

HiPerFRED²

High Performance Fast Recovery Diode

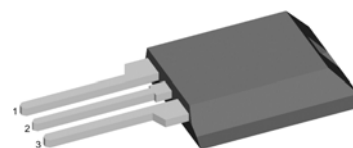
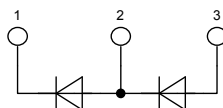
Low Loss and Soft Recovery

Phase leg

Part number

DPG 30 P 300 PJ

$$\begin{aligned} V_{RRM} &= 300 \text{ V} \\ I_{FAV} &= 30 \text{ A} \\ t_{rr} &= 35 \text{ ns} \end{aligned}$$



Backside: isolated

E72873

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:

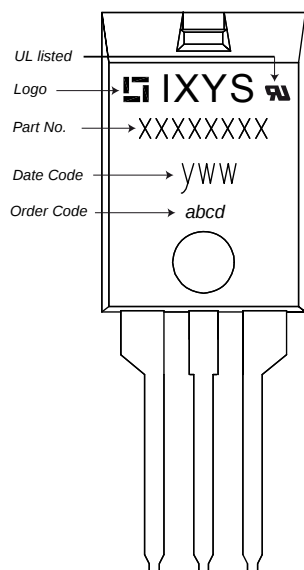
- Housing: ISOPLUS220
- Industry standard outline
- DCB isolated backside
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

Symbol	Definition	Conditions	min.	typ.	max.	Unit
V_{RRM}	max. repetitive reverse voltage	$T_{VJ} = 25^\circ\text{C}$			300	V
I_R	reverse current	$V_R = 300 \text{ V}$ $T_{VJ} = 25^\circ\text{C}$			1	μA
		$V_R = 300 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$			0.2	mA
V_F	forward voltage	$I_F = 30 \text{ A}$ $T_{VJ} = 25^\circ\text{C}$			1.28	V
		$I_F = 60 \text{ A}$ $T_{VJ} = 25^\circ\text{C}$			1.58	V
		$I_F = 30 \text{ A}$ $T_{VJ} = 150^\circ\text{C}$			0.99	V
		$I_F = 60 \text{ A}$ $T_{VJ} = 150^\circ\text{C}$			1.32	V
I_{FAV}	average forward current	rectangular $d = 0.5$ $T_C = 135^\circ\text{C}$			30	A
V_{FO}	threshold voltage	$T_{VJ} = 175^\circ\text{C}$ for power loss calculation only			0.60	V
r_F	slope resistance				11	m Ω
R_{thJC}	thermal resistance junction to case				1.05	K/W
T_{VJ}	virtual junction temperature		-55		175	$^\circ\text{C}$
P_{tot}	total power dissipation	$T_C = 25^\circ\text{C}$			145	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms}$ (50 Hz), sine $T_{VJ} = 45^\circ\text{C}$			450	A
I_{RM}	max. reverse recovery current	$T_{VJ} = 25^\circ\text{C}$		3		A
		$I_F = 30 \text{ A}; V_R = 200 \text{ V}$ $T_{VJ} = 125^\circ\text{C}$		8.5		A
t_{rr}	reverse recovery time	$-di_F/dt = 200 \text{ A}/\mu\text{s}$ $T_{VJ} = 25^\circ\text{C}$		35		ns
		$T_{VJ} = 125^\circ\text{C}$		65		ns
C_J	junction capacitance	$V_R = 200 \text{ V}; f = 1 \text{ MHz}$ $T_{VJ} = 25^\circ\text{C}$		60		pF

Symbol	Definition	Conditions	Ratings			
			min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			35	A
R_{thCH}	thermal resistance case to heatsink			0.50		K/W
T_{stg}	storage temperature		-55		150	°C
Weight				2		g
F_c	mounting force with clip		20		60	N
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V
$d_{Spp/App}$	creepage striking distance on surface through air	terminal to terminal	1.0			mm
$d_{Spb/Apb}$	creepage striking distance on surface through air	terminal to backside	3.0			mm

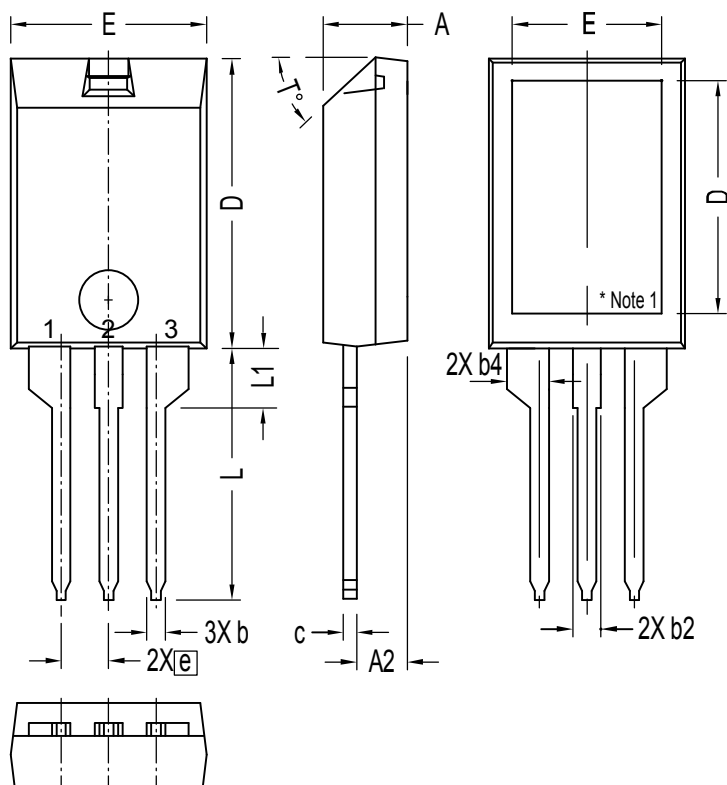
Product Marking



Part number

D = Diode
 P = HiPerFRED
 G = extreme fast
 30 = Current Rating [A]
 P = Phase leg
 300 = Reverse Voltage [V]
 PJ = ISOPLUS220AB (3)

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 30 P 300 PJ	DPG30P300PJ	Tube	50	508134

Outlines ISOPLUS220


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100 BASIC		2.55 BASIC	
L	.512	.571	13.00	14.50
L1	.118	.138	3.00	3.50
T°			42.5°	47.5°

NOTE:

1. Bottom heatsink is electrically isolated from Pin 1, 2, or 3.
2. This drawing will meet dimensional requirement of JEDEC SS Product Outline TO-273 except D and D1 dimension.

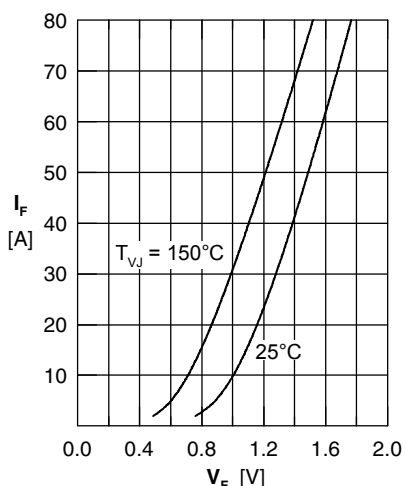


Fig. 1 Forward current I_F versus forward voltage V_F

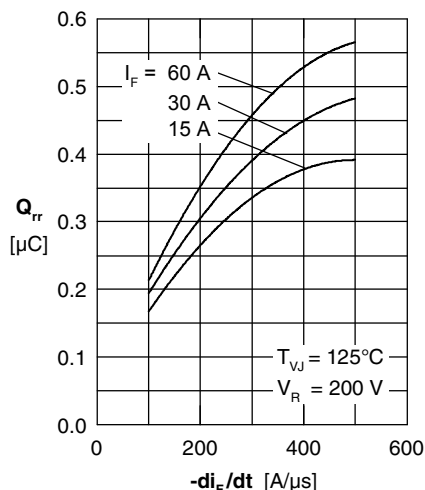


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

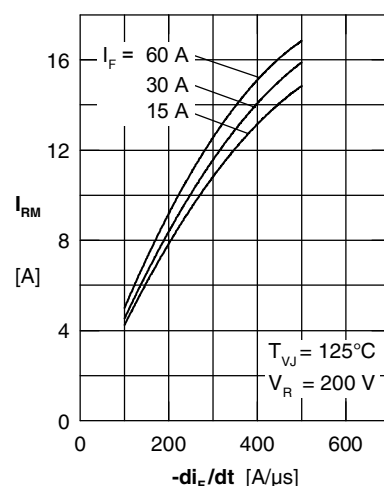


Fig. 3 Typ. reverse recovery current I_{RM} versus $-di_F/dt$

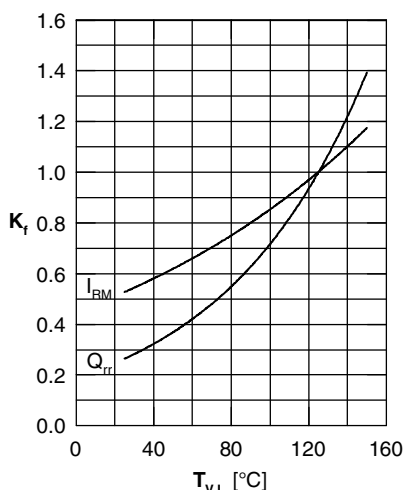


Fig. 4 Dynamic parameters Q_{rr} , I_{RM} versus T_{VJ}

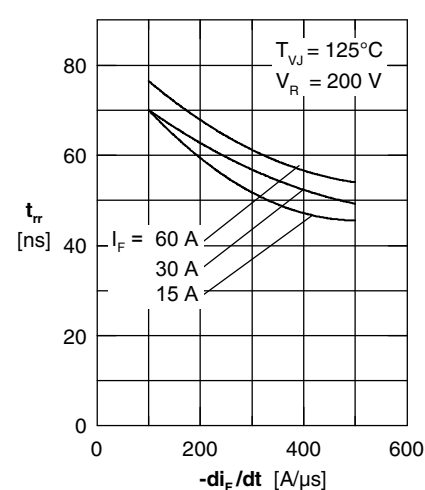


Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

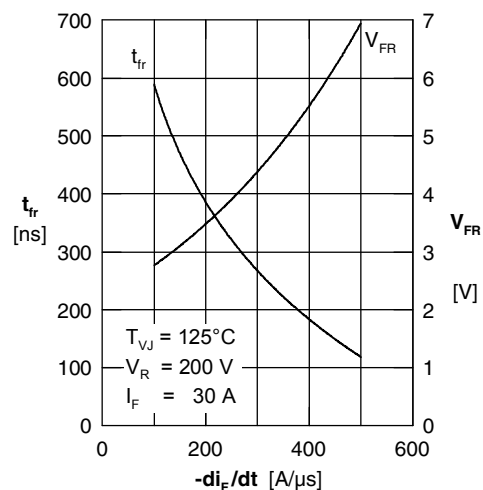


Fig. 6 Typ. forward recovery voltage V_{FR} & forward recovery time t_{fr} vs. di_F/dt

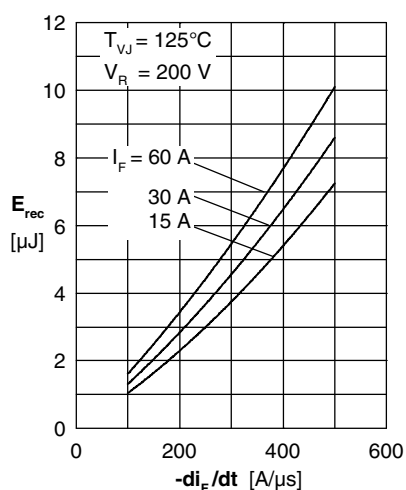


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

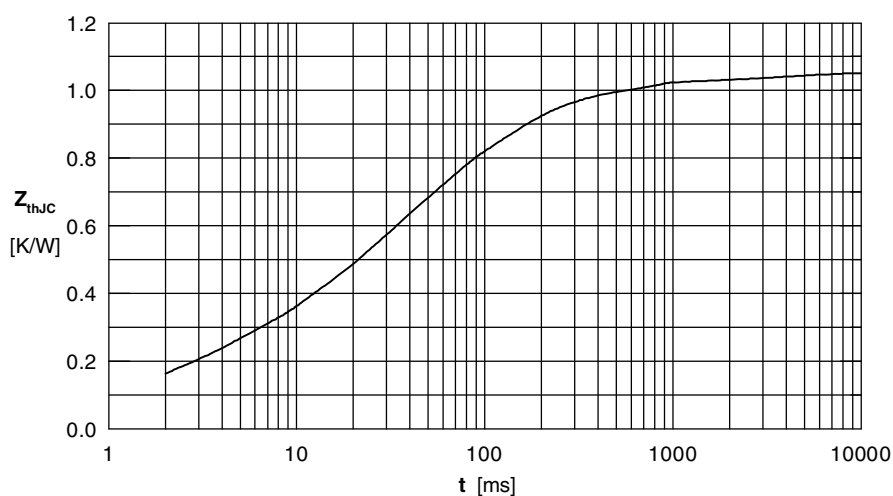


Fig. 8 Transient thermal impedance junction to case