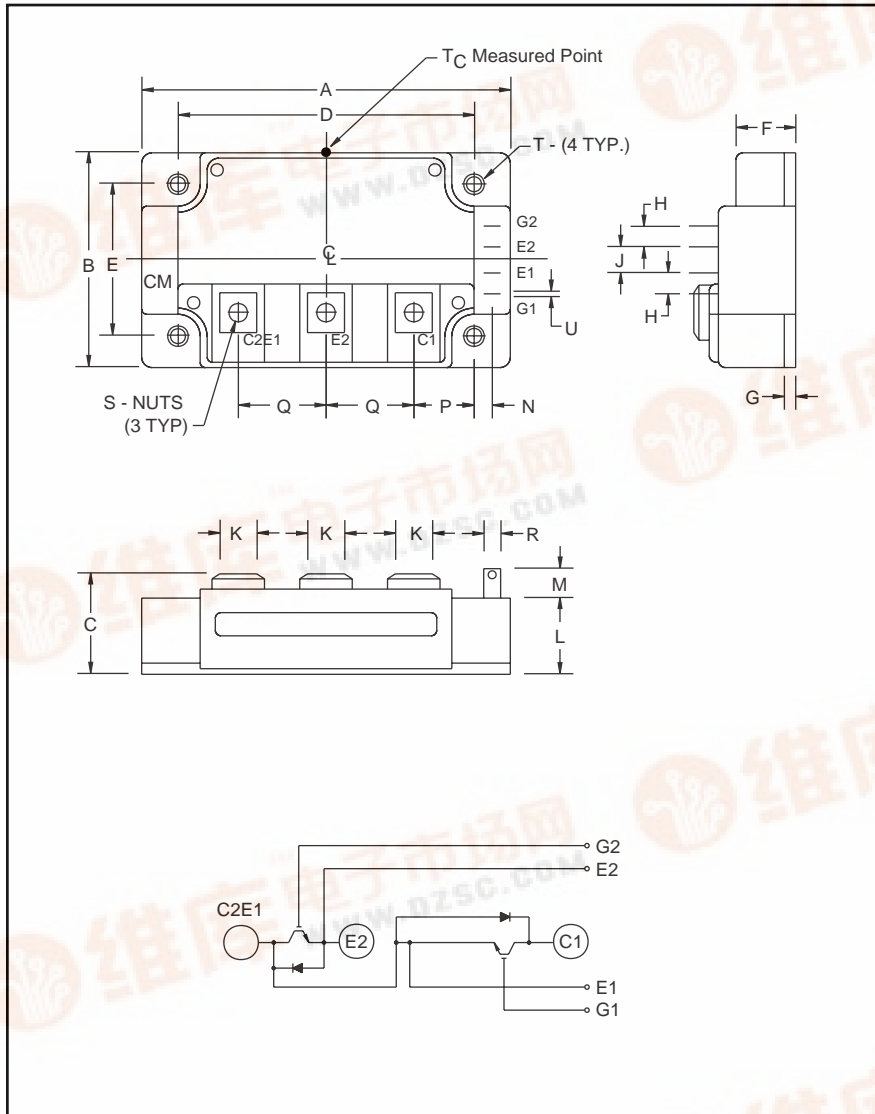




Powerex, Inc., 200 E. Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

## CM100DU-34KA

### Dual IGBTMOD™ KA-Series Module 100 Amperes/1700 Volts



#### 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. CM100DU-34KA is a 1700V ( $V_{CES}$ ), 100 Ampere Dual IGBTMOD™ Power Module.

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.25	108.0
B	2.44	62.0
C	1.14 +0.04/-0.02	29.0 +1.0/-0.5
D	3.66±0.01	93.0±0.25
E	1.88±0.01	48.0±0.25
F	0.67	17.0
G	0.16	4.0
H	0.24	6.0
J	0.59	15.0
K	0.55	14.0

Dimensions	Inches	Millimeters
L	0.87	22.0
M	0.33	8.5
N	0.10	2.5
P	0.85	21.5
Q	0.98	25.0
R	0.11	2.8
S	M6	M6
T	0.26 Dia.	6.5 Dia.
U	0.02	0.5

Type	Current Rating Amperes	$V_{CES}$ Volts (x 50)
CM	100	34





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

Ratings	Symbol	CM100DU-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 ( $T_c = 25^\circ\text{C}$ )	$I_C$	100	Amperes
Peak Collector Current ( $T_j \leq 150^\circ\text{C}$ )	$I_{CM}$	200*	Amperes
Emitter Current** ( $T_c = 25^\circ\text{C}$ )	$I_E$	100	Amperes
Peak Emitter Current**	$I_{EM}$	200*	Amperes
Maximum Collector Dissipation ( $T_c = 25^\circ\text{C}$ )	$P_c$	890	Watts
Mounting Torque, M6 Main Terminal	–	40	in-lb
Mounting Torque, M6 Mounting	–	40	in-lb
Weight	–	400	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	$V_{GE(th)}$	$I_C = 10\text{mA}, V_{CE} = 10V$	4.0	5.5	7.0	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 100A, V_{GE} = 15V, T_j = 25^\circ\text{C}$	–	3.2	4.0	Volts
		$I_C = 100A, V_{GE} = 15V, T_j = 125^\circ\text{C}$	–	3.8	–	Volts
Total Gate Charge	$Q_G$	$V_{CC} = 1000V, I_C = 100A, V_{GE} = 15V$	–	450	–	nC
Emitter-Collector Voltage*	$V_{EC}$	$I_E = 100A, V_{GE} = 0V, T_j = 25^\circ\text{C}$	–	–	4.6	Volts
		$I_E = 100A, V_{GE} = 0V, T_j = 125^\circ\text{C}$	–	2.2	–	Volts

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

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	$C_{ies}$		–	–	14.0	nf
Output Capacitance	$C_{oes}$	$V_{CE} = 10V, V_{GE} = 0V$	–	–	2.4	nf
Reverse Transfer Capacitance	$C_{res}$		–	–	0.75	nf
Resistive	Turn-on Delay Time	$V_{CC} = 1000V, I_C = 100A,$ $V_{GE1} = V_{GE2} = 15V,$	–	–	350	ns
	Rise Time					
Load	Turn-off Delay Time	$R_G = 3.1\Omega, \text{Resistive}$ Inductive Load	–	–	550	ns
	Fall Time					
Switch			–	–	800	ns
Reverse Recovery Time	$t_{rr}$	Switching Operation	–	–	600	ns
Reverse Recovery Charge	$Q_{rr}$	$I_E = 100A$	–	5.8	–	$\mu\text{C}$



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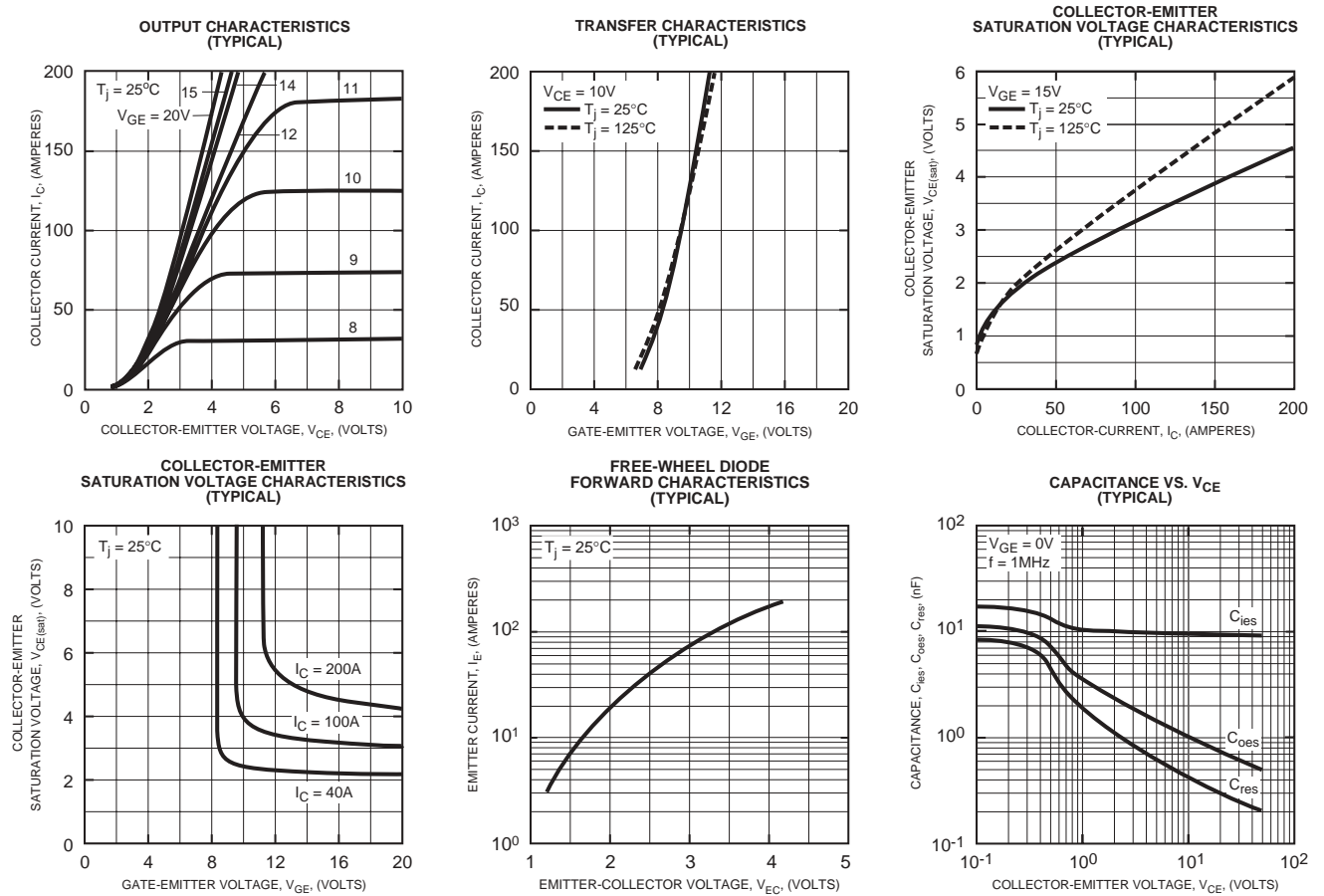
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**Thermal and Mechanical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)Q}$	Per IGBT 1/2 Module	–	–	0.14	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)D}$	Per FWDi 1/2 Module	–	–	0.24	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	–	0.040	–	$^\circ\text{C/W}$
Thermal Resistance	$R_{th(j-c)Q}$	$T_c$ Measured Point	–	–	0.09*	$^\circ\text{C/W}$

(Under Chips - IGBT Part)

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

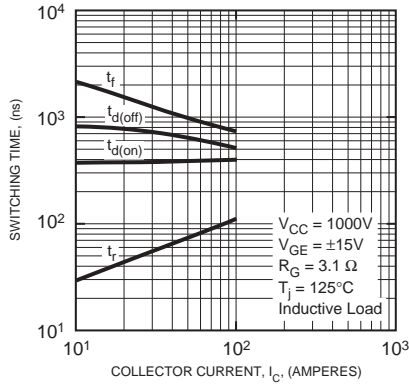




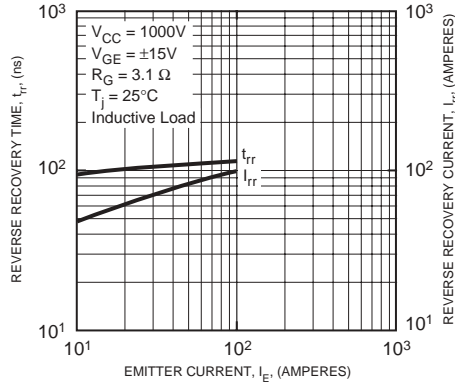
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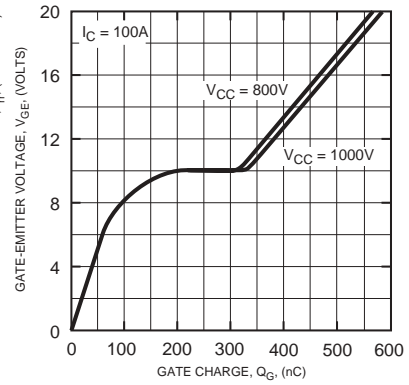
**HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)**



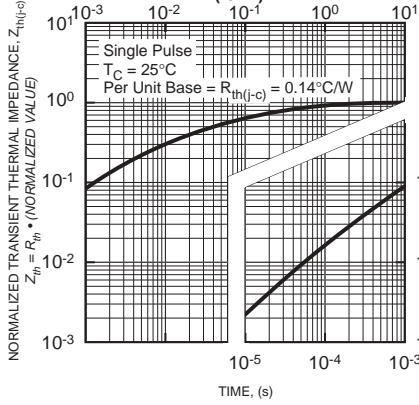
**REVERSE RECOVERY CHARACTERISTICS (TYPICAL)**



**GATE CHARGE,  $V_{GE}$**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (FWD)**

