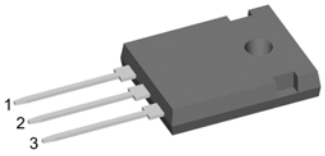
HiPerFRED²

V_{RRM} = 400 V
I_{FAV} = 2x 30 A
t_{rr} = 45 ns

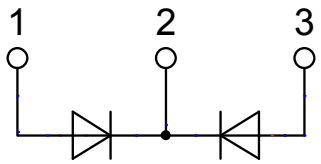
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Common Cathode

Part number

DPG60C400HB



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-247

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

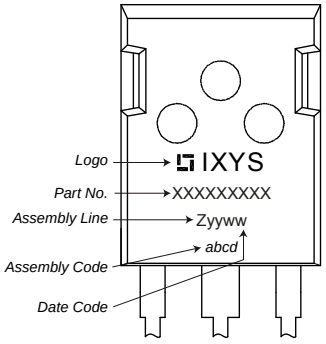
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Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			400	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			400	V
I_R	*reverse current, drain current*	V_R = 400 V	T_{VJ} = 25°C			1	µA
		V_R = 400 V	T_{VJ} = 150°C			0.2	mA
V_F	*forward voltage drop*	I_F = 30 A	T_{VJ} = 25°C			1.41	V
		I_F = 60 A				1.69	V
		I_F = 30 A	T_{VJ} = 150°C			1.13	V
		I_F = 60 A				1.46	V
I_{FAV}	*average forward current*	T_C = 135°C	T_{VJ} = 175°C			30	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.76	V
r_F	*slope resistance* }					10.7	mΩ
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°C			160	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			360	A
C_J	*junction capacitance*	V_R = 200 V f = 1 MHz	T_{VJ} = 25°C		39		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		4		A
		I_F = 30 A; V_R = 270 V	T_{VJ} = 125°C		8.5		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		45		ns
			T_{VJ} = 125°C		85		ns

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Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal [1]			50	A
T_{VJ}	*virtual junction temperature*		-55		175	°C
T_{op}	*operation temperature*		-55		150	°C
T_{stg}	*storage temperature*		-55		150	°C
Weight				6		g
M_D	*mounting torque*		0.8		1.2	Nm
F_C	*mounting force with clip*		20		120	N

Product Marking



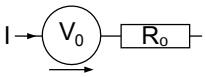
Part number

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

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG60C400HB	DPG60C400HB	Tube	30	505825

Similar Part	Package	Voltage class
DPG60C400QB	TO-3P (3)	400
DPG80C400HB	TO-247AD (3)	400

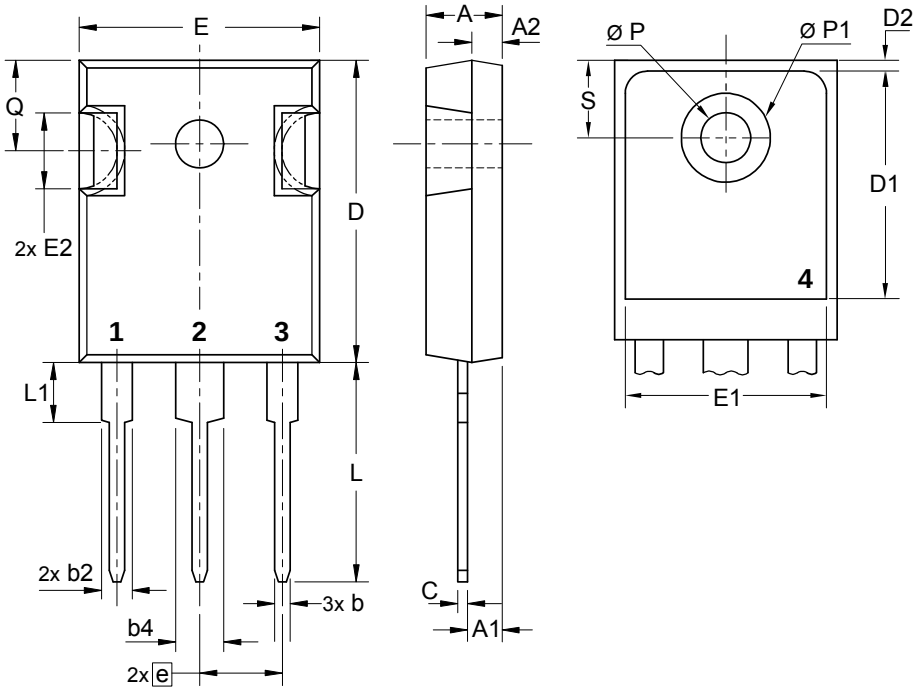
Equivalent Circuits for Simulation ** on die level* T_{VJ} = 175 °C



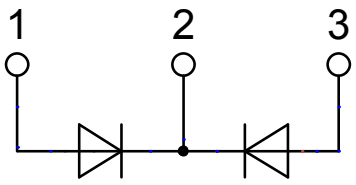
		Fast Diode	
$V_{0\,max}$	*threshold voltage*	0.76	V
$R_{0\,max}$	*slope resistance **	8.1	mΩ

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Outlines TO-247



Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.215 BSC		5.46 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242 BSC		6.14 BSC	
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39



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Fast Diode

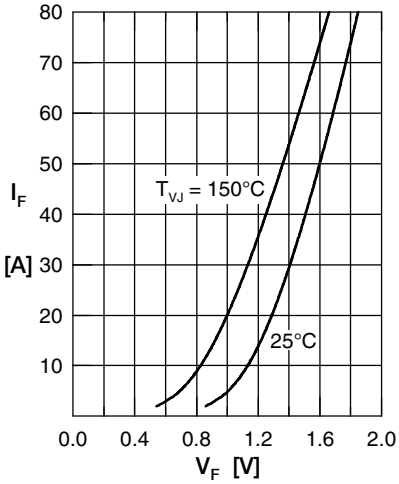


Fig. 1 Forward current I_F versus V_F

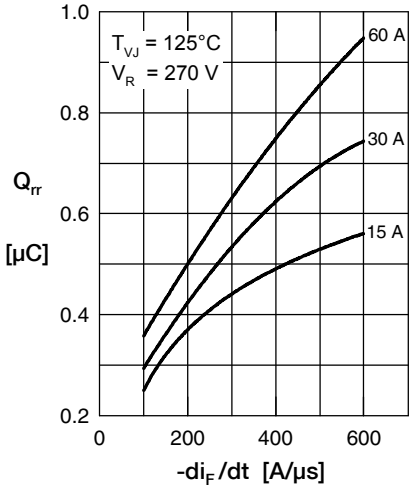


Fig. 2 Typ. reverse recov. charge Q_{rr} versus -di$_F$/dt

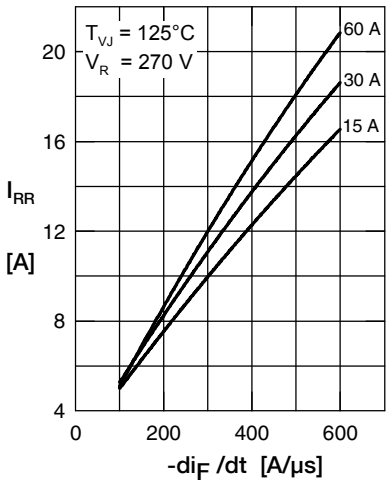


Fig. 3 Typ. reverse recovery current I_{RR} versus -di$_F$/dt

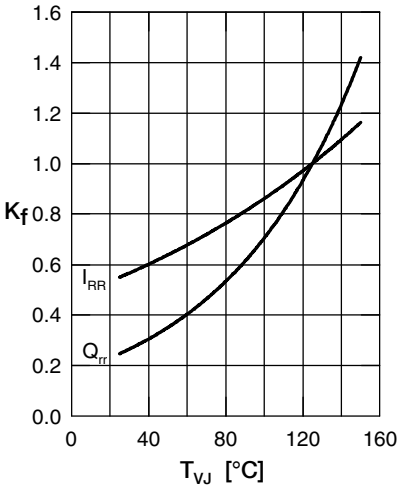


Fig. 4 Typ. dynamic parameters Q_{rr}, I_{RR} versus T_{VJ}

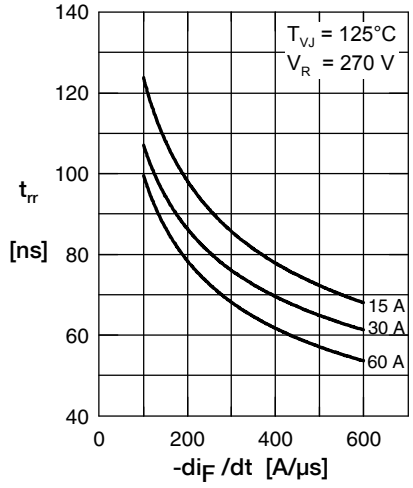


Fig. 5 Typ. reverse recov. time t_{rr} versus -di$_F$/dt

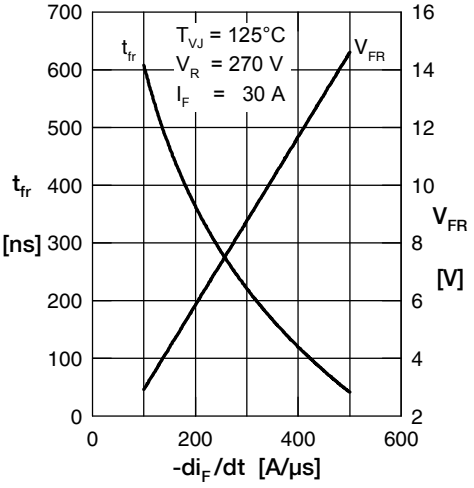


Fig. 6 Typ. forward recov. voltage V_{FR} & time t_{fr} versus di$_F$/dt

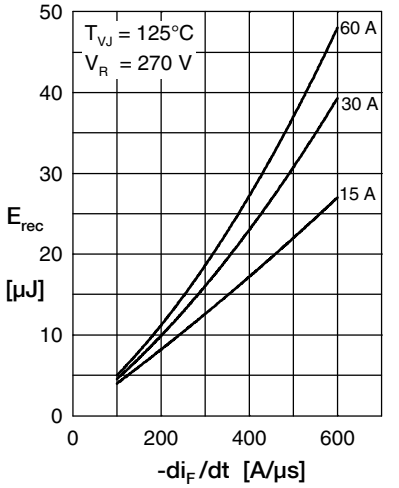


Fig. 7 Typ. recovery energy E_{rec} versus -di$_F$/dt

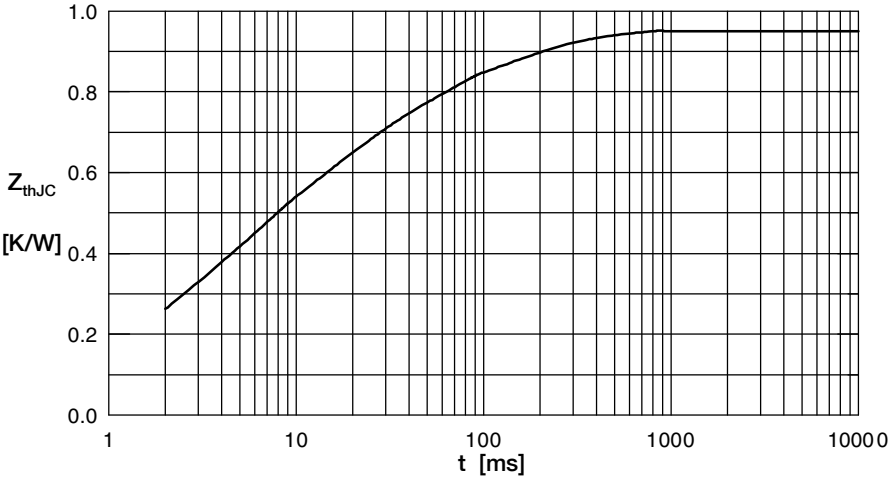


Fig. 8 Transient thermal impedance junction to case

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