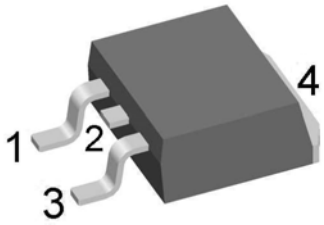
HiPerFRED²

V_{RRM} = 400 V
I_{FAV} = 2x 10 A
t_{rr} = 45 ns

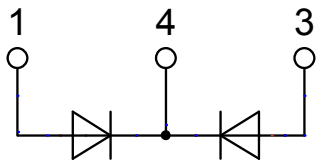
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Common Cathode

Part number

DPG20C400PC



Backside: cathode



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm 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

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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°C			400	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			400	V
I_R	*reverse current, drain current*	V_R = 400 V	T_{VJ} = 25°C			1	µA
		V_R = 400 V	T_{VJ} = 150°C			0.15	mA
V_F	*forward voltage drop*	I_F = 10 A	T_{VJ} = 25°C			1.32	V
		I_F = 20 A				1.51	V
		I_F = 10 A	T_{VJ} = 150°C			1.03	V
		I_F = 20 A				1.24	V
I_{FAV}	*average forward current*	T_C = 150°C	T_{VJ} = 175°C			10	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.77	V
r_F	*slope resistance* }					19.8	mΩ
R_{thJC}	*thermal resistance junction to case*					2.3	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.25		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			65	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			150	A
C_J	*junction capacitance*	V_R = 200 V f = 1 MHz	T_{VJ} = 25°C		12		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		4		A
		I_F = 10 A; V_R = 270 V	T_{VJ} = 125°C		6		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		45		ns
			T_{VJ} = 125°C		65		ns

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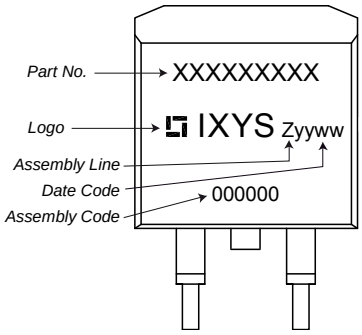
Package TO-263 (D2Pak)			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal			35	A
T_{VJ}	*virtual junction temperature*		-55		175	°C
T_{op}	*operation temperature*		-55		150	°C
T_{stg}	*storage temperature*		-55		150	°C
Weight				2		g
F_C	*mounting force with clip*		20		60	N

Product Marking



Part number

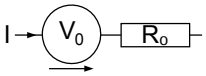
D = Diode
P = HiPerFRED
G = extreme fast
20 = Current Rating [A]
C = Common Cathode
400 = Reverse Voltage [V]
PC = TO-263AB (D2Pak) (2)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG20C400PC	DPG20C400PC	Tape & Reel	800	507327

Similar Part	Package	Voltage class
DPG20C400PB	TO-220AB (3)	400
DPG20C400PN	TO-220ABFP (3)	400

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 175 °C



		Fast Diode	
$V_{0\,max}$	*threshold voltage*	0.77	V
$R_{0\,max}$	*slope resistance **	16.6	mΩ

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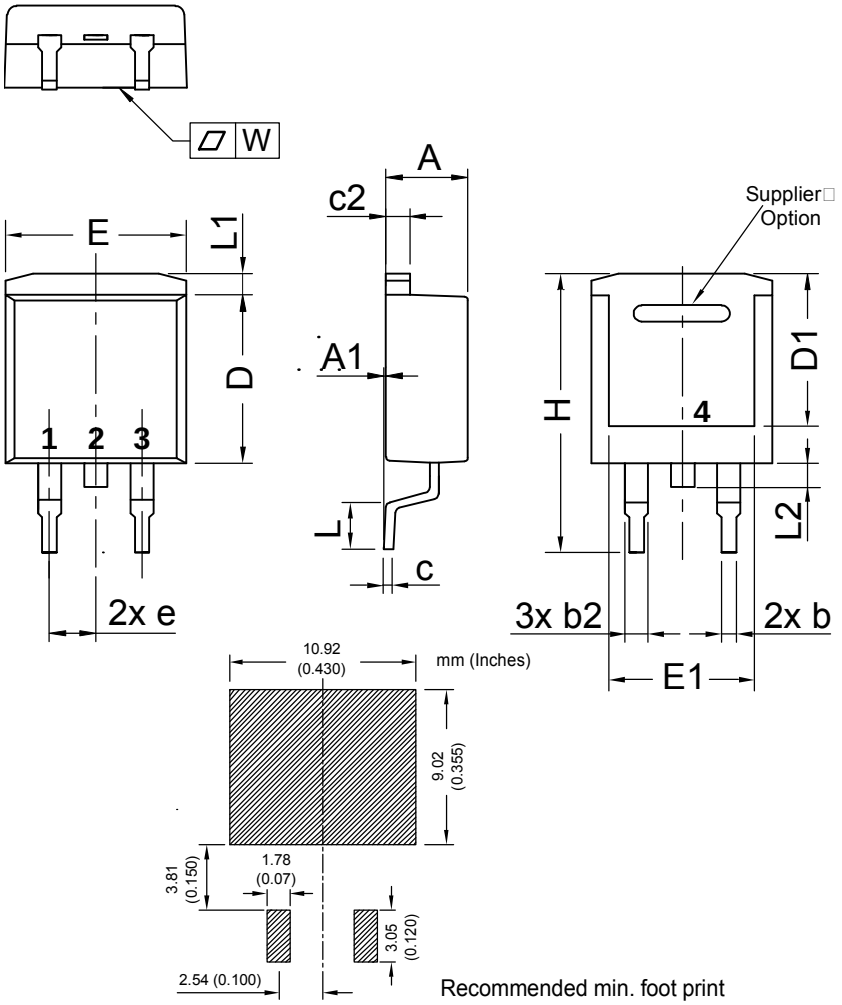
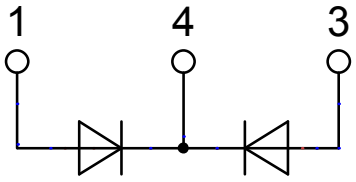
Outlines TO-263 (D2Pak)



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.



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Fast Diode

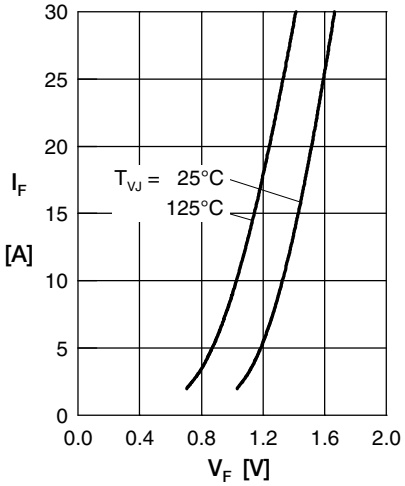

Fig. 1 Forward current I_F versus V_F

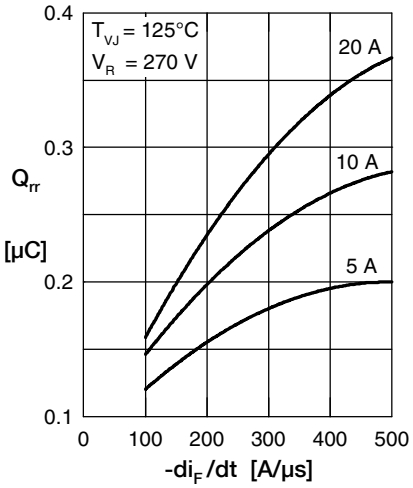

Fig. 2 Typ. reverse recov. charge Q_{rr} versus -di$_F$/dt

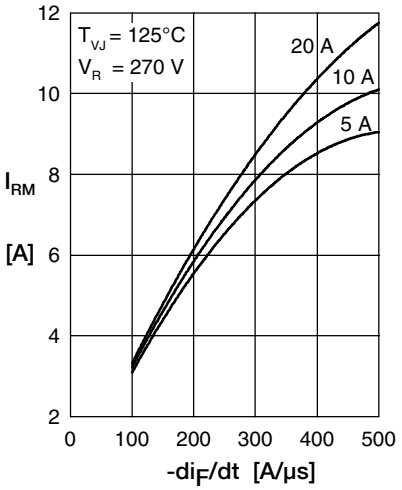

Fig. 3 Typ. reverse recov. current I_{RM} versus -di$_F$/dt

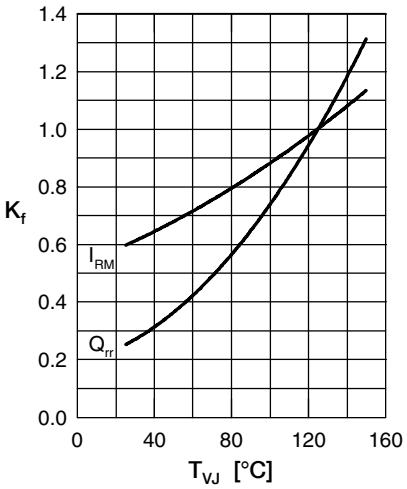

Fig. 4 Typ. dynamic parameters Q_{rr}, I_{RM} versus T_{VJ}

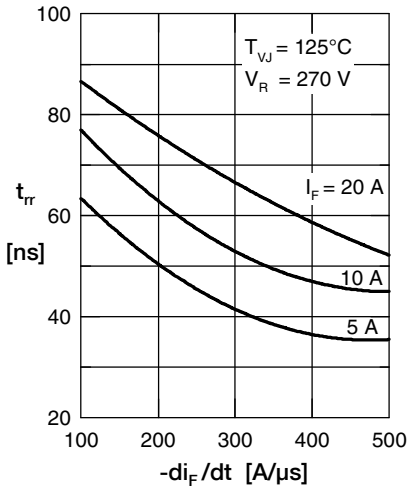

Fig. 5 Typ. reverse recov. time t_{rr} versus -di$_F$/dt

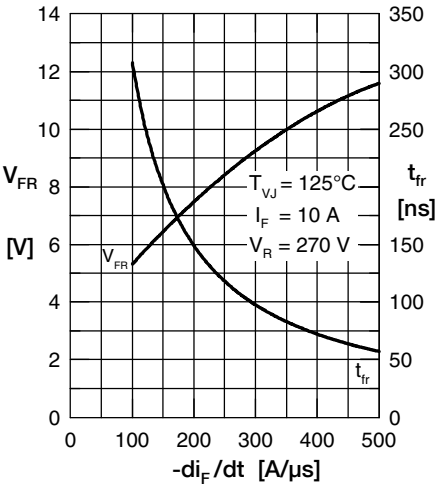

Fig. 6 Typ. forward recov. voltage V_{FR} and t_{fr} versus di$_F$/dt

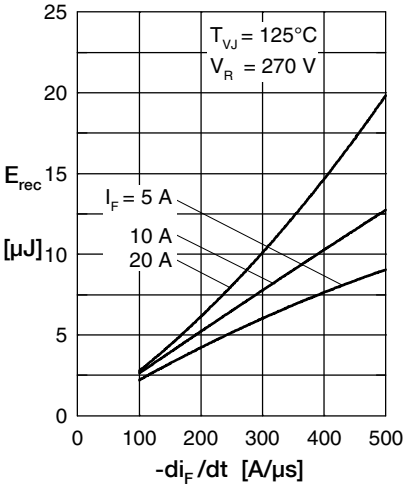

Fig. 7 Typ. recovery energy E_{rec} versus -di$_F$/dt

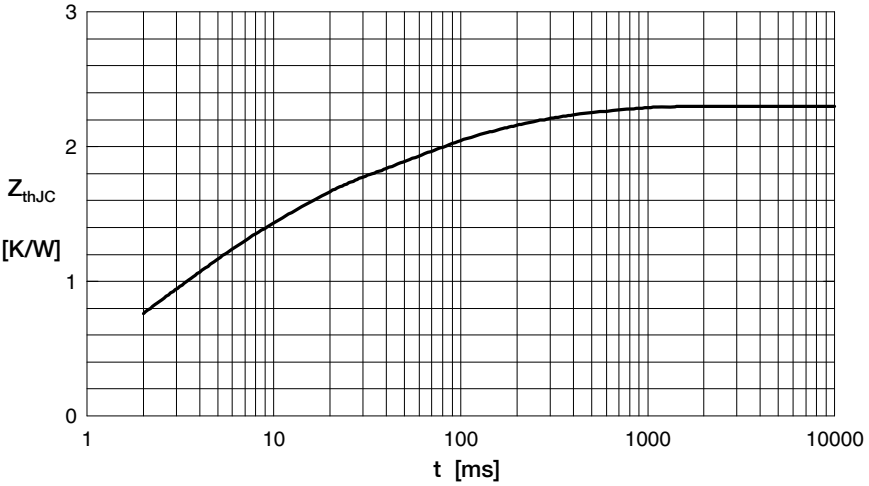

Fig. 8 Transient thermal resistance junction to case

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