

## Optically Immersed 3.4 $\mu\text{m}$ LED in heatsink optimized housing

### LED34Su, LED34Sr

## TE cooled Optically Immersed 3.4 $\mu\text{m}$ LED

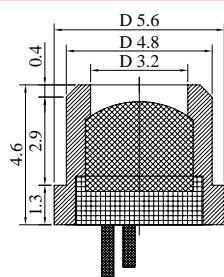
### LED34TO8TEC

Peak wavelength	$\mu\text{m}$	$3.4 \pm 0.05$	@22 °C
Pulse power	mW	Drive current 1 A, 0.02 duty cycle	$0.4 \div 0.5$
Quasi-CW power	mW	Drive current 0.3 A, 0.5 duty cycle	$0.20 \div 0.25$
CW power	mW	Drive current 0.2 A	$0.15 \div 0.20$
Cut-off frequency	MHz	50	<sup>1</sup>

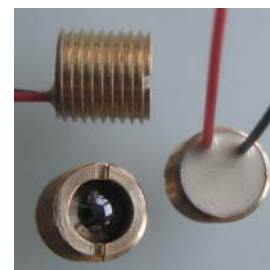
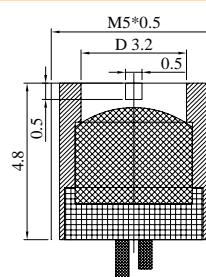
Code	Emission size, mm	Weight, g	Optical components	Far-field pattern FWHM, deg.	Optical axis deviation, deg.	Optical power deviation in lot, %	Operation conditions, °C	Lifetime, hrs
LED34Su LED34Sr	$\varnothing 3.2$	~0.4	Si lens	~15	$\leq 5$	$\pm 25$	$-60 \div +120$ <sup>2</sup>	>80 000 <sup>4</sup>
LED34 TO8TEC		~10	Si lens and output sapphire window D=6mm				$-60 \div +85$ <sup>3</sup>	

### Product view

LED34Su

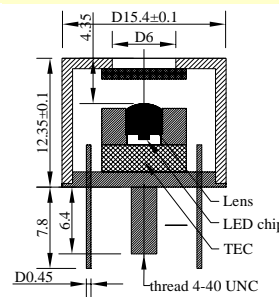
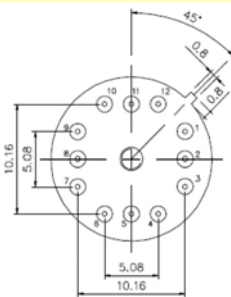


LED34Sr



Pin assignment: red wire or long wire and red point on house - positive

Pin assignment: red wire or long wire and red point on house - positive



Pin assignment  
LED34TO8TEC12

1 TEC negative;  
3 TEC positive;  
4 LED negative;  
6 LED positive;  
7, 9 thermosensor;  
11  $\perp$  (House)

### Features

- Original growth of narrow gap semiconductor alloys onto  $n^+$ -InAs substrate;
- Flip-chip design of LEDs;
- Optical coupling through the use of chalcogenide glasses and Si lenses with antireflection coating
- 3-fold increased LED output power;
- Beam collimation;
- Small on-off time (tenths of ns);
- Low power consumption ( $\leq 0.1\text{W}$ )

Emission beam divergence is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices. We recommend if possible using low duty cycle mode of operation with  $I < 0.5 \times I_{\text{max}}$  so that higher efficiency and long term stability of a LED are achieved. Data are valid for LED attached to a heatsink and thermostabilized at 22°C. Heatsink is essential for TEC operation!

### Notes

<sup>1</sup> - according to estimation

<sup>2</sup> - devices have passed through 15 thermo cycles : (20°C, 8 hrs) -transition period of 30 min - (+125°C, 8 hrs) without changes in specifications. Valid for devices produced since 01.2013. Operation conditions: -25÷+60 °C for old version LEDs.

<sup>3</sup> - devices have passed through 15 thermo cycles : (-60°C, 30 min) - transition period of 30 min - (+85°C, 30 min) without changes in specifications. Valid for devices produced since 01.2013. Operation conditions: -25÷+60 °C for old version LEDs.

<sup>4</sup> - according to accelerated degradation stress at CW drive current 0.2 A

Product specifications are subject to change without prior notice due to improvements or other reasons. Updated 16.05.13

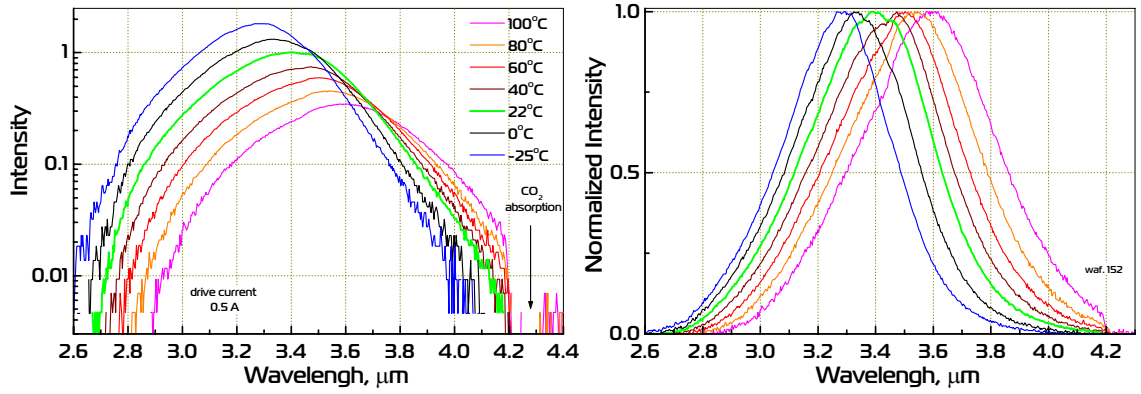


ООО «ИюффеЛЕД»  
IoffeLED, Ltd

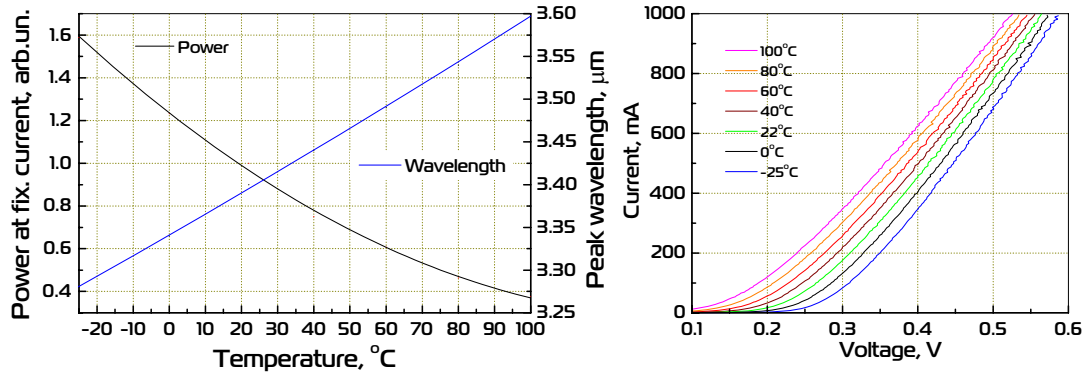
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<http://www.mirdog.spb.ru>; e-mail: bmat@iropt3.ioffe.ru

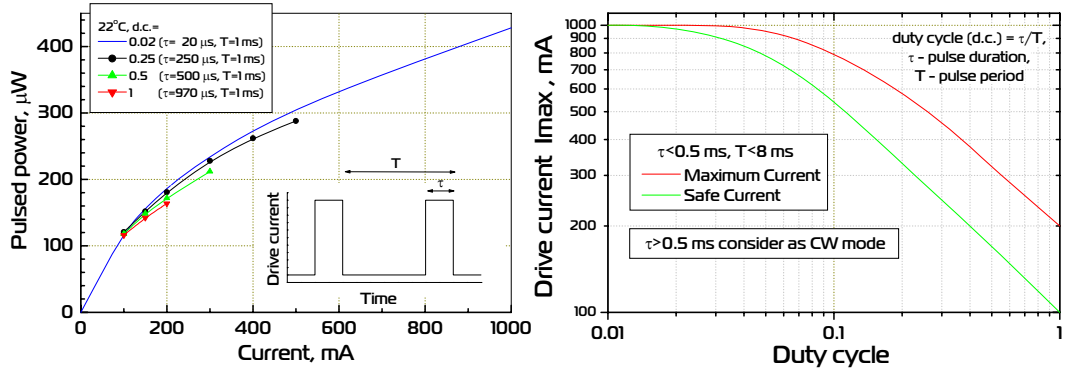
Emission spectra



Power and peak wavelength vs. temperature; I - V curve

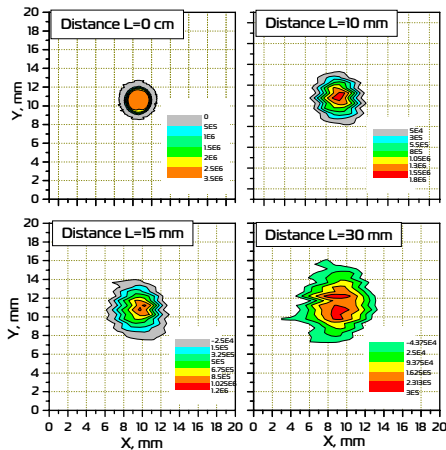


Output power and drive current vs operation conditions

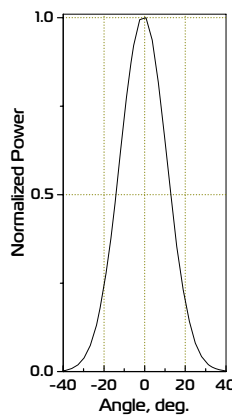


Far-field characterization

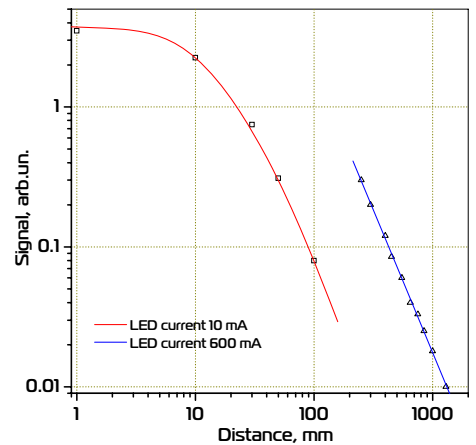
Radiation beam pattern in plane orthogonal to beam axis at several distances from LED



Angle distribution of output power



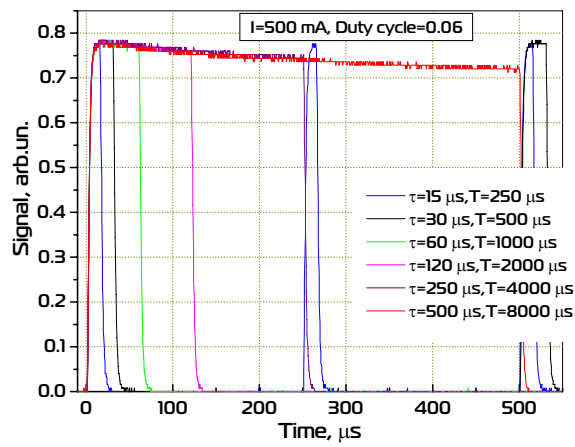
PD signal (PDxSr/Su) vs. distance from activated LED



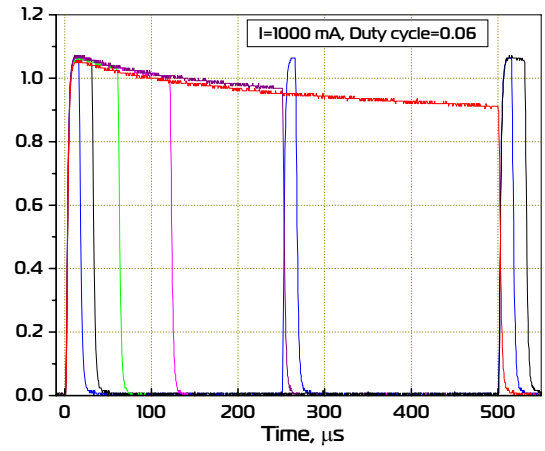
## Time dependence of the output power for several values of d.c. and currents (LED attached to a heatsink at room temperature).

Pulse operation (d.c.=0.06)

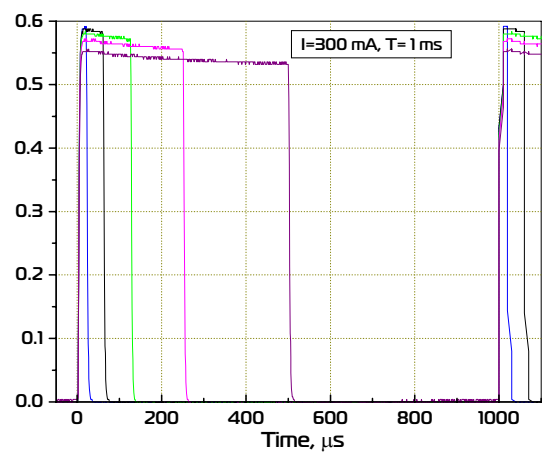
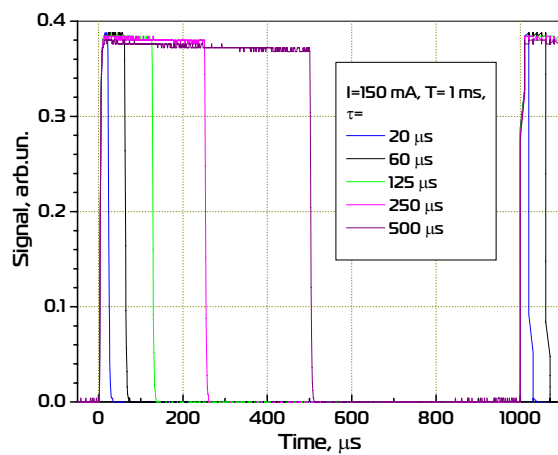
“Safe” operation mode



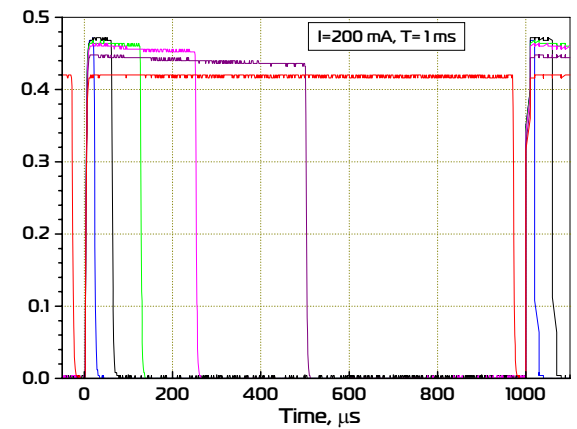
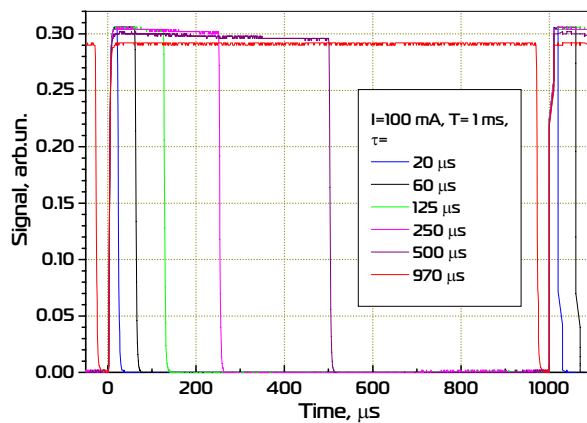
“Maximum current” operation mode



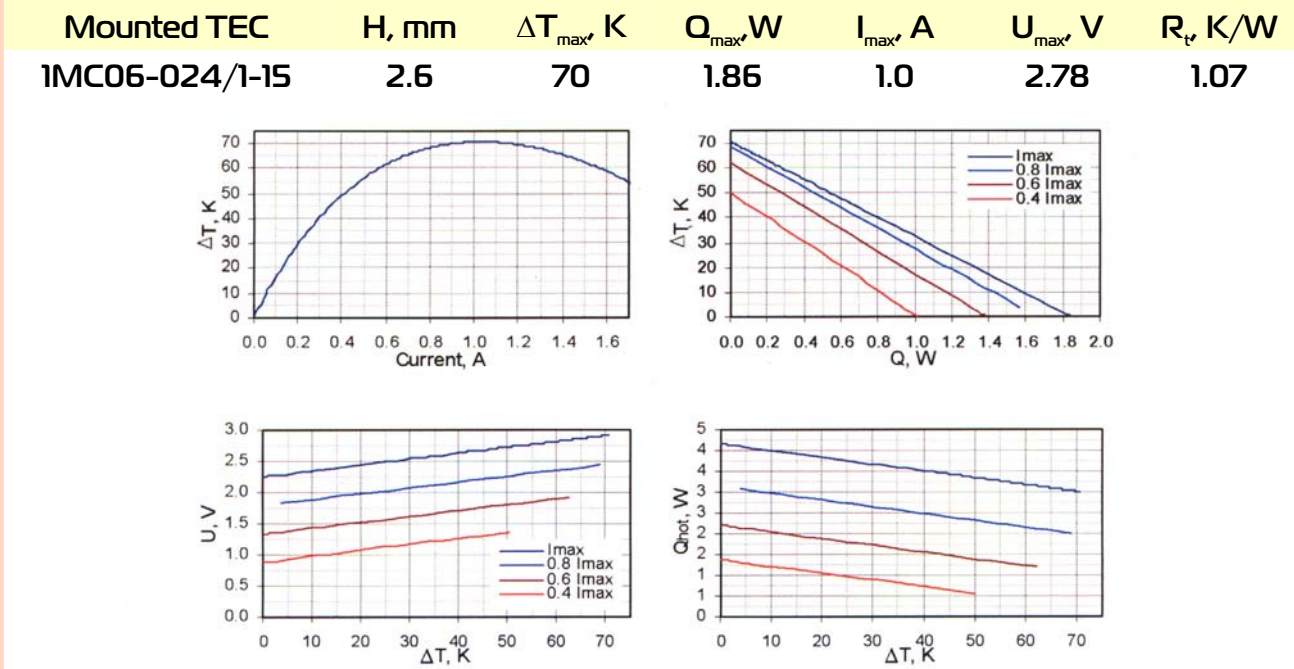
Quasi CW mode (d.c.=0.5)



CW mode (d.c.=1)

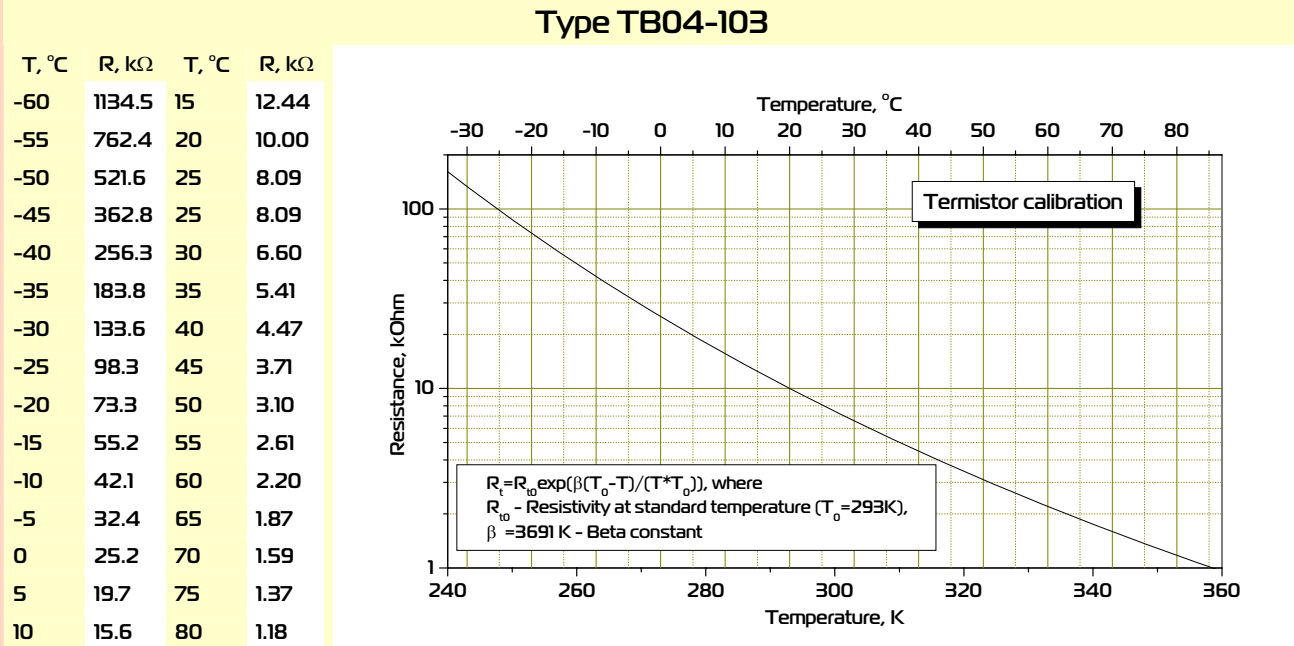


Thermoelectric cooling module datasheet



Data for  $T_{hot} = 300$  K, from [www.tec-microsystems.com](http://www.tec-microsystems.com); [www.rmtitd.ru](http://www.rmtitd.ru)

Thermistor specification



Possible TEC heatsink view

