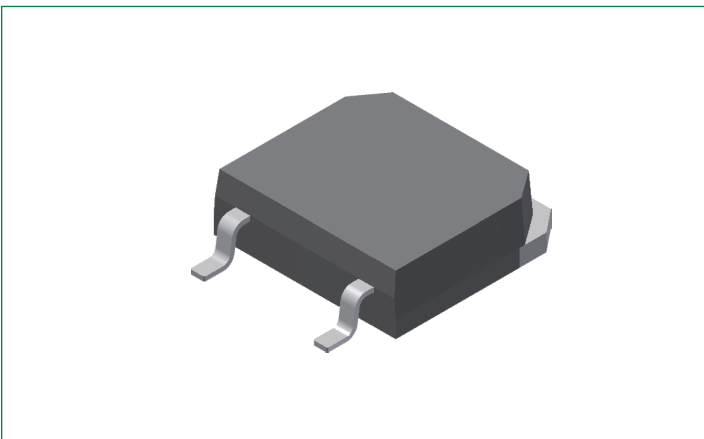


DSEP60-06AZ

600 V, 60 A High Performance Fast Recovery Diode

Low Loss and Soft Recovery Single Diode

RoHS



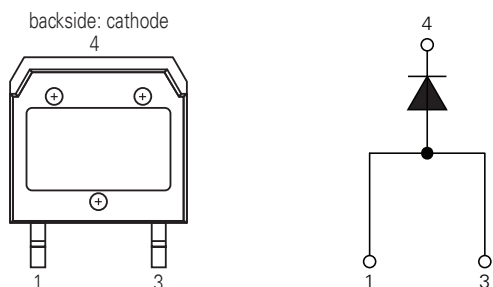
Features:

- Planar passivated chips
- Very low leakage current
- Short recovery time
- Soft recovery behavior
- Low I_{RM} values
- Avalanche voltage rated for reliable operation
- 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

Pinout Diagram TO-268AA (D³PAK-HV)



1: Anode; 3: Anode; 4: Cathode

Applications:

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Freewheeling diode
- Rectifiers in Switch Mode Power Supplies (SMPS)
- Uninterruptible power supplies (UPS)

Package:

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

Product Summary

Characteristic	Value	Unit
V_{RRM}	600	V
I_{FAV}	60	A
t_{rr}	35	ns

Maximum Ratings

Symbol	Characteristics	Conditions	Value	Units
V_{RRM}	Repetitive Reverse Blocking Voltage	$T_{vj} = 25\text{ }^{\circ}\text{C}$	600	V
I_{FAV}	Average Forward Current	$T_C = 130\text{ }^{\circ}\text{C}$, $T_{vj} = 175\text{ }^{\circ}\text{C}$; rectangular d = 0.5	60	A
I_{FSM}	Forward Surge Current	t = 10 ms; (50 Hz), sine; $V_R = 0\text{ V}$, $T_{vj} = 45\text{ }^{\circ}\text{C}$	600	A
T_{stg}	Storage Temperature Range	–	–55 to +150	$^{\circ}\text{C}$
T_{vj}	Virtual Junction Temperature Range	–	–55 to +175	$^{\circ}\text{C}$
T_{OP}	Operating Temperature Range	–	–55 to +150	$^{\circ}\text{C}$
P_{tot}	Total Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	330	W

Thermal Specifications

Symbol	Characteristic	Value			Units
		Min.	Typ.	Max.	
R_{thJC}	Thermal Resistance, Junction to Case	–	–	0.45	K/W
R_{thCH}	Thermal Resistance, Case to Heatsink	–	0.15	–	K/W

Electrical Characteristics – Static

Symbol	Characteristics	Conditions		Value			Units
				Min.	Typ.	Max.	
I_R	Reverse Leakage Current	$T_{vj} = 25\text{ }^{\circ}\text{C}$	$V_R = 600\text{ V}$	–	–	650	μA
		$T_{vj} = 150\text{ }^{\circ}\text{C}$		–	–	2.5	mA
V_F	Forward Voltage	$T_{vj} = 25\text{ }^{\circ}\text{C}$	$I_F = 60\text{ A}$	–	–	2.04	V
			$I_F = 120\text{ A}$	–	–	2.33	
		$T_{vj} = 150\text{ }^{\circ}\text{C}$	$I_F = 60\text{ A}$	–	–	1.39	
			$I_F = 120\text{ A}$	–	–	1.70	
V_{FO}	Threshold Voltage	$T_{vj} = 175\text{ }^{\circ}\text{C}$		–	–	0.95	V
r_F	Slope Resistance	$T_{vj} = 175\text{ }^{\circ}\text{C}$		–	–	5	m Ω
C_J	Junction Capacitance	$V_R = 400\text{ V}$; f = 1 MHz		–	67	–	pF

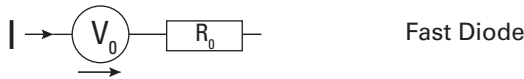
Electrical Characteristics – Dynamic

Symbol	Characteristics	Conditions		Value			Units
				Min.	Typ.	Max.	
I_{RM}	Reverse Recovery Current	$T_{vj} = 25\text{ }^{\circ}\text{C}$	$I_F = 60\text{ A}$; $V_R = 300\text{ V}$; -di/dt = 200 A/ μs	–	8	–	A
		$T_{vj} = 100\text{ }^{\circ}\text{C}$		–	13	–	
t_{rr}	Reverse Recovery Time	$T_{vj} = 25\text{ }^{\circ}\text{C}$		–	35	–	ns
		$T_{vj} = 100\text{ }^{\circ}\text{C}$		–	110	–	

Package TO-268AA (D³PAK-HV)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
I _{RMS}	RMS Current	per terminal	–	–	70	A
F _C	Mounting Force with Clip	–	20	–	120	N
G	Weight	–	–	4	–	g
d _{Spp/App}	Creepage Distance on Surface/ Striking Distance through Air	terminal to terminal	9.4	–	–	mm
d _{Spb/Apb}		terminal to backside	5.6	–	–	mm

Equivalent Circuits for Simulation (T_{vj} = 175 °C)



Symbol	Characteristics	Value	Units
V _{0 max}	Threshold Voltage	0.95	V
R _{0 max}	Slope Resistance ¹	2.4	mΩ

Note 1: On die level

Characteristic Curves

Figure 1. Forward Characteristics

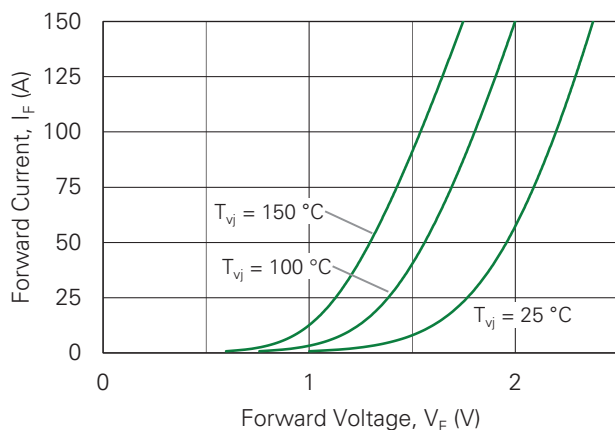
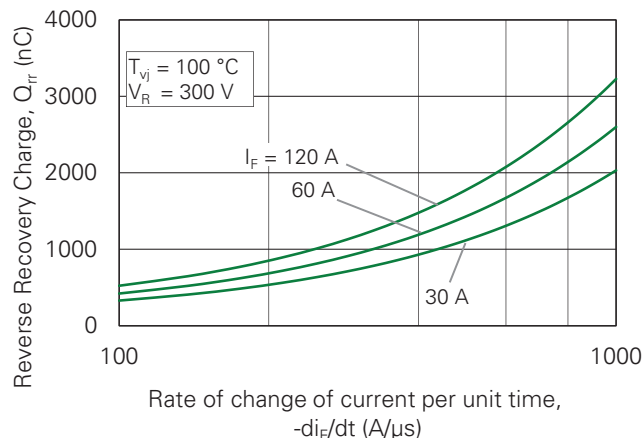
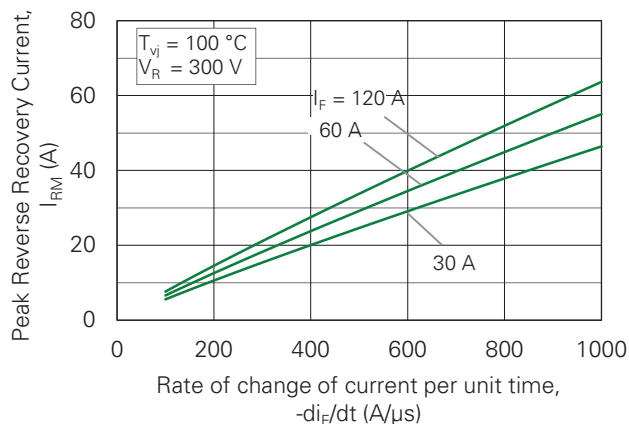
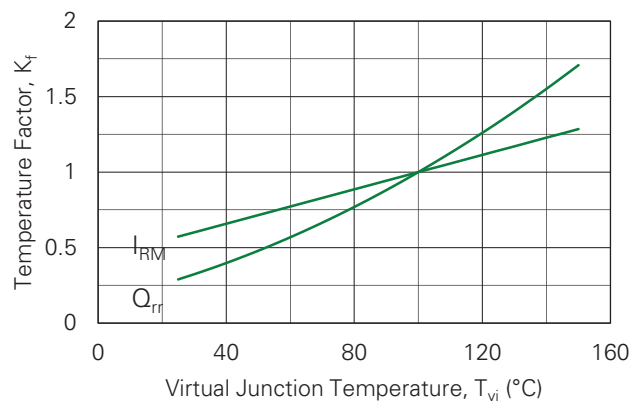
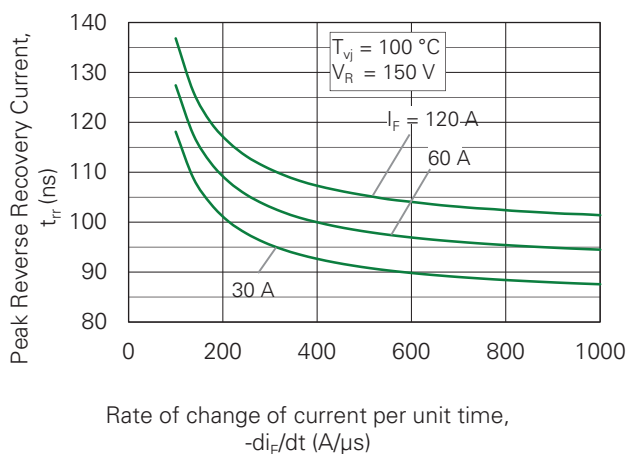
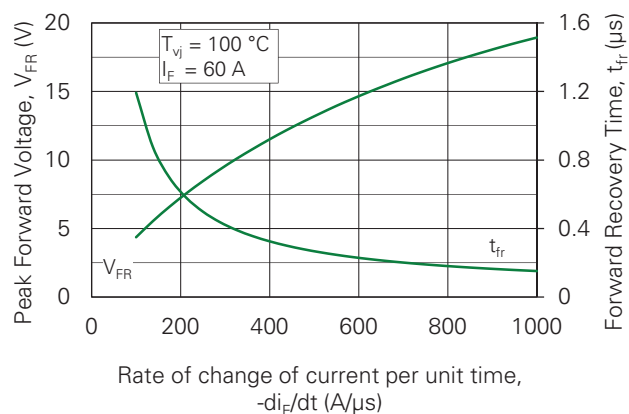
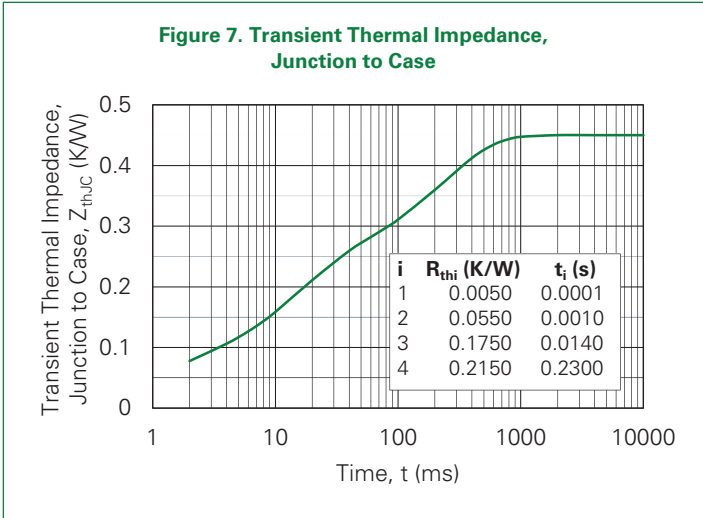
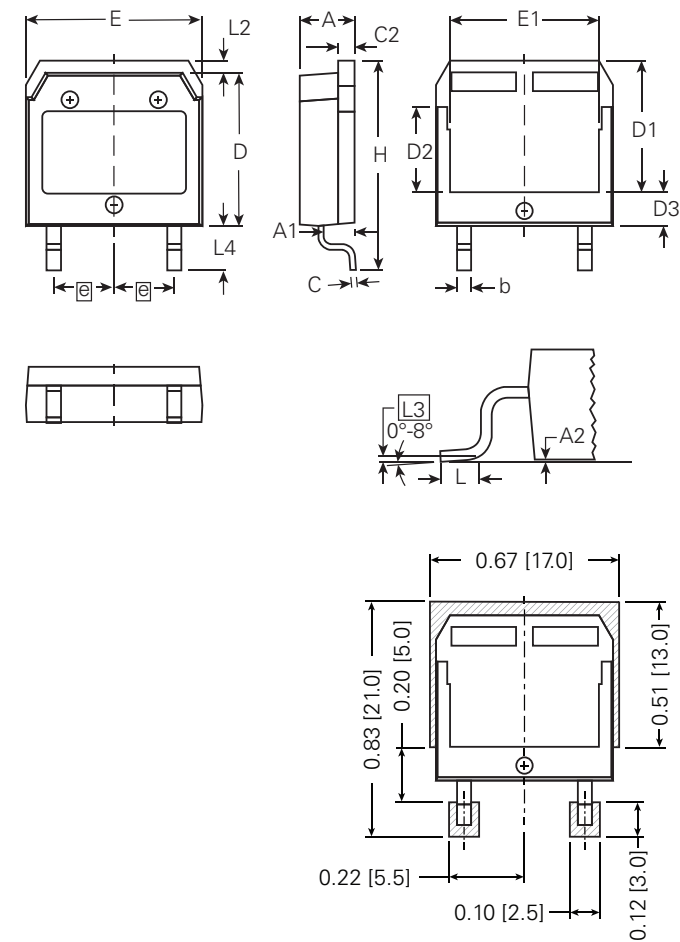
Figure 2. Typical Reverse Recovery Charge vs. $-di_F/dt$ Figure 3. Typical Peak Reverse Current vs. $-di_F/dt$ Figure 4. Dynamic Parameters Q_{rr} , I_{RM} vs. Virtual Junction TemperatureFigure 5. Typical Recovery Time vs. $-di_F/dt$ Figure 6. Typical Peak Forward Voltage V_{FR} and t_{fr} vs. $-di_F/dt$ 

Figure 7. Transient Thermal Impedance, Junction to Case

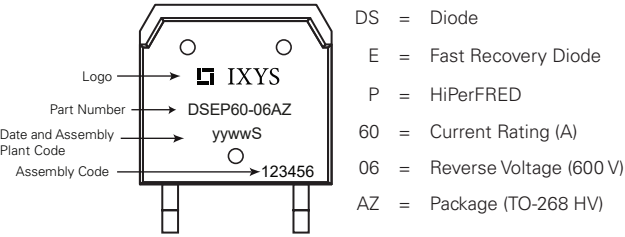


Part Outline Drawing TO-268AA (D³PAK-HV)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
A2	0.02	0.25	0.001	0.010
b	1.15	1.45	0.045	0.057
C	0.40	0.65	0.016	0.026
C2	1.45	1.60	0.057	0.063
D	13.80	14.00	0.543	0.551
D1	11.80	12.10	0.465	0.476
D2	7.50	7.80	0.295	0.307
D3	2.90	3.20	0.114	0.126
E	15.85	16.05	0.624	0.632
E1	13.30	13.60	0.524	0.535
e	5.450 BSC		0.215 BSC	
H	18.70	19.10	0.736	0.752
L	1.70	2.00	0.067	0.079
L2	1.00	1.15	0.039	0.045
L3	0.250 BSC		0.010 BSC	
L4	3.80	4.10	0.150	0.161

Part Numbering and Marking



Packing Options

Part Number	Marking	Packing Mode	Quantity
DSEP60-06AZ-TUB	DSEP60-06AZ	Tube	30 pcs
DSEP60-06AZ-TRL	DSEP60-06AZ	Tape & Reel	400 pcs

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Part of:

