TSTS7100, TSTS7300, TSTS7500- 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 and 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: TSTS7100, TSTS7300, TSTS7500,

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 Sun Aug 25, 2024 or as specified by contract.

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

TSTS7100, TSTS7300, TSTS7500

Change overview

PCN - TSTS7100, TSTS7300, TS

Key changes:

-Higher radiant intensity
-Higher radiant power
-Slightly higher forward voltage

TSTS7100

Page 1 of the datasheet - Introduction

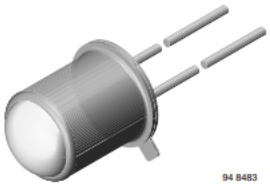
PRE PCN

TSTS7100

Vishay Semiconductors

VISHAY

Infrared Emitting Diode, RoHS Compliant, 950 nm, GaAs



FEATURES

- Package type: leaded
- Package form: TO-18
- Dimensions (in mm): ∅ 4.7
- Peak wavelength: λ_p = 950 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

Pb-free

e4

RoHS COMPLIANT

APPLICATIONS

- Radiation source in near infrared range

DESCRIPTION

TSTS7100 is an infrared, 950 nm emitting diode in GaAs technology in a hermetically sealed TO-18 package with lens.

After PCN – wit

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Infrared Em

DESCRIPTION

TSTS7100 is an infrared, 950 nm emitt
multi quantum well (MQW) technolog
sealed 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)
TSTS7100	> 10	± 5	950	800

Note
Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSTS7100	Bulk	MOQ: 1000 pcs, 1000 pcs/bulk	TO-18

Note
MOQ: minimum order quantity

After PCN – wit

PRODUCT SUMMARY

COMPONENT
TSTS7100

Note
- Test conditions see table "Basic Charact

ORDERING INFORMATION

ORDERING CODE
TSTS7100

Note
- MOQ: minimum order quantity

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

PRE PCN

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current	$T_{case} \leq 25$ °C	I_F	250	mA
Peak forward current	$t_p/T = 0.5$, $t_p \leq 100$ µs, $T_{case} \leq 25$ °C	I_{FM}	500	mA
Surge forward current	$t_p \leq 100$ µs	I_{FSM}	2.5	A
Power dissipation		P_V	170	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

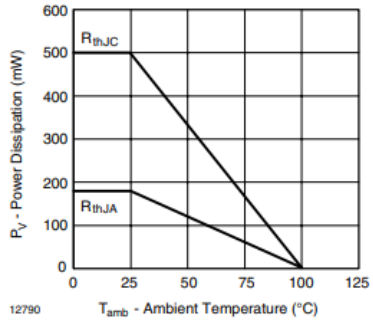

Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

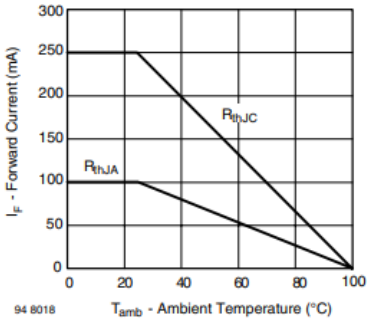

Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

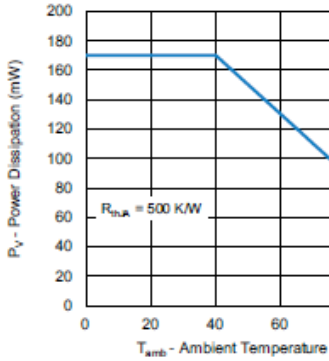

Fig. 1 - Power Dissipation Limit vs. Am

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		1.3	1.7	V
Temperature coefficient of V_F	I_F = 100 mA	TK_{VF}		- 1.3		mV/K
Breakdown voltage	I_R = 100 µA	$V_{(BR)}$	5			V
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_j		30		pF
Radiant intensity	I_F = 100 mA, t_p = 20 ms	I_e	10		50	mW/sr
Radiant power	I_F = 100 mA, $t_p \leq 20$ ms	ϕ_e		7		mW
Temperature coefficient of ϕ_e	I_F = 100 mA	$TK\phi_e$		- 0.8		%/K
Angle of half intensity		φ		± 5		deg
Peak wavelength	I_F = 100 mA	λ_p		950		nm
Spectral bandwidth	I_F = 100 mA	$\Delta\lambda$		50		nm
Rise time	I_F = 100 mA	t_r		800		ns
	I_F = 1.5 A, t_p/T = 0.01, $t_p \leq 10$ µs	t_r		400		ns
Virtual source diameter		d		1.5		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 λ_p	
Rise time	
Fall time	

Page 3 of the datasheet - Graphs

PRE PCN

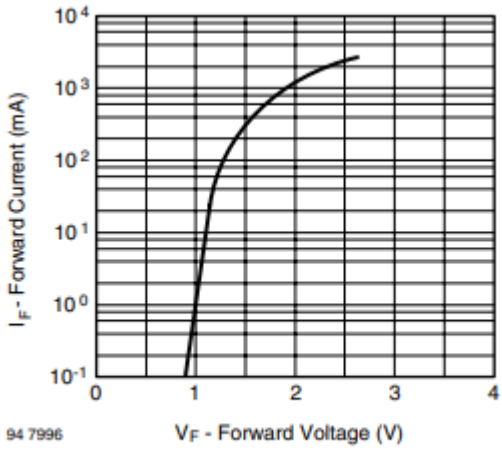

Fig. 4 - Forward Current vs. Forward Voltage

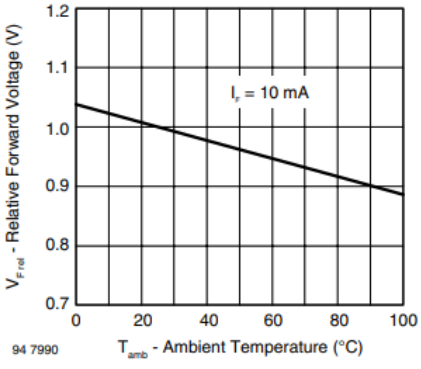

Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

After PCN – wit

Page 3 of the datasheet - Graphs

PRE PCN

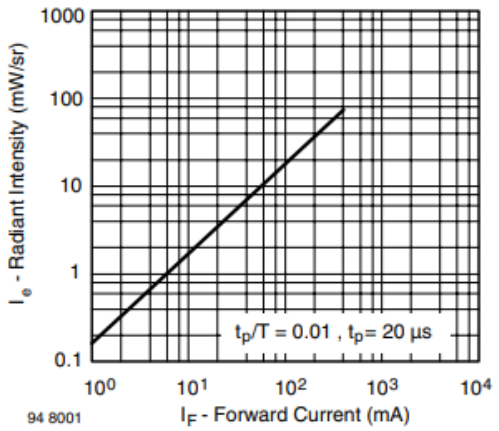

Fig. 6 - Radiant Intensity vs. Forward Current

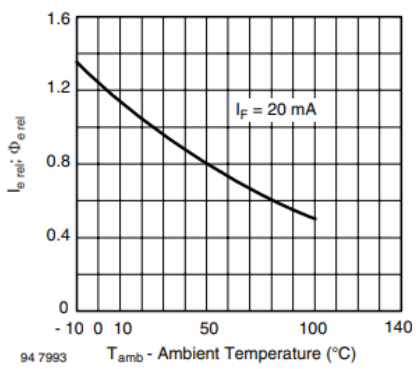

Fig. 8 - Rel. Radiant Intensity/Power vs. Ambient Temperature

After PCN – wit

Fig

Page 3 of the datasheet - Graphs

PRE PCN

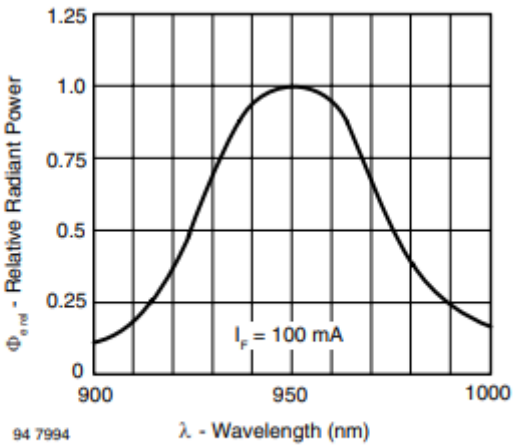

Fig. 9 - Relative Radiant Power vs. Wavelength

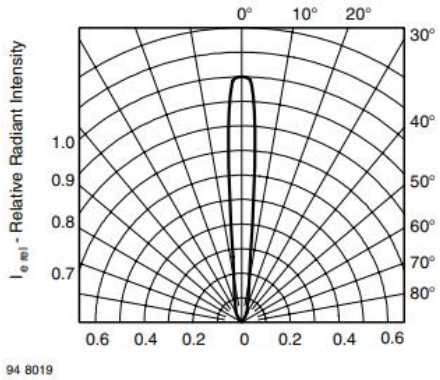

Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

After PCN – wit

Additional comments

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

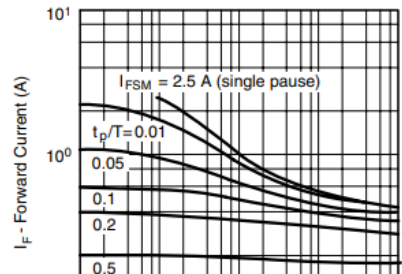

Fig. 3 - Pulse Forward Current vs. Pulse Duratio

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

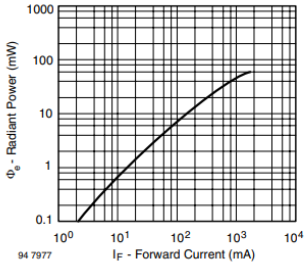

Fig. 7 - Radiant Power vs. Forward Current

TSTS7300

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		1.3	1.7	V
Temperature coefficient of V_F	I_F = 100 mA	TK_{VF}		- 1.3		mV/K
Breakdown voltage	I_R = 100 µA	$V_{(BR)}$	5			V
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_j		30		pF
Radiant intensity	I_F = 100 mA, t_p = 20 ms	I_e	4	6.3	32	mW/sr
Radiant power	I_F = 100 mA, $t_p \leq$ 20 ms	ϕ_e		7		mW
Temperature coefficient of ϕ_e	I_F = 100 mA	$TK\phi_e$		- 0.8		%/K
Angle of half intensity		φ		± 12		deg
Peak wavelength	I_F = 100 mA	λ_p		950		nm
Spectral bandwidth	I_F = 100 mA	$\Delta\lambda$		50		nm
Rise time	I_F = 100 mA	t_r		800		ns
	I_F = 1.5 A, t_p/T = 0.01, $t_p \leq$ 10 µs	t_r		400		ns
Virtual source diameter		d		1		mm

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

After PCN – wit

BASIC CHARACTERISTICS (
PARAMETER
Forward voltage
Temperature coefficient of V_F
Reverse current
Junction capacitance
Radiant intensity
Radiant power
Temperature coefficient of ϕ_e
Angle of half intensity
Peak wavelength
Spectral bandwidth
Temperature coefficient of λ_p
Rise time
Fall time

Page 3 of the datasheet - Graphs

PRE PCN

After PCN – wit

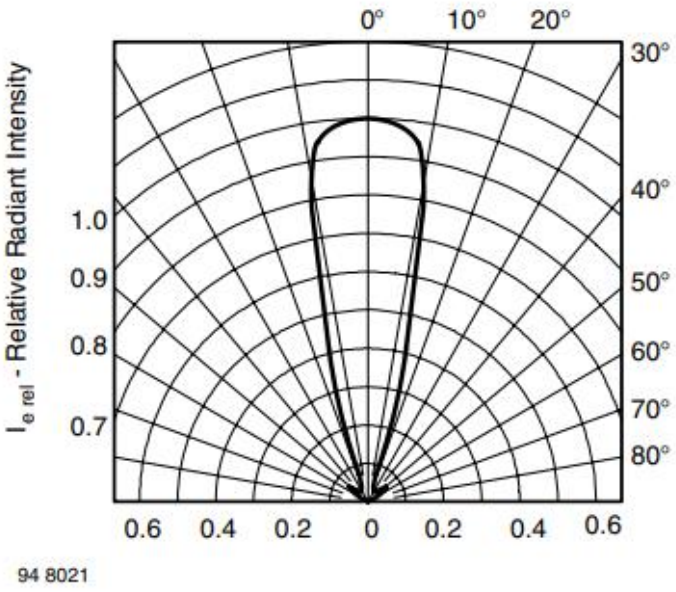

Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

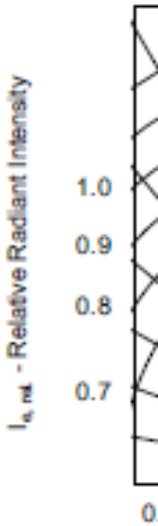

Fig. 8 - Rel

TSTS7500

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		1.3	1.7	V
Temperature coefficient of V_F	I_F = 100 mA	TK_{VF}		- 1.3		mV/K
Breakdown voltage	I_R = 100 µA	$V_{(BR)}$	5			V
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_j		30		pF
Radiant intensity	I_F = 100 mA, t_p = 20 ms	I_e	1.25	1.6	8	mW/sr
Radiant power	I_F = 100 mA, $t_p \leq$ 20 ms	ϕ_e		7		mW
Temperature coefficient of ϕ_e	I_F = 100 mA	$TK\phi_e$		- 0.8		%/K
Angle of half intensity		φ		± 30		deg
Peak wavelength	I_F = 100 mA	λ_p		950		nm
Spectral bandwidth	I_F = 100 mA	$\Delta\lambda$		50		nm
Rise time	I_F = 100 mA	t_r		800		ns
	I_F = 1.5 A, t_p/T = 0.01, $t_p \leq$ 10 µs	t_r		400		ns
Virtual source diameter		d		0.5		mm

Note

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

After PCN – wit

BASIC CHARACTERISTICS

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

Page 3 of the datasheet - Graphs

PRE PCN

After PCN – wit

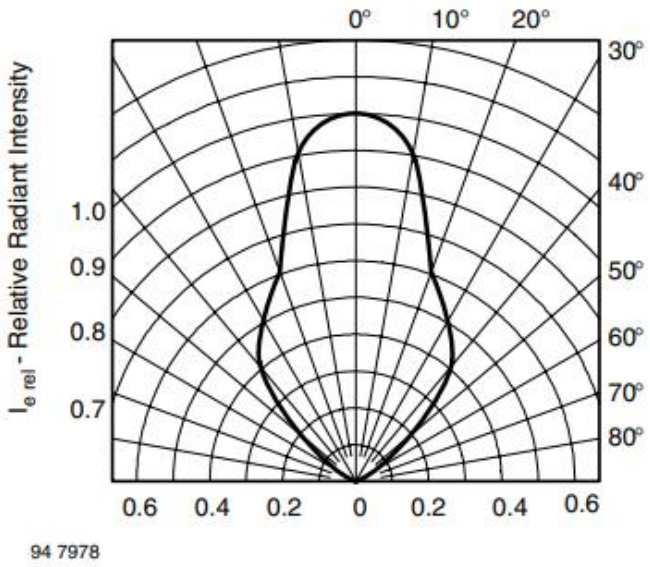

Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

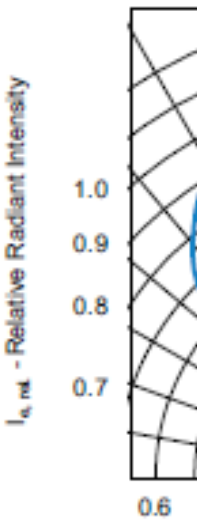

Fig. 8 - Relativ

TSTS7100, TSTS73000 & TSTS75000

After PCN – with surface emitting chip technology

- For the TSTS7100, TSTS73000 & TSTS75000 the
  different packages – hence no change in the elect
  between the post PCN parts

- Differences between the three parts are only seen
  of the angular and intensity behaviour of the part

Thank you