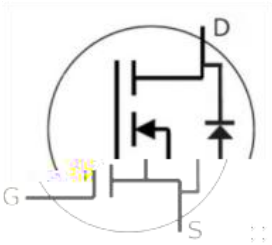
S3M010120RK-A

TriQSiC™1200V Silicon Carbide Power MOSFET G3 N Channel Enhancement

Features



- High speed switching
- Very low switching losses
- High blocking voltage with low on-resistance
- 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
S3M010120RK-A	4.8 * 6.3

Applications

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

Table 1 Key performance and package parameters

Type	V_{DS}	I_{DS} (T_C=25 , $R_{th\ (j\text{-}c),max}$ ≤ 0.26 °C/W)	$R_{DS(on),\ typ}$ (V_{GS} = 18V, I_D = 86A, T_J=25)	$T_{J,max}$
S3M010120RK-A	1200V	179A	10mΩ	175

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3 Electrical characteristic diagrams

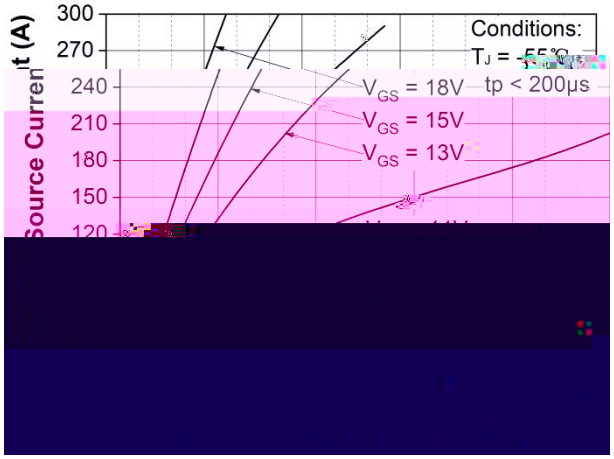


Figure 1. Output characteristics T_J = -55 ºC

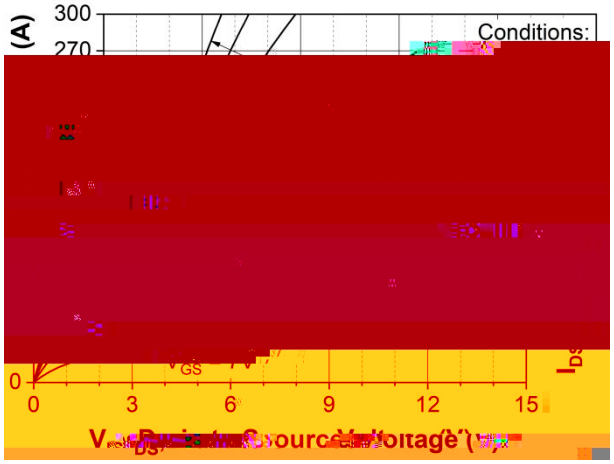


Figure 2. Output characteristics T_J = 25 ºC

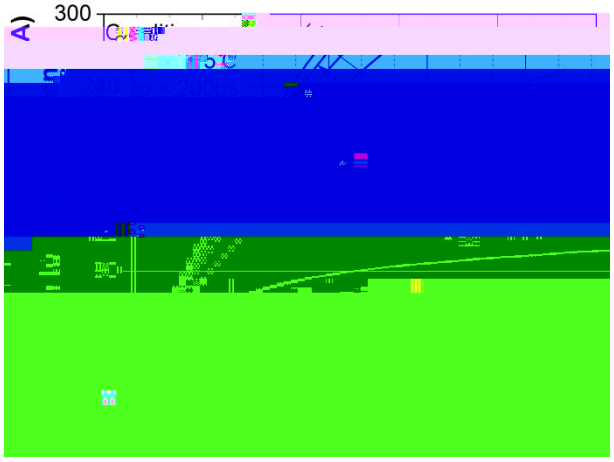


Figure 3. Output characteristics T_J = 175 ºC

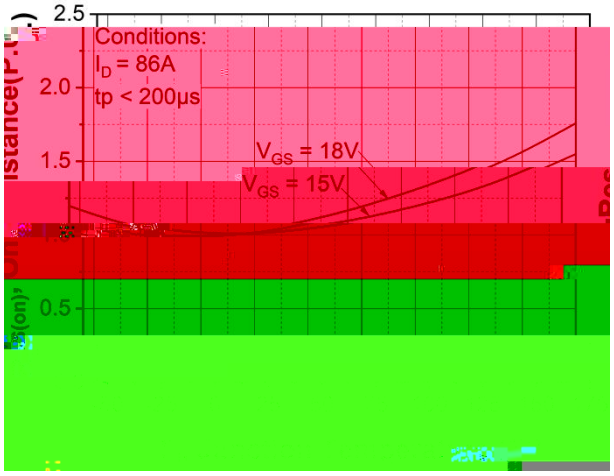


Figure 4. Normalized on-resistance vs. temperature

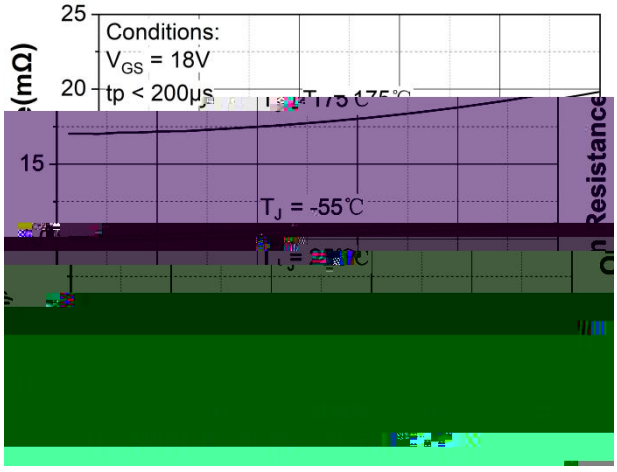


Figure 5. On-resistance vs. drain current for various temperatures

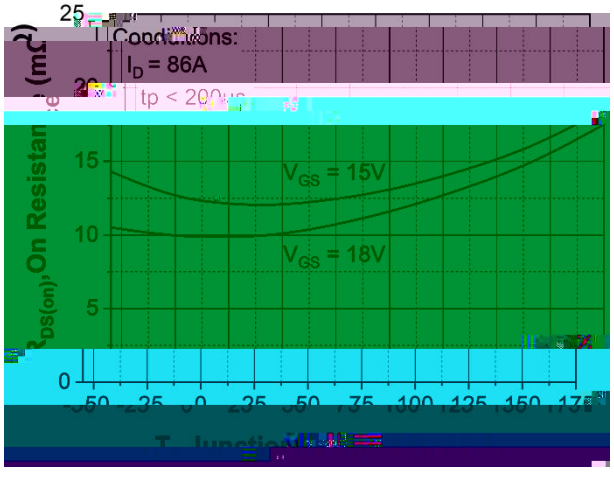


Figure 6. On-resistance vs. temperature for various gate voltages

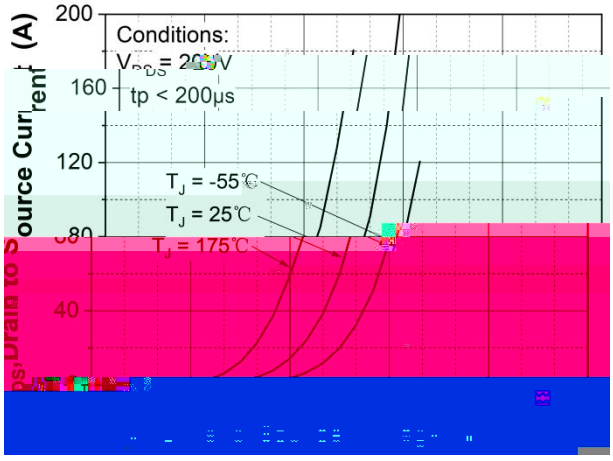


Figure 7. Transfer characteristic for various junction temperatures

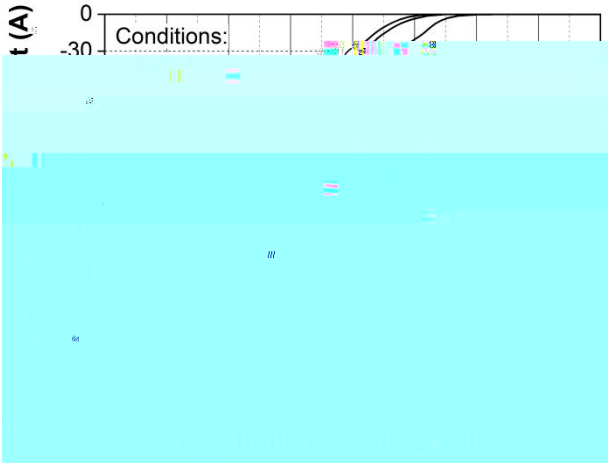


Figure 8. Body diode characteristic at T_J = -55 ºC

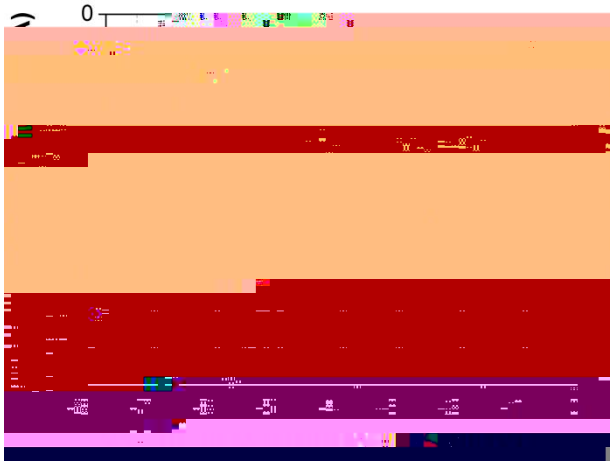


Figure 9. Body diode characteristic at T_J = 25 ºC

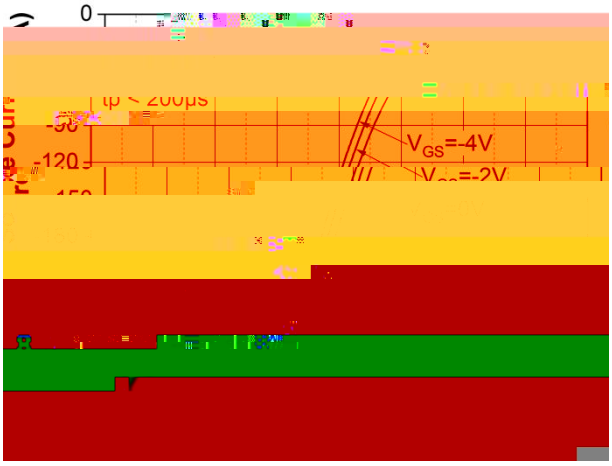


Figure 10. Body diode characteristic at T_J = 175ºC

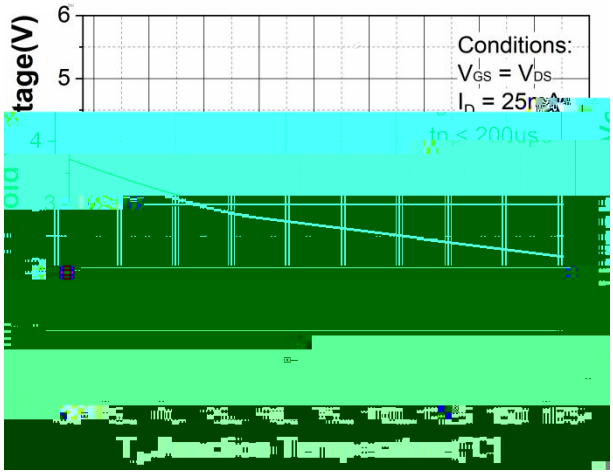


Figure 11. Threshold voltage vs. temperature

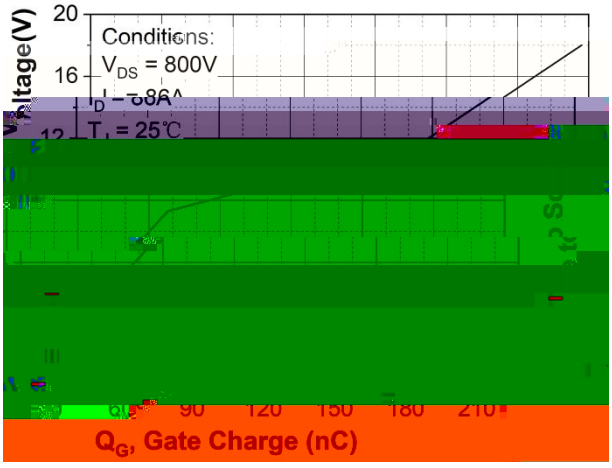


Figure 12. Gate charge characteristic

Figure 13. 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

4 Mechanical parameters

4.1 Dimensions and metallization

Parameter	Typical value	Unit	Metallization
Die size W x L	4.80 * 6.30	mm	
Gate pad size W x L	0.78 * 0.67	mm	
Source pad size W x L	1.75 *4.30	mm	
Kelvin pad size W x L	1.10 * 0.70	mm	
Die thickness	150 ± 20	μm	
Top side gate & kelvin source metallization	4	μm	AlCu

Top side

5 Test conditions

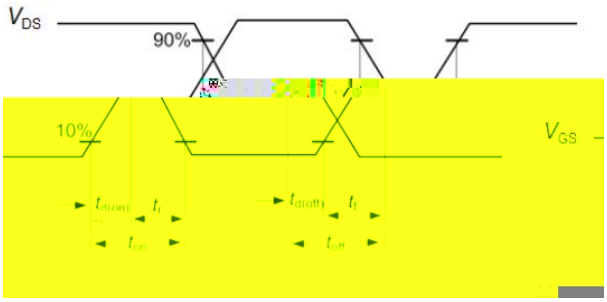


Figure A. Definition of switching times

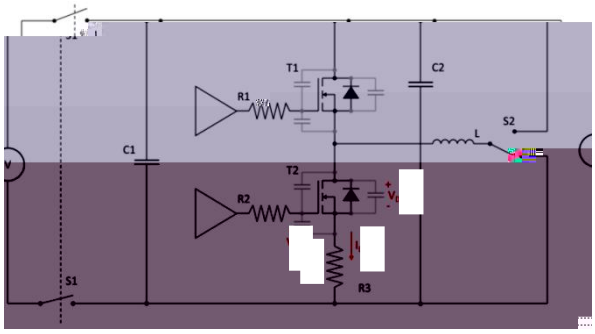


Figure B. Dynamic test circuit

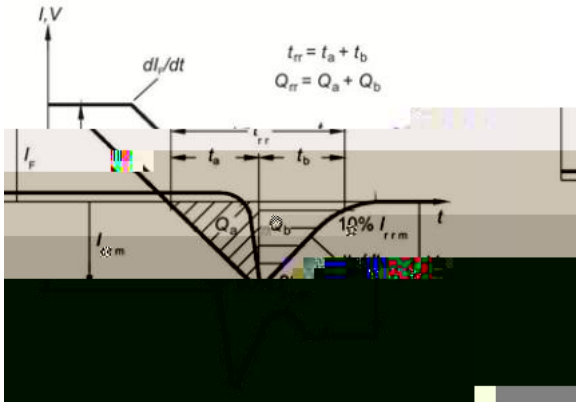


Figure C. Definition of body diode switching characteristics

Revision History

Document version	Date of release	Document stage	Description of changes
V01_00	2026-06-26	Final	——

Attention

1. RoHS compli[illegible]

Th[illegible]s o[illegible]nc[illegible]ues [illegible] to as the
[illegible] EU
2[illegible]

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.