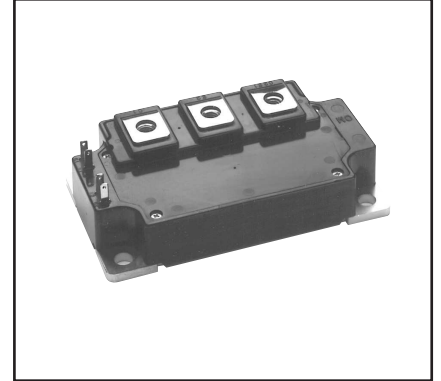
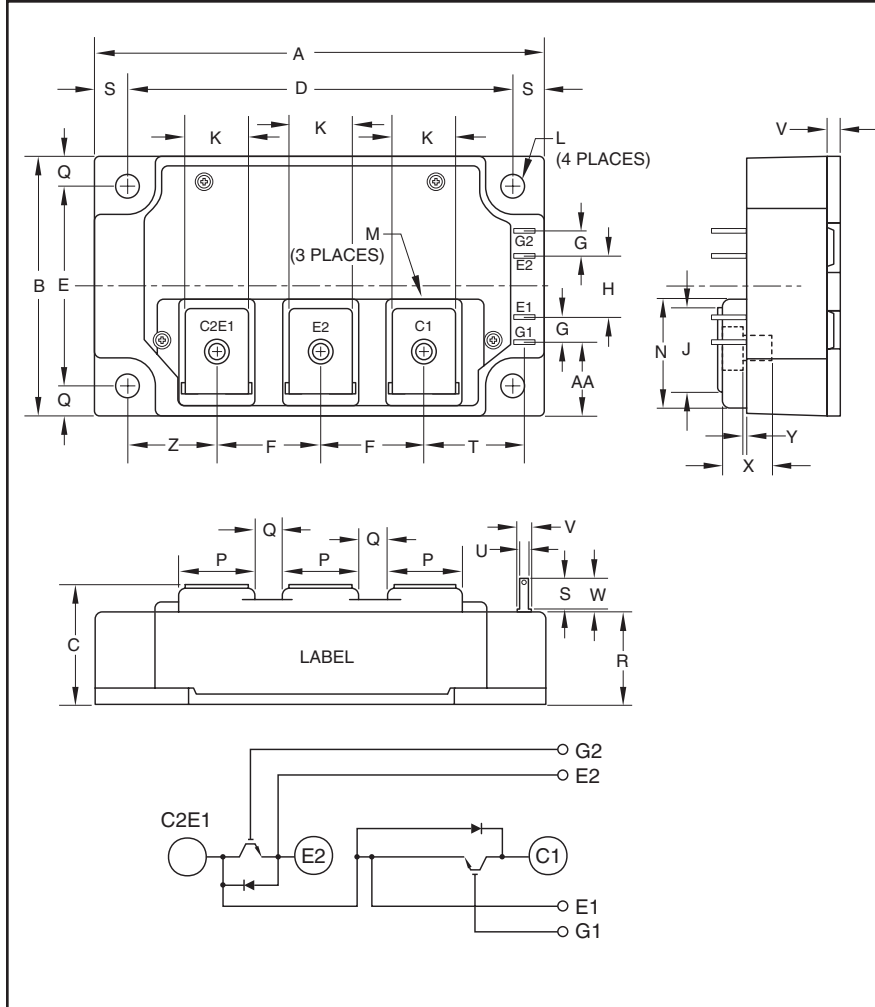


### Dual IGBTMOD™ NFH-Series Module 200 Amperes/1200 Volts



#### Description:

Powerex IGBTMOD™ Modules are designed for use in high frequency applications; 30 kHz for hard switching applications and 60 to 70 kHz for soft 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 ESW(off)
- Discrete Super-Fast Recovery Free-Wheel Diode
- Isolated Baseplate for Easy Heat Sinking

#### Applications:

- Power Supplies
- Induction Heating
- Welders

#### Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM200DU-24NFH is a 1200V (V<sub>CEs</sub>), 200 Ampere Dual IGBTMOD™ Power Module.

| Type | Current Rating<br>Amperes | V <sub>CEs</sub><br>Volts (x 50) |
|------|---------------------------|----------------------------------|
| CM   | 200                       | 24                               |

#### Outline Drawing and Circuit Diagram

| Dimensions | Inches          | Millimeters   |
|------------|-----------------|---------------|
| A          | 4.25            | 108.0         |
| B          | 2.44            | 62.0          |
| C          | 1.14+0.04/-0.02 | 29.0+1.0/-0.5 |
| D          | 3.66±0.01       | 93.0±0.25     |
| E          | 1.89±0.01       | 48.0±0.25     |
| F          | 0.98            | 25.0          |
| G          | 0.24            | 6.0           |
| H          | 0.59            | 15.0          |
| J          | 0.7854          | 19.95         |
| K          | 0.55            | 14.0          |
| L          | 0.26 Dia.       | 6.5 Dia.      |
| M          | M6 Metric       | M6            |
| N          | 1.022           | 25.95         |

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| P          | 0.71      | 18.0        |
| Q          | 0.28      | 7.0         |
| R          | 0.874     | 22.2        |
| S          | 0.30      | 7.5         |
| T          | 0.94      | 24.0        |
| U          | 0.11      | 2.8         |
| V          | 0.16      | 4.0         |
| W          | 0.33      | 8.5         |
| X          | 0.46      | 11.75       |
| Y          | 0.012 ~ 0 | 0.3 ~ 0     |
| Z          | 0.85      | 21.5        |
| AA         | 0.69      | 17.5        |



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**CM200DU-24NFH**  
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**Absolute Maximum Ratings,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

| Ratings   | Symbol    | CM200DU-24NFH | 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 (C-E Short)  | $V_{GES}$ | $\pm 20$      | Volts            |
| Collector Current ( $T_C = 25^\circ\text{C}$ )  | $I_C$     | 200*          | Amperes          |
| Peak Collector Current  | $I_{CM}$  | 400*          | Amperes          |
| Emitter Current** ( $T_C = 25^\circ\text{C}$ )  | $I_E$     | 200*          | Amperes          |
| Peak Emitter Current**  | $I_{EM}$  | 400*          | Amperes          |
| Maximum Collector Dissipation ( $T_C = 25^\circ\text{C}$ , $T_j \leq 150^\circ\text{C}$ ) | $P_C$     | 830           | Watts            |
| Maximum Collector Dissipation ( $T_C = 25^\circ\text{C}$ , $T_j \leq 150^\circ\text{C}$ ) | $P_C$     | 1300          | Watts            |
| Mounting Torque, M6 Main Terminal   | —         | 40            | in-lb            |
| Mounting Torque, M6 Mounting  | —         | 40            | in-lb            |
| Weight  | —         | 400           | Grams            |
| Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)                                 | $V_{ISO}$ | 2500          | Volts            |

**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                 | $I_{GES}$     | $V_{GE} = V_{GES}$ , $V_{CE} = 0V$                               | —    | —    | 0.7  | $\mu\text{A}$ |
| Gate-Emitter Threshold Voltage       | $V_{GE(th)}$  | $I_C = 20\text{mA}$ , $V_{CE} = 10V$                             | 4.5  | 6.0  | 7.5  | Volts         |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 200\text{A}$ , $V_{GE} = 15V$ , $T_j = 25^\circ\text{C}$  | —    | 5.0  | 6.5  | Volts         |
|                                      |               | $I_C = 200\text{A}$ , $V_{GE} = 15V$ , $T_j = 125^\circ\text{C}$ | —    | 5.0  | —    | Volts         |
| Total Gate Charge                    | $Q_G$         | $V_{CC} = 600V$ , $I_C = 200\text{A}$ , $V_{GE} = 15V$           | —    | 900  | —    | nC            |
| Emitter-Collector Voltage**          | $V_{EC}$      | $I_E = 200\text{A}$ , $V_{GE} = 0V$                              | —    | —    | 3.5  | Volts         |

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

| Characteristics                 | Symbol              | Test Conditions  | Min. | Typ. | Max. | Units         |
|---------------------------------|---------------------|--|------|------|------|---------------|
| Input Capacitance               | $C_{ies}$           |  | —    | —    | 32   | nf            |
| Output Capacitance              | $C_{oes}$           | $V_{CE} = 10V$ , $V_{GE} = 0V$                             | —    | —    | 2.7  | nf            |
| Reverse Transfer Capacitance    | $C_{res}$           |  | —    | —    | 0.6  | nf            |
| Inductive Load                  | Turn-on Delay Time  | $V_{CC} = 600V$ , $I_C = 200\text{A}$ ,                    | —    | —    | 300  | ns            |
|                                 | Rise Time           |  |      |      |      |               |
| Switch Time                     | Turn-off Delay Time | $V_{GE1} = V_{GE2} = 15V$ , $R_G = 1.6\Omega$ ,            | —    | —    | 500  | ns            |
|                                 | Fall Time           |  |      |      |      |               |
| Diode Reverse Recovery Time**   | $t_{rr}$            | Inductive Load Switching Operation,<br>$I_E = 200\text{A}$ | —    | —    | 150  | ns            |
| Diode Reverse Recovery Charge** | $Q_{rr}$            |  | —    | 7.5  | —    | $\mu\text{C}$ |

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

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

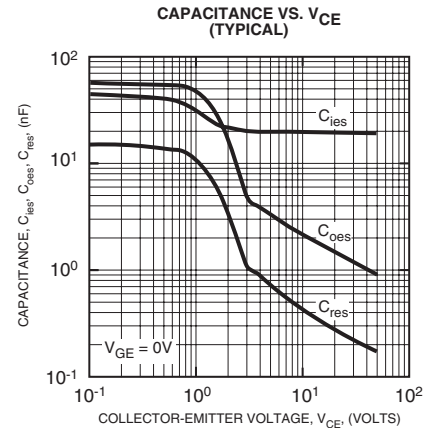
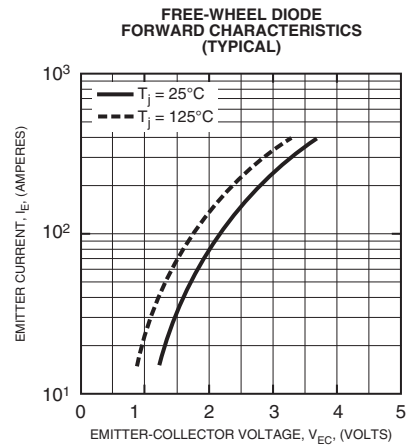
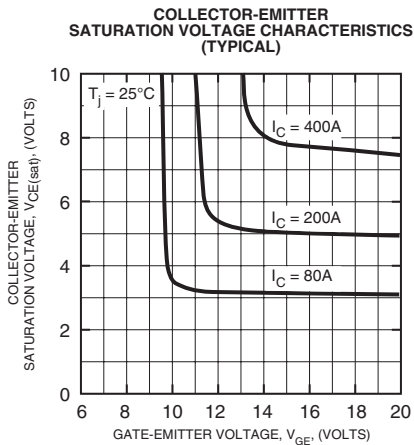
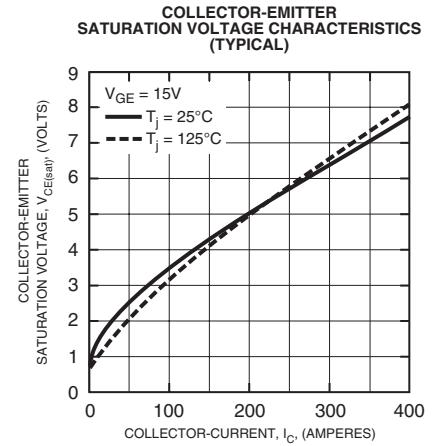
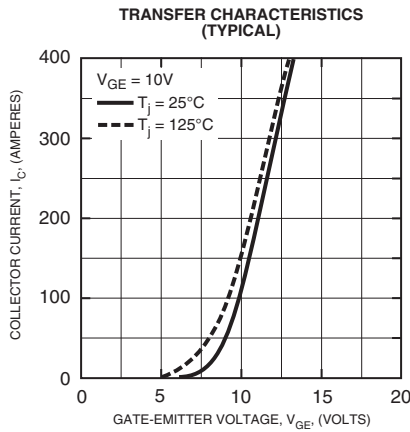
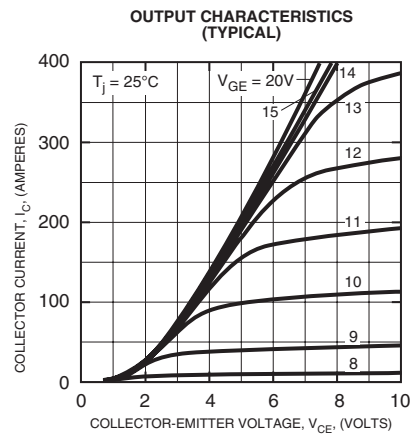


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**Thermal and Mechanical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

| Characteristics                      | Symbol          | Test Conditions  | Min. | Typ. | Max.  | Units              |
|--------------------------------------|-----------------|--|------|------|-------|--------------------|
| Thermal Resistance, Junction to Case | $R_{th(j-c)Q}$  | Per IGBT 1/2 Module, $T_C$ Reference Point per Outline Drawing | —    | —    | 0.15  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)D}$  | Per FWDi 1/2 Module, $T_C$ Reference Point per Outline Drawing | —    | —    | 0.24  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)'Q}$ | Per IGBT 1/2 Module, $T_C$ Reference Point Under Chips         | —    | —    | 0.095 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)'D}$ | Per FWDi 1/2 Module, $T_C$ Reference Point Under Chips         | —    | —    | 0.14  | $^\circ\text{C/W}$ |
| Contact Thermal Resistance           | $R_{th(c-f)}$   | Per 1/2 Module, Thermal Grease Applied                         | —    | 0.04 | —     | $^\circ\text{C/W}$ |
| External Gate Resistance             | $R_G$           |  | 1.6  | —    | 16    | $\Omega$           |





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