

CBSD-EUD Test Report

Report No.: RF181220E07-2

FCC ID: I88LTE7480-S905

Test Model: LTE7480-S905

Received Date: Dec. 20, 2018

Test Date: Apr. 19, 2019

Issued Date: Apr. 19, 2019

Applicant: Zyxel Communications Corporation

Address: No.2 Industry East RD. IX, Hsinchu Science Park, Hsinchu 30075, Taiwan

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan R.O.C.

Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan R.O.C.

**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RF181220E07-2	Original release.	Apr. 19, 2019

1 Certificate of Conformity

Product: LTE-A Pro Outdoor Router

Brand: ZYXEL

Test Model: LTE7480-S905

Sample Status: ENGINEERING SAMPLE

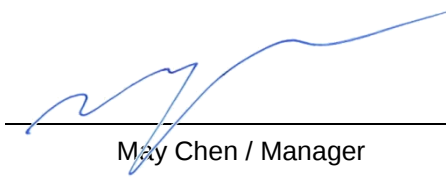
Applicant: Zyxel Communications Corporation

Test Date: Apr. 19, 2019

Standards: FCC Part 96.47

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** Apr. 19, 2019
Claire Kuan / Specialist

Approved by :  , **Date:** Apr. 19, 2019
May Chen / Manager

2 Summary of Test Results

Applied Standard : FCC Part 96.47			
FCC Clause	Test Item	Result	Remarks
96.47(a)(1)	End User Device additional requirements	Pass	Meet the requirement

Note:

Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	LTE-A Pro Outdoor Router	
Brand	ZYNEL	
Test Model	LTE7480-S905	
RF CPU Model No.	MT7621AT	
WiFi Chip Model No.	MT7603E	
LTE chip Model No.	SDX20	
FW version	LTE7480-S905 V2.00(ABQT.0)C0	
Status of EUT	ENGINEERING SAMPLE	
Power Supply Rating	DC 48V from adapter (POE)	
Modulation Type	QPSK, 16QAM, 64QAM	
Operating Frequency	Channel Bandwidth 5MHz	TX: 3552.5 ~ 3697.5 MHz RX: 3552.5 ~ 3697.5 MHz
	Channel Bandwidth 10MHz	TX: 3555 ~ 3695 MHz RX: 3555 ~ 3695 MHz
	Channel Bandwidth 15MHz	TX: 3557.5 ~ 3692.5 MHz RX: 3557.5 ~ 3692.5 MHz
	Channel Bandwidth 20MHz	TX: 3560 ~ 3690 MHz RX: 3560 ~ 3690 MHz
	5MHz, 10MHz, 15MHz & 20MHz	
	Channel Bandwidth 5MHz	22.77 dBm
	Channel Bandwidth 10MHz	22.66 dBm
	Channel Bandwidth 15MHz	22.75 dBm
Emission Designator	Channel Bandwidth 5MHz	QPSK: 4M47G7D 16QAM: 4M47D7W 64QAM: 4M47D7W
	Channel Bandwidth 10MHz	QPSK: 8M92G7D 16QAM: 8M94D7W 64QAM: 8M92D7W
	Channel Bandwidth 15MHz	QPSK: 13M5G7D 16QAM: 13M4D7W 64QAM: 13M4D7W
	Channel Bandwidth 20MHz	QPSK: 17M9G7D 16QAM: 17M8D7W 64QAM: 17M8D7W
	Antenna Type	
	Refer to note as below	
	Antenna Connector	
	Refer to note as below	
	Accessory Device	
	Adapter (POE) x 1	
	Data Cable Supplied	
	RJ45 cable (Unshielded, 1.8m)	

Note:

1. There are WLAN and WWAN technology used for the EUT. The EUT has below radios as following table:

Radio 1	Radio 2
WLAN (2.4GHz)	WWAN (LTE) / 3G

2. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)	WWAN (LTE) / 3G

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

3. The EUT must be supplied with a adapter (POE) as following table:

Brand	Model No.	Spec.
SHENZHEN	TPT24S48A-MC	Input: 100-240Vac, 0.5A, 50/60Hz AC input cable: Unshielded 1.8m Output: 48Vdc

4. The antennas provided to the EUT, please refer to the following table:

Chain No.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
WLAN-ANT0	6	2.4 ~ 2.4835GHz	PIFA	iPEX
WLAN-ANT1	5	2.4 ~ 2.4835GHz	PIFA	iPEX
WWAN_0 (TX & RX)	9.85	3550 ~ 3700 MHz	Dipole	iPEX
WWAN_1 (RX only)	9.85	3550 ~ 3700 MHz	Dipole	iPEX
WWAN_2 (RX only)	9.85	3550 ~ 3700 MHz	Dipole	iPEX
WWAN_3 (RX only)	9.85	3550 ~ 3700 MHz	Dipole	iPEX

5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

4 Measurement

4.1 End User Device additional requirements

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.

(1) 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.

4.2 Test Procedure

Following test procedure can be done by WINNF-TS-0122 CBRS CBSD Test Specification, use the certified CBSD(FCC ID: P27P208) as CBSD device to show compliance with FCC Part 96.47 requirements for End User Device(EUD):

- a. Setup WINNF.PT.C.HBT.1 with 3615 ~ 3635 MHz and MaxEIRP at 20 dBm/MHz.
- b. Enable CBSD service from EPC management.
- c. Check EUD Tx Frequency and connection successful.
- d. Change CBSD frequencies with 3595 ~ 3615 MHz.
 - (1) Check EUD must discontinue operations, change frequencies within 10 seconds of receiving instructions from its associated CBSD.
- e. Setup WINNF.PT.C.HBT.1 with 3595 ~ 3615 MHz and MaxEIRP at 10 dBm/MHz.
- f. Enable CBSD service from EPC management.
- g. Check EUD Tx Frequency and connection successful.
- h. Change its MaxEIRP at 20 dBm/MHz from its associated CBSD.
- i. Disable the CBSD service.
 - (1) Check EUD must discontinue operations, change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

4.3 Test Environment

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
End User Device additional requirements	24deg. C, 71%RH	120Vac, 60Hz	Matthew Yang

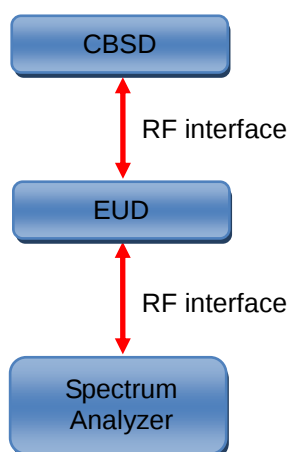
4.4 Test Equipment

Description & Manufacturer	Model no.	Serial No.	Calibrated Date	Calibrated Until
CBSD Sercomm	P208-TP (FCCID:P27P208)	1801BVV000034	NA	NA
Laptop DELL	Inspiron 15 3000	D67MYN2	NA	NA
Spectrum Analyzer Keysight	N9030B	MY57140953	Jun 1, 2018	May. 31, 2019

NOTE:

1. The test was performed in **OVEN 4 Test Room**
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: April 19, 2019

4.5 Test Setup



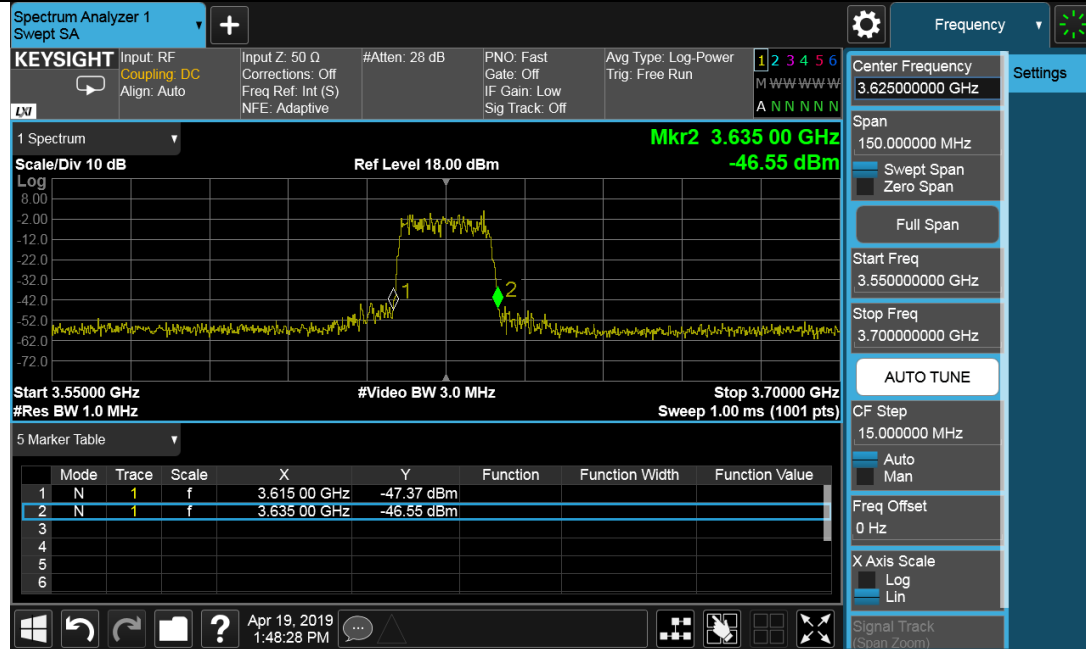
NOTE : The CBSD device is certified CBSD(FCC ID: P27P208). Where the CBSD device connection with EUD is by radiated method. The EUD device connection with Spectrum Analyzer is by conducted method.

5 Test Result

- Test case 4.2 Step (c)

Set frequency to 3615 ~ 3635 MHz and MaxEIRP to 20 dBm/MHz and enable the CBSD.

The End User Device successfully starts on assigned channel and power as shown below:



Plot 5-1 EUD frequency of operations

- Step d(1) – Change assigned signal by CBSD to 3595 ~ 3615 MHz :

The End User Device **evacuates present channel** and switches to another **frequency** within 10 seconds immediately after associated CBSD issues the channel change. As shown below:



Plot 5-2 EUD discontinues operations within 10s

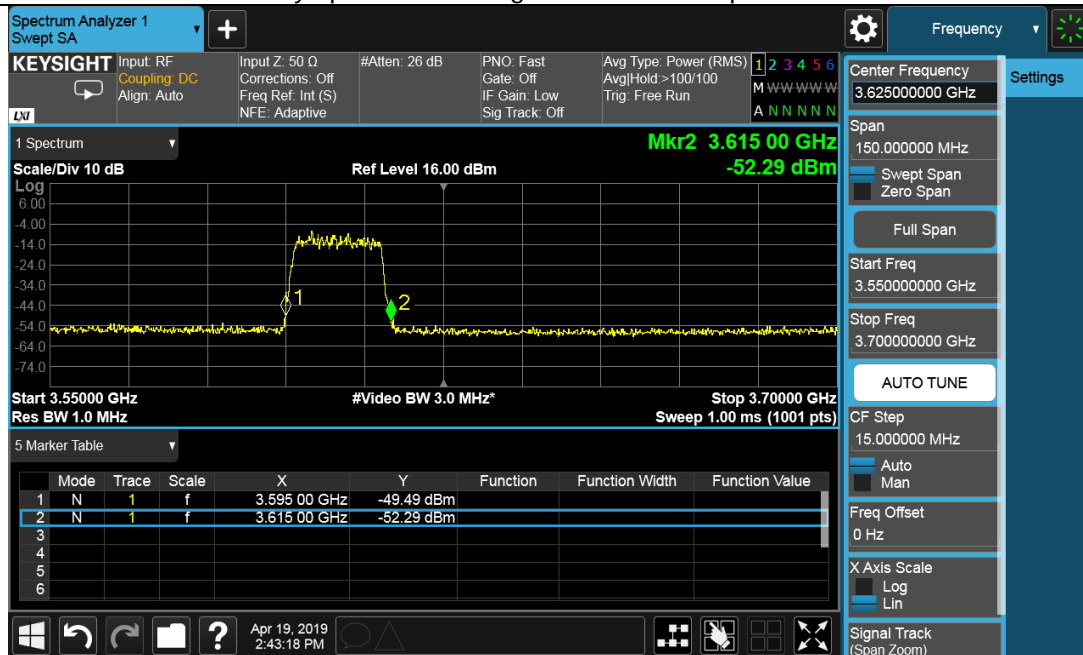
Note :

Marker 1 : CBSD sends instructions to discontinues operations.

Marker 2 : EUD discontinues operation.

Marker 3 : 10 seconds elapsed time from CBSD sending instructions to EUD.

- Step (g)
Frequency is set to 3595 ~ 3615 MHz and MaxEIRP to 10 dBm/MHz
End User Device successfully operates on assigned channel and power as shown below:



- Step i(1):
End User Device successfully stops all operation within 10 seconds after CBSD disable its service as shown below:



Note :

Marker 1 : CBSD sends instructions to discontinues operations.

Marker 2 : EUD discontinues operation.

Marker 3 : 10 seconds elapsed time from CBSD sending instructions to EUD.

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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