

STARPOWER

SEMICONDUCTOR™

FRED

FD400HFS120C2S

Molding Type Module

1200V/400A 2 in one-package

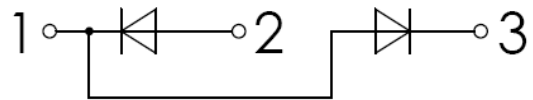


General Description

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	FD400HFS120C2S	Units
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Continuous Forward Current @ $T_C=80^{\circ}\text{C}$	400	A
I_{FRM}	Repetitive Peak Forward Current	800	A
I_{FSM}	Surge Forward Current $T_j=45^{\circ}\text{C}, V_R=0\text{V}$	3200	A
T_j	Maximum Junction Temperature	150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-40 to +125	$^{\circ}\text{C}$
I^2t -value, Diode	$V_R=0\text{V}, t=10\text{ms}, T_j=125^{\circ}\text{C}$	27500	A^2s
V_{ISO}	Isolation Voltage RMS, $f=50\text{Hz}, t=1\text{min}$	2500	V
Mounting Torque	Power Terminal Screw:M5	2.5 to 5.0	N.m
	Mounting Screw:M6	3.0 to 5.0	N.m

Notes:

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

Characteristics Values

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	$I_F=400\text{A}, V_{GE}=0\text{V}$	$T_j=25^{\circ}\text{C}$	1.95	2.20	V
			$T_j=125^{\circ}\text{C}$		1.85	
I_R	Diode Reverse Current	$V_R=V_{RRM}$			4.0	mA
Q_r	Recovered Charge	$I_F=400\text{A}, V_R=600\text{V}, di/dt=-4290\text{A}/\mu\text{s}$	$T_j=25^{\circ}\text{C}$	18.1		nC
			$T_j=125^{\circ}\text{C}$	44.9		
I_{RM}	Peak Reverse Recovery Current	$I_F=400\text{A}, V_R=600\text{V}, di/dt=-4290\text{A}/\mu\text{s}$	$T_j=25^{\circ}\text{C}$	260		A
			$T_j=125^{\circ}\text{C}$	405		
E_{rec}	Reverse Recovery Energy	$I_F=400\text{A}, V_R=600\text{V}, di/dt=-4290\text{A}/\mu\text{s}$	$T_j=25^{\circ}\text{C}$	9.0		mJ
			$T_j=125^{\circ}\text{C}$	23.6		
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 (DIODE Part, per 1/2 Module)		0.10	K/W
$R_{\theta CS}$	Case-to-Sink (conductive grease applied, per Module)	0.038		K/W
Weight	Weight of Module	300		g

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