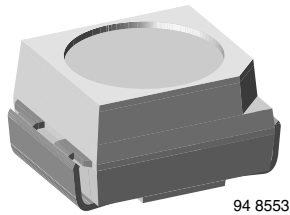


High Speed Infrared Emitting Diode, RoHS Compliant, 870 nm, GaAIAs Double Hetero



94 8553

DESCRIPTION

VSMF4720 is an infrared, 870 nm emitting diode in GaAIAs double hetero (DH) technology with high radiant power and high speed, molded in a PLCC-2 package for surface mounting (SMD). A 19" chip provides outstanding low forward voltage and radiant intensity even at 1 A pulse current.

FEATURES

- Package type: surface mount
- Package form: PLCC-2
- Dimensions (L x W x H in mm): 3.5 x 2.8 x 1.75
- Peak wavelength: $\lambda_p = 870$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\varphi = \pm 60^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- High modulation band width: $f_c = 24$ MHz
- Good spectral matching with Si photodetectors
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC


RoHS
COMPLIANT

APPLICATIONS

- High speed IR data transmission
- High power emitter for low space applications
- High performance transmissive or reflective sensors

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMF4720	16	± 60	870	15

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMF4720-GS08	Tape and reel	MOQ: 7500 pcs, 1500 pcs/reel	PLCC-2
VSMF4720-GS18	Tape and reel	MOQ: 8000 pcs, 8000 pcs/reel	PLCC-2

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	100	mA
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu s$	I_{FM}	200	mA
Surge forward current	$t_p = 100 \mu s$	I_{FSM}	1	A
Power dissipation		P_V	160	mW
Junction temperature		T_j	100	$^\circ C$
Operating temperature range		T_{amb}	- 40 to + 85	$^\circ C$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ C$
Soldering temperature	Acc. figure 8, J-STD-020B	T_{sd}	260	$^\circ C$
Thermal resistance junction/ambient	J-STD-051, soldered on PCB	R_{thJA}	250	K/W

Note

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



High Speed Infrared Emitting Diode, RoHS Vishay Semiconductors
Compliant, 870 nm, GaAlAs Double Hetero

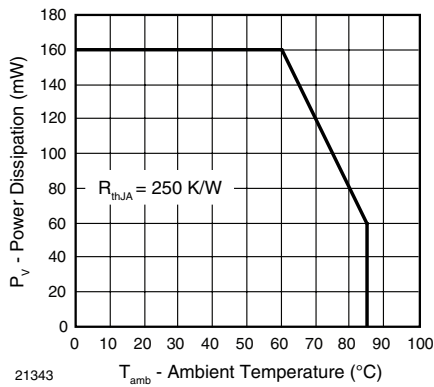


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

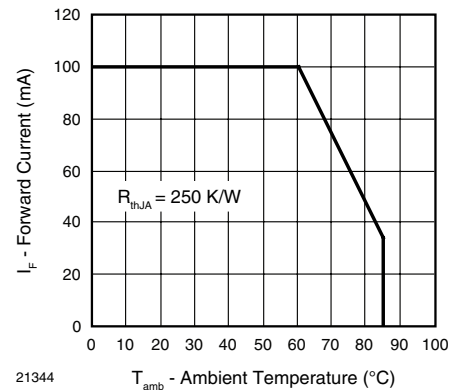


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 100 mA, t _p = 20 ms	V _F		1.45	1.6	V
	I _F = 1 A, t _p = 100 μs	V _F		2.1		V
Temperature coefficient of V _F	I _F = 1 mA	TK _{V_F}		- 1.8		mV/K
Reverse current	V _R = 5 V	I _R			10	μA
Junction capacitance	V _R = 0 V, f = 1 MHz, E = 0	C _j		125		pF
Radiant intensity	I _F = 100 mA, t _p = 20 ms	I _e	10	16	30	mW/sr
	I _F = 1 A, t _p = 100 μs	I _e		150		mW/sr
Radiant power	I _F = 100 mA, t _p = 20 ms	φ _e		50		mW
Temperature coefficient of φ _e	I _F = 100 mA	TKφ _e		- 0.35		%/K
Angle of half intensity		φ		± 60		deg
Peak wavelength	I _F = 100 mA	λ _p		870		nm
Spectral bandwidth	I _F = 100 mA	Δλ		40		nm
Temperature coefficient of λ _p	I _F = 100 mA	TKλ _p		0.25		nm/K
Rise time	I _F = 100 mA	t _r		15		ns
Fall time	I _F = 100 mA	t _f		15		ns
Cut-off frequency	I _{DC} = 70 mA, I _{AC} = 30 mA pp	f _c		24		MHz
Virtual source diameter		d		0.67		mm

Note

T_{amb} = 25 °C, unless otherwise specified

BASIC CHARACTERISTICS

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

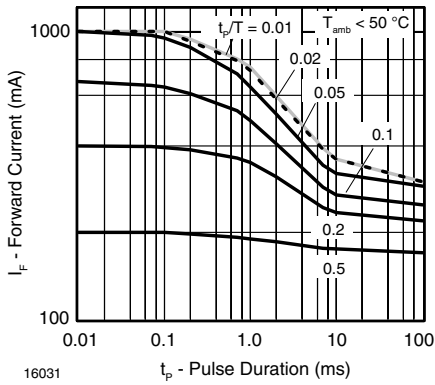


Fig. 3 - Pulse Forward Current vs. Pulse Duration

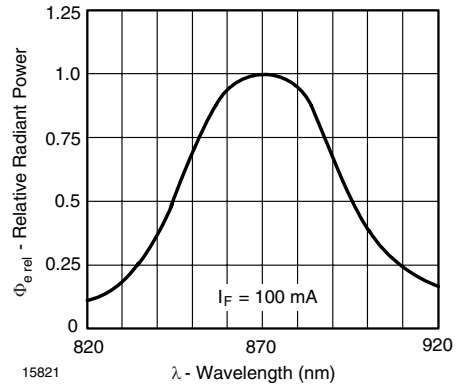


Fig. 6 - Relative Radiant Power vs. Wavelength

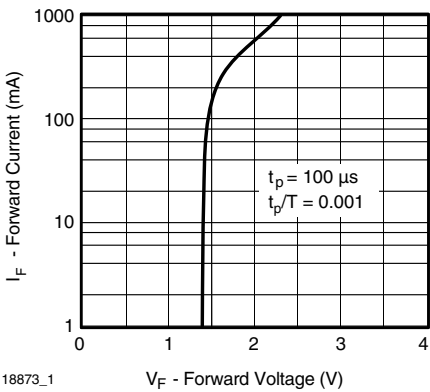


Fig. 4 - Forward Current vs. Forward Voltage

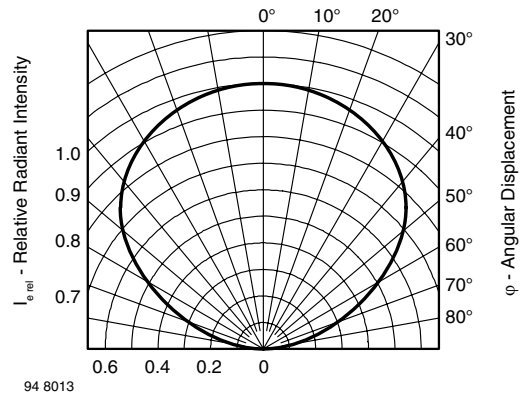


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

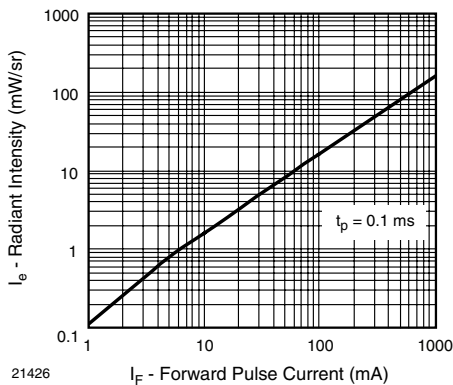
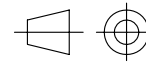
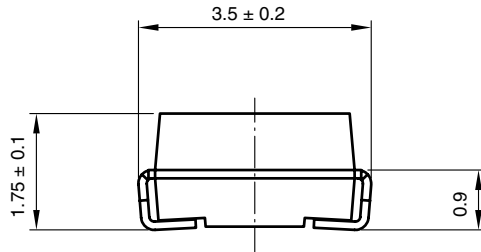


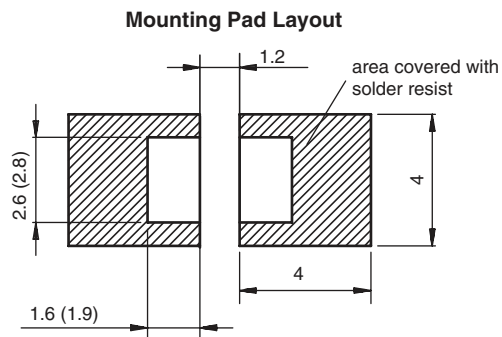
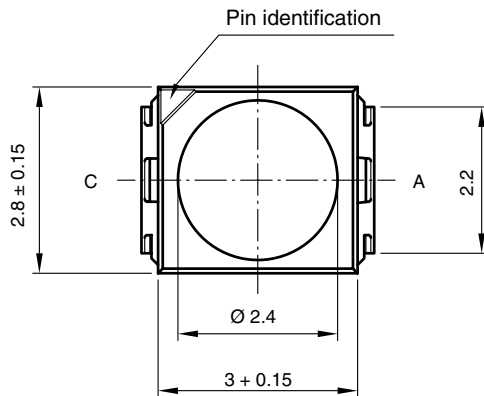
Fig. 5 - Radiant Intensity vs. Forward Current



PACKAGE DIMENSIONS in millimeters



technical drawings
according to DIN
specifications



Drawing-No.: 6.541-5067.01-4

Issue: 4; 30.07.07

20541

SOLDER PROFILE

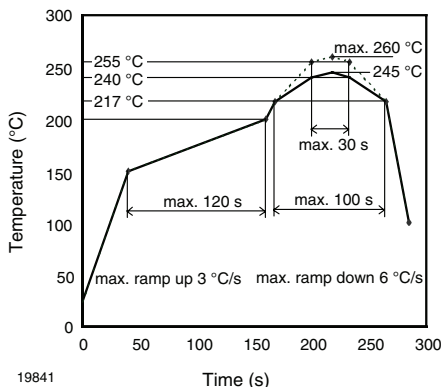


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020B for Preconditioning acc. to JEDEC, Level 2a

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

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 4 weeks

Conditions: T_{amb} < 30 °C, RH < 60 %

Moisture sensitivity level 2a, acc. to J-STD-020B.

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 %.

TAPE AND REEL

PLCC-2 components are packed in antistatic blister tape (DIN IEC (CO) 564) for automatic component insertion. Cavities of blister tape are covered with adhesive tape.

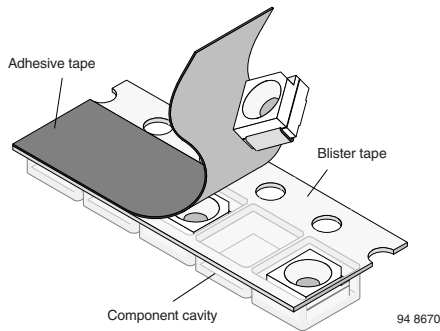


Fig. 9 - Blister Tape

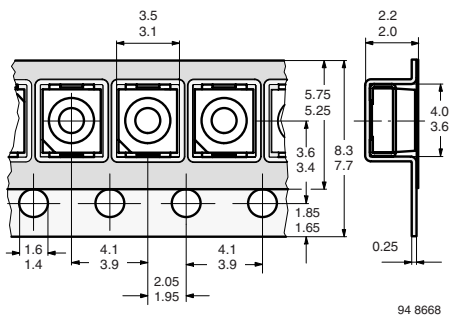


Fig. 10 - Tape Dimensions in mm for PLCC-2

MISSING DEVICES

A maximum of 0.5 % of the total number of components per reel may be missing, exclusively missing components at the beginning and at the end of the reel. A maximum of three consecutive components may be missing, provided this gap is followed by six consecutive components.

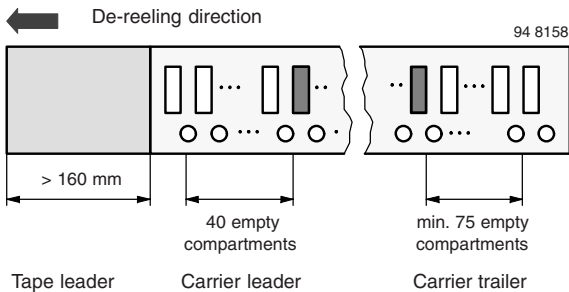


Fig. 11 - Beginning and End of Reel

The tape leader is at least 160 mm and is followed by a carrier tape leader with at least 40 empty compartments. The tape leader may include the carrier tape as long as the cover tape is not connected to the carrier tape. The least component is followed by a carrier tape trailer with a least 75 empty compartments and sealed with cover tape.

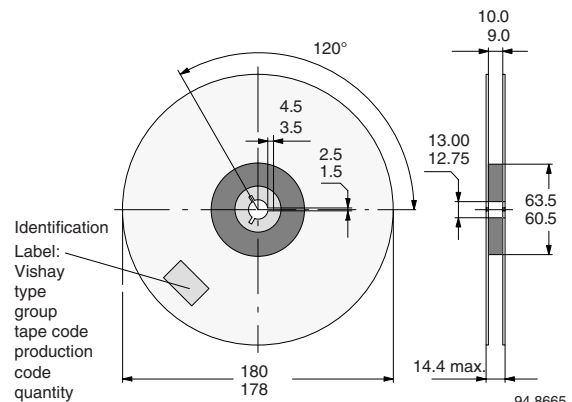


Fig. 12 - Dimensions of Reel-GS08

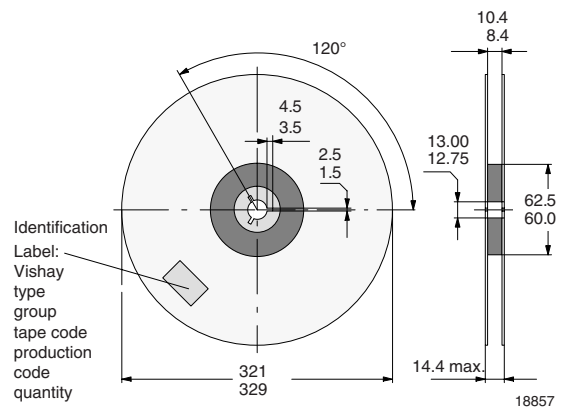


Fig. 13 - Dimensions of Reel-GS18

COVER TAPE REMOVAL FORCE

The removal force lies between 0.1 N and 1.0 N at a removal speed of 5 mm/s. In order to prevent components from popping out of the blisters, the cover tape must be pulled off at an angle of 180° with regard to the feed direction.



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