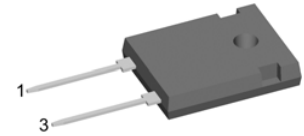
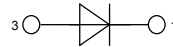


HiPerFRED<sup>2</sup>

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

Part number

DPG 60 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)

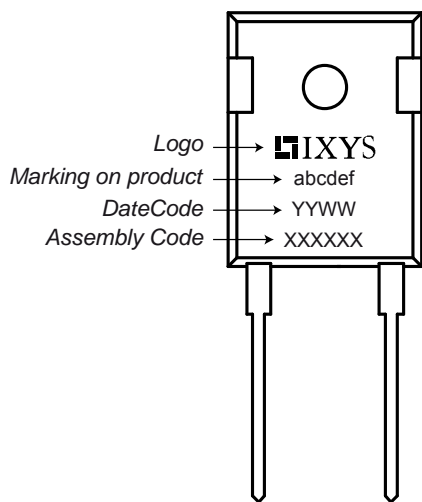
## Package:

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

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
V <sub>RRM</sub>	max. repetitive reverse voltage				400	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 400V			1	μA
		V <sub>R</sub> = 400V			0.3	mA
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 60A			1.47	V
		I <sub>F</sub> = 120A			1.80	V
		I <sub>F</sub> = 60A			1.22	V
		I <sub>F</sub> = 120A			1.59	V
I <sub>FAV</sub>	average forward current	rectangular d = 0.5			60	A
V <sub>F0</sub>	threshold voltage	} for power loss calculation only			0.81	V
r <sub>F</sub>	slope resistance				6.1	mΩ
R <sub>thJC</sub>	thermal resistance junction to case				0.55	K/W
T <sub>VJ</sub>	virtual junction temperature		-55		175	°C
P <sub>tot</sub>	total power dissipation				275	W
I <sub>FSM</sub>	max. forward surge current	t = 10 ms (50 Hz), sine			450	A
I <sub>RM</sub>	max. reverse recovery current				4	A
		I <sub>F</sub> = 60A; V <sub>R</sub> = 270V			9.5	A
t <sub>rr</sub>	reverse recovery time	-di <sub>F</sub> /dt = 200 A/μs			45	ns
					85	ns
C <sub>J</sub>	junction capacitance	V <sub>R</sub> = 200V; f = 1 MHz			61	pF

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	RMS current	per pin <sup>1)</sup>			70	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.

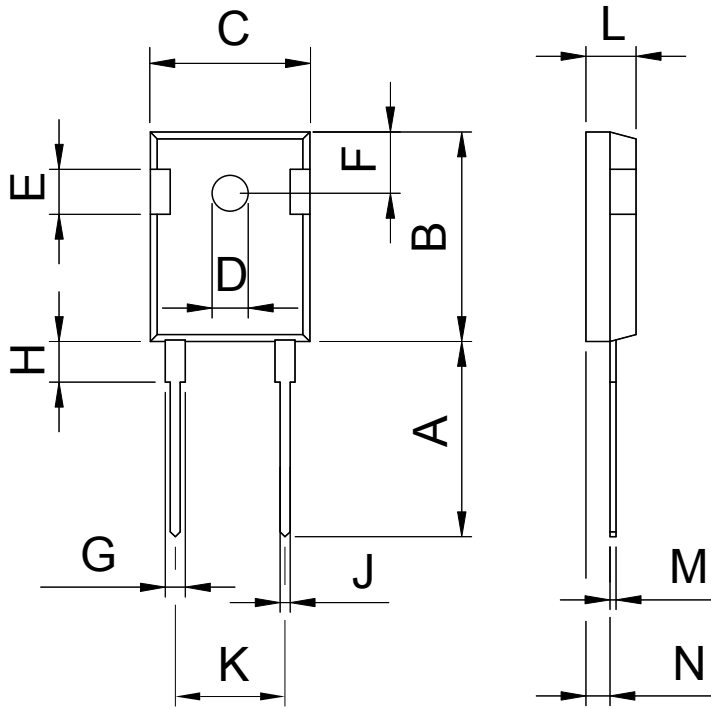
**Product Marking**

**Part number**

- D = Diode
- P = HiPerFRED
- G = extreme fast
- 60 = 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 60 I 400 HA	DPG60I400HA	Tube	30	506242

Similar Part	Package	Voltage Class
DPG60IM400QB	TO-3P (3)	400

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

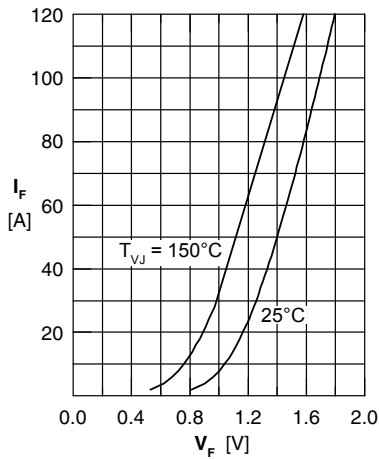


Fig. 1 Forward current  $I_F$  versus forward voltage  $V_F$

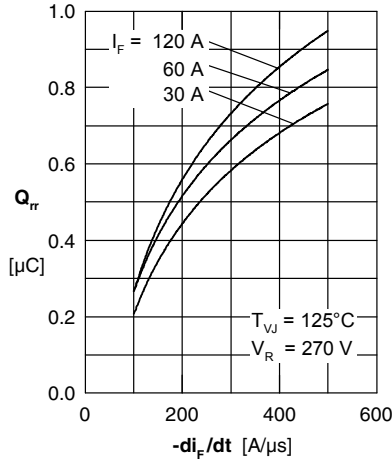


Fig. 2 Typ. reverse recovery charge  $Q_{rr}$  versus  $-di_F/dt$

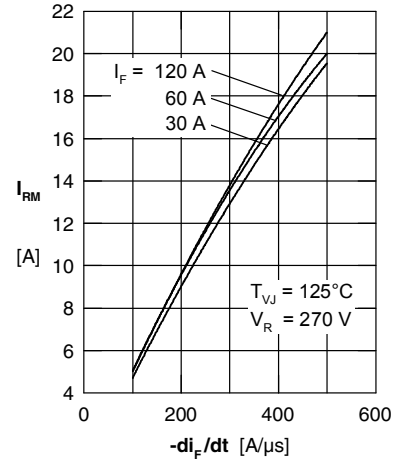


Fig. 3 Typ. reverse recovery current  $I_{RM}$  versus  $-di_F/dt$

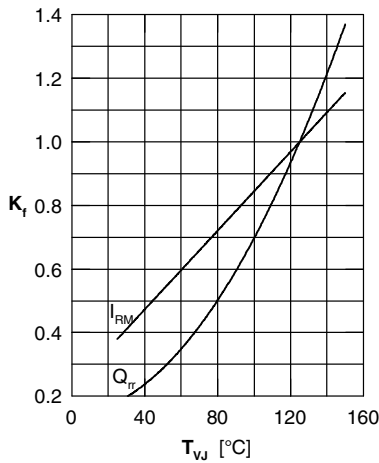


Fig. 4 Dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

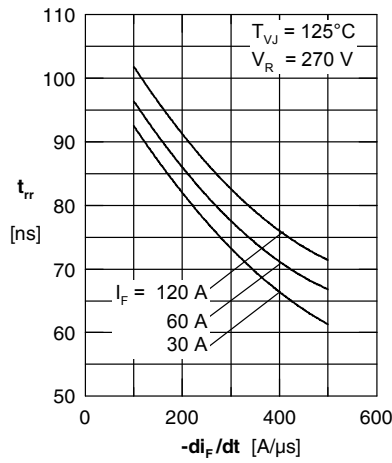


Fig. 5 Typ. reverse recovery time  $t_{rr}$  versus  $-di_F/dt$

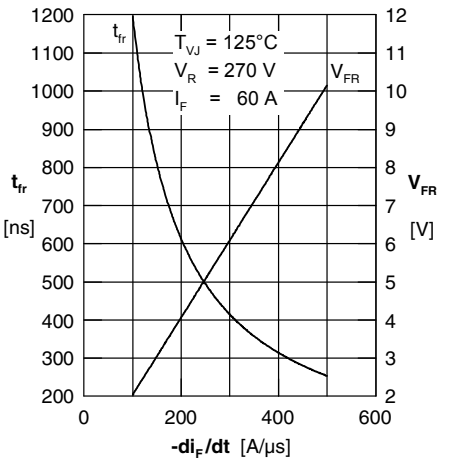


Fig. 6 Typ. forward recovery voltage  $V_{FR}$  & forward recovery time  $t_{fr}$  vs.  $di_F/dt$

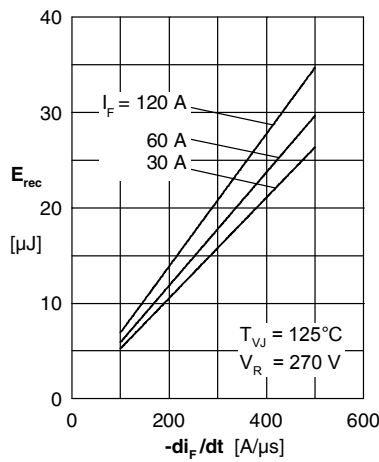


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

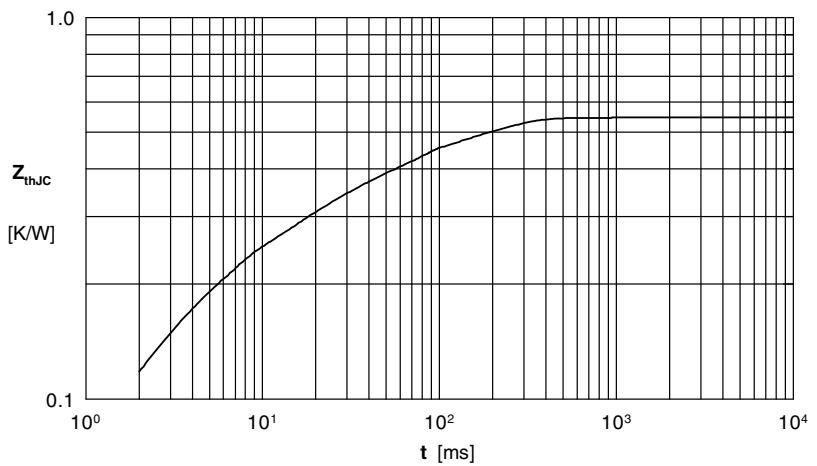


Fig. 8 Transient thermal impedance junction to case