

XPT IGBT

$$V_{CES} = 1200V$$

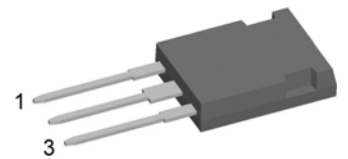
$$I_{C25} = 43A$$

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

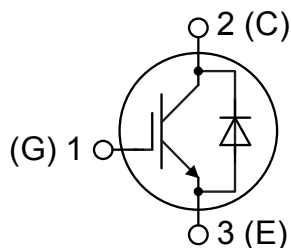
Copack

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

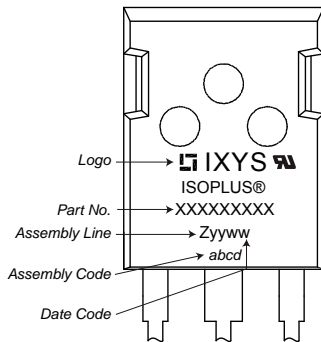
Package: ISOPLUS247

- 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	$T_{VJ} = 25^{\circ}C$			1200	V	
V_{GES}	max. DC gate voltage				± 20	V	
V_{GEM}	max. transient gate emitter voltage				± 30	V	
I_{C25}	collector current	$T_C = 25^{\circ}C$			43	A	
I_{C80}		$T_C = 80^{\circ}C$			27	A	
P_{tot}	total power dissipation	$T_C = 25^{\circ}C$			150	W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 25A; V_{GE} = 15V$		1.8	2.1	V	
				2.1		V	
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 1mA; V_{GE} = V_{CE}$	5.4	5.9	6.5	V	
I_{CES}	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0V$			0.1	mA	
				0.1		mA	
I_{GES}	gate emitter leakage current	$V_{GE} = \pm 20V$			500	nA	
$Q_{G(on)}$	total gate charge	$V_{CE} = 600V; V_{GE} = 15V; I_C = 25A$		76		nC	
$t_{d(on)}$	turn-on delay time	inductive load $V_{CE} = 600V; I_C = 25A$ $V_{GE} = \pm 15V; R_G = 39\Omega$	$T_{VJ} = 125^{\circ}C$	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	$V_{GE} = \pm 15V; R_G = 39\Omega$	$T_{VJ} = 125^{\circ}C$				
I_{CM}		$V_{CEmax} = 1200V$			75	A	
SCSOA	short circuit safe operating area	$V_{CEmax} = 900V$	$T_{VJ} = 125^{\circ}C$				
t_{sc}	short circuit duration	$V_{CE} = 900V; V_{GE} = \pm 15V$			10	μs	
I_{sc}	short circuit current	$R_G = 39\Omega; \text{non-repetitive}$		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		$T_{VJ} = 25^{\circ}C$		1200	V	
I_{F25}	forward current		$T_C = 25^{\circ}C$		42	A	
I_{F80}			$T_C = 80^{\circ}C$		25	A	
V_F	forward voltage	$I_F = 30A$	$T_{VJ} = 25^{\circ}C$		2.20	V	
			$T_{VJ} = 125^{\circ}C$	1.95		V	
I_R	reverse current	$V_R = V_{RRM}$	$T_{VJ} = 25^{\circ}C$		*	mA	
	* not applicable, see Ices value above		$T_{VJ} = 125^{\circ}C$	*		mA	
Q_{rr}	reverse recovery charge	$V_R = 600V$ $-di_F/dt = -600A/\mu s$ $I_F = 30A; V_{GE} = 0V$	$T_{VJ} = 125^{\circ}C$	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
$d_{Spbl/Apb}$		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

$T_{VJ} = 150\text{ °C}$

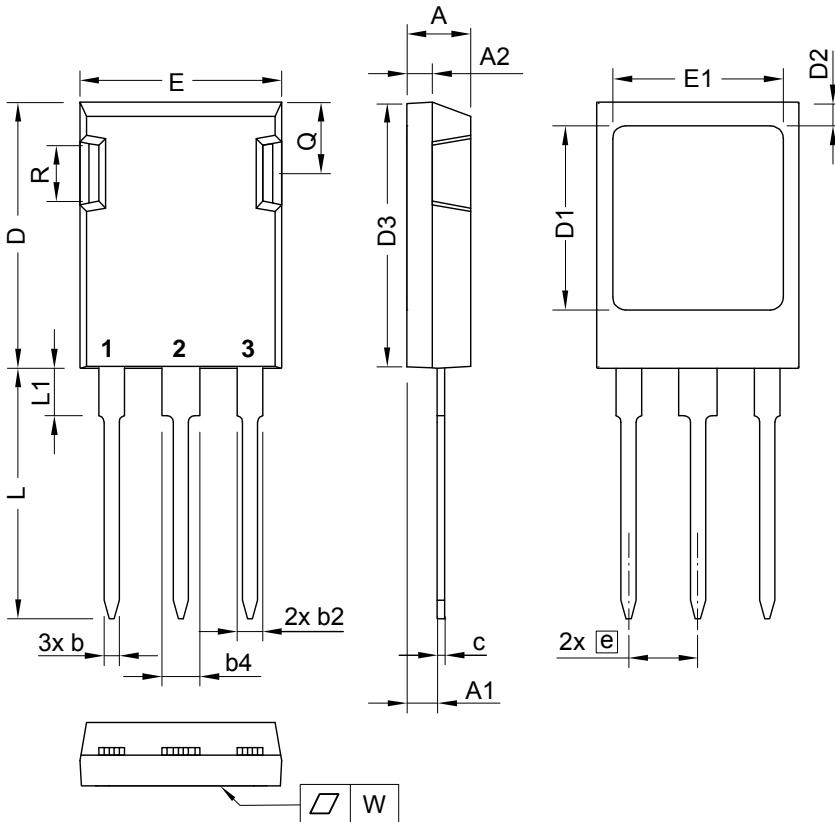


$V_{0\max}$ threshold voltage

$R_{0\max}$ slope resistance *

	IGBT	Diode	
$V_{0\max}$	1.1	1.25	V
$R_{0\max}$	55	28.3	mΩ

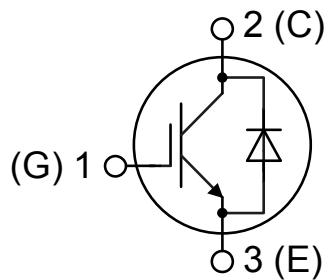
Outlines ISOPLUS247



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

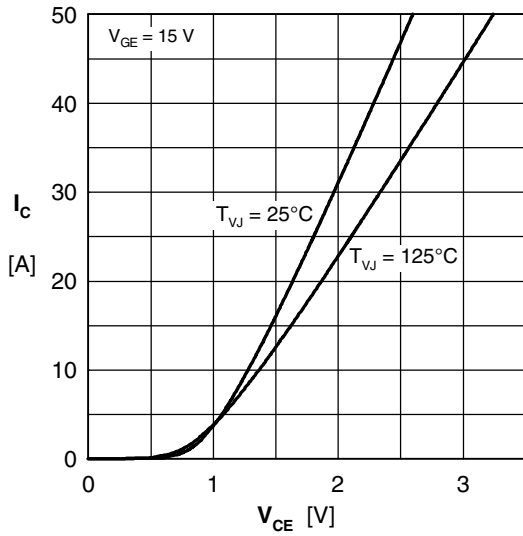


Fig. 1 Typ. output characteristics

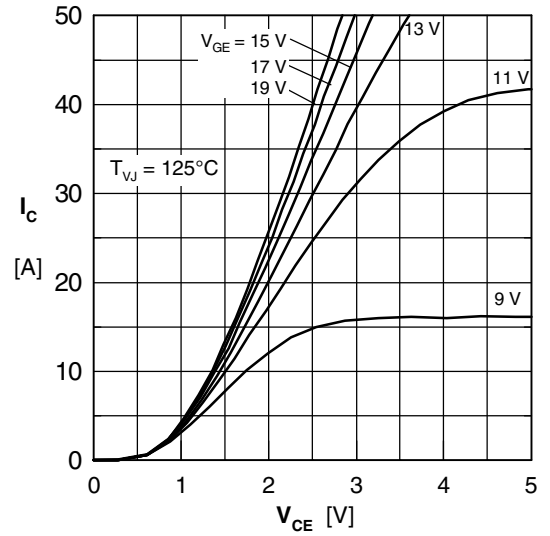


Fig. 2 Typ. output characteristics

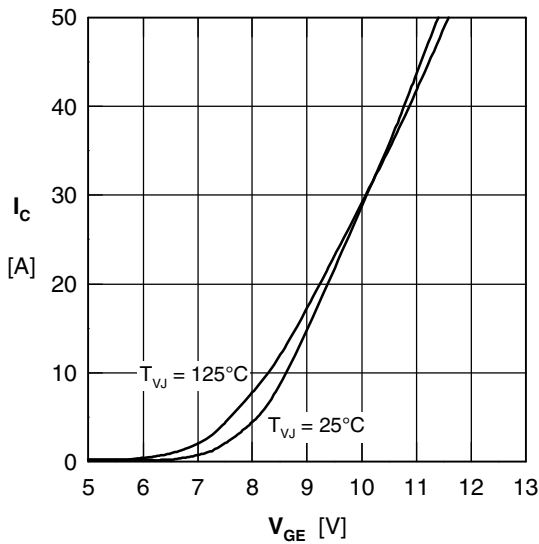


Fig. 3 Typ. transfer characteristics

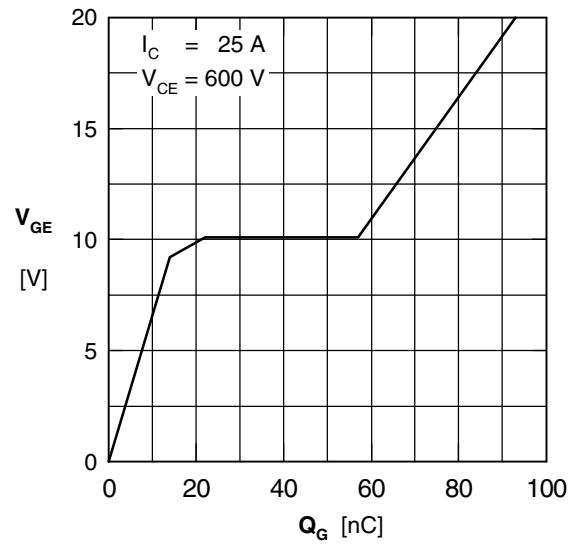


Fig. 4 Typ. turn-on gate charge

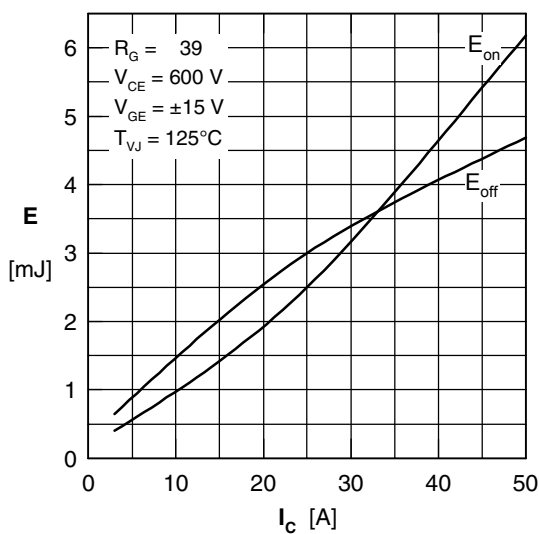


Fig. 5 Typ. switching energy vs. collector current

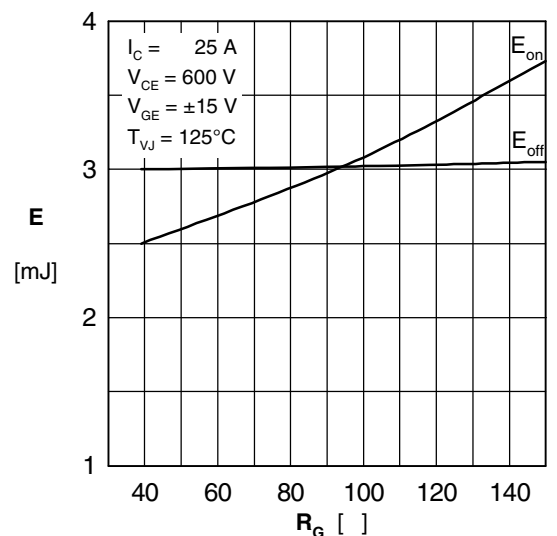


Fig. 6 Typ. switching energy vs. gate resistance

Diode

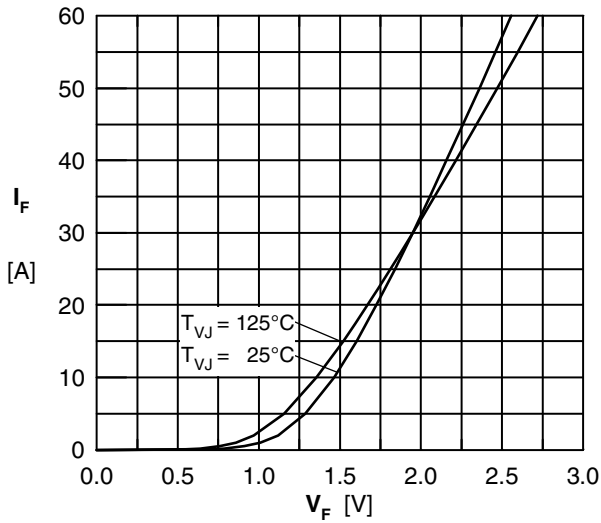


Fig. 7 Typ. Forward current versus V_F

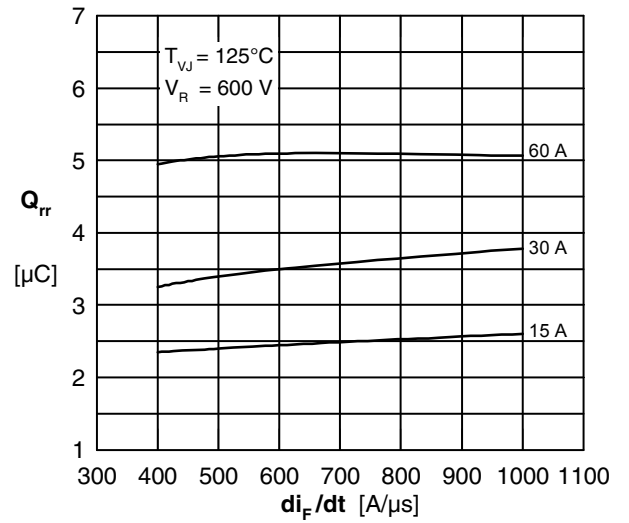


Fig. 8 Typ. reverse recov. charge Q_{rr} vs. di/dt

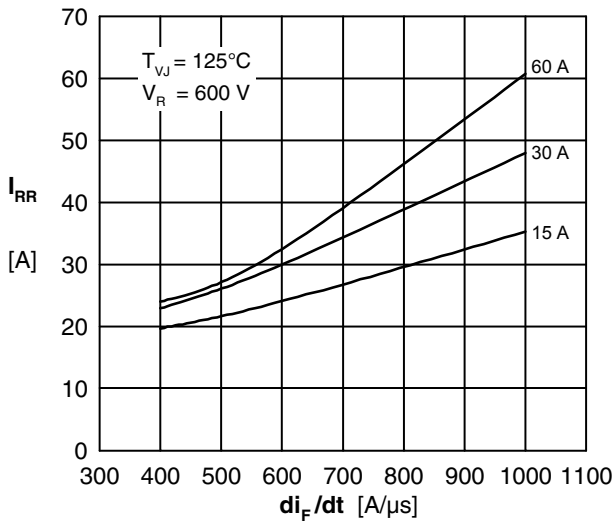


Fig. 9 Typ. peak reverse current I_{RM} vs. di/dt

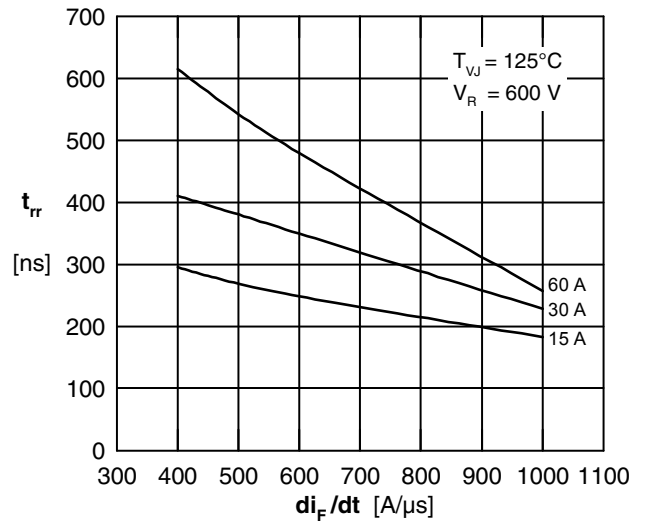


Fig. 10 Typ. recovery time t_{rr} versus di/dt

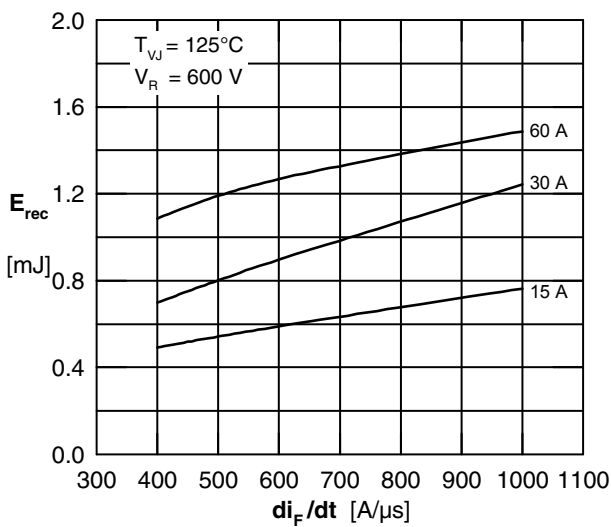


Fig. 11 Typ. recovery energy E_{rec} versus di/dt

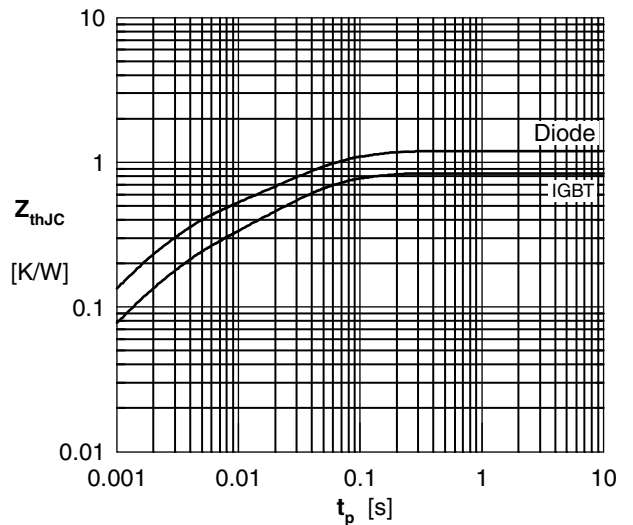


Fig. 12 Typ. transient thermal impedance



Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.