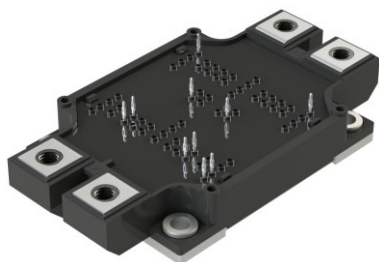


Description

The DFS300X2CU12I3R1 is a dual chopper SiC MOSFET Power Module. It integrates high performance SiC MOSFET chips designed for the applications such as Converter and Renewable energy.



Features

- 1200V/3.7mΩ
- Low thermal resistance with Si₃N₄ AMB
- 175°C maximum junction temperature
- Low Inductive Design
- Thermistor inside
- Copper base size: 79mm*62mm

Applications

- xEV Applications
- Converter
- Vehicle Fast Chargers
- Smart-Grid / Grid-Tied Distributed Generation

Circuit diagram

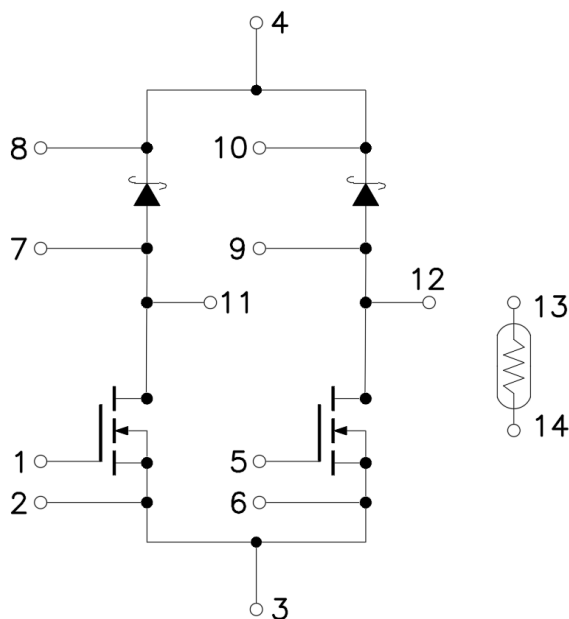


Figure 1. Out drawing & circuit diagram for DFS300X2CU12I3R1

Pin Configuration and Marking Information

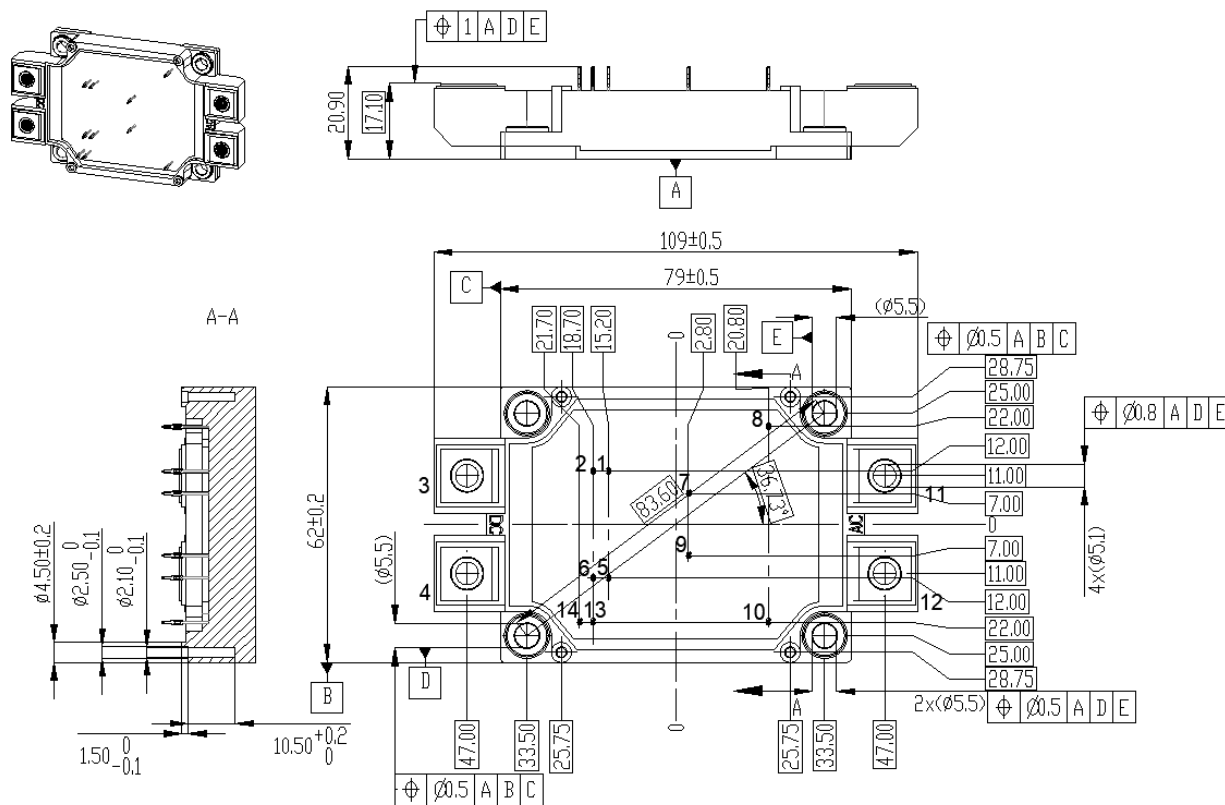


Figure 2. Pin configuration

Module

Parameter	Conditions	Value	Unit
Isolation Voltage	RMS, f = 50Hz, t = 1min	3.4	KV
Material of module baseplate	-	Cu	-
Creepage distance	terminal to heatsink terminal to terminal	14.5 10	mm
Clearance	terminal to heatsink terminal to terminal	12.5 10	mm
CTI	-	>400	-
Module lead resistance, terminals–chip	T _c = 25°C	0.3	mΩ
Mounting torque for module mounting	M5, M6	3 to 6	Nm
Weight	-	150	g

Maximum Ratings ($T_j = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Ratings	Unit
V_{DS}	Drain-Source Voltage	G-S Short	1200	V
V_{RRM}	Repetitive Reverse Voltage	Clamp Diode	1200	V
V_{GSS}	Gate-Source Voltage(+)	D-S Short	21	V
V_{GSS}	Gate-Source Voltage(-)	D-S Short	-2	V
$V_{GSSSurge}$	G-S Voltage($t_{surge} < 300\text{nsec}$)	D-S Short, Note1	-6 to 23	V
I_{DS}	DC Continuous Drain Current	$T_C = 40^\circ\text{C}$, $V_{GS} = 18\text{V}$	300	A
I_{DS}	DC Continuous Drain Current	$T_C = 100^\circ\text{C}$, $V_{GS} = 18\text{V}$	225	A
I_{DSM}	Pulse Drain Current	$T_C = 100^\circ\text{C}$, Pulse width = 1ms, $V_{GS} = 18\text{V}$, Note2	600	A
I_F	Forward Current (Diode)	$T_C = 25^\circ\text{C}$	400	A
I_F	Forward Current (Diode)	$T_C = 100^\circ\text{C}$	250	A
I_{FRM}	Pulse Forward Current(Diode)	$T_C = 100^\circ\text{C}$, Pulse width = 1ms, Note2	600	A
$P_{tot(MOS)}$	Total Power Dissipation (MOS)	$T_C = 25^\circ\text{C}$	880	W
$P_{tot(SBD)}$	Total Power Dissipation(SBD)	$T_C = 25^\circ\text{C}$	1360	W
T_{jmax}	Max Junction Temperature	-	175	$^\circ\text{C}$
T_{jop}	Operating junction temperature	-	-40 to 150	$^\circ\text{C}$
T_{stg}	Storage temperature	-	-40 to 125	$^\circ\text{C}$

Note1: Recommended Operating Value, -0V/+18V

Note2: Pulse width limited by maximum junction temperature

PTC characteristics

Symbol	Parameter	Condition	Value			Unit
			Min.	Typ.	Max.	
$T_{C_{MAX}}$	Temperature	Continuous operation	-40	-	175	$^\circ\text{C}$
R	Resistance	$T_C = 0^\circ\text{C}$	999.7	1000	1000.3	Ω
		$T_C = 150^\circ\text{C}$	1576.5	1577.5	1578.5	Ω
T_{CR}	Temperature coefficient	-	-	0.385	-	%/K
T_{SH}	Self-heating	$T_C = 0^\circ\text{C}$, $I_m = 0.1 \dots 0.3\text{mA}$	-	0.4	-	K/mW

Note3: Calculate $T = (R - R_0) / T_{CR} / 10$

Example: When $R = 1385\Omega$, Then $T = (R - R_0) / T_{CR} / 10 = (1385 - 1000) / 0.385 / 10 = 100^\circ\text{C}$

Editing record

Version	Content	Data
A	First edition	2021.12.22

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