XPT IGBT Chip

Type	V$_{CE}$ [V]	I$_C$ [A]	Chip Size [mm] x [mm]		Package	Ordering Code
IX85X12A	1200	75	9.32	9.22	sawn on foil ☐	-
					unsawn wafer ☐	-
					in waffle pack ☑	tbd

Features / Advantages:

● Easy paralleling due to the positive temperature coefficient of the on-state voltage
● Rugged XPT design (Xtreme light Punch Through) results in:
 - short circuit rated for 10 μsec.
 - very low gate charge
 - square RBSOA @ 2x Ic
 - low EMI
● Thin wafer technology combined with the XPT design results in a competitive low Vce(sat)

Applications:

● AC motor drives
● Solar inverter
● Medical equipment
● Uninterruptible power supply
● Air-conditioning systems
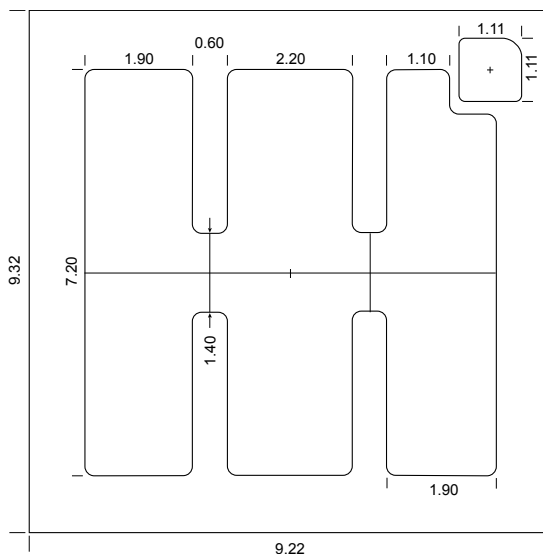● Welding equipment

Mechanical Parameters

Parameters	Conditions		Ratings	Unit
Area active			67.57	mm²
Area total			85.93	mm²
Wafer size Ø			150	mm
Thickness			130	μm
Material	SiFZ	Orientation	<100>	
Max. possible chips	per wafer			
Passivation	front side		SiN	
Metalization	top side		AlSi	
	backside		Al / Ti / Ni / Ag	
Recom. wire bonds (Al)	Emitter	Number / Ø	8 / 300	- / μm
	Gate	Number / Ø	1 / 300	- / μm
Reject Ink Dot Size	Ø		0.4-1.0	mm
Recom. Storage Environment	in orig. container, in dry nitrogen		< 6	month
	Storage Temperature (Tstg)		-40 ... 40	°C
Soldering temperature (5 min.)			max. tbd	°C
Virtual junction temperature T$_{VJ}$			-40 ... 150	°C

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Electrical Parameters

Symbol	Definition	Conditions			min.	typ.	max.	Unit
V_{CES}	Collector emitter voltage	V_{GE} = 0 V	I_C = 1 mA	T_{VJ} = 25°C			1200	V
V_{GES}	Maximum DC gate voltage						±20	V
I_C	Collector current	*(depending on thermal properties of assembly)*					75	A
$V_{CE\,sat}$	Collector emitter saturation voltage	V_{GE} = 15 V	I_C = 77 A	T_{VJ} = 25°C		1.8	2.1	V
				T_{VJ} = 125°C		2.1		V
V_{TO}	Threshold voltage	V_{GE} = 15 V;	T_{VJ} = 150 °C				1.1	V
r_T	*(for power loss calculation)*						17.9	m Ω
I_{CES}	Collector emitter leakage current	V_{CE} = 1200 V	V_{GE} = 0 V	T_{VJ} = 25°C		10	100	µA
				T_{VJ} = 125°C		100		µA
I_{GES}	Gate emitter leakage current	V_{CE} = 0 V	V_{GE} = ±20 V				500	nA
$V_{GE(th)}$	Gate emitter threshold voltage	I_C = 3 mA	$V_{CE} = V_{GE}$	T_{VJ} = 25°C	5.4		6.5	V
Q_{Gon}	Total gate charge	I_C = 50 A	V_{CE} = 600 V	V_{GE} = 15 V		230		nC
C_{ies}	Input capacitance	V_{CE} = 25 V	V_{GE} = 0 V	T_{VJ} = 25°C		4.55		pF
C_{oes}	Output capacitance					387		pF
C_{res}	Reverse transfer capacitance	f = 1 MHz				158		pF
$t_{d(on)}$	Turn-on delay time					70		ns
t_r	Current rise time					40		ns
$t_{d(off)}$	Turn-off delay time	V_G = 600 V	I_C = 75 A			250		ns
t_f	Current fall time	R_G = 10 Ω	V_{GE} = ±15 V	T_{VJ} = 125°C		100		ns
E_{on}	Turn-on energy per pulse	measured with: DWHP 69-12B				6.8		mJ
E_{off}	Turn-off energy per pulse					8.3		mJ
RBSOA	Reverse bias safe operation area	V_{GE} = 15 V	R_G = 10 Ω	T_{VJ} = 125°C				
				V_{CE} = 1200 V			225	A
SCSOA	Short circuit safe operation area							
t_{SC}	Short circuit duration	V_{CE} = 900 V	V_{GE} = ±15 V	T_{VJ} = 125°C			10	µs
I_{SC}	Short circuit current	R_G = 10 Ω	non-repetitive			300		A

Data according to IEC 60747

Dimensions (1 mm = 0.0394")

A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
9.32	9.22	n/a	n/a	n/a

F [mm]	G [mm]	H [mm]	I [mm]	J [mm]
n/a	n/a	n/a	n/a	n/a

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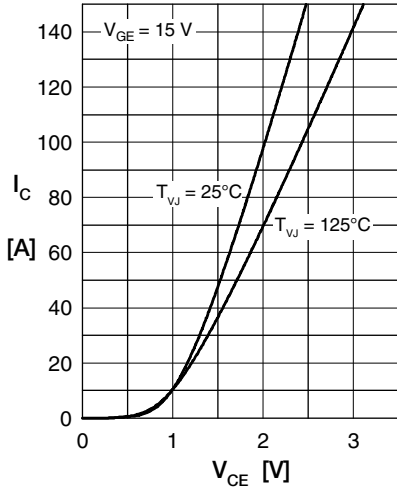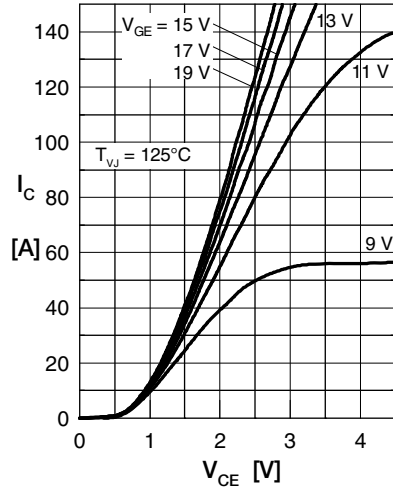
Fig. 1 Typ. output characteristics

Fig. 2 Typ. output characteristics
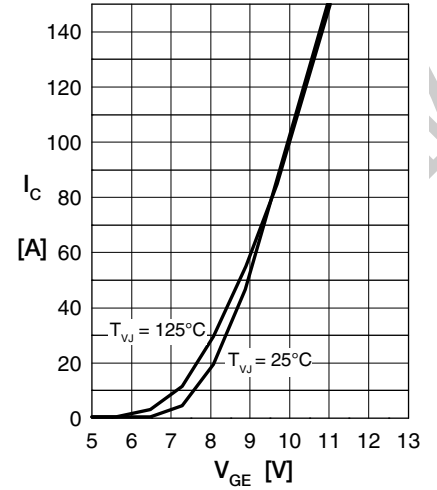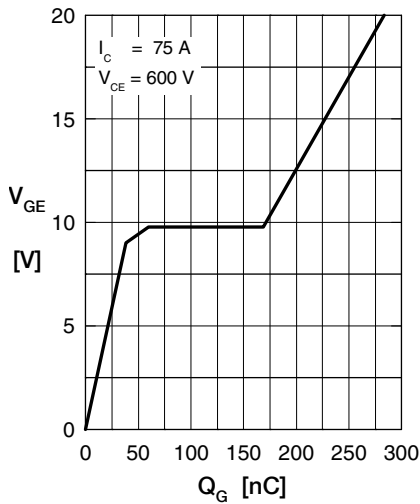

Fig. 3 Typ. tranfer characteristics
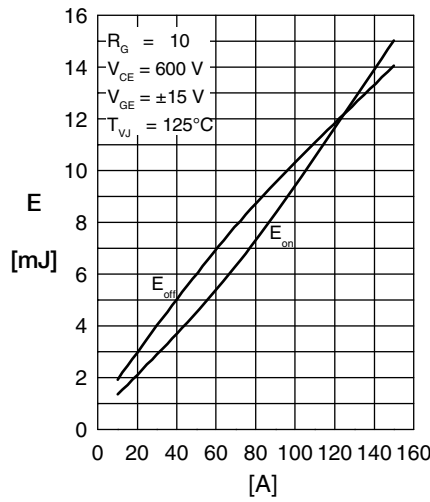

Fig. 4 Typ. turn-on gate charge

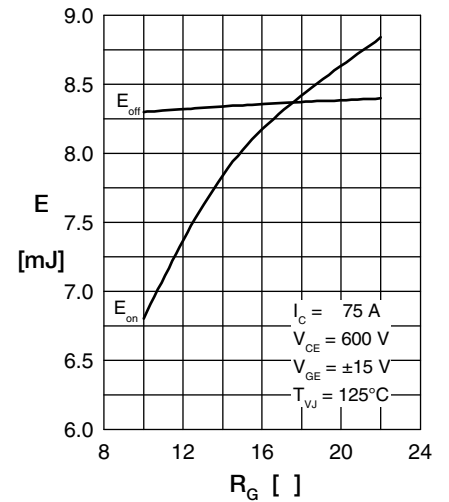Fig. 5 Typ. switching energy versus collector current
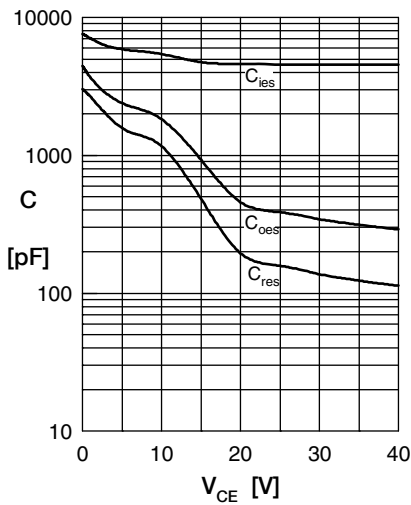

Fig. 6 Typ. switching energy versus gate resistance

Fig. 7 Capacitance

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