MEASUREMENT REPORT

FCC PART 24 Subpart E

FCC ID:	2AWAS-910-00086
Application:	Mavenir Systems, Inc.
Application Type:	Certification
Product:	B25 4T4R 160W Radio Unit
Model No.:	MR44MA
Trade Mark:	MAVENIR
FCC Rule Part(s):	Part 24 Subpart E
Test Procedure(s):	ANSI C63.26-2015
Test Date:	April 23 ~ May 13, 2021

Reviewed By: Jame Yuan

Approved By: Robin Wu

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.

Revision History

Report No.	Version	Description	Issue Date	Note
2104RSU074-U1	Rev. 01	Initial Report	05-14-2021	Valid

CONTENTS

1. General Information

1.1. Applicant

Mavenir Systems, Inc.

1700 International Pkwy, Richardson, TX 75081

1.2. Manufacturer

JABIL CIRCUIT (SHANGHAI) LTD.

600, TIAN LIN ROAD, SHANGHAI, 200233, P.R. CHINA

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

1.4. Product Information

Product Name:	B25 4T4R 160W Radio Unit
Model No.:	MR44MA
Test Device Serial No.:	MAV000018
Hardware Version:	B0.1
Software Version:	MD3.2
Voltage Range:	-48VDC
LTE Operating Band (s):	FDD Band 25, single carrier
T_X Frequency Range:	Band 25: 1930 ~ 1995 MHz
R_X Frequency Range:	Band 25: 1850 ~ 1915 MHz
Modulation Type:	QPSK, 16QAM, 64QAM, 256QAM
Max EIRP Power Density:	5MHz: 60.01dBm/MHz; 10MHz: 60.34dBm/MHz; 15MHz: 60.07dBm/MHz; 20MHz: 59.95dBm/MHz;
Max Antenna Gain:	15dBi

Note: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.

1.5. Emission Designator

Bandwidth (MHz)	Modulation	Emission Designator
5	QPSK	4M48G7D
	16QAM	4M48W7D
	64QAM	4M47W7D
	256QAM	4M47W7D
10	QPSK	8M94G7D
	16QAM	8M93W7D
	64QAM	8M95W7D
	256QAM	8M93W7D
15	QPSK	13M4G7D
	16QAM	13M4W7D
	64QAM	13M5W7D
	256QAM	13M4W7D
20	QPSK	17M9G7D
	16QAM	17M9W7D
	64QAM	17M9W7D
	256QAM	17M9W7D

1.6. Test Mode and Channel Detail

Spot Check Test Item	Channel Bandwidth	Modulation
Equivalent Isotropically Radiated Power	5 MHz, 10 MHz 15 MHz, 20MHz	QPSK, 16QAM, 64QAM, 256QAM
Emission Bandwidth		
Peak to Average Ratio		QPSK
Conducted Spurious Emissions		
Band Edge Measurements		
Frequency Stability	20MHz	
Radiated Spurious Emissions	5 MHz, 20 MHz	

1.7. EMI Suppression Device(s)/Modifications

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

1.8. Applicable Standards

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

- ANSI C63.26 - 2015
- FCC KDB 971168 D01v03r01
- FCC Part 24 Subpart E

1.9. Test Environment Condition

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

2. 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	2022/01/12
PXA Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2021/08/30
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/10/22
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/08/08
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2021/09/27
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06597	1 year	2021/12/14
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2021/11/14
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Thermal Hygrometer	testo	608-H1	MRTSUE06403	1 year	2021/07/26
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2022/04/30

Conducted Test Equipment (WZ-TR3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2022/04/13
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2022/01/07
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2022/04/13
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2021/10/22
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2021/08/30
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2021/08/08
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2021/06/11
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2021/06/11
Modulation Analyzer	HP	HP8901A	MRTSUE06098	1 year	2021/09/26
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2021/10/22
Thermal Hygrometer	testo	608-H1	MRTSUE06401	1 year	2021/07/26
Attenuator	MVE	6dB	MRTSUE06534	1 year	N/A
Attenuator	MVE	10dB	MRTSUE06543	1 year	N/A

Software	Version	Function
EMI Software	V3	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 Disturbance
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
Spurious Emissions, Conducted
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
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.15dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.28%

4. Test Result

4.1. Summary

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1046; 24.232(a)(2)	Equivalent Isotropically Radiated Power	< 1640 watts/MHz	Conducted	Pass	Section 4.2
2.1055; 24.235	Frequency Stability	N/A		Pass	Section 4.3
2.1049	Emission Bandwidth	Refer to Section 6.4		Pass	Section 4.4
24.238(a)	Band Edge Measurements	< -13 dBm		Pass	Section 4.5
2.1046; 24.232(d)	Peak to Average Ratio	< 13 dB		Pass	Section 4.6
2.1051; 24.238(a)	Conducted Spurious Emissions	< -13 dBm		Pass	Section 4.7
2.1053; 24.238(a)	Radiated Spurious Emissions	< -13 dBm	Radiated	Pass	Section 4.8

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 of the system to connect the EUT to the analyzer at all frequencies of interest.
2) The Channel Band-edge, Radiated Spurious Emission were presented the worst test data of modultation & antenna port in the test report.

4.2. Equivalent Isotropically Radiated Power Measurement

4.2.1.Test Limit

The Radiated Equivalent Isotropically Power shall be according to the specific rule Part 24.232(a)(2) that are limited to EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

4.2.2.Test Procedures Used

KDB 971168 D01v03r01 - Section 5.2.4 & 5.4 & 5.6

ANSI C63.26-2015 - Section 5.2.4.2 & 5.2.4.5 & 5.2.5.5

4.2.3.Test Setting

Average Power Measurement

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.

Average Power Spectral Density Measurement

1. Span to 2 × to 3 × the OBW
2. RBW ≥ 1% to 5% of the OBW
3. VBW ≥ 3*RBW
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period)
5. Detector = power averaging (rms)
6. Set sweep trigger to “free run”
7. If the EUT can be configured to transmit continuously, then set the trigger to free run
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple.
9. The trace was allowed to stabilize
10. RBW set to the reference bandwidth specified by the applicable regulatory requirement, and by using the marker function to identify the maximum PSD.

Note: 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)

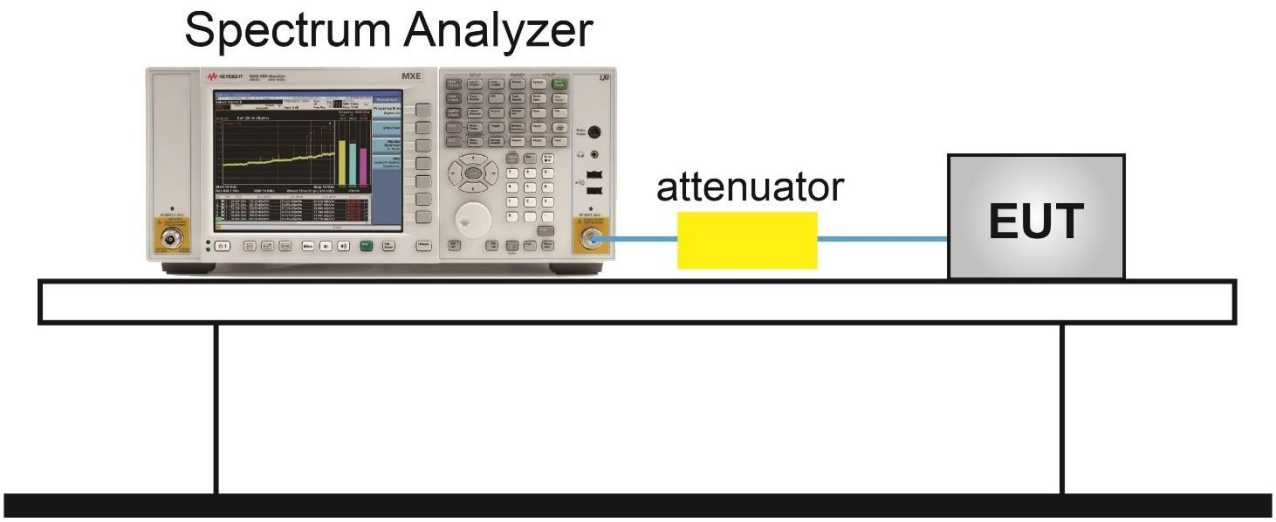
P_{Meas} measured transmitter output power or PSD, in dBm or dBW

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

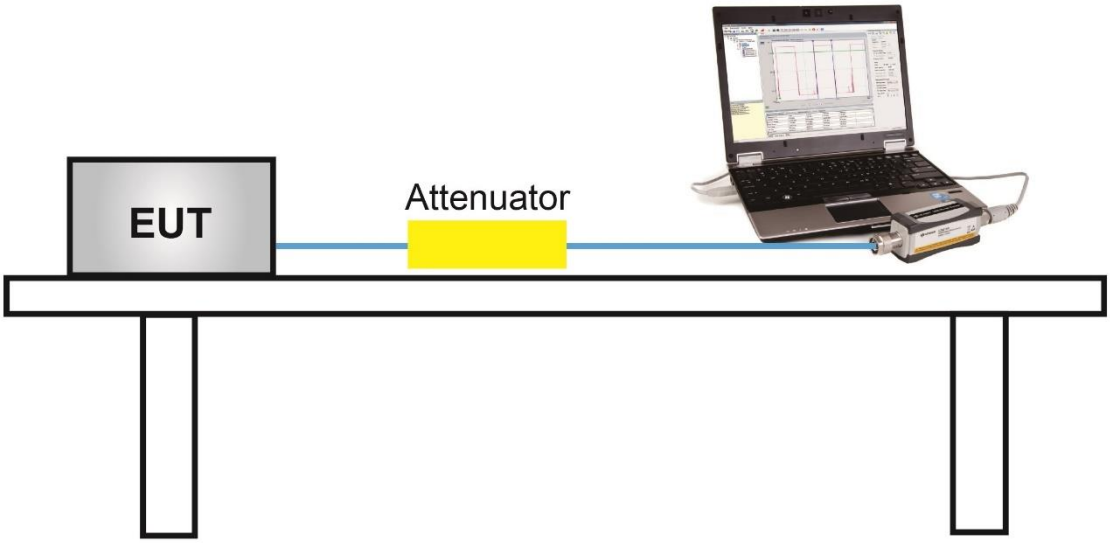
ERP = EIRP -2.15

4.2.4.Test Setup

Average Power Spectral Density Measurement



Conducted Measurment of Output Power



4.2.5.Test Result

Product	B25 4T4R 160W Radio Unit	Test Engineer	Larry Yan
Test Site	WZ-TR3	Test Date	2021/05/06
Test Configuration	LTE Band 25 (Single Carrier)		

Frequency (MHz)	Channel BW (MHz)	Power Density (dBm/MHz)				EIRP Density (dBm/MHz)	Limit (dBm/MHz)
		Ant 1	Ant 2	Ant 3	Ant 4		
QPSK							
1932.5	5	38.82	38.62	38.52	38.42	59.62	< 62.15
1962.5	5	39.23	39.00	38.78	38.92	60.01	< 62.15
1992.5	5	39.09	39.09	38.70	38.96	59.98	< 62.15
1935.0	10	35.67	35.73	35.65	35.35	56.62	< 62.15
1962.5	10	35.92	36.07	35.93	35.75	56.94	< 62.15
1990.0	10	36.26	36.18	35.79	35.72	57.01	< 62.15
1937.5	15	34.59	34.37	33.96	34.28	55.33	< 62.15
1962.5	15	34.22	34.34	34.21	34.41	55.32	< 62.15
1987.5	15	34.37	34.32	34.06	34.00	55.21	< 62.15
1940.0	20	33.10	33.78	32.73	33.35	54.28	< 62.15
1962.5	20	33.15	33.24	32.81	33.14	54.11	< 62.15
1985.0	20	33.01	33.14	32.65	32.84	53.93	< 62.15
16QAM							
1932.5	5	39.01	38.89	38.85	38.84	59.92	< 62.15
1962.5	5	39.49	39.53	39.32	38.90	60.34	< 62.15
1992.5	5	39.16	39.25	39.26	39.04	60.20	< 62.15
1935.0	10	36.19	35.92	35.58	35.51	56.83	< 62.15
1962.5	10	36.59	36.40	36.10	36.27	57.36	< 62.15
1990.0	10	36.60	36.35	36.36	35.96	57.34	< 62.15
1937.5	15	34.92	34.54	34.73	34.76	55.76	< 62.15
1962.5	15	34.41	35.02	34.38	34.83	55.69	< 62.15
1987.5	15	34.52	34.93	34.71	34.90	55.79	< 62.15
1940.0	20	33.41	33.47	33.15	33.00	54.28	< 62.15
1962.5	20	33.49	32.97	33.29	33.07	54.23	< 62.15
1985.0	20	32.78	33.36	32.97	32.96	54.04	< 62.15

Frequency (MHz)	Channel Bandwidth (MHz)	Power Density (dBm/MHz)				EIRP Density (dBm/MHz)	Limit (dBm/MHz)
		Ant 1	Ant 2	Ant 3	Ant 4		
64QAM							
1932.5	5	39.05	38.80	38.47	38.81	59.81	< 62.15
1962.5	5	39.20	39.25	38.81	38.93	60.07	< 62.15
1992.5	5	39.04	38.96	38.74	38.85	59.92	< 62.15
1935.0	10	35.69	35.78	35.45	35.78	56.70	< 62.15
1962.5	10	36.40	36.30	36.05	35.99	57.21	< 62.15
1990.0	10	36.21	36.10	35.95	36.22	57.14	< 62.15
1937.5	15	34.54	34.23	34.06	34.21	55.28	< 62.15
1962.5	15	34.54	34.46	34.00	34.39	55.37	< 62.15
1987.5	15	34.42	34.25	34.10	34.20	55.26	< 62.15
1940.0	20	33.18	33.10	32.89	33.00	54.06	< 62.15
1962.5	20	33.73	32.98	33.00	33.05	54.22	< 62.15
1985.0	20	32.81	33.23	32.69	32.97	53.95	< 62.15
256QAM							
1932.5	5	38.81	38.75	38.40	38.64	59.67	< 62.15
1962.5	5	39.06	38.99	38.77	38.89	59.95	< 62.15
1992.5	5	38.99	38.84	38.52	38.43	59.72	< 62.15
1935.0	10	35.85	35.74	35.30	35.66	56.66	< 62.15
1962.5	10	36.17	36.08	36.06	36.11	57.13	< 62.15
1990.0	10	36.18	36.34	36.06	36.08	57.19	< 62.15
1937.5	15	34.47	34.19	33.90	34.08	55.19	< 62.15
1962.5	15	34.33	34.50	34.02	34.06	55.25	< 62.15
1987.5	15	34.45	34.33	34.16	34.23	55.31	< 62.15
1940.0	20	33.30	32.99	32.98	33.22	54.15	< 62.15
1962.5	20	32.79	33.29	33.03	33.01	54.05	< 62.15
1985.0	20	32.98	33.15	33.03	32.80	54.01	< 62.15

Note 1: Total Power Density (dBm/MHz) = 10*log*{$10^{\wedge[\text{ANT 1 Power Density / 10}]}$ + $10^{\wedge[\text{ANT 2 Power Density / 10}]}$ + $10^{\wedge[\text{ANT 3 Power Density / 10}]}$ + $10^{\wedge[\text{ANT 4 Power Density / 10}]}$} (dBm/MHz).

Note 2: EIRP Density (dBm/MHz) = Total Power Density (dBm/MHz) + Antenna Gain (dBi).

Frequency (MHz)	Channel BW (MHz)	Conducted Output Power (dBm)				Total Output Power (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	
QPSK						
1932.5	5	45.78	45.82	45.52	45.63	51.71
1962.5	5	45.78	45.72	45.59	45.71	51.72
1992.5	5	45.74	45.69	45.49	45.57	51.64
1935.0	10	45.82	45.78	45.61	45.71	51.75
1962.5	10	45.84	45.81	45.66	45.74	51.78
1990.0	10	45.81	45.68	45.69	45.69	51.74
1937.5	15	45.87	45.86	45.69	45.78	51.82
1962.5	15	45.84	45.91	45.69	45.83	51.84
1987.5	15	45.76	45.70	45.59	45.71	51.71
1940.0	20	45.89	45.77	45.63	45.79	51.79
1962.5	20	45.84	45.74	45.60	45.68	51.74
1985.0	20	45.77	45.72	45.66	45.69	51.73
16QAM						
1932.5	5	45.83	45.78	45.56	45.67	51.73
1962.5	5	45.74	45.76	45.62	45.77	51.74
1992.5	5	45.75	45.66	45.57	45.60	51.67
1935.0	10	45.85	45.76	45.68	45.75	51.78
1962.5	10	45.83	45.84	45.77	45.79	51.83
1990.0	10	45.79	45.72	45.71	45.73	51.76
1937.5	15	45.83	45.87	45.68	45.88	51.84
1962.5	15	45.95	45.82	45.72	45.69	51.82
1987.5	15	45.82	45.83	45.69	45.72	51.79
1940.0	20	45.84	45.75	45.60	45.71	51.75
1962.5	20	45.81	45.76	45.62	45.71	51.75
1985.0	20	45.78	45.62	45.69	45.69	51.72

Frequency (MHz)	Channel Bandwidth (MHz)	Conducted Output Power (dBm)				Total Output Power (dBm)
		Ant 1	Ant 2	Ant 3	Ant 4	
64QAM						
1932.5	5	45.83	45.80	45.61	45.72	51.76
1962.5	5	45.82	45.75	45.58	45.68	51.73
1992.5	5	45.86	45.72	45.56	45.57	51.70
1935.0	10	45.88	45.79	45.67	45.70	51.78
1962.5	10	45.86	45.81	45.72	45.74	51.80
1990.0	10	45.87	45.72	45.58	45.69	51.74
1937.5	15	45.92	45.83	45.73	45.72	51.82
1962.5	15	45.82	45.83	45.66	45.76	51.79
1987.5	15	45.80	45.84	45.66	45.71	51.77
1940.0	20	45.87	45.78	45.67	45.70	51.78
1962.5	20	45.85	45.83	45.58	45.85	51.80
1985.0	20	45.73	45.77	45.63	45.67	51.72
256QAM						
1932.5	5	45.86	45.72	45.45	45.64	51.69
1962.5	5	45.75	45.76	45.59	45.68	51.72
1992.5	5	45.76	45.70	45.49	45.57	51.65
1935.0	10	45.82	45.83	45.66	45.84	51.81
1962.5	10	45.83	45.80	45.70	45.82	51.81
1990.0	10	45.80	45.82	45.73	45.73	51.79
1937.5	15	45.88	45.85	45.70	45.78	51.82
1962.5	15	45.85	45.82	45.67	45.70	51.78
1987.5	15	45.78	45.71	45.53	45.76	51.72
1940.0	20	45.84	45.82	45.58	45.71	51.76
1962.5	20	45.86	45.83	45.67	45.74	51.80
1985.0	20	45.72	45.72	45.58	45.69	51.70

Note: Total Output Power (dBm) = $10*\log\{10^{\wedge[\text{ANT 1 Output Power / 10}]} + 10^{\wedge[\text{ANT 2 Output Power / 10}]} + 10^{\wedge[\text{ANT 3 Output Power / 10}]} + 10^{\wedge[\text{ANT 4 Output Power / 10}]}\}$ (dBm).

4.3. Frequency Stability Measurement

4.3.1.Test Limit

N/A

4.3.2.Test Procedures Used

KDB 971168 D01v03r01 - Section 9

ANSI C63.26-2015 - Section 5.6

4.3.3.Test Setting

Frequency Stability Under Temperature Variations:

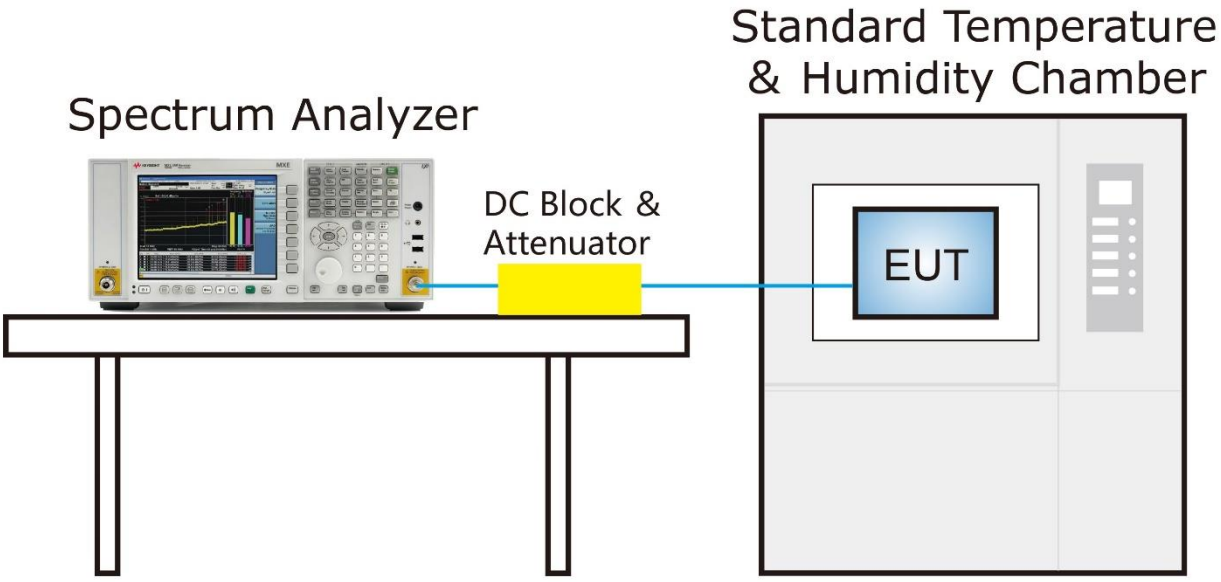
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain 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 input voltage to specify extreme voltage variation (±15%) and endpoint (If a product is specified to operate over a range of input voltage then the −15% variation is applied to the lowermost voltage and the +15%is applied to the uppermost voltage), recordthe maximum frequency change.

4.3.4.Test Setup



6.3.5. Test Result

Product	B25 4T4R 160W Radio Unit	Test Engineer	Larry Yan
Test Site	WZ-TR3	Test Date	20201/04/29
Test Confirmation	LTE Band 25 (Single Carrier), BW=20MHz, QPSK		

Voltage (DC)	Temp (°C)	Frequency Tolerance (ppm)
48V	- 30	-0.011
	- 20	-0.011
	- 10	-0.012
	0	-0.013
	+ 10	-0.011
	+ 20	-0.013
	+ 30	-0.013
	+ 40	-0.012
	+ 50	-0.012
40.8V	+ 20	-0.014
55.2V	+ 20	-0.012

4.4. Emission Bandwidth

4.4.1.Test Limit

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.4.2.Test Procedure

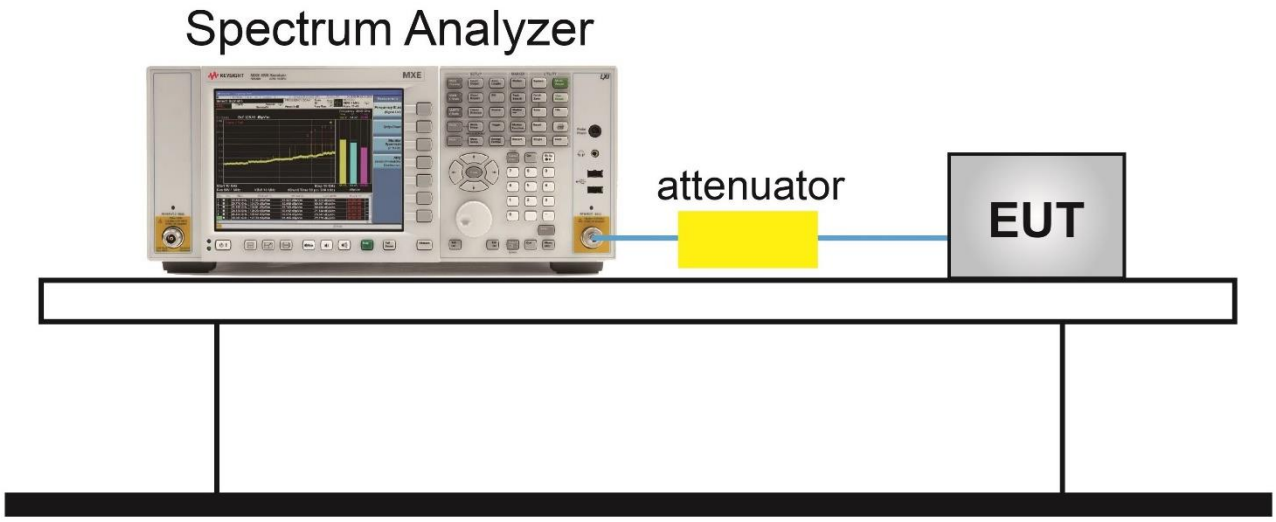
KDB 971168 D01v03r01 - Section 4.1 & 4.2

ANSI C63.26-2015 - Section 5.4.3 & 5.4.4

4.4.3.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. The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “−X dB” requirement, i.e., if the requirement calls for measuring the −26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 26 dB below the reference level

4.4.4.Test Setup



6.4.5. Test Result

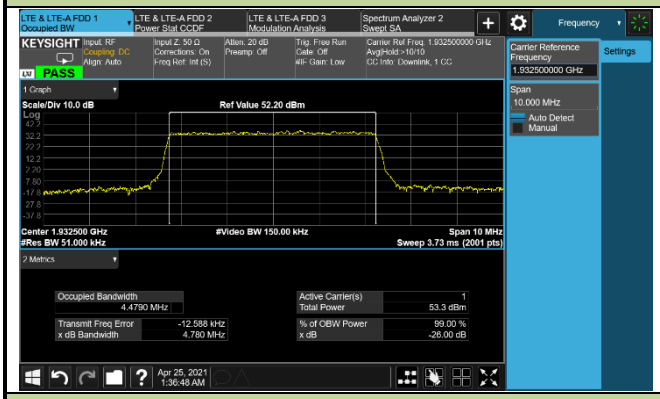
Product	B25 4T4R 160W Radio Unit	Test Engineer	Larry Yan
Test Site	WZ-TR3	Test Date	2021/04/26
Test Configuration	LTE Band 25 (Single Carrier)		

Frequency (MHz)	Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
QPSK			
1932.5	5	4.78	4.48
1962.5	5	4.78	4.48
1992.5	5	4.78	4.48
1935.0	10	9.49	8.93
1962.5	10	9.49	8.94
1990.0	10	9.49	8.92
1937.5	15	14.57	13.42
1962.5	15	14.59	13.42
1987.5	15	14.60	13.41
1940.0	20	19.00	17.87
1962.5	20	19.00	17.87
1985.0	20	19.00	17.86
16QAM			
1932.5	5	4.77	4.48
1962.5	5	4.77	4.48
1992.5	5	4.77	4.48
1935.0	10	9.49	8.93
1962.5	10	9.49	8.93
1990.0	10	9.48	8.92
1937.5	15	14.43	13.43
1962.5	15	14.43	13.43
.431987.5	15	14.44	13.41
1940.0	20	18.93	17.88
1962.5	20	18.93	17.89
1985.0	20	18.91	17.88

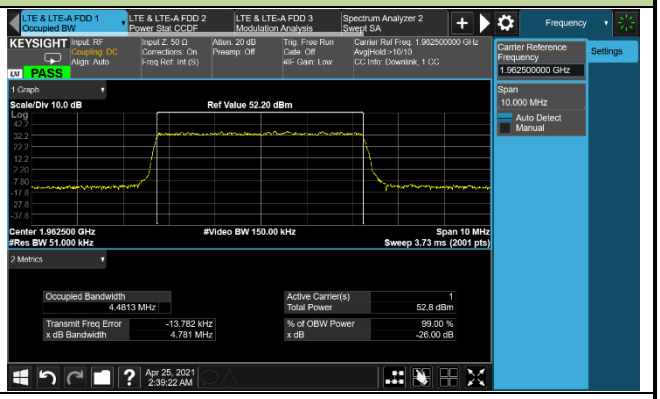
Frequency (MHz)	Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
64QAM			
1932.5	5	4.75	4.47
1962.5	5	4.75	4.47
1992.5	5	4.75	4.47
1935.0	10	9.51	8.95
1962.5	10	9.51	8.94
1990.0	10	9.52	8.94
1937.5	15	14.52	13.45
1962.5	15	14.53	13.46
1987.5	15	14.53	13.45
1940.0	20	18.96	17.85
1962.5	20	18.98	17.85
1985.0	20	18.97	17.85
256QAM			
1932.5	5	4.76	4.47
1962.5	5	4.76	4.47
1992.5	5	4.76	4.47
1935.0	10	9.51	8.93
1962.5	10	9.52	8.93
1990.0	10	9.52	8.93
1937.5	15	14.51	13.43
1962.5	15	14.52	13.43
1987.5	15	14.51	13.43
1940.0	20	18.90	17.86
1962.5	20	18.96	17.86
1985.0	20	18.94	17.86

5MHz Channel Bandwidth - QPSK

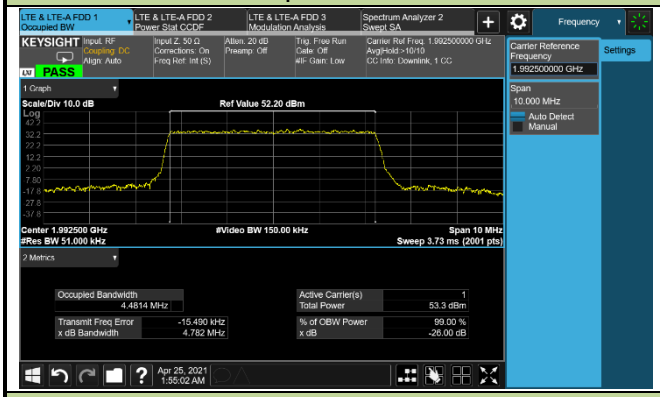
Bottom Channel



Middle Channel

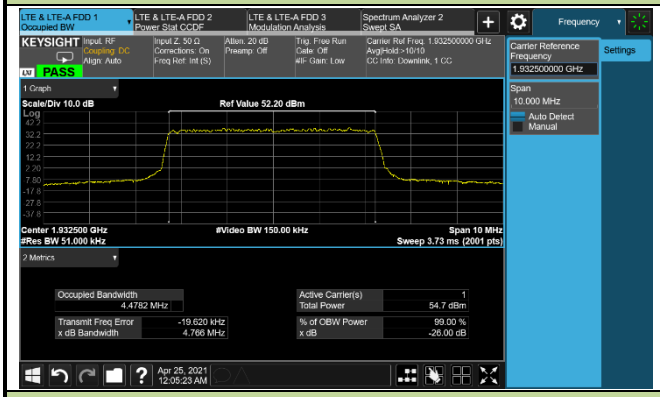


Top Channel

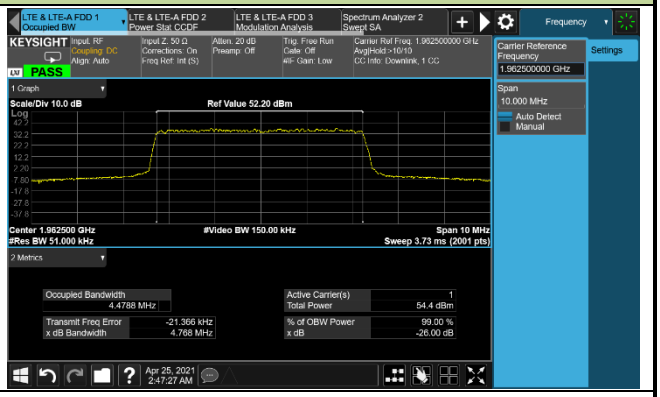


5MHz Channel Bandwidth - 16QAM

Bottom Channel



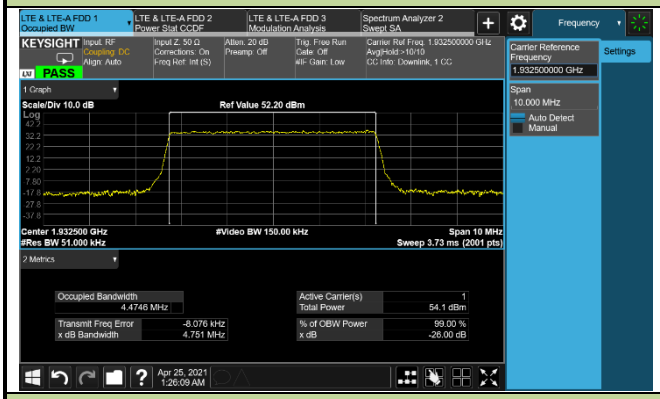
Middle Channel



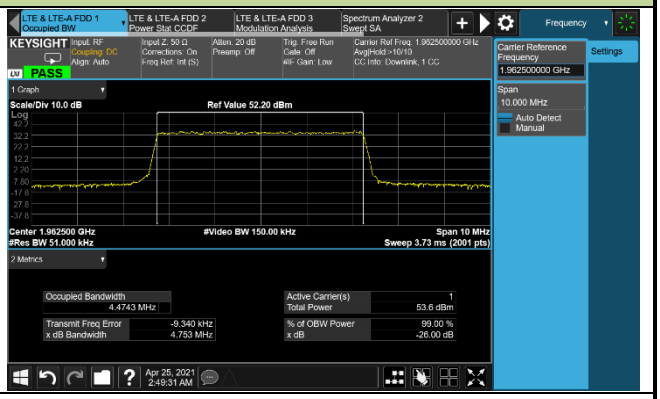
Top Channel

5MHz Channel Bandwidth - 64QAM

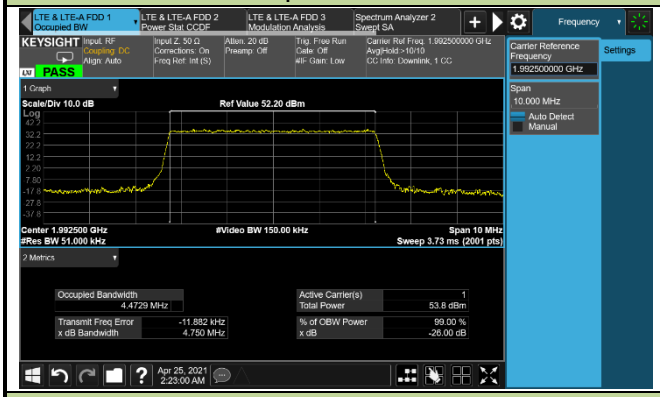
Bottom Channel



Middle Channel

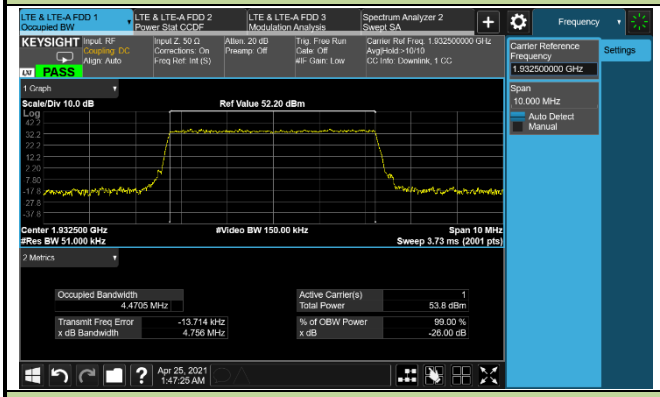


Top Channel

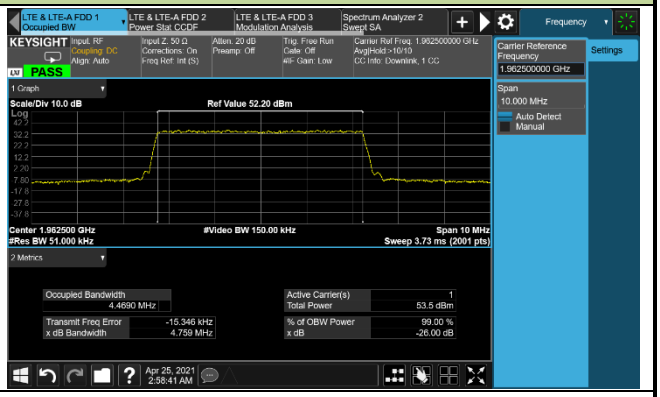


5MHz Channel Bandwidth - 256QAM

Bottom Channel



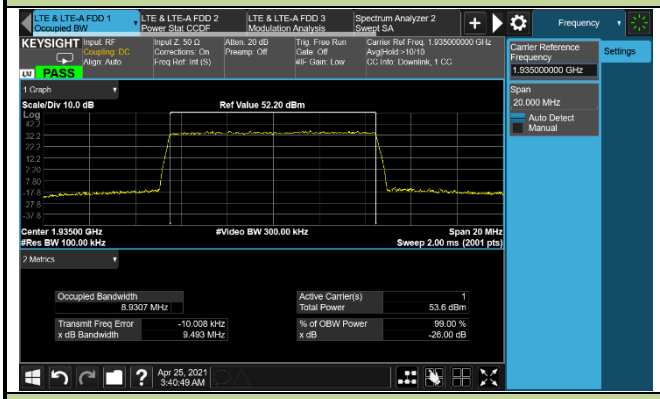
Middle Channel



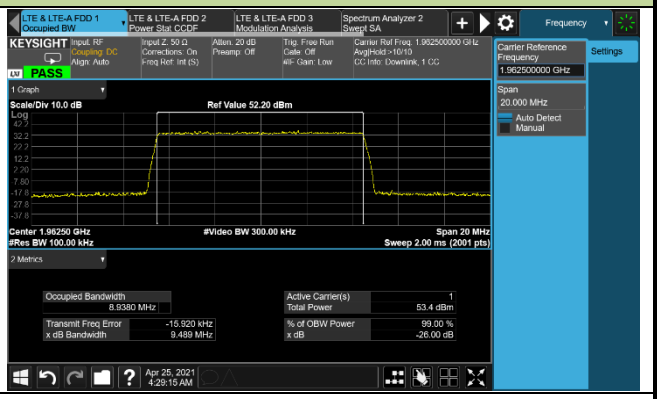
Top Channel

10MHz Channel Bandwidth - QPSK

Bottom Channel



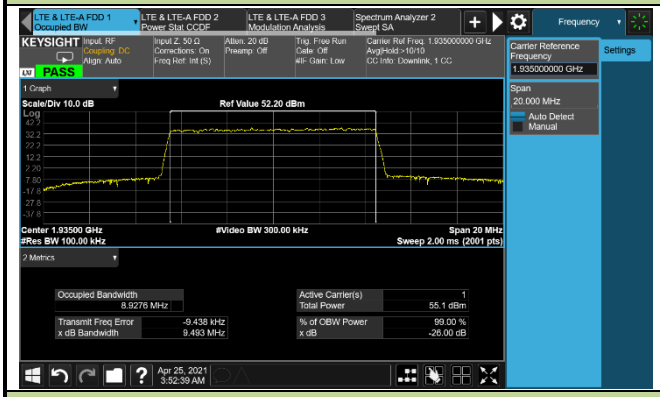
Middle Channel



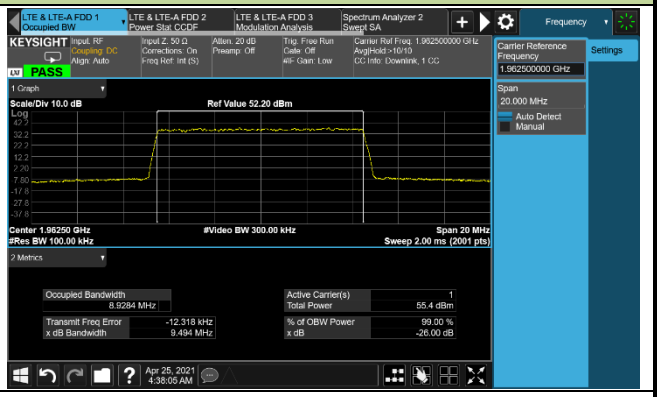
Top Channel

10MHz Channel Bandwidth - 16QAM

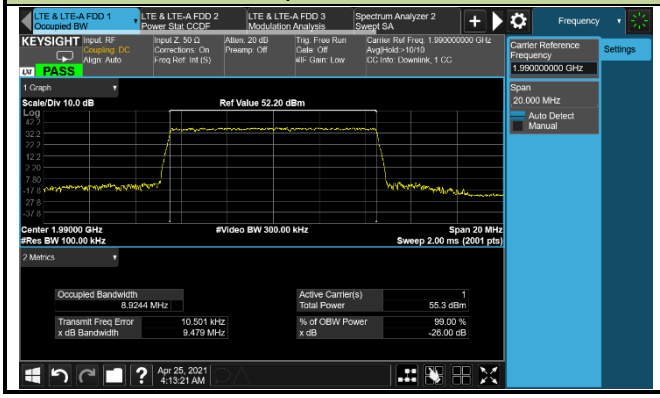
Bottom Channel



Middle Channel

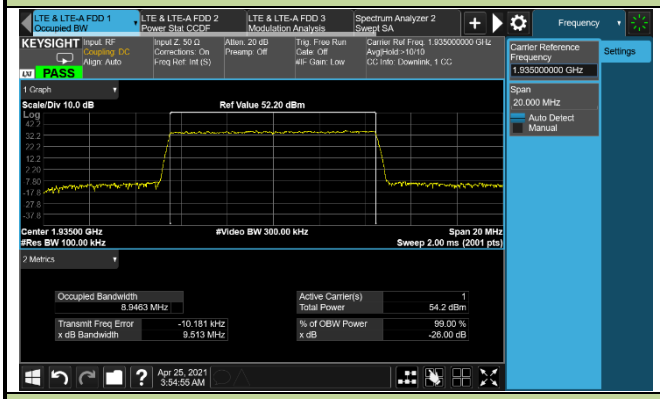


Top Channel

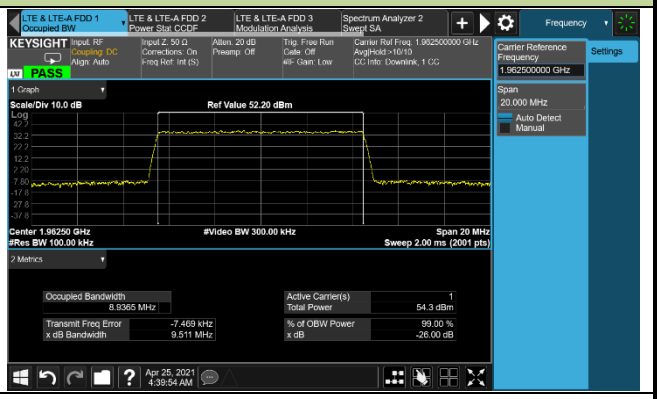


10MHz Channel Bandwidth - 64QAM

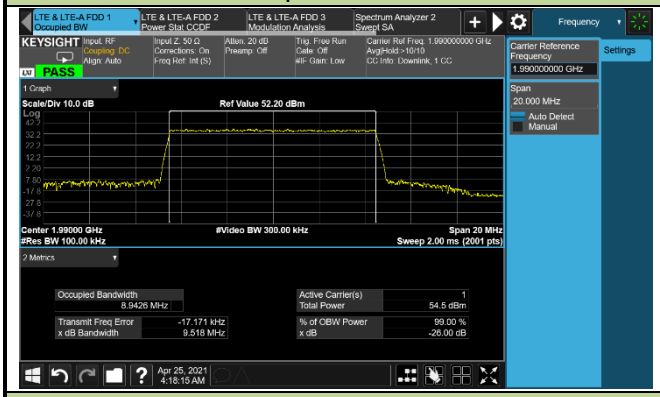
Bottom Channel



Middle Channel

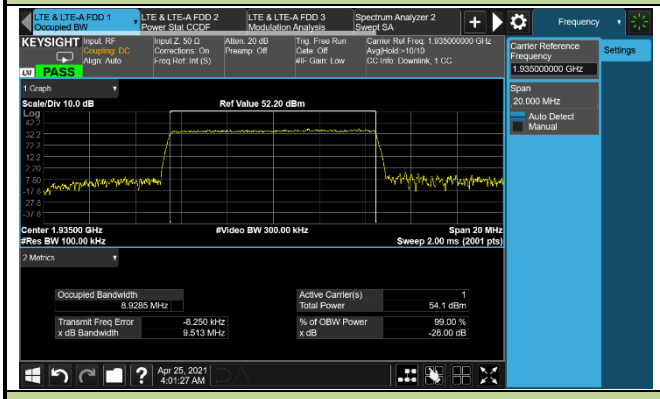


Top Channel

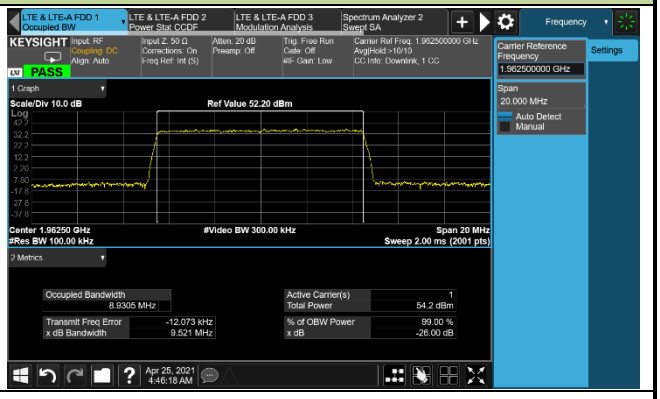


10MHz Channel Bandwidth - 256QAM

Bottom Channel



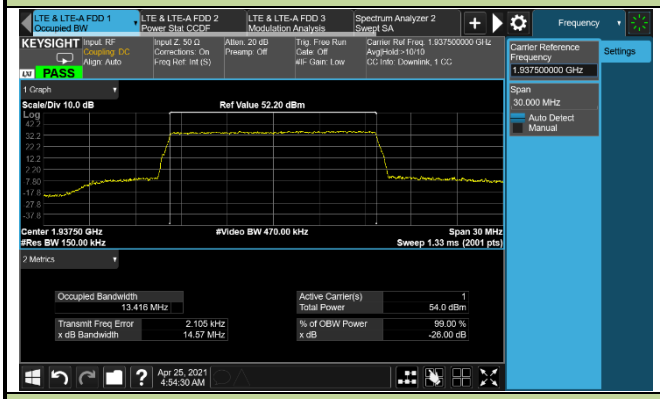
Middle Channel



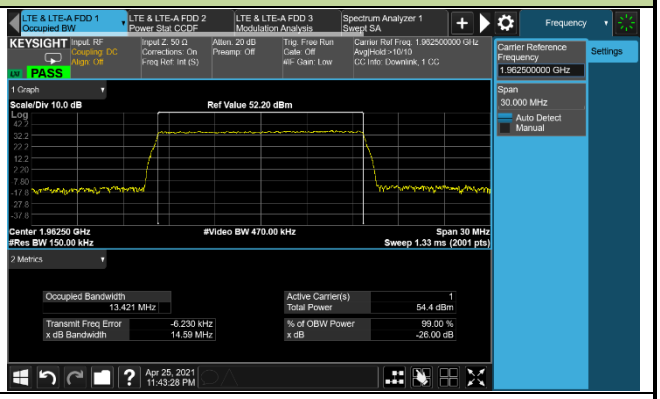
Top Channel

15MHz Channel Bandwidth - QPSK

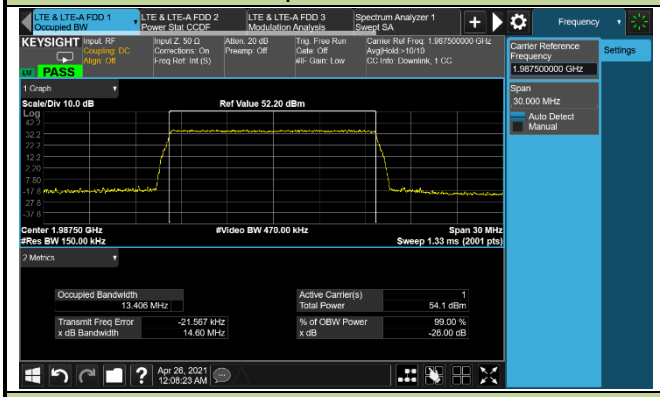
Bottom Channel



Middle Channel

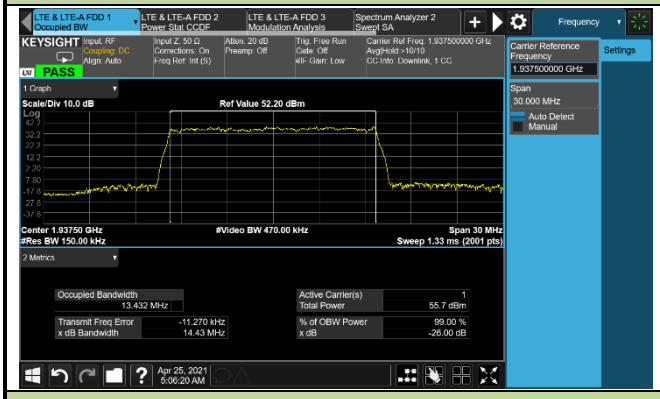


Top Channel

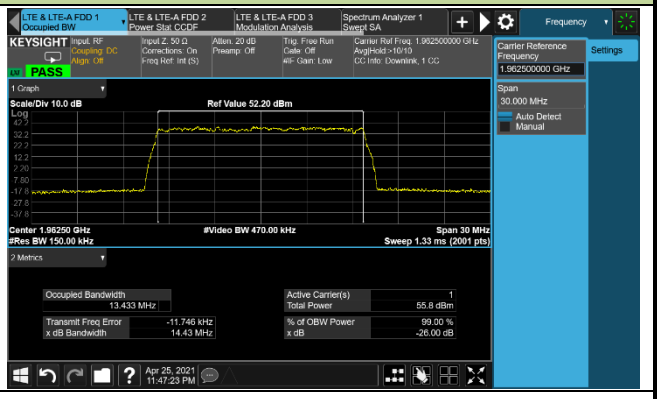


15MHz Channel Bandwidth - 16QAM

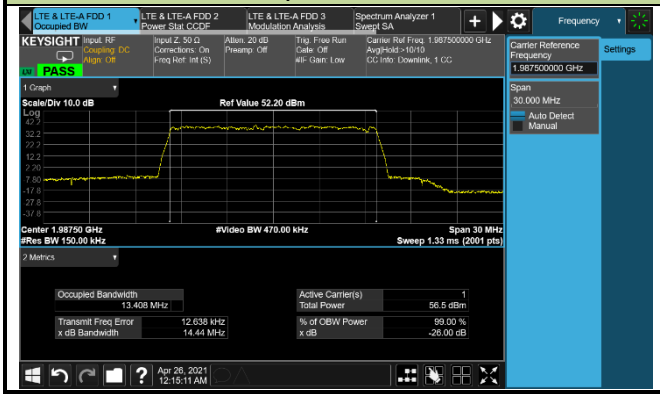
Bottom Channel



Middle Channel

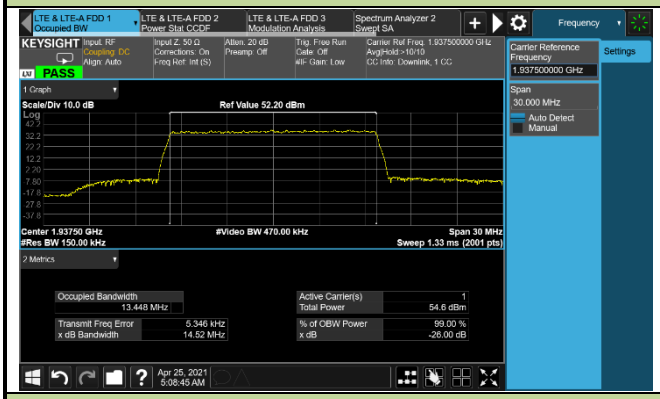


Top Channel

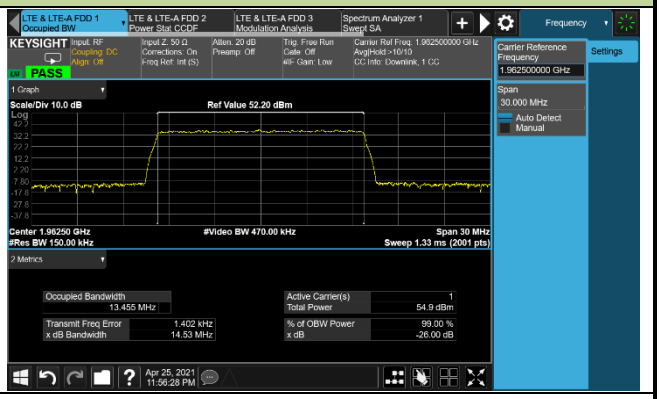


15MHz Channel Bandwidth - 64QAM

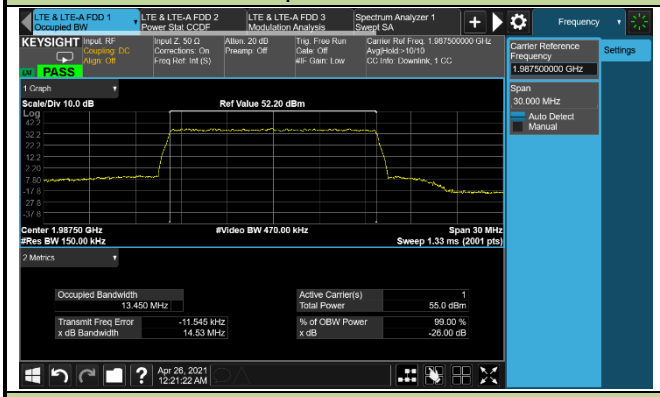
Bottom Channel



Middle Channel

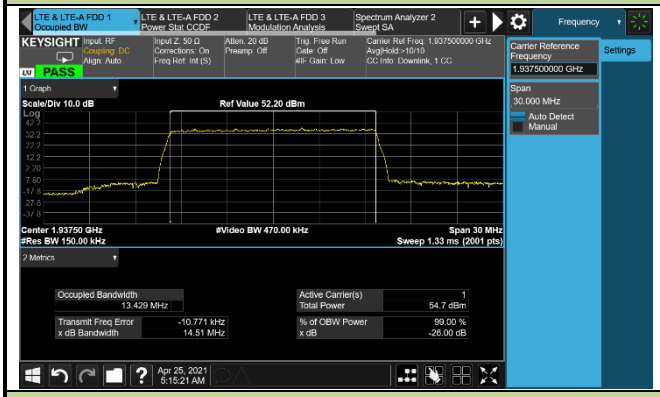


Top Channel

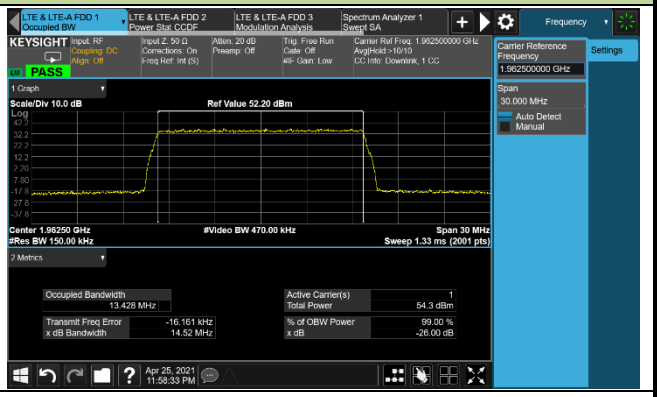


15MHz Channel Bandwidth - 256QAM

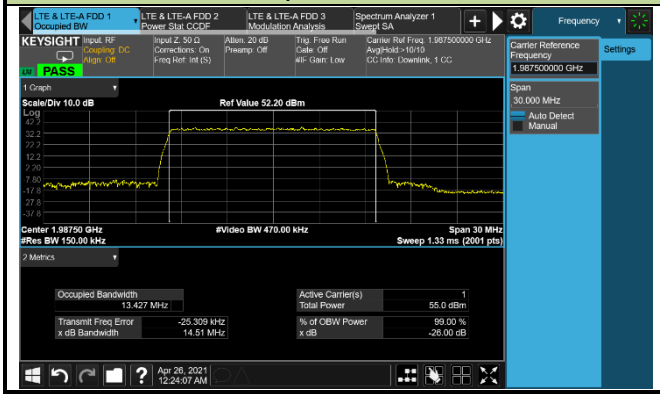
Bottom Channel



Middle Channel

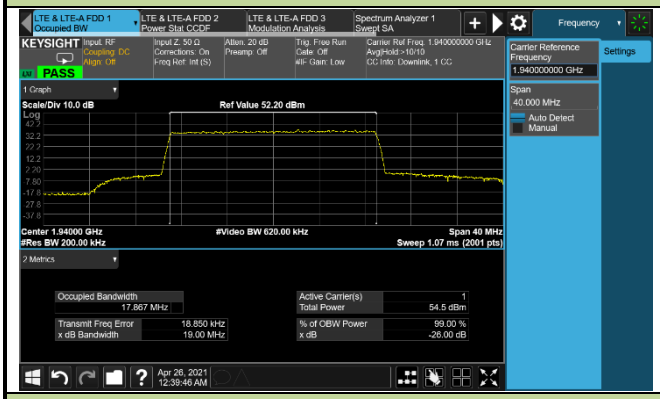


Top Channel

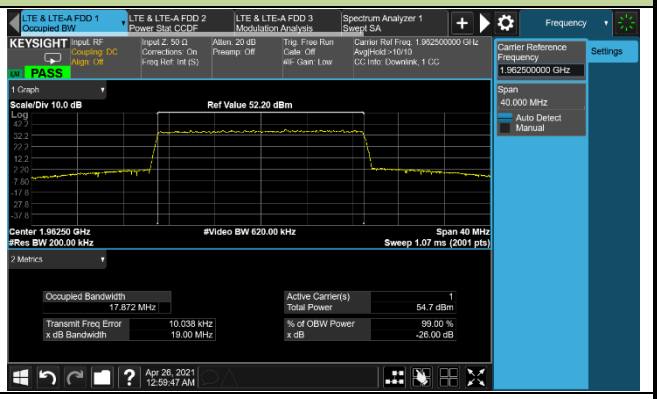


20MHz Channel Bandwidth - QPSK

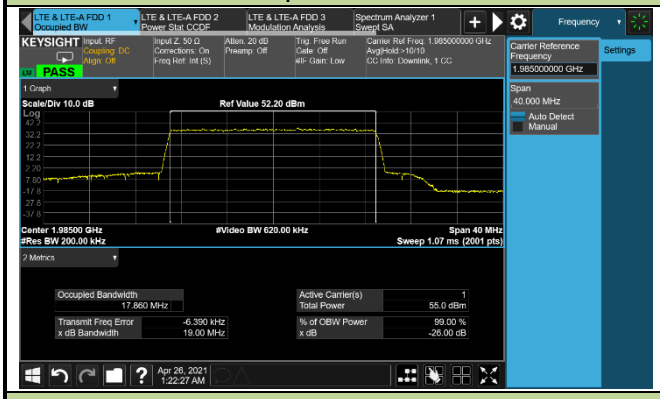
Bottom Channel



Middle Channel

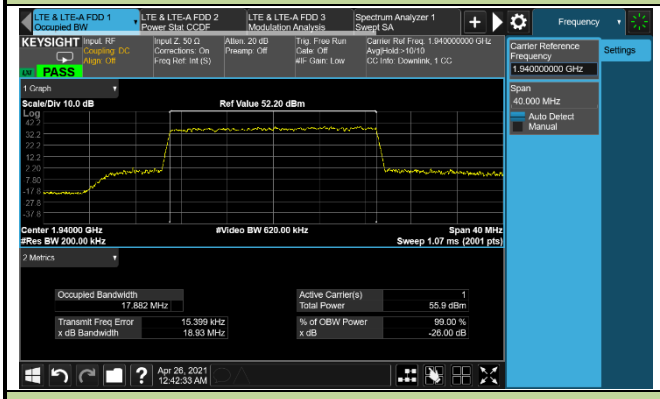


Top Channel

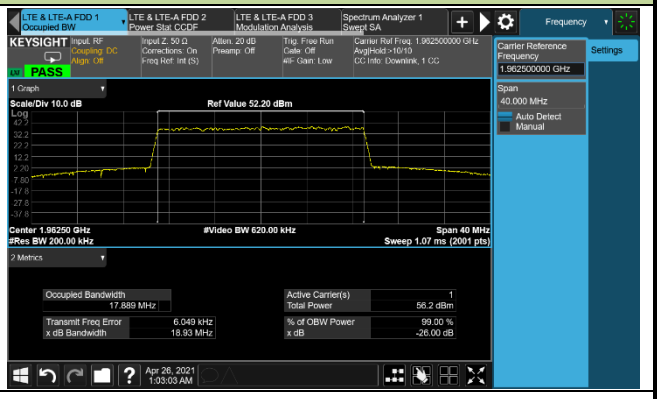


20MHz Channel Bandwidth - 16QAM

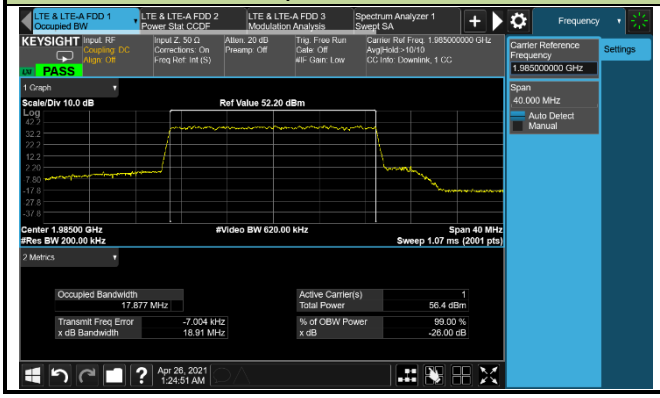
Bottom Channel



Middle Channel

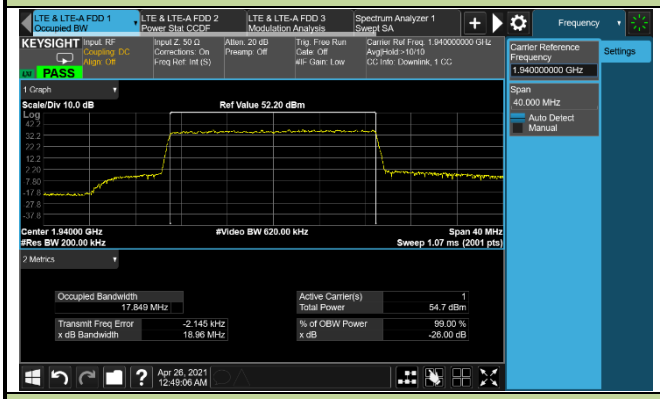


Top Channel

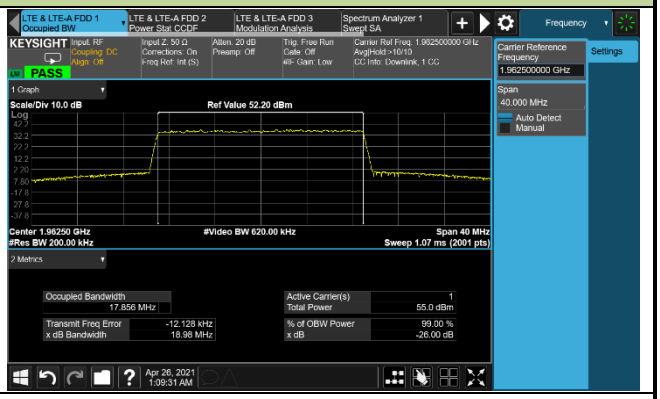


20MHz Channel Bandwidth - 64QAM

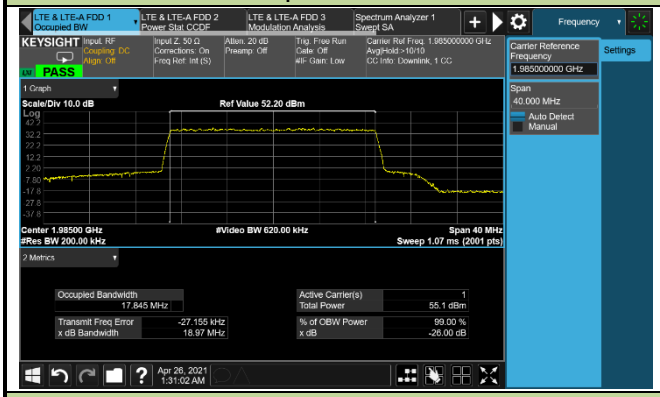
Bottom Channel



Middle Channel

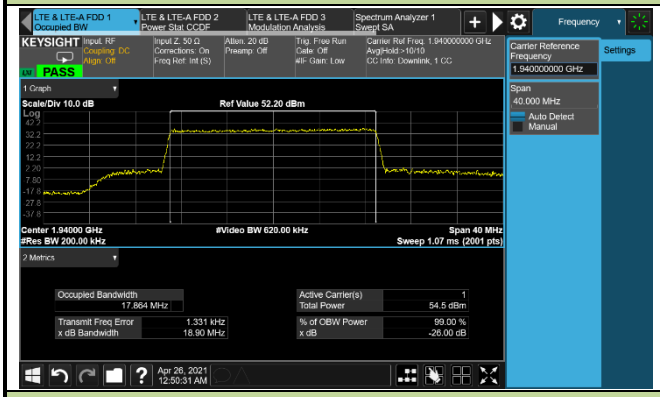


Top Channel

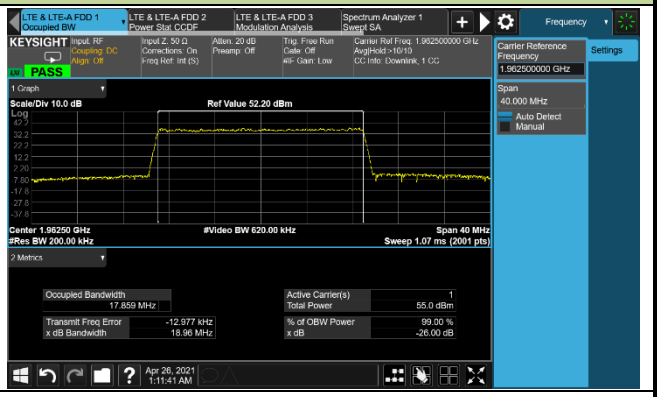


20MHz Channel Bandwidth - 256QAM

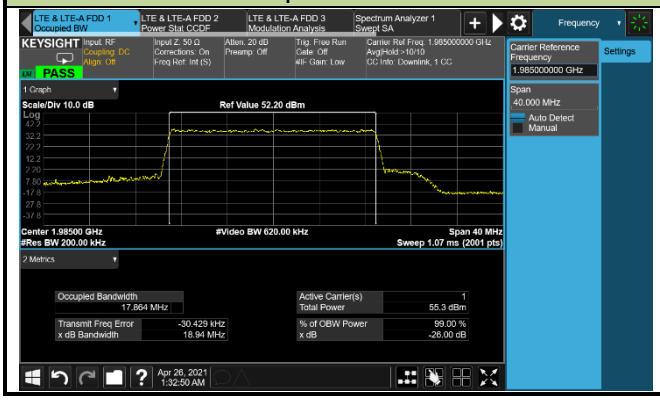
Bottom Channel



Middle Channel



Top Channel



4.5. Band Edge Measurement

4.5.1.Test Limit

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.

This device can be impelement MIMO function, so the limit of spurious emissions needs to be reduced by 10*log($Numbers_{Ant}$) according to FCC KDB 662911 D01 guidance.

The limit is adjusted to -13 dBm - 10*log (4) = -19.02dBm

4.5.2.Test Procedure Used

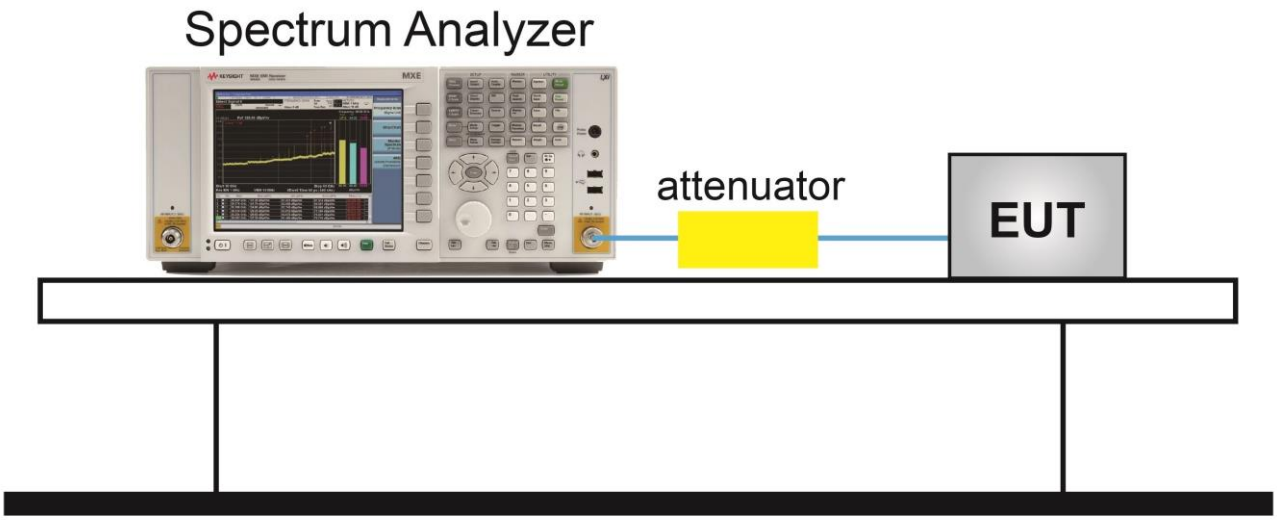
KDB 971168 D01v03r01 - Section 6.1

ANSI C63.26-2015 - Section 5.7.1

4.5.3.Test Setting

1. Set the analyzer frequency to Bottom or Top channel.
1. RBW = The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW
2. VBW ≥ 3*RBW
3. Sweep time = auto
4. Detector = power averaging (rms)
5. Set sweep trigger to “free run”
6. 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.

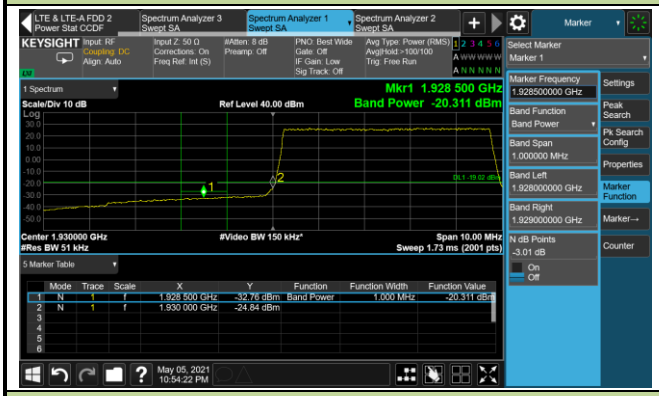
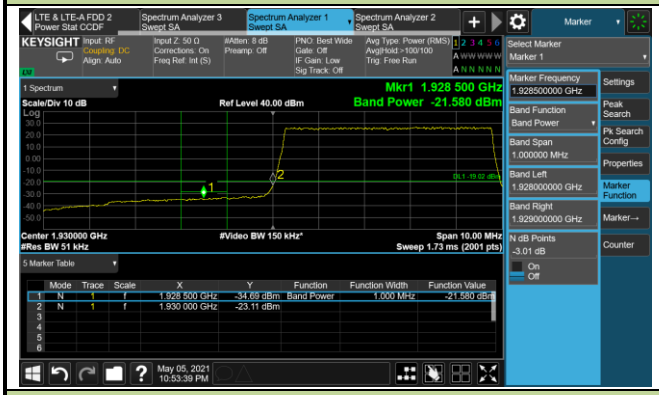
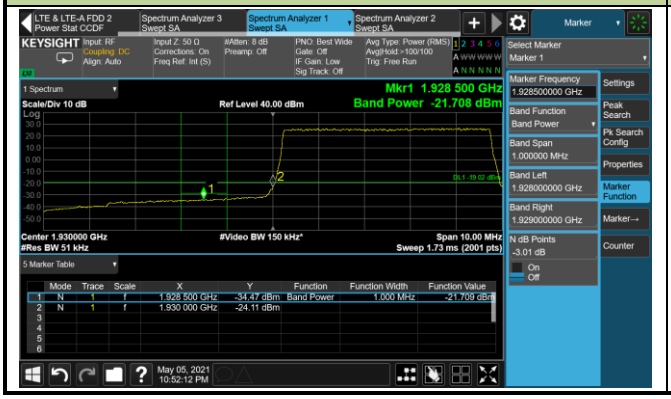
4.5.4.Test Setup

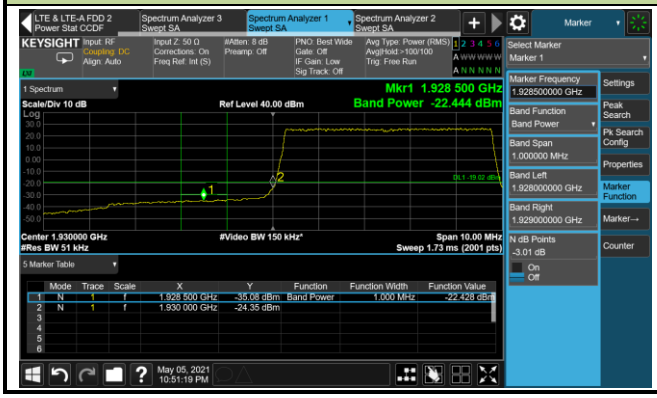


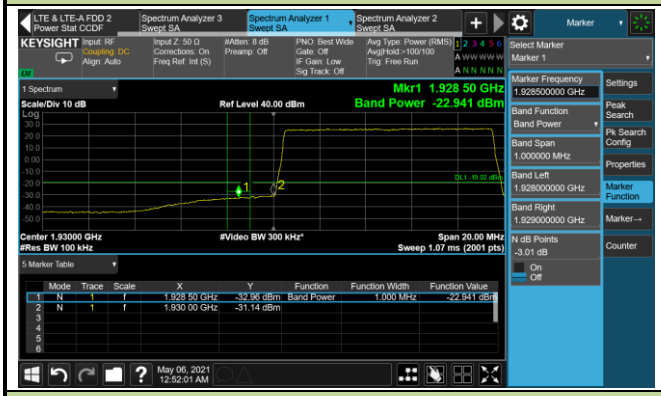
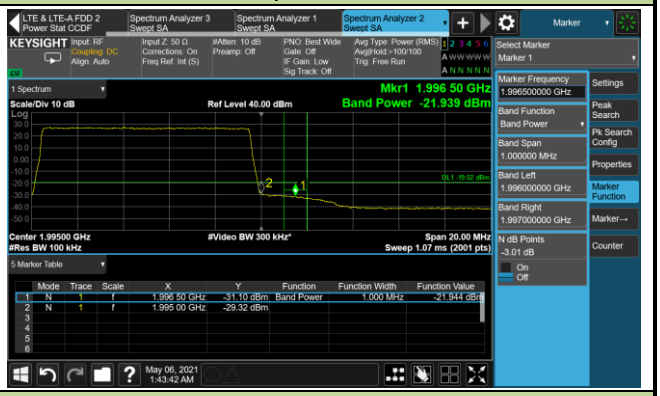
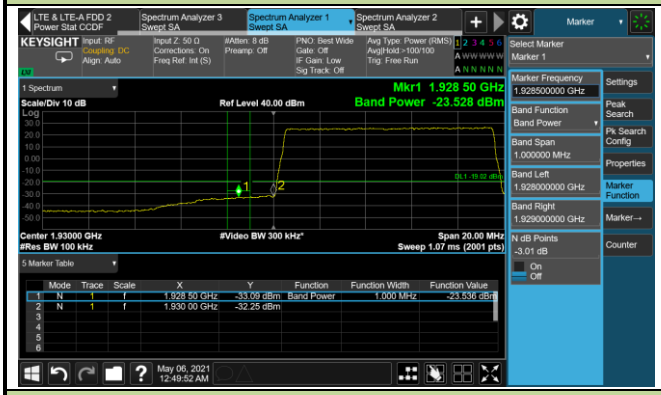
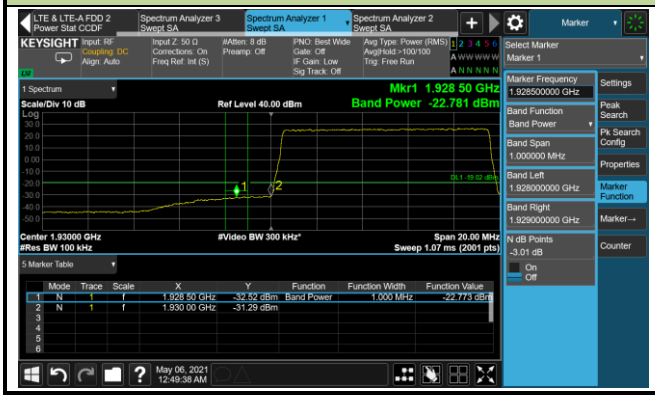
4.5.5.Test Result

Product	B25 4T4R 160W Radio Unit	Test Engineer	Larry Yan
Test Site	WZ-TR3	Test Date	2020/05/06
Test Configuration	LTE Band 25 (Single Carrier), QPSK		

Frequency (MHz)	Channel BW (MHz)	Max Band Edge (dBm)				Limit (dBm)	Result
		Ant 1	Ant 2	Ant 3	Ant 4		
1932.5	5	-20.31	-21.58	-21.71	-22.44	≤ -19.02	Pass
1992.5	5	-19.58	-19.32	-19.92	-19.28	≤ -19.02	Pass
1935.0	10	-22.94	-23.53	-22.78	-23.75	≤ -19.02	Pass
1990.0	10	-21.94	-21.49	-22.02	-21.57	≤ -19.02	Pass
1937.5	15	-24.22	-24.89	-24.99	-24.95	≤ -19.02	Pass
1987.5	15	-23.01	-23.38	-23.10	-22.56	≤ -19.02	Pass
1940.0	20	-25.57	-24.78	-25.20	-24.39	≤ -19.02	Pass
1985.0	20	-24.05	-23.99	-24.14	-22.72	≤ -19.02	Pass

5MHz Channel Bandwidth - Ant 1	
Bottom Channel	Top Channel
	
5MHz Channel Bandwidth - Ant 2	
Bottom Channel	Top Channel
	
5MHz Channel Bandwidth - Ant 3	
Bottom Channel	Top Channel
	

5MHz Channel Bandwidth - Ant 4	
Bottom Channel	Top Channel
	

10MHz Channel Bandwidth - Ant 1	
Bottom Channel	Top Channel
	
10MHz Channel Bandwidth - Ant 2	
Bottom Channel	Top Channel
	
10MHz Channel Bandwidth - Ant 3	
Bottom Channel	Top Channel
	

10MHz Channel Bandwidth - Ant 4	
Bottom Channel	Top Channel