

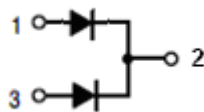
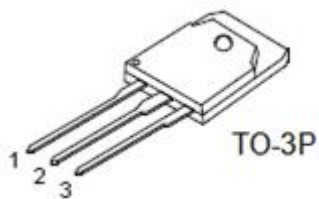
1. Description

FRED from KIA utilizes advanced processing techniques to achieve ultrafast recovery times and higher forward current. Its soft recovery characteristics and high reliability suit for wide industrial applications.

2. Features

- n Ultrafast recovery time
- n Low forward voltage
- n Low leakage current
- n Low recovery voltage
- n Soft recovery characteristics
- n High surge current capability

3. Pin configuration



Pin (TO-3P)	Function
1	Anode
2	Cathode
3	Anode

4. Maximum ratings

Parameter	Symbol	Rating	Units
Peak repetitive reverse voltage DC blocking voltage	V_{RRM} V_R	300	V
Average forward current	$I_{F(AV)}$	$T_C = 110^\circ\text{C}$, Per diode	30
		$T_C = 110^\circ\text{C}$, Per package	60
RMS forward current Per diode, $T_C = 110^\circ\text{C}$	I_F	42	A
Non-repetitive surge forward current $T_J=45^\circ\text{C}$, $t=10\text{ms}$, 50Hz, sine	I_{FSM}	480	A
Power dissipation	P_D	156	W
Operating junction temperature and storage temperature range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Maximum thermal resistance, junction-to-case	$R_{\theta JC}$	0.8	$^\circ\text{C/W}$

6. Electrical characteristics

Parameter	Symbol	Conditions	Rating			Unit
			Min	Typ	Max	
Maximum Instantaneous Forward Voltage	V_F	$I_F=30\text{A}$	-	1.25	1.8	V
		$I_F=30\text{A}$, $T_J=125^\circ\text{C}$	-	1.12	-	
Maximum Instantaneous Reverse Current	I_R	$V_R=300\text{V}$	-	-	10	μA
		$V_R=300\text{V}$ $T_J=125^\circ\text{C}$	-	-	10	mA
Reverse Recovery Time	t_{rr}	$I_F=1\text{A}$, $V_R=30\text{V}$, $di_F/dt=-200\text{A}/\mu\text{s}$	-	22	-	ns
Reverse Recovery Time	t_{rr}	$V_R=150\text{V}$, $I_F=30\text{A}$, $di_F/dt=-200\text{A}/\mu\text{s}$, $T_J=25^\circ\text{C}$	-	35	-	ns
Max Reverse Recovery Current	I_{RRM}		-	2.5	-	A
Reverse Recovery Time	t_{rr}	$V_R=150\text{V}$, $I_F=30\text{A}$, $di_F/dt=-200\text{A}/\mu\text{s}$, $T_J=125^\circ\text{C}$	-	70	-	ns
Max Reverse Recovery Current	I_{RRM}		-	6.8	-	A

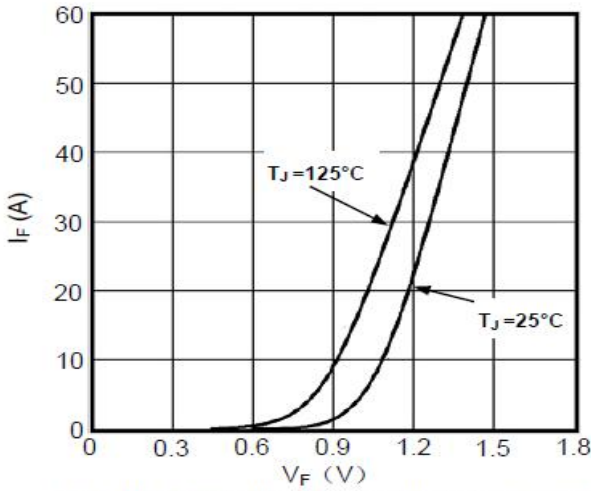


Fig1. Forward Voltage Drop vs Forward Current

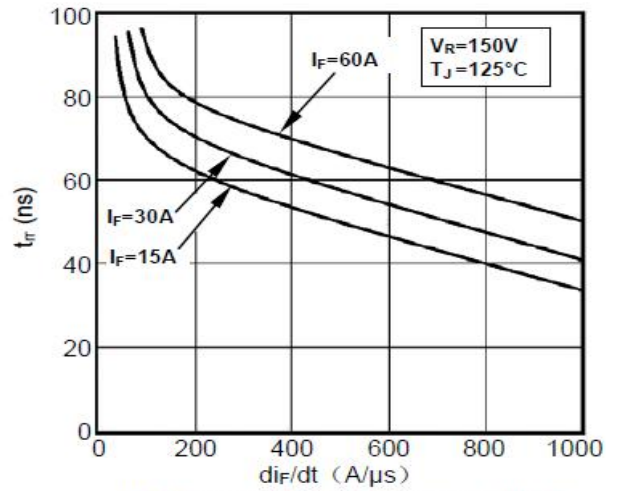


Fig2. Reverse Recovery Time vs di_F/dt

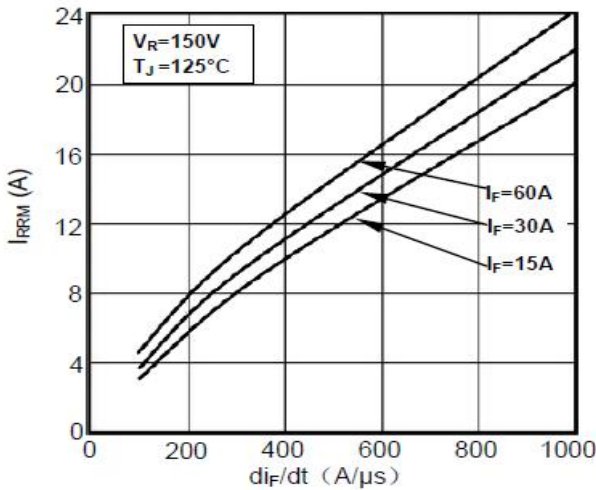


Fig3. Reverse Recovery Current vs di_F/dt

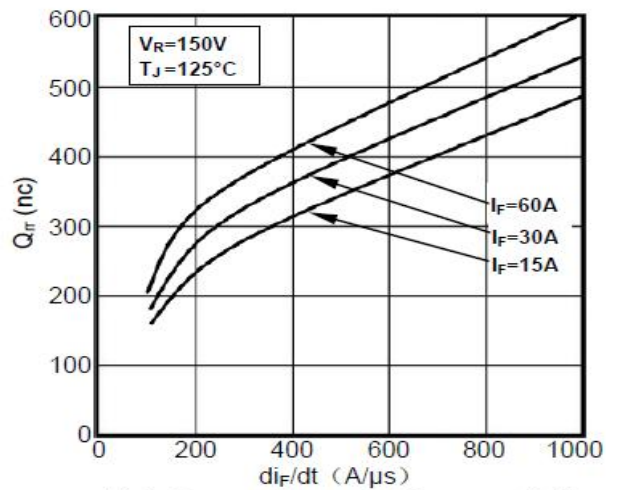


Fig4. Reverse Recovery Charge vs di_F/dt

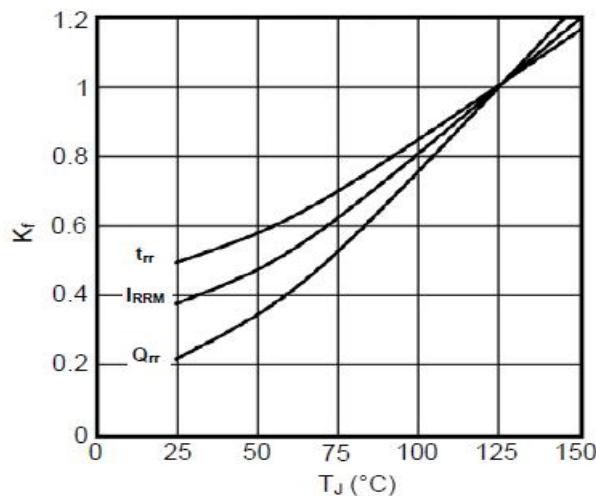


Fig5. Dynamic Parameters vs Junction Temperature

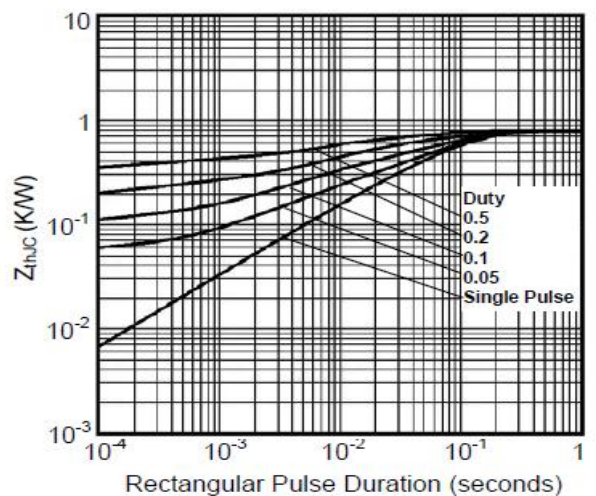


Fig6. Transient Thermal Impedance