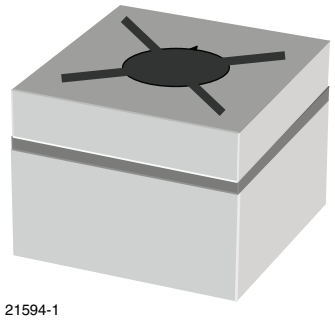
Specification of GaAlAs IR Emitting Diode Chip



21594-1

FEATURES

- Package type: chip
- Package form: single chip
- Technology: double hetero
- Dimensions chip (L x W x H in mm): 0.37 x 0.37 x 0.16
- Peak wavelength: λ = 865 nm
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e4

RoHS COMPLIANT

DESCRIPTION

T8714VA is an infrared, 865 nm emitting diode in GaAlAs double hetero technology with high radiant power and high speed. Anode is the bond pad on top.

GENERAL INFORMATION

The datasheet is based on Vishay optoelectronics sample testing under certain predetermined and assumed conditions, and is provided for illustration purpose only. Customers are encouraged to perform testing in actual proposed packaged and used conditions. Vishay optoelectronics die products are tested using Vishay optoelectronics based quality assurance procedures and are manufactured using Vishay optoelectronics established processes. Estimates such as those described and set forth in this datasheet for semiconductor die will vary depending on a number of packaging, handling, use, and other factors. Therefore sold die may not perform on an equivalent basis to standard package products.

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
T8714VA	4.2	> ± 80	865	13

Note

Test condition see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
T8714VA-SF-F	Wafer sawn on foil	MOQ: 25 000 pcs	Chip

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current		I_F	100	mA
Reverse voltage		V_R	5	V
Surge forward current	t_p = 100 µs	I_{FSM}	1	A
Junction temperature		T_j	125	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range chip		T_{stg1}	- 40 to + 100	°C
Storage temperature range on foil		T_{stg2}	- 40 to + 50	°C

Note

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

BASIC CHARACTERISTICS (1)

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I_F = 100 mA	V_F		1.5		V
Radiant power (2)	I_F = 100 mA	ϕ_e		26		mW
Radiant intensity (3)	I_F = 100 mA	I_e		4.2		mW/sr
Radiant power (epoxy encapsulated)	I_F = 100 mA	ϕ_e		52		mW
Radiant power chip (4)	I_F = 50 mA	ϕ_e	4.4	5.8	7.2	mW
Temperature coefficient of radiant power	I_F = 100 mA	$TK_{\phi e}$		- 0.35		%/K
Reverse voltage	I_R = 10 µA	V_R	5	18		V
Temperature coefficient of forward voltage	I_F = 1 mA	TK_{VF}		- 1.8		mV/K
Angle of half intensity	I_F = 100 mA	φ		> ± 80		deg
Peak wavelength	I_F = 30 mA	λ_p	850	865	880	nm
Spectral bandwidth	I_F = 30 mA	$\lambda_{0.5}$		48		nm
Rise time/fall time	I_F = 100 mA	t_r, t_f		13		ns

Notes

(1) T_{amb} = 25 °C, unless otherwise specified
(2) The measurements are based on samples of die which are mounted on a TO-18 gold header without resin coating
(3) The radiant intensity, I_e, is measured on the geometric axis of the TO-18 header
(4) The radiant power, ϕ_e, is measured with chip on bare plate and aperture angle about 30°, as indicated on the label of each wafer

BASIC CHARACTERISTICS

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

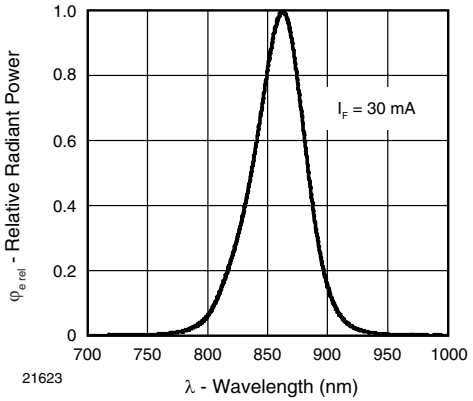


Fig. 1 - Relative Spectral Emission
$\phi_{e\,rel} = f(\lambda)$

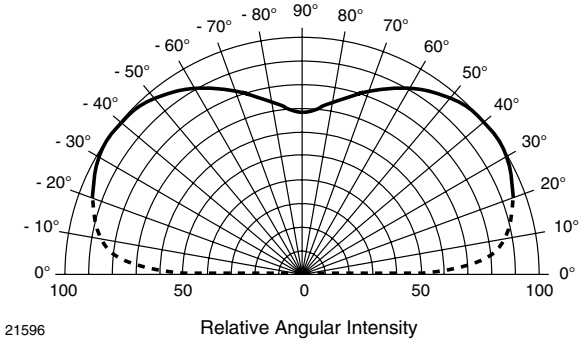


Fig. 2 - Radiant Characteristics
$I_{rel} = f(\varphi)$

DIMENSIONS

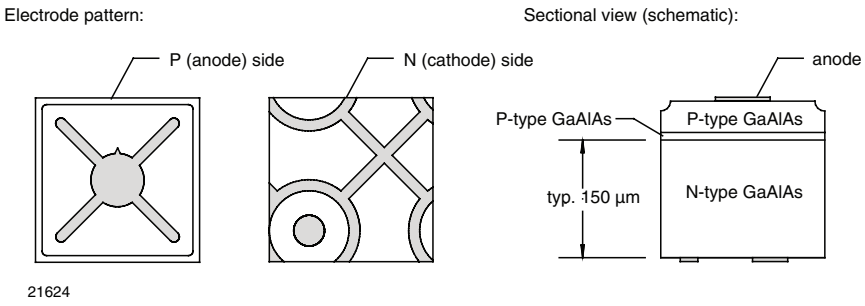


Fig. 3

MECHANICAL DIMENSIONS					
PARAMETER	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Length of chip edge (x-direction)	L_x		0.37		mm
Length of chip edge (y-direction)	L_y		0.37		mm
Emission area	A_E		0.325 x 0.325		mm^2
Die height	H		0.16		mm
Diameter of bondpad	d		0.14		mm

ADDITIONAL INFORMATION (1)	
Frontside metallization, anode	Aluminum
Backside metallization, cathode	Gold alloy
Dicing	Sawing
Die bonding technology	Epoxy bonding

Note

(1) All chips are checked in accordance with the Vishay Semiconductor, specification of visual inspection FVOV6870.
The visual inspection shall be made in accordance with the “specification of visual inspection as referenced”. The visual inspection of chip backside is performed with stereo microscope with incident light and 40x to 80x magnification.
The quality inspection (final visual inspection) is performed by production. An additional visual inspection step as special release procedure by QM is not installed.

HANDLING AND STORAGE CONDITIONS

- The hermetically sealed shipment lots shall be opened in temperature and moisture controlled cleanroom environment only. It is mandatory to follow the rules for disposition of material that can be hazardous for humans and environment.
- Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263.
- Singulated die are not to be handled with tweezers. A vacuum wand with non metallic ESD protected tip should be used.

PACKING

Chips are fixed on adhesive foil. Upon request the foils can be mounted on plastic frame or disco frame. For shipment, the wafers are arranged to stacks and hermetically sealed in plastic bags to ensure protection against environmental influence (humidity and contamination).
Use for recycling reliable operators only. We can help getting in touch with your nearest sales office. By agreement we will take back packing material, if it is sorted. You will have to bear the costs of transport. We will invoice you for any costs incurred for packing material that is returned unsorted or which we are not obliged to accept.

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.