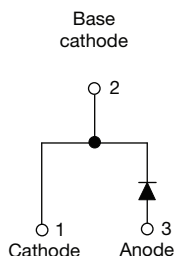
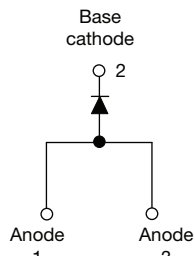


Fast Soft Recovery Rectifier Diode, 30 A


TO-247AC 2L

TO-247AC 3L

VS-30EPF0...

VS-30APF0...

FEATURES

- Glass passivated pellet chip junction
- 150 °C max. operating junction temperature
- Low forward voltage drop and short reverse recovery time
- 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
Available

APPLICATIONS

These devices are intended for use in output rectification and freewheeling in inverters, choppers and converters as well as in input rectification where severe restrictions on conducted EMI should be met.

DESCRIPTION

The VS-30EPF06-M3 and VS-30APF06-M3 soft recovery rectifier series has been optimized for combined short reverse recovery time and low forward voltage drop.

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

PRIMARY CHARACTERISTICS

| | |
|-----------------------|--------------------------|
| $I_{F(AV)}$ | 30 A |
| V_R | 200 V, 400 V, 600 V |
| V_F at I_F | 1.41 V |
| I_{FSM} | 320 A |
| t_{rr} | 60 ns |
| T_J max. | 150 °C |
| Package | TO-247AC 2L, TO-247AC 3L |
| Circuit configuration | Single |
| Snap factor | 0.6 |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|---------------------|-------------|-------|
| $I_{F(AV)}$ | Sinusoidal waveform | 30 | A |
| V_{RRM} | | 200 to 600 | V |
| I_{FSM} | | 320 | A |
| V_F | 10 A, $T_J = 25$ °C | 1.2 | V |
| t_{rr} | 1 A, 100 A/μs | 60 | ns |
| 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-30EPF02-M3, VS-30APF02-M3 | 200 | 300 | 5 |
| VS-30EPF04-M3, VS-30APF04-M3 | 400 | 500 | |
| VS-30EPF06-M3, VS-30APF06-M3 | 600 | 700 | |

**ABSOLUTE MAXIMUM RATINGS**

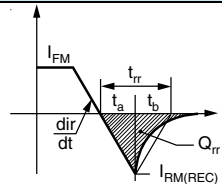
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|---------------|---|--------|-----------------------------|
| Maximum average forward current | $I_{F(AV)}$ | $T_C = 98\text{ }^{\circ}\text{C}$, 180° conduction half sine wave | 30 | A |
| Maximum peak one cycle non-repetitive surge current | I_{FSM} | 10 ms sine pulse, rated V_{RRM} applied | 270 | |
| | | 10 ms sine pulse, no voltage reapplied | 320 | |
| Maximum I^2t for fusing | I^2t | 10 ms sine pulse, rated V_{RRM} applied | 365 | A^2s |
| | | 10 ms sine pulse, no voltage reapplied | 515 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | $t = 0.1\text{ ms to }10\text{ ms}$, no voltage reapplied | 5150 | $\text{A}^2\sqrt{\text{s}}$ |

ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---------------------------------|-------------|--|--------|------------------|
| Maximum forward voltage drop | V_{FM} | 30 A, $T_J = 25\text{ }^{\circ}\text{C}$ | 1.41 | V |
| Forward slope resistance | r_t | $T_J = 150\text{ }^{\circ}\text{C}$ | 12.5 | $\text{m}\Omega$ |
| Threshold voltage | $V_{F(TO)}$ | | 0.9 | V |
| Maximum reverse leakage current | I_{RM} | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.1 | mA |
| | | $T_J = 150\text{ }^{\circ}\text{C}$ | 5.0 | |

RECOVERY CHARACTERISTICS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|--------------------------|----------|--|--------|---------------|
| Reverse recovery time | t_{rr} | I_F at 20 A _{pk} 100 A/ μs 25 °C | 160 | ns |
| Reverse recovery current | I_{rr} | | 10 | A |
| Reverse recovery charge | Q_{rr} | | 1.25 | μC |
| Snap factor | S | Typical | 0.6 | |

**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 | 0.8 | $^{\circ}\text{C/W}$ |
| Maximum thermal resistance, junction to ambient | R_{thJA} | | 40 | |
| Maximum thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased | 0.2 | |
| Approximate weight | | | 6 | g |
| | | | 0.21 | oz. |
| Mounting torque | minimum | | 6 (5) | $\text{kgf} \cdot \text{cm}$ ($\text{lbf} \cdot \text{in}$) |
| | maximum | | 12 (10) | |
| Marking device | | Case style TO-247AC 2L | 30EPF02 | |
| | | | 30EPF04 | |
| | | | 30EPF06 | |
| | | Case style TO-247AC 3L | 30APF02 | |
| | | | 30APF04 | |
| | | | 30APF06 | |

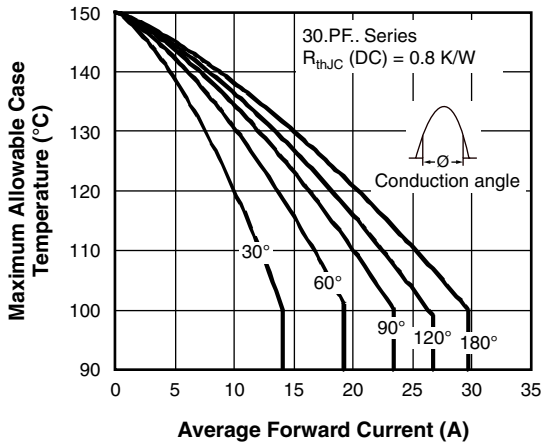


Fig. 1 - Current Rating Characteristics

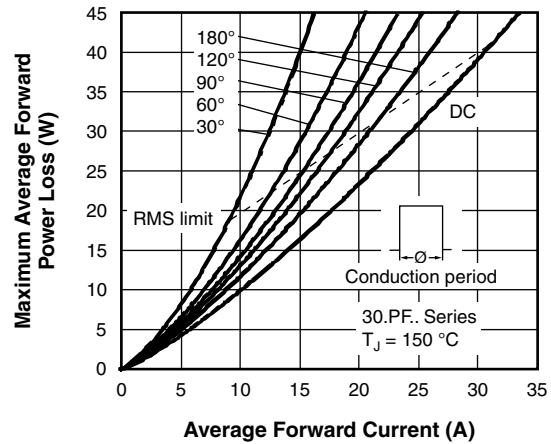


Fig. 4 - Forward Power Loss Characteristics

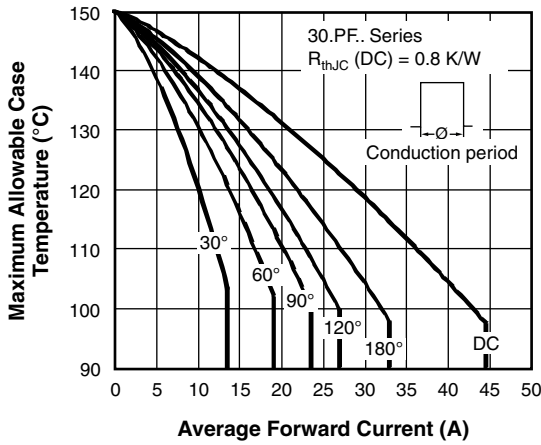


Fig. 2 - Current Rating Characteristics

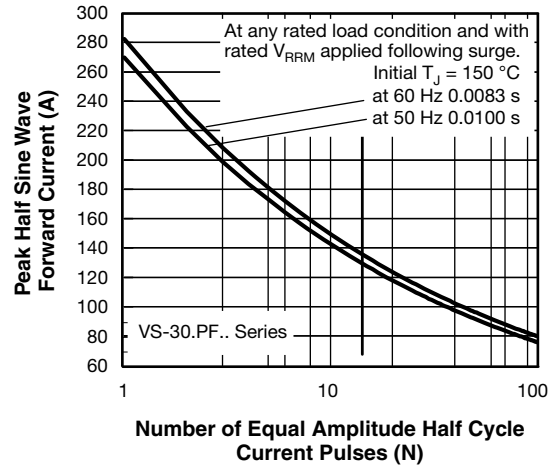


Fig. 5 - Maximum Non-Repetitive Surge Current

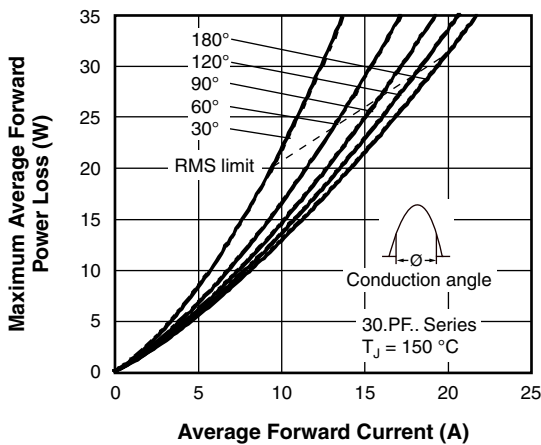


Fig. 3 - Forward Power Loss Characteristics

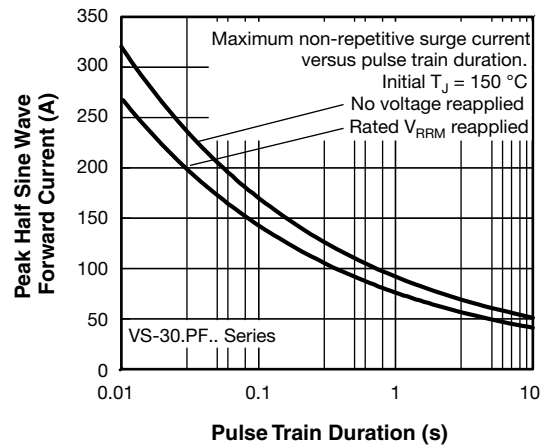


Fig. 6 - Maximum Non-Repetitive Surge Current

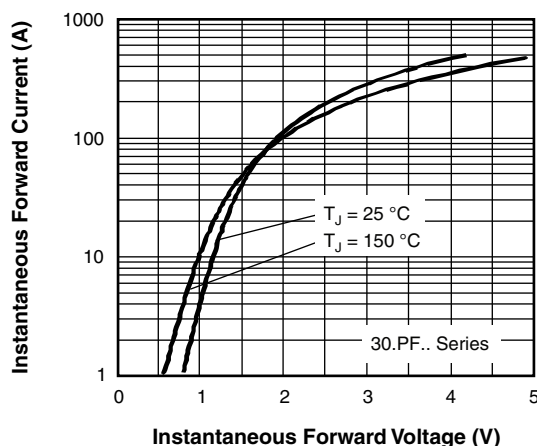
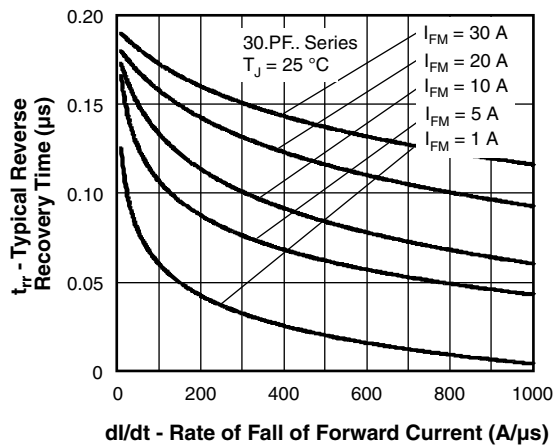
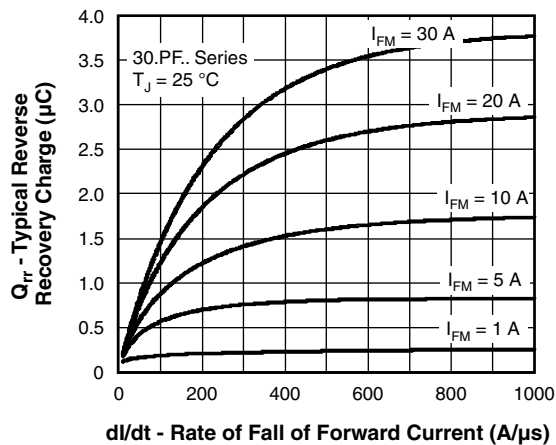
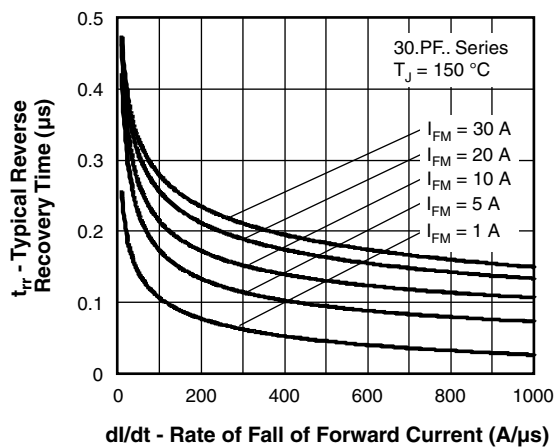
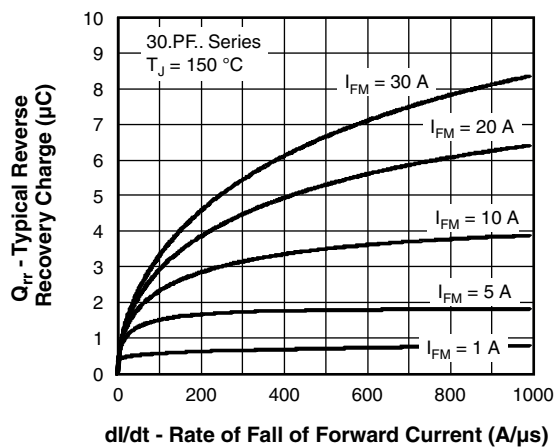
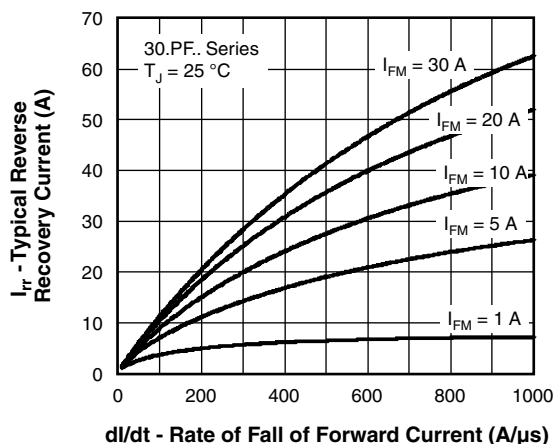
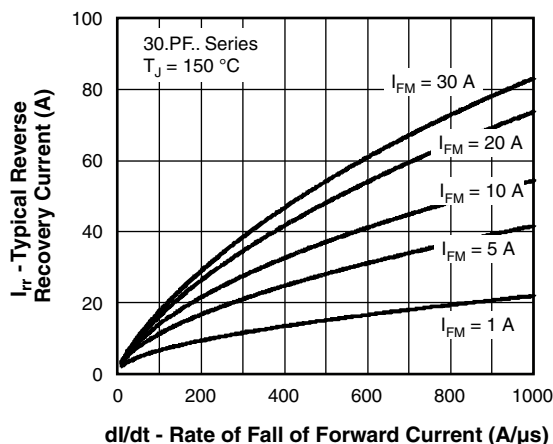
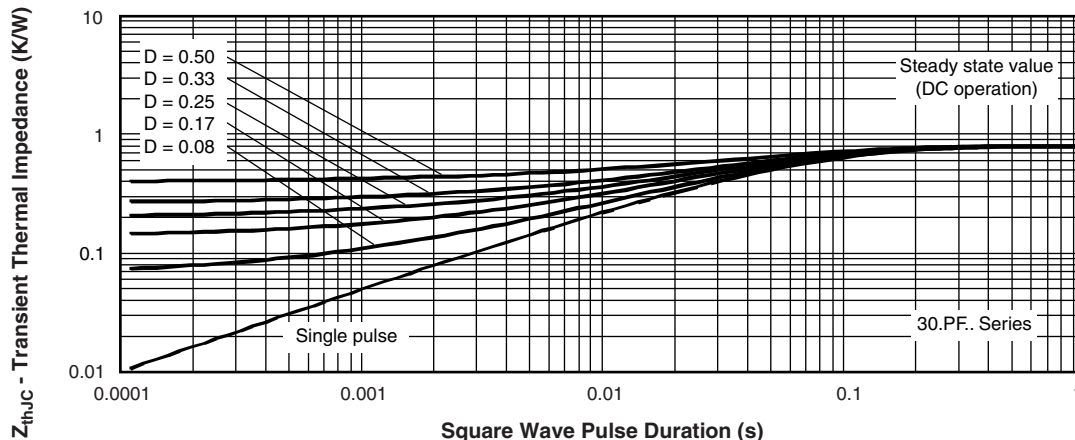


Fig. 7 - Forward Voltage Drop Characteristics


Fig. 8 - Recovery Time Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

Fig. 10 - Recovery Charge Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

Fig. 9 - Recovery Time Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

Fig. 11 - Recovery Charge Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$


Fig. 12 - Recovery Current Characteristics, $T_J = 25^\circ C$

Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ C$

Fig. 14 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE

| Device code | VS- | 30 | E | P | F | 06 | -M3 |
|-------------|-----|---|---|---|---|----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | - | Vishay Semiconductors product | | | | | |
| 2 | - | Current rating (30 = 30 A) | | | | | |
| 3 | - | Circuit configuration: E = single diode, 2 pins A = single diode, 3 pins | | | | | |
| 4 | - | Package: P = TO-247AC 3L / TO-247AC 2L | | | | | |
| 5 | - | Type of silicon: F = fast recovery | | | | | |
| 6 | - | Voltage code x 100 = V_{RRM} | | | | | |
| 7 | - | Environmental digit: -M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free | | | | | |

| |
|------------|
| 02 = 200 V |
| 04 = 400 V |
| 06 = 600 V |

| ORDERING INFORMATION (Example) | | | |
|--------------------------------|------------------|------------------------|--------------------------|
| PREFERRED P/N | QUANTITY PER T/R | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION |
| VS-30EPF02-M3 | 25 | 500 | Antistatic plastic tubes |
| VS-30APF02-M3 | 25 | 500 | Antistatic plastic tubes |
| VS-30EPF04-M3 | 25 | 500 | Antistatic plastic tubes |
| VS-30APF04-M3 | 25 | 500 | Antistatic plastic tubes |
| VS-30EPF06-M3 | 25 | 500 | Antistatic plastic tubes |
| VS-30APF06-M3 | 25 | 500 | Antistatic plastic tubes |

| LINKS TO RELATED DOCUMENTS | | |
|----------------------------|-------------|--|
| Dimensions | TO-247AC 2L | www.vishay.com/doc?96144 |
| | TO-247AC 3L | www.vishay.com/doc?96138 |
| Part marking information | TO-247AC 2L | www.vishay.com/doc?95648 |
| | TO-247AC 3L | www.vishay.com/doc?95007 |



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