

**Rectifier Module Circuit Series- Package A**

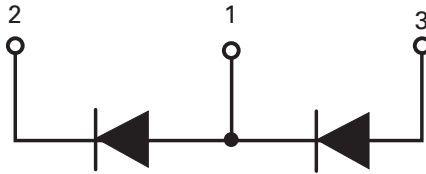


**Agency Approvals**

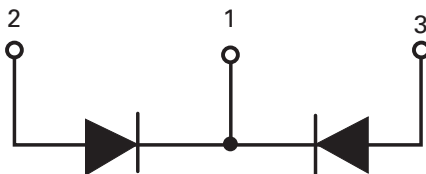
| AGENCY | AGENCY FILE NUMBER |
|--------|--------------------|
|        | E71639             |

**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<br>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 <sup>2</sup> 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  | $\mu\text{A}$ |
|          |   | $V_R=V_{RRM}, T_J=125^\circ\text{C}$ | -   | -   | 10   | mA            |
| $V_F$    | Forward Voltage   | MDxx90A<br>$I_F=280\text{A}$         | -   | -   | 1.6  | V             |
|          |   | MDxx110A<br>$I_F=350\text{A}$        | -   | -   | 1.6  |               |
| $V_{TO}$ | For power-loss calculations only<br>$T_J=125^\circ\text{C}$ | MDxx90A                              | -   | -   | 0.85 | V             |
|          |   | MDxx110A                             | -   | -   | 0.8  |               |
| $r_T$    |   | MDxx90A                              | -   | -   | 2.9  | m $\Omega$    |
|          |   | MDxx110A                             | -   | -   | 2.4  |               |

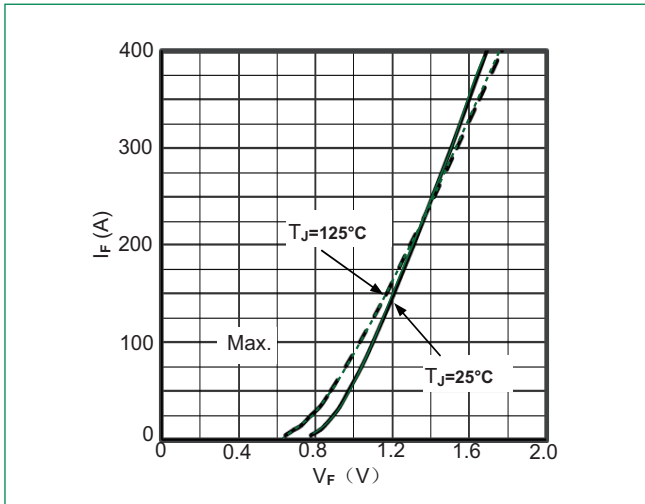
### Mechanical Characteristics

| 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  |

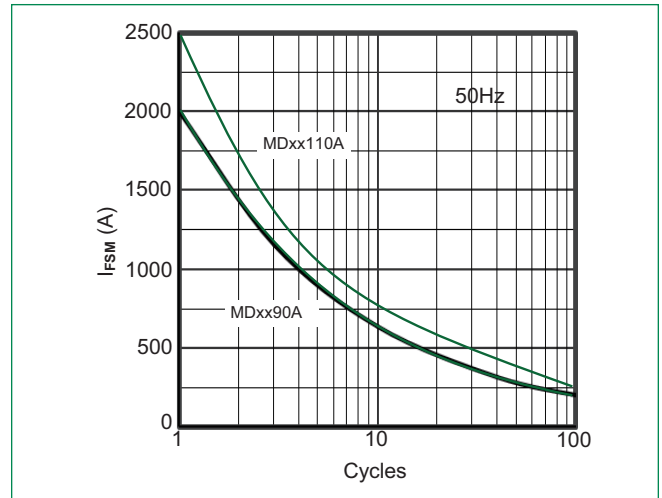
### Electrical and Thermal Specifications ( $T_c = 25^\circ\text{C}$ , unless otherwise specified)

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

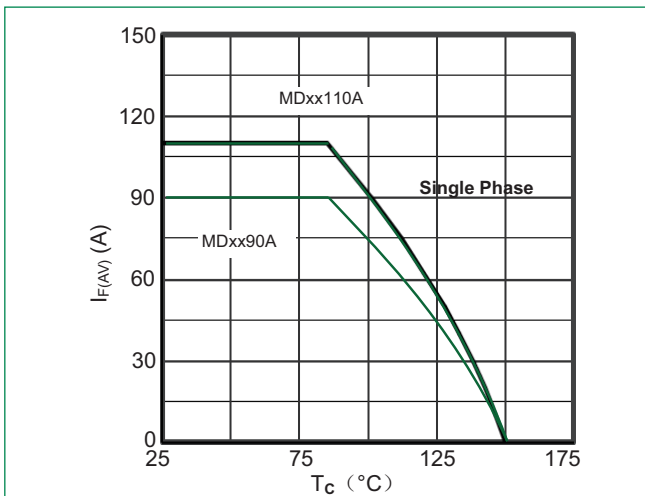
**Figure 1: Forward current vs.voltage drop**



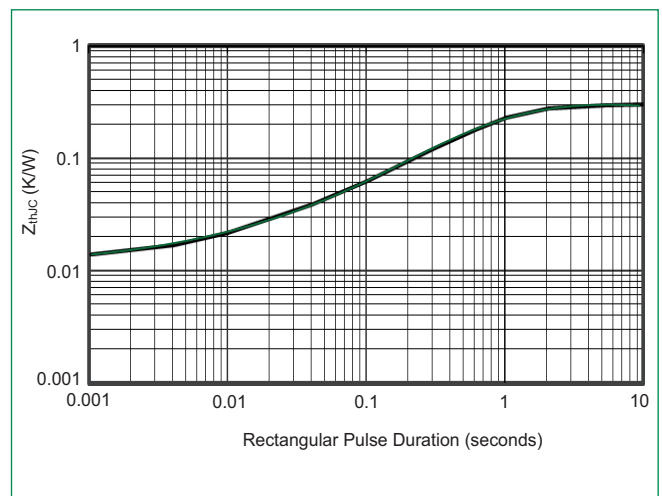
**Figure 2: Max Non-Repetitive Forward Surge Current**



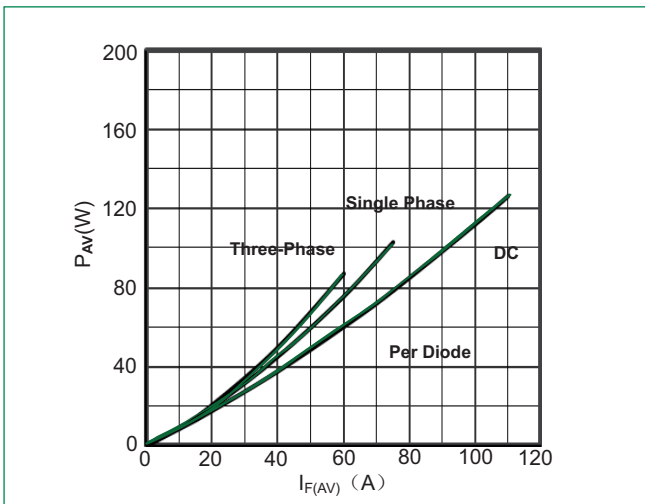
**Figure 3: Forward current vs.Case temperature**



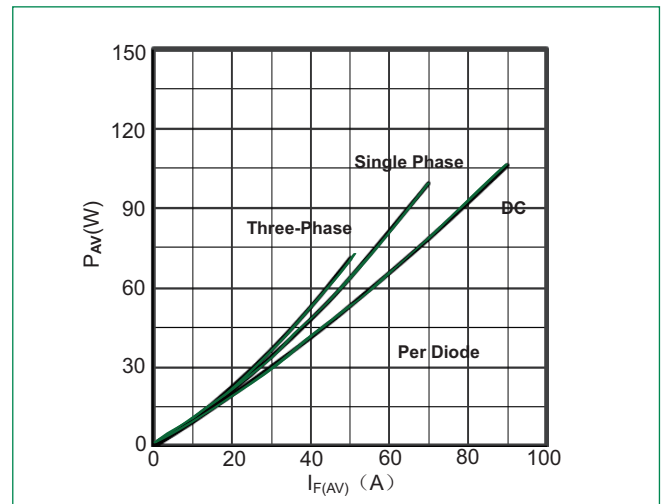
**Figure 4: Transient Thermal Impedance**



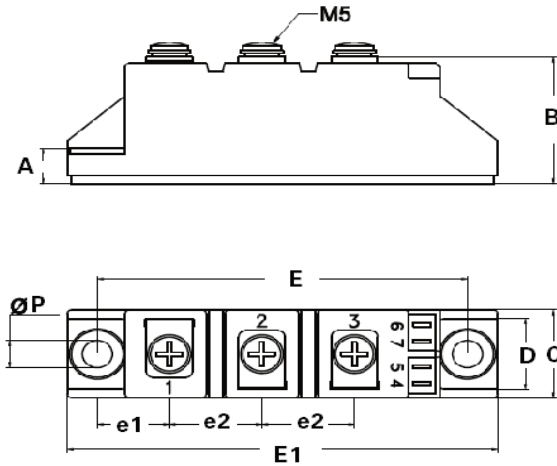
**Figure 5: Power dissipation vs.  $I_{F(AV)}$  for MDxx90A**



**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  |

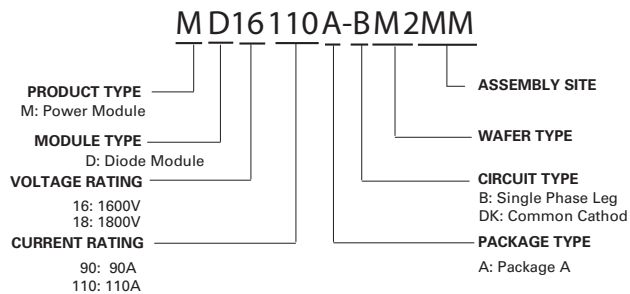
### Packing Selector

| 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

