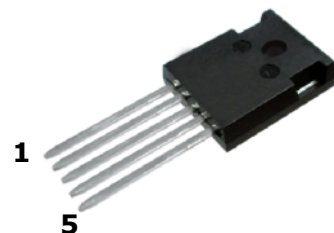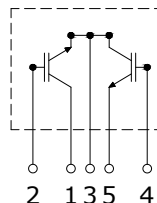## PRELIMINARY DATASHEET
Fast IGBT in NPT Technology
Series 2x1200, 8A in TO247 Package

- Short circuit withstand time – 10 us
- Designed for motor controls, inverters and SMPS
- High ruggedness, temperature stability
  - parallel switching capability
- Pb-free lead finish; RoHS compliant

1

5

2 1 3 5 4

MAXIMUM RATINGS (per IGBT), at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Value	Units
Collector-emitter voltage	V_{CE}	1200	V
DC collector current, limited by T_{jmax} T_C= 25°C T_C= 100°C	I_C	16.5 7.9	A
Pulsed collector current, t_p limited by T_{jmax}	I_{Cpulse}	27	
Turn off safe operating area $V_{CE} \leq$ 1200V, $T_j \leq$ 150°C	-	27	
Gate-emitter voltage	V_{GE}	± 20	V
Avalanche energy, single pulse I_C = 8A, V_{CC} = 50V, R_{GE} = 25Ω, start at T_j = 25°C	E_{AS}	40	mJ
Short circuit withstand time[1] V_{GE} = 15V, 100$\leq$ $V_{CC} \leq$ 1200V, $T_j \leq$ 150°C	t_{SC}	10	μs
Soldering temperature Wave soldering, 1.6 mm (0.063 in.) from case for 10s	T_S	260	°C
Operating junction and storage temperature	T_j, T_{stg}	-55… +150	°C

Thermal Resistance (per IGBT)

Parameter	Symbol	Max. Value	Units
Characteristics			
IGBT thermal resistance, junction to case	R_{thJC}	1.25	K/W
Thermal resistance, junction to ambient	R_{thJA}	62	

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

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

ELECTRICAL CHARACTERISTICS (per IGBT), at T_j = 25°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 = 500µA	1200	-	-	
Collector-emitter saturation voltage	$V_{CE(sat)}$	V_{GE} = 15V, I_C = 8A T_j = 25°C T_j = 150°C	2.5 -	3.1 3.7	3.6 4.3	V
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C = 350µA, V_{CE} = V_{GE}	3.0	4.0	5.0	
Zero gate voltage collector current	I_{CES}	V_{CE} = 1200V, V_{GE} = 0 T_j = 25°C T_j = 150°C	- -	- -	100 400	µA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = 20V	-	-	100	nA
Transconductance	g_{fs}	V_{CE} = 20V, I_C = 8A	-	6	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz	-	720	-	
Output capacitance	C_{oss}		-	60	-	pF
Reverse transfer capacitance	C_{rss}		-	40	-	
Gate charge	Q_{Gate}	V_{CC} = 960V, I_C = 8A V_{GE} = 15V	-	70	-	nC
Internal emitter inductance measured 5mm (0,197 in.) from case	L_E		-	7	-	nH
Short circuit collector current[1]	$I_{C(SC)}$	V_{GE} = 15V, t_{SC} ≤ 10 µS 100V ≤ V_{CC} ≤ 1200V, T_j = 150°C	-	75	-	A

SWITCHING CHARACTERISTICS (per IGBT), 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}=800V, I_C=8A, V_{GE}=0/15V, R_G=47Ω, L_σ^2 = 180nH, C_σ^2 = 40pF Energy losses include tail and diode reverse recovery.	-	27	-	
Rise time	t_r		-	29	-	
Turn-off delay time	$t_{d(off)}$		-	440	-	ns
Fall time	t_f		-	21	-	
Turn-on energy	E_{on}		-	0.6	-	
Turn-off energy	E_{off}		-	0.4	-	mJ
Total switching energy	E_{ts}		-	1.0	-	

SWITCHING CHARACTERISTICS (per IGBT), 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}=800V, I_C=8A, V_{GE}=0/15V, R_G=47Ω, L_σ^2 = 180nH, C_σ^2 = 40pF	-	30	-	
Rise time	t_r		-	26	-	
Turn-off delay time	$t_{d(off)}$		-	490	-	ns
Fall time	t_f		-	30	-	

Turn-on energy	E_{on}	Energy losses include tail and diode reverse recovery.	-	1.0	-	
Turn-off energy	E_{off}		-	0.7	-	mJ
Total switching energy	E_{ts}		-	1.7	-	

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.*

Package Outline Drawing