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With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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## XPT IGBT

tentative

$$V_{CES} = 650V$$

$$I_{C25} = 255A$$

$$V_{CE(sat)} = 1.6V$$

## Single IGBT

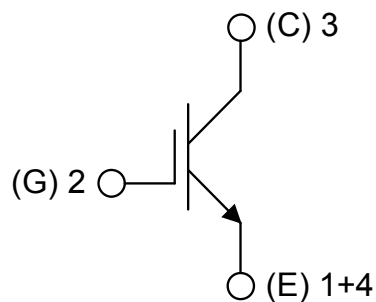
## Part number

IXA220I650NA



Backside: isolated

E72873

**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 @ 2x  $I_c$
- 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:** SOT-227B (minibloc)

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate: Copper internally DCB isolated
- Advanced power cycling
- Either emitter terminal can be used as main or Kelvin emitter

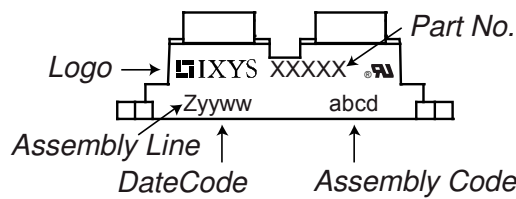
IGBT				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{CES}$	collector emitter voltage	$T_{VJ} = 25^{\circ}\text{C}$			650	V	
$V_{GES}$	max. DC gate voltage				$\pm 20$	V	
$V_{GEM}$	max. transient gate emitter voltage				$\pm 30$	V	
$I_{C25}$	collector current	$T_C = 25^{\circ}\text{C}$			255	A	
$I_{C80}$		$T_C = 80^{\circ}\text{C}$			156	A	
$P_{tot}$	total power dissipation	$T_C = 25^{\circ}\text{C}$			625	W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 200\text{A}; V_{GE} = 15\text{V}$		1.6	1.8	V	
				1.9		V	
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 3.2\text{mA}; V_{GE} = V_{CE}$	4	4.8	5.5	V	
$I_{CES}$	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0\text{V}$			0.1	mA	
				0.1		mA	
$I_{GES}$	gate emitter leakage current	$V_{GE} = \pm 20\text{V}$			500	nA	
$Q_{G(on)}$	total gate charge	$V_{CE} = 300\text{V}; V_{GE} = 15\text{V}; I_C = 200\text{A}$		280		nC	
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 300\text{V}; I_C = 200\text{A}$ $V_{GE} = \pm 15\text{V}; R_G = 3.9\Omega$	$T_{VJ} = 125^{\circ}\text{C}$	30		ns	
$t_r$	current rise time			50		ns	
$t_{d(off)}$	turn-off delay time			100		ns	
$t_f$	current fall time			40		ns	
$E_{on}$	turn-on energy per pulse			2		mJ	
$E_{off}$	turn-off energy per pulse			7.6		mJ	
<b>RBSOA</b>	reverse bias safe operating area	$V_{GE} = \pm 15\text{V}; R_G = 3.9\Omega$					
$I_{CM}$		$V_{CEmax} = 650\text{V}$			400	A	
<b>SCSOA</b>	short circuit safe operating area	$V_{CEmax} = 650\text{V}$					
$t_{sc}$	short circuit duration	$V_{CE} = 360\text{V}; V_{GE} = \pm 15\text{V}$			10	$\mu\text{s}$	
$I_{sc}$	short circuit current	$R_G = 3.9\Omega; \text{non-repetitive}$		800		A	
$R_{thJC}$	thermal resistance junction to case				0.2	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0.10		K/W	

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Package SOT-227B (minibloc)		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal <sup>1)</sup>			150	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>				30		g
$M_D$	mounting torque		1.1		1.5	Nm
$M_T$	terminal torque		1.1		1.5	Nm
$d_{Spp/APP}$	creepage distance on surface   striking distance through air	terminal to terminal	10.5	3.2		mm
$d_{Spb/Apb}$		terminal to backside	8.6	6.8		mm
$V_{ISOL}$	isolation voltage	t = 1 second			3000	V
		t = 1 minute	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		2500	V

<sup>1)</sup>  $I_{RMS}$  is typically limited by the pin-to-chip resistance (1); or by the current capability of the chip (2). In case of (1) and a product with multiple pins for one chip-potential, the current capability can be increased by connecting the pins as one contact.

### Product Marking



### Part description

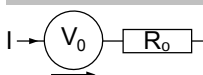
- I = IGBT
- X = XPT IGBT
- A = Gen 1 / std
- 220 = Current Rating [A]
- I = Single IGBT
- 650 = Reverse Voltage [V]
- NA = SOT-227B (minibloc)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA220I650NA	IXA220I650NA	Tube	10	514555

### Equivalent Circuits for Simulation

\* on die level

$T_{VJ} = 150^\circ\text{C}$



IGBT

$V_{0\max}$  threshold voltage

1.1

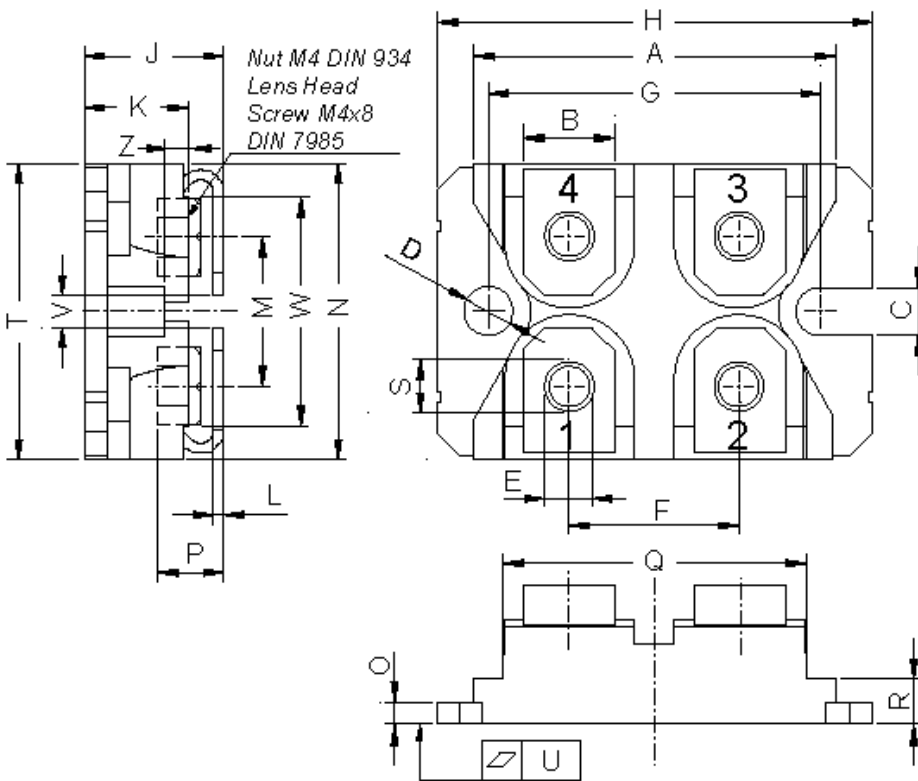
V

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

5.3

mΩ

## Outlines SOT-227B (minibloc)



Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106

