

XPT IGBT

preliminary

$V_{CES} = 1200V$

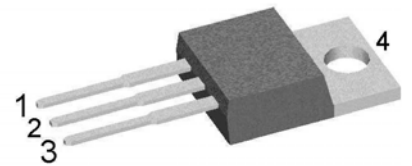
$I_{C25} = 38A$

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

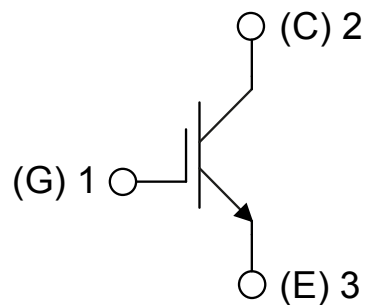
Single IGBT

Part number

IXA20I1200PB



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-220

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

IGBT				Ratings					
Symbol	Definition	Conditions	min.	typ.	max.	Unit			
V_{CES}	collector emitter voltage	$T_{VJ} = 25^{\circ}\text{C}$			1200	V			
V_{GES}	max. DC gate voltage				± 20	V			
V_{GEM}	max. transient gate emitter voltage				± 30	V			
I_{C25}	collector current	$T_C = 25^{\circ}\text{C}$			38	A			
I_{C80}		$T_C = 80^{\circ}\text{C}$			22	A			
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$			165	W			
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 15\text{A}; V_{GE} = 15\text{V}$		1.8	2.1	V			
				2.1		V			
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 0.6\text{mA}; V_{GE} = V_{CE}$	5.4	5.9	6.5	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	$V_{CE} = 600\text{V}; V_{GE} = 15\text{V}; I_C = 15\text{A}$		47		nC			
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 600\text{V}; I_C = 15\text{A}$ $V_{GE} = \pm 15\text{V}; R_G = 56\Omega$							
t_r	current rise time						$T_{VJ} = 125^{\circ}\text{C}$	70	ns
$t_{d(off)}$	turn-off delay time						40	ns	
t_f	current fall time						250	ns	
E_{on}	turn-on energy per pulse						100	ns	
E_{off}	turn-off energy per pulse						1.65	mJ	
E_{off}		1.7	mJ						
RBSOA	reverse bias safe operating area	$V_{GE} = \pm 15\text{V}; R_G = 56\Omega$							
I_{CM}		$V_{CEmax} = 1200\text{V}$			45	A			
SCSOA	short circuit safe operating area	$V_{CEmax} = 900\text{V}$							
t_{sc}	short circuit duration	$V_{CE} = 900\text{V}; V_{GE} = \pm 15\text{V}$			10	μs			
I_{sc}	short circuit current	$R_G = 56\Omega; \text{non-repetitive}$			60	A			
R_{thJC}	thermal resistance junction to case				0.76	K/W			
R_{thCH}	thermal resistance case to heatsink			0.50		K/W			

preliminary

Package TO-220			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			35	A
T_{VJ}	virtual junction temperature		-40		150	°C
T_{op}	operation temperature		-40		125	°C
T_{stg}	storage temperature		-40		150	°C
Weight				2		g
M_D	mounting torque		0.4		0.6	Nm
F_C	mounting force with clip		20		60	N

Product Marking



Part number

- I = IGBT
- X = XPT IGBT
- A = Gen 1 / std
- 20 = Current Rating [A]
- I = Single IGBT
- 1200 = Reverse Voltage [V]
- PB = TO-220AB (3)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA20I1200PB	IXA20I1200PB	Tube	50	507929

Similar Part	Package	Voltage class
IXA20IF1200HB	TO-247AD (3)	1200

Equivalent Circuits for Simulation

* on die level

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



IGBT

$V_{0\text{ max}}$ threshold voltage

1.1

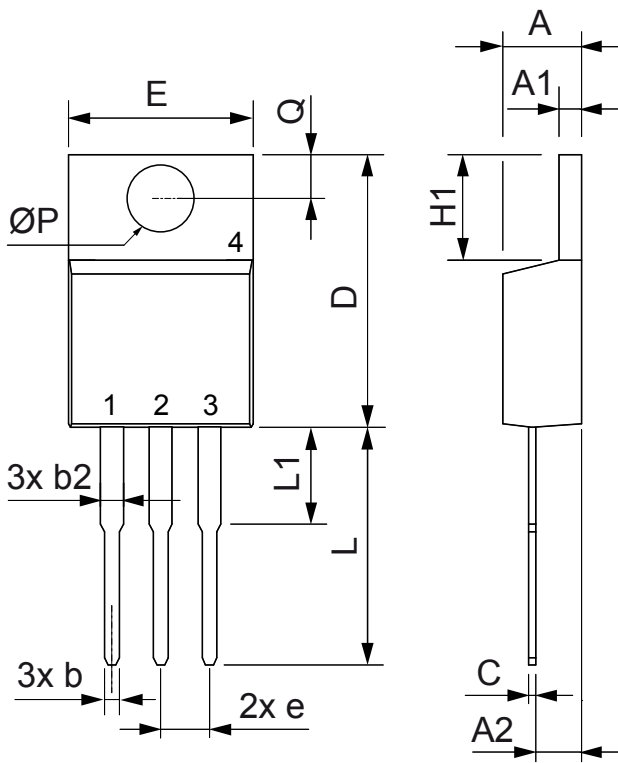
V

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

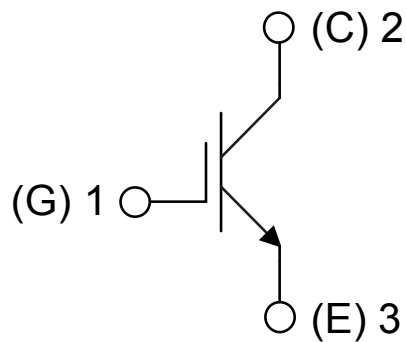
86

mΩ

Outlines TO-220



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	2.54	BSC	0.100	BSC
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
$\varnothing P$	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125





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