

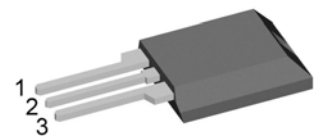
HiPerFRED²

$$\begin{aligned}
 V_{RRM} &= 2 \times 400 \text{ V} \\
 I_{FAV} &= 10 \text{ A} \\
 t_{rr} &= 45 \text{ ns}
 \end{aligned}$$

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

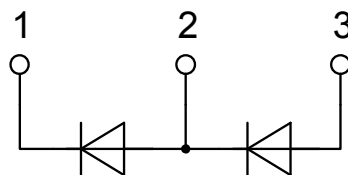
Part number

DPG10P400PJ



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:

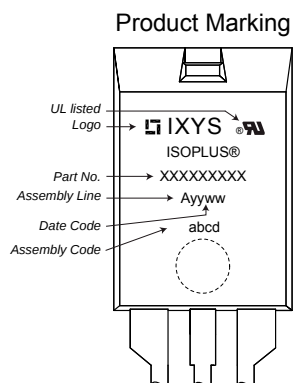
- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

Package: ISOPLUS220

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

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			0.18	mA
V _F	forward voltage drop	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			1.02	V
		I _F = 20 A				1.24	V
I _{FAV}	average forward current	T _C = 145°C	T _{VJ} = 175°C			10	A
		rectangular d = 0.5					
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 175°C		0.78	V
r _F	slope resistance					19.4	mΩ
R _{thJC}	thermal resistance junction to case					2.5	K/W
R _{thCH}	thermal resistance case to heatsink				0.50		K/W
P _{tot}	total power dissipation	T _C = 25°C				60	W
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		130	A
C _J	junction capacitance	V _R = 200 V f = 1 MHz		T _{VJ} = 25°C	16		pF
I _{RM}	max. reverse recovery current	} I _F = 15 A; V _R = 270 V -di _F /dt = 200 A/μs		T _{VJ} = 25°C	4		A
				T _{VJ} = 125°C	5.5		A
t _{rr}	reverse recovery time			T _{VJ} = 25°C	45		ns
				T _{VJ} = 125°C	70		ns

Package ISOPLUS220			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
$d_{Spp/App}$	creepage distance on surface striking distance through air	terminal to terminal	1.0			mm
$d_{Spbl/Apb}$		terminal to backside	3.0			mm
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V



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 Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG10P400PJ	DPG10P400PJ	Tube	50	507202

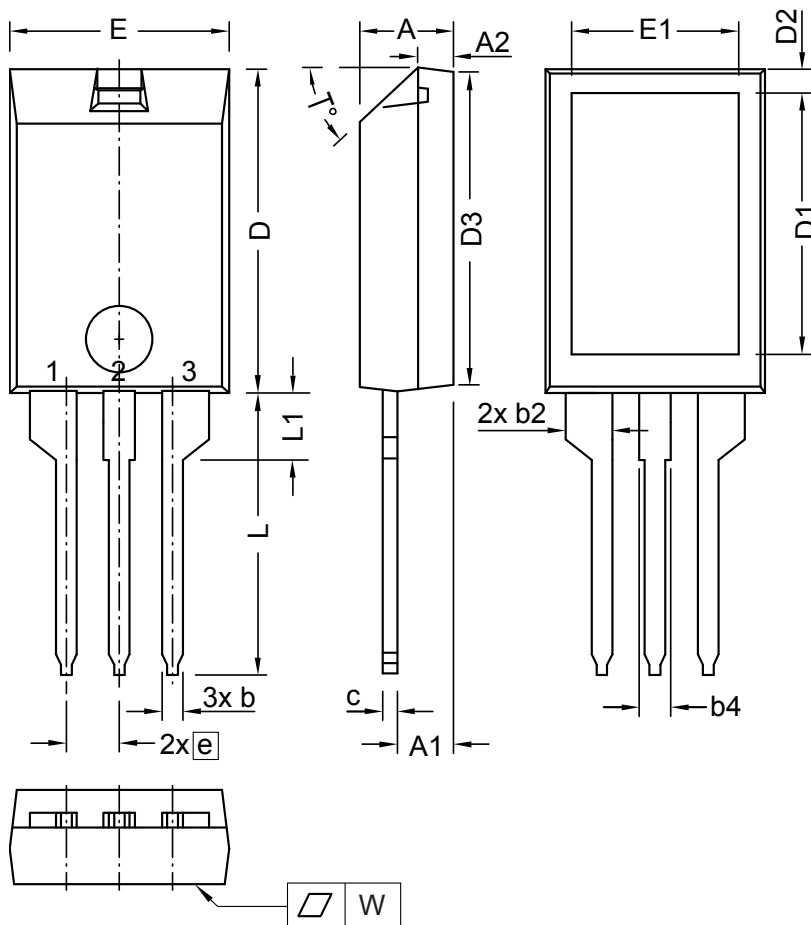
Equivalent Circuits for Simulation

* on die level

 $T_{VJ} = 175^{\circ}\text{C}$

			Fast Diode	
$V_{0\max}$	threshold voltage	0.78		V
$R_{0\max}$	slope resistance *	16.2		mΩ

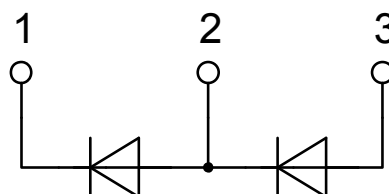
Outlines ISOPLUS220



Dim.	Millimeters		Inches	
	min	max	min	max
A	4.00	5.00	0.157	0.197
A1	2.50	3.00	0.098	0.118
A2	1.60	1.80	0.063	0.071
b	0.90	1.30	0.035	0.051
b2	2.35	2.55	0.093	0.100
b4	1.25	1.65	0.049	0.065
c	0.70	1.00	0.028	0.039
D	15.00	16.00	0.591	0.630
D1	12.00	13.00	0.472	0.512
D2	1.10	1.50	0.043	0.059
D3	14.90	15.50	0.587	0.610
E	10.00	11.00	0.394	0.433
E1	7.50	8.50	0.295	0.335
e	2.54 BSC		0.100 BSC	
L	13.00	14.50	0.512	0.571
L1	3.00	3.50	0.118	0.138
T°	42.5	47.5		
W	-	0.1	-	0.004

Die konvexe Form des Substrates ist typ. < 0.04 mm über der Kunststoffoberfläche der Bauteilunterseite
The convex bow of substrate is typ. < 0.04 mm over plastic surface level of device bottom side

Die Gehäuseabmessungen entsprechen dem Typ TO-273 gemäß JEDEC außer D und D1.
This drawing will meet all dimensions requirement of JEDEC outline TO-273 except D and D1.



Fast Diode

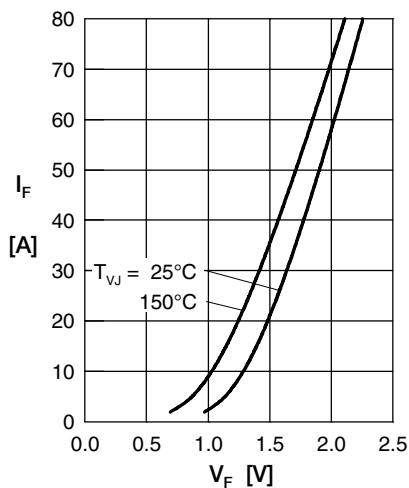


Fig. 1 Forward current I_F versus V_F

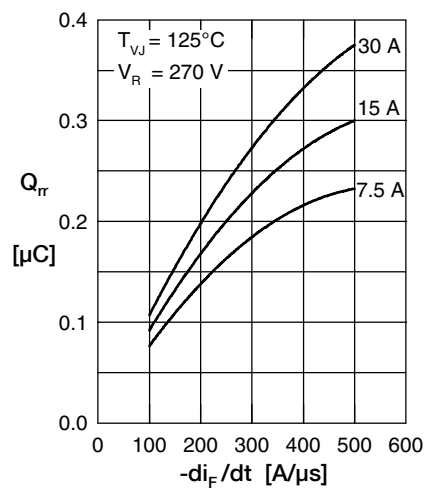


Fig. 2 Typ. reverse recov. charge Q_{rr} versus $-di_F/dt$

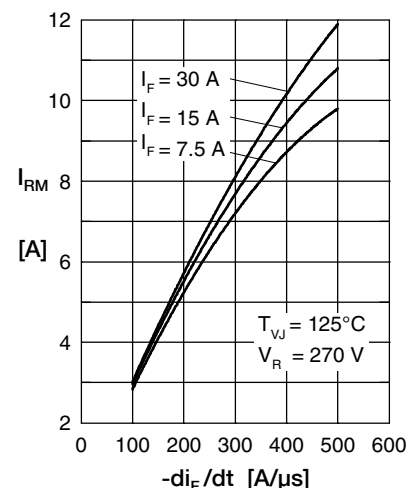


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

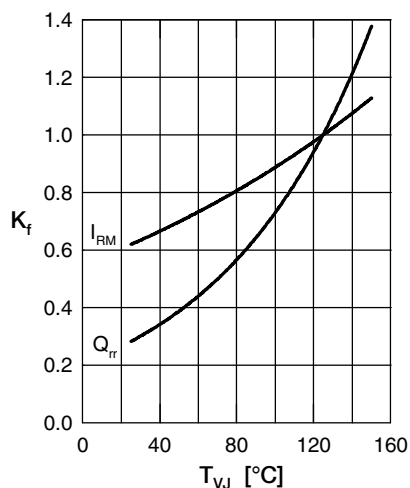


Fig. 4 Typ. dynamic parameters Q_{rr} , I_{RM} versus T_{VJ}

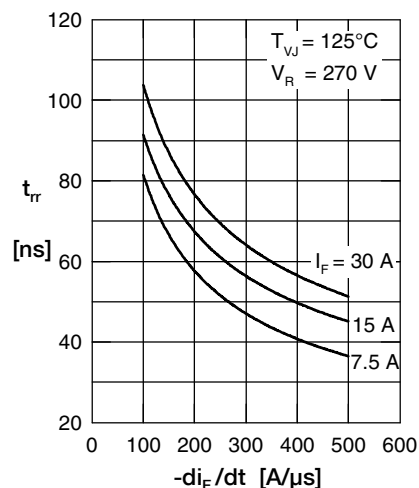


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

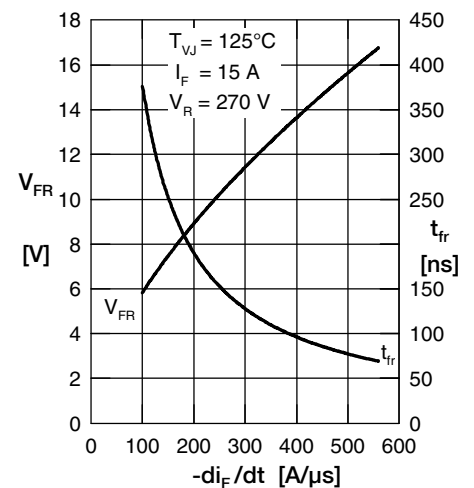


Fig. 6 Typ. peak forward voltage V_{FR} and t_{rr} versus di_F/dt

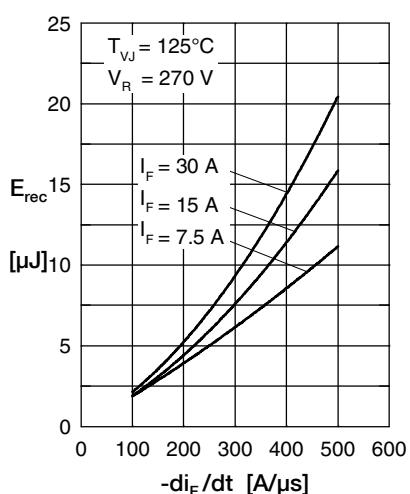


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

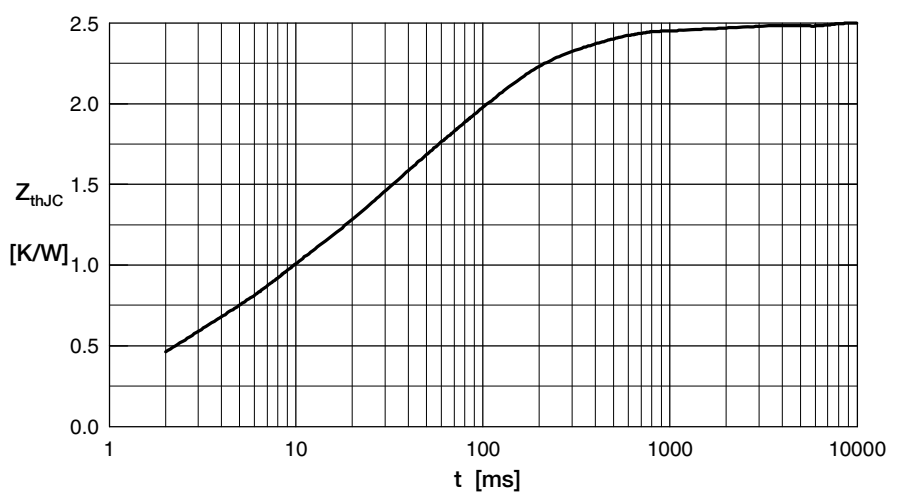


Fig. 8 Transient thermal resistance junction to case