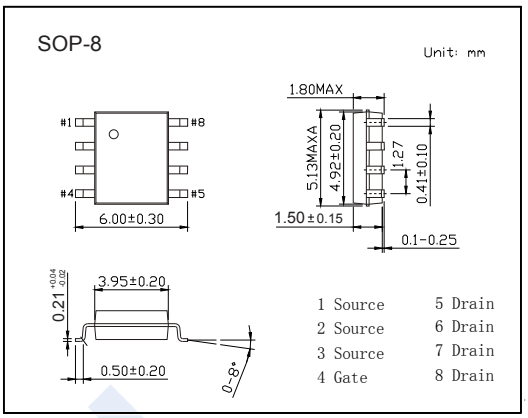
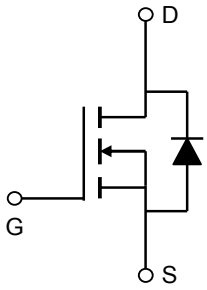
N-Channel MOSFET

AO4478 (KO4478)



■ Features

- V_{DS} (V) = 30V
- I_D = 9 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 19mΩ (V_{GS} = 10V)
- $R_{DS(ON)}$ < 26mΩ (V_{GS} = 4.5V)



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±25	
Continuous Drain Current	T_A=25℃	I_D	9	A
	T_A=70℃		7	
Pulsed Drain Current		I_{DM}	60	
Avalanche Current		I_{AR}	17	
Repetitive Avalanche Energy	L=0.1mH	E_{AR}	14	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	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	uA
		V_{DS}=30V, V_{GS}=0V, T_J=55℃			5	
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	1		2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=9A			19	mΩ
		V_{GS}=10V, I_D=9A T_J=125℃			30	
		V_{GS}=4.5V, I_D=8A			26	
On State Drain Current	$I_{D(ON)}$	V_{GS}=10V, V_{DS}=5V	60			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=10A		24		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, f=1MHz		466	560	pF
Output Capacitance	C_{oss}			90		
Reverse Transfer Capacitance	C_{rss}			61		
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		3.7	5.6	Ω
Total Gate Charge (10V)	Q_g	V_{GS}=10V, V_{DS}=15V, I_D=9A		9.3	11	nC
Total Gate Charge (4.5V)				4.3	5.2	
Gate Source Charge	Q_{gs}			1		
Gate Drain Charge	Q_{gd}			2.3		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=10V, V_{DS}=15V, R_L=1.65Ω, R_{GEN}=3Ω		5		ns
Turn-On Rise Time	t_r			8		
Turn-Off DelayTime	$t_{d(off)}$			20		
Turn-Off Fall Time	t_f			5		
Body Diode Reverse Recovery Time	t_{rr}	I_F= 9A, dI/dt = 500A/μs		7.5	9	
Body Diode Reverse Recovery Charge	Q_{rr}			9.8		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	4478 KC****

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■ Typical Characterisitics

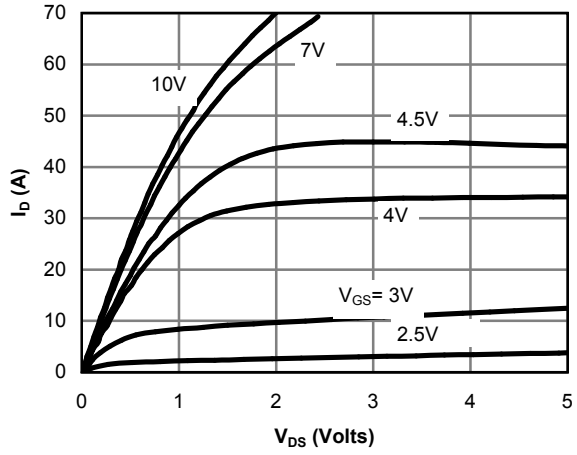


Figure 1: On-Region Characteristics(Note E)

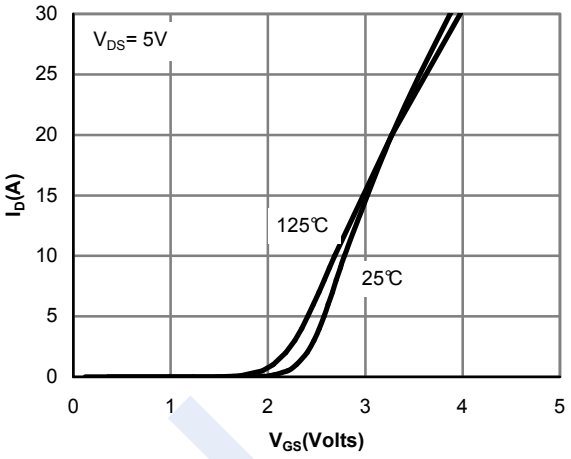


Figure 2: Transfer Characteristics(Note E)

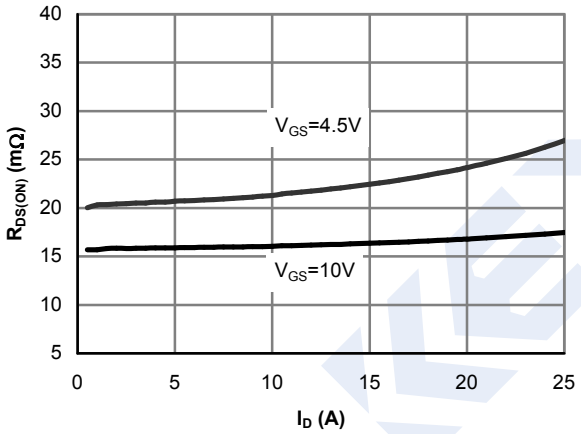


Figure 3: On-Resistance vs. Drain Current and Gate Voltage(Note E)

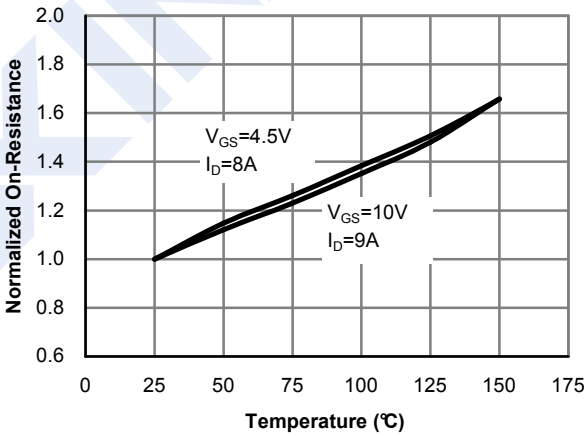


Figure 4: On-Resistance vs. Junction Temperature(Note E)

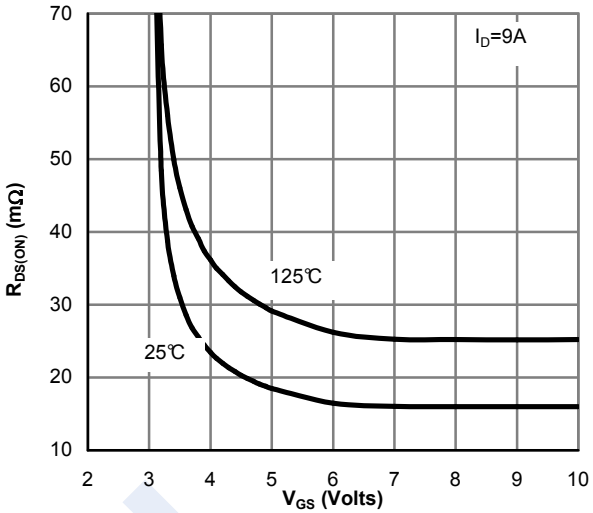


Figure 5: On-Resistance vs. Gate-Source Voltage(Note E)

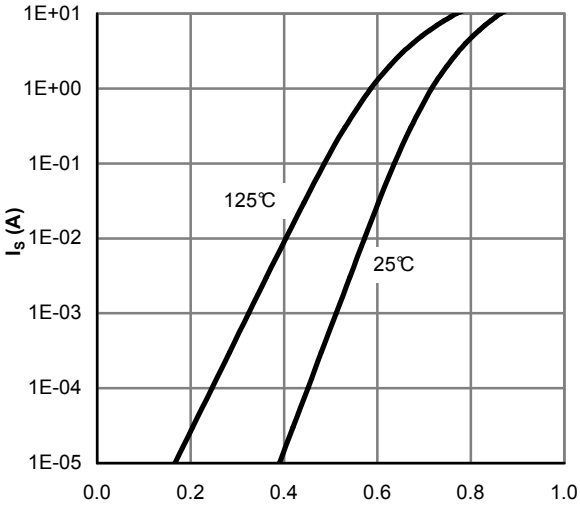


Figure 6: Body-Diode Characteristics(Note E)

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■ Typical Characterisitics

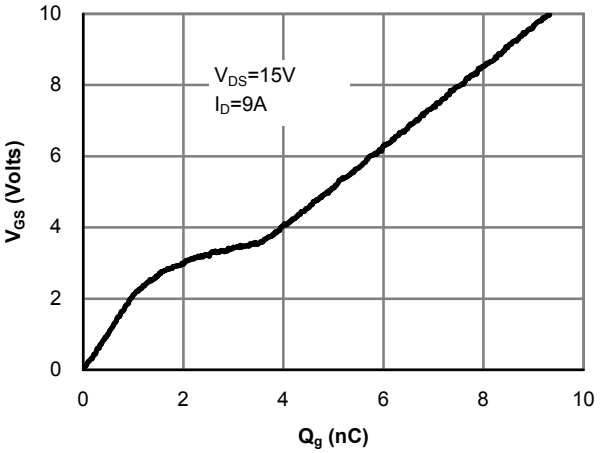


Figure 7: Gate-Charge Characteristics

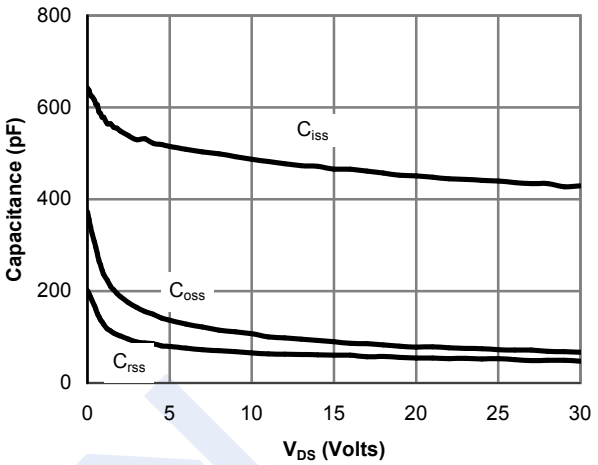


Figure 8: Capacitance Characteristics

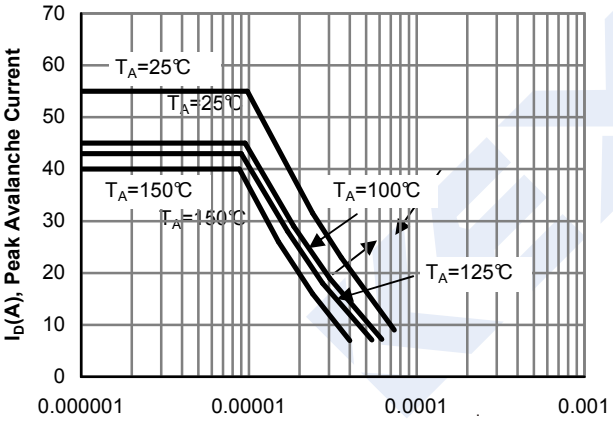


Figure 9: Single Pulse Avalanche capability (Note C)

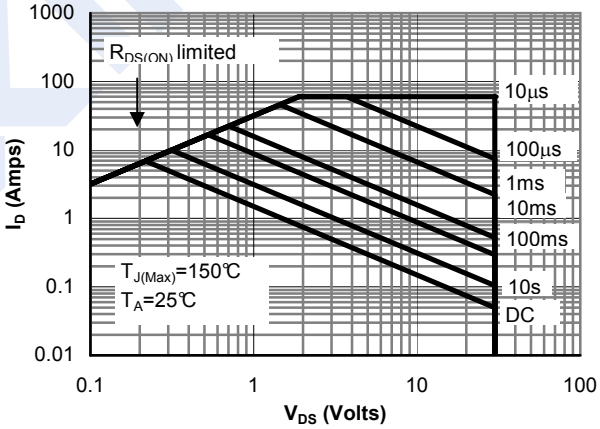


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

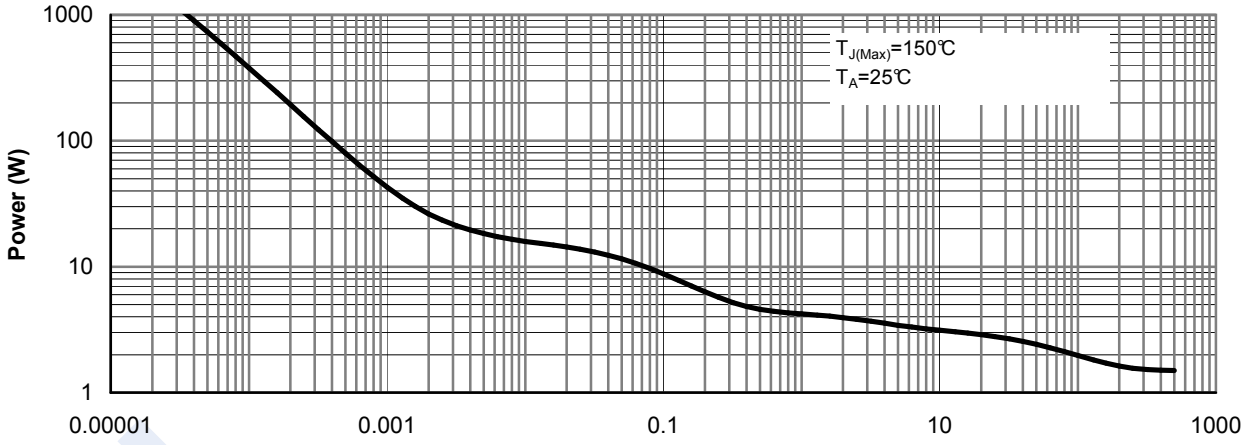


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

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■ Typical Characterisitics

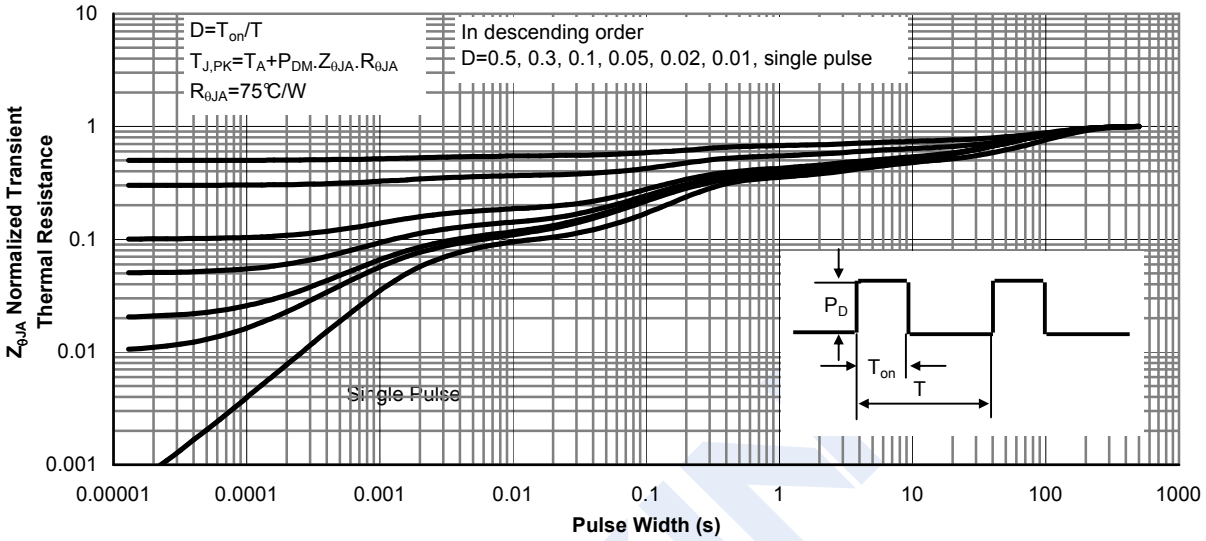


Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)