

XPT IGBT

preliminary

$$V_{CES} = 1200V$$

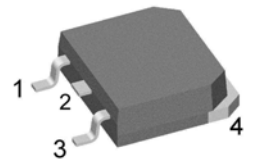
$$I_{C25} = 9A$$

$$V_{CE(sat)} = 1.8V$$

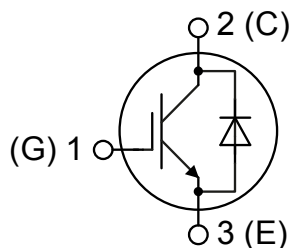
Copack

Part number

IXA4IF1200TC



Backside: collector

**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 μ sec.
 - very low gate charge
 - low EMI
 - square RBSOA @ 3x Ic
- Thin wafer technology combined with the XPT design results in a competitive low VCE(sat)
- SONIC™ diode
 - fast and soft reverse recovery
 - low operating forward voltage

Applications:

- AC motor drives
- Solar inverter
- Medical equipment
- Uninterruptible power supply
- Air-conditioning systems
- Welding equipment
- Switched-mode and resonant-mode power supplies
- Inductive heating, cookers
- Pumps, Fans

Package: TO-268AA (D3Pak)

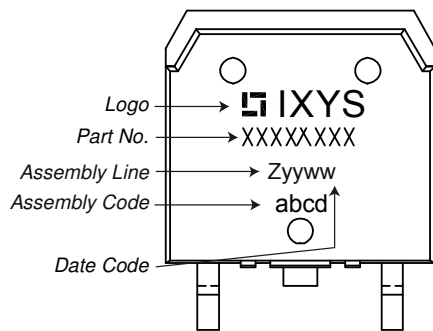
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

IGBT				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
V_{CES}	collector emitter voltage	$T_{VJ} = 25^{\circ}\text{C}$			1200	V	
V_{GES}	max. DC gate voltage				± 20	V	
V_{GEM}	max. transient gate emitter voltage				± 30	V	
I_{C25}	collector current	$T_C = 25^{\circ}\text{C}$			9	A	
I_{C100}		$T_C = 100^{\circ}\text{C}$			5	A	
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$			45	W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 3\text{A}; V_{GE} = 15\text{V}$		1.8	2.1	V	
				2.1		V	
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 0.1\text{mA}; V_{GE} = V_{CE}$	5.4	5.9	6.5	V	
I_{CES}	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0\text{V}$			0.1	mA	
				0.1		mA	
I_{GES}	gate emitter leakage current	$V_{GE} = \pm 20\text{V}$			500	nA	
$Q_{G(on)}$	total gate charge	$V_{CE} = 600\text{V}; V_{GE} = 15\text{V}; I_C = 3\text{A}$		12		nC	
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 600\text{V}; I_C = 3\text{A}$ $V_{GE} = \pm 15\text{V}; R_G = 330\Omega$		70		ns	
t_r	current rise time		$T_{VJ} = 125^{\circ}\text{C}$	40		ns	
$t_{d(off)}$	turn-off delay time		250		ns		
t_f	current fall time		100		ns		
E_{on}	turn-on energy per pulse		0.4		mJ		
E_{off}	turn-off energy per pulse		0.3		mJ		
RBSOA	reverse bias safe operating area	$V_{GE} = \pm 15\text{V}; R_G = 330\Omega$					
I_{CM}		$V_{CEmax} = 1200\text{V}$			9	A	
SCSOA	short circuit safe operating area	$V_{CEmax} = 900\text{V}$					
t_{sc}	short circuit duration	$V_{CE} = 900\text{V}; V_{GE} = \pm 15\text{V}$			10	μs	
I_{sc}	short circuit current	$R_G = 330\Omega; \text{non-repetitive}$		12		A	
R_{thJC}	thermal resistance junction to case				2.7	K/W	
R_{thCH}	thermal resistance case to heatsink			0.15		K/W	
Diode							
V_{RRM}	max. repetitive reverse voltage	$T_{VJ} = 25^{\circ}\text{C}$			1200	V	
I_{F25}	forward current	$T_C = 25^{\circ}\text{C}$			10	A	
I_{F100}		$T_C = 100^{\circ}\text{C}$			6	A	
V_F	forward voltage	$I_F = 3\text{A}$			2.20	V	
				1.90		V	
I_R	reverse current	$V_R = V_{RRM}$			*	mA	
	* not applicable, see Ices value above				*	mA	
Q_{rr}	reverse recovery charge	$V_R = 600\text{V}$ $-di_F/dt = -150\text{A}/\mu\text{s}$ $I_F = 3\text{A}; V_{GE} = 0\text{V}$		0.5		μC	
I_{RM}	max. reverse recovery current		$T_{VJ} = 125^{\circ}\text{C}$	5		A	
t_{rr}	reverse recovery time		350		ns		
E_{rec}	reverse recovery energy		0.1		mJ		
R_{thJC}	thermal resistance junction to case				3	K/W	
R_{thCH}	thermal resistance case to heatsink			0.15		K/W	

preliminary

Package TO-268AA (D3Pak)			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			70	A
T_{VJ}	virtual junction temperature		-40		150	°C
T_{op}	operation temperature		-40		125	°C
T_{stg}	storage temperature		-40		150	°C
Weight				5		g
F_c	mounting force with clip		20		120	N

Product Marking



Part number

- I = IGBT
- X = XPT IGBT
- A = Gen 1 / std
- 4 = Current Rating [A]
- IF = Copack
- 1200 = Reverse Voltage [V]
- TC = TO-268AA (D3Pak) (2)

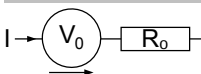
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA4IF1200TC	IXA4IF1200TC	Tube	30	510224

Similar Part	Package	Voltage class
IXA4IF1200UC	TO-252AA (DPak)	1200

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 150\text{ °C}$



$V_{0\ max}$ threshold voltage
 $R_{0\ max}$ slope resistance *

	IGBT	Diode	
$V_{0\ max}$	1.1	1.25	V
$R_{0\ max}$	460	280	mΩ



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