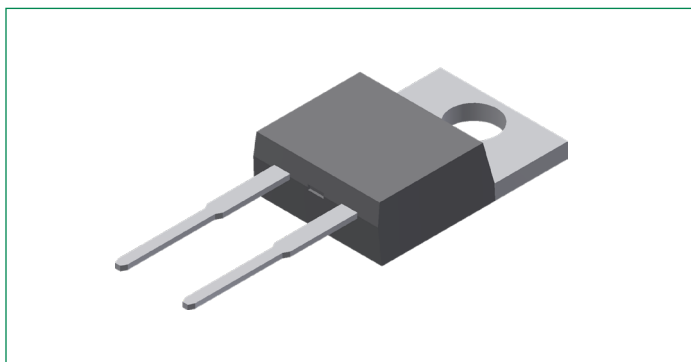


DPT15I600PA

600 V, 15 A Fast Recovery Diode

RoHS



Description

This 600 V, 15 A general-purpose, power fast recovery diode features a single chip in a TO-220 package.

Features

- Reverse leakage current, $I_R \leq 10 \mu\text{A}$ @ 25 °C
- Efficient heat transfer; $R_{\text{th(j-c)}}$ is 0.86 K/W
- Typical recovery time is 26 ns

Benefits

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

Applications

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

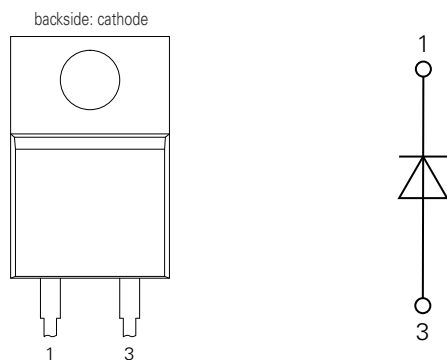
Package TO-220

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

Product Summary

Characteristic	Value	Unit
V_{RRM}	600	V
$I_{\text{F(AV)}}$	15	A
t_{rr}	26	ns

Pinout Diagram TO-220



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

Maximum Ratings

Symbol	Characteristics	Condition	Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj} = 25\text{ }^{\circ}\text{C}$	600	V
$I_{F(AV)}$	Average Forward Current	$T_c = 120\text{ }^{\circ}\text{C}, T_{vj} = 150\text{ }^{\circ}\text{C}, \text{rectangular, } d = 0.5$	15	A
I_{FSM}	Non-repetitive Forward Surge Current	$t_p = 10\text{ ms, half sine wave, } V_R = 0\text{ V}$	150	A
P_{tot}	Total Power Dissipation	$T_c = 25\text{ }^{\circ}\text{C}$	145	W
T_{vj}	Virtual Junction Temperature Range	–	–55 to +150	$^{\circ}\text{C}$
T_{op}	Operating 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	$V_R = 600\text{ V}, T_{vj} = 25\text{ }^{\circ}\text{C}$	–	–	10	μA
		$V_R = 600\text{ V}, T_{vj} = 150\text{ }^{\circ}\text{C}$	–	–	0.5	mA
V_F	Forward Voltage	$I_F = 15\text{ A; Pulse, } T_{vj} = 25\text{ }^{\circ}\text{C}$	–	1.9	2.3	V
		$I_F = 30\text{ A; Pulse, } T_{vj} = 25\text{ }^{\circ}\text{C}$	–	–	2.5	
		$I_F = 15\text{ A; Pulse, } T_{vj} = 150\text{ }^{\circ}\text{C}$	–	1.37	1.75	
		$I_F = 30\text{ A; Pulse, } T_{vj} = 150\text{ }^{\circ}\text{C}$	–	–	2.04	
$V_{(FO)}$	Threshold Voltage	–	–	0.77	V	
r_F	Slope Resistance	–	–	28.4	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	$V_R = 400\text{ V}, f = 1\text{ MHz}$	–	14	–	pF
t_{rr}	Reverse Recovery Time	$I_F = 0.5\text{ A}, I_R = 1\text{ A}, I_{rr} = 0.25\text{ A}$	–	28	35	ns
		$I_F = 1\text{ A}, V_R = 30\text{ V}, -di_F/dt = 200\text{ A}/\mu\text{s}$	–	26	–	
		$I_F = 15\text{ A}, V_R = 300\text{ V}, -di_F/dt = 200\text{ A}/\mu\text{s}$	–	25	–	
I_{rm}	Peak Reverse Recovery Current	$I_F = 15\text{ A}, V_R = 300\text{ V}, -di_F/dt = 200\text{ A}/\mu\text{s}$	–	2.5	–	A

Thermal Specifications

Symbol	Characteristics	Value			Units
		Min.	Typ.	Max.	
$R_{th(j-c)}$	Thermal Resistance, Junction to Case	–	–	0.86	K/W

Package TO-220

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
G	Weight	–	–	2	–	g
M_d	Mounting Torque	–	0.4	–	0.6	Nm
F_C	Mounting Force with clip	–	20	–	60	N

Characteristic Curves

Figure 1. Typical Forward Characteristics

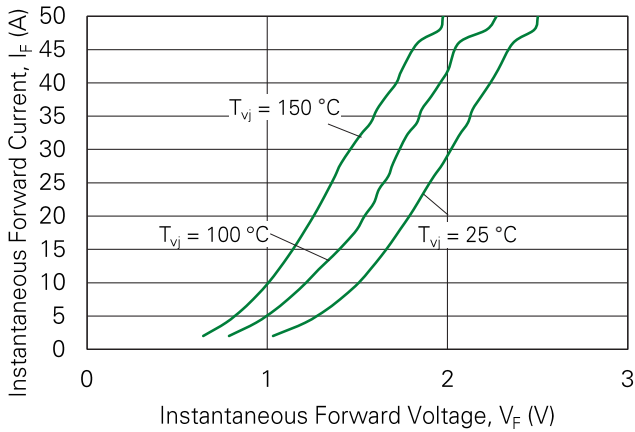


Figure 2. Typical Reverse Recovery Charge vs. $-di_F/dt$

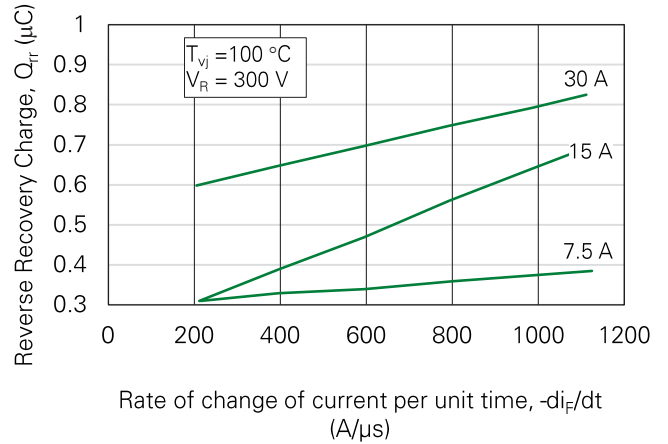


Figure 3. Typical Peak Reverse Recovery Current vs. $-di_F/dt$

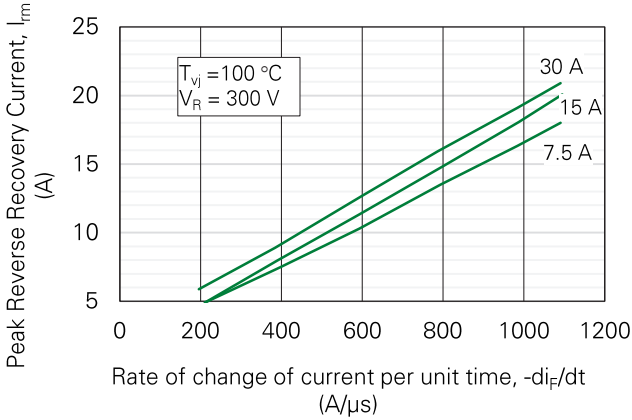


Figure 4. Typical Recovery Time vs. $-di_F/dt$

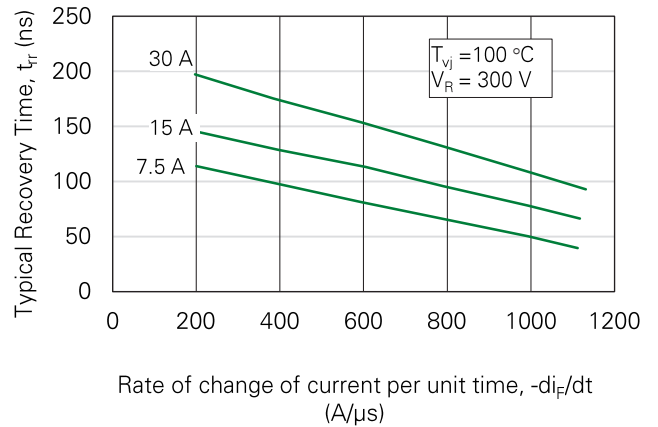


Figure 5. Typical Forward Recovery Voltage vs. Diode Current Slope

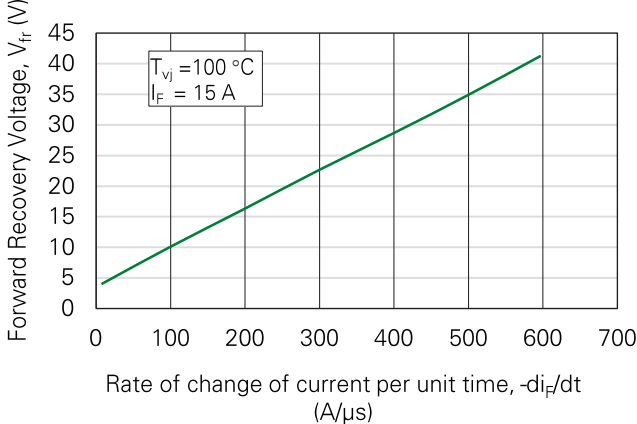
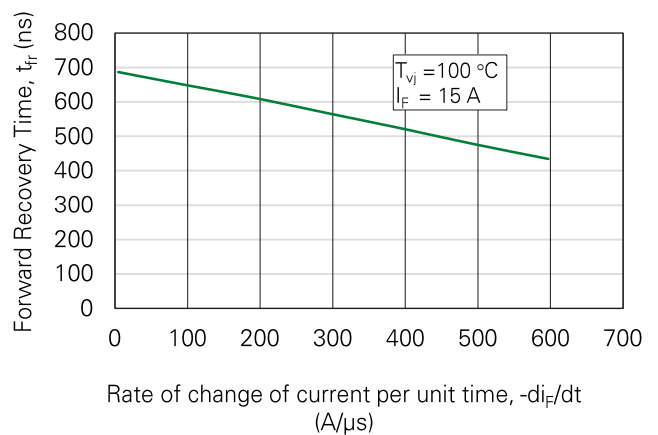
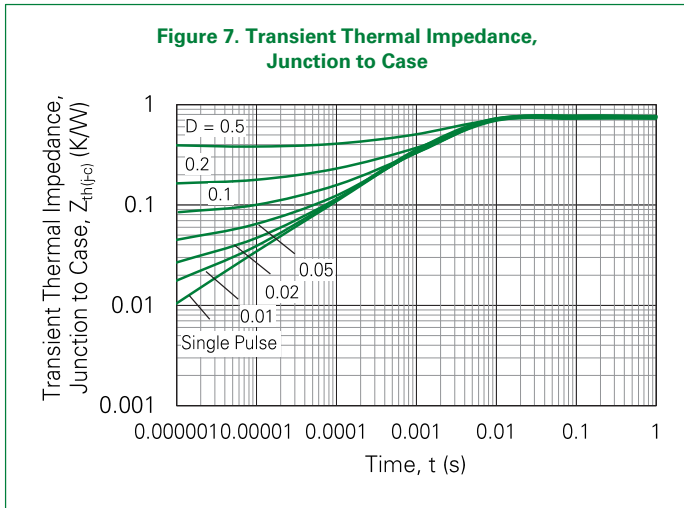


Figure 6. Typical Forward Recovery Time vs. Diode Current Slope

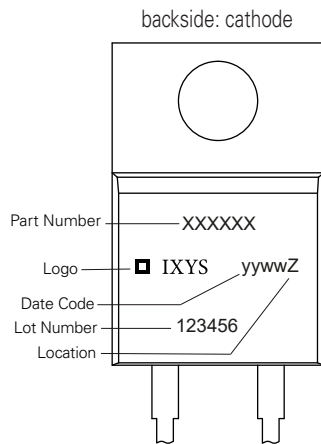




Packing Options

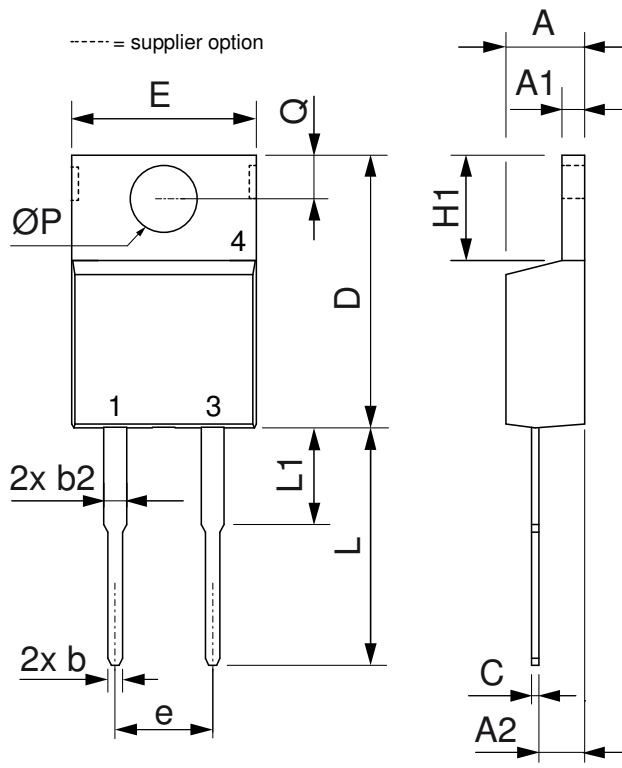
Part Number	Marking	Packing Mode
DPT15I600PA	DPT15I600PA	Tube (50 pcs)

Part Numbering and Marking



- D = Diode
- P = FRED
- T = Hyperfast
- 15 = Current Rating (A)
- I = Single Part Diode
- 600 = Voltage Rating (V)
- PA = Package (TO-220AC)

Part Outline Drawing TO-220AC



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	5.08 BSC		0.200 BSC	
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
ØP	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125

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Part of:

