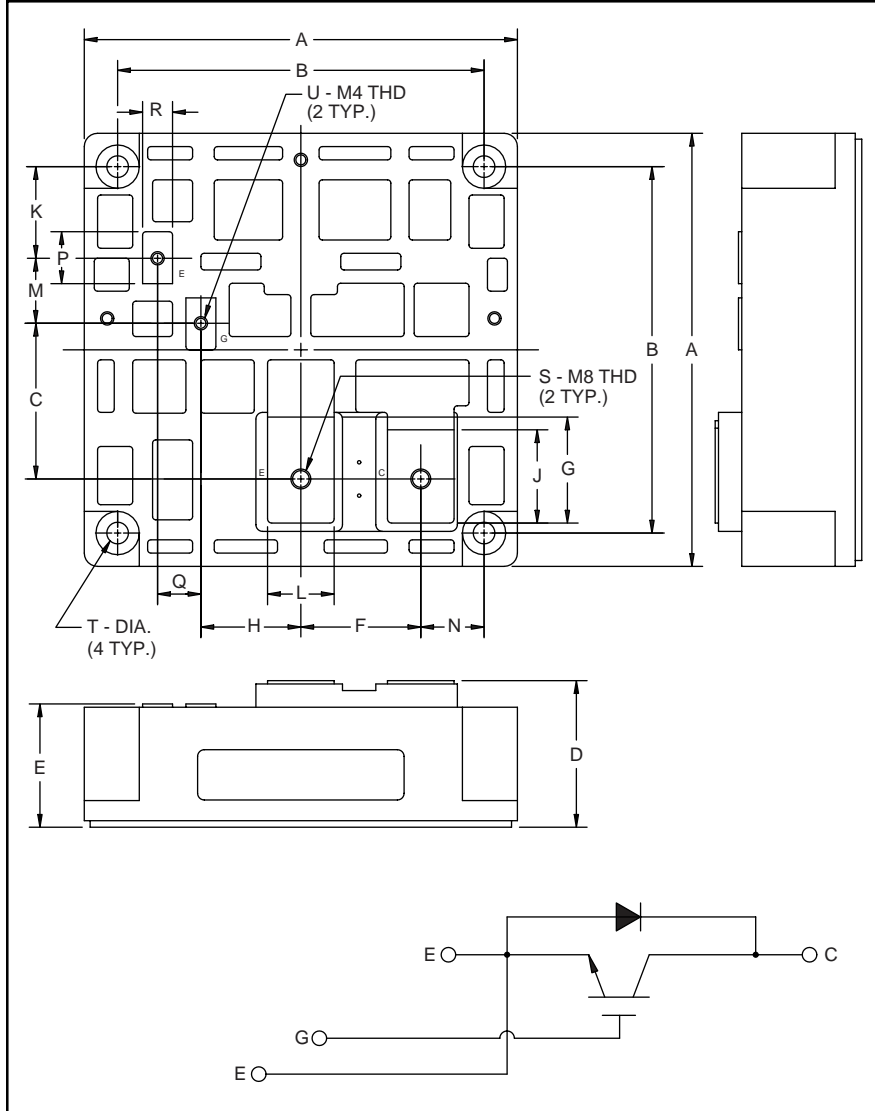


Single IGBTMOD™ H-Series Module 1000 Amperes/1400 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	5.12	130.0
B	4.33±0.01	110.0±0.25
C	1.840	46.75
D	1.73±0.04/0.02	44.0±1.0/0.5
E	1.46±0.04/0.02	37.0±1.0/0.5
F	1.42	36.0
G	1.25	31.8
H	1.18	30.0
J	1.10	28.0
K	1.08	27.5

Dimensions	Inches	Millimeters
L	0.79	20.0
M	0.77	19.5
N	0.75	19.0
P	0.61	15.6
Q	0.51	13.0
R	0.35	9.0
S	M8 Metric	M8
T	0.26 Dia.	Dia. 6.5
U	M4 Metric	M4



Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of one IGBT Transistor in a single configuration with 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. CM1000HA-28H is a 1400V (V_{CES}), 1000 Ampere Single IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	1000	28

CM1000HA-28H
Single IGBTMOD™ H-Series Module
 1000 Amperes/1400 Volts

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

Ratings	Symbol	CM1000HA-28H	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}	1400	Volts
Gate-Emitter Voltage	V_{GES}	± 20	Volts
Collector Current	I_C	1000	Amperes
Peak Collector Current	I_{CM}	2000*	Amperes
Diode Forward Current	I_F	1000	Amperes
Diode Forward Surge Current	I_{FM}	2000*	Amperes
Power Dissipation	P_d	5800	Watts
Max. Mounting Torque M8 Terminal Screws	-	95	in-lb
Max. Mounting Torque M6 Mounting Screws	-	26	in-lb
Max. Mounting Torque M4 G-E Terminal Screws	-	13	in-lb
Module Weight (Typical)	-	1600	Grams
V Isolation	V_{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_{CES}	$V_{CE} = V_{CES}, V_{GE} = 0V$	-	-	2.0	mA
Gate Leakage Current	I_{GES}	$V_{GE} = V_{GES}, V_{CE} = 0V$	-	-	0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 100\text{mA}, V_{CE} = 10V$	5.0	6.5	8.0	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1000A, V_{GE} = 15V$	-	3.1	4.5	Volts
		$I_C = 1000A, V_{GE} = 15V, T_j = 150^\circ\text{C}$	-	3.1	-	Volts
Total Gate Charge	Q_G	$V_{CC} = 800V, I_C = 1000A, V_{GS} = 15V$	-	5355	-	nC
Diode Forward Voltage	V_{FM}	$I_E = 10000A, V_{GS} = 0V$	-	-	4.0	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_{ies}		-	-	200	nF	
Output Capacitance	C_{oes}	$V_{GE} = 0V, V_{CE} = 10V, f = 1\text{MHz}$	-	-	70	nF	
Reverse Transfer Capacitance	C_{res}		-	-	40	nF	
Resistive	Turn-on Delay Time	$t_{d(on)}$	-	-	800	ns	
	Load	Rise Time	t_r	$V_{CC} = 800V, I_C = 1000A,$	-	-	2000
Switching	Turn-off Delay Time	$t_{d(off)}$	$V_{GE1} = V_{GE2} = 15V, R_G = 3.3\Omega$	-	-	1200	ns
	Times	Fall Time	t_f	-	-	650	ns
Diode Reverse Recovery Time	t_{rr}	$I_E = 1000A, di_E/dt = -2000A/\mu\text{s}$	-	-	300	ns	
Diode Reverse Recovery Charge	Q_{rr}	$I_E = 1000A, di_E/dt = -2000A/\mu\text{s}$	-	10.5	-	μC	

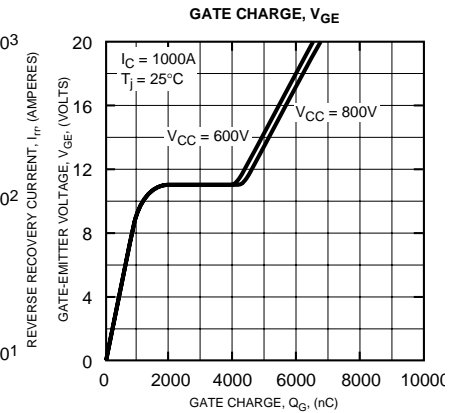
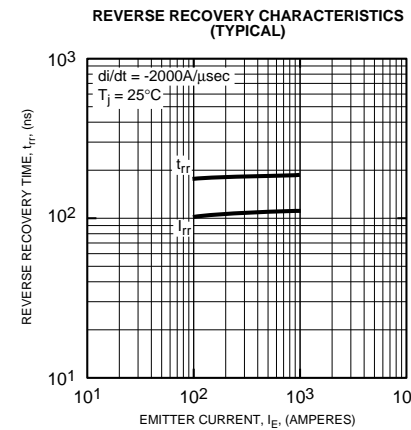
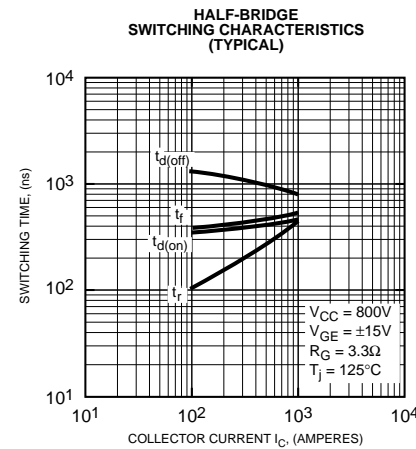
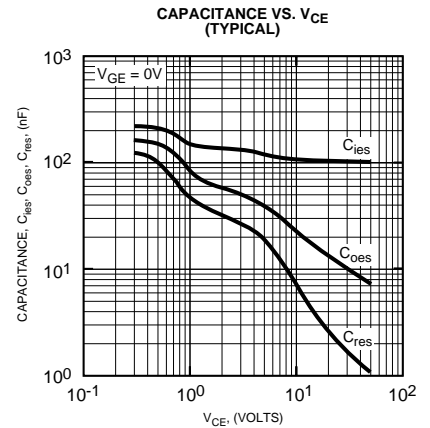
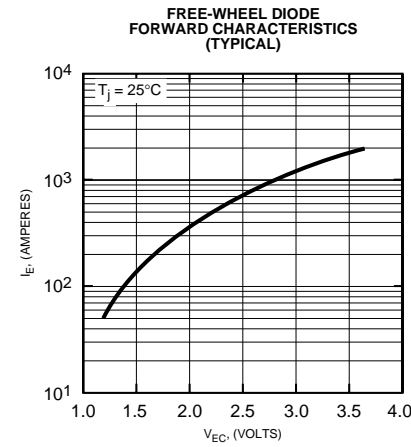
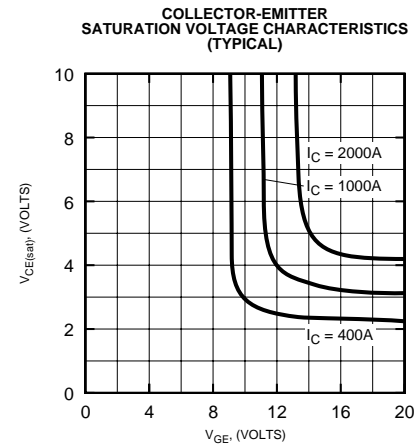
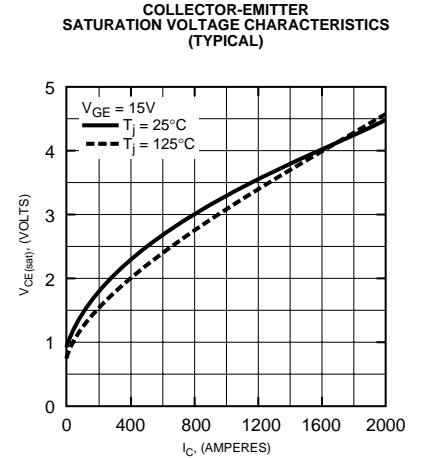
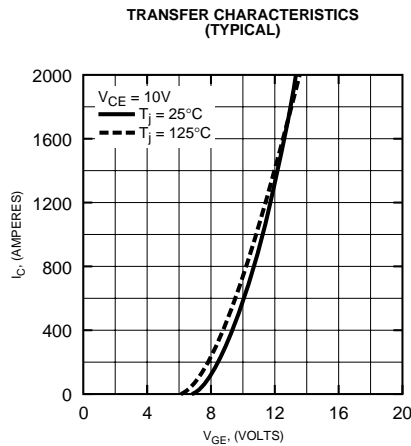
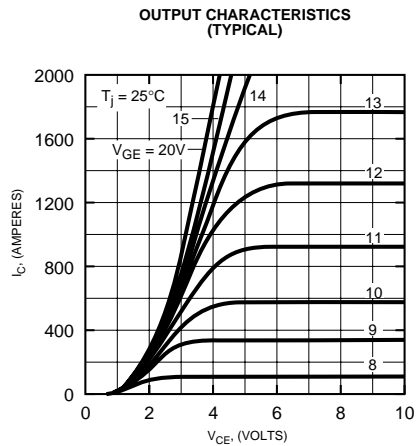
Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per IGBT	-	-	0.022	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per FWDi	-	-	0.050	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	-	-	0.018	$^\circ\text{C/W}$



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

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