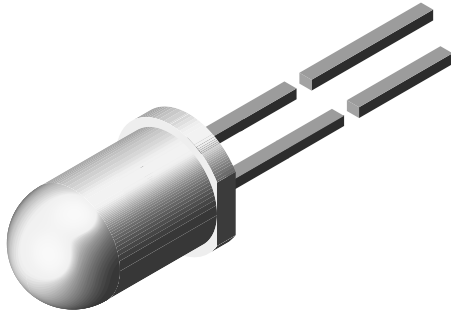




High Speed Infrared Emitting Diode, 830 nm, GaAlAs Double Hetero



DESCRIPTION

TSHG8400 is an infrared, 830 nm emitting diode in GaAlAs double hetero (DH) technology with high radiant power and high speed, molded in a clear, untinted plastic package.

FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm): \varnothing 5
- Peak wavelength: $\lambda_p = 830$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\phi = \pm 22^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- High modulation bandwidth: $f_c = 18$ MHz
- Good spectral matching with CMOS cameras
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- Infrared radiation source for operation with CMOS cameras (illumination)
- High speed IR data transmission

PRODUCT SUMMARY

| COMPONENT | I_e (mW/sr) | ϕ ($^\circ$) | λ_p (nm) | t_r (ns) |
|-----------|---------------|---------------------|------------------|------------|
| TSHG8400 | 70 | ± 22 | 830 | 20 |

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|-----------|------------------------------|-------------------|
| TSHG8400 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25$ $^\circ$ 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 | $t_p/T = 0.5$, $t_p = 100$ μ s | I_{FM} | 200 | mA |
| Surge forward current | $t_p = 100$ μ s | I_{FSM} | 1 | A |
| Power dissipation | | P_V | 180 | 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 | $t \leq 5$ s, 2 mm from case | T_{sd} | 260 | $^\circ$ C |
| Thermal resistance junction to ambient | J-STD-051, leads 7 mm soldered on PCB | R_{thJA} | 230 | K/W |

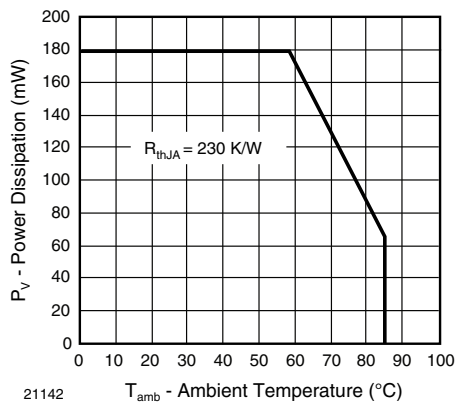


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

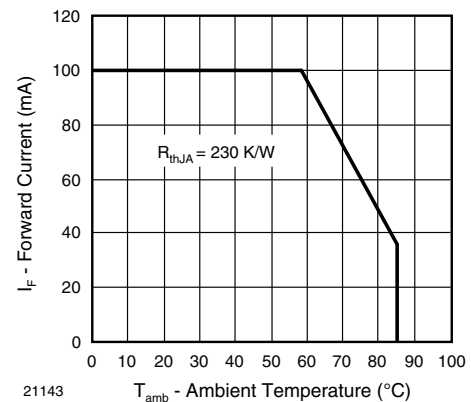


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| 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 | - | 1.5 | 1.8 | 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 |
| Reverse current | $V_R = 5\text{ V}$ | I_R | - | - | 10 | μA |
| Junction capacitance | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_j | - | 125 | - | pF |
| Radiant intensity | $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | I_e | 45 | 70 | 135 | mW/sr |
| | $I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$ | I_e | - | 700 | - | mW/sr |
| Radiant power | $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | ϕ_e | - | 50 | - | mW |
| Temperature coefficient of ϕ_e | $I_F = 100\text{ mA}$ | TK_{ϕ_e} | - | -0.35 | - | %/K |
| Angle of half intensity | | ϕ | - | ± 22 | - | $^{\circ}$ |
| Peak wavelength | $I_F = 100\text{ mA}$ | λ_p | - | 830 | - | nm |
| Spectral bandwidth | $I_F = 100\text{ mA}$ | $\Delta\lambda$ | - | 40 | - | nm |
| Temperature coefficient of λ_p | $I_F = 100\text{ mA}$ | TK_{λ_p} | - | 0.25 | - | nm/K |
| Rise time | $I_F = 100\text{ mA}$ | t_r | - | 20 | - | ns |
| Fall time | $I_F = 100\text{ mA}$ | t_f | - | 13 | - | ns |
| Cut-off frequency | $I_{DC} = 70\text{ mA}$, $I_{AC} = 30\text{ mA pp}$ | f_c | - | 18 | - | MHz |
| Virtual source diameter | | d | - | 3.7 | - | mm |



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

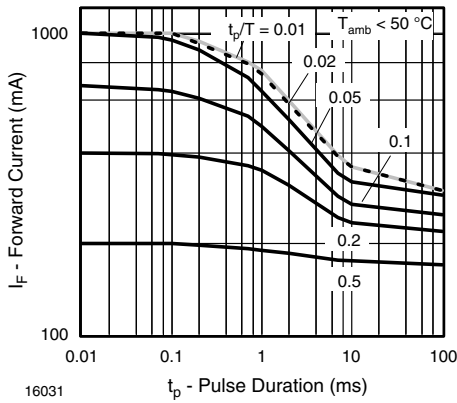


Fig. 3 - Pulse Forward Current vs. Pulse Duration

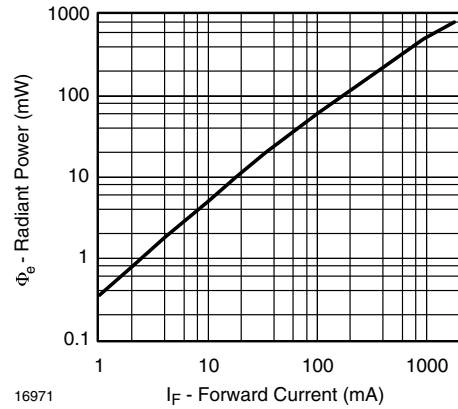


Fig. 6 - Radiant Power vs. Forward Current

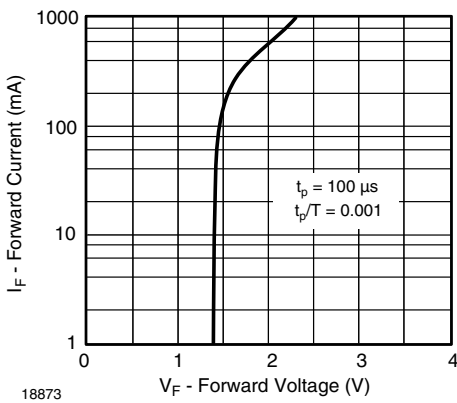


Fig. 4 - Forward Current vs. Forward Voltage

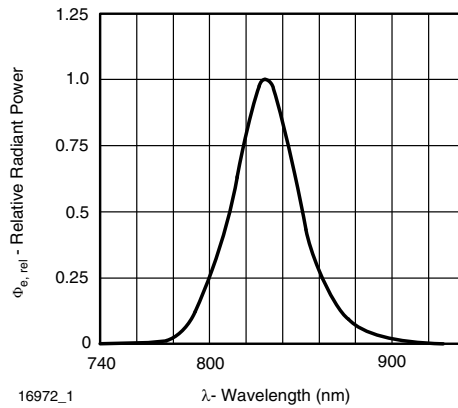


Fig. 7 - Relative Radiant Power vs. Wavelength

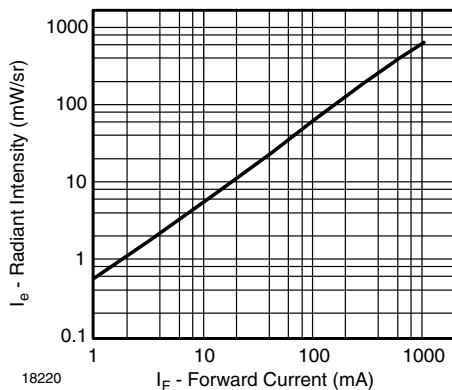


Fig. 5 - Radiant Intensity vs. Forward Current

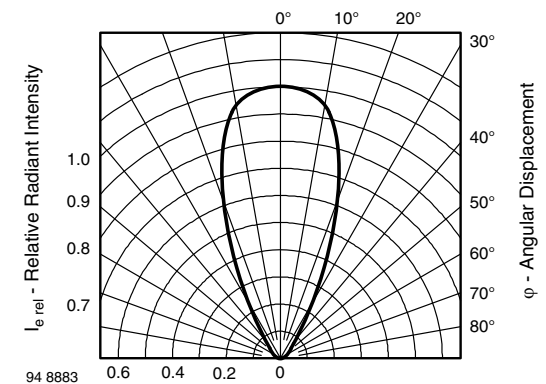
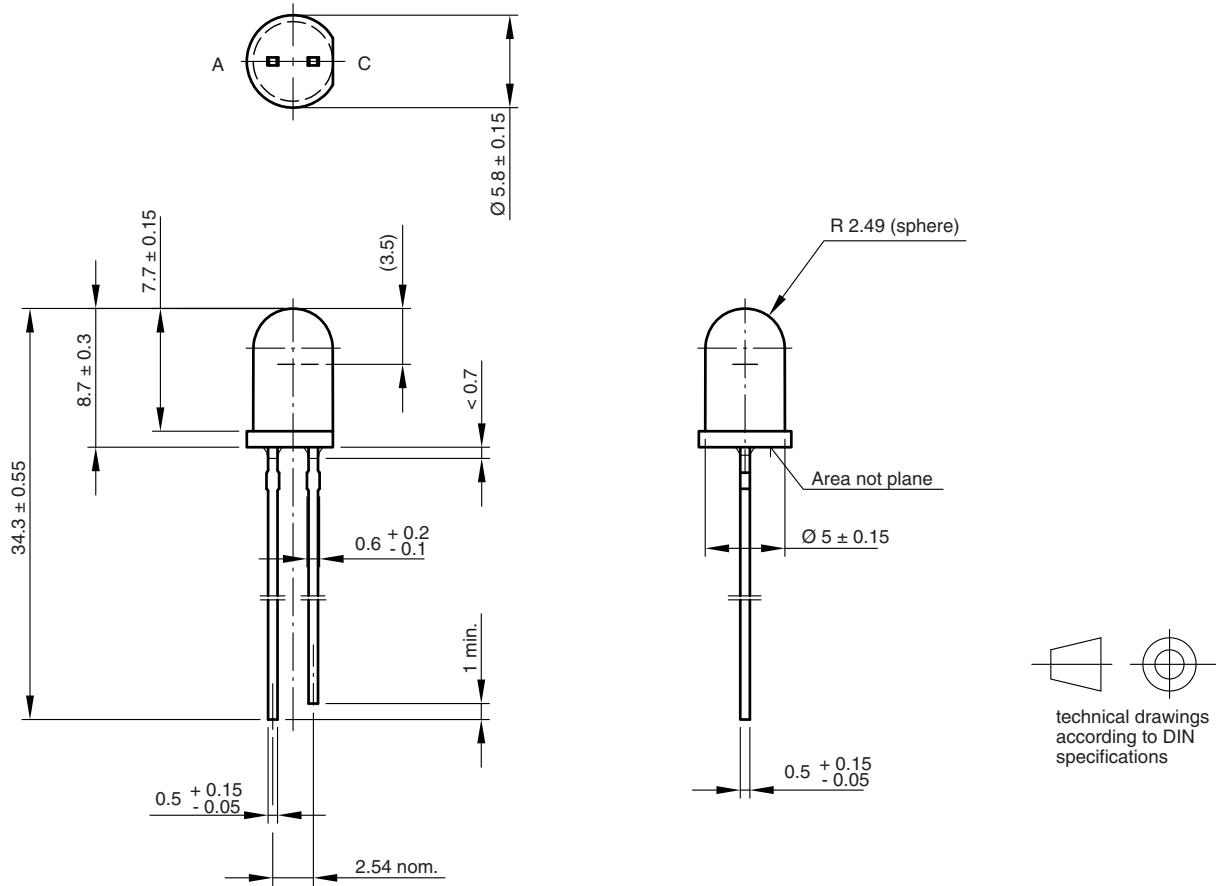


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



PACKAGE DIMENSIONS in millimeters



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