

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

$$V_{RRM} = 400V$$

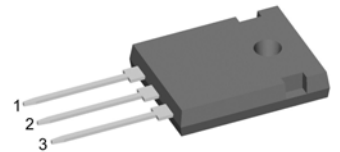
$$I_{FAV} = 2 \times 15A$$

$$t_{rr} = 45ns$$

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

Part number

**DPG30C400HB**



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:**

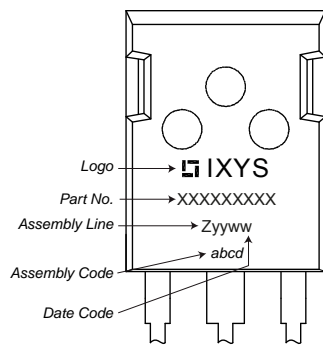
- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

**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	$T_{VJ} = 25^{\circ}C$			400	V
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			400	V
$I_R$	reverse current, drain current	$V_R = 400 V$	$T_{VJ} = 25^{\circ}C$		1	$\mu A$
		$V_R = 400 V$	$T_{VJ} = 150^{\circ}C$		0.18	mA
$V_F$	forward voltage drop	$I_F = 15 A$	$T_{VJ} = 25^{\circ}C$		1.38	V
		$I_F = 30 A$			1.61	V
		$I_F = 15 A$	$T_{VJ} = 150^{\circ}C$		1.13	V
		$I_F = 30 A$			1.39	V
$I_{FAV}$	average forward current	$T_C = 140^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}C$		15	A
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		0.84	V
$r_F$	slope resistance				15.9	m $\Omega$
$R_{thJC}$	thermal resistance junction to case				1.7	K/W
$R_{thCH}$	thermal resistance case to heatsink			0.25		K/W
$P_{tot}$	total power dissipation		$T_C = 25^{\circ}C$		90	W
$I_{FSM}$	max. forward surge current	$t = 10 ms; (50 Hz), sine; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$		190	A
$C_J$	junction capacitance	$V_R = 200 V f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		16	pF
$I_{RM}$	max. reverse recovery current	} $I_F = 15 A; V_R = 270 V$ $-di_F/dt = 200 A/\mu s$	$T_{VJ} = 25^{\circ}C$		4	A
$t_{rr}$	reverse recovery time		$T_{VJ} = 125^{\circ}C$		5.5	A
			$T_{VJ} = 25^{\circ}C$		45	ns
			$T_{VJ} = 125^{\circ}C$		70	ns

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal <sup>1)</sup>			35	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
- 30 = Current Rating [A]
- C = Common Cathode
- 400 = Reverse Voltage [V]
- HB = TO-247AD (3)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG30C400HB	DPG30C400HB	Tube	30	505790

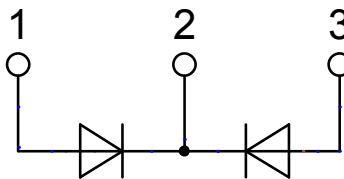
Similar Part	Package	Voltage class
DPG30C400PB	TO-220AB (3)	400

**Equivalent Circuits for Simulation**
*\* on die level*
 $T_{VJ} = 175\text{ °C}$ 

**Fast Diode**

$V_{0\ max}$	threshold voltage	0.84	V
$R_{0\ max}$	slope resistance *	13.3	mΩ

## Outlines TO-247



## Fast Diode

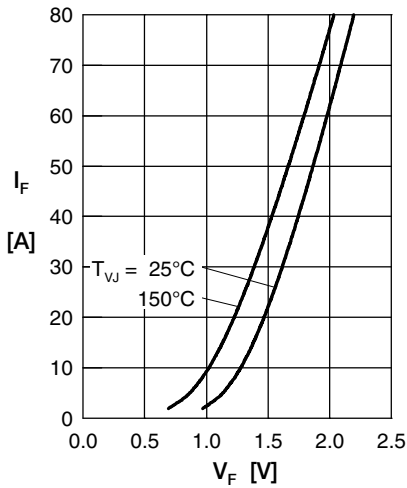


Fig. 1 Forward current  $I_F$  versus  $V_F$

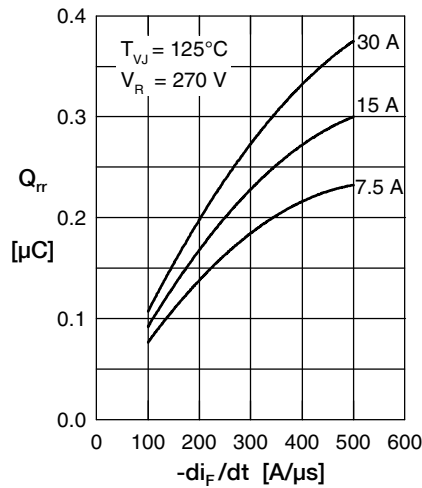


Fig. 2 Typ. reverse recov. charge  $Q_{rr}$  versus  $-di_F/dt$

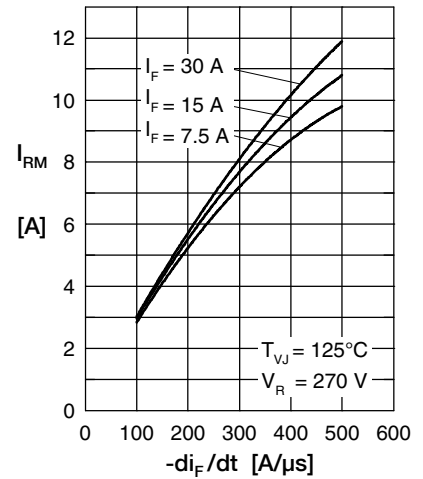


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

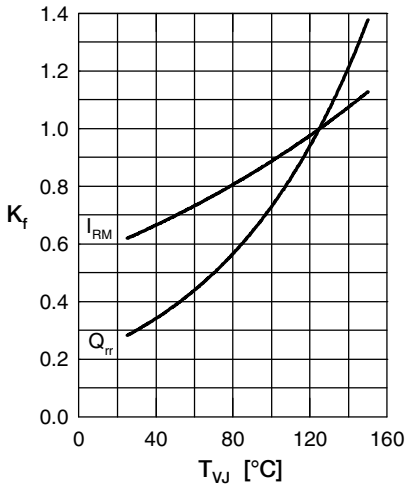


Fig. 4 Typ. dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

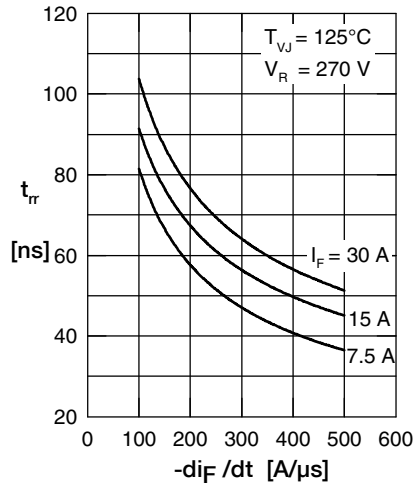


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$

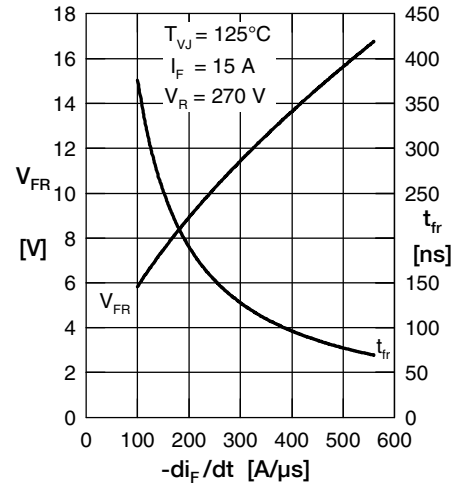


Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

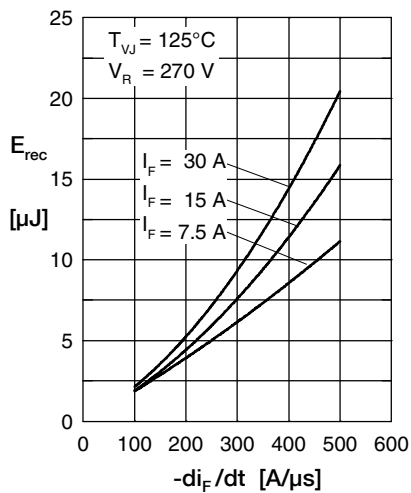


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

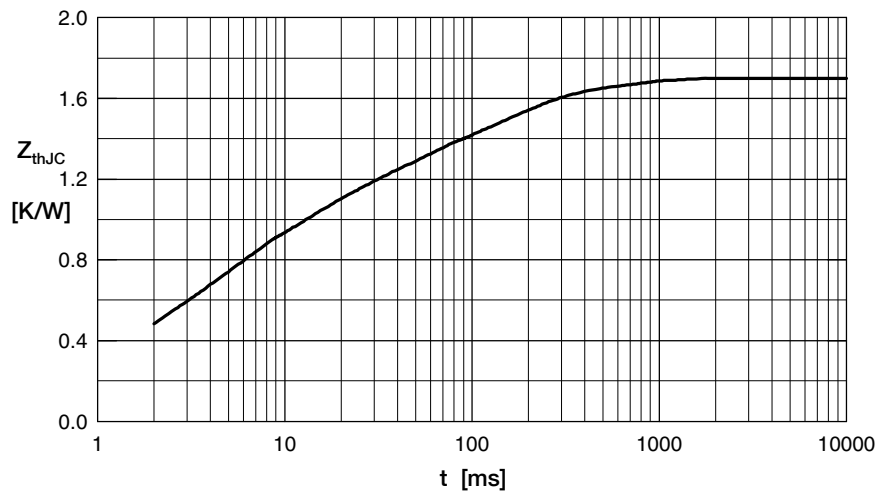


Fig. 8 Transient thermal resistance junction to case