Rev. A1

LED20 series

- Mid-IR LED Series
- 2.00 – 2.09 µm
- 0.8 – 1.2 mW QCW

RoHS COMPLIANT　Pb Pb-Free

Description

LED20 series contain one LED chip die with a typical peak wavelength of **2.05 µm**, an optical power of typ. **0.9 mW QCW**. There are different options of packaging available, as you can choose between TO-can, with parabolic reflector (R), window (W), and containing thermoelectric cooler and thermoresistor (T).

Maximum Ratings

Parameter	Symbol	Values		Unit
		Min.	Max.	
Operating Current, QCW mode	$I_{QCW\ max}$		250	mA
Operating Current, pulsed mode	$I_{PULSE\ max}$		2	A
Storage Temperature *	I_{STR}	-60	+90	°C
Operating Temperature *	T_{CASE}	-60	+90	°C
Lead Solder Temperature *²	T_{SLD}		+180	°C

* Temperature range may vary for different packaging types
*² must be completed within 5 seconds

LED Characteristics　　　(T_{CASE}=25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Peak Wavelength	λ_P	I_F=150mA QCW	2.00		2.09	µm
Half Width (FWHM)	$\Delta\lambda$	I_F=150mA QCW	150		250	nm
Optical Output Power, QCW *	P_O	QCW mode *	0.8	0.9		mW
Optical Output Power, pulsed *²	P_O	Pulse mode *²	7.5	8.5		mW
Operating Voltage	V_{OP}	I_F=200mA QCW	0.5		2.5	V
Switching Time	t_s					ns

* Repetition rate: 0.5 kHz, pulse duration: 1 ms, duty cycle: 50%, current: 200 mA
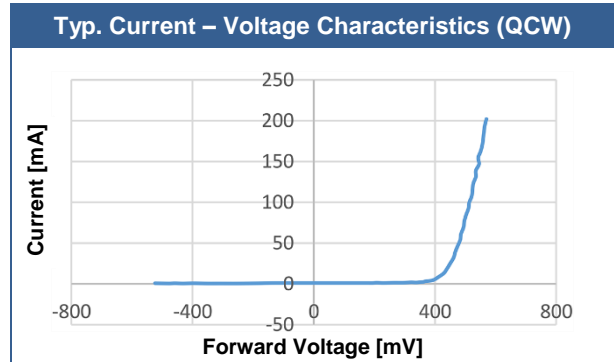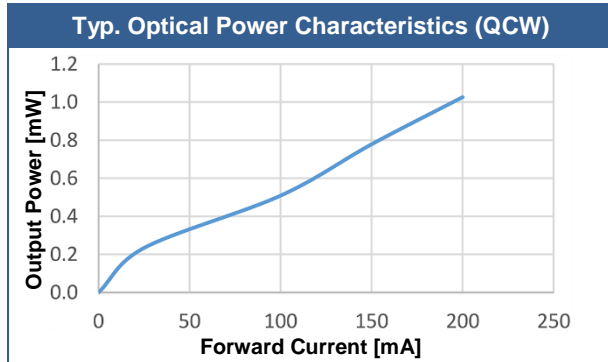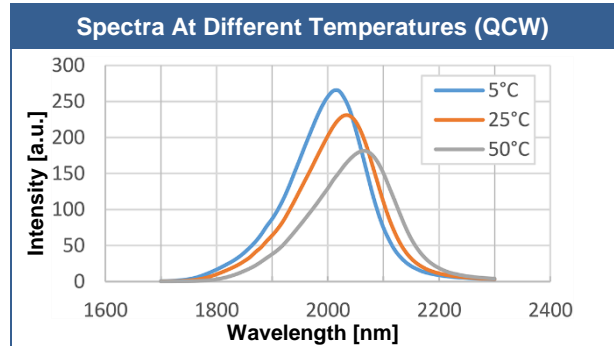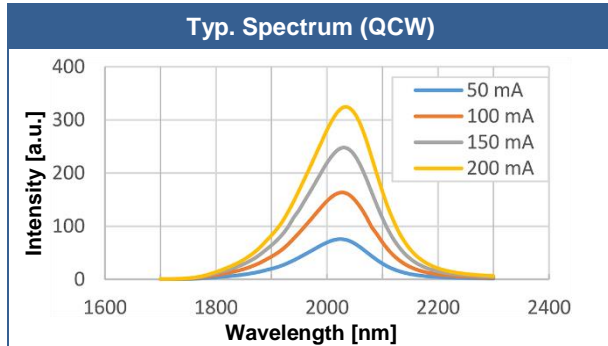*² Repetition rate: 0.5 kHz, pulse duration: 20 µs, duty cycle: 1%, current: 1 A

Packages

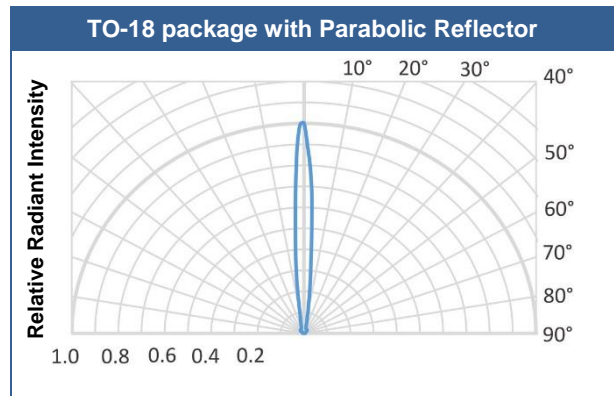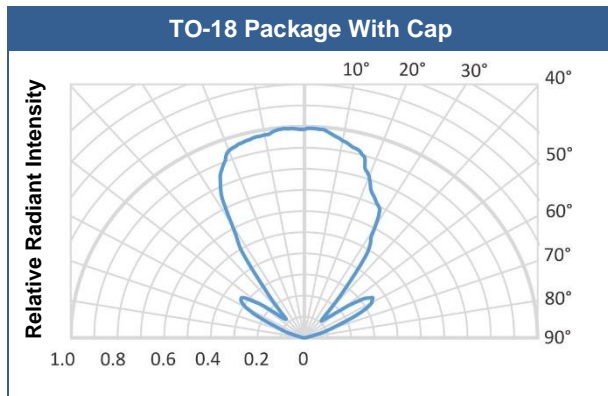| Part Number	Package
LED20	TO-18 with cap with glass window
LED20-R	TO-18 with parabolic reflector without glass window
LED20-RW	TO-18 with parabolic reflector with glass window
LED20-TW	TO-5 with built-in thermocooler and thermoresistor, covered by cap with glass window
LED20-TRW	TO-5 with built-in thermocooler and thermoresistor, covered by parabolic reflector with glass window

All parameters refer to LEDs in TO18 package with a cavity and operation at ambient temperature 25°C unless otherwise stated.

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Performance Characteristics

Typ. Spectrum (QCW)

Spectra At Different Temperatures (QCW)

Typ. Optical Power Characteristics (QCW)

Typ. Current – Voltage Characteristics (QCW)

Radiant Characteristics (Far-Field Pattern)

TO-18 Package With Cap

TO-18 package with Parabolic Reflector

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Outline Dimensions

LED20	TO-18, with cap, with window

Ø4,8±0,2
Ø3,5±0,2
LED chip
0,3
4,1±0,2
2,6±0,2
13,5±0,5
1
2
0,2
2 pins Ø0,4

TOP VIEW
LED chip
1 2

Lead	Description
PIN 1	LED Cathode
PIN 2	LED Anode (red dot)

BOTTOM VIEW
45°
1
2 1
1
Ø2,5±0,1
Ø5,6±0,2

All Dimensions in mm

LED20-R	TO-18, with parabolic reflector, without window

Ø9,0±0,2
Ø8,4±0,1
LED chip
0,3
5,0±0,2
2,6±0,2
13,5±0,5
1
2
0,2
2 pins Ø0,4

TOP VIEW
LED chip
1 2

Lead	Description
PIN 1	LED Cathode
PIN 2	LED Anode (red dot)

BOTTOM VIEW
45°
1
2 1
1
Ø2,5±0,1
Ø5,6±0,2

All Dimensions in mm

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LED20-RW   TO-18, with parabolic reflector and window
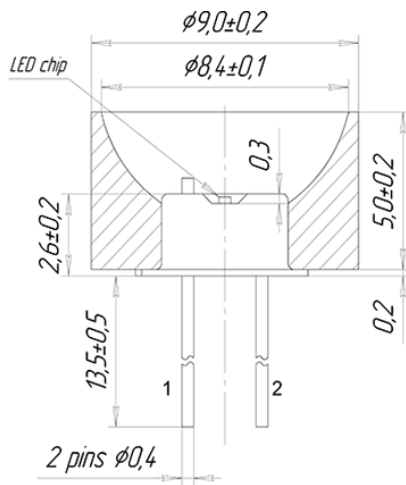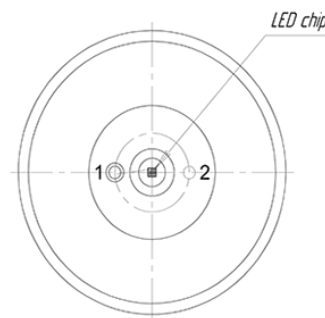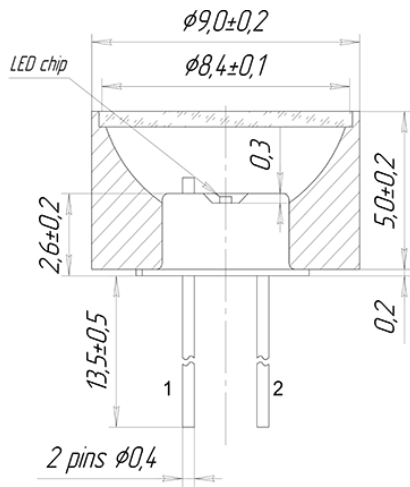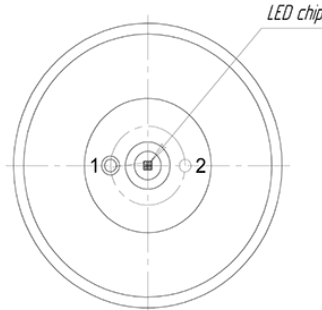
TOP VIEW   BOTTOM VIEW
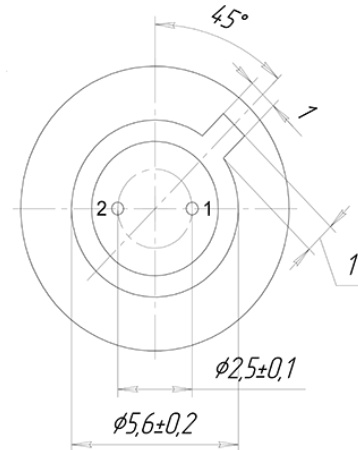
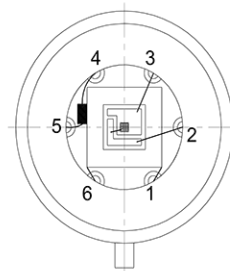| Lead	Description
PIN 1	LED Cathode
PIN 2	LED Anode (red dot)

All Dimensions in mm

LED20-TW   TO-5, thermocooler and thermoresistor, cap and window
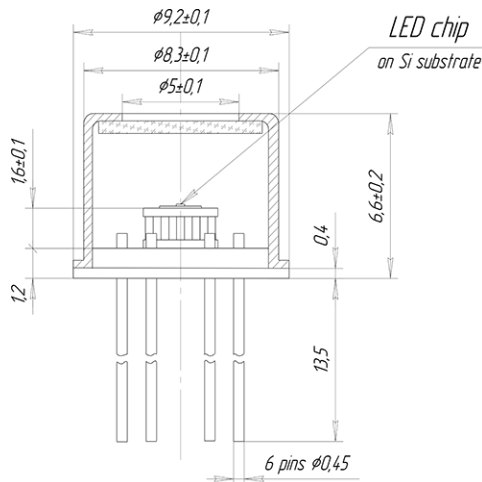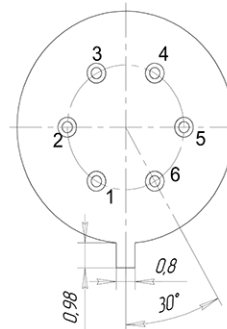
TOP VIEW   BOTTOM VIEW

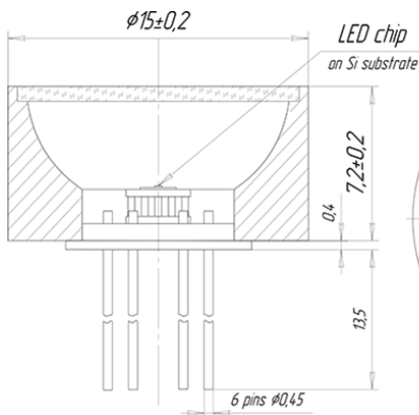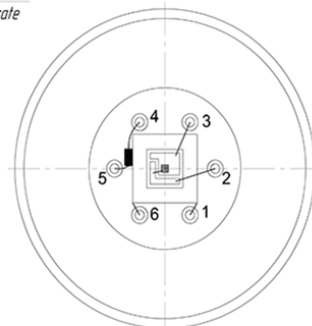| Lead	Description
PIN 1	TEC +
PIN 2	LED Anode (red dot)
PIN 3	LED Cathode
PIN 4	Thermistor
PIN 5	Thermistor
PIN 6	TEC -

All Dimensions in mm

LED20-TRW   TO-5, thermocooler and thermoresistor, cap and window
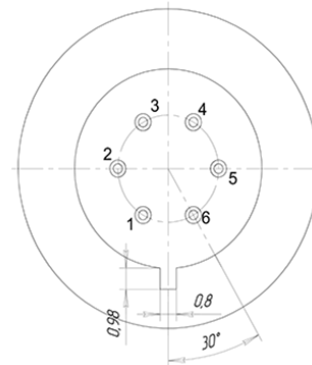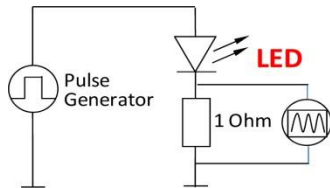
TOP VIEW   BOTTOM VIEW

Lead	Description
PIN 1	TEC +
PIN 2	LED Anode (red dot)
PIN 3	LED Cathode
PIN 4	Thermistor
PIN 5	Thermistor
PIN 6	TEC -

All Dimensions in mm

Operating Regime

LED Basic Circuit Connection	LED With Thermoelectric Module

Constant current source
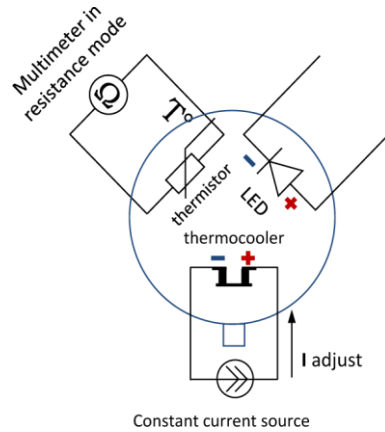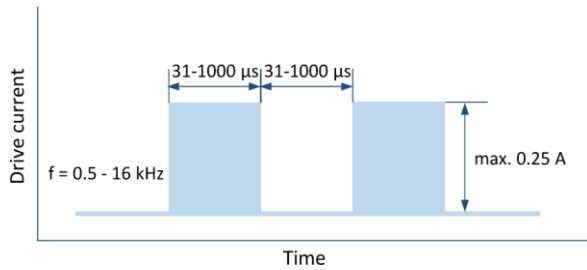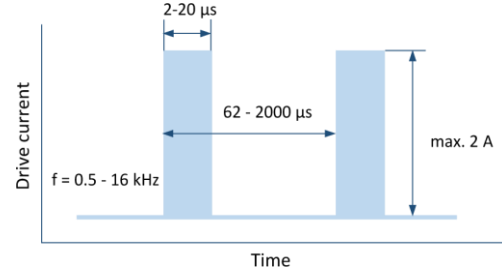
We recommend to use **Quasi Continuous Wave (QCW) mode** with duty cycle 50% or 25% to obtain maximum average optical power and **Pulse mode** to obtain maximum peak power. Hard CW (continuous wave) mode is **NOT** recommended.

Quasi Continuous Wave (QCW) mode	Pulse Mode

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Precautions

Cautions:

- Check your connection circuits before turning on the LED.
- Mind the LED polarity: LED anode is marked with a RED dot.
  Reverse voltage applying is FORBIDDEN!
- DO NOT connect the LED to the multimeter.
- Control the current applied to the LED in order not to exceed the maximum allowable values.

Soldering:

- Do avoid overheating of the LED
- Do avoid electrostatic discharge (ESD)
- Do avoid mechanical stress, shock, and vibration
- Do only use non-corrosive flux
- Do not apply current to the LED until it has cooled down to room temperature after soldering

Static Electricity:

LEDs are **sensitive to electrostatic discharge (ESD)**. Precautions against ESD must be taken when handling or operating these LEDs. Surge voltage or electrostatic discharge can result in complete failure of the device.

CAUTION
ELECTROSTATIC
SENSITIVE
DEVICES
DO NOT OPEN OR HANDLE
EXCEPT AT A
STATIC-FREE WORKSTATION

Operation:

Do only operate LEDs with a current source.
Running these LEDs from a voltage source will result in complete failure of the device.
Current of a LED is an exponential function of the voltage across it. Usage of current regulated drive circuits is mandatory.

Revisions History

Rev.	Rel. Date	Chapter	Modification	Page
A1	*2020-07-08*	-	Initial release	-

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