

Optically Immersed 3.4 μm LED in heatsink optimized housing

LED34Su, LED34Sr

TE cooled Optically Immersed 3.4 μm LED

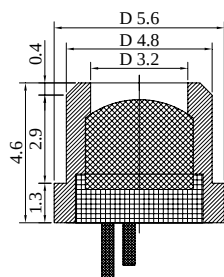
LED34TO8TEC

Peak wavelength	μm	3.4 ± 0.05	@22 °C
Pulse power	mW	Drive current 1 A, 0.02 duty cycle	0.4 ÷ 0.5
Quasi-CW power	mW	Drive current 0.3 A, 0.5 duty cycle	0.20 ÷ 0.25
CW power	mW	Drive current 0.2 A	0.15 ÷ 0.20
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
LED34Su LED34Sr	$\varnothing 3.2$	~0.4	Si lens	~15	≤ 5	± 25	-60 ÷ +120 ²	>80 000 ⁴
LED34 TO8TEC		~10	Si lens and output sapphire window D=6mm				-60 ÷ +85 ³	

Product view

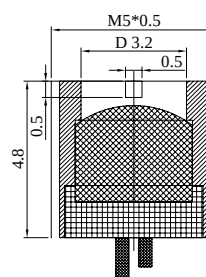
LED34Su



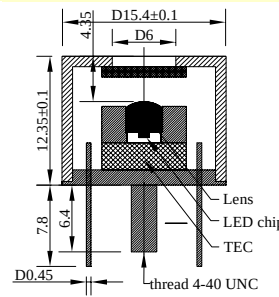
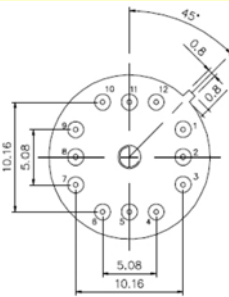
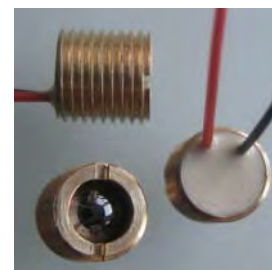
Pin assignment: red wire or long wire and red point on house - positive



LED34Sr



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 (≤ 0.1 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

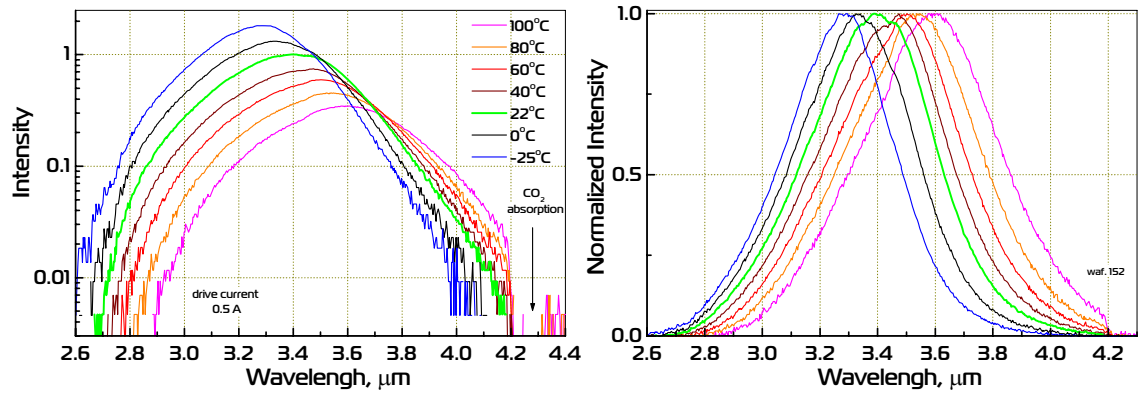
² - devices have passed through 15 thermo cycles : (20°C, 8 hrs) -transition period of 30 min - (+125°C, 8 hrs) without changes in specifications. Valid for devices produced since 01.2013. Operation conditions: -25 ÷ +60 °C for old version LEDs.

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.

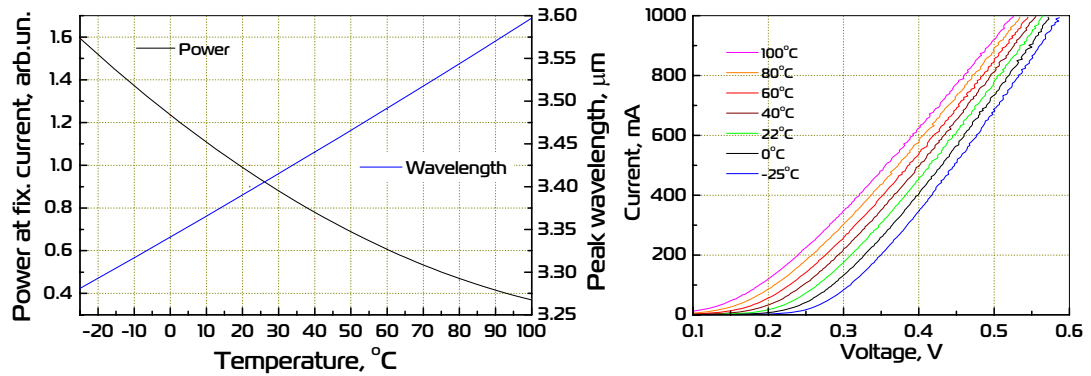
⁴ - according to accelerated degradation stress at CW drive current 0.2 A

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

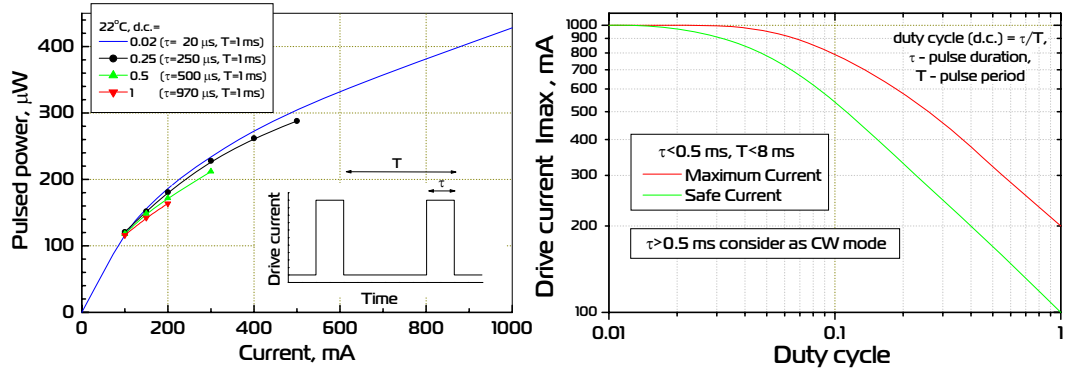
Emission spectra



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

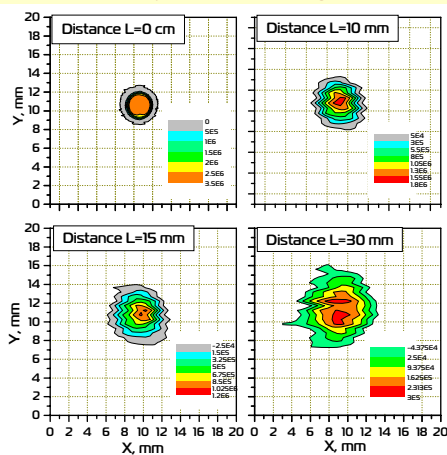


Output power and drive current vs operation conditions

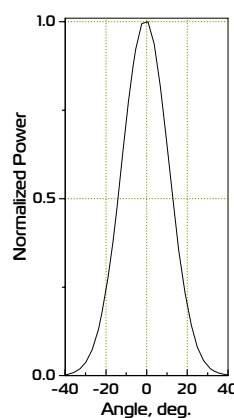


Far-field characterization

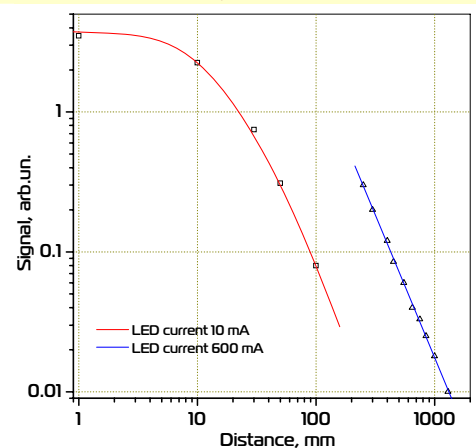
Radiation beam pattern in plane orthogonal to beam axis at several distances from LED



Angle distribution of output power



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

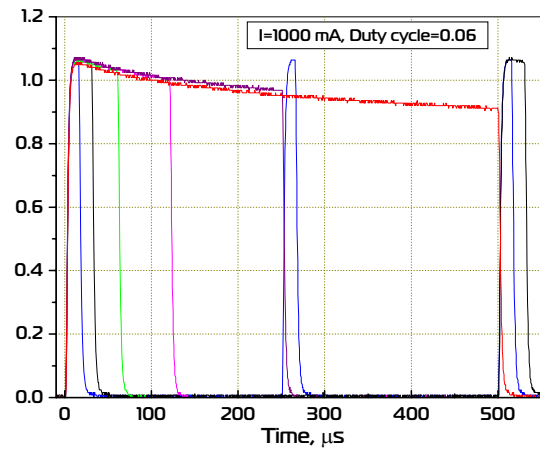
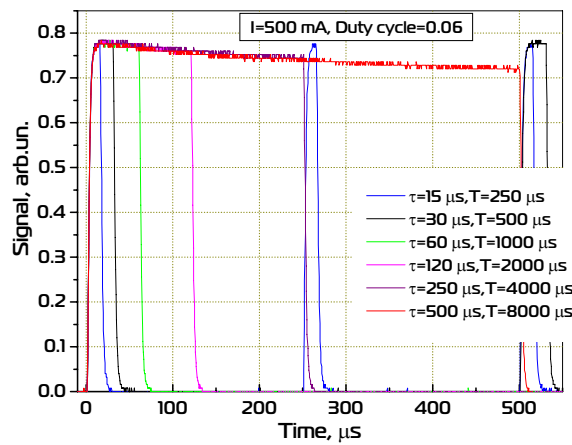


Time dependence of the output power for several values of d.c. and currents (LED attached to a heatsink at room temperature).

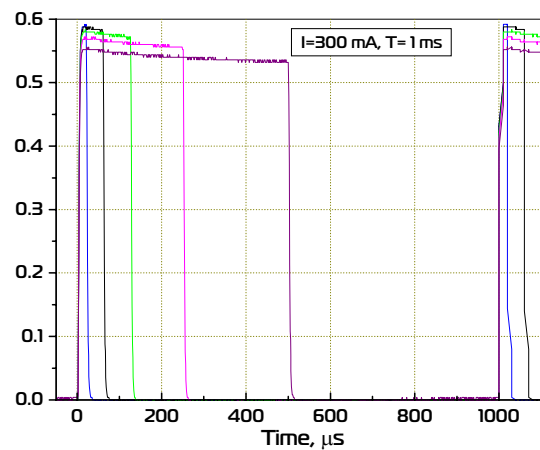
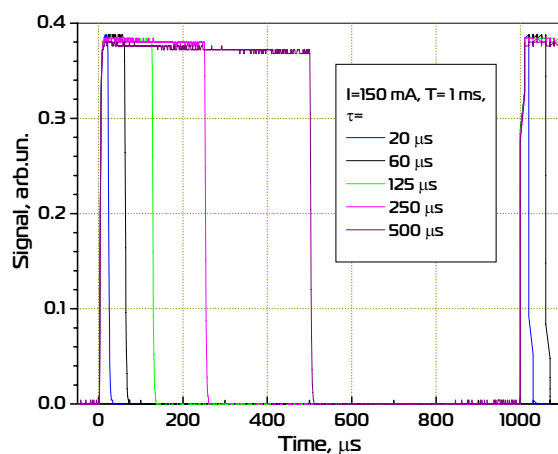
“Safe” operation mode

“Maximum current” operation mode

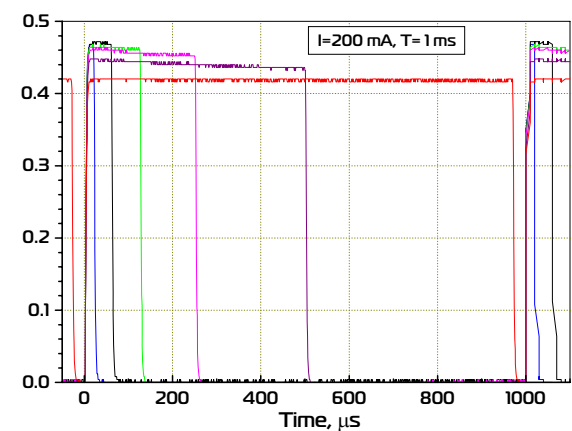
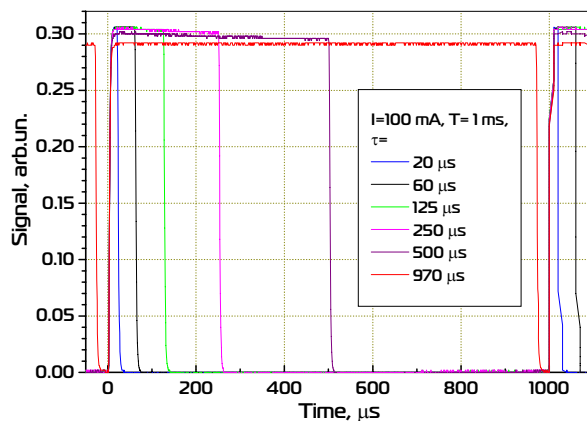
Pulse operation (d.c.=0.06)



Quasi CW mode (d.c.=0.5)



CW mode (d.c.=1)



Thermoelectric cooling module datasheet

Mounted TEC	H, mm	$\Delta T_{\max}$, K	$Q_{\max}$, W	$I_{\max}$, A	$U_{\max}$, V	R_{θ} , K/W
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1MC06-024/1-15

2.6

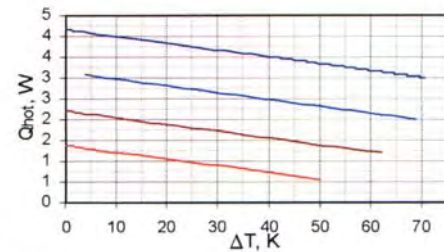
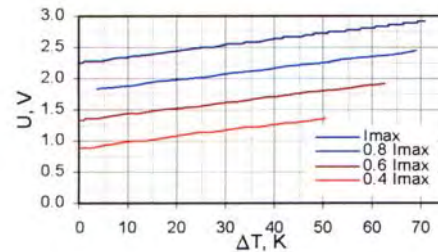
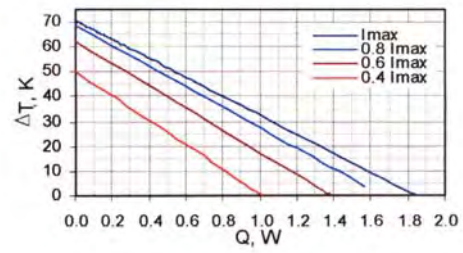
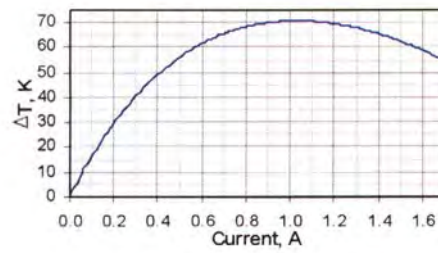
70

1.86

1.0

2.78

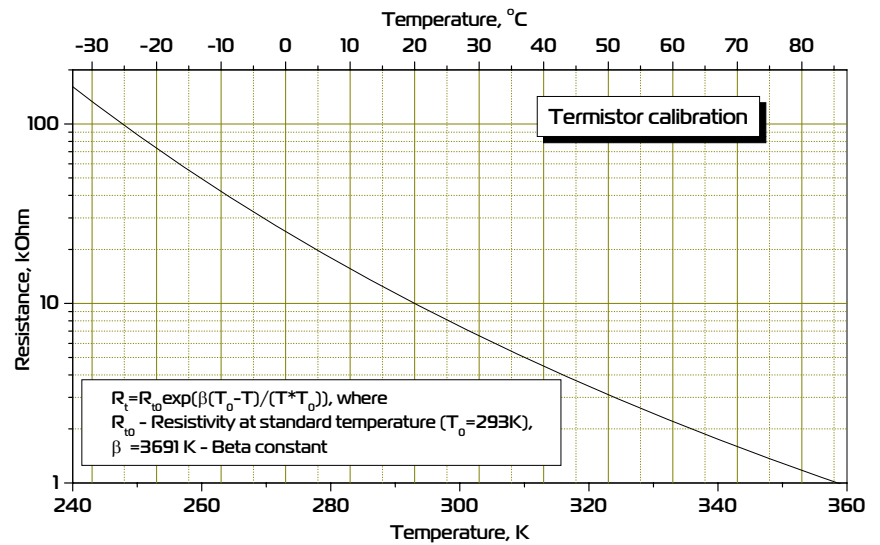
1.07

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

Thermistor specification

T, °C	R, kΩ	T, °C	R, kΩ
-60	1134.5	15	12.44
-55	762.4	20	10.00
-50	521.6	25	8.09
-45	362.8	25	8.09
-40	256.3	30	6.60
-35	183.8	35	5.41
-30	133.6	40	4.47
-25	98.3	45	3.71
-20	73.3	50	3.10
-15	55.2	55	2.61
-10	42.1	60	2.20
-5	32.4	65	1.87
0	25.2	70	1.59
5	19.7	75	1.37
10	15.6	80	1.18

Type TB04-103

Possible TEC
heatsink view