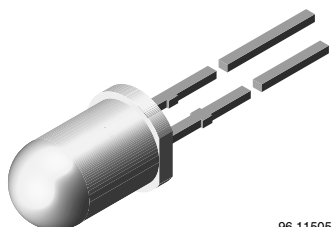


High Power Infrared Emitting Diode, RoHS Compliant, 940 nm, GaAlAs/GaAs



96 11505

DESCRIPTION

TSAL5300 is an infrared, 940 nm emitting diode in GaAlAs/GaAs technology with high radiant power molded in a blue-gray plastic package.

FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm): \varnothing 5
- Leads with stand-off
- Peak wavelength: $\lambda_p = 940$ 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
- 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) |
|-----------|---------------|-----------------|------------------|------------|
| TSAL5300 | 45 | ± 22 | 940 | 800 |

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|------------------|---------------------------------|-------------------|
| TSAL5300 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |
| TSAL5300-MSZ | Tape and ammpack | MOQ: 5000 pcs, 1000 pcs/ammpack | 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

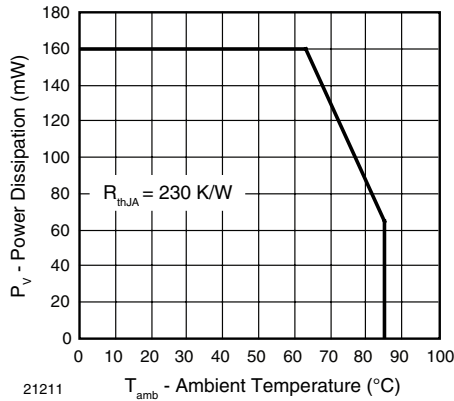


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

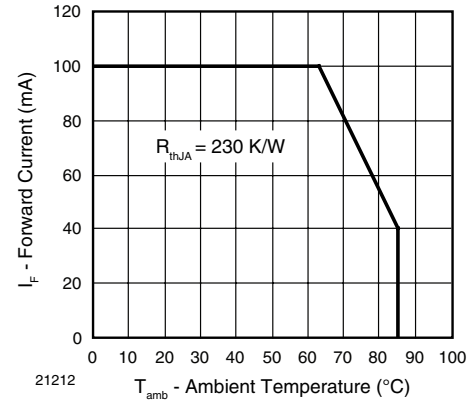


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| 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 | TKV _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 | 30 | 45 | 150 | mW/sr |
| | I _F = 1 A, t _p = 100 μs | I _e | 260 | 350 | | 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 | | ± 22 | | 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 |
| | I _F = 1 A | t _r | | 500 | | ns |
| Fall time | I _F = 100 mA | t _f | | 800 | | ns |
| | I _F = 1 A | t _f | | 500 | | ns |
| Virtual source diameter | Method: 63 % encircled energy | d | | 2.3 | | mm |

Note

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

BASIC CHARACTERISTICS

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

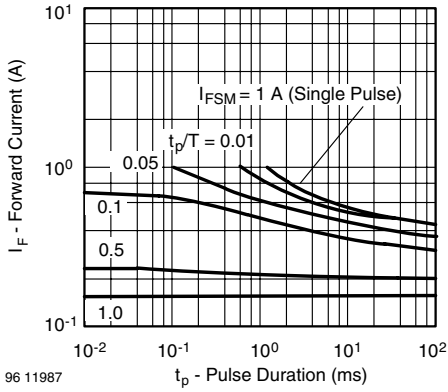


Fig. 3 - Pulse Forward Current vs. Pulse Duration

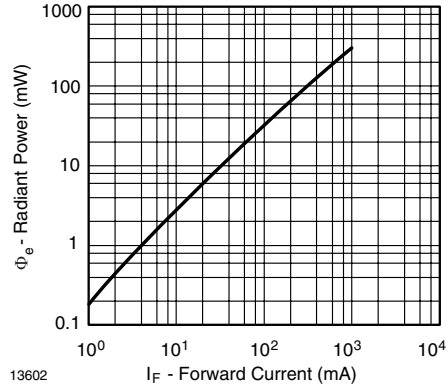


Fig. 6 - Radiant Power vs. Forward Current

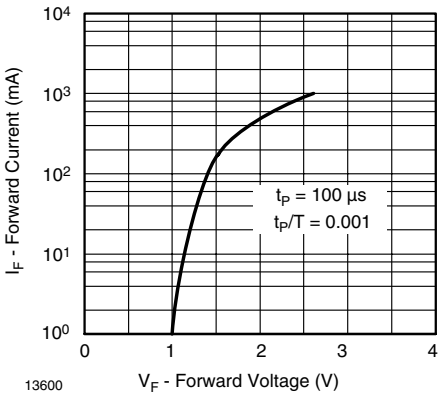


Fig. 4 - Forward Current vs. Forward Voltage

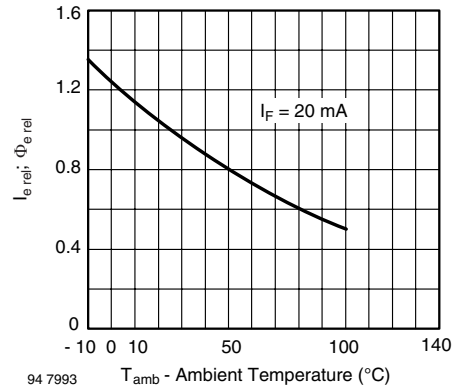


Fig. 7 - Relative Radiant Intensity/Power vs. Ambient Temperature

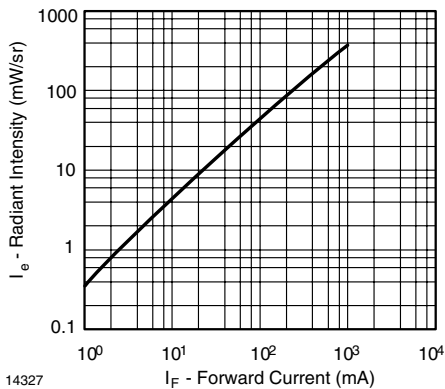


Fig. 5 - Radiant Intensity vs. Forward Current

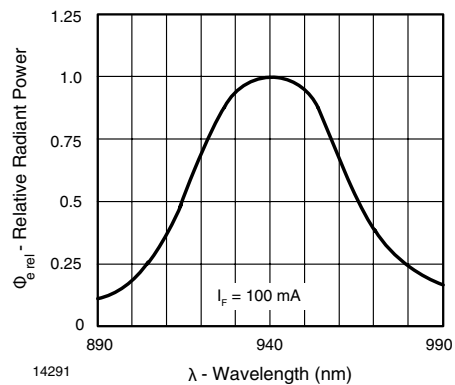


Fig. 8 - Relative Radiant Power vs. Wavelength

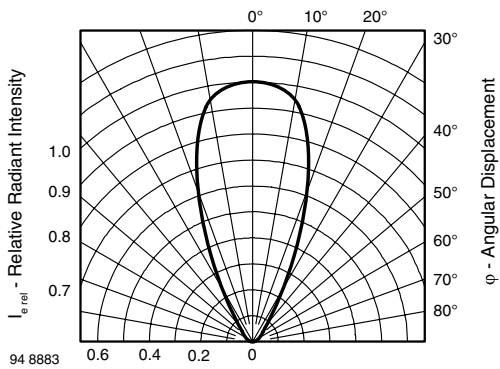
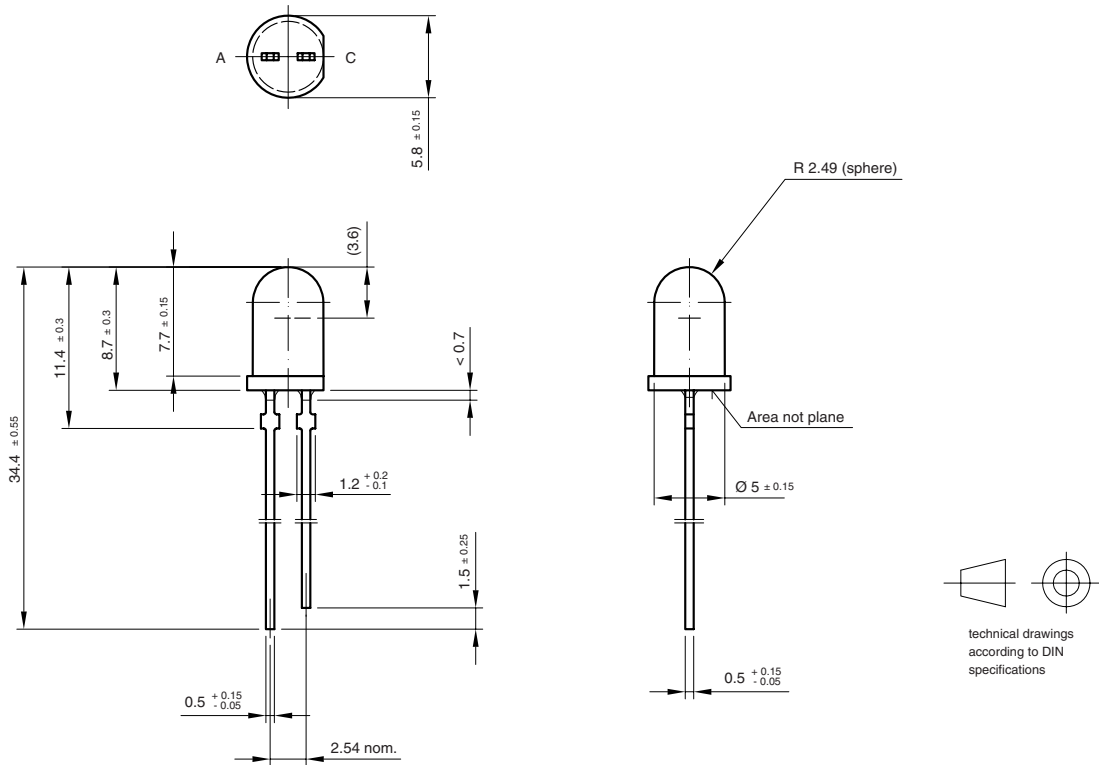


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



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| TAPE DIMENSIONS TSAL5300 | | |
|--------------------------|------------|--------------|
| OPTION | H ± 0.5 mm | QUANTITY/BOX |
| CS21Z | 22 | 1000 |
| FSZ | 27 | 1000 |
| GSZ | 29 | 1000 |
| MSZ | 25.5 | 1000 |

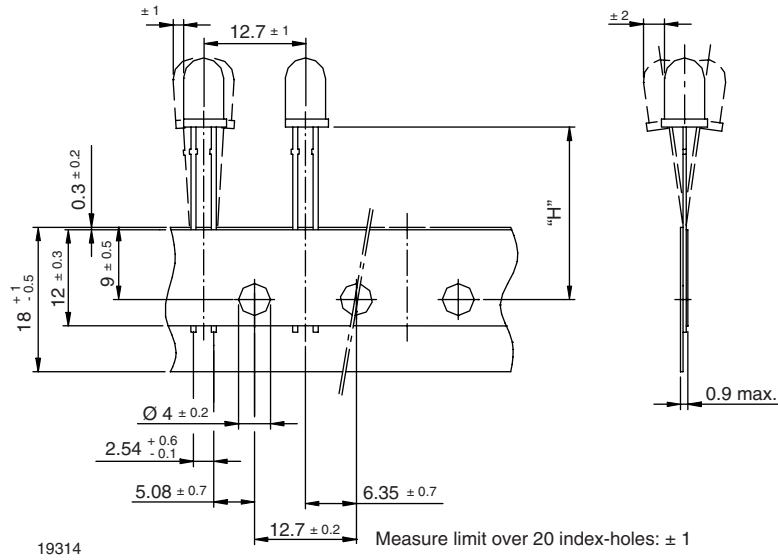


Fig. 10 - Ø 5 mm Devices on Tape

AMMOPACK

The tape is folded in a concertina arrangement and laid in cardboard box.

If components are required with cathode before the anode (figure 12), then start of tape should be taken from the side of the box marked “-”. If components are required with anode before cathode, then tape should be taken from the side of the box marked “+”.

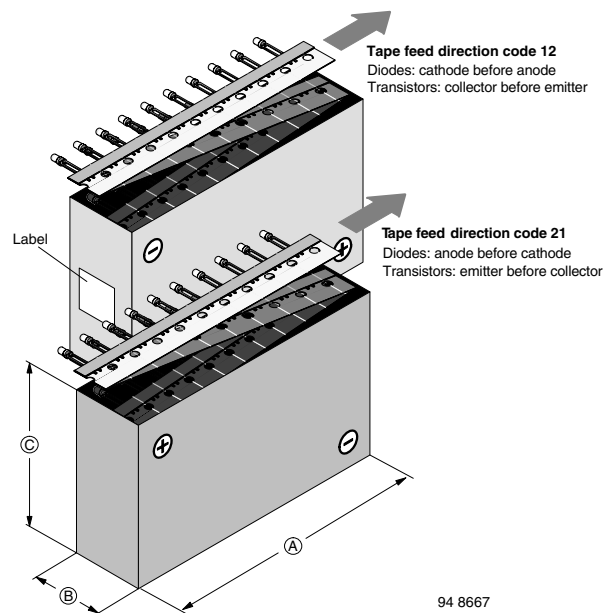


Fig. 11 - Tape Direction



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