

Report No.:STS2410091W02

Issued for

Hiconics Eco-energy Drive Technology Co., Ltd

No.3 Boxing 2nd Road, Economic and Technological Development Zone 100176, Beijing P.R. China

Product Name: Internet Dongle

Brand Name: N/A

Model Name: MH-W01-U3-G

Series Model(s): N/A

FCC ID: 2BG23MDC-HKA94E6

Test Standards: FCC Part15.247

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.



Report No.: STS2410091W02

TEST REPORT

Applicant's Name:	Hiconics Eco-energy Drive Technology Co., Ltd
Address:	No.3 Boxing 2nd Road, Economic and Technological Development Zone 100176, Beijing P.R. China
Manufacturer's Name:	Hiconics Eco-energy Drive Technology Co., Ltd
Address:	No.3 Boxing 2nd Road, Economic and Technological Development Zone 100176, Beijing P.R. China

Product Description

Product Name:	Internet Dongle
Brand Name:	N/A
Model Name:	MH-W01-U3-G
Series Model(s):	N/A
Test Standards	FCC Part 15.247
Test Procedure	ANSI C63.10-2020

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

Date of Test	
Date of receipt of test item:	28 May 2024
Date (s) of performance of tests:	28 May 2024 ~ 14 Jan. 2025
Date of Issue:	14 Jan. 2025
Test Result:	Pass

(Bovey Yang)



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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	27 June 2024	STS2405119W02	ALL	Initial Issue
00	14 Jan. 2025	STS2410091W02	ALL	Update radiated emission and model.

101, Building B, Zhuoke Science Park, No. 190 Chongqing Road, Zhancheng Shequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guangdong, China Tel: +86-755 3688 6288 Fax: +86-755 3688 6277 Http://www.stsapp.com E-mail:sts@stsapp.com



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards: KDB 558074 D01 15.247 Meas Guidance v05r02.

FCC Part 15.247,Subpart C				
Standard Section	Test Item	Judgment	Remark	
15.209	Radiated Spurious Emission	PASS		
15.203	Antenna Requirement	PASS		

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2020.



1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

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FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y \pm U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Unwanted Emissions, conducted	±2.874dB
2	All emissions, radiated 9K-30MHz	±3.80dB
3	All emissions, radiated 30M-1GHz	±4.18dB
4	All emissions, radiated 1G-6GHz	±4.90dB
5	All emissions, radiated>6G	±5.24dB



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Internet Dongle			
Brand Name	N/A	1	1	
Model Name	MH-W01-U3-G			
Series Model(s)	N/A	N/A		
Model Difference	N/A			
Product Description	The EUT is a Intern Operation Frequency: Modulation Type: Bit Rate of Transmitter: Number of Channel: Antenna Type: Antenna Gain (dBi	Inet Dongle 802.11b/g/n 20: 2412~2462 M 802.11b(DSSS):CCK,DQPSK 802.11g(OFDM):BPSK,QPSK 802.11n(OFDM):BPSK,QPSK 802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/ 802.11g:54/48/36/24/18/12/9/ 802.11n(20MHz): 65/58.5/52/39/26/19.5/13/6.5M 802.11b/g/n20: 11CH Out-board PCB Antenna): 3.34 dBi	IHz ,DBPSK ,16-QAM,64-QAM ,16-QAM,64-QAM 6Mbps //bps	
Channel List	Please refer to the Note 3.			
Rating	Input: DC 5V			
Hardware version number	N/A			
Software version number	N/A			
Connecting I/O Port(s)	Please refer to the	Please refer to the Note 1.		
	-			

Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
- 2. The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of problems such as the accuracy of the test results will be borne by the customer.



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802.11b/g/n(20MHz)			
Channel	Frequency		
01	2412		
02	2417		
03	2422		
04	2427		
05	2432		
06	2437		
07	2442		
08	2447		
09	2452		
10	2457		
11	2462		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, themiddle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below: Carrier Frequency Channel

2.4GHz Test Frequency:

For 802.11b/g/n (HT20)			
Channel Freq.(MHz)			
01	2412		
06	2437		
11	2462		



2.2 DESCRIPTION OF THE TEST MODES

Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11b CH1	1 Mbps
Mode 2	TX IEEE 802.11b CH6	1 Mbps
Mode 3	TX IEEE 802.11 b CH11	1 Mbps
Mode 4	TX IEEE 802.11g CH1	6 Mbps
Mode 5	TX IEEE 802.11g CH6	6 Mbps
Mode 6	TX IEEE 802.11g CH11	6 Mbps
Mode 7	TX IEEE 802.11n HT20 CH1	MCS 0
Mode 8	TX IEEE 802.11n HT20 CH6	MCS 0
Mode 9	TX IEEE 802.11n HT20 CH11	MCS 0

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

(2) We have be tested for all avaiable U.S. voltage and frequencies(For DC 5V) for which the device is capable of operation, and the worst case of DC 5V is shown in the report.

2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Туре	Mode Or Modulation type	ANT Gain(dBi)	Power Class	Software For Testing
		802.11b		-2	
WIFI(2.4G)	2.4G WIFI	802.11g	3.34	-2	DOGO_VP2.4.7
		802.11n(HT20)		-2	



2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories								
Item	Equipment Mfr/Brand		Model/Type No. Length		Note			
	N/A	N/A	N/A	N/A	N/A			
1					~~~			
		1						

Support units

Item	Equipment Mfr/Brand		Model/Type No.	Length	Note	
	Personal computer	DELL	Inspiron 14-3467	N/A	N/A	
	USB Cable	N/A	N/A	150cm	NO	
	DC Power	HONGSHENGFENG	DPS-305AF	N/A	N/A	

Note:

- (1) For detachable type I/O cable should be specified the length in cm in $\[$ ^{Γ}Length $\]$ column.
- (2) "YES" is means "with core"; "NO" is means "without core".



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

RF Radiation Test Equipment							
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until		
Temperature & Humidity	SW-108	SuWei	N/A	2024.03.15	2025.03.14		
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2024.02.23	2025.02.22		
Pre-Amplifier(1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2024.09.23	2025.09.22		
Pre-Amplifier(18G-40GHz)	SKET	LNPA_1840-50	SK2018101801	2024.02.23	2025.02.22		
Active loop Antenna	ZHINAN	ZN30900C	16035	2023.02.28	2025.02.27		
Bilog Antenna	TESEQ	CBL6111D	34678	2024.09.30	2025.09.29		
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2023.09.24	2025.09.23		
Horn Antenna	A-INFOMW	LB-180400-KF	J211020657	2023.10.10	2025.10.09		
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A		
Signal Analyzer	R&S	FSV 40-N	101823	2024.09.23	2025.09.22		
Switch Control Box	N/A	N/A	N/A	N/A	N/A		
Filter Box	BALUN Technology	SU319E	BL-SZ1530051	N/A	N/A		
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A		
Turn Table	MF	SC100_1	60531	N/A	N/A		
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A		
DC power supply	HONGSHENGFENG	DPS-305AF	17064939	2024.09.23	2025.09.22		
Test SW	EZ-EMC	Ver.STSLAB-03A1 RE					



3. RADIATED EMISSION MEASUREMENT

3.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2020 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies	Field Strength	Measurement Distance	
(MHz)	(micorvolts/meter)	(meters)	
0.009~0.490	2400/F(KHz)	300	
0.490~1.705	24000/F(KHz)	30	
1.705~30.0	30	30	
30~88	100	3	
88~216	150	3	
216~960	200	3	
Above 960	500	3	

LIMITS OF RADIATED EMISSION MEASUREMENT (1000MHz-25GHz)

	(dBuV/m) (at 3M)		
FREQUENCE (MHZ)	PEAK	AVERAGE	
Above 1000	74	54	

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			



For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP/AV
Start Frequency	9 KHz/150KHz(Peak/QP/AV)
Stop Frequency	150KHz/30MHz(Peak/QP/AV)
	200Hz (From 9kHz to 0.15MHz)/
RB / VB (emission in restricted	9KHz (From 0.15MHz to 30MHz);
band)	200Hz (From 9kHz to 0.15MHz)/
	9KHz (From 0.15MHz to 30MHz)

Spectrum Parameter	Setting
	Cotting
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz(Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted	
band)	

	Spectrum Parameter	Setting
	Attenuation	Auto
	Detector	Peak/AV
	Start Frequency	1000 MHz(Peak/AV)
Γ	Stop Frequency	10th carrier hamonic(Peak/AV)
Γ	RB / VB (emission in restricted	1 MHz / 3 MHz(Peak)
	band)	1 MHz/1/T MHz(AVG)
Fo	r Restricted band	

Spectrum Parameter	Setting	
Detector	Peak/AV	
Ctort/Ston Fraguency	Lower Band Edge: 2310 to 2430 MHz	
Start/Stop Frequency	Upper Band Edge: 2445 to 2500 MHz	
	1 MHz / 3 MHz(Peak)	
RB / VB	1 MHz/1/T MHz(AVG)	



Receiver Parameter	Setting
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2 TEST PROCEDURE

- a. The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- c. The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
- e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos. Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.



3.3 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz







3.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AGWhere FS = Field Strength CL = Cable Attenuation Factor (Cable Loss) RA = Reading Amplitude AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBµV/m)	(dBµV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG



3.6 TEST RESULT

9KHz-30MHz

Temperature:	23.4 ℃	Relative Humidtity:	60%
Test Voltage:	DC 5V	Polarization:	-
Test Mode:	TX Mode		

Freq.	Reading	Limit	Margin	State	Test	
(MHz)	(MHz) (dBuV/m) (dBu'		(dB)	P/F	Result	
					PASS	
					PASS	

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB); Limit line = specific limits(dBuv) + distance extrapolation factor.



(30MHz - 1000MHz)

Temperature:	23.4℃	Relative Humidtity:	60%		
Test Voltage:	DC 5V	Phase:	Horizontal		
Test Mode:	Mode 1/2/3/4/5/6/7/8/9 (Mode 4 worst mode)				

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/ m)	(dBuV/m)	(dBuV/m)	(dB)	
1	38.7300	48.90	-17.36	31.54	40.00	-8.46	peak
2	77.5300	57.00	-23.49	33.51	40.00	-6.49	peak
3	198.7800	58.07	-21.12	36.95	43.50	-6.55	peak
4	377.2600	51.42	-12.33	39.09	46.00	-6.91	peak
5	531.4900	44.92	-7.37	37.55	46.00	-8.45	peak
6	762.3500	41.97	-2.21	39.76	46.00	-6.24	peak

Remark:

- Margin = Result (Result = Reading + Factor)–Limit
 Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
- 3. All modes have been tested, only show the worst case.

80.0 dBuV/m





Report No.: STS2410091W02

Temperature:	23.4℃	Relative Humidtity:	60%		
Test Voltage:	DC 5V	Phase:	Vertical		
Test Mode:	Mode 1/2/3/4/5/6/7/8/9 (Mode 4 worst mode)				

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/ m)	(dBuV/m)	(dBuV/m)	(dB)	
1	38.7300	50.23	-17.36	32.87	40.00	-7.13	peak
2	77.5300	54.18	-23.49	30.69	40.00	-9.31	peak
3	199.7500	58.13	-21.11	37.02	43.50	-6.48	peak
4	284.1400	53.40	-15.46	37.94	46.00	-8.06	peak
5	533.4300	44.51	-7.25	37.26	46.00	-8.74	peak
6	763.3200	41.17	-2.22	38.95	46.00	-7.05	peak

Remark:.

- Margin = Result (Result = Reading + Factor)–Limit
 Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
- 3. All modes have been tested, only show the worst case.

80.0 dBuV/m





4. ANTENNA REQUIREMENT

4.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible partyshall be used with the device.

4.2 EUT ANTENNA

The EUT antenna is PCB Antenna. It comply with the standard requirement.



APPENDIX 1-PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

* * * * END OF THE REPORT * * * *