6 §1.1307(b) (1), §2.1091 & 101.1525 - RF EXPOSURE

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f^2)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

MPE Prediction

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01

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

Where: S = power density
    P = power input to antenna
    G = power gain of the antenna in the direction of interest relative to an isotropic radiator
    R = distance to the center of radiation of the antenna

EUT with 24" 51 dBi Antenna

73.85 GHz Transmitter

Maximum peak output power at antenna input terminal:	13.20 (dBm)
Maximum peak output power at antenna input terminal:	20.89(mW)
Prediction distance:	480 (cm)
Predication frequency:	73850 (MHz)
Antenna Gain (typical):	51 (dBi)
antenna gain:	125892 (numeric)
Power density at predication frequency at 480 cm:	0.908 (mW/cm^2)
MPE limit for uncontrolled exposure at prediction frequency:	1 (mW/cm^2)

74.76 GHz Transmitter

Maximum peak output power at antenna input terminal:	10.62 (dBm)
Maximum peak output power at antenna input terminal:	11.53 (mW)
Prediction distance:	350 (cm)
Predication frequency:	74760 (MHz)
Antenna Gain (typical):	51 (dBi)
antenna gain:	125892 (numeric)
Power density at predication frequency at 350 cm:	0.943 (mW/cm^2)
MPE limit for uncontrolled exposure at prediction frequency:	1 (mW/cm^2)

EUT with 12" 43 dBi Antenna

73.85 GHz Transmitter

Maximum peak output power at antenna input terminal:	13.20 (dBm)
Maximum peak output power at antenna input terminal:	20.89(mW)
Prediction distance:	190 (cm)
Predication frequency:	73850 (MHz)
Antenna Gain (typical):	43 (dBi)
antenna gain:	19953 (numeric)
Power density at predication frequency at 190 cm:	0.918 (mW/cm^2)
MPE limit for uncontrolled exposure at prediction frequency:	1 (mW/cm^2)

74.76 GHz Transmitter

Maximum peak output power at antenna input terminal:	10.62 (dBm)
Maximum peak output power at antenna input terminal:	11.53 (mW)
Prediction distance:	140 (cm)
Predication frequency:	74760 (MHz)
Antenna Gain (typical):	43 (dBi)
antenna gain:	19953 (numeric)
Power density at predication frequency at 190 cm:	0.934 (mW/cm^2)
MPE limit for uncontrolled exposure at prediction frequency:	1 (mW/cm^2)

6.1 Test Result

Minimum operating distance for 24" 51 dBi antenna is 480 cm, and 190 cm for 12" 43 dBi antenna.

Please refer to the table below for summary of test results:

Antenna Size	Gain (dBi)	Frequency Setting (GHz)	Max Output Power (mW)	Prediction Distance (cm)	Power density at predication (mW/cm^2)	MPE limit (mW/cm^2)
24"	51	73.85	20.89	480	0.908	1.0
24"	51	74.76	11.53	350	0.943	1.0
12"	43	73.85	20.89	190	0.918	1.0
12"	43	74.76	11.53	140	0.934	1.0