

Freiberg Instruments

laser Selection Guide

MDP

Wavelength 1 337 nm ... 1550 nm

Freiberg Instruments nm 337

Which material do you want to measure?

| Freiberg Instruments | nm | 337 | 355 | 405 | 660 | 780 | 980 | 1550 |
|------------------------------|----|-----|-----|-----|-----|-----|-----|------|
| offers different wavelengths | | | | | | | | |
| from UV to IR | eV | 3.7 | 3.5 | 3.1 | 1.9 | 1.6 | 1.3 | 0.8 |
| | | | | | | | | |
| | | | | | | | | |



Do you want to investigate the surface/passivation or bulk? High energy light (short wavelength) is absorbed at the surface



2 Power

μW ... W

What kind of defects you want to investigate?

Low power means low injection density (generated carriers per volume) \rightarrow More influence of traps

Spot size З 10 µm ... 2.5 mm

How large are the structures you want to investigate? The default spot size is \sim 150 µm in our tools. If you want to go below that, special optics are needed.

High power leads to high injection \rightarrow Recombination centers or even Auger recombination Please be aware of the typical diffusion length of your material as it makes no sense to go below that.



Exemplary optics for fiber coupled laser, laser diode and external laser



| How to | select |
|---------|----------|
| the apt | laser |
| using a | formula? |

| Example | Band gap in eV | Calculation based on the formula | Wavelength using the formula | Recommended laser |
|---------|-------------------|--|------------------------------------|----------------------|
| Si | 1.1 eV | <= 1240/1.1 | ~1130 nm | ~980 nm |
| SiC | 3.3 eV | <= 1240/3.3 | ~375 nm | ~375 nm |

Formula

Wavelength <= 1240/band gap in eV

The wavelength of the laser chosen must be less than or equal to the wavelength you get by using this formula.



