

DataRay Inc. Application Note

BeamScope-P7 Silicon Head Power Limits

Beam Profiling ... Engineered as a system
... Delivered as a Solution

This addendum to the manual and data sheet provides a more convenient way of assessing the beam powers that standard BeamScope-P7 heads will handle, plus the limits for a 1 μm silica slit and a 1 micron pinhole in thin metal film.

Three graphs are offered, with maximum and minimum limits at 400, 675, 830 and 1064 nm.

The titles for the first two graphs include advice on how to extrapolate for different slit widths.

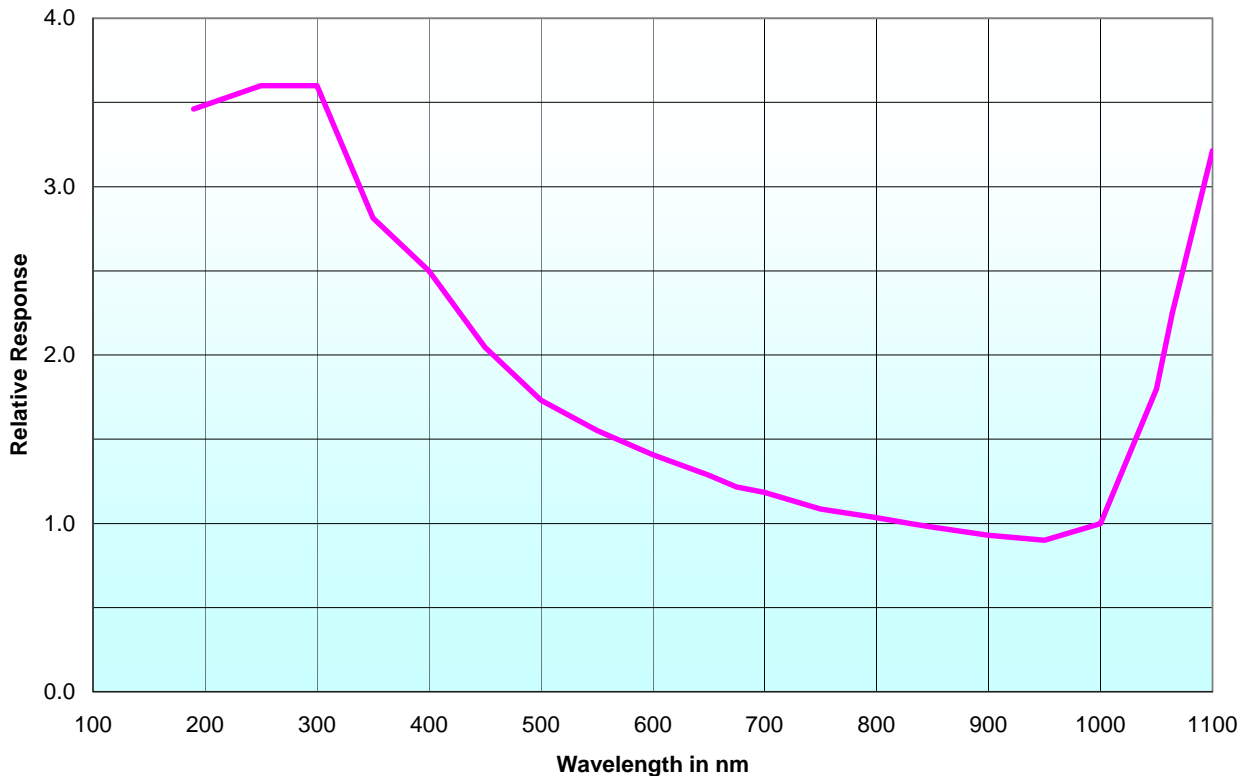
W/cm² units. In term of the W/cm² units that some people use, the limits are given below.

However use such irradiance numbers very carefully, or you will melt the slits.

W/cm ²	Saturation	Minimum	Damage threshold	Max total Watts
5 μm sapphire slits	60	0.0024	1.2.10 ⁵	3 W
1 μm silica slits	300	0.012	2.10 ⁴	1 W
5 μm pinholes	1.2.10 ⁴	0.5	Est. >10 ⁴	2 W
1 μm pinholes	3.10 ⁵	12	Est. >10 ⁴	2 W

If you need a value for other wavelengths, the power limit multiplier for other wavelengths, as compared with the 830 nm peak response, is plotted below.

BeamScope-P7 Silicon head Power Limits Multiplier compared to 830 nm



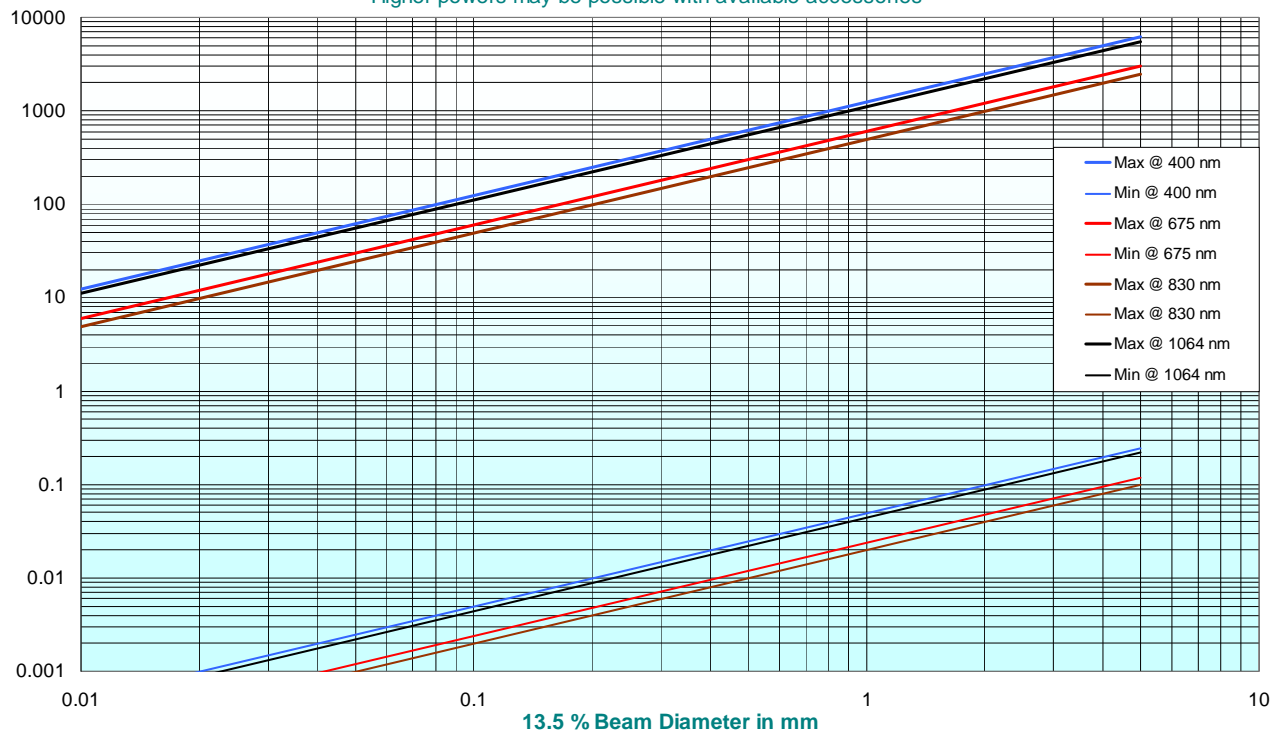
Graphs 1 & 2. 7XY5 units with dual 5 μm slits. 7PA5 with 5 μm pinhole

BeamScope-P7 Upper and Lower Power Limits, Standard 5 μm XY Slit system.

85% of ADC. For other slit widths, multiply by 5/(slit width in μm).

Higher powers may be possible with available accessories

Beam Power in mW

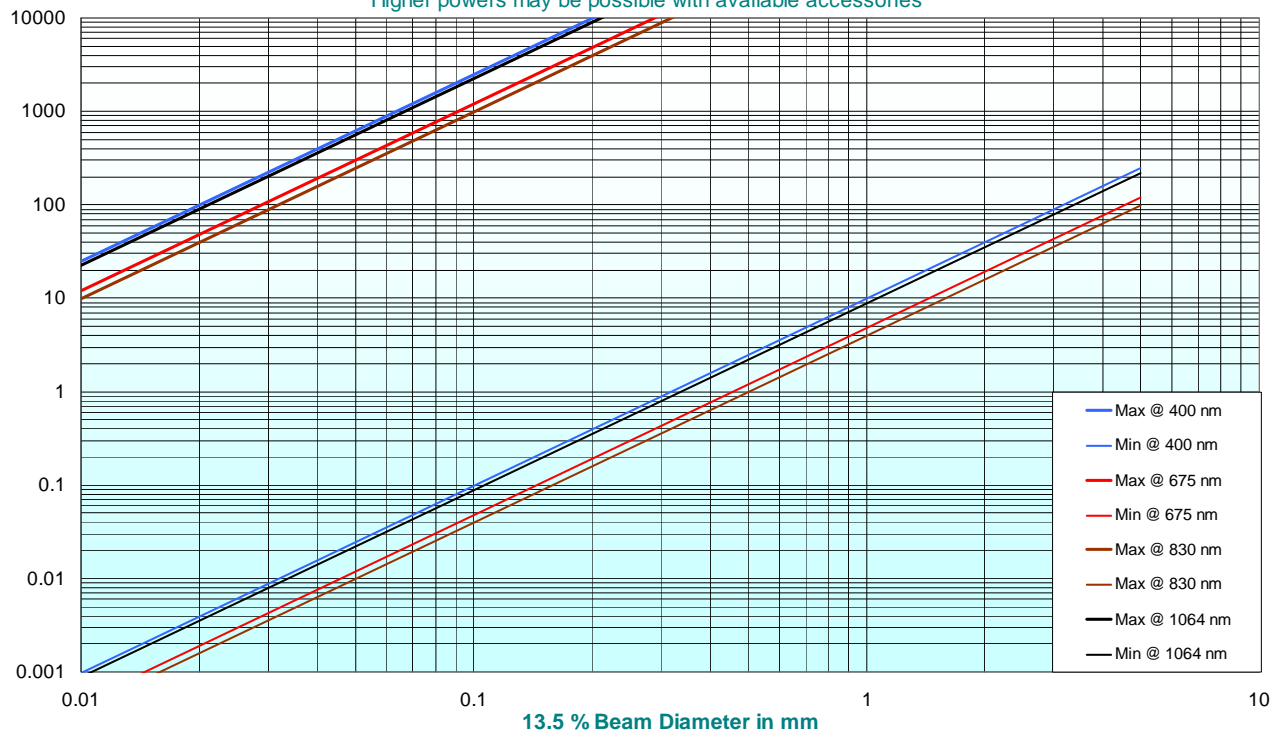


BeamScope-P7 Upper and Lower Power Limits, Standard 5 μm Pinhole system.

85% of ADC. For other slit widths, multiply by $(5/(\text{pinhole diameter in } \mu\text{m}))^2$.

Higher powers may be possible with available accessories

Beam Power in mW



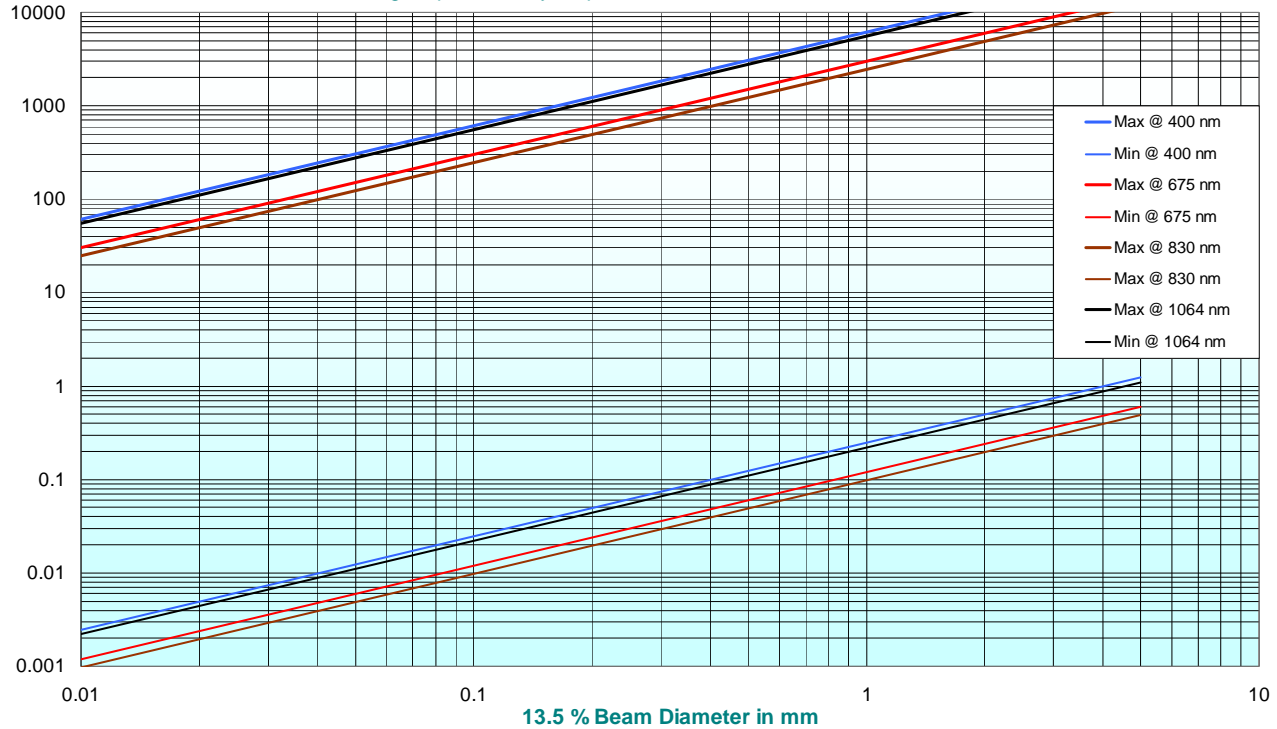
Graphs 3 & 4. 7SS1 units with 1 μm slit. 7PA1 with 1.0 μm pinhole

BeamScope-P7 Upper and Lower Power Limits, 1 μm Slit system.

85% of ADC.

Higher powers may be possible with available accessories

Beam Power in mW



BeamScope-P7 Upper and Lower Power Limits, 1 μm Pinhole system.

85% of ADC.

Higher powers may be possible with available accessories

Beam Power in mW

