FRED

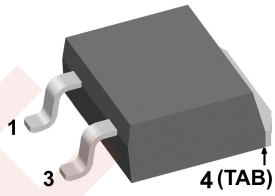
V_{RRM} = 1200 V
I_{FAV} = 12 A
t_{rr} = 50 ns

Fast Recovery Epitaxial Diode
Single Diode

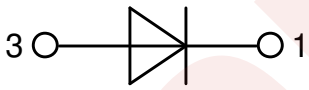
Part number

DSEI12-12AZ

Marking on Product: DSEI12-12AZ



Backside: cathode



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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-263 (D2Pak-HV)

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

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			250	µA
		V_R = 960 V	T_{VJ} = 125°C			4	mA
V_F	*forward voltage drop*	I_F = 12 A	T_{VJ} = 25°C			2,58	V
		I_F = 24 A				2,94	V
		I_F = 12 A	T_{VJ} = 150°C			2,23	V
		I_F = 24 A				2,72	V
I_{FAV}	*average forward current*	T_C = 100°C	T_{VJ} = 150°C			12	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			1,77	V
r_F	*slope resistance* }					38	mΩ
R_{thJC}	*thermal resistance junction to case*					1,6	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,25		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			78	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			75	A
C_J	*junction capacitance*	V_R = 600 V f = 1 MHz	T_{VJ} = 25°C		6		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		4		A
		I_F = 11 A; V_R = 540 V	T_{VJ} = 100°C		6		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 100 A/µs	T_{VJ} = 25°C		150		ns
			T_{VJ} = 100°C		300		ns

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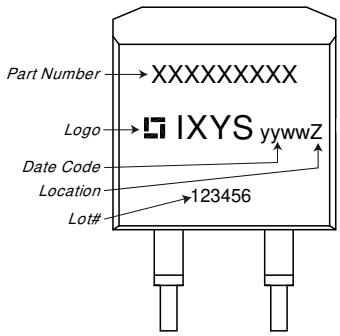
Package TO-263 (D2Pak-HV)			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal			25	A
T_{VJ}	*virtual junction temperature*		-40		150	°C
T_{op}	*operation temperature*		-40		125	°C
T_{stg}	*storage temperature*		-40		150	°C
Weight				1,5		g
F_C	*mounting force with clip*		20		60	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*	*terminal to terminal*	4,2			mm
$d_{Spb/Apb}$		*terminal to backside*	4,7			mm

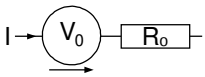
Product Marking



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEI12-12AZ-TRL	DSEI12-12AZ	Tape & Reel	800	515338
Alternative	DSEI12-12AZ-TUB	DSEI12-12AZ	Tube	50	525375

Equivalent Circuits for Simulation

** on die level* $T_{VJ} = 150°C$



		Fast Diode	
$V_{0\,max}$	*threshold voltage*	1,77	V
$R_{0\,max}$	*slope resistance **	35	mΩ

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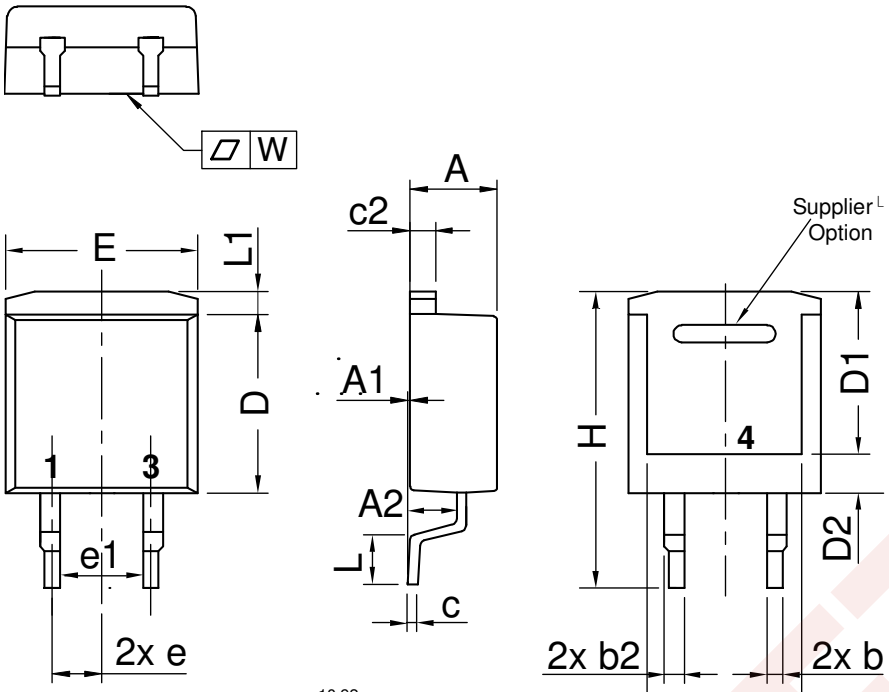
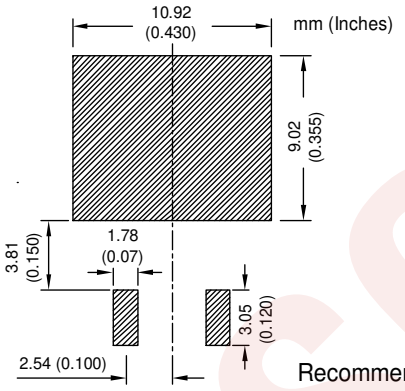
Outlines TO-263 (D2Pak-HV)

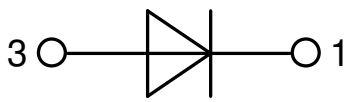




Recommended min. foot print

Dim.	Millimeter		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A1	typ. 0.10		typ. 0.004	
A2	2.41		0.095	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	2.3		0.091	
E	9.65	10.41	0.380	0.410
E1	6.22	8.50	0.245	0.335
e	2,54 BSC		0,100 BSC	
e1	4.28		0.169	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	1.02	1.68	0.040	0.066
W	typ. 0.02	0.040	typ. 0.0008	0.002

All dimensions conform with and/or within JEDEC standard.



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Fast Diode

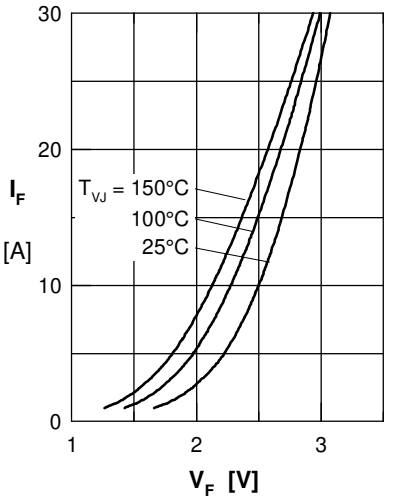

Fig. 1 Forward current I_F versus max. forward voltage drop V_F

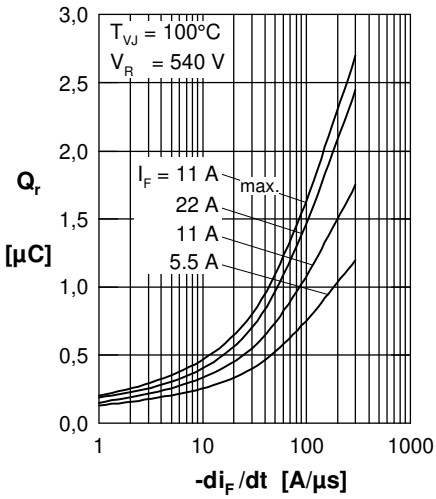

Fig. 2 Typ. reverse recov. charge Q_r versus -di_F/dt

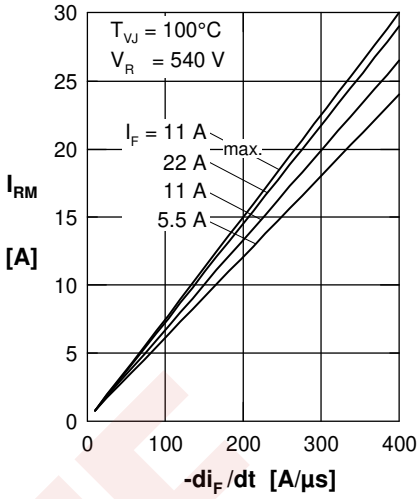

Fig. 3 Typ. peak reverse current I_{RM} versus -di_F/dt

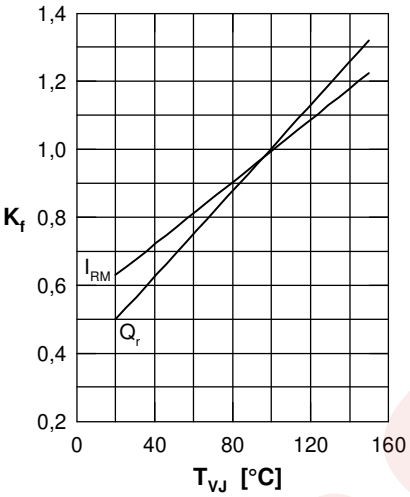

Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

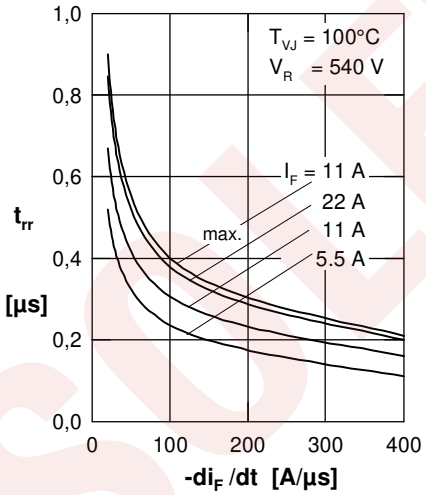

Fig. 5 Typ. recovery time t_{rr} versus -di_F/dt

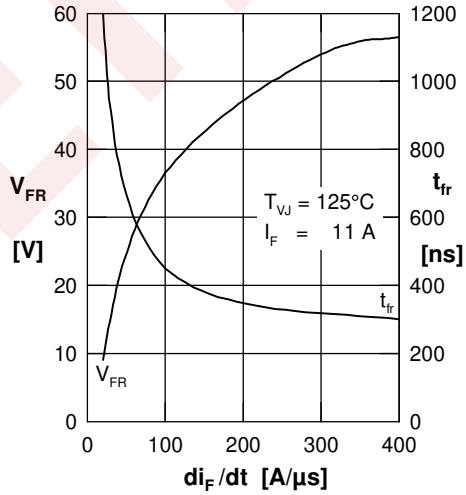

Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

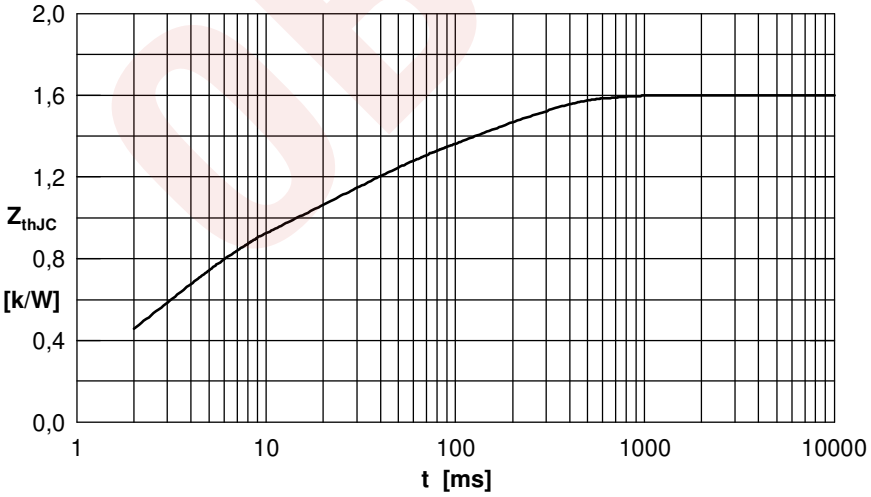

Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.200	0.0018
2	0.220	0.0100
3	0.080	0.5000
4	0.300	0.0900
5	0.680	0.0300

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