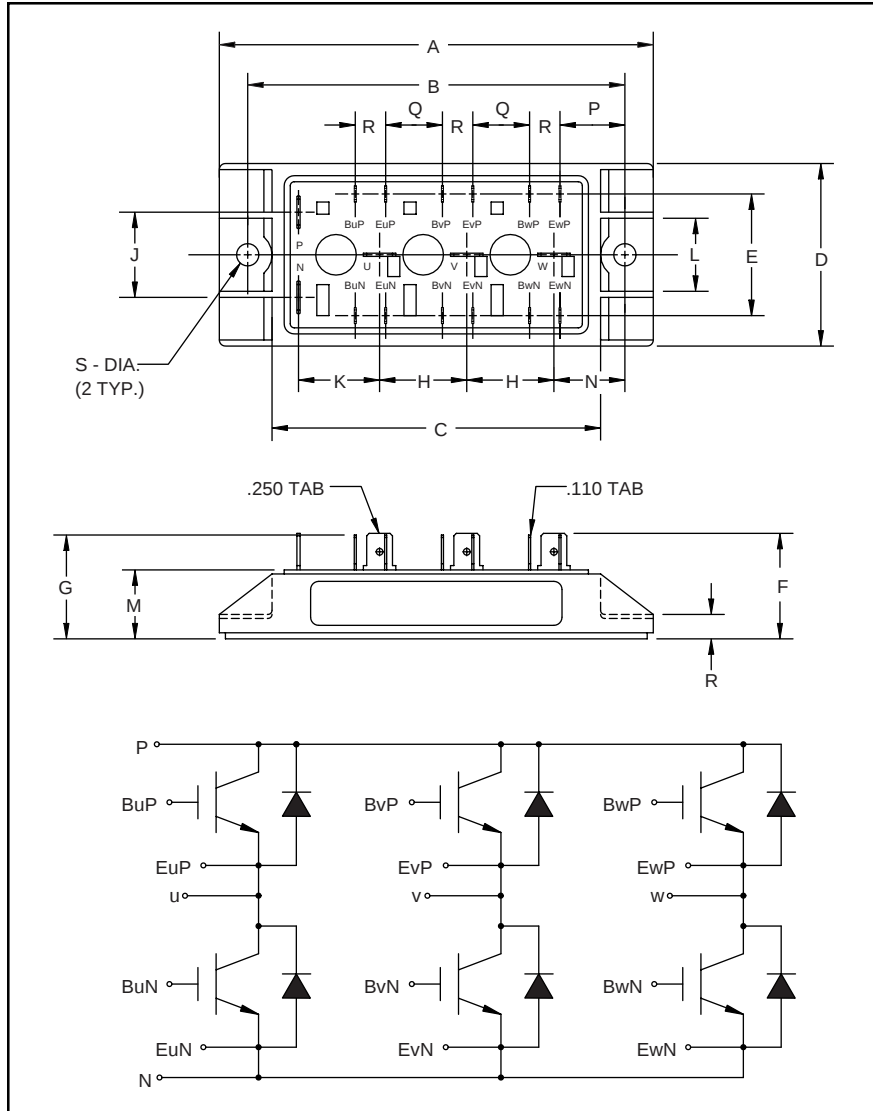


### Six-IGBT IGBTMOD™ H-Series Module 30 Amperes/600 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| A          | 4.21      | 107.0       |
| B          | 3.66±0.01 | 93.0±0.3    |
| C          | 3.19      | 81.0        |
| D          | 1.77      | 45.0        |
| E          | 1.18      | 30.0        |
| F          | 1.04      | 26.5        |
| G          | 1.01      | 25.6        |
| H          | 0.85      | 21.5        |
| J          | 0.83      | 21.0        |

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| K          | 0.79      | 20.0        |
| L          | 0.71      | 18.0        |
| M          | 0.69±0.02 | 17.5±0.5    |
| N          | 0.69      | 17.5        |
| P          | 0.63      | 16.0        |
| Q          | 0.55      | 14.0        |
| R          | 0.30      | 7.5         |
| S          | 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 (150ns) Free-Wheel Diode
- ☐ High Frequency Operation (15-20kHz)
- ☐ 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. CM30TF-12H is a 600V ( $V_{CES}$ ), 30 Ampere Six-IGBT IGBTMOD™ Power Module.

| Type | Current Rating<br>Amperes (30) | $V_{CES}$<br>Volts (x 50) |
|------|--------------------------------|---------------------------|
| CM   | 30                             | 12                        |

## CM30TF-12H

### Six-IGBT IGBTMOD™ H-Series Module

30 Amperes/600 Volts

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

| Ratings                                 | Symbol    | CM30TF-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                       | $I_C$     | 30         | Amperes          |
| Peak Collector Current                  | $I_{CM}$  | 60*        | Amperes          |
| Diode Forward Current                   | $I_F$     | 30         | Amperes          |
| Diode Forward Surge Current             | $I_{FM}$  | 60*        | Amperes          |
| Power Dissipation                       | $P_d$     | 150        | Watts            |
| Max. Mounting Torque M5 Mounting Screws | —         | 17         | in-lb            |
| Module Weight (Typical)                 | —         | 260        | 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, $T_j = 25^\circ\text{C}$ 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       | $V_{GE(th)}$  | $I_C = 3mA, V_{CE} = 10V$                          | 4.5  | 6.0  | 7.5   | Volts         |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 30A, V_{GE} = 15V$                          | —    | 2.1  | 2.8** | Volts         |
|                                      |               | $I_C = 30A, V_{GE} = 15V, T_j = 150^\circ\text{C}$ | —    | 2.15 | —     | Volts         |
| Total Gate Charge                    | $Q_G$         | $V_{CC} = 300V, I_C = 30A, V_{GS} = 15V$           | —    | 90   | —     | nC            |
| Diode Forward Voltage                | $V_{FM}$      | $I_E = 30A, V_{GS} = 0V$                           | —    | —    | 2.8   | Volts         |

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

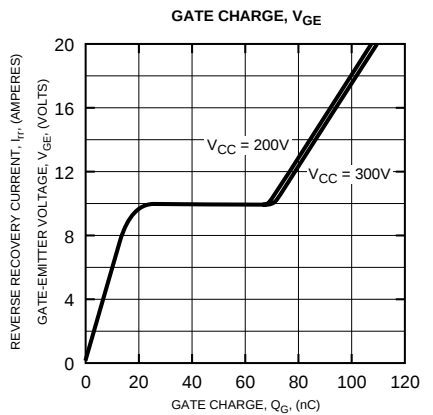
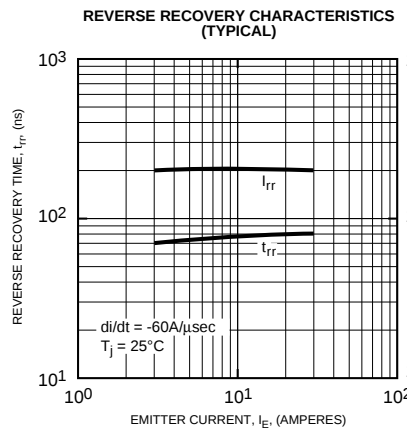
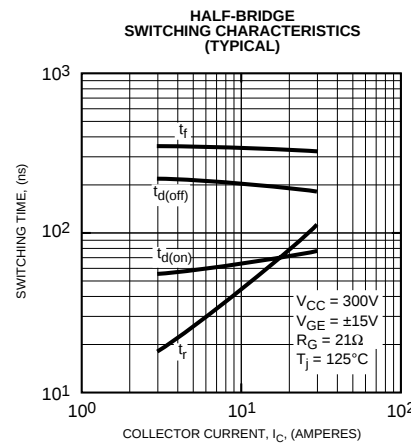
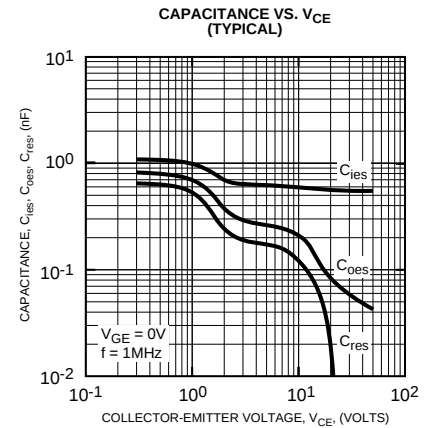
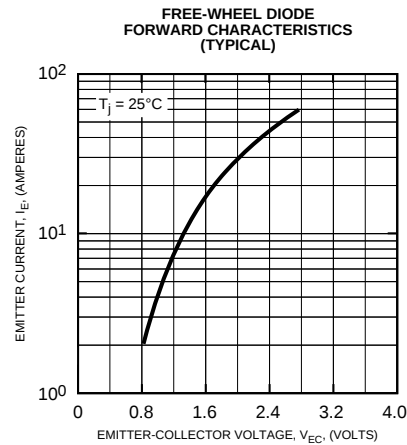
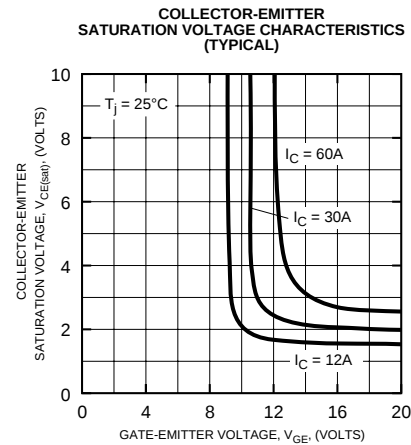
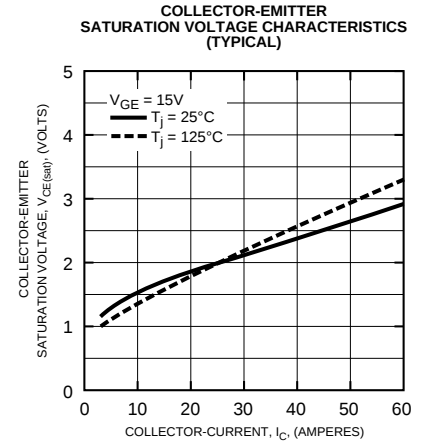
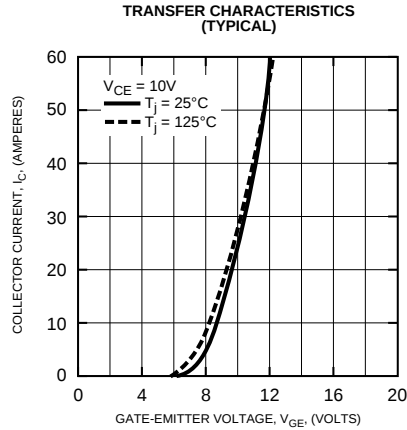
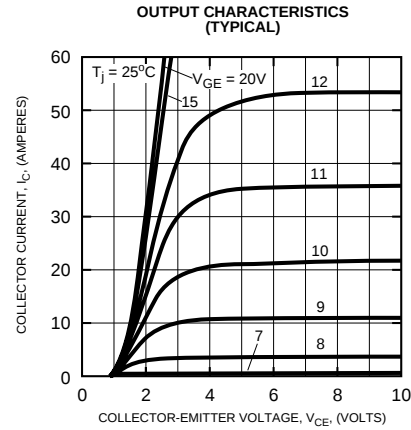
## Dynamic Electrical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

| Characteristics               | Symbol              | Test Conditions                                                     | Min. | Typ. | Max. | Units         |
|-------------------------------|---------------------|---------------------------------------------------------------------|------|------|------|---------------|
| Input Capacitance             | $C_{ies}$           | $V_{GE} = 0V, V_{CE} = 10V, f = 1MHz$                               | —    | —    | 3.0  | nF            |
| Output Capacitance            | $C_{oes}$           |                                                                     | —    | —    | 1.1  | nF            |
| Reverse Transfer Capacitance  | $C_{res}$           |                                                                     | —    | —    | 0.6  | nF            |
| Resistive                     | Turn-on Delay Time  | $V_{CC} = 300V, I_C = 30A, V_{GE1} = V_{GE2} = 15V, R_G = 21\Omega$ | —    | —    | 120  | ns            |
| Load                          | Rise Time           |                                                                     | —    | —    | 300  | ns            |
| Switching                     | Turn-off Delay Time |                                                                     | —    | —    | 200  | ns            |
| Times                         | Fall Time           |                                                                     | —    | —    | 300  | ns            |
| Diode Reverse Recovery Time   | $t_{rr}$            | $I_E = 30A, di_E/dt = -60A/\mu s$                                   | —    | —    | 110  | ns            |
| Diode Reverse Recovery Charge | $Q_{rr}$            | $I_E = 30A, di_E/dt = -60A/\mu s$                                   | —    | 0.08 | —    | $\mu\text{C}$ |

## 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 | $R_{th(j-c)}$ | Per IGBT                           | —    | —    | 0.80  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)}$ | Per FWDi                           | —    | —    | 2.00  | $^\circ\text{C/W}$ |
| Contact Thermal Resistance           | $R_{th(c-f)}$ | Per Module, Thermal Grease Applied | —    | —    | 0.058 | $^\circ\text{C/W}$ |

**CM30TF-12H**  
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 30 Amperes/600 Volts



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