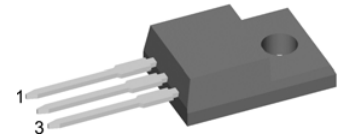
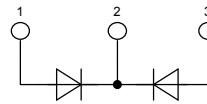


# HiPerFRED<sup>2</sup>

High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 Common Cathode

$V_{RRM} = 300\text{ V}$   
 $I_{FAV} = 2 \times 10\text{ A}$   
 $t_{rr} = 35\text{ ns}$

Part number  
**DPG 20 C 300 PN**



Backside: isolated

E72873

### 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:

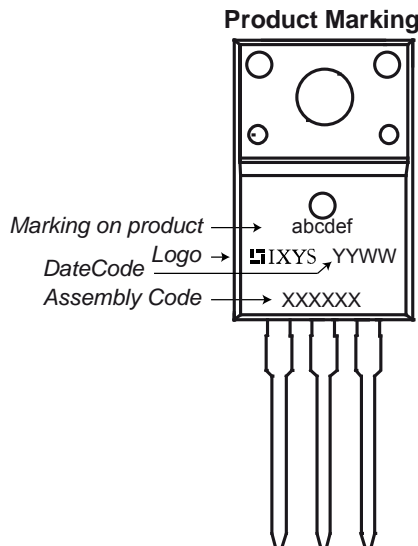
- Housing: TO-220FP
- Industry standard outline
- Plastic overmolded tab for electrical isolation
- Isolation Voltage 2500 V
- UL registered E 72873
- Epoxy meets UL 94V-0
- RoHS compliant

### Ratings

Symbol	Definition	Conditions	min.	typ.	max.	Unit
$V_{RRM}$	max. repetitive reverse voltage				300	V
$I_R$	reverse current	$V_R = 300\text{ V}$			1	$\mu\text{A}$
		$V_R = 300\text{ V}$			0.06	mA
$V_F$	forward voltage	$I_F = 10\text{ A}$			1.27	V
		$I_F = 20\text{ A}$			1.45	V
		$I_F = 10\text{ A}$			0.98	V
		$I_F = 20\text{ A}$			1.17	V
$I_{FAV}$	average forward current	rectangular d = 0.5			10	A
$V_{FO}$	threshold voltage	} for power loss calculation only			0.74	V
$r_F$	slope resistance				17.7	m $\Omega$
$R_{thJC}$	thermal resistance junction to case				4.40	K/W
$T_{VJ}$	virtual junction temperature		-55		175	$^{\circ}\text{C}$
$P_{tot}$	total power dissipation				35	W
$I_{FSM}$	max. forward surge current	t = 10 ms (50 Hz), sine			140	A
$I_{RM}$	max. reverse recovery current				3	A
		$I_F = 10\text{ A}; V_R = 200\text{ V}$			5.5	A
$t_{rr}$	reverse recovery time	-di <sub>F</sub> /dt = 200 A/ $\mu\text{s}$			35	ns
					45	ns
$C_J$	junction capacitance	$V_R = 150\text{ V}; f = 1\text{ MHz}$			15	pF

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$I_{RMS}$	RMS current	per pin <sup>1)</sup>			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
$V_{ISOL}$	isolation voltage	t = 1 second	2500			V
		t = 1 minute	2000			V
$d_s$	creepage distance on surface		1.07			mm
$d_A$	striking distance through air		1.07			mm

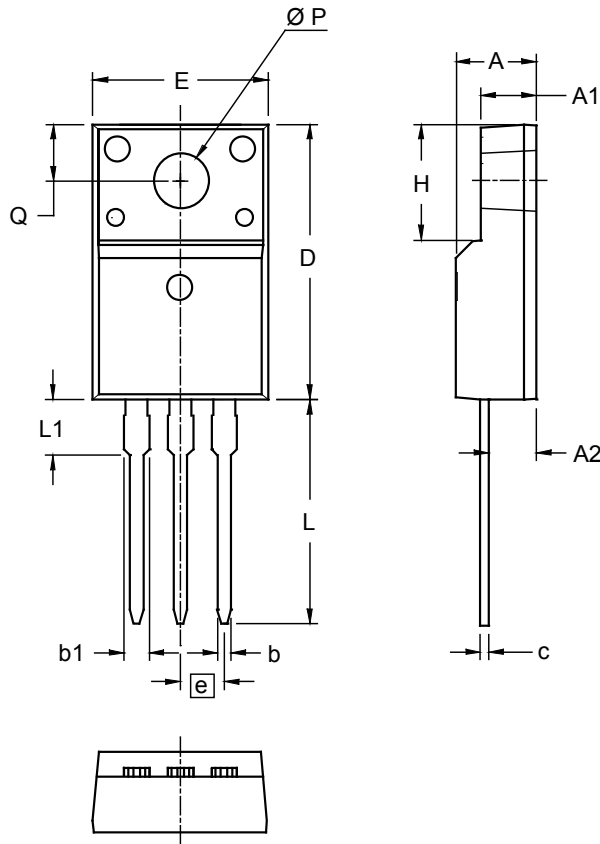
<sup>1)</sup>  $I_{RMS}$  is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.  
 In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.


**Part number**

D = Diode  
 P = HiPerFRED  
 G = extreme fast  
 20 = Current Rating [A]  
 C = Common Cathode  
 300 = Reverse Voltage [V]  
 PN = TO-220ABFP (3)

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 20 C 300 PN	DPG20C300PN	Tube	50	503665

Similar Part	Package	Voltage Class
DPG20C300PB	TO-220AB (3)	300

**Outlines TO-220FP**


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.177	.193	4.50	4.90
A1	.092	.108	2.34	2.74
A2	.101	.117	2.56	2.96
b	.028	.035	0.70	0.90
b1	.050	.058	1.27	1.47
c	.018	.024	0.45	0.60
D	.617	.633	15.67	16.07
E	.392	.408	9.96	10.36
e	.100 BSC		2.54 BSC	
H	.255	.271	6.48	6.88
L	.499	.523	12.68	13.28
L1	.119	.135	3.03	3.43
$\varnothing P$	.121	.129	3.08	3.28
Q	.126	.134	3.20	3.40

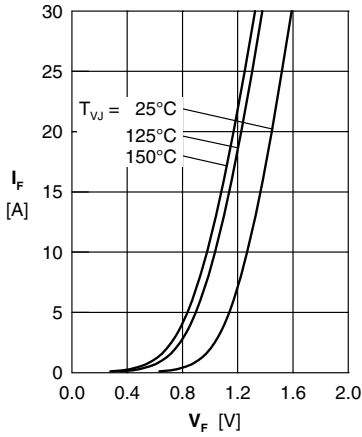


Fig. 1 Forward current  $I_F$  versus forward voltage drop  $V_F$

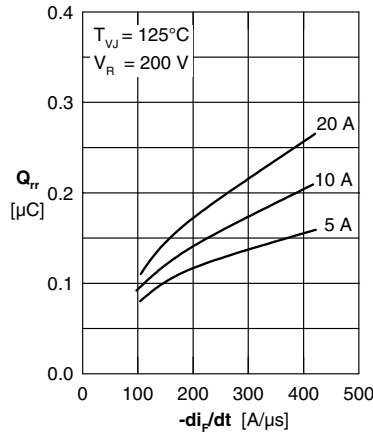


Fig. 2 Typ. reverse recovery charge  $Q_{rr}$  versus  $-di_F/dt$

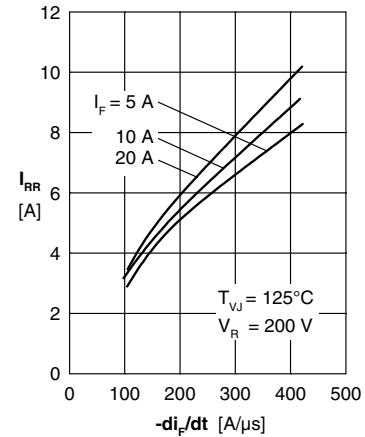


Fig. 3 Typ. reverse recovery current  $I_{RR}$  versus  $-di_F/dt$

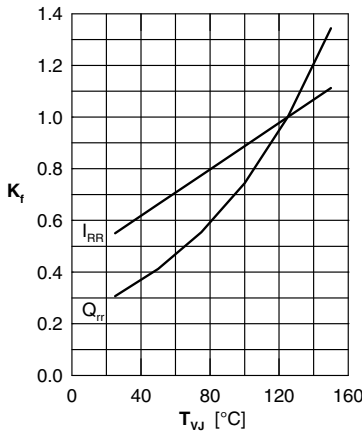


Fig. 4 Dynamic parameters  $Q_{rr}$ ,  $I_{RR}$  versus  $T_{VJ}$

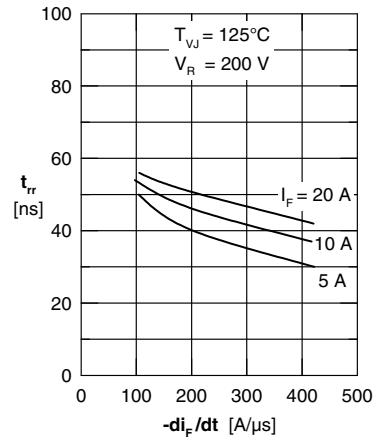


Fig. 5 Typ. reverse recovery time  $t_{rr}$  versus  $-di_F/dt$

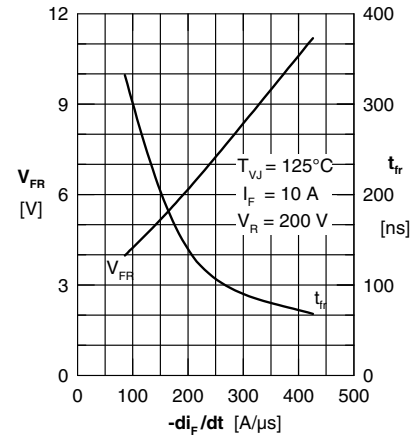


Fig. 6 Typ. forward recovery voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

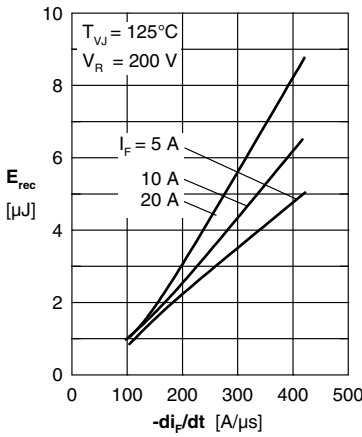


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

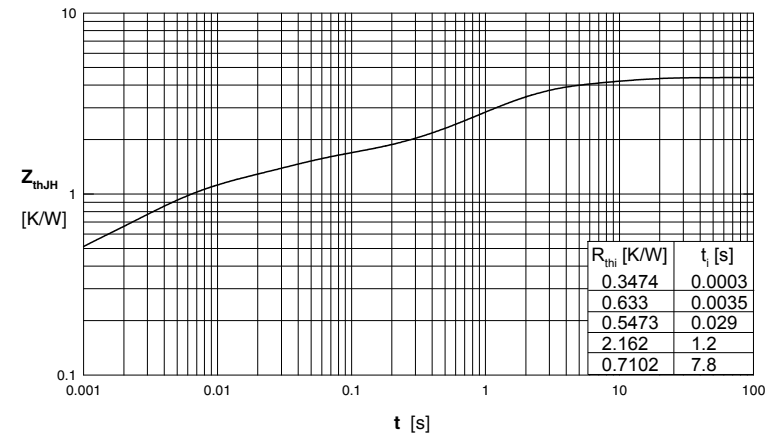


Fig. 8 Transient thermal resistance junction to case