XPT IGBT

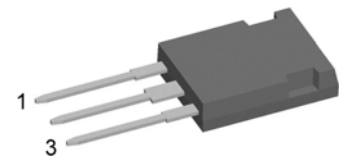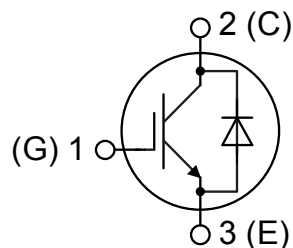|		
V_{CES}	=	1200 V
I_{C25}	=	58 A
$V_{CE(sat)}$	=	1.8 V

Copack

Part number

IXA37IF1200HJ

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 μsec.
  - very low gate charge
  - low EMI
  - square RBSOA @ 3x Ic
- Thin wafer technology combined with the XPT design results in a competitive low VCE(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
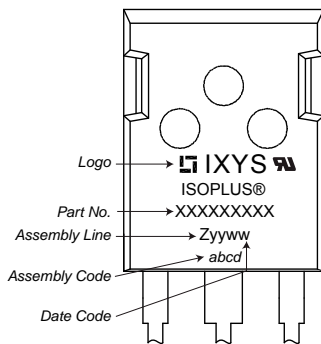- Inductive heating, cookers
- Pumps, Fans

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		$T_C = 25°C$			58	A
I_{C80}			$T_C = 80°C$			37	A
P_{tot}	total power dissipation		$T_C = 25°C$			195	W
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 35A$; $V_{GE} = 15$ V	$T_{VJ} = 25°C$		1.8	2.1	V
			$T_{VJ} = 125°C$		2.1		V
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 1.5mA$; $V_{GE} = V_{CE}$	$T_{VJ} = 25°C$	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; $I_C = 35$ A			106		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 $T_{VJ} = 125°C$			250		ns
t_f	current fall time	$V_{CE} = 600V$; $I_C = 35A$			100		ns
E_{on}	turn-on energy per pulse	$V_{GE} = ±15$ V; $R_G = 27$ Ω			3.8		mJ
E_{off}	turn-off energy per pulse				4.1		mJ
RBSOA	reverse bias safe operating area	$V_{GE} = ±15$ V; $R_G = 27$ Ω $T_{VJ} = 125°C$					
I_{CM}		$V_{CEmax} = 1200V$				105	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	$R_G = 27$ Ω; non-repetitive			140		A
R_{thJC}	thermal resistance junction to case					0.64	K/W
R_{thCH}	thermal resistance case to heatsink				0.25		K/W

Diode | | | | | | | |

Symbol	Definition	Conditions		min.	typ.	max.	Unit
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			3.5		µC
I_{RM}	max. reverse recovery current	$-di_F/dt = -600$ A/µs			30		A
t_{rr}	reverse recovery time	$T_{VJ} = 125°C$			350		ns
E_{rec}	reverse recovery energy	$I_F = 30A$; $V_{GE} = 0$ V			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 50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3000			V

Product Marking

Logo → IXYS ⓤ
ISOPLUS®
Part No. → XXXXXXXXX
Assembly Line → Zyyww
Assembly Code → abcd
Date Code

Part number

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

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	IXA37IF1200HJ	IXA37IF1200HJ	Tube	30	507993

Equivalent Circuits for Simulation	*on die level*	T_{VJ} = 150 °C		
		IGBT	Diode	
$V_{0\,max}$	threshold voltage	1.1	1.25	V
$R_{0\,max}$	slope resistance *	39	28.3	mΩ
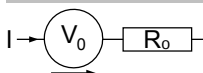
Outlines ISOPLUS247
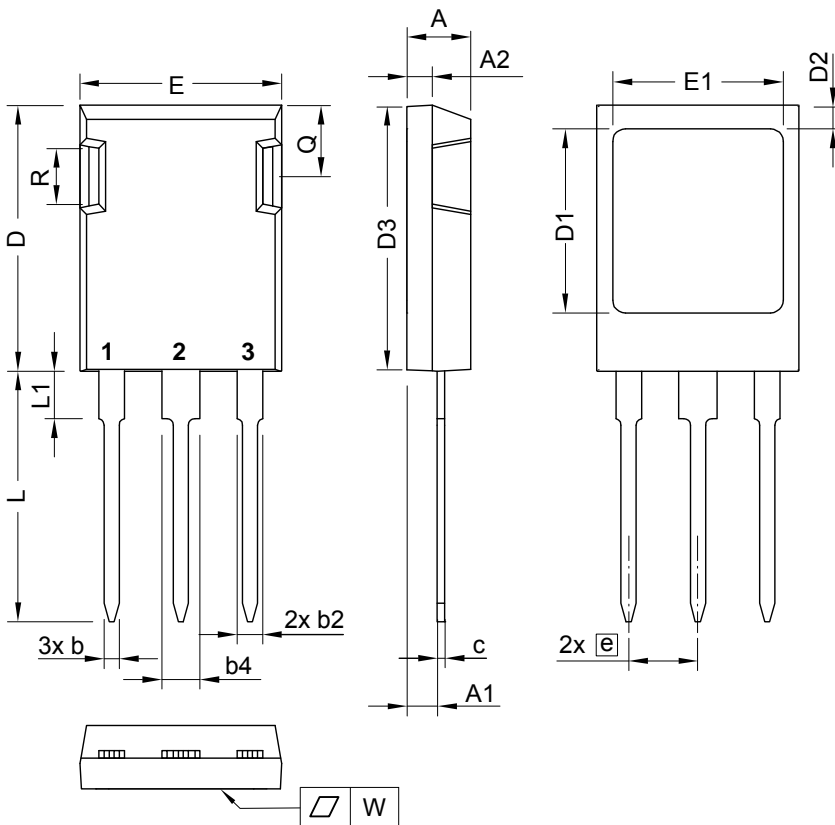
Dim.	Millimeter		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b2	1.91	2.20	0.075	0.087
b4	2.92	3.24	0.115	0.128
c	0.61	0.83	0.024	0.033
D	20.80	21.34	0.819	0.840
D1	15.75	16.26	0.620	0.640
D2	1.65	2.15	0.065	0.085
D3	20.30	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 requiarement of JEDEC outline TO-247 AD except screw hole and except L$_{max}$.

IXYS reserves the right to change limits, conditions and dimensions.

Data according to IEC 60747and per semiconductor unless otherwise specified

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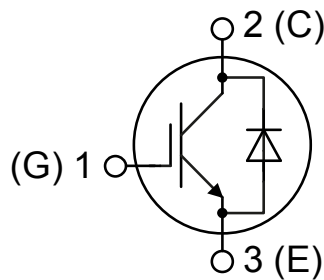
IGBT
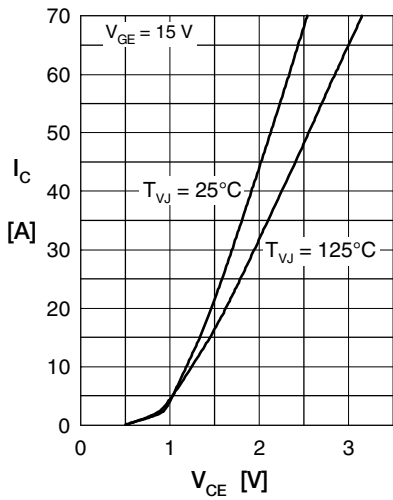
Fig. 1 Typ. output characteristics
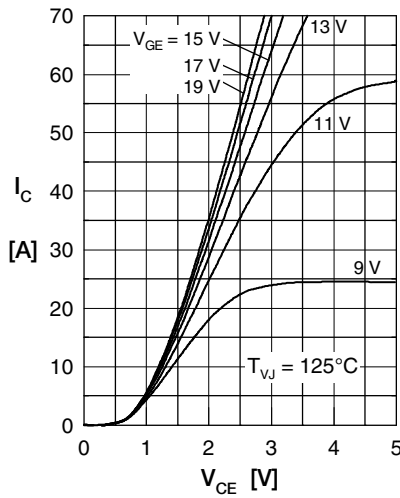
Fig. 2 Typ. output characteristics
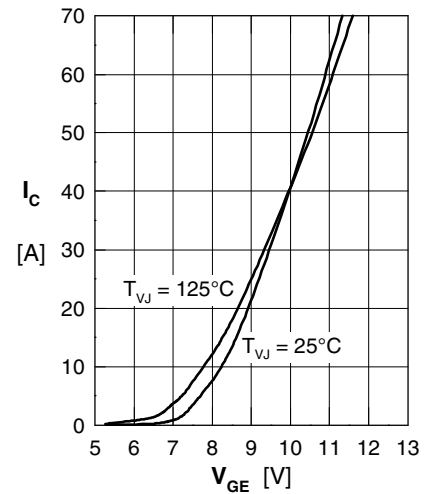
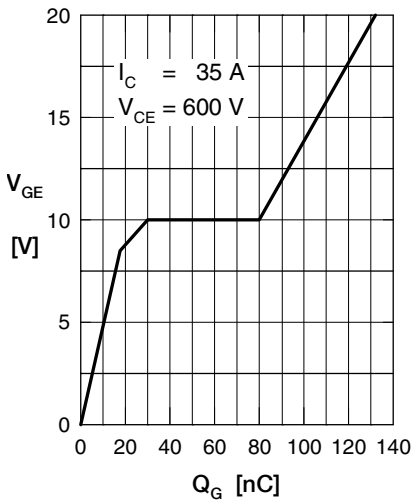Fig. 3 Typ. tranfer characteristics

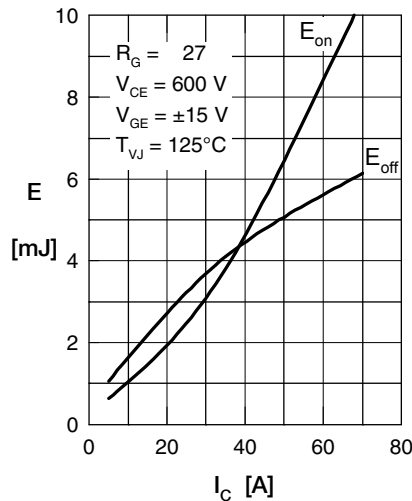Fig. 4 Typ. turn-on gate charge

Fig. 5 Typ. switching energy
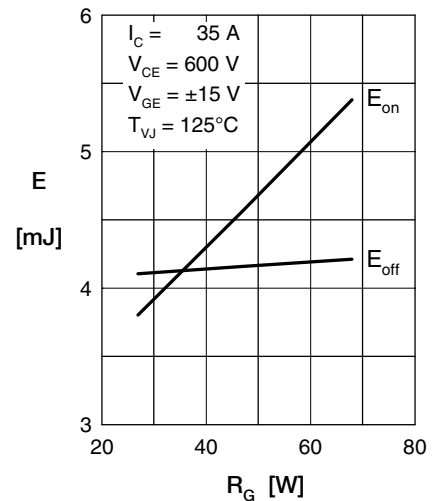vs. collector current

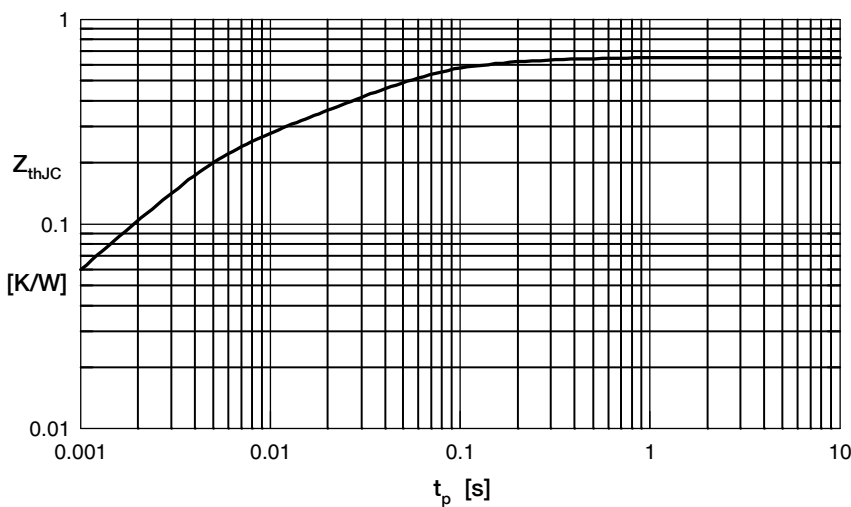Fig. 6 Typ. switching energy
vs. gate resistance

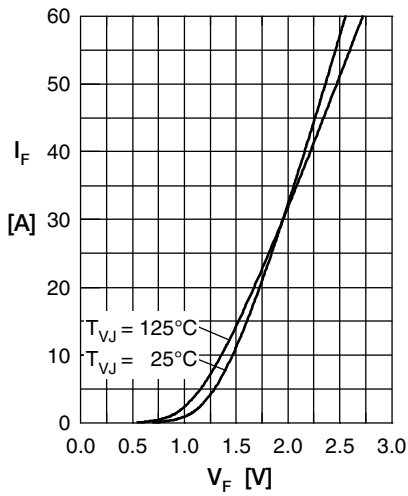Fig. 7 Typ. transient thermal impedance junction to case

Diode

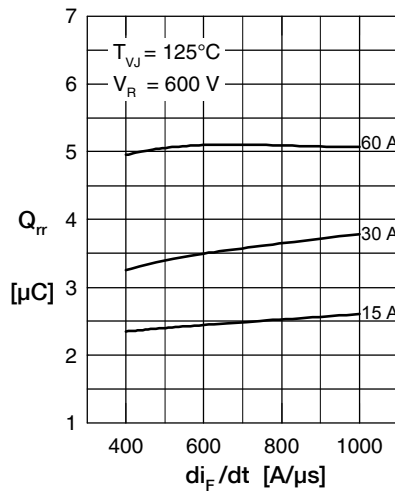
Fig. 1 Typ. Forward current versus V_F
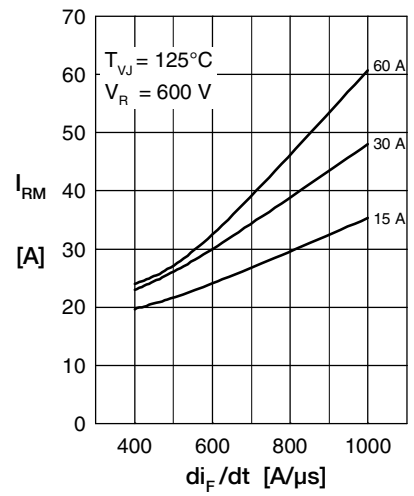

Fig. 2 Typ. reverse recov. charge Q_{rr} versus di/dt
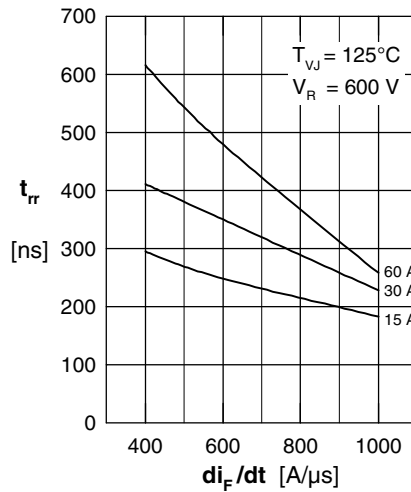

Fig. 3 Typ. peak reverse current I_{RM} versus di/dt

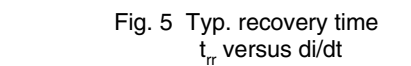Fig. 4 Dynamic parameters Q_{rr}, I_{RM} versus di/dt
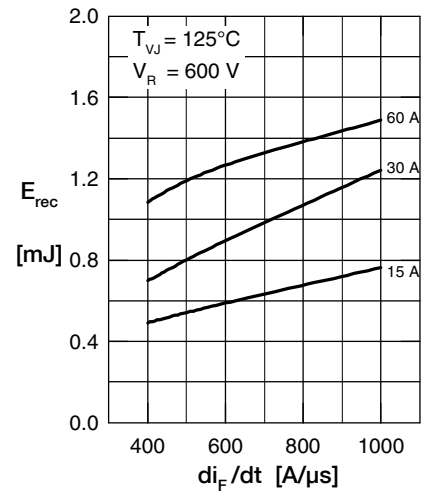

Fig. 5 Typ. recovery time t_{rr} versus di/dt
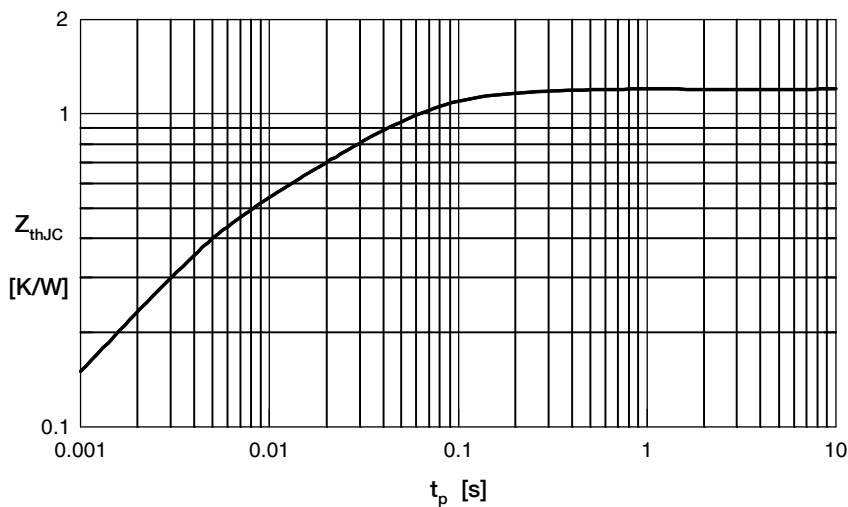

Fig. 6 Typ. recovery energy E_{rec} versus di/dt

Fig. 7 Typ. transient thermal impedance junction to case

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