

Optically Immersed 4.2 μm LED in heatsink optimized housing

LED42Su, LED42Sr

TE cooled Optically Immersed 4.2 μm LED

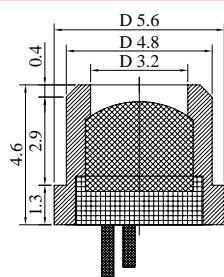
LED42TO8TEC

Peak wavelength	μm	4.15÷4.2	@22 °C
Pulse power	mW	Drive current 1 A, 0.02 duty cycle	0.08÷0.10
Quasi-CW power	mW	Drive current 0.3 A, 0.5 duty cycle	0.04÷0.05
CW power	mW	Drive current 0.2 A	0.03÷0.04
Cut-off frequency	MHz	50	¹

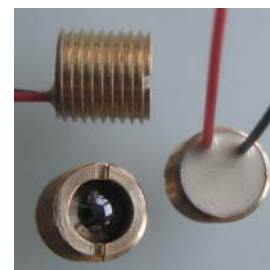
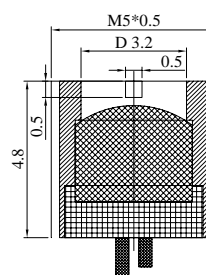
Code	Emission size, mm	Weight, g	Optical components	Far-field pattern FWHM, deg.	Optical axis deviation, deg.	Optical power deviation in lot, %	Operation conditions, °C	Lifetime, hrs
LED42Su LED42Sr	$\varnothing 3.2$	~0.4	Si lens	~15	≤ 5	± 25	-60÷+120 ²	>100 000 ⁴
LED42 TO8TEC		~10	Si lens and output sapphire window D=6mm				-60÷+85 ³	

Product view

LED42Su

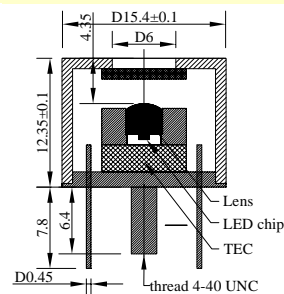
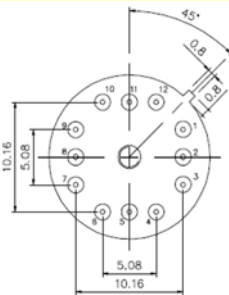


LED42Sr



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
LED42TO8TEC12

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

¹ - according to estimation

² - 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.

³ - 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.

⁴ - 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 04.09.13

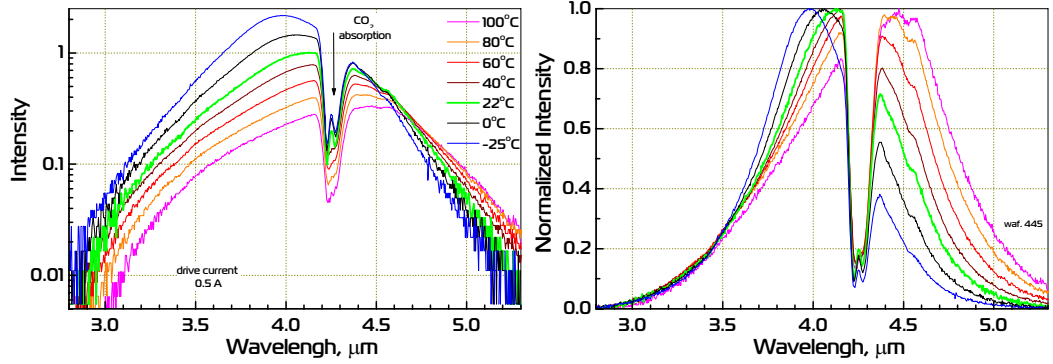


ООО «ИюффеЛЕД»
IoffeLED, Ltd

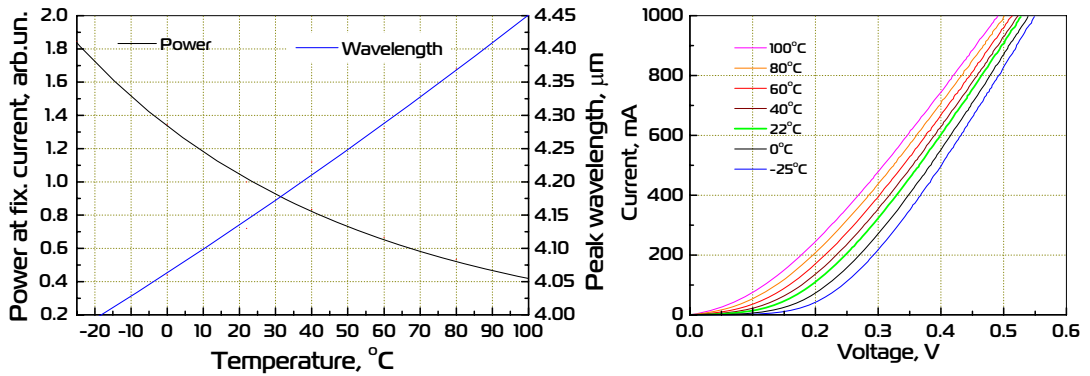
Politechnicheskaya 26,
St.Petersburg, 194021, RUSSIA

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

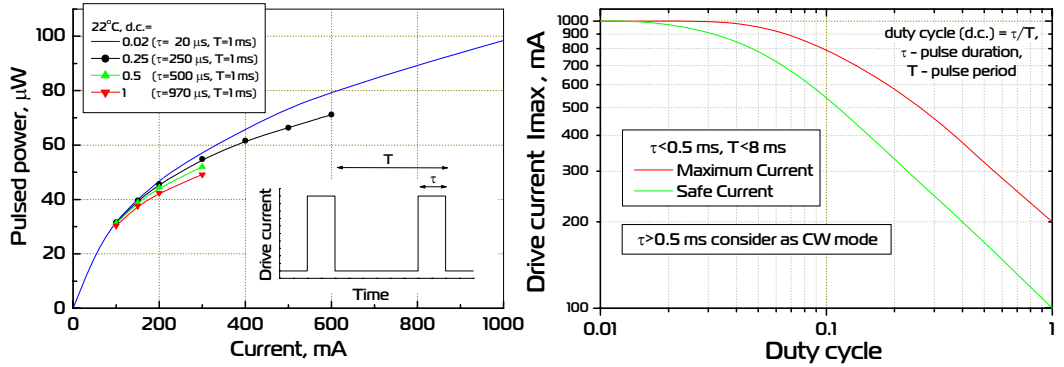
Emission spectra



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

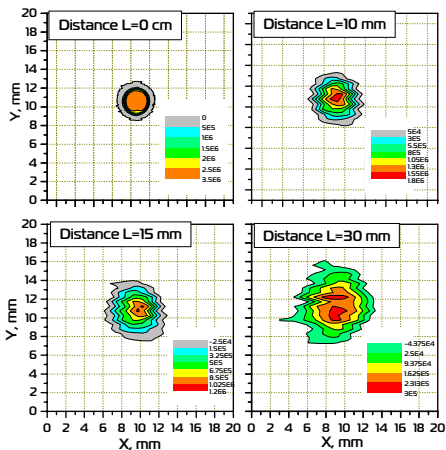


Output power and drive current vs operation conditions

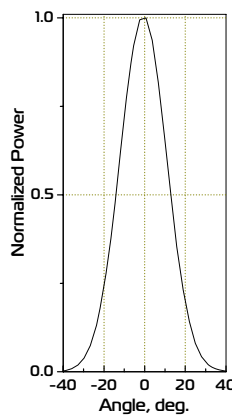


Far-field characterization

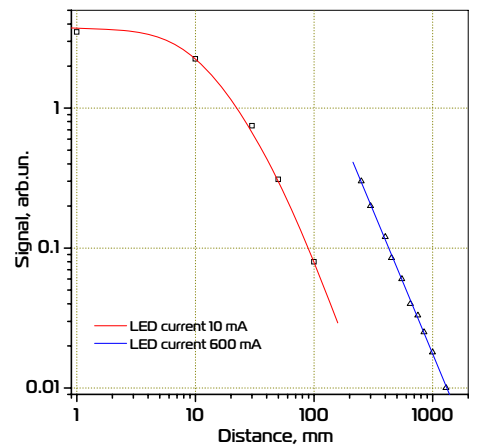
Radiation beam pattern in plane orthogonal to beam axis at several distances from LED



Angle distribution of output power



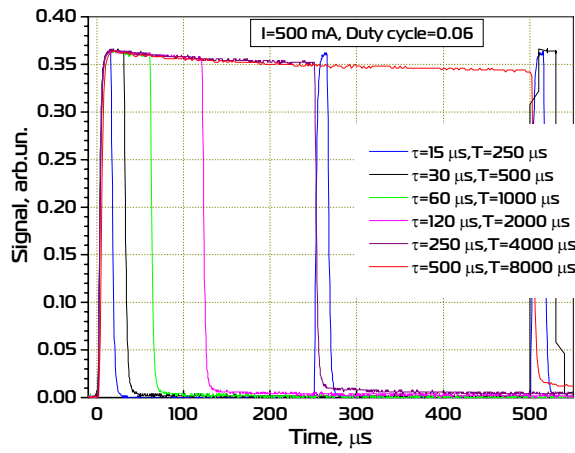
PD signal (PDxxSr/Su) vs. distance from activated LED



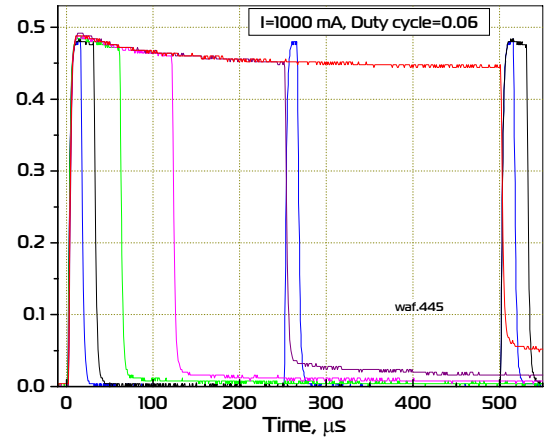
Time dependence of the output power for several values of d.c. and currents (LED attached to a heatsink at room temperature).

Pulse operation (d.c.=0.06)

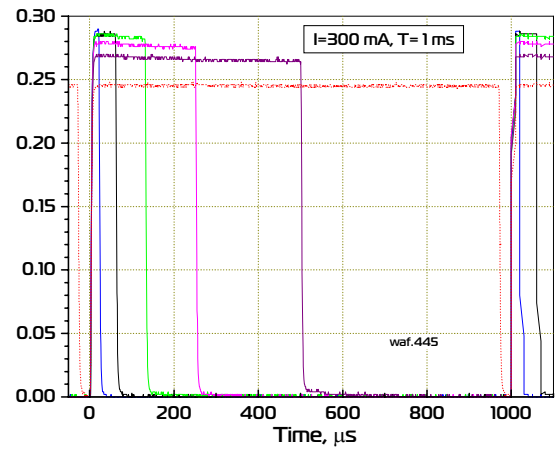
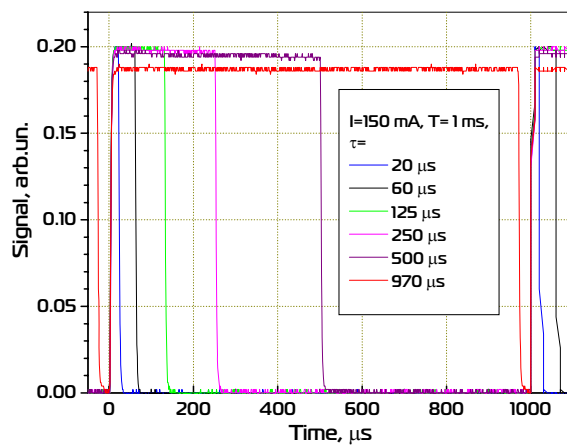
“Safe” operation mode



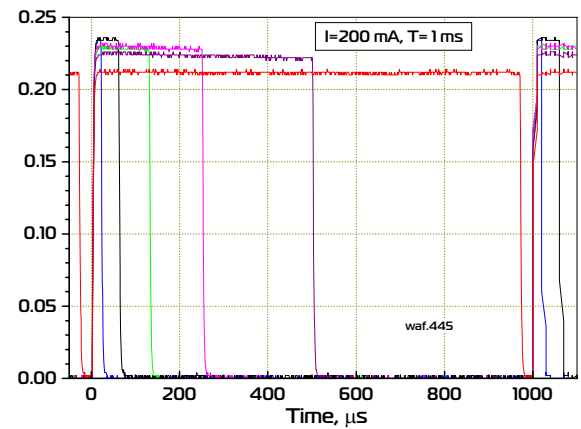
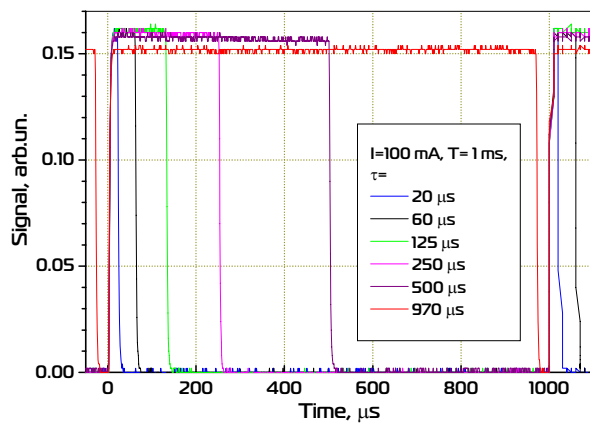
“Maximum current” operation mode



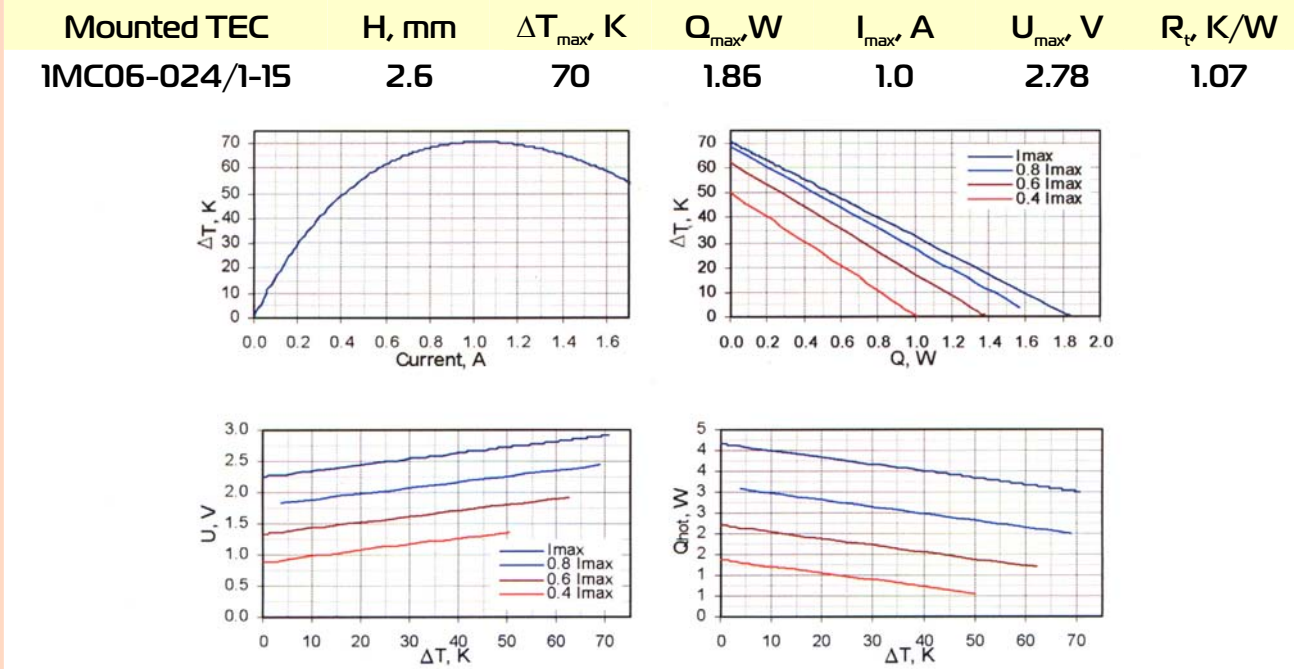
Quasi CW mode (d.c.=0.5)



CW mode (d.c.=1)

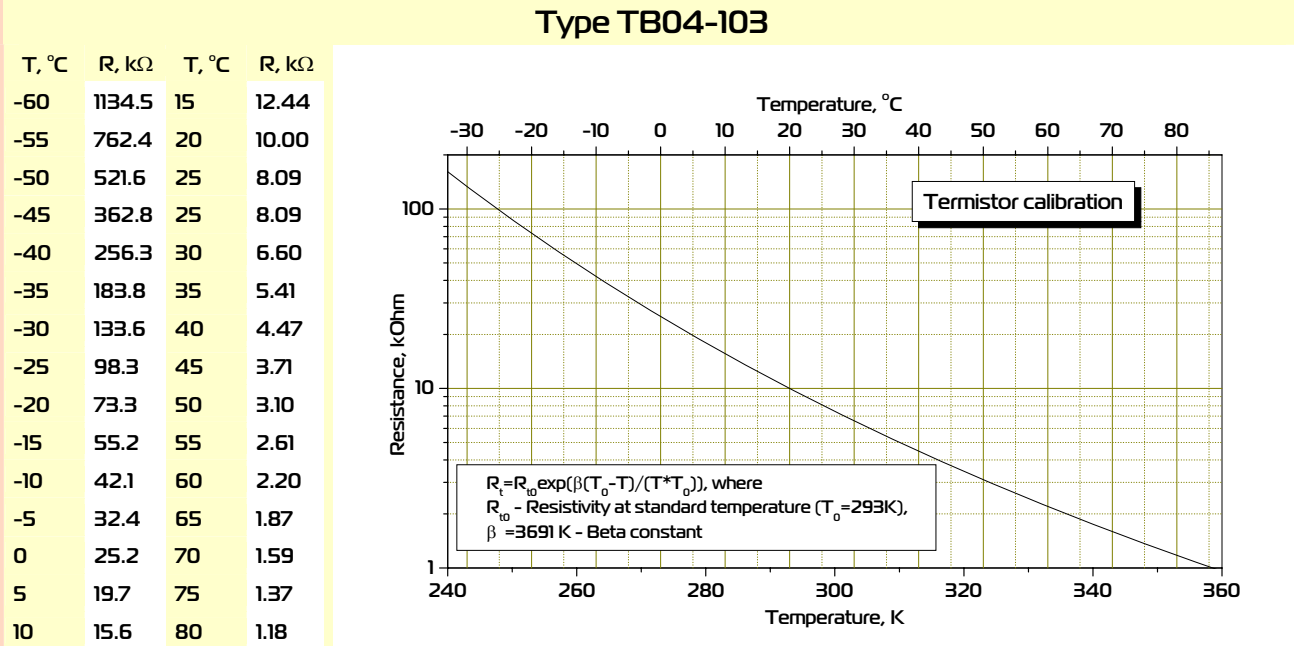


Thermoelectric cooling module datasheet



Data for $T_{hot}=300$ K, from www.tec-microsystems.com; www.rmtitd.ru

Thermistor specification



Possible TEC heatsink view

