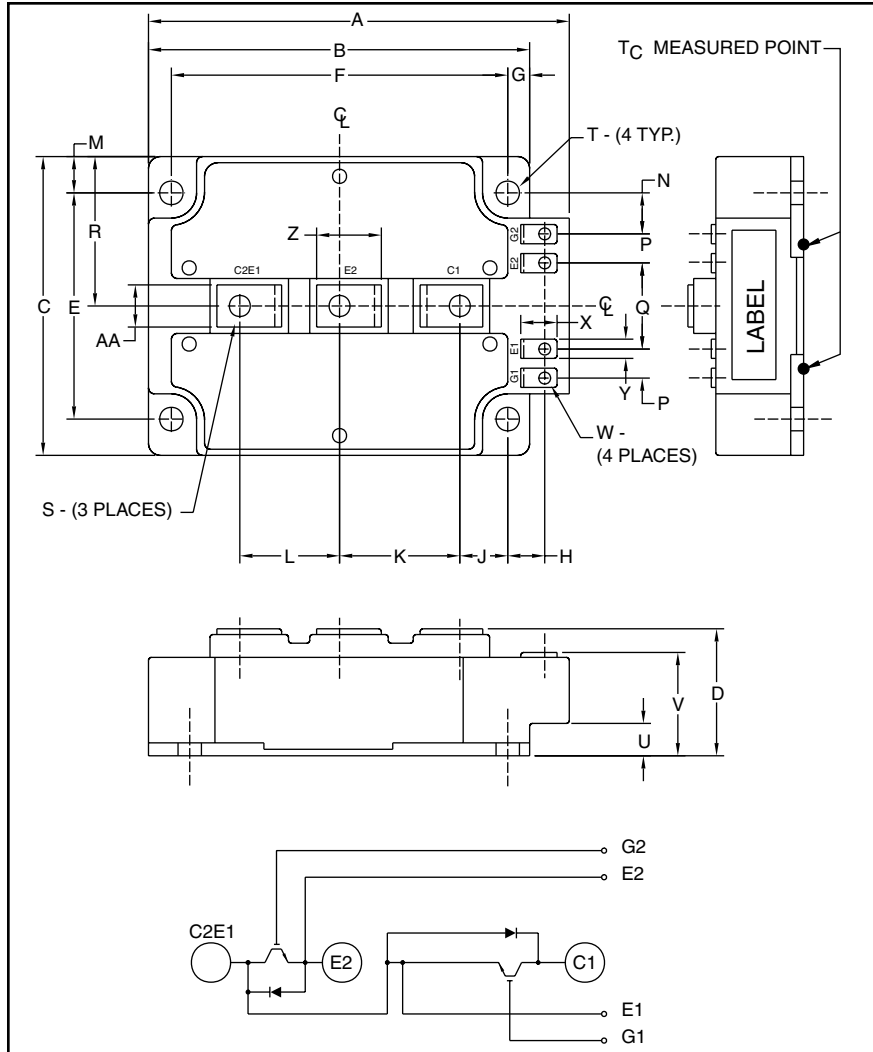


Dual IGBTMOD™ KA-Series Module 300 Amperes/1700 Volts



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. CM300DU-34KA is a 1700V (V_{CES}), 300 Ampere Dual IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	300	34

CM300DU-34KA
Dual IGBTMOD™ KA-Series Module
 300 Amperes/1700 Volts

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

Ratings	Symbol	CM300DU-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}	± 20	Volts
Collector Current ($T_c = 25^\circ\text{C}$)	I_C	300	Amperes
Peak Collector Current	I_{CM}	600*	Amperes
Emitter Current** ($T_c = 25^\circ\text{C}$)	I_E	300	Amperes
Peak Emitter Current**	I_{EM}	600*	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}	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, $T_j = 25^\circ\text{C}$ 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	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 30\text{mA}$, $V_{CE} = 10V$	4.0	5.5	7.0	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 300A$, $V_{GE} = 15V$, $T_j = 25^\circ\text{C}$	—	3.2	4.0	Volts
		$I_C = 300A$, $V_{GE} = 15V$, $T_j = 125^\circ\text{C}$	—	3.8	—	Volts
Total Gate Charge	Q_G	$V_{CC} = 1000V$, $I_C = 300A$, $V_{GE} = 15V$	—	1350	—	nC
Emitter-Collector Voltage**	V_{EC}	$I_E = 300A$, $V_{GE} = 0V$, $T_j = 25^\circ\text{C}$	—	—	4.6	Volts
		$I_E = 300A$, $V_{GE} = 0V$, $T_j = 125^\circ\text{C}$	—	2.2	—	Volts

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

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{ies}		—	—	42.0	nf
Output Capacitance	C_{oes}	$V_{CE} = 10V$, $V_{GE} = 0V$	—	—	7.2	nf
Reverse Transfer Capacitance	C_{res}		—	—	2.3	nf
Resistive	Turn-on Delay Time	$V_{CC} = 1000V$, $I_C = 300A$,	—	—	800	ns
Load	Rise Time					
Switch	Turn-off Delay Time	$V_{GE1} = V_{GE2} = 15V$, $R_G = 3.1\Omega$, Resistive	—	—	1000	ns
Times	Fall Time					
Diode Reverse Recovery Time**	t_{rr}	Inductive Load	—	—	800	ns
		Switching Operation	—	—	600	ns
Diode Reverse Recovery Charge**	Q_{rr}	$I_E = 300A$	—	11.2	—	μC

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

CM300DU-34KA

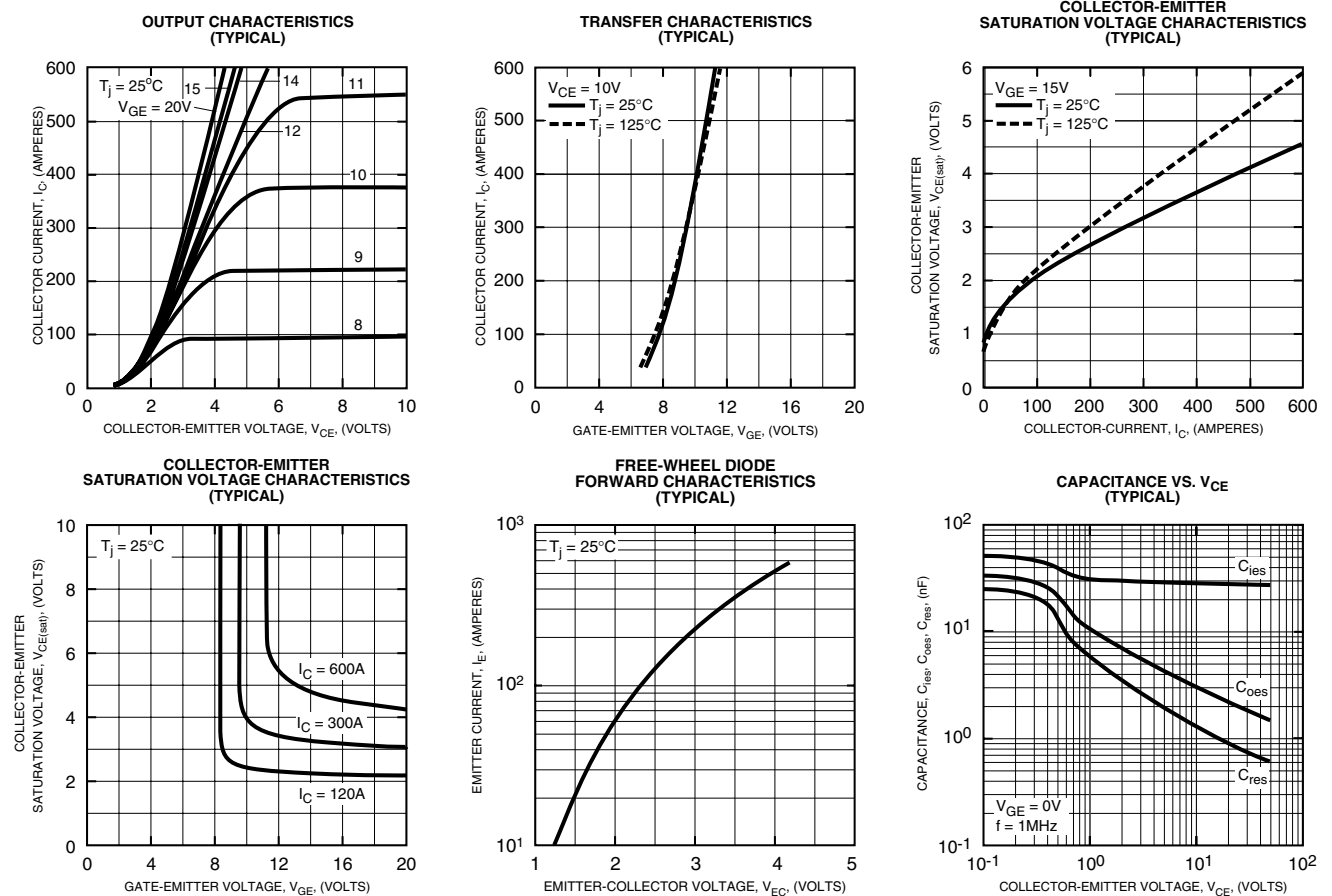
Dual IGBTMOD™ KA-Series Module

300 Amperes/1700 Volts

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	—	—	0.083	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)D}$	Per FWDi 1/2 Module	—	—	0.13	$^\circ\text{C/W}$
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)	—	—	0.035*	$^\circ\text{C/W}$

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

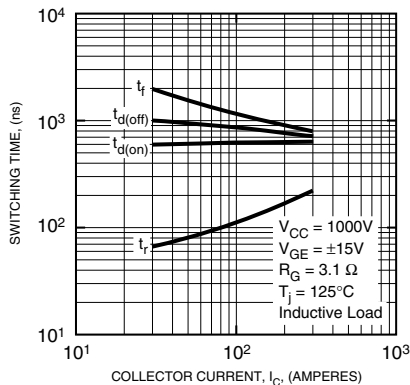


CM300DU-34KA

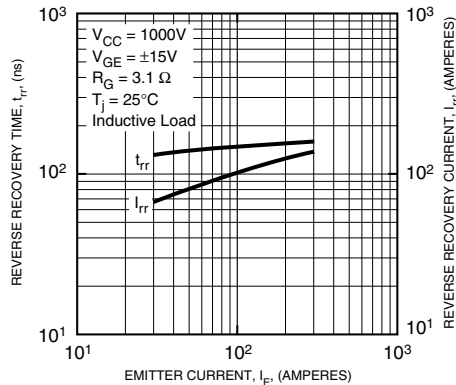
Dual IGBTMOD™ KA-Series Module

300 Amperes/1700 Volts

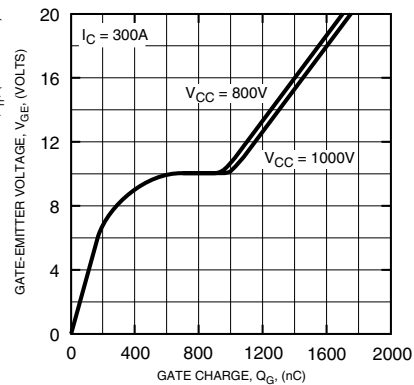
HALF-BRIDGE
SWITCHING CHARACTERISTICS
(TYPICAL)



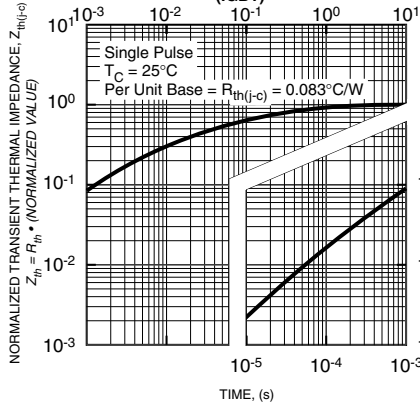
REVERSE RECOVERY CHARACTERISTICS
(TYPICAL)



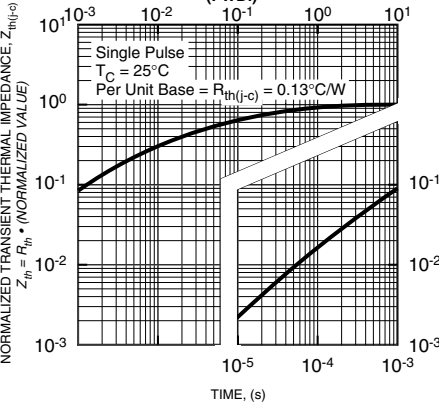
GATE CHARGE, V_{GE}



TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(IGBT)



TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(FWDI)



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