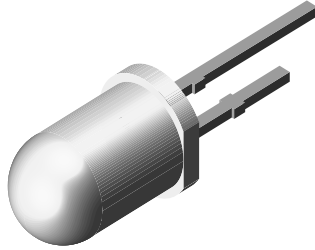




## Infrared Emitting Diode, 875 nm, GaAlAs



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



**RoHS**  
COMPLIANT  
**GREEN**  
(5-2008)\*\*

### DESCRIPTION

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

### Note

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

### 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 <sub>e</sub> (mW/sr)	$\varphi$ (deg)	$\lambda_p$ (nm)	t <sub>r</sub> (ns)
TSHA5200	40	$\pm 12$	875	600
TSHA5201	50	$\pm 12$	875	600
TSHA5202	60	$\pm 12$	875	600
TSHA5203	65	$\pm 12$	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 ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	5	V
Forward current		$I_F$	100	mA
Peak forward current	$t_p/T = 0.5$ , $t_p = 100\text{ }\mu\text{s}$	$I_{FM}$	200	mA
Surge forward current	$t_p = 100\text{ }\mu\text{s}$	$I_{FSM}$	2.5	A
Power dissipation		$P_V$	180	mW
Junction temperature		$T_j$	100	$^{\circ}\text{C}$
Operating temperature range		$T_{amb}$	- 40 to + 85	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	- 40 to + 100	$^{\circ}\text{C}$
Soldering temperature	$t \leq 5\text{ s}$ , 2 mm from case	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	$R_{thJA}$	230	K/W

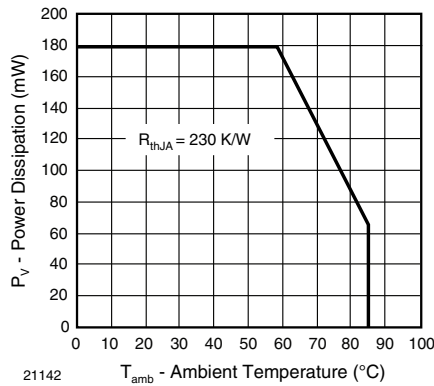


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

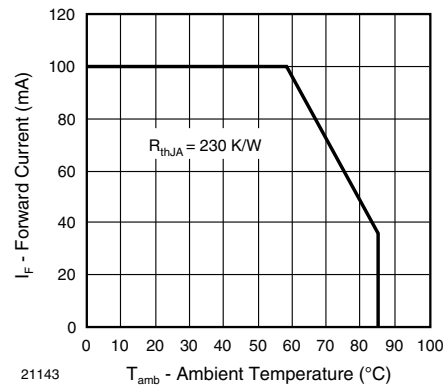


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$V_F$		1.5	1.8	V
Temperature coefficient of $V_F$	$I_F = 100\text{ mA}$	$TK_{V_F}$		- 1.6		mV/K
Reverse current	$V_R = 5\text{ V}$	$I_R$			100	$\mu\text{A}$
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$	$C_j$		20		pF
Temperature coefficient of $\phi_e$	$I_F = 20\text{ mA}$	$TK_{\phi_e}$		- 0.7		%/K
Angle of half intensity		$\phi$		$\pm 12$		deg
Peak wavelength	$I_F = 100\text{ mA}$	$\lambda_p$		875		nm
Spectral bandwidth	$I_F = 100\text{ mA}$	$\Delta\lambda$		80		nm
Temperature coefficient of $\lambda_p$	$I_F = 100\text{ mA}$	$TK_{\lambda_p}$		0.2		nm/K
Rise time	$I_F = 100\text{ mA}$	$t_r$		600		ns
	$I_F = 1\text{ A}$	$t_r$		300		ns
Fall time	$I_F = 100\text{ mA}$	$t_f$		600		ns
	$I_F = 1\text{ A}$	$t_f$		300		ns
Virtual source diameter		$d$		3.7		mm



TYPE DEDICATED CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	TSHA5200	V <sub>F</sub>		2.8	3.5	V
		TSHA5201	V <sub>F</sub>		2.8	3.5	V
		TSHA5202	V <sub>F</sub>		2.8	3.5	V
		TSHA5203	V <sub>F</sub>		2.8	3.5	V
Radiant intensity	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 μs	TSHA5200	I <sub>e</sub>	25	40	125	mW/sr
		TSHA5201	I <sub>e</sub>	30	50	125	mW/sr
		TSHA5202	I <sub>e</sub>	36	60	125	mW/sr
		TSHA5203	I <sub>e</sub>	50	65	125	mW/sr
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	TSHA5200	I <sub>e</sub>	200	330		mW/sr
		TSHA5201	I <sub>e</sub>	260	400		mW/sr
		TSHA5202	I <sub>e</sub>	330	460		mW/sr
		TSHA5203	I <sub>e</sub>	400	530		mW/sr
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 μs	TSHA5200	φ <sub>e</sub>		22		mW
		TSHA5201	φ <sub>e</sub>		23		mW
		TSHA5202	φ <sub>e</sub>		24		mW
		TSHA5203	φ <sub>e</sub>		25		mW

**BASIC CHARACTERISTICS** (T<sub>amb</sub> = 25 °C, unless otherwise specified)

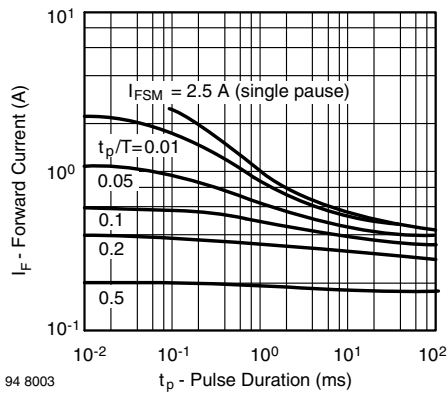


Fig. 3 - Pulse Forward Current vs. Pulse Duration

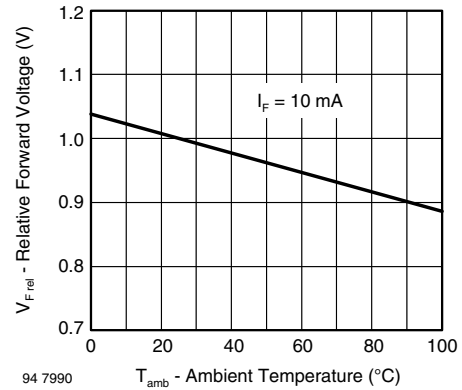


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

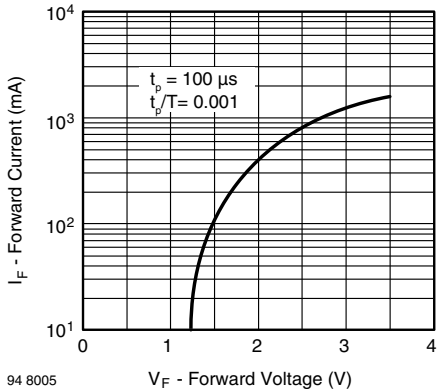


Fig. 4 - Forward Current vs. Forward Voltage

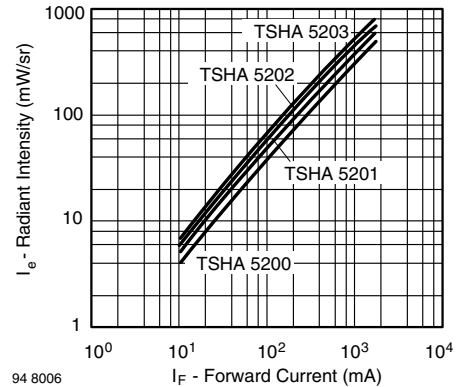


Fig. 6 - Radiant Intensity vs. Forward Current

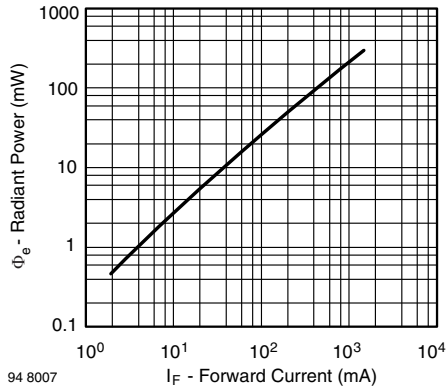


Fig. 7 - Radiant Power vs. Forward Current

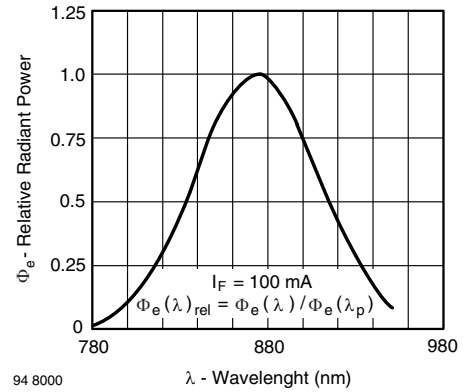


Fig. 9 - Relative Radiant Power vs. Wavelength

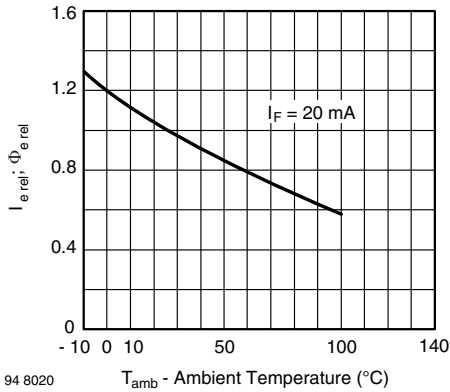


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

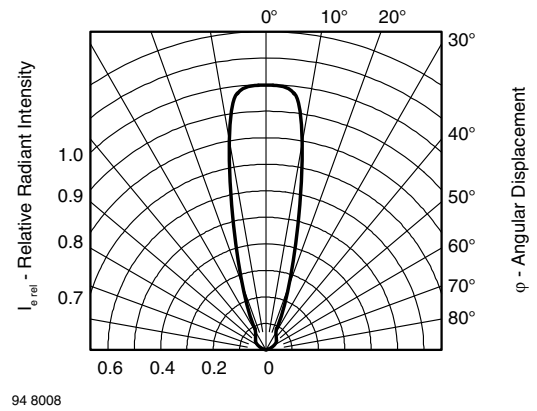
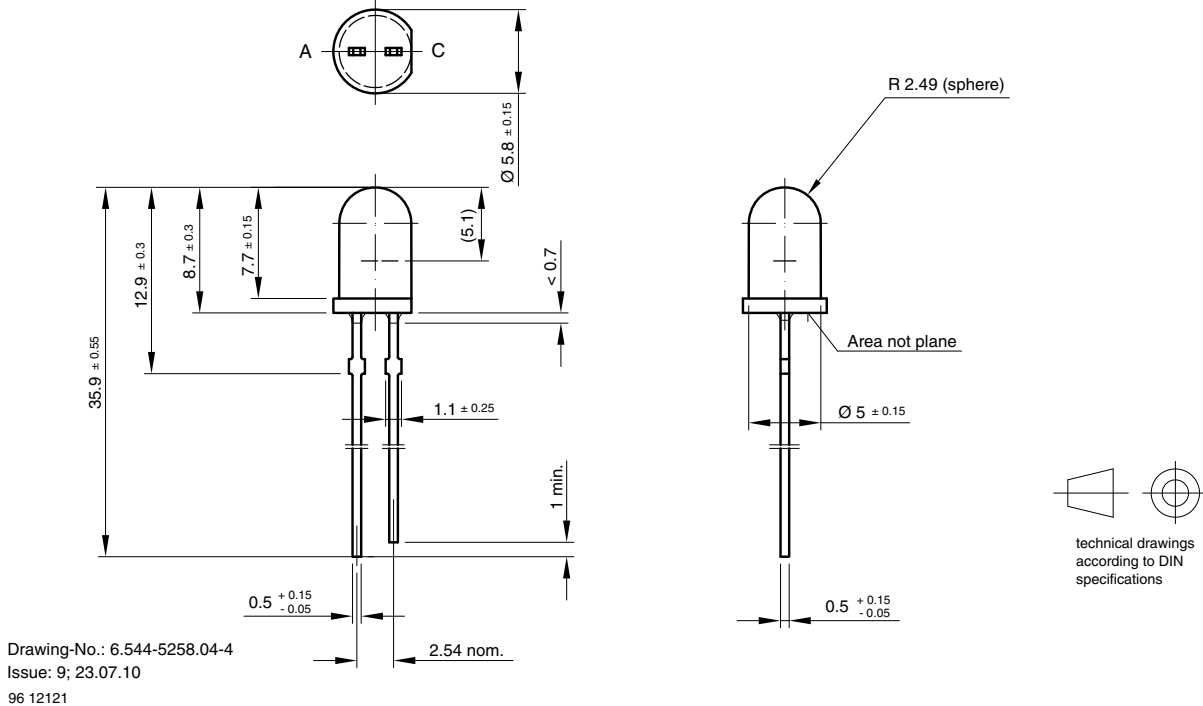
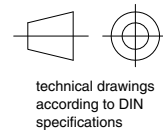


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

**PACKAGE DIMENSIONS** in millimeters



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