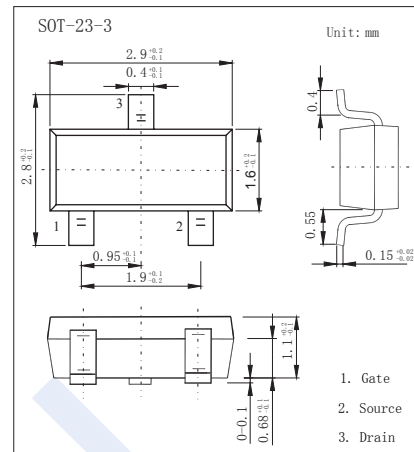
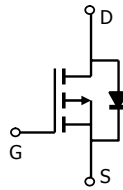


## P-Channel Enhancement MOSFET

## AO3409-HF (KO3409-HF)

## ■ Features

- $V_{DS}$  (V) = -30V
- $I_D$  = -2.6 A ( $V_{GS}$  = -10V)
- $R_{DS(ON)}$  < 130m $\Omega$  ( $V_{GS}$  = -10V)
- $R_{DS(ON)}$  < 200m $\Omega$  ( $V_{GS}$  = -4.5V)
- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish

■ Absolute Maximum Ratings  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$	A
		$T_A=70^\circ\text{C}$	
Pulsed Drain Current	$I_{DM}$	-20	
Power Dissipation	$P_D$	$T_A=25^\circ\text{C}$	W
		$T_A=70^\circ\text{C}$	
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{thJC}$	80	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

## AO3409-HF (KO3409-HF)

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250 μ A, V <sub>GS</sub> =0V	-30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V			-1	μ A
		V <sub>DS</sub> =-24V, 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> =-250 μ A	-1	-1.9	-3	V
Static Drain-Source On-Resistance	r <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.6A		97	130	mΩ
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.6A T <sub>J</sub> =125°C		135	150	
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A		166	200	mΩ
On state drain current	I <sub>D(ON)</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-5V	-5			A
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-5A	3	3.8		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		302	370	pF
Output Capacitance	C <sub>oss</sub>			50.3		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			37.8		pF
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		12	18	Ω
Total Gate Charge (10V)	Q <sub>g</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-2.6A		6.8	9	nC
Total Gate Charge (4.5V)				2.4		nC
Gate Source Charge	Q <sub>gs</sub>			1.6		nC
Gate Drain Charge	Q <sub>gd</sub>			0.95		nC
Turn-On DelayTime	t <sub>D(on)</sub>		V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =5.8 Ω, R <sub>GEN</sub> =3 Ω		7.5	
Turn-On Rise Time	t <sub>r</sub>			3.2		ns
Turn-Off DelayTime	t <sub>D(off)</sub>			17		ns
Turn-Off Fall Time	t <sub>f</sub>			6.8		ns
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-2.6A, dI/dt=100A/μ s			16.8	22
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =-2.6A, dI/dt=100A/μ s		10		nC
Maximum Body-Diode Continuous Current	I <sub>S</sub>				-2	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V		-0.82	-1	V

\* Repetitive rating, pulse width limited by junction temperature.

## ■ Marking

Marking	A9* <sub>F</sub>
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# AO3409-HF (KO3409-HF)

## Typical Characteristics

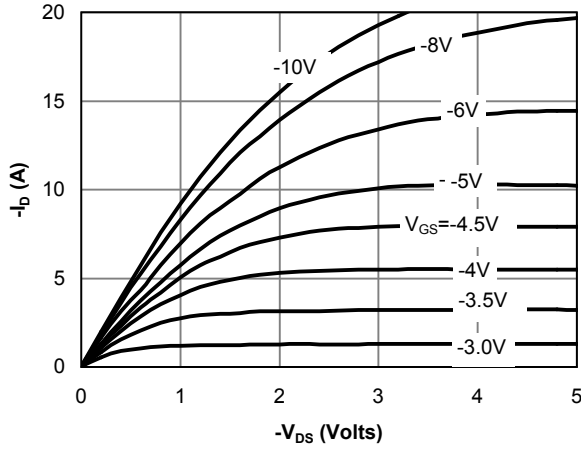


Fig 1: On-Region Characteristics

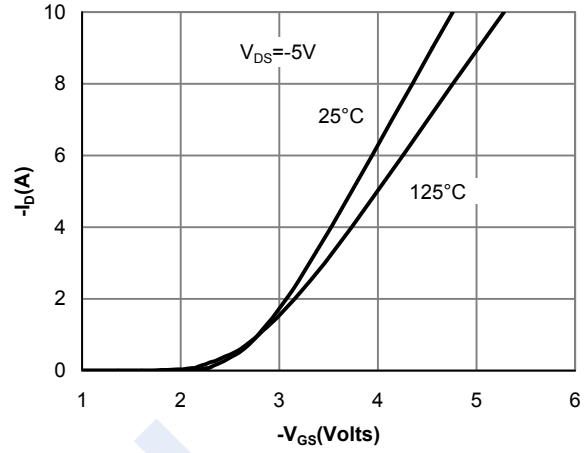


Figure 2: Transfer Characteristics

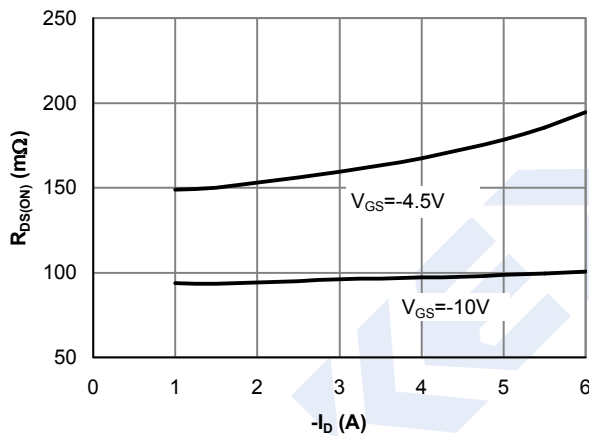


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

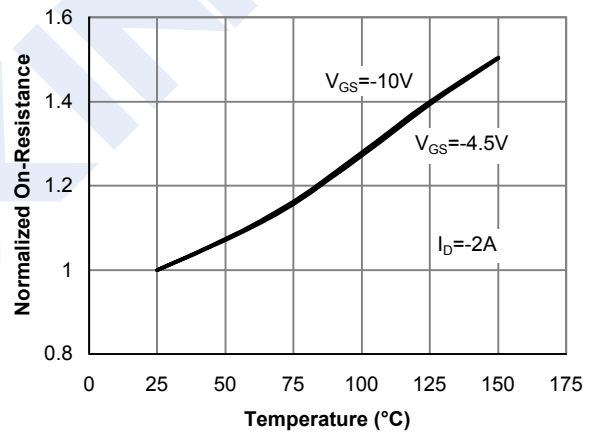


Figure 4: On-Resistance vs. Junction Temperature

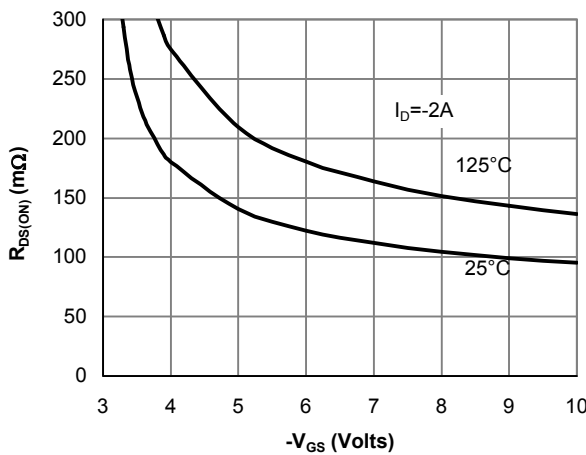


Figure 5: On-Resistance vs. Gate-Source Voltage

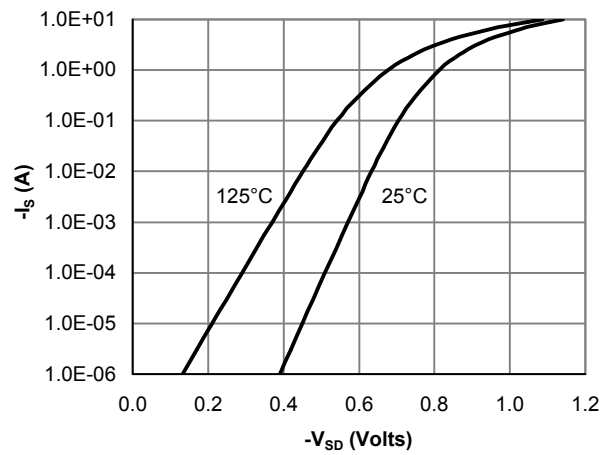


Figure 6: Body-Diode Characteristics

AO3409-HF (KO3409-HF)

■ Typical Characteristics

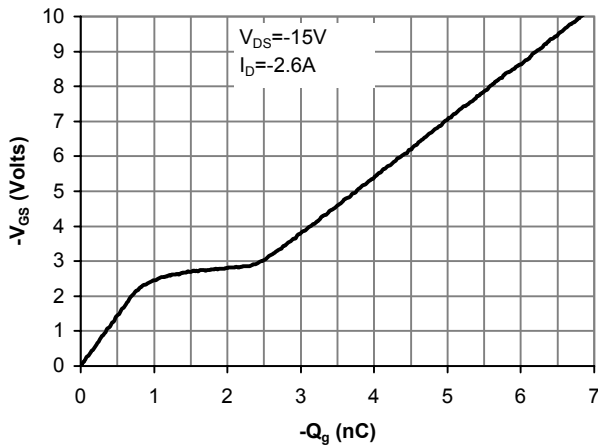


Figure 7: Gate-Charge Characteristics

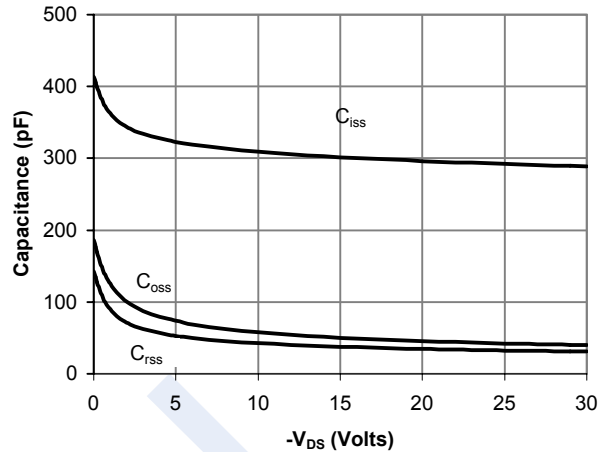


Figure 8: Capacitance Characteristics

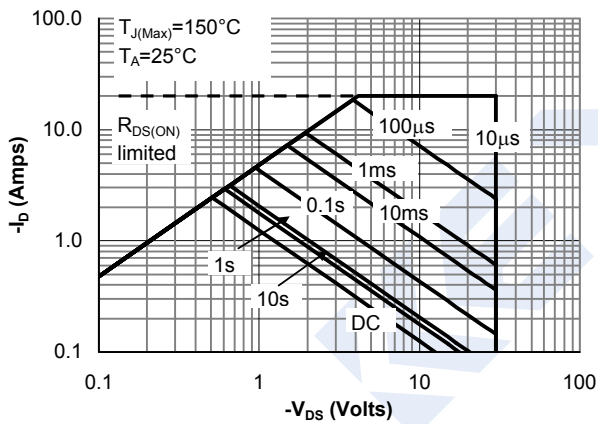


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

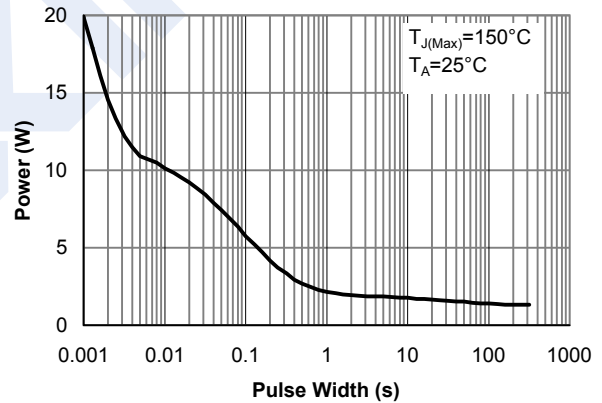


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

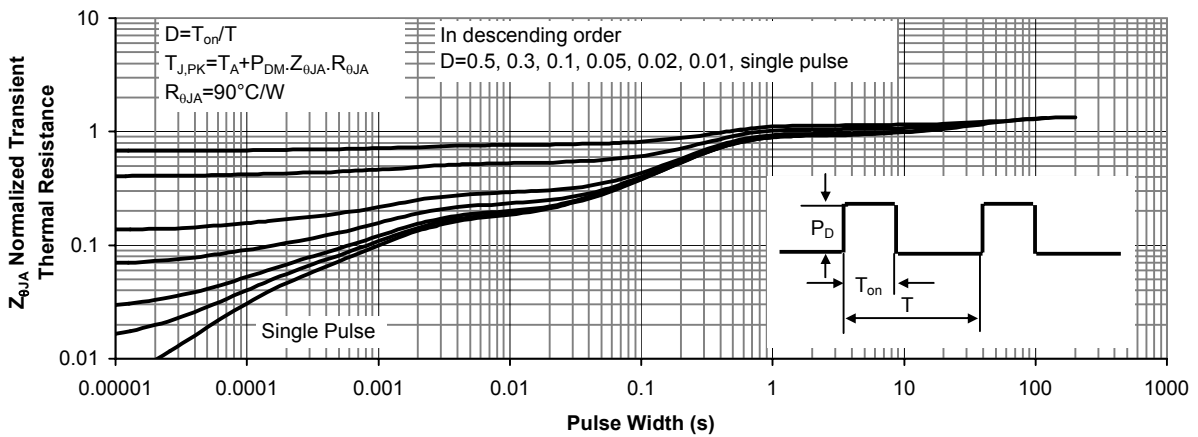


Figure 11: Normalized Maximum Transient Thermal Impedance