

# STARPOWER

SEMICONDUCTOR™

**FRED**

## FD150HFE170C2S

Molding Type Module

1700V/150A 2 in one-package

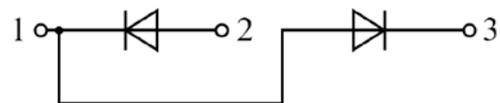
### General Description

STARPOWER Diode Power Module provides low forward voltage as well as low reverse recovery loss. They are designed for the applications such as SMPS.



### Features

- Fast soft diode
- Low forward voltage drop
- Small temperature coefficient
- Low reverse recovery losses
- High ruggedness
- Low inductance
- Isolated copper baseplate using DBC technology



Equivalent Circuit Schematic

### Typical Applications

- SMPS
- PFC
- Electric welders
- DC choppers

**Absolute Maximum Ratings**  $T_C=25^\circ\text{C}$  unless otherwise noted

Symbol	Description	FD150HFE170C2S	Units
$V_{RRM}$	Repetitive Peak Reverse Voltage	1700	V
$I_F$	Continuous Forward Current @ $T_C=80^\circ\text{C}$	150	A
$I_{FRM}$	Repetitive Peak Forward Current	300	A
$I_{FSM}$	Surge Forward Current $t_p=10\text{ms}$	860	A
$T_j$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-40 to +125	$^\circ\text{C}$
$V_{ISO}$	Isolation Voltage RMS, $f=50\text{Hz}$ , $t=1\text{min}$	3400	V
Mounting	Power Terminal Screw:M6	2.5 to 5.0	N.m
Torque	Mounting Screw:M6	3.0 to 5.0	N.m

**Notes:**

(1) Repetitive rating: Pulse width limited by max. junction temperature

**Electrical Characteristics of DIODE**  $T_C=25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_F$	Diode Forward Voltage	$I_F=150\text{A}$	$T_j=25^\circ\text{C}$	1.80	2.20	V
			$T_j=125^\circ\text{C}$	1.90		
$I_R$	Diode Reverse Current	$V_R=V_{RRM}$	$T_j=125^\circ\text{C}$		5.0	mA
$Q_r$	Diode Reverse Recovery Charge		$T_j=25^\circ\text{C}$	39.0		$\mu\text{C}$
			$T_j=125^\circ\text{C}$	65.5		
$I_{RM}$	Diode Peak Reverse Recovery Current	$I_F=150\text{A}$ , $V_R=900\text{V}$ , $di/dt=-2150\text{A}/\mu\text{s}$ ,	$T_j=25^\circ\text{C}$	175		A
			$T_j=125^\circ\text{C}$	190		
$E_{rec}$	Reverse Recovery Energy		$T_j=25^\circ\text{C}$	20		mJ
			$T_j=125^\circ\text{C}$	36		
$L_{CE}$	Stray Inductance				20	nH
$R_{CC'+EE'}$	Module Lead Resistance, Terminal To Chip	$T_C=25^\circ\text{C}$		0.35		$\text{m}\Omega$

**Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case (per DIODE Part)		0.22	K/W
$R_{\theta JC}$	Case-to-Sink (Conductive grease applied)	0.035		K/W
Weight	Weight of Module	300		g

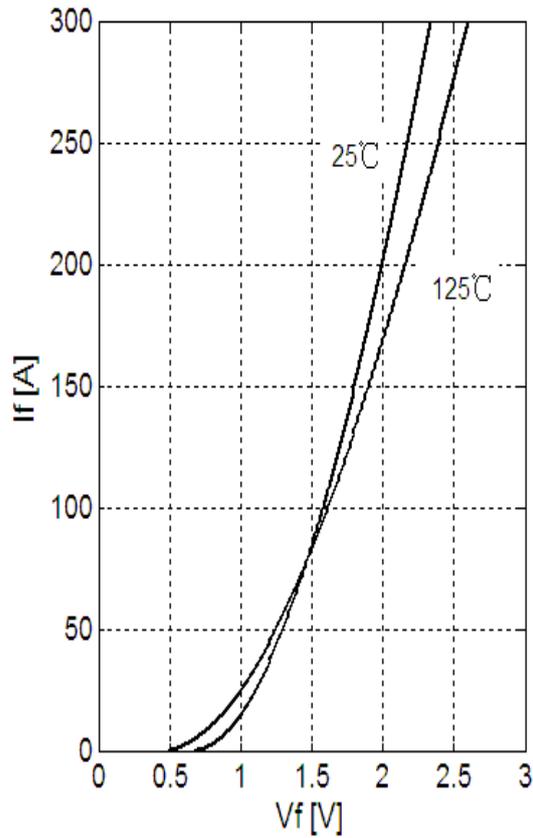


Fig 1. Diode Forward Characteristics

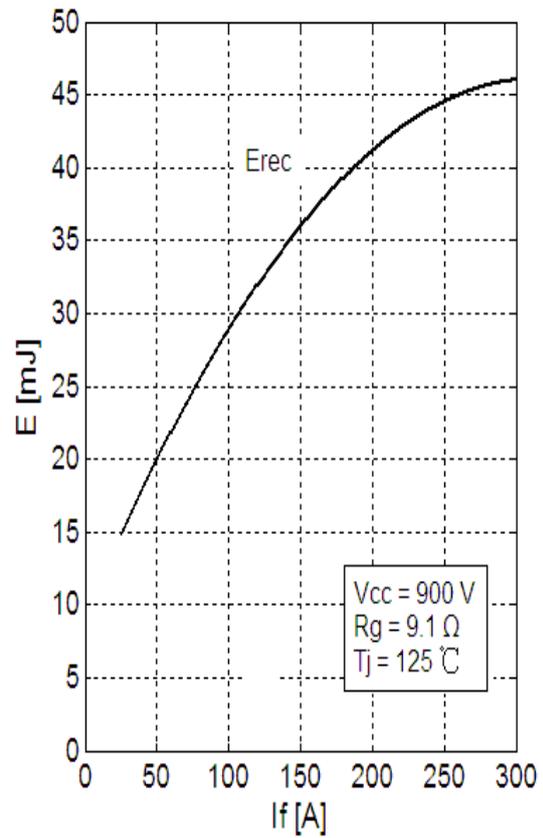


Fig 2. Diode Switching Loss vs.  $I_f$

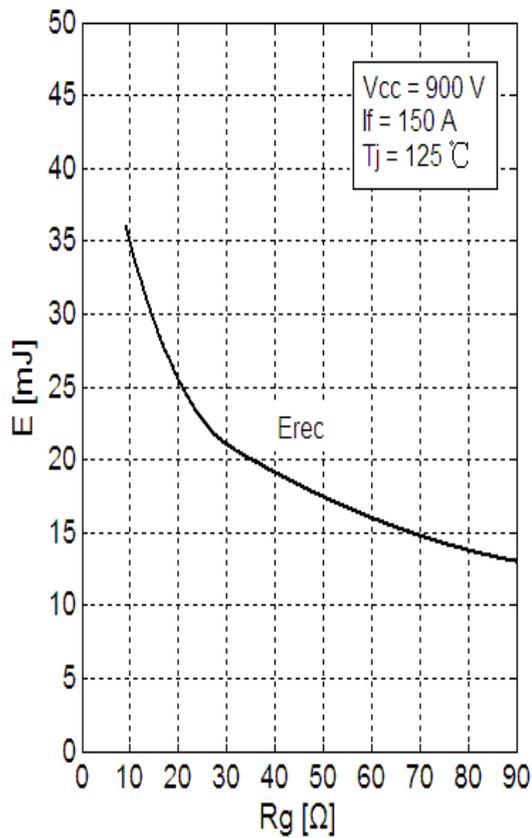


Fig 9. Diode Switching Loss vs.  $R_g$

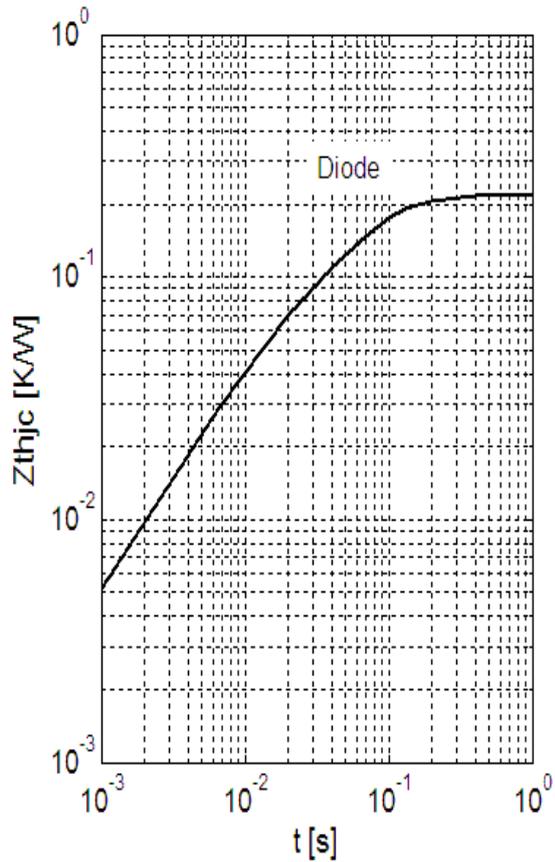
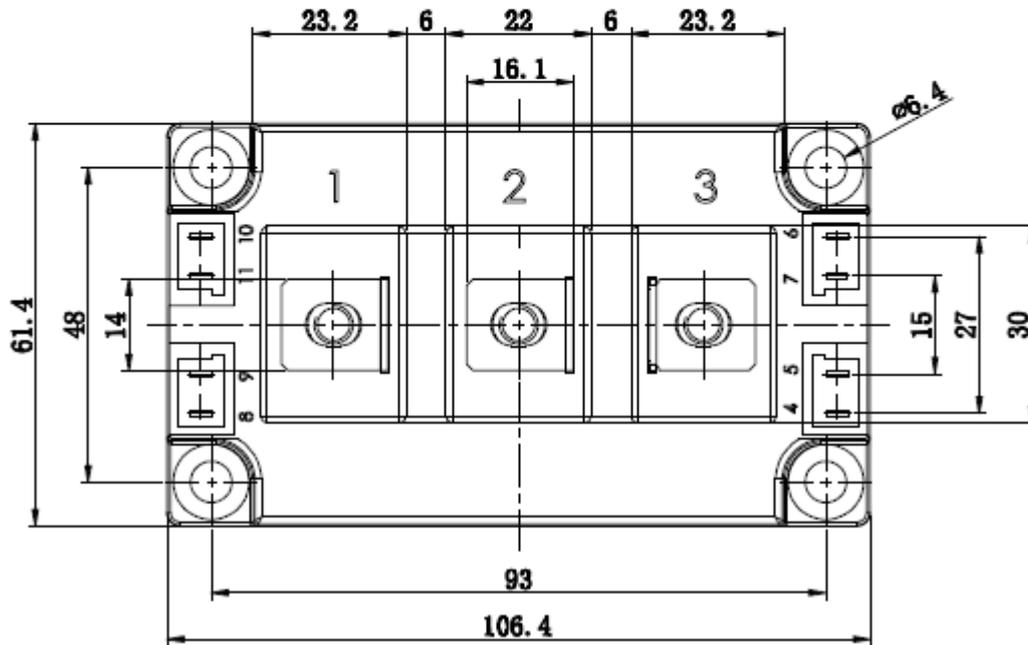
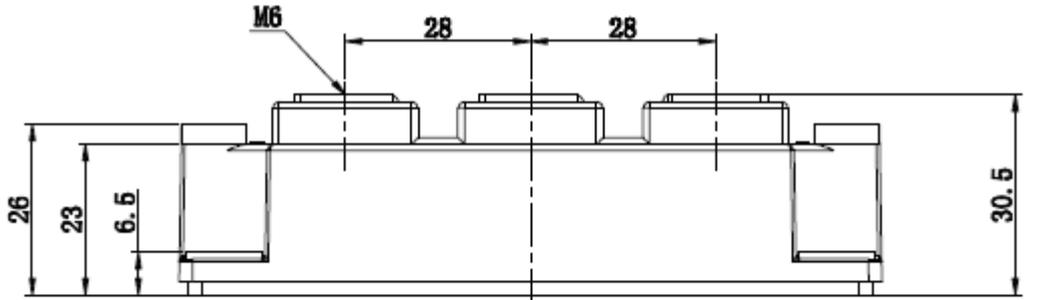


Fig 10. Diode Transient Thermal Impedance

### Package Dimension

Dimensions in Millimeters



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