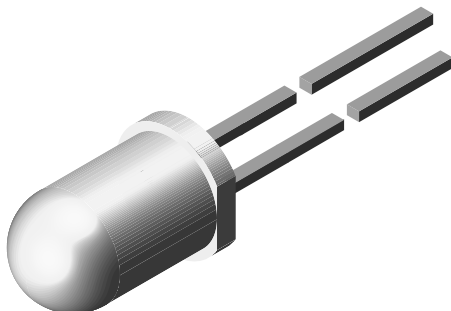




High Speed Infrared Emitting Diode, 890 nm, Surface Emitter Technology



94 8389

DESCRIPTION

TSHF6410 is an infrared, 890 nm emitting diode based on surface emitter chip 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: $\phi = \pm 27^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- Good spectral matching with Si photodetectors
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

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 (°) | λ_p (nm) | t_r (ns) |
|-----------|---------------|------------|------------------|------------|
| TSHF6410 | 62 | ± 27 | 890 | 10 |

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 | $t_p/T = 0.5$, $t_p = 100$ μs | I_{FM} | 200 | mA |
| Surge forward current | $t_p = 100$ μs | I_{FSM} | 1 | A |
| Power dissipation | | P_V | 170 | mW |
| Junction temperature | | T_j | 100 | $^\circ\text{C}$ |
| Ambient 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 to ambient | J-STD-051, leads 7 mm soldered on PCB | R_{thJA} | 230 | K/W |

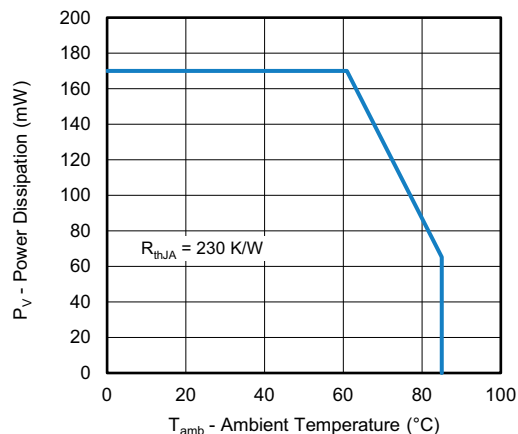


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

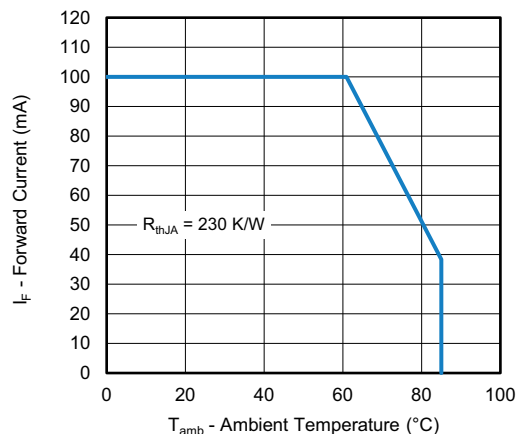


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| 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 | 1.7 | V |
| | I _F = 1 A, t _p = 100 μs | V _F | - | 3 | - | V |
| Temperature coefficient of V _F | I _F = 100 mA, t _p = 20 ms | TK _{V_F} | - | -1.3 | - | mV/K |
| Reverse current | | I _R | Not designed for reverse operation | | | μA |
| Junction capacitance | V _R = 0 V, f = 1 MHz, E = 0 mW/cm ² | C _j | - | 55 | - | pF |
| Radiant intensity | I _F = 100 mA, t _p = 20 ms | I _e | 40 | 62 | 120 | mW/sr |
| | I _F = 1 A, t _p = 100 μs | I _e | - | 528 | - | mW/sr |
| Radiant power | I _F = 100 mA, t _p = 20 ms | φ _e | - | 53 | - | mW |
| Temperature coefficient of φ _e | I _F = 100 mA | TKφ _e | - | -0.3 | - | %/K |
| Angle of half intensity | | φ | - | ± 27 | - | ° |
| 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 | TKλ _p | - | 0.3 | - | nm/K |
| Rise time | I _F = 100 mA | t _r | - | 10 | - | ns |
| Fall time | I _F = 100 mA | t _f | - | 10 | - | ns |



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

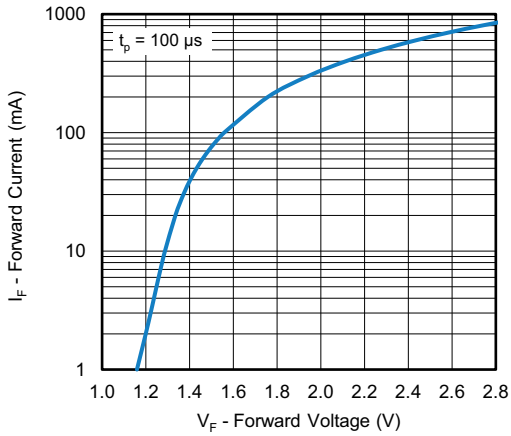


Fig. 3 - Forward Current vs. Forward Voltage

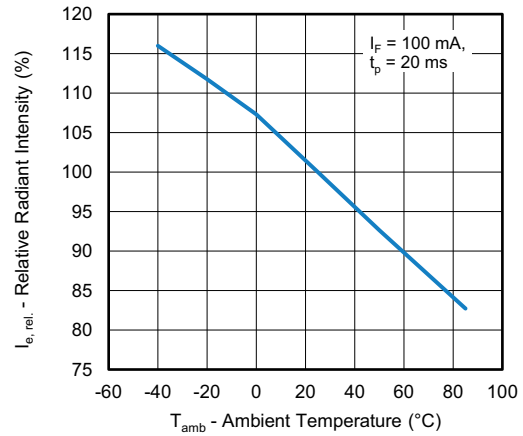


Fig. 6 - Relative Radiant Intensity vs Ambient Temperature

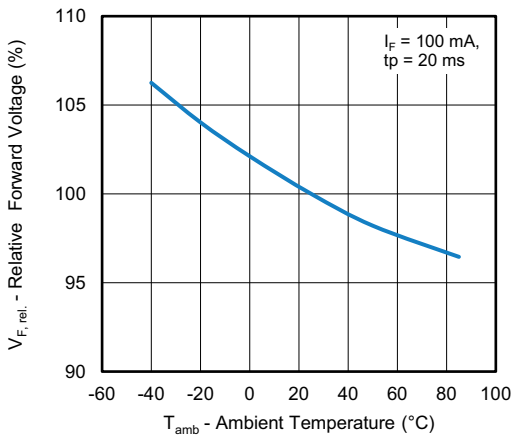


Fig. 4 - Forward Voltage vs. Ambient Temperature

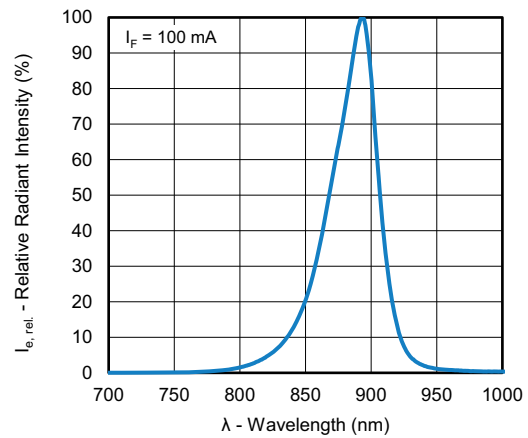


Fig. 7 - Relative Radiant Intensity vs. Wavelength

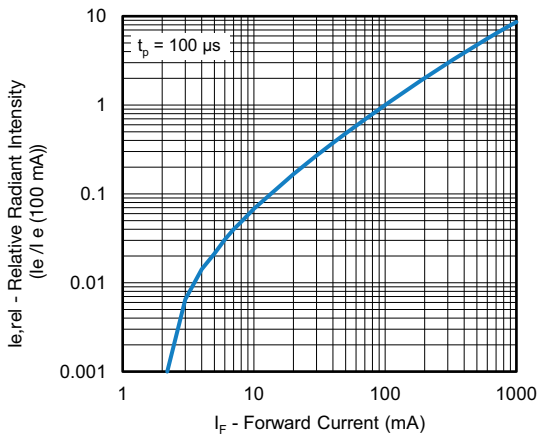


Fig. 5 - Relative Radiant Intensity vs. Forward Current

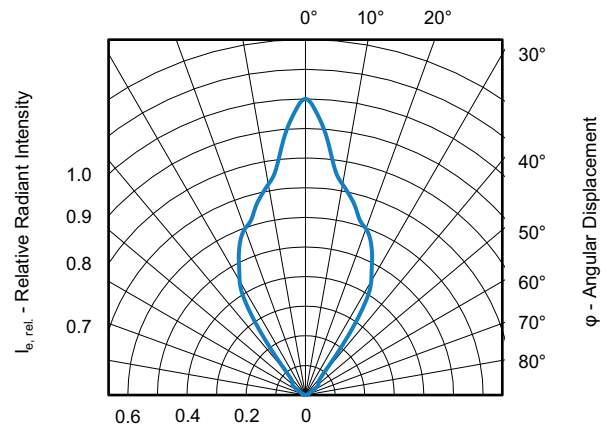
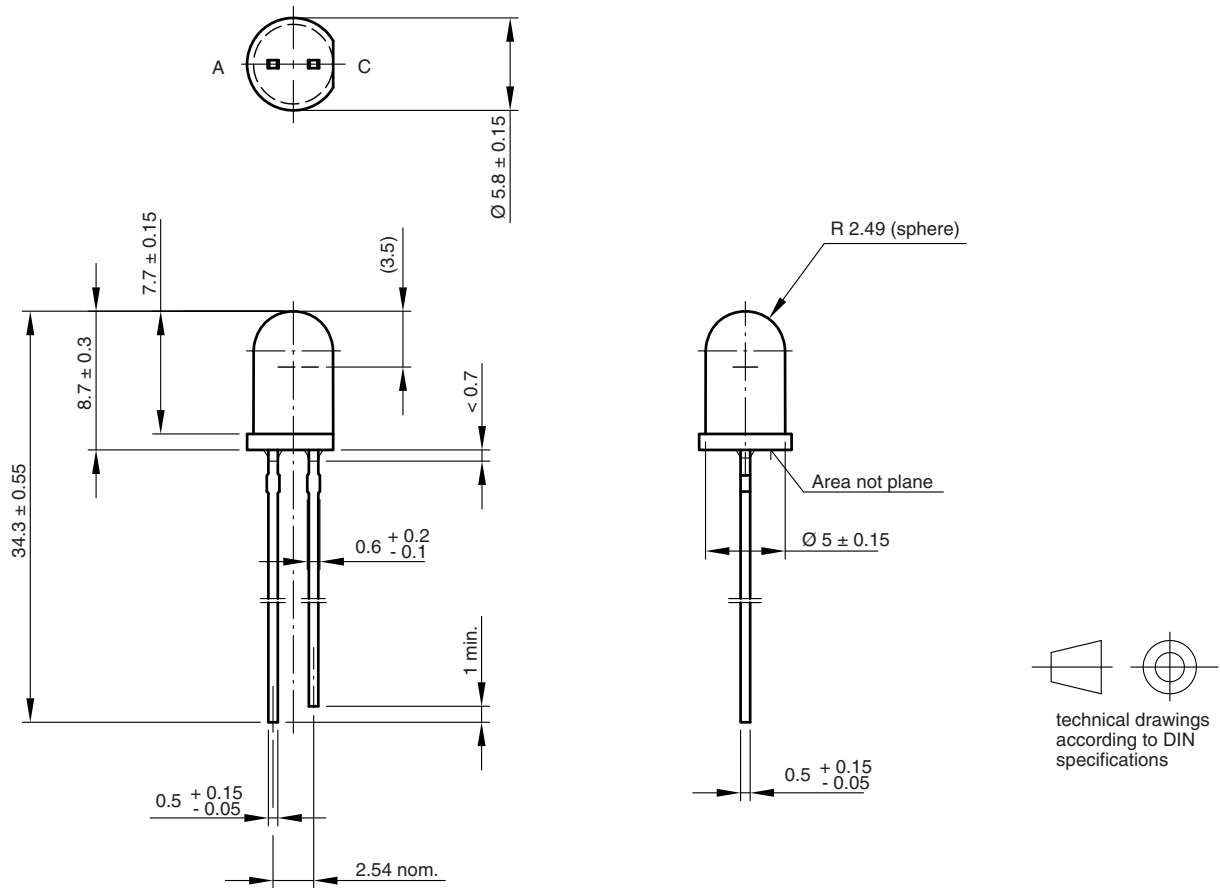


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



PACKAGE DIMENSIONS in millimeters



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