



High Speed Infrared Emitting Diode, 890 nm, GaAlAs, DH

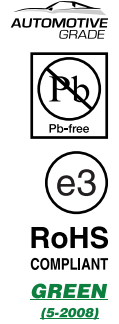


DESCRIPTION

VSMF2893SLX01 is an infrared, 890 nm, side looking emitting diode in GaAlAs (DH) technology with high radiant power and high speed, molded in clear, untinted plastic package (with lens) for surface mounting (SMD).

FEATURES

- Package type: surface mount
- Package form: side view
- Dimensions (L x W x H in mm): 2.3 x 2.55 x 2.3
- AEC-Q101 qualified
- Peak wavelength: $\lambda_p = 890$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\phi = \pm 25^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- Package matches with detector VEMD2xx3SSLX01 and VEMT2xx3SLX01 series
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



APPLICATIONS

- IrDA compatible data transmission
- 3D TV
- IR touch panels
- Miniature light barrier
- Photointerrupters
- Optical switch
- Shaft encoders
- IR emitter source for proximity applications

| PRODUCT SUMMARY | | | | |
|-----------------|---------------|--------------|------------------|------------|
| COMPONENT | I_e (mW/sr) | ϕ (deg) | λ_p (nm) | t_r (ns) |
| VSMF2893SLX01 | 20 | ± 25 | 890 | 30 |

Note

- Test conditions see table "Basic Characteristics"

| ORDERING INFORMATION | | | |
|----------------------|---------------|------------------------------|--------------|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| VSMF2893SLX01 | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | Side view |

Note

- MOQ: minimum order quantity



| ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | |
|--|--|------------|---------------|--------------------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Reverse voltage | | V_R | 5 | V |
| Forward current | | I_F | 100 | mA |
| Peak forward current | $t_p/T = 0.5$, $t_p = 100\text{ }\mu\text{s}$ | I_{FM} | 200 | mA |
| Surge forward current | $t_p = 100\text{ }\mu\text{s}$ | I_{FSM} | 1 | A |
| Power dissipation | | P_V | 160 | 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 | Acc. figure 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} | 250 | K/W |

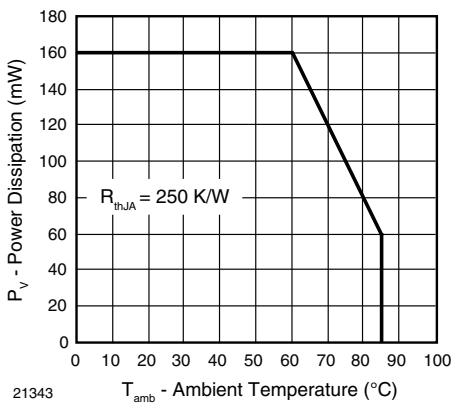


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

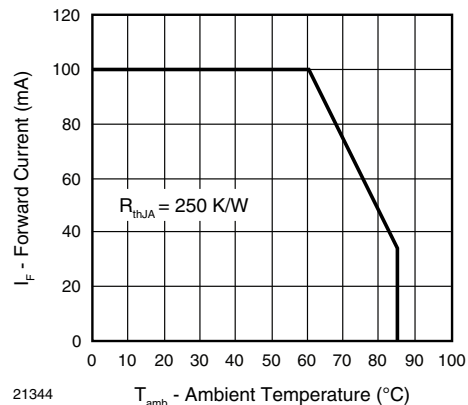


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | |
|---|--|------------------|------|----------|------|---------------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | V_F | 1.25 | 1.4 | 1.6 | V |
| | $I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$ | V_F | | 2.3 | | V |
| Temperature coefficient of V_F | $I_F = 1\text{ mA}$ | TK_{V_F} | | - 1.8 | | mV/K |
| | $I_F = 100\text{ mA}$ | TK_{V_F} | | - 1.1 | | mV/K |
| Reverse current | $V_R = 5\text{ V}$ | I_R | | | 10 | μA |
| Junction capacitance | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0\text{ mW/cm}^2$ | C_J | | 125 | | pF |
| Radiant intensity | $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | I_e | 10 | 20 | 30 | mW/sr |
| | $I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$ | I_e | | 180 | | mW/sr |
| Radiant power | $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | ϕ_e | | 40 | | mW |
| Temperature coefficient of ϕ_e | $I_F = 100\text{ mA}$ | TK_{ϕ_e} | | - 0.35 | | %/K |
| Angle of half intensity | | ϕ | | ± 25 | | deg |
| Peak wavelength | $I_F = 30\text{ mA}$ | λ_p | 870 | 890 | 910 | nm |
| Spectral bandwidth | $I_F = 30\text{ mA}$ | $\Delta\lambda$ | | 40 | | nm |
| Temperature coefficient of λ_p | $I_F = 30\text{ mA}$ | TK_{λ_p} | | 0.25 | | nm/K |
| Rise time | $I_F = 100\text{ mA}$, 20 % to 80 % | t_r | | 30 | | ns |
| Fall time | $I_F = 100\text{ mA}$, 20 % to 80 % | t_f | | 30 | | ns |
| Cut-off frequency | $I_{DC} = 70\text{ mA}$, $I_{AC} = 30\text{ mA pp}$ | f_c | | 12 | | MHz |

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

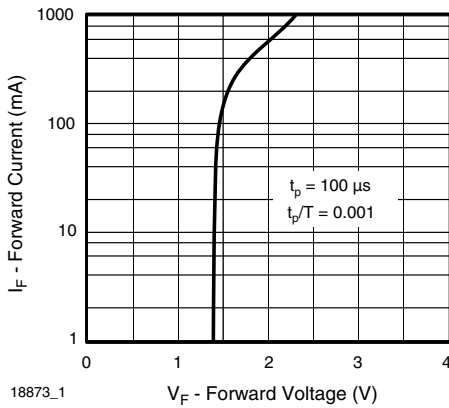


Fig. 3 - Forward Current vs. Forward Voltage

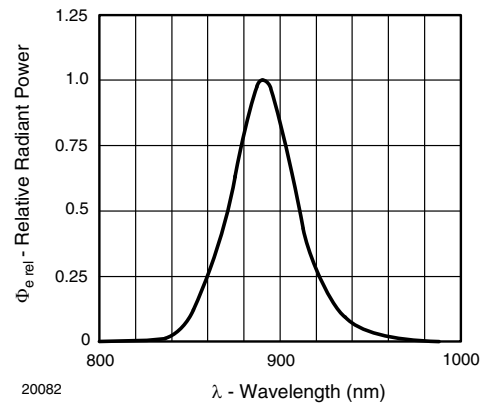


Fig. 6 - Relative Radiant Power vs. Wavelength

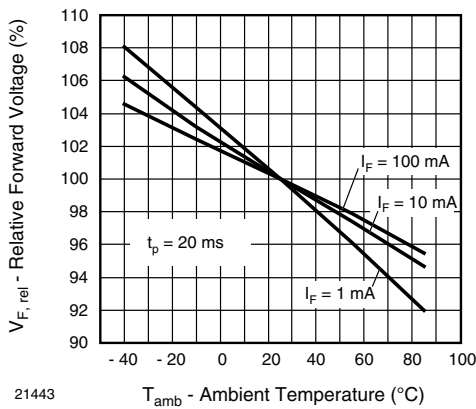


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

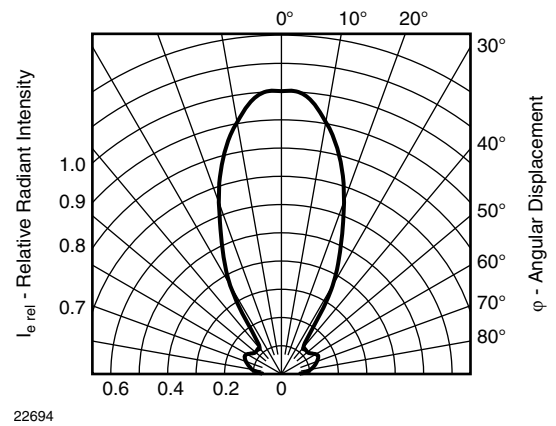


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

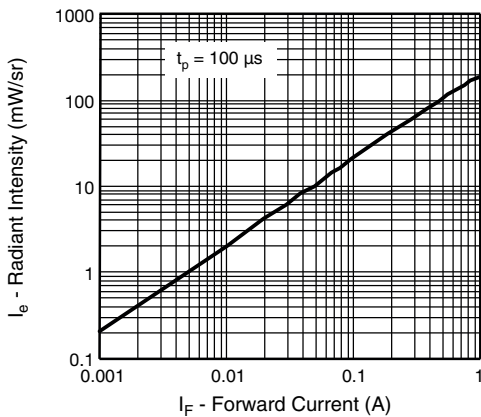


Fig. 5 - Radiant Intensity vs. Forward Current

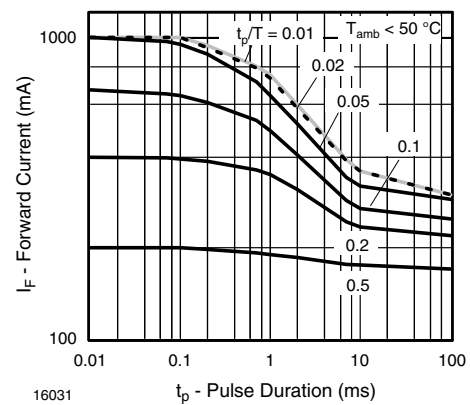


Fig. 8 - Pulse Forward Current vs. Pulse Duration

SOLDER PROFILE

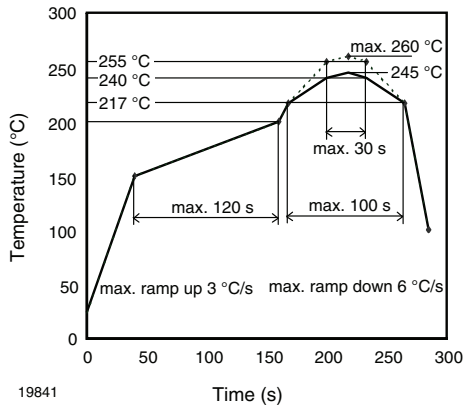


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

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

Floor life: 4 weeks

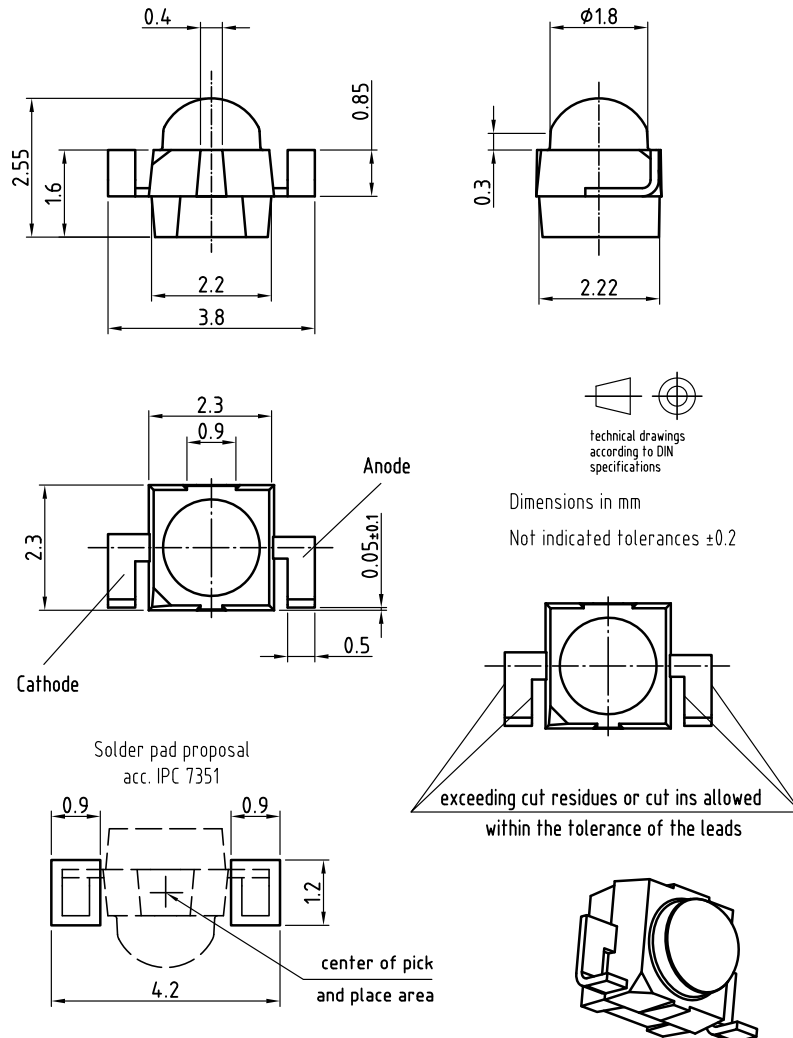
Conditions: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

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

DRYING

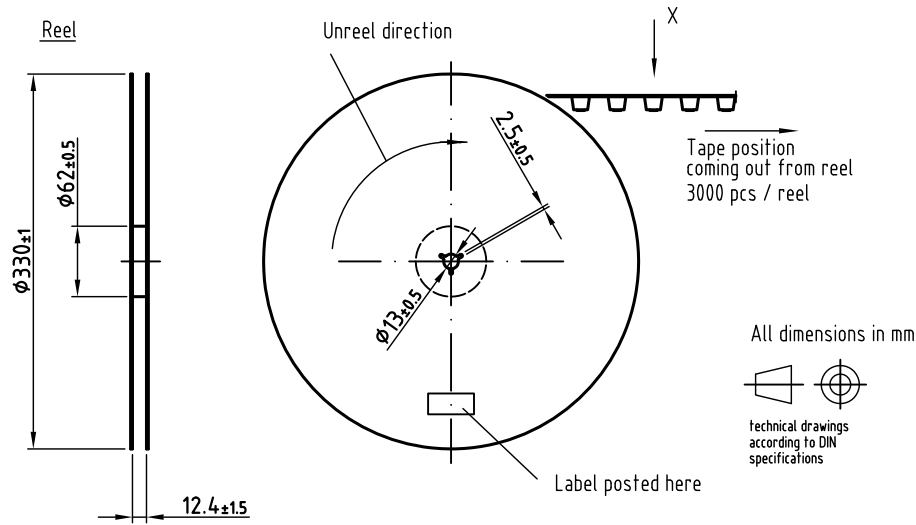
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at $40\text{ °C} (+ 5\text{ °C})$, $RH < 5\%$.

PACKAGE DIMENSIONS in millimeters: **VSMF2893SLX01**

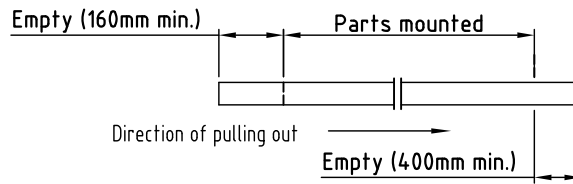


Drawing refers to following types: VSMB2943SLX01
VSMF2893SLX01
Drawing-No.: 6.544-5410.02-4 VSMB2948SL
Issue: prel. 03.08.12 VEMD2x23SLX01

TAPING AND REEL DIMENSIONS in millimeters: VSMF2893SLX01

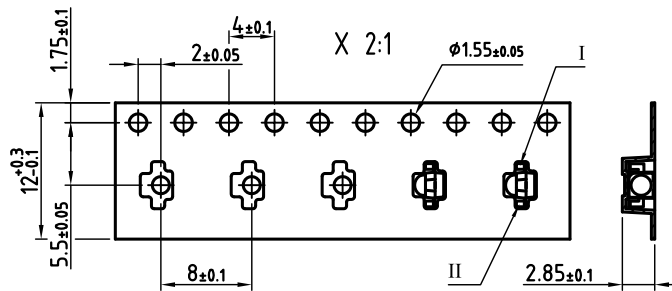


Leader and trailer tape:



Terminal position in tape

| Device | Lead I | Lead II |
|-----------------|-----------|---------|
| V SMB294.3SLX01 | Cathode | Anode |
| V SMF2893SLX01 | | |
| V SMB294.8SL | | |
| V EMD2023SLX01 | | |
| V EMD2523SLX01 | Collector | Emitter |
| V EMT2023SLX01 | | |
| V EMT2523SLX01 | | |
| V SMY2853SL | Anode | Cathode |



Drawing refers to following types: see table
Reel dimensions and tape

Drawing-No.: 9.800-5123.01-4
Issue: prel; 01.02.13



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