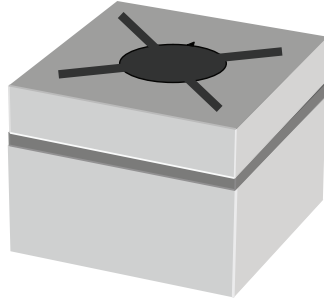


Specification of GaAlAs IR Emitting Diode Chip



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: $\lambda = 865 \text{ nm}$
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC


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 | $> \pm 80$ | 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 | $t_p = 100 \mu\text{s}$ | I_{FSM} | 1 | A |
| Junction temperature | | T_j | 125 | $^{\circ}\text{C}$ |
| Operating temperature range | | T_{amb} | - 40 to + 100 | $^{\circ}\text{C}$ |
| Storage temperature range chip | | T_{stg1} | - 40 to + 100 | $^{\circ}\text{C}$ |
| Storage temperature range on foil | | T_{stg2} | - 40 to + 50 | $^{\circ}\text{C}$ |

Note

$T_{amb} = 25 \text{ }^{\circ}\text{C}$, unless otherwise specified

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

Notes

- (1) $T_{amb} = 25 \text{ }^\circ\text{C}$, 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

$T_{amb} = 25 \text{ }^\circ\text{C}$, unless otherwise specified

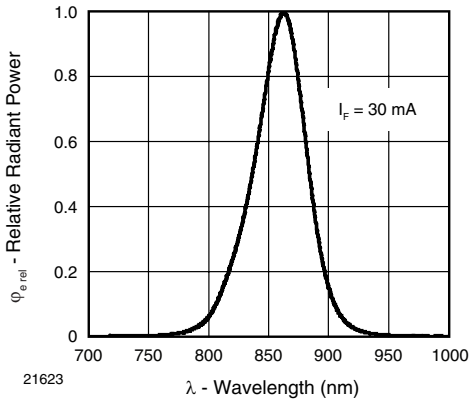


Fig. 1 - Relative Spectral Emission
 $\phi_{e,rel} = f(\lambda)$

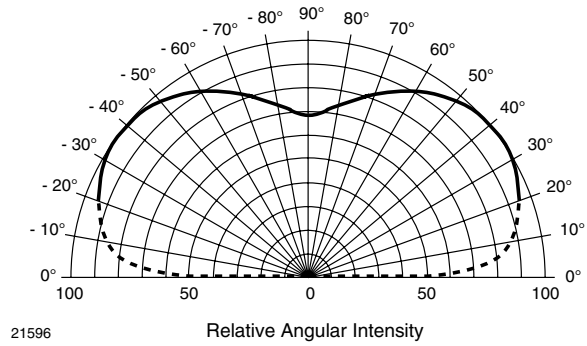


Fig. 2 - Radiant Characteristics
 $I_{rel} = f(\varphi)$

DIMENSIONS

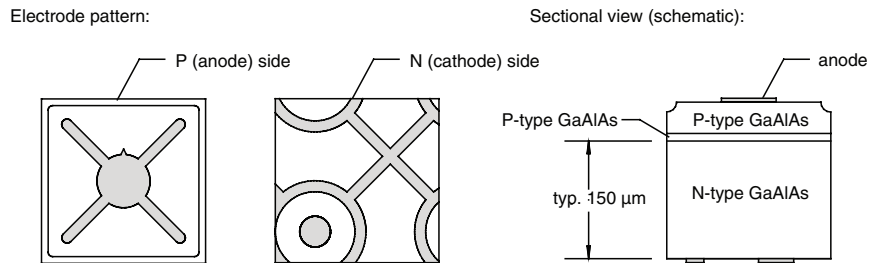


Fig. 3

**Specification of GaAIAs IR Emitting Vishay Semiconductors Diode Chip**

| 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 specifications and data are subject to change without notice.

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 herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

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.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.