S3M007075V1K-A

TriQSiC™750V 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
S3M007075V1K-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 , $R_{th\ (j\text{-}c),max} \leq 0.26°C/W$)	$R_{DS(on),\ typ}$ (V_{GS} = 18V, I_D = 96A, T_J = 25)	$T_{J,max}$
S3M007075V1K-A	750V	219A	7.5mΩ	175

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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	750	V	V_{GS} = 0V, I_D = 100 μA	
$V_{GS,max}$	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	219	A	V_{GS} = 18V, T_C = 25˚C	
		155		V_{GS} = 18V, T_C = 100˚C	
$I_{D(pulse)}$	Pulsed drain current	656	A	Pulse width tp=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

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Datasheet

Q_{gs}	Gate source charge	-	80	-	nC	V_{DS} = 500V, V_{GS} = -4/+18V I_D = 96A	Fig.12
Q_{gd}	Gate drain charge	-	52	-			
Q_g	Gate charge	-	262	-			

3 Electric ` к

Figure 1. Output characteristics T_J = -55 ºC

Figure 2. Output characteristics T_J = 25 ºC

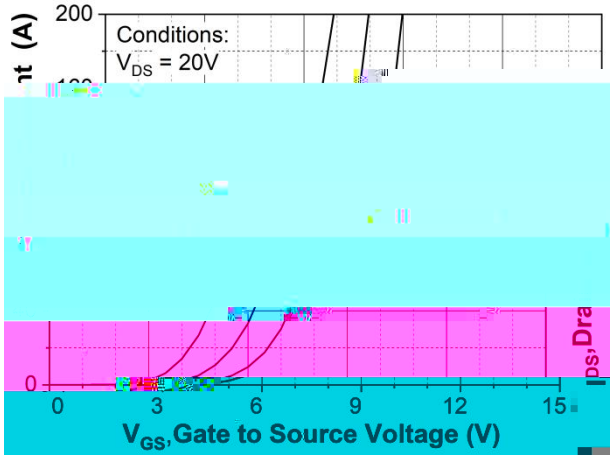


Figure 7. Transfer characteristic for various junction temperatures



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

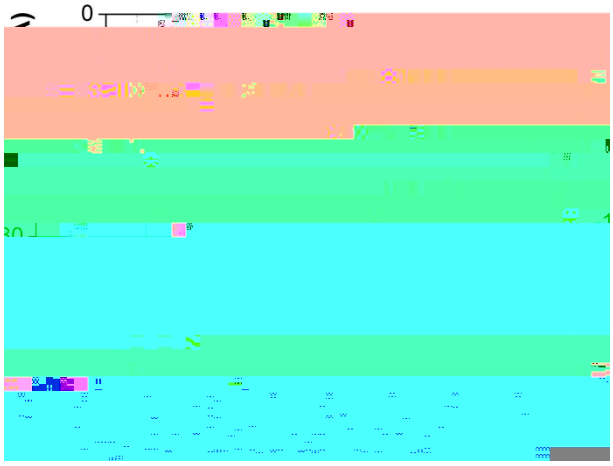


Figure 9. Body diode characteristic at T_J = 25 ºC

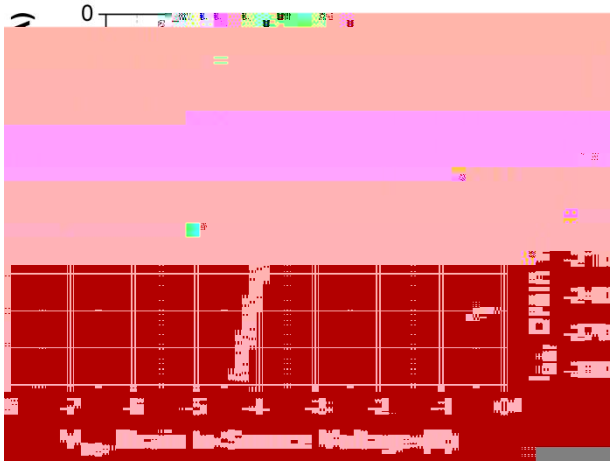


Figure 10. Body diode characteristic at T_J = 175ºC

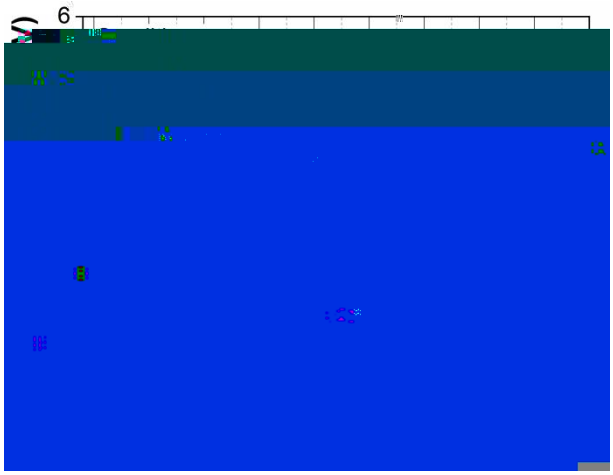


Figure 11. Threshold voltage vs. temperature

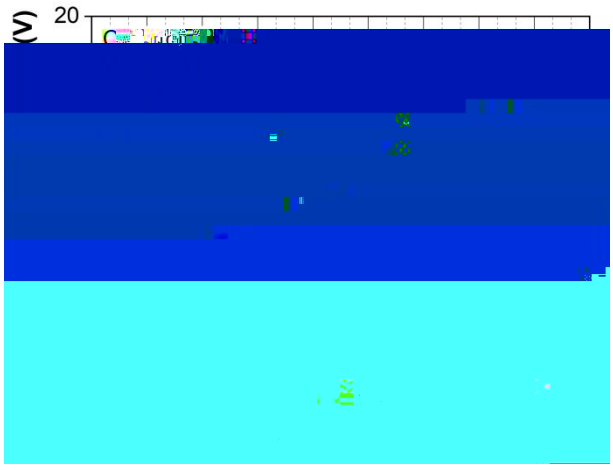


Figure 12. Gate charge characteristic

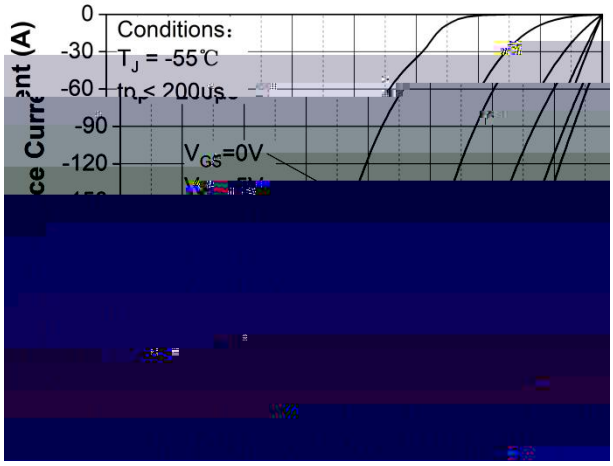


Figure 13. 3rd quadrant characteristic at T_J = -55 ºC

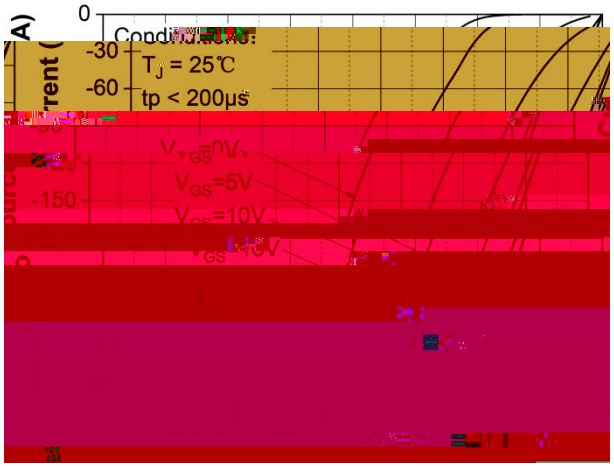


Figure 14. 3rd quadrant characteristic at T_J = 25 ºC

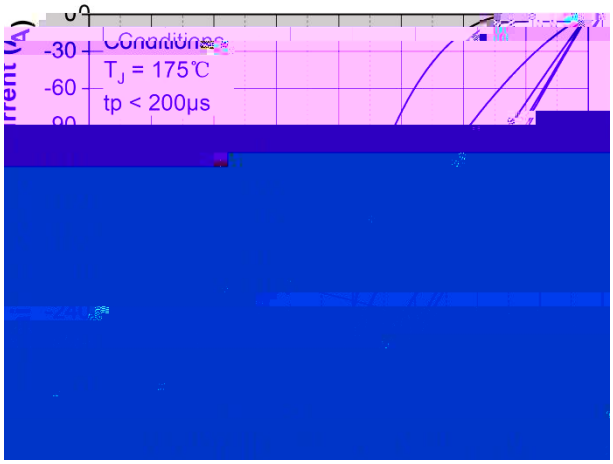


Figure 15. 3rd quadrant characteristic at T_J = 175 ºC

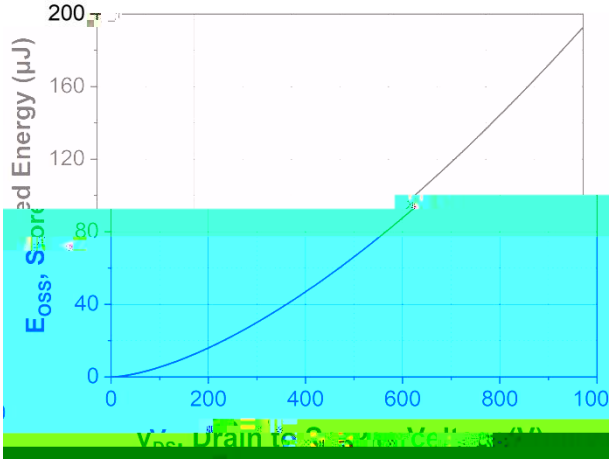


Figure 16. Output capacitor stored energy

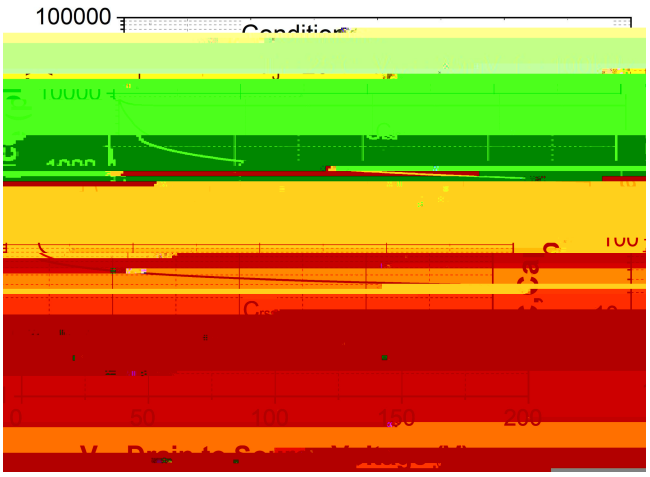


Figure 17. Capacitances vs. drain-source voltage (0 - 200V)

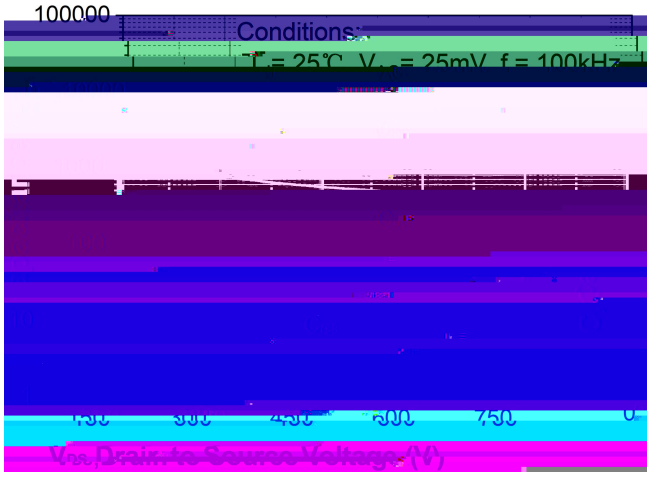


Figure 18. Capacitances vs. drain-source voltage (0 - 750V)

Revision history

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