



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 1 of 16

TEST REPORT

Application No.: KSCR2404000626AT
FCC ID: 2ADZR5GMM28B
Applicant: Nokia Shanghai Bell Co., Ltd.
Address of Applicant: 388#, Ningqiao Road, China (Shanghai) Pilot Free Trade Zone, Shanghai 201206, China
Manufacturer: Nokia Solutions and Networks Oy
Address of Manufacturer: Karakaari 7 02610 Espoo Finland
Equipment Under Test (EUT):
EUT Name: FastMile 5G mmWave Receiver
Model No.: 5Gmm28-B
Trade Mark: Nokia
Standard(s): FCC Part 96.47
FCC KDB 940660 D01 Part 96 CBRS Eqpt v03
WINNF-TS-0122-V1.0.2 CBRS CBSD Test Specification
WINNF-18-IN-00178 CBRS End User Device as UUT Test Guidelines
Date of Receipt: 2024-04-15
Date of Test: 2024-04-16 to 2024-04-20
Date of Issue: 2024-05-07

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

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Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 2 of 16

Revision Record			
Version	Description	Date	Remark
00	Original	2024-05-07	/

Authorized for issue by:				
Tested By		Damon Zhou		
		Damon Zhou /Project Engineer		
Approved By		Terry Hou		
		Terry Hou /Reviewer		



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 3 of 16

2 Test Summary

Item	Standard	Test Case ID	Result
End User Device additional requirement	96.47	/	Pass

The UUT is an End User Device. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC Part 96.47

FCC KDB 940660 D01 Part 96 CBRS Eqpt v03

WINNF-TS-0122-V1.0.2 CBRS CBSD Test Specification

WINNF-18-IN-00178 CBRS End User Device as UUT Test Guidelines



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 4 of 16

3 Contents

	Page
1 COVER PAGE	1
2 Test Summary	3
3 Contents	4
4 General Information.....	5
4.1 Details of E.U.T.	5
4.2 Measurement Uncertainty	5
4.3 Description of Support Units	6
4.4 Test Location.....	7
4.5 Test Facility	7
4.6 Deviation from Standards.....	7
4.7 Abnormalities from Standard Conditions	7
5 Equipment List	8
6 Test Method and Environment	9
6.1 End User Device Conformance and Performance	9
6.2 Test Environment	9
6.3 Test Requirement.....	9
6.4 Test Procedure.....	10
6.5 Test Setup	11
6.6 Test Result	12
7 Test Setup Photographs	16

4 General Information

4.1 Details of E.U.T.

Power supply:	DC 54V by POE	
Sample Type:	End User device	
Transmitter Frequency Band:	LTE: Band 48 5GNR: n48	
Transmitter Frequency Range:	3550~3700MHz	
SCS	30k	
Antenna Type:	Internal Antenna	
Modulation	LTE: QPSK\16QAM\64QAM NR: BPSK\QPSK\16QAM\64QAM\256 QAM	
Hardware Version:	3TG02974Axxx(x:A~Z)	
Software Version:	5GmmReceiver-360-1_D240200BieT0601E0600	
Antenna Gain:	B48	Ant 1:3.4dBi (Provided by the manufacturer)
	n48	Ant 1:3.4dBi (Provided by the manufacturer) Ant 0&1 MIMO:2.2dBi (Provided by the manufacturer)

4.2 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	RF conducted power	$\pm 0.75\text{dB}$
3	Temperature test	$\pm 1^{\circ}\text{C}$
4	Humidity test	$\pm 3\%$
5	Supply voltages	$\pm 1.5\%$
6	Time	$\pm 3\%$

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 6 of 16

4.3 Description of Support Units

For LTE test:

Description	Manufacturer	Model No.	Serial No.
EPC	Lanner Electronics Inc.	LICA-1513A	LR202002004052
Router	TP-LINK	TL-R860+	1175379002425
Base station	Baicells	pBS31010 (FCC ID: 2AG32PBS31010)	12020002912122B0001

For 5GNR test:

Description	Manufacturer	Model No.	Serial No.
5GC	astir	astir_5GC	A372768X0507398
Router	TP-Link	TL-R860+	1175379002425
Base Band Unit	BTI	sCELL- G52091NAX	L603JESE1I
Remote Radio Unit	BTI	RU4370 (FCC ID: WBK-RU4370)	C0214921000004S

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 7 of 16

4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

1.SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).

2.SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).

3. Sample source: sent by customer.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• ISED

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

• VCCI

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 8 of 16

5 Equipment List

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
Laptop	Lenovo	Y510P	HFL000026	N/A	N/A
Spectrum Analyzer	KEYSIGHT	N9020A	KUS2001M00 1-2	2023/8/24	2024/8/23
Shield Room	YanChuang	N/A	KS301115-2	N/A	N/A
Coaxial Cable	Thermax	N/A	13	2023/9/16	2024/9/15
Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R.	N.C.R.
Humidity / Temperature Indicator	Renke	RS-WS-N01-6J	1032844	2024/3/21	2025/3/20



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 9 of 16

6 Test Method and Environment

6.1 End User Device Conformance and Performance

Test Requirement: FCC Part 96.47

Test Method: WINNF-18-IN-00178 CBRS End User Device as UUT Test Guidelines

6.2 Test Environment

Environmental Conditions: 25°C, 65%RH

6.3 Test Requirement

FCC Part 96.47

- a). End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.
- b). An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

6.4 Test Procedure

Following procedure can be done by applying WINNF-TS-0122-V1.0.2 CBRS CBSD Test Specification, use the 5GNR Base station CBSD (FCC ID: WBK-RU4370) as companion device to show compliance with Part 96.47 requirement for End User Device (EUD):

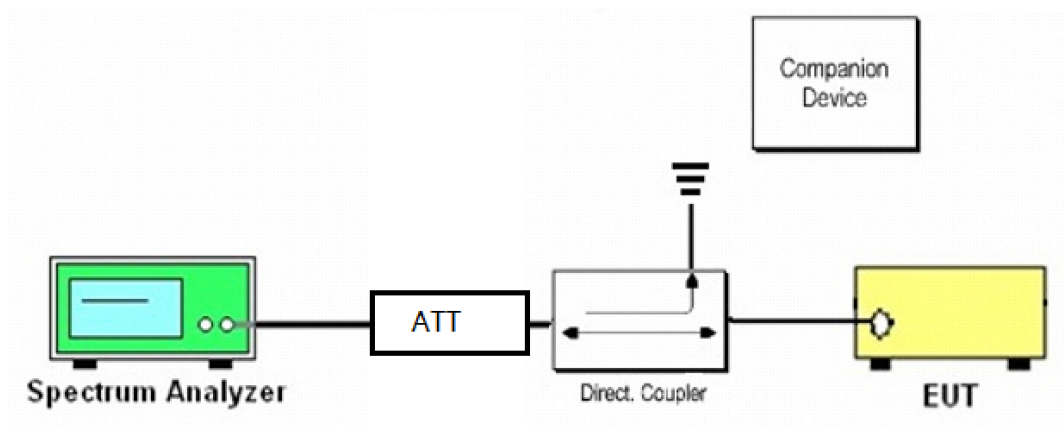
For LTE:

1. Setup with frequency 3560-3580MHz and power level 14dBm/MHz;
2. Enable CBSD service ;
3. Check EUD Tx Frequency and power;
4. Disable AP service ;
5. Check EUD stops transmission within 10seconds;
6. Setup with 3575-3595MHz & power level 8dBm/MHz;
7. Enable CBSD service;
8. Check EUD Tx Frequency and power;
9. Disable CBSD service;
10. Check EUD stops transmission within 10seconds.

For 5G NR:

1. Setup with frequency 3620-3640MHz and power level 16dBm/MHz;
2. Enable CBSD service ;
3. Check EUD Tx Frequency and power;
4. Disable AP service ;
5. Check EUD stops transmission within 10seconds;
6. Setup with 3680-3700MHz & power level 10dBm/MHz;
7. Enable CBSD service;
8. Check EUD Tx Frequency and power;
9. Disable CBSD service;
10. Check EUD stops transmission within 10seconds.

6.5 Test Setup



For LTE:

End User Device as UUT, the companion device is certified CBRS (FCC ID: 2AG32PBS31010)

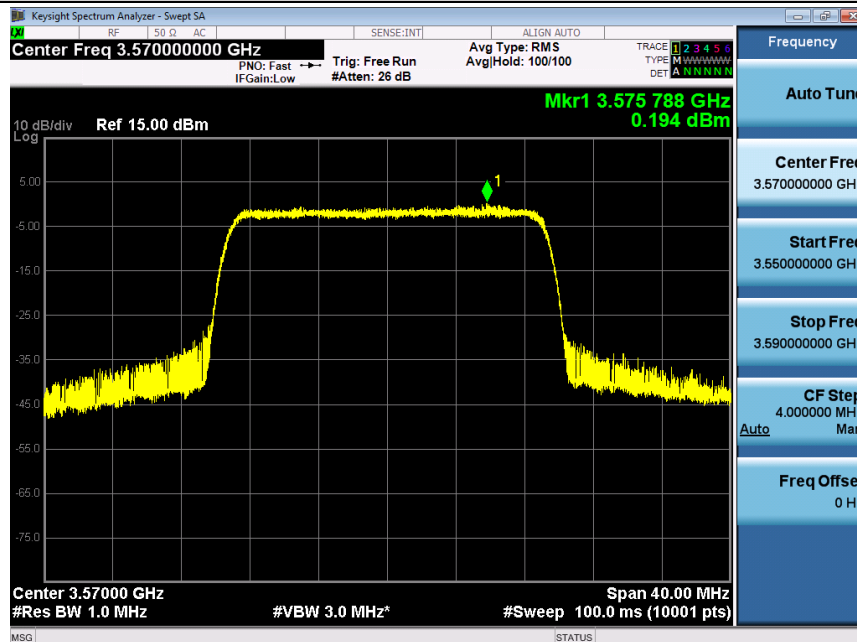
For 5G NR:

End User Device as UUT, the companion device is certified CBRS (FCC ID: WBK-RU4370)

6.6 Test Result

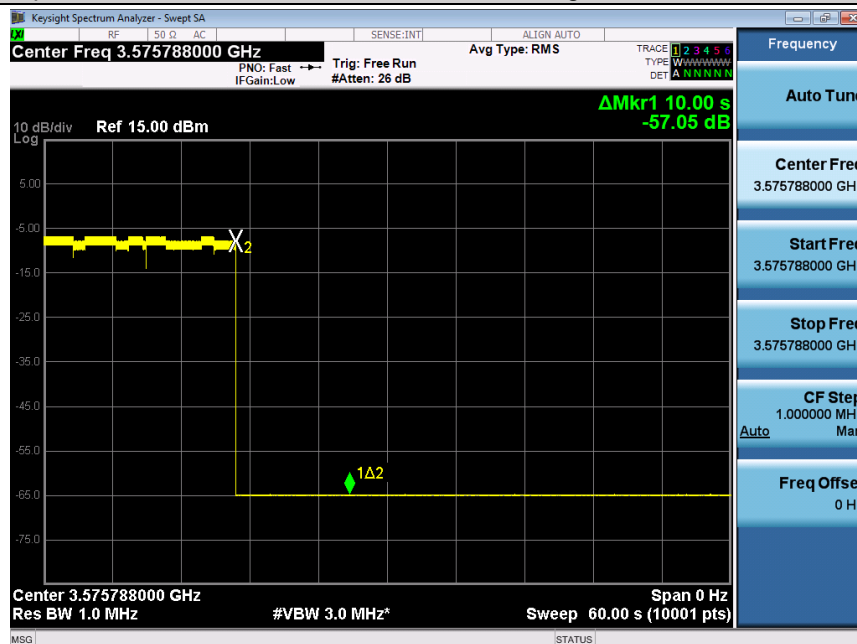
[Step 1] Setup with frequency 3560-3580MHz and power level 14dBm/MHz

[Step 3] Check EUD Tx Frequency and power



EIRP PSD=0.194+3.4+4.5=8.094dBm/MHz, Antenna gain is 3.4dBi,the path loss is 4.5dB

[Step 5] EUD stops transmission within 10 seconds of receiving instructions from its associated CBSD.



Compliance Certification Services (Kunshan) Inc.

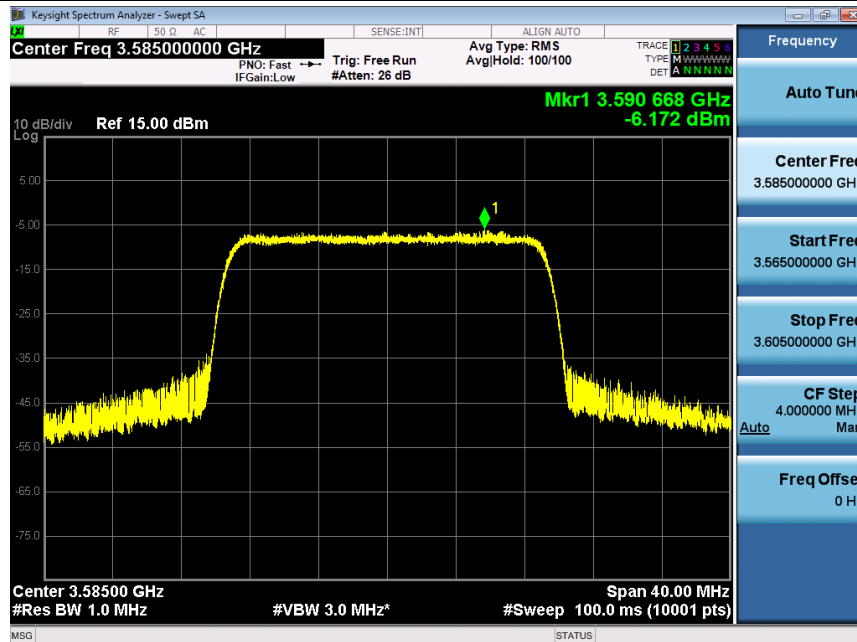
CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 13 of 16

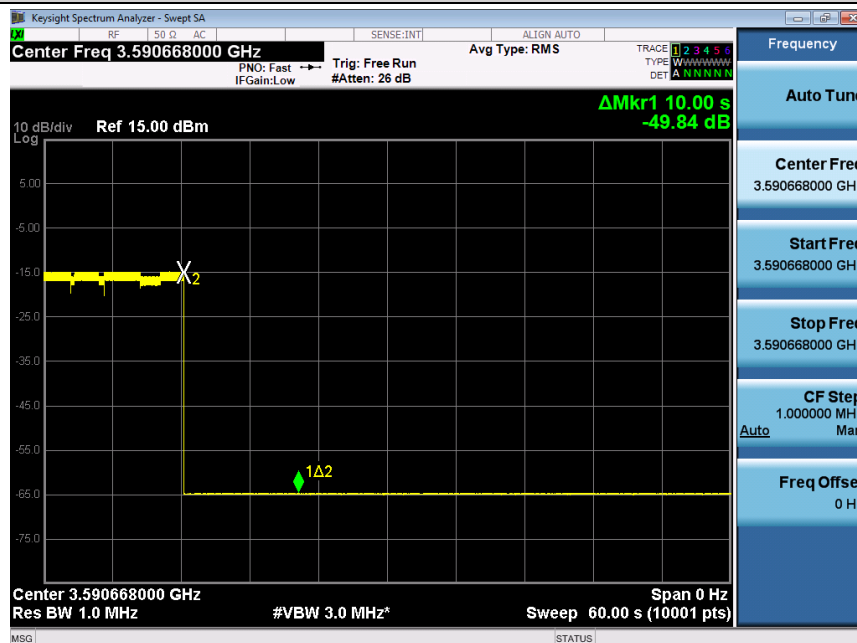
[Step 6] Setup with frequency 3575-3595MHz and power level 8dBm/MHz

[Step 8] Check EUD Tx Frequency and power



EIRP PSD=-6.172+3.4+4.5=1.728dBm/MHz, Antenna gain is 3.4dBi,the path loss is 4.5dB

[Step 10] EUD stops transmission within 10 seconds of receiving instructions from its associated CBSD.



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

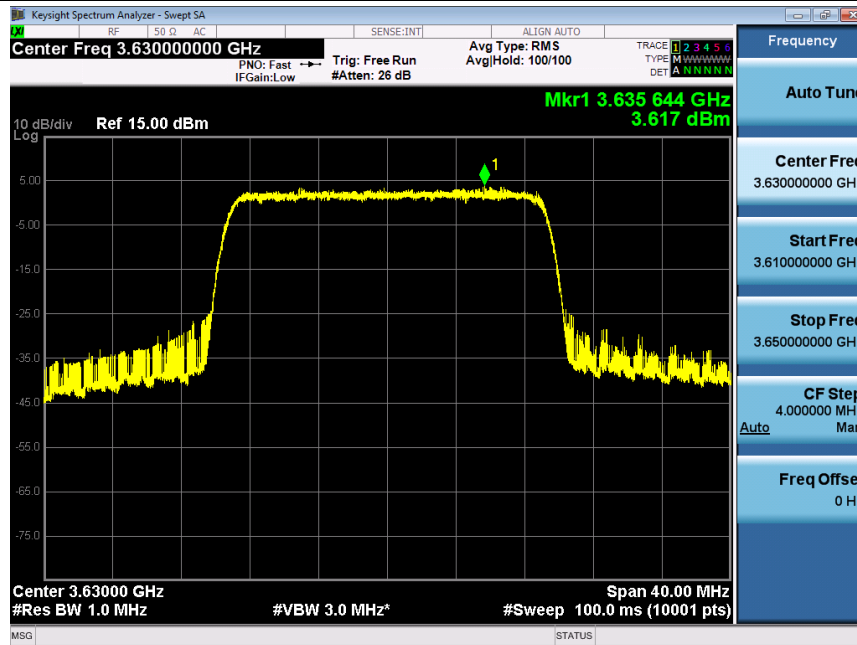
Report No.: KSCR240400062601

Page: 14 of 16

For 5GNR

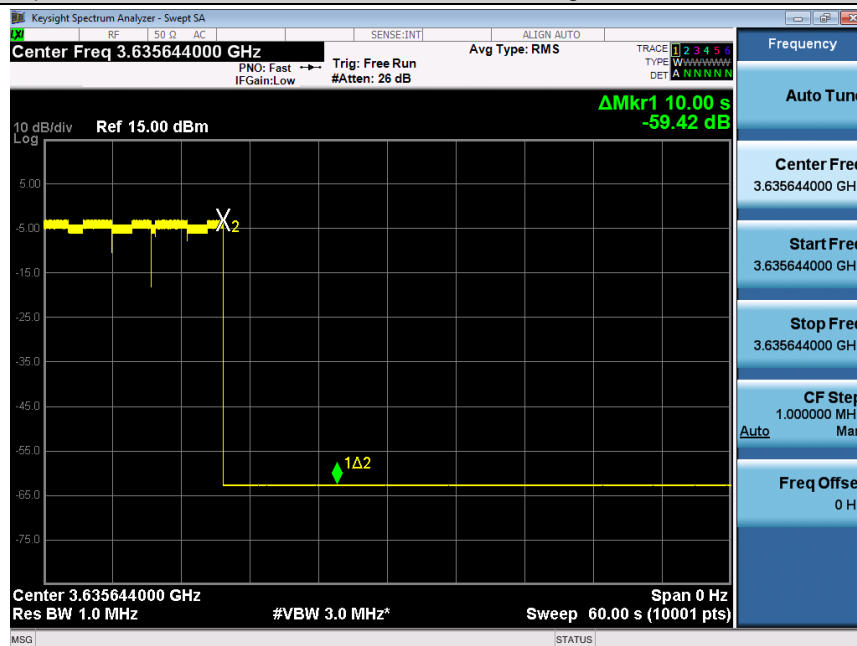
[Step 1] Setup with frequency 3620-3640MHz and power level 16dBm/MHz

[Step 3] Check EUD Tx Frequency and power



EIRP PSD=3.617+3.4+4.5+3=14.517dBm/MHz, Antenna gain is 3.4dBi,the path loss is 4.5dB, the MIMO Factor is 3dB

[Step 5] EUD stops transmission within 10 seconds of receiving instructions from its associated CBSD.



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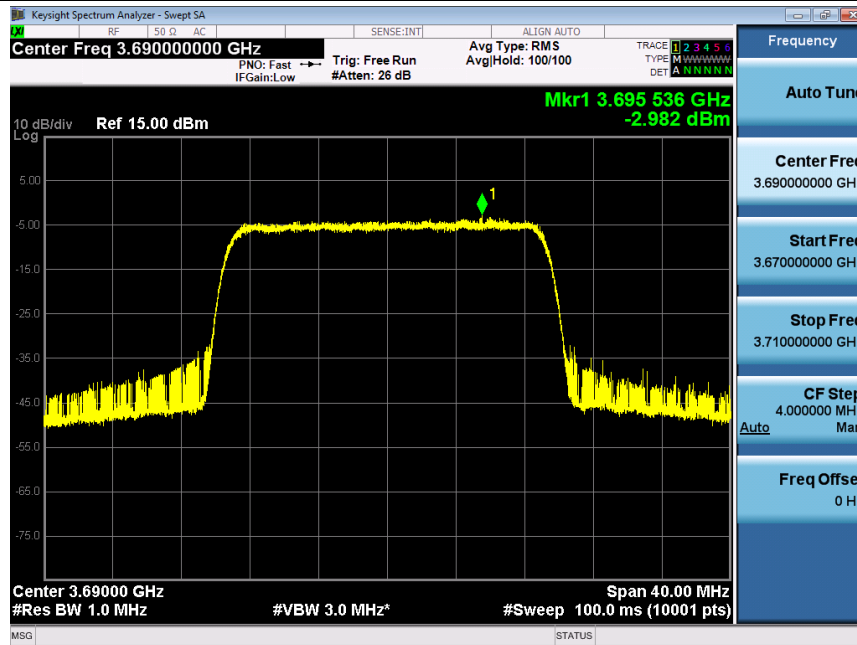
CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 15 of 16

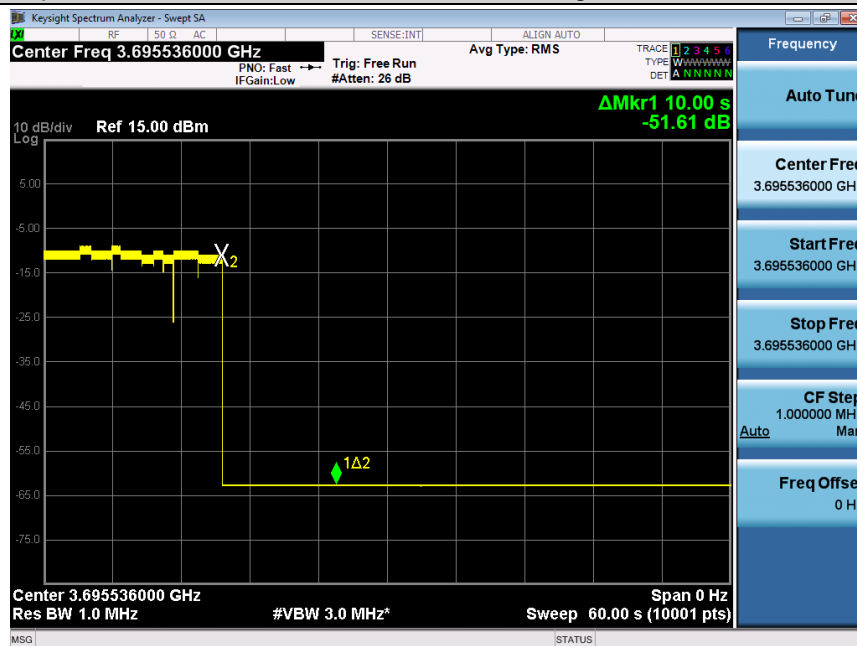
[Step 6] Setup with frequency 3680-3700MHz and power level 10dBm/MHz

[Step 8] Check EUD Tx Frequency and power



EIRP PSD=-2.982+3.4+4.5+3=7.918dBm/MHz, Antenna gain is 3.4dBi,the path loss is 4.5dB, the MIMO Factor is 3dB

[Step 10] EUD stops transmission within 10 seconds of receiving instructions from its associated CBSD.





Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240400062601

Page: 16 of 16

7 Test Setup Photographs

Refer to Appendix - Test Setup Photo for KSCR2404000626AT.

- End of the Report -