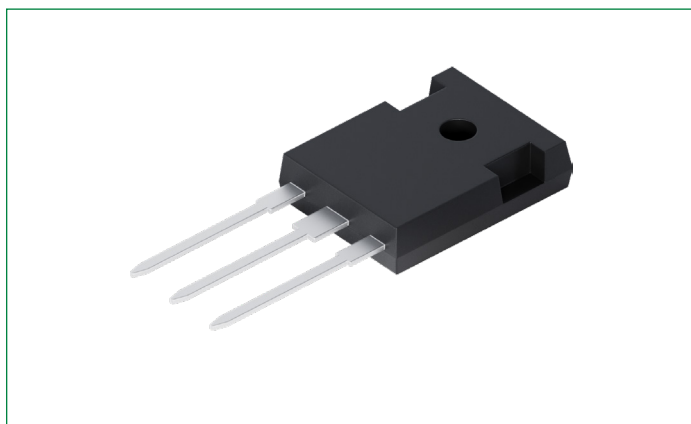


DPF100C1200HB

1200 V, 2 x 50 A High-Performance Fast Recovery Diode

RoHS



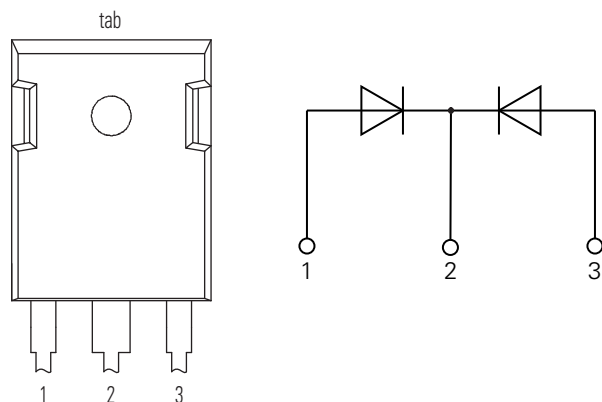
Description

This 1200 V, 2 x 50 A device includes two general purpose, power switching diodes in common cathode configuration assembled in a TO-247 package.

The embedded diode chips belong to the High-Performance Fast Recovery Diode (HiPerFRED) 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 (TO-247-3L)



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

Features

- Planar passivated chips
- Very low leakage current
- Short recovery time
- Low I_{rm} values
- Soft recovery behavior
- Soft reverse recovery

Benefits

- Low I_{rm} reduces:
 - Power dissipation within the diode
 - Turn-on loss in the commutating switch
- Improved thermal behavior
- Low EMI/RFI

Applications

- Antiparallel diode for high-frequency switching devices
- Snubber diode
- Rectifiers in Switch Mode Power Supplies (SMPS)

Product Summary

Characteristic	Value	Unit
V_{RRM}	1200	V
$I_{F(AV)}$	2 x 50	A
t_{rr}	75	ns

Maximum Ratings (per diode)

Symbol	Characteristics	Conditions	Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj} = 25\text{ }^{\circ}\text{C}$	1200	V
I_{RMS}	RMS Current	per terminal	70	A
$I_{F(AV)}$	Average Forward Current	$T_C = 125\text{ }^{\circ}\text{C}$, $T_{vj} = 175\text{ }^{\circ}\text{C}$; rectangular d = 0.5	50	A
I_{FSM}	Non-repetitive Surge Forward Current	t = 10 ms; (50 Hz), sine; $V_R = 0\text{ V}$, $T_{vj} = 45\text{ }^{\circ}\text{C}$	400	A
T_{stg}	Storage Temperature Range	–	–55 to +150	$^{\circ}\text{C}$
T_{vj}	Virtual Junction Temperature Range	–	–55 to +175	$^{\circ}\text{C}$
T_{op}	Operating Temperature Range	–	–55 to +150	$^{\circ}\text{C}$
P_{tot}	Total Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	214	W

Thermal Specifications

Symbol	Characteristic	Value			Unit
		Min.	Typ.	Max.	
$R_{th(j-c)}$	Maximum Thermal Resistance, Junction to Case	–	–	0.7	K/W
$R_{th(c-h)}$	Typical Thermal Resistance, Case to Heatsink	–	0.25	–	K/W

Electrical Characteristics – Static

Symbol	Characteristics	Conditions		Value			Units
				Min.	Typ.	Max.	
I_R	Reverse Current	$T_{vj} = 25\text{ }^{\circ}\text{C}$	$V_R = V_{RRM}$	–	–	20	μA
		$T_{vj} = 125\text{ }^{\circ}\text{C}$		–	150	2000	
V_F	Forward Voltage	$T_{vj} = 25\text{ }^{\circ}\text{C}$	$I_F = 50\text{ A}$	–	2	2.5	V
			$I_F = 100\text{ A}$	–	2.4	–	
		$T_{vj} = 150\text{ }^{\circ}\text{C}$	$I_F = 50\text{ A}$	–	1.6	1.9	
			$I_F = 100\text{ A}$	–	2.15	–	
$V_{(FO)}$	Threshold Voltage	$T_{vj} = 175\text{ }^{\circ}\text{C}$		–	–	0.96	V
r_F	Slope Resistance	$T_{vj} = 175\text{ }^{\circ}\text{C}$		–	–	12.4	m Ω
C_j	Junction Capacitance	$V_R = 200\text{ V}$		–	53	–	pF

Electrical Characteristics – Dynamic

Symbol	Characteristics	Conditions		Value			Units
				Min.	Typ.	Max.	
Q_{rr}	Reverse Recovery Charge	$T_{vj} = 25\text{ }^{\circ}\text{C}$	$I_F = 50\text{ A}$; $V_R = 600\text{ V}$ di/dt = 1000 A/ μs	–	3	–	μC
		$T_{vj} = 125\text{ }^{\circ}\text{C}$		–	9	–	
I_{rm}	Reverse Recovery Current	$T_{vj} = 25\text{ }^{\circ}\text{C}$		–	42	–	A
		$T_{vj} = 125\text{ }^{\circ}\text{C}$		–	60	–	
t_{rr}	Reverse Recovery Time	$T_{vj} = 25\text{ }^{\circ}\text{C}$		–	75	–	ns
		$T_{vj} = 125\text{ }^{\circ}\text{C}$		–	135	–	

Characteristic Curves

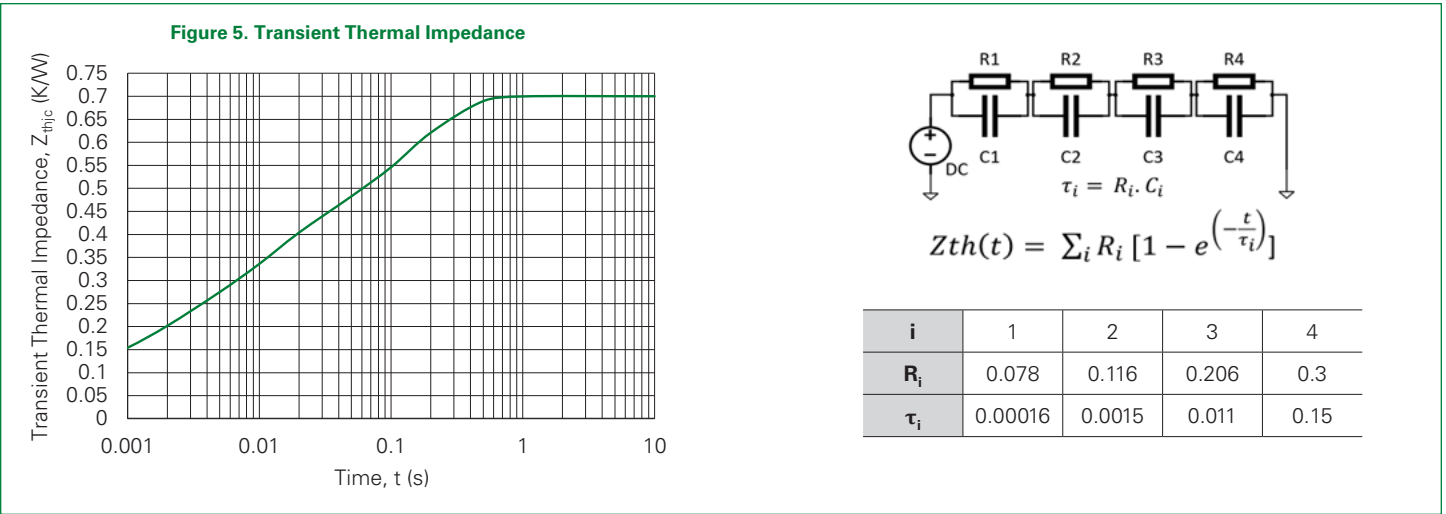
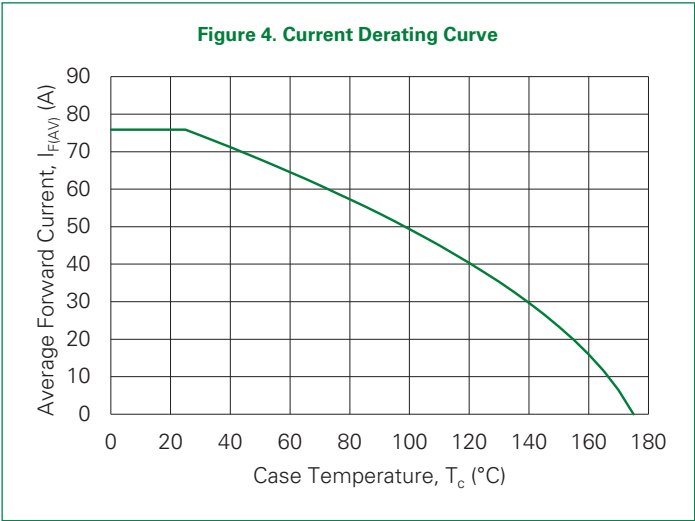
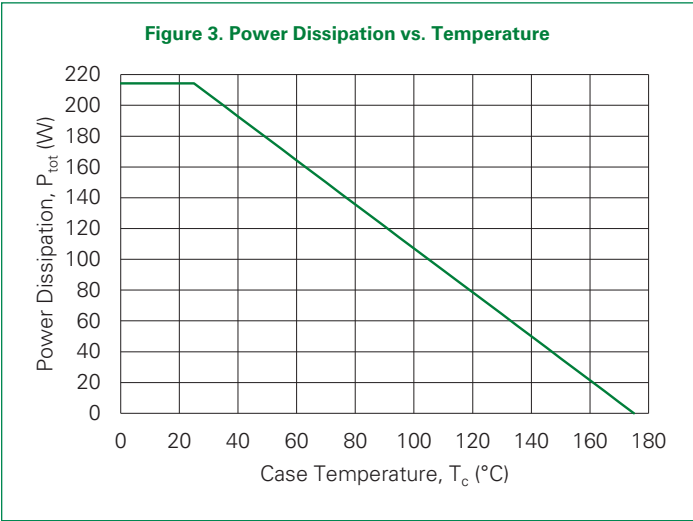
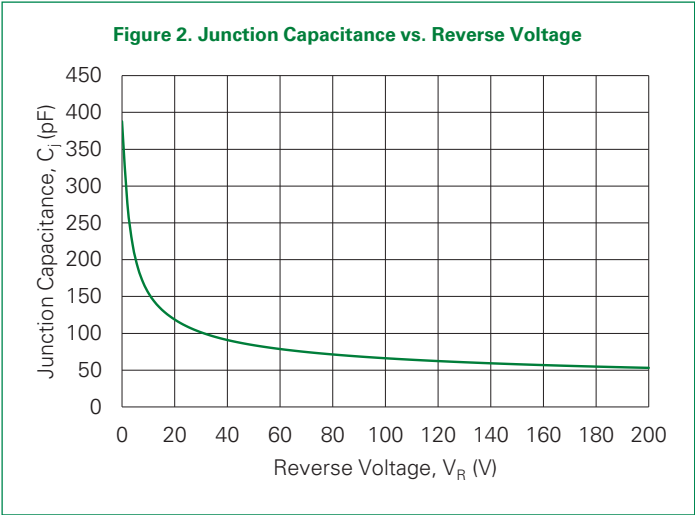
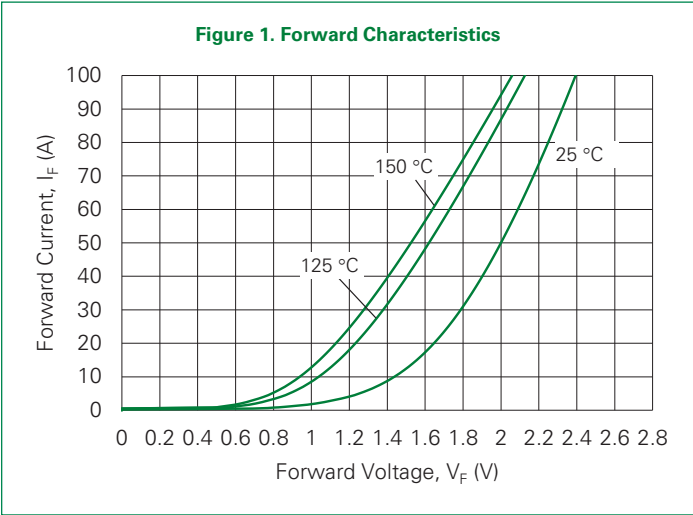


Figure 6. Reverse Recovery Charge vs. di/dt

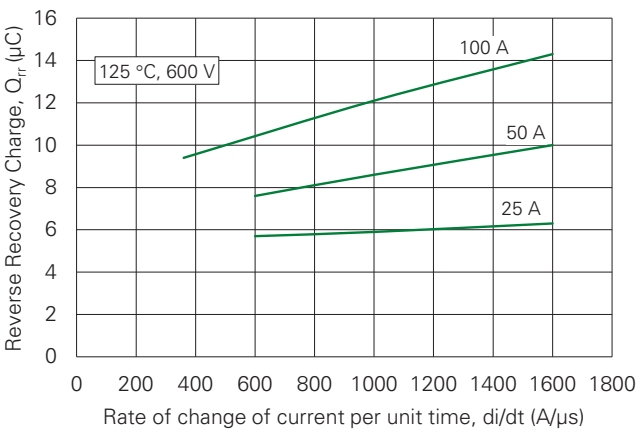


Figure 7. Reverse Recovery Current vs. di/dt

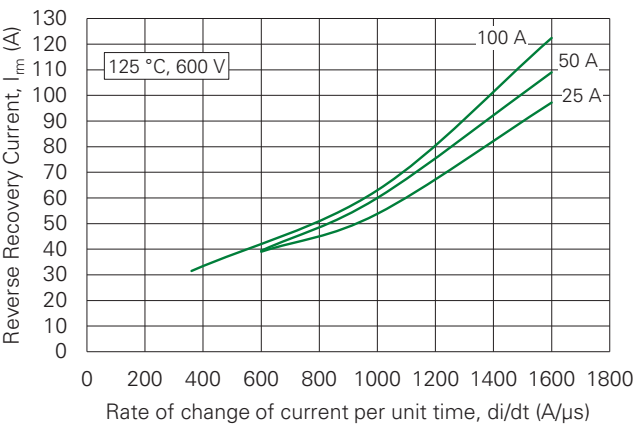


Figure 8. Reverse Recovery Time vs. di/dt

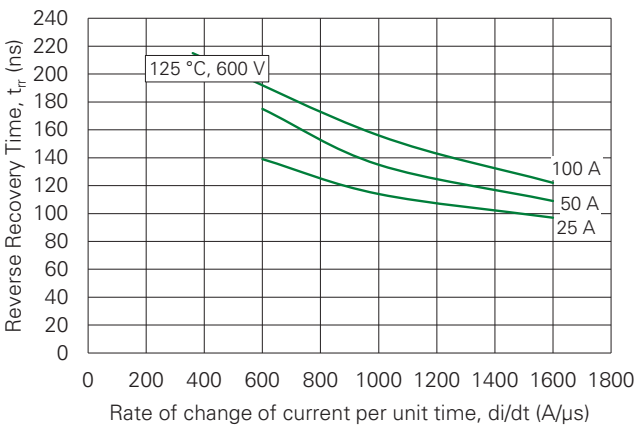
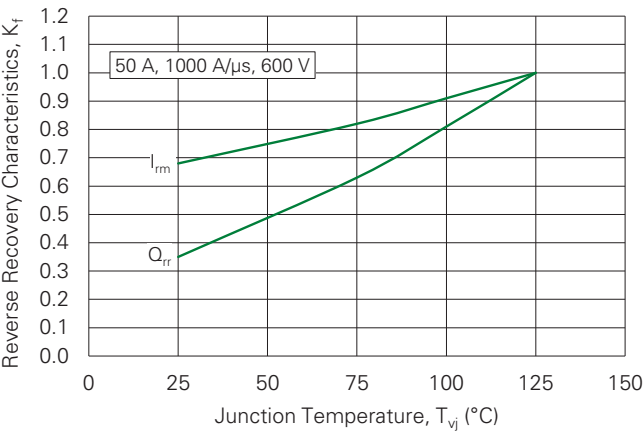


Figure 9. Recovery Characteristics vs. Temperature



Technical drawing of a three-pin plug, showing three views: front, side, and top.

Front View (Left): Shows the overall dimensions and internal features. The total width is E , and the total height is D . The distance between the centers of the two side pins is $2x E2$. The distance from the top edge to the center of the side pins is Q . The distance from the top edge to the center of the bottom pin is $L1$. The total length of the plug is L . The distance between the centers of the two side pins is $2x b2$. The distance from the center of the bottom pin to the side edge is $b4$. The distance between the centers of the two side pins is $2x [e]$. The distance from the center of the bottom pin to the side edge is $3x b$.

Side View (Middle): Shows the profile of the plug. The total width is A , and the distance from the center of the bottom pin to the side edge is $A2$. The distance from the center of the bottom pin to the side edge is C . The distance from the center of the bottom pin to the side edge is $A1$.

Top View (Right): Shows the top of the plug. The distance between the centers of the two side pins is $E1$. The distance from the center of the bottom pin to the side edge is $D1$. The distance from the center of the bottom pin to the side edge is $D2$. The distance from the center of the bottom pin to the side edge is S . The distance from the center of the bottom pin to the side edge is $\varnothing P$. The distance from the center of the bottom pin to the side edge is $\varnothing P1$. The distance from the center of the bottom pin to the side edge is 4 .

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	5.46 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

Diagram illustrating the marking on a TO-247-3L package:

- Logo
- Part Number: DPF100C1200HB
- Date Code and Assembly Plant Code: YYWWXX
- Assembly Lot Number: XXXX

Legend:

- D = Diode
- P = HiPerFRED
- F = Ultra Fast
- 100 = Current Rating (A)
- C = Common Cathode
- 1200 = Reverse Voltage (V)
- HB = Package (TO-247-3L)

Part Number	Marking	Packing Mode	M.O.Q.
DPF100C1200HB	DPF100C1200HB	Tube (30 pcs)	300