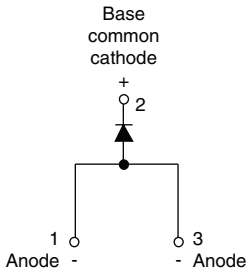
# Surface Mountable
# Fast Soft Recovery Diode, 8 A

D-PAK




## FEATURES/DESCRIPTION

Available
RoHS* COMPLIANT

The 8EWF..SPbF fast soft recovery rectifier series has been optimized for combined short reverse recovery time, low forward voltage drop and low leakage current.

The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions.

This series is designed and qualified for industrial level and lead (Pb)-free.

| PRODUCT SUMMARY | |
|---|---|
| $V_F$ at 8 A | < 1.3 V |
| $t_{rr}$ | 80 ns |
| $V_{RRM}$ | 1000/1200 V |

## APPLICATIONS

- Output rectification and freewheeling diode in inverters, choppers and converters
- Input rectifications where severe restrictions on conducted EMI should be met

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|---|---|---|---|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Sinusoidal waveform | 8 | A |
| $V_{RRM}$ | | 1000/1200 | V |
| $I_{FSM}$ | | 170 | A |
| $V_F$ | 8 A, $T_J$ = 25 °C | 1.3 | V |
| $t_{rr}$ | 1 A, 100 A/µs | 80 | ns |
| $T_J$ | Range | - 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 |
| 8EWF10SPbF | 1000 | 1100 | 4 |
| 8EWF12SPbF | 1200 | 1300 | |

| ABSOLUTE MAXIMUM RATINGS | | | | |
|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum average forward current | $I_{F(AV)}$ | $T_C$ = 94 °C, 180° conduction half sine wave | 8 | 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 | 144 | $A^2s$ |
| | | 10 ms sine pulse, no voltage reapplied | 200 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reapplied | 2000 | $A^2\sqrt{s}$ |

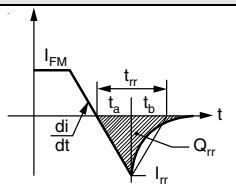
* Pb containing terminations are not RoHS compliant, exemptions may apply

## ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
|---|---|---|---|---|---|
| Maximum forward voltage drop | $V_{FM}$ | 8 A, $T_J$ = 25 °C | | 1.3 | V |
| Forward slope resistance | $r_t$ | $T_J$ = 150 °C | | 25.6 | mΩ |
| Threshold voltage | $V_{F(TO)}$ | | | 0.93 | V |
| Maximum reverse leakage current | $I_{RM}$ | $T_J$ = 25 °C | $V_R$ = Rated $V_{RRM}$ | 0.1 | mA |
| | | $T_J$ = 150 °C | | 4 | |

## RECOVERY CHARACTERISTICS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|---|---|---|---|
| Reverse recovery time | $t_{rr}$ | $I_F$ at 8 Apk<br>25 A/µs<br>$T_J$ = 25 °C | 270 | ns |
| Reverse recovery current | $I_{rr}$ | | 4.2 | A |
| Reverse recovery charge | $Q_{rr}$ | | 1 | µC |
| Snap factor | S | | 0.6 | |




## 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 |
| Typical thermal resistance, junction to ambient (PCB mount) | $R_{thJA}$ (1) | | 50 | |
| Soldering temperature | $T_S$ | For 10 seconds | 240 | °C |
| Approximate weight | | | 1 | g |
| | | | 0.03 | oz. |
| Marking device | | Case style D-PAK (TO-252AA) | 8EWF12S | |

**Note**

(1) When mounted on 1" square (650 $mm^2$) 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

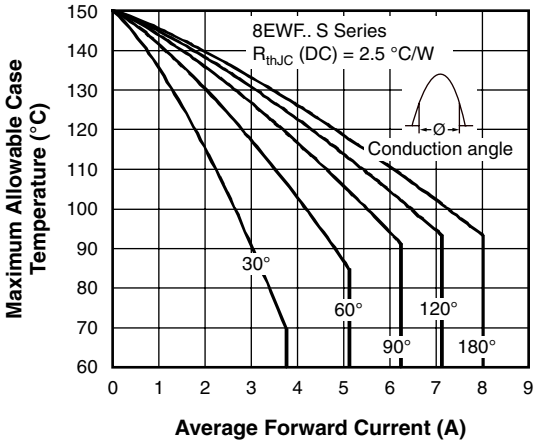



Fig. 1 - Current Rating Characteristics

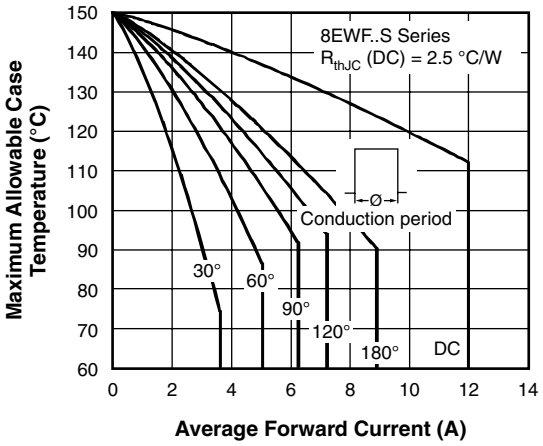



Fig. 2 - Current Rating Characteristics

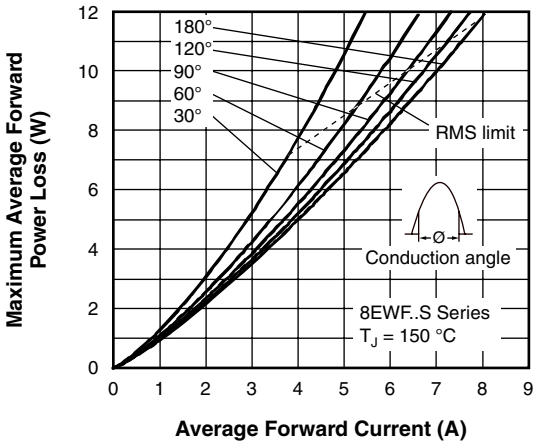



Fig. 3 - Forward Power Loss Characteristics

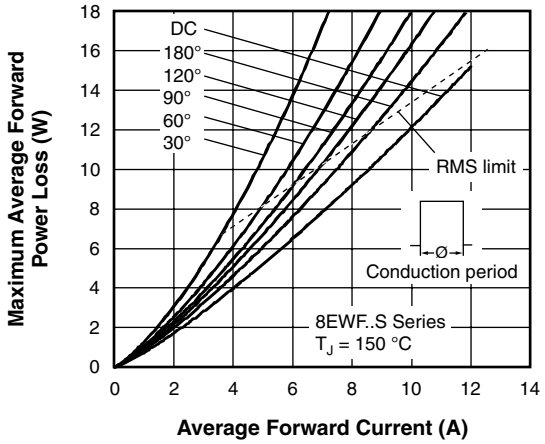



Fig. 4 - Forward Power Loss Characteristics

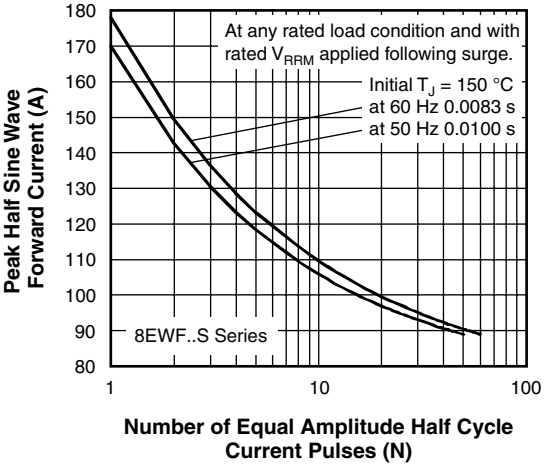



Fig. 5 - Maximum Non-Repetitive Surge Current

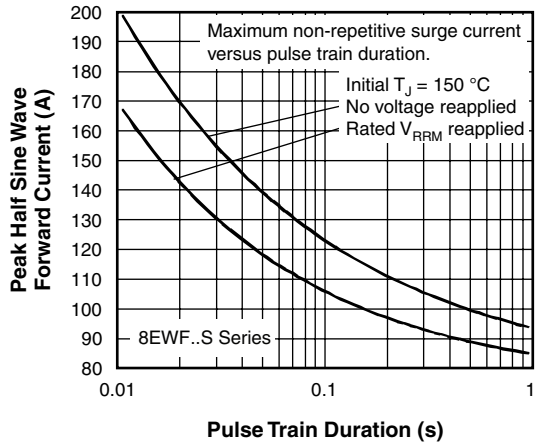



Fig. 6 - Maximum Non-Repetitive Surge Current

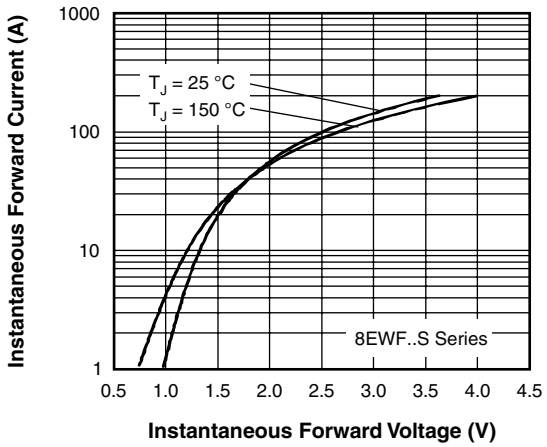



Fig. 7 - Forward Voltage Drop Characteristics

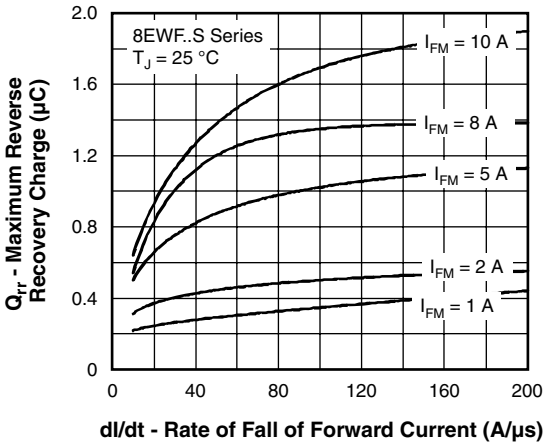



Fig. 10 - Recovery Charge Characteristics, $T_J$ = 25 °C

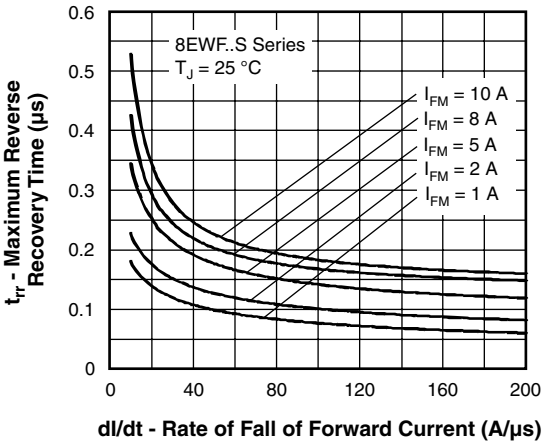



Fig. 8 - Recovery Time Characteristics, $T_J$ = 25 °C

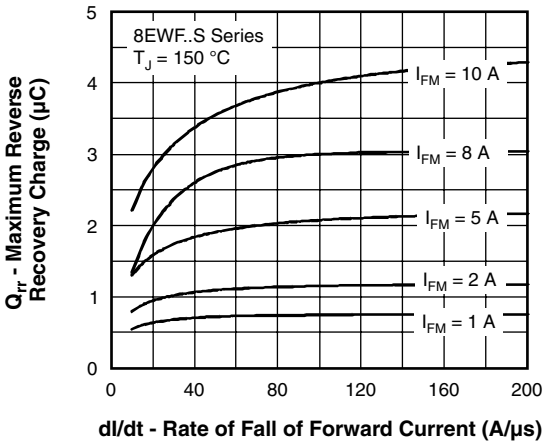



Fig. 11 - Recovery Charge Characteristics, $T_J$ = 150 °C

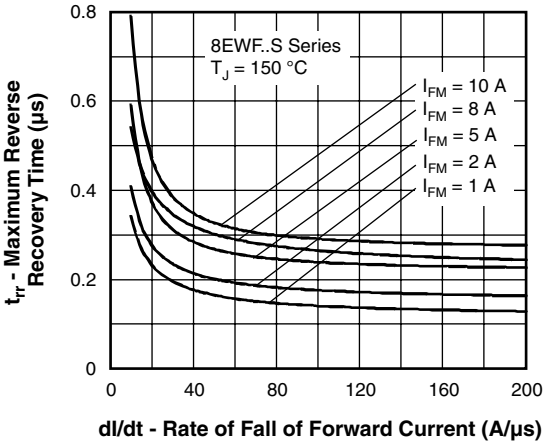



Fig. 9 - Recovery Time Characteristics, $T_J$ = 150 °C

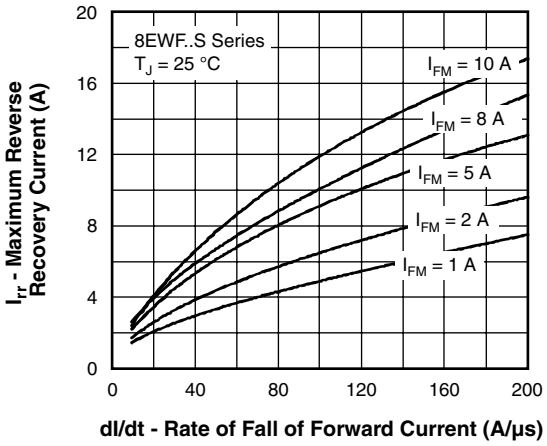



Fig. 12 - Recovery Current Characteristics, $T_J$ = 25 °C

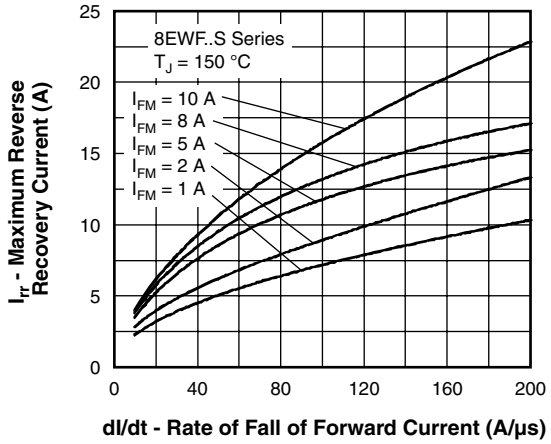



Fig. 13 - Recovery Current Characteristics, $T_J$ = 150 °C

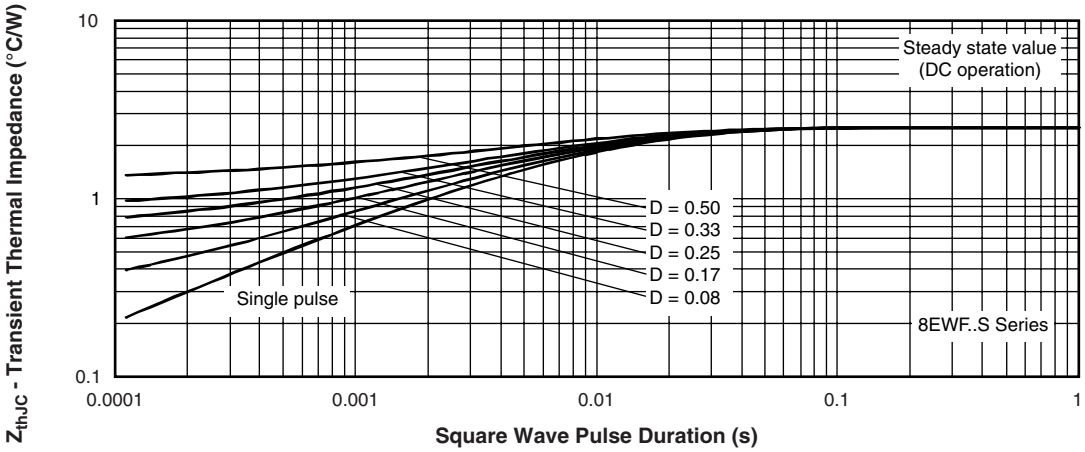



Fig. 14 - Thermal Impedance $Z_{thJC}$ Characteristics

## ORDERING INFORMATION TABLE

**Device code**

| 8 | E | W | F | 12 | S | TR | PbF |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |

- **1** - Current rating (8 = 8 A)
- **2** - Circuit configuration:
  E = Single diode
- **3** - Package:
  W = D-PAK
- **4** - Type of silicon:
  F = Fast soft recovery rectifier
- **5** - Voltage code x 100 = $V_{RRM}$
  10 = 1000 V
  12 = 1200 V
- **6** - S = Surface mountable
- **7** - • TR = Tape and reel
  • TRR = Tape and reel (right oriented)
  • TRL = Tape and reel (left oriented)
- **8** - • None = Standard production
  • PbF = Lead (Pb)-free

| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | http://www.vishay.com/doc?95016 |
| Part marking information | http://www.vishay.com/doc?95059 |
| Packaging information | http://www.vishay.com/doc?95033 |

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