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[Powerex Inc.](#)  
[CM300DU-24H](#)

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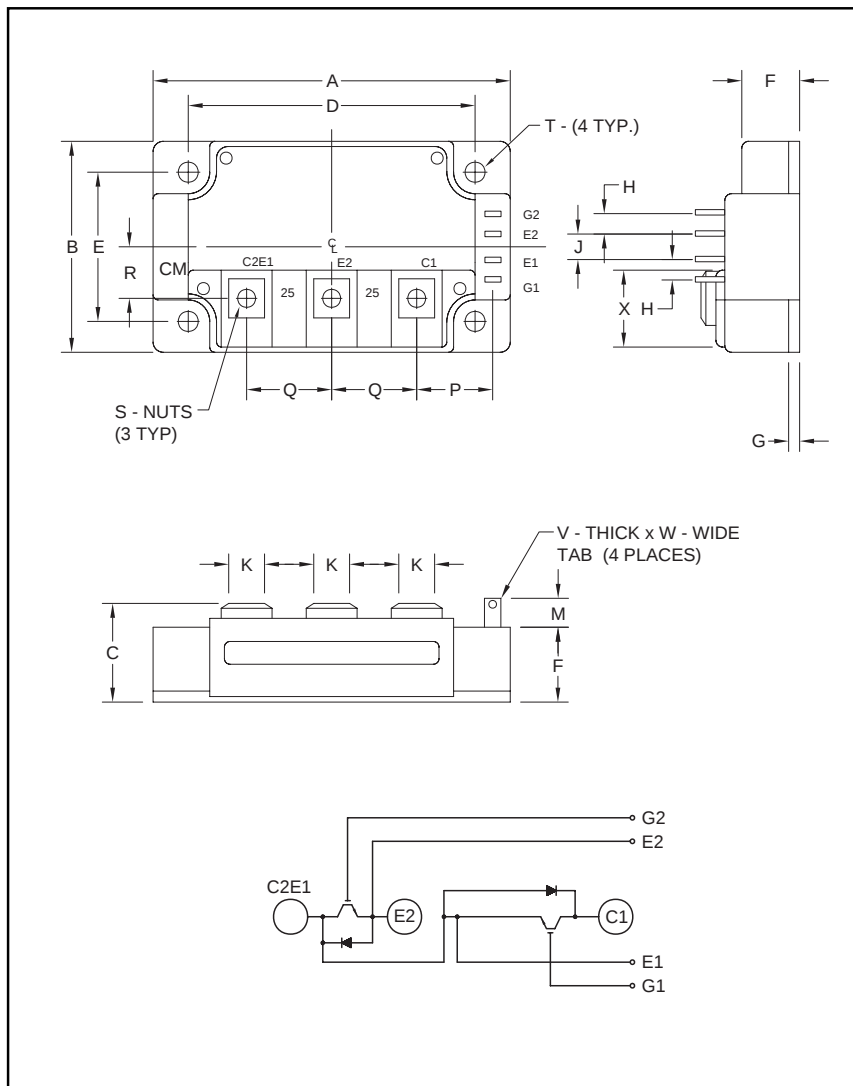
[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)



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

## CM300DU-24H

### Dual IGBTMOD™ U-Series Module 300 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches           | Millimeters    |
|------------|------------------|----------------|
| A          | 4.33             | 110.0          |
| B          | 3.15             | 80.0           |
| C          | 1.14 +0.04/-0.02 | 29.0 +1.0/-0.5 |
| D          | 3.66±0.01        | 93.0±0.25      |
| E          | 2.44±0.01        | 14.0±0.25      |
| F          | 0.83             | 21.0           |
| G          | 0.16             | 4.0            |
| H          | 0.24             | 6.0            |
| J          | 0.59             | 15.0           |
| K          | 0.55             | 14.0           |

| Dimensions | Inches | Millimeters |
|------------|--------|-------------|
| M          | 0.33   | 8.5         |
| P          | 0.94   | 24.0        |
| Q          | 0.98   | 25.0        |
| R          | 0.86   | 21.75       |
| S          | M6     | M6          |
| T          | 0.26   | 6.5         |
| V          | 0.02   | 0.5         |
| W          | 0.110  | 2.79        |
| X          | 1.08   | 27.35       |



#### 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
- ☐ 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. CM300DU-24H is a 1200V ( $V_{CES}$ ), 300 Ampere Dual IGBTMOD™ Power Module.

| Type | Current Rating<br>Amperes | $V_{CES}$<br>Volts (x 50) |
|------|---------------------------|---------------------------|
| CM   | 300                       | 24                        |



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

| Ratings                                                    | Symbol           | CM300DU-24H | Units            |
|------------------------------------------------------------|------------------|-------------|------------------|
| Junction Temperature                                       | $T_j$            | -40 to 150  | $^\circ\text{C}$ |
| Storage Temperature                                        | $T_{\text{stg}}$ | -40 to 125  | $^\circ\text{C}$ |
| Collector-Emitter Voltage (G-E SHORT)                      | $V_{\text{CES}}$ | 1200        | Volts            |
| Gate-Emitter Voltage (C-E SHORT)                           | $V_{\text{GES}}$ | $\pm 20$    | Volts            |
| Collector Current ( $T_c = 25^\circ\text{C}$ )             | $I_C$            | 300         | Amperes          |
| Peak Collector Current ( $T_j \leq 150^\circ\text{C}$ )    | $I_{\text{CM}}$  | 600*        | Amperes          |
| Emitter Current** ( $T_c = 25^\circ\text{C}$ )             | $I_E$            | 300         | Amperes          |
| Peak Emitter Current**                                     | $I_{\text{EM}}$  | 600*        | Amperes          |
| Maximum Collector Dissipation ( $T_c = 25^\circ\text{C}$ ) | $P_c$            | 1130        | Watts            |
| Mounting Torque, M6 Main Terminal                          | —                | 40          | in-lb            |
| Mounting Torque, M6 Mounting                               | —                | 40          | in-lb            |
| Weight                                                     | —                | 580         | Grams            |
| Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)  | $V_{\text{iso}}$ | 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             | $I_{\text{CES}}$     | $V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$                  | —    | —    | 1    | mA            |
| Gate Leakage Voltage                 | $I_{\text{GES}}$     | $V_{\text{GE}} = V_{\text{GES}}, V_{\text{CE}} = 0\text{V}$                  | —    | —    | 0.5  | $\mu\text{A}$ |
| Gate-Emitter Threshold Voltage       | $V_{\text{GE(th)}}$  | $I_C = 30\text{mA}, V_{\text{CE}} = 10\text{V}$                              | 4.5  | 6    | 7.5  | Volts         |
| Collector-Emitter Saturation Voltage | $V_{\text{CE(sat)}}$ | $I_C = 300\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 25^\circ\text{C}$      | —    | 2.9  | 3.7  | Volts         |
|                                      |                      | $I_C = 300\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 125^\circ\text{C}$     | —    | 2.85 | —    | Volts         |
| Total Gate Charge                    | $Q_G$                | $V_{\text{CC}} = 600\text{V}, I_C = 300\text{A}, V_{\text{GE}} = 15\text{V}$ | —    | 1125 | —    | nC            |
| Emitter-Collector Voltage*           | $V_{\text{EC}}$      | $I_E = 300\text{A}, V_{\text{GE}} = 0\text{V}$                               | —    | —    | 3.2  | 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 <sub>ies</sub>    | V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0V           | —    | —    | 45   | nf    |
| Output Capacitance            |                     | C <sub>oes</sub>    |                                                       | —    | —    | 15   | nf    |
| Reverse Transfer Capacitance  |                     | C <sub>res</sub>    |                                                       | —    | —    | 9    | nf    |
| Resistive                     | Turn-on Delay Time  | t <sub>d(on)</sub>  | V <sub>CC</sub> = 600V, I <sub>C</sub> = 300A,        | —    | —    | 200  | ns    |
| Load                          | Rise Time           | t <sub>r</sub>      | V <sub>GE1</sub> = V <sub>GE2</sub> = 15V,            | —    | —    | 300  | ns    |
| Switch                        | Turn-off Delay Time | t <sub>d(off)</sub> | R <sub>G</sub> = 1.0Ω, Resistive                      | —    | —    | 300  | ns    |
| Times                         | Fall Time           | t <sub>f</sub>      | Load Switching Operation                              | —    | —    | 350  | ns    |
| Diode Reverse Recovery Time   |                     | t <sub>rr</sub>     | I <sub>E</sub> = 300A, di <sub>E</sub> /dt = -600A/μs | —    | —    | 300  | ns    |
| Diode Reverse Recovery Charge |                     | Q <sub>rr</sub>     | I <sub>E</sub> = 300A, di <sub>E</sub> /dt = -600A/μs | —    | 1.65 | —    | μC    |

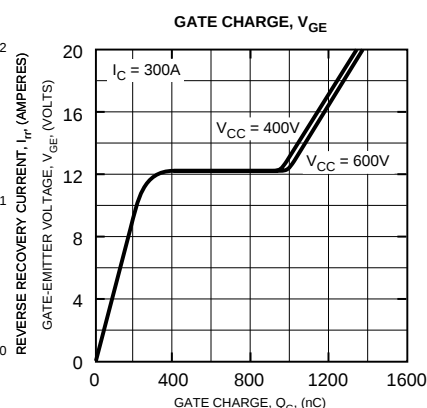
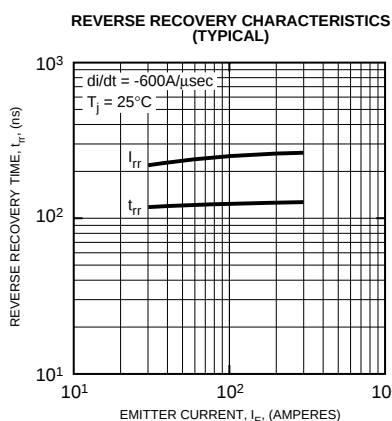
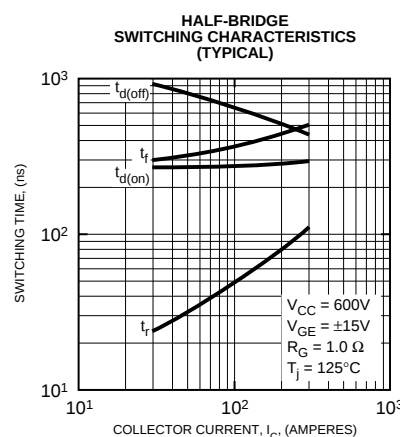
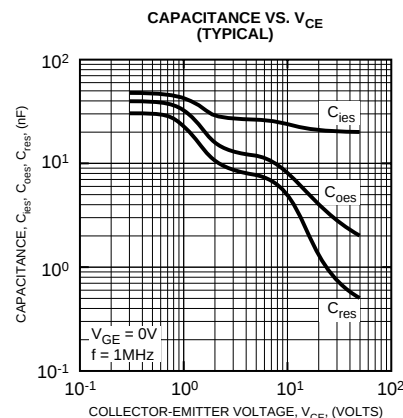
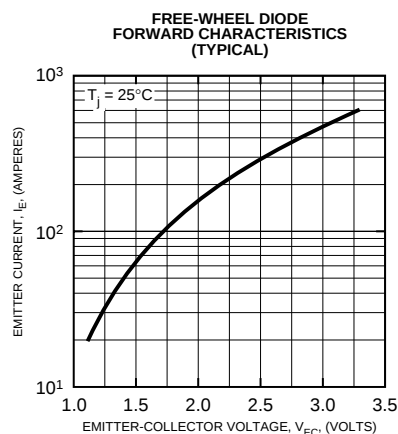
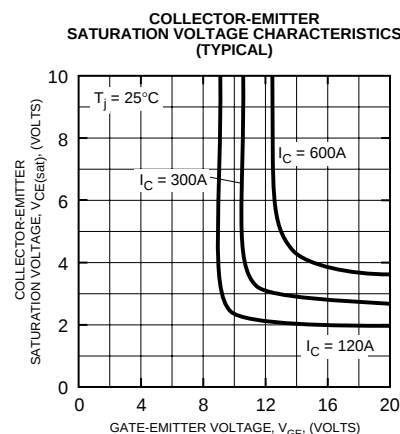
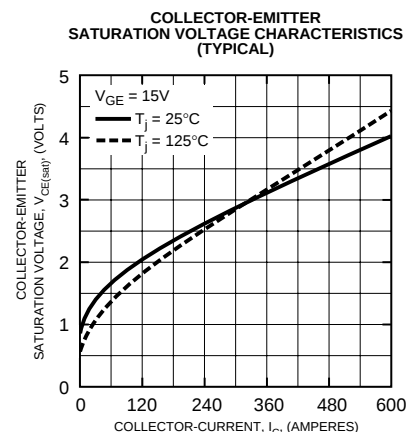
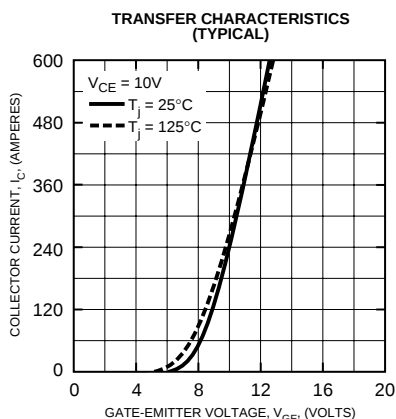
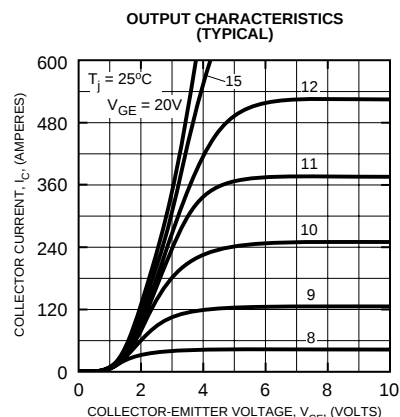
### Thermal and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

| Characteristics                      | Symbol                | Test Conditions                    | Min. | Typ.  | Max. | Units                     |
|--------------------------------------|-----------------------|------------------------------------|------|-------|------|---------------------------|
| Thermal Resistance, Junction to Case | $R_{\text{th(j-c)Q}}$ | Per IGBT 1/2 Module                | —    | —     | 0.11 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Case | $R_{\text{th(j-c)D}}$ | Per FWDi 1/2 Module                | —    | —     | 0.18 | $^\circ\text{C}/\text{W}$ |
| Contact Thermal Resistance           | $R_{\text{th(c-f)}}$  | Per Module, Thermal Grease Applied | —    | 0.010 | —    | $^\circ\text{C}/\text{W}$ |



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