

**HiPerFRED<sup>2</sup>**

$$V_{RRM} = 300V$$

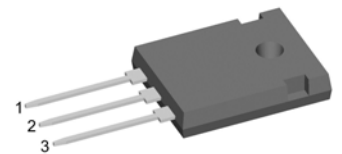
$$I_{FAV} = 2x \quad 30A$$

$$t_{rr} = 35ns$$

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

Part number

**DPG60C300HB**



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-247**

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

Fast Diode				Ratings		
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			300	V
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			300	V
$I_R$	reverse current, drain current	$V_R = 300 V$	$T_{VJ} = 25^{\circ}C$		1	$\mu A$
		$V_R = 300 V$	$T_{VJ} = 150^{\circ}C$		0.1	mA
$V_F$	forward voltage drop	$I_F = 30 A$	$T_{VJ} = 25^{\circ}C$		1.34	V
					1.63	V
		$I_F = 30 A$	$T_{VJ} = 150^{\circ}C$		1.06	V
					1.39	V
$I_{FAV}$	average forward current	$T_C = 140^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}C$		30	A
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		0.70	V
$r_F$	slope resistance				10.5	m $\Omega$
$R_{thJC}$	thermal resistance junction to case				0.95	K/W
$R_{thCH}$	thermal resistance case to heatsink			0.25		K/W
$P_{tot}$	total power dissipation	$T_C = 25^{\circ}C$			160	W
$I_{FSM}$	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$		360	A
$C_J$	junction capacitance	$V_R = 150 V \quad f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		42	pF
$I_{RM}$	max. reverse recovery current	} $I_F = 30 A; V_R = 200 V$	$T_{VJ} = 25^{\circ}C$		3	A
			$T_{VJ} = 125^{\circ}C$		7	A
$t_{rr}$	reverse recovery time	} $-di_F/dt = 200 A/\mu s$	$T_{VJ} = 25^{\circ}C$		35	ns
			$T_{VJ} = 125^{\circ}C$		55	ns

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal <sup>1)</sup>			50	A
$T_{VJ}$	virtual junction temperature		-55		175	°C
$T_{op}$	operation temperature		-55		150	°C
$T_{stg}$	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

### Product Marking



### Part number

- D = Diode
- P = HiPerFRED
- G = extreme fast
- 60 = Current Rating [A]
- C = Common Cathode
- 300 = Reverse Voltage [V]
- HB = TO-247AD (3)

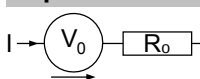
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG60C300HB	DPG60C300HB	Tube	30	502163

Similar Part	Package	Voltage class
DPG60C300QB	TO-3P (3)	300
DPG60C300HJ	ISOPLUS247 (3)	300
DPG60C300PC	TO-263AB (D2Pak) (2)	300
DPF60C300HB	TO-247AD (3)	300
DPG80C300HB	TO-247AD (3)	300

### Equivalent Circuits for Simulation

\* on die level

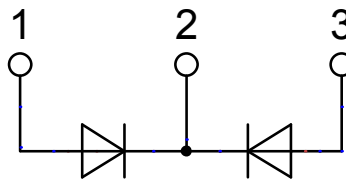
$T_{VJ} = 175^\circ\text{C}$



**Fast Diode**

$V_{0\ max}$	threshold voltage	0.7	V
$R_{0\ max}$	slope resistance *	7.9	mΩ

## Outlines TO-247



## Fast Diode

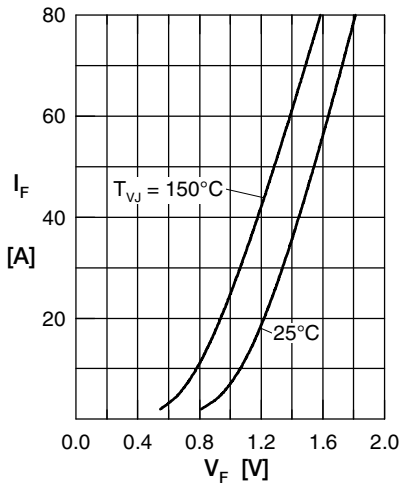


Fig. 1 Forward current  $I_F$  versus  $V_F$

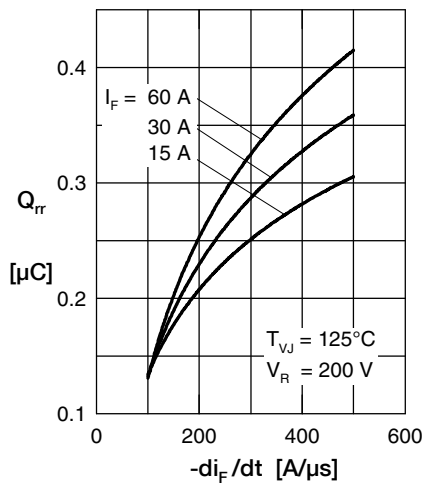


Fig. 2 Typ. reverse recov. charge  $Q_{rr}$  versus  $-di_F/dt$

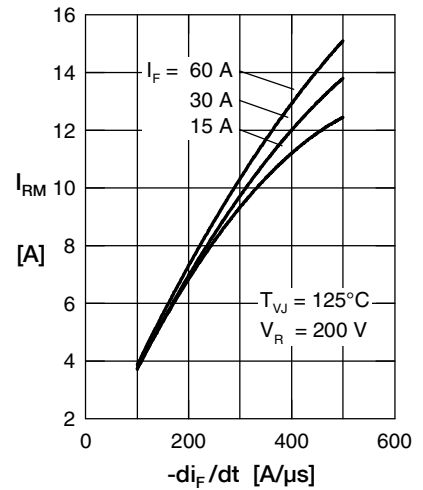


Fig. 3 Typ. reverse recov. current  $I_{RM}$  versus  $-di_F/dt$

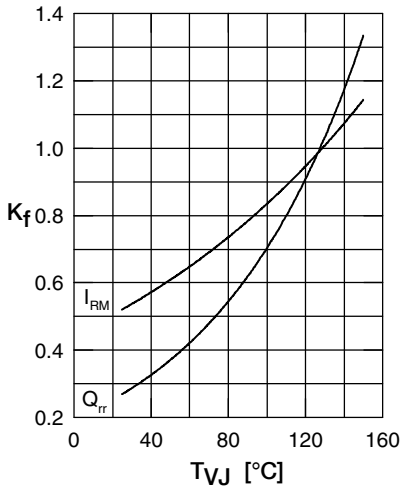


Fig. 4 Dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

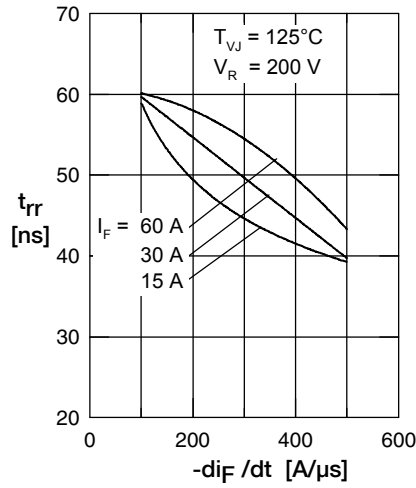


Fig. 5 Typ. reverse recovery time  $t_{rr}$  versus  $-di_F/dt$

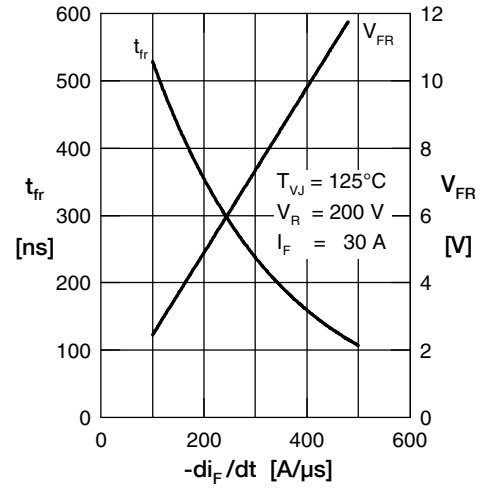


Fig. 6 Typ. forward recovery voltage  $V_{FR}$  & time  $t_{fr}$  versus  $di_F/dt$

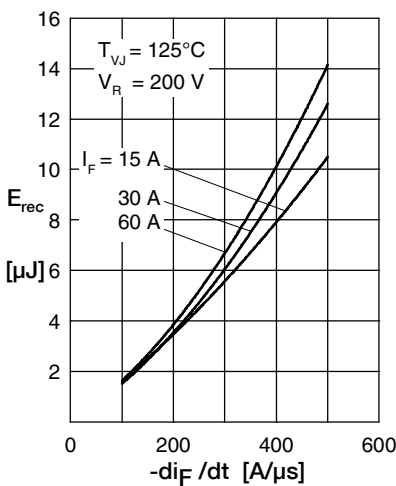


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

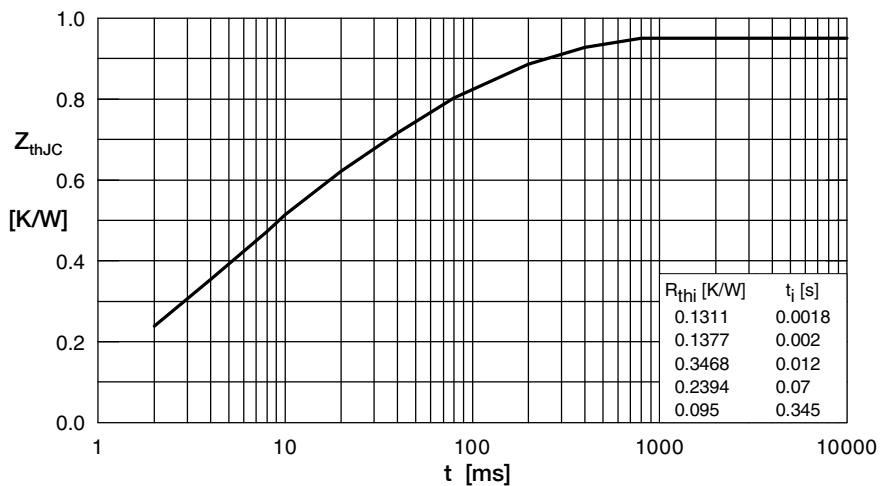


Fig. 8 Transient thermal impedance junction to case