BGGSe (BaGa2GeSe6) Nonlinear Crystal for Mid-IR, 0.5–18 µm, d11 = 66 pm/V

Model WQ-NLC-BGGSE · waveqvanta.com/products/bggse-baga2gese6-nonlinear-crystal

BGGSe (BaGa2GeSe6) is a mid-infrared nonlinear crystal transparent from 0.5 to 18 µm, with a nonlinear coefficient of d11 = 66 ± 15 pm/V and an optical damage threshold of 110 MW/cm^2. It is used for frequency conversion of laser radiation into and within the mid-IR, including SHG of CO and CO2 lasers and difference-frequency generation. WaveQuanta supplies BGGSe as oriented blanks and as polished, uncoated elements.



Key features

- Transparency range 0.5–18 µm
- Nonlinear coefficient d11 = 66 ± 15 pm/V
- Optical damage threshold 110 MW/cm^2, compared with 78 MW/cm^2 for ZnGeP2, 30 MW/cm^2 for GaSe and 20 MW/cm^2 for AgGaSe2
- Broadband two-stage frequency conversion of multi-line CO laser radiation within 2.5–9.0 µm, reported with higher efficiency than in ZnGeP2 and AgGaSe2
- Some wavelength combinations give an effective nonlinear coefficient that changes only slightly over a wide frequency band

Specifications

Chemical Formula	BaGa2GeSe6
Transparency Range	0.5–18 µm
Nonlinear Coefficient	d11 = 66 ± 15 pm/V
Optical Damage Threshold	110 MW/cm^2
Dimension Tolerance	(W ±0.1 mm) × (H ±0.1 mm) × (L +1 mm/−0.5 mm)
Clear Aperture	> 90% central area
Flatness	λ/8 @ 633 nm (T ≥ 1 mm)
Surface Quality	60-40 scratch-dig (after coating)
Parallelism	Better than 30″
Perpendicularity	10′
Orientation Accuracy	< 30″

Standard sizes

Size	Cut / orientation	Surface / coating	Mount
5 × 5 × 0.5 mm	θ = 23°, φ = 42.7°	Polished, uncoated	Unmounted
5 × 5 × 1 mm	θ = 23°, φ = 42.7°	Polished, uncoated	Unmounted
5 × 5 × 2 mm	θ = 23°, φ = 42.7°	Polished, uncoated	Unmounted
5 × 5 × 3 mm	θ = 23°, φ = 42.7°	Polished, uncoated	Unmounted
5 × 5 × 1 mm	θ = 32.1°, φ = 12.7°	Polished, uncoated	Unmounted
5 × 5 × 2 mm	θ = 32.1°, φ = 12.7°	Polished, uncoated	Unmounted
5.8 × 6.1 × 17.7 mm	θ = 22.7°, φ = 30°, Type I	Polished, uncoated	Unmounted
6 × 6 × 10 mm	θ = 27°, φ = 42.7°	Blank	Unmounted

Values are typical and subject to change. Custom sizes, cut angles and coatings are available on request.

Size	Cut / orientation	Surface / coating	Mount
7 × 7 × 10.5 mm	θ = 26°, φ = 42.7°, Type I	Blank	Unmounted
10 × 10 × 4.95 mm	θ = 25.2°, φ = 42.7°, Type I	Blank	Unmounted

Typical applications

- Second-harmonic generation of CO and CO2 laser radiation
- Two-stage frequency conversion of multi-line CO lasers within 2.5–9.0 µm
- Difference-frequency generation (DFG) in the mid-IR
- Nonlinear frequency conversion across the 0.5–18 µm transparency range