



HiPerFRED

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

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

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



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.



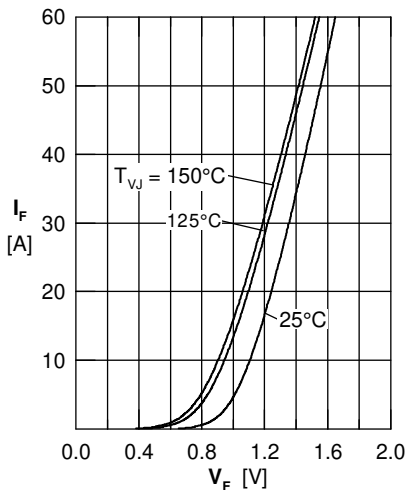
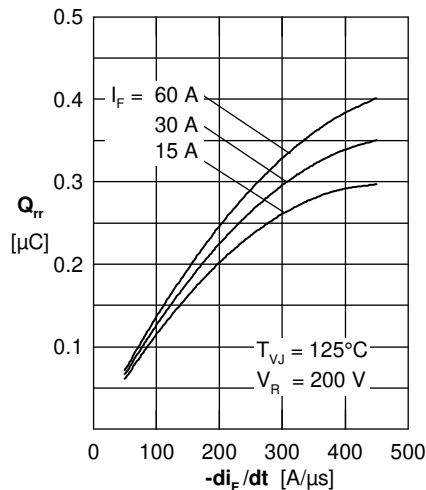
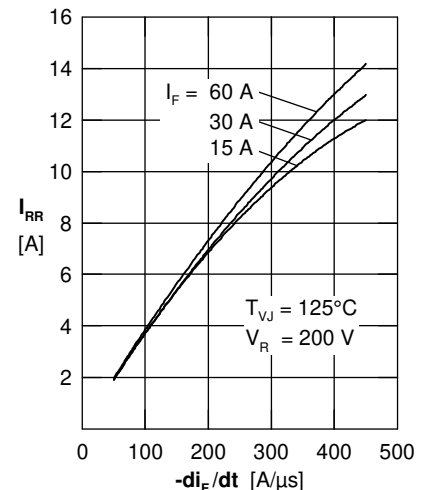
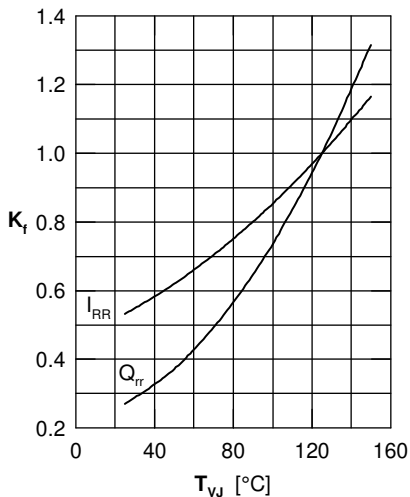
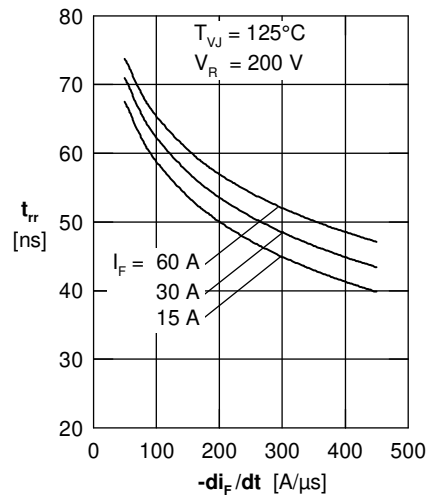
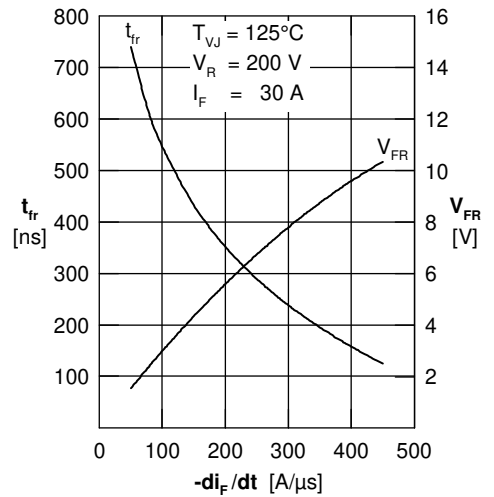
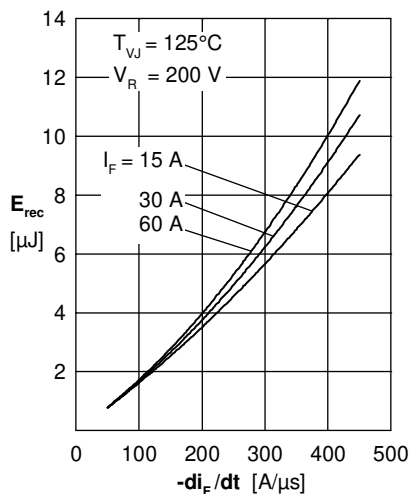
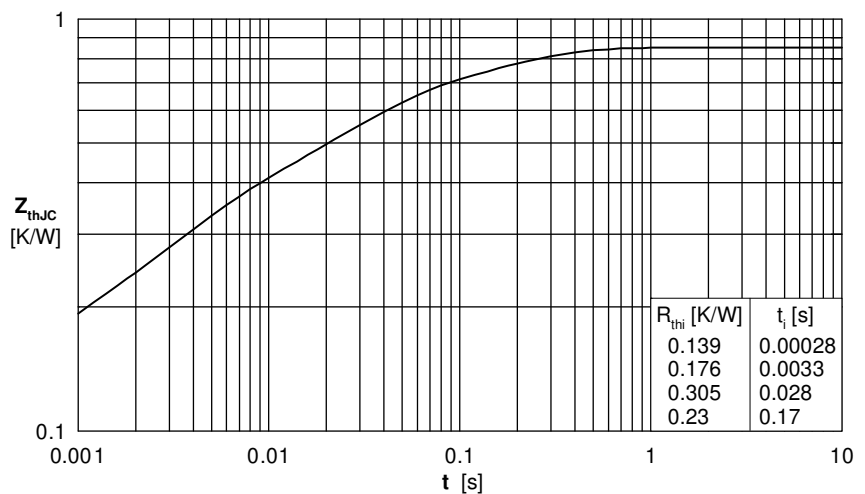
Fast Diode

 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