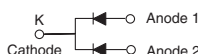


High Current Density Surface Mount Schottky Barrier Rectifier

eSMP® Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal impedance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
 - Automotive ordering code: base P/NHM3
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

PRIMARY CHARACTERISTICS

| | |
|------------------------|---------------------|
| $I_{F(AV)}$ | 2 x 6.0 A |
| V_{RRM} | 40 V |
| I_{FSM} | 150 A |
| E_{AS} | 20 mJ |
| V_F at $I_F = 6.0$ A | 0.40 V |
| T_J max. | 125 °C |
| Package | TO-277A (SMPC) |
| Diode variations | Dual common cathode |

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS-compliant and AEC-Q101 qualified

Base P/NHM3_X - halogen-free, RoHS-compliant and AEC-Q101 qualified

("_X" denotes revision code e.g. A, B,.....)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

| PARAMETER | SYMBOL | SS12P4C | UNIT |
|---------------------------------------------------------------------------------------------|----------------|-------------|------|
| Device marking code | | S124C | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 40 | V |
| Maximum average forward rectified current (fig. 1) ⁽¹⁾ | $I_{F(AV)}$ | 12 | A |
| | | 6.0 | |
| Maximum average forward rectified current ⁽²⁾ | $I_{F(AV)}$ | 3.5 | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode | I_{FSM} | 150 | A |
| Non-repetitive avalanche energy at $T_J = 25$ °C, $L = 60$ mH per diode | E_{AS} | 20 | mJ |
| Peak repetitive reverse current at $t_p = 2$ μs, 1 kHz, at $T_J = 25$ °C per diode | I_{RRM} | 1.0 | A |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +125 | °C |

Notes

⁽¹⁾ Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink

⁽²⁾ Free air, mounted on recommended copper pad area

| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | |
|----------------------------------------------------------------------------|----------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode | I _F = 1 A | T _A = 25 °C | V _F ⁽¹⁾ | 0.34 | - | V |
| | I _F = 3 A | | | 0.40 | - | |
| | I _F = 6 A | | | 0.46 | 0.52 | |
| | I _F = 1 A | T _A = 100 °C | | 0.24 | - | |
| | I _F = 3 A | | | 0.31 | - | |
| | I _F = 6 A | | | 0.40 | 0.45 | |
| Reverse current per diode | Rated V _R | T _A = 25 °C | I _R ⁽²⁾ | 129 | 500 | μA |
| | | T _A = 100 °C | | 11.9 | 25 | mA |
| Typical junction capacitance per diode | 4.0 V, 1 MHz | | C _J | 400 | - | pF |

Notes

(3) Pulse test: 300 μs pulse width, 1 % duty cycle

(4) Pulse test: Pulse width $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) | | | |
|---------------------------------------------------------------------------------------------|-----------------------|---------|----------------------|
| PARAMETER | SYMBOL | SS12P4C | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 100 | $^{\circ}\text{C/W}$ |
| | $R_{\theta JM}^{(2)}$ | 3 | |

Notes

(1) Free air, mounted on recommended copper pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient.

(2) Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink. Thermal resistance $R_{\theta JM}$ - junction to mount.

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| SS12P4C-M3/86A | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| SS12P4C-M3/87A | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |
| SS12P4CHM3/86A ⁽¹⁾ | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| SS12P4CHM3/87A ⁽¹⁾ | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |
| SS12P4CHM3_A/H ⁽¹⁾ | 0.10 | H | 1500 | 7" diameter plastic tape and reel |
| SS12P4CHM3_A/I ⁽¹⁾ | 0.10 | I | 6500 | 13" diameter plastic tape and reel |

Note

(1) AEC-Q101 qualified

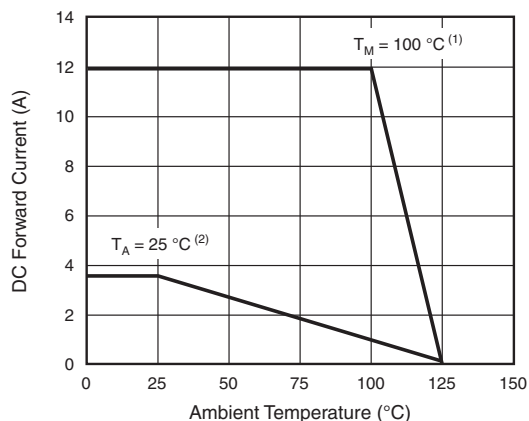
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

Notes

- Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink, T_M measured at the terminal of cathode band ($R_{\theta JM} = 3\text{ }^{\circ}\text{C/W}$)
- Free air, mounted on recommended copper pad area ($R_{\theta JA} = 100\text{ }^{\circ}\text{C/W}$)

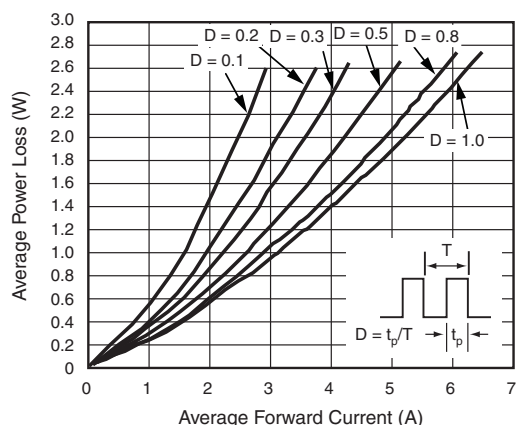


Fig. 2 - Forward Power Loss Characteristics Per Diode

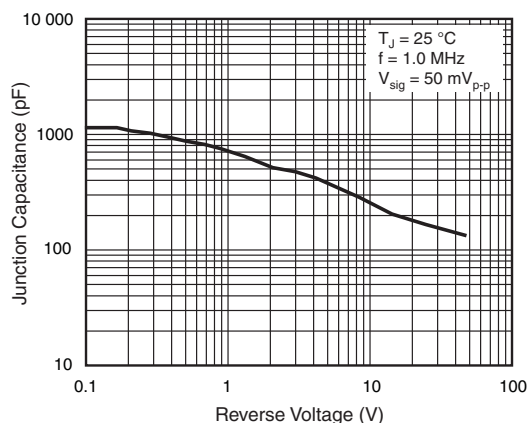


Fig. 5 - Typical Junction Capacitance Per Diode

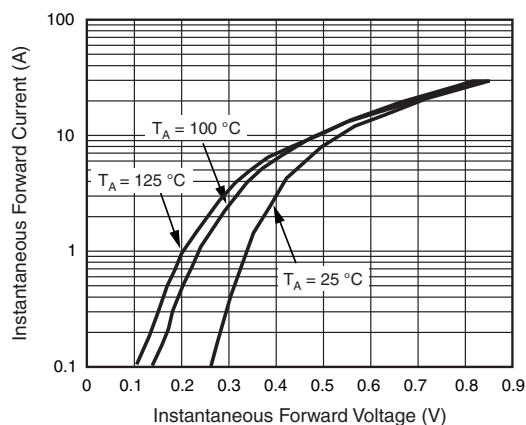


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

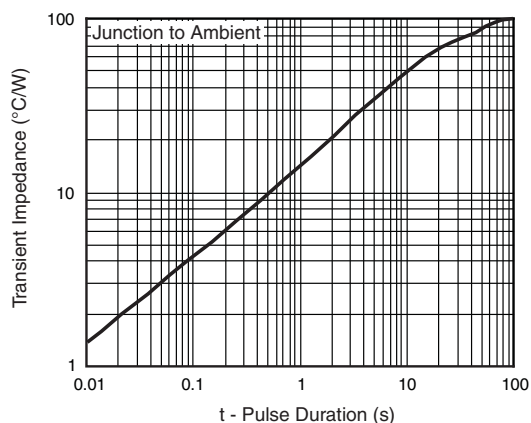


Fig. 6 - Typical Transient Thermal Impedance Per Diode

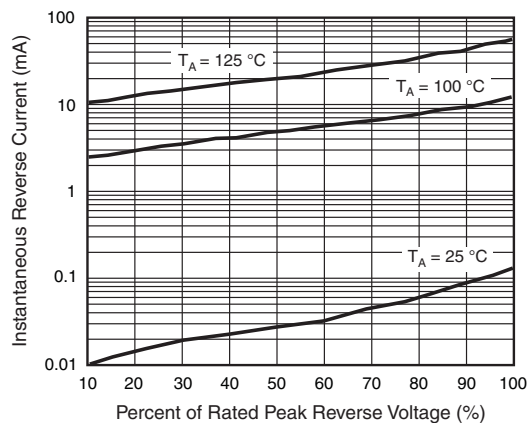
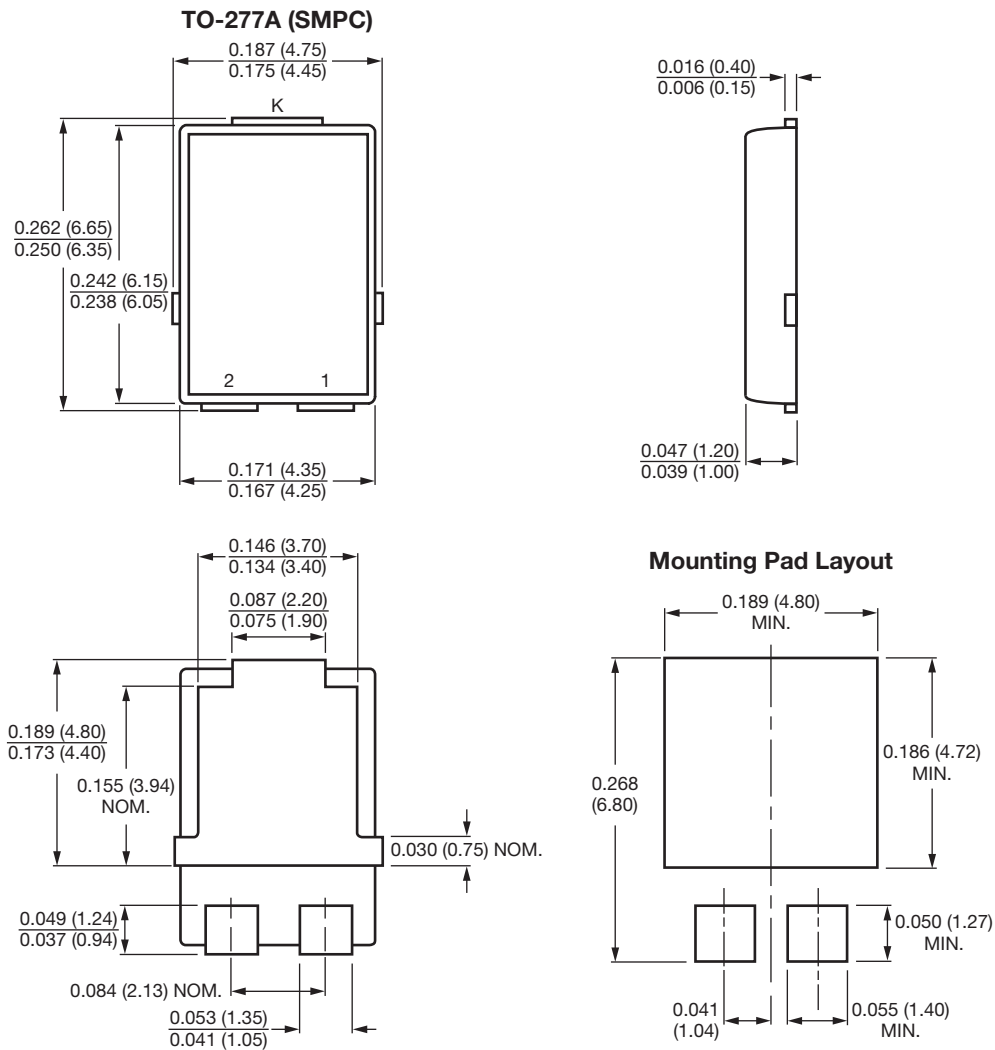


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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