MEASUREMENT REPORT

FCC PART 96

FCC ID: XMR2020RM502QAE

Application: Quectel Wireless Solutions Company Limited

Application Type: Certification

Product: 5G Sub-6 GHz M.2 Module

Model No.: RM502Q-AE

Brand Name: Quectel

FCC Rule Part(s): Part 96

Test Procedure(s): ANSI C63.26: 2015

Test Date: October 08 ~ November 15, 2020

Reviewed By: (Sunny Sun)

Approved By: (Robin Wu)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.26-2015. Test results reported herein relate only to the item(s) tested.
The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2010RSU005-U1	Rev. 01	Initial Report	11-16-2020	Invalid
2010RSU005-U1	Rev. 02	Removed some EN-DC Bands	11-30-2020	Valid

CONTENTS

Description Page

1. GENERAL INFORMATION 5

1.1. Applicant 5
1.2. Manufacturer 5
1.3. Testing Facility 5

2. PRODUCT INFORMATION 6

2.1. Equipment Description 6
2.2. Product Specification Subjective to this Report 6
2.3. Description of Available Antennas 7
2.4. Test Methodology 7
2.5. EMI Suppression Device(s)/Modifications 7
2.6. Maximum Power, Frequency Tolerance, and Emission Designator 8
2.7. Configuration of Tested System 8
2.8. Test Environment Condition 8

3. TEST EQUIPMENT CALIBRATION DATE 9

4. MEASUREMENT UNCERTAINTY 11

5. TEST RESULT 12

5.1. Summary 12
5.2. Occupied Bandwidth 13
5.2.1. Test Limit 13
5.2.2. Test Procedure 13
5.2.3. Test Setting 13
5.2.4. Test Setup 13
5.2.5. Test Result 14
5.3. Frequency Stability Measurement 18
5.3.1. Test Limit 18
5.3.2. Test Procedures Used 18
5.3.3. Test Setting 18
5.3.4. Test Setup 19
5.3.5. Test Result 20
5.4. Equivalent Isotropically Radiated Power Measurement 21
5.4.1. Test Limit 21
5.4.2. Test Procedures Used 21
5.4.3. Test Setting 21
5.4.4. Test Setup 22

5.4.5. Test Result 23
5.5. Band Edge Measurement 25
5.5.1. Test Limit 25
5.5.2. Test Procedure Used 25
5.5.3. Test Setting 25
5.5.4. Test Setup 26
5.5.5. Test Result 27
5.6. Conducted Spurious Emissions 37
5.6.1. Test Limit 37
5.6.2. Test Procedure Used 37
5.6.3. Test Setting 37
5.6.4. Test Setup 38
5.6.5. Test Result 39
5.7. Radiated Spurious Emissions Measurements 42
5.7.1. Test Limit 42
5.7.2. Test Procedure Used 42
5.7.3. Test Setting 42
5.7.4. Test Setup 42
5.7.5. Test Result 44
5.8. End User Device Additional Requirement (CBSD Protocol) 45
5.8.1. Test Limit 45
5.8.2. Test Procedure Used 45
5.8.3. Test Setting 45
5.8.4. Test Result 46

6. CONCLUSION 48

Appendix A - Test Setup Photograph 49

Appendix B - EUT Photograph 50

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	
☐	**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

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	5G Sub-6 GHz M.2 Module
Model No.:	RM502Q-AE
Brand Name:	Quectel
IMEI:	Conducted Measurement: 867826050002666 Radiated Measurement: 867826050003060
Operating Temperature:	-20 ~ 60 °C
Power Type:	3.135 ~ 4.4Vdc, typical 3.7Vdc
UMTS Specification	
Single Band:	Band 2, 4, 5
Modulation:	Uplink up to 16QAM, Downlink up to 64QAM
Category:	Category 6
E-UTRA Specification	
Single Band:	Band 2, 4, 5, 7, 12, 13, 14, 17, 25, 26, 30, 38, 41, 48, 66, 71
Intra-Band:	CA_2C, CA_5B, CA_7C, CA_38C, CA_41C, CA_66C
Modulation:	UL & DL up to 256QAM
Category:	Category 18
5G NR Specification	
SA Band:	n2, n5, n7, n12, n25, n41, n66, n71, n77
SA UL MIMO Band:	n41
EN-DC Band:	DC_5A_n2A, DC_12A_n2, DC_13A_n2A, DC_2A_n5A DC_30A_n5A, DC_66A_n5A, DC_5A_n7A, DC_12A_n7A DC_2A_n12A, DC_12A_n25A, DC_2A_n41A, DC_25A_n41A DC_26A_n41A, DC_66A_n41A, DC_5A_n66A, DC_12A_n66A DC_13A_n66A, DC_14A_n66A, DC_71A_n66A, DC_2A_n71A DC_7A_n71A, DC_66A_n71A
HPUE Band:	n41, n77 (SA & UL MIMO)
SCS for NR cell:	FDD Band: 15kHz; TDD Band: 30kHz
Modulation:	UL & DL up to 256QAM

2.2. Product Specification Subjective to this Report

Frequency Range:	TDD Band 48: 3550 ~ 3700 MHz
Device Type:	End User Device

Note: For other features of this EUT, test report will be issued separately.

2.3. 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		2.68
LTE Band 30	2305 ~ 2315		-3.06
LTE Band 38	2570 ~ 2620		0.78
LTE Band 41	2496 ~ 2690		0.78
LTE Band 48	3550 ~ 3700		-4.29
LTE Band 66	1710 ~ 1780		1.47
LTE Band 71	663 ~ 698		1.22

Note: All antenna information (Antenna type and Peak Gain) is provided by the manufacturer.

2.4. Test Methodology

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

- ANSI C63.26:2015
- FCC CFR 47 Part 96
- 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
- WINNF-TS-0122 V1.0.0: Test and Certification for Citizens Broadband Radio Service (CBRS); Conformance and Performance Test Technical Specification; CBSD/DP as Unit Under Test (UUT)

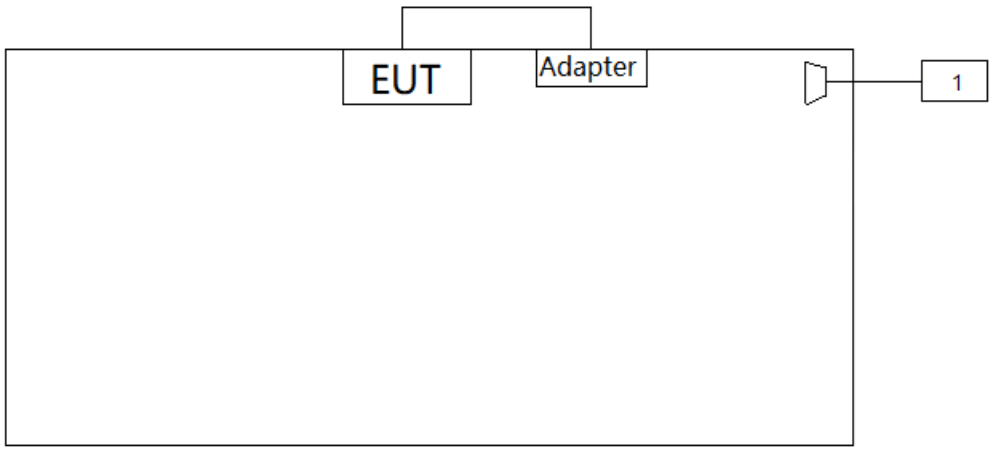
2.5. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.6. Maximum Power, Frequency Tolerance, and Emission Designator

LTE Band 48		QPSK			16QAM		
BW (MHz)	BW (MHz)	Designator	Tolerance (ppm)	Max EIPR (W/10MHz)	Designator	Tolerance (ppm)	Max EIPR (W/10MHz)
5	3552.5 ~ 3697.5	4M44G7D	-	0.0787	4M45W7D	-	0.0700
10	3555.0 ~ 3695.0	8M95G7D	-	0.0855	8M95W7D	-	0.0652
15	3557.5 ~ 3692.5	13M5G7D	-	0.0562	13M4G7D	-	0.0432
20	3560.0 ~ 3690.0	17M9G7D	-0.0041	0.0486	17M8W7D	-	0.0358
LTE Band 48		64QAM			256QAM		
BW (MHz)	BW (MHz)	Designator	Tolerance (ppm)	Max EIPR (W/10MHz)	Designator	Tolerance (ppm)	Max EIPR (W/10MHz)
5	3552.5 ~ 3697.5	4M46W7D	-	0.0708	4M45W7D	-	0.0252
10	3555.0 ~ 3695.0	8M91W7D	-	0.0650	8M95W7D	-	0.0253
15	3557.5 ~ 3692.5	13M4G7D	-	0.0432	13M4G7D	-	0.0191
20	3560.0 ~ 3690.0	17M8W7D	-	0.0362	17M9W7D	-	0.0147

2.7. Configuration of Tested System



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

2.8. Test Environment Condition

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

3. TEST EQUIPMENT CALIBRATION DATE

Radiated Emission (WZ-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2021/08/01
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/11/07
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2021/09/03
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/10
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/03/31
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2021/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2021/02/23
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2021/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2021/08/08
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2021/04/30

Radiated Emission (WZ-AC2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Keysight	N9038A	MRTSUE06125	1 year	2021/08/01
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/11/07
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/10
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2021/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2021/10/27
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2021/02/23
Broad Band Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2021/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2020/12/15
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2021/04/30

Conducted Test Equipment (WZ)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2021/04/15
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06452	1 year	2021/07/11
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/15
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/11/07
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2021/11/18
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
True RMS Clamp Meter	Fluke	319	MRTSUE06080	1 year	2021/05/06
Directional Coupler	Agilent	87301D	MRTSUE06082	1 year	2021/03/25
Dual Directional Coupler	Agilent	7778D	MRTSUE06083	1 year	2021/03/25
Attenuator	MVE	6dB	MRTSUE06534	1 year	2020/12/12
Attenuator	MVE	10dB	MRTSUE06543	1 year	2020/12/12
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2021/11/07
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2021/08/08

Software	Version	Function
EMI Software	V3	EMI Test Software

4. 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

5. TEST RESULT

5.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	Conducted	Pass	Section5.2
2.1055	Frequency Stability	Refer to section 5.3		Pass	Section5.3
96.41(b)	Equivalent Isotropic Radiated Power	Refer to section 5.4		Pass	Section5.4
2.1051 96.41(e)	Spurious Emissions; Band Edge Emissions	Refer to section 5.5, 5.6		Pass	Section 5.5, 5.6
2.1053, 96.41(e)	Spurious Emissions	Refer to section 5.7	Radiated	Pass	Section5.7
96.47	End User Device Additional Requirements (CBSD Protocol)	Refer to section 5.8		Pass	Section5.8

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) Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations the worst-case was found.
3) All supported modulation types were evaluated. The worst-case emission of modulation was selected. Therefore, the Frequency Stability, Band Edge, Radiated & Conducted SpuriousEmission were presented worst case in the test report.

5.2. Occupied Bandwidth

5.2.1.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.

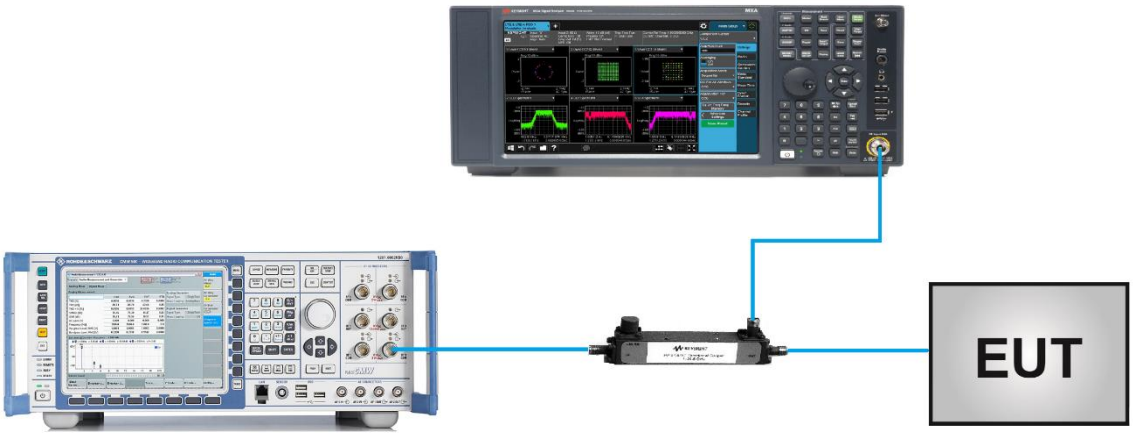
5.2.2.Test Procedure

ANSI C63.26-2015 - Section 5.4

5.2.3.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.

5.2.4.Test Setup



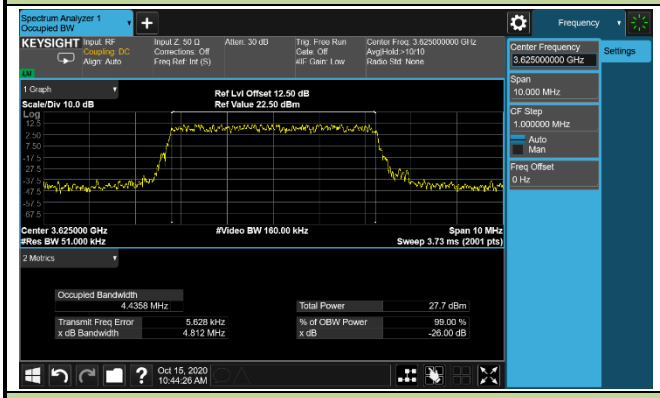
5.2.4.1. Test Result

Product	5G Sub-6 GHz M.2 Module	Test Site	WZ-SR6
Test Engineer	Candy Luo	Test Date	2020/10/15 ~ 2020/11/15

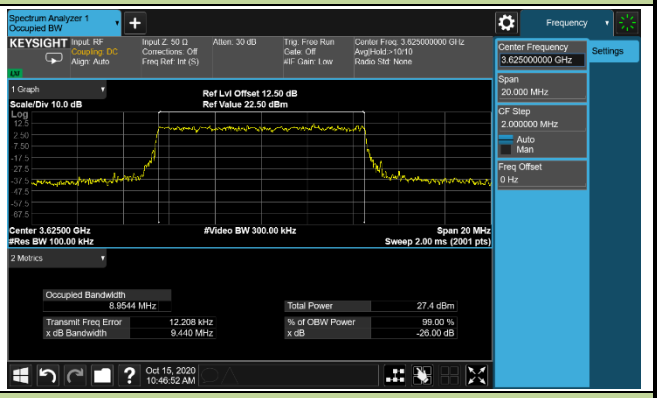
Modulation	Frequency (MHz)	Bandwidth (MHz)	99% Bandwidth (MHz)
QPSK	3625.0	5	4.44
		10	8.95
		15	13.45
		20	17.92
16QAM	3625.0	5	4.45
		10	8.95
		15	13.40
		20	17.88
64QAM	3625.0	5	4.46
		10	8.91
		15	13.42
		20	17.83
256QAM	3625.0	5	4.45
		10	8.95
		15	13.41
		20	17.88

99% Bandwidth - QPSK

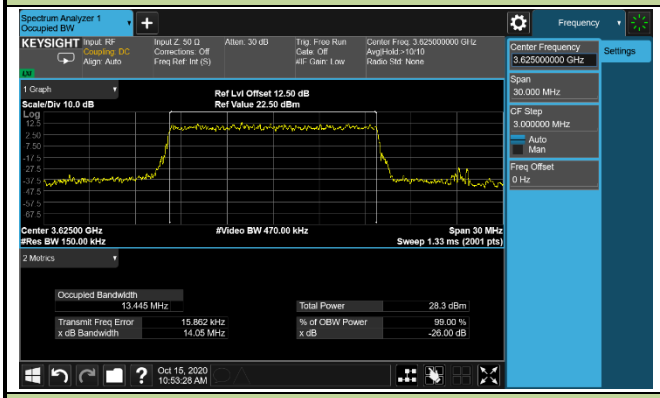
5MHz Channel Bandwidth



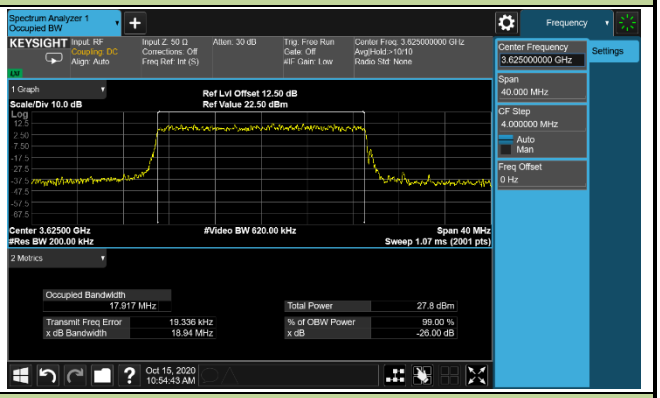
10MHz Channel Bandwidth



15MHz Channel Bandwidth

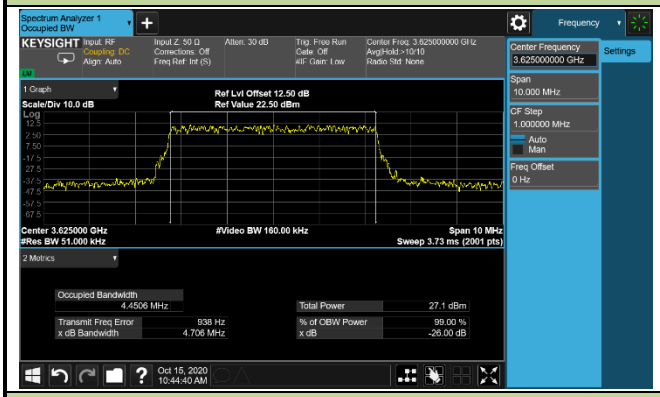


20MHz Channel Bandwidth

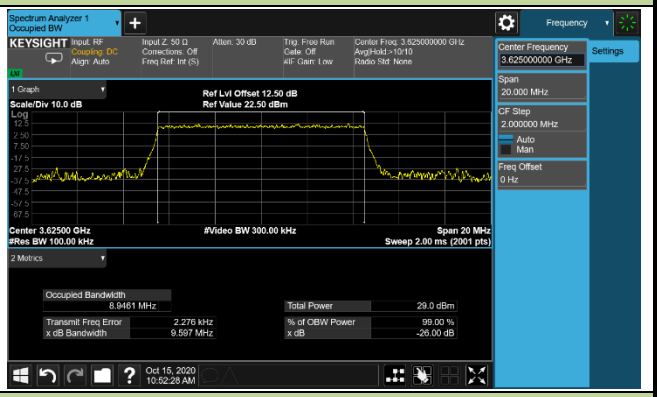


99% Bandwidth -16QAM

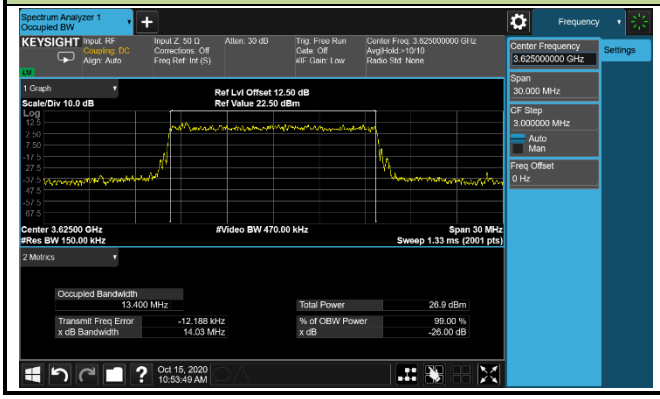
5MHz Channel Bandwidth



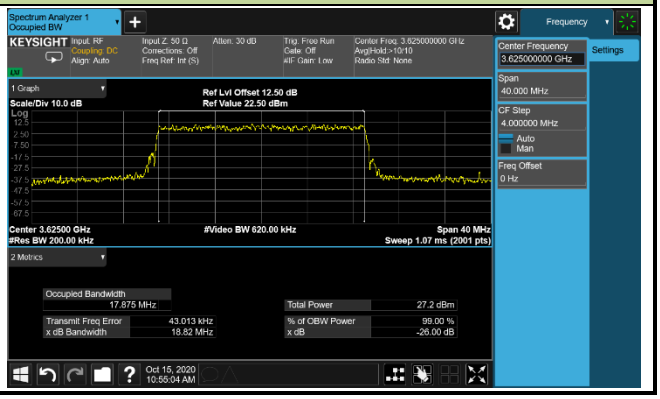
10MHz Channel Bandwidth



15MHz Channel Bandwidth

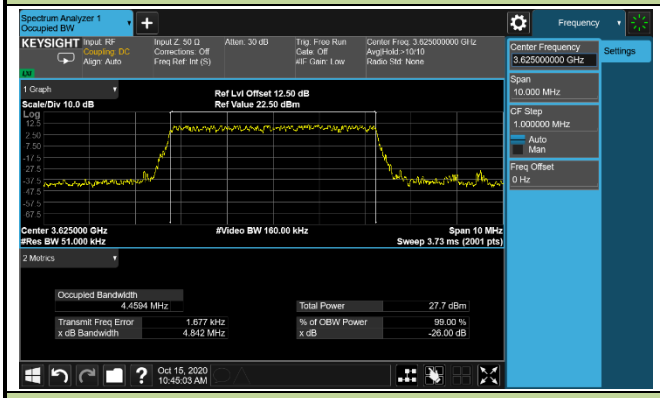


20MHz Channel Bandwidth

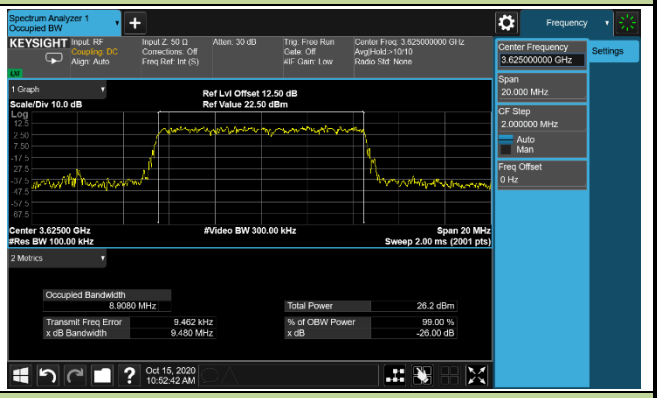


99% Bandwidth - 64QAM

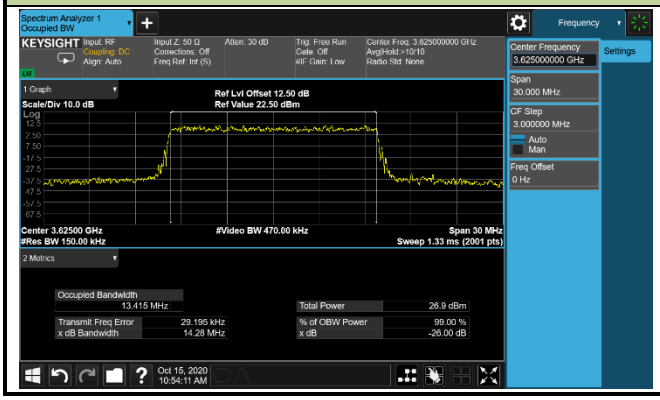
5MHz Channel Bandwidth



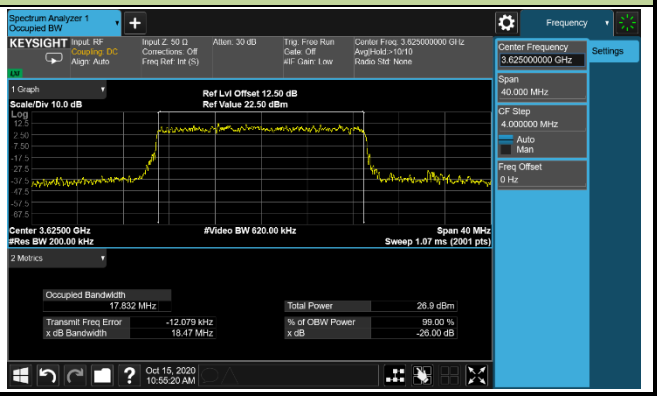
10MHz Channel Bandwidth

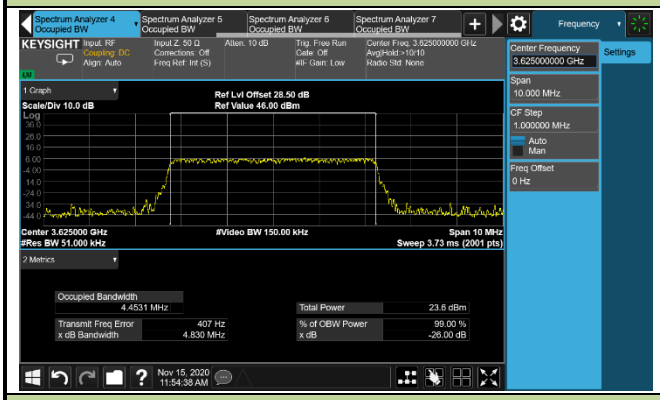
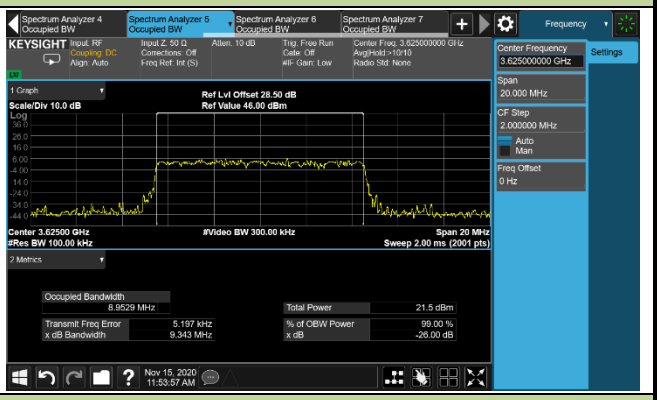
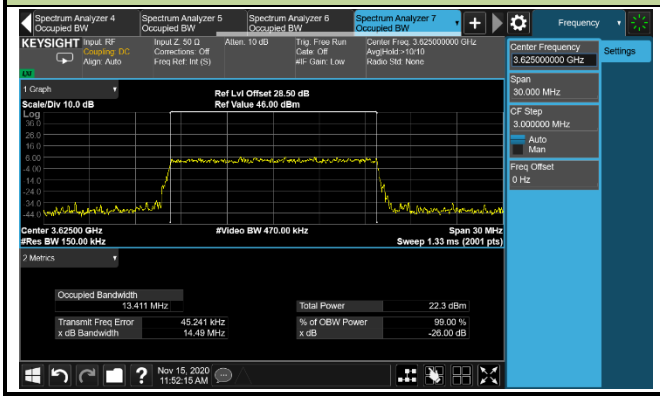
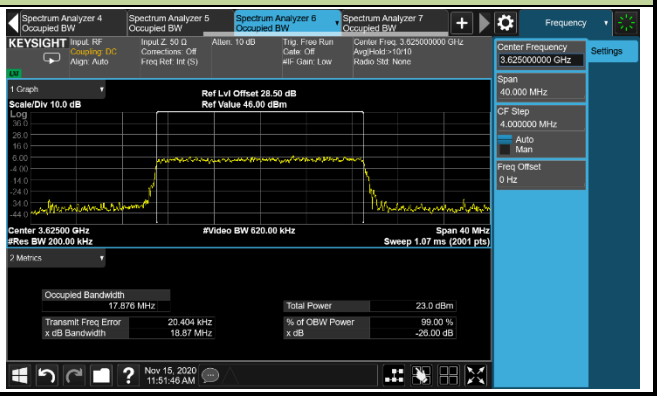


15MHz Channel Bandwidth



20MHz Channel Bandwidth



99% Bandwidth - 256QAM	
5MHz Channel Bandwidth	10MHz Channel Bandwidth
	
15MHz Channel Bandwidth	20MHz Channel Bandwidth
	

5.3. Frequency Stability Measurement

5.3.1.Test Limit

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

5.3.2.Test Procedures Used

ANSI C63.26-2015 - Section 5.6

5.3.3.Test Setting

Frequency Stability Under Temperature Variations:

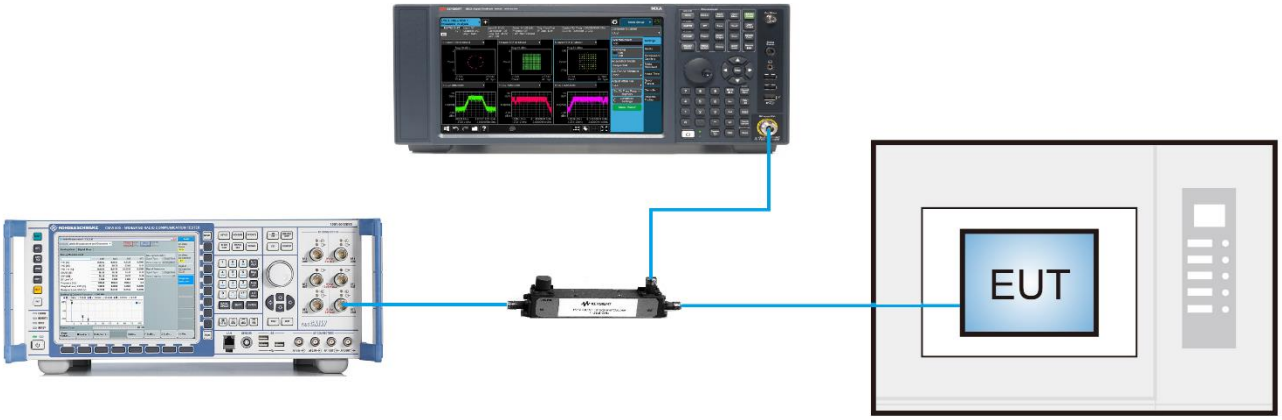
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain 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 endpoint, recordthe maximum frequency change.

5.3.4.Test Setup



5.3.5.Test Result

Product	5G Sub-6 GHz M.2 Module	Test Site	WZ-TR3
Test Engineer	Candy Luo	Test Date	2020/10/14

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.7	- 30	-0.0002
	- 20	-0.0038
	- 10	-0.0012
	0	-0.0028
	+ 10	-0.0041
	+ 20 (Ref)	-0.0028
	+ 30	-0.0013
	+ 40	-0.0036
	+ 50	-0.0011
4.4	+ 20	-0.0025
3.135	+ 20	-0.0027

5.4. Equivalent Isotropically Radiated Power Measurement

5.4.1.Test Limit

The maximum effective isotropic radiated power (EIRP) End User Device is 23dBm/10MHz

5.4.2.Test Procedures Used

ANSI C63.26-2015 - Section 5.2.4.4.2 &5.2.5.5

5.4.3.Test Setting

When the fundamental condition for average power measurements cannot be realized (i.e., the EUT can not be configured to transmit at full-power on a continuous basis (i.e., duty cycle < 98%) and the instrumentation cannot be configured to measure only during active full-power transmissions), then thefollowing procedure can be used if the EUT duty cycle is constant (i.e., duty cycle variations are less thanor equal to ±2%).

a) Set span to 2 × to 3 × the OBW.

b) Set RBW = 1% to 5% of the OBW.

c) Set VBW ≥ 3 × RBW.

d) Set number of measurement points in sweep ≥ 2 × span / RBW.

e) Sweep time:

1) Set = auto-couple, or

2) Set ≥ [10 × (number of points in sweep) × (transmission symbol period)] for single sweep (automation-compatible) measurement.

f) Detector = power averaging (rms).

g) Set sweep trigger to “free run.”

h) 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.

i) Using the marker function to identify the maximum PSD.

j) Add 10 log (1/duty cycle) to the measured power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.

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 = $P_{Meas} + G_T$ (1)

where

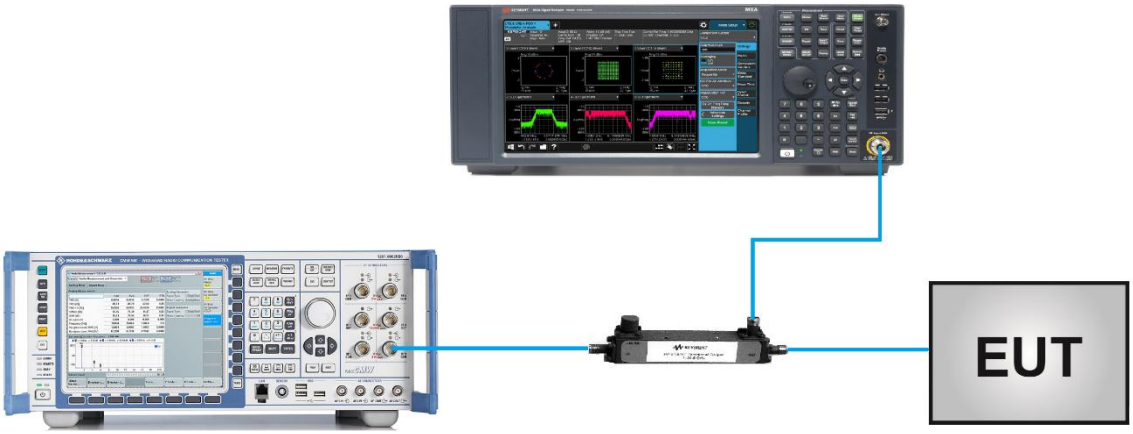
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, e.g., dBm or dBW)

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)

For devices utilizing multiple antennas, see 6.4 for guidance with respect to determining the effective array transmit antenna gain term to be used in the above equation.

5.4.4.Test Setup



5.4.5.Test Result

Product	5G Sub-6 GHz M.2 Module	Test Site	WZ-SR6
Test Engineer	Candy Luo	Test Date	2020/10/22 ~ 2020/11/15

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
QPSK							
55265	3552.50	5	25	0	23.19	18.90	<23.00
55900	3625.00				22.53	18.24	<23.00
56715	3697.50				23.25	18.96	<23.00
55290	3555.00	10	50	0	23.61	19.32	<23.00
55900	3625.00				22.60	18.31	<23.00
56690	3695.00				22.69	18.40	<23.00
55315	3557.50	15	75	0	21.73	17.44	<23.00
55990	3625.00				21.31	17.02	<23.00
56665	3692.50				21.79	17.50	<23.00
55340	3560.00	20	100	0	20.40	16.11	<23.00
55990	3625.00				20.22	15.93	<23.00
56640	3690.00				21.16	16.87	<23.00
16QAM							
55265	3552.50	5	25	0	22.74	18.45	<23.00
55900	3625.00				21.77	17.48	<23.00
56715	3697.50				21.92	17.63	<23.00
55290	3555.00	10	50	0	22.43	18.14	<23.00
55900	3625.00				21.65	17.36	<23.00
56690	3695.00				21.70	17.41	<23.00
55315	3557.50	15	75	0	20.48	16.19	<23.00
55990	3625.00				20.14	15.85	<23.00
56665	3692.50				20.64	16.35	<23.00
55340	3560.00	20	100	0	19.83	15.54	<23.00
55990	3625.00				19.76	15.47	<23.00
56640	3690.00				19.42	15.13	<23.00
Note: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)							

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
64QAM							
55265	3552.50	5	25	0	22.79	18.50	<23.00
55900	3625.00				21.80	17.51	<23.00
56715	3697.50				21.91	17.62	<23.00
55290	3555.00	10	50	0	22.42	18.13	<23.00
55900	3625.00				21.62	17.33	<23.00
56690	3695.00				21.68	17.39	<23.00
55315	3557.50	15	75	0	20.49	16.20	<23.00
55990	3625.00				20.00	15.71	<23.00
56665	3692.50				20.64	16.35	<23.00
55340	3560.00	20	100	0	19.88	15.59	<23.00
55990	3625.00				19.72	15.43	<23.00
56640	3690.00				19.39	15.10	<23.00
256QAM							
55265	3552.50	5	25	0	17.91	13.62	<23.00
55900	3625.00				18.30	14.01	<23.00
56715	3697.50				18.18	13.89	<23.00
55290	3555.00	10	50	0	17.56	13.27	<23.00
55900	3625.00				18.32	14.03	<23.00
56690	3695.00				17.35	13.06	<23.00
55315	3557.50	15	75	0	16.38	12.09	<23.00
55990	3625.00				17.09	12.80	<23.00
56665	3692.50				16.80	12.51	<23.00
55340	3560.00	20	100	0	15.32	11.03	<23.00
55990	3625.00				15.96	11.67	<23.00
56640	3690.00				15.65	11.36	<23.00
Note: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)							

5.5. Band Edge Measurement

5.5.1.Test Limit

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 emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed −25 dBm/MHz.

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

5.5.2.Test Procedure Used

ANSI C63.26-2015 - Section5.7

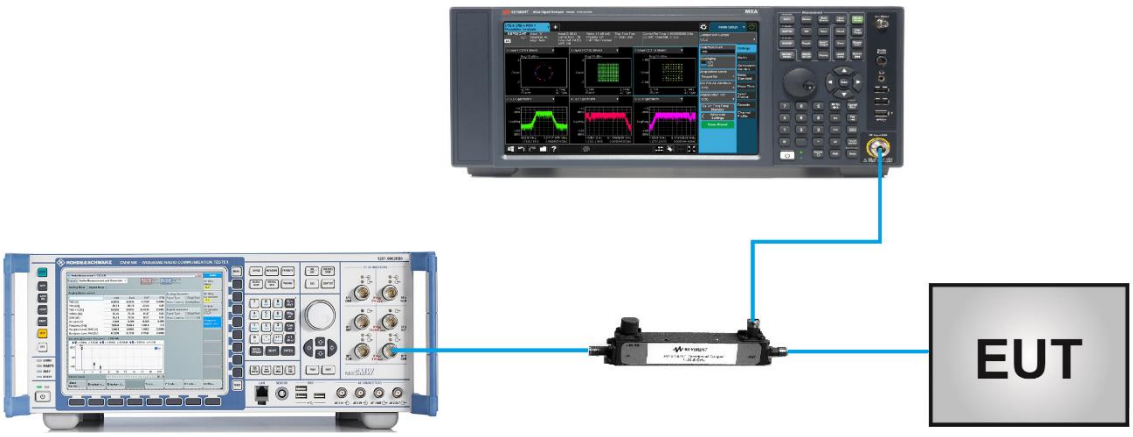
5.5.3.Test Setting

1. Set the analyzer frequency to low, middle, 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

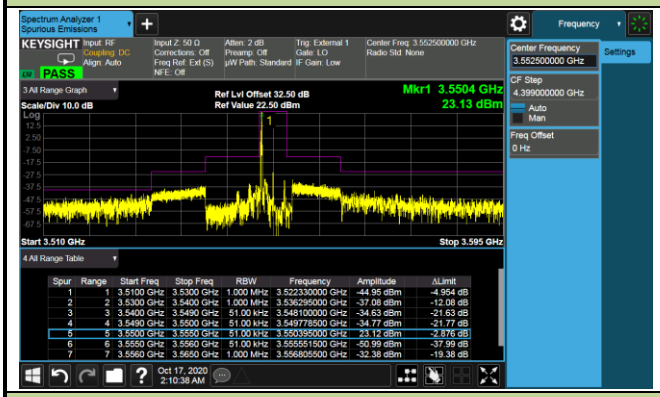
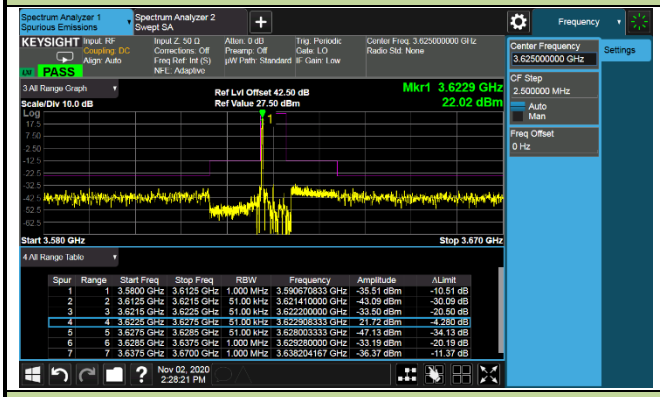
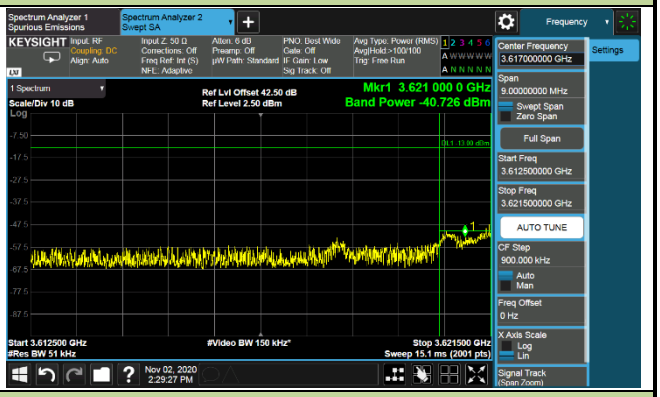
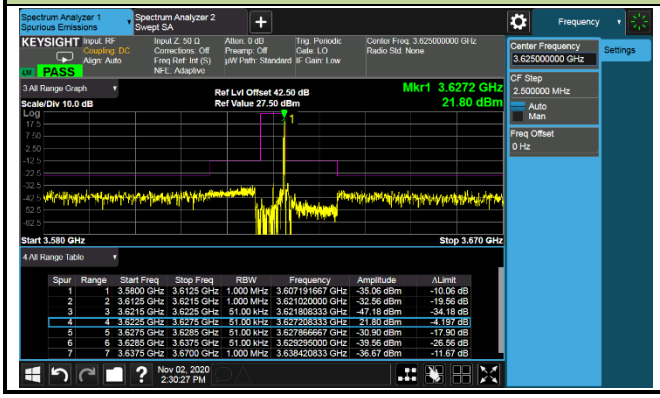
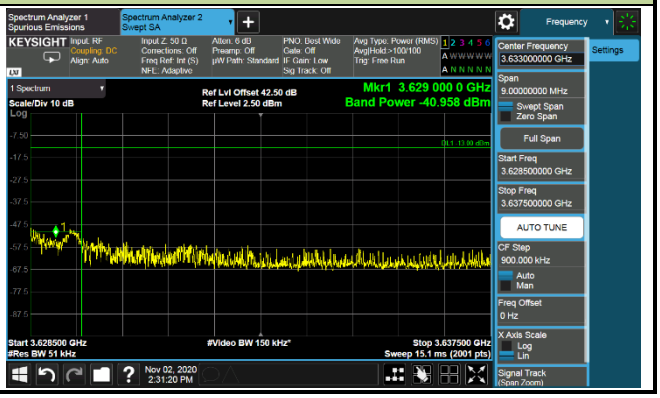
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.
9. Used power integration whenusing a measurement bandwidth smaller than the specified bandwidth.

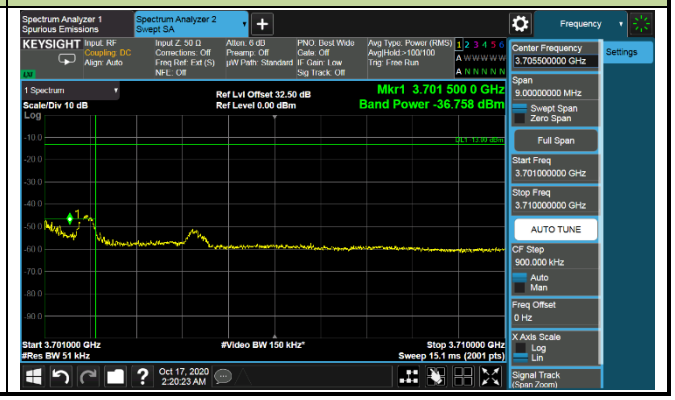
5.5.4.Test Setup



5.5.5.Test Result

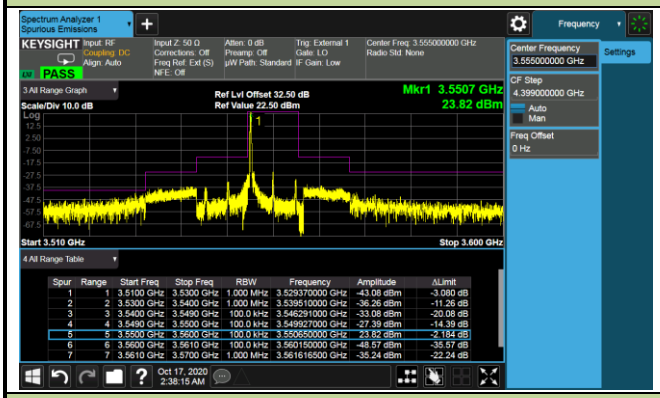
Product	5G Sub-6 GHz M.2 Module	Test Site	WZ-SR6
Test Engineer	Candy Luo	Test Date	2020/10/17

5MHz Channel Bandwidth - 1RB	
Low Channel ACP	Extended Band Edge
	
MiddleChannel ACP - Low RB Position	Extended Band Edge
	
Middle Channel ACP - High RB Position	Extended Band Edge
	

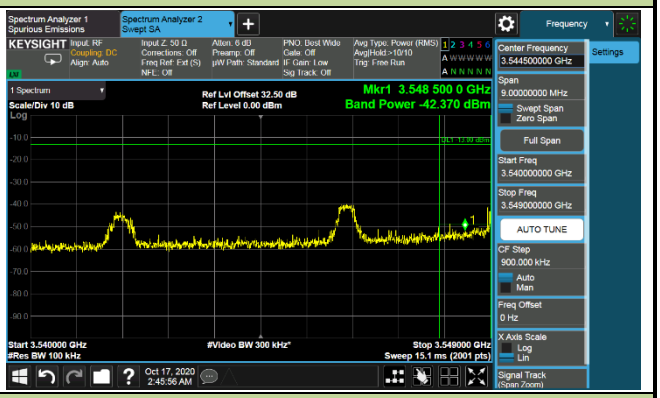
High Channel ACP	Extended Band Edge
	

10MHz Channel Bandwidth - 1RB

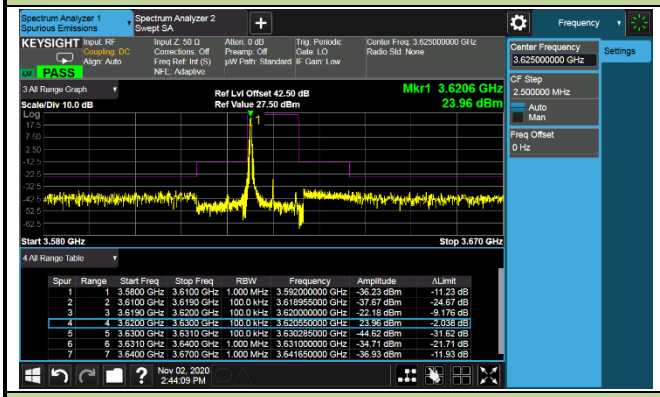
Low Channel ACP



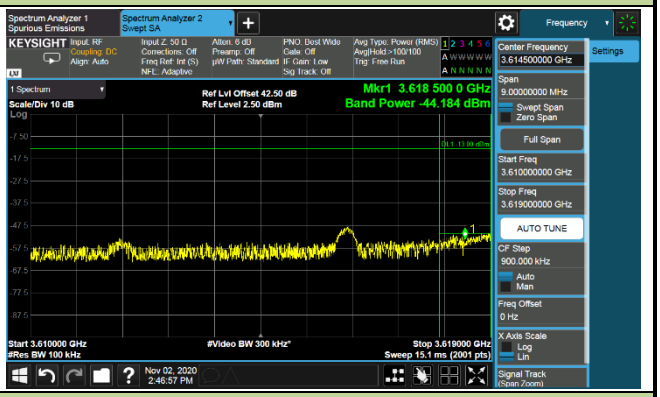
Extended Band Edge



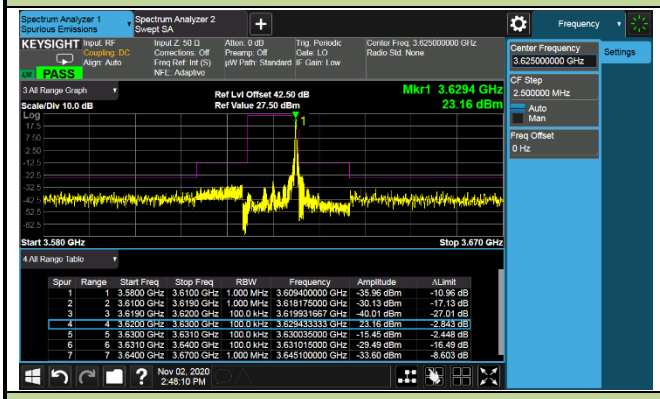
MiddleChannel ACP - Low RB Position



Extended Band Edge

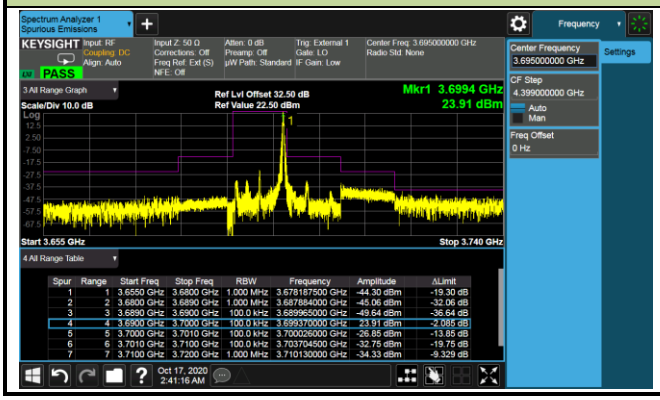


MiddleChannel ACP - High RB Position

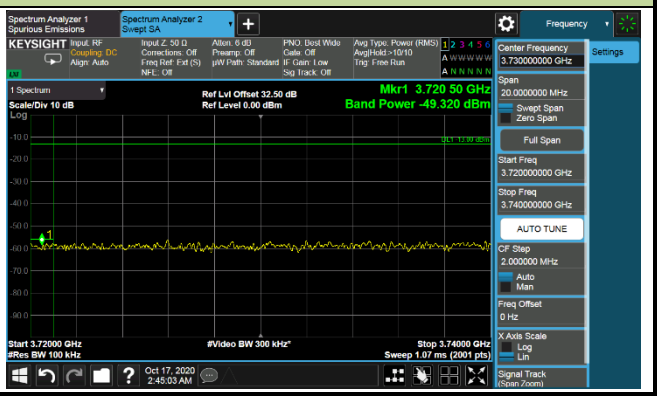


Extended Band Edge

High Channel ACP



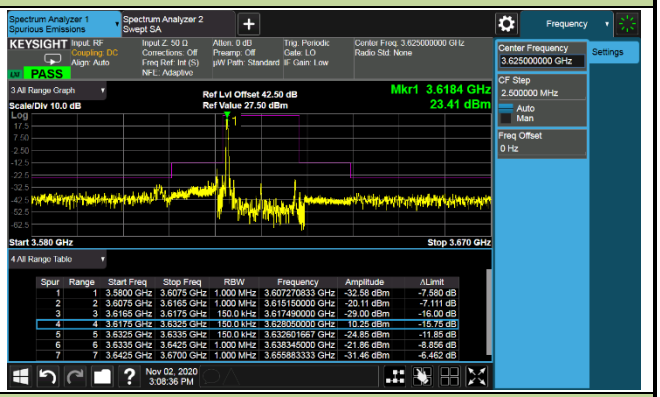
Extended Band Edge



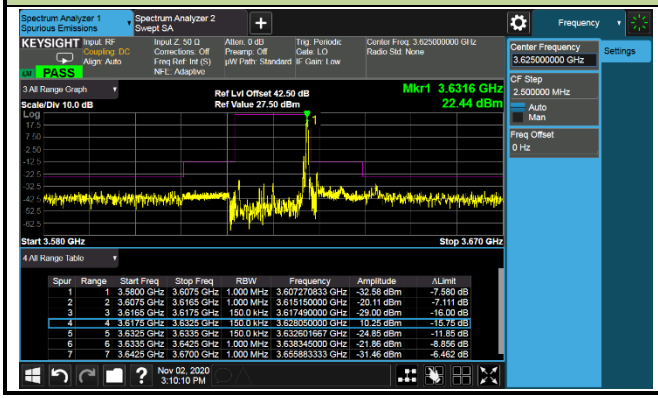
15MHz Channel Bandwidth - 1RB

Low Channel ACP

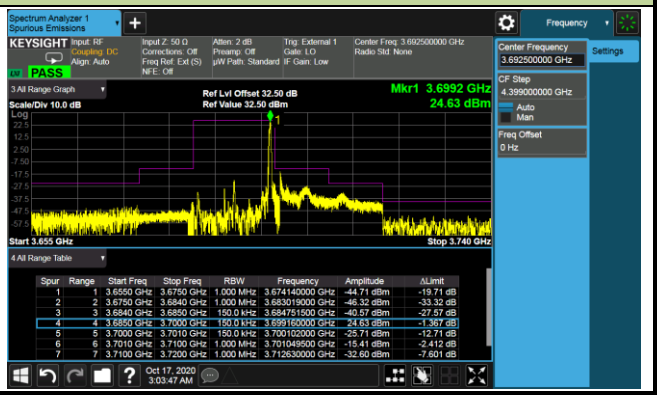
MiddleChannel ACP - Low RB Position



MiddleChannel ACP - High RB Position

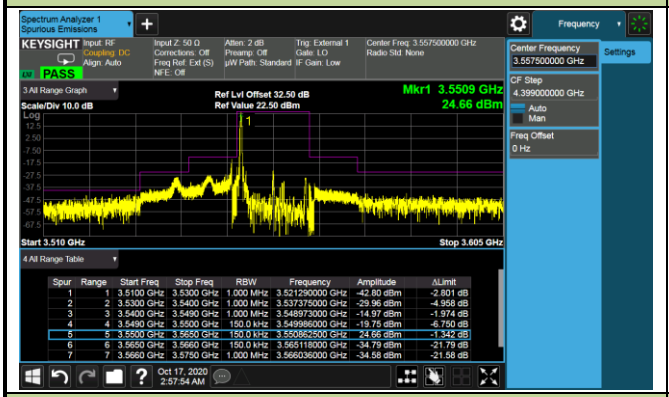


High Channel ACP

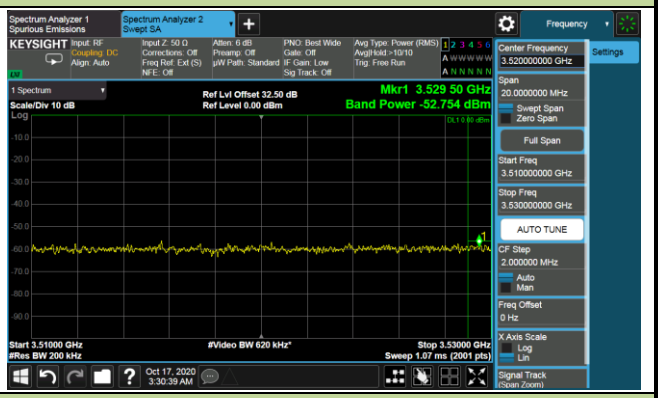


20MHz Channel Bandwidth - 1RB

Low Channel ACP

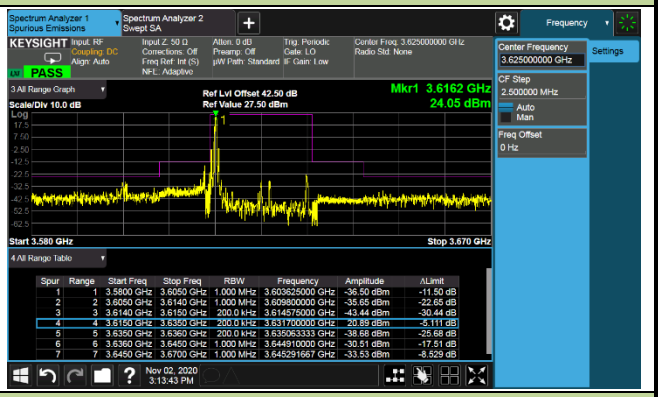


Extended Band Edge

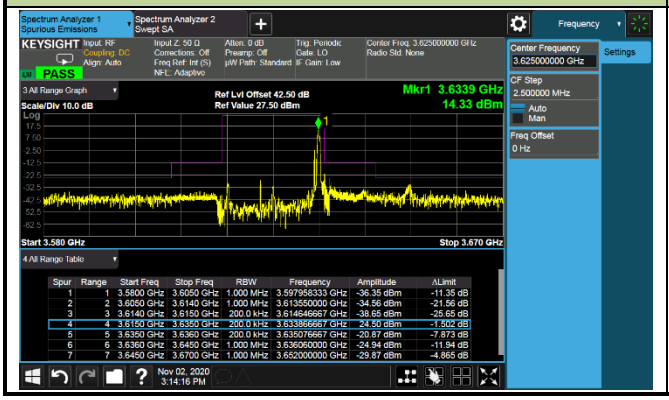


Extended Band Edge

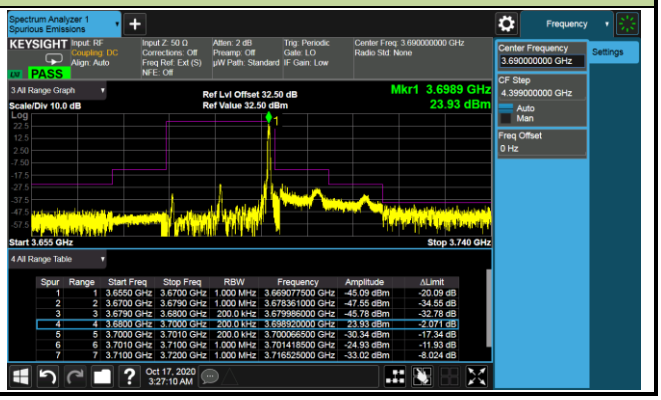
MiddleChannel ACP - Low RB Position



MiddleChannel ACP - High RB Position

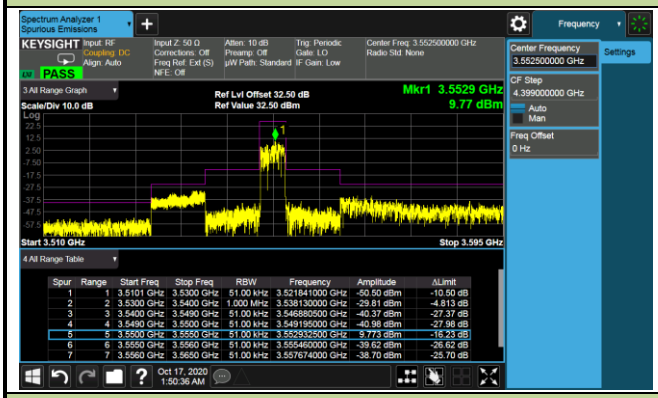


High Channel ACP

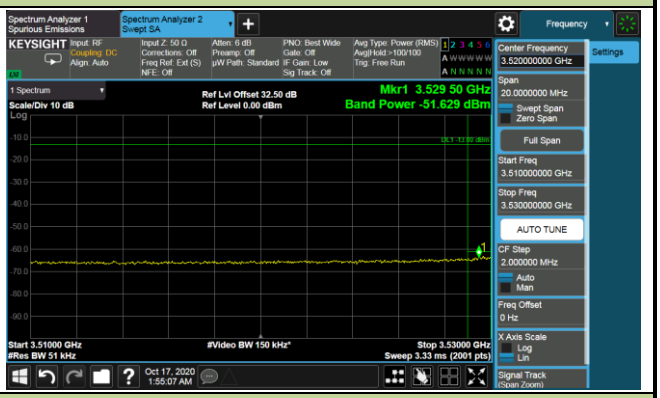


5MHz Channel Bandwidth - Full RB

Low Channel ACP

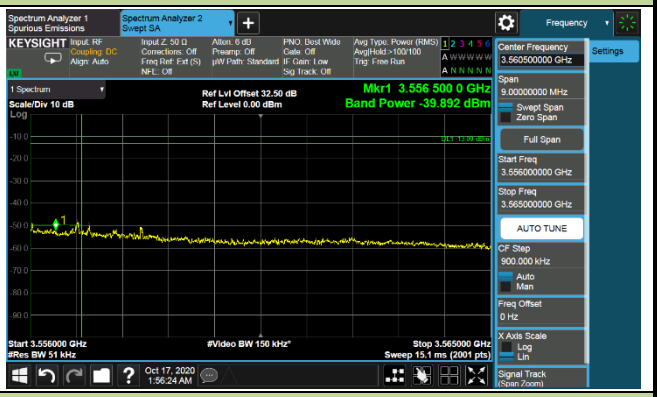


Extended Band Edge

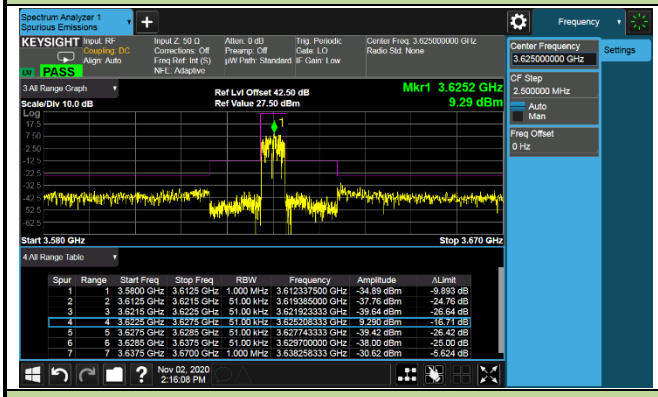


Extended Band Edge

Extended Band Edge



Middle Channel ACP



Extended Band Edge

Extended Band Edge