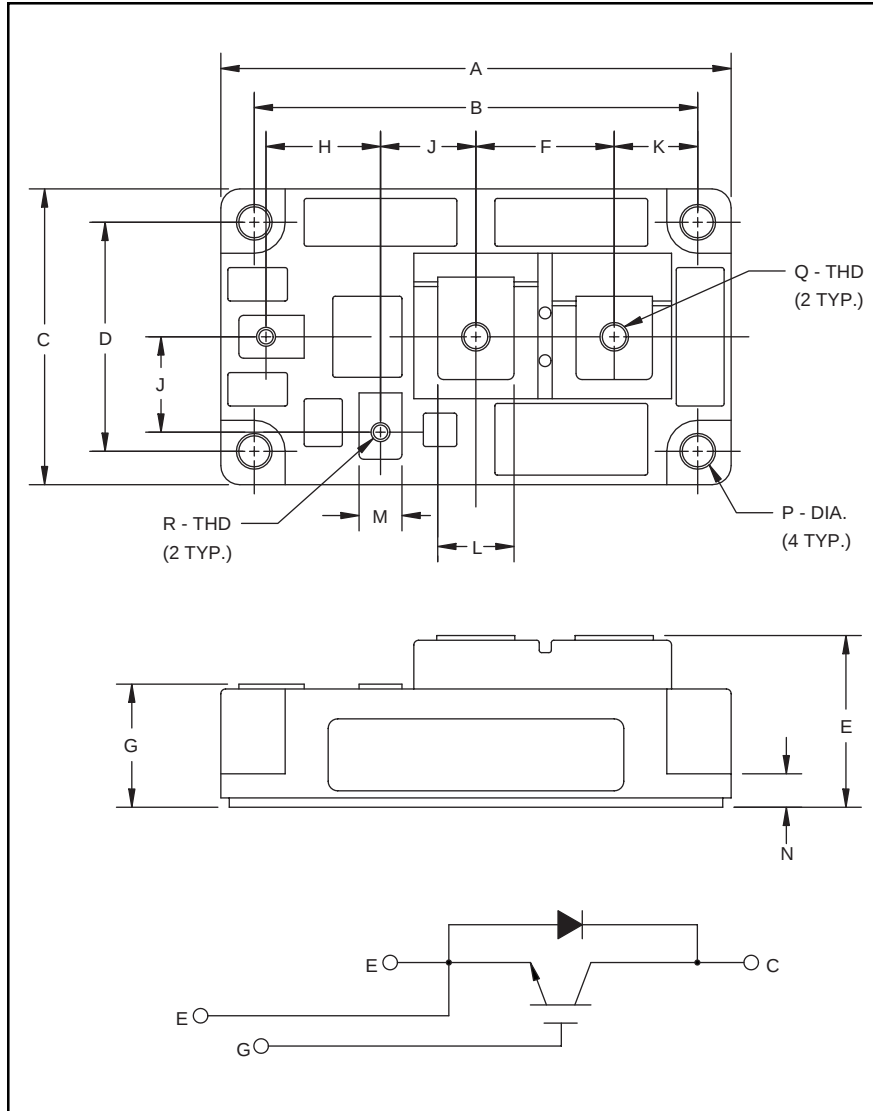


Single IGBTMOD™ H-Series Module 400 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.21	107.0
B	3.661±0.01	93.0±0.25
C	2.44	62.0
D	1.89±0.01	48.0±0.25
E	1.42+0.04/-0.02	36.0+1.0/-0.5
F	1.14	29.0
G	1.02+0.04/-0.2	25.8+1.0/-0.5
H	0.94	24.0

Dimensions	Inches	Millimeters
J	0.79	20.0
K	0.69	17.5
L	0.63	16.0
M	0.35	9.0
N	0.28	7.0
P	0.26 Dia.	Dia. 6.5
Q	M6 Metric	M6
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 (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. CM400HA-24H is a 1200V (V_{CES}), 400 Ampere Single IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	400	24

CM400HA-24H
Single IGBTMOD™ H-Series Module
 400 Amperes/1200 Volts

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

Ratings	Symbol	CM400HA-24H	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}	1200	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	2800	Watts
Max. Mounting Torque M6 Terminal Screws	—	26	in-lb
Max. Mounting Torque M6 Mounting Screws	—	26	in-lb
Module Weight (Typical)	—	400	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, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	I_{CES}	$V_{CE} = V_{CES}, V_{GE} = 0V$	—	—	1.0	mA
Gate Leakage Current	I_{GES}	$V_{GE} = V_{GES}, V_{CE} = 0V$	—	—	0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 40\text{mA}, V_{CE} = 10V$	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 400A, V_{GE} = 15V$	—	2.5	3.4**	Volts
		$I_C = 400A, V_{GE} = 15V, T_j = 150^\circ\text{C}$	—	2.25	—	Volts
Total Gate Charge	Q_G	$V_{CC} = 600V, I_C = 400A, V_{GS} = 15V$	—	2000	—	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.

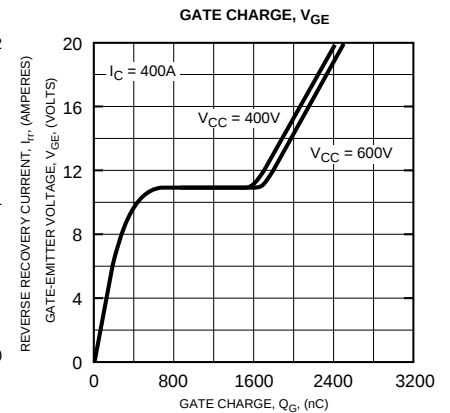
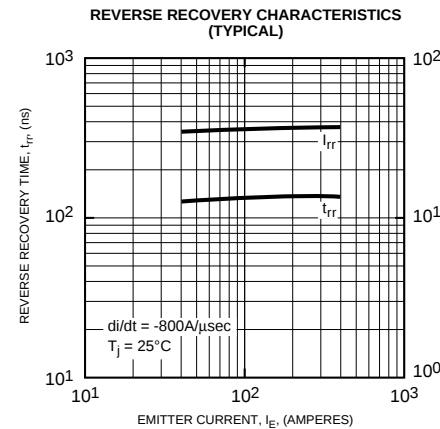
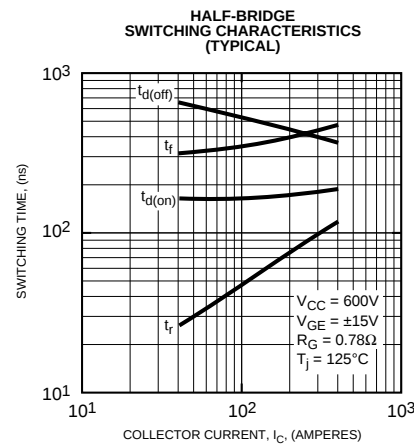
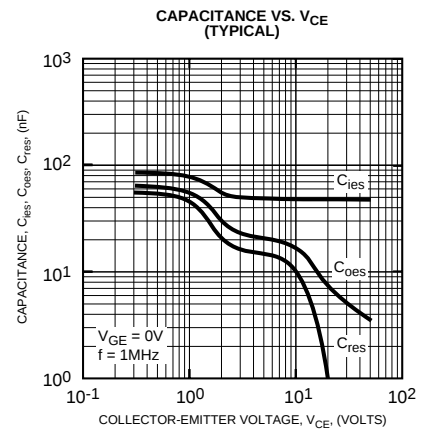
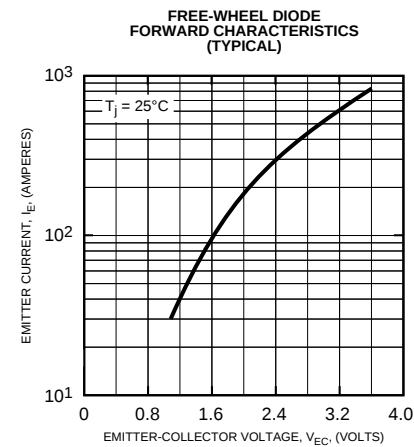
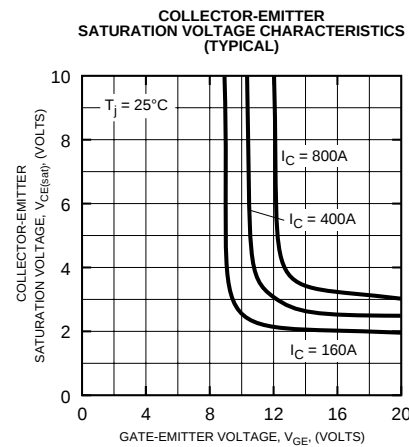
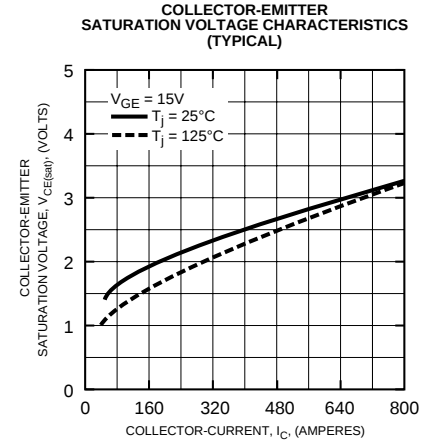
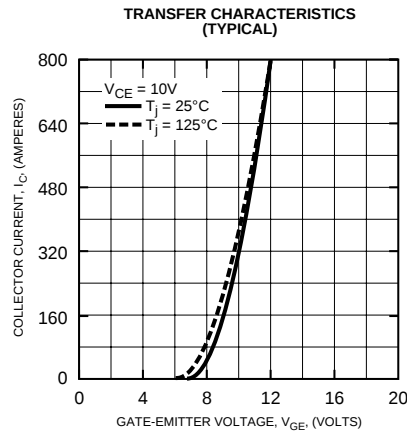
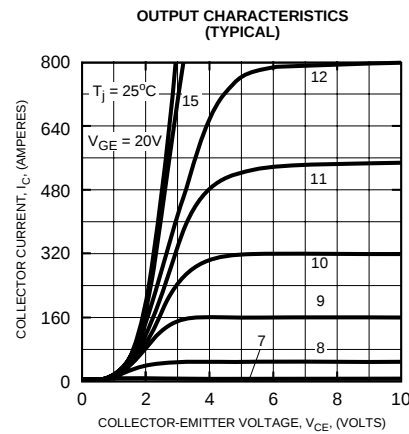
Dynamic Electrical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{ies}	$V_{GE} = 0V, V_{CE} = 10V, f = 1\text{MHz}$	—	—	80	nF
Output Capacitance	C_{oes}		—	—	28	nF
Reverse Transfer Capacitance	C_{res}		—	—	16	nF
Resistive	Turn-on Delay Time	$V_{CC} = 600V, I_C = 400A$ $V_{GE1} = V_{GE2} = 15V, R_G = 0.78\Omega$	—	—	300	ns
Load	Rise Time		—	—	500	ns
Switching	Turn-off Delay Time		—	—	350	ns
Times	Fall Time		—	—	350	ns
Diode Reverse Recovery Time	t_{rr}	$I_E = 400A, di_E/dt = -800A/\mu s$	—	—	250	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_E = 400A, di_E/dt = -800A/\mu s$	—	2.97	—	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	$R_{th(j-c)}$	Per IGBT	—	—	0.045	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per FWDi	—	—	0.09	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	—	—	0.040	$^\circ\text{C/W}$

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