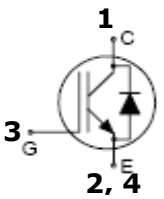
PRELIMINARY DATASHEET

IGBT in Trench & Field Stop technology with soft, fast recovery anti-parallel diode, in Isolated SOT227 Package

- Very high switching speed
- Very low $V_{CE(sat)}$
- Designed for frequency converters and UPS
- Very tight parameter distribution
- High ruggedness, temperature stability
  - parallel switching capability
- Very soft, fast recovery anti-parallel diode
- Pb-free lead finish; RoHS compliant



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

Parameter	Symbol	Value	Units
Collector-emitter voltage	V_{CE}	600	V
DC collector current, limited by T_{jmax} T_C= 80°C	I_C	100	A
Pulsed collector current, t_p limited by T_{jmax}	I_{Cpulse}	200	
Diode forward current	I_F	75	
Gate-emitter voltage	V_{GE}	± 20	V
Operating junction and storage temperature	T_j, T_{stg}	-40… +175	°C

Thermal Resistance

Parameter	Symbol	Max. Value	Units
Characteristics			
IGBT thermal resistance, junction to case	R_{thJC}	0.45	K/W
Diode thermal resistance, junction to case	R_{thJCD}	0.95	
Isolation voltage, RMS (measured between terminals and mounting base, 50-60 Hz, for 1-2 seconds)	V_{iso}	3000	V

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

CAUTION: These devices are ESD sensitive. Use proper handling procedure.

Team Pacific Building, Electronics Avenue
FTI Complex, Special Economic Zone
Taguig City, Philippines

Website: www.iqxprzpower.com
Telefax +632 837 1538

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

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Collector-emitter saturation voltage	$V_{CE(sat)}$	V_{GE} = 15V, I_C = 75A T_j = 25°C T_j = 175°C	 - -	 1.45 1.7	 1.9 -	V
Diode forward voltage	V_F	V_{GE} = 0V, I_F = 75A T_j = 25°C T_j = 150°C	 - -	 1.55 1.45	 1.95 -	
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C = 1.2mA, V_{CE} = V_{GE}	4.9	5.8	6.5	
Zero gate voltage collector current	I_{CES}	V_{CE} = 600V, V_{GE} = 0	-	-	1.0	μA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = 20V	-	-	100	nA
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz	-	6200	-	pF
Output capacitance	C_{oss}		-	384	-	
Reverse transfer capacitance	C_{rss}		-	190	-	
Gate charge	Q_{Gate}	V_{GE} = 15V	-	1000	-	nC

SWITCHING CHARACTERISTICS, Inductive Load at T_j = 25°C

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
IGBT Characteristics						
Turn-on delay time	$t_{d(on)}$	V_{CC}=300V, I_C=100A, V_{GE}=±15V, R_G=24Ω	-	100	-	ns
Rise time	t_r		-	60	-	
Turn-off delay time	$t_{d(off)}$		-	600	-	
Fall time	t_f		-	70	-	
Turn-on energy	E_{on}		-	4.85	-	mJ
Turn-off energy	E_{off}		-	6.0	-	
Anti-Parallel Diode Characteristics						
Diode reverse recovery time	trr	V_R=400V, I_F=30A, di_F/dt = 1000A/ μS	-	121	-	ns
Diode reverse recovery charge	Q_{rr}		-	2300	-	μC
Diode peak reverse recovery current	I_{rrm}		-	38	-	A

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

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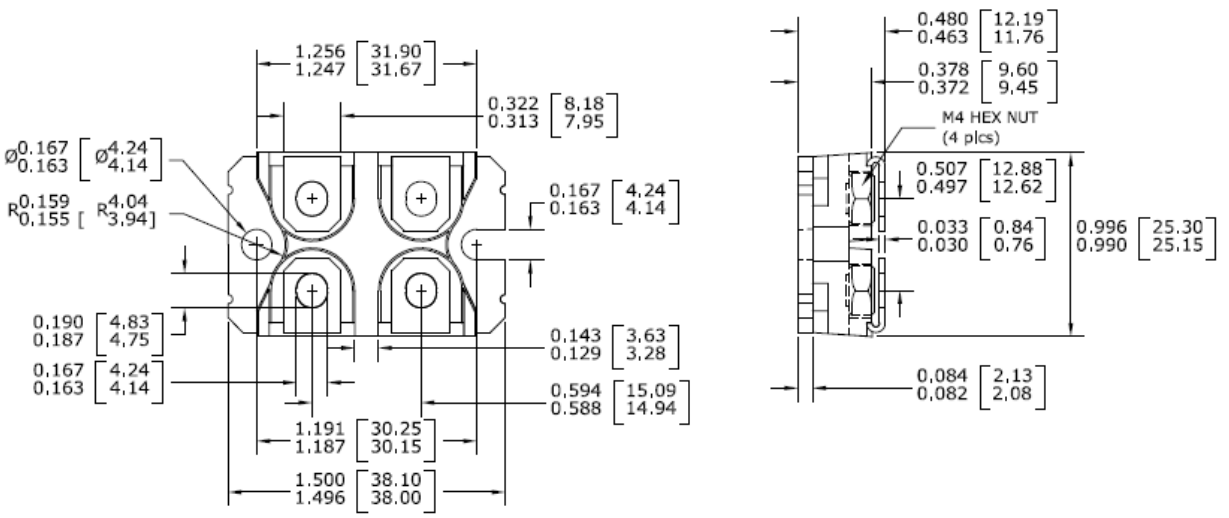
SWITCHING CHARACTERISTICS, Inductive Load at T_j = 150°C

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
IGBT Characteristics						
Turn-on delay time	$t_{d(on)}$	V_{CC}=400V, I_C=75A, V_{GE}=0/15V, R_G=5Ω, L_σ[1] = 100nH, C_σ[1] = 39pF Energy losses include tail and diode reverse recovery.	-	100	-	ns
Rise time	t_r		-	70	-	
Turn-off delay time	$t_{d(off)}$		-	700	-	
Fall time	t_f		-	120	-	
Turn-on energy	E_{on}		-	6.0	-	mJ
Turn-off energy	E_{off}		-	4.6	-	
Anti-Parallel Diode Characteristics						
Diode reverse recovery time	trr	V_R=400V, I_F=75A, di_F/dt = 1460A/ µS	-	182	-	ns
Diode reverse recovery charge	Q_{rr}		-	5600	-	µC
Diode peak reverse recovery current	I_{rrm}		-	51.0	-	A

1 *Leakage inductance L_σ and Stray capacity C_σ due to dynamic test circuit.*

Package Outline Drawing



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