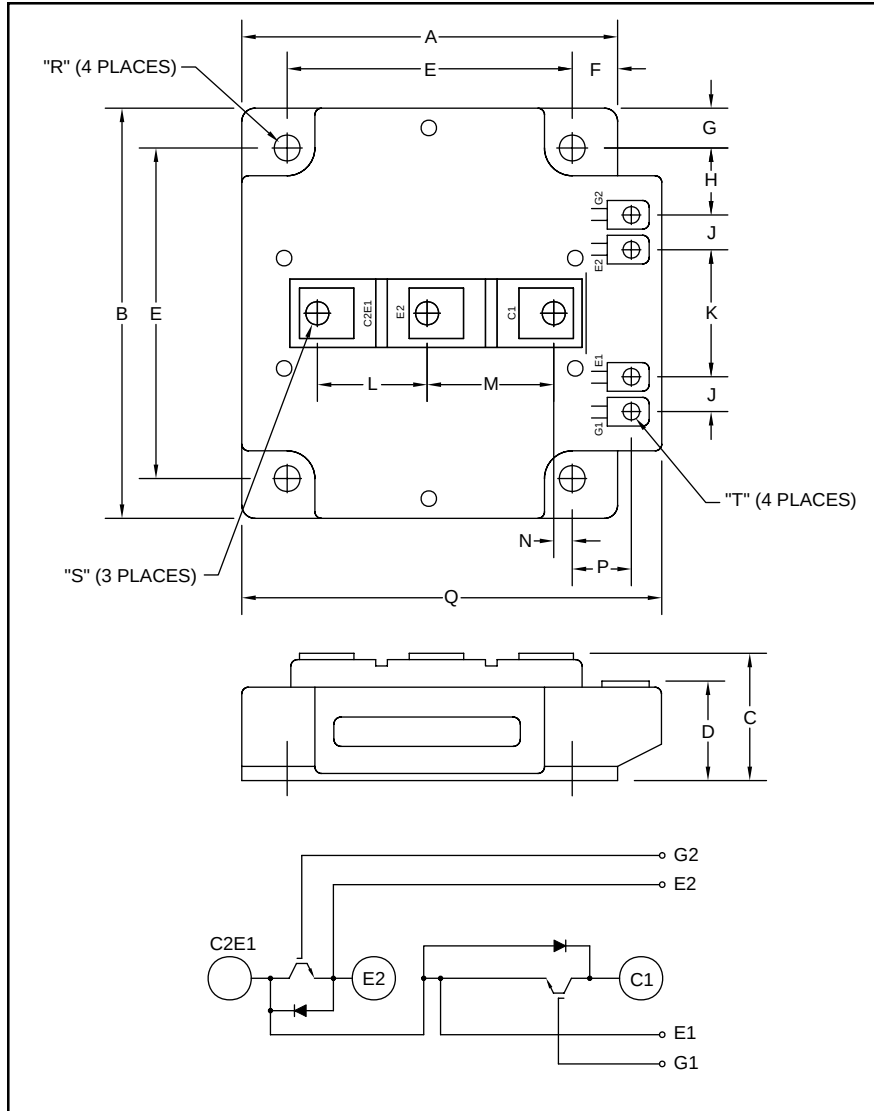


Dual IGBTMOD™ U-Series Module 800 Amperes/600 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	5.12	130.0
B	5.12	130.0
C	1.38	35.0
D	0.96	24.5
E	4.33	110.0
F	0.39	10.0
G	0.39	10.0
H	0.81	20.5
J	0.53	14.5

Dimensions	Inches	Millimeters
K	1.57	40.0
L	1.42	36.0
M	1.72	43.8
N	0.54	13.8
P	0.45	11.5
Q	5.51	140.0
R	0.26	6.5
S	M8	M8
T	M4	M4



Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of two IGBT Transistors in a half-bridge configuration with each transistor having 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. CM800DU-12H is a 600V (V_{CES}), 800 Ampere Dual IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	800	12

CM800DU-12H
Dual IGBTMOD™ U-Series Module
 800 Amperes/600 Volts

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

Ratings	Symbol	CM800DU-12H	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}	600	Volts
Gate-Emitter Voltage (C-E SHORT)	V_{GES}	± 20	Volts
Collector Current ($T_c = 25^\circ\text{C}$)	I_c	800	Amperes
Peak Collector Current	I_{CM}	1600*	Amperes
Emitter Current** ($T_c = 25^\circ\text{C}$)	I_E	800	Amperes
Peak Emitter Current**	I_{EM}	1600*	Amperes
Maximum Collector Dissipation ($T_c = 25^\circ\text{C}$, $T_j \leq 150^\circ\text{C}$)	P_c	1500	Watts
Mounting Torque, M8 Main Terminal	—	95	in-lb
Mounting Torque, M6 Mounting	—	40	in-lb
G(E) Terminal, M4	—	15	in-lb
Weight	—	1200	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	$V_{\text{GE(th)}}$	$I_c = 80\text{mA}$, $V_{\text{CE}} = 10\text{V}$	4.5	6	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_c = 800\text{A}$, $V_{\text{GE}} = 15\text{V}$, $T_j = 25^\circ\text{C}$	—	2.55	3.15	Volts
		$I_c = 800\text{A}$, $V_{\text{GE}} = 15\text{V}$, $T_j = 125^\circ\text{C}$	—	2.75	—	Volts
Total Gate Charge	Q_G	$V_{\text{CC}} = 300\text{V}$, $I_c = 800\text{A}$, $V_{\text{GE}} = 15\text{V}$	—	1600	—	nC
Emitter-Collector Voltage**	V_{EC}	$I_E = 800\text{A}$, $V_{\text{GE}} = 0\text{V}$	—	—	2.6	Volts

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

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{ies}		—	—	70.4	nF
Output Capacitance	C_{oes}	$V_{\text{CE}} = 10\text{V}$, $V_{\text{GE}} = 0\text{V}$	—	—	38.4	nF
Reverse Transfer Capacitance	C_{res}		—	—	10.4	nF
Resistive	Turn-on Delay Time	$V_{\text{CC}} = 300\text{V}$, $I_c = 800\text{A}$, $V_{\text{GE1}} = V_{\text{GE2}} = 15\text{V}$,	—	—	400	ns
Load	Rise Time		—	—	2000	ns
Switch	Turn-off Delay Time	$R_G = 3.1\Omega$, Resistive Load Switching Operation	—	—	500	ns
Times	Fall Time		—	—	300	ns
Diode Reverse Recovery Time**	t_{rr}	$I_E = 800\text{A}$, $dI_E/dt = -1600\text{A}/\mu\text{s}$	—	—	160	ns
Diode Reverse Recovery Charge**	Q_{rr}	$I_E = 800\text{A}$, $dI_E/dt = -1600\text{A}/\mu\text{s}$	—	1.92	—	μC

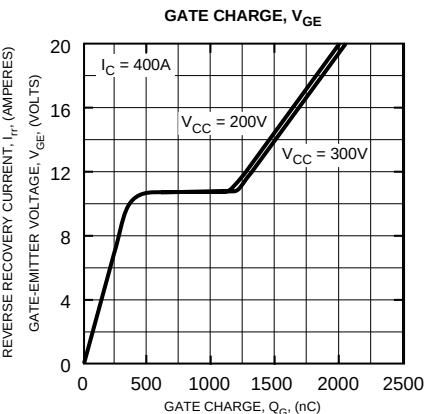
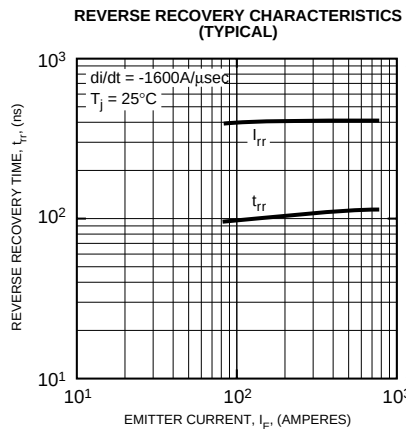
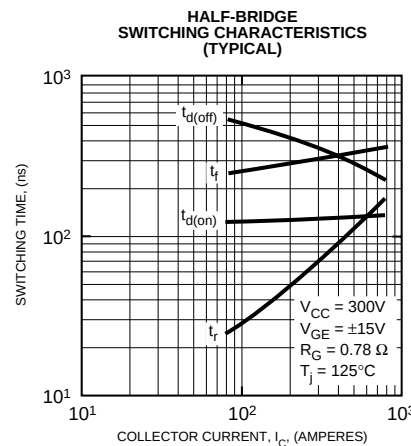
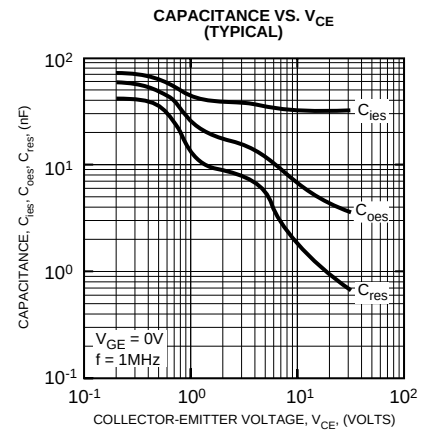
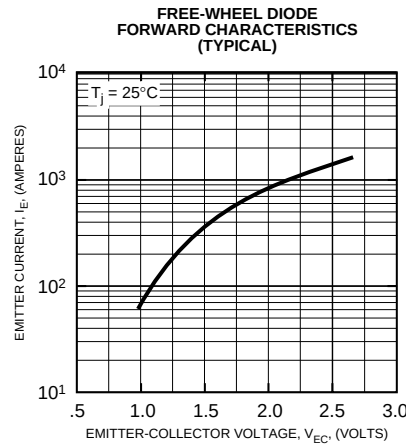
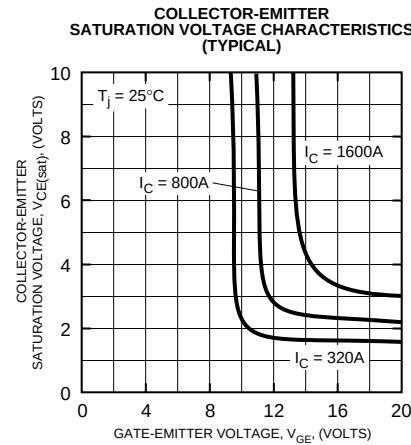
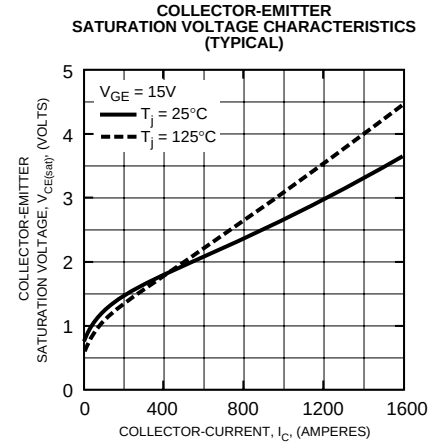
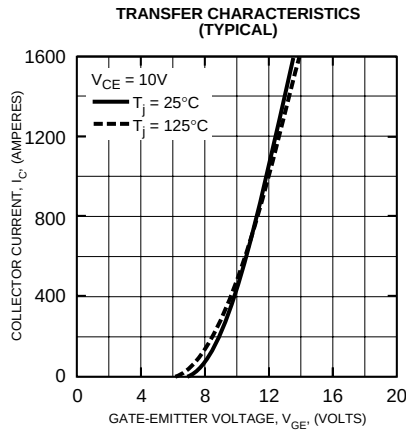
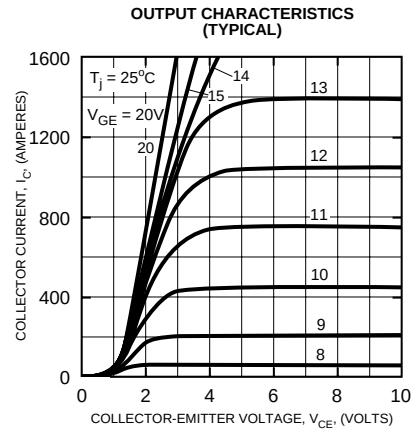
**Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDI).

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 1/2 Module	—	—	0.083	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)R}}$	Per FWDI 1/2 Module	—	—	0.13	$^\circ\text{C}/\text{W}$
Contact Thermal Resistance	$R_{\text{th(c-f)}}$	Per Module, Thermal Grease Applied	—	0.010	—	$^\circ\text{C}/\text{W}$

CM800DU-12H

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