

Complementary Trench MOSFET

AO6601 (KO6601)

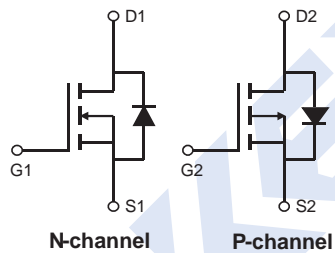
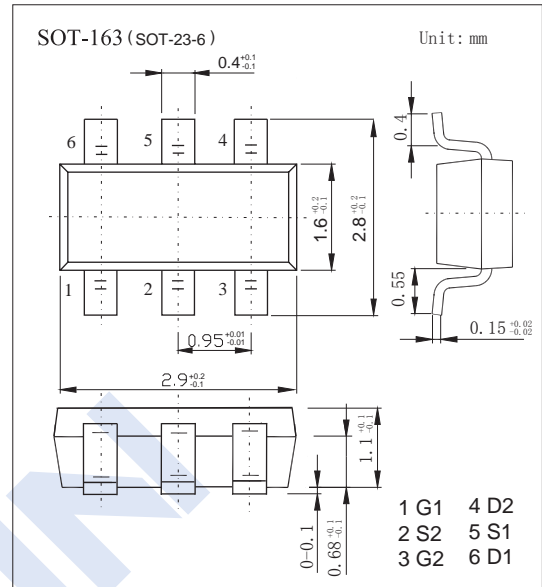
■ Features

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}	± 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 _{DSS}	I _D =250 μ A, 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} =±12V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	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°C			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 =4.4 Ω, R _G =3 Ω		3.5	
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/ μ s			12	nC
Body Diode Reverse Recovery Charge	Q _{rr}				4	
Maximum Body-Diode Continuous Current	I _S				1.5	A
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =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 _{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} =±12V			±100	nA	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250 μA	-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°C			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
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	ns	
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*
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■ N-Channel Mosfet Typical Characteristics

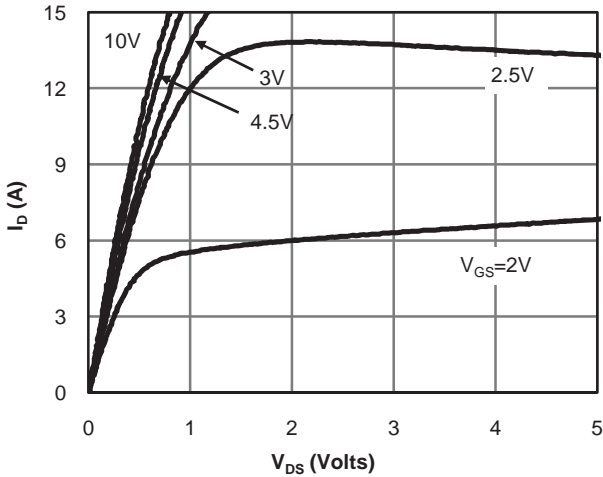


Fig 1: On-Region Characteristics

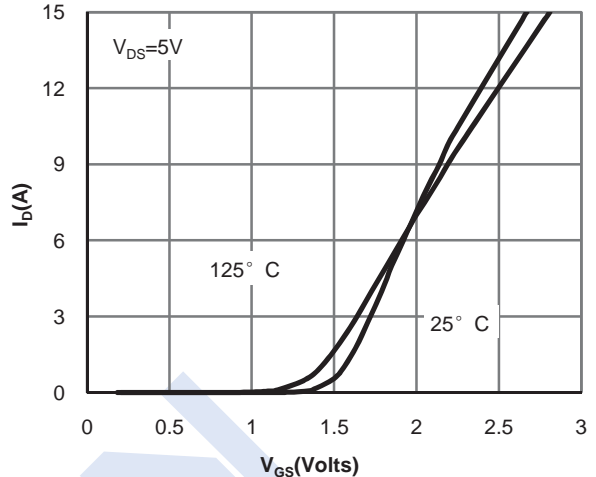


Figure 2: Transfer Characteristics

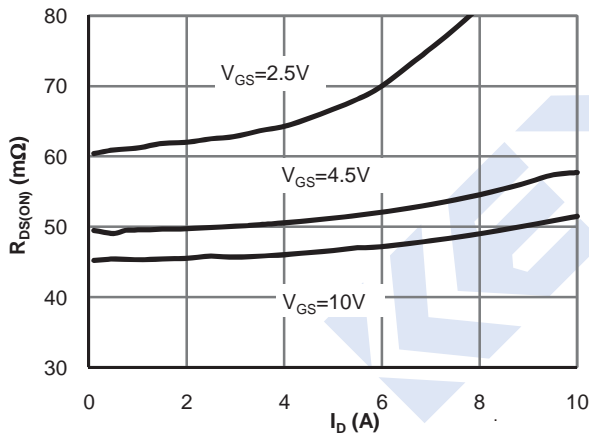


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

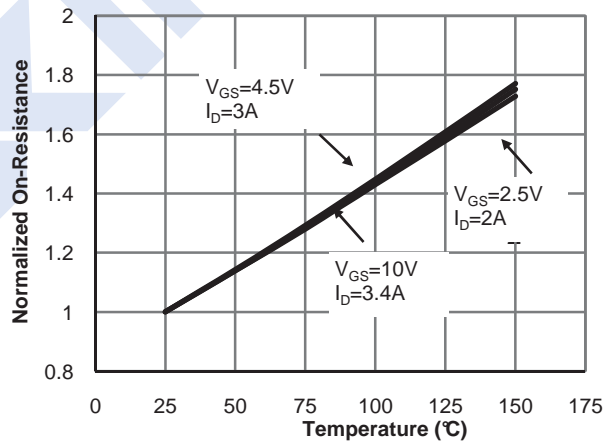


Figure 4: On-Resistance vs. Junction Temperature

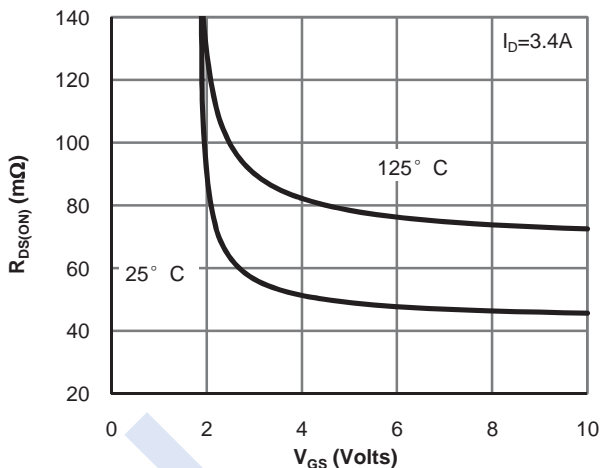


Figure 5: On-Resistance vs. Gate-Source Voltage

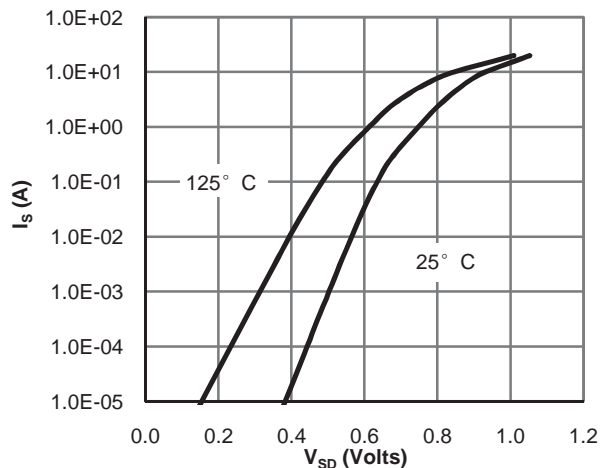


Figure 6: Body-Diode Characteristics

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■ N-Channel Mosfet Typical Characteristics

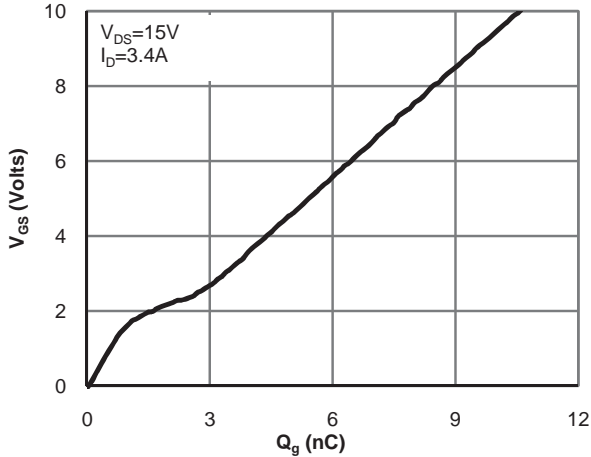


Figure 7: Gate-Charge Characteristics

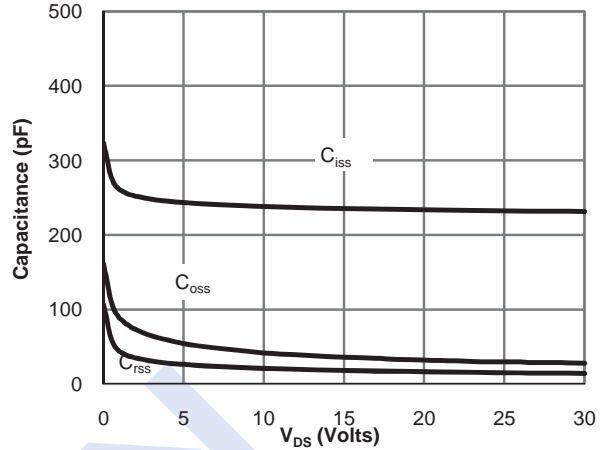


Figure 8: Capacitance Characteristics

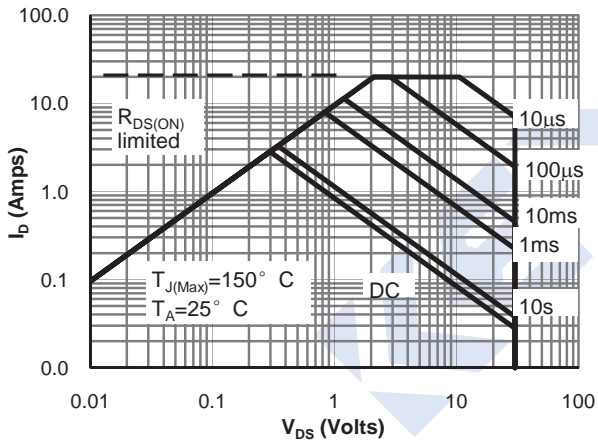


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

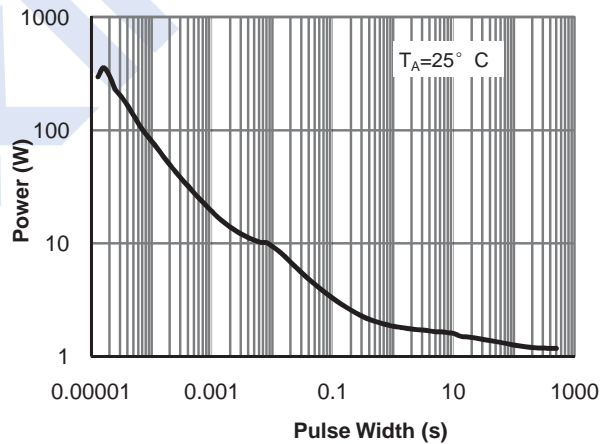


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

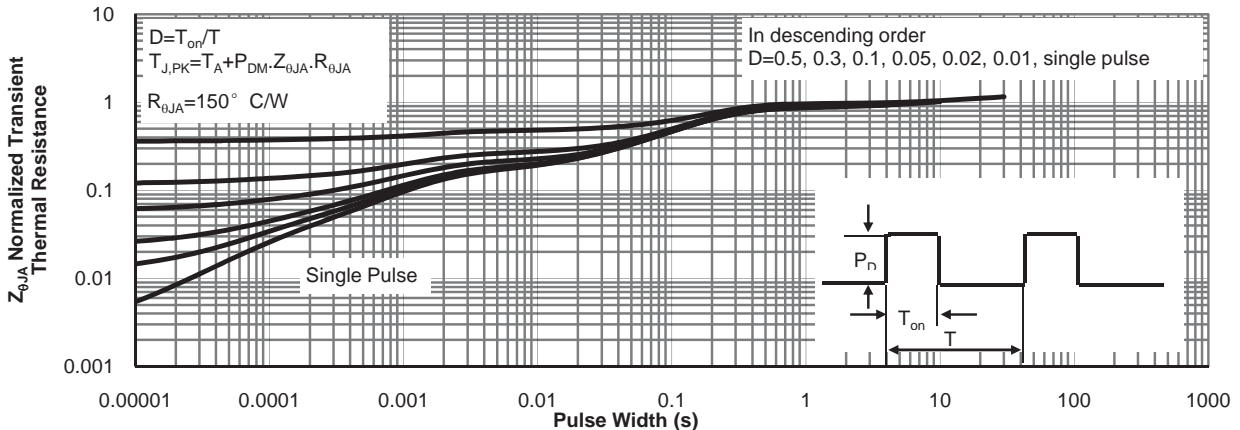


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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■ P-Channel Mosfet Typical Characteristics

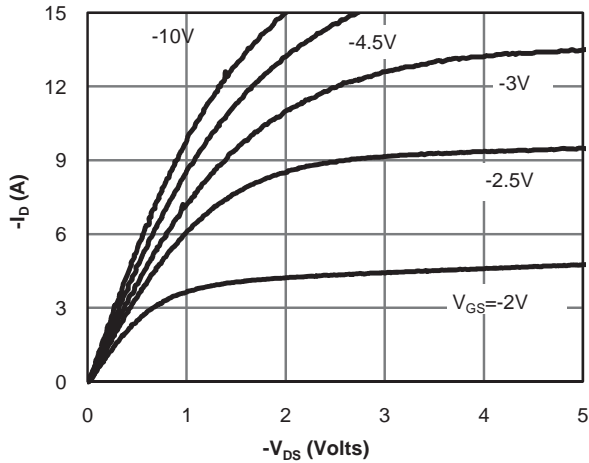


Fig 1: On-Region Characteristics

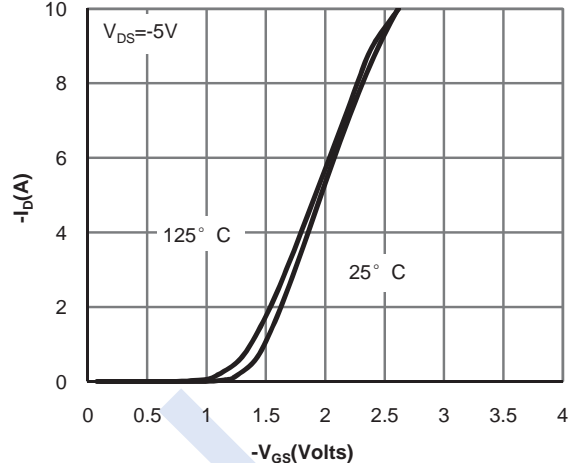


Figure 2: Transfer Characteristics

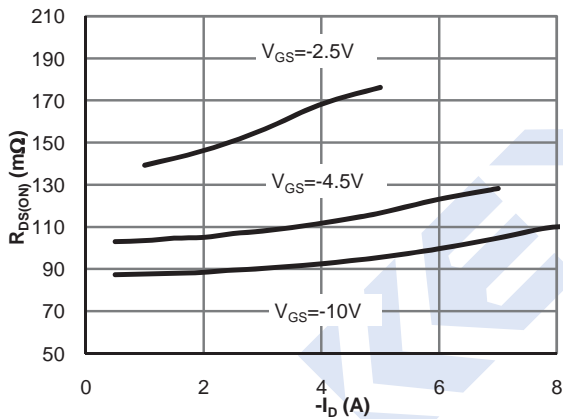


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

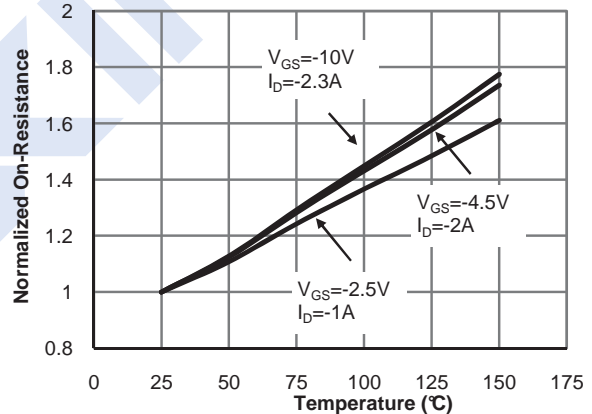


Figure 4: On-Resistance vs. Junction Temperature

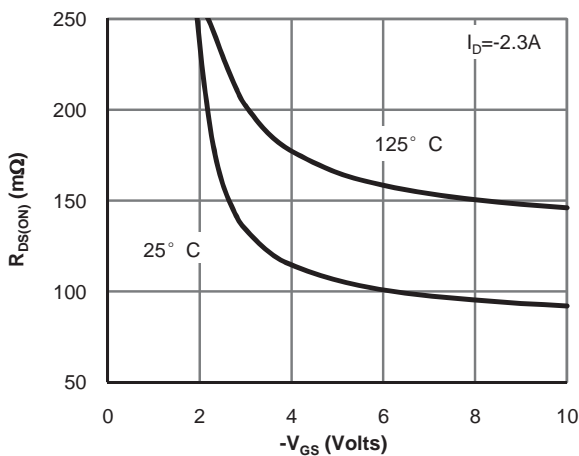


Figure 5: On-Resistance vs. Gate-Source Voltage

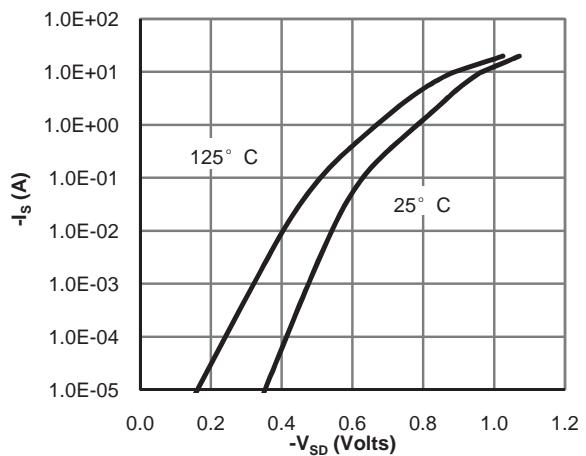


Figure 6: Body-Diode Characteristics

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■ P-Channel Mosfet Typical Characteristics

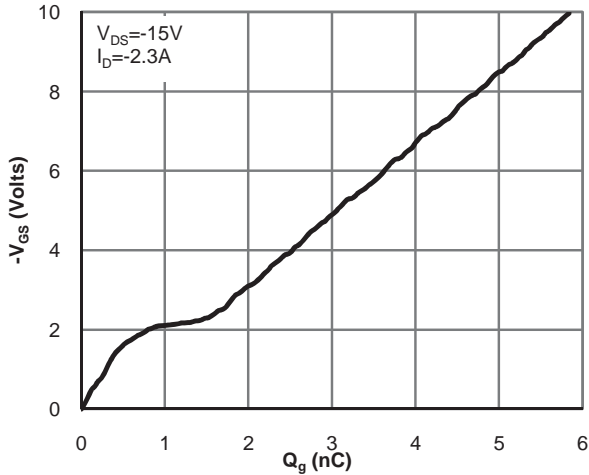


Figure 7: Gate-Charge Characteristics

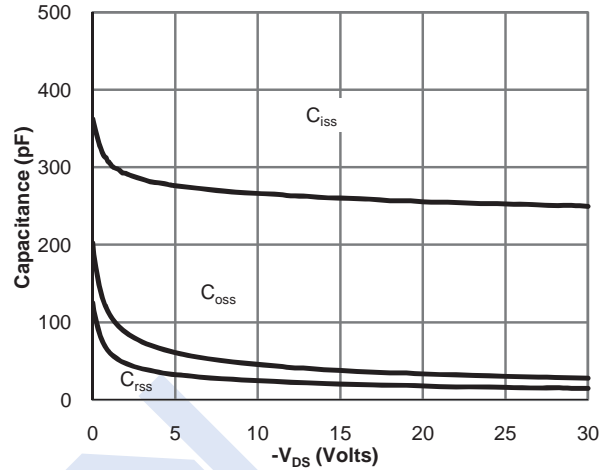


Figure 8: Capacitance Characteristics

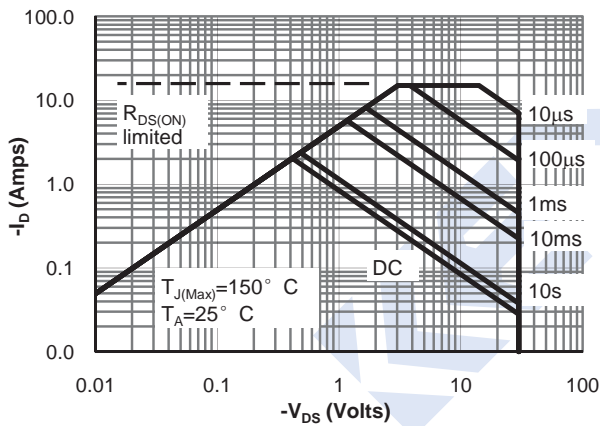


Figure 9: Maximum Forward Biased Safe Operating Area

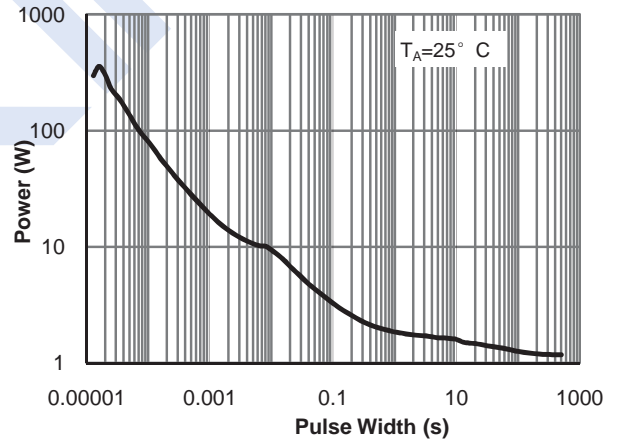


Figure 10: Single Pulse Power Rating Junction-to-Ambient

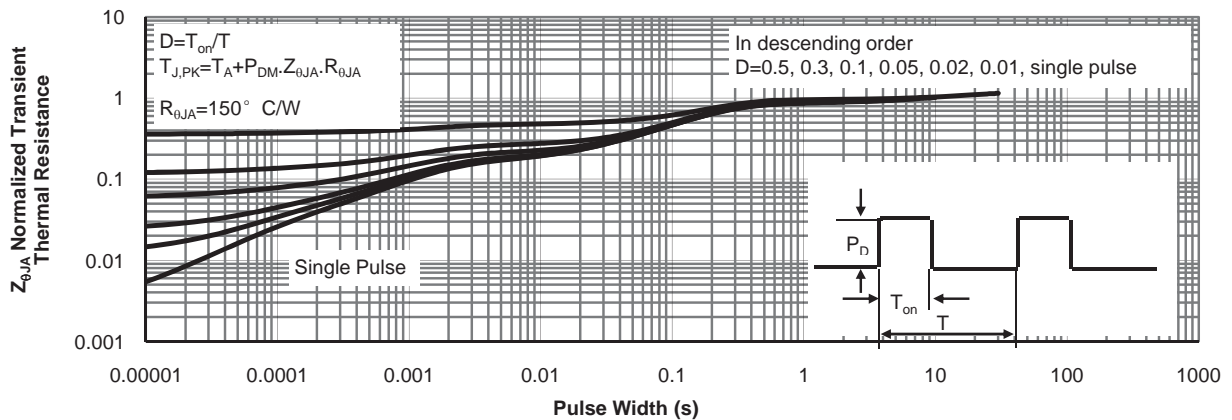


Figure 11: Normalized Maximum Transient Thermal Impedance