

**HiPerFRED<sup>2</sup>**

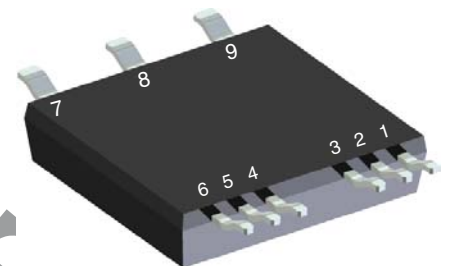
$$V_{RRM} = 600 \text{ V}$$

$$I_{DAV} = 60 \text{ A}$$


$$t_{rr} = 40 \text{ ns}$$

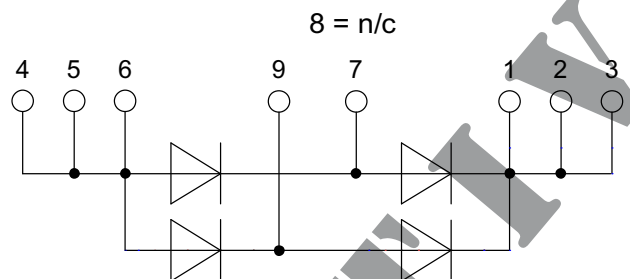
High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 1~ Rectifier Bridge

**Part number**  
 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:**

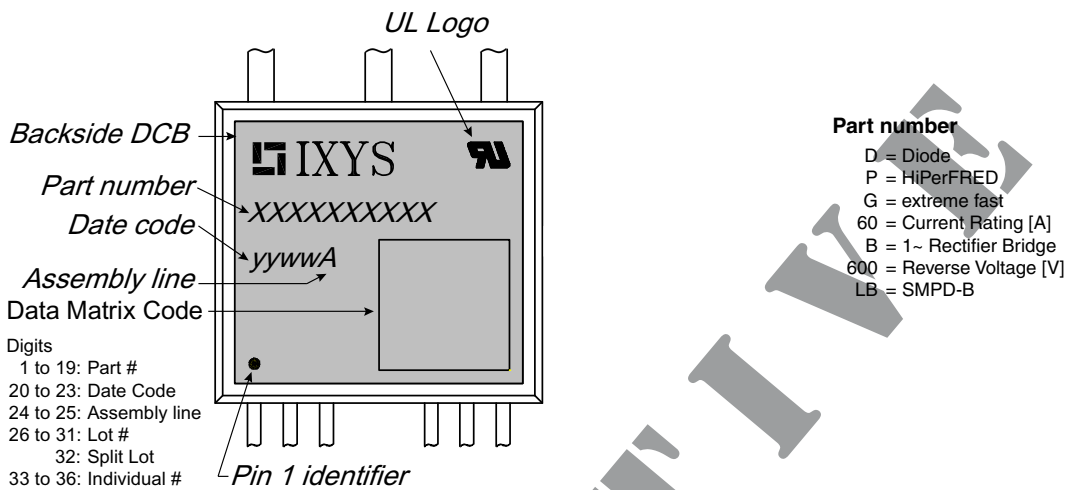
- Rectifiers in switch mode power supplies (SMPS)

**Package:** SMPD

- Isolation Voltage: 3000 V~ ( $t = 1s$ )
- Industry convenient outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

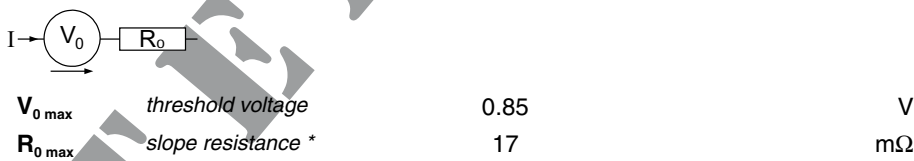
Fast Diode				Ratings		
Symbol	Definitions	Conditions	min.	typ.	max.	
$V_{RSM}$	max. non-repetitive rev. blocking voltage				600	V
$V_{RRM}$	max. repetitive reverse blocking voltage				600	V
$I_R$	reverse current, drain current	$V_R = 600\text{ V}$			250 2	$\mu\text{A}$ mA
$V_F$	forward voltage drop	$I_F = 30\text{ A}$			2.51	V
		$I_F = 60\text{ A}$			3.19	V
		$I_F = 30\text{ A}$			1.59	V
		$I_F = 60\text{ A}$			2.21	V
$I_{D25}$	diode forward DC current	$T_C = 25^\circ\text{C}$			77	A
$I_{D80}$		$T_C = 80^\circ\text{C}$			58	A
$I_{DAV}$	bridge output current	rectangular; $d = 0.5$ ; $T_C = 125^\circ\text{C}$			60	A
$V_{FO}$	threshold voltage	} for power loss calculation only			0.85	V
$r_F$	slope resistance		$T_{VJ} = 175^\circ\text{C}$			17
$R_{thJC}$	thermal resistance junction to case				101	K/W
$R_{thJH}$	thermal resistance case to heatsink	with thermal transfer paste (IXYS test setup)		0.40		K/W
$P_{tot}$	total power dissipation				135	W
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}$ ; (50 Hz), sine; $V_R = 0\text{ V}$			250	A
$C_J$		$V_R = 300\text{ V}$ ; $f = 1\text{ MHz}$		30		pF
$I_{RM}$	max. reverse recovery current	} $I_F = 30\text{ A}$ ; $V_R = 300\text{ V}$ $-di_F/dt = 400\text{ A}/\mu\text{s}$			5.5	A
					12	A
$t_{rr}$	reverse recovery time				40	ns
					85	ns

Package SMPD				Ratings		
Symbol	Definitions	Conditions	min.	typ.	max.	
$I_{RMS}$	RMS current	wide pin standard pin			100 60	A A
$T_{stg}$	storage temperature		-55		125	°C
$T_{op}$	operation temperature		-55		150	°C
$T_{vJ}$	virtual junction temperature		-55		175	°C
<b>Weight</b>					8.5	g
$F_C$	mounting force with clip		40		130	N
$d_{Spp/App}$	creepage distance on surface /	terminal to terminal	1.6			mm
$d_{Spb/Apb}$	striking distance through air	terminal to backside	4.0			mm
$V_{ISOL}$	isolation voltage	$t = 1$ second $t = 1$ minute		3000 2500		V V



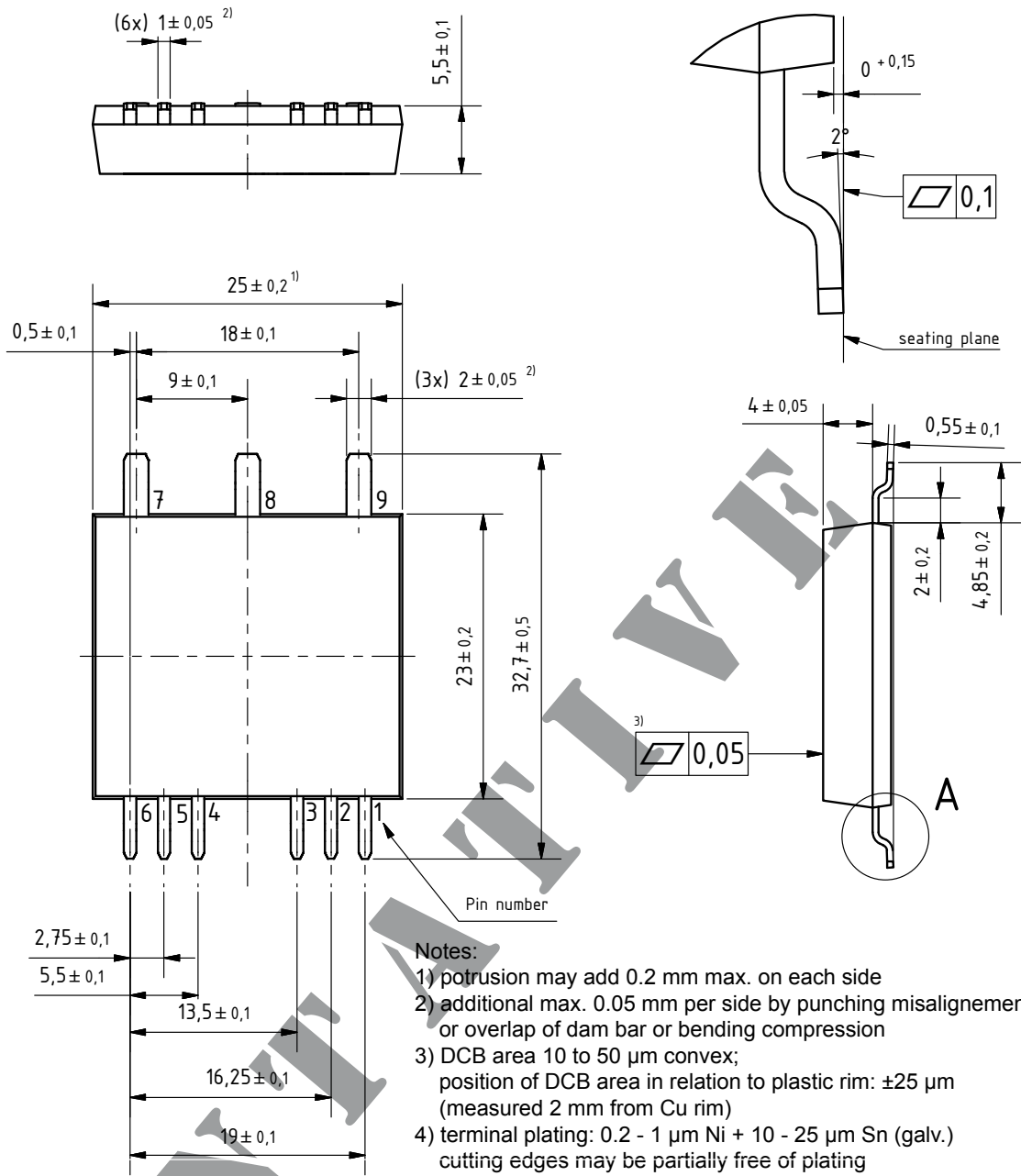
Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	DPG60B600LB	DPG60B600LB	Blister	45	512859
	DPG60B600LB-TRR	DPG60B600LB	Tape&Reel	200	512852

### Equivalent Circuits for Simulation \*on die level $T_{vJ} = 175^\circ\text{C}$

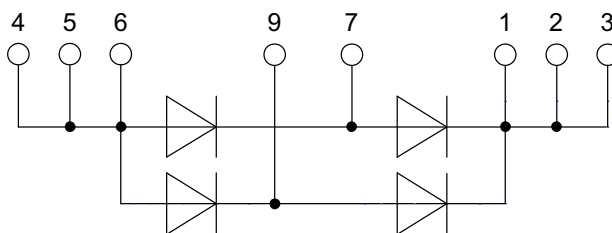


Outlines SMPD

A ( 8 : 1 )



8 = n/c



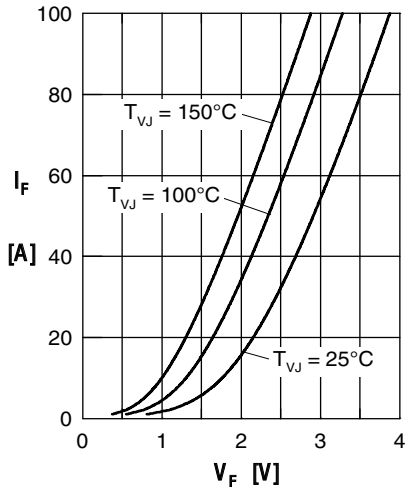


Fig. 1 Forward current  $I_F$  versus  $V_F$

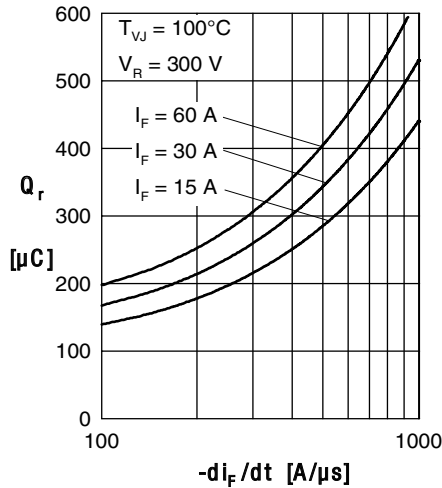


Fig. 2 Typ. reverse recov. charge  $Q_r$  versus  $-di_F/dt$

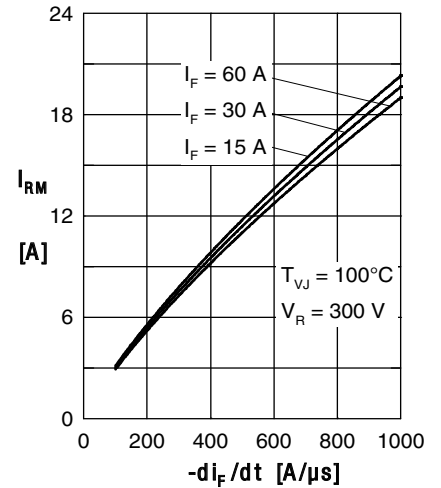


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

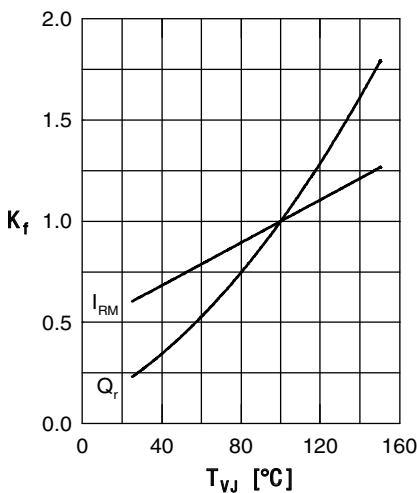


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

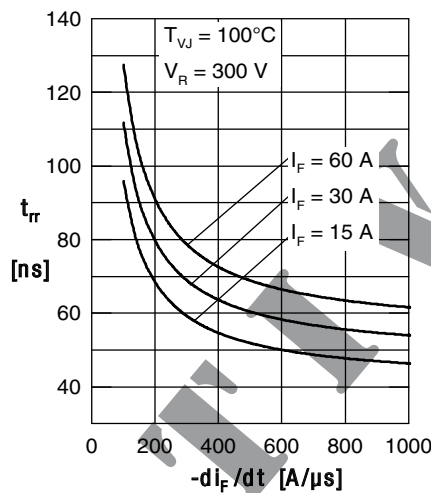


Fig. 5 Typ. recovery time  $t_{tr}$  versus  $-di_F/dt$

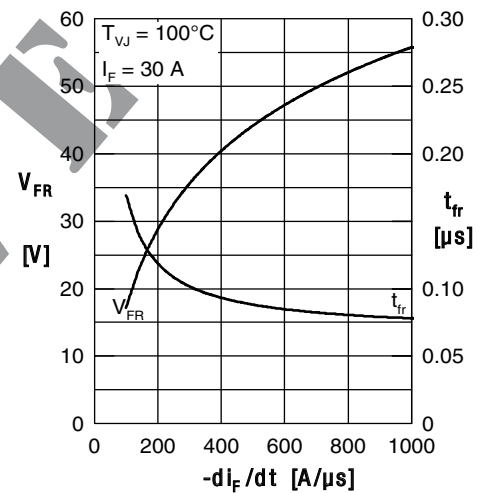


Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{tr}$  versus  $di_F/dt$

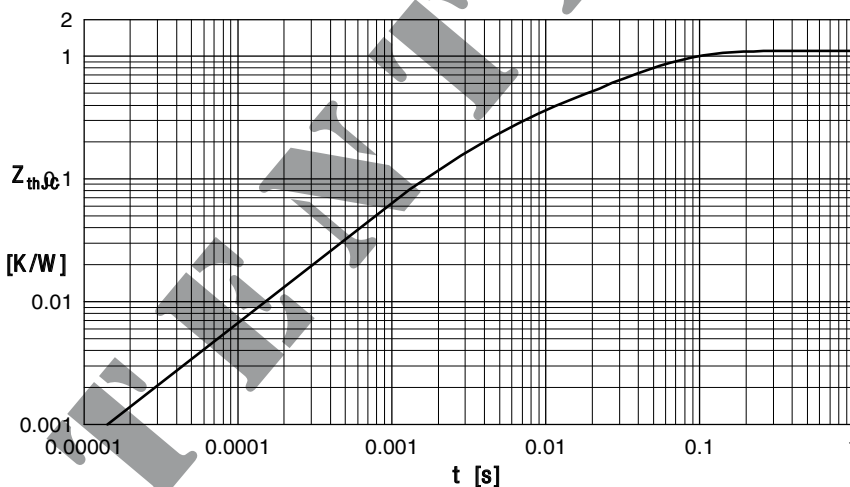


Fig. 7 Transient thermal impedance junction to case

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