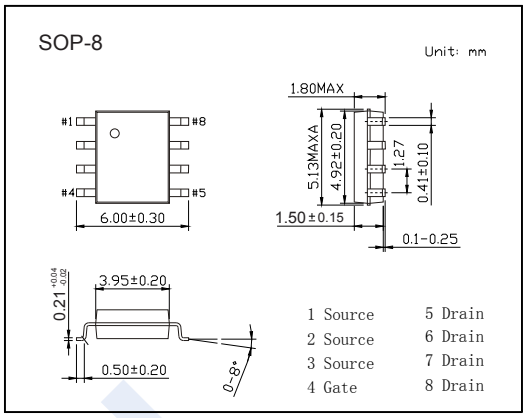
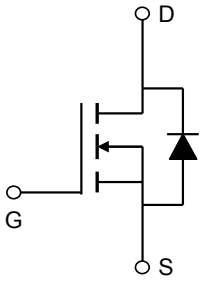
# N-Channel MOSFET

# AO4454-HF (KO4454-HF)




## ■ Features

- $V_{DS\ (V)}$ = 100V
- $I_D$ = 6.5 A ($V_{GS}$ = 10V)
- $R_{DS(ON)}$ < 36mΩ ($V_{GS}$ = 10V)
- $R_{DS(ON)}$ < 43mΩ ($V_{GS}$ = 7V)
- Pb−Free Package May be Available. The G−Suffix Denotes a Pb−Free Lead Finish




## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±25 | |
| Continuous Drain Current | $T_A$=25℃ | $I_D$ | 6.5 | A |
| | $T_A$=70℃ | | 5.3 | |
| Pulsed Drain Current | | $I_{DM}$ | 46 | |
| Avalanche Current | | $I_{AS}$,$I_{AR}$ | 28 | |
| Avalanche Energy | L=0.1mH | $E_{AS}$,$E_{AR}$ | 39 | mJ |
| Power Dissipation | $T_A$=25℃ | $P_D$ | 3.1 | W |
| | $T_A$=70℃ | | 2 | |
| Thermal Resistance.Junction- to-Ambient | t ≤ 10s | $R_{thJA}$ | 40 | ℃/W |
| | Steady-State | | 75 | |
| Thermal Resistance.Junction- to-Lead | | $R_{thJL}$ | 24 | |
| Junction Temperature | | $T_J$ | 150 | ℃ |
| Storage Temperature Range | | $T_{stg}$ | -55 to 150 | |

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■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{DSS}$ | $I_D$=250uA, $V_{GS}$=0V | 100 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=100V, $V_{GS}$=0V | | | 10 | uA |
| | | $V_{DS}$=100V, $V_{GS}$=0V, $T_J$=55℃ | | | 50 | |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±25V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ , $I_D$=250uA | 2.8 | | 4 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=6.5A | | | 36 | mΩ |
| | | $V_{GS}$=10V, $I_D$=6.5A $T_J$=125℃ | | | 67 | |
| | | $V_{GS}$=7V, $I_D$=6A | | | 43 | |
| On State Drain Current | $I_{D(ON)}$ | $V_{GS}$=10V, $V_{DS}$=5V | 46 | | | A |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=5V, $I_D$=6.5A | | 20 | | S |
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=50V, f=1MHz | 950 | | 1450 | pF |
| Output Capacitance | $C_{oss}$ | | 77 | | 145 | |
| Reverse Transfer Capacitance | $C_{rss}$ | | 21 | | 50 | |
| Gate Resistance | $R_g$ | $V_{GS}$=0V, $V_{DS}$=0V, f=1MHz | 0.35 | | 1.05 | Ω |
| Total Gate Charge | $Q_g$ | $V_{GS}$=10V, $V_{DS}$=50V, $I_D$=6.5A | 15 | | 23 | nC |
| Gate Source Charge | $Q_{gs}$ | | 5.5 | | 8.5 | |
| Gate Drain Charge | $Q_{gd}$ | | 3.5 | | 9 | |
| Turn-On DelayTime | $t_{d(on)}$ | $V_{GS}$=10V, $V_{DS}$=50V, $R_L$=6.7Ω, $R_{GEN}$=3Ω | | 10 | | ns |
| Turn-On Rise Time | $t_r$ | | | 7.2 | | |
| Turn-Off DelayTime | $t_{d(off)}$ | | | 15 | | |
| Turn-Off Fall Time | $t_f$ | | | 7 | | |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$= 6.5A, dI/dt= 500A/μs | 11 | | 21 | |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | | 35 | | 65 | nC |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | 4 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1A,$V_{GS}$=0V | | | 1 | V |

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

■ Marking

| | |
|---|---|
| Marking | 4454<br>KC**** F |

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■ Typical Characterisitics

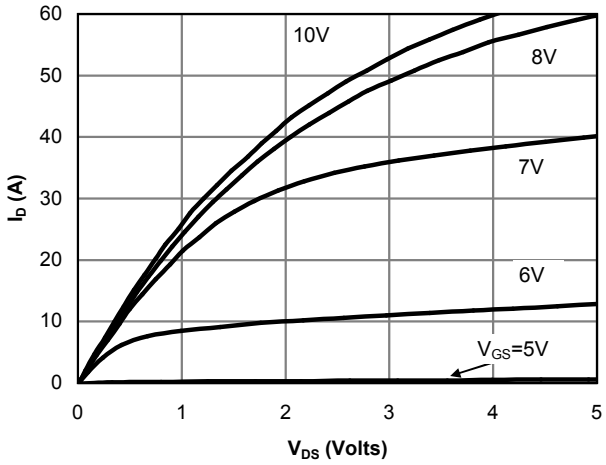


Fig 1: On-Region Characteristics (Note E)

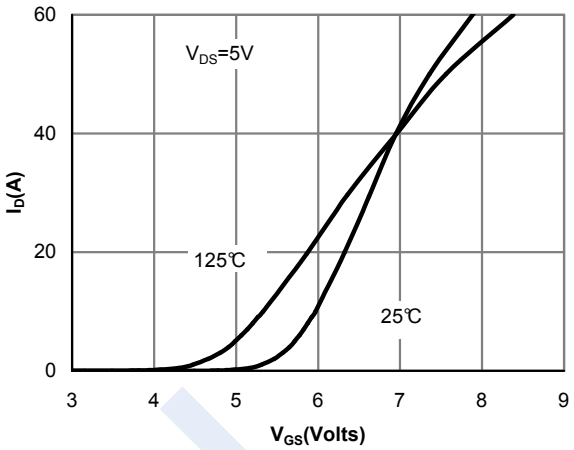


Figure 2: Transfer Characteristics (Note E)

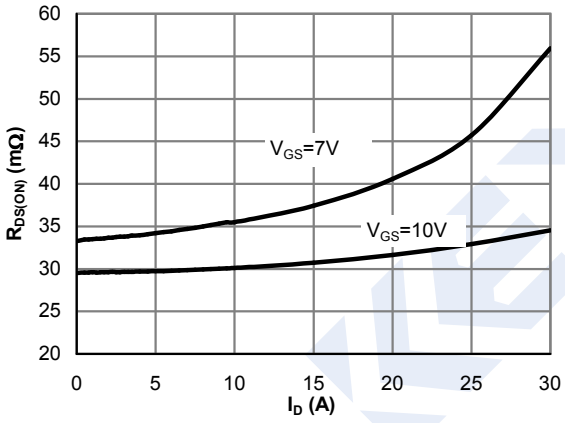


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

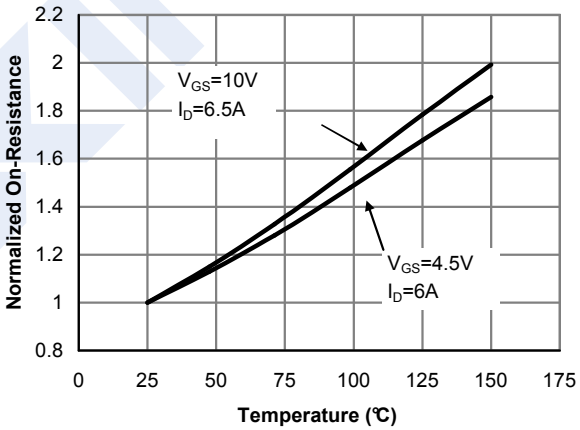


Figure 4: On-Resistance vs. Junction Temperature (Note E)

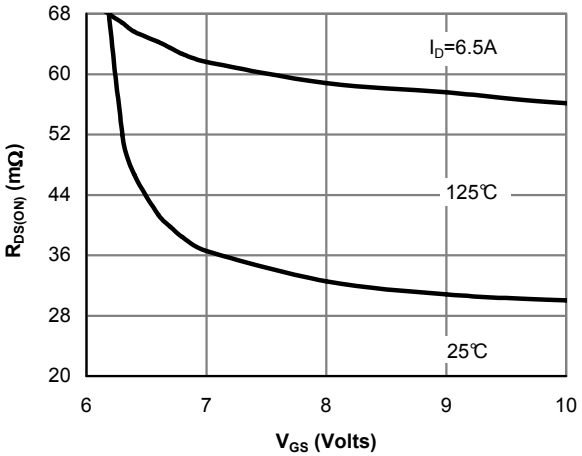


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

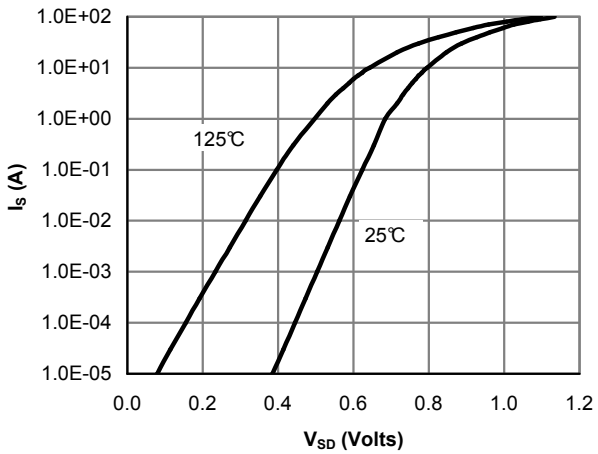


Figure 6: Body-Diode Characteristics (Note E)

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■ Typical Characterisitics

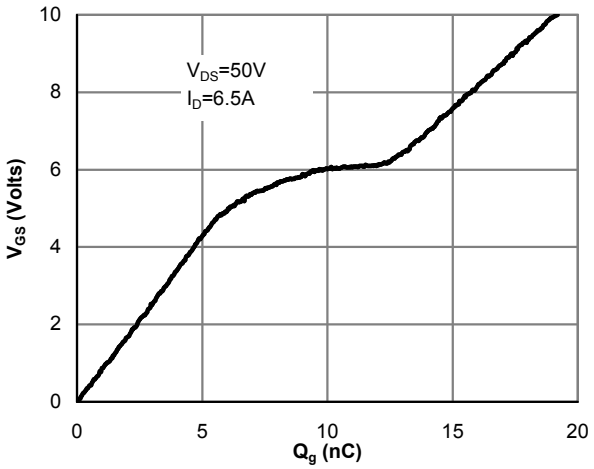


Figure 7: Gate-Charge Characteristics

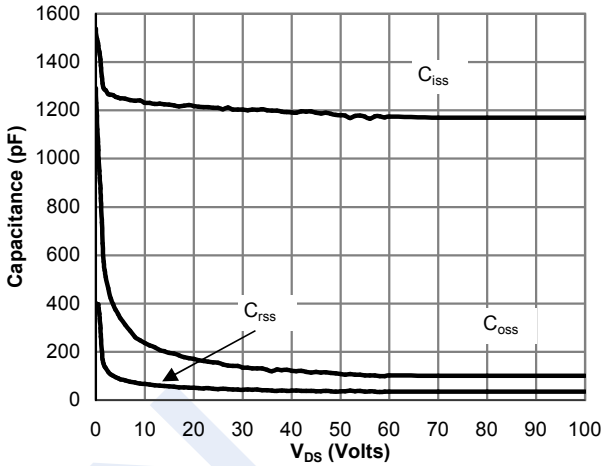


Figure 8: Capacitance Characteristics

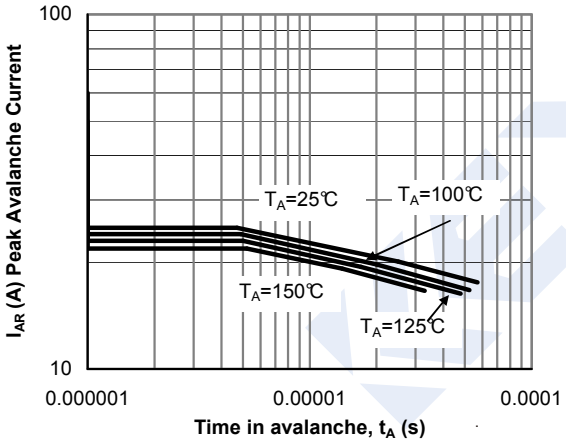


Figure 9: Single Pulse Avalanche capability (Note C)

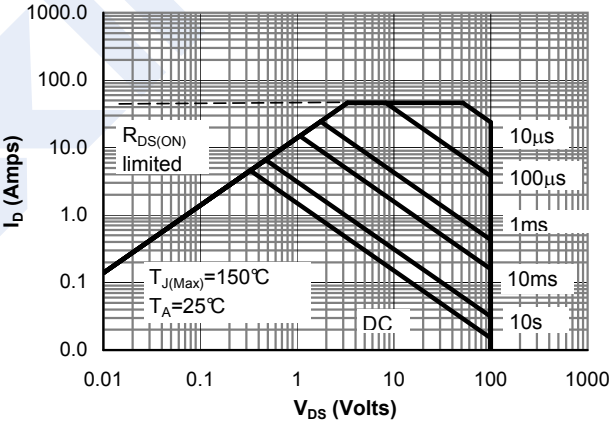


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

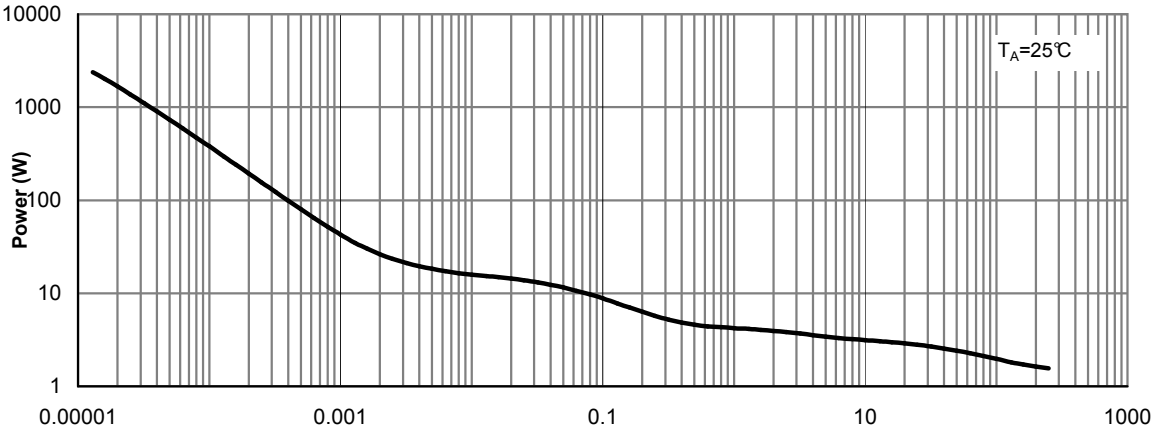


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

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■ Typical Characterisitics

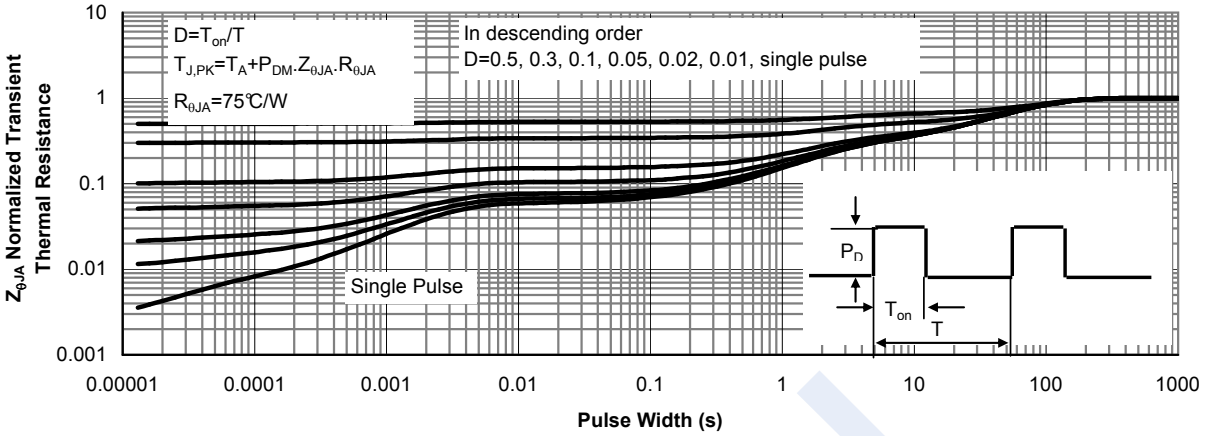


**Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)**

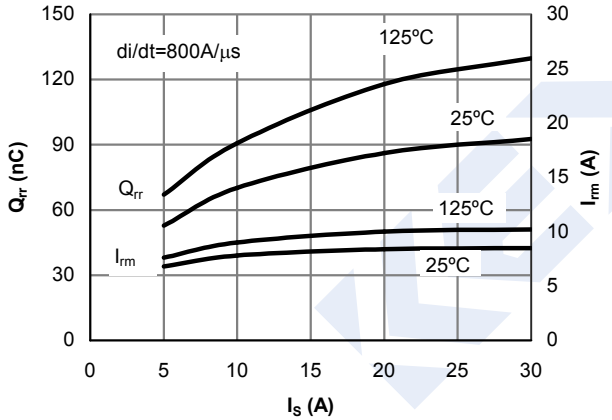


**Figure 13: Diode Reverse Recovery Charge and Peak Current vs. Conduction Current**

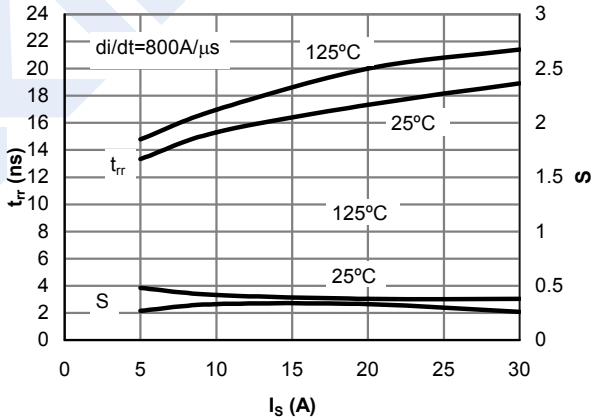


**Figure 14: Diode Reverse Recovery Time and Softness Factor vs. Conduction Current**

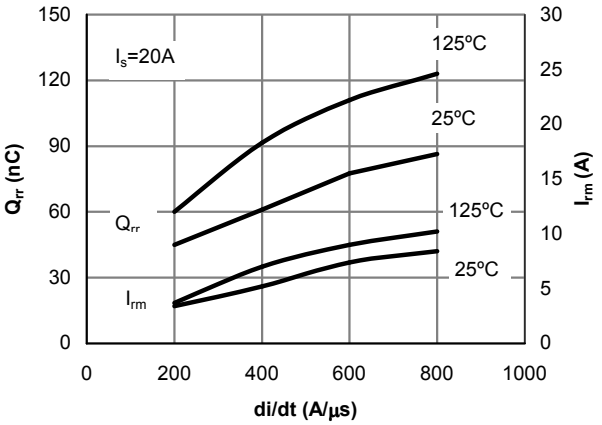


**Figure 15: Diode Reverse Recovery Charge and Peak Current vs. di/dt**

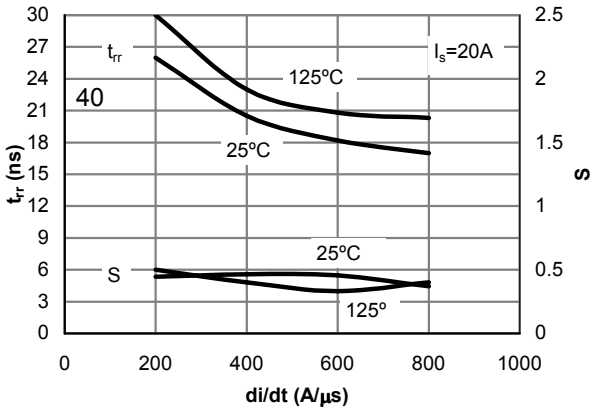


**Figure 16: Diode Reverse Recovery Time and Softness Factor vs. di/dt**