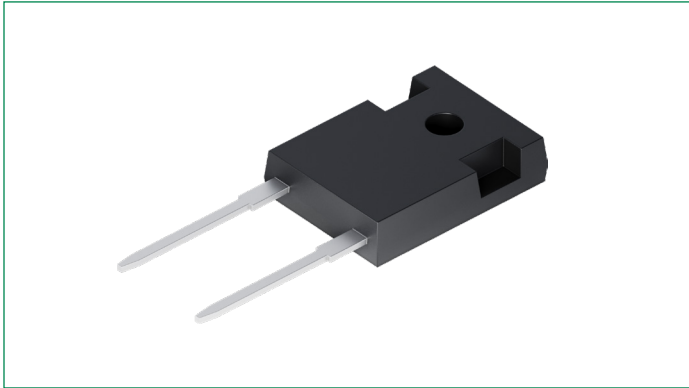


DPS120I1200HA

1200 V, 120 A Fast Recovery Diode

RoHS



Description

This 1200 V, 120 A general-purpose, power fast recovery diode features a single chip in a TO-247 package.

Features

- Planar passivated chips
- Reverse leakage current, $I_R \leq 100 \mu\text{A} @ 25^\circ\text{C}$
- Good thermal behavior; $R_{th(j-c)}$ is 0.25 K/W
- Typical recovery time is 54 ns

Benefits

- Stable long-term reliability
- Low standby losses
- Higher current-handling capability
- High efficiency in switching

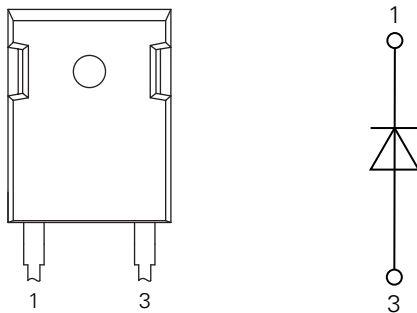
Applications

- Antiparallel diode for high frequency switching devices
- Anti-saturation diode
- Snubber diode
- Freewheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptable power supplies (UPS)

Package

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

Pinout Diagram (TO-247)



1: Cathode; **3:** Anode; **Backside:** Cathode

Product Summary

Characteristic	Value	Unit
V_{RRM}	1200	V
$I_{F(AV)}$	120	A
t_{rr}	54	ns

Maximum Ratings

Symbol	Characteristics	Condition	Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj} = 25\text{ }^{\circ}\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current	$T_c = 85\text{ }^{\circ}\text{C}$, $T_{vj} = 150\text{ }^{\circ}\text{C}$, rectangular, $d = 0.5$	120	A
I_{FSM}	Non-repetitive Forward Surge Current	$t_p = 10\text{ ms}$, (50 Hz), half sine wave, $V_R = 0\text{ V}$, $T_{vj} = 45\text{ }^{\circ}\text{C}$	1000	A
P_{tot}	Total Power Dissipation	$T_c = 25\text{ }^{\circ}\text{C}$	500	W
T_{vj}	Virtual Junction Temperature Range	–	–55 to +150	$^{\circ}\text{C}$
T_{op}	Operating Temperature Range	–	–55 to +125	$^{\circ}\text{C}$
T_{stg}	Storage Temperature Range	–	–55 to +150	$^{\circ}\text{C}$

Electrical Characteristics – Static

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
I_R	Reverse Current	$V_R = 1200\text{ V}$, $T_{vj} = 25\text{ }^{\circ}\text{C}$	–	–	100	μA
		$V_R = 1200\text{ V}$, $T_{vj} = 150\text{ }^{\circ}\text{C}$	–	–	10	mA
V_F	Forward Voltage	$I_F = 120\text{ A}$; Pulse, $T_{vj} = 25\text{ }^{\circ}\text{C}$	–	1.85	2.3	V
		$I_F = 240\text{ A}$; Pulse, $T_{vj} = 25\text{ }^{\circ}\text{C}$	–	–	2.5	
		$I_F = 120\text{ A}$; Pulse, $T_{vj} = 150\text{ }^{\circ}\text{C}$	–	1.6	2.1	
		$I_F = 240\text{ A}$; Pulse, $T_{vj} = 150\text{ }^{\circ}\text{C}$	–	–	2.25	
$V_{(FO)}$	Threshold Voltage	–	–	–	0.56	V
r_F	Slope Resistance	–	–	–	13.4	m Ω

Electrical Characteristics – Dynamic ($T_{vj} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
C_j	Junction Capacitance	$V_R = 600\text{ V}$, $f = 1\text{ MHz}$	–	55	–	pF
t_{rr}	Reverse Recovery Time	$I_F = 0.5\text{ A}$, $I_R = 1\text{ A}$, $I_{rr} = 0.25\text{ A}$	–	130	200	ns
		$I_F = 1\text{ A}$, $V_R = 30\text{ V}$, $-di_F/dt = 200\text{ A}/\mu\text{s}$	–	54	–	
		$I_F = 60\text{ A}$, $V_R = 600\text{ V}$, $-di_F/dt = 200\text{ A}/\mu\text{s}$	–	240	–	
I_{rm}	Peak Reverse Recovery Current	$I_F = 60\text{ A}$, $V_R = 600\text{ V}$, $-di_F/dt = 200\text{ A}/\mu\text{s}$	–	11.1	–	A

Thermal Specifications

Symbol	Characteristics	Value			Units
		Min.	Typ.	Max.	
$R_{th(j-c)}$	Thermal Resistance, Junction to Case	–	–	0.25	K/W

Package TO-247-2L

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
G	Weight	–	–	6	–	g
M_d	Mounting Torque	–	0.8	–	1.2	Nm
F_c	Mounting Force with clip	–	20	–	120	N

Characteristic Curves

Figure 1. Typical Forward Characteristics

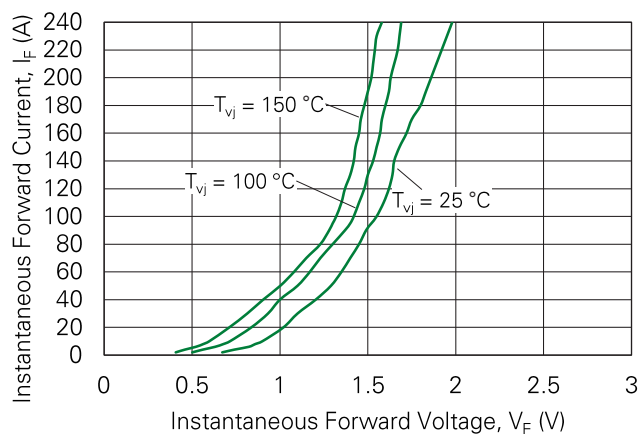
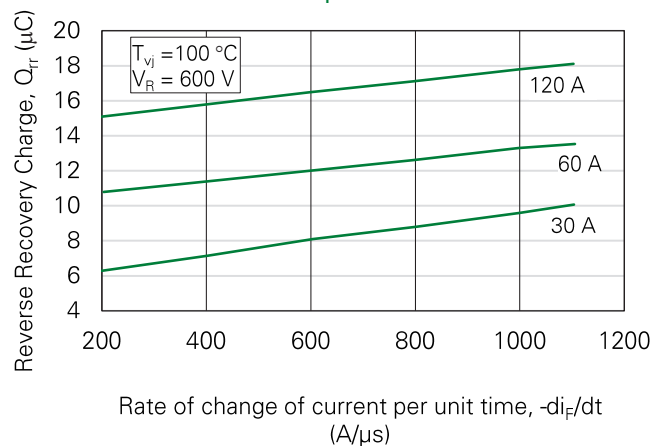
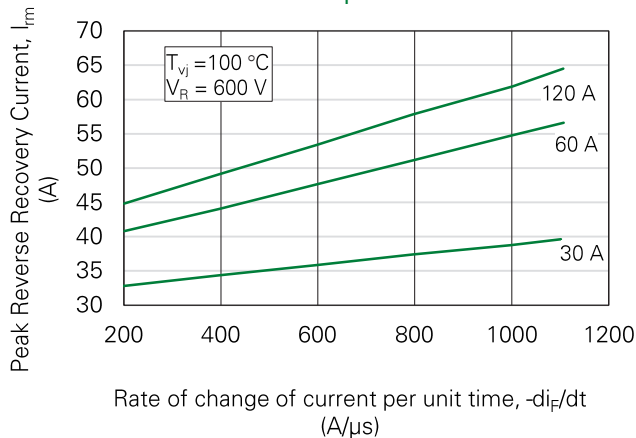
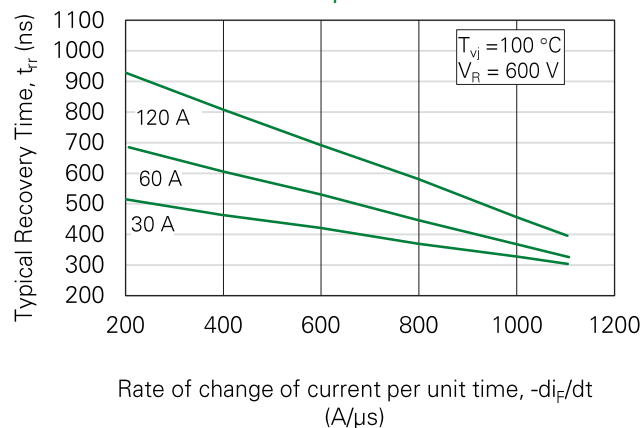
Figure 2. Typical Reverse Recovery Charge vs. $-di_F/dt$ Figure 3. Typical Peak Reverse Recovery Current vs. $-di_F/dt$ Figure 4. Typical Recovery Time vs. $-di_F/dt$ 

Figure 5. Typical Forward Recovery Voltage vs. Diode Current Slope

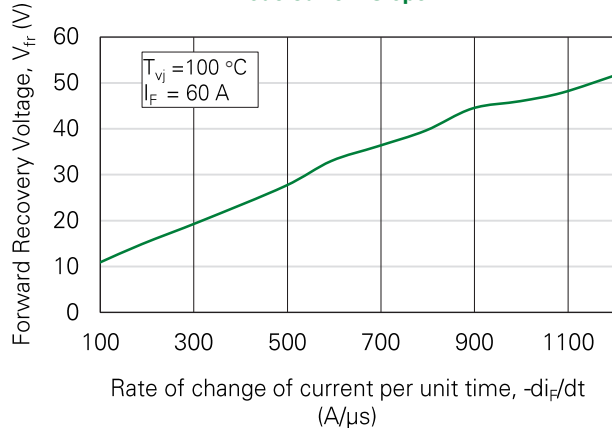
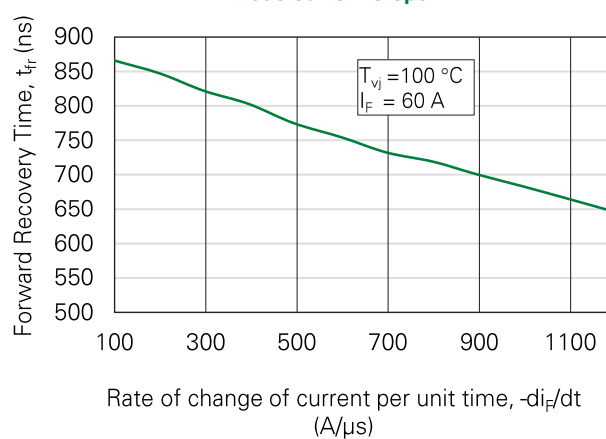
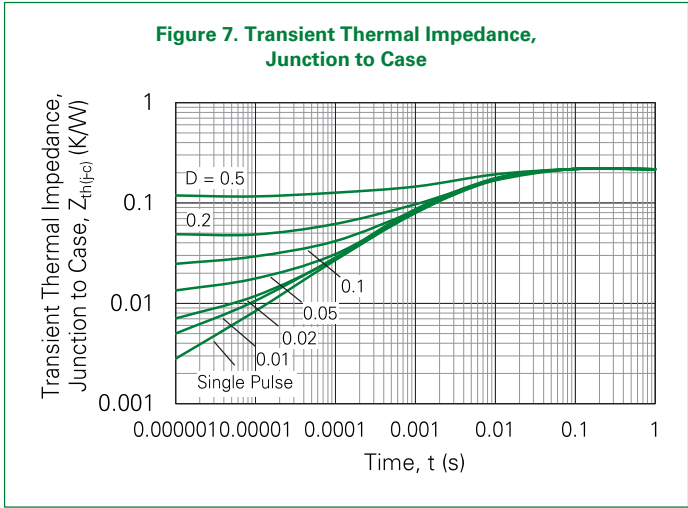


Figure 6. Typical Forward Recovery Time vs. Diode Current Slope

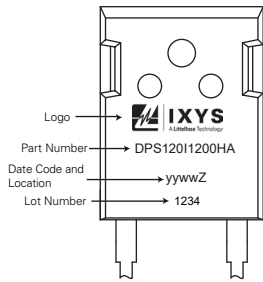




Packing Options

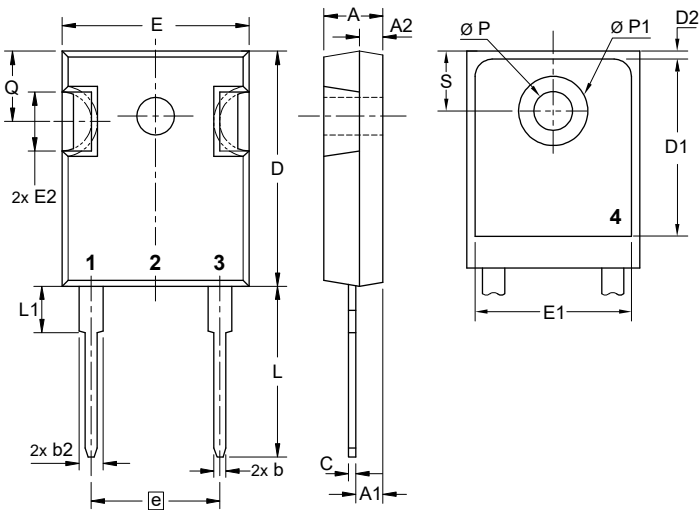
Part Number	Marking	Packing Mode
DPS120I1200HA	DPS120I1200HA	Tube (30 pcs)

Part Numbering and Marking



- D = Diode
- P = FRED
- S = Fast
- 120 = Current Rating (A)
- I = Single Part Diode
- 1200 = Voltage Rating (V)
- HA = Package (TO-247-2L)

Part Outline Drawing TO-247-2L



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	15.48	16.24	0.610	0.640
E1	13.45	—	0.530	—
E2	4.31	5.48	0.170	0.216
e	10.92 BSC		0.430 BSC	
L	19.80	20.30	0.780	0.800
L1	—	4.49	—	0.177
Q	5.38	6.19	0.212	0.244
S	6.14BSC		0.242 BSC	
ØP	3.55	3.65	0.140	0.144
ØP1	—	7.39	—	0.29

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