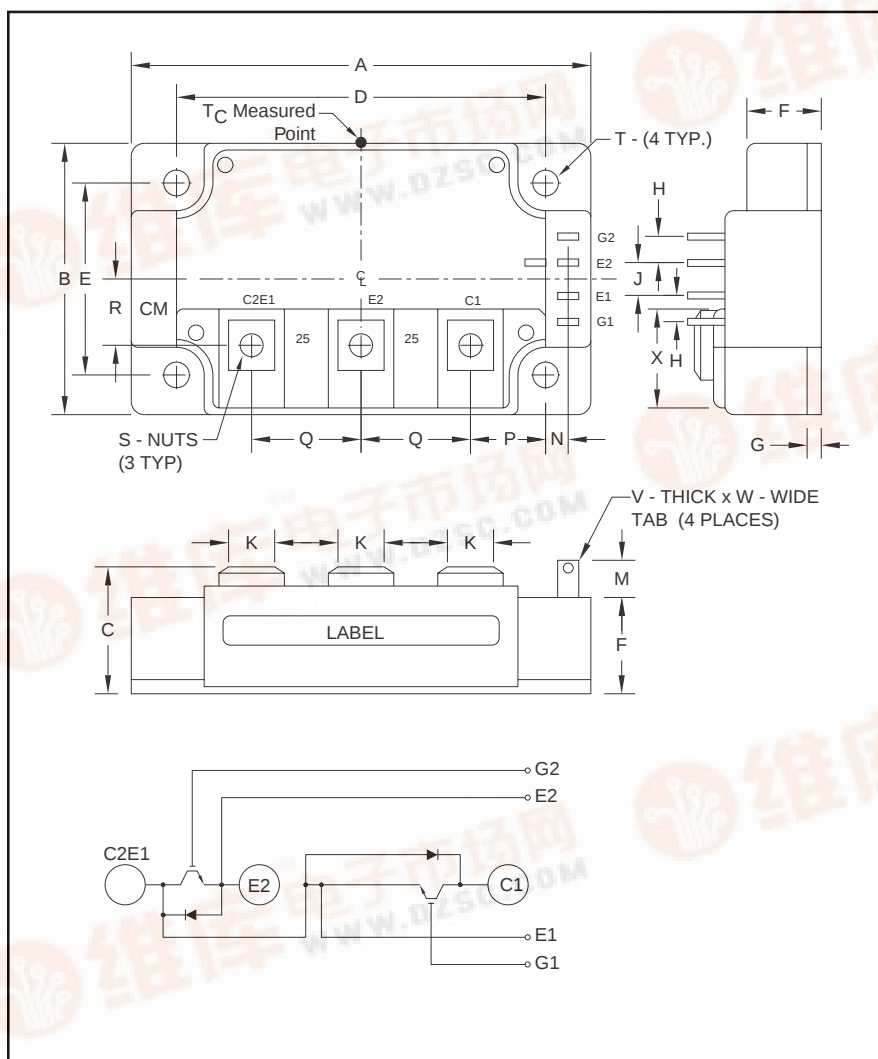


CM600DU-5F

Dual IGBTMOD™ F-Series Module 600 Amperes/250 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.33	110.0
B	3.15	80.0
C	1.14 +0.04/-0.02	29.0 +1.0/-0.5
D	3.66±0.01	93.0±0.25
E	2.44±0.01	62.0±0.25
F	0.83	21.0
G	0.16	4.0
H	0.24	6.0
J	0.59	15.0
K	0.55	14.0

Dimensions	Inches	Millimeters
M	0.33	8.5
N	0.10	2.5
P	0.85	21.6
Q	0.98	25.0
R	0.86	21.75
S	M6	M6
T	0.26 Dia.	6.5 Dia.
V	0.02	0.5
W	0.110	2.79
X	1.08	27.35



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. CM600DU-5F is a 250V (V_{CES}), 600 Ampere Dual IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	600	5



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

CM600DU-5F
Dual IGBTMOD™ F-Series Module
600 Amperes/250 Volts

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

Ratings	Symbol	CM600DU-5F	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}	250	Volts
Gate-Emitter Voltage (C-E SHORT)	V_{GES}	± 20	Volts
Collector Current ($T_c = 25^\circ\text{C}$)	I_C	600	Amperes
	$I_{\text{C(rms)}}$	350	Amperes (rms)
Peak Collector Current	I_{CM}	1200*	Amperes
Emitter Current** ($T_c = 25^\circ\text{C}$)	I_E	600	Amperes
	$I_{\text{E(rms)}}$	350	Amperes (rms)
Peak Emitter Current**	I_{EM}	1200*	Amperes
Maximum Collector Dissipation ($T_c = 25^\circ\text{C}$, $T_j \leq 150^\circ\text{C}$)	P_c	1100	Watts
Mounting Torque, M6 Main Terminal	–	40	in-lb
Mounting Torque, M6 Mounting	–	40	in-lb
Weight	–	580	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V_{iso}	2500	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).

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}	$V_{\text{GE}} = V_{\text{GES}}$, $V_{\text{CE}} = 0\text{V}$	–	–	0.5	μA
Gate-Emitter Threshold Voltage	$V_{\text{GE(th)}}$	$I_C = 60\text{mA}$, $V_{\text{CE}} = 10\text{V}$	3.0	4.0	5.0	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_C = 600\text{A}$, $V_{\text{GE}} = 10\text{V}$, $T_j = 25^\circ\text{C}$	–	1.2	1.7	Volts
		$I_C = 600\text{A}$, $V_{\text{GE}} = 10\text{V}$, $T_j = 125^\circ\text{C}$	–	1.1	–	Volts
Total Gate Charge	Q_G	$V_{\text{CC}} = 100\text{V}$, $I_C = 600\text{A}$, $V_{\text{GE}} = 10\text{V}$	–	2200	–	nC
Emitter-Collector Voltage**	V_{EC}	$I_E = 600\text{A}$, $V_{\text{GE}} = 0\text{V}$	–	–	2.0	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}		–	–	170	nF
Output Capacitance	C_{oes}	$V_{\text{CE}} = 10\text{V}$, $V_{\text{GE}} = 0\text{V}$	–	–	11	nF
Reverse Transfer Capacitance	C_{res}		–	–	5.7	nF
Turn-on Delay Time	$t_{\text{d(on)}}$	$V_{\text{CC}} = 100\text{V}$, $I_C = 600\text{A}$,	–	–	850	ns
Rise Time	t_r	$V_{\text{GE1}} = V_{\text{GE2}} = 10\text{V}$,	–	–	600	ns
Turn-off Delay Time	$t_{\text{d(off)}}$	$R_G = 4.2\Omega$,	–	–	1100	ns
Fall Time	t_f	Inductive Load	–	–	500	ns
Diode Reverse Recovery Time**	t_{rr}	Switching Operation	–	–	300	ns
Diode Reverse Recovery Charge**	Q_{rr}	$I_E = 600\text{A}$	–	20.0	–	μC

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



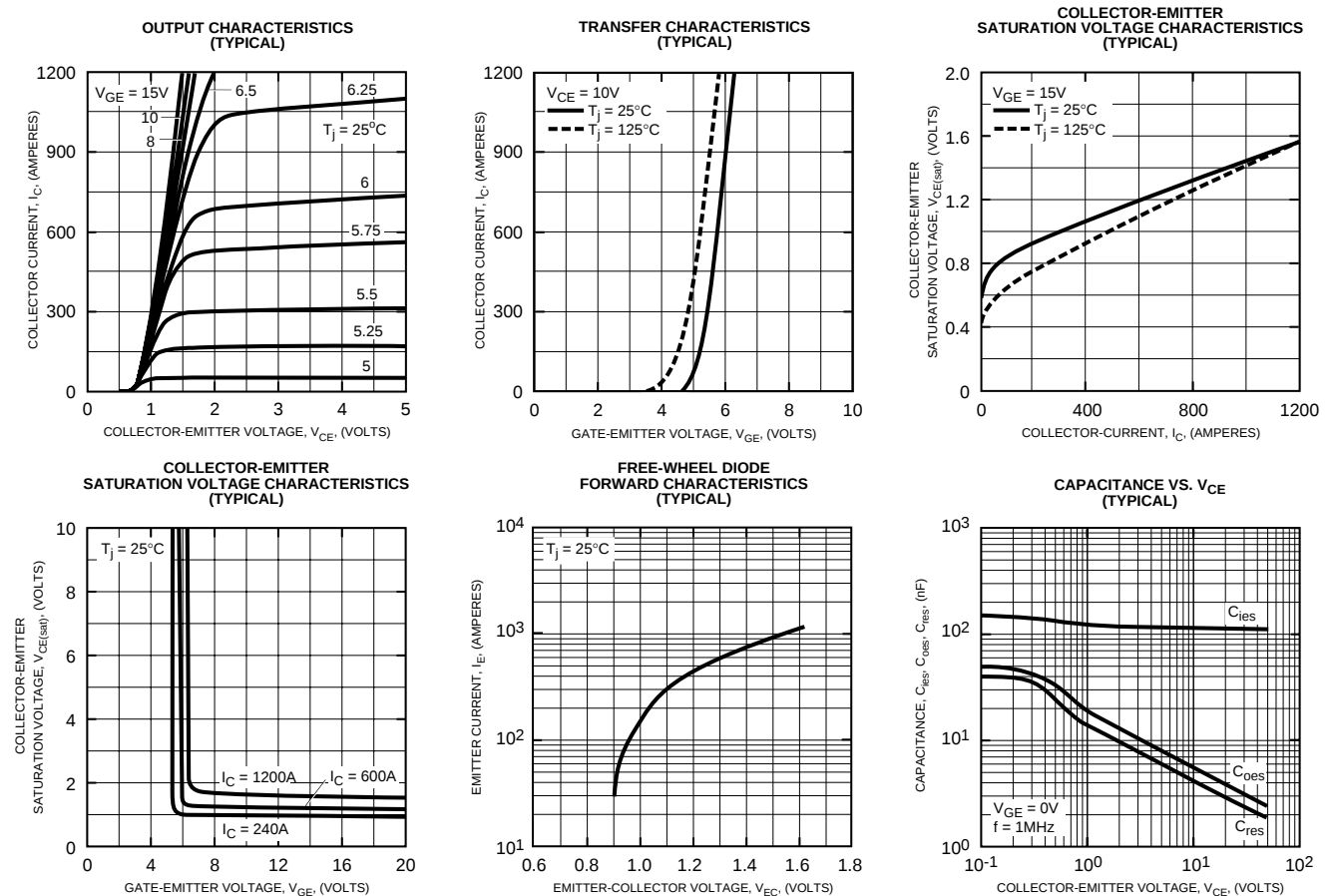
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CM600DU-5F
Dual IGBTMOD™ F-Series Module
600 Amperes/250 Volts

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	—	—	0.11	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)}R$	Per FWDi 1/2 Module	—	—	0.20	$^\circ\text{C/W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	—	0.020	—	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)}Q$	Per IGBT 1/2 Module	—	—	0.05	$^\circ\text{C/W}$

T_C Reference Point Under Chip





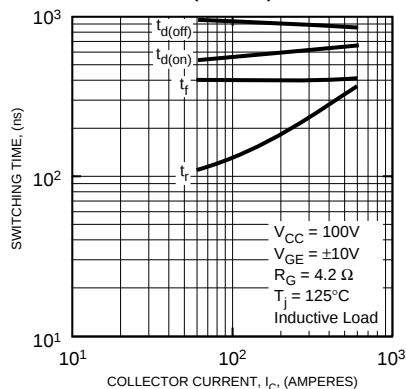
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CM600DU-5F

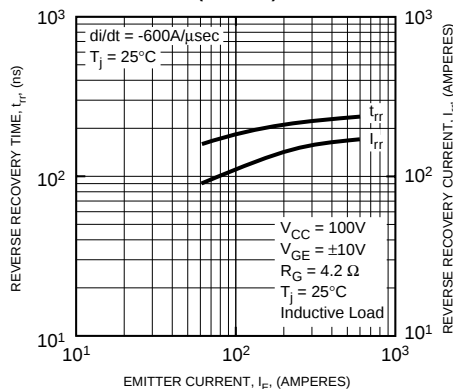
Dual IGBTMOD™ F-Series Module

600 Amperes/250 Volts

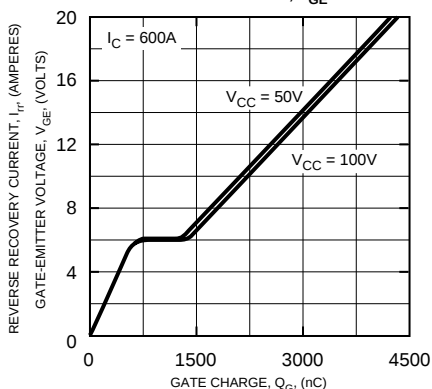
HALF-BRIDGE
SWITCHING CHARACTERISTICS
(TYPICAL)



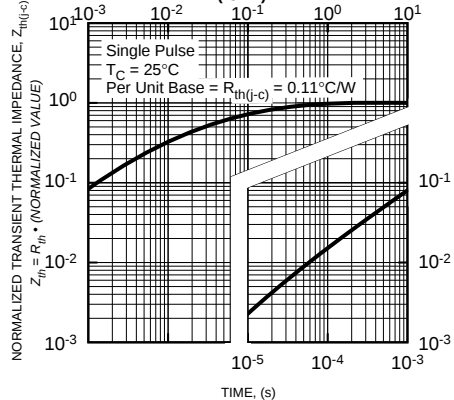
REVERSE RECOVERY CHARACTERISTICS
(TYPICAL)



GATE CHARGE, V_{GE}



TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(IGBT)



TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(FWD)

