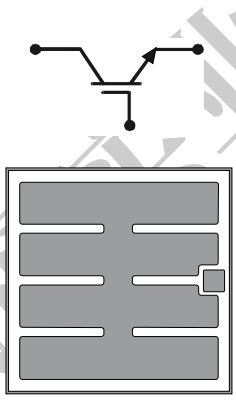
tentative

X2PT IGBT Chip



Type	V_{CE} [V]	I_C [A]	Chip Size [mm] x [mm]	Package	Ordering Code
IX183X12M2	1200	150	13.55 13.55	sawn on foil ☐	-
				unsawn wafer ☐	-
				in waffle pack ☑	tbd

Features / Advantages:

- Tvjm = 175°C
- Easy paralleling due to the positive temperature coefficient of the on-state voltage
- Rugged X2PT design (2nd generation Xtreme light Punch Through)
  - short circuit rated for 10 µsec.
  - improved trade-off
  - low switching losses
  - low EMI
- Thin wafer technology combined with the X2PT 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			155.9	mm²
Area total			183.60	mm²
Wafer size Ø			150	mm
Thickness			130	µm
Material	Si	Orientation	<100>	
Max. possible chips	per wafer		61	
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 (Tstg)		-40 ... 40	°C
Virtual junction temperature T_{VJ}			-40 ... 175	°C

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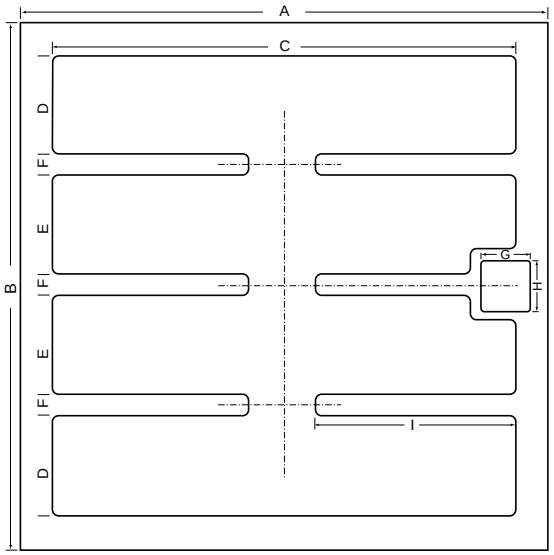
Electrical Parameters

Symbol	Definition	Conditions			Ratings 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)*				150		A
$V_{CE\ sat}$	Collector emitter saturation voltage	V_{GE} = 15 V	I_C = 150 A	T_{VJ} = 25°C		1.7	2	V
				T_{VJ} = 150°C		2		V
V_{TO}	Threshold voltage	V_{GE} = 15 V;	T_{VJ} = 175°C				1.2	V
r_T	(for power loss calculation)						7.7	mΩ
I_{CES}	Collector emitter leakage current	V_{CE} = 1200 V	V_{GE} = 0 V	T_{VJ} = 25°C		10	100	µA
				T_{VJ} = 150°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 = 6 mA	V_{CE} = V_{GE}	T_{VJ} = 25°C	5.5		7	V
Q_{Gon}	Total gate charge	I_C = 150 A	V_{CE} = 600V	V_{GE} = ±15 V		520		nC
$R_{G\ int}$	Internal gate resistor							Ω
C_{ies}	Input capacitance	V_{CE} = 25 V	V_{GE} = 0 V	T_{VJ} = 25°C		tbd		nF
C_{oes}	Output capacitance	f = 1 MHz				tbd		pF
C_{res}	Reverse transfer capacitance					tbd		pF
$t_{d(on)}$	Turn-on delay time					100		ns
t_r	Current rise time					50		ns
$t_{d(off)}$	Turn-off delay time	V_G = 600 V	I_C = 150 A			300		ns
t_f	Current fall time	R_G = 4.7 Ω	V_{GE} = ±15 V	T_{VJ} = 150°C		150		ns
E_{on}	Turn-on energy per pulse	measured with: DMHP 107-12				17		mJ
E_{off}	Turn-off energy per pulse					12		mJ
RBSOA	Reverse bias safe operation area	V_{GE} = 15 V	R_G = 4.7 Ω	T_{VJ} = 150°C				
				V_{CE} = 1200 V			300	A
SCSOA	Short circuit safe operation area							
t_{SC}	Short circuit duration	V_{CE} = 800 V	V_{GE} = ±15 V	T_{VJ} = 150°C			10	µs
I_{SC}	Short circuit current	R_G = 4.7 Ω	non-repetitive			700		A

Data according to IEC 60747

Dimensions (1 mm = 0.0394")



A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
13.55	13.55	12.1	2.73	2.6

F [mm]	G [mm]	H [mm]	I [mm]	J [mm]
0.5	1.14	1.18	5.45	n/a