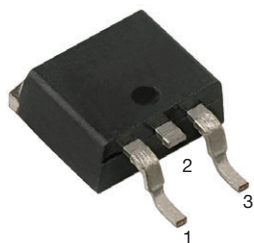
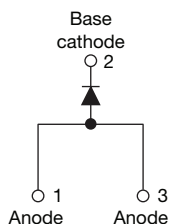


High Voltage Surface Mount Input Rectifier Diode, 10 A


D²PAK (TO-263AB)


FEATURES

- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- Glass passivated pellet chip junction
- AEC-Q101 qualified
- Meets JESD 201 class 1A whisker test
- Flexible solution for reliable AC power rectification
- High surge, low V_F rugged blocking diode for DC charging stations
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

PRIMARY CHARACTERISTICS

| | |
|-----------------------|-------------------------------|
| $I_{F(AV)}$ | 10 A |
| V_R | 1200 V |
| V_F at I_F | 1.1 V |
| I_{FSM} | 160 A |
| T_J max. | 150 °C |
| Package | D ² PAK (TO-263AB) |
| Circuit configuration | Single |

APPLICATIONS

- Input rectification
- On-board and off-board EV / HEV battery chargers

DESCRIPTION

The VS-10ETS12SLHM3 rectifier series has been optimized for very low forward voltage drop, with moderate leakage.

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} | | 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-10ETS12SLHM3 | 1200 | 1300 | 0.5 |

**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^2s |
| | | 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 | $\text{A}^2\sqrt{\text{s}}$ |

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 | $\text{m}\Omega$ |
| Threshold voltage | $V_{F(TO)}$ | | 0.82 | V |
| Maximum reverse leakage current | I_{RM} | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.05 | mA |
| | | $T_J = 150\text{ }^{\circ}\text{C}$ | 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 | $^{\circ}\text{C/W}$ |
| Maximum thermal resistance, junction to ambient (PCB mount) | $R_{thJA}^{(1)}$ | | 62 | |
| Approximate weight | | | 2 | g |
| | | | 0.07 | oz. |
| Marking device | | Case style D ² PAK (TO-263AB) | 10ETS12SH | |

Note

⁽¹⁾ When mounted on 1" square (650 mm²) PCB of FR-4 or G-10 material 4 oz. (140 μm) copper 40 $^{\circ}\text{C/W}$.

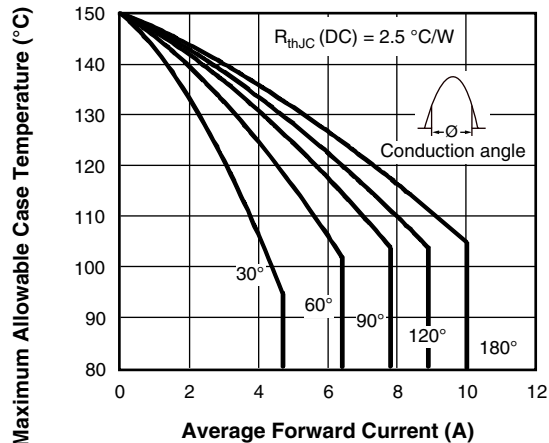


Fig. 1 - Current Rating Characteristics

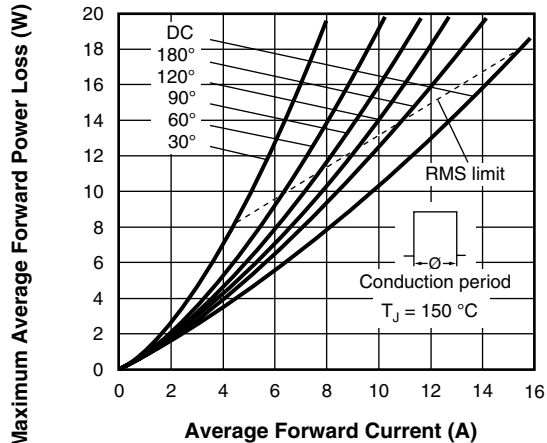


Fig. 4 - Forward Power Loss Characteristics

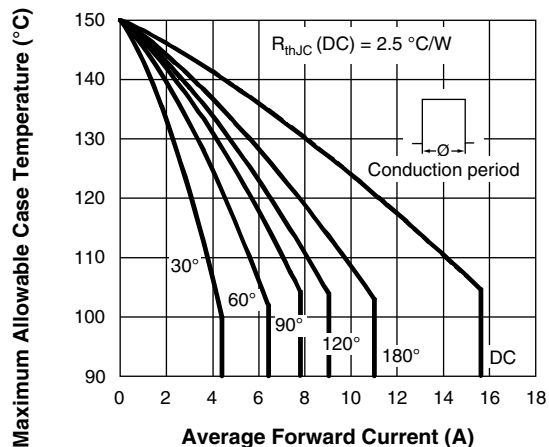


Fig. 2 - Current Rating Characteristics

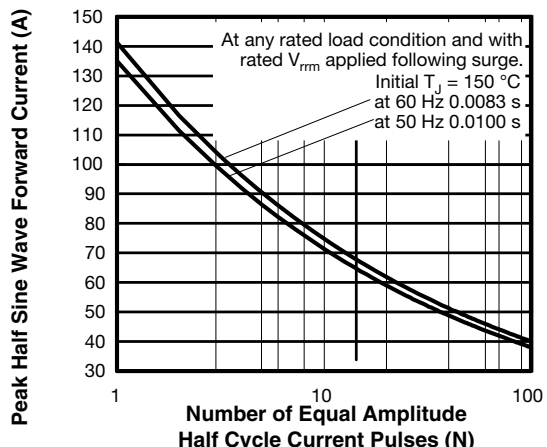


Fig. 5 - Maximum Non-Repetitive Surge Current

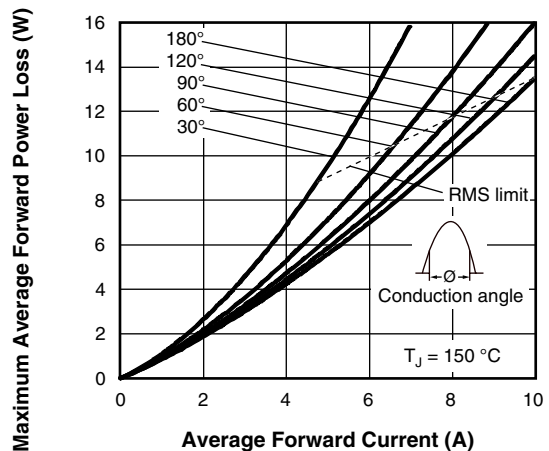


Fig. 3 - Forward Power Loss Characteristics

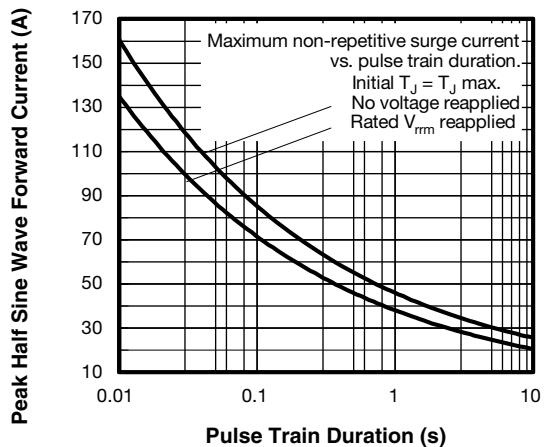


Fig. 6 - Maximum Non-Repetitive Surge Current

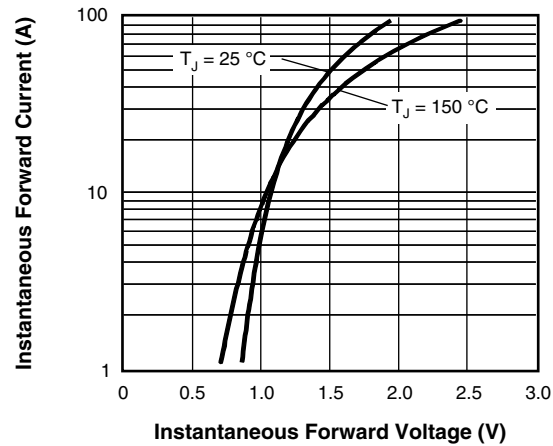


Fig. 7 - Forward Voltage Drop Characteristics

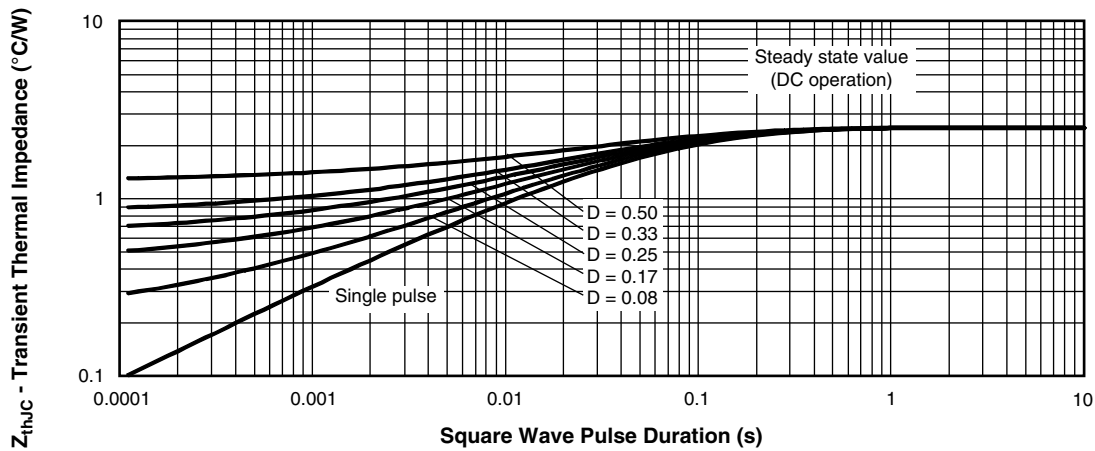


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

**ORDERING INFORMATION TABLE**

| | | | | | | | | | | |
|-------------|-----|----|---|---|---|----|---|---|---|----|
| Device code | VS- | 10 | E | T | S | 12 | S | L | H | M3 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

- 1** - Vishay Semiconductors product
- 2** - Current rating (10 = 10 A)
- 3** - Circuit configuration:
E = single
- 4** - Package:
T = D²PAK (TO-263AB)
- 5** - Type of silicon:
S = standard recovery rectifier
- 6** - Voltage code x 100 = V_{RRM} ——— 12 = 1200 V
- 7** - S = surface mountable
- 8** - L = tape and reel (left oriented), for different orientation, contact factory
- 9** - H = AEC-Q101 qualified
- 10** - Environmental digit:
M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)

| PREFERRED P/N | QUANTITY PER TUBE | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION |
|-----------------|-------------------|------------------------|-----------------------|
| VS-10ETS12SLHM3 | 800 | 800 | 13" diameter reel |

LINKS TO RELATED DOCUMENTS

| | |
|--------------------------|--|
| Dimensions | www.vishay.com/doc?95046 |
| Part marking information | www.vishay.com/doc?95444 |
| Packaging information | www.vishay.com/doc?96317 |

D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC® outline D²PAK (SMD-220)



| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|--------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 4.06 | 4.83 | 0.160 | 0.190 | |
| A1 | 0.00 | 0.254 | 0.000 | 0.010 | |
| b | 0.51 | 0.99 | 0.020 | 0.039 | |
| b1 | 0.51 | 0.89 | 0.020 | 0.035 | 4 |
| b2 | 1.14 | 1.78 | 0.045 | 0.070 | |
| b3 | 1.14 | 1.73 | 0.045 | 0.068 | 4 |
| c | 0.38 | 0.74 | 0.015 | 0.029 | |
| c1 | 0.38 | 0.58 | 0.015 | 0.023 | 4 |
| c2 | 1.14 | 1.65 | 0.045 | 0.065 | |
| D | 8.51 | 9.65 | 0.335 | 0.380 | 2 |

| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| D1 | 6.86 | 8.00 | 0.270 | 0.315 | 3 |
| E | 9.65 | 10.67 | 0.380 | 0.420 | 2, 3 |
| E1 | 7.90 | 8.80 | 0.311 | 0.346 | 3 |
| e | 2.54 BSC | | 0.100 BSC | | |
| H | 14.61 | 15.88 | 0.575 | 0.625 | |
| L | 1.78 | 2.79 | 0.070 | 0.110 | |
| L1 | - | 1.65 | - | 0.066 | 3 |
| L2 | 1.27 | 1.78 | 0.050 | 0.070 | |
| L3 | 0.25 BSC | | 0.010 BSC | | |
| 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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