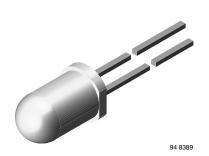
RoHS

GREEN

<u>(5-2008)</u>**

Vishay Semiconductors

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



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-1¾
Dimensions (in mm): Ø 5

• Peak wavelength: $\lambda_p = 890 \text{ nm}$

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

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-1¾ | |

Note

MOQ: minimum order quantity

| ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °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 | $t_p/T = 0.5$, $t_p = 100 \mu s$ | I _{FM} | 200 | mA | |
| Surge forward current | t _p = 100 μs | I _{FSM} | 1.5 | Α | |
| Power dissipation | | P _V | 160 | mW | |
| Junction temperature | | Tj | 100 | °C | |
| Operating temperature range | | T _{amb} | - 40 to + 85 | °C | |
| Storage temperature range | | T _{stg} | - 40 to + 100 | °C | |
| Soldering temperature | $t \le 5$ s, 2 mm from case | T _{sd} | 260 | °C | |
| Thermal resistance junction/ambient | J-STD-051, leads 7 mm soldered on PCB | R _{thJA} | 230 | K/W | |





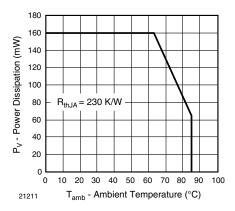


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

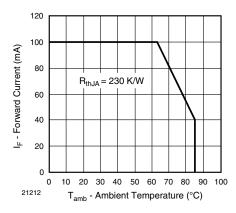


Fig. 1 - Forward Current Limit vs. Ambient Temperature

| 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 _{VF} | | - 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 | $I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$ | l _e | 45 | 70 | 135 | mW/sr |
| | $I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$ | l _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 mA | TKφ _e | | - 0.35 | | %/K |
| Angle of half intensity | | φ | | ± 22 | | deg |
| Peak wavelength | I _F = 100 mA | λρ | | 890 | | 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 | | 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 °C, unless otherwise specified)

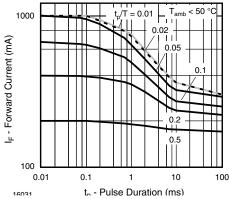


Fig. 2 - Pulse Forward Current vs. Pulse Duration

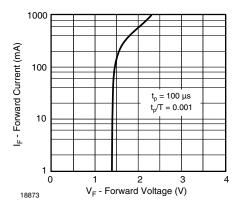


Fig. 3 - Forward Current vs. Forward Voltage

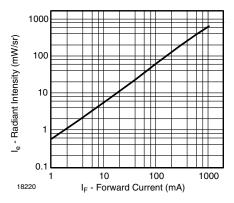


Fig. 4 - Radiant Intensity vs. Forward Current

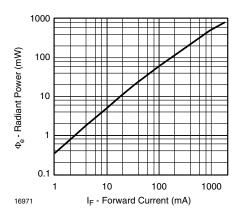


Fig. 5 - Radiant Power vs. Forward Current

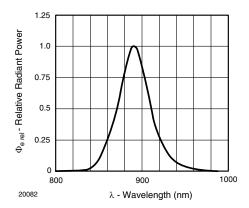


Fig. 6 - Relative Radiant Power vs. Wavelength

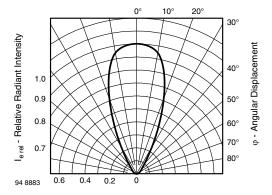
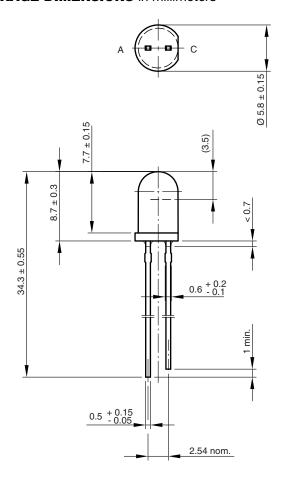


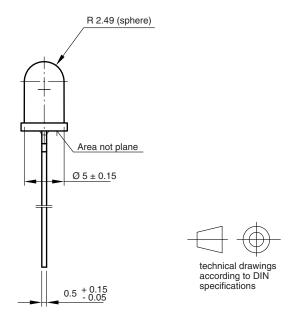
Fig. 7 - Relative Radiant Intensity vs. Angular Displacement



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PACKAGE DIMENSIONS in millimeters





Drawing-No.: 6.544-5259.06-4

Issue: 6; 19.05.09

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Material Category Policy

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