



### Description:

Powerex Low Side Chopper IGBT Module 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 600V Chips per IGBT Switch
- (6) F Series 150A 600V Chips per Diode
- Isolated Baseplate for Easy Heat Sinking
- Low Thermal Impedance
- Isolated Material: DBC Alumina

### Applications:

- Choppers
- Welding Power Supplies

Dim	Inches	Millimeters
A	4.25	108.0
B	2.44	62.0
C	1.14+0.04/-0.02	29+1.0/-0.5
D	3.66±0.01	93.0±0.25
E	1.88±0.01	48.0±0.25
F	0.67	17.0
G	0.16	4.0
H	0.24	6.0
J	0.59	15.0

Dim	Inches	Millimeters
K	0.55	14.0
L	0.87	22.0
M	0.33	8.5
N	0.10	2.5
P	0.85	21.5
Q	0.98	25.0
R	0.11	2.8
S	0.25 Dia.	6.5 Dia.
T	0.6	15.15

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

Ratings	Symbol	QIQ0645002	Units
Collector Emitter Voltage	V <sub>CES</sub>	600	Volts
Gate Emitter Voltage	V <sub>GES</sub>	±20	Volts
Collector Current (T <sub>C</sub> =25°C)	I <sub>C</sub>	450	Amperes
Peak Collector Current (T <sub>j</sub> ≤150°C)	I <sub>CM</sub>	900*	Amperes
Diode Average Forward Current 180° Conduction, T <sub>C</sub> =70°C	I <sub>FM</sub>	450	Amperes
Peak Diode Forward Current	I <sub>FM</sub>	1800	Amperes
Diode I <sup>2</sup> t for Fusing for One Cycle t=8.3mS	I <sup>2</sup> t	121500	A <sup>2</sup> sec
Power Dissipation	P <sub>d</sub>	1650	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)	-	400	Grams
V Isolation	V <sub>RMS</sub>	2000	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	-	1.6	2.2	Volts
		I <sub>C</sub> =450A, V <sub>GE</sub> =15V, T <sub>j</sub> =125°C	-	1.6	-	Volts
Total Gate Charge	Q <sub>G</sub>	V <sub>CC</sub> =300V, I <sub>C</sub> =450A, V <sub>GE</sub> =15V	-	2790	-	nC
Diode Forward Voltage	V <sub>FM</sub>	I <sub>F</sub> =900A	-	2.0	2.6	Volts
		I <sub>F</sub> =450A	-	1.7	-	Volts
		I <sub>F</sub> =300A	-	1.3	-	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	-	-	123	nF
Output Capacitance	C <sub>oes</sub>	V <sub>CE</sub> =10V	-	-	8.1	nF
Reverse Transfer Capacitance	C <sub>res</sub>	f=1MHz	-	-	4.5	ns
Turn on Delay time	t <sub>d(on)</sub>	V <sub>CC</sub> =300V	-	-	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> =4.2Ω	-	-	TBD	ns
Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =900A	-	-	150	ns
Diode Reverse Recovery Charge	Q <sub>rr</sub>	di <sub>F</sub> /dt=-1800A/µS	-	8.4	-	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	-	0.10	TBD	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	Per Diode	-	0.085	TBD	°C/W
Contact Thermal Resistance (Thermal Grease Applied)	R <sub>θCF</sub>	Per Module	-	0.02	-	°C/W