

HiPerFRED

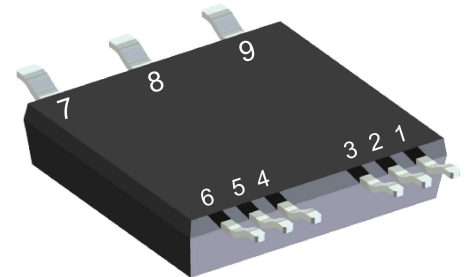
V_{RRM}	=	600 V
I_{DAV}	=	60 A
t_{rr}	=	40 ns

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

Part number

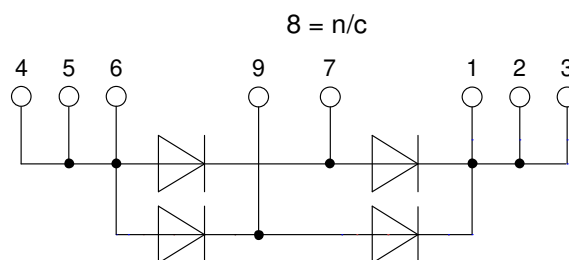
DPG60B600LB

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

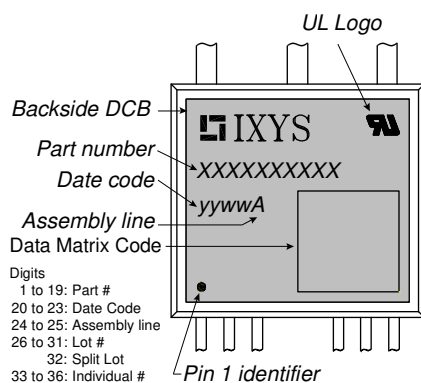
- Isolation Voltage: 3000 V~
- Industry convenient outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

Disclaimer Notice

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Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				600	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				600	V
I_R	reverse current, drain current	$V_R = 600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			250	μA
		$V_R = 600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			2	mA
V_F	forward voltage drop	$I_F = 30\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			2.51	V
		$I_F = 60\text{ A}$				3.19	V
		$I_F = 30\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.59	V
		$I_F = 60\text{ A}$				2.21	V
I_{DAV}	bridge output current	$T_C = 125^{\circ}\text{C}$ rectangular	$T_{VJ} = 175^{\circ}\text{C}$ d = 0.5			60	A
V_{F0}	threshold voltage	for power loss calculation only		$T_{VJ} = 175^{\circ}\text{C}$		0.85	V
r_F	slope resistance					17	m Ω
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	$T_C = 25^{\circ}\text{C}$				135	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; $V_R = 0\text{ V}$		$T_{VJ} = 45^{\circ}\text{C}$		250	A
C_J	junction capacitance	$V_R = 300\text{ V}$ f = 1 MHz		$T_{VJ} = 25^{\circ}\text{C}$	30		pF
I_{RM}	max. reverse recovery current	$I_F = 30\text{ A}; V_R = 300\text{ V}$ -di _F /dt = 400 A/ μs		$T_{VJ} = 25^{\circ}\text{C}$	5.5		A
				$T_{VJ} = 125^{\circ}\text{C}$	12		A
t_{rr}	reverse recovery time			$T_{VJ} = 25^{\circ}\text{C}$	40		ns
				$T_{VJ} = 125^{\circ}\text{C}$	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

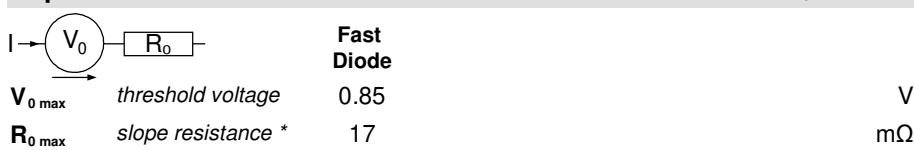
D = Diode
 P = HiPerFRED
 G = extreme fast
 60 = Current Rating [A]
 B = 1~ Rectifier Bridge
 600 = Reverse Voltage [V]
 LB = SMPD-B

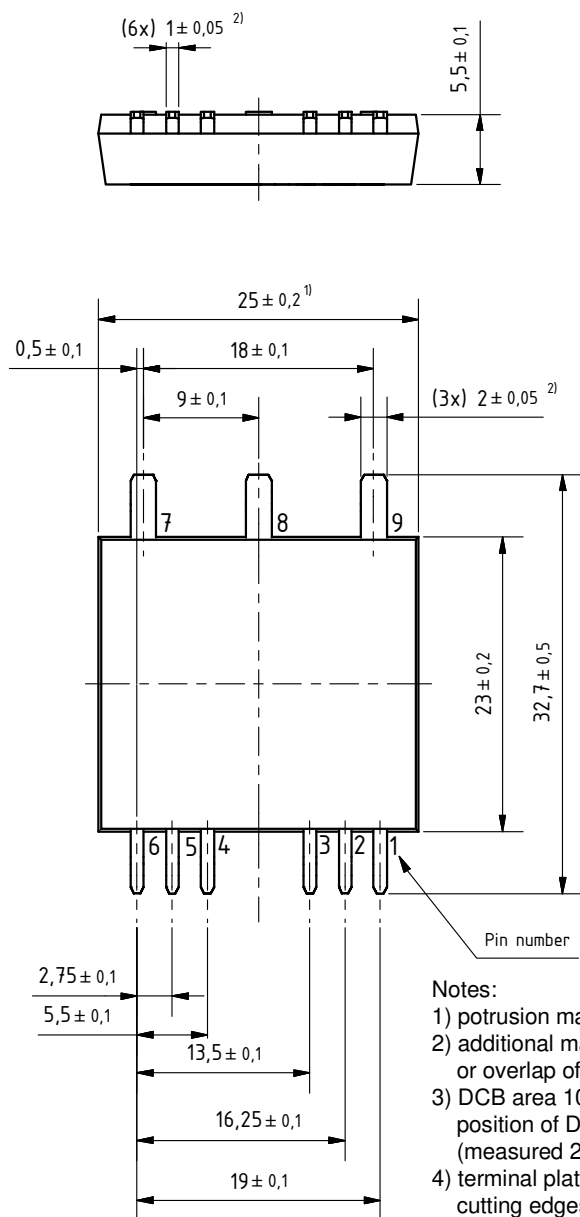
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG60B600LB-TUB	DPG60B600LB	Tube	20	524759
Alternative	DPG60B600LB-TRR	DPG60B600LB	Tape & Reel	200	516148

Equivalent Circuits for Simulation

* on die level

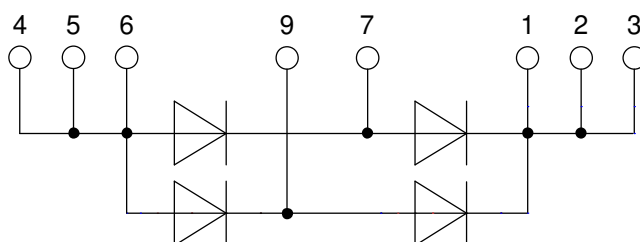
$T_{VJ} = 175\text{ °C}$



Outlines SMPD
A (8 : 1)

Notes:

- 1) protrusion 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

$$8 = n/c$$



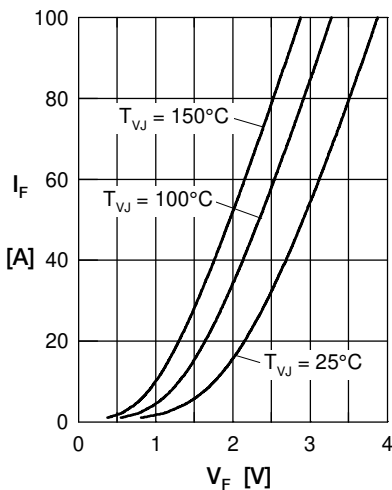
Fast Diode


Fig. 1 Forward current
 I_F versus V_F

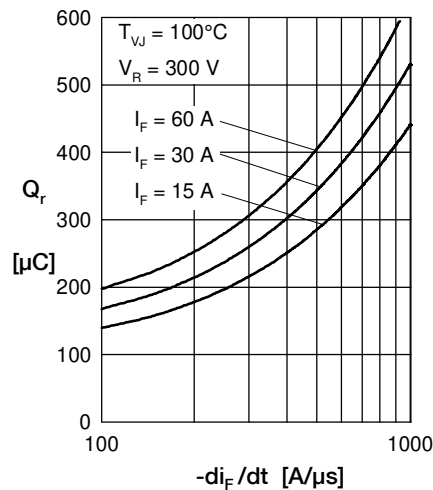


Fig. 2 Typ. reverse recov. charge
 Q_r versus $-di_F/dt$

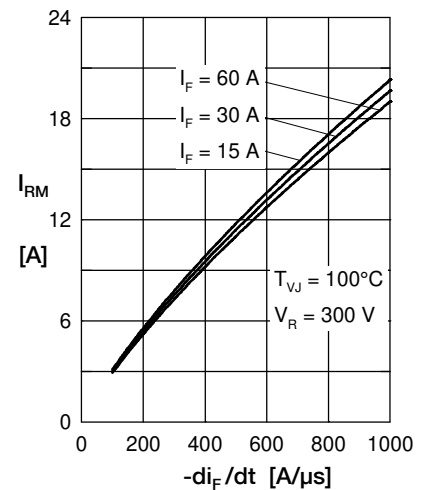


Fig. 3 Typ. peak reverse current
 I_{RM} versus $-di_F/dt$

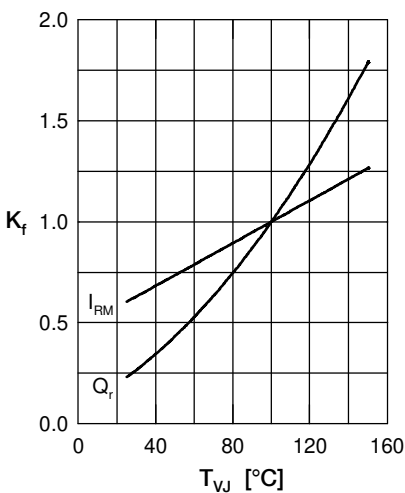


Fig. 4 Dynamic parameters
 Q_r , I_{RM} versus T_{VJ}

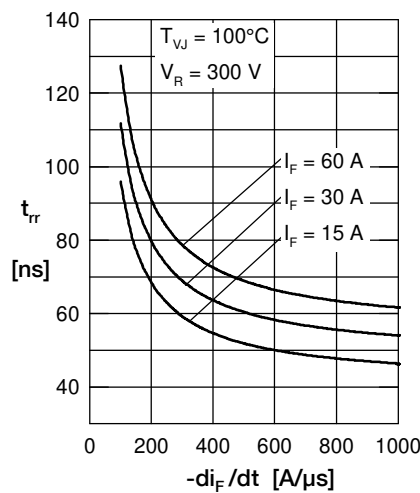


Fig. 5 Typ. recovery time
 t_{rr} versus $-di_F/dt$

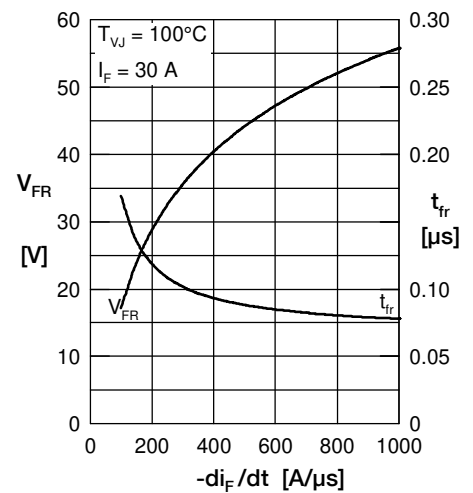


Fig. 6 Typ. peak forward voltage
 V_{FR} and t_{fr} versus di_F/dt

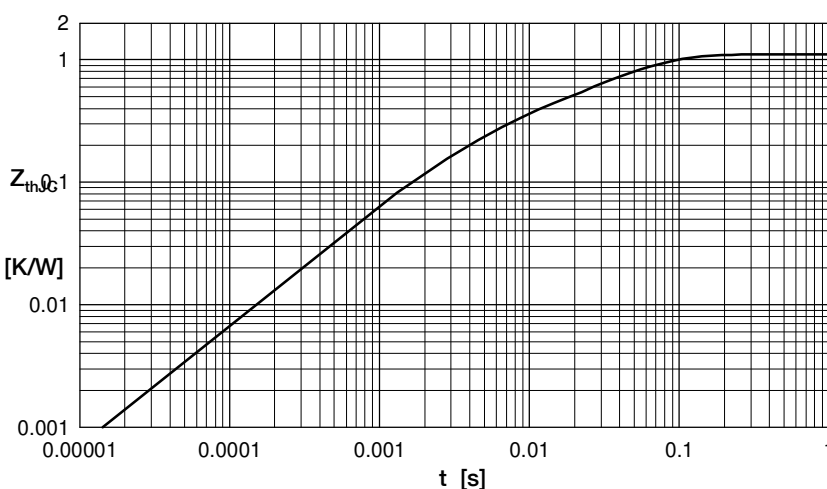


Fig. 7 Transient thermal impedance junction to case

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