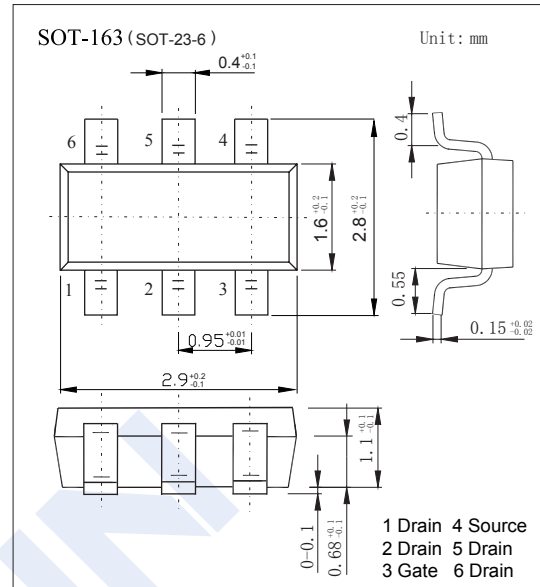
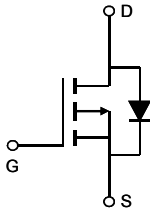


## P-Channel MOSFET

### AO6401 (KO6401)

#### ■ Features

- $V_{DS} (V) = -30V$
- $I_D = -5 A (V_{GS} = -10V)$
- $R_{DS(ON)} < 47m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 64m\Omega (V_{GS} = -4.5V)$
- $R_{DS(ON)} < 85m\Omega (V_{GS} = -2.5V)$



#### ■ 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                | $I_D$      | $T_A = 25^\circ C$ | -5         | A            |
|   |            | $T_A = 70^\circ C$ | -4         |              |
| Pulsed Drain Current                    | $I_{DM}$   | -28                |            |              |
| Power Dissipation                       | $P_D$      | $T_A = 25^\circ C$ | 2          | W            |
|   |            | $T_A = 70^\circ C$ | 1.3        |              |
| Thermal Resistance.Junction- to-Ambient | $R_{thJA}$ | $t \leq 10s$       | 62.5       | $^\circ C/W$ |
|   |            | Steady-State       | 110        |              |
| Thermal Resistance.Junction- to-Lead    | $R_{thJL}$ | 50                 |            |              |
| Junction Temperature                    | $T_J$      | 150                | $^\circ C$ |              |
| Junction Storage Temperature Range      | $T_{stg}$  | -55 to 150         |            |              |

## P-Channel MOSFET

## AO6401 (KO6401)

## ■ 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 μ A, 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                        |   |     | -1   | μA   |
|                                       |                     | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C  |   |     | -5   |      |
| Gate-Body leakage current             | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V                        |   |     | ±100 | nA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250 μ A       | -0.5  |     | -1.3 | V    |
| Static Drain-Source On-Resistance     | R <sub>DS(on)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-5A                        |   |     | 47   | mΩ   |
|                                       |                     | V <sub>GS</sub> =-10V, I <sub>D</sub> =-5A T <sub>J</sub> =125°C  |   |     | 74   |      |
|                                       |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A                       |   |     | 64   |      |
|                                       |                     | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1A                       |   |     | 85   |      |
| On state drain current                | I <sub>D(ON)</sub>  | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V                       | -28   |     |      | A    |
| Forward Transconductance              | g <sub>FS</sub>     | V <sub>DS</sub> =-5V, I <sub>D</sub> =-5A                         |   | 18  |      | S    |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz                |   | 645 | 780  | pF   |
| Output Capacitance                    | C <sub>oss</sub>    |   |   | 80  |      |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |   |   | 55  | 80   |      |
| Gate resistance                       | R <sub>g</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz                  | 4   |     | 12   | Ω    |
| Total Gate Charge (10V)               | Q <sub>g</sub>      | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-5A |   | 14  | 17   | nC   |
| Total Gate Charge (4.5V)              |                     |   |   | 7   | 8.5  |      |
| Gate Source Charge                    | Q <sub>gs</sub>     |   |   | 1.5 |      |      |
| Gate Drain Charge                     | Q <sub>gd</sub>     |   |   | 2.5 |      |      |
| Turn-On DelayTime                     | t <sub>d(on)</sub>  |   | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =3Ω,<br>R <sub>GEN</sub> =3Ω |     | 6.5  |      |
| Turn-On Rise Time                     | t <sub>r</sub>      |   |   | 3.5 |      |      |
| Turn-Off DelayTime                    | t <sub>d(off)</sub> |   |   | 41  |      |      |
| Turn-Off Fall Time                    | t <sub>f</sub>      |   |   | 9   |      |      |
| Body Diode Reverse Recovery Time      | t <sub>rr</sub>     | I <sub>F</sub> =-5A, di/dt=100A/μ s                               |   | 11  | 13.5 | nC   |
| Body Diode Reverse Recovery Charge    | Q <sub>rr</sub>     |   |   | 3.5 |      |      |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |   |   |     | -2.5 | A    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =-1A, V <sub>GS</sub> =0V                          |   |     | -1   | V    |

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

## ■ Marking

|         |      |
|---------|------|
| Marking | D1** |
|---------|------|

## P-Channel MOSFET AO6401 (KO6401)

### Typical Characteristics

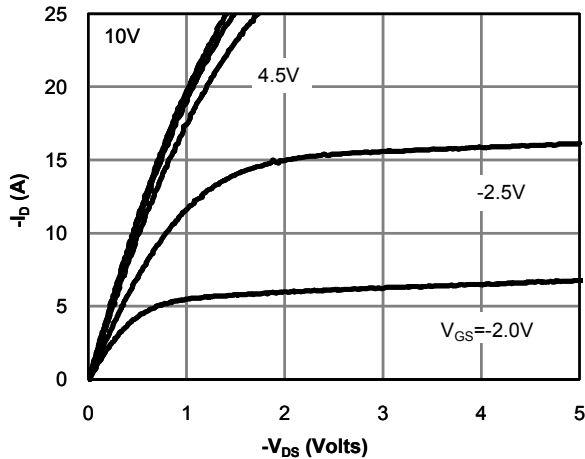


Fig 1: On-Region Characteristics (Note E)

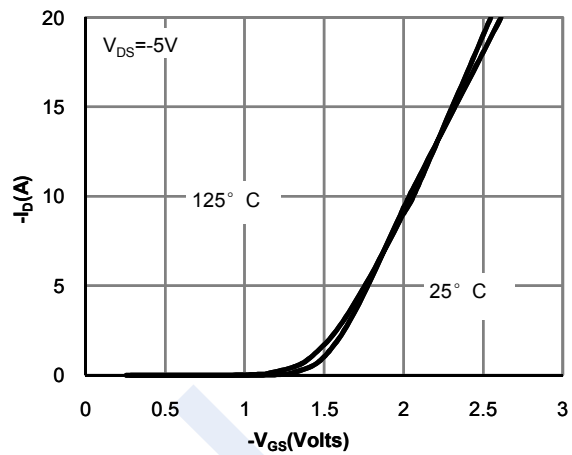


Figure 2: Transfer Characteristics (Note E)

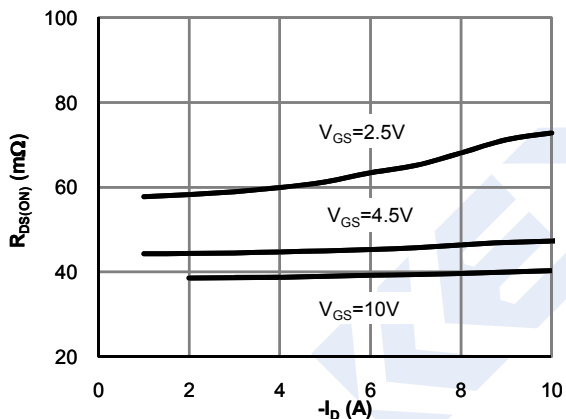


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

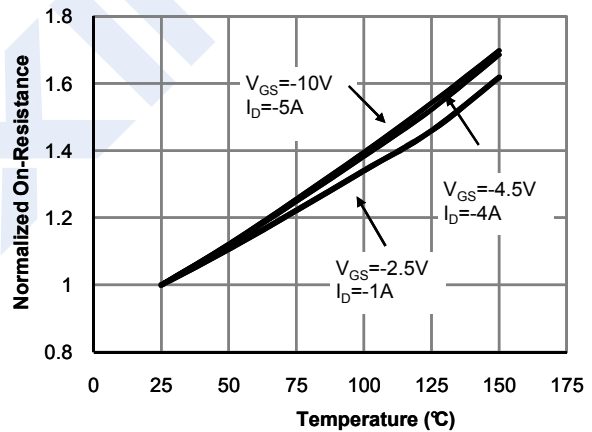


Figure 4: On-Resistance vs. Junction Temperature (Note E)

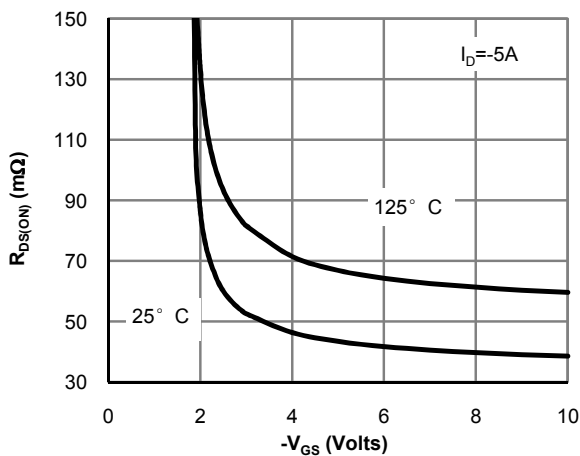


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

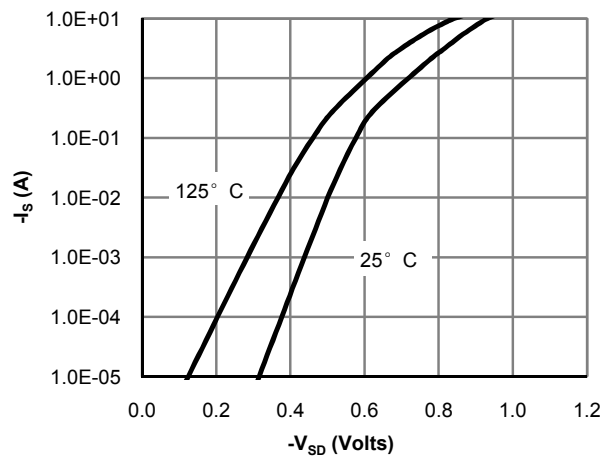


Figure 6: Body-Diode Characteristics (Note E)

## P-Channel MOSFET AO6401 (KO6401)

■ Typical Characteristics

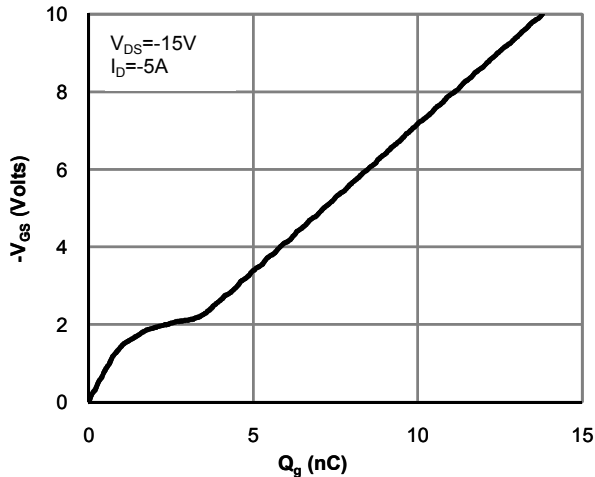


Figure 7: Gate-Charge Characteristics

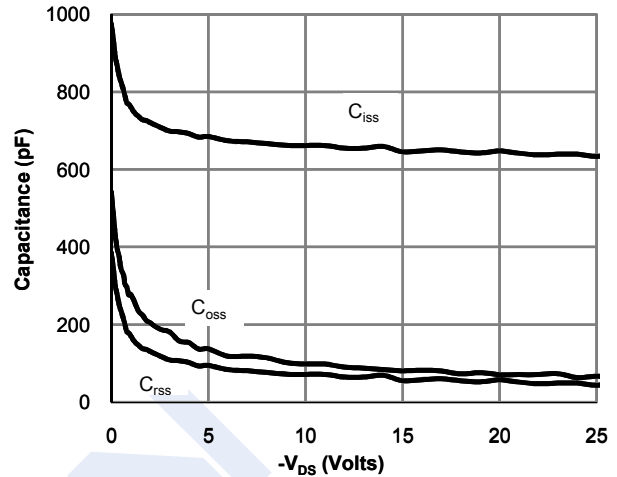


Figure 8: Capacitance Characteristics

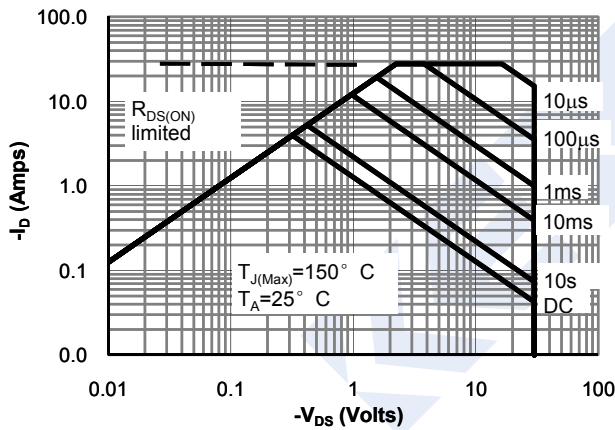


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

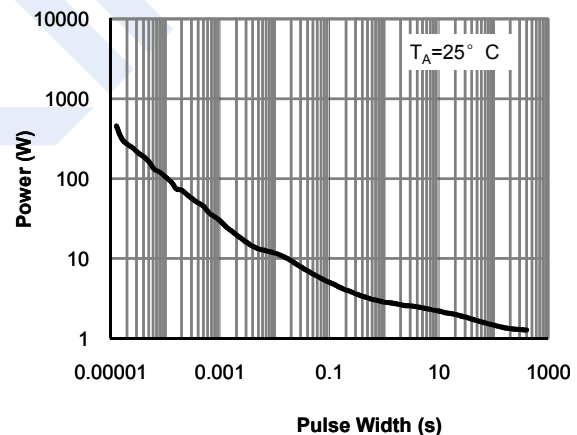


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

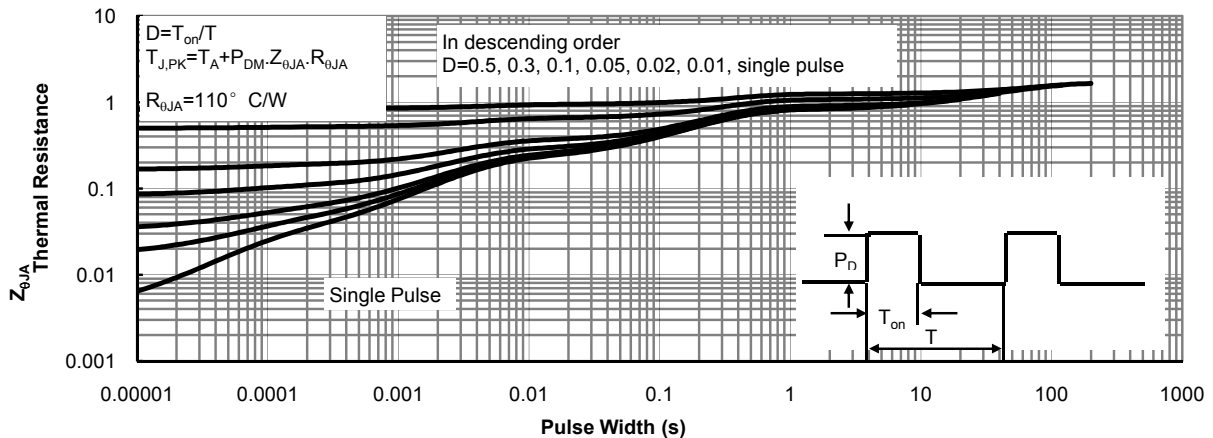


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)