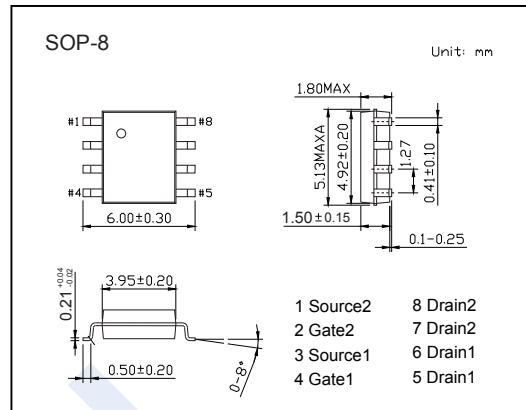
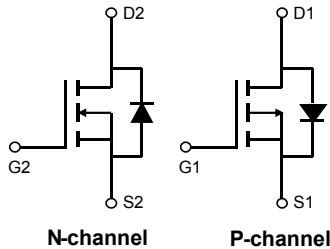


Complementary Trench MOSFET

AO4606 (KO4606)

■ Features

- N-Channel: $V_{DS}=30V$ $I_D=6A$
 $R_{DS(ON)} < 30m\Omega$ ($V_{GS} = 10V$)
 $R_{DS(ON)} < 42m\Omega$ ($V_{GS} = 4.5V$)
- P-Channel: $V_{DS}=-30V$ $I_D=-6.5A$
 $R_{DS(ON)} < 28m\Omega$ ($V_{GS} = -10V$)
 $R_{DS(ON)} < 44m\Omega$ ($V_{GS} = -4.5V$)



■ 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	I_D	$T_a = 25^\circ C$	6	-6.5	A
		$T_a = 70^\circ C$	5	-5.3	
Pulsed Drain Current	I_{DM}	30	-30		
Avalanche Current	I_{AS}, I_{AR}	10	23		
Avalanche energy $L=0.1mH$	E_{AS}, E_{AR}	5	26	mJ	
Power Dissipation	P_D	$T_a = 25^\circ C$	2		W
		$T_a = 70^\circ C$	1.3		
Thermal Resistance.Junction- to-Ambient	R_{thJA}	$t \leq 10s$	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			

Complementary Trench MOSFET

AO4606 (KO4606)

■ 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 =250 μA	1.2	1.8	2.4	V	
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =6A		25	30	mΩ	
		V _{GS} =10V, I _D =6A, T _J =125°C		40	48		
		V _{GS} =4.5V, I _D =5A		33.5	42		
On State Drain Current	I _{D(ON)}	V _{GS} =10V, V _{DS} =5V	30			A	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =6A		15		S	
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz	200	255	310	pF	
Output Capacitance	C _{oss}		30	45	60		
Reverse Transfer Capacitance	C _{rss}		20	35	50		
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz	1.6	3.25	4.9	Ω	
Total Gate Charge (10V)	Q _g	V _{GS} =10V, V _{DS} =15V, I _D =6A	4	5.2	6	nC	
Total Gate Charge (4.5V)			2	2.55	3		
Gate Source Charge			Q _{gs}		0.85		
Gate Drain Charge			Q _{gd}		1.3		
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =15V, R _L =2.5Ω, R _{GEN} =3Ω		4.5		ns	
Turn-On Rise Time	t _r			2.5			
Turn-Off DelayTime	t _{d(off)}			14.5			
Turn-Off Fall Time	t _f			3.5			
Body Diode Reverse Recovery Time	t _{rr}	I _F =6A, di/dt=100A/μs		8.5	12	nC	
Body Diode Reverse Recovery Charge	Q _{rr}			2.2	3		
Maximum Body-Diode Continuous Current	I _S				2.5	A	
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V		0.76	1	V	

■ Marking

Marking	4606 KA****
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Complementary Trench MOSFET

AO4606 (KO4606)

■ P-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 =-250 μA	-1.3	-1.85	-2.4	V	
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-6.5A		22	28	mΩ	
		V _{GS} =-10V, I _D =-6.5A T _J =125°C		32	40		
		V _{GS} =-4.5V, I _D =-5A		34	44		
On state drain current	I _{D(ON)}	V _{GS} =-10V, V _{DS} =-5V	-30			A	
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-6.5A		18		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	1.5	3.2	5	Ω	
Total Gate Charge (10V)	Q _g	V _{GS} =-10V, V _{DS} =-15V, I _D =-6.5A		13.6	16	nC	
Total Gate Charge (4.5V)				6.7	8		
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 =2.3 Ω, R _{GEN} =3 Ω		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 =-6.5A, di/dt=100A/μs		15		nA	
Body Diode Reverse Recovery Charge	Q _{rr}			9.7			
Maximum Body-Diode Continuous Current	I _S				-2.5	A	
Diode Forward Voltage	V _{SD}	I _S =-1A, V _{GS} =0V		-0.8	-1	V	

Complementary Trench MOSFET AO4606 (KO4606)

■ N-Channel Typical Characteristics

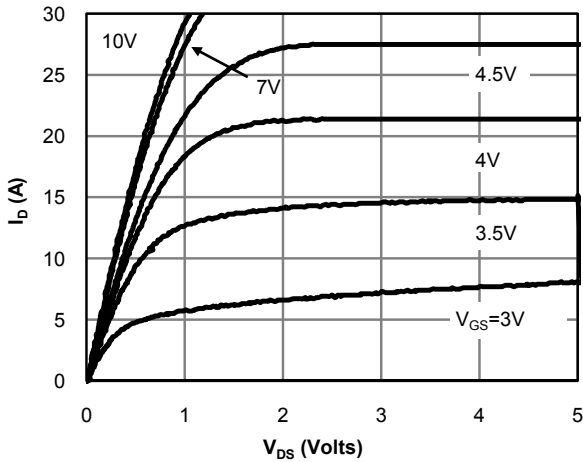


Figure 1: On-Region Characteristics (Note E)

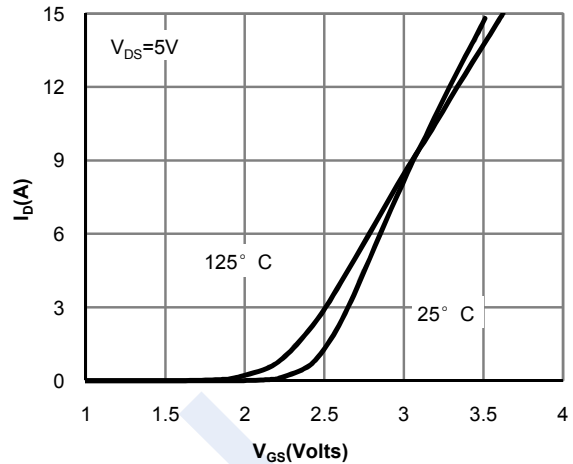


Figure 2: Transfer Characteristics (Note E)

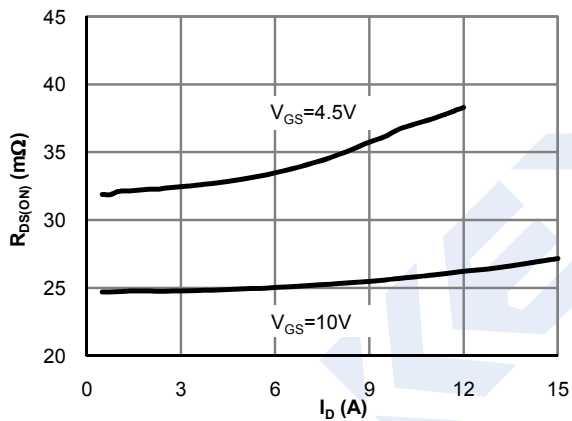


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

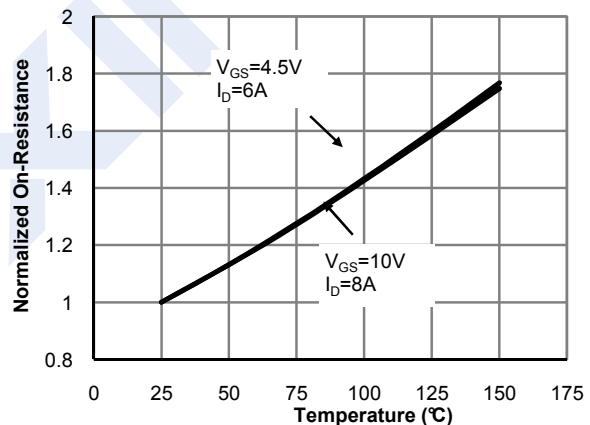


Figure 4: On-Resistance vs. Junction Temperature (Note E)

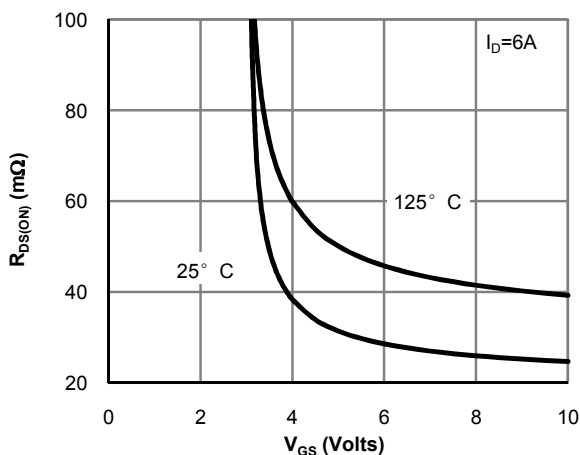


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

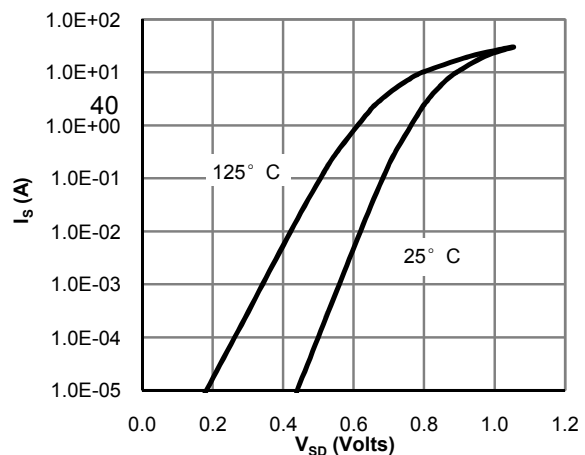


Figure 6: Body-Diode Characteristics (Note E)

Complementary Trench MOSFET

AO4606 (KO4606)

■ N-Channel Typical Characteristics

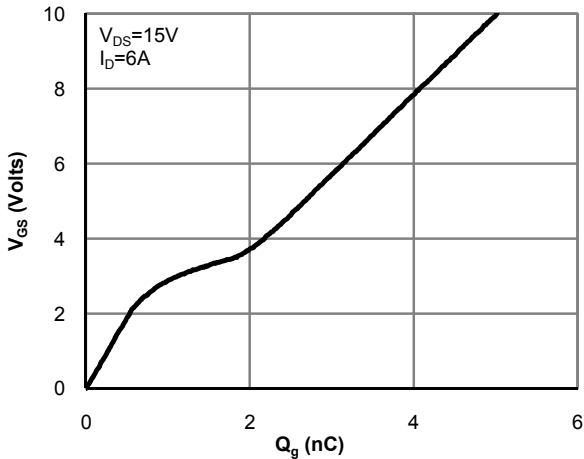


Figure 7: Gate-Charge Characteristics

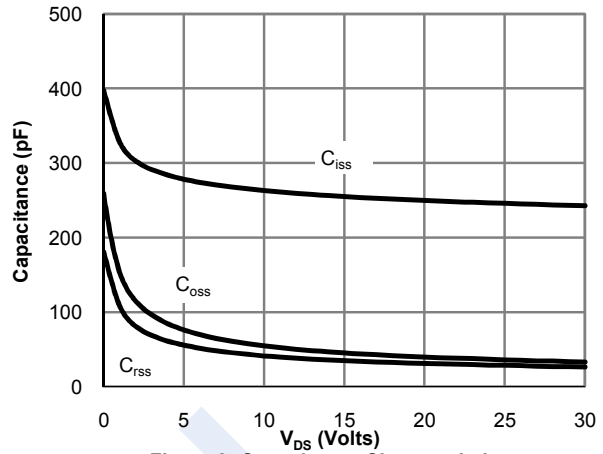


Figure 8: Capacitance Characteristics

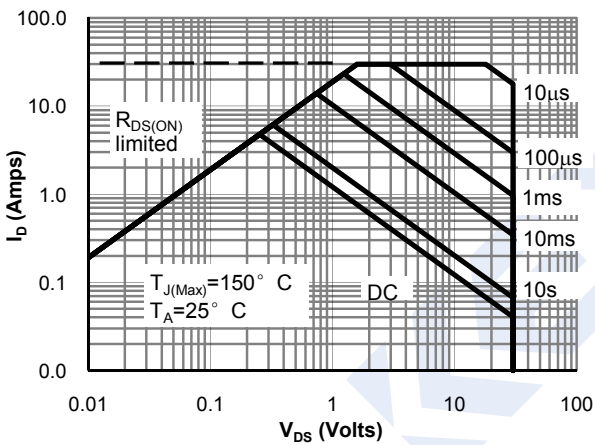


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

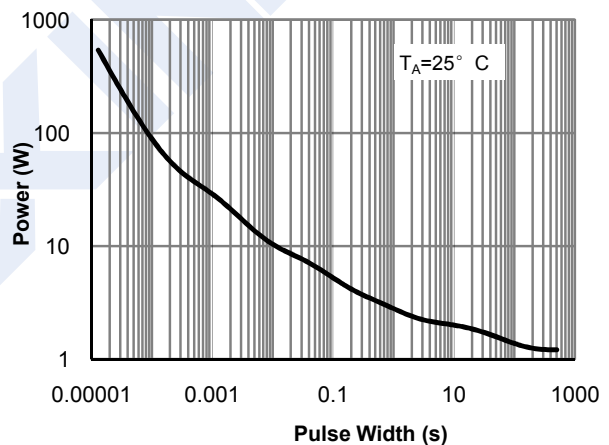


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

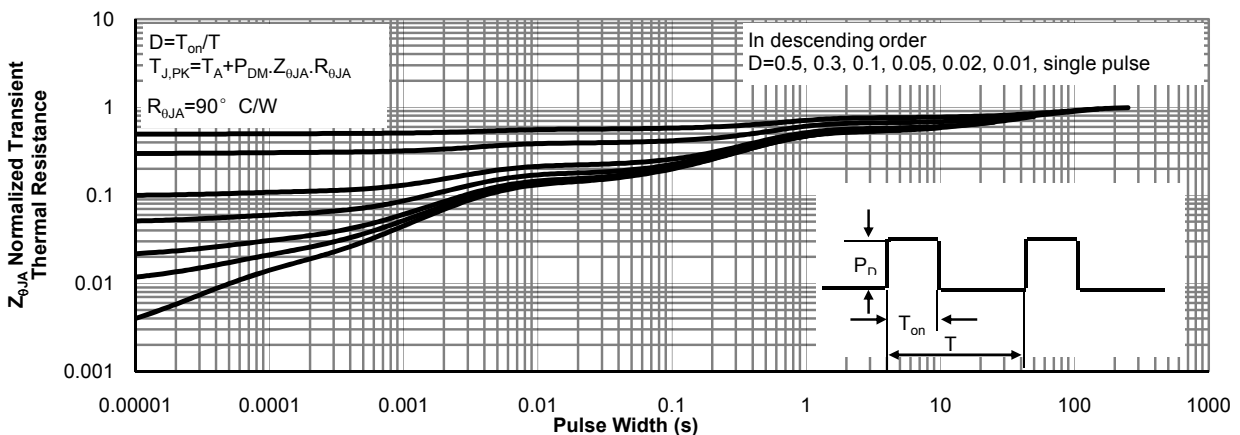


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Complementary Trench MOSFET AO4606 (KO4606)

■ P-Channel Typical Characteristics

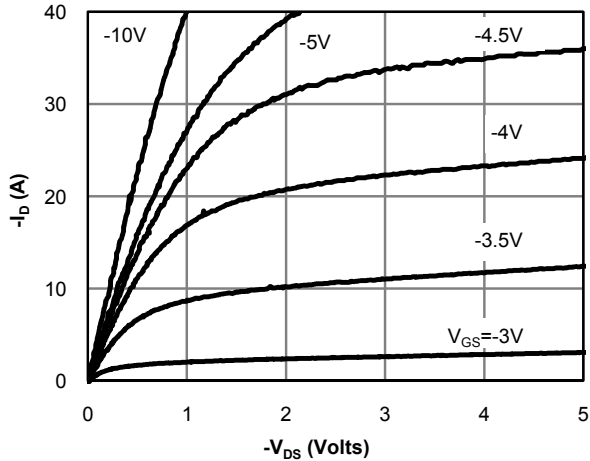


Fig 1: On-Region Characteristics (Note E)

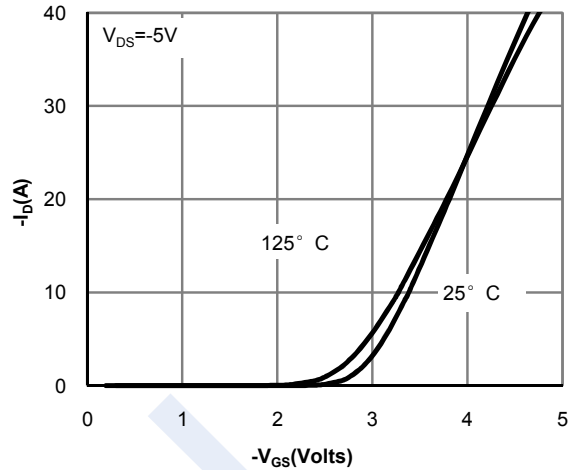


Figure 2: Transfer Characteristics (Note E)

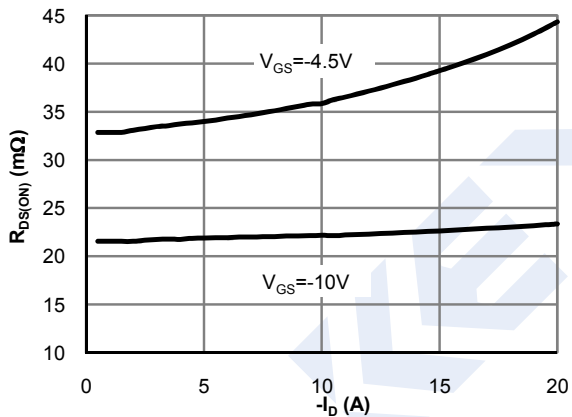


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

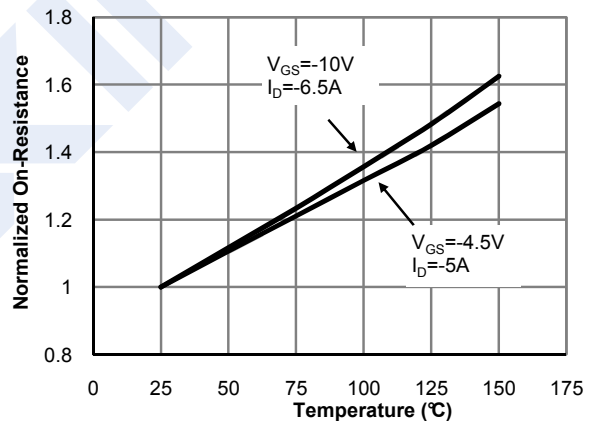


Figure 4: On-Resistance vs. Junction Temperature (Note E)

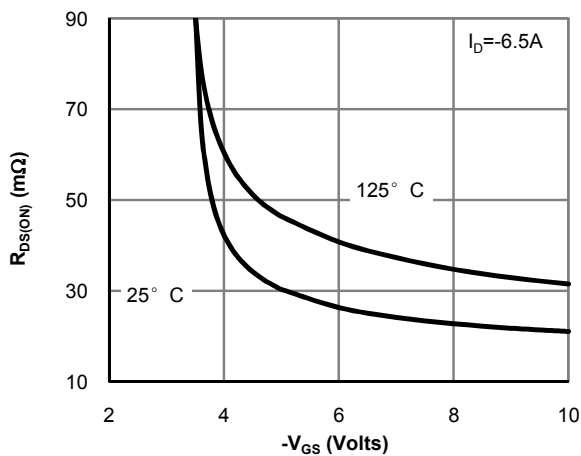


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

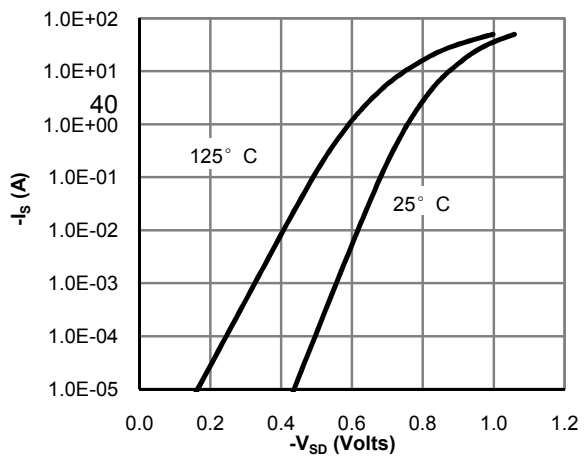


Figure 6: Body-Diode Characteristics (Note E)

Complementary Trench MOSFET

AO4606 (KO4606)

■ P-Channel Typical Characteristics

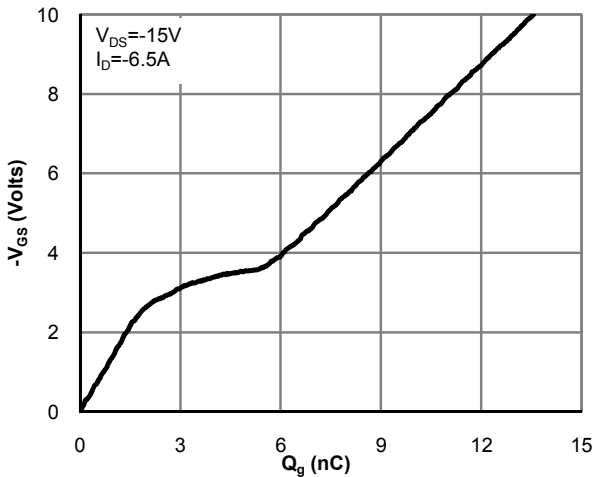


Figure 7: Gate-Charge Characteristics

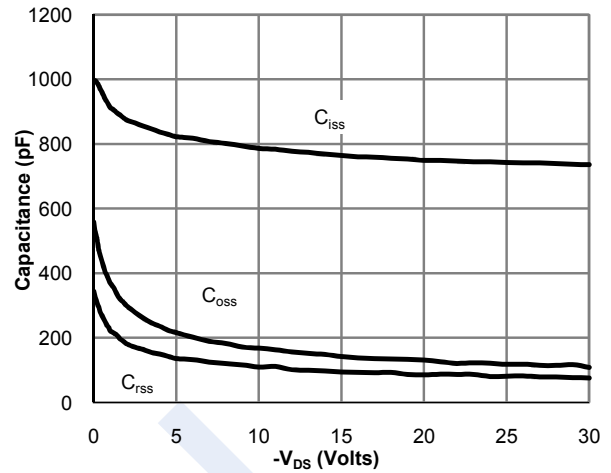


Figure 8: Capacitance Characteristics

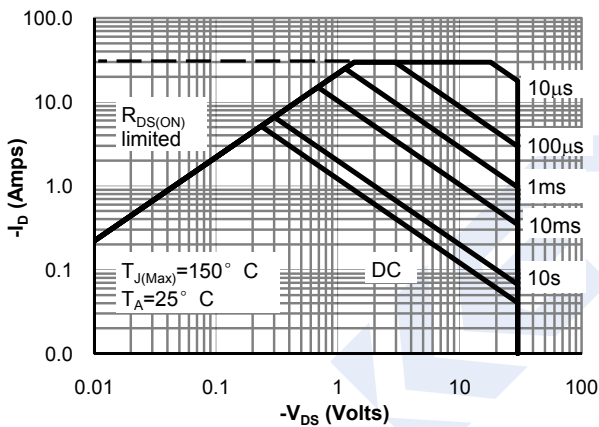


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

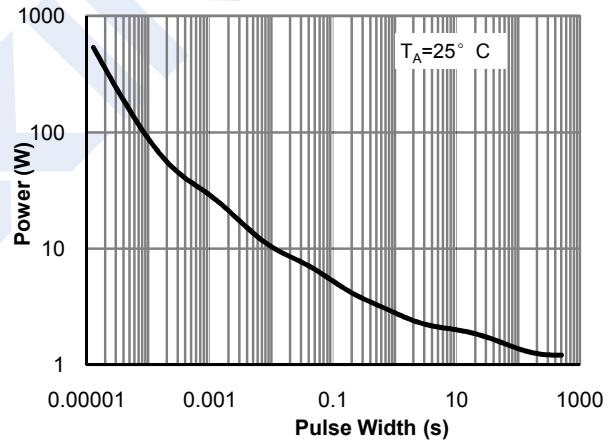


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

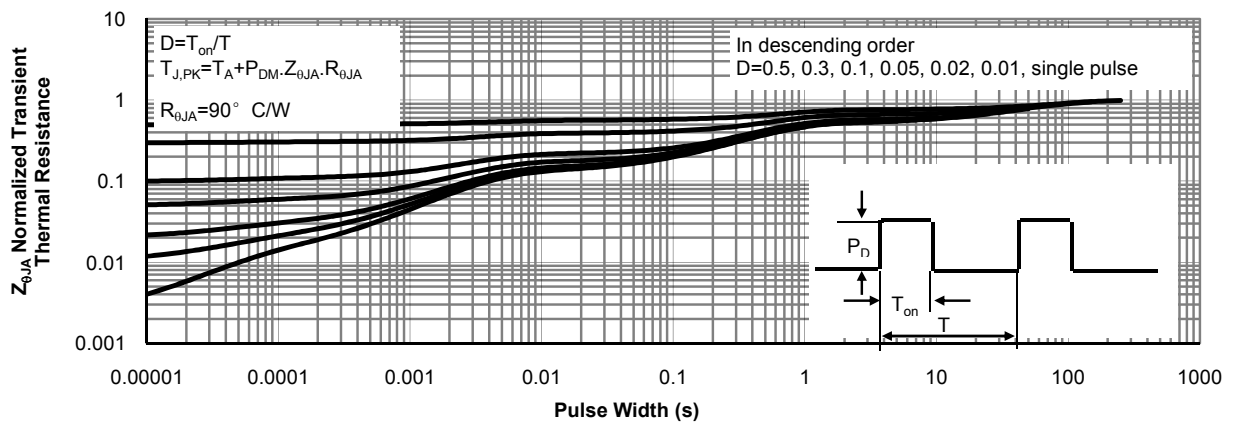


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)