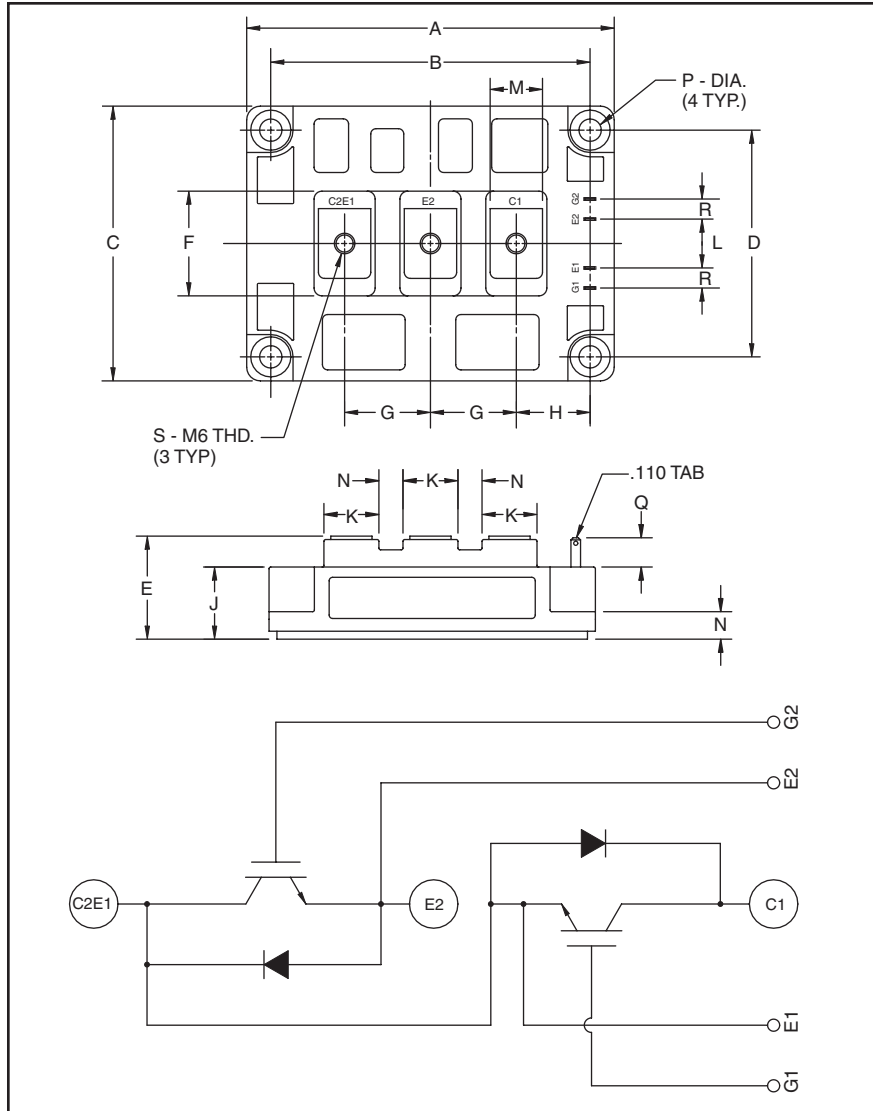


### Dual IGBTMOD™ H-Series Module 300 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches     | Millimeters |
|------------|------------|-------------|
| A          | 4.33       | 110.0       |
| B          | 3.661±0.01 | 93.0±0.25   |
| C          | 3.15       | 80.0        |
| D          | 2.441±0.01 | 62.0±0.25   |
| E          | 1.18 Max.  | 30.0 Max.   |
| F          | 1.18       | 30.0        |
| G          | 0.98       | 25.0        |
| H          | 0.85       | 21.5        |
| J          | 0.83       | 21.2        |

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| K          | 0.71      | 18.0        |
| L          | 0.59      | 15.0        |
| M          | 0.55      | 14.0        |
| N          | 0.28      | 7.0         |
| P          | 0.26 Dia. | Dia. 6.5    |
| Q          | 0.33      | 8.5         |
| R          | 0.24      | 6.0         |
| S          | M6 Metric | M6          |



#### 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 (135ns) Free-Wheel Diode
- ☐ High Frequency Operation (20-25kHz)
- ☐ Isolated Baseplate for Easy Heat Sinking

#### Applications:

- ☐ AC Motor Control
- ☐ Motion/Servo Control
- ☐ UPS
- ☐ Welding Power Supplies
- ☐ Laser Power Supplies

#### Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM300DY-24H is a 1200V ( $V_{CES}$ ), 300 Ampere Dual IGBTMOD™ Power Module.

| Type | Current Rating<br>Amperes | $V_{CES}$<br>Volts (x 50) |
|------|---------------------------|---------------------------|
| CM   | 300                       | 24                        |

### CM300DY-24H

#### Dual IGBTMOD™ H-Series Module

300 Amperes/1200 Volts

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

| Ratings                                 | Symbol           | CM300DY-24H | 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                    | $V_{\text{GES}}$ | $\pm 20$    | Volts            |
| Collector Current                       | $I_C$            | 300         | Amperes          |
| Peak Collector Current                  | $I_{\text{CM}}$  | 600*        | Amperes          |
| Diode Forward Current                   | $I_F$            | 300         | Amperes          |
| Diode Forward Surge Current             | $I_{\text{FM}}$  | 600*        | Amperes          |
| Power Dissipation                       | $P_d$            | 2100        | Watts            |
| Max. Mounting Torque M6 Terminal Screws | —                | 26          | in-lb            |
| Max. Mounting Torque M6 Mounting Screws | —                | 26          | in-lb            |
| Module Weight (Typical)                 | —                | 500         | Grams            |
| V Isolation                             | $V_{\text{RMS}}$ | 2500        | Volts            |

\* Pulse width and repetition rate should be such that device junction temperature does not exceed the device rating.

### 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       | $V_{\text{GE(th)}}$  | $I_C = 30\text{mA}, V_{\text{CE}} = 10\text{V}$                              | 4.5  | 6.0  | 7.5   | Volts         |
| Collector-Emitter Saturation Voltage | $V_{\text{CE(sat)}}$ | $I_C = 300\text{A}, V_{\text{GE}} = 15\text{V}$                              | —    | 2.5  | 3.2** | Volts         |
|                                      |                      | $I_C = 300\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 150^\circ\text{C}$     | —    | 2.25 | —     | Volts         |
| Total Gate Charge                    | $Q_G$                | $V_{\text{CC}} = 600\text{V}, I_C = 300\text{A}, V_{\text{GS}} = 15\text{V}$ | —    | 1500 | —     | nC            |
| Diode Forward Voltage                | $V_{\text{FM}}$      | $I_E = 300\text{A}, V_{\text{GS}} = 0\text{V}$                               | —    | —    | 3.5   | Volts         |

\*\* Pulse width and repetition rate should be such that device junction temperature rise is negligible.

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

| Characteristics               | Symbol              | Test Conditions                                                         | Min. | Typ. | Max. | Units         |
|-------------------------------|---------------------|-------------------------------------------------------------------------|------|------|------|---------------|
| Input Capacitance             | $C_{\text{ies}}$    |                                                                         | —    | —    | 60   | nF            |
| Output Capacitance            | $C_{\text{oes}}$    | $V_{\text{GE}} = 0\text{V}, V_{\text{CE}} = 10\text{V}, f = \text{MHz}$ | —    | —    | 21   | nF            |
| Reverse Transfer Capacitance  | $C_{\text{res}}$    |                                                                         | —    | —    | 12   | nF            |
| Resistive                     | Turn-on Delay Time  | $t_{\text{d(on)}}$                                                      | —    | —    | 250  | ns            |
| Load                          | Rise Time           | $t_r$                                                                   | —    | —    | 500  | ns            |
| Switching                     | Turn-off Delay Time | $t_{\text{d(off)}}$                                                     | —    | —    | 350  | ns            |
| Times                         | Fall Time           | $t_f$                                                                   | —    | —    | 350  | ns            |
| Diode Reverse Recovery Time   | $t_{\text{rr}}$     | $I_E = 300\text{A}, di_E/dt = -600\text{A}/\mu\text{s}$                 | —    | —    | 250  | ns            |
| Diode Reverse Recovery Charge | $Q_{\text{rr}}$     | $I_E = 300\text{A}, di_E/dt = -600\text{A}/\mu\text{s}$                 | —    | 2.23 | —    | $\mu\text{C}$ |

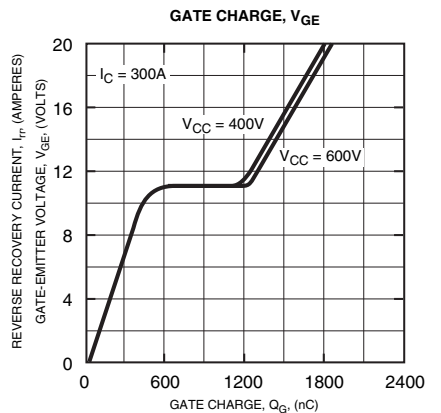
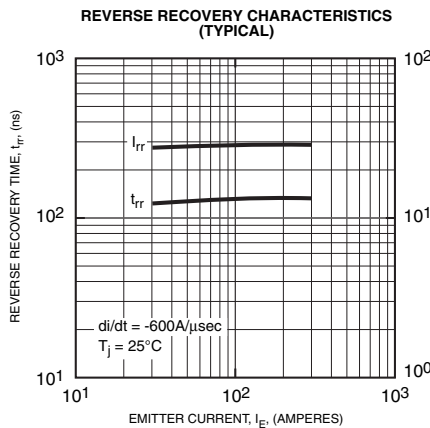
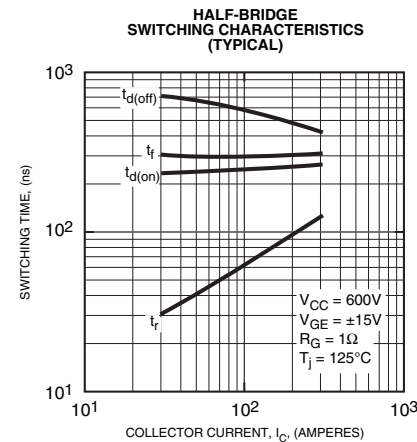
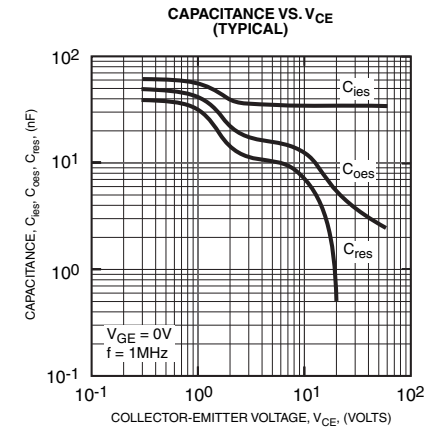
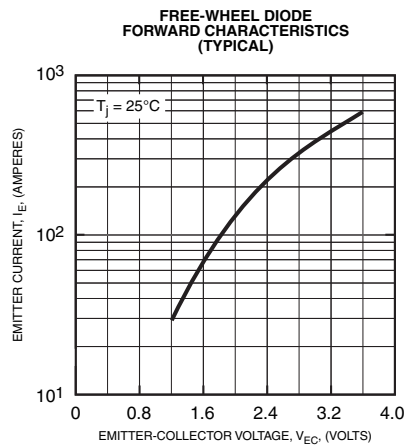
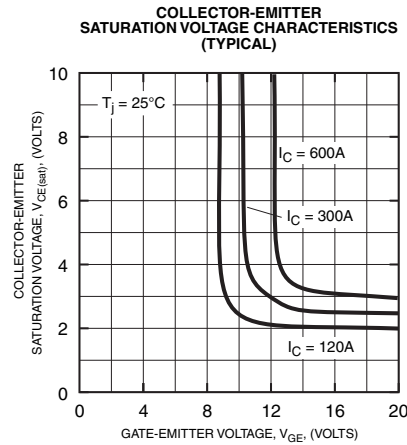
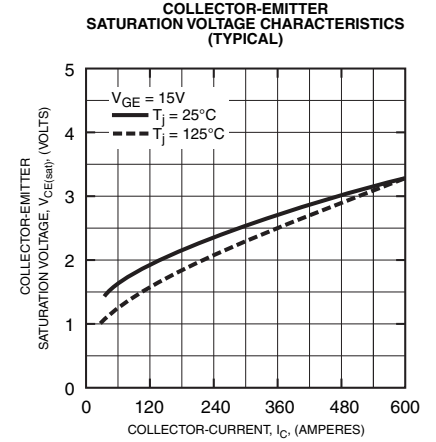
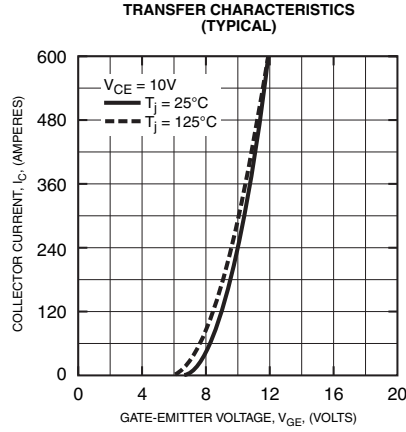
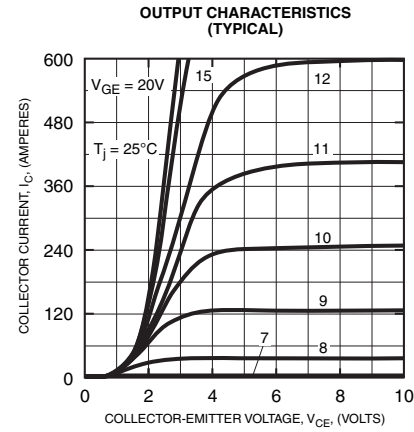
### Thermal and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

| Characteristics                      | Symbol               | Test Conditions                    | Min. | Typ. | Max.  | Units                     |
|--------------------------------------|----------------------|------------------------------------|------|------|-------|---------------------------|
| Thermal Resistance, Junction to Case | $R_{\text{th(j-c)}}$ | Per IGBT                           | —    | —    | 0.06  | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Case | $R_{\text{th(j-c)}}$ | Per FWDi                           | —    | —    | 0.12  | $^\circ\text{C}/\text{W}$ |
| Contact Thermal Resistance           | $R_{\text{th(c-f)}}$ | Per Module, Thermal Grease Applied | —    | —    | 0.035 | $^\circ\text{C}/\text{W}$ |

## CM300DY-24H

### Dual IGBTMOD™ H-Series Module

300 Amperes/1200 Volts



## CM300DY-24H

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