Optically Immersed 3.8 μm LED in heatsink optimized housing

LED38Su, LED38Sr

TE cooled Optically Immersed 3.8 μm LED

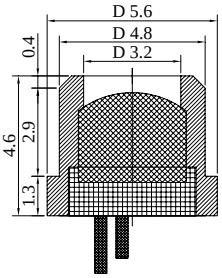
LED38TO8TEC

Peak wavelength	μm		3.8±0.05	@22 °C
Pulse power	mW	Drive current 1 A, 0.02 duty cycle	0.15÷0.2	
Quasi-CW power	mW	Drive current 0.3 A, 0.5 duty cycle	0.08÷0.1	
CW power	mW	Drive current 0.2 A	0.06÷0.08	
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
LED38Su LED38Sr	∅ 3.2	~0.4	Si lens	~15	≤5	±25	-60÷+120 [2]	>100 000 [4]
LED38 TO8TEC		~10	Si lens and output sapphire window D=6mm				-60÷+85 [3]	

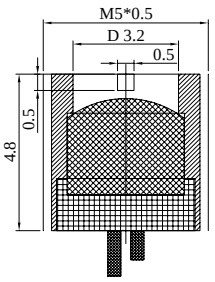
Product view

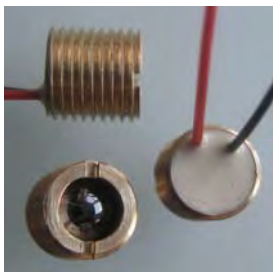
LED38Su



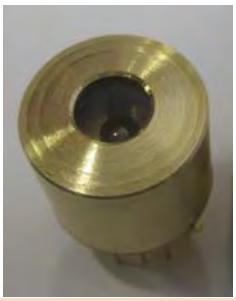
Pin assignment: red wire or long wire and red point on house - positive

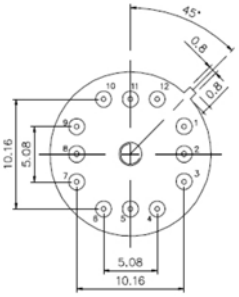
LED38Sr

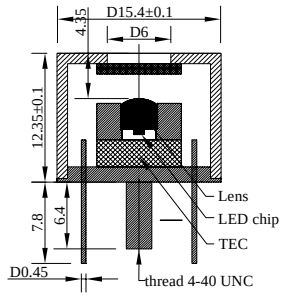




Pin assignment: red wire or long wire and red point on house - positive







Pin assignment LED38TO8TEC12

1 TEC negative;
3 TEC positive;
4 LED negative;
6 LED pozitive;
7, 9 thermosensor;
11 ⊥ (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×Imax 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

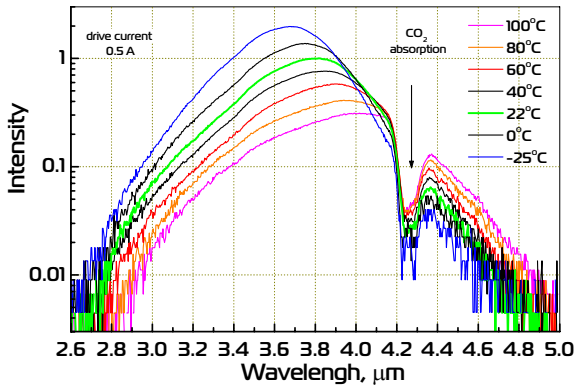
[2] - devices have passed through 15 thermo cycles : (20°C, 8 hrs) -transition period of 30 min – (+125°C, 8 hrs) without changes in specifications. Valid for devices produced since 01.2013. Operation conditions: -25÷+60 °C for old version LEDs.

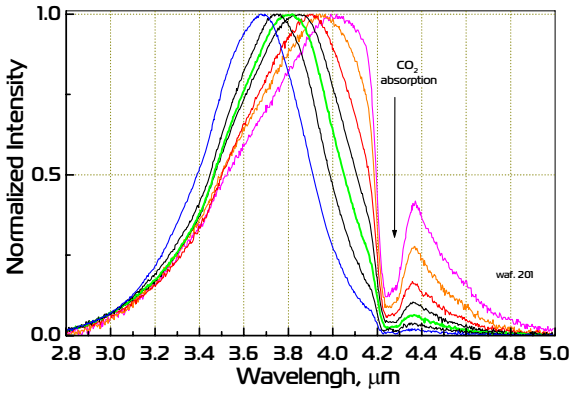
[3] - devices have passed through 15 thermo cycles : (-60°C, 30 min) - transition period of 30 min -(+85°C, 30 min) without changes in specifications. Valid for devices produced since 01.2013. Operation conditions: -25÷+60 °C for old version LEDs.

[4] – according to accelerated degradation stress at CW drive current 0.2 A

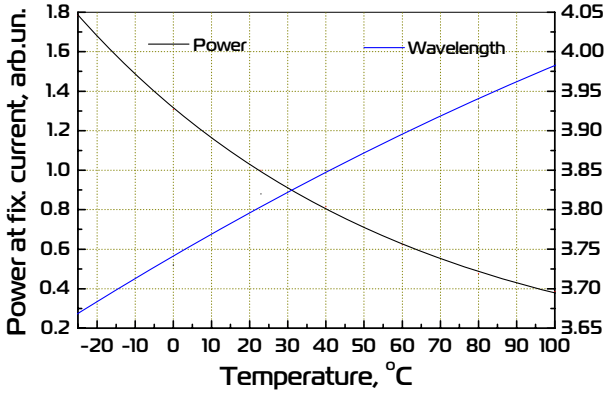
Product specifications are subject to change without prior notice due to improvements or other reasons. Updated 05.09.13

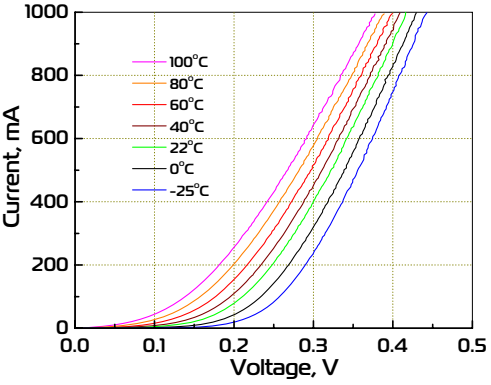
Emission spectra



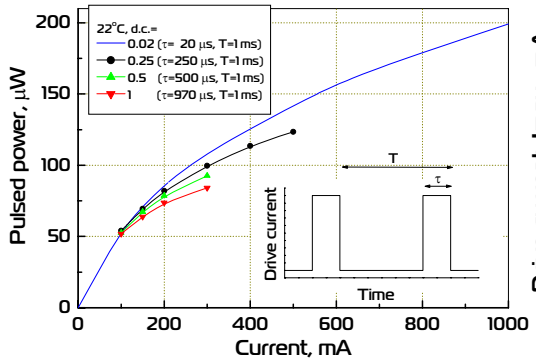


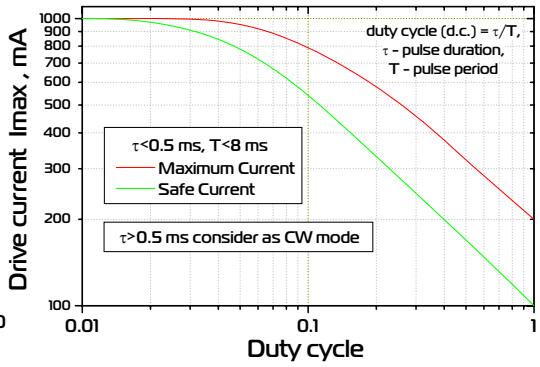
Power and peak wavelength vs. temperature; I – V curve





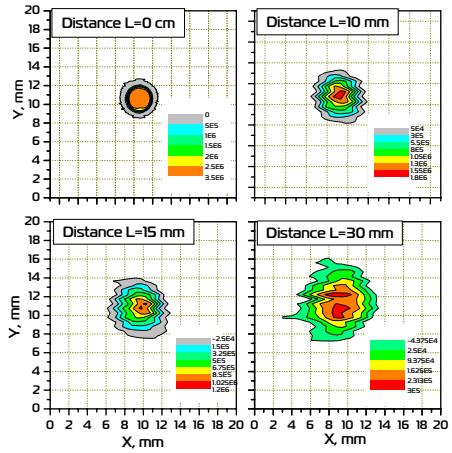
Output power and drive current vs operation conditions



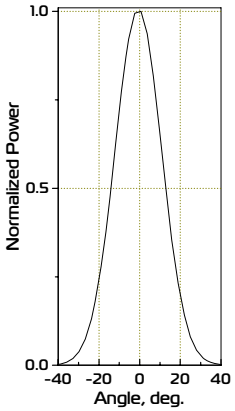


Far-field characterization

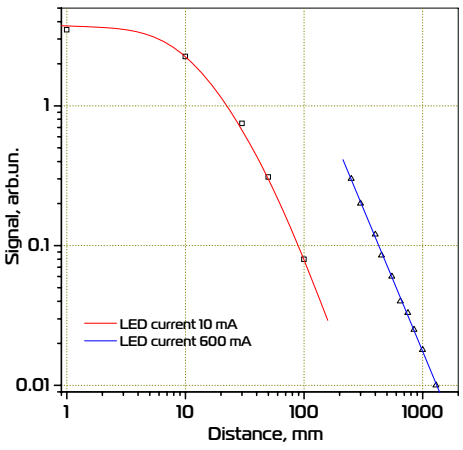
Radiation beam pattern in plane orthogonal to beam axis at several distances from LED



Angle distribution of output power

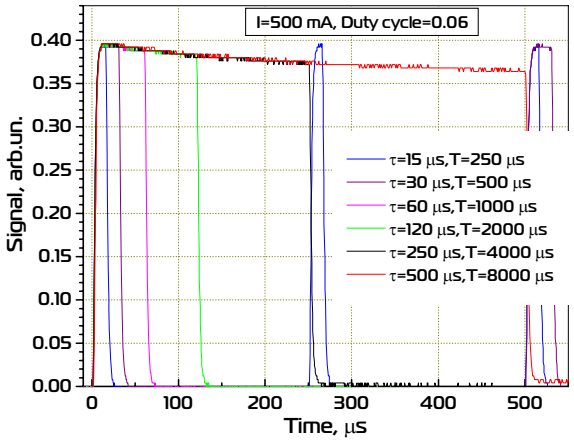
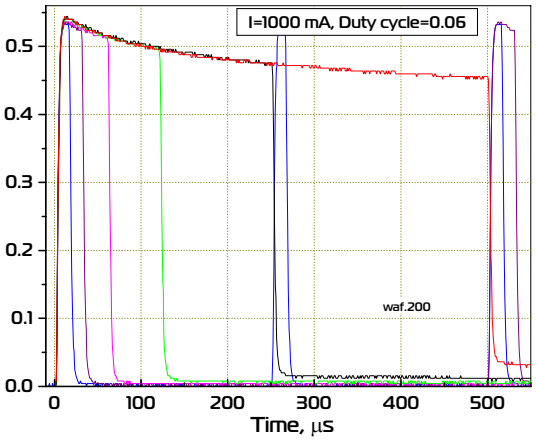
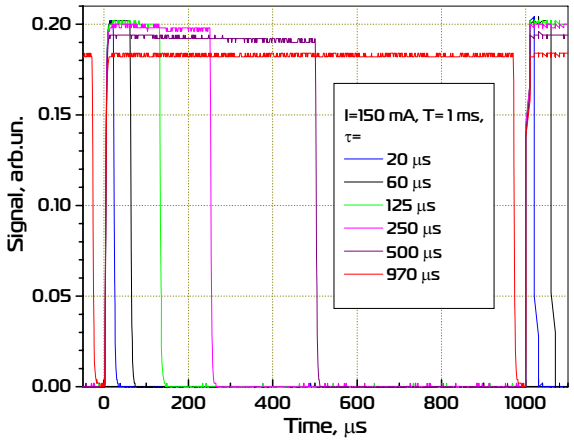
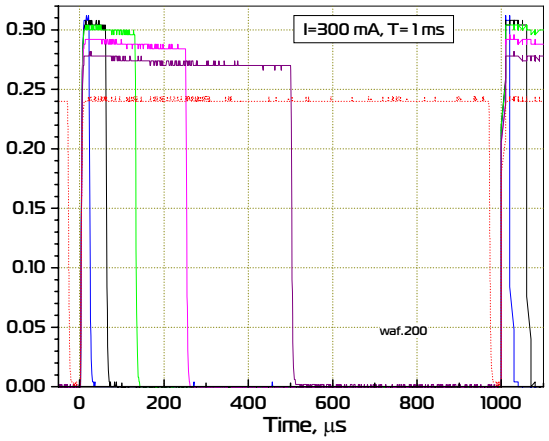
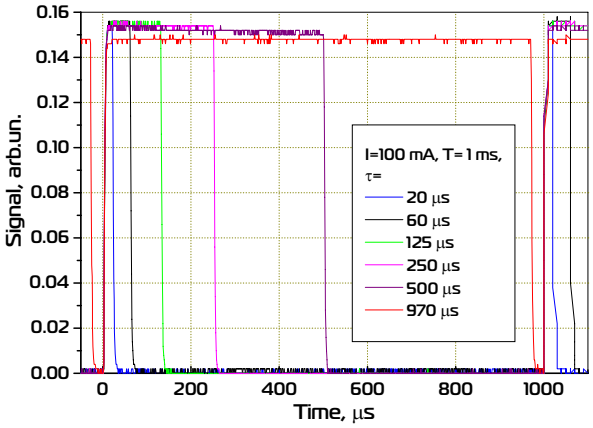
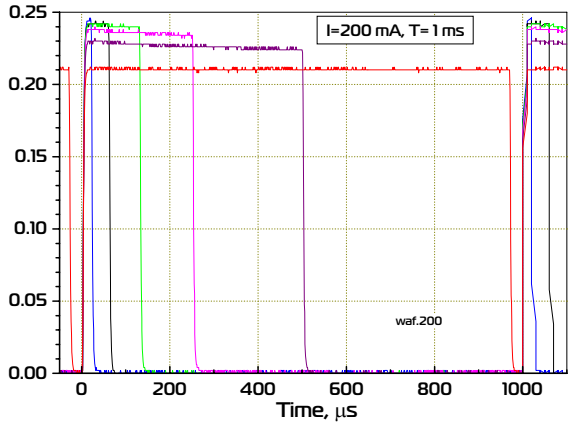


PD signal (PDxxSr/Su) vs. distance from activated LED



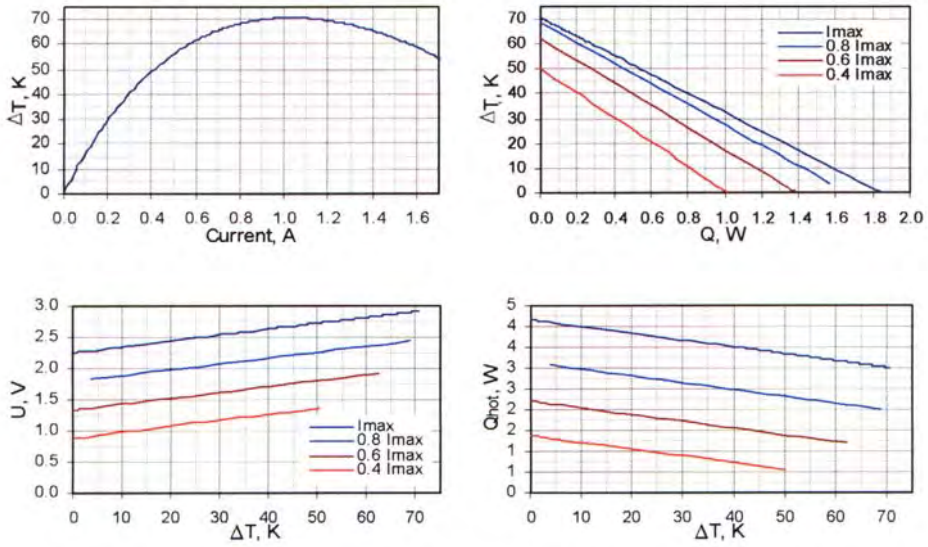
Time dependence of the output power for several values of d.c. and currents

(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	ΔT_{max}, K	Q_{max},W	I_{max}, A	U_{max}, V	R_t, K/W
1MC06-024/1-15	2.6	70	1.86	1.0	2.78	1.07

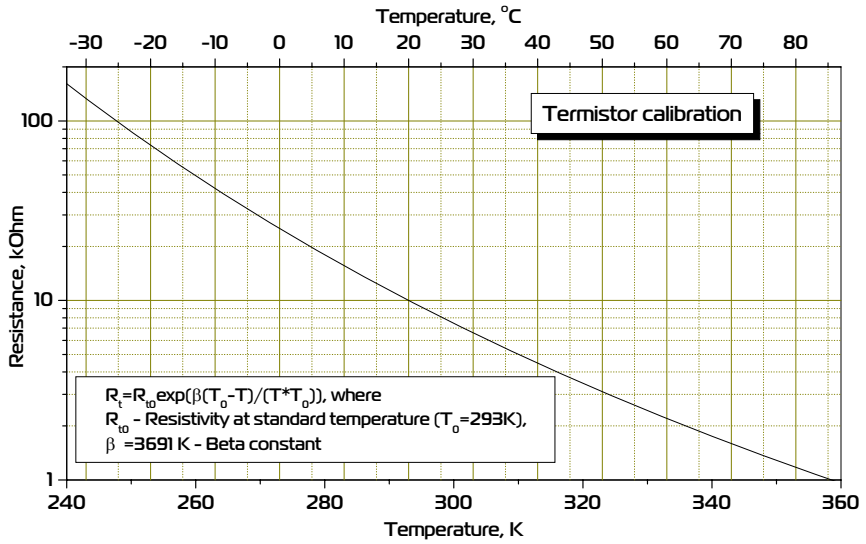


Data for T_{hot}=300 K, from www.tec-microsystems.com; www.rmtltd.ru

Thermistor specification

Type TB04-103

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



Possible TEC heatsink view