

### Description:

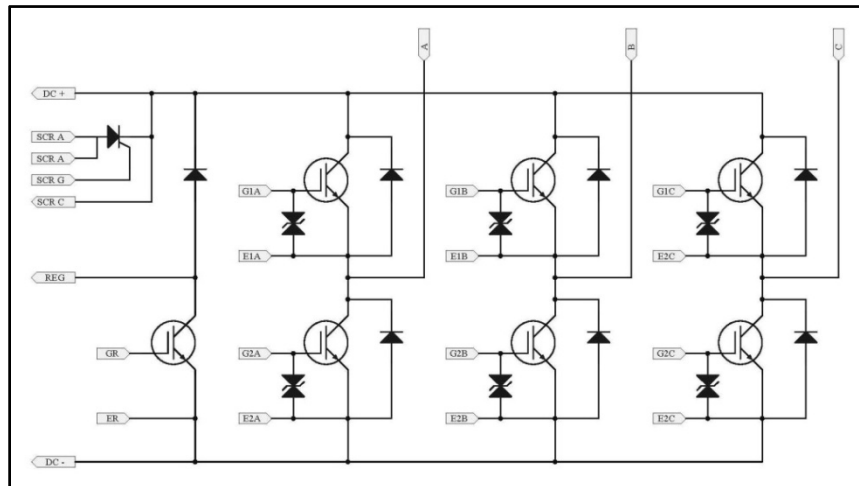
Powerex 7-Pack IGBT power module is configured as a full-bridge inverter with an additional IGBT switch and an additional SCR. The Aluminum Silicon Carbide (AlSiC) baseplate offers light weight module design. The power module is designed to operate reliably in harsh aerospace, military and other environments. The module is rated to operate over full temperature range -55°C to 125°C. Powerex is using High Accelerated Stress Test (HAST) to assure long term reliability of plastic power modules.

### Features:

- Class H hybrid screened to MIL-PRF-38534 requirements
- Withstand HAST
- Light Weight AlSiC Baseplate
- Low Drive Requirement
- Ultra Fast Free Wheeling Diode
- Internal Zener Protection on Gates
- High Power Density
- Aluminum Nitride DBC Ceramic

### Applications:

- Aerospace
- Military
- Motor Control



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

Ratings	Symbol	QIA0615007	Units
Collector Emitter Voltage	V <sub>CEs</sub>	600	Volts
Gate Emitter Voltage	V <sub>GES</sub>	±20	Volts
Collector Current	I <sub>c</sub>	150	Amperes
Peak Collector Current, 1msec	I <sub>CM</sub>	300	Amperes
Diode Forward Current	I <sub>F</sub>	150	Amperes
Diode Surge Current, 1msec	I <sub>FM</sub>	300	Amperes
SCR Forward Current, T <sub>case</sub> = 80°C	I <sub>T(DC)</sub>	100	Amperes
SCR Surge Current, Half Cycle t=8.3msec	I <sub>TSM</sub>	500	Amperes
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to 125	°C
Mounting Torque, Terminal Screws	-	26	in-lb
Mounting Torque, Mounting Screws	-	26	in-lb
Module Weight (Typical)	-	410	Grams
V Isolation	V <sub>RMS</sub>	2500	Volts

**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	-	-	10.0	µA
Gate-Emitter Threshold Voltage	V <sub>GE(th)</sub>	I <sub>c</sub> =15mA, V <sub>CE</sub> =10V	4.0	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>c</sub> =150A, V <sub>GE</sub> =15V	-	2.3	2.6	Volts
		I <sub>c</sub> =75A, V <sub>GE</sub> =15V	-	1.8	2.1	Volts
Total Gate Charge	Q <sub>G</sub>	V <sub>CC</sub> =300V, I <sub>c</sub> =150A, V <sub>GS</sub> =15V	-	-	1600	nC
Diode Forward Voltage	V <sub>FM</sub>	I <sub>E</sub> =150A, V <sub>GS</sub> =0V	-	2.3	2.6	Volts
Regen Diode Forward Voltage	V <sub>FM</sub>	I <sub>E</sub> =50A, V <sub>GS</sub> =0V	-	-	2.4	Volts
SCR Forward On-State Voltage	V <sub>TM</sub>	I <sub>F</sub> =100A	-	-	1.35	Volts
SCR Reverse Leakage Current, Peak	I <sub>RRM</sub>	V <sub>RRM</sub> =600V	-	-	15	mA
SCR Forward Leakage Current, Peak	I <sub>DRM</sub>	V <sub>DRM</sub> =600V	-	-	15	mA

**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	-	-	TBD	nF
Output Capacitance	C <sub>oes</sub>	V <sub>CE</sub> =25V	-	-	TBD	nF
Reverse Transfer Capacitance	C <sub>res</sub>	f=1KHz	-	-	TBD	nF
Turn on Delay time	t <sub>d(on)</sub>	V <sub>CC</sub> =300V I <sub>c</sub> =150A	-	-	900	ns
Rise Time	t <sub>r</sub>	V <sub>GE1</sub> =V <sub>GE2</sub> =15V	-	-	700	ns
Turn- off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> =20Ω turn-on	-	-	2.1	µs
Fall Time	t <sub>f</sub>	R <sub>G</sub> =10Ω turn-off	-	-	300	ns
Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =150A	-	-	170	ns
Diode Reverse Recovery Charge	Q <sub>rr</sub>	di <sub>F</sub> /dt=-300A/µS	-	-	2.5	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>	IGBT	-	0.20	0.24	°C/W
		Diode	-	0.38	0.45	
		Regen Diode	-	0.60	0.80	
		SCR	-	0.21	0.27	