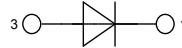


# HiPerFRED<sup>2</sup>

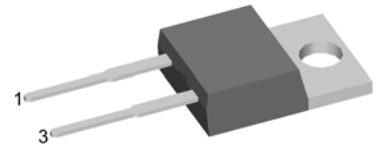
High Performance Fast Recovery Diode  
Low Loss and Soft Recovery  
Single Diode

Part number

DPG 15 I 300 PA



$$\begin{aligned} V_{RRM} &= 300 \text{ V} \\ I_{FAV} &= 15 \text{ A} \\ t_{rr} &= 35 \text{ ns} \end{aligned}$$



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)

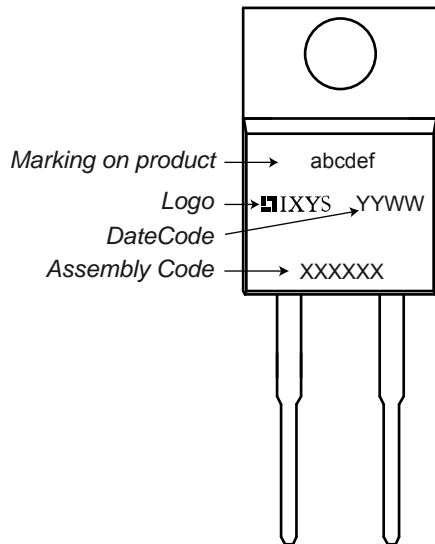
## Package:

- Housing: TO-220
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

## Ratings

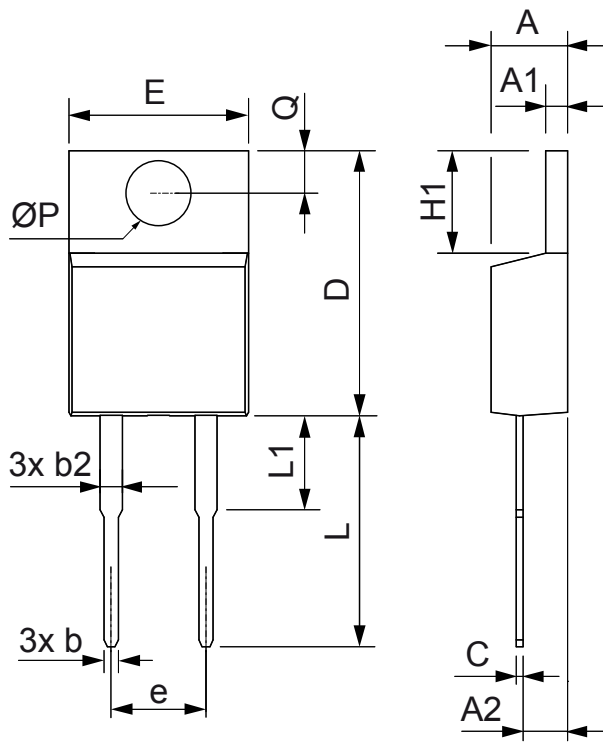
Symbol	Definition	Conditions	Ratings			Unit	
			min.	typ.	max.		
$V_{RRM}$	max. repetitive reverse voltage				300	V	
$I_R$	reverse current	$V_R = 300 \text{ V}$			1	$\mu\text{A}$	
		$V_R = 300 \text{ V}$			0.08	mA	
$V_F$	forward voltage	$I_F = 15 \text{ A}$			1.26	V	
		$I_F = 30 \text{ A}$			1.51	V	
		$I_F = 15 \text{ A}$	$T_{VJ} = 150^\circ\text{C}$			1.01	V
		$I_F = 30 \text{ A}$	$T_{VJ} = 150^\circ\text{C}$			1.29	V
$I_{FAV}$	average forward current	rectangular $d = 0.5$	$T_C = 140^\circ\text{C}$		15	A	
$V_{F0}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^\circ\text{C}$		0.69	V	
$r_F$	slope resistance				18	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				1.70	K/W	
$T_{VJ}$	virtual junction temperature		-55		175	$^\circ\text{C}$	
$P_{tot}$	total power dissipation		$T_C = 25^\circ\text{C}$		90	W	
$I_{FSM}$	max. forward surge current	$t = 10 \text{ ms}$ (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$		240	A	
$I_{RM}$	max. reverse recovery current		$T_{VJ} = 25^\circ\text{C}$		3	A	
		$I_F = 15 \text{ A}; V_R = 200 \text{ V}$	$T_{VJ} = 125^\circ\text{C}$		6.5	A	
$t_{rr}$	reverse recovery time	$-di_F/dt = 200 \text{ A}/\mu\text{s}$	$T_{VJ} = 25^\circ\text{C}$		35	ns	
			$T_{VJ} = 125^\circ\text{C}$		55	ns	
$C_J$	junction capacitance	$V_R = 150 \text{ V}; f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		20	pF	

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	RMS current	per terminal			35	A
$R_{thCH}$	thermal resistance case to heatsink			0.50		K/W
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				2		g
$M_D$	mounting torque		0.4		0.6	Nm
$F_C$	mounting force with clip		20		60	N

**Product Marking**

**Part number**

- D = Diode
- P = HiPerFRED
- G = extreme fast
- 15 = Current Rating [A]
- I = Single Diode
- 300 = Reverse Voltage [V]
- PA = TO-220AC (2)

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 15 I 300 PA	DPG15I300PA	Tube	50	506633

**Outlines TO-220**


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	5.08	BSC	0.200	BSC
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
$\varnothing P$	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125

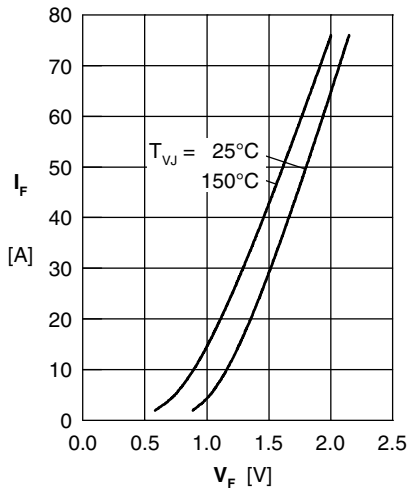


Fig. 1 Forward current  $I_F$  vs.  $V_F$

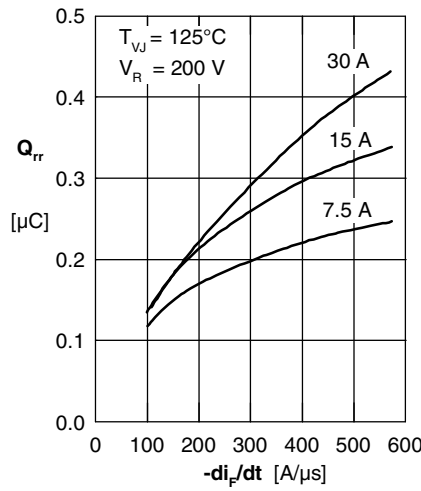


Fig. 2 Typ. reverse recovery charge  $Q_{rr}$  versus  $-di_F/dt$

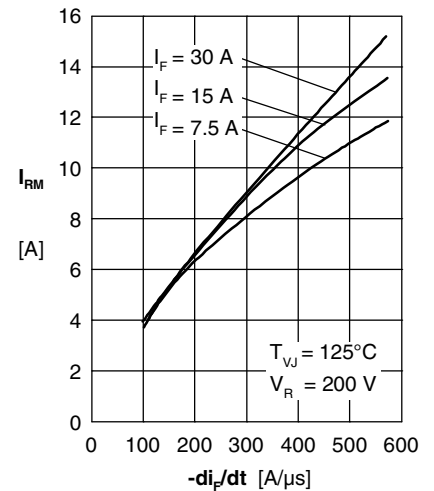


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

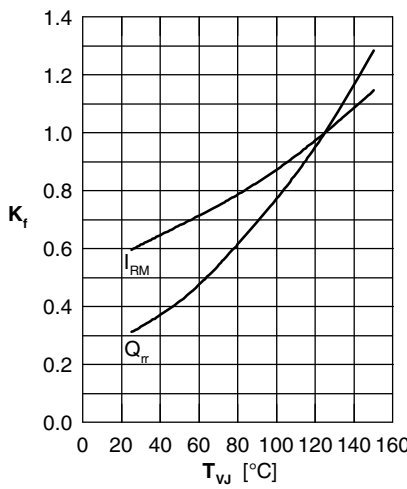


Fig. 4 Dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

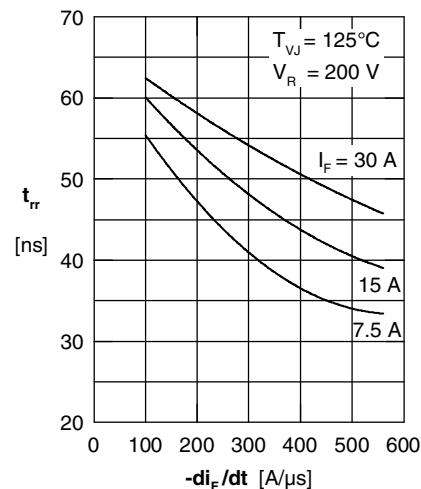


Fig. 5 Typ. recovery time  $t_{rr}$  vs.  $-di_F/dt$

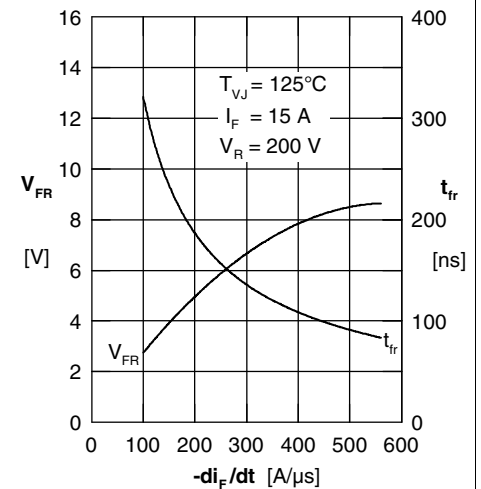


Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{rr}$  versus  $di_F/dt$

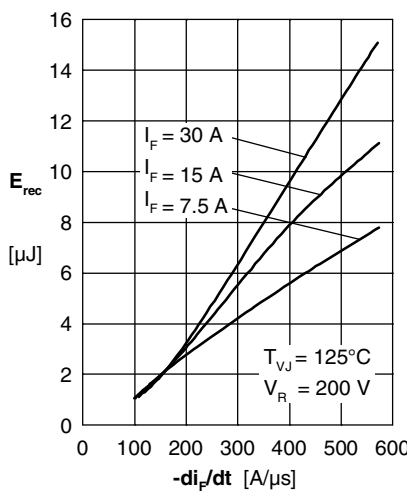


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

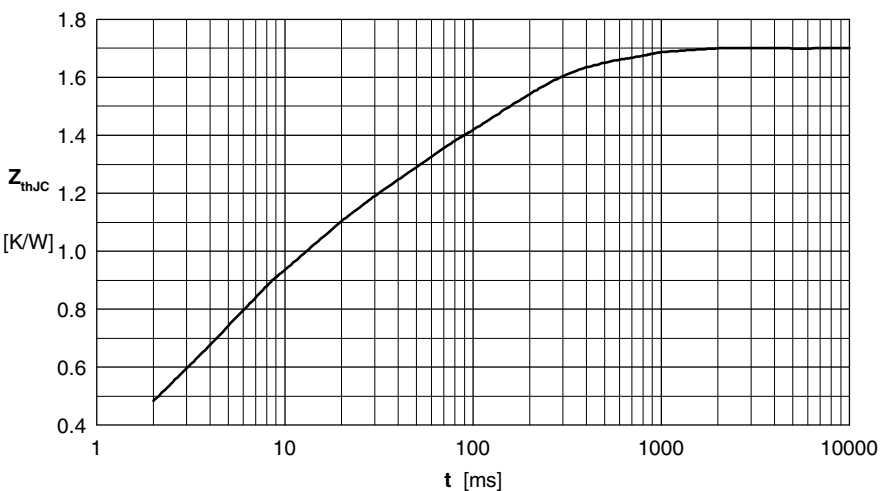


Fig. 8 Transient thermal resistance junction to case