



FCC RADIO EXPOSURE TEST REPORT

FCC ID : 2AHBN-AP63
Equipment : Premium Outdoor 802.11ax WiFi and BLE Array AP
Brand Name : Mist
Model Name : AP63, AP63E
Applicant : Juniper Networks, Inc.
1133 Innovation Way, Sunnyvale, CA 94089, USA
Manufacturer : Juniper Networks, Inc.
1133 Innovation Way, Sunnyvale, CA 94089, USA
Standard : 47 CFR Part 2.1091

The product was received on Apr. 16, 2020, and testing was started from Jul. 03, 2020 and completed on Jul. 24, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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 variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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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: Wendy Pan

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, 1024QAM) 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, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK

1.1.1 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	EUT	Description
AP63	EUT 1	The model name: AP63 indicates that it comes with internal antennas and The model name: AP63E indicates that the access point comes with external antenna connectors.
AP63E	EUT 2	

1.1.2 Table for EUT Configuration

Configuration	EUT	Radio 1	Radio 2	Radio 3	Radio 4
1	1	WLAN 5GHz (Full Band)	WLAN 2.4GHz	WLAN 2.4GHz + WLAN 5GHz (Full Band)	Bluetooth
2	2	WLAN 5GHz (Full Band)	WLAN 2.4GHz	WLAN 2.4GHz + WLAN 5GHz (Full Band)	Bluetooth
3	1	WLAN 5GHz (Low Band)	WLAN 2.4GHz + WLAN 5GHz (High Band)	WLAN 2.4GHz + WLAN 5GHz	Bluetooth

Note: The above information was declared by manufacturer.



1.1.3 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA041650

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding 5GHz band 2 and band 3 (5250~5350 MHz, 5470~5725 MHz) for this device.	Maximum Permissible Exposure.

Note: Maximum Permissible Exposure of 2.4GHz, Bluetooth and 5GHz band 1, 4 are based on original test report.

1.2 Testing Location

Testing Location		
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.



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)*	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)*	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 31 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

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

For EUT 1 / Internal Antenna:

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)
5.2G;D1D (Radio 1)	6.00	18.77	24.77	0.50	25.27	0.33651	31	0.02786	1.00000
5.3G;D1D (Radio 1)	12.02	17.92	29.94	0.05	29.99	0.99770	31	0.08261	1.00000
5.6G;D1D (Radio 1)	12.02	17.93	29.95	0.04	29.99	0.99770	31	0.08261	1.00000
5.8G;D1D (Radio 1)	12.02	23.95	35.97	0.02	35.99	3.97192	31	0.32889	1.00000
2.4G;D1D (Radio 2)	10.02	25.71	35.73	0.26	35.99	3.97192	31	0.32889	1.00000
5.6G;D1D (Radio 2)	12.02	17.94	29.96	0.03	29.99	0.99770	31	0.08261	1.00000
5.8G;D1D (Radio 2)	12.02	23.96	35.98	0.01	35.99	3.97192	31	0.32889	1.00000
2.4G;G1D (Radio 3)	2.30	25.57	27.87	0.50	28.37	0.68707	31	0.05689	1.00000
5.2G;D1D (Radio 3)	4.70	19.69	24.39	0.03	24.42	0.27669	31	0.02291	1.00000
5.3G;D1D (Radio 3)	4.70	23.90	28.60	0.50	29.10	0.81283	31	0.06731	1.00000
5.6G;D1D (Radio 3)	4.70	23.94	28.64	0.50	29.14	0.82035	31	0.06793	1.00000
5.8G;D1D (Radio 3)	4.70	28.18	32.88	0.50	33.38	2.17771	31	0.18033	1.00000
2.4G;BT-LE (Radio 4)	5.10	2.25	7.35	0.50	7.85	0.00610	31	0.00050	1.00000

**For EUT 2 / Omni Antenna:**

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)
5.2G;D1D (Radio 1)	12.02	14.51	26.53	0.50	27.03	0.50466	31	0.04179	1.00000
5.3G;D1D (Radio 1)	12.02	17.89	29.91	0.08	29.99	0.99770	31	0.08261	1.00000
5.6G;D1D (Radio 1)	12.02	17.94	29.96	0.03	29.99	0.99770	31	0.08261	1.00000
5.8G;D1D (Radio 1)	12.02	23.96	35.98	0.01	35.99	3.97192	31	0.32889	1.00000
2.4G;D1D (Radio 2)	10.02	25.96	35.98	0.01	35.99	3.97192	31	0.32889	1.00000
2.4G;G1D (Radio 3)	4.00	25.06	29.06	0.50	29.56	0.90365	31	0.07483	1.00000
5.2G;D1D (Radio 3)	6.00	22.34	28.34	0.50	28.84	0.76560	31	0.06340	1.00000
5.3G;D1D (Radio 3)	6.00	23.74	29.74	0.25	29.99	0.99770	31	0.08261	1.00000
5.6G;D1D (Radio 3)	6.00	23.91	29.91	0.08	29.99	0.99770	31	0.08261	1.00000
5.8G;D1D (Radio 3)	6.00	28.29	34.29	0.50	34.79	3.01301	31	0.24949	1.00000

**For EUT 2 / Patch Antenna:**

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)
5.2G;D1D (Radio 1)	10.00	16.88	26.88	0.50	27.38	0.54702	31	0.04530	1.00000
5.3G;D1D (Radio 1)	16.02	13.86	29.88	0.11	29.99	0.99770	31	0.08261	1.00000
5.6G;D1D (Radio 1)	16.02	13.95	29.97	0.02	29.99	0.99770	31	0.08261	1.00000
5.8G;D2D (Radio 1)	10.00	25.98	35.98	0.01	35.99	3.97192	31	0.32889	1.00000
2.4G;G1D (Radio 2)	8.00	27.82	35.82	0.17	35.99	3.97192	31	0.32889	1.00000
2.4G;G1D (Radio 3)	8.00	25.10	33.10	0.50	33.60	2.29087	31	0.18970	1.00000
5.2G;D1D (Radio 3)	10.00	19.42	29.42	0.50	29.92	0.98175	31	0.08129	1.00000
5.3G;D1D (Radio 3)	10.00	19.95	29.95	0.04	29.99	0.99770	31	0.08261	1.00000
5.6G;D1D (Radio 3)	10.00	19.95	29.95	0.04	29.99	0.99770	31	0.08261	1.00000
5.8G;D1D (Radio 3)	10.00	25.99	35.99	0.00	35.99	3.97192	31	0.32889	1.00000

**Simultaneous Transmission Analysis Mode:****For Configuration 1 / EUT 1**

Test Mode: WLAN 5GHz (Radio 1) + WLAN 2.4GHz (Radio 2) + WLAN 2.4GHz (Radio 3) + Bluetooth (Radio 4)

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)
5.8G;D1D (Radio 1)	12.02	23.95	35.97	0.02	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;D1D (Radio 2)	10.02	25.71	35.73	0.26	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;G1D (Radio 3)	2.30	25.57	27.87	0.50	28.37	0.68707	31	0.05689	1.00000	0.05689
2.4G;BT-LE (Radio 4)	5.10	2.25	7.35	0.50	7.85	0.00610	31	0.00050	1.00000	0.00050
									Sum Ratio	0.71517
									Ratio Limit	1

Test Mode: WLAN 5GHz (Radio 1) + WLAN 2.4GHz (Radio 2) + WLAN 5GHz (Radio 3) + Bluetooth (Radio 4)

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)
5.8G;D1D (Radio 1)	12.02	23.95	35.97	0.02	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;D1D (Radio 2)	10.02	25.71	35.73	0.26	35.99	3.97192	31	0.32889	1.00000	0.32889
5.8G;D1D (Radio 3)	4.70	28.18	32.88	0.50	33.38	2.17771	31	0.18033	1.00000	0.18033
2.4G;BT-LE (Radio 4)	5.10	2.25	7.35	0.50	7.85	0.00610	31	0.00050	1.00000	0.00050
									Sum Ratio	0.83861
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

**For Configuration 2 / EUT 2**

Test Mode: WLAN 5GHz (Radio 1) + WLAN 2.4GHz (Radio 2) + WLAN 2.4GHz (Radio 3) + Bluetooth (Radio 4)

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)
5.8G;D1D (Radio 1)	12.02	23.96	35.98	0.01	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;D1D (Radio 2)	10.02	25.96	35.98	0.01	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;G1D (Radio 3)	8.00	25.10	33.10	0.50	33.60	2.29087	31	0.18970	1.00000	0.18970
2.4G;BT-LE (Radio 4)	5.10	2.25	7.35	0.50	7.85	0.00610	31	0.00050	1.00000	0.00050
									Sum Ratio	0.84798
									Ratio Limit	1

Test Mode: WLAN 5GHz (Radio 1) + WLAN 2.4GHz (Radio 2) + WLAN 5GHz (Radio 3) + Bluetooth (Radio 4)

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)
5.8G;D1D (Radio 1)	12.02	23.96	35.98	0.01	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;D1D (Radio 2)	10.02	25.96	35.98	0.01	35.99	3.97192	31	0.32889	1.00000	0.32889
5.8G;D1D (Radio 3)	10.00	25.99	35.99	0.00	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;BT-LE (Radio 4)	5.10	2.25	7.35	0.50	7.85	0.00610	31	0.00050	1.00000	0.00050
									Sum Ratio	0.98717
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

**For Configuration 3 / EUT 1**

Test Mode: WLAN 5GHz Band 1 (Radio 1) + WLAN 5GHz Band 4 (Radio 2) + WLAN 2.4GHz (Radio 3) + Bluetooth
(Radio 4)

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)
5.3G;D1D (Radio 1)	12.02	17.92	29.94	0.50	30.44	1.10662	31	0.09163	1.00000	0.09163
5.8G;D1D (Radio 2)	12.02	23.96	35.98	0.01	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;G1D (Radio 3)	2.30	25.57	27.87	0.50	28.37	0.68707	31	0.05689	1.00000	0.05689
2.4G;BT-LE (Radio 4)	5.10	2.25	7.35	0.50	7.85	0.00610	31	0.00050	1.00000	0.00050
									Sum Ratio	0.47791
									Ratio Limit	1

Test Mode: WLAN 5GHz Band 1 (Radio 1) + WLAN 5GHz Band 4 (Radio 2) + WLAN 5GHz (Radio 3) + Bluetooth
(Radio 4)

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)
5.3G;D1D (Radio 1)	12.02	17.92	29.94	0.50	30.44	1.10662	31	0.09163	1.00000	0.09163
5.8G;D1D (Radio 2)	12.02	23.96	35.98	0.01	35.99	3.97192	31	0.32889	1.00000	0.32889
5.8G;D1D (Radio 3)	4.70	28.18	32.88	0.50	33.38	2.17771	31	0.18033	1.00000	0.18033
2.4G;BT-LE (Radio 4)	5.10	2.25	7.35	0.50	7.85	0.00610	31	0.00050	1.00000	0.00050
									Sum Ratio	0.60135
									Ratio Limit	1



Test Mode: WLAN 5GHz Band 1 (Radio 1) + WLAN 2.4GHz (Radio 2) + WLAN 2.4GHz (Radio 3) + Bluetooth
(Radio 4)

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)
5.3G;D1D (Radio 1)	12.02	17.92	29.94	0.50	30.44	1.10662	31	0.09163	1.00000	0.09163
2.4G;D1D (Radio 2)	10.02	25.71	35.73	0.26	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;G1D (Radio 3)	2.30	25.57	27.87	0.50	28.37	0.68707	31	0.05689	1.00000	0.05689
2.4G;BT-LE (Radio 4)	5.10	2.25	7.35	0.50	7.85	0.00610	31	0.00050	1.00000	0.00050
									Sum Ratio	0.47791
									Ratio Limit	1

Test Mode: WLAN 5GHz Band 1 (Radio 1) + WLAN 2.4GHz (Radio 2) + WLAN 5GHz (Radio 3) + Bluetooth (Radio
4)

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)
5.3G;D1D (Radio 1)	12.02	17.92	29.94	0.50	30.44	1.10662	31	0.09163	1.00000	0.09163
2.4G;D1D (Radio 2)	10.02	25.71	35.73	0.26	35.99	3.97192	31	0.32889	1.00000	0.32889
5.8G;D1D (Radio 3)	4.70	28.18	32.88	0.50	33.38	2.17771	31	0.18033	1.00000	0.18033
2.4G;BT-LE (Radio 4)	5.10	2.25	7.35	0.50	7.85	0.00610	31	0.00050	1.00000	0.00050
									Sum Ratio	0.60135
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

————THE END————