

HiPerFRED

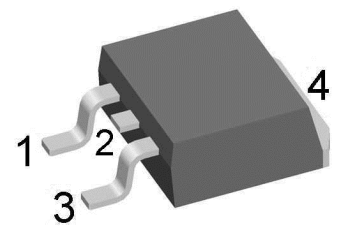
V_{RRM}	=	300 V
I_{FAV}	=	40 A
t_{rr}	=	35 ns

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

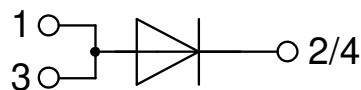
Part number

DSEP40-03AS

Marking on Product: DSEP40-03AS



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				300	V
V _{RRM}	max. repetitive reverse blocking voltage	T _{VJ} = 25°C				300	V
I _R	reverse current, drain current	V _R = 300 V	T _{VJ} = 25°C			5	μA
		V _R = 300 V	T _{VJ} = 150°C			0.1	mA
V _F	forward voltage drop	I _F = 40 A	T _{VJ} = 25°C			1.46	V
		I _F = 80 A				1.85	V
		I _F = 40 A	T _{VJ} = 150°C			1.20	V
		I _F = 80 A				1.63	V
I _{FAV}	average forward current	T _C = 120°C rectangular d = 0.5	T _{VJ} = 175°C			40	A
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 175°C		0.72	V
r _F	slope resistance					10.7	mΩ
R _{thJC}	thermal resistance junction to case					0.85	K/W
R _{thCH}	thermal resistance case to heatsink				0.25		K/W
P _{tot}	total power dissipation	T _C = 25°C				175	W
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		340	A
C _J	junction capacitance	V _R = 150 V f = 1 MHz		T _{VJ} = 25°C	50		pF
I _{RM}	max. reverse recovery current	} I _F = 30 A; V _R = 200 V -di _F /dt = 200 A/μs		T _{VJ} = 25 °C	3.5		A
				T _{VJ} = 125 °C	7		A
t _{rr}	reverse recovery time			T _{VJ} = 25 °C	35		ns
				T _{VJ} = 125 °C	55		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	DSEP40-03AS-TRL	DSEP40-03AS	Tape & Reel	800	501174
Alternative	DSEP40-03AS-TUB	DSEP40-03AS	Tube	50	525191

Equivalent Circuits for Simulation

* on die level

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



Fast Diode

$V_{0\max}$ threshold voltage

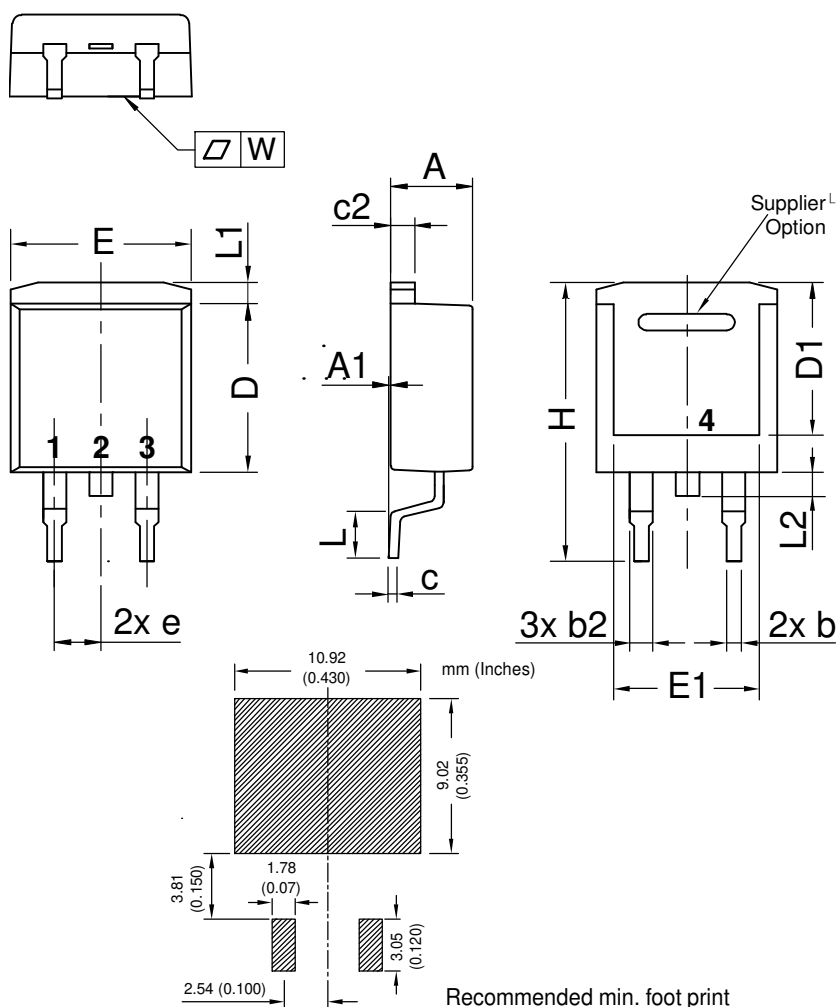
0.72

V

$R_{0\max}$ slope resistance *

7.5

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.



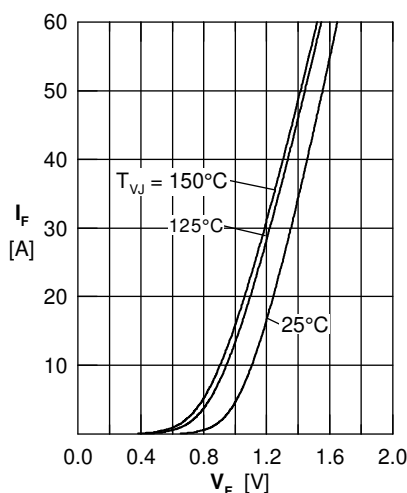
Fast Diode


Fig. 1 Forward current I_F versus forward voltage V_F

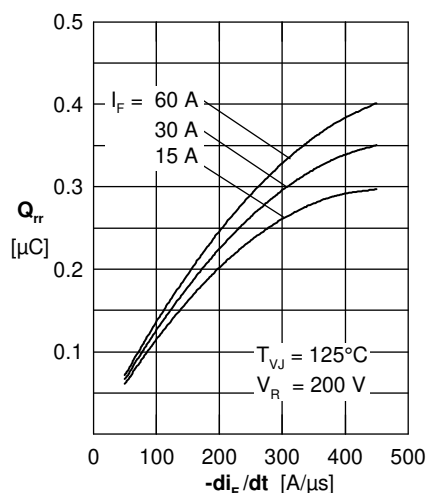


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

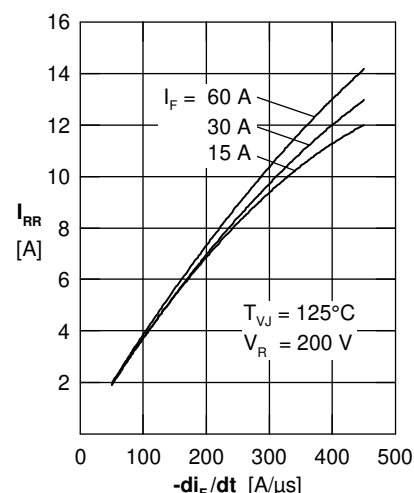


Fig. 3 Typ. reverse recovery current I_{RR} versus $-di_F/dt$

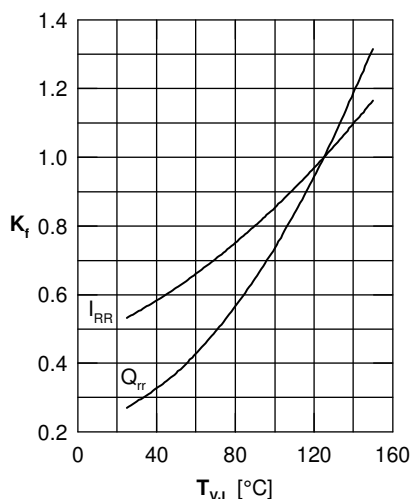


Fig. 4 Dynamic parameters Q_{rr} , I_{RR} versus T_{VJ}

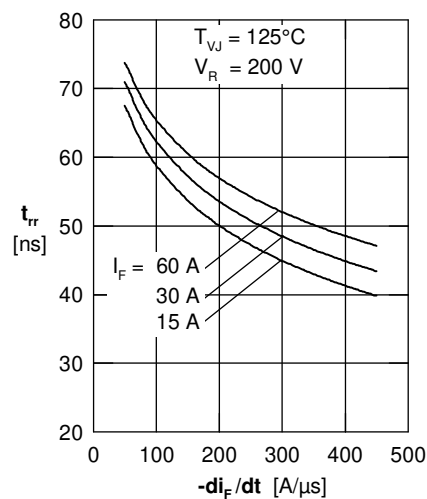


Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

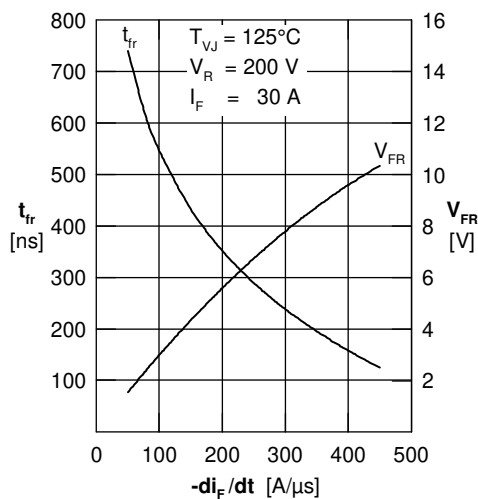


Fig. 6 Typ. forward recovery voltage V_{FR} & forward recovery time t_{fr} vs. di_F/dt

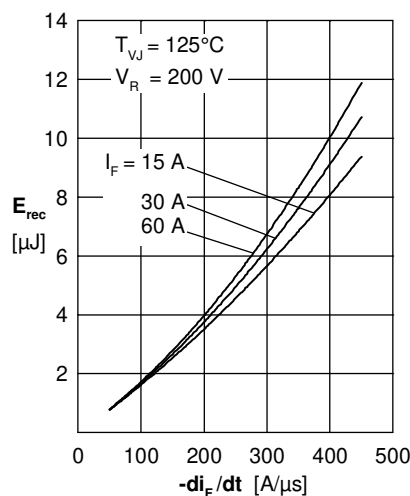


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

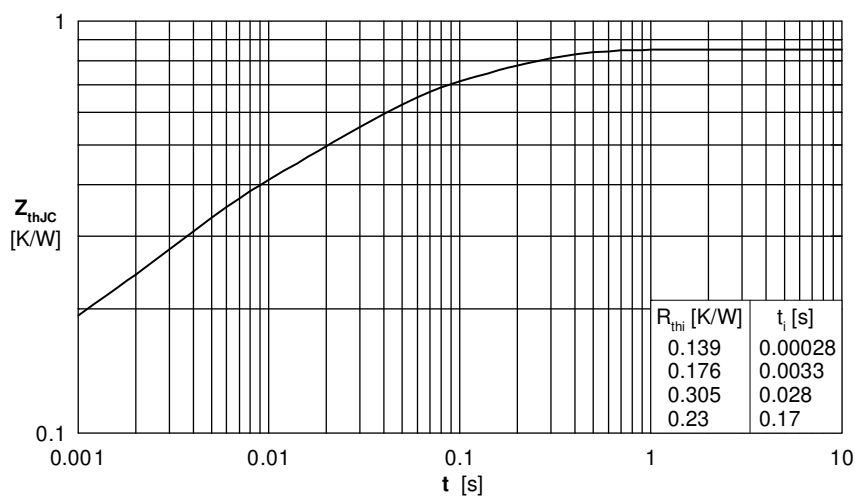


Fig. 8 Transient thermal impedance junction to case

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