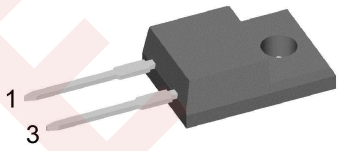
HiPerFRED²

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

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

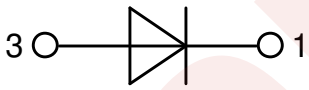
Part number

DPG10I400PM



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

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Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

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Fast Diode

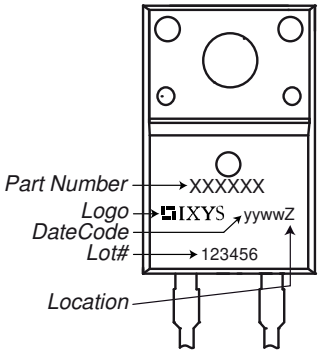
Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			400	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			400	V
I_R	*reverse current, drain current*	V_R = 400 V	T_{VJ} = 25°C			1	µA
		V_R = 400 V	T_{VJ} = 150°C			0.15	mA
V_F	*forward voltage drop*	I_F = 10 A	T_{VJ} = 25°C			1.32	V
		I_F = 20 A				1.51	V
		I_F = 10 A	T_{VJ} = 150°C			1.03	V
		I_F = 20 A				1.24	V
I_{FAV}	*average forward current*	T_C = 125°C rectangular d = 0.5	T_{VJ} = 175°C			10	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.77	V
r_F	*slope resistance* }					19.8	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			150	A
C_J	*junction capacitance*	V_R = 150 V f = 1 MHz	T_{VJ} = 25°C		12		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25 °C		4		A
		I_F = 10 A; V_R = 270 V	T_{VJ} = 125 °C		6		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25 °C		45		ns
			T_{VJ} = 125 °C		65		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

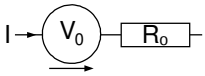
D = Diode
P = HiPerFRED
G = extreme fast
10 = Current Rating [A]
I = Single Diode
400 = Reverse Voltage [V]
PM = TO-220ACFP (2)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG10I400PM	DPG10I400PM	Tube	50	503778

Similar Part	Package	Voltage class
DPG10I400PA	TO-220AC (2)	400

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 175°C

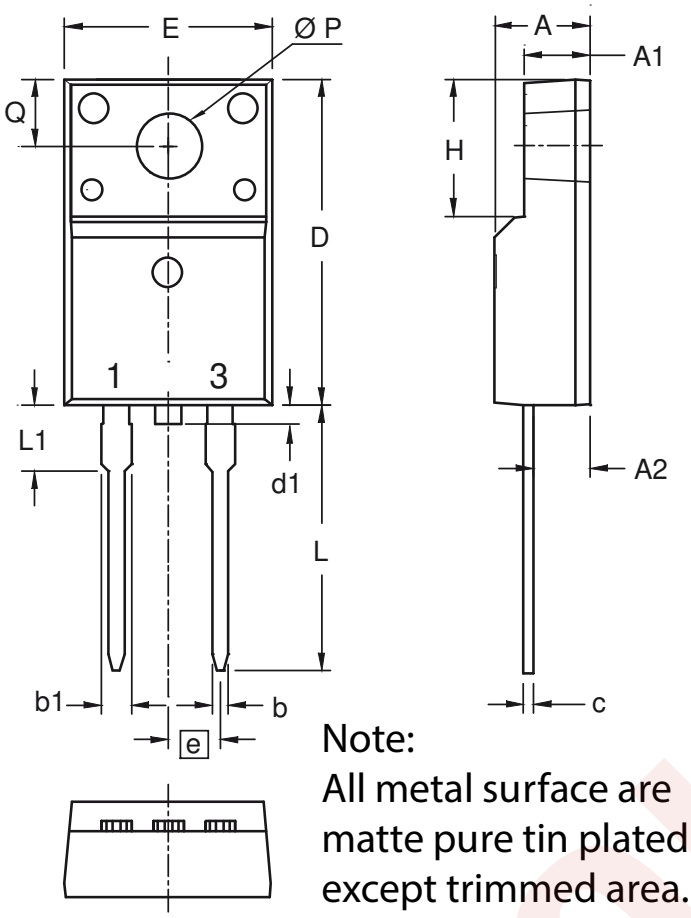


		Fast Diode	
$V_{0\ max}$	*threshold voltage*	0.77	V
$R_{0\ max}$	*slope resistance **	16.6	mΩ

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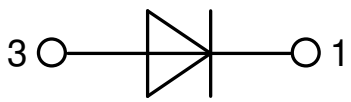
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Outlines TO-220FP



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

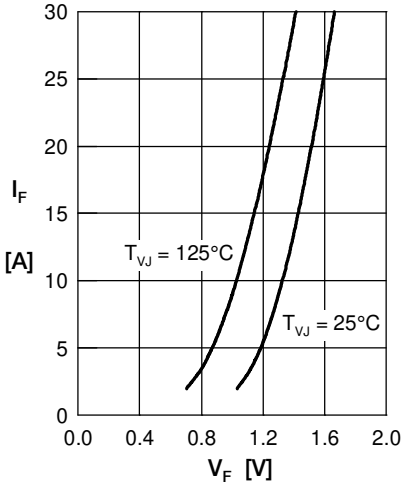


Fig. 1 Forward current I_F versus V_F

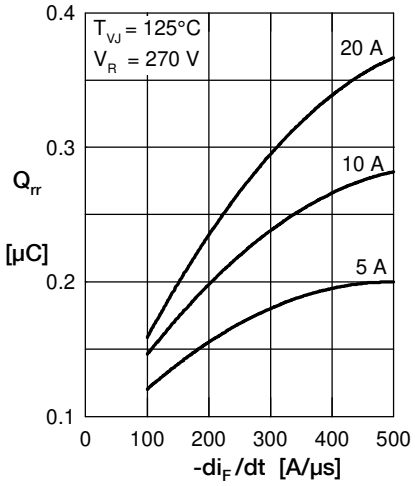


Fig. 2 Typ. reverse recov. charge Q_{rr} versus $-di_F/dt$

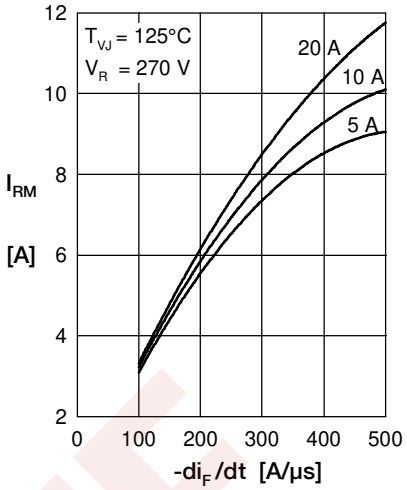


Fig. 3 Typ. reverse recov. current I_{RM} versus $-di_F/dt$

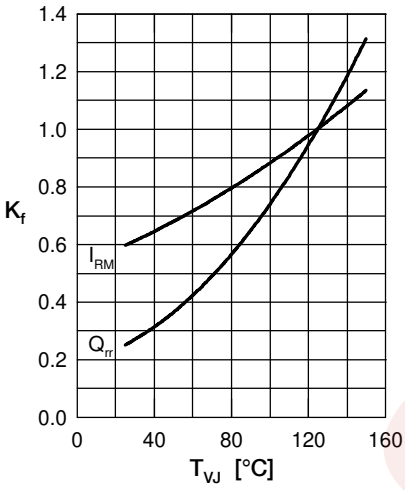


Fig. 4 Typ. dynamic parameters Q_{rr}, I_{RM} versus T_{VJ}

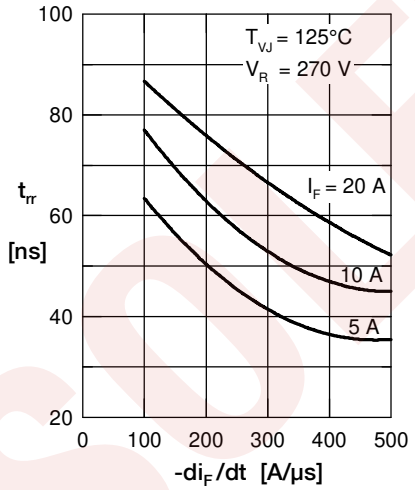


Fig. 5 Typ. reverse recov. time t_{rr} versus $-di_F/dt$

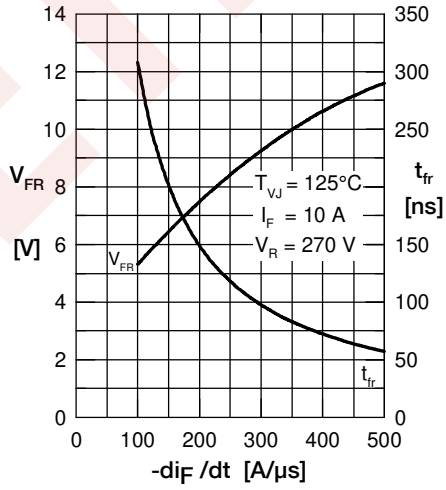


Fig. 6 Typ. forward recovery voltage V_{FR} and t_{fr} versus di_F/dt

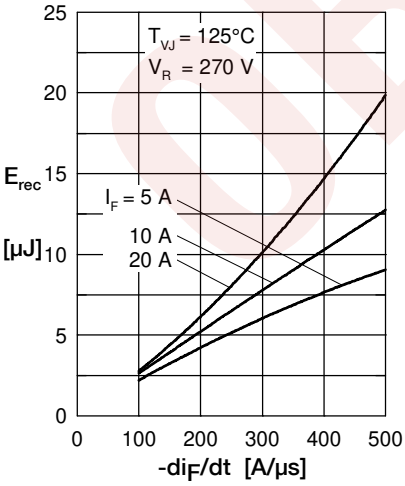


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

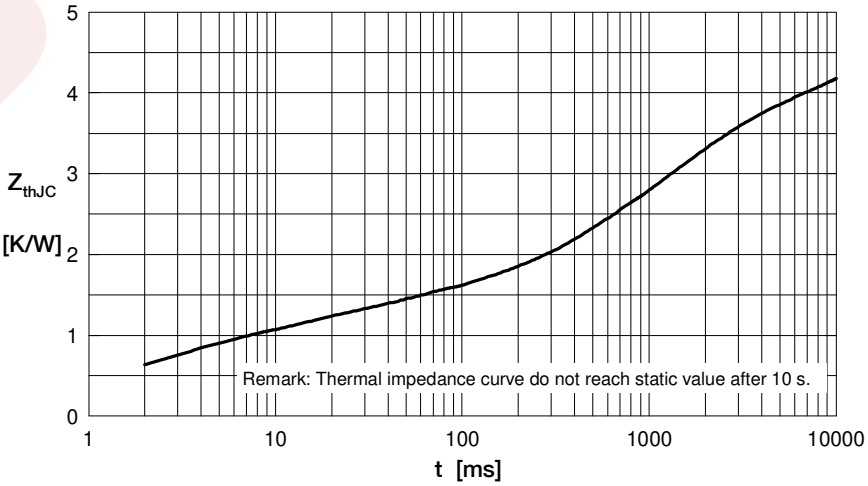


Fig. 8 Transient thermal resistance junction to case

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