

**FCC RF Exposure Exemption report
for**

Smart Home Energy Monitor Gen3

Model No.: EMV3A

FCC ID: 2AS6P-EMV3A

of

Applicant: Emporia Corp

Address: 7901 Shaffer Pkwy. Littleton, CO 80127 United States

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: TW1477, TW1072

Industry Canada filed test laboratory Reg. No.: 20037, 5107A



Report No.: W6M22301-22427-EE

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
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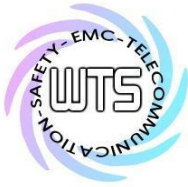


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Worldwide Testing Services(Taiwan) Co., Ltd.

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1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.

The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

Laboratory disclaimer-

1. The test results of this test report relate exclusively to the item tested as specified in 1.5.
2. The test report may only be reproduced or published in full.
3. Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.
4. Antenna gain is provided by applicant and laboratory issue relevant data and results.

Tester:

May 25, 2023

Sora Kuo

Date

WTS-Lab.

Name

Signature

Technical responsibility for area of testing:

May 25, 2023

Kevin Wang

Date

WTS

Name

Signature



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1.2 Testing laboratory

1.2.1 Location

10m OATS

No.5-1, Lishui, Shuang Sing Village, Wanli Dist.,
New Taipei City 207, Taiwan (R.O.C.)

3 meter semi-anechoic chamber

No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist.,
Taipei City 114, Taiwan (R.O.C.)

Tel: 886-2-6613-0228

Worldwide Testing Services (Taiwan) Co., Ltd.

6F., No. 58, Ln. 188, Ruiguang Rd., Neihu Dist.,
Taipei City 114, Taiwan (R.O.C.)

Tel: 886-2-6606-8877

1.2.2 Details of accreditation status

Accredited testing laboratory

FCC filed test laboratory Reg. No.: TW1477, TW1072

Industry Canada filed test laboratory Reg. No.: 20037, 5107A

Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :

Name: ./.

Accredited no.: ./.

Street: ./.

Town: ./.

Country: ./.

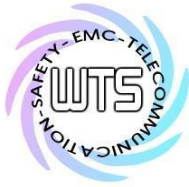
1.3 Application details

Approval holder

Name: Emporia Corp
Street: 7901 Shaffer Pkwy. Littleton,
Town: CO 80127
Country: United States

Manufacturer: (if applicable)

Name: VVDN Technology Pvt. Ltd.
Street: Plot No: CP-07, Sector-8, IMT Manesar,
Town: Gurugram, Haryana-122050
Country: India



Registration number: W6M22301-22427-EE

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Date of receipt of test item: January 16, 2023

Date of test: from January 17, 2023 to May 11, 2023

1.4 General information of Test item

Type of test item: Smart Home Energy Monitor Gen3

Model no.: EMV3A

Multi-listing model no.: ./.

Brand name: Emporia

Power supply: 100-240Va.c.

Type of antenna: Whip antenna

Antenna gain: 2.2 dBi

Technical data:

WLAN

Band	Mode	Channel	Conducted Power (dBm)
2.4GHz	802.11b	Ch 1 : 2412 MHz	17.69
		Ch 6 : 2437 MHz	17.87
		Ch 11 : 2462 MHz	17.97
	802.11g	Ch 1 : 2412 MHz	14.37
		Ch 6 : 2437 MHz	14.50
		Ch 11 : 2462 MHz	14.17
	802.11n 20M	Ch 1 : 2412 MHz	12.32
		Ch 6 : 2437 MHz	12.47
		Ch 11 : 2462 MHz	12.14
	802.11n 40M	Ch 1 : 2422 MHz	11.58
		Ch 4 : 2437 MHz	11.43
		Ch 7 : 2452 MHz	11.75



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Bluetooth

Normal & EDR

Band	Mode	Channel	Conducted Power (dBm)
2.4GHz	BR	Ch 0 : 2402 MHz	8.92
		Ch 39 : 2441 MHz	9.51
		Ch 78 : 2480 MHz	9.84
	EDR	Ch 0 : 2402 MHz	11.01
		Ch 39 : 2441 MHz	11.66
		Ch 78 : 2480 MHz	12.19

Low Energy

Band	Mode	Channel	Conducted Power (dBm)
2.4GHz	BLE	Ch 0 : 2402 MHz	7.48
		Ch 19 : 2440 MHz	8.38
		Ch 39 : 2480 MHz	8.90

Operation modes:

Duplex

Modulation type:

DSSS/OFDM、GFSK、 $\pi/4$ DQPSK、8DPSK

Sample no.:

#05

Special statement:

./.

Classification:

Fixed Device	☒
Mobile Device (Human Body distance > 20cm)	☐
Portable Device (Human Body distance < 20cm)	☐



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1.5 Duty cycle and factor

The duty factor is computed as $[10 \log (1 / D)]$, where D is the duty cycle.

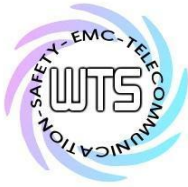
WLAN

Mode	T _{on} (ms)	T _{on} +T _{off} (ms)	Duty cycle (%)	Duty Factor (dB)	1/T - VBW (kHz)
802.11b	100	100	100.00%	0.00	0.01
802.11g	100	100	100.00%	0.00	0.01
802.11n 20M	100	100	100.00%	0.00	0.01
802.11n 40M	100	100	100.00%	0.00	0.01

Bluetooth

Low Energy

Mode	T _{on} (ms)	T _{on} +T _{off} (ms)	Duty cycle (%)	1/T - VBW (kHz)
BLE	2.131	2.5	85.24%	0.47

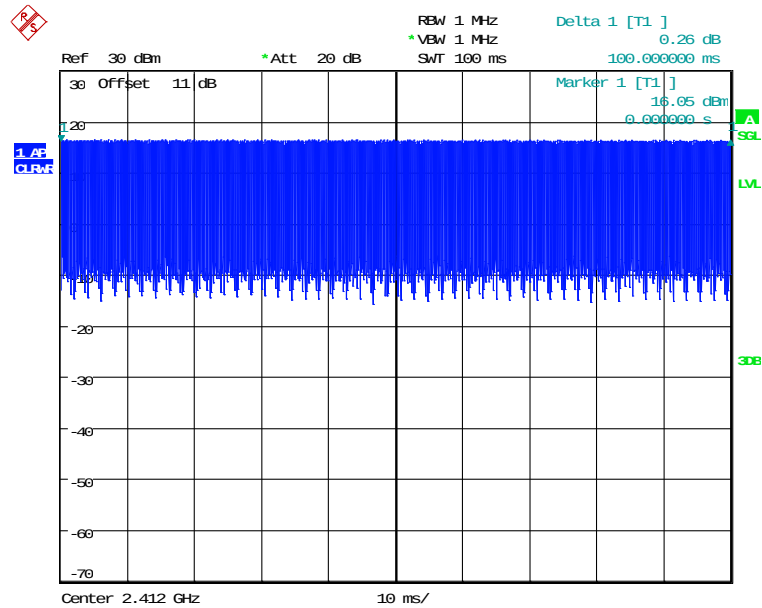


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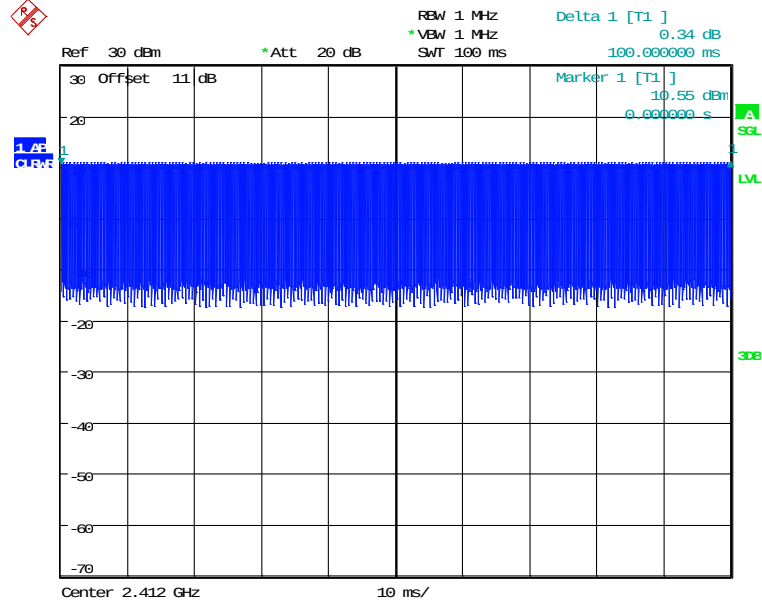
Duty cycle plot

WLAN



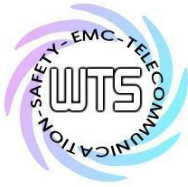
DUTY 802.11B

Date: 9.FEB.2023 11:39:39



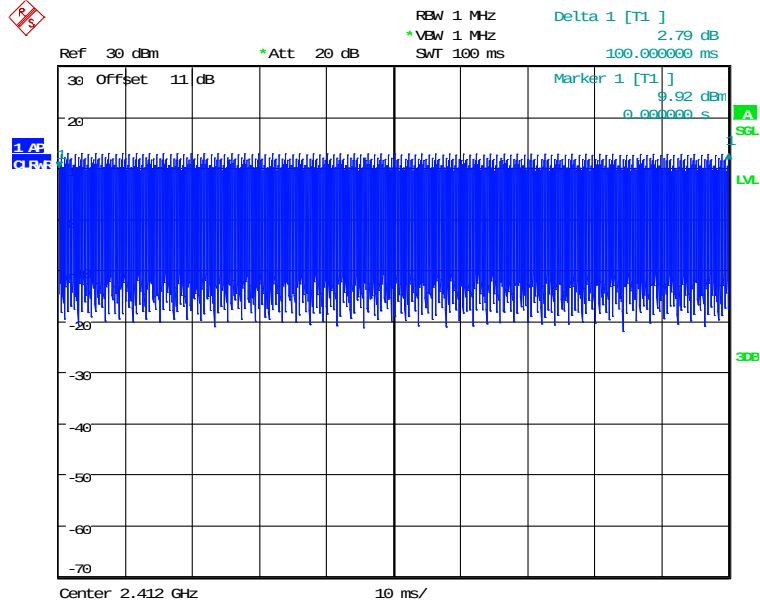
DUTY 802.11G

Date: 9.FEB.2023 11:40:56

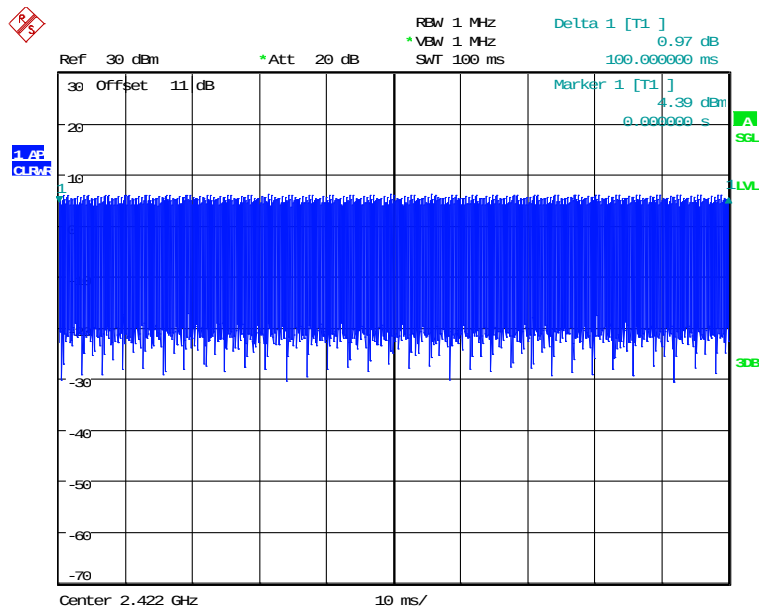


Worldwide Testing Services(Taiwan) Co., Ltd.

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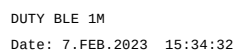
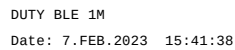
DUTY 802.11N 20MHZ
Date: 9.FEB.2023 11:42:29



DUTY 802.11N 40MHZ
Date: 9.FEB.2023 11:43:56



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47 CFR PART 15 SUBPART C § 15.247 (2021-10)



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2 Test configuration

2.1 Test environment

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Extreme conditions parameters: ./.

2.2 Measurement uncertainty

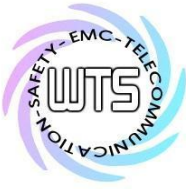
Test item Name	Uncertainty
Estimation Result of Uncertainty of Conducted Output Power Measurement (Peak Output Power (transmitter))	Expanded Uncertainty : 1.48 dB

The decision rule is: Measurement uncertainty is not included in the calculation of test results.

2.3 Test Equipment List

RF Conducted

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2022/8/3	2023/8/2
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2023/3/22	2024/3/21
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2023/2/17	2024/2/16
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	T-0A023536	T-Power	Function test	
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2023/2/17	2024/2/16
ETSTW-RE 153	Signal Analyzer	FSV40	101929	R&S	2022/10/3	2023/10/2
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2022/9/2	2023/9/1
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2023/4/27	2024/4/26
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 (S_Cable 9)	279067	HUBER+SUHNER	2023/02/17	2024/2/16
ETSTW-Cable 045	Microwave Cable	SUCOFLEX 104	325536	HUBER+SUHNER	2022/10/21	2023/10/20
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2023/5/18	2024/5/17
WTSTW-SW 008	Signal studio	Agilent	None	AUDIX	Version 2.0.0.1	



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3 Equivalent Isotropic Radiated Power (EIRP)

FCC Rule: 15.247

EIRP = max. conducted output power + antenna gain

WLAN

EIRP = 17.97 dBm+ (2.2 dBi [antenna gain claimed by manufacturer]) = 20.17 dBm = 103.992mW

Bluetooth

EDR

EIRP = 12.19 dBm+ (2.2 dBi [antenna gain claimed by manufacturer]) = 14.39 dBm = 24.4789 mW

Low Energy

EIRP = 8.90 dBm+ (2.2 dBi [antenna gain claimed by manufacturer]) = 11.1 dBm = 12.8825 mW

3.1 Exemption Limits for Routine Evaluation

according to 47 CFR FCC Part 2 Subpart J, section 2.1091

FCC OET Bulletin 65 Edition 97.01 determines the equations for predicting RF fields and applicable limits.

The prediction for power density in the far-field but will over-predict power density in the near field, where it could be used for walking a “worst case” or conservative prediction.

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 limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20 cm normally can be maintained between the user and the device.



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MPE Calculation Method

(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

f = frequency in MHz

*Plane-wave equivalent power density

E = Electric field (V/m) P = output power (W) G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)

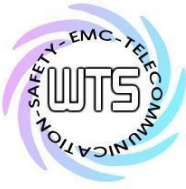
The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2} \text{ mW/cm}^2.$$

Established separation distance is 20 cm.

Operating frequency band: 2412-2462 MHz, 2422-2452 MHz for WLAN,
2402-2480 MHz for Bluetooth

The product meets RF exposure requirement.



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WLAN

The power density of 0.0207 mW/cm² at 2462 MHz is below the power density limit of 1 mW/cm².

Bluetooth

EDR

The power density of 0.0055 mW/cm² at 2480 MHz is below the power density limit of 1 mW/cm².

Low Energy

The power density of 0.0026 mW/cm² at 2480 MHz is below the power density limit of 1 mW/cm².