2M0 0BJ

SiC™ 12 con Carb ver MOSFET G2 N Channel Enhancement

tures

- High spe ng
- Very low g losses
- High blo ltage with low on-resistance
- Tempe dependent turn-off switching losses
- e, RoHS compliant

Benefits

- Cooling effort reduction
- Efficiency improvement
- Reduced cooling requirements
- Increased power density
- Increased system switching frequency

Applications

- EV motor drive
- PV string inverters
- Solar power optimizer
- Switch mode power supplies

Key performa

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Features **1**

Benefits ..... **abf**

1 Maximum ratings

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

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{DS,max}$	Drain source voltage	1200	V	V_{GS} = 0V, I_D = 100μA	
$V_{GS,max}$	Gate source voltage	-8 /+22	V	Absolute maximum values	Note1
$V_{GSpulse}$	Gate-source voltage,max. transient voltage	-10 /+25	V	t_p 0.5μs, D 0.01	
V_{GSop}	Gate source voltage	-4 /+18	V	Recommended operational values	
I_D	Continuous drain current	97	A	V_{GS} = 18V, T_C = 25˚C	
		68		V_{GS} = 18V, T_C = 100˚C	
I_D(pulse)	Pulsed drain current	266	A	Pulse width t_P =100μs limited by $T_{J,max}$	
T_J ,T_{stg}	Operating Junction and storage temperature	-55 to +175	˚C		

Note 1 when using MOSFET Body Diode $V_{GS,max}$ = -4 / +22V

SG2M023120BJ

Datasheet

SG2M023120BJ

Datasheet

3 Electrical characteristic diagrams

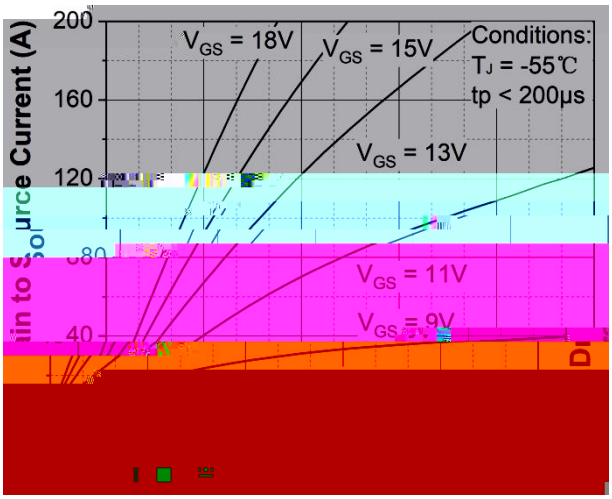


Figure 1. Output characteristics T_J = -55 ºC

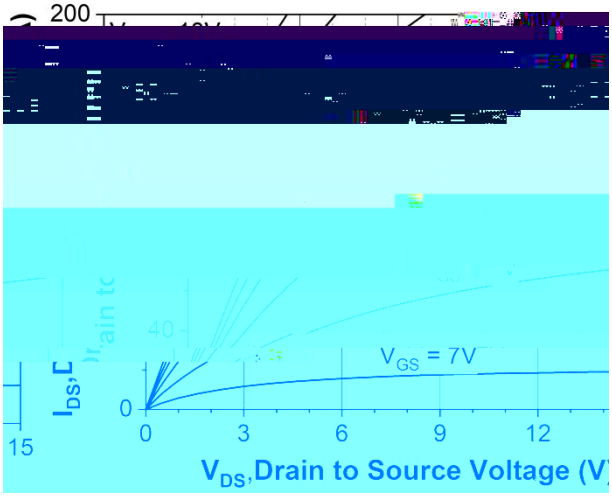


Figure 2. Output characteristics T_J = 25 ºC

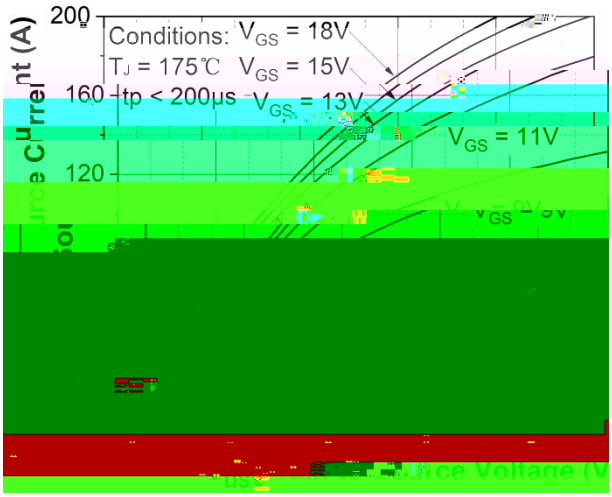


Figure 3. Output characteristics T_J = 175 ºC

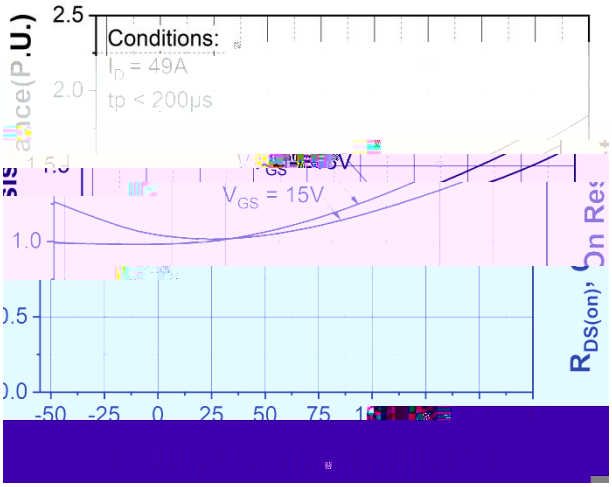


Figure 4. Normalized on-resistance vs. temperature

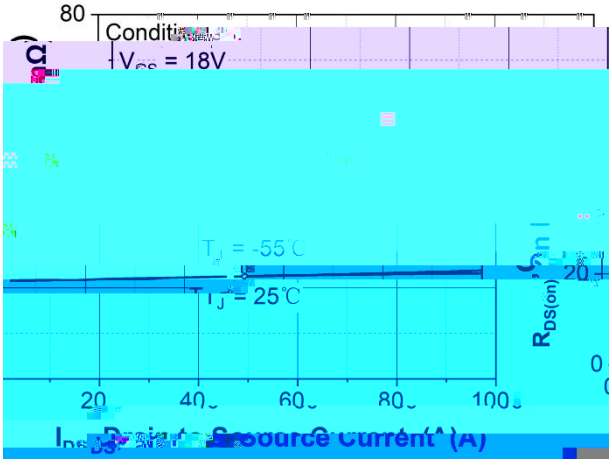


Figure 5. On-resistance vs. drain current for various temperatures

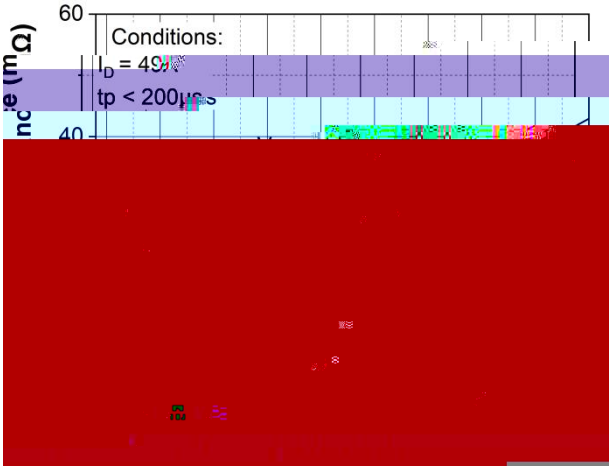


Figure 6. On-resistance vs. temperature for various gate voltage

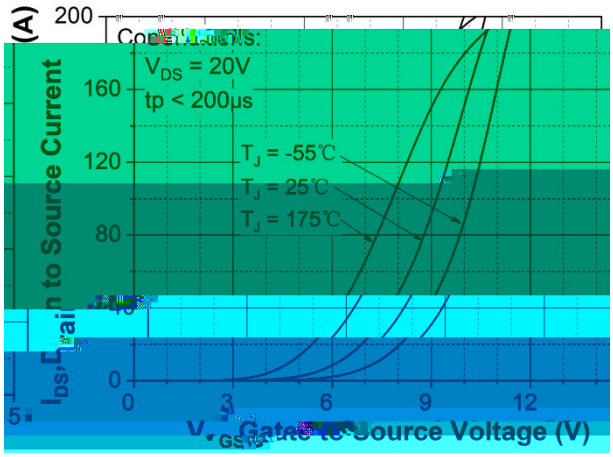


Figure 7. Transfer characteristic for various junction temperatures

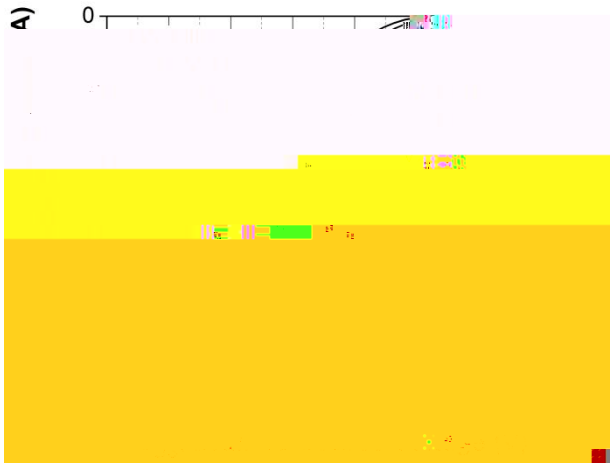


Figure 8. Body diode characteristic at T_J = -55 ºC

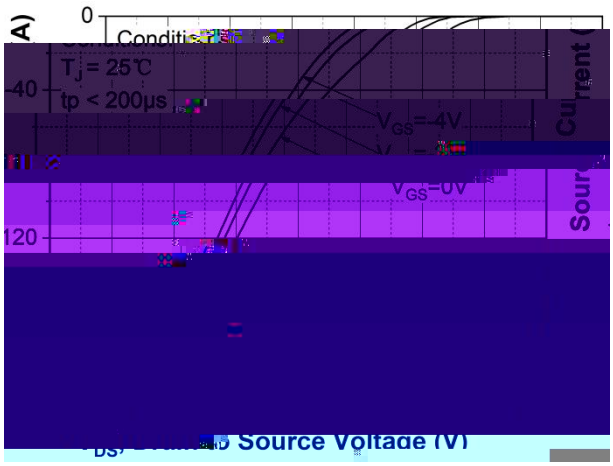


Figure 9. Body diode characteristic at T_J = 25 ºC

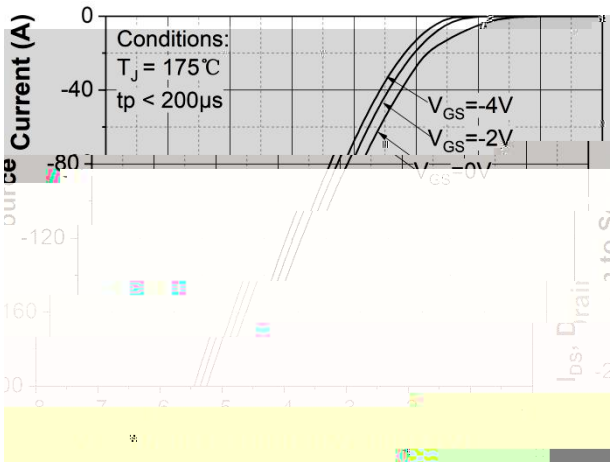


Figure 10. Body diode characteristic at T_J = 175ºC

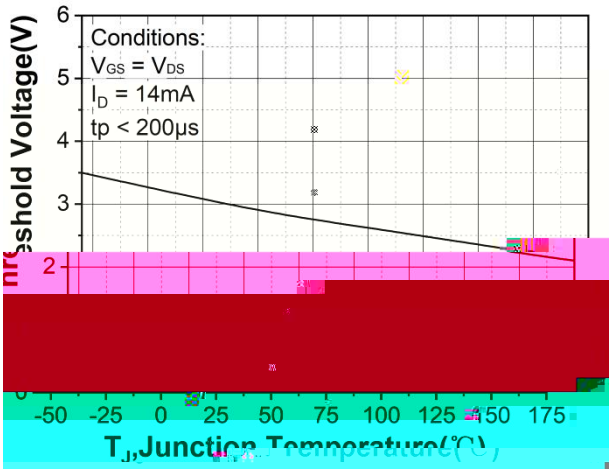


Figure 11. Threshold voltage vs. temperature

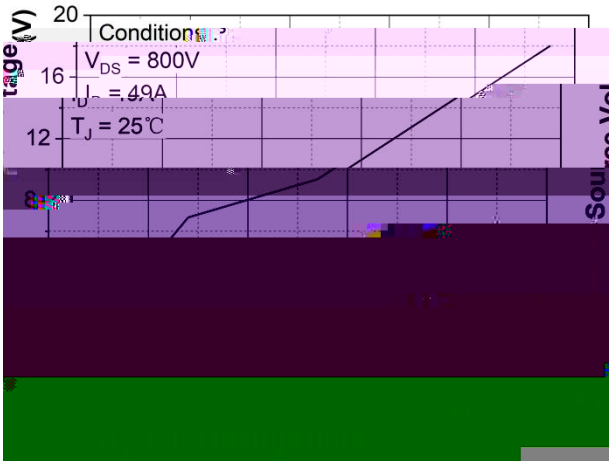


Figure 12. Gate charge characteristic

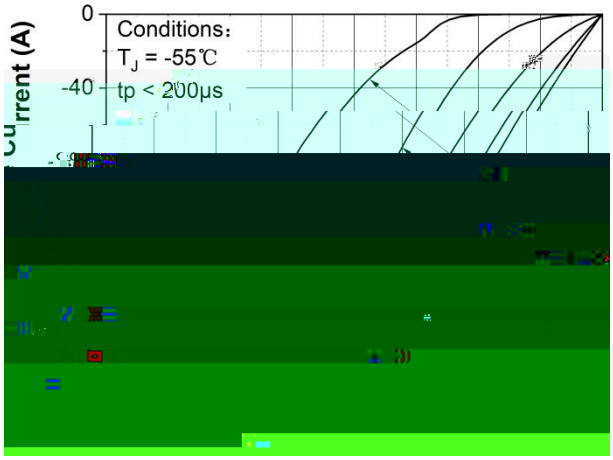


Figure 13. 3rd quadrant characteristic at T_J = -55 ºC

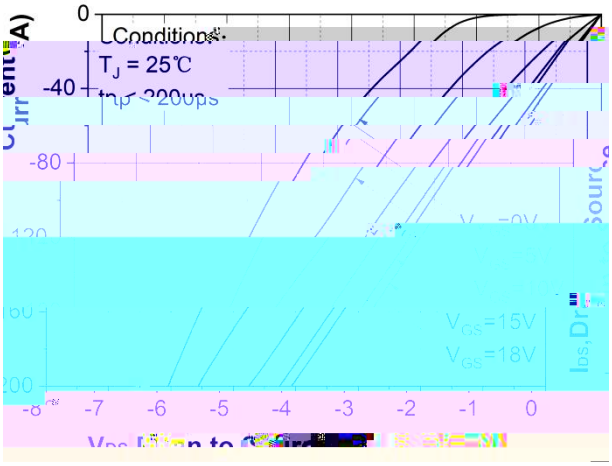


Figure 14. 3rd quadrant characteristic at T_J = 25 ºC

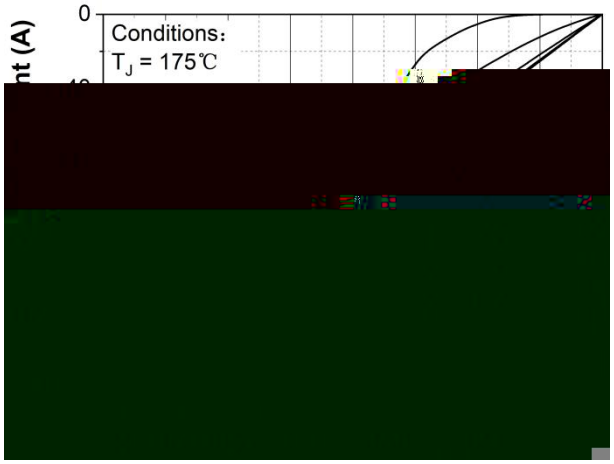


Figure 15. 3rd quadrant characteristic at T_J = 175 ºC

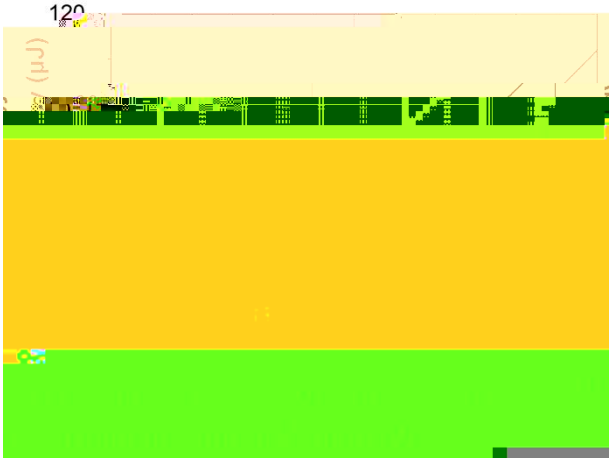


Figure 16. Output capacitor stored energy

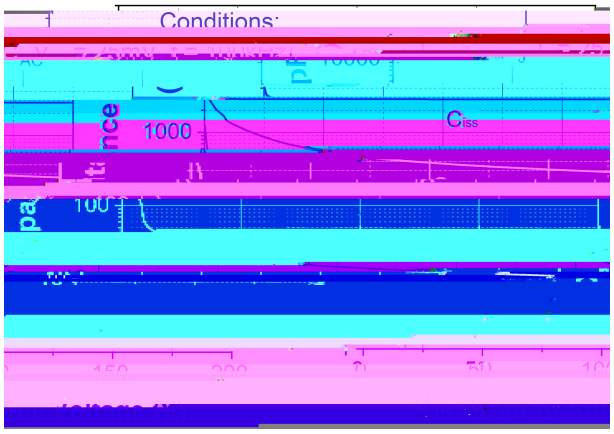


Figure 17. Capacitances vs. drain-source voltage (0 - 200V)

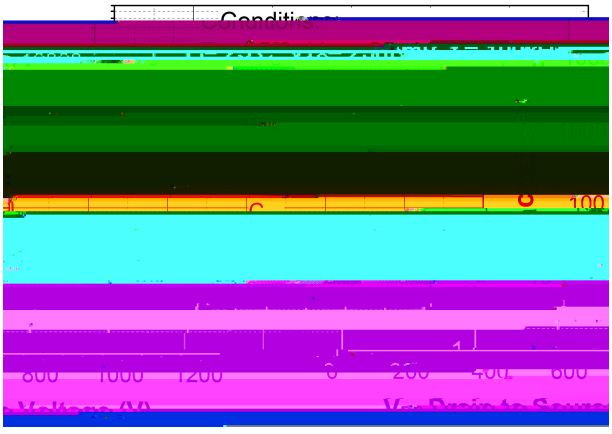


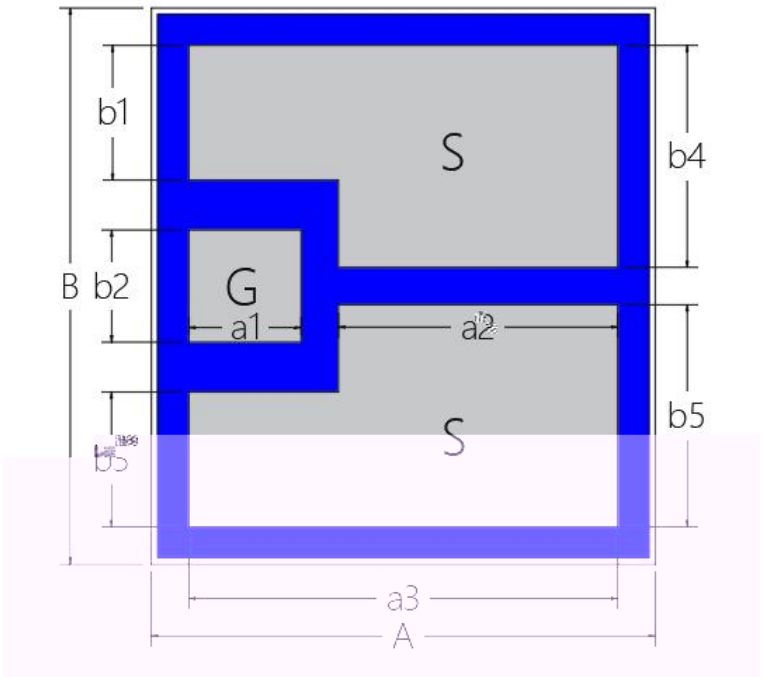
Figure 18. Capacitances vs. drain-source voltage (0 - 1200V)

4 Mechanical parameters

4.1 Dimensions and metallization

Parameter	Typical value	Unit	Metallization
Die size W x L	4.46 * 4.04	mm	
Gate pad size W x L	0.8 * 0.8	mm	
Die thickness	175	μm	
Top side source gate metallization	4	μm	Al
Back side drain metallization	1	μm	Ag

4.2 Layout



Symbol	Dimension / mm
B	4.46
b1	1.08
b2	0.80
b3	1.08
b4	1.78
b5	1.78
A	4.04
a1	0.80
a2	2.24
a3	3.34

5 Test conditions

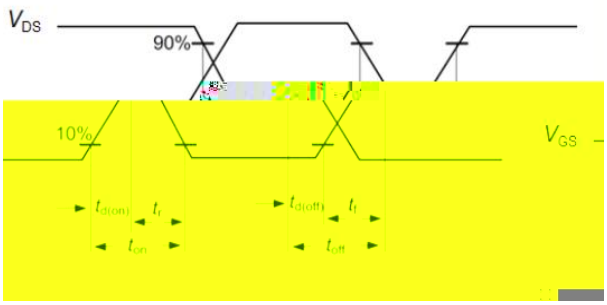


Figure A. Definition of switching times

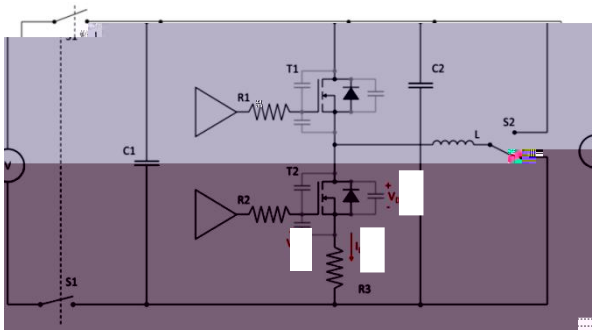


Figure B. Dynamic test circuit

Revision history

Document version	Date of release	Document stage	Description of changes
V01_00	2024-11-21	——	——
V01_01	2025-08-28	——	——
V01_02	2025-12-08	——	——
V01_03	2025-12-22	Final	——

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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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.

8. For use of our products in applications requiring a high degree of reliability (as exemplified below), please contact and consult with a Sichain representatives, for example but not limited to: transportation equipment,primary communication equipment,traffic lights,fire/crime prevention, safety equipment, medical systems, and power transmission systems.