

FEATURES

- Low Reverse Recovery Charge
- High Switching Speed
- Low Forward Volt Drop
- Isolated AISiC Base With AlN Substrates
- Lead Free Construction
- Low FIT Rate

APPLICATIONS

- Chopper Diodes
- Boost and Buck Converters
- Free-wheel Circuits
- Snubber Circuits
- Resonant Converters
- Induction Heating
- Multi-level Switch Inverters

The DFM200PXM33-F000 is a series pair 3300V, fast recovery diode (FRD) module. Designed for low power loss, the module is suitable for a variety of high voltage applications in motor drives and power conversion.

Fast switching times and low reverse recovery losses allow high frequency operation, making the device suitable for the latest drive designs employing PWM and high frequency switching.

The module incorporates an electrically isolated base plate and low inductance construction enabling circuit designers to optimise circuit layouts and utilise grounded heat sinks for safety.

ORDERING INFORMATION

Order As:

DFM200PXM33-F000

Note: When ordering, please use the complete part number

KEY PARAMETERS

| | | |
|-----------|-------|--------------|
| V_{RRM} | | 3300V |
| V_F | (typ) | 2.9V |
| I_F | (max) | 200A |
| I_{FM} | (max) | 400A |

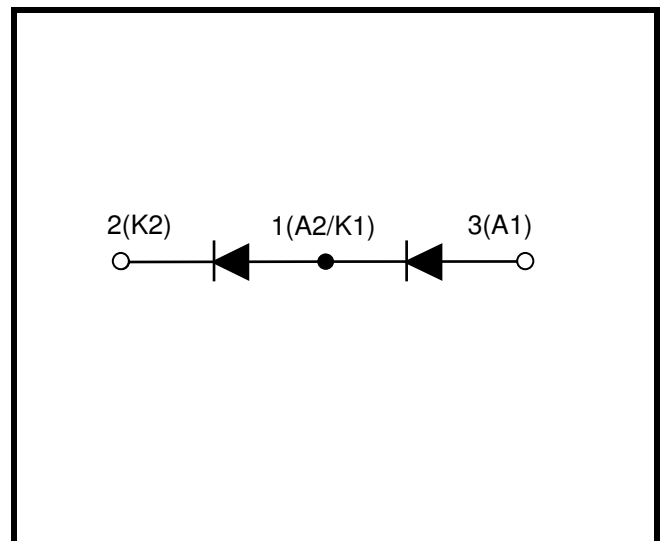
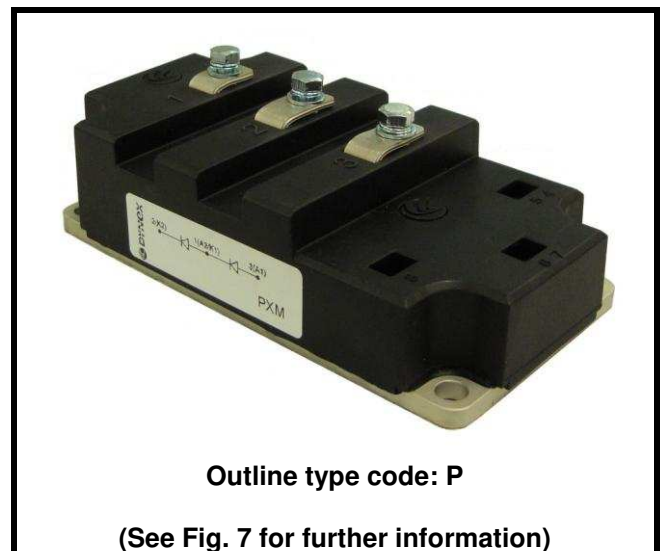


Fig. 1 Circuit configuration



Outline type code: P

(See Fig. 7 for further information)

Fig. 2 Package

ABSOLUTE MAXIMUM RATINGS

Stresses above those listed under 'Absolute Maximum Ratings' may cause permanent damage to the device. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture of the package. Appropriate safety precautions should always be followed. Exposure to Absolute Maximum Ratings may affect device reliability.

$T_{case} = 25\text{ °C}$ unless stated otherwise

| Symbol | Parameter | Test Conditions | Max. | Units |
|---------------|----------------------------------|---|------|-----------------------|
| V_{RRM} | Repetitive peak reverse voltage | $T_j = 125\text{ °C}$ | 3300 | V |
| I_F | Forward current (per arm) | DC, $T_{case} = 70\text{ °C}$ | 200 | A |
| I_{FM} | Max. forward current (per arm) | $T_{case} = 105\text{ °C}$, $t_p = 1\text{ ms}$ | 400 | A |
| I^2t | I^2t value fuse current rating | $V_R = 0$, $t_p = 10\text{ ms}$, $T_j = 125\text{ °C}$ | 20 | kA^2s |
| P_{max} | Max. power dissipation | $T_{case} = 25\text{ °C}$, $T_j = 125\text{ °C}$ | 1040 | W |
| V_{isol} | Isolation voltage – per module | Commoned terminals to base plate. AC RMS, 1 min, 50Hz | 6000 | V |
| Q_{PD} | Partial discharge – per module | IEC1287, $V_1 = 3500\text{ V}$, $V_2 = 2600\text{ V}$, 50Hz RMS | 10 | pC |
| $V_{RRM\ DC}$ | DC Voltage stability | 25 °C at sea level, 100 FITs | 2200 | V |

THERMAL AND MECHANICAL RATINGS

| | |
|-----------------------------------|-------|
| Internal insulation material: | AlN |
| Baseplate material: | AlSiC |
| Creepage distance: | 33mm |
| Clearance: | 20mm |
| CTI (Comparative Tracking Index): | >600 |

| Symbol | Parameter | Test Conditions | Min | Typ. | Max | Units |
|---------------|---|---|-----|------|-----|----------------|
| $R_{th(j-c)}$ | Thermal resistance (per arm) | Continuous dissipation – junction to case | - | - | 96 | °C/kW |
| $R_{th(c-h)}$ | Thermal resistance – case to heatsink (per module) | Mounting torque 5Nm (with mounting grease) | - | - | 16 | °C/kW |
| T_j | Junction temperature | | -40 | - | 125 | °C |
| T_{stg} | Storage temperature range | | -40 | - | 125 | °C |
| | Screw Torque | Mounting – M6 | - | - | 5 | Nm |
| | | Electrical connections – M5 | - | - | 4 | Nm |

STATIC ELECTRICAL CHARACTERISTICS – PER ARM
T_{case} = 25 °C unless stated otherwise.

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|-----------------|----------------------|---|-----|-----|-----|-------|
| I _{RM} | Peak reverse current | V _R = 3300V, T _j = 125 °C | | | 15 | mA |
| V _F | Forward voltage | I _F = 200A | | 2.9 | | V |
| | | I _F = 200A, T _j = 125 °C | | 3.0 | | V |
| L _M | Inductance | - | | 40 | | nH |

DYNAMIC ELECTRICAL CHARACTERISTICS – PER ARM
T_{case} = 25 °C unless stated otherwise

| Symbol | Parameter | Test Conditions | Min | Typ. | Max | Units |
|------------------|-------------------------------|---|-----|------|-----|-------|
| Q _{rr} | Reverse recovery charge | I _F = 200A V _R = 1800V di _F /dt = 1600A/μs | | 80 | | μC |
| I _{rr} | Peak reverse recovery current | | | 150 | | A |
| E _{rec} | Reverse recovery energy | | | 75 | | mJ |

T_{case} = 125 °C unless stated otherwise

| Symbol | Parameter | Test Conditions | Min | Typ. | Max | Units |
|------------------|-------------------------------|---|-----|------|-----|-------|
| Q _{rr} | Reverse recovery charge | I _F = 200A V _R = 1800V di _F /dt = 1600A/μs | | 125 | | μC |
| I _{rr} | Peak reverse recovery current | | | 160 | | A |
| E _{rec} | Reverse recovery energy | | | 130 | | mJ |

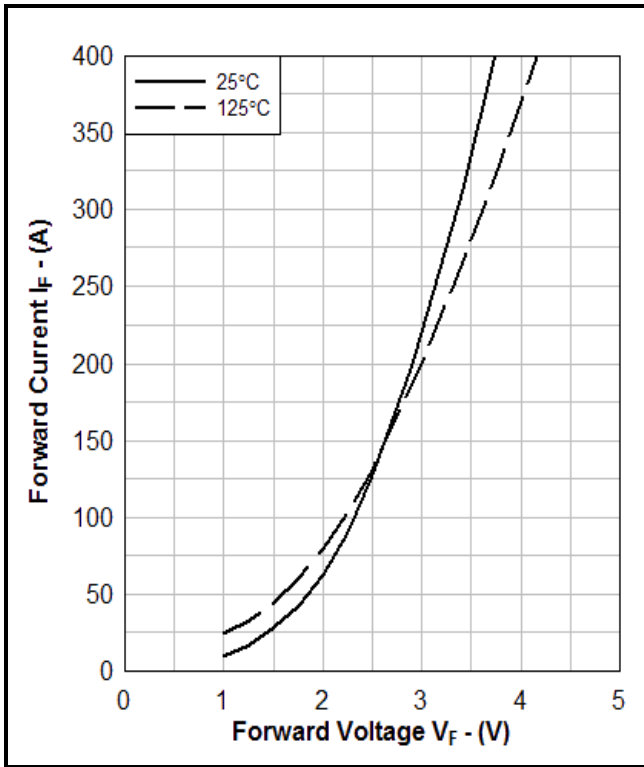


Fig. 3 Diode typical forward characteristics

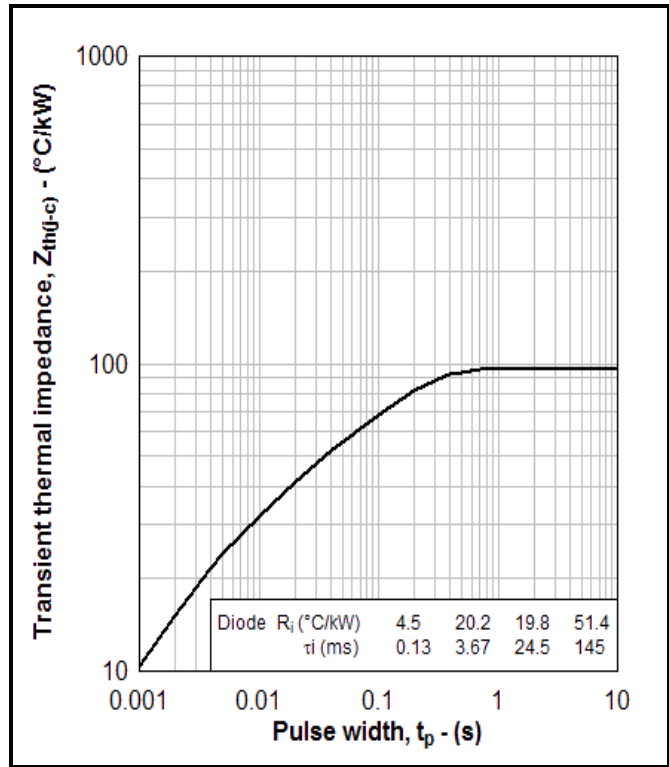


Fig. 4 Transient thermal impedance

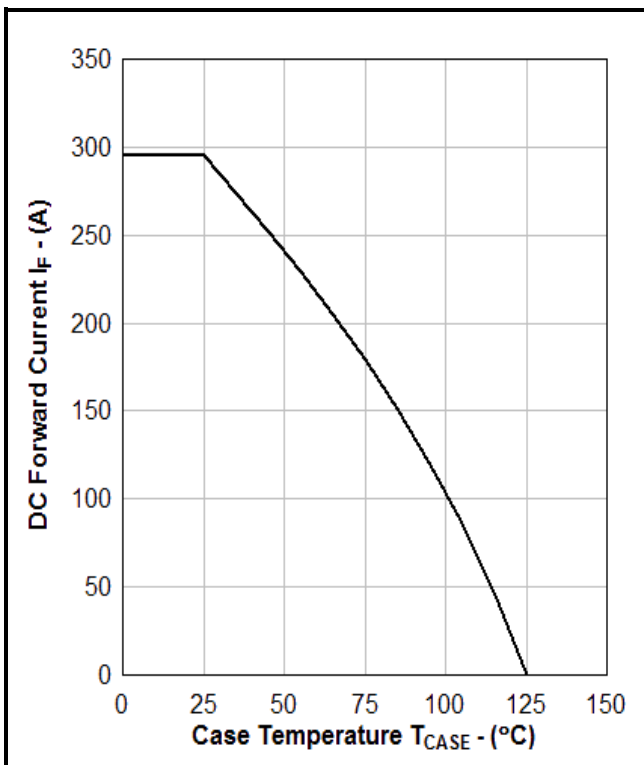


Fig. 5 DC current rating vs case temperature

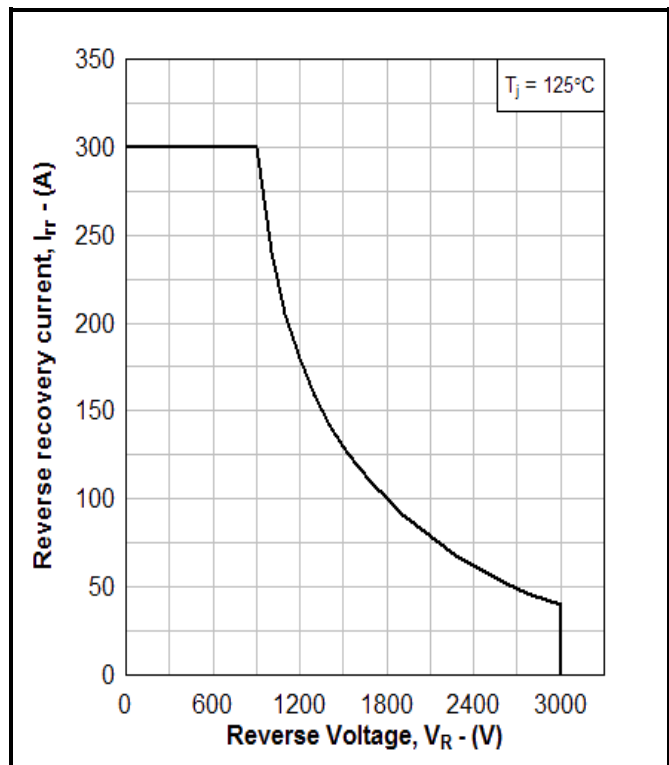


Fig. 6 Reverse Bias Safe Operating Area (RBSOA)

PACKAGE DETAILS

For further package information, please visit our website or contact Customer Services.
 All dimensions in mm, unless stated otherwise.
DO NOT SCALE.

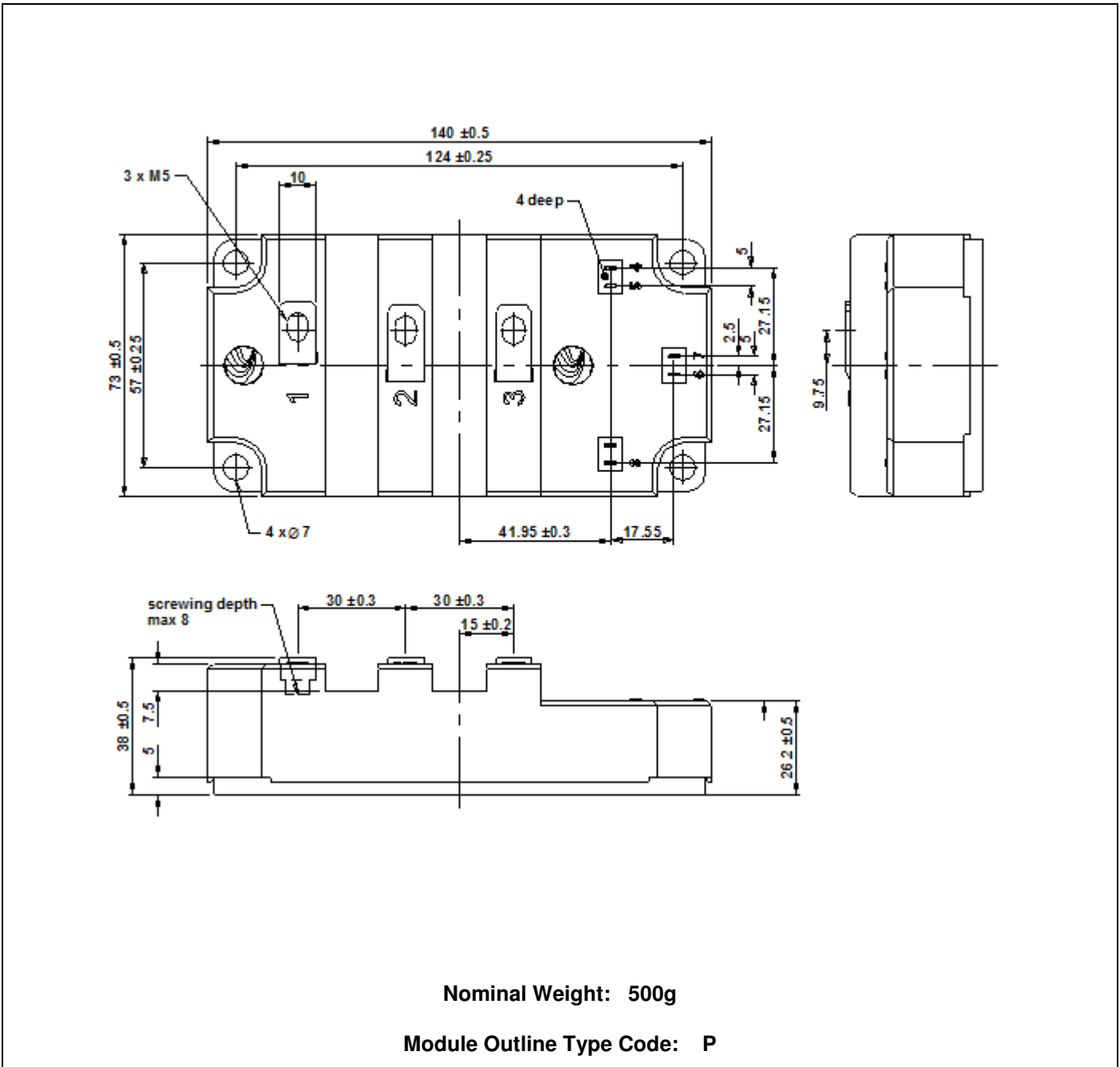


Fig. 7 Module outline drawing

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| | |
|---------------------------------|---|
| Target Information: | This is the most tentative form of information and represents a very preliminary specification. No actual design work on the product has been started. |
| Preliminary Information: | The product design is complete and final characterisation for volume production is in progress. The datasheet represents the product as it is now understood but details may change. |
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