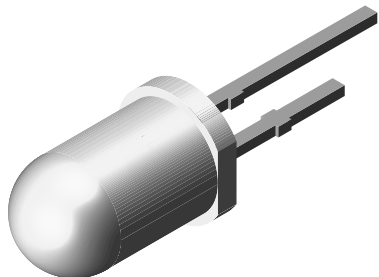




## Infrared Emitting Diode, 875 nm, GaAlAs



### 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### DESCRIPTION

The TSHA520. 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)	$\varphi$ (°)	$\lambda_p$ (nm)	$t_r$ (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	$t \leq 5\text{ s}, 2\text{ mm from case}$	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal resistance junction to ambient	J-STD-051, leads 7 mm, soldered on PCB	$R_{thJA}$	230	K/W

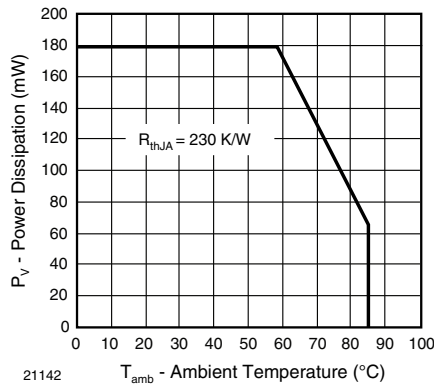


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

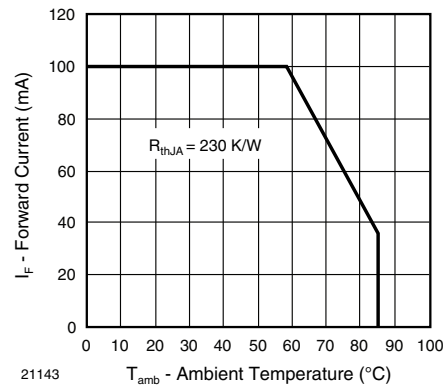


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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		$\phi$	-	$\pm 12$	-	$^{\circ}$
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 ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	TSHA5200	$V_F$	-	2.8	3.5	V
		TSHA5201	$V_F$	-	2.8	3.5	V
		TSHA5202	$V_F$	-	2.8	3.5	V
		TSHA5203	$V_F$	-	2.8	3.5	V
Radiant intensity	$I_F = 100\text{ mA}$ , $t_p = 20\text{ }\mu\text{s}$	TSHA5200	$I_e$	25	40	125	mW/sr
		TSHA5201	$I_e$	30	50	125	mW/sr
		TSHA5202	$I_e$	36	60	125	mW/sr
		TSHA5203	$I_e$	50	65	125	mW/sr
	$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	TSHA5200	$I_e$	200	330	-	mW/sr
		TSHA5201	$I_e$	260	400	-	mW/sr
		TSHA5202	$I_e$	330	460	-	mW/sr
		TSHA5203	$I_e$	400	530	-	mW/sr
Radiant power	$I_F = 100\text{ mA}$ , $t_p = 20\text{ }\mu\text{s}$	TSHA5200	$\phi_e$	-	22	-	mW
		TSHA5201	$\phi_e$	-	23	-	mW
		TSHA5202	$\phi_e$	-	24	-	mW
		TSHA5203	$\phi_e$	-	25	-	mW

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

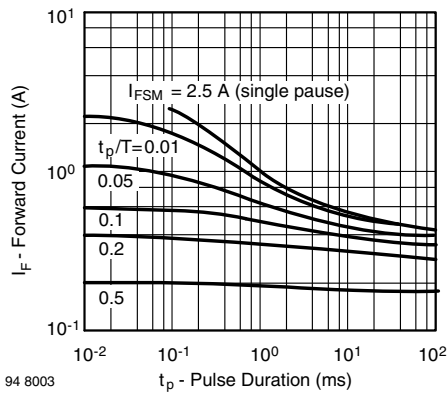


Fig. 3 - Pulse Forward Current vs. Pulse Duration

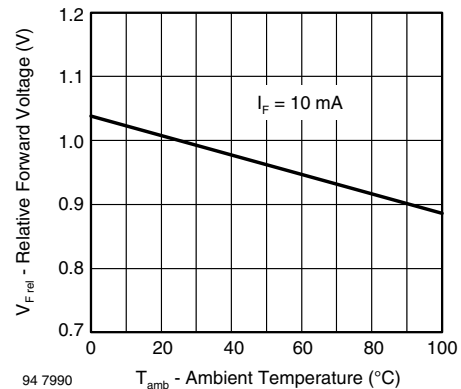


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

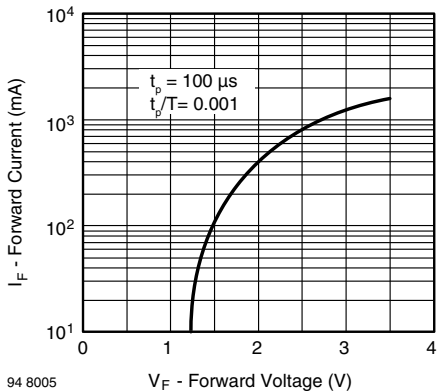


Fig. 4 - Forward Current vs. Forward Voltage

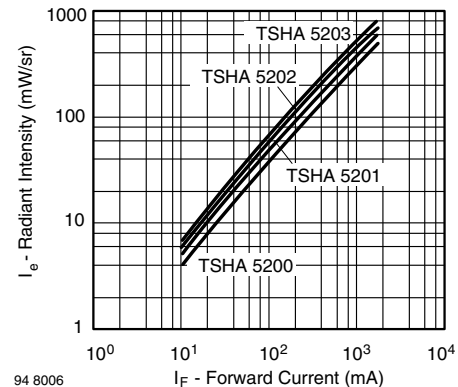


Fig. 6 - Radiant Intensity vs. Forward Current

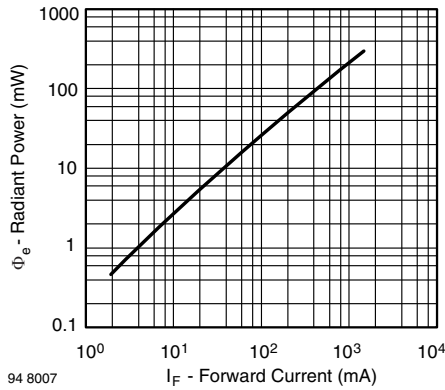


Fig. 7 - Radiant Power vs. Forward Current

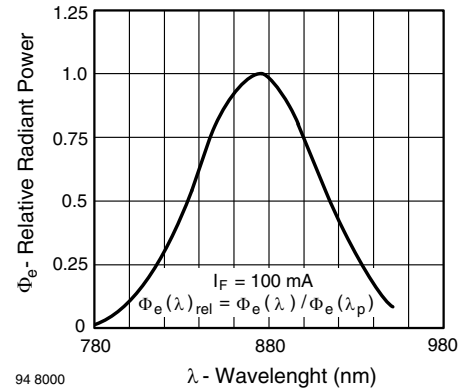


Fig. 9 - Relative Radiant Power vs. Wavelength

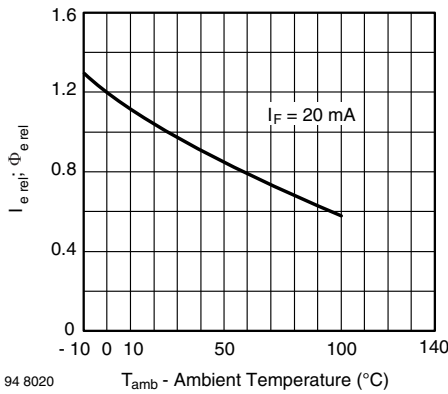


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

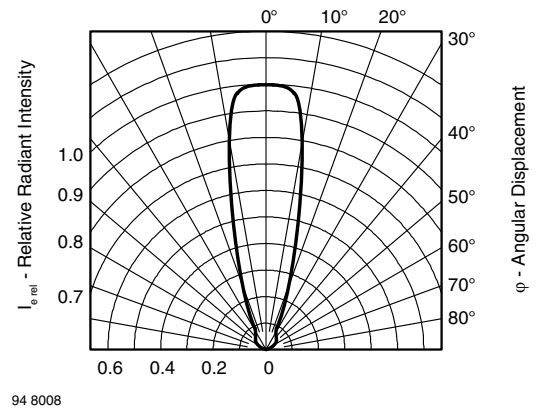


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement





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