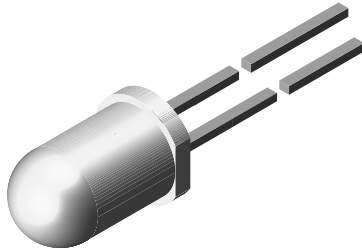


## Infrared Emitting Diode, 875 nm, GaAlAs



94 8389

### FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm):  $\varnothing$  5
- 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
- Good spectral matching with Si photodetectors
- 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 TSHA620. 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) | $\varphi$ (deg) | $\lambda_p$ (nm) | $t_r$ (ns) |
| TSHA6200        | 40            | $\pm 12$        | 875              | 600        |
| TSHA6201        | 50            | $\pm 12$        | 875              | 600        |
| TSHA6202        | 60            | $\pm 12$        | 875              | 600        |
| TSHA6203        | 65            | $\pm 12$        | 875              | 600        |

#### Note

Test conditions see table "Basic Characteristics"

| ORDERING INFORMATION |           |                              |                   |
|----------------------|-----------|------------------------------|-------------------|
| ORDERING CODE        | PACKAGING | REMARKS                      | PACKAGE FORM      |
| TSHA6200             | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |
| TSHA6201             | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |
| TSHA6202             | Bulk      | MOQ: 4000 pcs, 4000 pcs/bulk | T-1 $\frac{3}{4}$ |
| TSHA6203             | 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

# TSHA6200, TSHA6201, TSHA6202, TSHA6203



Vishay Semiconductors Infrared Emitting Diode, 875 nm, GaAlAs

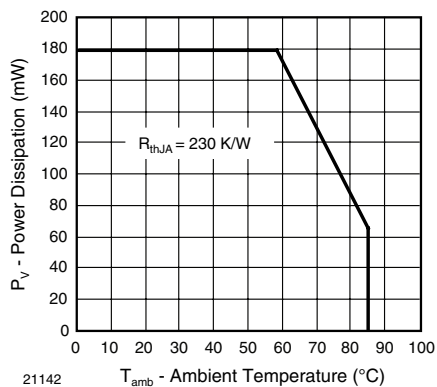


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

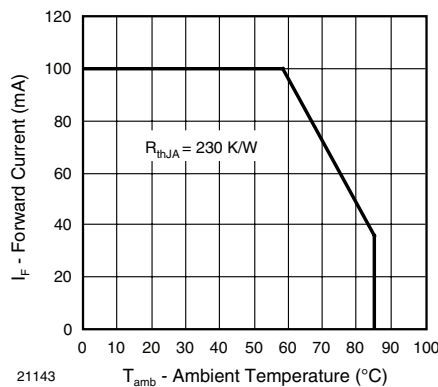


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

**Note**

T<sub>amb</sub> = 25 °C, unless otherwise specified



# TSHA6200, TSHA6201, TSHA6202, TSHA6203

Infrared Emitting Diode, 875 nm, GaAlAs Vishay Semiconductors

| TYPE DEDICATED CHARACTERISTICS |   |          |          |      |      |      |       |
|--------------------------------|---|----------|----------|------|------|------|-------|
| PARAMETER                      | TEST CONDITION                              | PART     | SYMBOL   | MIN. | TYP. | MAX. | UNIT  |
| Forward voltage                | $I_F = 1 \text{ A}, t_p = 100 \mu\text{s}$  | TSHA6200 | $V_F$    |      | 2.8  | 3.5  | V     |
|                                |   | TSHA6201 | $V_F$    |      | 2.8  | 3.5  | V     |
|                                |   | TSHA6202 | $V_F$    |      | 2.8  | 3.5  | V     |
|                                |   | TSHA6203 | $V_F$    |      | 2.8  | 3.5  | V     |
| Radiant intensity              | $I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$ | TSHA6200 | $I_e$    | 25   | 40   | 125  | mW/sr |
|                                |   | TSHA6201 | $I_e$    | 30   | 50   | 125  | mW/sr |
|                                |   | TSHA6202 | $I_e$    | 36   | 60   | 125  | mW/sr |
|                                |   | TSHA6203 | $I_e$    | 50   | 65   | 125  | mW/sr |
|                                | $I_F = 1 \text{ A}, t_p = 100 \mu\text{s}$  | TSHA6200 | $I_e$    | 200  | 330  |      | mW/sr |
|                                |   | TSHA6201 | $I_e$    | 260  | 400  |      | mW/sr |
|                                |   | TSHA6202 | $I_e$    | 330  | 460  |      | mW/sr |
|                                |   | TSHA6203 | $I_e$    | 400  | 530  |      | mW/sr |
| Radiant power                  | $I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$ | TSHA6200 | $\phi_e$ |      | 22   |      | mW    |
|                                |   | TSHA6201 | $\phi_e$ |      | 23   |      | mW    |
|                                |   | TSHA6202 | $\phi_e$ |      | 24   |      | mW    |
|                                |   | TSHA6203 | $\phi_e$ |      | 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

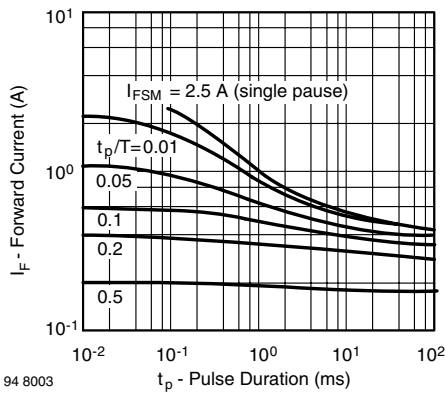


Fig. 3 - Pulse Forward Current vs. Pulse Duration

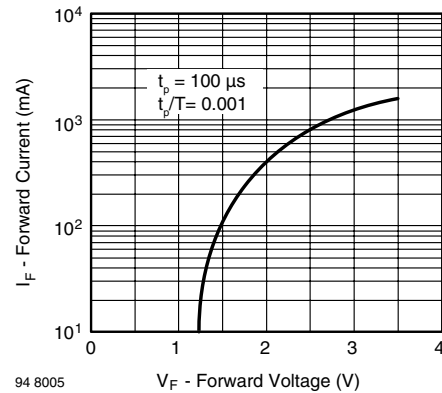


Fig. 4 - Forward Current vs. Forward Voltage

# TSHA6200, TSHA6201, TSHA6202, TSHA6203



Vishay Semiconductors Infrared Emitting Diode, 875 nm, GaAlAs

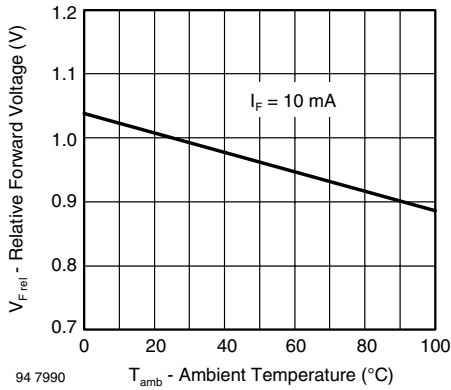


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

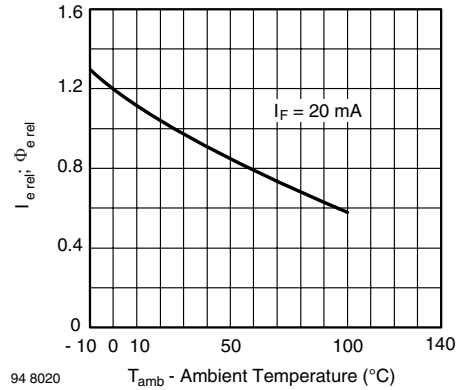


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

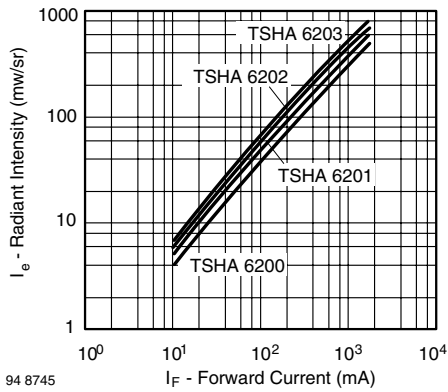


Fig. 6 - Radiant Intensity vs. Forward Current

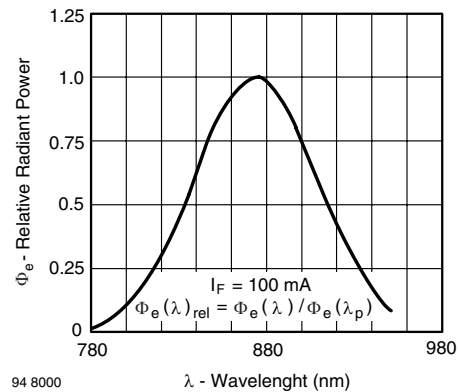


Fig. 9 - Relative Radiant Power vs. Wavelength

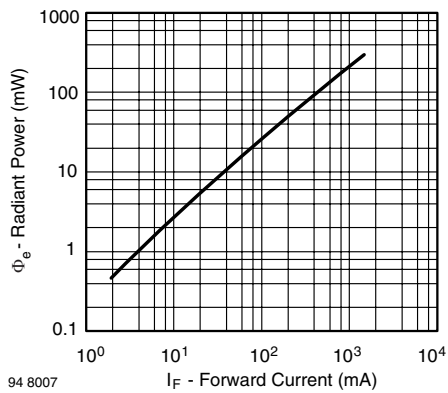


Fig. 7 - Radiant Power vs. Forward Current

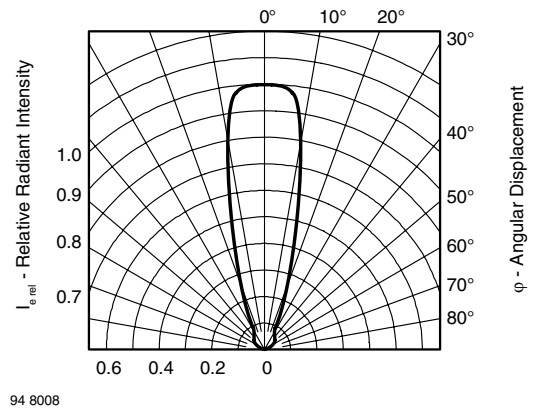


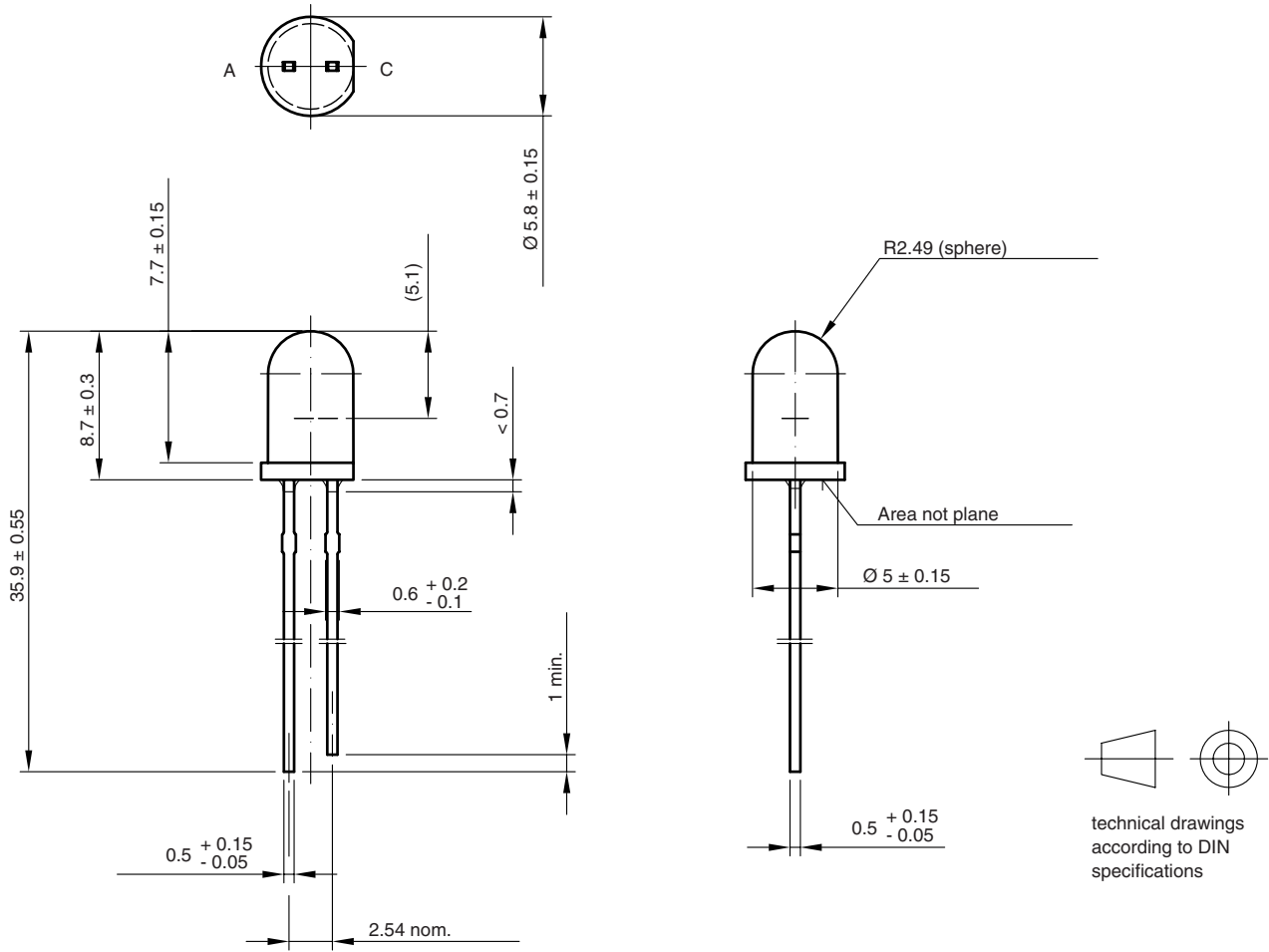
Fig. 10 - Relative Radiant Intensity vs. Angular Displacement



# TSHA6200, TSHA6201, TSHA6202, TSHA6203

Infrared Emitting Diode, 875 nm, GaAlAs Vishay Semiconductors

## PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5259.04-4  
 Issue: 8; 19.05.09  
 96 12125

technical drawings  
 according to DIN  
 specifications



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