



FD3 SERIES LENSES *for OSRAM GOLDEN DRAGON™ LEDs*

- **High efficiency**
- **Available in 2 different beams**
- **35mm diameter, sized for MR11 lamp applications**
- **Patent Pending**

The FD3 series Low Profile Tri-lens module is available for Golden dragon LEDs from Osram Optosemiconductor.

A software-optimized aspheric profile combined with front shaped micro-lens arrays enable the generation of two different lens models: narrow beam and medium beam (2).

The high collection efficiency reaches 85% of the total flux emitted from the LED.

These lenses are assembled with a 35mm diameter holder. The holder assures the proper relative placement between the lens and the Golden dragon LEDs. Heat staking the three legs of the holder to the customer's PCB or heat sink provides excellent optical and mechanical assembly (see Fraen Application Note FAN01-EN, at www.fraensrl.com).

Typical applications are:

- Reading lamps
- Signs
- Architectural Lighting
- Street Lights
- Most application where uniformity and high intensity over a wide angle is required



- (1) Golden Dragon is a trademark of Osram OptoSemiconductor. For technical specification on LEDs please refer to the Golden dragon datasheet or visit www.osram-os.com
- (2) Typical beam divergence may change with different color LEDs.

For ordering instructions, please contact

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To find a local distributor, check the Fraen website.

Website: www.fraensrl.com



General Characteristics

Lens Material	Optical Grade PMMA
Holder Material	PC ABS or Transparent PC
Operating Temperature range	-40deg C / + 80 deg C
Storage Temperature range	-40deg C / + 80 deg C

Average transmittance in visible spectrum (400 – 700nm) >90%, as measured using 3mm thick Optical Grade PMMA.

Please note that flow lines and weld lines on the external surfaces of the lenses are acceptable if the optical performance of the lens is within the specification described in the section "OPTICAL CHARACTERISTICS"

IMPORTANT NOTE – Lenses handling and cleaning:

Handling: Always use gloves to handle lenses and/or handle the lenses only by the flange. Never touch the outside surfaces of the lenses with fingers; finger oils and contamination will absorb or refract light.

Cleaning: Clean lenses only if necessary. Use only soap and water to clean the surfaces and lenses. Never expose the lenses to alcohol, as it will damage the plastic.



Optical Characteristics

		Typical beam total divergence (degrees)		
Lens Part Number	Type of lens	Blue Green Dragon ● ●	Yellow Red Dragon ● ●	White Dragon Chip Coated ○
FD3-N1-D01-H	Narrow beam	14.0	13.5	12.5
FD3-M1-D01-H	Medium beam	17.0	15.0	16.0

The typical total divergence is the full angle measured where the luminous intensity is half of the peak value. The typical divergence may change with different color LEDs due to different chip size and chip position tolerance.

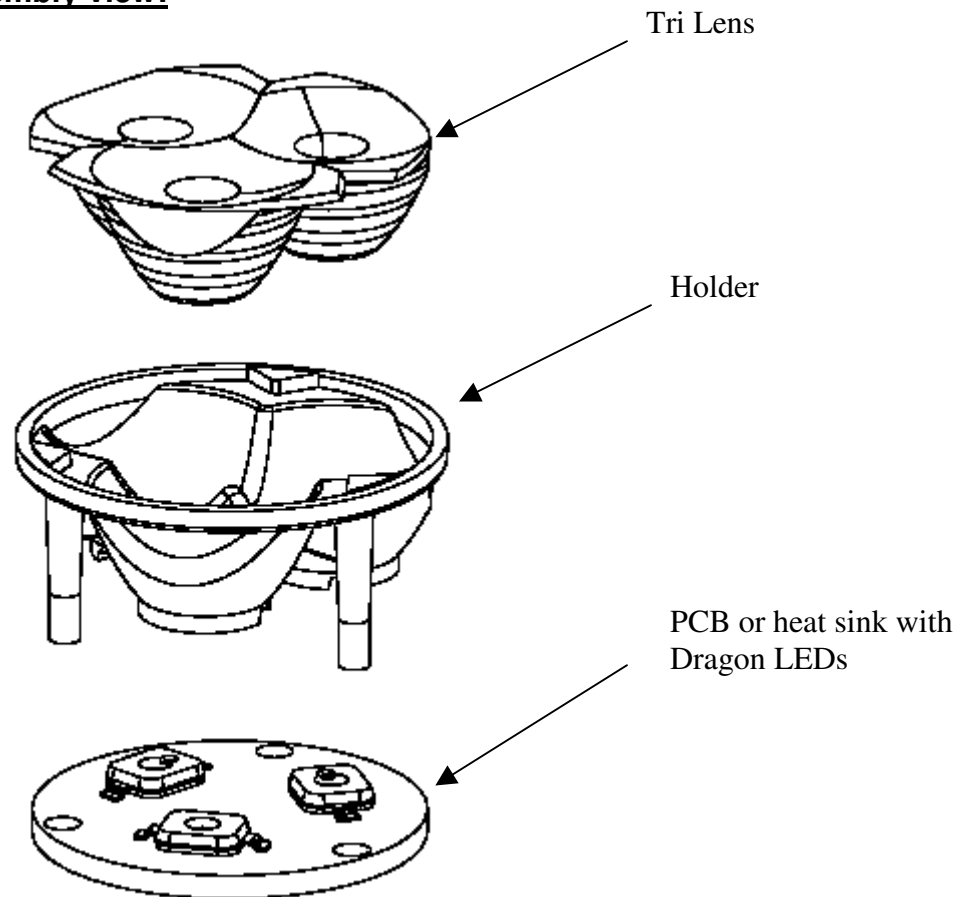
		Typical on axis efficiency (cd/lm)		
Lens Part Number	Type of lens	Blue Green Dragon ● ●	Yellow Red Dragon ● ●	White Dragon Chip Coated ○
FD3-N1-D01-H	Narrow beam	4.5	4.6	8.3
FD3-M1-D01-H	Medium beam	2.7	2.8	4.3

To calculate the on axis intensity, multiply the on axis efficiency of the lens (cd/lm) by the total flux of the Dragon LEDs you use. For more detail on flux binning please check the datasheet of the Golden Dragon LEDs by Osram OS.

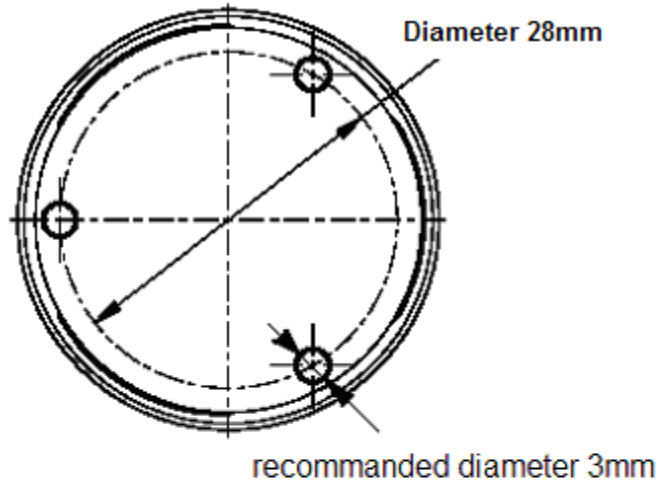
Mechanical Characteristics

For best optical performance (shown above), correct mechanical position of the lens on the LED is critical. To achieve correct lens position on the LED, the module comes pre-assembled in a holder.

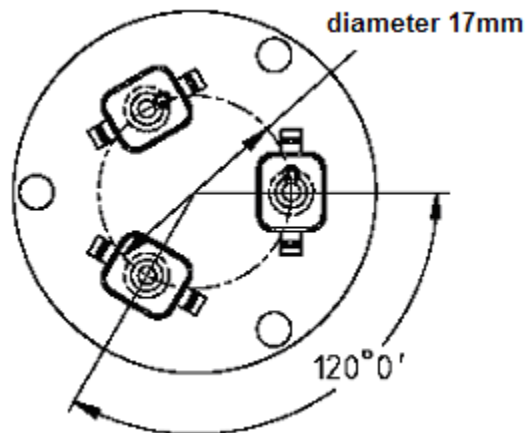
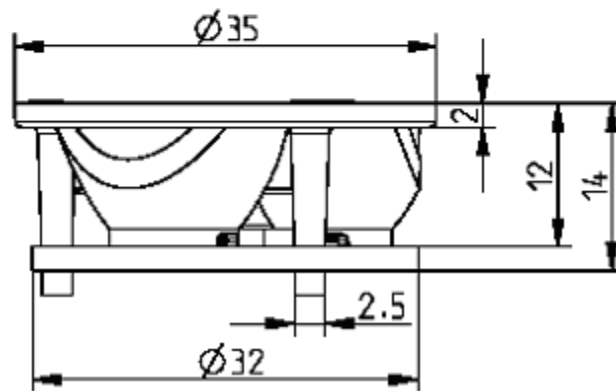
Lens + holder assembly view:



Lens + Holder assembly dimensions on PCB board:



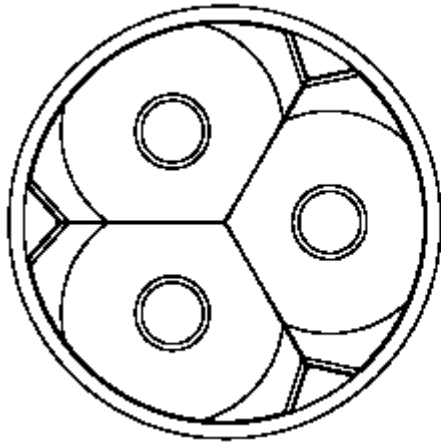
PCB with holes to heat stake the holder



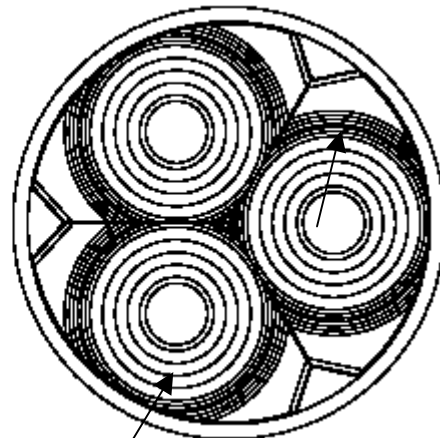
Tolerances : +/- 0.2mm

The lens can be identified by the top view:

Narrow beam lens:



Medium beam lens:



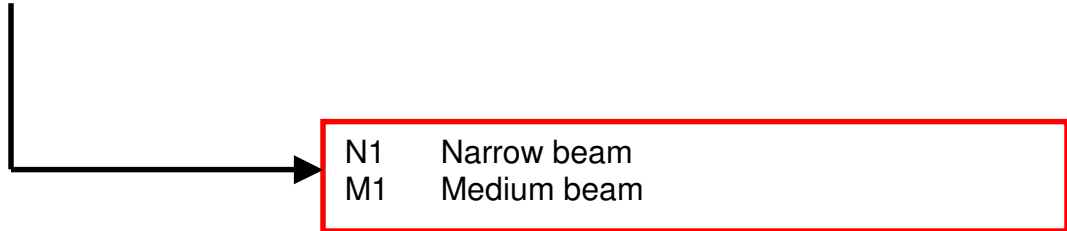
Light texture on the top lens

Please note that flow lines and weld lines on the external surfaces of the lenses are acceptable if the optical performance of the lens is within the specification described in the section "OPTICAL CHARACTERISTICS"



Ordering part numbers

FD3-xx-D01-H



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Document Revision Record

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00	08-21-2006	S.A.H.	Initial Release
01	08-23-2006	S.A.H.	Added Data