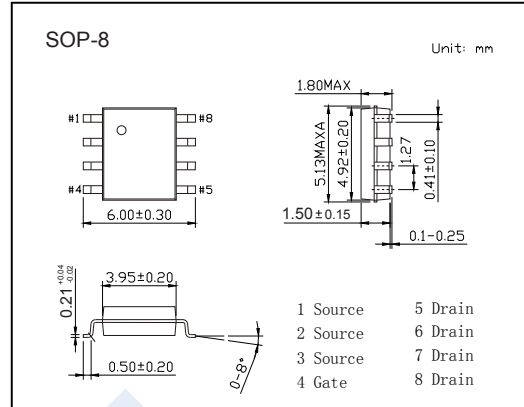
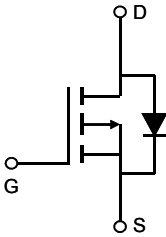


## P-Channel MOSFET

### AO4413 (KO4413)

#### ■ Features

- $V_{DS} (V) = -30V$
- $I_D = -15 A (V_{GS} = -20V)$
- $R_{DS(ON)} < 7m\Omega (V_{GS} = -20V)$
- $R_{DS(ON)} < 8.5m\Omega (V_{GS} = -10V)$



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

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	-30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 25$		
Continuous Drain Current	$I_D$	$T_A = 25^\circ C$	-15	A
		$T_A = 70^\circ C$	-12.8	
Pulsed Drain Current	$I_{DM}$	-120		
Avalanche Current	$I_{AS}, I_{AR}$	50		
Avalanche energy	$L = 0.1mH$	$E_{AS}, E_{AR}$	125	mJ
Power Dissipation	$P_D$	$T_A = 25^\circ C$	3.1	W
		$T_A = 70^\circ C$	2	
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	$t \leq 10s$	40	$^\circ C/W$
		Steady-State	75	
Thermal Resistance.Junction- to-Lead	$R_{thJL}$	24		
Junction Temperature	$T_J$	150	$^\circ C$	
Junction Storage Temperature Range	$T_{stg}$	-55 to 150		

## P-Channel MOSFET

### AO4413 (KO4413)

#### ■ 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> =±25V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250 μA	-1.5		-3.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-20V, I <sub>D</sub> =-15A			7	mΩ
		V <sub>GS</sub> =-20V, I <sub>D</sub> =-15A T <sub>J</sub> =125°C			9	
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A			8.5	
On state drain current	I <sub>D(ON)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V	-120			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-15A		35		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz	2310		3500	pF
Output Capacitance	C <sub>oss</sub>		410		760	
Reverse Transfer Capacitance	C <sub>rss</sub>		280		660	
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	1.9		5.7	Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-15A	40		61	nC
Gate Source Charge	Q <sub>gs</sub>		10		14	
Gate Drain Charge	Q <sub>gd</sub>		10		22	
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =1Ω, R <sub>GEN</sub> =3Ω		16		ns
Turn-On Rise Time	t <sub>r</sub>			12		
Turn-Off DelayTime	t <sub>d(off)</sub>			45		
Turn-Off Fall Time	t <sub>f</sub>			22		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-15A, di/dt=100A/μs	14		22	nC
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		9		13	
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 <300 μs pulses, duty cycle 0.5% max.

#### ■ Marking

Marking	4413 KC****
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## P-Channel MOSFET AO4413 (KO4413)

■ Typical Characteristics

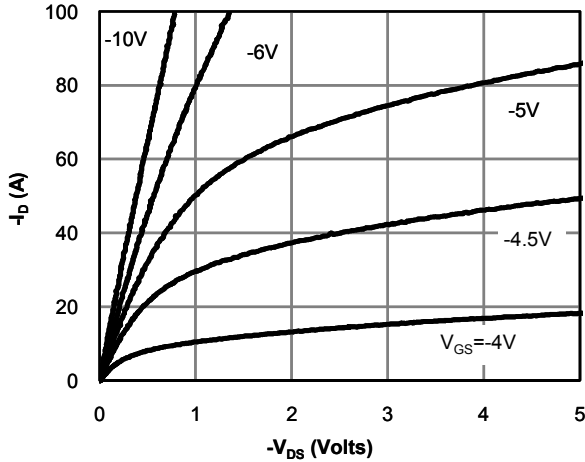


Figure 1: On-Region Characteristics (Note E)

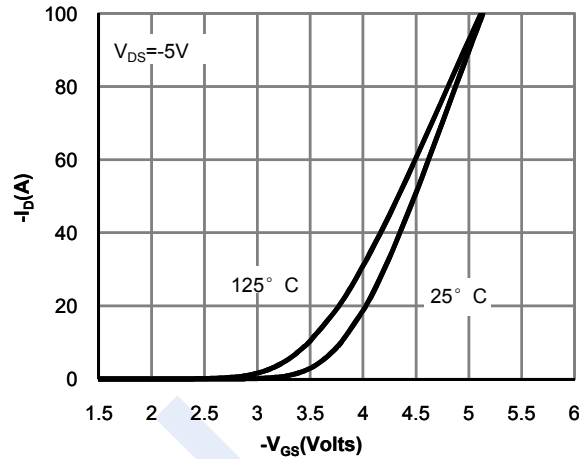


Figure 2: Transfer Characteristics (Note E)

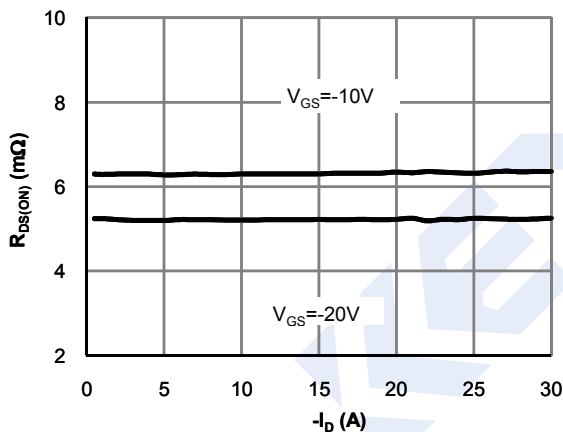


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

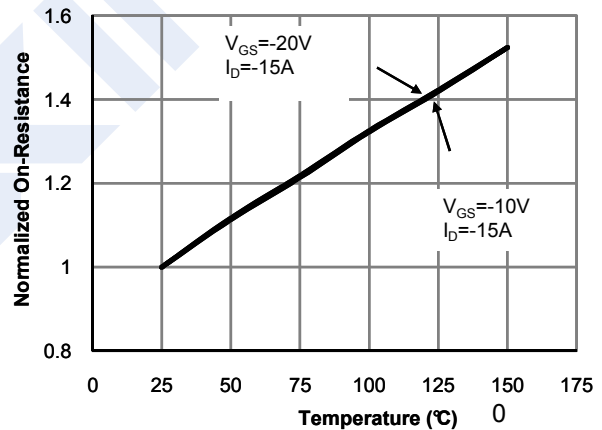


Figure 4: On-Resistance vs. Junction Temperature (Note E)

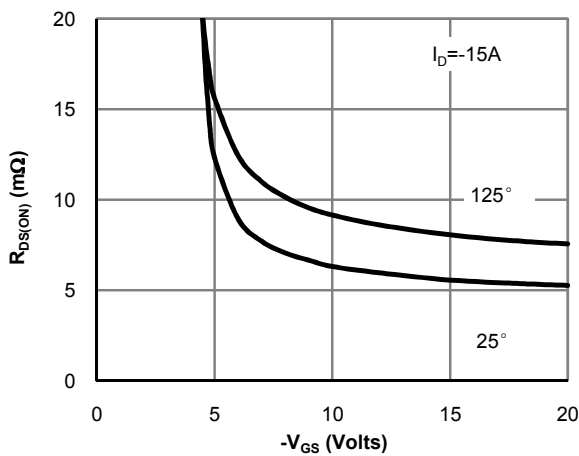


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

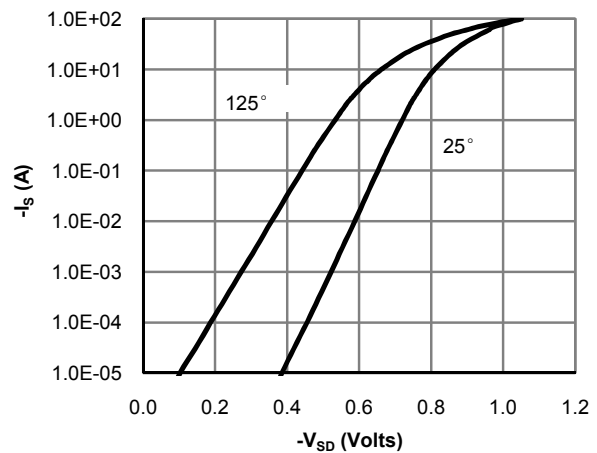


Figure 6: Body-Diode Characteristics (Note E)

## P-Channel MOSFET AO4413 (KO4413)

■ Typical Characteristics

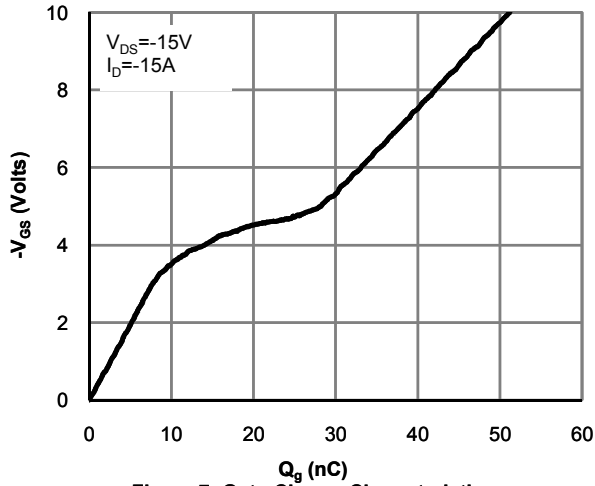


Figure 7: Gate-Charge Characteristics

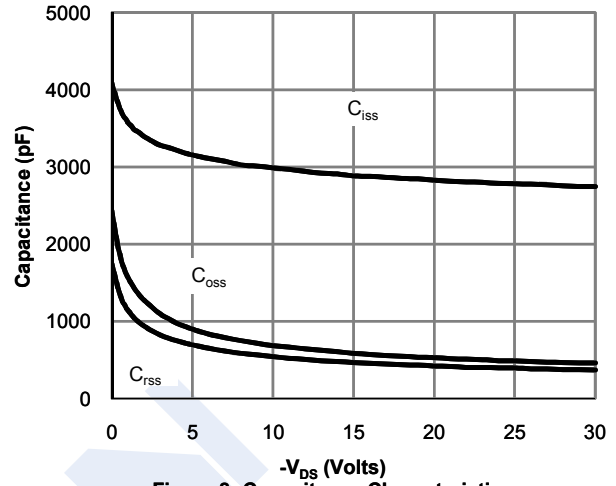


Figure 8: Capacitance Characteristics

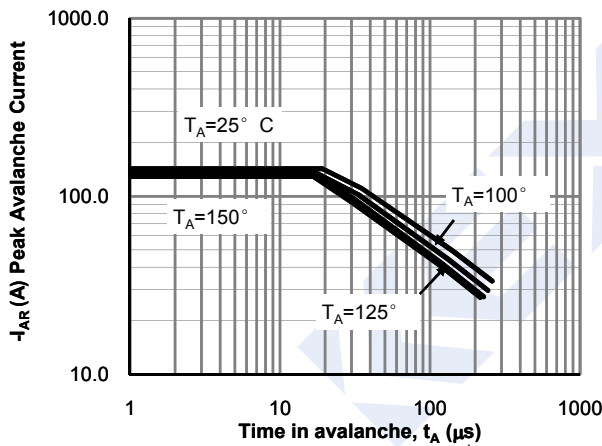


Figure 9: Single Pulse Avalanche capability (Note C)

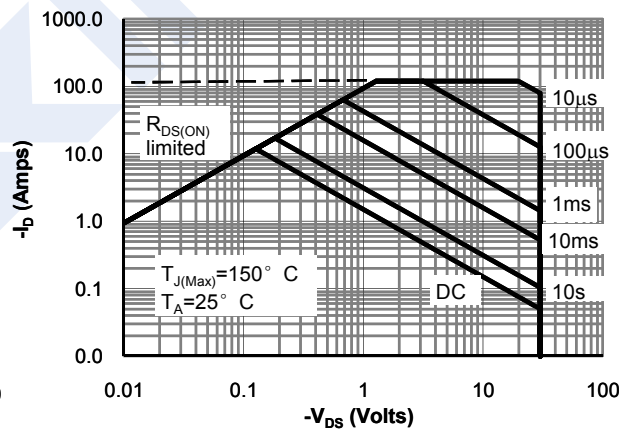


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

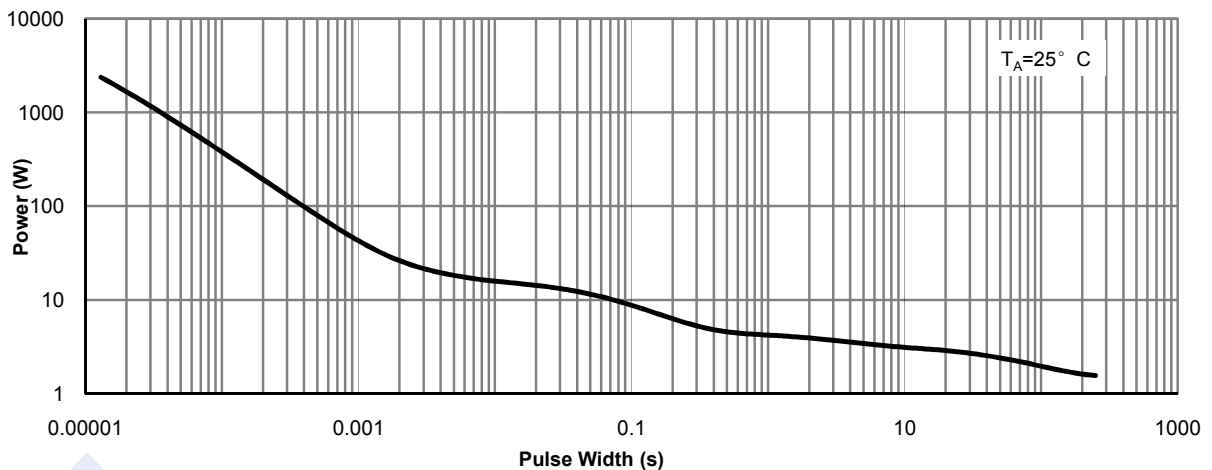


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

## P-Channel MOSFET AO4413 (KO4413)

■ Typical Characteristics

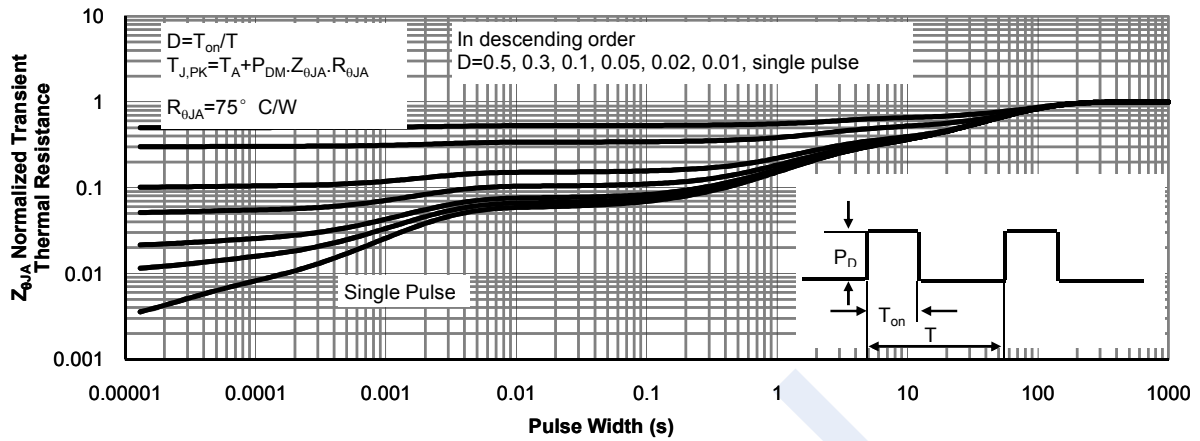


Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)