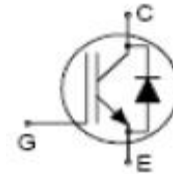
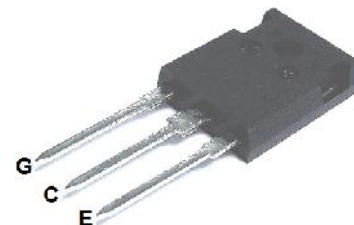


PRELIMINARY DATASHEET
600V 30A, Fast N-Channel IGBT in NPT-technology with soft, fast recovery anti-parallel diode, in TO247 Package
APPLICATIONS

- Motor controls
- Inverters
- Induction heating
- Switch mode power supplies (SMPS)


FEATURES

- Low Eoff combined with low conduction loss
- Short circuit withstand time - 10 μ s
- Very tight parameter distribution
- High ruggedness, temperature stability
- Parallel switching capability
- 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 $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	I_C	41 30	A
Pulsed collector current, t_p limited by T_{jmax}	I_{Cpulse}	112	
Turn off safe operating area $V_{CE} \leq 600\text{V}$, $T_j \leq 150^\circ\text{C}$	-	112	
Diode forward current $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	I_F	41 30	
Diode pulsed current, t_p limited by T_{jmax}	I_{Fpulse}	112	
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}	10	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...+150	

Thermal Characteristics

Parameter	Symbol	Max. Value	Units
Characteristics			
IGBT thermal resistance, junction to case	R_{thJC}	0.5	K/W
Diode thermal resistance, junction to case	R_{thJCD}	1	
Thermal resistance, junction to ambient	R_{thJA}	40	

Electrical Characteristics, at $T_J = 25^\circ\text{C}$, unless otherwise specified

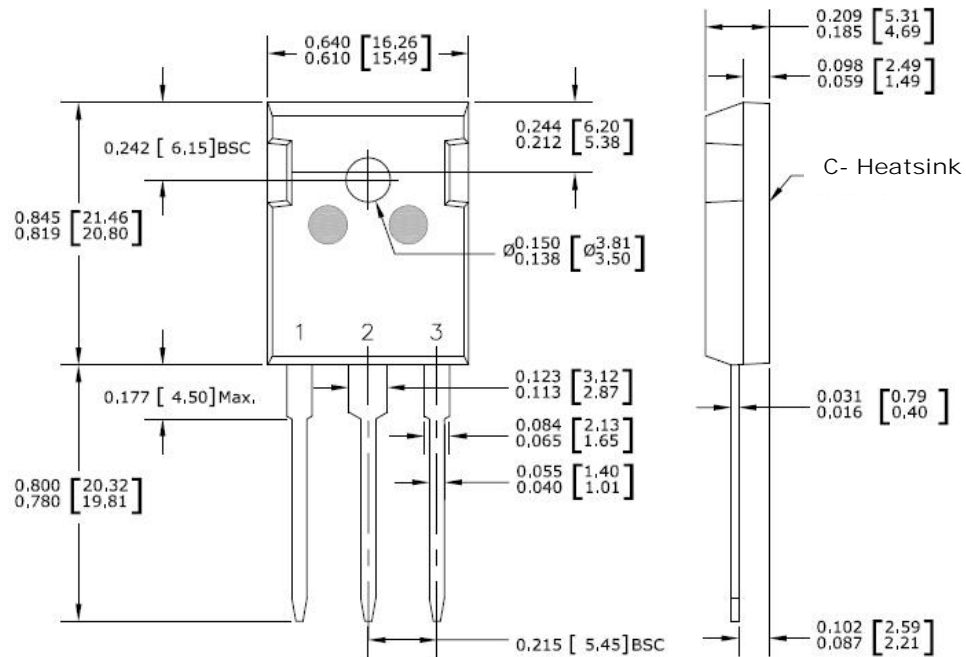
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE} = 0V, I_C = 500\mu A$	600	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15V, I_C = 30A$ $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$	1.7 -	2.1 2.5	2.4 3.0	
Diode forward voltage	V_F	$V_{GE} = 0V, I_F = 30A$ $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$	1.2 -	1.4 1.25	1.8 1.65	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C = 0.7mA, V_{CE} = V_{GE}$	3	4	5	
Zero gate voltage collector current	I_{CES}	$V_{CE} = 600V, V_{GE} = 0$ $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$	- -	- -	40 3000	μA
Gate-emitter leakage current	I_{GES}	$V_{CE} = 0V, V_{GE} = 20V$	-	-	100	nA
Transconductance	g_{fs}	$V_{CE} = 20V, I_C = 30A$	-	20	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{CE} = 25V,$ $V_{GE} = 0V,$ $f = 1\text{MHz}$	-	1600	-	pF
Output capacitance	C_{oss}		-	150	-	
Reverse transfer capacitance	C_{rss}		-	92	-	
Gate charge	Q_{Gate}	$V_{CC} = 480V, I_C = 30A$ $V_{GE} = 15V$	-	140	-	nC
Internal emitter inductance measured 5mm (0,197 in.) from case	L_E		-	13	-	nH
Short circuit collector current ¹	$I_{C(SC)}$	$V_{GE} = 15V, t_{sc} \leq 5\mu s$ $V_{CC} \leq 600V, T_J = 150^\circ\text{C}$	-	300	-	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	$t_{d(on)}$	$V_{CC} = 400V, I_C = 30A,$ $V_{GE} = 0/15V,$ $R_G = 11\Omega,$ $L_{O2} = 180nH$ $C_{O2} = 900pF$ Energy losses included tail and diode reverse recovery.	-	44	-	ns
Rise time	t_r		-	34	-	
Turn-off delay time	$t_{d(off)}$		-	291	-	
Fall time	t_f		-	58	-	
Turn-on energy	E_{on}		-	0.64	-	mJ
Turn-off energy	E_{off}		-	0.65	-	
Total switching energy	E_{ts}		-	1.29	-	
Anti-Parallel Diode Characteristics						
Diode reverse recovery time	t_{rr}	$V_R = 400V, I_F = 30A,$ $di_F/dt = 1000A/\mu s$	-	126	-	ns
Diode reverse recovery charge	Q_{rr}		-	1100	-	μC
Diode peak reverse recovery current	I_{rrm}		-	19	-	A

1. Allowed number of short circuits: < 1000; time between short circuits: > 1s.
2. Leakage inductance L_s and Stray capacity C_s due to dynamic test circuit.

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.**