

Description

The DFS40HF12EYQ1 is a Half Bridge SiC MOSFET Power Module. It integrates high performance SiC MOSFET chips designed for the applications such as Solar Inverter, UPS, Fuel cell-DC/DC converter, Energy storage Systems.



Features

- Blocking voltage:1200V
- 40mΩ $R_{ds(on)}$ @ $T_j = 25^{\circ}\text{C}$
- 74.5mΩ $R_{ds(on)}$ @ $T_j = 175^{\circ}\text{C}$
- Low Switching Losses
- 175°C maximum junction temperature
- Si₃N₄ DBC
- Thermistor inside

Applications

- Solar inverter Systems
- Fuel cell-DC/DC converter
- Uninterruptible Power Supplier
- Energy Storage Systems

Circuit diagram

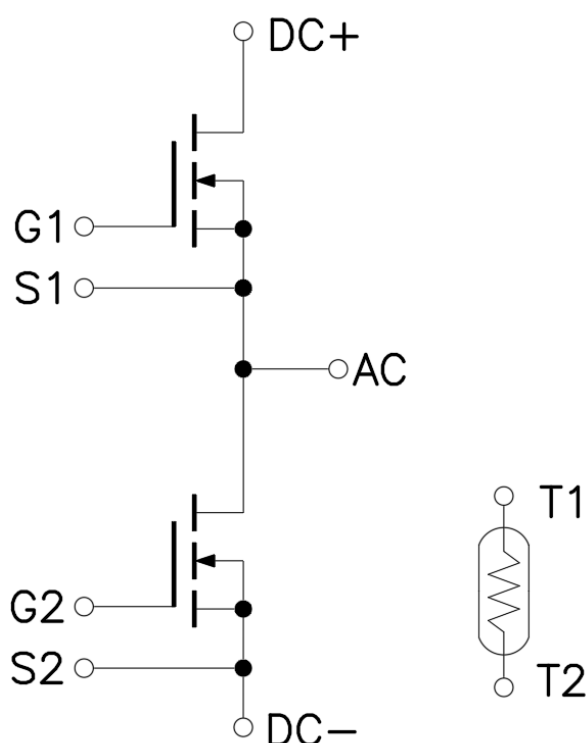


Figure 1. Out drawing & circuit diagram for DFS40HF12EYQ1

Pin Configuration and Marking Information

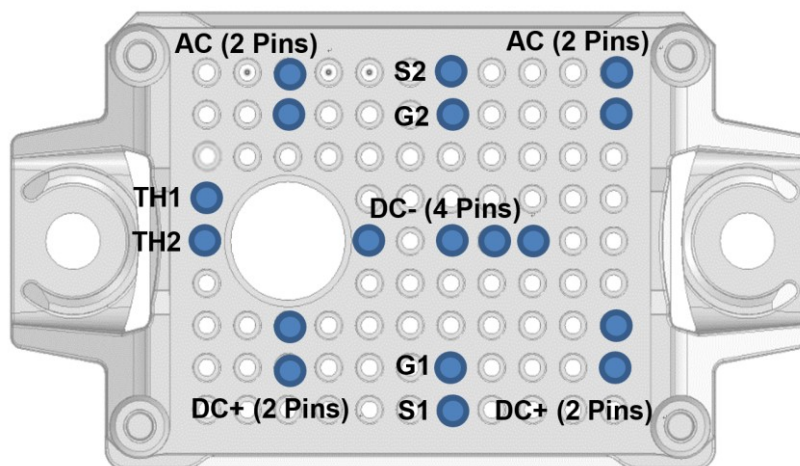


Figure 2. Pin configuration

Symbol	Description
AC	Output terminal of half bridge
S2	Low side source signal terminal
G2	Low side gate signal terminal
DC+	DC+ Bus connection
DC-	DC- Bus connection
S1	High side source signal terminal
G1	High side gate signal terminal
TH1	Thermistor connection 1
TH2	Thermistor connection 2

Module

Parameter	Conditions	Value	Unit
Isolation Voltage	RMS, f=50Hz, t=1min	3.4	kV
Clearance	Terminal to Terminal	5	mm
	Terminal to Heatsink	10	mm
Creepage distance	Terminal to Terminal	6.3	mm
	Terminal to Heatsink	12.7	mm
Comparative Tracking Index	-	400	-
Weight	-	24	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 _{GSS}	Gate-Source Voltage(+)	D-S Short	20	V
V _{GSS}	Gate-Source Voltage(-)	D-S Short	-5	V
V _{GSSSurge}	G-S Voltage(t _{surge} <300nsec)	D-S Short, Note1	-10 to 25	V
I _{DS}	DC Continuous Drain Current	T _f =80°C, Note2	50	A
I _{DS}	DC Continuous Drain Current	T _f =60°C, Note2	55	A
I _{SD}	Source (Body Diode) Current	T _f =80°C, with ON signal	50	A
I _{SD}	Source (Body Diode) Current	T _f =60°C, with ON signal	55	A
I _{DP}	Drain Pulse Current, Peak	Less than 1ms, Note3	100	A
T _j	junction temperature	-	-40 to 175	°C
T _{stg}	Storage temperature	-	-40 to 125	°C

Note1: Recommended Operating Value, 20V/-5V;18V/-5V;15V/-4V

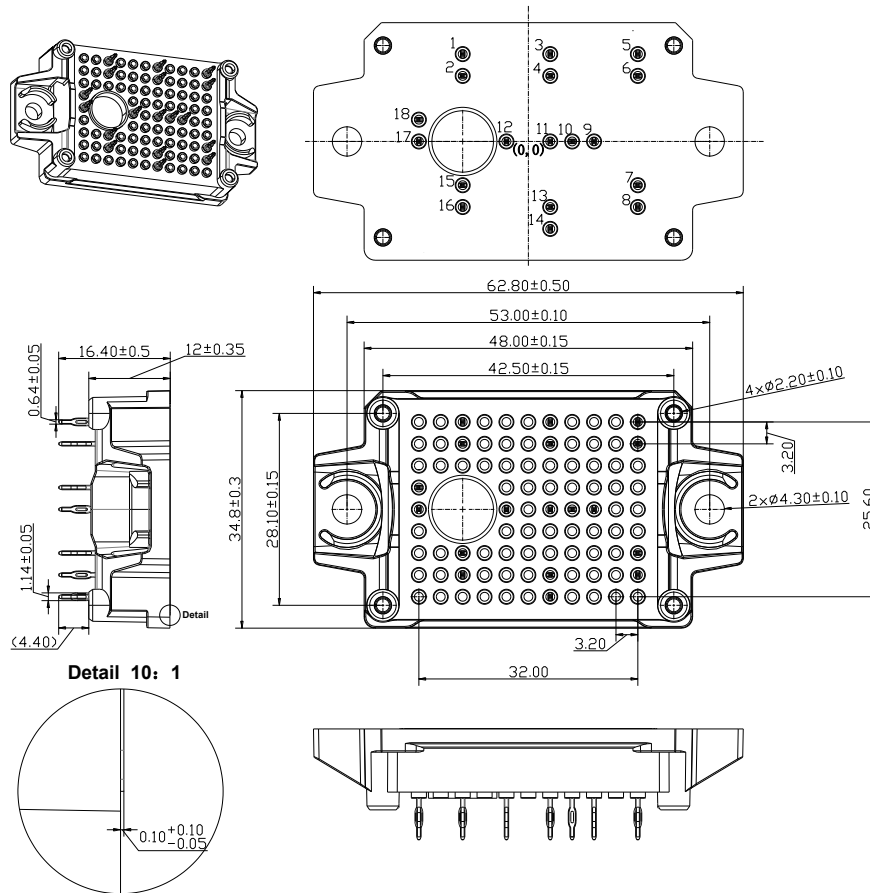
Note2: Case temperature(T_c) is defined on the surface of AMB substrate bottom just under the chips

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 R ₁₀₀	T _C =100°C, R ₁₀₀ =493Ω	5	-	5	%
P ₂₅	Power dissipation	T _C =25°C	-	-	20	mW
B _{25/50}	B-value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298,15 K))]$	-	3375	-	K
B _{25/80}	B-value	$R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15 K))]$	-	3411	-	K
B _{25/100}	B-value	$R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298,15 K))]$	-	3433	-	K

Package dimensions



Pin Table		
Pin	X	Y
1	-9.6	12.8
2	-9.6	9.6
3	3.2	12.8
4	3.2	9.6
5	16	12.8
6	16	9.6
7	16	-6.4
8	16	-9.6
9	9.6	0
10	6.4	0
11	3.2	0
12	-3.2	0
13	3.2	-9.6
14	3.2	-12.8
15	-9.6	-6.4
16	-9.6	-9.6
17	-16	0
18	-16	3.2

Editing record

Version	Content	Data
A	First edition	2022.03.17

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