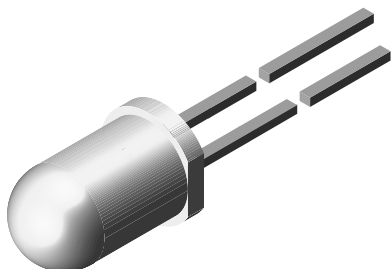


Infrared Emitting Diode, RoHS Compliant, 875 nm, GaAlAs



94 8389

DESCRIPTION

The TSHA650. series are infrared, 875 nm emitting diodes in GaAlAs technology, 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: $\lambda_p = 875$ nm
- High reliability
- Angle of half intensity: $\varphi = \pm 24^\circ$
- 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 and free air data transmission systems with comfortable radiation angle
- 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)
TSHA6500	20	± 24	875	600
TSHA6501	25	± 24	875	600
TSHA6502	30	± 24	875	600
TSHA6503	35	± 24	875	600

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSHA6500	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$
TSHA6501	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$
TSHA6502	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$
TSHA6503	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



TSHA6500, TSHA6501, TSHA6502, TSHA6503

Infrared Emitting Diode, RoHS Compliant, Vishay Semiconductors
875 nm, GaAlAs

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
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	$t \leq 5$ s, 2 mm from case	T_{sd}	260	°C
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R_{thJA}	230	K/W

Note

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

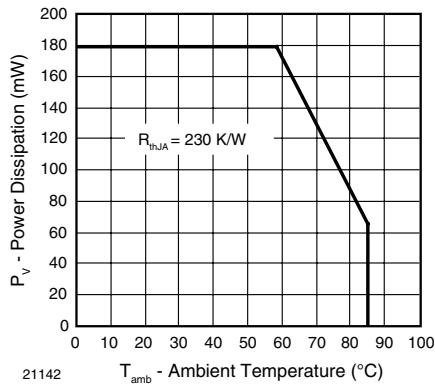


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

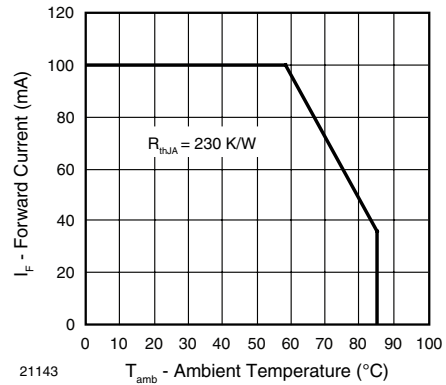


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100$ mA, $t_p = 20$ ms	V_F		1.5	1.8	V
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
Temperature coefficient of ϕ_e	$I_F = 20$ mA	TK_{ϕ_e}		- 0.7		%/K
Angle of half intensity		ϕ		± 24		deg
Peak wavelength	$I_F = 100$ mA	λ_p		875		nm
Spectral bandwidth	$I_F = 100$ mA	$\Delta\lambda$		80		nm
Temperature coefficient of λ_p	$I_F = 100$ mA	TK_{λ_p}		0.2		nm/K
Rise time	$I_F = 100$ mA	t_r		600		ns
	$I_F = 1.5$ A	t_r		300		ns
Fall time	$I_F = 100$ mA	t_f		600		ns
	$I_F = 1.5$ A	t_f		300		ns
Virtual source diameter		d		2.2		mm

Note

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

TSHA6500, TSHA6501, TSHA6502, TSHA6503

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875 nm, GaAlAs



TYPE DEDICATED CHARACTERISTICS							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 1.5 \text{ A}$, $t_p = 100 \mu\text{s}$	TSHA6500	V_F		3.2	4.9	V
		TSHA6501	V_F		3.2	4.9	V
		TSHA6502	V_F		3.2	4.5	V
		TSHA6503	V_F		3.2	4.5	V
Radiant intensity	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	TSHA6500	I_e	12	20	60	mW/sr
		TSHA6501	I_e	16	25	60	mW/sr
		TSHA6502	I_e	20	30	60	mW/sr
		TSHA6503	I_e	24	35	60	mW/sr
	$I_F = 1.5 \text{ A}$, $t_p = 100 \mu\text{s}$	TSHA6500	I_e	150	240		mW/sr
		TSHA6501	I_e	200	300		mW/sr
		TSHA6502	I_e	250	360		mW/sr
		TSHA6503	I_e	300	420		mW/sr
Radiant power	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	TSHA6500	ϕ_e		22		mW
		TSHA6501	ϕ_e		23		mW
		TSHA6502	ϕ_e		24		mW
		TSHA6503	ϕ_e		25		mW

Note

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

BASIC CHARACTERISTICS

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

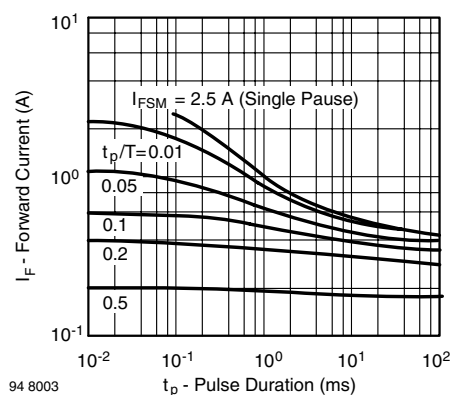


Fig. 3 - Pulse Forward Current vs. Pulse Duration

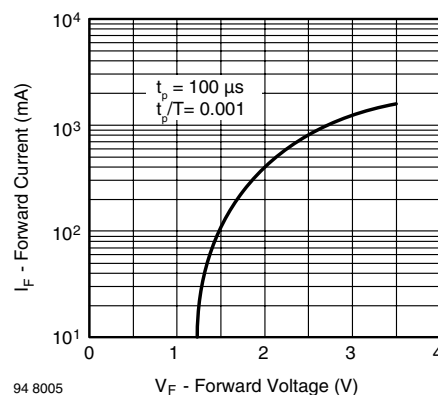


Fig. 4 - Forward Current vs. Forward Voltage



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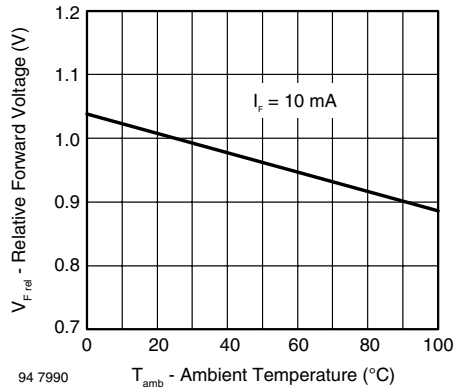


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

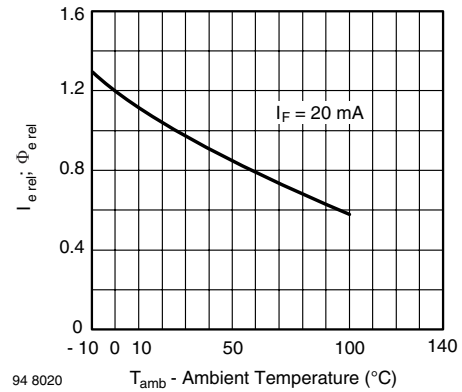


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

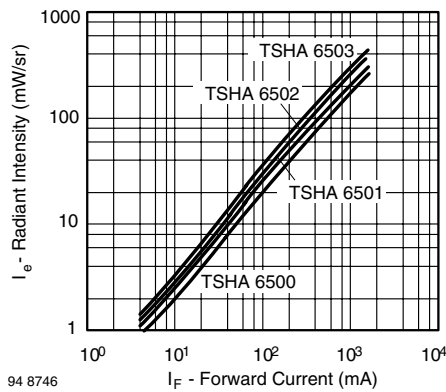


Fig. 6 - Radiant Intensity vs. Forward Current

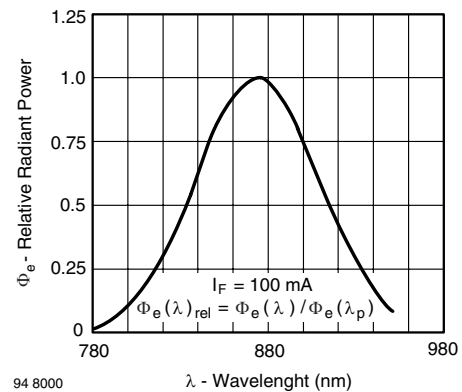


Fig. 9 - Relative Radiant Power vs. Wavelength

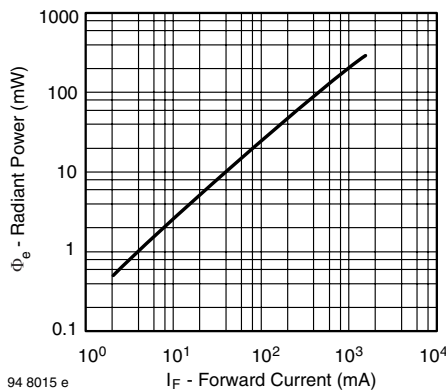


Fig. 7 - Radiant Power vs. Forward Current

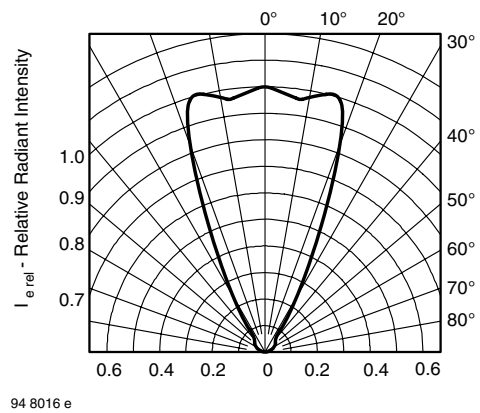


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

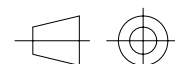
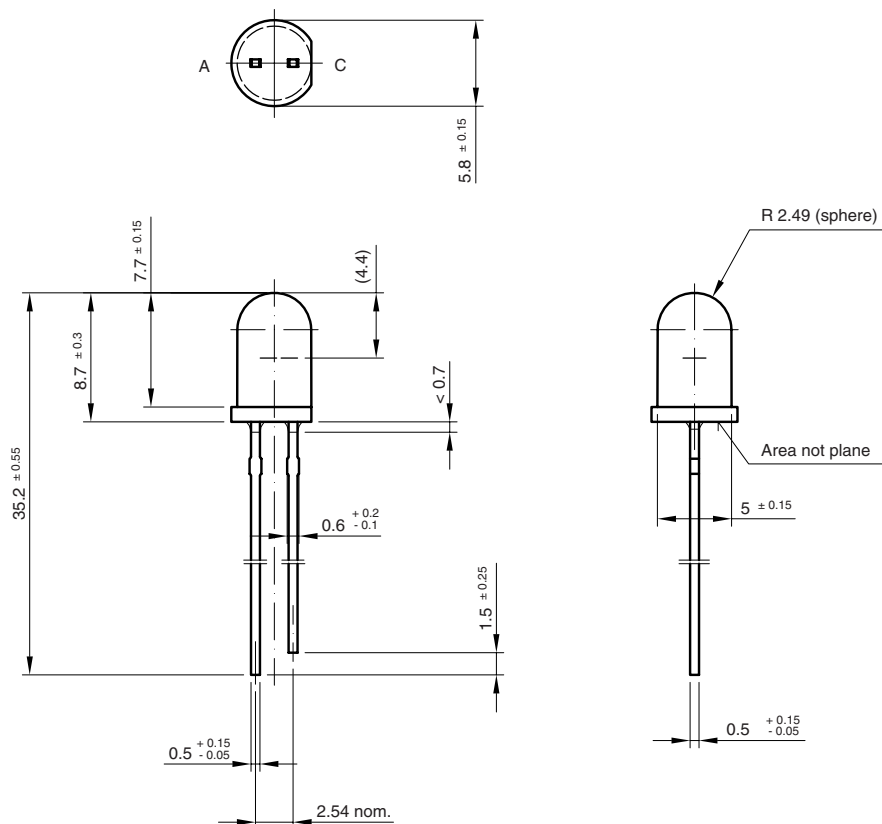
TSHA6500, TSHA6501, TSHA6502, TSHA6503

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Infrared Emitting Diode, RoHS Compliant,
875 nm, GaAlAs



PACKAGE DIMENSIONS in millimeters



technical drawings
according to DIN
specifications

6.544-5259.08-4
Issue: 2; 25.08.98
14436



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