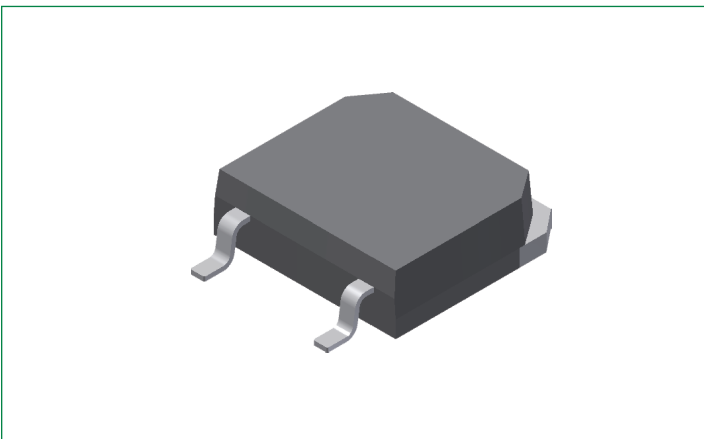


DSEP60-06AZ

600 V, 60 A High Performance Fast Recovery Diode

Low Loss and Soft Recovery Single Diode

RoHS



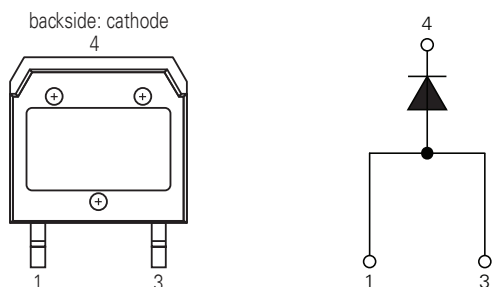
Features:

- 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

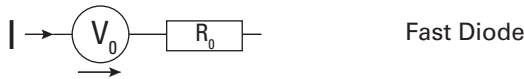
Electrical Characteristics – Dynamic

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

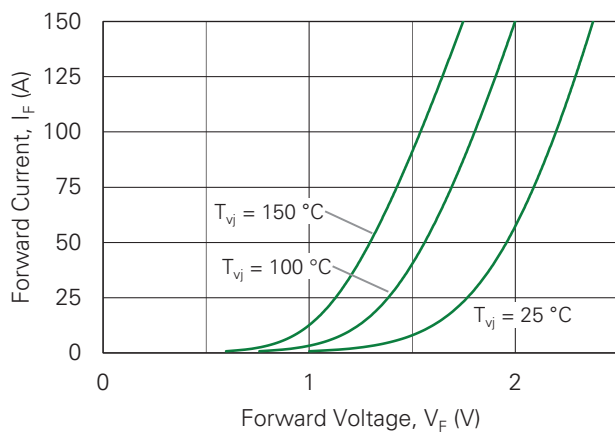
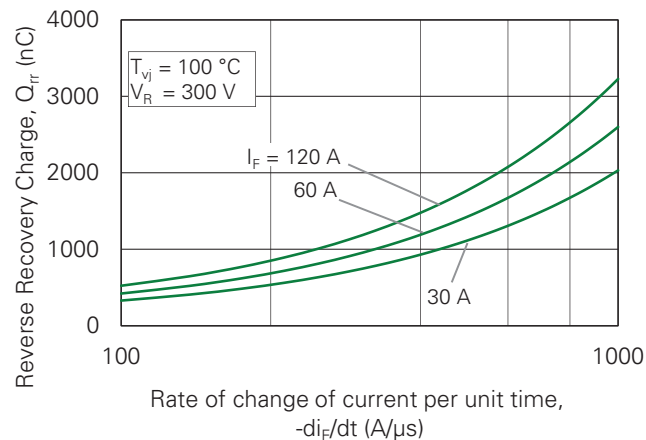
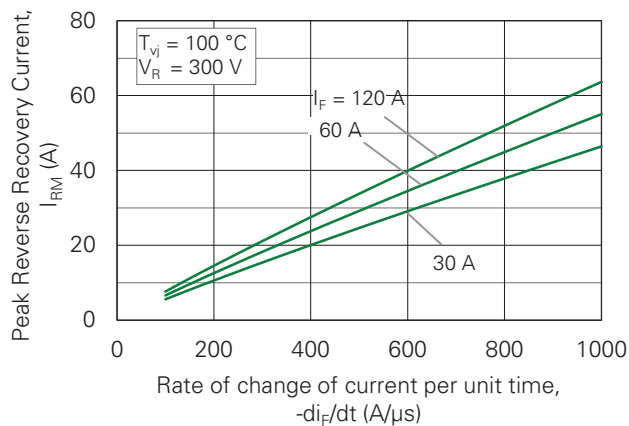
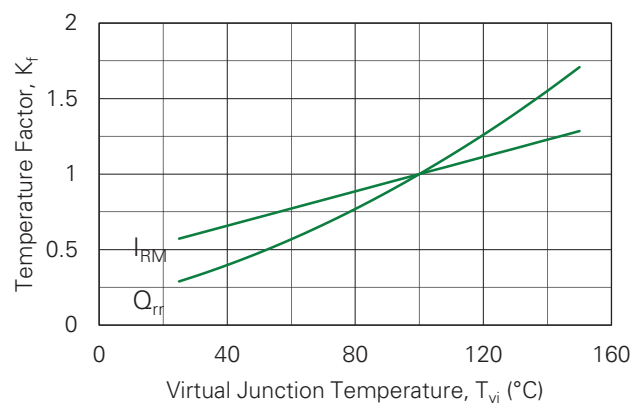
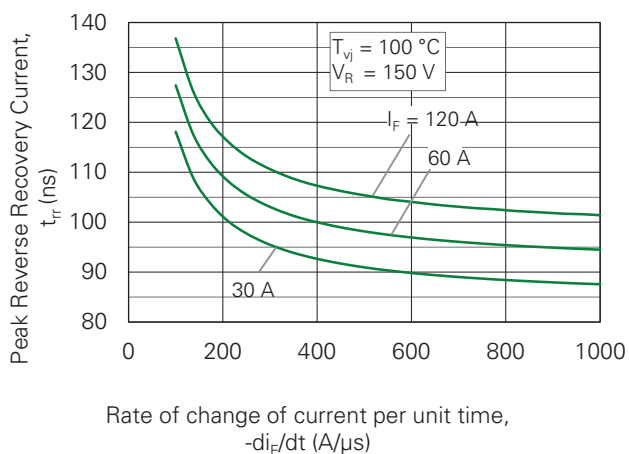
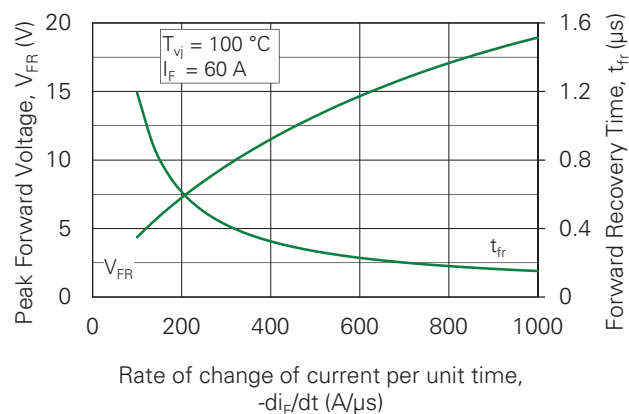
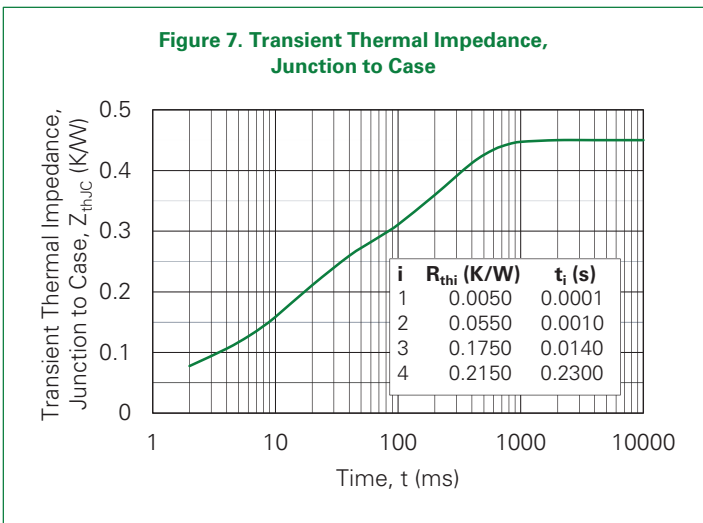
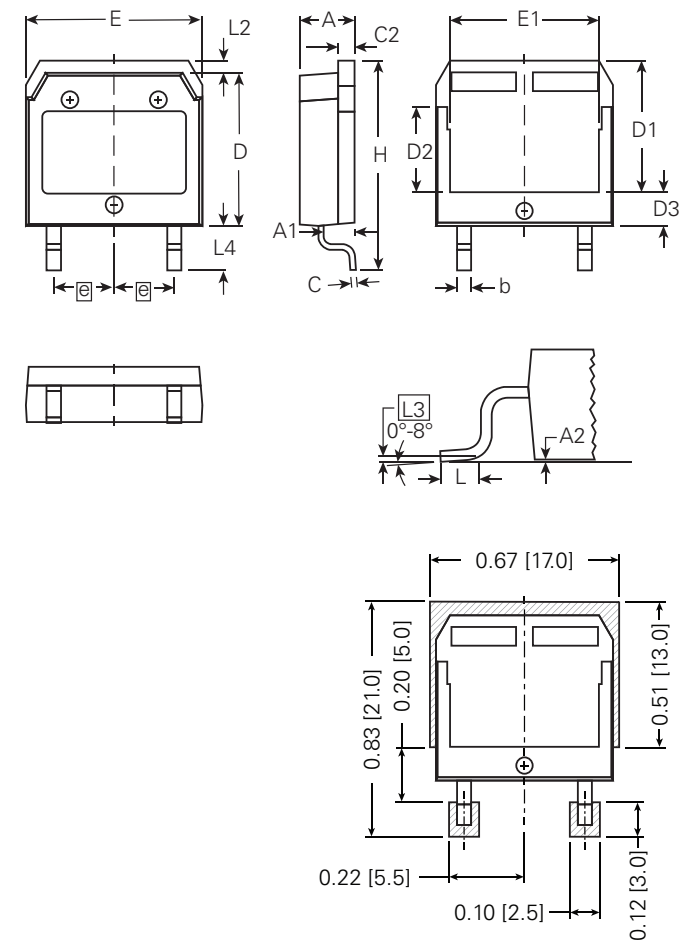
Figure 2. Typical Reverse Recovery Charge vs. $-di_F/dt$ Figure 3. Typical Peak Reverse Current vs. $-di_F/dt$ Figure 4. Dynamic Parameters Q_{rr} , I_{RM} vs. Virtual Junction TemperatureFigure 5. Typical Recovery Time vs. $-di_F/dt$ Figure 6. Typical Peak Forward Voltage V_{FR} and t_{fr} vs. $-di_F/dt$ 

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

Logo

Part Number

Date and Assembly Plant Code

Assembly Code



DSEP60-06AZ

yywwS

123456

DS = Diode

E = Fast Recovery Diode

P = HiPerFRED

60 = Current Rating (A)

06 = Reverse Voltage (600 V)

AZ = Package (TO-268 HV)

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:

