

# HiPerFRED

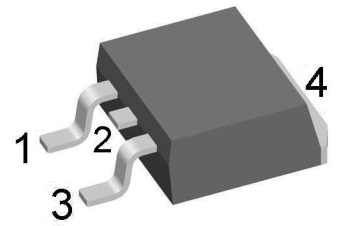
$V_{RRM} = 200\text{ V}$   
 $I_{FAV} = 2 \times 15\text{ A}$   
 $t_{rr} = 35\text{ ns}$

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

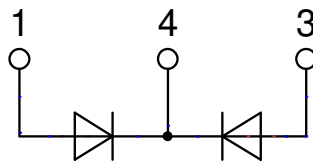
Part number

**DPG30C200PC**

Marking on Product: *DPG30C200PC*



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-263 (D2Pak)

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

### Disclaimer Notice

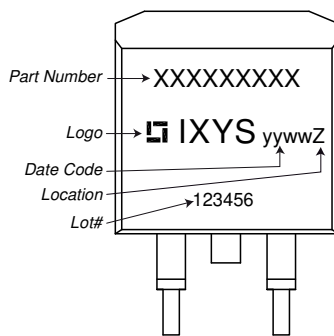
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Fast Diode				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			200	V	
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			200	V	
$I_R$	reverse current, drain current	$V_R = 200 V$	$T_{VJ} = 25^{\circ}C$		1	$\mu A$	
		$V_R = 200 V$	$T_{VJ} = 150^{\circ}C$		0.08	mA	
$V_F$	forward voltage drop	$I_F = 15 A$	$T_{VJ} = 25^{\circ}C$		1.26	V	
		$I_F = 30 A$			1.51	V	
		$I_F = 15 A$	$T_{VJ} = 150^{\circ}C$		1.01	V	
		$I_F = 30 A$			1.29	V	
$I_{FAV}$	average forward current	$T_C = 145^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}C$		15	A	
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		0.69	V	
$r_F$	slope resistance				18	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	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$		240	A	
$C_J$	junction capacitance	$V_R = 150 V$ $f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		20	pF	
$I_{RM}$	max. reverse recovery current	} $I_F = 15 A; V_R = 130 V$ $-di_F/dt = 130 A/\mu s$	$T_{VJ} = 25^{\circ}C$		3	A	
			$T_{VJ} = 125^{\circ}C$		6.5	A	
$t_{rr}$	reverse recovery time		$T_{VJ} = 25^{\circ}C$		35	ns	
			$T_{VJ} = 125^{\circ}C$		55	ns	

Package TO-263 (D2Pak)			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			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>				1.5		g
$F_C$	mounting force with clip		20		60	N

### Product Marking



### Part description

D = Diode  
 P = HiPerFRED  
 G = extreme fast  
 30 = Current Rating [A]  
 C = Common Cathode  
 200 = Reverse Voltage [V]  
 PC = TO-263AB (D2Pak) (2)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG30C200PC-TRL	DPG30C200PC	Tape & Reel	800	506675
Alternative	DPG30C200PC-TUB	DPG30C200PC	Tube	50	525099

Similar Part	Package	Voltage class
DPG30C200PB	TO-220AB (3)	200
DPG30C200HB	TO-247AD (3)	200

### Equivalent Circuits for Simulation

\* on die level

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



$V_{0\ max}$  threshold voltage

**Fast Diode**

0.69

V

$R_{0\ max}$  slope resistance \*

14.7

mΩ

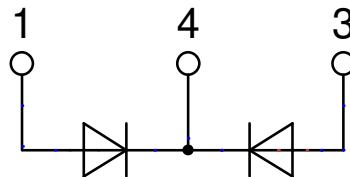


**Outlines TO-263 (D2Pak)**



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A1	typ. 0.10		typ. 0.004	
A2	2.41		0.095	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	2.5		0.098	
E	9.65	10.41	0.380	0.410
E1	6.22	8.50	0.245	0.335
e	2.54 BSC		0.100 BSC	
e1	4.28		0.169	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	1.02	1.68	0.040	0.066
W	typ. 0.02	0.040	typ. 0.0008	0.002

*All dimensions conform with and/or within JEDEC standard.*



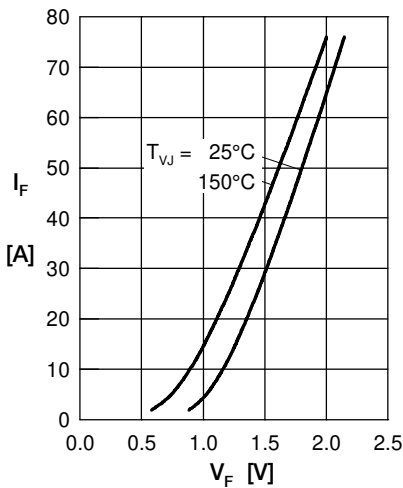
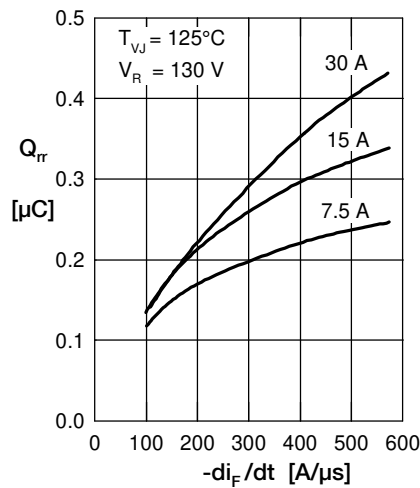
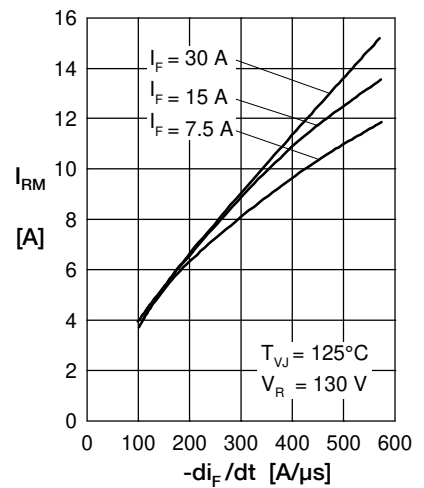
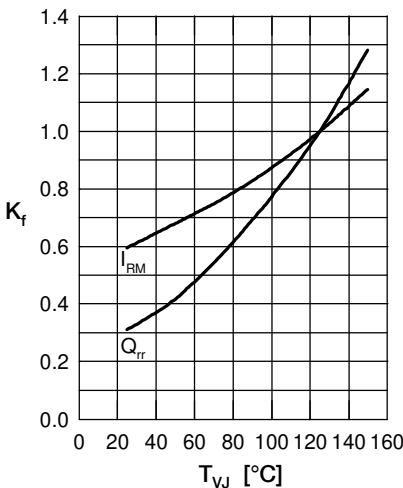
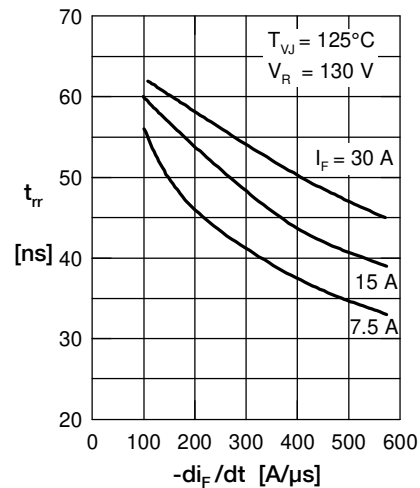
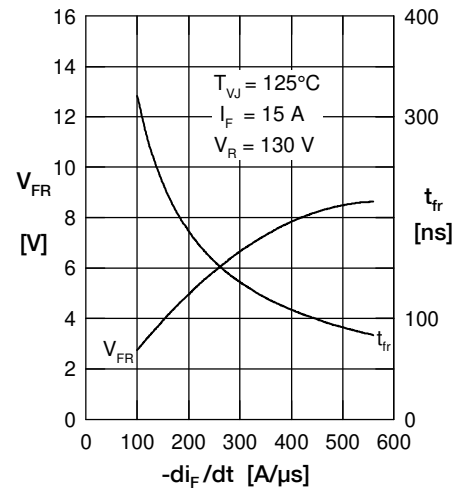
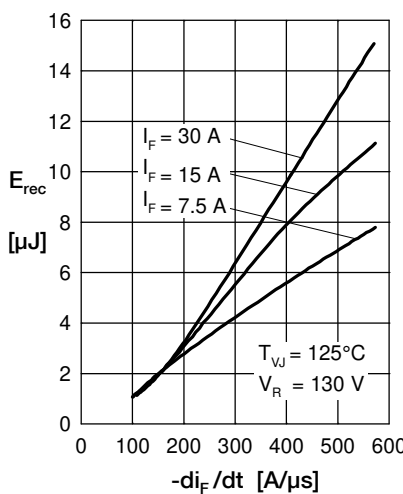
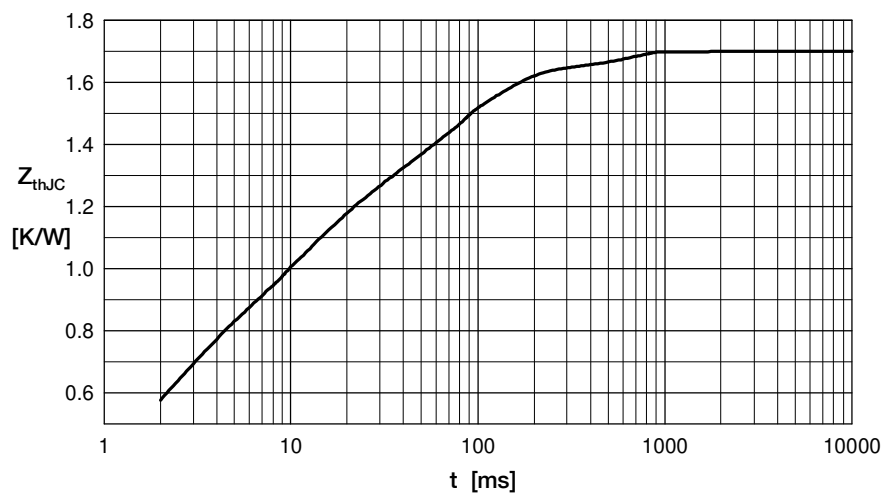
**Fast Diode**

 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  $t_{rr}$  versus  $di_F/dt$ 

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


Fig. 8 Transient thermal resistance junction to case

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