HiPerFRED²
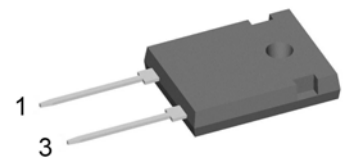
V_{RRM}	=	400 V
I_{FAV}	=	30 A
t_{rr}	=	45 ns

High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Single Diode

Part number

DPG30I400HA

1
3

Backside: cathode

3 ○——▷|——○ 1

Features / Advantages:
- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Applications:
- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
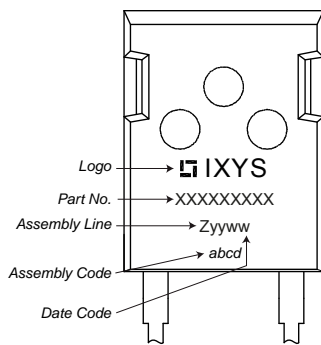- Uninterruptible power supplies (UPS)

Package: TO-247
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747and per semiconductor unless otherwise specified   20131101a

Fast Diode

Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage		T_{VJ} = 25°C			400	V
V_{RRM}	max. repetitive reverse blocking voltage		T_{VJ} = 25°C			400	V
I_R	reverse current, drain current	V_R = 400 V	T_{VJ} = 25°C			1	μA
		V_R = 400 V	T_{VJ} = 150°C			0.2	mA
V_F	forward voltage drop	I_F = 30 A	T_{VJ} = 25°C			1.41	V
		I_F = 60 A				1.69	V
		I_F = 30 A	T_{VJ} = 150°C			1.13	V
		I_F = 60 A				1.46	V
I_{FAV}	average forward current	T_C = 135°C rectangular d = 0.5	T_{VJ} = 175°C			30	A
V_{F0}	threshold voltage	for power loss calculation only	T_{VJ} = 175°C			0.76	V
r_F	slope resistance					10.7	mΩ
R_{thJC}	thermal resistance junction to case					0.95	K/W
R_{thCH}	thermal resistance case to heatsink				0.25		K/W
P_{tot}	total power dissipation		T_C = 25°C			160	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			360	A
C_J	junction capacitance	V_R = 200 V f = 1 MHz	T_{VJ} = 25°C		32		pF
I_{RM}	max. reverse recovery current	I_F = 30 A; V_R = 270 V -di$_F$/dt = 200 A/μs	T_{VJ} = 25°C		4		A
			T_{VJ} = 125°C		8.5		A
t_{rr}	reverse recovery time		T_{VJ} = 25°C		45		ns
			T_{VJ} = 125°C		85		ns

Package	TO-247			Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal				50	A
T_{VJ}	virtual junction temperature			-55		175	°C
T_{op}	operation temperature			-55		150	°C
T_{stg}	storage temperature			-55		150	°C
Weight					6		g
M_D	mounting torque			0.8		1.2	Nm
F_C	mounting force with clip			20		120	N

Product Marking

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

Part number
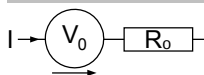
D = Diode
P = HiPerFRED
G = extreme fast
30 = Current Rating [A]
I = Single Diode
400 = Reverse Voltage [V]
HA = TO-247AD (2)

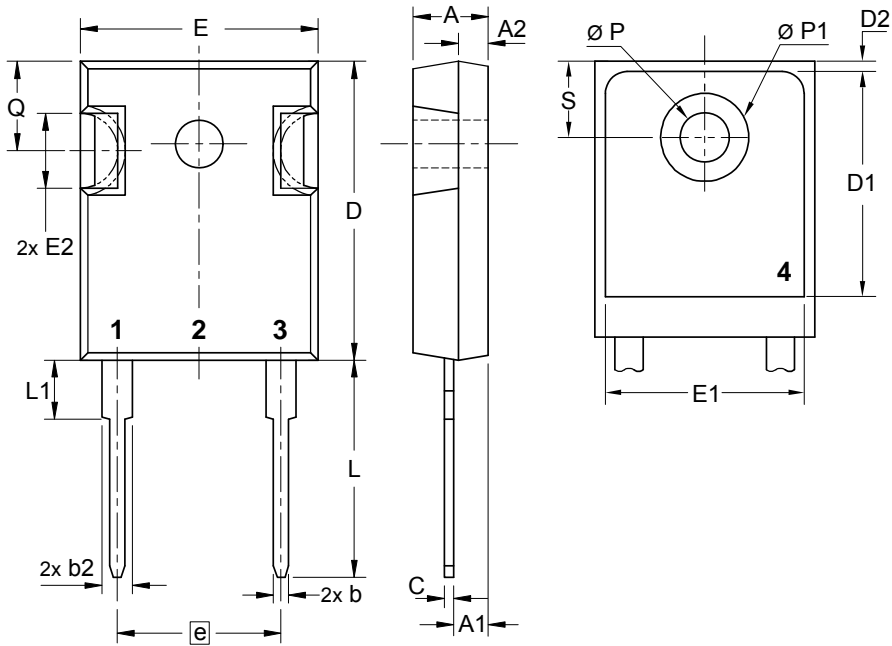| Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG30I400HA	DPG30I400HA	Tube	30	507320

Equivalent Circuits for Simulation   *on die level* T_{VJ} = 175 °C

		Fast Diode		
$V_{0\ max}$	threshold voltage	0.76		V
$R_{0\ max}$	slope resistance *	8.1		mΩ

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Outlines   TO-247

Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.430 BSC		10.92 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242 BSC		6.14 BSC	
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39

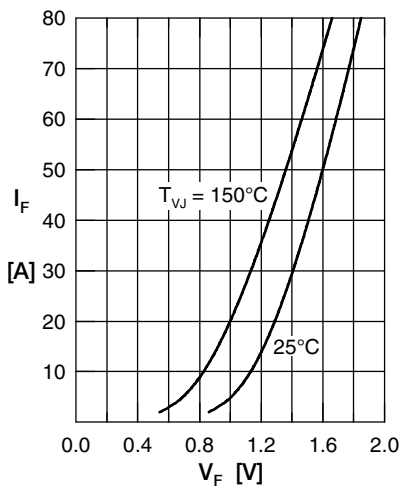IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747and per semiconductor unless otherwise specified   20131101a

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Fast Diode

Fig. 1 Forward current
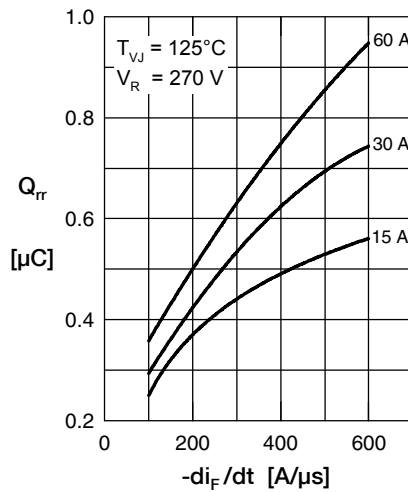I_F versus V_F

Fig. 2 Typ. reverse recov. charge
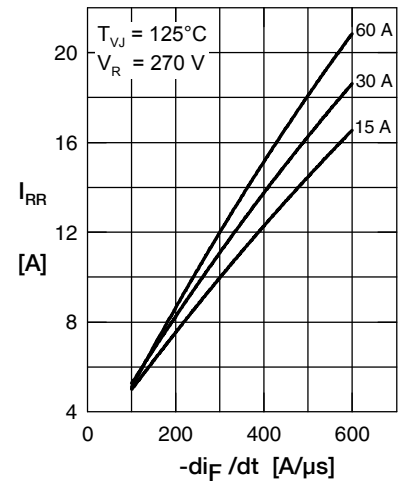Q_{rr} versus $-di_F/dt$

Fig. 3 Typ. reverse recovery current
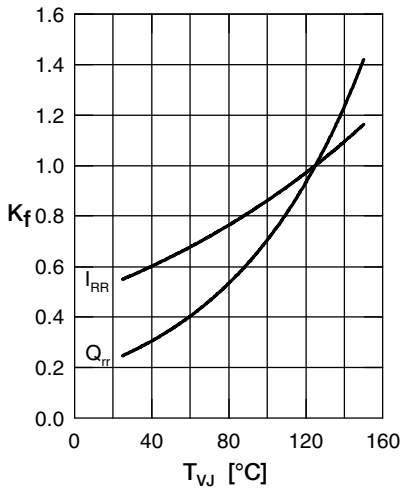I_{RR} versus $-di_F/dt$

Fig. 4 Typ. dynamic parameters
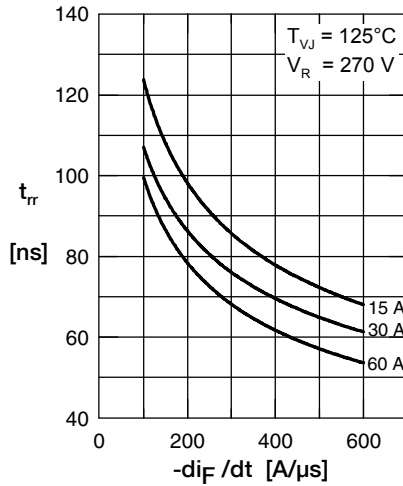Q_{rr}, I_{RR} versus T_{VJ}

Fig. 5 Typ. reverse recov. time
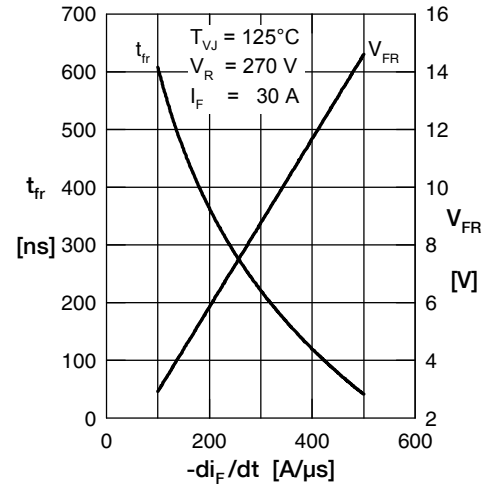t_{rr} versus $-di_F/dt$

Fig. 6 Typ. forward recov. voltage
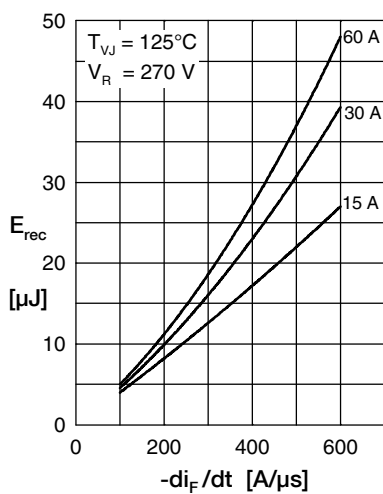V_{FR} & time t_{fr} versus di_F/dt

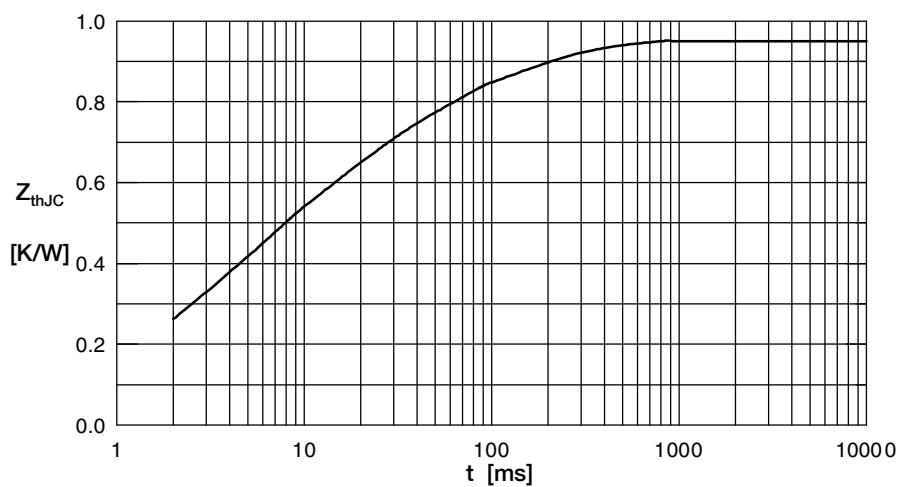Fig. 7 Typ. recovery energy
E_{rec} versus $-di_F/dt$

Fig. 8 Transient thermal impedance junction to case

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