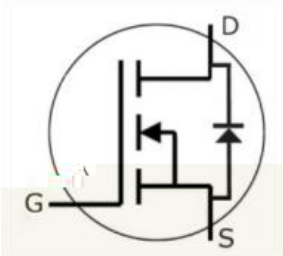
S3M007075RK-A

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
S3M007075RK-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)	$T_{J,max}$
S3M007075RK-A	750V	219A	7.5mΩ	175

S3M009075LK

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	-			

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	-	1605	-	μJ	V_{DS} = 500V, V_{GS} = -4/+18V I_D = 96A, Rg = 2.5Ω, L = 16.7μH	
E_{off}	Turn off switching energy	-	1256	-			
$t_{d\ on}$	Turn on delay time	-	3		ns		
t_r	Rise time	-	61				
t_d	Turn off delay time	-	14-				
t_f	Fall time	-	28				

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

Symbol Parameter [x.

3 Electrical characteristic diagrams

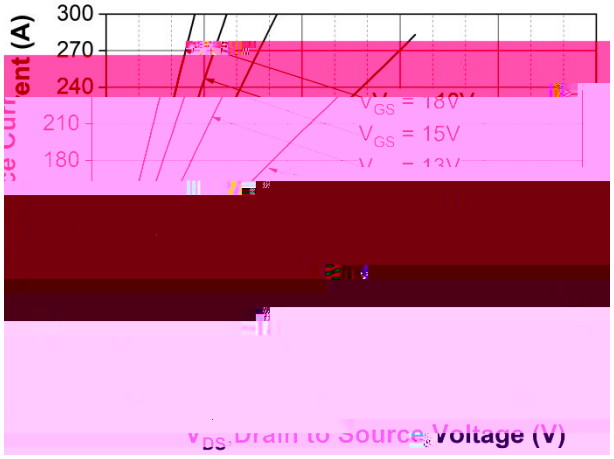


Figure 1. Output characteristics T_J = -55 ºC

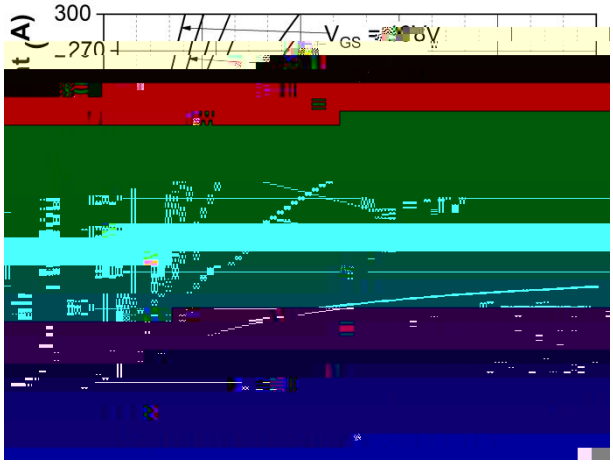


Figure 2. Output characteristics T_J = 25 ºC

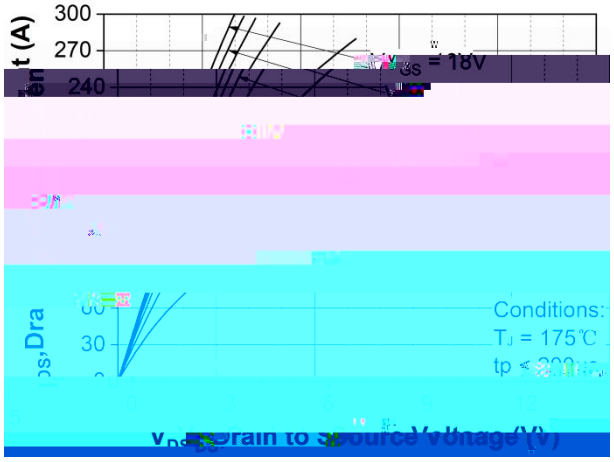


Figure 3. Output characteristics T_J = 175 ºC

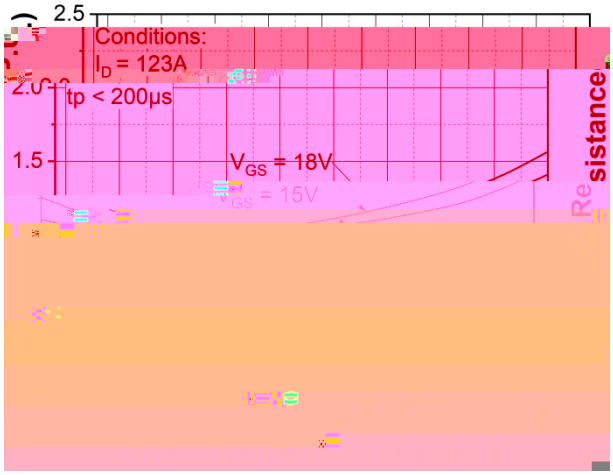


Figure 4. Normalized on-resistance vs. temperature

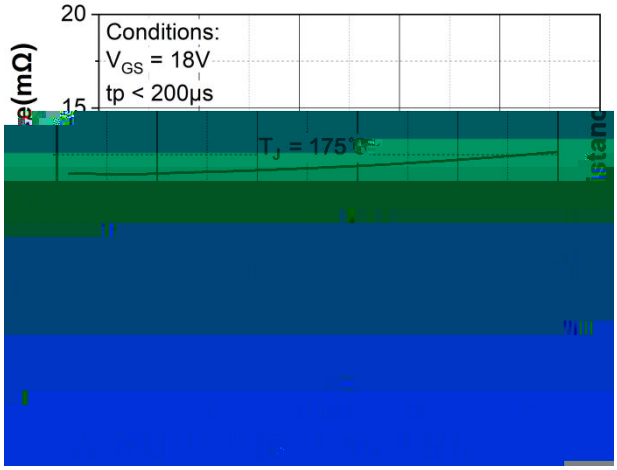


Figure 5. On-resistance vs. drain current for various temperatures

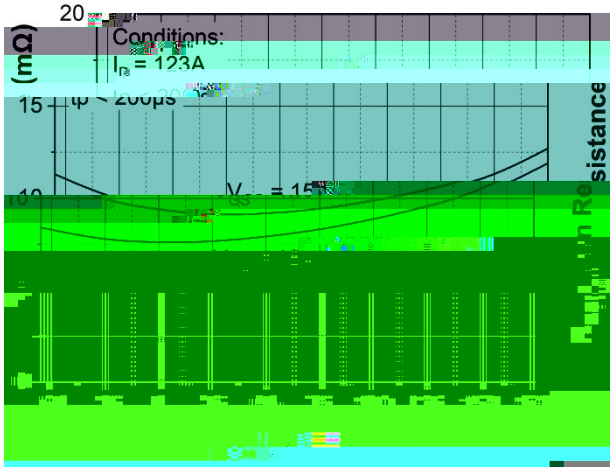


Figure 6. On-resistance vs. temperature for various gate voltages

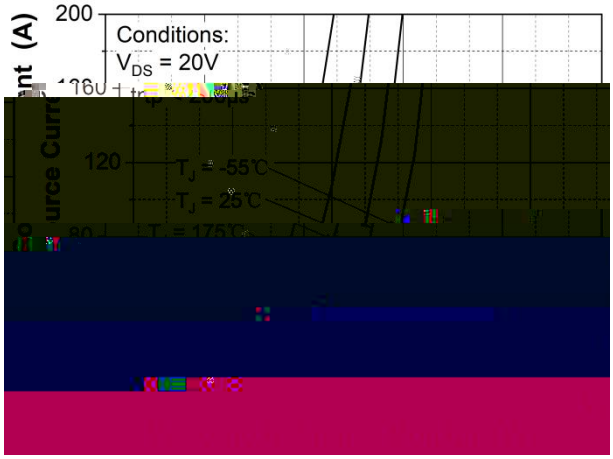


Figure 7. Transfer characteristic for various junction temperatures

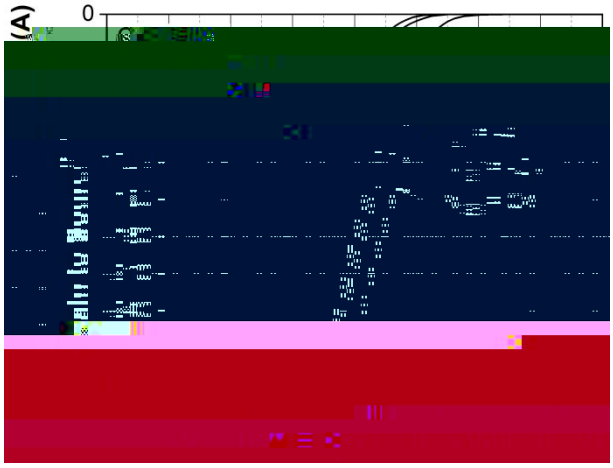


Figure 8. Body diode characteristic at T_J = -55 ºC

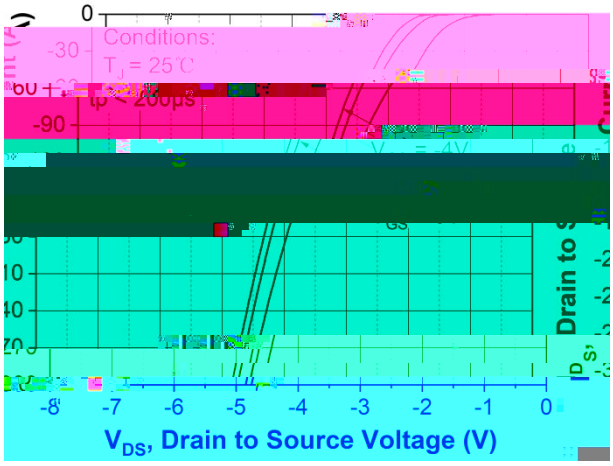


Figure 9. Body diode characteristic at T_J = 25 ºC

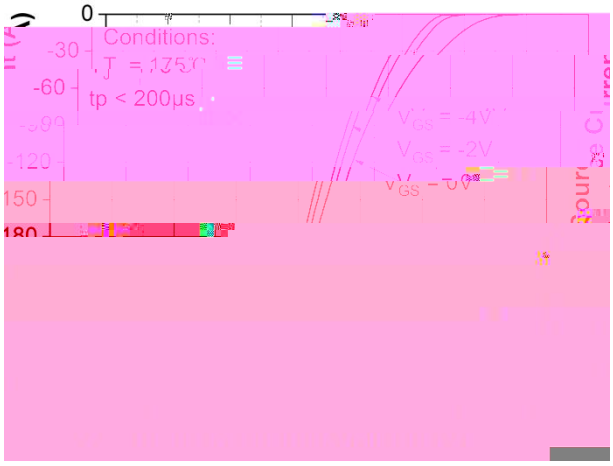


Figure 10. Body diode characteristic at T_J = 175ºC

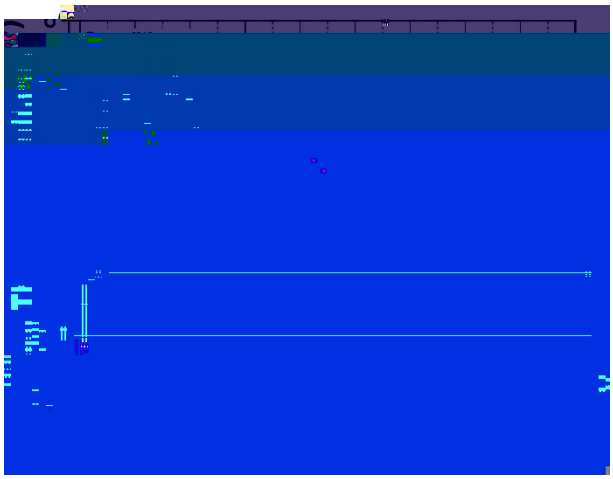


Figure 11. Threshold voltage vs. temperature

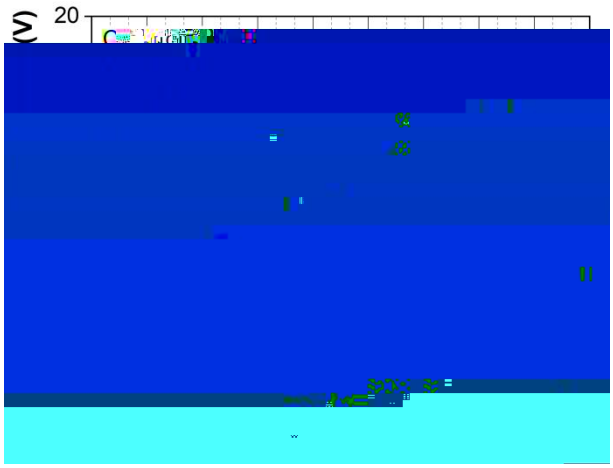


Figure 12. Gate charge characteristic

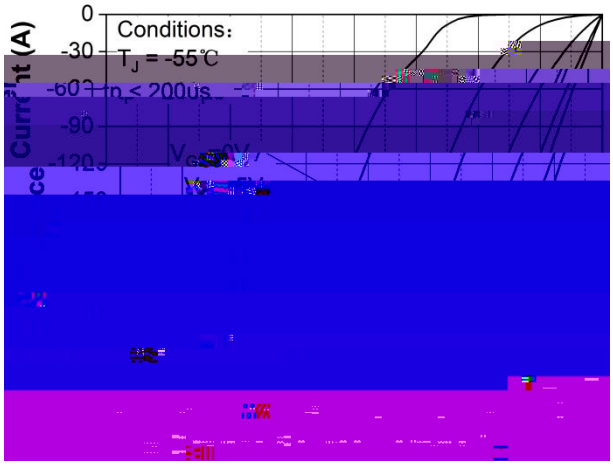


Figure 13. 3rd quadrant characteristic at T_J = -55 ºC

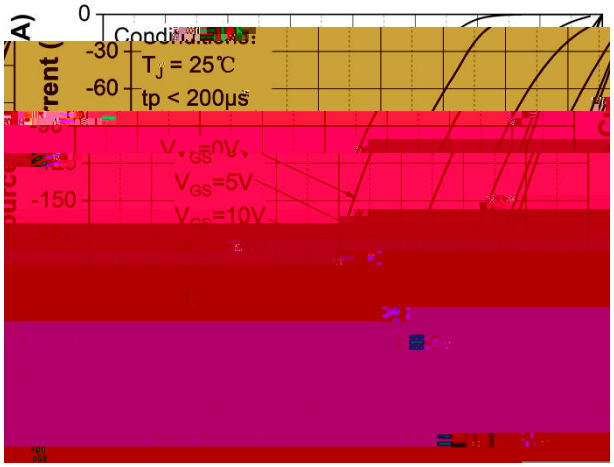


Figure 14. 3rd quadrant characteristic at T_J = 25 ºC

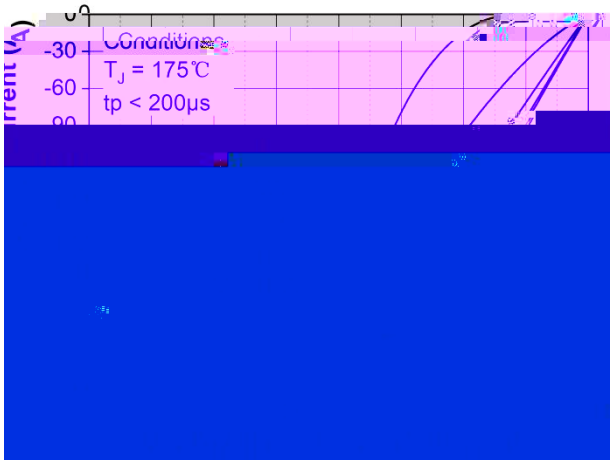


Figure 15. 3rd quadrant characteristic at T_J = 175 ºC

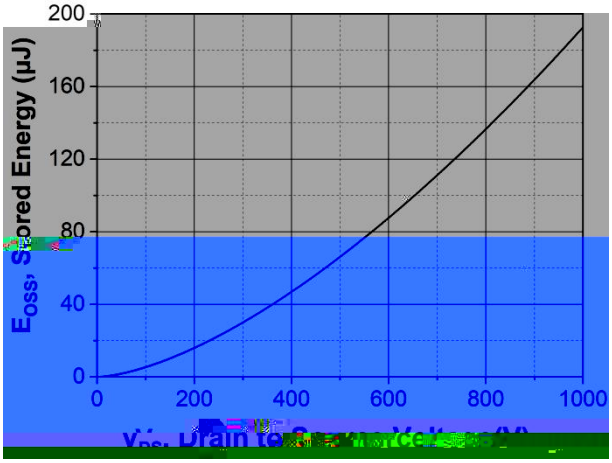


Figure 16. Output capacitor stored energy

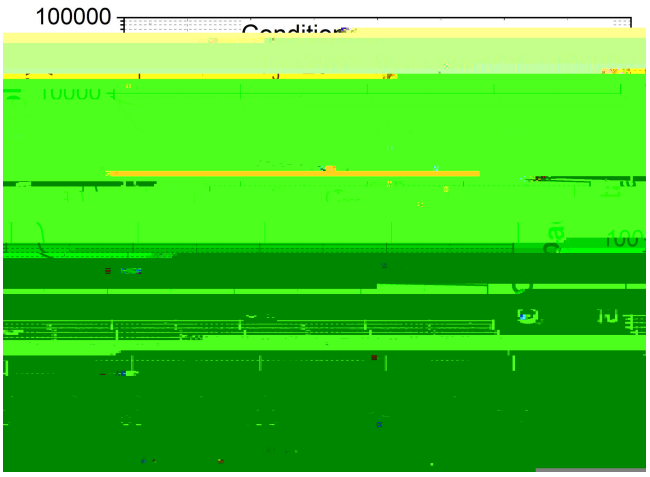


Figure 17. Capacitances vs. drain-source voltage (0 - 200V)

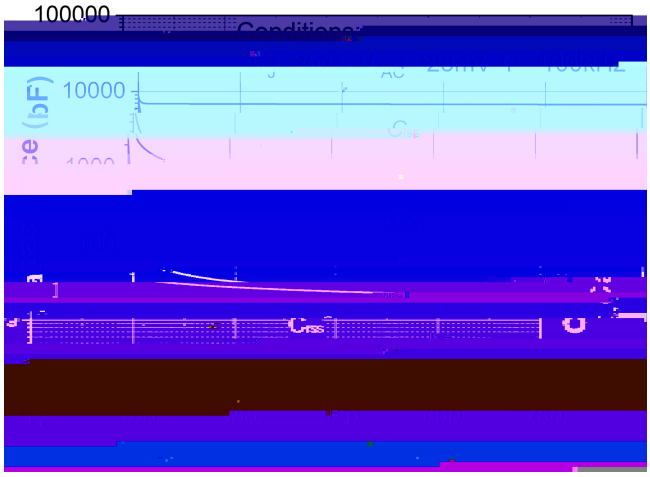


Figure 18. Capacitances vs. drain-source voltage (0 - 750V)

S3

5 Test conditions

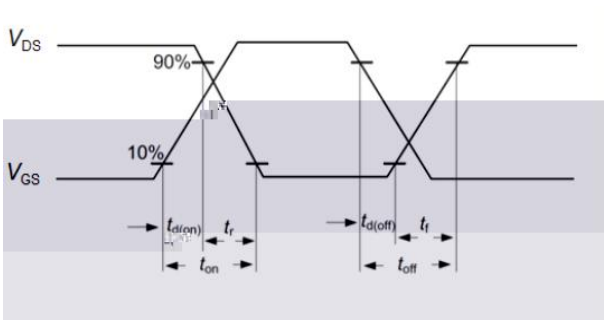


Figure A. Definition of switching times

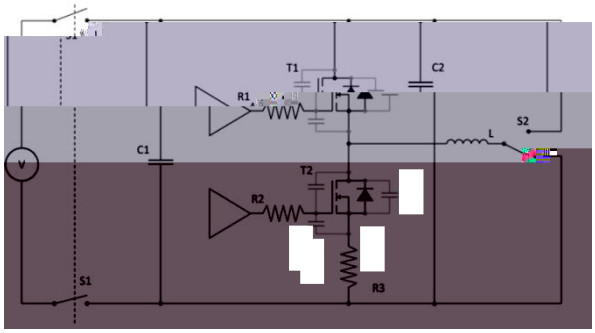


Figure B. Dynamic test circuit

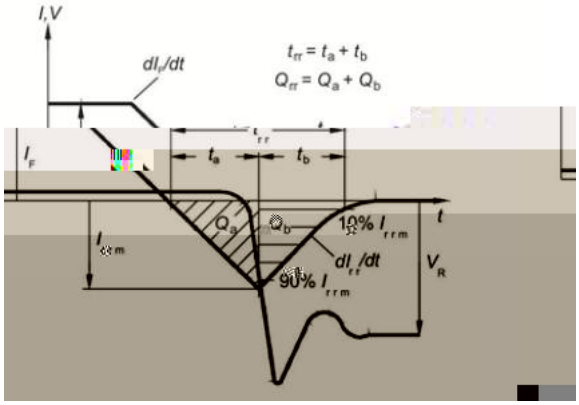


Figure C. Definition of b ’ פ

