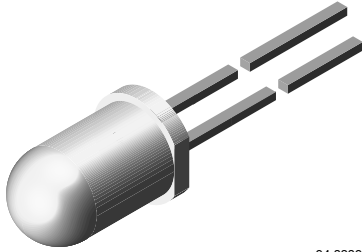


High Speed Infrared Emitting Diode, 890 nm, GaAlAs Double Hetero



94 8389

DESCRIPTION

TSHF6410 is an infrared, 890 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: $\lambda_p = 890$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\varphi = \pm 22^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- High modulation bandwidth: $f_c = 12$ MHz
- Good spectral matching with Si photodetectors
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT
GREEN
(5-2008)**

Note

** Please see document "Vishay Material Category Policy":
www.vishay.com/doc?99902

APPLICATIONS

- Infrared high speed remote control and free air data transmission systems with high modulation frequencies or high data transmission rate requirements
- Transmission systems according to IrDA requirements and for carrier frequency based systems (e.g. ASK/FSK - coded, 450 kHz or 1.3 MHz)

| PRODUCT SUMMARY | | | | |
|-----------------|---------------|-----------------|------------------|---------|
| COMPONENT | I_e (mW/sr) | φ (deg) | λ_p (nm) | tr (ns) |
| TSHF6410 | 70 | ± 22 | 890 | 30 |

Note

- Test conditions see table "Basic Characteristics"

| ORDERING INFORMATION | | | |
|----------------------|-----------|------------------------------|-------------------|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| TSHF6410 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |

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} | 1.5 | 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 | $t \leq 5$ s, 2 mm from case | T_{sd} | 260 | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | J-STD-051, leads 7 mm soldered on PCB | R_{thJA} | 230 | K/W |

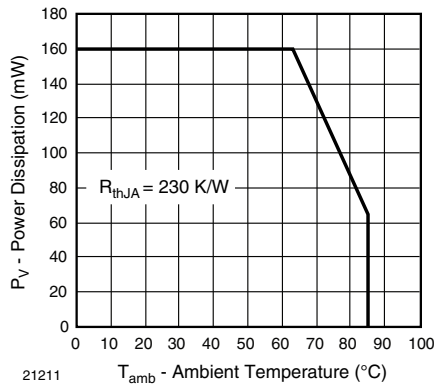


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

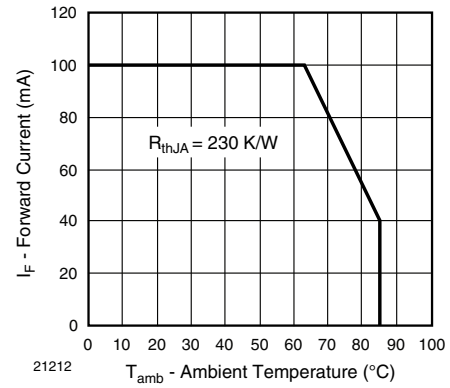


Fig. 1 - Forward Current Limit vs. Ambient Temperature

| 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 | | 1.4 | 1.6 | 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 | 45 | 70 | 135 | mW/sr |
| | I _F = 1 A, t _p = 100 μs | I _e | | 700 | | 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 | | ± 22 | | deg |
| Peak wavelength | I _F = 100 mA | λ _p | | 890 | | nm |
| Spectral bandwidth | I _F = 100 mA | Δλ | | 40 | | nm |
| Temperature coefficient of λ _p | I _F = 100 mA | TK _{λ_p} | | 0.25 | | nm/K |
| Rise time | I _F = 100 mA | t _r | | 30 | | ns |
| Fall time | I _F = 100 mA | t _f | | 30 | | ns |
| Cut-off frequency | I _{DC} = 70 mA, I _{AC} = 30 mA pp | f _c | | 12 | | MHz |
| Virtual source diameter | | d | | 2.1 | | mm |

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

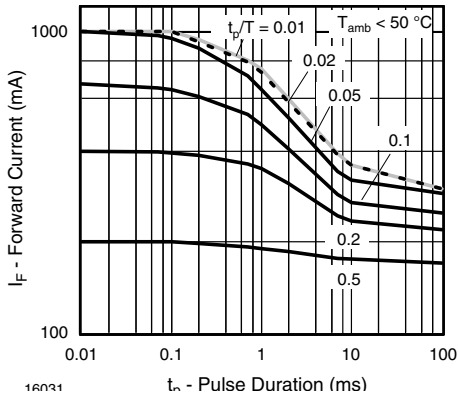


Fig. 2 - Pulse Forward Current vs. Pulse Duration

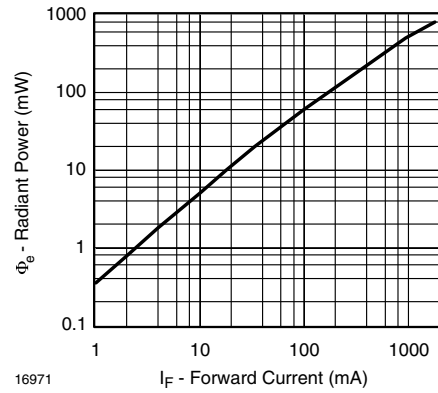


Fig. 5 - Radiant Power vs. Forward Current

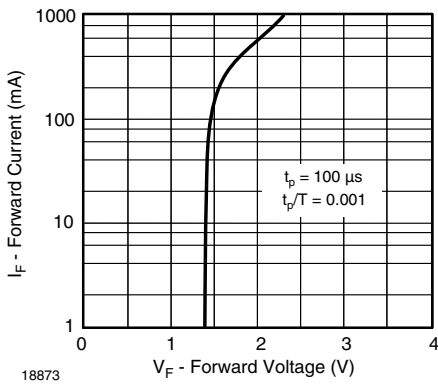


Fig. 3 - Forward Current vs. Forward Voltage

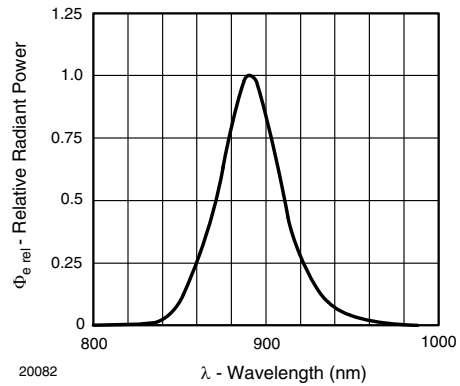


Fig. 6 - Relative Radiant Power vs. Wavelength

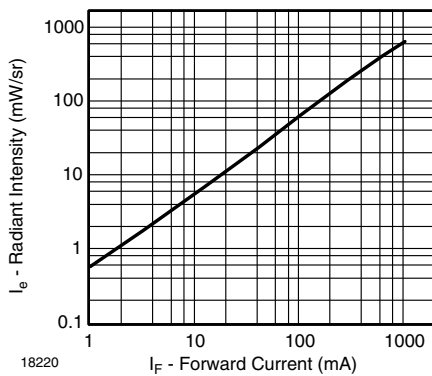


Fig. 4 - Radiant Intensity vs. Forward Current

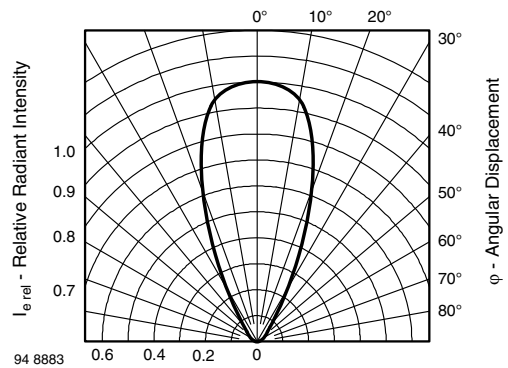
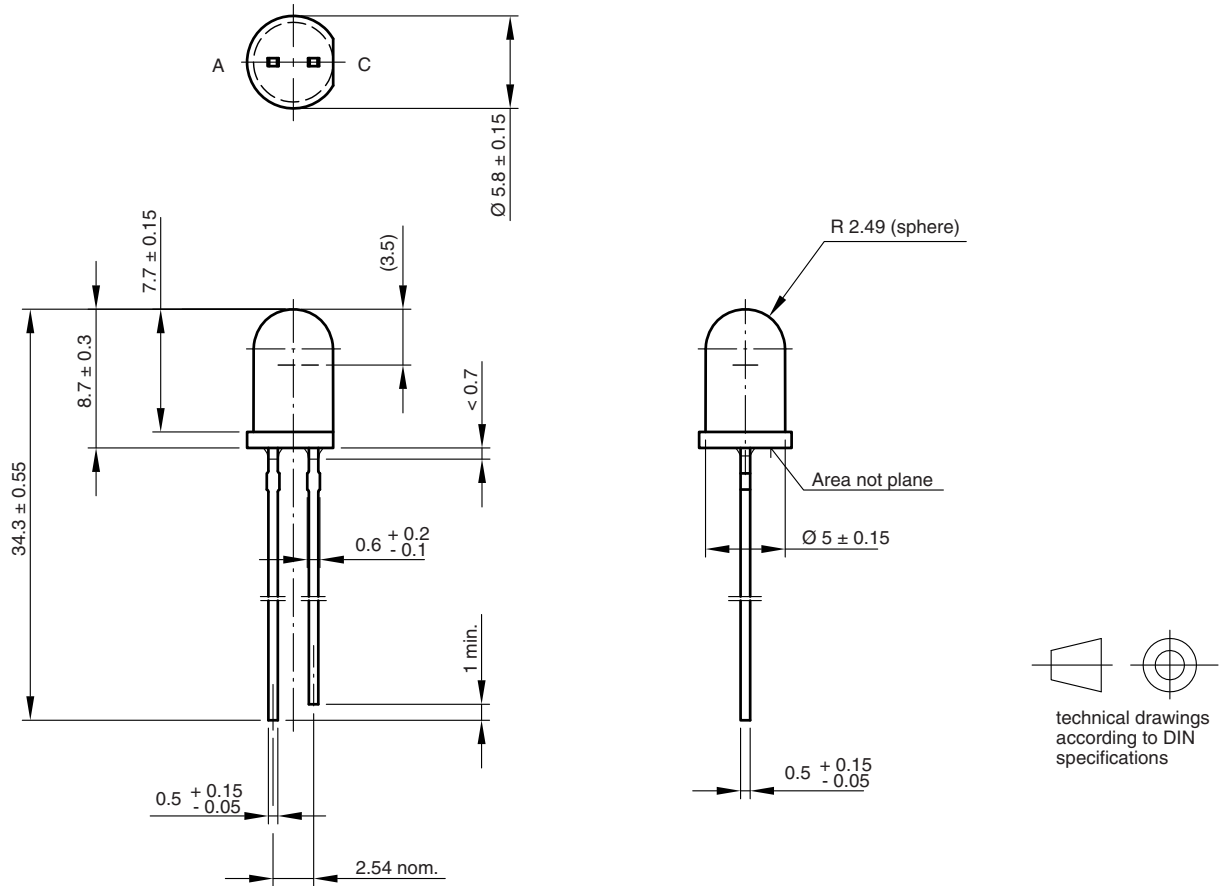


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement



PACKAGE DIMENSIONS in millimeters



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