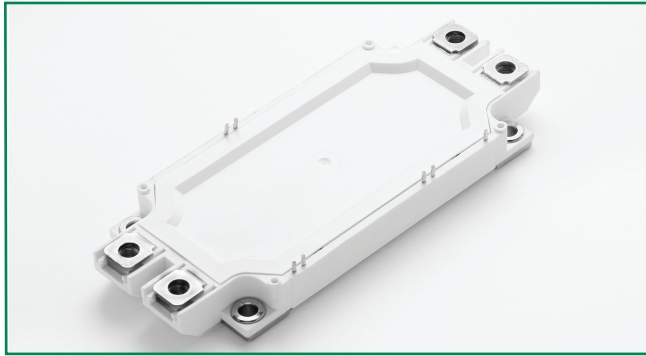


### MG06600WB-BN4MM

#### Features

- High short circuit capability, self limiting short circuit current
- $V_{CE(sat)}$  with positive temperature coefficient
- Fast switching and short tail current
- Free wheeling diodes with fast and soft reverse recovery
- Low switching losses

#### Applications

- High frequency switching application
- Medical applications
- Motion/servo control supplies
- UPS systems

#### Module Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

| Symbol     | Parameters                 | Test Conditions  | Min | Typ  | Max | Unit             |
|------------|----------------------------|------------------|-----|------|-----|------------------|
| $T_{Jmax}$ | Max. Junction Temperature  |                  |     |      | 175 | $^\circ\text{C}$ |
| $T_{Jop}$  | Operating Temperature      |                  | -40 |      | 150 | $^\circ\text{C}$ |
| $T_{stg}$  | Storage Temperature        |                  | -40 |      | 125 | $^\circ\text{C}$ |
| $V_{isol}$ | Insulation Test Voltage    | AC, t=1min       |     | 3000 |     | V                |
| CTI        | Comparative Tracking Index |                  | 250 |      |     |                  |
| Torque     | Module-to-Sink             | Recommended (M5) | 2.5 |      | 5   | N-m              |
| Torque     | Module Electrodes          | Recommended (M6) | 3   |      | 5   | N-m              |
| Weight     |                            |                  |     | 350  |     | g                |

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

| Symbol       | Parameters                        | Test Conditions                                   | Values   | Unit                 |
|--------------|-----------------------------------|---|----------|----------------------|
| <b>IGBT</b>  |                                   |   |          |                      |
| $V_{CES}$    | Collector - Emitter Voltage       | $T_J=25^\circ\text{C}$                            | 600      | V                    |
| $V_{GES}$    | Gate - Emitter Voltage            |   | $\pm 20$ | V                    |
| $I_C$        | DC Collector Current              | $T_C=25^\circ\text{C}$                            | 700      | A                    |
|              |                                   | $T_C=50^\circ\text{C}$                            | 600      | A                    |
| $I_{CM}$     | Repetitive Peak Collector Current | $t_p=1\text{ms}$                                  | 1200     | A                    |
| $P_{tot}$    | Power Dissipation Per IGBT        |   | 1500     | W                    |
| <b>Diode</b> |                                   |   |          |                      |
| $V_{RRM}$    | Repetitive Reverse Voltage        | $T_J=25^\circ\text{C}$                            | 600      | V                    |
| $I_{F(AV)}$  | Average Forward Current           | $T_C=25^\circ\text{C}$                            | 700      | A                    |
|              |                                   | $T_C=50^\circ\text{C}$                            | 600      | A                    |
| $I_{FRM}$    | Repetitive Peak Forward Current   | $t_p=1\text{ms}$                                  | 1200     | A                    |
| $I^2t$       |                                   | $T_J=125^\circ\text{C}$ , t=10ms, $V_R=0\text{V}$ | 17000    | $\text{A}^2\text{s}$ |

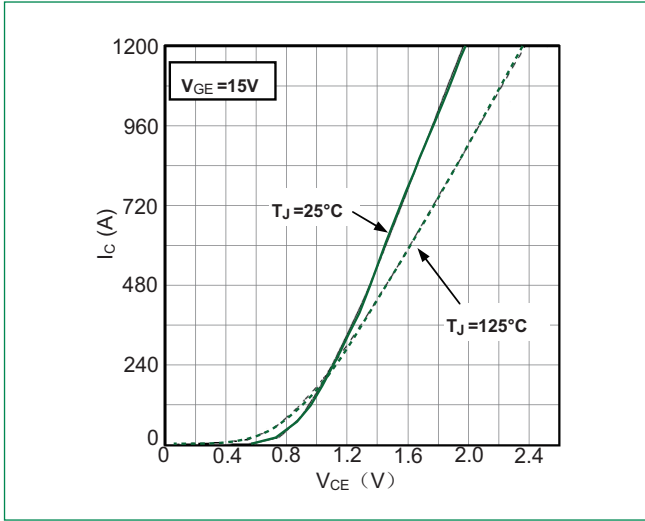
### Electrical and Thermal Specifications ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

| Symbol        | Parameters                                      | Test Conditions   | Min                     | Typ  | Max  | Unit          |
|---------------|---|---|-------------------------|------|------|---------------|
| <b>IGBT</b>   |   |   |                         |      |      |               |
| $V_{GE(th)}$  | Gate - Emitter Threshold Voltage                | $V_{CE}=V_{GE}, I_C=9.6\text{mA}$   | 4.9                     | 5.8  | 6.5  | V             |
| $V_{CE(sat)}$ | Collector - Emitter                             | $I_C=600\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$  |                         | 1.45 |      | V             |
|               | Saturation Voltage                              | $I_C=600\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$   |                         | 1.6  |      | V             |
| $I_{ICES}$    | Collector Leakage Current                       | $V_{CE}=600\text{V}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$  |                         |      | 1    | mA            |
|               |   | $V_{CE}=600\text{V}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$   |                         |      | 5    | mA            |
| $I_{GES}$     | Gate Leakage Current                            | $V_{CE}=0\text{V}, V_{GE}=\pm 15\text{V}, T_J=125^\circ\text{C}$  | -400                    |      | 400  | nA            |
| $R_{Gint}$    | Integrated Gate Resistor                        |   |                         | 0.68 |      | $\Omega$      |
| $Q_{ge}$      | Gate Charge                                     | $V_{CE}=300\text{V}, I_C=600\text{A}, V_{GE}=\pm 15\text{V}$  |                         | 6.5  |      | $\mu\text{C}$ |
| $C_{ies}$     | Input Capacitance                               | $V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$  |                         | 39   |      | nF            |
| $C_{res}$     | Reverse Transfer Capacitance                    |   |                         | 1.15 |      | nF            |
| $t_{d(on)}$   | Turn - on Delay Time                            | $V_{CC}=300\text{V}$<br>$I_C=600\text{A}$<br>$R_G=2.4\Omega$<br>$V_{GE}=\pm 15\text{V}$<br>Inductive Load | $T_J=25^\circ\text{C}$  |      | 100  | ns            |
|               |   |   | $T_J=125^\circ\text{C}$ |      | 110  | ns            |
| $t_r$         | Rise Time                                       |   | $T_J=25^\circ\text{C}$  |      | 90   | ns            |
|               |   |   | $T_J=125^\circ\text{C}$ |      | 95   | ns            |
| $t_{d(off)}$  | Turn - off Delay Time                           |   | $T_J=25^\circ\text{C}$  |      | 670  | ns            |
|               |   |   | $T_J=125^\circ\text{C}$ |      | 710  | ns            |
| $t_f$         | Fall Time                                       |   | $T_J=25^\circ\text{C}$  |      | 70   | ns            |
|               |   |   | $T_J=125^\circ\text{C}$ |      | 75   | ns            |
| $E_{on}$      | Turn - on Energy                                |   | $T_J=25^\circ\text{C}$  |      | 8.9  | mJ            |
|               |   |   | $T_J=125^\circ\text{C}$ |      | 9.9  | mJ            |
| $E_{off}$     | Turn - off Energy                               | $T_J=25^\circ\text{C}$  |                         | 21.5 | mJ   |               |
|               |   | $T_J=125^\circ\text{C}$   |                         | 25   | mJ   |               |
| $I_{SC}$      | Short Circuit Current                           | $t_{psc}\leq 6\mu\text{s}, V_{GE}=15\text{V}; T_J=125^\circ\text{C}, V_{CC}=360\text{V}$                  |                         | 3000 |      | A             |
| $R_{thJC}$    | Junction-to-Case Thermal Resistance (Per IGBT)  |   |                         |      | 0.10 | K/W           |
| <b>Diode</b>  |   |   |                         |      |      |               |
| $V_F$         | Forward Voltage                                 | $I_F=600\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$   |                         | 1.55 |      | V             |
|               |   | $I_F=600\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$  |                         | 1.5  |      | V             |
| $t_{RR}$      | Reverse Recovery Time                           | $I_F=600\text{A}, V_R=300\text{V}$<br>$di_F/dt=-6000\text{A}/\mu\text{s}$<br>$T_J=125^\circ\text{C}$      |                         | 400  |      | ns            |
| $I_{RRM}$     | Max. Reverse Recovery Current                   |   |                         | 300  |      | A             |
| $E_{rec}$     | Reverse Recovery Energy                         |   |                         | 9.3  |      | mJ            |
| $R_{thJCD}$   | Junction-to-Case Thermal Resistance (Per Diode) |   |                         |      | 0.16 | K/W           |

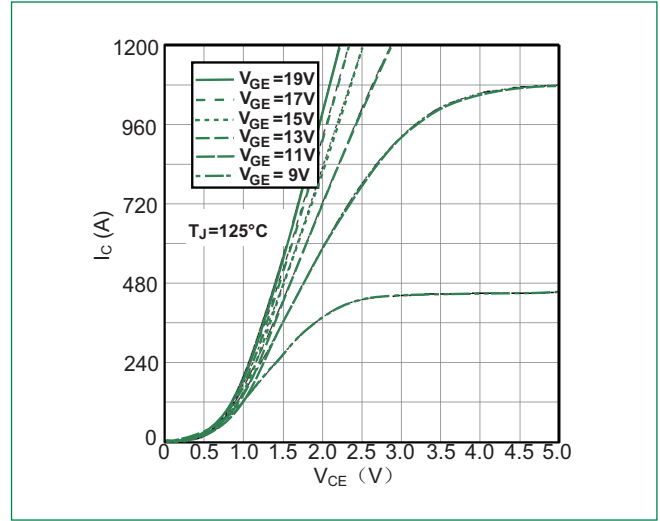
### NTC Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

| Symbol      | Parameters | Test Conditions        | Min | Typ  | Max | Unit       |
|-------------|------------|------------------------|-----|------|-----|------------|
| $R_{25}$    | Resistance | $T_c=25^\circ\text{C}$ |     | 5    |     | K $\Omega$ |
| $B_{25/50}$ |            |                        |     | 3375 |     | K          |

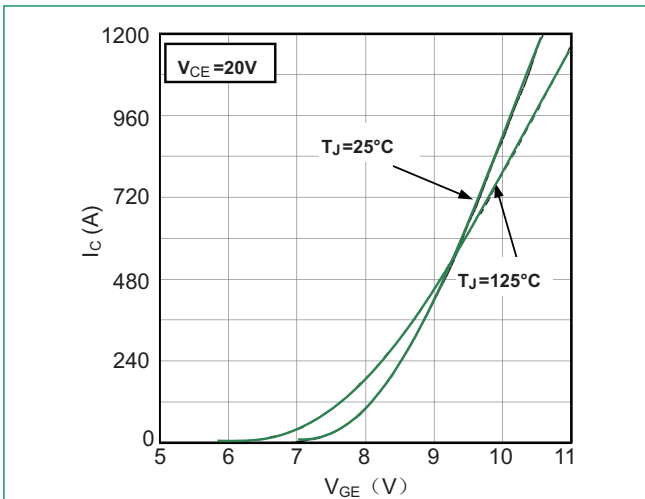
**Figure 1: Typical Output Characteristics for IGBT Inverter**



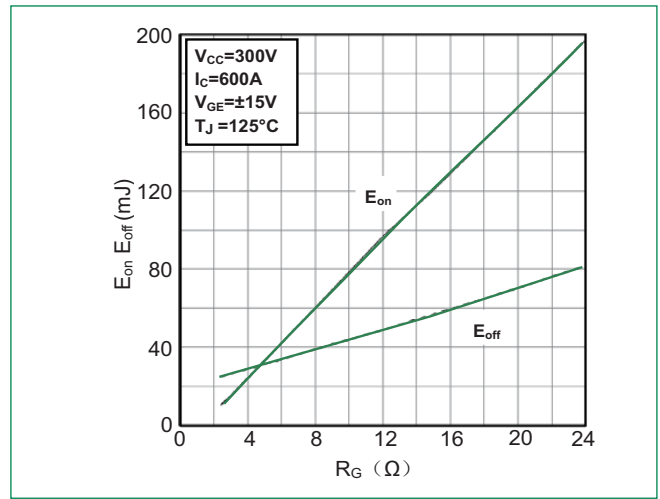
**Figure 2: Typical Output Characteristics for IGBT Inverter**



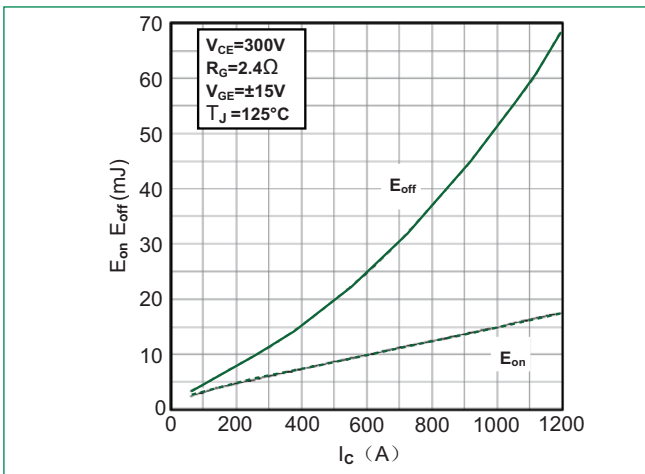
**Figure 3: Typical Transfer Characteristics for IGBT Inverter**



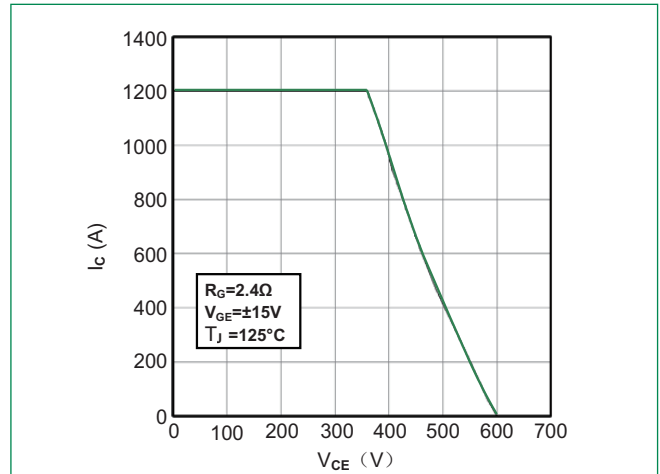
**Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter**



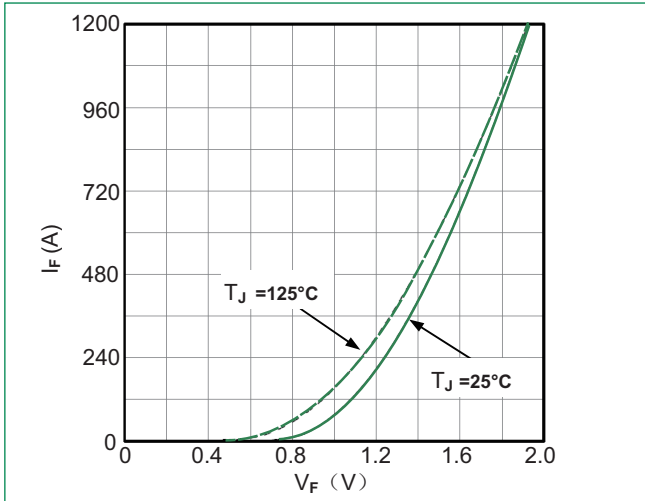
**Figure 5: Switching Energy vs. Collector Current for IGBT Inverter**



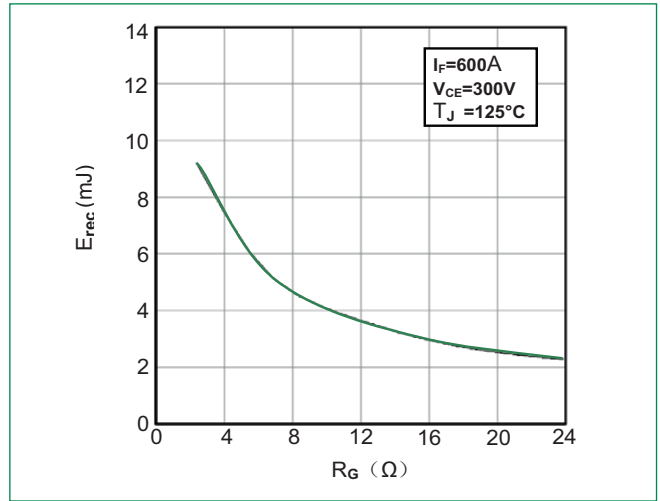
**Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter**



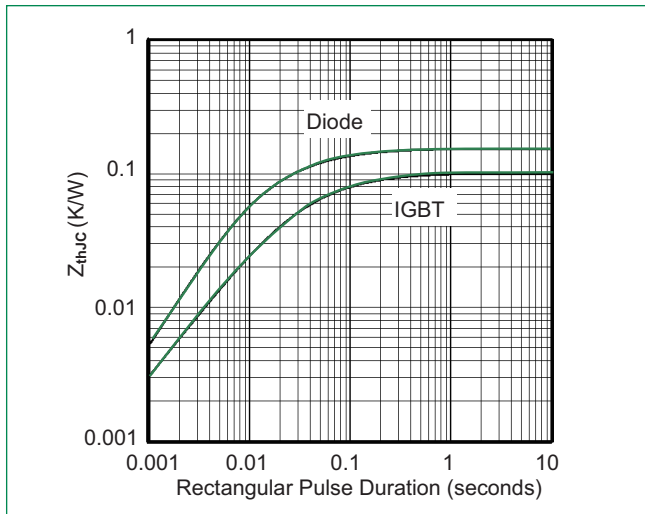
**Figure 7: Diode Forward Characteristics for Diode Inverter**



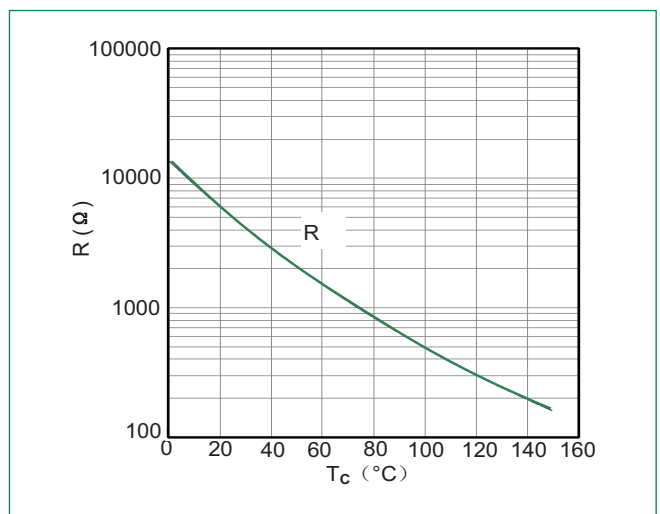
**Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter**



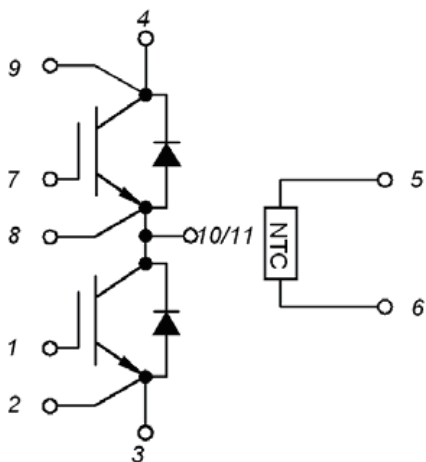
**Figure 9: Transient Thermal Impedance of Diode and IGBT Inverter**



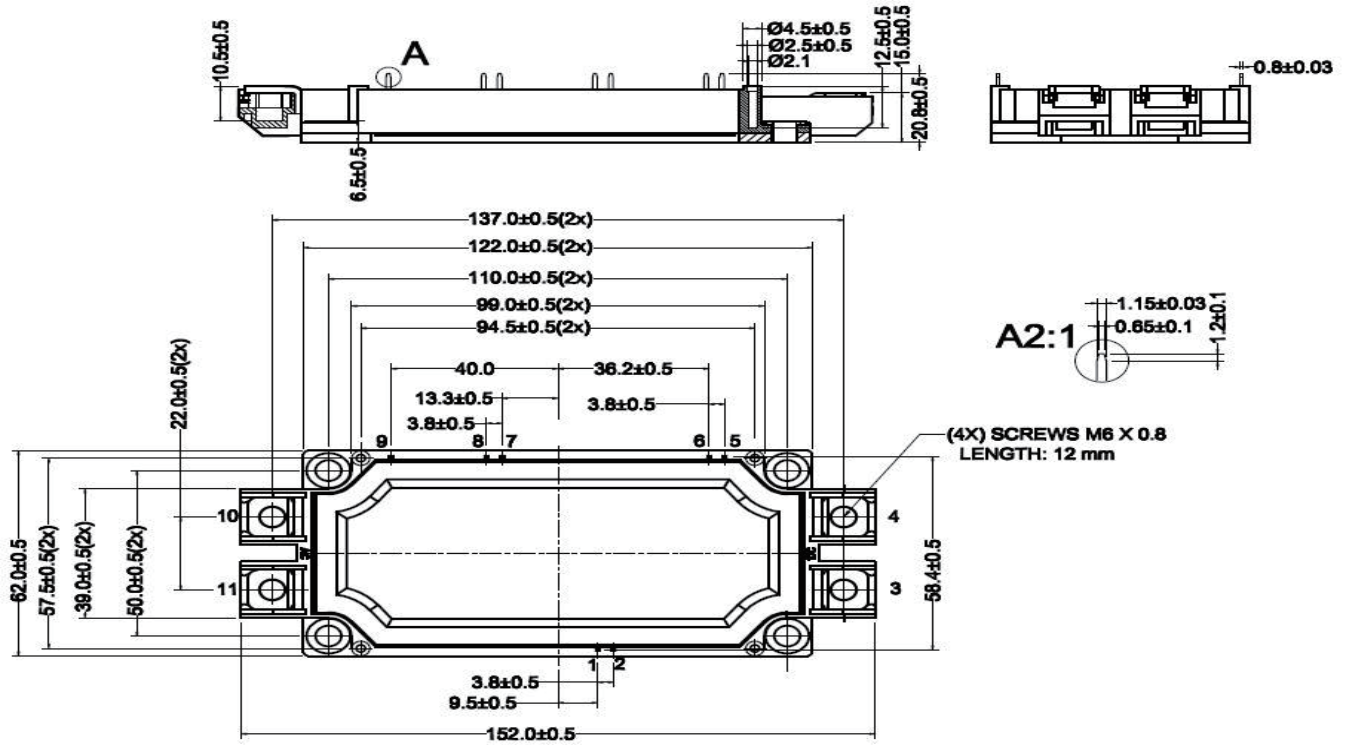
**Figure 10: NTC Characteristics**



**Circuit Diagram**



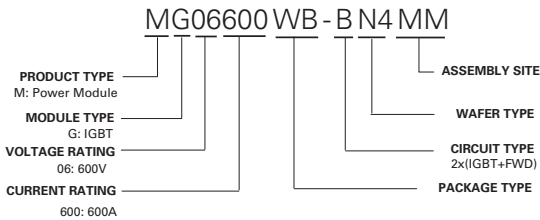
### Dimensions-Package WB



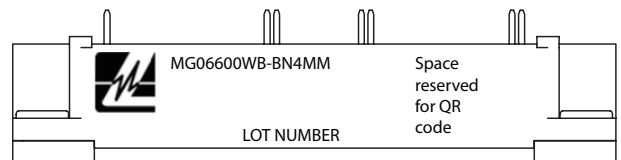
### Packing Options

| Part Number     | Marking         | Weight | Packing Mode | M.O.Q |
|-----------------|-----------------|--------|--------------|-------|
| MG06600WB-BN4MM | MG06600WB-BN4MM | 350g   | Bulk Pack    | 60    |

### Part Numbering System



### Part Marking System



# AMEYA360

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