

FRED

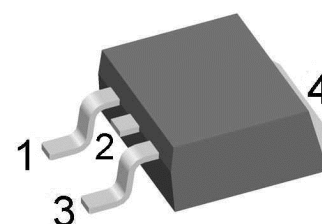
V_{RRM}	=	600 V
I_{FAV}	=	14 A
t_{rr}	=	35 ns

Fast Recovery Epitaxial Diode Single Diode

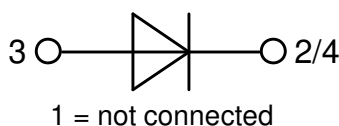
Part number

DSEI12-06AS

Marking on Product: DSEI12-06AS



Backside: cathode



Features / Advantages:

- Planar passivated chips
- Low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low I_{rm} -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{rm} 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)

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

Disclaimer Notice

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Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				600	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				600	V
I_R	reverse current, drain current	$V_R = 600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			50	μA
		$V_R = 480\text{ V}$	$T_{VJ} = 125^{\circ}\text{C}$			3	mA
V_F	forward voltage drop	$I_F = 12\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.62	V
		$I_F = 24\text{ A}$				1.80	V
		$I_F = 12\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.43	V
		$I_F = 24\text{ A}$				1.69	V
I_{FAV}	average forward current	$T_C = 115^{\circ}\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 150^{\circ}\text{C}$			14	A
V_{F0}	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^{\circ}\text{C}$		1.21	V
r_F	slope resistance					18.9	m Ω
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	$T_C = 25^{\circ}\text{C}$				62	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$	$T_{VJ} = 45^{\circ}\text{C}$			100	A
C_J	junction capacitance	$V_R = 400\text{ V}$ $f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		12		pF
I_{RM}	max. reverse recovery current	$I_F = 14\text{ A}; V_R = 350\text{ V}$ $-di_F/dt = 100\text{ A}/\mu\text{s}$		$T_{VJ} = 25^{\circ}\text{C}$		2.5	A
				$T_{VJ} = 100^{\circ}\text{C}$		4	A
t_{rr}	reverse recovery time			$T_{VJ} = 25^{\circ}\text{C}$		90	ns
				$T_{VJ} = 100^{\circ}\text{C}$		150	ns

Package TO-263 (D2Pak)			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal ¹⁾			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

¹⁾ I_{RMS} is typically limited by the pin-to-chip resistance (1); or by the current capability of the chip (2). In case of (1) and a product with multiple pins for one chip-potential, the current capability can be increased by connecting the pins as one contact.

Product Marking

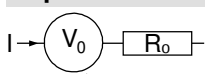


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEI12-06AS-TRL	DSEI12-06AS	Tape & Reel	800	513858
Alternative	DSEI12-06AS-TUB	DSEI12-06AS	Tube	50	525163

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 150^{\circ}\text{C}$



Fast Diode

$V_{0\max}$ threshold voltage

1.21

V

$R_{0\max}$ slope resistance *

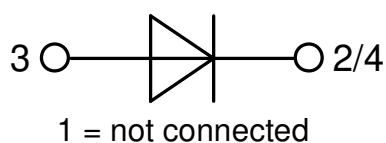
15.8

mΩ

Outlines TO-263 (D2Pak)


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	2.5		0.098	
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.



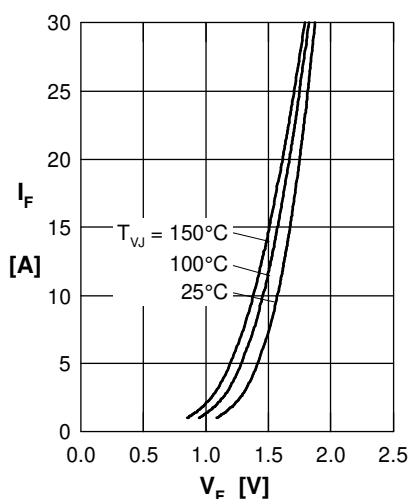
Fast Diode


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

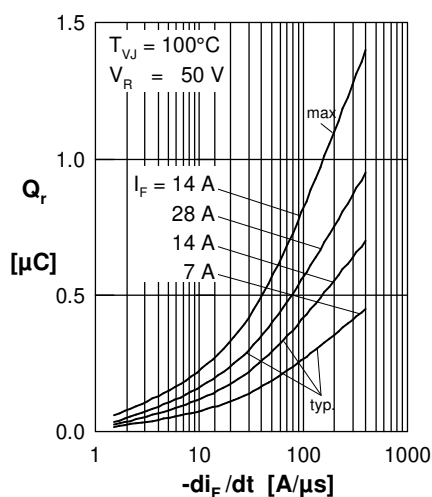


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

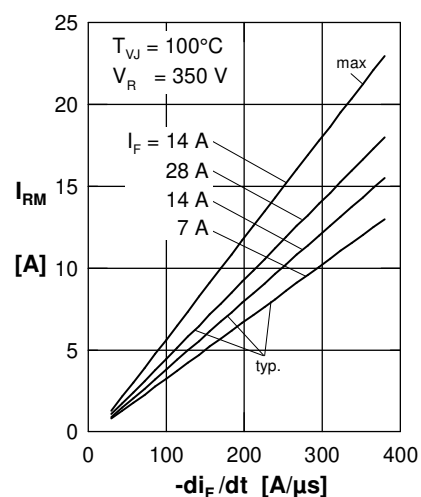


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

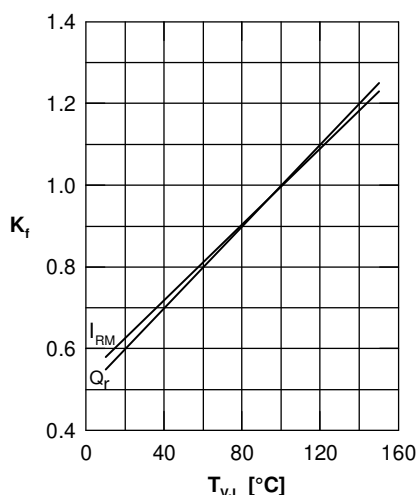


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

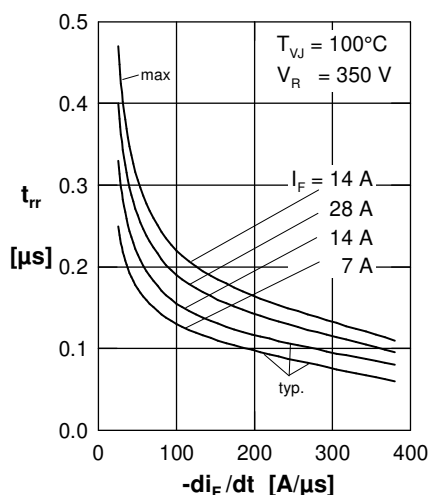


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

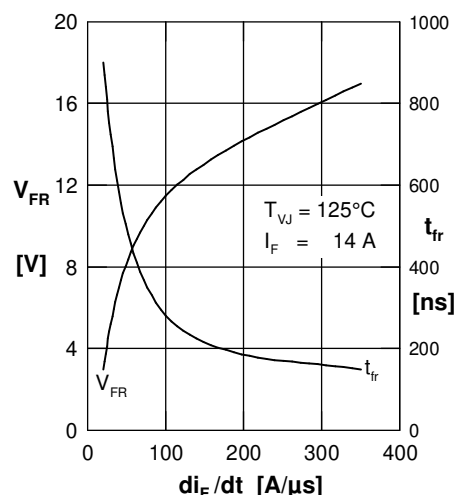


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

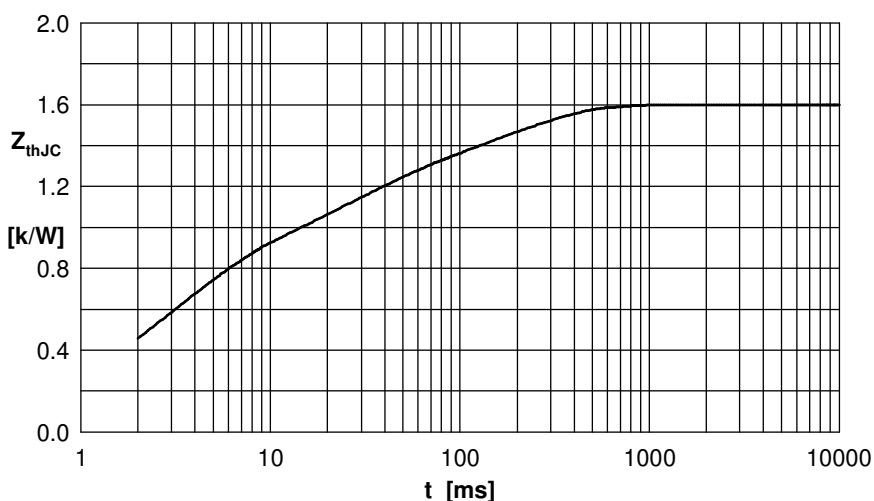


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.100	0.001
2	0.020	0.010
3	0.400	0.180
4	0.400	0.024
5	0.680	0.003