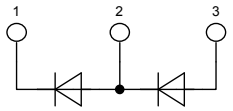
HiPerFRED²

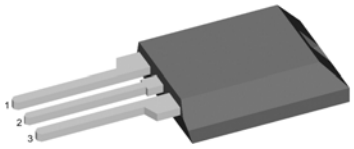
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Phase leg

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

Part number

DPG 10 P 400 PJ





Backside: isolated

E72873

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

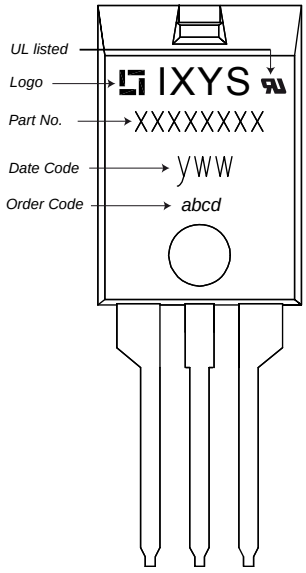
Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			400	V
I_R	*reverse current*	V_R = 400 V	T_{VJ} = 25°C			1	µA
		V_R = 400 V	T_{VJ} = 150°C			0.18	mA
V_F	*forward voltage*	I_F = 10 A	T_{VJ} = 25°C			1.28	V
		I_F = 20 A				1.48	V
		I_F = 10 A	T_{VJ} = 150°C			1.03	V
		I_F = 20 A				1.24	V
I_{FAV}	*average forward current*	rectangular d = 0.5	T_C = 145°C			10	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.80	V
r_F	*slope resistance* }					20	mΩ
R_{thJC}	*thermal resistance junction to case*					2.50	K/W
T_{VJ}	*virtual junction temperature*			-55		175	°C
P_{tot}	*total power dissipation*		T_C = 25°C			60	W
I_{FSM}	*max. forward surge current*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			130	A
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		4		A
		I_F = 15 A; V_R = 270 V	T_{VJ} = 125°C		5.5		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		45		ns
			T_{VJ} = 125°C		70		ns
C_J	*junction capacitance*	V_R = 200 V; f = 1 MHz	T_{VJ} = 25°C		16		pF

Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per pin [1]			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_S	*creapage distance on surface*					mm
d_A	*striking distance through air*					mm

[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

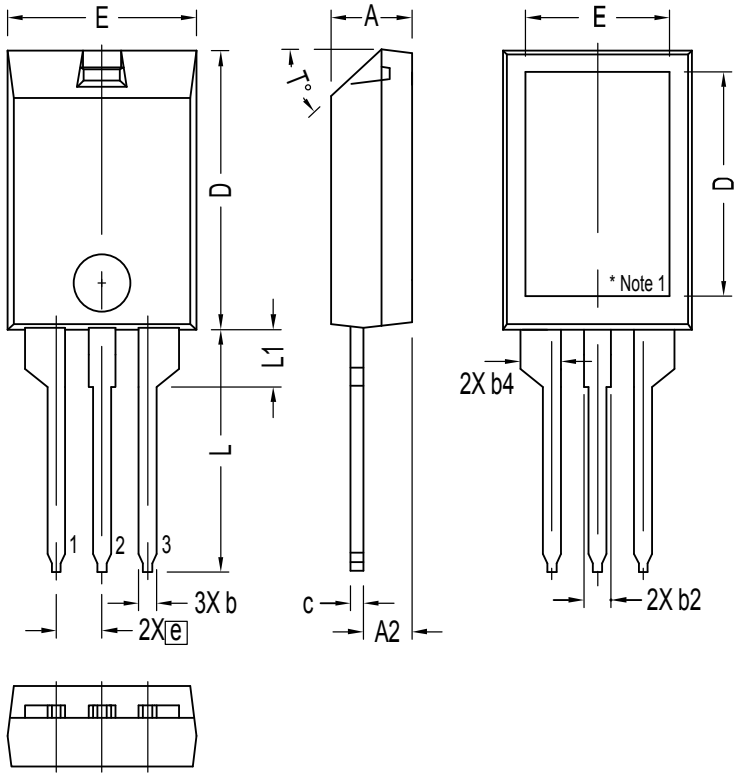


Part number

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

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 10 P 400 PJ	DPG10P400PJ	Tube	50	507202

Outlines ISOPLUS220



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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.

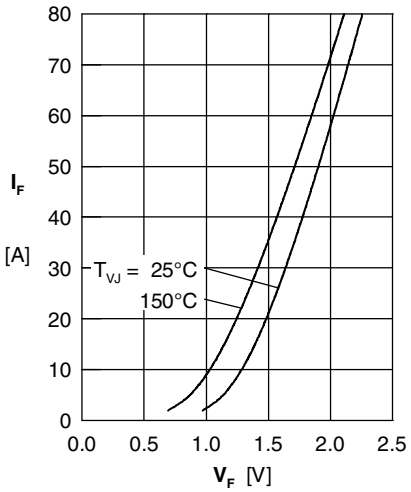


Fig. 1 Forward current I_F vs. V_F

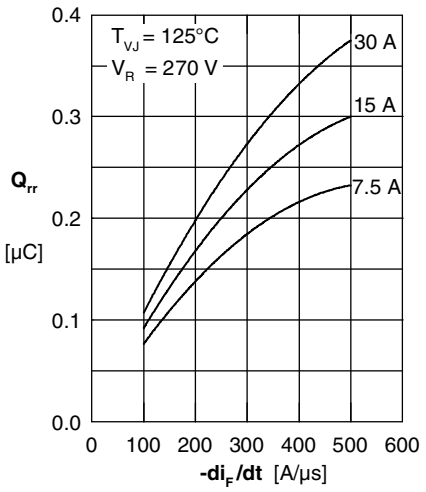


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

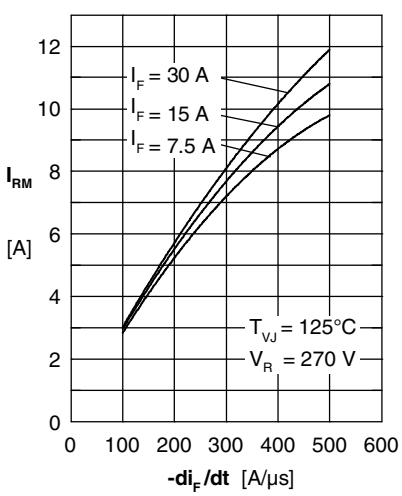


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

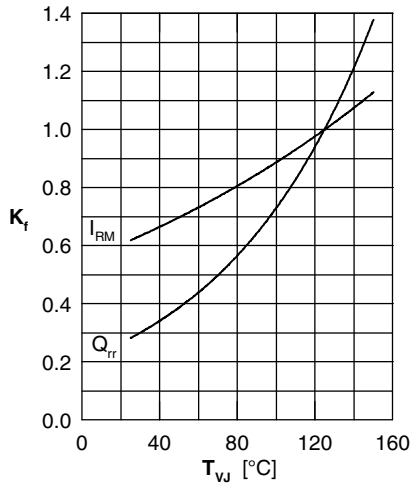


Fig. 4 Dynamic parameters Q_{rr}, I_{RM} versus T_{VJ}

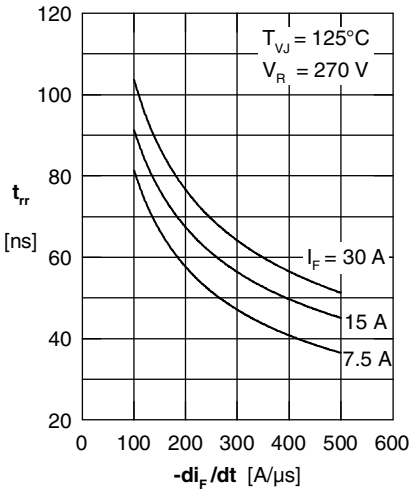


Fig. 5 Typ. recovery time t_{rr} vs. $-di_F/dt$

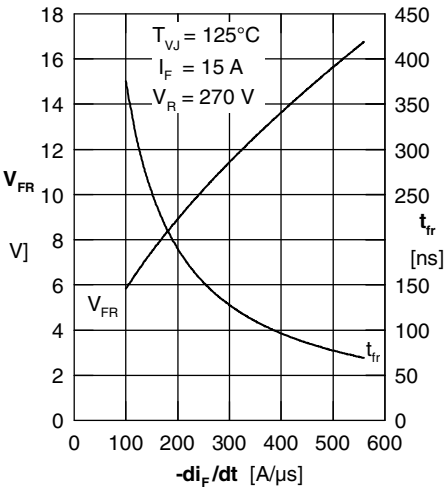


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

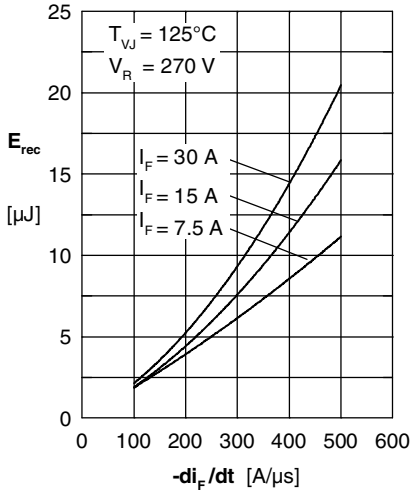


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

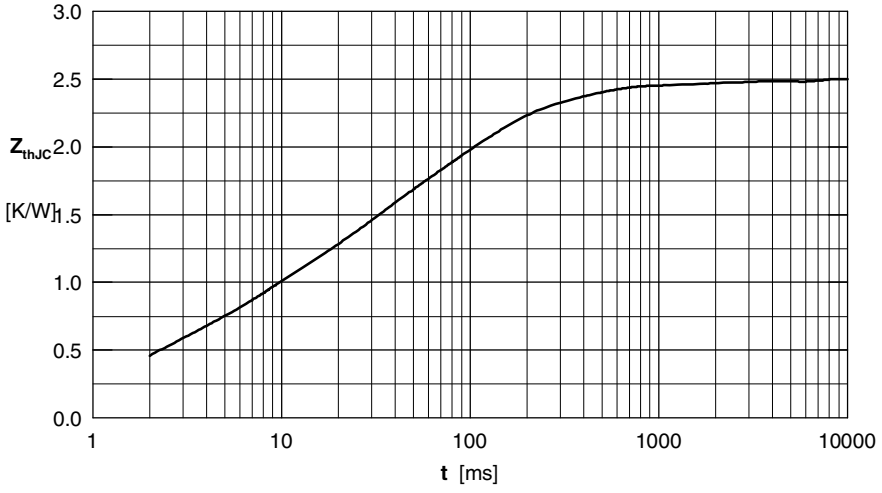


Fig. 8 Transient thermal resistance junction to case