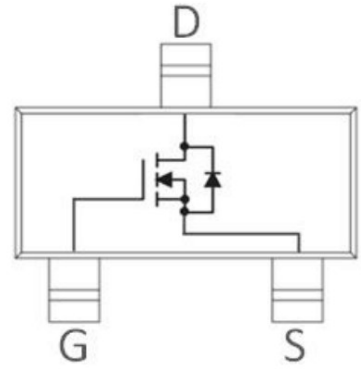
N-Channel MOSFET

FEATURES

✧Epoxy meets UL 94 V-0 flammability rating
✧High density cell design for low RDS(ON)
✧Trench Power LV MOSFET technology

PIN CONFIGURATION



Package: SOT-23 Marking: A09T

APPLICATIONS

✧Battery management
✧High speed switch
✧Low power DC to DC converter

ABSOLUTE MAXIMUM RATING (Tamb=25°C)

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Continuous Drain Current	5.8	A
I_{DM}	Drain Current-Pulsed	23	A
P_D	Total Power Dissipation	1.2	W
T_J & T_{stg}	Junction Temperature and Storage Temperature	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	104	°C/W

ELECTRICAL CHARACTERISTICS (Tamb=25°C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
$V_{(BR)DSS}$	Drain-Source Voltage Breakdown Voltage	V_{GS}=0V, I_D=250uA	30			V
$V_{GS(th)}$	Gate-Threshold Voltage	V_{DS}=VGS, I_D=250uA	0.7	0.8	1.5	V
I_{GSS}	Gate-Body Leakage	V_{DS}=0V, V_{GS}=±12V			100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	μA
$R_{DS(on)}$	Drain-Source On-Resistance ①	V_{GS}=10V, I_D=5.8A V_{GS}=4.5V, I_D=5A V_{GS}=2.5V, I_D=4A		21 24 32	30 35 50	mΩ
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=2A			0.9	V

Dynamic Characteristics (Tamb=25°C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
Ciss	Input Capacitance②	V_{DS}=15V V_{GS}=0V f=1MHZ		635		pF
Coss	Output Capacitance②			56		
Crss	Reverse Transfer Capacitance②			46		

Switching Characteristics (Tamb=25°C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
$t_{d(on)}$	Turn on Delay Time	V_{GS}=10V, V_{DS}=15V, R_L=2.7Ω,R_{GEN}=6Ω		12		nS
t_r	Turn-on Rise Time			52		
$t_{d(off)}$	Turn off Delay Time			17		
t_f	Turn-off Fall Time			10		
Qg	Total Gate Charge	V_{GS}=10V I_D=5.6A,V_{DS}=15V		5.2		nC
Qgs	Gate-Source Charge			1.2		
Qgd	Gate-Drain Charge			1.7		

Note:

① Pulse test: Pulse width≤300μS, duty cycle≤2%.

② These parameters have no way to verify.

ELECTRICAL CHARACTERISTICS CURVE

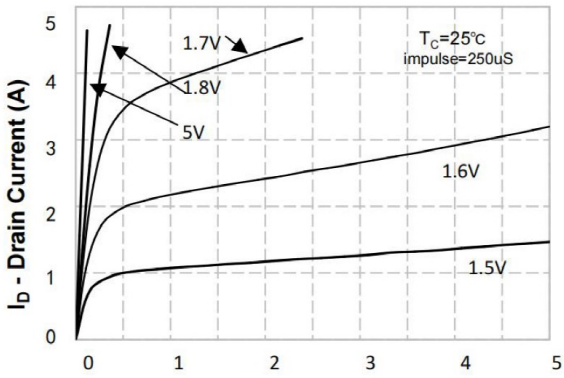


Figure 1. On-Region Characteristics

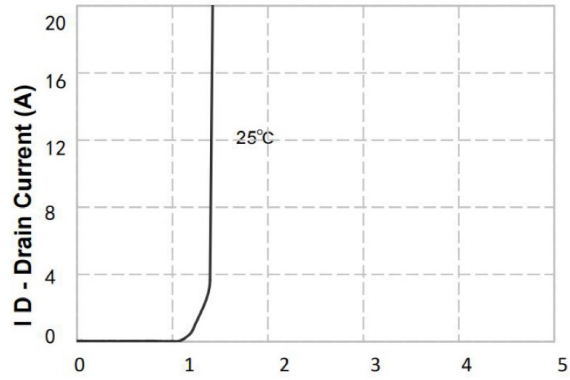


Figure 2. Transfer Characteristics

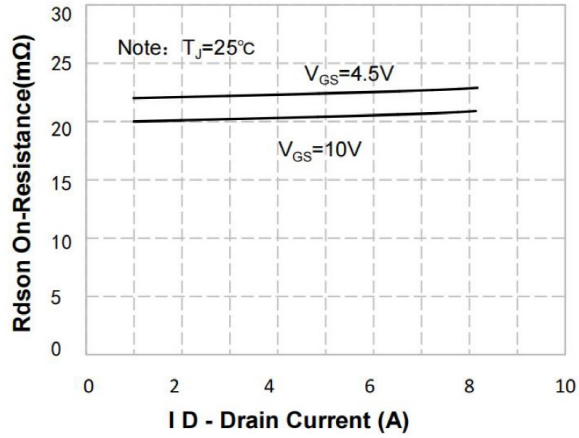


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

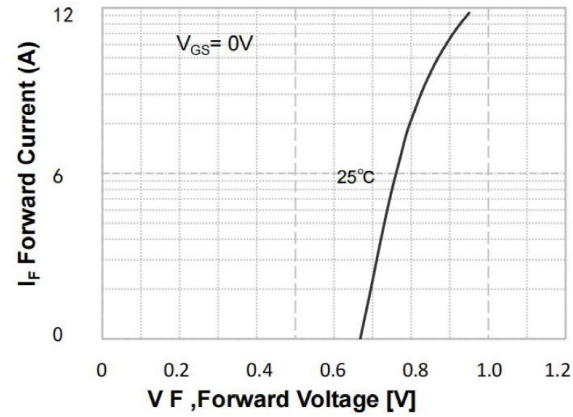


Figure 4. Body Diode Forward Voltage Variation with Source Current

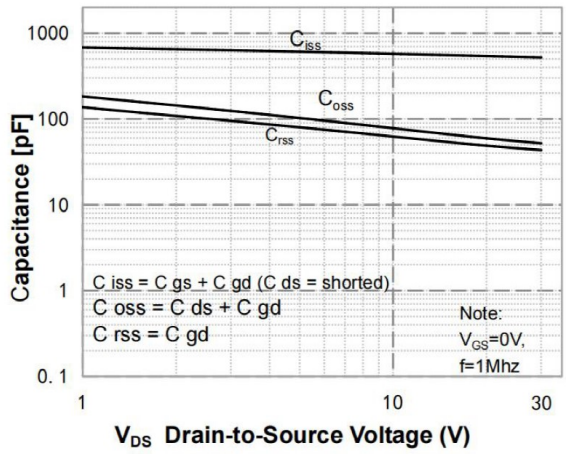


Figure 5. Capacitance Characteristics

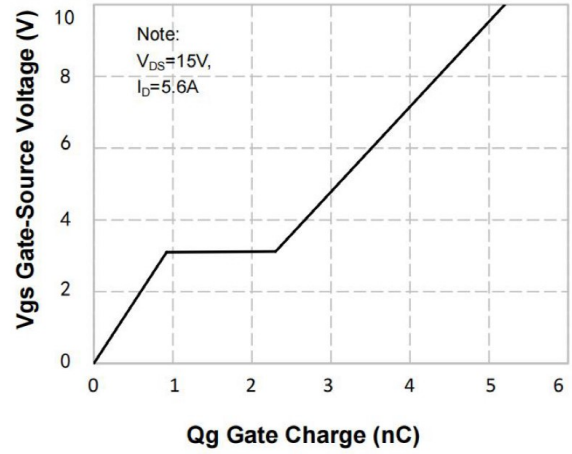


Figure 6. Gate Charge Characteristics

ELECTRICAL CHARACTERISTICS CURVE

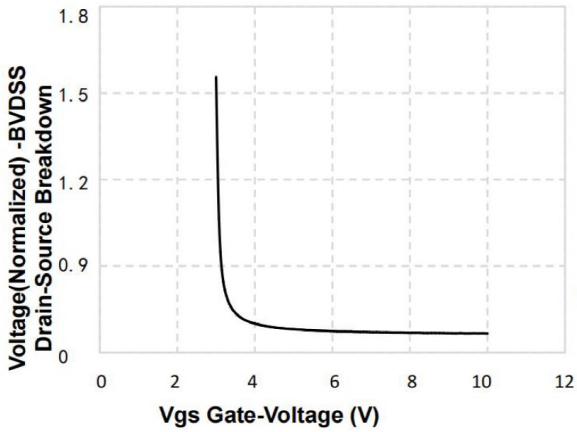


Figure 7. Breakdown Voltage Variation vs Gate-Voltage

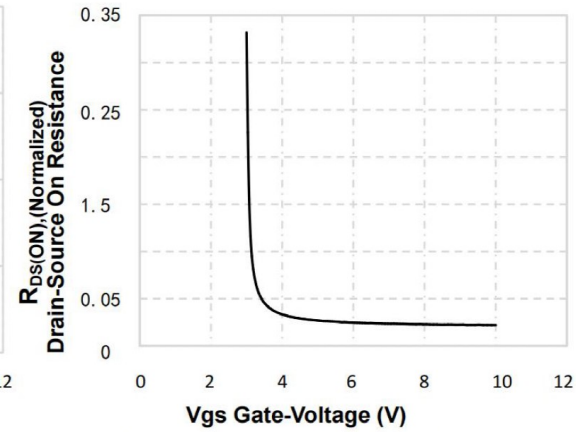


Figure 8. On-Resistance Variation vs Gate Voltage

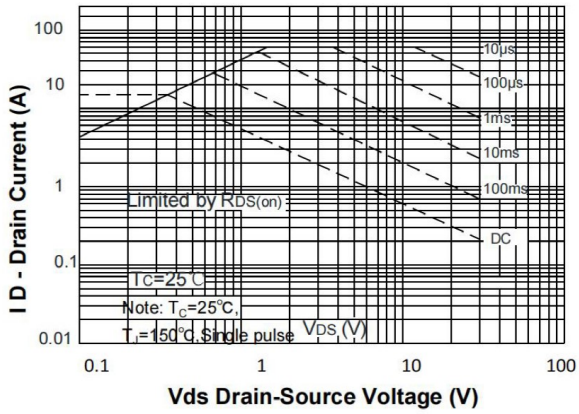


Figure 9. Maximum Safe Operating Area

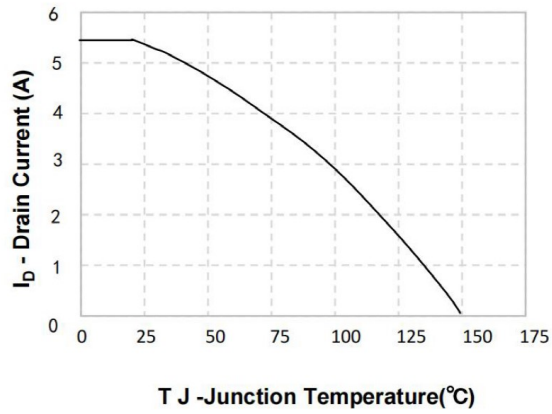


Figure 10. Maximum Continuous Drain Current vs Temperature

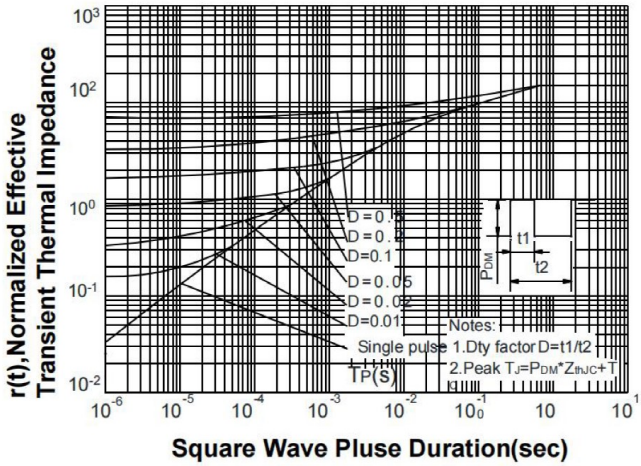
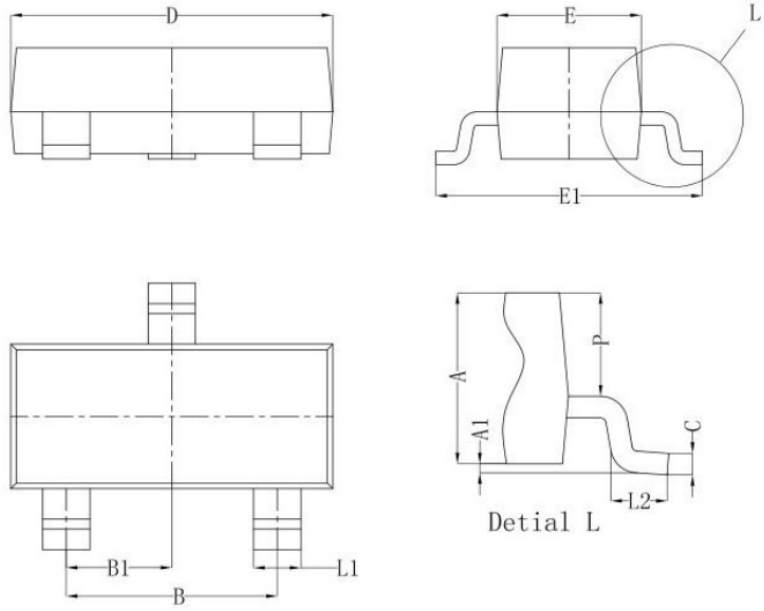


Figure 11. Transient Thermal Response Curve

SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dim in mm		
	Min	Nom	Max
A	0.900	1.000	1.100
A1	0.000	0.050	0.100
B	1.800	1.900	2.000
B1	0.950 TYP		
C	0.100	0.110	0.120
D	2.800	2.900	3.000
E	1.250	1.300	1.350
E1	2.250	2.400	2.550
L1	0.350	0.400	0.500
L2	0.200	0.350	0.450
P	0.550	0.575	0.600