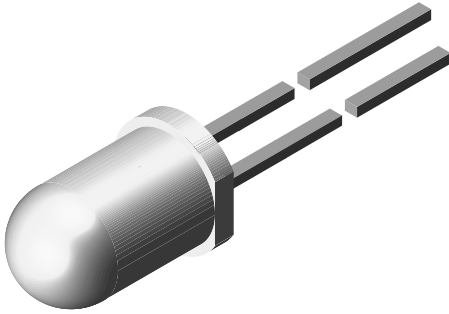




High Speed Infrared Emitting Diode, 830 nm, GaAlAs Double Hetero



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: $\phi = \pm 10^\circ$
- 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)

DESCRIPTION

TSHG8200 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.

APPLICATIONS

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

PRODUCT SUMMARY

| COMPONENT | I_e (mW/sr) | ϕ ($^\circ$) | λ_p (nm) | t_r (ns) |
|-----------|---------------|---------------------|------------------|------------|
| TSHG8200 | 180 | ± 10 | 830 | 20 |

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|-----------|------------------------------|-------------------|
| TSHG8200 | 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 |

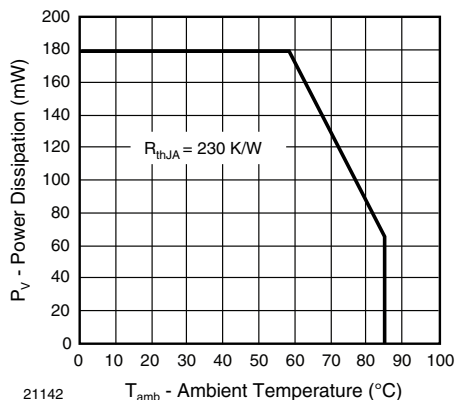


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

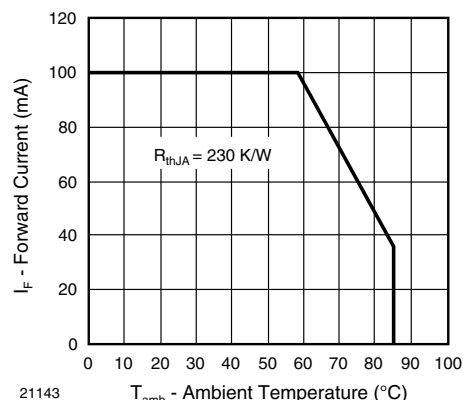


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) | | | | | | |
|--|---|-----------------------------|------|-------|------|-------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | I _F = 100 mA, t _p = 20 ms | V _F | - | 1.5 | 1.8 | V |
| | I _F = 1 A, t _p = 100 μs | V _F | - | 2.3 | - | V |
| Temperature coefficient of V _F | I _F = 1 mA | TK _{V_F} | - | -1.8 | - | 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 | - | 125 | - | pF |
| Radiant intensity | I _F = 100 mA, t _p = 20 ms | I _e | 120 | 180 | 360 | mW/sr |
| | I _F = 1 A, t _p = 100 μs | I _e | - | 1600 | - | mW/sr |
| Radiant power | I _F = 100 mA, t _p = 20 ms | φ _e | - | 50 | - | mW |
| Temperature coefficient of φ _e | I _F = 100 mA | TK _{φ_e} | - | -0.35 | - | %/K |
| Angle of half intensity | | φ | - | ± 10 | - | ° |
| Peak wavelength | I _F = 100 mA | λ _p | - | 830 | - | nm |
| Spectral bandwidth | I _F = 100 mA | Δλ | - | 40 | - | nm |
| Temperature coefficient of λ _p | I _F = 100 mA | TKλ _p | - | 0.25 | - | nm/K |
| Rise time | I _F = 100 mA | t _r | - | 20 | - | ns |
| Fall time | I _F = 100 mA | t _f | - | 13 | - | ns |
| Cut-off frequency | I _{DC} = 70 mA, I _{AC} = 30 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)

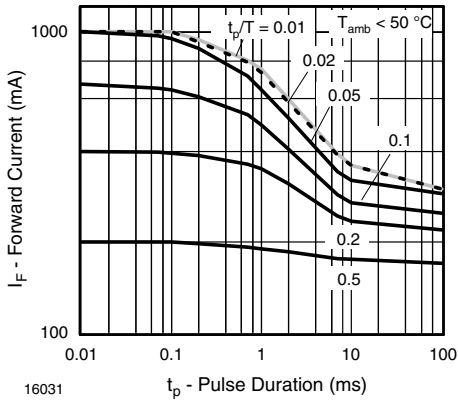


Fig. 3 - Pulse Forward Current vs. Pulse Duration

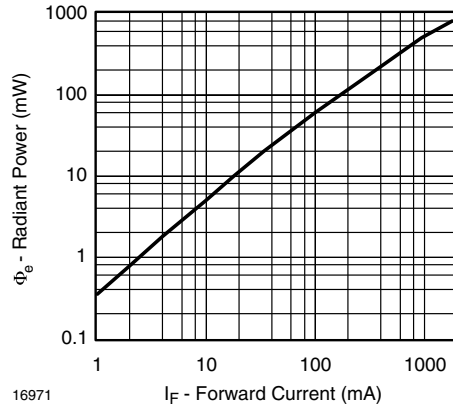


Fig. 6 - Radiant Power vs. Forward Current

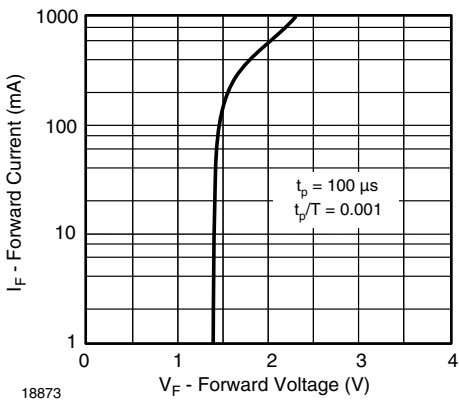


Fig. 4 - Forward Current vs. Forward Voltage

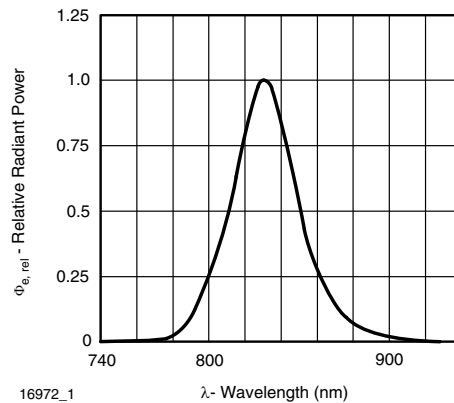


Fig. 7 - Relative Radiant Power vs. Wavelength

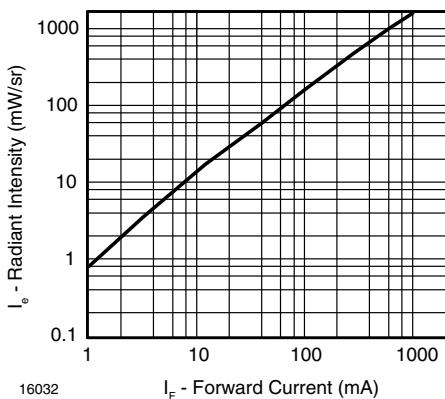


Fig. 5 - Radiant Intensity vs. Forward Current

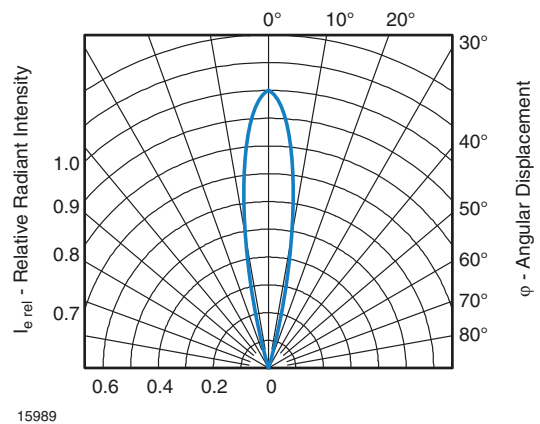
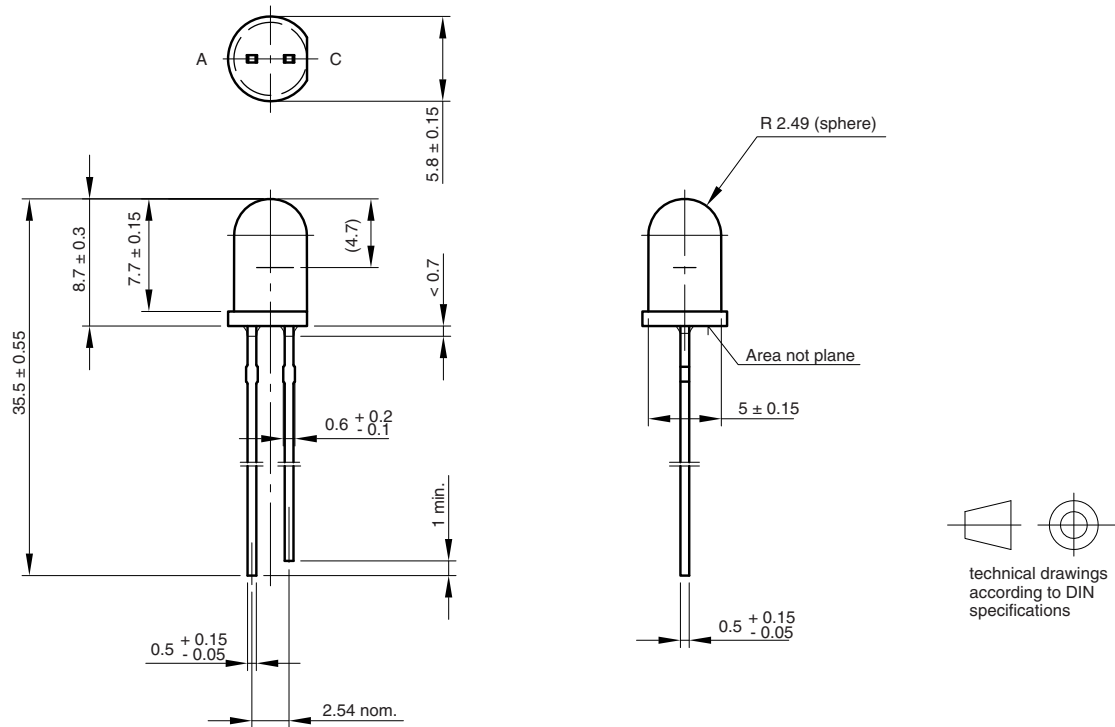


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



PACKAGE DIMENSIONS in millimeters



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