

## Dual N-Channel MOSFET

### AO4952 (KO4952)

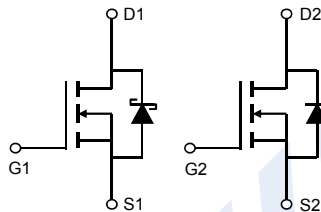
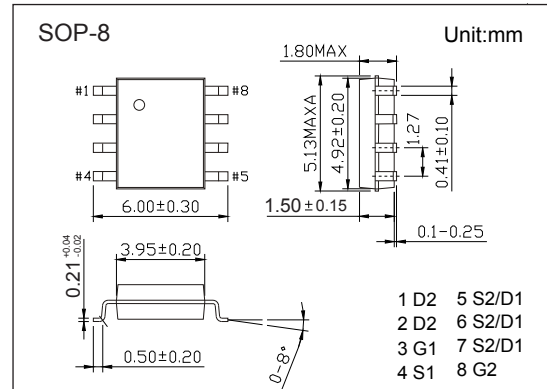
#### ■ Features

N-Channel 1

- $V_{DS} (V) = 30V$
- $I_D = 11 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 10.5m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 15.5m\Omega (V_{GS} = 4.5V)$
- SRFET™ Soft Recovery MOSFET: Integrated Schottky Diode

N-Channel 2

- $V_{DS} (V) = 30V$
- $I_D = 11 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 11.5m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 16.5m\Omega (V_{GS} = 4.5V)$



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

Parameter		Symbol	N-Channel 1	N-Channel 2	Unit
Drain-Source Voltage		$V_{DS}$	30		V
Gate-Source Voltage		$V_{GS}$	$\pm 20$		
Continuous Drain Current	$T_A=25^\circ C$	$I_D$	11		A
	$T_A=70^\circ C$		9		
Pulsed Drain Current		$I_{DM}$	75	74	
Avalanche Current		$I_{AR}$	18	15	
Repetitive Avalanche Energy	$L=0.1mH$	$E_{AR}$	16	11	mJ
Power Dissipation	$T_A=25^\circ C$	$P_D$	2		W
	$T_A=70^\circ C$		1.3		
Thermal Resistance.Junction- to-Ambient	$t \leq 10s$	$R_{thJA}$	62.5		$^\circ C/W$
	Steady-State		90		
Thermal Resistance.Junction- to-Lead		$R_{thJL}$	40		
Junction Temperature		$T_J$	150		$^\circ C$
Storage Temperature Range		$T_{stg}$	-55 to 150		

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#### ■ N-Channel 1 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> =10mA, 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			0.5	mA	
		V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			100		
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.4		2.5	V	
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =11A			10.5	mΩ	
		V <sub>GS</sub> =10V, I <sub>D</sub> =11A T <sub>J</sub> =125°C			15		
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =9A			15.5		
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =11A		52		S	
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz		605		pF	
Output Capacitance	C <sub>oss</sub>			275			
Reverse Transfer Capacitance	C <sub>rss</sub>			37			
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	1		3	Ω	
Total Gate Charge (10V)	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =11A		10.2	15	nC	
Total Gate Charge (4.5V)				4.9	8		
Gate Source Charge			Q <sub>gs</sub>		2		
Gate Drain Charge			Q <sub>gd</sub>		2.3		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =1.36Ω, R <sub>GEN</sub> =3Ω		5		ns	
Turn-On Rise Time	t <sub>r</sub>			3			
Turn-Off DelayTime	t <sub>d(off)</sub>			17.5			
Turn-Off Fall Time	t <sub>f</sub>			3			
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 11A, di/dt= 500A/us		11		nC	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			12.5			
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			0.65	V	

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

#### ■ Marking

Marking	4952
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## Dual N-Channel MOSFET

### AO4952 (KO4952)

#### ■ N-Channel 2 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 μA, 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> =±20V			±100	nA	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.4		2.2	V	
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =11A			11.5	mΩ	
		V <sub>GS</sub> =10V, I <sub>D</sub> =11A T <sub>J</sub> =125°C			15.8		
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =9A			16.5		
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =11A		40		S	
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz		542		pF	
Output Capacitance	C <sub>oss</sub>			233			
Reverse Transfer Capacitance	C <sub>rss</sub>			31			
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	1		3	Ω	
Total Gate Charge (10V)	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =11A		9	12.5	nC	
Total Gate Charge (4.5V)				4.3	6		
Gate Source Charge			Q <sub>gs</sub>		2.2		
Gate Drain Charge			Q <sub>gd</sub>		1.7		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =1.36Ω, R <sub>GEN</sub> =3Ω		4		ns	
Turn-On Rise Time	t <sub>r</sub>			3.5			
Turn-Off DelayTime	t <sub>d(off)</sub>			18			
Turn-Off Fall Time	t <sub>f</sub>			3			
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 11A, di/dt= 500A/us		9.7		nC	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			11.5			
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	

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

## Dual N-Channel MOSFET AO4952 (K04952)

■ N-Channel 1 Typical Characteristics

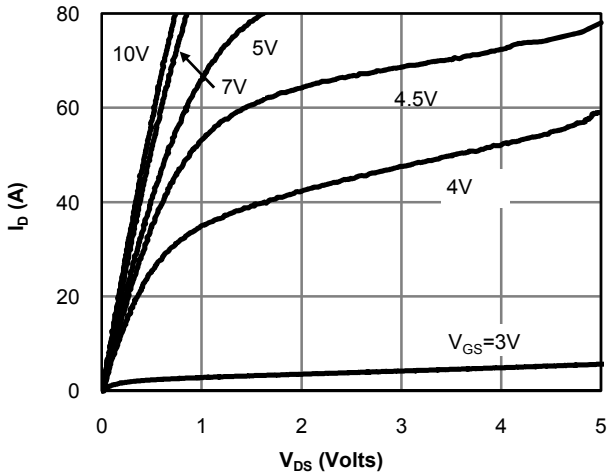


Fig 1: On-Region Characteristics (Note E)

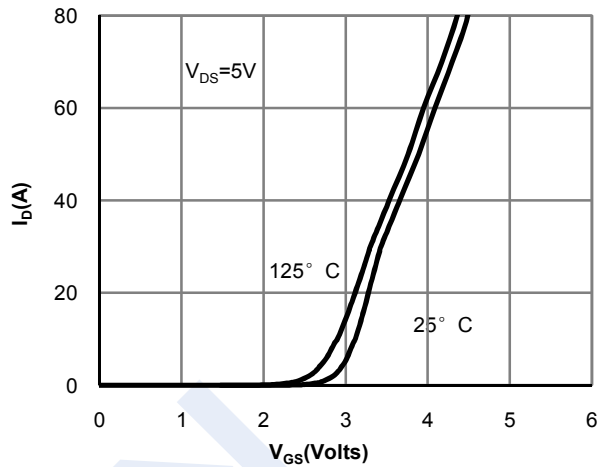


Figure 2: Transfer Characteristics (Note E)

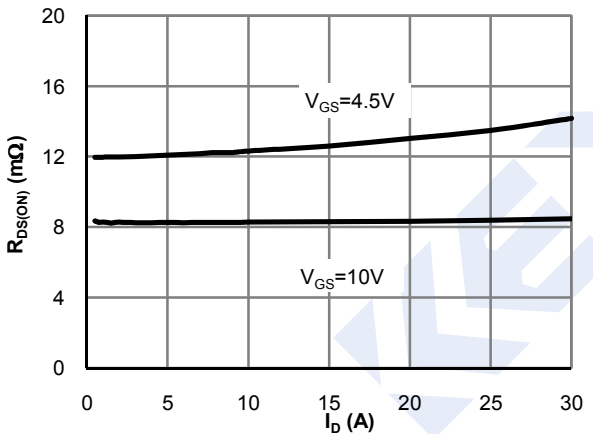


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

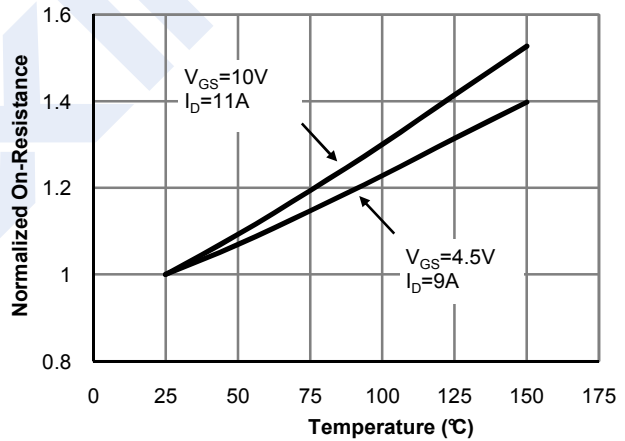


Figure 4: On-Resistance vs. Junction Temperature

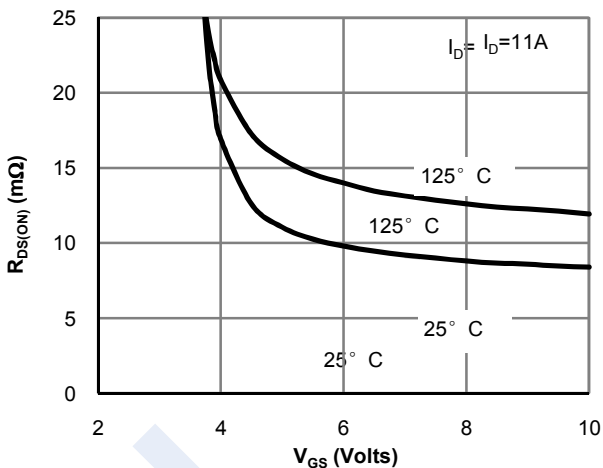


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

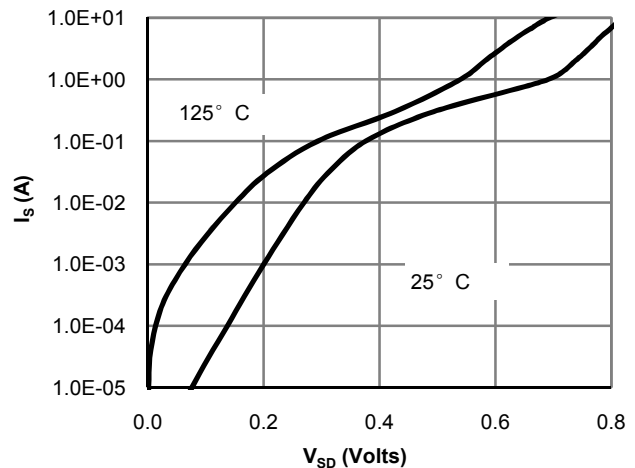


Figure 6: Body-Diode Characteristics (Note E)

## Dual N-Channel MOSFET AO4952 (KO4952)

■ N-Channel 1 Typical Characteristics

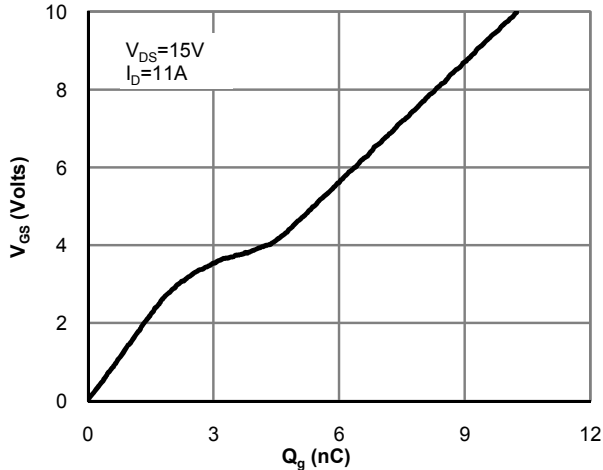


Figure 7: Gate-Charge Characteristics

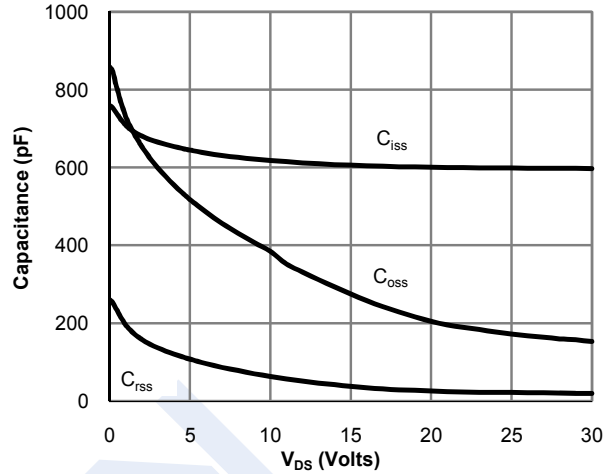
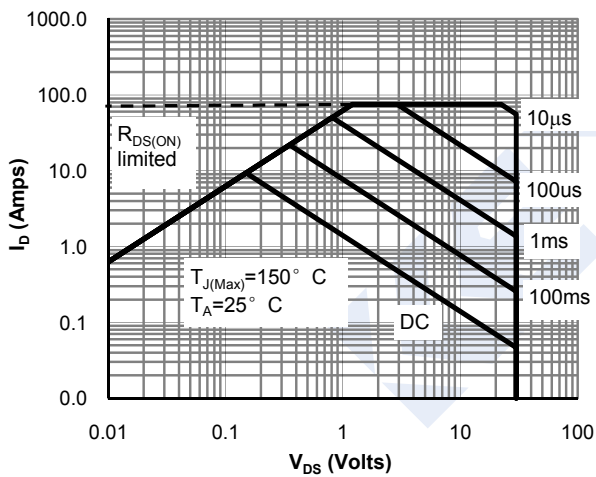


Figure 8: Capacitance Characteristics



VGS > or equal to 4.5V  
Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

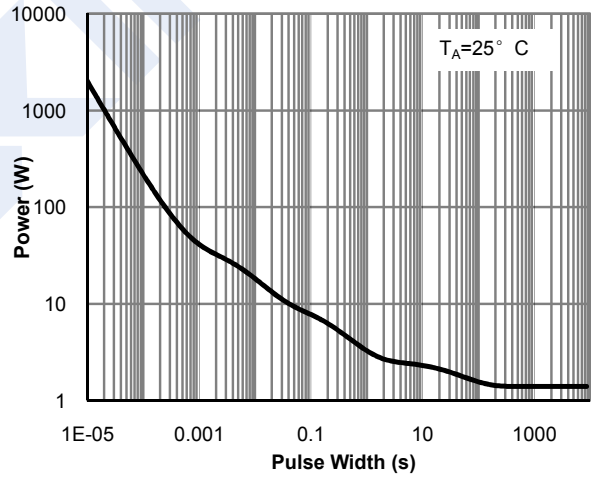


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note H)

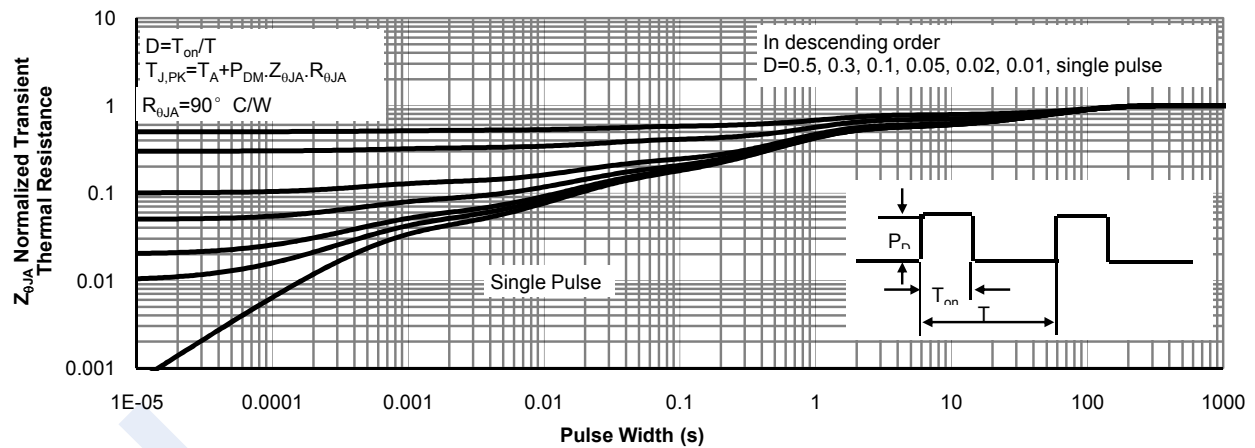


Figure 11: Normalized Maximum Transient Thermal Impedance (Note H)

## Dual N-Channel MOSFET AO4952 (K04952)

■ N-Channel 2 Typical Characteristics

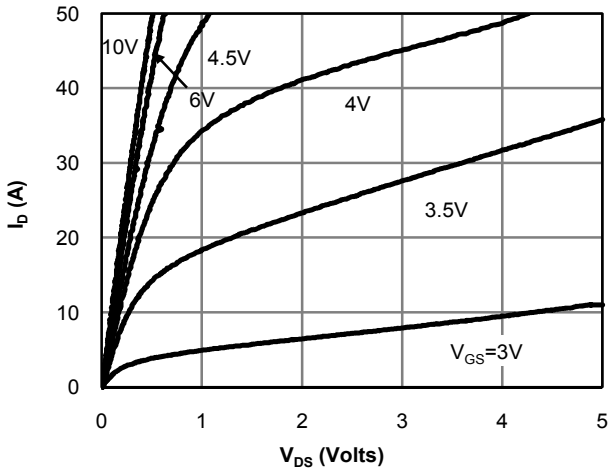


Fig 1: On-Region Characteristics (Note E)

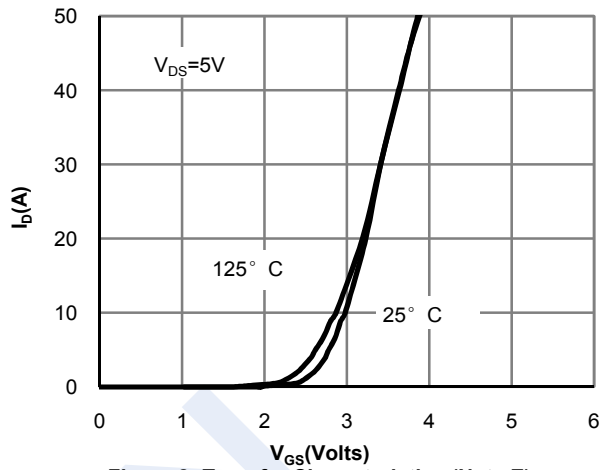


Figure 2: Transfer Characteristics (Note E)

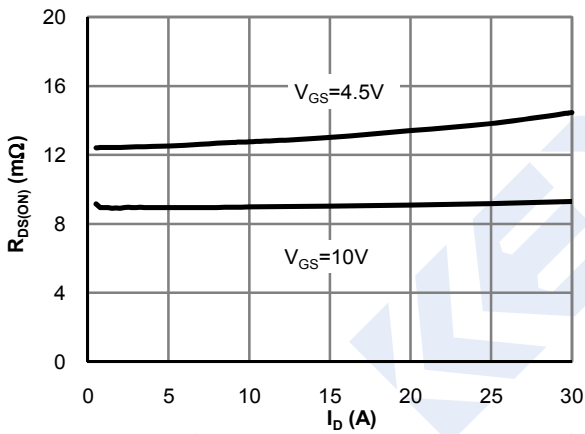


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

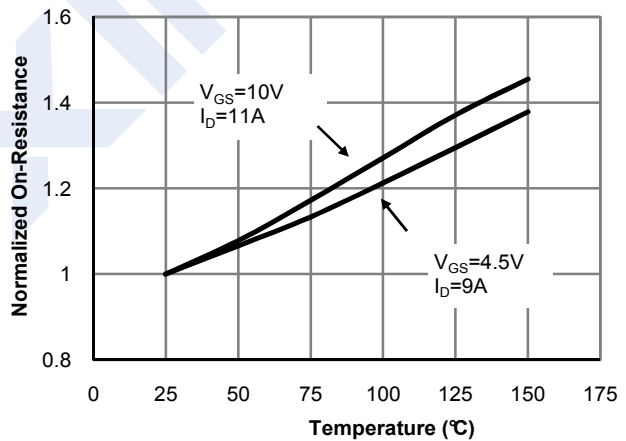


Figure 4: On-Resistance vs. Junction Temperature

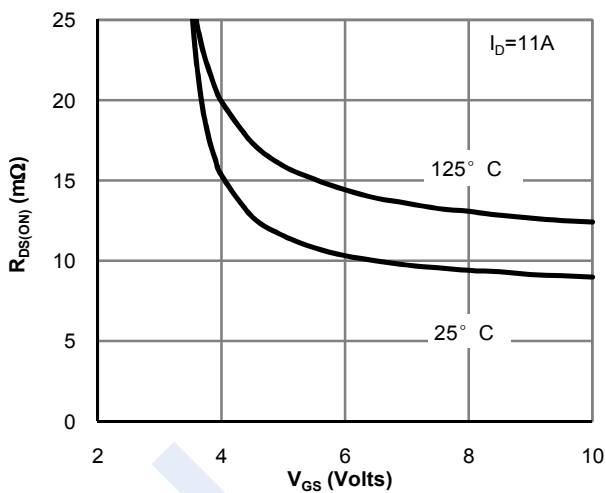


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

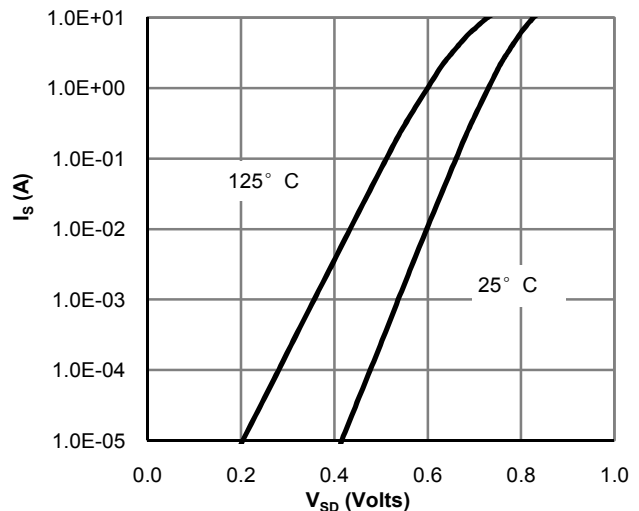


Figure 6: Body-Diode Characteristics (Note E)

## Dual N-Channel MOSFET AO4952 (KO4952)

■ N-Channel 2 Typical Characteristics

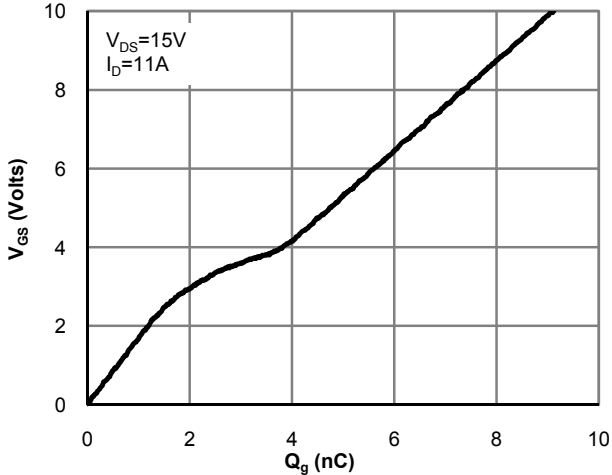


Figure 7: Gate-Charge Characteristics

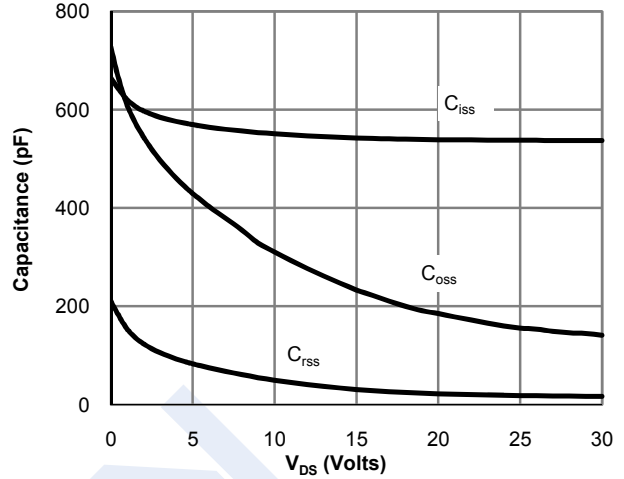
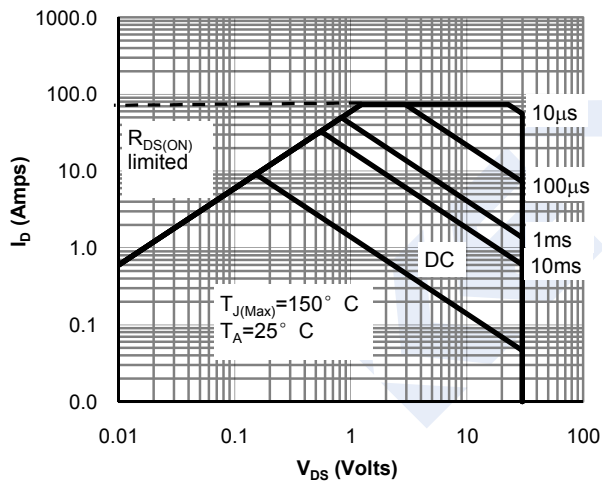


Figure 8: Capacitance Characteristics



VGS > or equal to 4.5V  
Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

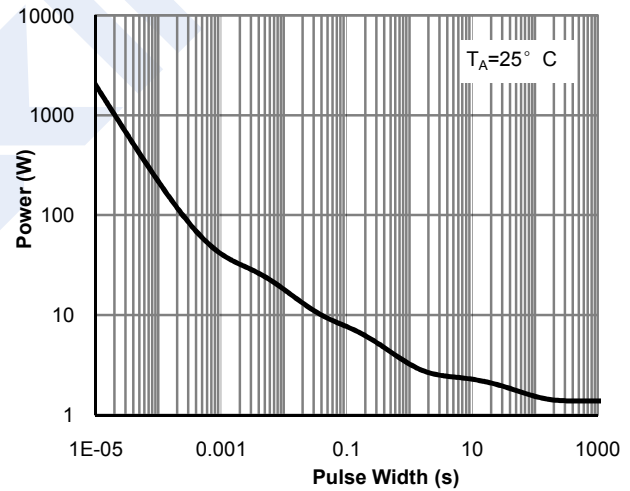


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note H)

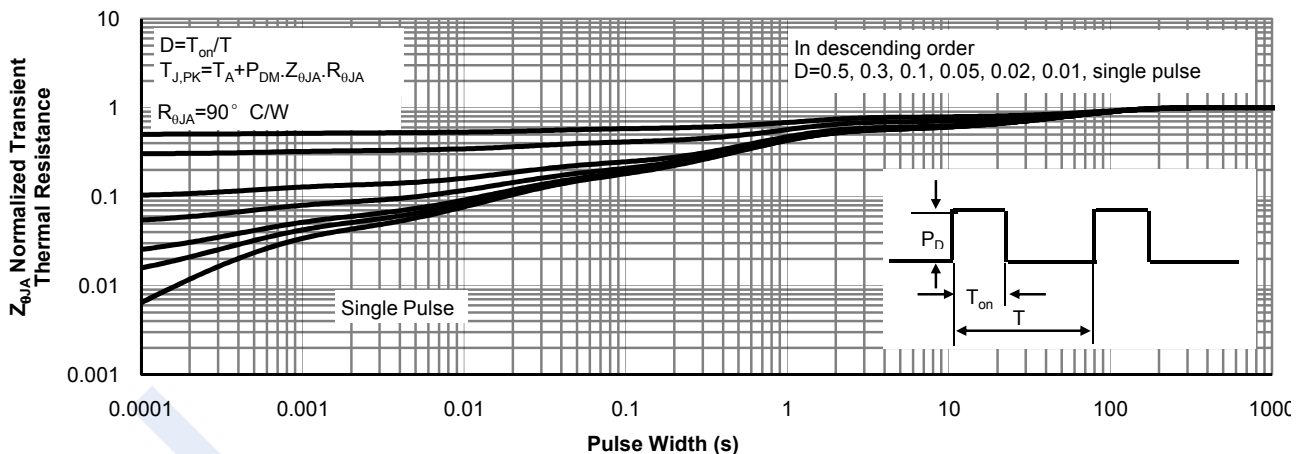


Figure 11: Normalized Maximum Transient Thermal Impedance (Note H)