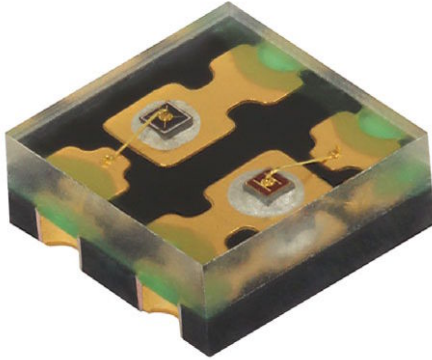


Dual Color Emitting Diodes, 660 nm and 940 nm



FEATURES

- Package type: surface mount
- Package form: square PCB
- Dimensions (L x W x H in mm): 2 x 2 x 0.87
- Peak wavelength: $\lambda_p = 660$ nm and 940 nm
- High reliability
- High radiant power
- Angle of half intensity: $\phi = \pm 60^\circ$
- 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



DESCRIPTION

VSMD66694 is a dual color emitting device with 660 nm and 940 nm peak wavelength. The emitters are based on the [SurfLight™](#) technology, providing high radiant power.

APPLICATIONS

- Wearables
- Health monitoring
- Pulse oximetry

PRODUCT SUMMARY

| COMPONENT | COLOR | I_e (mW/sr) | ϕ (deg) | λ_p (nm) | t_r (ns) |
|-----------|-------|---------------|--------------|------------------|------------|
| VSMD66694 | Red | 2.3 | ± 60 | 660 | 10 |
| | IR | 1.5 | | 940 | |

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| VSMD66694 | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | square PCB |

Note

- MOQ: minimum order quantity

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

| PARAMETER | TEST CONDITION | SYMBOL | COLOR | VALUE | UNIT |
|---------------------------------------|--------------------------------------|------------|-------|------------|------------------|
| Reverse voltage | | V_R | | 5 | V |
| Forward current | | I_F | Red | 70 | mA |
| | | | IR | 70 | |
| Peak forward current | $t_p/T = 0.1, t_p = 100 \mu\text{s}$ | I_{FM} | Red | 140 | mA |
| | | | IR | 140 | |
| Surge forward current | $t_p = 100 \mu\text{s}$ | I_{FSM} | Red | 1 | A |
| | | | IR | 1 | |
| Power dissipation | | P_V | Red | 161 | mW |
| | | | IR | 119 | |
| Junction temperature | | T_j | | 100 | $^\circ\text{C}$ |
| Operating temperature range | | T_{amb} | | -25 to +85 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | | -25 to +85 | $^\circ\text{C}$ |
| Soldering temperature | According fig. 10, J-STD-020 | T_{sd} | | 260 | $^\circ\text{C}$ |
| Thermal resistance junction / ambient | J-STD-051 | R_{thJA} | | 390 | K/W |

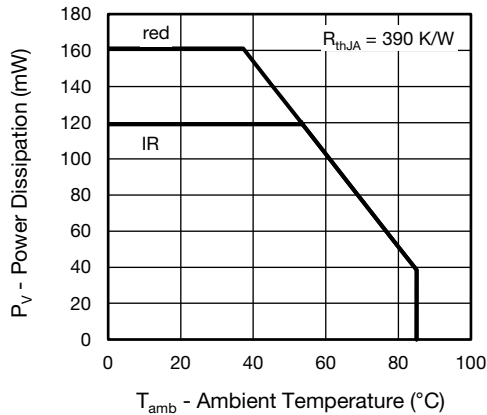


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

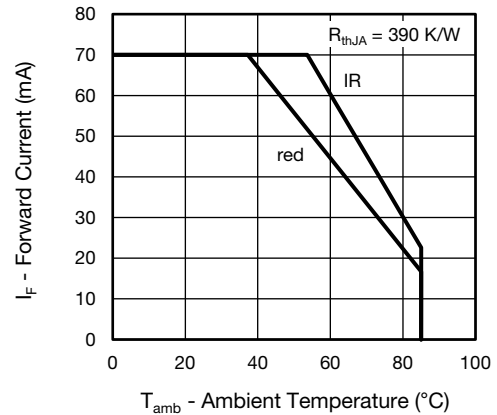
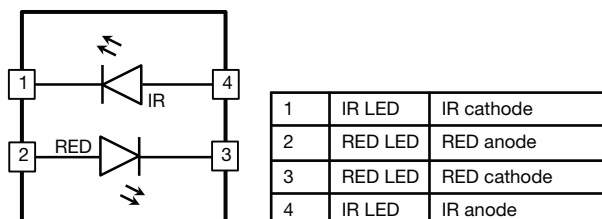


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|---|---|------------------|------------------------------------|------|----------|------|---------------|
| PARAMETER | TEST CONDITION | SYMBOL | COLOR | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | $I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$ | V_F | Red | - | 2.0 | 2.3 | V |
| | | | IR | - | 1.4 | 1.7 | |
| Temperature coefficient | $I_F = 20\text{ mA}$ | TK_{VF} | Red | - | -2.3 | - | mV/K |
| | | | IR | - | -2.3 | - | |
| Reverse current | | I_R | not designed for reverse operation | | | | μA |
| Junction capacitance | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0\text{ mW/cm}^2$ | C_J | Red | - | 7 | - | pF |
| | | | IR | - | 5 | - | |
| Radiant intensity | $I_F = 20\text{ mA}$ | I_e | Red | 1.9 | 2.3 | - | mW/sr |
| | | | IR | 0.8 | 1.5 | - | |
| Radiant power | $I_F = 20\text{ mA}$ | ϕ_e | Red | - | 9.5 | - | mW |
| | | | IR | - | 8.5 | - | |
| Angle of half intensity | $I_F = 20\text{ mA}$ | ϕ | | - | ± 60 | - | deg |
| Peak wavelength | $I_F = 20\text{ mA}$ | λ_p | Red | 650 | 660 | 670 | nm |
| | | | IR | 920 | 940 | 960 | |
| Spectral bandwidth | $I_F = 20\text{ mA}$ | $\Delta\lambda$ | Red | - | 20 | - | nm |
| | | | IR | - | 40 | - | |
| Temperature coefficient of λ_p | $I_F = 20\text{ mA}$ | TK_{λ_p} | Red | - | 0.2 | - | nm/K |
| | | | IR | - | 0.3 | - | |
| Rise time | $I_F = 20\text{ mA}$ | t_r | Red | - | 10 | - | ns |
| | | | IR | - | 10 | - | |
| Fall time | $I_F = 20\text{ mA}$ | t_f | Red | - | 10 | - | ns |
| | | | IR | - | 10 | - | |

CIRCUIT BLOCK DIAGRAM


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

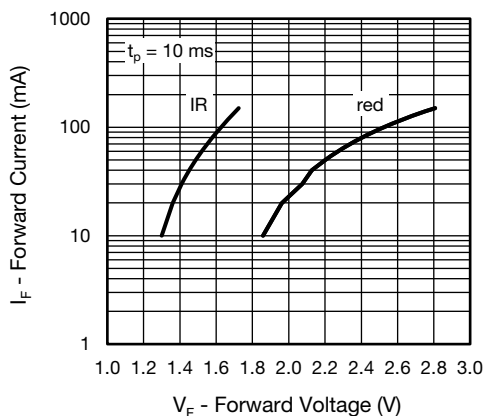


Fig. 3 - Forward Current vs. Forward Voltage

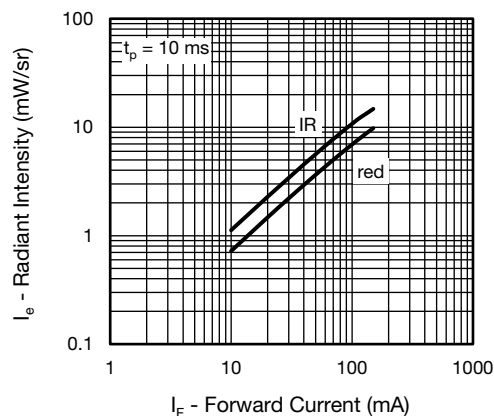


Fig. 6 - Radiant Intensity vs. Forward Current

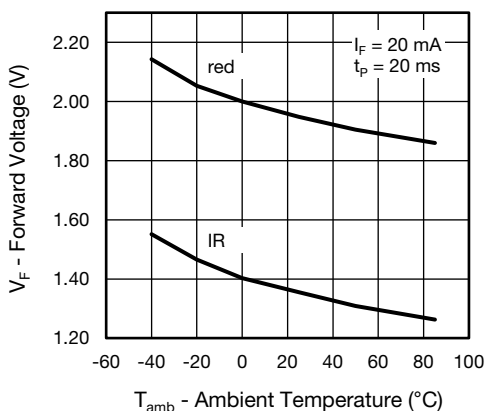


Fig. 4 - Forward Voltage vs. Ambient Temperature

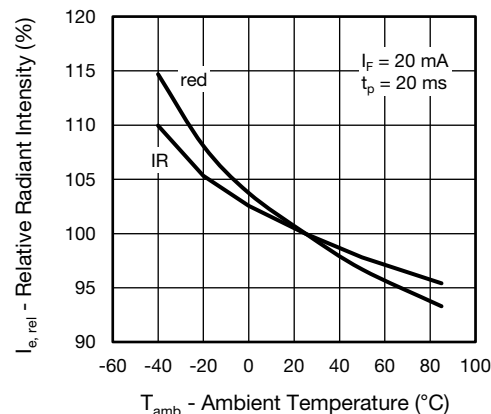


Fig. 7 - Relative Radiant Intensity vs. Ambient Temperature

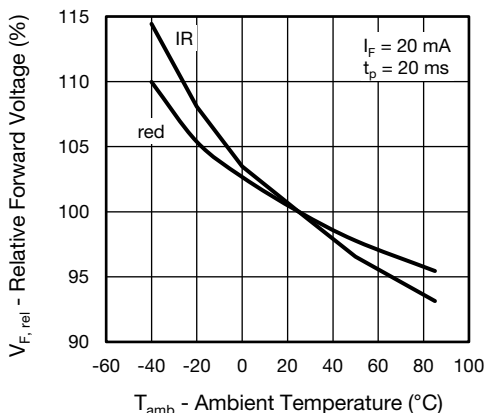


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

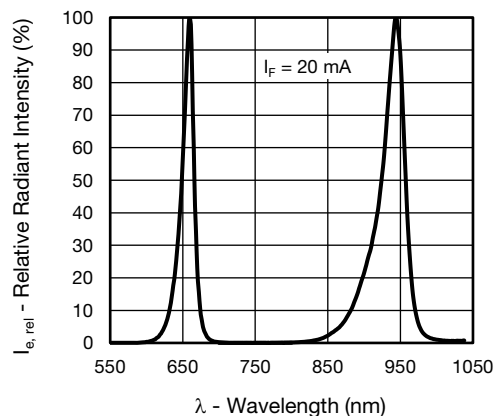


Fig. 8 - Relative Radiant Intensity vs. Wavelength

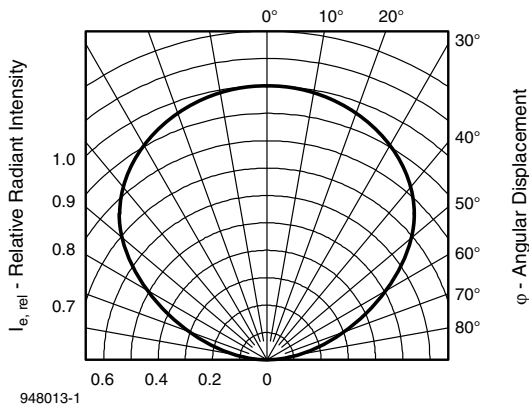


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

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

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

REFLOW SOLDER PROFILE

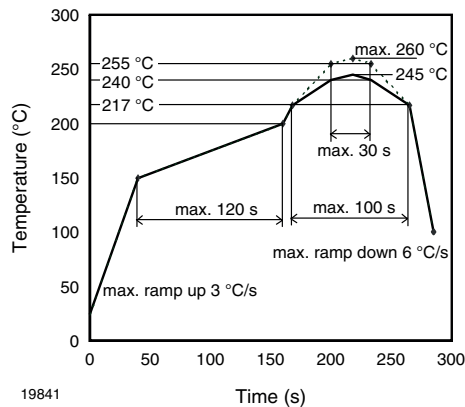
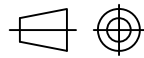
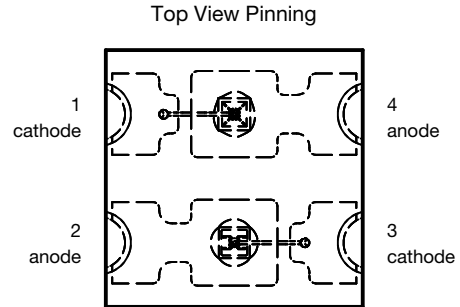
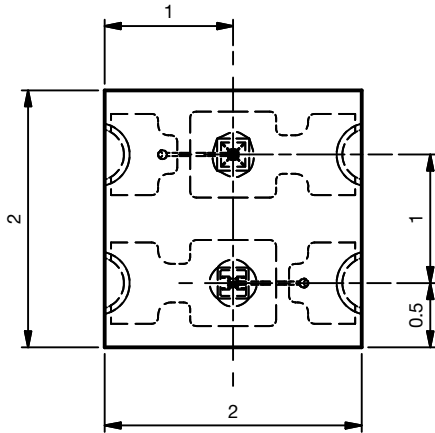
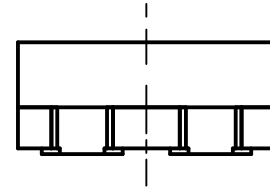
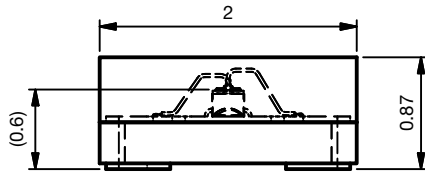


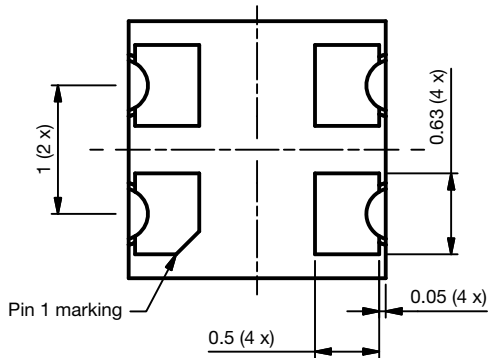
Fig. 10 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020



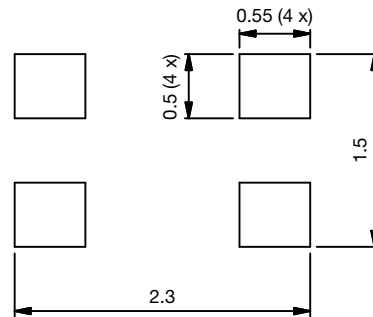
PACKAGE DIMENSIONS in millimeters



Technical drawings according to DIN specification



Recommended Footprint

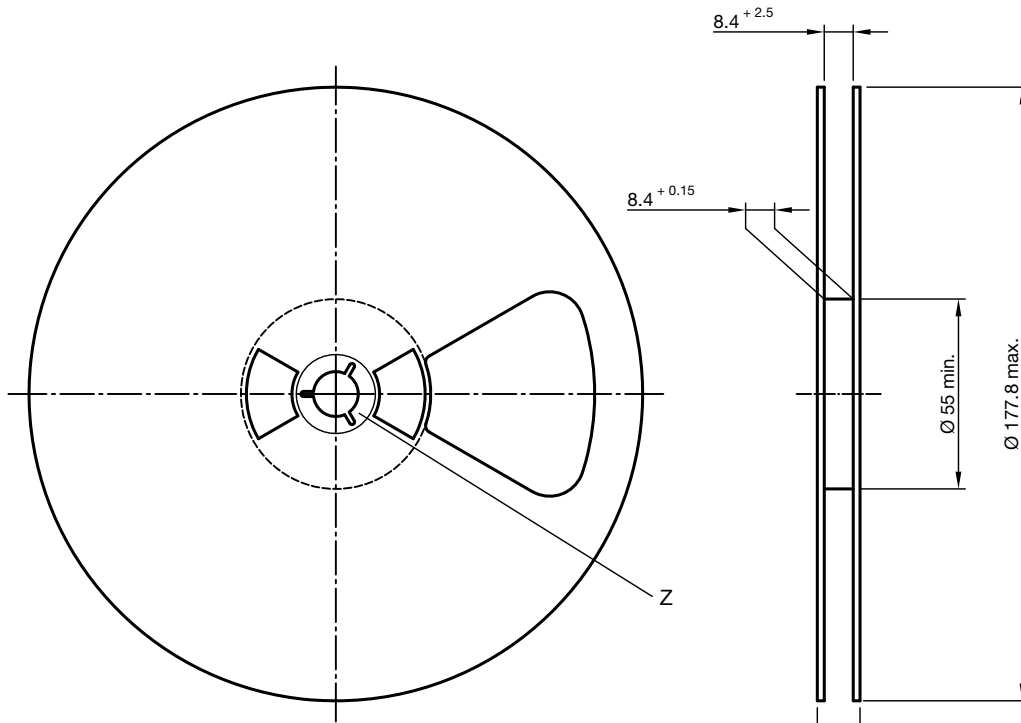


Drawing No.: 6.550-5347.01-4
Issue: 1; 19.02.16

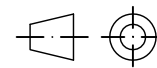
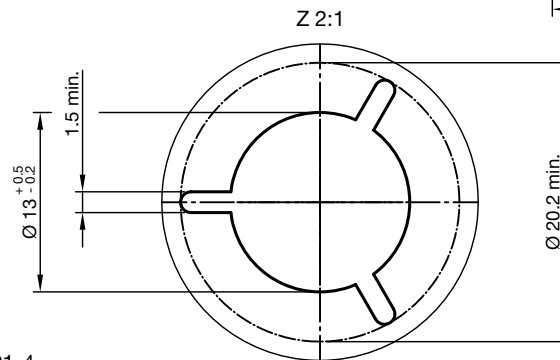
Not indicated tolerances ± 0.1



REEL DIMENSIONS in millimeters



Form of the leave open of the wheel is supplier specific.



technical drawings according to DIN specifications

Drawing-No.: 9.800-5096.01-4

Issue: 4; 08.03.2016



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