

## TSHA5200, TSHA5201, TSHA5202, TSHA5203

Vishay Semiconductors

GREEN

# Infrared Emitting Diode, 875 nm, GaAlAs



### **DESCRIPTION**

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

### **FEATURES**

Package type: leadedPackage form: T-1¾

• Dimensions (in mm): Ø 5

· Leads with stand-off

• Peak wavelength:  $\lambda_p = 875 \text{ nm}$ 

High reliability

• Angle of half intensity:  $\phi = \pm 12^{\circ}$ 

· Low forward voltage

• Suitable for high pulse current operation

 Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

### Note

\*\* Please see document "Vishay Material Category Policy": 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 absorbtion of 875 nm radiation in glass

PRODUCT SUMMARY						
COMPONENT	I <sub>e</sub> (mW/sr)	φ (deg)	λ <sub>p</sub> (nm)	t <sub>r</sub> (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-1¾			
TSHA5201	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾			
TSHA5202	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾			
TSHA5203	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾			

#### Note

· MOQ: minimum order quantity



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ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT		
Reverse voltage		V <sub>R</sub>	5	V		
Forward current		l <sub>F</sub>	100	mA		
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu s$	I <sub>FM</sub>	200	mA		
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	2.5	Α		
Power dissipation		P <sub>V</sub>	180	mW		
Junction temperature		Tj	100	°C		
Operating temperature range		T <sub>amb</sub>	- 40 to + 85	°C		
Storage temperature range		T <sub>stg</sub>	- 40 to + 100	°C		
Soldering temperature	$t \le 5$ s, 2 mm from case	T <sub>sd</sub>	260	°C		
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R <sub>thJA</sub>	230	K/W		

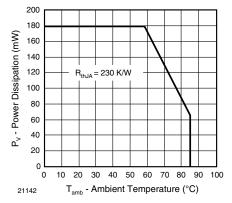


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

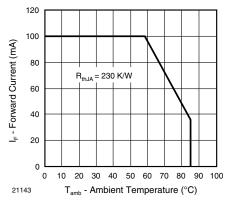


Fig. 2 - Forward Current Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION SYMBOL MIN. TYP. N		MAX.	UNIT			
Forward voltage	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V <sub>F</sub>		1.5	1.8	V	
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 100 mA	TK <sub>VF</sub>		- 1.6		mV/K	
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>			100	μΑ	
Junction capacitance	$V_R = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	Cj		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	λρ		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	
Piece Piece	I <sub>F</sub> = 100 mA	t <sub>r</sub>		600		ns	
Rise time	I <sub>F</sub> = 1 A	t <sub>r</sub>		300	300	ns	
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>		600		ns	
raii tiirie	I <sub>F</sub> = 1 A	t <sub>f</sub>		300		ns	
Virtual source diameter		d		3.7		mm	



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TYPE DEDICATED CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
		TSHA5200	$V_{F}$		2.8	3.5	V
Command valtage	I 1 A + 100 ···	TSHA5201	V <sub>F</sub>		2.8	3.5	V
Forward voltage	$I_F = IA$ , $I_p = 100 \mu S$	$I_F = 1 \text{ A}, t_p = 100  \mu \text{s}$ $TSHA5202 \qquad V_F$	2.8	3.5	V		
		TSHA5203	V <sub>F</sub>		2.8	3.5	V
		TSHA5200	I <sub>e</sub>	25	40	125	mW/sr
	100 4 + 20	TSHA5201	l <sub>e</sub>	30	50	125	mW/sr
	$I_F = 100 \text{ mA}, t_p = 20 \mu s$	TSHA5202	l <sub>e</sub>	36	60	125	mW/sr
Dedient intensity		TSHA5203		125	mW/sr		
Radiant intensity		TSHA5200	l <sub>e</sub>	200	65 125 330	mW/sr	
	100	TSHA5201	l <sub>e</sub>	260	400		V mW/sr mW/sr mW/sr
	$I_F = 1 \text{ A}, t_p = 100 \mu s$	TSHA5202	l <sub>e</sub>	330	460		mW/sr
		TSHA5203 I <sub>e</sub> 400	400	530		mW/sr	
		TSHA5200	фe		22		mW
Padient newer	L = 100 mA + = 20 up	TSHA5201	фe		23		mW
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \mu s$	TSHA5202	фe		24		mW
		TSHA5203	Фe		25		mW

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

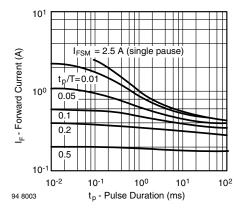


Fig. 3 - Pulse Forward Current vs. Pulse Duration

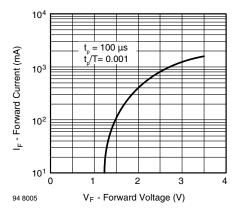


Fig. 4 - Forward Current vs. Forward Voltage

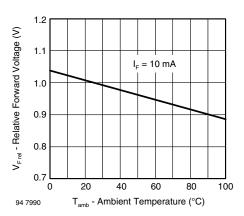


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

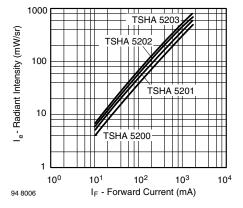


Fig. 6 - Radiant Intensity vs. Forward Current

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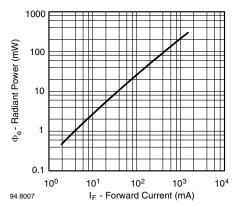


Fig. 7 - Radiant Power vs. Forward Current

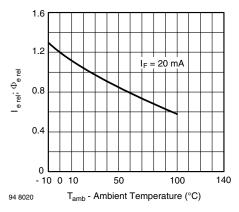


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

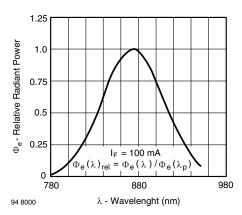


Fig. 9 - Relative Radiant Power vs. Wavelength

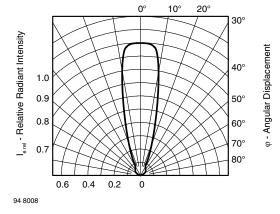
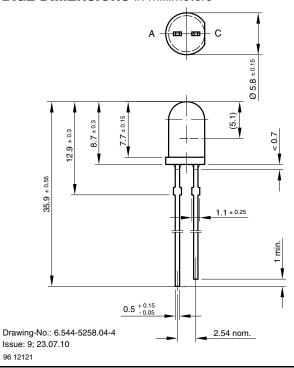
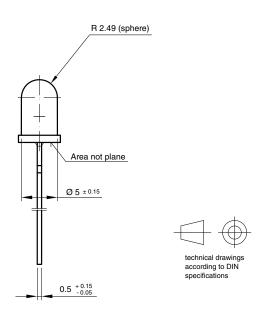


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

### **PACKAGE DIMENSIONS** in millimeters





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