Testing Laboratory 3787

RADIO EXPOSURE TEST REPORT

FCC ID	:	LDKIW9167EH
Equipment	:	Cisco Catalyst IW9167E Heavy Duty Access Point
Brand Name	:	CISCO
Model Name	:	IW9167EH-B
Applicant	:	Cisco Systems Inc 125 West Tasman Drive San Jose California United States 95134-1706
Manufacturer	:	Cisco Systems Inc 125 West Tasman Drive San Jose California United States 95134-1706
Standard	:	47 CFR Part 2.1091

The product was received on Aug. 11, 2022, and testing was started from Aug. 17, 2022 and completed on Dec. 15, 2022. 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
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FA281101	01	Initial issue of report	Feb. 01, 2023

Summary of Test Result

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

Declaration of Conformity:
1. The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results. 2. The measurement uncertainty please refer to report "Measurement Uncertainty".
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	5180-5250 5250-5320 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)
4.9GHz WLAN	4940-4990	4945-4985	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK

1.2 Antenna Information

Set.	CISCO's Brand Name / Manufacturer's Brand Name	CISCO's Model Name / Manufacturer's Model Name	Antenna Type	Connector	Gain (dBi)
1	CISCO / CUSHCRAFT	AIR-ANT2480V-N= / S2406BFCNM	Dipole	N Male	Note 1
2	CISCO / PCTEL	AIR-ANT2413P2M-N= / 07-1193-01	Panel	N Male	
3	CISCO / MP Antenna	IW-ANT-OMM-53-N= / 08-ANT-0985	Monopole	N Female	
4	CISCO / Laird TECHNOLOGES	AIR-ANT5180V-N= / S4905WBCFNM	Dipole	N Male	
5	CISCO / HUBER+SUHNER	IW-ANT-PNL-59-N= / 1356.17.0076	Panel	SMA Female	
6	CISCO / RF ELEMENTS	IW-ANT-H90-510-N= / HG3-CC-S90	Horn	N Female	
7	CISCO / PCTEL	AIR-ANT5114P2M-N= / 07-1192-01	Panel	N Male	
8	CISCO / PCTEL	IW-ANT-SKD-513-Q= / 74-133202-01	Patch	QMA Female	
9	CISCO / PCTEL	IW-ANT-SKS-514-Q= / 74-133201-01	Patch	QMA Female	
10	CISCO / HUBER+SUHNER	FLMESH-HW-ANT-28 / 1356.17.0023	Panel	N Female	
11	CISCO / Laird TECHNOLOGES	AIR-ANT2547V-N= / OC24527-CS1	Dipole	N Male	
12	CISCO / Laird TECHNOLOGES	AIR-ANT2547VG-N= / OC24528-CS3	Dipole	N Male	
13	CISCO / Laird Connectivity	AIR-ANT2547VG-NS= / OC24528-CS4	Dipole	N Male	
14	CISCO / Laird Connectivity	AIR-ANT2568VG-N= / OCX24529-CS1	Dipole	N Male	
15	CISCO / Laird Connectivity	AIR-ANT2568VG-NS= / OCX24529-CS2	Dipole	N Male	
16	CISCO / Laird Connectivity	AIR-ANT2588P4M-NS= / PDM24499-CS1	Patch	N Female	
17	CISCO / Laird Connectivity	AIR-ANT2513P4M-N= / PDM245115H-CS1	Patch	N Female	
18	CISCO / Laird Connectivity	AIR-ANT2513P4M-NS= / PDM245115H-CS2	Patch	N Female	
19	CISCO / TE connectivity	IW-ANT-OMV-2567-N / OCX24688-CS1	Dipole	N Male	
20	CISCO / TE connectivity	IW-ANT-OMH-2567-N / OCX24688H-CS1	Dipole	N Male	
21	CISCO / Pulse	ANT-GNSS-OUT-TNC= / W4053T4572	Patch	TNC Male	

Set.	Port						
	WLAN 2.4GHz (Radio 1)	4.9GHz / 5GHz (Radio 1)	4.9GHz / 5GHz (Radio 2)	WLAN 2.4GHz (Scanning Radio 3)	WLAN 5GHz (Scanning Radio 3)	BT (Radio 4)	GPS (Radio 5)
1	-	-	-	-	-	-	-
2	1	-	-	1	-	-	-
	2	-	-	-	-	-	-
	3	-	-	-	-	-	-
	4	-	-	-	-	1	-
3	-	4	1	-	2	-	-
	-	3	2	-	1	-	-
	-	2	3	-	-	-	-
	-	1	4	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-
9	-	4	1	-	-	-	-
	-	3	2	-	-	-	-
	-	2	3	-	-	-	-
	-	1	4	-	-	-	-
10	-	4	1	-	2	-	-
	-	3	2	-	1	-	-
	-	2	3	-	-	-	-
	-	1	4	-	-	-	-
11	1	-	-	1	-	-	-
	2	-	-	-	-	-	-
	3	-	-	-	-	-	-
	4	-	-	-	-	1	-
12	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-
21	-	-	-	-	-	-	1

Note 1:

Set.	Antenna Gain (dBi)				Cable loss (dB)				Net Gain (dBi)			
	WLAN 2.4GHz (Radio 1) (Scanning Radio 3) BT (Radio 4)	5GHz (Radio 1) (Radio 2) (Scanning Radio 3)		GPS (Radio 5)	WLAN 2.4GHz (Radio 1) (Scanning Radio 3) BT (Radio 4)	5GHz (Radio 1) (Radio 2) (Scanning Radio 3)		GPS (Radio 5)	WLAN 2.4GHz (Radio 1) (Scanning Radio 3) BT (Radio 4)	5GHz (Radio 1) (Radio 2) (Scanning Radio 3)		GPS (Radio 5)
	2.4G / Bluetooth	UNII 1~3	4.9G	-	2.4G / Bluetooth	UNII 1~3	4.9G	-	2.4G / Bluetooth	UNII 1~3	4.9G	-
1	8	-	-	-	-	-	-	-	8	-	-	-
2	13	-	-	-	-	-	-	-	13	-	-	-
3	-	3	3	-	-	-	-	-	-	3	3	-
4	-	8	7	-	-	-	-	-	-	8	7	-
5	-	9	-	-	-	0.97	-	-	-	8.03	-	-
6	-	10	-	-	-	0.97	-	-	-	9.03	-	-
7	-	13	-	-	-	-	-	-	-	13	-	-
8	-	13	13	-	-	0.97	0.97	-	-	12.09	12.09	-
9	-	14	14	-	-	0.97	0.97	-	-	13.03	13.03	-
10	-	19.5	-	-	-	0.97	-	-	-	18.53	-	-
11	4	7	-	-	-	-	-	-	4	7	-	-
12	4	7	-	-	-	-	-	-	4	7	-	-
13	4	7	-	-	-	-	-	-	4	7	-	-
14	6	8	-	-	-	-	-	-	6	8	-	-
15	6	8	-	-	-	-	-	-	6	8	-	-
16	Vertical: 9.1 Horizontal: 7.1	Vertical: 9.6 Horizontal: 7.8	-	-	0.62	0.97	-	-	Vertical: 8.48 Horizontal: 6.48	Vertical: 8.63 Horizontal: 6.83	-	-
17	13	13	-	-	0.62	0.97	-	-	12.38	12.03	-	-
18	13	13	-	-	0.62	0.97	-	-	12.38	12.03	-	-
19	4	7	7	-	-	-	-	-	4	7	7	-
20	4	7	7	-	-	-	-	-	4	7	7	-
21	-	-	-	2.5	-	-	-	-	-	-	-	2.5

Set.	Point-to-Multipoint	Point-to-Point
1	Yes	No
2	Yes	Yes
3	Yes	No
4	Yes	No
5	Yes	Yes
6	Yes	Yes
7	Yes	Yes
8	Yes	Yes
9	Yes	Yes
10	Yes	Yes
11	Yes	No
12	Yes	No
13	Yes	No
14	Yes	No
15	Yes	No
16	Yes	No
17	Yes	Yes
18	Yes	Yes
19	Yes	No
20	Yes	No
21	-	-

Note 2: The above information was declared by manufacturer.
Note 3: There are 21 set antennas in the antenna table list.
The lowest and highest antenna gain was selected for the test and recorded in this report.
The antennas were selected as below:
For WLAN 2.4GHz/BT: Set 2, 11.
For WLAN 5GHz: Set 3, 10.
For 4.9GHz: Set 3, 9.

Note 4: Directional gain information.

Type	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 ≤ 4	$Directional Gain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$
BF	$Directional Gain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$	$Directional Gain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

Ex.

Directional Gain (NSS1) formula : $Directional Gain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

NSS1(g1,1) = $10^{G1/20}$; NSS1(g1,2)= $10^{G2/20}$; NSS1(g1,2)= $10^{G3/20}$; NSS1(g1,2)= $10^{G4/20}$

gj,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}] => 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$ + $10^{G4/20}$)^2 / N_{ANT}]

Where ;

2.4G G1 = 4 dBi; G2 = 4 dBi; G3 = 4 dBi; G4 = 4 dBi;
2TDG = 7.01 dBi 4TDG = 10.02 dBi

2.4G G1 = 13 dBi; G2 = 13 dBi; G3 = 13 dBi; G13 = 13 dBi;
2TDG = 16.01 dBi 4TDG = 19.02 dBi

5G G1 = 3 dBi; G2 = 3 dBi; G3 = 3 dBi; G4 = 3 dBi;
2TDG = 6.01 dBi 4TDG = 9.02 dBi

5G G1 = 18.53 dBi; G2 = 18.53 dBi; G18.53 = 18.53 dBi; G4 = 18.53 dBi;
2TDG = 18.53 dBi 4TDG = 21.54 dBi

4.9G G1 = 3 dBi; G2 = 3 dBi; G3 = 3 dBi; G4 = 3 dBi;
2TDG = 6.01 dBi 4TDG = 9.02 dBi

4.9G G1 = 13.03 dBi; G2 = 13.03 dBi; G13.03 = 13.03 dBi; G4 = 13.03 dBi;
2TDG = 16.04 dBi 4TDG = 19.05 dBi

For Iron Radio 1
For 2.4GHz:
For IEEE 802.11b/g/n/VHT/ax mode (1TX, 2TX, 4TX/4RX):
1TX
Only Port 1 can be use as transmitting antenna.
2TX
Port 1, Port 2 can be use as transmitting antenna.
Port 1, Port 2 could transmitting simultaneously.
4TX
Port 1, Port 2, Port 3 and Port 4 can be used as transmitting antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit simultaneously.

4RX
Port 1, Port 2, Port 3, Port 4 can be used as receiving antennas.
Port 1, Port 2, Port 3, Port 4 could receive simultaneously.
For Iron 5GHz UNII 1~UNII 3 and 4.9GHz:
For IEEE 802.11a/n/ac/ax mode (1TX, 2TX, 4TX/4RX):
1TX
Only Port 1 can be use as transmitting antenna.
2TX
Port 1, Port 2 can be use as transmitting antenna.
Port 1, Port 2 could transmitting simultaneously.
4TX
Port 1, Port 2, Port 3 and Port 4 can be used as transmitting antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit simultaneously.
4RX
Port 1, Port 2, Port 3, Port 4 can be used as receiving antennas.
Port 1, Port 2, Port 3, Port 4 could receive simultaneously.

For Pine Radio 2
For 5GHz UNII 1~UNII 3 and 4.9GHz:
For IEEE 802.11a/n/ac/ax mode (1TX, 2TX, 4TX/4RX):
1TX
Only Port 1 can be use as transmitting antenna.
2TX
Port 1, Port 2 can be use as transmitting antenna.
Port 1, Port 2 could transmitting simultaneously.
4TX
Port 1, Port 2, Port 3 and Port 4 can be used as transmitting antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit simultaneously.
4RX
Port 1, Port 2, Port 3, Port 4 can be used as receiving antennas.
Port 1, Port 2, Port 3, Port 4 could receive simultaneously.

For Scanning Radio 3
For 2.4GHz:
For IEEE 802.11b/g/n/VHT/ax mode (1TX/1RX):
Only Port 1 can be used as transmitting/receiving antenna.
For 5GHz UNII 1~UNII 3:
For IEEE 802.11a/n/ac/ax mode (1TX/1RX):
The EUT supports the antenna with TX and RX diversity functions.
Both port 1 and port 2 support transmit and receive functions, but only one of them will be used at one time.
The port 1 generated the worst case, so it was selected to test and record in the report.

For Radio 4
Bluetooth (1TX/1RX):
Only Port 1 can be used as transmitting/receiving antenna.

For Radio 5
GPS (1RX):
Only Port 1 can be used as receiving antenna.

1.3 Table for EUT support function

Function	Support Band
AP	2.4GHz, 5GHz, 4.9GHz
P2P/P2MP	2.4GHz, 5GHz, 4.9GHz

Note1: For above table list, only AP mode was tested and recorded in this test.

Note2: The above information was declared by manufacturer.

1.4 Table for Radio function

Radio (R)	WLAN 2.4GHz	5GHz UNII 1~UNII 3	4.9 GHz	Scanning radio (WLAN 2.4GHz / 5GHz UNII 1~UNII 3)	Bluetooth	GPS
R1 (Iron Radio)	V (AP: 20) (P2P/P2MP: 20)	V (AP: 20/40/80) (P2P/P2MP: 20/40/80)	V	-	-	-
R2 (Pine Radio)	-	V (AP: 20/40/80/160) (P2P/P2MP: 20/40/80/160)	V	-	-	-
R3 (Scanning Radio)	-	-	-	V (AP: 20/40/80/160) (P2P/P2MP: 20/40/80/160)	-	-
R4	-	-	-	-	V	-
R5	-	-	-	-	-	V

Note: The above information was declared by manufacturer.

1.5 Accessories

Accessories
Sealing collar*3
Wall-mounted rack*2
Grounding wire*1, Non shielded, 0.8m
DC cable*1, Non shielded, 2.6m
DC cable connect*1
Ethernet cable*2, Shielded, 3m
Ethernet cable connect*2

1.6 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2.1091
- KDB 447498 D04 Interim General RF Exposure Guidance v01

The following reference test guidance is not within the scope of accreditation of TAF.

- 47 CFR Part 1.1307
- 47 CFR Part 1.1310

1.7 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/ cm²)	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/f²)	<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/ cm²)	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/f²)	<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 100 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

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 MPE Exemption

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= Pth.

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\,cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\,cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\,cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance R between the person and the antenna / radiating structure, where R > λ / 2 π.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	**Threshold ERP (watts)**
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.
Note: R is in meters, f is in MHz.	

2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For Iron Radio 1

For Antenna set 11

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	4.00	25.58	29.58	0.50	30.08	1.01859	100	0.00811	1.00000
2.4G;D1D-BF	10.02	23.44	33.46	0.50	33.96	2.48886	100	0.01981	1.00000

For Antenna set 2

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;G1D	13.00	20.84	33.84	0.50	34.34	2.71644	100	0.02162	1.00000
2.4G;D1D-BF	16.01	19.49	35.50	0.49	35.99	3.97192	100	0.03161	1.00000

For Antenna set 3

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	3.00	20.97	23.97	0.50	24.47	0.27990	100	0.00223	1.00000
5.2G;D1D-BF 2T1S	6.01	17.80	23.81	0.50	24.31	0.26977	100	0.00215	1.00000
5.2G;D1D-BF 4T1S	9.02	14.95	23.97	0.50	24.47	0.27990	100	0.00223	1.00000
5.3G;D1D	3.00	23.97	26.97	0.50	27.47	0.55847	100	0.00444	1.00000
5.3G;D1D-BF 2T1S	6.01	23.79	29.80	0.50	30.30	1.07152	100	0.00853	1.00000
5.3G;D1D-BF 4T1S	9.02	20.93	29.95	0.50	30.45	1.10917	100	0.00883	1.00000
5.6G;D1D	3.00	23.97	26.97	0.50	27.47	0.55847	100	0.00444	1.00000
5.6G;D1D-BF 2T1S	6.01	23.95	29.96	0.50	30.46	1.11173	100	0.00885	1.00000
5.6G;D1D-BF 4T1S	9.02	20.83	29.85	0.50	30.35	1.08393	100	0.00863	1.00000
5.8G;D1D	3.00	28.17	31.17	0.50	31.67	1.46893	100	0.01169	1.00000
5.8G;D1D-BF 2T1S	6.01	24.66	30.67	0.50	31.17	1.30918	100	0.01042	1.00000
5.8G;D1D-BF 4T1S	9.02	26.89	35.91	0.08	35.99	3.97192	100	0.03161	1.00000
4.9G	9.02	22.16	31.18	0.50	31.68	1.47231	100	0.01172	1.00000

For Antenna set 9

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)
4.9G	19.05	22.13	41.18	0.50	41.68	14.72313	100	0.11716	1.00000

For Antenna set 10 P to M

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	18.53	15.84	34.37	0.50	34.87	3.06902	100	0.02442	1.00000
5.2G;D1D-BF 2T1S	18.53	15.84	34.37	0.50	34.87	3.06902	100	0.02442	1.00000
5.2G;D1D-BF 4T1S	21.54	4.92	26.46	0.50	26.96	0.49659	100	0.00395	1.00000
5.3G;D1D	18.53	11.33	29.86	0.50	30.36	1.08643	100	0.00865	1.00000
5.3G;D1D-BF 2T1S	18.53	11.08	29.61	0.50	30.11	1.02565	100	0.00816	1.00000
5.3G;D1D-BF 4T1S	21.54	4.20	25.74	0.50	26.24	0.42073	100	0.00335	1.00000
5.6G;D1D	18.53	11.44	29.97	0.50	30.47	1.11429	100	0.00887	1.00000
5.6G;D1D-BF 2T1S	18.53	11.44	29.97	0.50	30.47	1.11429	100	0.00887	1.00000
5.6G;D1D-BF 4T1S	21.54	5.50	27.04	0.50	27.54	0.56754	100	0.00452	1.00000
5.8G;D1D	18.53	16.46	34.99	0.50	35.49	3.53997	100	0.02817	1.00000
5.8G;D1D-BF 2T1S	18.53	16.46	34.99	0.50	35.49	3.53997	100	0.02817	1.00000
5.8G;D1D-BF 4T1S	21.54	4.87	26.41	0.50	26.91	0.49091	100	0.00391	1.00000

For Antenna set 10 P to P

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	18.53	15.84	34.37	0.50	34.87	3.06902	100	0.02442	1.00000
5.2G;D1D-BF	18.53	15.84	34.37	0.50	34.87	3.06902	100	0.02442	1.00000
5.3G;D1D	18.53	11.33	29.86	0.50	30.36	1.08643	100	0.00865	1.00000
5.3G;D1D-BF	18.53	11.08	29.61	0.50	30.11	1.02565	100	0.00816	1.00000
5.6G;D1D	18.53	11.44	29.97	0.50	30.47	1.11429	100	0.00887	1.00000
5.6G;D1D-BF	18.53	11.44	29.97	0.50	30.47	1.11429	100	0.00887	1.00000
5.8G;D1D	18.53	16.46	34.99	0.50	35.49	3.53997	100	0.02817	1.00000
5.8G;D1D-BF	18.53	16.46	34.99	0.50	35.49	3.53997	100	0.02817	1.00000

For Pine Radio 2

For Antenna set 3

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	3.00	20.91	23.91	0.50	24.41	0.27606	100	0.00220	1.00000
5.2G;D1D-BF 2T1S	6.01	17.96	23.97	0.50	24.47	0.27990	100	0.00223	1.00000
5.2G;D1D-BF 4T1S	9.02	14.89	23.91	0.50	24.41	0.27606	100	0.00220	1.00000
5.3G;D1D	3.00	21.77	24.77	0.50	25.27	0.33651	100	0.00268	1.00000
5.3G;D1D-BF 2T1S	6.01	18.89	24.90	0.50	25.40	0.34674	100	0.00276	1.00000
5.3G;D1D-BF 4T1S	9.02	20.87	29.89	0.50	30.39	1.09396	100	0.00871	1.00000
5.6G;D1D	3.00	22.48	25.48	0.50	25.98	0.39628	100	0.00315	1.00000
5.6G;D1D-BF 2T1S	6.01	18.48	24.49	0.50	24.99	0.31550	100	0.00251	1.00000
5.6G;D1D-BF 4T1S	9.02	20.78	29.80	0.50	30.30	1.07152	100	0.00853	1.00000
5.8G;D1D	3.00	23.33	26.33	0.50	26.83	0.48195	100	0.00384	1.00000
5.8G;D1D-BF 2T1S	6.01	19.44	25.45	0.50	25.95	0.39355	100	0.00313	1.00000
5.8G;D1D-BF 4T1S	9.02	23.33	32.35	0.50	32.85	1.92752	100	0.01534	1.00000
4.9G	9.02	19.48	28.50	0.50	29.00	0.79433	100	0.00632	1.00000

For Antenna set 9

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)
4.9G	19.05	19.45	38.50	0.50	39.00	7.94328	100	0.06321	1.00000

For Antenna set 10 P to M

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	18.53	17.17	35.70	0.29	35.99	3.97192	100	0.03161	1.00000
5.2G;D1D-BF 2T1S	18.53	17.17	35.70	0.29	35.99	3.97192	100	0.03161	1.00000
5.2G;D1D-BF 4T1S	21.54	14.25	35.79	0.20	35.99	3.97192	100	0.03161	1.00000
5.3G;D1D	18.53	11.39	29.92	0.50	30.42	1.10154	100	0.00877	1.00000
5.3G;D1D-BF 2T1S	18.53	11.39	29.92	0.50	30.42	1.10154	100	0.00877	1.00000
5.3G;D1D-BF 4T1S	21.54	8.15	29.69	0.50	30.19	1.04472	100	0.00831	1.00000
5.6G;D1D	18.53	11.43	29.96	0.50	30.46	1.11173	100	0.00885	1.00000
5.6G;D1D-BF 2T1S	18.53	11.43	29.96	0.50	30.46	1.11173	100	0.00885	1.00000
5.6G;D1D-BF 4T1S	21.54	8.43	29.97	0.50	30.47	1.11429	100	0.00887	1.00000
5.8G;D1D	18.53	17.45	35.98	0.01	35.99	3.97192	100	0.03161	1.00000
5.8G;D1D-BF 2T1S	18.53	17.42	35.95	0.04	35.99	3.97192	100	0.03161	1.00000
5.8G;D1D-BF 4T1S	21.54	14.38	35.92	0.07	35.99	3.97192	100	0.03161	1.00000

For Antenna set 10 P to P

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	18.53	18.10	36.63	-0.64	35.99	3.97192	100	0.03161	1.00000
5.2G;D1D-BF	18.53	18.10	36.63	-0.64	35.99	3.97192	100	0.03161	1.00000
5.3G;D1D	18.53	11.39	29.92	0.50	30.42	1.10154	100	0.00877	1.00000
5.3G;D1D-BF	18.53	11.39	29.92	0.50	30.42	1.10154	100	0.00877	1.00000
5.6G;D1D	18.53	11.43	29.96	0.50	30.46	1.11173	100	0.00885	1.00000
5.6G;D1D-BF	18.53	11.43	29.96	0.50	30.46	1.11173	100	0.00885	1.00000
5.8G;D1D	18.53	18.37	36.90	-0.91	35.99	3.97192	100	0.03161	1.00000
5.8G;D1D-BF	21.54	17.44	38.98	-2.99	35.99	3.97192	100	0.03161	1.00000

For Scanning Radio 3

For Antenna set 11

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	4.00	21.16	25.16	0.50	25.66	0.36813	100	0.00293	1.00000

For Antenna set 2

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;G1D	13.00	20.93	33.93	0.50	34.43	2.77332	100	0.02207	1.00000

For Antenna set 3

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	3.00	16.48	19.48	0.50	19.98	0.09954	100	0.00079	1.00000
5.3G;D1D	3.00	15.81	18.81	0.50	19.31	0.08531	100	0.00068	1.00000
5.6G;D1D	3.00	16.86	19.86	0.50	20.36	0.10864	100	0.00086	1.00000
5.8G;D1D	3.00	17.36	20.36	0.50	20.86	0.12190	100	0.00097	1.00000

For Antenna set 10 P to M

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	18.53	15.33	33.86	0.50	34.36	2.72898	100	0.02172	1.00000
5.3G;D1D	18.53	11.29	29.82	0.50	30.32	1.07647	100	0.00857	1.00000
5.6G;D1D	18.53	11.43	29.96	0.50	30.46	1.11173	100	0.00885	1.00000
5.8G;D1D	18.53	16.92	35.45	0.50	35.95	3.93550	100	0.03132	1.00000

For Antenna set 10 P to P

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	18.53	15.33	33.86	0.50	34.36	2.72898	100	0.02172	1.00000
5.3G;D1D	18.53	11.29	29.82	0.50	30.32	1.07647	100	0.00857	1.00000
5.6G;D1D	18.53	11.43	29.96	0.50	30.46	1.11173	100	0.00885	1.00000
5.8G;D1D	18.53	16.92	35.45	0.50	35.95	3.93550	100	0.03132	1.00000

For Radio 4

For Antenna set 11

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;F1D	4.00	14.89	18.89	0.50	19.39	0.08690	100	0.00069	1.00000

For Antenna set 2

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;F1D	13.00	14.81	27.81	0.50	28.31	0.67764	100	0.00539	1.00000

MPE Exemption Option C							
Frequency (MHz)	λ/2π (m)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	MPE Exemption
2437 (Iron R1)	0.0196	1	35.99	33.84	2.421	19.200	Complies
4980 (Iron R1: 4.9G)	0.0096		41.68	39.53	8.974	19.200	Complies
4980 (Pine R2: 4.9G)	0.0096		39.00	36.85	4.842	19.200	Complies
2440 (R4: Bluetooth)	0.0196		28.31	26.16	0.413	19.200	Complies
2437 (Scanning Radio 3: 2.4G)	0.0196		34.43	32.28	1.690	19.200	Complies
5795 (Scanning Radio 3: 5G port 1)	0.0082		35.95	33.80	2.399	19.200	Complies
5795 (Scanning Radio 3: 5G port 2)	0.0082		35.95	33.80	2.399	19.200	Complies

Simultaneous Transmission Analysis Mode:

Mode 1: Iron R1 (2.4GHz) + Iron R1 (4.9GHz / 5GHz) + Pine R2 (4.9GHz / 5GHz) + Scanning R3 (2.4GHz) + R4 (Bluetooth)

Simultaneous Transmissions Option C							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
2437	1	35.99	33.84	2.421	19.200	0.96	<= 1
4980		41.68	39.53	8.974	19.200		
4980		39.00	36.85	4.842	19.200		
2440		28.31	26.16	0.413	19.200		
2437		34.43	32.28	1.690	19.200		

Mode 2: Iron R1 (2.4GHz) + Iron R1 (4.9GHz / 5GHz) + Pine R2 (4.9GHz / 5GHz) + Scanning R3 (5GHz port 2 set 10) + R4 (Bluetooth)

Simultaneous Transmissions Option C							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
2437	1	35.99	33.84	2.421	19.200	0.99	<= 1
4980		41.68	39.53	8.974	19.200		
4980		39.00	36.85	4.842	19.200		
2440		28.31	26.16	0.413	19.200		
5795		35.95	33.80	2.399	19.200		

Mode 3: Iron R1 (2.4GHz) + Iron R1 (4.9GHz / 5GHz) + Pine R2 (4.9GHz / 5GHz) + Scanning R3 (5GHz port 1 set 10) + R4 (Bluetooth)

Simultaneous Transmissions Option C							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
2437	1	35.99	33.84	2.421	19.200	0.99	<= 1
4980		41.68	39.53	8.974	19.200		
5745		39.00	36.85	4.842	19.200		
2440		28.31	26.16	0.413	19.200		
5795		35.95	33.80	2.399	19.200		

———THE END———