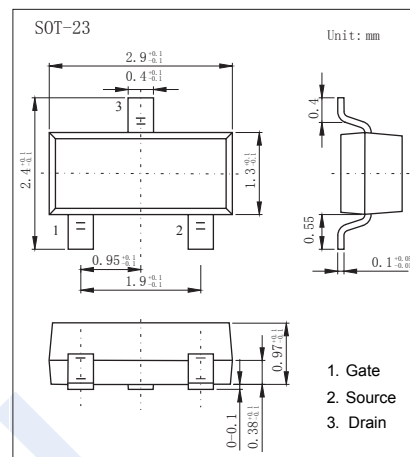
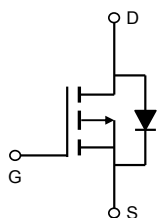


## P-Channel MOSFET

### AO3401A (KO3401A)

#### ■ Features

- $V_{DS} (V) \approx -30V$
- $I_D = -4 A$  ( $V_{GS} \approx -10V$ )
- $R_{DS(ON)} < 50m\Omega$  ( $V_{GS} \approx -10V$ )
- $R_{DS(ON)} < 60m\Omega$  ( $V_{GS} \approx -4.5V$ )
- $R_{DS(ON)} < 85m\Omega$  ( $V_{GS} \approx -2.5V$ )



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

| Parameter                               |                    | Symbol     | Rating     | Unit         |
|-----------------------------------------|--------------------|------------|------------|--------------|
| Drain-Source Voltage                    |                    | $V_{DS}$   | -30        | V            |
| Gate-Source Voltage                     |                    | $V_{GS}$   | $\pm 12$   |              |
| Continuous Drain Current                | $T_A = 25^\circ C$ | $I_D$      | -4         | A            |
|                                         | $T_A = 70^\circ C$ |            | -3.2       |              |
| Pulsed Drain Current                    |                    | $I_{DM}$   | -27        |              |
| Power Dissipation                       | $T_A = 25^\circ C$ | $P_D$      | 1.4        | W            |
|                                         | $T_A = 70^\circ C$ |            | 0.9        |              |
| Thermal Resistance.Junction- to-Ambient | $t \leq 10s$       | $R_{thJA}$ | 90         | $^\circ C/W$ |
|                                         | Steady-State       |            | 125        |              |
| Thermal Resistance.Junction- to-Lead    |                    | $R_{thJL}$ | 80         |              |
| Junction Temperature                    |                    | $T_J$      | 150        | $^\circ C$   |
| Storage Temperature Range               |                    | $T_{stg}$  | -55 to 150 |              |

## P-Channel MOSFET

### AO3401A (KO3401A)

#### ■ Electrical Characteristics Ta = 25°C

| Parameter                             | Symbol       | Test Conditions                                                              | Min  | Typ | Max       | Unit       |
|---------------------------------------|--------------|------------------------------------------------------------------------------|------|-----|-----------|------------|
| Drain-Source Breakdown Voltage        | $V_{DS}$     | $I_D = -250 \mu A$ , $V_{GS} = 0V$                                           | -30  |     |           | V          |
| Zero Gate Voltage Drain Current       | $I_{DSS}$    | $V_{DS} = -30V$ , $V_{GS} = 0V$                                              |      |     | -1        | $\mu A$    |
|                                       |              | $V_{DS} = -30V$ , $V_{GS} = 0V$ , $T_J = 55^\circ C$                         |      |     | -5        |            |
| Gate-Body leakage current             | $I_{GSS}$    | $V_{DS} = 0V$ , $V_{GS} = \pm 12V$                                           |      |     | $\pm 100$ | nA         |
| Gate Threshold Voltage                | $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = -250 \mu A$                                       | -0.5 |     | -1.3      | V          |
| Static Drain-Source On-Resistance     | $R_{DS(on)}$ | $V_{GS} = -10V$ , $I_D = -4A$                                                |      |     | 50        | m $\Omega$ |
|                                       |              | $V_{GS} = -10V$ , $I_D = -4A$ , $T_J = 125^\circ C$                          |      |     | 75        |            |
|                                       |              | $V_{GS} = -4.5V$ , $I_D = -3.5A$                                             |      |     | 60        |            |
|                                       |              | $V_{GS} = -2.5V$ , $I_D = -2.5A$                                             |      |     | 85        |            |
| On state drain current                | $I_{D(on)}$  | $V_{GS} = -10V$ , $V_{DS} = -5V$                                             | -27  |     |           | A          |
| Forward Transconductance              | $g_{FS}$     | $V_{DS} = -5V$ , $I_D = -4A$                                                 |      | 17  |           | S          |
| Input Capacitance                     | $C_{iss}$    | $V_{GS} = 0V$ , $V_{DS} = -15V$ , $f = 1MHz$                                 |      | 645 |           | pF         |
| Output Capacitance                    | $C_{oss}$    |                                                                              |      | 80  |           |            |
| Reverse Transfer Capacitance          | $C_{rss}$    |                                                                              |      | 55  |           |            |
| Gate resistance                       | $R_g$        | $V_{GS} = 0V$ , $V_{DS} = 0V$ , $f = 1MHz$                                   | 4    |     | 12        | $\Omega$   |
| Total Gate Charge (10V)               | $Q_g$        | $V_{GS} = -10V$ , $V_{DS} = -15V$ , $I_D = -4A$                              |      | 14  |           | nC         |
| Total Gate Charge (4.5V)              |              |                                                                              |      | 7   |           |            |
| Gate Source Charge                    | $Q_{gs}$     |                                                                              |      | 1.5 |           |            |
| Gate Drain Charge                     | $Q_{gd}$     |                                                                              |      | 2.5 |           |            |
| Turn-On DelayTime                     | $t_{d(on)}$  |                                                                              |      | 6.5 |           | ns         |
| Turn-On Rise Time                     | $t_r$        | $V_{GS} = -10V$ , $V_{DS} = -15V$ , $R_L = 3.75\Omega$ , $R_{GEN} = 3\Omega$ |      | 3.5 |           |            |
| Turn-Off DelayTime                    | $t_{d(off)}$ |                                                                              |      | 41  |           |            |
| Turn-Off Fall Time                    | $t_f$        |                                                                              |      | 9   |           |            |
| Body Diode Reverse Recovery Time      | $t_{rr}$     |                                                                              |      | 11  |           |            |
| Body Diode Reverse Recovery Charge    | $Q_{rr}$     | $I_F = -4A$ , $dI/dt = 100A/\mu s$                                           |      | 3.5 |           | nC         |
| Maximum Body-Diode Continuous Current | $I_S$        |                                                                              |      |     | -2        | A          |
| Diode Forward Voltage                 | $V_{SD}$     | $I_S = -1A$ , $V_{GS} = 0V$                                                  |      |     | -1        | V          |

\* The static characteristics in Figures 1 to 6 are obtained using <300 $\mu s$  pulses, duty cycle 0.5% max.

#### ■ Marking

|         |      |
|---------|------|
| Marking | X1** |
|---------|------|

## P-Channel MOSFET

### AO3401A (KO3401A)

#### ■ Typical Characteristics

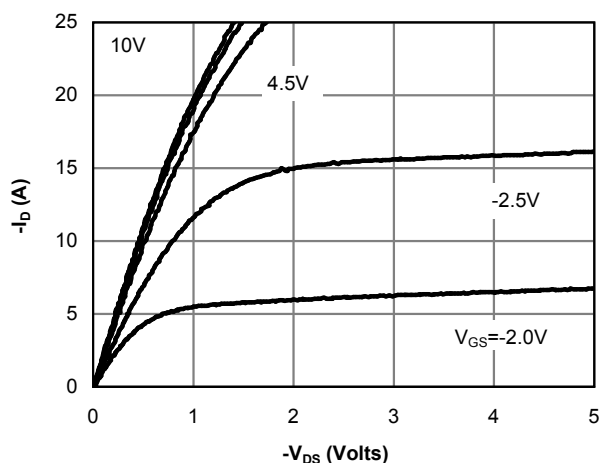


Fig 1: On-Region Characteristics

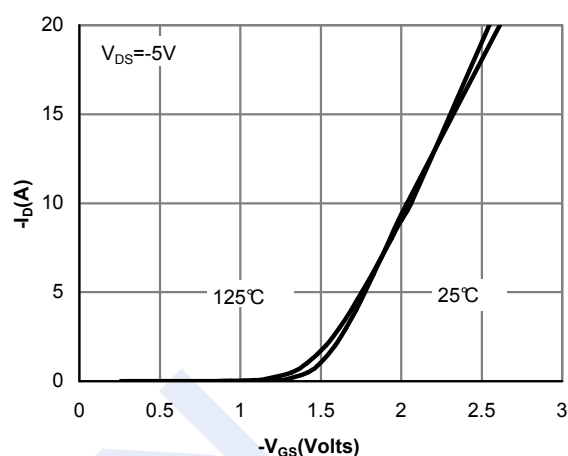


Figure 2: Transfer Characteristics

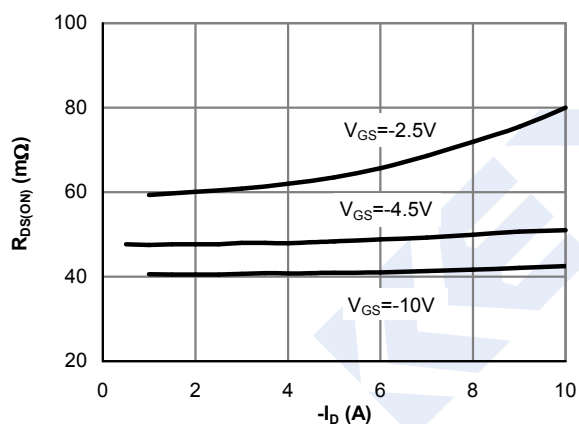


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

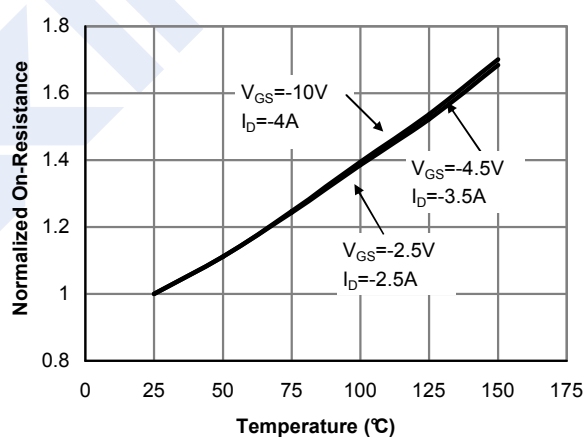


Figure 4: On-Resistance vs. Junction Temperature

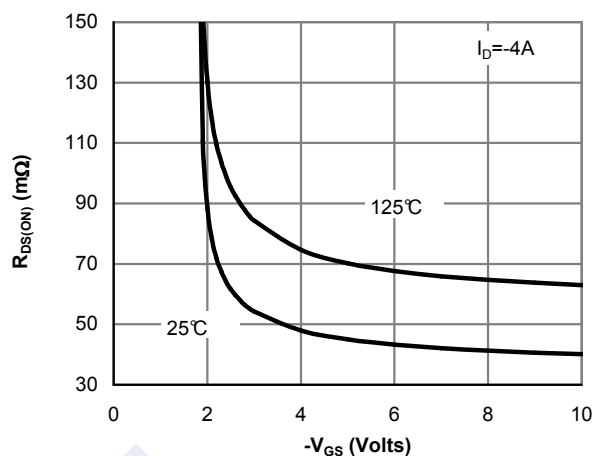


Figure 5: On-Resistance vs. Gate-Source Voltage

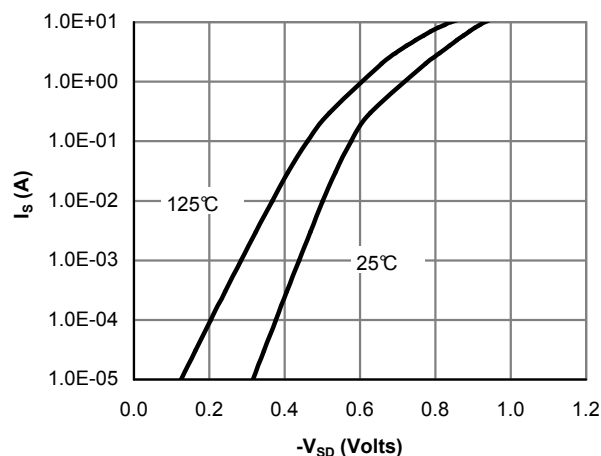


Figure 6: Body-Diode Characteristics

## P-Channel MOSFET

### AO3401A (KO3401A)

#### ■ Typical Characteristics

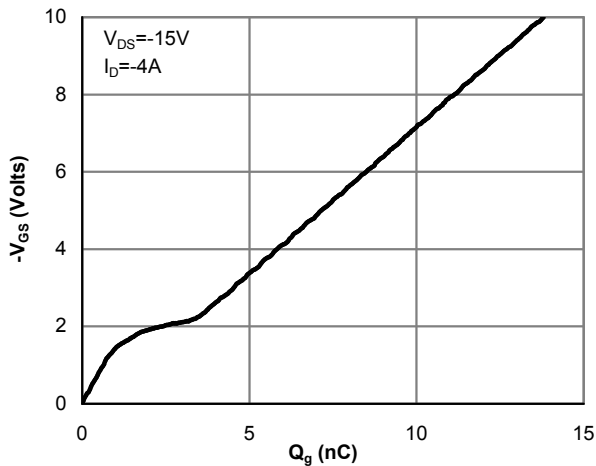


Figure 7: Gate-Charge Characteristics

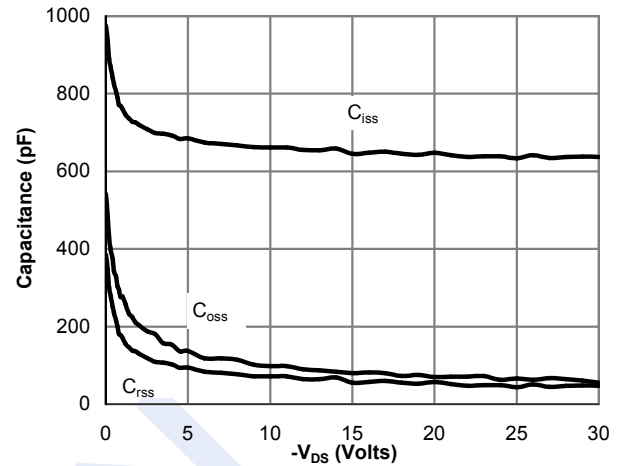


Figure 8: Capacitance Characteristics

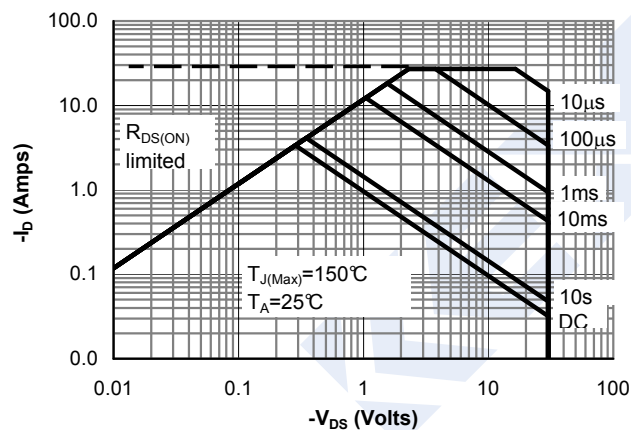


Figure 9: Maximum Forward Biased Safe Operating Area

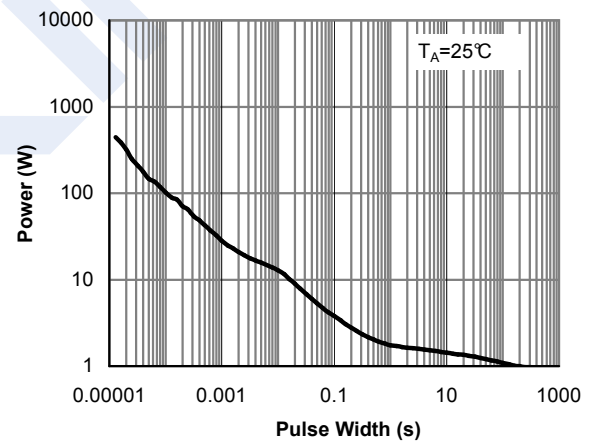


Figure 10: Single Pulse Power Rating Junction-to-Ambient

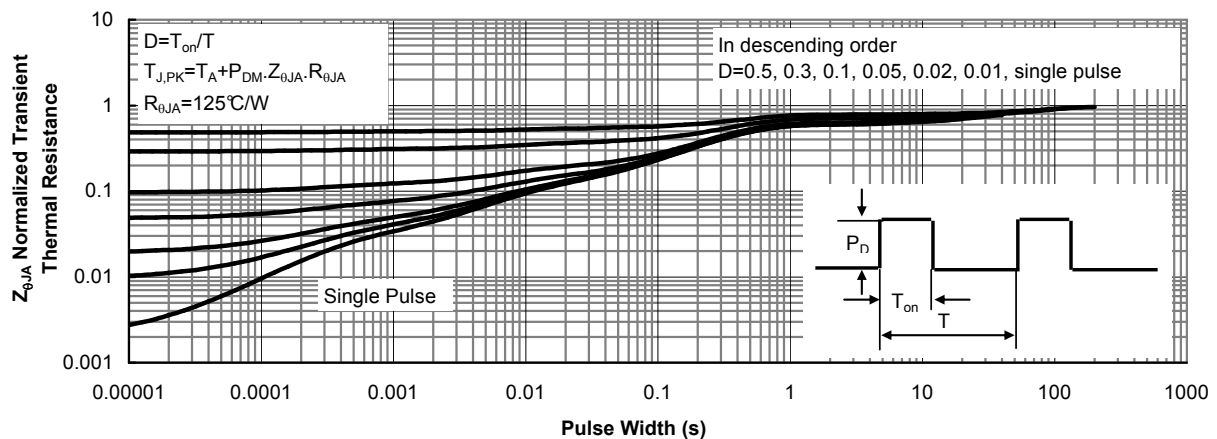


Figure 11: Normalized Maximum Transient Thermal Impedance