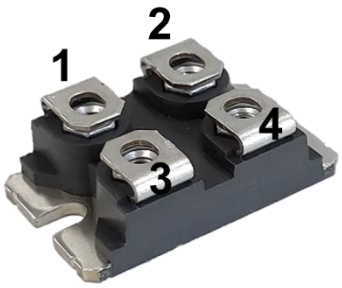
S1P12A120DDE（Target）

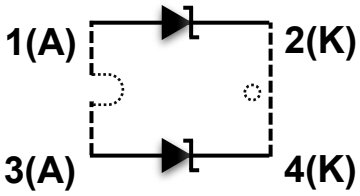
1200V / 120A SiC Schottky Diode Module

Features



- Superior Figure of Merit Q_C/I_F
- Zero Reverse Recovery Current / Zero forward recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Low forward voltage
- Isolated back-side

Applications



- EV Fast Chargers
- Switch Mode Power Supplies
- Power Factor Correction
- Free Wheeling Diodes in Inverter Stages
- AC/DC Converters
- Solar Inverter
- Pulse Power

Table 1 Key performance and package parameters

Type	V_{RRM}	I_F (T_C = 110℃, $R_{th\ (j\text{-}c,max)}$)	$T_{j,max}$	Marking	Package
S1P12A120DDE	1200V	120A	175℃	S1P12A120DDE	SOT227

Table of contents

1、Maximum ratings

Table 2 Maximum rating (Tc = 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage（Per Leg）	1200	V		
V_R	DC Peak Reverse Voltage	1200	V		
I_F	Continuous Forward Current (Per Leg)	120	A	Tc = 25˚C	
		80		Tc = 100˚C	
		60		Tc = 115˚C	
I_{FRM}	Repetitive Peak Forward Surge Current (Per Leg)	300	A	Tc =25˚C, tp=10ms	
I_{FSM}	Non-Repetitive Peak Forward Surge Current (Per Leg)	450	A	Tc = 25℃， tp = 10ms	
$\int i^2dt$	$\int i^2dt$ (Per Leg)	230	A^2s	Tc = 25℃，tp = 10 ms	
dV/dt	Diode Ruggedness (Per Leg)	200	V/ns	V_R = 0~960V	
P_{total}	Power dissipation (Per Leg)	375	W	T_C = 25˚C	
T_J ,T_{stg}	Operating Junction and storage temperature	-55 to +175	˚C		

2、Thermal / Packaging characteristics

Table 3 Thermal and packaging characteristics

Symbol	Description	Min.	Typ.	Max.	Unit	Note
R_{th-JC}	Thermal Resistance, Junction to Case	-	0.4*	-	℃/W	
V_{ISO}	Isolation Test Voltage RMS, f=50Hz, t=1min	2.5	-	-	kV	
Creepage	Terminal to Heatsink Creepage Distance	-	8.5	-	mm	
	Terminal to Terminal Creepage Distance	-	10.5	-	mm	
Clearance	Terminal to Heatsink Clearance	-	6.8	-	mm	
	Terminal to Terminal Clearance	-	4.4	-	mm	
T_{jmax}	Maximum Junction Temperature	-	175	-	˚C	
T_{jop}	Operation Junction Temperature	-	-55 to +175	-	˚C	
T_{STG}	Storage Temperature Range	-	-55 to +175	-	˚C	
W	Weight	-	28.5	-	g	
T_M	Screws to Heatsink Mounting Torque	-	-	1.5	N·m	
T_C	Terminal Connection Torque (M4 *9mm)	-	-	1.3	N·m	

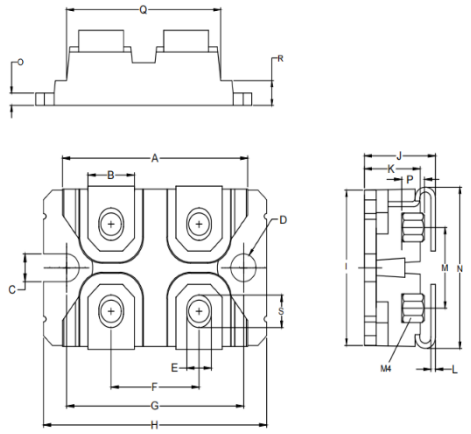
[1] Not subject to production test. Parameter verified by design/characterization. * By estimated

3、Electrical characteristics

Table 4　SiC SBD characteristics (Per Leg)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V_F	Diode Forward Voltage	-	1.5	1.8	V	I_F = 60A, T_j = 25°C	
		-	1.9	-	V	I_F = 60A, T_j = 175°C	
I_R	Reverse Current	-	2	200	μA	V_R = 1200V, T_j = 25°C	
Q_C	Total Capacitive Charge	-	288	-	nC	V_R = 800V，I_F = 60A di/dt = 200A/μs，T_j = 25°C	
C	Total Capacitance	-	4240	-	pF	V_R = 0V，T_j = 25°C, f = 1MHZ	
		-	208	-		V_R = 400V，T_j = 25°C, f = 1MHZ	
		-	152	-		V_R = 800V，T_j = 25°C, f = 1MHZ	

4、Package drawing



DiM	Millimeter	
	Min	Max
A	31.40	31.60
B	7.70	8.10
C	4.20	4.40
D	4.20	4.40
E	4.10	4.30
F	14.90	15.10
G	30.10	30.20
H	38.00	38.40
I	23.80	24.20
J	11.80	12.20
K	9.40	9.60
L	0.75	0.85
M	12.40	12.80
N	24.50	25.40
O	1.90	2.10
P	3.10	3.95
Q	26.60	27.00
R	3.80	4.20
S	5.10	5.40

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Revision history

Document version	Date of release	Description of changes	
V01_00	2024-06-06	——	

Attention

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