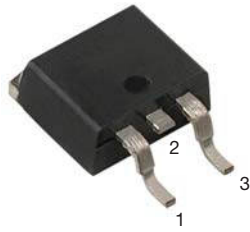
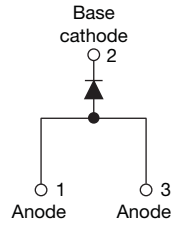


High Voltage Surface Mount Input Rectifier Diode, 10 A


TO-263AB (D²PAK)

FEATURES

- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Glass passivated pellet chip junction
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE
APPLICATIONS

- Input rectification
- Vishay switches and output rectifiers which are available in identical package outlines

DESCRIPTION

The VS-10ETS..SPbF 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.

| PRODUCT SUMMARY | |
|-----------------|-------------------------------|
| Package | TO-263AB (D ² PAK) |
| $I_{F(AV)}$ | 10 A |
| V_R | 800 V, 1000 V, 1200 V |
| V_F at I_F | 1.1 V |
| I_{FSM} | 160 A |
| T_j max. | 150 °C |
| Diode variation | Single die |

| OUTPUT CURRENT IN TYPICAL APPLICATIONS | | | |
|---|---------------------|--------------------|-------|
| APPLICATIONS | SINGLE-PHASE BRIDGE | THREE-PHASE BRIDGE | UNITS |
| Capacitive input filter $T_A = 55$ °C, $T_J = 125$ °C 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} | | 160 | A |
| V_F | 10 A, $T_J = 25$ °C | 1.1 | V |
| T_J | | -40 to +150 | °C |

| VOLTAGE RATINGS | | | |
|-----------------|---|--|------------------------------|
| PART NUMBER | V_{RRM} , MAXIMUM PEAK REVERSE VOLTAGE V | V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | I_{RRM} AT 150 °C mA |
| VS-10ETS08SPbF | 800 | 900 | 0.5 |
| VS-10ETS10SPbF | 1000 | 1100 | |
| VS-10ETS12SPbF | 1200 | 1300 | |



| ABSOLUTE MAXIMUM RATINGS | | | | |
|---|---------------|--|--------|-------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum average forward current | $I_{F(AV)}$ | $T_C = 105\text{ }^\circ\text{C}$, 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 | 135 | |
| | | 10 ms sine pulse, no voltage reapplied | 160 | |
| Maximum I^2t for fusing | I^2t | 10 ms sine pulse, rated V_{RRM} applied | 91 | A ² s |
| | | 10 ms sine pulse, no voltage reapplied | 130 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | $t = 0.1\text{ ms to }10\text{ ms}$, no voltage reapplied | 1290 | A ² √s |

| 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 | mΩ |
| Threshold voltage | $V_{F(TO)}$ | | 0.82 | V |
| Maximum reverse leakage current | I_{RM} | $T_J = 25\text{ }^\circ\text{C}$ | 0.05 | mA |
| | | $T_J = 150\text{ }^\circ\text{C}$ | | |

| THERMAL - MECHANICAL SPECIFICATIONS | | | | |
|---|------------------|--|-------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum junction and storage temperature range | T_J, T_{Stg} | | -40 to +150 | °C |
| Maximum thermal resistance, junction to case | R_{thJC} | DC operation | 2.5 | °C/W |
| Maximum thermal resistance, junction to ambient (PCB mount) | $R_{thJA}^{(1)}$ | | 62 | |
| Soldering temperature | T_S | | 260 | °C |
| Approximate weight | | | 2 | g |
| | | | 0.07 | oz. |
| Marking device | | Case style TO-263AB (D ² PAK) | 10ETS08S | |
| | | | 10ETS10S | |
| | | | 10ETS12S | |

Note

- (1) When mounted on 1" square (650 mm²) PCB of FR-4 or G-10 material 4 oz. (140 μm) copper 40 °C/W
For recommended footprint and soldering techniques refer to application note #AN-994

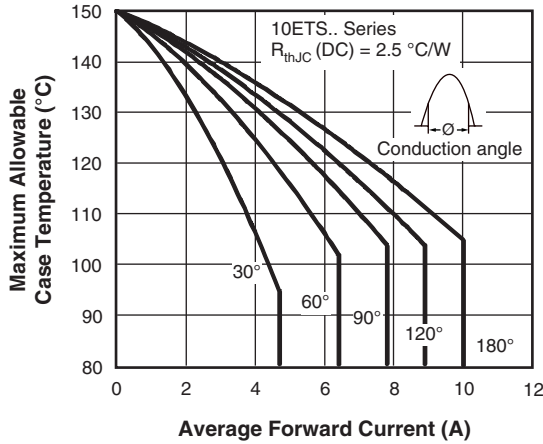


Fig. 1 - Current Rating Characteristics

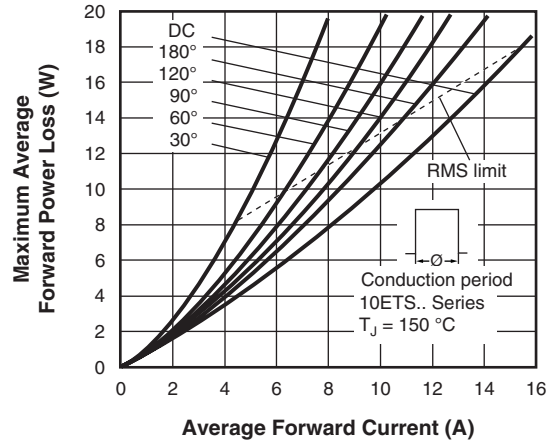


Fig. 4 - Forward Power Loss Characteristics

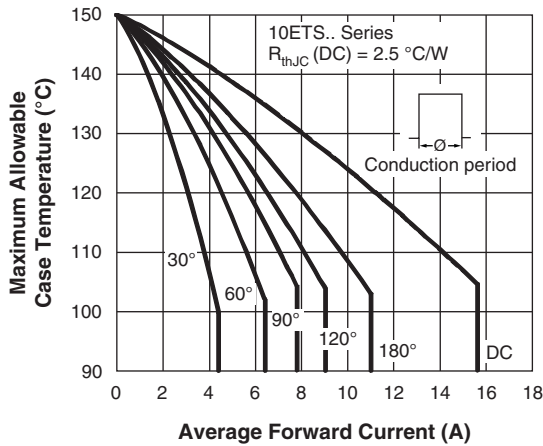


Fig. 2 - Current Rating Characteristics

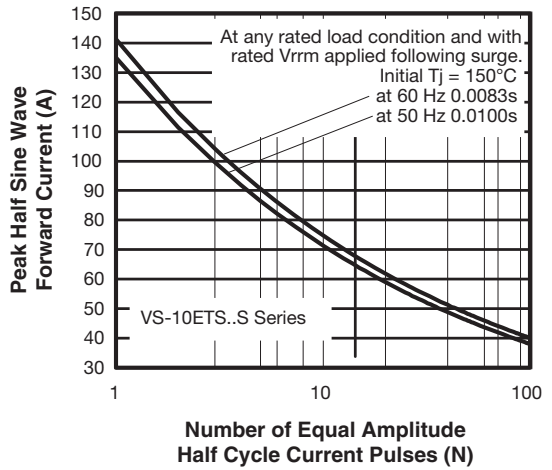


Fig. 5 - Maximum Non-Repetitive Surge Current

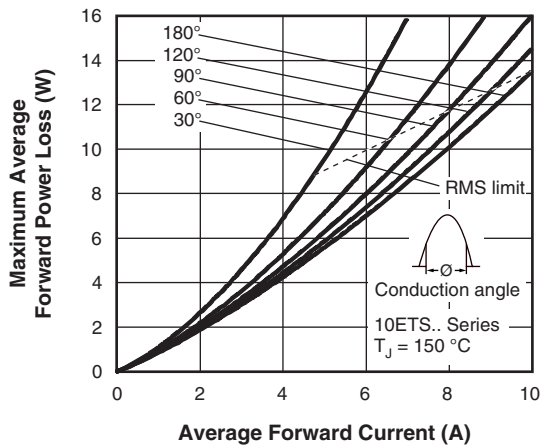


Fig. 3 - Forward Power Loss Characteristics

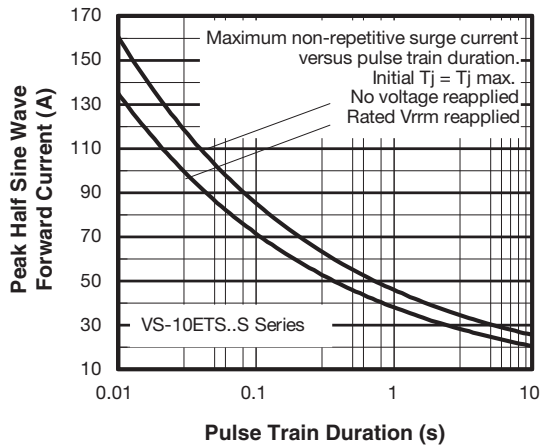


Fig. 6 - Maximum Non-Repetitive Surge Current

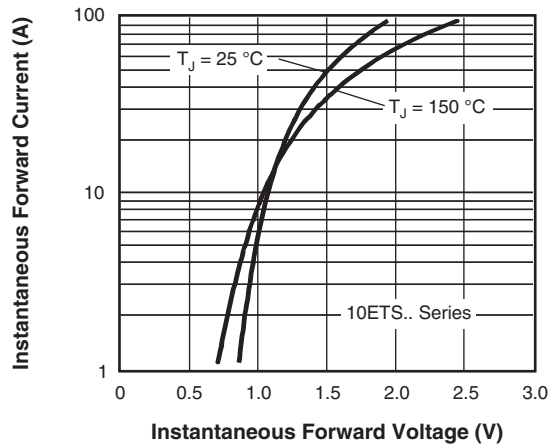


Fig. 7 - Forward Voltage Drop Characteristics

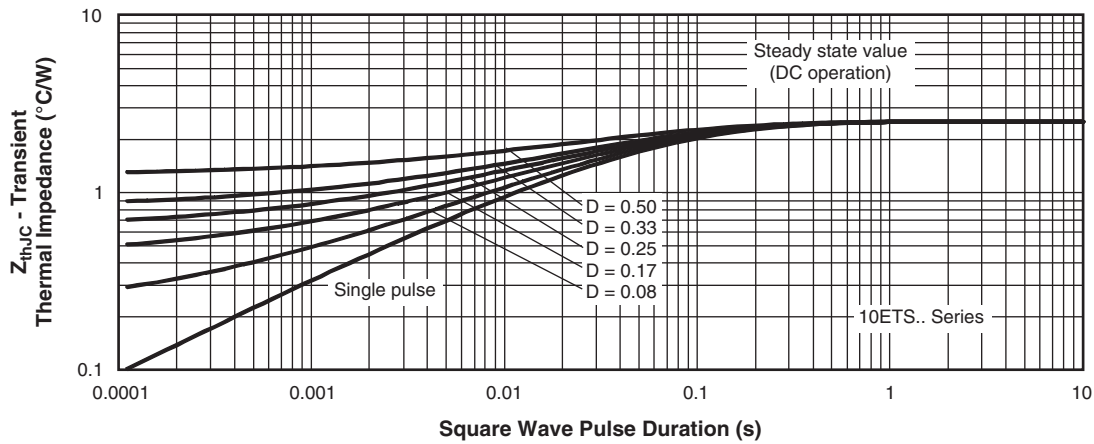
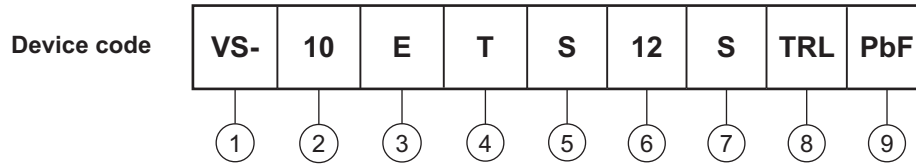


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (10 = 10 A)
- 3** - Circuit configuration:
E = single diode
- 4** - Package:
T = TO-220AC
- 5** - Type of silicon:
S = standard recovery rectifier
- 6** - Voltage code x 100 = V_{RRM}

| |
|-------------|
| 08 = 800 V |
| 10 = 1000 V |
| 12 = 1200 V |
- 7** - S = TO-220 D²PAK (SMD-220) version
- 8** -
 - None = tube
 - TRL = tape and reel (left oriented)
 - TRR = tape and reel (right oriented)
- 9** - PbF = Lead (Pb)-free

| ORDERING INFORMATION (Example) | | | |
|--------------------------------|-------------------|------------------------|-------------------------|
| PREFERRED P/N | QUANTITY PER TUBE | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION |
| VS-10ETS08SPbF | 50 | 1000 | Antistatic plastic tube |
| VS-10ETS08STRRPbF | 800 | 800 | 13" diameter reel |
| VS-10ETS08STRLPbF | 800 | 800 | 13" diameter reel |
| VS-10ETS10SPbF | 50 | 1000 | Antistatic plastic tube |
| VS-10ETS10STRRPbF | 800 | 800 | 13" diameter reel |
| VS-10ETS10STRLPbF | 800 | 800 | 13" diameter reel |
| VS-10ETS12SPbF | 50 | 1000 | Antistatic plastic tube |
| VS-10ETS12STRRPbF | 800 | 800 | 13" diameter reel |
| VS-10ETS12STRLPbF | 800 | 800 | 13" diameter reel |
| VS-10ETS08SPbF | 50 | 1000 | Antistatic plastic tube |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?95046 |
| Part marking information | www.vishay.com/doc?95054 |
| Packaging information | www.vishay.com/doc?95032 |

D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC[®] outline D²PAK (SMD-220)



| SYMBOL | MILLIMETERS | | INCHES | | NOTES | SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|--------|-------|-------|--------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | | | MIN. | MAX. | MIN. | MAX. | |
| A | 4.06 | 4.83 | 0.160 | 0.190 | | D1 | 6.86 | 8.00 | 0.270 | 0.315 | 3 |
| A1 | 0.00 | 0.254 | 0.000 | 0.010 | | E | 9.65 | 10.67 | 0.380 | 0.420 | 2, 3 |
| b | 0.51 | 0.99 | 0.020 | 0.039 | | E1 | 7.90 | 8.80 | 0.311 | 0.346 | 3 |
| b1 | 0.51 | 0.89 | 0.020 | 0.035 | 4 | e | 2.54 BSC | | 0.100 BSC | | |
| b2 | 1.14 | 1.78 | 0.045 | 0.070 | | H | 14.61 | 15.88 | 0.575 | 0.625 | |
| b3 | 1.14 | 1.73 | 0.045 | 0.068 | 4 | L | 1.78 | 2.79 | 0.070 | 0.110 | |
| c | 0.38 | 0.74 | 0.015 | 0.029 | | L1 | - | 1.65 | - | 0.066 | 3 |
| c1 | 0.38 | 0.58 | 0.015 | 0.023 | 4 | L2 | 1.27 | 1.78 | 0.050 | 0.070 | |
| c2 | 1.14 | 1.65 | 0.045 | 0.065 | | L3 | 0.25 BSC | | 0.010 BSC | | |
| D | 8.51 | 9.65 | 0.335 | 0.380 | 2 | L4 | 4.78 | 5.28 | 0.188 | 0.208 | |

Notes

- Dimensioning and tolerancing per ASME Y14.5 M-1994
- Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- Thermal pad contour optional within dimension E, L1, D1 and E1
- Dimension b1 and c1 apply to base metal only
- Datum A and B to be determined at datum plane H
- Controlling dimension: inch
- Outline conforms to JEDEC[®] outline TO-263AB



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