Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

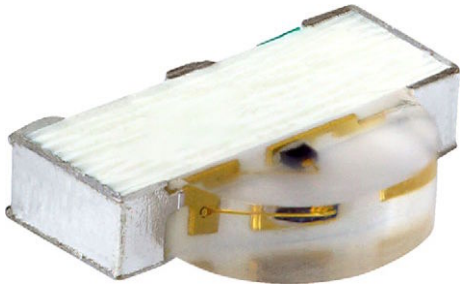
With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!


## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

# High Speed Infrared Emitting Diode, 940 nm, GaAlAs, MQW



## FEATURES

- Package type: surface mount
- Package form: side view
- Dimensions (L x W x H in mm): 3 x 2 x 0.6
- AEC-Q101 qualified
- Peak wavelength: $\lambda_p$ = 940 nm
- High reliability
- High radiant power
- High radiant intensity
- High speed
- Angle of half intensity: $\varphi$ = ± 75°
- Low forward voltage
- Package matches with detector VEMD11940FX01
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

## DESCRIPTION

VSMB11940X01 is an infrared, 940 nm side looking emitting diode in GaAlAs multi quantum well (MQW) technology with high radiant power and high speed, molded in clear, untinted plastic package (with lens) for surface mounting (SMD).

## APPLICATIONS

- IR touch panel
- High power emitter for low space applications
- High performance transmissive or reflective sensors

## PRODUCT SUMMARY

| COMPONENT | $I_e$ (mW/sr), 20 mA | $\varphi$ (deg) | $\lambda_p$ (nm) | $t_r$ (ns) |
|---|---|---|---|---|
| VSMB11940X01 | 1 | ± 75 | 940 | 15 |

**Note**

- Test conditions see table “Basic Characteristics“

## ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---|---|---|---|
| VSMB11940X01 | Tape and reel | MOQ: 4000 pcs, 4000 pcs/reel | side view |

**Note**

- MOQ: minimum order quantity

## ABSOLUTE MAXIMUM RATINGS ($T_{amb}$ = 25 °C, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Reverse voltage | | $V_R$ | 5 | V |
| Forward current | | $I_F$ | 65 | mA |
| Peak forward current | $t_p/T$ = 0.5, $t_p$ = 100 µs | $I_{FM}$ | 130 | mA |
| Surge forward current | $t_p$ = 100 µs | $I_{FSM}$ | 500 | mA |
| Power dissipation | | $P_V$ | 104 | mW |
| Junction temperature | | $T_j$ | 100 | °C |
| Operating temperature range | | $T_{amb}$ | -40 to +85 | °C |
| Storage temperature range | | $T_{stg}$ | -40 to +100 | °C |
| Soldering temperature | According to Fig. 9, J-STD-020 | $T_{sd}$ | 260 | °C |
| Thermal resistance junction / ambient | JESD 51 | $R_{thJA}$ | 580 | K/W |



For technical questions, contact: emittertechsupport@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

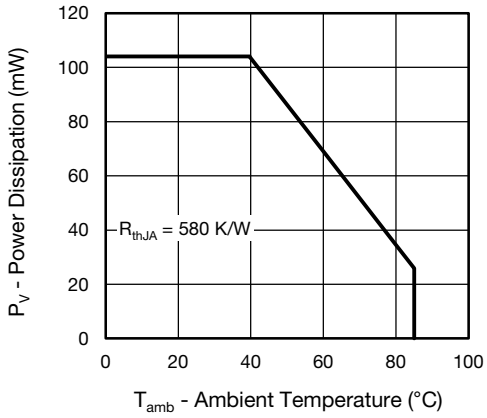



Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

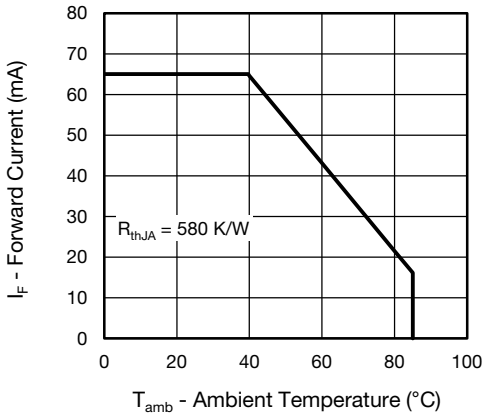



Fig. 2 - Forward Current Limit vs. Ambient Temperature

| **BASIC CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **MIN.** | **TYP.** | **MAX.** | **UNIT** |
| Forward voltage | $I_F$ = 20 mA, $t_p$ = 20 ms | $V_F$ | 1.1 | 1.24 | 1.5 | V |
| | $I_F$ = 65 mA, $t_p$ = 20 ms | $V_F$ | - | 1.35 | - | V |
| | $I_F$ = 500 mA, $t_p$ = 100 µs | $V_F$ | - | 1.8 | - | V |
| Temperature coefficient of $V_F$ | $I_F$ = 1 mA | $TK_{VF}$ | - | -1.5 | - | mV/K |
| Reverse current | $V_R$ = 5 V | $I_R$ | - | - | 10 | µA |
| Junction capacitance | $V_R$ = 0 V, f = 1 MHz, E = 0 mW/cm$^2$ | $C_J$ | - | 21 | - | pF |
| Radiant intensity | $I_F$ = 20 mA, $t_p$ = 20 ms | $I_e$ | 0.5 | 1.0 | 1.5 | mW/sr |
| | $I_F$ = 65 mA, $t_p$ = 20 ms | $I_e$ | - | 3.2 | - | mW/sr |
| | $I_F$ = 500 mA, $t_p$ = 100 µs | $I_e$ | - | 20 | - | mW/sr |
| Radiant power | $I_F$ = 100 mA, $t_p$ = 20 ms | $\phi e$ | - | 35 | - | mW |
| Temperature coefficient of radiant power | $I_F$ = 100 mA | $TK\phi_e$ | - | -0.47 | - | %/K |
| Angle of half intensity - horizontal | | $\varphi_h$ | - | ± 77.5 | - | deg |
| Angle of half intensity - vertical | | $\varphi_v$ | - | ± 72.5 | - | deg |
| Peak wavelength | $I_F$ = 30 mA | $\lambda_p$ | - | 940 | - | nm |
| Spectral bandwidth | $I_F$ = 30 mA | $\Delta\lambda$ | - | 25 | - | nm |
| Temperature coefficient of $\lambda_p$ | $I_F$ = 30 mA | $TK_{\lambda p}$ | - | 0.3 | - | nm |
| Rise time | $I_F$ = 100 mA, 20 % to 80 % | $t_r$ | - | 15 | - | ns |
| Fall time | $I_F$ = 100 mA, 20 % to 80 % | $t_f$ | - | 15 | - | ns |



For technical questions, contact: emittertechsupport@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

**BASIC CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified)

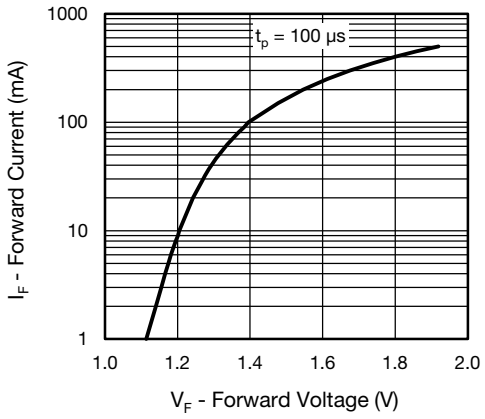



Fig. 3 - Forward Current vs. Forward Voltage

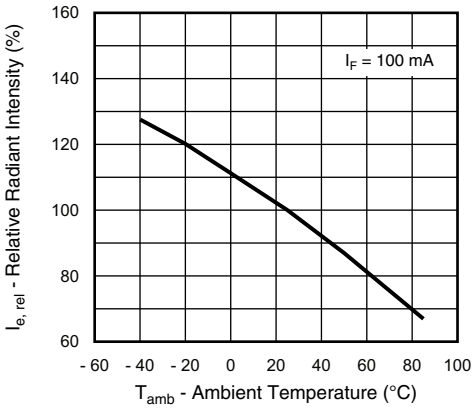



Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

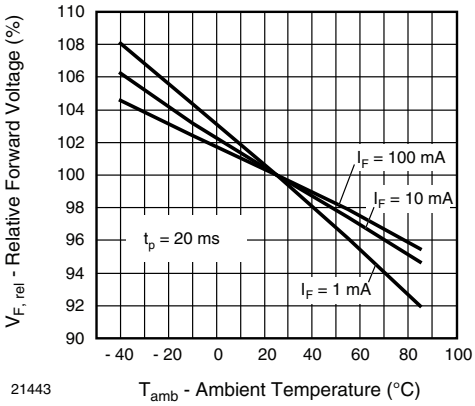



Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

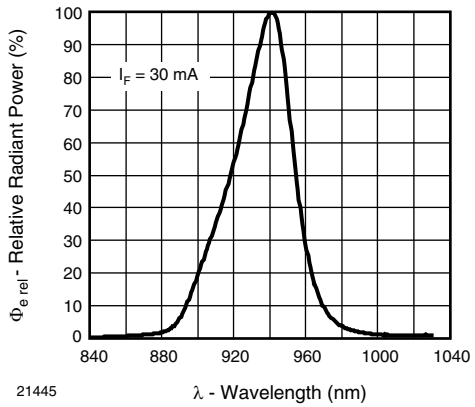



Fig. 7 - Relative Radiant Power vs. Wavelength

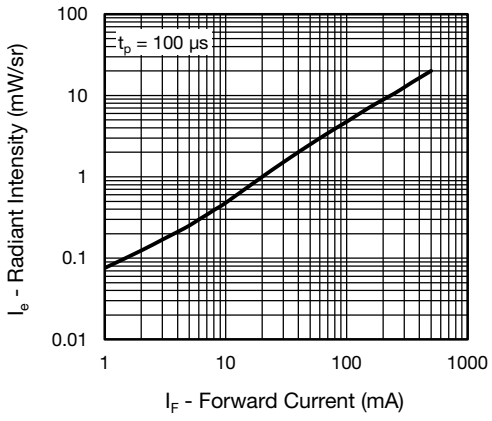



Fig. 5 - Radiant Intensity vs. Forward Current

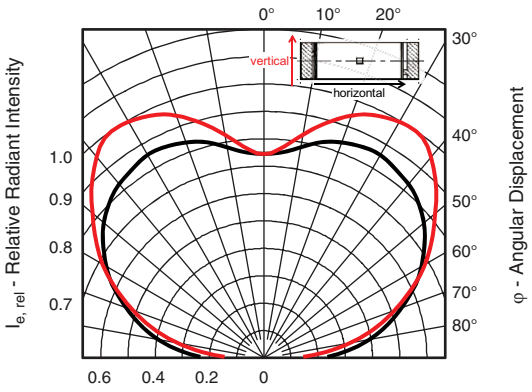



Fig. 8 - Relative Radiant Intensity vs. Angular Displacement


For technical questions, contact: emittertechsupport@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

## REFLOW SOLDER PROFILE

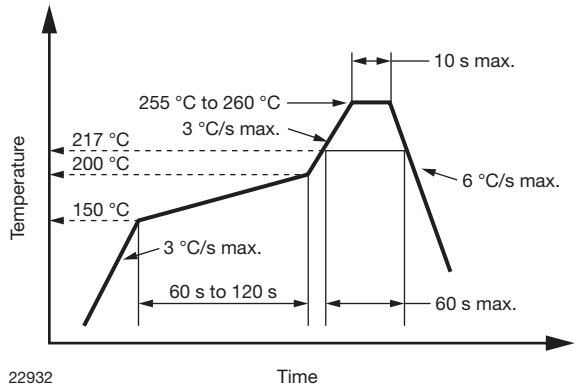



Fig. 9 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020

## DRYPACK

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

## FLOOR LIFE

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

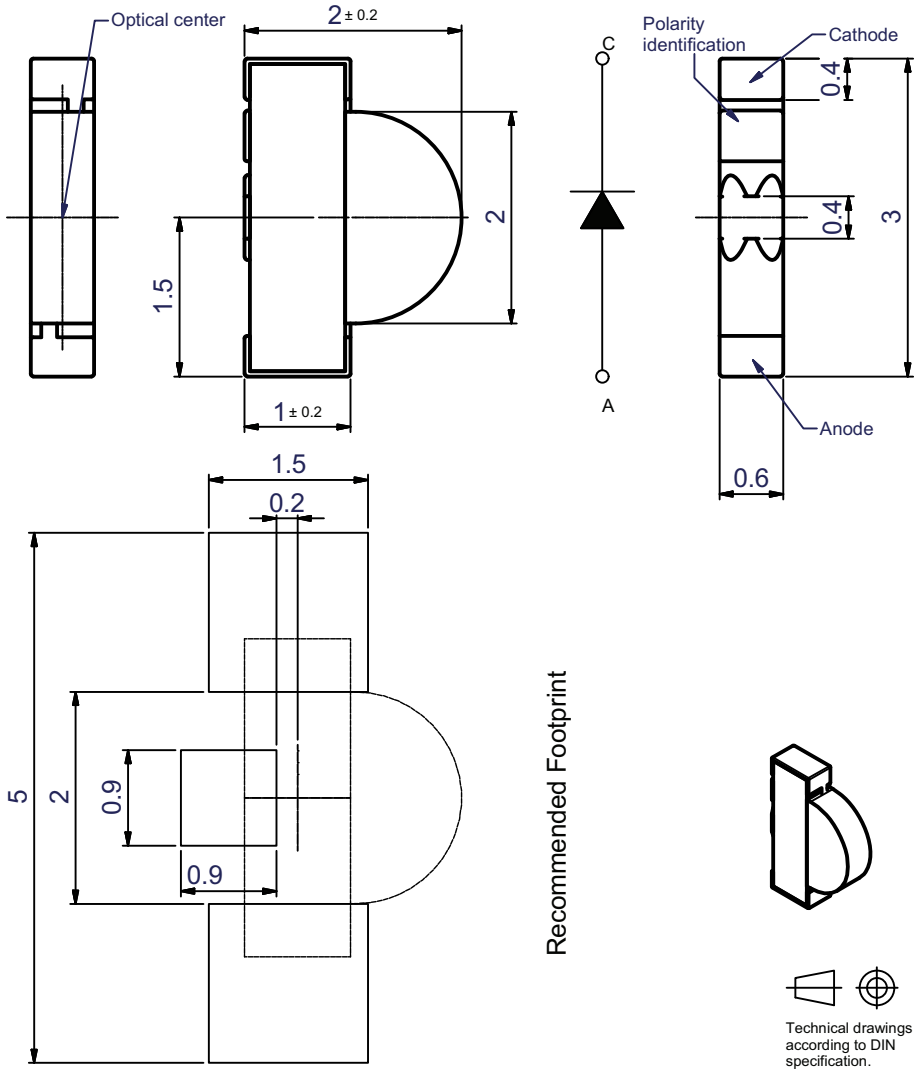
Floor life: 168 h

Conditions: $T_{amb}$ < 30 °C, RH < 60 %

## DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

## PACKAGE DIMENSIONS in millimeters




Drawing- No: 6.550-5327.01-4
Issue: Prel. 26.11.2013

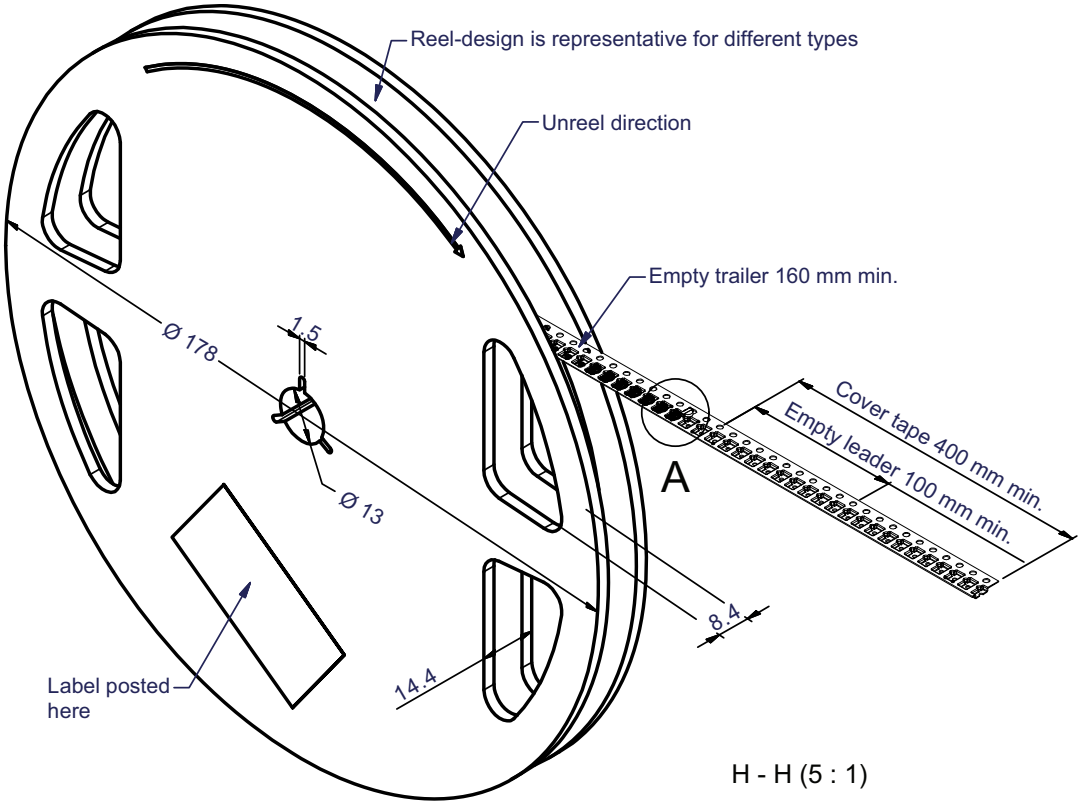
Not indicated tolerances ± 0.1 mm



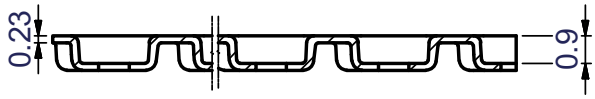
For technical questions, contact: emittertechsupport@vishay.com

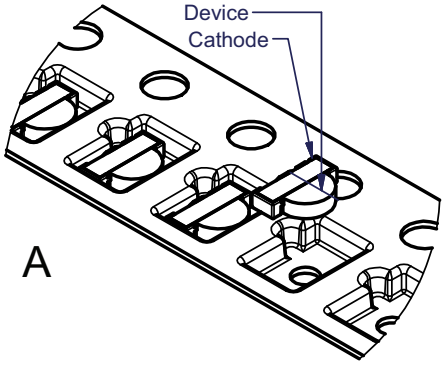
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

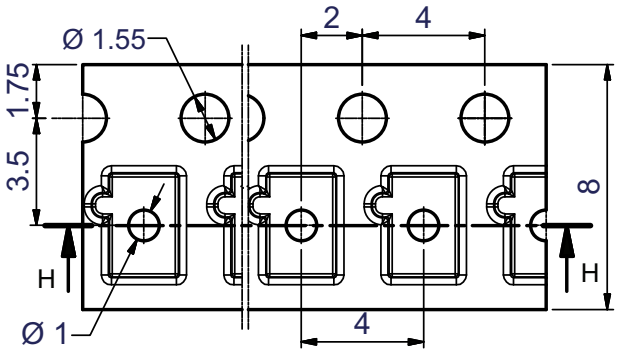
**TAPING AND REEL DIMENSIONS** in millimeters




H - H (5 : 1)




Drawing refers to following types: VSMB11940
VEMD11940F

Drawing No. 9.800-5126.01-4; Issue: Prel. 23.05.2013


For technical questions, contact: emittertechsupport@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

# 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. 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.

*© 2017 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED*