



TEST REPORT

Application No.: SZCR2104020387AT
Applicant: Fortinet Inc.
Address of Applicant: 899 Kifer Road, Sunnyvale, California, 94086 United States
Manufacturer: Fortinet, Inc.
Address of Manufacturer: 899 Kifer Road, Sunnyvale, California, 94086 United States
Equipment Under Test (EUT):
EUT Name: Secured Network Extension Device
Model No.: FEX-511F, FortiExtender 511Fxxxxxx, FORTIEXTENDER-511Fxxxxxx, FEX-511Fxxxxxx (where "x" can be "0-9", or "A-Z", or "-", or blank for marketing purposes or software changes only and no Safety or EMC related changes)
♣
Trade Mark: FORTINET
FCC ID: TVE-251M01
Standard(s) : FCC Part 96.47
FCC KDB 940660 D01 Part 96 CBRS Eqpt v03
WINNF-TS-0122-V1.0.1 CBRS CBSD Test Specification
WINNF-18-IN-00178 CBRS End User Device as UUT Test Guidelines
Date of Receipt: 2021-04-07
Date of Test: 2021-07-14 to 2021-07-19
Date of Issue: 2021-07-19

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

Keny Xu

Keny Xu
EMC Laboratory Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch, EMC Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-07-19		Original

Authorized for issue by:			
			
		<hr/>	
		Damon Su/Project Engineer	
			
		<hr/>	
		Eric Fu /Reviewer	



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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-V1.0.1 CBRS CBSD Test Specification

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



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 12V by adapter or POE adapter. Adapter Model: WA-30P12R Input: AC 100-240V 50/60Hz Output: DC 12V 2.5A
Sample Type:	End User device
Transmitter Frequency Band:	LTE Band 48
Transmitter Frequency Range:	3550~3700MHz
Hardware version:	V1.0
Software version:	V7.0
Antenna Gain:	-0.94 dBi

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	$\pm 3\%$

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
EPC	Lanner Electronics Inc.	LICA-1513A	LR202002004052
Router	TP-LINK	TL-R860+	1175379002425
Base station	Baicells	mBS1105 (FCC ID: 2AG32MBS110596N)	1102000466000000010



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4.4 Test Location

All tests were performed at:

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518057.

Tel: +86 755 2601 2053

Fax: +86 755 2671 0594

No tests were sub-contracted.



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5 Equipment List

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Laptop (With SAS Test harness)	Lenovo	Pro-13API 2019	REF. No.SEA1800	/	/
Spectrum Analyzer	Keysight	N9020A	SEM004-17	2021-05-21	2022-05-20
Shield Room	SAEMC	MSR433	SEM001-11	2021-03-13	2022-03-12
Coaxial Cable	SGS	N/A	SEM031-01	2021-07-11	2022-07-10
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2020-09-27	2021-09-26



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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: 25deg. 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-V1.0.1 CBRS CBSD Test Specification, use the certified Base station CBSD (FCC ID: 2AG32MBS110596N) as companion device to show compliance with Part 96.47 requirement for End User Device (EUD):

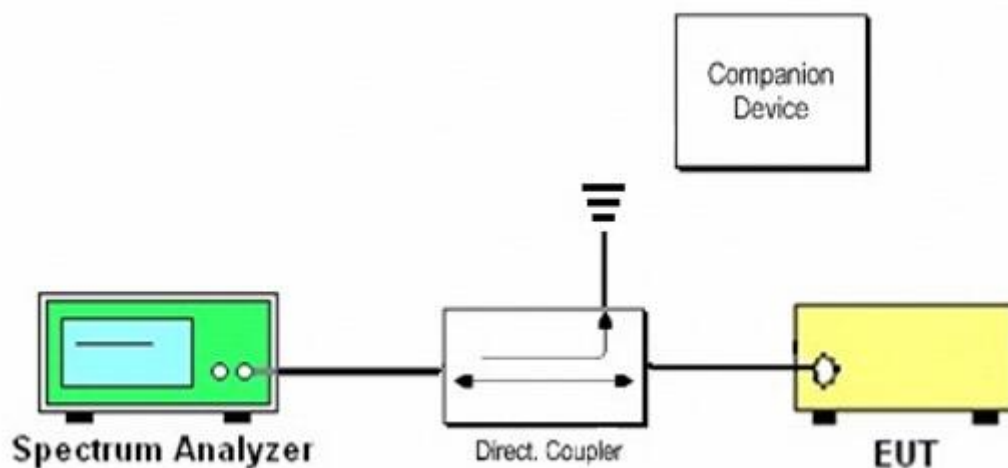
1. Setup with frequency 3590-3610MHz and power level 18dBm/MHz;
2. Enable CBSD service ;
3. Check EUD Tx Frequency and power;
4. Disable AP service ;
5. Check EUD stops transmission within 10seconds;
6. Setup with 3610-3630MHz & power level 8dBm/MHz;
7. Enable CBSD service;
8. Check EUD Tx Frequency and power;
9. Disable CBSD service;
10. Check EUD stops transmission within 10seconds.



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6.5 Test Setup



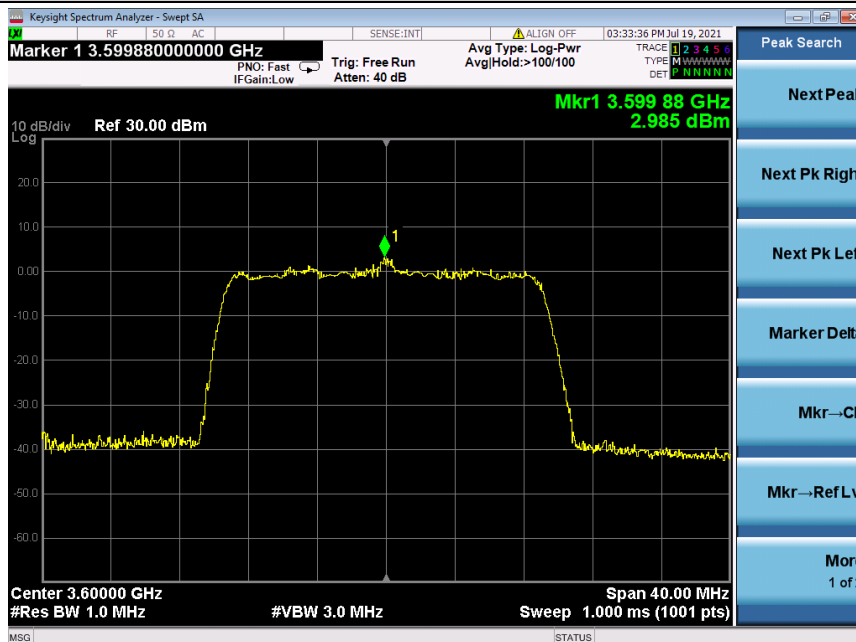
End User Device as UUT, the companion device is certified CBRS (FCC ID: 2AG32MBS110596N)



6.6 Test Result

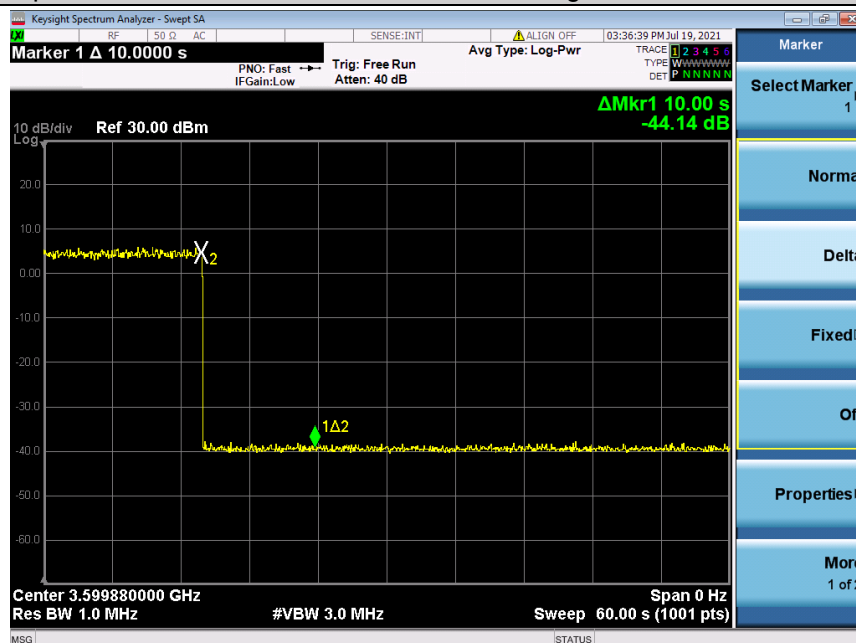
[Step 1] Setup with frequency 3590-3610MHz and power level 18dBm/MHz

[Step 3] Check EUD Tx Frequency and power



EIRP PSD=2.985+5-0.94=7.045dBm/MHz, attenuation of Cable and Splitter is 5dB, antenna gain is -0.94dBi

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



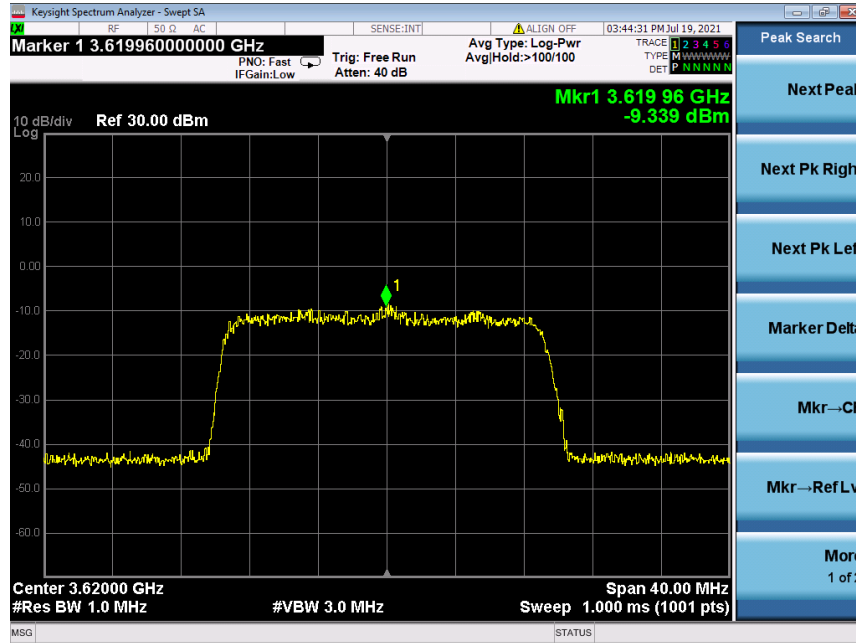
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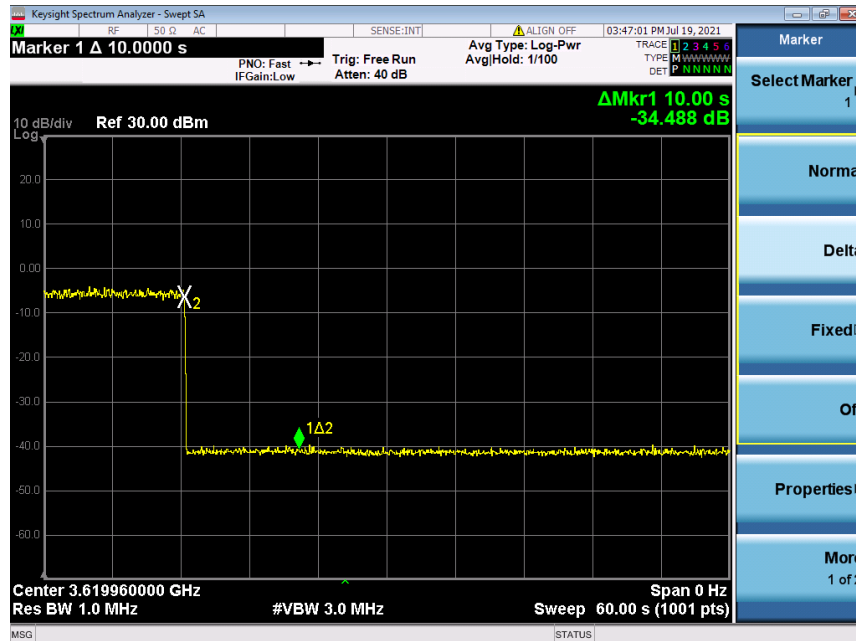
[Step 6] Setup with frequency 3610-3630MHz and power level 8dBm/MHz

[Step 8] Check EUD Tx Frequency and power



EIRP PSD=-9.339+5-0.94=-5.279dBm/MHz, attenuation of Cable and Splitter is 5dB, antenna gain is -0.94dBi

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





7 Photographs

7.1 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -



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