RoHS

HALOGEN

**FREE** 

GREEN

# Vishay Semiconductors

# High Speed Infrared Emitting Diode, 850 nm, Surface Emitter Technology



#### **DESCRIPTION**

As part of the <u>SurfLight<sup>IM</sup></u> portfolio, the VSLY5850 is an infrared, 850 nm emitting diode based on GaAlAs surface emitter chip technology with extreme high radiant intensity, high optical power and high speed, molded in a clear, untinted plastic package, with a parabolic lens.

#### **FEATURES**

Package type: leaded
Package form: T-1¾

• Dimensions (in mm): Ø 5

· Leads with stand-off

Peak wavelength: λ<sub>p</sub> = 850 nm

High reliability

High radiant power

High radiant intensity

• Narrow angle of half intensity:  $\phi = \pm 3^{\circ}$ 

Suitable for high pulse current operation

· Good spectral matching with CMOS cameras

 Material categorization: For definitions of compliance please see <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>

#### **APPLICATIONS**

- Infrared radiation source for operation with CMOS cameras
- · High speed IR data transmission
- · Smoke-automatic fire detectors
- IR Flash

PRODUCT SUMMARY				
COMPONENT	I <sub>e</sub> (mW/sr)	φ (deg)	λ <sub>p</sub> (nm)	t <sub>r</sub> (ns)
VSLY5850	600	± 3	850	10

#### Note

· Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
VSLY5850	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾	

#### Note

MOQ: minimum order quantity

<b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		V <sub>R</sub>	5	V	
Forward current		I <sub>F</sub>	100	mA	
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu s$	I <sub>FM</sub>	200	mA	
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	1	Α	
Power dissipation		P <sub>V</sub>	190	mW	
Junction temperature		Tj	100	°C	
Operating temperature range		T <sub>amb</sub>	- 40 to + 85	°C	
Storage temperature range		T <sub>stg</sub>	- 40 to + 100	°C	
Soldering temperature	t ≤ 5 s, 2 mm from case	T <sub>sd</sub>	260	°C	
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R <sub>thJA</sub>	230	K/W	





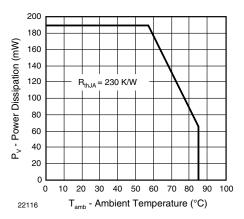


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

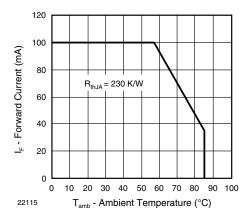


Fig. 2 - Forward Current Limit vs. Ambient Temperature

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V <sub>F</sub>		1.65	1.9	V
	$I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$	V <sub>F</sub>		2.9		V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 1 mA	TK <sub>VF</sub>		- 1.45		mV/K
	I <sub>F</sub> = 10 mA	TK <sub>VF</sub>		- 1.25		mV/K
Reverse current		I <sub>R</sub>	not designed for reverse operation		μΑ	
Junction capacitance	$V_R = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	C <sub>i</sub>		125		pF
Radiant intensity	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	I <sub>e</sub>	300	600	900	mW/sr
	$I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$	I <sub>e</sub>		5100		mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	фe		55		mW
Temperature coefficient of φ <sub>e</sub>	I <sub>F</sub> = 100 mA	TKφ <sub>e</sub>		- 0.35		%/K
Angle of half intensity		φ		± 3		deg
Peak wavelength	I <sub>F</sub> = 100 mA	$\lambda_{p}$	840	850	870	nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ		30		nm
Temperature coefficient of $\lambda_p$	I <sub>F</sub> = 100 mA	TKλ <sub>p</sub>		0.25		nm/K
Rise time	I <sub>F</sub> = 100 mA	t <sub>r</sub>		10		ns
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>		10		ns

### **BASIC CHARACTERISTICS** (T<sub>amb</sub> = 25 °C, unless otherwise specified)

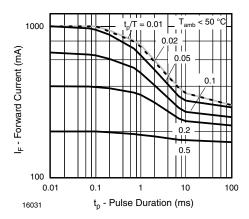


Fig. 3 - Pulse Forward Current vs. Pulse Duration

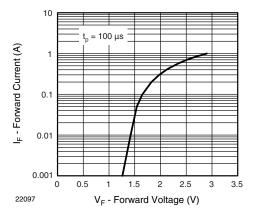


Fig. 4 - Forward Current vs. Forward Voltage

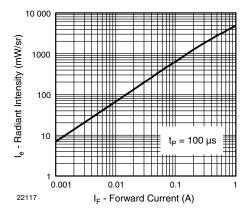


Fig. 5 - Radiant Intensity vs. Forward Current

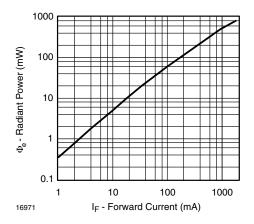


Fig. 6 - Radiant Power vs. Forward Current

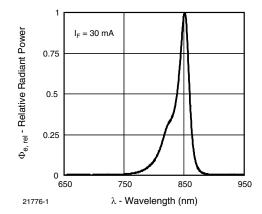


Fig. 7 - Relative Radiant Power vs. Wavelength

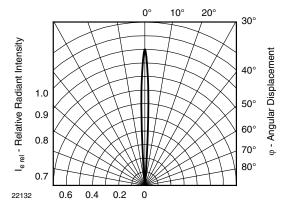
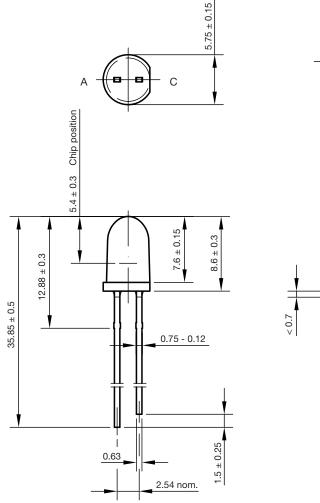
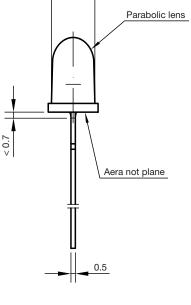


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

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#### **PACKAGE DIMENSIONS** in millimeters





Ø 5  $\pm$  0.15

according to DIN specifications

Not indicated tolerances ± 0.1

Drawing-No.: 6.544-5385.01-4

Issue: 2; 08.03.10

20531



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