Appendix C – Operating Space Charts

Operating Ranges are at Peak Sensitivity of Detector.
Operating Space is NOT absolute.
THESE CHARTS TO BE USED AS A GUIDE ONLY.

The following information is a guide to reading the charts pertaining to **Silicon** detectors.

Silicon Detector: Responsivity varies with wavelength. Detects between 190-950nm. Peak responsivity is 0.4 amps/watt at 850nm. Detector to detector responsivity variation can be as great as ±20%.

Power: Power in the measured laser beam. Assumes a round beam diameter. An elliptic beam can be approximated by using the maximum width dimension and assuming all the energy is in a beam of this diameter. For extremely elliptic beams (ratio >4:1)/ contact the factory.

Pulsed Operation ( ): Upper limit of the operating space for pulsed laser measurements.

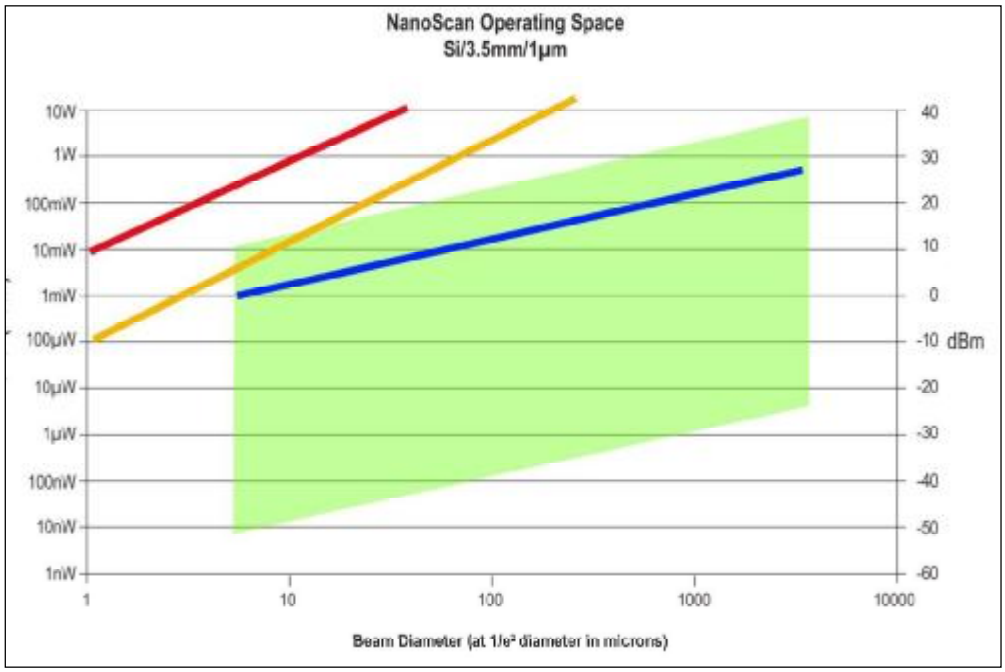
Black Coating Removed ( ): Slits are blackened to reduce back reflections; blackening begins to vaporize near this line. Slits in pyro detectors are not blackened.

Slit Damage ( ): Power density (watts/cm^2) where one can begin to cut the slits. Refer to Spiricon's *Damage Threshold with High Power Laser Measurements* document.

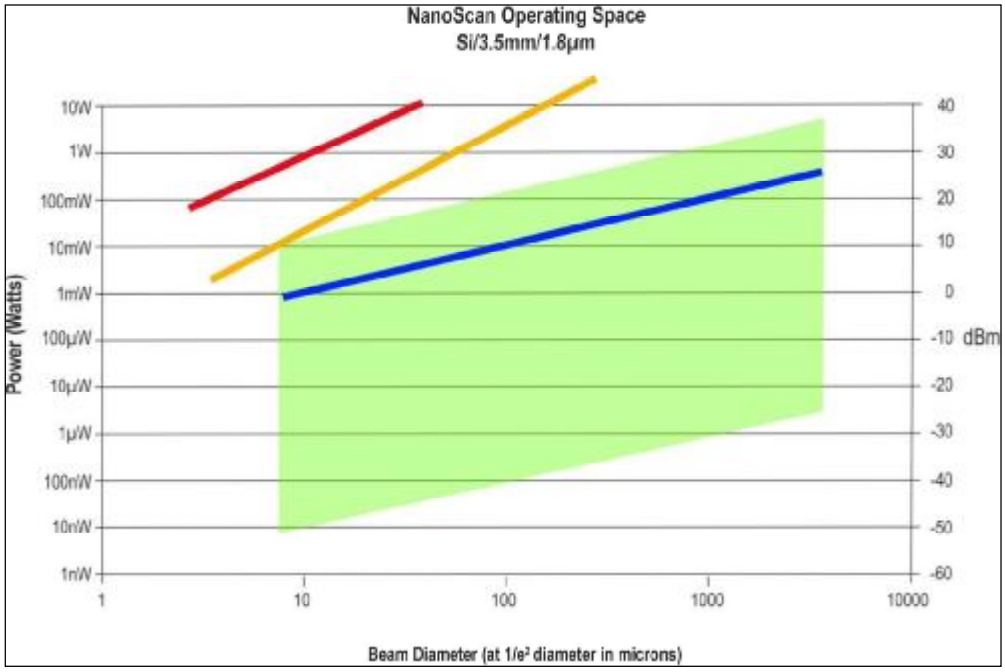
Left Boundary: Smallest beam size limited to 4-5 times the slit width. Some models have another limit due to electrical bandwidth.

Right Boundary: Instrument entrance aperture. The largest beam width (1/e²) will be the aperture divided by 1.2-1.4.

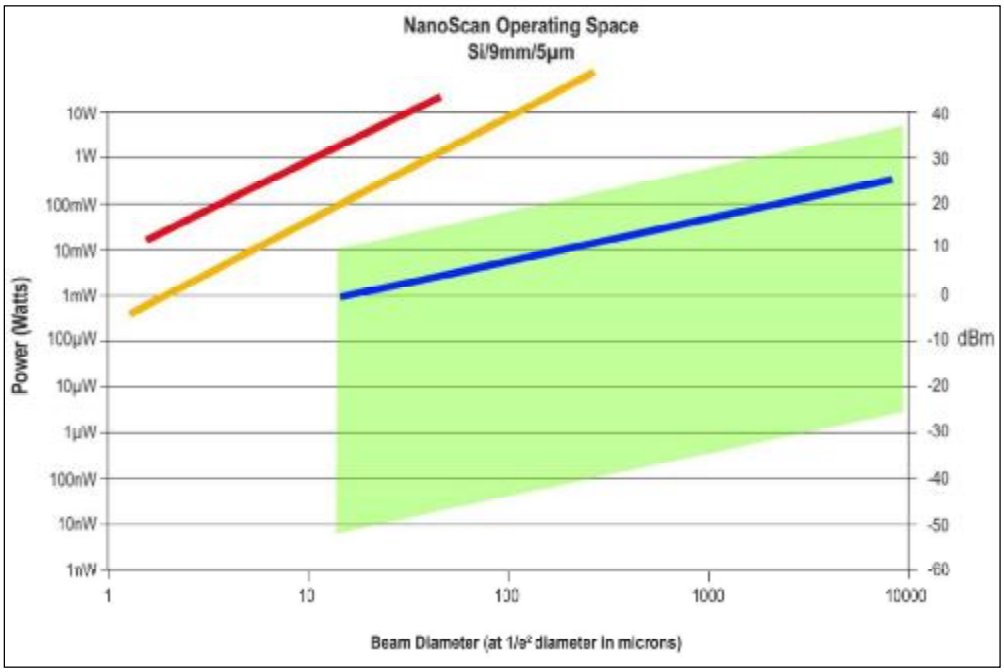
Silicon/3.5mm/1µm



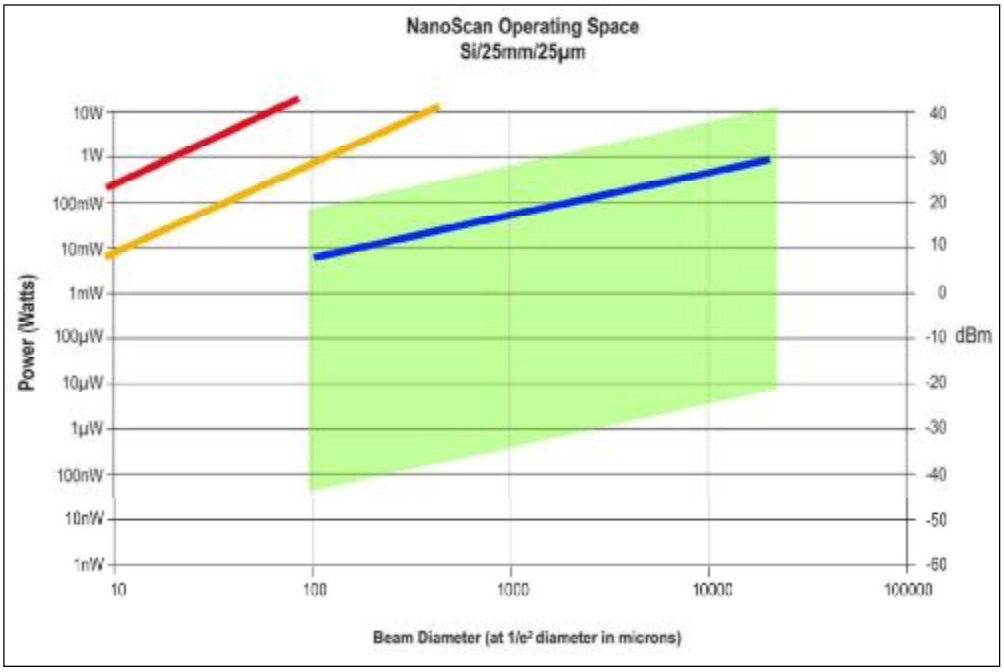
Silicon/3.5mm/1.8µm



Silicon/9mm/5µm



Silicon/25mm/25µm



The following information is a guide to reading the charts pertaining to **Germanium** detectors.

Responsivity: Detector conversion constant, incident photons to a current.

Detector: Responsivity varies with wavelength. Detects between 800-1800nm. Peak responsivity is 0.7 amps/watt at 1550nm. Detector to detector responsivity variation can be as great as ±20%.

Power: Power in the measured laser beam. Assumes a round beam diameter. An elliptic beam can be approximated by using the maximum width dimension and assuming all the energy is in a beam of this diameter. For extremely elliptic beams (ratio >4:1) contact the factory.

Beam Diameter: Circular laser spot being measured by a narrow slit. Clip level method.

Pulsed Operation ( ): Upper limit of the operating space for pulsed laser measurements.

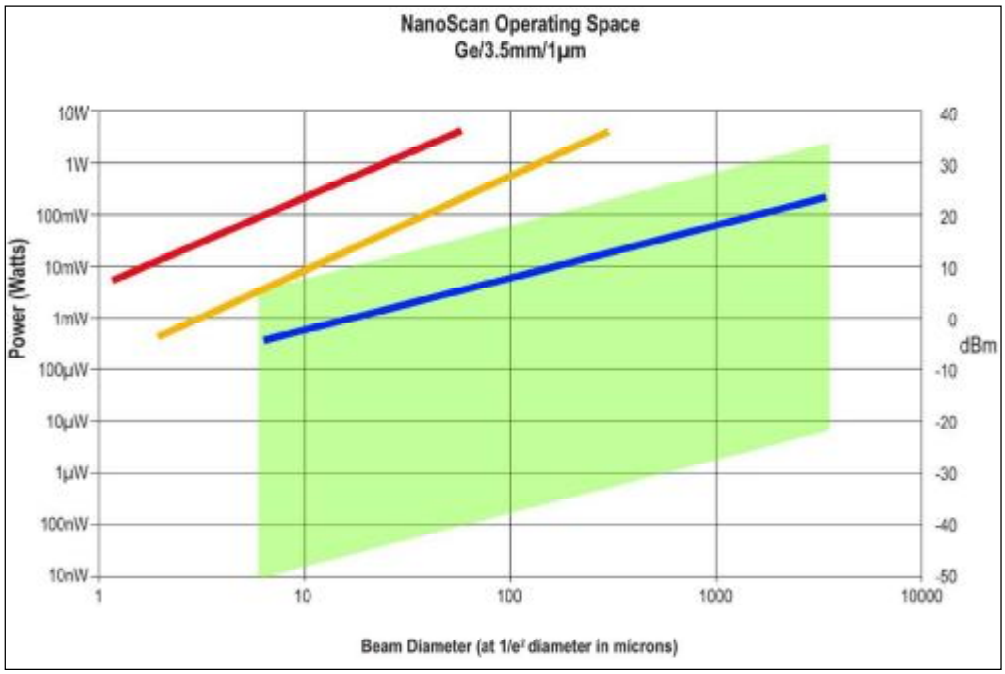
Black Coating Removed ( ): Slits are blackened to reduce back reflections; blackening begins to vaporize near this line. Slits in pyro detectors are not blackened.

Slit Damage ( ): Power density (watts/cm^2) where one can begin to cut the slits. Refer to Spiricon's Slit Damage due to High Incident Power document.

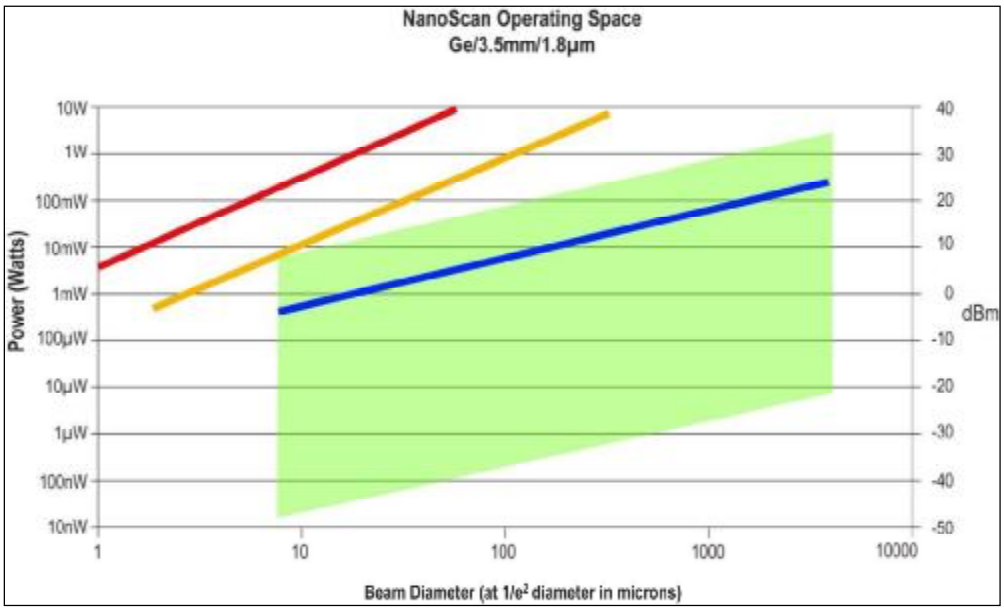
Left Boundary: Smallest beam size limited to 4-5 times the slit width. Some models have another limit due to electrical bandwidth.

Right Boundary: Instrument entrance aperture. The largest beam width (1/e²) will be the aperture divided by 1.2-1.4.

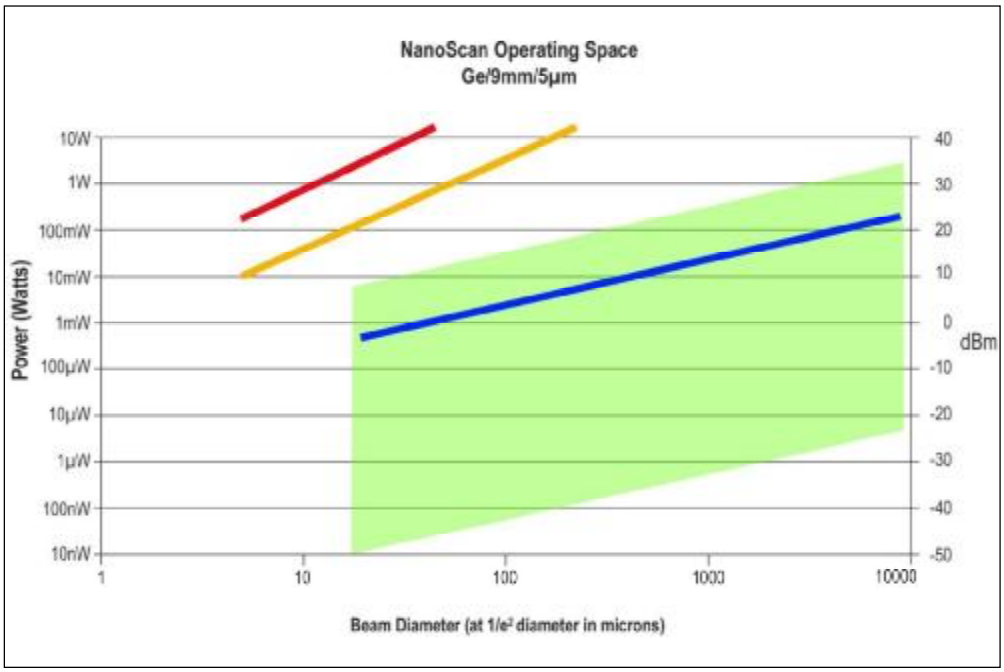
Germanium/3.5mm/1µm



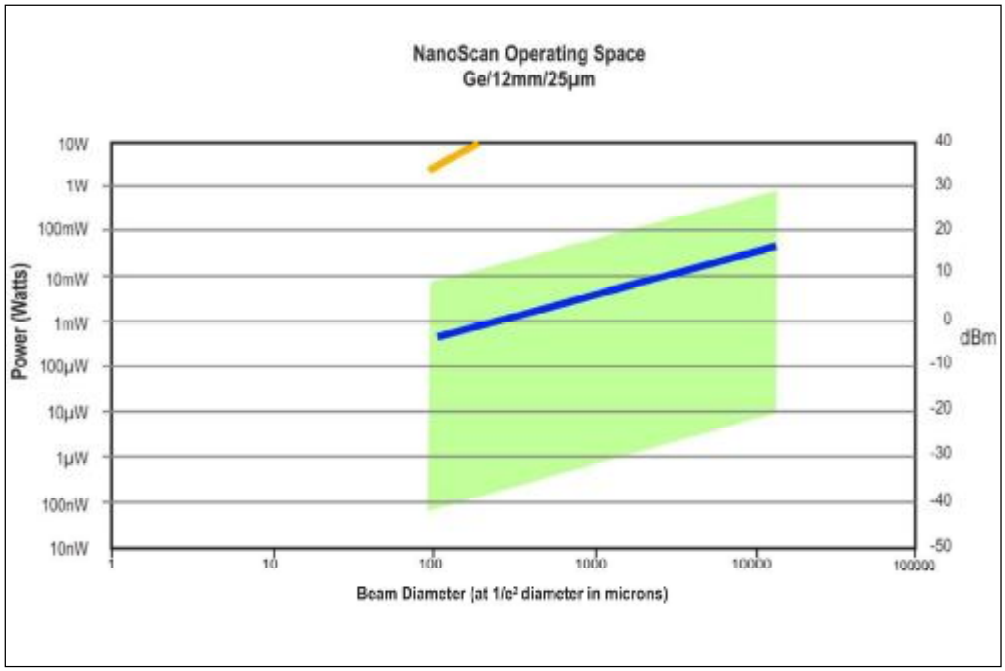
Germanium/3.5mm/1.8µm



Germanium/9mm/5µm



Germanium/12mm/25µm



The following information is a guide to reading the charts pertaining only to **Pyroelectric** detectors.

Pyroelectric Detector: Uniform in response between 0.2 and 20 microns wavelength.

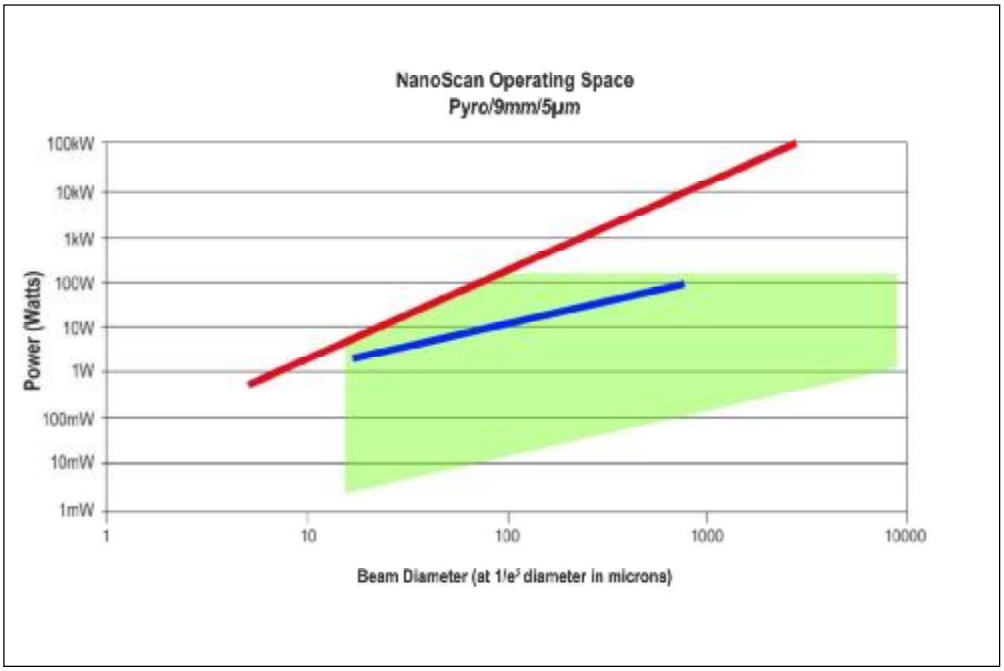
Pulsed Operation: (**)** Upper limit of the operating space for pulsed laser measurements.

Slit Damage ( ): Power density (watts/cm^2) where one can begin to cut the slits. Refer to Spiricon's Slit Damage due to High Incident Power document.

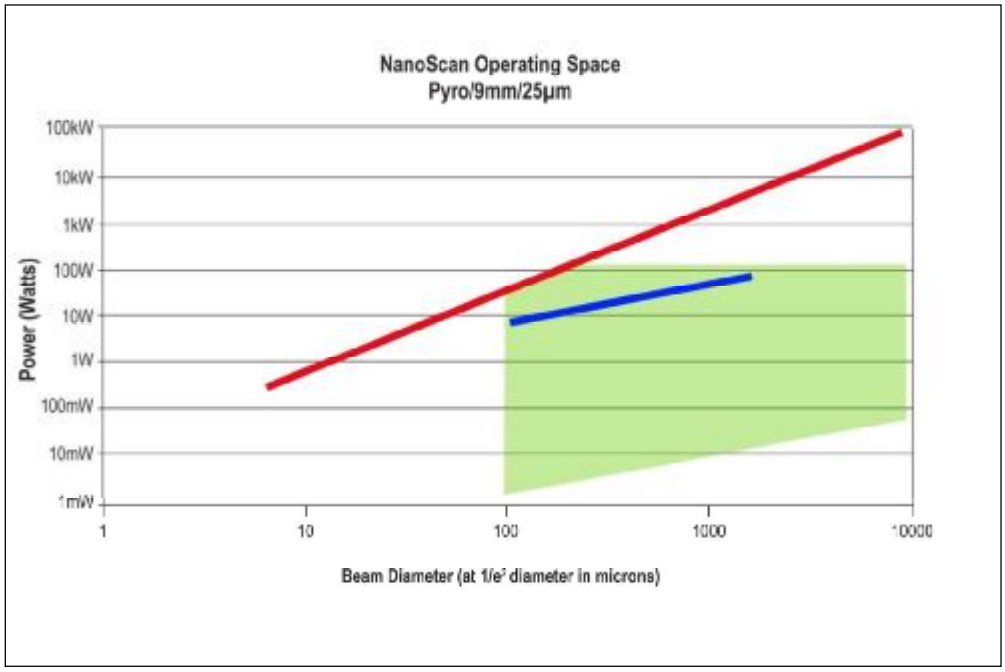
Left Boundary: Smallest beam size limited to 4-5 times the slit width. Some models have another limit due to electrical bandwidth.

Right Boundary: Instrument entrance aperture. The largest beam width (1/e²) will be the aperture divided by 1.2-1.4.

Pyroelectric/9mm/5µm



Pyroelectric/9mm/25µm



Pyroelectric/20mm/25µm