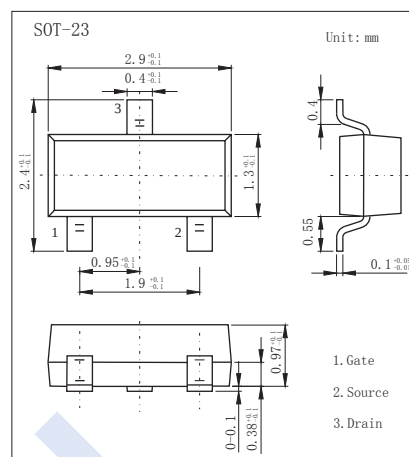
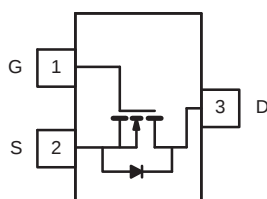


## N-Channel Enhancement MOSFET

## SI2304DS (KI2304DS)

## ■ Features

- $V_{DS} (V) = 30V$
- $R_{DS(ON)} < 117m\Omega$  ( $V_{GS} = 10V$ )
- $R_{DS(ON)} < 190m\Omega$  ( $V_{GS} = 4.5V$ )

■ Absolute Maximum Ratings  $T_a = 25^\circ C$ 

| Parameter                                  |        | Symbol            | Rating     | Unit |
|--------------------------------------------|--------|-------------------|------------|------|
| Drain-Source Voltage                       |        | V <sub>DS</sub>   | 30         | V    |
| Gate-Source Voltage                        |        | V <sub>GS</sub>   | ±20        |      |
| Continuous Drain Current *1                | Ta=25℃ | I <sub>D</sub>    | 2.5        | A    |
|                                            | Ta=70℃ |                   | 2.0        |      |
| Pulsed Drain Current *2                    |        | I <sub>DM</sub>   | 10         |      |
| Power Dissipation                          | Ta=25℃ | P <sub>D</sub>    | 1.25       | W    |
|                                            | Ta=70℃ |                   | 0.8        |      |
| Thermal Resistance.Junction- to-Ambient *1 |        | R <sub>thJA</sub> | 100        | ℃/W  |
| Thermal Resistance.Junction- to-Ambient *3 |        |                   | 166        |      |
| Junction Temperature                       |        | T <sub>J</sub>    | 150        | ℃    |
| Storage Temperature Range                  |        | T <sub>stg</sub>  | -55 to 150 |      |

\*1 Surface Mounted on FR4 Board,  $t \leq 5$  sec.

\*2 Pulse width limited by maximum junction temperature.

\*3 Surface Mounted on FR4 Board.

## N-Channel Enhancement MOSFET

## SI2304DS (KI2304DS)

## ■ Electrical Characteristics Ta = 25°C

| Parameter                             | Symbol              | Test Conditions                                                                                             | Min | Typ  | Max  | Unit |
|---------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------|-----|------|------|------|
| Drain-Source Breakdown Voltage        | V <sub>DSS</sub>    | I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V                                                                 | 30  |      |      | V    |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V                                                                   |     |      | 0.5  | μA   |
|                                       |                     | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, Ta=55°C                                                          |     |      | 10   |      |
| Gate-Body Leakage Current             | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                                                  |     |      | ±100 | nA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA                                                   | 1.5 |      | 3    | V    |
| On-State Drain Current *1             | I <sub>D(on)</sub>  | V <sub>DS</sub> ≥ 4.5 V, V <sub>GS</sub> = 10 V                                                             | 6   |      |      | A    |
|                                       |                     | V <sub>DS</sub> ≥ 4.5 V, V <sub>GS</sub> = 4.5 V                                                            | 4   |      |      |      |
| Static Drain-Source On-Resistance *1  | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =2.5A                                                                  |     | 92   | 117  | mΩ   |
|                                       |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.0A                                                                 |     | 142  | 190  |      |
| Forward Transconductance *1           | g <sub>FS</sub>     | V <sub>DS</sub> =4.5V, I <sub>D</sub> =2.5A                                                                 |     | 4.6  |      | S    |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz                                                           |     | 240  |      | pF   |
| Output Capacitance                    | C <sub>oss</sub>    |                                                                                                             |     | 110  |      |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |                                                                                                             |     | 17   |      |      |
| Total Gate Charge                     | Q <sub>g</sub>      | V <sub>DS</sub> =15V, V <sub>GS</sub> =5V, I <sub>D</sub> =2.5A                                             |     | 2.4  | 4    | nC   |
| Gate-Source Charge                    | Q <sub>gt</sub>     | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =2.5A                                            |     | 4.5  | 10   |      |
| Gate Source Charge                    | Q <sub>gs</sub>     |                                                                                                             |     | 0.8  |      |      |
| Gate Drain Charge                     | Q <sub>gd</sub>     |                                                                                                             |     | 1.0  |      |      |
| Turn-On DelayTime                     | t <sub>d(on)</sub>  | I <sub>D</sub> =1A, V <sub>DS</sub> =15V, R <sub>GEN</sub> =6Ω<br>R <sub>L</sub> =15Ω, V <sub>GS</sub> =10V |     | 8    | 20   | ns   |
| Turn-On Rise Time                     | t <sub>r</sub>      |                                                                                                             |     | 12   | 30   |      |
| Turn-Off DelayTime                    | t <sub>d(off)</sub> |                                                                                                             |     | 17   | 35   |      |
| Turn-Off Fall Time                    | t <sub>f</sub>      |                                                                                                             |     | 8    | 20   |      |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |                                                                                                             |     |      | 1.25 | A    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =1.25A, V <sub>GS</sub> =0V                                                                  |     | 0.77 | 1.2  | V    |

\*1 Pulse test: PW ≤ 300μs duty cycle ≤ 2%.

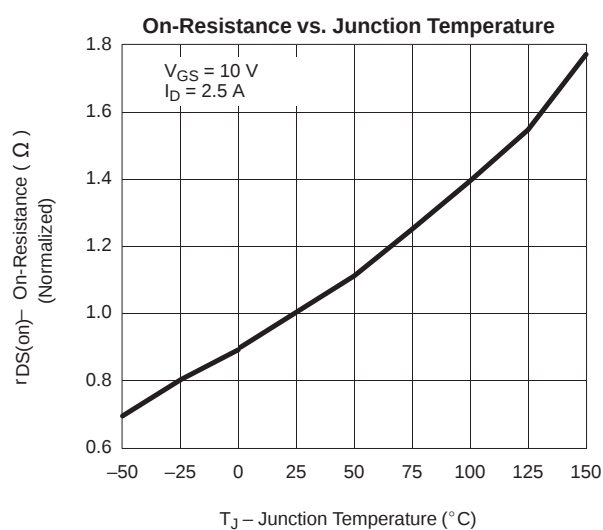
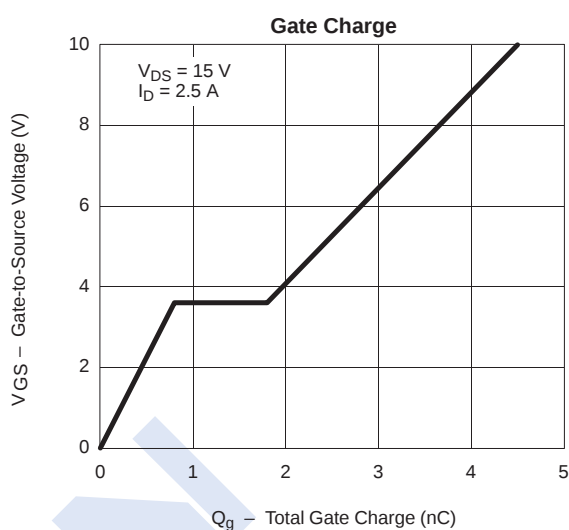
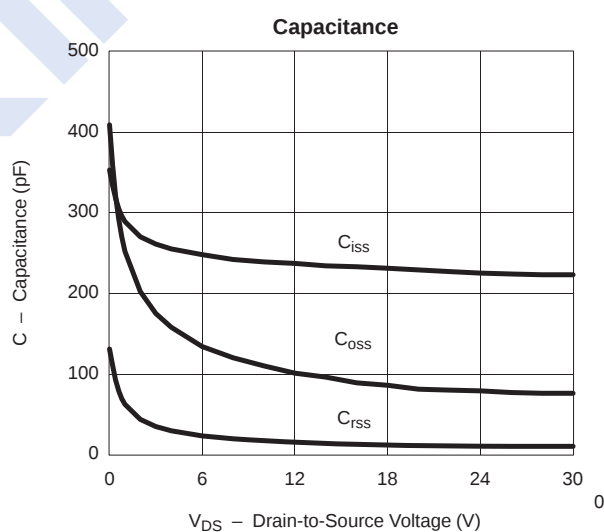
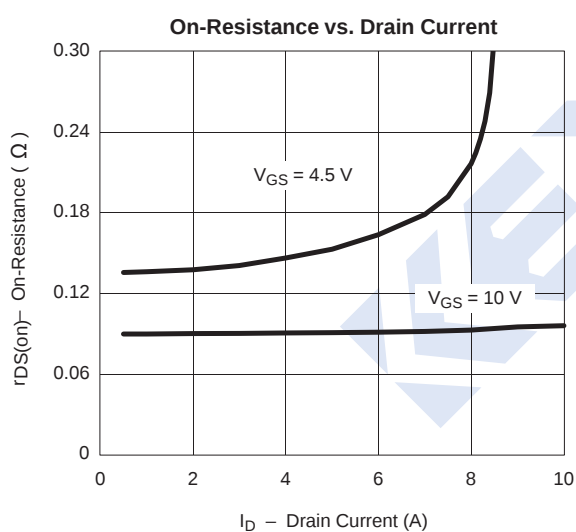
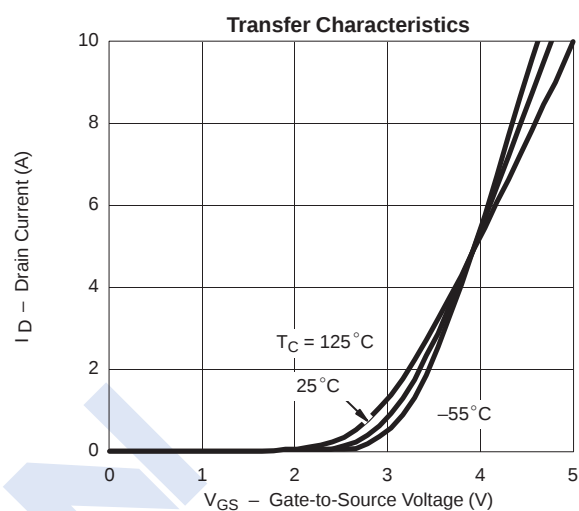
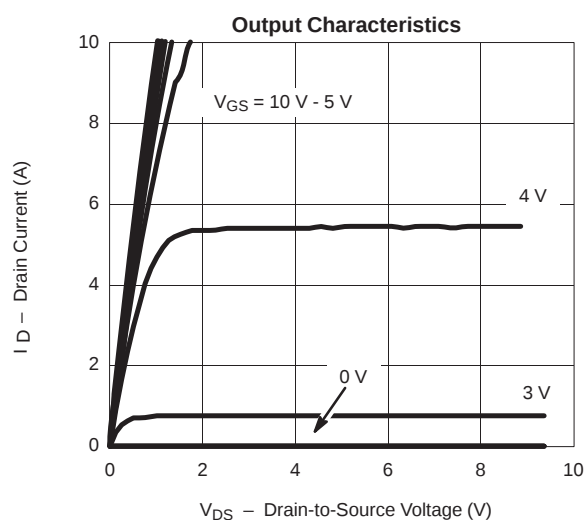
## ■ Marking

|         |     |
|---------|-----|
| Marking | A4* |
|---------|-----|

## N-Channel Enhancement MOSFET

## SI2304DS (KI2304DS)

## ■ Typical Characteristics



## N-Channel Enhancement MOSFET

## SI2304DS (K12304DS)

## ■ Typical Characteristics

