MPE Calculations

Systems operating under the provision of 47 CFR 1.1307(b)(1) shall be operated in a manor that ensures that the public is not exposed to radio frequency energy levels in excess of the FCC guidelines.

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user or nearby persons and can therefore be considered a mobile transmitter per 47 CFR 2.1091(b). The MPE calculation for this exposure is shown below.

Using the Antennas with highest output power:

The peak radiated output power (EIRP) is calculated as follows:

Antenna	*Frequency (GHz)*	*Power input to the antenna (P) (dBm)*	*Power gain of the antenna (G) (dBi)*	*EIRP (P+G) (dBm)*	*EIRP $Log^{-1(dBm/10)}$ (mW)*
WNC (Acer Solution 2)	5	23.30	4.09	27.39	548.28
WNC (Acer Solution 2)	2.4	24.10	2.00	26.10	407.38
WNC (Acer TravelMate 4050)	5	23.30	2.86	26.16	413.05
WNC (Acer TravelMate 4050)	2.4	24.10	0.66	24.76	299.23
Foxconn (Sony I306)	5	23.30	-0.55	22.75	188.36
Foxconn (Sony I306)	2.4	24.10	-2.17	21.93	155.96
Phycomp/Yageo (Sony I275)	5	23.30	4.00	27.30	537.03
Phycomp/Yageo (Sony I275)	2.4	24.10	0.60	24.70	295.12
Amphenol (Samsung Neon)	5	23.30	4.12	27.42	552.08
Amphenol (Samsung Neon)	2.4	24.10	0.45	24.55	285.10
Hitachi (Sumsung Neon)	5	23.30	1.92	25.22	332.66
Hitachi (Sumsung Neon)	2.4	24.10	1.84	25.94	392.64

EIRP = P + G
Where
P = Power input to the antenna (mW).
G = Power gain of the antenna (dBi)

The numeric gain (G) of the antenna with a gain specified in dB is determined by:

Antenna	*Frequency (GHz)*	*Antenna Gain (G) (dBi)*	*Numeric Antenna Gain* $Log^{-1(dBm/10)}$ *(dB)*
WNC (Acer Solution 2)	5	4.09	2.56
WNC (Acer Solution 2)	2.4	2.00	1.58
WNC (Acer TravelMate 4050)	5	2.86	1.93
WNC (Acer TravelMate 4050)	2.4	0.66	1.16
Foxconn (Sony I306)	5	-0.55	0.88
Foxconn (Sony I306)	2.4	-2.17	0.61
Phycomp/Yageo (Sony I275)	5	4.00	2.51
Phycomp/Yageo (Sony I275)	2.4	0.60	1.15
Amphenol (Samsung Neon)	5	4.12	2.58
Amphenol (Samsung Neon)	2.4	0.45	1.11
Hitachi (Sumsung Neon)	5	1.92	1.56
Hitachi (Sumsung Neon)	2.4	1.84	1.53

$G = Log^{-1}$ (dB antenna gain/10)

Power density at the specific separation:

Antenna	*Frequency (GHz)*	*Power input to the antenna (P) (mW)*	*Numeric Power Gain of the Antenna (G) (dB)*	*Maximum Power Spectral Density $S=PG/(4R^2\pi)$ (mW/cm^2)*	*Maximum Power Spectral Density Limit (mW/cm^2)*
WNC (Acer Solution 2)	5	213.80	2.56	0.11	1.00
WNC (Acer Solution 2)	2.4	257.04	1.58	0.08	1.00
WNC (Acer TravelMate 4050)	5	213.80	1.93	0.08	1.00
WNC (Acer TravelMate 4050)	2.4	257.04	1.16	0.06	1.00
Foxconn (Sony I306)	5	213.80	0.88	0.04	1.00
Foxconn (Sony I306)	2.4	257.04	0.61	0.03	1.00
Phycomp/Yageo (Sony I275)	5	213.80	2.51	0.11	1.00
Phycomp/Yageo (Sony I275)	2.4	257.04	1.15	0.06	1.00
Amphenol (Samsung Neon)	5	213.80	2.58	0.11	1.00
Amphenol (Samsung Neon)	2.4	257.04	1.11	0.06	1.00
Hitachi (Sumsung Neon)	5	213.80	1.56	0.07	1.00
Hitachi (Sumsung Neon)	2.4	257.04	1.53	0.08	1.00

$S = PG/(4R^2\pi)$

Where

S = Maximum power density (mW/cm^2)

P = Power input to the antenna (mW).

G = Numeric power gain of the antenna

R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The maximum permissible exposure (MPE) for the general population is $1mW/cm^2$.

The power density at 20cm does not exceed the $1mW/cm^2$ limit. Therefore, the exposure condition is compliant with FCC rules.