

HiPerFRED

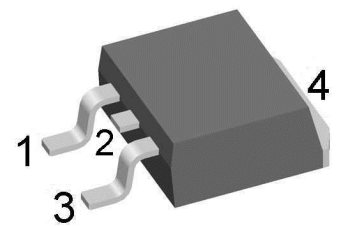
V_{RRM}	=	600 V
I_{FAV}	=	15 A
t_{rr}	=	35 ns

High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Single Diode

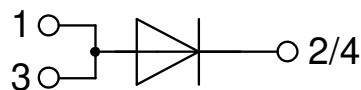
Part number

DSEP15-06AS

Marking on Product: DSEP15-06AS



Backside: cathode



Features / Advantages:

- Planar passivated chips
- Very 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°C				600	V	
V _{RRM}	max. repetitive reverse blocking voltage	T _{VJ} = 25°C				600	V	
I _R	reverse current, drain current	V _R = 600 V	T _{VJ} = 25°C			100	μA	
		V _R = 600 V	T _{VJ} = 150°C			0.5	mA	
V _F	forward voltage drop	I _F = 15 A	T _{VJ} = 25°C			2.04	V	
		I _F = 30 A				2.25	V	
		I _F = 15 A	T _{VJ} = 150°C			1.35	V	
		I _F = 30 A				1.59	V	
I _{FAV}	average forward current	T _C = 140°C rectangular d = 0.5	T _{VJ} = 175°C			15	A	
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 175°C		0.99	V	
r _F	slope resistance					15	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				95	W	
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		110	A	
C _J	junction capacitance	V _R = 400 V f = 1 MHz		T _{VJ} = 25°C	12		pF	
I _{RM}	max. reverse recovery current	} I _F = 15 A; V _R = 300 V -di _F /dt = 200 A/μs		T _{VJ} = 25 °C	5		A	
				T _{VJ} = 100 °C	7		A	
t _{rr}	reverse recovery time			T _{VJ} = 25 °C	35		ns	
				T _{VJ} = 100 °C	95		ns	

Package TO-263 (D2Pak)			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal ¹⁾			35	A
T_{VJ}	virtual junction temperature		-55		175	°C
T_{op}	operation temperature		-55		150	°C
T_{stg}	storage temperature		-55		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



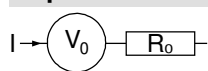
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEP15-06AS-TRL	DSEP15-06AS	Tape & Reel	800	513021
Alternative	DSEP15-06AS-TUB	DSEP15-06AS	Tube	50	525177

Similar Part	Package	Voltage class
DSEP15-06BS	TO-263AB (D2Pak) (2)	600
DSEP15-06A	TO-220AC	600
DSEP15-06B	TO-220AC	600

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175^{\circ}\text{C}$

		Fast Diode	
$V_{0 \max}$	threshold voltage	0.99	V
$R_{0 \max}$	slope resistance *	12	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.



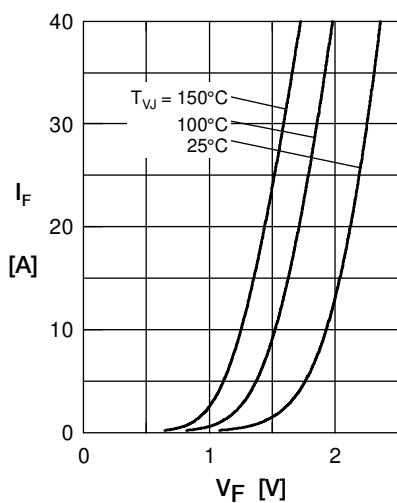
Fast Diode


Fig. 1 Forward current I_F versus V_F

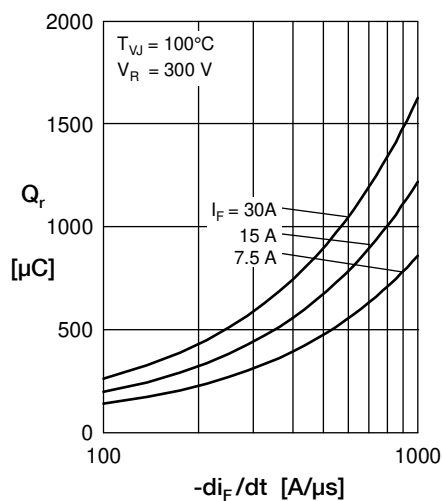


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

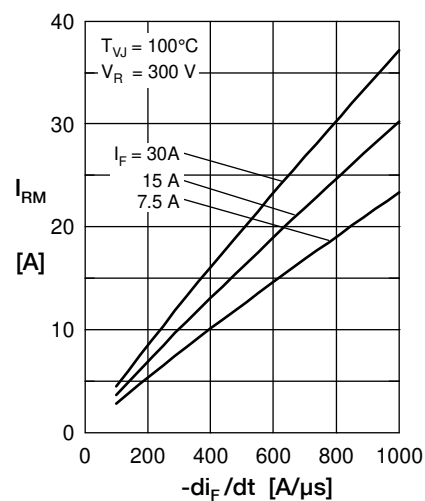


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

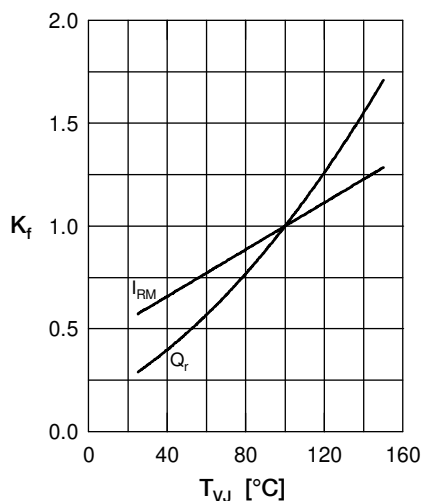


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

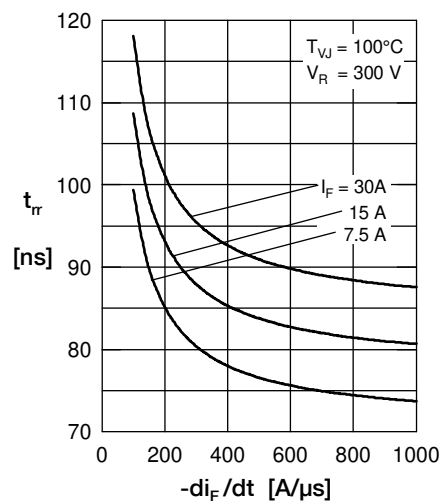


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

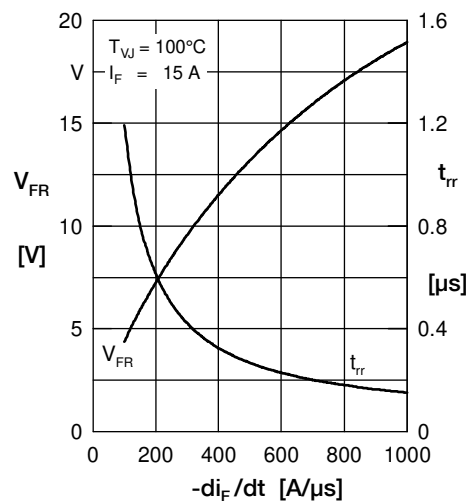


Fig. 6 Typ. peak forward voltage V_{FR} and t_{rr} versus di_F/dt

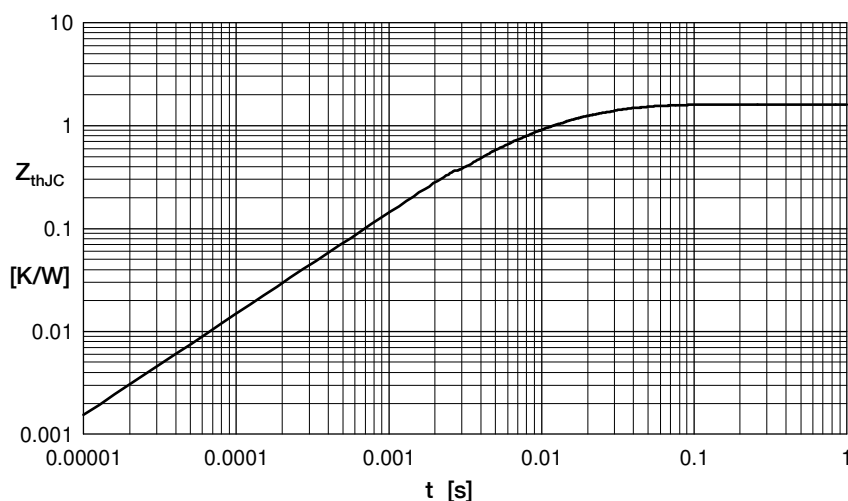


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.908	0.0052
2	0.350	0.0003
3	0.342	0.017