IXYS

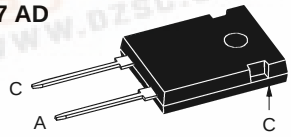
Fast Recovery Epitaxial Diode (FRED)

DSEI 120

I_{FAVM} = 109 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEI 120-12A

TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ①	T_C = 60°C; rectangular, d = 0.5		109	A
I_{FAV} ②	T_C = 95°C; rectangular, d = 0.5		75	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		tbd	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	600	A
		t = 8.3 ms (60 Hz), sine	660	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	540	A
		t = 8.3 ms (60 Hz), sine	600	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1800	A^2s
		t = 8.3 ms (60 Hz), sine	1800	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1450	A^2s
		t = 8.3 ms (60 Hz), sine	1500	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		357	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		3	mA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		1.5	mA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		20	mA
V_F	I_F = 70 A;	T_{VJ} = 150°C		1.55	V
		T_{VJ} = 25°C		1.8	V
V_{T0}	For power-loss calculations only			1.2	V
r_T	$T_{VJ} = T_{VJM}$			4.6	mΩ
R_{thJC}				0.35	K/W
R_{thCK}			0.25		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C		40	60	ns
I_{RM}	V_R = 350 V; I_F = 75 A; $-di_F/dt$ = 200 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		25	30	A

① Chip capability, ② limited to 70 A by leads

Features

- International standard package JEDEC TO-247 AD
- 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

Dimensions

See DSEI 60-12 on page D5 - 27

Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

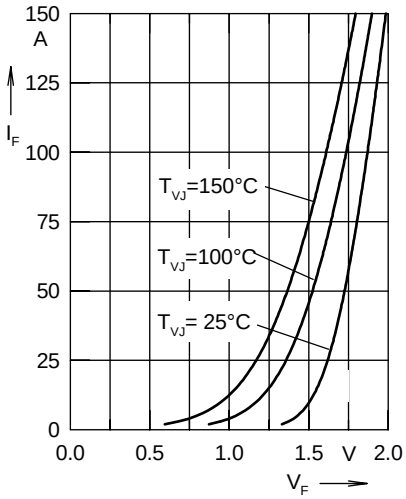


Fig. 1 Forward current I_F versus V_F

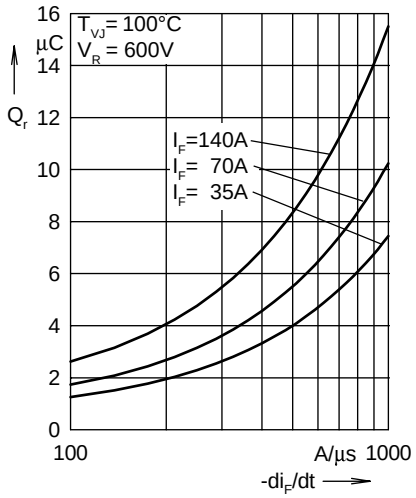


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

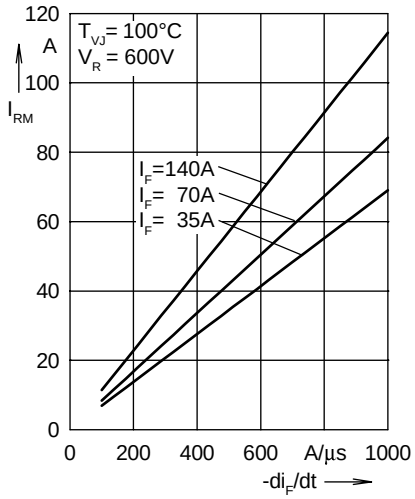


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

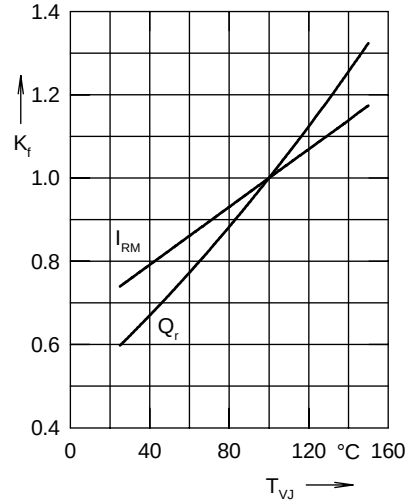


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

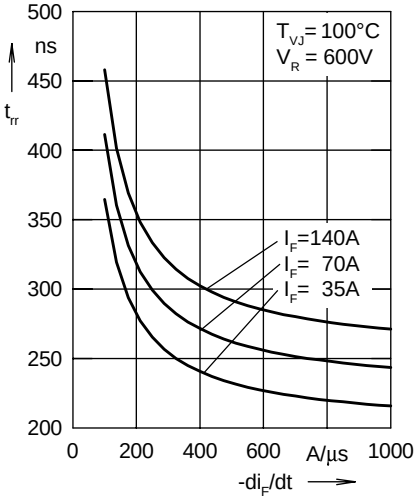


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

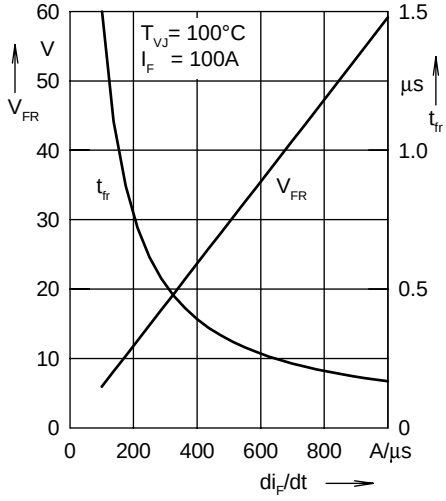


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

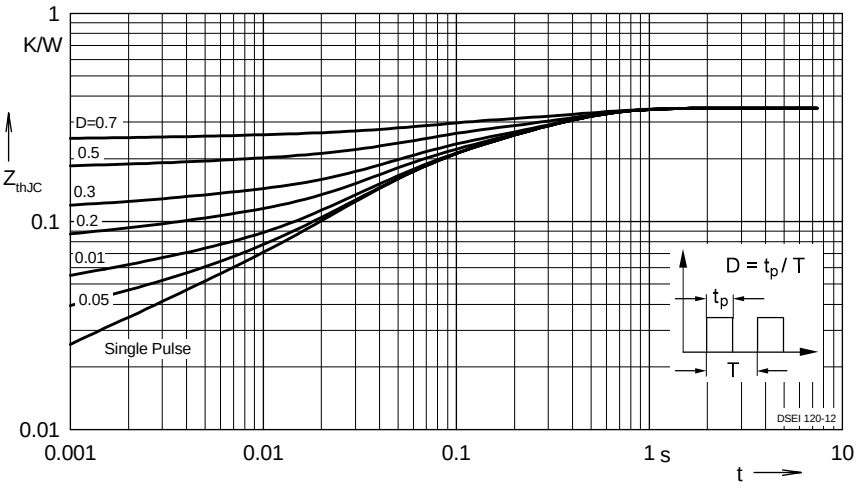


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.017	0.00038
2	0.0184	0.0026
3	0.1296	0.0387
4	0.185	0.274