S3M009075V1K-A

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1 Maximum ratings

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

Symbol	Parameter	Value	Unit	Test Cop o	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 Conditions	Note
$V_{(BR)DSS}$	Drain-source breakdown voltage	750	-	-	V	V_{GS} = 0V, I_D = 100μA	
$V_{GS(th)}$	Gate threshold voltage	2.3	2.8	3.6	V	V_{DS} = V_{GS}, I_D = 28mA	Fig.11
		-	2.1	-	V	V_{DS} = V_{GS}, I_D = 28mA, T_J = 175°C	
I_{DSS}	Zero gate voltage drain current	-	1	10	μA	V_{DS} = 750V, V_{GS} = 0V	
I_{GSS}	Gate source leakage current	-	-	100	nA	V_{GS} = 18V, V_{DS} = 0V	
$R_{DS(on)}$	Current drain-source on-state resistance	-	11.3	19	mΩ	V_{GS} = 15V, I_D = 100A	Fig.4,5,6
		-	16.2	-		V_{GS} = 15V, I_D = 100A, T_J = 175°C	
		-	9.6	15		V_{GS} = 18V, I_D = 100A	
		-	15.2	-		V_{GS} = 18V, I_D = 100A, T_J = 175°C	
g_{fs}	Transconductance	-	84	-	S	V_{DS} = 20V, I_D = 100A	Fig.7
		-	72	-		V_{DS} = 20V, I_D = 100A, T_J = 175°C	
$R_{g,int}$	Internal gate resistance	-	7.9				

Q_{gs}	Gate source charge			60	-	nC	V_{DS} = 500V, V_{GS} = -4/+18V I_D = 100A	Fig.12
Q_{gd}	Gate drain charge		-	42	-			
Q_g	Gate charge		-		-			

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	-	980	-	μJ	V_{DS} = 500V, V_{GS} = -4/+18V I_D = 100A, Rg = 2.5Ω, L = R *T*	

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3 Electrical characteristic diagrams

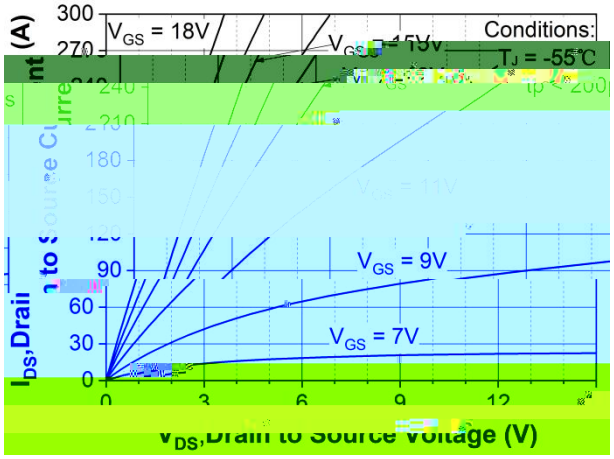


Figure 1. Output characteristics T_J = -55 ºC

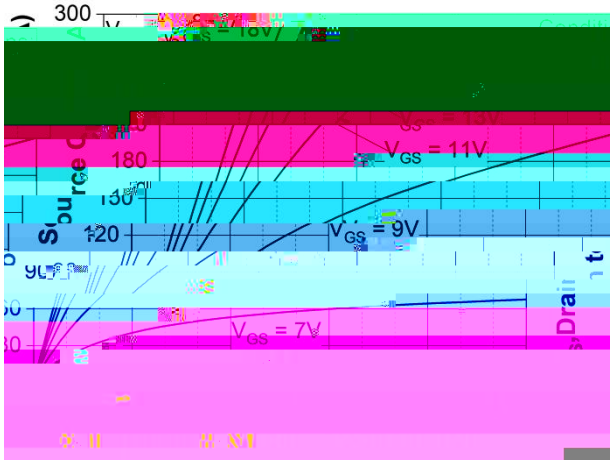


Figure 2. Output characteristics T_J = 25 ºC

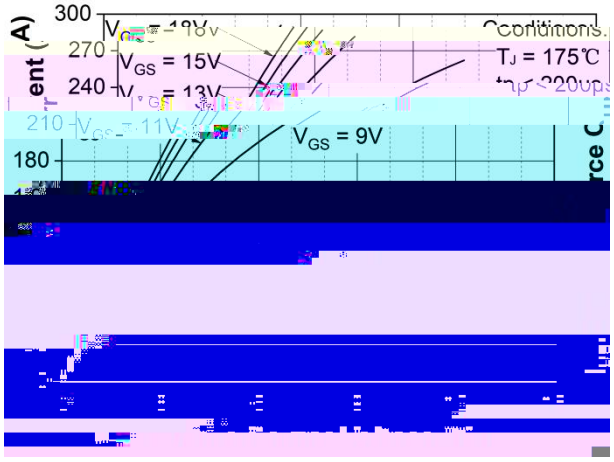


Figure 3. Output characteristics T_J = 175 ºC

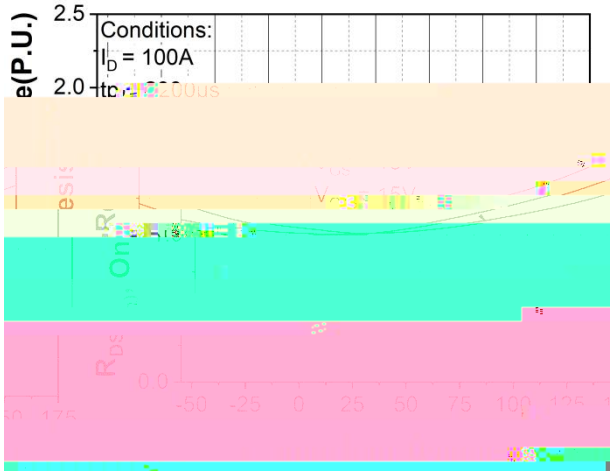


Figure 4. Normalized on-resistance vs. temperature

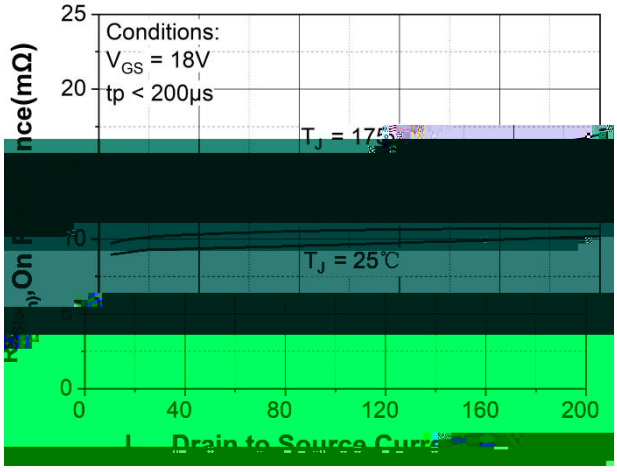


Figure 5. On-resistance vs. drain current for various temperatures

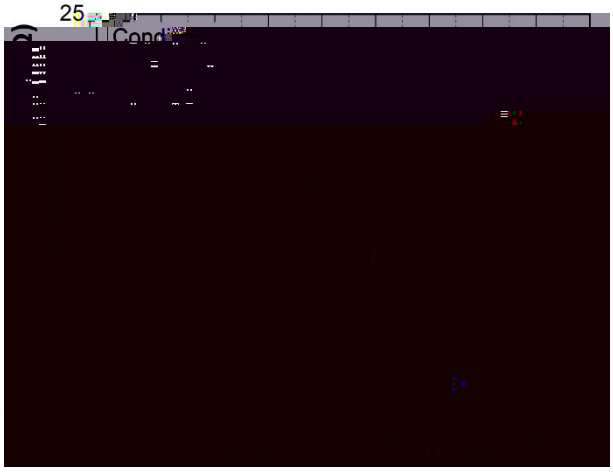


Figure 6. On-resistance vs. temperature for various gate voltages

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

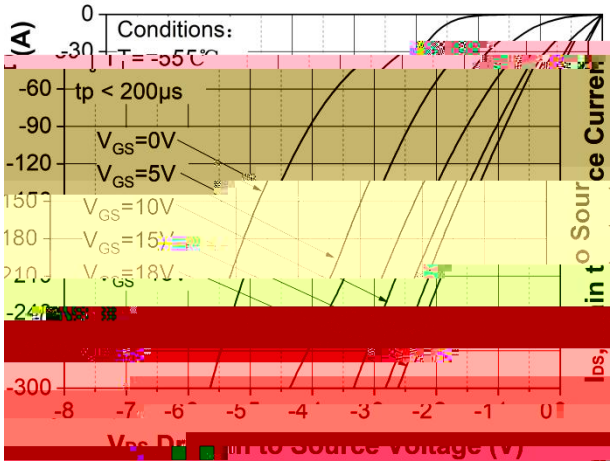


Figure 13. 3rd quadrant characteristic at T_J = -55 ºC

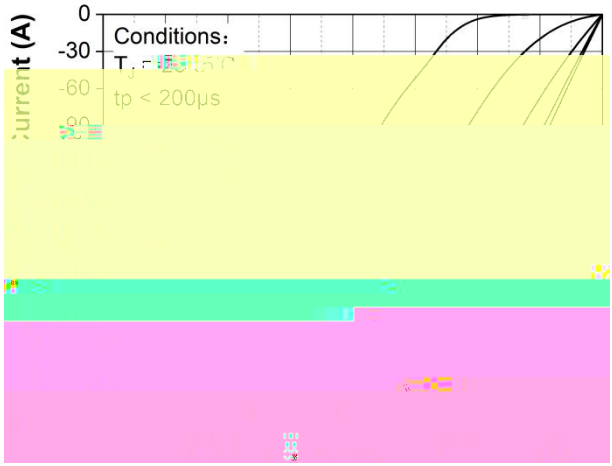


Figure 14. 3rd quadrant characteristic at T_J = 25 ºC

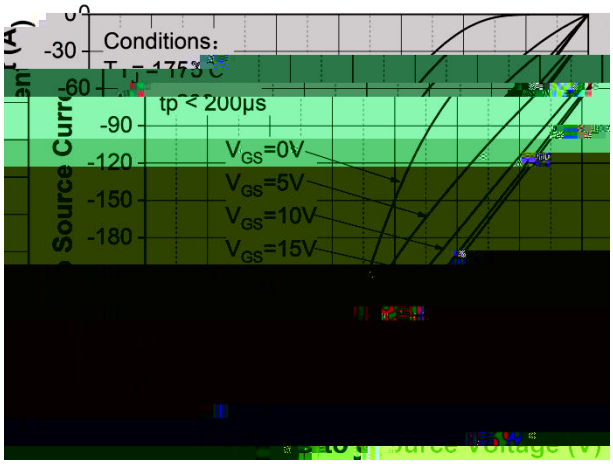


Figure 15. 3rd quadrant characteristic at T_J = 175 ºC

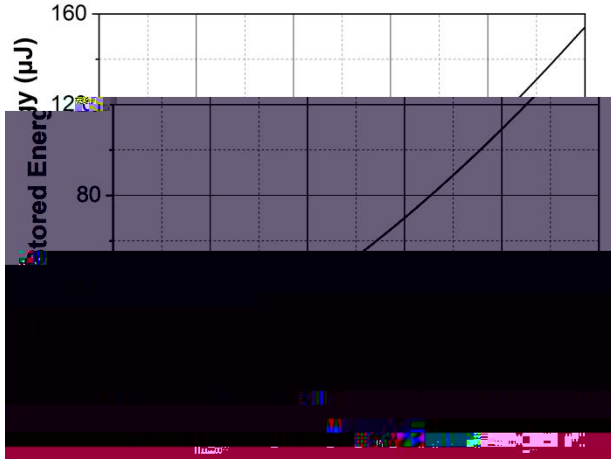


Figure 16. Output capacitor stored energy

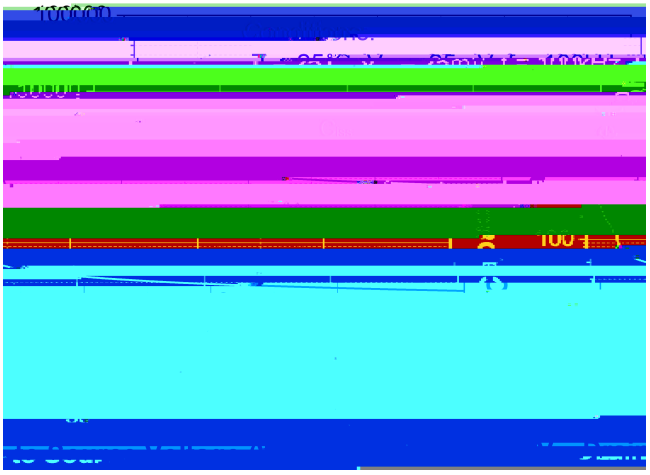


Figure 17. Capacitances vs. drain-source voltage (0 - 200V)

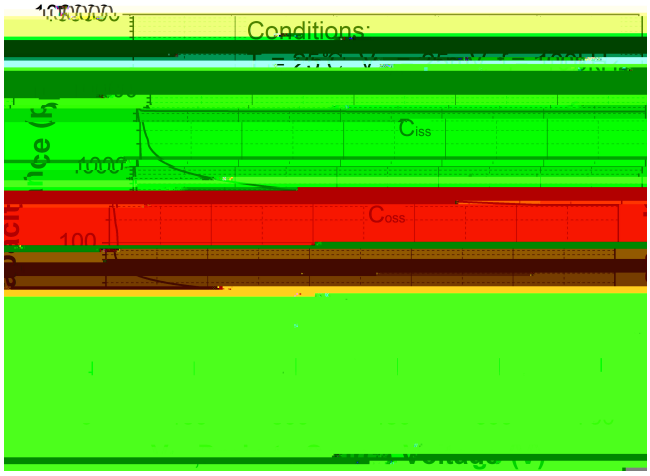


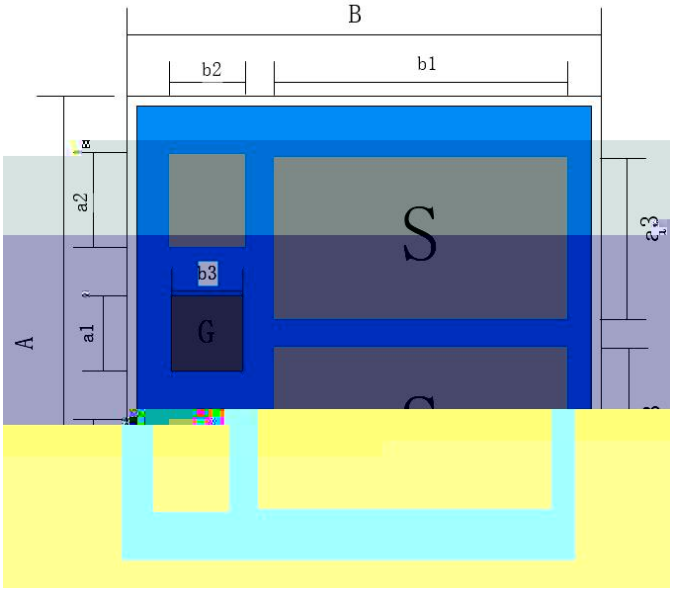
Figure 18. Capacitances vs. drain-source voltage (0 - 750V)

4 Mechanical parameters

4.1 Dimensions and metallization

Parameter	Typical value	Unit	Metallization
Die size W x L	5 * 5	mm	
Gate pad size W x L	0.78 * 0.68	mm	
Source pad size W x L	1.9 * 3.1	mm	
Kelvin pad size W x L	1.25 * 0.70	mm	
Die thickness	130 ± 20	μm	
Top side gate & kelvin source metallization	4/4/12	μm	AlCu/Ni/Cu
Top side power source metallization	4/4/12	μm	AlCu/Ni/Cu
Back side drain metallization	1	μm	Ag

4.2 Layout



Symbol	Dimension / mm
B	5
b1	3.1
b2	0.7
b3	0.68
A	5
a1	0.78
a2	1.25
a3	1.9

S3M009075V1K-A

Revision history

Document version	Date of release

[redacted]

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