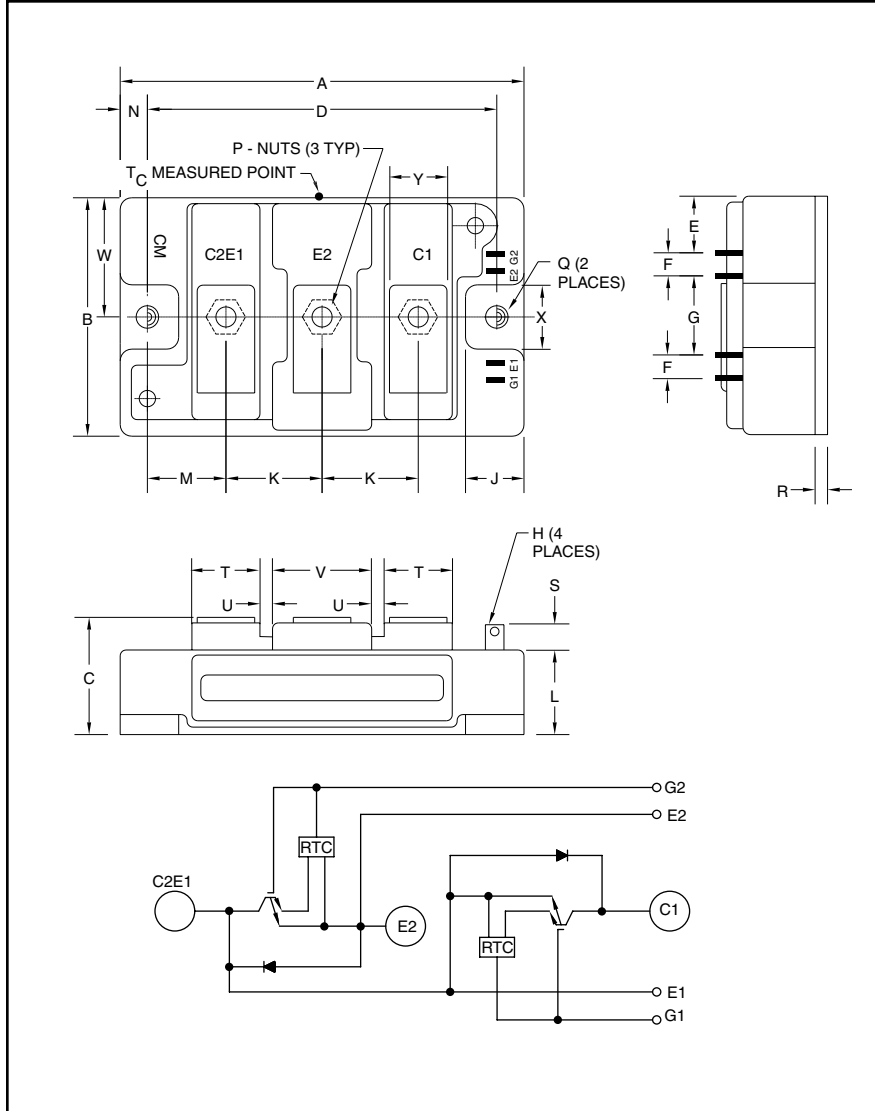


Trench Gate Design Dual IGBTMOD™ 50 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	3.70	94.0
B	1.89	48.0
C	1.18 +0.04/-0.02	30.0 +1.0/-0.5
D	3.15±0.01	80.0±0.25
E	0.43	11.0
F	0.16	4.0
G	0.71	18.0
H	0.02	0.5
J	0.53	13.5
K	0.91	23.0
L	0.83	21.2
M	0.67	17.0

Dimensions	Inches	Millimeters
N	0.28	7.0
P	M5	M5
Q	Dia. 0.26	6.5 Dia.
R	0.02	4.0
S	0.30	7.5
T	0.63	16.0
U	0.10	2.5
V	1.0	25.0
W	0.94	24.0
X	0.51	13.0
Y	0.47	12.0
Z	0.47	12.0



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
- UPS
- Battery Powered Supplies

Ordering Information:

Example: Select the complete module number you desire from the table - i.e. CM50DU-24F is a 1200V (V_{CES}), 50 Ampere Dual IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	50	24



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

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

Ratings	Symbol	CM50DU-24F	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}	1200	Volts
Gate-Emitter Voltage (C-E SHORT)	V_{GES}	± 20	Volts
Collector Current ($T_c = 25^\circ\text{C}$)	I_c	50	Amperes
Peak Collector Current	I_{CM}	100*	Amperes
Emitter Current** ($T_c = 25^\circ\text{C}$)	I_e	50	Amperes
Peak Emitter Current**	I_{EM}	100*	Amperes
Maximum Collector Dissipation ($T_c = 25^\circ\text{C}$, $T_j \leq 150^\circ\text{C}$)	P_c	320	Watts
Mounting Torque, M5 Main Terminal	–	31	in-lb
Mounting Torque, M6 Mounting	–	40	in-lb
Weight	–	310	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V_{iso}	2500	Volts

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}	$V_{\text{CE}} = V_{\text{CES}}$, $V_{\text{GE}} = 0\text{V}$	–	–	1	mA
Gate Leakage Current	I_{GES}	$V_{\text{GE}} = V_{\text{GES}}$, $V_{\text{CE}} = 0\text{V}$	–	–	20	μA
Gate-Emitter Threshold Voltage	$V_{\text{GE(th)}}$	$I_c = 5\text{mA}$, $V_{\text{CE}} = 10\text{V}$	5	6	7	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_c = 50\text{A}$, $V_{\text{GE}} = 15\text{V}$, $T_j = 25^\circ\text{C}$	–	1.8	2.4	Volts
		$I_c = 50\text{A}$, $V_{\text{GE}} = 15\text{V}$, $T_j = 125^\circ\text{C}$	–	1.9	–	Volts
Total Gate Charge	Q_g	$V_{\text{CC}} = 600\text{V}$, $I_c = 50\text{A}$, $V_{\text{GE}} = 15\text{V}$	–	550	–	nC
Emitter-Collector Voltage**	V_{EC}	$I_e = 50\text{A}$, $V_{\text{GE}} = 0\text{V}$	–	–	3.2	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).



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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{ies}		–	–	20	nf
Output Capacitance	C_{oes}	$V_{CE} = 10V, V_{GE} = 0V$	–	–	0.85	nf
Reverse Transfer Capacitance	C_{res}		–	–	0.5	nf
Inductive	Turn-on Delay Time	$V_{CC} = 600V, I_C = 50A,$ $V_{GE1} = V_{GE2} = 15V,$ $R_G = 6.3\Omega,$	–	–	100	ns
Load	Rise Time					
Switch	Turn-off Delay Time	Inductive Load	–	–	300	ns
Times	Fall Time					
Diode Reverse Recovery Time**	t_{rr}	Switching Operation	–	–	150	ns
Diode Reverse Recovery Charge**	Q_{rr}	$I_E = 50A$	–	2.1	–	μC

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, T_C Reference Point per Outline Drawing	–	–	0.39	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)D}$	Per FWDi 1/2 Module, T_C Reference Point per Outline Drawing	–	–	0.70	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)'Q}$	Per IGBT 1/2 Module, T_C Reference Point Under Chip	–	0.26	–	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	–	0.045	–	$^\circ\text{C/W}$

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



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