

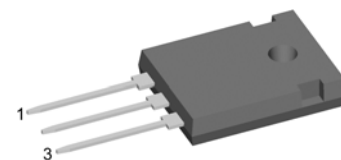
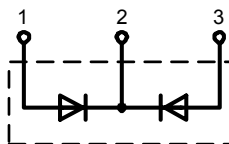
HiPerFRED

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

$$\begin{aligned} V_{RRM} &= 300 \text{ V} \\ I_{FAV} &= 2 \times 30 \text{ A} \\ t_{rr} &= 35 \text{ ns} \end{aligned}$$

Part number (Marking on product)

DPG 60 C 300HB



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-247AD
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

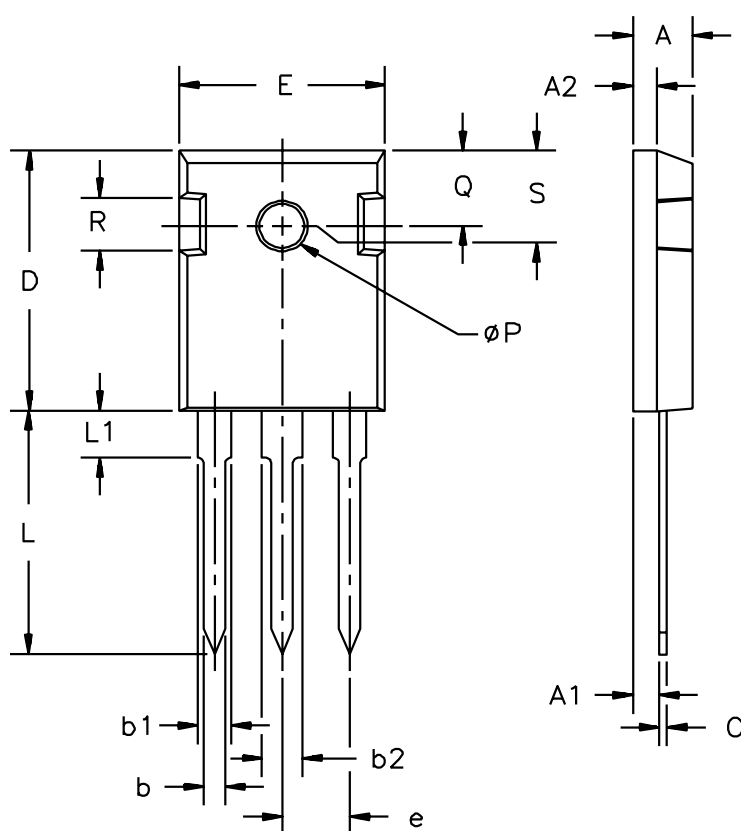
Symbol	Definition	Conditions	min.	typ.	max.	Unit
V_{RRM}	max. repetitive reverse voltage	$T_{VJ} = 25^\circ\text{C}$			300	V
I_R	reverse current	$V_R = 300 \text{ V}$ $T_{VJ} = 25^\circ\text{C}$			1	μA
		$V_R = 300 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$			0.1	mA
V_F	forward voltage	$I_F = 30 \text{ A}$ $T_{VJ} = 25^\circ\text{C}$			1.34	V
		$I_F = 60 \text{ A}$ $T_{VJ} = 25^\circ\text{C}$			1.63	V
		$I_F = 30 \text{ A}$ $T_{VJ} = 150^\circ\text{C}$			1.06	V
		$I_F = 60 \text{ A}$ $T_{VJ} = 150^\circ\text{C}$			1.39	V
I_{FAV}	average forward current	rectangular, $d = 0.5$ $T_C = 135^\circ\text{C}$			30	A
V_{F0}	threshold voltage	$T_{VJ} = 175^\circ\text{C}$ for power loss calculation only			0.70	V
r_F	slope resistance				10.5	$\text{m}\Omega$
R_{thJC}	thermal resistance junction to case				0.95	K/W
T_{VJ}	virtual junction temperature		-55		175	$^\circ\text{C}$
P_{tot}	total power dissipation	$T_C = 25^\circ\text{C}$			160	W
I_{FSM}	max. forward surge current	$t_p = 10 \text{ ms (50 Hz), sine}$ $T_{VJ} = 45^\circ\text{C}$			300	A
I_{RM}	max. reverse recovery current	$I_F = 30 \text{ A};$ $T_{VJ} = 25^\circ\text{C}$		3		A
		$-di_F/dt = 200 \text{ A}/\mu\text{s}$ $T_{VJ} = 125^\circ\text{C}$				A
t_{rr}	reverse recovery time	$V_R = 100 \text{ V}$ $T_{VJ} = 25^\circ\text{C}$		35		ns
		$T_{VJ} = 125^\circ\text{C}$				ns
C_j	junction capacitance	$V_R = 150 \text{ V}; f = 1 \text{ MHz}$ $T_{VJ} = 25^\circ\text{C}$		40		pF
E_{AS}	non-repetitive avalanche energy	$I_{AS} = 9 \text{ A}; L = 100 \mu\text{H}$ $T_{VJ} = 25^\circ\text{C}$			4	mJ
I_{AR}	repetitive avalanche current	$V_A = 1.5 \cdot V_R$ typ.; $f = 10 \text{ kHz}$			0.9	A

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
I_{RMS}	RMS current	per pin*			50	A
R_{thCH}	thermal resistance case to heatsink			0.25		K/W
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N
T_{stg}	storage temperature		-55		150	°C
Weight				6		g

* 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.

Outlines TO-247AD



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

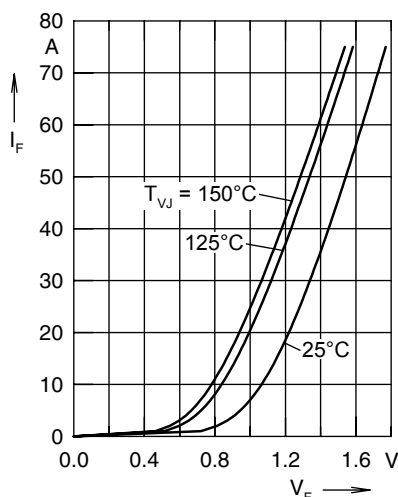


Fig. 1 Forward current I_F vs. V_F

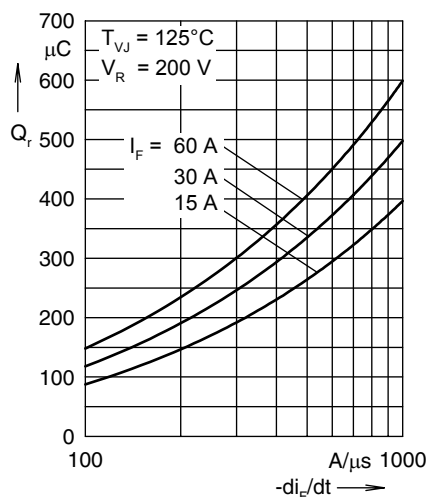


Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$

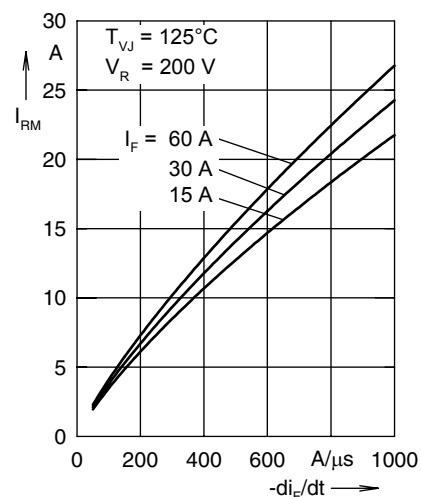


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

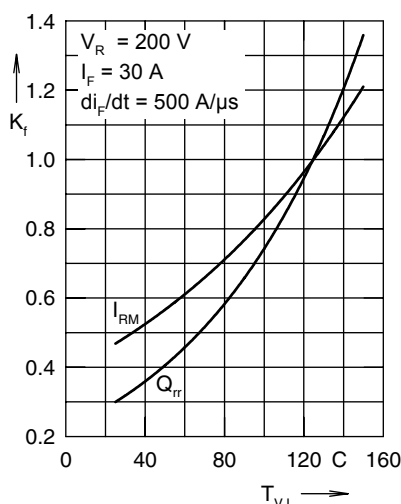


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

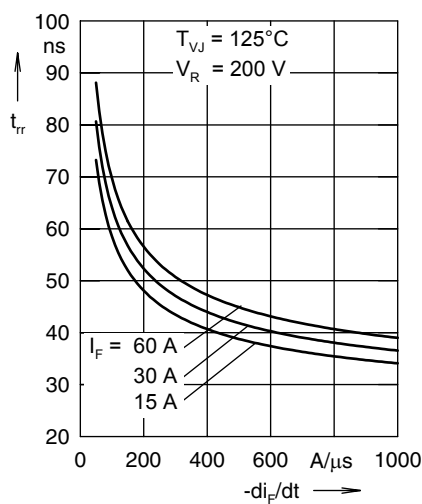


Fig. 5 Typ. recovery time t_{rr} vs. $-di_F/dt$

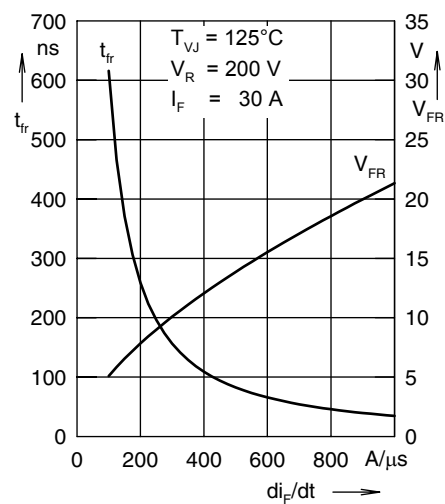


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

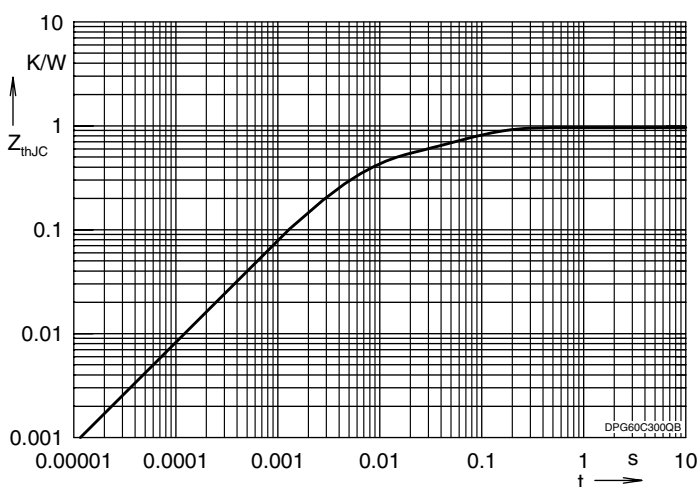


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} [K/W]	t_i [s]
1	0.505	0.005
2	0.195	0.0003
3	0.250	0.041