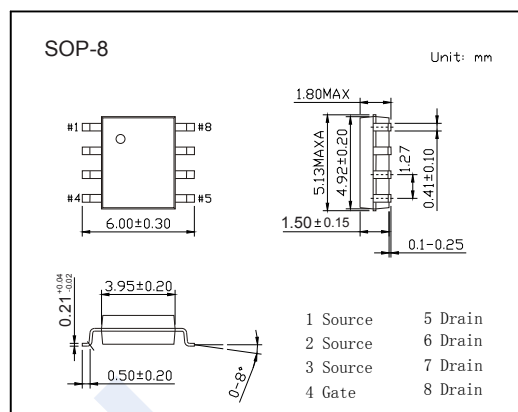
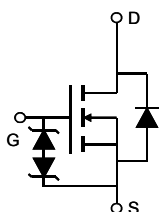


## N-Channel MOSFET

### AO4302 (KO4302)

#### ■ Features

- $V_{DS}$  (V) = 30V
- $I_D$  = 23 A ( $V_{GS}$  = 10V)
- $R_{DS(ON)}$  < 4m $\Omega$  ( $V_{GS}$  = 10V)
- $R_{DS(ON)}$  < 5m $\Omega$  ( $V_{GS}$  = 4.5V)
- ESD Rating: 2000V HBM



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

| Parameter                               |                          | Symbol           | Rating     | Unit               |
|-----------------------------------------|--------------------------|------------------|------------|--------------------|
| Drain-Source Voltage                    |                          | $V_{DS}$         | 30         | V                  |
| Gate-Source Voltage                     |                          | $V_{GS}$         | $\pm 20$   |                    |
| Continuous Drain Current                | $T_A = 25^\circ\text{C}$ | $I_D$            | 23         | A                  |
|                                         | $T_A = 70^\circ\text{C}$ |                  | 18         |                    |
| Pulsed Drain Current                    |                          | $I_{DM}$         | 316        |                    |
| Avalanche Current                       |                          | $I_{AS}, I_{AR}$ | 49         | mJ                 |
| Avalanche energy                        | $L = 0.1\text{mH}$       | $E_{AS}, E_{AR}$ | 120        |                    |
| Power Dissipation                       | $T_A = 25^\circ\text{C}$ | $P_D$            | 3.6        | W                  |
|                                         | $T_A = 70^\circ\text{C}$ |                  | 2.3        |                    |
| Thermal Resistance.Junction- to-Ambient | $t \leq 10\text{s}$      | $R_{thJA}$       | 35         | $^\circ\text{C/W}$ |
|                                         | Steady-State             |                  | 65         |                    |
| Thermal Resistance.Junction- to-Lead    |                          | $R_{thJL}$       | 15         |                    |
| Junction Temperature                    |                          | $T_J$            | 150        | $^\circ\text{C}$   |
| Storage Temperature Range               |                          | $T_{stg}$        | -55 to 150 |                    |

## N-Channel MOSFET

## AO4302 (KO4302)

## ■ 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 uA, 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    | uA   |
|                                       |                     | 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> =±20V                                              |      |      | ±10  | uA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                                | 1.3  |      | 2.3  | V    |
| Static Drain-Source On-Resistance     | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =20A                                               |      |      | 4    | mΩ   |
|                                       |                     | V <sub>GS</sub> =10V, I <sub>D</sub> =20A T <sub>J</sub> =125°C                         |      |      | 6    |      |
|                                       |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =18A                                              |      |      | 5    |      |
| On State Drain Current                | I <sub>D(ON)</sub>  | V <sub>GS</sub> =10V, V <sub>DS</sub> =5V                                               | 316  |      |      | A    |
| Forward Transconductance              | g <sub>FS</sub>     | V <sub>DS</sub> =5V, I <sub>D</sub> =20A                                                |      | 120  |      | S    |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz                                       | 2310 |      | 3470 | pF   |
| Output Capacitance                    | C <sub>oss</sub>    |                                                                                         | 330  |      | 620  |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |                                                                                         | 150  |      | 360  |      |
| Gate Resistance                       | R <sub>g</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz                                        | 0.7  |      | 2.4  | Ω    |
| Total Gate Charge (10V)               | Q <sub>g</sub>      | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =20A                         | 41   |      | 63   | nC   |
| Total Gate Charge (4.5V)              |                     |                                                                                         | 19   |      | 30   |      |
| Gate Source Charge                    | Q <sub>gs</sub>     |                                                                                         |      | 7.5  |      |      |
| Gate Drain Charge                     | Q <sub>gd</sub>     |                                                                                         |      | 10.9 |      |      |
| Turn-On DelayTime                     | t <sub>d(on)</sub>  |                                                                                         |      | 7    |      |      |
| Turn-On Rise Time                     | t <sub>r</sub>      | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =0.75Ω, R <sub>GEN</sub> =3Ω |      | 4.8  |      | ns   |
| Turn-Off DelayTime                    | t <sub>d(off)</sub> |                                                                                         |      | 41.5 |      |      |
| Turn-Off Fall Time                    | t <sub>f</sub>      |                                                                                         |      | 8.8  |      |      |
| Body Diode Reverse Recovery Time      | t <sub>rr</sub>     | I <sub>F</sub> = 20A, di/dt= 500A/us                                                    | 11   |      | 17   | nC   |
| Body Diode Reverse Recovery Charge    | Q <sub>rr</sub>     |                                                                                         | 24   |      | 37   |      |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |                                                                                         |      |      | 5    | A    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =1A, V <sub>GS</sub> =0V                                                 |      |      | 1    | V    |

Note : The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

## ■ Marking

|         |                |
|---------|----------------|
| Marking | 4302<br>KC**** |
|---------|----------------|

## N-Channel MOSFET

### AO4302 (KO4302)

#### ■ Typical Characteristics

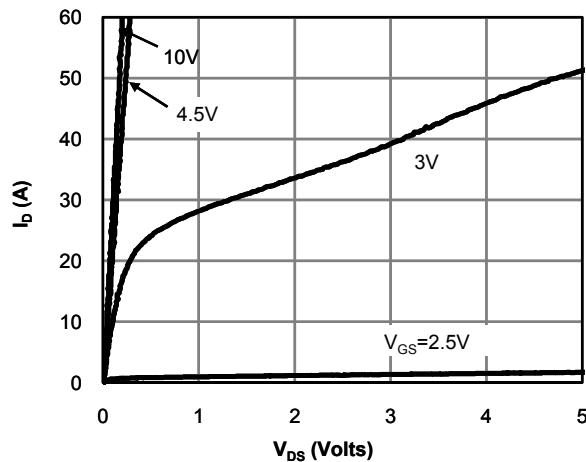


Fig 1: On-Region Characteristics (Note E)

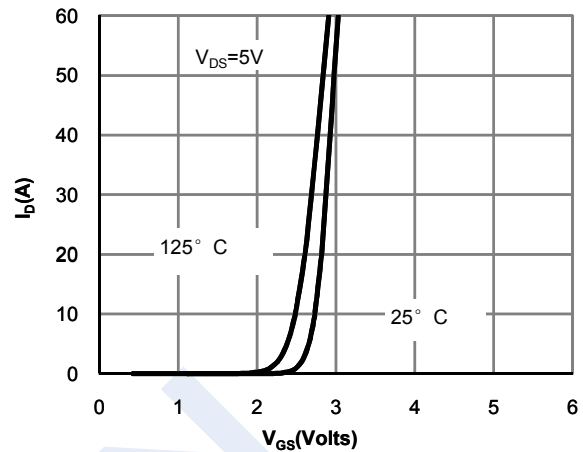


Figure 2: Transfer Characteristics (Note E)

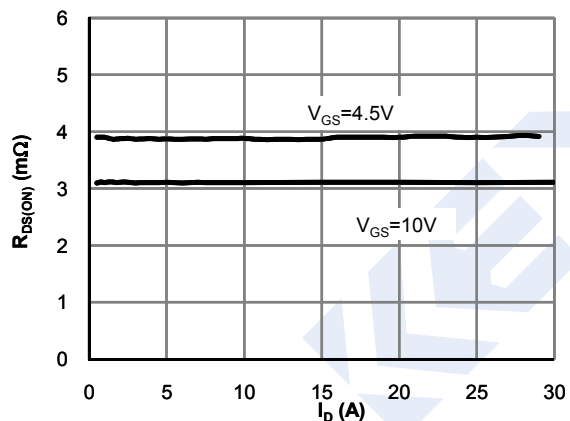


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

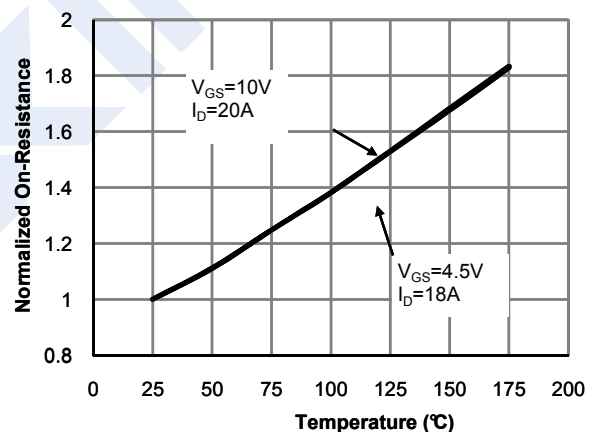


Figure 4: On-Resistance vs. Junction Temperature (Note E)

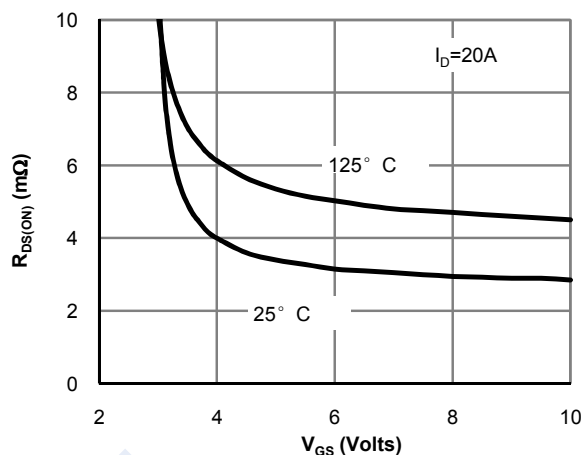


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

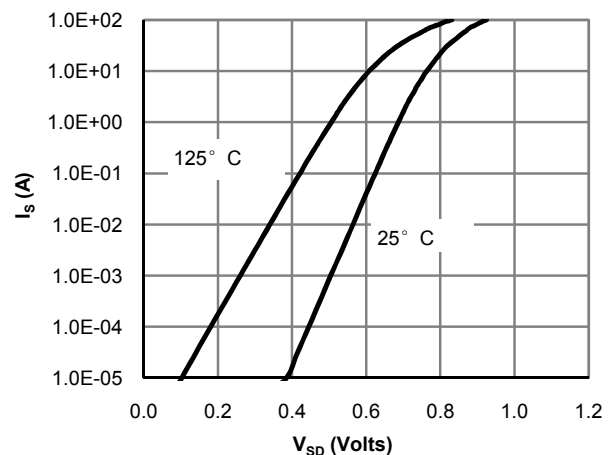


Figure 6: Body-Diode Characteristics (Note E)

## N-Channel MOSFET

## AO4302 (KO4302)

## ■ Typical Characteristics

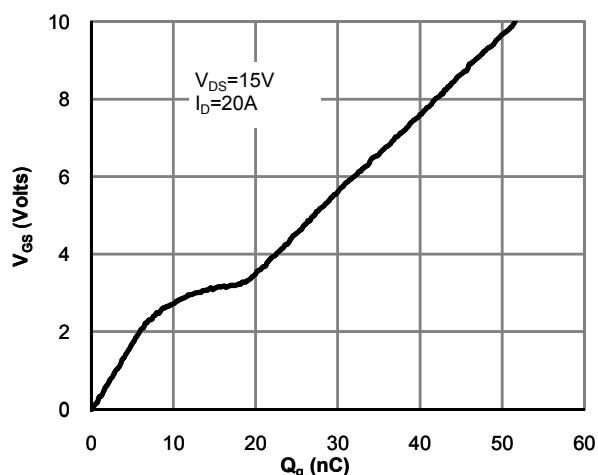


Figure 7: Gate-Charge Characteristics

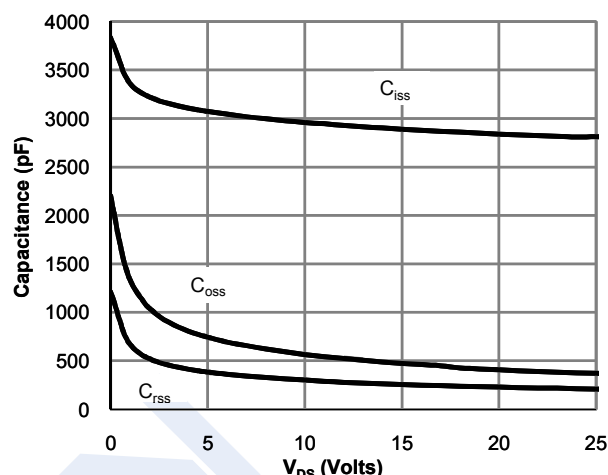


Figure 8: Capacitance Characteristics

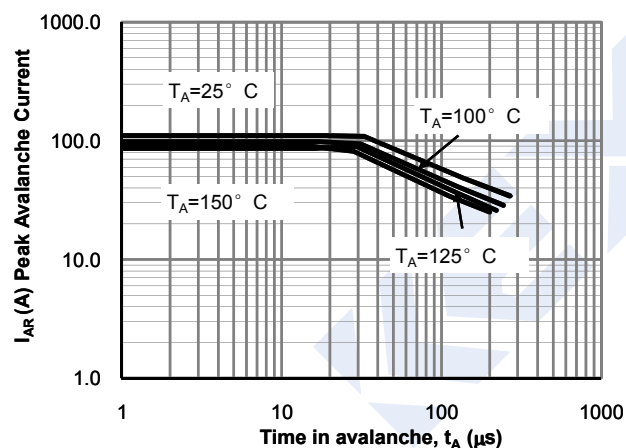


Figure 9: Single Pulse Avalanche capability (Note C)

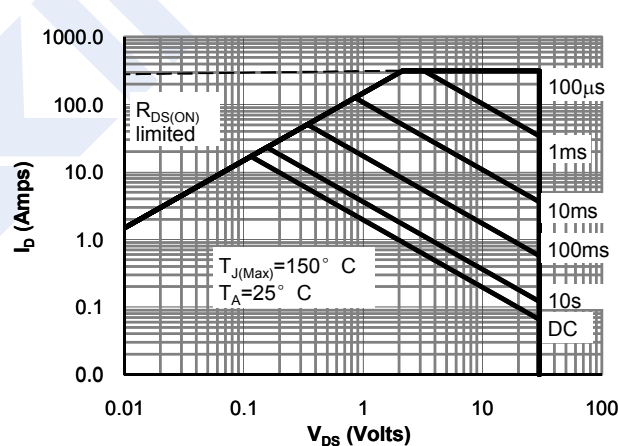


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

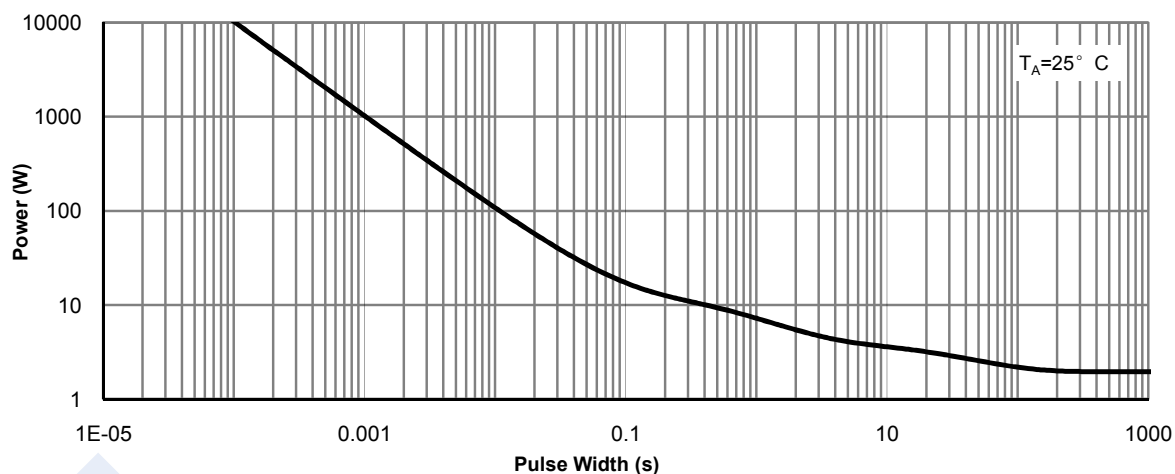


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

## N-Channel MOSFET

### AO4302 (KO4302)

#### ■ Typical Characteristics

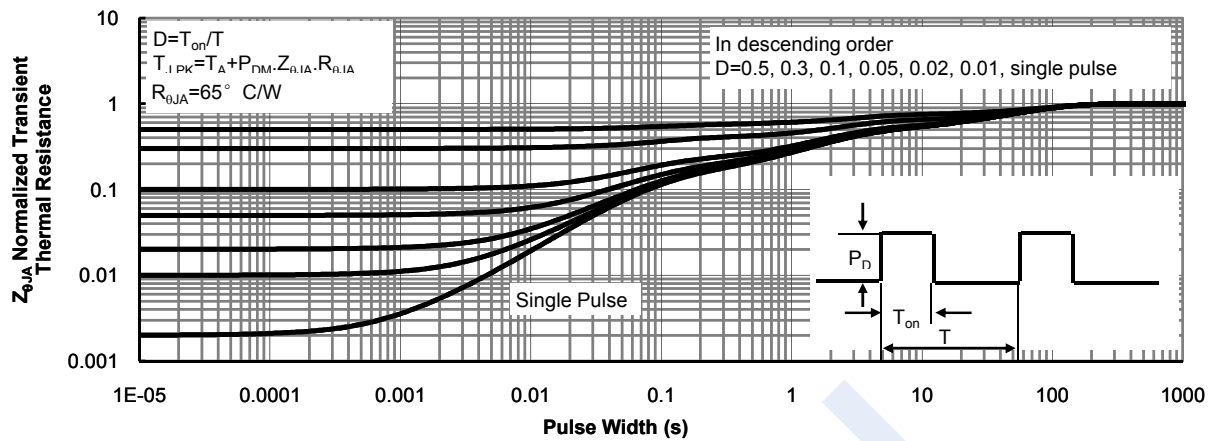


Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)