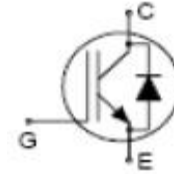


PRELIMINARY DATASHEET

600V 75A, N-Channel IGBT in Trench & Field Stop technology with soft, fast recovery anti-parallel diode, in TO-247 Package

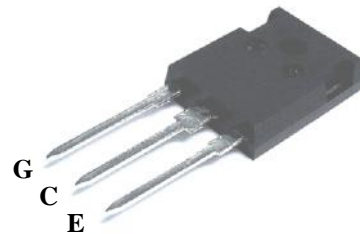
APPLICATIONS

- 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 $T_C = 100^\circ\text{C}$	I_C	75	A
Pulsed collector current, t_p limited by T_{jmax}	I_{Cpulse}	225	
Diode forward current $T_C = 100^\circ\text{C}$	I_F	75	
Gate-emitter voltage	V_{GE}	± 20	V
Short circuit withstand time ¹ $V_{GE} = 15\text{V}$, $V_{CC} \leq 600\text{V}$, $T_j \leq 150^\circ\text{C}$	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	

Thermal Characteristics

Parameter	Symbol	Max. Value	Units
Characteristics			
IGBT thermal resistance, junction to case	R_{thJC}	0.35	K/W
Diode thermal resistance, junction to case	R_{thJCD}	0.6	

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

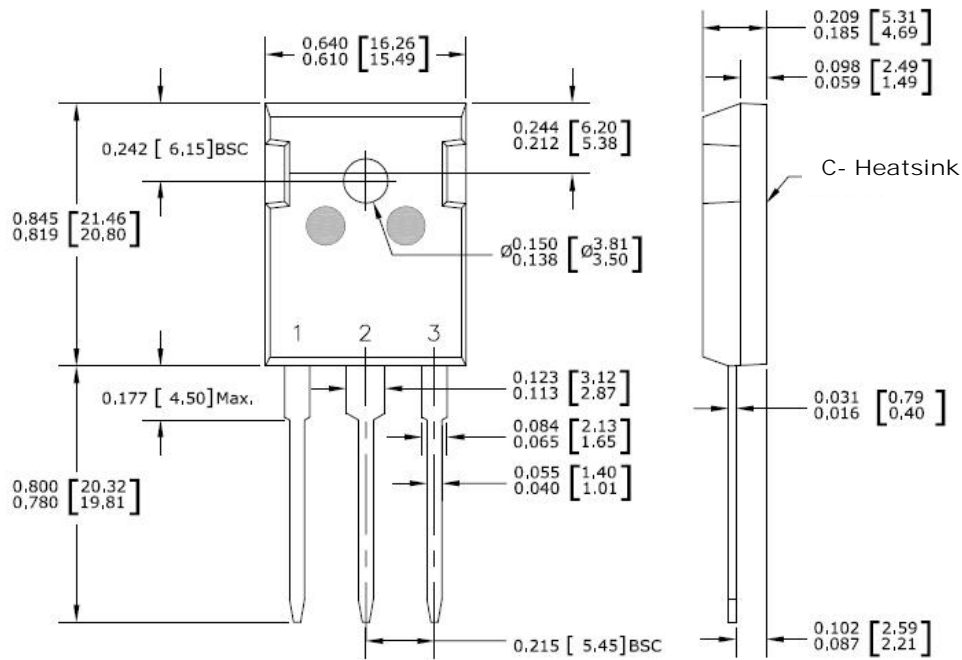
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE} = 0\text{V}, I_C = 0.2\text{mA}$	600	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15\text{V}, I_C = 75\text{A}$ $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$	- -	1.5 1.9	2.0 -	
Diode forward voltage	V_F	$V_{GE} = 0\text{V}, I_F = 75\text{A}$ $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$	1.2 -	1.6 1.5	1.9 -	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C = 1.2\text{mA}, V_{CE} = V_{GE}$	4.1	-	5.7	
Zero gate voltage collector current	I_{CES}	$V_{CE} = 600\text{V}, V_{GE} = 0$ $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$	- -	- -	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_{rss}		-	137	-	
Gate charge	Q_{Gate}	$V_{CC} = 600\text{V}, I_C = 75\text{A}$ $V_{GE} = \pm 15\text{V}$	-	465	-	nC
Internal emitter inductance measured 5mm (0,197 in.) from case	L_E		-	13	-	nH
Short circuit collector current ¹	$I_{C(SC)}$	$V_{GE} = 15\text{V}, t_{sc} \leq 5\mu\text{s}$ $V_{CC} \leq 600\text{V}, T_J = 150^\circ\text{C}$	-	690	-	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	$t_{d(on)}$	$T_J = 25^\circ\text{C},$ $V_{CC} = 300\text{V}, I_C = 75\text{A},$ $V_{GE} = 0/15\text{V},$ $R_G = 6\Omega,$	-	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}		-	3.4	-	mJ
Turn-off energy	E_{off}		-	2.2	-	
Total switching energy	E_{ts}		-	5.6	-	
Anti-Parallel Diode Characteristics						
Diode reverse recovery time	t_{rr}	$V_R = 300\text{V}, I_F = 75\text{A},$ $di_F/dt = 100\text{A}/\mu\text{s}$	-	135	-	ns
Diode reverse recovery charge	Q_{rr}		-	0.265	-	μC
Diode peak reverse recovery current	I_{rrm}		-	3.7	-	A

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

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.**