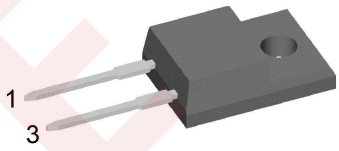
HiPerFRED²

V_{RRM}	=	200 V
I_{FAV}	=	10 A
t_{rr}	=	35 ns

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

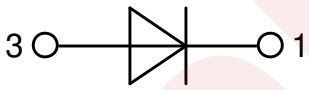
Part number

DPG10I200PM



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: TO-220FP

- Isolation Voltage: 2500 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Base plate: Plastic overmolded tab
- Reduced weight

Disclaimer Notice

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Fast Diode

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			200	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			200	V
I_R	*reverse current, drain current*	V_R = 200 V	T_{VJ} = 25°C			1	µA
		V_R = 200 V	T_{VJ} = 150°C			0.06	mA
V_F	*forward voltage drop*	I_F = 10 A	T_{VJ} = 25°C			1.27	V
		I_F = 20 A				1.45	V
		I_F = 10 A	T_{VJ} = 150°C			0.98	V
		I_F = 20 A				1.17	V
I_{FAV}	*average forward current*	T_C = 125°C	T_{VJ} = 175°C			10	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.74	V
r_F	*slope resistance* }					17.7	mΩ
R_{thJC}	*thermal resistance junction to case*					4.4	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.5		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			35	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			140	A
C_J	*junction capacitance*	V_R = 150 V f = 1 MHz	T_{VJ} = 25°C		15		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		3		A
		I_F = 10 A; V_R = 130 V	T_{VJ} = 125°C		5.5		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		35		ns
			T_{VJ} = 125°C		45		ns

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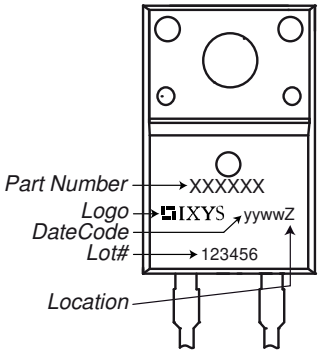
Package TO-220FP					Ratings			
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal					35	A
T_{VJ}	*virtual junction temperature*				-55		175	°C
T_{op}	*operation temperature*				-55		150	°C
T_{stg}	*storage temperature*				-55		150	°C
Weight						2		g
M_D	*mounting torque*				0.4		0.6	Nm
F_C	*mounting force with clip*				20		60	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	3.2	2.7			mm
$d_{Spb/Apb}$			*terminal to backside*	2.5	2.5			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA		2500			V
		t = 1 minute			2100			V

Product Marking



Part description

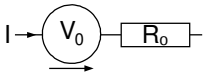
D = Diode
P = HiPerFRED
G = extreme fast
10 = Current Rating [A]
I = Single Diode
200 = Reverse Voltage [V]
PM = TO-220ACFP (2)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG10I200PM	DPG10I200PM	Tube	50	503771

Similar Part	Package	Voltage class
DPG10I200PA	TO-220AC (2)	200

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 175°C



		Fast Diode	
$V_{0\ max}$	*threshold voltage*	0.74	V
$R_{0\ max}$	*slope resistance **	14.5	mΩ

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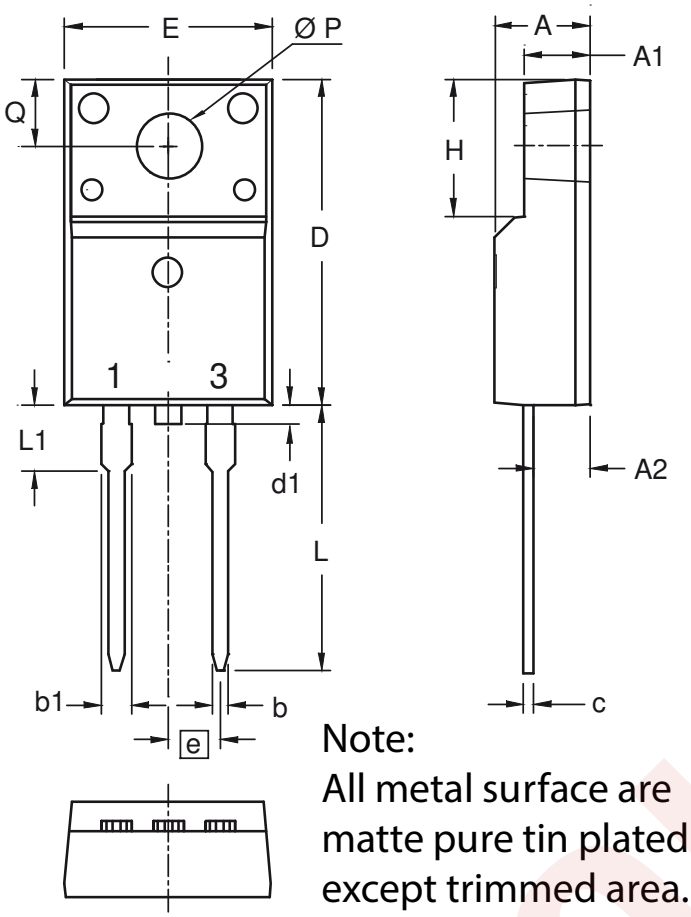
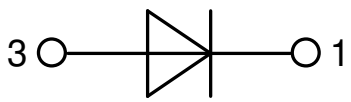
Outlines TO-220FP



Note:
All metal surface are matte pure tin plated except trimmed area.

Dim.	Millimeters		Inches	
	min	max	min	max
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.56	2.96	0.101	0.117
b	0.70	0.90	0.028	0.035
b1	1.27	1.47	0.050	0.058
c	0.45	0.60	0.018	0.024
D	15.67	16.07	0.617	0.633
d1	0	1.10	0	0.043
E	9.96	10.36	0.392	0.408
e	2.54 BSC		0.100 BSC	
H	6.48	6.88	0.255	0.271
L	12.68	13.28	0.499	0.523
L1	3.03	3.43	0.119	0.135
Ø P	3.08	3.28	0.121	0.129
Q	3.20	3.40	0.126	0.134



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Fast Diode

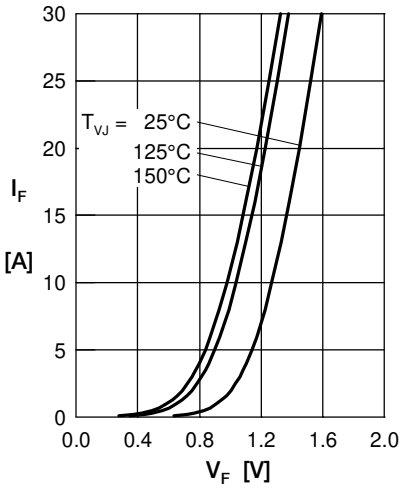

Fig. 1 Forward current I_F versus V_F

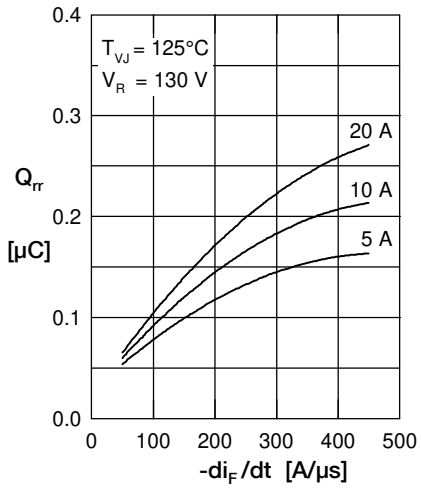

Fig. 2 Typ. reverse recov. charge Q_{rr} versus $-di_F/dt$

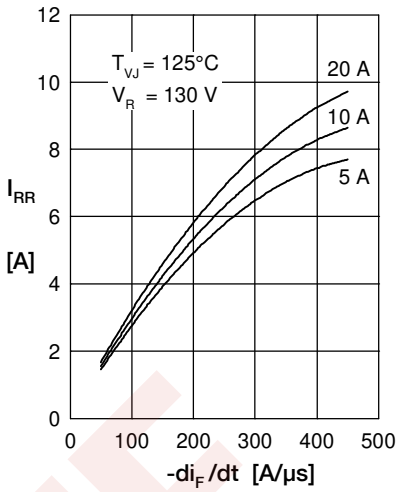

Fig. 3 Typ. reverse recov. current I_{RR} versus $-di_F/dt$

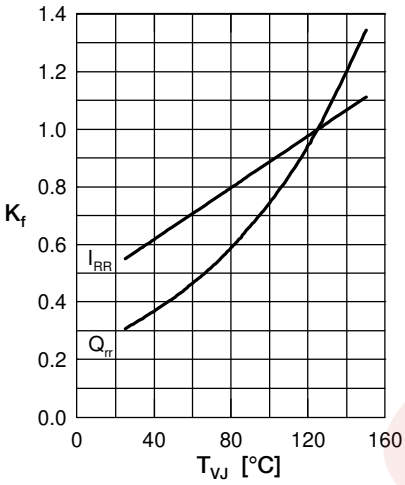

Fig. 4 Typ. dynamic parameters Q_{rr}, I_{RR} versus T_{VJ}

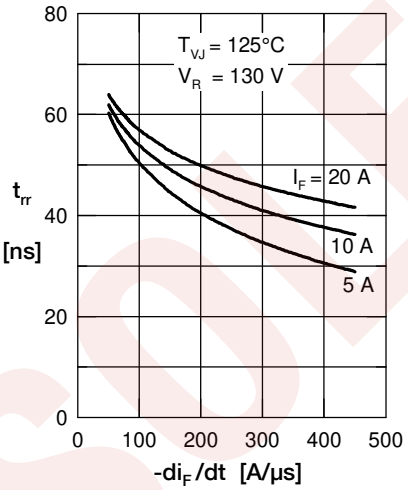

Fig. 5 Typ. reverse recov. time t_{rr} versus $-di_F/dt$

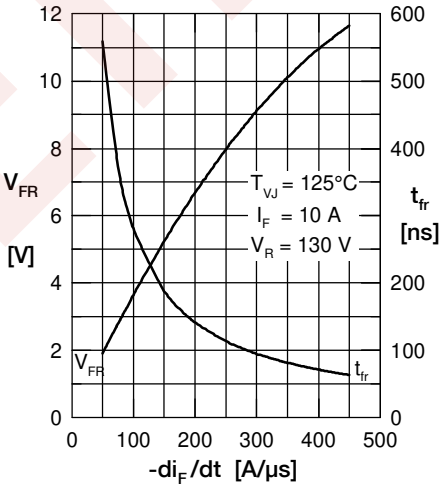

Fig. 6 Typ. forward recov. voltage V_{FR} and t_{fr} versus di_F/dt

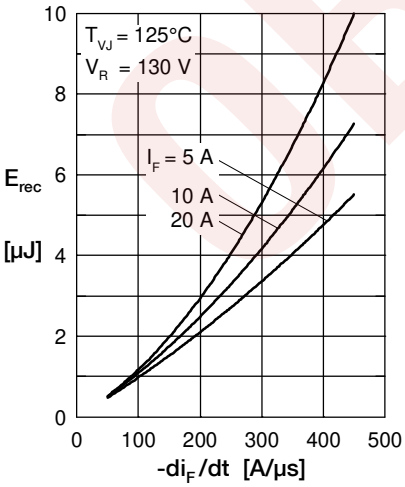

Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

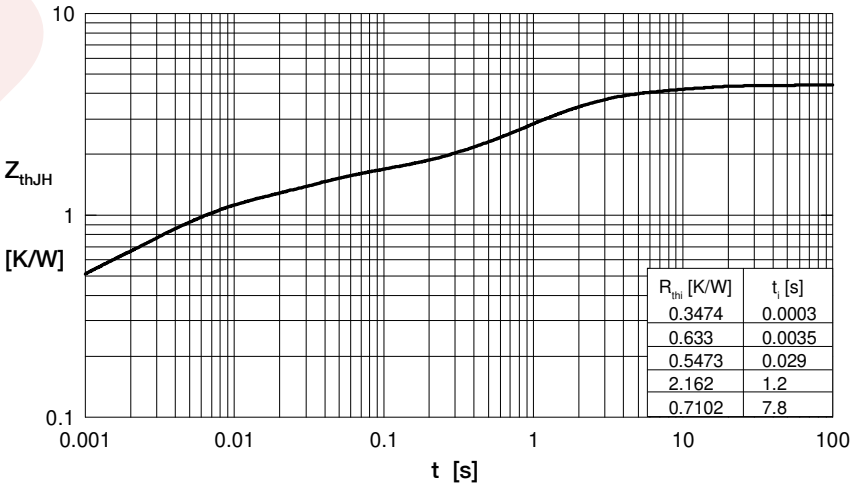

Fig. 8 Transient thermal resistance junction to case

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