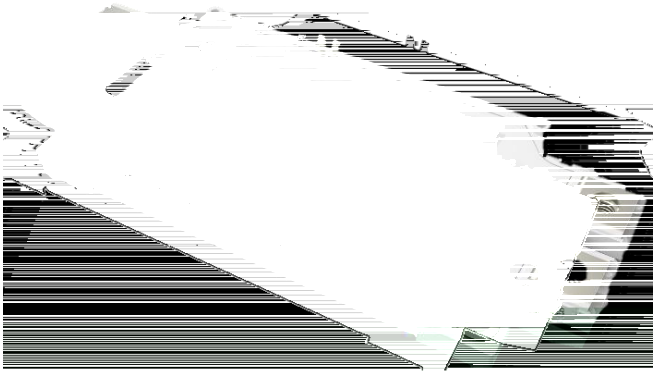
S1P02R170HBG-C Preliminary

1700V / 750A All-Silicon Carbide MOSFET Half-Bridge Module

Features

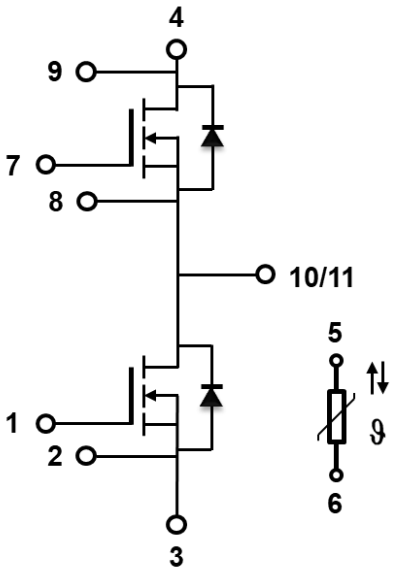


Electrical features
- V_{DSS} = 1700V
- $I_{D\ nom}$ = 750A

High-speed Switching Possible
High Power Density
High Frequency Operation
Ultra-low Losses

Applications

Motor drives
High power converters
Photovoltaics, wind power generation
Induction heating equipment
Electrified vehicle traction inverter



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2 Packaging Characteristics

Table 2 Package Characteristics

Symbol	Description	Value	Unit	Note
R_{HS}	High-side Resistance	2.0		
R_{LS}	Low-side Resistance	2.0		
Ls	Stray inductance	18	nH	

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

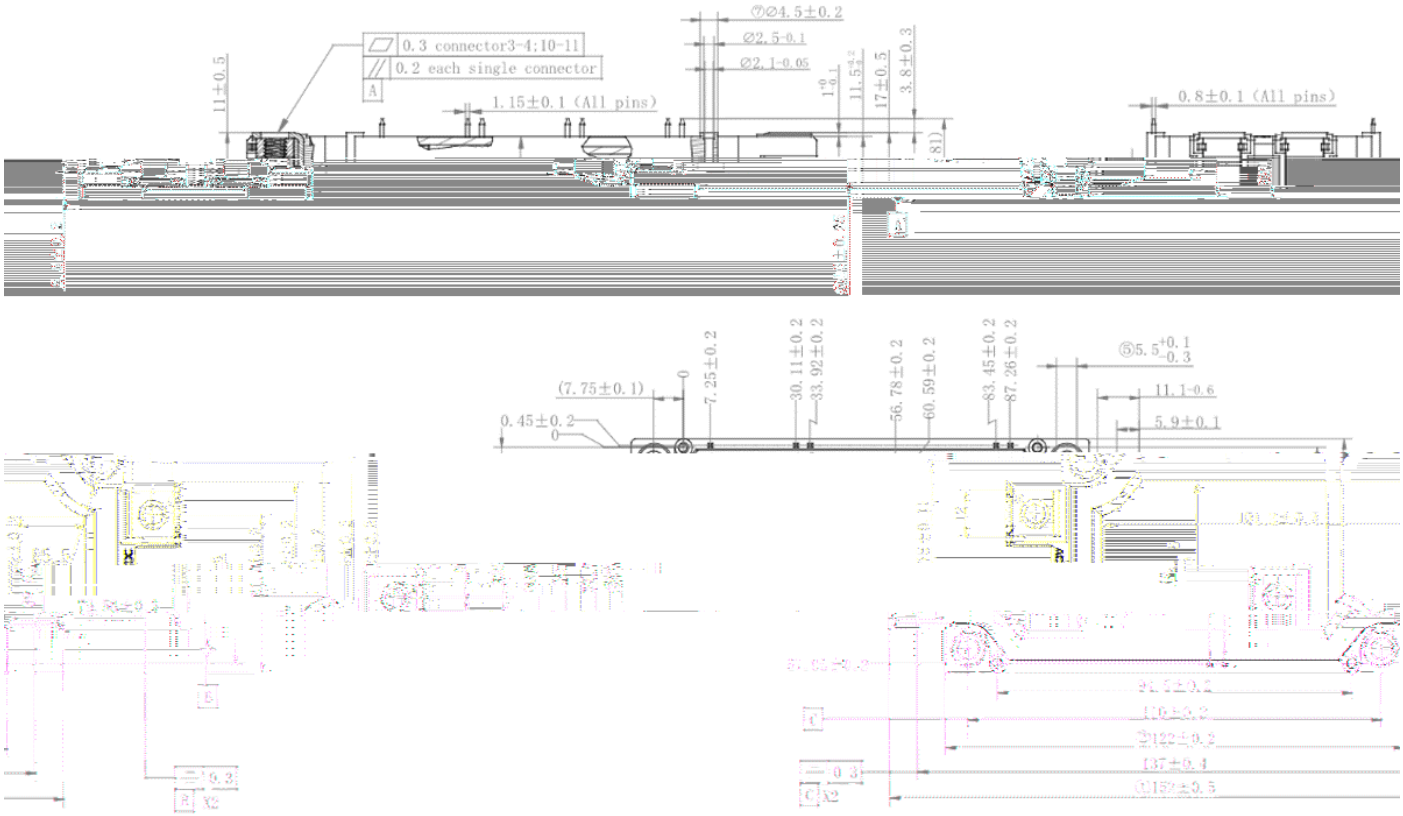
3 Electrical characteristics

Table 4 SiC MOSFET characteristics (Tc = 25°C unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-source breakdown voltage	1700	-	-	V	V_{GS} = 0V, I_D = 1	
$V_{GS(th)}$	Gate threshold voltage	2.5	3.1	4.0	V	V_{DS} = V_{GS}, I_D = 240mA	
		-	2.3	-	V	V_{DS} = V_{GS}, I_D = 240mA, T_J = 175°C	
I_{DSS}	Zero gate voltage drain current	-	10	100		V_{DS} = 1700V, V_{GS} = 0V	
I_{GSS}	Gate source leakage current	-	-	1		V_{GS} = 18V, V_{DS} = 0V	
$R_{DS(on)}$	Current drain-source on-state resistance	-	2.0	2.8		V_{GS} = 18V, I_D = 750A	
		-	4.4	-		V_{GS} = 18V, I_D =750A, T_J = 175°C	
g_{fs}	Transconductance	-	510	-			

Table 5 Body diode characteristics (Tc = 25°C unless otherwise specified)

4 Package drawing



5 Test conditions

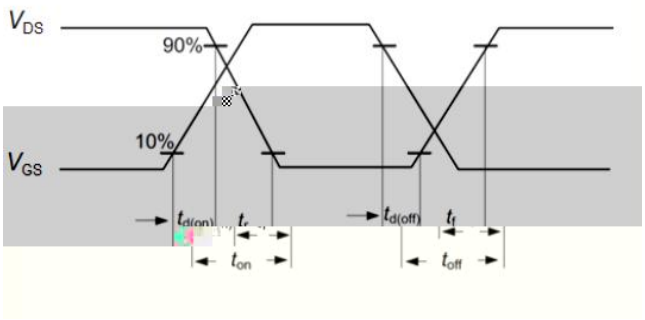


Figure A. Definition of switching times

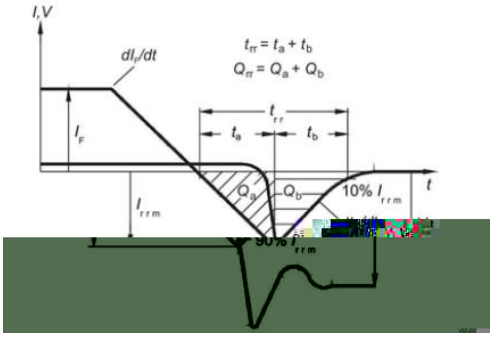


Figure B. Definition of body diode switching characteristics

Revision history

Document version	Date of release	Description of changes	
V01_00	2024-11-30	——	

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.

3. With respect to information regarding the application of the product, Sichain hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

4. Any information given in this documents subject to customer's compliance with its obligations and any applicable legal requirements, norms and standards concerning any use of the product of Sichain in any customer's applications.

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6. Due to technical requirements products may contain dangerous substances. For information on the types in question please contact Sichain office.

7. Except as otherwise explicitly approved by Sichain in a written document signed by authorized representatives of Sichain, Sichain' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.

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