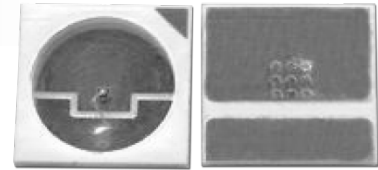




## LED21-SMD5

- Mid-IR LED
- 2.15  $\mu\text{m}$ , 1.0 mW qCW
- Ceramic SMD, 5 x 5 x 1 mm



### Description

**LED21-SMD5** is fabricated from narrow band-gap GaInAsSb/AlGaAsSb heterostructures lattice matched to GaSb substrate. This surface mount Mid-IR LED provides a typical peak wavelength of **2.15  $\mu\text{m}$**  and optical power of typ. **1.0 mW qCW**. It comes in low temperature co-fired ceramic SMD package, with anode and cathode metalized areas on the back side of the surface.

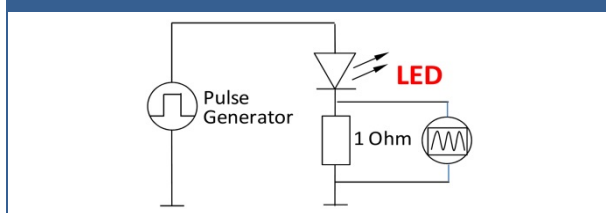
### Electro-Optical Characteristics ( $T_{\text{CASE}}=25^{\circ}\text{C}$ )

Parameter	Symbol	Conditions	Min.	Values Typ.	Max.	Unit
Peak Wavelength	$\lambda_{\text{Peak}}$	$I_F=150\text{mA qCW}$	2.10	2.15	2.19	$\mu\text{m}$
FWHM of the emission band	$\Delta\lambda$	$I_F=150\text{mA qCW}$	170	200	250	nm
Optical Output Power, qCW	$P_O$	$I_F=200\text{mA qCW}$	0.8	1.0	1.2	mW
Optical Output Power, pulsed	$P_O$	$I_F=1\text{A}$ , $f=1\text{kHz}$ , duty cycle 0.1%	15	20	30	mW
Operating Voltage	$V_{OP}$	$I_F=200\text{mA qCW}$	0.5		1.0	V
Switching Time			10	20	30	ns
Operating Temperature	$T_{\text{CASE}}$		- 200		+ 50	$^{\circ}\text{C}$
Soldering Temperature *	$T_{\text{SOLD}}$				+ 180	$^{\circ}\text{C}$

\* must be completed within 10 seconds

### Operating Regime

#### LED Basic Circuit Connection

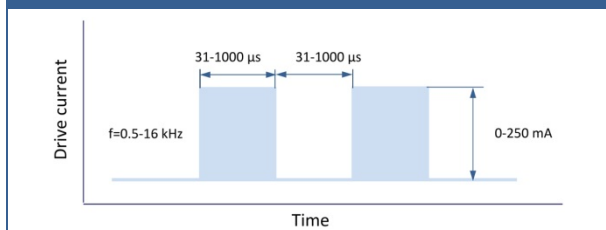


#### Suitable Drivers and Evaluation Boards

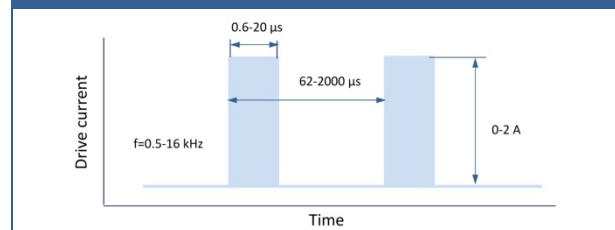
We recommend to use **Quasi Continuous Wave (qCW) mode** with duty cycle 50% or 25% to obtain maximum average optical power, and short **Pulse mode** to obtain maximum peak power.

**CW (continuous wave) mode is NOT recommended!**

#### Quasi Continuous Wave (qCW) Mode



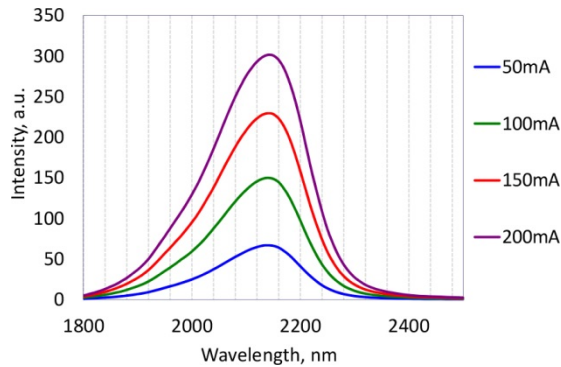
#### Pulse Mode



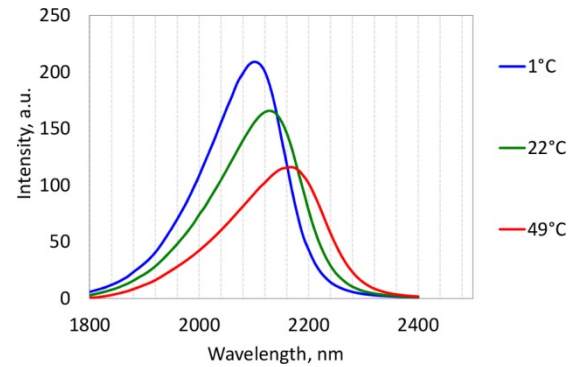


## Performance Characteristics

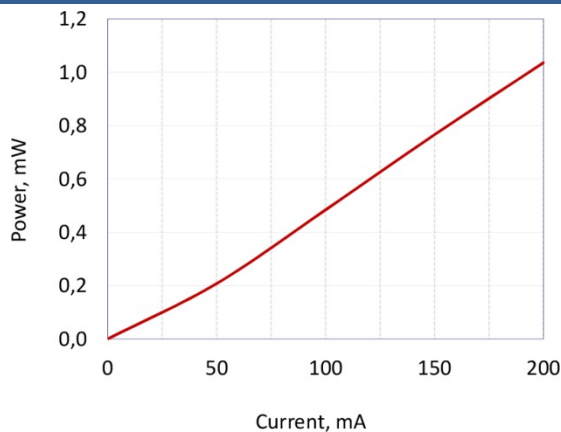
**Spectra At Different Currents**  
(qCW,  $T_{CASE}=25^{\circ}\text{C}$ )



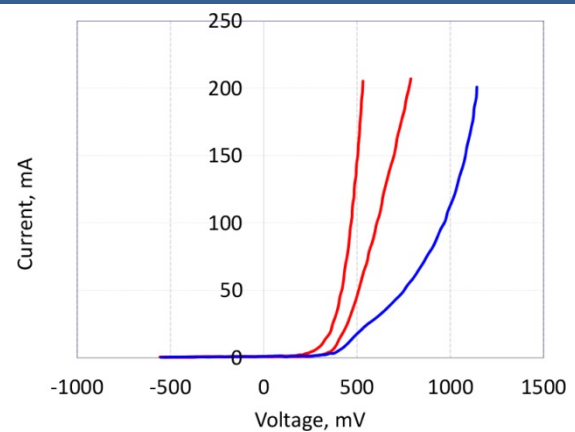
**Spectra At Different Temperatures**  
(qCW,  $I_F=150\text{mA}$ )



**Output Power vs. Operating Current**  
(qCW,  $T_{CASE}=25^{\circ}\text{C}$ )



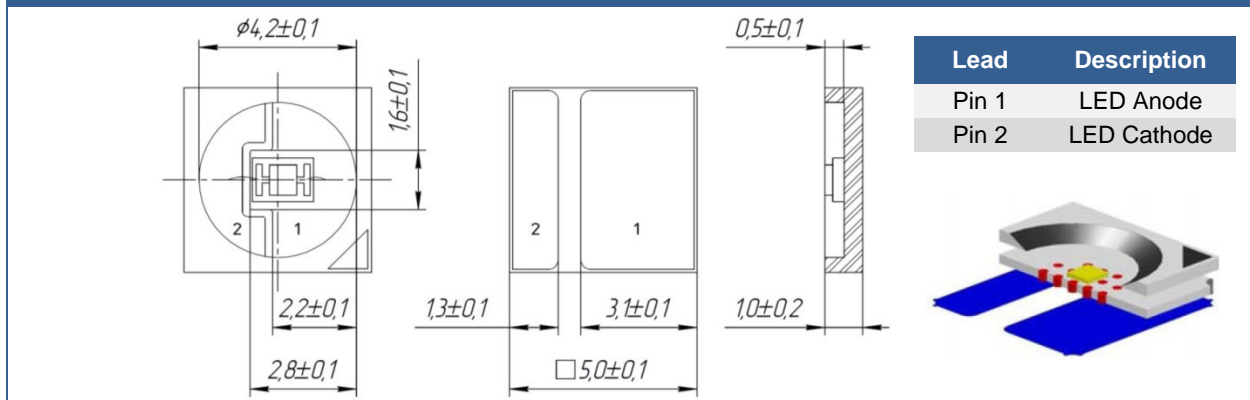
**Forward Current vs. Forward Voltage**  
( $T_{CASE}=25^{\circ}\text{C}$ )



## Outline Dimensions

SMB1N

flat



All Dimensions in mm

Material – Low Temperature Co-fired Ceramic (LTCC):

- thermal conductivity 25 W/mK
- thermoresistance 8  $^{\circ}\text{C/W}$



## Precautions

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### Cautions:

- Check your connection circuits before turning on the LED.
- Observe the LED polarity: LED anode is marked with a RED dot.
- DO NOT connect the LED to the multimeter!

### Soldering:

- Do avoid overheating of the LED
- Do avoid electrostatic discharge (ESD)
- Do avoid mechanical stress, shock, and vibration
- Do only use non-corrosive flux
- Do not apply current to the LED until it has cooled down to room temperature after soldering

### Static Electricity:

**LEDs are sensitive to electrostatic discharge (ESD).** Precautions against ESD must be taken when handling or operating these LEDs. Surge voltage or electrostatic discharge can result in complete failure of the device.

### Operation:

**Do only operate LEDs with a current source.**

Running these LEDs from a voltage source will result in complete failure of the device.

Current of a LED is an exponential function of the voltage across it. Usage of current regulated drive circuits is mandatory.