

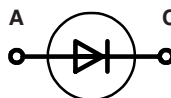
Fast Recovery Epitaxial Diode (FRED)

$$V_{RRM} = 600 \text{ V}$$

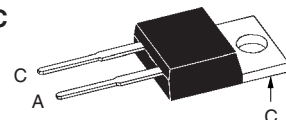
$$I_{FAVM} = 14 \text{ A}$$

$$t_{rr} = 35 \text{ ns}$$

V_{RSM} V	V_{RRM} V	Type
640	600	DSEI 12-06A



TO-220 AC



A = Anode, C = Cathode

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	100 A
	$t = 8.3 \text{ ms}$ (60 Hz), sine	110 A
	$T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$ (50 Hz), sine	85 A
	$t = 8.3 \text{ ms}$ (60 Hz), sine	95 A
I^2t	$T_{VJ} = 45^\circ\text{C}$ $t = 10 \text{ ms}$ (50 Hz), sine	50 A ² s
	$t = 8.3 \text{ ms}$ (60 Hz), sine	50 A ² s
	$T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$ (50 Hz), sine	36 A ² s
	$t = 8.3 \text{ ms}$ (60 Hz), sine	37 A ² s
T_{VJ}		-40...+150 °C
T_{VJM}		150 °C
T_{stg}		-40...+150 °C
P_{tot}	$T_C = 25^\circ\text{C}$	62 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	Conditions	Characteristic Values	
		typ.	max.
I_R	$T_{VJ} = 25^\circ\text{C}$; $V_R = V_{RRM}$ $T_{VJ} = 25^\circ\text{C}$; $V_R = 0.8 \cdot V_{RRM}$ $T_{VJ} = 125^\circ\text{C}$; $V_R = 0.8 \cdot V_{RRM}$	50 25 3	μA μA mA
V_F	$I_F = 16 \text{ A}$; $T_{VJ} = 150^\circ\text{C}$ $T_{VJ} = 25^\circ\text{C}$	1.5 1.7	V V
V_{T0}	For power-loss calculations only	1.12	V
r_T	$T_{VJ} = T_{VJM}$	23.2	mΩ
R_{thJC}	0.5	2	K/W
R_{thCH}			K/W
R_{thJA}		60	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} , $V_R = 0.8 V_{RRM}$; duty cycle $d = 0.5$
Data according to IEC 60747

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

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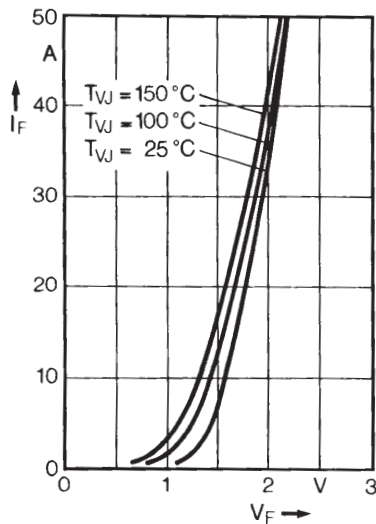


Fig. 1 Forward current versus voltage drop.

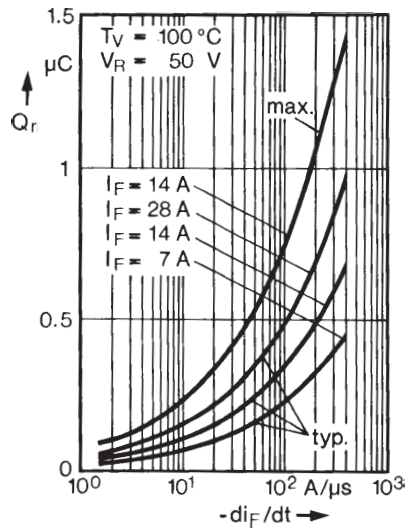


Fig. 2 Recovery charge versus $-di_F/dt$.

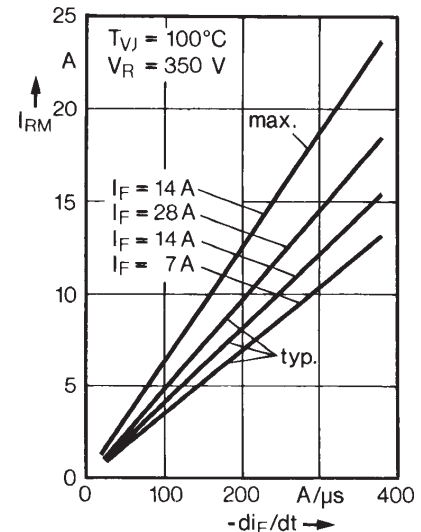


Fig. 3 Peak reverse current versus $-di_F/dt$.

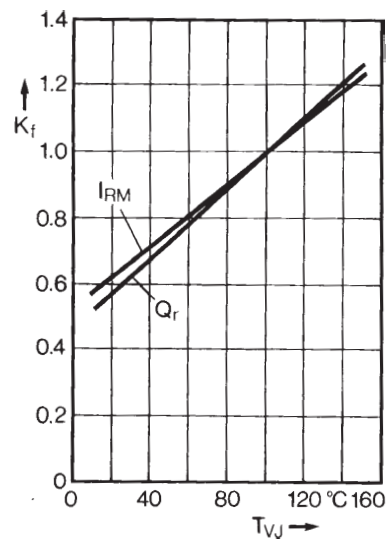


Fig. 4 Dynamic parameters versus junction temperature.

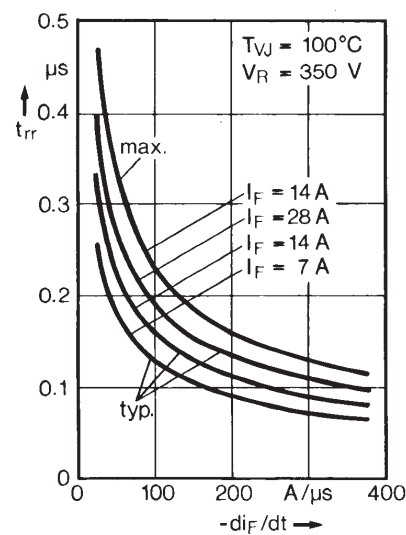


Fig. 5 Recovery time versus $-di_F/dt$.

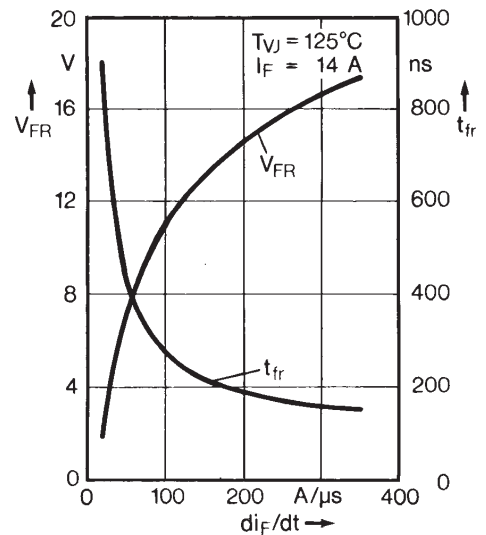


Fig. 6 Peak forward voltage versus di_F/dt .

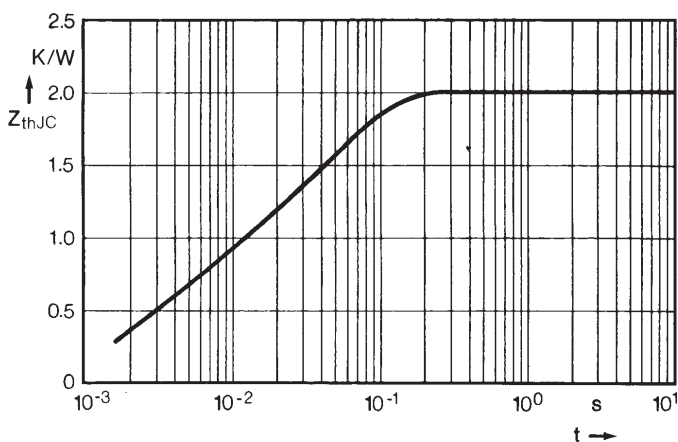
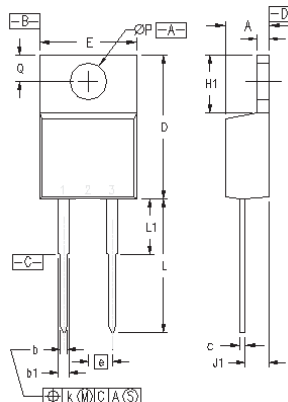


Fig. 7 Transient thermal impedance junction to case.

Dimensions



Dim.	Millimeter	Millimeter	Inches	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
OP	3.53	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125

Note: This drawing will meet all dimensions requirement of JEDEC outline TO-220 AB