

Fast Recovery Epitaxial Diode (FRED)

PSEI 2x121

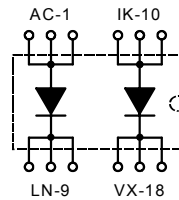
$$I_{FAVM} = 2x\ 123\ A$$

$$V_{RRM} = 200\ V$$

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

Preliminary Data Sheet

V_{RSM} (V)	V_{RRM} (V)	Type
200	200	PSEI 2x121/02



Symbol	Test Conditions	Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$	150	A
I_{FAVM}^*	$T_C = 70\ ^\circ C$, rectangular, $d=0.5$	123	A
I_{FRM}	$t_p < 10\ \mu s$; rep. rating, pulse width limited by T_{VJM}	600	A
I_{FSM}	$T_{VJ} = 45\ ^\circ C$ $t = 10\ ms$ (50 Hz), sine	1200	A
	$V_R = 0$ $t = 8.3\ ms$ (60 Hz), sine	1300	A
	$T_{VJ} = 125\ ^\circ C$ $t = 10\ ms$ (50 Hz), sine	1080	A
	$V_R = 0$ $t = 8.3\ ms$ (60 Hz), sine	1170	A
$\int i^2 dt$	$T_{VJ} = 45\ ^\circ C$ $t = 10\ ms$ (50 Hz), sine	7200	A ² s
	$V_R = 0$ $t = 8.3\ ms$ (60 Hz), sine	7100	A ² s
	$T_{VJ} = 125\ ^\circ C$ $t = 10\ ms$ (50 Hz), sine	5800	A ² s
	$V_R = 0$ $t = 8.3\ ms$ (60 Hz), sine	5700	A ² s
T_{VJ}		-40... + 150	$^\circ C$
T_{VJM}		150	$^\circ C$
T_{stg}		-40... + 150	$^\circ C$
V_{ISOL}	50/60 Hz, RMS $t = 1\ min$	2500	V~
	$I_{ISOL} \leq 1\ mA$ $t = 1\ s$	3000	V~
M_d	Mounting torque (M4)	1.5 - 2.0	Nm
		14 - 18	lb.in.
Weight	typ.	24	g

Symbol	Test Conditions	Characteristic Value	
I_R	$T_{VJ} = 25\ ^\circ C$, $V_R = V_{RRM}$	max.	1 mA
	$T_{VJ} = 25\ ^\circ C$, $V_R = 0.8 \cdot V_{RRM}$	max.	0.5 mA
	$T_{VJ} = 125\ ^\circ C$, $V_R = 0.8 \cdot V_{RRM}$	max.	20 mA
V_F	$I_F = 120\ A$, $T_{VJ} = 150\ ^\circ C$	max.	0.95 V
	$T_{VJ} = 25\ ^\circ C$	max.	1.10 V
V_{TO}	For power-loss calculations only	0.7	V
r_T		2.1	m Ω
R_{thJC}	per diode; max.	0.7	K/W
R_{thCH}	per diode; typ.	0.1	K/W
I_{RM}	$I_F = 100\ A$; $-di_F/dt = 200\ A/\mu s$; $V_R = 100\ V$ $L \leq 0.05\ mH$; $T_{VJ} = 100\ ^\circ C$	typ.	12 A
t_{rr}	$I_F = 1\ A$; $-di_F/dt = 400\ A/\mu s$; $V_R = 30\ V$; $T_{VJ} = 25\ ^\circ C$	typ.	35 ns
d_s	Creeping distance on surface	11.2	mm
d_A	Creeping distance in air	11.2	mm
a	Max. allowable acceleration	50	m/s ²

Features

- 2 independent FRED in 1 package
- Isolation voltage 3000 V~
- Planar glass passivated chips
- Low forward voltage drop
- Leads suitable for PC board soldering
- Very short recovery time
- Soft recovery behaviour
- UL registered, E 148688

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

- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling capability
- Low noise switching
- Small and light weight

Data according to IEC 60747 refer to a single diode unless otherwise stated

* I_{FAVM} rating includes blocking losses at T_{VJM} ;
 $V_R = 0.8 \cdot V_{RRM}$; duty cycle $d = 0.5$

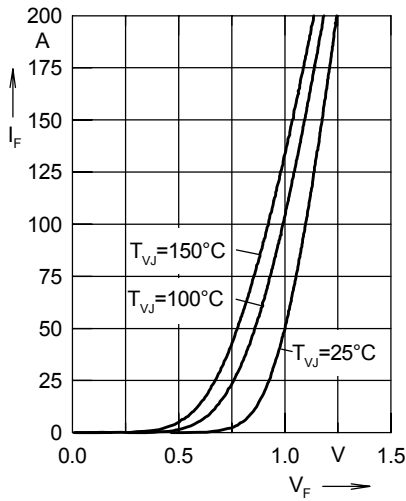


Fig. 1 Forward current I_F versus V_F

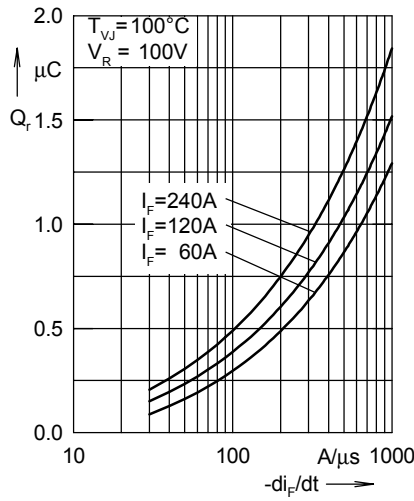


Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$

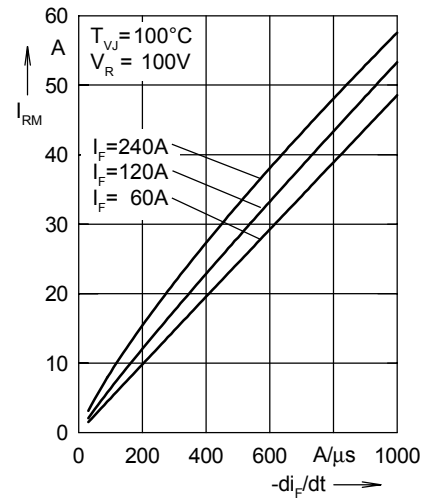


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

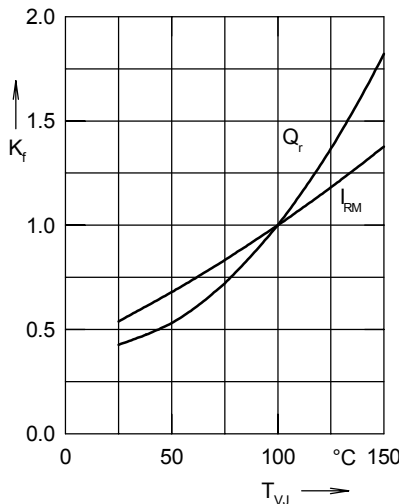


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

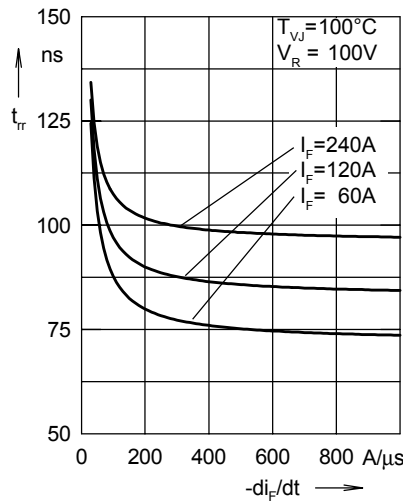


Fig. 5 Typ. recovery time t_{tr} versus $-di_F/dt$

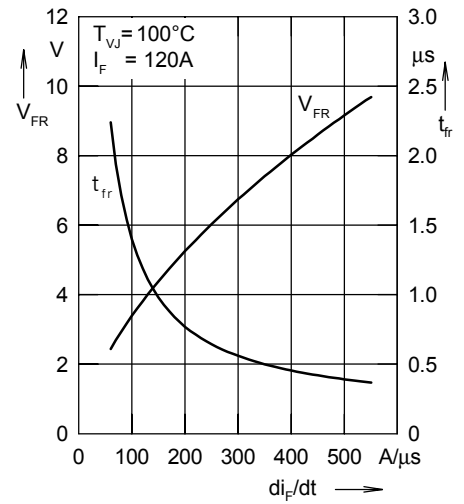


Fig. 6 Typ. peak forward voltage V_{FR} and t_{tr} versus di_F/dt

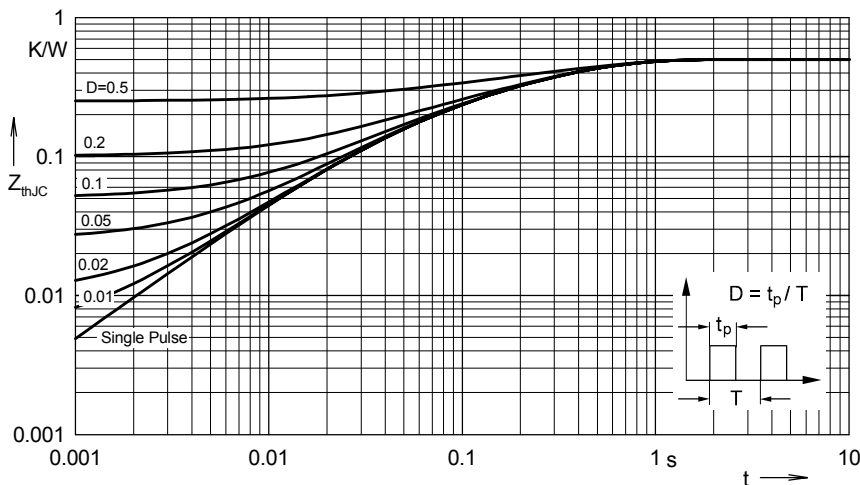


Fig. 7 Transient thermal impedance junction to case at various duty cycles

Package style and outline

Dimensions in mm (1mm = 0.0394")

