

## Complementary Trench MOSFET

### AO6601 (KO6601)

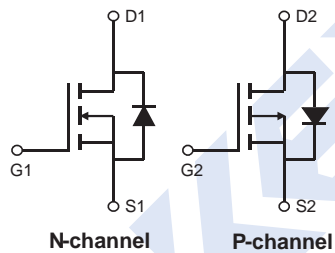
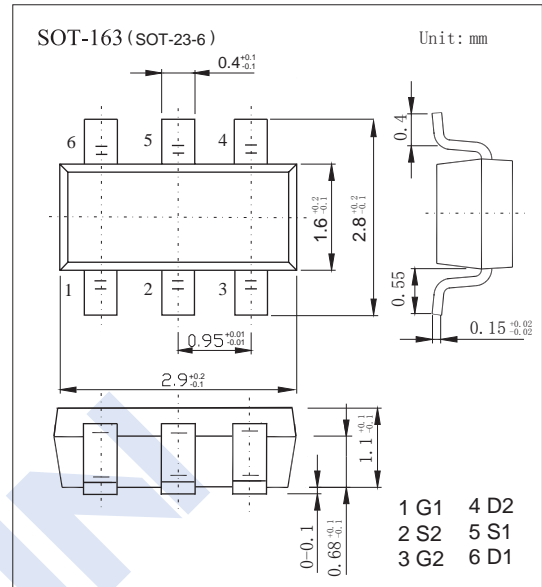
#### ■ Features

N-Channel :

- $V_{DS} (V) = 30V$
- $I_D = 3.4 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 60m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 70m\Omega (V_{GS} = 4.5V)$
- $R_{DS(ON)} < 90m\Omega (V_{GS} = 2.5V)$

P-Channel :

- $V_{DS} (V) = -30V$
- $I_D = -2.3 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 115m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 150m\Omega (V_{GS} = -4.5V)$
- $R_{DS(ON)} < 200m\Omega (V_{GS} = -2.5V)$



#### ■ 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	$V_{GS}$	$\pm 12$			
Continuous Drain Current	$I_D$	$T_A=25^\circ C$	3.4	-2.3	A
		$T_A=70^\circ C$	2.7	-1.8	
Pulsed Drain Current	$I_{DM}$	20	-15		
Power Dissipation	$P_D$	$T_A=25^\circ C$	1.15		W
		$T_A=70^\circ C$	0.73		
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	$t \leq 10s$	110		$^\circ C/W$
		Steady-State	150		
Thermal Resistance.Junction- to-Lead	$R_{thJL}$	80			
Junction Temperature	$T_J$	150		$^\circ C$	
Storage Temperature Range	$T_{stg}$	-55 to 150			

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■ N-Channel Mosfet 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 μ A, 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> =±12V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5		1.5	V
Static Drain-Source On-Resistance	R <sub>Ds(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =3.4A			60	mΩ
		V <sub>GS</sub> =10V, I <sub>D</sub> =3.4A T <sub>J</sub> =125°C			88	
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A			70	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =2A			90	
On State Drain Current	I <sub>D(ON)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =5V	20			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =3.4A		14		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz	182		285	pF
Output Capacitance	C <sub>oss</sub>		25		45	
Reverse Transfer Capacitance	C <sub>rss</sub>		10		25	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	0.9		2.7	Ω
Total Gate Charge (10V)	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =3.4A		10	12	nC
Total Gate Charge (4.5V)				4.7	6	
Gate Source Charge	Q <sub>gs</sub>		0.95			
Gate Drain Charge	Q <sub>gd</sub>		1.6			
Turn-On DelayTime	t <sub>d(on)</sub>		V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =4.4 Ω, R <sub>G</sub> =3 Ω		3.5	
Turn-On Rise Time	t <sub>r</sub>			1.5		
Turn-Off DelayTime	t <sub>d(off)</sub>			17.5		
Turn-Off Fall Time	t <sub>f</sub>			2.5		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 3.4A, di/dt= 100A/ μ s			12	nC
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>				4	
Maximum Body-Diode Continuous Current	I <sub>S</sub>				1.5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1	V

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#### ■ P-Channel Mosfet 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> =±12V			±100	nA	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250 μA	-0.6		-1.4	V	
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.3A			115	mΩ	
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.3A T <sub>J</sub> =125°C			200		
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A			150		
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1A			200		
On state drain current	I <sub>D(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V	-15			A	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-2.3A		8		S	
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz	205		315	pF	
Output Capacitance	C <sub>oss</sub>		25		50		
Reverse Transfer Capacitance	C <sub>rss</sub>		10		30		
Gate resistance	R <sub>g</sub>		V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	4			12
Total Gate Charge (10V)	Q <sub>g</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-2.3A	4.5		7	nC	
Total Gate Charge (4.5V)			2		4		
Gate Source Charge			Q <sub>gs</sub>		0.7		
Gate Drain Charge			Q <sub>gd</sub>		1		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =6Ω, R <sub>G</sub> =3Ω		6		ns	
Turn-On Rise Time	t <sub>r</sub>			3.5			
Turn-Off DelayTime	t <sub>d(off)</sub>			20			
Turn-Off Fall Time	t <sub>f</sub>			5			
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-2.3A, di/dt=100A/μs			15	ns	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>				6		nC
Maximum Body-Diode Continuous Current	I <sub>S</sub>				-1.5	A	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V			-1	V	

#### ■ Marking

Marking	F1*
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## Complementary Trench MOSFET AO6601 (KO6601)

■ N-Channel Mosfet Typical Characteristics

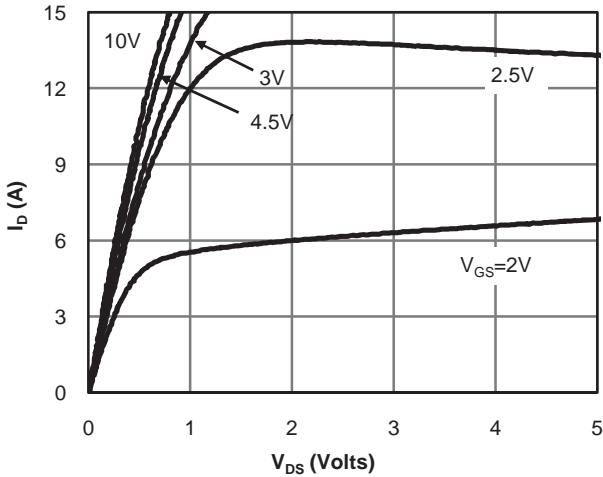


Fig 1: On-Region Characteristics

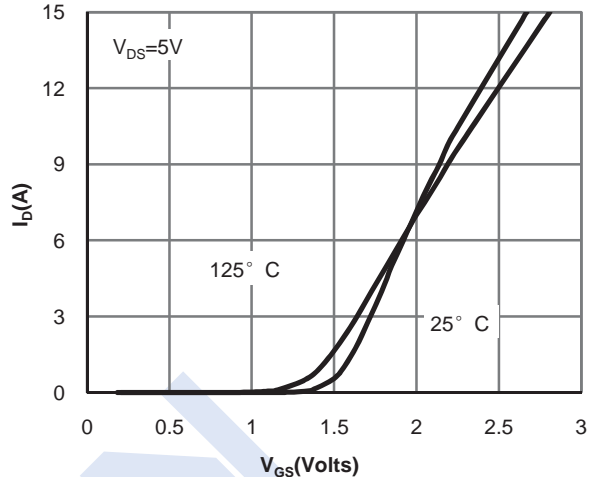


Figure 2: Transfer Characteristics

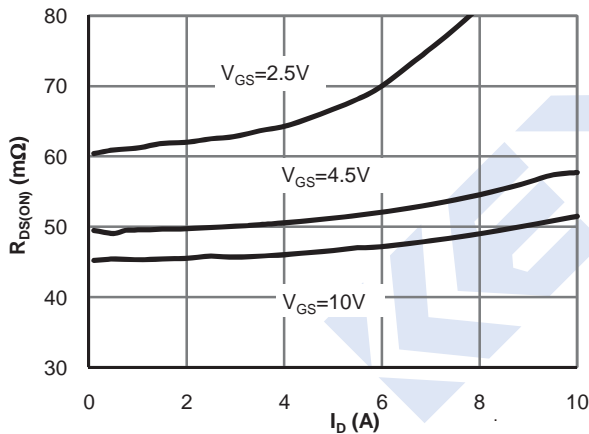


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

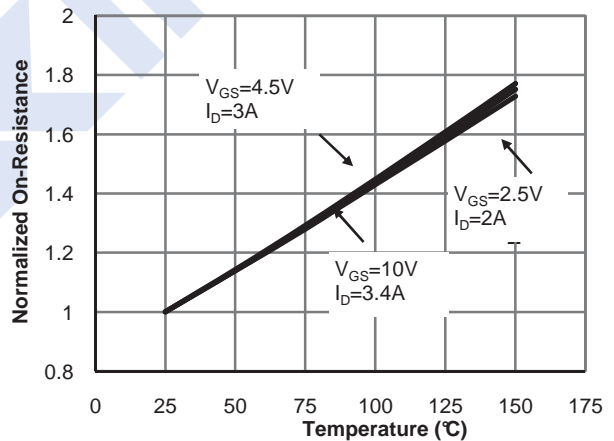


Figure 4: On-Resistance vs. Junction Temperature

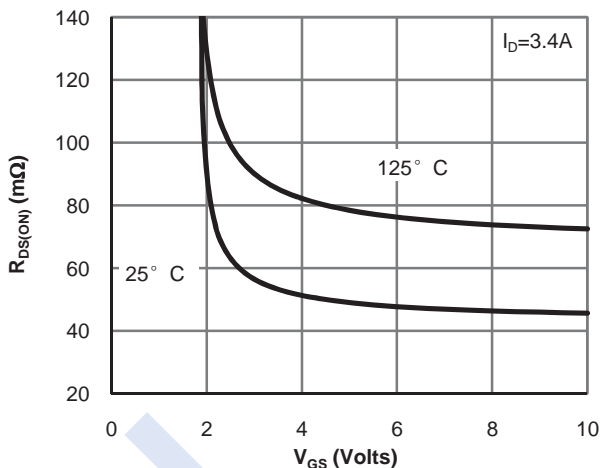


Figure 5: On-Resistance vs. Gate-Source Voltage

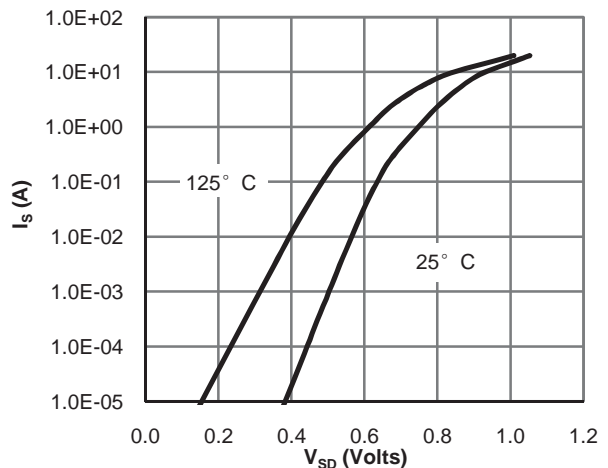


Figure 6: Body-Diode Characteristics

Complementary Trench MOSFET

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■ N-Channel Mosfet Typical Characteristics

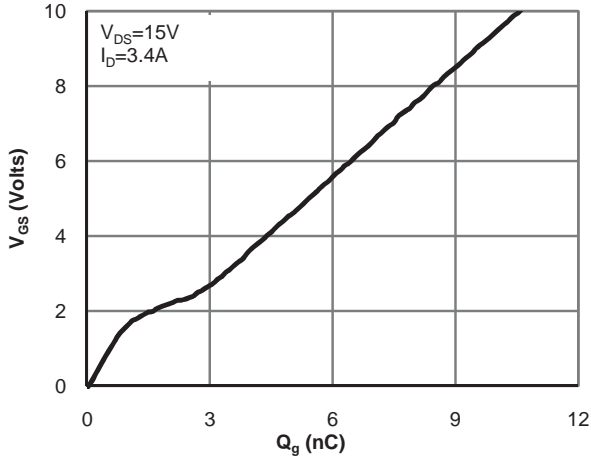


Figure 7: Gate-Charge Characteristics

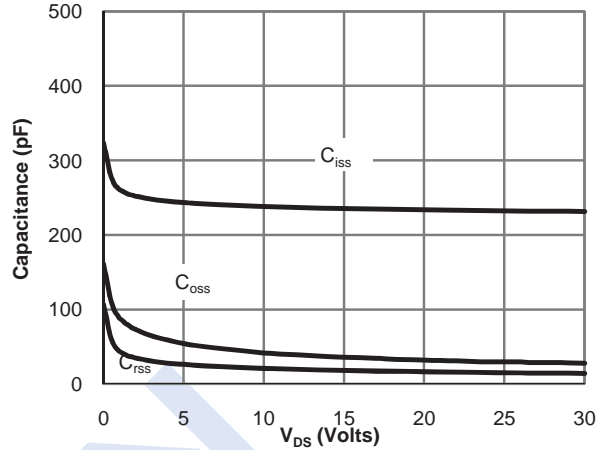


Figure 8: Capacitance Characteristics

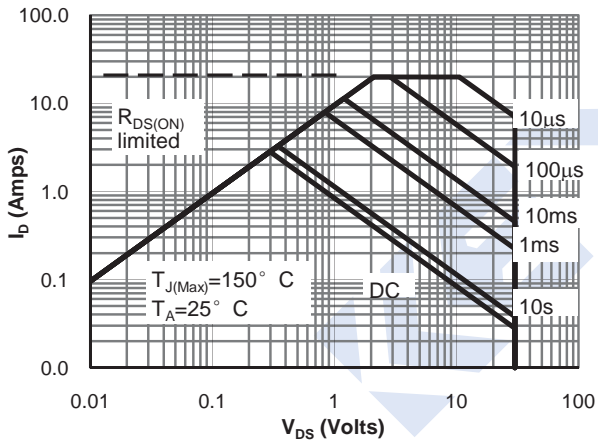


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

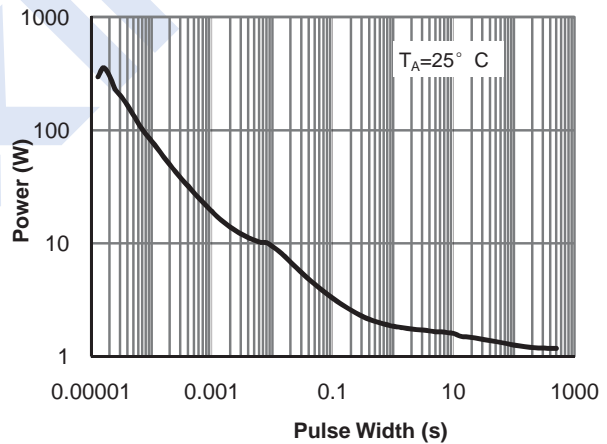


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

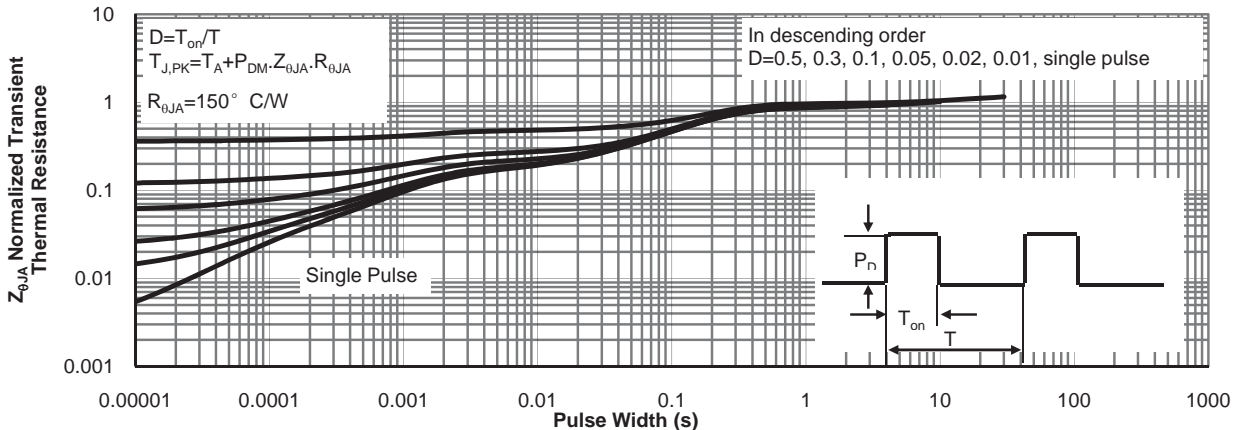


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

## Complementary Trench MOSFET AO6601 (KO6601)

■ P-Channel Mosfet Typical Characteristics

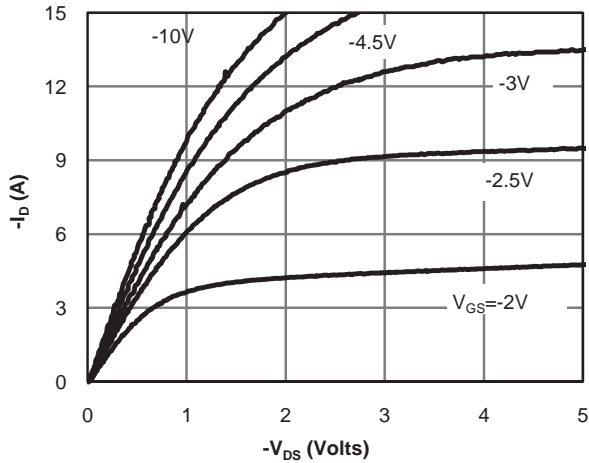


Fig 1: On-Region Characteristics

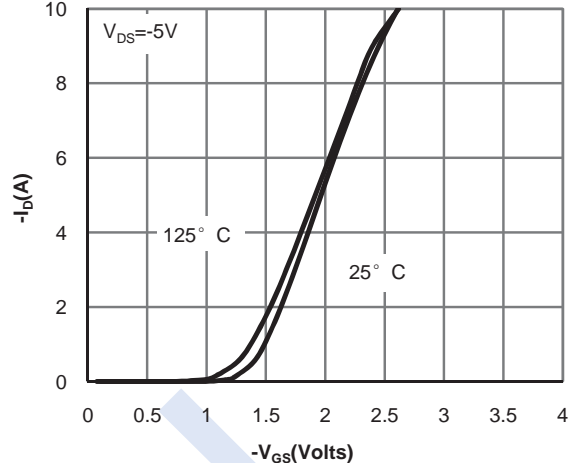


Figure 2: Transfer Characteristics

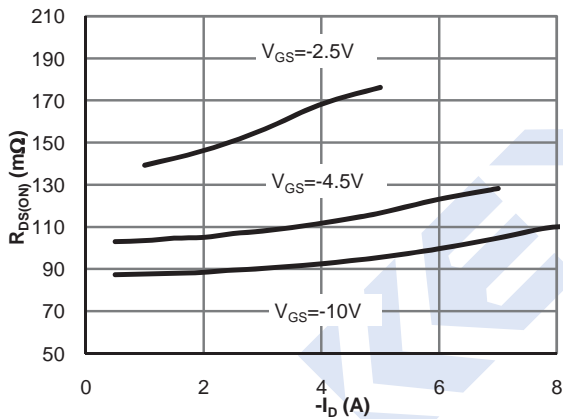


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

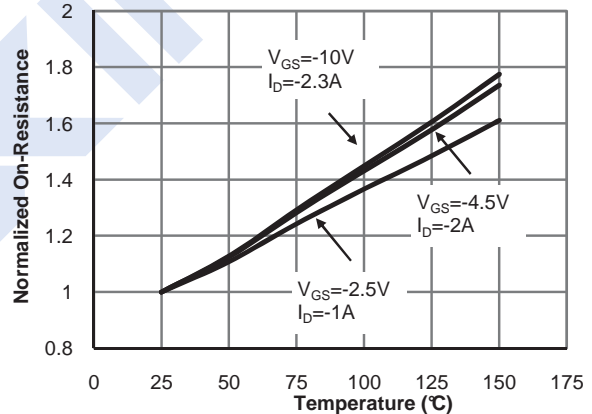


Figure 4: On-Resistance vs. Junction Temperature

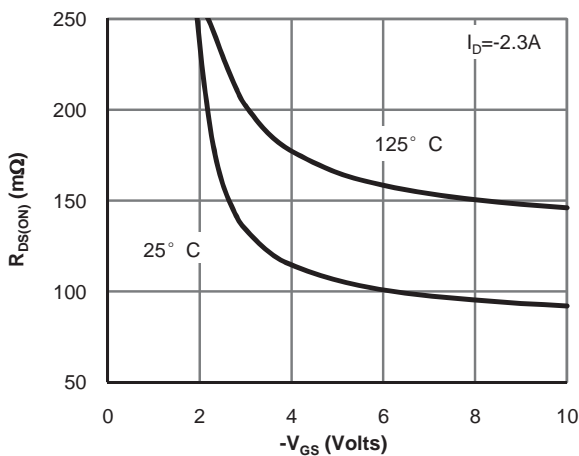


Figure 5: On-Resistance vs. Gate-Source Voltage

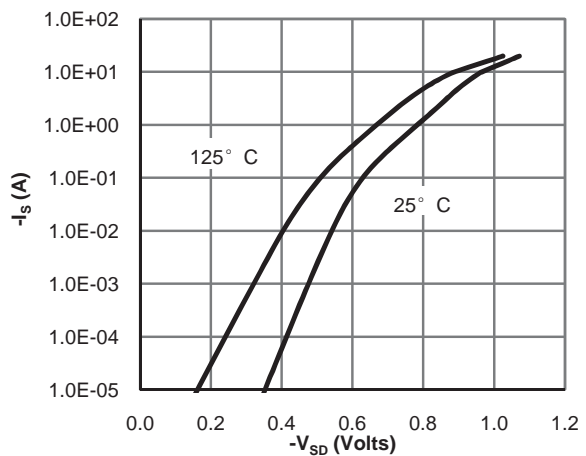


Figure 6: Body-Diode Characteristics

## Complementary Trench MOSFET AO6601 (KO6601)

■ P-Channel Mosfet Typical Characteristics

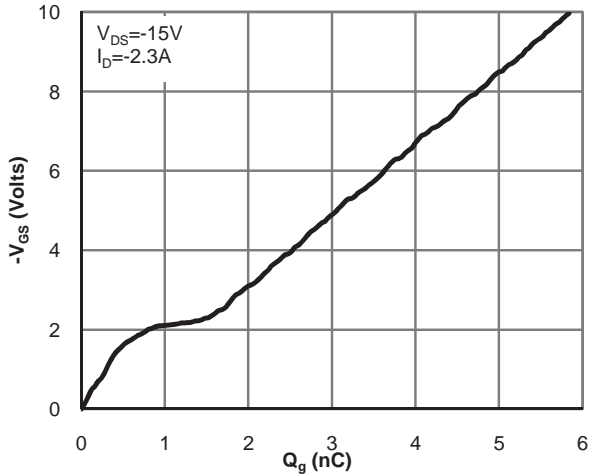


Figure 7: Gate-Charge Characteristics

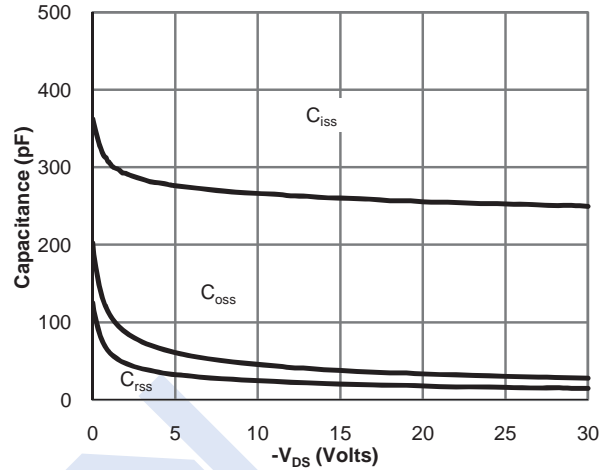


Figure 8: Capacitance Characteristics

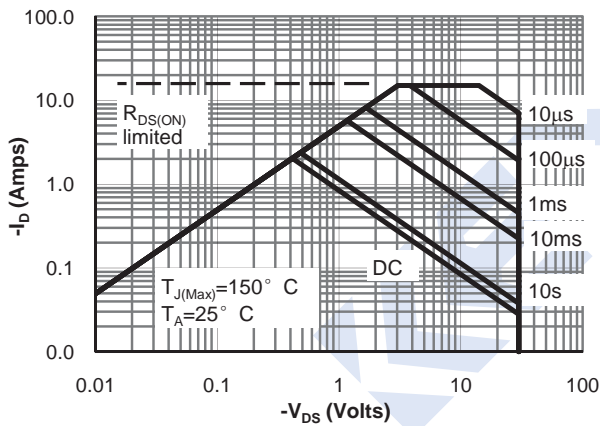


Figure 9: Maximum Forward Biased Safe Operating Area

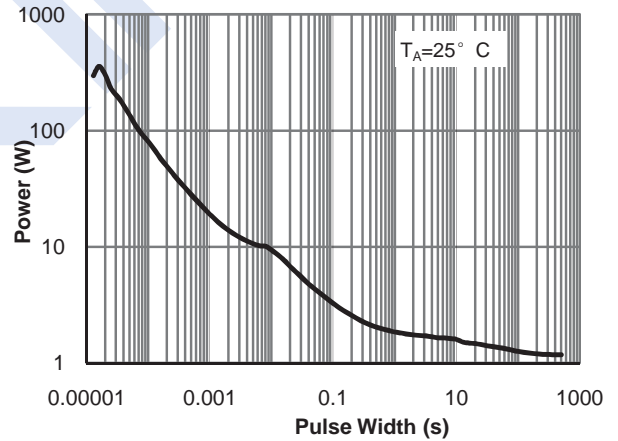


Figure 10: Single Pulse Power Rating Junction-to-Ambient

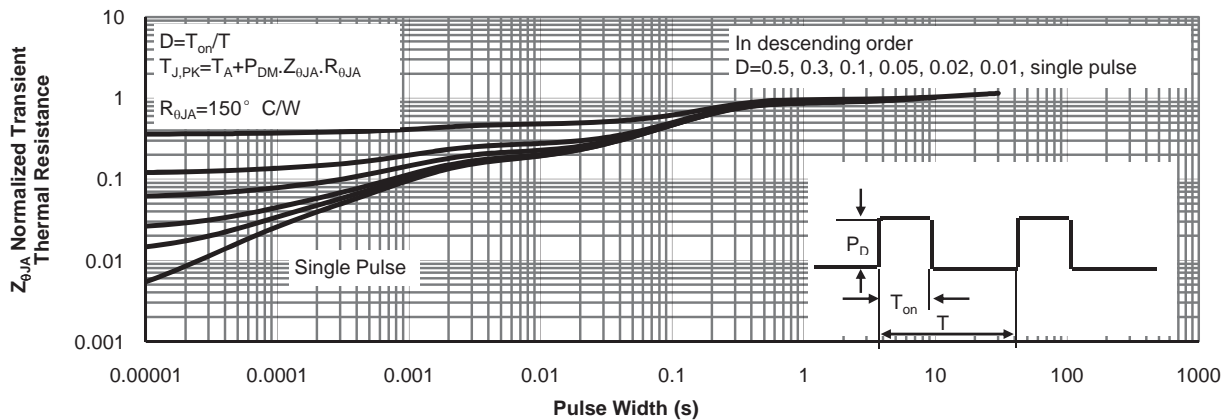


Figure 11: Normalized Maximum Transient Thermal Impedance

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