

Complementary Trench MOSFET

AO4622 (KO4622)

■ Features

● N-Channel :

$$V_{DS}(V) = 20V$$

$$I_D = 7.3 A (V_{GS} = 4.5V)$$

$$R_{DS(ON)} < 23m\Omega (V_{GS} = 10V)$$

$$R_{DS(ON)} < 30m\Omega (V_{GS} = 4.5V)$$

$$R_{DS(ON)} < 84m\Omega (V_{GS} = 2.5V)$$

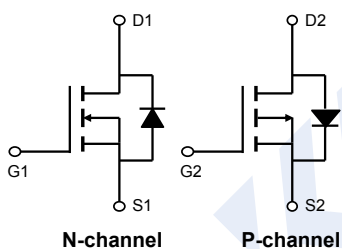
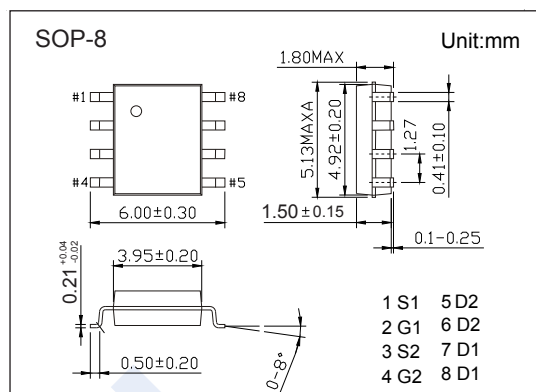
● P-Channel :

$$V_{DS}(V) = -20V$$

$$I_D = -5 A (V_{GS} = -4.5V)$$

$$R_{DS(ON)} < 53m\Omega (V_{GS} = -10V)$$

$$R_{DS(ON)} < 87m\Omega (V_{GS} = -4.5V)$$

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

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V _{DS}	20	-20	V
Gate-Source Voltage		V _{GS}	± 16	± 12	
Continuous Drain Current	T _A =25℃	I _D	7.3	-5	A
	T _A =70℃		6.2	-4.2	
Pulsed Drain Current		I _{DM}	35	-25	
Avalanche Current		I _{AR}	13	-13	
Repetitive Avalanche Energy	L=0.1mH	E _{AR}	25	25	mJ
Power Dissipation	T _A =25℃	P _D	2		W
	T _A =70℃		1.44		
Thermal Resistance.Junction- to-Ambient	t ≤ 10s	R _{thJA}	62.5		℃/W
	Steady-State		100		
Thermal Resistance.Junction- to-Lead		R _{thJL}	40		℃
Junction Temperature		T _J	150		
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	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	μA
		V _{DS} =16V, V _{GS} =0V, T _J =55°C			5	
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±16V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.6		2	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =7.3A			23	mΩ
		V _{GS} =10V, I _D =7.3A T _J =125°C			33.6	
		V _{GS} =4.5V, I _D =6.4A			30	
		V _{GS} =2.5V, I _D =2A			84	
On State Drain Current	I _{D(on)}	V _{GS} =4.5V, V _{DS} =5V	35			A
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =7.3A		17		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =10V, f=1MHz		900	1100	pF
Output Capacitance	C _{oss}			162		
Reverse Transfer Capacitance	C _{rss}			105		
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		0.9	1.35	Ω
Total Gate Charge (10V)	Q _g	V _{GS} =10V, V _{DS} =10V, I _D =6.5A		15	18	nC
Total Gate Charge (4.5V)				7.9	9	
Gate Source Charge	Q _{gs}			1.8		
Gate Drain Charge	Q _{gd}			2.8		
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =10V, R _L =1.4Ω, R _{GEN} =3Ω		4.5		ns
Turn-On Rise Time	t _r			9.2		
Turn-Off DelayTime	t _{d(off)}			18.7		
Turn-Off Fall Time	t _f			3.3		
Body Diode Reverse Recovery Time	t _{rr}	I _F = 7.3A, di/dt= 100A/us		18		nC
Body Diode Reverse Recovery Charge	Q _{rr}			9.5		
Maximum Body-Diode Continuous Current	I _S				3	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	4622 KA****
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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	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-16V, V _{GS} =0V			-1	μA
		V _{DS} =-16V, V _{GS} =0V, T _J =55°C			-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 =-250 μA	-0.5		-1.3	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-5A			53	mΩ
		V _{GS} =-4.5V, I _D =-5A T _J =125°C			71	
		V _{GS} =-2.5V, I _D =-4.2A			87	
On state drain current	I _{D(ON)}	V _{GS} =-4.5V, V _{DS} =-5V	-25			A
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-5A		13		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =-10V, f=1MHz		800	960	pF
Output Capacitance	C _{oss}			131		
Reverse Transfer Capacitance	C _{rss}			103		
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		6.7	10	Ω
Total Gate Charge (10V)	Q _g	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-4.5A		15.5		nC
Total Gate Charge (4.5V)				7.4		
Gate Source Charge	Q _{gs}			1.3		
Gate Drain Charge	Q _{gd}			2.9		
Turn-On DelayTime	t _{d(on)}			4.4		
Turn-On Rise Time	t _r	V _{GS} =-4.5V, V _{DS} =-10V, R _L =2Ω, R _{GEN} =3Ω		7.6		ns
Turn-Off DelayTime	t _{d(off)}			44		
Turn-Off Fall Time	t _f			13.5		
Body Diode Reverse Recovery Time	t _{rr}			20		
Body Diode Reverse Recovery Charge	Q _{rr}	I _F =-5A, di/dt=100A/μs		9		nC
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 μs pulses, duty cycle 0.5% max.

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■ N-Channel Typical Characteristics

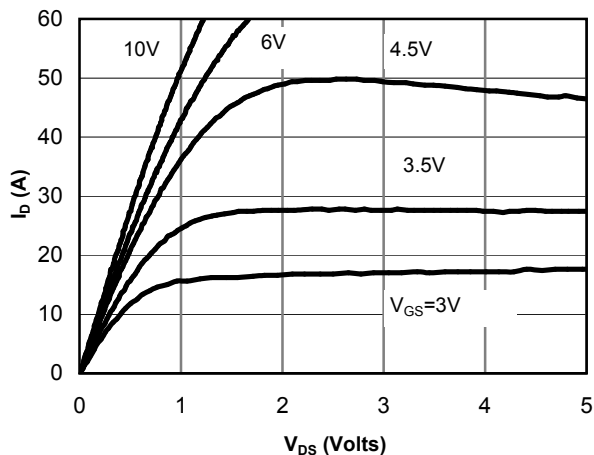


Figure 1: On-Region Characteristics

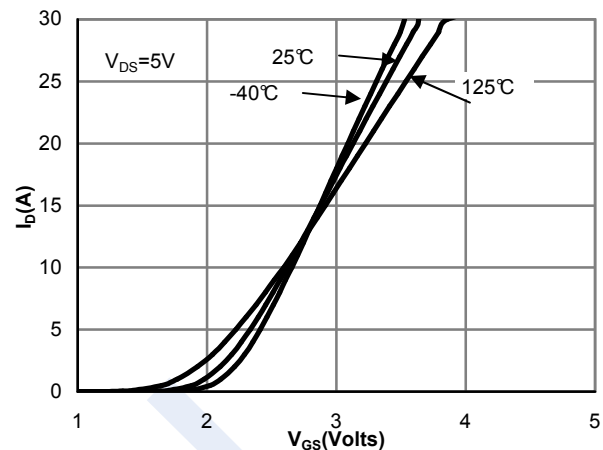


Figure 2: Transfer Characteristics

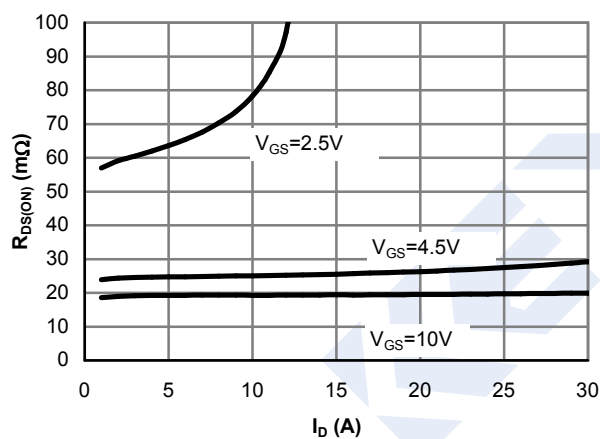


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

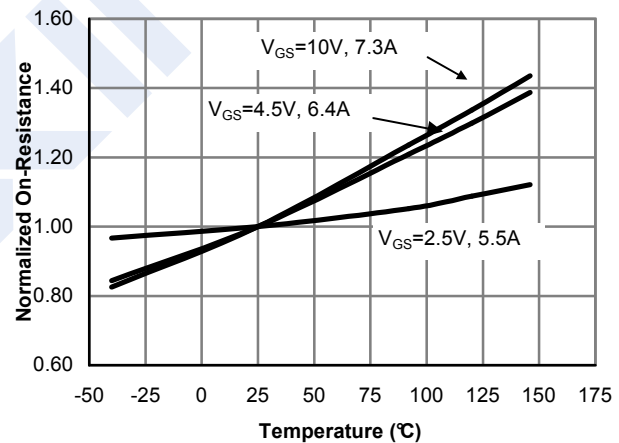


Figure 4: On-Resistance vs. Junction Temperature

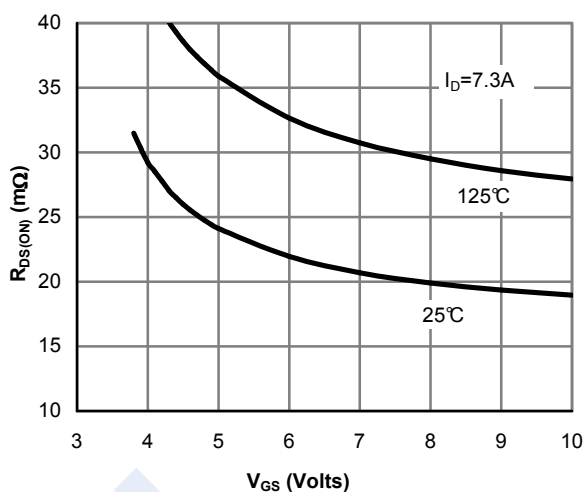


Figure 5: On-Resistance vs. Gate-Source Voltage

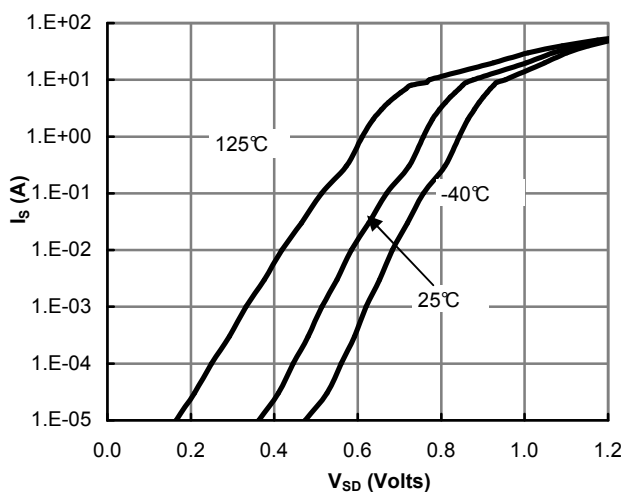


Figure 6: Body-Diode Characteristics

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■ N-Channel Typical Characteristics

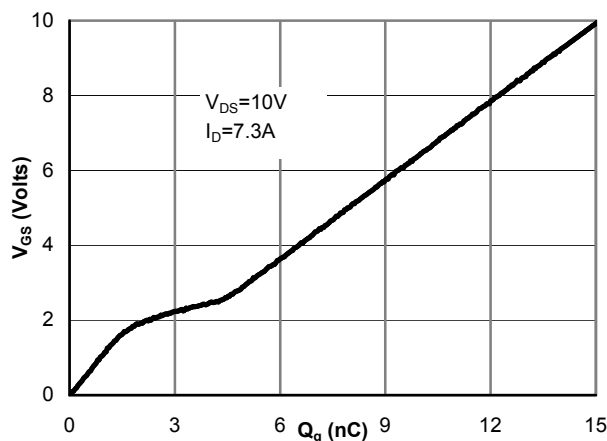


Figure 7: Gate-Charge Characteristics

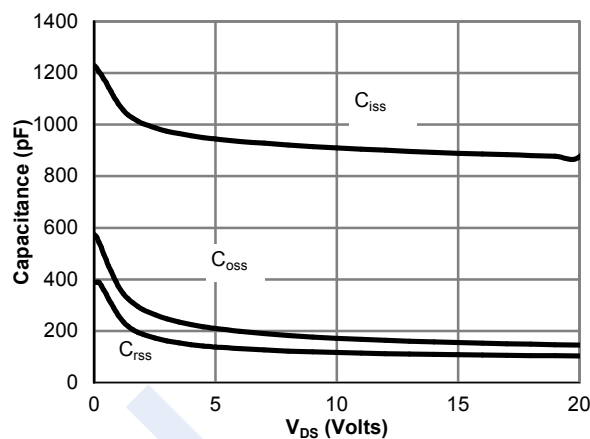


Figure 8: Capacitance Characteristics

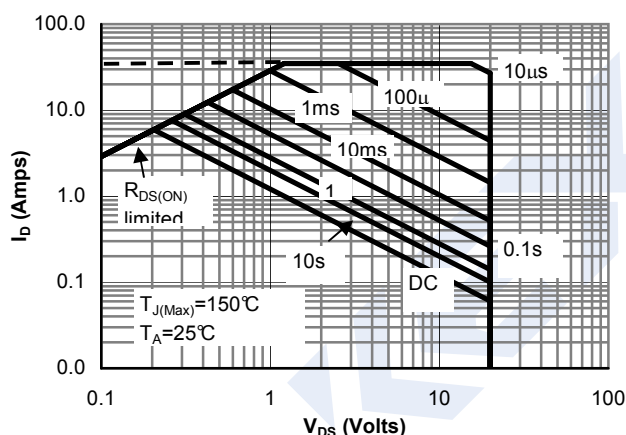


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

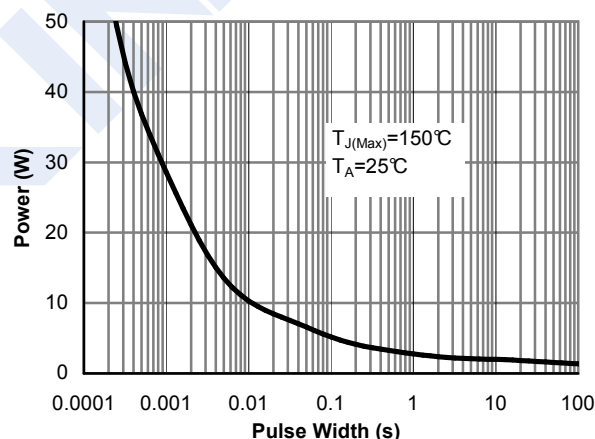


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

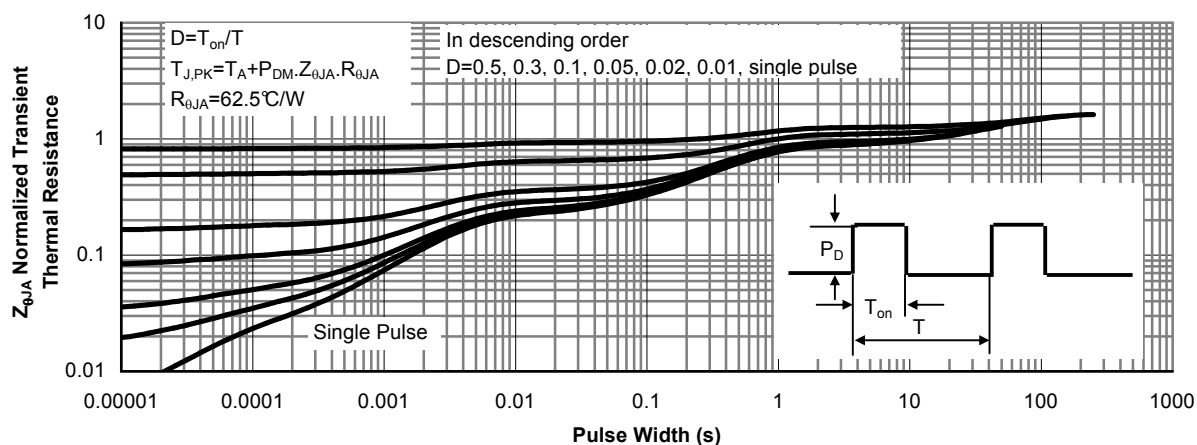


Figure 11: Normalized Maximum Transient Thermal Impedance

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■ P-Channel Typical Characteristics

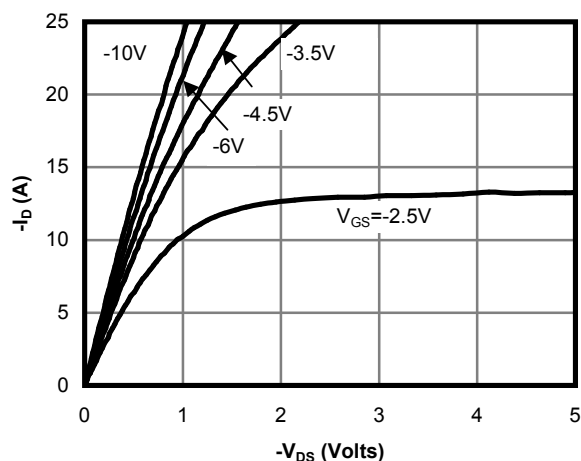


Fig 1: On-Region Characteristics

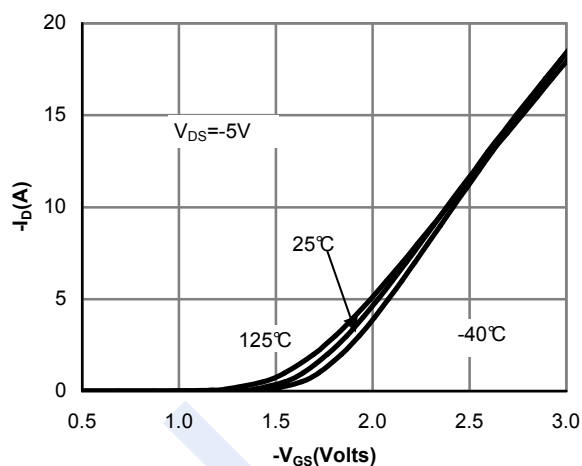


Figure 2: Transfer Characteristics

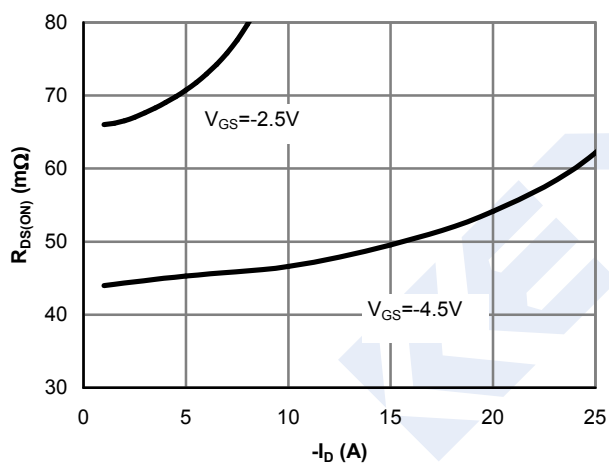


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

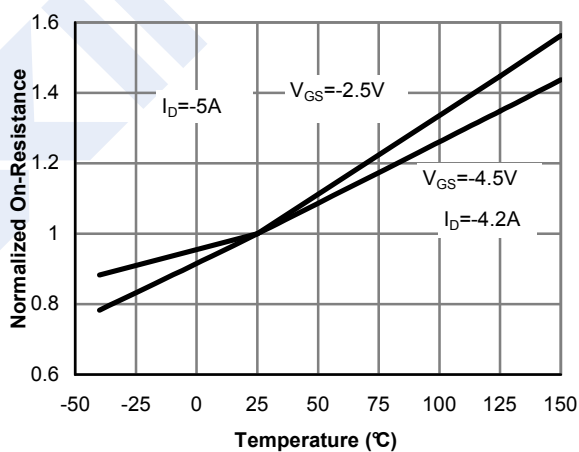


Figure 4: On-Resistance vs. Junction Temperature

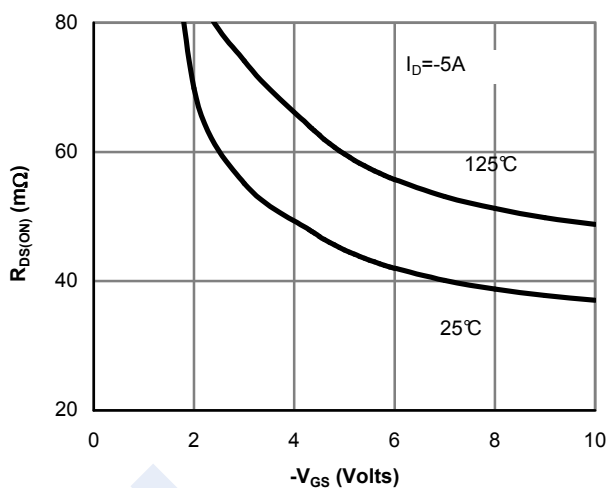


Figure 5: On-Resistance vs. Gate-Source Voltage

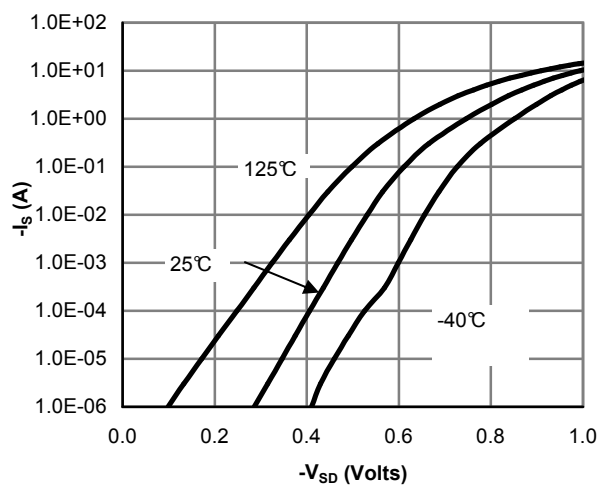


Figure 6: Body-Diode Characteristics

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■ P-Channel Typical Characteristics

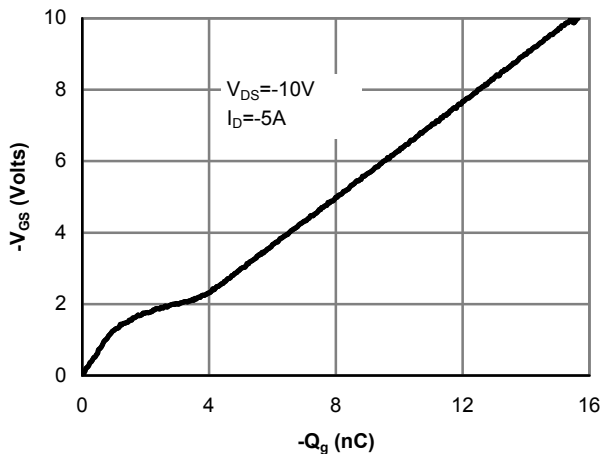


Figure 7: Gate-Charge Characteristics

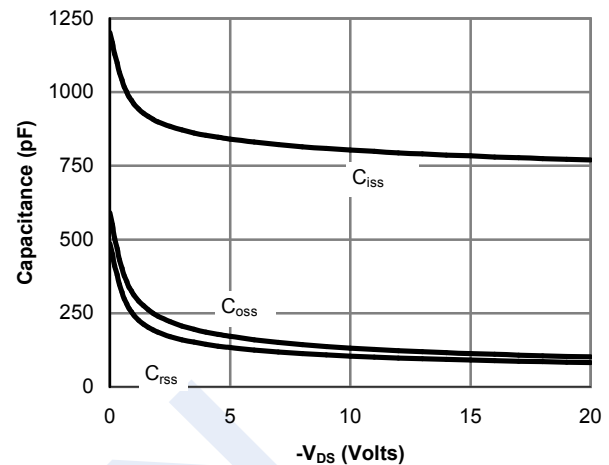


Figure 8: Capacitance Characteristics

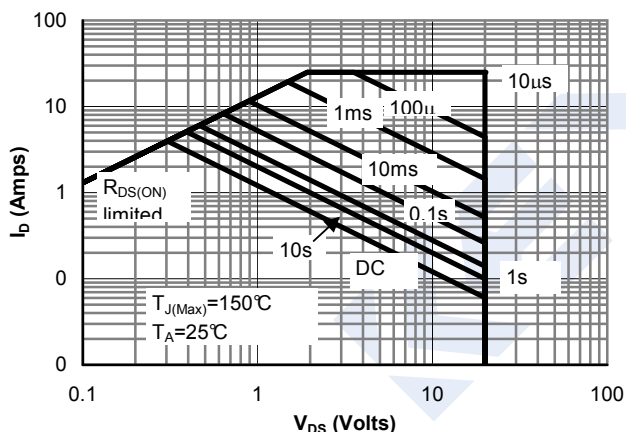


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

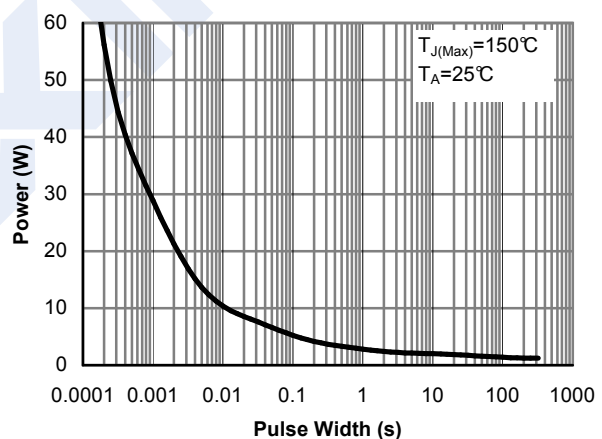


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

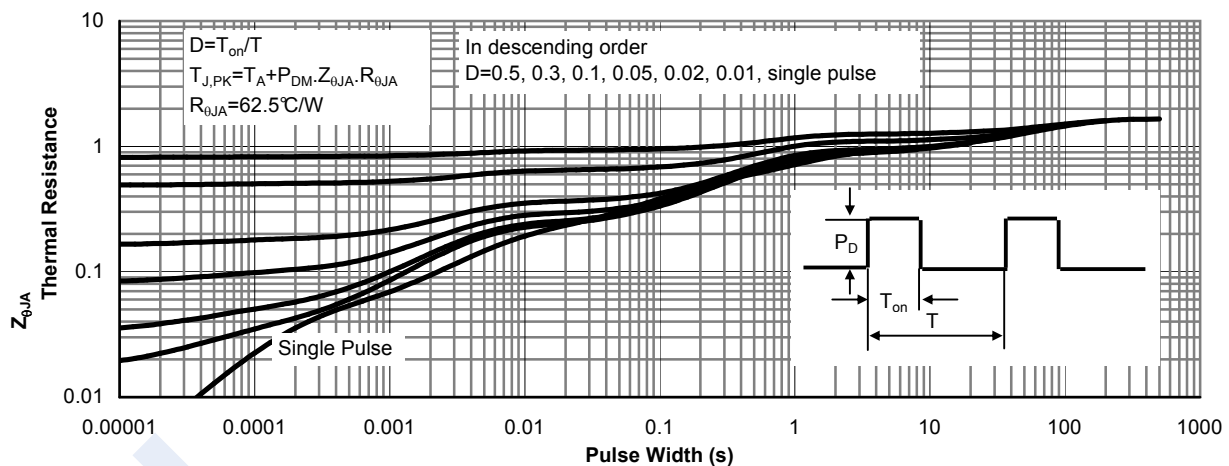


Figure 11: Normalized Maximum Transient Thermal Impedance