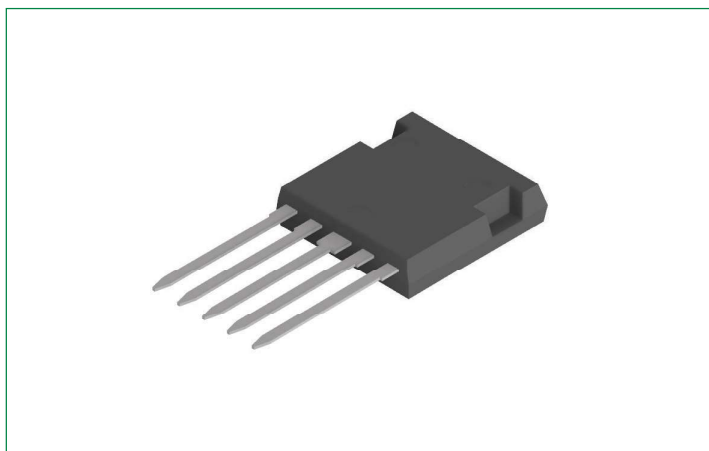


DPF30U200FC

200 V, 30 A High Performance Fast Recovery Diode



Description:

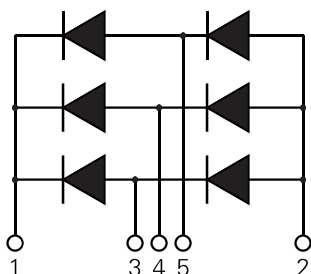
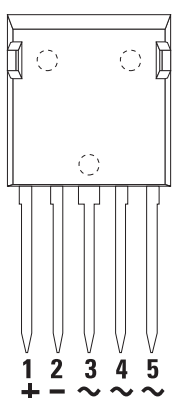
This 200 V, 30 A three-phase diode bridge rectifier integrates high-performance fast recovery diodes packaged in i4-Pac 5-Leads and is commonly used as a rectifier in Switch Mode Power Supplies (SMPS).

This device belongs to the High-Performance Fast Recovery Diode (HiPerFRED) series that features planar passivated chips, a 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 (i4-Pac-5L)

backside: isolated



Features:

- Planar passivated chips
- Very low leakage current
- Short recovery time
- Soft recovery behavior
- Avalanche voltage rated for reliable operation
- Low I_{RM} values
- Recognized as an Electrically Isolated Semiconductor Device (file number E72873)
- Soft reverse recovery for low EMI/RFI

Benefits:

- Low I_{RM} reduces power dissipation within the diode and turn-on loss in the commutating switch
- Improved thermal behavior

Applications:

- Rectifiers in Switch Mode Power Supplies (SMPS)

Package:

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

Product Summary

Characteristic	Value	Unit
V_{RRM}	200	V
I_{DAV}	30	A
t_{rr}	25	ns

Maximum Ratings

Symbol	Characteristics	Conditions	Value	Units
V_{RRM}	Repetitive Reverse Blocking Voltage	$T_{vj} = 25\text{ °C}$	200	V
I_{DAV}	Bridge Output Current	$T_C = 120\text{ °C}, T_{vj} = 175\text{ °C};$ rectangular $d = 1/3$	30	A
I_{FSM}	Non-repetitive Surge Forward Current	$t_p = 10\text{ ms}; (50\text{ Hz}),$ Half sine pulse; $V_R = 0\text{ V}, T_{vj} = 45\text{ °C}$	150	A
T_{stg}	Storage Temperature Range	–	–55 to +150	°C
T_{vj}	Virtual Junction Temperature Range	–	–55 to +175	°C
T_{OP}	Operating Temperature Range	–	–55 to +150	°C
P_{tot}	Total Power Dissipation	$T_C = 25\text{ °C}$	58	W

Thermal Specifications

Symbol	Characteristic	Value			Units
		Min.	Typ.	Max.	
R_{thJC}	Thermal Resistance, Junction to Case	–	–	2.6	K/W
R_{thCH}	Thermal Resistance, Case to Heatsink	–	1	–	K/W

Electrical Characteristics – Static

Symbol	Characteristics	Conditions	Value			Units	
			Min.	Typ.	Max.		
I_R	Reverse Current	$T_{vj} = 25\text{ °C}$	$V_R = V_{RRM}$	–	–	20	μA
		$T_{vj} = 125\text{ °C}$		–	10	100	
V_F	Forward Voltage	$T_{vj} = 25\text{ °C}$	$I_F = 15\text{ A}$	–	1	1.15	V
				$T_{vj} = 125\text{ °C}$	–	1.14	
		$T_{vj} = 25\text{ °C}$			–	0.9	
				$T_{vj} = 125\text{ °C}$	–	1.06	
V_{FO}	Threshold Voltage	$T_{vj} = 175\text{ °C}$	–	–	0.71	V	
r_F	Slope Resistance	$T_{vj} = 175\text{ °C}$	–	–	18.5	$\text{m}\Omega$	
C_J	Junction Capacitance	$V_R = 200\text{ V}$	–	55	–	pF	

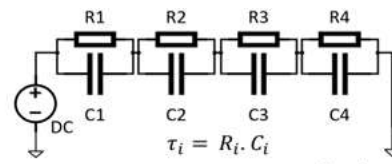
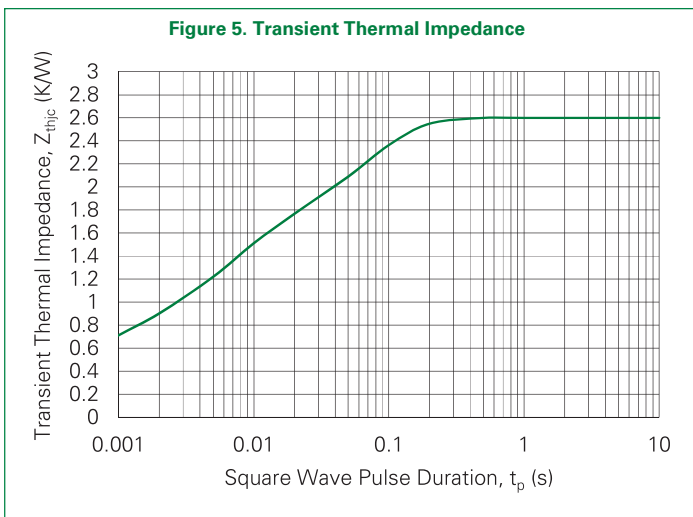
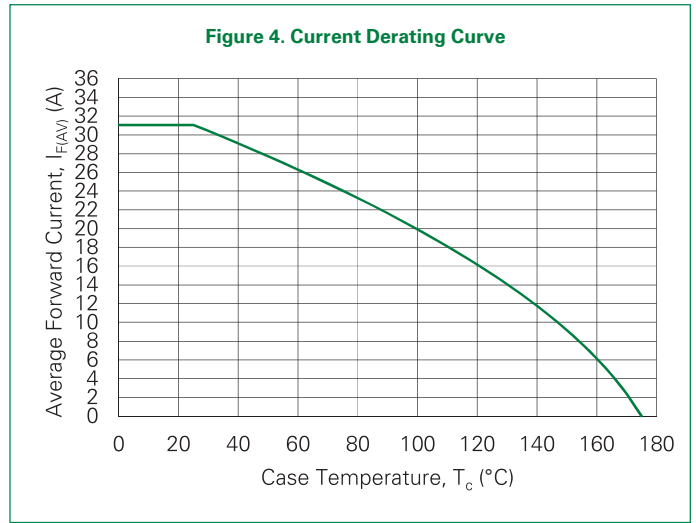
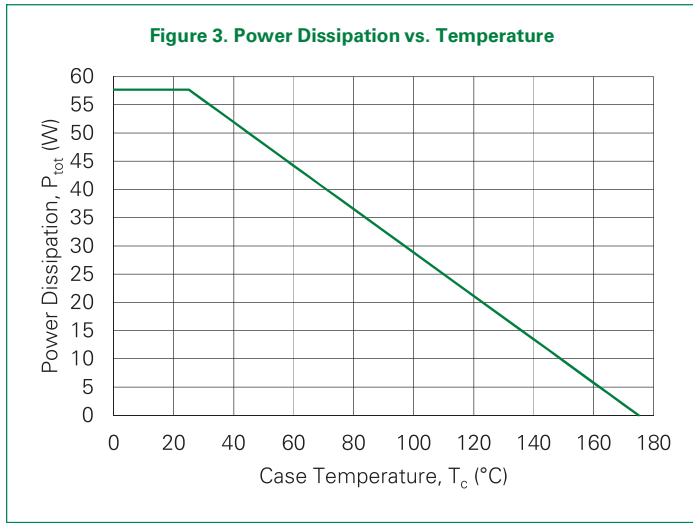
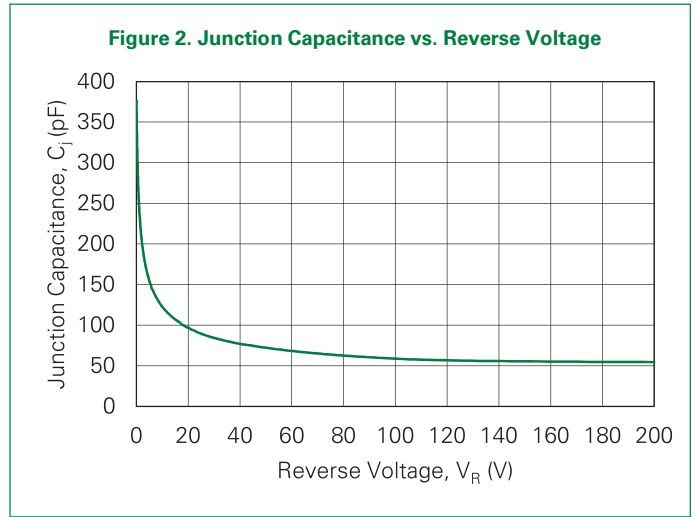
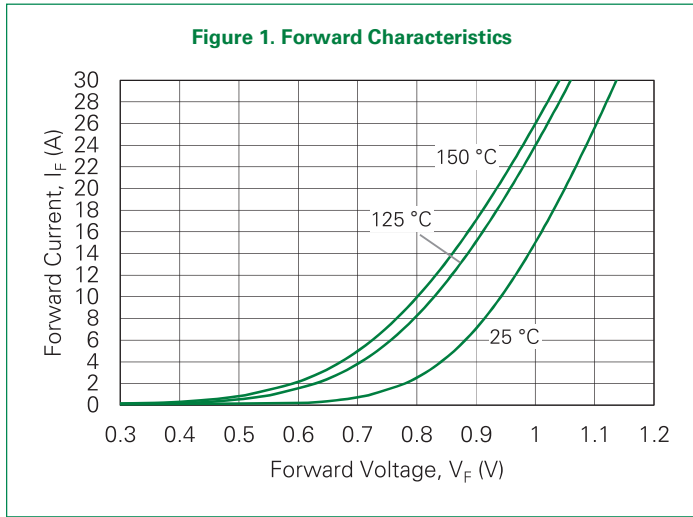
Electrical Characteristics – Dynamic

Symbol	Characteristics	Conditions	Value			Units	
			Min.	Typ.	Max.		
Q_{rr}	Reverse Recovery Charge	$T_{vj} = 25\text{ °C}$	$I_F = 15\text{ A}; V_R = 100\text{ V}$ $di/dt = 200\text{ A}/\mu\text{s}$	–	60	–	nC
		$T_{vj} = 125\text{ °C}$		–	200	–	
I_{RM}	Reverse Recovery Current	$T_{vj} = 25\text{ °C}$		–	4	–	A
		$T_{vj} = 125\text{ °C}$		–	6.7	–	
t_{rr}	Reverse Recovery Time	$T_{vj} = 25\text{ °C}$		–	25	–	ns
		$T_{vj} = 125\text{ °C}$		–	51	–	

Package

Symbol	Characteristics	Conditions	Value			Units	
			Min.	Typ.	Max.		
I_{RMS}	RMS Current	per terminal	–	–	50	A	
F_C	Mounting Force with Clip	–	20	–	120	N	
G	Weight	–	–	6	–	g	
$d_{Spb/App}$	Creepage Distance on Surface/ Striking Distance through Air	terminal to terminal	1.7	–	–	mm	
$d_{Spb/Apb}$		terminal to backside	5.1	–	–		
V_{isol}	Isolation Voltage	1 second	50 Hz, RMS; $I_{isol} \leq 1$ mA	3000	–	–	V
		1 minute		2500	–	–	

Characteristic Curves (per Diode)



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

i	1	2	3	4
R_i	0.01	0.05	0.09	1.1
T_j	0.00001	0.00045	0.0055	0.065

Figure 6. Reverse Recovery Charge vs. di/dt

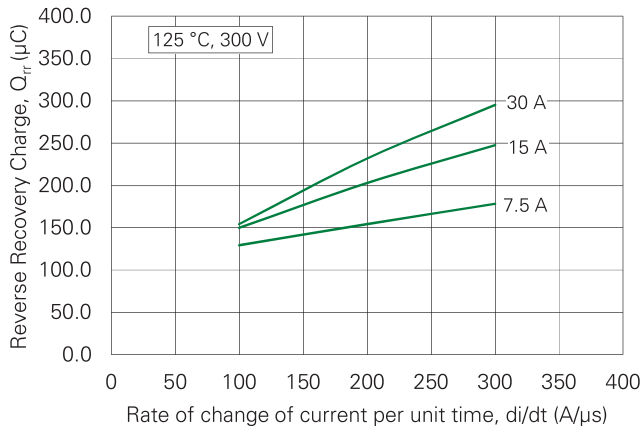


Figure 7. Reverse Recovery Current vs. di/dt

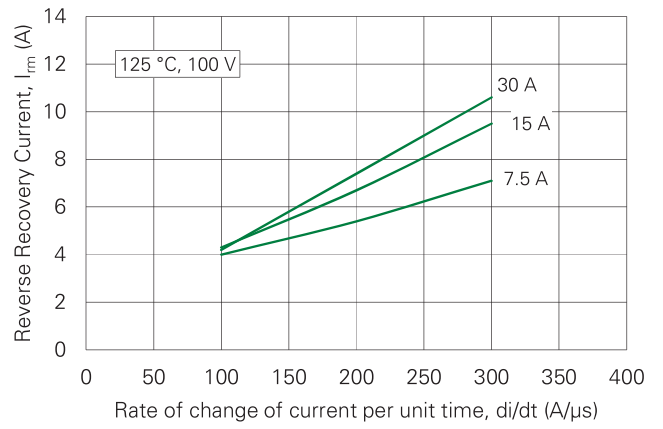


Figure 8. Reverse Recovery Time vs. di/dt

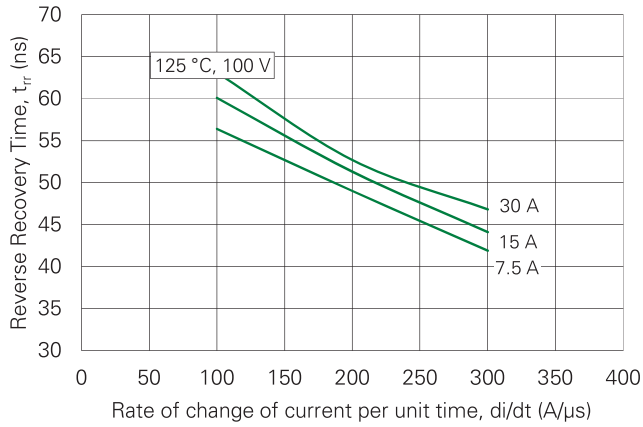
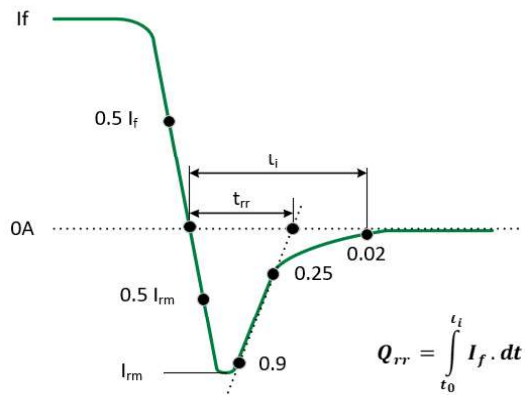
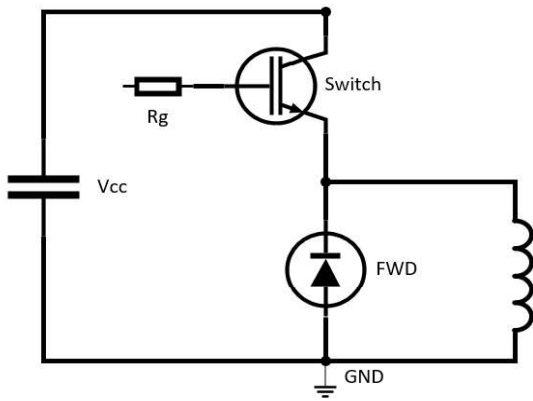
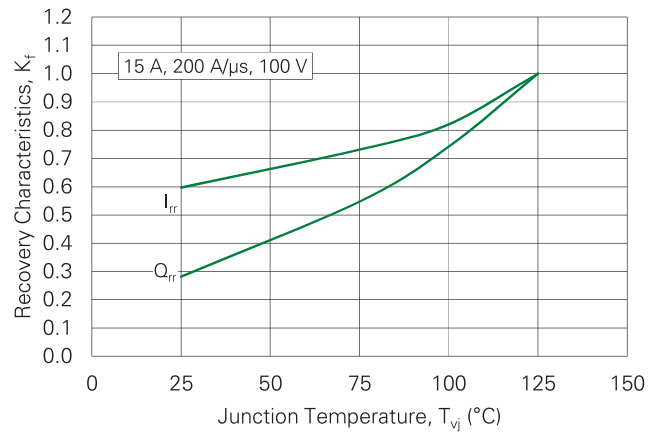
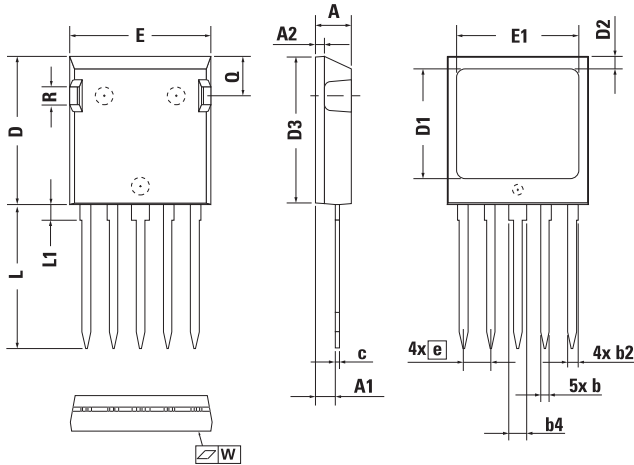


Figure 9. Recovery Characteristics vs. Temperature

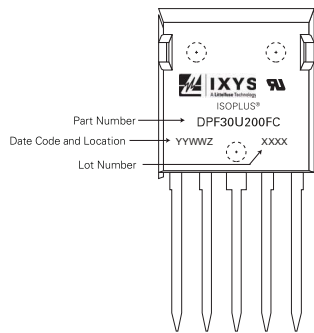


Part Outline Drawing (i4-Pac-5L)



Note: The convex bow of substrate is typically <0.05 mm over plastic surface level of the device's bottom side.

Part Numbering and Marking



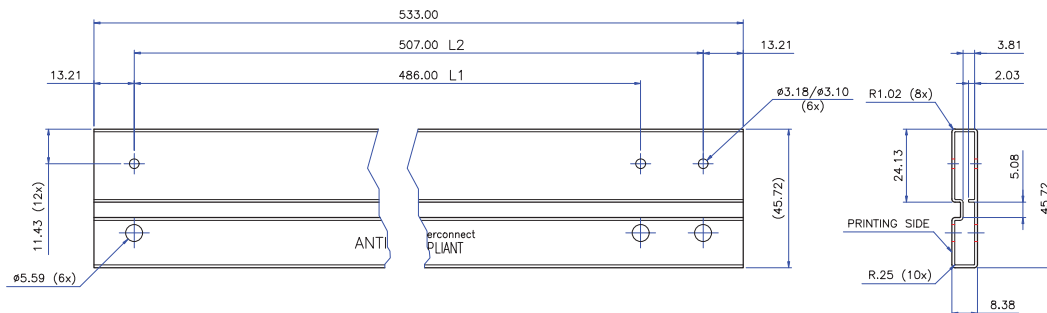
- D = Diode
- P = HiPerFRED
- F = Ultra Fast
- 30 = Current Rating (A)
- U = 3~ Rectifier Bridge
- 200 = Reverse Voltage (V)
- FC = Package (i4-Pac-5L)

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
b4	2.54	2.79	0.100	0.110
c	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
D3	20.30	20.70	0.799	0.815
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	3.81 BSC		0.150 BSC	
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	-	0.10	-	0.004

Packing Options

Part Number	Marking	Packing Mode	M.O.Q.
DPF30U200FC	DPF30U200FC	Tube (25 pcs)	250

Packing Specifications (Tube Option)



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