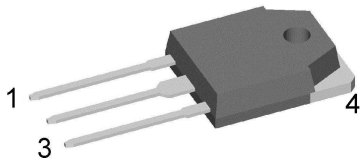
HiPerFRED²

V_{RRM}	=	300 V
I_{FAV}	= 2x	60 A
t_{rr}	=	35 ns

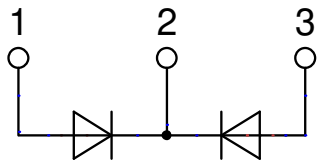
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Common Cathode

Part number

DPG120C300QB



Backside: cathode



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-3P

- Industry standard outline compatible with TO-247
- RoHS compliant
- Epoxy meets UL 94V-0

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			300	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			300	V
I_R	*reverse current, drain current*	V_R = 300 V	T_{VJ} = 25°C			1	µA
		V_R = 300 V	T_{VJ} = 150°C			0.35	mA
V_F	*forward voltage drop*	I_F = 60 A	T_{VJ} = 25°C			1.40	V
		I_F = 120 A				1.72	V
		I_F = 60 A	T_{VJ} = 125°C			1.10	V
		I_F = 120 A				1.45	V
I_{FAV}	*average forward current*	T_C = 130°C	T_{VJ} = 175°C			60	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.69	V
r_F	*slope resistance* }					5.8	mΩ
R_{thJC}	*thermal resistance junction to case*					0.55	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.3		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			275	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			450	A
C_J	*junction capacitance*	V_R = 150 V f = 1 MHz	T_{VJ} = 25°C		80		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25 °C		3.5		A
		I_F = 60 A; V_R = 200 V	T_{VJ} = 125 °C		9		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25 °C		35		ns
			T_{VJ} = 125 °C		65		ns

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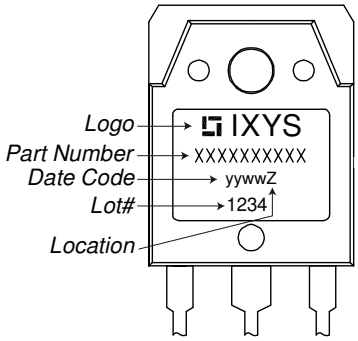
Package TO-3P			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal [1]			70	A
T_{VJ}	*virtual junction temperature*		-55		175	°C
T_{op}	*operation temperature*		-55		150	°C
T_{stg}	*storage temperature*		-55		150	°C
Weight				5		g
M_D	*mounting torque*		0.8		1.2	Nm
F_C	*mounting force with clip*		20		120	N

Product Marking

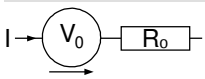


Part description

D = Diode
P = HiPerFRED
G = extreme fast
120 = Current Rating [A]
C = Common Cathode
300 = Reverse Voltage [V]
QB = TO-3P (3)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG120C300QB	DPG120C300QB	Tube	30	503821

Equivalent Circuits for Simulation ** on die level* T_{VJ} = 175°C



		Fast Diode	
$V_{0\,max}$	*threshold voltage*	0.69	V
$R_{0\,max}$	*slope resistance **	3.2	mΩ

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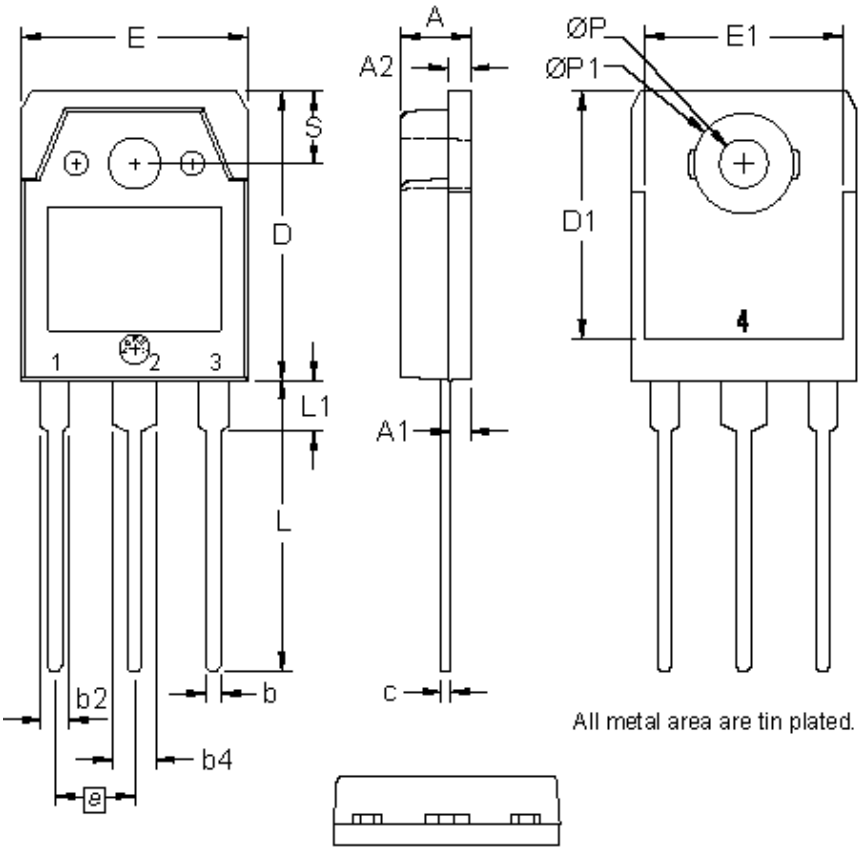
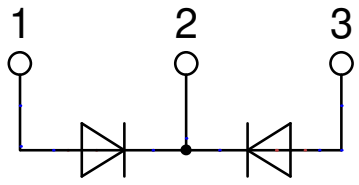
Outlines TO-3P



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.70	4.90	0.185	0.193
A1	1.30	1.50	0.051	0.059
A2	1.45	1.65	0.057	0.065
b	0.90	1.15	0.035	0.045
b2	1.90	2.20	0.075	0.087
b4	2.90	3.20	0.114	0.126
c	0.55	0.80	0.022	0.031
D	19.80	20.10	0.780	0.791
D1	16.90	17.20	0.665	0.677
E	15.50	15.80	0.610	0.622
E1	13.50	13.70	0.531	0.539
e	5.45 BSC		0.215 BSC	
L	19.80	20.20	0.780	0.795
L1	3.40	3.60	0.134	0.142
Ø P	3.20	3.40	0.126	0.134
ØP1	6.90	7.10	0.272	0.280
S	4.90	5.10	0.193	0.201



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Fast Diode

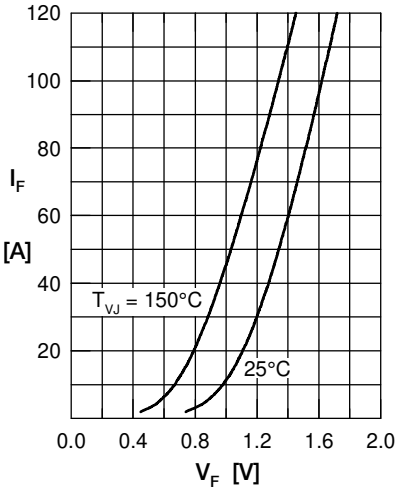

Fig. 1 Forward current I_F versus V_F

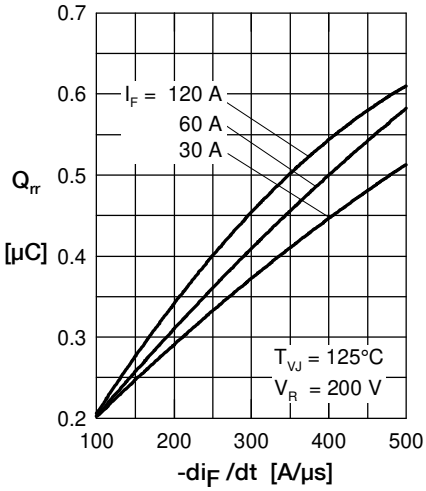

Fig. 2 Typ. reverse recov. charge Q_{rr} versus $-di_F/dt$

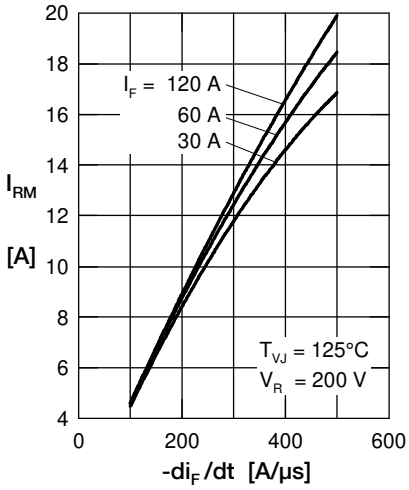

Fig. 3 Typ. reverse recov. current I_{RM} versus $-di_F/dt$

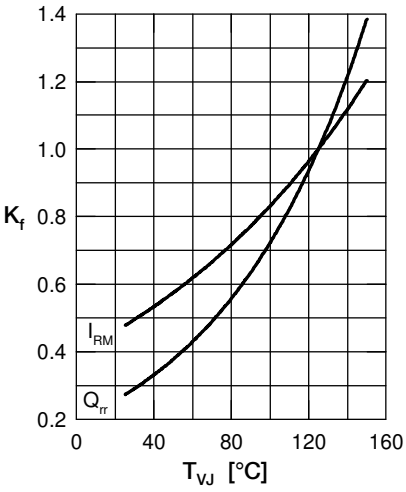

Fig. 4 Typ. dynamic parameters Q_{rr}, I_{RM} versus T_{VJ}

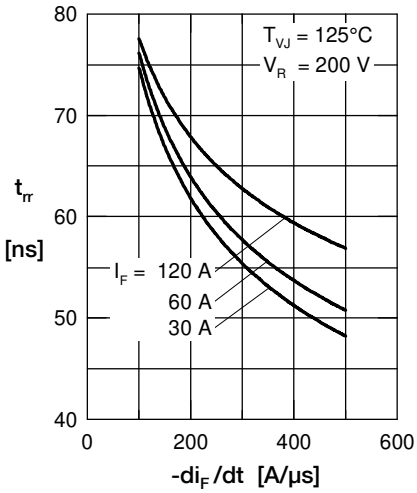

Fig. 5 Typ. reverse recov. time t_{rr} versus $-di_F/dt$

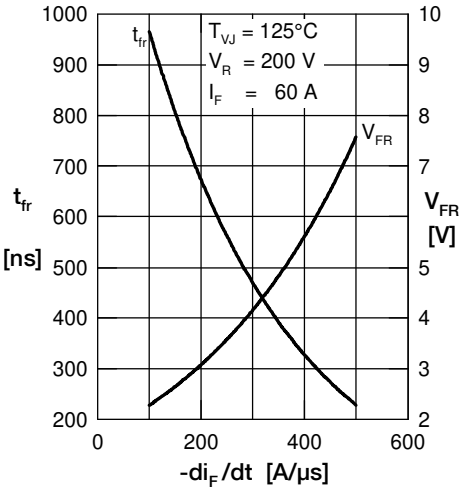

Fig. 6 Typ. forward recov. voltage V_{FR} & time t_{fr} versus di_F/dt

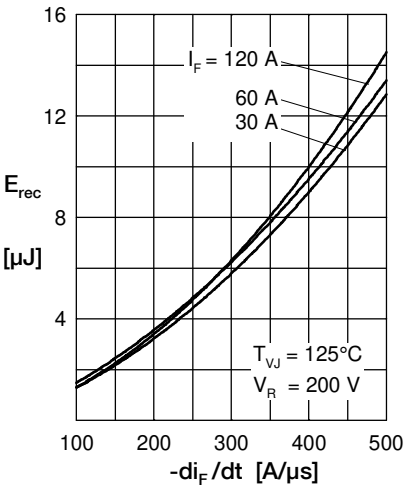

Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

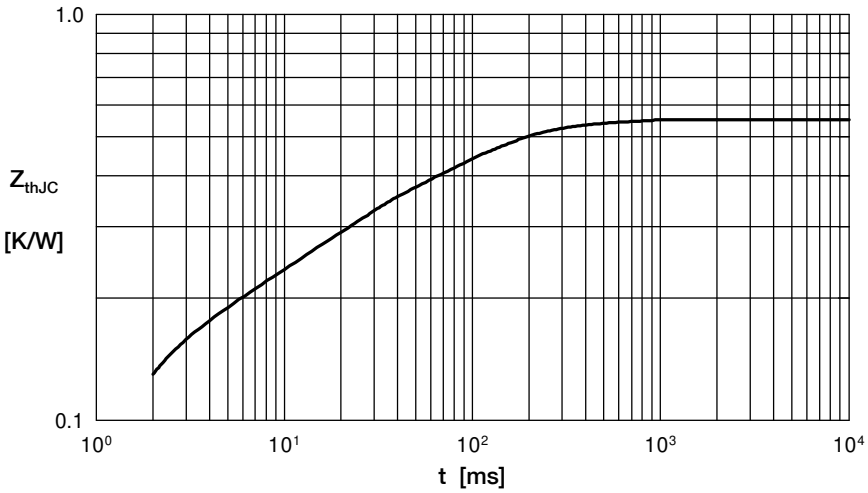

Fig. 8 Transient thermal impedance junction to case

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