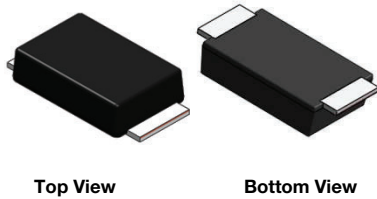


Hyperfast Rectifier, 3 A FRED Pt[®]

eSMP[®] Series



Top View

Bottom View

SlimSMAW (DO-221AD)



LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS | |
|-------------------------|---------------------|
| $I_{F(AV)}$ | 3 A |
| V_R | 100 V, 200 V |
| V_F at I_F | 0.71 V |
| I_{FSM} | 70 A |
| t_{rr} (typ.) | 16 ns |
| T_J max. | 175 °C |
| Package | SlimSMAW (DO-221AD) |
| Circuit configuration | Single |

FEATURES

- Low profile package
- Ideal for automated placement
- Low forward voltage drop, low power losses
- Low leakage current
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified, class 2 whisker test
- Compatible to SOD-128 package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



DESCRIPTION / APPLICATIONS

For use in high frequency, freewheeling, DC/DC converters, PFC, and in snubber industrial, and automotive applications.

MECHANICAL DATA

Case: SlimSMAW (DO-221AD)

Molding compound meets UL 94 V-0 flammability rating
Halogen-free, RoHS-compliant

Terminals: matte tin plated leads, solderable per J-STD-002

Polarity: color band denotes cathode end

| ABSOLUTE MAXIMUM RATINGS | | | | | |
|---|----------------------------|--|-------------|-------|--|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS | |
| Peak repetitive reverse voltage | V_{RRM} | | 100 | V | |
| | | | 200 | | |
| Average rectified forward current | $I_{F(AV)}$ ⁽¹⁾ | $T_C = 137\text{ °C}$ | 3 | A | |
| Non-repetitive peak surge current | I_{FSM} | $T_J = 25\text{ °C}$, 10 ms sine pulse wave | 70 | | |
| Operating junction and storage temperatures | T_J, T_{Stg} | | -55 to +175 | °C | |

Note

⁽¹⁾ Mounted on infinite heatsink

| ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ °C}$ unless otherwise specified) | | | | | | | |
|--|---------------|---|------|------|------|---------------|--|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS | |
| Breakdown voltage, blocking voltage | V_{BR}, V_R | $I_R = 100\text{ }\mu\text{A}$ | 100 | - | - | V | |
| | | | 200 | - | - | | |
| Forward voltage, per diode | V_F | $I_F = 3\text{ A}$ | - | 0.86 | 0.95 | | |
| | | $I_F = 3\text{ A}, T_J = 150\text{ °C}$ | - | 0.71 | 0.79 | | |
| Reverse leakage current, per diode | I_R | $V_R = V_R$ rated | - | - | 2 | μA | |
| | | $T_J = 150\text{ °C}, V_R = V_R$ rated | - | - | 20 | | |
| Junction capacitance | C_T | $V_R = 200\text{ V}$ | - | 16 | - | pF | |



| DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified) | | | | | | | |
|--|-----------|--|-----------------------------------|------|------|-------|----|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS | |
| Reverse recovery time | t_{rr} | $I_F = 1.0\text{ A}$, $dI_F/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$ | - | 22 | - | ns | |
| | | $I_F = 1.0\text{ A}$, $dI_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$ | - | 16 | - | | |
| | | $I_F = 0.5\text{ A}$, $I_R = 1\text{ A}$, $I_{rr} = 0.25\text{ A}$ | - | - | 30 | | |
| | | $T_J = 25\text{ }^\circ\text{C}$ | - | 18 | - | | |
| | | $T_J = 125\text{ }^\circ\text{C}$ | - | 30 | - | | |
| Peak recovery current | I_{RRM} | $I_F = 3\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$ | $T_J = 25\text{ }^\circ\text{C}$ | - | 2.5 | - | A |
| | | | $T_J = 125\text{ }^\circ\text{C}$ | - | 4 | - | |
| Reverse recovery charge | Q_{rr} | $T_J = 25\text{ }^\circ\text{C}$ | $T_J = 25\text{ }^\circ\text{C}$ | - | 23 | - | nC |
| | | | $T_J = 125\text{ }^\circ\text{C}$ | - | 60 | - | |

| THERMAL - MECHANICAL SPECIFICATIONS | | | | | | |
|--|------------------|--|------|------|------|---------------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNITS |
| Maximum junction and storage temperature range | T_J, T_{Stg} | | -55 | - | 175 | $^\circ\text{C}$ |
| Thermal resistance, junction to mount | $R_{thJM}^{(1)}$ | Infinite heatsink | - | 12 | 15 | $^\circ\text{C}/\text{W}$ |
| Thermal resistance, junction to ambient | R_{thJA} | Device mounted on FR4 PCB, 2 oz. standard footprint | - | 120 | 150 | |
| Marking device | VS-3EYH01HM3 | Case style SlimSMAW (DO-221AD) | 3H1 | | | |
| | VS-3EYH02HM3 | | 3H2 | | | |

Note

⁽¹⁾ Thermal resistance junction to mount follows JEDEC® 51-14 transient dual interface test method (TDIM)

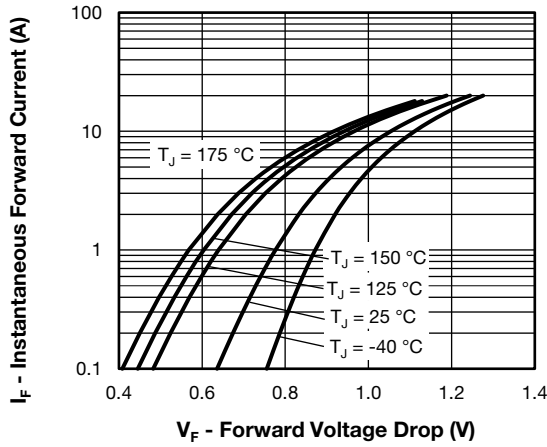


Fig. 1 - Typical Forward Voltage Drop Characteristics

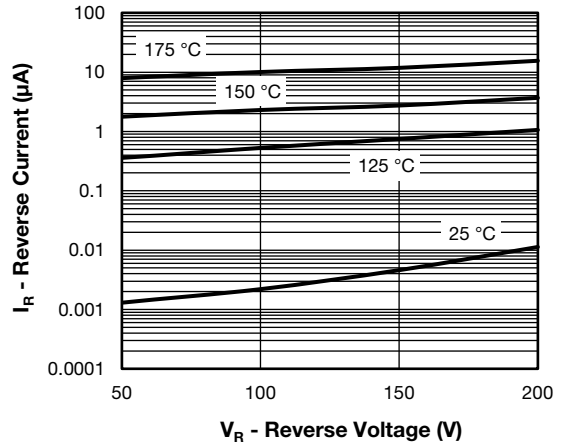


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

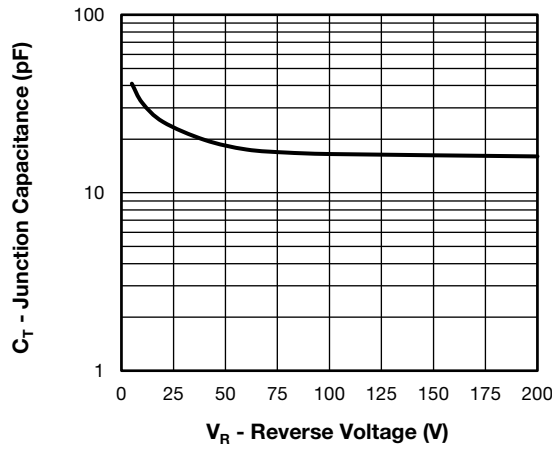


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

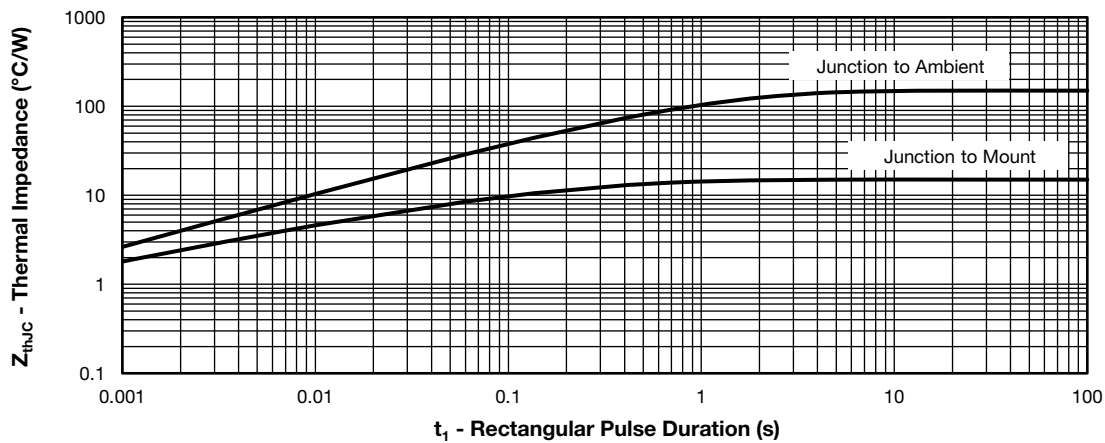


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

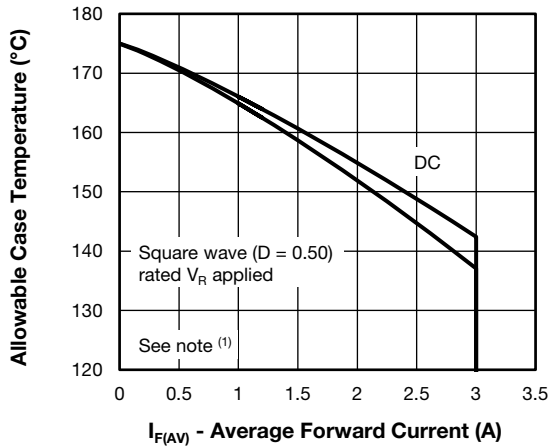


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

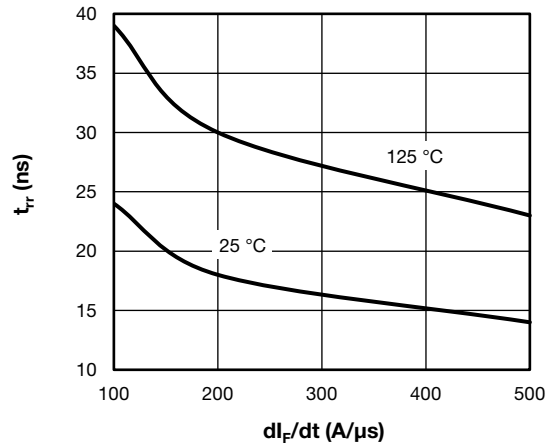


Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt

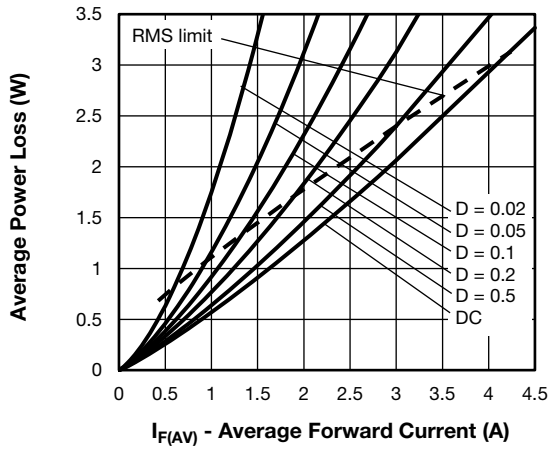


Fig. 6 - Forward Power Loss Characteristics

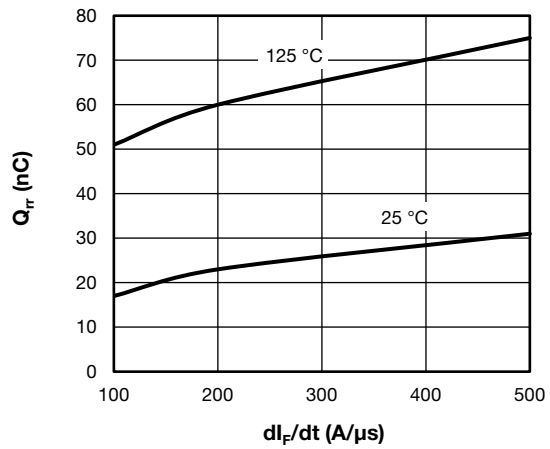


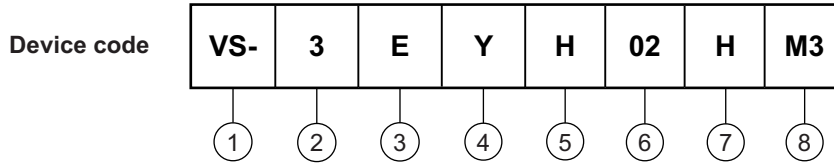
Fig. 8 - Typical Stored Charge vs. dI_F/dt

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
- P_d = forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 5);
- $P_{d_{REV}}$ = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = rated V_R



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (3 = 3 A)
- 3** - Circuit configuration:
E = single diode
- 4** - Y = SlimSMAW (DO-221AD)
- 5** - Process type,
H = hyperfast recovery
- 6** - Voltage code (02 = 200 V)
- 7** - H = AEC-Q101 qualified
- 8** - M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | PACKAGING DESCRIPTION |
| VS-3EYH01HM3/H | 0.033 | H | 3500 | 7" diameter plastic tape and reel |
| VS-3EYH01HM3/I | 0.033 | I | 14 000 | 13" diameter plastic tape and reel |
| VS-3EYH02HM3/H | 0.033 | H | 3500 | 7" diameter plastic tape and reel |
| VS-3EYH02HM3/I | 0.033 | I | 14 000 | 13" diameter plastic tape and reel |

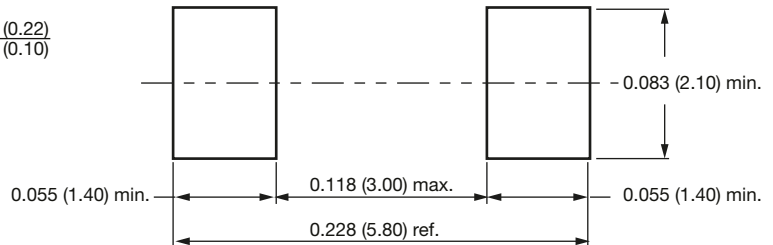
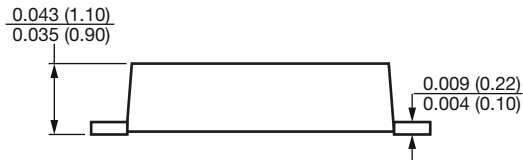
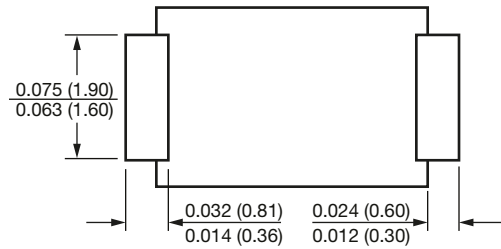
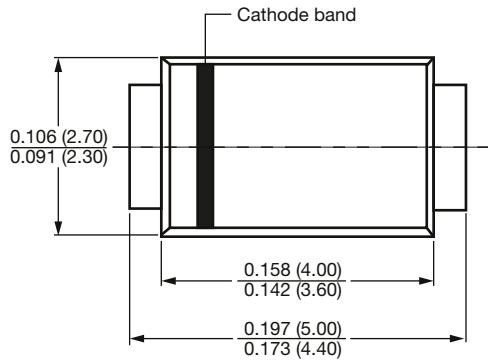
| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?96582 |
| Part marking information | www.vishay.com/doc?95562 |
| Packaging information | www.vishay.com/doc?88869 |
| SPICE model | www.vishay.com/doc?96586 |



SlimSMAW (DO-221AD)

DIMENSIONS in inches (millimeters)

SlimSMAW (DO-221AD)



Mounting pad layout



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