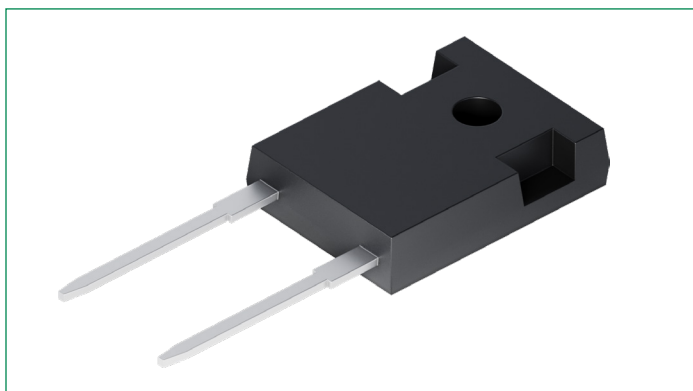


DPS120I1200HA

1200 V, 120 A Fast Recovery Diode

RoHS



Description

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

Features

- Reverse leakage current, $I_R \leq 100 \mu\text{A} @ 25^\circ\text{C}$
- Low thermal resistance, $R_{th(j-c)} = 0.25 \text{ K/W}$
- Typical recovery time is 54 ns @ $I_F = 1 \text{ A}$

Benefits

- Stable long-term reliability
- Higher current-handling capability
- Optimized for higher switching frequencies

Applications

- Power factor control
- Switch mode power supplies (SMPS)
- Maximum Power Point Tracking (MPPT) solar inverters

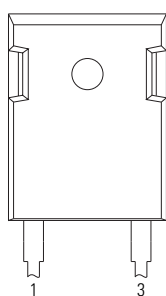
Package

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

Product Summary

Characteristic	Value	Unit
V_{RRM}	1200	V
$I_{F(AV)}$	120	A
$t_{rr} @ I_F = 1 \text{ A}$	54	ns

Pinout Diagram (TO-247)



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

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_{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	$I_F = 120\text{ A}$; $T_{vj} = 25\text{ }^{\circ}\text{C}$	–	1.85	2.3	V
		$I_F = 240\text{ A}$; $T_{vj} = 25\text{ }^{\circ}\text{C}$	–	–	2.5	
		$I_F = 120\text{ A}$; $T_{vj} = 150\text{ }^{\circ}\text{C}$	–	1.6	2.1	
		$I_F = 240\text{ A}$; $T_{vj} = 150\text{ }^{\circ}\text{C}$	–	–	2.25	
$V_{(TO)}$	Threshold Voltage	$T_{vj} = 150\text{ }^{\circ}\text{C}$	–	–	0.56	V
r_T	Slope Resistance	$T_{vj} = 150\text{ }^{\circ}\text{C}$	–	–	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	$I_F = 1\text{ A}$, $I_R = 1\text{ A}$	–	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_{rrm}	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	Mounting Force	–	20	–	120	N
T_{op}	Operating Temperature Range	–	–	–	–55 to +125	$^{\circ}\text{C}$

Characteristic Curves

Figure 1. Typical Forward Characteristics

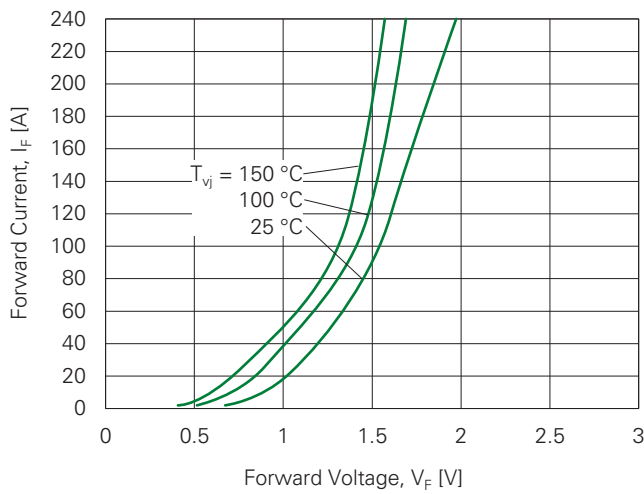
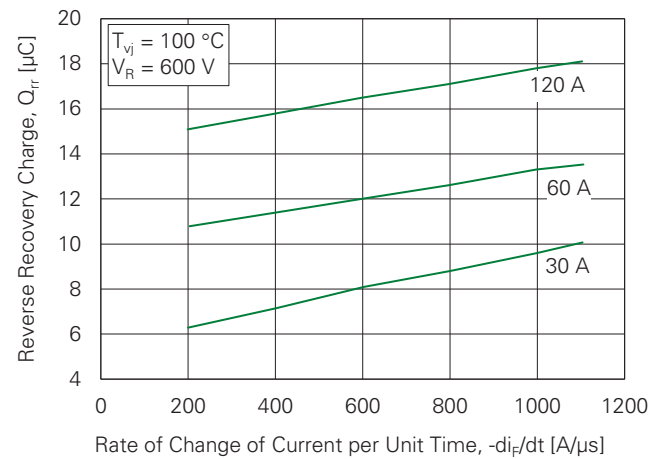
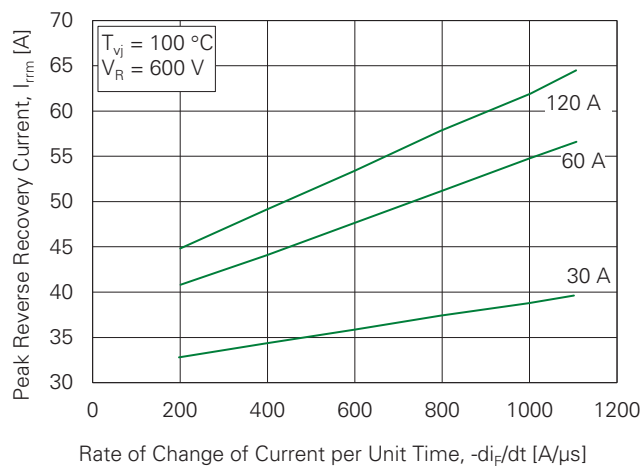
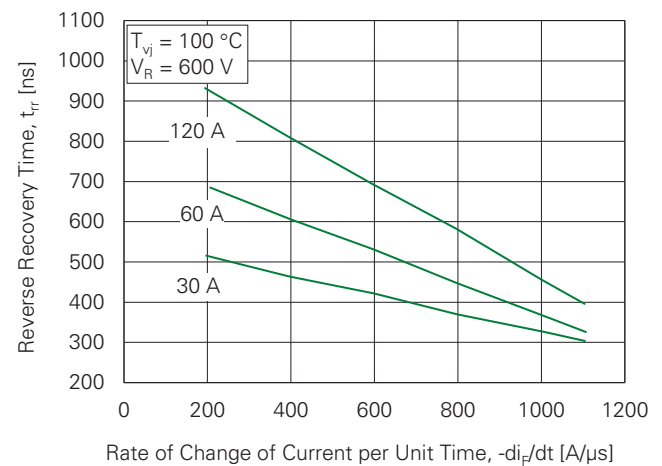
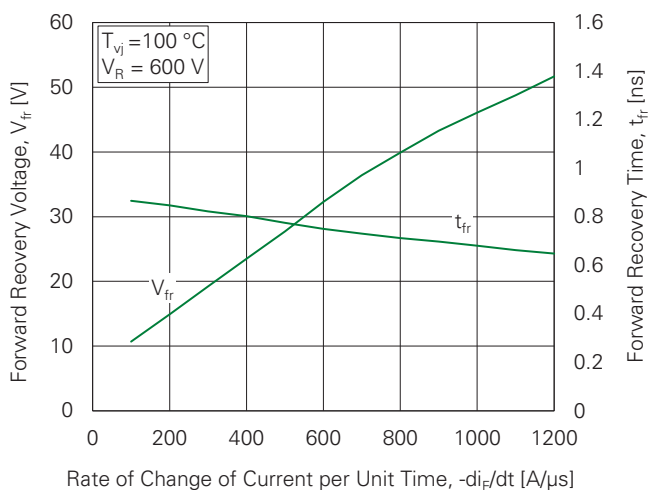
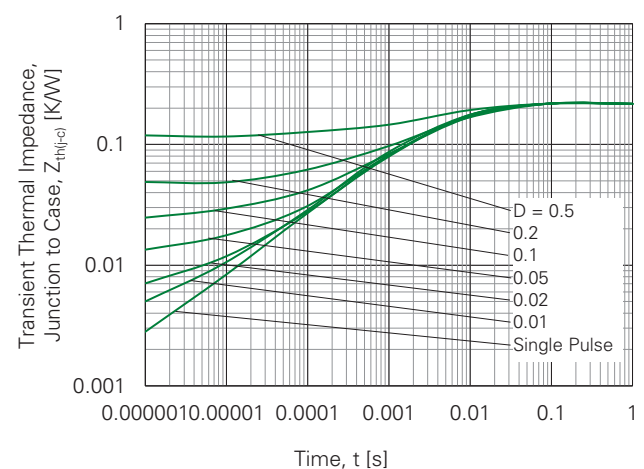
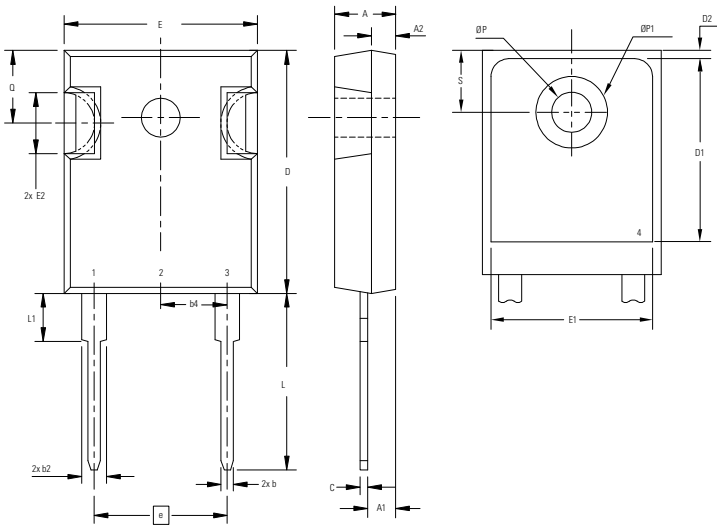
Fig. 2. Typical Reverse Recovery Charge vs. $-di_F/dt$ Fig. 3. Typical Peak Reverse Recovery Current vs. $-di_F/dt$ Fig. 4. Typical Reverse Recovery Time vs. $-di_F/dt$ Fig. 5. Typical Forward Voltage V_{fr} and t_{fr} vs $-di_F/dt$ 

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

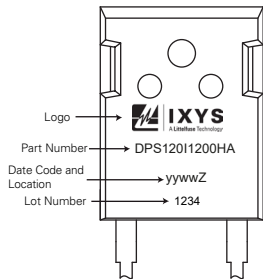


Part Outline Drawing TO-247-2L



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

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)

Ordering Information

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

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Part of:

