



RADIO EXPOSURE TEST REPORT

FCC ID : PD5-CBW150AX
Equipment : Cisco Business 150AX Access Point
Brand Name : CISCO
Model Name : CBW150AX
Applicant : Delta Electronics, Inc.
31-1, Shien Pan Rd., Kuei San Industrial Zone,
Taoyuan City 333, Taiwan
Manufacturer : Delta Electronics, Inc.
31-1, Shien Pan Rd., Kuei San Industrial Zone,
Taoyuan City 333, Taiwan
Standard : 47 CFR Part 2.1091

The product was received on Aug. 24, 2021, and testing was started from Aug. 27, 2021 and completed on Nov. 15, 2021. 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: Sam Chen

Sporton International Inc. Hsinchu Laboratory
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Photographs of EUT v01



History of this test report

Report No.	Version	Description	Issued Date
FA182329	01	Initial issue of report	Dec. 23, 2021



Summary of Test Result

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

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Viola Huang



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	5180-5240 5260-5320 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)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK



1.2 Antenna Information

Ant.	2.4GHz Port	5GHz Port	Bluetooth Port	Brand Name	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	1	-	Delta	0990262017	Metal PIFA antenna	I-PEX	Note 1
2	2	2	-	Delta	0990262117	Metal PIFA antenna	I-PEX	
3	-	-	3	Delta	0990262217	Metal PIFA antenna	I-PEX	

Note 1:

Ant.	Gain (dBi)					
	2.4GHz	UNII 1	UNII 2A	UNII 2C	UNII 3	Bluetooth
1	3.9	4.9	4.9	4.2	5.1	-
2	3.1	4.6	4.6	5.4	5.4	-
3	-	-	-	-	-	4

Note 2: The EUT has three antennas.

Note 3: Directional gain information.

-	Maximum Output Power	Power Spectral Density
Non-BF	Directional gain = Max.gain + array gain. For power measurements on IEEE 802.11 devices Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$
BF	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$



Ex.

Directional Gain (NSS1) formula :

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

$$NSS1(g1,1) = 10^{G1/20} ; NSS1(g1,2) = 10^{G2/20} ; NSS1(g1,3) = 10^{G3/20} ; NSS1(g1,4) = 10^{G4/20} \quad g_{j,k}$$

$$= (NSS1(g1,1) + NSS1(g1,2) + NSS1(g1,3) + NSS1(g1,4))^2$$

$$DG = 10 \log [(NSS1(g1,1) + NSS1(g1,2) + NSS1(g1,3) + NSS1(g1,4))^2 / N_{ANT}] \Rightarrow 10 \log [(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / N_{ANT}]$$

Where ;

G1 = Ant 1 Gain ; G2 = Ant 2 Gain

2.4GHz DG = 6.52 dBi

5 GHz Band1 DG = 7.76 dBi

5 GHz Band2 DG = 7.76 dBi

5 GHz Band3 DG = 7.83 dBi

5 GHz Band4 DG = 8.26 dBi

For 2.4GHz function:

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

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

Port 1 and Port 2 could transmit/receive simultaneously.

For bluetooth function:

For bluetooth (1TX/1RX)

Only Port 1 can be used as transmitting/receiving antenna.



1.3 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
PoE	RISUNIC	RP024W01-4800320ZG	IN PUT: 100-240V~50/60Hz, 0.6A Max OUT PUT: 48V, 0.32, 15.36W
Others			
Cradle*1			

1.4 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 20 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 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	6.52	19.82	26.34	0.50	26.84	0.48306	20	0.09610	1.00000
5.2G;D1D	7.76	19.81	27.57	0.50	28.07	0.64121	20	0.12756	1.00000
5.3G;D1D	7.76	19.79	27.55	0.50	28.05	0.63826	20	0.12698	1.00000
5.6G;D1D	7.83	19.86	27.69	0.50	28.19	0.65917	20	0.13114	1.00000
5.8G;D1D	8.26	19.91	28.17	0.50	28.67	0.73621	20	0.14646	1.00000
2.4G;F1D	4.00	5.61	9.61	0.50	10.11	0.01026	20	0.00204	1.00000

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

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	6.52	19.82	26.34	0.50	26.84	0.48306	20	0.0961	1.00000	0.0961
5.8G;D1D	8.26	19.91	28.17	0.50	28.67	0.73621	20	0.14646	1.00000	0.14646
2.4G;F1D	4.00	5.61	9.61	0.50	10.11	0.01026	20	0.00204	1.00000	0.00204
									Sum Ratio	0.24460
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

—————THE END—————