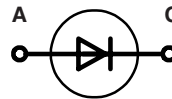
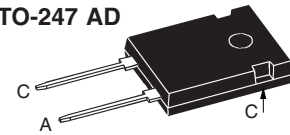
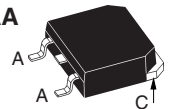


# Fast Recovery Epitaxial Diode (FRED)

**V<sub>RRM</sub> = 600 V**  
**I<sub>FAVM</sub> = 60 A**  
**t<sub>rr</sub> = 35 ns**

V <sub>RSM</sub> V	V <sub>RRM</sub> V	Type
600	600	DSEI 60-06A
600	600	DSEI 60-06AT


**TO-247 AD**

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


A = Anode, C = Cathode

Symbol	Conditions	Maximum Ratings	
I <sub>FRMS</sub>	T <sub>VJ</sub> = T <sub>VJM</sub>	100	A
I <sub>FAVM</sub> ①	T <sub>C</sub> = 70°C; rectangular, d = 0.5	60	A
I <sub>FRM</sub>	t <sub>p</sub> < 10 µs; rep. rating, pulse width limited by T <sub>VJM</sub>	800	A
I <sub>FSM</sub>	T <sub>VJ</sub> = 45°C; t = 10 ms (50 Hz), sine	550	A
	t = 8.3 ms (60 Hz), sine	600	A
I <sup>2</sup> t	T <sub>VJ</sub> = 150°C; t = 10 ms (50 Hz), sine	480	A
	t = 8.3 ms (60 Hz), sine	520	A
I <sup>2</sup> t	T <sub>VJ</sub> = 45°C t = 10 ms (50 Hz), sine	1510	A <sup>2</sup> s
	t = 8.3 ms (60 Hz), sine	1490	A <sup>2</sup> s
I <sup>2</sup> t	T <sub>VJ</sub> = 150°C; t = 10 ms (50 Hz), sine	1150	A <sup>2</sup> s
	t = 8.3 ms (60 Hz), sine	1120	A <sup>2</sup> s
T <sub>VJ</sub>		-40...+150	°C
T <sub>VJM</sub>		150	°C
T <sub>stg</sub>		-40...+150	°C
P <sub>tot</sub>	T <sub>C</sub> = 25°C	166	W
M <sub>d</sub>	Mounting torque	0.8...1.2	Nm
Weight		6	g

## Features

- International standard package JEDEC TO-247 AD
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I<sub>RM</sub>-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 <sub>R</sub>	T <sub>VJ</sub> = 25°C; V <sub>R</sub> = V <sub>RRM</sub>		200 µA
	T <sub>VJ</sub> = 25°C; V <sub>R</sub> = 0.8 • V <sub>RRM</sub>		100 µA
	T <sub>VJ</sub> = 125°C; V <sub>R</sub> = 0.8 • V <sub>RRM</sub>		14 mA
V <sub>F</sub>	I <sub>F</sub> = 16 A; T <sub>VJ</sub> = 150°C		1.5 V
		T <sub>VJ</sub> = 25°C	1.8 V
V <sub>T0</sub>	For power-loss calculations only		1.13 V
r <sub>T</sub>	T <sub>VJ</sub> = T <sub>VJM</sub>		4.7 mΩ
R <sub>thJC</sub>	(version A)		0.75 K/W
R <sub>thCH</sub>		0.25	K/W
t <sub>rr</sub>	I <sub>F</sub> = 1 A; -di/dt = 200 A/µs; V <sub>R</sub> = 30 V; T <sub>VJ</sub> = 25°C	35	50 ns
I <sub>RM</sub>	V <sub>R</sub> = 350 V; I <sub>F</sub> = 60 A; -di <sub>p</sub> /dt = 480 A/µs L ≤ 0.05 µH; T <sub>VJ</sub> = 100°C	4	4.4 A

① I<sub>FAVM</sub> rating includes reverse blocking losses at T<sub>VJM</sub>, V<sub>R</sub> = 0.8 V<sub>RRM</sub>, duty cycle d = 0.5  
 Data according to IEC 60747

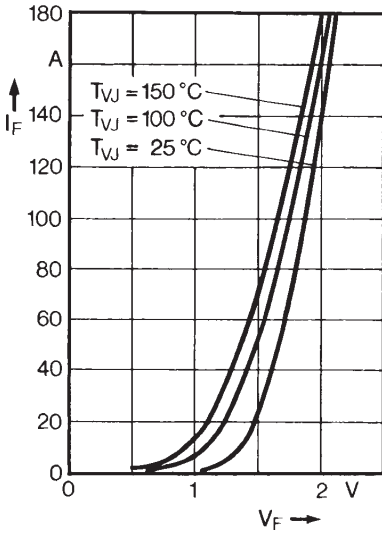


Fig. 1 Forward current versus voltage drop.

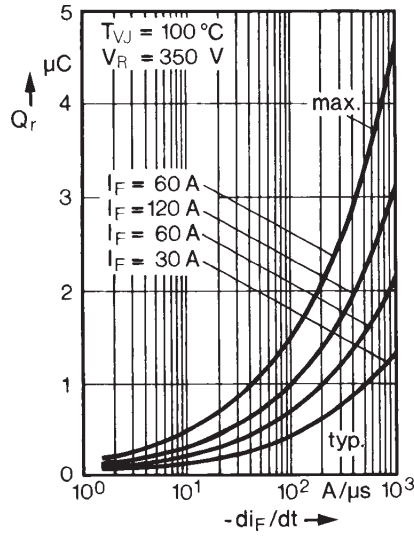


Fig. 2 Recovery charge versus  $-di_F/dt$ .

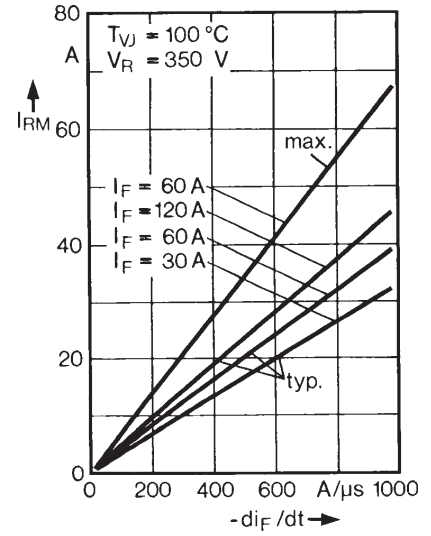


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

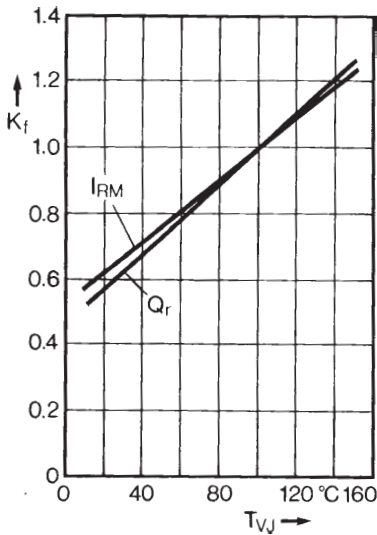


Fig. 4 Dynamic parameters versus junction temperature.

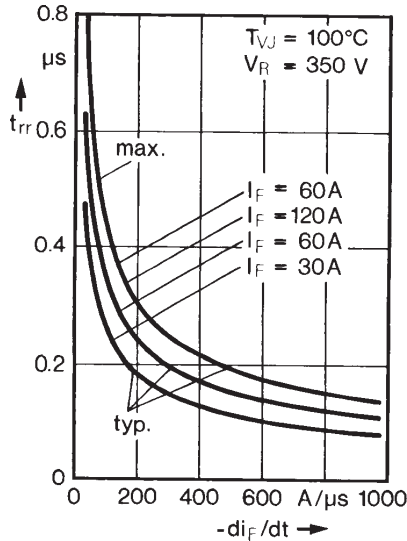


Fig. 5 Recovery time versus  $-di_F/dt$ .

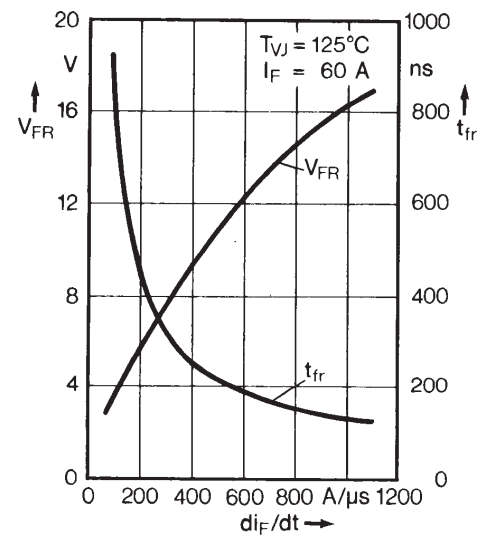


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

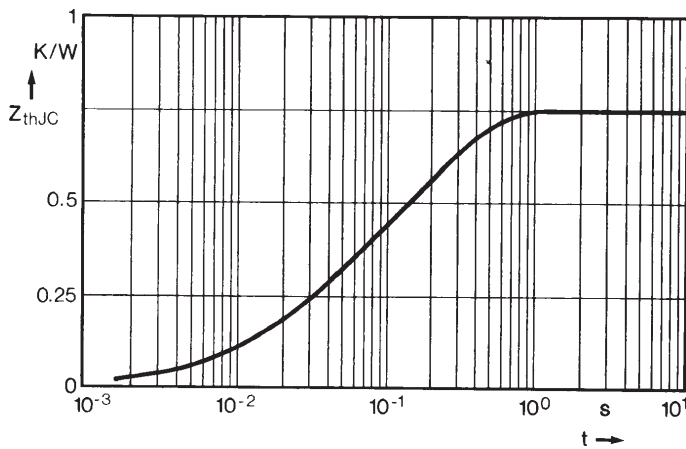
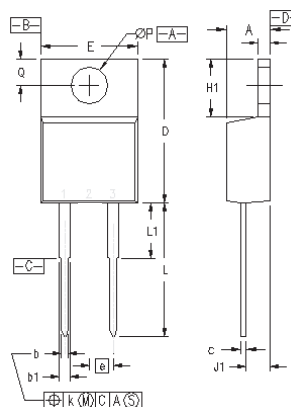


Fig. 7 Transient thermal impedance junction to case.

### Dimensions



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.83	0.170	0.190
b	0.64	1.02	0.025	0.040
b1	1.15	1.65	0.045	0.065
c	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	2.54 BSC		0.100 BSC	
F	1.14	1.40	0.045	0.055
H1	5.85	6.85	0.230	0.270
J1	2.29	2.79	0.090	0.110
k	0	0.38	0	0.015
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
ØP	3.53	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125