

# STARPOWER

SEMICONDUCTOR

**FRED**

## FD300DGS60D6S

**600V/300A 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

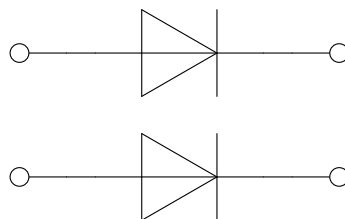
- Fast soft diode
- Low forward voltage drop
- Small temperature coefficient
- Low reverse recovery loss
- High ruggedness
- Low inductance
- Isolated copper baseplate using DBC technology



### Typical Applications

- SMPS
- PFC
- Welding machine

### Equivalent Circuit Schematic



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

Symbol	Description	Value	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage	600	V
$V_{RSM}$	Non-repetitive Peak Reverse Voltage	650	V
$I_F$	Diode Continuous Forward Current	300	A
$I_{FSM}$	Surge Forward Current $V_R=0\text{V}, t_p=10\text{ms}, T_j=150^{\circ}\text{C}$	3000	A
$I^2t$	$I^2t$ -value $V_R=0\text{V}, t_p=10\text{ms}, T_j=150^{\circ}\text{C}$	45000	$\text{A}^2\text{s}$
$P_D$	Maximum Power Dissipation @ $T_j=175^{\circ}\text{C}$	534	W

**Module**

Symbol	Description	Value	Unit
$T_{jmax}$	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, $f=50\text{Hz}, t=1\text{min}$	2500	V

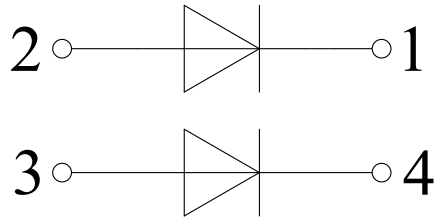
**Diode Characteristics**  $T_C=25^{\circ}\text{C}$  unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_F$	Diode Forward Voltage	$I_F=300\text{A}, T_j=25^{\circ}\text{C}$		1.55	1.95	V
		$I_F=300\text{A}, T_j=125^{\circ}\text{C}$		1.50		
		$I_F=300\text{A}, T_j=150^{\circ}\text{C}$		1.45		
$Q_r$	Recovered Charge			13.0		$\mu\text{C}$
$I_{RM}$	Peak Reverse Recovery Current	$V_R=300\text{V}, I_F=300\text{A},$ $-di/dt=6500\text{A}/\mu\text{s}, T_j=25^{\circ}\text{C}$		190		A
$E_{rec}$	Reverse Recovery Energy			3.40		mJ
$Q_r$	Recovered Charge			24.0		$\mu\text{C}$
$I_{RM}$	Peak Reverse Recovery Current	$V_R=300\text{V}, I_F=300\text{A},$ $-di/dt=6500\text{A}/\mu\text{s}, T_j=125^{\circ}\text{C}$		235		A
$E_{rec}$	Reverse Recovery Energy			6.20		mJ
$Q_r$	Recovered Charge			28.0		$\mu\text{C}$
$I_{RM}$	Peak Reverse Recovery Current	$V_R=300\text{V}, I_F=300\text{A},$ $-di/dt=6500\text{A}/\mu\text{s}, T_j=150^{\circ}\text{C}$		250		A
$E_{rec}$	Reverse Recovery Energy			7.00		mJ

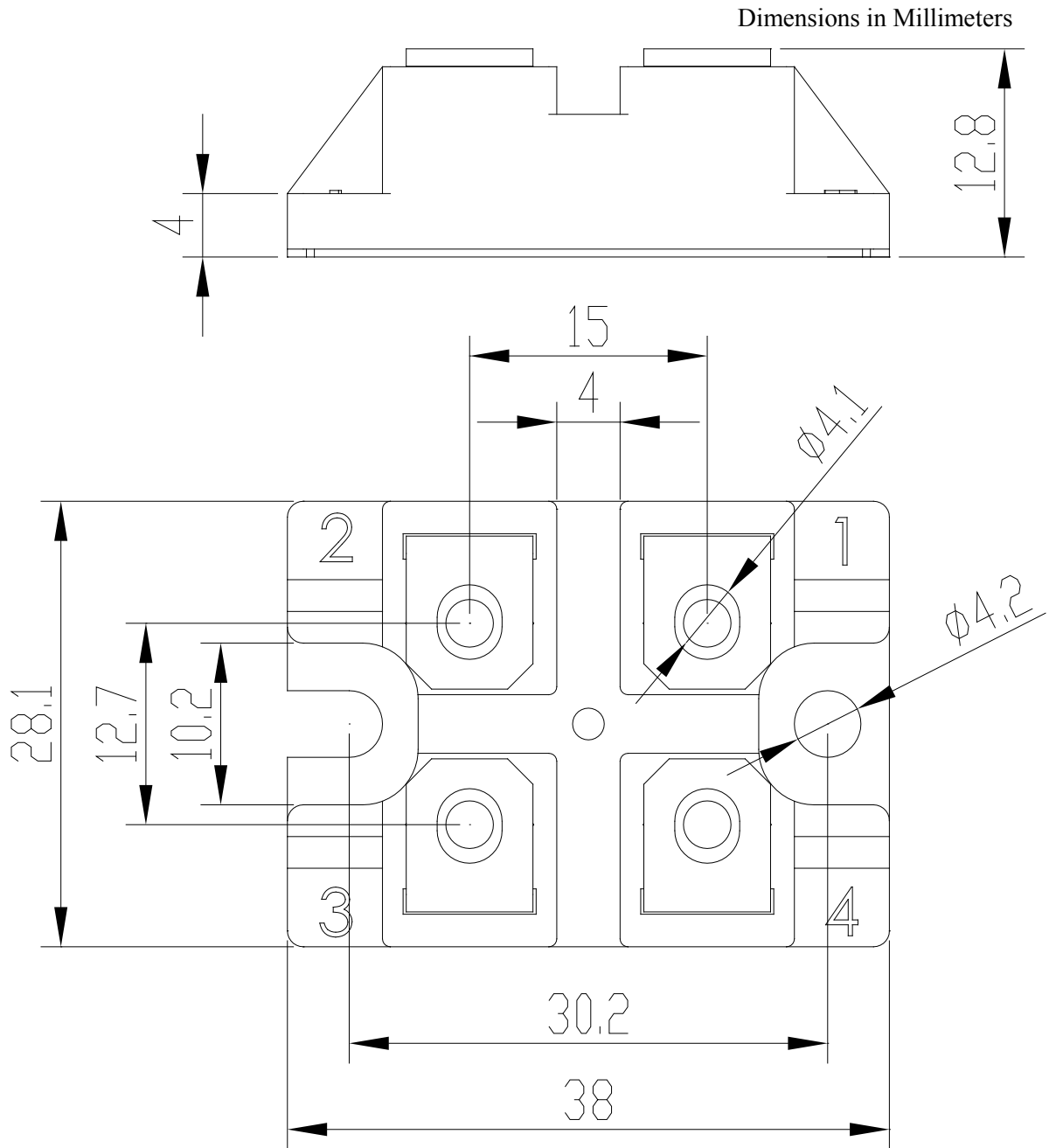
**Module Characteristics**  $T_c=25^{\circ}\text{C}$  unless otherwise noted

Symbol	Parameter	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction-to-Case			0.281	K/W
$R_{\theta CS}$	Case-to-Sink		0.15		K/W
M	Terminal Connection Torque, Screw M3	2.5		5.0	N.m
	Mounting Torque, Screw M3	2.5		5.0	
G	Weight of Module		35		g

**Circuit Schematic**



**Package Dimensions**



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