TSTA7100, TSTA7300, TSTA7500 - Change in chip

For further information, please contact your regional Vishay office.

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Description of Change: Introduce the new state-of-the art Chip technology (MOCVD) to ensure long term availability of product series.
The new chip generation will have Higher radiant intensity,Higher radiant power,Change in spectral response and a slightly higher forward voltage.

For detailed overview, please refer to the changes summary in the attachment.

Reason for Change: Introduce the new state-of-the art Chip technology (MOCVD)

Expected Influence on Quality/Reliability/Performance: No influence on quality and reliability expected. Nevertheless, we request the customer to test the parts in customers application.

Part Numbers/Series/Families Affected: TSTA7100, TSTA7300, TSTA7500,

Vishay Brand(S): Vishay Semiconductors

Time Schedule:
Start Shipment Date: Mon Sep 2, 2024

Sample Availability: 05/30/2024

Product Identification: Date code

Qualification Data: Available upon request

This PCN is considered approved, without further notification, unless we receive specific customer concerns before Tue Aug 27, 2024 or as specified by contract.

Issued By: Mohankumar Kannusamy, mohankumar.kannusamy@vishay.com

TSTA7100, TSTA7300, TSTA7500

Change overview

PCN - TSTA7100, TSTA7300, TS

Key changes:

- Higher radiant intensity
- Higher radiant power
- Change in spectral response
- Slightly higher forward voltage

TSTA7100

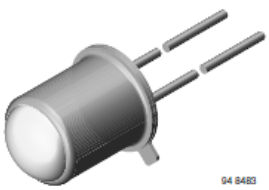
Page 1 of the datasheet - Introduction

PRE PCN

TSTA7100

Vishay Semiconductors

Infrared Emitting Diode, RoHS Compliant, 875 nm, GaAlAs



FEATURES

- Package type: leaded
- Package form: TO-18
- Dimensions (in mm): ⌀ 4.7
- Peak wavelength: λ_p = 875 nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: φ = ± 5°
- 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

- Radiation source near infrared range

DESCRIPTION

TSTA7100 is an infrared, 875 nm emitting diode in GaAlAs technology in a hermetically sealed TO-18 package with lens.

After PCN – wit

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Infrared Emit
Su

DESCRIPTION

TSTA7100 is an infrared, 890 nm emitti
surface emitting chip technology in a
TO-18 package with lens.

Page 1 of the datasheet – Product Summary

PRE PCN

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
TSTA7100	50	± 5	875	600

Note
Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSTA7100	Bulk	MOQ: 1000 pcs, 1000 pcs/bulk	TO-18

Note
MOQ: minimum order quantity

After PCN – wit

PRODUCT SUMMARY

COMPONENT
TSTA7100

Note
- Test conditions see table "Basic Charac

ORDERING INFORMATION

ORDERING CODE
TSTA7100

Note
- MOQ: minimum order quantity

Page 1&2 of the datasheet– Abs. max. rating

PRE PCN

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	100	mA
Peak forward current	$t_p/T = 0.5$, $t_p \leq 100$ µs	I_{FM}	200	mA
Surge forward current	$t_p \leq 100$ µs	I_{FSM}	2.5	A
Power dissipation		P_V	180	mW
	$T_{case} \leq 25$ °C	P_V	500	mW
Junction temperature		T_j	100	°C
Storage temperature range		T_{stg}	- 55 to + 100	°C
Thermal resistance junction/ambient	leads not soldered	R_{thJA}	450	K/W
Thermal resistance junction/case	leads not soldered	R_{thJC}	150	K/W

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

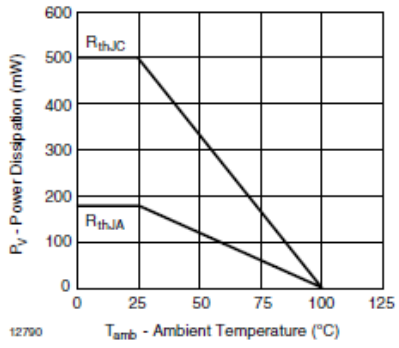


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

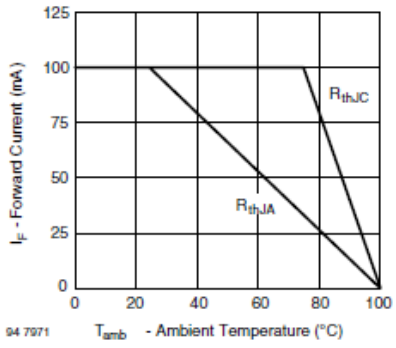


Fig. 2 - Forward Current Limit vs. Ambient Temperature

After PCN – wit

ABSOLUTE MAXIMUM RATIN

PARAMETER
Reverse voltage
Forward current
Power dissipation
Junction temperature
Ambient temperature range
Storage temperature range
Soldering temperature
Thermal resistance junction to ambient

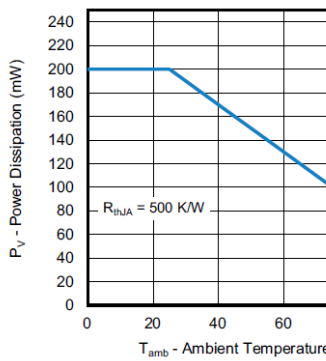


Fig. 1 - Power Dissipation Limit vs. Am

Page 2 of the datasheet – Basic Characteris

PRE PCN

BASIC CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I_F = 100 mA, $t_p \leq$ 20 ms	V_F		1.4	1.8	V
Breakdown voltage	I_R = 100 µA	$V_{(BR)}$	5			V
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_j		20		pF
Radiant intensity	I_F = 100 mA, $t_p \leq$ 20 ms	I_e	20	50	100	mW/sr
Radiant power	I_F = 100 mA, $t_p \leq$ 20 ms	ϕ_e		10		mW
Temperature coefficient of ϕ_e	I_F = 100 mA	$TK\phi_e$		- 0.7		%/K
Angle of half intensity		φ		± 5		deg
Peak wavelength	I_F = 100 mA	λ_p		875		nm
Spectral bandwidth	I_F = 100 mA	$\Delta\lambda$		80		nm
Rise time	I_F = 100 mA	t_r		600		ns
	I_F = 1.5 A, t_p/T = 0.01, $t_p \leq$ 10 µs	t_r		300		ns
Virtual source diameter		d		1.5		mm

Note

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

After PCN – wit

BASIC CHARACTERISTICS (T_a

PARAMETER	
Forward voltage	
Temperature coefficient of V_F	
Reverse current	
Junction capacitance	V_R =
Radiant intensity	
Radiant power	
Temperature coefficient of ϕ_e	
Angle of half intensity	
Peak wavelength	
Spectral bandwidth	
Temperature coefficient of V_F	
Rise time	

Page 3 of the datasheet - Graphs

PRE PCN

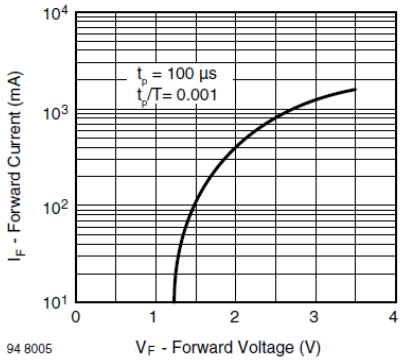


Fig. 4 - Forward Current vs. Forward Voltage

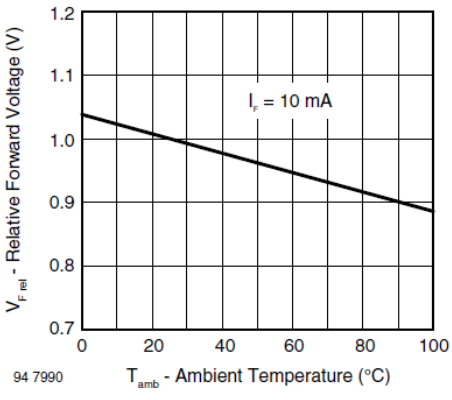


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

After PCN – wit

Page 3 of the datasheet - Graphs

PRE PCN

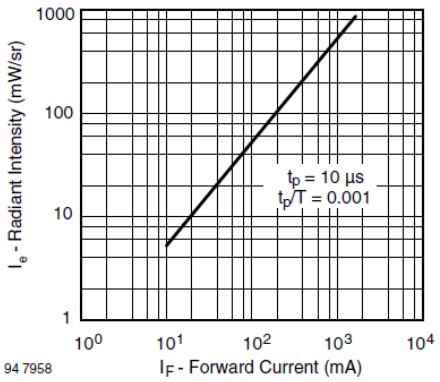


Fig. 6 - Radiant Intensity vs. Forward Current

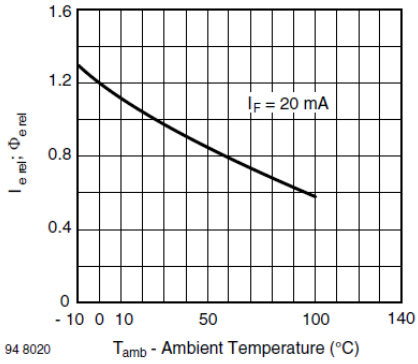
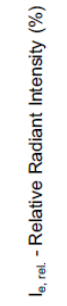


Fig. 8 - Rel. Radiant Intensity/Power vs. Ambient Temperature

After PCN – wit



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Page 3 of the datasheet - Graphs

PRE PCN

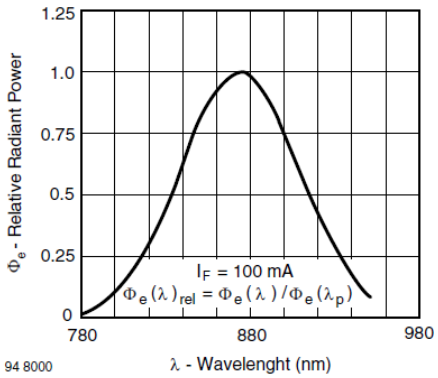


Fig. 9 - Relative Radiant Power vs. Wavelength

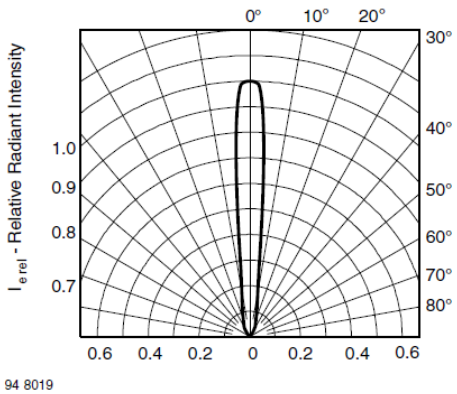
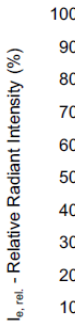


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

After PCN – wit



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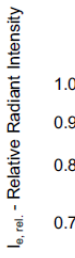

Fig. 8 -

Additional comments

- Following generic pulse handling graph deleted in datashee
  taken from App Note “Driving an Infrared Emitter in Steady a
  (84155)” generic pulse

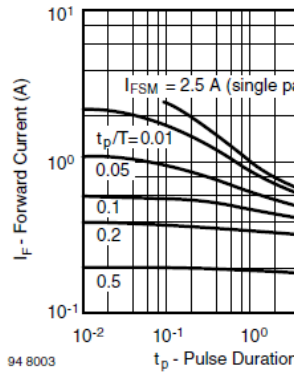

Fig. 3 - Pulse Forward Current vs

- Following graph deleted in datasheet. It is covered by Graph
  Forward Current

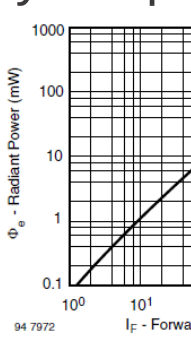

Fig. 7 - Radiant Power

TSTA7300

Page 2 of the datasheet – Basic Characteris

PRE PCN

After PCN – wit

BASIC CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I_F = 100 mA, $t_p \leq 20$ ms	V_F		1.4	1.8	V
Breakdown voltage	I_R = 100 µA	$V_{(BR)}$	5			V
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_j		20		pF
Radiant intensity	I_F = 100 mA, $t_p \leq 20$ ms	I_e	10	20	50	mW/sr
Radiant power	I_F = 100 mA, $t_p \leq 20$ ms	ϕ_e		10		mW
Temperature coefficient of ϕ_e	I_F = 100 mA	$TK\phi_e$		- 0.7		%/K
Angle of half intensity		φ		± 12		deg
Peak wavelength	I_F = 100 mA	λ_p		875		nm
Spectral bandwidth	I_F = 100 mA	$\Delta\lambda$		80		nm
Rise time	I_F = 100 mA	t_r		600		ns
	I_F = 1.5 A, t_p/T = 0.01, $t_p \leq 10$ µs	t_r		300		ns
Virtual source diameter		d		1		mm

Note

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

BASIC CHARACTERISTICS (T_j

PARAMETER	
Forward voltage	
Temperature coefficient of V_F	
Reverse current	
Junction capacitance	V_R
Radiant intensity	
Radiant power	
Temperature coefficient of ϕ_e	
Angle of half intensity	
Peak wavelength	
Spectral bandwidth	
Temperature coefficient of V_F	
Rise time	

Page 3 of the datasheet - Graphs

PRE PCN

After PCN – wit

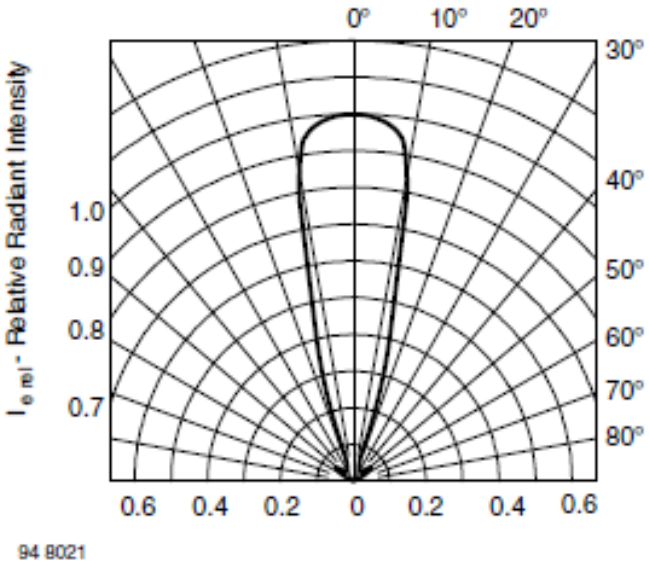

Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

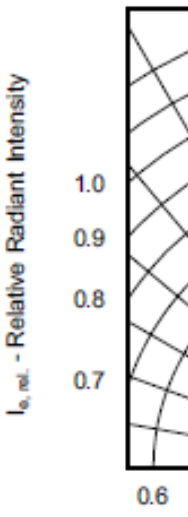

Fig. 8 - Relati

TSTA7500

Page 2 of the datasheet – Basic Characteris

PRE PCN

BASIC CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I_F = 100 mA, $t_p \leq 20$ ms	V_F		1.4	1.8	V
Breakdown voltage	I_R = 100 µA	$V_{(BR)}$	5			V
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_j		20		pF
Radiant intensity	I_F = 100 mA, $t_p \leq 20$ ms	I_e	3.5	6	16	mW/sr
Radiant power	I_F = 100 mA, $t_p \leq 20$ ms	ϕ_e		10		mW
Temperature coefficient of ϕ_e	I_F = 100 mA	$TK\phi_e$		- 0.7		%/K
Angle of half intensity		φ		± 30		deg
Peak wavelength	I_F = 100 mA	λ_p		875		nm
Spectral bandwidth	I_F = 100 mA	$\Delta\lambda$		80		nm
Rise time	I_F = 100 mA	t_r		600		ns
	I_F = 1.5 A, t_p/T = 0.01, $t_p \leq 10$ µs	t_r		300		ns
Virtual source diameter		d		0.5		mm

Note

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

After PCN – wit

BASIC CHARACTERISTICS (T

PARAMETER	
Forward voltage	
Temperature coefficient of V_F	
Reverse current	
Junction capacitance	V_R
Radiant intensity	
Radiant power	
Temperature coefficient of ϕ_e	
Angle of half intensity	
Peak wavelength	
Spectral bandwidth	
Temperature coefficient of V_F	
Rise time	

Page 3 of the datasheet - Graphs

PRE PCN

After PCN – wit

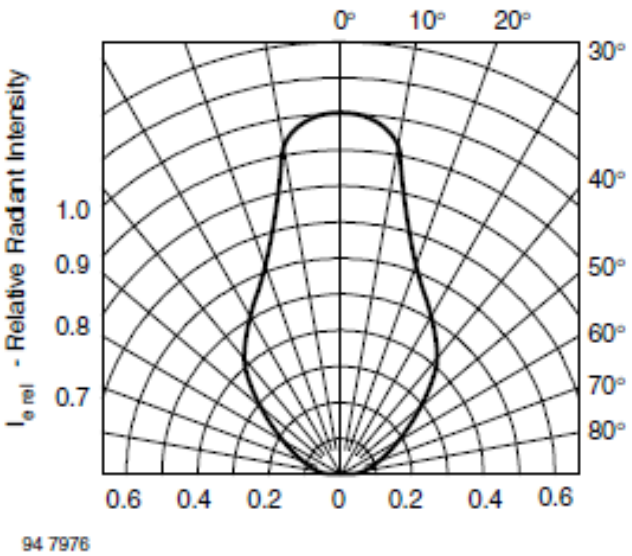

Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

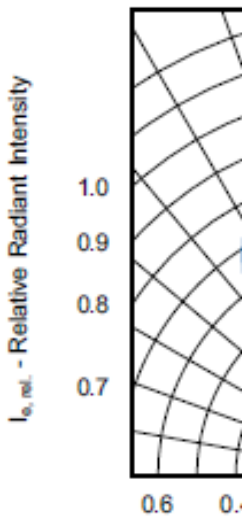

Fig. 8 - Relative R

TSTA7100, TSTA73000 & TSTA75000

After PCN – with surface emitting chip technology

- For the TSTA7100, TSTA73000 & TSTA75000 the
  different packages – hence no change in the elect
  between the post PCN parts

- Differences between the TSTA7100, TSTA73000 &
  seen in the optical parameters of the angular and
  part

Thank you