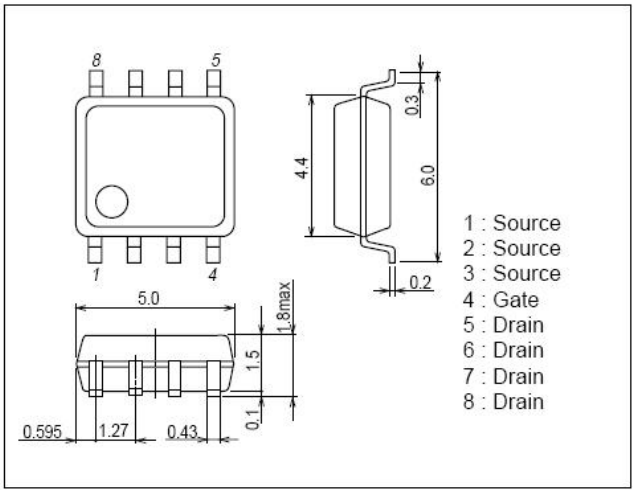
# Si4435

## Features

- Low On resistance.
- −4.5V drive.
- RoHS compliant.

## Package Dimensions

unit : mm
SOP-8




## Specifications

### Absolute Maximum Ratings at $T_a$=25$^0$C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Drain-to-Source Voltage | $V_{DSS}$ | | -30 | V |
| Gate-to-Source Voltage | $V_{GSS}$ | | ±20 | V |
| Drain Current (DC) | $I_D$ | | -10 | A |
| Drain Current (Pulse) | $I_{DP}$ | PW≤10uS, duty cycle≤1% | -40 | A |
| Allowable Power Dissipation | $P_D$ | Mounted on a ceramic board (1000mm$^2$×0.8mm) 1unit | 3.2 | W |
| Total Dissipation | $P_T$ | Mounted on a ceramic board (1000mm$^2$×0.8mm) | - | W |
| Channel Temperature | $T_{ch}$ | | 150 | $^0$C |
| Storage Temperature | $T_{stg}$ | | -55~+150 | $^0$C |

### Electrical Characteristics at $T_a$=25$^0$C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$=-250uA, $V_{GS}$=0V | -30 | | | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-24V, $V_{GS}$=0V | | | -10 | uA |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V, $V_{DS}$=0V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$= $V_{GS}$, $I_D$=-250uA | -1 | -1.6 | -3.0 | V |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=-5V, $I_D$=-5A | | 18 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS(ON)}$ | $I_D$=-10A, $V_{GS}$=-10V | | 13 | 20 | mΩ |
| | $R_{DS(ON)}$ | $I_D$=-5A, $V_{GS}$=-4.5V | | 19 | 30 | mΩ |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-15V, $V_{GS}$=0V, f=1MHz | | 1800 | - | pF |
| Output Capacitance | $C_{oss}$ | $V_{DS}$=-15V, $V_{GS}$=0V, f=1MHz | | 305 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | $V_{DS}$=-15V, $V_{GS}$=0V, f=1MHz | | 216 | | pF |

## Electrical Characteristics at $T_a$=25$^0$C (Continued)

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | Typ | max | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{GS}$=-10V, $V_{DS}$=-15V, $R_L$=15Ω, $R_{GEN}$=2.5Ω | | 10 | | nS |
| Rise Time | $t_r$ | | | 26 | | nS |
| Turn-off Delay Time | $t_{d(off)}$ | | | 35 | | nS |
| Fall Time | $t_f$ | | | 8 | | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-10V, $V_{GS}$=-15V, $I_D$=-1A | | 30 | - | nC |
| Gate-to-Source Charge | $Q_{gs}$ | | | 6 | | nC |
| Gate-to-Drain "Miller" Charge | $Q_{gd}$ | | | 9 | | nC |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=-10A, $V_{GS}$=0V | | - | -1.2 | V |

## Typical Characteristics at $T_a$=25$^0$C

Figure1. Power Dissipation

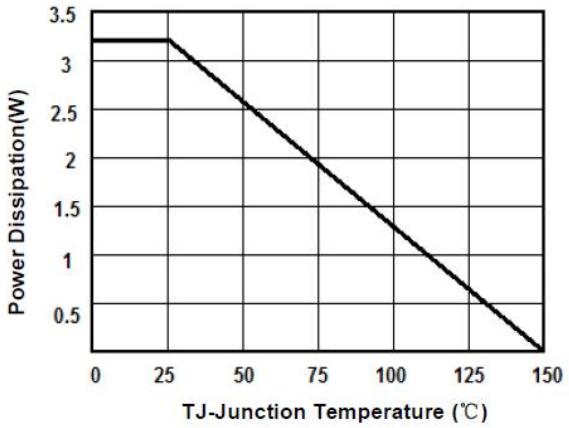



Figure2. Drain Current

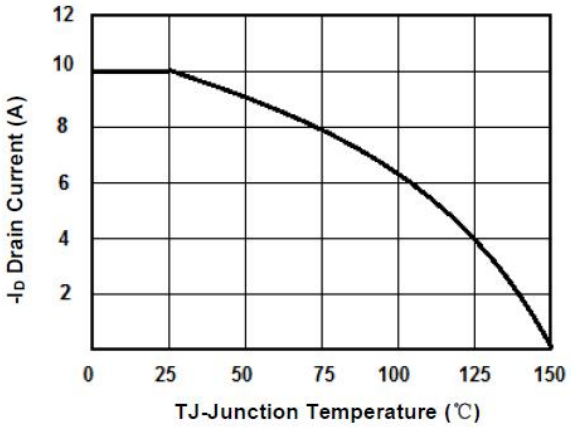



Figure3. Output Characteristics

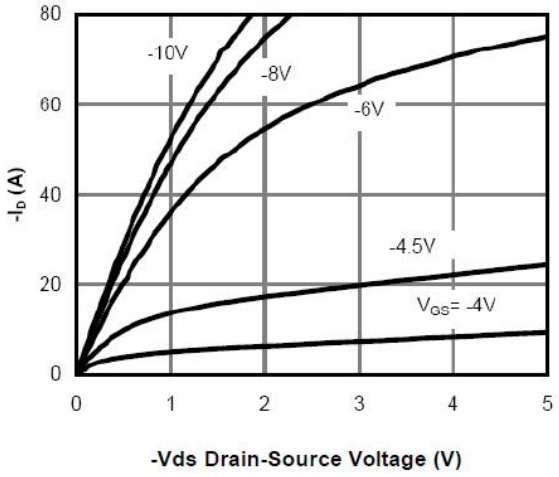



Figure4. Transfer Characteristics

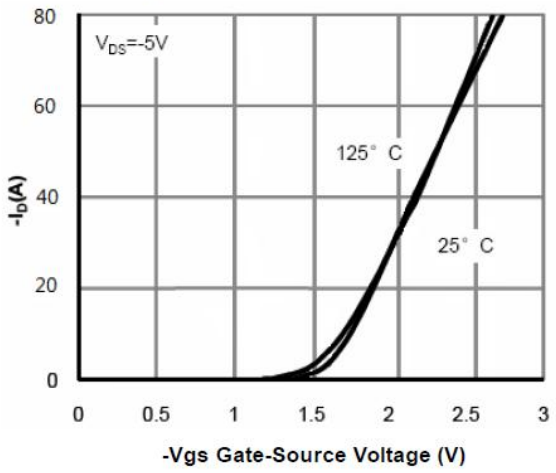


**Figure5. Capacitance**

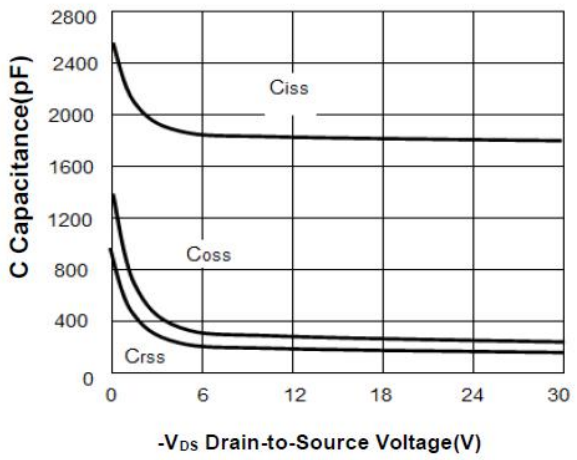



**Figure6. $R_{DS(ON)}$ vs Junction Temperature**

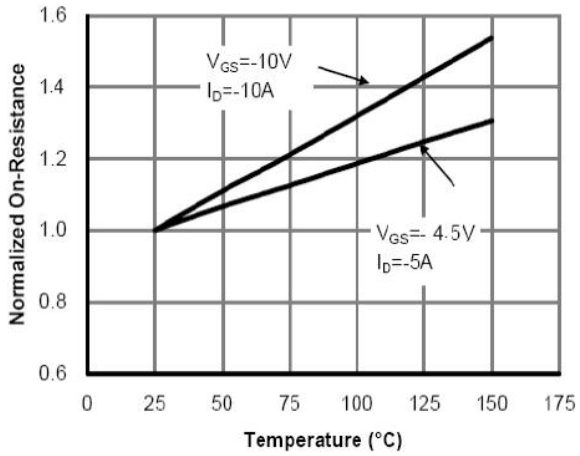



**Figure7. Max $BV_{DSS}$ vs Junction Temperature**

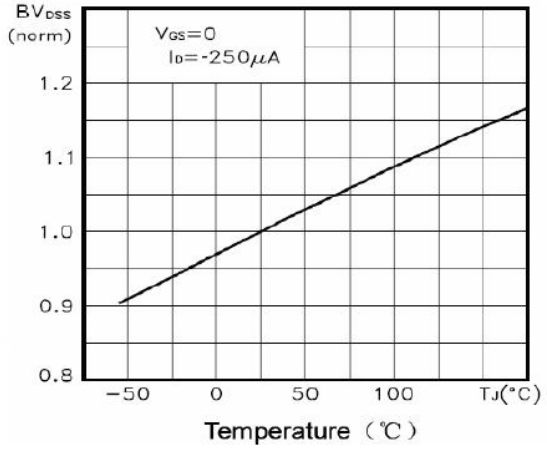



**Figure8. $V_{GS(th)}$ vs Junction Temperature**

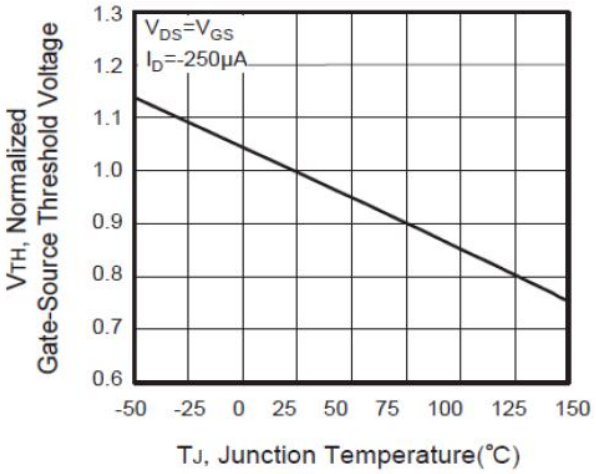



**Figure9. Gate Charge Waveforms**

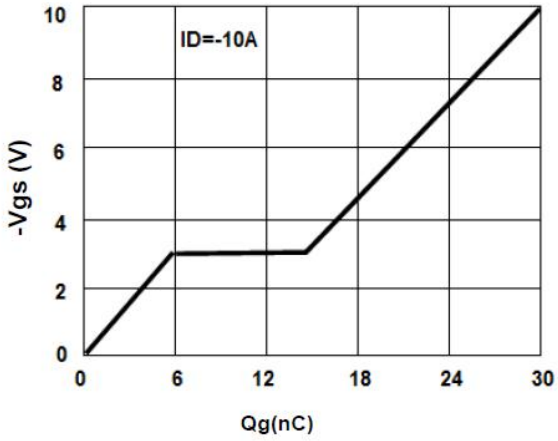



**Figure10. Maximum Safe Operating Area**

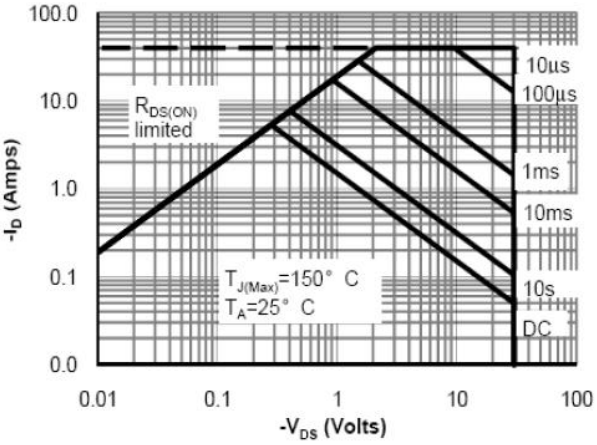


**Figure11. Normalized Maximum Transient Thermal Impedance**