

STARPOWER

SEMICONDUCTOR

FRED

FD400SGE170C2S

Molding Type Module

1700V/400A 1 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

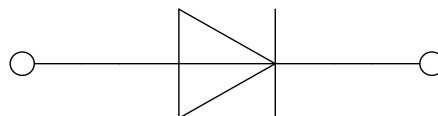
- Fast soft diode
- Low forward voltage drop
- Small temperature coefficient
- Low reverse recovery losses
- High ruggedness
- Low inductance
- Isolated copper baseplate using DBC technology



Typical Applications

- SMPS
- PFC
- Electric welders
- DC choppers

Equivalent Circuit Schematic



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

Symbol	Description	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	1700	V
I_F	Continuous Forward Current	400	A
I_{FRM}	Repetitive Peak Forward Current	800	A
P_D	Maximum Power Dissipation @ $T_j=175^{\circ}\text{C}$	1456	W
T_{jmax}	Maximum Junction Temperature	175	$^{\circ}\text{C}$
T_{jop}	Operating Junction Temperature	-40 to +150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-40 to +125	$^{\circ}\text{C}$
V_{ISO}	Isolation Voltage RMS, $f=50\text{Hz}, t=1\text{min}$	4000	V

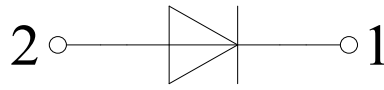
Electrical Characteristics of Diode $T_C=25^{\circ}\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Diode Forward Voltage	$I_F=400\text{A}, T_j=25^{\circ}\text{C}$		1.80	2.25	V
		$I_F=400\text{A}, T_j=125^{\circ}\text{C}$		1.90		
		$I_F=400\text{A}, T_j=150^{\circ}\text{C}$		1.95		
Q_r	Recovered Charge	$I_F=400\text{A}, V_R=900\text{V}$ $-di/dt=2900\text{A}/\mu\text{s}$ $T_j=25^{\circ}\text{C}$		101		μC
I_{RM}	Peak Reverse Recovery Current			488		A
E_{rec}	Reverse Recovery Energy			71.1		mJ
Q_r	Recovered Charge	$I_F=400\text{A}, V_R=900\text{V}$ $-di/dt=2900\text{A}/\mu\text{s}$ $T_j=125^{\circ}\text{C}$		150		μC
I_{RM}	Peak Reverse Recovery Current			562		A
E_{rec}	Reverse Recovery Energy			106		mJ
Q_r	Recovered Charge	$I_F=400\text{A}, V_R=900\text{V}$ $-di/dt=2900\text{A}/\mu\text{s}$ $T_j=150^{\circ}\text{C}$		160		μC
I_{RM}	Peak Reverse Recovery Current			575		A
E_{rec}	Reverse Recovery Energy			112		mJ

Thermal Characteristics

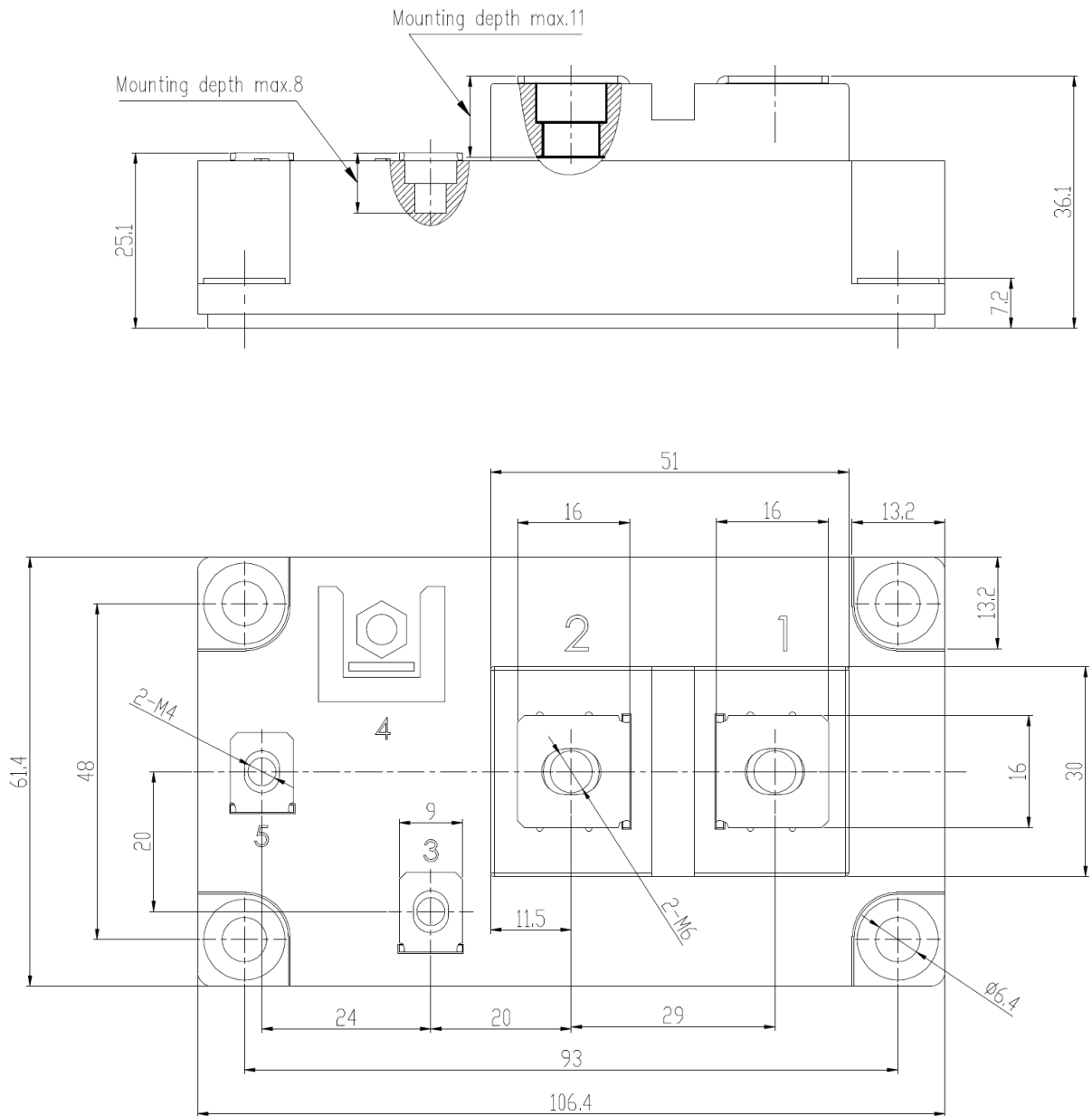
Symbol	Parameter	Min.	Typ.	Max.	Unit
L_{CE}	Stray Inductance			20	nH
$R_{CC'+EE'}$	Module Lead Resistance, Terminal to Chip		0.18		m Ω
R_{thJC}	Junction-to-Case (per Diode)			0.103	K/W
R_{thCH}	Case-to-Heatsink (per Module)		0.035		K/W
M	Terminal Connection Torque, Screw M6	2.5		5.0	N.m
	Mounting Torque, Screw M6	3.0		5.0	
G	Weight of Module		300		g

Equivalent Circuit Schematic



Package Dimensions

Dimensions in Millimeters



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