

Multi-Spot Generator

Overview:

PowerPhotonic Multi-spot Generators are freeform diffractive optical elements (DOEs) designed to transform a single mode input beam into a multi spot array in the focal plane of a lens. The currently available output spot configurations are: (i) 1D line of spots, (ii) 2D rectangular array of spots, (iii) Hexagonal array of spots. All three configuration types are available as custom designs for specific input wavelength, number of output spots and spot separation.

The freeform grating structure design allows for much higher diffraction efficiencies than are available from commonly available traditional binary gratings, with efficiency values approaching mathematical design limits.

Multi-spot generators are increasingly important in applications that require parallel processing from a single laser. One such application is the surface micro-structuring of metal to produce, for example hydrophobic surfaces, using a femtosecond laser.

Multi-spot Generators are manufactured on fused silica, which has intrinsically high power-handling capabilities in both pulsed and CW operating regimes across a wide bandwidth.

The PowerPhotonic Effect:

>90%

Diffraction Efficiency

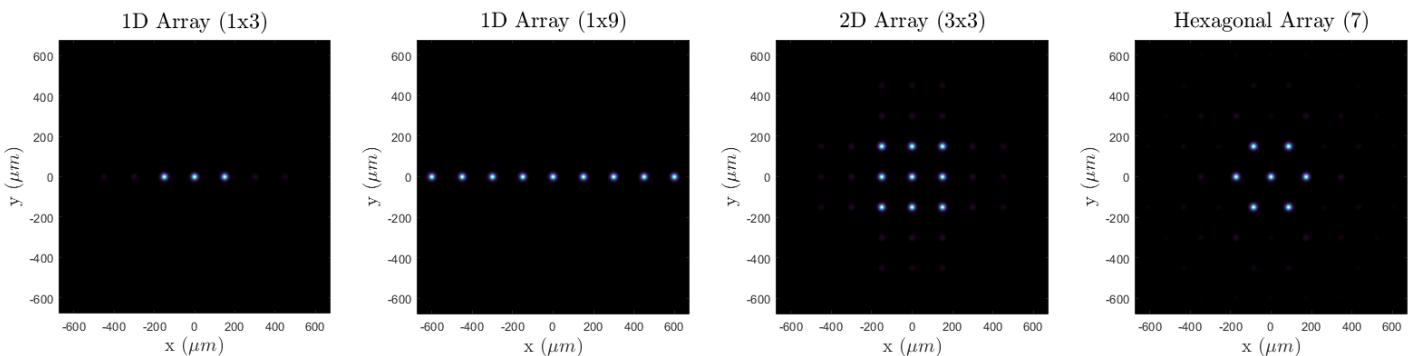
±2%

Spot-to-spot uniformity

50 kW

CW power

Sample Design Output Profiles:



Key Features:

- Low spot distortion
- High Efficiency
- High power handling (CW and pulsed)

Target Applications:

- Laser surface texturing
- Laser Machining (Cutting/Welding)
- Biomedical
- Laser additive manufacturing



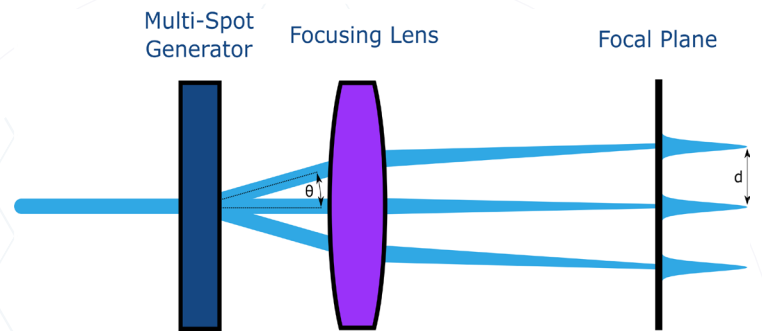
Multi-Spot Generator

Typical Part Specification

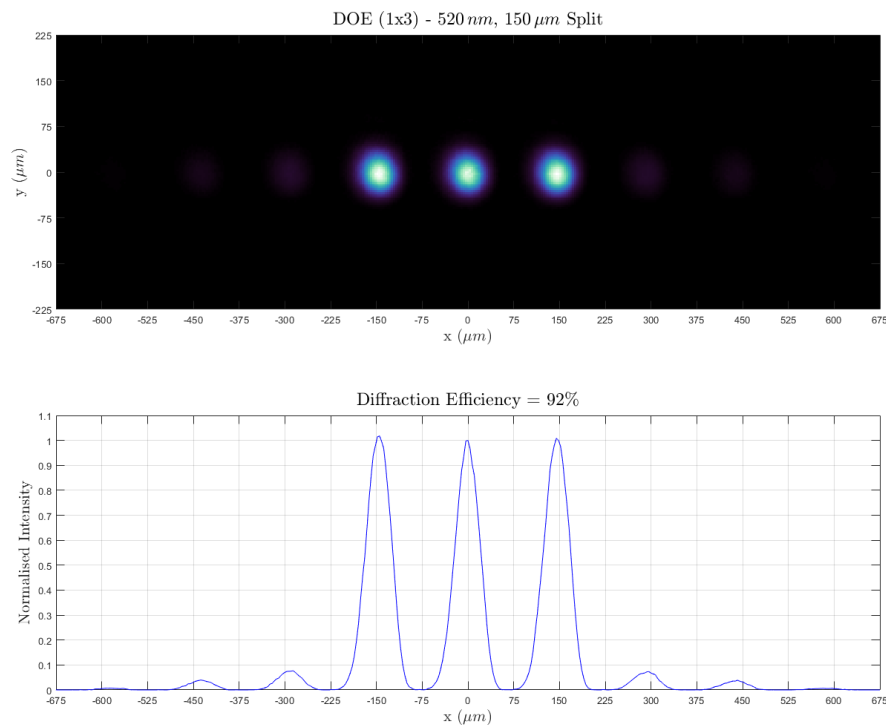
Parameter	Selectable Value
Wavelength	300 - 2000 nm
Input Beam Diameter	2-20mm
Spot Separation/Split Angle	Consult Powerphotonic, dependant on focal length and wavelength
Operation	Ultrashort Pulsed -CW

Excellent uniform distribution of power.

Typical System Set Up



Manufactured Part Measurement Data :



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