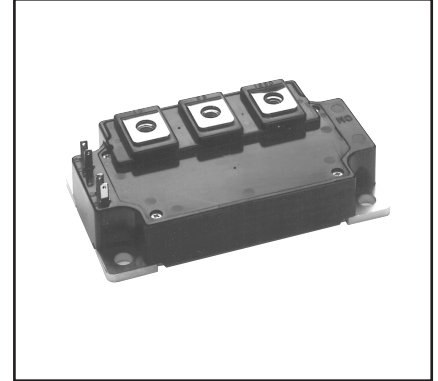
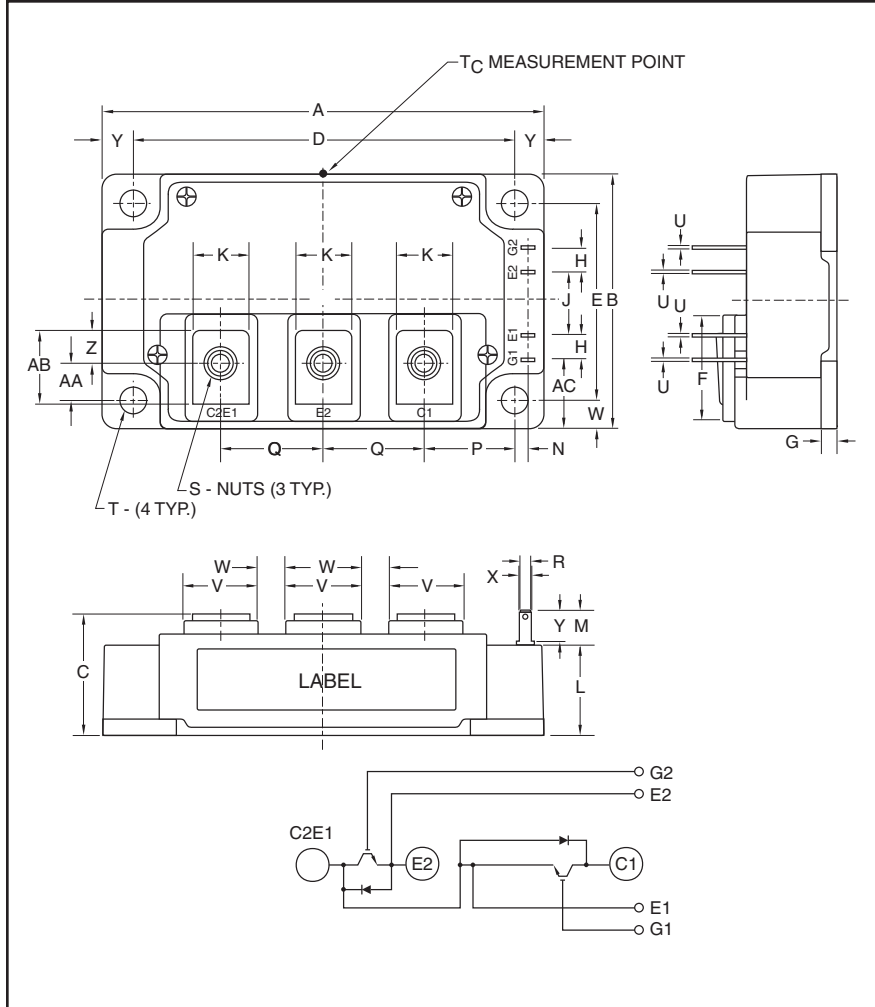


### Dual IGBT NFH-Series Module 200 Amperes/1200 Volts



#### Description:

Powerex IGBT 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 IGBT Power Module.

#### 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	1.012	25.7
G	0.16	4.0
H	0.24	6.0
J	0.59	15.0
K	0.55	14.0
L	0.87	22.0
M	0.33	8.5
N	0.10	2.5
P	0.85	21.5

Dimensions	Inches	Millimeters
Q	0.98	25.0
R	0.11	2.8
S	M6 Metric	M6
T	0.26 Dia.	6.5 Dia.
U	0.002	0.5
V	0.71	18.0
W	0.28	7.0
X	0.16	4.0
Y	0.3	7.5
Z	0.325	8.25
AA	0.35	8.85
AB	0.709	18.0
AC	0.69	17.5

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

**CM200DU-24NFH**  
**Dual IGBT NFH-Series Module**  
 200 Amperes/1200 Volts

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

Ratings	Symbol	CM200DU-24NFH	Units
Collector-Emitter Voltage (G-E Short)	$V_{CES}$	1200	Volts
Gate-Emitter Voltage (C-E Short)	$V_{GES}$	$\pm 20$	Volts
Collector Current (Operation) <sup>*2</sup>	$I_C$	200	Amperes
Peak Collector Current (Pulse) <sup>*2</sup>	$I_{CM}$	400	Amperes
Emitter Current (Operation) <sup>*2</sup>	$I_E^{*1}$	200	Amperes
Peak Emitter Current (Pulse) <sup>*2</sup>	$I_{EM}^{*1}$	400	Amperes
Maximum Collector Dissipation ( $T_C = 25\text{ }^\circ\text{C}$ )	$P_C^{*3}$	830	Watts
Maximum Collector Dissipation ( $T_C = 25\text{ }^\circ\text{C}$ ) <sup>*7</sup>	$P_C^{*3}$	1300	Watts
Junction Temperature	$T_j$	-40 ~ +150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ +125	$^\circ\text{C}$
Isolation Voltage (Terminals to Baseplate, f = 60Hz, AC 1 Minute)	$V_{ISO}$	2500	Volts
Mounting Torque, M6 Main Terminal	—	40	in-lb
Mounting Torque, M6 Mounting	—	40	in-lb
Weight	—	400	Grams

**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-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 20mA, V_{CE} = 10V$	4.5	6.0	7.5	Volts
Gate Leakage Current	$I_{GES}$	$V_{GE} = V_{GES}, V_{CE} = 0V$	—	—	0.7	$\mu\text{A}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 200A, V_{GE} = 15V, T_j = 25\text{ }^\circ\text{C}$	—	5.0	6.5	Volts
		$I_C = 200A, V_{GE} = 15V, T_j = 125\text{ }^\circ\text{C}$	—	5.0	—	Volts
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
Total Gate Charge	$Q_G$	$V_{CC} = 600V, I_C = 200A, V_{GE} = 15V$	—	900	—	nC
Turn-on Delay Time	$t_{d(on)}$		—	—	300	ns
Turn-on Rise Time	$t_r$	$V_{CC} = 600V, I_C = 200A,$	—	—	80	ns
Turn-off Delay Time	$t_{d(off)}$	$V_{GE} = \pm 15V, R_G = 1.6\Omega,$	—	—	500	ns
Turn-off Fall Time	$t_f$	Inductive Load Switching Operation,	—	—	150	ns
Reverse Recovery Time	$t_{rr}^{*1}$	$I_E = 200A$	—	—	250	ns
Reverse Recovery Charge	$Q_{rr}^{*1}$		—	7.5	—	$\mu\text{C}$
Emitter-Collector Voltage	$V_{EC}^{*1}$	$I_E = 200A, V_{GE} = 0V$	—	—	3.5	Volts

\*1 Represent ratings and characteristics of the anti-parallel, emitter-to-collector free wheeling diode (FWDI).

\*2 Pulse width and repetition rate should be such that device junction temperature ( $T_j$ ) does not exceed  $T_{j(max)}$  rating.

\*3 Junction temperature ( $T_j$ ) should not increase beyond maximum junction temperature ( $T_{j(max)}$ ) rating.

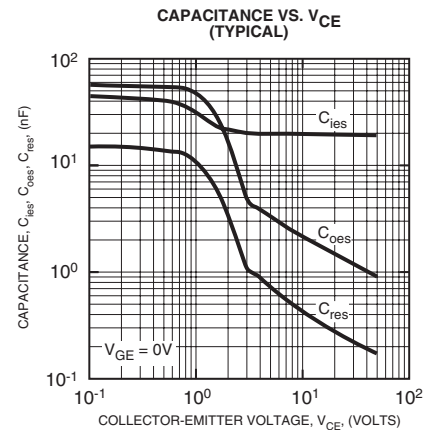
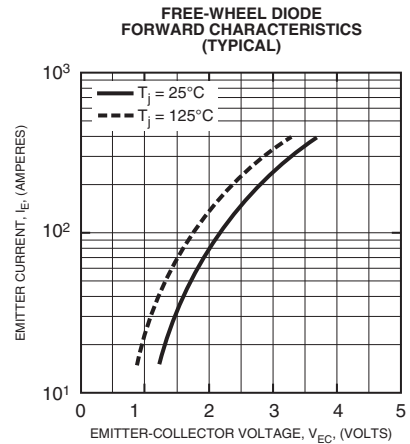
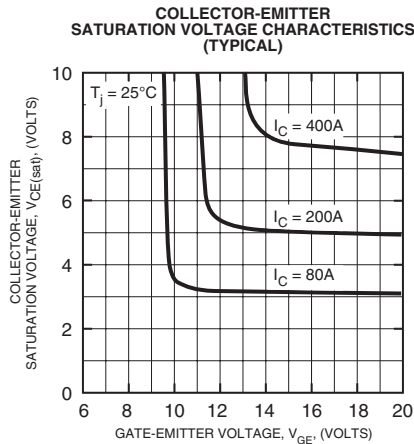
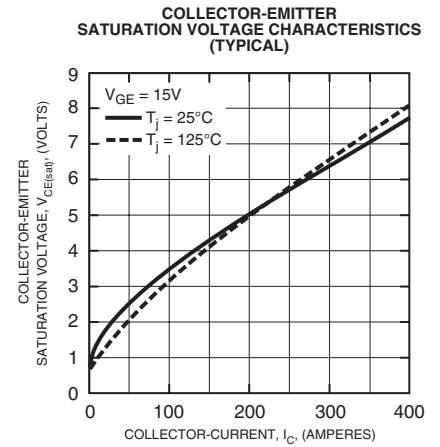
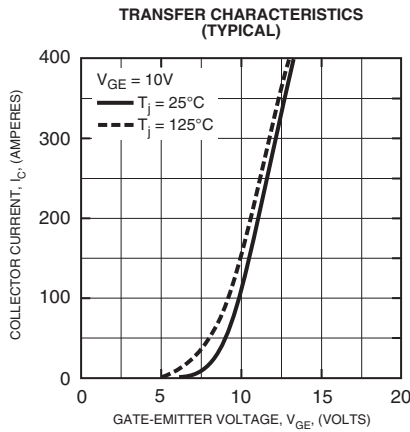
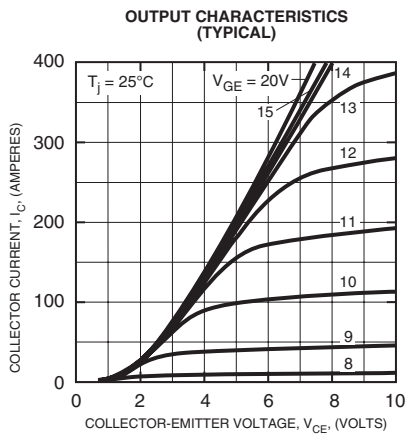
\*7 Case temperature ( $T_C$ ) measured point is just under the chips.

**CM200DU-24NFH**  
**Dual IGBT NFH-Series Module**  
 200 Amperes/1200 Volts

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance <sup>*4</sup> Junction to Case	$R_{th(j-c)Q}$	Per IGBT 1/2 Module	—	—	0.15	K/W
Thermal Resistance <sup>*4</sup> Junction to Case	$R_{th(j-c)D}$	Per FWDi 1/2 Module	—	—	0.24	K/W
Contact Thermal Resistance <sup>*5</sup> Case to Heatsink	$R_{th(c-f)}$	Per 1/2 Module, Thermal Grease Applied	—	0.04	—	K/W
Thermal Resistance <sup>*7</sup> Junction to Case	$R_{th(j-c)'Q}$	Per IGBT 1/2 Module	—	—	0.095 <sup>*6</sup>	K/W
Thermal Resistance <sup>*7</sup> Junction to Case	$R_{th(j-c)'D}$	Per FWDi 1/2 Module	—	—	0.14 <sup>*6</sup>	K/W
External Gate Resistance	$R_G$		1.6	—	16	$\Omega$

\*4 Case temperature ( $T_C$ ) measured point is shown on page 1 of the outline drawing.  
 \*5 Typical value is measured by using thermally conductive grease of  $\lambda = 0.9\text{ [W/(m}\cdot\text{K)]}$ .  
 \*6 If you use this value,  $R_{th(f-a)}$  should be measured just under the chips.  
 \*7 Case temperature ( $T_C$ ) measured point is just under the chips.





**CM200DU-24NFH**  
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