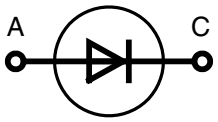
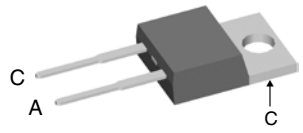
Fast Recovery Epitaxial Diode (FRED)

I_{FAV} = 12 A
V_{RRM} = 1000 V
t_{rr} = 50 ns

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



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°C; rectangular, d = 0.5		12	A
I_{FRM}	t_p < 10 µs; rep. rating, pulse width limited by T_{VJM}		150	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	75	A
		t = 8.3 ms (60 Hz), sine	80	
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	65	A
		t = 8.3 ms (60 Hz), sine	70	
I^2t	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	28	A^2s
		t = 8.3 ms (60 Hz), sine	27	
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	21	A^2s
		t = 8.3 ms (60 Hz), sine	20	
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		78	W
M_d	mounting torque		0.4...0.6	Nm
Weight	typical		2	g

Symbol	Conditions		Characteristic Values typ.	max.	
I_R	$V_R = V_{RRM}$	T_{VJ} = 25°C		250	µA
	$V_R = 0.8 \cdot V_{RRM}$	T_{VJ} = 25°C		150	µA
	$V_R = 0.8 \cdot V_{RRM}$	T_{VJ} = 125°C		4	mA
V_F	I_F = 12 A	T_{VJ} = 150°C		2.1	V
		T_{VJ} = 25°C		2.7	V
V_{T0}	For power-loss calculations only			1.67	V
r_T	$T_{VJ} = T_{VJM}$			33.6	mΩ
R_{thJC}				1.6	K/W
R_{thCH}			0.5		K/W
R_{thJA}				60	K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C		50	60	ns
I_{RM}	V_R = 540 V; I_F = 12 A; $-di_F/dt$ = 100 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		6.5	7.2	A

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}. $V_R = 0.8 \cdot V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747

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

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

20071004

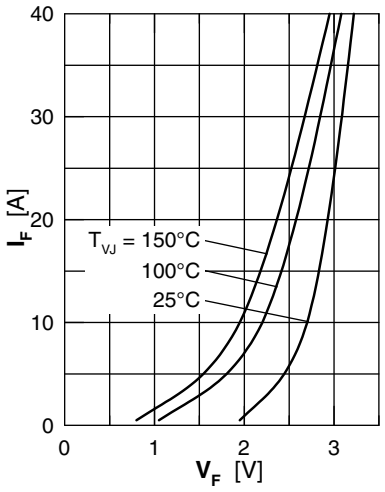


Fig. 1 Forward current versus voltage drop

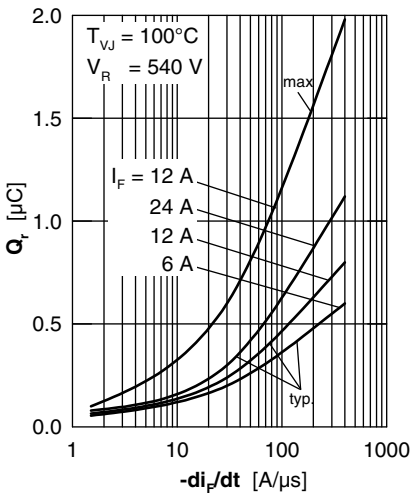


Fig. 2 Recovery charge versus $-di_F/dt$

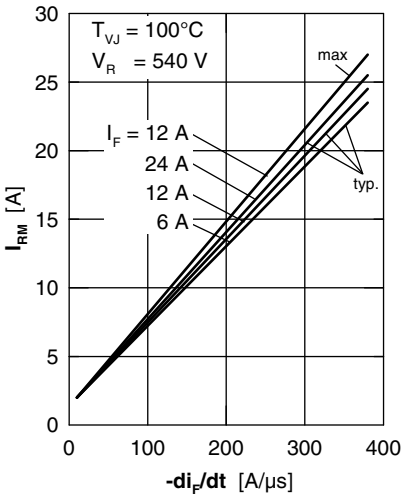


Fig. 3 Peak reverse current versus $-di_F/dt$

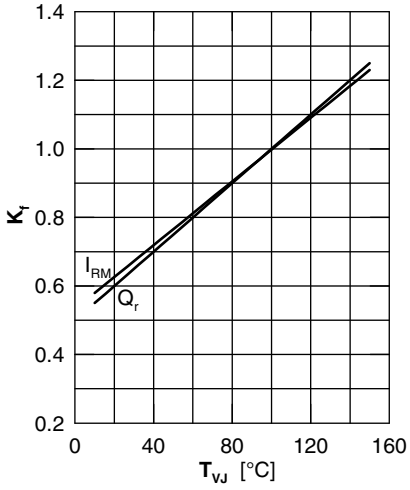


Fig. 4 Dynamic parameters versus junction temperature

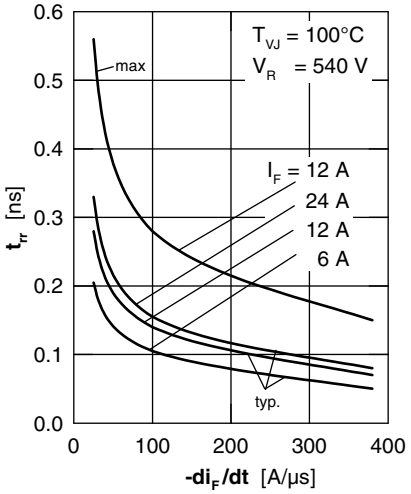


Fig. 5 Recovery time versus $-di_F/dt$

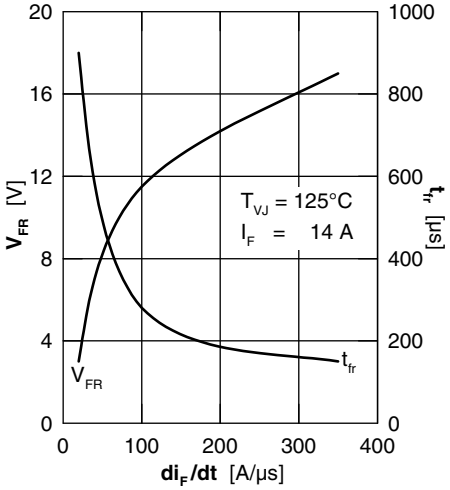


Fig. 6 Peak forward voltage versus di_F/dt

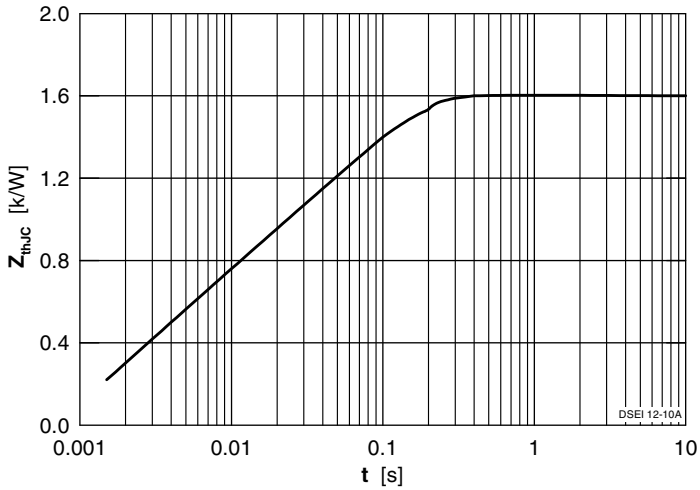


Fig. 7 Transient thermal resistance junction to case

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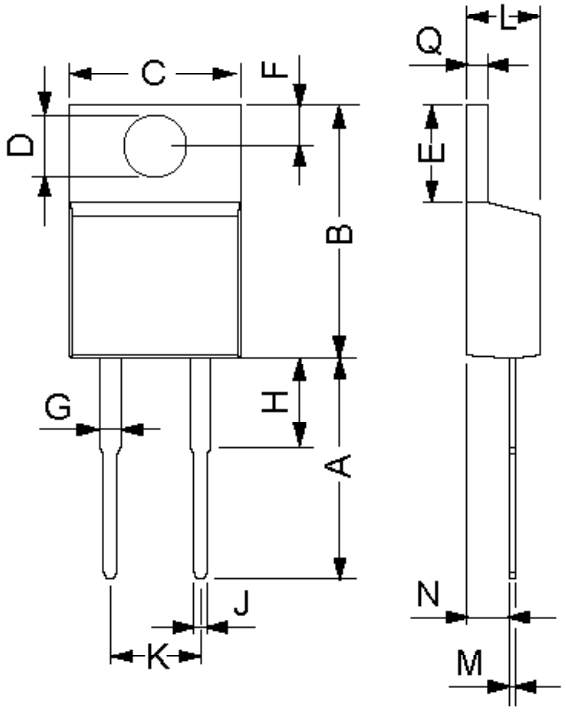
Dimensions TO-220 AC



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	12.7	14.73	0.5	0.58
B	14.23	16.51	0.56	0.65
C	9.66	10.66	0.38	0.42
D	3.54	4.08	0.139	0.161
E	5.85	6.85	2.3	0.42
F	2.54	3.42	0.1	0.135
G	1.15	1.77	0.045	0.07
H	-	6.35	-	0.25
J	0.64	0.89	0.025	0.035
K	4.83	5.33	0.19	0.21
L	3.56	4.82	0.14	0.19
M	0.51	0.76	0.02	0.03
N	2.04	2.49	0.08	0.115
Q	0.64	1.39	0.025	0.055

20071004