



Silicon NPN Phototransistor

VEMT2520X01



16758-10

VEMT2500X01



DESCRIPTION

VEMT2500X01 series are silicon NPN epitaxial planar phototransistors in a miniature dome lens, clear epoxy package for surface mounting. The device is sensitive to visible and near infrared radiation.

FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.8
- AEC-Q101 qualified
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\phi = \pm 15^\circ$
- Package matched with IR emitter series VSMB2000X01
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



Note

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

APPLICATIONS

- Detector in automotive applications
- Photo interrupters
- Miniature switches
- Counters
- Encoders
- Position sensors

| PRODUCT SUMMARY | | | |
|-----------------|----------------------|--------------|----------------------|
| COMPONENT | I _{ca} (mA) | ϕ (deg) | $\lambda_{0.1}$ (nm) |
| VEMT2500X01 | 6 | ± 15 | 470 to 1090 |
| VEMT2520X01 | 6 | ± 15 | 470 to 1090 |

Note

- Test condition see table "Basic Characteristics"

| ORDERING INFORMATION | | | |
|----------------------|---------------|------------------------------|------------------|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| VEMT2500X01 | Tape and reel | MOQ: 6000 pcs, 6000 pcs/reel | Reverse gullwing |
| VEMT2520X01 | Tape and reel | MOQ: 6000 pcs, 6000 pcs/reel | Gullwing |

Note

- MOQ: minimum order quantity

| ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) | | | | |
|---|--------------------------|------------------|---------------|------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Collector emitter voltage | | V _{CEO} | 20 | V |
| Emitter collector voltage | | V _{ECO} | 7 | V |
| Collector current | | I _C | 50 | mA |
| Power power dissipation | T _{amb} ≤ 75 °C | P _V | 100 | mW |
| Junction temperature | | T _J | 100 | °C |
| Operating temperature range | | T _{amb} | - 40 to + 100 | °C |



| ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | |
|---|----------------------------|------------|---------------|--------------------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Storage temperature range | | T_{stg} | - 40 to + 100 | $^{\circ}\text{C}$ |
| Soldering temperature | Acc. reflow profile fig. 8 | T_{sd} | 260 | $^{\circ}\text{C}$ |
| Thermal resistance junction/ambient | Acc. J-STD-051 | R_{thJA} | 250 | K/W |

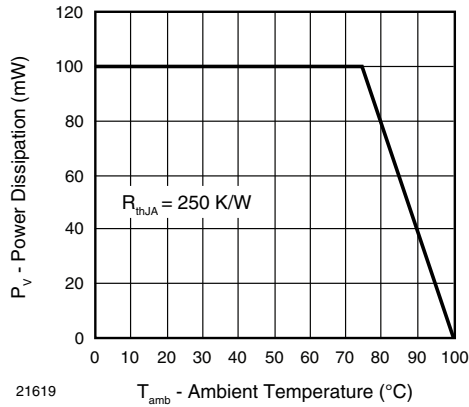


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | |
|--|--|-----------------|------|-------------|------|------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Collector emitter breakdown voltage | $I_C = 0.1\text{ mA}$ | V_{CEO} | 20 | | | V |
| Collector dark current | $V_{CE} = 5\text{ V}, E = 0$ | I_{CEO} | | 1 | 100 | nA |
| Collector emitter capacitance | $V_{CE} = 0\text{ V}, f = 1\text{ MHz}, E = 0$ | C_{CEO} | | 25 | | pF |
| Collector light current | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$ | I_{CA} | 3 | 6 | 9 | mA |
| Angle of half sensitivity | | φ | | ± 15 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 850 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.1}$ | | 470 to 1090 | | nm |
| Collector emitter saturation voltage | $I_C = 0.05\text{ mA}$ | V_{CEsat} | | | 0.4 | V |
| Temperature coefficient of I_{ca} | $E_e = 1\text{ mW/cm}^2, \lambda = 950\text{ nm}, V_{CE} = 5\text{ V}$ | TK_{Ica} | | 1.1 | | %/K |

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

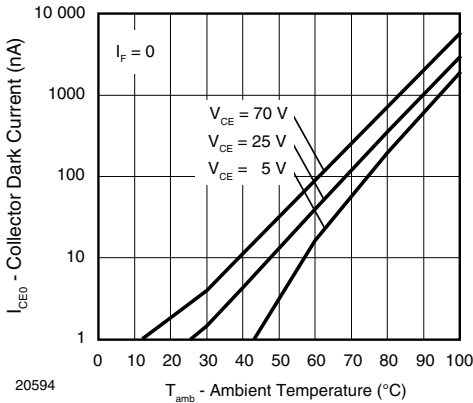


Fig. 2 - Collector Dark Current vs. Ambient Temperature

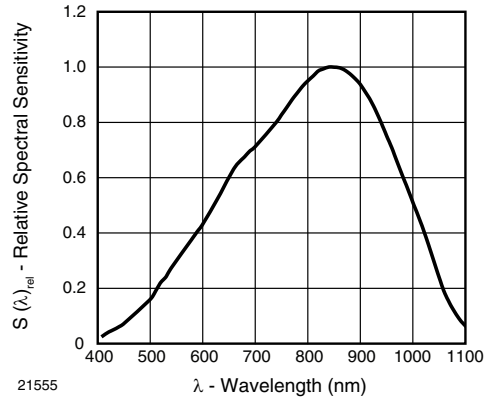


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

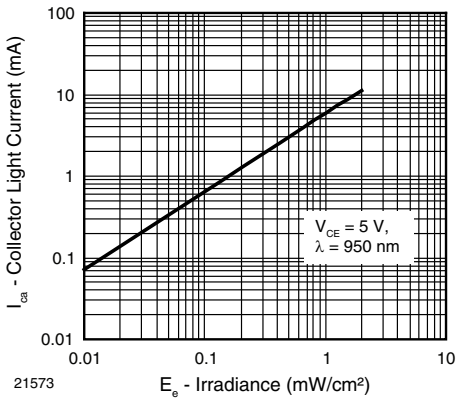


Fig. 3 - Collector Light Current vs. Irradiance

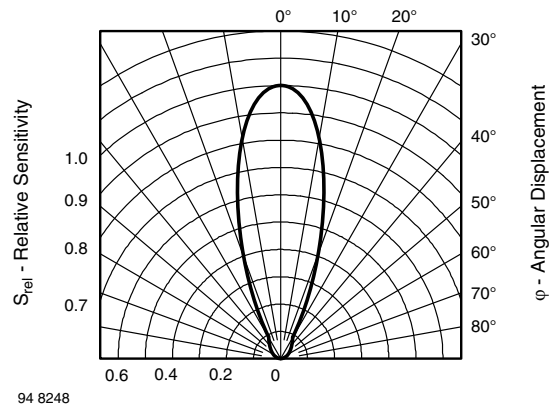


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

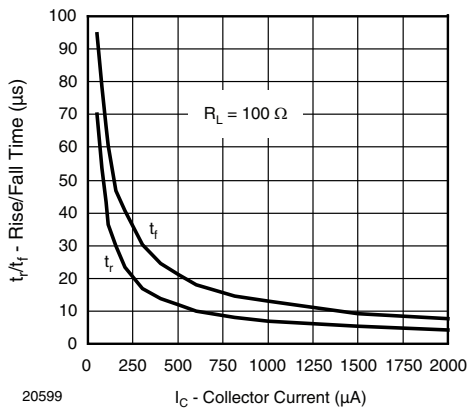


Fig. 4 - Rise/Fall Time vs. Collector Current

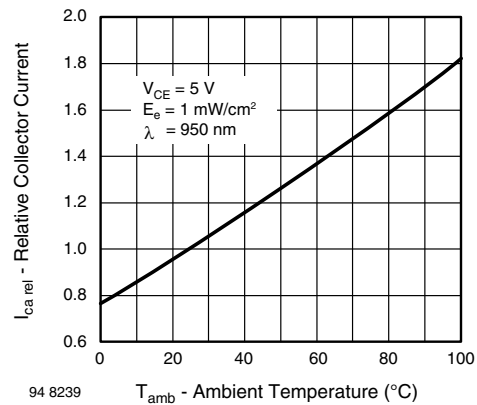
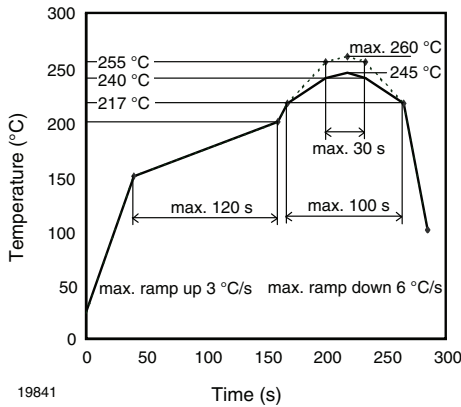


Fig. 7 - Relative Collector Current vs. Ambient Temperature



REFLOW SOLDER PROFILE



19841

Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. 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

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 4 weeks

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

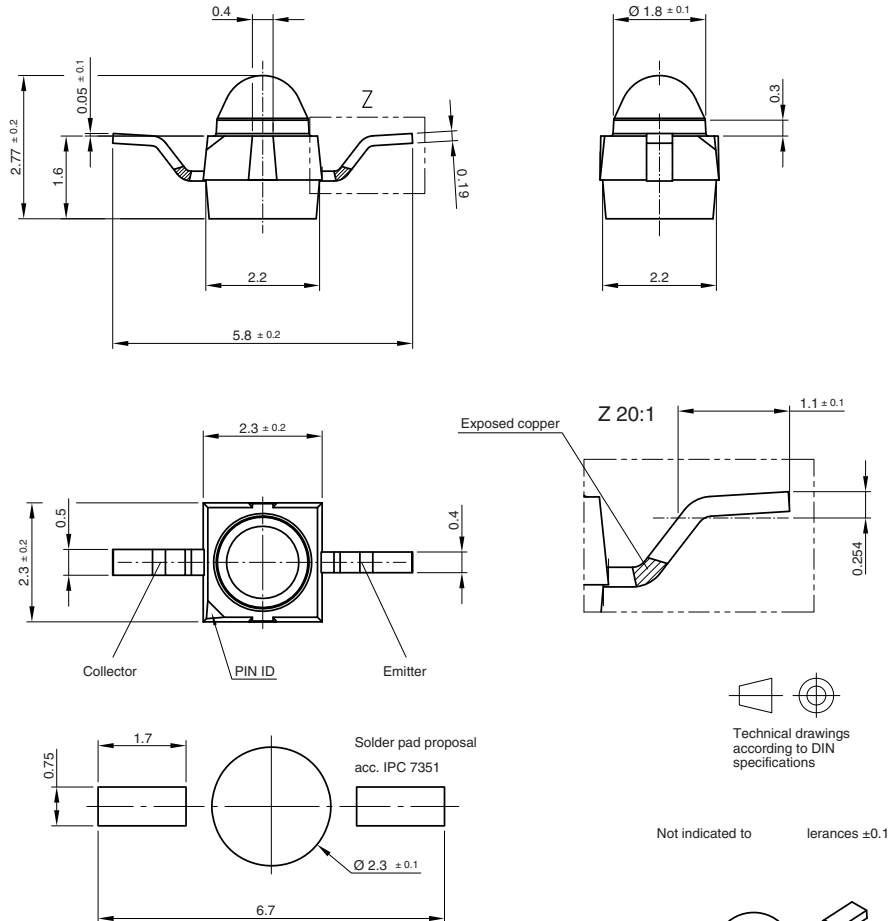
Moisture sensitivity level 2a, acc. to J-STD-020.

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), $RH < 5\%$.

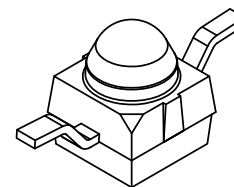
PACKAGE DIMENSIONS VEMT2500X01 in millimeters



Drawing-No.: 6.544-5391.01-4

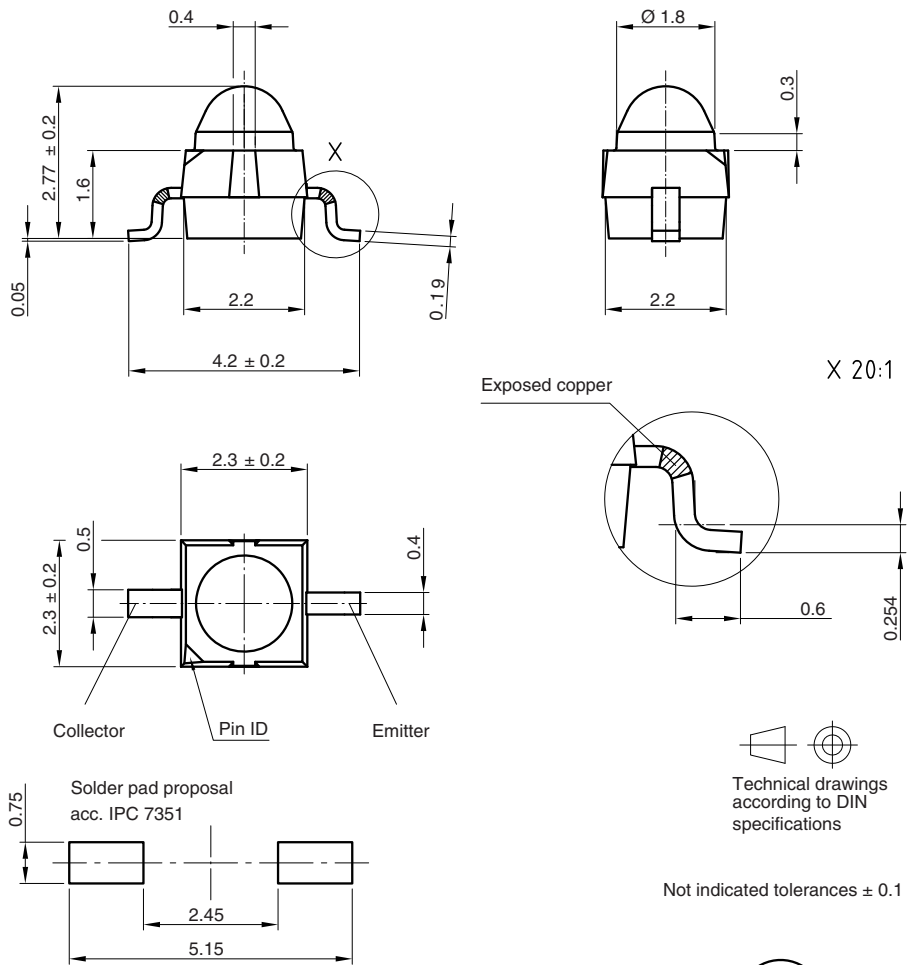
Issue: 1; 26.09.08

21570

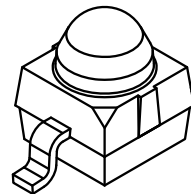




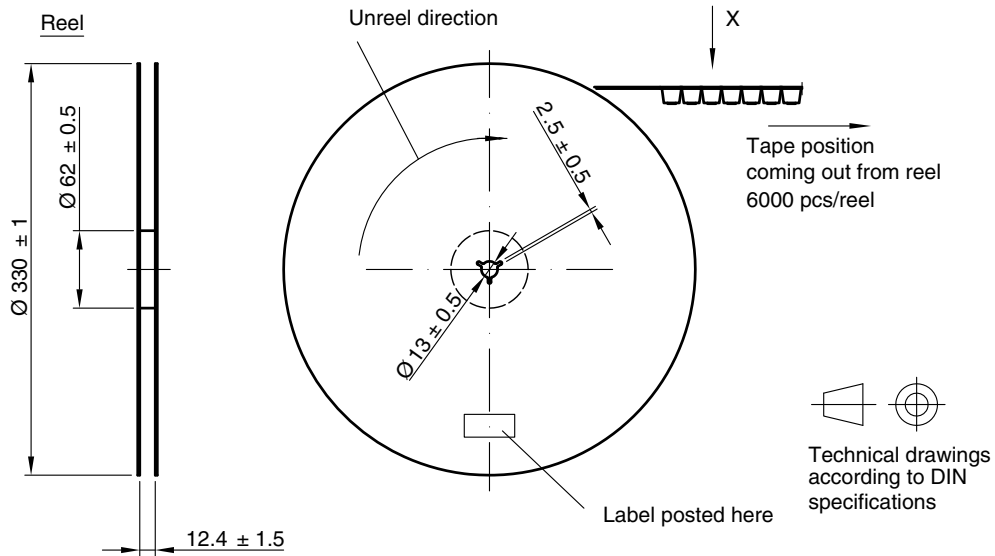
PACKAGE DIMENSIONS VEMT2520X01 in millimeters



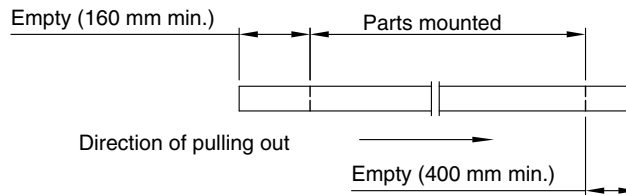
Drawing-No.: 6.544-5383.01-4
Issue: 4; 28.01.09
21569



TAPE AND REEL DIMENSIONS VEMT2500X01 in millimeters

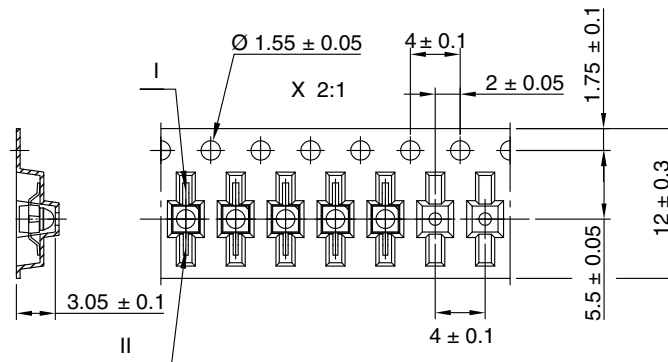


Leader and trailer tape:



Terminal position in tape

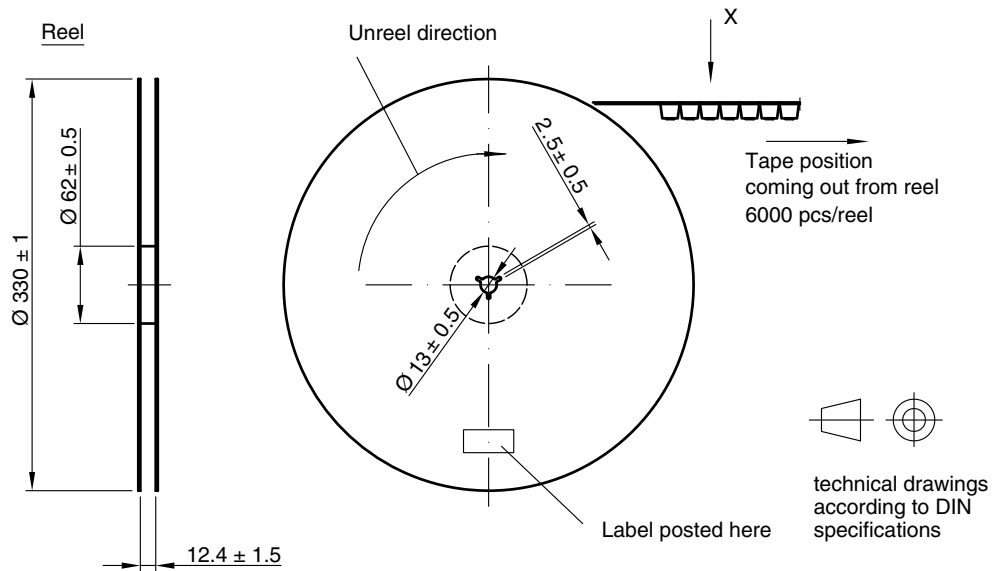
| Devicce | Lead I | Lead II |
|------------|-----------|---------|
| VEMT2000 | Collector | Emitter |
| VEMT2500 | | |
| VEMD2000 | Cathode | Anode |
| VEMD2500 | | |
| VSMB2000 | | |
| VSMG2000 | | |
| VSMY2850RG | Anode | Cathode |



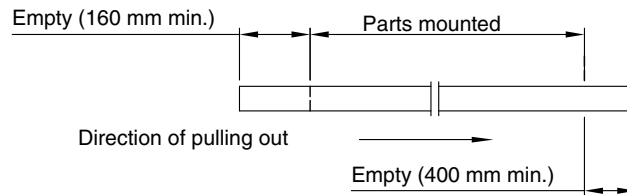
Drawing-No.: 9.800-5100.01-4
 Issue: 2; 18.03.10
 21572



TAPE AND REEL DIMENSIONS VENT2520X01 in millimeters

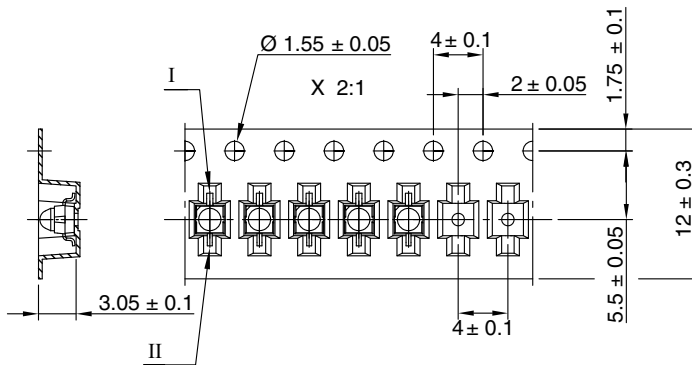


Leader and trailer tape:



Terminal position in tape

| Device | Lead I | Lead II |
|-----------|-----------|---------|
| VENT2020 | | |
| VENT2520 | Collector | Emitter |
| VSMB2020 | | |
| VSMG2020 | Cathode | Anode |
| VEMD2020 | | |
| VEMD2520 | | |
| VSMY2850G | Anode | Cathode |



Drawing-No.: 9.800-5091.01-4

Issue: 3; 18.03.10

21571



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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

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.

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View VEMT2520X01 on WIN SOURCE](#)

 [Vishay Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management