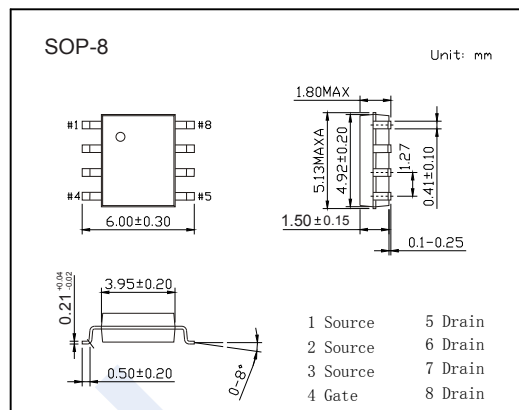
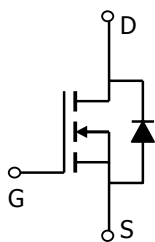


## N-Channel MOSFET

### AO4446-HF (KO4446-HF)

#### ■ Features

- $V_{DS} (V) = 30V$
- $I_D = 15 A$  ( $V_{GS} = 10V$ )
- $R_{DS(ON)} < 8.5m\Omega$  ( $V_{GS} = 10V$ )
- $R_{DS(ON)} < 14.5m\Omega$  ( $V_{GS} = 4.5V$ )
- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish



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

| Parameter                               |                    | Symbol     | Rating     | Unit         |
|-----------------------------------------|--------------------|------------|------------|--------------|
| Drain-Source Voltage                    |                    | $V_{DS}$   | 30         | V            |
| Gate-Source Voltage                     |                    | $V_{GS}$   | ±20        |              |
| Continuous Drain Current                | $T_A = 25^\circ C$ | $I_D$      | 15         | A            |
|                                         | $T_A = 70^\circ C$ |            | 12         |              |
| Pulsed Drain Current                    |                    | $I_{DM}$   | 40         |              |
| Avalanche Current                       |                    | $I_{AR}$   | 20         |              |
| Repetitive Avalanche Energy             | $L = 0.1mH$        | $E_{AR}$   | 50         | mJ           |
| Power Dissipation                       | $T_A = 25^\circ C$ | $P_D$      | 3          | W            |
|                                         | $T_A = 70^\circ C$ |            | 2.1        |              |
| Thermal Resistance.Junction- to-Ambient | $t \leq 10s$       | $R_{thJA}$ | 40         | $^\circ C/W$ |
|                                         | Steady-State       |            | 75         |              |
| Thermal Resistance.Junction- to-Lead    |                    | $R_{thJL}$ | 24         |              |
| Junction Temperature                    |                    | $T_J$      | 150        | $^\circ C$   |
| Storage Temperature Range               |                    | $T_{stg}$  | -55 to 150 |              |

## N-Channel MOSFET

### AO4446-HF (KO4446-HF)

■ 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> =250μA, V <sub>GS</sub> =0V                                             | 30  |      |      | V    |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>D</sub> =24V, V <sub>GS</sub> =0V                                               |     |      | 1    | μA   |
|                                       |                     | V <sub>D</sub> =24V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C                         |     |      | 5    |      |
| Gate-Body Leakage Current             | I <sub>GSS</sub>    | V <sub>D</sub> =0V, V <sub>GS</sub> =±20V                                              |     |      | ±100 | nA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>D</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA                               | 1   |      | 3    | V    |
| Static Drain-Source On-Resistance     | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =15A                                              |     |      | 8.5  | mΩ   |
|                                       |                     | V <sub>GS</sub> =10V, I <sub>D</sub> =15A T <sub>J</sub> =125°C                        |     |      | 13.5 |      |
|                                       |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =11A                                             |     |      | 14.5 |      |
| On State Drain Current                | I <sub>D(ON)</sub>  | V <sub>GS</sub> =10V, V <sub>D</sub> =5V                                               | 40  |      |      | A    |
| Forward Transconductance              | g <sub>FS</sub>     | V <sub>D</sub> =5V, I <sub>D</sub> =15A                                                |     | 27   |      | S    |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>GS</sub> =0V, V <sub>D</sub> =15V, f=100KHz                                     |     | 1520 | 1825 | pF   |
| Output Capacitance                    | C <sub>oss</sub>    |                                                                                        |     | 306  |      |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |                                                                                        |     | 214  |      |      |
| Gate Resistance                       | R <sub>g</sub>      | V <sub>GS</sub> =0V, V <sub>D</sub> =0V, f=1MHz                                        |     | 0.47 | 0.7  | Ω    |
| Total Gate Charge (10V)               | Q <sub>g</sub>      | V <sub>GS</sub> =4.5V, V <sub>D</sub> =15V, I <sub>D</sub> =15A                        |     | 33.7 | 40   | nC   |
| Total Gate Charge (4.5V)              |                     |                                                                                        |     | 17   | 20   |      |
| Gate Source Charge                    | Q <sub>gs</sub>     |                                                                                        |     | 6.2  |      |      |
| Gate Drain Charge                     | Q <sub>gd</sub>     |                                                                                        |     | 10   |      |      |
| Turn-On DelayTime                     | t <sub>d(on)</sub>  |                                                                                        |     | 7.2  |      |      |
| Turn-On Rise Time                     | t <sub>r</sub>      | V <sub>GS</sub> =10V, V <sub>D</sub> =15V, R <sub>L</sub> =1Ω,<br>R <sub>GEN</sub> =3Ω |     | 8.2  |      | ns   |
| Turn-Off DelayTime                    | t <sub>d(off)</sub> |                                                                                        |     | 22   |      |      |
| Turn-Off Fall Time                    | t <sub>f</sub>      |                                                                                        |     | 6.7  |      |      |
| Body Diode Reverse Recovery Time      | t <sub>rr</sub>     | I <sub>F</sub> = 15A, di/dt= 100A/μs                                                   |     | 24   | 30   | nC   |
| Body Diode Reverse Recovery Charge    | Q <sub>rr</sub>     |                                                                                        |     | 19   |      |      |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |                                                                                        |     |      | 4    | 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 <300μs pulses, duty cycle 0.5% max.

#### ■ Marking

|         |                             |
|---------|-----------------------------|
| Marking | 4446<br>KC**** <sub>F</sub> |
|---------|-----------------------------|

## N-Channel MOSFET

### AO4446-HF (KO4446-HF)

#### ■ Typical Characteristics

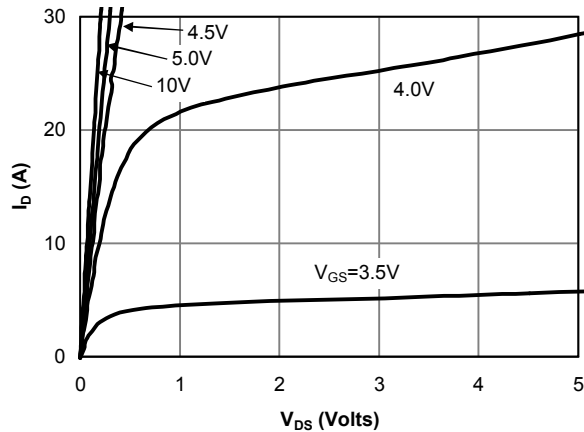


Fig 1: On-Region Characteristics

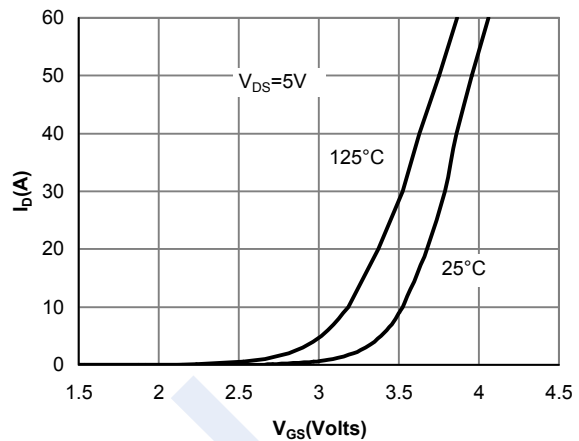


Figure 2: Transfer Characteristics

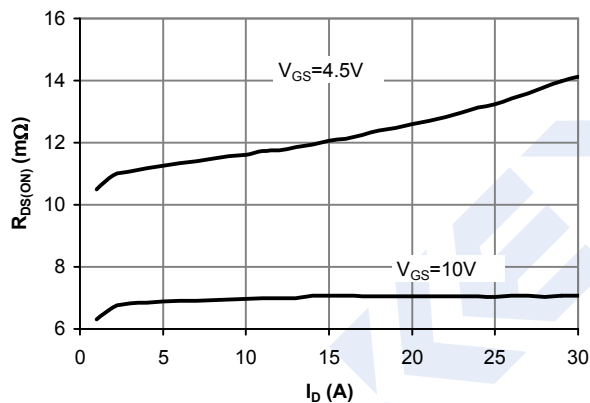


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

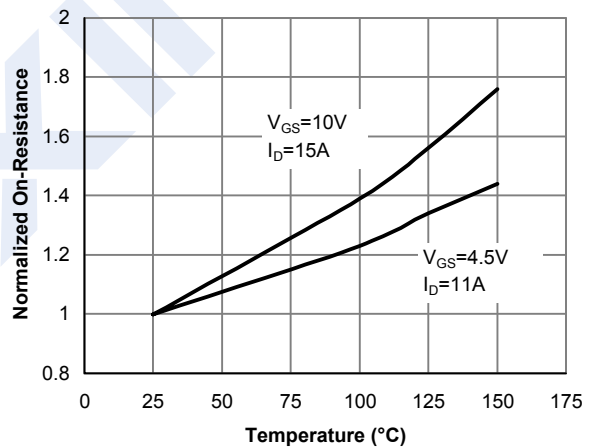


Figure 4: On-Resistance vs. Junction Temperature

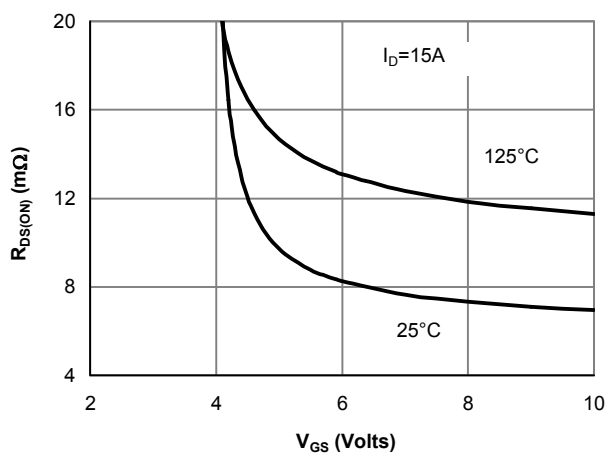


Figure 5: On-Resistance vs. Gate-Source Voltage

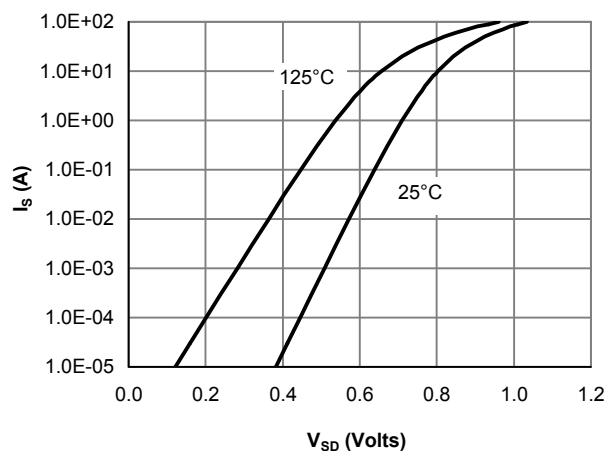


Figure 6: Body-Diode Characteristics

## N-Channel MOSFET

### AO4446-HF (KO4446-HF)

#### ■ Typical Characteristics

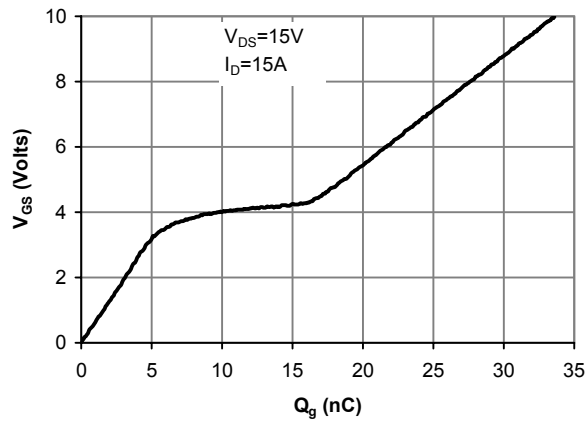


Figure 7: Gate-Charge Characteristics

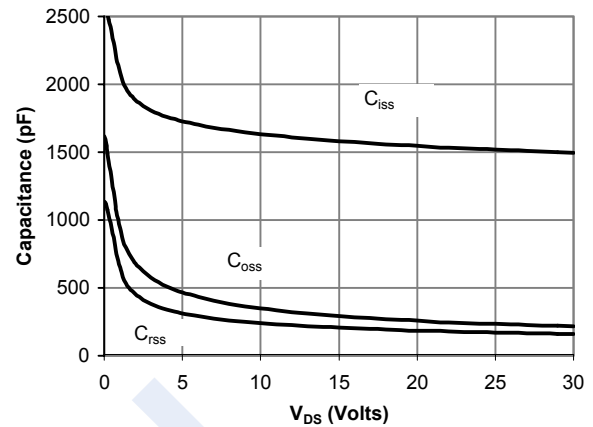


Figure 8: Capacitance Characteristics

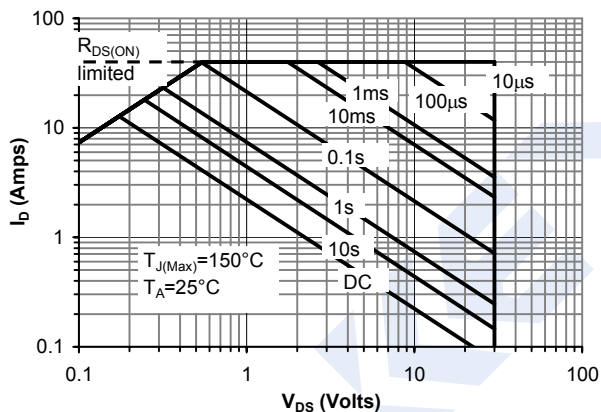


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

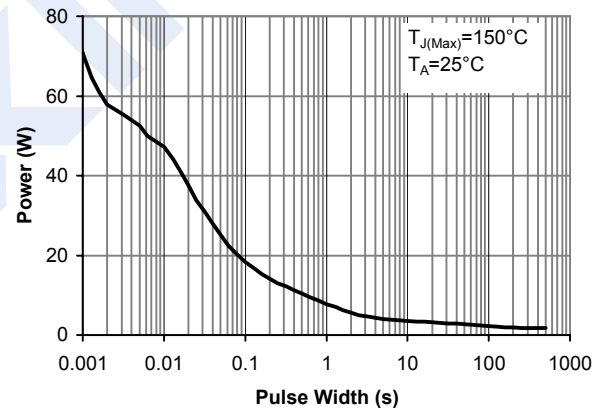


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

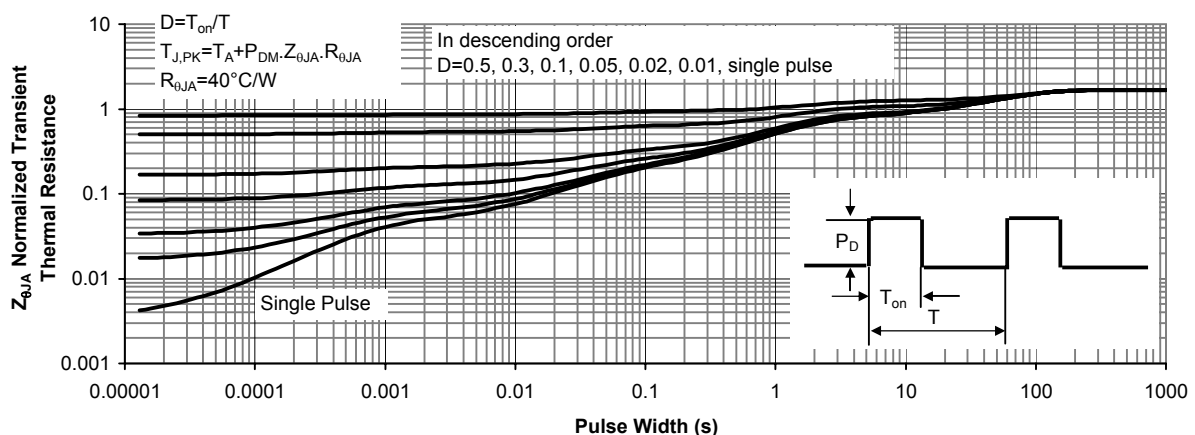


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)