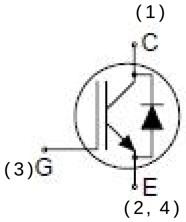
PRELIMINARY DATASHEET

1200V, 75A IGBT in SPT+ Technology with Fast and Soft Recovery Anti-parallel Diode in SOT227 Package

- Ultra low loss IGBT
- Smooth switching for good EMC
- Highly rugged SPT+ design
- Minimize gate charge, short delay times
- Optimized for paralleling
- Pb-free finished; RoHS compliant



MAXIMUM RATINGS[1], at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Value	Units
Collector-emitter voltage	V_{CE}	1200	V
DC collector current T_C = 80 °C	I_C	75	A
Peak collector current, limited by T_{jmax}	I_{CM}	150	
Diode forward current	I_F	50	
Repetitive peak forward current, limited by T_{jmax}	I_{FRM}	100	
Gate-emitter voltage	V_{GES}	± 20	V
IGBT short circuit SOA V_{CC} =900V, $V_{CEM} \leq$ 1200V, $V_{GE} \leq$ 15V, T_{VJ} = 125°C	t_{PSC}	10	µs
Operating junction and storage temperature	T_j, T_{stg}	-40… +150	°C

Thermal and Isolation Characteristics

Parameter	Symbol	Max. Value	Units
Characteristics			
IGBT thermal resistance, junction to case	R_{thJC}	0.22	K/W
Diode thermal resistance, junction to case	R_{thJCD}	0.7	
Isolation voltage, RMS (measured between terminals and mounting base, 50-60 Hz, for 1-2 seconds)	V_{ISO}	3000	V

ELECTRICAL CHARACTERISTICS[2], at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE} = 0V, I_C = 1mA	1200	-	-	V
Collector-emitter saturation voltage at T=25°C at T=125°C	$V_{CE(sat)}$	V_{GE} = 15V, I_C = 75A	- -	1.8 2.0	- -	
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C = 3 mA, V_{CE} = V_{GE}	5	6.2	7	
Diode forward voltage	V_F	I_F = 50A	1.3	1.6	1.9	
Zero gate voltage collector current at T = 25°C at T_j= 125°C	I_{CES}	V_{CE} = 1200V, V_{GE} = 0	- -	- 85	100 -	µA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = $\pm$20V at T=125 °C	-200	-	200	nA
Short Circuit Current	I_{SC}	V_{CC} = 900V, V_{GE} = 15V $t_{psc} \leq$ 10µs $V_{CEM} \leq$ 1200V at T_C= 125°C	-	350	-	A

ELECTRICAL CHARACTERISTICS², at T_j = 25°C, unless otherwise specified

Dynamic Characteristics

Input capacitance	C_{iss}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz	-	5..52	-	nF
Output capacitance	C_{oss}		-	0.40	-	
Reverse transfer capacitance	C_{rss}		-	0.26	-	
Gate Charge	Q_g	V_{CE} = 600V I_C = 75A V_{GE} = -15V, 15V	-	780	-	nC

SWITCHING CHARACTERISTICS², at T_j = 25°C, unless otherwise specified

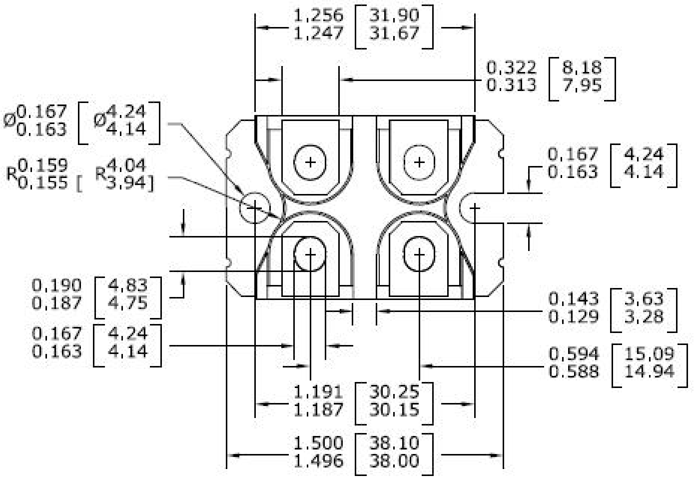
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
IGBT Characteristics						
Turn-on delay time	$t_{d(on)}$	V_{CC} = 600V, I_C = 75A, V_{GE} = ±15V, R_G =15Ω, L_σ = 60nH Inductive Load	-	165	-	ns
Rise time	t_r		-	75	-	
Turn-off delay time	$t_{d(off)}$		-	435	-	
Fall time	t_f		-	50	-	
Turn-on energy	E_{on}		-	9.3	-	mJ
Turn-off energy	E_{off}		-	4.5	-	
Anti – Parallel Diode Characteristics						
Diode reverse recovery time	t_{rr}	I_F = 50A V_R = 600V di/dt = 1200A/µs L_σ = 60nH, Inductive load	-	190	-	ns
Diode reverse recovery charge	Q_{rr}		-	7.5	-	µC
Diode peak reverse recovery current	I_{rrm}		-	55	-	A

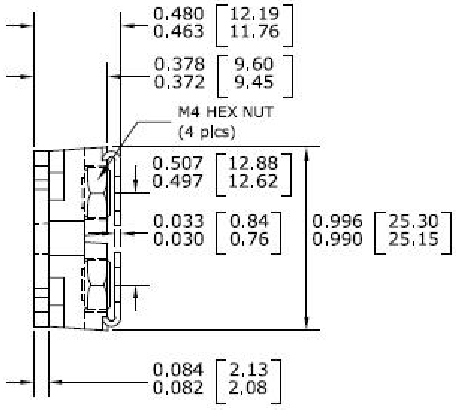
SWITCHING CHARACTERISTICS², at T_j = 125°C, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
IGBT Characteristics						
Turn-on delay time	$t_{d(on)}$	V_{CC} = 600V, I_C = 75A, V_{GE} = ±15V, R_G =15Ω, L_σ = 60nH Inductive Load	-	175	-	ns
Rise time	t_r		-	70	-	
Turn-off delay time	$t_{d(off)}$		-	500	-	
Fall time	t_f		-	70	-	
Turn-on energy	E_{on}		-	12.4	-	µJ
Turn-off energy	E_{off}		-	7.5	-	
Anti – Parallel Diode Characteristics						
Diode reverse recovery time	t_{rr}	I_F = 50A V_R = 600V di/dt = 1200A/µs L_σ = 60nH, Inductive load	-	280	-	ns
Diode reverse recovery charge	Q_{rr}		-	13.5	-	µC
Diode peak reverse recovery current	I_{rrm}		-	70	-	A

1) *Maximum rated values indicate limits beyond which damage to the device may occur per IEC 60747-9*
2) *Characteristic values according to IEC 60747-9*

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.**