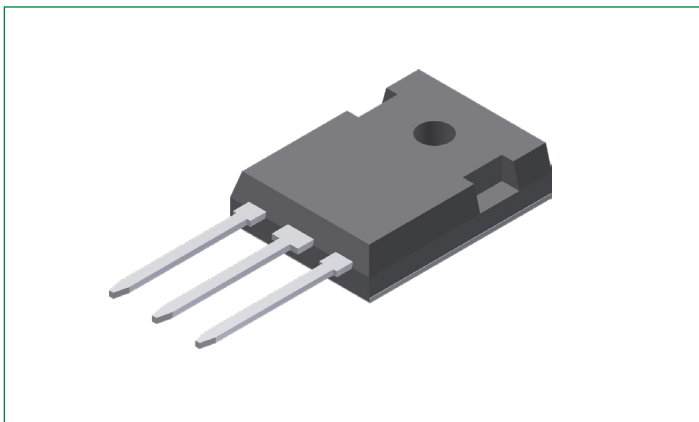


# DPF120C600HB

## 600 V, 2 x 60 A High Performance Fast Recovery Diode

RoHS



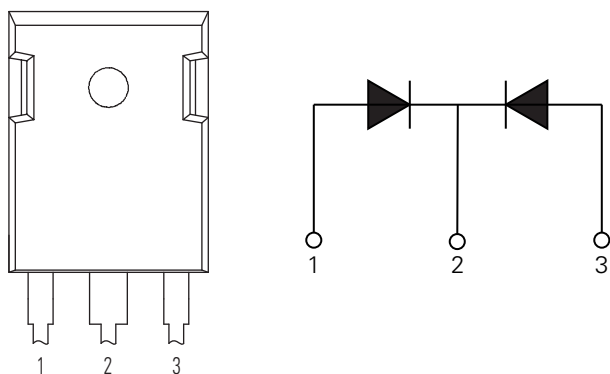
### Description:

This 600 V, 2 x 60 A general purpose, power switching diode utilizes a diode array with common cathode configuration assembled in a TO-247 package.

This device belongs to the HiPerFRED (High-Performance Fast Recovery Diode) series that features planar passivated chips, very low leakage current, and very short recovery time. These features make the HiPerFRED series suitable for high-frequency applications such as battery chargers, PFC, and high-frequency output rectifiers.

Littelfuse power switching diodes can be integrated with other power semiconductors to provide complete power solutions for a wide range of applications.

### Pinout Diagram



**1:** Anode; **2:** Cathode; **3** Anode

### Features:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behavior
- Very low  $I_{RM}$  values
- Very soft recovery behavior
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Epoxy meets UL 94V-0
- Low  $I_{RM}$  reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

### Applications:

- Antiparallel diode for high frequency switching devices
- Anti-saturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in Switch Mode Power Supplies (SMPS)
- Uninterruptable Power Supplies (UPS)

### Product Summary

Characteristic	Value	Unit
$V_{RRM}$	600	V
$I_{FAV}$	2 x 60	A
$t_{rr}$	40	ns

## Maximum Ratings

Symbol	Characteristics	Conditions	Value	Units
$V_{RRM}$	Repetitive Reverse Blocking Voltage	$T_{VJ} = 25^{\circ}\text{C}$	600	V
$I_{RMS}$	RMS Current	per terminal	70	A
$I_{FAV}$	Average Forward Current	$T_C = 95^{\circ}\text{C}, T_{VJ} = 175^{\circ}\text{C};$ rectangular $d = 0.5$	60	A
$I_{FSM}$	Forward Surge Current	$t = 10\text{ ms}; (50\text{ Hz}),$ sine; $V_R = 0\text{ V}, T_{VJ} = 45^{\circ}\text{C}$	500	A
$T_{stg}$	Storage Temperature	–	–55 to +150	$^{\circ}\text{C}$
$T_{OP}$	Operation Temperature	–	–55 to +150	$^{\circ}\text{C}$
$T_{VJ}$	Virtual Junction Temperature	–	–55 to +175	$^{\circ}\text{C}$
$P_{tot}$	Total Power Dissipation	$T_C = 25^{\circ}\text{C}$	214	W

## Thermal Specifications

Symbol	Characteristic	Value			Unit
		Min.	Typ.	Max.	
$R_{thJC}$	Maximum Thermal Resistance, Junction to Case	–	–	0.70	$^{\circ}\text{C}/\text{W}$
$R_{thCH}$	Maximum Thermal Resistance, Case to Heatsink	–	0.25	–	$^{\circ}\text{C}/\text{W}$

## Electrical Characteristics

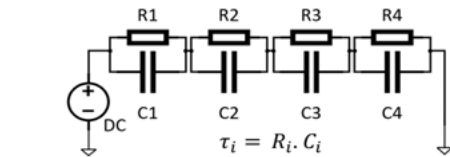
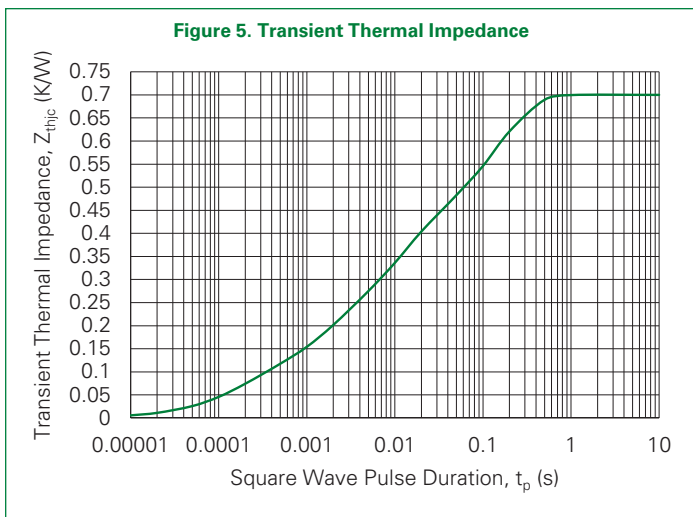
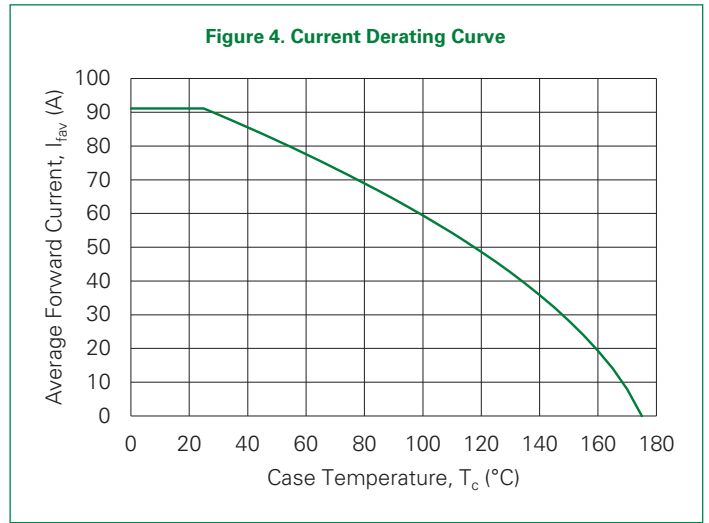
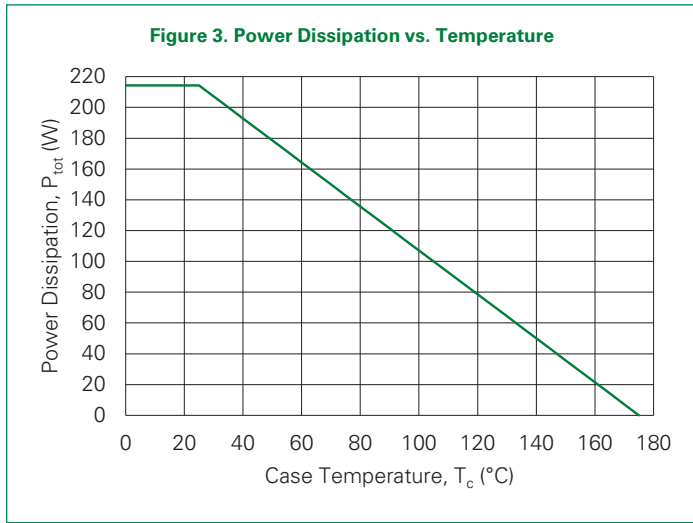
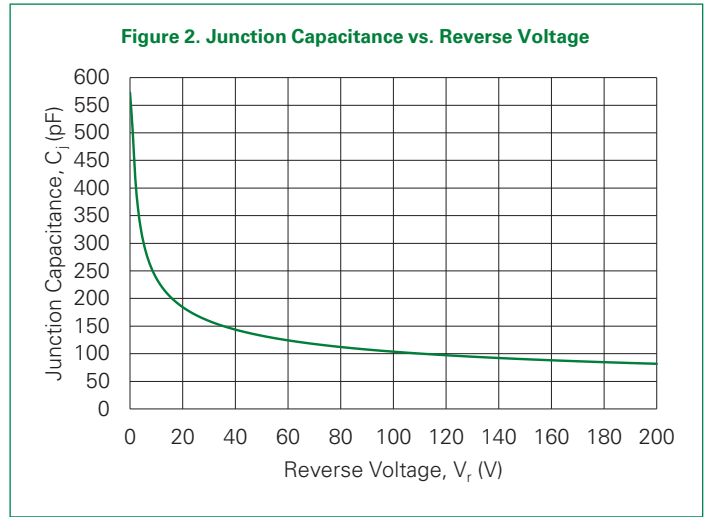
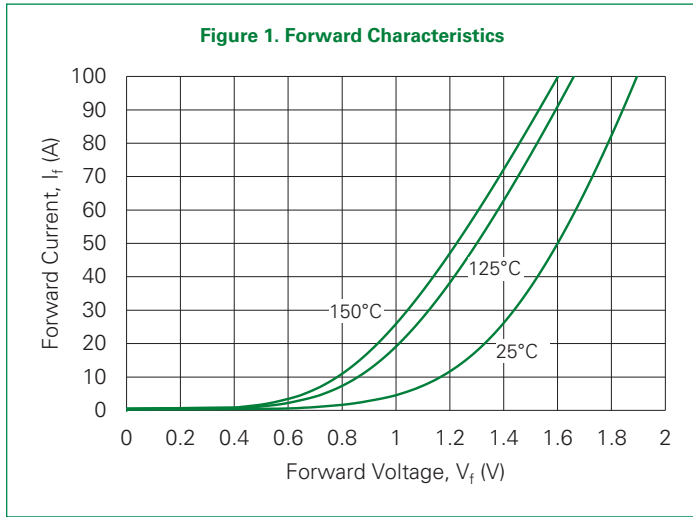
### Static Characteristics

Symbol	Characteristics	Conditions	Value			Units	
			Min.	Typ.	Max.		
$I_R$	Reverse Leakage Current	$T_{VJ} = 25^{\circ}\text{C}$	$V_R = V_{RRM}$	–	–	20	$\mu\text{A}$
		$T_{VJ} = 125^{\circ}\text{C}$		–	150	600	
$V_F$	Forward Voltage	$T_{VJ} = 25^{\circ}\text{C}$	$I_F = 50\text{ A}$	–	1.6	1.9	V
			$I_F = 100\text{ A}$	–	1.89	–	
		$T_{VJ} = 125^{\circ}\text{C}$	$I_F = 50\text{ A}$	–	1.3	1.44	
			$I_F = 100\text{ A}$	–	1.66	–	
$V_{FO}$	Threshold Voltage	$T_{VJ} = 175^{\circ}\text{C}$	–	–	0.78	V	
$r_F$	Slope Resistance		–	–	8.7	$\text{m}\Omega$	
$C_J$	Junction Capacitance	$V_R = 200\text{ V}$	–	82	–	pF	

### Dynamic Characteristics

Symbol	Characteristics	Conditions	Value			Units	
			Min.	Typ.	Max.		
$Q_{rr}$	Reverse Recovery Charge	$T_{VJ} = 25^{\circ}\text{C}$	–	0.5	–	$\mu\text{C}$	
		$T_{VJ} = 125^{\circ}\text{C}$	–	1.9	–		
$I_{RM}$	Reverse Recovery Current	$T_{VJ} = 25^{\circ}\text{C}$	$I_F = 50\text{ A}; V_R = 300\text{ V}$ $di/dt = 800\text{ A}/\mu\text{s}$	–	20	–	A
		$T_{VJ} = 125^{\circ}\text{C}$		–	37	–	
$t_{rr}$	Reverse Recovery Time	$T_{VJ} = 25^{\circ}\text{C}$		–	40	–	ns
		$T_{VJ} = 125^{\circ}\text{C}$		–	90	–	

Characteristic Curves



$$Zth(t) = \sum_i R_i [1 - e^{-\frac{t}{\tau_i}}]$$

i	1	2	3	4
$R_i$	0.078	0.116	0.206	0.3
$T_i$	0.00016	0.0015	0.011	0.15

Figure 6. Reverse Recovery Charge vs. di/dt

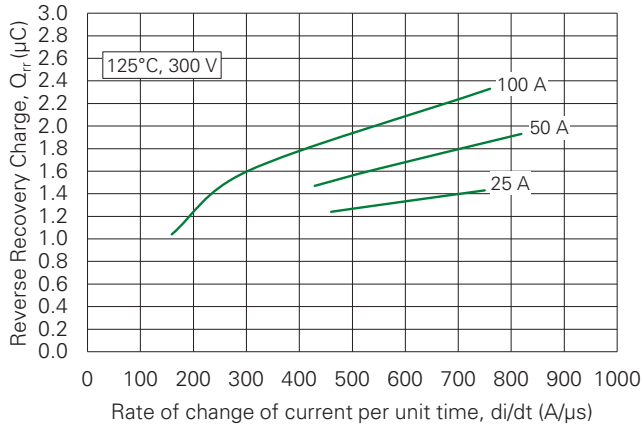


Figure 7. Reverse Recovery Current vs. di/dt

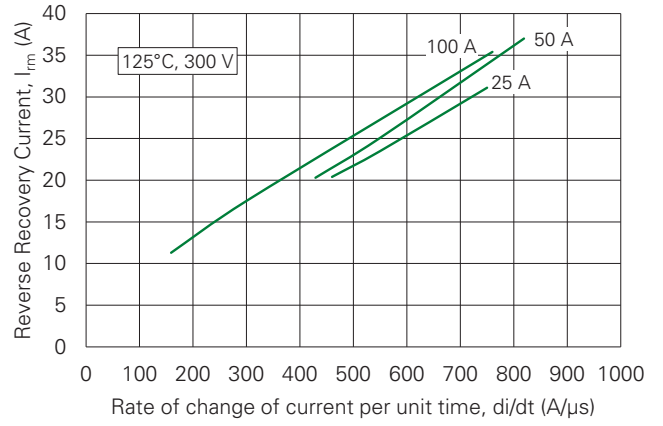


Figure 8. Reverse Recovery Time vs. di/dt

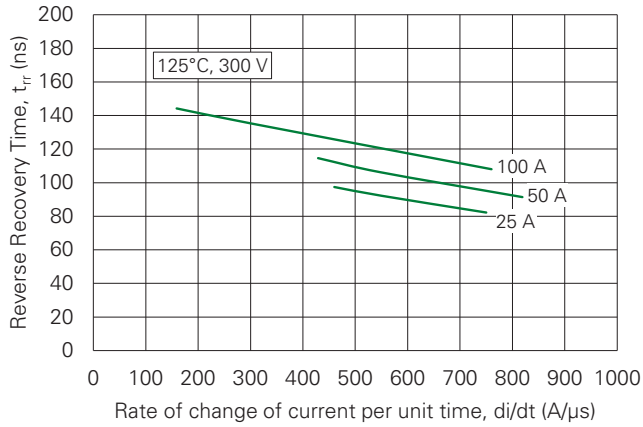


Figure 9. Recovery Characteristics vs. Temperature

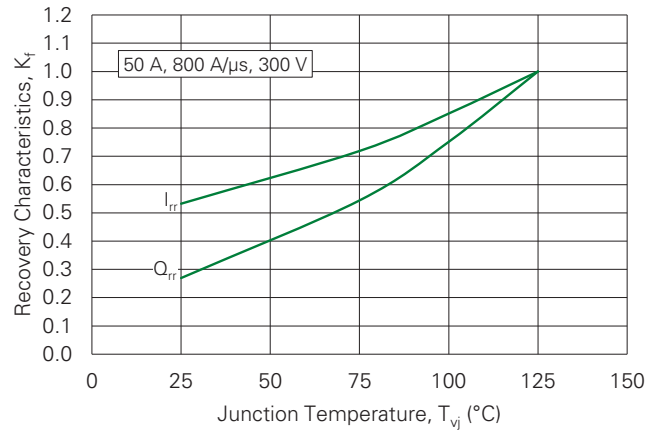
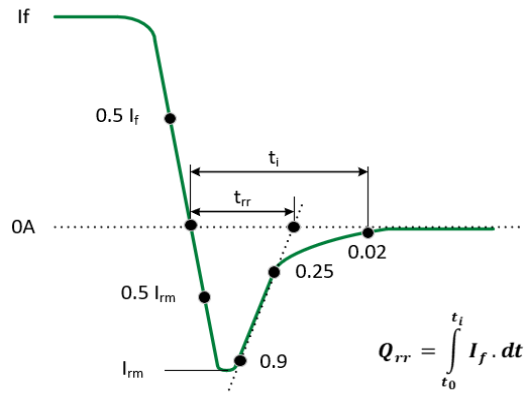
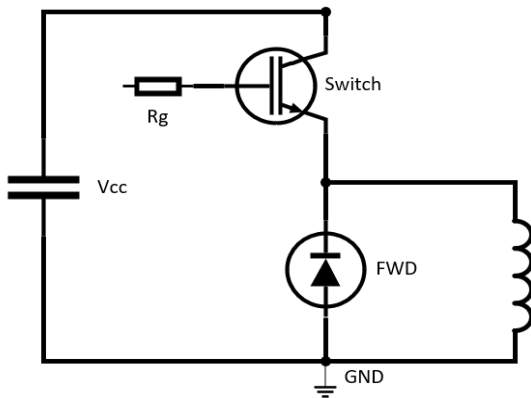
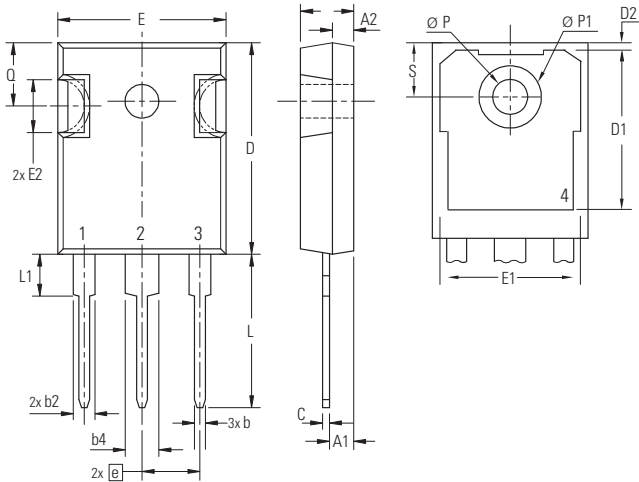


Figure 10. Test Circuit and Waveform Definition

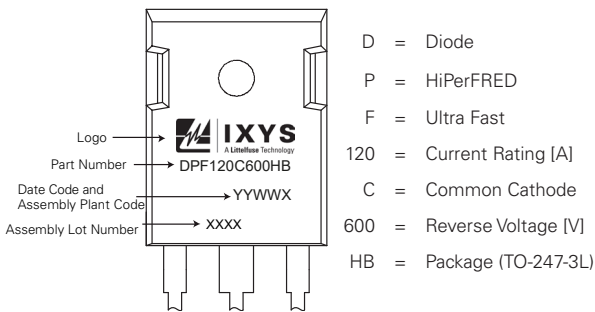


Part Outline Drawing (TO-247-3L)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.845
D1	13.07	-	0.515	-
D2	0.51	1.35	0.020	0.053
e	5.45 BSC		0.215 BSC	
E	15.48	16.24	0.610	0.640
E1	13.45	-	0.530	-
E2	4.31	5.48	0.170	0.216
L	19.80	20.30	0.780	0.800
L1	-	4.49	-	0.177
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	
ØP	3.55	3.65	0.140	0.144
ØP1	-	7.39	-	0.29

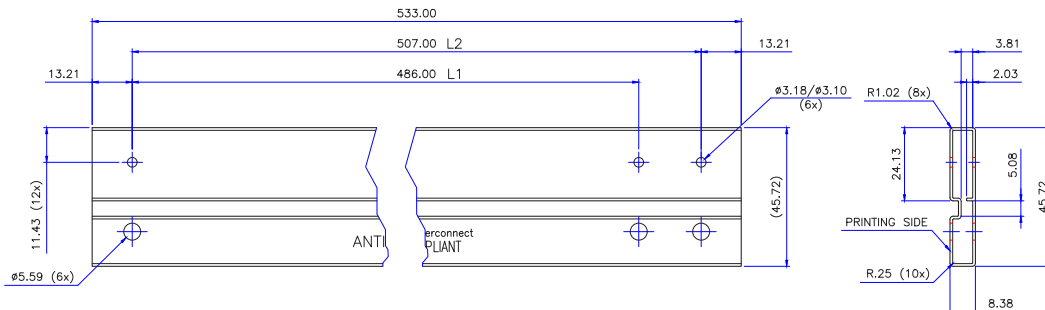
Part Numbering and Marking



Packing Options

Part Number	Marking	Packing Mode	M.O.Q.
DPF120C600HB	DPF120C600HB	Tube (30 pcs)	300

Packing Specifications (Tube Option)



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Part of:

