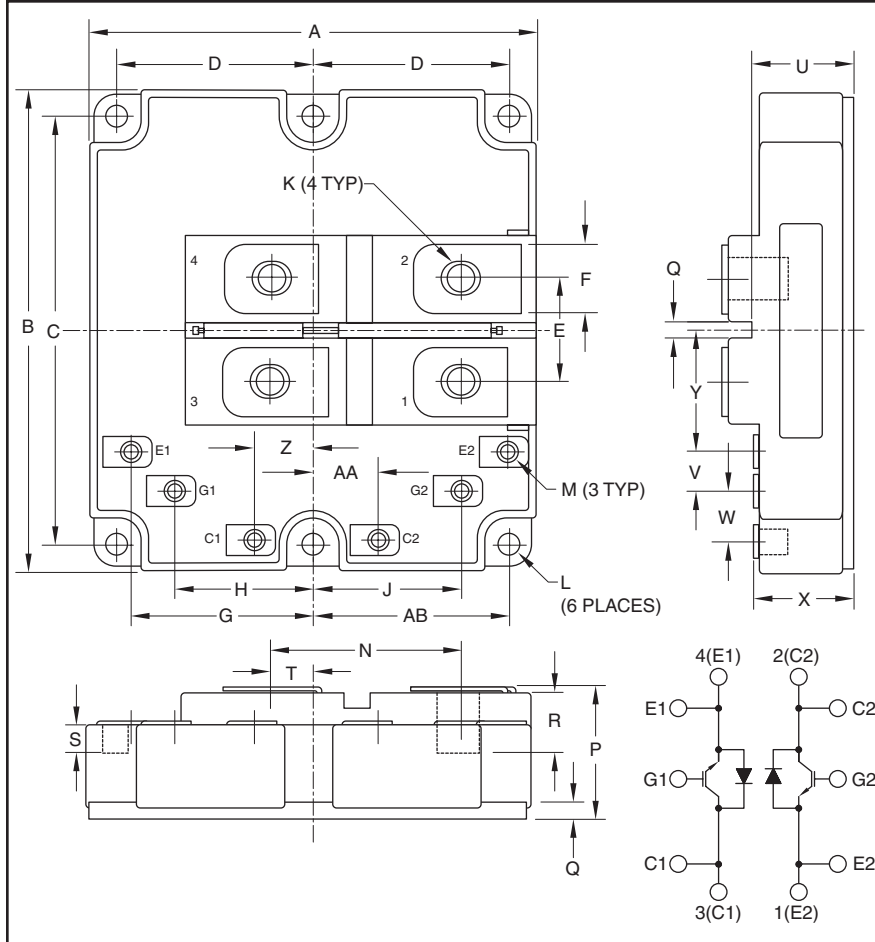


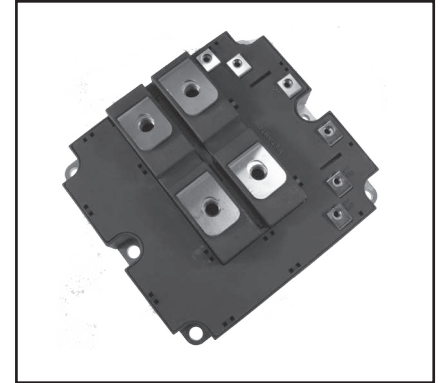
### Dual IGBTMOD™ HVIGBT Module 1200 Amperes/1700 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	5.12±0.02	130.0±0.5
B	5.51±0.02	140.0±0.5
C	4.88±0.01	124.0±0.25
D	2.24±0.01	57.0±0.25
E	1.18±0.008	30.0±0.2
F	0.79±0.004	20.0±0.1
G	2.09±0.008	53.0±0.2
H	1.57±0.008	40.0±0.2
J	1.73±0.008	44.0±0.2
K	M8 Metric	M8
L	0.28 Dia.	7.0 Dia.
M	M4 Metric	M4
N	2.17±0.01	55.2±0.3

Dimensions	Inches	Millimeters
P	1.50+0.04/-0.0	38.0+1.0/-0.0
Q	0.2±0.008	5.0±0.2
R	0.65 Min.	16.5 Min.
S	0.30 Min.	7.7 Min.
T	0.47±0.008	11.85±0.2
U	1.16±0.02	29.5±0.5
V	0.45±0.008	11.5±0.2
W	0.55±0.008	14.0±0.2
X	1.10+0.04/-0.0	28.0+1.0/-0.0
Y	1.38±0.008	35.0±0.2
Z	0.63±0.008	16.0±0.2
AA	0.71±0.008	18.0±0.2
AB	2.24±0.008	57.0±0.2



#### 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  $V_{CE(sat)}$
- Super-Fast Recovery Free-Wheel Diode
- Isolated Baseplate for Easy Heat Sinking

#### Applications:

- Traction
- Medium Voltage Drives
- High Voltage Power Supplies

#### Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM1200DB-34N is a 1700V ( $V_{CES}$ ), 1200 Ampere Dual IGBTMOD™ Power Module.

Type	Current Rating Amperes	$V_{CES}$ Volts (x 50)
CM	1200	34



Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272 www.pwr.com

**CM1200DB-34N**  
**Dual IGBTMOD™ HVIGBT Module**  
1200 Amperes/1700 Volts

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

Ratings	Symbol	CM1200DB-34N	Units
Junction Temperature	$T_j$	-40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 to 125	$^\circ\text{C}$
Operating Temperature	$T_{opr}$	-40 to 125	$^\circ\text{C}$
Collector-Emitter Voltage ( $V_{GE} = 0\text{V}$ )	$V_{CES}$	1700	Volts
Gate-Emitter Voltage ( $V_{CE} = 0\text{V}$ )	$V_{GES}$	$\pm 20$	Volts
Collector Current (DC, $T_c = 80^\circ\text{C}$ )	$I_C$	1200	Amperes
Peak Collector Current (Pulse)	$I_{CM}^{*1}$	2400	Amperes
Emitter Current ( $T_c = 25^\circ\text{C}$ )* <sup>2</sup>	$I_E$	1200	Amperes
Emitter Surge Current (Pulse)* <sup>2</sup>	$I_{EM}^{*1}$	2400	Amperes
Maximum Power Dissipation ( $T_c = 25^\circ\text{C}$ , IGBT Part)* <sup>3</sup>	$P_C$	6900	Watts
Max. Mounting Torque M8 Main Terminal Screws	–	177	in-lb
Max. Mounting Torque M6 Mounting Screws	–	53	in-lb
Max. Mounting Torque M4 Auxiliary Terminal Screws	–	27	in-lb
Module Weight (Typical)	–	1.3	kg
Isolation Voltage (RMS, Sinusoidal, $f = 60\text{Hz}$ , $t = 1\text{ min.}$ )	$V_{iso}$	4000	Volts
Maximum Short Circuit Pulse Width ( $V_{CC} = 1200\text{V}$ , $V_{CES} \leq 1700\text{V}$ , $V_{GE} = 15\text{V}$ , $T_j = 125^\circ\text{C}$ )	$t_{psc}$	10	$\mu\text{s}$

\*<sup>1</sup> Pulse width and repetition rate should be such that device junction temperature ( $T_j$ ) does not exceed  $T_{opr(max)}$  rating ( $125^\circ\text{C}$ ).

\*<sup>2</sup> Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDi).

\*<sup>3</sup> Junction temperature ( $T_j$ ) should not exceed  $T_{j(max)}$  rating ( $150^\circ\text{C}$ ).

**CM1200DB-34N**  
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**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-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 120mA, V_{CE} = 10V$	6.0	7.0	8.0	Volts
Gate Leakage Current	$I_{GES}$	$V_{GE} = V_{GES}, V_{CE} = 0V$	–	–	0.5	$\mu A$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1200A, V_{GE} = 15V, T_j = 25^\circ C^{*4}$	–	2.15	2.80	Volts
		$I_C = 1200A, V_{GE} = 15V, T_j = 125^\circ C^{*4}$	–	2.40	–	Volts
Input Capacitance	$C_{ies}$		–	176	–	nF
Output Capacitance	$C_{oes}$	$V_{CE} = 10V, f = 100kHz, V_{GE} = 0V$	–	9.6	–	nF
Reverse Transfer Capacitance	$C_{res}$		–	2.8	–	nF
Total Gate Charge	$Q_G$	$V_{CC} = 850V, I_C = 1200A, V_{GE} = 15V$	–	6.8	–	$\mu C$
Emitter-Collector Voltage	$V_{EC}^{*2}$	$I_E = 1200A, V_{GE} = 0V, T_j = 25^\circ C^{*4}$	–	2.60	3.30	Volts
		$I_E = 1200A, V_{GE} = 0V, T_j = 125^\circ C^{*4}$	–	2.30	–	Volts
Turn-On Delay Time	$t_{d(on)}$	$V_{CC} = 850V, I_C = 1200A,$	–	1.00	–	$\mu s$
Turn-On Rise Time	$t_r$	$V_{GE} = \pm 15V, R_{G(on)} = 1.3\Omega,$	–	0.40	–	$\mu s$
Turn-On Switching Energy	$E_{on}$	$T_j = 125^\circ C, L_s = 150nH, \text{ Inductive Load}$	–	380	–	mJ/P
Turn-Off Delay Time	$t_{d(off)}$	$V_{CC} = 850V, I_C = 1200A,$	–	1.20	–	$\mu s$
Turn-Off Fall Time	$t_f$	$V_{GE} = \pm 15V, R_{G(off)} = 3.3\Omega,$	–	0.30	–	$\mu s$
Turn-Off Switching Energy	$E_{off}$	$T_j = 125^\circ C, L_s = 150nH, \text{ Inductive Load}$	–	360	–	mJ/P
Reverse Recovery Time	$t_{rr}^{*2}$	$V_{CC} = 850V, I_C = 1200A,$	–	1.00	–	$\mu s$
Reverse Recovery Current	$I_{rr}^{*2}$	$V_{GE} = \pm 15V, R_{G(on)} = 1.3\Omega,$	–	560	–	Amperes
Reverse Recovery Charge	$Q_{rr}^{*2}$	$T_j = 125^\circ C, L_s = 150nH,$	–	300	–	$\mu C$
Reverse Recovery Energy	$E_{rec}^{*2}$	Inductive Load	–	220	–	mJ/P

\*2 Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDI).

\*4 Pulse width and repetition rate should be such as to cause negligible temperature rise.



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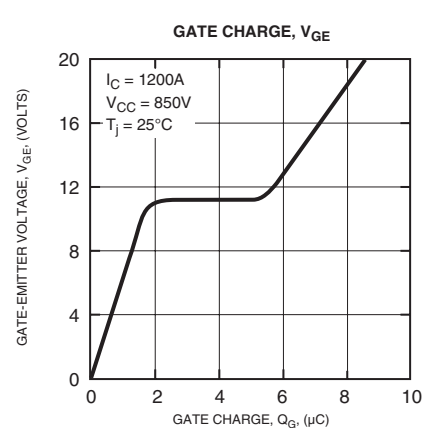
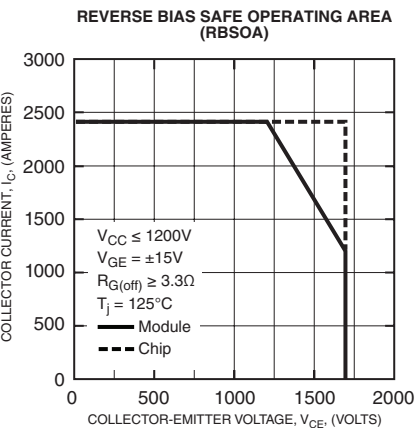
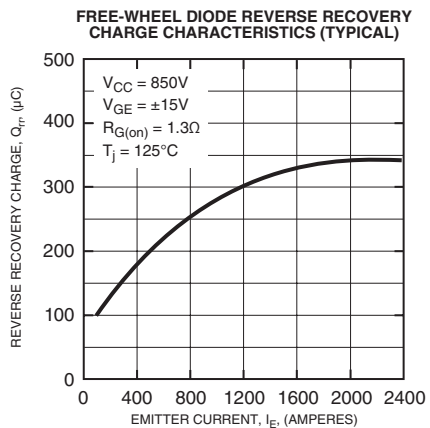
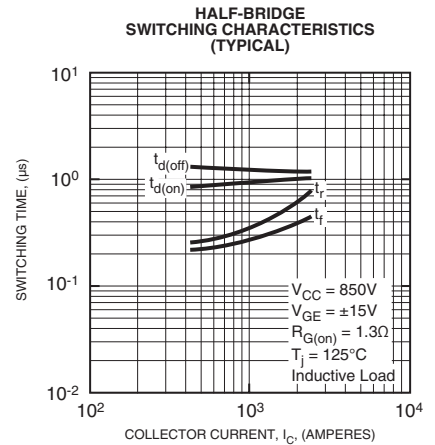
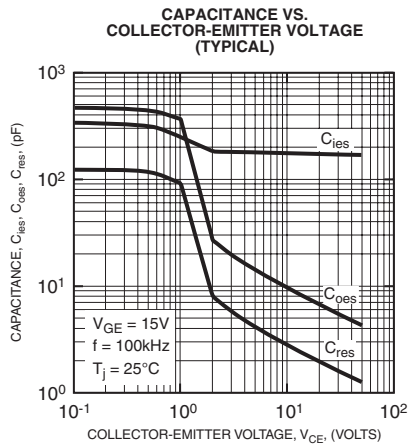
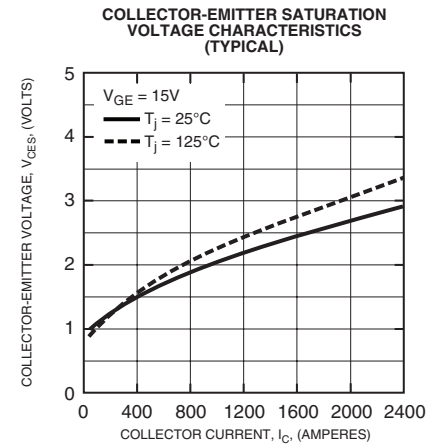
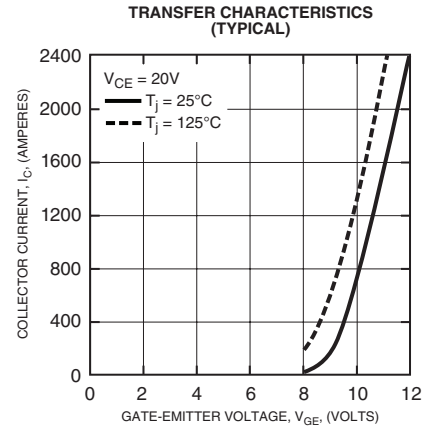
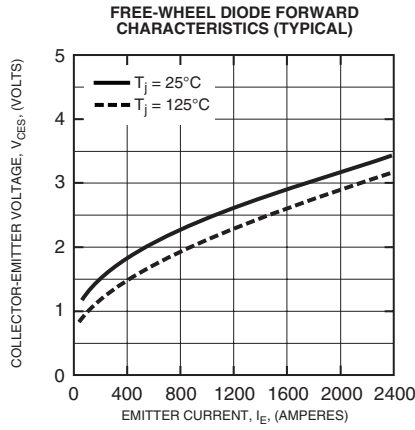
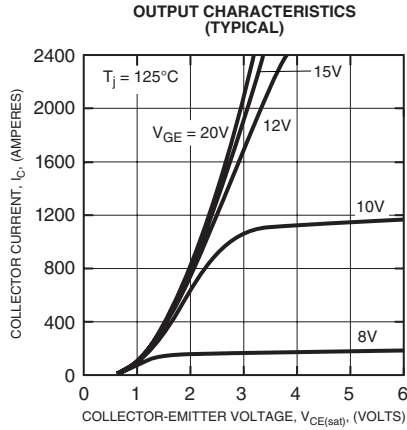
### Thermal Characteristics, $T_j = 25\text{ °C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c) Q}$	IGBT Part, 1/2 Module	–	–	0.018	°C/W
Thermal Resistance, Junction to Case	$R_{th(j-c) D}$	FWDi Part, 1/2 Module	–	–	0.040	°C/W
Contact Thermal Resistance, Case to Fin	$R_{th(c-f)}$	$\lambda_{grease} = 1W/m^2K$ , 1/2 Module	–	0.016	–	°C/W

### Mechanical Characteristics, $T_j = 25\text{ °C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Comparative Tracking Index	CTI	–	600	–	–	–
Clearance Distance in Air	$d_a$	–	9.5	–	–	mm
Creepage Distance Along Surface	$d_s$	–	15.0	–	–	mm
Internal Inductance	$L_{C-E(int)}$	IGBT Part	–	30	–	nH
Internal Lead Resistance	$R_{C-E(int)}$	$T_C = 25\text{ °C}$	–	0.28	–	mΩ

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