

EN IEC 62311:2020

TEST REPORT

For

WiFi+Bluetooth 5.2 System on Module

Model:

PIXI-IW416

Trade Name: TechNexion

Issued to

TechNexion Ltd.

**16F-5, No. 736, Zhongzheng Road, ZhongHe District, 23511, New Taipei City,
Taiwan**

Issued by

Compliance Certification Services Inc.

Wugu Laboratory

**No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City, Taiwan**

Issued Date: July 31, 2023

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	July 31, 2023	Initial Issue	ALL	Allison Chen

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Report No.: TMWK2305001495KS

1 Test Result Certification

Applicant: TechNexion Ltd.
16F-5, No. 736, Zhongzheng Road, ZhongHe District,
23511, New Taipei City, Taiwan

Equipment Under Test: WiFi+Bluetooth 5.2 System on Module

Trade Name: TechNexion

Model: PIXI-IW416

Model Discrepancy N/A

Received date: May 16, 2023

Applicable Standards
EN IEC 62311:2020
Result
PASS
Statements of Conformity
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in EN IEC 62311. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

This test report can be used for CE and UKCA marking application which is based on equivalent requirements between UK and EU. It is appropriate using designated standards to provide presumption of conformity with GB law.

Approved by:



Sky Zhou
Asst. Section Manager

Report No.: TMWK2305001495KS

2 EUT Description

Frequency Range	Bluetooth: 2402 ~ 2480 (MHz) WiFi 2.4GHz: 2412 ~ 2472 (MHz) WiFi 5GHz (Band 1) 5180 ~ 5240 (MHz)
Max Tune-up Power in Watt (TP)	BT: 6.00 dBm (0.004 W) BLE 6.00 dBm (0.004 W) 2.4GHz IEEE 802.11b 15.00 dBm (0.032 W) IEEE 802.11g 16.00 dBm (0.040 W) IEEE 802.11n HT 20 14.00 dBm (0.025 W) IEEE 802.11n HT 40 15.00 dBm (0.032 W) 5GHz Band 1 IEEE 802.11a 15.00 dBm (0.032 W) IEEE 802.11n HT 20 15.00 dBm (0.032 W) IEEE 802.11n HT 40 15.00 dBm (0.032 W)
Antenna gain (G)	1. Type: PIFA Antenna Brand / Model: TechNexion / VM2450-25523-OOX-180 BT& WIFI 2.4GHz: Gain: 2.5 dBi WIFI 5GHz (Band 1): Gain: 3 dBi 2. Type: Dipole Antenna Brand / Model: TechNexion / VM2450-ASSY1005 BT& WIFI 2.4GHz: Gain: 4 dBi (*worst) WIFI 5GHz (Band 1): Gain: 6 dBi (*worst) Bluetooth 4.00 dBi (Numeric gain: 2.51) worst WiFi 2.4GHz 4.00 dBi (Numeric gain: 2.51) worst WiFi 5GHz (Band 1) 6.00 dBi (Numeric gain: 3.98) worst

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
3. The WIFI Max tune up power referred the test report TMWK2305001493KR and TMWK2305001494KR for RF Exposure assessment purpose.

3 Facilities and Accreditations

3.1. Facilities

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist, New Taipei City, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2299-9721

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4 EN IEC 62311 Requirement

4.1. Limit

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the following limits.

Basic Restrictions Reference levels

Council Recommendation 99/519/EC

Basic restrictions for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

**Reference levels for electric, magnetic and electromagnetic fields
(0 Hz to 300 GHz, unperturbed rms values)**

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density S_{eq} (W/m ²)
0-1 Hz	—	$3,2 \times 10^4$	4×10^4	—
1-8 Hz	10 000	$3,2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8-25 Hz	10 000	$4\,000/f$	$5\,000/f$	—
0,025-0,8 kHz	$250/f$	$4/f$	$5/f$	—
0,8-3 kHz	$250/f$	5	6,25	—
3-150 kHz	87	5	6,25	—
0,15-1 MHz	87	$0,73/f$	$0,92/f$	—
1-10 MHz	$87/f^{1/2}$	$0,73/f$	$0,92/f$	—
10-400 MHz	28	0,073	0,092	2
400-2 000 MHz	$1,375 f^{1/2}$	$0,0037 f^{1/2}$	$0,0046 f^{1/2}$	$f/200$
2-300 GHz	61	0,16	0,20	10

Frequency range	Magnetic flux density (mT)	Current density (Ma/m ²) (rms)	Whole body average SAR (W/kg)	Localised SAR (head and trunk) (W/kg)	Localised SAR (limbs) (W/kg)	Power density, S (W/m ²)
0Hz	40	-	-	-	-	-
>0-1Hz	-	8	-	-	-	-
1-4Hz	-	8/f	-	-	-	-
4-1000Hz	-	2	-	-	-	-
1000Hz-100kHz	-	f/500	-	-	-	-
100kHz-10MHz	-	f/500	0.08	2	4	-
10MHz-10GHz	-	-	0.08	2	4	-
10-300GHz	-	-	-	-	-	10

For Frequency Range 10 MHz to 10 GHz

The basic restriction at frequencies between 10 MHz and 100 GHz is on localized SAR in the head. Any device with output power below 20 mW cannot produce an exposure exceeding this restriction under the most pessimistic exposure conditions.

The basic restriction is 2 W/kg so any unit which supplies less than 20 mW ($=2/100\text{W}$) from its antenna port, averaged over 6 minutes, will meet the basic restriction.

For Frequency Range 10 GHz to 300 GHz

The most conservative assumption is that all the transmitted power is absorbed within the specified area, therefore any device which supplies less than 20 mW will meet the basic restriction. The average time is equal to $68/f^{1.05}$ minutes (where f is in GHz)

In the frequency range 10 GHz to 300 GHz, the basic restriction is 10 Wm^{-2} averaged over any 20 cm^2 of exposed area with a spatial maximum of 200 Wm^{-2} averaged over 1 cm^2

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4.2. Human Exposure Assessment

Exposure evaluation	
<p>Given</p> $E = \frac{\sqrt{30 \times G \times TP}}{D}$ $D = \frac{\sqrt{30 \times G \times TP}}{E}$	<p>Where:</p> <ul style="list-style-type: none"> ● E: E field Strength ● G: numerical gain of transmitting antenna ● TP: Transmitted power in watt ● D: distance from the transmitting antenna in meter

Bluetooth:

Mode	Max Tune-up power(dBm)	TP (W)	G(dBi)	G(num.)	D(m)	Electric Field(V/m)	Limit of Electric Field (V/m)	Result
BT	6.00	0.004	4.00	2.51	0.2	2.744	61	Pass
BLE	6.00	0.004	4.00	2.51	0.2	2.744	61	Pass

WiFi 2.4GHz:

Mode	Max Tune-up power(dBm)	P (W)	G(dBi)	G(num.)	D(m)	Electric Field(V/m)	Limit of Electric Field (V/m)	Result
IEEE 802.11b	15.00	0.032	4.00	2.51	0.2	7.761	61	Pass
IEEE 802.11g	16.00	0.040	4.00	2.51	0.2	8.678	61	Pass
IEEE 802.11n HT 20	14.00	0.025	4.00	2.51	0.2	6.860	61	Pass
IEEE 802.11n HT 40	15.00	0.032	4.00	2.51	0.2	7.761	61	Pass

WIFI 5GHz (B1):

Mode	Max Tune-up power(dBm)	P (W)	G(dBi)	G(num.)	D(m)	Electric Field(V/m)	Limit of Electric Field (V/m)	Result
IEEE 802.11a	15.00	0.032	6.00	3.98	0.2	9.773	61	Pass
IEEE 802.11n HT 20	15.00	0.032	6.00	3.98	0.2	9.773	61	Pass
IEEE 802.11n HT 40	15.00	0.032	6.00	3.98	0.2	9.773	61	Pass

Conclusion:

→ E= 9.773 V/m (max) is the E-Field strength when safety distance between the EUT and human body is 0.2m, which is below 61V/m as required in Annex II table 2 of EC Council Recommendation (99/519/EC).

5 Simultaneous Transmission SAR Analysis

5.1. WiFi 2.4GHz + Bluetooth

Therefore, the worst-case situation is $8.678 / 61 + 2.744 / 61 = 0.187$, which is less than "1".

5.2. WiFi 5GHz + Bluetooth

Therefore, the worst-case situation is $9.773 / 61 + 2.744 / 61 = 0.205$, which is less than "1".

- End of Test Report -