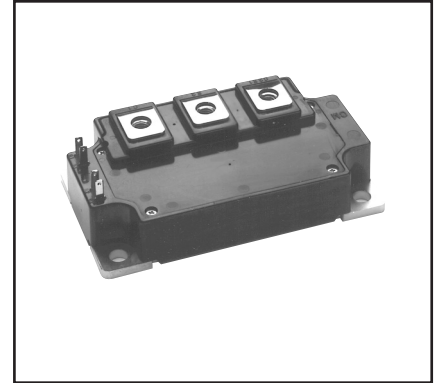
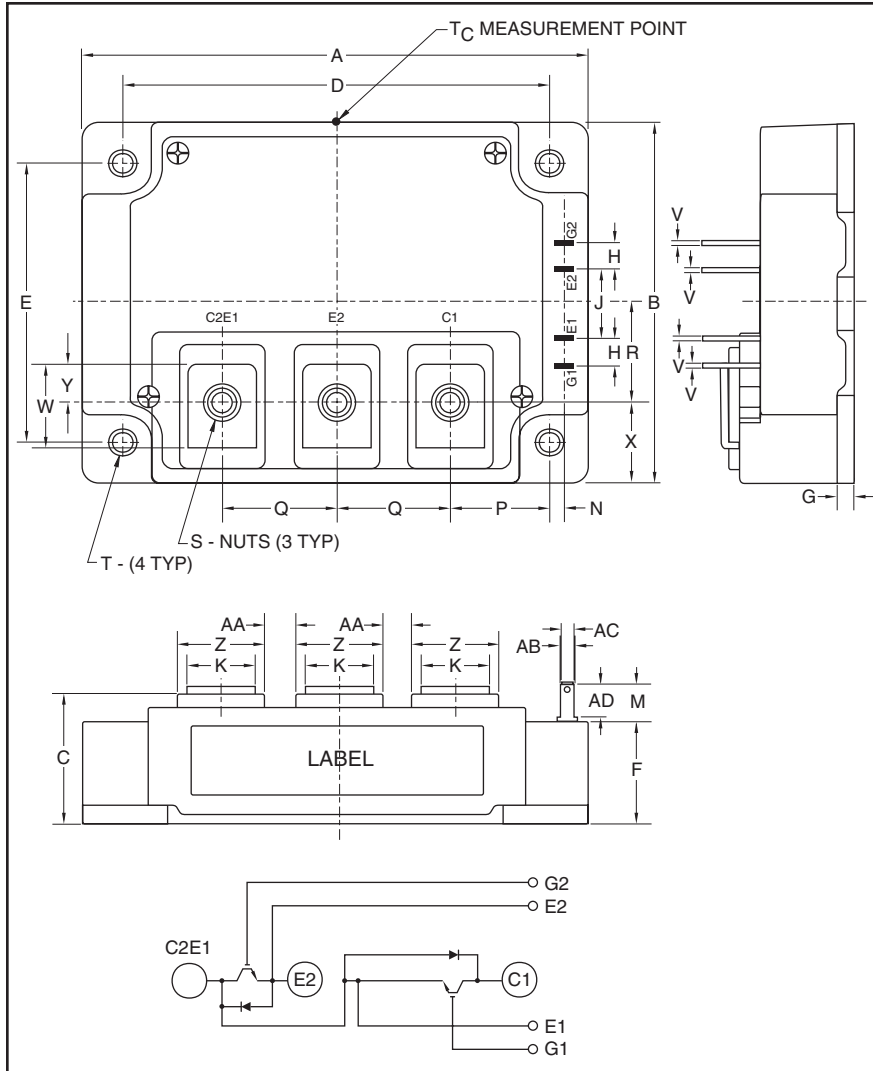


Dual IGBTMOD™ NFH-Series Module 600 Amperes/1200 Volts



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 $E_{SW(off)}$
- 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. CM600DU-24NFH is a 1200V (V_{CES}), 600 Ampere Dual IGBTMOD™ Power Module.

Outline Drawing and Circuit Diagram

| Dimensions | Inches | Millimeters |
|------------|-----------------|---------------|
| A | 4.33 | 110.0 |
| B | 3.15 | 80.0 |
| C | 1.14+0.04/-0.01 | 29.0+1.0/-0.5 |
| D | 3.66±0.01 | 93.0±0.25 |
| E | 2.44±0.01 | 62.0±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 |
| M | 0.33 | 8.5 |
| N | 0.10 | 2.5 |
| P | 0.85 | 21.5 |

| Dimensions | Inches | Millimeters |
|------------|-----------|-------------|
| Q | 0.98 | 25.0 |
| R | 0.86 | 21.75 |
| S | M6 Metric | M6 |
| T | 0.26 Dia. | Dia. 6.5 |
| V | 0.02 | 0.5 |
| W | 0.73 | 18.5 |
| X | 0.72 | 18.25 |
| Y | 0.32 | 8.25 |
| Z | 0.71 | 18.0 |
| AA | 0.28 | 7.0 |
| AB | 0.16 | 4.0 |
| AC | 0.11 | 2.8 |
| AD | 0.30 | 7.5 |

| Type | Current Rating Amperes | V_{CES} Volts (x 50) |
|------|---------------------------|---------------------------|
| CM | 600 | 24 |



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

CM600DU-24NFH
Dual IGBTMOD™ NFH-Series Module
 600 Amperes/1200 Volts

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

| Ratings | Symbol | CM600DU-24NF | 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} | ± 20 | Volts |
| Collector Current ($T_C = 25^\circ\text{C}$) | I_C | 600* | Amperes |
| Peak Collector Current | I_{CM} | 1200* | Amperes |
| Emitter Current** ($T_C = 25^\circ\text{C}$) | I_E | 600* | Amperes |
| Peak Emitter Current** | I_{EM} | 1200* | Amperes |
| Maximum Collector Dissipation ($T_C = 25^\circ\text{C}, T_j \leq 150^\circ\text{C}$) | P_C | 1550 | Watts |
| Maximum Collector Dissipation ($T_C = 25^\circ\text{C}, T_j \leq 150^\circ\text{C}$) | P_C | 3700 | 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_{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} | $V_{GE} = V_{GES}, V_{CE} = 0V$ | — | — | 2.0 | μA |
| Gate-Emitter Threshold Voltage | $V_{GE(th)}$ | $I_C = 60\text{mA}, V_{CE} = 10V$ | 4.5 | 6.0 | 7.5 | Volts |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 600\text{A}, V_{GE} = 15V, T_j = 25^\circ\text{C}$ | — | 5.0 | 6.5 | Volts |
| | | $I_C = 600\text{A}, V_{GE} = 15V, T_j = 125^\circ\text{C}$ | — | 5.0 | — | Volts |
| Total Gate Charge | Q_G | $V_{CC} = 600V, I_C = 600\text{A}, V_{GE} = 15V$ | — | 2700 | — | nC |
| Emitter-Collector Voltage** | V_{EC} | $I_E = 600\text{A}, V_{GE} = 0V$ | — | — | 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} | | — | — | 95 | nf |
| Output Capacitance | C_{oes} | $V_{CE} = 10V, V_{GE} = 0V$ | — | — | 8.0 | nf |
| Reverse Transfer Capacitance | C_{res} | | — | — | 1.8 | nf |
| Inductive Load | Turn-on Delay Time | $t_d(on)$ | — | — | 400 | ns |
| | Rise Time | | t_r | — | — | 120 |
| Switch Time | Turn-off Delay Time | $t_d(off)$ | — | — | 700 | ns |
| | Fall Time | | t_f | — | — | 150 |
| Diode Reverse Recovery Time** | t_{rr} | Switching Operation, | — | — | 250 | ns |
| Diode Reverse Recovery Charge** | Q_{rr} | $I_E = 600\text{A}$ | — | 28 | — | μC |

* 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).

CM600DU-24NFH
Dual IGBTMOD™ NFH-Series Module
 600 Amperes/1200 Volts

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 | $R_{th(j-c)Q}$ | Per IGBT 1/2 Module, T_C Reference Point per Outline Drawing | — | — | 0.083 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)D}$ | Per FWDi 1/2 Module, T_C Reference Point per Outline Drawing | — | — | 0.15 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)'Q}$ | Per IGBT 1/2 Module, T_C Reference Point Under Chips | — | — | 0.034 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)'D}$ | Per FWDi 1/2 Module, T_C Reference Point per Outline Drawing | — | — | 0.06 | $^\circ\text{C/W}$ |
| Contact Thermal Resistance | $R_{th(c-f)}$ | Per 1/2 Module, Thermal Grease Applied | — | 0.02 | — | $^\circ\text{C/W}$ |
| External Gate Resistance | R_G | | 0.52 | — | 5.2 | Ω |

