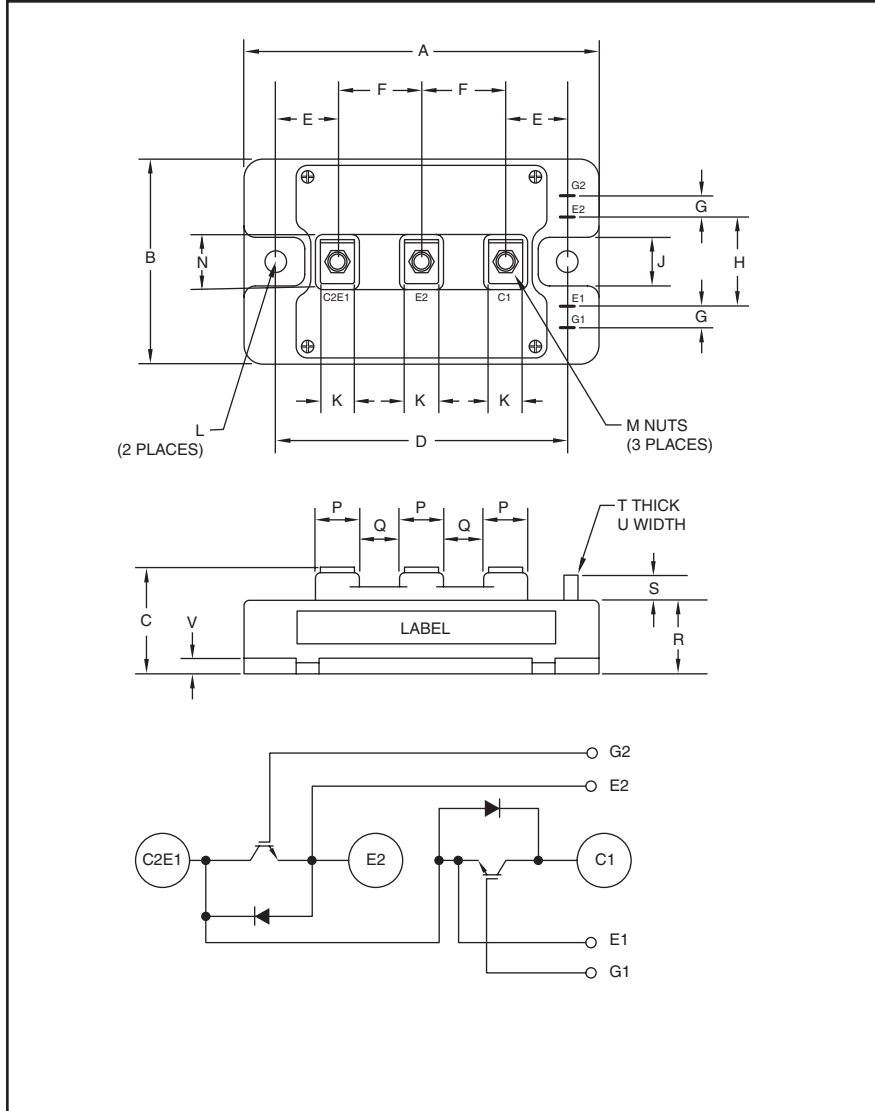


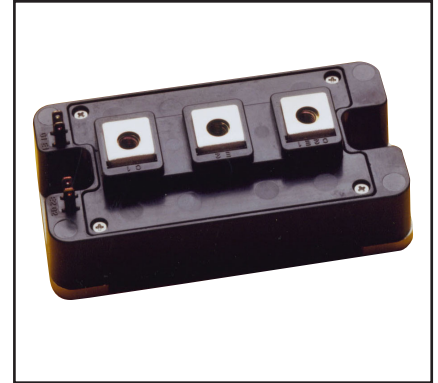
### Dual IGBTMOD™ A-Series Module 100 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches           | Millimeters   |
|------------|------------------|---------------|
| A          | 3.70             | 94.0          |
| B          | 1.89             | 48.0          |
| C          | 1.14+0.004/-0.02 | 29.0+0.1/-0.5 |
| D          | 3.15±0.01        | 80.0±0.25     |
| E          | 0.67             | 17.0          |
| F          | 0.91             | 23.0          |
| G          | 0.16             | 4.0           |
| H          | 0.71             | 18.0          |
| J          | 0.51             | 13.0          |
| K          | 0.47             | 12.0          |

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| L          | 0.26 Dia. | Dia. 6.5    |
| M          | M5 Metric | M5          |
| N          | 0.79      | 20.0        |
| P          | 0.63      | 16.0        |
| Q          | 0.28      | 7.0         |
| R          | 0.83      | 21.2        |
| S          | 0.30      | 7.5         |
| T          | 0.02      | 0.5         |
| U          | 0.110     | 2.8         |
| V          | 0.16      | 4.0         |



#### Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of two IGBT Transistors in a half-bridge configuration with each transistor having a reverse-connected super-fast recovery free-wheel diode. All components and interconnects are isolated from the heat sinking baseplate, offering simplified system assembly and thermal management.

#### Features:

- Low Drive Power
- Low  $V_{CE(sat)}$
- Discrete Super-Fast Recovery Free-Wheel Diode
- Isolated Baseplate for Easy Heat Sinking

#### Applications:

- AC Motor Control
- UPS
- Battery Powered Supplies

#### Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM100DY-24A is a 1200V ( $V_{CES}$ ), 100 Ampere Dual IGBTMOD™ Power Module.

| Type | Current Rating<br>Amperes | $V_{CES}$<br>Volts (x 50) |
|------|---------------------------|---------------------------|
| CM   | 100                       | 24                        |

**CM100DY-24A**  
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**Absolute Maximum Ratings,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

| Ratings   | Symbol    | CM100DY-24A | Units            |
|---|-----------|-------------|------------------|
| Junction Temperature  | $T_j$     | -40 to 150  | $^\circ\text{C}$ |
| Storage Temperature   | $T_{stg}$ | -40 to 125  | $^\circ\text{C}$ |
| Collector-Emitter Voltage (G-E Short)   | $V_{CES}$ | 1200        | Volts            |
| Gate-Emitter Voltage (C-E Short)  | $V_{GES}$ | $\pm 20$    | Volts            |
| Collector Current (DC, $T_C = 84^\circ\text{C}^*$ )   | $I_C$     | 100         | Amperes          |
| Peak Collector Current  | $I_{CM}$  | 200**       | Amperes          |
| Emitter Current*** ( $T_C = 25^\circ\text{C}$ )   | $I_E$     | 100         | Amperes          |
| Peak Emitter Current***   | $I_{EM}$  | 200**       | Amperes          |
| Maximum Collector Dissipation ( $T_C = 25^\circ\text{C}^*$ , $T_j \leq 150^\circ\text{C}$ ) | $P_C$     | 672         | Watts            |
| Mounting Torque, M5 Main Terminal   | —         | 30          | in-lb            |
| Mounting Torque, M6 Mounting  | —         | 40          | in-lb            |
| Weight  | —         | 310         | Grams            |
| Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)                                   | $V_{ISO}$ | 2500        | Volts            |

**Static Electrical Characteristics,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

| Characteristics                      | Symbol        | Test Conditions   | Min. | Typ. | Max. | Units         |
|--------------------------------------|---------------|---|------|------|------|---------------|
| Collector-Cutoff Current             | $I_{CES}$     | $V_{CE} = V_{CES}$ , $V_{GE} = 0\text{V}$                               | —    | —    | 1.0  | mA            |
| Gate Leakage Current                 | $I_{GES}$     | $V_{GE} = V_{GES}$ , $V_{CE} = 0\text{V}$                               | —    | —    | 0.5  | $\mu\text{A}$ |
| Gate-Emitter Threshold Voltage       | $V_{GE(th)}$  | $I_C = 10\text{mA}$ , $V_{CE} = 10\text{V}$                             | 6.0  | 7.0  | 8.0  | Volts         |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 100\text{A}$ , $V_{GE} = 15\text{V}$ , $T_j = 25^\circ\text{C}$  | —    | 2.1  | 3.0  | Volts         |
|                                      |               | $I_C = 100\text{A}$ , $V_{GE} = 15\text{V}$ , $T_j = 125^\circ\text{C}$ | —    | 2.4  | —    | Volts         |
| Total Gate Charge                    | $Q_G$         | $V_{CC} = 600\text{V}$ , $I_C = 100\text{A}$ , $V_{GE} = 15\text{V}$    | —    | 500  | —    | nC            |
| Emitter-Collector Voltage**          | $V_{EC}$      | $I_E = 100\text{A}$ , $V_{GE} = 0\text{V}$                              | —    | —    | 3.8  | Volts         |

**Dynamic Electrical Characteristics,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

| Characteristics                  | Symbol              | Test Conditions  | Min. | Typ. | Max. | Units         |
|----------------------------------|---------------------|--|------|------|------|---------------|
| Input Capacitance                | $C_{ies}$           |  | —    | —    | 17.5 | nf            |
| Output Capacitance               | $C_{oes}$           | $V_{CE} = 10\text{V}$ , $V_{GE} = 0\text{V}$   | —    | —    | 1.5  | nf            |
| Reverse Transfer Capacitance     | $C_{res}$           |  | —    | —    | 0.34 | nf            |
| Inductive                        | Turn-on Delay Time  | $V_{CC} = 600\text{V}$ , $I_C = 100\text{A}$ ,<br>$V_{GE1} = V_{GE2} = 15\text{V}$ , $R_G = 3.1\Omega$ , | —    | —    | 100  | ns            |
|                                  | Load                |  |      |      |      |               |
| Switch                           | Turn-off Delay Time | Inductive Load   | —    | —    | 400  | ns            |
|                                  | Time                |  |      |      |      |               |
| Diode Reverse Recovery Time***   | $t_{rr}$            | Switching Operation,   | —    | —    | 150  | ns            |
| Diode Reverse Recovery Charge*** | $Q_{rr}$            | $I_E = 100\text{A}$  | —    | 5.0  | —    | $\mu\text{C}$ |

\* $T_C$ ,  $T_f$  measured point is just under the chips.

\*\*Pulse width and repetition rate should be such that device junction temperature ( $T_j$ ) does not exceed  $T_{j(max)}$  rating.

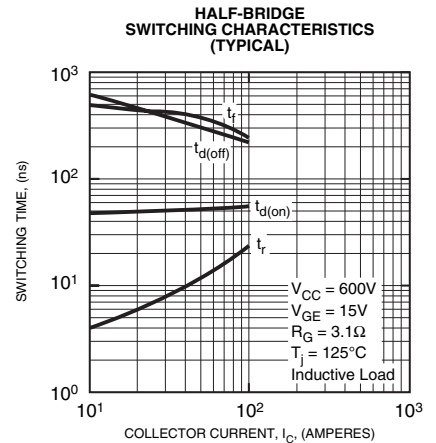
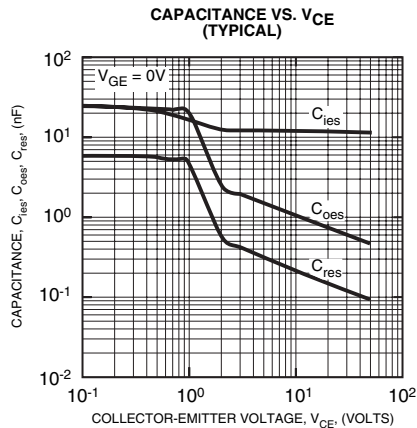
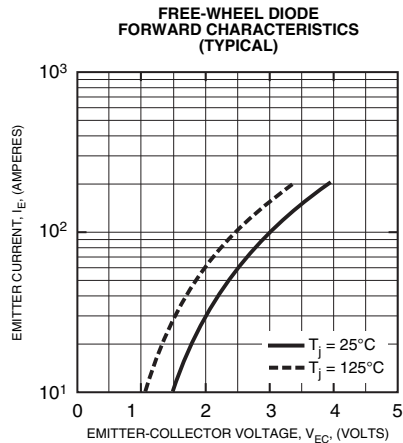
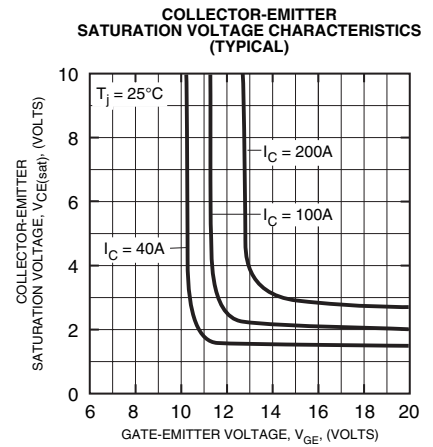
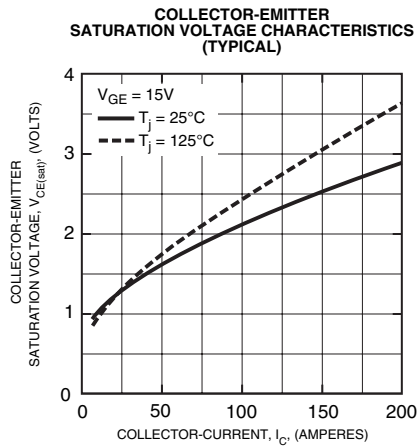
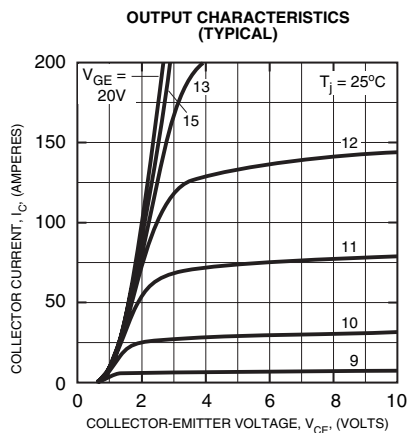
\*\*\*Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDi).

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**Thermal and Mechanical Characteristics,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

| Characteristics                       | Symbol         | Test Conditions                        | Min. | Typ.  | Max.  | Units              |
|---------------------------------------|----------------|--|------|-------|-------|--------------------|
| Thermal Resistance, Junction to Case* | $R_{th(j-c)Q}$ | Per IGBT 1/2 Module                    | —    | —     | 0.186 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case* | $R_{th(j-c)D}$ | Per FWDi 1/2 Module                    | —    | —     | 0.34  | $^\circ\text{C/W}$ |
| Contact Thermal Resistance            | $R_{th(c-f)}$  | Per 1/2 Module, Thermal Grease Applied | —    | 0.022 | —     | $^\circ\text{C/W}$ |
| External Gate Resistance              | $R_G$          |  | 3.1  | —     | 42    | $\Omega$           |

\* $T_C$ ,  $T_f$  measured point is just under the chips.



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