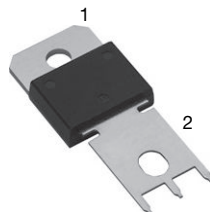
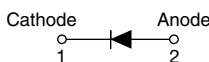


Fast Soft Recovery Rectifier Diode, 85 A


PowerTab®


FEATURES

- Glass passivated pellet chip junction
- 150 °C max. operating junction temperature
- Output rectification and freewheeling in inverters, choppers and converters
- Input rectifications where severe restrictions on conducted EMI should be met
- Screw mounting only
- AEC-Q101 qualified
- PowerTab® package
- Material categorization: for definitions of compliance please see www.vishay.com/doc299912


RoHS
COMPLIANT
HALOGEN
FREE

LINKS TO ADDITIONAL RESOURCES



3D Models

| PRIMARY CHARACTERISTICS | |
|-------------------------|-----------|
| $I_{F(AV)}$ | 85 A |
| V_R | 1200 V |
| V_F at I_F | 1.36 V |
| I_{FSM} | 1190 A |
| t_{rr} | 95 ns |
| T_J max. | 150 °C |
| Snap factor | 0.5 |
| Package | PowerTab® |
| Circuit configuration | Single |

DESCRIPTION

The VS-85EPF12 fast 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. Available in the new PowerTab package, this new series is suitable for a large range of applications combining excellent die to footprint ratio and sturdiness connectivity for use in high current environments.

MECHANICAL DATA

Case: PowerTab®

Molding compound meets UL 94 V-0 flammability rating

Terminal: nickel plated, screwable

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|-----------------------------------|--|-------------|-------|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Rect. conduction 50 % duty cycle at $T_C = 85\text{ °C}$ | 85 | A |
| $I_{F(RMS)}$ | | 160 | |
| V_{RRM} | | 1200 | V |
| I_{FSM} | | 1190 | A |
| V_F | 100 A, $T_J = 25\text{ °C}$ | 1.4 | V |
| t_{rr} | 1 A, - 100 A/μs | 95 | ns |
| T_J | Range | -40 to +150 | °C |

| VOLTAGE RATINGS | | | |
|-----------------|---|--|---------------------------|
| TYPE NUMBER | V_{RRM} , MAXIMUM PEAK REVERSE VOLTAGE V | V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | I_{RRM} AT 150 °C mA |
| VS-85EPF12-M4 | 1200 | 1300 | 18 |

**ABSOLUTE MAXIMUM RATINGS**

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|---------------|---|--------|-----------------------------|
| Maximum average forward current | $I_{F(AV)}$ | $T_C = 85\text{ }^{\circ}\text{C}$, 180° conduction half sine wave | 85 | A |
| Maximum peak one cycle non-repetitive surge current | I_{FSM} | 10 ms sine pulse, rated V_{RRM} applied | 1000 | |
| | | 10 ms sine pulse, no voltage reapplied | 1190 | |
| Maximum I^2t for fusing | I^2t | 10 ms sine pulse, rated V_{RRM} applied | 5000 | A^2s |
| | | 10 ms sine pulse, no voltage reapplied | 7000 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | $t = 0.1\text{ ms to }10\text{ ms}$, no voltage reapplied | 70 000 | $\text{A}^2\sqrt{\text{s}}$ |

ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---------------------------------|-------------|--|--------|------------------|
| Maximum forward voltage drop | V_{FM} | 85 A, $T_J = 25\text{ }^{\circ}\text{C}$ | 1.36 | V |
| Forward slope resistance | r_t | $T_J = 150\text{ }^{\circ}\text{C}$ | 4.03 | $\text{m}\Omega$ |
| Threshold voltage | $V_{F(TO)}$ | | 0.87 | V |
| Maximum reverse leakage current | I_{RM} | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.1 | mA |
| | | $T_J = 150\text{ }^{\circ}\text{C}$ | 18 | |

RECOVERY CHARACTERISTICS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS | |
|--------------------------|----------|---|--------|---------------|--|
| Reverse recovery time | t_{rr} | I_F at 85 A _{pk} 25 A/ μs 25 $^{\circ}\text{C}$ | 480 | ns | |
| Reverse recovery current | I_{rr} | | 7.1 | A | |
| Reverse recovery charge | Q_{rr} | | 2.1 | μC | |
| Snap factor | S | | 0.5 | | |

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 | 0.35 | °C/W |
| Maximum thermal resistance, junction to ambient | R _{thJA} | | 40 | |
| Typical thermal resistance, case to heatsink | R _{thCS} | Mounting surface, smooth and greased | 0.2 | |
| Approximate weight | | | 6 | g |
| Mounting torque | minimum | | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | 12 (10) | |
| Marking device | | Case style PowerTab® | 85EPF12H | |

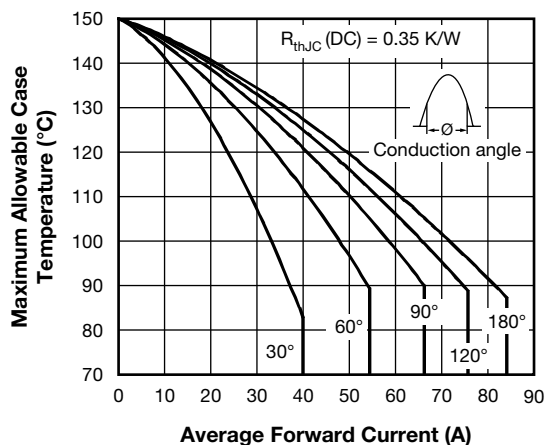


Fig. 1 - Current Rating Characteristics

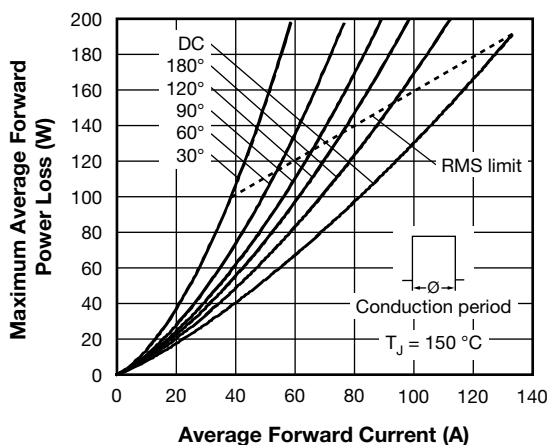


Fig. 4 - Forward Power Loss Characteristics

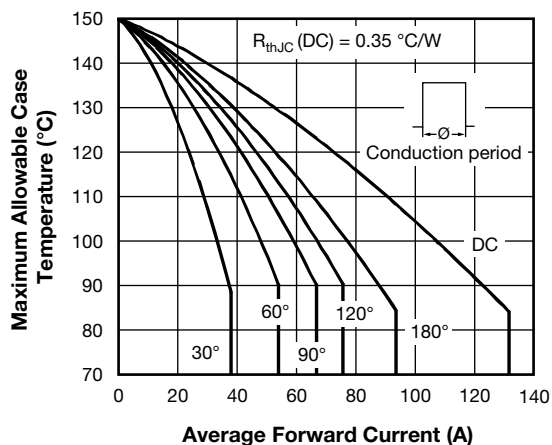


Fig. 2 - Current Rating Characteristics

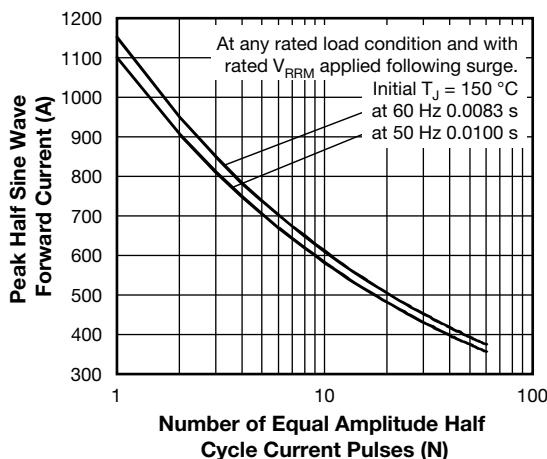


Fig. 5 - Maximum Non-Repetitive Surge Current

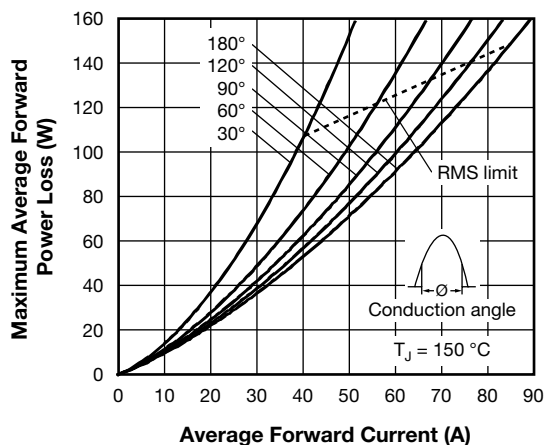


Fig. 3 - Forward Power Loss Characteristics

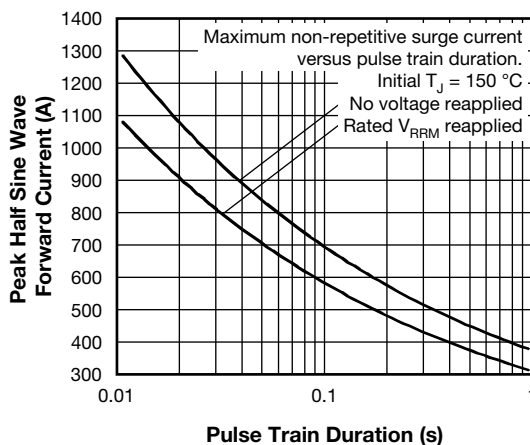


Fig. 6 - Maximum Non-Repetitive Surge Current

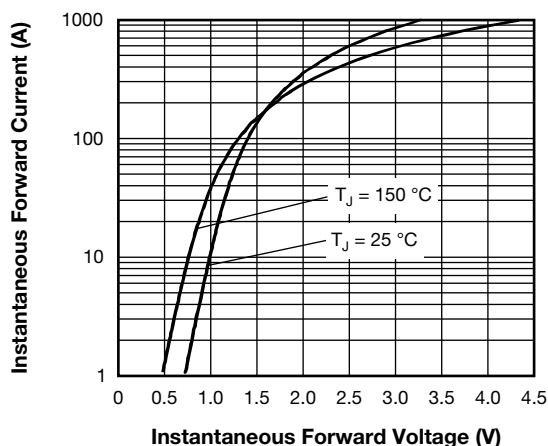
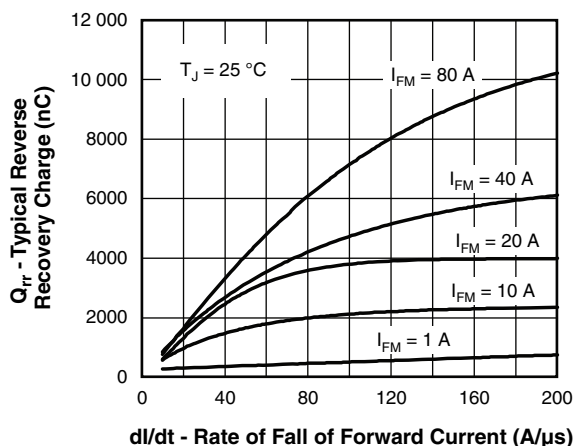
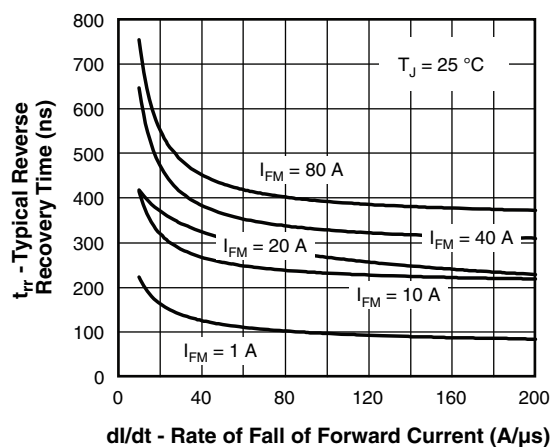
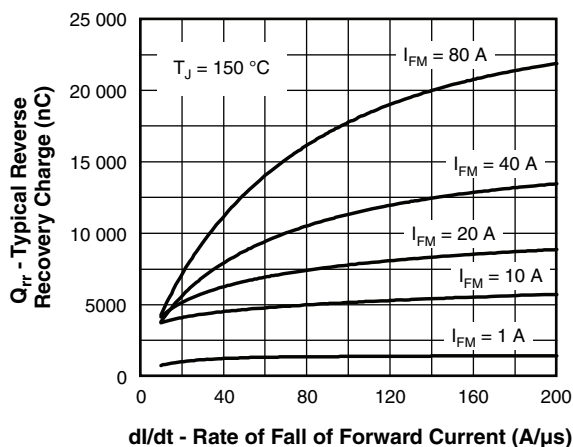
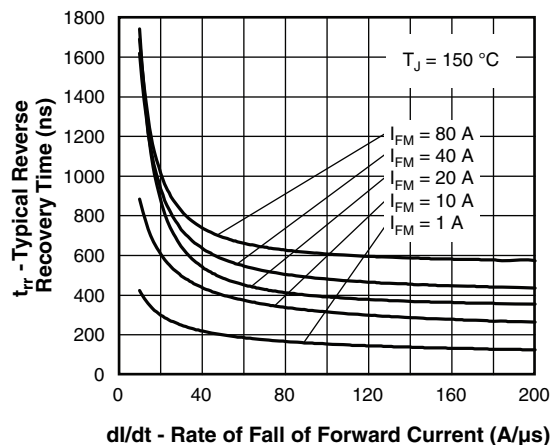
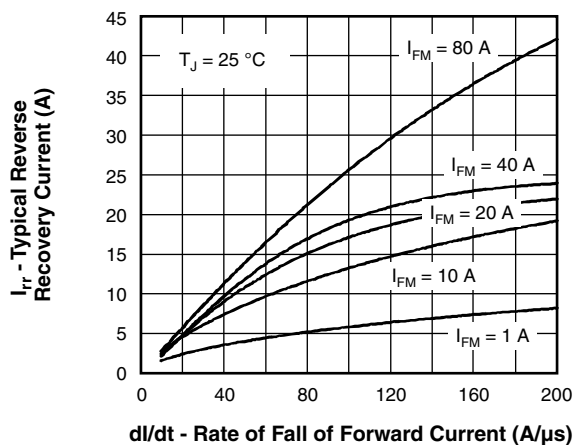


Fig. 7 - Forward Voltage Drop Characteristics


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

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

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

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

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

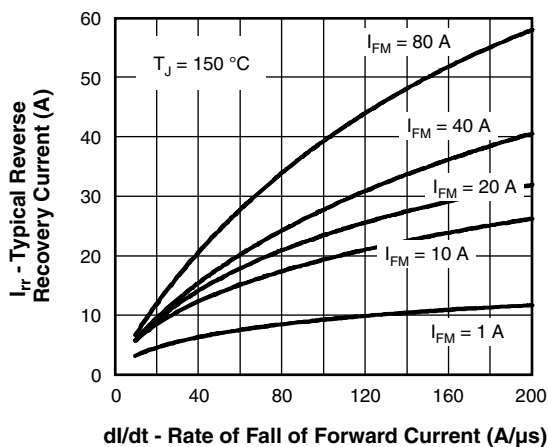


Fig. 13 - Recovery Current Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

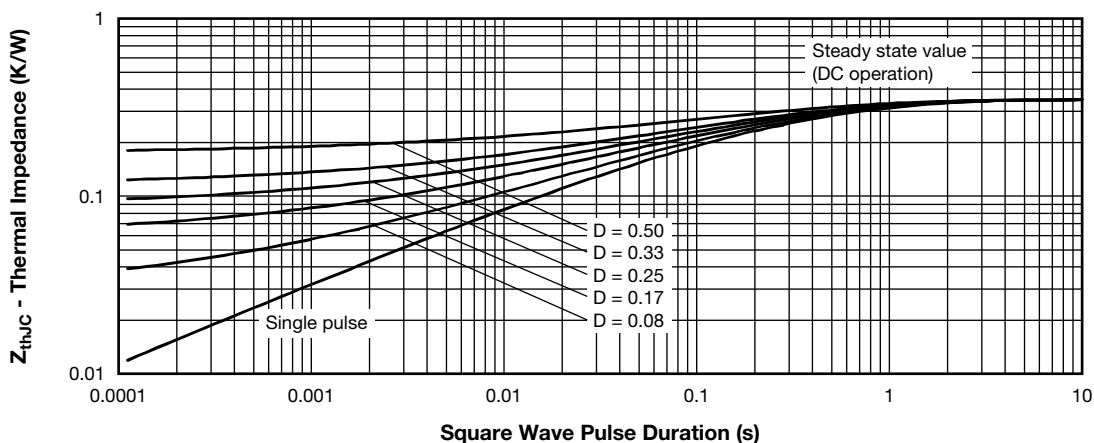


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

**ORDERING INFORMATION TABLE**

| | | | | | | | | |
|-------------|-----|----|---|---|---|----|---|----|
| Device code | VS- | 85 | E | P | F | 12 | H | M4 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

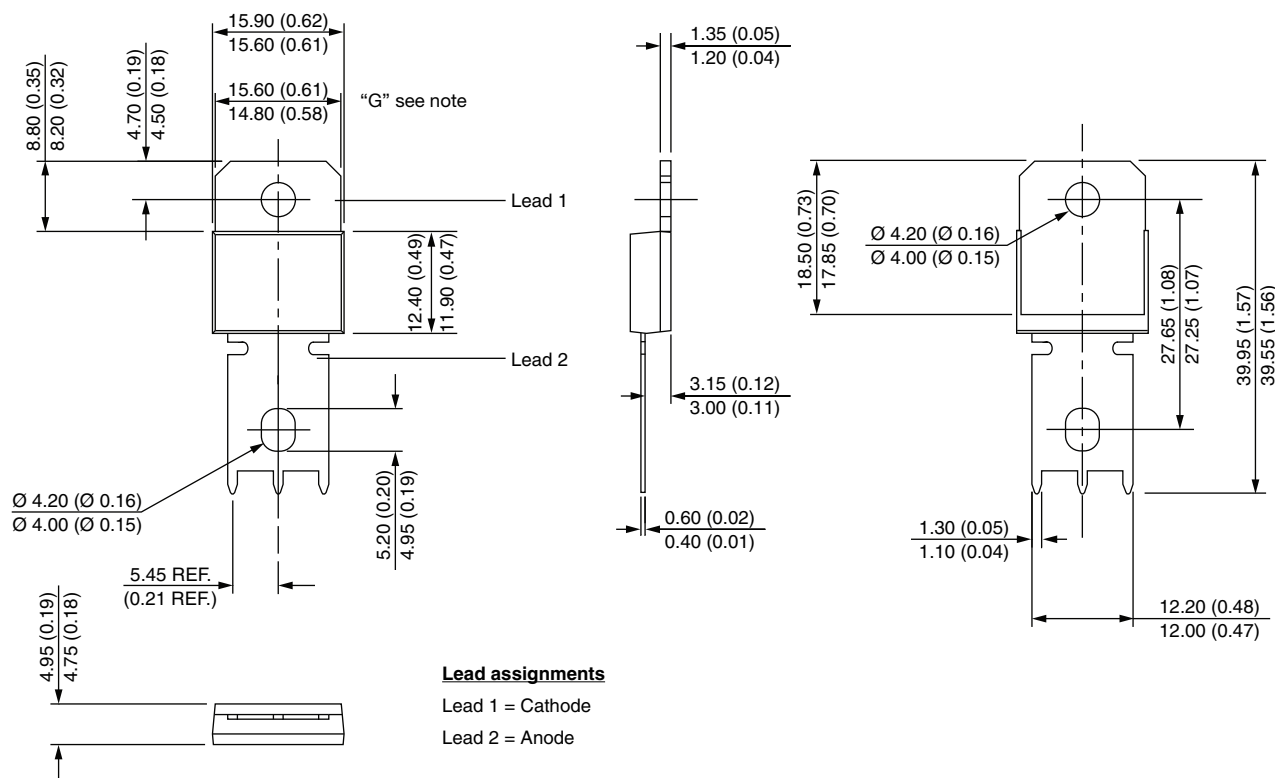
- 1** - Vishay Semiconductors product
- 2** - Current rating (85 = 85 A)
- 3** - Circuit configuration:
E = single diode
- 4** - Package:
P = PowerTab®
- 5** - Type of silicon:
F = fast recovery
- 6** - Voltage code x 100 = V_{RRM} (12 = 1200 V)
- 7** - AEC-Q101 qualified
- 8** - Environmental digit:
M4 = Halogen-free, RoHS-compliant and terminations lead (Pb)-free

| ORDERING INFORMATION (Example) | | |
|---------------------------------------|---------------|-------------------------|
| PREFERRED P/N | BASE QUANTITY | PACKAGING DESCRIPTION |
| VS-85EPF12HM4 | 25/tube | Antistatic plastic tube |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?95240 |
| Part marking information | www.vishay.com/doc?95467 |
| SPIICE model | www.vishay.com/doc?97277 |
| Application note | www.vishay.com/doc?95179 |

PowerTab®

DIMENSIONS in millimeters (inches)



Note:

Outline conform to JEDEC® TO-275, except for dimension "G" only



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