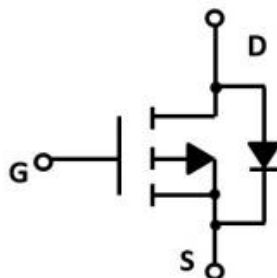
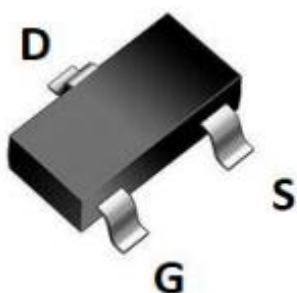


**SOT-23**

**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**
**SI2309CDS-T1-GE3-CN = 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<br>特性参数                                                                                                                             | Symbol<br>符号 | Min<br>最小值 | Typ<br>典型值 | Max<br>最大值 | Unit<br>单位       |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------|------------|------------|------------------|
| Drain-Source Breakdown Voltage<br>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<br>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<br>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<br>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<br>静态漏源导通电阻( $I_D = -1.5\text{A}, V_{GS}= -10\text{V}$ )<br>( $I_D = -1.5\text{A}, V_{GS}= -4.5\text{V}$ ) | $R_{DS(on)}$ | —          | 168<br>185 | 220<br>270 | $\text{m}\Omega$ |
| Diode Forward Voltage Drop<br>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<br>( $V_{GS}=0\text{V}, V_{DS}= -30\text{V}, f=1\text{MHz}$ )                                                               | $C_{ISS}$    | —          | 450        | —          | pF               |
| Common Source Output Capacitance<br>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<br>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<br>( $V_{DS}= -30\text{V}, I_D= -1.5\text{A}, V_{GS}= -10\text{V}$ )                                                      | $Q_g$        | —          | 11         | —          | nC               |
| Gate Source Charge 栅源电荷密度<br>( $V_{DS}= -30\text{V}, I_D= -1.5\text{A}, V_{GS}= -10\text{V}$ )                                                     | $Q_{gs}$     | —          | 3          | —          | nC               |
| Gate Drain Charge 栅漏电荷密度<br>( $V_{DS}= -30\text{V}, I_D= -1.5\text{A}, V_{GS}= -10\text{V}$ )                                                      | $Q_{gd}$     | —          | 2          | —          | nC               |
| Turn-ON Delay Time 开启延迟时间<br>( $V_{DS}= -30\text{V}, I_D= -1.5\text{A}, R_{GEN}=3\Omega, V_{GS}= -10\text{V}$ )                                    | $t_{d(on)}$  | —          | 40         | —          | ns               |
| Turn-ON Rise Time 开启上升时间<br>( $V_{DS}= -30\text{V}, I_D= -1.5\text{A}, R_{GEN}=3\Omega, V_{GS}= -10\text{V}$ )                                     | $t_r$        | —          | 35         | —          | ns               |
| Turn-OFF Delay Time 关断延迟时间<br>( $V_{DS}= -30\text{V}, I_D= -1.5\text{A}, R_{GEN}=3\Omega, V_{GS}= -10\text{V}$ )                                   | $t_{d(off)}$ | —          | 15         | —          | ns               |
| Turn-OFF Fall Time 关断下降时间<br>( $V_{DS}= -30\text{V}, I_D= -1.5\text{A}, R_{GEN}=3\Omega, V_{GS}= -10\text{V}$ )                                    | $t_f$        | —          | 10         | —          | ns               |

### Typical Characteristic Curve 典型特性曲线

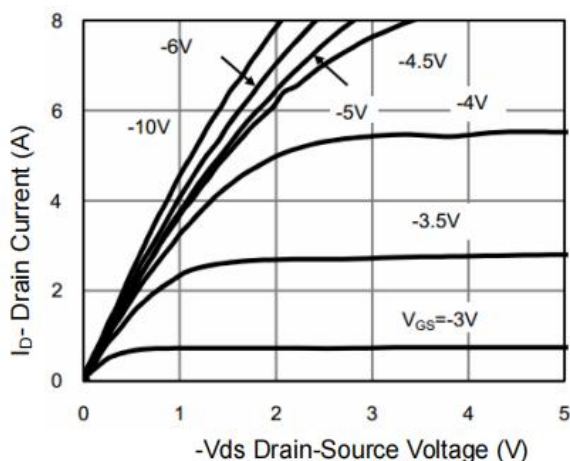


Figure 1: Output Characteristics

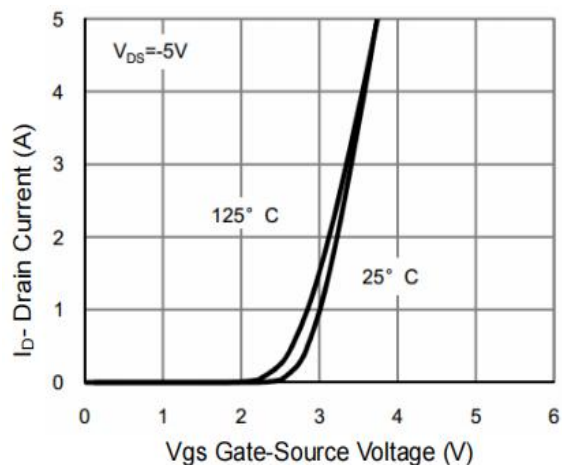


Figure 2: Transfer Characteristics

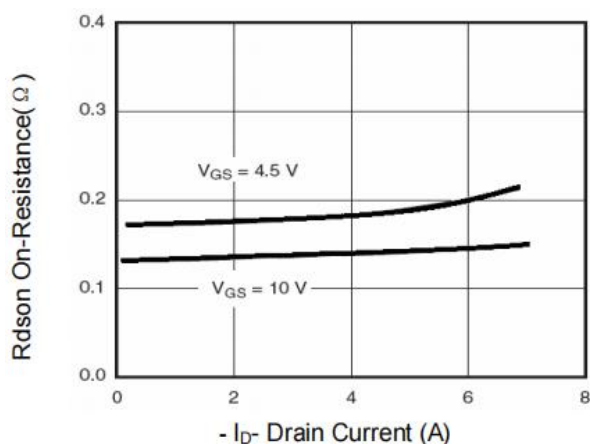


Figure 3: On-Resistance vs. Drain Current

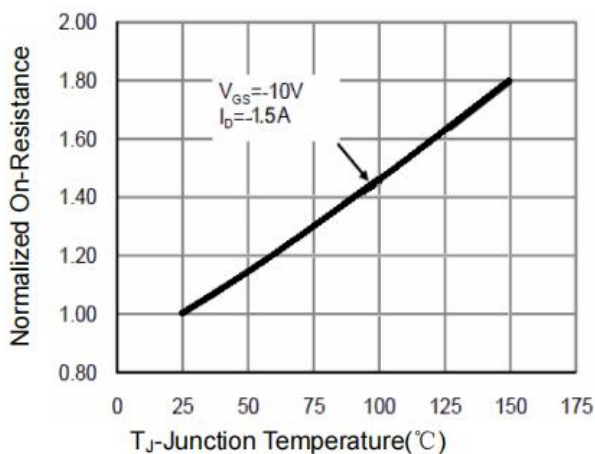


Figure 4: On-Resistance vs. Temperature

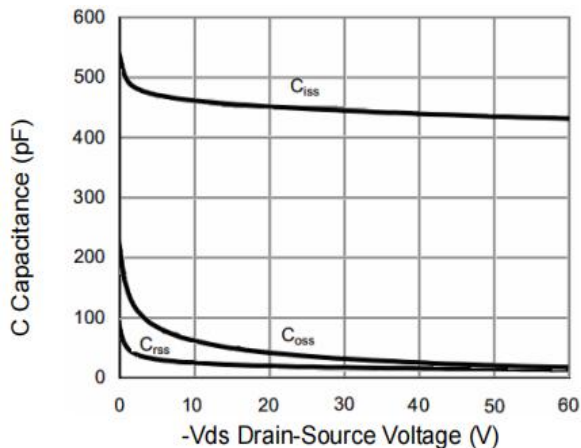


Figure 5: Capacitance Characteristics

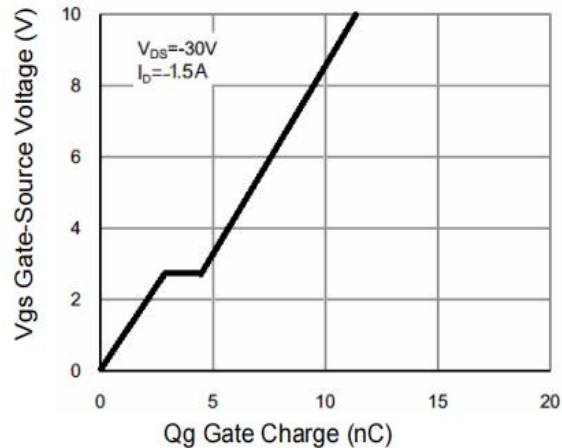


Figure 6: Gate-Charge Characteristics

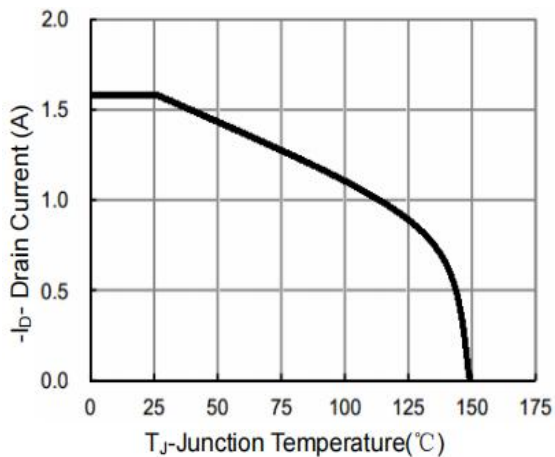
**Typical Characteristic Curve 典型特性曲线**


Figure 7: Drain Current vs. Temperature

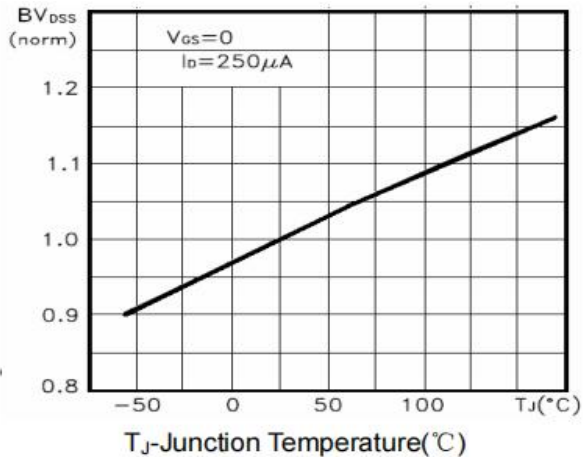


Figure 8: Power Dissipation

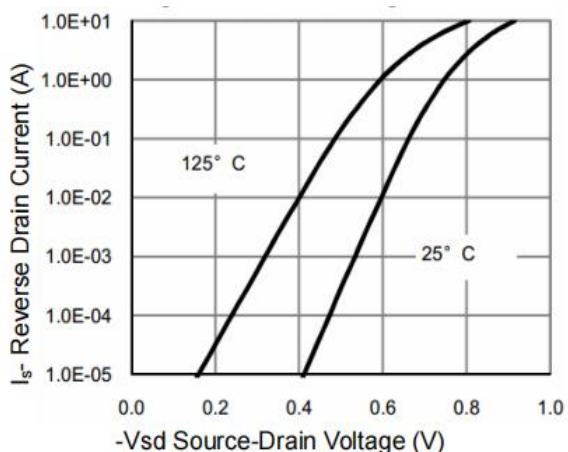


Figure 9: Body Diode Characteristics

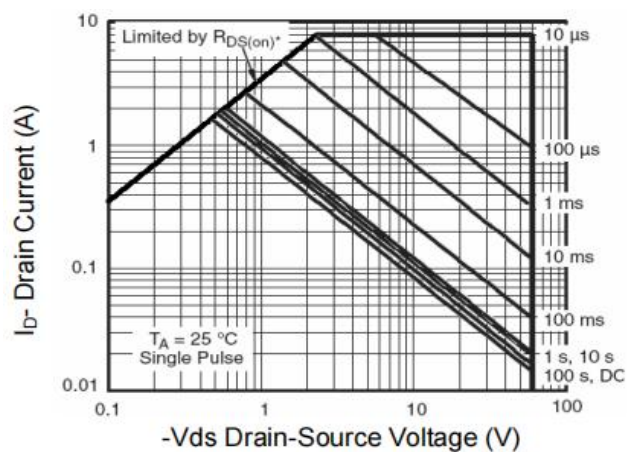


Figure 10: Safe Operating Area

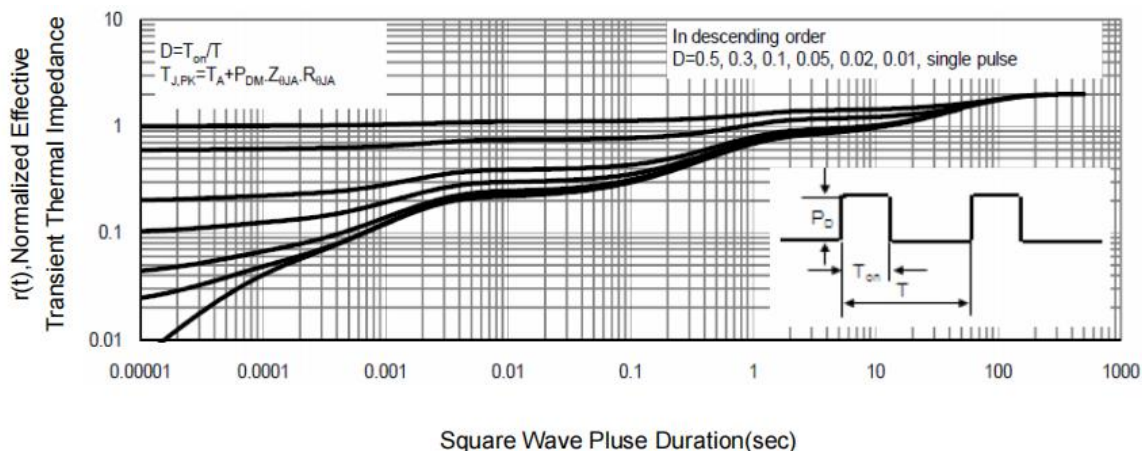
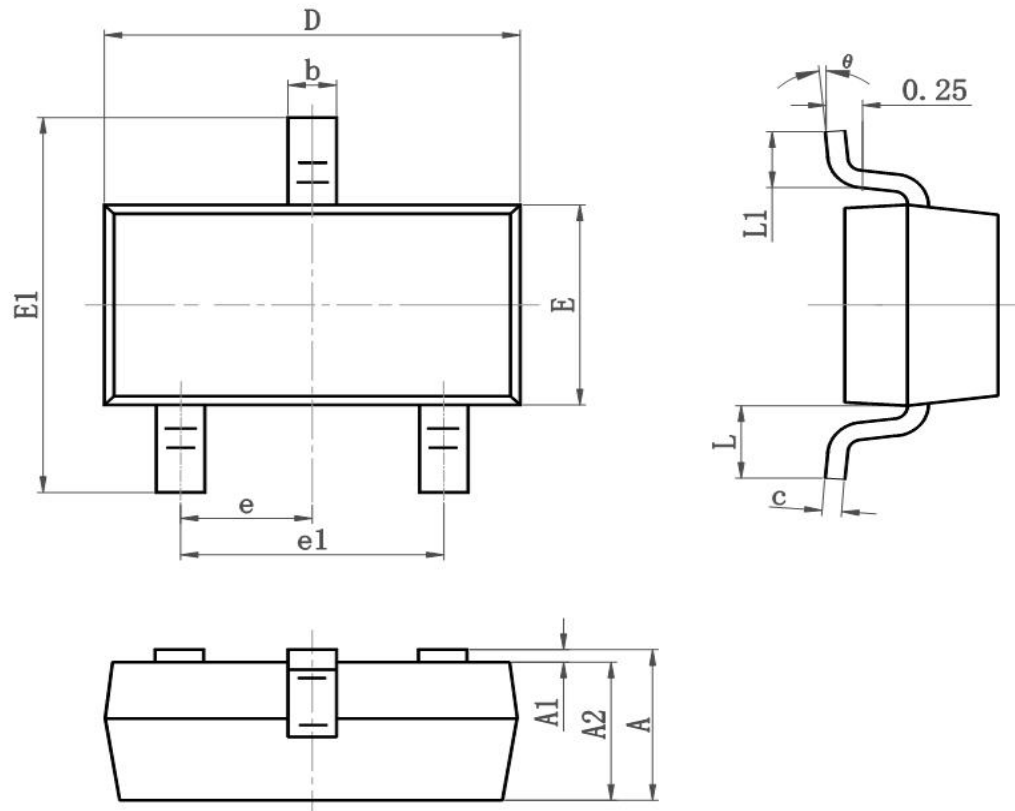


Figure 11: Transient Thermal Res onse Curve

**Dimension 外形封装尺寸**


| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.050                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.900                     | 1.00  | 0.035                | 0.039 |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.500                     | 0.600 | 0.020                | 0.024 |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

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