

XPT IGBT

$$V_{CES} = 1200V$$

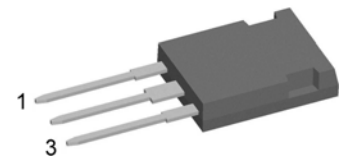
$$I_{C25} = 43A$$

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

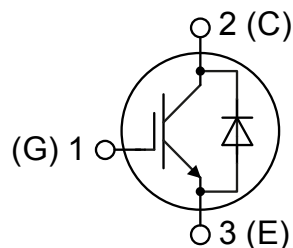
Copack

Part number

IXA27IF1200HJ



Backside: isolated



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
- Pumps, Fans

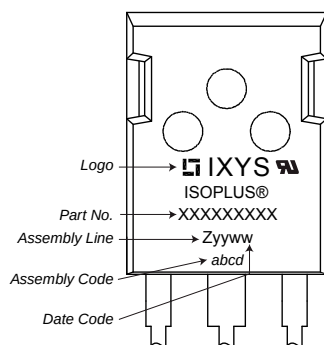
Package: ISOPLUS247

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

IGBT				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V _{CES}	collector emitter voltage	T _{VJ} = 25°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°C				43	A
I _{C80}		T _C = 80°C				27	A
P _{tot}	total power dissipation	T _C = 25°C				150	W
V _{CE(sat)}	collector emitter saturation voltage	I _C = 25A; V _{GE} = 15 V	T _{VJ} = 25°C		1.8	2.1	V
			T _{VJ} = 125°C		2.1		V
V _{GE(th)}	gate emitter threshold voltage	I _C = 1mA; V _{GE} = V _{CE}	T _{VJ} = 25°C	5.4	5.9	6.5	V
I _{CES}	collector emitter leakage current	V _{CE} = V _{CES} ; V _{GE} = 0 V	T _{VJ} = 25°C			0.1	mA
			T _{VJ} = 125°C		0.1		mA
I _{GES}	gate emitter leakage current	V _{GE} = ±20 V				500	nA
Q _{G(on)}	total gate charge	V _{CE} = 600 V; V _{GE} = 15 V; I _C = 25 A			76		nC
t _{d(on)}	turn-on delay time	inductive load V _{CE} = 600 V; I _C = 25 A V _{GE} = ±15 V; R _G = 39 Ω	T _{VJ} = 125°C		70		ns
t _r	current rise time				40		ns
t _{d(off)}	turn-off delay time				250		ns
t _f	current fall time				100		ns
E _{on}	turn-on energy per pulse				2.5		mJ
E _{off}	turn-off energy per pulse				3		mJ
RBSOA	reverse bias safe operating area	V _{GE} = ±15 V; R _G = 39 Ω	T _{VJ} = 125°C				
I _{CM}		V _{CEmax} = 1200V				75	A
SCSOA	short circuit safe operating area	V _{CEmax} = 900 V					
t _{SC}	short circuit duration	V _{CE} = 900 V; V _{GE} = ±15 V	T _{VJ} = 125°C			10	μs
I _{SC}	short circuit current	R _G = 39 Ω; non-repetitive			100		A
R _{thJC}	thermal resistance junction to case					0.84	K/W
R _{thCH}	thermal resistance case to heatsink				0.25		K/W
Diode							
V _{RRM}	max. repetitive reverse voltage	T _{VJ} = 25°C				1200	V
I _{F25}	forward current	T _C = 25°C				42	A
I _{F80}		T _C = 80°C				25	A
V _F	forward voltage	I _F = 30A	T _{VJ} = 25°C			2.20	V
			T _{VJ} = 125°C		1.95		V
I _R	reverse current	V _R = V _{RRM}	T _{VJ} = 25°C			*	mA
	* not applicable, see Ices value above		T _{VJ} = 125°C		*		mA
Q _{rr}	reverse recovery charge	V _R = 600 V -di _F /dt = -600 A/μs I _F = 30A; V _{GE} = 0 V	T _{VJ} = 125°C		3.5		μC
I _{RM}	max. reverse recovery current				30		A
t _{rr}	reverse recovery time				350		ns
E _{rec}	reverse recovery energy				0.9		mJ
R _{thJC}	thermal resistance junction to case					1.2	K/W
R _{thCH}	thermal resistance case to heatsink				0.25		K/W

Package ISOPLUS247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			70	A
T_{VJ}	virtual junction temperature		-40		150	°C
T_{op}	operation temperature		-40		125	°C
T_{stg}	storage temperature		-40		150	°C
Weight				6		g
F_c	mounting force with clip		20		120	N
$d_{Spp/App}$	creepage distance on surface striking distance through air	terminal to terminal	2.7			mm
$d_{Spb/Apb}$		terminal to backside	4.1			mm
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V

Product Marking



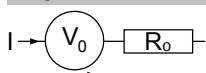
Part number

I = IGBT
 X = XPT IGBT
 A = Gen 1 / std
 27 = Current Rating [A]
 IF = Copack
 1200 = Reverse Voltage [V]
 HJ = ISOPLUS247 (3)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA27IF1200HJ	IXA27IF1200HJ	Tube	30	509098

Equivalent Circuits for Simulation

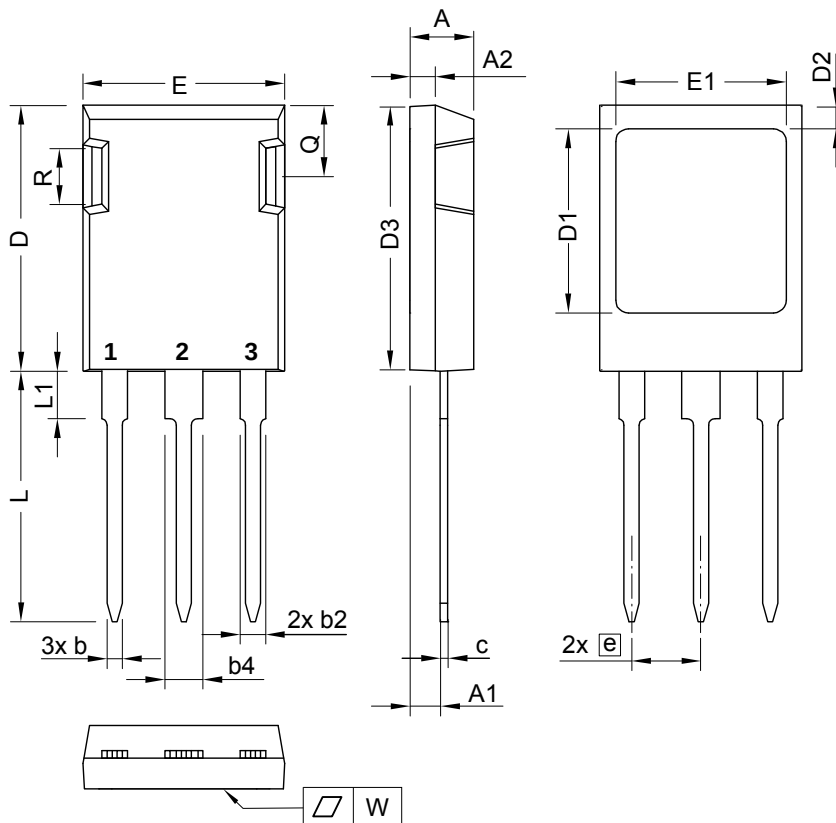
* on die level

 $T_{VJ} = 150\text{ °C}$ 

$V_{0\max}$ threshold voltage
 $R_{0\max}$ slope resistance *

	IGBT	Diode	
	1.1	1.25	V
	55	28.3	mΩ

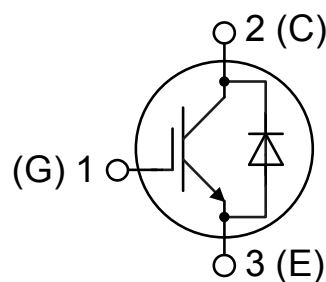
Outlines ISOPLUS247



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b2	1.91	2.20	0.075	0.087
b4	2.92	3.24	0.115	0.128
c	0.61	0.83	0.024	0.033
D	20.80	21.34	0.819	0.840
D1	15.75	16.26	0.620	0.640
D2	1.65	2.15	0.065	0.085
D3	20.30	20.70	0.799	0.815
E	15.75	16.13	0.620	0.635
E1	13.21	13.72	0.520	0.540
e	5.45 BSC		0.215 BSC	
L	19.81	20.60	0.780	0.811
L1	3.81	4.38	0.150	0.172
Q	5.59	6.20	0.220	0.244
R	4.25	5.50	0.167	0.217
W	-	0.10	-	0.004

Die konvexe Form des Substrates ist typ. < 0.04 mm über der Kunststoffoberfläche der Bauteilunterseite
The convex bow of substrate is typ. < 0.04 mm over plastic surface level of device bottom side

Die Gehäuseabmessungen entsprechen dem Typ TO-247 AD gemäß JEDEC außer Schraubloch und L_{max} .
This drawing will meet all dimensions requirement of JEDEC outline TO-247 AD except screw hole and except L_{max} .



IGBT

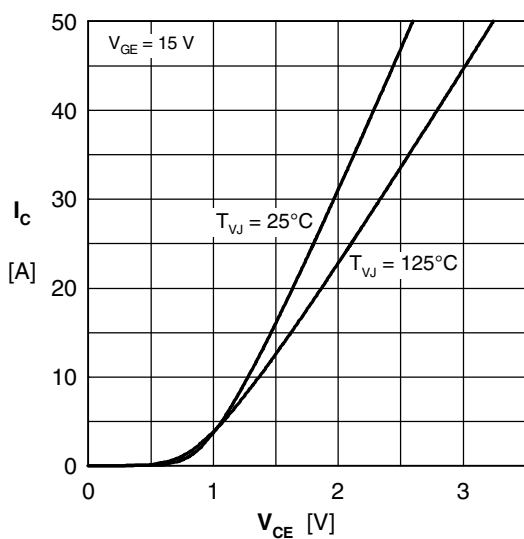


Fig. 1 Typ. output characteristics

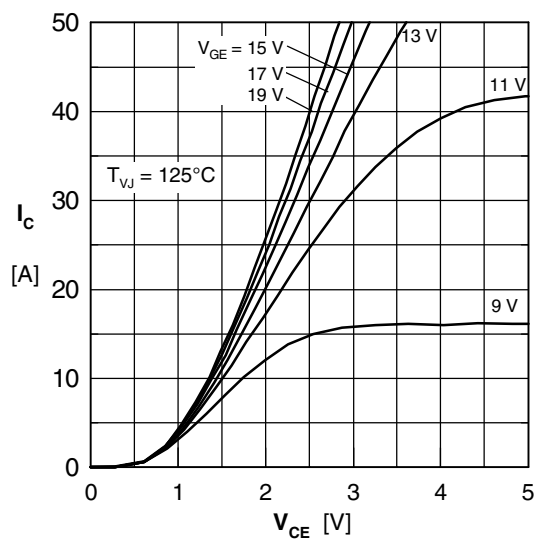


Fig. 2 Typ. output characteristics

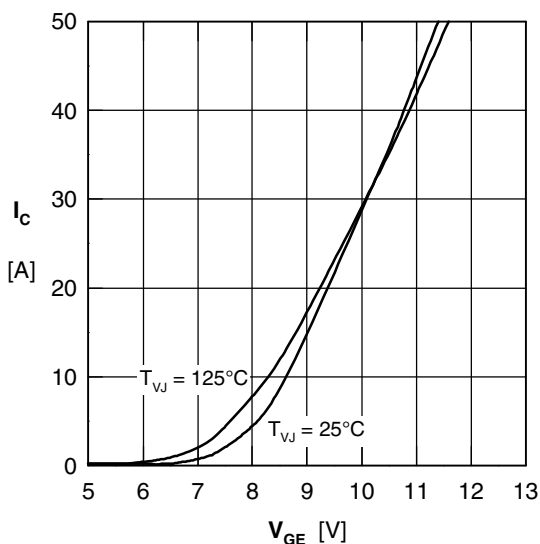


Fig. 3 Typ. transfer characteristics

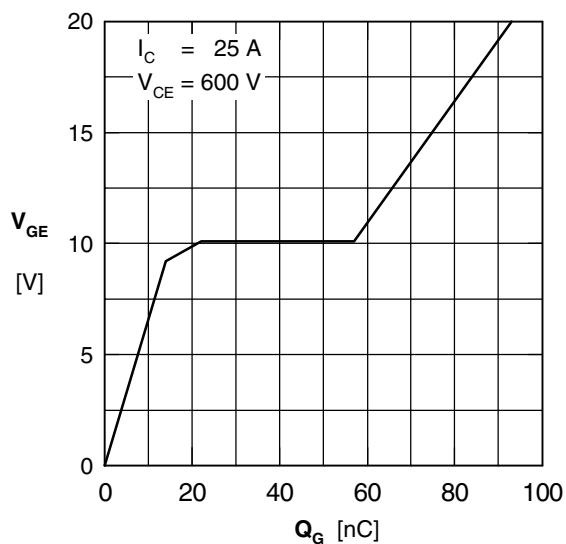


Fig. 4 Typ. turn-on gate charge

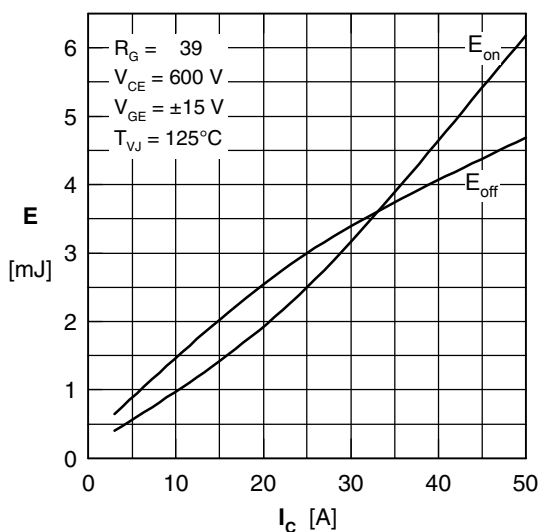


Fig. 5 Typ. switching energy vs. collector current

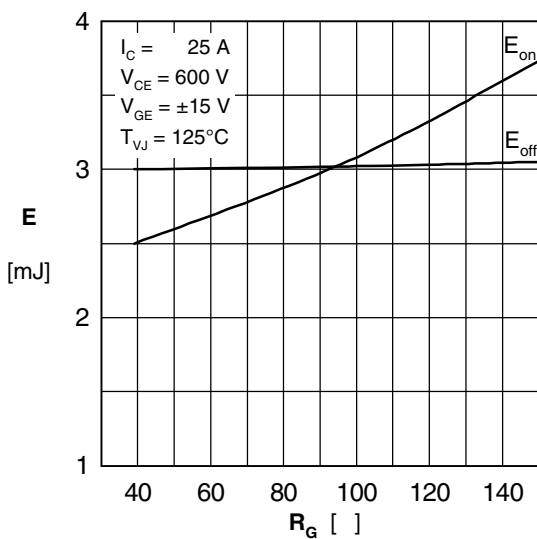


Fig. 6 Typ. switching energy vs. gate resistance

Diode

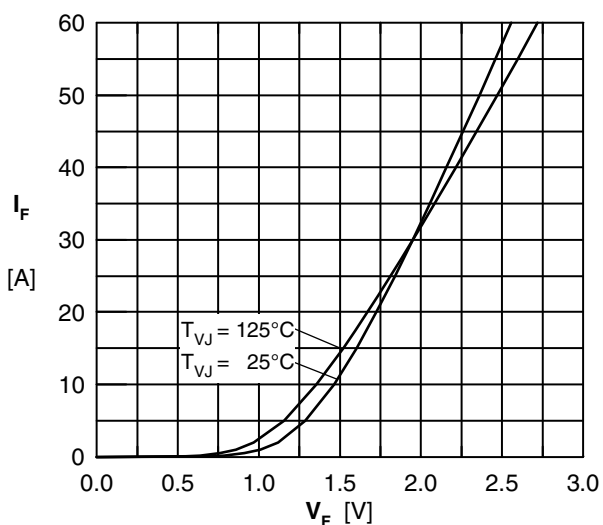


Fig. 7 Typ. Forward current versus V_F

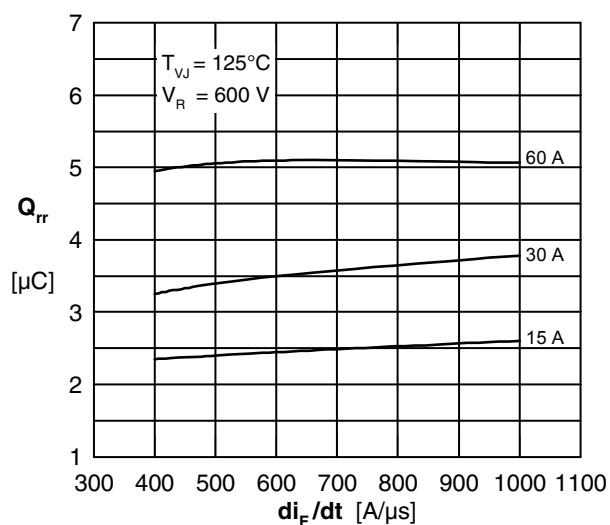


Fig. 8 Typ. reverse recov.charge Q_{rr} vs. di/dt

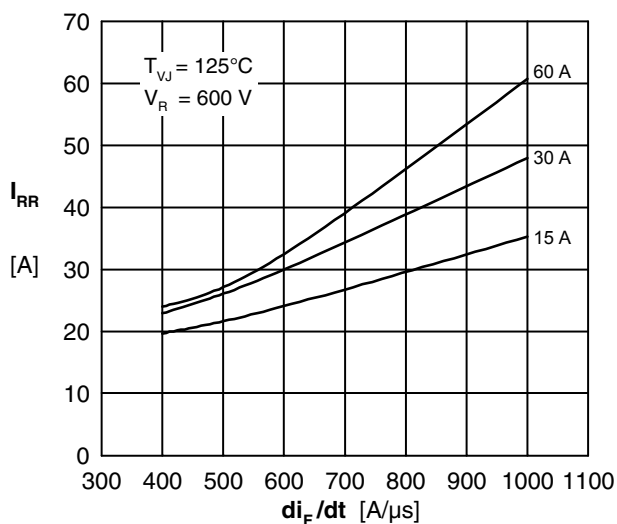


Fig. 9 Typ. peak reverse current I_{RM} vs. di/dt

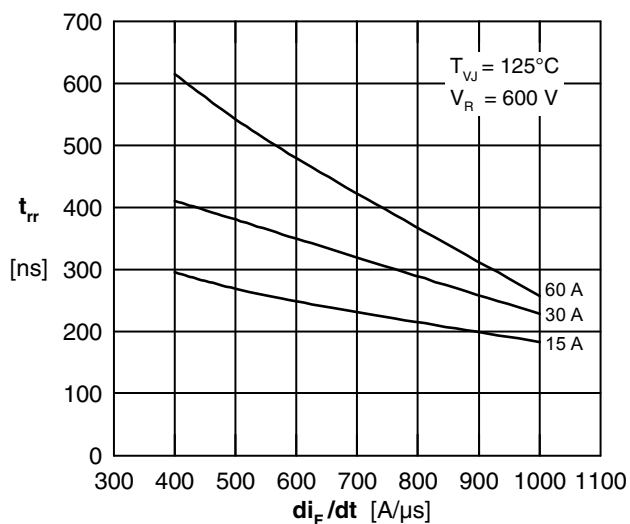


Fig. 10 Typ. recovery time t_{rr} versus di/dt

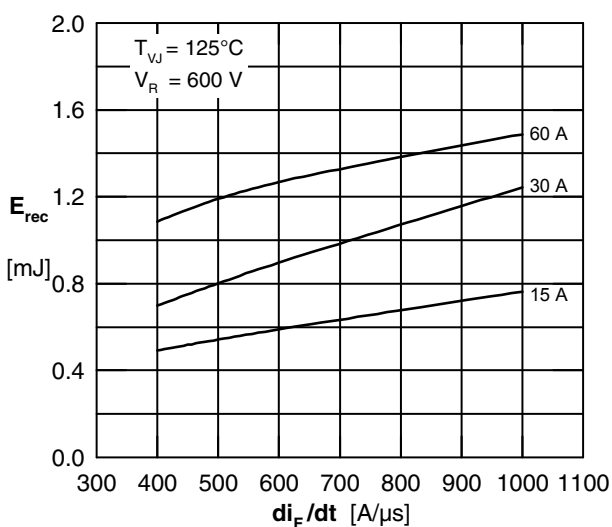


Fig. 11 Typ. recovery energy E_{rec} versus di/dt

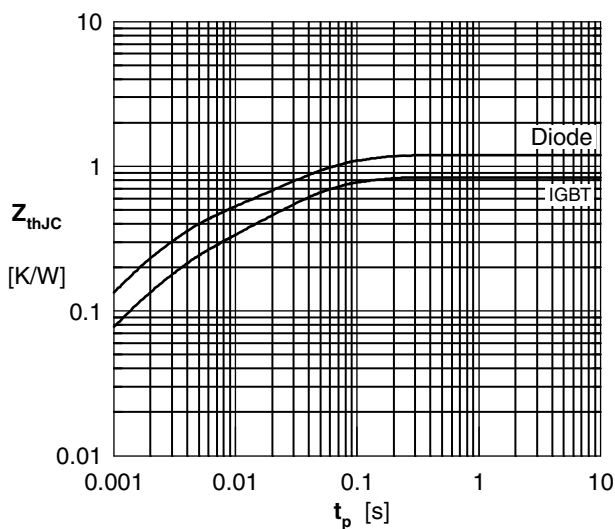


Fig. 12 Typ. transient thermal impedance