

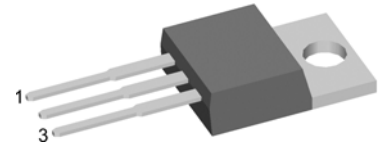
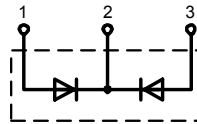
# HiPerFRED<sup>2</sup>

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

$V_{RRM} = 400\text{ V}$   
 $I_{FAV} = 2 \times 10\text{ A}$   
 $t_{rr} = 45\text{ ns}$

Part number

**DPG 20 C 400PB**



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:

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

### Ratings

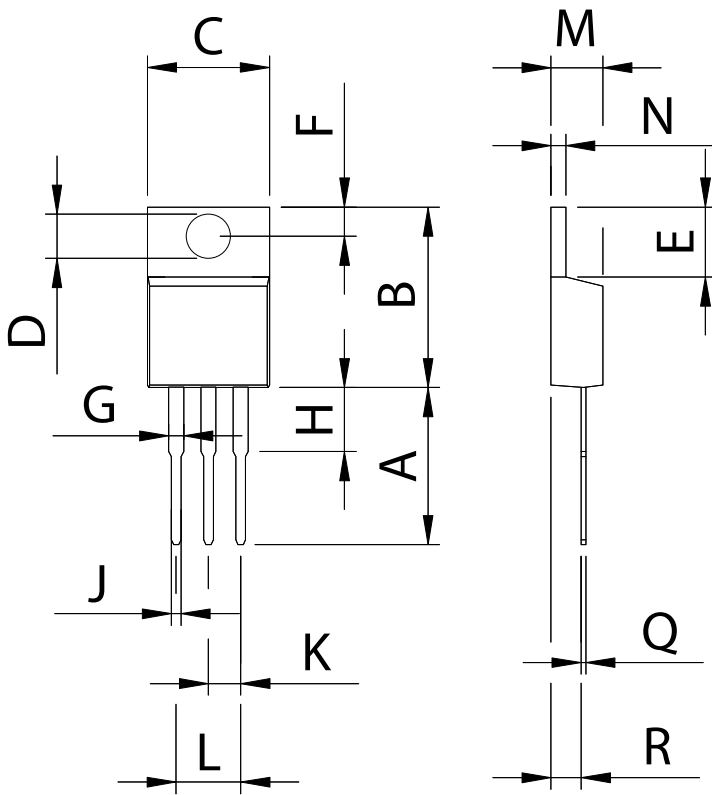
Symbol	Definition	Conditions	Ratings			Unit	
			min.	typ.	max.		
$V_{RRM}$	max. repetitive reverse voltage	$T_{VJ} = 25\text{ °C}$			400	V	
$I_R$	reverse current	$V_R = 400\text{ V}$			1	$\mu\text{A}$	
		$V_R = 400\text{ V}$			0.1	mA	
$V_F$	forward voltage	$I_F = 10\text{ A}$			1.40	V	
		$I_F = 20\text{ A}$			1.60	V	
		$I_F = 10\text{ A}$	$T_{VJ} = 150\text{ °C}$			1.08	V
		$I_F = 20\text{ A}$	$T_{VJ} = 150\text{ °C}$			1.29	V
$I_{FAV}$	average forward current	rectangular, $d = 0.5$			10	A	
$V_{FO}$	threshold voltage	} for power loss calculation only			0.75	V	
$r_F$	slope resistance				25.4	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				2.30	K/W	
$T_{VJ}$	virtual junction temperature		-55		175	$^{\circ}\text{C}$	
$P_{tot}$	total power dissipation	$T_C = 25\text{ °C}$			65	W	
$I_{FSM}$	max. forward surge current	$t_p = 10\text{ ms (50 Hz), sine}$			100	A	
$I_{RM}$	max. reverse recovery current	$I_F = 10\text{ A};$		4		A	
		$-di_F/dt = 200\text{ A}/\mu\text{s}$	$T_{VJ} = 125\text{ °C}$			A	
$t_{rr}$	reverse recovery time	$V_R = 100\text{ V}$		45		ns	
			$T_{VJ} = 125\text{ °C}$			ns	
$C_J$	junction capacitance	$V_R = 200\text{ V}; f = 1\text{ MHz}$		tbd		pF	
$E_{AS}$	non-repetitive avalanche energy	$I_{AS} = \text{tbd A}; L = 100\text{ }\mu\text{H}$			tbd	mJ	
$I_{AR}$	repetitive avalanche current	$V_A = 1.5 \cdot V_R \text{ typ.}; f = 10\text{ kHz}$			tbd	A	

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

\* Irms 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.

### Outlines TO-220AB



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	12.70	13.97	0.500	0.550
B	14.73	16.00	0.580	0.630
C	9.91	10.66	0.390	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.270
F	2.54	3.18	0.100	0.125
G	1.15	1.65	0.045	0.065
H	2.79	5.84	0.110	0.230
J	0.64	1.01	0.025	0.040
K	2.54	BSC	0.100	BSC
M	4.32	4.82	0.170	0.190
N	1.14	1.39	0.045	0.055
Q	0.35	0.56	0.014	0.022
R	2.29	2.79	0.090	0.110