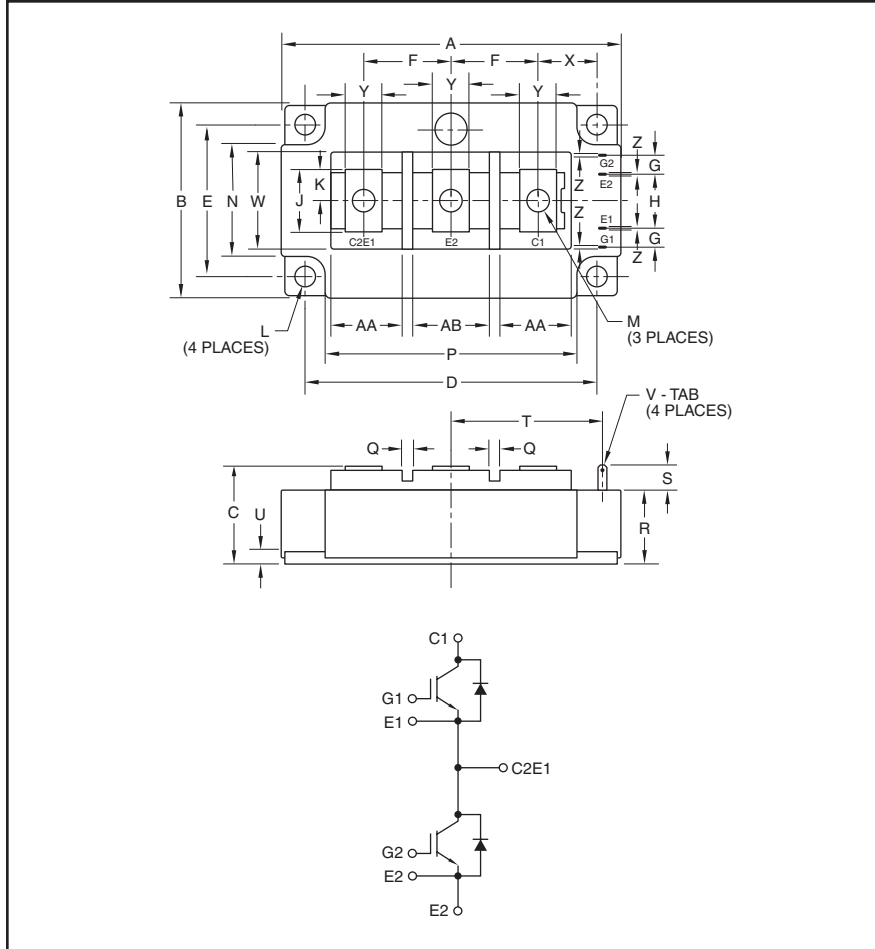


Dual IGBT NFM-Series Module 300 Amperes/1200 Volts



Description:

Powerex NFM IGBT Modules are designed for use in hard switching (15-30kHz) 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 $E_{SW(off)}$
- Discrete Super-Fast Recovery Free-Wheel Diode
- Isolated Baseplate for Easy Heat Sinking

Applications:

- Power Supplies
- UPS
- Battery Powered Supplies
- Induction Heating

Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM300DC-24NFM is a 1200V (V_{CES}), 300 Ampere Dual IGBT Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	300	24

Outline Drawing and Circuit Diagram

Dim.	Inches	Millimeters
A	4.25	108.0
B	2.44	62.0
C	1.19+0.04/-0.02	30.4+1.0/-0.5
D	3.66±0.01	93.0±0.25
E	1.89±0.01	48.0±0.25
F	1.10	28.0
G	0.23	6.0
H	0.67	17.0
J	0.79	20.0
K	0.39	10.0
L	0.26 Dia.	6.5 Dia.
M	M6	M6
N	1.38	35.0

Dim.	Inches	Millimeters
P	3.15	80.0
Q	0.11	3.0
R	0.91	23.2
S	0.31	8.0
T	1.93	49.0
U	0.14	3.5
V	#110 Tab	
W	1.18	30.0
X	0.62	18.5
Y	0.47	12.0
Z	0.02	0.5
AA	0.88	22.5
AB	0.98	25.0



Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272

CM300DC-24NFM
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Absolute Maximum Ratings, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

Ratings	Symbol	CM300DC-24NFM	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	I_C	300	Amperes
Peak Collector Current	I_{CM}	600*	Amperes
Emitter Current**	I_E	300	Amperes
Peak Emitter Current**	I_{EM}	600*	Amperes
Maximum Collector Dissipation*** ($T_C = 25^\circ\text{C}$)****	P_C	1890	Watts
Mounting Torque, M6 Main Terminal	—	40	in-lb
Mounting Torque, M6 Mounting	—	40	in-lb
Weight	—	375	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}	$V_{GE} = V_{GES}, V_{CE} = 0V$	—	—	0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 30\text{mA}, V_{CE} = 10V$	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage*****	$V_{CE(sat)}$	$I_C = 300\text{A}, V_{GE} = 15V, T_j = 25^\circ\text{C}$	—	3.0	4.5	Volts
		$I_C = 300\text{A}, V_{GE} = 15V, T_j = 125^\circ\text{C}$	—	3.0	—	Volts
Total Gate Charge	Q_G	$V_{CC} = 600V, I_C = 300\text{A}, V_{GE} = 15V$	—	1360	—	nC
Emitter-Collector Voltage**	V_{EC}	$I_E = 300\text{A}, V_{GE} = 0V$	—	2.3	3.3	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}		—	—	47	nF
Output Capacitance	C_{oes}	$V_{CE} = 10V, V_{GE} = 0V$	—	—	4.0	nF
Reverse Transfer Capacitance	C_{res}		—	—	0.9	nF
Inductive Load	Turn-on Delay Time	$V_{CC} = 600V, I_C = 300\text{A},$ $V_{GE1} = V_{GE2} = 15V, R_G = 1.0\Omega,$	—	—	300	ns
	Rise Time					
Switch Time	Turn-off Delay Time	Inductive Load	—	—	500	ns
	Fall Time					
Diode Reverse Recovery Time**	t_{rr}	Switching Operation,	—	110	180	ns
Diode Reverse Recovery Charge**	Q_{rr}	$I_E = 300\text{A}$	—	14	—	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).

***Junction temperature (T_j) should not increase beyond 150°C .

**** T_C, T_f measured point is just under the chips.

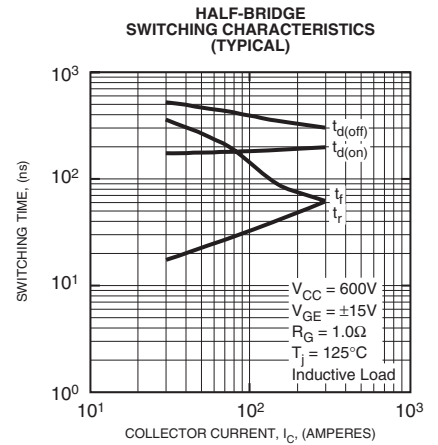
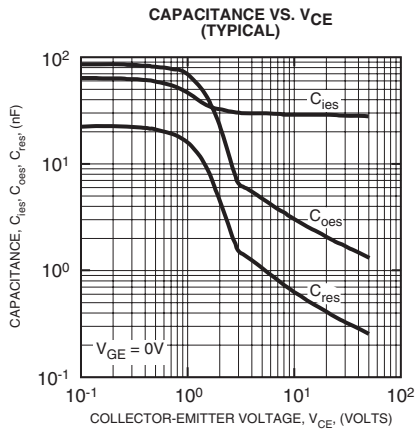
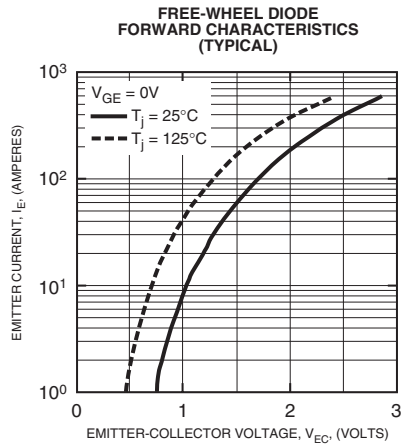
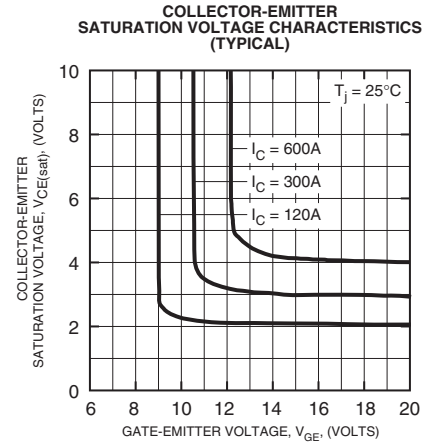
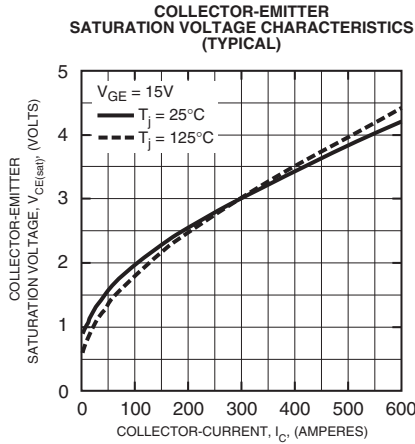
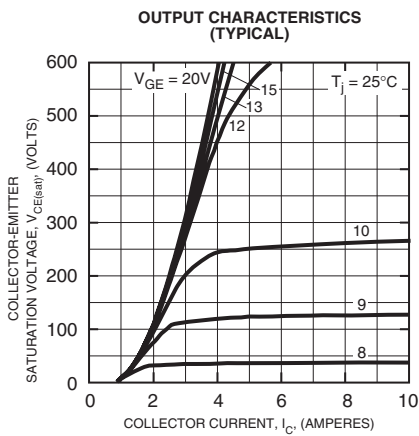
*****Pulse width and repetition rate should be such as to cause negligible temperature rise.

CM300DC-24NFM
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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 Measured Point Just Under Chips*	—	—	0.066	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)D}$	Per FWDi 1/2 Module, T_C Measured Point Just Under Chips*	—	—	0.14	$^\circ\text{C/W}$
Contact Thermal Resistance, Case to Fin	$R_{th(c-f)}$	Per 1/2 Module, Thermal Grease Applied	—	0.02	—	$^\circ\text{C/W}$
External Gate Resistance	R_G		1.0	—	10	Ω

*If using this value, $R_{th(f-a)}$ should be measured just under the chips.



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