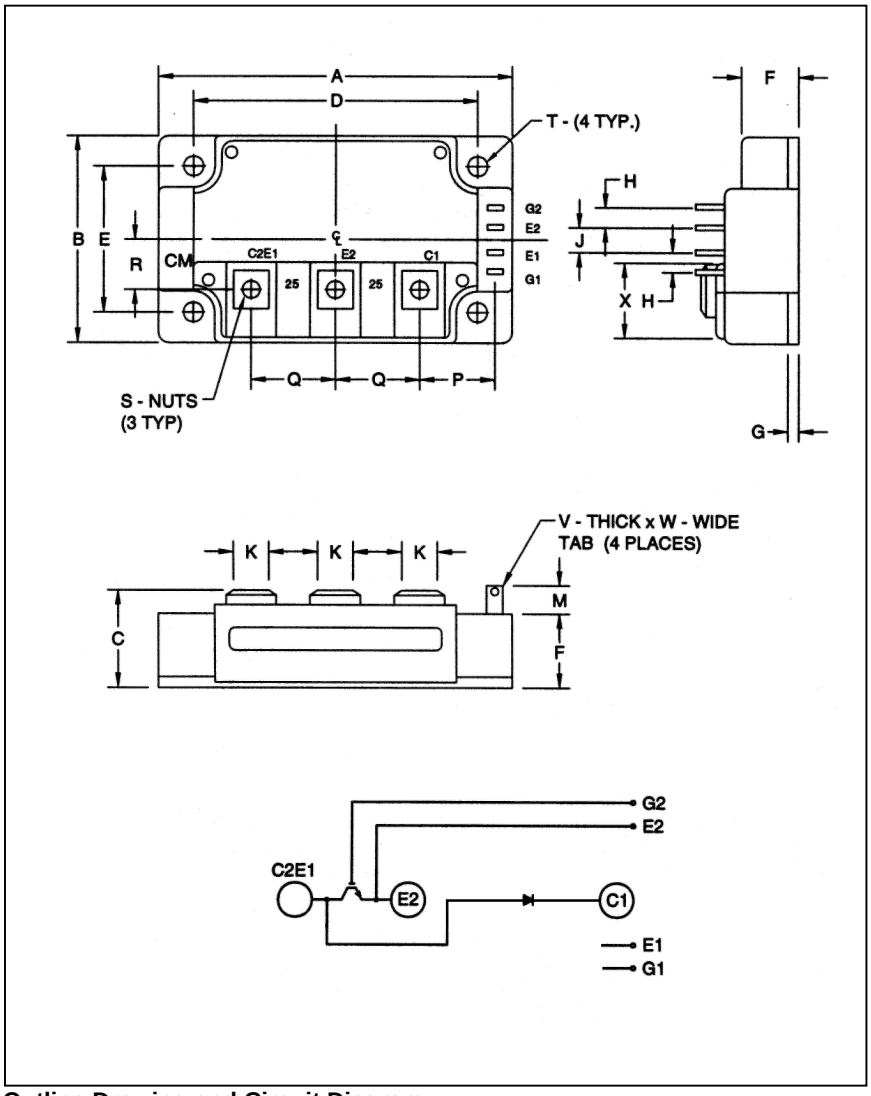
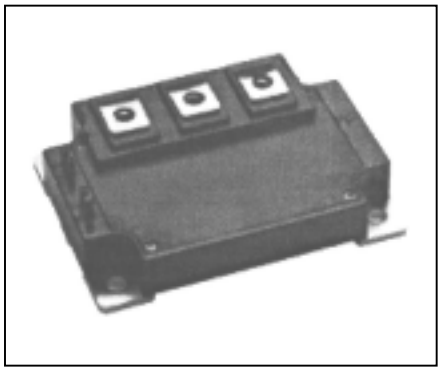
Powerex, Inc., 200 Hillis St., Youngwood 15697 (724) 925-7272

Low side Chopper IGBT Module
1200V 450A IGBT / 1200V 750A Fast Diode



Outline Drawing and Circuit Diagram



Description:

Powerex Low Side Chopper IGBT Module is designed specially for customer applications. The modules are isolated for easy mounting with other components on a common heatsink.

Features:

- Low Drive Requirement
- Low $V_{CE(sat)}$
- Super Fast Diode
- (3) F Series 150A 1200V Trench Gate Chips per IGBT
- (5) F Series 150A 1200V Chips per Diode
- Isolated Baseplate for Easy Heat Sinking
- Al_2O_3 DBC Ceramic
- Low Thermal Impedance

Applications:

- Choppers
- Welding Power Supplies

Dim	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

Dim	Inches	Millimeters
K	0.55	14.0
M	0.33	8.5
P	0.94	24.0
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	0.11	2.79
X	1.08	27.35

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Maximum Ratings, Tj=25°C unless otherwise specified

Ratings	Symbol	QIQ1245001	Units
Collector- Emitter Voltage (G-E Short)	V_{CES}	1200	Volts
Gate- Emitter Voltage (C-E Short)	V_{GES}	±20	Volts
Collector Current	I_C	450	Amperes
Peak Collector Current (Tj<= 150° C)	I_{CM}	900*	Amperes
Diode Forward Current	I_{FM}	750	Amperes
Power Dissipation	P_d	TBD	Watts
Junction Temperature	T_j	-40 to 150	°C
Storage Temperature	T_{stg}	-40 to 125	°C
Mounting Torque, M6 Terminal Screws	-	40	In-lb
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Module Weight (Typical)	-	580	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V_{RMS}	2500	Volts

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

Static Electrical Characteristics, Tj=25°C unless otherwise specified

Characteristic	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}	$V_{GE}=V_{GES}$ $V_{CE}=0V$	-	-	60	µA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	I_C=45mA, V_{CE}=10V	5.0	6.0	7.0	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=450A, V_{GE}=15V	-	1.8	2.4	Volts
		I_C=450A, V_{GE}=15V, T_j=125°C	-	1.9	-	Volts
Total Gate Charge	Q_G	V_{CC}=600V, I_C=450A, V_{GS}=15V	-	4950	-	nC
Diode Forward Voltage	V_{FM}	I_F=750A	-	-	3.2	Volts

Dynamic Electrical Characteristics, Tj=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{ies}	V_{GE}=0V, V_{CE}=10V, f=1MHz	-	-	180	nF
Output Capacitance	C_{oes}		-	-	7.6	nF
Reverse Transfer Capacitance	C_{res}		-	-	4.5	nF
Turn on Delay time	$t_{d(on)}$	V_{CC}=600V, I_C=450A, $V_{GE1}=V_{GE2}$=15V, R_G=1.0Ω	-	-	TBD	ns
Rise Time	t_r		-	-	TBD	ns
Turn-off Delay Time	$t_{d(off)}$		-	-	TBD	ns
Fall Time	t_f		-	-	TBD	ns
Diode Reverse Recovery Time	trr	I_F=750A	-	-	250	ns
Diode Reverse Recovery Charge	Qrr		-	44.0	-	µC

Thermal and Mechanical Characteristics, Tj=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Per IGBT	-	0.075	TBD	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Per Diode	-	0.052	TBD	°C/W
Contact Thermal Resistance	$R_{\theta CF}$	Per Module	-	0.01	-	°C/W