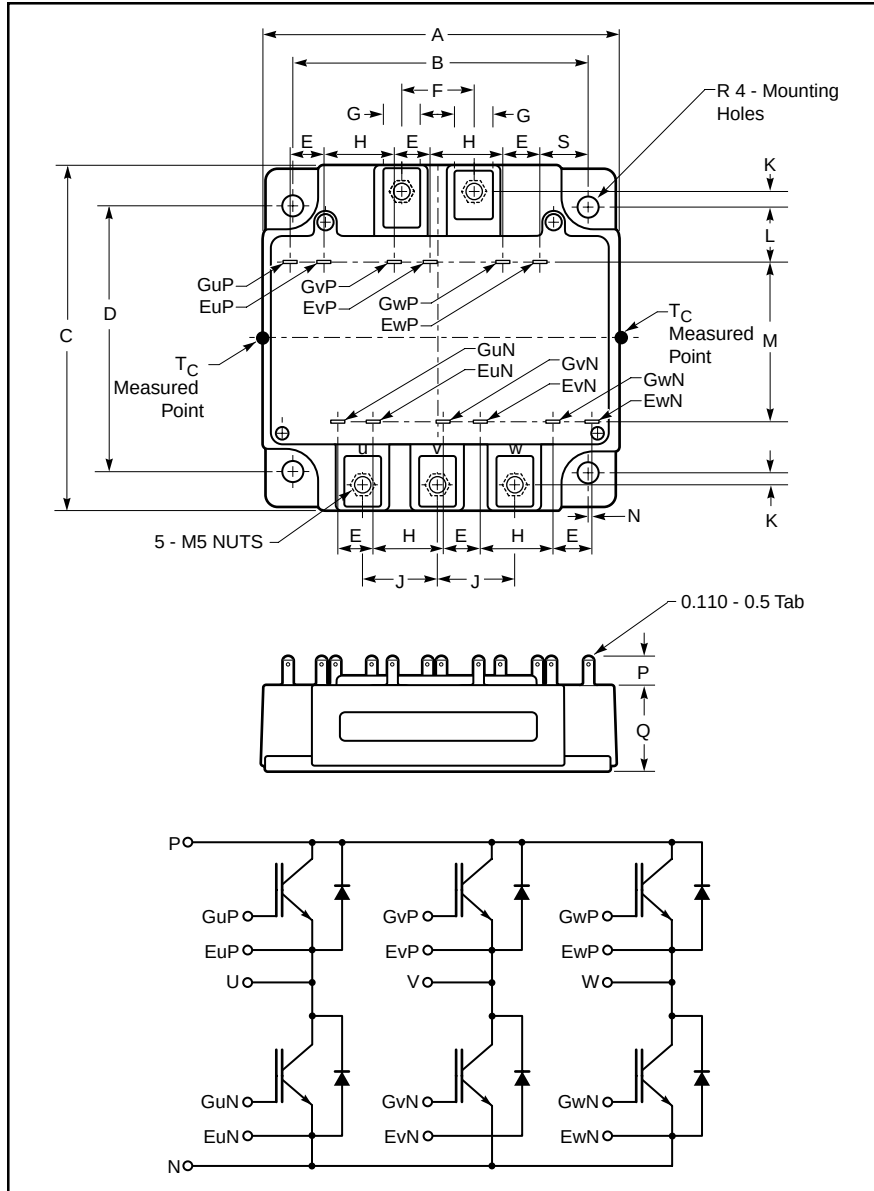


Trench Gate Design Six IGBTMOD™ 200 Amperes/250 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.21	107.0
B	3.54±0.01	90.0±0.25
C	4.02	102.0
D	3.15±0.01	80.0±0.25
E	0.43	11.0
F	0.91	23.0
G	0.47	12.0
H	0.85	21.7
J	0.91	23.0

Dimensions	Inches	Millimeters
K	0.15	3.75
L	0.67	17.0
M	1.91	48.5
N	0.03	0.8
P	0.32	8.1
Q	1.02	26.0
R	0.22 Dia.	5.5 Dia.
S	0.57	14.4



Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of six IGBT Transistors in a three phase 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 Free-Wheel Diode
- ☐ Isolated Baseplate for Easy Heat Sinking

Applications:

- ☐ AC Motor Control
- ☐ UPS
- ☐ Battery Powered Supplies

Ordering Information:

Example: Select the complete module number you desire from the table - i.e. CM200TU-5F is a 250V (V_{CES}), 200 Ampere Six-IGBT IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	200	5

CM200TU-5F

Trench Gate Design Six IGBTMOD™

200 Amperes/250 Volts

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

Ratings	Symbol	CM200TU-5F	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}	250	Volts
Gate-Emitter Voltage (C-E SHORT)	V_{GES}	± 20	Volts
Collector Current ($T_c = 25^\circ\text{C}$)	I_C	200	Amperes
Peak Collector Current ($T_j \leq 150^\circ\text{C}$)	I_{CM}	400*	Amperes
Emitter Current**	I_E	200	Amperes
Peak Emitter Current**	I_{EM}	400*	Amperes
Maximum Collector Dissipation ($T_j < 150^\circ\text{C}$)	P_c	600	Watts
Mounting Torque, M5 Main Terminal	–	31	in-lb
Mounting Torque, M5 Mounting	–	31	in-lb
Weight	–	680	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V_{iso}	2500	Volts

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	I_{CES}	$V_{CE} = V_{CES}, V_{GE} = 0V$	–	–	1	mA
Gate Leakage Voltage	I_{GES}	$V_{GE} = V_{CES}, V_{CE} = 0V$	–	–	0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 20\text{mA}, V_{CE} = 10V$	3.0	4.0	5.0	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 200A, V_{GE} = 10V, T_j = 25^\circ\text{C}$	–	1.2	1.7	Volts
		$I_C = 200A, V_{GE} = 10V, T_j = 125^\circ\text{C}$	–	1.1	–	Volts
Total Gate Charge	Q_G	$V_{CC} = 100V, I_C = 200A, V_{GE} = 10V$	–	–	–	nC
Emitter-Collector Voltage**	V_{EC}	$I_E = 200A, V_{GE} = 0V$	–	–	2.0	Volts

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

Characteristics		Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0V$	–	–	66	nf
Output Capacitance		C_{oes}		–	–	3.0	nf
Reverse Transfer Capacitance		C_{res}		–	–	2.3	nf
Resistive Load	Turn-on Delay Time	$t_{d(on)}$	$V_{CC} = 100V, I_C = 200A,$	–	–	700	ns
	Rise Time	t_r	$V_{GE1} = V_{GE2} = 10V,$	–	–	1800	ns
Switch	Turn-off Delay Time	$t_{d(off)}$	$R_G = 13\Omega,$ Resistive	–	–	700	ns
Times	Fall Time	t_f	Load Switching Operation	–	–	500	ns
Diode Reverse Recovery Time**		t_{rr}	$I_E = 200A, di_E/dt = -400A/\mu s$	–	–	300	ns
Diode Reverse Recovery Charge**		Q_{rr}	$I_E = 200A, di_E/dt = -400A/\mu s$	–		–	μC

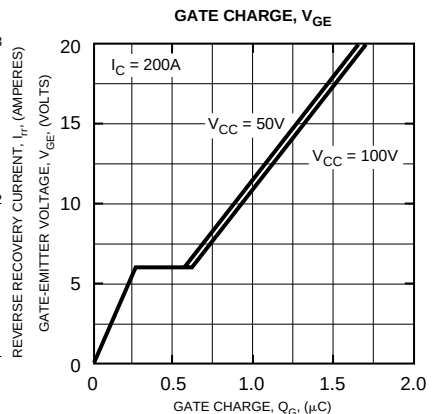
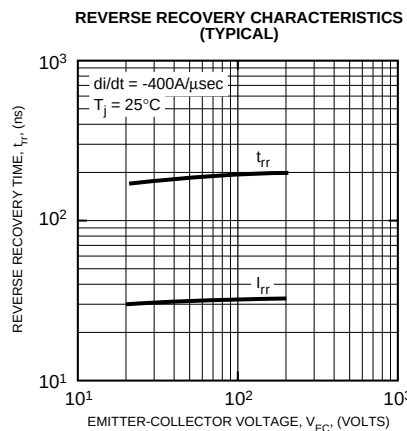
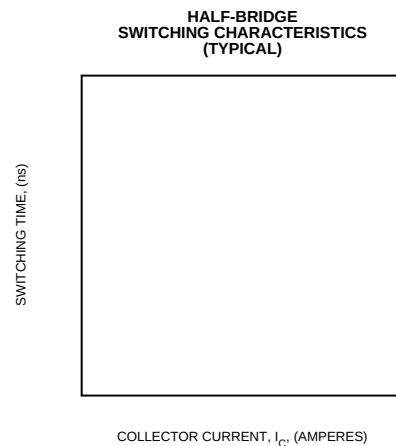
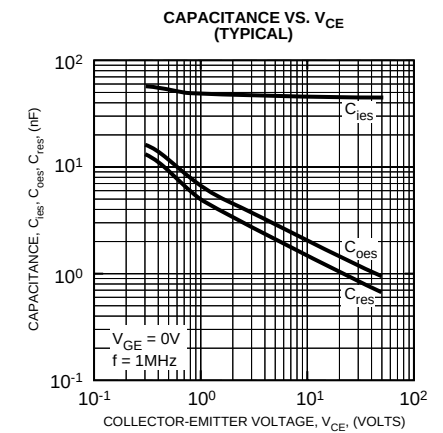
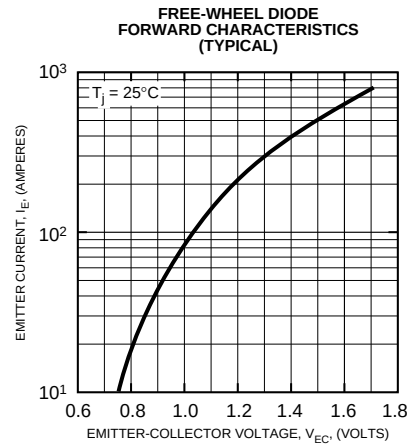
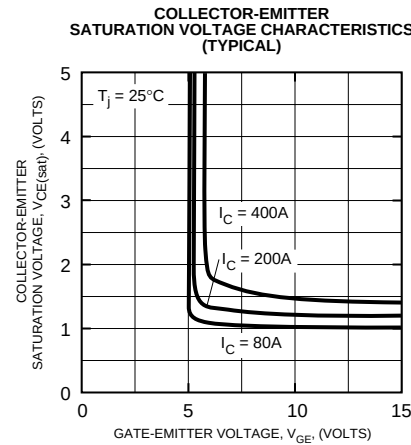
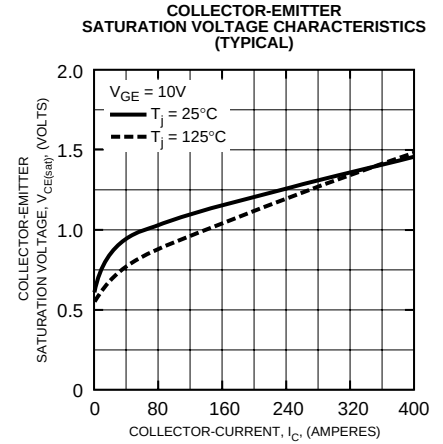
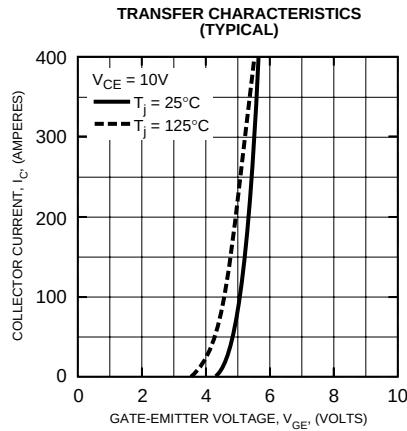
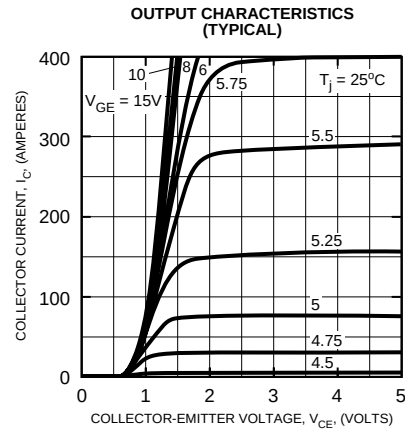
Thermal and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)Q}$	Per IGBT 1/6 Module	–	–	0.21	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)R}$	Per Free-Wheel Diode 1/6 Module	–	–	0.47	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per 1/6 Module, Thermal Grease Applied	–	0.09	–	$^\circ\text{C/W}$

* Pulse width and repetition rate should be such that the 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).

CM200TU-5F
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