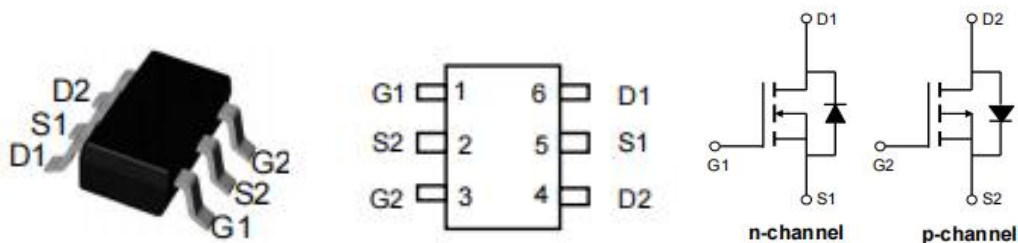




SOT-23-6L 20/-20V N+P Channel Enhancement 双沟道增强型 MOS Field Effect Transistor 场效应管



■ 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} | 20/-20 | V |
| Gate- Source Voltage 栅极-源极电压 | V_{GS} | $\pm 10/\pm 12$ | V |
| Drain Current (continuous)漏极电流-连续 | I_D (at $T_A = 25^\circ C$) | 3.5/-3.5 | A |
| Drain Current (pulsed)漏极电流-脉冲 | I_{DM} | 13/-13 | A |
| Total Device Dissipation 总耗散功率 | P_D (at $T_A = 25^\circ C$) | 700/900 | mW |
| Thermal Resistance Junction-Ambient 热阻 | $R_{\theta JA}$ | 178/140 | $^\circ C/W$ |
| Junction/Storage Temperature 结温/储存温度 | T_J, T_{stg} | -55~150 | $^\circ C$ |

■ Device Marking 产品字标

FS6604=6604



■ Electrical Characteristics 电特性(N)

($T_A=25^{\circ}\text{C}$ unless otherwise noted 如无特殊说明, 温度为 25°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} | 20 | — | — | V |
| Gate Threshold Voltage 栅极开启电压($I_D=250\mu\text{A}, V_{GS}=V_{DS}$) | $V_{GS(th)}$ | 0.55 | 0.78 | 1.1 | V |
| Zero Gate Voltage Drain Current 零栅压漏极电流($V_{GS}=0\text{V}, V_{DS}=20\text{V}$) | I_{DSS} | — | — | 1 | μA |
| Gate Body Leakage 栅极漏电流($V_{GS}=\pm 10\text{V}, V_{DS}=0\text{V}$) | I_{GSS} | — | — | ± 100 | nA |
| Static Drain-Source On-State Resistance 静态漏源导通电阻($I_D=3.5\text{A}, V_{GS}=4.5\text{V}$) ($I_D=2\text{A}, V_{GS}=2.5\text{V}$) | $R_{DS(ON)}$ | — | 40 55 | 52 80 | $\text{m}\Omega$ |
| Diode Forward Voltage Drop 内附二极管正向压降($I_{SD}=3.5\text{A}, V_{GS}=0\text{V}$) | V_{SD} | — | — | 1.2 | V |
| Input Capacitance 输入电容 ($V_{GS}=0\text{V}, V_{DS}=10\text{V}, f=1\text{MHz}$) | C_{ISS} | — | 220 | — | pF |
| Common Source Output Capacitance 共源输出电容($V_{GS}=0\text{V}, V_{DS}=10\text{V}, f=1\text{MHz}$) | C_{OSS} | — | 34 | — | pF |
| Reverse Transfer Capacitance 反馈电容($V_{GS}=0\text{V}, V_{DS}=10\text{V}, f=1\text{MHz}$) | C_{RSS} | — | 26 | — | pF |
| Total Gate Charge 栅极电荷密度 ($V_{DS}=10\text{V}, I_D=3\text{A}, V_{GS}=4.5\text{V}$) | Q_g | — | 3.6 | — | nC |
| Gate Source Charge 栅源电荷密度 ($V_{DS}=10\text{V}, I_D=3\text{A}, V_{GS}=4.5\text{V}$) | Q_{gs} | — | 0.9 | — | nC |
| Gate Drain Charge 栅漏电荷密度 ($V_{DS}=10\text{V}, I_D=3\text{A}, V_{GS}=4.5\text{V}$) | Q_{gd} | — | 0.8 | — | nC |
| Turn-ON Delay Time 开启延迟时间 ($V_{DS}=10\text{V}, I_D=3\text{A}, R_{GEN}=3\Omega, V_{GS}=4.5\text{V}$) | $t_{d(on)}$ | — | 8 | — | ns |
| Turn-ON Rise Time 开启上升时间 ($V_{DS}=10\text{V}, I_D=3\text{A}, R_{GEN}=3\Omega, V_{GS}=4.5\text{V}$) | t_r | — | 58 | — | ns |
| Turn-OFF Delay Time 关断延迟时间 ($V_{DS}=10\text{V}, I_D=3\text{A}, R_{GEN}=3\Omega, V_{GS}=4.5\text{V}$) | $t_{d(off)}$ | — | 15 | — | ns |
| Turn-OFF Fall Time 关断下降时间 ($V_{DS}=10\text{V}, I_D=3\text{A}, R_{GEN}=3\Omega, V_{GS}=4.5\text{V}$) | t_f | — | 53 | — | ns |



■ Electrical Characteristics 电特性(P)

($T_A=25^{\circ}\text{C}$ unless otherwise noted 如无特殊说明, 温度为 25°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} | -20 | — | — | V |
| Gate Threshold Voltage 栅极开启电压($I_D = -250\mu\text{A}, V_{GS} = V_{DS}$) | $V_{GS(th)}$ | -0.4 | -0.75 | -1 | V |
| Zero Gate Voltage Drain Current 零栅压漏极电流($V_{GS}=0\text{V}, V_{DS}= -20\text{V}$) | I_{DSS} | — | — | 1 | μA |
| Gate Body Leakage 栅极漏电流($V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$) | I_{GSS} | — | — | ± 100 | nA |
| Static Drain-Source On-State Resistance 静态漏源导通电阻($I_D = -3.5\text{A}, V_{GS} = -4.5\text{V}$) ($I_D = -3\text{A}, V_{GS} = -2.5\text{V}$) | $R_{DS(ON)}$ | — | 64 87 | 80 110 | $\text{m}\Omega$ |
| Diode Forward Voltage Drop 内附二极管正向压降($I_{SD} = -3.5\text{A}, V_{GS}=0\text{V}$) | V_{SD} | — | — | -1.2 | V |
| Input Capacitance 输入电容 ($V_{GS}=0\text{V}, V_{DS} = -10\text{V}, f=1\text{MHz}$) | C_{ISS} | — | 325 | — | pF |
| Common Source Output Capacitance 共源输出电容($V_{GS}=0\text{V}, V_{DS} = -10\text{V}, f=1\text{MHz}$) | C_{OSS} | — | 63 | — | pF |
| Reverse Transfer Capacitance 反馈电容($V_{GS}=0\text{V}, V_{DS} = -10\text{V}, f=1\text{MHz}$) | C_{RSS} | — | 37 | — | pF |
| Total Gate Charge 栅极电荷密度 ($V_{DS} = -10\text{V}, I_D = -2\text{A}, V_{GS} = -4.5\text{V}$) | Q_g | — | 3.2 | — | nC |
| Gate Source Charge 栅源电荷密度 ($V_{DS} = -10\text{V}, I_D = -2\text{A}, V_{GS} = -4.5\text{V}$) | Q_{gs} | — | 0.6 | — | nC |
| Gate Drain Charge 栅漏电荷密度 ($V_{DS} = -10\text{V}, I_D = -2\text{A}, V_{GS} = -4.5\text{V}$) | Q_{gd} | — | 0.9 | — | nC |
| Turn-ON Delay Time 开启延迟时间 ($V_{DS} = -10\text{V}, I_D = -1\text{A}, R_{GEN}=2.5\Omega, V_{GS} = -4.5\text{V}$) | $t_{d(on)}$ | — | 11 | — | ns |
| Turn-ON Rise Time 开启上升时间 ($V_{DS} = -10\text{V}, I_D = -1\text{A}, R_{GEN}=2.5\Omega, V_{GS} = -4.5\text{V}$) | t_r | — | 5.5 | — | ns |
| Turn-OFF Delay Time 关断延迟时间 ($V_{DS} = -10\text{V}, I_D = -1\text{A}, R_{GEN}=2.5\Omega, V_{GS} = -4.5\text{V}$) | $t_{d(off)}$ | — | 22 | — | ns |
| Turn-OFF Fall Time 关断下降时间 ($V_{DS} = -10\text{V}, I_D = -1\text{A}, R_{GEN}=2.5\Omega, V_{GS} = -4.5\text{V}$) | t_f | — | 8 | — | ns |

Typical Characteristic Curve 典型特性曲线(N)

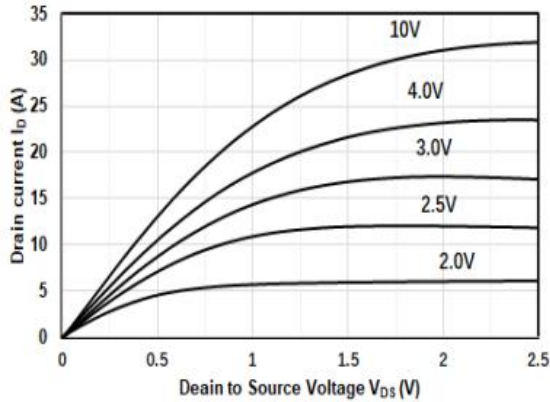


Figure 1: Output Characteristics

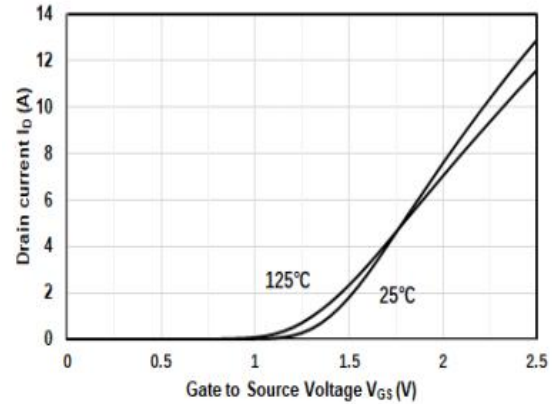


Figure 2: Transfer Characteristics

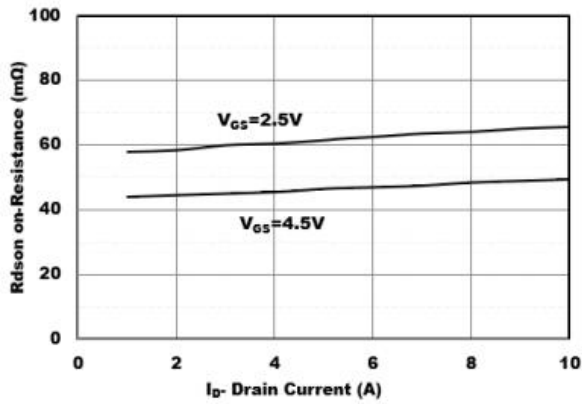


Figure 3: On-Resistance vs. Drain Current

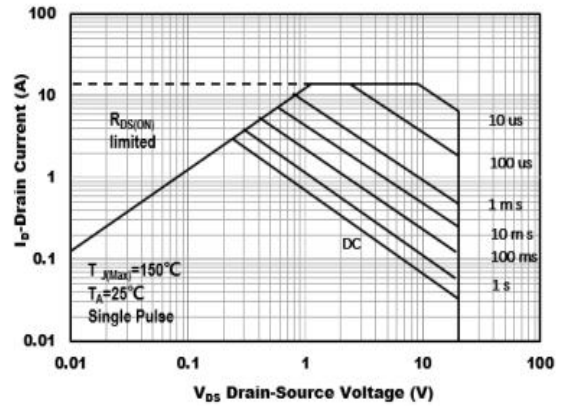


Figure 4: Safe Operating Area

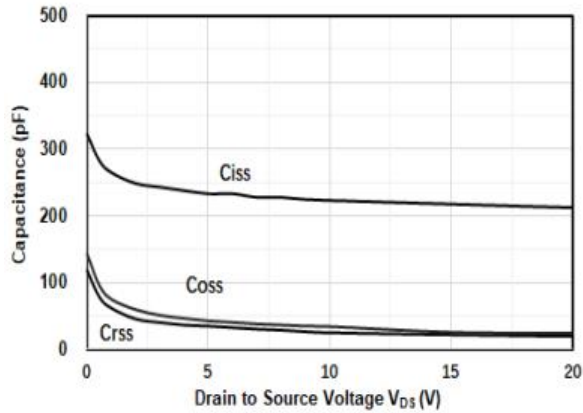


Figure 5: Capacitance Characteristics

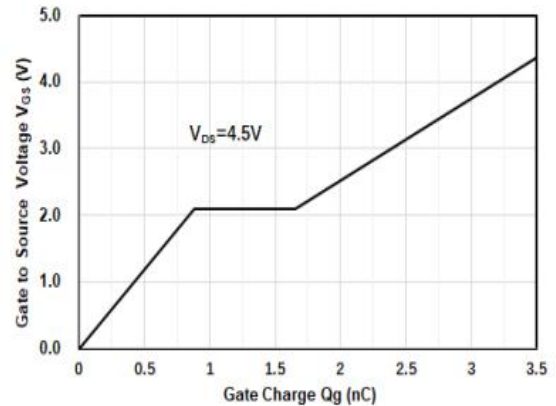


Figure 6: Gate-Charge Characteristics

Typical Characteristic Curve 典型特性曲线(P)

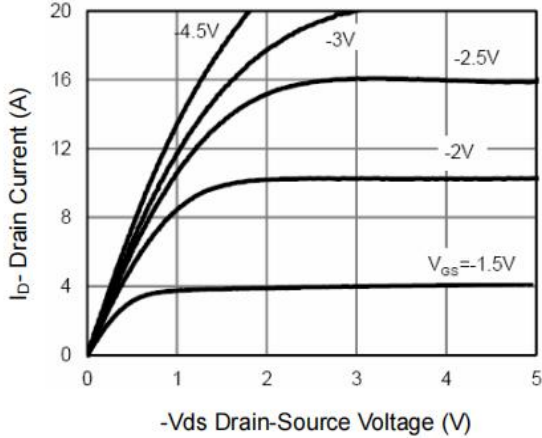


Figure 1: Output Characteristics

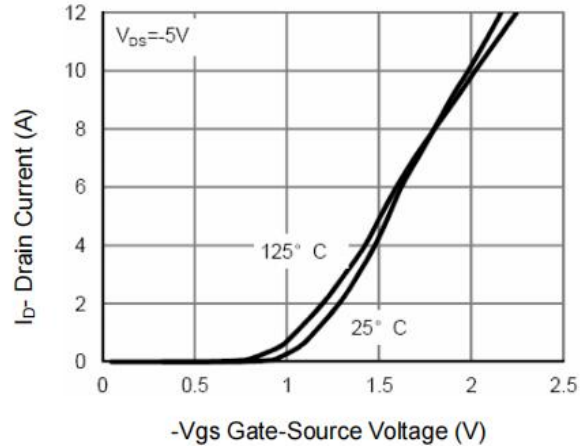


Figure 2: Transfer Characteristics

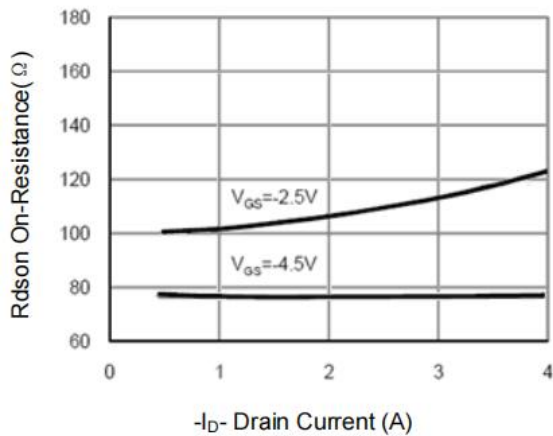


Figure 3: On-Resistance vs. Drain Current

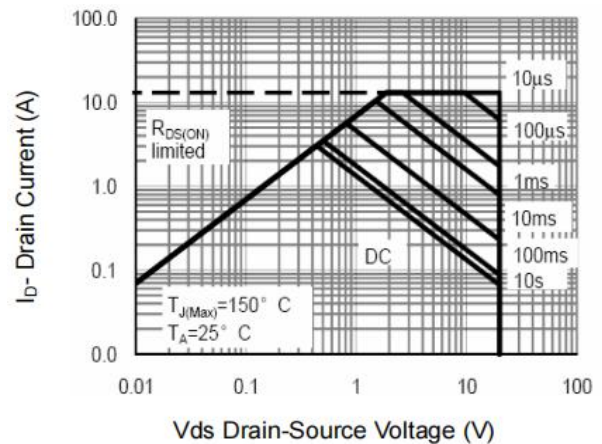


Figure 4: Safe Operating Area

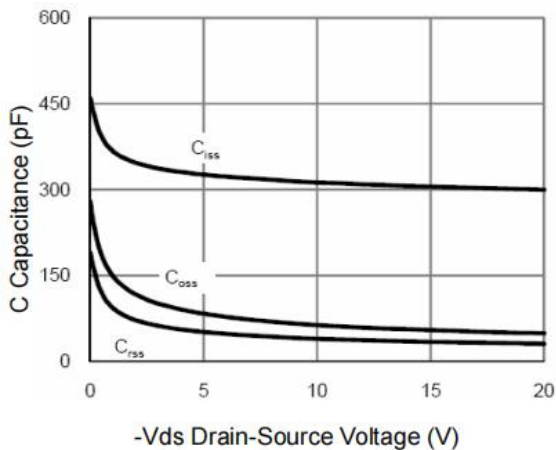


Figure 5: Capacitance Characteristics

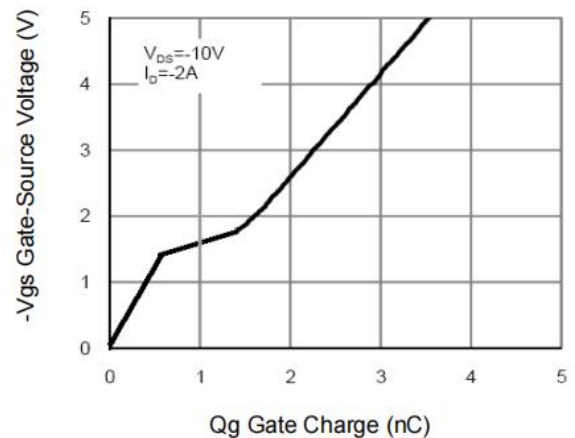
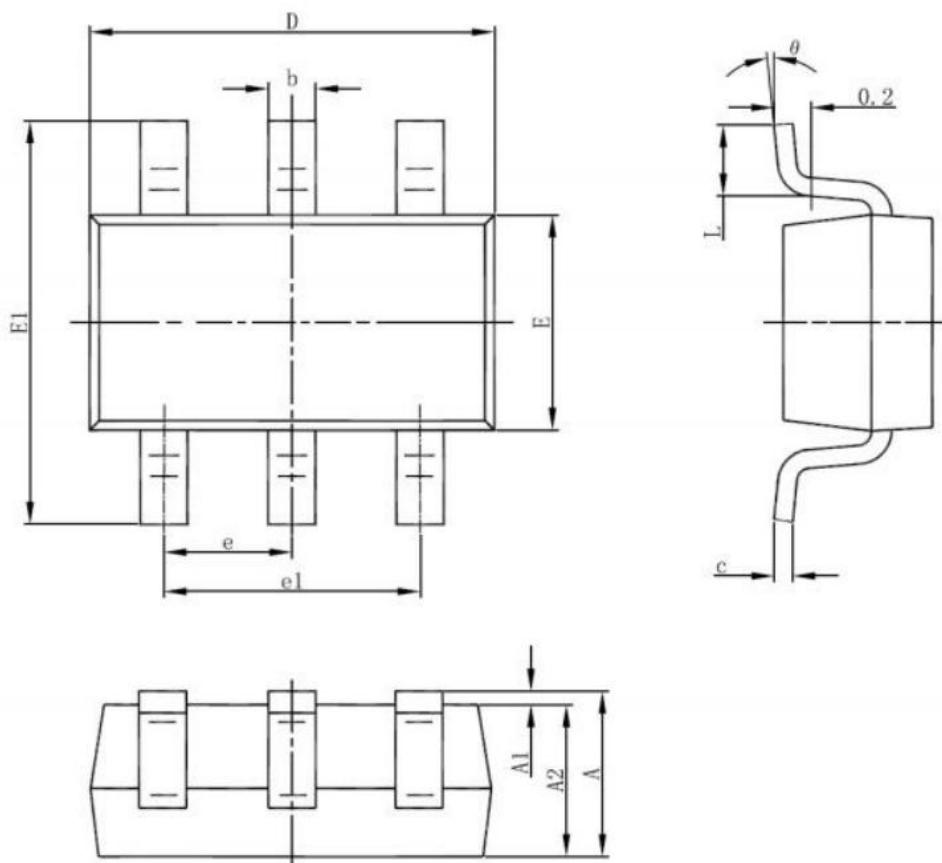


Figure 6: Gate-Charge Characteristics

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 | 0.950TYP | | 0.037TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.600REF | | 0.024REF | |
| θ | 0° | 8° | 0° | 8° |