preliminary

XPT IGBT

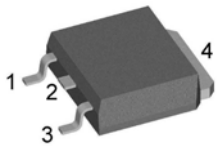
V_{CES} = 1200V
I_{C25} = 9A
$V_{CE(sat)}$ = 1.8V

Copack

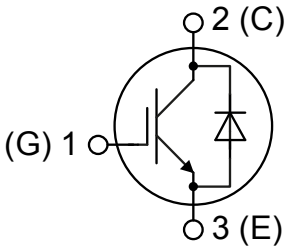
Part number

IXA4IF1200UC

Marking on Product: X4TAUF



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 µsec.
  - 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-252 (DPak)

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

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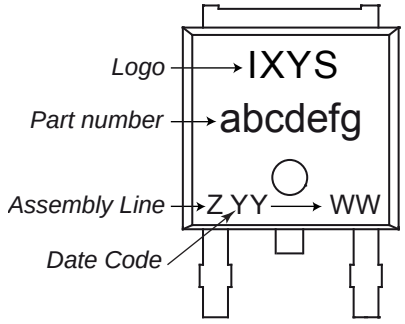
IGBT				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C			1200	V
V_{GES}	*max. DC gate voltage*					±20	V
V_{GEM}	*max. transient gate emitter voltage*					±30	V
I_{C25}	*collector current*		T_C = 25°C			9	A
I_{C100}			T_C = 100°C			5	A
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		1.8	2.1	V
			T_{VJ} = 125°C		2.1		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			0.1	mA
			T_{VJ} = 125°C		0.1		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*				70		ns
t_r	*current rise time*				40		ns
$t_{d(off)}$	*turn-off delay time*	inductive load	T_{VJ} = 125°C		250		ns
t_f	*current fall time*	V_{CE} = 600 V; I_C = 3 A			100		ns
E_{on}	*turn-on energy per pulse*	V_{GE} = ±15 V; R_G = 330 Ω			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} = 1200 V				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*				0.50		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			2.20	V
			T_{VJ} = 125°C		1.90		V
I_R	*reverse current*	V_R = V_{RRM}	T_{VJ} = 25°C			*	mA
	* not applicable, see Ices value above		T_{VJ} = 125°C		*		mA
Q_{rr}	*reverse recovery charge*				0.5		µC
I_{RM}	*max. reverse recovery current*	V_R = 600 V			5		A
t_{rr}	*reverse recovery time*	-di_F/dt = -150 A/µs	T_{VJ} = 125°C		350		ns
E_{rec}	*reverse recovery energy*	I_F = 3A; V_{GE} = 0 V			0.1		mJ
R_{thJC}	*thermal resistance junction to case*					3	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.50		K/W

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Package TO-252 (DPak)			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal			20	A
T_{VJ}	*virtual junction temperature*		-40		150	°C
T_{op}	*operation temperature*		-40		125	°C
T_{stg}	*storage temperature*		-40		150	°C
Weight				0.3		g
F_C	*mounting force with clip*		20		60	N

Product Marking



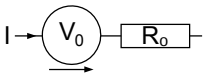
Part number

I = IGBT
X = XPT IGBT
A = Gen 1 / std
4 = Current Rating [A]
IF = Copack
1200 = Reverse Voltage [V]
UC = TO-252AA (DPak)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA4IF1200UC	X4TAUF	Tape & Reel	2500	510217

Similar Part	Package	Voltage class
IXA4IF1200TC	TO-268AA (D3Pak) (2)	1200

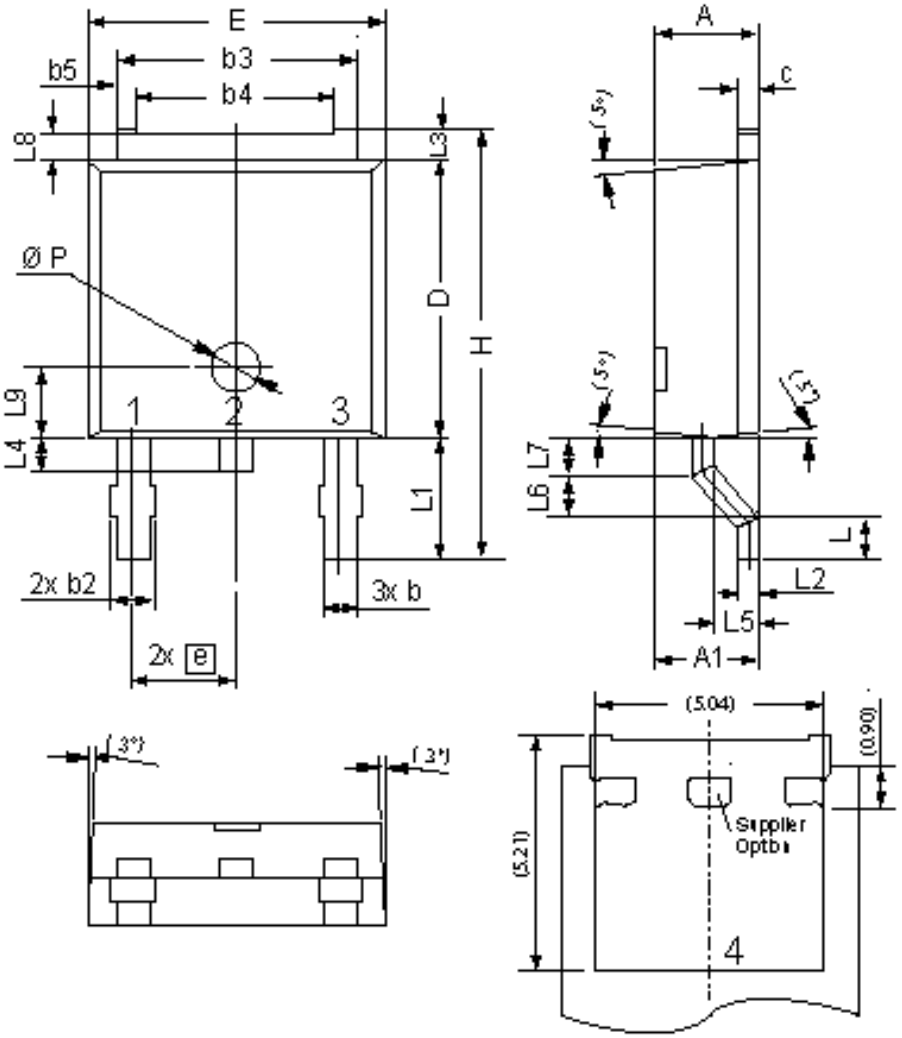
Equivalent Circuits for Simulation ** on die level* T_{VJ} = 150 °C



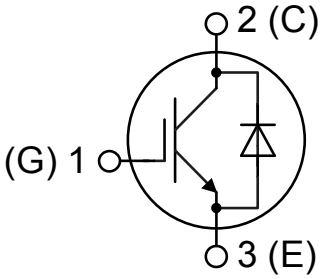
		IGBT	Diode	
$V_{0\,max}$	*threshold voltage*	1.1	1.25	V
$R_{0\,max}$	*slope resistance **	460	280	mΩ

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Outlines TO-252 (DPak)



Dim.	Millimeters		Inches	
	min	max	min	max
A	2.20	2.40	0.087	0.094
A1	2.10	2.50	0.083	0.098
b	0.66	0.86	0.026	0.034
b2	-	0.96	-	0.038
b3	5.04	5.64	0.198	0.222
b4	4.34 BSC		0.171 BSC	
b5	0.50 BSC		0.020 BSC	
c	0.40	0.86	0.016	0.034
D	5.90	6.30	0.232	0.248
E	6.40	6.80	0.252	0.268
e	2.10	2.50	0.083	0.098
H	9.20	10.10	0.362	0.398
L	0.55	1.28	0.022	0.050
L1	2.50	2.90	0.098	0.114
L2	0.40	0.60	0.016	0.024
L3	0.50	0.90	0.020	0.035
L4	0.60	1.00	0.024	0.039
L5	0.82	1.22	0.032	0.048
L6	0.79	0.99	0.031	0.039
L7	0.81	1.01	0.032	0.040
L8	0.40	0.80	0.016	0.031
L9	1.50 BSC		0.059 BSC	
Ø P	1.00 BSC		0.039 BSC	



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