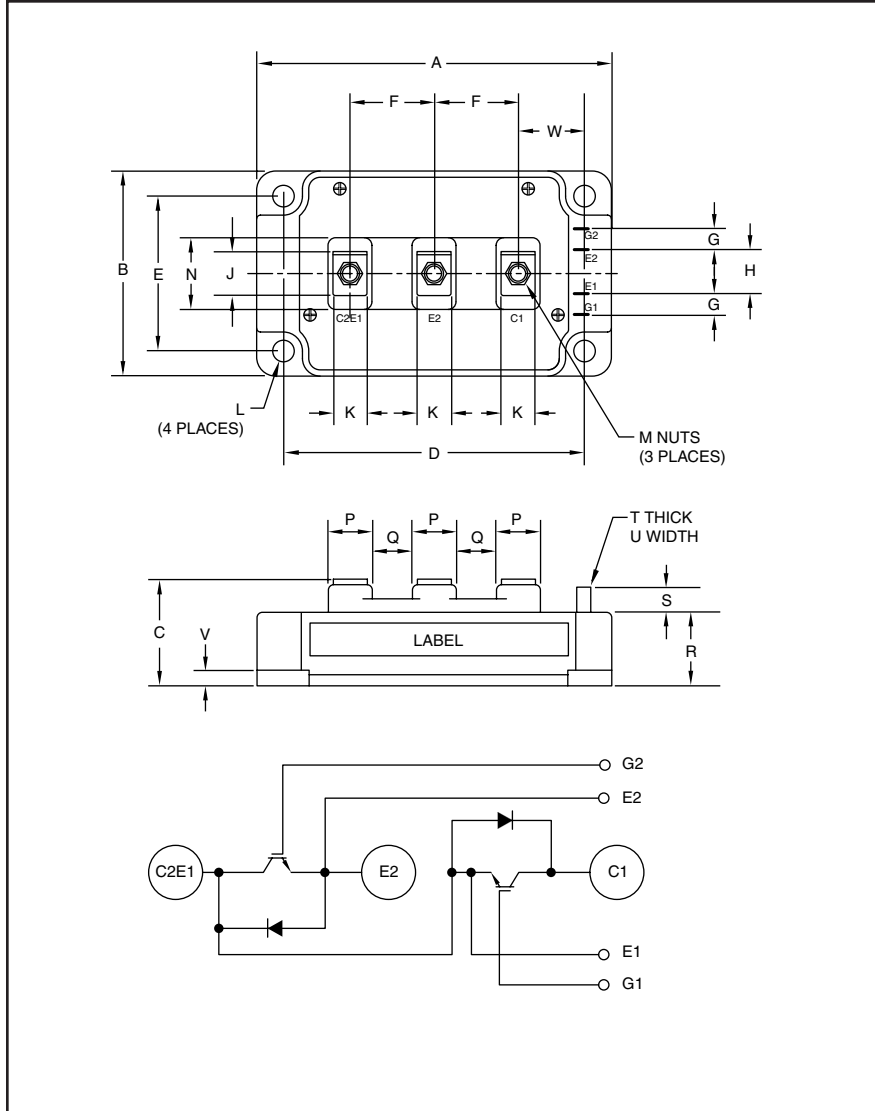


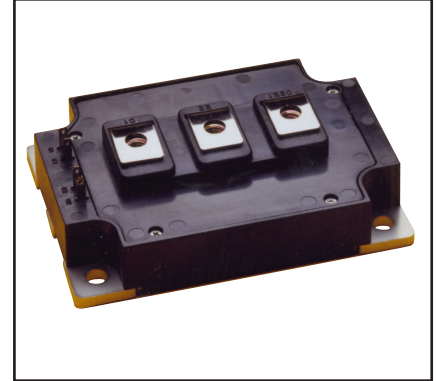
### Dual IGBTMOD™ A-Series Module 600 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches          | Millimeters   |
|------------|-----------------|---------------|
| A          | 4.33            | 110.0         |
| B          | 3.15            | 80.0          |
| C          | 1.14+0.4/-0.002 | 29.0+1.0/-0.5 |
| D          | 3.66±0.01       | 93.0±0.25     |
| E          | 2.44±0.01       | 62.0±0.25     |
| F          | 0.98            | 25.0          |
| G          | 0.24            | 6.0           |
| H          | 0.59            | 15.0          |
| J          | 0.81            | 20.5          |
| K          | 0.55            | 14.0          |
| L          | 0.26 Dia.       | Dia. 6.5      |

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| M          | M6 Metric | M6          |
| N          | 1.18      | 30.0        |
| P          | 0.71      | 18.0        |
| Q          | 0.28      | 7.0         |
| R          | 0.83      | 21.2        |
| S          | 0.33      | 8.5         |
| T          | 0.02      | 0.5         |
| U          | 0.110     | 2.8         |
| V          | 0.16      | 4.0         |
| W          | 0.85      | 21.5        |



#### 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. CM600DY-24A is a 1200V ( $V_{CES}$ ), 600 Ampere Dual IGBTMOD™ Power Module

| Type | Current Rating<br>Amperes | $V_{CES}$<br>Volts (x 50) |
|------|---------------------------|---------------------------|
| CM   | 600                       | 24                        |

**CM600DY-24A**  
**Dual IGBTMOD™ A-Series Module**  
 600 Amperes/1200 Volts

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

| Ratings   | Symbol           | CM600DY-24A | Units            |
|---|------------------|-------------|------------------|
| Junction Temperature  | $T_j$            | -40 to 150  | $^\circ\text{C}$ |
| Storage Temperature   | $T_{\text{stg}}$ | -40 to 125  | $^\circ\text{C}$ |
| Collector-Emitter Voltage (G-E Short)   | $V_{\text{CES}}$ | 1200        | Volts            |
| Gate-Emitter Voltage (C-E Short)  | $V_{\text{GES}}$ | $\pm 20$    | Volts            |
| Collector Current (DC, $T_C = 80^\circ\text{C}^*$ )   | $I_C$            | 600         | Amperes          |
| Peak Collector Current  | $I_{\text{CM}}$  | 1200**      | Amperes          |
| Emitter Current*** ( $T_C = 25^\circ\text{C}$ )   | $I_E$            | 600         | Amperes          |
| Peak Emitter Current***   | $I_{\text{EM}}$  | 1200**      | Amperes          |
| Maximum Collector Dissipation ( $T_C = 25^\circ\text{C}^*$ , $T_j \leq 150^\circ\text{C}$ ) | $P_C$            | 3670        | Watts            |
| Mounting Torque, M6 Main Terminal   | —                | 40          | in-lb            |
| Mounting Torque, M6 Mounting  | —                | 40          | in-lb            |
| Weight  | —                | 580         | Grams            |
| Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)                                   | $V_{\text{ISO}}$ | 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             | $I_{\text{CES}}$     | $V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$                  | —    | —    | 1.0  | mA            |
| Gate Leakage Current                 | $I_{\text{GES}}$     | $V_{\text{GE}} = V_{\text{GES}}, V_{\text{CE}} = 0\text{V}$                  | —    | —    | 0.5  | $\mu\text{A}$ |
| Gate-Emitter Threshold Voltage       | $V_{\text{GE(th)}}$  | $I_C = 60\text{mA}, V_{\text{CE}} = 10\text{V}$                              | 6.0  | 7.0  | 8.0  | Volts         |
| Collector-Emitter Saturation Voltage | $V_{\text{CE(sat)}}$ | $I_C = 600\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 25^\circ\text{C}$      | —    | 2.1  | 3.0  | Volts         |
|                                      |                      | $I_C = 600\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 125^\circ\text{C}$     | —    | 2.4  | —    | Volts         |
| Total Gate Charge                    | $Q_G$                | $V_{\text{CC}} = 600\text{V}, I_C = 600\text{A}, V_{\text{GE}} = 15\text{V}$ | —    | 2700 | —    | nC            |
| Emitter-Collector Voltage**          | $V_{\text{EC}}$      | $I_E = 600\text{A}, V_{\text{GE}} = 0\text{V}$                               | —    | —    | 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               | $C_{\text{ies}}$    |  | —    | —    | 94   | nf            |
| Output Capacitance              | $C_{\text{oes}}$    | $V_{\text{CE}} = 10\text{V}, V_{\text{GE}} = 0\text{V}$  | —    | —    | 8.0  | nf            |
| Reverse Transfer Capacitance    | $C_{\text{res}}$    |  | —    | —    | 1.8  | nf            |
| Inductive Load                  | Turn-on Delay Time  | $V_{\text{CC}} = 600\text{V}, I_C = 600\text{A},$<br>$V_{\text{GE1}} = V_{\text{GE2}} = 15\text{V}, R_G = 0.52\Omega,$ | —    | —    | 660  | ns            |
|                                 | Rise Time           |  |      |      |      |               |
| Switch Time                     | Turn-off Delay Time | Inductive Load   | —    | —    | 700  | ns            |
|                                 | Fall Time           |  |      |      |      |               |
| Diode Reverse Recovery Time**   | $t_{\text{rr}}$     | Switching Operation,   | —    | —    | 250  | ns            |
| Diode Reverse Recovery Charge** | $Q_{\text{rr}}$     | $I_E = 600\text{A}$  | —    | 19   | —    | $\mu\text{C}$ |

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

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

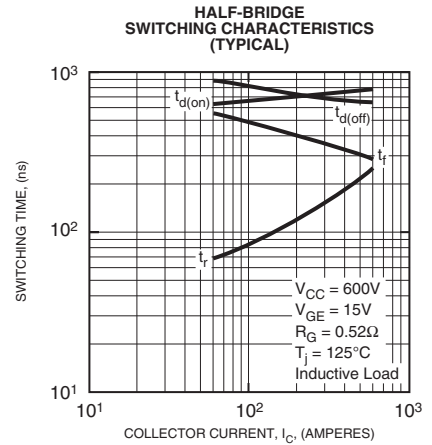
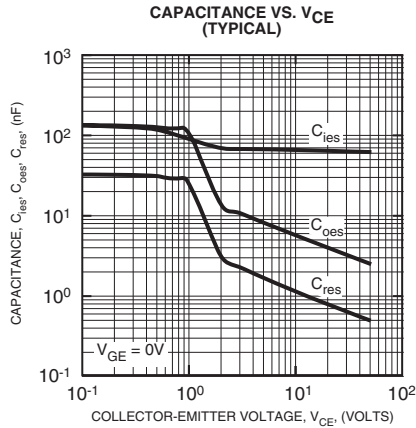
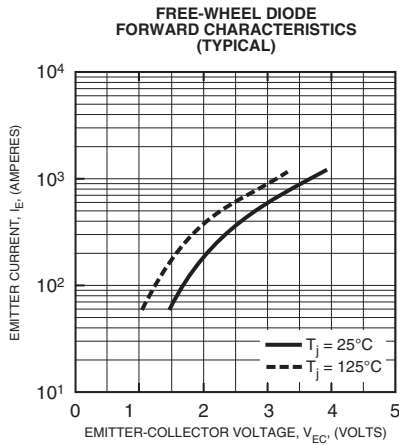
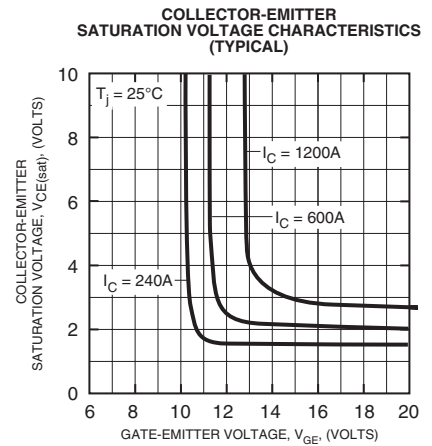
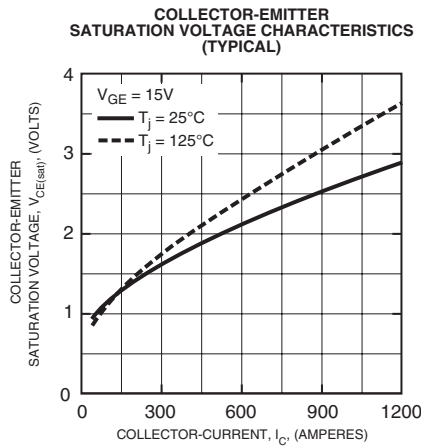
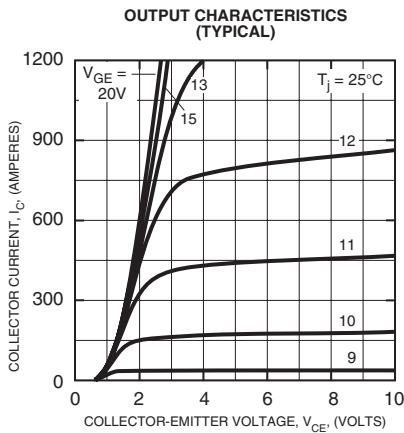
\*\*\*Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDi).

**CM600DY-24A**  
**Dual IGBTMOD™ A-Series Module**  
 600 Amperes/1200 Volts

**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                    | —    | —     | 0.034 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case* | $R_{th(j-c)D}$ | Per FWDi 1/2 Module                    | —    | —     | 0.062 | $^\circ\text{C/W}$ |
| Contact Thermal Resistance            | $R_{th(c-f)}$  | Per 1/2 Module, Thermal Grease Applied | —    | 0.018 | —     | $^\circ\text{C/W}$ |
| External Gate Resistance              | $R_G$          |  | 0.52 | —     | 7.8   | $\Omega$           |

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



**CM600DY-24A**  
**Dual IGBTMOD™ A-Series Module**  
 600 Amperes/1200 Volts

