

### Description

The DFS300CU12I4W2 is a Chopper SiC MOSFET Power Module. It integrates high performance SiC MOSFET chips designed for the applications such as Converter and Renewable energy.



### Features

- Blocking Voltage 1200V
- low on-resistance  $R_{DS(on)}$
- Low Switching Losses
- 175 °C maximum junction temperature
- Low Inductive Design
- Si<sub>3</sub>N<sub>4</sub> AMB substrate
- Thermistor inside

### Applications

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

### Circuit diagram

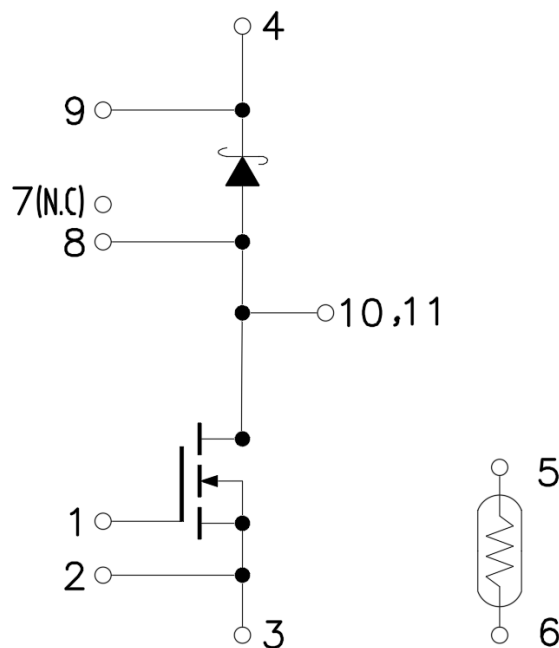


Figure 1. Out drawing & circuit diagram for DFS300CU12I4W2

### Pin Configuration and Marking Information

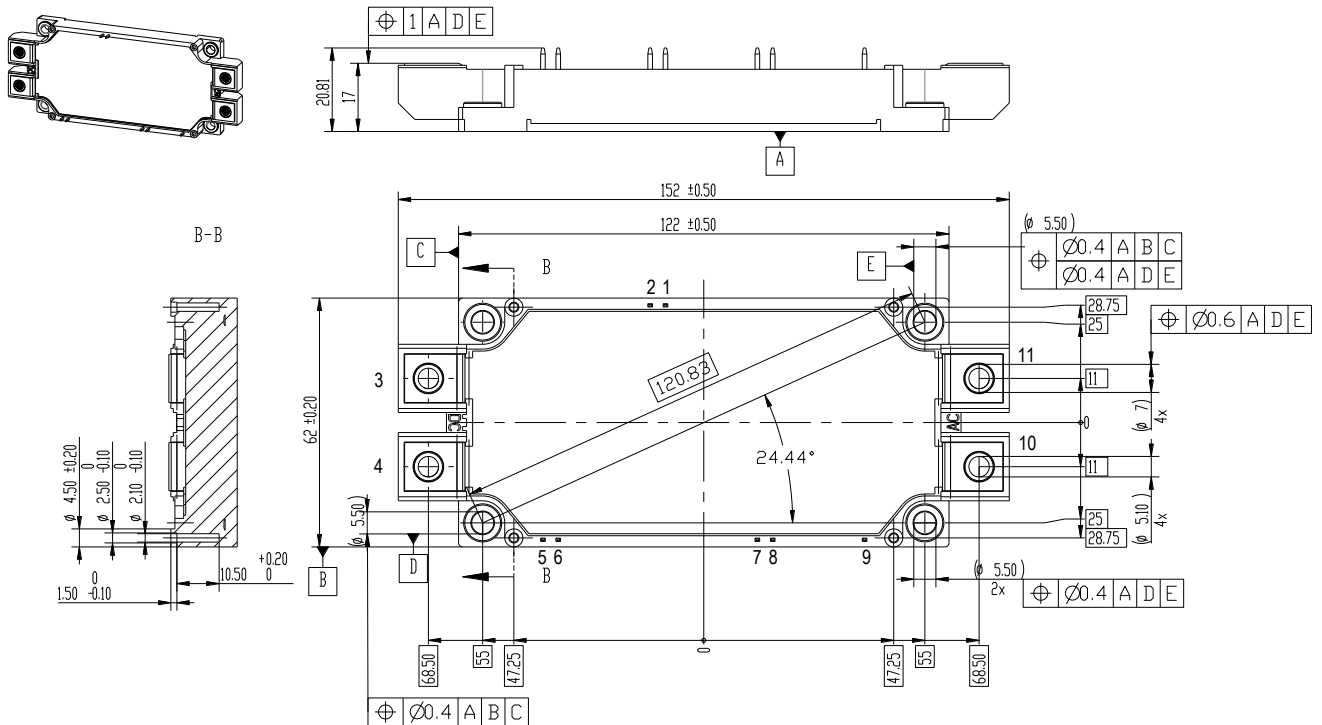


Figure 2. Pin configuration

### 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 13	mm
Clearance	terminal to heatsink terminal to terminal	12.5 10	mm
CTI	-	>400	-
Module lead resistance, terminals – chip	T <sub>c</sub> = 25°C	0.5	mΩ
Mounting torque for module mounting	M5, M6	3 to 6	Nm
Weight	-	420	g

### Maximum Ratings (T<sub>j</sub>=25°C unless otherwise specified)

Symbol	Parameter	Conditions	Ratings	Unit
V <sub>DSS</sub>	Drain-Source Voltage	G-S Short	1200	V
V <sub>RRM</sub>	Repetitive Reverse Voltage	Clamp Diode	1200	V
V <sub>GSS</sub>	Gate-Source Voltage(+)	D-S Short	19	V
V <sub>GSS</sub>	Gate-Source Voltage(-)	D-S Short	-8	V
V <sub>GSSSurge</sub>	G-S Voltage(t <sub>surge</sub> < 300nsec)	D-S Short, Note1	-8 to 19	V
I <sub>DS</sub>	DC Continuous Drain Current	T <sub>C</sub> = 25°C , V <sub>GS</sub> = 18V, Note2	310	A
I <sub>DS</sub>	DC Continuous Drain Current	T <sub>C</sub> = 100°C , V <sub>GS</sub> = 18V, Note2	220	A
I <sub>DSM</sub>	Pulse Drain Current	T <sub>C</sub> = 100°C, Pulse width = 1ms, V <sub>GS</sub> = 18V Note2, Note3	600	A
I <sub>F</sub>	Forward Current (Diode)	T <sub>C</sub> = 25°C	400	A
I <sub>F</sub>	Forward Current (Diode)	T <sub>C</sub> = 100°C	250	A
I <sub>FRM</sub>	Pulse Forward Current( Diode)	T <sub>C</sub> = 100°C, Pulse width = 1ms, Note3	600	A
P <sub>tot(MOS)</sub>	Total Power Dissipation (MOS)	T <sub>C</sub> = 25°C	1000	W
P <sub>tot(SBD)</sub>	Total Power Dissipation(SBD)	T <sub>C</sub> = 25°C	1300	W
T <sub>jmax</sub>	Max Junction temperature	-	175	°C
T <sub>jop</sub>	Operating junction temperature	-	-40 to 150	°C
T <sub>stg</sub>	Storage temperature	-	-40 to 125	°C

Note1: When using MOSFET body diode, V<sub>GSS</sub> = -4V

Note2: Recommended Operating Value, -4V/+15V

Note3: Pulse width limited by maximum junction temperature

### NTC characteristics

Symbol	Parameter	Condition	Value			Unit
			Min.	Typ.	Max.	
R <sub>25</sub>	Resistance	T <sub>C</sub> = 25°C	-	5	-	kΩ
ΔR/R	Deviation of R100	T <sub>C</sub> = 100°C, R <sub>100</sub> = 493Ω	5	-	5	%
P <sub>25</sub>	Power dissipation	T <sub>C</sub> = 25°C	-	-	20	mW
B <sub>25/50</sub>	B-value	R <sub>2</sub> = R <sub>25</sub> exp [B <sub>25/50</sub> (1/T <sub>2</sub> - 1/(298,15 K))]	-	3375	-	K
B <sub>25/80</sub>	B-value	R <sub>2</sub> = R <sub>25</sub> exp [B <sub>25/80</sub> (1/T <sub>2</sub> - 1/(298,15 K))]	-	3411	-	K
B <sub>25/100</sub>	B-value	R <sub>2</sub> = R <sub>25</sub> exp [B <sub>25/100</sub> (1/T <sub>2</sub> - 1/(298,15 K))]	-	3433	-	K

### Editing record

Version	Content	Data
A	First edition	2021.12.27

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