

## Excellent Integrated System Limited

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[Powerex Inc.](#)  
[CM400DU-34KA](#)

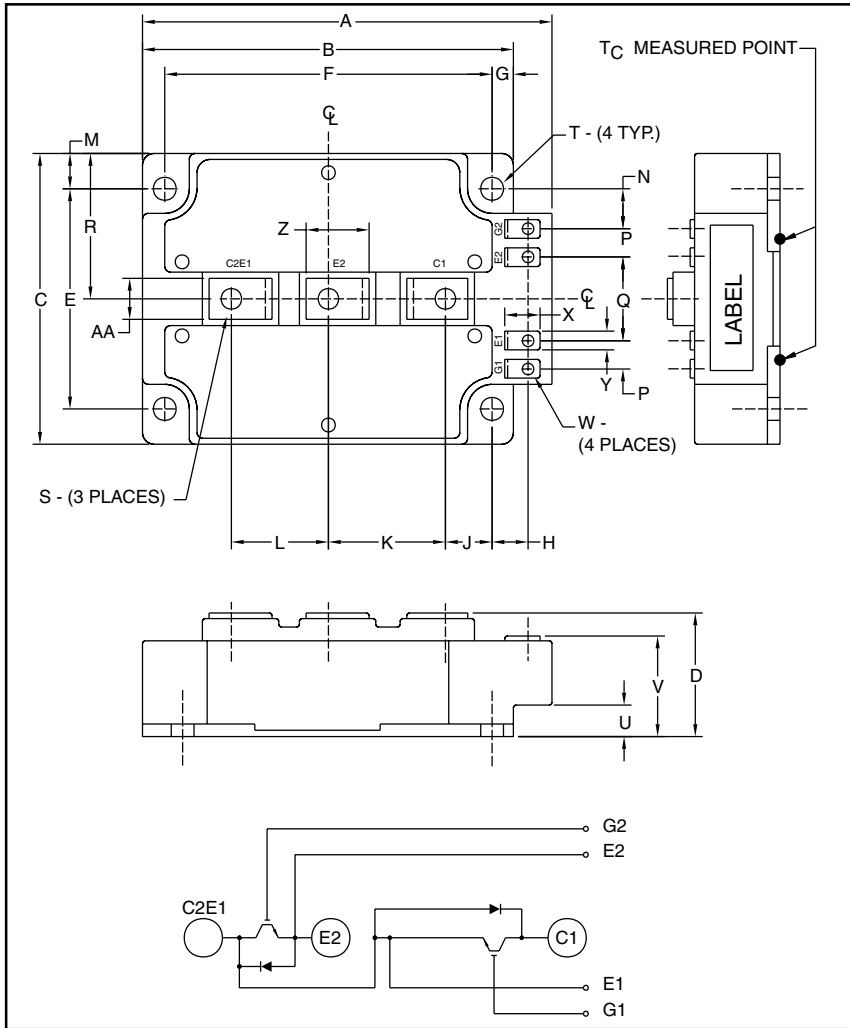
For any questions, you can email us directly:  
[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)



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

**CM400DU-34KA**

**Dual IGBTMOD™  
KA-Series Module  
400 Amperes/1700 Volts**



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	5.51	140.0
B	5.12	130.0
C	5.12	130.0
D	1.38	35.0
E	4.33	110.0
F	4.33	110.0
G	0.39	10.0
H	0.45	11.5
J	0.54	13.8
K	1.72	43.8
L	1.42	36.0
M	0.39	10.0
N	0.80	20.4

Dimensions	Inches	Millimeters
P	0.57	14.5
Q	1.57	40.0
R	2.56	65.0
S	M8	M8
T	0.26 Dia.	6.5 Dia.
S	0.32	8.0
V	0.97	24.5
W	M4	M4
X	0.59	15.0
Y	0.35	9.0
Z	1.02	26.0
AA	0.79	20.0



**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. CM400DU-34KA is a 1700V ( $V_{CES}$ ), 400 Ampere Dual IGBTMOD™ Power Module.

Type	Current Rating Amperes	$V_{CES}$ Volts (x 50)
CM	400	34



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

Ratings	Symbol	CM400DU-34KA	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)	$V_{CES}$	1700	Volts
Gate-Emitter Voltage (C-E SHORT)	$V_{GES}$	$\pm 20$	Volts
Collector Current ( $T_C = 25^\circ\text{C}$ )	$I_C$	400	Amperes
Peak Collector Current	$I_{CM}$	800*	Amperes
Emitter Current** ( $T_C = 25^\circ\text{C}$ )	$I_E$	400	Amperes
Peak Emitter Current**	$I_{EM}$	800*	Amperes
Maximum Collector Dissipation ( $T_C = 25^\circ\text{C}$ , $T_j \leq 150^\circ\text{C}$ )	$P_C$	1950	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.)	$V_{iso}$	3500	Volts

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

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

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	$I_{CES}$	$V_{CE} = V_{CES}$ , $V_{GE} = 0V$	-	-	1	mA
Gate Leakage Current	$I_{GES}$	$V_{GE} = V_{GES}$ , $V_{CE} = 0V$	-	-	0.5	$\mu\text{A}$
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 40\text{mA}$ , $V_{CE} = 10V$	4.0	5.5	7.0	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 400\text{A}$ , $V_{GE} = 15V$ , $T_j = 25^\circ\text{C}$	-	3.2	4.1	Volts
		$I_C = 400\text{A}$ , $V_{GE} = 15V$ , $T_j = 125^\circ\text{C}$	-	3.8	-	Volts
Total Gate Charge	$Q_G$	$V_{CC} = 1000V$ , $I_C = 400\text{A}$ , $V_{GE} = 15V$	-	1800	-	nC
Emitter-Collector Voltage**	$V_{EC}$	$I_E = 400\text{A}$ , $V_{GE} = 0V$ , $T_j = 25^\circ\text{C}$	-	-	4.6	Volts
		$I_E = 400\text{A}$ , $V_{GE} = 0V$ , $T_j = 125^\circ\text{C}$	-	2.2	-	Volts

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

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	$C_{ies}$		-	-	57.0	nf
Output Capacitance	$C_{oes}$	$V_{CE} = 10V$ , $V_{GE} = 0V$	-	-	9.6	nf
Reverse Transfer Capacitance	$C_{res}$		-	-	3.0	nf
Resistive Load	Turn-on Delay Time	$V_{CC} = 1000V$ , $I_C = 400\text{A}$ , $V_{GE1} = V_{GE2} = 15V$ ,	-	-	1000	ns
	Rise Time					
Switch Times	Turn-off Delay Time	$R_G = 1.0\Omega$ , Resistive Inductive Load	-	-	1000	ns
	Fall Time					
Diode Reverse Recovery Time**	$t_{rr}$	Switching Operation	-	-	600	ns
Diode Reverse Recovery Charge**	$Q_{rr}$	$I_E = 400\text{A}$	-	18.9	-	$\mu\text{C}$

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



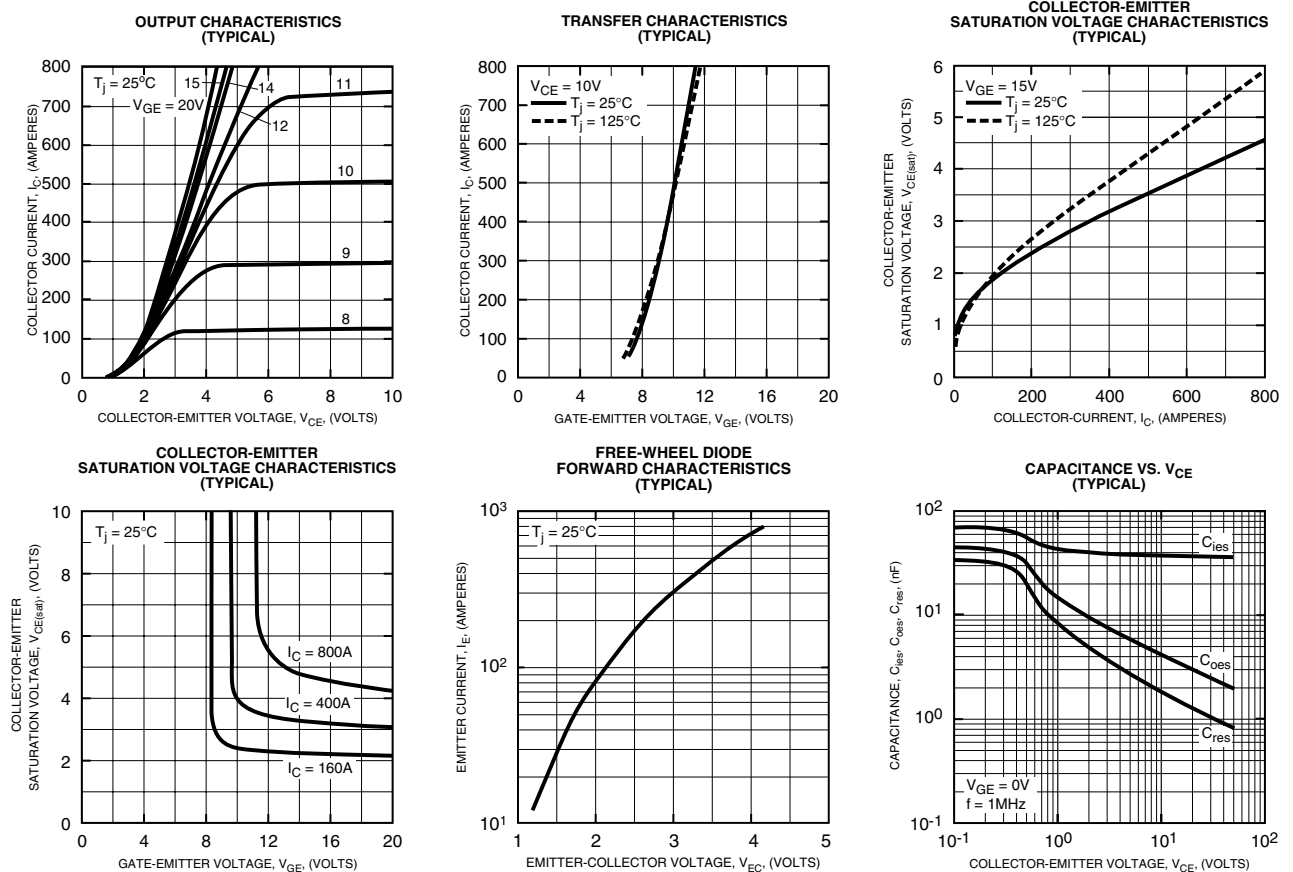
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**Thermal and Mechanical Characteristics,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)Q}$	Per IGBT 1/2 Module	—	—	0.064	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)D}$	Per FWDi 1/2 Module	—	—	0.11	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	—	0.010	—	$^\circ\text{C/W}$
Thermal Resistance	$R_{th(j-c')Q}$	$T_c$ Measured Point (Under Chips - IGBT Part)	—	—	0.025*	$^\circ\text{C/W}$

\* If you use this value,  $R_{th(f-a)}$  should be measured just under the chips.

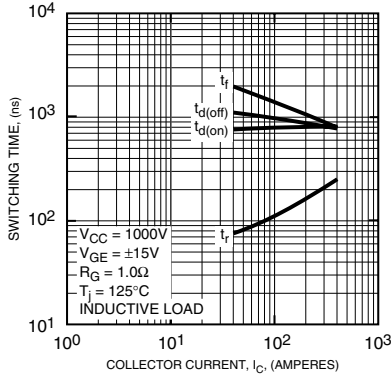




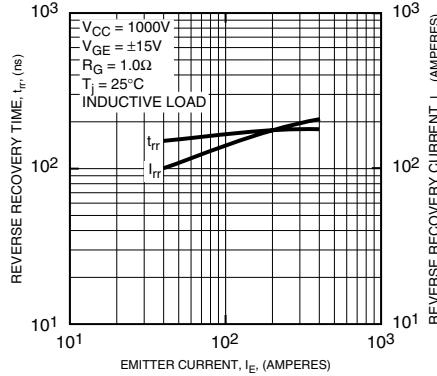
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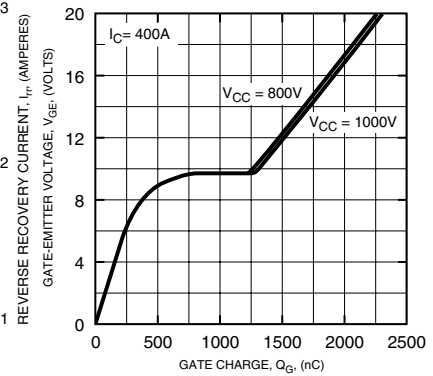
REVERSE RECOVERY CHARACTERISTICS (TYPICAL)



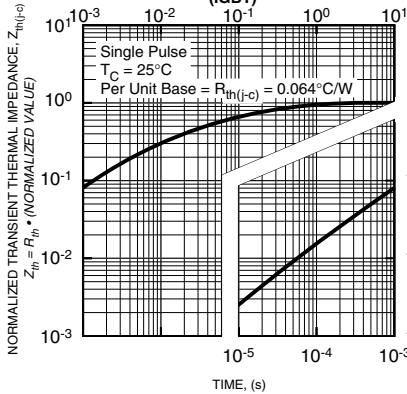
REVERSE RECOVERY CHARACTERISTICS (TYPICAL)



GATE CHARGE,  $V_{GE}$



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (FWD)

