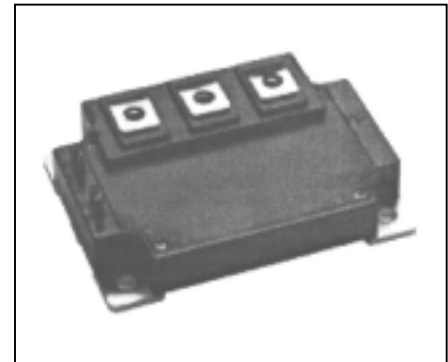


Outline Drawing and Circuit Diagram



## 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

**Maximum Ratings, T<sub>j</sub>=25°C unless otherwise specified**

Ratings	Symbol	QIQ1245001	Units
Collector- Emitter Voltage (G-E Short)	V <sub>CES</sub>	1200	Volts
Gate- Emitter Voltage (C-E Short)	V <sub>GES</sub>	±20	Volts
Collector Current	I <sub>C</sub>	450	Amperes
Peak Collector Current (T <sub>j</sub> ≤ 150°C)	I <sub>CM</sub>	900*	Amperes
Diode Forward Current	I <sub>FM</sub>	750	Amperes
Power Dissipation	P <sub>d</sub>	TBD	Watts
Junction Temperature	T <sub>j</sub>	-40 to 150	°C
Storage Temperature	T <sub>stg</sub>	-40 to 125	°C
Mounting Torque, M6 Terminal Screws	-	40	In-lb
Mounting Torque, M6 Mounting Screws	-	40	In-lb
Module Weight (Typical)	-	580	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V <sub>RMS</sub>	2500	Volts

\*Pulse width and repetition rate should be such that the device junction temperature (T<sub>j</sub>) does not exceed T<sub>j</sub>(max) rating.

**Static Electrical Characteristics, T<sub>j</sub>=25°C unless otherwise specified**

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector Cutoff Current	I <sub>CES</sub>	V <sub>CE</sub> =V <sub>CES</sub> V <sub>GE</sub> =0V	-	-	1.0	mA
Gate Leakage Current	I <sub>GES</sub>	V <sub>GE</sub> =V <sub>GES</sub> V <sub>CE</sub> =0V	-	-	60	μA
Gate-Emitter Threshold Voltage	V <sub>GE(th)</sub>	I <sub>C</sub> =45mA, V <sub>CE</sub> =10V	5.0	6.0	7.0	Volts
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =450A, V <sub>GE</sub> =15V	-	1.8	2.4	Volts
		I <sub>C</sub> =450A, V <sub>GE</sub> =15V, T <sub>j</sub> =125°C	-	1.9	-	Volts
Total Gate Charge	Q <sub>G</sub>	V <sub>CC</sub> =600V, I <sub>C</sub> =450A, V <sub>GS</sub> =15V	-	4950	-	nC
Diode Forward Voltage	V <sub>FM</sub>	I <sub>F</sub> =750A	-	-	3.2	Volts

**Dynamic Electrical Characteristics, T<sub>j</sub>=25°C unless otherwise specified**

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C <sub>ies</sub>	V <sub>GE</sub> =0V	-	-	180	nF
Output Capacitance	C <sub>oes</sub>	V <sub>CE</sub> =10V	-	-	7.6	nF
Reverse Transfer Capacitance	C <sub>res</sub>	f=1MHz	-	-	4.5	nF
Turn on Delay time	t <sub>d(on)</sub>	V <sub>CC</sub> =600V	-	-	TBD	ns
Rise Time	t <sub>r</sub>	I <sub>C</sub> =450A	-	-	TBD	ns
Turn-off Delay Time	t <sub>d(off)</sub>	V <sub>GE1</sub> =V <sub>GE2</sub> =15V	-	-	TBD	ns
Fall Time	t <sub>f</sub>	R <sub>G</sub> =1.0Ω	-	-	TBD	ns
Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =750A	-	-	250	ns
Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	44.0	-	μC

**Thermal and Mechanical Characteristics, T<sub>j</sub>=25°C unless otherwise specified**

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	Per IGBT	-	0.075	TBD	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	Per Diode	-	0.052	TBD	°C/W
Contact Thermal Resistance	R <sub>θCF</sub>	Per Module	-	0.01	-	°C/W