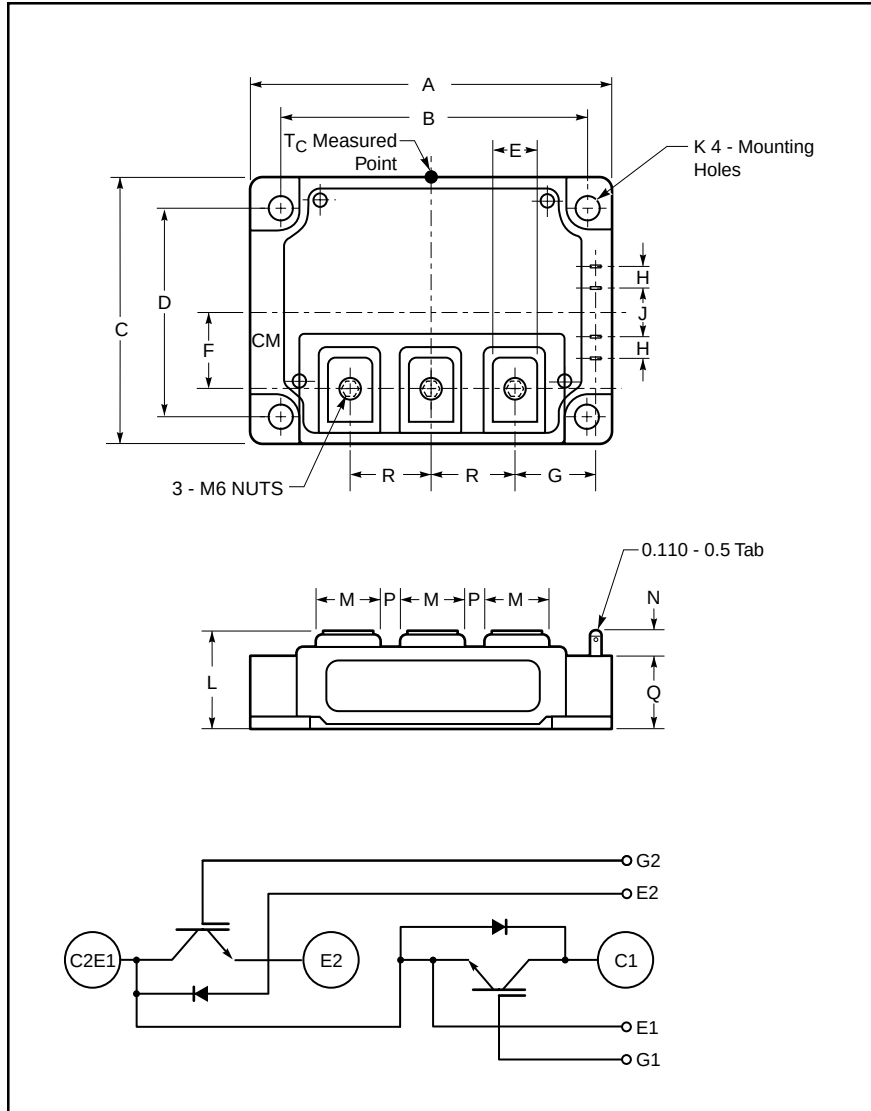


Trench Gate Design Dual IGBTMOD™ 350 Amperes/250 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.33	110.0
B	3.66±0.01	93.0±0.25
C	3.15	80.0
D	2.44±0.01	62.0±0.25
E	0.55	14.0
F	0.86	21.75
G	0.94	24.0
H	0.24	6.0

Dimensions	Inches	Millimeters
J	0.59	15.0
K	0.26 Dia.	6.5 Dia.
L	1.14 +0.04/-0.02	29 +1.0/-0.5
M	0.71	18.0
N	0.33	8.5
P	0.28	7.0
Q	0.83	21.0
R	0.98	25.0



Description:

Powerex IGBTMOD™ Modules are designed for use in 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 Drive Power
- ☐ Low $V_{CE(sat)}$
- ☐ Discrete Super-Fast Recovery (150ns) Free-Wheel Diode
- ☐ High Frequency Operation (15-20kHz)
- ☐ Isolated Baseplate for Easy Heat Sinking

Applications:

- ☐ DC Motor Control
- ☐ Boost Regulator

Ordering Information:

Example: Select the complete module number you desire from the table - i.e. CM350DU-5F is a 250V (V_{CES}), 350 Ampere Trench Gate Design Dual IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	350	5

CM350DU-5F

Trench Gate Design Dual IGBTMOD™

350 Amperes/250 Volts

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

Ratings	Symbol	CM350DU-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	350	Amperes
Peak Collector Current ($T_j \leq 150^\circ\text{C}$)	I_{CM}	700	Amperes
Emitter Current** ($T_c = 25^\circ\text{C}$)	I_E	350	Amperes
Peak Emitter Current**	I_{EM}	700*	Amperes
Maximum Collector Dissipation ($T_c = 25^\circ\text{C}$)	P_c	960	Watts
Mounting Torque, M6 Main Terminal	–	26	in-lb
Mounting Torque, M6 Mounting	–	26	in-lb
Weight	–	520	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V_{iso}	2500	Volts

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

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

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}	$V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$	–	–	1	mA
Gate Leakage Current	I_{GES}	$V_{\text{GE}} = V_{\text{CES}}, V_{\text{CE}} = 0\text{V}$	–	–	0.5	μA
Gate-Emitter Threshold Voltage	$V_{\text{GE(th)}}$	$I_C = 35\text{mA}, V_{\text{CE}} = 10\text{V}$	3.0	4.0	5.0	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_C = 350\text{A}, V_{\text{GE}} = 10\text{V}, T_j = 25^\circ\text{C}$	–	1.2	1.7	Volts
		$I_C = 350\text{A}, V_{\text{GE}} = 10\text{V}, T_j = 125^\circ\text{C}$	–	1.10	–	Volts
Total Gate Charge	Q_G	$V_{\text{CC}} = 100\text{V}, I_C = 350\text{A}, V_{\text{GE}} = 10\text{V}$	–	1320	–	nC
Emitter-Collector Voltage*	V_{EC}	$I_E = 350\text{A}, V_{\text{GE}} = 0\text{V}$	–	–	2.0	Volts

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

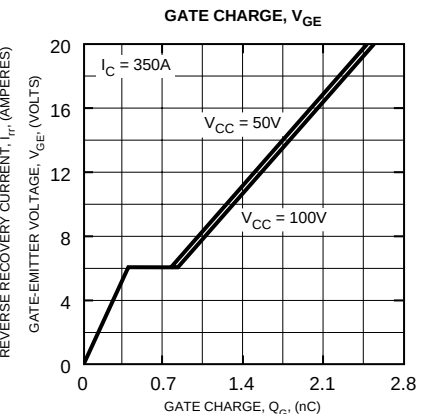
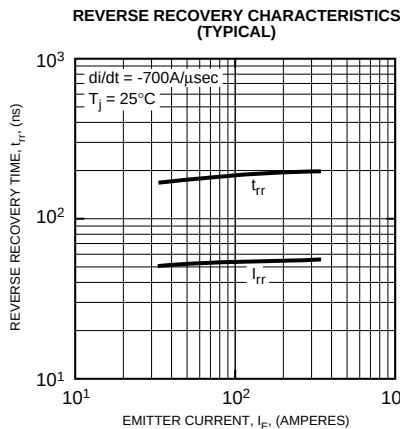
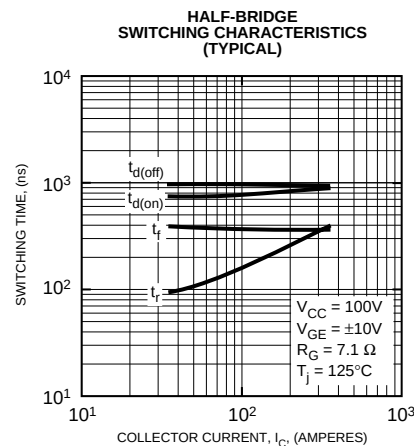
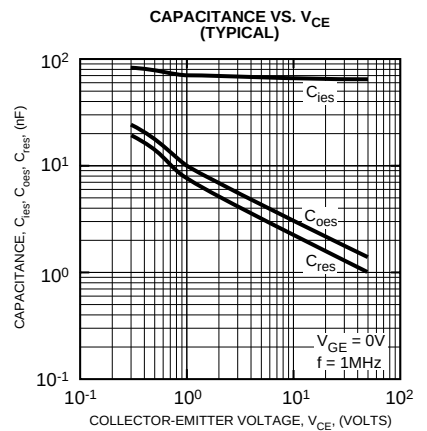
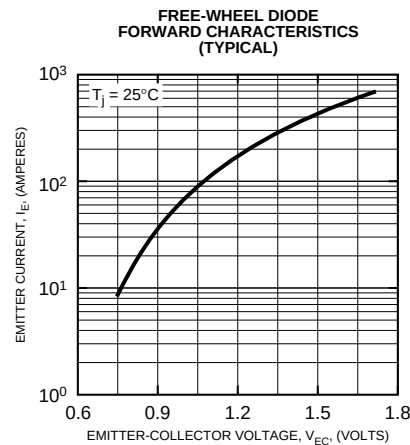
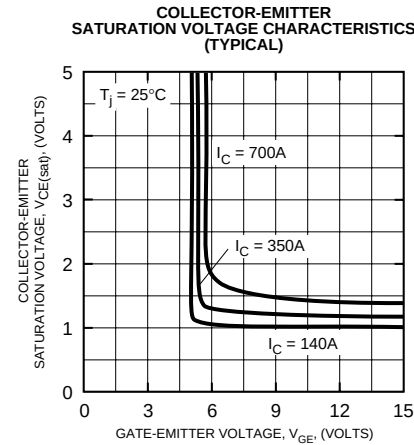
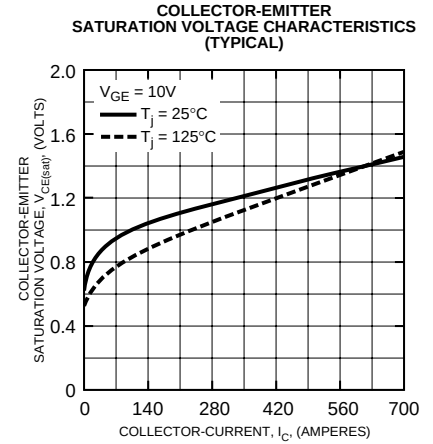
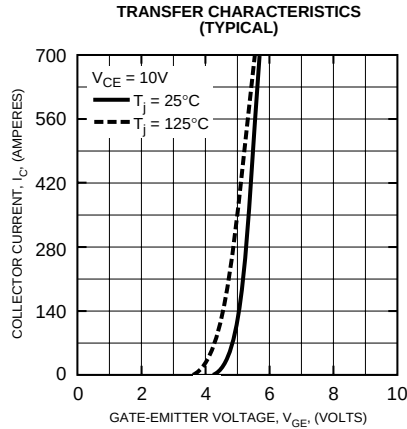
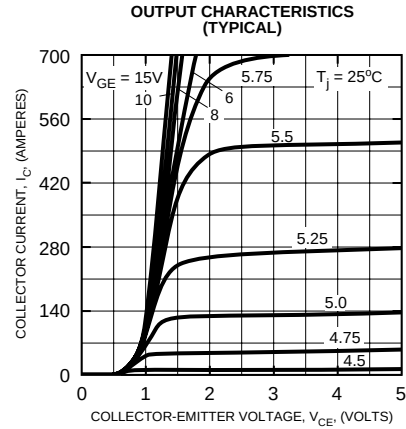
Dynamic Electrical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics		Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance		C _{ies}	V _{CE} = 10V, V _{GE} = 0V	–	–	99	nf
Output Capacitance		C _{oes}		–	–	4.5	nf
Reverse Transfer Capacitance		C _{res}		–	–	3.4	nf
Resistive	Turn-on Delay Time	t _{d(on)}	V _{CC} = 100V, I _C = 350A,	–	–	1100	ns
Load	Rise Time	t _r	V _{GE1} = V _{GE2} = 10V,	–	–	2400	ns
Switch	Turn-off Delay Time	t _{d(off)}	R _G = 7.1W, Resistive	–	–	900	ns
Times	Fall Time	t _f	Load Switching Operation	–	–	500	ns
Diode Reverse Recovery Time		t _{rr}	I _E = 350A, di _E /dt = -700A/ms	–	–	300	ns
Diode Reverse Recovery Charge		Q _{rr}	I _E = 350A, di _E /dt = -700A/ms	–	5.7	–	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	$R_{\text{th(j-c)}}$	Per IGBT	–	–	0.13	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	Per Free-Wheel Diode	–	–	0.19	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{\text{th(c-f)}}$	Per Module, Thermal Grease Applied	–	0.010	–	$^\circ\text{C/W}$

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