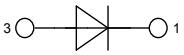
HiPerFRED²

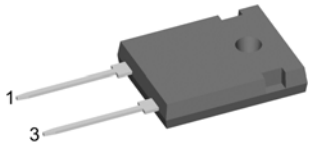
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Single Diode

V_{RRM} = 300 V
I_{FAV} = 30 A
t_{rr} = 35 ns

Part number

DPG 30 I 300 HA





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:

- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

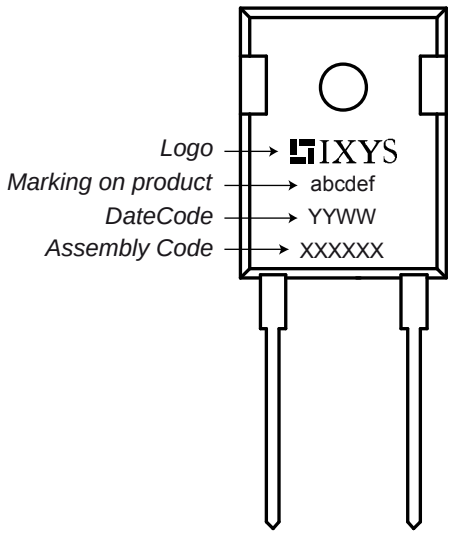
Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			300	V
I_R	*reverse current*	V_R = 300 V	T_{VJ} = 25°C			1	µA
		V_R = 300 V	T_{VJ} = 150°C			0.1	mA
V_F	*forward voltage*	I_F = 30 A	T_{VJ} = 25°C			1.34	V
		I_F = 60 A				1.63	V
		I_F = 30 A	T_{VJ} = 150°C			1.06	V
		I_F = 60 A				1.39	V
I_{FAV}	*average forward current*	rectangular d = 0.5	T_C = 135°C			30	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.70	V
r_F	*slope resistance* }					10.5	mΩ
R_{thJC}	*thermal resistance junction to case*					0.95	K/W
T_{VJ}	*virtual junction temperature*			-55		175	°C
P_{tot}	*total power dissipation*		T_C = 25°C			160	W
I_{FSM}	*max. forward surge current*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			340	A
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		3		A
		I_F = 30 A; V_R = 200 V	T_{VJ} = 125°C		7		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		35		ns
			T_{VJ} = 125°C		55		ns
C_J	*junction capacitance*	V_R = 150 V; f = 1 MHz	T_{VJ} = 25°C		50		pF

Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per pin [1]			50	A
R_{thCH}	*thermal resistance case to heatsink*			0.25		K/W
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

[1] I_{RMS} is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.
In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

Product Marking



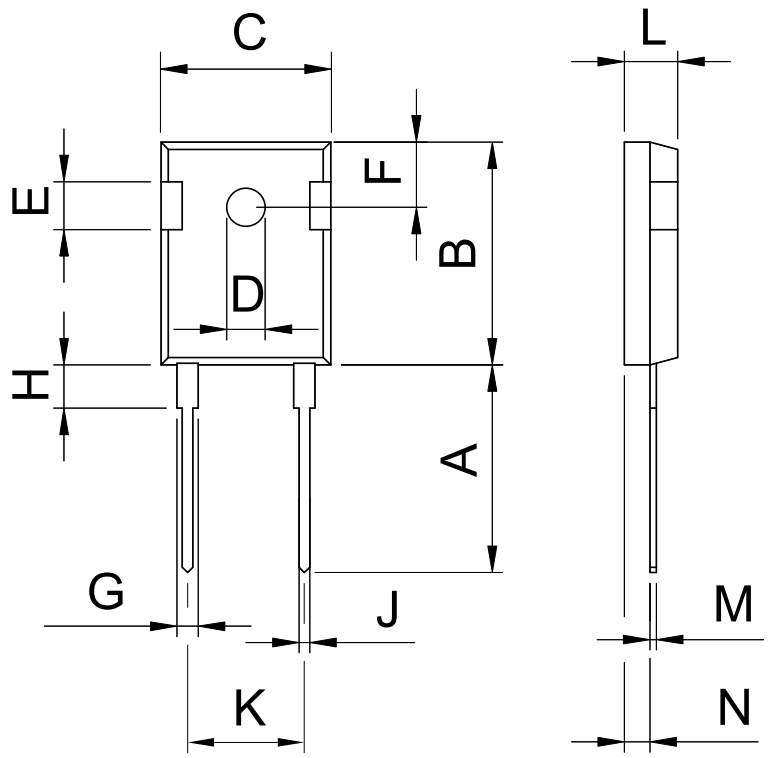
Part number

D = Diode
P = HiPerFRED
G = extreme fast
30 = Current Rating [A]
I = Single Diode
300 = Reverse Voltage [V]
HA = TO-247AD (2)

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 30 I 300 HA	DPG30I300HA	Tube	30	507313

Similar Part	Package	Voltage Class
DPG30I300PA	TO-220AC (2)	300

Outlines TO-247



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

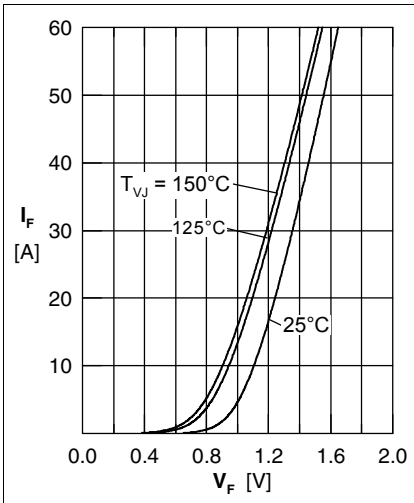


Fig. 1 Forward current I_F versus forward voltage V_F

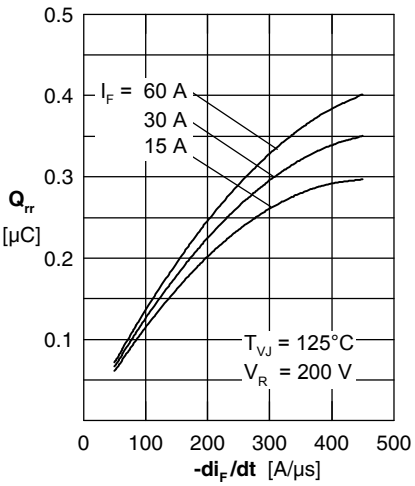


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

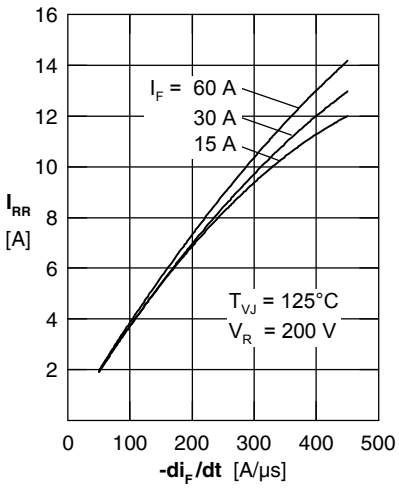


Fig. 3 Typ. reverse recovery current I_{RR} versus $-di_F/dt$

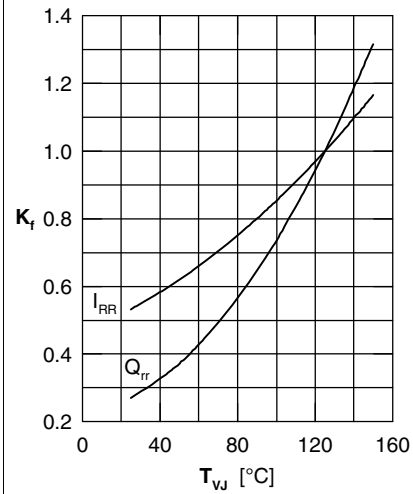


Fig. 4 Dynamic parameters Q_{rr}, I_{RR} versus T_{VJ}

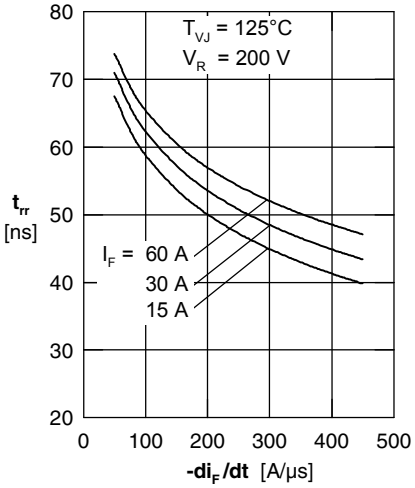


Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

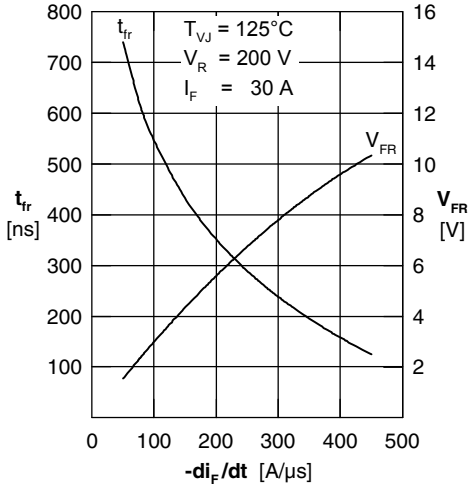


Fig. 6 Typ. forward recovery voltage V_{FR} & forward recovery time t_{fr} vs. di_F/dt

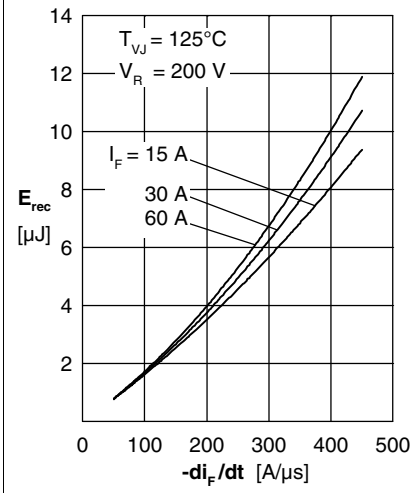


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

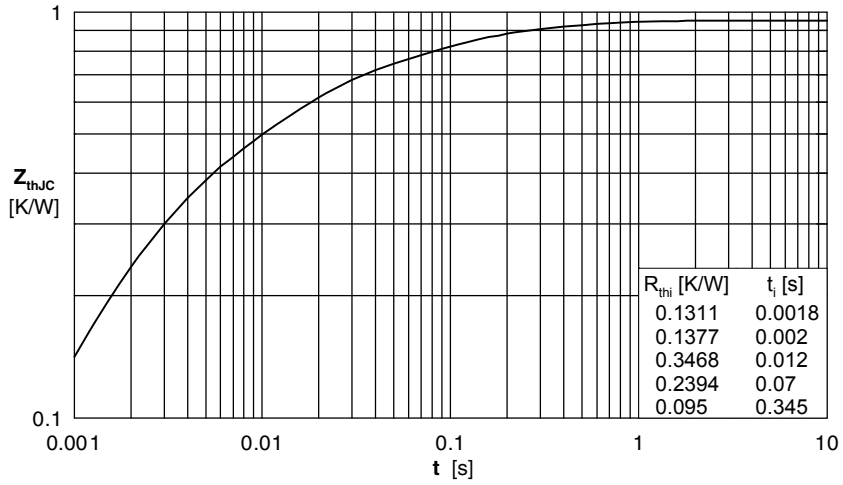


Fig. 8 Transient thermal impedance junction to case