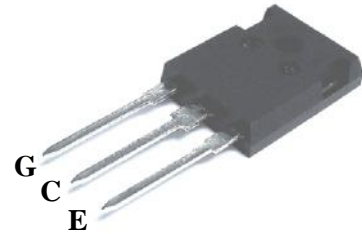
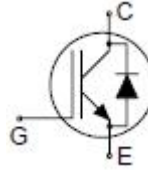


**PRELIMINARY DATASHEET**
**NPT IGBT with soft, fast recovery anti-parallel diode, in TO247 Package**

- Square RBSOA
- Positive  $V_{CE(on)}$  temperature coefficient


**MAXIMUM RATINGS**

Parameter	Symbol	Value	Units
Collector-emitter voltage	$V_{CES}$	1200	V
DC collector current, limited by $T_{jmax}$ $T_c=25^\circ\text{C}$ $T_c=100^\circ\text{C}$	$I_C$	40 20	A
Peak collector current <sup>1</sup>	$I_{CM}$	80	
Diode forward current $T_c=100^\circ\text{C}$	$I_F$	15	
Diode maximum forward current <sup>1</sup>	$I_{FM}$	80	
Gate-emitter voltage	$V_{GES}$	$\pm 30$	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	$\mu\text{s}$
Operating junction and storage temperature	$T_j, T_{stg}$	-55... +150	$^\circ\text{C}$

1. Repetitive rating; pulse width limited by maximum junction temperature.

**Thermal Resistance**

Parameter	Symbol	Max. Value	Units
<b>Characteristics</b>			
IGBT thermal resistance, junction to case	$R_{thJC}$	0.77	K/W
Diode thermal resistance, junction to case	$R_{thJCD}$	0.85	

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

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE} = 0\text{V}$ , $I_C = 0.25\text{mA}$	1200	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15\text{V}$ , $I_C = 20\text{A}$	-	2.3	-	
Diode forward voltage	$V_F$	$V_{GE} = 0\text{V}$ , $I_F = 15\text{A}$	-	1.9	-	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C = 0.5\text{mA}$ , $V_{CE} = V_{GE}$	3.0	-	6.0	
Zero gate voltage collector current	$I_{CES}$	$V_{CE} = 1200\text{V}$ , $V_{GE} = 0$	-	-	250	$\mu\text{A}$
Gate-emitter leakage current	$I_{GES}$	$V_{CE} = 0\text{V}$ , $V_{GE} = \pm 30\text{V}$	-100	-	100	nA

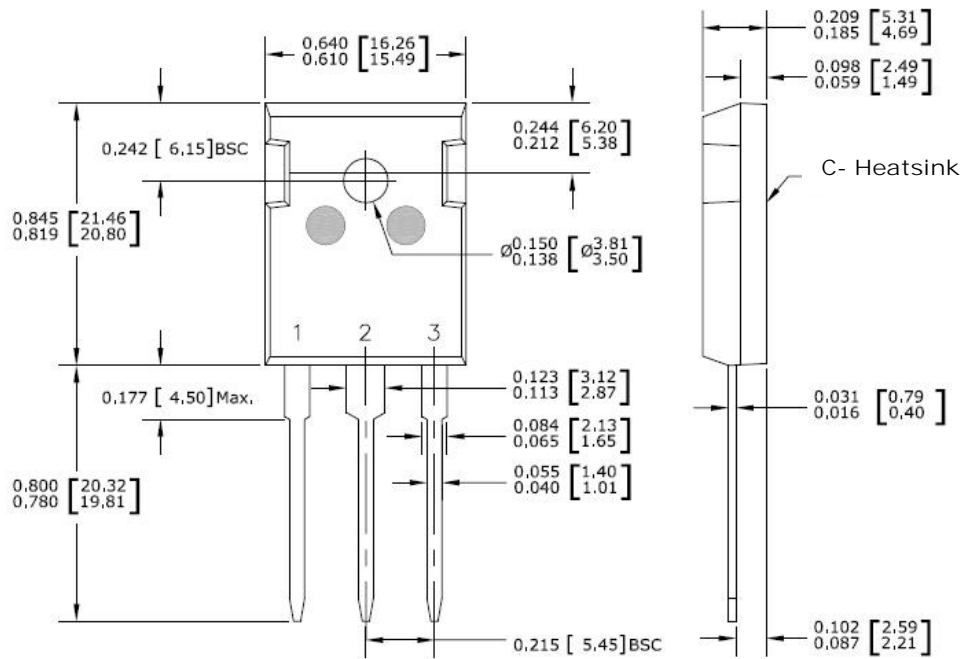
**Dynamic Characteristics**

Input capacitance	$C_{ies}$	$V_{CE}=30V$	-	1228	-	pF
Output capacitance	$C_{oes}$	$V_{GE}=0V$	-	109	-	
Reverse transfer capacitance	$C_{res}$	$f=1MHz$	-	46	-	
Total gate charge	$Q_g$	$V_{CC}=600V,$	-	186	230	nC
Gate-emitter charge	$Q_{ge}$	$V_{GE}=15V,$	-	15	20	
Gate-collector charge	$Q_{gc}$	$I_C=20A$	-	79	110	

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

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>IGBT Characteristics</b>						
Turn-on delay time	$t_{d(ON)}$	$V_{CC}=600V,$ $V_{GE}=15V,$ $I_C=20A,$ $R_G=10\Omega,$	-	50	-	ns
Rise time	$t_r$		-	50	-	
Turn-off delay time	$t_{d(OFF)}$		-	100	-	
Fall time	$t_f$		-	230	-	mJ
Turn-on switching loss	$E_{on}$		-	2.3	-	
Turn-off switching loss	$E_{off}$		-	0.9	-	
Total switching loss	$E_{ts}$	-	3.2	-		
<b>Anti-Parallel Diode Characteristics</b>						
Diode reverse recovery time	$t_{rr}$	$I_F=15A,$ $di_r/dt=-200A/\mu s$	-	210	330	ns
Maximum reverse recovery current	$I_{rrm}$		-	27	40	A
Reverse recovery charge	$Q_{rr}$		-	2.8	6.6	$\mu C$

**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.**