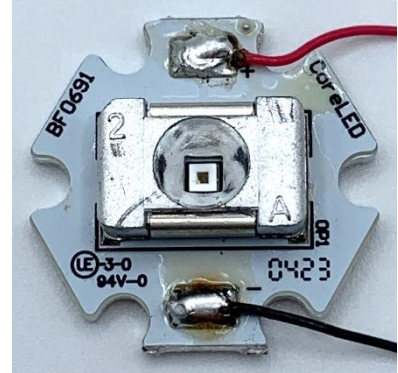


CoreLED P/N 11001-STAR-P1616-IR###

- 4H x 4V or 5H x 5V Spot
  - Osram OSOLON P1616 IR LED
  - Available in either 940nm or 850nm options
    - P/N 11003-STAR-P1616-IR940nm
    - P/N 11003-STAR-P1616-IR850nm



### Product Description:

The SMR product family is a series of vacuum metallized high temperature polymer mini-reflectors that attach directly to a standard Starboard Circuit Board. These components achieve high collection efficiency, a variety of engineered beam patterns, and are supplied for high volume electronics assembly.

### Key Features:

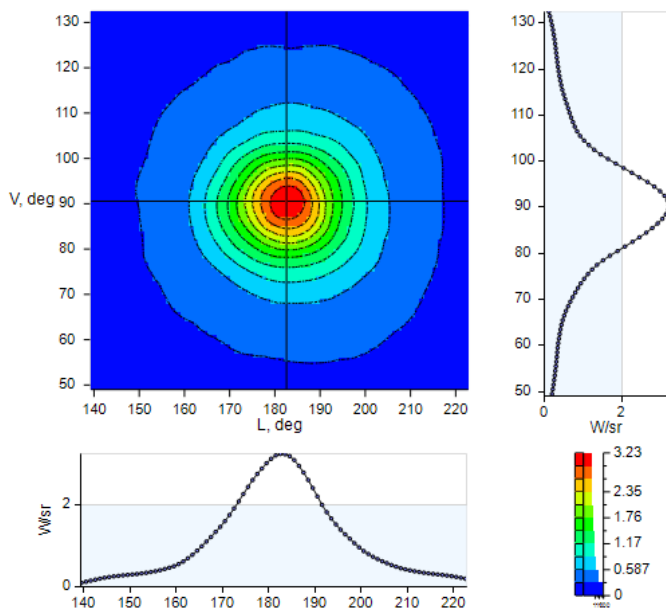
- Optical reflector mounted on starboard for easy assembly
- Supplied on 20mm Starboard
- Increased control of IR radiation/light output (940nm or 850nm)
- Precision alignment (within  $\pm 0.1$ mm)
- Family of optical beam patterns
- Manufactured without the need for additional components to attach the optics
- Provided on starboard for evaluation and testing

**STARBOARD mounted optics are meant for PROTOTYPE and EVALUATION purposes only**

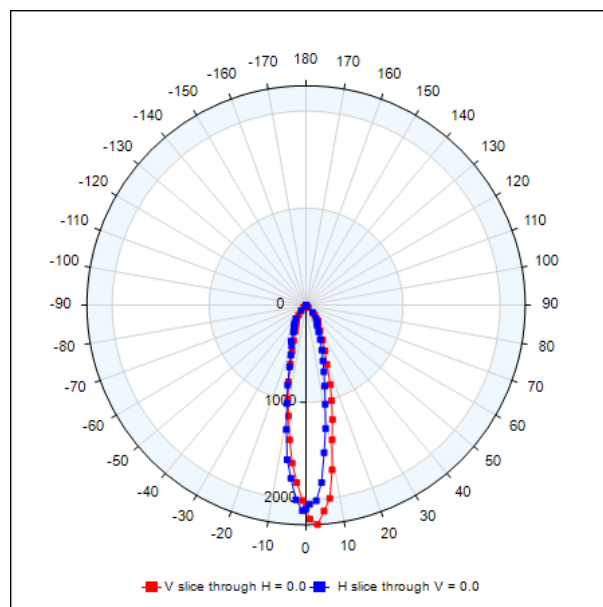
## Emitted Pattern Profile

### Oslon P1616-IR940nm SFH 4180 (Measured)

IES NEMA Type	4H x 4V
Horizontal Beam Angle (50%)	23.1
Vertical Beam Angle (50%)	21.1
Horizontal Field Angle (10%)	61.2
Vertical Field Angle (10%)	63.3
Total Efficiency	85%



Radiant Intensity  
W/sr vs Angle



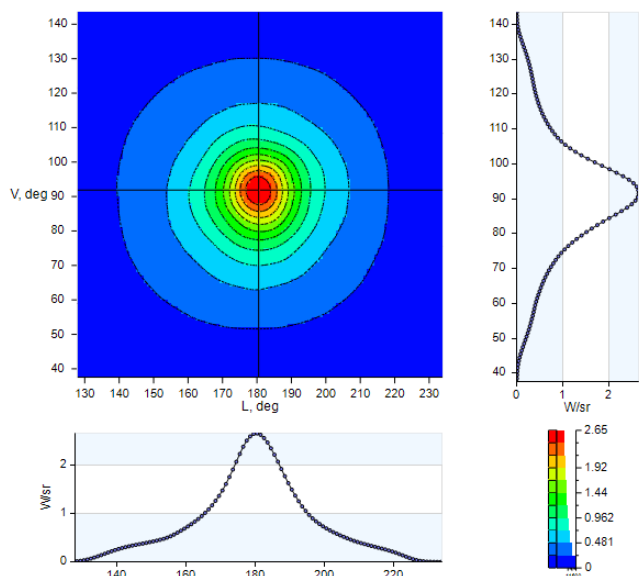
22 DEGREE FWHM

IES files and Raytrace models are available upon request from  
CoreLed Engineering.

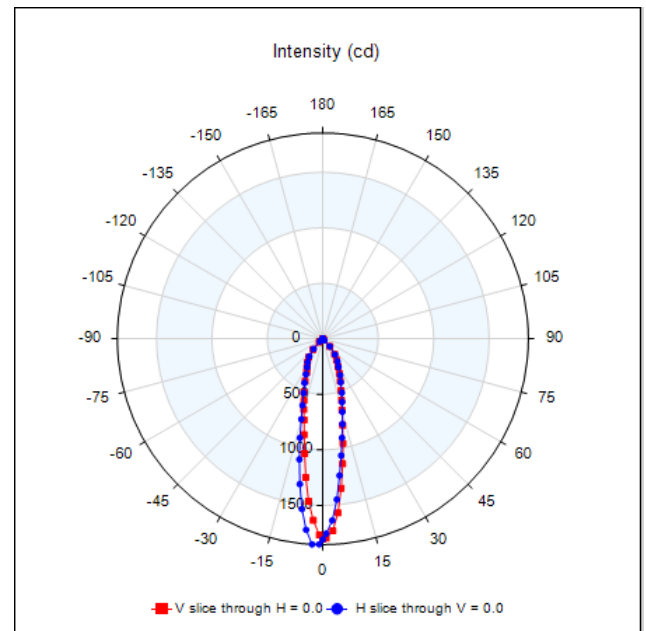
## Emitted Pattern Profile

### Oslon P1616-IR850nm SFH 4170 (Measured)

IES NEMA Type	5H x 5V
Horizontal Beam Angle (50%)	22.0
Vertical Beam Angle (50%)	23.7
Horizontal Field Angle (10%)	75.7
Vertical Field Angle (10%)	75.7
Total Efficiency	85%



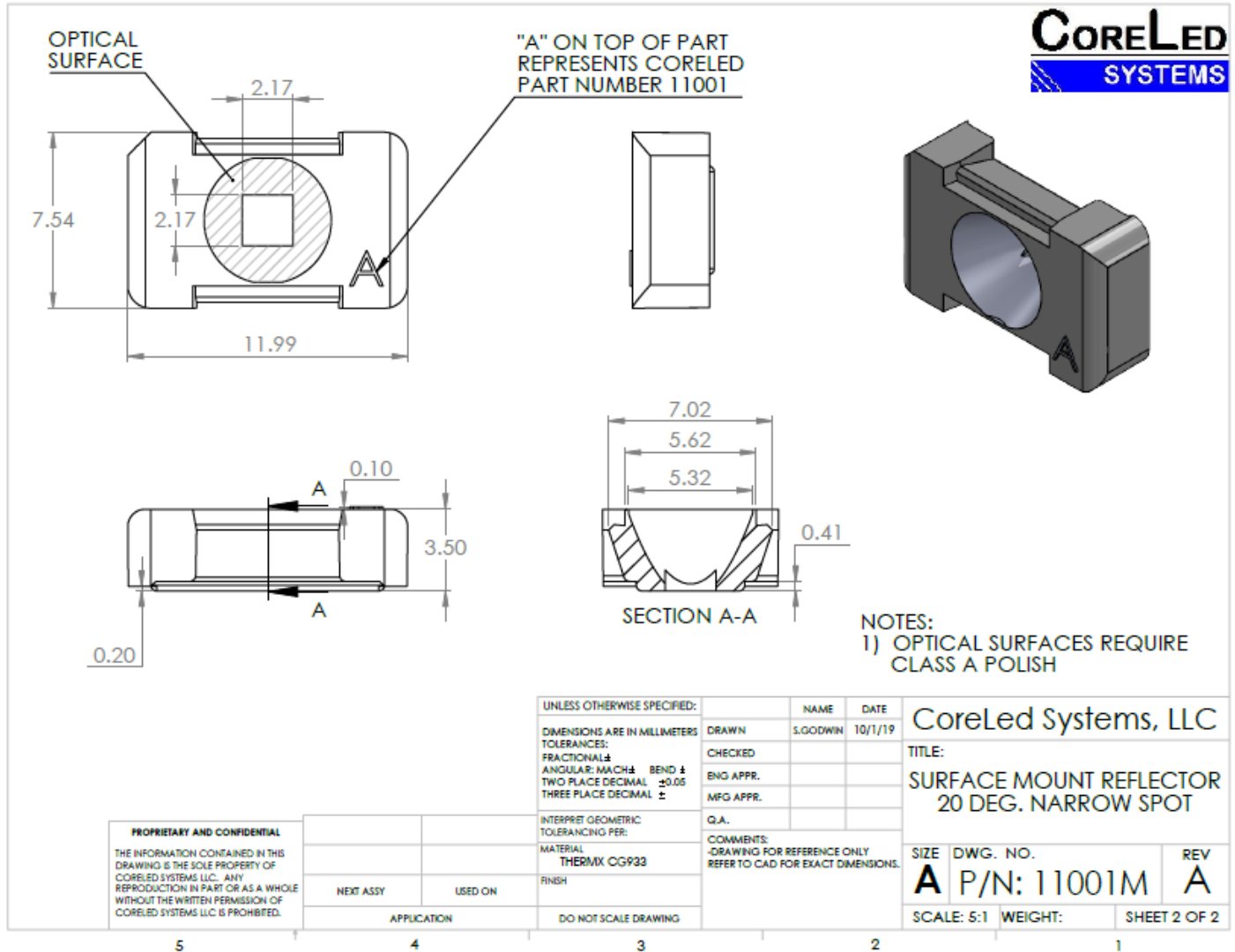
Radiant Intensity  
W/sr vs Angle



23 DEGREE FWHM

IES files and Raytrace models are available upon request from  
CoreLed Engineering.

#### Mechanical Profile: Reflector ( "Narrow" )



CAD files available upon request from CoreLed Engineering

## LED Information

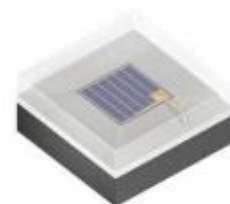
### Features:

- Package: clear silicone
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM)
- IR lightsource with high efficiency
- Double stack emitter
- Centroid wavelength 940 nm

## SFH 4180S

### OSLON<sup>®</sup> P1616

High Power Infrared Emitter (940 nm)



### Ordering Information

Type	Total radiant flux <sup>1)</sup> $I_F = 1000 \text{ mA}; t_p = 10 \text{ ms}$ $\Phi_e$	Total radiant flux <sup>1)</sup> typ. $I_F = 1000 \text{ mA}; t_p = 10 \text{ ms}$ $\Phi_e$	Ordering Code
SFH 4180S	1000 ... 1400 mW	1.15 W	Q65112A8326

The brightness values are measured during a current pulse of typically 10ms, with a tolerance of +/- 12%.

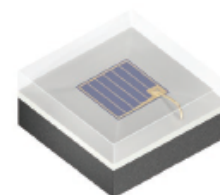
### Features:

- Package: clear silicone
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM)
- IR lightsource with high efficiency
- Double stack emitter
- Centroid wavelength 850 nm

## SFH 4170S

### OSLON<sup>®</sup> P1616

High Power Infrared Emitter (850 nm)



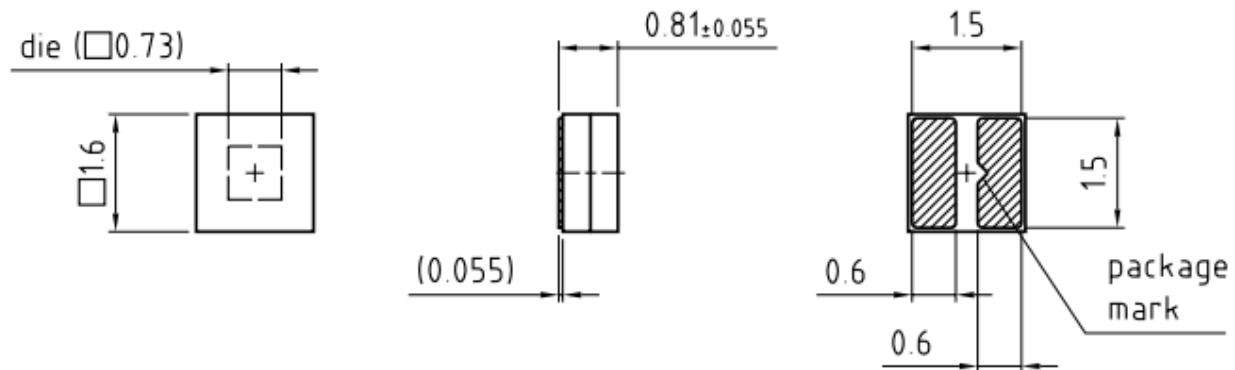
### Ordering Information

Type	Total radiant flux <sup>1)</sup> $I_F = 1000 \text{ mA}; t_p = 10 \text{ ms}$ $\Phi_e$	Total radiant flux <sup>1)</sup> typ. $I_F = 1000 \text{ mA}; t_p = 10 \text{ ms}$ $\Phi_e$	Ordering Code
SFH 4170S	1000 ... 1400 mW	1.15 W	Q65112A9014

The brightness values are measured during a current pulse of typically 10ms, with a tolerance of +/- 12%.

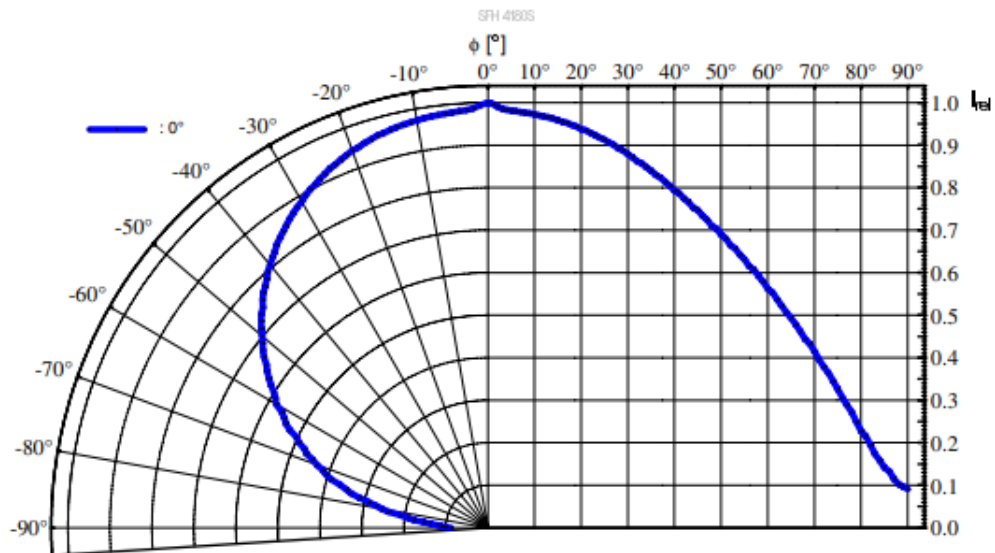
## LED Information: Dimensions & Radiation Profile

### Dimensional Drawing <sup>6)</sup>

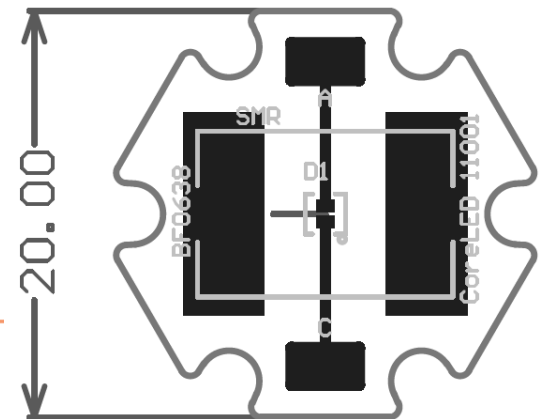
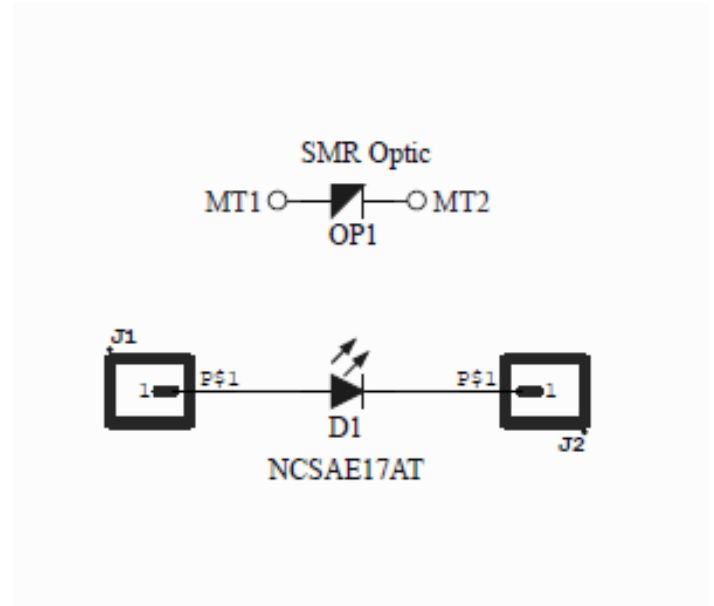
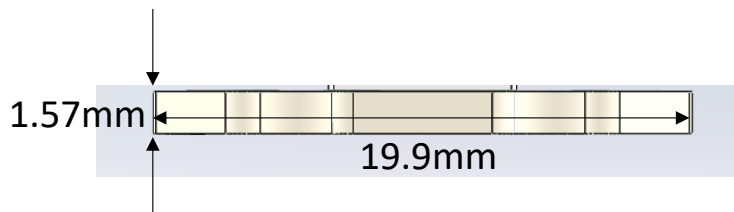
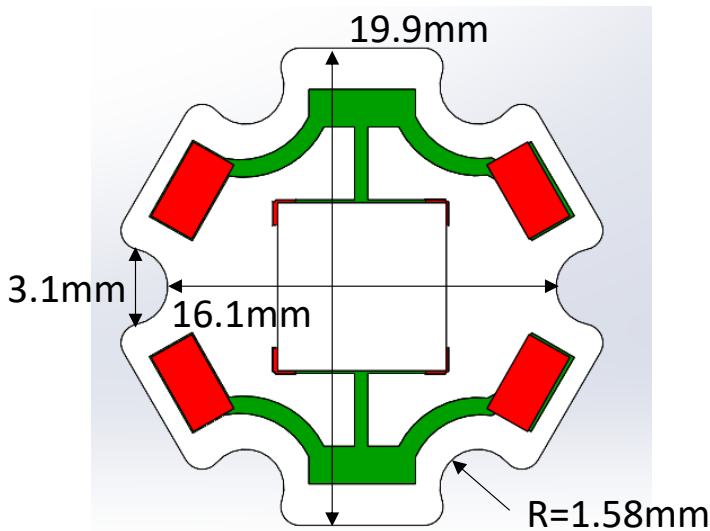


### Radiation Characteristics <sup>4), 5)</sup>

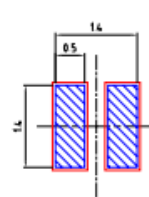
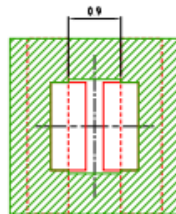
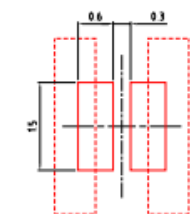
$$I_{e,rel} = f(\phi)$$



#### Starboard Schematic



#### Recommended Solder Pad <sup>6)</sup>

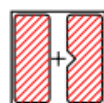
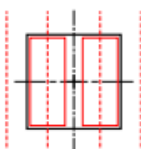


□ foot print    □ Cu area

■ solder resist

■ solder stencil  
recommended stencil  
thickness 120µm

Component Location on Pad





#### Electrical:

#### Characteristics

$I_F = 1000 \text{ mA}$ ;  $t_p = 10 \text{ ms}$ ;  $T_A = 25 \text{ °C}$

Parameter	Symbol		Values
Peak wavelength	$\lambda_{\text{peak}}$	typ.	950 nm
Centroid wavelength	$\lambda_{\text{centroid}}$	typ.	940 nm
Forward voltage	$V_F$	typ. max.	2.95 V 3.3 V
Forward voltage $I_F = 2 \text{ A}$ ; $t_p = 100 \text{ } \mu\text{s}$	$V_F$	typ. max.	3.4 V 4.0 V
Reverse current <sup>2)</sup> $V_R = 5 \text{ V}$	$I_R$	typ. max.	0.01 $\mu\text{A}$ 10 $\mu\text{A}$
Radiant intensity	$I_e$	typ.	280 mW/sr

#### Characteristics

$I_F = 1000 \text{ mA}$ ;  $T_A = 25 \text{ °C}$

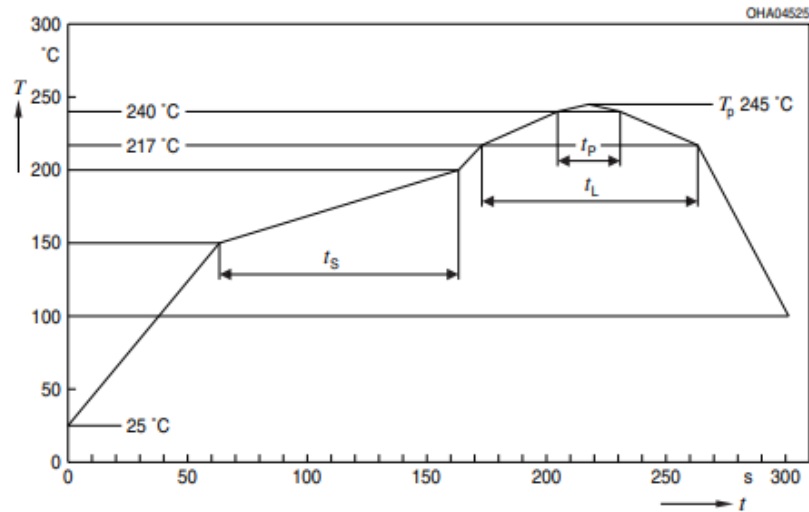
Parameter	Symbol		Values
Peak wavelength	$\lambda_{\text{peak}}$	typ.	860 nm
Centroid wavelength	$\lambda_{\text{centroid}}$	typ.	850 nm
Spectral bandwidth at 50% $I_{\text{rel,max}}$ (FWHM)	$\Delta\lambda$	typ.	30 nm
Forward voltage	$V_F$	typ. max.	3.25 V 3.6 V
Forward voltage $I_F = 2 \text{ A}$ ; $t_p = 100 \text{ } \mu\text{s}$	$V_F$	typ. max.	3.7 V 4.3 V
Reverse current <sup>2)</sup> $V_R = 5 \text{ V}$	$I_R$	typ. max.	0.01 $\mu\text{A}$ 10 $\mu\text{A}$
Radiant intensity	$I_e$	typ.	280 mW/sr



#### Thermal: LED Solder Profile.

#### Reflow Soldering Profile

Product complies to MSL Level 3 acc. to JEDEC J-STD-020E



Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat <sup>1)</sup> 25 °C to 150 °C			2	3	K/s
Time $t_s$ $T_{Smin}$ to $T_{Smax}$	$t_s$	60	100	120	s
Ramp-up rate to peak <sup>1)</sup> $T_{Smax}$ to $T_p$			2	3	K/s
Liquidus temperature	$T_L$		217		°C
Time above liquidus temperature	$t_L$		80	100	s
Peak temperature	$T_p$		245	260	°C
Time within 5 °C of the specified peak temperature $T_p - 5$ K	$t_p$	10	20	30	s
Ramp-down rate* $T_p$ to 100 °C			3	6	K/s
Time 25 °C to $T_p$				480	s

#### Packaging:

Individually packaged in static controlled bag.