SG2M027120BJ

TriQSiC™ 1200V Silicon Carbide Power MOSFET G2 N Channel Enhancement

Features

- High speed switching
- Very low switching losses
- Fully controllable dv/dt
- High blocking voltage with low on-resistance
- Fast intrinsic diode with low reverse recovery (Qrr)
- Temperature independent turn-off switching losses
- Halogen free, RoHS compliant

Benefits

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

Part number	**Die size W x L mm**
SG2M027120BJ	3.390*4.725

Applications

- On-board charger/PFC
- EV battery chargers
- Booster/DC-DC converter
- Switch mode power supplies

Table 1 Key performance and package parameters

Type	**V_{DS}**	**I_{DS}** (T_C=25 , $R_{th\ (j-c),max} \leq 0.44$°C/W)	**$R_{DS(on),\ typ}$** (V_{GS} = 18V, I_D = 40A,

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1 Maximum ratings

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

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{DS,max}$	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	$t_p \leq 0.5\mu s$, D 0.01	
V_{GSop}	Gate source voltage	-4 /+18	V	Recommended operational values	
I_D	Continuous drain current	85	A	V_{GS} = 18V, T_C = 25˚C	
		60		V_{GS} = 18V, T_C = 100˚C	
I_D(pulse)	Pulsed drain current	220	A	Pulse width t_P =100μs limited by $T_{J,max}$	
T_J ,Tstg	Operating Junction and storage temperature	-55 to +175	˚C		

2 Electrical characteristics

2.1 Static characteristics

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

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Cond t

Q_{gs}	Gate source charge	-	24	-	nC	V_{DS} = 800V

3 Electrical characteristic diagrams

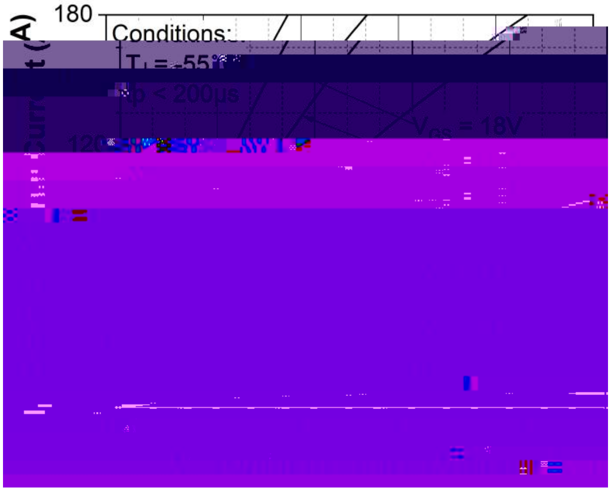

Figure 1. Output characteristics T_J = -55 ºC

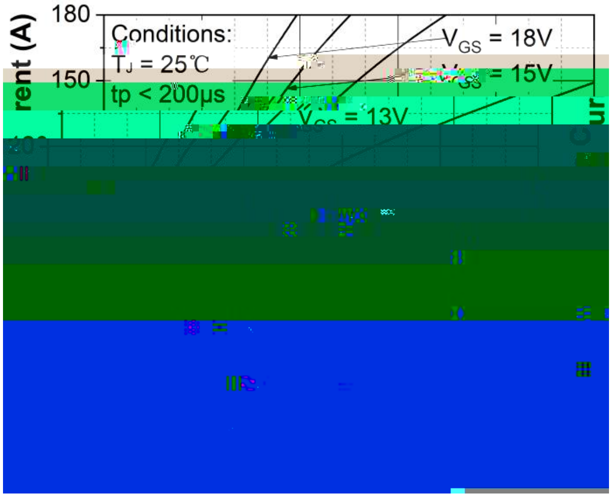

Figure 2. Output characteristics T_J = 25 ºC

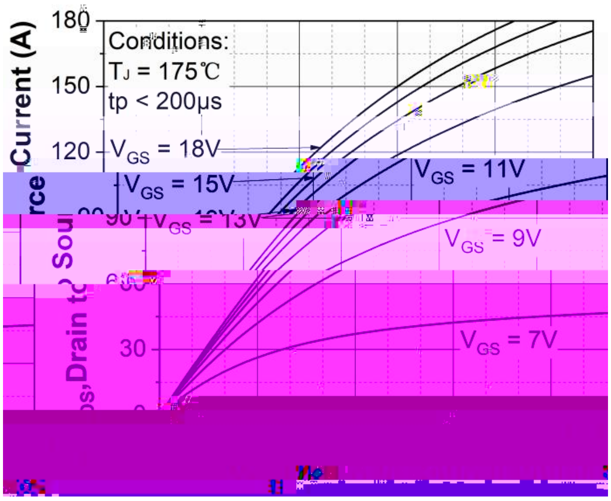

Figure 3. Output characteristics T_J = 175 ºC

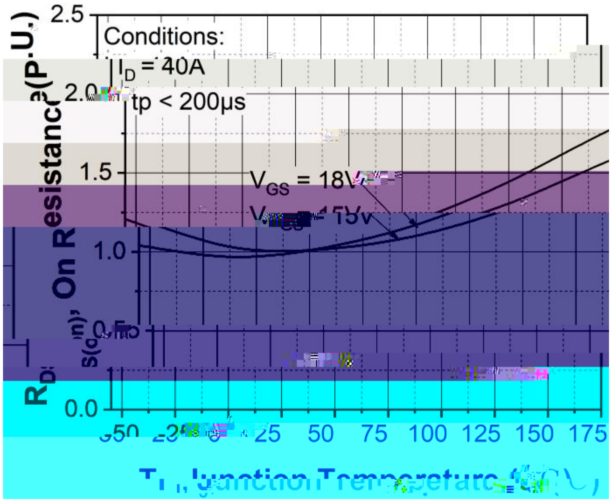

Figure 4. Normalized on-resistance vs. temperature

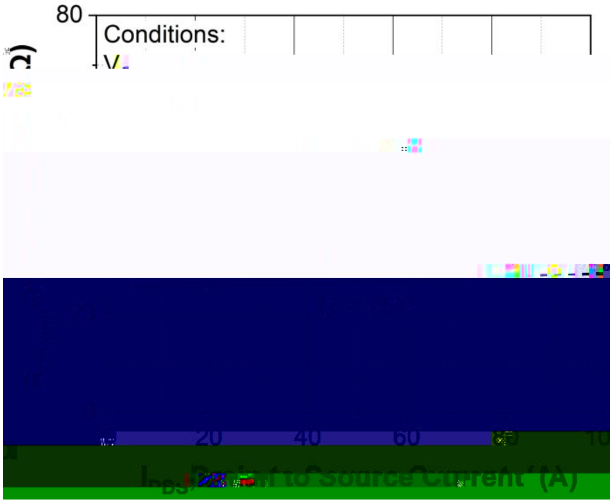

Figure 5. On-resistance vs. drain current for various temperatures

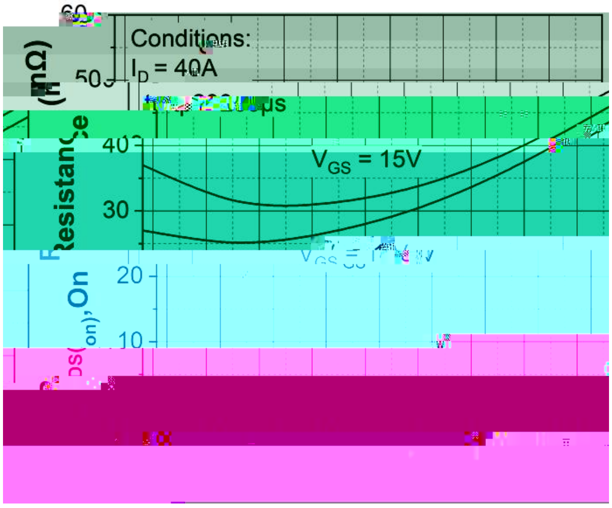

Figure 6. On-resistance vs. temperature for various gate voltages

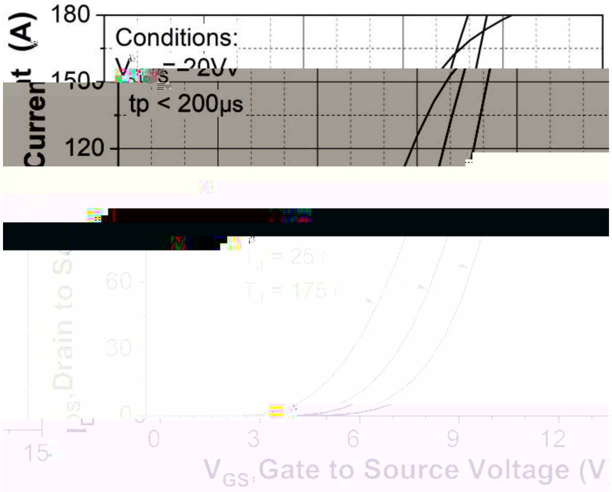

Figure 7. Transfer characteristic for various junction temperatures

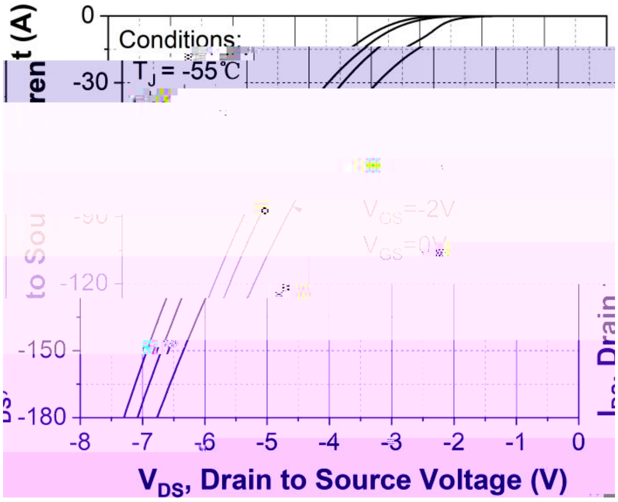

Figure 8. Body diode characteristic at T_J = -55 ºC

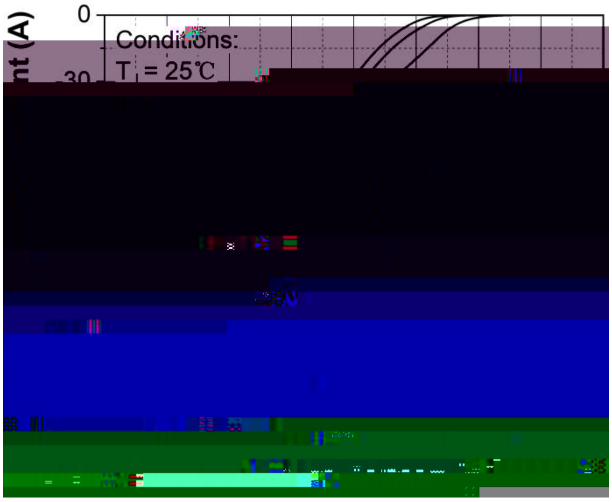

Figure 9. Body diode characteristic at T_J = 25 ºC

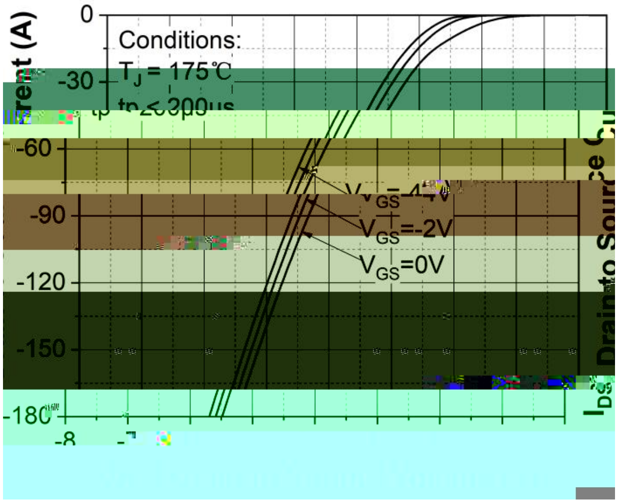

Figure 10. Body diode characteristic at T_J = 175ºC

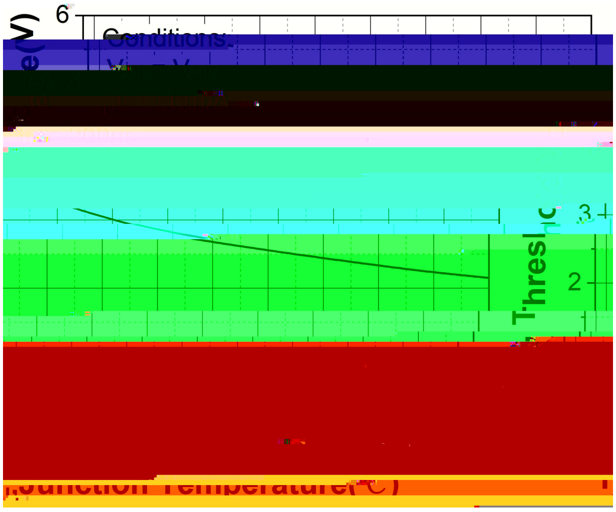

Figure 11. Threshold voltage vs. temperature

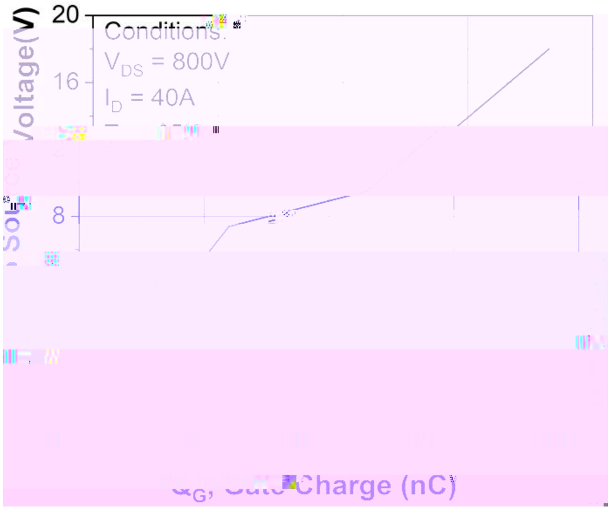

Figure 12. Gate charge characteristic

Figure 13.

4 Mechanical parameters

4.1 Dimensions and metallization

Parameter	Typical value	Unit	Metallization
Die size W x L	3.390*4.725	mm	
Gate pad size W x L	0.800*0.800	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	4.725
b1	4.025
b2	3.075
b3	0.800
A	3.390
a1	0.800
a2	0.79<bo]ጰp

5 Test conditions

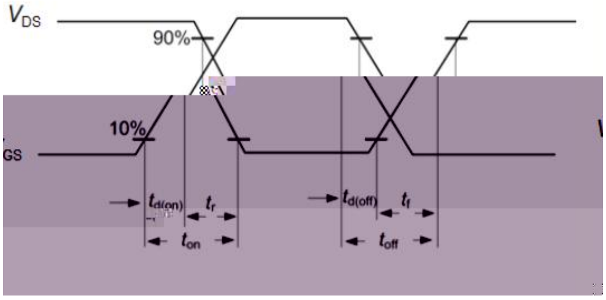

Figure A. Definition of switching times

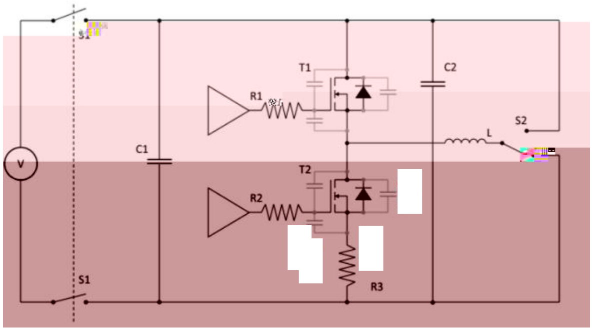

Figure B. Dynamic test circuit

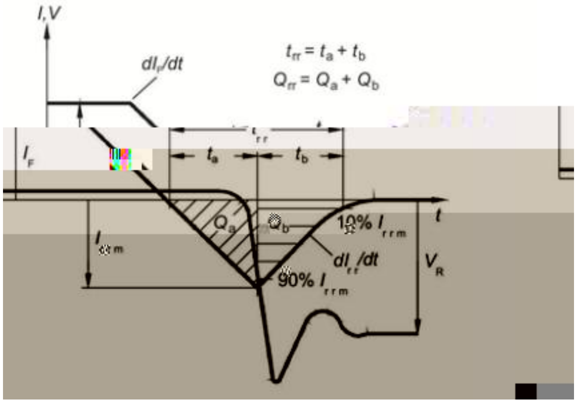

Figure C. Definition of body diode switching characteristics

Revision history

Document version	Date of release	Document stage	Description of changes
V01_00	2025-06-11	——	——
V01_01	2025-09-08	——	——
V01_02	2025-12-08	——	——
V02_00	2025-12-10	Final	——

7. Except as otherwise