

Complementary Trench MOSFET

AO4620-HF (KO4620-HF)

■ Features

● N-Channel :

$$V_{DS} (V) = 30V$$

$$I_D = 7.2 A (V_{GS} = 10V)$$

$$R_{DS(ON)} < 24m \Omega (V_{GS} = 10V)$$

$$R_{DS(ON)} < 36m \Omega (V_{GS} = 4.5V)$$

● P-Channel :

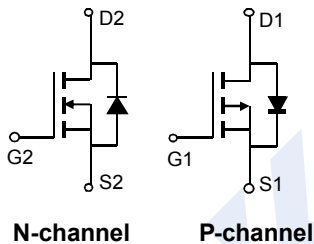
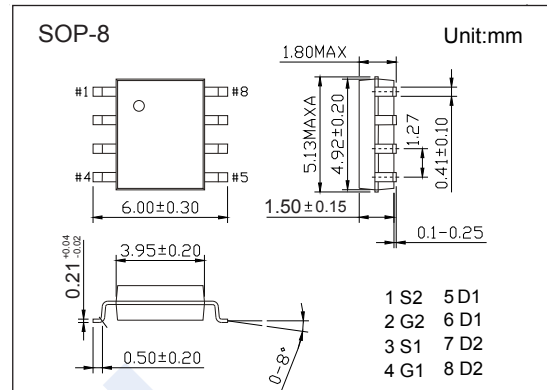
$$V_{DS} (V) = -30V$$

$$I_D = -5.3 A (V_{GS} = -10V)$$

$$R_{DS(ON)} < 32m \Omega (V_{GS} = -10V)$$

$$R_{DS(ON)} < 55m \Omega (V_{GS} = -4.5V)$$

- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish



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

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current	$T_A=25^\circ C$	I_D	7.2	-5.3	A
	$T_A=70^\circ C$		6.2	-4.5	
Pulsed Drain Current		I_{DM}	64	-40	
Avalanche Current		I_{AR}	9	-17	
Repetitive Avalanche Energy	$L=0.1mH$	E_{AR}	12	43	mJ
Power Dissipation	$T_A=25^\circ C$	P_D	2		W
	$T_A=70^\circ C$		1.44		
Thermal Resistance.Junction- to-Ambient	$t \leq 10s$	R_{thJA}	62.5		$^\circ C/W$
	Steady-State		100		
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 Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Drain-Source Breakdown Voltage	V _{DSS}	I _D =250 μA, V _{GS} =0V	30			V	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA	
		V _{DS} =30V, V _{GS} =0V, T _J =55°C			5		
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.5		2.6	V	
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =7.2A			24	mΩ	
		V _{GS} =10V, I _D =7.2A T _J =125°C			32		
		V _{GS} =4.5V, I _D =5A			36		
On State Drain Current	I _{D(on)}	V _{GS} =10V, V _{DS} =5V	64			A	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =7.2A		20		S	
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz		373	448	pF	
Output Capacitance	C _{oss}			67			
Reverse Transfer Capacitance	C _{rss}			41			
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		1.8	2.8	Ω	
Total Gate Charge (10V)	Q _g	V _{GS} =10V, V _{DS} =15V, I _D =7.2A		7.2	11	nC	
Total Gate Charge (4.5V)				3.5			
Gate Source Charge			Q _{gs}		1.3		
Gate Drain Charge			Q _{gd}		1.7		
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =15V, R _L =2.1Ω, R _{GEN} =3Ω		4.5		ns	
Turn-On Rise Time	t _r			2.7			
Turn-Off DelayTime	t _{d(off)}			14.9			
Turn-Off Fall Time	t _f			2.9			
Body Diode Reverse Recovery Time	t _{rr}	I _F = 7.2A, di/dt= 100A/us		10.5	12.6	nC	
Body Diode Reverse Recovery Charge	Q _{rr}			4.5			
Maximum Body-Diode Continuous Current	I _S				2.5	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 <300 us pulses, duty cycle 0.5% max.

■ Marking

Marking	4620
	KA**** F

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■ P-Channel Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Drain-Source Breakdown Voltage	V _{DSS}	I _D =-250μA, V _{GS} =0V	-30			V	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V			-1	μA	
		V _{DS} =-30V, V _{GS} =0V, T _J =55°C			-5		
Gate-Body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250 μ A	-1.3		-2.4	V	
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-5.3A			32	mΩ	
		V _{GS} =-10V, I _D =-5.3A T _J =125°C		31.5			
		V _{GS} =-4.5V, I _D =-4.5A			55		
On state drain current	I _{D(ON)}	V _{GS} =-10V, V _{DS} =-5V			-40	A	
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-5.3A		19		S	
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =-15V, f=1MHz		760		pF	
Output Capacitance	C _{oss}			140			
Reverse Transfer Capacitance	C _{rss}			95			
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		3.2	5	Ω	
Total Gate Charge (10V)	Q _g	V _{GS} =-10V, V _{DS} =-15V, I _D =-5.3A		13.6	16	nC	
Total Gate Charge (4.5V)				6.7			
Gate Source Charge			Q _{gs}		2.5		
Gate Drain Charge			Q _{gd}		3.2		
Turn-On DelayTime	t _{d(on)}	V _{GS} =-10V, V _{DS} =-15V, R _L =2.8Ω, R _{GEN} =3Ω		8		ns	
Turn-On Rise Time	t _r			6			
Turn-Off DelayTime	t _{d(off)}			17			
Turn-Off Fall Time	t _f			5			
Body Diode Reverse Recovery Time	t _{rr}	I _F =-5.3A, dI/dt=100A/us		15		nC	
Body Diode Reverse Recovery Charge	Q _{rr}			9.7			
Maximum Body-Diode Continuous Current	I _S				-3.5	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 <300 us pulses, duty cycle 0.5% max.

Complementary Trench MOSFET AO4620-HF (KO4620-HF)

■ N-Channel Typical Characteristics

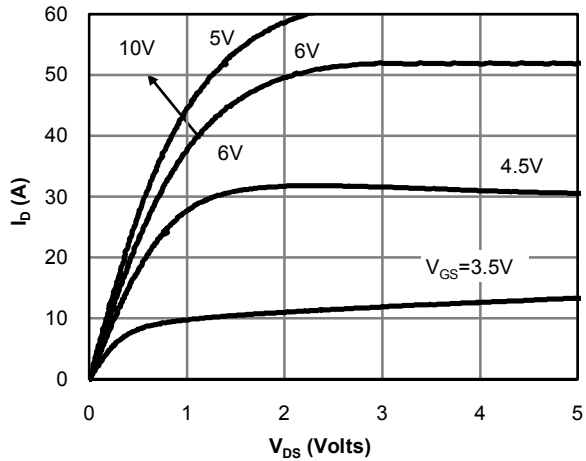


Fig 1: On-Region Characteristics

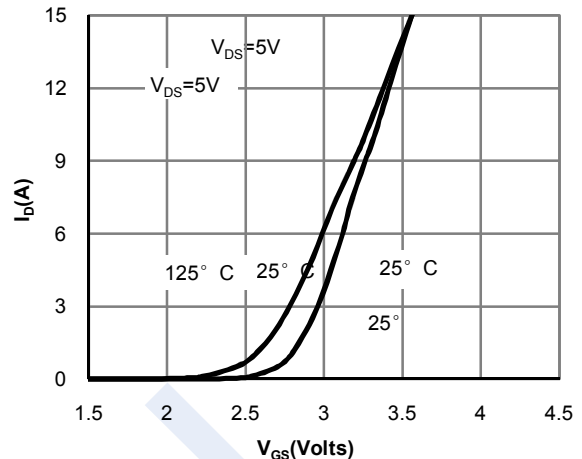


Figure 2: Transfer Characteristics

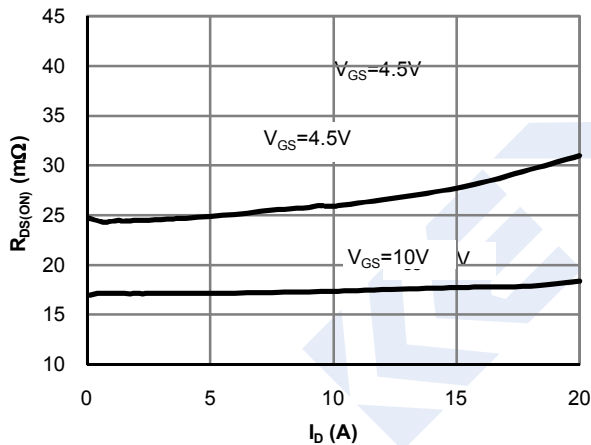


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

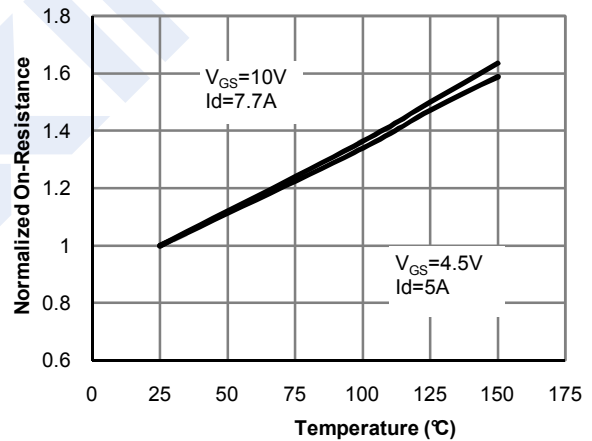


Figure 4: On-Resistance vs. Junction Temperature

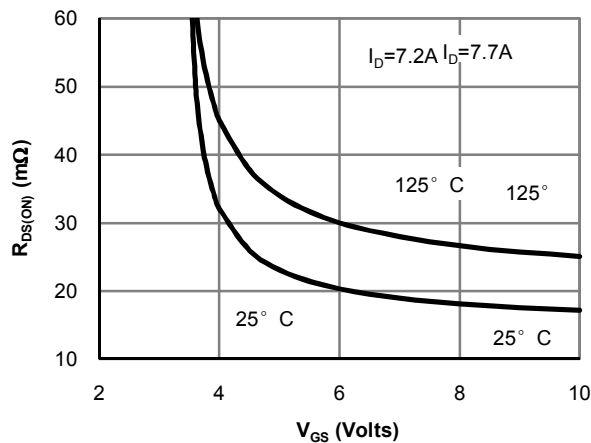


Figure 5: On-Resistance vs. Gate-Source Voltage

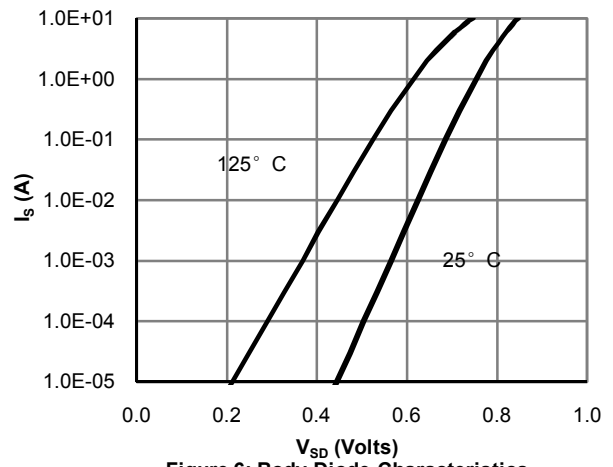


Figure 6: Body-Diode Characteristics

Complementary Trench MOSFET AO4620-HF (KO4620-HF)

■ N-Channel Typical Characteristics

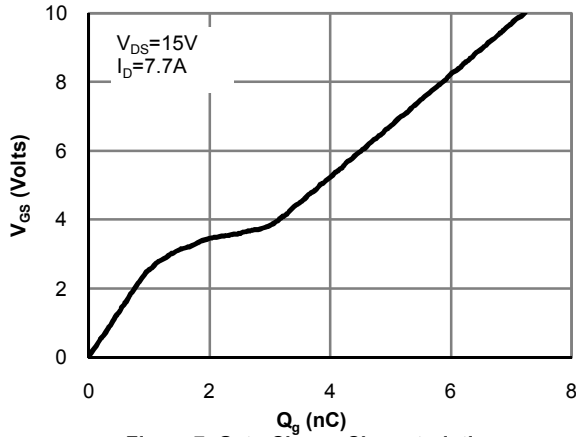


Figure 7: Gate-Charge Characteristics

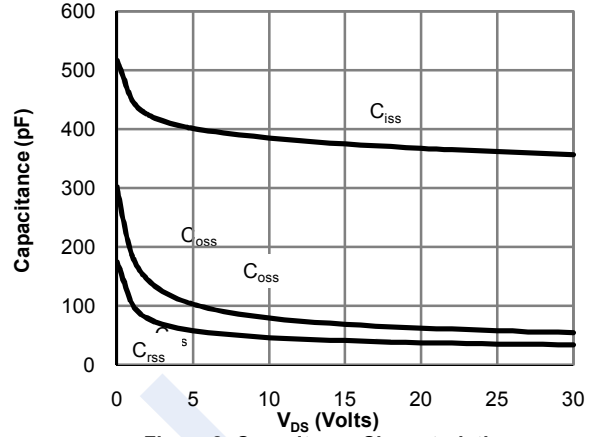


Figure 8: Capacitance Characteristics

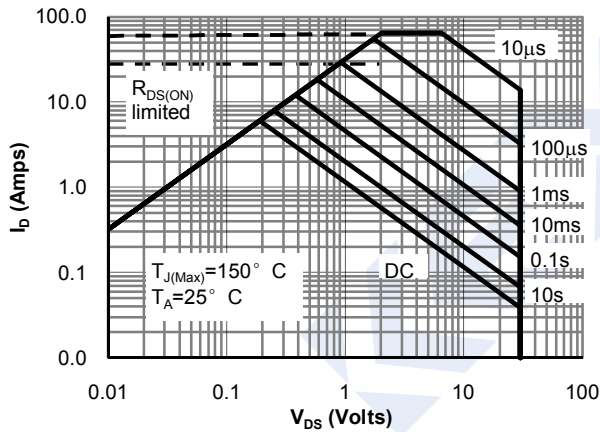


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

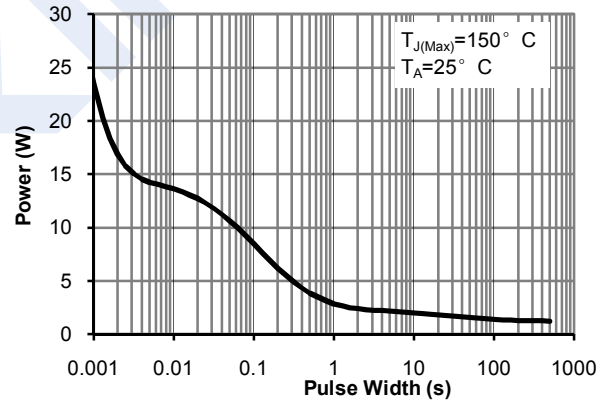


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

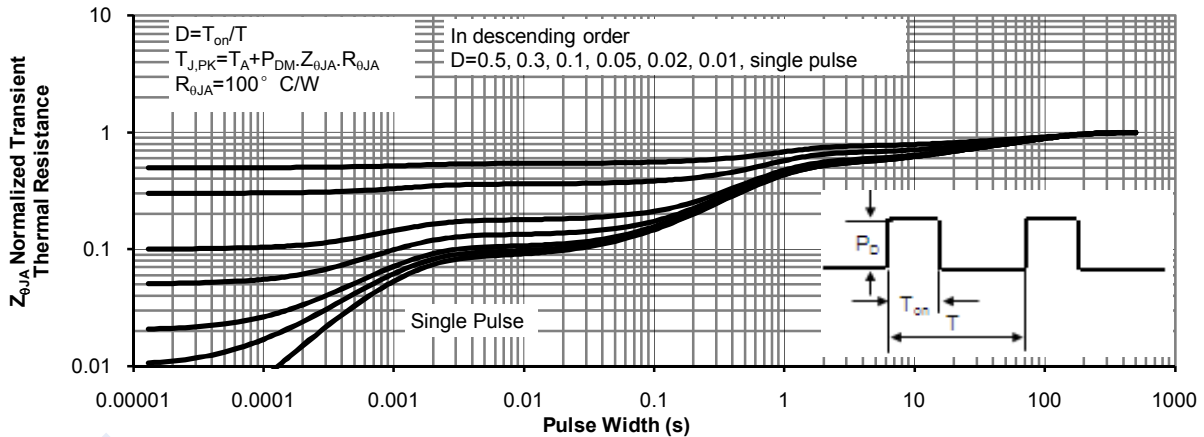


Figure 11: Normalized Maximum Transient Thermal Impedance

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■ P-Channel Typical Characteristics

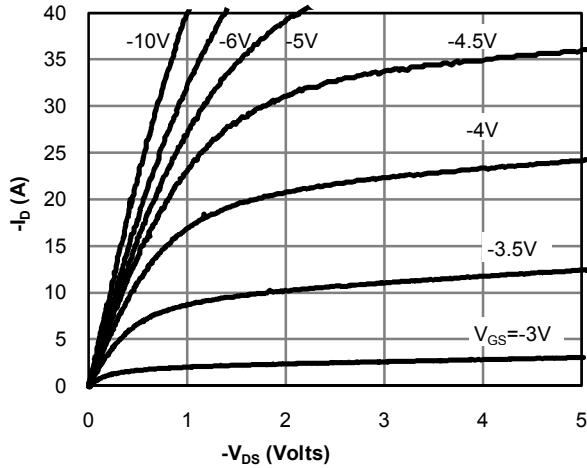


Fig 1: On-Region Characteristics

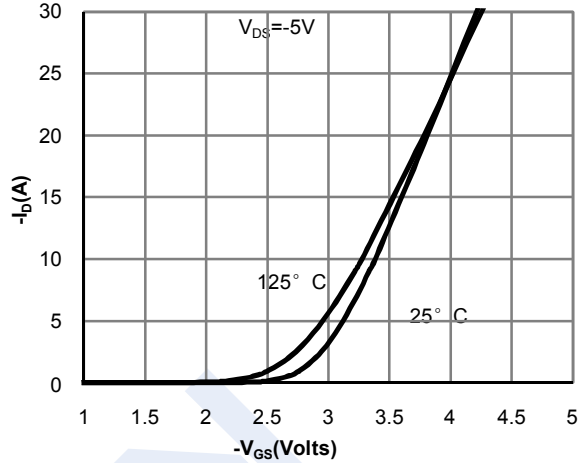


Figure 2: Transfer Characteristics

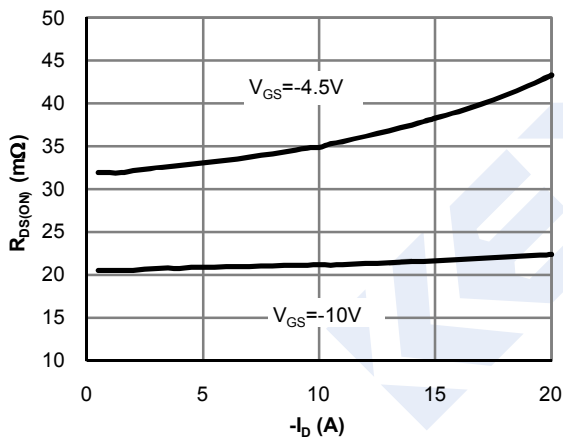


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

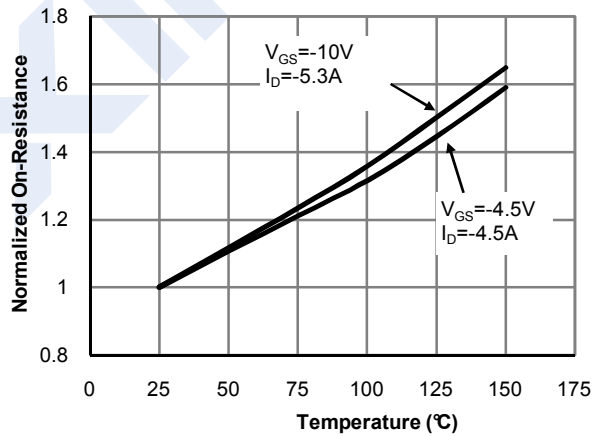


Figure 4: On-Resistance vs. Junction Temperature

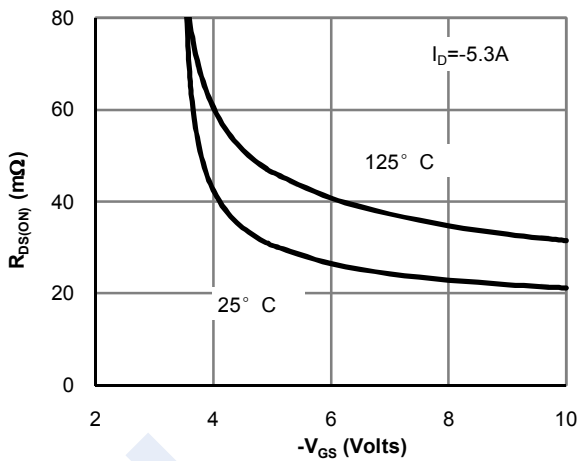


Figure 5: On-Resistance vs. Gate-Source Voltage

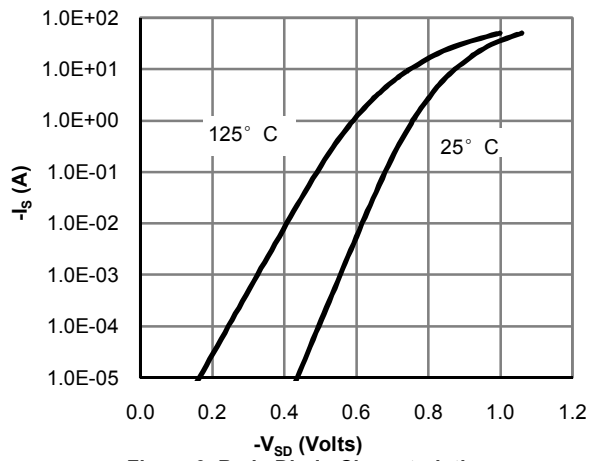


Figure 6: Body-Diode Characteristics

Complementary Trench MOSFET AO4620-HF (KO4620-HF)

■ P-Channel Typical Characteristics

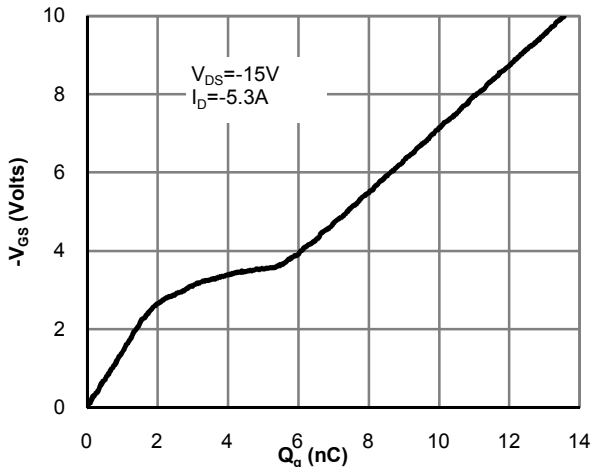


Figure 7: Gate-Charge Characteristics

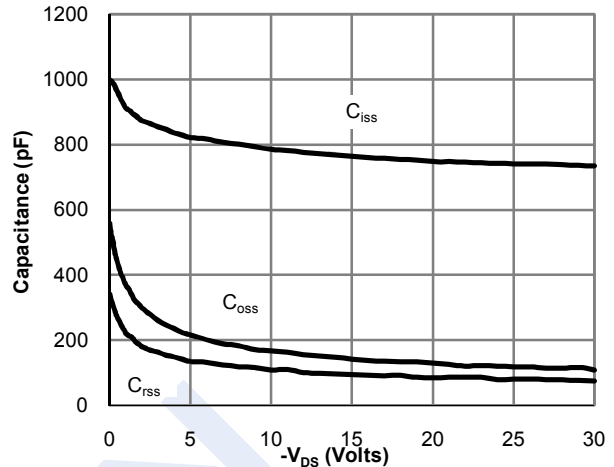


Figure 8: Capacitance Characteristics

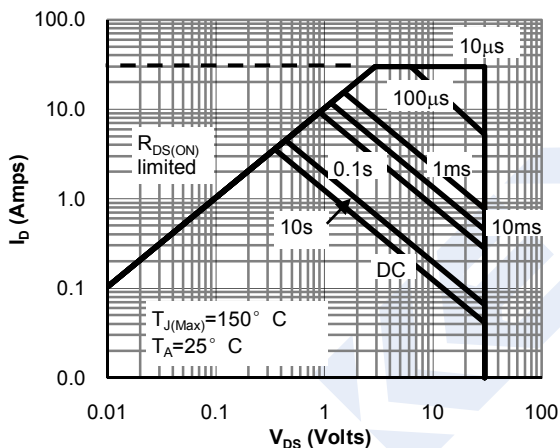


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

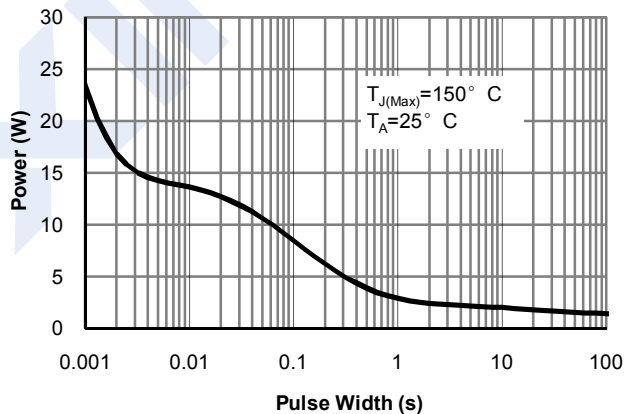


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

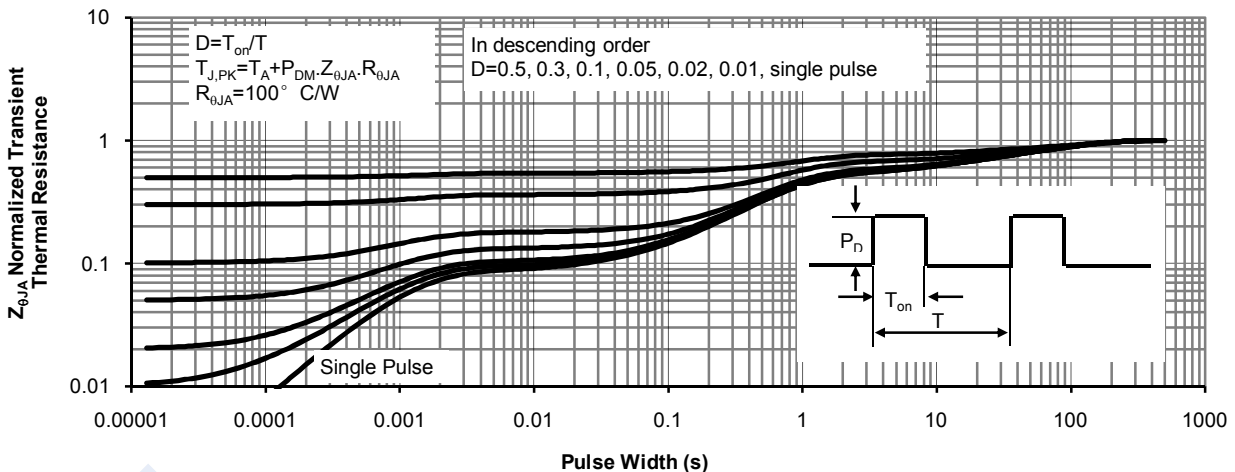


Figure 11: Normalized Maximum Transient Thermal Impedance