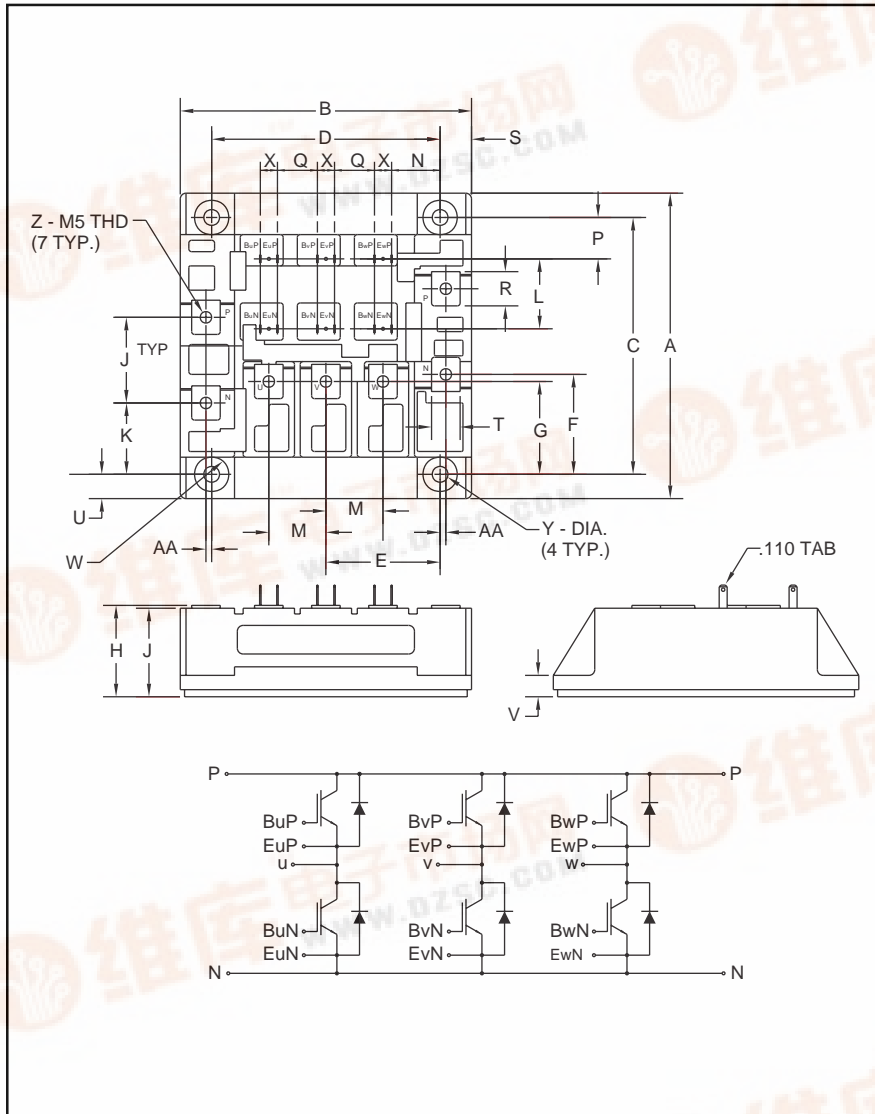




Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

## CM150TF-12H

### Six-IGBT IGBTMOD™ H-Series Module 150 Amperes/600 Volts



#### 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 (70ns) Free-Wheel Diode
- High Frequency Operation (20-25kHz)
- Isolated Baseplate for Easy Heat Sinking

#### Applications:

- AC Motor Control
- Motion/Servo Control
- UPS
- Welding Power Supplies
- Laser Power Supplies

#### Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM150TF-12H is a 600V ( $V_{CES}$ ), 150 Ampere Six-IGBT IGBTMOD™ Power Module.

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.21	107.0
B	4.02	102.0
C	3.543±0.01	90.0±0.25
D	3.15±0.01	80.0±0.25
E	1.57	40.0
F	1.38	35.0
G	1.28	32.5
H	1.26 Max.	32.0 Max
J	1.18	30.0
K	0.98	25.0
L	0.96	24.5

Dimensions	Inches	Millimeters
P	0.57	14.5
Q	0.55	14.0
R	0.47	12.0
S	0.43	11.0
T	0.39	10.0
U	0.33	8.5
V	0.30	7.5
W	0.24 Rad.	Rad. 6.0
X	0.24	6.0
Y	0.22	5.5
Z	M5 Metric	M5

Type	Current Rating Amperes	$V_{CES}$ Volts (x 50)
CM	150	12





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

Ratings	Symbol	CM150TF-12H	Units
Junction Temperature	$T_j$	-40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	-40 to 125	$^\circ\text{C}$
Collector-Emitter Voltage (G-E SHORT)	$V_{\text{CES}}$	600	Volts
Gate-Emitter Voltage	$V_{\text{GES}}$	$\pm 20$	Volts
Collector Current	$I_C$	150	Amperes
Peak Collector Current	$I_{\text{CM}}$	300*	Amperes
Diode Forward Current	$I_F$	150	Amperes
Diode Forward Surge Current	$I_{\text{FM}}$	200*	Amperes
Power Dissipation	$P_d$	600	Watts
Max. Mounting Torque M5 Terminal Screws	-	17	in-lb
Max. Mounting Torque M5 Mounting Screws	-	17	in-lb
Module Weight (Typical)	-	830	Grams
V Isolation	$V_{\text{RMS}}$	2500	Volts

\* Pulse width and repetition rate should be such that device junction temperature does not exceed the device rating.

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	$I_{\text{CES}}$	$V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$	-	-	1.0	mA
Gate Leakage Current	$I_{\text{GES}}$	$V_{\text{GE}} = V_{\text{GES}}, V_{\text{CE}} = 0\text{V}$	-	-	0.5	$\mu\text{A}$
Gate-Emitter Threshold Voltage	$V_{\text{GE(th)}}$	$I_C = 15\text{mA}, V_{\text{CE}} = 10\text{V}$	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_C = 150\text{A}, V_{\text{GE}} = 15\text{V}$	-	2.1	2.8**	Volts
		$I_C = 150\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 150^\circ\text{C}$	-	2.15	-	Volts
Total Gate Charge	$Q_G$	$V_{\text{CC}} = 300\text{V}, I_C = 150\text{A}, V_{\text{GS}} = 15\text{V}$	-	450	-	nC
Diode Forward Voltage	$V_{\text{FM}}$	$I_E = 150\text{A}, V_{\text{GE}} = 0\text{V}$	-	-	2.8	Volts

\*\* Pulse width and repetition rate should be such that device junction temperature rise is negligible.

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Input Capacitance	$C_{\text{ies}}$		-	-	15	nF	
Output Capacitance	$C_{\text{oes}}$	$V_{\text{GE}} = 0\text{V}, V_{\text{CE}} = 10\text{V}, 1\text{MHz}$	-	-	5.3	nF	
Reverse Transfer Capacitance	$C_{\text{res}}$		-	-	3	nF	
Resistive	Turn-on Delay Time	$t_{\text{d(on)}}$	-	-	200	ns	
Load	Rise Time	$t_r$	-	-	550	ns	
Switching	Turn-off Delay Time	$t_{\text{d(off)}}$	$V_{\text{CC}} = 300\text{V}, I_C = 150\text{A},$ $V_{\text{GE1}} = V_{\text{GE2}} = 15\text{V}, R_G = 4.2\Omega$	-	-	300	ns
				Fall Time	$t_f$	-	-
Diode Reverse Recovery Time	$t_{\text{rr}}$	$I_E = 150\text{A}, di_E/dt = -300\text{A}/\mu\text{s}$	-	-	110	ns	
Diode Reverse Recovery Charge	$Q_{\text{rr}}$	$I_E = 150\text{A}, di_E/dt = -300\text{A}/\mu\text{s}$	-	0.41	-	$\mu\text{C}$	

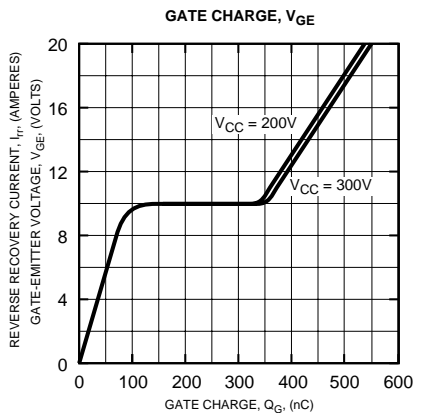
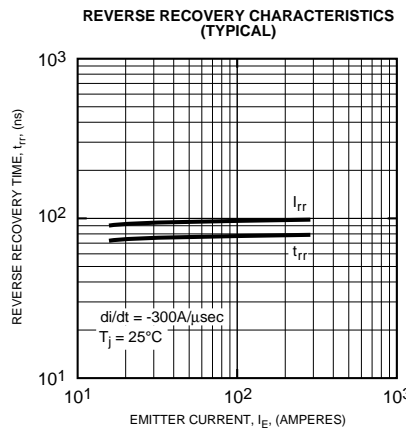
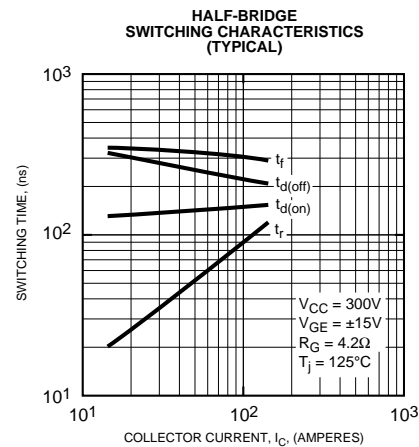
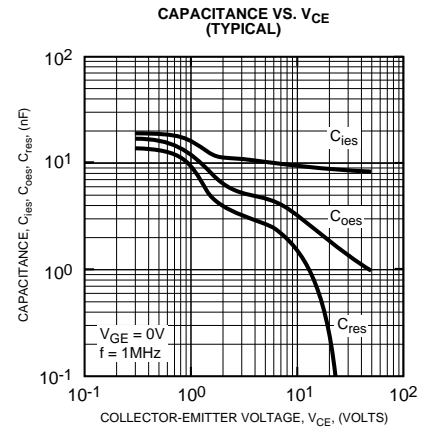
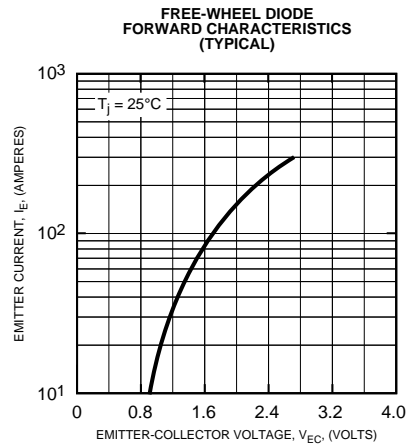
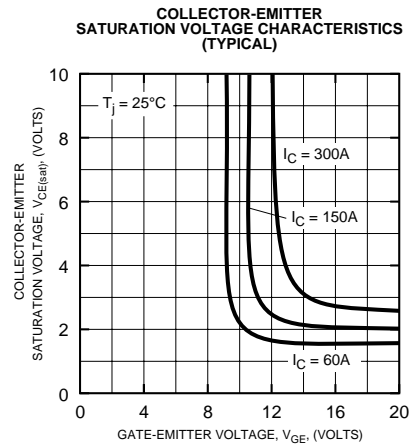
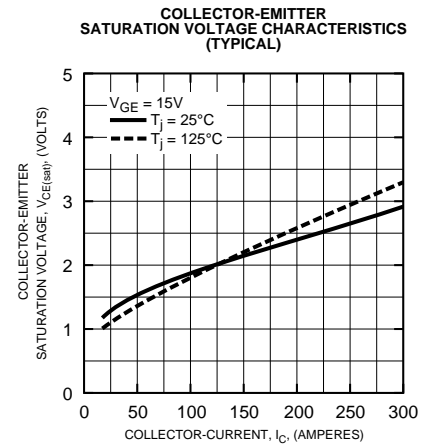
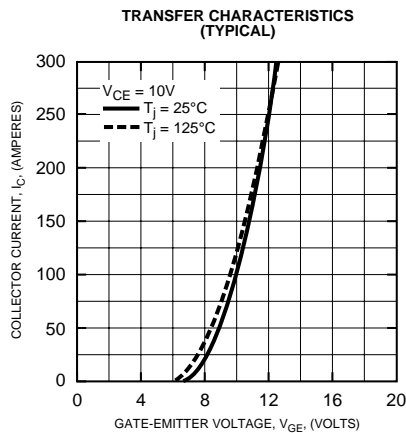
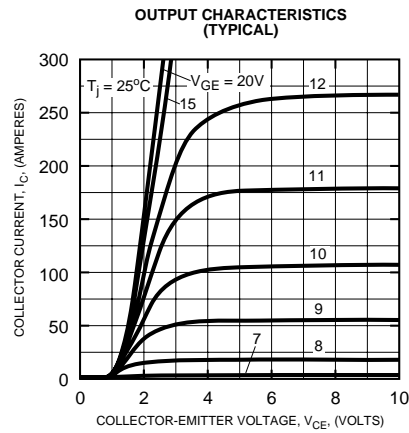
### Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	Per IGBT	-	-	0.21	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	Per FWDi	-	-	0.47	$^\circ\text{C}/\text{W}$
Contact Thermal Resistance	$R_{\text{th(c-f)}}$	Per Module, Thermal Grease Applied	-	-	0.025	$^\circ\text{C}/\text{W}$



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