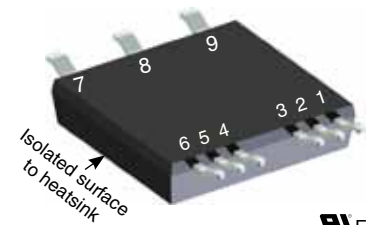
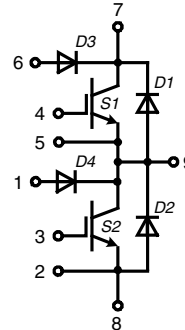


XPT IGBT phaseleg ISOPLUS™ Surface Mount Power Device

$$\begin{aligned} I_{C25} &= 63 \text{ A} \\ V_{CES} &= 1200 \text{ V} \\ V_{CE(sat) \text{ typ}} &= 1.85 \text{ V} \end{aligned}$$



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}	$V_{GE} = 15 \text{ V}; R_G = 27 \Omega; T_{VJ} = 125^{\circ}\text{C}$ RBSOA, clamped inductive load; $L = 100 \mu\text{H}$	105	A
V_{CEK}		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

 $(T_{VJ} = 25^{\circ}\text{C}, \text{ unless otherwise specified})$

		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}			tbd		pF
Q_{gon}			107		nC
R_{thJC}			0.55		K/W
R_{thJH}			0.75	0.95	K/W
					with heatsink compound (IXYS test setup)

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_{CESat} 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 ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
V_F	$I_F = 35\text{ A}$		2.1	2.4	V
	$T_{VJ} = 25^\circ\text{C}$		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		mJ
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 ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
V_F	$I_F = 1\text{ A}$		1.7	2.2	V
	$T_{VJ} = 25^\circ\text{C}$		1.5		V
I_R	$V_R = 1200\text{ V}$			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		ns

Component

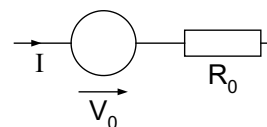
Symbol	Conditions	Maximum Ratings	
T_{VJ}		-55...+150	$^\circ\text{C}$
T_{stg}		-55...+125	$^\circ\text{C}$
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	2500	V~
F_C	mounting force	40 ... 130	N

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

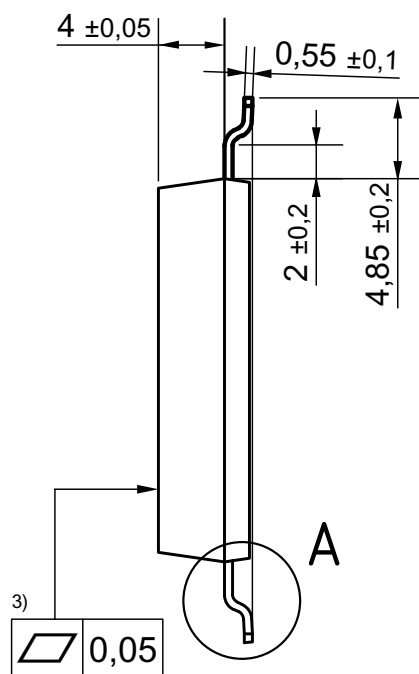
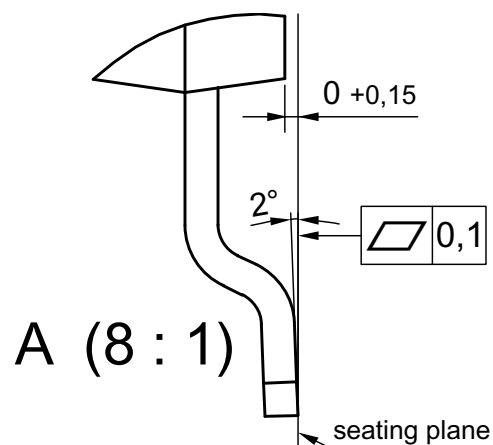
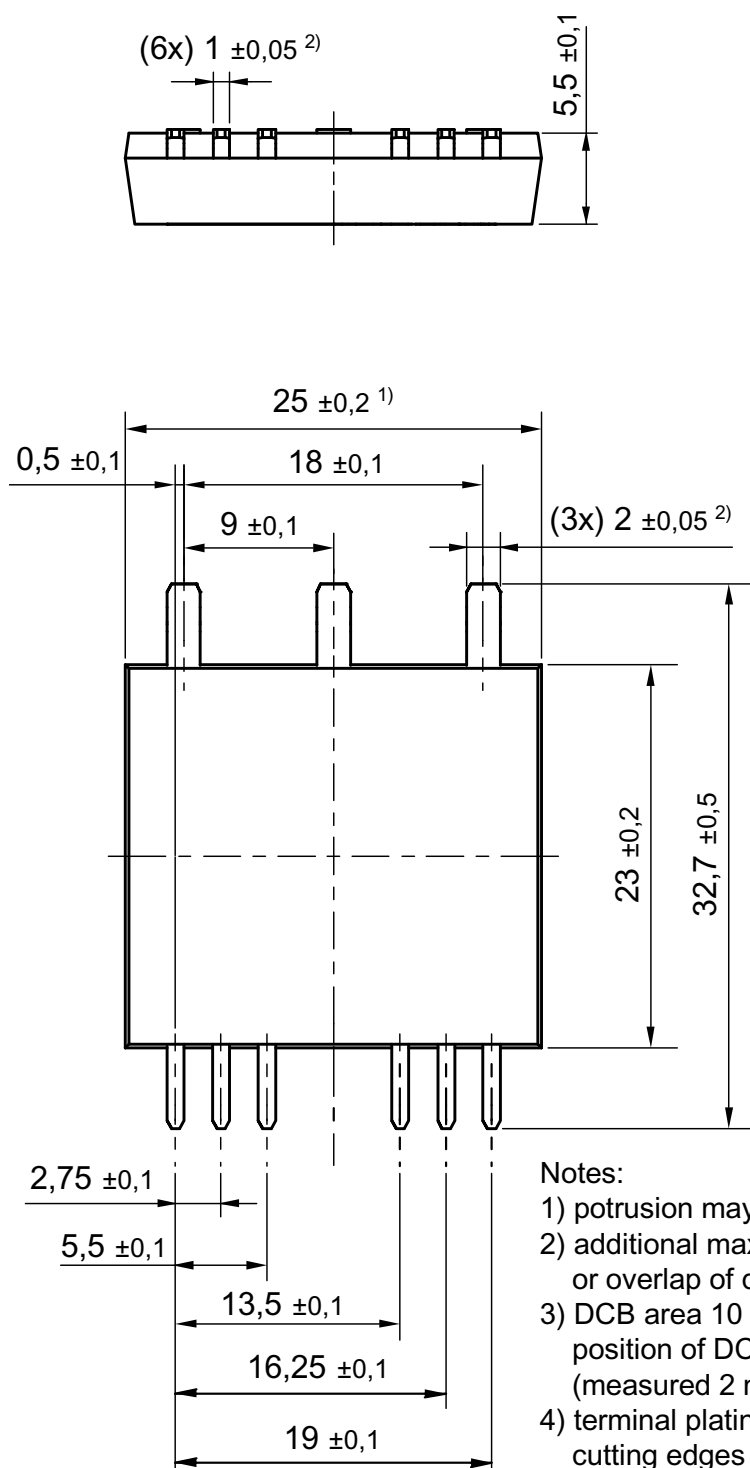
Conduction



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) potrusion 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: $\pm 25 \mu\text{m}$ (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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