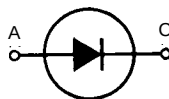


Fast Recovery Epitaxial Diode (FRED)

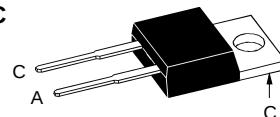
DSEI 12

$I_{FAVM} = 12\text{ A}$
 $V_{RRM} = 1000\text{ V}$
 $t_{rr} = 50\text{ ns}$

V_{RSM}	V_{RRM}	Type
V	V	
1000	1000	DSEI 12-10A



TO-220 AC



A = Anode, C = Cathode

Symbol	Test Conditions	Maximum Ratings	
I_{FRMS} I_{FAVM} ① I_{FRM}	$T_{VJ} = T_{VJM}$ $T_C = 100^\circ\text{C}$; rectangular, $d = 0.5$ $t_p < 10\text{ }\mu\text{s}$; rep. rating, pulse width limited by T_{VJM}	25 12 150	A A A
I_{FSM}	$T_{VJ} = 45^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine $t = 8.3\text{ ms}$ (60 Hz), sine	75 80	A A
	$T_{VJ} = 150^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine $t = 8.3\text{ ms}$ (60 Hz), sine	65 70	A A
I^2t	$T_{VJ} = 45^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine $t = 8.3\text{ ms}$ (60 Hz), sine	28 27	A^2s A^2s
	$T_{VJ} = 150^\circ\text{C}$; $t = 10\text{ ms}$ (50 Hz), sine $t = 8.3\text{ ms}$ (60 Hz), sine	21 20	A^2s A^2s
T_{VJ} T_{VJM} T_{stg}		-40...+150 150 -40...+150	$^\circ\text{C}$ $^\circ\text{C}$ $^\circ\text{C}$
P_{tot}	$T_C = 25^\circ\text{C}$	78	W
M_d	Mounting torque	0.4...0.6	Nm
Weight		2	g

Features

- International standard package JEDEC TO-220 AC
- 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	Test Conditions	Characteristic Values	
		typ.	max.
I_R	$T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$ $T_{VJ} = 25^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$ $T_{VJ} = 125^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$	250 150 4	μA μA mA
V_F	$I_F = 12\text{ A}$; $T_{VJ} = 150^\circ\text{C}$ $T_{VJ} = 25^\circ\text{C}$	2.1 2.7	V V
V_{T0} r_T	For power-loss calculations only $T_{VJ} = T_{VJM}$	1.67 33.6	V $\text{m}\Omega$
R_{thJC} R_{thCK} R_{thJA}	0.5	1.6 60	K/W K/W K/W
t_{rr}	$I_F = 1\text{ A}$; $-di/dt = 50\text{ A}/\mu\text{s}$; $V_R = 30\text{ V}$; $T_{VJ} = 25^\circ\text{C}$	50	60 ns
I_{RM}	$V_R = 540\text{ V}$; $I_F = 12\text{ A}$; $-di_F/dt = 100\text{ A}/\mu\text{s}$ $L \leq 0.05\text{ }\mu\text{H}$; $T_{VJ} = 100^\circ\text{C}$	6.5	7.2 A

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

Data according to IEC 60747

IXYS reserves the right to change limits, test conditions and dimensions

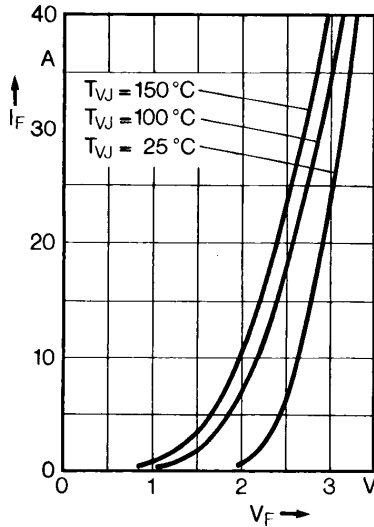


Fig. 1 Forward current versus voltage drop.

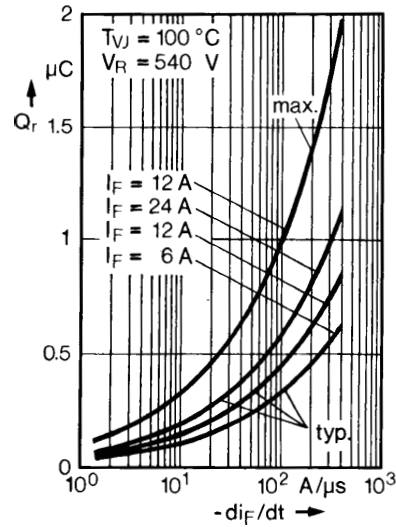


Fig. 2 Recovery charge versus $-di_F/dt$.

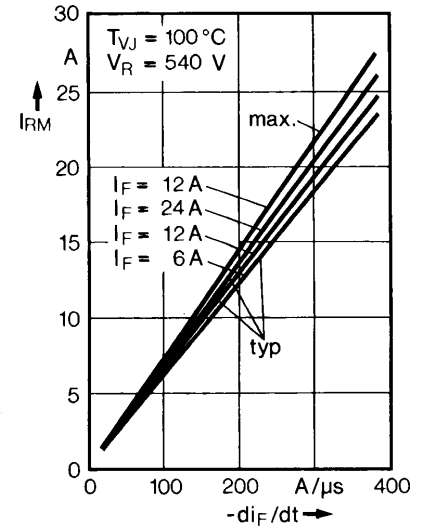


Fig. 3 Peak reverse current versus $-di_F/dt$.

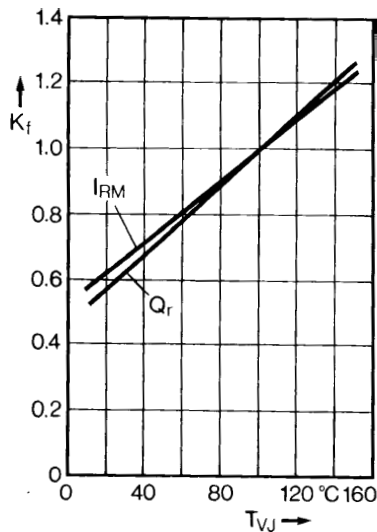


Fig. 4 Dynamic parameters versus junction temperature.

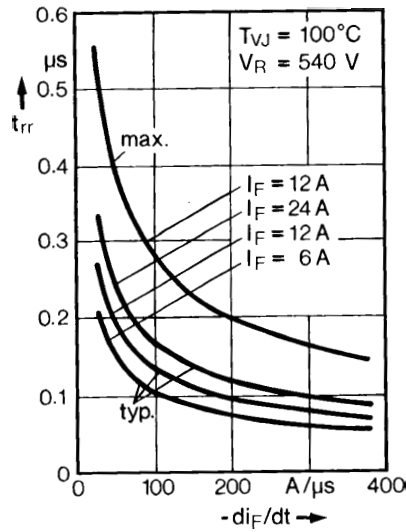


Fig. 5 Recovery time versus $-di_F/dt$.

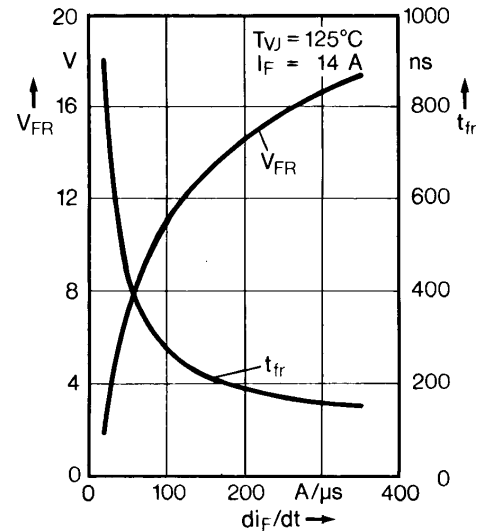


Fig. 6 Peak forward voltage versus di_F/dt .

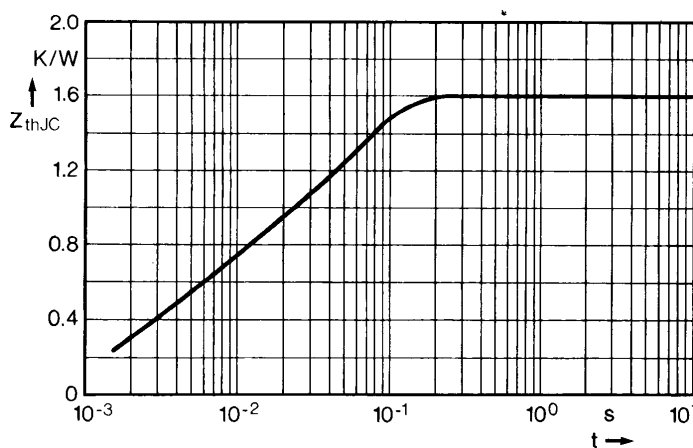
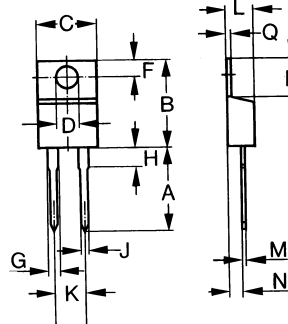


Fig. 7 Transient thermal impedance junction to case.

Dimensions



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	12.70	14.73	0.500	0.580
B	14.23	16.51	0.560	0.650
C	9.66	10.66	0.380	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.420
F	2.54	3.42	0.100	0.135
G	1.15	1.77	0.045	0.070
H	-	6.35	-	0.250
J	0.64	0.89	0.025	0.035
K	4.83	5.33	0.190	0.210
L	3.56	4.82	0.140	0.190
M	0.38	0.56	0.015	0.022
N	2.04	2.49	0.080	0.115
Q	0.64	1.39	0.025	0.055