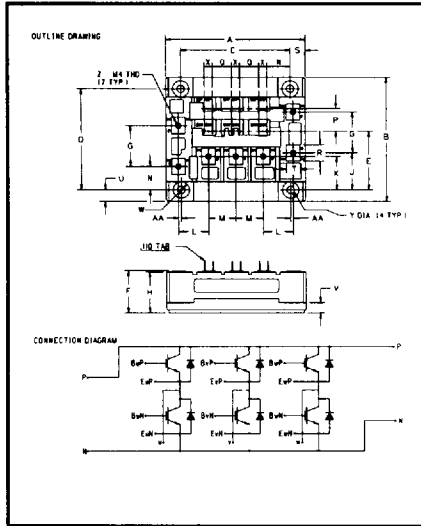
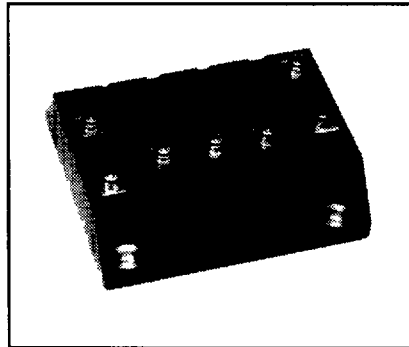


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Six-IGBT IGBTMOD™ E-Series Module 100 Amperes/600 Volts



CM100TF-12E
 Outline Drawing



CM100TF-12E
 Six-IGBT IGBTMOD™ E-Series Module
 100 Amperes/600 Volts

Description

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of six IGBT Transistors in a three phase 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 (150ns) Free-Wheel Diode
- High Frequency Operation (15-20kHz)
- 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 part module number you desire from the table below

-i.e. CM100TF-12E is a 600V (V_{CES}), 100 Ampere Six-IGBT IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	100	12

Dimensions	Inches	Millimeters
A	4.02±0.02	102.0±0.5
B	3.58±0.02	91.0±0.5
C	3.15±0.01	80.0±0.25
D	2.913±0.1	74.0±0.25
E	1.69	43.0
F	1.24 Max.	31.5 Max.
G	1.18	30.0
H	1.16	29.5
J	1.06	27.0
K	0.96	24.5
L	0.87	22.0
M	0.79	20.0
N	0.67	17.0
P	0.65	16.5
Q	0.55	14.0
R	0.47	12.0
S	0.43	11.0
T	0.39	10.0
U	0.33	8.5
V	0.28	7.0
W	0.24 R	R 6.0
X	0.24	6.0
Y	0.22 Dia.	Dia. 5.5
Z	M4 Metric	M4
AA	0.08	2.0

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

Ratings	Symbol	CM100TF-12E	Units
Junction Temperature	T_j	-40 to 150	°C
Storage Temperature	T_{stg}	-40 to 125	°C
Collector-Emitter Voltage (G-E SHORT)	V_{CES}	600	Volts
Gate-Emitter Voltage	V_{GES}	±20	Volts
Collector Current	I_C	100	Amperes
Peak Collector Current	I_{CM}	200*	Amperes
Diode Forward Current	I_{FM}	100	Amperes
Diode Forward Surge Current	I_{FM}	200*	Amperes
Power Dissipation	P_d	400	Watts
Max. Mounting Torque M4 Terminal Screws	-	12	in-lb
Max. Mounting Torque M5 Mounting Screws	-	17	in-lb
Module Weight (Typical)	-	540	Grams
V Isolation	V_{RMS}	2500	Volts

* Pulse width and repetition rate should be such that device junction temperature does not exceed the device rating.

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	I_{CES}	$V_{CE} = V_{CES}, V_{GE} = 0V$	-	-	1.0	mA
Gate Leakage Current	I_{GES}	$V_{GE} = V_{GES}, V_{CE} = 0V$	-	-	0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 10mA, V_{CE} = 10V$	3.5	5.0	6.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 100A, V_{GE} = 15V$	-	2.7	3.5**	Volts
		$I_C = 100A, V_{GE} = 15V, T_j = 150\text{ °C}$	-	2.7	-	Volts
Total Gate Charge	Q_G	$V_{CC} = 300V, I_C = 100A, V_{GS} = 15V$	-	500	-	nC
Diode Forward Voltage	V_{FM}	$I_E = 100A, V_{GS} = 0V$	-	-	2.5	Volts

** Pulse width and repetition rate should be such that device junction temperature rise is negligible

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

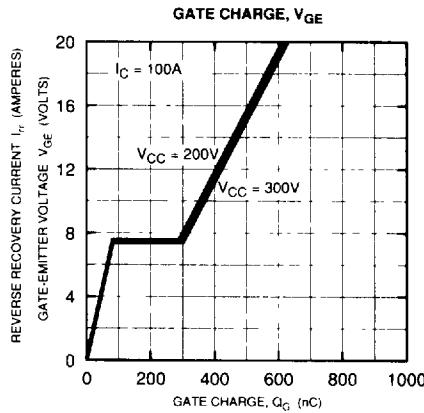
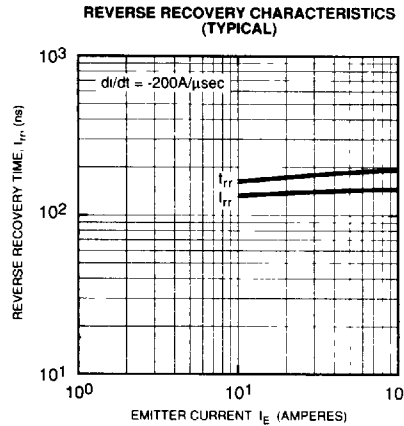
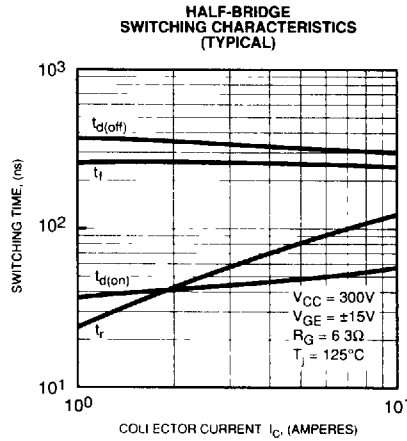
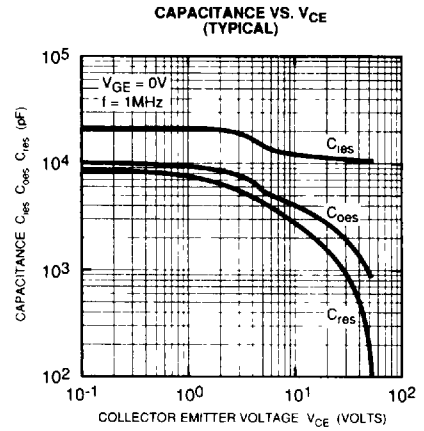
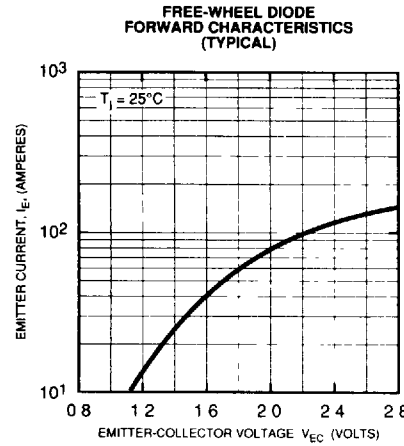
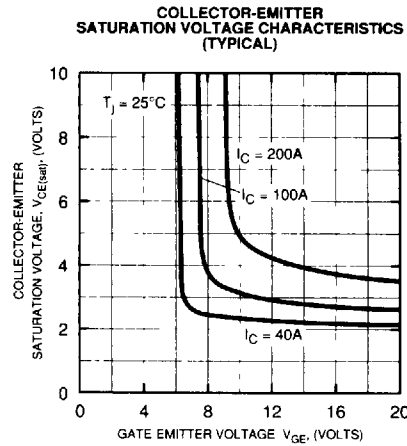
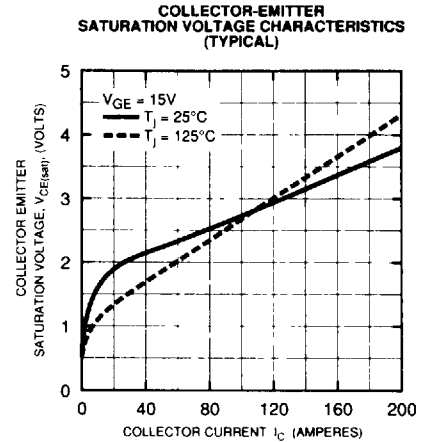
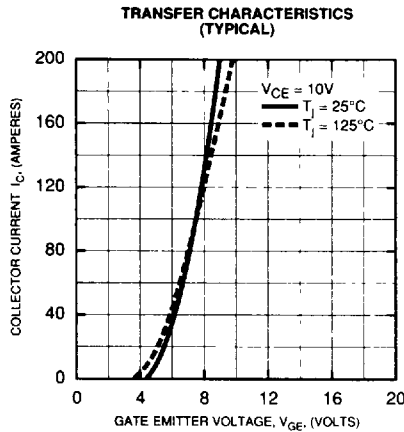
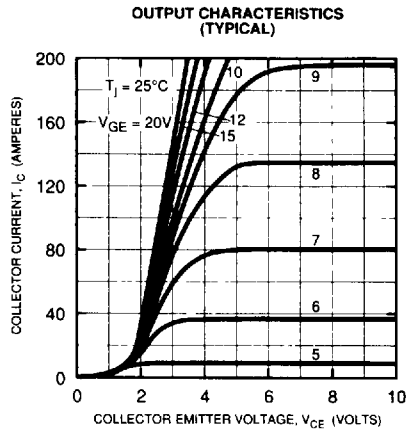
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{ies}		-	-	20	nF
Output Capacitance	C_{oes}	$V_{GE} = 0V, V_{CE} = 10V, f = 1MHz$	-	-	6	nF
Reverse Transfer Capacitance	C_{res}		-	-	4	nF
Resistive	Turn-on Delay Time	$t_{d(on)}$	-	-	150	ns
Load	Rise Time	t_r	-	-	300	ns
Switch Times	Turn-off Delay Time	$t_{d(off)}$	-	-	400	ns
	Fall Time	t_f	-	-	350	ns
Diode Reverse Recovery Time	t_{rr}	$I_E = 100A, di_E/dt = -200A/\mu s$	-	-	200	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_E = 100A, di_E/dt = -200A/\mu s$	-	1.0	-	μC

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per IGBT	-	-	0.31	°C/W
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per Free Wheel Diode	-	-	0.70	°C/W
Contact Thermal Resistance	$R_{th(c-f)}$	Per 1/6 Module	-	-	0.20	°C/W

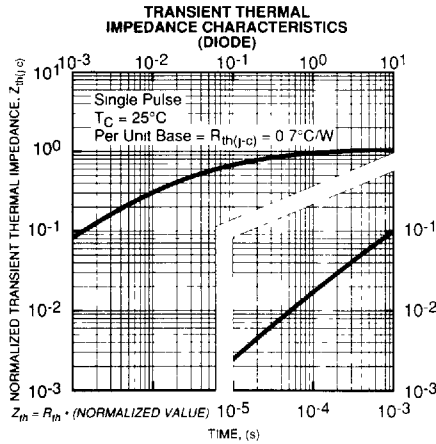
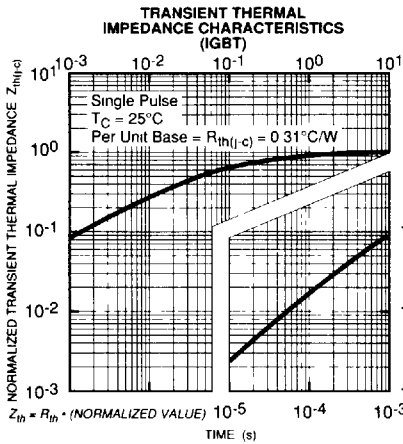
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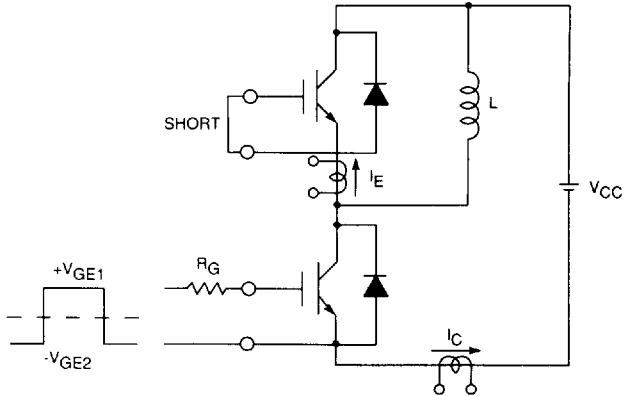
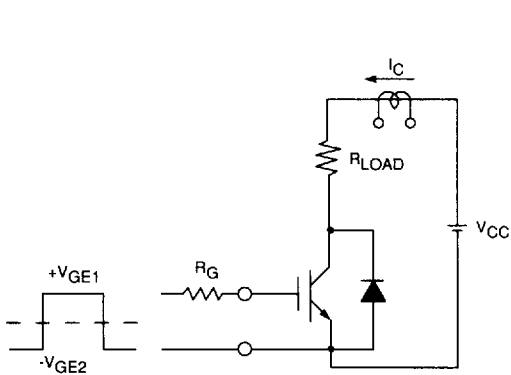


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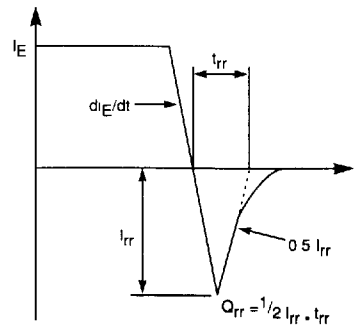
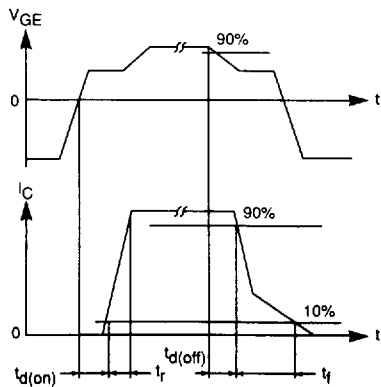


SWITCHING TIME TEST CIRCUITS & WAVEFORMS



RESISTANCE LOAD SWITCHING TEST CIRCUIT

HALF-BRIDGE SWITCHING TEST CIRCUIT



SWITCHING TIME TEST WAVEFORMS

t_{rr}, Q_{rr} WAVEFORMS