

High Power IR Emitting Diode Chip



FEATURES

- Package type: chip
- Package form: single chip
- Technology: surface emitter
- Dimensions chip (L x W x H in mm): 0.260 x 0.260 x 0.170
- Peak wavelength: $\lambda = 855 \text{ nm}$
- Material categorization:
for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

DESCRIPTION

TSP8510VA is a high power infrared, 855 nm surface emitting diode in GaAlAs technology with high radiant power and high speed. Polarity configuration is “n-up”.

GENERAL INFORMATION

The datasheet is based on Vishay optoelectronics sample testing under certain predetermined and assumed conditions, and is provided for illustration purpose only. Customers are encouraged to perform testing in actual proposed packaged and used conditions. Vishay optoelectronics die products are tested using Vishay optoelectronics based quality assurance procedures and are manufactured using Vishay optoelectronics established processes. Estimates such as those described and set forth in this datasheet for semiconductor die will vary depending on a number of packaging, handling, use, and other factors. Therefore sold die may not perform on an equivalent basis to standard package products.

PRODUCT SUMMARY

COMPONENT	ϕ_e (mW)	ϕ (°)	λ_p (nm)	t_r (ns)
TSP8510VA	19.5	55	855	25

Note

- Test condition see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSP8510VA-SD-F	Wafer sawn on foil with disco frame	MOQ: 220 000 pcs	Chip

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current		I_F	100	mA
Reverse voltage	$I_R = 10 \mu\text{A}$	V_R	15	V
Junction temperature		T_j	140	°C
Operating temperature range		T_{amb}	-55 to +140	°C
Storage temperature range chip		T_{stg1}	-55 to +150	°C
Storage temperature range on foil	While on mylar membrane	T_{stg2}	0 to +40	°C



BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage ⁽¹⁾	$I_F = 1\text{ mA}$	V_F	-	1.30	-	V
	$I_F = 5\text{ mA}$	V_F	-	1.38	-	V
	$I_F = 10\text{ mA}$	V_F	-	1.41	-	V
	$I_F = 50\text{ mA}$	V_F	-	1.54	-	V
Radiant power ⁽²⁾	$I_F = 5\text{ mA}$	ϕ_e	-	1.6	-	mW
	$I_F = 10\text{ mA}$	ϕ_e	-	3.5	-	mW
	$I_F = 50\text{ mA}$	ϕ_e	-	19.5	-	mW
Reverse voltage ⁽²⁾	$I_R = 10\text{ }\mu\text{A}$	V_R	15	28	-	V
Angle of half intensity	$I_F = 50\text{ mA}$	ϕ	-	55	-	$^{\circ}$
Peak wavelength	$I_F = 10\text{ mA}$	λ_p	840	855	870	nm
	$I_F = 50\text{ mA}$	λ_p	840	858	870	nm
Spectral bandwidth	$I_F = 50\text{ mA}$	$\lambda_{0.5}$	-	33	-	nm
Rise time ⁽³⁾	$I_F = 7\text{ mA}$	t_r	-	25	-	ns
	$I_F = 30\text{ mA}$	t_r	-	20	-	ns
Fall time ⁽³⁾	$I_F = 7\text{ mA}$	t_f	-	28	-	ns
	$I_F = 30\text{ mA}$	t_f	-	26	-	ns

Notes

- ⁽¹⁾ Measured on TO-18 header in integrating sphere
⁽²⁾ Measured on Vishay automated testing system
⁽³⁾ Pulse width of $t_p = 40\text{ ns}$, $t_p/T = 0.04$

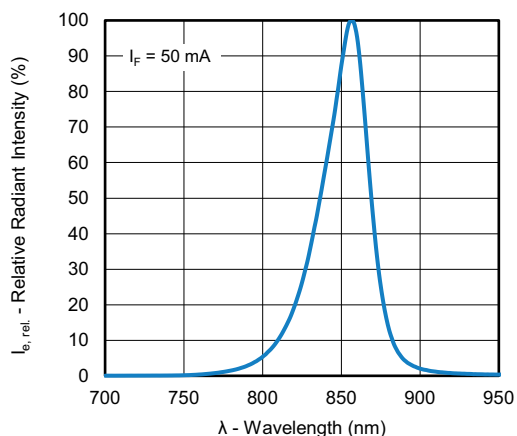
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Relative Spectral Emission
 $I_{rel} = f(\lambda)$, $I_F = 50\text{ mA}$

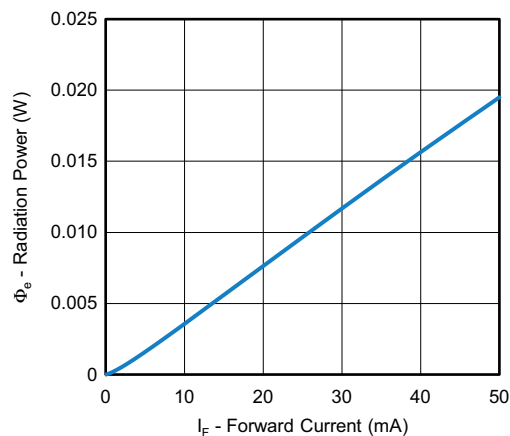


Fig. 3 - Radiant Power vs. Forward Current

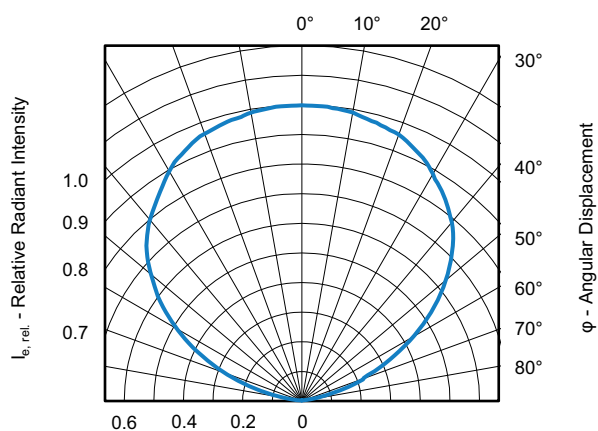


Fig. 2 - Radiant Characteristics
 $I_{rel} = f(\phi)$

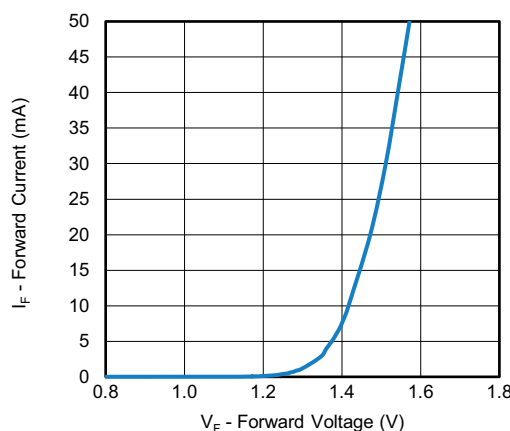


Fig. 4 - Forward Current vs. Forward Voltage

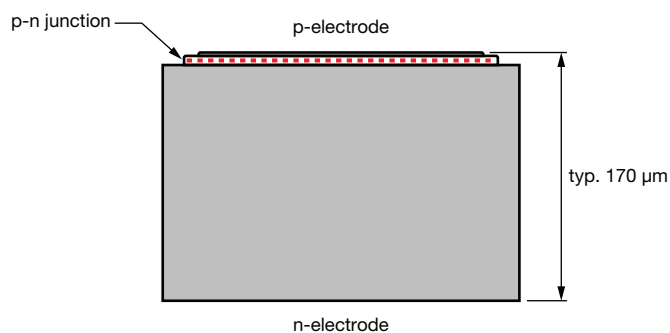
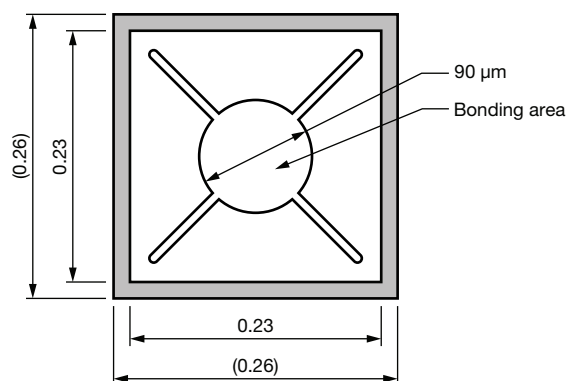
DIMENSIONS


Fig. 5 - Sectional View

**MECHANICAL DIMENSIONS**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Length of chip edge (x-direction)	L_x	0.245	0.260	0.275	mm
Length of chip edge (y-direction)	L_y	0.245	0.260	0.275	mm
Die height	H	0.155	0.170	0.185	mm
Diameter of bondpad	d	0.080	0.090	0.100	mm

ADDITIONAL INFORMATION

Frontside metallization, cathode	Gold alloy
Backside metallization, anode	Gold alloy
Dicing	Sawing
Die bonding technology	Epoxy bonding
Wire bonding technology	Ball, BSOB, not suitable for reverse bonding
Operation mode	Only suitable for forward current operation

Note

- All chips are checked in accordance with the Vishay Semiconductor, specification of visual inspection FVOV6870.
- The visual inspection shall be made in accordance with the "specification of visual inspection as referenced". The visual inspection of chip backside is performed with stereo microscope with incident light and 40x to 80x magnification.
- The quality inspection (final visual inspection) is performed by production. An additional visual inspection step as special release procedure by QM is not installed.

HANDLING AND STORAGE CONDITIONS

- The hermetically sealed shipment lots shall be opened in temperature and moisture controlled cleanroom environment only. It is mandatory to follow the rules for disposition of material that can be hazardous for humans and environment
- Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263
- Singulated die are not to be handled with tweezers. A vacuum wand with non metallic ESD protected tip should be used

PACKING

Chips are fixed on adhesive foil. Upon request the foils can be mounted on plastic frame or disco frame. For shipment, the wafers are arranged to stacks and hermetically sealed in plastic bags to ensure protection against environmental influence (humidity and contamination).

Use for recycling reliable operators only. We can help getting in touch with your nearest sales office. By agreement we will take back packing material, if it is sorted. You will have to bear the costs of transport. We will invoice you for any costs incurred for packing material that is returned unsorted or which we are not obliged to accept.



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