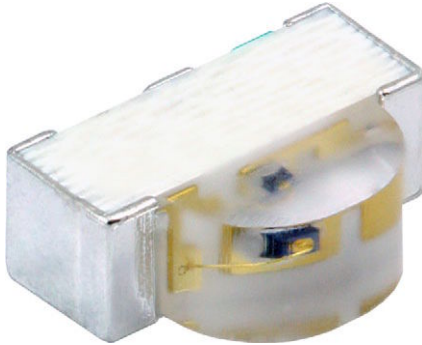


High Speed Infrared Emitting Diode, 940 nm, GaAlAs, MQW



DESCRIPTION

VSMB10941X01 is an infrared, 940 nm side looking emitting diode in GaAlAs multi quantum well (MQW) 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): 3 x 2 x 1
- AEC-Q101 qualified
- Peak wavelength: $\lambda_p = 940$ nm
- High pulse current
- High speed
- Angle of half intensity: $\phi = \pm 75^\circ$
- Package matches with detector VEMD10940FX01
- 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

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- IR touch panel
- High performance transmissive or reflective sensors
- Automotive applications

PRODUCT SUMMARY

| COMPONENT | I_e (mW/sr), 20 mA | ϕ (°) | λ_p (nm) | t_r (ns) |
|--------------|----------------------|------------|------------------|------------|
| VSMB10941X01 | 1 | ± 75 | 940 | 15 |

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| VSMB10941X01 | 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 | 100 | mA |
| Peak forward current | $t_p/T = 0.5, t_p = 100 \mu\text{s}$ | I_{FM} | 200 | mA |
| Surge forward current | $t_p = 100 \mu\text{s}$ | I_{FSM} | 1.0 | A |
| Power dissipation | | P_V | 160 | mW |
| Junction temperature | | T_j | 105 | $^\circ\text{C}$ |
| Operating temperature range | | T_{amb} | -55 to +100 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | -55 to +105 | $^\circ\text{C}$ |
| Soldering temperature | According to Fig. 9, J-STD-020 | T_{sd} | 260 | $^\circ\text{C}$ |
| Thermal resistance junction-to-ambient | J-STD-051 | R_{thJA} | 450 | K/W |

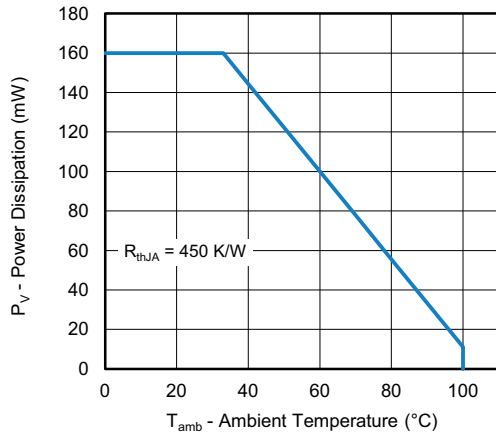


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

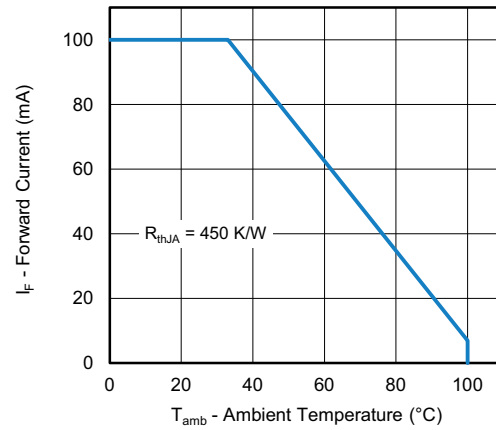


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) | | | | | | |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------|------|--------|------|-------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | I _F = 20 mA, t _p = 20 ms | V _F | 1.0 | 1.2 | 1.5 | V |
| | I _F = 1.0 A, t _p = 100 μs | V _F | - | 2.6 | - | V |
| Reverse current | V _R = 5 V | I _R | - | - | 5 | μA |
| Junction capacitance | V _R = 0 V, f = 1 MHz, E = 0 mW/cm ² | C _J | - | 60 | - | pF |
| Radiant intensity | I _F = 20 mA, t _p = 20 ms | I _e | 0.5 | 1.0 | 1.5 | mW/sr |
| | I _F = 1.0 A, t _p = 100 μs | I _e | - | 45 | - | mW/sr |
| Radiant power | I _F = 100 mA, t _p = 20 ms | φ _e | - | 40 | - | mW |
| Angle of half intensity - horizontal | | φ _h | - | ± 77.5 | - | ° |
| Angle of half intensity - vertical | | φ _v | - | ± 72.5 | - | ° |
| Peak wavelength | I _F = 30 mA | λ _p | 920 | 940 | 960 | nm |
| Spectral bandwidth | I _F = 20 mA | Δλ | - | 25 | - | nm |
| Rise time | I _F = 100 mA, 20 % to 80 % | t _r | - | 15 | - | ns |
| Fall time | I _F = 100 mA, 20 % to 80 % | t _f | - | 15 | - | ns |

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

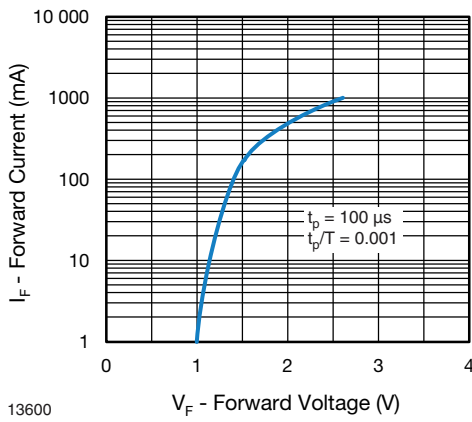


Fig. 3 - Forward Current vs. Forward Voltage

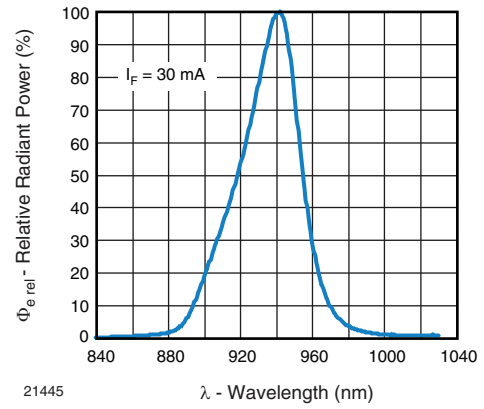


Fig. 5 - Relative Radiant Power vs. Wavelength

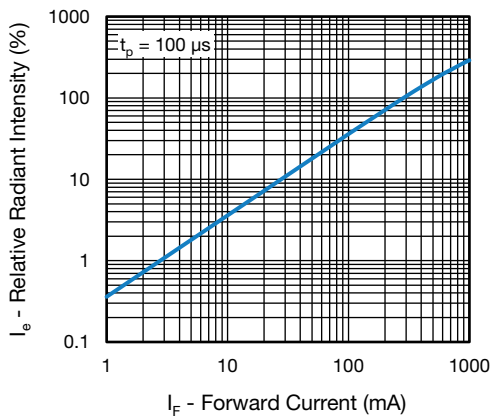


Fig. 4 - Relative Radiant Intensity vs. Forward Current

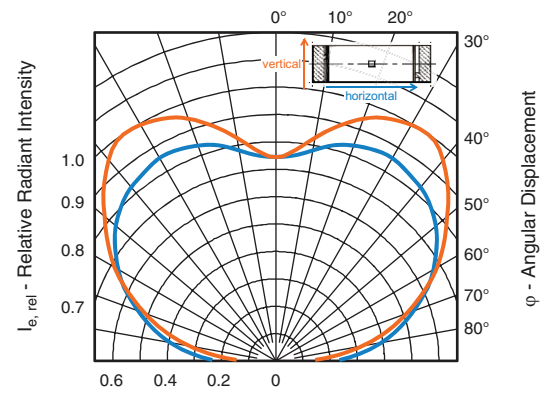


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE

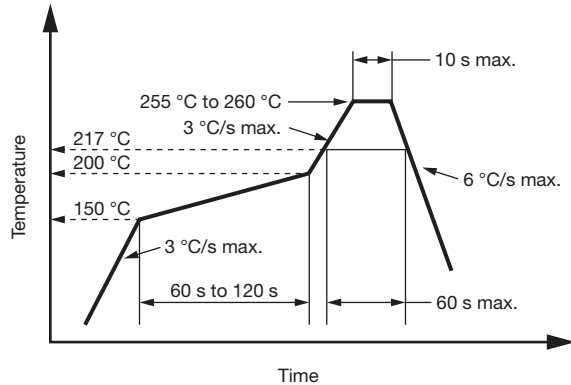


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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

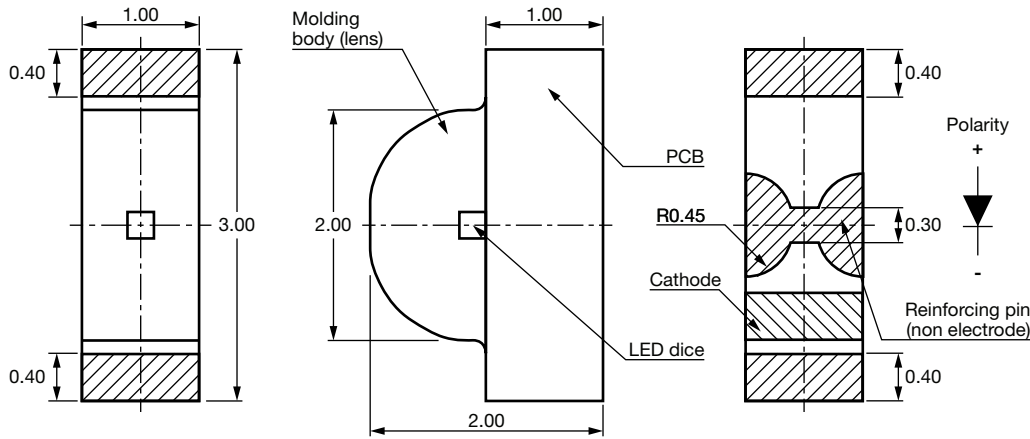
Floor life: 168 h

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

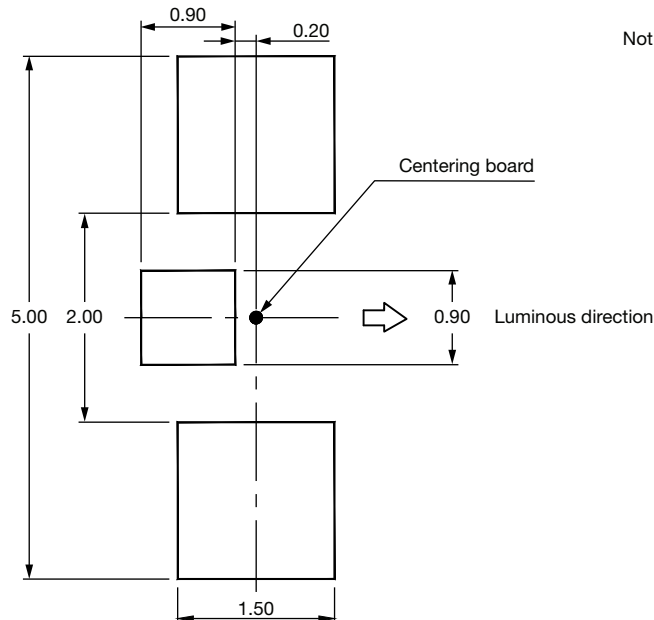
DRYING

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 $40\text{ }^{\circ}\text{C}$ ($+ 5\text{ }^{\circ}\text{C}$), $\text{RH} < 5\%$.

PACKAGE DIMENSIONS in millimeters



Recommended Solder Pad Footprint

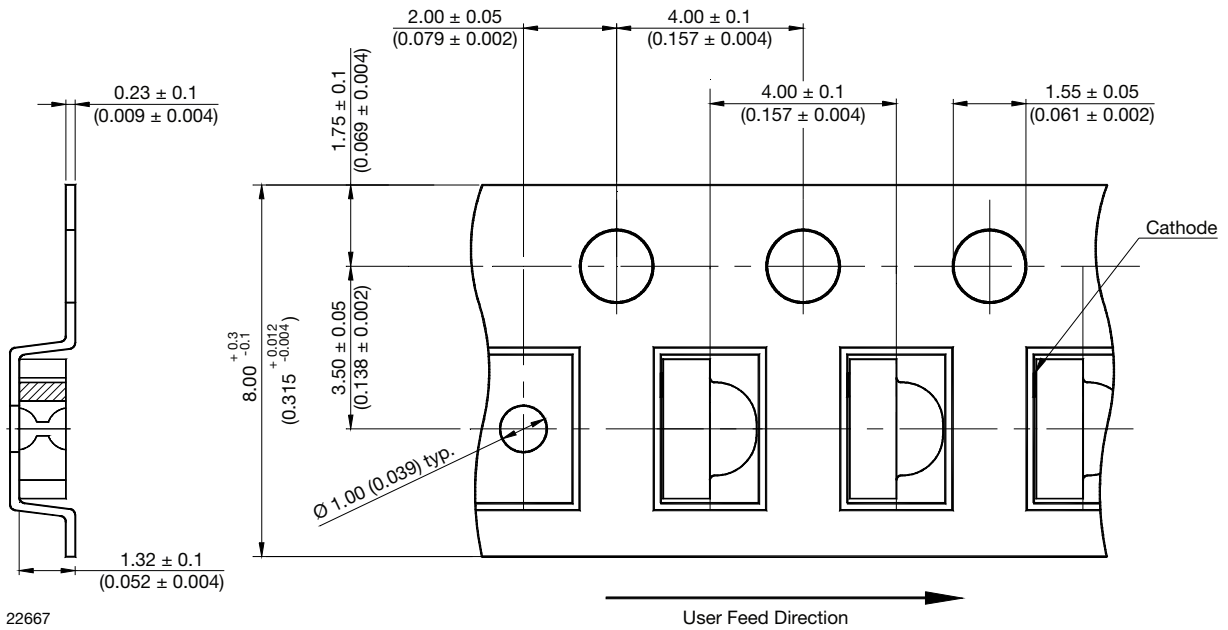


Not indicated tolerances: $\pm 0.1\text{ mm}$

22701

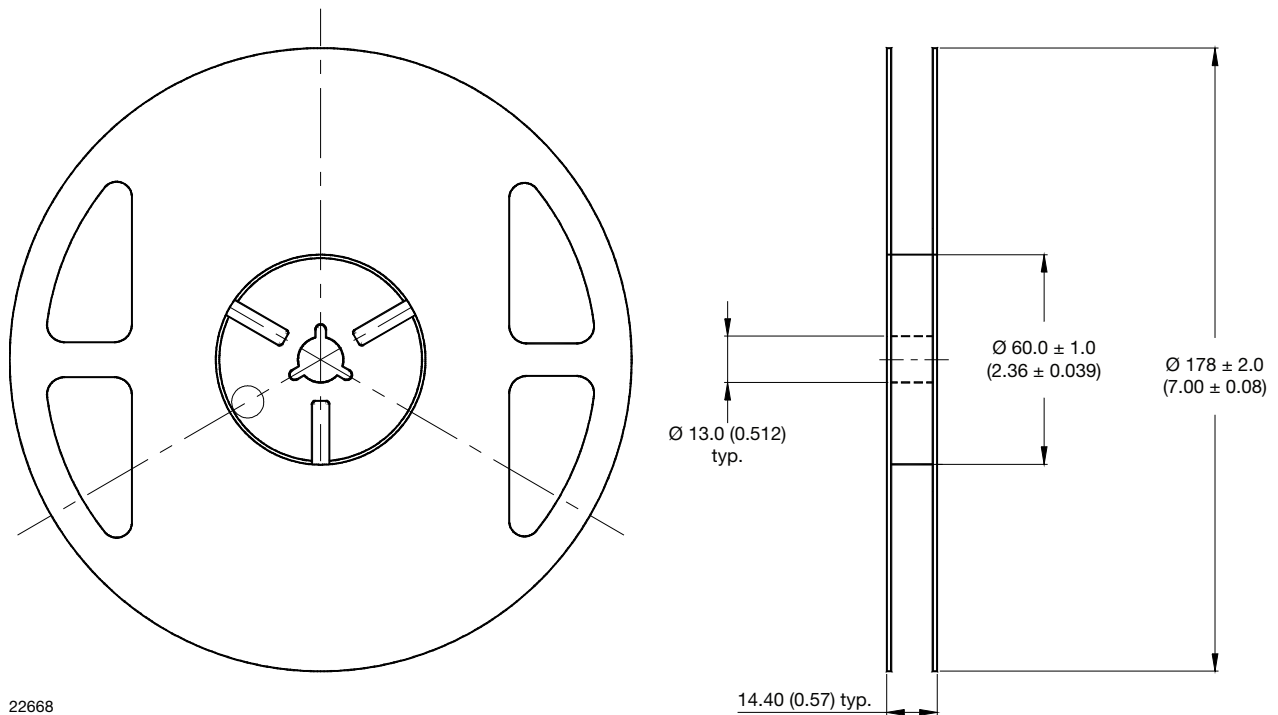


BLISTER TAPE DIMENSIONS in millimeters



22667

REEL DIMENSIONS in millimeters



22668



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