

V12PM10-M3/I Datasheet

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| | |
|------------------------------|--|
| DiGi Electronics Part Number | V12PM10-M3/I-DG |
| Manufacturer | Vishay General Semiconductor - Diodes Division |
| Manufacturer Product Number | V12PM10-M3/I |
| Description | DIODE SCHOTTKY 100V 12A TO277A |
| Detailed Description | Diode 100 V 12A Surface Mount TO-277A (SMPC) |

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Purchase and inquiry

Manufacturer Product Number:

V12PM10-M3/I

Series:

eSMP®, TMBS®

Technology:

Schottky

Current - Average Rectified (Io):

12A

Speed:

Fast Recovery =< 500ns, > 200mA (Io)

Capacitance @ Vr, F:

-

Package / Case:

TO-277, 3-PowerDFN

Operating Temperature - Junction:

-40°C ~ 150°C

Manufacturer:

Vishay General Semiconductor - Diodes Division

Product Status:

Active

Voltage - DC Reverse (Vr) (Max):

100 V

Voltage - Forward (Vf) (Max) @ If:

750 mV @ 12 A

Current - Reverse Leakage @ Vr:

200 µA @ 100 V

Mounting Type:

Surface Mount

Supplier Device Package:

TO-277A (SMPC)

Base Product Number:

V12PM10

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

ECCN:

EAR99

REACH Status:

REACH Unaffected

HTSUS:

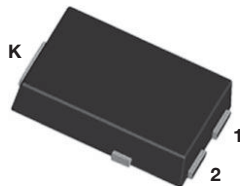
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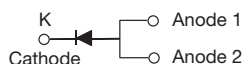
High Current Density Surface-Mount TMBS[®] (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.50$ V at $I_F = 6$ A

eSMP[®] Series



SMPC (TO-277A)



DESIGN SUPPORT TOOLS

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FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- 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

AUTOMOTIVE
GRADE
Available



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMPC (TO-277A)

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

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

M3 and HM3 suffix meets JESD 201 class 2 whisker test

| PRIMARY CHARACTERISTICS | |
|--------------------------------|----------------|
| $I_{F(AV)}$ | 12 A |
| V_{RRM} | 100 V |
| I_{FSM} | 200 A |
| V_F at $I_F = 15$ A (125 °C) | 0.61 V |
| T_J max. | 175 °C |
| Package | SMPC (TO-277A) |
| Circuit configuration | Single |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | |
|---|-------------------|-------------|------|
| PARAMETER | SYMBOL | V12PM10 | UNIT |
| Device marking code | | 12M10 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | V |
| Maximum DC forward current | $I_{F(AV)}^{(1)}$ | 12 | A |
| | $I_{F(AV)}^{(2)}$ | 4.2 | |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 200 | A |
| Operating junction temperature range | $T_J^{(3)}$ | -40 to +175 | °C |
| Storage temperature range | T_{STG} | -55 to +175 | °C |

Notes

(1) Mounted on 30 mm x 30 mm pad areas aluminum PCB

(2) Free air, mounted on recommended pad area

(3) The heat generated must be less than the thermal conductivity from junction to ambient: $dP_D/dT_J < 1/R_{\theta JA}$



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|----------------------|-----------------------------------|-------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | $I_F = 6\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.57 | - | V |
| | $I_F = 12\text{ A}$ | | | 0.69 | 0.75 | |
| | $I_F = 6\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.50 | - | |
| | $I_F = 12\text{ A}$ | | | 0.61 | 0.66 | |
| Reverse current | $V_R = 70\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 0.02 | - | mA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 2.5 | - | |
| | $V_R = 100\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 0.20 | |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 5 | 16 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 1200 | - | pF |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
 (2) Pulse test: Pulse width $\leq 5\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified) | | | |
|--|--------------------------|---------|--------------------|
| PARAMETER | SYMBOL | V12PM10 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)(2)}$ | 75 | $^\circ\text{C/W}$ |
| | $R_{\theta JM}^{(3)}$ | 4 | |

Notes

- (1) The heat generated must be less than the thermal conductivity from junction to ambient: $dP_D/dT_J < 1/R_{\theta JA}$
 (2) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient
 (3) Units mounted on 30 mm x 30 mm aluminum PCB, thermal resistance $R_{\theta JM}$ - junction to mount

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|--------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| V12PM10-M3/H | 0.10 | H | 1500 | 7" diameter plastic tape and reel |
| V12PM10-M3/I | 0.10 | I | 6500 | 13" diameter plastic tape and reel |
| V12PM10HM3/H ⁽¹⁾ | 0.10 | H | 1500 | 7" diameter plastic tape and reel |
| V12PM10HM3/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 specified)

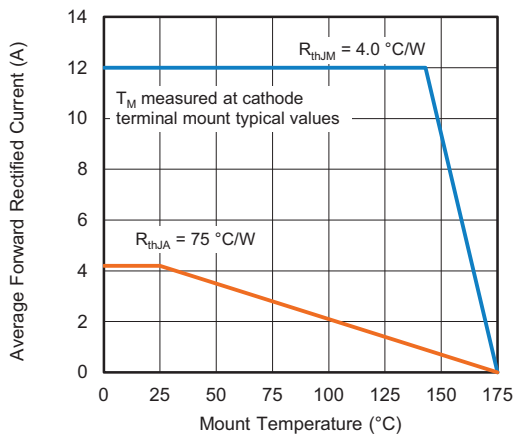


Fig. 1 - Maximum Forward Current Derating Curve

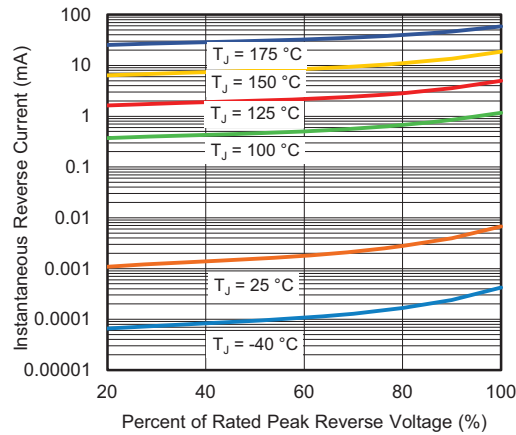


Fig. 4 - Typical Reverse Characteristics

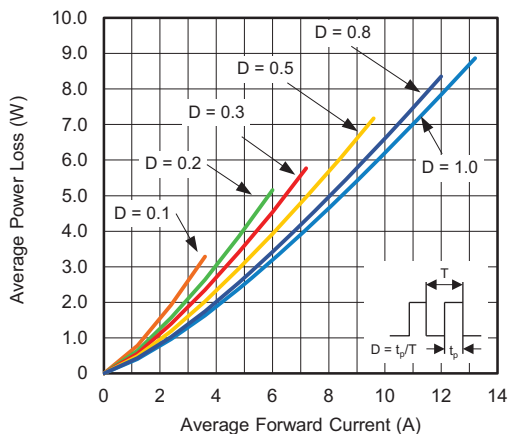


Fig. 2 - Forward Power Loss Characteristics

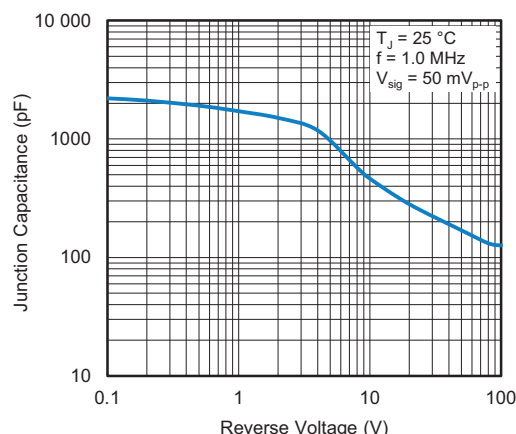


Fig. 5 - Typical Junction Capacitance

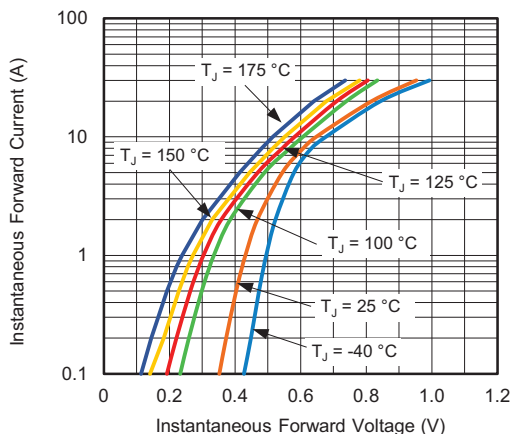


Fig. 3 - Typical Instantaneous Forward Characteristics

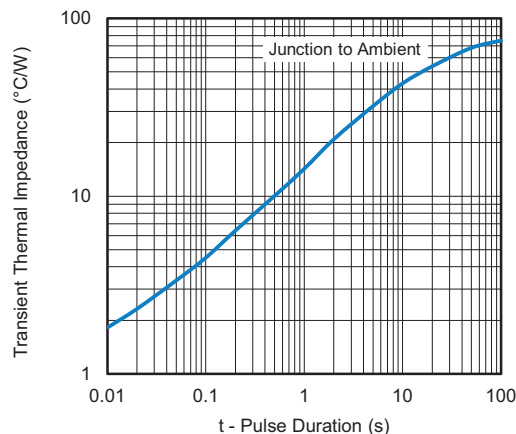
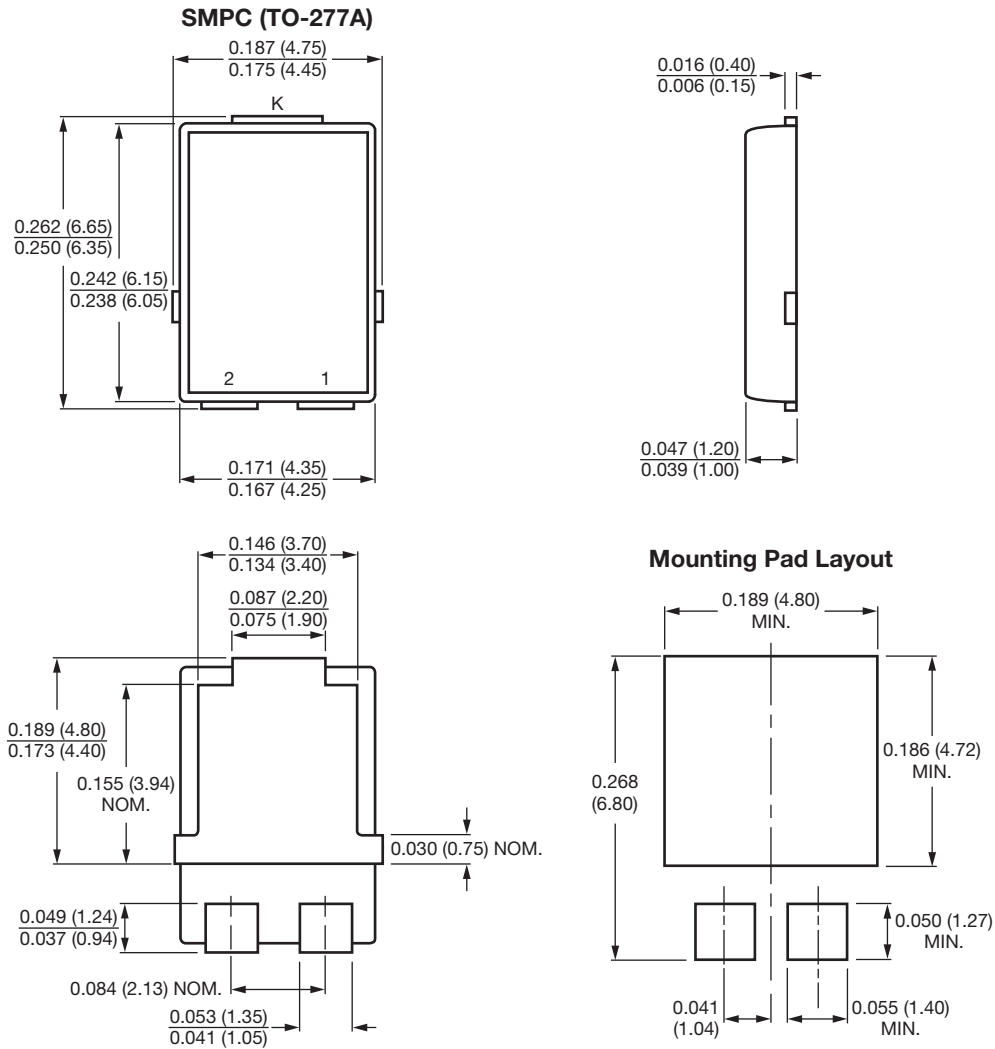


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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