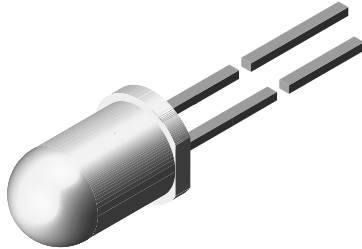


High Power Infrared Emitting Diode, RoHS Compliant, 940 nm, GaAlAs/GaAs



94 8389

DESCRIPTION

TSAL7400 is an infrared, 940 nm emitting diode in GaAlAs/GaAs technology with high radiant power 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: $\lambda_p = 940$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\varphi = \pm 25^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- Good spectral matching with Si photodetectors
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC


RoHS
COMPLIANT

APPLICATIONS

- Infrared remote control units with high power requirements
- Free air transmission systems
- Infrared source for optical counters and card readers

PRODUCT SUMMARY

| COMPONENT | I_e (mW/sr) | φ (deg) | λ_p (nm) | t_r (ns) |
|-----------|---------------|-----------------|------------------|------------|
| TSAL7400 | 40 | ± 25 | 940 | 800 |

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|-----------|------------------------------|-------------------|
| TSAL7400 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

| 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 | $t_p = 100 \mu s$ | I_{FSM} | 1.5 | A |
| Power dissipation | | P_V | 160 | 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/ambient | J-STD-051, leads 7 mm soldered on PCB | R_{thJA} | 230 | K/W |

Note

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

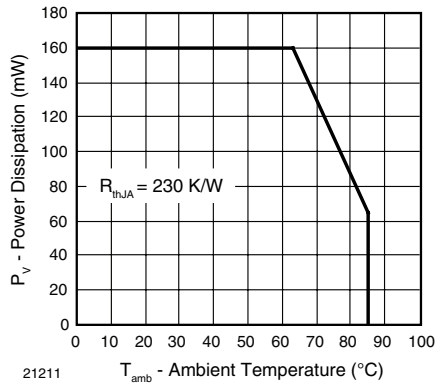


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

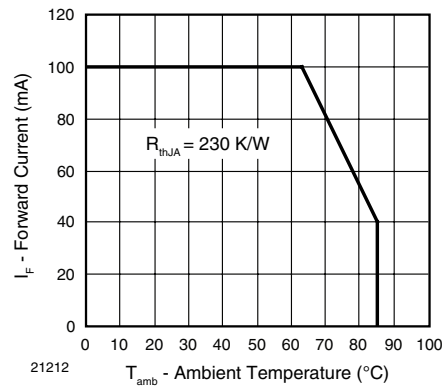


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS | | | | | | |
|---|---|-----------------------------|------|-------|------|-------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | I _F = 100 mA, t _p = 20 ms | V _F | | 1.35 | 1.6 | V |
| | I _F = 1 A, t _p = 100 μs | V _F | | 2.6 | 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 | | 25 | | pF |
| Radiant intensity | I _F = 100 mA, t _p = 20 ms | I _e | 25 | 40 | 125 | mW/sr |
| | I _F = 1 A, t _p = 100 μs | I _e | 220 | 310 | | mW/sr |
| Radiant power | I _F = 100 mA, t _p = 20 ms | φ _e | | 35 | | mW |
| Temperature coefficient of φ _e | I _F = 20 mA | TKφ _e | | - 0.6 | | %/K |
| Angle of half intensity | | φ | | ± 25 | | deg |
| Peak wavelength | I _F = 100 mA | λ _p | | 940 | | nm |
| Spectral bandwidth | I _F = 100 mA | Δλ | | 50 | | nm |
| Temperature coefficient of λ _p | I _F = 100 mA | TKλ _p | | 0.2 | | nm/K |
| Rise time | I _F = 100 mA | t _r | | 800 | | ns |
| Fall time | I _F = 100 mA | t _f | | 800 | | ns |
| Virtual source diameter | | d | | 2.2 | | mm |

Note

T_{amb} = 25 °C, unless otherwise specified

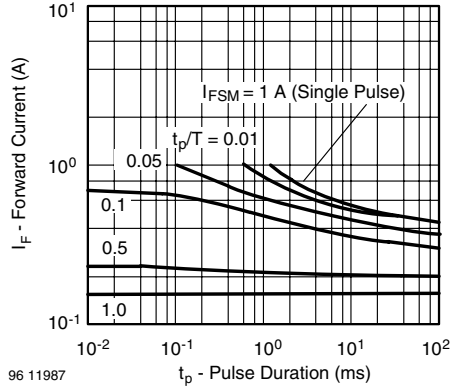
BASIC CHARACTERISTICS
 $T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified


Fig. 3 - Pulse Forward Current vs. Pulse Duration

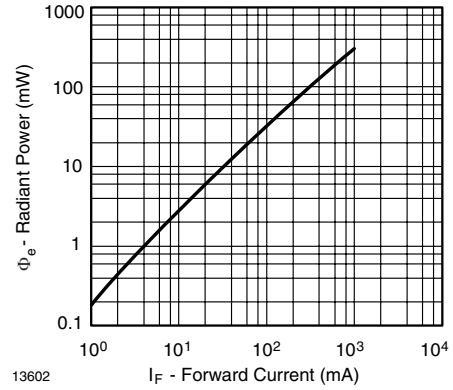


Fig. 6 - Radiant Power vs. Forward Current

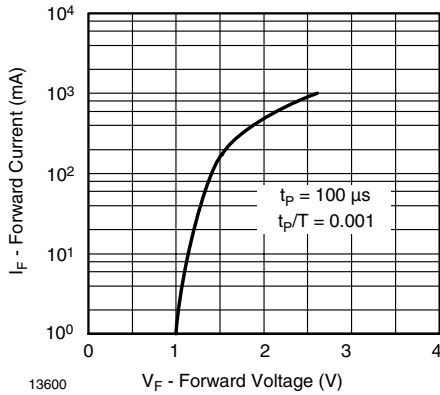


Fig. 4 - Forward Current vs. Forward Voltage

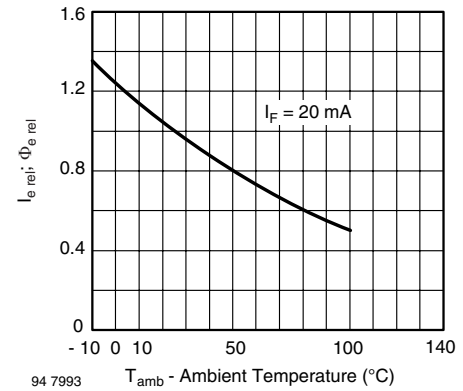


Fig. 7 - Relative Radiant Intensity/Power vs. Ambient Temperature

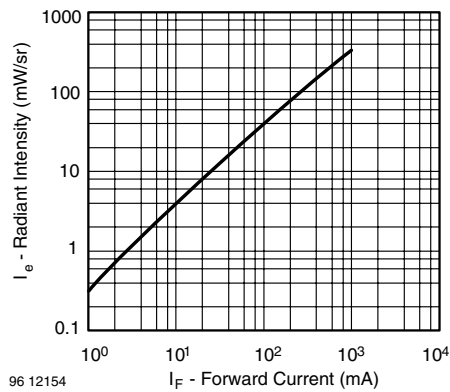


Fig. 5 - Radiant Intensity vs. Forward Current

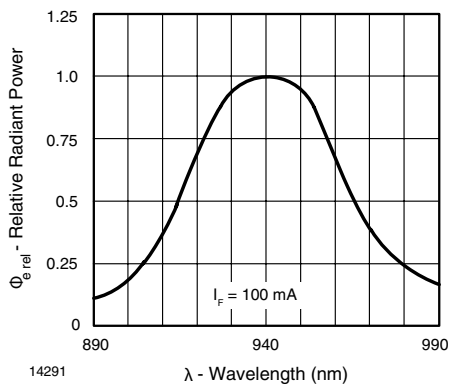


Fig. 8 - Relative Radiant Power vs. Wavelength

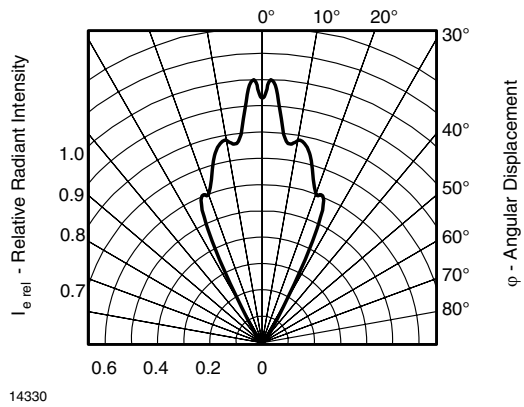
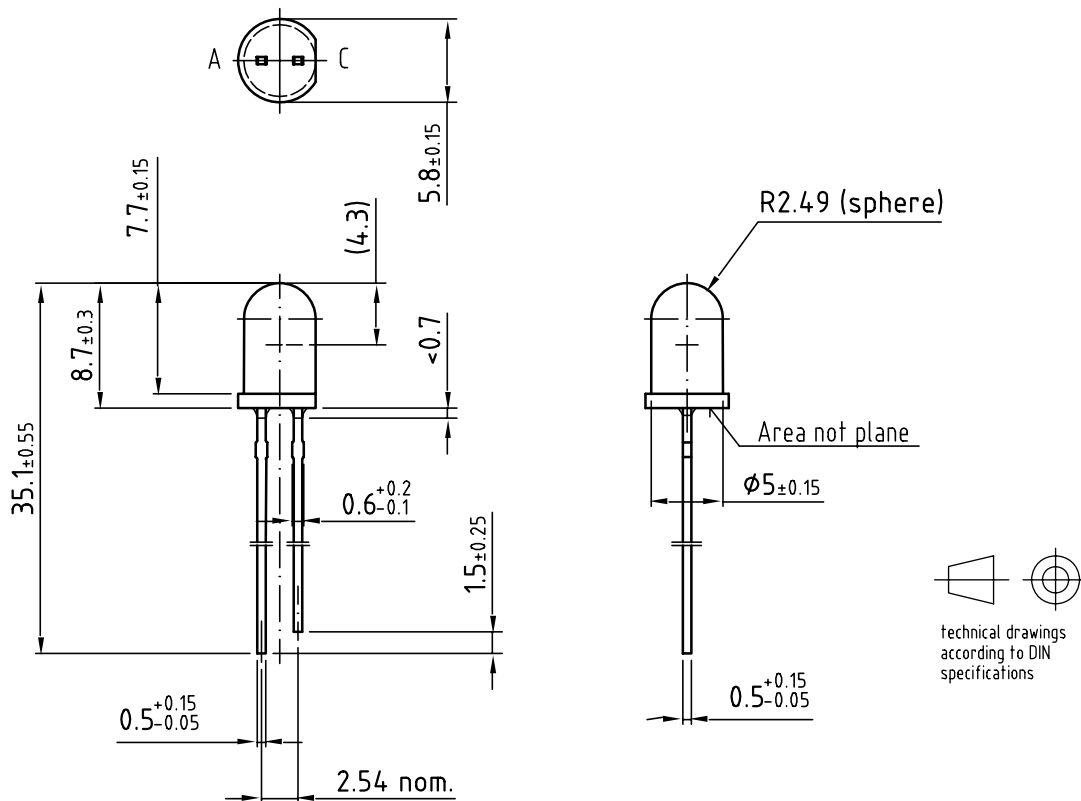


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



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