

Rectifier Module Circuit Series- Package A

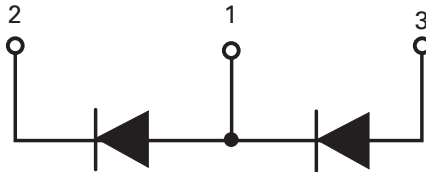


Agency Approvals

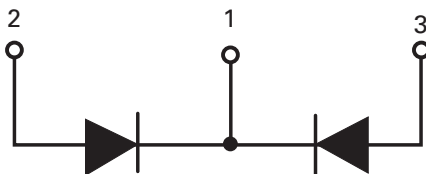
| AGENCY | AGENCY FILE NUMBER |
|--------|--------------------|
| | E71639 |

Circuit Diagram

B type



DK type



Features

- Low reverse recovery loss
- Low forward voltage
- High surge current capability
- Low inductance package

Applications

- Field supply for DC motors
- Line rectifiers for transistorized AC motor controllers
- Non-controllable rectifiers for AC/DC converter

Main Features

| Symbol | Value | Unit |
|-------------|--------------|------|
| $I_{F(AV)}$ | 90 to 110 | A |
| V_{RRM} | 1600 to 1800 | V |
| V_{RSM} | 1700 to 1900 | V |

Absolute Maximum Rating ($T_c = 25^\circ\text{C}$, unless otherwise specified)

| Symbol | Parameters | | Value | Unit |
|-----------|-------------------------------------|----------|-------|------|
| V_{RRM} | Repetitive Peak Reverse Voltage | MD16xxxA | 1600 | V |
| | | MD18xxxA | 1800 | |
| V_{RSM} | Non-Repetitive Peak Reverse Voltage | MD16xxxA | 1700 | V |
| | | MD18xxxA | 1900 | |

Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$, unless otherwise specified)

| Symbol | Parameters | Test Conditions | Values | | Unit |
|--------------|--------------------------------------|---|-------------|----------|-------------------|
| | | | MDxx90A | MDxx110A | |
| $I_{F(AV)}$ | Average Forward Current | Single phase, half wave 180°C conduction, $T_c=85^\circ\text{C}$ | 90 | 110 | A |
| $I_{F(RMS)}$ | RMS Forward Current | | 141 | 170 | A |
| I_{FSM} | Non-Repetitive Surge Forward Current | $T_c=45^\circ\text{C}$, 50Hz, Single wave | 2000 | 2500 | A |
| | | $T_c=45^\circ\text{C}$, 60Hz, Single wave | 2200 | 2700 | |
| I^2t | I^2t (For Fusing) | $T_c=45^\circ\text{C}$, 50Hz, Single wave | 20.0 | 31.2 | KA ² s |
| | | $T_c=45^\circ\text{C}$, 60Hz, Single wave | 20.1 | 30.2 | |
| P_D | Power Dissipation | | 310 | 410 | W |
| T_J | Junction Temperature | | -40 to +150 | | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | | -40 to +125 | | $^\circ\text{C}$ |
| V_{ISOL} | Insulation Test Voltage | AC, 50Hz, t=1min | 3000 | | V |

Electrical and Thermal Specifications ($T_c = 25^\circ\text{C}$, unless otherwise specified)

| Symbol | Parameters | Test Conditions | Min | Typ | Max | Unit |
|----------|---|--------------------------------------|-----|-----|------|---------------|
| I_{RM} | Reverse Leakage Current | $V_R=V_{RRM}$ | - | - | 500 | μA |
| | | $V_R=V_{RRM}, T_J=125^\circ\text{C}$ | - | - | 10 | mA |
| V_F | Forward Voltage | MDxx90A $I_F=280\text{A}$ | - | - | 1.6 | V |
| | | MDxx110A $I_F=350\text{A}$ | - | - | 1.6 | |
| V_{TO} | For power-loss calculations only $T_J=125^\circ\text{C}$ | MDxx90A | - | - | 0.85 | V |
| | | MDxx110A | - | - | 0.8 | |
| r_T | | MDxx90A | - | - | 2.9 | m Ω |
| | | MDxx110A | - | - | 2.4 | |

Mechanical Characteristics

| Symbol | Parameters | Test Conditions | Min | Typ | Max | Unit |
|--------|-------------------|------------------|-----|-----|-----|------|
| Torque | Module-to-Sink | Recommended (M6) | 3 | | 5 | N·m |
| Torque | Module Electrodes | Recommended (M6) | 2.5 | | 5 | N·m |

Electrical and Thermal Specifications ($T_c = 25^\circ\text{C}$, unless otherwise specified)

| Symbol | Parameters | Test Conditions | Max | Unit |
|------------|------------------|-----------------|-----|------|
| R_{thJC} | Junction-to-Case | MDxx90A | 0.4 | K/W |
| | | MDxx110A | 0.3 | |

Figure 1: Forward current vs.voltage drop

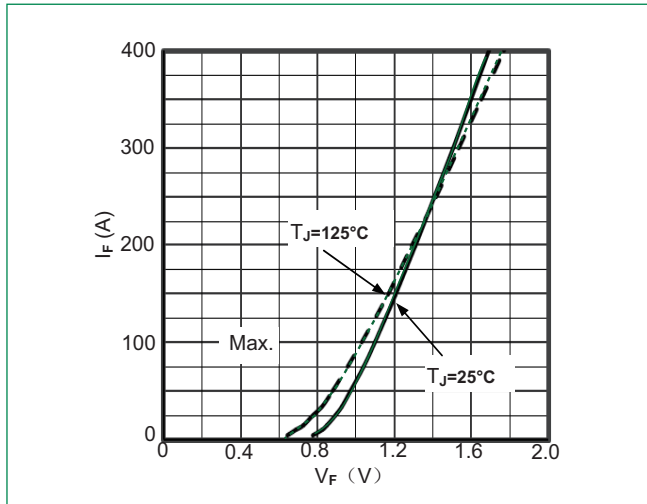


Figure 2: Max Non-Repetitive Forward Surge Current

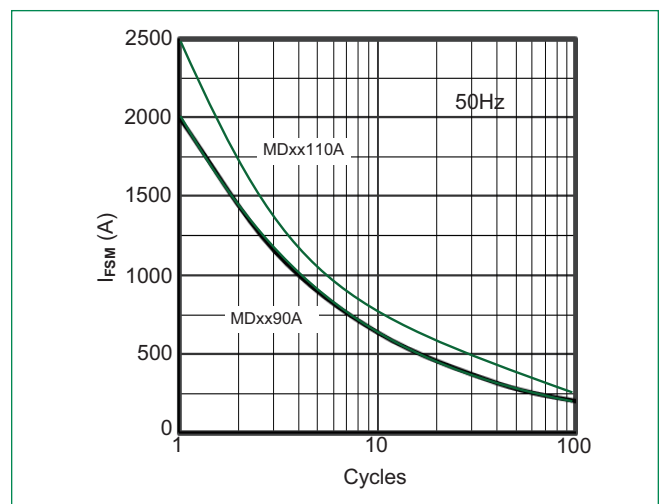


Figure 3: Forward current vs.Case temperature

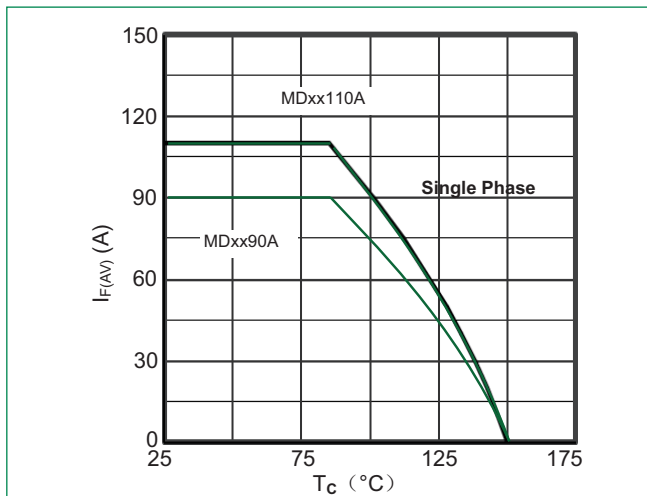


Figure 4: Transient Thermal Impedance

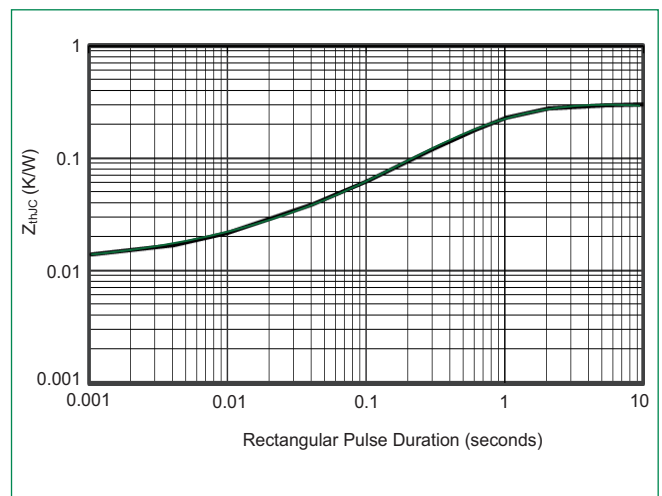


Figure 5: Power dissipation vs. $I_{F(AV)}$ for MDxx90A

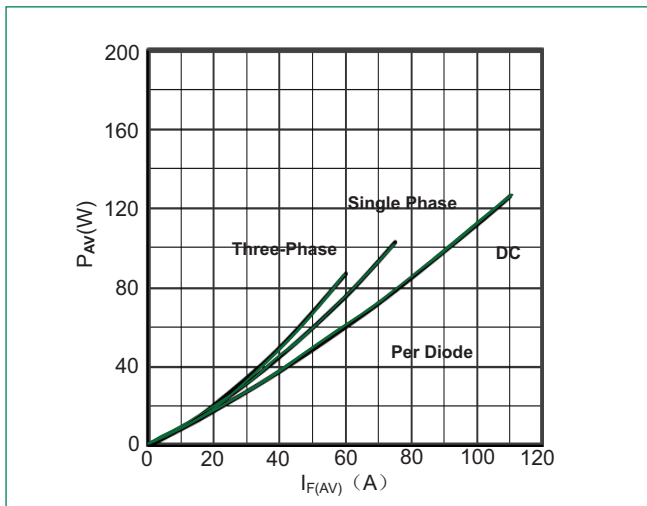
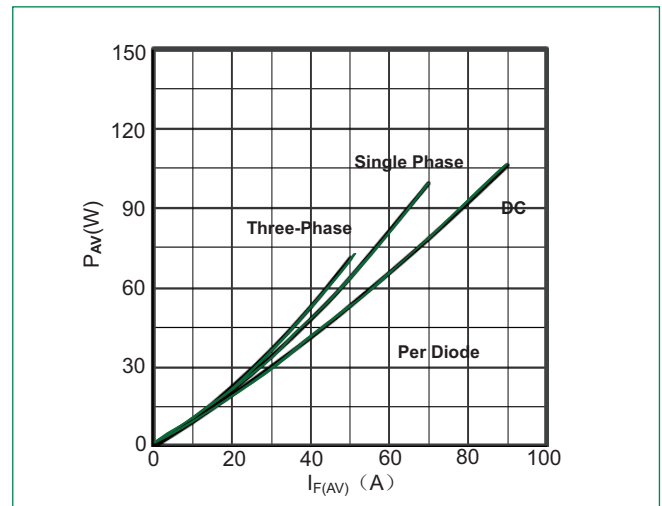
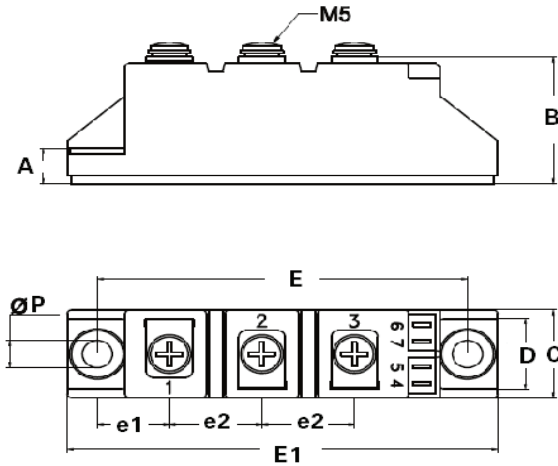


Figure 5: Power dissipation vs. $I_{F(AV)}$ for MDxx110A



Dimensions-Package A



| Dimension | Inches | | Millimeters | |
|-----------|--------|-------|-------------|------|
| | Max | Max | Min | Max |
| A | 0.315 | 0.354 | 8.0 | 9.0 |
| B | 1.177 | 1.217 | 29.9 | 30.9 |
| C | 0.807 | 0.846 | 20.5 | 21.5 |
| D | 0.650 | 0.689 | 16.5 | 17.5 |
| E | 3.110 | 3.189 | 79.0 | 81.0 |
| E1 | 3.622 | 3.700 | 92.0 | 94.0 |
| e1 | 0.594 | 0.634 | 15.1 | 16.1 |
| e2 | 0.768 | 0.807 | 19.5 | 20.5 |
| P | 0.236 | 0.276 | 6.0 | 7.0 |

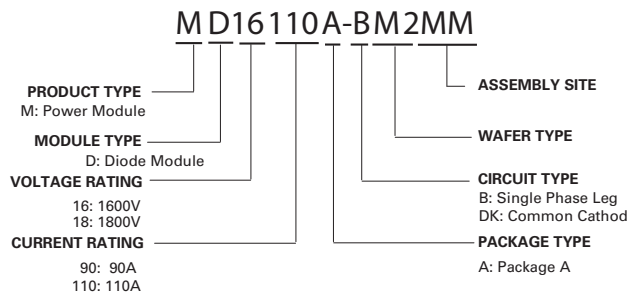
Packing Selector

| Part Number | V_{RRM} | | $I_{F(AV)}$ | Circuit Type | Package |
|-----------------|-----------|-------|-------------|--------------|---------|
| | 1600V | 1800V | | | |
| MDxx90A-BM2MM | X | X | 90A | B | A |
| MDxx90A-DKM2MM | X | X | | DK | |
| MDxx110A-BM2MM | X | X | 110A | B | |
| MDxx110A-DKM2MM | X | X | | DK | |

Packing Options

| Part Number | Marking | Weight | Packing Mode | M.O.Q. |
|----------------|----------------|--------|--------------|--------|
| MDxxxxxA-xM2MM | MDxxxxxA-xM2MM | 110g | Bulk Pack | 70 |

Part Numbering System



Part Marking System

