

# XPT IGBT

preliminary

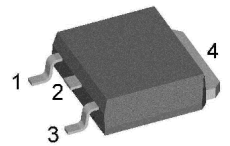
$$V_{CES} = 1200 \text{ V}$$

$$I_{C25} = 9 \text{ A}$$

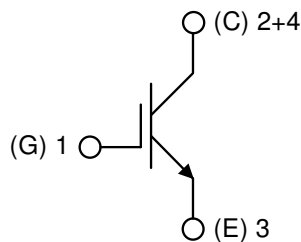
$$V_{CE(sat)} = 1.8 \text{ V}$$

## Single IGBT

### Part number

**IXA4I1200UC**
*Marking on Product: X4TAU*


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  $\mu$ 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  $V_{CE(sat)}$

### 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

### Terms Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact the sales office, which is responsible for you.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the product in aviation, in health or live endangering or life support applications, please notify. For any such application we urgently recommend

- to perform joint risk and quality assessments;

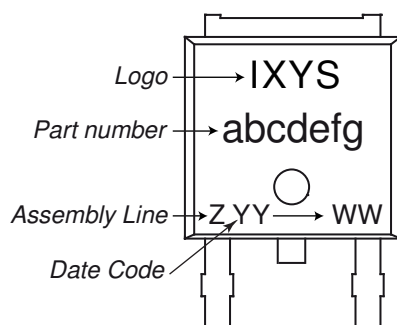
- the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IGBT				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{CES}$	collector emitter voltage				1200	V	
$V_{GES}$	max. DC gate voltage				$\pm 20$	V	
$V_{GEM}$	max. transient gate emitter voltage				$\pm 30$	V	
$I_{C25}$	collector current				9	A	
$I_{C100}$					5	A	
$P_{tot}$	total power dissipation				45	W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 3A; V_{GE} = 15V$			1.8	V	
					2.1	V	
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 0.1mA; V_{GE} = V_{CE}$	5.4	5.9	6.5	V	
$I_{CES}$	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0V$			0.1	mA	
					0.1	mA	
$I_{GES}$	gate emitter leakage current	$V_{GE} = \pm 20V$			500	nA	
$Q_{G(on)}$	total gate charge	$V_{CE} = 600V; V_{GE} = 15V; I_C = 3A$		12		nC	
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 600V; I_C = 3A$ $V_{GE} = \pm 15V; R_G = 330\Omega$		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	
<b>RBSOA</b>	reverse bias safe operating area	$V_{GE} = \pm 15V; R_G = 330\Omega$					
$I_{CM}$		$V_{CEmax} = 1200V$			9	A	
<b>SCSOA</b>	short circuit safe operating area	$V_{CEmax} = 1200V$					
$t_{sc}$	short circuit duration	$V_{CE} = 900V; V_{GE} = \pm 15V$			10	$\mu s$	
$I_{sc}$	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			0.50		K/W	

preliminary

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
<b>Weight</b>				0.3		g
$F_C$	mounting force with clip		20		60	N

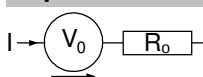
**Product Marking**

**Part description**

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

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA4I1200UC	X4TAU	Tape & Reel	2500	

**Equivalent Circuits for Simulation**

\* on die level

 $T_{VJ} = 150\text{ °C}$ 

**IGBT**
 $V_{0\ max}$  threshold voltage

1.1

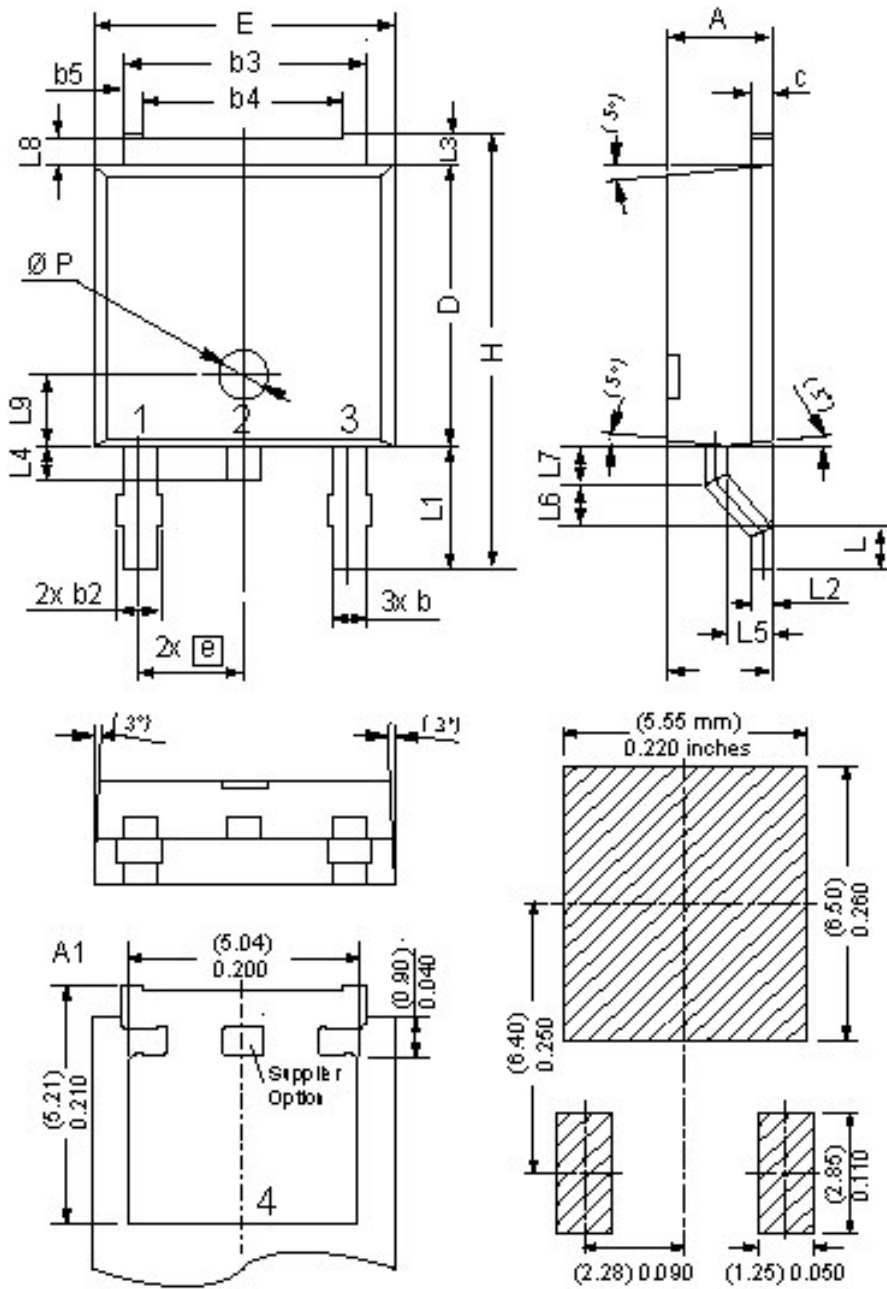
V

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

460

mΩ

## 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

Recommended  
min. footprint

