

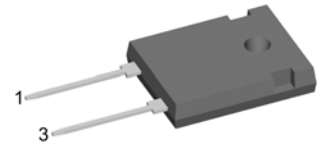
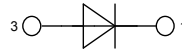
# HiPerFRED<sup>2</sup>

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

$V_{RRM} = 300\text{ V}$   
 $I_{FAV} = 60\text{ A}$   
 $t_{rr} = 35\text{ ns}$

Part number

**DPG 60 I 300 HA**



Backside: cathode

### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low  $I_{rm}$ -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low  $I_{rm}$  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:

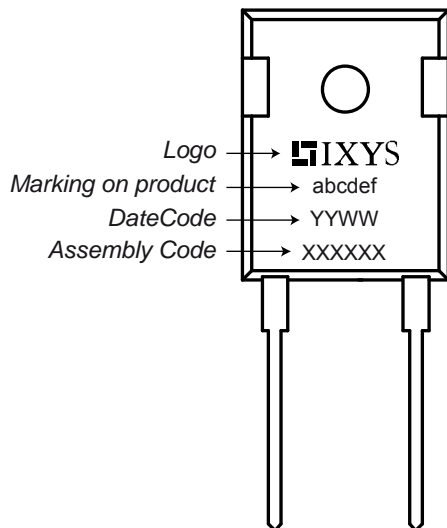
- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

### Ratings

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$V_{RRM}$	max. repetitive reverse voltage				300	V
$I_R$	reverse current	$V_R = 300\text{ V}$			1	$\mu\text{A}$
		$V_R = 300\text{ V}$			0.35	mA
$V_F$	forward voltage	$I_F = 60\text{ A}$			1.40	V
		$I_F = 120\text{ A}$			1.72	V
		$I_F = 60\text{ A}$			1.10	V
		$I_F = 120\text{ A}$			1.45	V
$I_{FAV}$	average forward current	rectangular d = 0.5			60	A
$V_{F0}$	threshold voltage	} for power loss calculation only			0.69	V
$r_F$	slope resistance				5.8	m $\Omega$
$R_{thJC}$	thermal resistance junction to case				0.55	K/W
$T_{VJ}$	virtual junction temperature		-55		175	$^{\circ}\text{C}$
$P_{tot}$	total power dissipation				275	W
$I_{FSM}$	max. forward surge current	t = 10 ms (50 Hz), sine			450	A
$I_{RM}$	max. reverse recovery current				3.5	A
		$I_F = 60\text{ A}; V_R = 150\text{ V}$			9	A
$t_{rr}$	reverse recovery time	-di <sub>F</sub> /dt = 200 A/ $\mu\text{s}$			35	ns
					65	ns
$C_J$	junction capacitance	$V_R = 150\text{ V}; f = 1\text{ MHz}$			80	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.

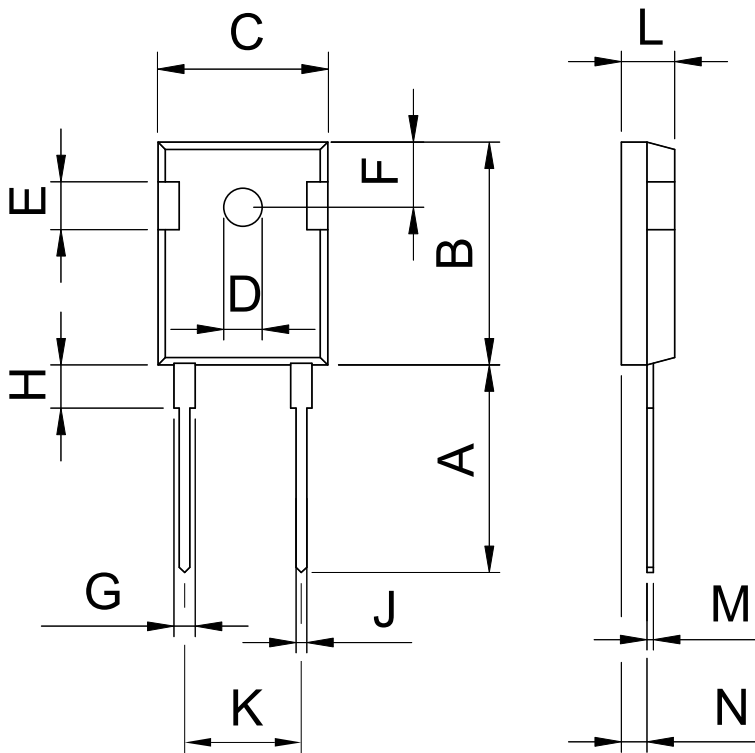
**Product Marking**

**Part number**

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

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 60 I 300 HA	DPG60I300HA	Tube	30	585818

Similar Part	Package	Voltage Class
DPG60IM300PC	TO-263AB (D2Pak)	300

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

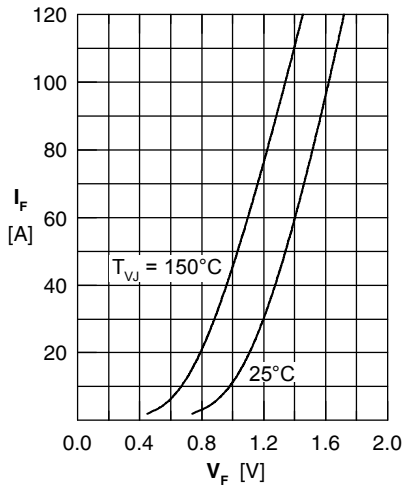


Fig. 1 Forward current  $I_F$  versus forward voltage  $V_F$

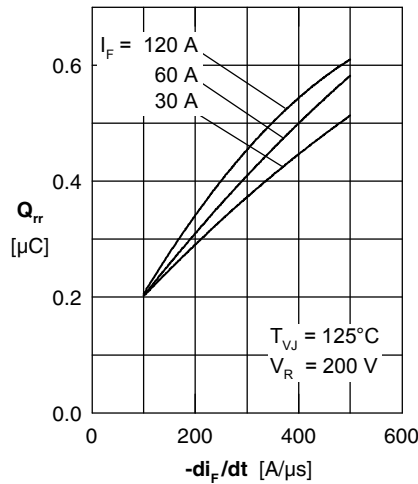


Fig. 2 Typ. reverse recovery charge  $Q_{rr}$  versus  $-di_F/dt$

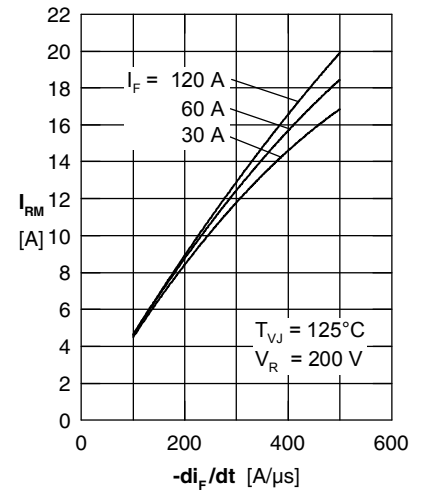


Fig. 3 Typ. reverse recovery current  $I_{RM}$  versus  $-di_F/dt$

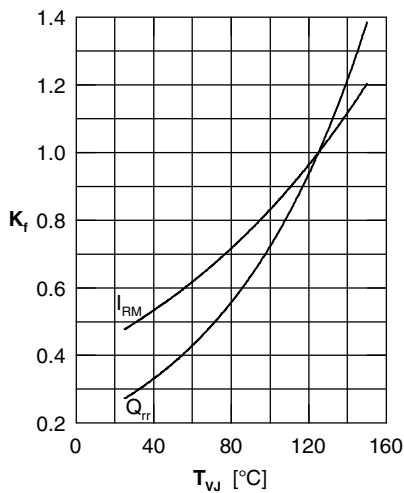


Fig. 4 Dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

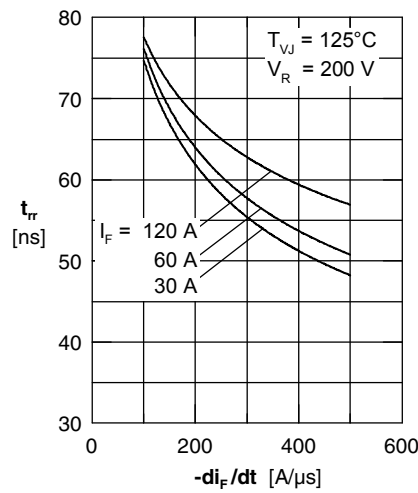


Fig. 5 Typ. reverse recovery time  $t_{rr}$  versus  $-di_F/dt$

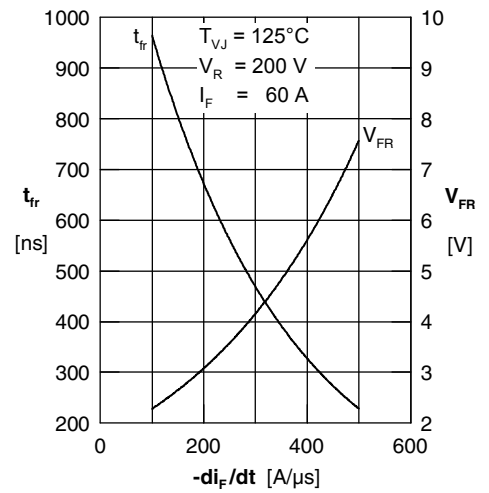


Fig. 6 Typ. forward recovery voltage  $V_{FR}$  & forward recovery time  $t_{fr}$  vs.  $di_F/dt$

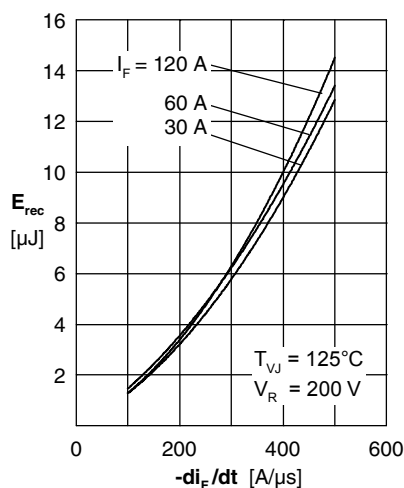


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

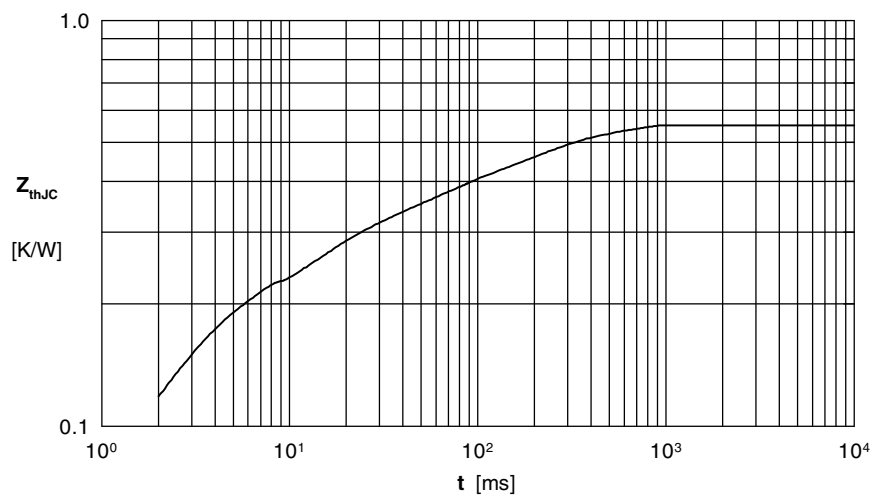


Fig. 8 Transient thermal impedance junction to case