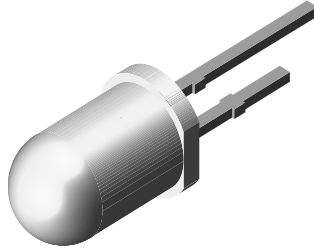




Infrared Emitting Diode, 875 nm, GaAlAs



94 8390

FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm): \varnothing 5
- Leads with stand-off
- Peak wavelength: $\lambda_p = 875$ nm
- High reliability
- Angle of half intensity: $\varphi = \pm 12^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



RoHS
COMPLIANT
HALOGEN
FREE

DESCRIPTION

The TSHA520. series are infrared, 875 nm emitting diodes in GaAlAs technology, molded in a clear, untinted plastic package.

APPLICATIONS

- Infrared remote control and free air data transmission systems
- This emitter series is dedicated to systems with panes in transmission space between emitter and detector, because of the low absorption of 875 nm radiation in glass

| PRODUCT SUMMARY | | | | |
|-----------------|---------------|-----------------|------------------|------------|
| COMPONENT | I_e (mW/sr) | φ (deg) | λ_p (nm) | t_r (ns) |
| TSHA5200 | 40 | ± 12 | 875 | 600 |
| TSHA5201 | 50 | ± 12 | 875 | 600 |
| TSHA5202 | 60 | ± 12 | 875 | 600 |
| TSHA5203 | 65 | ± 12 | 875 | 600 |

Note

Test conditions see table "Basic Characteristics"

| ORDERING INFORMATION | | | |
|----------------------|-----------|------------------------------|-------------------|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| TSHA5200 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |
| TSHA5201 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |
| TSHA5202 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |
| TSHA5203 | 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} | 2.5 | A |
| Power dissipation | | P_V | 180 | 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

TSHA5200, TSHA5201, TSHA5202, TSHA5203

Vishay Semiconductors Infrared Emitting Diode, 875 nm, GaAlAs

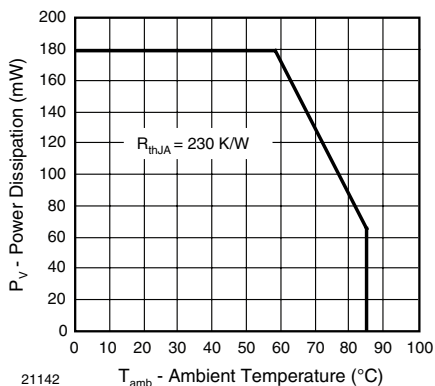


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

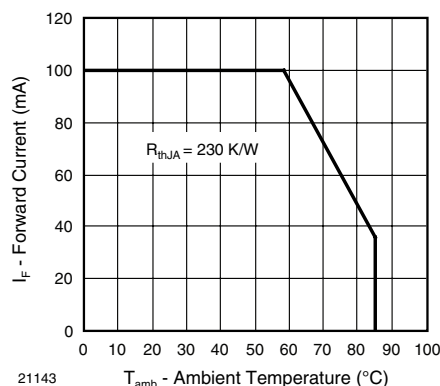


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS | | | | | | |
|---|---|-----------------------------|------|-------|------|------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | I _F = 100 mA, t _p = 20 ms | V _F | | 1.5 | 1.8 | V |
| Temperature coefficient of V _F | I _F = 100 mA | TK _{V_F} | | - 1.6 | | mV/K |
| Reverse current | V _R = 5 V | I _R | | | 100 | μA |
| Junction capacitance | V _R = 0 V, f = 1 MHz, E = 0 | C _j | | 20 | | pF |
| Temperature coefficient of φ _e | I _F = 20 mA | TKφ _e | | - 0.7 | | %/K |
| Angle of half intensity | | φ | | ± 12 | | deg |
| Peak wavelength | I _F = 100 mA | λ _p | | 875 | | nm |
| Spectral bandwidth | I _F = 100 mA | Δλ | | 80 | | nm |
| Temperature coefficient of λ _p | I _F = 100 mA | TKλ _p | | 0.2 | | nm/K |
| Rise time | I _F = 100 mA | t _r | | 600 | | ns |
| | I _F = 1 A | t _r | | 300 | | ns |
| Fall time | I _F = 100 mA | t _f | | 600 | | ns |
| | I _F = 1 A | t _f | | 300 | | ns |
| Virtual source diameter | | d | | 3.7 | | mm |

Note

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



TSHA5200, TSHA5201, TSHA5202, TSHA5203

Infrared Emitting Diode, 875 nm, GaAIAs Vishay Semiconductors

| TYPE DEDICATED CHARACTERISTICS | | | | | | | |
|--------------------------------|--|----------|----------|------|------|------|-------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | $I_F = 1 \text{ A}, t_p = 100 \mu\text{s}$ | TSHA5200 | V_F | | 2.8 | 3.5 | V |
| | | TSHA5201 | V_F | | 2.8 | 3.5 | V |
| | | TSHA5202 | V_F | | 2.8 | 3.5 | V |
| | | TSHA5203 | V_F | | 2.8 | 3.5 | V |
| Radiant intensity | $I_F = 100 \text{ mA}, t_p = 20 \mu\text{s}$ | TSHA5200 | I_e | 25 | 40 | 125 | mW/sr |
| | | TSHA5201 | I_e | 30 | 50 | 125 | mW/sr |
| | | TSHA5202 | I_e | 36 | 60 | 125 | mW/sr |
| | | TSHA5203 | I_e | 50 | 65 | 125 | mW/sr |
| | $I_F = 1 \text{ A}, t_p = 100 \mu\text{s}$ | TSHA5200 | I_e | 200 | 330 | | mW/sr |
| | | TSHA5201 | I_e | 260 | 400 | | mW/sr |
| | | TSHA5202 | I_e | 330 | 460 | | mW/sr |
| | | TSHA5203 | I_e | 400 | 530 | | mW/sr |
| Radiant power | $I_F = 100 \text{ mA}, t_p = 20 \mu\text{s}$ | TSHA5200 | ϕ_e | | 22 | | mW |
| | | TSHA5201 | ϕ_e | | 23 | | mW |
| | | TSHA5202 | ϕ_e | | 24 | | mW |
| | | TSHA5203 | ϕ_e | | 25 | | mW |

Note

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

BASIC CHARACTERISTICS

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

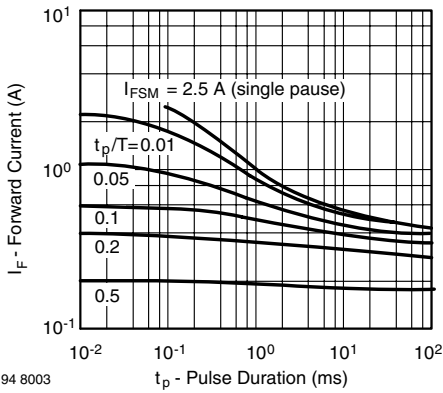


Fig. 3 - Pulse Forward Current vs. Pulse Duration

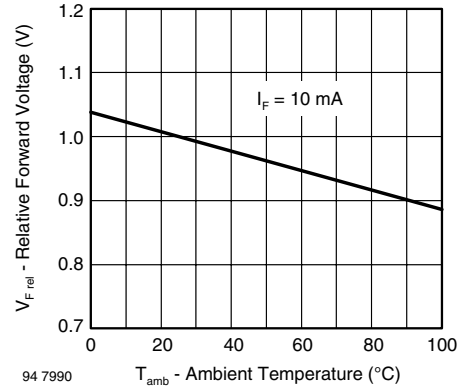


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

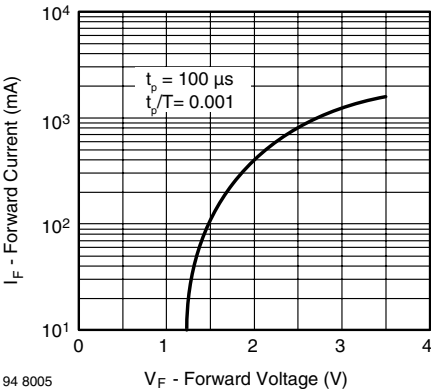


Fig. 4 - Forward Current vs. Forward Voltage

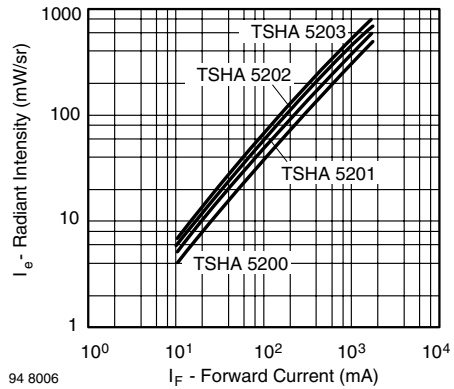
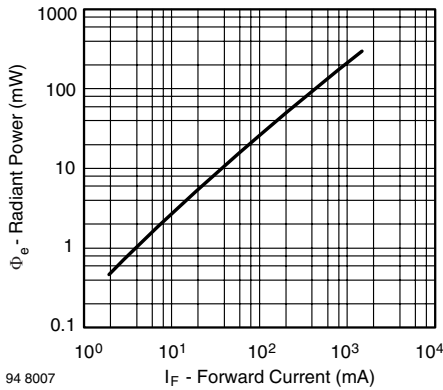


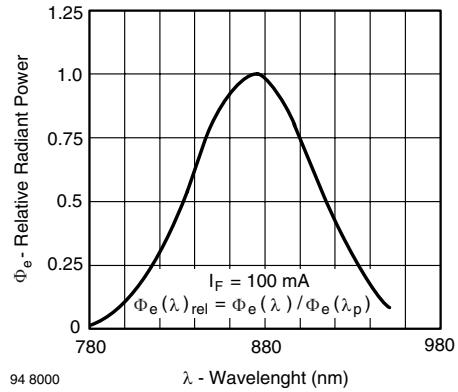
Fig. 6 - Radiant Intensity vs. Forward Current

TSHA5200, TSHA5201, TSHA5202, TSHA5203

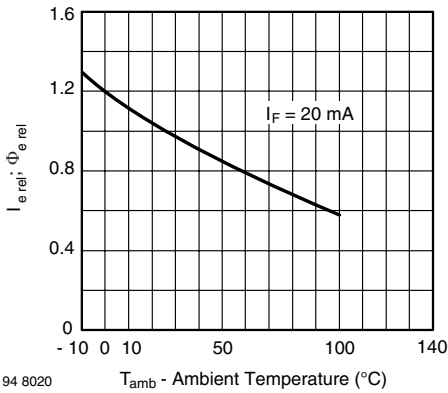
Vishay Semiconductors Infrared Emitting Diode, 875 nm, GaAlAs



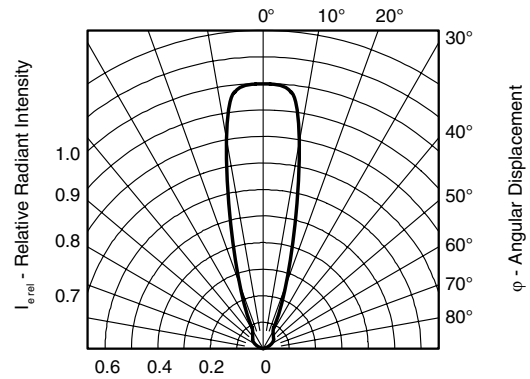
94 8007
Fig. 7 - Radiant Power vs. Forward Current



94 8000
Fig. 9 - Relative Radiant Power vs. Wavelength

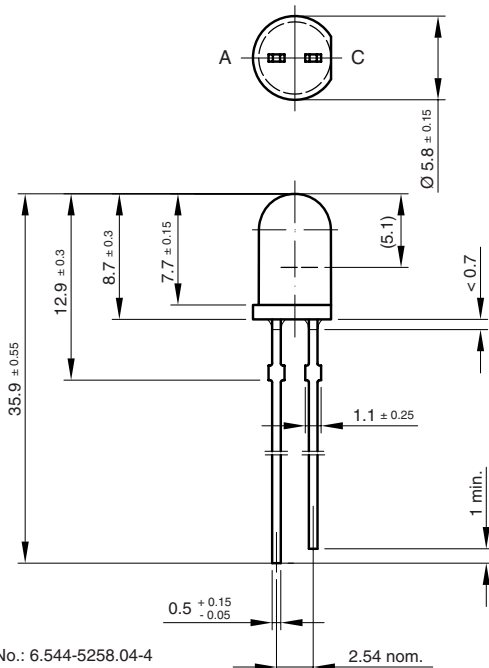


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Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

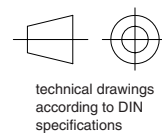
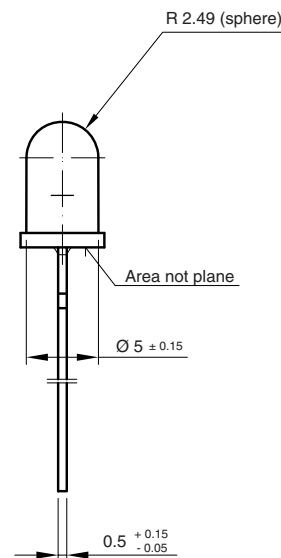


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Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



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