

XPT IGBT

preliminary

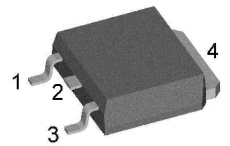
$$V_{CES} = 1200 \text{ V}$$

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

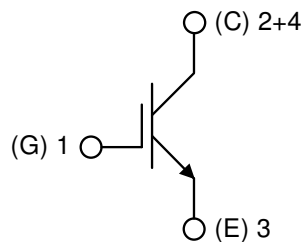
$$V_{CE(sat)} = 1.8 \text{ V}$$

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 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 $V_{CE(sat)}$

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;

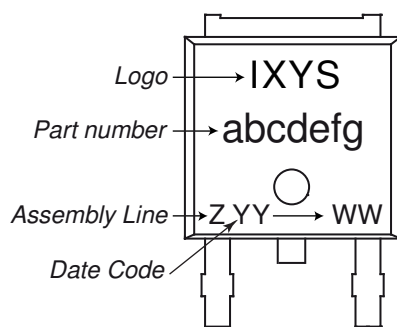
- the conclusion of quality agreements;

- 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 | | | | ±20 | V | |
| V_{GEM} | max. transient gate emitter voltage | | | | ±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 | $V_{GE} = ±20V$ | | | 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 $V_{CE} = 600V; I_C = 3A$ $V_{GE} = ±15V; R_G = 330Ω$ | | 70 | | ns | |
| t_r | current rise time | | $T_{VJ} = 125°C$ | 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 | $V_{GE} = ±15V; R_G = 330Ω$ | | | | | |
| I_{CM} | | $V_{CEmax} = 1200V$ | | | 9 | A | |
| SCSOA | short circuit safe operating area | $V_{CEmax} = 1200V$ | | | | | |
| t_{sc} | short circuit duration | $V_{CE} = 900V; V_{GE} = ±15V$ | | | 10 | μs | |
| I_{sc} | short circuit current | $R_G = 330Ω; \text{non-repetitive}$ | | 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 |
| Weight | | | | 0.3 | | g |
| F_C | mounting force with clip | | 20 | | 60 | N |

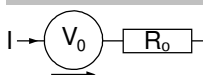
Product Marking

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

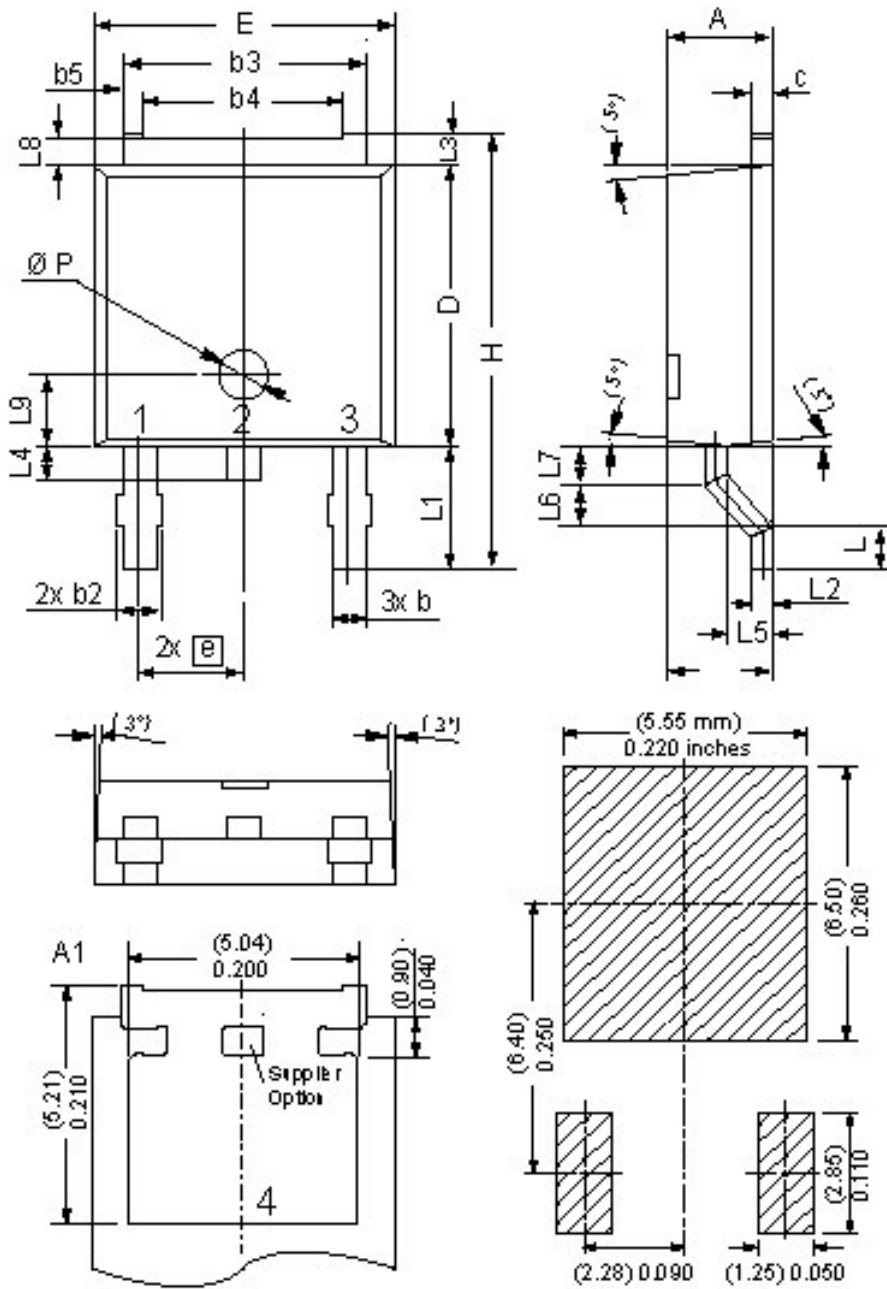
V

 $R_{0\ max}$ 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. foot print

