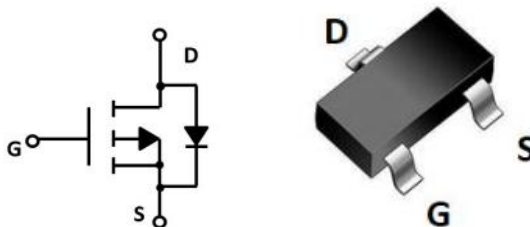


**SOT-23-3L -60V P Channel Enhancement 沟道增强型  
MOS Field Effect Transistor 场效应管**



**■ Absolute Maximum Ratings 最大额定值**

Characteristic 特性参数	Symbol 符号	Rat 额定值	Unit 单位
Drain-Source Voltage 漏极-源极电压	$BV_{DSS}$	-60	V
Gate- Source Voltage 栅极-源极电压	$V_{GS}$	$\pm 20$	V
Drain Current (continuous)漏极电流-连续	$I_D$ (at $T_A = 25^\circ C$ )	-2	A
Drain Current (pulsed)漏极电流-脉冲	$I_{DM}$	-8	A
Total Device Dissipation 总耗散功率	$P_D$ (at $T_A = 25^\circ C$ )	1500	mW
Thermal Resistance Junction-Ambient 热阻	$R_{\theta JA}$	83	$^\circ C/W$
Junction/Storage Temperature 结温/储存温度	$T_J, T_{stg}$	-55~150	$^\circ C$

**■ Device Marking 产品字标**

**FS2309=S09**

### ■ Electrical Characteristics 电特性

( $T_A=25^{\circ}\text{C}$  unless otherwise noted 如无特殊说明, 温度为  $25^{\circ}\text{C}$ )

Characteristic 特性参数	Symbol 符号	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
Drain-Source Breakdown Voltage 漏极-源极击穿电压( $I_D = -250\mu\text{A}, V_{GS}=0\text{V}$ )	$BV_{DSS}$	-60	—	—	V
Gate Threshold Voltage 栅极开启电压( $I_D = -250\mu\text{A}, V_{GS}= V_{DS}$ )	$V_{GS(th)}$	-1	-1.65	-2.4	V
Zero Gate Voltage Drain Current 零栅压漏极电流( $V_{GS}=0\text{V}, V_{DS}= -60\text{V}$ )	$I_{DSS}$	—	—	1	$\mu\text{A}$
Gate Body Leakage 栅极漏电流( $V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$ )	$I_{GSS}$	—	—	$\pm 100$	nA
Static Drain-Source On-State Resistance 静态漏源导通电阻( $I_D = -1.5\text{A}, V_{GS}= -10\text{V}$ ) ( $I_D = -1.5\text{A}, V_{GS}= -4.5\text{V}$ )	$R_{DS(ON)}$	—	168 185	220 270	$\text{m}\Omega$
Diode Forward Voltage Drop 内附二极管正向压降( $I_{SD} = -1.5\text{A}, V_{GS}=0\text{V}$ )	$V_{SD}$	—	—	-1.2	V
Input Capacitance 输入电容 ( $V_{GS}=0\text{V}, V_{DS}= -30\text{V}, f=1\text{MHz}$ )	$C_{ISS}$	—	450	—	pF
Common Source Output Capacitance 共源输出电容( $V_{GS}=0\text{V}, V_{DS}= -30\text{V}, f=1\text{MHz}$ )	$C_{OSS}$	—	20	—	pF
Reverse Transfer Capacitance 反馈电容( $V_{GS}=0\text{V}, V_{DS}= -30\text{V}, f=1\text{MHz}$ )	$C_{RSS}$	—	18	—	pF
Total Gate Charge 栅极电荷密度 ( $V_{DS}= -30\text{V}, I_D = -1.5\text{A}, V_{GS}= -10\text{V}$ )	$Q_g$	—	11	—	nC
Gate Source Charge 栅源电荷密度 ( $V_{DS}= -30\text{V}, I_D = -1.5\text{A}, V_{GS}= -10\text{V}$ )	$Q_{gs}$	—	3	—	nC
Gate Drain Charge 栅漏电荷密度 ( $V_{DS}= -30\text{V}, I_D = -1.5\text{A}, V_{GS}= -10\text{V}$ )	$Q_{gd}$	—	2	—	nC
Turn-ON Delay Time 开启延迟时间 ( $V_{DS}= -30\text{V}, I_D = -1.5\text{A}, R_{GEN}=3\Omega, V_{GS}= -10\text{V}$ )	$t_{d(on)}$	—	40	—	ns
Turn-ON Rise Time 开启上升时间 ( $V_{DS}= -30\text{V}, I_D = -1.5\text{A}, R_{GEN}=3\Omega, V_{GS}= -10\text{V}$ )	$t_r$	—	35	—	ns
Turn-OFF Delay Time 关断延迟时间 ( $V_{DS}= -30\text{V}, I_D = -1.5\text{A}, R_{GEN}=3\Omega, V_{GS}= -10\text{V}$ )	$t_{d(off)}$	—	15	—	ns
Turn-OFF Fall Time 关断下降时间 ( $V_{DS}= -30\text{V}, I_D = -1.5\text{A}, R_{GEN}=3\Omega, V_{GS}= -10\text{V}$ )	$t_f$	—	10	—	ns

■ Typical Characteristic Curve 典型特性曲线

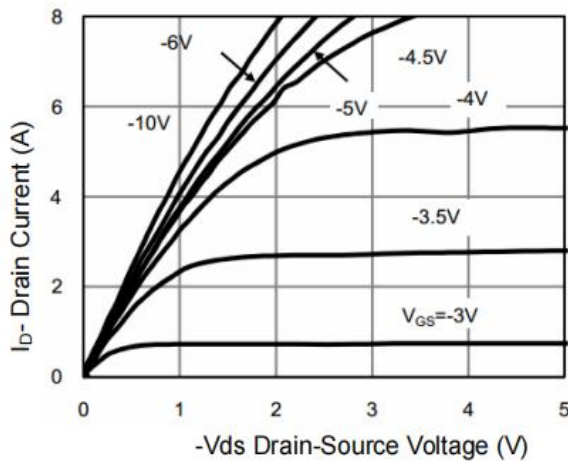


Figure 1: Output Characteristics

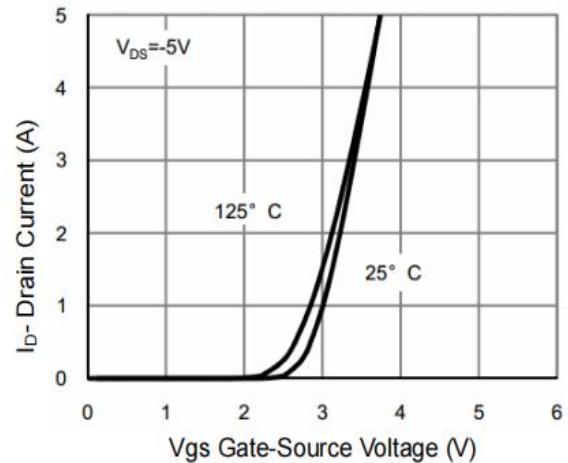


Figure 2: Transfer Characteristics

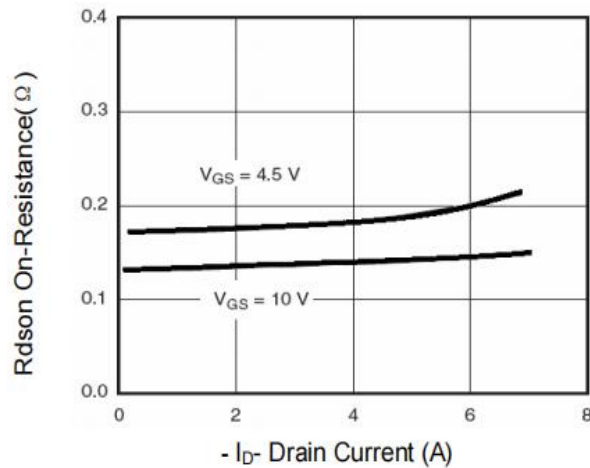


Figure 3: On-Resistance vs. Drain Current

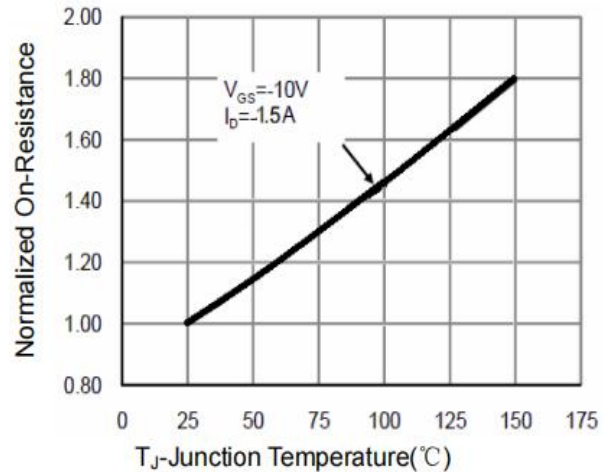


Figure 4: On-Resistance vs. Temperature

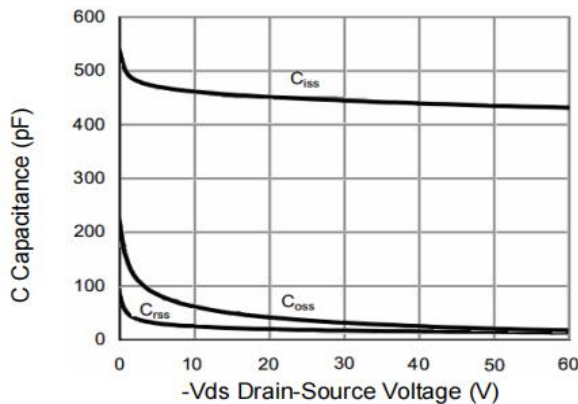


Figure 5: Capacitance Characteristics

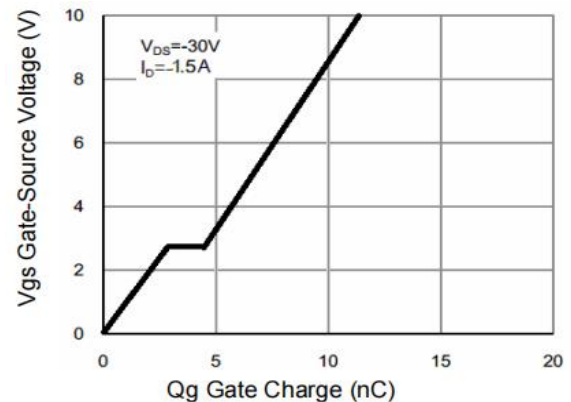


Figure 6: Gate-Charge Characteristics

■ Typical Characteristic Curve 典型特性曲线

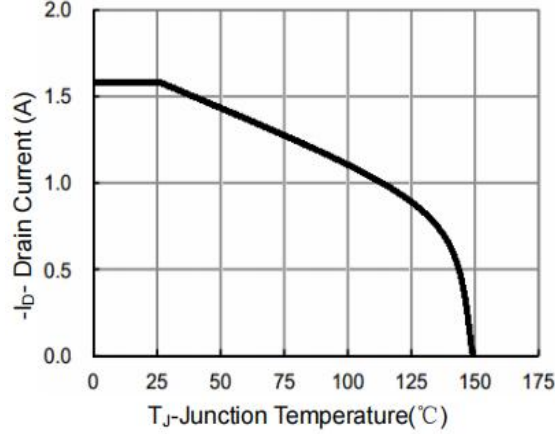


Figure 7: Drain Current vs. Temperature

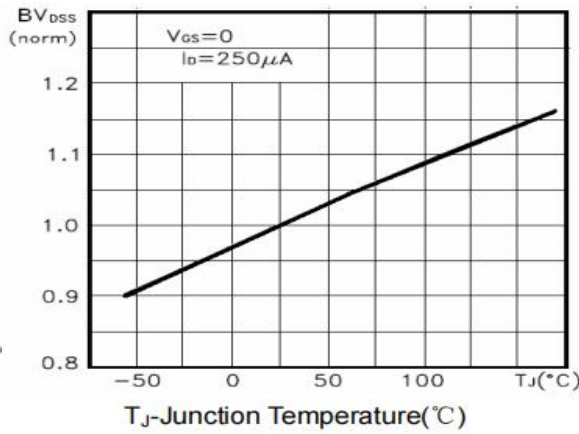


Figure 8: Power Dissipation

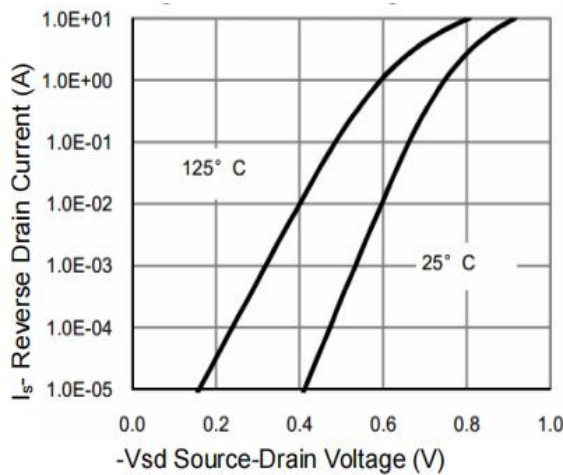


Figure 9: Body Diode Characteristics

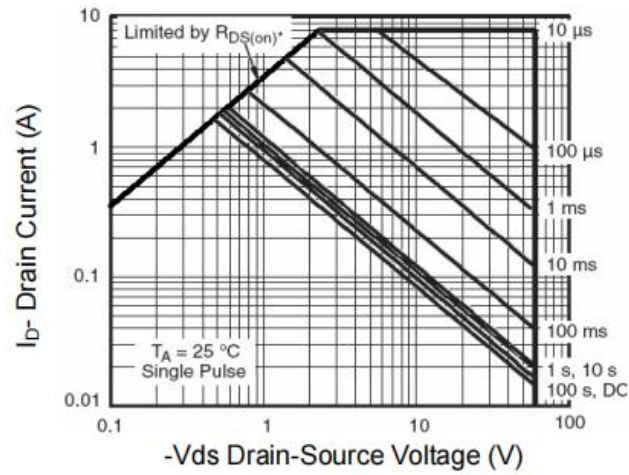


Figure 10: Safe Operating Area

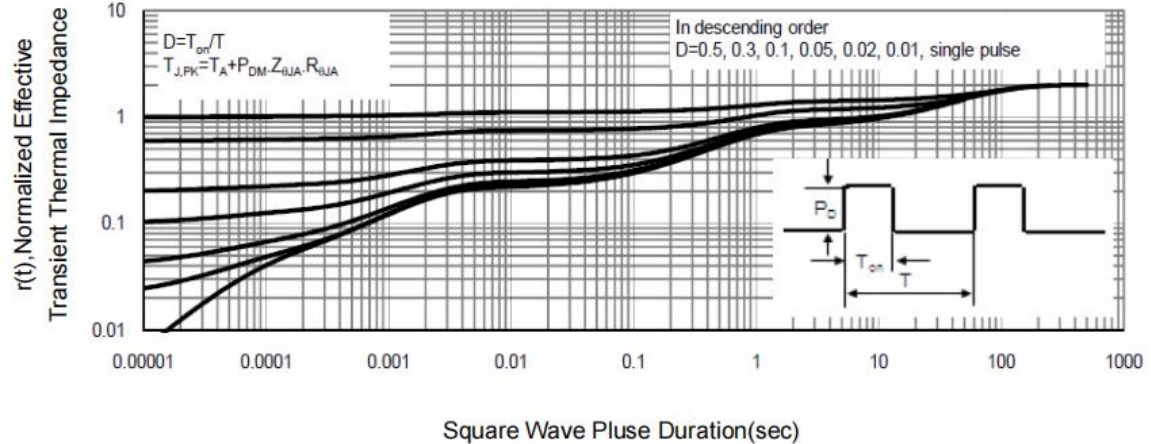
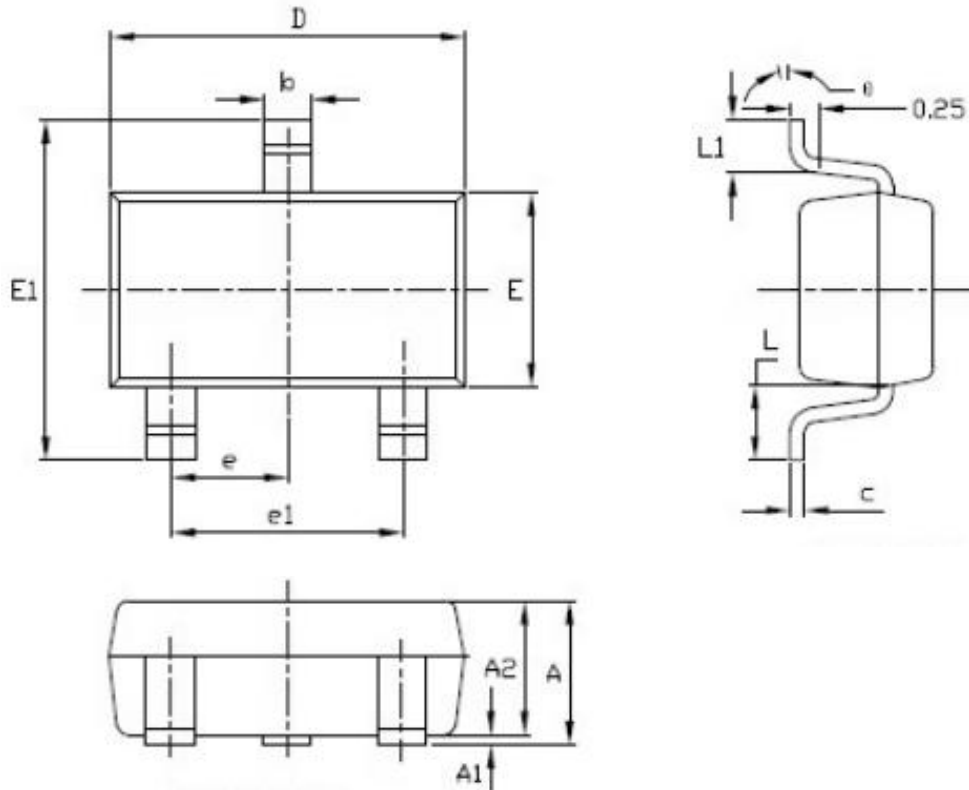


Figure 11: Transient Thermal Response Curve

■ Dimension 外形封装尺寸



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.900	1.00	0.035	0.039
e1	1.800	2.000	0.071	0.079
L	0.450	0.650	0.018	0.026
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°