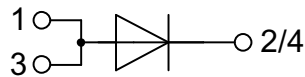


Fast Recovery Epitaxial Diode (FRED)

$$\begin{aligned} I_{FAV} &= 14 \text{ A} \\ V_{RRM} &= 600 \text{ V} \\ t_{rr} &= 35 \text{ ns} \end{aligned}$$

V_{RSM}	V_{RRM}	Type
V	V	
640	600	DSEI 12-06AS


TO-263 AA


Symbol	Conditions	Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$	25	A
I_{FAVM} ①	$T_C = 100^\circ\text{C}$; rectangular, $d = 0.5$	14	A
I_{FRM}	$t_p < 10 \mu\text{s}$; rep. rating, pulse width limited by T_{VJM}	150	A
I_{FSM}	$T_{VJ} = 45^\circ\text{C}$; $t = 10 \text{ ms}$ (50 Hz), sine	100	A
	$t = 8.3 \text{ ms}$ (60 Hz), sine	110	A
	$T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$ (50 Hz), sine	85	A
	$t = 8.3 \text{ ms}$ (60 Hz), sine	95	A
I^2t	$T_{VJ} = 45^\circ\text{C}$; $t = 10 \text{ ms}$ (50 Hz), sine	50	A ² s
	$t = 8.3 \text{ ms}$ (60 Hz), sine	50	A ² s
	$T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$ (50 Hz), sine	36	A ² s
	$t = 8.3 \text{ ms}$ (60 Hz), sine	37	A ² s
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
M_d	mounting torque	0.4...0.6	Nm
P_{tot}	$T_C = 25^\circ\text{C}$	62	W
Weight	typical	2	g

Features

- International standard package JEDEC TO-263 AA
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM} -values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Anti saturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating and melting
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching
- Low losses
- Operating at lower temperature or space saving by reduced cooling

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R	$V_R = V_{RRM}$		50	μA
	$V_R = 0.8 \cdot V_{RRM}$		25	μA
	$V_R = 0.8 \cdot V_{RRM}$		3	mA
V_F	$I_F = 16 \text{ A}$		1.5	V
			1.7	V
V_{T0}	For power-loss calculations only		1.12	V
r_T	$T_{VJ} = T_{VJM}$		23.2	m Ω
R_{thJC}		0.25	2	K/W
R_{thCH}				K/W
t_{rr}	$I_F = 1 \text{ A}$; $-di/dt = 50 \text{ A}/\mu\text{s}$; $V_R = 30 \text{ V}$; $T_{VJ} = 25^\circ\text{C}$	35	50	ns
I_{RM}	$V_R = 350 \text{ V}$; $I_F = 12 \text{ A}$; $-di_F/dt = 100 \text{ A}/\mu\text{s}$ $L \leq 0.05 \mu\text{H}$; $T_{VJ} = 100^\circ\text{C}$	4	4.4	A

① I_{FAVM} rating includes reverse blocking losses at T_{VJM} . $V_R = 0.8 \cdot V_{RRM}$, duty cycle $d = 0.5$
Data according to IEC 60747

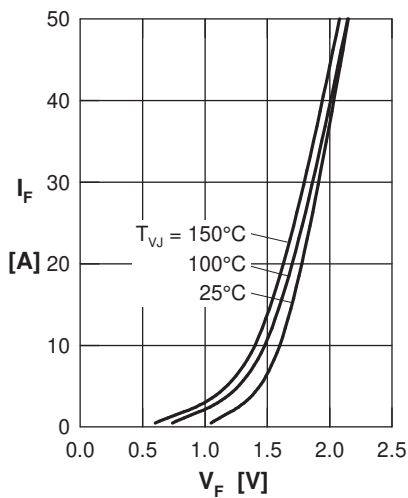


Fig. 1 Forward current I_F versus V_F

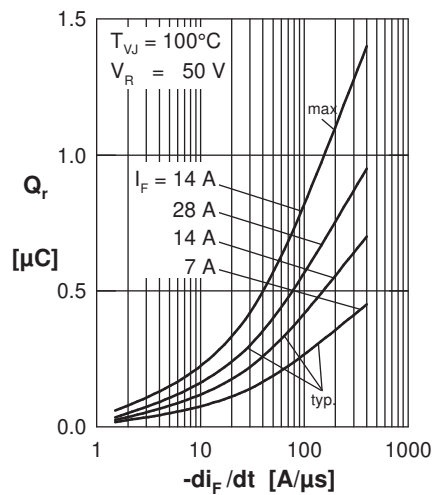


Fig. 2 Typ. recovery charge Q_r versus $-di_F/dt$

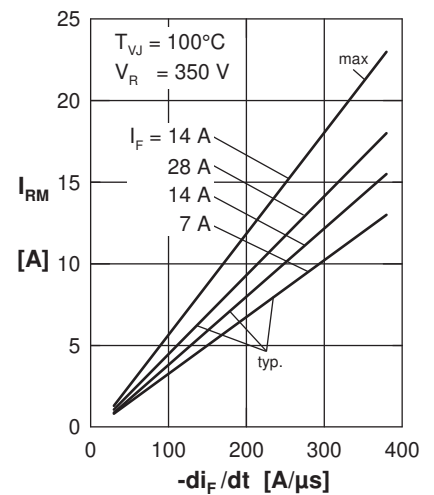


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

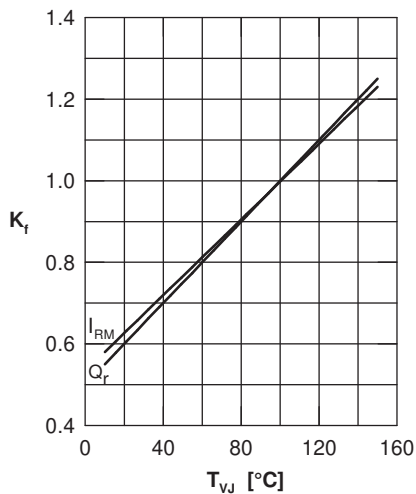


Fig. 4 Typ. dynamic parameters K_f vs. junction temperature

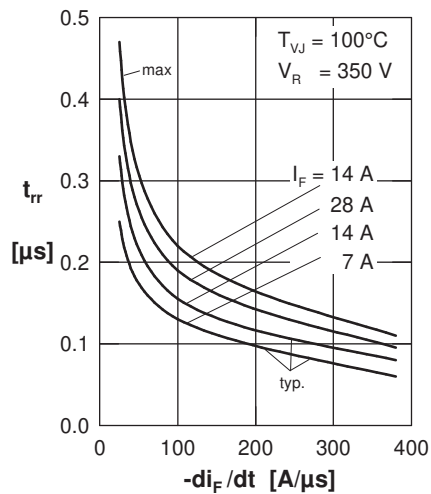


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

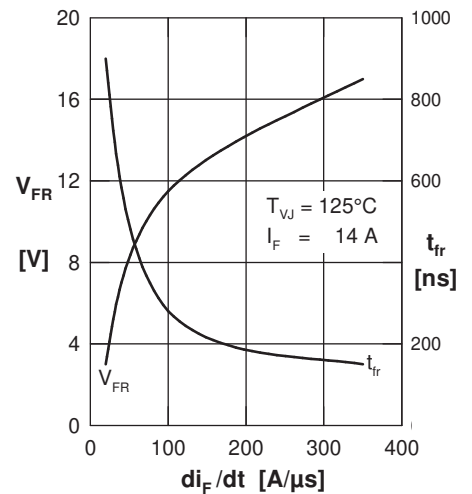


Fig. 6 Typ. peak forward voltage V_{FR} versus di_F/dt

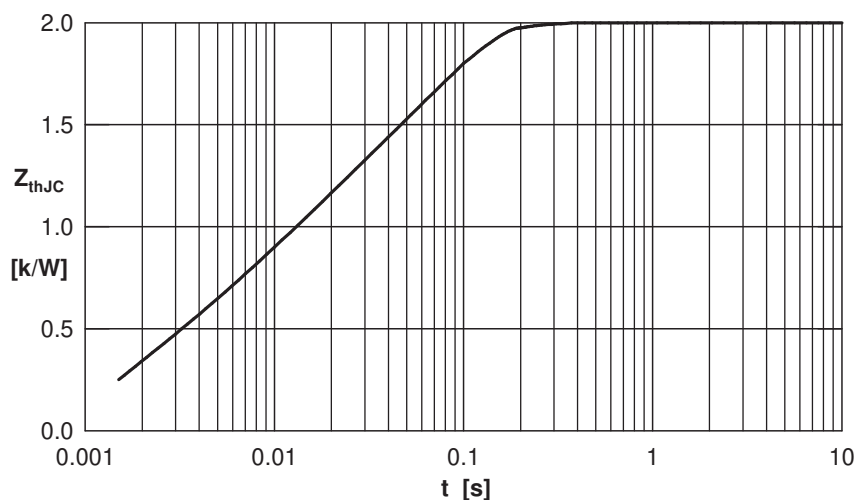
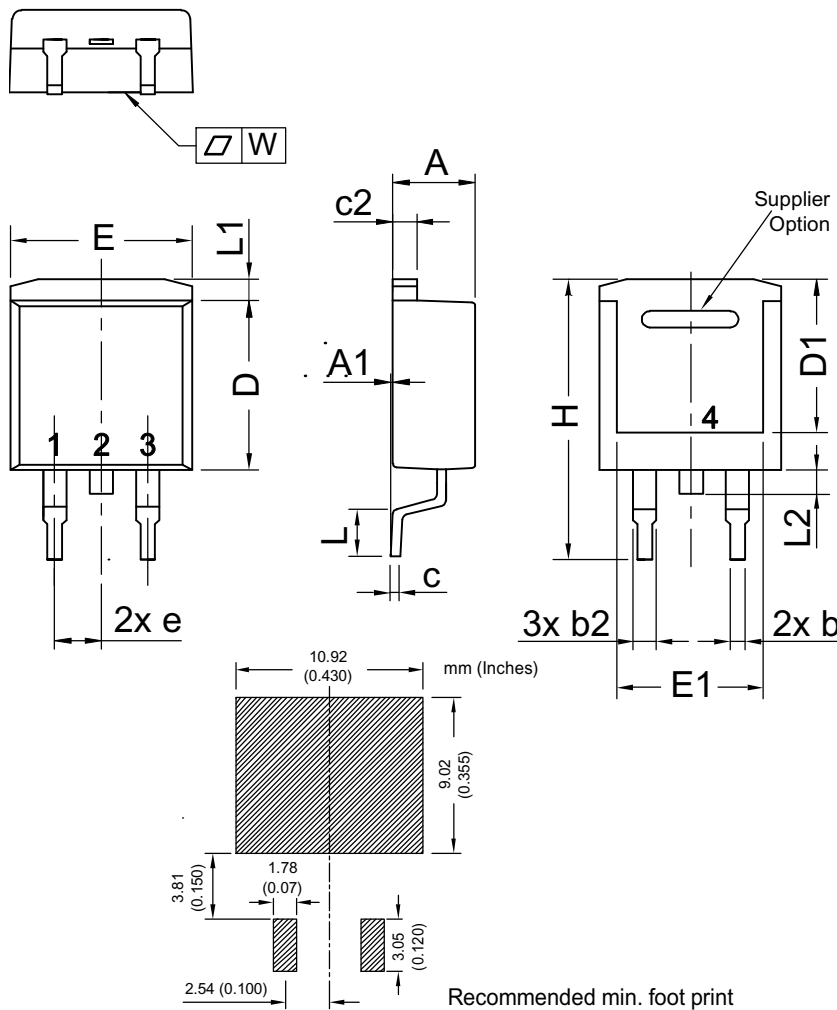


Fig. 7 Transient thermal resistance junction to case

Dimensions TO-263 AA



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.

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