The MPE Data of NKE-2255

Type NKE-2255-6HS, NKE-2255-7, NKE-2255-9
X-band Scanner Unit

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1. Regulation

47 CFR §1.1310 Radiofrequency radiation exposure

Table 1. LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(A) Limits for Occupational / Controlled Exposure

Frequency range [MHz]	Power density [mW/cm^2]	Averaging time [minutes]
1,5000-100,000	5.0	6

2. Result

Power density of NKE-2255-6HS, NKE-2255-7 and NKE-2255-9 are satisfied MPE limits (5.0mW/cm^2) in all region.

Calculated Maximum power density in all region

NKE-2255-6HS	NKE-2255-7	NKE-2255-9
1.348 mW/cm^2	0.934 mW/cm^2	0.576 mW/cm^2

3. Details

EUT	NKE-2255-6HS	NKE-2255-7	NKE-2255-9
$\mathbf{P}$	16250 mW		
$\mathbf{f}$	9410 MHz		
$\boldsymbol{\lambda}$	3.188 cm		
$\mathbf{G}$	30.1 dBi	30.5 dBi	31.9 dBi
$\mathbf{R_{nf}}$	2407.0 cm	3476.0 cm	5638.1 cm
$\mathbf{R_{ff}}$	5776.8 cm	8342.4 cm	13531.4 cm
$\mathbf{S_{nf}}$	1.348 mW/cm^2	0.934 mW/cm^2	0.576 mW/cm^2
$\mathbf{S_t\|_{max}}$	〃	〃	〃
$\mathbf{S_{ff}\|_{max}}$	0.040 mW/cm^2	0.021 mW/cm^2	0.011 mW/cm^2

※ $\mathbf{P}$ is maximum average power of the EUT. (Peak Power 25kW, Maximum Duty Cycle 0.00065)

※ $\mathbf{f}$ is typical value.

※ $\mathbf{G}$ is measured value refer to "The Test Data of Antenna".

Calculated by prediction method refer to "OET Bulletin 65" as follows:

$$\mathbf{R_{nf}} = \frac{\mathbf{D^2}}{\mathbf{4\lambda}}$$

$$\mathbf{R_{ff}} = \frac{\mathbf{0.6D^2}}{\boldsymbol{\lambda}}$$

$$\mathbf{S_{nf}} = \frac{\mathbf{16\eta P}}{\boldsymbol{\pi}\mathbf{D^2}}$$

$$\mathbf{S_t} = \frac{\mathbf{S_{nf}R_{nf}}}{\mathbf{R}} \rightarrow \mathbf{S_t|_{max}} = \frac{\mathbf{S_{nf}R_{nf}}}{\mathbf{R_{nf}}} = \mathbf{S_{nf}}$$

$$\mathbf{S_{ff}} = \frac{\mathbf{PG}}{\mathbf{4\pi R^2}} \rightarrow \mathbf{S_{ff}|_{max}} = \frac{\mathbf{PG}}{\mathbf{4\pi R_{ff}{}^2}}$$

$\mathbf{P}$: average power
$\boldsymbol{\lambda}$: wavelength
$\boldsymbol{\eta}$: aperture efficiency
$\mathbf{G}$: antenna gain
$\mathbf{D}$: maximum dimension of antenna
$\mathbf{R_{nf}}$: distance to extending of near-field
$\mathbf{R_{ff}}$: distance to beginning of far-field
$\mathbf{S_{nf}}$: power density in near-field region
$\mathbf{S_t}$: power density in transition region
$\mathbf{S_{ff}}$: power density in far-field region