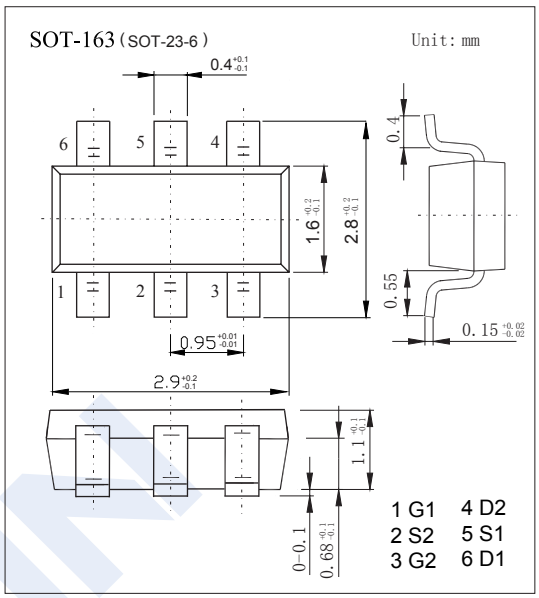
Complementary Trench MOSFET

AO6601 (KO6601)



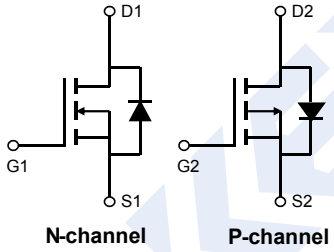
■ Features

N-Channel :

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

P-Channel :

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



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±12		
Continuous Drain Current	TA=25℃	I_D	3.4	-2.3	A
	TA=70℃		2.7	-1.8	
Pulsed Drain Current		I_{DM}	20	-15	
Power Dissipation	TA=25℃	P_D	1.15		W
	TA=70℃		0.73		
Thermal Resistance.Junction- to-Ambient	t ≤ 10s	R_{thJA}	110		℃/W
	Steady-State		150		
Thermal Resistance.Junction- to-Lead		R_{thJL}	80		
Junction Temperature		T_J	150		℃
Storage Temperature Range		T_{stg}	-55 to 150		

Complementary Trench MOSFET

AO6601 (KO6601)

■ N-Channel Mosfet Electrical Characteristics Ta = 25℃

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	uA
		V_{DS}=30V, V_{GS}=0V, T_J=55℃			5	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250uA	0.5		1.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=3.4A			60	mΩ
		V_{GS}=10V, I_D=3.4A T_J=125℃			88	
		V_{GS}=4.5V, I_D=3A			70	
		V_{GS}=2.5V, I_D=2A			90	
On State Drain Current	$I_{D(ON)}$	V_{GS}=10V, V_{DS}=5V	20			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=3.4A		14		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, f=1MHz	182		285	pF
Output Capacitance	C_{oss}		25		45	
Reverse Transfer Capacitance	C_{rss}		10		25	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	0.9		2.7	Ω
Total Gate Charge (10V)	Q_g	V_{GS}=10V, V_{DS}=15V, I_D=3.4A		10	12	nC
Total Gate Charge (4.5V)				4.7	6	
Gate Source Charge	Q_{gs}			0.95		
Gate Drain Charge	Q_{gd}			1.6		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=10V, V_{DS}=15V, R_L=4.4Ω,R_G=3Ω		3.5		ns
Turn-On Rise Time	t_r			1.5		
Turn-Off DelayTime	$t_{d(off)}$			17.5		
Turn-Off Fall Time	t_f			2.5		
Body Diode Reverse Recovery Time	t_{rr}	I_F= 3.4A, dI/dt= 100A/μs			12	
Body Diode Reverse Recovery Charge	Q_{rr}				4	nC
Maximum Body-Diode Continuous Current	I_S				1.5	A
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V			1	V

Complementary Trench MOSFET

AO6601 (KO6601)

■ P-Channel Mosfet Electrical Characteristics Ta = 25℃

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	uA
		V_{DS}=-30V, V_{GS}=0V, T_J=55℃			-5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=-250μA	-0.6		-1.4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-2.3A			115	mΩ
		V_{GS}=-10V, I_D=-2.3A T_J=125℃			200	
		V_{GS}=-4.5V, I_D=-2A			150	
		V_{GS}=-2.5V, I_D=-1A			200	
On state drain current	$I_{D(ON)}$	V_{GS}=-10V, V_{DS}=-5V	-15			A
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-2.3A		8		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-15V, f=1MHz	205		315	pF
Output Capacitance	C_{oss}		25		50	
Reverse Transfer Capacitance	C_{rss}		10		30	
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	4		12	Ω
Total Gate Charge (10V)	Q_g	V_{GS}=-10V, V_{DS}=-15V, I_D=-2.3A	4.5		7	nC
Total Gate Charge (4.5V)			2		4	
Gate Source Charge	Q_{gs}			0.7		
Gate Drain Charge	Q_{gd}			1		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-15V, R_L=6Ω ,R_G=3Ω		6		ns
Turn-On Rise Time	t_r			3.5		
Turn-Off DelayTime	$t_{d(off)}$			20		
Turn-Off Fall Time	t_f			5		
Body Diode Reverse Recovery Time	t_{rr}	I_F=-2.3A, dI/dt=100A/μs			15	
Body Diode Reverse Recovery Charge	Q_{rr}				6	nC
Maximum Body-Diode Continuous Current	I_S				-1.5	A
Diode Forward Voltage	V_{SD}	I_S=-1A,V_{GS}=0V			-1	V

■ Marking

Marking	F1

Complementary Trench MOSFET

AO6601 (KO6601)

■ N-Channel Mosfet Typical Characterisitics

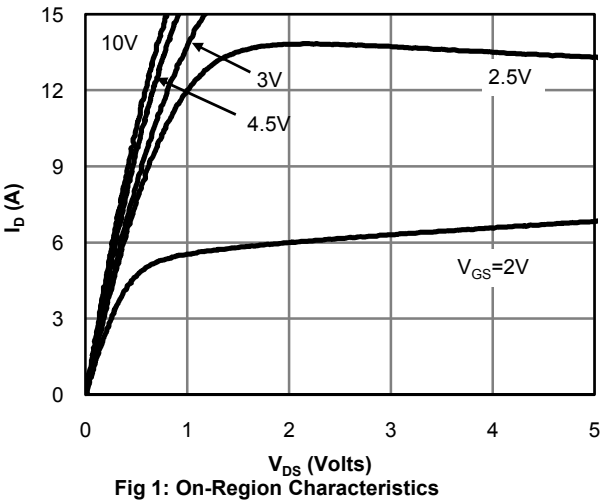


Fig 1: On-Region Characteristics

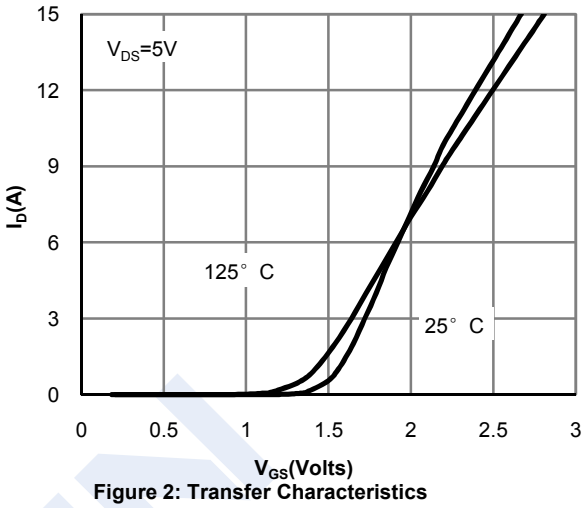


Figure 2: Transfer Characteristics

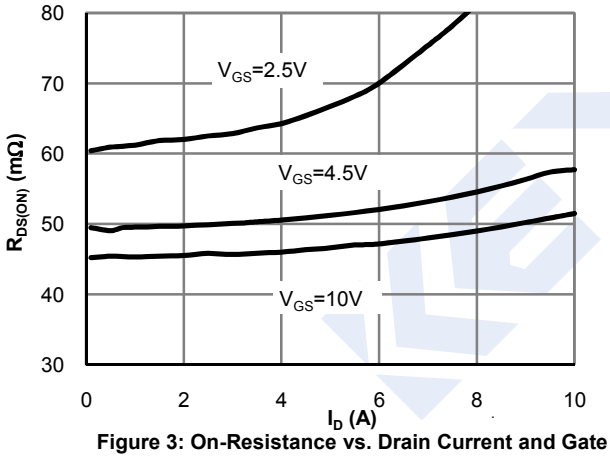


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

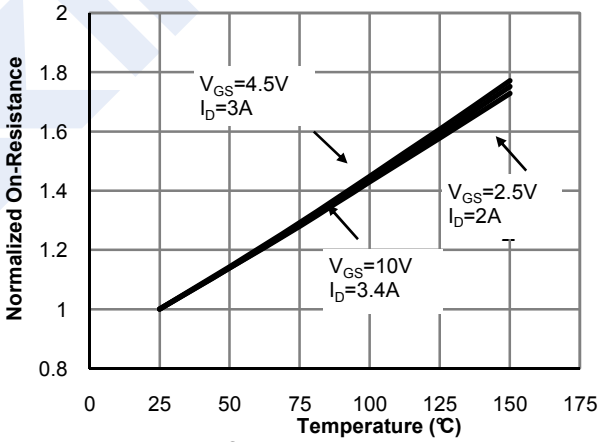


Figure 4: On-Resistance vs. Junction Temperature

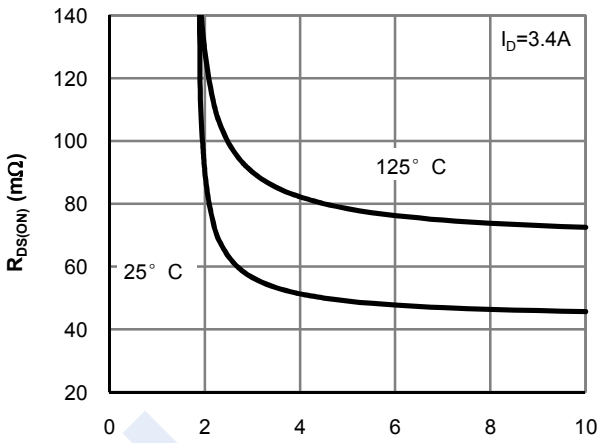


Figure 5: On-Resistance vs. Gate-Source Voltage

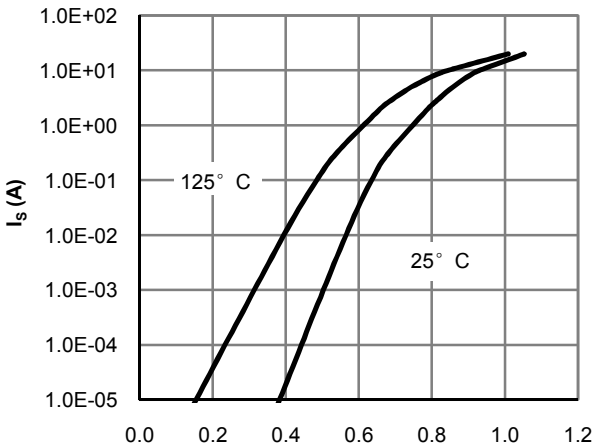


Figure 6: Body-Diode Characteristics

Complementary Trench MOSFET

AO6601 (KO6601)

■ N-Channel Mosfet Typical Characterisitics

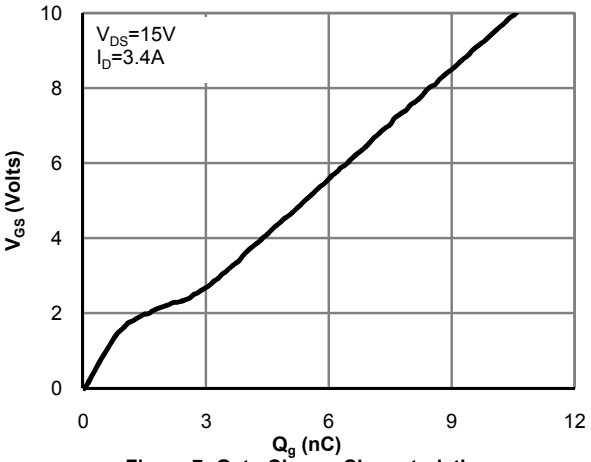


Figure 7: Gate-Charge Characteristics

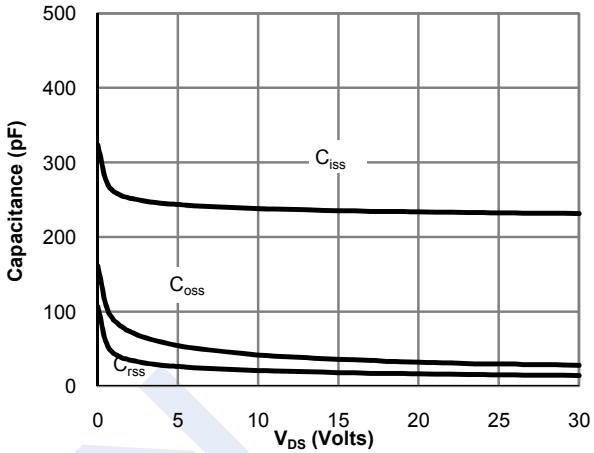


Figure 8: Capacitance Characteristics

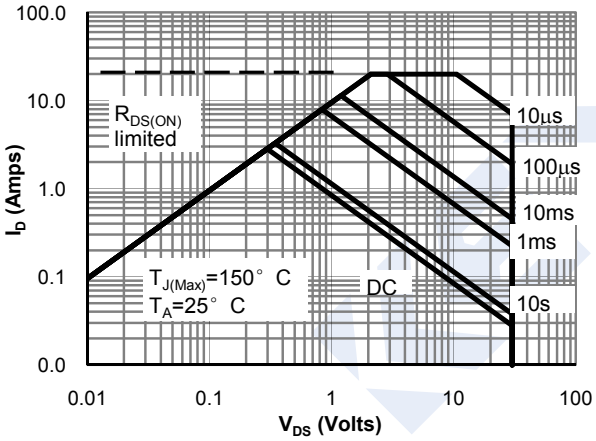


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

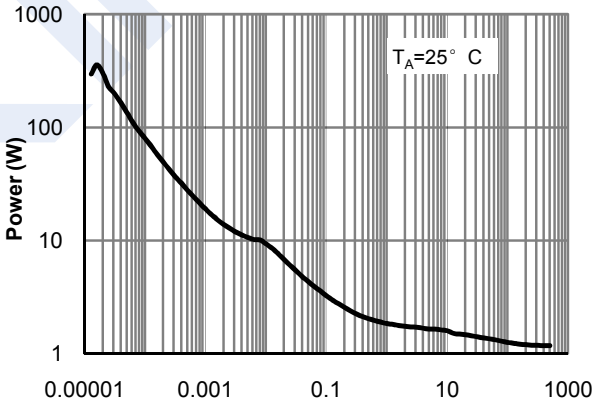


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

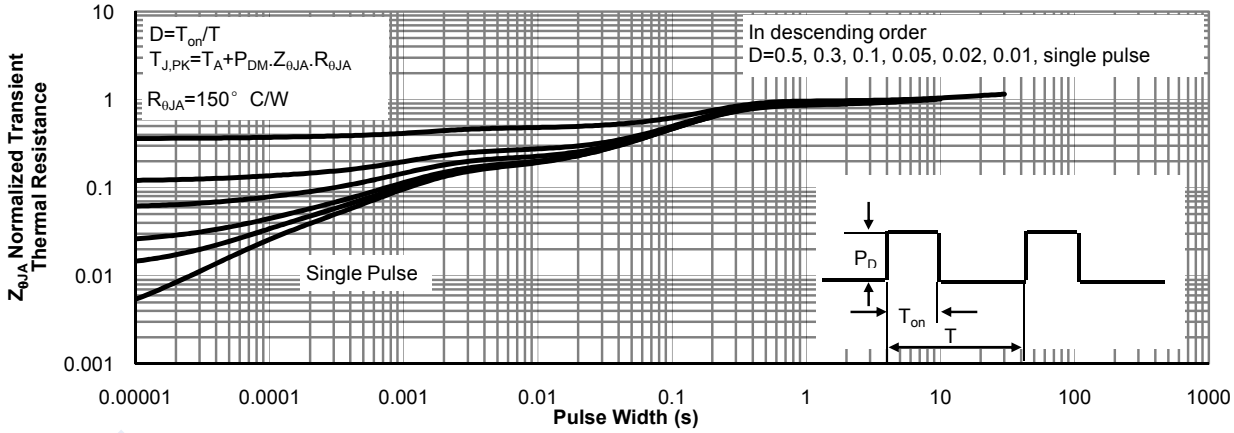


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Complementary Trench MOSFET

AO6601 (KO6601)

■ P-Channel Mosfet Typical Characterisitics

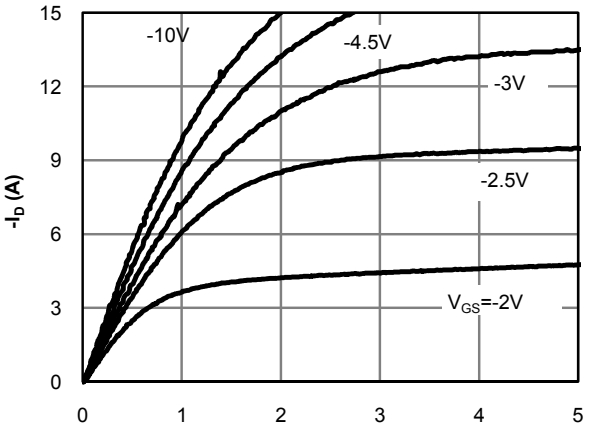


Fig 1: On-Region Characteristics

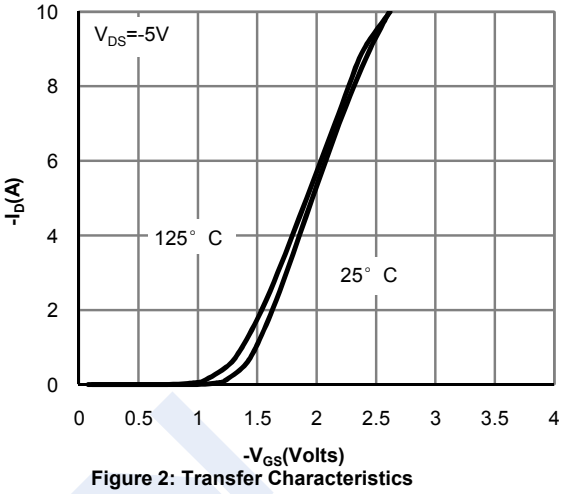


Figure 2: Transfer Characteristics

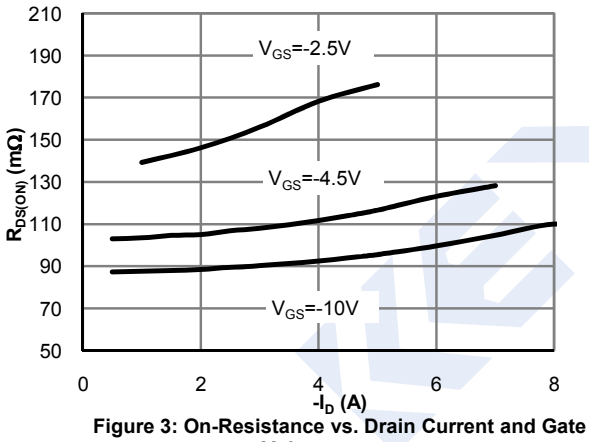


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

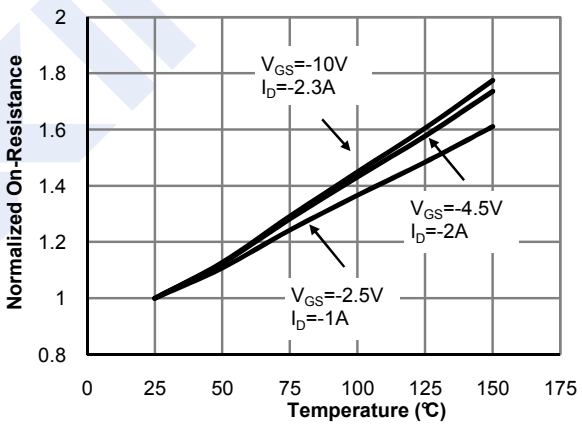


Figure 4: On-Resistance vs. Junction Temperature

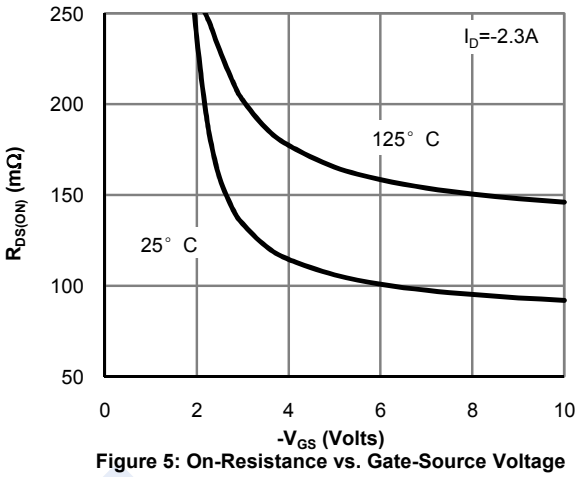


Figure 5: On-Resistance vs. Gate-Source Voltage

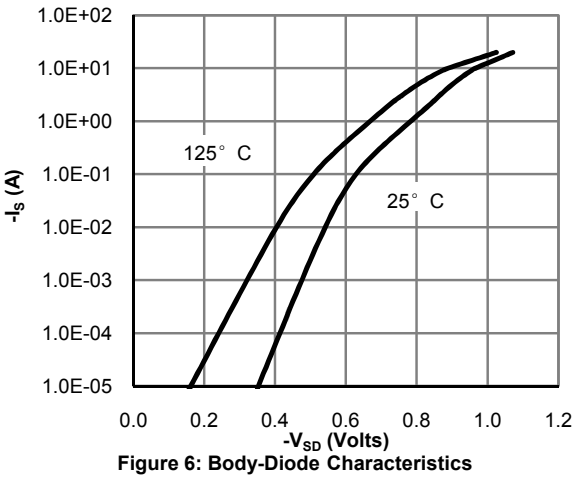


Figure 6: Body-Diode Characteristics

Complementary Trench MOSFET

AO6601 (KO6601)

■ P-Channel Mosfet Typical Characterisitics

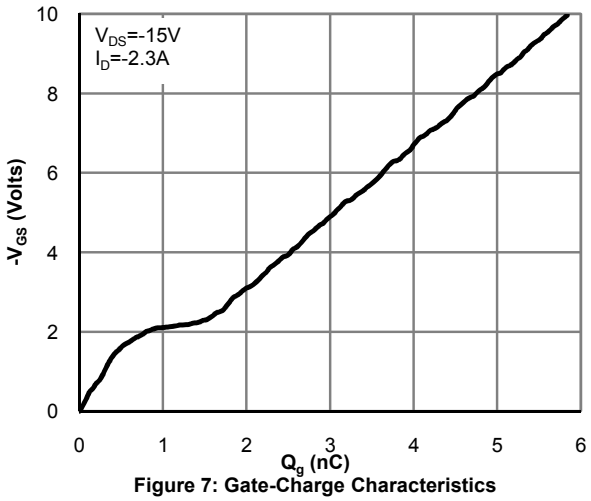


Figure 7: Gate-Charge Characteristics

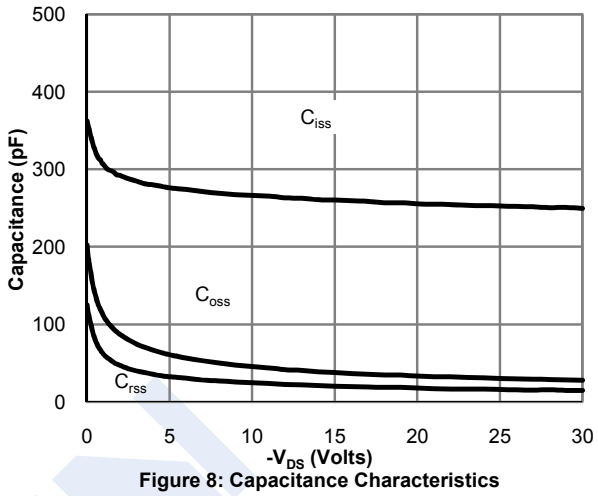


Figure 8: Capacitance Characteristics

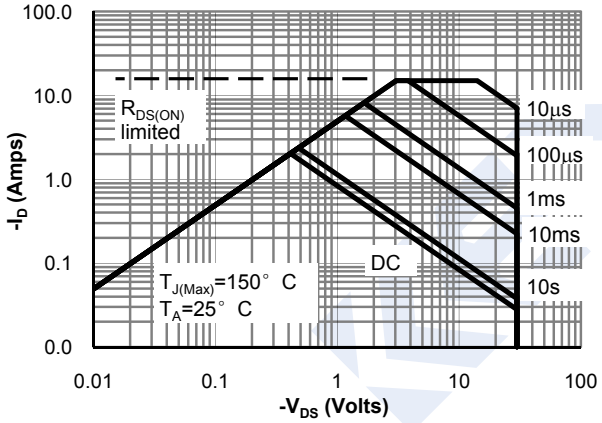


Figure 9: Maximum Forward Biased Safe Operating Area

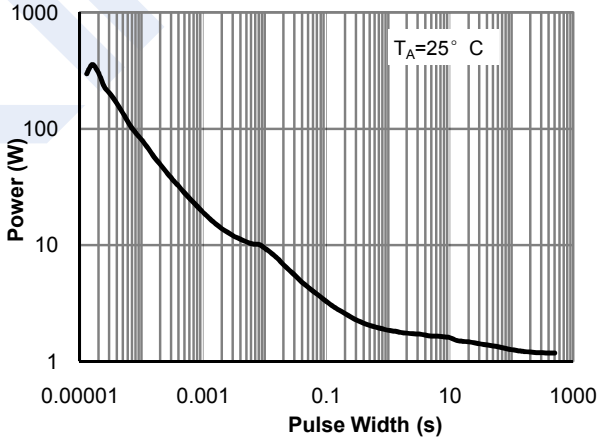


Figure 10: Single Pulse Power Rating Junction-to-Ambient

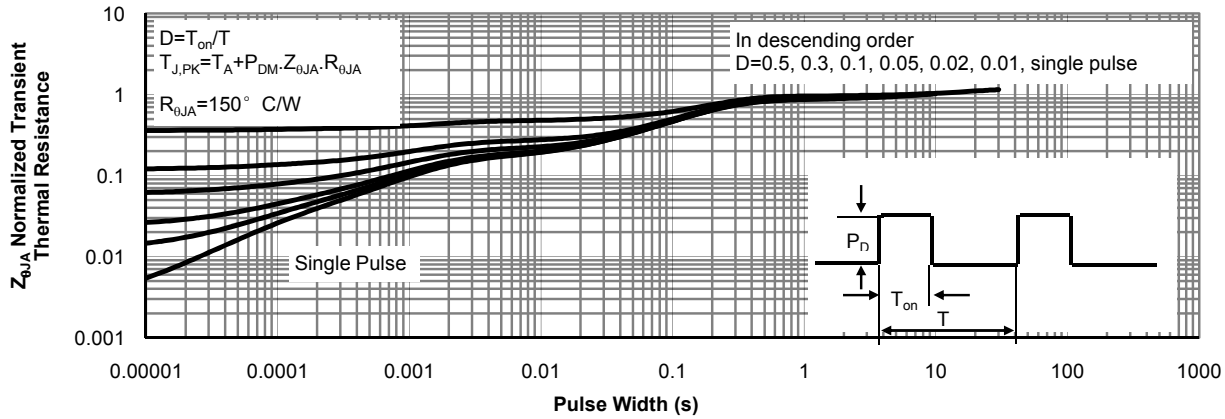


Figure 11: Normalized Maximum Transient Thermal Impedance