

General Description

Ultra-FRD module devices are optimized to reduce losses and EMI/RFI in high frequency power conditioning electrical systems. These diode modules are ideally suited for power converters, motors drives and other applications where switching losses are significant portion of the total losses.

Features

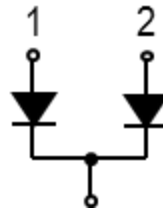
- Repetitive Reverse Voltage : $V_{RRM} = 600V$
- Low Forward Voltage : $V_F(\text{typ.}) = 1.45V$
- Average Forward Current : $I_F(\text{Av.}) = 100A @ T_C = 100^\circ C$
- Ultra-Fast Reverse Recovery Time : $t_{rr}(\text{typ.}) = 35ns$
- Extensive Characterization of Recovery Parameters
- Reduced EMI and RFI
- Non Isolation Type Package
- $175^\circ C$ Operating Junction Temperature
- Dual FRD Construction

Applications

- High Speed & High Power converters, Welders
- Various Switching and Telecommunication Power Supply



3DM-2NI



(Common Heat Sink)

Absolute Maximum Ratings @ $T_C = 25^\circ C$ (Per Leg)

| Characteristics | Conditions | Symbol | Rating | Unit | |
|---------------------------------------|--|-------------|---------------------|------------|---|
| Repetitive Peak Reverse Voltage | | V_{RRM} | 600 | V | |
| Reverse DC Voltage | | $V_{R(DC)}$ | 480 | V | |
| Average Forward Current | Resistive Load | $I_{F(AV)}$ | $T_C = 25^\circ C$ | 200 | A |
| | | | $T_C = 100^\circ C$ | 100 | A |
| Surge(non-repetitive) Forward Current | One Half Cycle at 60Hz, Peak Value | I_{FSM} | 1400 | A | |
| I^2t for Fusing | Value for One Cycle Current, $t_w = 8.3ms, T_j = 25^\circ C$ Start | I^2t | 16.2×10^3 | A^2s | |
| Junction Temperature | | T_J | -40 ~ 175 | $^\circ C$ | |
| Maximum Power Dissipation | | P_D | 620 | W | |
| Storage Temperature | | T_{stg} | -40 ~ 150 | $^\circ C$ | |
| Mounting Torque(M6) | | - | 4.0 | N.m | |
| Terminal Torque(M6) | Typical Including Screws | - | 3.0 | N.m | |
| Weight | | - | 95 | g | |

Electrical Characteristics @Tc = 25°C(unless otherwise specified)

| Characteristics | Conditions | Symbol | Min. | Typ. | Max. | Unit | |
|-------------------------------------|---|-----------|-------------------|------|------|------|----|
| Cathode Anode Breakdown Voltage | $I_R=100\mu A$ | V_R | 600 | - | - | V | |
| Diode Maximum Forward Voltage | $I_F=100A$ | V_{FM} | $T_C=25^\circ C$ | - | 1.45 | 1.8 | V |
| | | | $T_C=100^\circ C$ | - | 1.35 | - | |
| Diode Peak Reverse Recovery Current | $T_C=100^\circ C$, V_{RRM} applied | I_{RRM} | - | - | 1.0 | mA | |
| Diode Reverse Recovery Time | $I_F=1A, V_R=30V$ $di/dt = -200A/\mu S$ | t_{rr} | - | 35 | 50 | ns | |
| Diode Reverse Recovery Time | $I_F=100A, V_R=300V$ $di/dt = -200A/\mu S$ | t_{rr} | $T_C=25^\circ C$ | - | 90 | 130 | ns |
| | | | $T_C=100^\circ C$ | - | 160 | - | |

Thermal Characteristics

| Characteristics | Conditions | Symbol | Min. | Typ. | Max. | Unit |
|--|------------------|---------------|------|------|------|--------------|
| Thermal Resistance(Non-Isolation Type) | Junction to Case | $R_{th(j-c)}$ | - | - | 0.24 | $^\circ C/W$ |

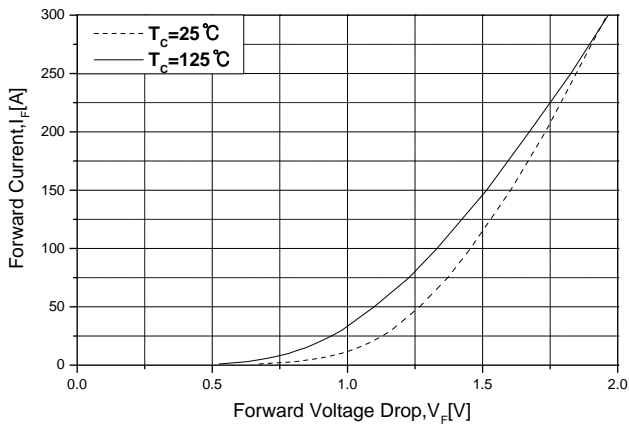


Fig.1 Typical Forward Voltage Drop vs. Instantaneous Forward Current

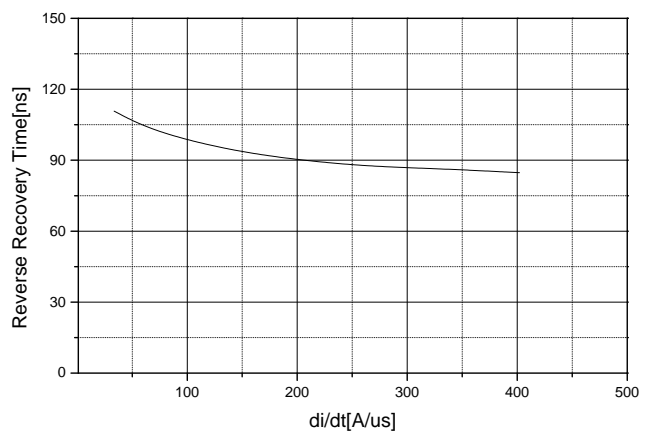


Fig.2 Typical Reverse Recovery Time Vs. $-di/dt$

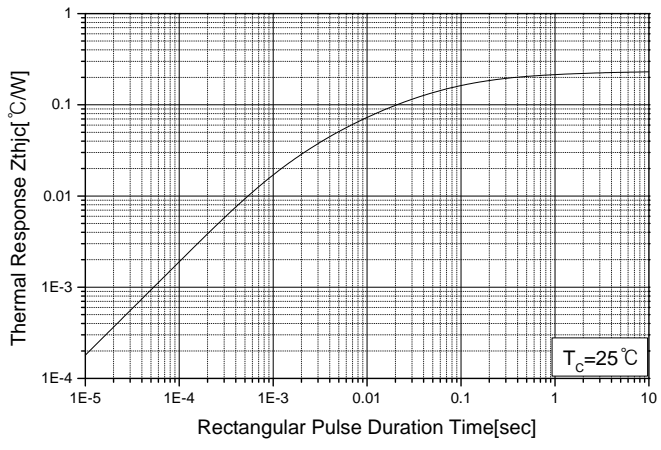


Fig.3 Transient Thermal Impedance (Zthjc) Characteristics

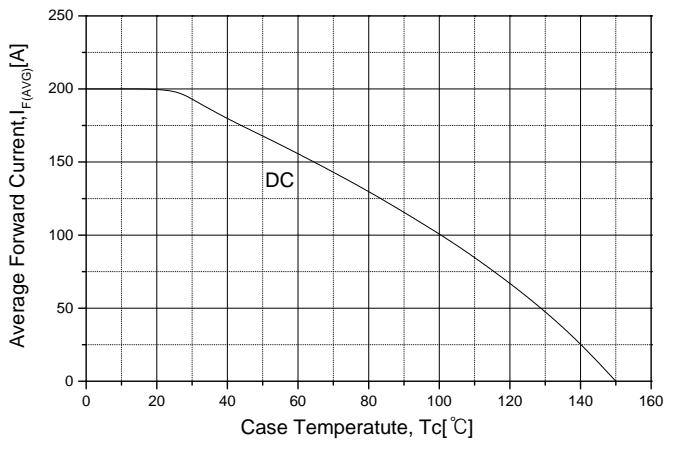
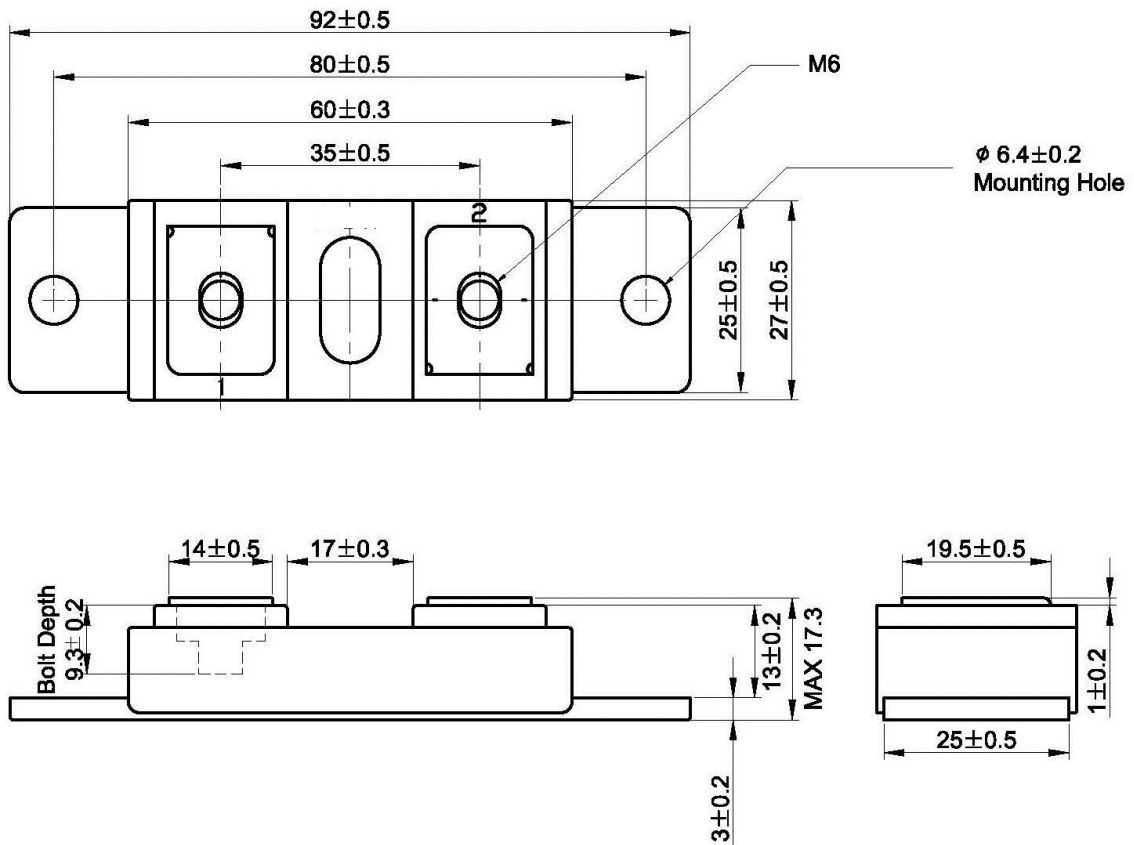


Fig.4 Forward Current Derating Curve

Package Dimension

3DM-2NI

Dimensions are in millimeters, unless otherwise specified



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