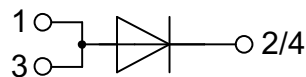
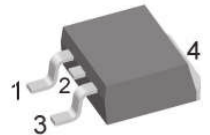


# Fast Recovery Epitaxial Diode (FRED)

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

$V_{RSM}$	$V_{RRM}$	Type
V	V	
<b>640</b>	<b>600</b>	<b>DSEI 12-06AS</b>


**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 $t = 8.3 \text{ ms}$ (60 Hz), sine	100	A
		110	
	$T_{VJ} = 150^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	85	A
		95	
$I^2t$	$T_{VJ} = 45^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	50	$\text{A}^2\text{s}$
		50	
	$T_{VJ} = 150^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	36	$\text{A}^2\text{s}$
		37	
$T_{VJ}$		-40...+150	$^\circ\text{C}$
$T_{VJM}$		150	$^\circ\text{C}$
$T_{stg}$		-40...+150	$^\circ\text{C}$
$M_d$	mounting torque	0.4...0.6	Nm
$P_{tot}$	$T_C = 25^\circ\text{C}$	62	W
<b>Weight</b>	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	$\mu\text{A}$
	$V_R = 0.8 \cdot V_{RRM}$	$T_{VJ} = 25^\circ\text{C}$	25	$\mu\text{A}$
	$V_R = 0.8 \cdot V_{RRM}$	$T_{VJ} = 125^\circ\text{C}$	3	mA
$V_F$	$I_F = 16 \text{ A}$	$T_{VJ} = 150^\circ\text{C}$	1.5	V
		$T_{VJ} = 25^\circ\text{C}$	1.7	V
$V_{T0}$	For power-loss calculations only		1.12	V
$r_T$	$T_{VJ} = T_{VJM}$		23.2	m $\Omega$
$R_{thJC}$			2	K/W
$R_{thCH}$		0.25		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

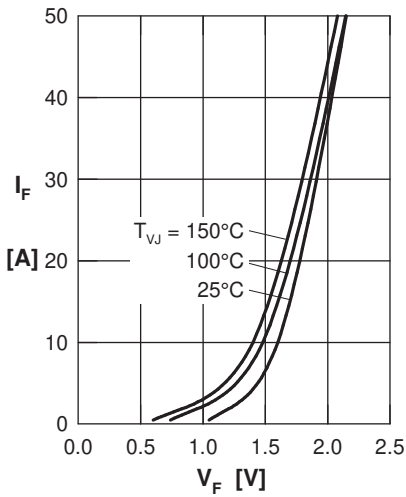


Fig. 1 Forward current  $I_F$  versus  $V_F$

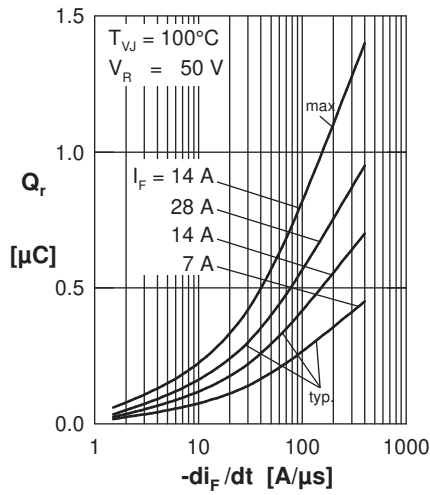


Fig. 2 Typ. recovery charge  $Q_r$  versus  $-di_F/dt$

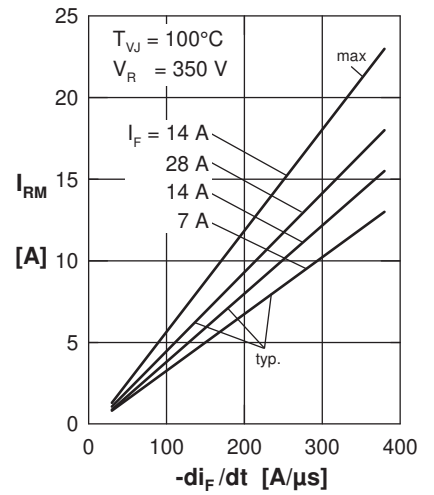


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

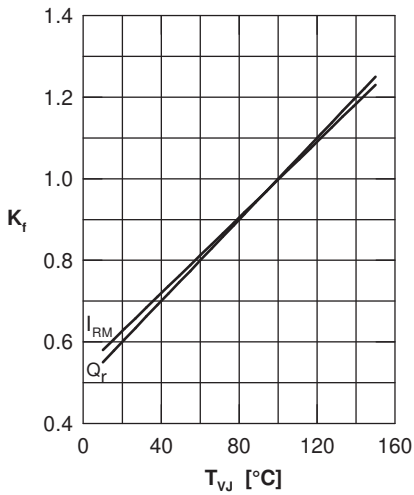


Fig. 4 Typ. dynamic parameters vs. junction temperature

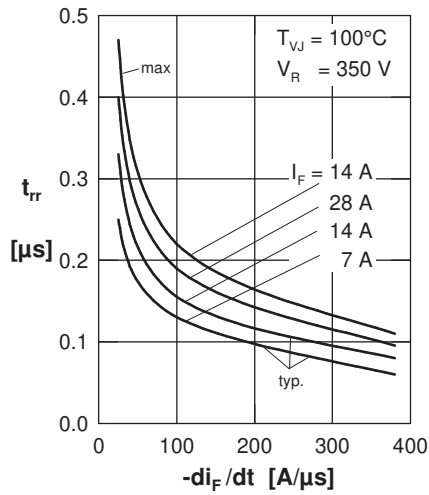


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$

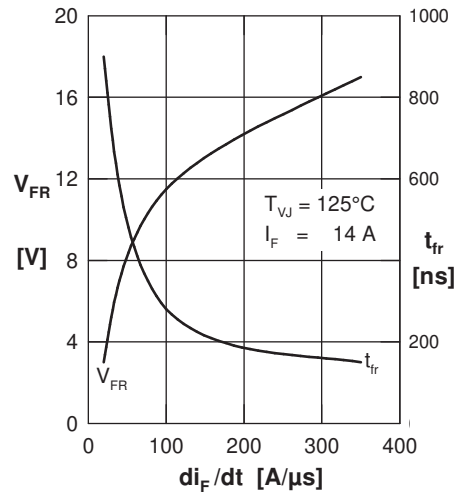


Fig. 6 Typ. peak forward voltage  $V_{FR}$  versus  $di_F/dt$

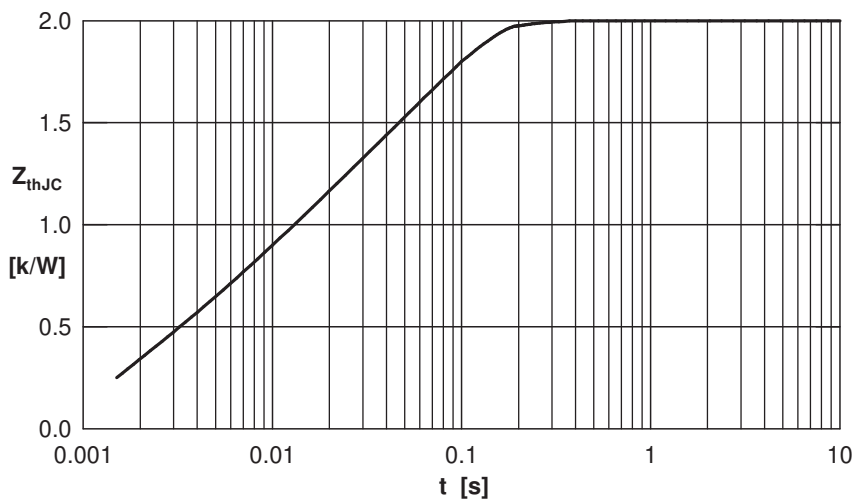
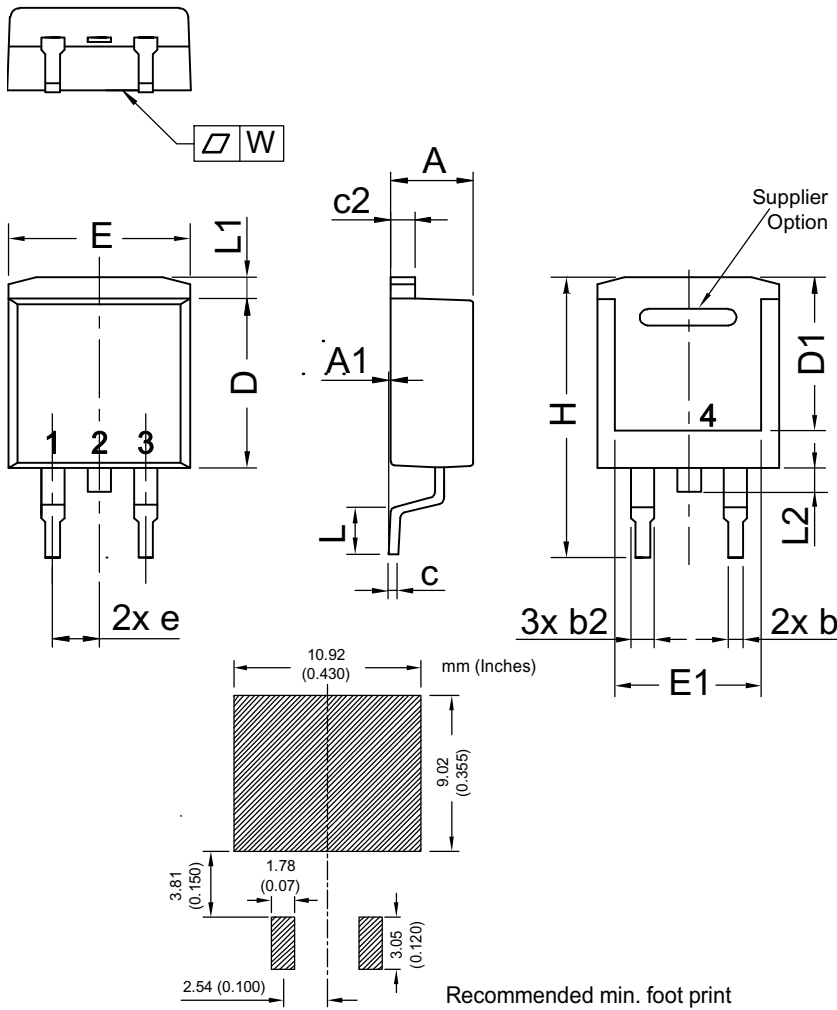


Fig. 7 Transient thermal resistance junction to case

## 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.*