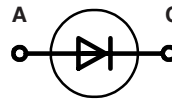
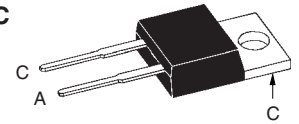


# Fast Recovery Epitaxial Diode (FRED)

$V_{RRM} = 600\text{ V}$   
 $I_{FAVM} = 14\text{ A}$   
 $t_{rr} = 35\text{ ns}$

$V_{RSM}$	$V_{RRM}$	Type
V	V	
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 <sup>2</sup> s
	$t = 8.3\text{ ms}$ (60 Hz), sine	50	A <sup>2</sup> s
	$T_{VJ} = 150^\circ\text{C}$ ; $t = 10\text{ ms}$ (50 Hz), sine	36	A <sup>2</sup> s
	$t = 8.3\text{ ms}$ (60 Hz), sine	37	A <sup>2</sup> 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
<b>Weight</b>		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.
$I_R$	$T_{VJ} = 25^\circ\text{C}$ ; $V_R = V_{RRM}$		50 $\mu\text{A}$
	$T_{VJ} = 25^\circ\text{C}$ ; $V_R = 0.8 \cdot V_{RRM}$		25 $\mu\text{A}$
	$T_{VJ} = 125^\circ\text{C}$ ; $V_R = 0.8 \cdot V_{RRM}$		3 mA
$V_F$	$I_F = 16\text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$ $T_{VJ} = 25^\circ\text{C}$		1.5 V
			1.7 V
$V_{T0}$	For power-loss calculations only		1.12 V
$r_T$	$T_{VJ} = T_{VJM}$		23.2 m $\Omega$
$R_{thJC}$	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

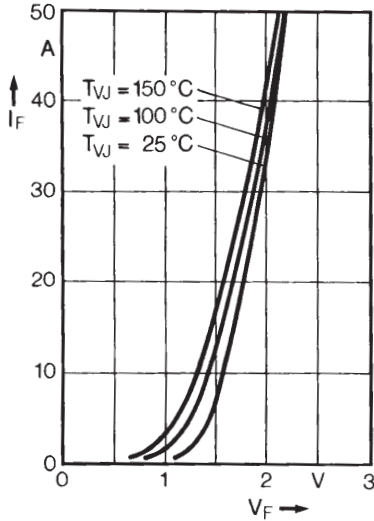


Fig. 1 Forward current versus voltage drop.

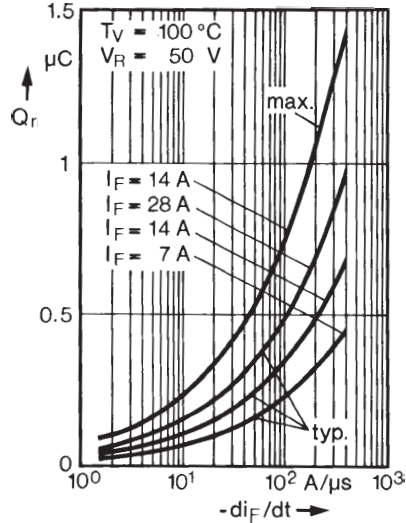


Fig. 2 Recovery charge versus  $-di_F/dt$ .

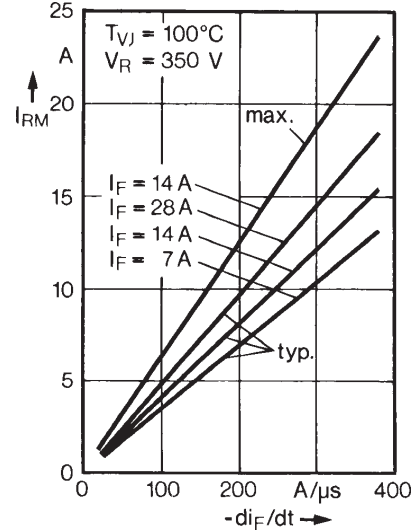


Fig. 3 Peak reverse current versus  $-di_F/dt$ .

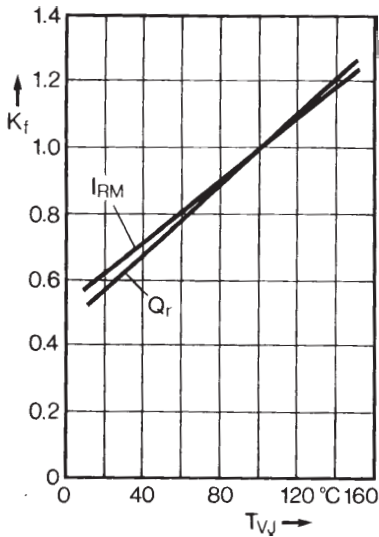


Fig. 4 Dynamic parameters versus junction temperature.

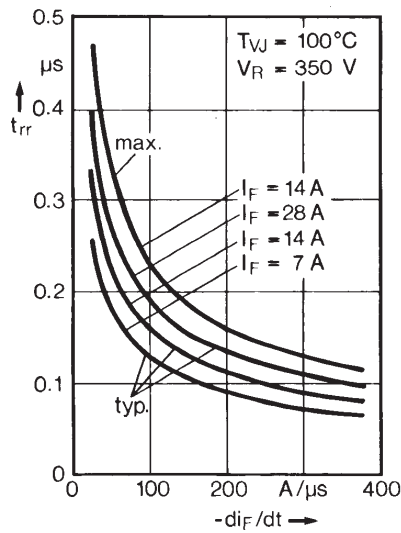


Fig. 5 Recovery time versus  $-di_F/dt$ .

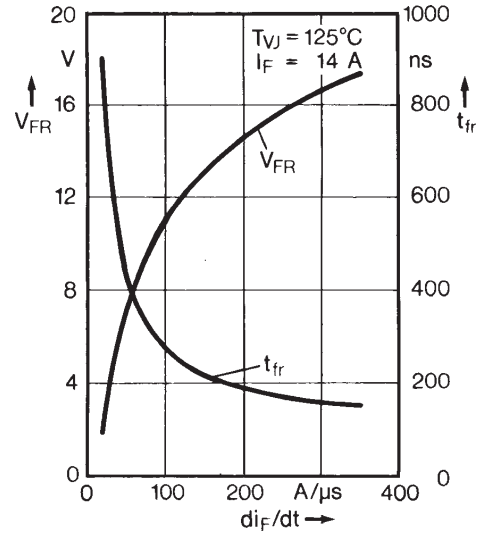


Fig. 6 Peak forward voltage versus  $di_F/dt$ .

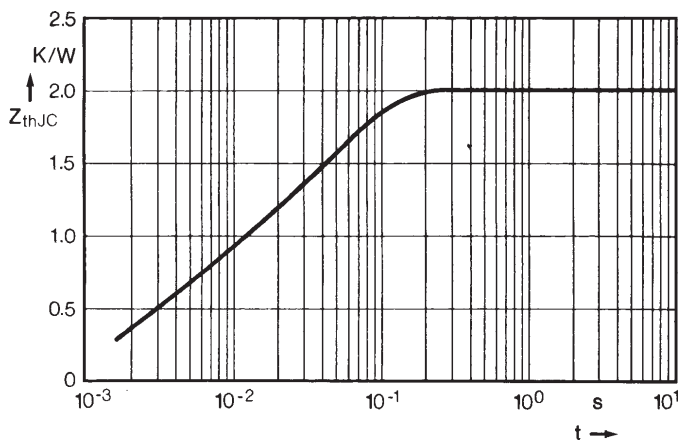
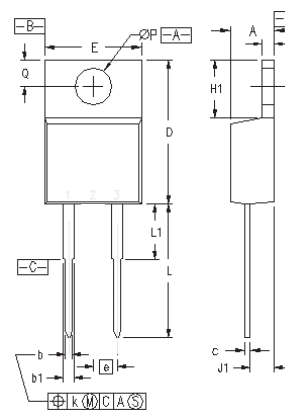


Fig. 7 Transient thermal impedance junction to case.

## 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

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

This datasheet has been download from:

[www.datasheetcatalog.com](http://www.datasheetcatalog.com)

Datasheets for electronics components.