

PRELIMINARY DATASHEET
IGBT Module in iQpak™3 Package
Single Switch

FEATURES

- Ultra low loss IGBT
- Highly rugged SPT design
- Pb free finished; **RoHS compliant**



MAXIMUM RATINGS, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Value	Units
Collector-emitter voltage	V_{CES}	1200	V
DC collector current, $T_{jmax}=150^\circ\text{C}$ $T_C=80^\circ\text{C}$	I_C	228	A
Peak collector current	I_{CM}	456	
Diode forward current, $T_{jmax}=150^\circ\text{C}$ $T_C=80^\circ\text{C}$	I_F	200	
Peak forward current	I_{FM}	400	
Gate-emitter voltage	V_{GE}	± 20	V
IGBT short circuit SOA $V_{CC} = 1200\text{V}$, $V_{GE} = 15\text{V}$, $V_{CEM} \leq 1200\text{V}$, $T_{vj} \leq 125^\circ\text{C}$	t_{SC}	10	μs
Operating junction and storage temperature	T_j, T_{stg}	-40... +150	$^\circ\text{C}$

Thermal and Isolation Characteristics

Parameter	Symbol	Max. Value	Units
Characteristics			
IGBT thermal resistance, junction to case	R_{thJC}	0.11	K/W
Diode thermal resistance, junction to case	R_{thJD}	0.16	
Isolation voltage, RMS (measured between terminals and mounting base, 50-60 Hz, for 1-3 seconds)	V_{iso}	3000	V

ELECTRICAL CHARACTERISTICS, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE} = 0\text{V}$, $I_C = 4\text{mA}$	1200	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15\text{V}$, $I_C = 228\text{A}$ $V_{GE} = 15\text{V}$, $I_C = 200\text{A}$	1.7	1.87	2.0	
Diode forward voltage	V_F	$V_{GE} = 0\text{V}$, $I_F = 200\text{A}$	-	1.8	2.2	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C = 8\text{mA}$, $V_{CE} = V_{GE}$	5.0	6.3	7.0	
Zero gate voltage collector current	I_{CES}	$V_{CE} = 1200\text{V}$, $V_{GE} = 0$ $T = 25^\circ\text{C}$	-	-	400	μA
Gate-emitter leakage current	I_{GES}	$V_{CE} = 0\text{V}$, $V_{GE} = \pm 20\text{V}$	-200	-	200	nA
Internal gate resistance	R_{Gint}		-	2.5	-	Ω

ELECTRICAL CHARACTERISTICS, at $T_j = 25^\circ\text{C}$, unless otherwise specified

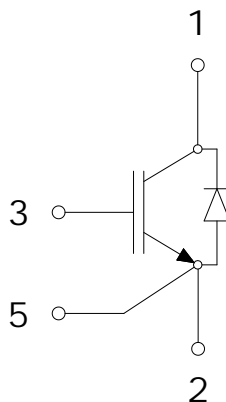
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Dynamic Characteristics						
Gate charge	Q_{ge}	$I_C = 228\text{A}$, $V_{CE} = 600\text{V}$, $V_{GE} = \pm 15\text{V}$	-	2444	-	nC
Input capacitance	C_{iss}	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$	-	17.2	-	nF
Output capacitance	C_{oss}		-	1.2	-	
Reverse transfer capacitance	C_{rss}		-	0.8	-	
Short circuit current	I_{sc}	$T_C = 125^\circ\text{C}$, $V_{CC} = 900\text{V}$, $V_{GE} = 15\text{V}$, $t_{psc} \leq 10\mu\text{s}$, $V_{CEM} \leq 1200\text{V}$	-	1080	-	A

SWITCHING CHARACTERISTICS, Inductive Load, at $T_j = 25^\circ\text{C}$, unless otherwise specified

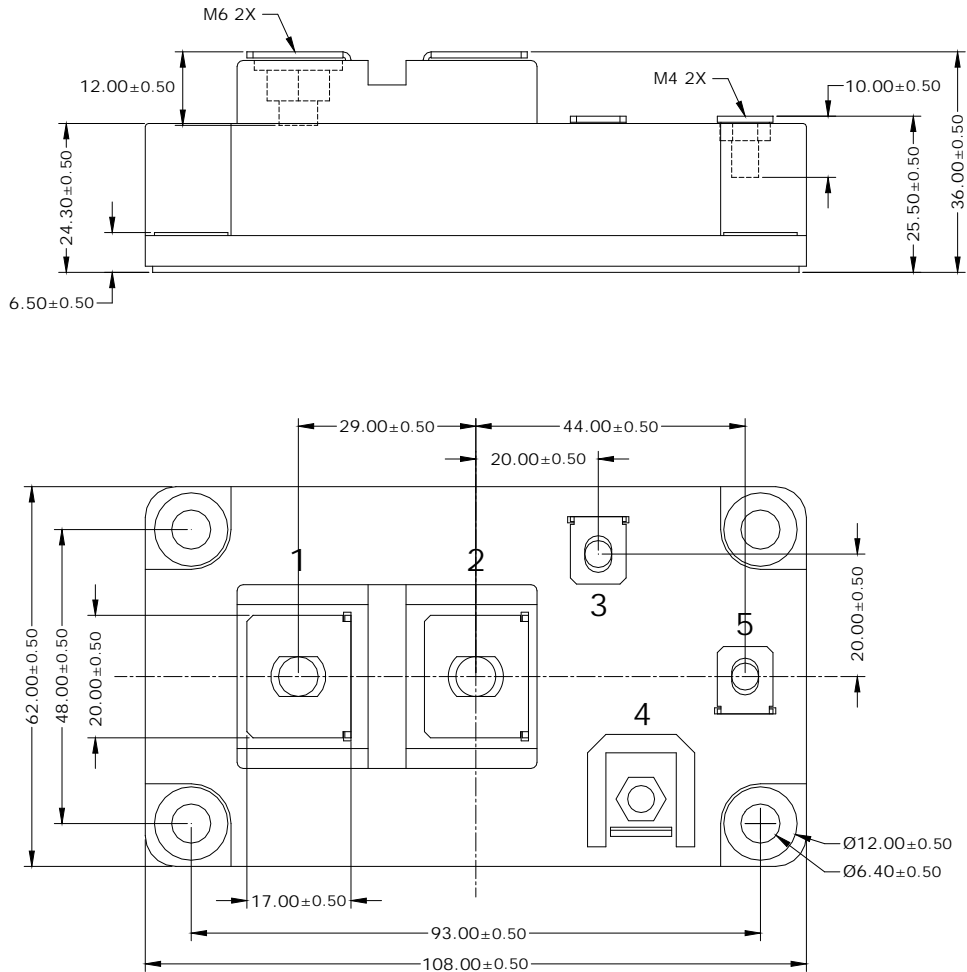
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
IGBT Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{CC} = 600\text{V}$, $I_C = 228\text{A}$, $V_{GE} = -15\text{V}$ to 18V , $R_G = 4.5\Omega$, Inductive load.	-	333	-	ns
Rise time	t_r		-	140	-	
Turn-off delay time	$t_{d(off)}$		-	224	-	
Fall time	t_f		-	115	-	
Turn-ON energy	E_{on}		-	46	-	
Turn-OFF energy	E_{off}		-	13	-	mJ

Anti-Parallel Diode Characteristics, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Diode reverse recovery time	t_{rr}	$V_R = 600\text{V}$, $I_F = 200\text{A}$, $di_F/dt = 650\text{A}/\mu\text{s}$, Inductive load	-	618	-	ns
Diode reverse recovery charge	Q_{rr}		-	23	-	μC
Diode peak reverse recovery current	I_{rrm}		-	57	-	A



Package Outline Drawing



CAUTION: These devices are ESD sensitive. Use proper handling procedure.

Disclaimer

These specifications may not be considered as a guarantee of components characteristics. Components have to be tested depending on intended application as adjustments may be necessary. The use of **iQXPRZ Power Inc.** components in life support appliances and systems are subject to written approval of **iQXPRZ Power Inc.**