

Optima — Injection Molded Plastic Aspheric Lenses

While glass lenses are generally preferred, there are several product applications where a high quality plastic lens can be effectively utilized. The 300 Series plastic aspheric collimating and objective lenses offer a lower cost alternative to glass and still perform well over a temperature range actually exceeding the upper limit for most laser diodes. Plastic lenses are used in products such as laser pointers, construction levels, and less critical alignment and position sensing devices.

Lens P/N 300-0380-780 Short FL Creates a Smaller Collimated Beam — If you need a collimated beam with smaller dimensions, consider using the 300-0380-780 plastic lens and/or the Optima LDM 4500 KIT Laser Diode Mounting Kit which includes the new smaller plastic asphere. As an example... when this lens is used with the Hitachi HL6312G (635nm/5mW) laser diode, a collimated beam measures approximately 0.715 mm in the parallel axis by 2.85 mm in the perpendicular axis, with divergence angles of 1.2 mrad x 0.34 mrad respectively. (The figures mentioned may vary from one diode to another or with other manufacturers diodes).

Lens P/N 300-0395-780 Creates a Larger, More Circular Collimated Beam — If you need a collimated beam with low divergence and consequently a smaller beam at long distances, consider the Optima 300-0395-780. With a long focal length (16mm) and small numerical aperture (NA=.14) this lens creates a relatively large diameter beam that's more circular than the output from the typical laser diode collimating lens. Also, the 300-0395-780 lens is a very high-quality injection molded plastic lens – this lens has been used in digital laser communication systems which are extremely sensitive to lens aberrations and diffraction patterns that can be misread as data when a beam sweeps across a detector. The only negative aspect of the lens might be the small NA – the coupling efficiency (or total transmission) for most visible laser diodes is just under 50%.

For reference we've profiled the beam from a 300-0395-780 lens using a Hitachi HL6312G laser diode; at 100 mm from the lens, a collimated beam measures ~3.38 mm x 4.65 mm (measured at the 1/e² clip point, the 3.38mm dimension is the laser diode's parallel axis).

Optima Injection Molded Plastic Aspheric Lens Specifications

PART NUMBER	300-0380-780	300-0395-780
UNIT PRICE (Qty 1-49 pcs.)	\$4.70	\$4.20
DESCRIPTION	Collimating Lens, Injection Molded Plastic Asphere, Unmounted	
CONJUGATE DISTANCE	Infinite	
DESIGN WAVELENGTH (note 1)	780nm	
FOCAL LENGTH	3.40mm	16mm
WORKING / SOURCE DISTANCE	1.43mm	13.79mm
NUMERICAL APERTURE	0.471	0.144
CLEAR APERTURE	3.20mm	4.80mm
F#	1.06	1.67
FIELD SIZE DIAMETER	0.150mm	0.100mm
AR COATING DESIGN CENTER, MgF2	780nm	
TRANSMISSION	>95%	>97%
COVER GLASS THICKNESS	1.25mm	
COVER GLASS INDEX (n)	1.55	1.51
TEMPERATURE RANGE	Storage Temp. -30°C to +75°C, Working Temp. -10°C to +65°C	
LENS DIMENSIONS (diameter x length)	Ø5.0mm x 2.11mm	Ø6.5 x 2.33mm

Notes: 1) In the specifications listed above, the design wavelength is used to calculate the focal length; however, this does not limit use of the lens to this particular wavelength — these lenses can be used with both near-infrared and visible laser diodes from 635nm through 850nm.

MOUNTED PLASTIC LENS P/N	302-0380-780	302-0395-780
UNIT PRICE (Qty 1-49 pcs.)	\$14.15	\$11.00
CELL DIMENSIONS (diameter x length)	3/8-64 thread x 5.9mm	3/8-64 thread x 3.8mm

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