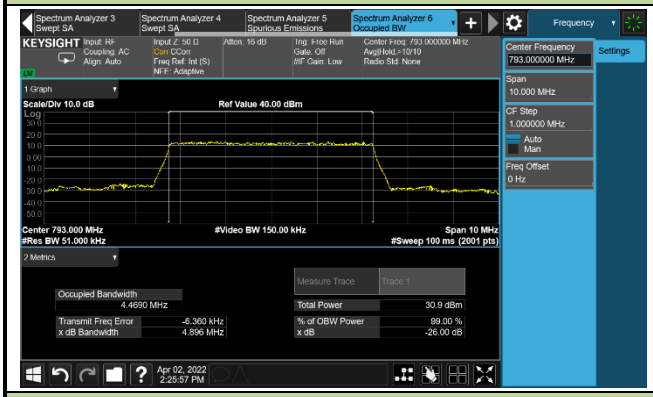
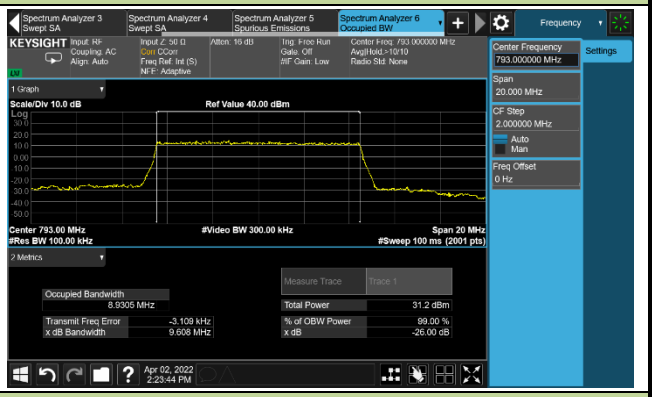
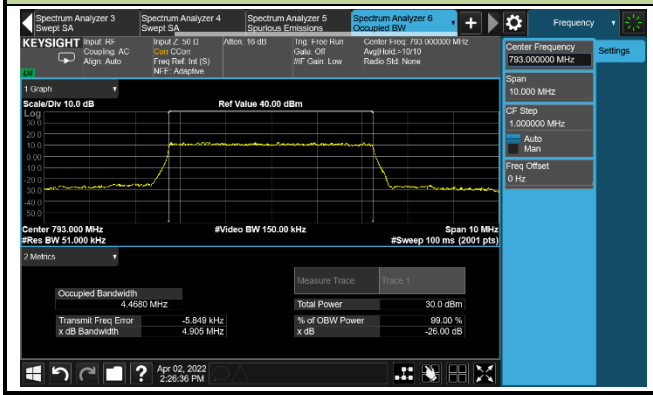
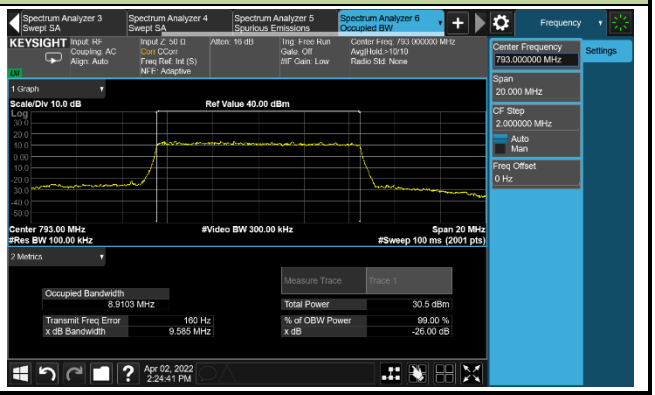
Refer to Appendix A.7.

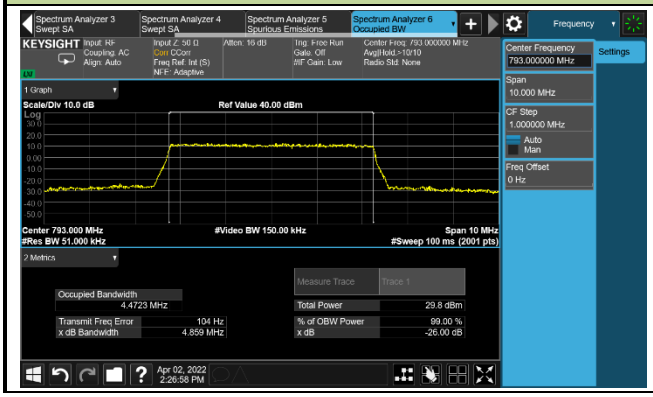
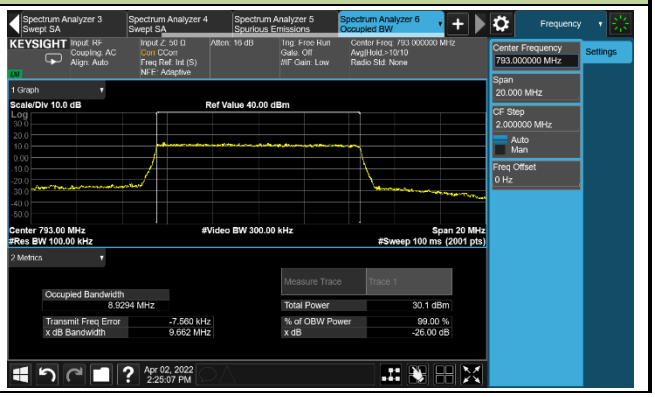
Appendix A - Test Result

A.1 Occupied Bandwidth Test Result

Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2022/04/02	Test Band	Band 14

Modulation	Frequency (MHz)	Bandwidth (MHz)	99% Bandwidth (MHz)
QPSK	793.0	5	4.47
		10	8.93
16QAM	793.0	5	4.47
		10	8.91
64QAM	793.0	5	4.47
		10	8.93

99% Bandwidth - QPSK	
5MHz Channel Bandwidth	10MHz Channel Bandwidth
	
99% Bandwidth - 16QAM	
5MHz Channel Bandwidth	10MHz Channel Bandwidth
	

99% Bandwidth - 64QAM	
5MHz Channel Bandwidth	10MHz Channel Bandwidth
	

A.2 Frequency Stability Test Result

Test Site	WZ-TR3	Test Engineer	Caitlin Chen
Test Date	2022/04/11~2022/04/13	Test Band	Band 14

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.7	- 30	-0.0072
	- 20	-0.0064
	- 10	0.0015
	0	-0.0053
	+ 10	-0.0073
	+ 20	-0.0074
	+ 30	-0.0064
	+ 40	-0.0069
	+ 50	-0.0018
4.4	+ 20	0.0018
3.135	+ 20	-0.0062

A.3 Equivalent Isotropically Radiated Power Test Result

Test Site	WZ-SR6	Test Engineer	Cloud Guo
Test Date	2022/03/21	Test Band	Band 14

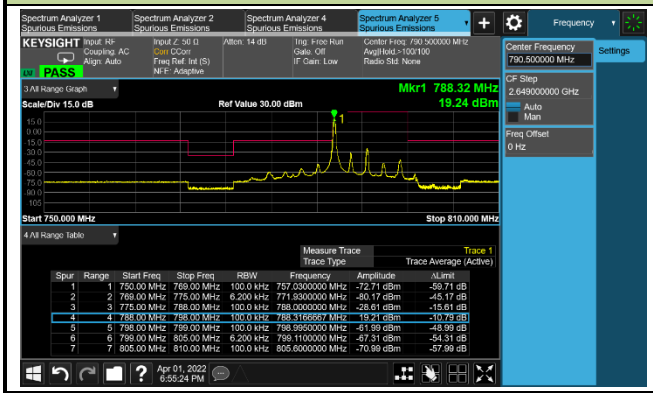
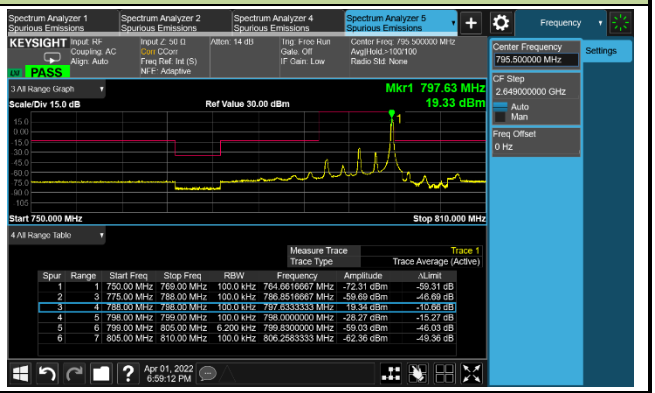
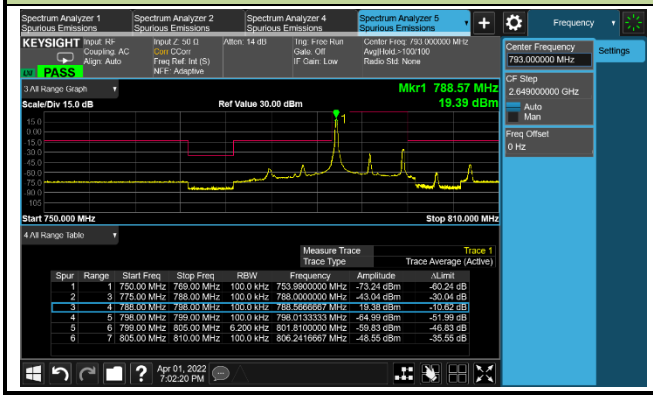
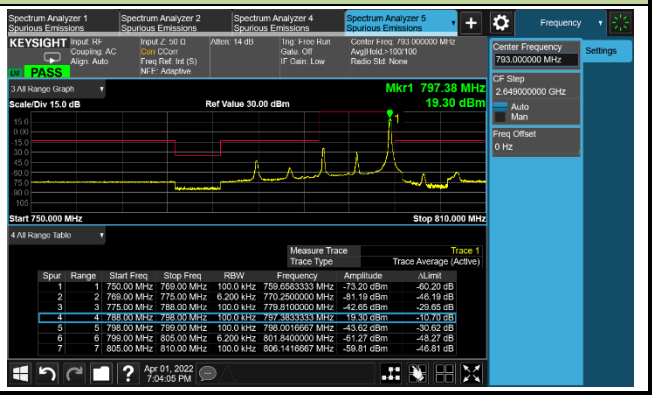
Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
QPSK						
790.5	5	1	0	23.03	23.30	< 44.77
793.0				23.04	23.31	< 44.77
795.5				22.99	23.26	< 44.77
790.5	5	1	12	22.97	23.24	< 44.77
793.0				23.05	23.32	< 44.77
795.5				22.95	23.22	< 44.77
790.5	5	1	24	22.91	23.18	< 44.77
793.0				22.98	23.25	< 44.77
795.5				22.96	23.23	< 44.77
790.5	5	25	0	22.06	22.33	< 44.77
793.0				22.05	22.32	< 44.77
795.5				22.10	22.37	< 44.77
793.0	10	1	0	23.03	23.30	< 44.77
793.0			24	23.00	23.27	< 44.77
793.0			49	22.96	23.23	< 44.77
793.0	10	50	0	22.12	22.39	< 44.77
Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15						

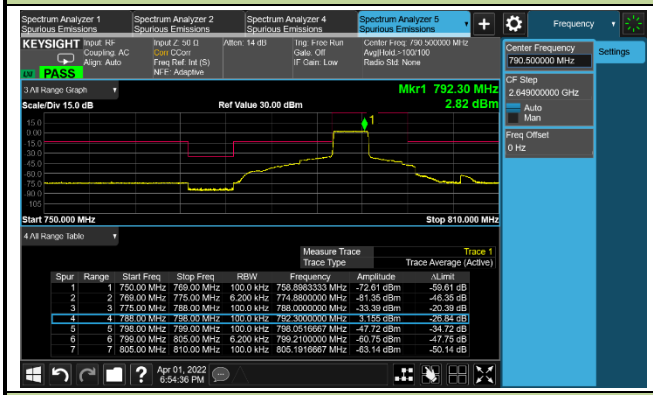
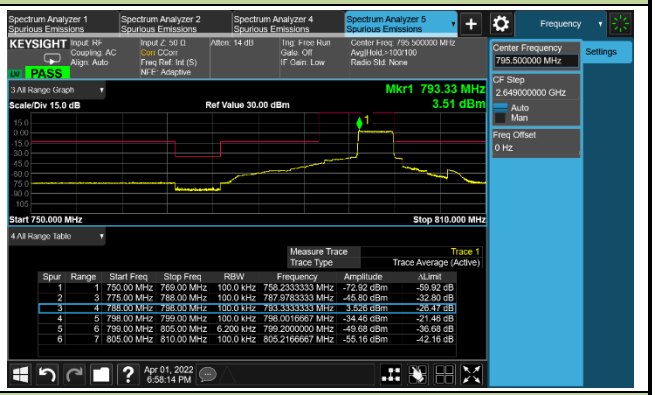
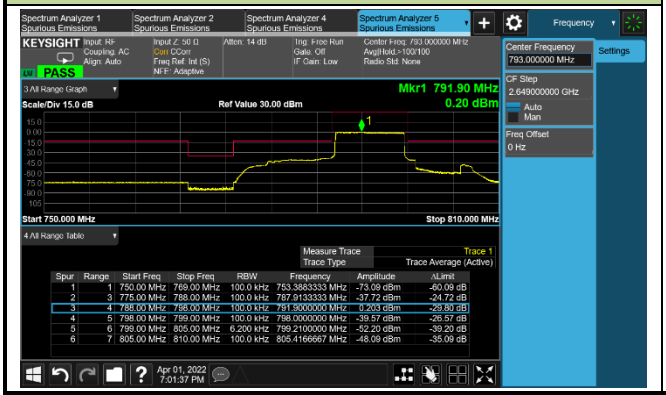
Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
16QAM						
790.5	5	1	0	22.40	22.67	< 44.77
793.0				22.30	22.57	< 44.77
795.5				22.50	22.77	< 44.77
790.5	5	1	12	22.28	22.55	< 44.77
793.0				22.36	22.63	< 44.77
795.5				22.24	22.51	< 44.77
790.5	5	1	24	22.30	22.57	< 44.77
793.0				22.34	22.61	< 44.77
795.5				22.29	22.56	< 44.77
790.5	5	25	0	21.07	21.34	< 44.77
793.0				21.04	21.31	< 44.77
795.5				21.07	21.34	< 44.77
793.0	10	1	0	22.41	22.68	< 44.77
793.0			24	22.18	22.45	< 44.77
793.0			49	22.07	22.34	< 44.77
793.0	10	50	0	21.10	21.37	< 44.77
Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
64QAM						
790.5	5	1	0	21.30	21.57	< 44.77
793.0				21.29	21.56	< 44.77
795.5				21.27	21.54	< 44.77
790.5	5	1	12	21.30	21.57	< 44.77
793.0				21.16	21.43	< 44.77
795.5				21.26	21.53	< 44.77
790.5	5	1	24	21.16	21.43	< 44.77
793.0				21.17	21.44	< 44.77
795.5				21.15	21.42	< 44.77
790.5	5	25	0	20.11	20.38	< 44.77
793.0				20.06	20.33	< 44.77
795.5				20.06	20.33	< 44.77
793.0	10	1	0	21.31	21.58	< 44.77
793.0			24	21.23	21.50	< 44.77
793.0			49	21.22	21.49	< 44.77
793.0	10	50	0	20.09	20.36	< 44.77
Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15						

A.4 Band Edge Test Result

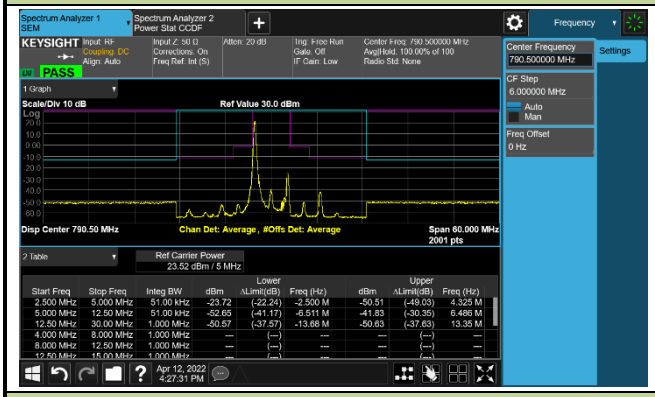
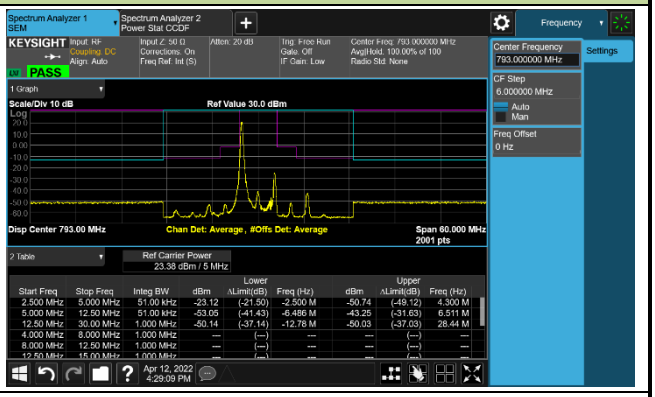
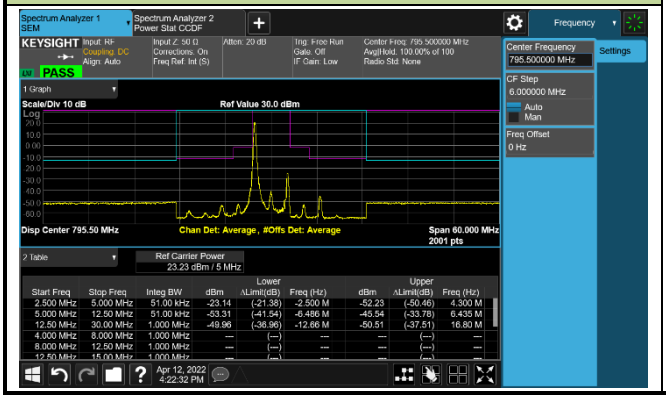
Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2022/04/01	Test Band	Band 14

5MHz Channel Bandwidth 1RB	
Lower ACP	Upper ACP
	
10MHz Channel Bandwidth 1RB	
Lower ACP	Upper ACP
	

5MHz Channel Bandwidth Full RB	
Lower ACP	Upper ACP
	
10MHz Channel Bandwidth Full RB	
Middle ACP	
	

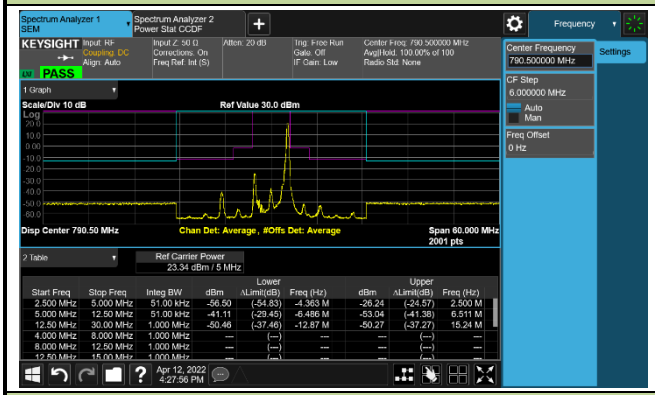
A.5 Emisson Mask Test Result

Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2022/04/12	Test Band	Band 14

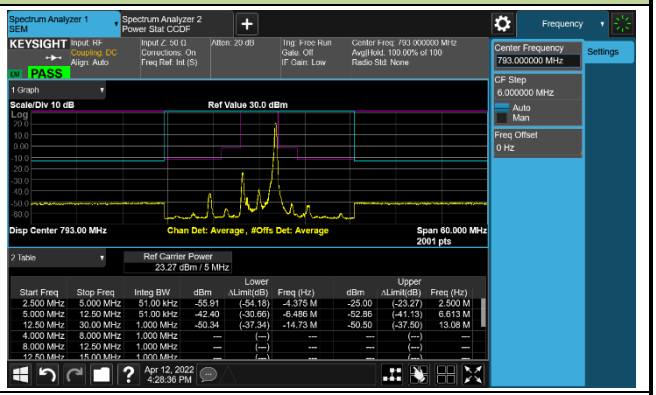
5MHz Channel Bandwidth 1RB@0	
Low Channel	Middle Channel
	
High Channel	
	

5MHz Channel Bandwidth 1RB@24

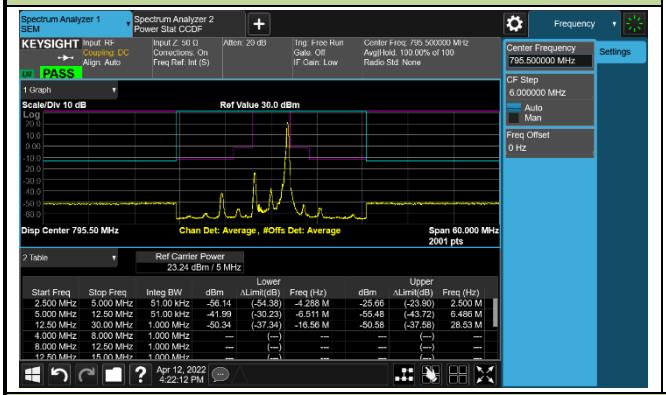
Low Channel



Middle Channel

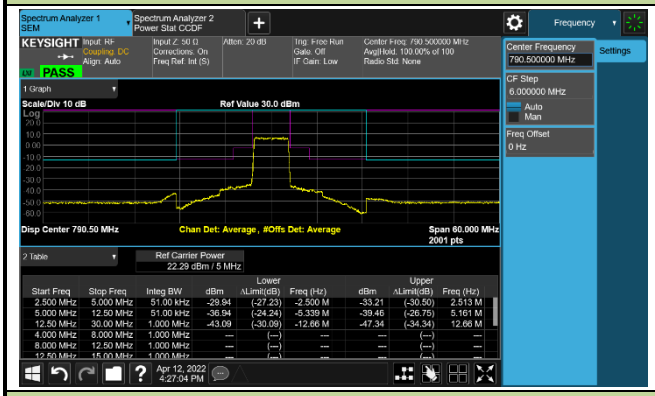


High Channel

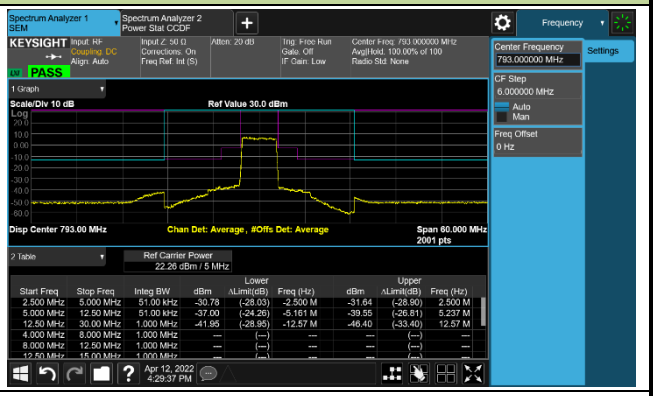


5MHz Channel Bandwidth Full RB

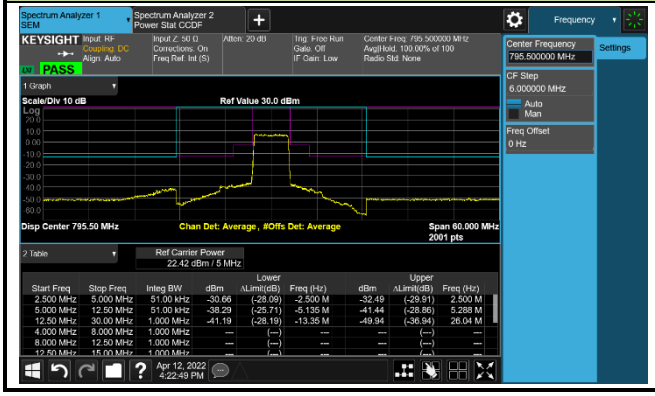
Low Channel

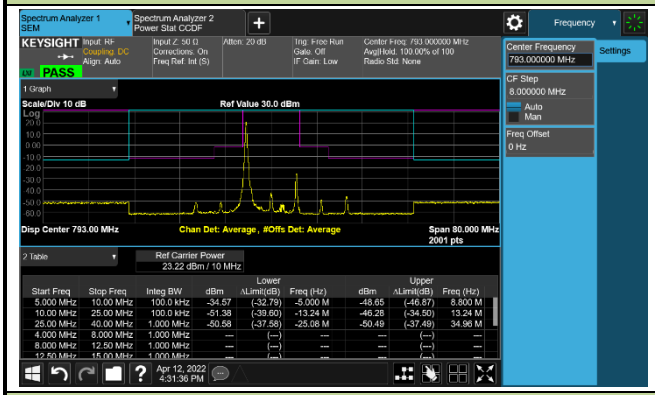
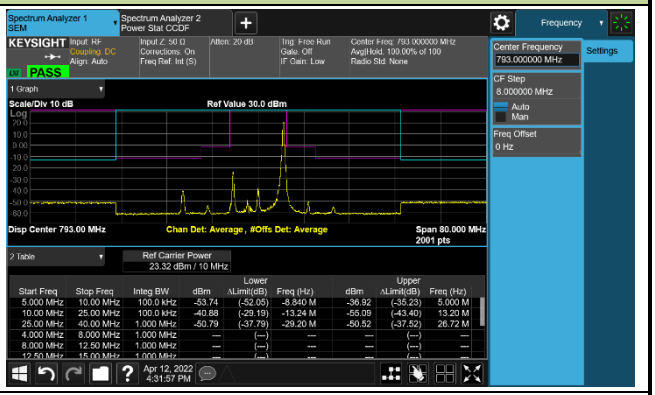
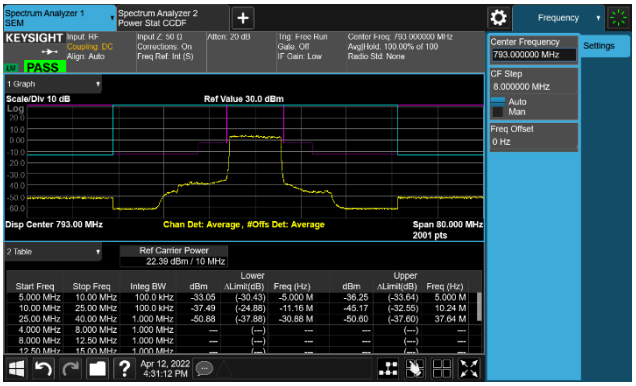


Middle Channel



High Channel



10MHz Channel Bandwidth 1RB@0	10MHz Channel Bandwidth 1RB@49
	
10MHz Channel Bandwidth Full RB	
	

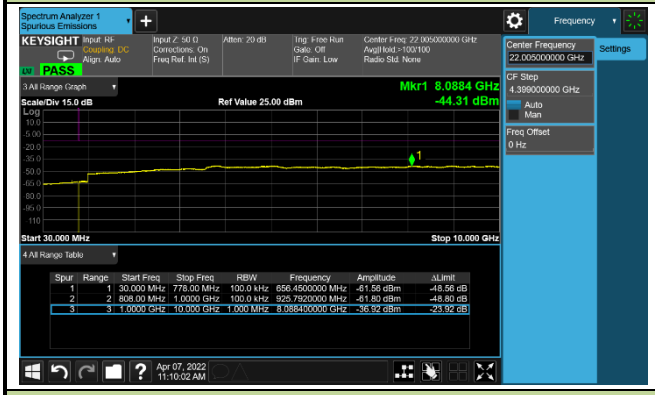
A.6 Conducted Supurious Emissions Test Result

Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2022/04/07	Test Band	Band 14

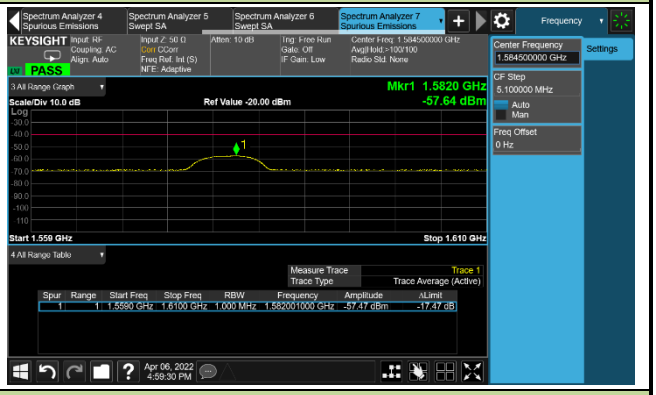
Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
QPSK					
790.5	5	30 ~ 10000	-44.31	≤ -13.00	Pass
793.0	5	30 ~ 10000	-44.25	≤ -13.00	Pass
795.5	5	30 ~ 10000	-44.23	≤ -13.00	Pass
793.0	10	30 ~ 10000	-44.14	≤ -13.00	Pass

5MHz Channel Bandwidth

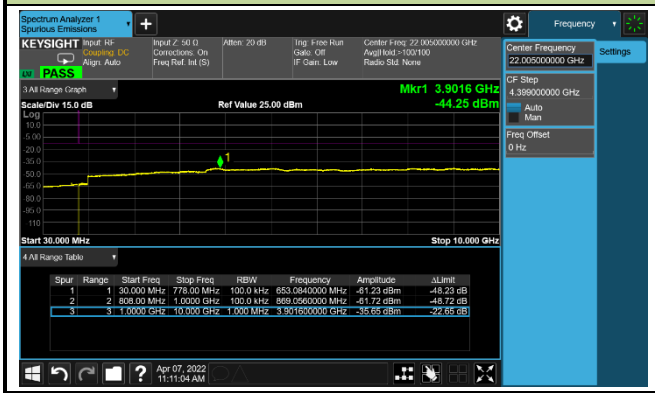
Low Channel



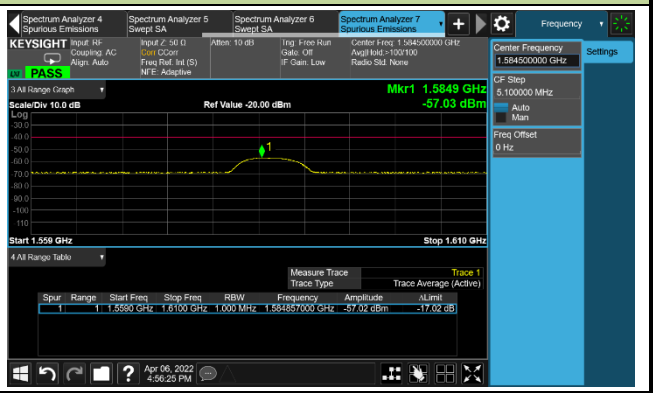
1559 - 1610MHz

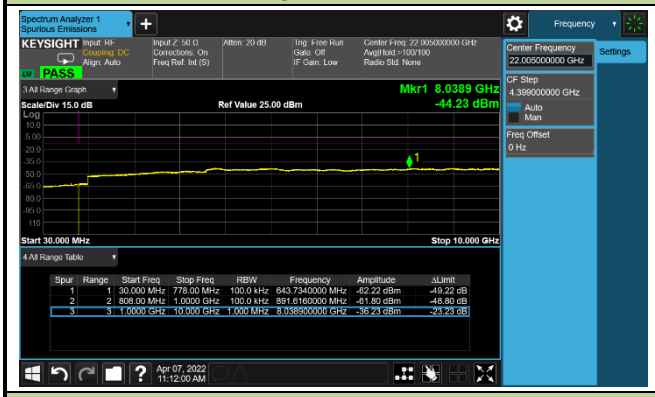
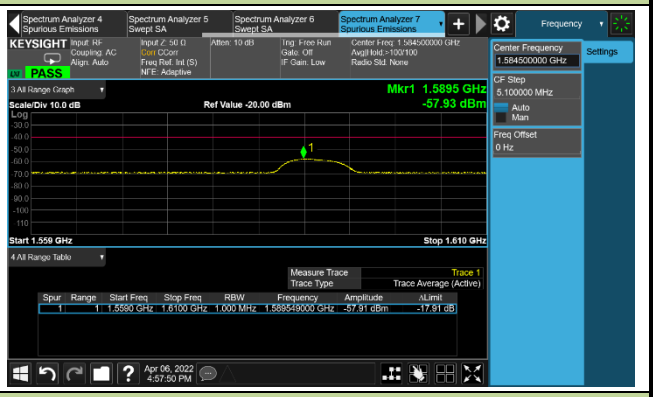
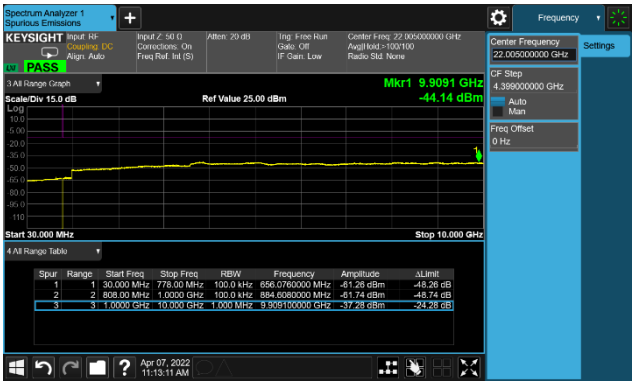
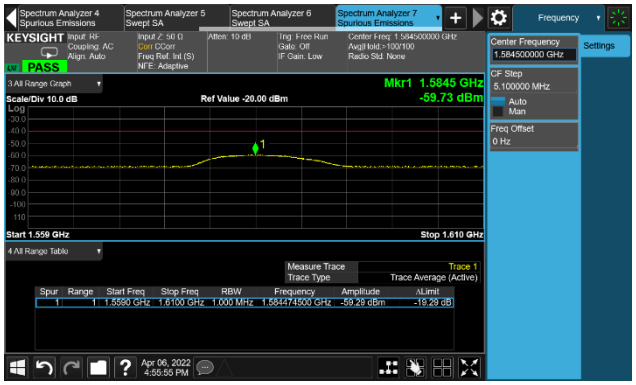


Middle Channel



1559 - 1610MHz



High Channel	1559 - 1610MHz
	
10MHz Channel Bandwidth	
Middle Channel	**1559 - 1610MHz**
	

A.7 Radiated Spurious Emissions Test Result

Test Site	SIP-AC1	Test Engineer	Allen Zhou
Test Date	2022/03/25~2022/04/07	Test Band	LTE Band 14, 5MHz, 1RB

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Low Channel							
401.0	18.3	20.6	38.9	82.3	-43.4	Peak	Horizontal
515.0	18.8	23.6	42.4	82.3	-39.9	Peak	Horizontal
147.9	17.6	18.2	35.8	82.3	-46.5	Peak	Vertical
370.5	18.6	20.1	38.7	82.3	-43.6	Peak	Vertical
1586.5	45.6	-16.1	29.5	55.3	-25.8	Peak	Horizontal
10800.5	41.9	7.1	49.0	82.3	-33.3	Peak	Horizontal
1569.5	45.3	-16.1	29.2	55.3	-26.1	Peak	Vertical
10800.5	42.1	7.1	49.2	82.3	-33.1	Peak	Vertical
Middle Channel							
353.5	18.6	19.5	38.1	82.3	-44.2	Peak	Horizontal
459.2	19.6	22.3	41.9	82.3	-40.4	Peak	Horizontal
315.7	18.3	18.9	37.2	82.3	-45.1	Peak	Vertical
461.2	19.5	22.3	41.8	82.3	-40.5	Peak	Vertical
1586.5	44.8	-16.1	28.7	55.3	-26.6	Peak	Horizontal
10316.0	42.4	6.4	48.8	82.3	-33.5	Peak	Horizontal
1578.0	44.9	-16.0	28.9	55.3	-26.4	Peak	Vertical
8794.5	43.1	4.0	47.1	82.3	-35.2	Peak	Vertical
High Channel							
52.8	18.8	17.9	36.7	82.3	-45.6	Peak	Horizontal
146.4	19.0	18.1	37.1	82.3	-45.2	Peak	Horizontal
54.3	17.6	17.9	35.5	82.3	-46.8	Peak	Vertical
146.9	17.9	18.1	36.0	82.3	-46.3	Peak	Vertical
1620.5	45.0	-16.1	28.9	82.3	-53.4	Peak	Horizontal
10333.0	42.6	6.6	49.2	82.3	-33.1	Peak	Horizontal
1612.0	44.9	-16.2	28.7	82.3	-53.6	Peak	Vertical
10834.5	42.1	7.4	49.5	82.3	-32.8	Peak	Vertical
Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB).							

Appendix B - Test Setup Photograph

Refer to “2203RSU046-UT” file.

Appendix C - EUT Photograph

Refer to “2203RSU046-UE” file.

The End