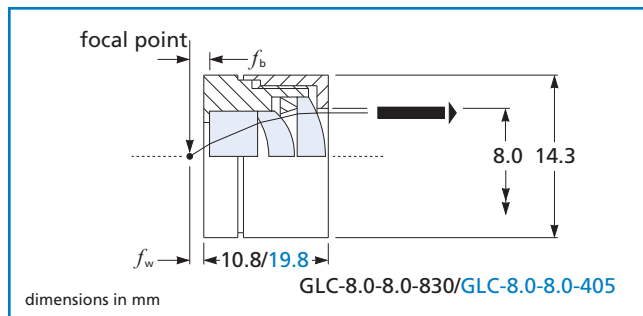




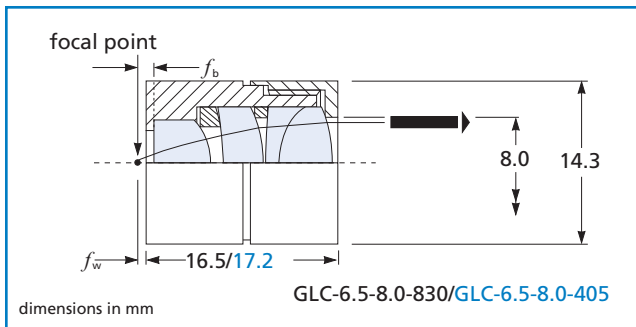
This set of lenses can be used to collimate or focus diode lasers. The lenses are optimized for specific diode laser wavelengths.

- 830, 405 and 375 nm GLC parts are diffraction limited and corrected for spherical aberration, coma, astigmatism, and spherochromatism.
- 830, 405 and 375 nm GLC parts (except for GLC-50.0-20.0-830) have the same clear aperture for interchangeable use in collimating and focusing to a diffraction-limited spot.
- GLC-2.0-2.0-780 is an aspheric single lens with a high numerical aperture for increased optical efficiency and minimal beam truncation.
- All GLC parts are RoHS compliant.

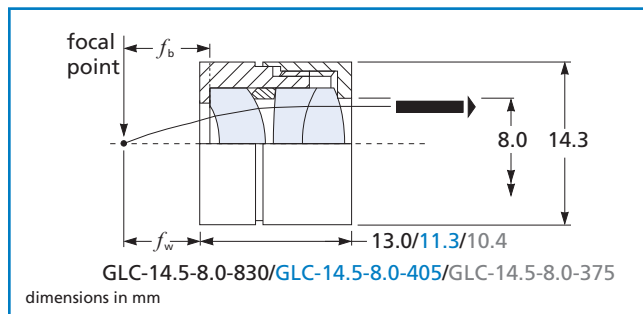
Collimating and Focusing Lenses for Diode Lasers



GLC-8.0-8.0-830/GLC-8.0-8.0-405 collimating lens



GLC-6.5-8.0-830/GLC-6.5-8.0-405 collimating lens

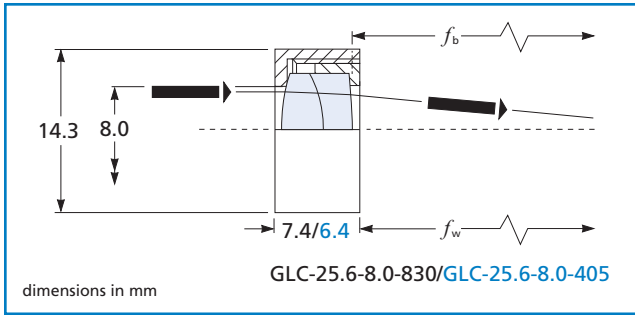


GLC-14.5-8.0-830/GLC-14.5-8.0-405/GLC-14.5-8.0-375 collimating lens

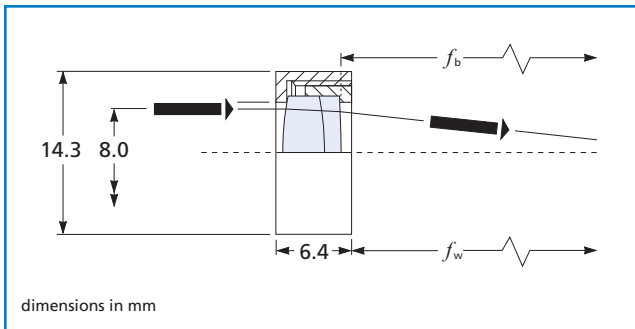
SPECIFICATIONS: Collimating and Focusing Lenses for Diode Lasers

Housing Material	Black-anodized aluminum
Paraxial Focal Length	$f \pm 2\%$ at the design wavelength
Clear Aperture Tolerance	0.5 mm
Focused Spot Radius	Diffraction limited according to Airy disc criterium
Surface Quality	60-40 scratch and dig for the 830 nm parts 40-20 scratch and dig for the 405 and 375 nm parts
Antireflection Coating	Single-layer MgF_2 for 670 nm, 830 nm, 1300 nm, or 1550 nm for the 830 nm parts Multi-layer centered at the design wavelength for the 405 and 375 nm parts Single-layer MgF_2 for 780 nm for GLC-2.0-2.0-780

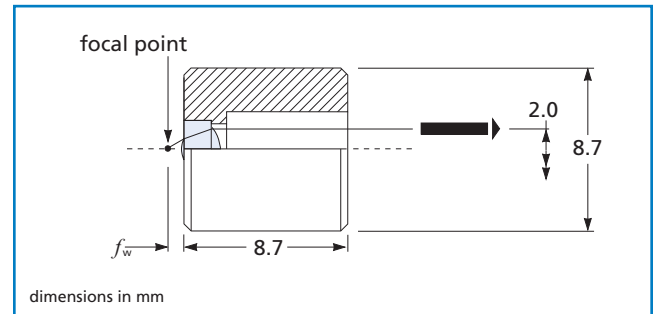
(continued)



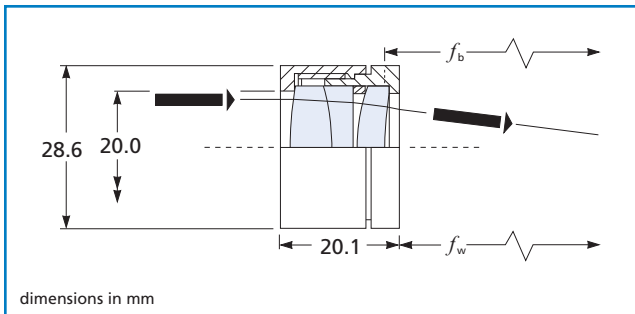
GLC-25.6-8.0-830/GLC-25.6-8.0-405 focusing lens



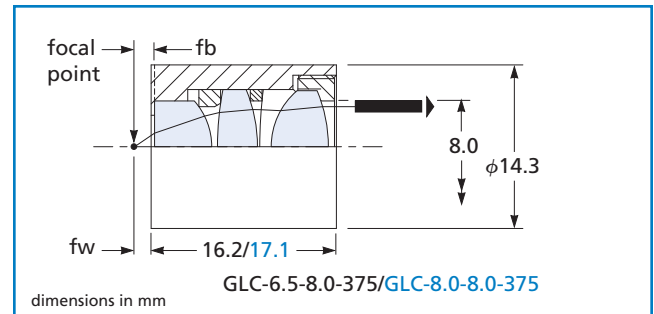
GLC-48.0-8.0-830/GLC-48.0-8.0-405/GLC-25.6-8.0-375/GLC-48.0-8.0-375 focusing lens



GLC-2.0-2.0-780 collimating lens



GLC-50.0-20.0-830 focusing lens



GLC-6.5-8.0-375/GLC-8.0-8.0-375 collimating lens

(continued)

APPLICATION NOTE

Diode Laser Window Aberrations

Typical diode laser window thicknesses range from 0.1 to 0.5 mm. If the numerical aperture of the collimating lens system is greater than 0.3, this window contributes an undesirable amount of spherical aberration and will degrade overall system performance.

These lenses are optimized for use without windows. When using a GLC-6.5-8.0-830 or GLC-8.0-8.0-830 lens with diodes having windows, you may insert the nominal window thickness (see table).

Diode Laser Window Aberrations

For Use with	Part Number	Nominal Window Thickness (mm)	Useful Range of Window Thickness (mm)
GLC-6.5-8.0-830	GLC-6.5-8.0-0.15-830	0.15	0.00–0.30
	GLC-6.5-8.0-0.30-830	0.30	0.15–0.45
GLC-8.0-8.0-830	GLC-8.0-8.0-0.030-830	0.30	0.15–0.45

Collimating and Focusing Lenses for Diode Lasers

f (mm)	Design Wavelength λ_0 (nm)	NA	Field Angular Radius (deg)	Working Distance f_w (mm)	Back Focal Length f_b (mm)	Transmitted Wavefront Error (p-p over clear aperture)	Focused Spot Diameter (μm)	PART NUMBER	
								FORMER‡	REPLACED BY
Wavelength Range 365-385 nm									
6.5	375	0.62	± 0.1	1.5	1.8	$\lambda/4^{**}$	0.8	06 GLC 301	GLC-6.5-8.0-375
8.0	375	0.50	± 0.3	2.0	2.4	$\lambda/4^{**}$	1.0	06 GLC 302	GLC-8.0-8.0-375
14.5	375	0.28	± 0.5	11.3	12.1	$\lambda/4^{**}$	1.7	06 GLC 303	GLC-14.5-8.0-375
25.6	375	0.16	± 0.4	22.5	23.3	$\lambda/4^{**}$	3.0	06 GLC 304	GLC-25.6-8.0-375
48.0	375	0.08	± 1.0	44.7	46.3	$\lambda/4^{**}$	5.5	06 GLC 305	GLC-48.0-8.0-375
Wavelength Range 395-415 nm									
6.5	405	0.62	± 0.2	1.5	1.8	$\lambda/4^{***}$	0.8	06 GLC 201	GLC-6.5-8.0-405
8.0	405	0.50	± 0.4	1.5	1.9	$\lambda/4^{***}$	1.0	06 GLC 202	GLC-8.0-8.0-405
14.5	405	0.28	± 0.5	10.0	10.9	$\lambda/4^{***}$	1.8	06 GLC 203	GLC-14.5-8.0-405
25.6	405	0.16	± 0.2	21.9	22.6	$\lambda/4^{***}$	3.2	06 GLC 204	GLC-25.6-8.0-405
48.0	405	0.08	± 1.0	44.6	45.8	$\lambda/4^{***}$	6.0	06 GLC 205	GLC-48.0-8.0-405
Wavelength Range 633-1550 nm									
2.0	780	0.50	± 0.5	1.1	N.A.	$\lambda/4$	1.9	06 GLC 011	GLC-2.0-2.0-780
6.5	830	0.62	± 0.7	0.8	1.2	$\lambda/4$	1.7	06 GLC 001	GLC-6.5-8.0-830
6.5	830	0.62	± 0.7	0.8	1.2	$\lambda/4$	1.7	06 GLC 001/B	GLC-6.5-8.0-0.15-830
6.5	830	0.62	± 0.7	0.8	1.2	$\lambda/4$	1.7	06 GLC 001/D	GLC-6.5-8.0-0.30-830
8.0	830	0.50	± 1.0	1.1	1.6	$\lambda/4$	2.0	06 GLC 002	GLC-8.0-8.0-830
8.0	830	0.50	± 1.0	1.1	1.6	$\lambda/4$	2.0	06 GLC 002/D	GLC-8.0-8.0-0.30-830
14.5	830	0.28	± 1.0	6.7	8.5	$\lambda/4$	3.7	06 GLC 003	GLC-14.5-8.0-830
25.6	830	0.16	± 1.0	20.0	22.6	$\lambda/4$	6.5	06 GLC 004	GLC-25.6-8.0-830
48.0	830	0.08	± 1.0	44.4	45.2	$\lambda/4$	12.2	06 GLC 005	GLC-48.0-8.0-830
50.0	830	0.20	± 0.7	41.1	43.6	$\lambda/4$	5.1	06 GLC 006	GLC-50.0-20.0-830

*Length varies if window options are specified.

**Measured @ 633 nm and calculated to 375 nm.

***Measured @ 633 nm and calculated to 405 nm.

Note: The GLC parts with a design wavelength of 830 nm have a MgF_2 coating centered around 830 nm. To request a different coating append a -670, -1300 or -1550. The GLC part with a design wavelength of 780 nm is available only with a MgF_2 coating centered at 780 nm.

The GLC parts with a design wavelength of 405 nm and 375 nm are available with a multilayer antireflection coating centered at 405 nm and 375 nm, respectively.

APPLICATION NOTE

GLC Collimating Lenses

Single-layer MgF_2 coatings are applied to the GLC-6.5-8.0-830 through GLC-50.0-20.0-830 lenses because most of the elements are flint glass. Due to the high refractive index of these glasses, MgF_2 coatings are very efficient. Typically they provide reflectances lower than 0.25% at the design wavelength and less than 1% reflectance for $\pm 10\%$ of the design wavelength.