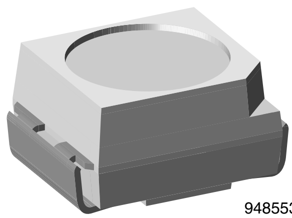
High Speed Infrared Emitting Diode, 890 nm



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DESCRIPTION

VSMF9700X01 is a high speed infrared emitting diode in GaAlAs double hetero (DH) technology in a miniature PLCC-2 package.

VSMF9700X01 is dedicated to emitter operation and detector operation.

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: λ_p = 890 nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half sensitivity: $\varphi = \pm 60°$
- Low forward voltage
- Suitable for high pulse current operation
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE
Pb-free
e3
RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

APPLICATIONS

- Automotive sensors
- Rain sensor
- Infrared high speed remote control and free air data transmission systems

PRODUCT SUMMARY				
COMPONENT	I_e (mW/sr)	φ (°)	λ_p (nm)	t_r (ns)
VSMF9700X01	8	± 60	890	50

Note

- Test condition see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMF9700X01-GS08	Tape and reel	MOQ: 7500 pcs, 1500 pcs/reel	PLCC-2
VSMF9700X01-GS18	Tape and reel	MOQ: 8000 pcs, 8000 pcs/reel	PLCC-2

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	100	mA
Surge forward current	t_p = 100 μs	I_{FSM}	200	mA
Power dissipation		P_V	170	mW
Junction temperature		T_j	110	°C
Operating temperature range		T_{amb}	-40 to +95	°C
Storage temperature range		T_{stg}	-40 to +110	°C
Soldering temperature	Acc. figure 8, J-STD-020	T_{sd}	260	°C
Thermal resistance junction-to-ambient		R_{thJA}	400	K/W

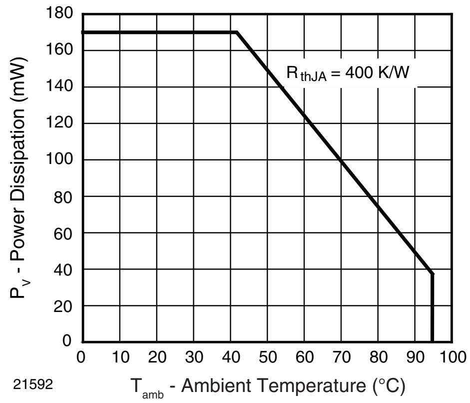


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

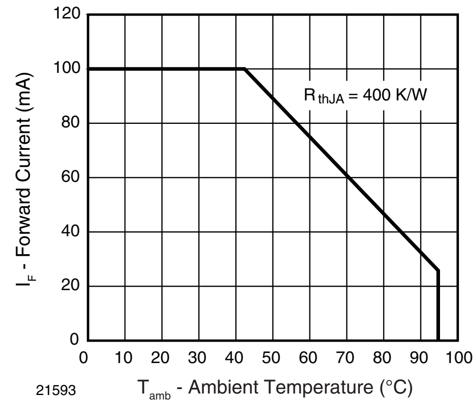


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 100 mA, t_p = 20 ms	V_F	-	1.6	1.8	V
	I_F = 200 mA, t_p = 100 μs	V_F	-	1.8	2.1	V
Temperature coefficient of V_F	I_F = 100 mA	TK_{VF}	-	-2.1	-	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	-	160	-	pF
Radiant intensity	I_F = 100 mA, t_p = 20 ms	I_e	5	8	-	mW/sr
Radiant power	I_F = 100 mA, t_p = 20 ms	ϕ_e	-	40	-	mW
Temperature coefficient of ϕ_e	I_F = 100 mA	$TK\phi_e$	-	-0.35	-	%/K
Angle of half intensity		φ	-	± 60	-	°
Peak wavelength	I_F = 100 mA	λ_p	-	890	-	nm
Spectral bandwidth	I_F = 100 mA	$\Delta\lambda_{½}$	-	50	-	nm
Temperature coefficient of λ_p	I_F = 100 mA	$TK\lambda_p$	-	0.25	-	nm/K
Rise time	I_F = 100 mA	t_r	-	50	-	ns
Fall time	I_F = 100 mA	t_f	-	50	-	ns

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

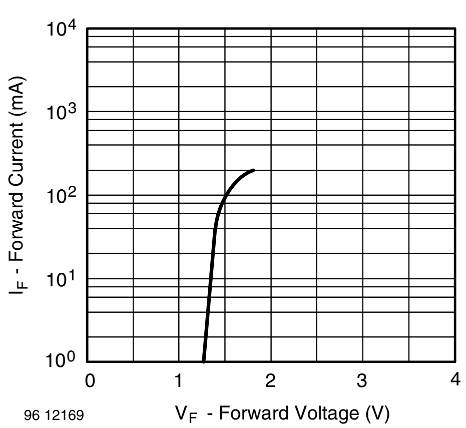


Fig. 3 - Forward Current vs. Forward Voltage

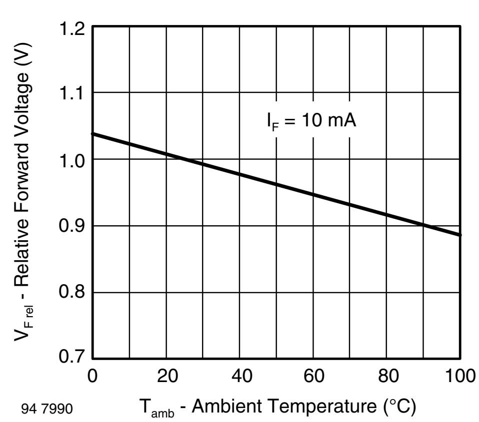


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

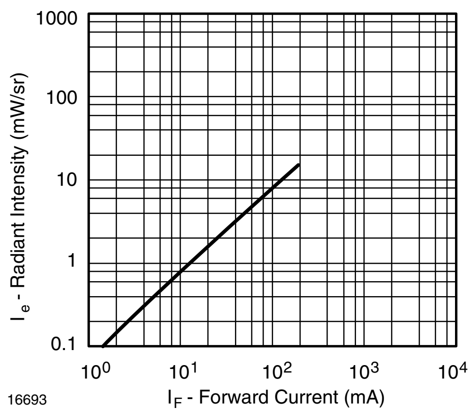


Fig. 5 - Radiant Intensity vs. Forward Current

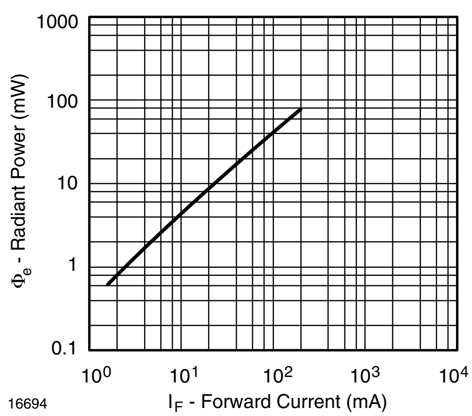


Fig. 6 - Radiant Power vs. Forward Current

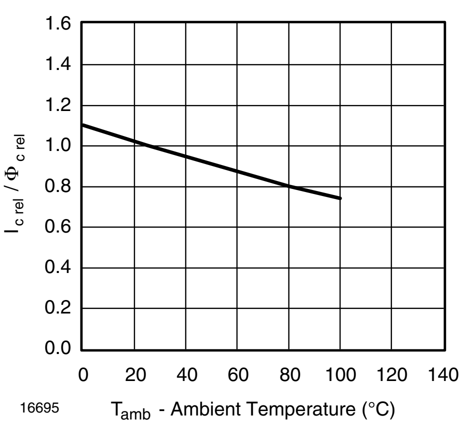


Fig. 7 - Relative Radiant Intensity/Power vs. Ambient Temperature

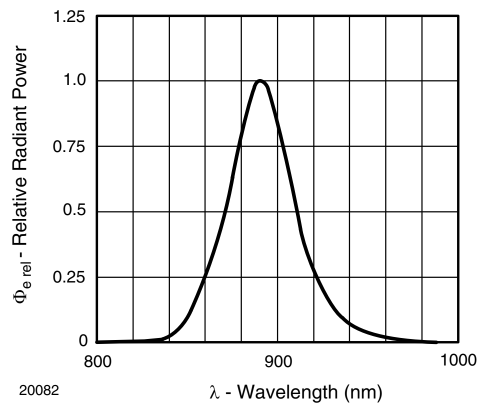


Fig. 8 - Relative Radiant Power vs. Wavelength

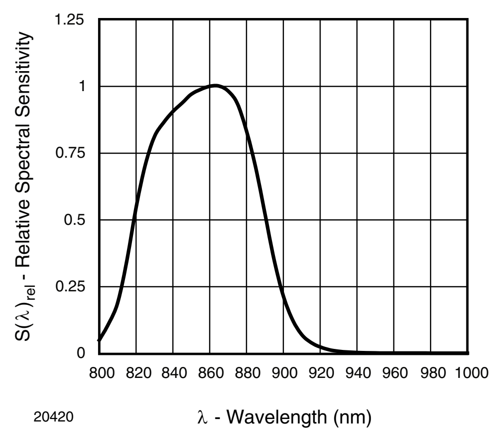


Fig. 9 - Relative Spectral Sensitivity vs. Wavelength

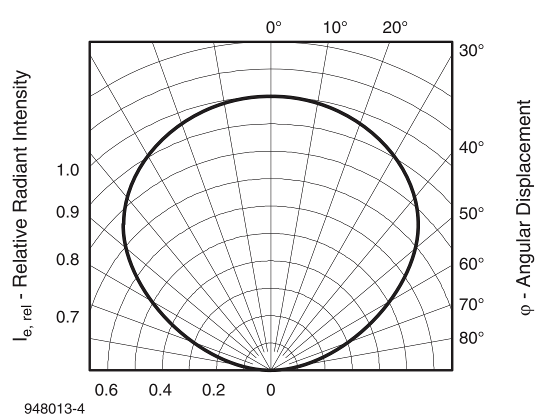
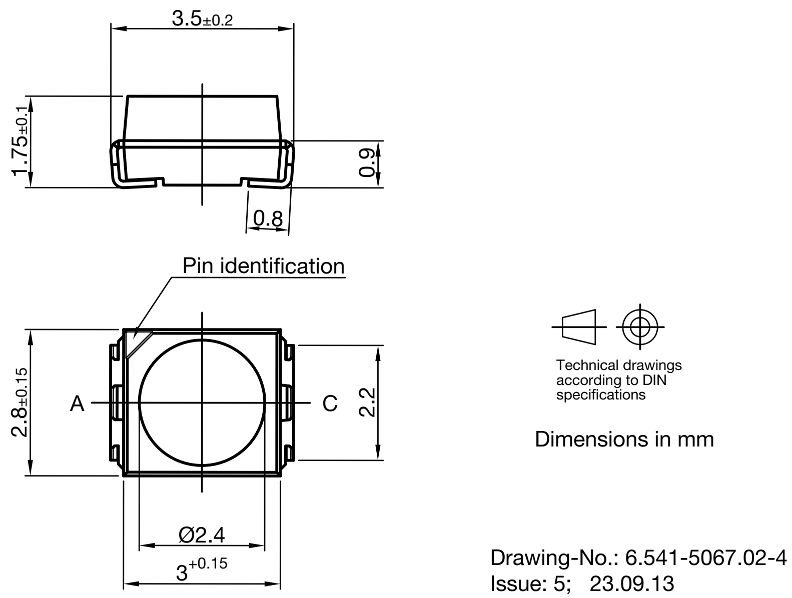
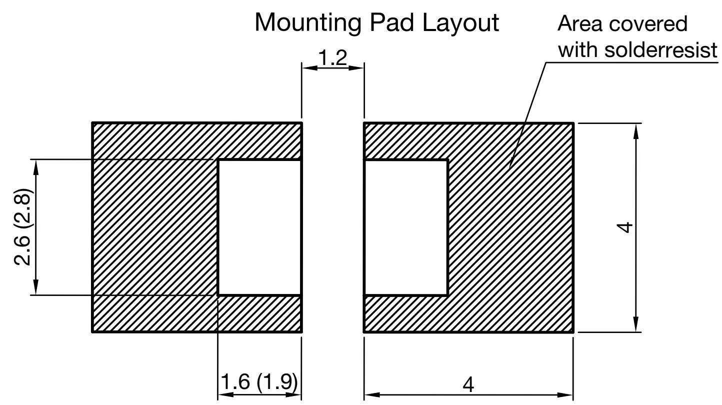


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters





Dimensions: Reflow and vapor phase (wave soldering)

REFLOW SOLDER PROFILE

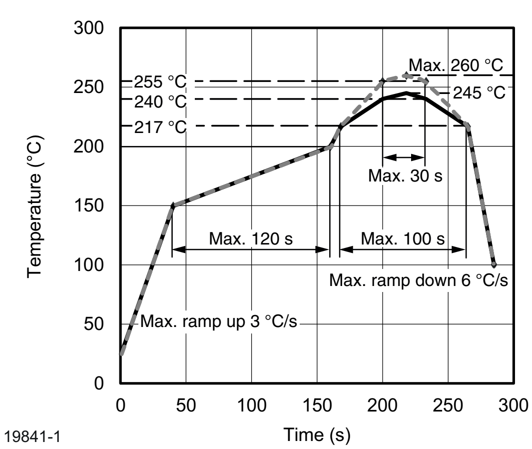


Fig. 11 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

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

Floor life: 168 h

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

Moisture sensitivity level 3, acc. to J-STD-020.

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.

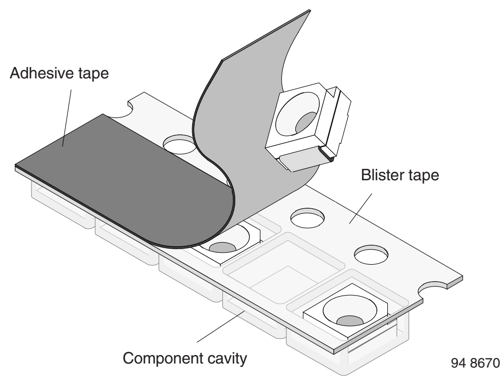


Fig. 12 - Blister Tape

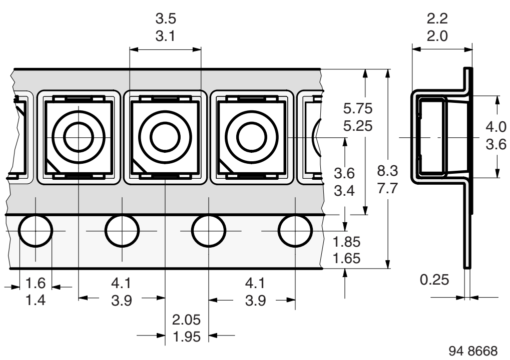


Fig. 13 - Tape Dimensions in mm for PLCC-2

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.

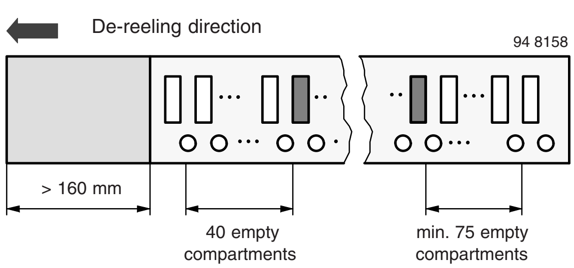


Fig. 14 - Beginning and End of Reel

The tape leader is at least 160 mm and is followed by a carrier tape leader with at least 40 empty compartements. 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 compartements and sealed with cover tape.

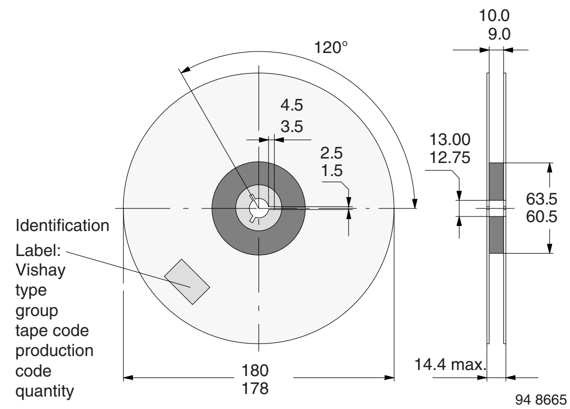


Fig. 15 - Dimensions of Reel-GS08

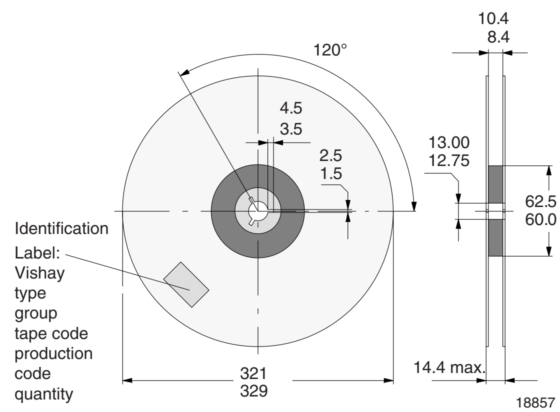


Fig. 16 - Dimensions of Reel-GS18

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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