

S1P20A120DDE（Target）



1200V / 200A 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

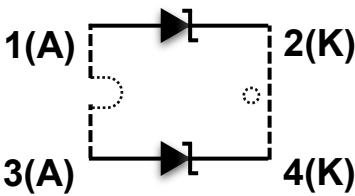


Table 1 Key performance and package parameters

Type	V_{RRM}	I_F ($T_C = 110^{\circ}C, R_{th(j-c,max)}$)	$T_{j,max}$	Marking	Package
S1P20A120DDE	1200V	200A	175°C	S1P20A120DDE	SOT227

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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)	180	A	T _c = 25°C	
		120		T _c = 100°C	
		100		T _c = 115°C	
I _{FRM}	Repetitive Peak Forward Surge Current (Per Leg)	600	A	T _c = 25°C, tp = 10ms	
I _{FSM}	Non-Repetitive Peak Forward Surge Current (Per Leg)	800	A	T _c = 25°C, tp = 10ms	
∫i ² dt	∫i ² dt (Per Leg)	538	A ² s	T _c = 25°C, tp = 10 ms	
dV/dt	Diode Ruggedness (Per Leg)	200	V/ns	V _R = 0~960V	
P _{total}	Power dissipation (Per Leg)	470	W	T _C = 25°C	
T _J , T _{stg}	Operating Junction and storage temperature	-55 to +175	°C		

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2、Thermal / Packaging Characteristics

Table 3 Package Characteristics

Symbol	Description	Min.	Typ.	Max.	Unit	Note
R _{th-JC}	Thermal Resistance, Junction to Case	-	0.32*	-	°C/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

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3、Electrical characteristics

Table 4 SiC SBD characteristics (Per Leg)

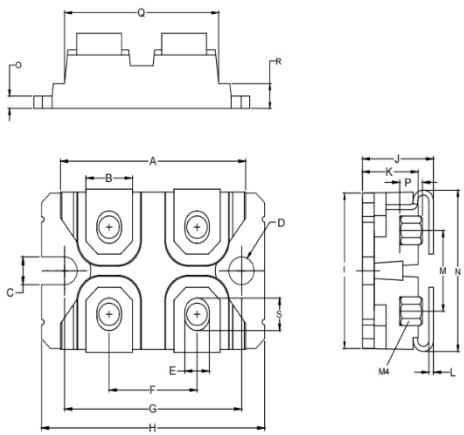
Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V_F	Diode Forward Voltage	-	1.5	1.8	V	$I_F = 100A, T_j = 25^{\circ}C$	
		-	1.9	-	V	$I_F = 100A, T_j = 175^{\circ}C$	
I_R	Reverse Current	-	2	200	μA	$V_R = 1200V, T_j = 25^{\circ}C$	
Q_C	Total Capacitive Charge	-	344*	-	nC	$V_R = 800V, I_F = 30A$ $di/dt = 200A/\mu s, T_j = 25^{\circ}C$	
C	Total Capacitance	-	6364*	-	pF	$V_R = 0V, T_j = 25^{\circ}C, f = 1MHz$	
		-	306*	-		$V_R = 400V, T_j = 25^{\circ}C, f = 1MHz$	
		-	224*	-		$V_R = 800V, T_j = 25^{\circ}C, f = 1MHz$	

* By estimated

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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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5、Test conditions

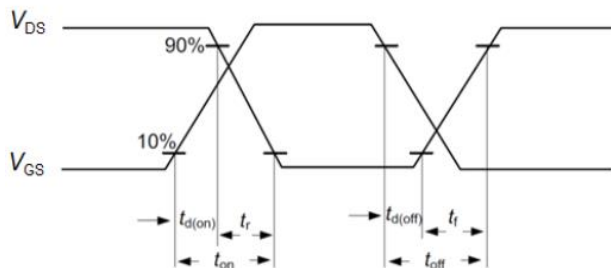


Figure A. Definition of switching times

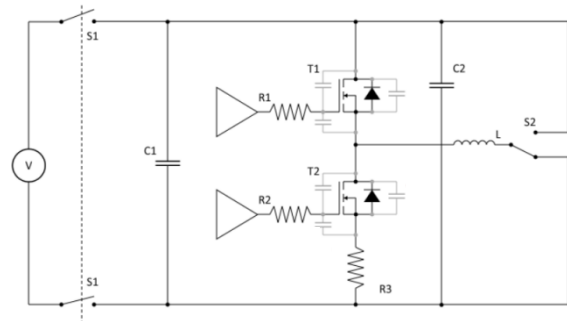


Figure B. Dynamic test circuit

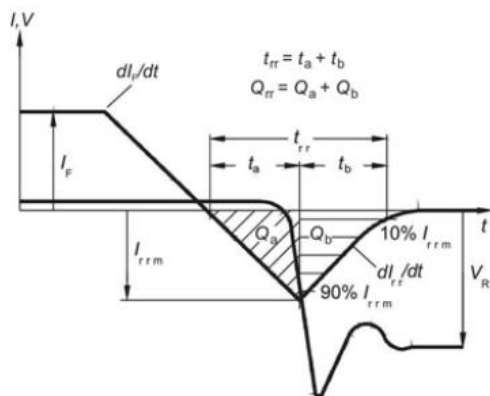


Figure C. Definition of diode switching characteristics

Figure C. Definition of body diode switching characteristics

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Revision history

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

Attention

1. Rohs compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/ EC (RoHS2), as implemented January 2, 2013.

2. REACH compliance

REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact a Sichain representative to insure you get the most up-to-date REACH SVHC Declaration. REACH banned substance information (REACH Article 67) is also available upon request.

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