



RADIO EXPOSURE TEST REPORT

FCC ID : 2ABLKU10XE
Equipment : GigaSpire BLAST u10xe
Brand Name : Calix
Model Name : u10xe GS4237
Applicant : Calix Inc.
1035 N. McDowell Blvd. Petaluma, CA94954 U.S.A
Manufacturer : NEWEB VIET NAM CO., LTD.
Land Lot CN01, Dong Van III Industrial zone,
Dong Van Ward, Duy Tien Town, Ha Nam Province,
VietNam
Standard : 47 CFR Part 2.1091

The product was received on Nov. 15, 2022, and testing was started from Nov. 16, 2022 and completed on Apr. 20, 2023. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Rex Liao

Sporton International Inc. Hsinchu Laboratory

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Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sam Chen

Report Producer: Sophia Shiung



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5250 5250-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
6GHz WLAN	5925-7125	5955-7095	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)



1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz					
1	1	3	-	WNC	81XKAC15.GFB	Dipole	I-PEX	Note 1
2	2	4	-	WNC	81XKAC15.GFC	Dipole	I-PEX	
3	-	1	-	WNC	81XKAC15.GGA	Dipole	I-PEX	
4	-	2	-	WNC	81XKAC15.GGA	Dipole	I-PEX	
5	-	-	1	WNC	81XKAC15.GFD	Dipole	I-PEX	
6	-	-	2	WNC	81XKAC15.GFE	Dipole	I-PEX	
7	-	-	3	WNC	81XKAC15.GFF	Dipole	I-PEX	
8	-	-	4	WNC	81XKAC15.GFG	Dipole	I-PEX	

Note 1:

Ant.	Antenna Gain (dBi)				
	WLAN 2.4GHz	WLAN 5GHz UNII 1	WLAN 5GHz UNII 2A	WLAN 5GHz UNII 2C	WLAN 5GHz UNII 3
1	2.88	0.9	1.02	3.27	1.99
2	3.07	0.72	0.74	2.25	1.46
3	-	1.13	2	2.99	3.26
4	-	0.82	1.2	1.82	2.95

Ant.	Antenna Gain (dBi)			
	WLAN 6GHz UNII 5	WLAN 6GHz UNII 6	WLAN 6GHz UNII 7	WLAN 6GHz UNII 8
5	3.00	3.70	3.11	3.23
6	3.68	3.56	3.60	3.60
7	4.75	4.70	4.90	4.93
8	4.84	4.55	4.21	3.93

Item	Directional gain (dBi)				
	WLAN 2.4GHz	WLAN 5GHz			
	2.45GHz	5.2GHz	5.3GHz	5.6GHz	5.785GHz
2T1S	4.76	-	-	-	-
2T2S	3.07	-	-	-	-
4T1S	-	3.32	4.34	6.76	7.06
4T2S	-	1.13	2	3.76	4.06
4T4S	-	1.13	2	3.27	3.26

Note 2: The above information (except antenna 1~4 gain and directional gain) was declared by manufacturer.

Note 3: For 2.4GHz / 5GHz, the antenna gain and directional gain are measured which follow the procedure of KDB 662911 D03.



Note 4: For 2.4GHz function:

For IEEE 802.11 b/g/n/VHT/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac/ax (4TX/4RX):

Port 1~4 can be used as transmitting/receiving antenna.

Port 1~4 could transmit/receive simultaneously.

For 6GHz function:

For IEEE 802.11ax (4TX/4RX):

Port 1~4 can be used as transmitting/receiving antenna.

Port 1~4 could transmit/receive simultaneously.



1.3 Accessories

Accessories			
Equipment Name	Brand Holder	Model Name	Rating
Adapter	Chenzhou Frecom	F65L1-120450SPAU	Input: 100-240V~50/60Hz, 1.8A Output: 12.0V, 4.5A, 54.0W

1.4 Table for EUT supports functions

Function
AP
Repeater

Note: The above information was declared by manufacturer.

1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2.1091
- ♦ KDB 447498 D04 Interim General RF Exposure Guidance v01

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ 47 CFR Part 1.1307
- ♦ 47 CFR Part 1.1310

1.6 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.
	Conformity Assessment Body Identifier (CABID) TW3787 with ISED.



2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	*(100)	<6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1500	-	-	f/300	<6
1500-100,000	-	-	5	<6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1500	-	-	f/1500	<30
1500-100,000	-	-	1.0	<30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 46 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 MPE Exemption

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= Pth.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance

R between the person and the antenna / radiating structure, where $R > \lambda / 2 \pi$.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R ² .
1.34-30	3,450 R ² /f ² .
30-300	3.83 R ² .
300-1,500	0.0128 R ² f.
1,500-100,000	19.2R ² .
Note: R is in meters, f is in MHz.	



2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm2)	S Limit (mW/cm2)	Option	TL EIRP (dBm)
2.4G;G1D	3.07	29.92	32.99	0.50	33.49	46	0.08400	1.00000	C	38.237
5.2G;D1D	3.32	29.98	33.30	0.50	33.80	46	0.09021	1.00000	C	38.237
5.3G;D1D	4.34	23.94	28.28	0.50	28.78	46	0.02840	1.00000	C	38.237
5.6G;D1D	6.76	23.04	29.80	0.19	29.99	46	0.03752	1.00000	C	38.237
5.8G;D1D	7.06	28.91	35.97	0.02	35.99	46	0.14937	1.00000	C	38.237
6.2G;D1D	4.84	-	23.29	0.50	23.79	46	0.00900	1.00000	C	38.237
6.4G;D1D	10.16	-	21.64	0.50	22.14	46	0.00616	1.00000	C	38.237
6.7G;D1D	10.00	-	23.20	0.50	23.70	46	0.00882	1.00000	C	38.237
7.0G;D1D	9.97	-	21.93	0.50	22.43	46	0.00658	1.00000	C	38.237

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm2)	Limit (mW/cm2)	Option	TL EIRP (dBm)	TL Ratio
6.2G;D1D	4.84	-	23.29	0.50	23.79	46	0.00900	1.00000	C	38.237	0.0359
2.4G;G1D	3.07	29.92	32.99	0.50	33.49	46	0.08400	1.00000	C	38.237	0.3352
5.8G;D1D	7.06	28.91	35.97	0.02	35.99	46	0.14937	1.00000	C	38.237	0.5961
Sum TL Ratio_C	0.9672										
Ratio Limit	1										

Note: The above antenna gain was declared by manufacturer.

—————THE END—————