

XPT IGBT phaseleg

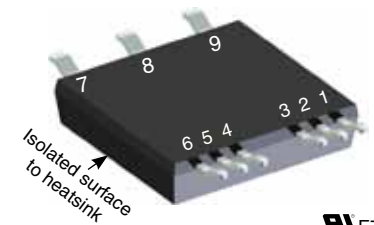
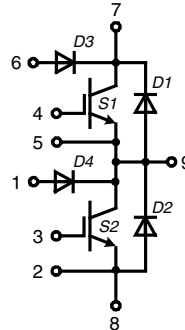
ISOPLUS™

Surface Mount Power Device

$$I_{C25} = 63 \text{ A}$$

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

$$V_{CE(sat) \text{ typ}} = 1.85 \text{ V}$$



E72873

IGBTs S1, S2

| Symbol | Conditions | Maximum Ratings |
|-----------------------|--|--------------------|
| V_{CES} | $T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$ | 1200 V |
| V_{GES} | | ± 20 V |
| I_{C25} | $T_C = 25^{\circ}\text{C}$ | 63 A |
| I_{C80} | $T_C = 80^{\circ}\text{C}$ | 45 A |
| I_{CM} V_{CEK} | $V_{GE} = 15 \text{ V}; R_G = 27 \Omega; T_{VJ} = 125^{\circ}\text{C}$ RBSOA, clamped inductive load; $L = 100 \mu\text{H}$ | 105 A V_{CES} |
| t_{SC} (SCSOA) | $V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V}; R_G = 27 \Omega; T_{VJ} = 125^{\circ}\text{C}$ none repetitive | 10 μs |
| P_{tot} | $T_{VJ} = 25^{\circ}\text{C}$ | 230 W |

| Symbol | Conditions | Characteristic Values | | | | |
|--|--|---|--------------------------------------|------|----------------------------------|-----|
| ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified) | | | | | | |
| | | min. | typ. | max. | | |
| $V_{CE(sat)}$ | $I_C = 35 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$ | | 1.85 2.2 | 2.15 | V V | |
| $V_{GE(th)}$ | $I_C = 1.5 \text{ mA}; V_{GE} = V_{CE}$ | 5.4 | | 6.5 | V | |
| I_{CES} | $V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$ | | 0.25 | 0.15 | mA mA | |
| I_{GES} | $V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$ | | | 200 | nA | |
| $t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off} | Inductive load; $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600 \text{ V}; I_C = 35 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; R_G = 27 \Omega$ | | 70 40 250 100 3.8 4.1 | | ns ns ns ns mJ mJ | |
| C_{ies} | | $V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$ | | tbd | | pF |
| Q_{Gon} | | $V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 35 \text{ A}$ | | 107 | | nC |
| R_{thJC} | | | | | 0.55 | K/W |
| R_{thJH} | | with heatsink compound (IXYS test setup) | | 0.75 | 0.95 | K/W |

Features

- **XPT IGBT**
 - low saturation voltage
 - positive temperature coefficient for easy paralleling
 - fast switching
 - short tail current for optimized performance in resonant circuits
- **Sonic™ diode**
 - fast reverse recovery
 - low operating forward voltage
 - low leakage current
- **$V_{CE(sat)}$ detection diode**
 - integrated into package
 - very fast diode
- **Package**
 - isolated back surface
 - low coupling capacity between pins and heatsink
 - PCB space saving
 - enlarged creepage towards heatsink
 - application friendly pinout
 - low inductive current path
 - high reliability

Applications

- **Phaseleg**
 - buck-boost chopper
- **Full bridge**
 - power supplies
 - induction heating
 - four quadrant DC drives
 - controlled rectifier
- **Three phase bridge**
 - AC drives
 - controlled rectifier

Diodes D1, D2

| Symbol | Conditions | Maximum Ratings | |
|-----------|--------------------------|-----------------|---|
| I_{F25} | $T_C = 25^\circ\text{C}$ | 40 | A |
| I_{F80} | $T_C = 80^\circ\text{C}$ | 27 | A |

| Symbol | Conditions | Characteristic Values | | | |
|---|--|------------------------------|------|------|-----|
| | | min. | typ. | max. | |
| ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified) | | | | | |
| V_F | $I_F = 35\text{ A}$ | $T_{VJ} = 25^\circ\text{C}$ | 2.1 | 2.4 | V |
| | | $T_{VJ} = 125^\circ\text{C}$ | 2.1 | | V |
| I_{RM} | $I_F = 35\text{ A}; R_G = 27\ \Omega; T_{VJ} = 125^\circ\text{C}$ $V_R = 600\text{ V}; V_{GE} = -15\text{ V}$ | | 30 | | A |
| t_{rr} | | | 350 | | ns |
| E_{rec} | | | tbd | | |
| R_{thJC} | per diode | | | 0.9 | K/W |
| R_{thJH} | with heatsink compound (IXYS test setup) | | 1.2 | 1.5 | K/W |

Diodes D3, D4

| Symbol | Conditions | Maximum Ratings | |
|--------|---|-----------------|---|
| V_R | $T_C = 25^\circ\text{C}$ to 150°C | 1200 | V |

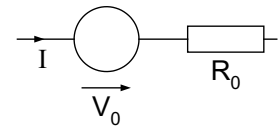
| Symbol | Conditions | Characteristic Values | | | |
|---|---|------------------------------|------|------|---------------|
| | | min. | typ. | max. | |
| ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified) | | | | | |
| V_F | $I_F = 1\text{ A}$ | $T_{VJ} = 25^\circ\text{C}$ | 1.7 | 2.2 | V |
| | | $T_{VJ} = 125^\circ\text{C}$ | 1.5 | | V |
| I_R | $V_R = 1200\text{ V}$ | $T_{VJ} = 25^\circ\text{C}$ | | 2 | μA |
| | | $T_{VJ} = 125^\circ\text{C}$ | 30 | | μA |
| I_{RM} | $I_F = 1\text{ A}; di_F/dt = -100\text{ A}/\mu\text{s}; T_{VJ} = 25^\circ\text{C}$ $V_R = 100\text{ V}; V_{GE} = 0\text{ V}$ | | 2.3 | | A |
| t_{rr} | | | | 40 | |

Component

| Symbol | Conditions | Maximum Ratings | |
|------------|--|-----------------|------------------|
| T_{VJ} | | -55...+150 | $^\circ\text{C}$ |
| T_{stg} | | -55...+125 | $^\circ\text{C}$ |
| V_{ISOL} | $I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$ | 2500 | V~ |
| F_C | mounting force | 40 ... 130 | N |

| Symbol | Conditions | Characteristic Values | | | |
|---------------|---|-----------------------|------|------|----|
| | | min. | typ. | max. | |
| C_P | coupling capacity between shorted pins and backside metal | | 90 | | pF |
| d_S, d_A | pin - pin | 1.65 | | | mm |
| d_S, d_A | pin - backside metal | 4 | | | mm |
| CTI | | 400 | | | |
| Weight | | | 8 | | g |

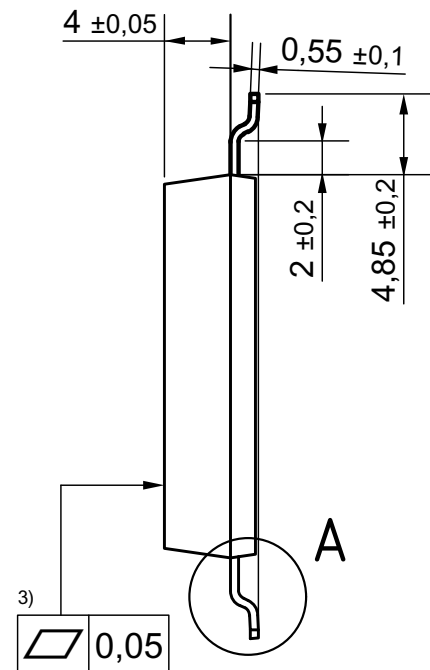
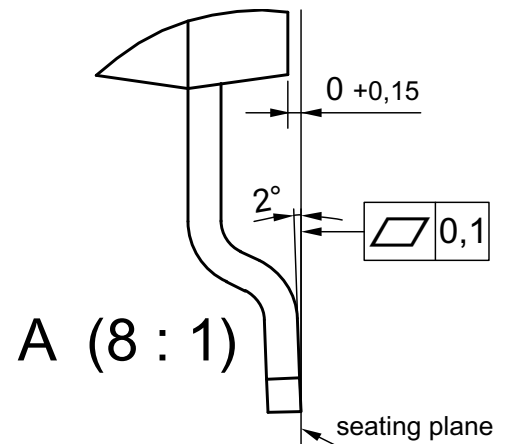
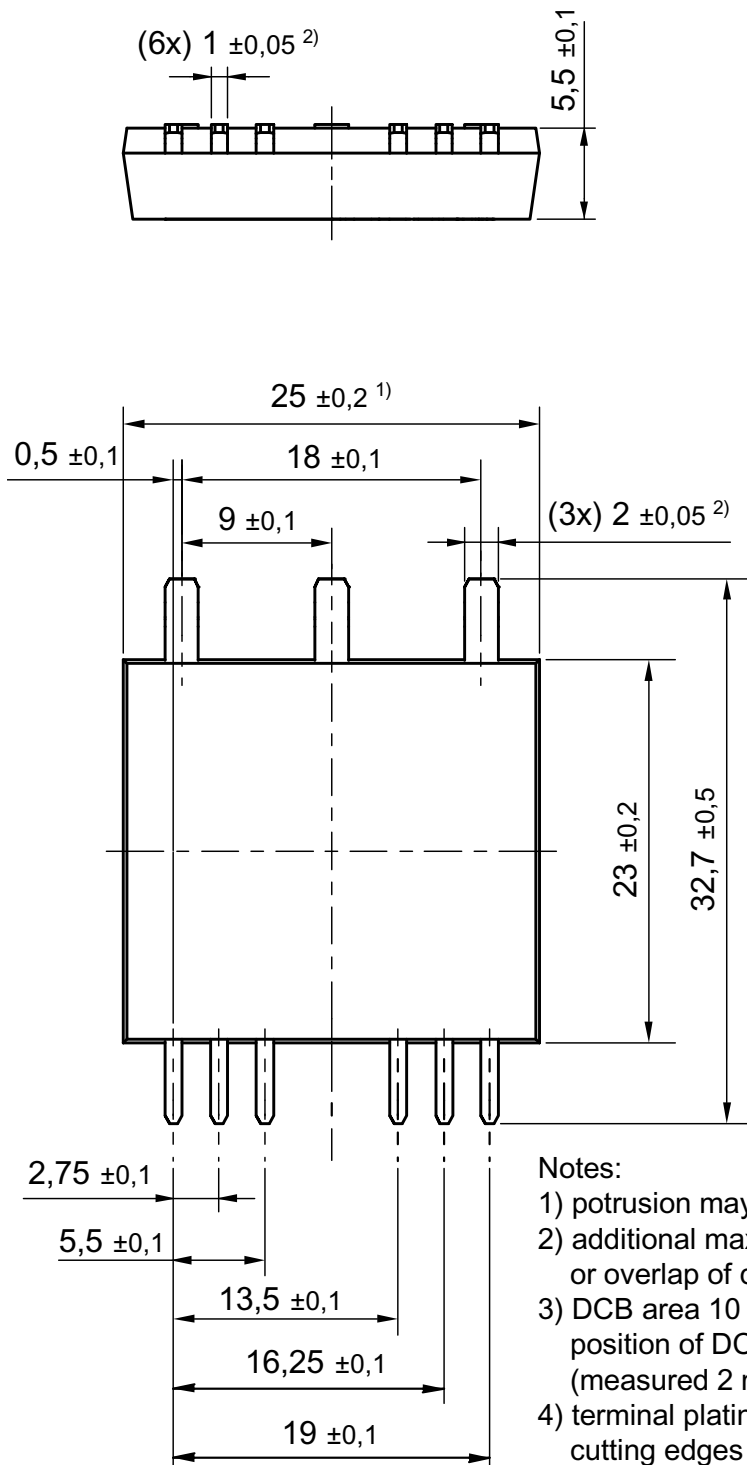
| Ordering | Ordering Name | Marking on Product | Delivering Mode | Base Qty | Ordering Code |
|----------|-------------------|--------------------|-----------------|----------|---------------|
| Standard | IXA 40PG1200DHGLB | IXA40PG1200DHGLB | Tape&Reel | 200 | tbd |

Equivalent Circuits for Simulation
Conduction


IGBTs (typ. at $V_{GE} = 15\text{ V}; T_J = 125^\circ\text{C}$)
 S1, S2 $V_0 = 1.1\text{ V}; R_0 = 40\text{ m}\Omega$

Diodes (typ. at $T_J = 125^\circ\text{C}$)
 D1, D2 $V_0 = 1.3\text{ V}; R_0 = 28\text{ m}\Omega$

Dimensions in mm (1 mm = 0.0394")


Notes:

- 1) protrusion may add 0.2 mm max. on each side
- 2) additional max. 0.05 mm per side by punching misalignment or overlap of dam bar or bending compression
- 3) DCB area 10 to 50 μm convex; position of DCB area in relation to plastic rim: ±25 μm (measured 2 mm from Cu rim)
- 4) terminal plating: 0.2 - 1 μm Ni + 10 - 25 μm Sn (gal v.) cutting edges may be partially free of plating



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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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