DFS400CU12I4W2

1200V/400A Chopper SiC MOSFET Module

Description

The DFS400CU12I4W2 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_3N_4 AMB substrate
- Thermistor inside

Applications

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

Circuit diagram

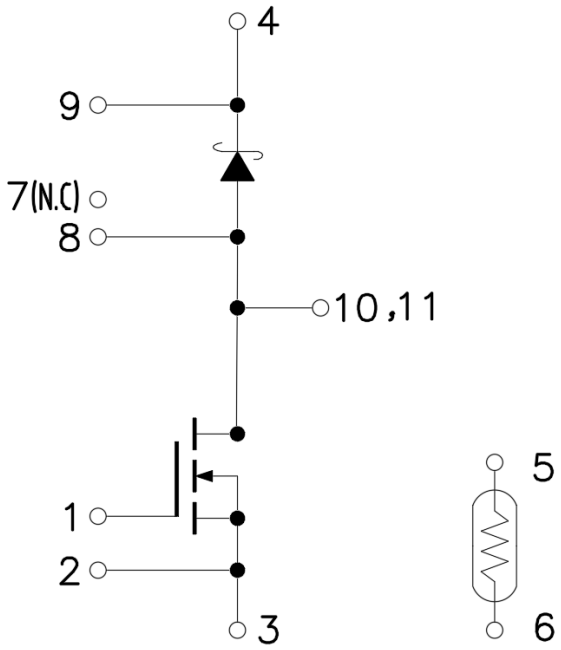

Figure 1. Out drawing & circuit diagram for DFS400CU12I4W2

Pin Configuration and Marking Information

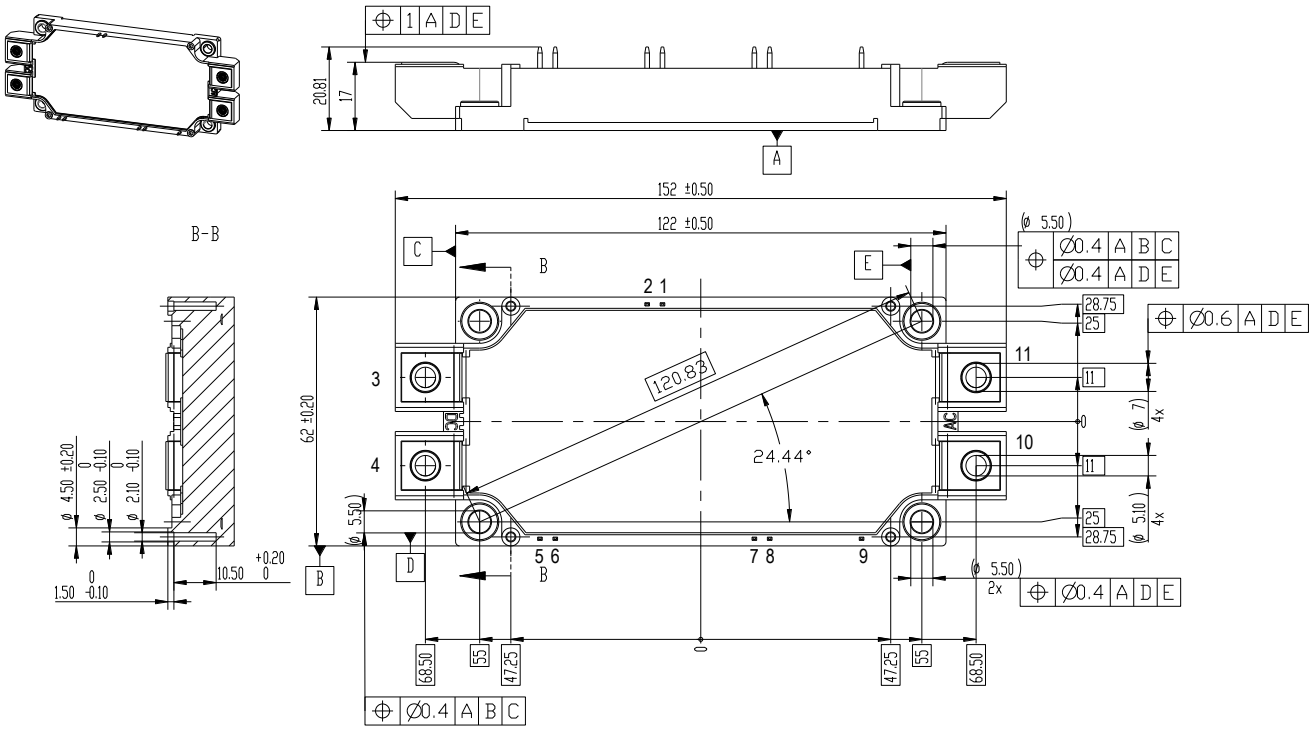

Figure 2. Pin configuration

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_C =25°C	0.5	mΩ
Mounting torque for module mounting	M5, M6	3 to 6	Nm
Weight	-	420	g

Maximum Ratings (T_j =25°C unless otherwise specified)

Symbol	Parameter	Conditions	Ratings	Unit
V_{DSS}	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	19	V
V_{GSS}	Gate-Source Voltage(-)	D-S Short	-8	V
$V_{GSSSurge}$	G-S Voltage(t_{surge} <300nsec)	D-S Short, Note1	-8 to 19	V
I_{DS}	DC Continuous Drain Current	T_C =25°C , V_{GS} =18V, Note2	420	A
I_{DS}	DC Continuous Drain Current	T_C =100°C , V_{GS} =18V, Note2	300	A
I_{DSM}	Pulse Drain Current	T_C =100°C, Pulse width =1ms, V_{GS} =18V Note2, Note3	800	A
I_F	Forward Current (Diode)	T_C =25°C	600	A
I_F	Forward Current (Diode)	T_C =100°C	400	A
I_{FRM}	Pulse Forward Current(Diode)	T_C =100°C, Pulse width =1ms, Note3	800	A
$P_{tot(MOS)}$	Total Power Dissipation (MOS)	T_C =25°C	1360	W
$P_{tot(SBD)}$	Total Power Dissipation(SBD)	T_C =25°C	2000	W
T_{jmax}	Max Junction temperature	-	175	°C
T_{jop}	Operating junction temperature	-	-40 to 150	°C
T_{stg}	Storage temperature	-	-40 to 125	°C

Note1: When using MOSFET body diode, V_{GSS} = -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_{25}	Resistance	T_C=25°C	-	5	-	kΩ
ΔR/R	Deviation of R100	T_C =100°C, R_{100} =493Ω	5	-	5	%
P_{25}	Power dissipation	T_C =25°C	-	-	20	mW
$B_{25/50}$	B-value	R2 =R25 exp [$B_{25/50}$(1/T2 - 1/(298,15 K))]	-	3375	-	K
$B_{25/80}$	B-value	R2 =R25 exp [$B_{25/80}$(1/T2 - 1/(298,15 K))]	-	3411	-	K
$B_{25/100}$	B-value	R2 =R25 exp [$B_{25/100}$(1/T2 - 1/(298,15 K))]	-	3433	-	K

Editing record

Version	Content	Data
A	First edition	2021.12.27

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