

## Excellent Integrated System Limited

Stocking Distributor

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[Powerex Inc.](#)  
[CM50TF-28H](#)

For any questions, you can email us directly:

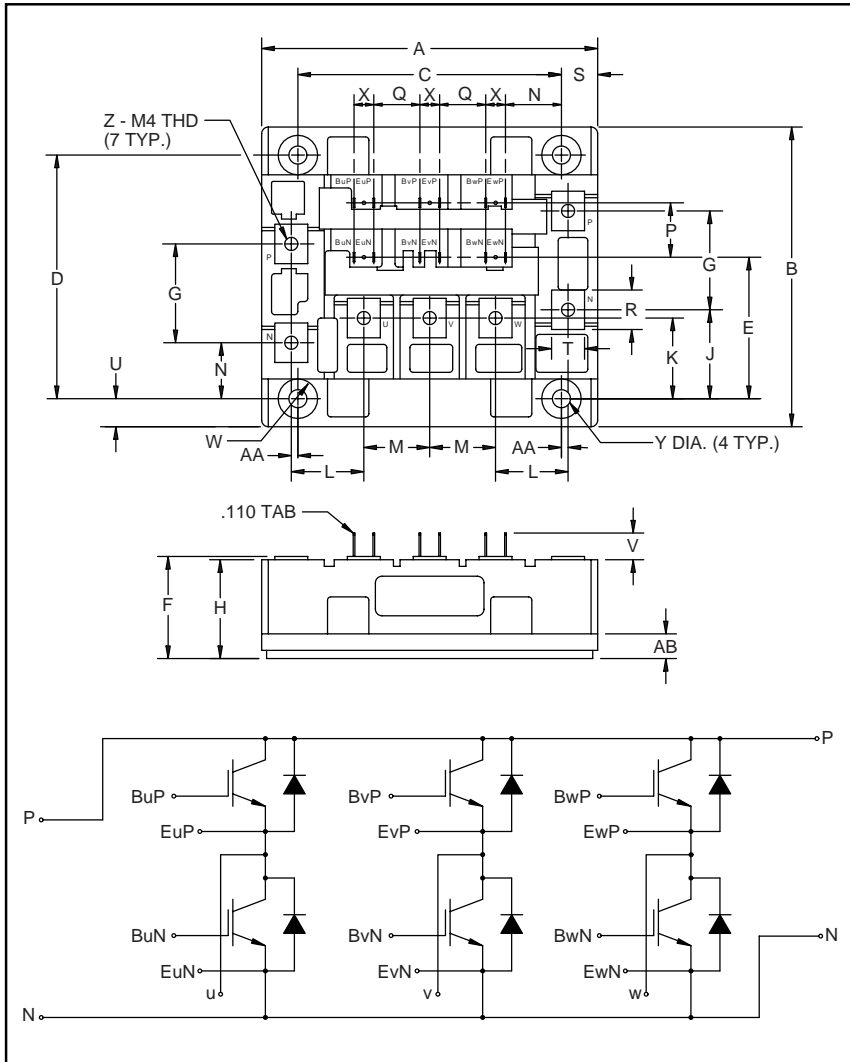
[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)



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

**CM50TF-28H**

**Six-IGBT IGBTMOD™  
H-Series Module  
50 Amperes/1400 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 (135ns) 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. CM50TF-28H is a 1400V ( $V_{CES}$ ), 50 Ampere Six-IGBT IGBTMOD™ Power Module.

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.02±0.02	102.0±0.5
B	3.58±0.02	91.0±0.5
C	3.150±0.01	80.0±0.25
D	2.913±0.01	74.0±0.25
E	1.69	43.0
F	1.18 +0.06/-0.02	30 +1.5/-0.5
G	1.18	30.0
H	1.16	29.5
J	1.06	27.0
K	0.96	24.5
L	0.87	22.0
M	0.79	20.0
N	0.67	17.0

Dimensions	Inches	Millimeters
P	0.65	16.5
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	0.32	8.1
W	0.24 Rad.	Rad. 6.0
X	0.24	6.0
Y	0.22 Dia.	Dia. 5.5
Z	M4 Metric	M4
AA	0.08	2.0
AB	0.28	7.0

Type	Current Rating Amperes	$V_{CES}$ Volts (x 50)
CM	50	28



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

Characteristics	Symbol	CM50TF-28H	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)	$V_{\text{CES}}$	1400	Volts
Gate-Emitter Voltage (C-E-SHORT)	$V_{\text{GES}}$	$\pm 20$	Volts
Collector Current	$I_C$	50	Amperes
Peak Collector Current	$I_{\text{CM}}$	100*	Amperes
Diode Forward Current	$I_{\text{EC}}$	50	Amperes
Diode Forward Pulse Current	$I_{\text{ECM}}$	100*	Amperes
Power Dissipation	$P_d$	400	Watts
Max. Mounting Torque M4 Terminal Screws	-	13	in-lb
Max. Mounting Torque M5 Mounting Screws	-	17	in-lb
Module Weight (Typical)	-	540	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	$V_{\text{GE(th)}}$	$I_C = 5\text{mA}, V_{\text{CE}} = 10\text{V}$	5.0	6.5	8.0	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_C = 50\text{A}, V_{\text{GE}} = 15\text{V}$	-	3.1	4.2**	Volts
		$I_C = 50\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 150^\circ\text{C}$	-	2.95	-	Volts
Total Gate Charge	$Q_G$	$V_{\text{CC}} = 800\text{V}, I_C = 50\text{A}, V_{\text{GS}} = 15\text{V}$	-	255	-	nC
Diode Forward Voltage	$V_{\text{FM}}$	$I_E = 50\text{A}, V_{\text{GS}} = 0\text{V}$	-	-	3.8	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	$C_{\text{ies}}$		-	-	10	nF
Output Capacitance	$C_{\text{oes}}$	$V_{\text{GE}} = 0\text{V}, V_{\text{CE}} = 10\text{V}, f = 1\text{MHz}$	-	-	3.5	nF
Reverse Transfer Capacitance	$C_{\text{res}}$		-	-	2	nF
Resistive	Turn-on Delay Time	$t_{\text{d(on)}}$	-	-	100	ns
Load	Rise Time	$t_r$	-	-	250	ns
Switch	Turn-off Delay Time	$t_{\text{d(off)}}$	-	-	150	ns
Diode Reverse Recovery Time	$t_{\text{rr}}$	$I_E = 50\text{A}, di_E/dt = -100\text{A}/\mu\text{s}$	-	-	300	ns
Diode Reverse Recovery Charge	$Q_{\text{rr}}$	$I_E = 50\text{A}, di_E/dt = -100\text{A}/\mu\text{s}$	-	0.5	-	$\mu\text{C}$

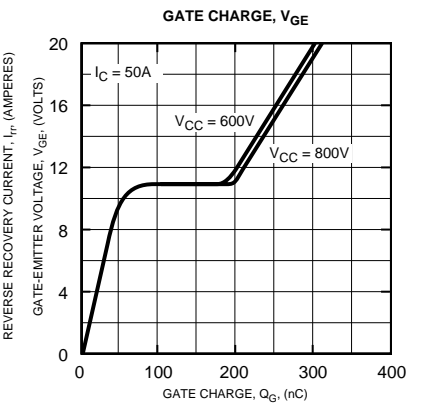
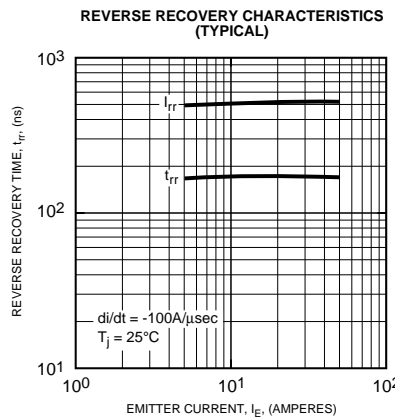
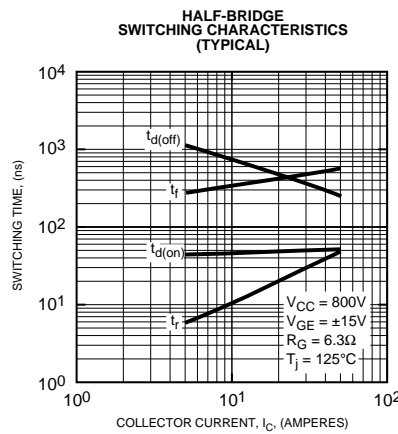
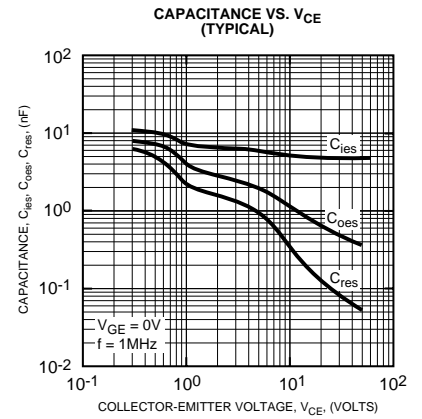
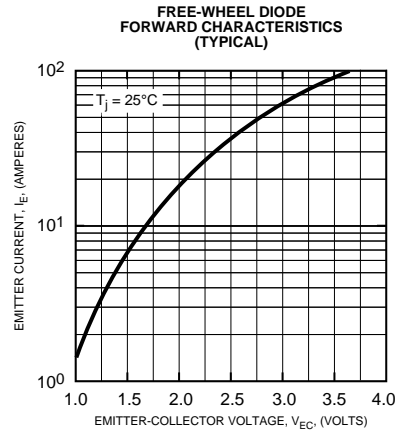
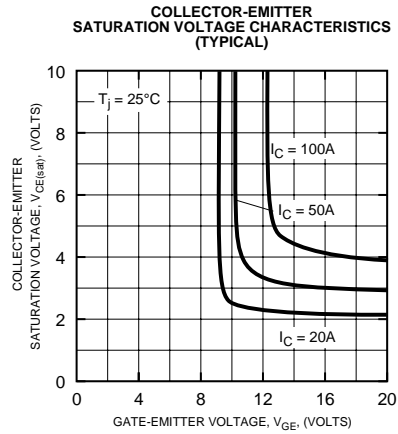
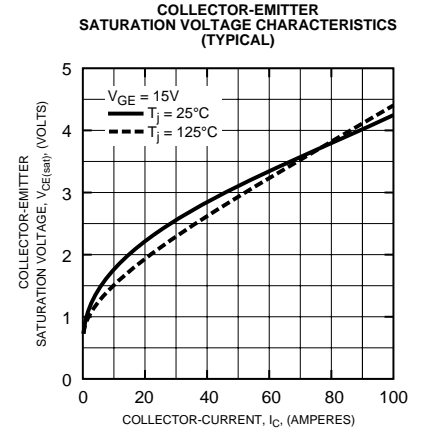
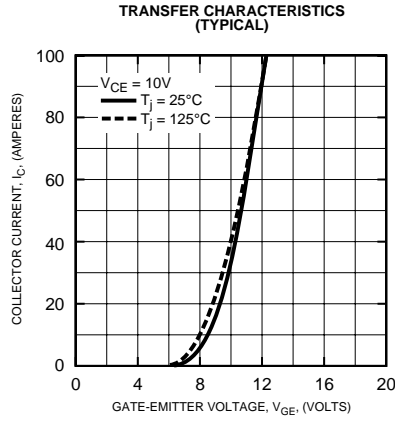
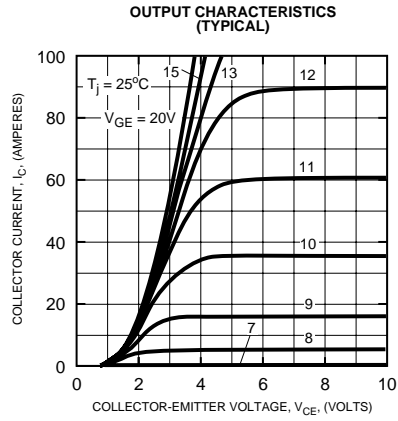
### Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	Per IGBT	-	-	0.31	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	Per FWDi	-	-	0.70	$^\circ\text{C}/\text{W}$
Contact Thermal Resistance	$R_{\text{th(c-f)}}$	Per Module, Thermal Grease Applied	-	-	0.033	$^\circ\text{C}/\text{W}$



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