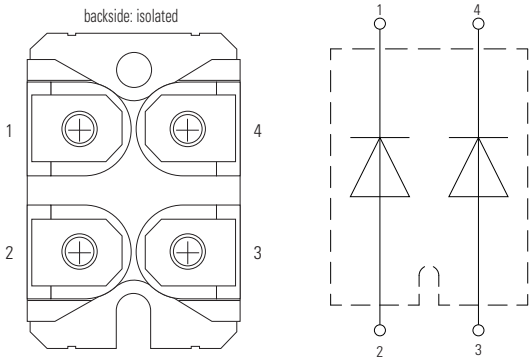
DPU120X600NA

600 V, 2 x 60 A Soft Recovery FRED



Pinout Diagram SOT-227B (miniBLOC™)



1: Cathode; **2:** Anode; **3:** Anode; **4:** Cathode

Description

This is a fast and soft recovery diode with two chips in a SOT-227B package.

Features

- Planar passivated chips
- Low leakage current
- Soft reverse recovery for low EMI/RFI
- UL recognized as an Electrically Isolated Semiconductor Device (file number E72873)

Benefits

- Reduced thermal management requirement
- Cost - efficient solution with ease of assembly
- Reduced switching loss & EMI
- Improved long-term reliability

Applications

- Switch Mode Power Supplies (SMPS)
- Uninterruptible Power Supplies (UPS)
- DC-DC converters
- Inverters / motor drives

Package SOT-227B (miniBLOC)

- Isolation voltage: 3000 V
- RoHS compliant
- Epoxy meets UL 94V-0
- Industry standard outline
- Base plate: Copper internally DCB isolated

Product Summary

Characteristic	Value	Unit
V_{RRM}/V_{DRM}	600	V
$I_{F(AV)}$	60	A

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Maximum Ratings (T_{vj} = 25 °C, unless otherwise specified)

Symbol	Characteristics	Condition	Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage	T_{vj} = 25 °C	600	V
$I_{F(AV)}$	Average Forward Current	T_c = 50 °C, T_{vj} = 150 °C, rectangular d = 0.5	60	A
I_{FSM}	Non-repetitive Surge Forward Current	t_p = 10 ms, f = 50 Hz, sine wave, T_{vj} = 45 °C	650	A
P_{tot}	Total Power Dissipation	T_c = 25 °C	300	W
T_{stg}	Storage Temperature Range	–	–55 to +150	°C
T_{vj}	Virtual Junction Temperature Range	–	–55 to +150	°C

Electrical Characteristics – Static

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
I_R	Reverse Current	V_R = 600 V, T_{vj} = 25 °C	–	–	20	µA
		V_R = 600 V, T_{vj} = 150 °C	–	–	7	mA
V_F	Forward Voltage	I_F = 60 A; T_{vj} = 25 °C	–	1.4	1.70	V
		I_F = 120 A; T_{vj} = 25 °C	–	–	1.95	
		I_F = 60 A; T_{vj} = 150 °C	–	1.2	1.55	
		I_F = 120 A; T_{vj} = 150 °C	–	–	1.75	
$V_{(TO)}$	Threshold Voltage	T_{vj} = 150 °C	–	–	1.19	V
r_T	Slope Resistance	T_{vj} = 150 °C	–	–	2.75	mΩ

Electrical Characteristics – Dynamic

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
t_{rr}	Reverse Recovery Time	I_F = 60 A, V_R = 600 V, -di_F/dt = 600 A/µs, T_{vj} = 25°C	–	100	–	ns
		I_F = 60 A, V_R = 600 V, -di_F/dt = 600 A/µs, T_{vj} = 100°C	–	210	–	ns
C_j	Junction Capacitance	T_{vj} = 150 °C, V_R = 400 V; f = 100 kHz	–	72	–	pF

Thermal Characteristics

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
$R_{th(j-c)}$	Thermal Resistance, Junction to Case	–	–	–	0.41	K/W

Package SOT-227B (minibloc)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
M_s	Mounting Torque For Screws To Heat Sink	–	1.1	–	1.5	Nm
M_t	Mounting Torque For Terminal Screws	–	1.1	–	1.5	Nm
V_{isol}	Isolation Withstand Voltage	f = 50/60 Hz, RMS; I_{isol} ≤ 1mA, t = 1 s	3000	–	–	V
		f = 50/60 Hz, RMS; I_{isol} ≤ 1mA, t = 1 min	2500	–	–	V
G	Weight	–	–	30	–	g
T_{op}	Operating Temperature	–	-55	–	125	°C

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Characteristic Curves

Fig. 1. Typical Forward Characteristics

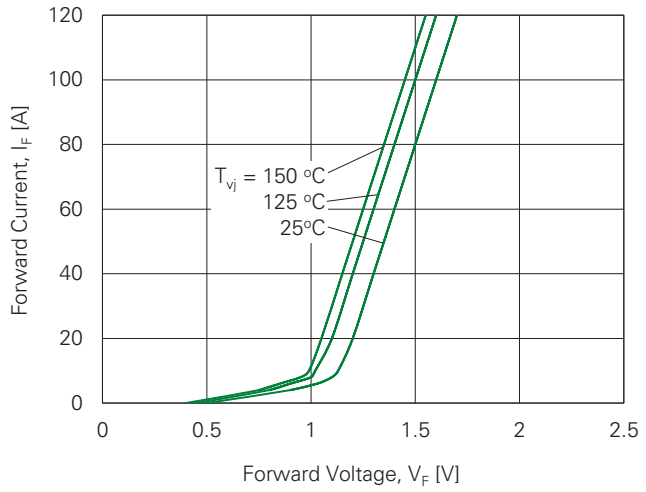


Fig. 2. Typical Reverse Recovery Charge vs. Diode Current Slope

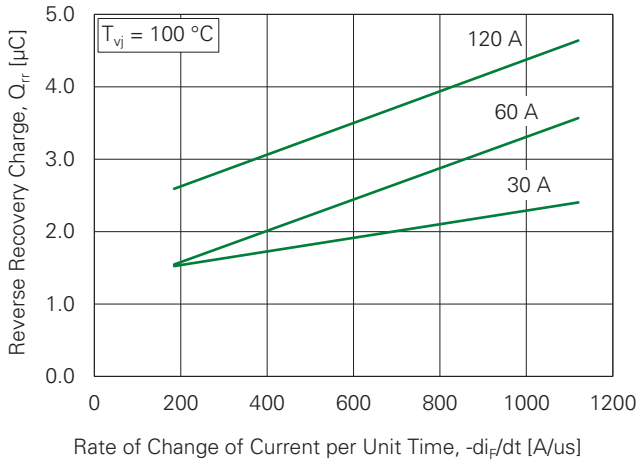


Fig. 3. Typical Reverse Recovery Time vs. Diode Current Slope

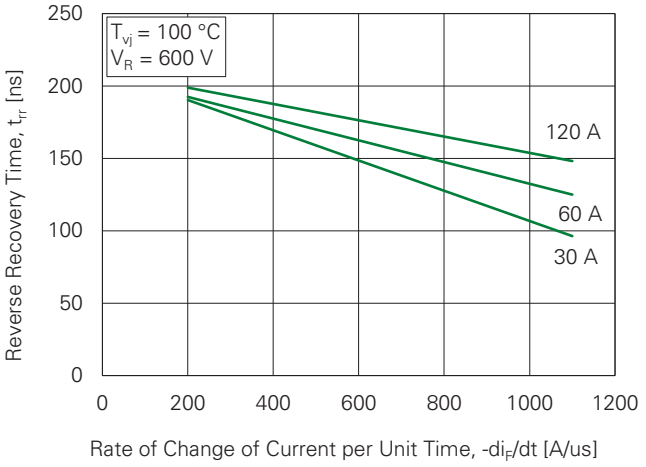


Fig. 4. Typical Peak Reverse Recovery Current vs. Diode Current Slope

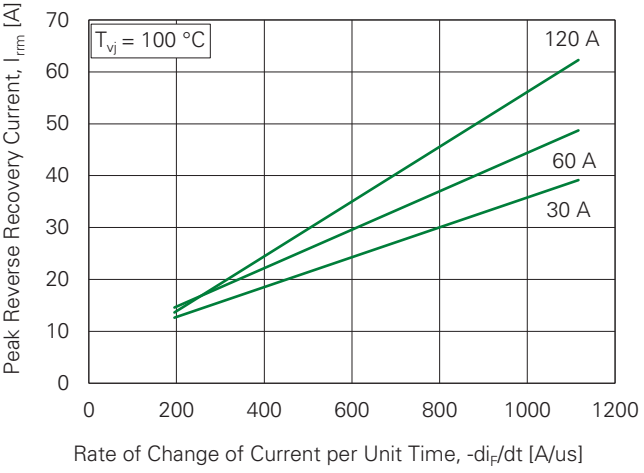


Fig. 5. Typical Forward Voltage V_{fr} and t_{fr} vs -di_F/dt

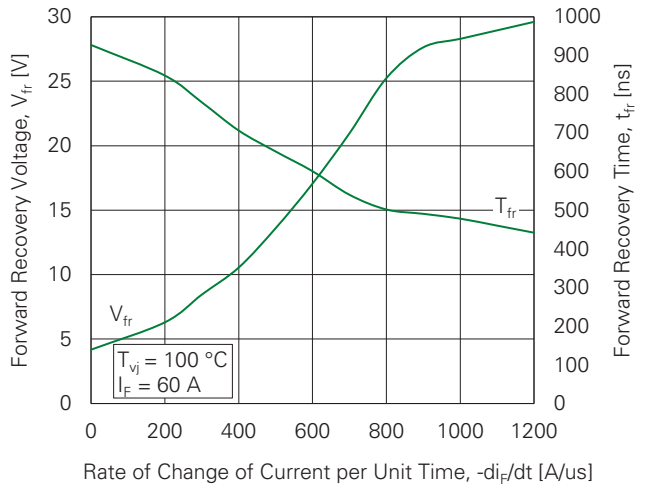
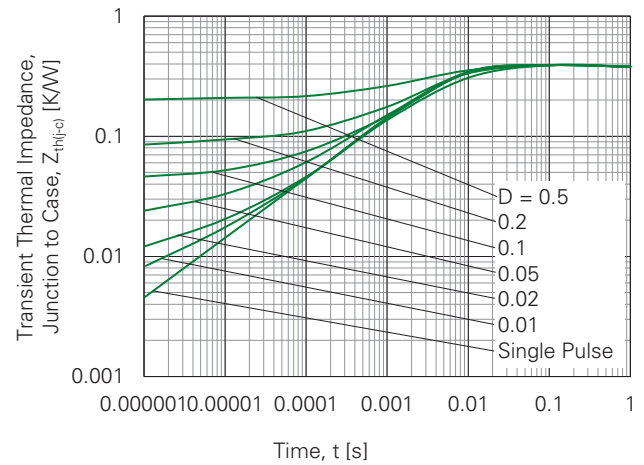
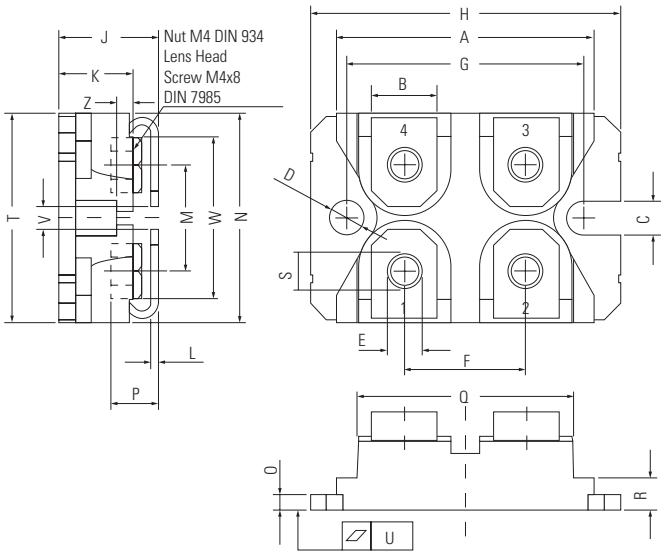


Fig. 6. Typical Transient Thermal Impedance, Junction to Case



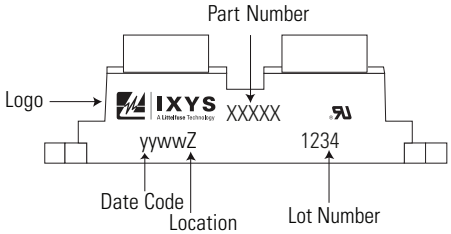
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Part Outline Drawing SOT-227B (miniBLOC)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	–0.05	0.10	–0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106

Part Number and Marking



D = Diode
P = FRED
U = Ultrafast
120 = Current (120 A)
X = Parallel Legs
600 = Voltage (600 V)
NA = SOT-227B (miniBLOC)

yy = Year
ww = Work Week
Z = Plant Location Code
xxxxx = Lot Number

Ordering Information

Part Number	Marking	Packing Mode	Quantity
DPU120X600NA	DPU120X600NA	Tube	10 pcs/ tube

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