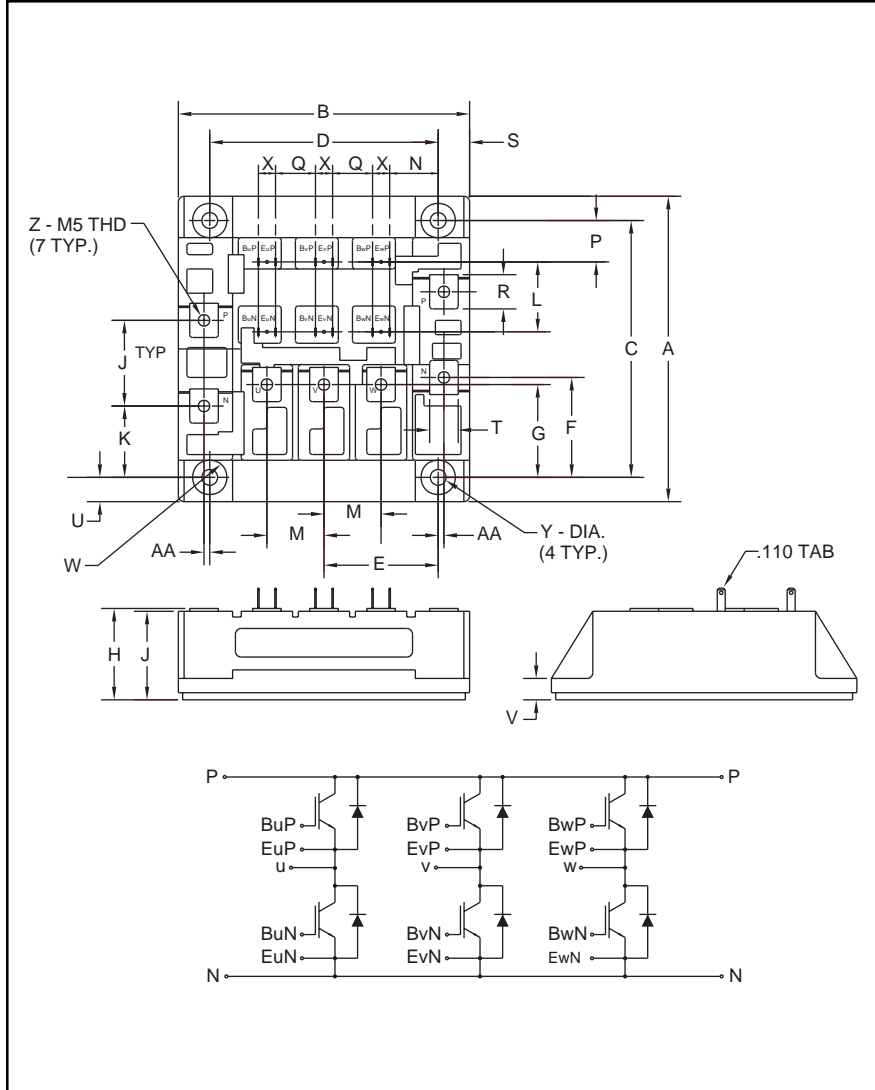


### Six-IGBT IGBTMOD™ H-Series Module 75 Amperes/1200 Volts



#### Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of six IGBT Transistors in a three phase 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. CM75TF-24H is a 1200V ( $V_{CES}$ ), 75 Ampere Six-IGBT IGBTMOD™ Power Module.

Outline Drawing and Circuit Diagram

| Dimensions | Inches     | Millimeters |
|------------|------------|-------------|
| A          | 4.21       | 107.0       |
| B          | 4.02       | 102.0       |
| C          | 3.543±0.01 | 90.0±0.25   |
| D          | 3.15±0.01  | 80.0±0.25   |
| E          | 1.57       | 40.0        |
| F          | 1.38       | 35.0        |
| G          | 1.28       | 32.5        |
| H          | 1.26 Max.  | 32.0 Max    |
| J          | 1.18       | 30.0        |
| K          | 0.98       | 25.0        |
| L          | 0.96       | 24.5        |
| M          | 0.79       | 20.0        |
| N          | 0.67       | 17.0        |

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| P          | 0.57      | 14.5        |
| Q          | 0.55      | 14.0        |
| R          | 0.47      | 12.0        |
| S          | 0.43      | 11.0        |
| T          | 0.39      | 10.0        |
| U          | 0.33      | 8.5         |
| V          | 0.30      | 7.5         |
| W          | 0.24 Rad. | Rad. 6.0    |
| X          | 0.24      | 6.0         |
| Y          | 0.22      | 5.5         |
| Z          | M5 Metric | M5          |
| AA         | 0.08      | 2.0         |

| Type | Current Rating<br>Amperes | $V_{CES}$<br>Volts (x 50) |
|------|---------------------------|---------------------------|
| CM   | 75                        | 24                        |

## CM75TF-24H

### Six-IGBT IGBTMOD™ H-Series Module

75 Amperes/1200 Volts

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

| Ratings                                 | Symbol    | CM75TF-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                       | $I_C$     | 75         | Amperes          |
| Peak Collector Current                  | $I_{CM}$  | 150*       | Amperes          |
| Diode Forward Current                   | $I_F$     | 75         | Amperes          |
| Diode Forward Surge Current             | $I_{FM}$  | 150*       | Amperes          |
| Power Dissipation                       | $P_d$     | 600        | Watts            |
| Max. Mounting Torque M5 Terminal Screws | -         | 17         | in-lb            |
| Max. Mounting Torque M5 Mounting Screws | -         | 17         | in-lb            |
| Module Weight (Typical)                 | -         | 830        | 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       | $V_{GE(th)}$  | $I_C = 7.5\text{mA}, V_{CE} = 10V$                 | 4.5  | 6.0  | 7.5   | Volts         |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 75A, V_{GE} = 15V$                          | -    | 2.5  | 3.4** | Volts         |
|                                      |               | $I_C = 75A, V_{GE} = 15V, T_j = 150^\circ\text{C}$ | -    | 2.25 | -     | Volts         |
| Total Gate Charge                    | $Q_G$         | $V_{CC} = 600V, I_C = 75A, V_{GS} = 15V$           | -    | 375  | -     | nC            |
| Diode Forward Voltage                | $V_{FM}$      | $I_E = 75A, V_{GS} = 0V$                           | -    | -    | 3.4   | Volts         |

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

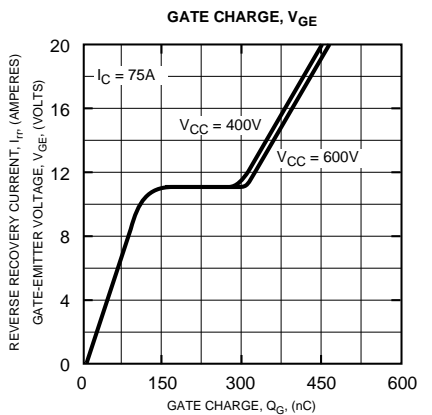
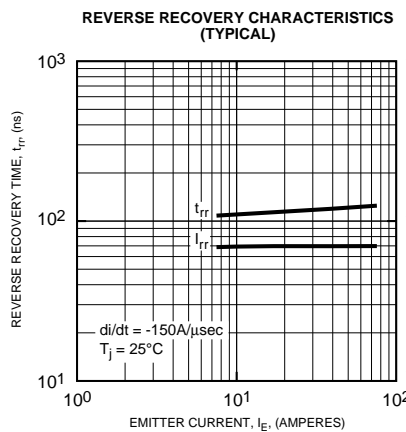
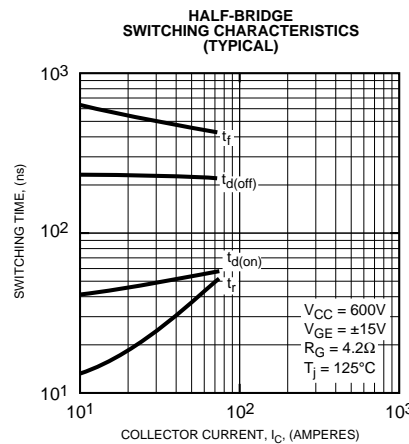
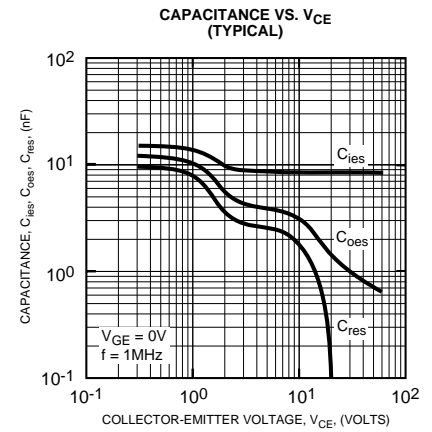
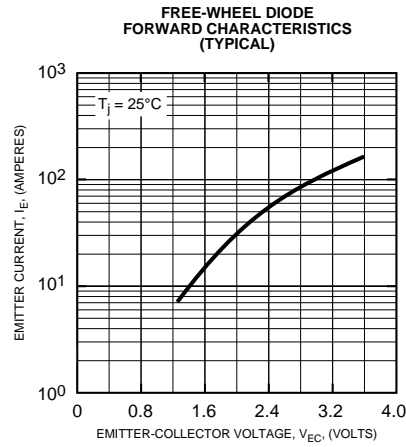
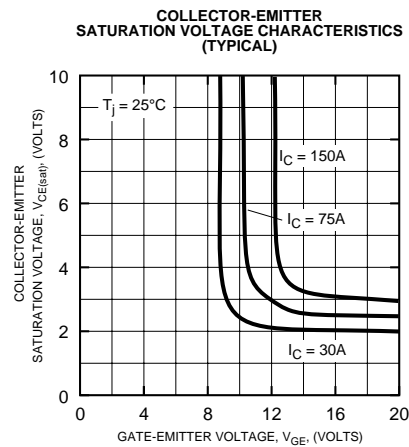
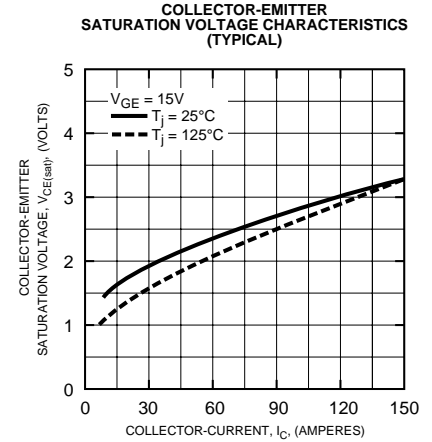
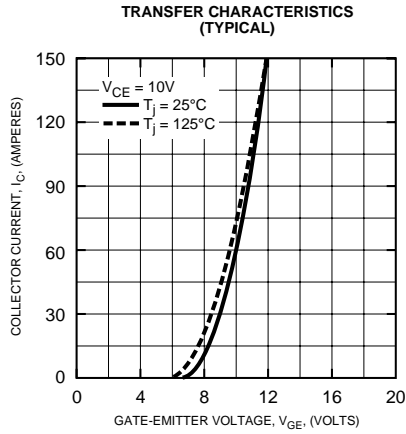
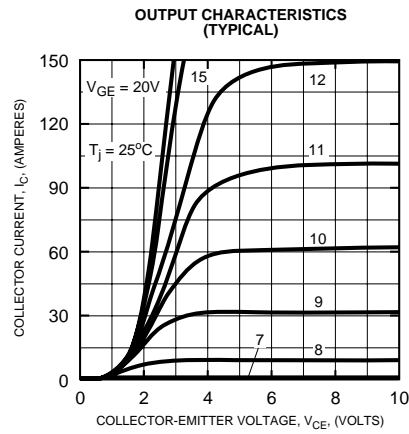
### Dynamic Electrical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

| Characteristics               | Symbol              | Test Conditions                              | Min. | Typ. | Max. | Units         |
|-------------------------------|---------------------|--|------|------|------|---------------|
| Input Capacitance             | $C_{ies}$           |  | -    | -    | 15   | nF            |
| Output Capacitance            | $C_{oes}$           | $V_{GE} = 0V, V_{CE} = 10V, f = 1\text{MHz}$ | -    | -    | 5.3  | nF            |
| Reverse Transfer Capacitance  | $C_{res}$           |  | -    | -    | 3    | nF            |
| Resistive                     | Turn-on Delay Time  | $V_{CC} = 600V, I_C = 75A,$                  |      |      |      | ns            |
| Load                          | Rise Time           |  |      |      |      |               |
| Switching                     | Turn-off Delay Time | $V_{GE1} = V_{GE2} = 15V, R_G = 4.2\Omega$   |      |      |      | ns            |
|                               | Time                |  |      |      |      |               |
| Diode Reverse Recovery Time   | $t_{rr}$            | $I_E = 75A, di_E/dt = -150A/\mu\text{s}$     | -    | -    | 250  | ns            |
| Diode Reverse Recovery Charge | $Q_{rr}$            | $I_E = 75A, di_E/dt = -150A/\mu\text{s}$     | -    | 0.56 | -    | $\mu\text{C}$ |

### 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                           | -    | -    | 0.21  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)}$ | Per FWDi                           | -    | -    | 0.47  | $^\circ\text{C/W}$ |
| Contact Thermal Resistance           | $R_{th(c-f)}$ | Per Module, Thermal Grease Applied | -    | -    | 0.025 | $^\circ\text{C/W}$ |

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 75 Amperes/1200 Volts



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