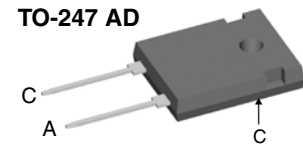
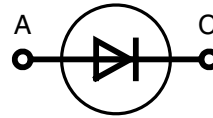


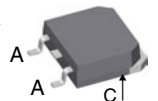
# Fast Recovery Epitaxial Diode (FRED)

$I_{FAV} = 60 \text{ A}$   
 $V_{RRM} = 600 \text{ V}$   
 $t_{rr} = 35 \text{ ms}$

$V_{RSM}$	$V_{RRM}$	Type
V	V	
600	600	DSEI 60-06A
600	600	DSEI 60-06AT



**TO-268 AA**  
(AT Type)



A = Anode, C = Cathode

Symbol	Conditions	Maximum Ratings	
$I_{FRMS}$		100	A
$I_{FAVM}$ ①	$T_C = 70^\circ\text{C}$ ; rectangular, $d = 0.5$	60	A
$I_{FRM}$	$t_p < 10 \mu\text{s}$ ; rep. rating, pulse width limited by $T_{VJM}$		
$I_{FSM}$	$T_{VJ} = 45^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	550	A
		600	
	$T_{VJ} = 150^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	480	A
		520	
$I^2t$	$T_{VJ} = 45^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	1510	$\text{A}^2\text{s}$
		1490	
	$T_{VJ} = 150^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	1150	$\text{A}^2\text{s}$
		1120	
$T_{VJ}$		-55...+150	$^\circ\text{C}$
$T_{VJM}$		150	$^\circ\text{C}$
$T_{stg}$		-55...+150	$^\circ\text{C}$
$P_{tot}$	$T_C = 25^\circ\text{C}$	166	W
$M_d$	mounting torque	0.8...1.2	Nm
<b>Weight</b>	typical	6	g

## Features

- International standard package JEDEC TO-247 AD
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low IRM-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.	
$I_R$	$V_R = V_{RRM}$		200	$\mu\text{A}$
	$V_R = 0.8 \cdot V_{RRM}$	$T_{VJ} = 25^\circ\text{C}$	100	$\mu\text{A}$
	$V_R = 0.8 \cdot V_{RRM}$	$T_{VJ} = 125^\circ\text{C}$	14	mA
$V_F$	$I_F = 70 \text{ A}$	$T_{VJ} = 150^\circ\text{C}$	1.5	V
		$T_{VJ} = 25^\circ\text{C}$	1.8	V
$V_{T0}$	For power-loss calculations only		1.13	V
$r_T$	$T_{VJ} = T_{VJM}$		4.7	$\text{m}\Omega$
$R_{thJC}$	(version A)		0.75	K/W
$R_{thCH}$		0.25	K/W	
$t_{rr}$	$I_F = 1 \text{ A}$ ; $-di_F/dt = 200 \text{ A}/\mu\text{s}$ ; $V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$	35	50	ns
$I_{RM}$	$V_R = 350 \text{ V}$ ; $I_F = 60 \text{ A}$ ; $-di_F/dt = 480 \text{ A}/\mu\text{s}$ $L \leq 0.05 \mu\text{H}$ ; $T_{VJ} = 100^\circ\text{C}$	6.0	7.5	A

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

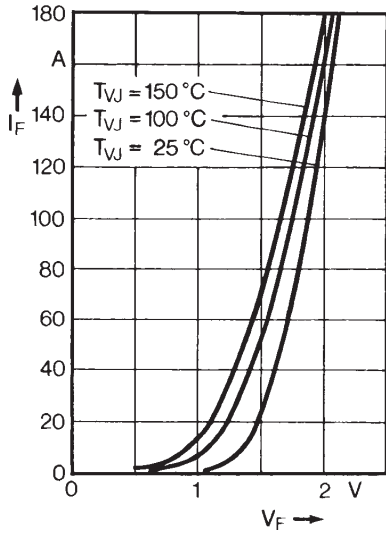


Fig. 1 Forward current versus voltage drop.

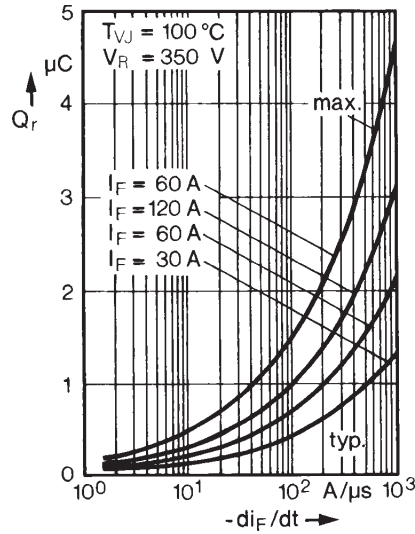


Fig. 2 Recovery charge versus  $-di_F/dt$ .

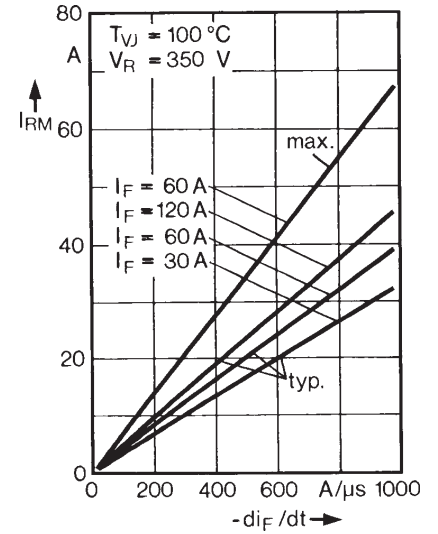


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

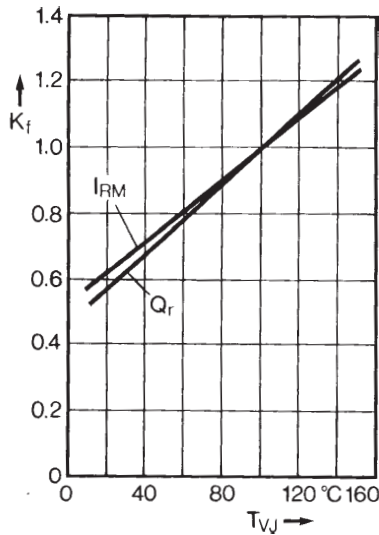


Fig. 4 Dynamic parameters versus junction temperature.

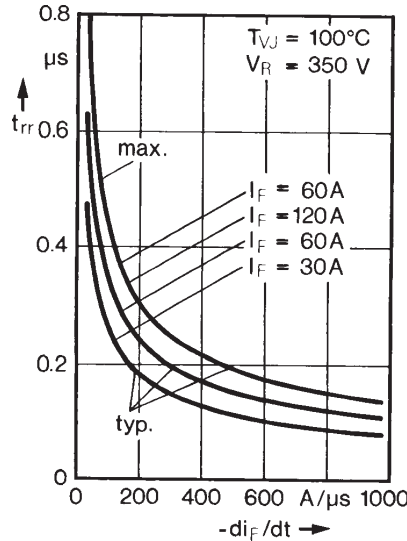


Fig. 5 Recovery time versus  $-di_F/dt$ .

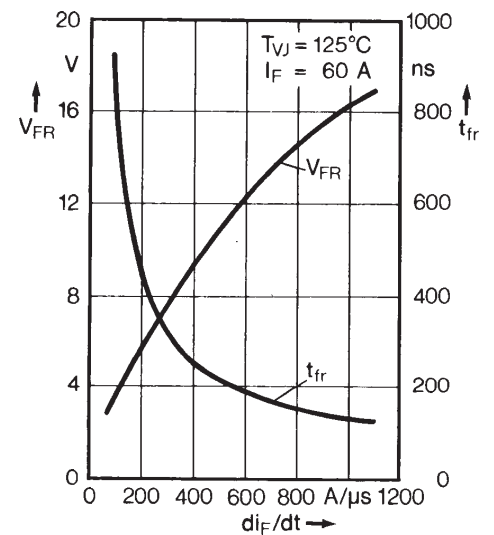


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

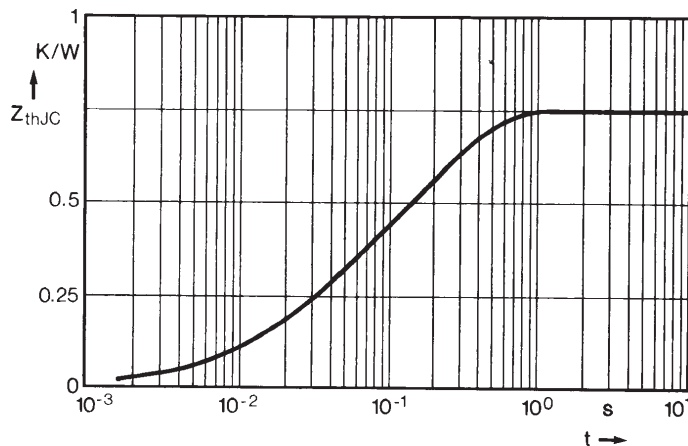
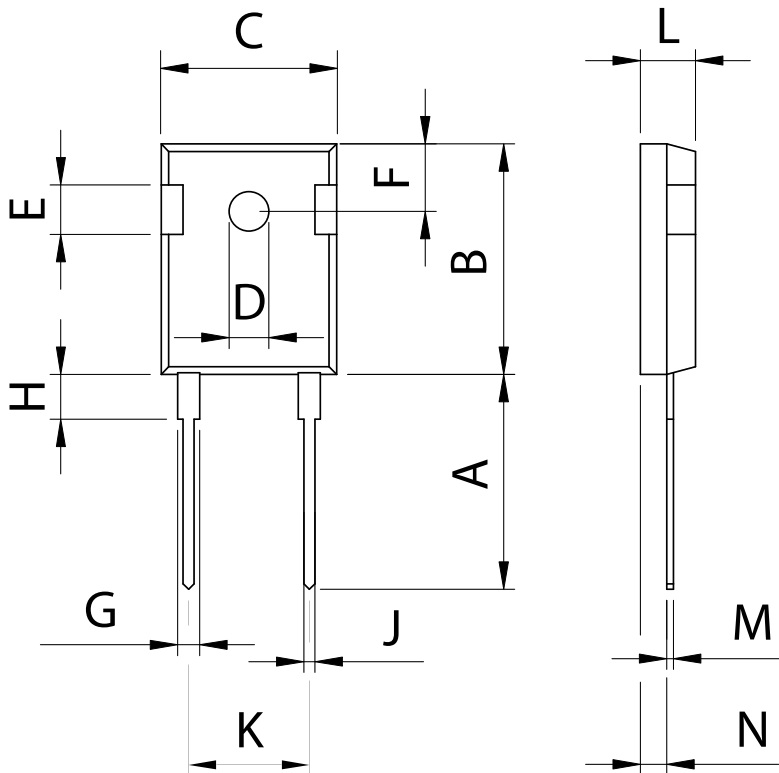


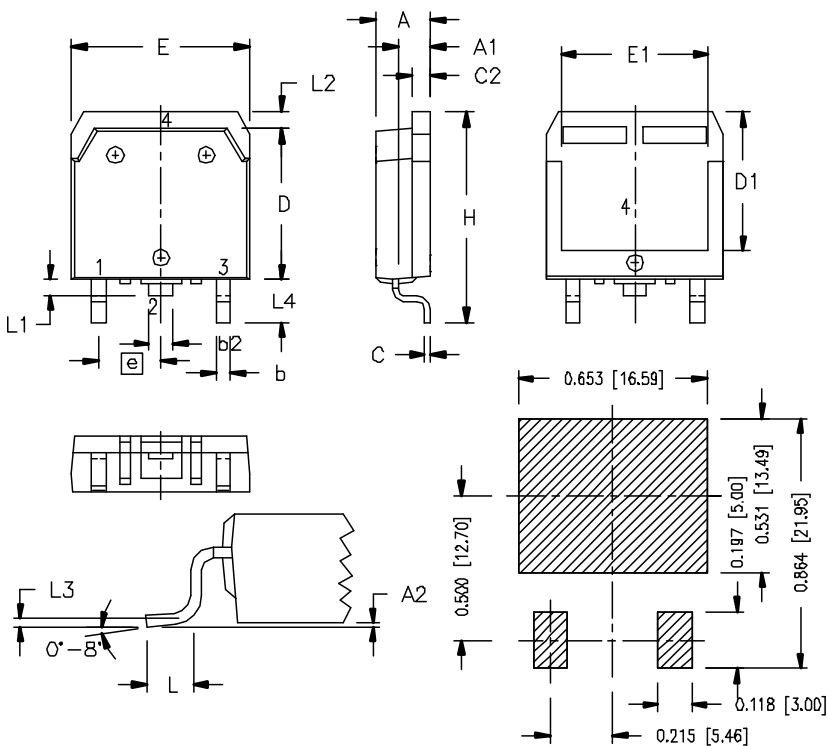
Fig. 7 Transient thermal impedance junction to case.

## Dimensions TO-247 AD



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

## Dimensions TO-268 AA



RECOMMENDED MINIMUM FOOT PRINT FOR SMD

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

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