

RF MEASUREMENT REPORT

FCC ID: HD5-EDA521

Application: Honeywell International Inc
Honeywell Safety and Productivity Solutions

Product: Mobile Computer

Model No.: EDA52-1

Brand Name: Honeywell

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part(s): Part 27 Subpart D

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

Test Date: January 11 ~ February 28, 2022

Reviewed By:

Jame Yuan

Approved By:

Robin Wu



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
2112RSU039-U9	Rev. 01	Initial Report	02-28-2022	Valid

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1. General Information

1.1. Applicant

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Bailes Rd. Fort Mill, SC 29707 United States

1.2. Manufacturer

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Bailes Rd. Fort Mill, SC 29707 United States

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 FCC: CN1166 VCCI: R-20025, G-20034, C-20020, T-20020
	CNAS: L10551 ISED: CN0001
☐	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 FCC: CN1284
	CNAS: L10551 ISED: CN0105
☐	Test Site - MRT Taiwan Laboratory
	Laboratory Location (Taiwan) No. 38, Fuxing 2 nd 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	Mobile Computer
Model No.	EDA52-1
IMEI	Conducted Measurement: 990017701062131 Radiated Measurement: 990017701732584
Wi-Fi Specification	802.11a/b/g/n/ac
Bluetooth Specification	v5.0 dual mode
NFC Specification	Active, 13.56MHz
GNSS Specification	GPS/Galileo/BDS/GLONASS
3GPP Specification	GSM 850/1900 WCDMA Band 2/4/5 LTE Band 2/4/5/7/12/13/17/25/26/30/38/40/41/66
Working Voltage	3.8Vdc
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. Radio Specification

FDD T _x Frequency Range	Band 30: 2305 ~ 2315 MHz
FDD R _x Frequency Range	Band 30: 2350 ~ 2360 MHz
TDD T _x &R _x Frequency Range	Band 40(Lower Band): 2305 ~ 2315 MHz Band 40(Upper Band): 2350 ~ 2360 MHz

Note 1: For other features of this EUT, test report will be issued separately.

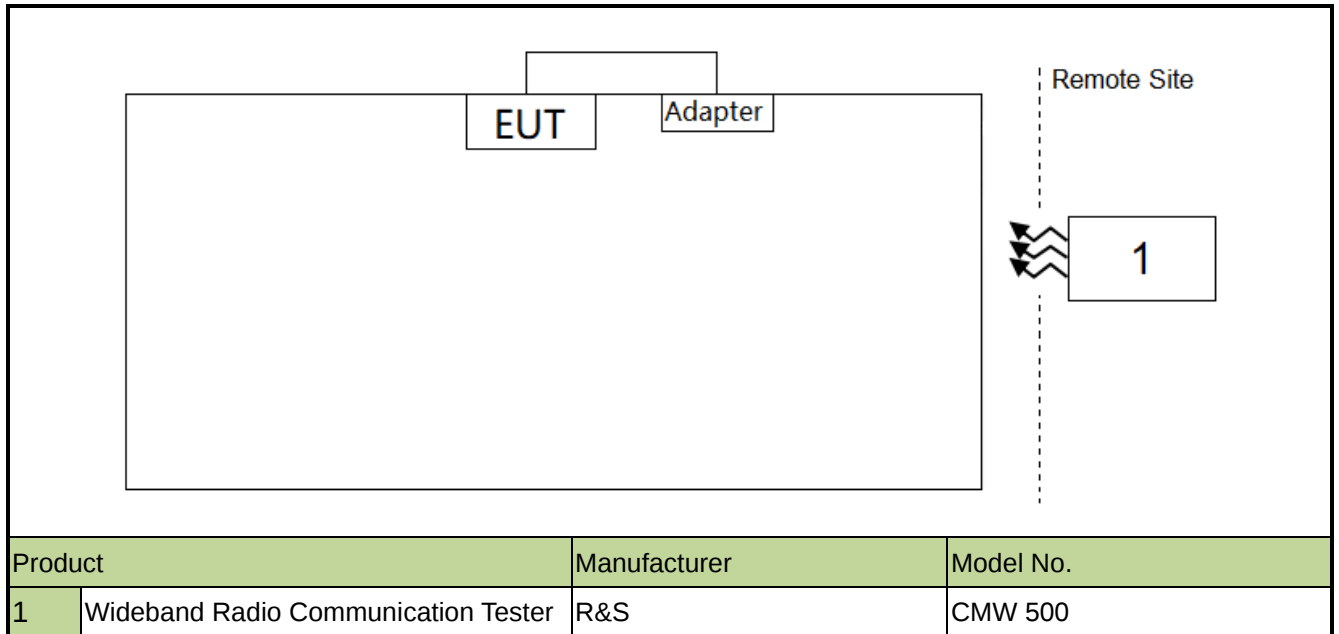
Note 2: B40 is divided into two frequency ranges to apply to the part 27 rule.

1.6. Antenna Details

Technology	Frequency Range (MHz)	Antenna Type	Max Peak Gain (dBi)
LTE Band 2	1850 ~ 1910	PIFA	2.66
LTE Band 4	1710 ~ 1755		0.94
LTE Band 5	824 ~ 849		-0.12
LTE Band 7	2500 ~ 2570		-0.33
LTE Band 12	699 ~ 716		-0.74
LTE Band 13	777 ~ 787		-1.64
LTE Band 17	704 ~ 716		-1.06
LTE Band 25	1850 ~ 1915		2.66
LTE Band 26	814 ~ 849		0.18
LTE Band 30	2305 ~ 2315		0.48
LTE Band 38	2570 ~ 2620		0.20
LTE Band 40	2300 ~ 2400		0.55
LTE Band 41	2500 ~ 2690		0.94
LTE Band 66	1710 ~ 1780		1.27

2. Test Configuration

2.1. Configuration of Tested System



2.2. 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 27
- 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

2.3. Test Environment Condition

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

3. Test Equipment Calibration Date

Instrument Name	Manufacturer	Model No.	Asset No.	Cali. Interval	Cal. Due Date	Test Site
Communication Tester	R&S	CMU 200	MRTSUE06009	1 year	2022/9/7	SIP-SR1
Communication Tester	R&S	CMW500	MRTSUE06243	1 year	2022/10/10	SIP-SR1
Signal Generator	Keysight	E8257D	MRTSUE06453	1 year	2022/6/24	SIP-SR1
Thermohygrometer	testo	622	MRTSUE06629	1 year	2022/11/2	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
Signal Analyzer	Keysight	N9021B	MRTSUE06915	1 year	2022/12/19	SIP-SR1
Temperature Chamber	BAOYT	BYG-80CL	MRTSUE06932	1 year	2022/3/16	SIP-SR1
Shielding Room	MIX-BEP	SIP-SR1	MRTSUE06948	/	/	SIP-SR1
Anechoic Chamber	RIKEN	SIP-AC1	MRTSUE06554	1 year	2022/12/23	SIP-AC1
Preamplifier	EMCI	EMC051845SE	MRTSUE06600	1 year	2022/11/8	SIP-AC1
Horn Antenna	R&S	HF907	MRTSUE06610	1 year	2022/8/5	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
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06645	1 year	2022/8/26	SIP-AC1
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2022/12/29	SIP-AC2
Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2022/6/24	SIP-AC2
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06599	1 year	2022/10/20	SIP-AC2
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2022/10/11	SIP-AC2
Signal Analyzer	Keysight	N9010B	MRTSUE06603	1 year	2022/10/31	SIP-AC2
Signal Analyzer	Keysight	N9020B	MRTSUE06604	1 year	2022/9/7	SIP-AC2
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2022/6/24	SIP-AC2
Thermohygrometer	testo	608-H1	MRTSUE06623	1 year	2022/11/28	SIP-AC2
Thermohygrometer	testo	608-H1	MRTSUE06624	1 year	2022/11/28	SIP-AC2
Preamplifier	EMCI	EMC001330	MRTSUE06643	1 year	2022/1/12	SIP-AC2
				1 year	2023/1/13	SIP-AC2
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06647	1 year	2022/8/5	SIP-AC2
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06648	1 year	2022/11/9	SIP-AC2
Anechoic Chamber	RIKEN	SIP-AC2	MRTSUE06781	1 year	2022/12/23	SIP-AC2
Loop Antenna	Schwarzbeck	FMZB 1519 B	MRTSUE06937	1 year	2022/3/9	SIP-AC2

Instrument Name	Manufacturer	Model No.	Asset No.	Cali. Interval	Cal. Due Date	Test Site
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2022/6/9	SIP-AC3
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06598	1 year	2022/11/9	SIP-AC3
Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2022/9/12	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE06619	1 year	2022/11/2	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE06622	1 year	2022/11/28	SIP-AC3
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2022/1/12	SIP-AC3
				1 year	2023/1/13	SIP-AC3
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06646	1 year	2022/8/26	SIP-AC3
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2022/12/23	SIP-AC3

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% ($U=2U_c(y)$): 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% ($U=2U_c(y)$): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.13dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.28%
Frequency Stability
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 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	Section 5.2
2.1055, 27.54	Frequency Stability	Within the band		Pass	Section 5.3
27.50(a)(3)	Equivalent Radiated Power	< 250mW/5MHz		Pass	Section 5.4
2.1051, 27.53(a)(4)	Band Edge	Refer to section 5.5		Pass	Section 5.5
2.1051, 27.53(a)(4)	Spurious Emission	<70 + 10log10 (P _[Watts])		Pass	Section 5.6
2.1053, 27.53(a)(4)	Spurious Emission	<70 + 10log10 (P _[Watts])	Radiated	Pass	Section 5.7

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) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
- 3) All supported modulation types were evaluated. The worst-case emission of modulation was selected. Therefore, the Frequency Stability, Occupied Bandwidth, Channel Band Edge, Radiated & Conducted Spurious Emission were presented worst-case in the test report.

5.2. Occupied Bandwidth Measurement

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.

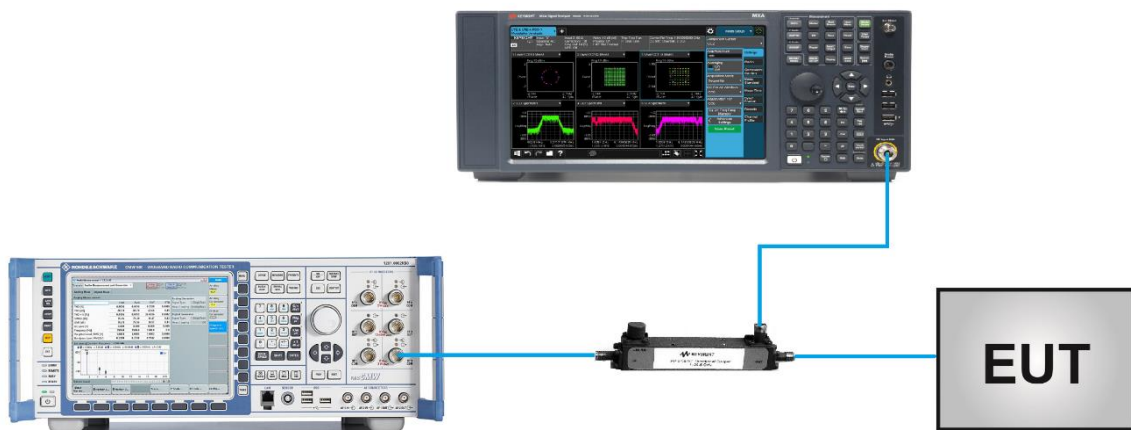
5.2.2. Test Procedure

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 $\geq 3 \times$ 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.

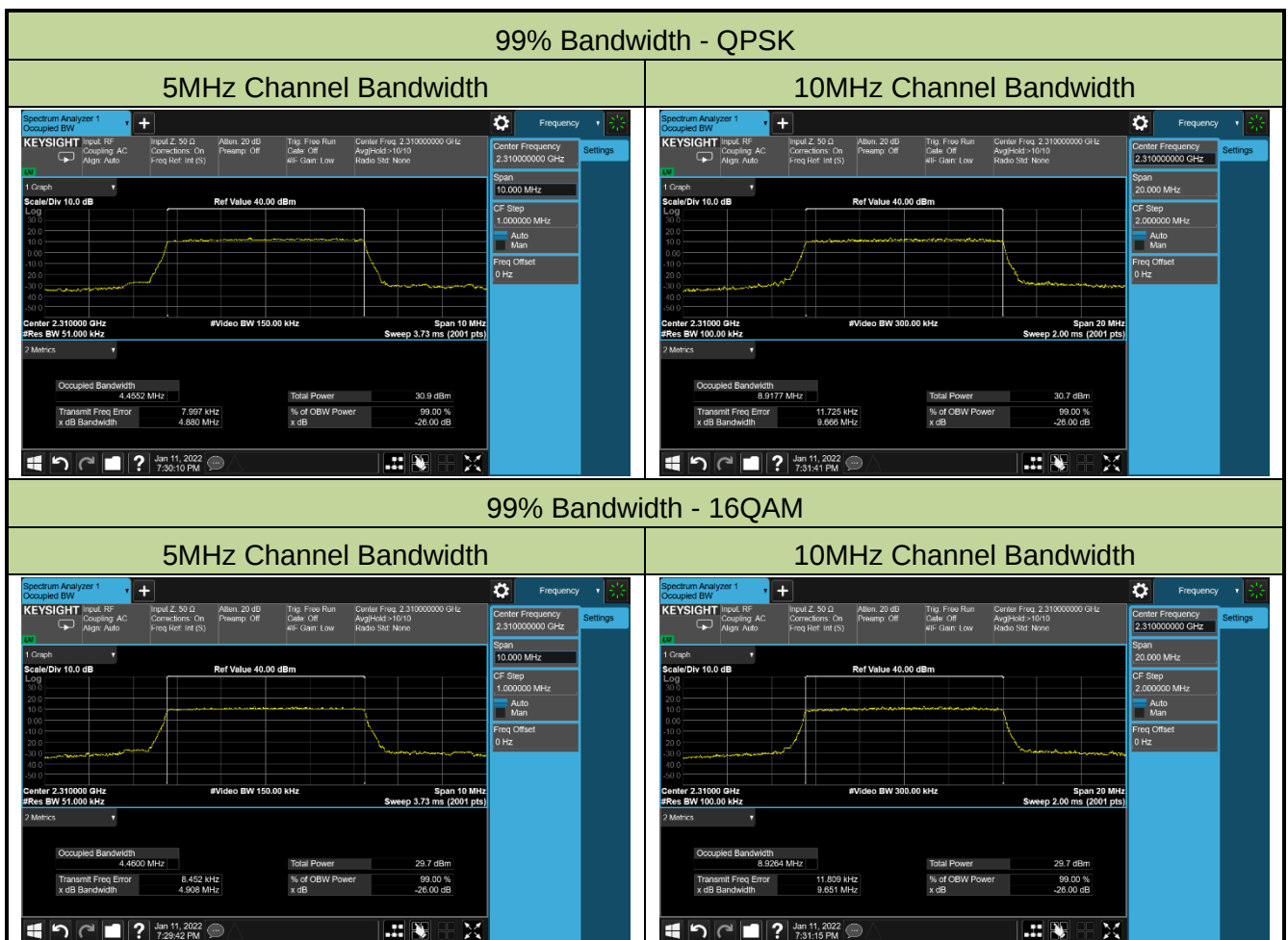
5.2.4. Test Setup

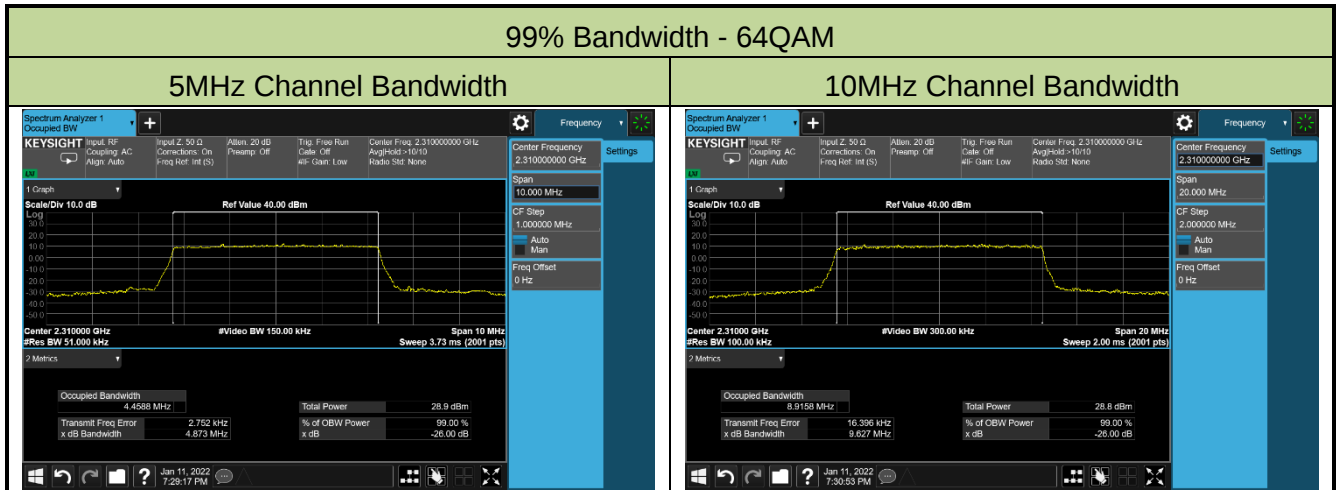


5.2.5. Test Result

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/11
Test Band	LTE Band 30		

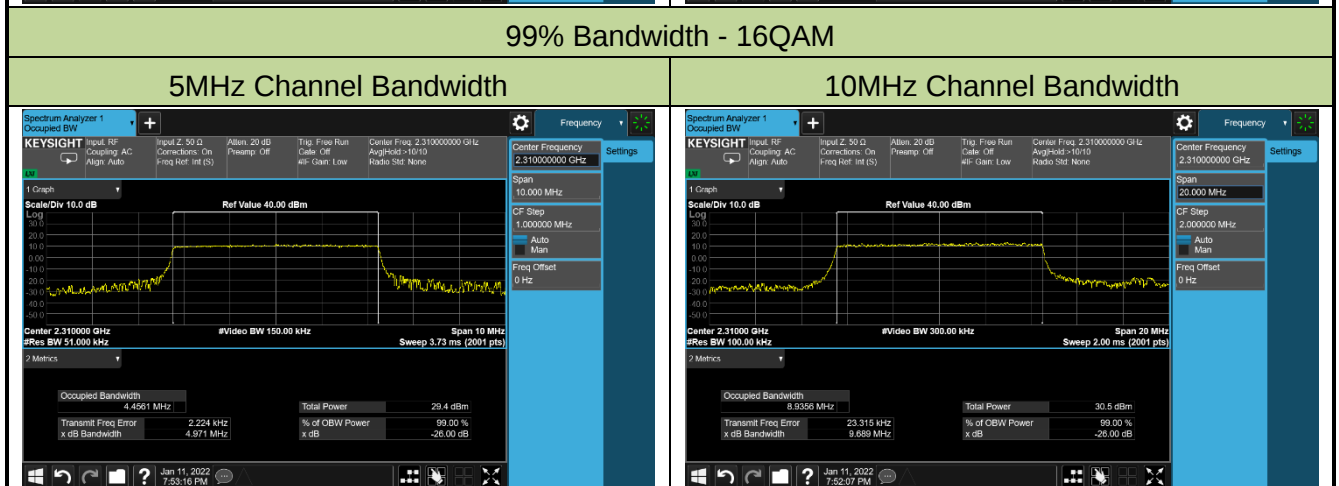
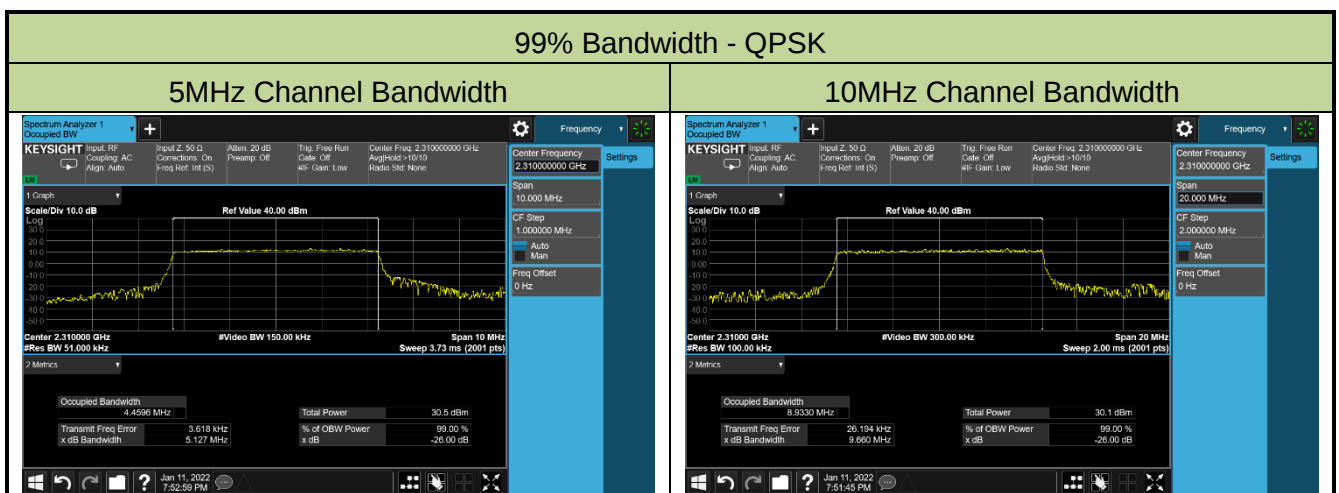
Modulation	Frequency (MHz)	Bandwidth (MHz)	99% Bandwidth (MHz)
QPSK	2310	5	4.46
		10	8.92
16QAM	2310	5	4.46
		10	8.93
64QAM	2310	5	4.46
		10	8.92

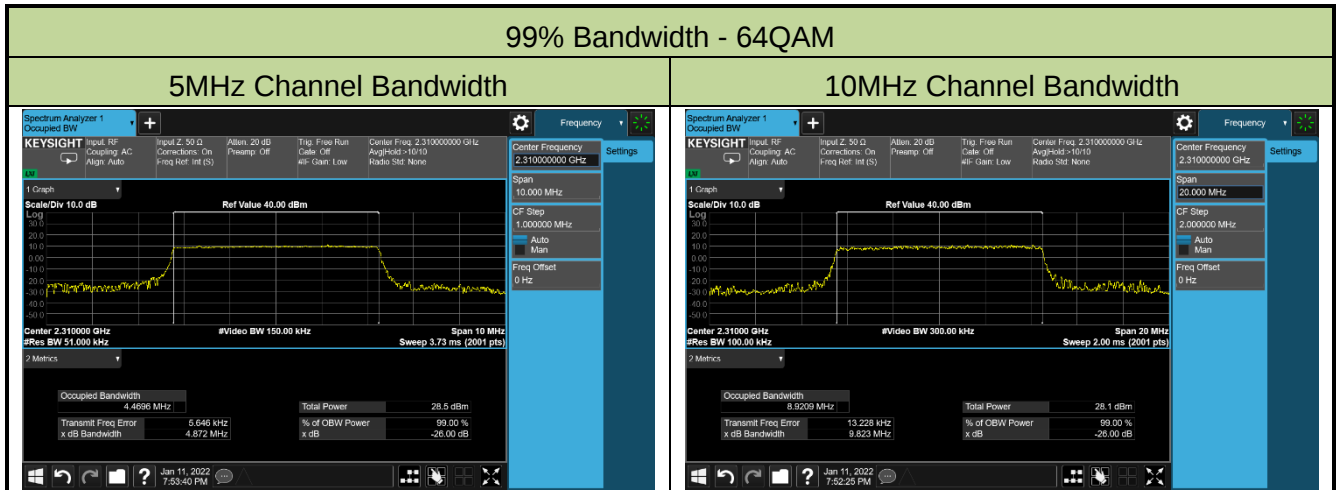




Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/11
Test Band	LTE Band 40(Lower Band)		

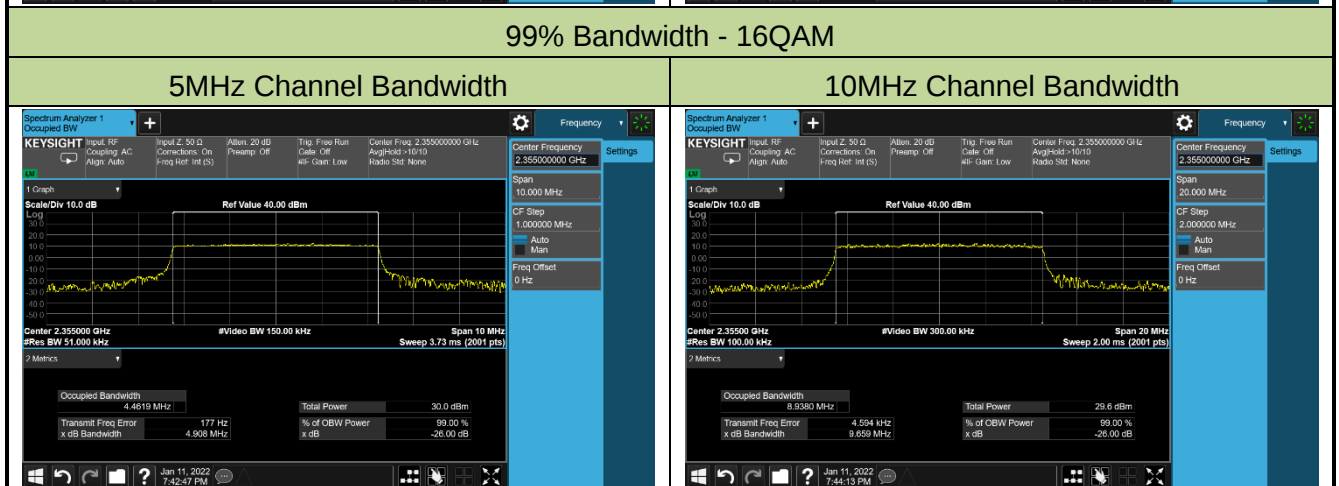
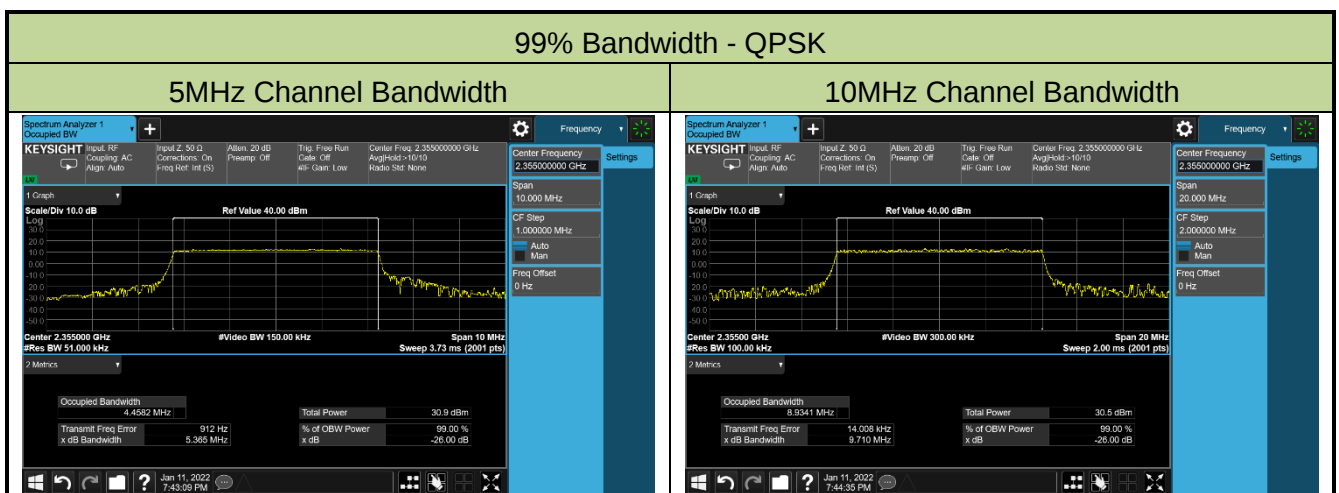
Modulation	Frequency (MHz)	Bandwidth (MHz)	99% Bandwidth (MHz)
QPSK	2310	5	4.46
		10	8.93
16QAM	2310	5	4.46
		10	8.94
64QAM	2310	5	4.47
		10	8.92

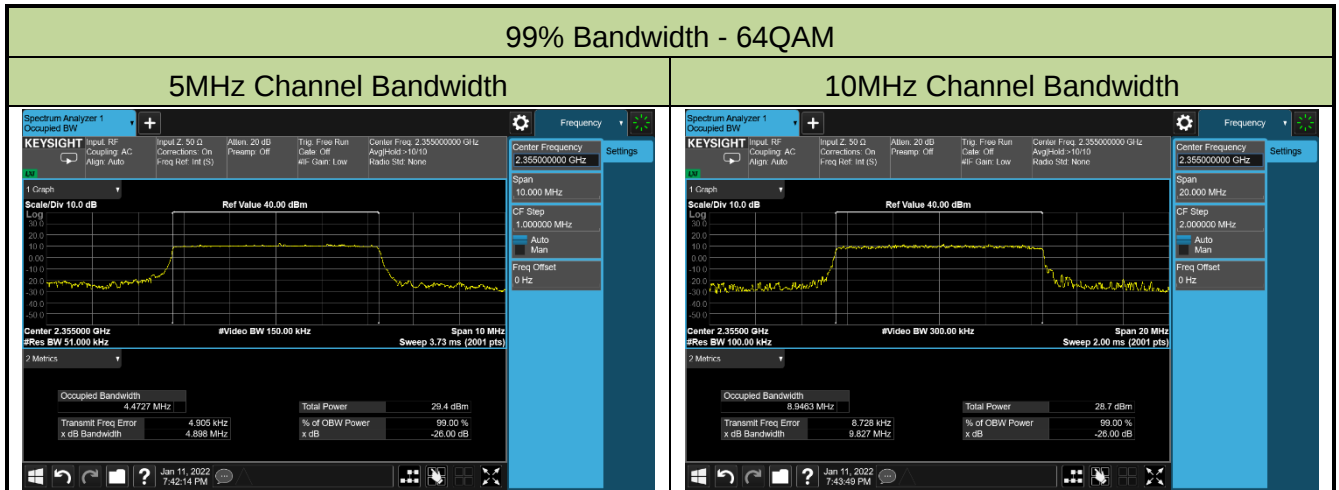




Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/11
Test Band	LTE Band 40(Upper Band)		

Modulation	Frequency (MHz)	Bandwidth (MHz)	99% Bandwidth (MHz)
QPSK	2355	5	4.46
		10	8.93
16QAM	2355	5	4.46
		10	8.95
64QAM	2355	5	4.47
		10	8.95





5.3. Frequency Stability Measurement

5.3.1. Test Limit

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

5.3.2. Test Procedure

ANSI C63.26-2015 - Section 5.6

5.3.3. Test Setting

Frequency Stability Under Temperature Variations:

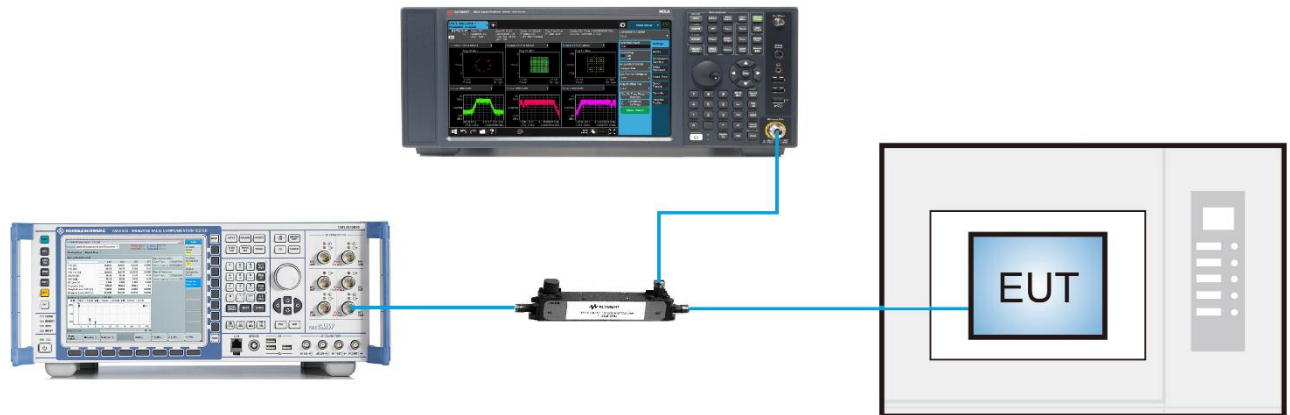
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain 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 input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

5.3.4. Test Setup



5.3.5.Test Result

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/17 ~ 2022/01/18
Test Band	LTE Band 30		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	-0.0001
	- 20	0.0083
	- 10	-0.0041
	0	0.0015
	+ 10	-0.0114
	+ 20	-0.0056
	+ 30	0.0011
	+ 40	-0.0017
	+ 50	0.0751
4.37	+ 20	-0.0027
3.23	+ 20	-0.0013

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/17 ~ 2022/01/18
Test Band	LTE Band 40(Lower Band)		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	0.0053
	- 20	-0.0077
	- 10	0.0052
	0	-0.0064
	+ 10	-0.0038
	+ 20	0.0026
	+ 30	-0.0029
	+ 40	0.0052
	+ 50	-0.0040
4.37	+ 20	-0.0093
3.23	+ 20	-0.0086

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/17 ~ 2022/01/18
Test Band	LTE Band 40(Upper Band)		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	0.0008
	- 20	0.0025
	- 10	-0.0011
	0	-0.0042
	+ 10	-0.0119
	+ 20	-0.0065
	+ 30	0.0148
	+ 40	0.0018
	+ 50	-0.0021
4.37	+ 20	0.0023
3.23	+ 20	-0.0060

5.4. Equivalent Isotropically Radiated Power Measurement

5.4.1. Test Limit

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth

5.4.2. Test Procedure

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 the following procedure can be used if the EUT duty cycle is constant (i.e., duty cycle variations are less than or equal to $\pm 2\%$).

- a) Set span to $2 \times$ to $3 \times$ the OBW.
- b) Set RBW = 1% to 5% of the OBW.
- c) Set VBW $\geq 3 \times$ RBW.
- d) Set number of measurement points in sweep $\geq 2 \times$ span / RBW.
- e) Sweep time:
 - 1) Set = auto-couple, or
 - 2) Set $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$ 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 $10 \log (1/\text{duty cycle})$ to the measured power level to compute the average power during continuous transmission. For example, add $[10 \log (1/0.25)] = 6 \text{ dB}$ 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:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T \quad (1)$$

where

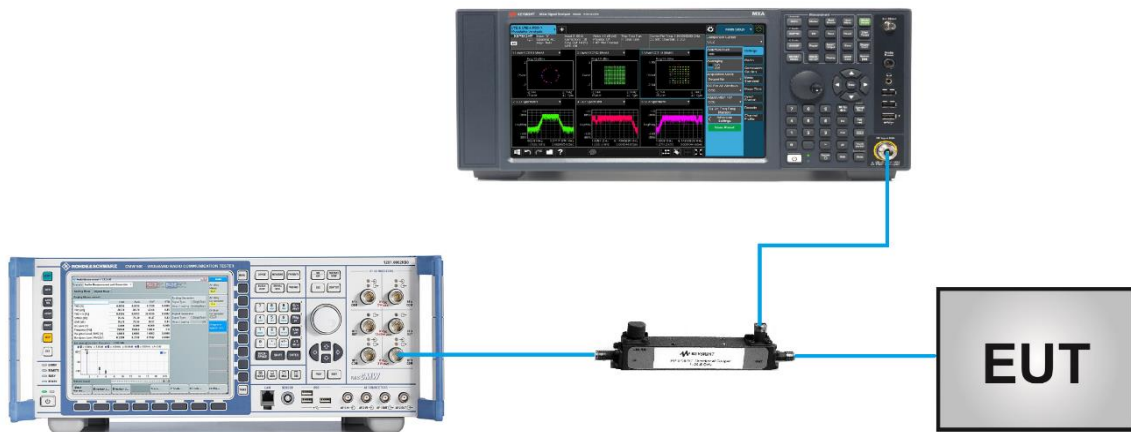
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , e.g., dBm or dBW)

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	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/02/22
Test Band	LTE Band 30		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power Density (dBm/5MHz)	EIRP Density (dBm/5MHz)	Limit (dBm /5MHz)
QPSK							
27685	2307.5	5	25	0	20.02	20.50	< 23.98
27710	2310.0				19.96	20.44	< 23.98
27735	2312.5				20.02	20.50	< 23.98
27710	2310.0	10	50	0	18.26	18.74	< 23.98
16QAM							
27685	2307.5	5	25	0	19.12	19.60	< 23.98
27710	2310.0				19.08	19.56	< 23.98
27735	2312.5				19.26	19.74	< 23.98
27710	2310.0	10	50	0	17.48	17.96	< 23.98
64QAM							
27685	2307.5	5	25	0	18.22	18.70	< 23.98
27710	2310.0				18.07	18.55	< 23.98
27735	2312.5				18.11	18.59	< 23.98
27710	2310.0	10	50	0	16.30	16.78	< 23.98
Note: The EIRP Density (dBm/5MHz) = Power Density (dBm/5MHz) + Antenna Gain (dBi)							

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/10
Test Band	LTE Band 40(Lower Band)		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power Density (dBm/5MHz)	EIRP Density (dBm/5MHz)	Limit (dBm /5MHz)
QPSK							
38725	2307.5	5	25	0	20.91	21.46	< 23.98
38750	2310.0				21.45	22.00	< 23.98
38775	2312.5				21.25	21.80	< 23.98
38750	2310.0	10	50	0	18.69	19.24	< 23.98
16QAM							
38725	2307.5	5	25	0	19.72	20.27	< 23.98
38750	2310.0				20.38	20.93	< 23.98
38775	2312.5				20.12	20.67	< 23.98
38750	2310.0	10	50	0	17.35	17.90	< 23.98
64QAM							
38725	2307.5	5	25	0	19.45	20.00	< 23.98
38750	2310.0				19.23	19.78	< 23.98
38775	2312.5				18.86	19.41	< 23.98
38750	2310.0	10	50	0	17.06	17.61	< 23.98
Note: The EIRP Density (dBm/5MHz) = Power Density (dBm/5MHz) + Antenna Gain (dBi)							

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/10
Test Band	LTE Band 40(Upper Band)		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power Density (dBm/5MHz)	EIRP Density (dBm/5MHz)	Limit (dBm /5MHz)
QPSK							
39175	2352.5	5	25	0	21.29	21.84	< 23.98
39200	2355.0				21.35	21.90	< 23.98
39225	2357.5				21.21	21.76	< 23.98
39200	2355.0	10	50	0	19.13	19.68	< 23.98
16QAM							
39175	2352.5	5	25	0	20.38	20.93	< 23.98
39200	2355.0				20.58	21.13	< 23.98
39225	2357.5				20.41	20.96	< 23.98
39200	2355.0	10	50	0	17.57	18.12	< 23.98
64QAM							
39175	2352.5	5	25	0	19.37	19.92	< 23.98
39200	2355.0				19.32	19.87	< 23.98
39225	2357.5				19.24	19.79	< 23.98
39200	2355.0	10	50	0	17.00	17.55	< 23.98
Note: The EIRP Density (dBm/5MHz) = Power Density (dBm/5MHz) + Antenna Gain (dBi)							

5.5. Band Edge Measurement

5.5.1. Test Limit

For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360MHz bands:

- (1) By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz;
- (2) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz;
- (3) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 MHz.

5.5.2. Test Procedure

ANSI C63.26-2015 - Section 5.7

5.5.3. Test Setting

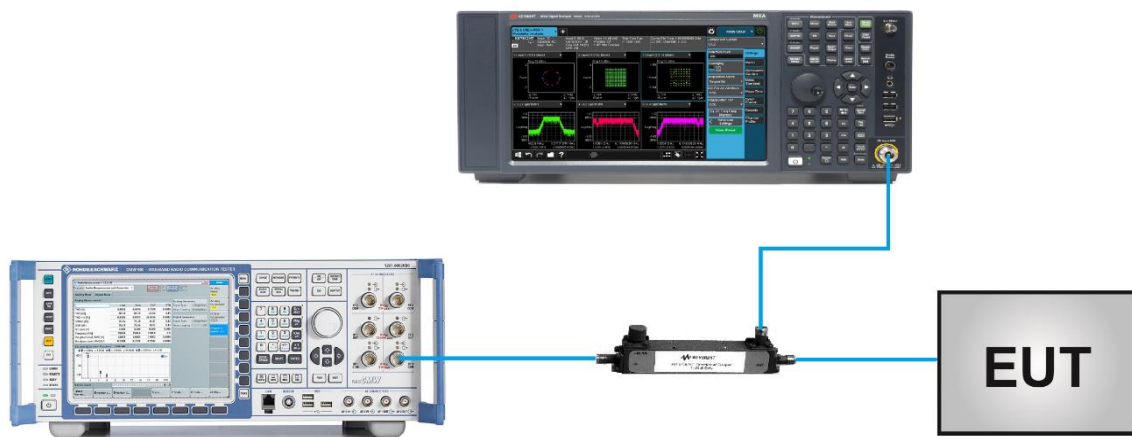
1. Set the analyzer frequency to low or high channel
2. $RBW \geq$ The nominal RBW shall be in the range of 1% of the anticipated OBW (in the 1MHz band immediately outside and adjacent to the band edge). For improvement of the accuracy in the measurement of the average power of a noise-like emission, 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. $VBW \geq 3 \cdot RBW$
4. Sweep time = auto
5. Detector = power averaging (rms)
6. Set sweep trigger to "free run."
7. User gate triggered such that the analyzer only sweeps when the device is transmitting at full

power

8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple.

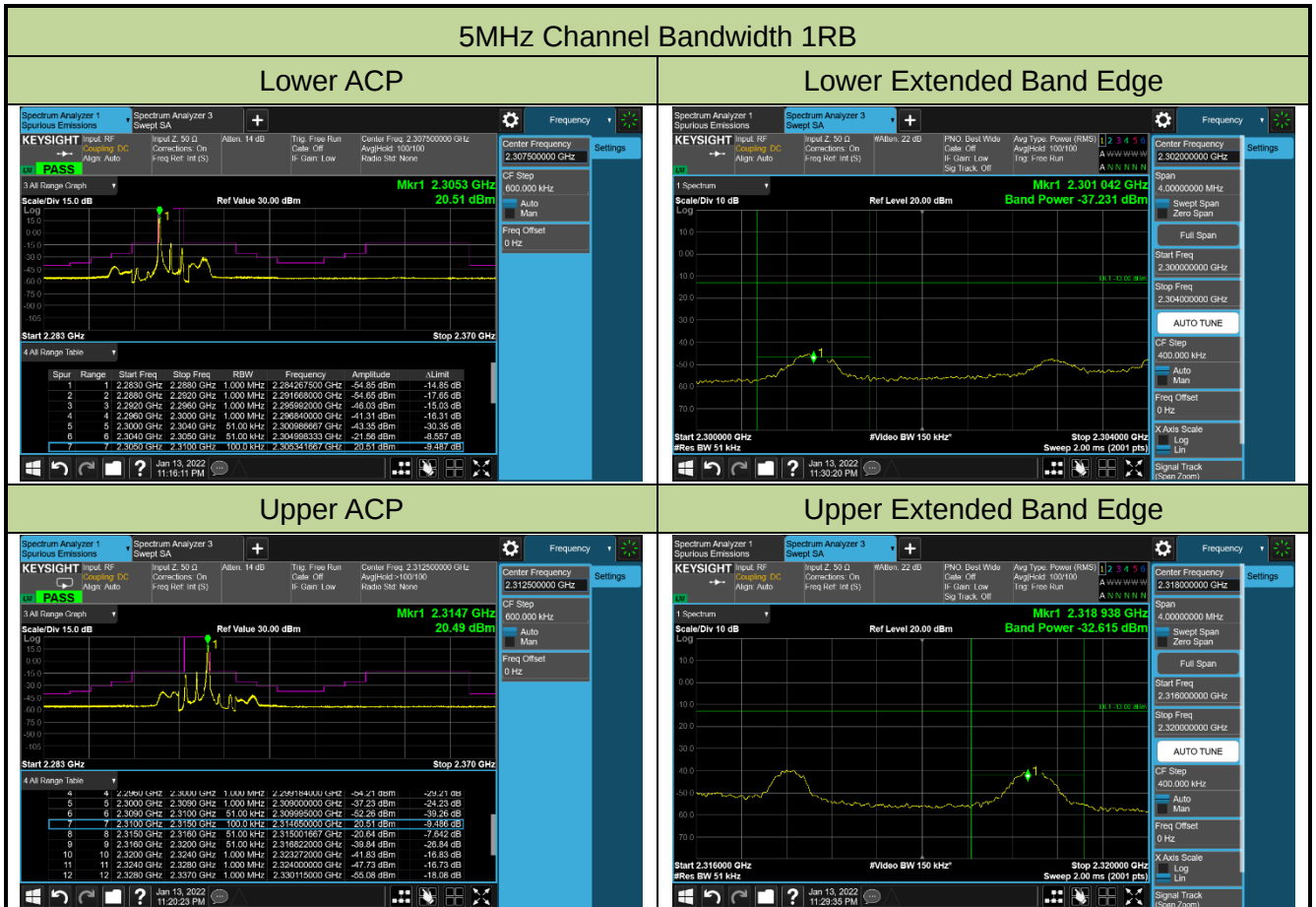
To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.

5.5.4.Test Setup



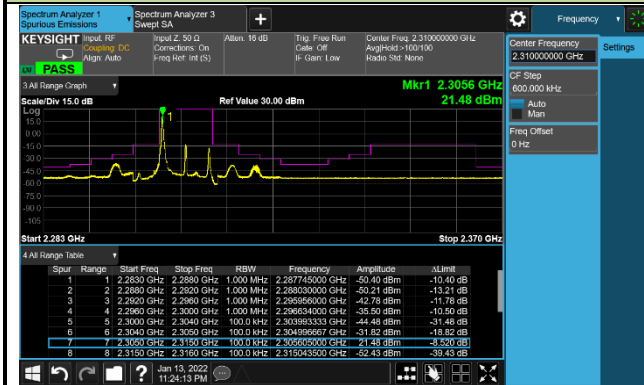
5.5.5. Test Result

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/13 ~ 2022/01/17
Test Band	LTE Band 30_QPSK		

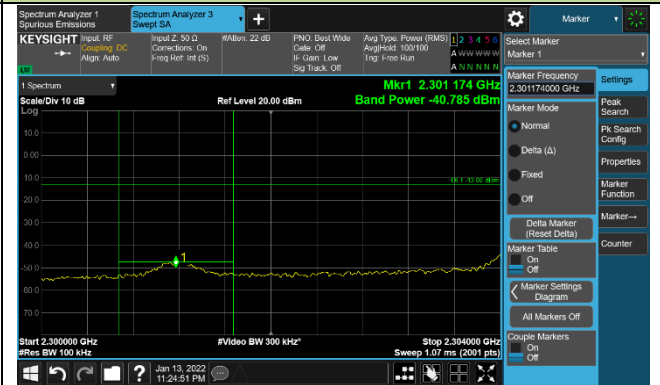


10MHz Channel Bandwidth 1RB

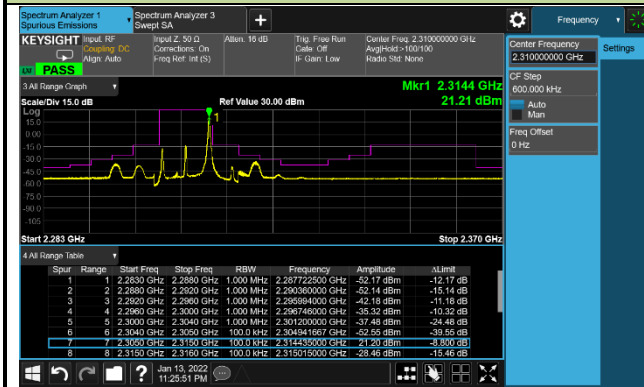
Lower ACP



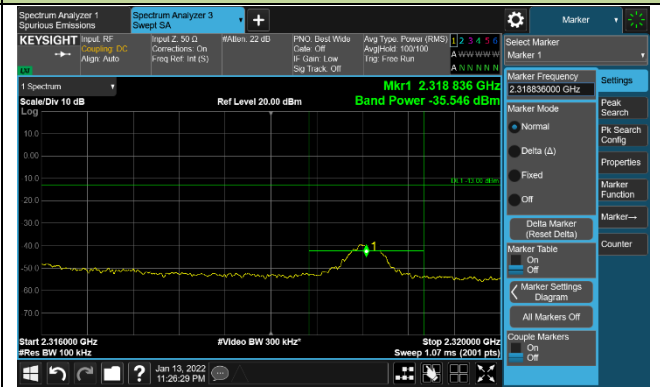
Lower Extended Band Edge



Upper ACP

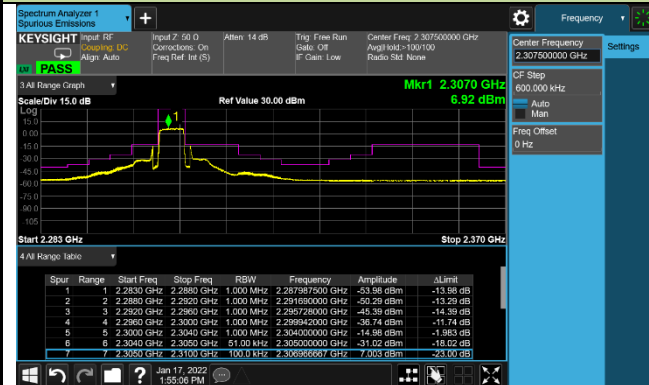


Upper Extended Band Edge

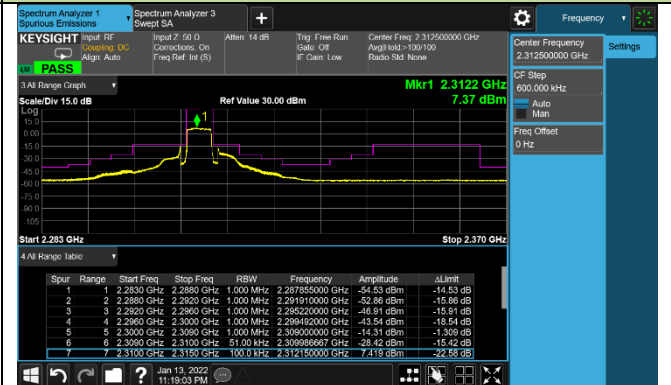


5MHz Channel Bandwidth Full RB

Lower ACP

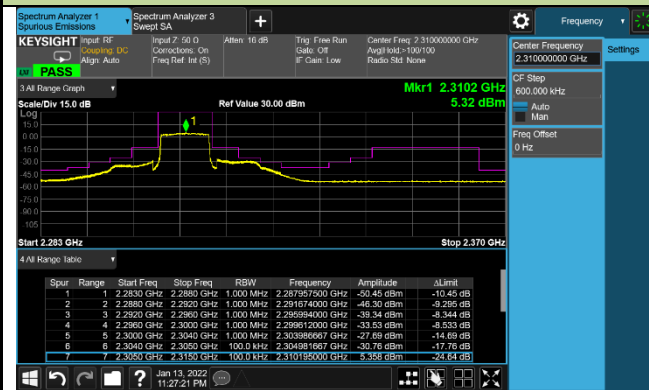


Upper ACP

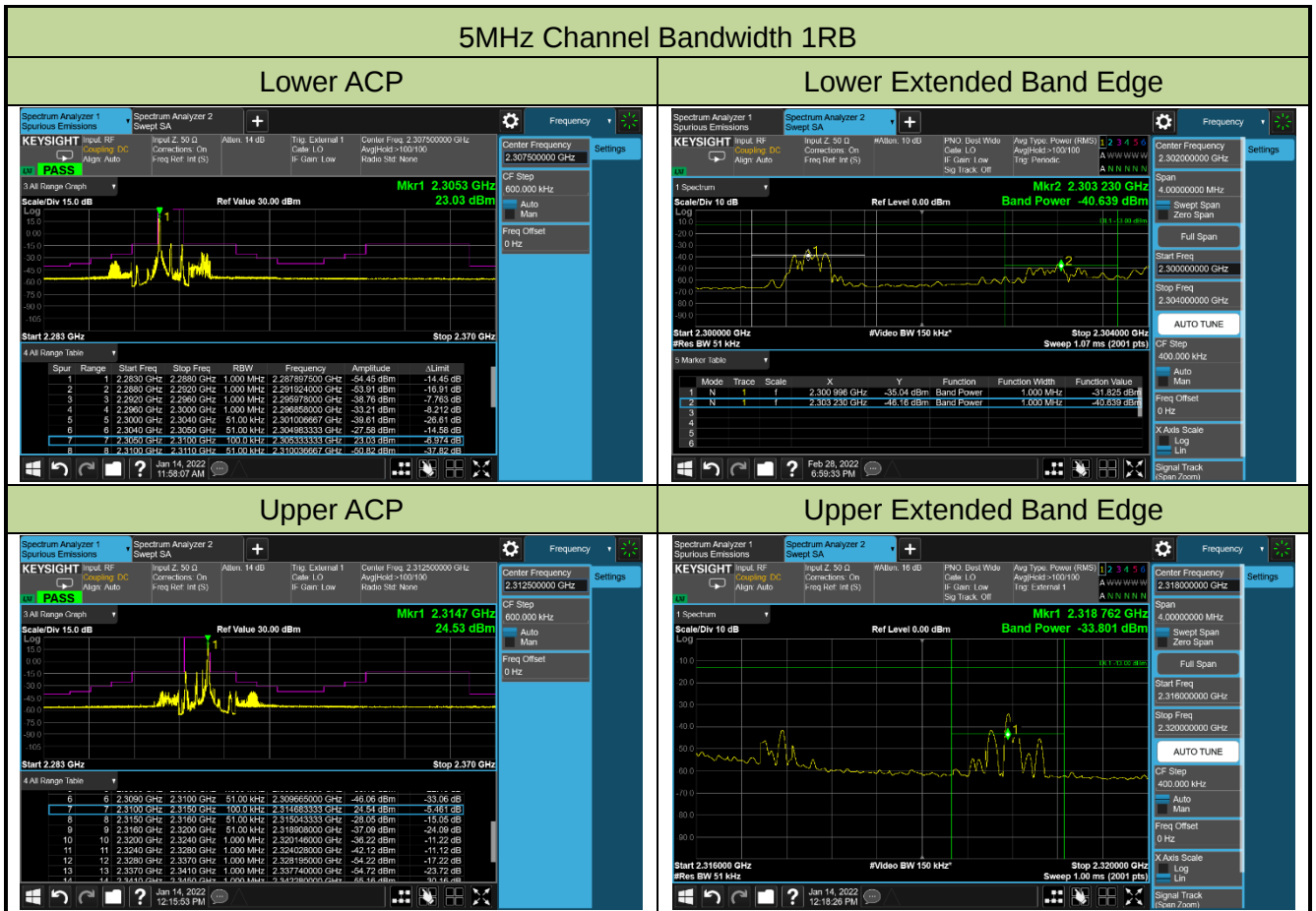


10MHz Channel Bandwidth Full RB

Middle ACP

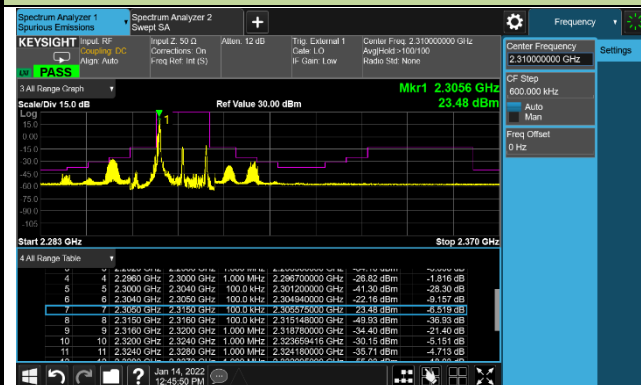


Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/14
Test Band	LTE Band 40(Lower Band) _QPSK		

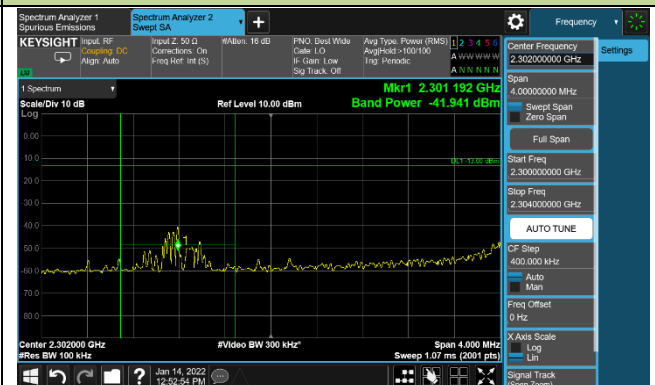


10MHz Channel Bandwidth 1RB

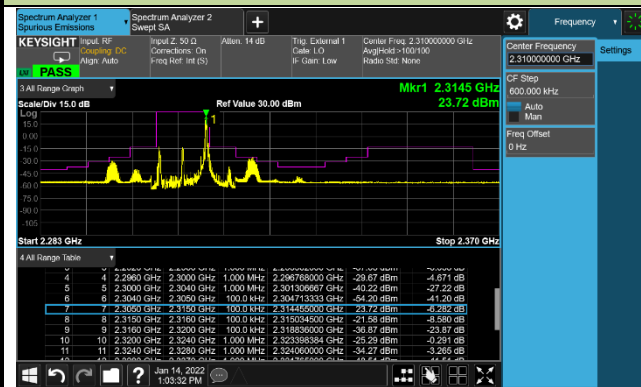
Lower ACP



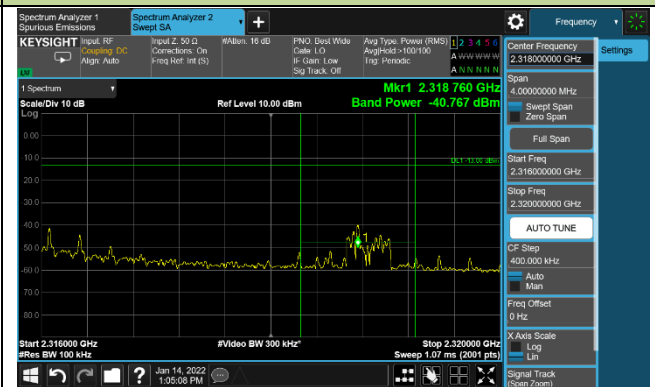
Lower Extended Band Edge



Upper ACP

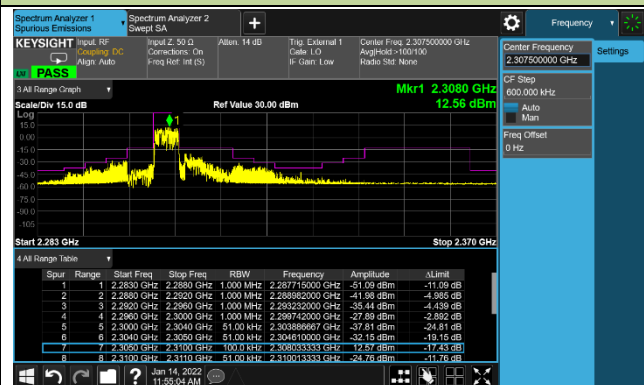


Upper Extended Band Edge

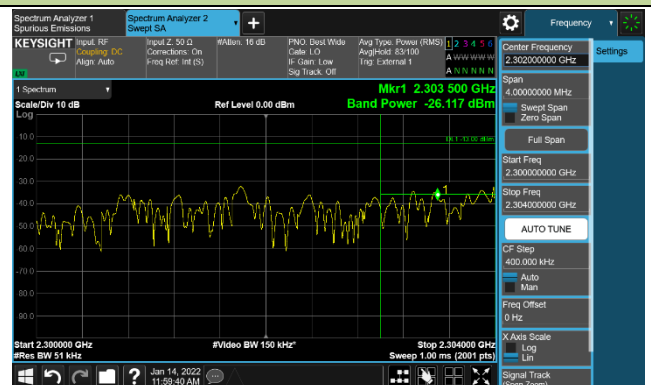


5MHz Channel Bandwidth Full RB

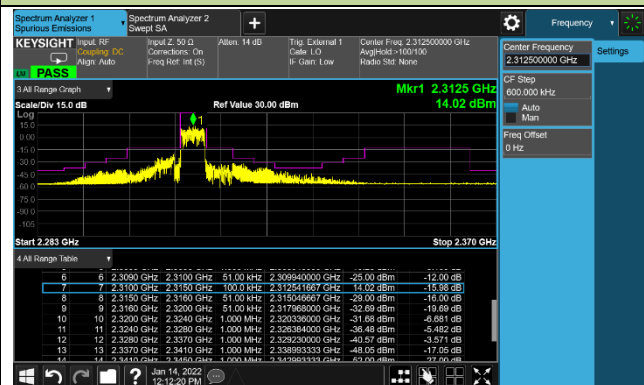
Lower ACP



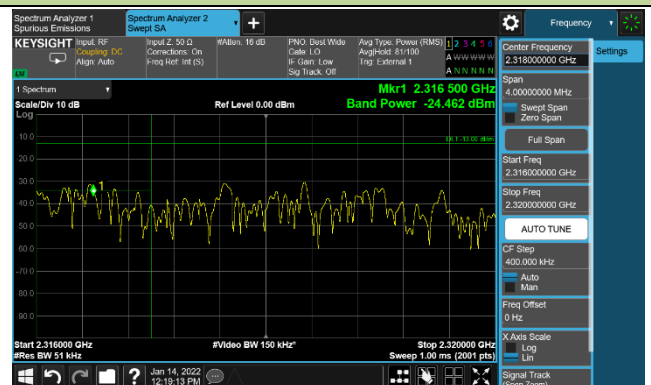
Lower Extended Band Edge



Upper ACP

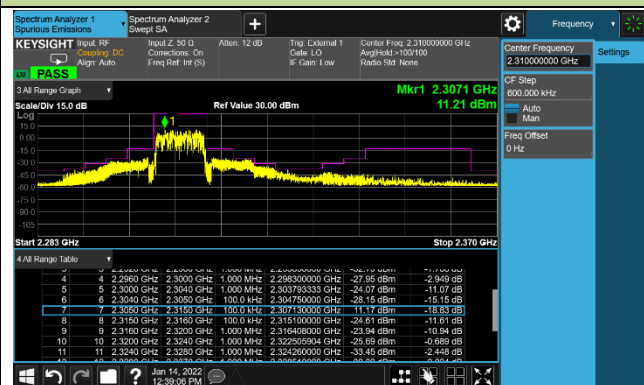


Upper Extended Band Edge



10MHz Channel Bandwidth Full RB

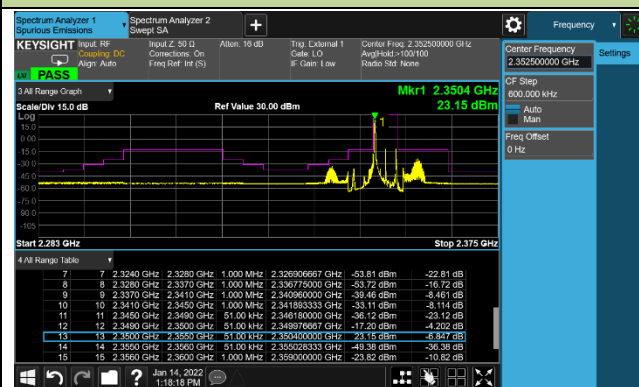
Middle ACP



Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/14
Test Band	LTE Band 40(Upper Band) _QPSK		

5MHz Channel Bandwidth 1RB

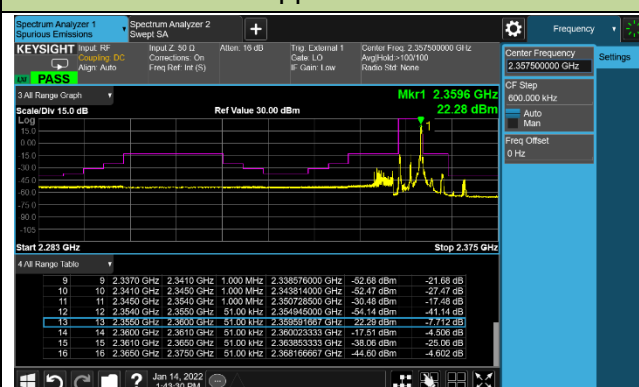
Lower ACP



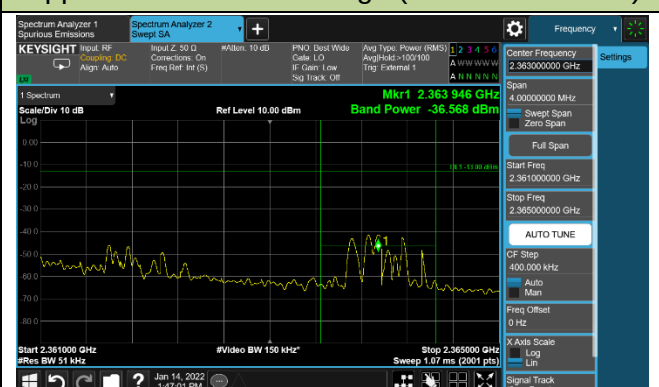
Lower Extended Band Edge



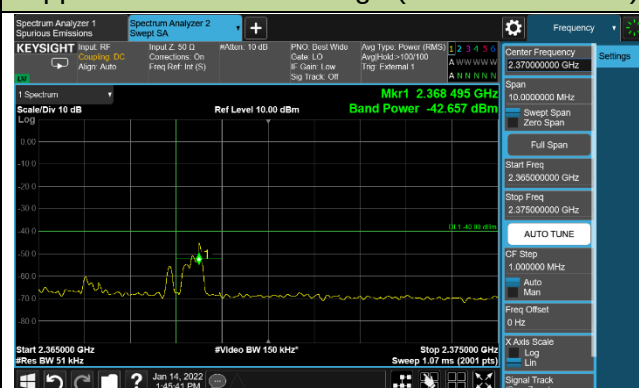
Upper ACP



Upper Extended Band Edge (2361 ~ 2365MHz)

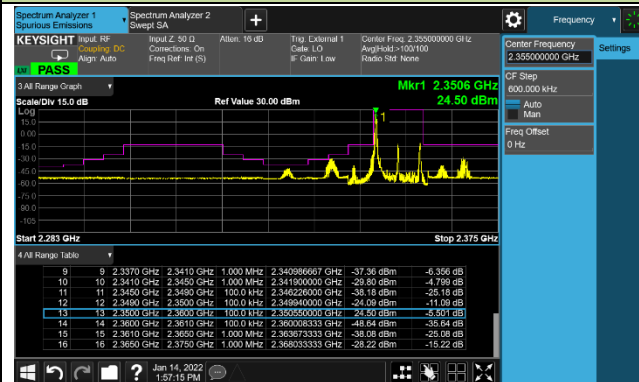


Upper Extended Band Edge (2365 ~ 2375MHz)

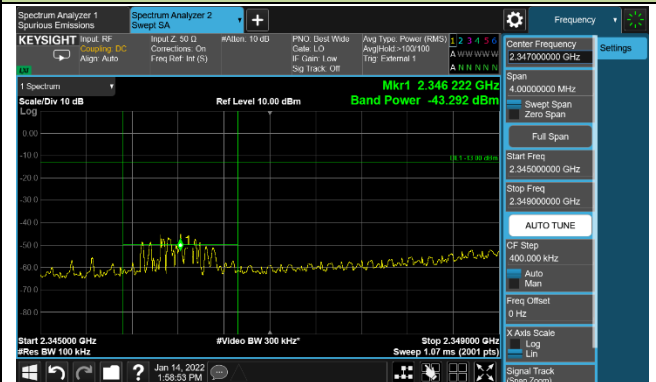


10MHz Channel Bandwidth 1RB

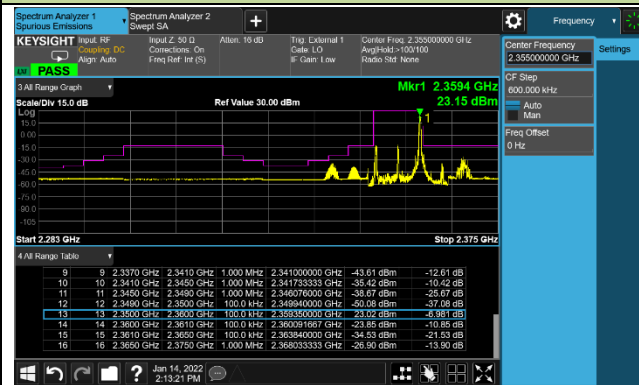
Lower ACP



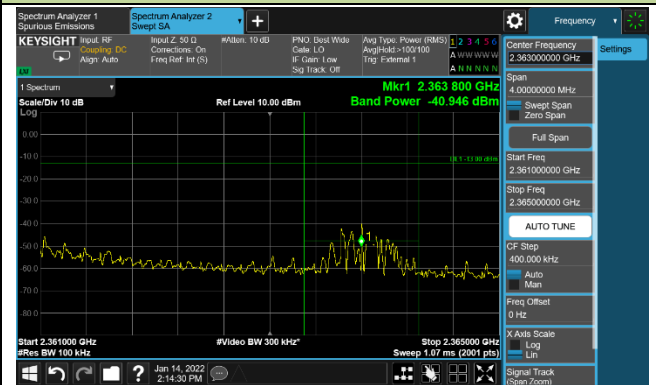
Lower Extended Band Edge



Upper ACP

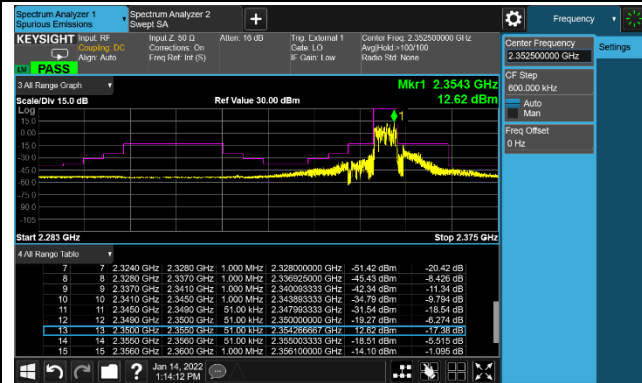


Upper Extended Band Edge

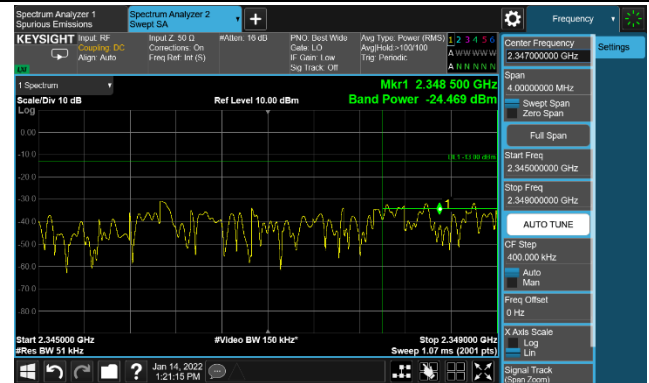


5MHz Channel Bandwidth Full RB

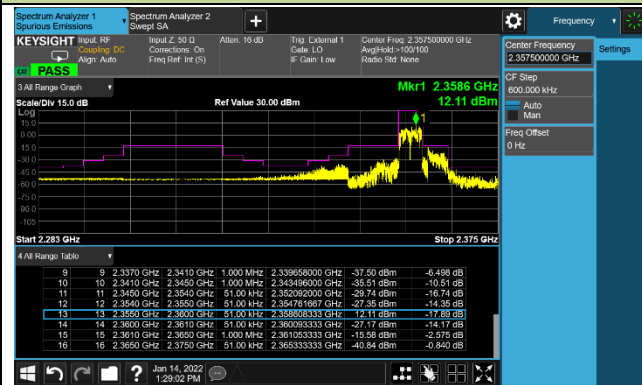
Lower ACP



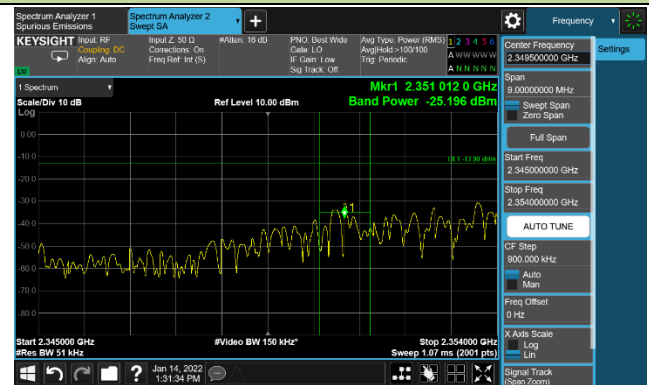
Lower Extended Band Edge



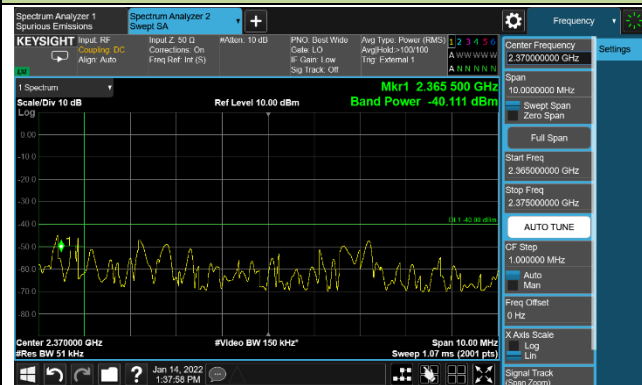
Upper ACP



Upper Extended Band Edge (2345 ~ 2354MHz)

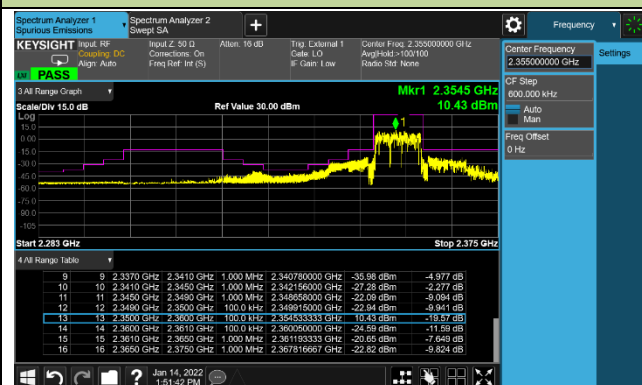


Upper Extended Band Edge (2365 ~ 2375MHz)



10MHz Channel Bandwidth Full RB

Middle ACP



5.6. Conducted Spurious Emission Measurement

5.6.1. Test Limit

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

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $70 + 10 \log (P)$ dB.

5.6.2. Test Procedure

ANSI C63.26-2015 - Section 5.7

5.6.3. Test Setting

1. Set the analyzer frequency to low, mid, high channel.
2. RBW = 1MHz
3. VBW $\geq 3 \times$ RBW
4. Sweep time = auto
5. Detector = power averaging (rms)
6. Set sweep trigger to "free run."
7. User gate triggered such that the analyzer only sweeps when the device is transmitting at full power.
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple.

To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.

5.6.4. Test Setup

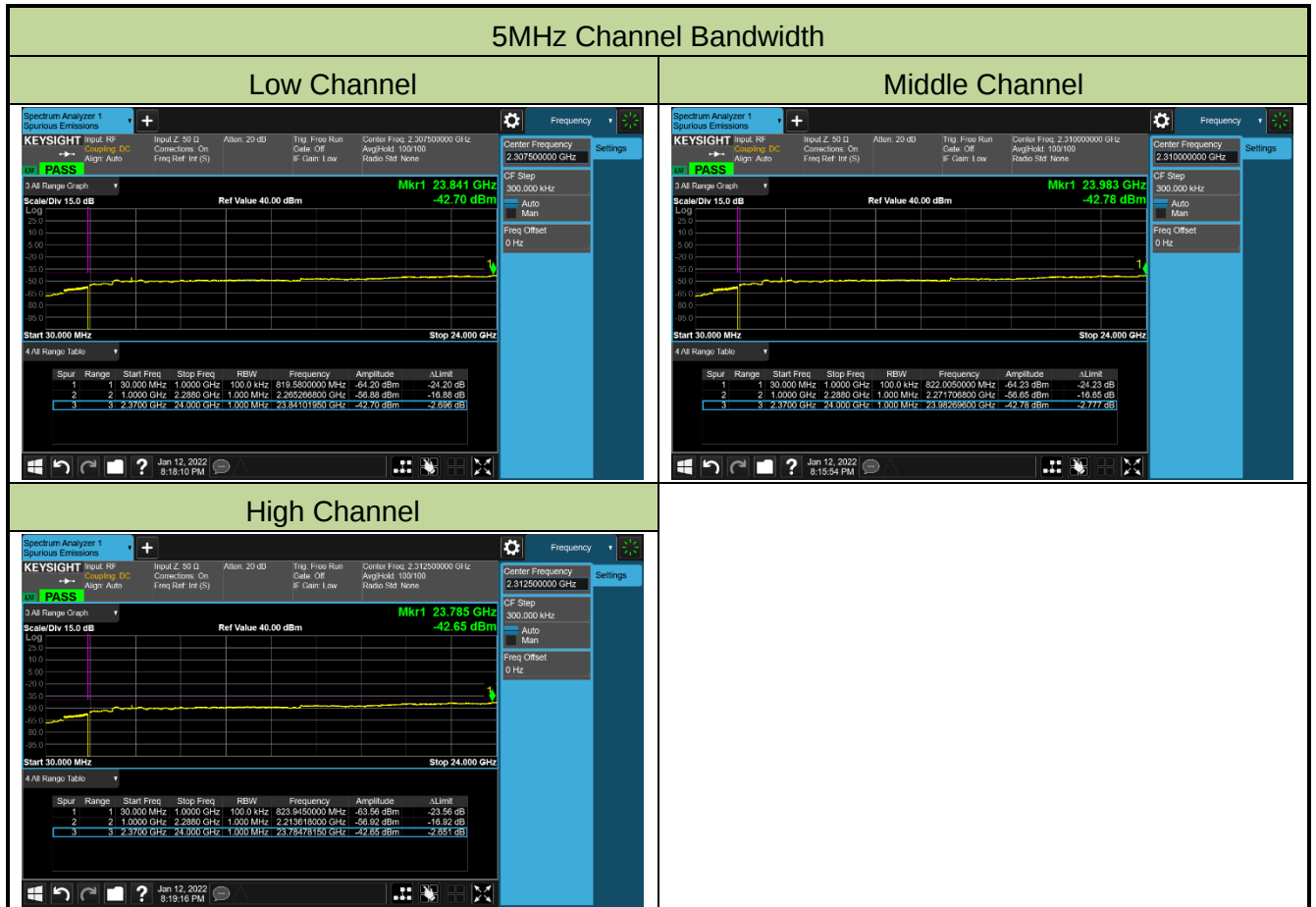


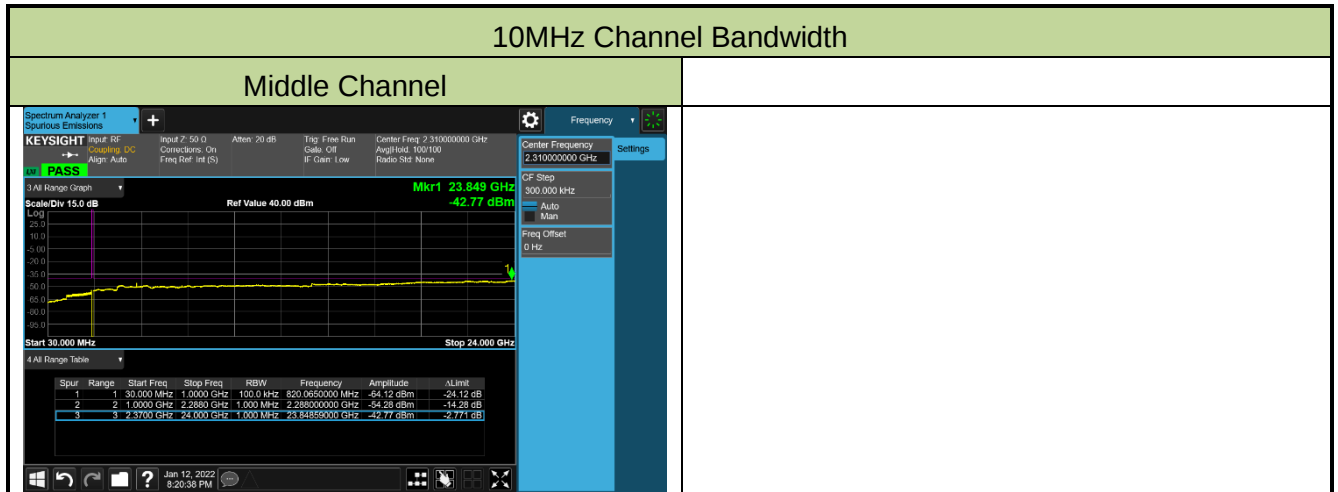
5.6.5. Test Result

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/12
Test Band	LTE Band 30_QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
27685	2307.5	5	30 ~ 24000	-42.70	≤ -40.00	Pass
27710	2310.0	5	30 ~ 24000	-42.78	≤ -40.00	Pass
27735	2312.5	5	30 ~ 24000	-42.80	≤ -40.00	Pass
27710	2310.0	10	30 ~ 24000	-42.94	≤ -40.00	Pass

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





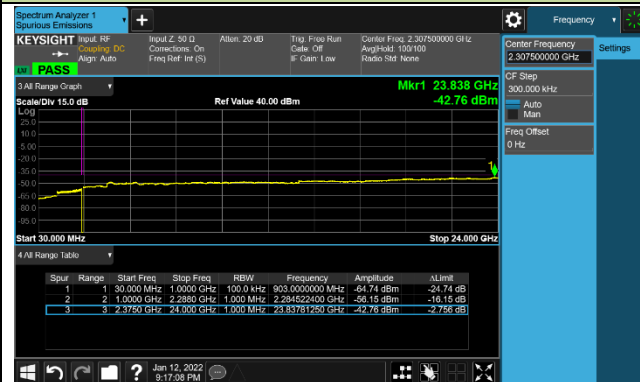
Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/12
Test Band	LTE Band 40(Lower Band) _QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
38725	2307.5	5	30 ~ 24000	-42.76	≤ -40.00	Pass
38750	2310.0	5	30 ~ 24000	-42.78	≤ -40.00	Pass
38775	2312.5	5	30 ~ 24000	-42.79	≤ -40.00	Pass
38750	2310.0	10	30 ~ 24000	-42.83	≤ -40.00	Pass

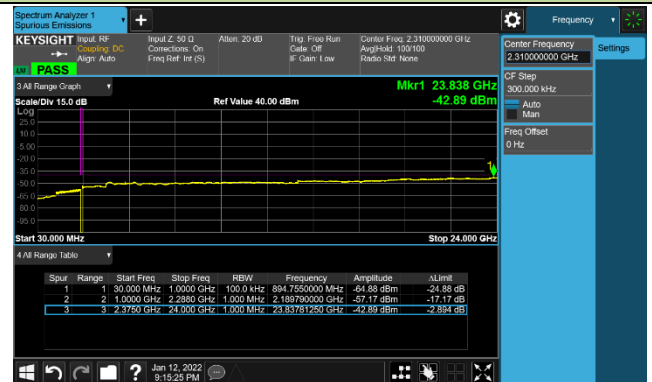
Note: Spurious emissions within 9kHz – 30MHz were found more than 20dB below limit line.

5MHz Channel Bandwidth

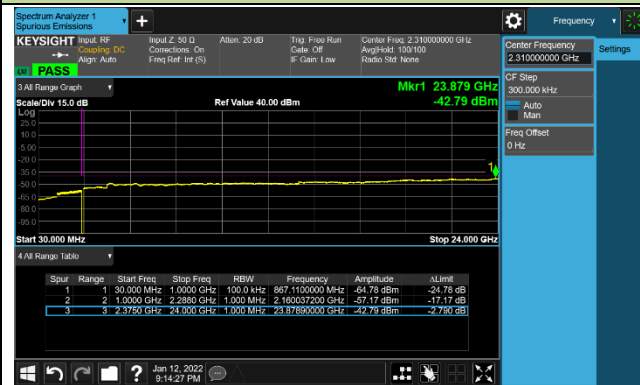
Low Channel

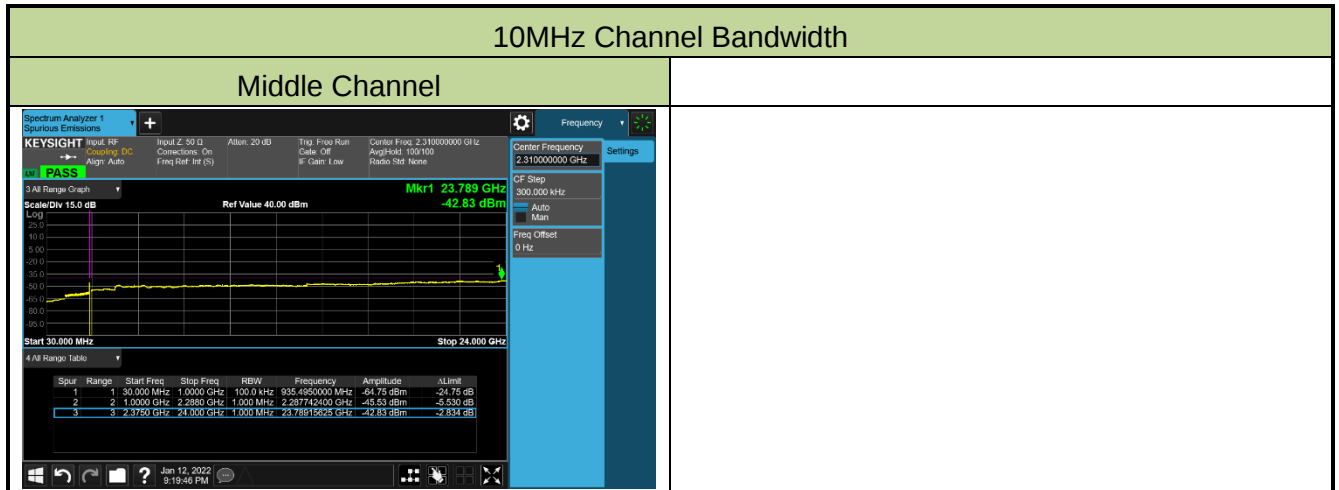


Middle Channel



High Channel





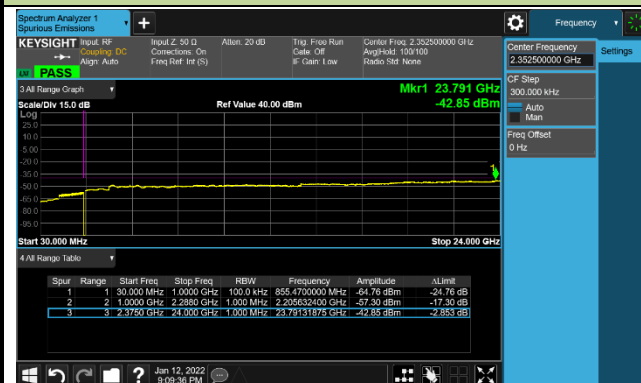
Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/12
Test Band	LTE Band 40(Upper Band)_QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
39175	2352.5	5	30 ~ 24000	-42.85	≤ -40.00	Pass
39200	2355.0	5	30 ~ 24000	-42.80	≤ -40.00	Pass
39225	2357.5	5	30 ~ 24000	-42.80	≤ -40.00	Pass
39200	2355.0	10	30 ~ 24000	-42.94	≤ -40.00	Pass

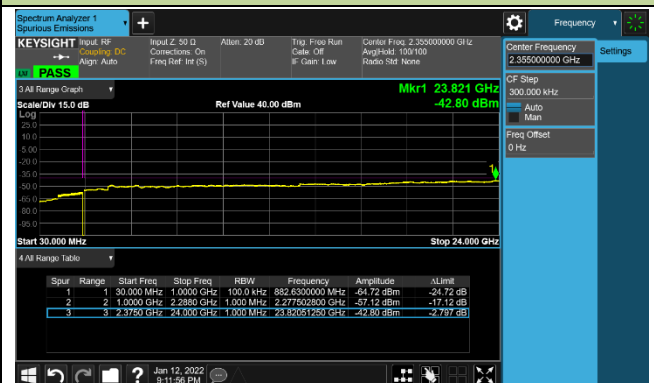
Note: Spurious emissions within 9kHz – 30MHz were found more than 20dB below limit line.

5MHz Channel Bandwidth

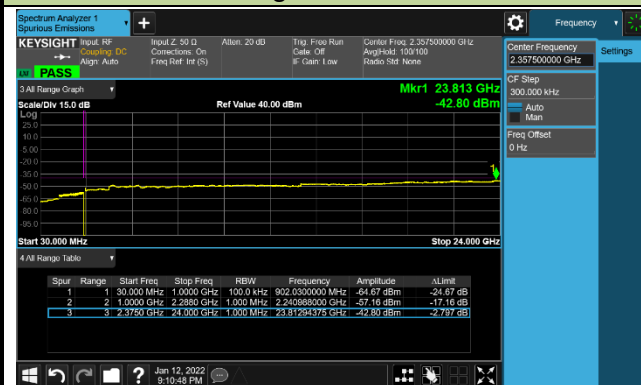
Low Channel

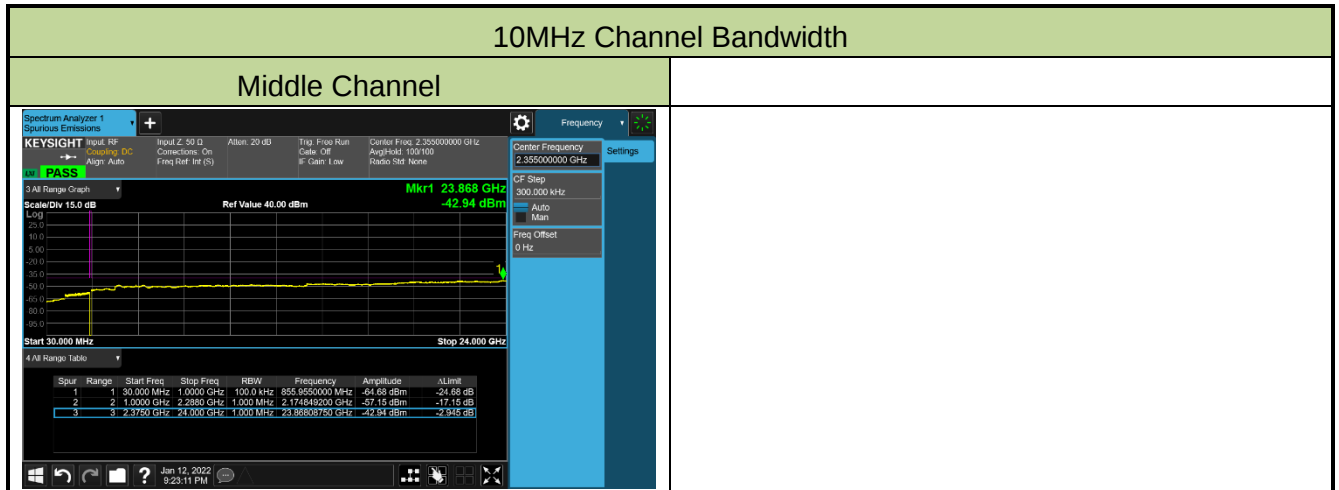


Middle Channel



High Channel





5.7. Radiated Spurious Emission Measurement

5.7.1. Test Limit

Out of band emissions: The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $70 + 10 \log (P)$ dB.

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

5.7.2. Test Procedure

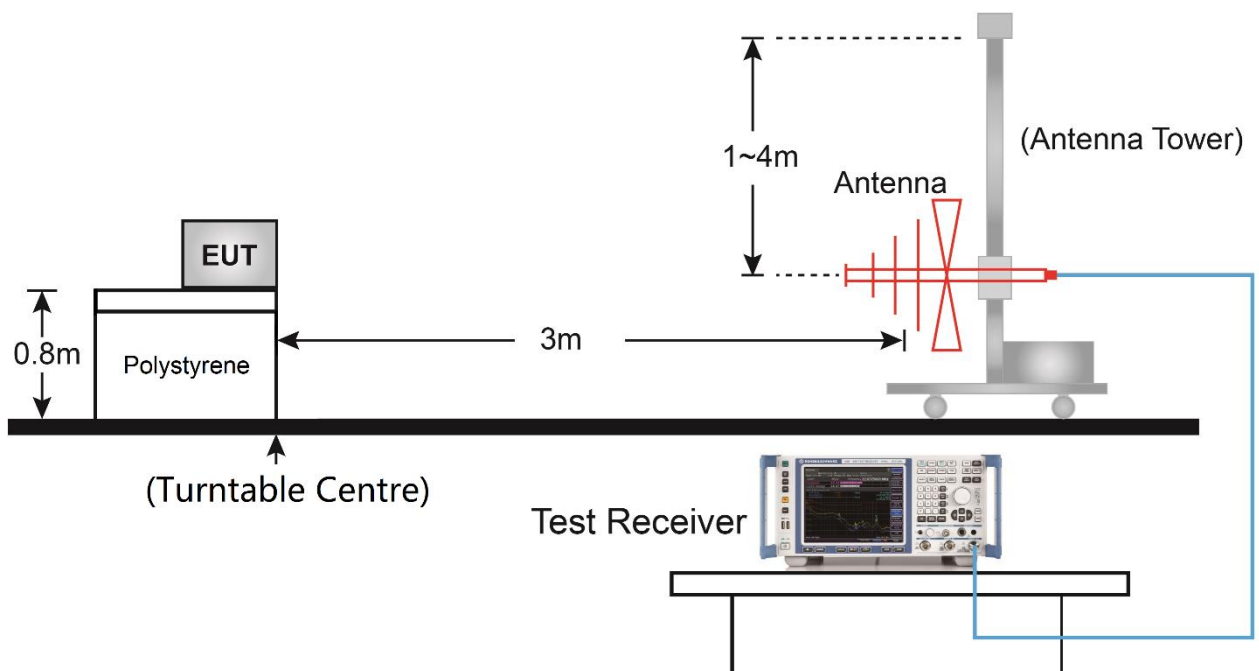
ANSI C63.26-2015 - Section 5.2.7 & 5.5

5.7.3. Test Setting

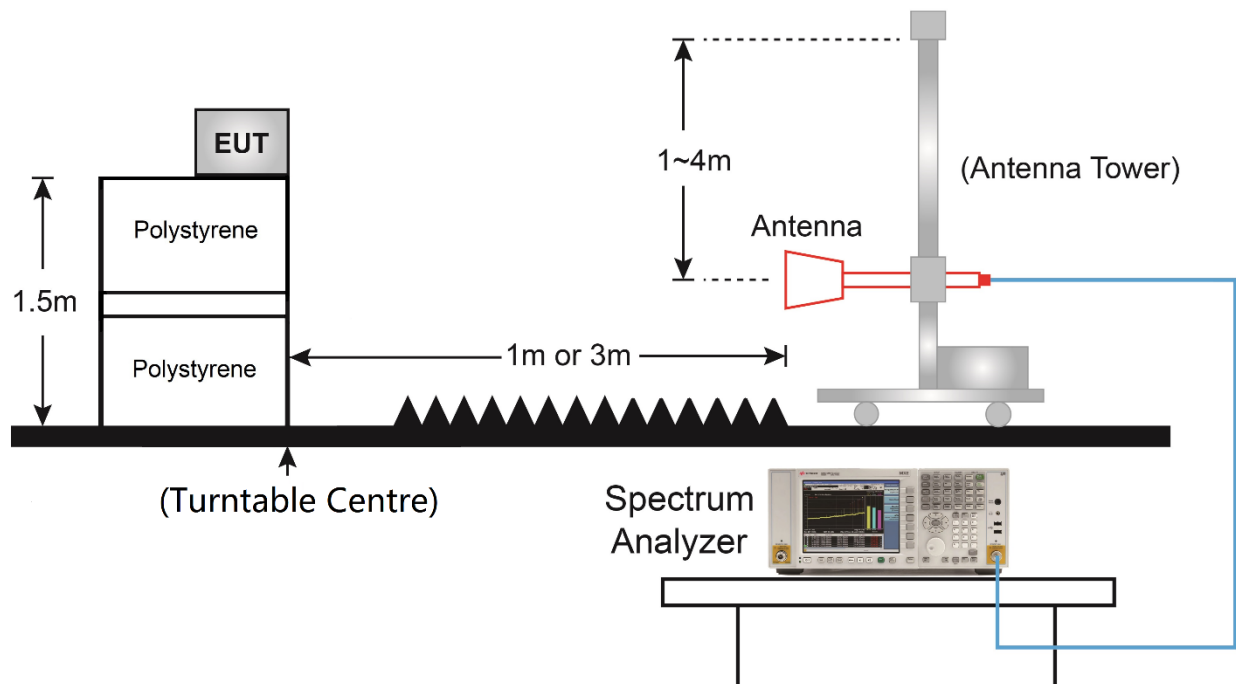
1. RBW = 1MHz
2. VBW $\geq 3 \times$ RBW
3. Sweep time $\geq 10 \times$ (number of points in sweep) $\times$ (transmission symbol period)
4. Detector = Peak
5. Trace mode = max hold
6. The trace was allowed to stabilize

5.7.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



5.7.5. Test Result

Product	Mobile Computer	Test Site	SIP-AC2
Test Engineer	Kyrie Xie	Test Date	2022/01/21 ~ 2022/01/23
Test Band	LTE Band 30_5MHz_1RB_QPSK		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level(dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Low Channel							
822.0	2.0	28.9	30.9	55.3	-24.4	Peak	Horizontal
961.2	2.6	30.1	32.7	55.3	-22.6	Peak	Horizontal
48.4	14.0	17.9	31.9	55.3	-23.4	Peak	Vertical
54.7	16.3	17.9	34.2	55.3	-21.1	Peak	Vertical
4612.5	53.2	-10.6	42.6	55.3	-12.7	RMS	Horizontal
6916.0	52.9	-6.9	46.0	55.3	-9.3	Peak	Horizontal
4612.5	55.2	-10.6	44.6	55.3	-10.7	RMS	Vertical
6916.0	47.4	-6.9	40.5	55.3	-14.8	RMS	Vertical
Middle Channel							
802.1	3.0	28.5	31.5	55.3	-25.0	Peak	Horizontal
960.2	2.9	30.0	32.9	55.3	-22.5	Peak	Horizontal
47.9	15.6	17.8	33.4	55.3	-24.1	Peak	Vertical
54.7	15.6	17.9	33.5	55.3	-23.1	Peak	Vertical
4612.5	52.4	-10.6	41.8	55.3	-13.5	RMS	Horizontal
6924.5	52.2	-7.3	44.9	55.3	-10.4	RMS	Horizontal
6924.5	51.3	-7.3	44.0	55.3	-11.3	RMS	Vertical
9228.0	50.6	-4.5	46.1	55.3	-9.2	RMS	Vertical
High Channel							
921.9	3.1	29.7	32.8	55.3	-22.5	Peak	Horizontal
954.9	2.4	30.1	32.5	55.3	-22.8	Peak	Horizontal
47.9	14.2	17.8	32.0	55.3	-23.3	Peak	Vertical
54.7	15.9	17.9	33.8	55.3	-21.5	Peak	Vertical
4621.0	54.4	-10.6	43.8	55.3	-11.5	RMS	Horizontal
6933.0	50.3	-7.7	42.6	55.3	-12.7	RMS	Horizontal
6933.0	58.2	-7.7	50.5	55.3	-4.8	RMS	Vertical
9245.0	50.4	-4.5	45.9	55.3	-9.4	RMS	Vertical

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

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

Product	Mobile Computer	Test Site	SIP-AC2
Test Engineer	Kyrie Xie	Test Date	2022/01/21 ~ 2022/01/23
Test Band	LTE Band 40(Lower Band) _5MHz_1RB_QPSK		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level(dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Low Channel							
763.8	2.5	27.9	30.4	55.3	-24.9	Peak	Horizontal
939.4	2.2	29.9	32.1	55.3	-23.2	Peak	Horizontal
47.9	13.5	17.8	31.3	55.3	-24.0	Peak	Vertical
54.7	15.3	17.9	33.2	55.3	-22.1	Peak	Vertical
4612.5	53.3	-10.6	42.7	55.3	-12.6	RMS	Horizontal
6916.0	53.5	-6.9	46.6	55.3	-8.7	Peak	Horizontal
4612.5	58.0	-10.6	47.4	55.3	-7.9	RMS	Vertical
6916.0	50.4	-6.9	43.5	55.3	-11.8	RMS	Vertical
Middle Channel							
802.6	2.2	28.5	30.7	55.3	-24.6	Peak	Horizontal
950.5	2.4	29.8	32.2	55.3	-23.1	Peak	Horizontal
54.7	16.6	17.9	34.5	55.3	-20.8	Peak	Vertical
972.4	3.0	30.1	33.1	55.3	-22.2	Peak	Vertical
4612.5	54.4	-10.6	43.8	55.3	-11.5	RMS	Horizontal
6924.5	52.4	-7.3	45.1	55.3	-10.2	Peak	Horizontal
4612.5	58.4	-10.6	47.8	55.3	-7.5	Peak	Vertical
9228.0	52.8	-4.5	48.3	55.3	-7.0	Peak	Vertical
High Channel							
827.3	2.5	28.8	31.3	55.3	-24.0	Peak	Horizontal
955.4	2.3	30.1	32.4	55.3	-22.9	Peak	Horizontal
54.7	16.1	17.9	34.0	55.3	-21.3	Peak	Vertical
946.7	2.8	30.0	32.8	55.3	-22.5	Peak	Vertical
4629.5	58.9	-10.3	48.6	55.3	-6.7	Peak	Horizontal
6941.5	52.9	-7.5	45.4	55.3	-9.9	Peak	Horizontal
4629.5	52.4	-10.3	42.1	55.3	-13.2	RMS	Vertical
6941.5	52.3	-7.5	44.8	55.3	-10.5	RMS	Vertical

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

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

Product	Mobile Computer	Test Site	SIP-AC2
Test Engineer	Kyrie Xie	Test Date	2022/01/21 ~ 2022/01/23
Test Band	LTE Band 40(Upper Band) _5MHz_1RB_QPSK		

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Low Channel							
820.6	1.8	28.9	30.7	55.3	-24.6	Peak	Horizontal
977.2	1.9	30.1	32.0	55.3	-23.3	Peak	Horizontal
54.7	15.5	17.9	33.4	55.3	-21.9	Peak	Vertical
999.5	2.7	30.0	32.7	55.3	-22.6	Peak	Vertical
4697.5	53.3	-10.4	42.9	55.3	-12.4	RMS	Horizontal
7052.0	54.5	-6.7	47.8	55.3	-7.5	Peak	Horizontal
7052.0	49.6	-6.7	42.9	55.3	-12.4	Peak	Vertical
9398.0	52.4	-4.6	47.8	55.3	-7.5	Peak	Vertical
Middle Channel							
819.6	2.4	28.9	31.3	55.3	-24.0	Peak	Horizontal
933.1	2.4	29.8	32.2	55.3	-23.1	Peak	Horizontal
54.7	14.6	17.9	32.5	55.3	-22.8	Peak	Vertical
992.7	2.9	30.1	33.0	55.3	-22.3	Peak	Vertical
4697.5	53.6	-10.4	43.2	55.3	-12.1	RMS	Horizontal
7043.5	53.3	-6.7	46.6	55.3	-8.7	Peak	Horizontal
4697.5	53.2	-10.4	42.8	55.3	-12.5	RMS	Vertical
9389.5	46.4	-4.5	41.9	55.3	-13.4	RMS	Vertical
High Channel							
808.9	2.4	28.8	31.2	55.3	-24.1	Peak	Horizontal
974.3	2.1	30.1	32.2	55.3	-23.1	Peak	Horizontal
47.9	14.7	17.8	32.5	55.3	-22.8	Peak	Vertical
54.7	16.0	17.9	33.9	55.3	-21.4	Peak	Vertical
4723.0	58.2	-9.9	48.3	55.3	-7.0	Peak	Horizontal
7077.5	51.2	-6.6	44.6	55.3	-10.7	Peak	Horizontal
4723.0	52.4	-9.9	42.5	55.3	-12.8	RMS	Vertical
9440.5	51.4	-4.4	47.0	55.3	-8.3	Peak	Vertical

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

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

Appendix A - Test Setup Photograph

Refer to “2112RSU039-UT” file.

Appendix B - EUT Photograph

Refer to “2112RSU039-UE” file.

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