

# MPE Estimates

FCC ID: S57 - 51306343  
Industry Canada ID: 5731 - 51306343

$P_{app} = (P_{mit}/G_{linear})/4\pi r^2$   
Glinear = antlog(Gdb/10)

## Multinode 2.4GHz DSSS-FH Radio

Application	Antenna Type	Antenna Part No.	Transmit Frequency	Max Peak Conducted Output Power	Antenna Gain	Minimum Antenna Cable Loss	Power Density @ 20 cm	General Population Exposure Limit from 1.1310	Ratio of Power Density to the Exposure Limit
			(MHz)	(mW)	(dBi)	(dB)	(mW/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )	
Integral Co-located	Omni	PacWireless OD24M-S Honeywell 5150634-101	2,402 - 2,482	99.08	5	0	0.062	1.00	0.062333
Integral Co-located	Omni	SMARTANT SAA04-220080 Honeywell 5150634-101	2,402 - 2,482	99.08	5	0	0.062	1.00	0.062333
Integral Co-located	Omni	SMARTANT HON04-052160 Honeywell 5150634-100	2,402 - 2,482	99.08	5	0	0.062	1.00	0.062333
Remote Not Co-located	Omni	Hyperlink HC1-2409U Honeywell 50018414-001	2,402 - 2,483	90.36	8	0.9	0.092	1.00	0.092195
Remote Not Co-located	Sector 120 deg.	Hyperlink HG2414P-120	2,402 - 2,484	90.36	14	0.9	0.367	1.00	0.367034

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 - WNMNCM9  
Industry Canada ID: 5731 - WNMNCM9

## 802.11 (a,b,g) Bridge/Mesh Radio

Application	Antenna Type	Antenna Part No.	Transmit Frequency	Max Peak Conducted Output Power	Antenna Gain	Minimum Antenna Cable Loss	Power Density @ 20 cm	General Population Exposure Limit from 1.1310	Ratio of Power Density to the Exposure Limit
			(MHz)	(mW)	(dBi)	(dB)	(mW/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )	
Integral Co-located	Omni	SMARTANT SAA04-220080	2,412 - 2,462	57.28	4.5	0	0.032	1.00	0.032117
Integral Co-located	Omni	SMARTANT SAA04-220080	5,745 - 5,825	264.24	7	0	0.263	1.00	0.263469
Remote Not Co-located	Omni	Hyperlink HGV2409U	2,412 - 2,462	57.28	8	0.9	0.058	1.00	0.058443
Remote Not Co-located	Omni	Hyperlink HG5812U-PRO	5,745 - 5,825	264.24	12	1.8	0.550	1.00	0.550464
Remote Not Co-located	Sector 120 deg.	Hyperlink HG2414SP-120	2,412 - 2,462	57.28	14	2.4	0.165	1.00	0.164715
Remote Not Co-located	Sector 90 deg.	Hyperlink HG5817P-090	5,745 - 5,825	73.11	17	1.8	0.482	1.00	0.481623
Remote Not Co-located	Yagi 19 deg.	Telex 5816AB	5,745 - 5,825	73.11	16.5	1.8	0.429	1.00	0.429247

Application	Antenna Type	Antenna Part No.	Transmit Frequency	Max Peak Conducted Output Power	Antenna Gain	Minimum Antenna Cable Loss	Power Density @ 100 cm	General Population Exposure Limit from 1.1310	Ratio of Power Density to the Exposure Limit
Remote Not Co-located Fixed Point to Point	Dish 9 deg.	Hyperlink HG5824D	5,745 - 5,825	264.24	24	1.8	0.349	1.00	0.348970

Overall Worst Case Ratio of Power Density to the Exposure Limit: 0.550464  
Worst Case Co-located Antenna Ratio of Power Density to the Exposure Limit: 0.263469

FCC ID: S57 - WNMNCM9  
Industry Canada ID: 5731 - WNMNCM9

## 802.11 (a,b,g) Access Point / Client Radio

Application	Antenna Type	Antenna Part No.	Transmit Frequency	Max Peak Conducted Output Power	Antenna Gain	Minimum Antenna Cable Loss	Power Density @ 20 cm	General Population Exposure Limit from 1.1310	Ratio of Power Density to the Exposure Limit
			(MHz)	(mW)	(dBi)	(dB)	(mW/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )	
Integral Co-located	Omni	SMARTANT SAA04-220080	2,412 - 2,462	57.28	4.5	0	0.032	1.00	0.032117
Integral Co-located	Omni	SMARTANT SAA04-220080	5,745 - 5,825	264.24	7	0	0.263	1.00	0.263469
Remote Not Co-located	Omni	Hyperlink HGV2409U	2,412 - 2,462	57.28	8	0.9	0.058	1.00	0.058443
Remote Not Co-located	Omni	Hyperlink HG5812U-PRO	5,745 - 5,825	264.24	12	1.8	0.550	1.00	0.550464
Remote Not Co-located	Sector 120 deg.	Hyperlink HG2414SP-120	2,412 - 2,462	57.28	14	2.4	0.165	1.00	0.164715
Remote Not Co-located	Sector 90 deg.	Hyperlink HG5817P-090	5,745 - 5,825	73.11	17	1.8	0.482	1.00	0.481623
Remote Not Co-located	Yagi 19 deg.	Telex 5816AB	5,745 - 5,825	73.11	16.5	1.8	0.429	1.00	0.429247

Application	Antenna Type	Antenna Part No.	Transmit Frequency	Max Peak Conducted Output Power	Antenna Gain	Minimum Antenna Cable Loss	Power Density @ 100 cm	General Population Exposure Limit from 1.1310	Ratio of Power Density to the Exposure Limit
Remote Not Co-located Fixed Point to Point	Dish 9 deg.	Hyperlink HG5824D	5,745 - 5,825	264.24	24	1.8	0.349	1.00	0.348970

Overall Worst Case Ratio of Power Density to the Exposure Limit: 0.550464  
Worst Case Co-located Antenna Ratio of Power Density to the Exposure Limit: 0.263469

## MPE Estimates for Self Co-located Device

FHSS Radio Worst Case Ratio of Power Density to the Exposure Limit	802.11 (a,b,g) Bridge/Mesh Radio Worst Case Ratio of Power Density to the Exposure Limit	802.11 (a,b,g) Access Point/Client Radio Worst Case Ratio of Power Density to the Exposure Limit	Sum of Worst Case Ratios (Power Density to the Exposure Limit)	FCC Limit for Sum of Worst Case Ratios
0.06233	0.26347	0.26347	0.58927	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) of greater than 20cm and a separation distance of at least 20cm from all persons.
- 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) of greater than 20cm and a separation distance 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.