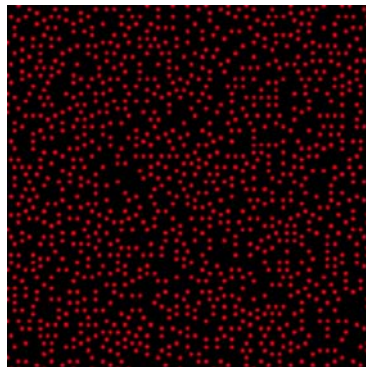


DE-R 384 Diffractive Optical Element

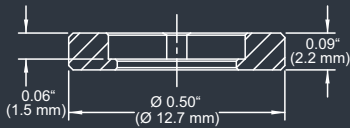


Random Dots Pattern

- **Element Number: DE-R 384**
- **Current Product Revision: A**
- Description: Random Pattern
- Number of Dots: 51978 Dots
- Substrate Material: Polycarbonate (PC)
- Size (Ø x Thickness): 8 x 0.63 mm
- Minimum Recommended Beam Diameter: 2-3 mm
- Design Wavelength: 640 nm
- Recommended Wavelength Range: 610-660 nm

MOUNTED VERSION

For testing or setups under laboratory conditions we offer a version mounted in 12.7 mm stainless steel frame for use with standard laboratory holders.



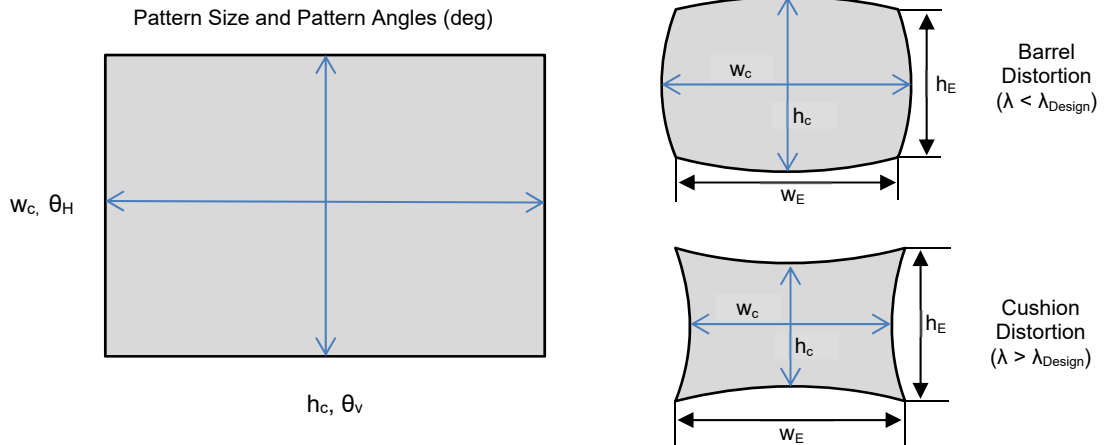
COLLIMATED / CONVERGING LASER

The laser can be collimated for long range use or converging for a fixed working distance.

Please note that the size/thickness of each spot or line depends on the focusing of the laser.

When the DOE is used at a wavelength different from the design wavelength, the pattern will scale in size and geometrical distortions may occur (see section 'Geometry and Diffraction Angles ▼'). When the DOE is used at a wavelength within the recommended wavelength range, the element shows the lowest intensity in the central spot (see section 'Zero Order Diffraction Intensity ▼' on reverse page).

Geometry and Diffraction Angles

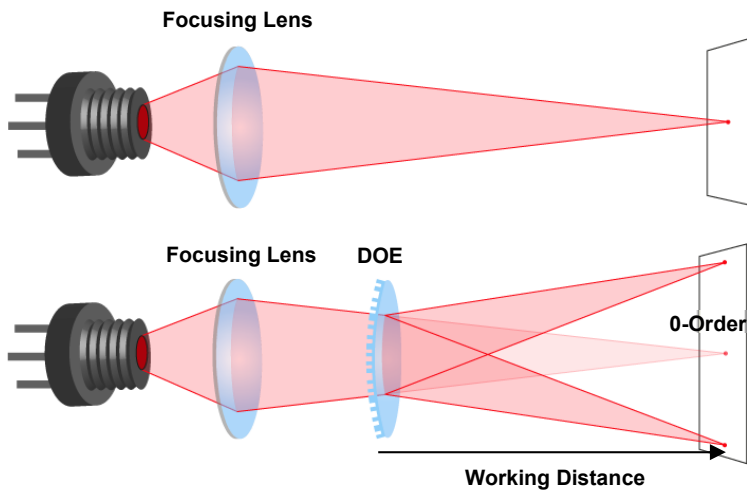


θ_H = horizontal angle, θ_V = vertical angle, h_c = center height, w_c = center width, h_E = edge height, w_E = edge width

If the DOE is used at laser wavelengths close to the design wavelength ($\Delta\lambda < 50\text{nm}$) the geometrical distortion is usually tolerable (see table below).

Wavelength	Pattern Size @ 100 mm Distance				Ratio corner-to-center		Pattern Angles	
	λ [nm]	w_c [mm]	h_c [mm]	w_E [mm]	h_E [mm]	Width	Height	θ_H [°]
450	83.2	64.8	79.3	59.4	95.4%	91.6%	45.2	35.9
515	97.8	75.4	94.4	70.7	96.5%	93.7%	52.1	41.3
532	101.9	78.3	98.7	73.9	96.9%	94.4%	54.0	42.8
640	130.4	97.6	130.4	97.6	100.0%	100.0%	66.2	52.0
658	135.7	101.0	136.6	102.3	100.7%	101.3%	68.3	53.6
684	143.7	106.1	146.4	109.6	101.9%	103.3%	71.4	55.9
750	166.6	119.8	176.1	131.9	105.7%	110.0%	79.6	61.9
800	186.8	131.1	205.8	154.1	110.2%	117.5%	86.1	66.5

Setup



Laser diodes are the most common light source to be used with diffractive optical elements, but other laser light sources may also be used.

The DOEs are best used with collimated or convergent laser sources. The microstructure surface should be oriented towards the laser.

The 0-order spot is equivalent in size and shape to the original beam, but its power is attenuated.

Zero Order Diffraction Intensity

Diffraction efficiencies given on this datasheet have been measured using elements of product revision A.

Wavelength	0-Order Intensity TM	0-Order Intensity TE
447 nm	29.4%	31.1%
515 nm	12.3%	14.5%
531 nm	9.4%	11.5%
640 nm	0.1%	0.4%
658 nm	0.2%	0.2%
684 nm	1.1%	0.5%
749 nm	5.4%	3.5%
800 nm	10.1%	7.2%

