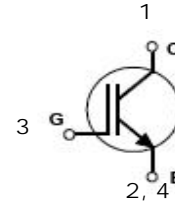


PRELIMINARY DATASHEET
**600V 75A, N-Channel IGBT in Trench & Field
 Stop-technology in Isolated SOT227 Package**
APPLICATIONS

- Uninterruptible power supplies (UPS)
- Solar inverters
- Welding inverters
- Motor drives
- Low power lighting: low frequency


FEATURES

- High speed switching
- Very low $V_{CE(sat)}$
- Very tight parameter distribution
- High ruggedness, temperature stable
- Parallel switching capability
- Very soft, fast recovery anti-parallel diode
- 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_{CE}	600	V
DC collector current, limited by T_{jmax} $T_C = 25^\circ\text{C}$ $T_C = 80^\circ\text{C}$	I_C	150 75	A
Pulsed collector current, t_p limited by T_{jmax}	I_{Cpulse}	225	
Turn off safe operating area $V_{CE} \leq 1200\text{V}$, $T_j \leq 150^\circ\text{C}$	-	225	
Gate-emitter voltage	V_{GE}	± 20	V
Short circuit withstand time ¹ $V_{GE} = 15\text{V}$, $V_{CC} \leq 1200\text{V}$, $T_j \leq 150^\circ\text{C}$	t_{SC}	5	μs
Soldering temperature Wave soldering, 1.6 mm (0.063 in.) from case for 10s	T_s	260	$^\circ\text{C}$
Operating junction and storage temperature	T_j, T_{stg}	-55... +175	$^\circ\text{C}$

Thermal and Isolation Characteristics

Parameter	Symbol	Max. Value	Units
Characteristics			
IGBT thermal resistance, junction to case	R_{thJC}	0.46	K/W
Thermal resistance, junction to ambient	R_{thJA}	40	
Isolation voltage, RMS (measured between terminals and mounting base, 50-60 Hz, for 1-3 seconds)	V_{iso}	3000	V

¹ Allowed number of short circuits: < 1000; time between short circuits: > 1s.

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	$V_{(BR)CES}$	$V_{GE} = 0\text{V}, I_C = 0.2\text{mA}$	600	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15\text{V}, I_C = 75\text{A}$ $T_j = 25^\circ\text{C}$ $T_j = 175^\circ\text{C}$	-	1.5 1.9	2.0 -	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C = 1.2\text{mA}, V_{CE} = V_{GE}$	4.1	4.9	5.7	
Zero gate voltage collector current	I_{CES}	$V_{CE} = 600\text{V}, V_{GE} = 0$ $T_j = 25^\circ\text{C}$ $T_j = 175^\circ\text{C}$	-	-	40 1000	μA
Gate-emitter leakage current	I_{GES}	$V_{CE} = 0\text{V}, V_{GE} = 20\text{V}$	-	-	100	nA
Transconductance	g_{fs}	$V_{CE} = 20\text{V}, I_C = 75\text{A}$	-	41	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{CE} = 25\text{V},$ $V_{GE} = 0\text{V},$ $f = 1\text{MHz}$	-	4620	-	pF
Output capacitance	C_{oss}		-	288	-	
Reverse transfer capacitance	C_{riss}		-	137	-	
Gate charge	Q_{Gate}	$V_{CC} = 480\text{V}, I_C = 75\text{A}$ $V_{GE} = 15\text{V}$	-	470	-	nC
Internal emitter inductance measured 5mm (0,197 in.) from case	L_E		-	13	-	nH
Short circuit collector current ¹	$I_{C(SC)}$	$V_{GE} = 15\text{V}, t_{SC} \leq 5\ \mu\text{s}$ $V_{CC} = 400\text{V},$ $T_j \leq 150^\circ\text{C}$	-	687.5	-	A

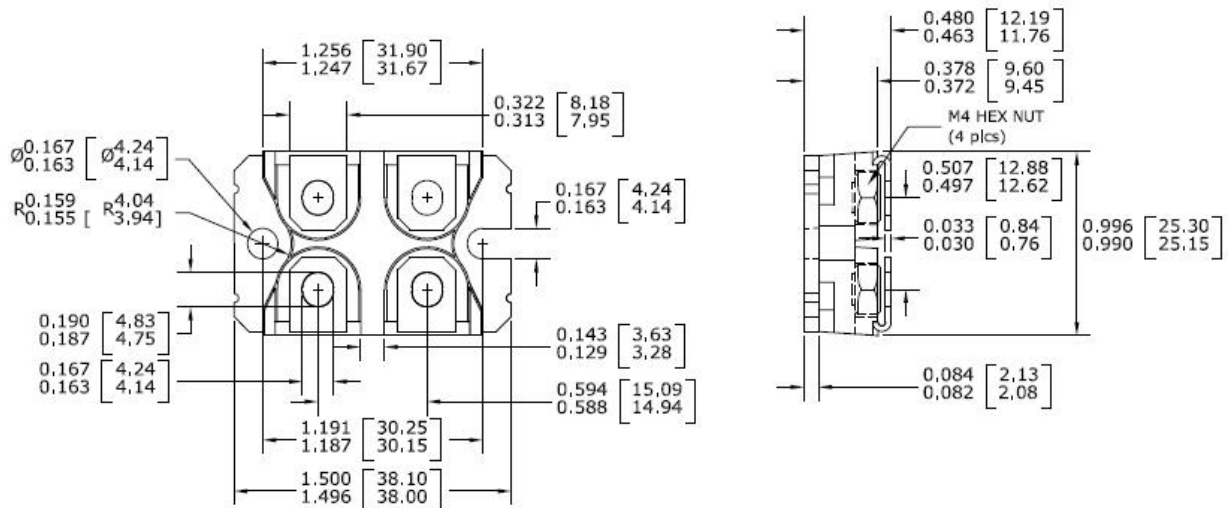
SWITCHING CHARACTERISTICS, Inductive Load at $T_j = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Turn-on delay time	$t_{d(on)}$	$T_j = 25^\circ\text{C},$ $V_{CC} = 400\text{V}, I_C = 75\text{A},$ $V_{GE} = 0/15\text{V},$ $R_G = 5\Omega,$ $L_o^2 = 100\text{nH},$ $C_o^2 = 39\text{pF}$ Energy losses include tail and diode reverse recovery.	-	33	-	ns
Rise time	t_r		-	36	-	
Turn-off delay time	$t_{d(off)}$		-	330	-	
Fall time	t_f		-	35	-	
Turn-on energy	E_{on}			-	2.0	-
Turn-off energy	E_{off}		-	2.5	-	
Total switching energy	E_{ts}		-	4.5	-	

SWITCHING CHARACTERISTICS, Inductive Load at $T_j = 150^\circ\text{C}$

Parameter	Symbol	Conditions	Value			Unit	
			Min.	Typ.	Max.		
Turn-on delay time	$t_{d(on)}$	$T_j = 150^\circ\text{C},$ $V_{CC} = 400\text{V}, I_C = 75\text{A},$ $V_{GE} = 0/15\text{V},$ $R_G = 5\Omega,$	-	32	-	ns	
Rise time	t_r		-	37	-		
Turn-off delay time	$t_{d(off)}$		-	363	-		
Fall time	t_f		-	38	-		
Turn-on energy	E_{on}			-	2.9	-	mJ
Turn-off energy	E_{off}			-	2.9	-	
Total switching energy	E_{ts}			-	5.8	-	

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.**