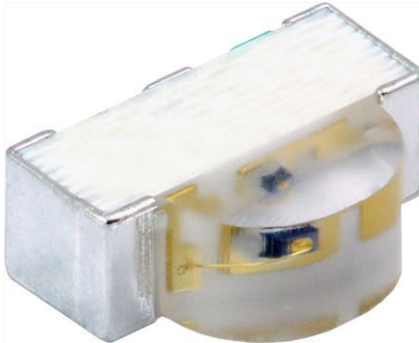


## High Speed Infrared Emitting Diode, 850 nm, GaAlAs, DH



### DESCRIPTION

VSMG10850 is an infrared, 850 nm side looking emitting diode in GaAlAs double hetero (DH) technology with high radiant power and high speed, molded in clear, untinted plastic package for surface mounting (SMD).

### FEATURES

- Package type: Surface mount
- Package form: Side view
- Dimensions (L x W x H in mm): 3 x 2 x 1
- Peak wavelength:  $\lambda_p = 850$  nm
- High reliability
- High radiant power
- High radiant intensity
- High speed
- Angle of half sensitivity:  $\phi = \pm 75^\circ$
- Low forward voltage
- Package matches with detector VEMD10940F
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### APPLICATIONS

- IR touch panel
- High power emitter for low space applications
- High performance transmissive or reflective sensors

PRODUCT SUMMARY				
COMPONENT	$I_e$ (mW/sr), 20 mA	$\phi$ (deg)	$\lambda_p$ (nm)	$t_r$ (ns)
VSMG10850	1	$\pm 75$	850	15

#### Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMG10850	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	side view

#### Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	5	V
Forward current		$I_F$	65	mA
Peak forward current	$t_p/T = 0.5$ , $t_p = 100 \mu\text{s}$	$I_{FM}$	130	mA
Surge forward current	$t_p = 100 \mu\text{s}$	$I_{FSM}$	500	mA
Power dissipation		$P_V$	110	mW
Junction temperature		$T_j$	100	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	- 40 to + 85	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	according to fig. 9, J-STD-020	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	$R_{thJA}$	450	K/W

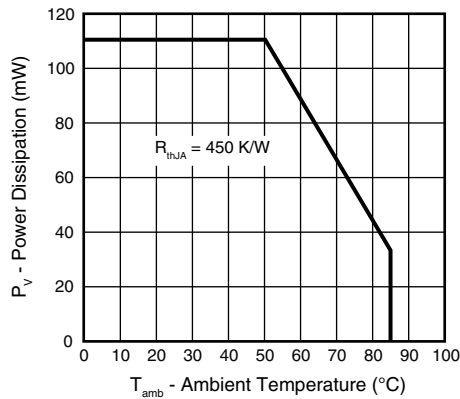


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

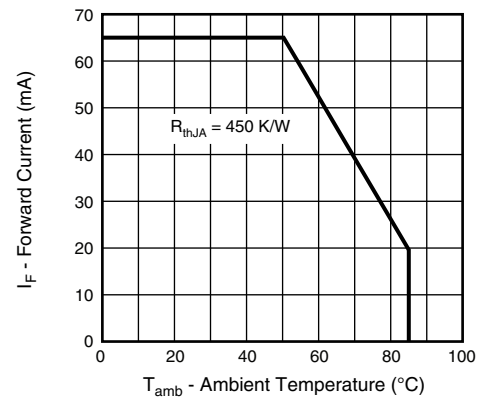


Fig. 2 - Forward Current Limit vs. Ambient Temperature

<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> = 20 mA, t <sub>p</sub> = 20 ms	V <sub>F</sub>	1.1	1.4	1.65	V
	I <sub>F</sub> = 65 mA, t <sub>p</sub> = 20 ms	V <sub>F</sub>		1.45		V
	I <sub>F</sub> = 500 mA, t <sub>p</sub> = 100 μs	V <sub>F</sub>		1.9		V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 1 mA	TK <sub>V<sub>F</sub></sub>		- 1.8		mV/K
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>			10	μA
Junction capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, E = 0 mW/cm <sup>2</sup>	C <sub>J</sub>		45		pF
Radiant intensity	I <sub>F</sub> = 20 mA, t <sub>p</sub> = 20 ms	I <sub>e</sub>	0.6	1	1.8	mW/sr
	I <sub>F</sub> = 65 mA, t <sub>p</sub> = 20 ms	I <sub>e</sub>		3.25		mW/sr
	I <sub>F</sub> = 500 mA, t <sub>p</sub> = 100 μs	I <sub>e</sub>		24		mW/sr
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	φ <sub>e</sub>		40		mW
Temperature coefficient of radiant power	I <sub>F</sub> = 1 mA	TK <sub>φ<sub>e</sub></sub>		- 1.1		%/K
Angle of half intensity - horizontal		φ <sub>h</sub>		± 77.5		deg
Angle of half intensity - vertical		φ <sub>v</sub>		± 72.5		deg
Peak wavelength	I <sub>F</sub> = 30 mA	λ <sub>p</sub>		850		nm
Spectral bandwidth	I <sub>F</sub> = 30 mA	Δλ		40		nm
Temperature coefficient of λ <sub>p</sub>	I <sub>F</sub> = 30 mA	TK <sub>λ<sub>p</sub></sub>		0.25		nm
Rise time	I <sub>F</sub> = 100 mA, 20 % to 80 %	t <sub>r</sub>		20		ns
Fall time	I <sub>F</sub> = 100 mA, 20 % to 80 %	t <sub>f</sub>		20		ns

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

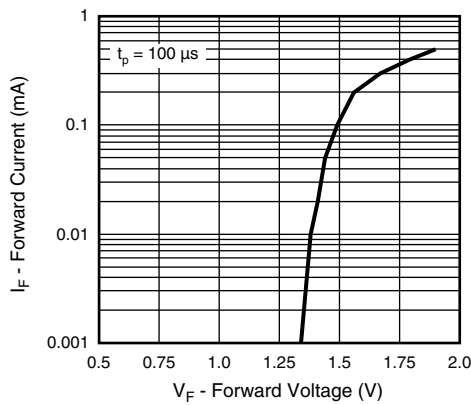


Fig. 3 - Forward Current vs. Forward Voltage

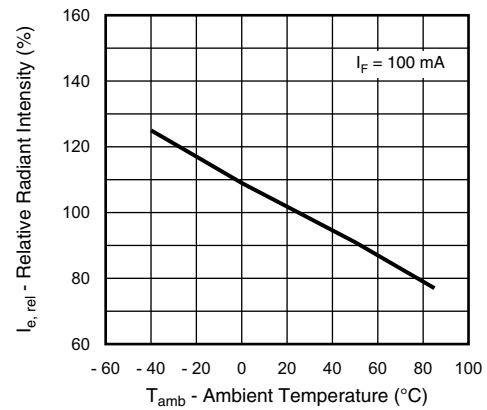


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

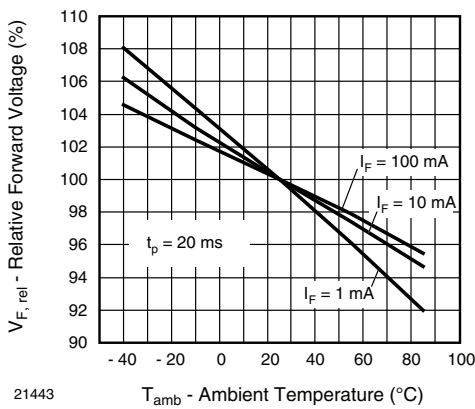


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

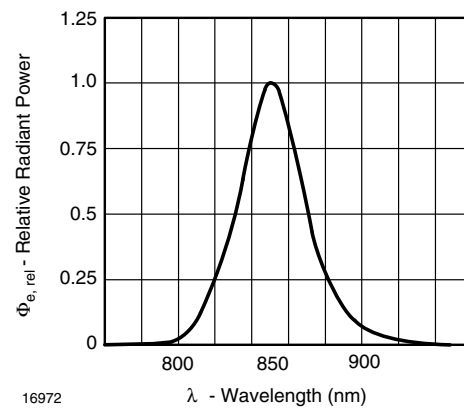


Fig. 7 - Relative Radiant Power vs. Wavelength

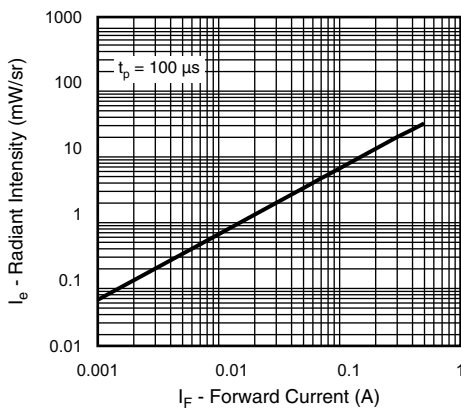


Fig. 5 - Radiant Intensity vs. Forward Current

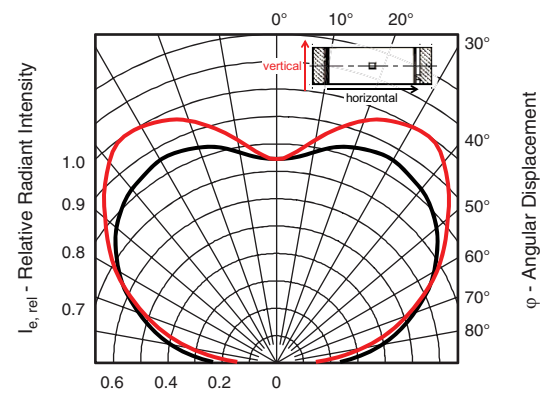


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

**REFLOW SOLDER PROFILE**

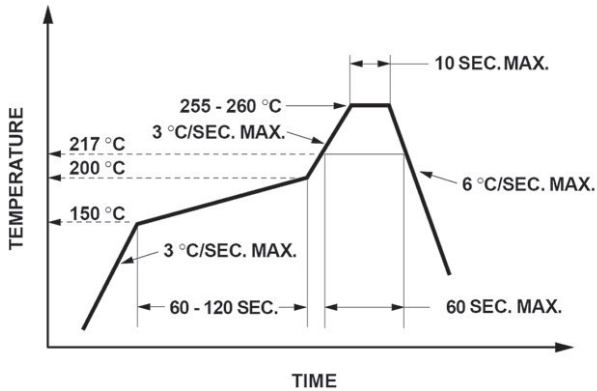


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

**DRYPACK**

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

**FLOOR LIFE**

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

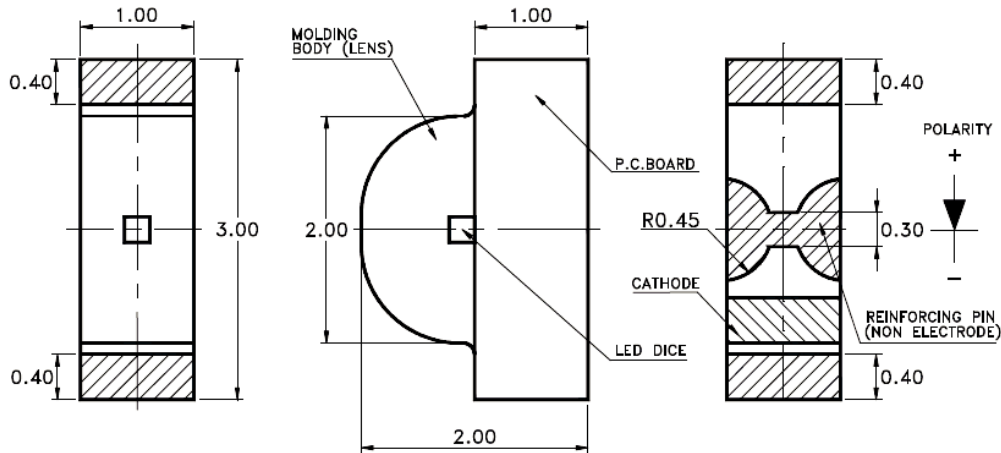
Floor life: 168 h

Conditions:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ , RH < 60 %

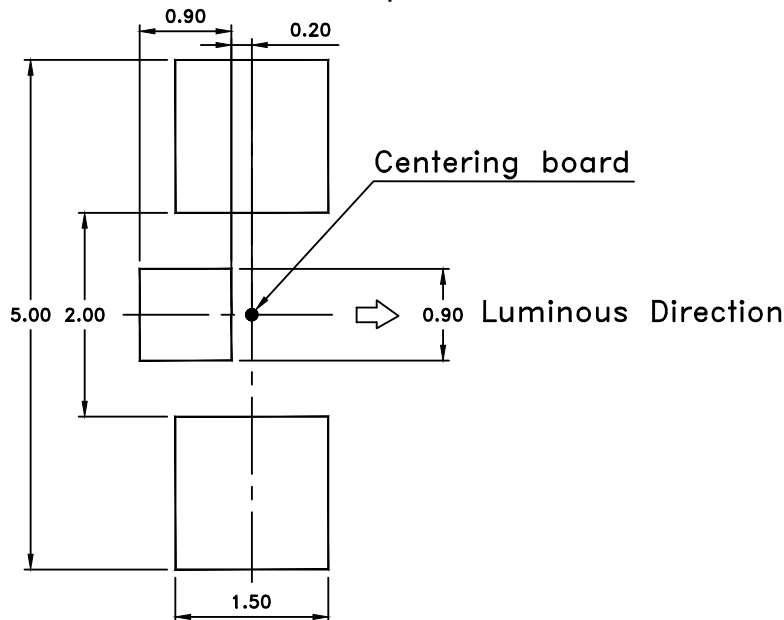
**DRYING**

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

**PACKAGE DIMENSIONS** in millimeters



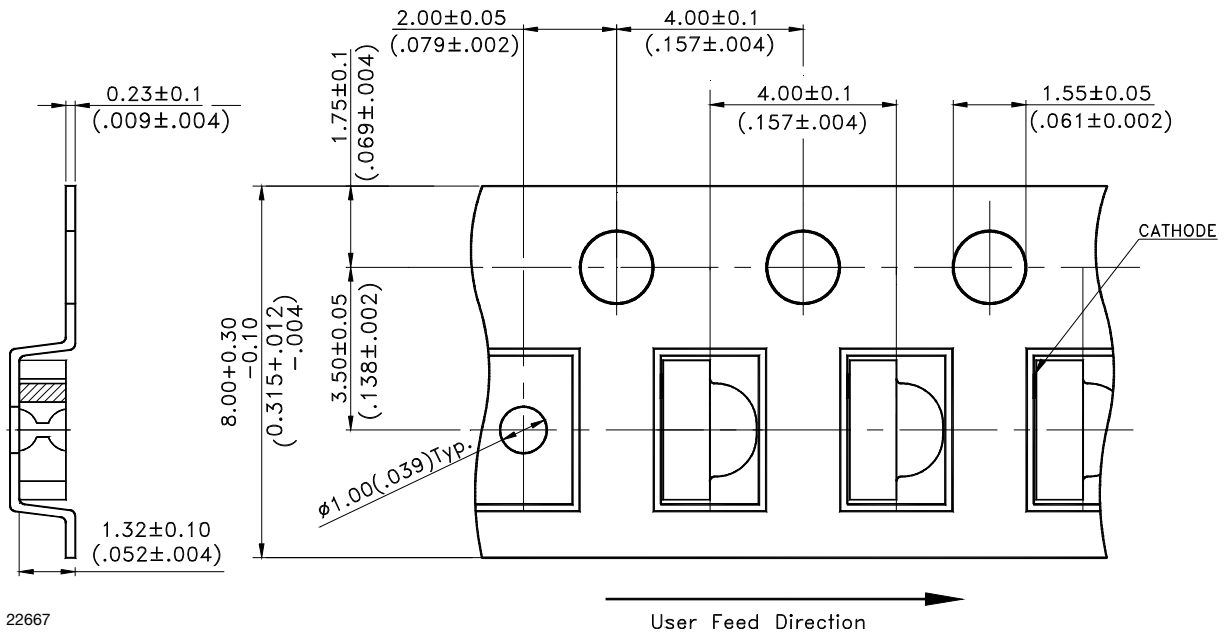
**Recommended Solder Pad Footprint**



22701

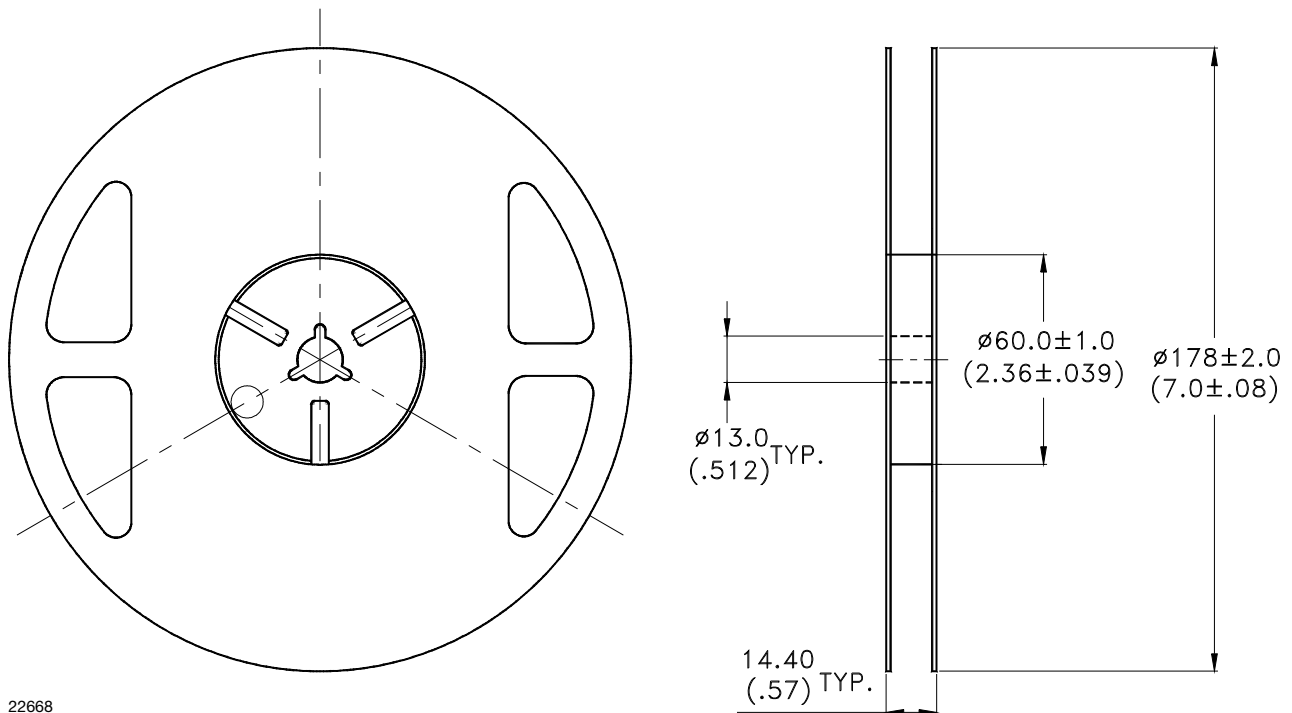


**BLISTER TAPE DIMENSIONS** in millimeters



22667

**REEL DIMENSIONS** in millimeters



22668



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