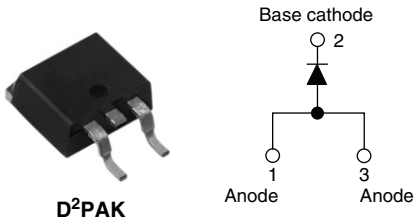


## Input Rectifier Diode, 10 A



### DESCRIPTION/FEATURES

The 10ETS..S rectifier series has been optimized for very low forward voltage drop, with moderate leakage. The glass passivation technology used has reliable operation up to 150 °C junction temperature.

Typical applications are in input rectification and these products are designed to be used with Vishay HPP switches and output rectifiers which are available in identical package outlines.

This product series has been designed and qualified for industrial level.

| PRODUCT SUMMARY |            |
|-----------------|------------|
| $V_F$ at 10 A   | < 1 V      |
| $I_{FSM}$       | 200 A      |
| $V_{RRM}$       | 800/1200 V |

| OUTPUT CURRENT IN TYPICAL APPLICATIONS  |                     |                    |       |
|---|---------------------|--------------------|-------|
| APPLICATIONS  | SINGLE-PHASE BRIDGE | THREE-PHASE BRIDGE | UNITS |
| Capacitive input filter $T_A = 55\text{ °C}$ , $T_J = 125\text{ °C}$<br>common heatsink of 1 °C/W | 12.0                | 16.0               | A     |

| MAJOR RATINGS AND CHARACTERISTICS |                            |             |       |
|-----------------------------------|----------------------------|-------------|-------|
| SYMBOL                            | CHARACTERISTICS            | VALUES      | UNITS |
| $I_{F(AV)}$                       | Sinusoidal waveform        | 10          | A     |
| $V_{RRM}$                         |                            | 800/1200    | V     |
| $I_{FSM}$                         |                            | 200         | A     |
| $V_F$                             | 10 A, $T_J = 25\text{ °C}$ | 1.1         | V     |
| $T_J$                             |                            | - 40 to 150 | °C    |

| VOLTAGE RATINGS |   |  |                              |
|-----------------|---|--|------------------------------|
| PART NUMBER     | $V_{RRM}$ , MAXIMUM PEAK REVERSE VOLTAGE<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE<br>V | $I_{RRM}$<br>AT 150 °C<br>mA |
| 10ETS08S        | 800   | 900  | 0.5                          |
| 10ETS10S        | 1000  | 1100   |                              |
| 10ETS12S        | 1200  | 1300   |                              |

| ABSOLUTE MAXIMUM RATINGS                            |               |  |        |                   |
|---|---------------|--|--------|-------------------|
| PARAMETER   | SYMBOL        | TEST CONDITIONS  | VALUES | UNITS             |
| Maximum average forward current                     | $I_{F(AV)}$   | $T_C = 105\text{ °C}$ , 180° conduction half sine wave | 10     | A                 |
| Maximum peak one cycle non-repetitive surge current | $I_{FSM}$     | 10 ms sine pulse, rated $V_{RRM}$ applied              | 170    |                   |
|   |               | 10 ms sine pulse, no voltage reapplied                 | 200    |                   |
| Maximum $I^2t$ for fusing                           | $I^2t$        | 10 ms sine pulse, rated $V_{RRM}$ applied              | 130    | A <sup>2</sup> s  |
|   |               | 10 ms sine pulse, no voltage reapplied                 | 145    |                   |
| Maximum $I^2\sqrt{t}$ for fusing                    | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reapplied                 | 1450   | A <sup>2</sup> √s |

# 10ETS..S High Voltage Series

Vishay High Power Products Input Rectifier Diode, 10 A



| ELECTRICAL SPECIFICATIONS       |             |  |                               |        |                  |
|---------------------------------|-------------|--|-------------------------------|--------|------------------|
| PARAMETER                       | SYMBOL      | TEST CONDITIONS                        |                               | VALUES | UNITS            |
| Maximum forward voltage drop    | $V_{FM}$    | 10 A, $T_J = 25\text{ }^\circ\text{C}$ |                               | 1.1    | V                |
| Forward slope resistance        | $r_t$       | $T_J = 150\text{ }^\circ\text{C}$      |                               | 20     | $\text{m}\Omega$ |
| Threshold voltage               | $V_{F(TO)}$ |  |                               | 0.82   | V                |
| Maximum reverse leakage current | $I_{RM}$    | $T_J = 25\text{ }^\circ\text{C}$       | $V_R = \text{Rated } V_{RRM}$ | 0.05   | mA               |
|                                 |             | $T_J = 150\text{ }^\circ\text{C}$      |                               | 0.50   |                  |

| THERMAL - MECHANICAL SPECIFICATIONS                         |                  |   |          |             |                           |
|---|------------------|---|----------|-------------|---------------------------|
| PARAMETER   | SYMBOL           | TEST CONDITIONS                         |          | VALUES      | UNITS                     |
| Maximum junction and storage temperature range              | $T_J, T_{Stg}$   |   |          | - 40 to 150 | $^\circ\text{C}$          |
| Maximum thermal resistance, junction to case                | $R_{thJC}$       | DC operation                            |          | 2.5         | $^\circ\text{C}/\text{W}$ |
| Maximum thermal resistance, junction to ambient (PCB mount) | $R_{thJA}^{(1)}$ |   |          | 62          |                           |
| Soldering temperature                                       | $T_S$            |   |          | 240         | $^\circ\text{C}$          |
| Approximate weight  |                  |   |          | 2           | g                         |
|   |                  |   |          | 0.07        | oz.                       |
| Marking device  |                  | Case style D <sup>2</sup> PAK (SMD-220) | 10ETS08S |             |                           |
|   |                  |   | 10ETS10S |             |                           |
|   |                  |   | 10ETS12S |             |                           |

## Note

<sup>(1)</sup> When mounted on 1" square (650 mm<sup>2</sup>) PCB of FR-4 or G-10 material 4 oz. (140  $\mu\text{m}$ ) copper 40  $^\circ\text{C}/\text{W}$   
For recommended footprint and soldering techniques refer to application note #AN-994



# 10ETS..S High Voltage Series

Input Rectifier Diode, 10 A Vishay High Power Products

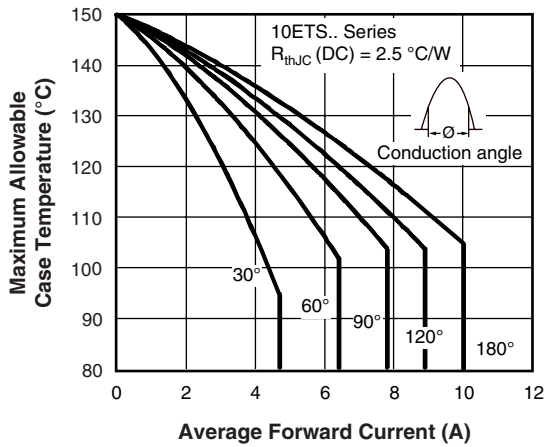


Fig. 1 - Current Rating Characteristics

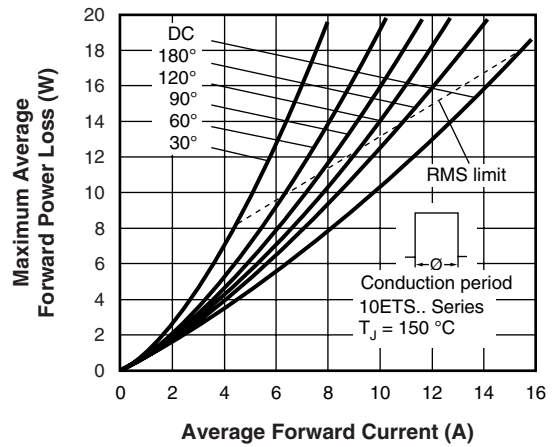


Fig. 4 - Forward Power Loss Characteristics

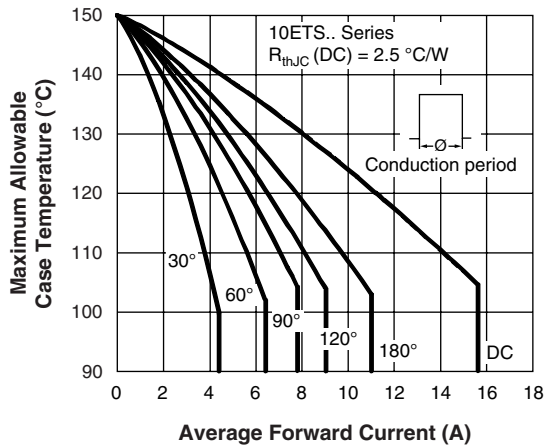


Fig. 2 - Current Rating Characteristics

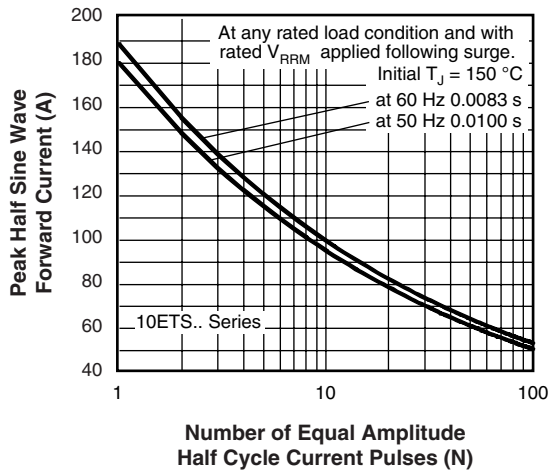


Fig. 5 - Maximum Non-Repetitive Surge Current

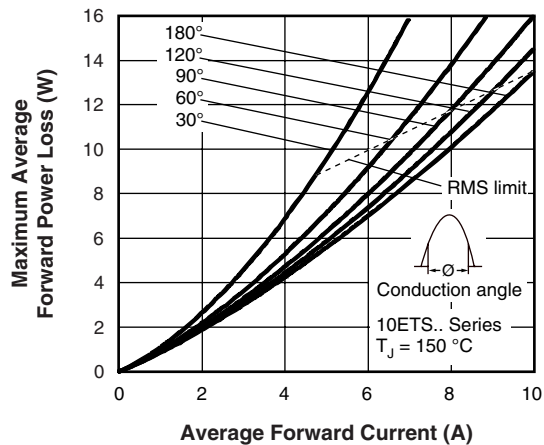


Fig. 3 - Forward Power Loss Characteristics

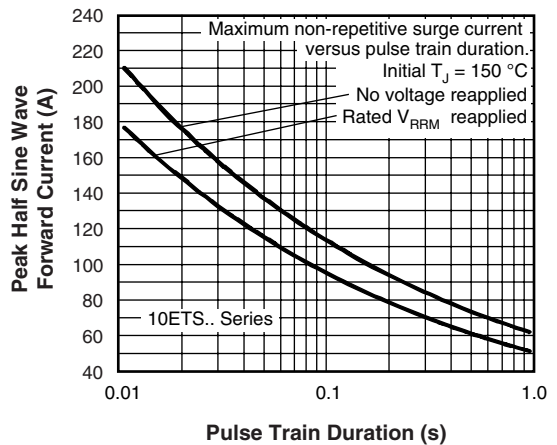


Fig. 6 - Maximum Non-Repetitive Surge Current

# 10ETS..S High Voltage Series

Vishay High Power Products Input Rectifier Diode, 10 A

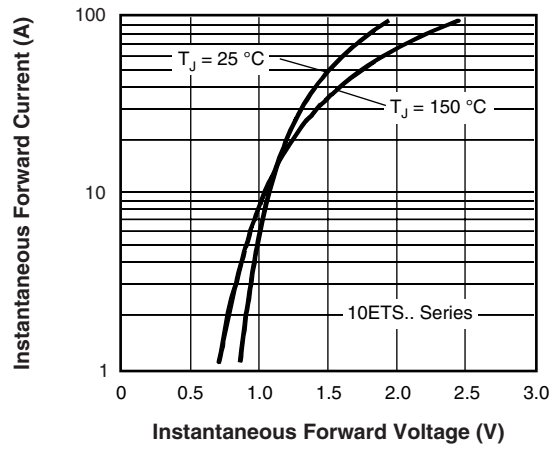


Fig. 7 - Forward Voltage Drop Characteristics

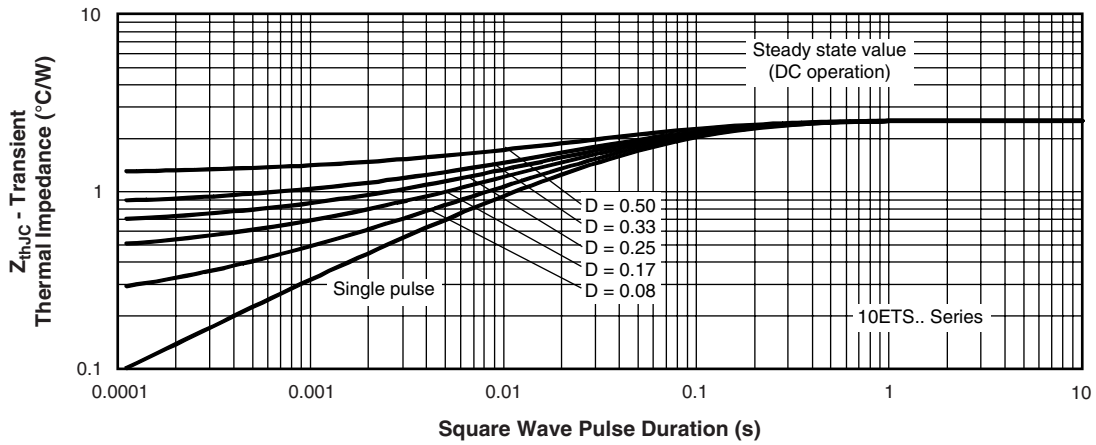


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics



# 10ETS..S High Voltage Series

Input Rectifier Diode, 10 A Vishay High Power Products

## ORDERING INFORMATION TABLE

|             |    |   |   |   |    |   |     |   |
|-------------|----|---|---|---|----|---|-----|---|
| Device code | 10 | E | T | S | 12 | S | TRL | - |
|             | ①  | ② | ③ | ④ | ⑤  | ⑥ | ⑦   | ⑧ |

**1** - Current rating (10 = 10 A)

**2** - Circuit configuration  
E = Single diode

**3** - Package  
T = TO-220AC

**4** - Type of silicon  
S = Standard recovery rectifier

**5** - Voltage code x 100 =  $V_{RRM}$

**6** - S = TO-220 D<sup>2</sup>PAK (SMD-220) version

**7** -  
• None = Tube  
• TRL = Tape and reel (left oriented)  
• TRR = Tape and reel (right oriented)

**8** -  
• None = Standard production  
• PbF = Lead (Pb)-free

|             |
|-------------|
| 08 = 800 V  |
| 10 = 1000 V |
| 12 = 1200 V |

### LINKS TO RELATED DOCUMENTS

|                          |   |
|--------------------------|---|
| Dimensions               | <a href="http://www.vishay.com/doc?95046">http://www.vishay.com/doc?95046</a> |
| Part marking information | <a href="http://www.vishay.com/doc?95054">http://www.vishay.com/doc?95054</a> |
| Packaging information    | <a href="http://www.vishay.com/doc?95032">http://www.vishay.com/doc?95032</a> |



## 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.