

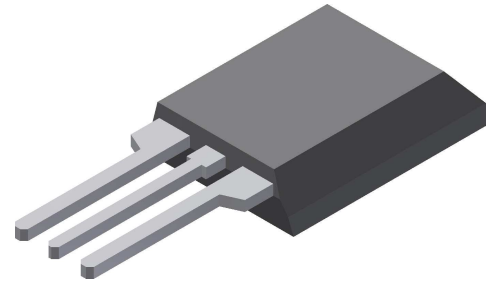
HiPerFRED

$V_{RRM} = 2 \times 400 \text{ V}$
 $I_{FAV} = 30 \text{ A}$
 $t_{rr} = 45 \text{ ns}$

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

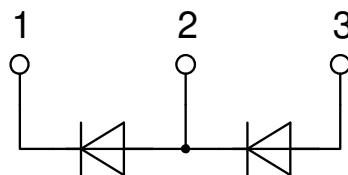
Part number

DPG30P400PJ



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

Disclaimer Notice

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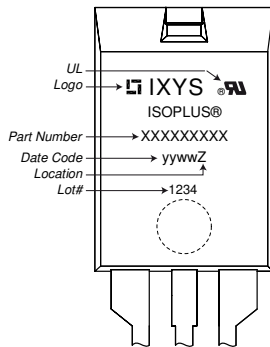


Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					400	V
V_{RRM}	max. repetitive reverse blocking voltage					400	V
I_R	reverse current, drain current	$V_R = 400\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		1	μA
		$V_R = 400\text{ V}$		$T_{VJ} = 150^\circ\text{C}$		0.2	mA
V_F	forward voltage drop	$I_F = 30\text{ A}$		$T_{VJ} = 25^\circ\text{C}$		1.35	V
		$I_F = 60\text{ A}$				1.57	V
		$I_F = 30\text{ A}$		$T_{VJ} = 150^\circ\text{C}$		1.05	V
		$I_F = 60\text{ A}$				1.30	V
I_{FAV}	average forward current	$T_C = 135^\circ\text{C}$	rectangular	$T_{VJ} = 175^\circ\text{C}$		30	A
V_{FO}	threshold voltage	} for power loss calculation only		$T_{VJ} = 175^\circ\text{C}$		0.75	V
r_F	slope resistance					8.5	m Ω
R_{thJC}	thermal resistance junction to case					1.05	K/W
R_{thCH}	thermal resistance case to heatsink				0.5		K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		145	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$		$T_{VJ} = 45^\circ\text{C}$		400	A
C_J	junction capacitance	$V_R = 200\text{ V}$ $f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		46	pF
I_{RM}	max. reverse recovery current	} $I_F = 30\text{ A}; V_R = 200\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		4	A
				$T_{VJ} = 125^\circ\text{C}$		8.5	A
t_{rr}	reverse recovery time	} $-di_F/dt = 200\text{ A}/\mu\text{s}$		$T_{VJ} = 25^\circ\text{C}$		45	ns
				$T_{VJ} = 125^\circ\text{C}$		75	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
$d_{Spb/Apb}$		terminal to backside	3.0			mm
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V

Product Marking



Part description

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

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG30P400PJ	DPG30P400PJ	Tube	50	521195

Similar Part	Package	Voltage class
DPG30P300PJ	ISOPLUS220 (3)	300

Equivalent Circuits for Simulation

* on die level

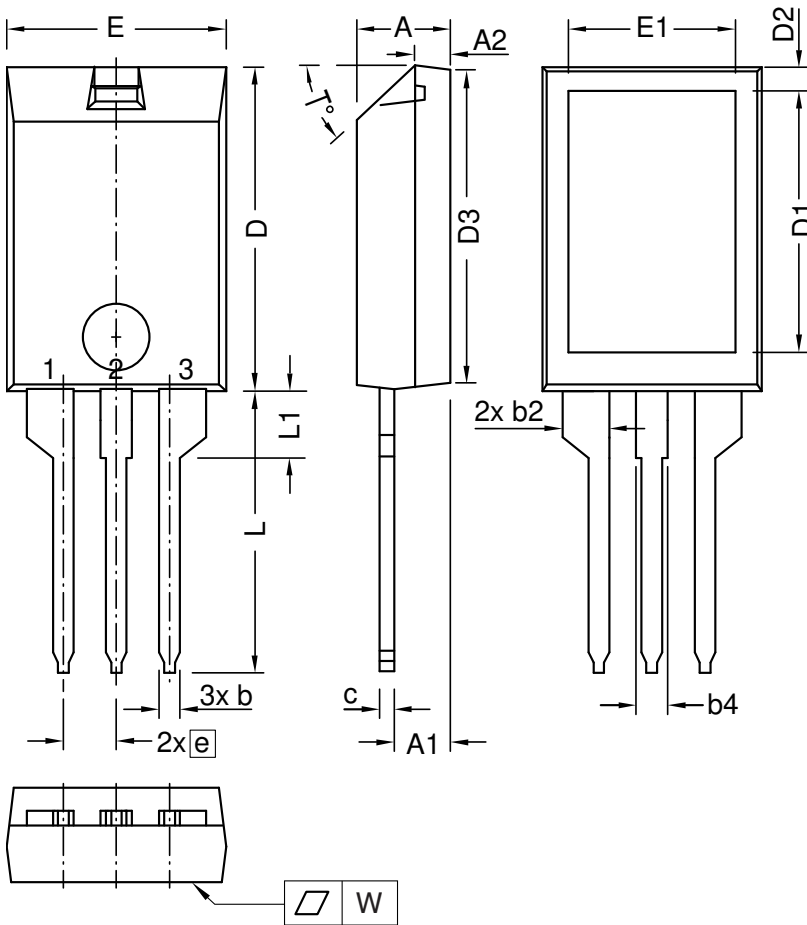
$T_{VJ} = 175^{\circ}C$



Symbol	Definition	Value	Unit
$V_{0\ max}$	threshold voltage	0.75	V
$R_{0\ max}$	slope resistance *	5.3	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.



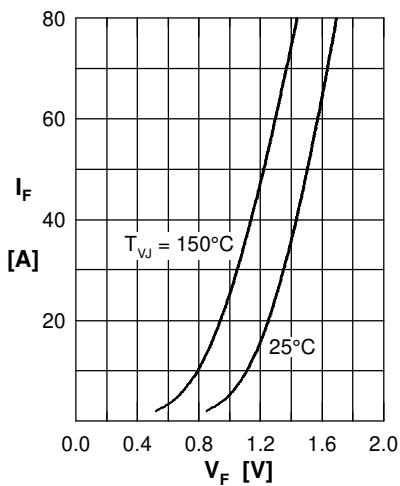
Fast Diode


Fig. 1 Forward current I_F versus V_F

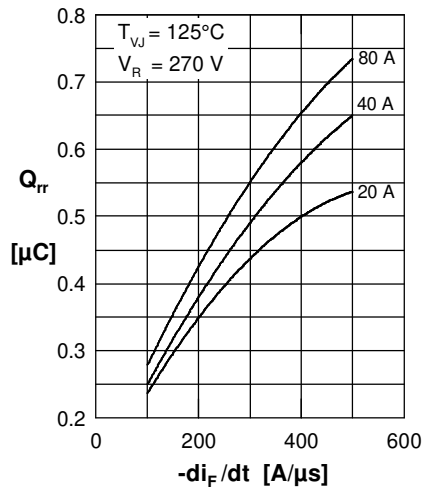


Fig. 2 Typ. reverse recov. charge Q_{rr} versus $-di_F/dt$

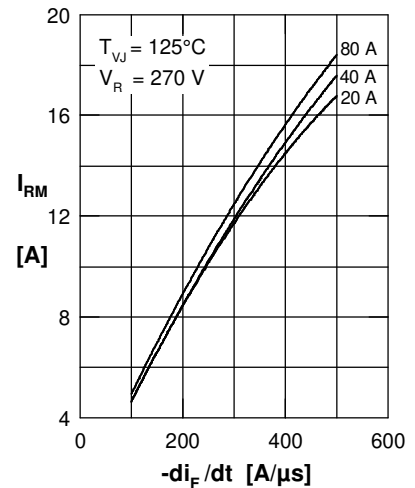


Fig. 3 Typ. reverse recov. current I_{RM} versus $-di_F/dt$

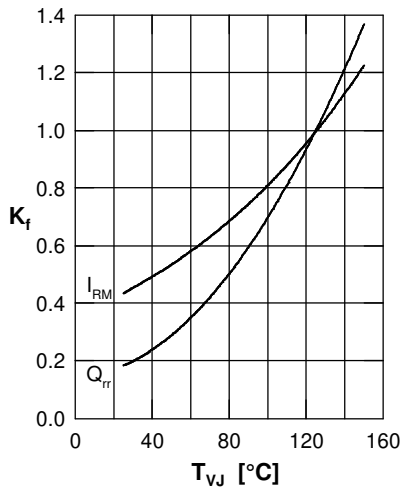


Fig. 4 Typ. dynamic parameters Q_{rr} , I_{RM} versus T_{VJ}

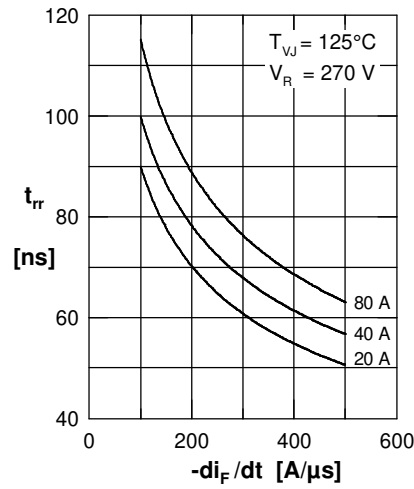


Fig. 5 Typ. reverse recov. time t_{rr} versus $-di_F/dt$

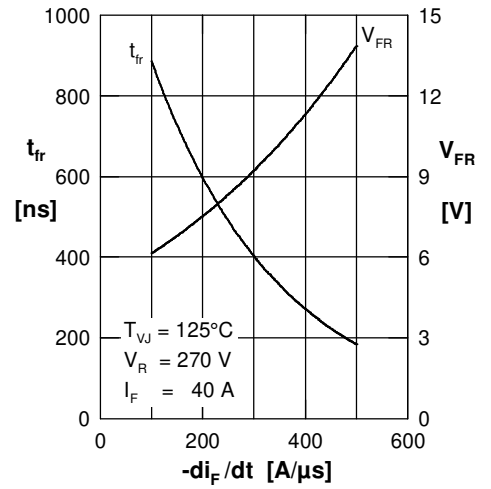


Fig. 6 Typ. forward recovery voltage V_{FR} & time t_{fr} versus di_F/dt

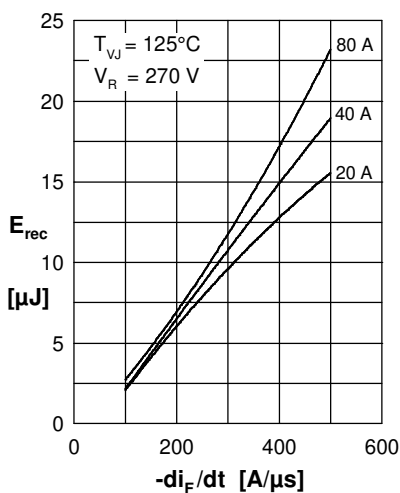


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

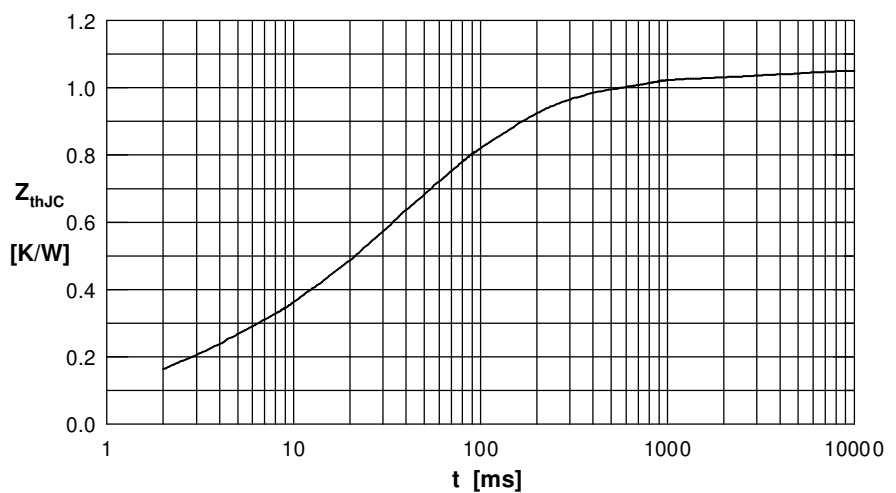


Fig. 8 Transient thermal impedance junction to case