TÜVRheinland®

Produkte
Products

MPE Calculation: 12024642 003

Client:	**Japan Radio Co., Ltd.** 1-1, Shimorenjaku 5-chome, Mitaka-shi, Tokyo 181-8510, Japan
Test item:	**Wireless Access System**
Identification:	**NTG-525EUL**

FCC Requirement

According to FCC 1.1307, table 1, local multipoint distribution services operating in the 24GHz band under FCC 101 subpart G are subject to routine environment evaluation if the output power EIRP is larger than 1640W.

In addition, the maximum permissible exposure (MPE) limit is specified in FCC 1.1310 and is given in the following table for:

Equipment Use	Frequency Range	Power Density [mW/cm^2]	Average Time [min]
General Population / Uncontrolled Exposure	1.5 – 100GHz	1	30

Power Density Evaluation

The maximum power densities for the different antennas to be used with the equipment are given in the following table:

Antenna Type	Maximum Antenna Gain G [dBi / num.]	Antenna Diameter D [cm]	Max. Conducted Output Power P [mW]	Maximum Output Power EIRP P_{EIRP} [W]	Max. Power Density in Near-Field [mW/cm^2]	Max. Power Density in Far-Field [mW/cm^2]
Flat Antenna (NAY-241R)	32.0dBi / 1584.9	16.0 (see Note)	28.84	45.71	0.512	0.219
Flat Antenna (NAY-2500)	32.0dBi / 1584.9	16.0 (see Note)	28.84	45.71	0.512	0.219
Parabolic antenna 0.6m (HP2-26)	41.5dBi / 14125.4	62.2	28.84	407.38	0.020	0.009
Parabolic antenna 0.3m (HPCPE-26)	35.9dBi / 3890.5	35.3	28.84	112.20	0.053	0.023

Calculation formulas:

Max. output power EIRP	$P_{EIRP} = PG$	
Max. power density in near-field:	$S_{nf} = 16\eta P / \pi D^2$	OET Bulletin 65 (13)
Aperture efficiency:	$\eta = (G\lambda^2/4\pi) / (\pi D^2/4)$	OET Bulletin 65 (14)
Max. power density in far-field:	$S_{ff} = PG / 4\pi R_{ff}^2$	OET Bulletin 65 (18)
Distance to beginning of far-field	$R_{ff} = 0.6\ D^2 / \lambda$	OET Bulletin 65 (16)

Where: G = maximum gain [numeric]
λ = wavelength at 25.15GHz (middle of operation band) in [cm] = 1.19cm
D = antenna diameter in [cm] (see Note)
P = maximum conducted output power in [mW]

MPE Calculation: 12024642 003

Note:

The flat antennas have a square shape. For calculation purpose, the diameter D is considered as the diameter of the largest circle that can fit inside the antenna square surface, to consider worst case conditions.

Conclusion

The device complies with the FCC RF exposure requirements since the maximum transmitter power densities (both in near-field and in far-field) are below the FCC limit. No routine environment evaluation is needed since the maximum EIRP output power is below the threshold specified for multipoint distribution services operating in the 24GHz band under FCC 101 subpart G.

Refer to test report 12024642 001 for more details.