

Fast Recovery Epitaxial Diode (FRED)

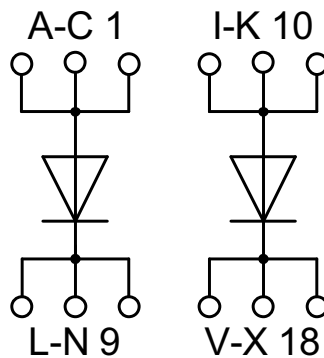
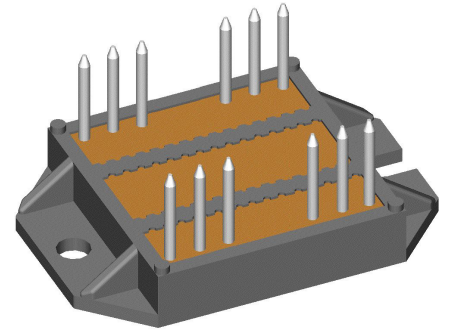
$$I_{FAVM} = 2 \times 96 \text{ A}$$

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

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

Part number

DSEI 2x 101-06P



Features / Advantages:

- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Leads suitable for PC board soldering
- Very short recovery time
- Soft recovery behaviour
- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling capability
- Low noise switching
- Small and light weight

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

Package: ECO-PAC2

- Isolation voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 9 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

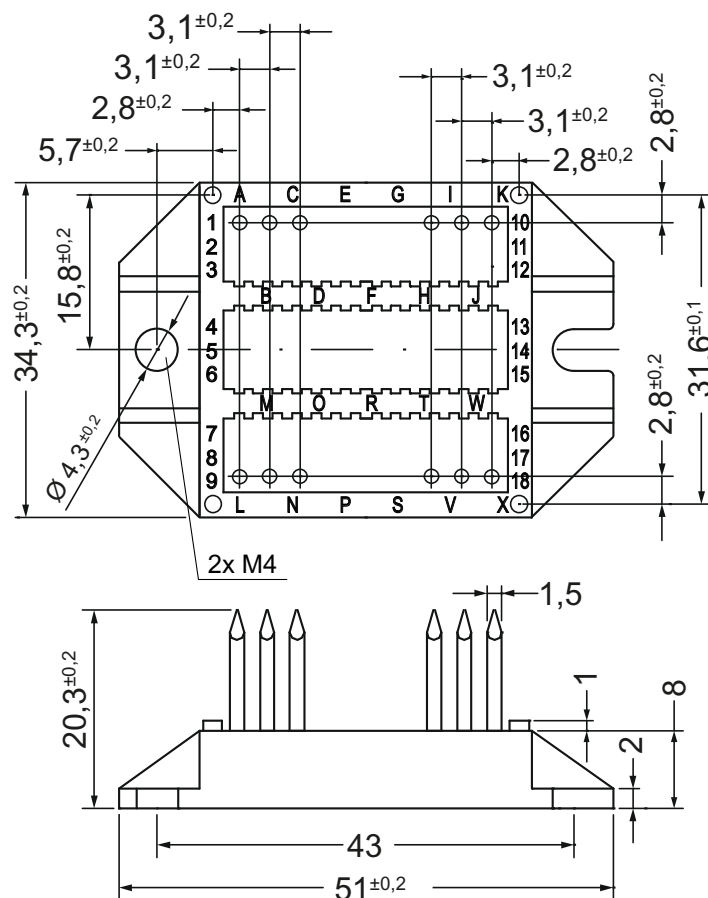
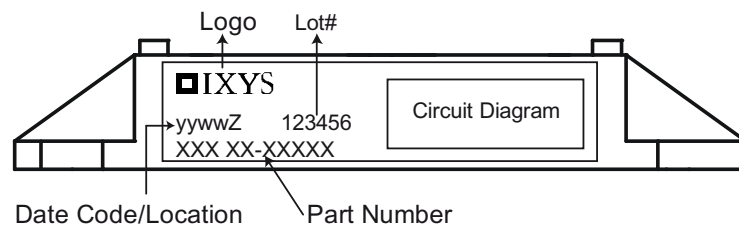
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Diode				Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	
I_{FRMS}	RMS forward current	$T_{VJ} = T_{VJM}$				150	A
I_{FAVM} ①	max. average forward current	rectangular, d = 0.5 $T_C = 70^{\circ}\text{C}$				96	A
I_{FRM}	max. repetitive forward current	$t_p < 10 \mu\text{s}$ rep. rating, pulse width limited by T_{VJM}				tbd	A
I_{FSM}	max. surge forward current	t = 10 ms (50 Hz), sine $T_{VJ} = 45^{\circ}\text{C}$				1200	A
P_{tot}	total power dissipation	$T_{VJ} = 25^{\circ}\text{C}$				250	W
I_R	reverse current	$V_R = V_{RRM}$ $V_R = 0.8 \cdot V_{RRM}$ $V_R = 0.8 \cdot V_{RRM}$ $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$				3 1 20	mA mA mA
V_F	forward voltage	$I_F = 100 \text{ A}$ $T_{VJ} = 150^{\circ}\text{C}$ $T_{VJ} = 25^{\circ}\text{C}$				1.17 1.25	V V
V_{TO} r_T	threshold voltage slope resistance	for power-loss calculations only $T_{VJ} = T_{VJM}$				0.7 4.7	V mΩ
R_{thJC} R_{thCH}	thermal resistance junction to case thermal resistance junction to heatsink				0.05	0.5	K/W K/W
t_{rr}	reverse recovery time	$I_F = 1 \text{ A}$; $-di/dt = 400 \text{ A}/\mu\text{s}$; $V_R = 30 \text{ V}$ $T_{VJ} = 25^{\circ}\text{C}$			40	60	ns
I_{RM}	max. reverse recovery current	$I_F = 80 \text{ A}$; $-di_F/dt = 200 \text{ A}/\mu\text{s}$ $V_R = 100 \text{ V}$; $L \leq 0.05 \mu\text{H}$ $T_{VJ} = 100^{\circ}\text{C}$			19	24	A

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

Package	ECO-PAC2			Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	
I_{RMS}	<i>RMS current</i>	per terminal				100	A
T_{VJ}	<i>virtual junction temperature</i>			-40		150	°C
T_{op}	<i>operation temperature</i>			-40		125	°C
T_{stg}	<i>storage temperature</i>			-40		125	°C
Weight					24		g
M_D	<i>mounting torque</i>			1.4		2.0	Nm
$d_{Spp/App}$	<i>creepage distance on surface</i>	terminal to terminal		6.0			mm
$d_{Spb/Appb}$	<i>striking distance through air</i>	terminal to backside		10.0			mm
V_{ISOL}	<i>isolation voltage</i>	t = 1 second t = 1 minute	50/60 Hz, RMS; $I_{ISOL} \leq 1\text{ mA}$	3000 2500			V V



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3 - 4

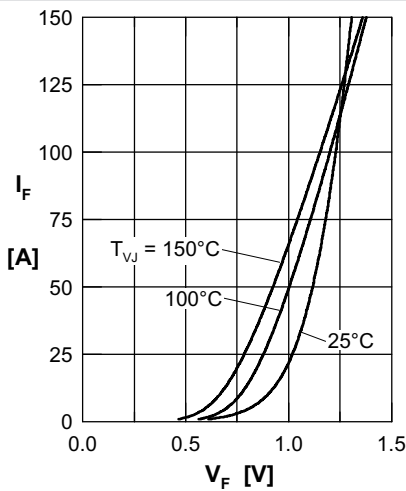
Curves


Fig. 1 Forward current I_F versus V_F

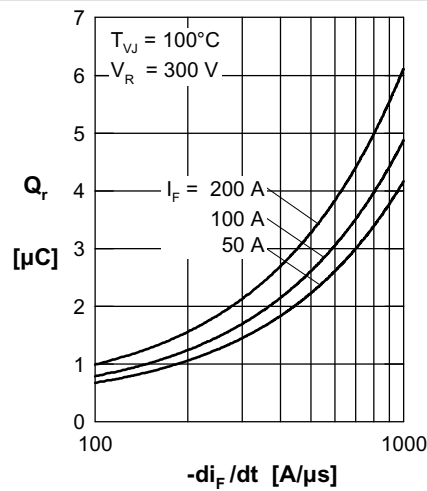


Fig. 2 Typ. reverse recov. charge Q_{rr} versus $-di_F/dt$

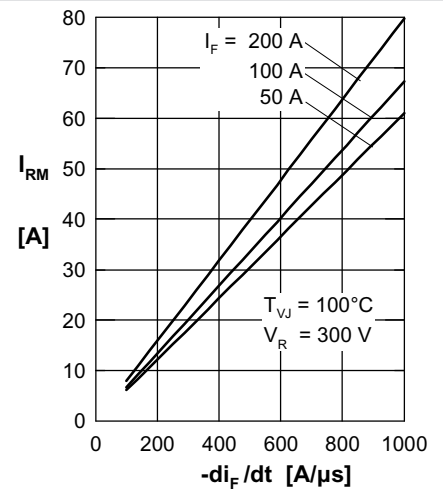


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

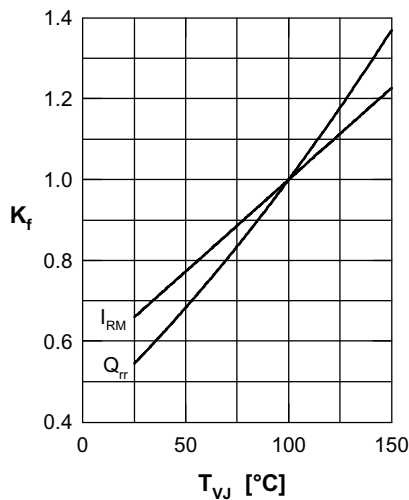


Fig. 4 Typ. dyn. parameters Q_{rr} , I_{RM} versus T_{VJ}

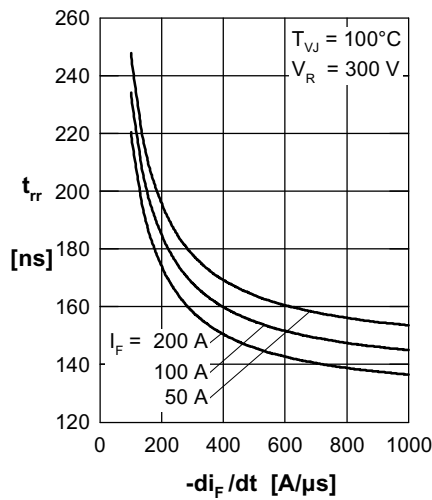


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

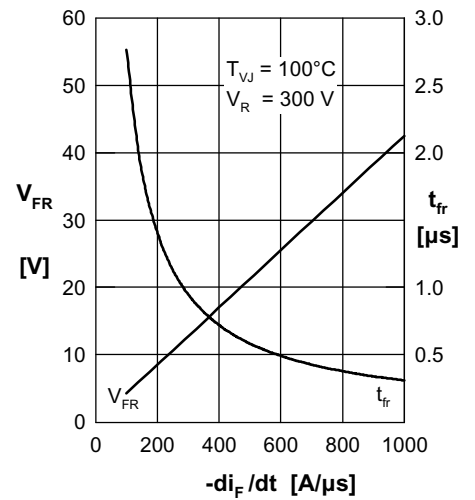


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

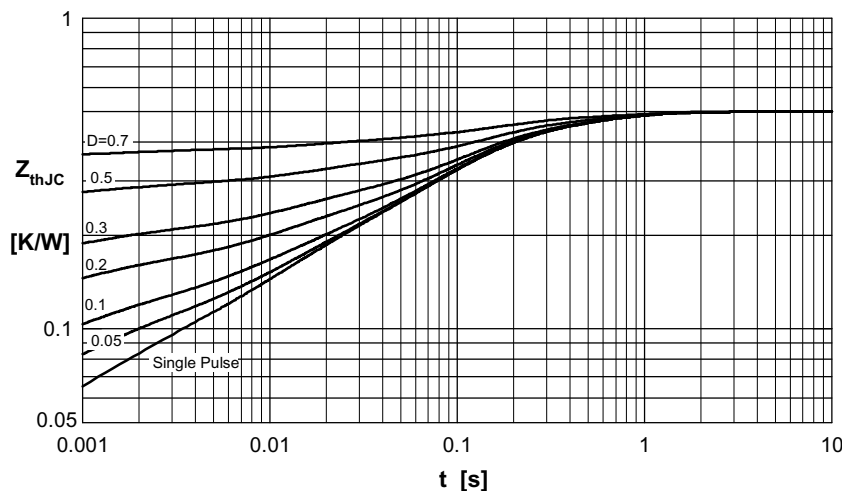


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} [K/W]	t_i [s]
1	0.020	0.00002
2	0.050	0.00081
3	0.076	0.01000
4	0.240	0.09400
5	0.114	0.45000