SG2M040075BJ

TriQSiC™ 750V Silicon Carbide Power MOSFET G2 N Channel Enhancement

Features

- High speed switchin

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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					

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Q_{gs}	Gate source charge	-	12	-	nC	V_{DS} = 500V, V_{GS} = -4/+18V I_D = 22A	Fig.12
Q_{gd}	Gate drain charge	-	12	-			
Q_g	Gate charge	-	38	-			

2.3 Switching characteristics

Table 6 Dynamic characteristics(Tc = 25°C unless otherwise specified,the data comes from TO-247-4L)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
E_{on}	Turn on switching energy	-	85	-	μJ	V_{DS} = 500V, V_{GS} = -4/+18V I_D = 22A, Rg = 2.5Ω L = 120μH	
E_{off}	Turn off switching energy	-	31	-			
$t_{d\ on}$	Turn on delay time	-	10.7	-	ns		
t_r	Rise time	-	11.6	-			
$t_{d\ off}$	Turn off delay time	-	21	-			
t_f	Fall time	-	9.5	-			

Table 7 Body diode characteristics(The data comes from TO-247-4L)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode forward voltage	-	3.7	-	V	V_{GS} = -4V, I_{SD} = 11A	Fig.8,9, 10
		-	3.2	-	V	V_{GS} = -4V, I_{SD} = 11A T_J = 175°C	
I_S	Continuous diode forward current	-	54	-	A	V_{GS} = -4V, Tc = 25°C	Note2
t_{rr}	Reverse recovery time	-	25	-	ns	V_R = 500V, V_{GS} = -4V I_{SD} = 22A di/dt = 2111A/μs T_J = 175°C	
Q_{rr}	Reverse recovery charge	-	246	-	nC		
I_{rrm}	Peak reverse recovery current	-	17	-	A		

Note 2: When using SiC Body Diode the maximum recommended V_{GS} = -4 V

3 Electrical characteristic diagrams

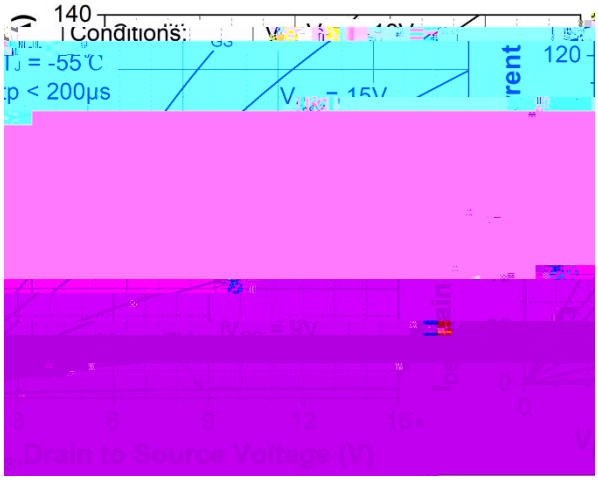


Figure 1. Output characteristics T_J = -55 ºC

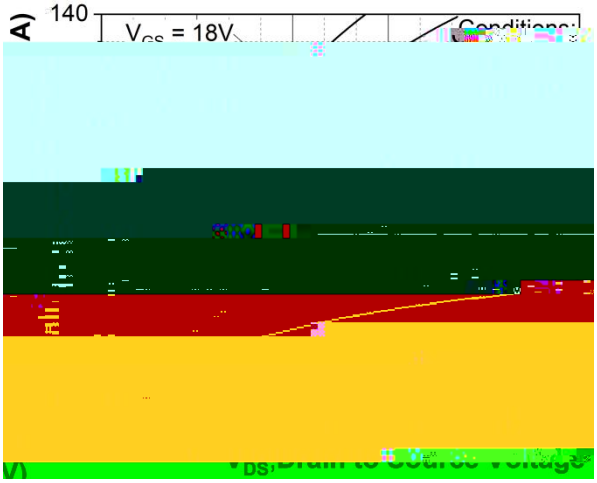


Figure 2. Output characteristics T_J = 25 ºC

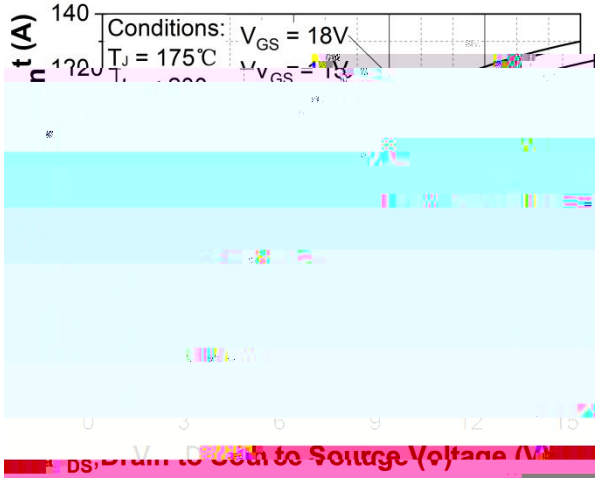


Figure 3. Output characteristics T_J = 175 ºC

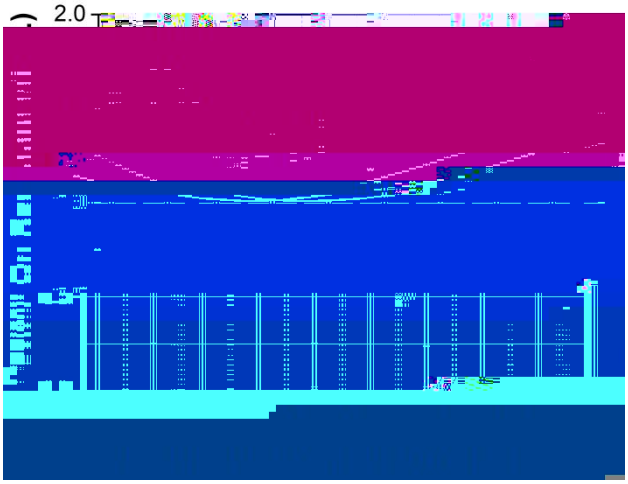


Figure 4. Normalized on-resistance vs. temperature

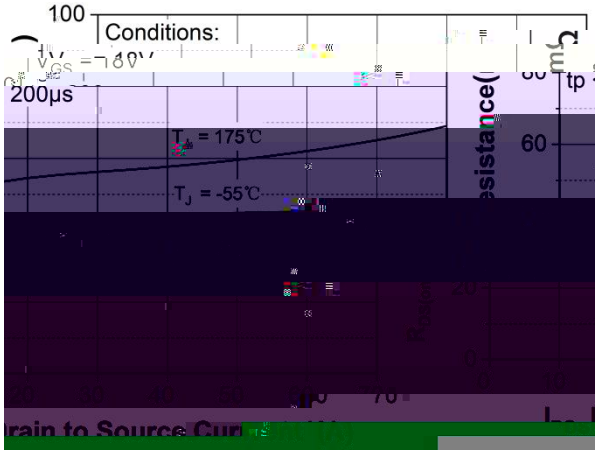


Figure 5. On-resistance vs. drain current for various temperatures

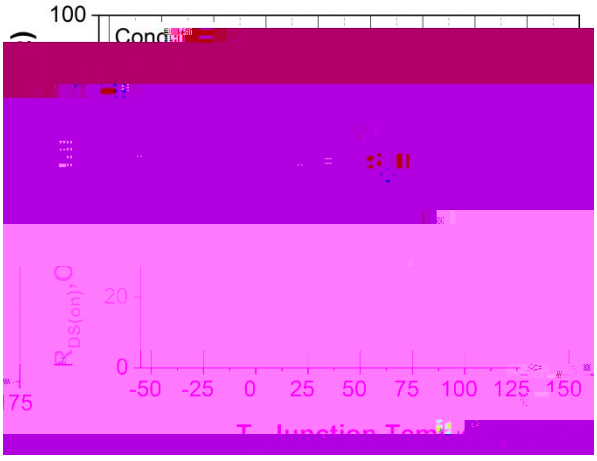


Figure 6. On-resistance vs. temperature for various gate voltages

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.

4 Mechanical parameters

4.1 Dimensions and metallization

Parameter	Typical value	Unit	Metallization
Die size W x L	2.800*3.400	mm	
Gate pad size W x L	0.800*0.800	mm	
Die thickness	175	μm	
Top side	source gate		

5 Test conditions

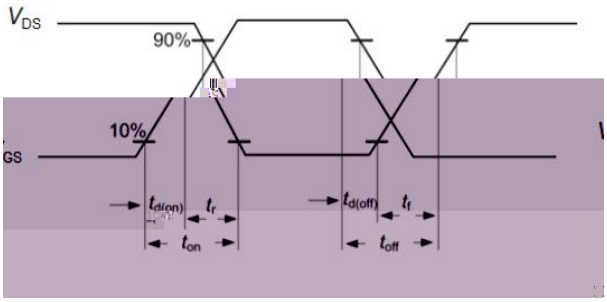


Figure A. Definition of switching times

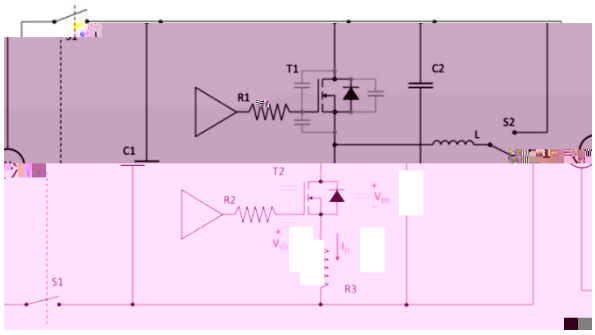


Figure B. Dynamic test circuit

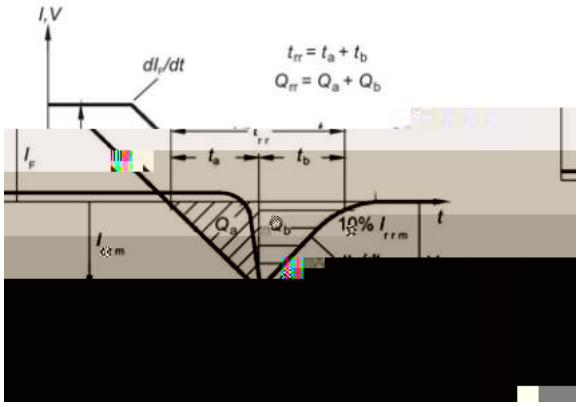


Figure C. Definition of body diode switching characteristics

Revision history

Document version	Date of release	Document stage	Description of changes
V01_00	2025-01-10	——	——
V01_01	2025-01-13	——	——
V01_02	2025-01-17	——	——
V02_00	2025-05-23	——	——
V02_01	2025-07-22	——	——
V02_02	2025-08-14	——	——
V03_00	2025-08-28	——	——
V03_01	2025-12-05	——	——
V03_02	2025-12-22	Final	

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