

XPT IGBT

preliminary

$$V_{CES} = 1200V$$

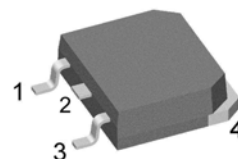
$$I_{C25} = 9A$$

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

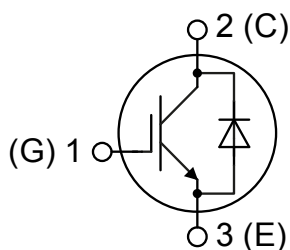
Copack

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 I_C
- Thin wafer technology combined with the XPT design results in a competitive low $V_{CE(sat)}$
- 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)

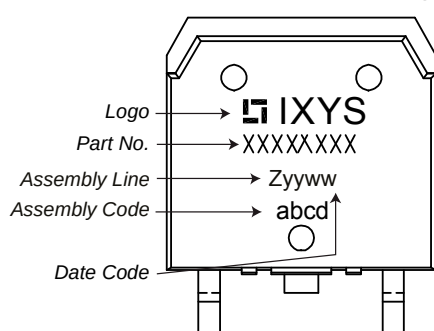
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

IGBT				Ratings				
Symbol	Definition	Conditions		min.	typ.	max.	Unit	
V _{CES}	collector emitter voltage	T _{VJ} = 25°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°C				9	A	
I _{C100}		T _C = 100°C				5	A	
P _{tot}	total power dissipation	T _C = 25°C				45	W	
V _{CE(sat)}	collector emitter saturation voltage	I _C = 3A; V _{GE} = 15 V	T _{VJ} = 25°C T _{VJ} = 125°C		1.8 2.1	2.1	V V	
V _{GE(th)}	gate emitter threshold voltage	I _C = 0.1mA; V _{GE} = V _{CE}	T _{VJ} = 25°C	5.4	5.9	6.5	V	
I _{CES}	collector emitter leakage current	V _{CE} = V _{CES} ; V _{GE} = 0 V	T _{VJ} = 25°C T _{VJ} = 125°C			0.1	mA mA	
I _{GES}	gate emitter leakage current	V _{GE} = ±20 V				500	nA	
Q _{G(on)}	total gate charge	V _{CE} = 600 V; V _{GE} = 15 V; I _C = 3 A			12		nC	
t _{d(on)}	turn-on delay time	inductive load T_{VJ} = 125°C V_{CE} = 600V; I_C = 3A V_{GE} = ±15 V; R_G=330 Ω			70		ns	
t _r	current rise time					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} = ±15 V; R _G =330 Ω	T _{VJ} = 125°C					
I _{CM}		V _{CEmax} = 1200V				9	A	
SCSOA	short circuit safe operating area	V _{CEmax} = 900 V						
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 = 330 Ω; 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°C				1200	V	
I _{F25}	forward current	T _C = 25°C				10	A	
I _{F100}		T _C = 100°C				6	A	
V _F	forward voltage	I _F = 3A	T _{VJ} = 25°C T _{VJ} = 125°C			2.20	V	
					1.90		V	
I _R	reverse current	V _R = V _{RRM}	T _{VJ} = 25°C T _{VJ} = 125°C			*	mA mA	
	* not applicable, see Ices value above				*			
Q _{rr}	reverse recovery charge	V_R = 600 V -di_F/dt = -150 A/μs I_F = 3A; V_{GE} = 0 V	T _{VJ} = 125°C		0.5		μC	
I _{RM}	max. reverse recovery current				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)

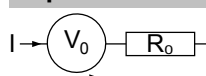
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA4IF1200TC	IXA4IF1200TC	Tube	30	510224

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

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 150\text{ °C}$



$V_{0\text{ max}}$ threshold voltage

$R_{0\text{ max}}$ slope resistance *

IGBT

1.1

460

Diode

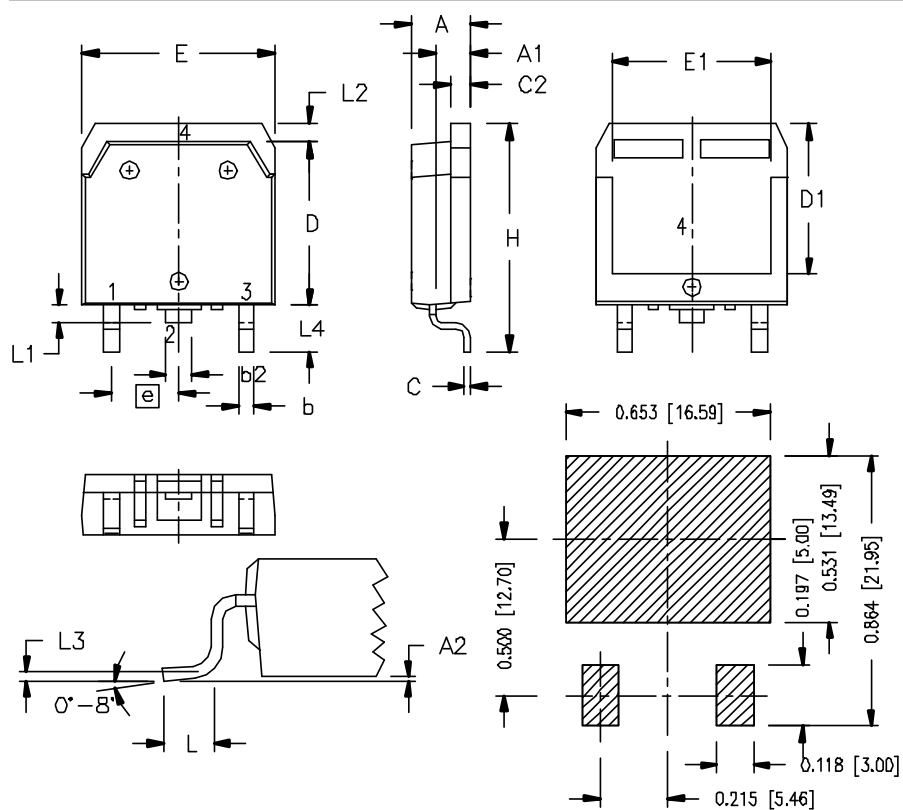
1.25

280

V

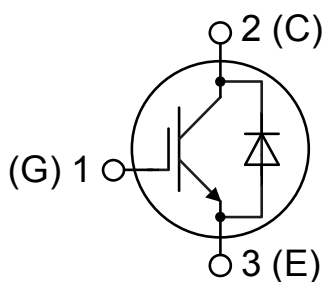
mΩ

Outlines TO-268AA (D3Pak)



RECOMMENDED MINIMUM FOOT PRINT FOR SMD

Dim.	Millimeter		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
A2	0.02	0.25	0.001	0.100
b	1.15	1.45	0.045	0.057
b2	1.90	2.10	0.075	0.083
C	0.40	0.65	0.016	0.026
C2	1.45	1.60	0.057	0.063
D	13.80	14.00	0.543	0.551
D1	12.40	12.70	0.488	0.500
E	15.85	16.05	0.624	0.632
E1	13.30	13.60	0.524	0.535
e	5.45 BSC		0.215 BSC	
H	18.70	19.10	0.736	0.752
L	2.40	2.70	0.094	0.106
L1	1.20	1.40	0.047	0.055
L2	1.00	1.15	0.039	0.045
L3	0.25 BSC		0.100 BSC	
L4	3.80	4.10	0.150	0.161





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