

HiPerFRED

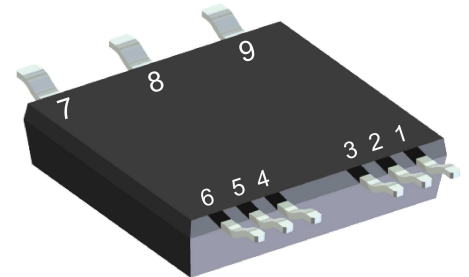
V_{RRM}	=	600 V
I_{DAV}	=	60 A
t_{rr}	=	40 ns

High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 1~ Rectifier Bridge

Part number

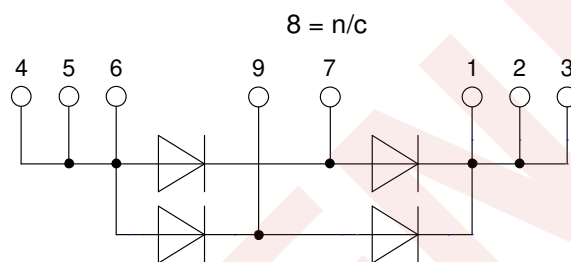
DPG60B600LB

Marking on Product: DPG60B600LB



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:

- Rectifiers in switch mode power supplies (SMPS)

Package: SMPD

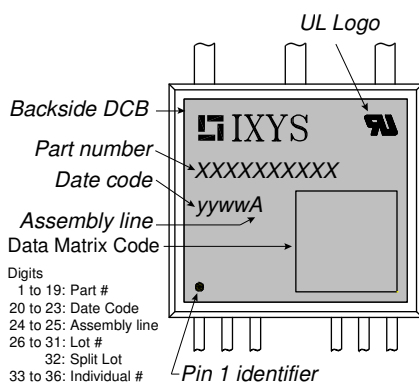
- Isolation Voltage: 3000 V~
- Industry convenient outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

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.

Fast Diode				Ratings				
Symbol	Definition	Conditions		min.	typ.	max.	Unit	
V _{RSM}	max. non-repetitive reverse blocking voltage	T _{VJ} = 25°C				600	V	
V _{RRM}	max. repetitive reverse blocking voltage	T _{VJ} = 25°C				600	V	
I _R	reverse current, drain current	V _R = 600 V	T _{VJ} = 25°C			250	μA	
		V _R = 600 V	T _{VJ} = 150°C			2	mA	
V _F	forward voltage drop	I _F = 30 A	T _{VJ} = 25°C			2.51	V	
		I _F = 60 A				3.19	V	
		I _F = 30 A	T _{VJ} = 150°C			1.59	V	
		I _F = 60 A				2.21	V	
I _{DAV}	bridge output current	T _C = 125°C rectangular d = 0.5	T _{VJ} = 175°C			60	A	
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 175°C		0.85	V	
r _F	slope resistance					17	mΩ	
R _{thJC}	thermal resistance junction to case					1.1	K/W	
R _{thCH}	thermal resistance case to heatsink				0.40		K/W	
P _{tot}	total power dissipation	T _C = 25°C				135	W	
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		250	A	
C _J	junction capacitance	V _R = 300 V f = 1 MHz		T _{VJ} = 25°C		30	pF	
I _{RM}	max. reverse recovery current	} I _F = 30 A; V _R = 300 V -di _F /dt = 400 A/μs		T _{VJ} = 25 °C		5.5	A	
				T _{VJ} = 125 °C		12	A	
t _{rr}	reverse recovery time			T _{VJ} = 25 °C		40	ns	
				T _{VJ} = 125 °C		85	ns	

Package SMPD				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal				50	A
T _{VJ}	virtual junction temperature			-55		175	°C
T _{op}	operation temperature			-55		150	°C
T _{stg}	storage temperature			-55		150	°C
Weight					8.5		g
F _C	mounting force with clip			40		130	N
d _{Spp/App}	creepage distance on surface striking distance through air	terminal to terminal		1.6			mm
d _{Spb/Apb}		terminal to backside		4.0			mm
V _{ISOL}	isolation voltage	t = 1 second	50/60 Hz, RMS; I _{ISOL} ≤ 1 mA	3000			V
		t = 1 minute		2500			V



Part description

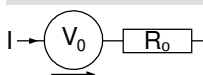
D = Diode
 P = HiPerFRED
 G = extreme fast
 60 = Current Rating [A]
 B = 1~ Rectifier Bridge
 600 = Reverse Voltage [V]
 LB = SMPD-B

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG60B600LB-TUB	DPG60B600LB	Tube	20	524759
Alternative	DPG60B600LB-TRR	DPG60B600LB	Tape & Reel	200	516148

Equivalent Circuits for Simulation

* on die level

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



$V_{0\max}$ threshold voltage

Fast Diode

0.85

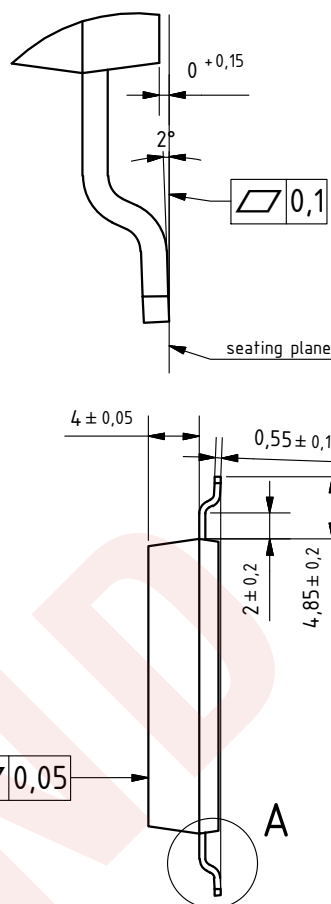
V

$R_{0\max}$ slope resistance *

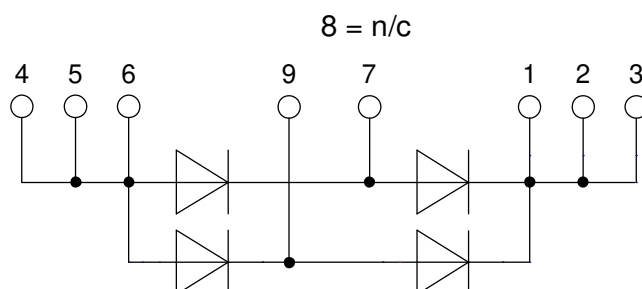
17

mΩ

A (8 : 1)



- 1) potrusion may add 0.2 mm max. on each side
- 2) additional max. 0.05 mm per side by punching misalignment or overlap of dam bar or bending compression
- 3) DCB area 10 to 50 μm convex;
position of DCB area in relation to plastic rim: $\pm 25 \mu\text{m}$
(measured 2 mm from Cu rim)
- 4) terminal plating: 0.2 - 1 μm Ni + 10 - 25 μm Sn (gal v.)
cutting edges may be partially free of plating



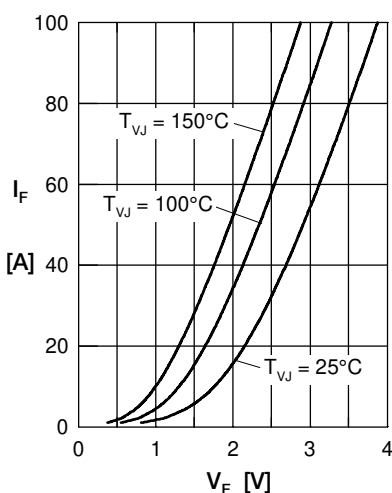
Fast Diode


Fig. 1 Forward current
 I_F versus V_F

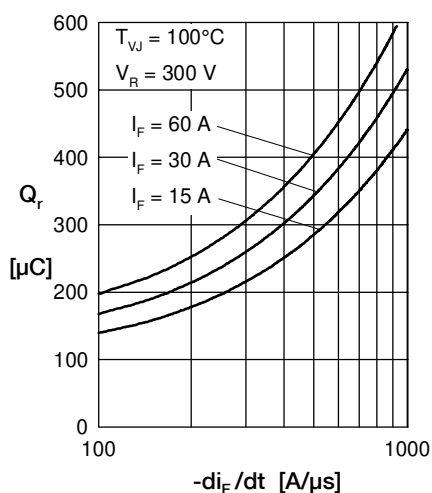


Fig. 2 Typ. reverse recov. charge
 Q_r versus $-di_F/dt$

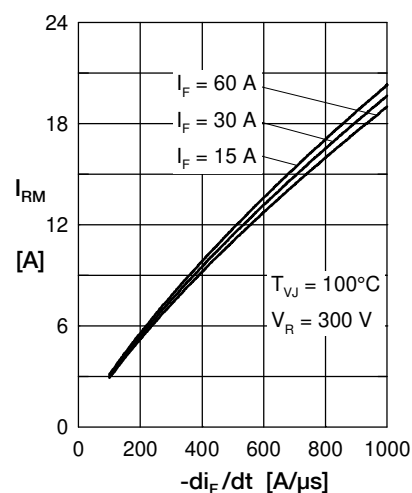


Fig. 3 Typ. peak reverse current
 I_{RM} versus $-di_F/dt$

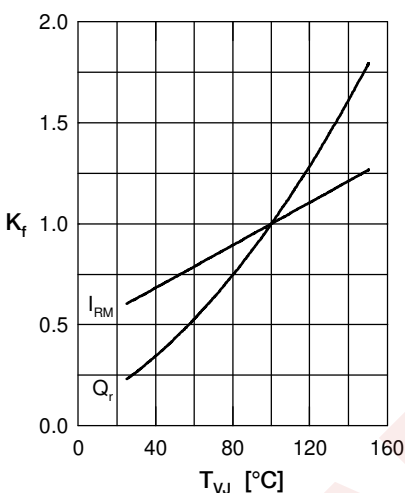


Fig. 4 Dynamic parameters
 Q_r , I_{RM} versus T_{VJ}

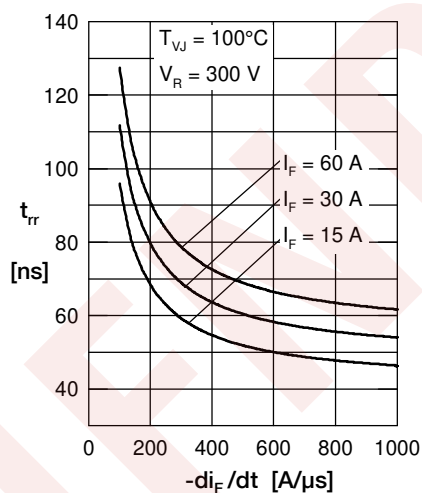


Fig. 5 Typ. recovery time
 t_{rr} versus $-di_F/dt$

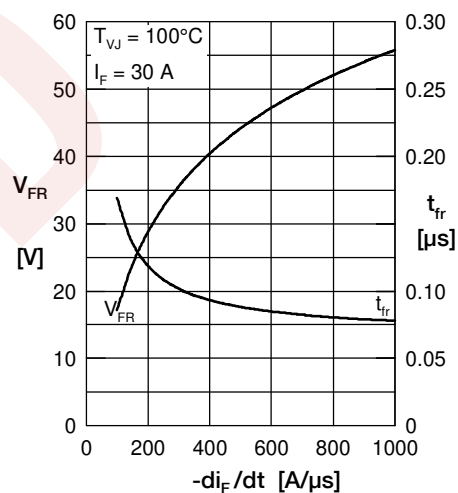


Fig. 6 Typ. peak forward voltage
 V_{FR} and t_{fr} versus di_F/dt

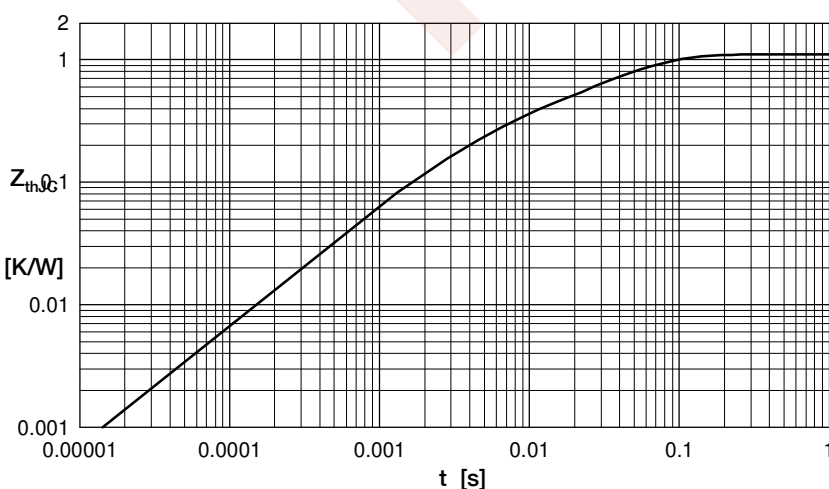


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0396