FRED

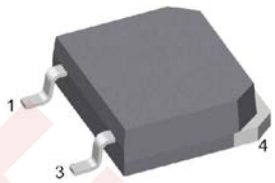
V_{RRM} = 1200 V
I_{FAV} = 109 A
t_{rr} = 40 ns

Fast Recovery Epitaxial Diode
Single Diode

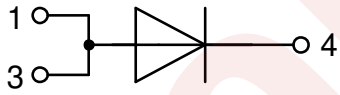
Part number

DSEI120-12AZ

Marking on Product: DSEI120-12AZ



Backside: cathode



Features / Advantages:

- Planar passivated chips
- Low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Applications:

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

Package: TO-268AA (D3Pak-HV)

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

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Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

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Fast Diode

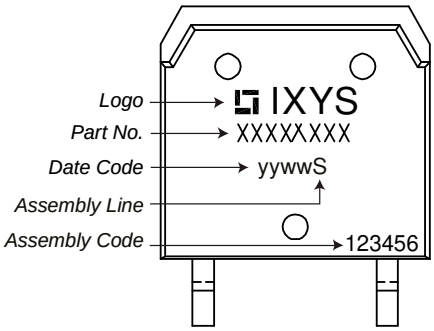
Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
I_R	*reverse current, drain current*	V_R = 1200 V	T_{VJ} = 25°C			300	µA
		V_R = 960 V	T_{VJ} = 125°C			20	mA
V_F	*forward voltage drop*	I_F = 70 A	T_{VJ} = 25°C			1,80	V
		I_F = 140 A					V
		I_F = 70 A	T_{VJ} = 150°C			1,55	V
		I_F = 140 A					V
I_{FAV}	*average forward current*	T_C = 60°C	T_{VJ} = 150°C			109	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			1,20	V
r_F	*slope resistance* }					4,6	mΩ
R_{thJC}	*thermal resistance junction to case*					0,35	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,15		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			357	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			600	A
C_J	*junction capacitance*	V_R = 600 V f = 1 MHz	T_{VJ} = 25°C		56		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		tbd		A
		I_F = 75 A; V_R = 350 V	T_{VJ} = 100°C		25		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		40		ns
			T_{VJ} = 100°C		tbd		ns

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Package TO-268AA (D3Pak-HV)			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal			70	A
T_{VJ}	*virtual junction temperature*		-40		150	°C
T_{op}	*operation temperature*		-40		125	°C
T_{stg}	*storage temperature*		-40		150	°C
Weight				4		g
F_C	*mounting force with clip*		20		120	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*	*terminal to terminal*	9,4			mm
$d_{Spb/Apb}$		*terminal to backside*	5,6			mm

Product Marking

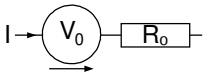


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEI120-12AZ-TUB	DSEI120-12AZ	Tube	30	520332

Similar Part	Package	Voltage class
DSEP90-12AZ	TO-268AA (D3Pak) (2HV)	1200
DSEP60-12AZ	TO-268AA (D3Pak) (2HV)	1200

Equivalent Circuits for Simulation

** on die level* $T_{VJ} = 150°C$

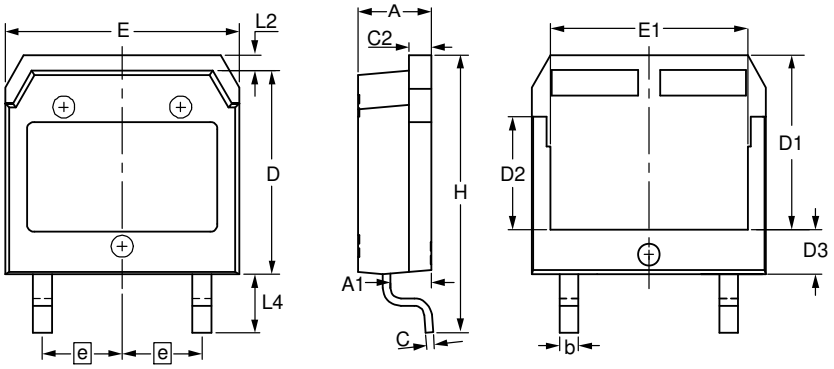


		Fast Diode	
$V_{0\ max}$	*threshold voltage*	1,2	V
$R_{0\ max}$	*slope resistance **		mΩ

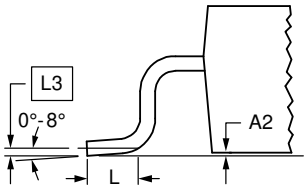
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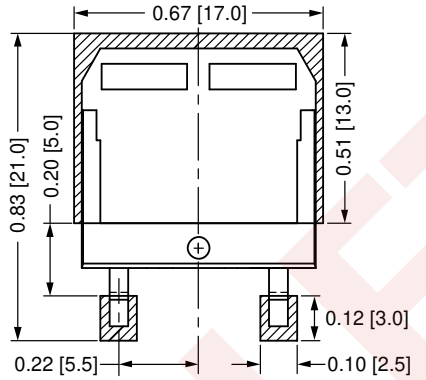
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Outlines TO-268AA (D3Pak-HV)



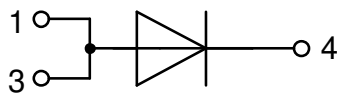






RECOMMENDED MINIMUM FOOT PRINT

Dim.	Millimeter		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



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Fast Diode

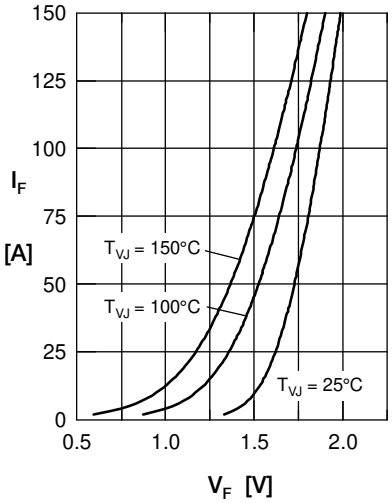


Fig. 1 Forward current I_F vs. V_F

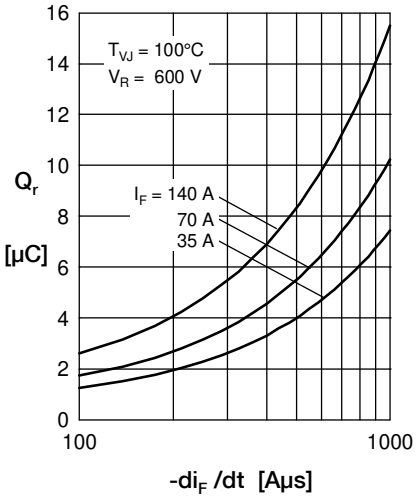


Fig. 2 Reverse recovery charge Q_r versus -di_F/dt

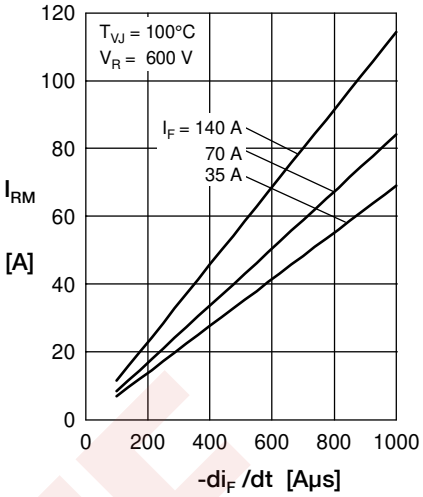


Fig. 3 Peak reverse current I_{RM} versus -di_F/dt

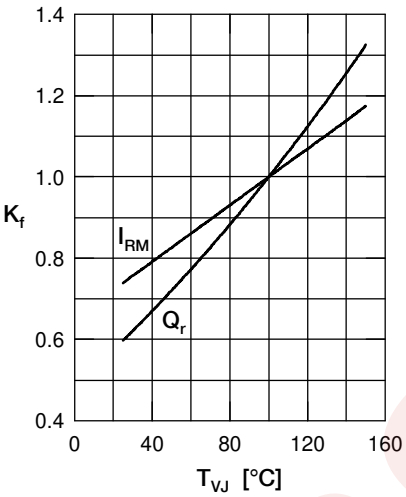


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

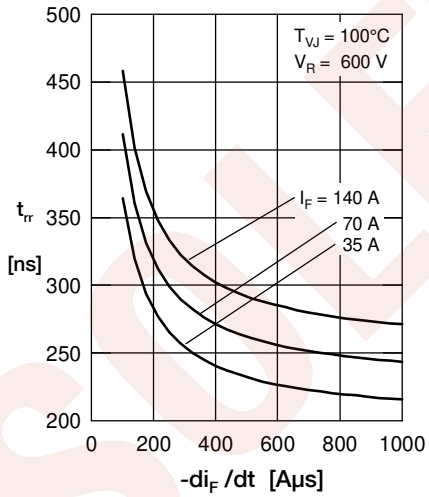


Fig. 5 Recovery time t_{rr} versus -di_F/dt

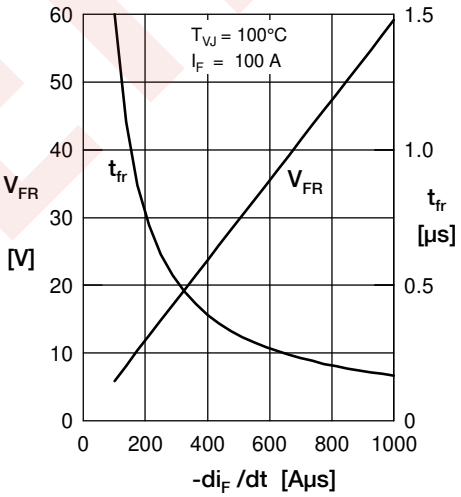
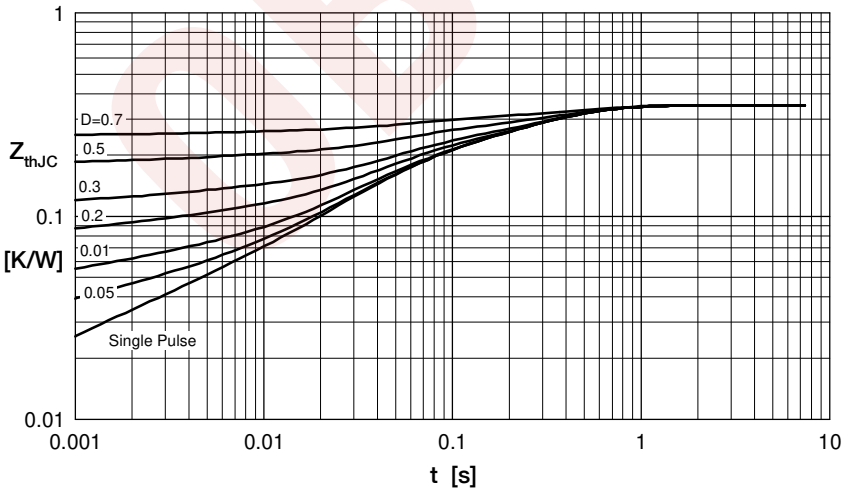


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus -di_F/dt



Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.017	0.00038
2	0.0184	0.0026
3	0.1296	0.0387
4	0.185	0.274

Fig. 7 Transient thermal resistance junction to case at various duty cycles

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