

FRED

$$V_{RRM} = 1200\text{ V}$$

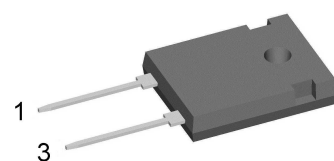
$$I_{FAV} = 30\text{ A}$$

$$t_{rr} = 50\text{ ns}$$

Fast Recovery Epitaxial Diode Single Diode

Part number

DSEI30-12A



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-247

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

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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°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			750	μA	
		V _R = 960 V	T _{VJ} = 125°C			7	mA	
V _F	forward voltage drop	I _F = 30 A	T _{VJ} = 25°C			2.55	V	
		I _F = 60 A				2.93	V	
		I _F = 30 A	T _{VJ} = 150°C			2.20	V	
		I _F = 60 A				2.76	V	
I _{FAV}	average forward current	T _C = 85°C rectangular d = 0.5	T _{VJ} = 150°C			30	A	
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 150°C		1.69	V	
r _F	slope resistance					17.2	mΩ	
R _{thJC}	thermal resistance junction to case					0.8	K/W	
R _{thCH}	thermal resistance case to heatsink				0.25		K/W	
P _{tot}	total power dissipation	T _C = 25°C				155	W	
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		200	A	
C _J	junction capacitance	V _R = 600 V f = 1 MHz		T _{VJ} = 25°C	14		pF	
I _{RM}	max. reverse recovery current	} I _F = 30 A; V _R = 540 V -di _F /dt = 200 A/μs		T _{VJ} = 25 °C	9		A	
				T _{VJ} = 100 °C	13		A	
t _{rr}	reverse recovery time			T _{VJ} = 25 °C	160		ns	
				T _{VJ} = 100 °C	320		ns	

Package TO-247			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				6		g
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N

Product Marking



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEI30-12A	DSEI30-12A	Tube	30	454885

Similar Part	Package	Voltage class
DSEI30-10A	TO-247AD (2)	1000
DSEI30-10AR	ISOPLUS247 (2)	1000

Equivalent Circuits for Simulation

* on die level

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

		Fast Diode	
$V_{0\max}$	threshold voltage	1.69	V
$R_{0\max}$	slope resistance *	14.7	mΩ

Outlines TO-247


Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.430	BSC	10.92	BSC
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242	BSC	6.14	BSC
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39



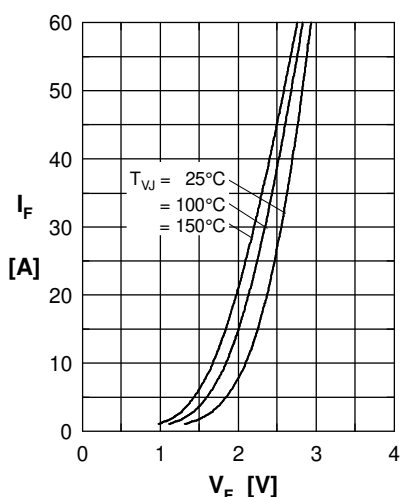
Fast Diode


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

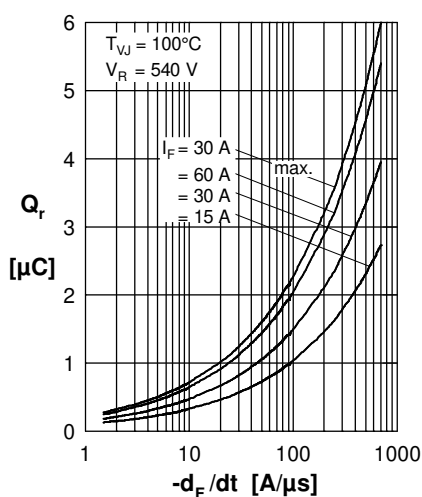


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

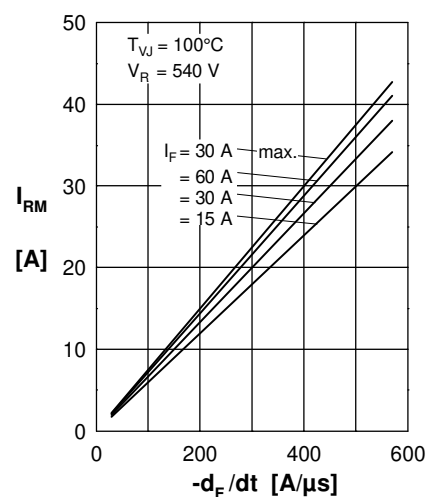


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

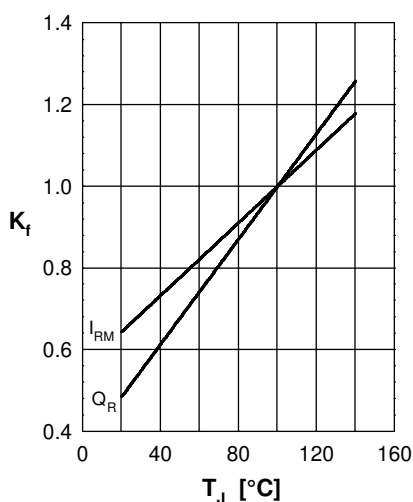


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

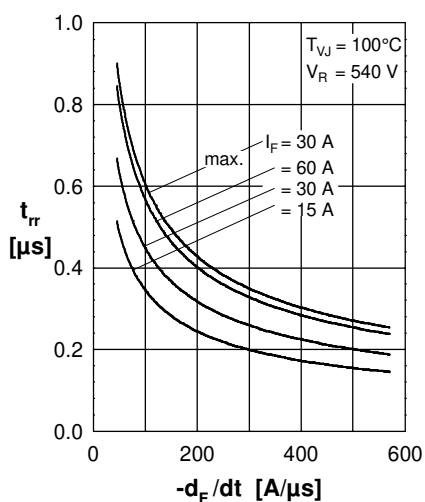


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

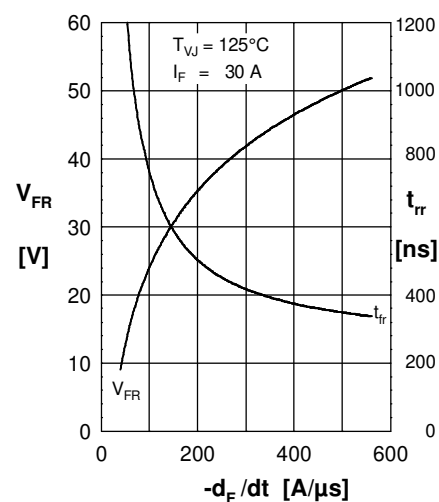


Fig. 6 Typ. peak forward voltage V_{FR} and t_{rr} versus di_F/dt

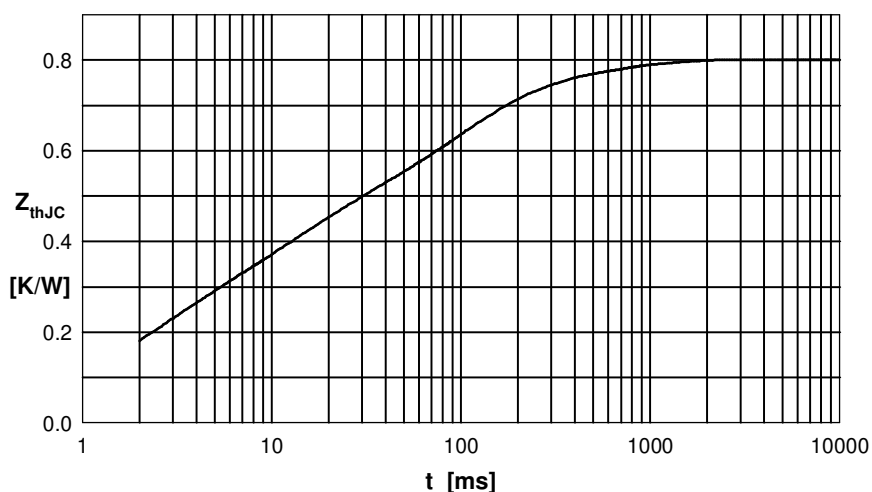


Fig. 7 Transient thermal impedance junction to case

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