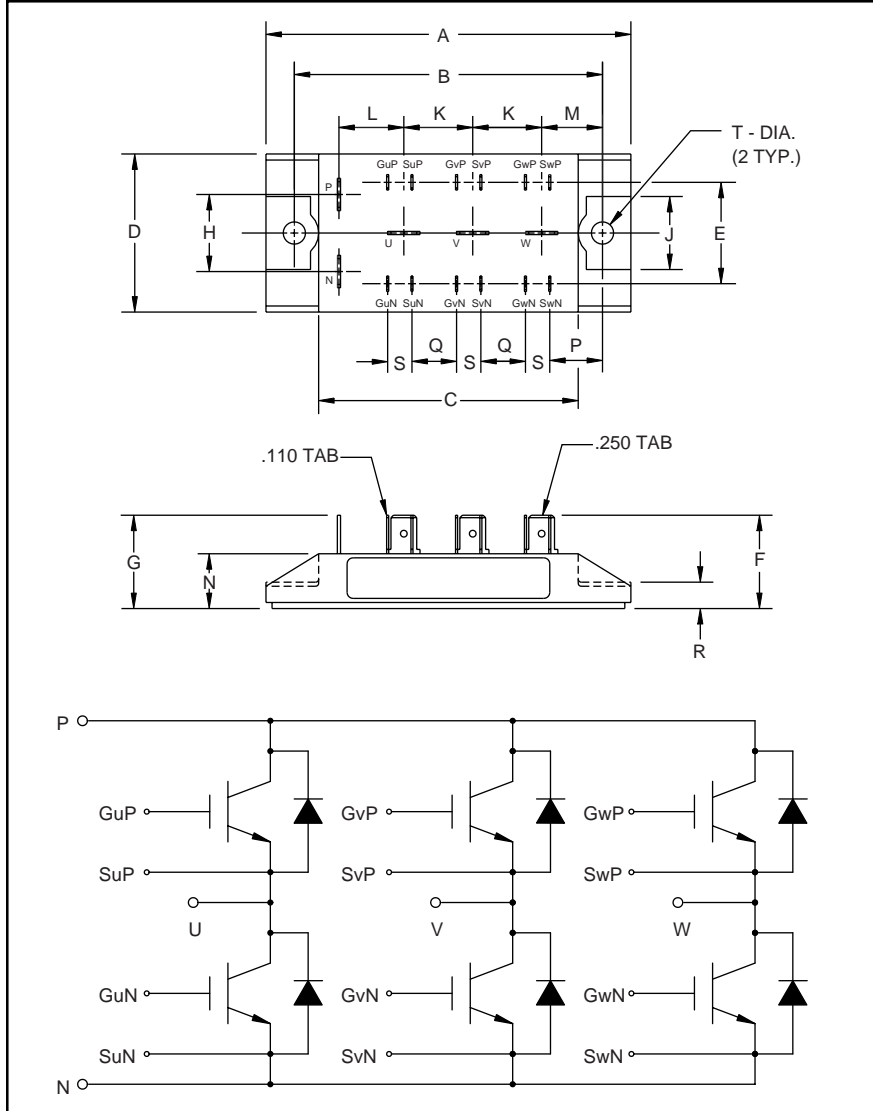


### Six-IGBT IGBTMOD™ H-Series Module 15 Amperes/600 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| A          | 3.54      | 90.0        |
| B          | 2.99±0.01 | 76.0±0.2    |
| C          | 2.52      | 64.0        |
| D          | 1.54      | 39.0        |
| E          | 0.98      | 25.0        |
| F          | 0.90      | 23.0        |
| G          | 0.87      | 22.0        |
| H          | 0.75      | 19.0        |
| J          | 0.71      | 18.0        |

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| K          | 0.67      | 17.0        |
| L          | 0.63      | 16.0        |
| M          | 0.59      | 15.0        |
| N          | 0.56      | 14.1        |
| P          | 0.51      | 13.0        |
| Q          | 0.43      | 11.0        |
| R          | 0.26      | 6.5         |
| S          | 0.24      | 6.0         |
| T          | 0.22 Dia. | Dia. 5.5    |



#### 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 (70ns) 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. CM15TF-12H is a 600V ( $V_{CES}$ ), 15 Ampere Six-IGBT IGBTMOD™ Power Module.

| Type | Current Rating<br>Amperes | $V_{CES}$<br>Volts (x 50) |
|------|---------------------------|---------------------------|
| CM   | 15                        | 12                        |

**CM15TF-12H**  
**Six-IGBT IGBTMOD™ H-Series Module**  
 15 Amperes/600 Volts

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

| Ratings                                 | Symbol    | CM15TF-12H  | 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)   | $V_{CES}$ | 600         | Volts            |
| Gate-Emitter Voltage                    | $V_{GES}$ | $\pm 20$    | Volts            |
| Collector Current                       | $I_C$     | 15          | Amperes          |
| Peak Collector Current                  | $I_{CM}$  | 30*         | Amperes          |
| Diode Forward Current                   | $I_F$     | 15          | Amperes          |
| Diode Forward Surge Current             | $I_{FM}$  | 30*         | Amperes          |
| Power Dissipation                       | $P_d$     | 100         | Watts            |
| Max. Mounting Torque M5 Mounting Screws | -         | 17          | in-lb            |
| Module Weight (Typical)                 | -         | 150         | 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       | $V_{GE(th)}$  | $I_C = 1.5\text{mA}, V_{CE} = 10V$                 | 4.5  | 6.0  | 7.5   | Volts         |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 15A, V_{GE} = 15V$                          | -    | 2.1  | 2.8** | Volts         |
|                                      |               | $I_C = 15A, V_{GE} = 15V, T_j = 150^\circ\text{C}$ | -    | 2.15 | -     | Volts         |
| Total Gate Charge                    | $Q_G$         | $V_{CC} = 300V, I_C = 15A, V_{GS} = 15V$           | -    | 45   | -     | nC            |
| Diode Forward Voltage                | $V_{FM}$      | $I_E = 15A, V_{GS} = 0V$                           | -    | -    | 2.8   | Volts         |

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

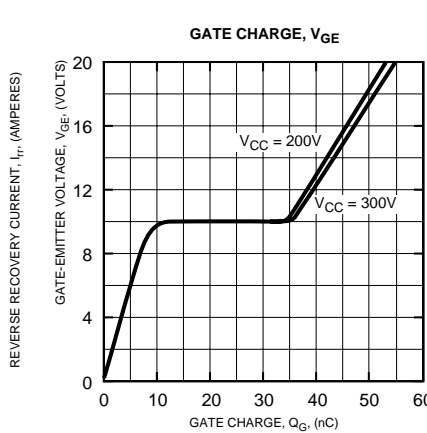
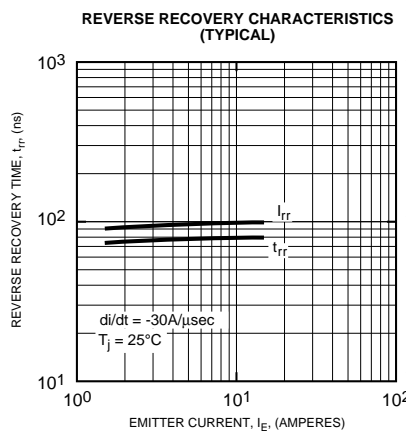
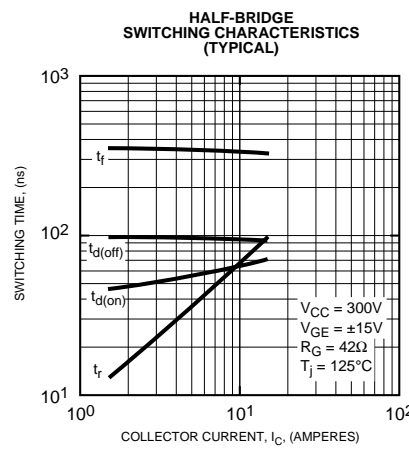
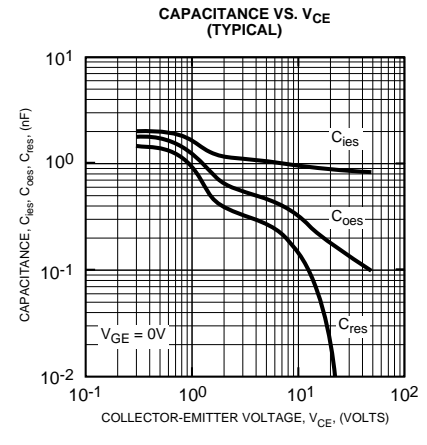
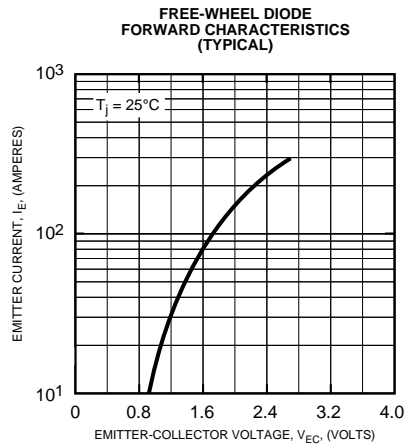
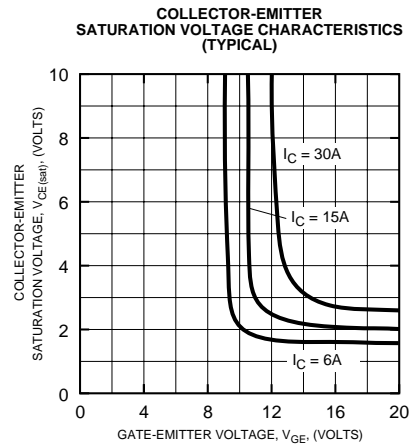
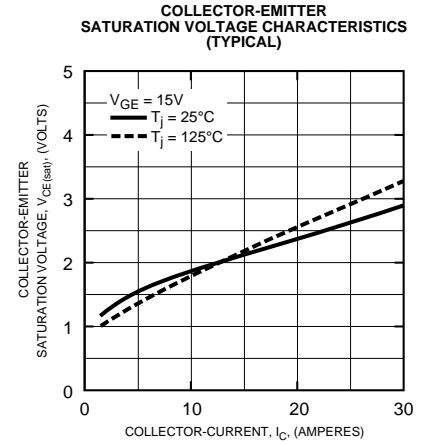
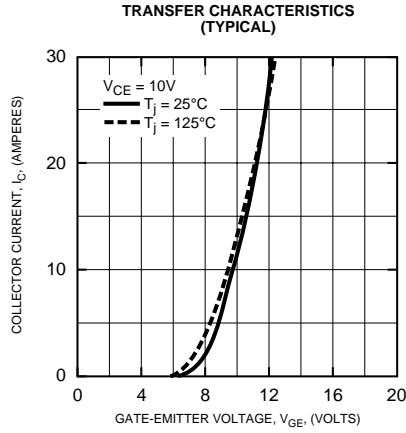
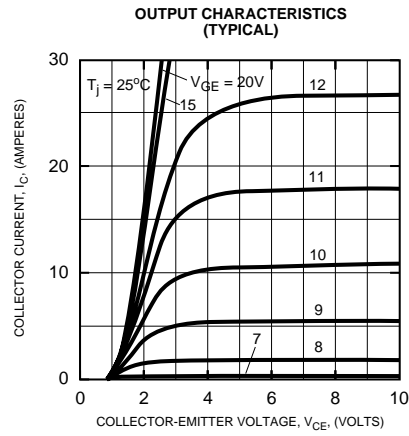
**Dynamic Electrical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

| Characteristics               | Symbol              | Test Conditions                              | Min. | Typ. | Max. | Units         |
|-------------------------------|---------------------|--|------|------|------|---------------|
| Input Capacitance             | $C_{ies}$           |  | -    | -    | 1.5  | nF            |
| Output Capacitance            | $C_{oes}$           | $V_{GE} = 0V, V_{CE} = 10V, f = 1\text{MHz}$ | -    | -    | 0.5  | nF            |
| Reverse Transfer Capacitance  | $C_{res}$           |  | -    | -    | 0.3  | nF            |
| Resistive                     | Turn-on Delay Time  | $t_{d(on)}$                                  | -    | -    | 120  | ns            |
| Load                          | Rise Time           | $t_r$  | -    | -    | 300  | ns            |
| Switch                        | Turn-off Delay Time | $t_{d(off)}$                                 | -    | -    | 200  | ns            |
| Times                         | Fall Time           | $t_f$  | -    | -    | 300  | ns            |
| Diode Reverse Recovery Time   | $t_{rr}$            | $I_E = 15A, di_E/dt = -30A/\mu\text{s}$      | -    | -    | 110  | ns            |
| Diode Reverse Recovery Charge | $Q_{rr}$            | $I_E = 15A, di_E/dt = -30A/\mu\text{s}$      | -    | 0.04 | -    | $\mu\text{C}$ |

**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                           | -    | -    | 1.30  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)}$ | Per FWDi                           | -    | -    | 3.50  | $^\circ\text{C/W}$ |
| Contact Thermal Resistance           | $R_{th(c-f)}$ | Per Module, Thermal Grease Applied | -    | -    | 0.092 | $^\circ\text{C/W}$ |

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