

XPT IGBT

Copack

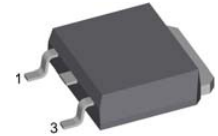
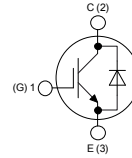
$$I_{C25} = 9 \text{ A}$$

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

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

Part number

IXA4IF1200UC



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 $V_{CE(sat)}$
- SONIC™ diode
 - fast and soft reverse recovery
 - low operating forward voltage

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

Package:

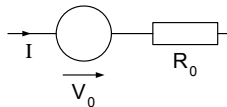
- Housing: TO-252 (DPak)
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

IGBT

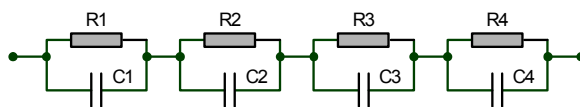
Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
V_{CES}	Collector emitter voltage	$V_{GE} = 0 \text{ V}$			1200	V
V_{GES}	Maximum DC gate voltage				± 20	V
I_{C25}	Collector current				9	A
I_{C100}					5	A
P_{tot}	Total power dissipation				45	W
I_{CES}	Collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}$			0.1	mA
				0.1		mA
I_{GES}	Gate emitter leakage current	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$			500	nA
$V_{CE(sat)}$	Collector emitter saturation voltage	$I_C = 3 \text{ A}; V_{GE} = 15 \text{ V}$		1.8	2.1	V
				2.1		V
$V_{GE(th)}$	Gate emitter threshold voltage	$I_C = 0.1 \text{ mA}; V_{GE} = V_{CE}$	5.4	6	6.5	V
Q_{on}	Total gate charge	$V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 3 \text{ A}$		12		nC
$t_{d(on)}$	Turn-on delay time			70		ns
t_r	Current rise time			40		ns
$t_{d(off)}$	Turn-off delay time	Inductive load		250		ns
t_f	Current fall time	$V_{CE} = 600 \text{ V}; I_C = 3 \text{ A}$		100		ns
E_{on}	Turn-on energy per pulse	$V_{GE} = \pm 15 \text{ V}; R_G = 330 \Omega$	$T_{VJ} = 125^\circ\text{C}$	0.4		mJ
E_{off}	Turn-off energy per pulse			0.3		mJ
RBSOA	Reverse bias safe operation area	$V_{GE} = 15 \text{ V}; R_G = 330 \Omega$ $V_{CEK} = 1200 \text{ V}$	$T_{VJ} = 125^\circ\text{C}$		9	A
SCSOA	Short circuit safe operation area					
t_{sc}	Short circuit duration	$V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V}$	$T_{VJ} = 125^\circ\text{C}$		10	μ s
I_{sc}	Short circuit current	$R_G = 330 \Omega$; non-repetitive			12	A
R_{thJC}	Thermal resistance junction to case				2.7	K/W

Diode

Symbol	Definition	Conditions	Ratings			Unit	
			min.	typ.	max.		
I_{F25}	Forward current	$T_C = 25^\circ\text{C}$			10	A	
I_{F100}		$T_C = 100^\circ\text{C}$			6	A	
V_F	Forward voltage	$I_F = 3\text{ A}$		$T_{VJ} = 25^\circ\text{C}$	1.9	2.2	V
				$T_{VJ} = 125^\circ\text{C}$	1.9		V
Q_{rr}	Reverse recovery charge	$V_R = 600\text{ V}$			0.5		μC
I_{RM}	Maximum reverse recovery current						$T_{VJ} = 125^\circ\text{C}$
t_{rr}	Reverse recovery time	$I_F = 3\text{ A}$					ns
$E_{rec(off)}$	Reverse recovery losses at turn-off						0.1
R_{thJC}	Thermal resistance junction to case				3		K/W

Equivalent Circuits for Simulation


Symbol	Definition		Ratings			Unit
			min.	typ.	max.	
V_0	IGBT	$T_{VJ} = 150^\circ\text{C}$			1.1	V
R_0					460	m Ω
V_0	Diode	$T_{VJ} = 150^\circ\text{C}$			1.25	V
R_0					280	m Ω



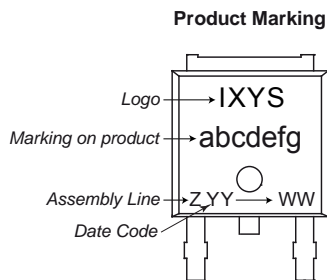
$$Z_{th}(t) = \sum_{i=1}^n \left[R_i \cdot \left(1 - \exp\left(-\frac{t}{\tau_i}\right) \right) \right]$$

$$\tau_i = R_i \cdot C_i$$

	IGBT	Diode
R_1	tbd	tbd
R_2	tbd	tbd
R_3	tbd	tbd
R_4	tbd	tbd
τ_1	tbd	tbd
τ_2	tbd	tbd
τ_3	tbd	tbd
τ_4	tbd	tbd

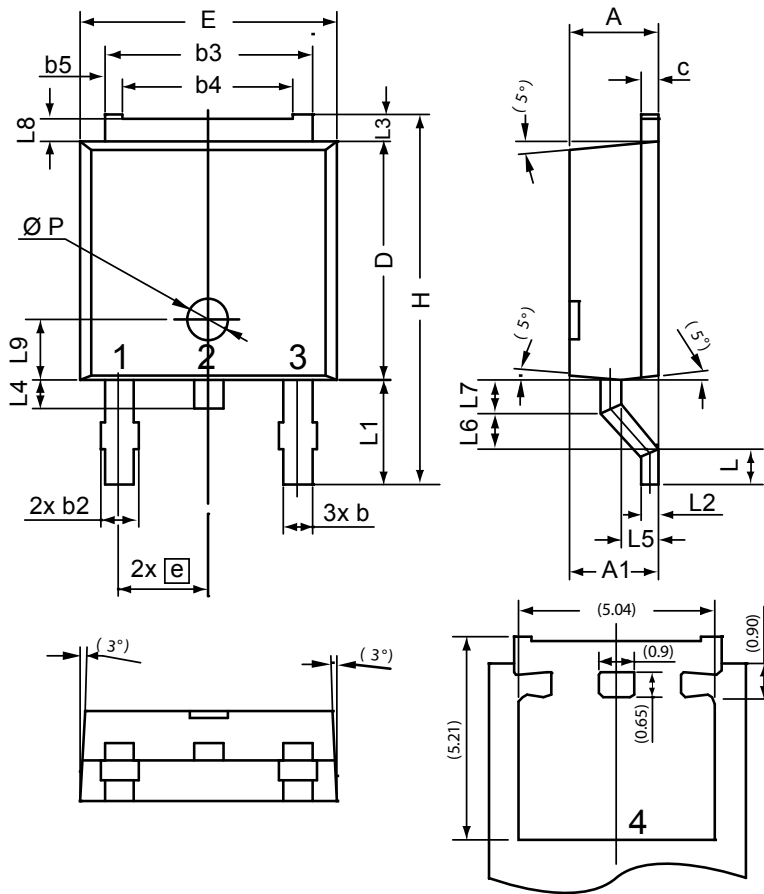
Package TO-252 (DPak)

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
T_{vj}	Virtual junction temperature		-55		150	°C
T_{stg}	Storage temperature		-55		150	°C
R_{thCH}	Thermal resistance case to heatsink			0.50		K/W
Weight				0.3		g
F_c	Mounting force with clip		20		60	N


Part number

I = IGBT
 X = XPT IGBT
 A = Gen 1 / std
 4 = Current Rating [A]
 IF = Copack
 1200 = Reverse Voltage [V]
 UC = TO-252AA (DPak)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA 4 IF 1200 UC	IXA4IF1200UC	Tape & Reel	2500	510217



Dim.	Millimeters		Inches	
	min	max	min	max
A	2.20	2.40	0.087	0.094
A1	2.10	2.50	0.083	0.098
b	0.66	0.86	0.026	0.034
b2	-	0.96	-	0.038
b3	5.04	5.64	0.198	0.222
b4	4.34 BSC		0.171 BSC	
b5	0.50 BSC		0.020 BSC	
c	0.40	0.60	0.016	0.024
D	5.90	6.30	0.232	0.248
E	6.40	6.80	0.252	0.268
e	2.10	2.50	0.083	0.098
H	9.20	9.80	0.362	0.386
L	0.55	1.02	0.022	0.040
L1	2.50	2.90	0.098	0.114
L2	0.40	0.60	0.016	0.024
L3	0.50	0.90	0.020	0.035
L4	0.60	1.00	0.024	0.039
L5	0.82	1.22	0.032	0.048
L6	0.79	0.99	0.031	0.039
L7	0.81	1.01	0.032	0.040
L8	0.40	0.80	0.016	0.031
L9	1.50 BSC		0.059 BSC	
Ø P	1.00 BSC		0.039 BSC	

