# **VSLY5850**



**Vishay Semiconductors** 

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



## DESCRIPTION

As part of the <u>SurfLight<sup>TM</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-1<sup>3</sup>/<sub>4</sub>
- Dimensions (in mm): Ø 5
- Leads with stand-off
- Peak wavelength:  $\lambda_p = 850 \text{ nm}$
- High reliability
- High radiant power
- High radiant intensity
- Narrow angle of half intensity:  $\varphi = \pm 3^{\circ}$
- Suitable for high pulse current operation
- · Good spectral matching with CMOS cameras
- Material categorization: For definitions of compliance please see <u>www.vishay.com/doc?99912</u>

## **APPLICATIONS**

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

# PRODUCT SUMMARY COMPONENT Ie (mW/sr) φ (deg) λp (nm) tr (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		١ <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	A		
Power dissipation		Pv	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	$t \leq 5 \; \text{s}, 2 \; \text{mm}$ 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		

Document Number: 83160







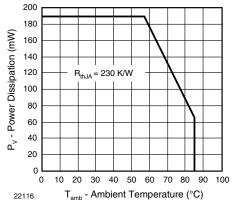


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

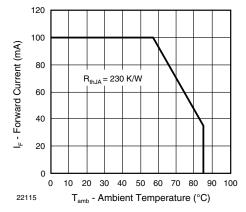


Fig. 2 - Forward Current Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Forward voltage	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 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 $V_{\text{F}}$	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			μA	
Junction capacitance	$V_{R} = 0 V, f = 1 MHz, E = 0$	Cj		125		pF	
De die at interneite	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	l <sub>e</sub>	300	600	900	mW/sr	
Radiant intensity	$I_F = 1 \text{ A}, t_p = 100 \ \mu \text{s}$	Ι <sub>e</sub>		5100		mW/sr	
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	фе		55		mW	
Temperature coefficient of $\phi_{e}$	I <sub>F</sub> = 100 mA	TKφe		- 0.35		%/K	
Angle of half intensity		φ		± 3		deg	
Peak wavelength	I <sub>F</sub> = 100 mA	λρ	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	ΤΚλρ		0.25		nm/K	
Rise time	I <sub>F</sub> = 100 mA	tr		10		ns	
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>		10		ns	

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

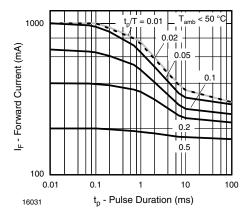


Fig. 3 - Pulse Forward Current vs. Pulse Duration

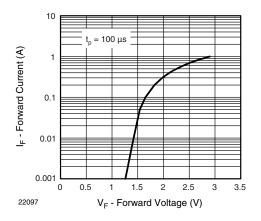


Fig. 4 - Forward Current vs. Forward Voltage

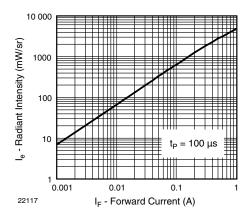


Fig. 5 - Radiant Intensity vs. Forward Current

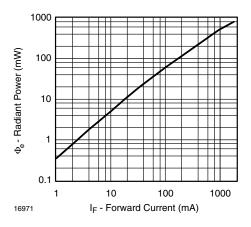


Fig. 6 - Radiant Power vs. Forward Current

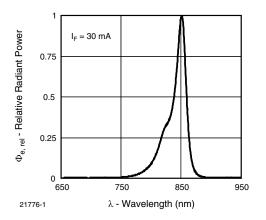


Fig. 7 - Relative Radiant Power vs. Wavelength

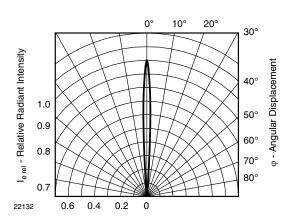


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

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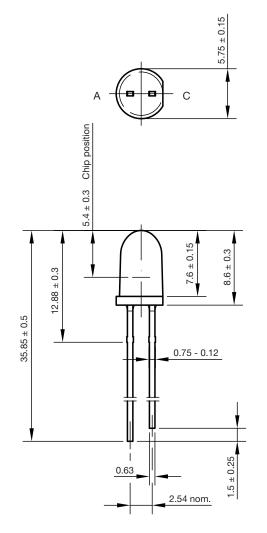
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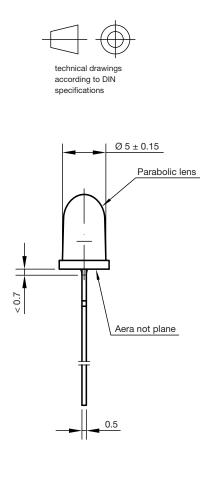


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## **PACKAGE DIMENSIONS** in millimeters







Not indicated tolerances  $\pm 0.1$ 



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