







ISO/IEC17025 Accredited Lab.

Report No: FCC1405065 File reference No: 2014-05-14

Applicant: Hi-Dow Electron Technology (Hefei) Co., Ltd.

Product: HiDow Wireless Tens/EMC System

Model No: HD-5N-RX

Brand Name: HiDow

Test Standards: FCC Part 15 Subpart C, Paragraph 15.249

Test result: It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 Subpart C,

Paragraph 15.249 regulations for the evaluation of

electromagnetic compatibility

Approved By

Jack Chung

Jack Chung

Manager

Dated: May 14, 2014

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

East 5/Block 4, Anhua Industrial Zone, No.8, Tairan Rd. CheGongMiao, FuTian District, Shenzhen, CHINA.

Tel (755) 83448688 Fax (755) 83442996

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Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC-Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-02.



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1.0 General Details

1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District,

Shenzhen, CHINA.

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Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-02

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: Hi-Dow Electron Technology (Hefei) Co., Ltd.

Address: Building D17/22, Baiyan Science & Technology Industrial Park, 168 Xiangzhang Road, Hefei,

Anhui, China

Telephone: 0551-62227909 Fax: 0551-65322298

1.3 Description of EUT

Product: HiDow Wireless Tens/EMC System

Manufacturer: Hi-Dow Electron Technology (Hefei) Co., Ltd.

Address: Building D17/22, Baiyan Science & Technology Industrial Park, 168 Xiangzhang

Road, Hefei, Anhui, China

Model Number: HD-5N-RX

Additional Model Name N/A
Additional Trade Name HiDow

Rating: DC3.7V powered by Lion-Battery

Modulation Type: GFSK

Operation Frequency 2426MHz, 2448MHz, 2478MHz Antenna Designation PCB Antenna with Gain 2.0dBi.

1.4 Submitted Sample

1 Sample

1.5 Test Duration

The report refers only to the sample tested and does not apply to the bulk.

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2014-05-09 to 2014-05-13

1.6 Test Uncertainty Conducted Emissions Uncertainty = 3.6Db Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

Terry Tang The sample tested by

Print Name: Terry Tang

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2.0		Test Equip	ments		
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2013-08-23	2014-08-22
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2013-08-23	2014-08-22
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2013-08-23	2014-08-22
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2013-08-25	2014-08-24
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2013-08-23	2014-08-22
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2013-08-24	2014-08-23
System Controller	CT	SC100	-		
Printer	EPSON	РНОТО ЕХЗ	CFNH234850		
Computer	IBM	8434	1S8434KCE99BLXL O*	-	-
Loop Antenna	EMCO	6502	00042960	2013-08-23	2014-08-22
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2013-08-23	2014-08-22
3m OATS			N/A	2013-08-22	2014-08-21
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2013-08-24	2014-08-23
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2013-08-24	2014-08-23
Power meter	Anritsu	ML2487A	6K00003613	2013-08-24	2014-08-23
Power sensor	Anritsu	MA2491A	32263	2013-08-24	2014-08-23
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2013-08-24	2014-08-23
LISN	AFJ	LS16C	10010947251	2013-08-23	2014-08-22
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2013-08-23	2014-08-22
9*6*6 Anechoic			N/A	2013-08-22	2014-08-21
EMI Test Receiver	RS	ESCS30	100139	2013-08-23	2014-08-22

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3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit	Field Strength of Fundamental	PASS	Complies
FCC Part 15, Paragraph 15.209	Radiated Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	PASS	Complies

3.2 Test Standards

FCC Part 15 Subpart C, Paragraph 15.249

4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co.,Ltd

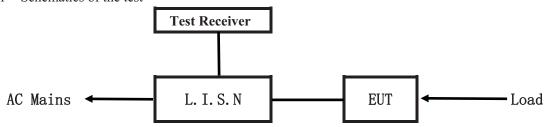
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5. Power Line Conducted Emission Test

5.1 Schematics of the test

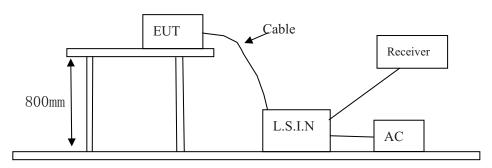


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4-2003.

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

One channels are provided to the EUT

A. EUT

Device	Manufacturer	Model	FCC ID
HiDow Wireless	Hi Davy Flacture Tackmalacry (Hafai) Co. 144	IID EN DV	24 CD4HD 5N DV
Tens/EMC System	Hi-Dow Electron Technology (Hefei) Co., Ltd.	HD-5N-RX	2ACD4HD-5N-RX

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

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C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
Power supply	SIMSUKIAN	SK21G-0500200U	VOC	

5.4 **EUT Operating Condition**

Operating condition is according to ANSI C63.4 -2003

- Α Setup the EUT and simulators as shown on follow
- В Enable AF signal and confirm EUT active to normal condition

Power line conducted Emission Limit according to Paragraph 15.207 5.5

Eraguan ay (MHz)	Class A Lir	nits (dB µ V)	Class B Limits (dB μ V)		
Frequency(MHz)	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level	
$0.15 \sim 0.50$	79.0	66.0	66.0~56.0*	56.0~46.0*	
$0.50 \sim 5.00$	73.0	60.0	56.0	46.0	
5.00 ~ 30.00	73.0	60.0	60.0	50.0	

Notes:

- 1. *Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

Test Results 5.6

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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A: Conducted Emission on Live Terminal (150kHz to 30MHz)

EUT Operating Environment

Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

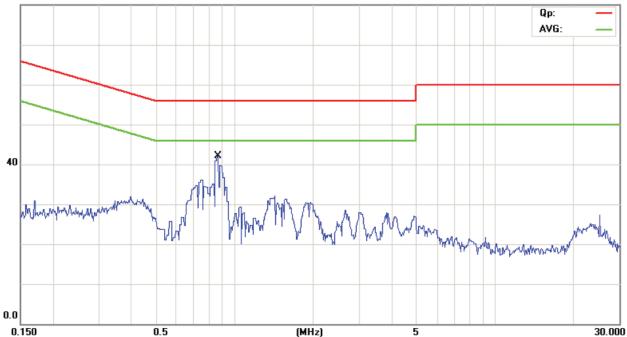
EUT set Condition: Charging and Keep Transmitting

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual

80.0 dBuV



No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBu∀	dBuV	dB	Detector	Comment
1 *	0.8643	26.60	11.76	38.36	56.00	-17.64	QP	
2	0.8643	13.60	11.76	25.36	46.00	-20.64	AVG	

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B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

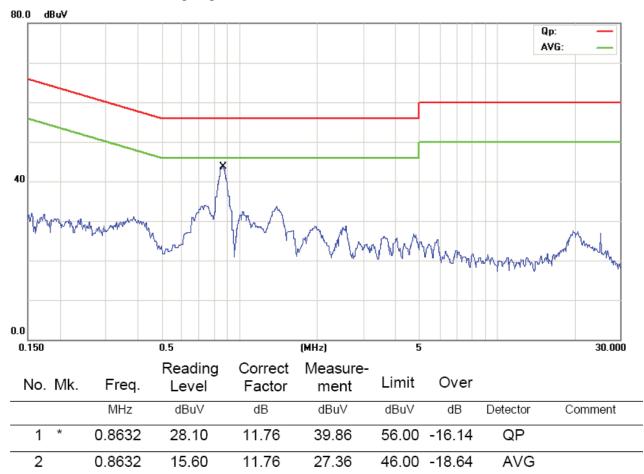
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Charging and Keep Transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



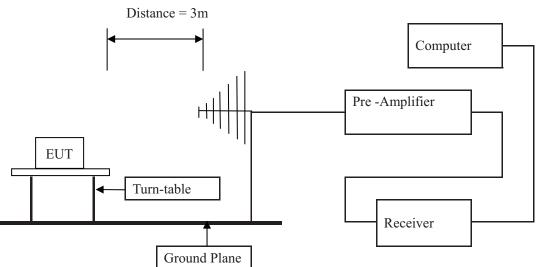
Report No: 1405065 Date: 2014-05-14



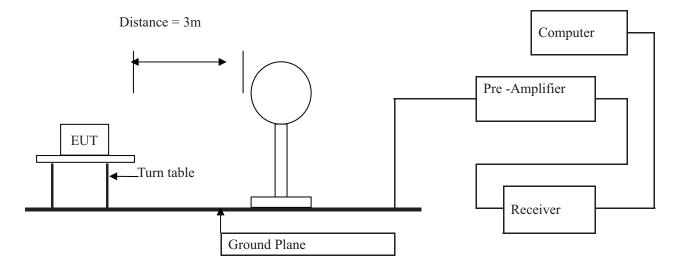
6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup



Block diagram of Test setup for frequency below 30MHz



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6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition
Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

A FCC Part 15 Subpart C Paragraph 15.249(a) Limit

Fundamental Frequency	Field Stre	Field Strength of Fundamental (3m)			trength of Harmo	nics (3m)
(MHz)	mV/m	dBuV/m		uV/m	dBu	V/m
2400-2483.5	50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)

Note:

- 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)
- 2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- 3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB µ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-25G, the final emission level got using PK and AV detector.

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6.5 Test result

A **Fundamental & Harmonics Radiated Emission Data**

Product:	HiDow Wireless Tens/EMC System	Test Mode:	Low Channel- keep transmitting
Test Item:	Fundamental Radiated Emission	Temperature:	25℃
	Data		
Test Voltage:	3.7VDC	Humidity:	56%
Test Result:	Pass		

Frequency	Emission PK/AV	Horiz /	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vert	(dBuV/m)	(dB)
2426	90.06(PK)	Н	114/94	-3.94
2426	88.62(PK)	V	114/94	-5.38
4852		H/V	74/54	
7278		H/V	74/54	
9704		H/V	74/54	
12130		H/V	74/54	
14556		H/V	74/54	
16982		H/V	74/54	
19408		H/V	74/54	
21834		H/V	74/54	
24260		H/V	74/54	

Note: Fundamental Radiated Emissions Measured with PK detector, RBW=3MHz, VBW=10MHz

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Product:	HiDow Wireless Tens/EMC System	Test Mode:	Middle Channel- keep transmitting
Test Item:	Fundamental Radiated Emission	Temperature:	25℃
	Data		
Test Voltage:	3.7VDC	Humidity:	56%
Test Result:	Pass		

Frequency (MHz)	Emission PK/AV (dBuV/m)	Horiz / Vert	Limits PK/AV (dBuV/m)	Margin (dB)
` ,	` ′		, ,	· · · · · · · · · · · · · · · · · · ·
2448	87.89(PK)	Н	114/94	-6.11
2448	89.69 (PK)	V	114/94	-4.31
4896		Н	74/54	
7344		V	74/54	
9792		H/V	74/54	
12240		H/V	74/54	
14688		H/V	74/54	
17136		H/V	74/54	
19584		H/V	74/54	
22032		H/V	74/54	
24480		H/V	74/54	

Note: Fundamental Radiated Emissions Measured with PK detector, RBW=3MHz, VBW=10MHz

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Product:	HiDow Wireless Tens/EMC System	Test Mode:	High Channel- keep transmitting
Test Item:	Fundamental Radiated Emission	Temperature:	25℃
	Data		
Test Voltage:	3.7VDC	Humidity:	56%
Test Result:	Pass		

Frequency	Emission PK/AV	Horiz /	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vert	(dBuV/m)	(dB)
2478	91.68(PK)	Н	114/94	-2.32
2478	90.11(PK)	V	114/94	-3.89
4956		H/V	74/54	
7434		H/V	74/54	
9912		H/V	74/54	
12390		H/V	74/54	
14868		H/V	74/54	
17346		H/V	74/54	
19824		H/V	74/54	
22302		H/V	74/54	
24780		H/V	74/54	

Note: (1) PK= Peak, AV= Average

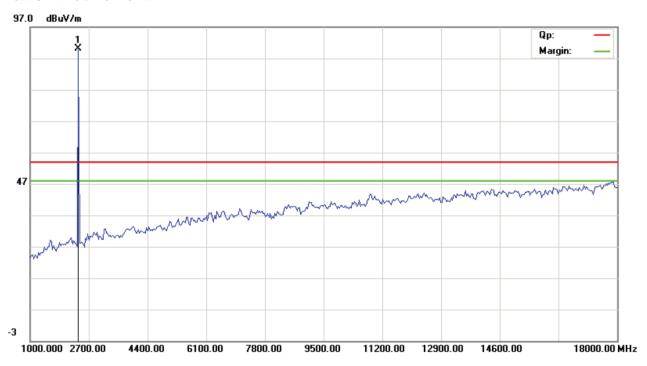
- (2) Emission Level = Reading Level + Antenna Factor + Cable Loss.
- (3)Margin=Emission-Limits
- (4)According to section 15.35(b), the peak limit is 20dB higher than the average limit
- (5) The measured PK value less than the AV limit.
- (6) Note: Fundamental Radiated Emissions Measured with PK detector, RBW=3MHz, VBW=10MHz

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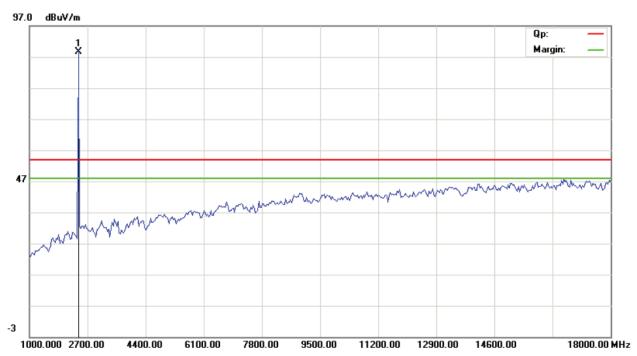


Please refer to the following test plots for details:

Low Channel: Horizontal



Low Channel: Vertical



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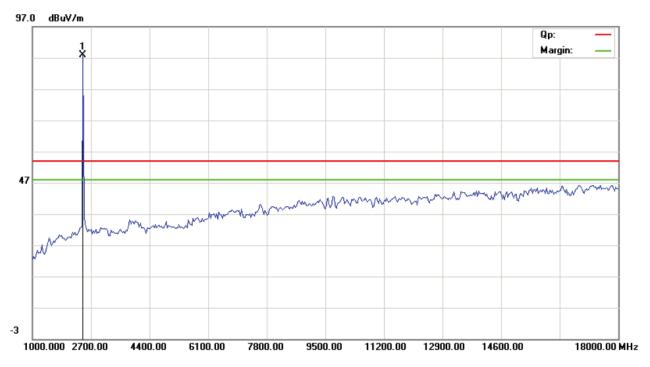
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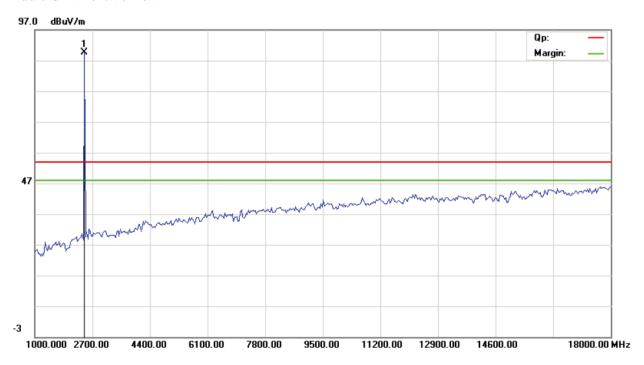
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Middle Channel: Horizontal



Middle Channel: Vertical

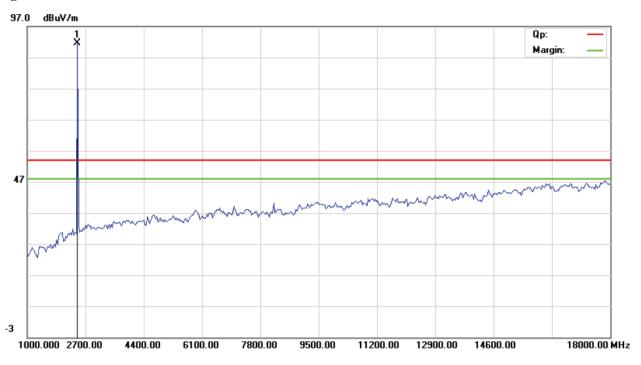


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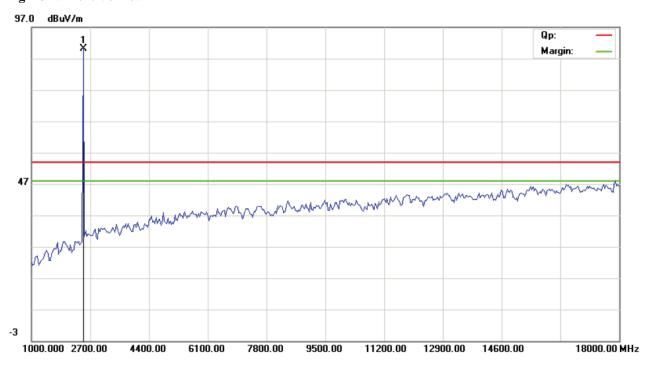
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High Channel: Horizontal



High Channel: Vertical



Note: for the radiated emissions from 18-25GHz, it was the floor noise.

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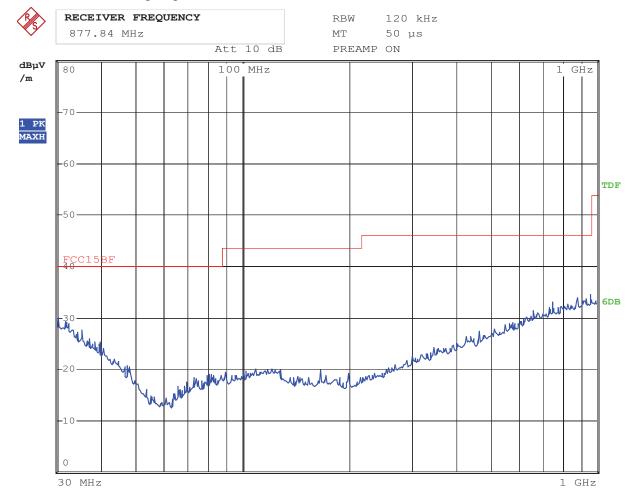
General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Date:

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)

-The test data shows much less than the limit, no necessary take down the results.

13.MAY.2014 19:18:02

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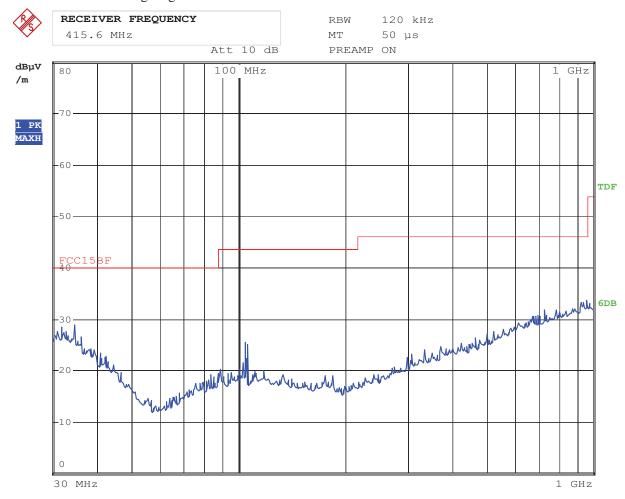


Radiated Emission In Vertical 30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



Date:	13.MAY.2014	19:16:49

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \u03b4 V/m)

⁻The test data shows much less than the limit, no necessary take down the results.

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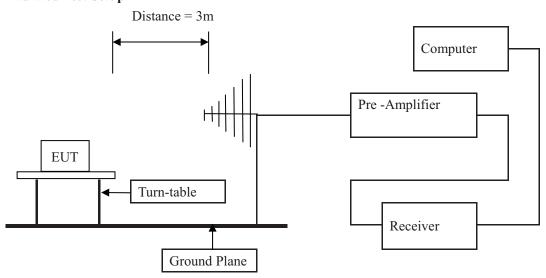


7. Band Edge

7.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) Set Spectrum as RBW=VBW=1MHz and Peak detector used
- (3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (4) The antenna polarization: Vertical polarization and Horizontal polarization.

7. 2 Radiated Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing

7.3 Configuration of The EUT

Same as section 5.3 of this report

7.4 EUT Operating Condition

Same as section 5.4 of this report.

7.5 Band Edge Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

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7.6 Test Result

Horizontal:

Product:	HiDow Wireless	Tens/EMC System	Test Mode:	Low Channel- keep transmitting
Mode	Keeping	Γransmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2390MHz	PK (dBμV/m)	39.87	T imait	74(dBμV/m)
2390MHZ	AV(dBμV/m)		Limit	54(dBμV/m)
2400MH=	PK (dBμV/m)	41.22	T imait	74(dBμV/m)
2400MHz	AV(dBμV/m)		Limit	54(dBμV/m)

Vertical:

Product:	HiDow Wireless	Tens/EMC System	Test Mode:	Low Channel- keep transmitting		
Mode	Keeping Transmitting		Keeping Transmitting		Test Voltage	DC3.7V
Temperature	24 deg. C,		Humidity	56% RH		
Test Result:	Pass		Detector	PK		
2390MHz	PK (dBμV/m)	39.23	Limit	$74(dB\mu V/m)$		
2390MITZ	AV(dBμV/m)		LIIIII	$54(dB\mu V/m)$		
2400MHz	PK (dBμV/m)	41.30	Limit	$74(dB\mu V/m)$		
2400MHz	$AV(dB\mu V/m)$		Limit	$54(dB\mu V/m)$		

Horizontal:

Product:	HiDow Wireless	Tens/EMC System	Test Mode:	High Channel- keep transmitting		
Mode	Keeping	Γransmitting	Test Voltage	DC3.7V		
Temperature	24 deg. C,		24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK		
2492 5MH-	PK (dBμV/m)	40.39	T imait	74(dBµV/m)		
2483.5MHz	AV(dBμV/m)		Limit	54(dBµV/m)		

Vertical				
Product:	HiDow Wireless	Tens/EMC System	Test Mode:	High Channel- keep transmitting
Mode	Keeping	Γransmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2492 5MHz	PK (dBμV/m)	39.82	Limit	$74(dB\mu V/m)$
2483.5MHz	AV(dBμV/m)	-	Limit	$54(dB\mu V/m)$

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8.0 Antenna Requirement

Applicable Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

This product has a PCB Antenna. The antenna gain is 2.0dBi. It fulfill the requirement of this section.

Test Result: Pass

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Product	t:	HiDov	Wireless	Tens/EM	C System	1 T	Test Mode:		Low Channel- keep transmitting		
Mode		Keeping Transmitting Test Voltage					est Voltage		DC:	3.7V	
Temperat	ure	24 deg. C,				Humidity		56%	6 RH		
Test Resu	ılt:		F	Pass			Detector		P	ΥK	
20dB Bandy	width		150	00kHz							
4 \$/	DELTA 1.5 MI ef 10			*Att 2	0 dB	* VBW	100 kHz 300 kHz 2.5 ms			.07 dB 000 MHz	
	. 0					3		Marker 2 Marker	-29] .11 dBm)00 GHz	A
	-10					M		2	-8 .425980	.04 dBm	
	-30	D1 -28.					2				
-	-40	mahy	Mymmunn	Marra	,		\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	Mund	MAMPA		3DB
	-80										
-	-90										
C	enter	2.42576	GHz		1 M	Mz/	•	•	Span	10 MHz	•

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Product: Mode Temperature Test Result: 20dB Bandwidth		HiDow Wireless Tens/EMC System					t Mode:	Middle Channel-keep transmitting				
		Keeping Transmitting 24 deg. C,				Test	Voltage	DC3.7V 56% RH				
						Hu	midity					
		Pass 1514kHz					etector	PK 				
8/5>	DELTA MARKER 2 1.514 MHz Ref 10 dBm *Att 20 dB				0 dB	*VBW 3	00 kHz 800 kHz 2.5 ms	Delta 2 [T1] 0.26 dB 1.514000000 MHz				
1 PK VIEW	10 -0-				3	Λ		Marker 2 Marker	-26 -447502 3 [T1	.88 dBm 000 GHz .30 dBm		
	20	-D1 -26.	3 dBm—	<u></u>	*	1	2					
	40 50 N /w	Many - V	www.	(www			the	Monda		huwy	3DB	
	70 80 -90											
	Center	2.448 G	Hz		1 MI	Hz/			Span	10 MHz	:	

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Product: Mode Temperature Test Result: 20dB Bandwidth		HiDow Wireless Tens/EMC System Keeping Transmitting 24 deg. C, Pass				Test Mode: Test Voltage Humidity Detector		High Channel- keep transmittir DC3.7V 56% RH PK														
													2320kHz									
												\$\hstar*align*	DELTA MARKER 2 2.32 MHz Ref 10 dBm *Att 20 dB				*VBW 3	00 kHz 00 kHz .5 ms	Delta 2 [T1] 0.50 dB 2.320000000 MHz			
												1 PK VIEW	10 -0 10				3		Marker 2 Marker 2	-27 .476802 3 [T1	.47 dBm .000 GHz .35 dBm	Α
			30	-D1 -26.35	dBm-			\sqrt{2}	8.5													
	50 Wdwww	Tong March M	ma land			\w/	Low	W III	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3DB												
	70 80																					
	-90	2.477822 GHz 1 M			z/		Span 10 MHz															

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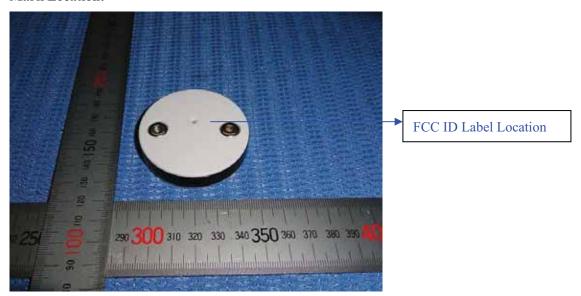
10.0 FCC ID Label

FCC ID: 2ACD4HD-5N-RX

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



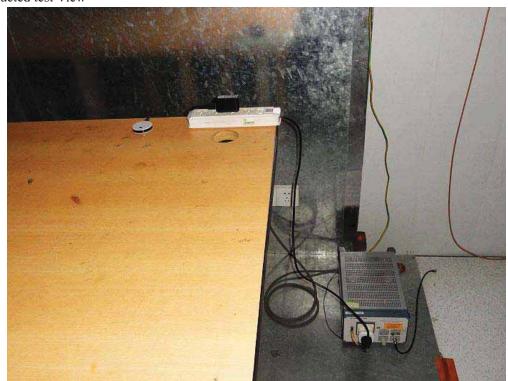
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11.0 Photo of testing

11.1 Conducted test View--



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11.2 Radiated emission test view





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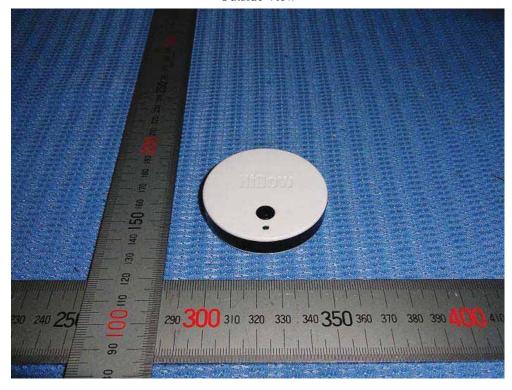
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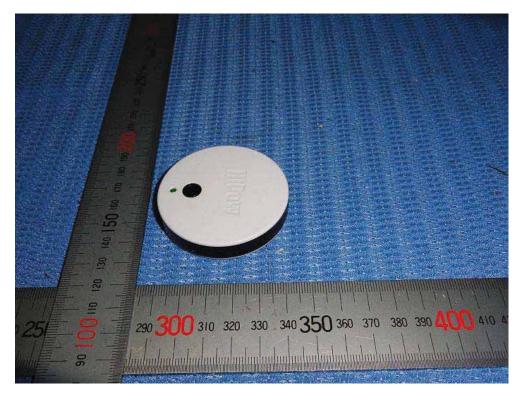
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Photographs - EUT 11.3

Outside View





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Outside View





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Different Appearance





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Interior View





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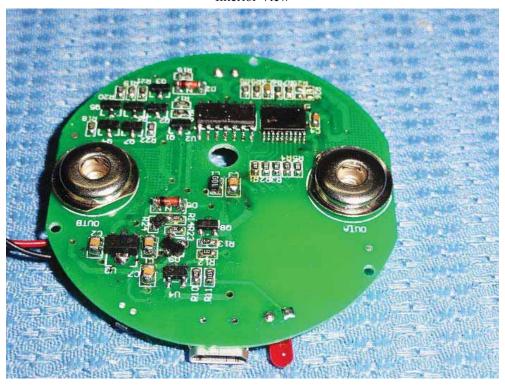
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Interior View





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Interior View





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