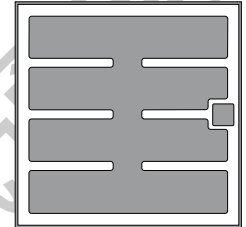


XPT IGBT Chip



Type	V _{CE} [V]	I _C [A]	Chip Size [mm] x [mm]	Package	Ordering Code
IX169X12A	1200	150	13.0 13.0	sawn on foil <input type="checkbox"/> unsawn wafer <input type="checkbox"/> in waffle pack <input checked="" type="checkbox"/>	- - 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 I_C
 - low EMI
- Thin wafer technology combined with the XPT design results in a competitive low V_{ce(sat)}

Applications:

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

Mechanical Parameters

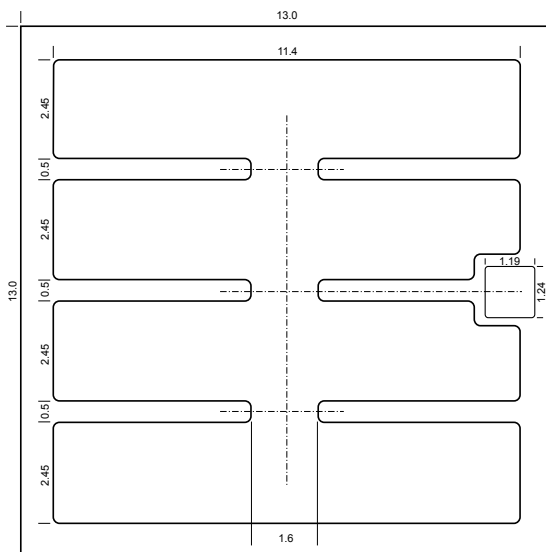
Parameters	Conditions	Orientation	Rating s	Unit
Area active			140.5	mm ²
Area total			169.00	mm ²
Wafer size Ø			150	mm
Thickness			130	µm
Material	SiFZ	Orientation	<100>	
Max. possible chips	per wafer			
Passivation	front side		SiN	
Metalization	top side		AlSi	
	backside		Al / Ti / Ni / Ag	
Recom. wire bonds (Al)	Emitter	Number / Ø	12 / 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 (T _{stg})		-40 ... 40	°C
Soldering temperature (5 min.)			max. tbd	°C
Virtual junction temperature T _{vj}			-40 ... 150	°C

Electrical Parameters

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
V_{CES}	Collector emitter voltage	$V_{GE} = 0\text{ V}$ $I_C = 1\text{ mA}$ $T_{VJ} = 25^\circ\text{C}$			1200	V
V_{GES}	Maximum DC gate voltage				± 20	V
I_C	Collector current (depending on thermal properties of assembly)				150	A
$V_{CE\text{ sat}}$	Collector emitter saturation voltage	$V_{GE} = 15\text{ V}$ $I_C = 160\text{ A}$ $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		1.8 2.1	2.1	V
V_{TO}	Threshold voltage	$V_{GE} = 15\text{ V};$ $T_{VJ} = 150^\circ\text{C}$			1.1	V
r_T	(for power loss calculation)				8.6	m Ω
I_{CES}	Collector emitter leakage current	$V_{CE} = 1200\text{ V}$ $V_{GE} = 0\text{ V}$ $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		10 100	100	μA μA
I_{GES}	Gate emitter leakage current	$V_{CE} = 0\text{ V}$ $V_{GE} = \pm 20\text{ V}$			500	nA
$V_{GE(th)}$	Gate emitter threshold voltage	$I_C = 6\text{ mA}$ $V_{CE} = V_{GE}$ $T_{VJ} = 25^\circ\text{C}$	5.4		6.5	V
Q_{Gon}	Total gate charge	$I_C = 150\text{ A}$ $V_{CE} = 600\text{ V}$ $V_{GE} = 15\text{ V}$		470		nC
C_{ies}	Input capacitance			9.69		pF
C_{oes}	Output capacitance	$V_{CE} = 25\text{ V}$ $V_{GE} = 0\text{ V}$ $T_{VJ} = 25^\circ\text{C}$		786		pF
C_{res}	Reverse transfer capacitance	$f = 1\text{ MHz}$		335		pF
$t_{d(on)}$	Turn-on delay time			70		ns
t_r	Current rise time			40		ns
$t_{d(off)}$	Turn-off delay time	$V_G = 600\text{ V}$ $I_C = 150\text{ A}$		250		ns
t_f	Current fall time	$R_G = 4.7\ \Omega$ $V_{GE} = \pm 15\text{ V}$ $T_{VJ} = 125^\circ\text{C}$		100		ns
E_{on}	Turn-on energy per pulse	measured with: DWHP 150-12B		14		mJ
E_{off}	Turn-off energy per pulse			16		mJ
RBSOA	Reverse bias safe operation area	$V_{GE} = 15\text{ V}$ $R_G = 4.7\ \Omega$ $T_{VJ} = 125^\circ\text{C}$ $V_{CE} = 1200\text{ V}$			300	A
SCSOA	Short circuit safe operation area					
t_{sc}	Short circuit duration	$V_{CE} = 900\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $T_{VJ} = 125^\circ\text{C}$			10	μs
I_{sc}	Short circuit current	$R_G = 4.7\ \Omega$ non-repetitive		600		A

Data according to IEC 60747

Dimensions (1 mm = 0.0394")



A	B	C	D	E
[mm]	[mm]	[mm]	[mm]	[mm]
13.0	13.0	n/a	n/a	n/a

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

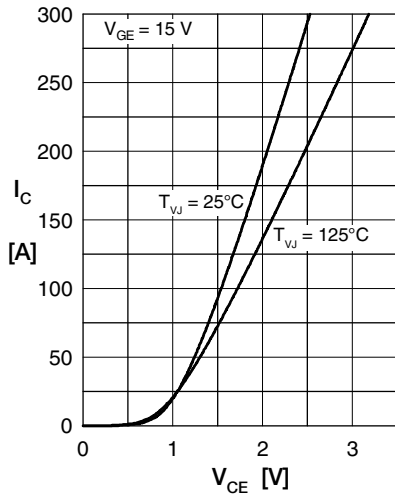


Fig. 1 Typ. output characteristics

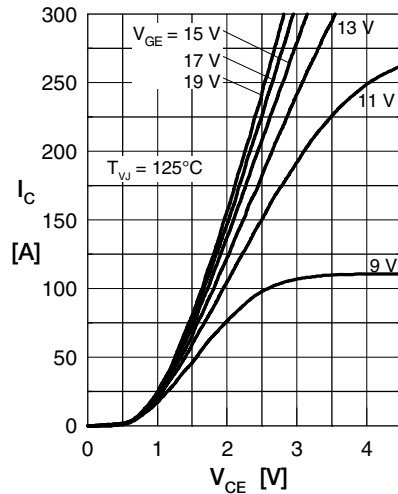


Fig. 2 Typ. output characteristics

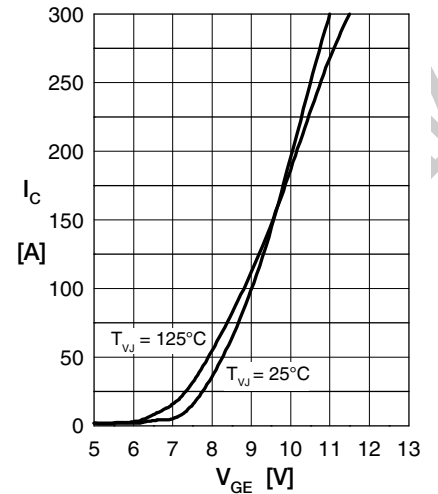


Fig. 3 Typ. transfer characteristics

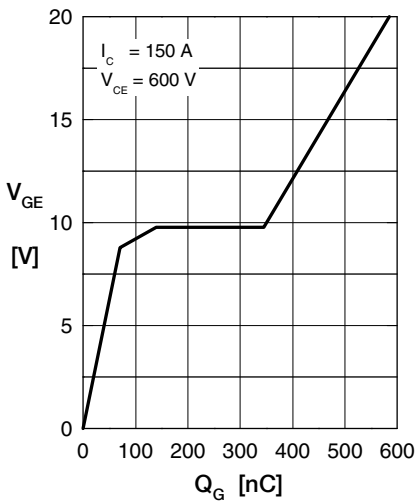


Fig. 4 Typ. turn-on gate charge

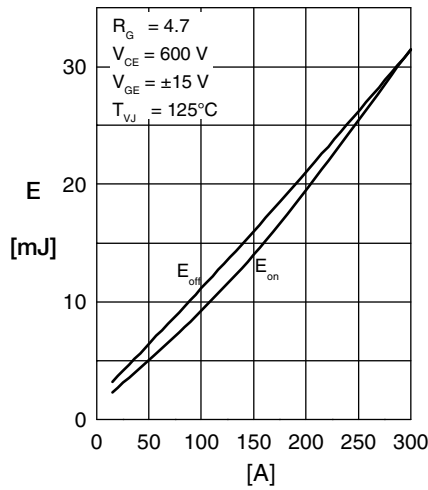


Fig. 5 Typ. switching energy versus collector current

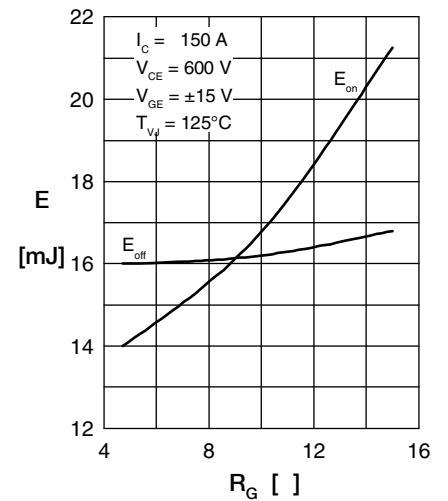


Fig. 6 Typ. switching energy versus gate resistance

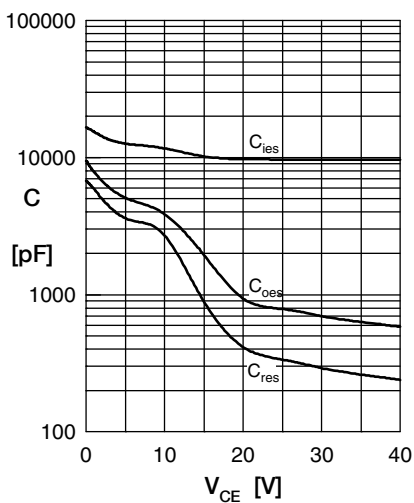


Fig. 7 Capacitance