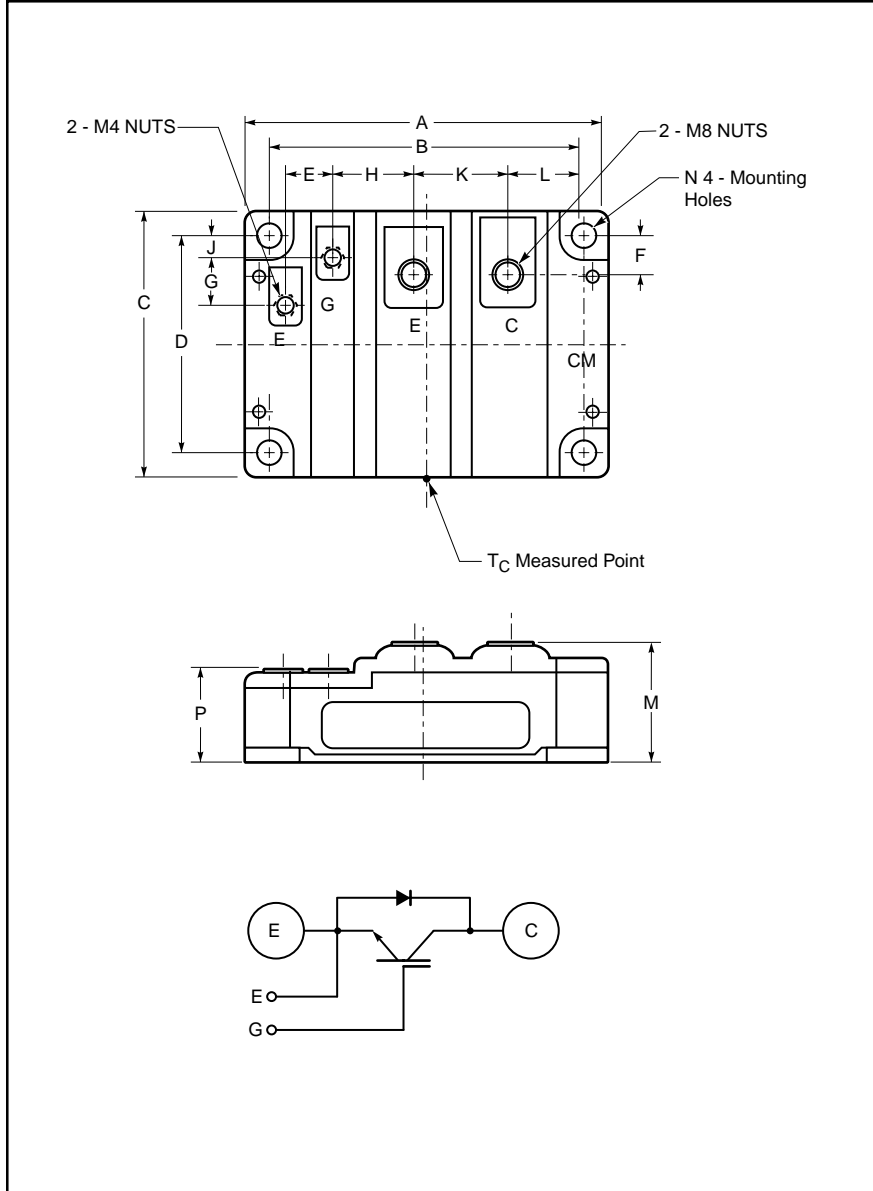


Single IGBTMOD™ U-Series Module 600 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.33	110.0
B	3.66±0.01	93.0±0.25
C	3.15	80.0
D	2.44±0.01	62.0±0.25
E	0.53	13.5
F	0.37	9.5
G	0.57	14.5

Dimensions	Inches	Millimeters
H	0.96	24.5
J	0.22	5.5
K	1.14	29.0
L	0.85	21.5
M	1.34 +0.04/-0.02	34 +1.0/-0.5
N	0.26 Dia.	6.5 Dia.
P	1.02 +0.04/-0.02	26 +1.0/-0.5



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
- 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 module number you desire from the table - i.e. CM600HU-24H is a 1200V (V_{CES}), 600 Ampere Single IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	600	24

CM600HU-24H
Single IGBTMOD™ U-Series Module
 600 Amperes/1200 Volts

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

Ratings	Symbol	CM600HU-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 (C-E SHORT)	V_{GES}	± 20	Volts
Collector Current ($T_c = 25^\circ\text{C}$)	I_c	600	Amperes
Peak Collector Current ($T_j \leq 150^\circ\text{C}$)	I_{CM}	1200*	Amperes
Emitter Current** ($T_c = 25^\circ\text{C}$)	I_E	600	Amperes
Peak Emitter Current**	I_{EM}	1200*	Amperes
Maximum Collector Dissipation ($T_c = 25^\circ\text{C}$)	P_c	3100	Watts
Mounting Torque, M8 Main Terminal	–	95	in-lb
Mounting Torque, M6 Mounting	–	40	in-lb
Mounting Torque, M4 Terminal	–	15	in-lb
Weight	–	600	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V_{ISO}	2500	Volts

* Pulse width and repetition rate should be such that the device junction temperature (T_j) does not exceed $T_{j(\text{max})}$ rating.

**Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDi).

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}	$V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$	–	–	2	mA
Gate Leakage Voltage	I_{GES}	$V_{\text{GE}} = V_{\text{GES}}, V_{\text{CE}} = 0\text{V}$	–	–	0.5	μA
Gate-Emitter Threshold Voltage	$V_{\text{GE(th)}}$	$I_c = 60\text{mA}, V_{\text{CE}} = 10\text{V}$	4.5	6	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_c = 600\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 25^\circ\text{C}$	–	2.9	3.7	Volts
		$I_c = 600\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 125^\circ\text{C}$	–	2.85	–	Volts
Total Gate Charge	Q_G	$V_{\text{CC}} = 600\text{V}, I_c = 600\text{A}, V_{\text{GE}} = 15\text{V}$	–	2250	–	nC
Emitter-Collector Voltage*	V_{EC}	$I_E = 600\text{A}, V_{\text{GE}} = 0\text{V}$	–	–	3.2	Volts

* Pulse width and repetition rate should be such that the device junction temperature (T_j) does not exceed $T_{j(\text{max})}$ rating.

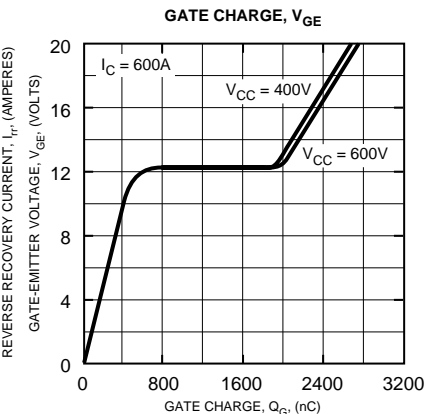
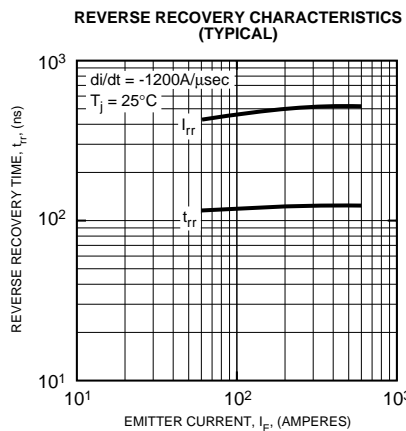
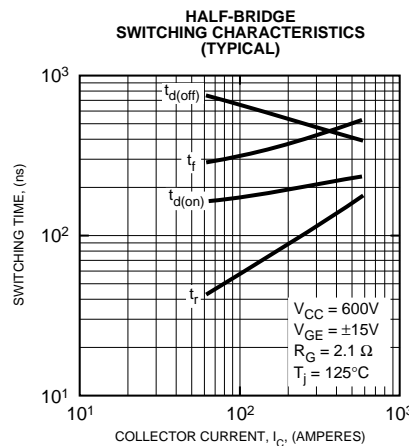
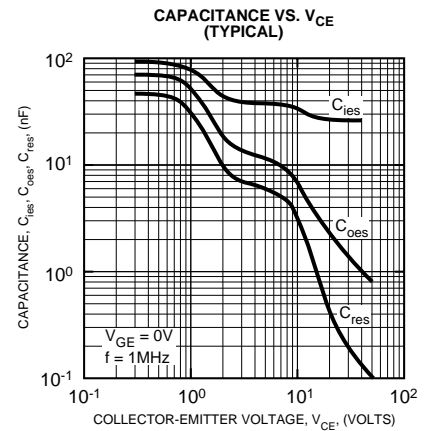
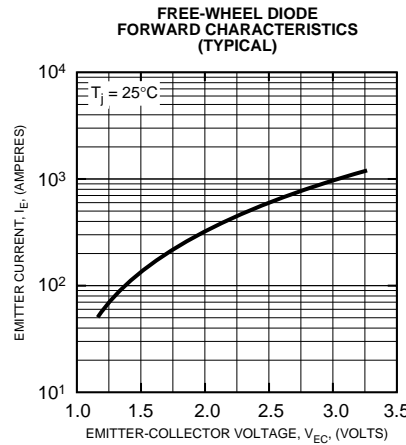
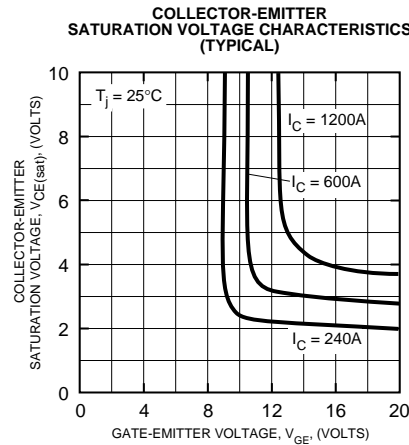
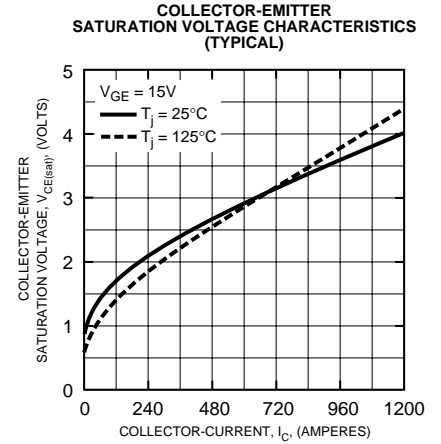
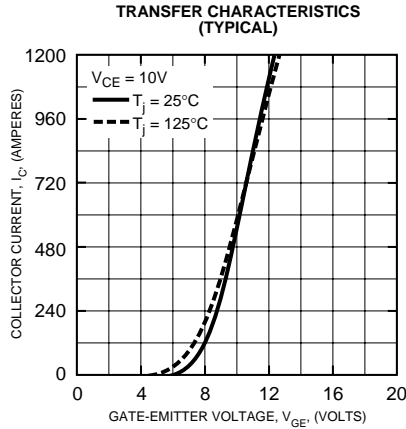
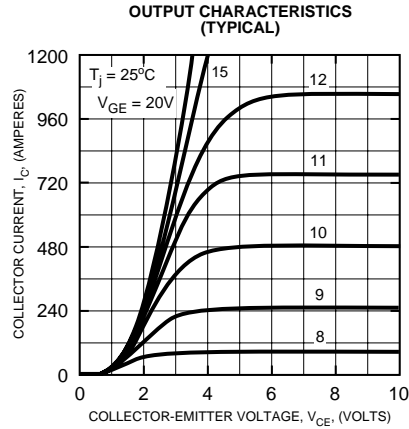
Dynamic Electrical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{ies}		–	–	90	nf
Output Capacitance	C_{oes}	$V_{\text{CE}} = 10\text{V}, V_{\text{GE}} = 0\text{V}$	–	–	31.5	nf
Reverse Transfer Capacitance	C_{res}		–	–	18	nf
Resistive Load	Turn-on Delay Time	$V_{\text{CC}} = 600\text{V}, I_c = 600\text{A},$ $V_{\text{GE1}} = V_{\text{GE2}} = 15\text{V},$ $R_G = 2.1\Omega,$ Resistive	–	–	300	ns
	Rise Time					
Switch Times	Turn-off Delay Time	Load Switching Operation	–	–	450	ns
	Fall Time					
Diode Reverse Recovery Time	t_{rr}	$I_E = 600\text{A}, di_E/dt = -1200\text{A}/\mu\text{s}$	–	–	300	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_E = 600\text{A}, di_E/dt = -1200\text{A}/\mu\text{s}$	–	3.3	–	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	$R_{\text{th(j-c)Q}}$	Per IGBT Module	–	–	0.04	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)D}}$	Per FWDi Module	–	–	0.06	$^\circ\text{C}/\text{W}$
Contact Thermal Resistance	$R_{\text{th(c-f)}}$	Per Module, Thermal Grease Applied	–	0.015	–	$^\circ\text{C}/\text{W}$

CM600HU-24H
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