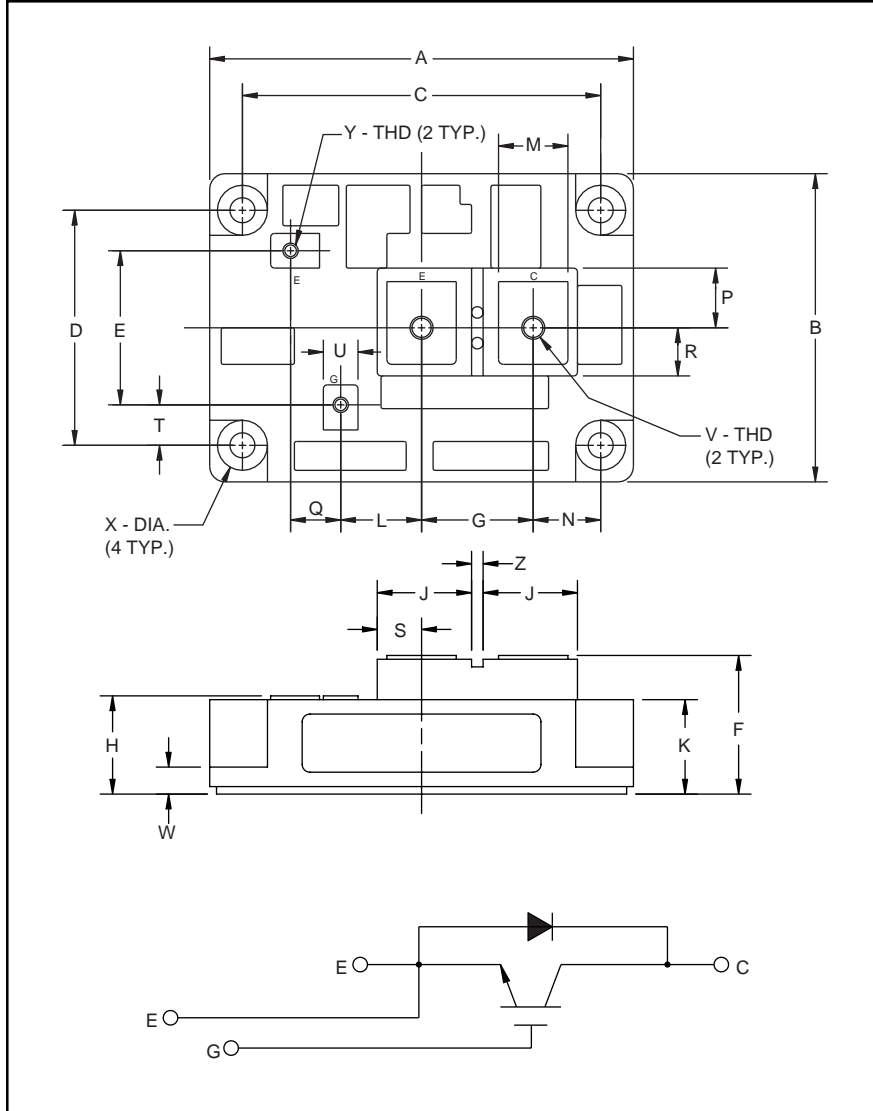


### Single IGBTMOD™ H-Series Module 600 Amperes/600 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.33	110.0
B	3.15	80.0
C	3.66±0.008	93.0±0.25
D	2.44±0.008	62.0±0.25
E	1.57	40.0
F	1.42 Max.	36.0 Max.
G	1.14	29.0
H	1.00 Max.	25.5 Max.
J	0.96	25.0
K	0.94	24.5
L	0.83	21.0
M	0.71	18.0

Dimensions	Inches	Millimeters
N	0.69	17.5
P	0.61	15.5
Q	0.51	13.0
R	0.49	12.5
S	0.45	11.5
T	0.43	11.0
U	0.35	9.0
V	M8 Metric	M8
W	0.28	7.0
X	0.256 Dia.	Dia. 6.50
Y	M4 Metric	M4
Z	0.12	3.04



#### 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 (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. CM600HA-12H is a 600V ( $V_{CES}$ ), 600 Ampere Single IGBTMOD™ Power Module.

Type	Current Rating Amperes	$V_{CES}$ Volts (x 50)
CM	600	12

**CM600HA-12H**  
**Single IGBTMOD™ H-Series Module**  
 600 Amperes/600 Volts

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

Ratings	Symbol	CM600HA-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	$I_C$	600	Amperes
Peak Collector Current	$I_{\text{CM}}$	1200*	Amperes
Diode Forward Current	$I_F$	600	Amperes
Diode Forward Surge Current	$I_{\text{FM}}$	1200*	Amperes
Power Dissipation	$P_d$	2100	Watts
Max. Mounting Torque M8 Terminal Screws	-	95	in-lb
Max. Mounting Torque M6 Mounting Screws	-	26	in-lb
Module Weight (Typical)	-	560	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	$V_{\text{GE(th)}}$	$I_C = 60\text{mA}, V_{\text{CE}} = 10\text{V}$	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_C = 600\text{A}, V_{\text{GE}} = 15\text{V}$	-	2.1	2.8**	Volts
		$I_C = 600\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 150\text{ }^\circ\text{C}$	-	2.15	-	Volts
Total Gate Charge	$Q_G$	$V_{\text{CC}} = 600\text{V}, I_C = 600\text{A}, V_{\text{GS}} = 15\text{V}$	-	1800	-	nC
Diode Forward Voltage	$V_{\text{FM}}$	$I_E = 600\text{A}, V_{\text{GS}} = 0\text{V}$	-	-	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	$C_{\text{ies}}$		-	-	60	nF
Output Capacitance	$C_{\text{oes}}$	$V_{\text{GE}} = 0\text{V}, V_{\text{CE}} = 10\text{V}, f = 1\text{MHz}$	-	-	21	nF
Reverse Transfer Capacitance	$C_{\text{res}}$		-	-	12	nF
Resistive	Turn-on Delay Time	$t_{\text{d(on)}}$	-	-	350	ns
	Rise Time	$t_r$	-	-	700	ns
Switching	Turn-off Delay Time	$t_{\text{d(off)}}$	-	-	350	ns
	Fall Time	$t_f$	-	-	300	ns
Diode Reverse Recovery Time	$t_{\text{rr}}$	$I_E = 600\text{A}, di_E/dt = -1200\text{A}/\mu\text{s}$	-	-	110	ns
Diode Reverse Recovery Charge	$Q_{\text{rr}}$	$I_E = 600\text{A}, di_E/dt = -1200\text{A}/\mu\text{s}$	-	1.62	-	$\mu\text{C}$

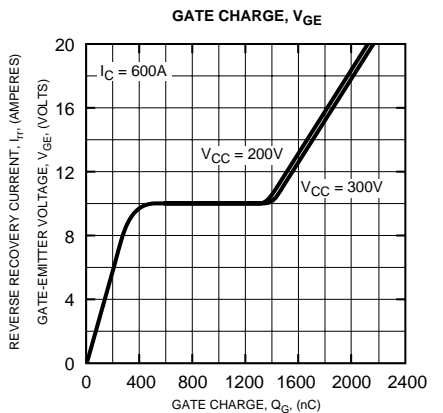
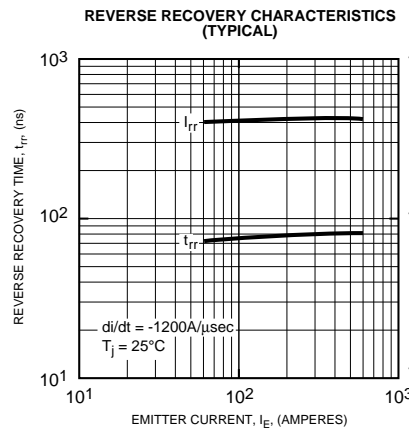
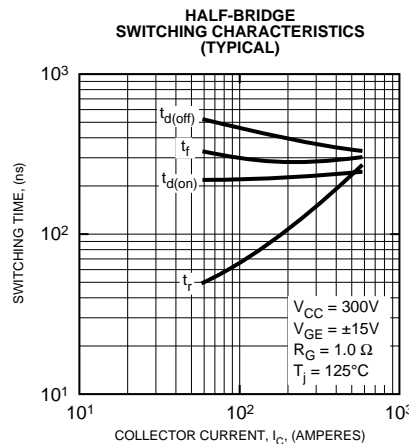
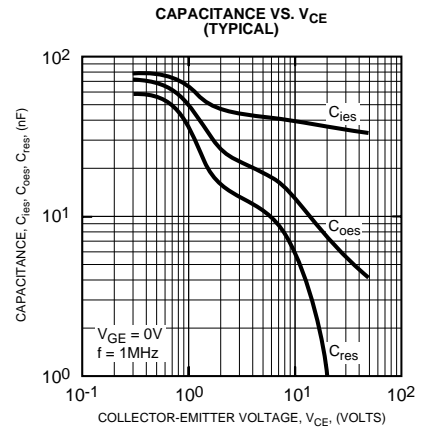
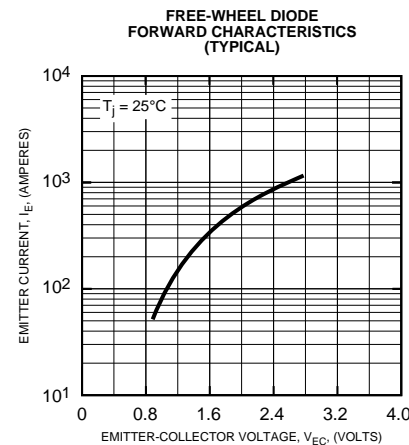
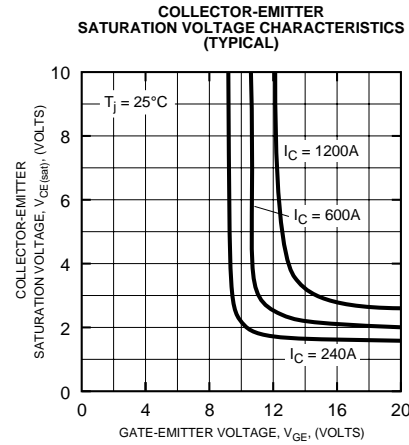
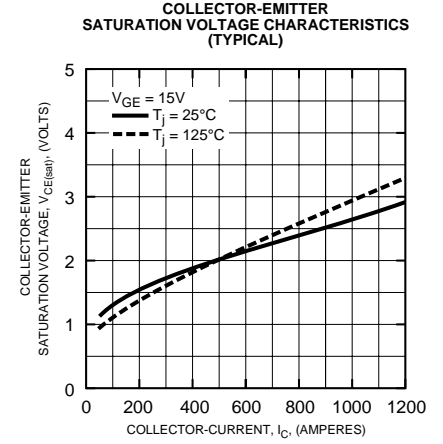
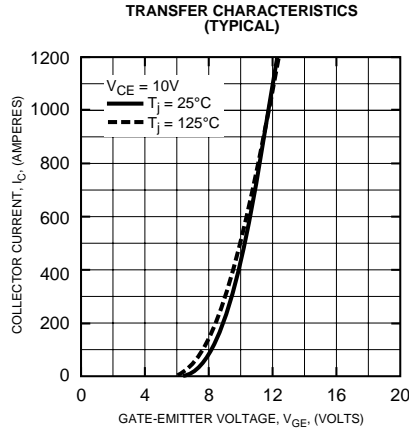
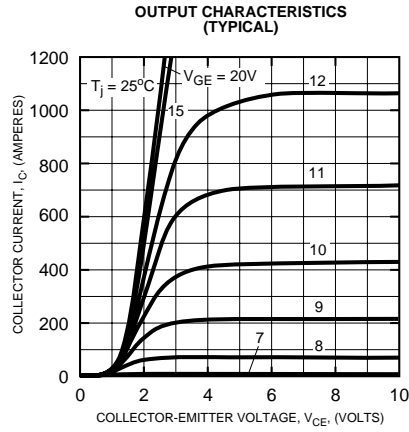
**Thermal and Mechanical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	Per IGBT	-	-	0.06	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	Per FWDi	-	-	0.12	$^\circ\text{C}/\text{W}$
Contact Thermal Resistance	$R_{\text{th(c-f)}}$	Per Module, Thermal Grease Applied	-	-	0.035	$^\circ\text{C}/\text{W}$



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

**CM600HA-12H**  
**Single IGBTMOD™ H-Series Module**  
 600 Amperes/600 Volts



**CM600HA-12H**  
**Single IGBTMOD™ H-Series Module**  
 600 Amperes/600 Volts

