

## XPT IGBT

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

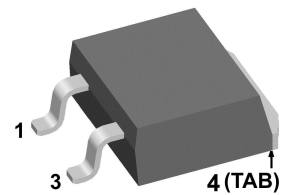
$$I_{C25} = 38 \text{ A}$$

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

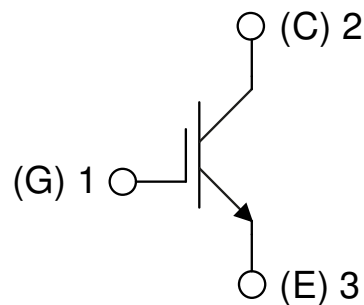
## Single IGBT

## Part number

IXA20I1200PZ



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  $\mu$ 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-263 (D2Pak-HV)

- 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 your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.

Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

- to perform joint risk and quality assessments;

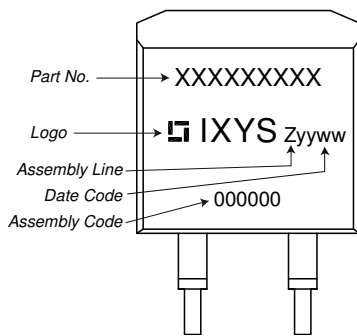
- the conclusion of quality agreements;

- 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				$\pm 20$	V	
$V_{GEM}$	max. transient gate emitter voltage				$\pm 30$	V	
$I_{C25}$	collector current				38	A	
$I_{C80}$					22	A	
$P_{tot}$	total power dissipation				165	W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 15\text{ A}; V_{GE} = 15\text{ V}$			1.8	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 $V_{CE} = 600\text{ V}; I_C = 15\text{ A}$ $V_{GE} = \pm 15\text{ V}; R_G = 56\ \Omega$		48		ns	
$t_r$	current rise time			30		ns	
$t_{d(off)}$	turn-off delay time			230		ns	
$t_f$	current fall time			350		ns	
$E_{on}$	turn-on energy per pulse			1.6		mJ	
$E_{off}$	turn-off energy per pulse			1.7		mJ	
<b>RBSOA</b>	reverse bias safe operating area	$V_{GE} = \pm 15\text{ V}; R_G = 56\ \Omega$					
$I_{CM}$		$V_{CEmax} = 1200\text{ V}$			45	A	
<b>SCSOA</b>	short circuit safe operating area	$V_{CEmax} = 1200\text{ V}$					
$t_{sc}$	short circuit duration	$V_{CE} = 900\text{ V}; V_{GE} = \pm 15\text{ V}$			10	$\mu\text{s}$	
$I_{sc}$	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			0.25		K/W	

Package TO-263 (D2Pak-HV)			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
<b>Weight</b>				1.5		g
$F_C$	mounting force with clip		20		60	N
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	4.2			mm
$d_{Spb/Apb}$		terminal to backside	4.7			mm

### Product Marking



### Part description

- I = IGBT
- X = XPT IGBT
- A = Gen 1 / std
- 20 = Current Rating [A]
- I = Single IGBT
- 1200 = Reverse Voltage [V]
- PZ = TO-263AB (D2Pak) (2HV)

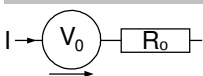
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA20I1200PZ	IXA20I1200PZ	Tape & Reel	800	518533

Similar Part	Package	Voltage class
IXA20I1200PZ	TO-220AB (3)	1200
IXA20IF1200HB	TO-247AD (3)	1200

### Equivalent Circuits for Simulation

\* on die level

$T_{VJ} = 150\text{ °C}$



IGBT

$V_{0\ max}$  threshold voltage

1.1

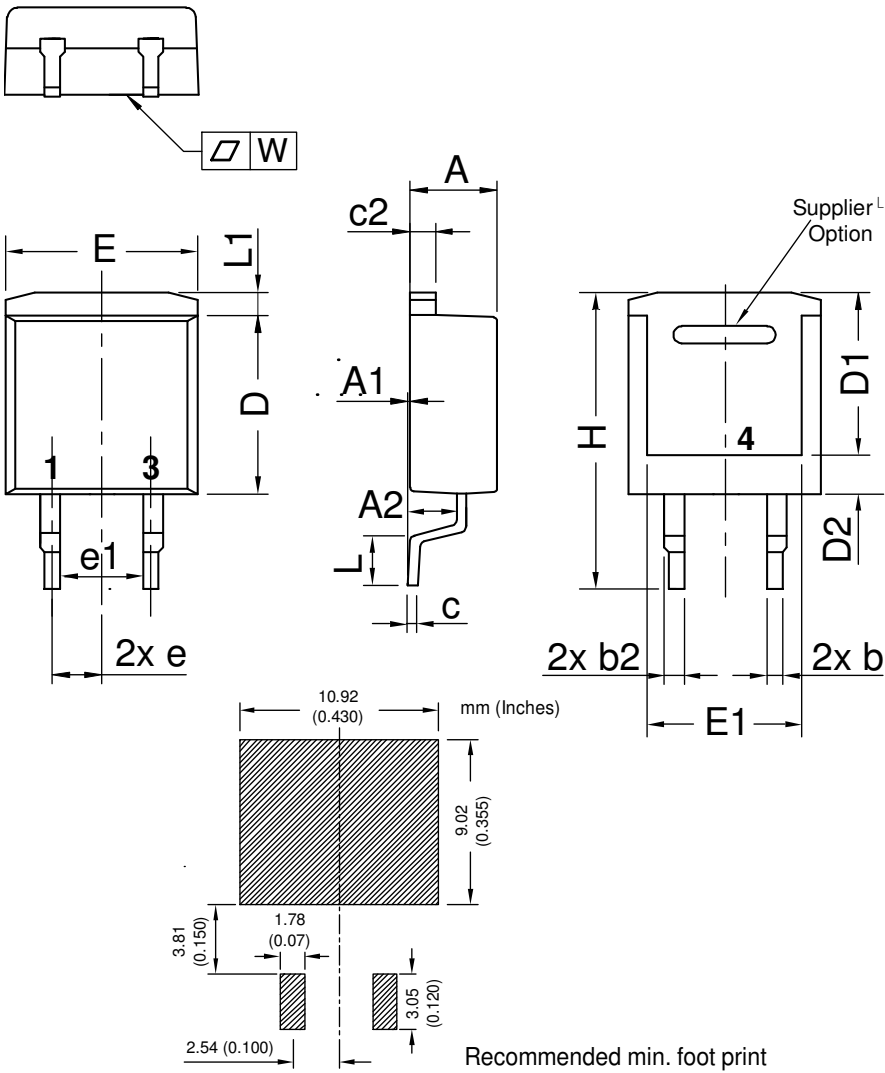
V

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

86

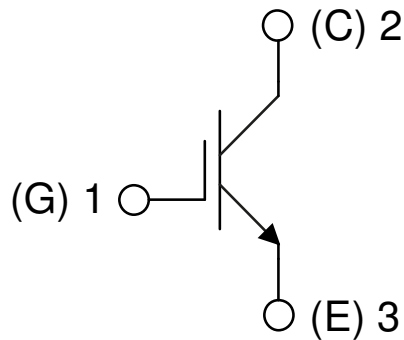
mΩ

**Outlines TO-263 (D2Pak-HV)**



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A1	typ. 0.10		typ. 0.004	
A2	2.41		0.095	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	2.3		0.091	
E	9.65	10.41	0.380	0.410
E1	6.22	8.50	0.245	0.335
e	2,54 BSC		0,100 BSC	
e1	4.28		0.169	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	1.02	1.68	0.040	0.066
W	typ. 0.02	0.040	typ. 0.0008	0.002

*All dimensions conform with and/or within JEDEC standard.*



## IGBT

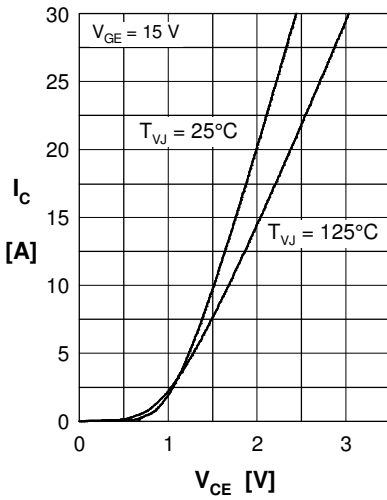


Fig. 1 Typ. output characteristics

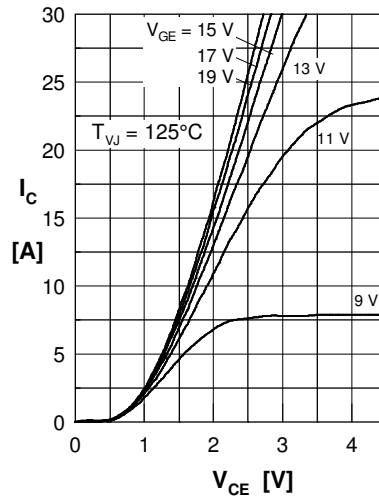


Fig. 2 Typ. output characteristics

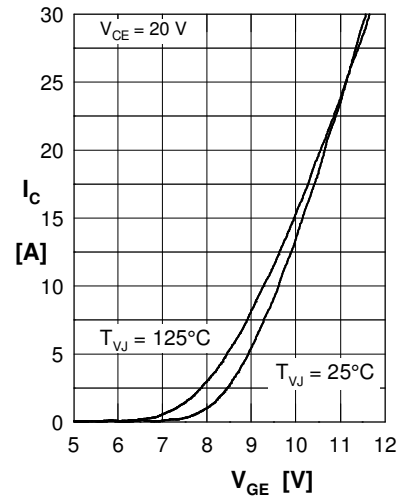


Fig. 3 Typ. transfer characteristics

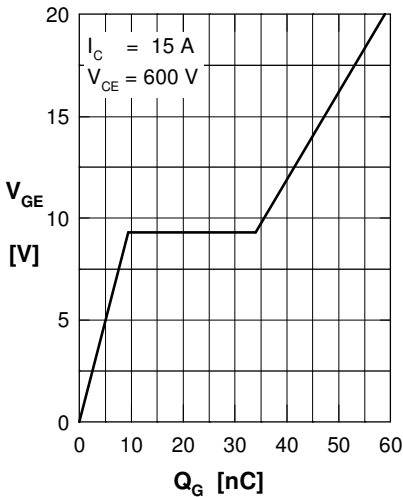


Fig. 4 Typ. turn-on gate charge

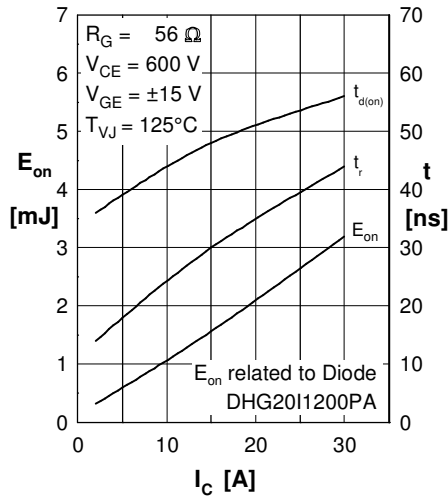


Fig. 5 Typ. switching energy vs. collector current

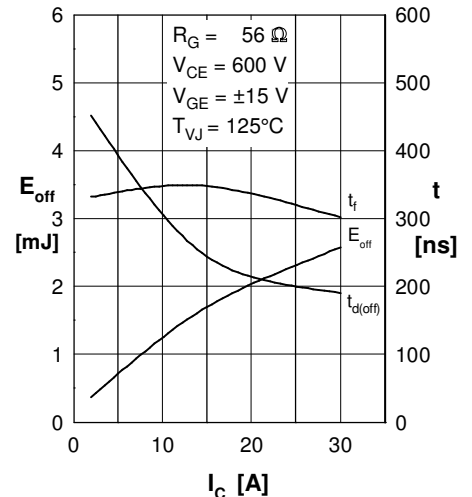


Fig. 6 Typ. switching energy vs. collector current

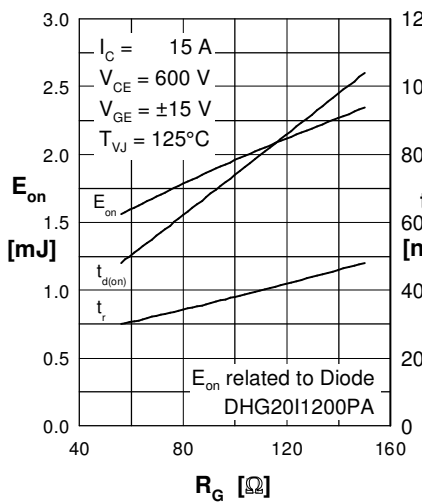


Fig. 7 Typ. switching energy vs. gate resistance

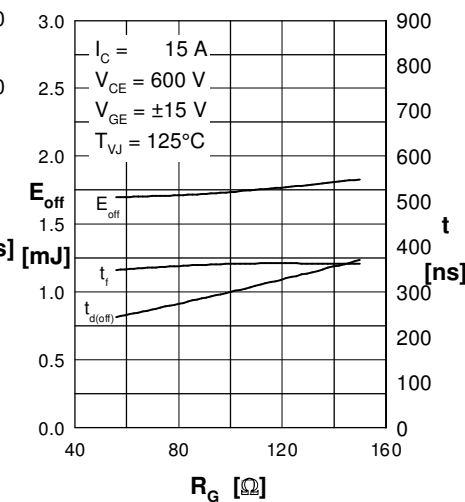


Fig. 8 Typ. switching energy vs. gate resistance

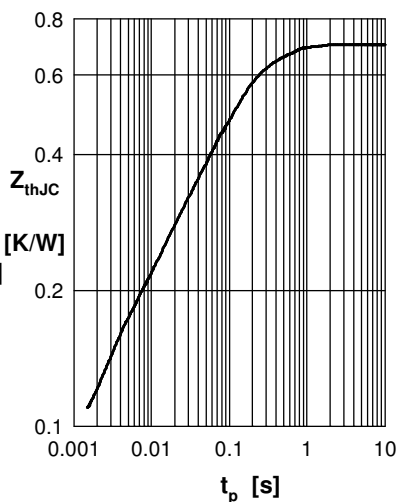


Fig. 9 Typ. transient thermal impedance junction to case