

HiPerFRED

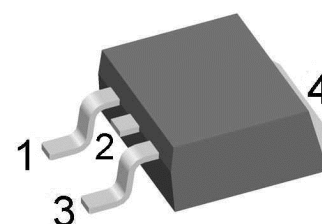
V_{RRM}	=	300 V
I_{FAV}	=	40 A
t_{rr}	=	35 ns

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

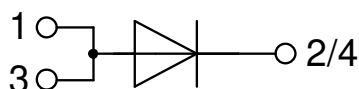
Part number

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

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.

Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				300	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				300	V
I_R	reverse current, drain current	$V_R = 300\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			5	μA
		$V_R = 300\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			0.1	mA
V_F	forward voltage drop	$I_F = 40\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.46	V
		$I_F = 80\text{ A}$				1.85	V
		$I_F = 40\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.20	V
		$I_F = 80\text{ A}$				1.63	V
I_{FAV}	average forward current	$T_C = 120^{\circ}\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}\text{C}$			40	A
V_{F0}	threshold voltage	} for power loss calculation only		$T_{VJ} = 175^{\circ}\text{C}$		0.72	V
r_F	slope resistance					10.7	m Ω
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	$T_C = 25^{\circ}\text{C}$				175	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$	$T_{VJ} = 45^{\circ}\text{C}$			340	A
C_J	junction capacitance	$V_R = 150\text{ V}$ $f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		50		pF
I_{RM}	max. reverse recovery current	$I_F = 30\text{ A}; V_R = 200\text{ V}$ $-di_F/dt = 200\text{ A}/\mu\text{s}$		$T_{VJ} = 25^{\circ}\text{C}$		3.5	A
				$T_{VJ} = 125^{\circ}\text{C}$		7	A
t_{rr}	reverse recovery time			$T_{VJ} = 25^{\circ}\text{C}$		35	ns
				$T_{VJ} = 125^{\circ}\text{C}$		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

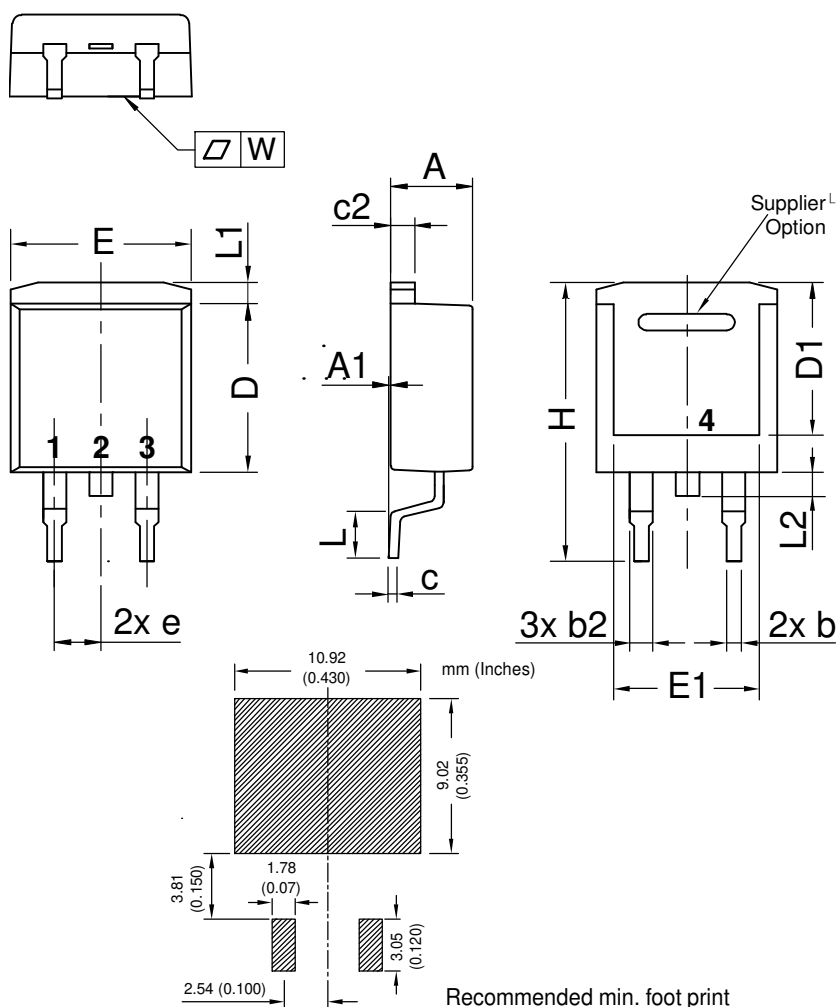
0.72

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.



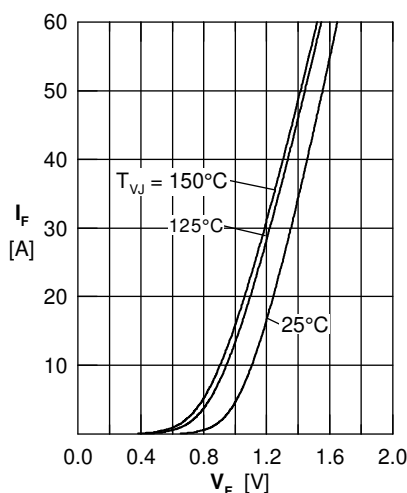
Fast Diode


Fig. 1 Forward current I_F versus forward voltage V_F

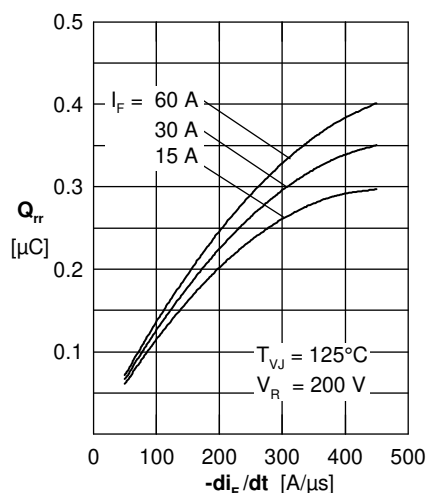


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

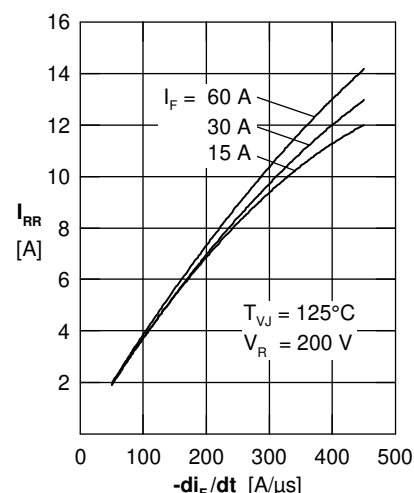


Fig. 3 Typ. reverse recovery current I_{RR} versus $-di_F/dt$

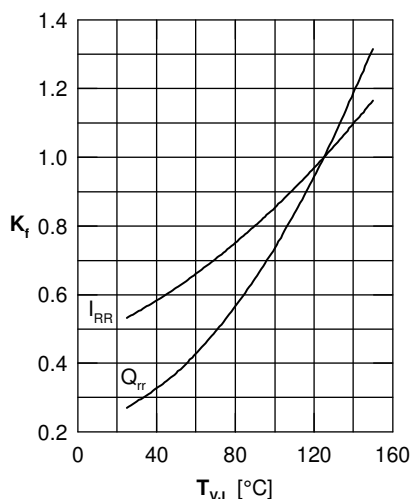


Fig. 4 Dynamic parameters Q_{rr} , I_{RR} versus T_{VJ}

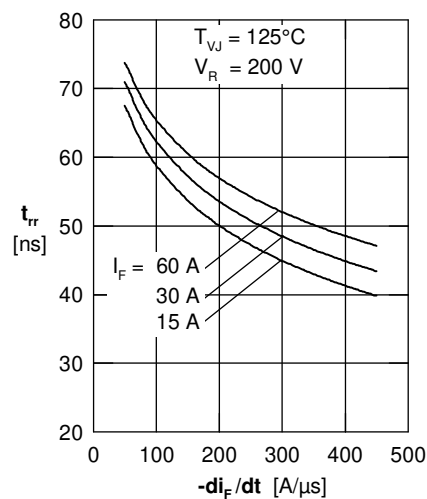


Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

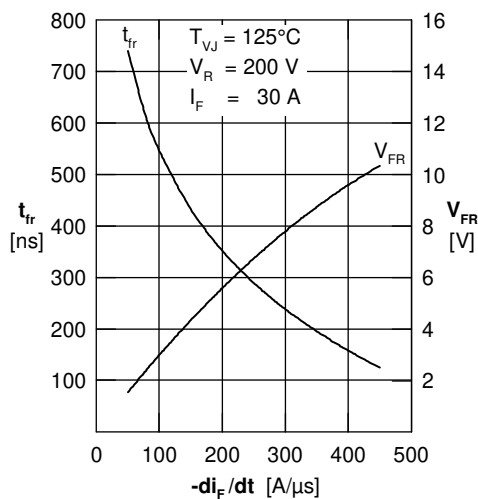


Fig. 6 Typ. forward recovery voltage V_{FR} & forward recovery time t_{fr} vs. di_F/dt

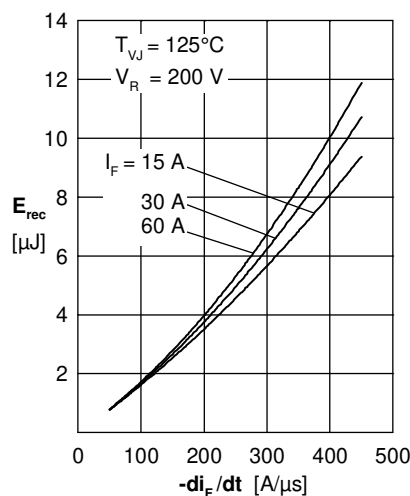


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

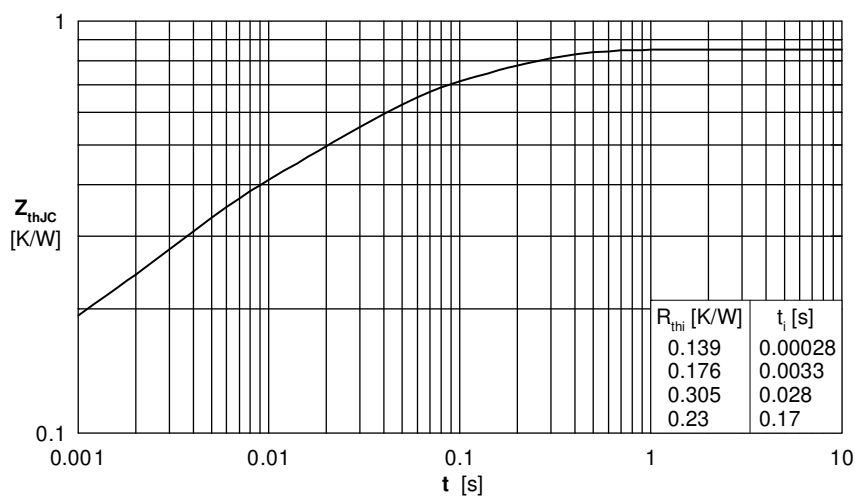


Fig. 8 Transient thermal impedance junction to case