F45D60U

Ultra-Fast Soft Recovery Diode Module

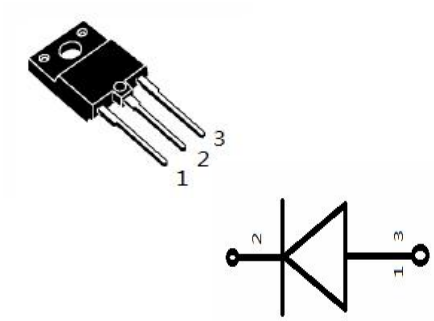
DESCRIPTION

FRED from EST 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.

Equivalent Circuit and Package

Equivalent Circuit

Package : TO-3PF



PRODUCT FEATURES

- Ultrafast Recovery Time
- Low Recovery Loss
- Soft Reverse Recovery Characteristics
- Low Leakage Current
- Low Forward Voltage
- High Surge Current Capability

APPLICATIONS

- Freewheeling, Snubber, Clamp
- Inversion Welder
- PFC
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Converter & Chopper
- UPS

ABSOLUTE MAXIMUM RATINGS (*T C =25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Values	Unit
V_R	Maximum D.C. Reverse Voltage		620	V
V_{RRM}	Maximum Repetitive Reverse Voltage			
$I_{F(AV)}$	Average Forward Current	T_C=100℃	45	A
$I_{F(RMS)}$	RMS Forward Current	T_C=100℃	50	
I_{FSM}	Non Repetitive Surge Forward Current	T_J=25℃,t=10ms, 50Hz, Sine	300	
P_D	Power Dissipation		160	W
T_J	Junction Temperature		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +125	℃
Torque	To Heat Sink	Recommended（M3）	1.1	Nm
R_{thJC}	Junction to Case Thermal Resistance		0.8	℃ /W
Weight			6	g

ELECTRICAL CHARACTERISTICS *(T_C =25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
I_{RM}	Maximum Reverse Leakage Current	V_R =620V			10	μA
		V_R =620V, T_J = 125℃			1	mA
V_F	Forward Voltage	I_F=30A		2	2.2	V
		I_F=30A,T_J=125℃		1.7		
trr	Reverse Recovery Time	(I_F = 1A, dI_F/dt = -200A/μs, V_R = 30V)		30	35	ns
trr	Reverse Recovery Time	(I_F = 0.5A, I_R=1A, I_{RR} = 0.25A)		35	45	ns

ELECTRICAL CHARACTERISTICS *(T_C =25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
trr	Reverse Recovery Time	I_F =30A,V_R =300V, dI_F/dt = -200A/μs		35		ns
I_{RRM}	Maximum Reverse Recovery Current			3		A
Q_{RR}	Reverse Recovery Charge			128		nC
trr	Reverse Recovery Time	I_F =30A,V_R =300V, dI_F/dt = -200A/μs ,T_J=125℃		125		ns
I_{RRM}	Maximum Reverse Recovery Current			6		A
Q_{RR}	Reverse Recovery Charge			475		nC

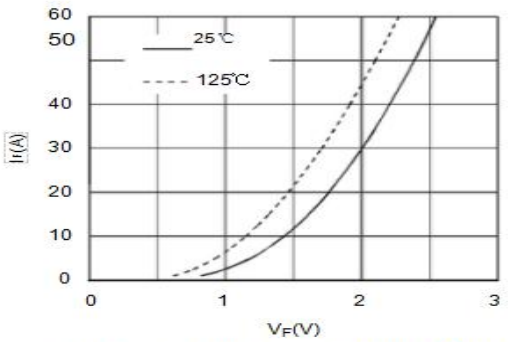


Figure 1. Forward Voltage Drop vs Forward Current

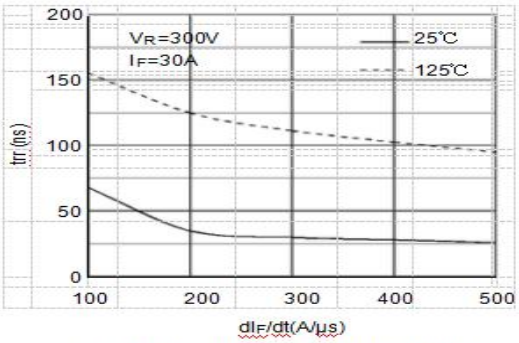


Figure 2. Reverse Recovery Time vs dI_F/dt

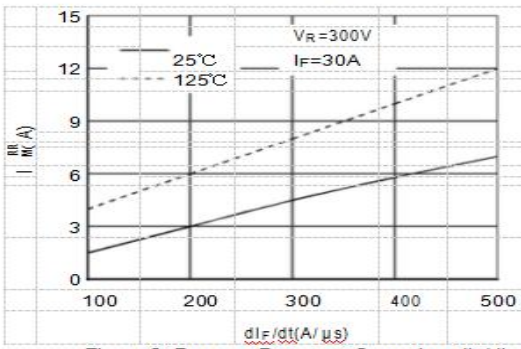


Figure 3. Reverse Recovery Current vs dI_F/dt

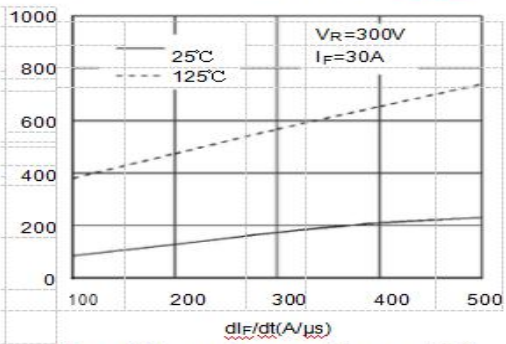


Figure 4. Reverse Recovery Charge vs dI_F/dt

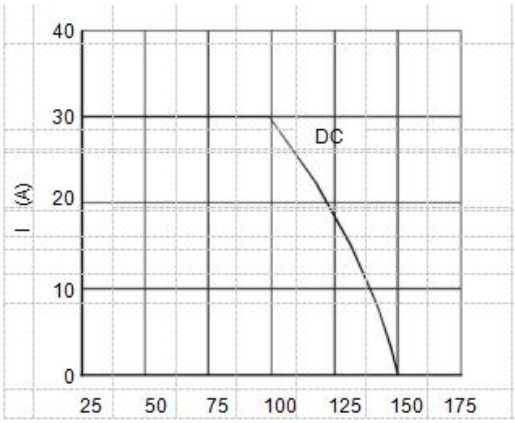


Figure 5.Forward current vs Case temperature

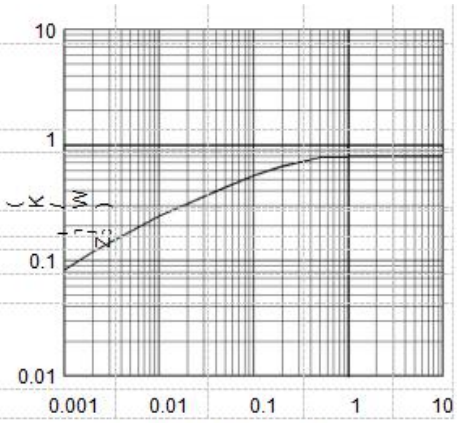


Figure 6.Transient Thermal Impedance

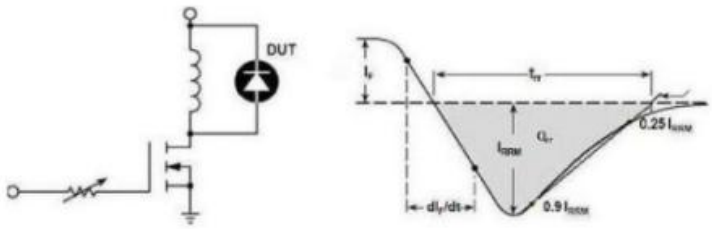


Figure 7. Diode Reverse Recovery Test Circuit and Waveform