

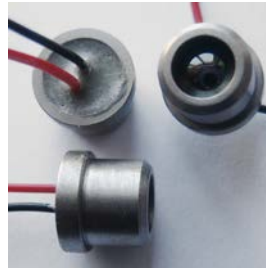
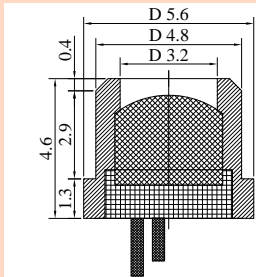
Optically Immersed 1.95 μm LED in heat-sink optimized housing

LED19Su, LED19Sr

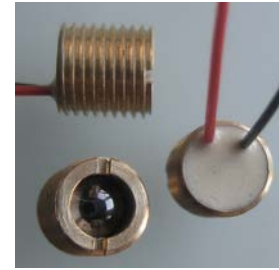
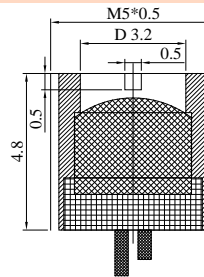
Peak wavelength λ_{max}	μm	1.9	
Pulse power P_{pulsed}	mW	Drive current 1 A, 2 % duty cycle	6
Quasi-CW power P_{QCW}	mW	Drive current 0.4 A, 50% duty cycle	2
CW power P_{CW}	mW	Drive current 0.2 A	0.6

Code	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Optical axis deviation, deg.	Optical power deviation, %	Operation conditions, °C	Lifetime, hrs	Polarity
LED19Su/Sr	\varnothing 3.2	Si	~15	≤ 5	± 25	-25 \pm +60	>80 000	Red wire – positive, Black wire – negative

Product view



LED19Su



LED19Sr

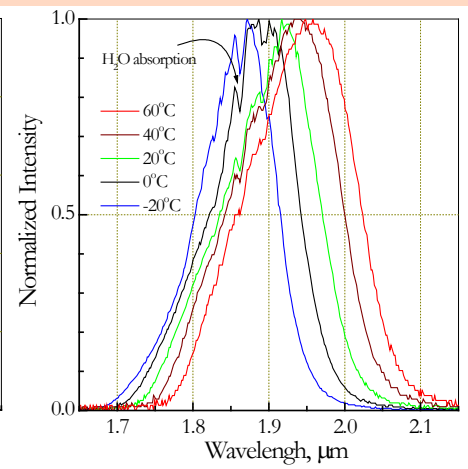
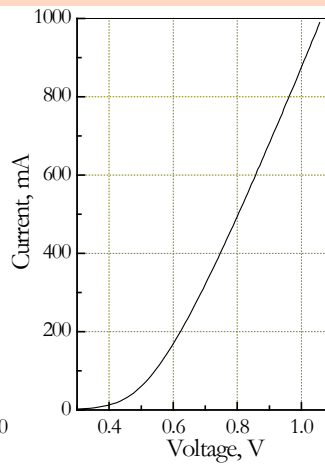
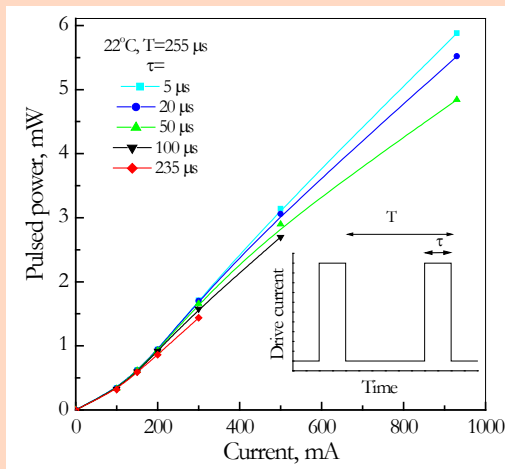
Features

Growth of narrow gap semiconductor alloys onto n^+ -GaSb substrate; Flip-chip design of LEDs; Optical coupling through the use of chalcogenide glasses and Si lenses with antireflection coating

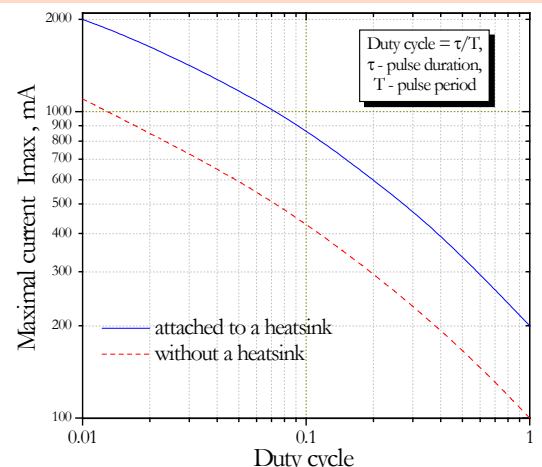
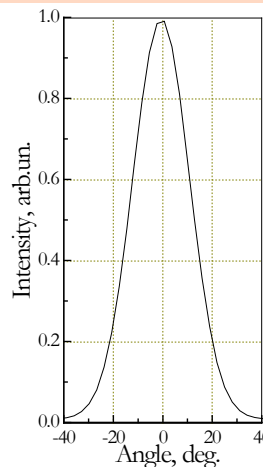
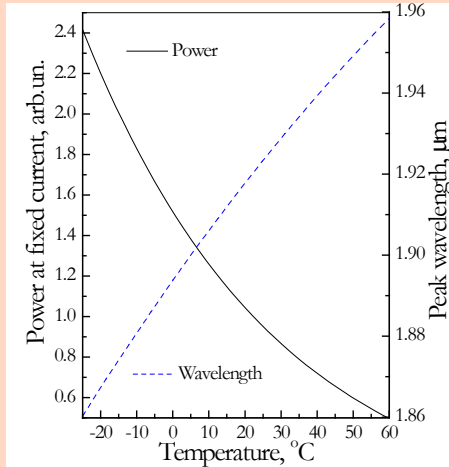
3-fold increased LED output power; Beam collimation within ~ 15 deg; Low serial resistance; Small on-off time (tenths of ns); Low power consumption (≤ 0.1 W)

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 22°C and LED attached to a heatsink.** Heatsink is important for LED operation especially in the CW mode.

I-V and I-V characteristics and emission spectra



Output power and peak wavelength vs temperature, far-field pattern and maximal current vs operation conditions



Product specifications are subject to change without prior notice due to improvements or other reasons. Updated 21.09.18




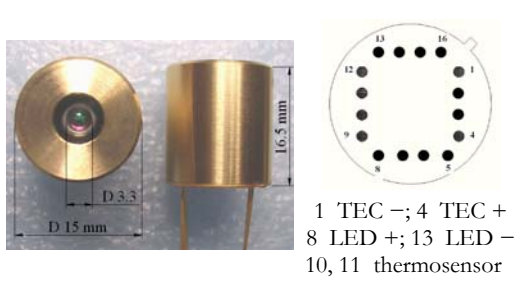
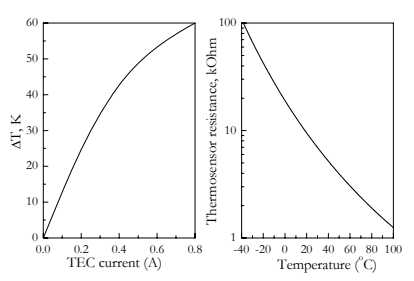
ООО «Иоффе ЛЕД»
Ioffe LED, Ltd

Politechnicheskaya 26,
St.Petersburg, 194021, RUSSIA

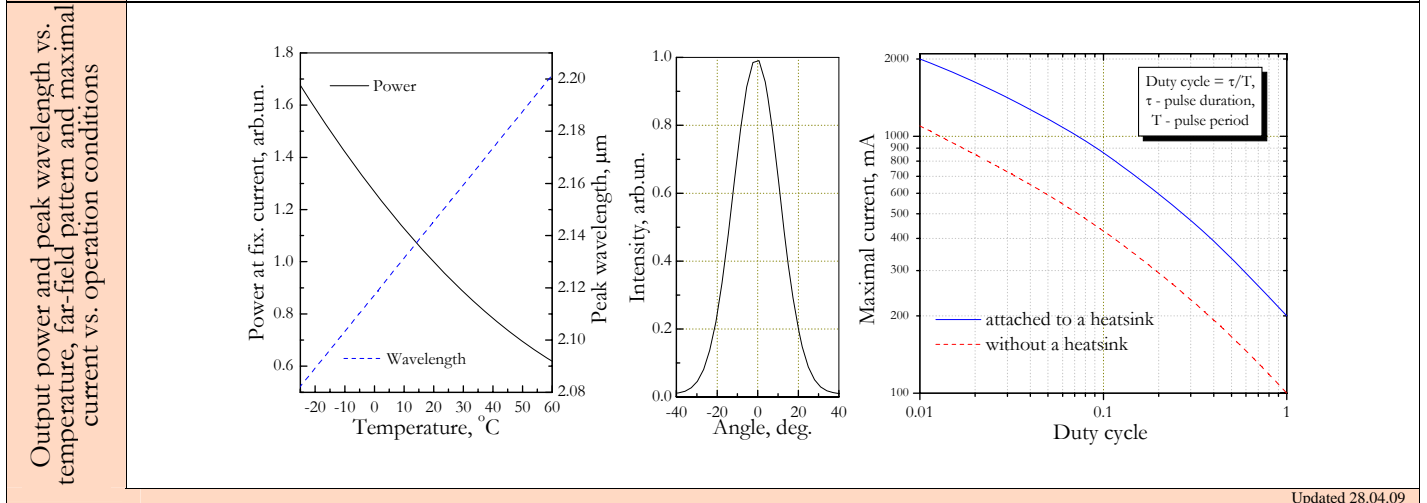
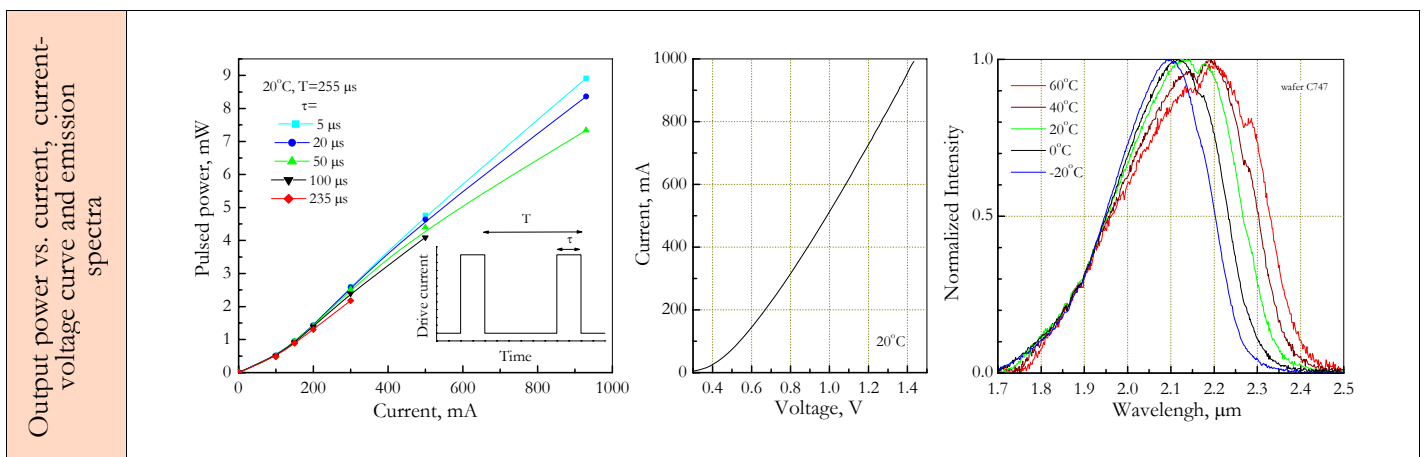
http://www.ioffeled.com
e-mail: Mremenny@mail.ioffe.ru
Tel./fax: +7 812 297 7446

Optically Immersed 2.15 μm LED in heat-sink optimized housing				LED21Sr
Peak wavelength	λ_{max}	μm		2.15 \pm 0.05
Pulsed power at I=1 A	P_{pulsed}	mW		9.0 \pm 2.0
CW power at I=200 mA	P_{CW}	mW		1.3 \pm 0.25
Switching time	τ	ns		\leq 20

Code	Thread	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Optical axis deviation, deg	Operation (storage) conditions, $^{\circ}\text{C}$
LED21Sr	M5 \times 0.5	\varnothing 3.3	Si	\leq 20	\leq 7	-25 \div +60 (+80)
LED21TO8TEC			Si lens and quartz window			


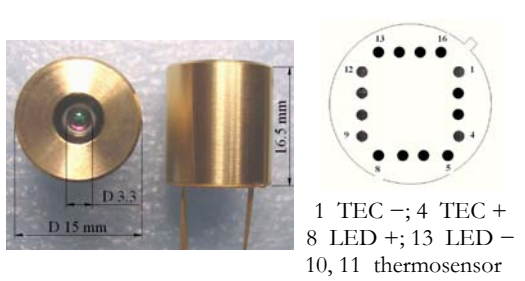
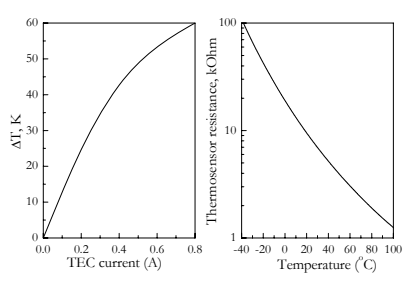
	LED21Sr	LED21TO8TEC
Product view		 <p>1 TEC -; 4 TEC + 8 LED +; 13 LED - 10, 11 thermosensor</p> 

- ✓ All devices are stressed at 80 $^{\circ}\text{C}$ (I=0) and I=200 mA (CW, 20 $^{\circ}\text{C}$) for 10 hrs before final test and shipping to a customer.
- ✓ Beam divergence of the LEDs is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices.
- ✓ All data are valid for room temperature (22 $^{\circ}\text{C}$) and LED attached to a heatsink. Heatsink is important for normal LED operation especially in the CW mode.
- ✓ Polarity: see Product view. In near future two color wires will be used.

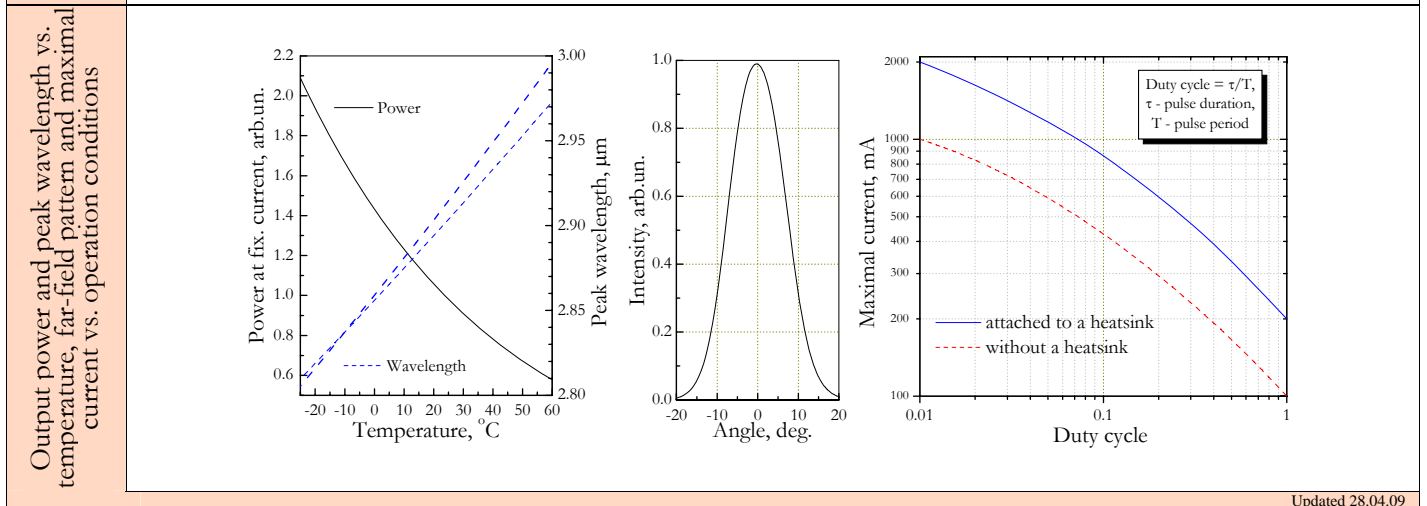
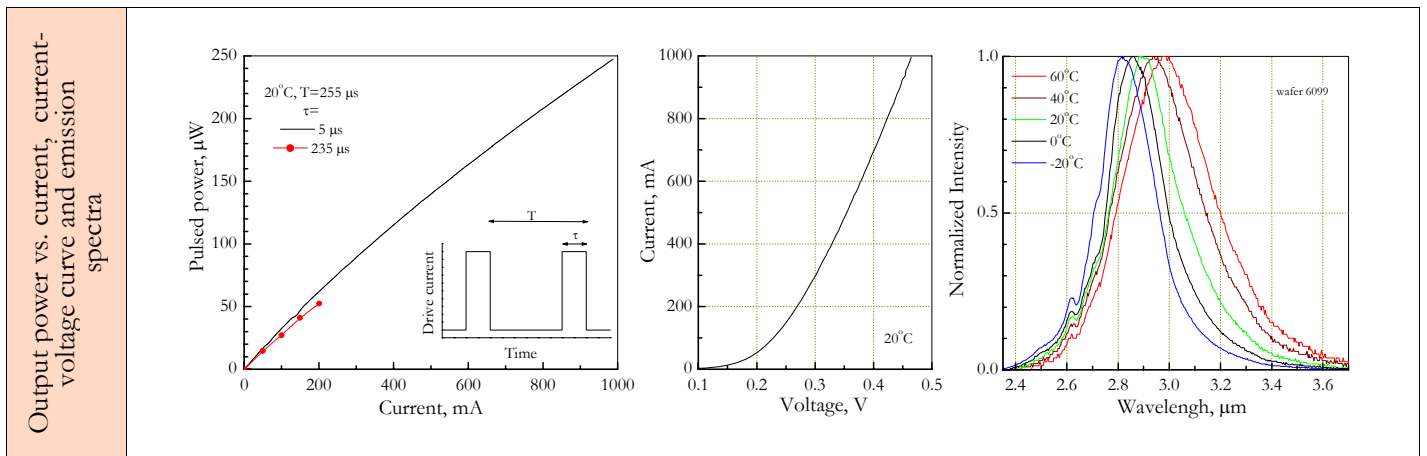


Optically Immersed 3.0 μm LED in heat-sink optimized housing				LED30Sr
Peak wavelength	λ_{max}	μm		2.95 \pm 0.05
Pulsed power at I=1 A	P_{pulsed}	μW		250 \pm 50
CW power at I=200 mA	P_{CW}	μW		50 \pm 10
Switching time	τ	ns		\leq 20

Code	Thread	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Optical axis deviation, deg	Operation (storage) conditions, $^{\circ}\text{C}$
LED30Sr	M5 \times 0.5	\varnothing 3.3	Si	\leq 20	\leq 7	-25 \div +60 (+80)
LED30TO8TEC			Si lens and quartz window			

	LED30Sr	LED30TO8TEC
Product view		 <p>1 TEC -; 4 TEC + 8 LED +; 13 LED - 10, 11 thermosensor</p> 

- ✓ All devices are stressed at 80 $^{\circ}\text{C}$ (I=0) and I=200 mA (CW, 20 $^{\circ}\text{C}$) for 10 hrs before final test and shipping to a customer.
- ✓ Beam divergence of the LEDs is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices.
- ✓ All data are valid for room temperature (22 $^{\circ}\text{C}$) and LED attached to a heatsink. Heatsink is important for normal LED operation especially in the CW mode.
- ✓ Polarity: see Product view. In near future two color wires will be used.

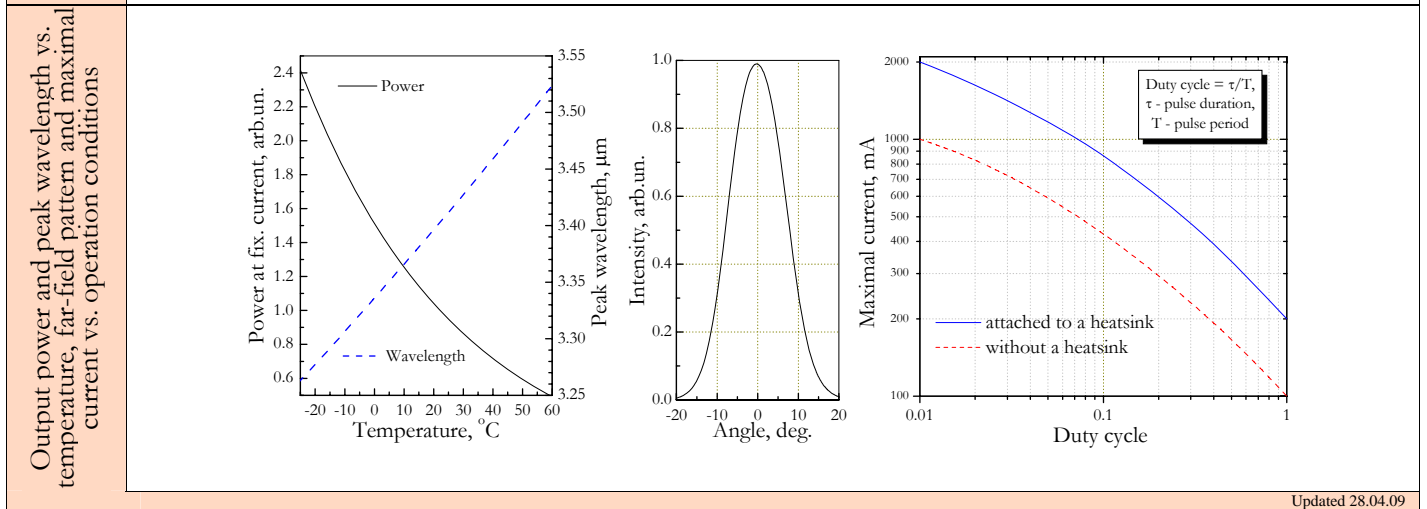
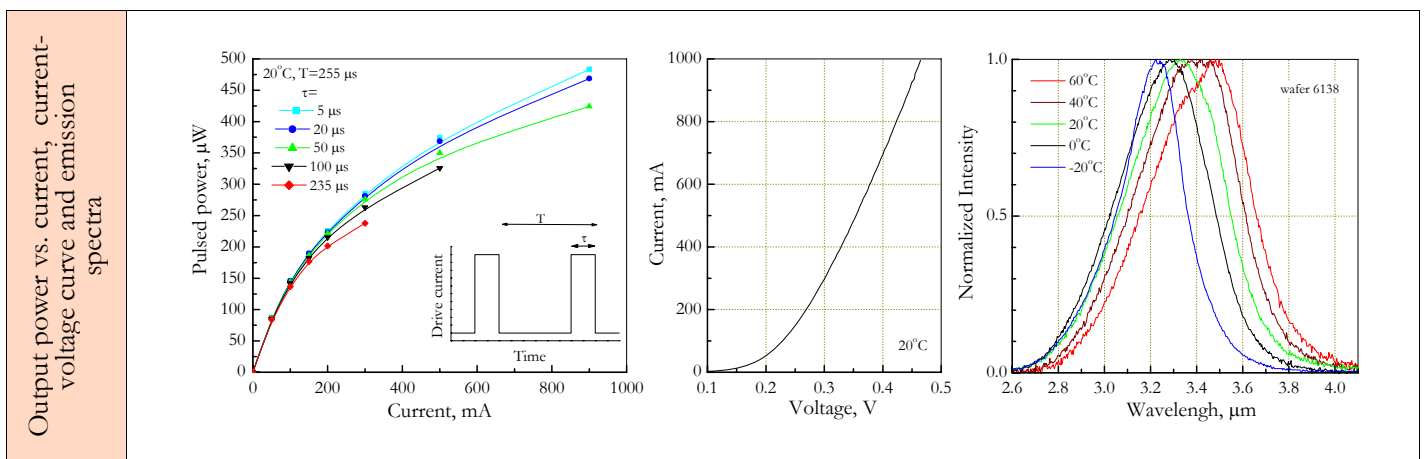


Optically Immersed 3.4 μm LED in heat-sink optimized housing				LED34Sr	
Peak wavelength	λ_{max}	μm	3.4±0.05		
Pulsed power at I=1 A	P_{pulsed}	μW	500±100		
CW power at I=200 mA	P_{CW}	μW	200±40		
Switching time	τ	ns	≤20		

Code	Thread	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Optical axis deviation, deg	Operation (storage) conditions, °C
LED34Sr	M5×0.5	Ø 3.3	Si	≤20	≤7	-25÷+60 (+80)
LED34TO8TEC			Si lens and quartz window			

	LED34Sr	LED34TO8TEC
Product view		<p>1 TEC -; 4 TEC + 8 LED +; 13 LED - 10, 11 thermosensor</p>

- ✓ All devices are stressed at 80°C (I=0) and I=200 mA (CW, 20°C) for 10 hrs before final test and shipping to a customer.
- ✓ Beam divergence of the LEDs is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices.
- ✓ All data are valid for room temperature (22°C) and LED attached to a heatsink. Heatsink is important for normal LED operation especially in the CW mode.
- ✓ Polarity: see Product view. In near future two color wires will be used.

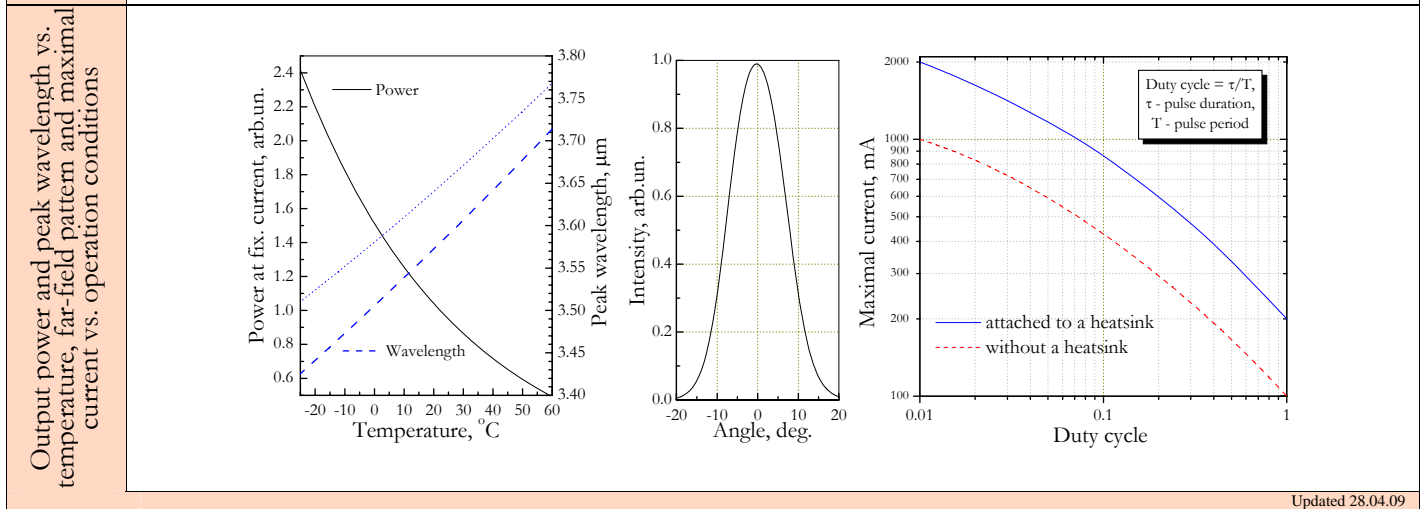
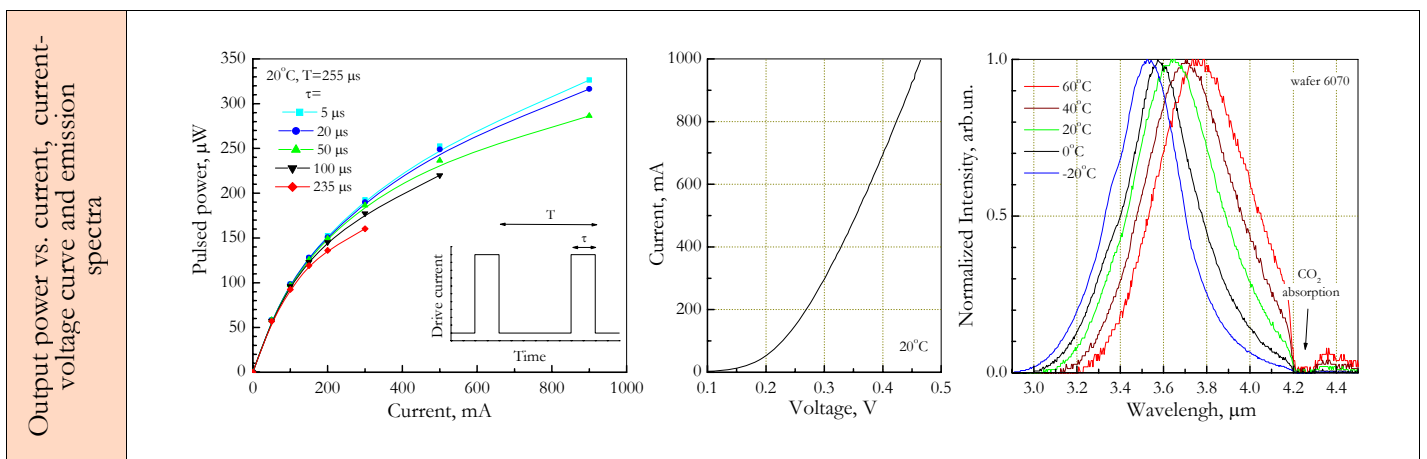


Optically Immersed 3.6 μm LED in heat-sink optimized housing				LED36Sr
Peak wavelength	λ_{max}	μm		3.65±0.05
Pulsed power at I=1 A	P_{pulsed}	μW		350±70
CW power at I=200 mA	P_{CW}	μW		135±25
Switching time	τ	ns		≤20

Code	Thread	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Optical axis deviation, deg	Operation (storage) conditions, °C
LED36Sr	M5×0.5	Ø 3.3	Si	≤20	≤7	-25÷+60 (+80)
LED36TO8TEC			Si lens and quartz window			


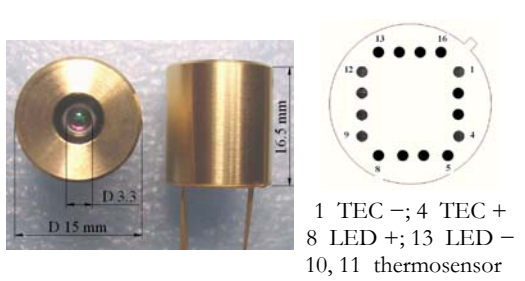
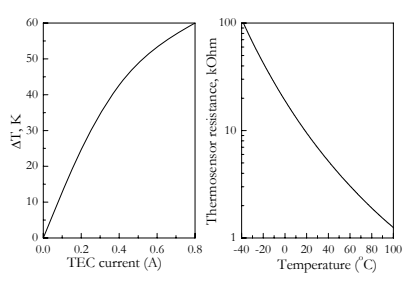
	LED36Sr	LED36TO8TEC
Product view		<p>1 TEC -; 4 TEC + 8 LED +; 13 LED - 10, 11 thermosensor</p>

- ✓ All devices are stressed at 80°C (I=0) and I=200 mA (CW, 20°C) for 10 hrs before final test and shipping to a customer.
- ✓ Beam divergence of the LEDs is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices.
- ✓ All data are valid for room temperature (22°C) and LED attached to a heatsink. Heatsink is important for normal LED operation especially in the CW mode.
- ✓ Polarity: see Product view. In near future two color wires will be used.

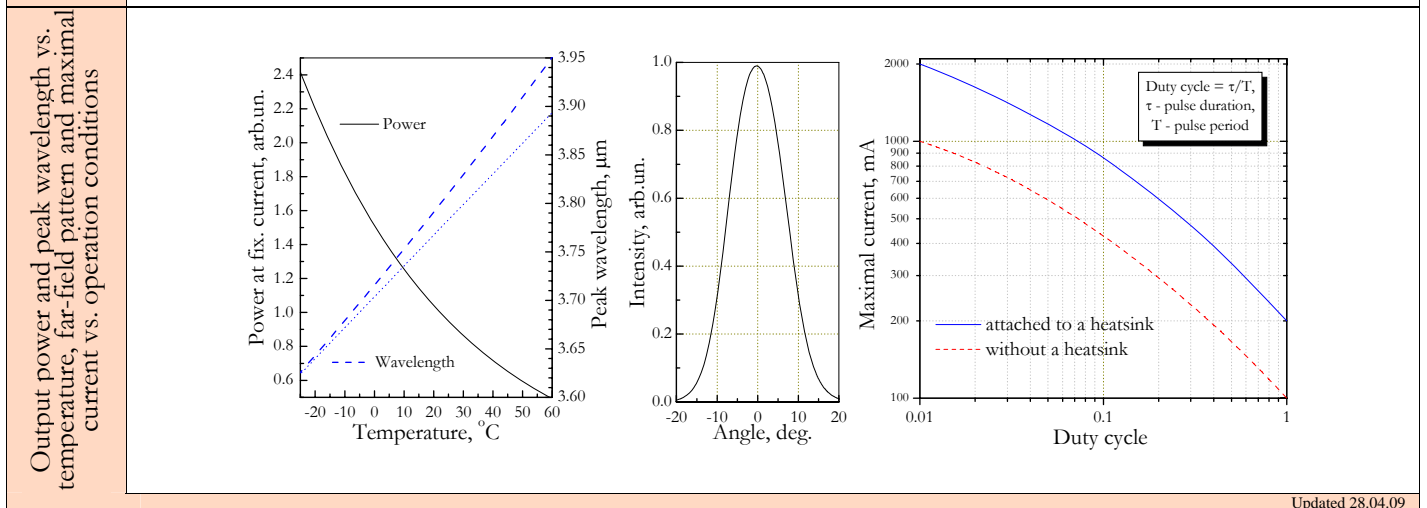
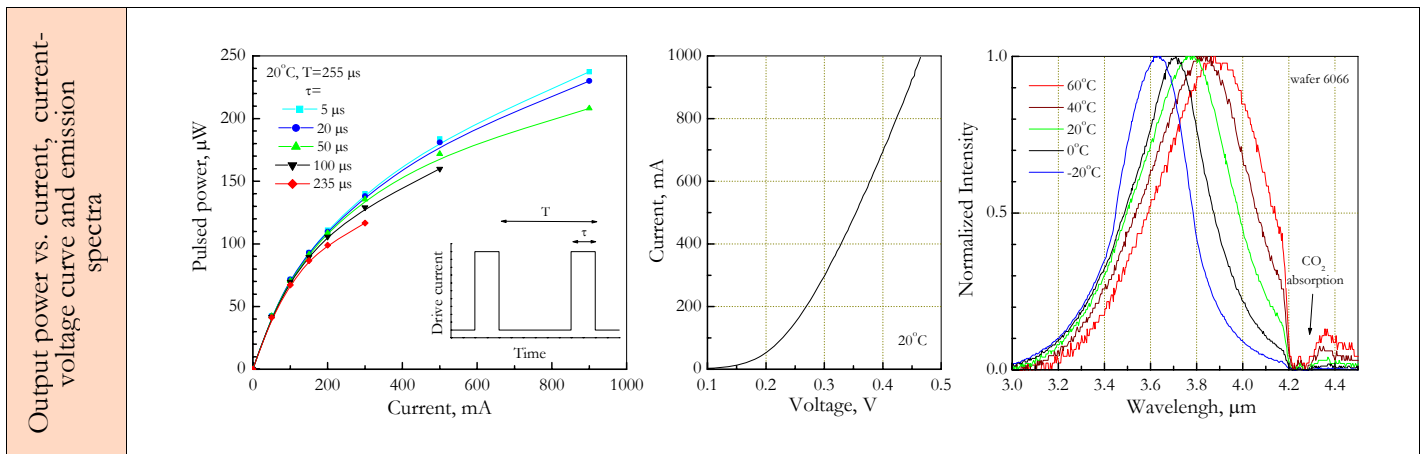


Optically Immersed 3.8 μm LED in heat-sink optimized housing				LED38Sr
Peak wavelength	λ_{max}	μm		3.85 \pm 0.05
Pulsed power at I=1 A	P_{pulsed}	μW		250 \pm 50
CW power at I=200 mA	P_{CW}	μW		100 \pm 20
Switching time	τ	ns		\leq 20

Code	Thread	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Optical axis deviation, deg	Operation (storage) conditions, $^{\circ}\text{C}$
LED38Sr	M5 \times 0.5	\varnothing 3.3	Si	\leq 20	\leq 7	-25 \div +60 (+80)
LED38TO8TEC			Si lens and quartz window			


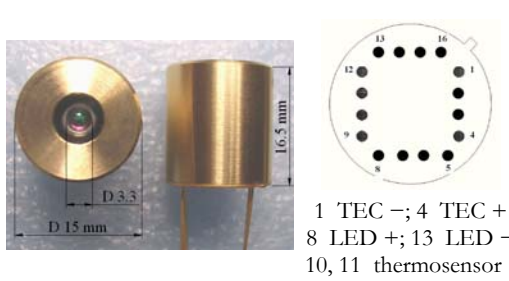
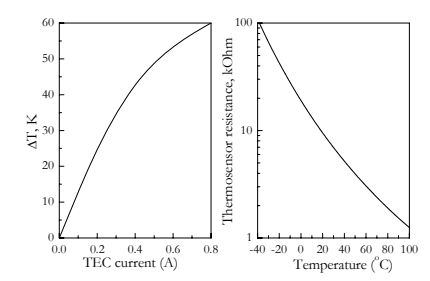
	LED38Sr	LED38TO8TEC
Product view		 <p>1 TEC -; 4 TEC + 8 LED +; 13 LED - 10, 11 thermosensor</p> 

- ✓ All devices are stressed at 80 $^{\circ}\text{C}$ (I=0) and I=200 mA (CW, 20 $^{\circ}\text{C}$) for 10 hrs before final test and shipping to a customer.
- ✓ Beam divergence of the LEDs is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices.
- ✓ All data are valid for room temperature (22 $^{\circ}\text{C}$) and LED attached to a heatsink. Heatsink is important for normal LED operation especially in the CW mode.
- ✓ Polarity: see Product view. In near future two color wires will be used.

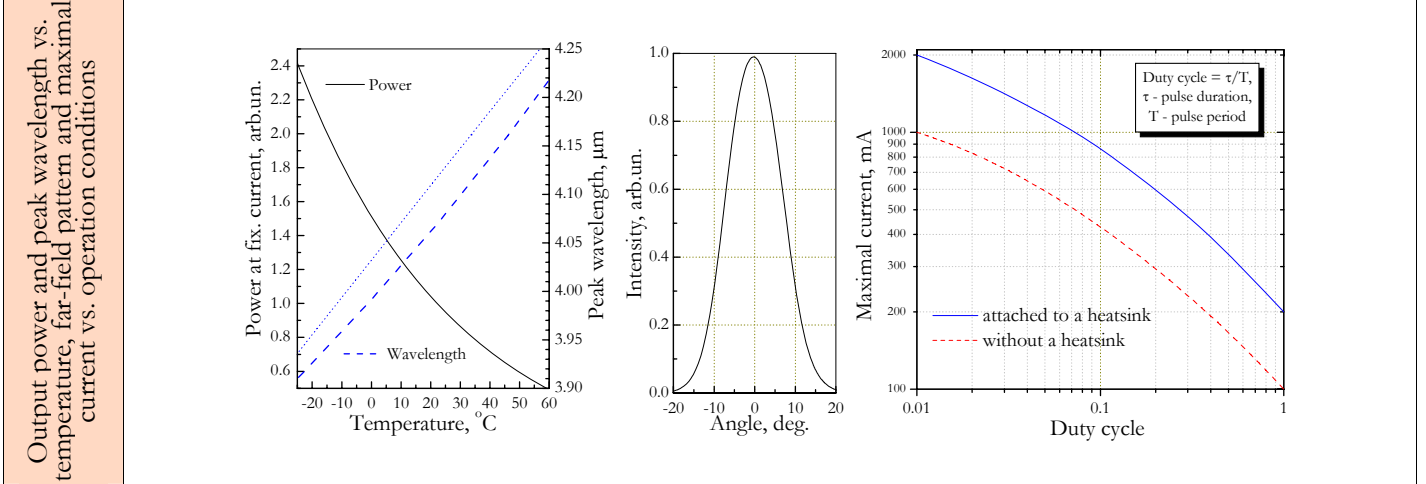
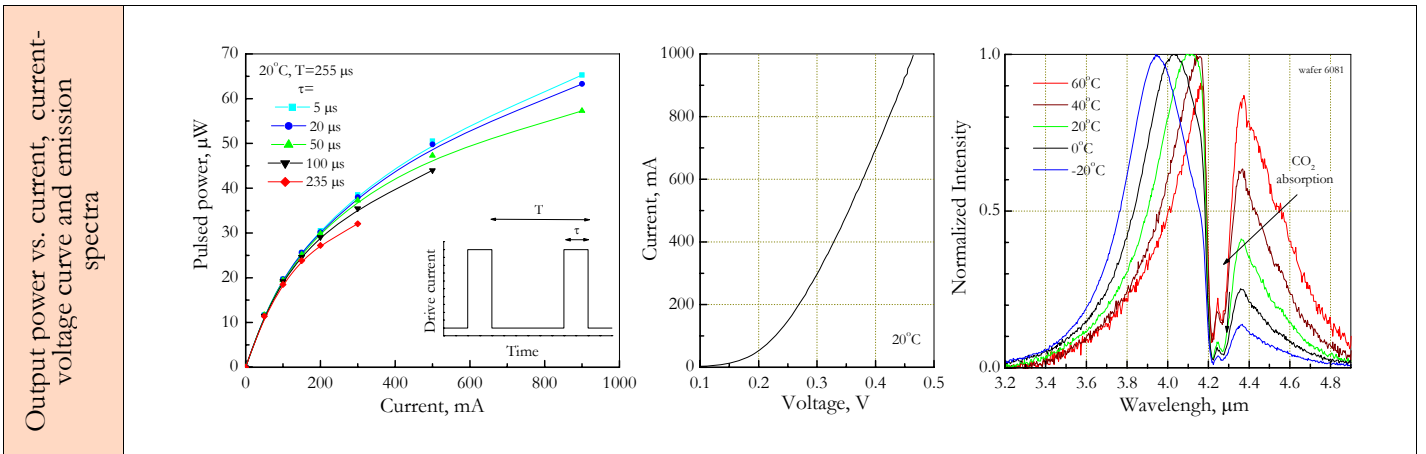


Optically Immersed 4.2 μm LED in heat-sink optimized housing				LED42Sr	
Peak wavelength	λ_{max}	μm	4.2 \pm 0.1		
Pulsed power at I=1 A	P_{pulsed}	μW	70 \pm 15		
CW power at I=200 mA	P_{CW}	μW	25 \pm 5		
Switching time	τ	ns	\leq 20		

Code	Thread	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Optical axis deviation, deg	Operation (storage) conditions, °C
LED42Sr	M5 \times 0.5	\varnothing 3.3	Si	\leq 20	\leq 7	-25 \div +60 (+80)
LED42TO8TEC			Si lens and quartz window			


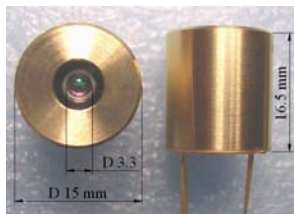
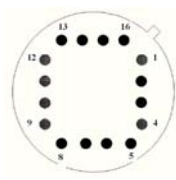
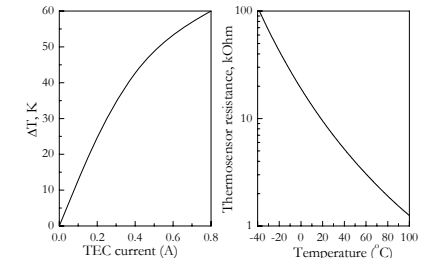
	LED42Sr	LED42TO8TEC
Product view		 <p>1 TEC -; 4 TEC + 8 LED +; 13 LED - 10, 11 thermosensor</p> 

- ✓ All devices are stressed at 80°C (I=0) and I=200 mA (CW, 20°C) for 10 hrs before final test and shipping to a customer.
- ✓ Beam divergence of the LEDs is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices.
- ✓ All data are valid for room temperature (22°C) and LED attached to a heatsink. Heatsink is important for normal LED operation especially in the CW mode.
- ✓ Polarity: see Product view. In near future two color wires will be used.

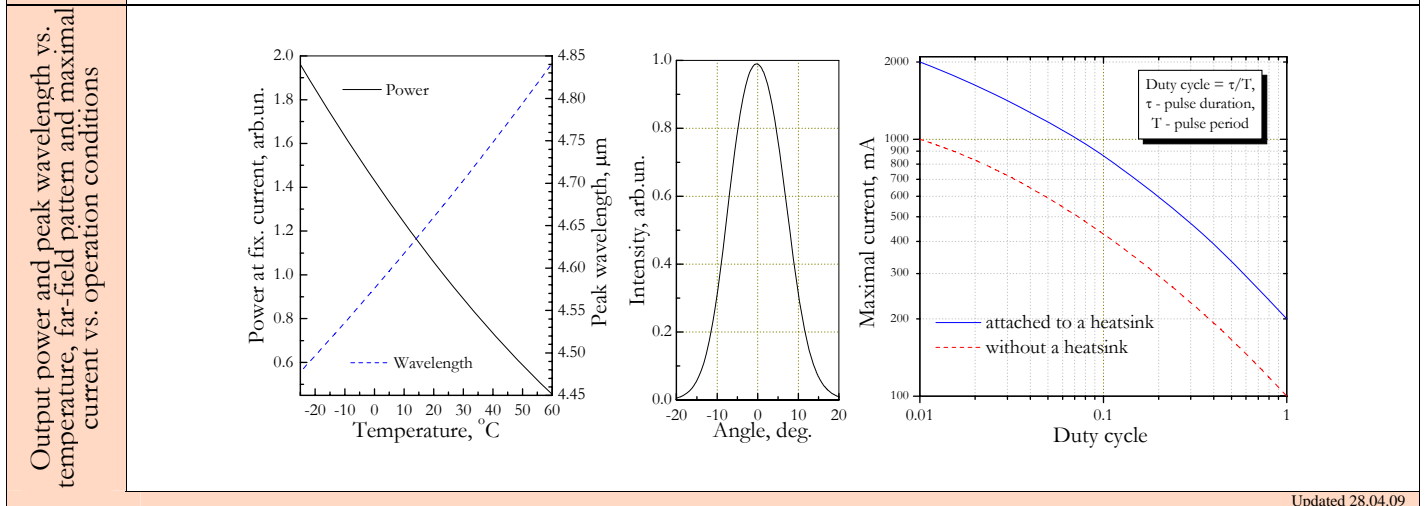
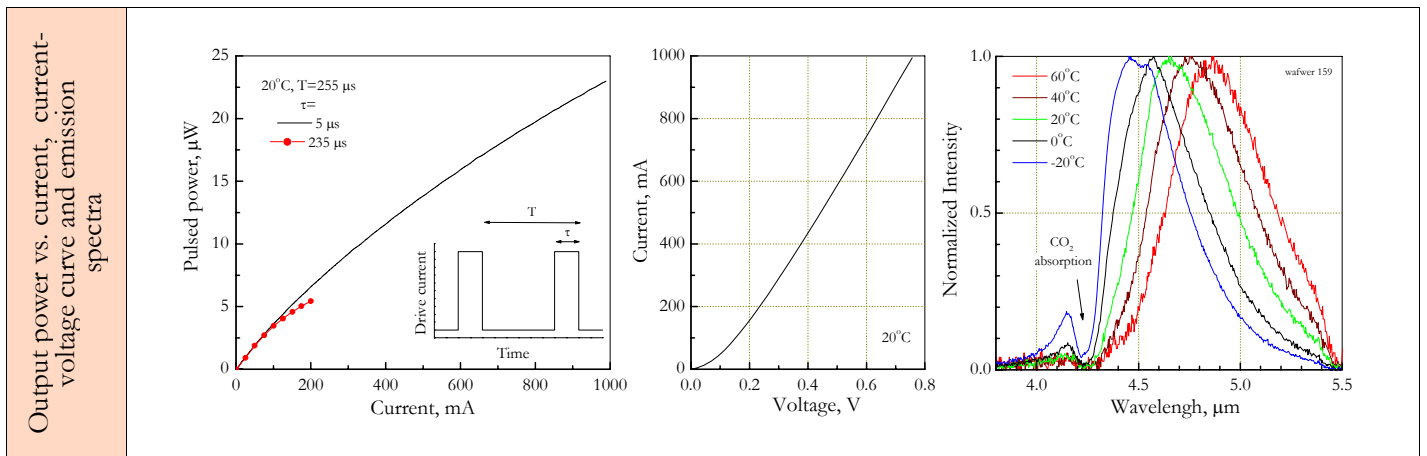


Optically Immersed 4.7 μm LED in heat-sink optimized housing				LED47Sr	
Peak wavelength	λ_{max}	μm	4.7±0.05		
Pulsed power at I=1 A	P_{pulsed}	μW	25±5		
CW power at I=200 mA	P_{CW}	μW	5±1		
Switching time	τ	ns	≤20		

Code	Thread	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Optical axis deviation, deg	Operation (storage) conditions, °C
LED47Sr	M5×0.5	Ø 3.3	Si	≤20	≤7	-25÷+60 (+80)
LED47TO8TEC			Si lens and sapphire window			


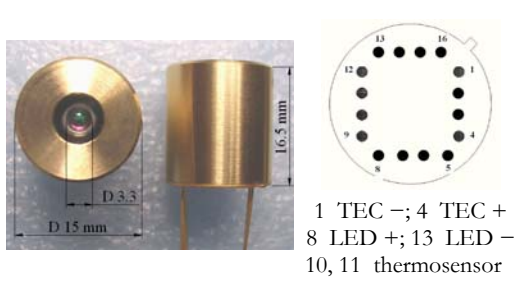
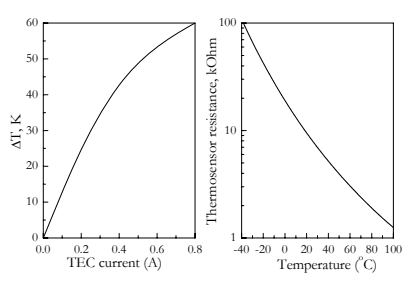
	LED47Sr	LED47TO8TEC
Product view		  1 TEC -; 4 TEC + 8 LED +; 13 LED - 10, 11 thermosensor
		

- ✓ All devices are stressed at 80°C (I=0) and I=150 mA (CW, 20°C) for 10 hrs before final test and shipping to a customer.
- ✓ Beam divergence of the LEDs is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices.
- ✓ All data are valid for room temperature (22°C) and LED attached to a heatsink. Heatsink is important for normal LED operation especially in the CW mode.
- ✓ Polarity: see Product view. In near future two color wires will be used.

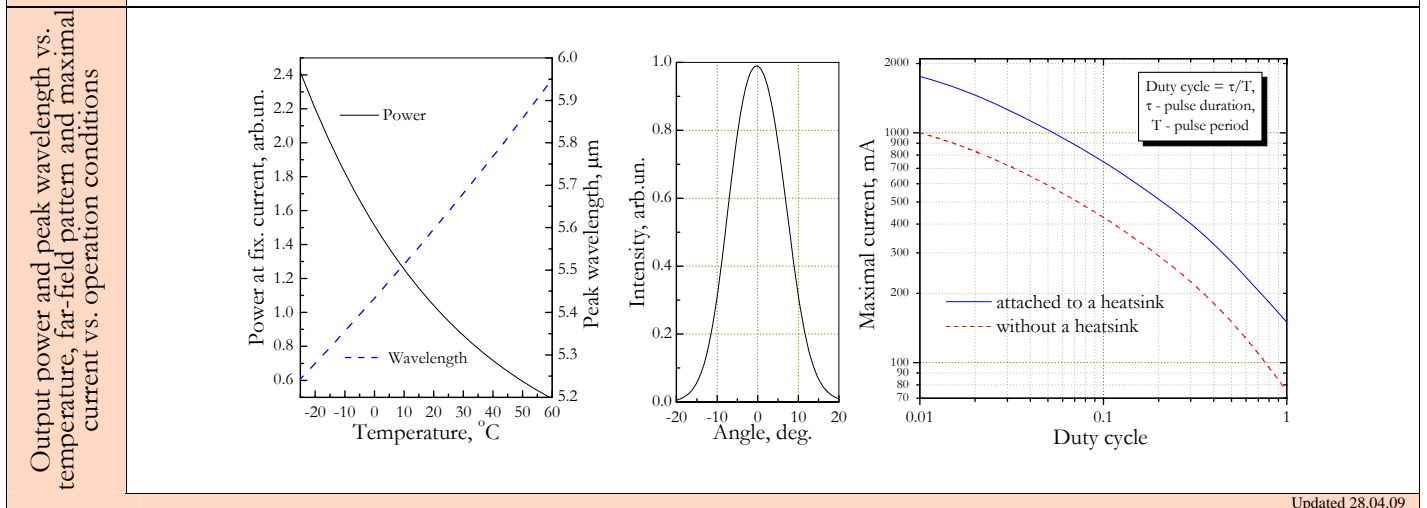
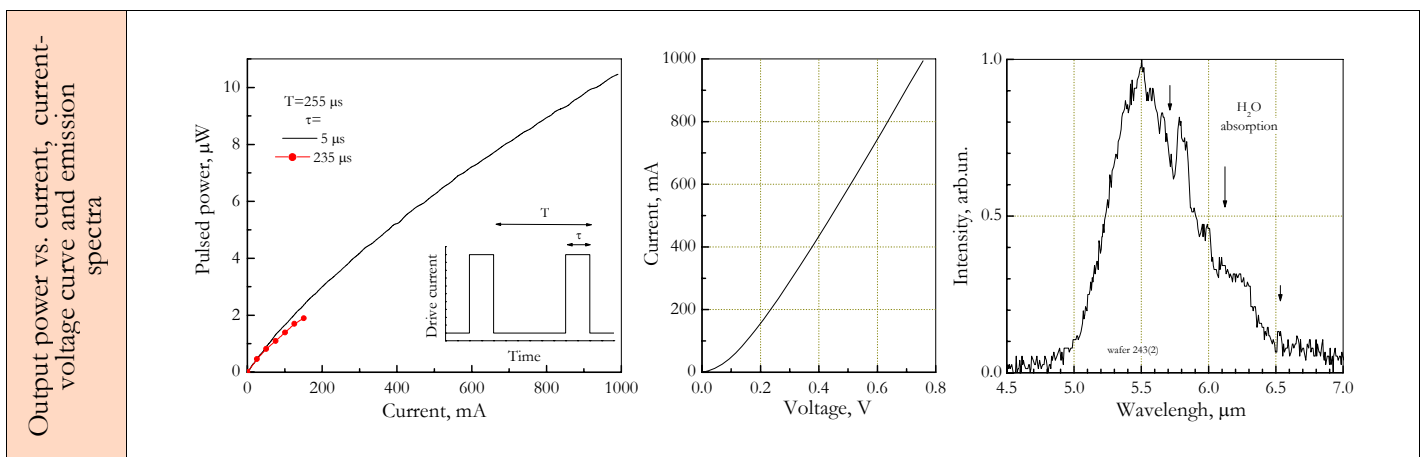


Optically Immersed 5.5 μm LED in heat-sink optimized housing				LED55Sr	
Peak wavelength	λ_{max}	μm	5.5 \div 5.7		
Pulsed power at I=1 A	P_{pulsed}	μW	10 \pm 2		
CW power at I=150 mA	P_{CW}	μW	2 \pm 0.5		
Switching time	τ	ns	\leq 20		

Code	Thread	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Optical axis deviation, deg	Operation (storage) conditions, $^{\circ}\text{C}$
LED55Sr	M5 \times 0.5	\varnothing 3.3	Si	\leq 20	\leq 7	-25 \div +60 (+80)
LED55TO8TEC			Si lens and sapphire window			

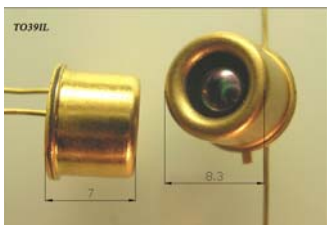
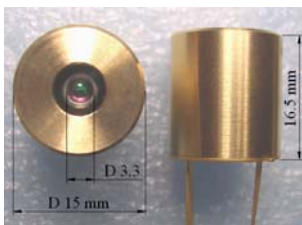
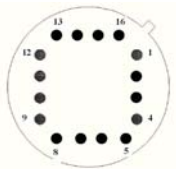
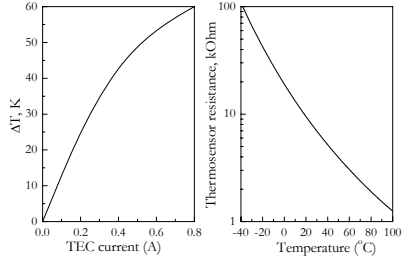
	LED55Sr	LED55TO8TEC
Product view		 <p>1 TEC -; 4 TEC + 8 LED +; 13 LED - 10, 11 thermosensor</p> 

- ✓ All devices are stressed at 80 $^{\circ}\text{C}$ (I=0) and I=150 mA (CW, 20 $^{\circ}\text{C}$) for 10 hrs before final test and shipping to a customer.
- ✓ Beam divergence of the LEDs is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices.
- ✓ All data are valid for room temperature (22 $^{\circ}\text{C}$) and LED attached to a heatsink. Heatsink is important for normal LED operation especially in the CW mode.
- ✓ Polarity: see Product view. In near future two color wires will be used.



Optically Immersed 7.0 μm LED in heat-sink optimized housing			OPLED70
Peak wavelength	λ_{\max}	μm	6.5÷7.0
Pulsed power at I=1 A	P_{pulsed}	μW	5÷10
CW power at I=100 mA	P_{CW}	μW	1÷1.8
Switching time	τ	ns	≤50

Code	Emission size, mm	Lens material	Far-field pattern FWHM, deg.	Operation (storage) conditions, °C	Polarity
OPLED70	Ø 3.3	CdSb	≤40	-25÷+40	short leg or key is negative
OPLED70TO8TEC		CdSb lens and sapphire window			See fig. below

	OPLED70	OPLED70TO8TEC
Product view		  1 TEC -; 4 TEC + 8 LED +; 13 LED - 10, 11 thermosensor
		

- ✓ All devices are stressed at I=100 mA (CW, 20°C) for 10 hrs before final test and shipping to a customer.
- ✓ Beam divergence of the LEDs is small and thus we recommend adjusting LED position regarding to the detector system before final evaluation/use of the devices.
- ✓ All data are valid for room temperature (22°C) and LED attached to a heatsink. Heatsink is important for normal LED operation especially in the CW mode.

