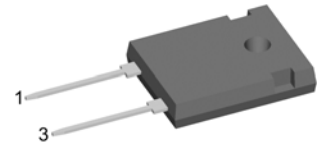
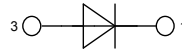


# HiPerFRED<sup>2</sup>

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

Part number

**DPG 30 I 400 HA**



Backside: cathode

### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low I<sub>rm</sub>-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I<sub>rm</sub> 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:

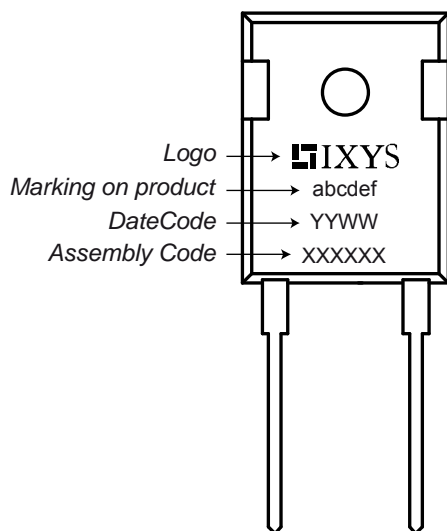
- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

### Ratings

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
V <sub>RRM</sub>	max. repetitive reverse voltage	T <sub>VJ</sub> = 25°C			400	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 400V			1	μA
		V <sub>R</sub> = 400V			0.2	mA
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 30A	T <sub>VJ</sub> = 25°C		1.41	V
					1.69	V
		I <sub>F</sub> = 60A	T <sub>VJ</sub> = 150°C		1.13	V
					1.46	V
I <sub>FAV</sub>	average forward current	rectangular d = 0.5	T <sub>C</sub> = 135°C		30	A
V <sub>F0</sub>	threshold voltage	} for power loss calculation only		T <sub>VJ</sub> = 175°C	0.76	V
r <sub>F</sub>	slope resistance				10.7	mΩ
R <sub>thJC</sub>	thermal resistance junction to case				0.95	K/W
T <sub>VJ</sub>	virtual junction temperature		-55		175	°C
P <sub>tot</sub>	total power dissipation		T <sub>C</sub> = 25°C		160	W
I <sub>FSM</sub>	max. forward surge current	t = 10 ms (50 Hz), sine	T <sub>VJ</sub> = 45°C		360	A
I <sub>RM</sub>	max. reverse recovery current		T <sub>VJ</sub> = 25°C		4	A
		I <sub>F</sub> = 30 A; V <sub>R</sub> = 270 V	T <sub>VJ</sub> = 125°C		8.5	A
t <sub>rr</sub>	reverse recovery time	-di <sub>F</sub> /dt = 200 A/μs	T <sub>VJ</sub> = 25°C		45	ns
			T <sub>VJ</sub> = 125°C		85	ns
C <sub>J</sub>	junction capacitance	V <sub>R</sub> = 200 V; f = 1 MHz	T <sub>VJ</sub> = 25°C		32	pF

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	RMS current	per pin <sup>1)</sup>			50	A
$R_{thCH}$	thermal resistance case to heatsink			0.25		K/W
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				6		g
$M_D$	mounting torque		0.8		1.2	Nm
$F_C$	mounting force with clip		20		120	N

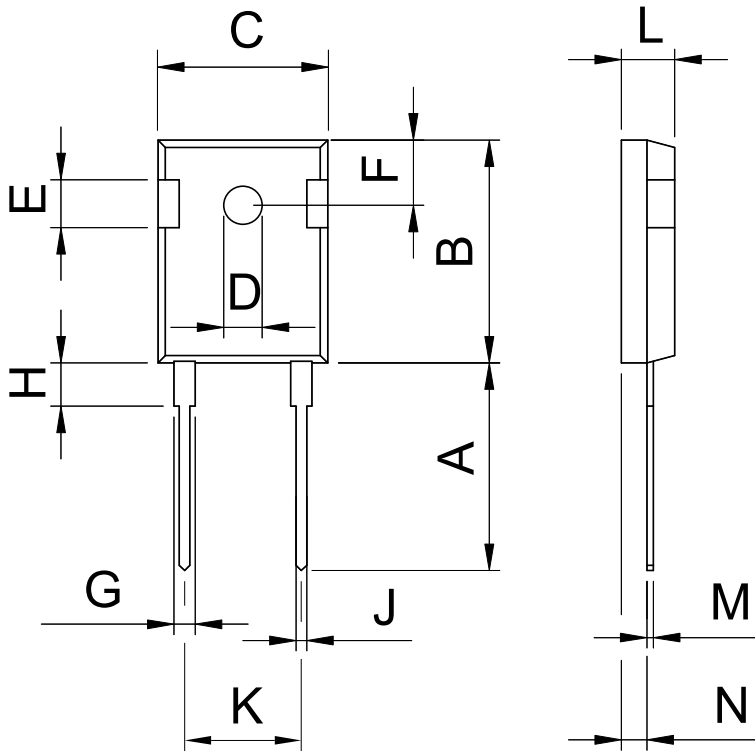
<sup>1)</sup>  $I_{RMS}$  is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.  
 In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

**Product Marking**

**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 Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 30 I 400 HA	DPG30I400HA	Tube	30	507320

Outlines TO-247



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

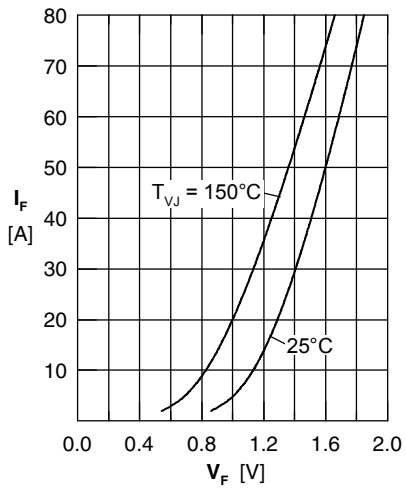


Fig. 1 Forward current  $I_F$  versus forward voltage  $V_F$

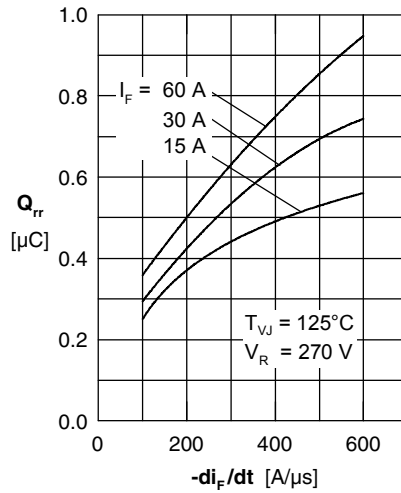


Fig. 2 Typ. reverse recovery charge  $Q_{rr}$  versus  $-di_F/dt$

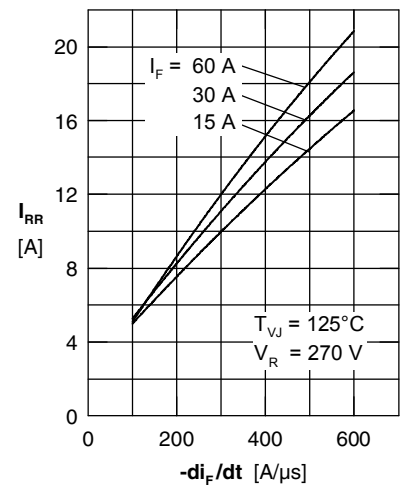


Fig. 3 Typ. reverse recovery current  $I_{RR}$  versus  $-di_F/dt$

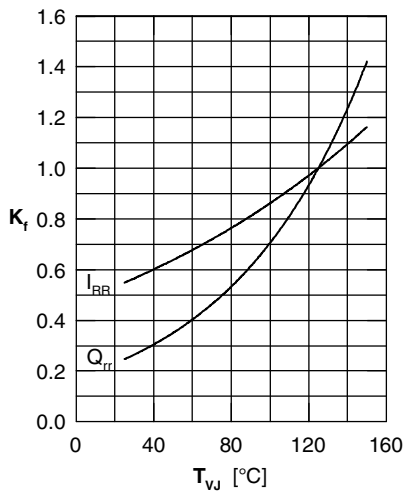


Fig. 4 Dynamic parameters  $Q_{rr}$ ,  $I_{RR}$  versus  $T_{VJ}$

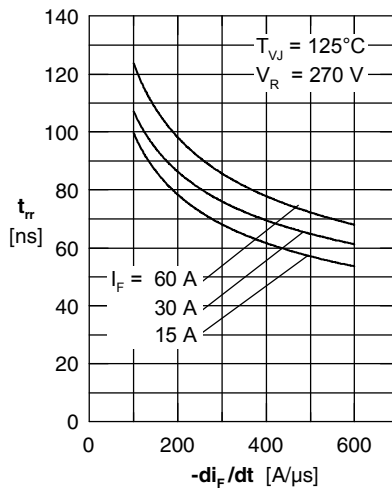


Fig. 5 Typ. reverse recovery time  $t_{rr}$  versus  $-di_F/dt$

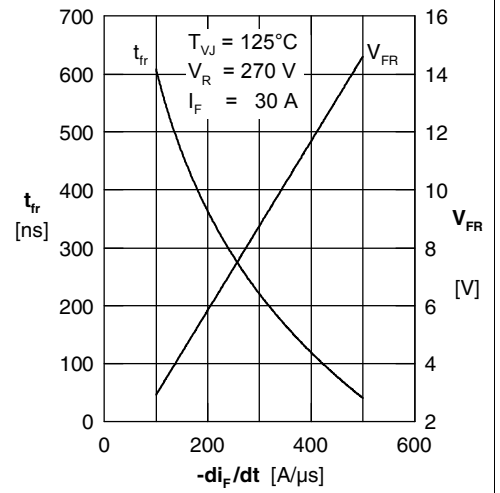


Fig. 6 Typ. forward recovery voltage  $V_{FR}$  & forward recovery time  $t_{fr}$  vs.  $di_F/dt$

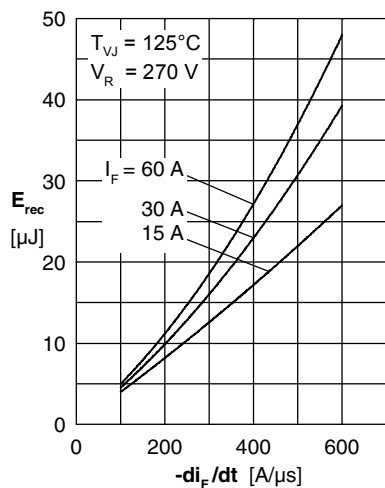


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

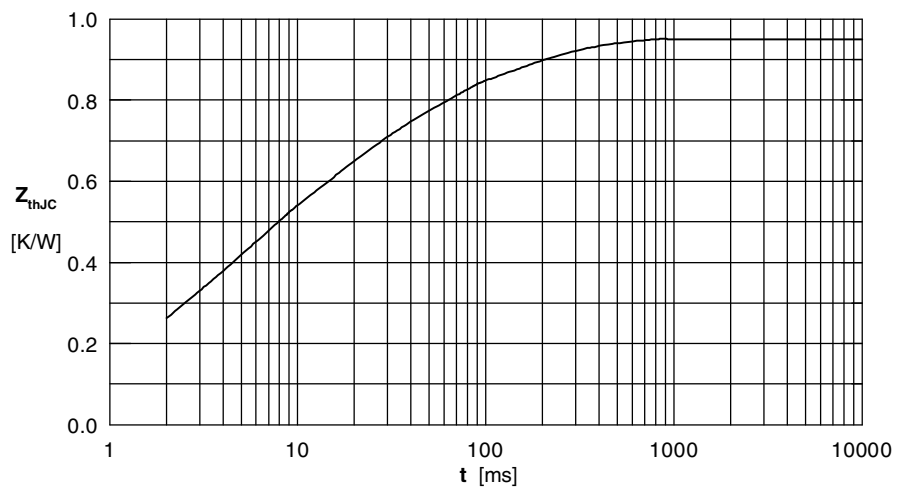


Fig. 8 Transient thermal impedance junction to case