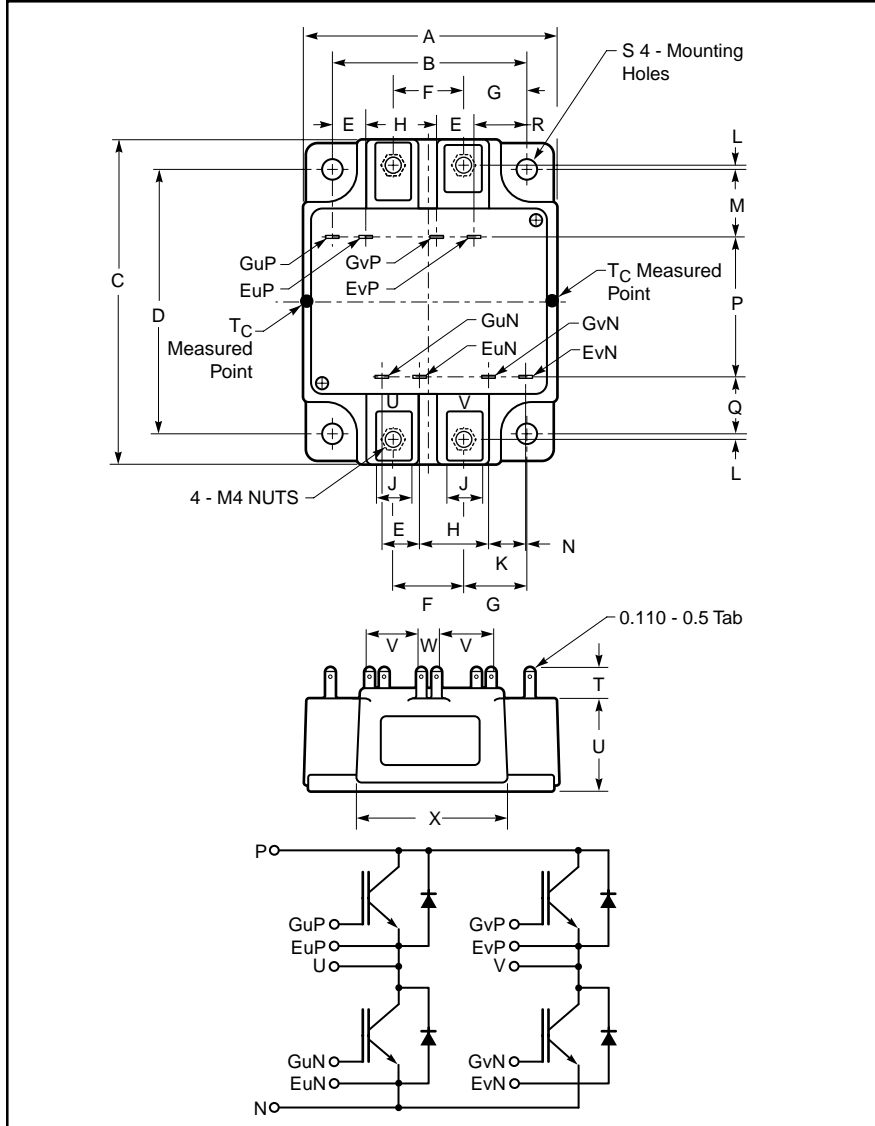


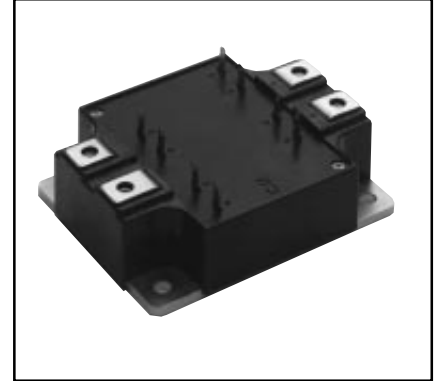
Four IGBTMOD™ U-Series Module 75 Amperes/600 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches | Millimeters |
|------------|-----------|-------------|
| A | 2.83 | 72.0 |
| B | 2.17±0.01 | 55±0.25 |
| C | 3.58 | 91.0 |
| D | 2.91±0.01 | 74.0±0.25 |
| E | 0.43 | 11.0 |
| F | 0.79 | 20.0 |
| G | 0.69 | 17.5 |
| H | 0.75 | 19.1 |
| J | 0.39 | 10.0 |
| K | 0.41 | 10.5 |
| L | 0.05 | 1.25 |

| Dimensions | Inches | Millimeters |
|------------|-----------|-------------|
| M | 0.74 | 18.7 |
| N | 0.02 | 0.5 |
| P | 1.55 | 39.3 |
| Q | 0.63 | 16.0 |
| R | 0.57 | 14.4 |
| S | 0.22 Dia. | 5.5 Dia. |
| T | 0.32 | 8.1 |
| U | 1.02 | 26.0 |
| V | 0.59 | 15.0 |
| W | 0.20 | 5.0 |
| X | 1.61 | 41.0 |



Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of four IGBT Transistors in an H-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 Free-Wheel Diode
- 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 module number you desire from the table - i.e. CM75BU-12H is a 600V (V_{CES}), 75 Ampere Four-IGBT IGBTMOD™ Power Module.

| Type | Current Rating Amperes | V_{CES} Volts (x 50) |
|------|---------------------------|---------------------------|
| CM | 75 | 12 |

CM75BU-12H
Four IGBTMOD™ U-Series Module
 75 Amperes/600 Volts

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

| Ratings | Symbol | CM75BU-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 (C-E SHORT) | V_{GES} | ± 20 | Volts |
| Collector Current ($T_c = 25^\circ\text{C}$) | I_c | 75 | Amperes |
| Peak Collector Current ($T_j \leq 150^\circ\text{C}$) | I_{CM} | 150* | Amperes |
| Emitter Current** ($T_c = 25^\circ\text{C}$) | I_e | 75 | Amperes |
| Peak Emitter Current** | I_{EM} | 150* | Amperes |
| Maximum Collector Dissipation ($T_c = 25^\circ\text{C}$) | P_c | 310 | Watts |
| Mounting Torque, M4 Main Terminal | – | 15 | in-lb |
| Mounting Torque, M5 Mounting | – | 31 | in-lb |
| Weight | – | 390 | Grams |
| Isolation Voltage (Main Terminal to Baseplate, AC 1 min.) | V_{iso} | 2500 | Volts |

* Pulse width and repetition rate should be such that the device junction temperature (T_j) does not exceed $T_{j(\text{max})}$ rating.

**Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDi).

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} | $V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$ | – | – | 1 | mA |
| Gate Leakage Voltage | I_{GES} | $V_{\text{GE}} = V_{\text{GES}}, V_{\text{CE}} = 0\text{V}$ | – | – | 0.5 | μA |
| Gate-Emitter Threshold Voltage | $V_{\text{GE(th)}}$ | $I_c = 7.5\text{mA}, V_{\text{CE}} = 10\text{V}$ | 4.5 | 6 | 7.5 | Volts |
| Collector-Emitter Saturation Voltage | $V_{\text{CE(sat)}}$ | $I_c = 75\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 25^\circ\text{C}$ | – | 2.4 | 3.0 | Volts |
| | | $I_c = 75\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 125^\circ\text{C}$ | – | 2.6 | – | Volts |
| Total Gate Charge | Q_g | $V_{\text{CC}} = 300\text{V}, I_c = 75\text{A}, V_{\text{GE}} = 15\text{V}$ | – | 150 | – | nC |
| Emitter-Collector Voltage* | V_{EC} | $I_e = 75\text{A}, V_{\text{GE}} = 0\text{V}$ | – | – | 2.6 | Volts |

* Pulse width and repetition rate should be such that the device junction temperature (T_j) does not exceed $T_{j(\text{max})}$ rating.

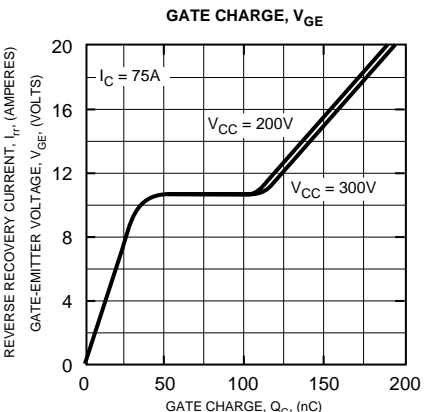
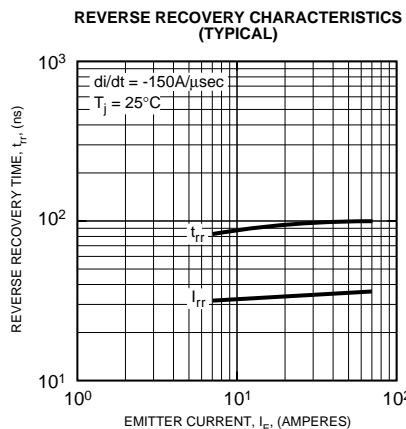
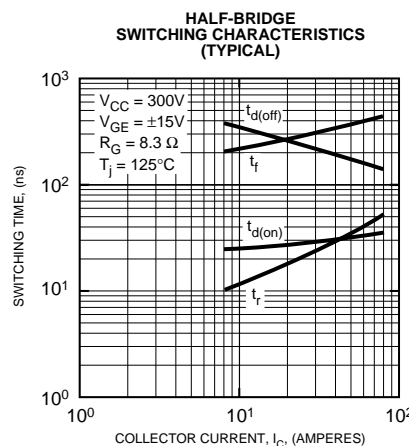
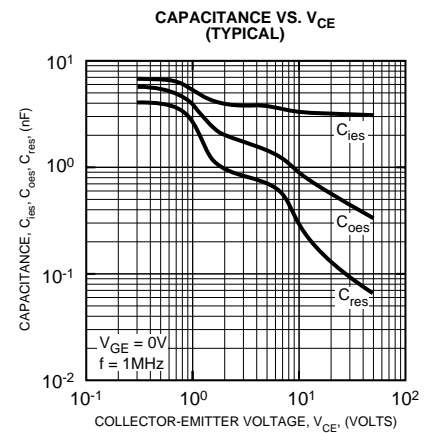
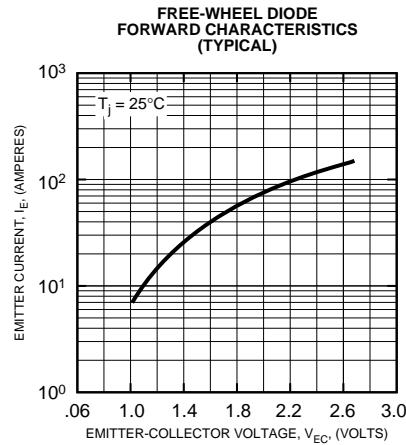
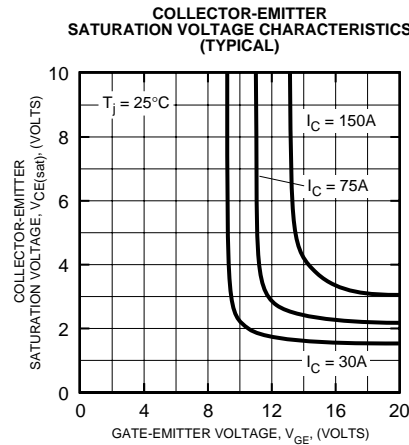
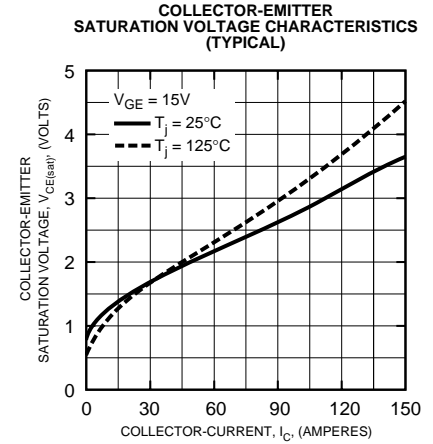
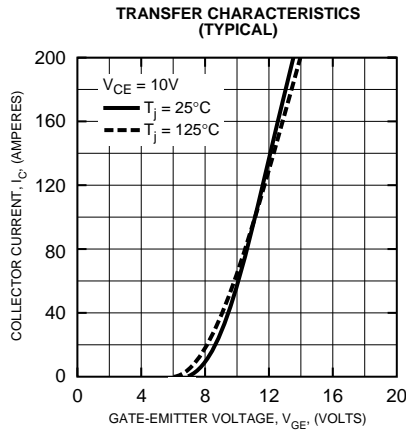
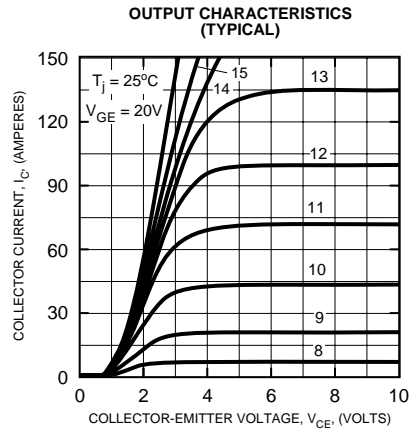
Dynamic Electrical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units | |
|-------------------------------|---------------------|---|--|------|------|---------------|----|
| Input Capacitance | C_{ies} | | – | – | 6.6 | nf | |
| Output Capacitance | C_{oes} | $V_{\text{CE}} = 10\text{V}, V_{\text{GE}} = 0\text{V}$ | – | – | 3.6 | nf | |
| Reverse Transfer Capacitance | C_{res} | | – | – | 1.0 | nf | |
| Resistive | Turn-on Delay Time | $t_{\text{d(on)}}$ | $V_{\text{CC}} = 300\text{V}, I_c = 75\text{A},$ | – | – | 100 | ns |
| | Rise Time | t_r | $V_{\text{GE1}} = V_{\text{GE2}} = 15\text{V},$ | – | – | 250 | ns |
| Switch | Turn-off Delay Time | $t_{\text{d(off)}}$ | $R_G = 8.3\Omega, \text{Resistive}$ | – | – | 200 | ns |
| | Fall Time | t_f | Load Switching Operation | – | – | 300 | ns |
| Diode Reverse Recovery Time | t_{rr} | $I_e = 75\text{A}, di_e/dt = -150\text{A}/\mu\text{s}$ | – | – | 160 | ns | |
| Diode Reverse Recovery Charge | Q_{rr} | $I_e = 75\text{A}, di_e/dt = -150\text{A}/\mu\text{s}$ | – | 0.18 | – | μC | |

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 | $R_{\text{th(j-c)Q}}$ | Per IGBT 1/4 Module | – | – | 0.4 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Case | $R_{\text{th(j-c)D}}$ | Per FWDi 1/4 Module | – | – | 0.9 | $^\circ\text{C}/\text{W}$ |
| Contact Thermal Resistance | $R_{\text{th(c-f)}}$ | Per Module, Thermal Grease Applied | – | 0.025 | – | $^\circ\text{C}/\text{W}$ |

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