

MPE Estimates

Only the following combinations of ratios are permitted in the Extended Temperature Multimode:
 A. DSSS Radio (FCC ID: S57 - 51306343) and TWO 802.11a/b/g Radio (FCC ID: S57 - DCM-82)
 B. FHSS Radio (FCC ID: S57 - WNMNFHSS) and TWO 802.11a/b/g Radio (FCC ID: S57 - DCM-82)

NOTE:

*The DSSS Radio (FCC ID: S57 - 51306343) and the FHSS Radio (FCC ID: S57 - WNMNFHSS) are never permitted to be co-located.

Multinode FHSS Radio FCC ID: S57 - WNMNFHSS
 Multinode FHSS Radio Industry Canada ID: 5731 - WNMNFHSS

Multinode 2.4GHz FHSS Radio

Application	Antenna Type	Antenna Part No.	Transmit Frequency (MHz)	Max Peak Conducted Output Power (mW)	Antenna Gain (dBi)	Minimum Antenna Cable Loss (dB)	Power Density @ 20 cm (mW/cm ²)	General Population Exposure Limit from 1.1310 (mW/cm ²)	Ratio of Power Density to the Exposure Limit
Integral Co-located	Omni	SMARTANT HDG040-052160	2.402 - 2.482	96.161	5	0	0.060	1.00	0.060496
Remote	Hyperlink HD71449L-100	SmartAnt SAAD5-220920	2.402 - 2.482	94.07	8	0.9	0.066	1.00	0.066576
Not Co-located	Omni	SmartAnt SAAD5-220920	2.402 - 2.482	17.5	14	0.9	0.071	1.00	0.071083
Not Co-located	Sector 120 deg.	Hyperlink HDG144P-120	2.402 - 2.482	90.36	8	0.9	0.062	1.00	0.062195
Not Co-located	Sector 120 deg.	Hyperlink HDG144P-120	2.402 - 2.482	90.36	14	0.9	0.067	1.00	0.067024

Overall Worst Case Ratio of Power Density to the Exposure Limit: 0.071083

Worst Case Co-located Antenna Ratio of Power Density to the Exposure Limit: 0.060496

Multinode DSSS Radio FCC ID: S57 - 51306343

Multinode DSSS Radio Industry Canada ID: 5731 - 51306343

Multinode 2.4GHz DSSS Radio, has the worst case output power density as compared to the FHSS radio.

Application	Antenna Type	Antenna Part No.	Transmit Frequency (MHz)	Max Peak Conducted Output Power (mW)	Antenna Gain (dBi)	Power Density @ 20 cm (mW/cm ²)	General Population Exposure Limit from 1.1310 (mW/cm ²)	Ratio of Power Density to the Exposure Limit	
Integral Co-located	Omni	SmartAnt HDG040-052160	2.402 - 2.482	99.08	5	0	0.062	1.00	0.062233
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Integral Co-located	Omni	SmartANT HDG040-052160	2.402 - 2.482	99.08	5	0	0.062	1.00	0.062233
Not Co-located	Omni	Hyperlink HD71449L-100	2.402 - 2.482	90.36	8	0.9	0.062	1.00	0.062195
Not Co-located	Sector 120 deg.	Hyperlink HDG144P-120	2.402 - 2.482	90.36	14	0.9	0.067	1.00	0.067024

Overall Worst Case Ratio of Power Density to the Exposure Limit: 0.367034

Worst Case Co-located Antenna Ratio of Power Density to the Exposure Limit: 0.062333

FCC ID: S57-DCMA-82

Industry Canada ID: 5731-DCMA-82

802.11 (a,b,g) BridgeMesh Radio

Application	Antenna Type	Antenna Part No.	Transmit Frequency (MHz)	Max Peak Conducted Output Power (mW)	Antenna Gain (dBi)	Minimum Antenna Cable Loss (dB)	Power Density @ 20 cm (mW/cm ²)	General Population Exposure Limit from 1.1310 (mW/cm ²)	Ratio of Power Density to the Exposure Limit
Integral Co-located	Omni	AIR802 AN00Q210XW	2.412 - 2.462	147	3.5	0	0.065	1.00	0.065471
Integral Co-located	Omni	AIR802 AN00Q210XW	5.745 - 5.825	446.68	5.3	0	0.301	1.00	0.301111
Integral Co-located	Omni	SmartAnt SAAD5-220920	2.412 - 2.462	147	5.5	0	0.104	1.00	0.103764
Integral Co-located	Omni	SmartAnt SAAD5-220920	5.745 - 5.825	330	8.5	0	0.465	1.00	0.464476
Not Co-located	Omni	Hyperlink HDV2009L	2.412 - 2.462	120	8	0.9	0.122	1.00	0.122437
Not Co-located	Omni	Hyperlink HDG144P-120	5.745 - 5.825	234.42	12	1.8	0.488	1.00	0.488343
Not Co-located	Sector 120 deg.	Hyperlink HDG144P-120	2.412 - 2.462	88.2	14	2.4	0.254	1.00	0.253629
Not Co-located	Sector 90 deg.	Hyperlink HDG144P-90	5.745 - 5.825	75.96	17	1.8	0.500	1.00	0.499739
Not Co-located	Yagi 19 dBi	Telex S816AB	5.745 - 5.825	75.86	16.5	1.8	0.445	1.00	0.445303

Overall Worst Case Ratio of Power Density to the Exposure Limit: 0.589911

Worst Case Co-located Antenna Ratio of Power Density to the Exposure Limit: 0.464776

FCC ID: S57-DCMA-82

Industry Canada ID: 5731-DCMA-82

802.11 (a,b,g) Access Point

Application	Antenna Type	Antenna Part No.	Transmit Frequency (MHz)	Max Peak Conducted Output Power (mW)	Antenna Gain (dBi)	Minimum Antenna Cable Loss (dB)	Power Density @ 20 cm (mW/cm ²)	General Population Exposure Limit from 1.1310 (mW/cm ²)	Ratio of Power Density to the Exposure Limit
Integral Co-located	Omni	AIR802 AN00Q210XW	2.412 - 2.462	147	3.5	0	0.065	1.00	0.065471
Integral Co-located	Omni	AIR802 AN00Q210XW	5.745 - 5.825	446.68	6.3	0	0.301	1.00	0.301111
Integral Co-located	Omni	SmartAnt SAAD5-220920	2.412 - 2.462	147	5.5	0	0.104	1.00	0.103764
Integral Co-located	Omni	SmartAnt SAAD5-220920	5.745 - 5.825	330	8.5	0	0.465	1.00	0.464476
Not Co-located	Omni	Hyperlink HDV2009L	2.412 - 2.462	120	8	0.9	0.122	1.00	0.122437
Not Co-located	Omni	Hyperlink HDG144P-120	5.745 - 5.825	234.42	12	1.8	0.488	1.00	0.488543
Not Co-located	Sector 120 deg.	Hyperlink HDG144P-120	2.412 - 2.462	88.2	14	2.4	0.254	1.00	0.253629
Not Co-located	Sector 90 deg.	Hyperlink HDG144P-90	5.745 - 5.825	75.96	17	1.8	0.500	1.00	0.499739
Not Co-located	Yagi 19 dBi	Telex S816AB	5.745 - 5.825	75.86	16.5	1.8	0.445	1.00	0.445303

Overall Worst Case Ratio of Power Density to the Exposure Limit: 0.589911

Worst Case Co-located Antenna Ratio of Power Density to the Exposure Limit: 0.464776

MPE Estimates for Self Co-located Device

802.11 (a,b,g) BridgeMesh	802.11 (a,b,g) Access Point	Sum of Worst Case Ratios (Power Density to the Exposure Limit)	FCC Limit (Power Density to the Exposure Limit)	Ratio of Power Density to the Exposure Limit
0.06233	0.44578	0.46478	0.39180	1.0

PASS

The results shown in the above table are equivalent to the Sum of the EIRP of the Two Co-located Transmitters (EIRP TX1 + EIRP TX2) compared to the exposure limit. The benefit of this method, is that accounts for transmitters operating at different frequencies against different exposure limits.

RF Safety Statement

To comply with FCC's and Industry Canada's RF exposure requirements, the following antenna installation and device operating configurations must be satisfied.

- Remote Point-to-Multi-Point antenna(s) for this unit must be fixed and mounted on outdoor permanent structures with a separation distance between the antenna(s) and the human operator of at least 20cm.
- Remote Fixed Point-to-Point antenna(s) for this unit must be fixed and mounted on outdoor permanent structures with a separation distance between the antenna(s) and the human operator of at least 100cm from all persons.
- Furthermore, when using integral antenna(s) the Multinode unit must not be co-located with any other antenna or transmitter device and have a separation distance of at least 20cm from all persons.

$$P_{app} = (P_{ave}^2/G_{linear})4\pi r^2$$

$G_{linear} = \text{antGain}/(\text{GdB} \times 10)$

NOTE: The max peak conducted output power has been reduced from what was tested, in order to comply with MPE limits. This has been accounted for in the professional installation guide ERP limits.

Also, the SmartAnt SAAD5-220920 was originally tested assuming a worst case gain of 5.5dBi @ 2.4GHz and 8.5dBi @ 5GHz. The actual gain values are 4dBi @ 2.4GHz and 7dBi @ 5GHz. Refer to Honeywell document 51506334.

This has also been accounted for in the professional installation guide. However, for the MPE calculations the

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