# SI2304

## N-Channel Enhancement Mode Field Effect Transistor

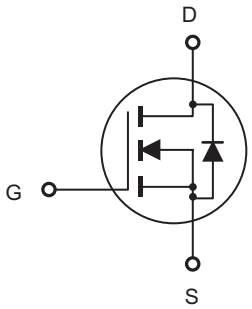
## Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- 30V,2.5A, $R_{DS(ON)}$=65mΩ @$V_{GS}$=10V
  30V,2.0A, $R_{DS(ON)}$=90mΩ @$V_{GS}$=4.5V
- High dense cell design for extremely low $R_{DS(ON)}$
- Rugged and reliable
- Lead free product is acquired
- SOT-23 Package
- Marking Code: S4

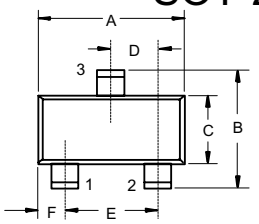
### Maximum Ratings @ 25ºC Unless Otherwise Specified

| Symbol | Parameter | Rating | Unit |
|---|---|---|---|
| $V_{DS}$ | Drain-source Voltage | 30 | V |
| $I_D$ | Drain Current-Continuous | 2.5 | A |
| $I_{DM}$ | Drain Current-Pulsed | 10 | A |
| $V_{GS}$ | Gate-source Voltage | ±20 | V |
| $P_D$ | Total Power Dissipation | 0.25 | W |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 500 | ℃/W |
| $T_J$ | Operating Junction Temperature | -55 to +150 | ℃ |
| $T_{STG}$ | Storage Temperature | -55 to +150 | ℃ |

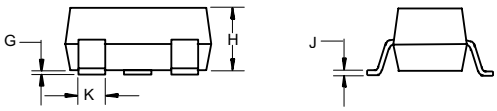
## Internal Block Diagram




## SOT-23

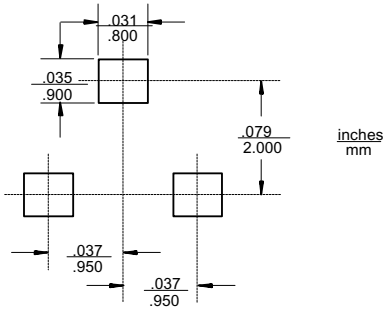



1.GATE
2. SOURCE
3. DRAIN




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| | INCHES | | MM | | |
| DIM | MIN | MAX | MIN | MAX | NOTE |
| A | .110 | .120 | 2.80 | 3.04 | |
| B | .083 | .098 | 2.10 | 2.64 | |
| C | .047 | .055 | 1.20 | 1.40 | |
| D | .035 | .041 | .89 | 1.03 | |
| E | .070 | .081 | 1.78 | 2.05 | |
| F | .018 | .024 | .45 | .60 | |
| G | .0005 | .0039 | .013 | .100 | |
| H | .035 | .044 | .89 | 1.12 | |
| J | .003 | .007 | .085 | .180 | |
| K | .015 | .020 | .37 | .51 | |

Suggested Solder Pad Layout



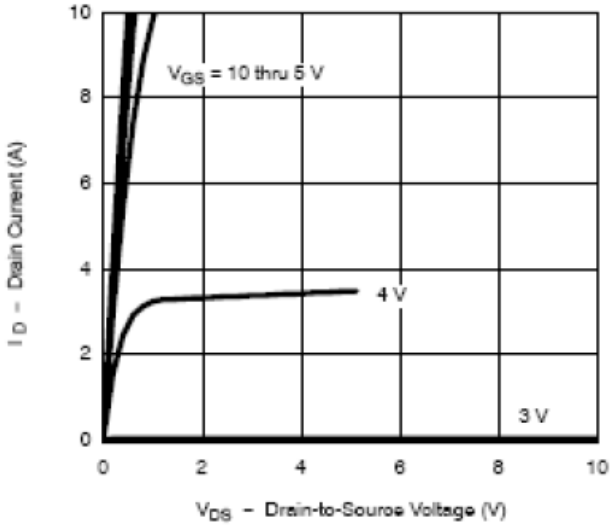
Yixin

# SI2304

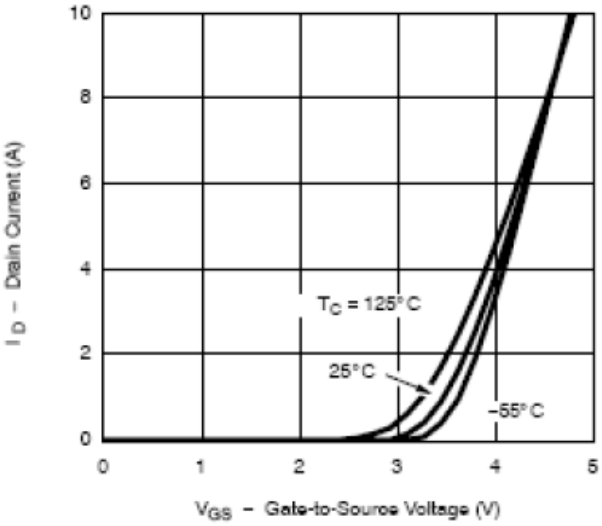
## Electrical Characteristics $T_A$ = 25°C unless otherwise noted

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | 30 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =30V, $V_{GS}$ =1V | | | 1 | μA |
| Gate Body Leakage Current, Forward | $I_{GSSF}$ | $V_{GS}$ = 20V, $V_{DS}$ = 0V | | | 100 | nA |
| Gate Body Leakage Current, Reverse | $I_{GSSR}$ | $V_{GS}$ = -20V, $V_{DS}$ = 0V | | | -100 | nA |
| **On Characteristics** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ =250μA | 1 | | 3 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =2.5A | | | 65 | mΩ |
| | | $V_{GS}$ =4.5V, $I_D$ =2A | | | 90 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ =4.5V, $I_D$ =2.5A | | 4.6 | | S |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =15V, $V_{GS}$ = 0V, f = 1.0 MHz | | 240 | | pF |
| Output Capacitance | $C_{oss}$ | | | 110 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 17 | | pF |
| **Switching Characteristics** | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = 15V, $I_D$ =1A, $V_{GEN}$ =10V, $R_G$=6Ω, $R_L$=15Ω | | 8 | 20 | ns |
| Turn-On Rise Time | $t_r$ | | | 12 | 30 | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 17 | 35 | ns |
| Turn-Off Fall Time | $t_f$ | | | 8 | 20 | ns |
| Total Gate Charge | $Q_g$ | $V_{DS}$ =15V, $I_D$ =2.5A, $V_{GS}$ =10V | | 4.5 | 10 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 0.8 | | nC |
| Gate-Drain Charge | $Q_{gd}$ | | | 1.0 | | nC |
| **Drain-Source Diode Characteristics and Maximun Ratings** | | | | | | |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$ =1.25A | | | 1.2 | V |

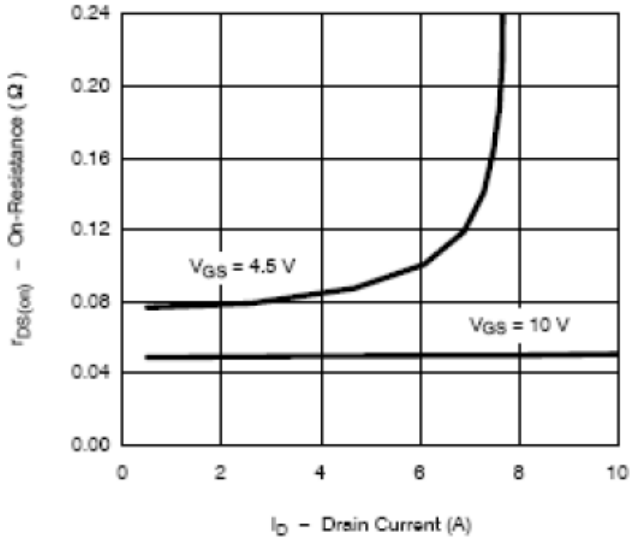
Output Characteristics



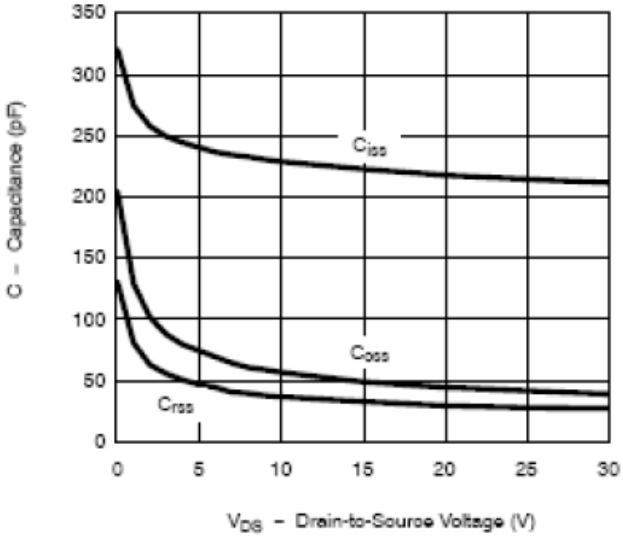

Transfer Characteristics



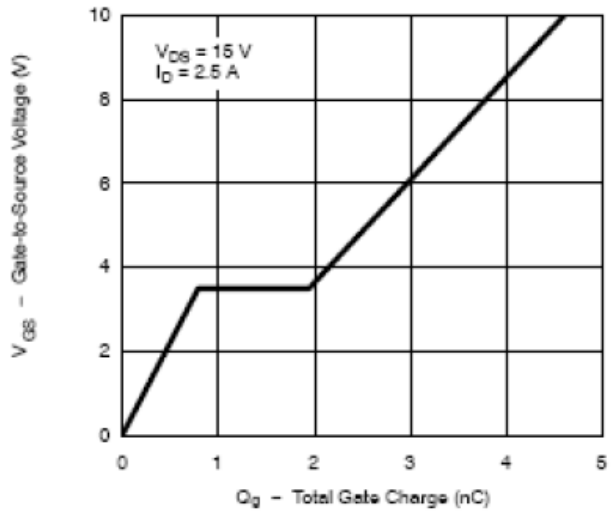

On-Resistance vs. Drain Current



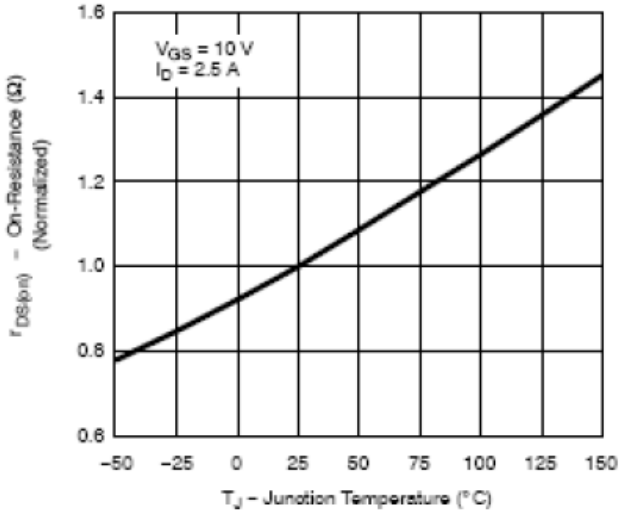

Capacitance



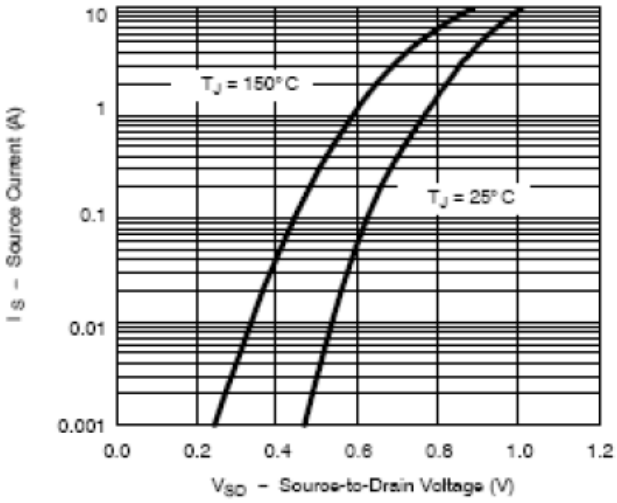

Gate Charge



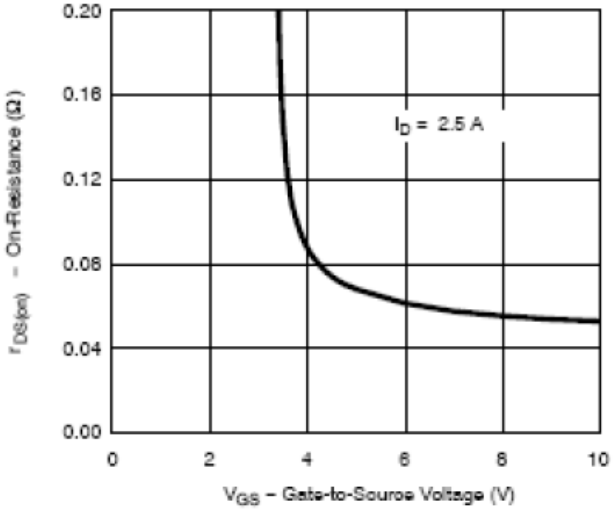

On-Resistance vs. Junction Temperature



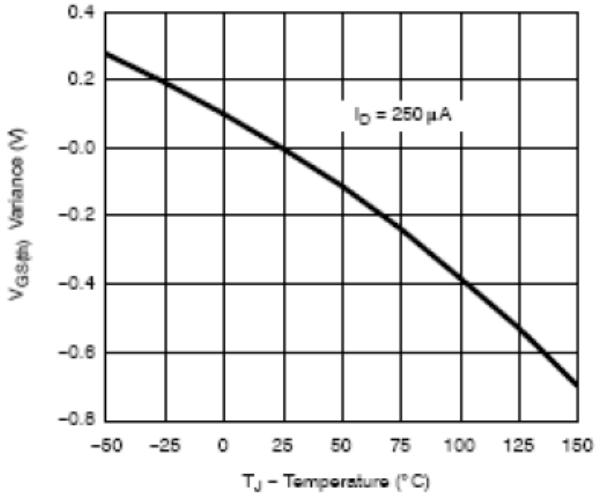
Source-Drain Diode Forward Voltage



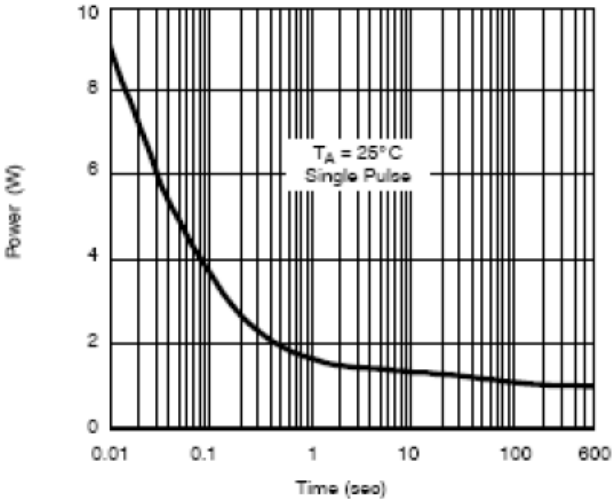

On-Resistance vs. Gate-to-Source Voltage



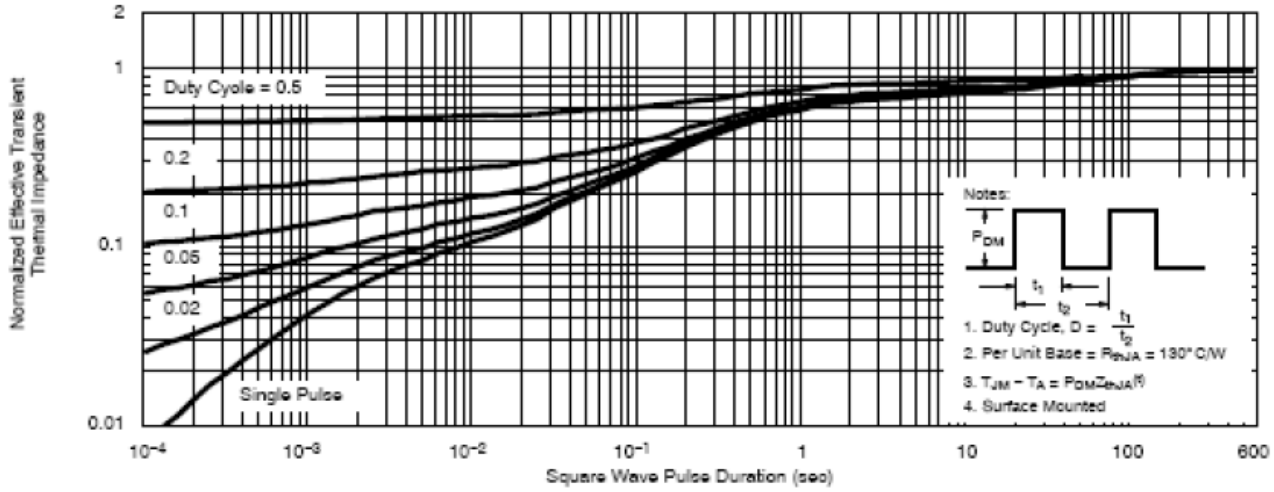

Threshold Voltage




Single Pulse Power




Normalized Thermal Transient Impedance, Junction-to-Ambient



## Ordering Information :

| Device | Packing |
|---|---|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |

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