

## FSG SERIES LENSES for SEOUL SEMICONDUCTOR Z-POWER P3 LEDs

- High efficiency
- Available in 4 different beams
- Patent Pending

The FSG series offers a complete range of lenses specifically designed for Seoul Semiconductor LEDs: Z-Power P3™. [www.seoulsemiconductor.com](http://www.seoulsemiconductor.com)

A software-optimized aspheric profile combined with front shaped micro-lens arrays enable the generation of four different lens models: narrow beam, medium beam, wide beam, and elliptical pattern.

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

Each of these lenses is available assembled with Fraen's Lens Holder. The holder assures the proper relative placement between the lens and the Z-Power (P3 series)™ LED. Heat staking the four 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.fraen.com](http://www.fraen.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) Z-Power is a trademark of Seoul Semiconductor. For technical specification on LEDs please refer to the Z-Power datasheet or visit [www.seoulsemiconductor.com](http://www.seoulsemiconductor.com)

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## Material Characteristics

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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”*

## Mechanical Characteristics

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### **IMPORTANT - Assembly information:**

For best optical performance (shown above), correct mechanical position of the lens on the LED Z-Power P3 is critical.

To achieve correct lens position with an LED Z-Power P3, all lenses need to be used with the Fraen **holder**.

*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”*

## Optical Characteristics: Beam Divergence

		Typical Total Divergence * (deg)			
Lens Part Number	Type of lens	Blue LEDs ●	Green LEDs ●	Red LEDs ●	White LEDs ○
FSG-HNB1-SSP3-z	Narrow beam	10	10	9,5	13
FSG-HMB1-SSP3-z	Medium beam	22	21.5	21	22.5
FSG-HWB1-SSP3-z	Wide beam	47	46.5	45.5	44.5
FSG-HEB1-SSP3-z	Elliptical beam	22 x 12	22 x 12	21 x 11	22 x 12

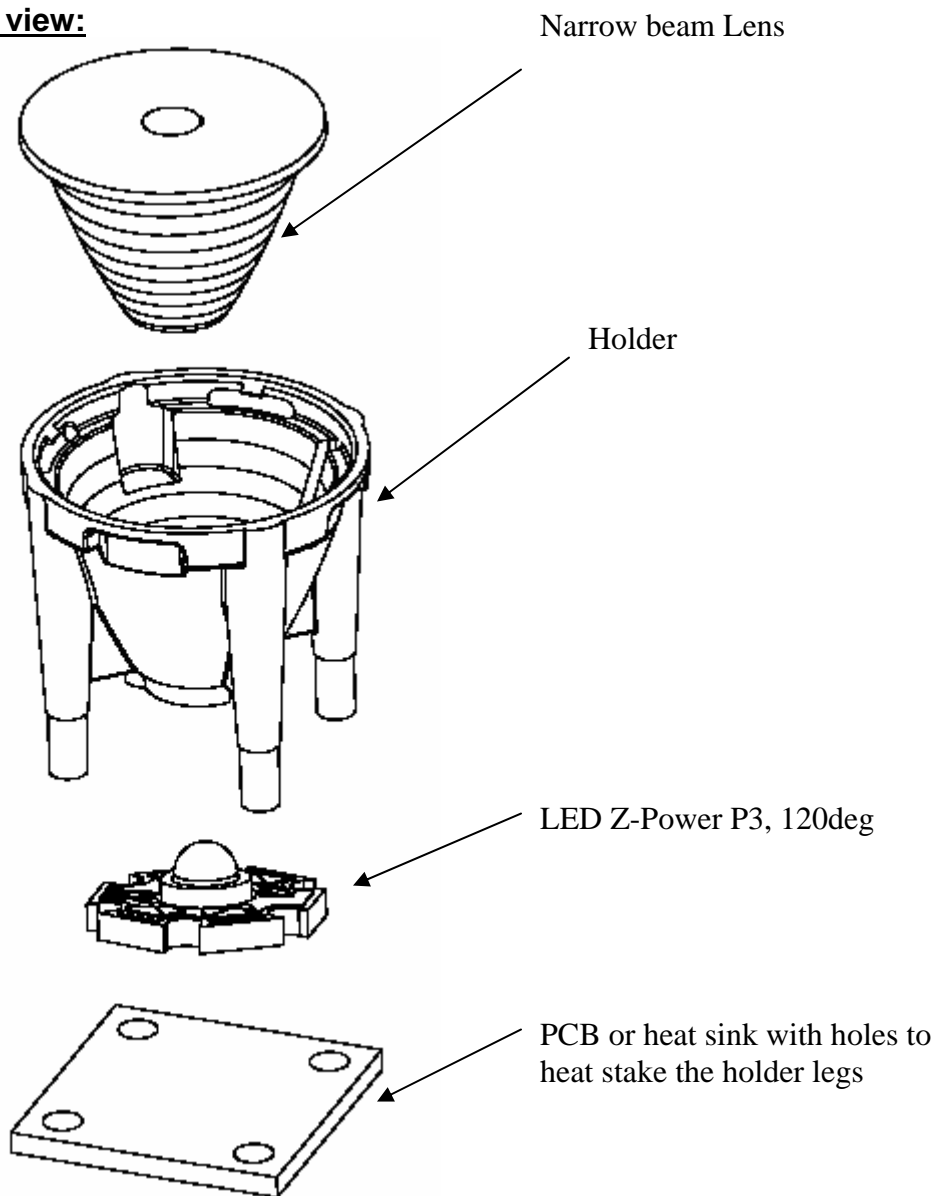
The typical total divergence is the full angle measured where the luminous intensity is half of the peak value of intensity. That typical divergence varies with LED color due to different chip size and chip position tolerance.

		Typical on-axis Intensity * (cd)			
Lens Part Number	Type of lens	Blue LEDs (14,2 lm) ●	Green LEDs (60,2 lm) ●	Red LEDs (41,9lm) ●	White LEDs (45,4 lm) ○
FSG-HNB1-SSP3-z	Narrow beam	183	1142	605	580
FSG-HMB1-SSP3-z	Medium beam	40	267	123	179
FSG-HWB1-SSP3-z	Wide beam	12	79	35	64
FSG-HEB1-SSP3-z	Elliptical beam	82	522	244	285

Luminous intensity depends on the flux binning and tolerances of the LEDs. Please refer to the LEDs datasheet for more details on flux binning and mechanical tolerances.

\* These optical measurements have been taken with preliminary LEDs.

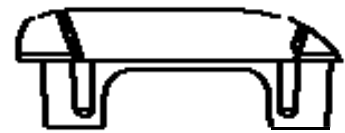
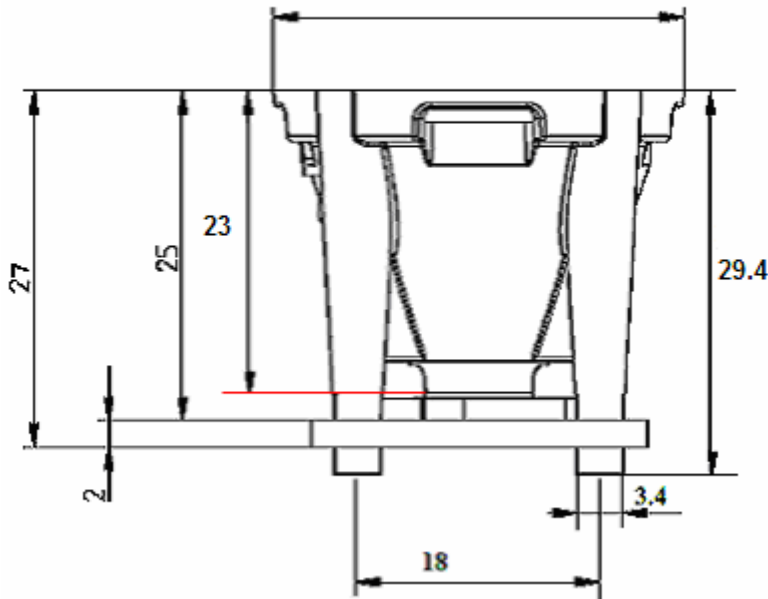
**Lens + holder assembly view:**





**Lens + holder assembly dimensions and identity:**

with standard holder = 30,5mm  
with MR11 holder = 34,9mm



Detail of bottom level of the holder

Dimensions tolerance is +/-0.2mm

The outside mechanical dimensions of all the lenses (Medium, Wide and elliptical beam) are the same for the different beams, except the top of the lens.

The lenses can be identified by their **top view**:

Narrow Beam lens: FSG-HNB1-SSP3-z	Medium Beam lens: FSG-HMB1-SSP3-z	Wide beam lens: FSG-HWB1-SSP3-z	Elliptical lens: FSG-HEB1-SSP3-z
	 <i>light texture on micro lens</i>		
Flat surface	2.6mm hexagonal shaped microlens array	1.7mm hexagonal shaped microlens array	1.0 x 3.7mm rectangular shaped microlens array

## Ordering part numbers

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FSG-HxB1-SSP3-z

**OPTIONS:**

H: with plastic standard holder

M11: with MR11 compatible plastic holder

**LENS TYPE:**

N: Narrow beam lens

M: Medium beam lens

W: Wide beam lens

E: Elliptical beam lens

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