HL3400
N-CHANNEL MOSFET

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SOT-23 Plastic-Encapsulate MOSFETS

● Features

· V_{DS}=30V
· I_D=5.6A
· $R_{DS(on)}@V_{GS}$=10V $<$ 27mΩ
· $R_{DS(on)}@V_{GS}$=4.5V $<$ 33mΩ
· Trench Power LV MOSFET technology
· Voltage controlled small signal switch
· Fast Switching Speed

● Applications

· Battery protection
· Load switch
· Power management
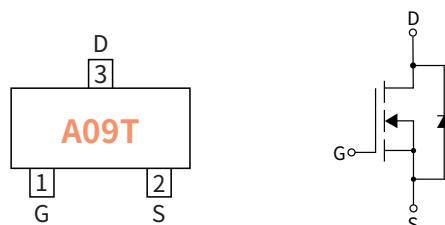
● Mechanical Data

· Case: SOT-23
  Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
· Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

Drain-source Voltage
30 V
Drain Current
5.6 Ampere

SOT-23

● Function Diagram

● Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Drain-source Voltage	V_{DS}	V	30
Gate-source Voltage	V_{GS}	V	±12
Drain Current	I_D	A	5.6
Pulsed Drain Current [1]	I_{DM}	A	23
Total Power Dissipation [2]	P_D	W	1.2
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Ambient @ Steady State [2]	$R_{\theta JA}$	°C / W	104

● Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	45000	180000	7''

● Static Parameter Characteristics (Ta=25℃ Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250µA	V	30	—	—
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V	µA	—	—	1.0
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±12V, V_{DS}=0V	nA	—	—	±100
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250µA	V	0.65	0.9	1.5
Static Drain-Source On-Resistance [3]	$R_{DS(ON)}$	V_{GS}= 10V, I_D=5.6A	mΩ	—	21	27
		V_{GS}= 4.5V, I_D=5.0A		—	25	33
		V_{GS}= 2.5V, I_D=3.0A		—	33	51
Gate resistance	R_g	V_{DS}=0V, ,V_{GS}= 0,f=1MHz	Ω	—	—	3.6
Forward Transconductance	g_{FS}	V_{DS}=5.0V, I_D=5.0A	S	8.0	—	—
Diode Forward Voltage	V_{SD}	I_S=5.6A, V_{GS}=0V	V	—	—	1.2

● Dynamic Parameters (Ta=25℃ Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	V_{DS}=15V V_{GS}=0V f=1MHZ	pF	—	630	—
Output Capacitance	C_{oss}			—	90	—
Reverse Transfer Capacitance	C_{rss}			—	71	—

● Switching Parameters (Ta=25℃ Unless otherwise specified)

| PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Total Gate Charge	Q_g	V_{GS}=10V V_{DS}=15V I_D=5.6	nC	—	17	—
Gate-Source Charge	Q_{gs}			—	2.0	—
Gate-Drain Charge	Q_{gd}			—	2.0	—
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V V_{DD}=15V I_D=5.6A R_{GEN}=3.0Ω	ns	—	5.0	—
Turn-on Rise Time	t_r			—	28	—
Turn-off Delay Time	$t_{D(off)}$			—	16	—
Turn-off fall Time	t_f			—	26	—

Note :

(1)Repetitive rating, pulse width limited by junction temperature $T_{J(Max)}$=150℃ .Ratings are based on low frequency and duty cycles to keep initial T_J=25℃ .

(2)The value of P_D and $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25℃ .

(3)Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

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● **Ratings And Characteristics Curves** (Ta=25℃ Unless otherwise specified)
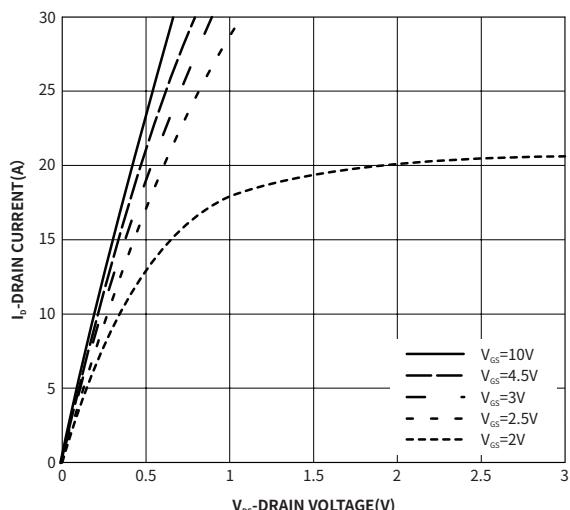
Fig.1 Output Characteristics

- V_{GS}=10V
- V_{GS}=4.5V
- V_{GS}=3V
- V_{GS}=2.5V
- V_{GS}=2V
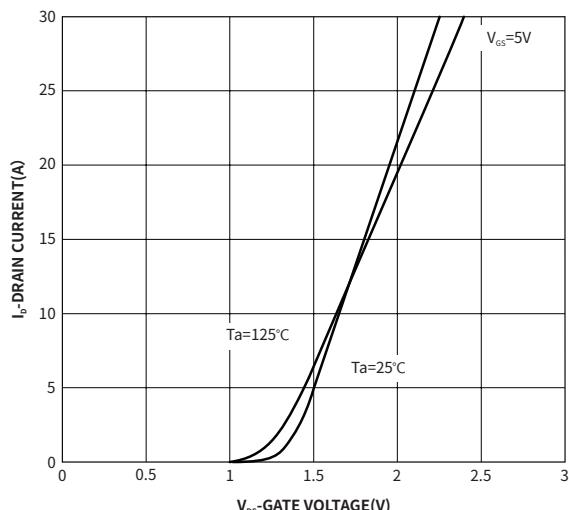
Fig.2 Transfer Characteristics

V_{GS}=5V
Ta=125℃
Ta=25℃
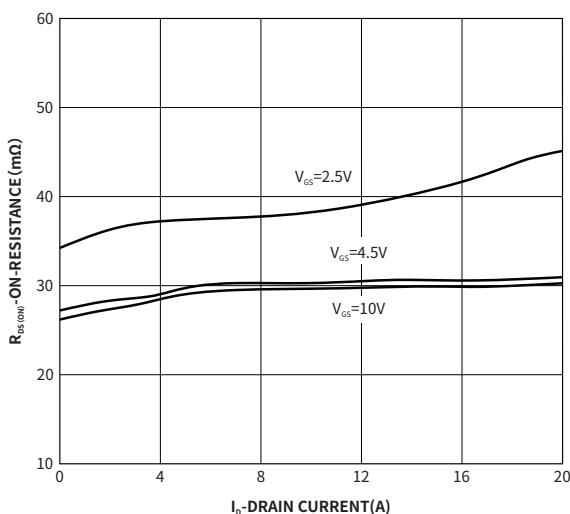
Fig.3 On-Resistance vs. Drain Current and Gate Voltage

V_{GS}=2.5V
V_{GS}=4.5V
V_{GS}=10V
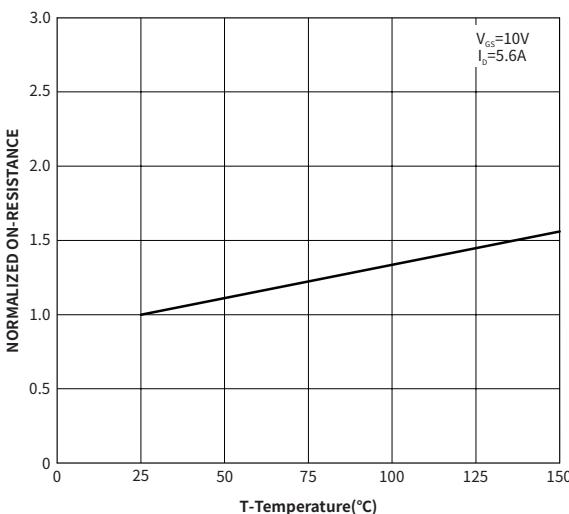
Fig.4 On-Resistance vs. Junction Temperature

V_{GS}=10V
I_D=5.6A
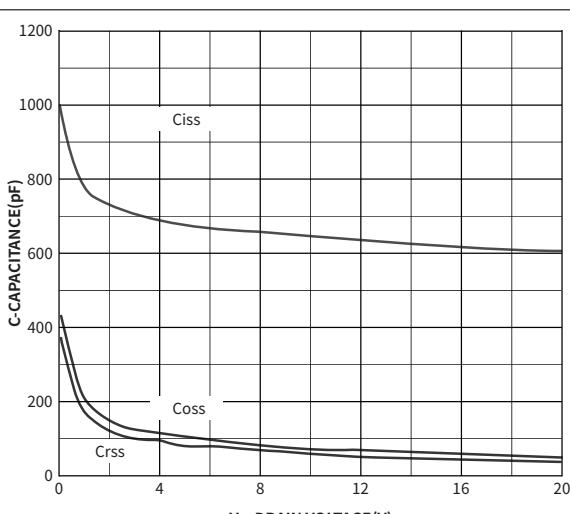
Fig.5 Capacitance Characteristics
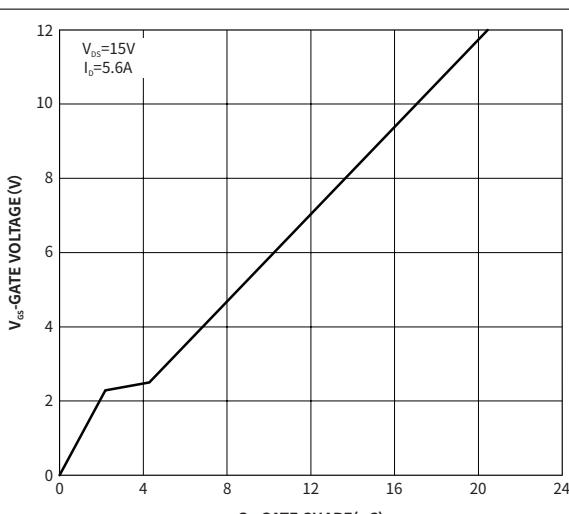
Ciss
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Fig.6 Gate Charge

V_{DS}=15V
I_D=5.6A

• Ratings And Characteristics Curves (Ta=25℃ Unless otherwise specified)
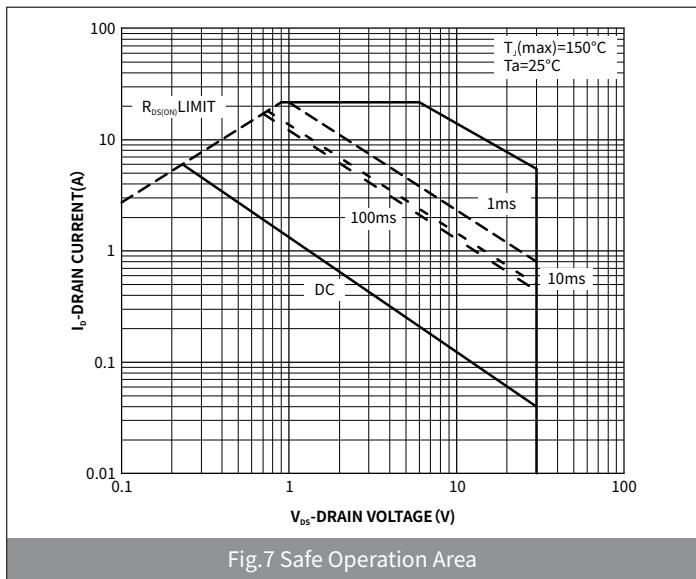
Fig.7 Safe Operation Area
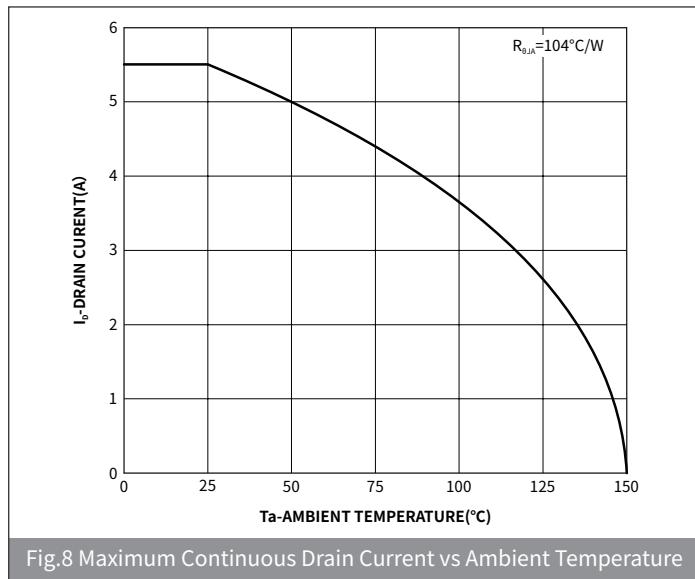
Fig.8 Maximum Continuous Drain Current vs Ambient Temperature
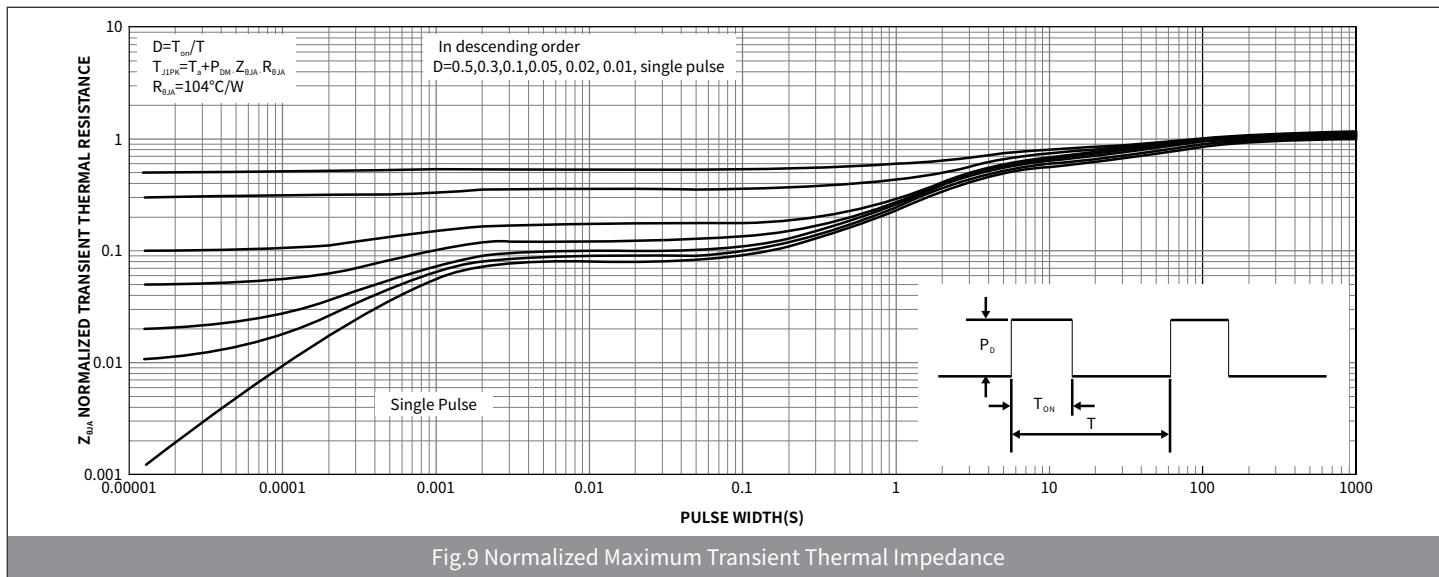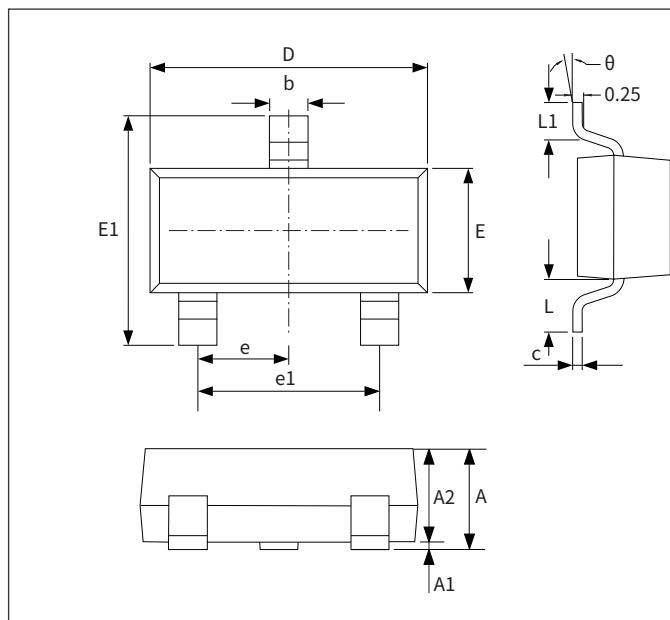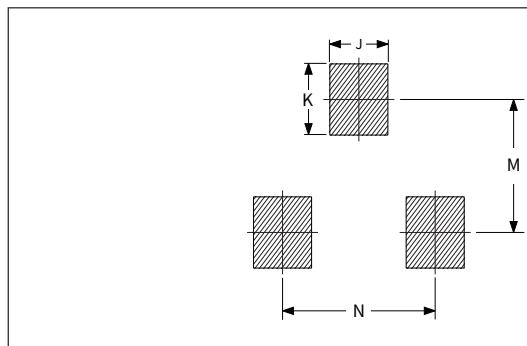
Fig.9 Normalized Maximum Transient Thermal Impedance

● Package Outline Dimensions (SOT-23)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	-	0.10	-	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.80	2.00	0.071	0.079
L	0.550REF		0.022REF	
L1	0.30	0.50	0.012	0.020
θ	-	8°	-	8°

● Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	0.75	0.85	0.030	0.033
K	0.85	0.95	0.033	0.037
M	1.95	2.05	0.077	0.081
N	1.85	1.95	0.073	0.077