

TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 1 of 70

Applicant : SIMCom Wireless Solutions Limited
Address of Applicant : SIMCom Headquarters Building, Building 3, No.289
Linhong Road, Changning District, Shanghai, China

Product Name : LTE Wireless Data Module
Brand Name : SIMCom
Model Name : SIM8918EA
Sample Acquisition Method : Sent by Client
Sample No. : E23060106-01#02

FCC ID : 2AJYU-8XRA001

Standards : FCC CFR47 Part 15, Subpart C

Date of Receipt : 2023-07-18
Date of Test : 2023-07-28~ 2023-09-14
Date of Issue : 2023-09-15

Remark:

This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

Prepared by:



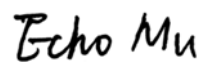
(Erik Yang)

Reviewed by:



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Approved by:



(Authorized signatory: Echo Mu)

TEST REPORT

Report No.: SHE23060106-01CE Date: 2023-09-15 Page 2 of 70

Contents

- 1 GENERAL INFORMATION 3
 - 1.1 TESTING LABORATORY 3
 - 1.2 DETAILS OF APPLICATION 3
 - 1.3 DETAILS OF EUT 3
 - 1.4 TEST METHODOLOGY 4
 - 1.5 TEST SUMMARY 4
- 2 TEST CONDITION 5
 - 2.1 ENVIRONMENTAL CONDITIONS 5
 - 2.2 EQUIPMENT LIST 5
 - 2.3 MEASUREMENT UNCERTAINTY 6
- 3 TEST SET-UP AND OPERATION MODES 7
 - 3.1 DETAILS OF TEST MODE 7
 - 3.2 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT 7
 - 3.3 SUPPORT SOFTWARE 7
 - 3.4 TEST SETUP DIAGRAM 8
- 4 TEST RESULTS 10
 - 4.1 TRANSMITTER REQUIREMENT & TEST SUITES 10
 - 4.1.1 Antenna Requirement 10
 - 4.1.2 Maximum Peak Output Power 11
 - 4.1.3 20dB Bandwidth 17
 - 4.1.4 Conducted Spurious Emission & Authorized-band band-edge 23
 - 4.1.5 Radiated Spurious Emission 48
 - 4.1.6 Band Edge (Restricted-band band-edge) 49
 - 4.1.7 Hopping Frequency Separation 50
 - 4.1.8 Number of Hopping Frequency 53
 - 4.1.9 Time of Occupancy 56
 - 4.2 MAINS EMISSIONS 62
 - 4.2.1 Conducted Emission on AC Mains 62
- 5 APPENDIXES 65
 - 5.1 PHOTOGRAPHS OF THE SAMPLE 65
 - 5.2 SET-UP FOR CONDUCTED EMISSION ON AC MAINS 69
 - 5.3 SET-UP FOR CONDUCTED RF TEST AT ANTENNA PORT 69
 - 5.4 SET-UP FOR RADIATED SPURIOUS EMISSIONS BELOW 1GHZ 70
 - 5.5 SET-UP FOR RADIATED SPURIOUS EMISSIONS ABOVE 1GHZ 70

TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 3 of 70

1 General Information

1.1 Testing Laboratory

Company Name	ICAS Testing Technology Service (Shanghai) Co., Ltd.
Address	No.1298, Pingan Road, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

1.2 Details of Application

Applicant Company Name	SIMCom Wireless Solutions Limited
Address	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China
Contact Person	Yongsheng Li
Telephone	+86 21 3252 3134
Email	yongsheng.li@simcom.com
Manufacturer Company Name	SIMCom Wireless Solutions Limited
Address	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China
Factory Company Name	SIMCom Wireless Solutions Limited
Address	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China

1.3 Details of EUT

Product Name	LTE Wireless Data Module
Brand Name	SIMCom
Test Model Name	SIM8918EA
FCC ID	2AJYU-8XRA001
Mode of Operation	Bluetooth BR/EDR Version 4.2
Frequency Range	2400MHz ~ 2483.5MHz
Number of Channels	79 (at intervals of 1 MHz)
Modulation Type	GFSK, $\pi/4$ -DQPSK, 8-DPSK
Max RF Output Power	10.95dBm
Antenna Type	External Antenna
Antenna Gain	4.01dBi
Extreme Temperature Range	-35°C ~ +75°C
Test Voltage	DC 3.9V
Hardware Version	8XR000-SIM8918_V1.03
Software Version	SIM8918B01V01

TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 4 of 70

RF power setting in TEST_SW	QRCT_Power level setting_ GFSK_ setting 9 QRCT_Power level setting_ $\pi/4$ -DQPSK _ setting 8 QRCT_Power level setting_ 8DPSK _ setting 8
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Note:

1. The above information was declared by the manufacture.
2. For more details, please refer to the User's manual of the EUT.

1.4 Test Methodology

47 CFR Part 15, Subpart C	Telecommunication-Radio Frequency Devices-Intentional Radiators
KDB Publication 558074 D01 v05r02	15.247 Meas Guidance.
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Note(s):

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test.

1.5 Test Summary

Test Item	FCC Rules	Result
Antenna Requirement	FCC Part 15.247(b)(4), 15.203	PASS
Maximum Peak Output Power	FCC Part 15.247(b)(1)	PASS
20dB Bandwidth	FCC Part 15.247(a)(1)	PASS
Conducted Spurious Emission & Authorized-band band-edge	FCC Part 15.247(d)	PASS
Radiated Spurious Emission	FCC Part 15.247(d), 15.205, 15.209	PASS
Band Edge (Restricted-band band-edge)	FCC Part 15.247(d), 15.205, 15.209	PASS
Hopping Frequency Separation	FCC Part 15.247(a)(1)	PASS
Number of Hopping Frequency	FCC Part 15.247(a)(1)(iii)	PASS
Time of Occupancy	FCC Part 15.247(a)(1)(iii)	PASS
Conducted Emission on AC Mains	FCC Part 15.207(a)	PASS

TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 5 of 70

2 Test Condition

2.1 Environmental conditions

Temperature (°C)	18-25
Humidity (%RH)	40-65
Barometric Pressure (mbar)	960-1060

2.2 Equipment List

Name of Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	Keysight	N9020B	MY59260184	2023-07-27	2024-07-26
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2023-06-08	2024-06-07
Signal Generator	Rohde & Schwarz	SMR27	100184	2023-07-27	2024-07-26
EMI Test Receiver	Rohde & Schwarz	ESPI3	100173	2023-06-08	2024-06-07
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2023-06-08	2024-06-07
V-network	SCHWARZBECK	NSLK 8127	8127-902	2023-06-07	2024-06-06
Attenuator	SCHWARZBECK	VTSD 9561-FN	/	2023-06-06	2024-06-05
Broadband Antenna	SCHWARZBECK	VULB9163	9163-1037	2023-03-22	2025-03-21
Horn Antenna-18G	SCHWARZBECK	BBHA9120D	9120D-1775	2023-06-13	2025-06-12
Loop Antenna	SCHWARZBECK	FMZB 1513	N/A	2023-06-09	2024-06-08
Horn Antenna-40G	YINGLIAN	LB-180400-KF	N/A	2023-06-18	2025-06-17
Broadband Preamplifier	SCHWARZBECK	BBV 9718	346	2023-06-08	2024-06-07
EMC chamber 9*6*6(L*W*H)	CHANGNING	966	N/A	2023-06-09	2024-06-08
Shielded Enclosure 8*5*4 (L*W*H)	CHANGNING	854	N/A	2023-06-09	2025-06-08
Test Software	BL	BL410_E	Version:1.0.0.117	N/A	N/A
Test Software	BL	BL410_R	Version:2.1.1.409	N/A	N/A

TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 6 of 70

2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI. The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Parameter		Uncertainty
Antenna Port Conducted Emission	< 1GHz	± 1.5 dB
	> 1GHz	± 1.5 dB
Radiated Emission	9KHz – 30MHz	± 3.42 dB
	30 MHz – 1GHz	± 5.00 dB
	> 1GHz	± 4.88 dB
Conducted Emission on AC Mains	150kHz-30MHz	± 2.68 dB
Occupied Channel Bandwidth		± 5 %

TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 7 of 70

3 Test Set-up and Operation Modes

3.1 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver mode. Select test channel as below:

Channel	Frequency
The lowest channel (CH0)	2402MHz
The middle channel (CH39)	2441MHz
The highest channel (CH78)	2480MHz

The basic operation modes are:

- A. On
 - 1. BR/EDR mode
 - a. Transmitting
 - i. Low Channel
 - ii. Middle Channel
 - iii. High Channel
 - iv. Hopping mode
 - b. Receiving
 - 2. Normal working with Bluetooth on
- B. Standby
- C. Off

3.2 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model Name	Serial No.
Laptop	Lenovo	TP00083A	N/A
SWITCHING POWER SUPPLY	N/A	P-050B-050200EU	N/A
EVB Debug Board 1	N/A	Smart Module-EVB_V1.03	N/A
EVB Debug Board 2	N/A	8918-TE_V1.02	N/A
USB Cable	N/A	N/A	1.00m Unshielded

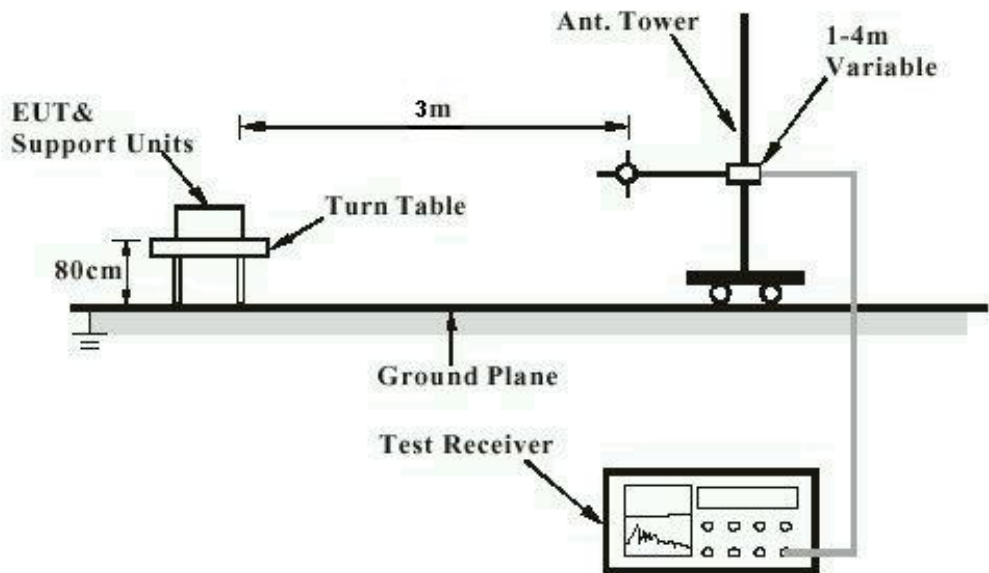
3.3 Support Software

Description	Manufacturer	Software Name
Software	Qualcomm	QRCT Version 4.0.00166.0

TEST REPORT

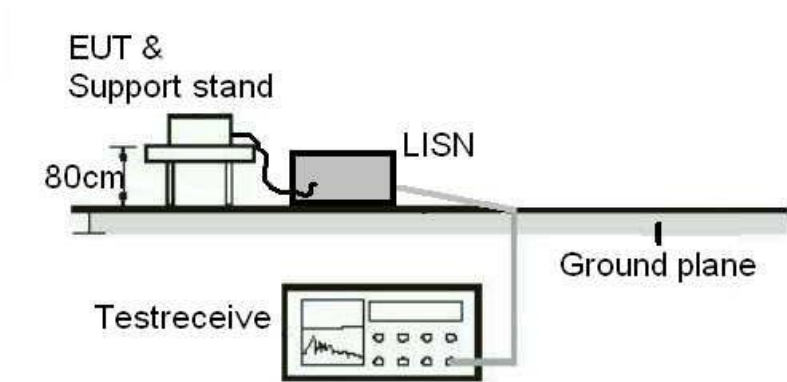
3.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Configuration for Conduction Test



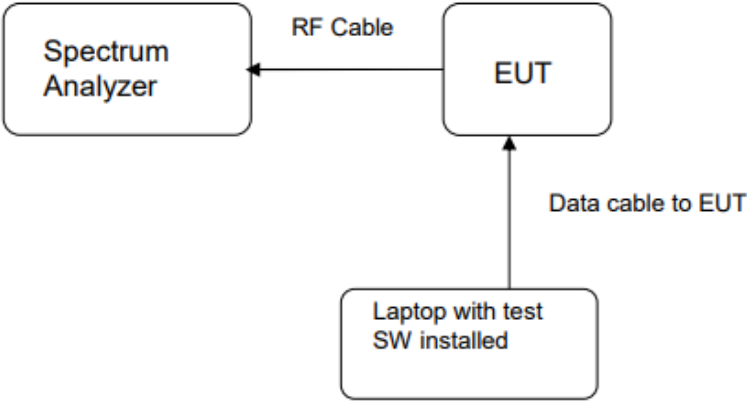
TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 9 of 70

Diagram of Measurement Configuration for Transmitter Test



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 10 of 70

4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

RESULT:

PASS

Test standard : FCC Part 15.247(b)(4), Part 15.203

Requirement : The use of approved antennas only with directional gains that do not exceed 6dBi

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 4.01dBi. The antenna is an external antenna with no possibility of replacement with a non-approved antenna by the end-user.

The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Therefore, the EUT is considered to comply with this provision.

TEST REPORT

Report No.: SHE23060106-01CE Date: 2023-09-15 Page 11 of 70

4.1.2 Maximum Peak Output Power

RESULT: PASS

Test standard : FCC Part 15.247(b)(1)

Requirement : ANSI C63.10-2013, Clause 7.8.5
KDB 558074 D01 v05r02, Clause 2.2

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.9°C

Relative humidity : 51%

Table 1: Maximum Peak Output Power

Test Mode	Test Channel (MHz)	Peak Output Power Measurement Result		Limit (W)
		(dBm)	(mW)	
GFSK	2402	10.66	11.64	< 1
	2441	10.95	12.45	
	2480	10.40	10.96	
π/4-DQPSK	2402	6.88	4.88	< 0.125
	2441	7.89	6.15	
	2480	7.63	5.79	
8-DPSK	2402	6.91	4.91	< 0.125
	2441	8.20	6.61	
	2480	7.97	6.27	

TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 12 of 70

Figure 1: Maximum Peak Output Power, 2402MHz, GFSK



Figure 2: Maximum Peak Output Power, 2441MHz, GFSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 13 of 70

Figure 3: Maximum Peak Output Power, 2480MHz, GFSK



Figure 4: Maximum Peak Output Power, 2402MHz, $\pi/4$ -DQPSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 14 of 70

Figure 5: Maximum Peak Output Power, 2441MHz, $\pi/4$ -DQPSK



Figure 6: Maximum Peak Output Power, 2480MHz, $\pi/4$ -DQPSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 15 of 70

Figure 7: Maximum Peak Output Power, 2402MHz, 8-DPSK



Figure 8: Maximum Peak Output Power, 2441MHz, 8-DPSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 16 of 70

Figure 9: Maximum Peak Output Power, 2480MHz, 8-DPSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 17 of 70

4.1.3 20dB Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)

Requirement : ANSI C63.10-2013, Clause 7.8.7
KDB 558074 D01 v05r02, Clause 2.2

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.9°C

Relative humidity : 51%

Table 2: 20dB Bandwidth

Test Mode	Test Channel (MHz)	20dB Bandwidth (MHz)
GFSK	2402	0.9531
	2441	0.9459
	2480	0.9396
π /4-DQPSK	2402	1.2810
	2441	1.2870
	2480	1.2820
8-DPSK	2402	1.2950
	2441	1.2940
	2480	1.2930

TEST REPORT

Report No.: SHE23060106-01CE Date: 2023-09-15 Page 18 of 70

Figure 10: 20dB Bandwidth, 2402MHz, GFSK



Figure 11: 20dB Bandwidth, 2441MHz, GFSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 19 of 70

Figure 12: 20dB Bandwidth, 2480MHz, GFSK



Figure 13: 20dB Bandwidth, 2402MHz, $\pi/4$ -DQPSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 20 of 70

Figure 14: 20dB Bandwidth, 2441MHz, $\pi/4$ -DQPSK

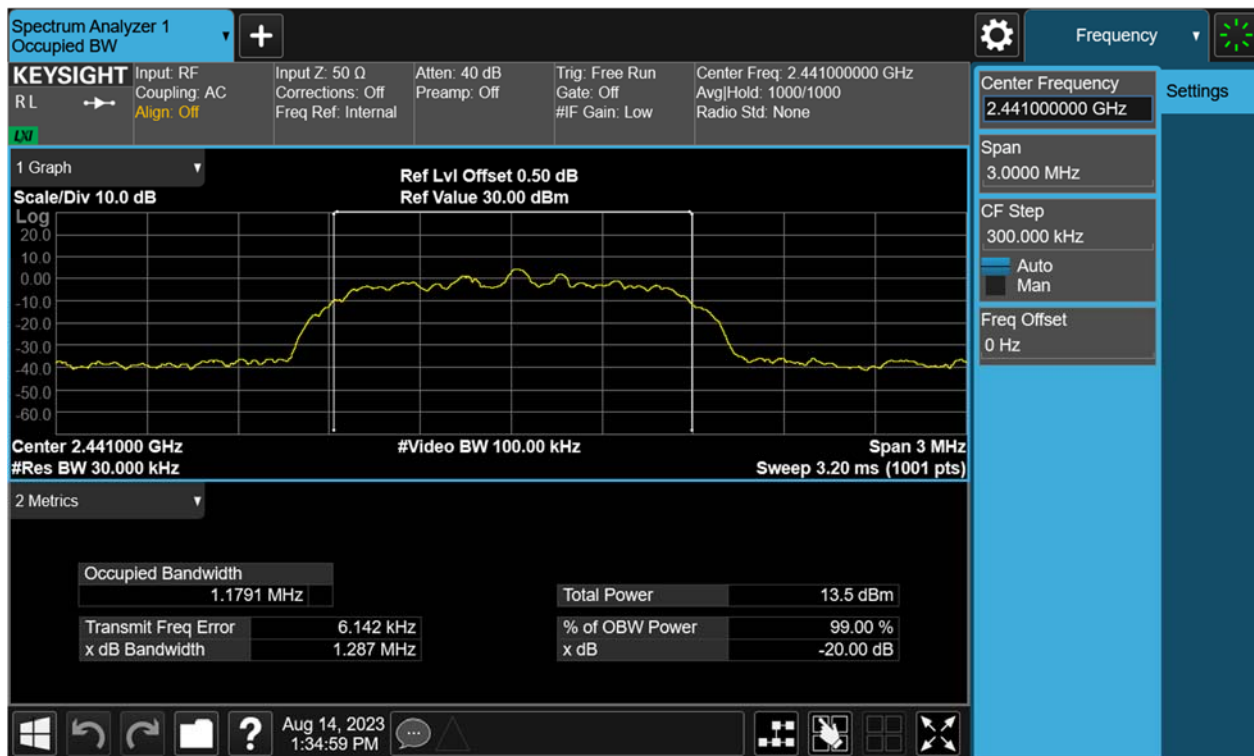
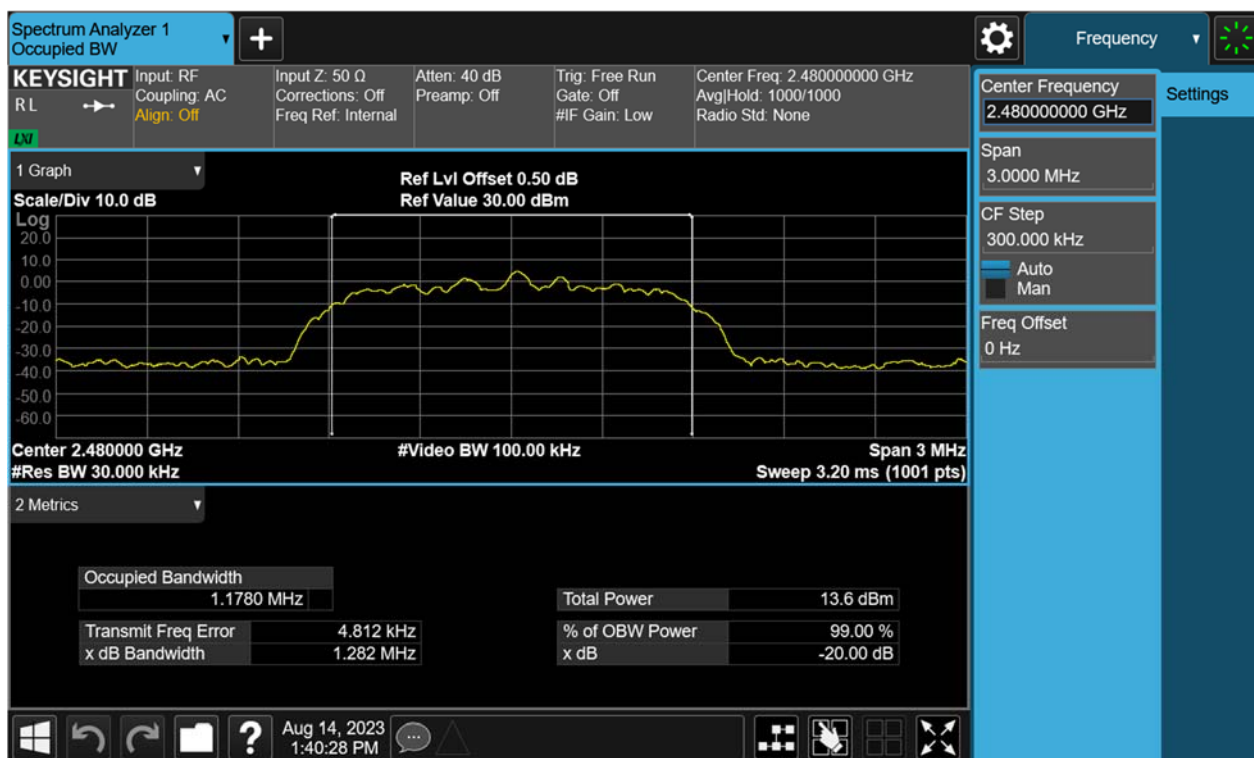


Figure 15: 20dB Bandwidth, 2480MHz, $\pi/4$ -DQPSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 21 of 70

Figure 16: 20dB Bandwidth, 2402MHz, 8-DPSK



Figure 17: 20dB Bandwidth, 2441MHz, 8-DPSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 22 of 70

Figure 18: 20dB Bandwidth, 2480MHz, 8-DPSK



TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 23 of 70

4.1.4 Conducted Spurious Emission & Authorized-band band-edge

RESULT:

PASS

Test standard	: FCC Part 15.247(d)
Requirement	: ANSI C63.10-2013, Clause 7.8.8
Kind of test site	: Shielded room

Test setup

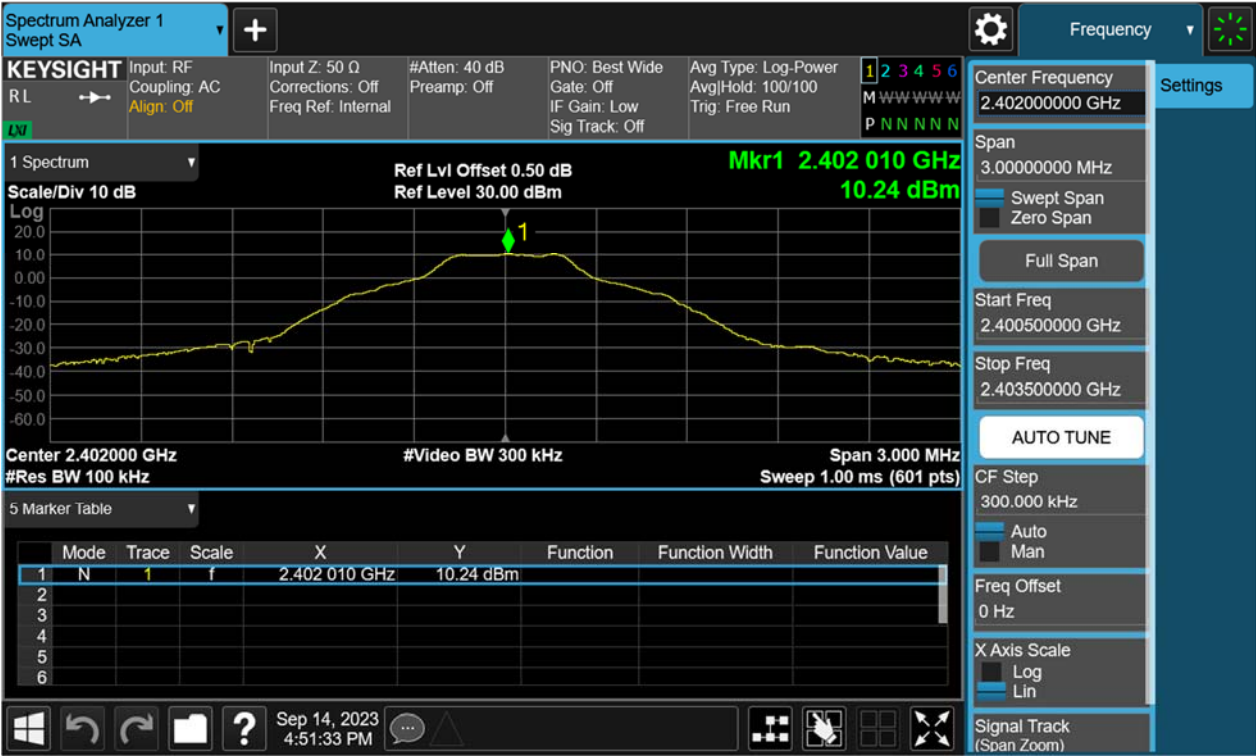
Test Channel	: Low/Middle/High for spurious, Low/High for Band Edge
Operation Mode	: A.1.a
Ambient temperature	: 24.9°C
Relative humidity	: 51%

For details refer to following test plot.

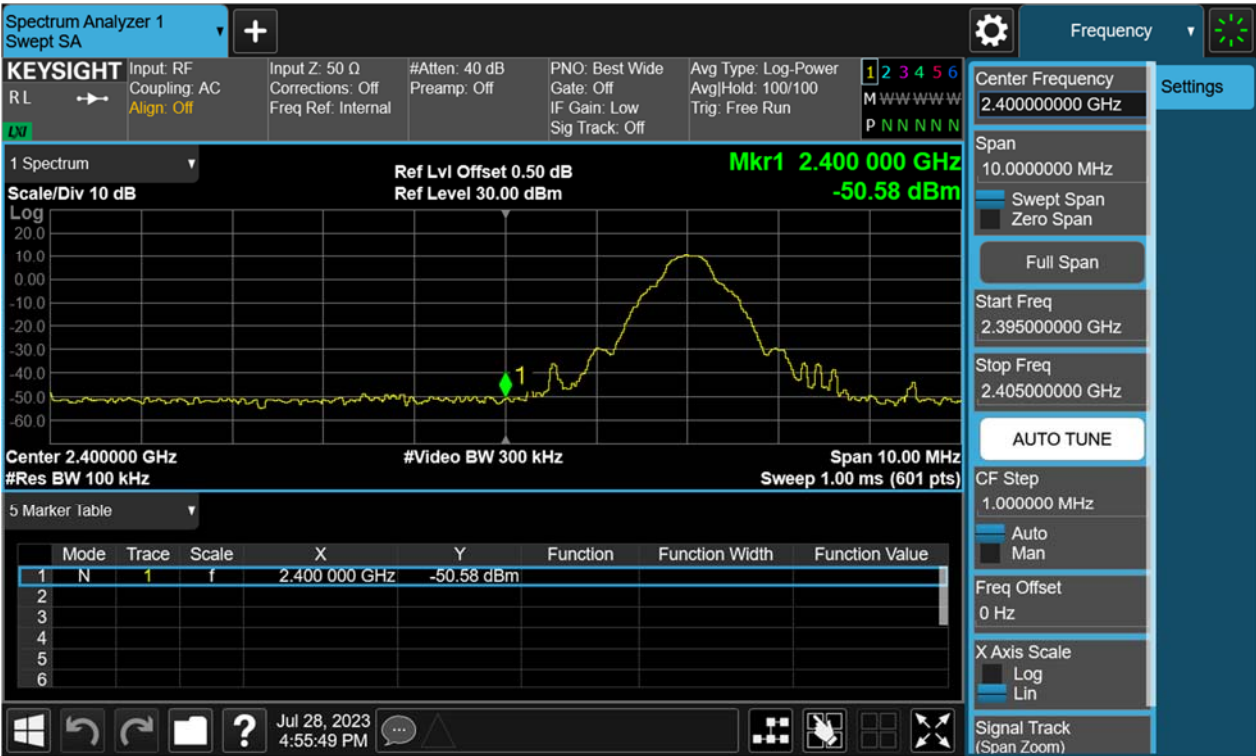
TEST REPORT

Report No.: SHE23060106-01CE Date: 2023-09-15 Page 24 of 70

Figure 19: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, GFSK Carrier Level



Band Edge



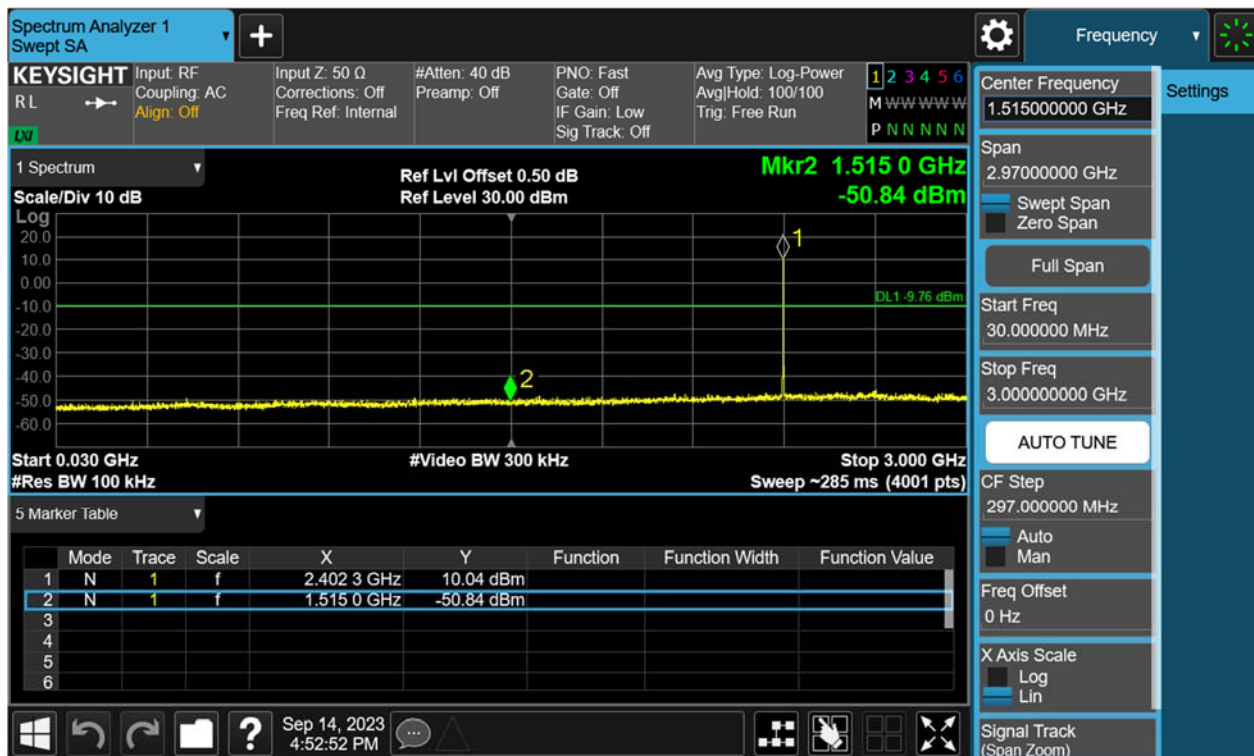
TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 25 of 70

Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE23060106-01CE

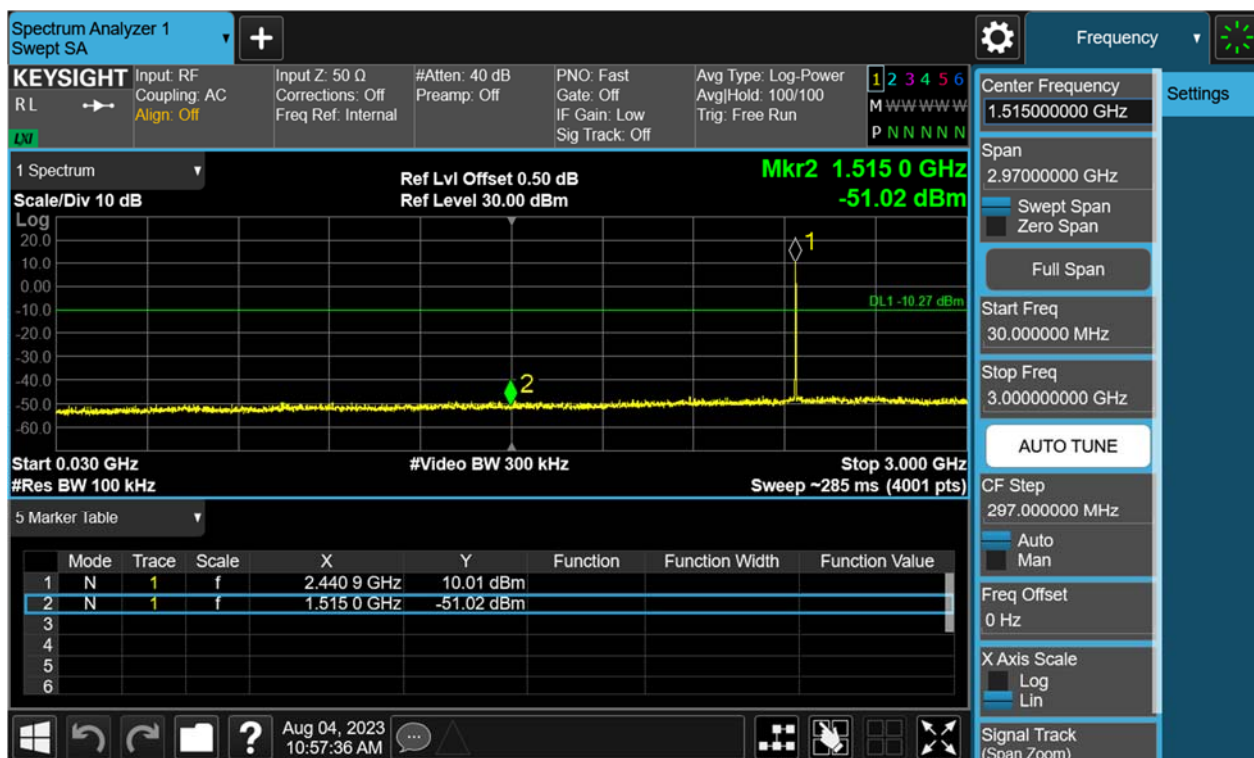
Date: 2023-09-15

Page 26 of 70

Figure 20: Conducted Spurious Emission & Authorized-band band-edge, 2441MHz, GFSK Carrier Level



Conducted spurious emissions 30MHz-25GHz

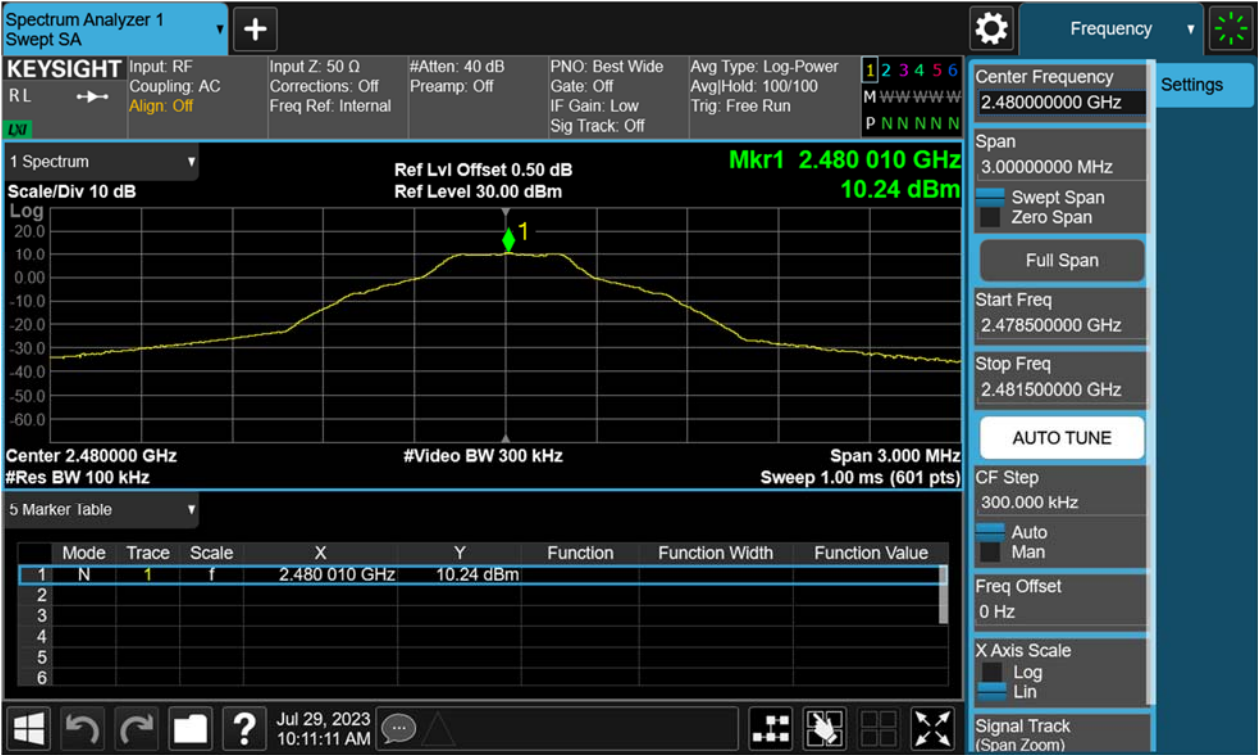


TEST REPORT

Report No.: SHE23060106-01CE Date: 2023-09-15 Page 27 of 70



Figure 21: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, GFSK Carrier Level



TEST REPORT

Report No.: SHE23060106-01CE

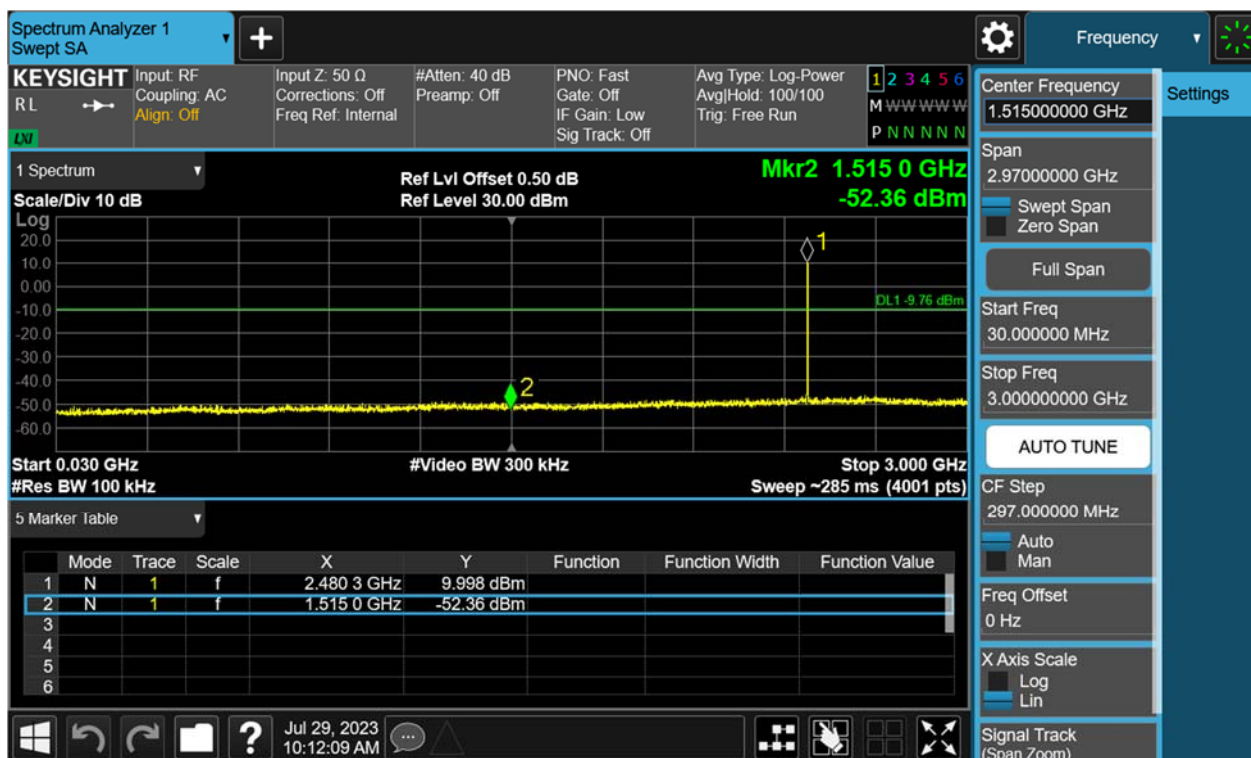
Date: 2023-09-15

Page 28 of 70

Band Edge



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.:

SHE23060106-01CE

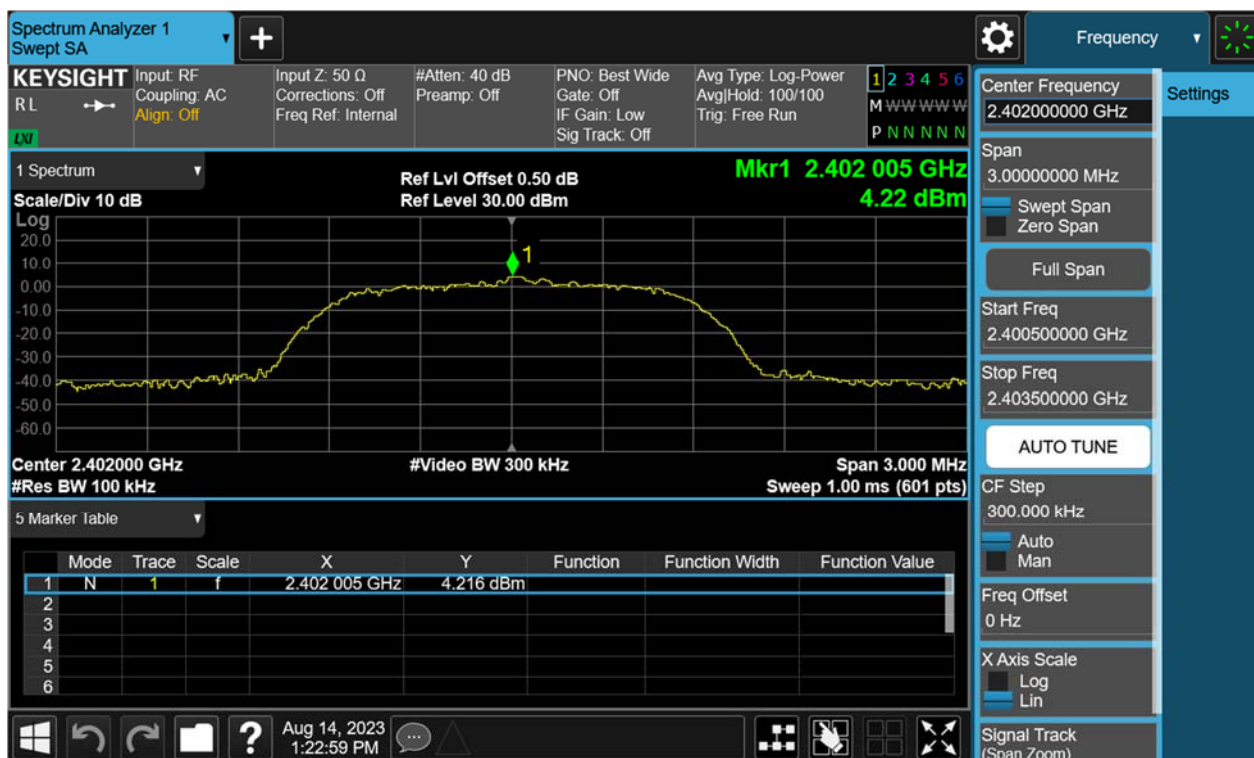
Date:

2023-09-15

Page 29 of 70



Figure 22: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, $\pi/4$ -DQPSK Carrier Level



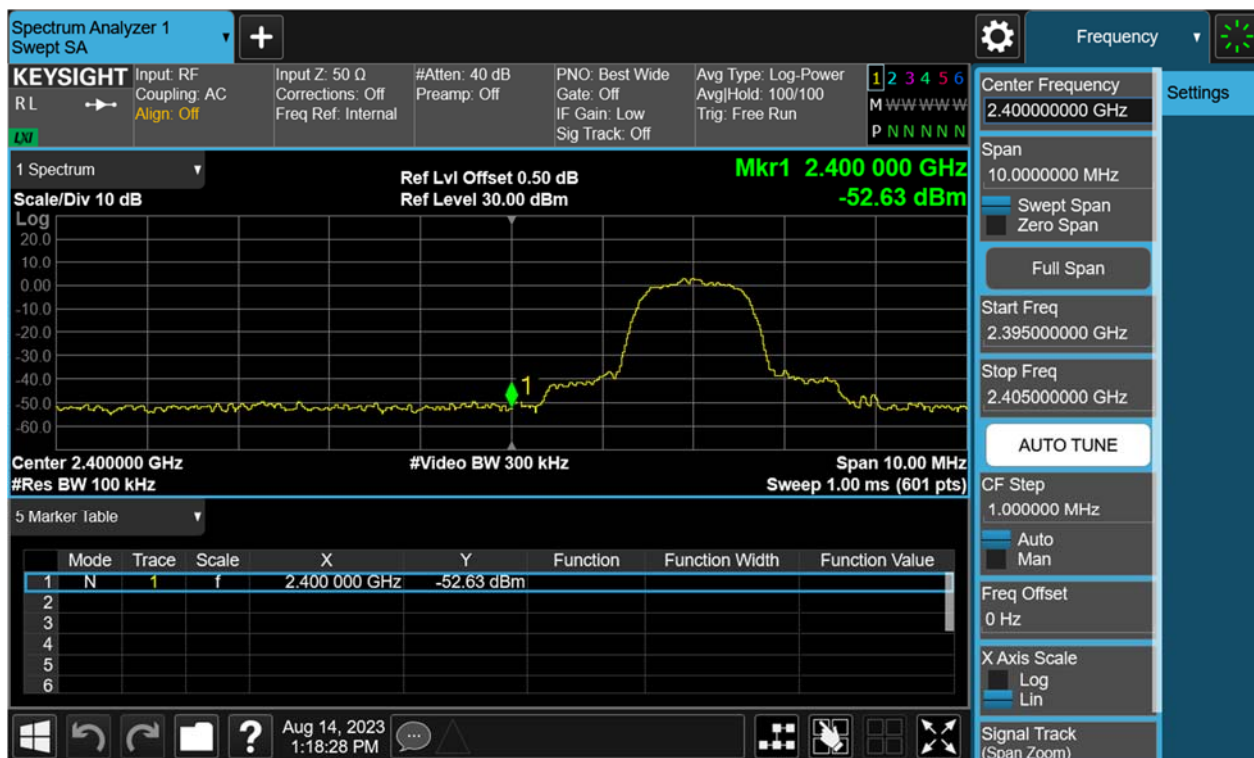
TEST REPORT

Report No.: SHE23060106-01CE

Date: 2023-09-15

Page 30 of 70

Band Edge



Conducted spurious emissions 30MHz-25GHz

