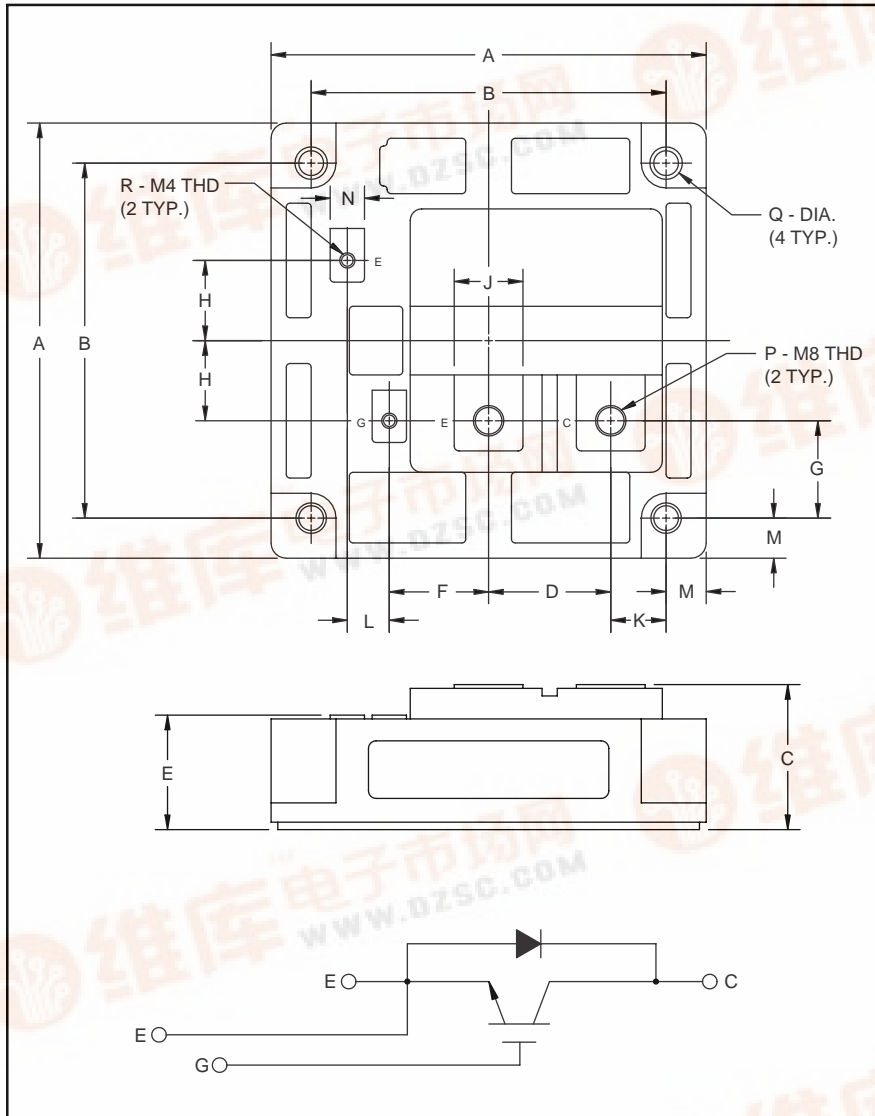




Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

CM400HA-34H

Single IGBTMOD™ H-Series Module 400 Amperes/1700 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.49	114.0
B	3.66±0.01	93.0±0.25
C	1.50+0.04/-0.02	38.0+1.0/-0.5
D	1.26	32.0
E	1.18+0.04/-0.02	30.0+1.0/-0.5
F	1.02	26.0
G	1.0	25.5
H	0.83	21.0

Dimensions	Inches	Millimeters
J	0.71	18.0
K	0.57	14.5
L	0.43	11.0
M	0.41	10.5
N	0.35	9.0
P	M8 Metric	M8
Q	0.26 Dia.	Dia. 6.5
R	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 Free-Wheel Diode
- High Frequency Operation (20-25kHz)
- Isolated Baseplate for Easy Heat Sinking

Applications:

- AC Motor Control
- Auxilliary Inverter for Traction
- UPS
- Welding Power Supplies
- Laser Power Supplies

Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM400HA-34H is a 1700V (V_{CES}), 400 Ampere Single IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	400	34





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

Ratings	Symbol	CM400HA-34H	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}	1700	Volts
Gate-Emitter Voltage	V_{GES}	± 20	Volts
Collector Current	I_C	400	Amperes
Peak Collector Current	I_{CM}	800*	Amperes
Diode Forward Current	I_F	400	Amperes
Diode Forward Surge Current	I_{FM}	800*	Amperes
Power Dissipation	P_d	4100	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 Screw	-	13	in-lb
Module Weight (Typical)	-	980	Grams
V Isolation	V_{RMS}	4000	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}	$V_{CE} = V_{CES}, V_{GE} = 0V$	-	-	4	mA
Gate Leakage Current	I_{GES}	$V_{GE} = V_{GES}, V_{CE} = 0V$	-	-	0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 40\text{mA}, V_{CE} = 10V$	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 400A, V_{GE} = 15V$	-	2.7	3.7**	Volts
		$I_C = 400A, V_{GE} = 15V, T_j = 150^\circ\text{C}$	-	-	-*	Volts
Total Gate Charge	Q_G	$V_{CC} = 750V, I_C = 400A, V_{GS} = 15V$	-	2900	-	nC
Diode Forward Voltage	V_{FM}	$I_E = 400A, V_{GS} = 0V$	-	-	3.4	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}		-	-	85	nF
Output Capacitance	C_{oes}	$V_{GE} = 0V, V_{CE} = 10V$	-	-	20	nF
Reverse Transfer Capacitance	C_{res}		-	-	15	nF
Resistive	Turn-on Delay Time	$t_{d(on)}$	-	-	900	ns
	Rise Time	t_r	-	-	1500	ns
Switching	Turn-off Delay Time	$t_{d(off)}$	-	-	1500	ns
	Fall Time	t_f	-	-	800	ns
Diode Reverse Recovery Time	t_{rr}	$I_E = 600A, di_E/dt = -800A/\mu\text{s}$	-	-	400	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_E = 600A, di_E/dt = -800A/\mu\text{s}$	-	7.0	-	μC

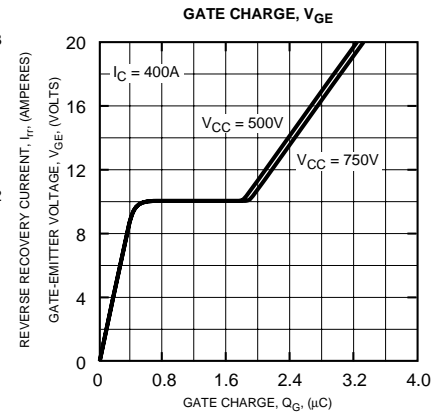
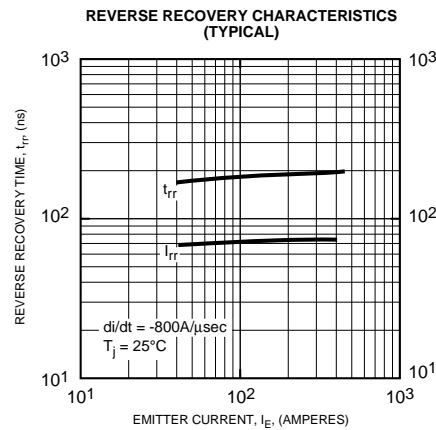
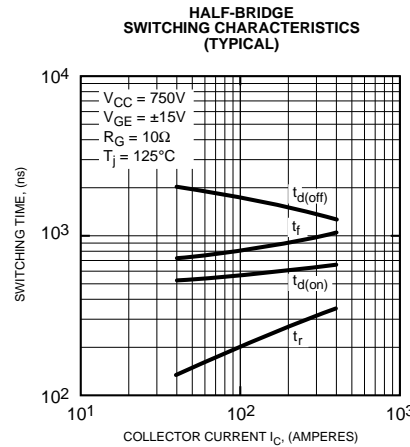
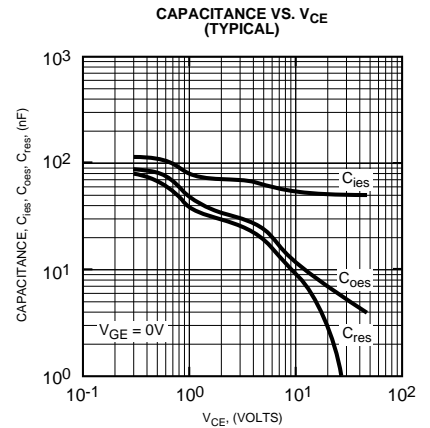
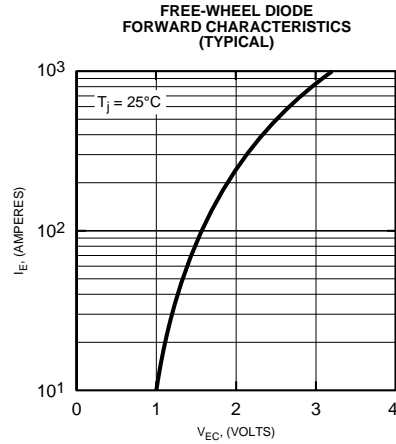
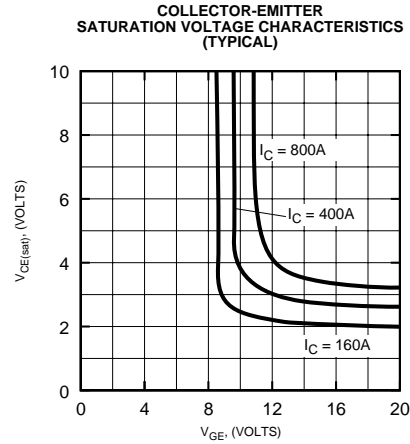
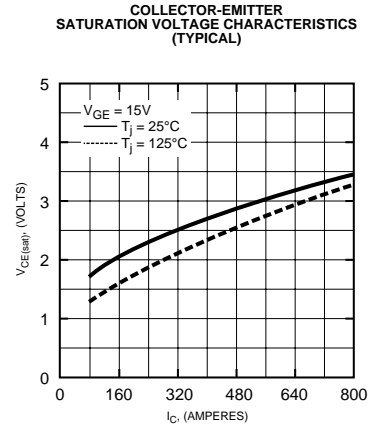
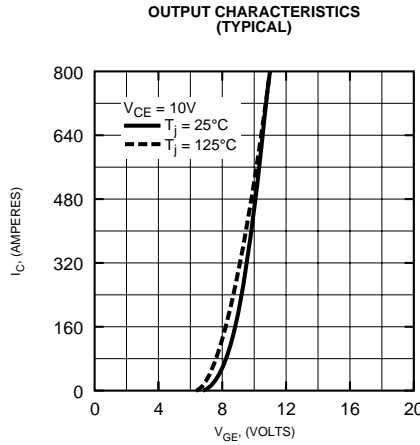
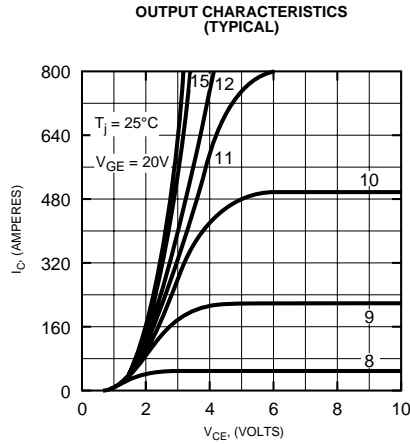
Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per IGBT	-	-	0.030	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per FWDi	-	-	0.060	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	-	-	0.023	$^\circ\text{C/W}$



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