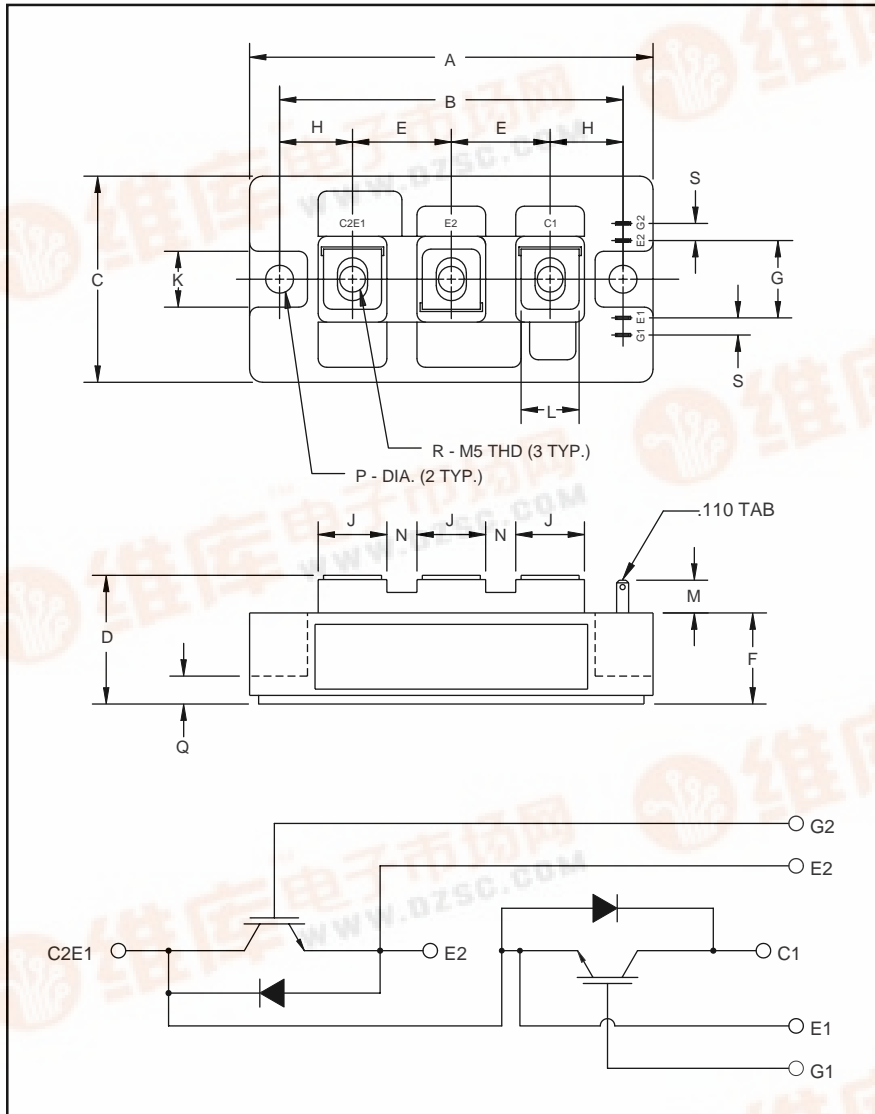




Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

## CM150DY-24H

### Dual IGBTMOD™ H-Series Module 150 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches     | Millimeters |
|------------|------------|-------------|
| A          | 3.70       | 94.0        |
| B          | 3.150±0.01 | 80.0±0.25   |
| C          | 1.89       | 48.0        |
| D          | 1.18 Max.  | 30.0 Max.   |
| E          | 0.90       | 23.0        |
| F          | 0.83       | 21.2        |
| G          | 0.71       | 18.0        |
| H          | 0.67       | 17.0        |
|            | 0.63       | 16.0        |

| Dimensions | Inches     | Millimeters |
|------------|------------|-------------|
| K          | 0.51       | 13.0        |
| L          | 0.47       | 12.0        |
| M          | 0.30       | 7.5         |
| N          | 0.28       | 7.0         |
| P          | 0.256 Dia. | Dia. 6.5    |
| Q          | 0.26       | 6.5         |
| R          | M5 Metric  | M5          |
| S          | 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 (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. CM150DY-24H is a 1200V ( $V_{CES}$ ), 150 Ampere Dual IGBTMOD™ Power Module.

| Type | Current Rating<br>Amperes | $V_{CES}$<br>Volts (x 50) |
|------|---------------------------|---------------------------|
| CM   | 150                       | 24                        |





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

| Ratings                                 | Symbol    | CM150DY-24H | 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                    | $V_{GES}$ | $\pm 20$    | Volts            |
| Collector Current                       | $I_C$     | 150         | Amperes          |
| Peak Collector Current                  | $I_{CM}$  | 300*        | Amperes          |
| Diode Forward Current                   | $I_F$     | 150         | Amperes          |
| Diode Forward Surge Current             | $I_{FM}$  | 300*        | Amperes          |
| Power Dissipation                       | $P_d$     | 1100        | Watts            |
| Max. Mounting Torque M5 Terminal Screws | -         | 17          | in-lb            |
| Max. Mounting Torque M6 Mounting Screws | -         | 26          | in-lb            |
| Module Weight (Typical)                 | -         | 270         | Grams            |
| V Isolation                             | $V_{RMS}$ | 2500        | Volts            |

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

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

| Characteristics                      | Symbol        | Test Conditions  | Min. | Typ. | Max.  | Units         |
|--------------------------------------|---------------|--|------|------|-------|---------------|
| Collector-Cutoff Current             | $I_{CES}$     | $V_{CE} = V_{CES}, V_{GE} = 0V$                            | -    | -    | 1.0   | mA            |
| Gate Leakage Current                 | $I_{GES}$     | $V_{GE} = V_{GES}, V_{CE} = 0V$                            | -    | -    | 0.5   | $\mu\text{A}$ |
| Gate-Emitter Threshold Voltage       | $V_{GE(th)}$  | $I_C = 15\text{mA}, V_{CE} = 10V$                          | 4.5  | 6.0  | 7.5   | Volts         |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 150\text{A}, V_{GE} = 15V$                          | -    | 2.5  | 3.4** | Volts         |
|                                      |               | $I_C = 150\text{A}, V_{GE} = 15V, T_j = 150^\circ\text{C}$ | -    | 2.25 | -     | Volts         |
| Total Gate Charge                    | $Q_G$         | $V_{CC} = 600V, I_C = 150\text{A}, V_{GS} = 15V$           | -    | 750  | -     | nC            |
| Diode Forward Voltage                | $V_{FM}$      | $I_E = 150\text{A}, V_{GS} = 0V$                           | -    | -    | 3.5   | Volts         |

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

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

| Characteristics               | Symbol              | Test Conditions   | Min. | Typ. | Max. | Units         |
|-------------------------------|---------------------|---|------|------|------|---------------|
| Input Capacitance             | $C_{ies}$           |   | -    | -    | 30   | nF            |
| Output Capacitance            | $C_{oes}$           | $V_{GE} = 0V, V_{CE} = 10V, f = 1\text{MHz}$            | -    | -    | 10.5 | nF            |
| Reverse Transfer Capacitance  | $C_{res}$           |   | -    | -    | 6    | nF            |
| Resistive                     | Turn-on Delay Time  | $t_{d(on)}$   | -    | -    | 250  | ns            |
|                               | Rise Time           | $t_r$   | -    | -    | 350  | ns            |
| Switching                     | Turn-off Delay Time | $t_{d(off)}$  | -    | -    | 300  | ns            |
|                               | Fall Time           | $t_f$   | -    | -    | 350  | ns            |
| Diode Reverse Recovery Time   | $t_{rr}$            | $I_E = 150\text{A}, di_E/dt = -300\text{A}/\mu\text{s}$ | -    | -    | 250  | ns            |
| Diode Reverse Recovery Charge | $Q_{rr}$            | $I_E = 150\text{A}, di_E/dt = -300\text{A}/\mu\text{s}$ | -    | 1.11 | -    | $\mu\text{C}$ |

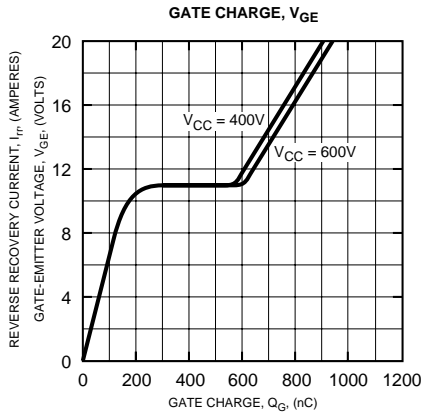
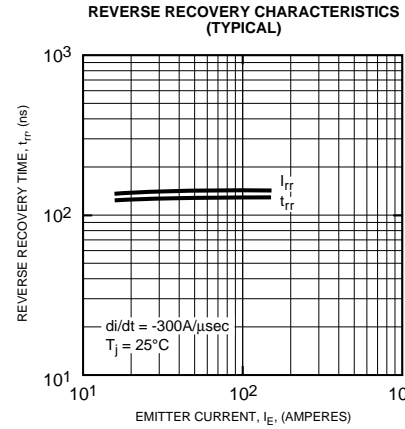
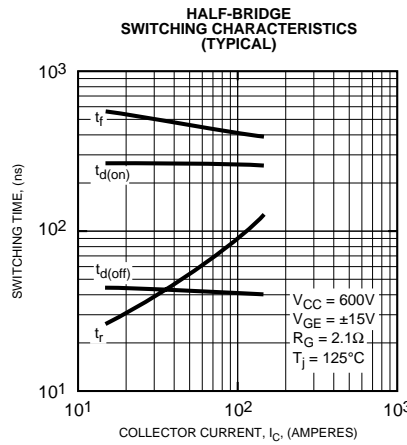
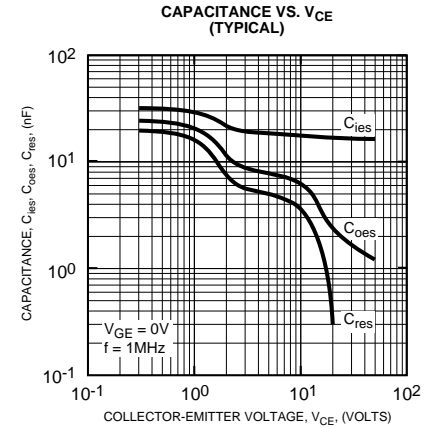
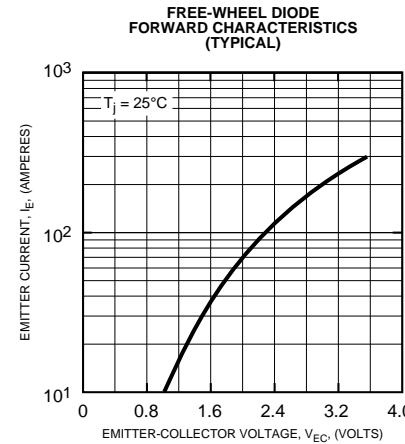
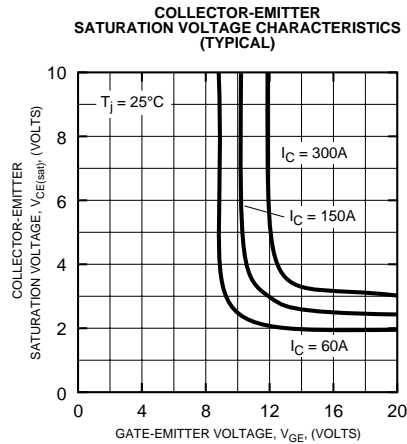
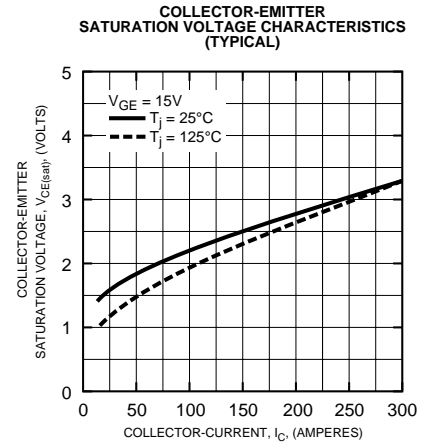
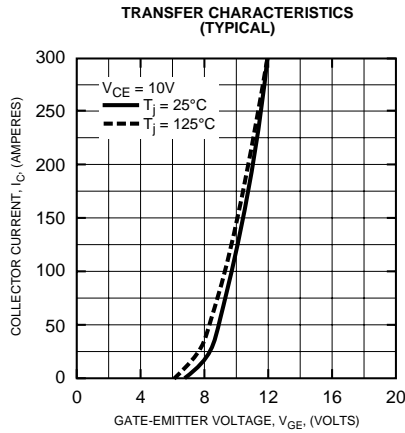
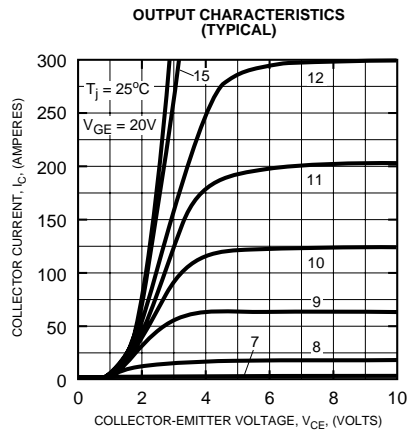
### Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

| Characteristics                      | Symbol        | Test Conditions                    | Min. | Typ. | Max.  | Units                     |
|--------------------------------------|---------------|------------------------------------|------|------|-------|---------------------------|
| Thermal Resistance, Junction to Case | $R_{th(j-c)}$ | Per IGBT                           | -    | -    | 0.11  | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)}$ | Per FWDi                           | -    | -    | 0.24  | $^\circ\text{C}/\text{W}$ |
| Contact Thermal Resistance           | $R_{th(c-f)}$ | Per Module, Thermal Grease Applied | -    | -    | 0.065 | $^\circ\text{C}/\text{W}$ |



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