






Optically pumped light emitting diodes (OP LEDs)  
Specifications (T=24 °C)

Type No.			MIRO39-xx-xxxxx series	
Peak wavelength	$\lambda$	$\mu\text{m}$	3.9±0.1	
Spectral FWHM,		$\mu\text{m}$	0.7±0.75	
Pulse conditions:	Pulse duration	$\tau$	$\mu\text{s}$	≤10
	Pulse period	T		≥1000
Maximum pulse current	$I_{\text{pulse}}$	mA	1000	
Pulse voltage at I=1000 mA	$U_{\text{pulse}}$	V	2.1÷2.8	
Pulse power at I=1000 mA	$P_{\text{pulse}}$	$\mu\text{W}$	250±40	
Maximum CW current (with a heatsink)	$I_{\text{CW}}$	mA	50	
CW voltage at I=50 mA	$U_{\text{CW}}$	V	1.30±1.4	
CW power at I=50 mA	$P_{\text{CW}}$	$\mu\text{W}$	20±4	
$d\lambda/dT$		nm/K	-4.2	
$dP/dT$		%/K	-(0.6±0.7)	

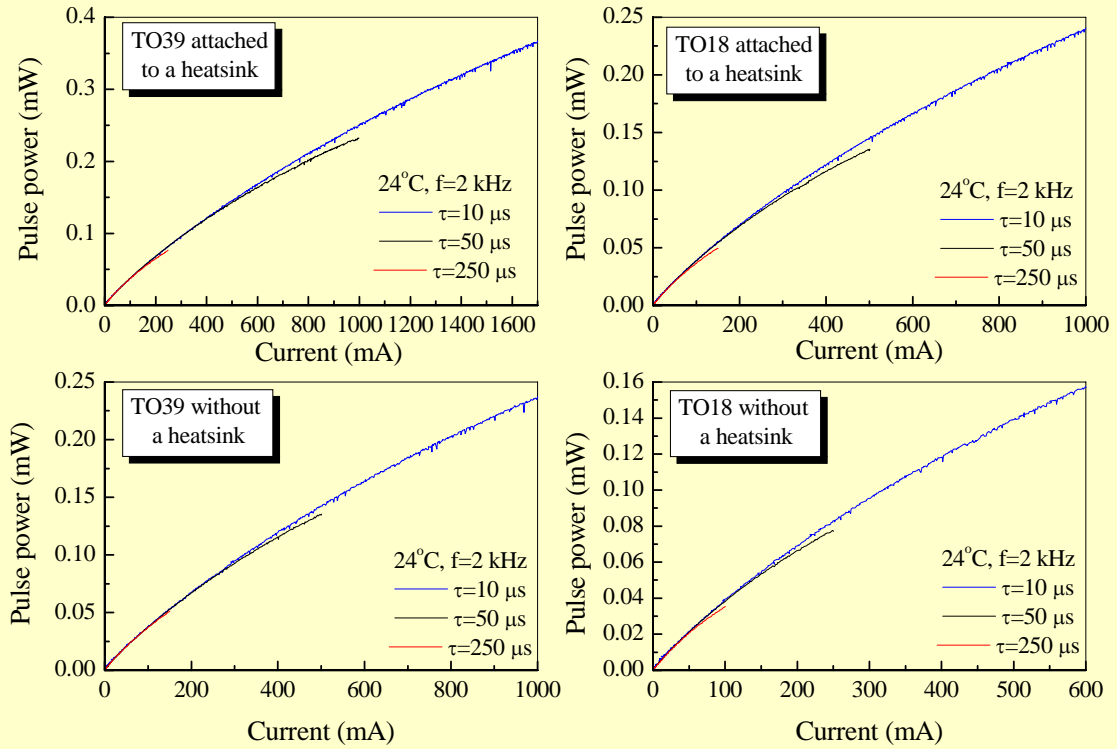
Package

House code	Lens type	Lens material	Emission size	Angle of view FWHM	Storage conditions	Operation conditions	Polarity
			mm	deg	°C	°C	
TO18	-		∅ 0.8	≤140	-25 to +55	-25 to +50	short leg or key is negative
TO18	mIL	Chalcogenide glass	∅ 1	≤50	-25 to +50	-25 to +45	the same
TO39	-		∅ 0.8	≤140	-25 to +55	-25 to +50	the same
TO39	IL	CdSb or Si	∅ 3.5	≤35	-25 to +50	-25 to +45	the same

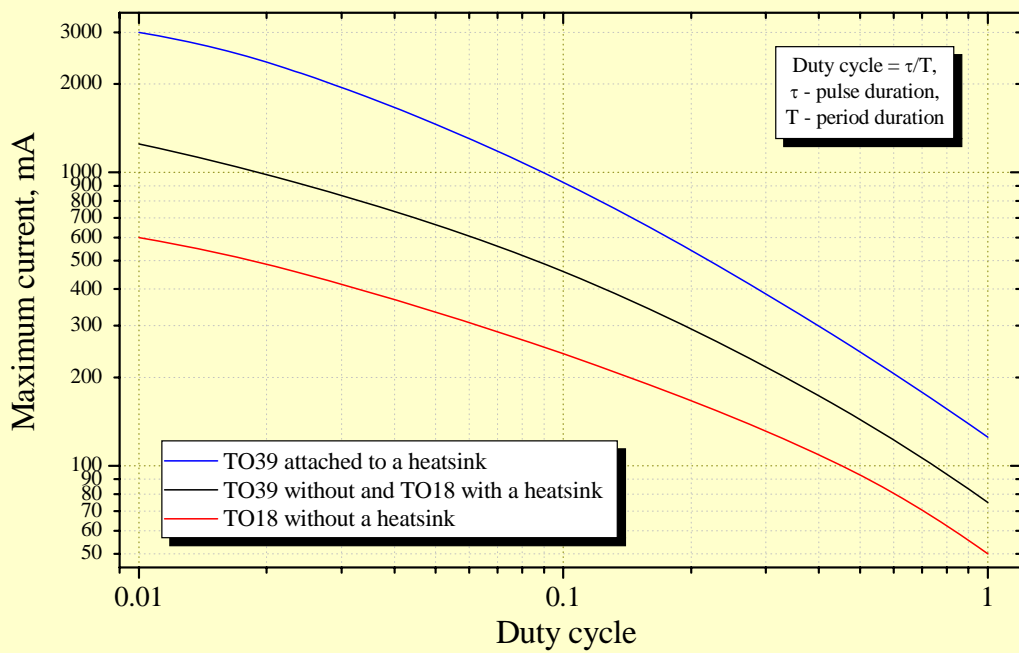
Type No.	MIRO39-140-18s	MIRO39-50-18GmL	MIRO39-140-39s	MIRO39-50-39GmL	MIRO39-35-39CL
	(TO18)	(TO18+mIL)	(TO39)	(TO39+mIL)	(TO39+IL)
Package photo					

## General characterization

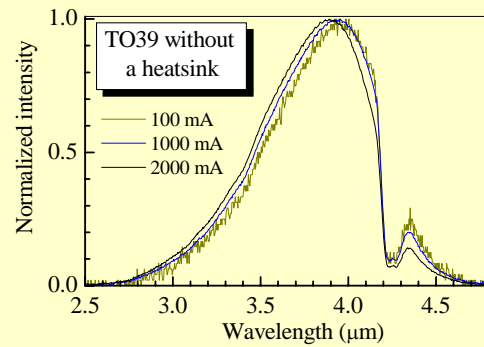
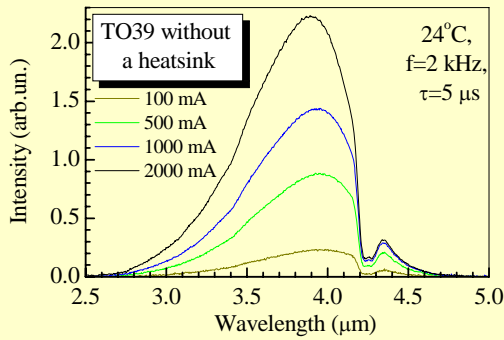
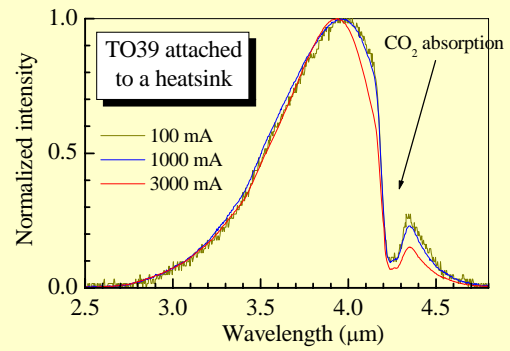
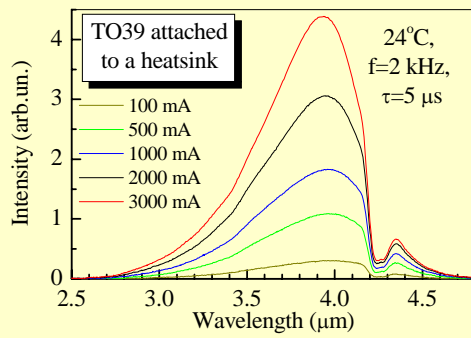
Current dependence of the output power (L-I) (24 °C)



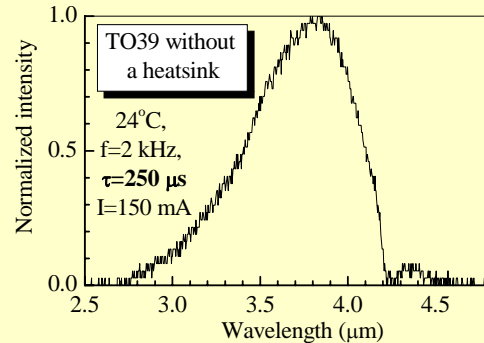
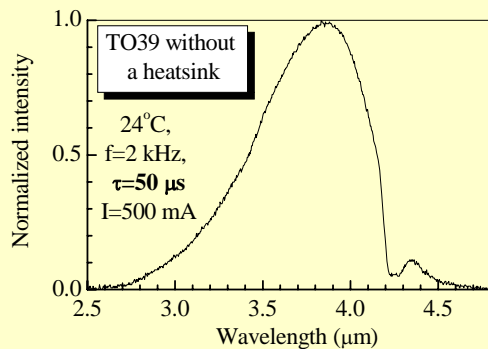
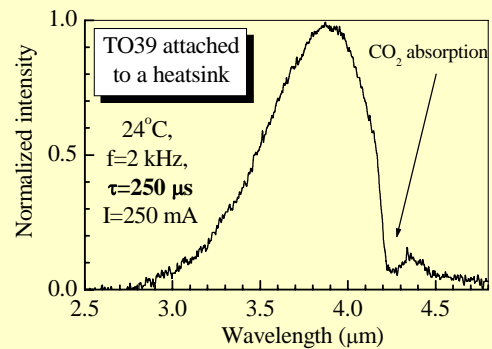
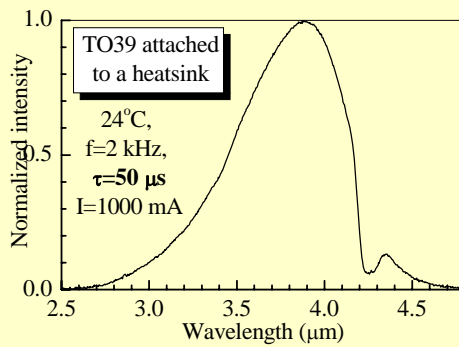
Maximal current vs. operation conditions



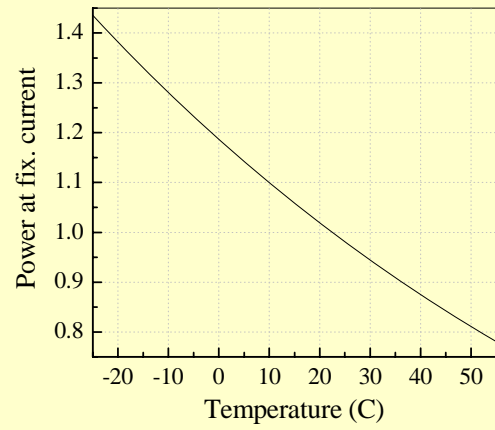
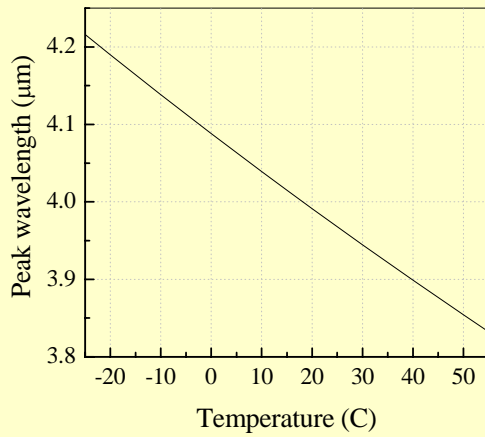
Current dependence of the emission spectra (24 °C,  $f=2\text{kHz}$ ,  $\tau=5\ \mu\text{s}$ )



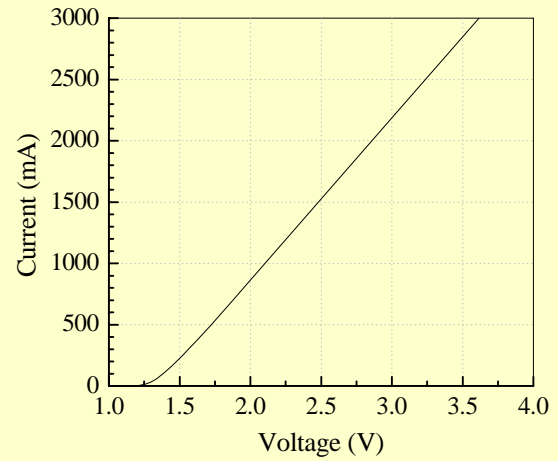
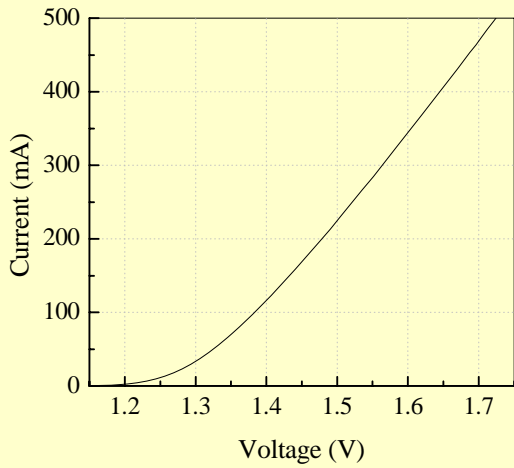
Normalized emission spectra at maximal current (24 °C)



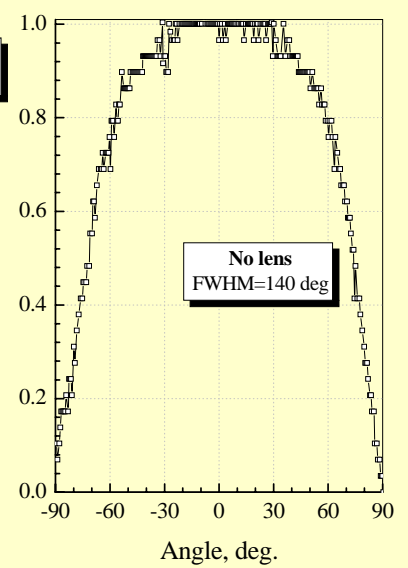
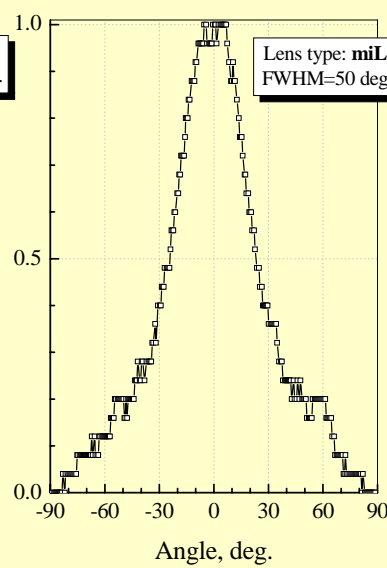
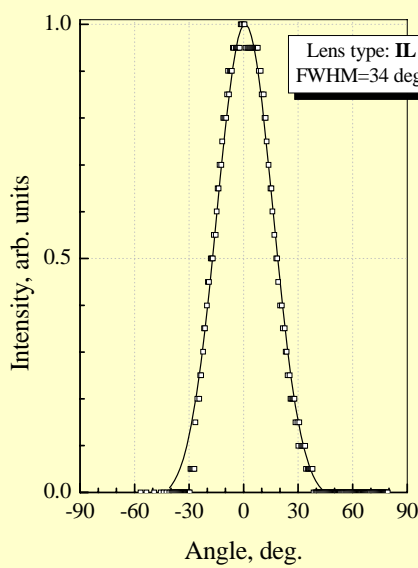
## Emission spectra and output power vs. temperature



## Current-voltage (I-V) characteristics



## Far-field pattern

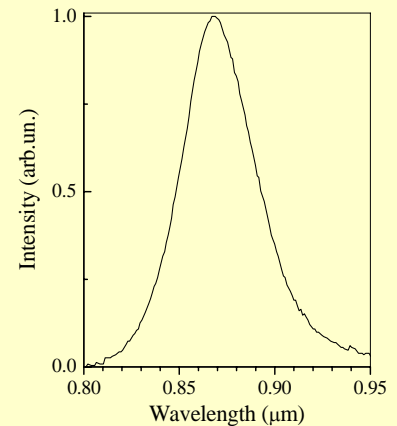


## Several useful notes

Microimmersion lenses (mIL) are made from chalcogenide glass with low melting temperature (60-70°C). That's why, please, try to install them vertically, pay attention to heatsinking conditions and avoid any heaters close to the mIL-LEDs.

Maximum operating current is defined as that producing  $\Delta t=10-20$  K overheating of the p-n junction relative to a heatsink temperature. We recommend not exceeding  $0.75 \times I_{max}$  for long term operating devices.

In certain applications it's important to know that in addition to mid-IR radiation most optically pumped LEDs emit NIR pumping radiation  $\lambda \approx 0.87 \mu\text{m}$  as well (see graph on the right). This "parasitic" emission can be cut off by filters or by a detector window, e.g. by CdSb lens in TO-39 packed LEDs.



Don't touch the chip, connecting wires and mIL surface.

## Answers to frequently asked questions

Q: What are the advantages of the IL and mIL package?

A: OP LEDs with immersion lenses emit radiation within small spatial angle, so it is easier to get a signal at some distance from the LED.

Q: What is the main difference between LEDs with microimmersion lens (mIL) and LEDs with immersion lens (IL)?

A: mIL LEDs are brighter/smaller than the L-equipped LEDs and thus standard detectors with  $1 \times 1 \text{ mm}^2$  area can be used (spherical mirror or close "face-to-face" schemes). However, IL LEDs are more stable than the mIL LEDs with respect to heating and high drive currents.