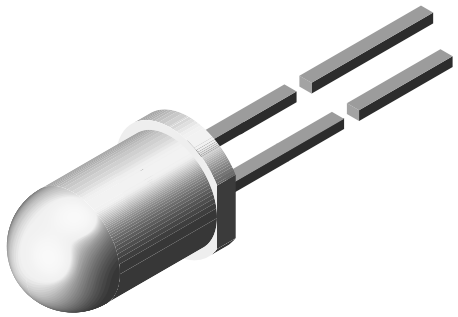
# Infrared Emitting Diode, 875 nm, GaAlAs



## FEATURES

- Package type: leaded
- Package form: T-1¾
- Dimensions (in mm): Ø 5
- Peak wavelength: $\lambda_p$ = 875 nm
- High reliability
- Angle of half intensity: φ = ± 12°
- UL217 recognized
- Low forward voltage
- Suitable for high pulse current operation
- Good spectral matching with Si photodetectors
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb e3 RoHS COMPLIANT HALOGEN FREE GREEN (5-2008)

## DESCRIPTION

The TSHA6203UL is an infrared, 875 nm emitting diode in GaAlAs technology, molded in a clear, untinted plastic package. It is certified according to UL217 standard for smoke alarms.

## APPLICATIONS

- Smoke detectors
- Fire alarms

| PRODUCT SUMMARY | | | | |
|---|---|---|---|---|
| **COMPONENT** | **$I_e$ (mW/sr)** | **φ (°)** | **$\lambda_p$ (nm)** | **$t_r$ (ns)** |
| TSHA6203UL | 65 | ± 12 | 875 | 600 |

**Note**

- Test conditions see table “Basic Characteristics“

| ORDERING INFORMATION | | | |
|---|---|---|---|
| **ORDERING CODE** | **PACKAGING** | **REMARKS** | **PACKAGE FORM** |
| TSHA6203UL | 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 µs | $I_{FM}$ | 200 | mA |
| Surge forward current | $t_p$ = 100 µs | $I_{FSM}$ | 2.5 | A |
| Power dissipation | | $P_V$ | 180 | mW |
| Junction temperature | | $T_j$ | 100 | °C |
| Operating temperature range | | $T_{amb}$ | -40 to +85 | °C |
| Storage temperature range | | $T_{stg}$ | -40 to +100 | °C |
| Soldering temperature | t ≤ 5 s, 2 mm from case | $T_{sd}$ | 260 | °C |
| Thermal resistance junction to ambient | J-STD-051, leads 7 mm, soldered on PCB | $R_{thJA}$ | 230 | K/W |

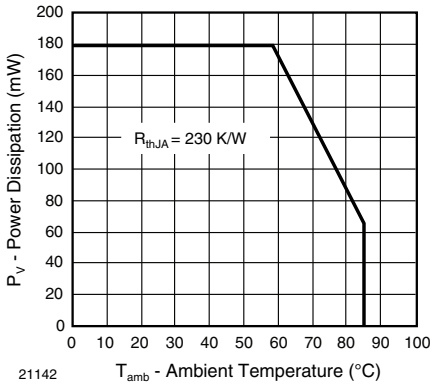



Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

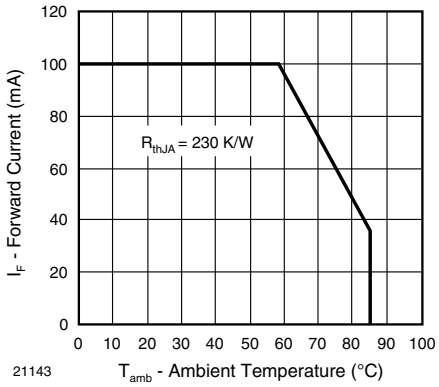



Fig. 2 - Forward Current Limit vs. Ambient Temperature

| **BASIC CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified) | | | | | | |
|---|---|---|---|---|---|---|
| **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 |
| | $I_F$ = 1 A, $t_p$ = 100 µs | | - | 2.8 | - | |
| Temperature coefficient of $V_F$ | $I_F$ = 100 mA | $TK_{VF}$ | - | -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 |
| Radiant intensity | $I_F$ = 100 mA, $t_p$ = 20 ms | $I_e$ | 50 | 65 | 125 | mW/sr |
| | $I_F$ = 1 A, $t_p$ = 100 µs | $I_e$ | - | 530 | - | |
| Radiant power | $I_F$ = 100 mA, $t_p$ = 20 ms | $\phi_e$ | - | 25 | - | mW |
| Temperature coefficient of $\phi_e$ | $I_F$ = 20 mA | $TK\phi_e$ | - | -0.7 | - | %/K |
| Angle of half intensity | | $\varphi$ | - | ± 12 | - | ° |
| Peak wavelength | $I_F$ = 100 mA | $\lambda_p$ | - | 875 | - | nm |
| Spectral bandwidth | $I_F$ = 100 mA | $\Delta\lambda$ | - | 80 | - | nm |
| Temperature coefficient of $\lambda_p$ | $I_F$ = 100 mA | $TK\lambda_p$ | - | 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 |

**BASIC CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified)

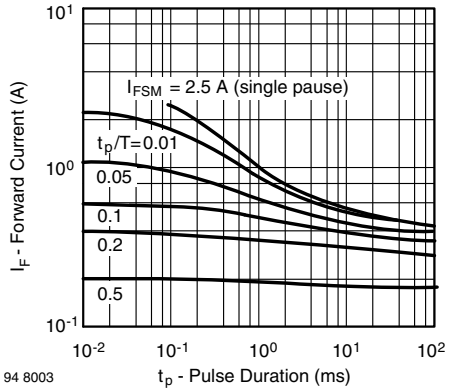



Fig. 3 - Pulse Forward Current vs. Pulse Duration

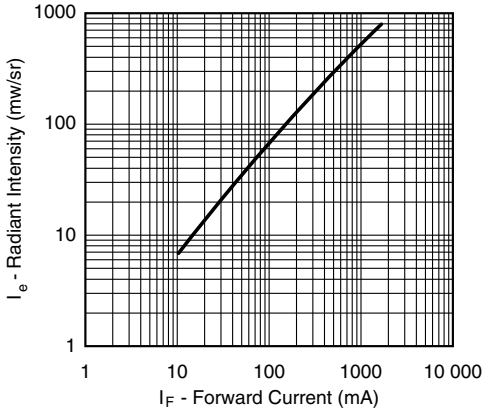



Fig. 6 - Radiant Intensity vs. Forward Current

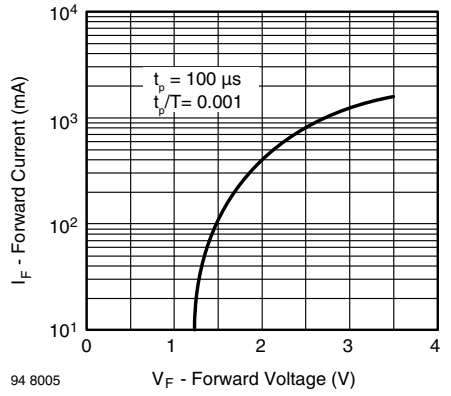



Fig. 4 - Forward Current vs. Forward Voltage

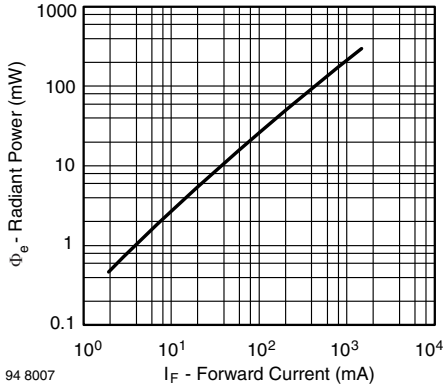



Fig. 7 - Radiant Power vs. Forward Current

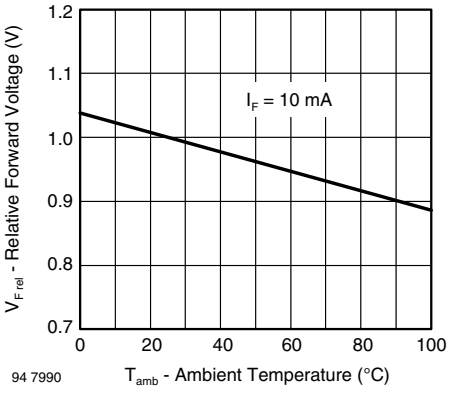



Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

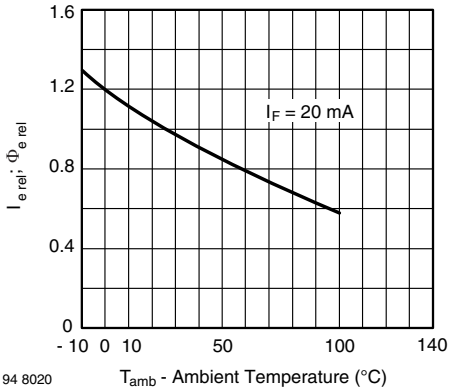



Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

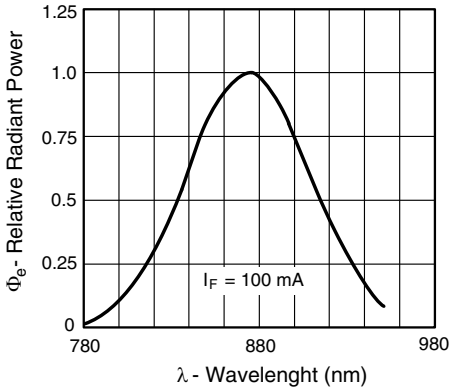



Fig. 9 - Relative Radiant Power vs. Wavelength

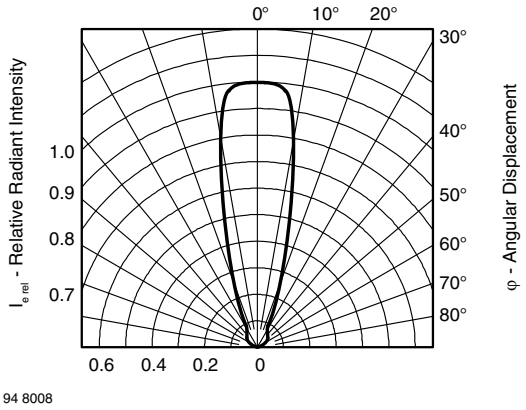
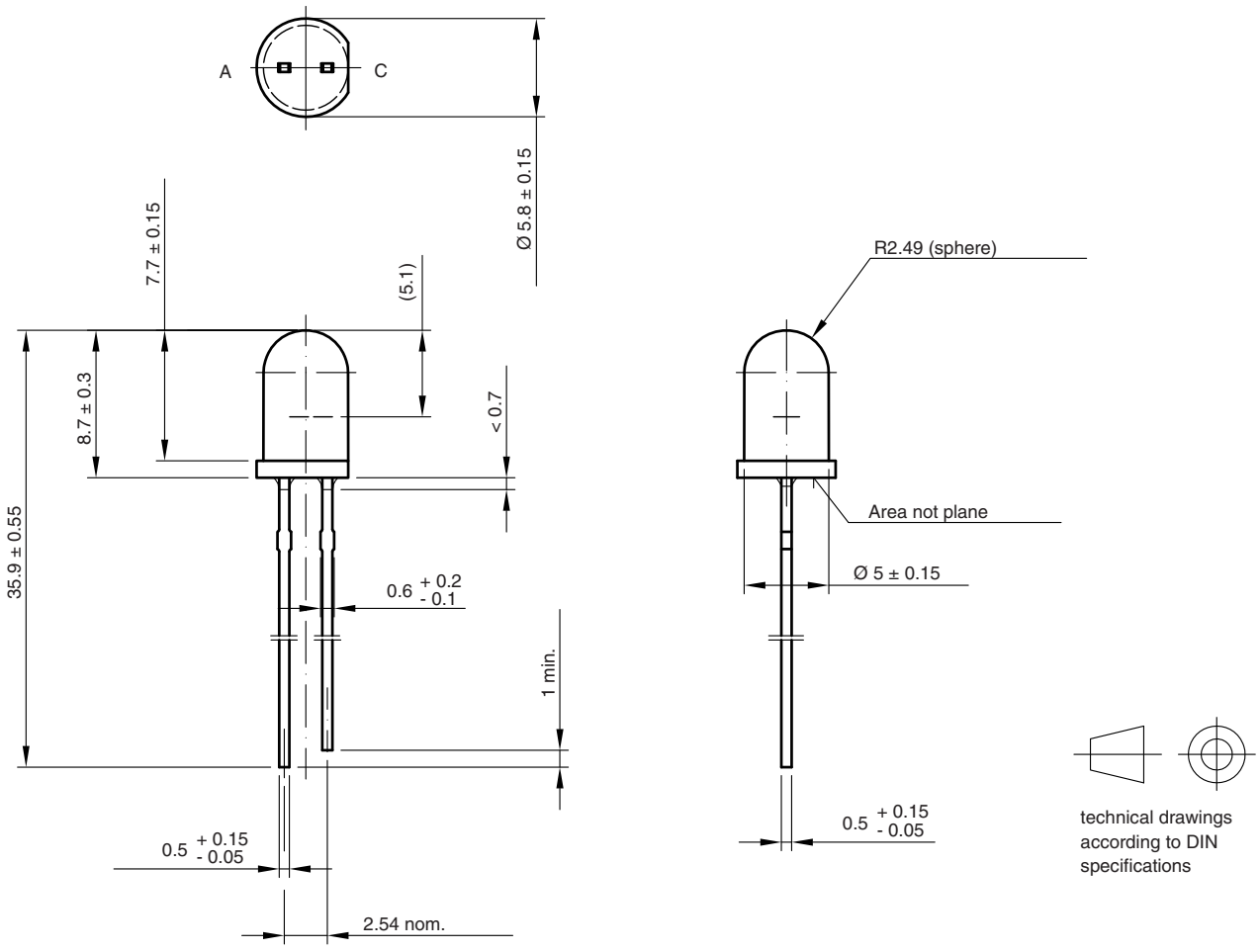



Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

## **PACKAGE DIMENSIONS** in millimeters

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