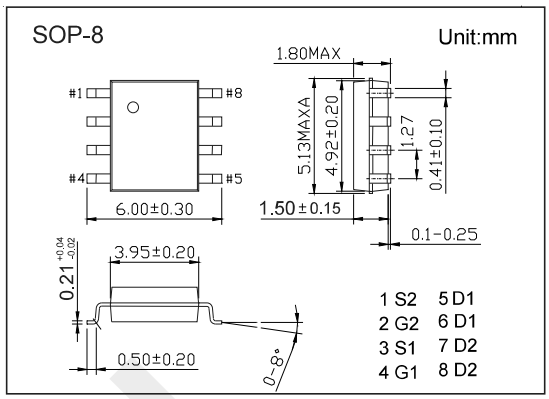
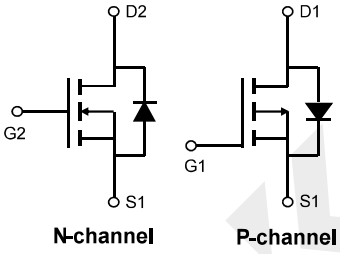
Complementary Trench MOSFET

AO4618 (KO4618)



■ Features

- N-Channel :
  - $V_{DS\ (V)}$ = 40V
  - I_D = 8 A (V_{GS} = 10V)
  - $R_{DS(ON)}$ < 19mΩ (V_{GS} = 10V)
  - $R_{DS(ON)}$ < 27mΩ (V_{GS} = 4.5V)
- P-Channel :
  - $V_{DS\ (V)}$ = -40V
  - I_D = -7 A (V_{GS} = -10V)
  - $R_{DS(ON)}$ < 23mΩ (V_{GS} = -10V)
  - $R_{DS(ON)}$ < 30mΩ (V_{GS} = -4.5V)



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	40	-40	V
Gate-Source Voltage		V_{GS}	±20		
Continuous Drain Current	T_A=25℃	I_D	8	-7	A
	T_A=70℃		6	-5.5	
Pulsed Drain Current		I_{DM}	40	-35	
Avalanche Current		I_{AS}	15	-25	
Avalanche Energy	L=0.1mH	E_{AS}	11	61	mJ
Power Dissipation	T_A=25℃	P_D	2		W
	T_A=70℃		1.3		
Thermal Resistance.Junction- to-Ambient	t ≤ 10s	R_{thJA}	62.5		℃/W
	Steady-State		90		
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℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V			1	uA
		V_{DS}=40V, V_{GS}=0V, T_J=55℃			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=250uA	1.4		2.4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=8A			19	mΩ
		V_{GS}=10V, I_D=8A T_J=125℃			29	
		V_{GS}=4.5V, I_D=4A			27	
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=8A		33		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, f=1MHz		415		pF
Output Capacitance	C_{oss}			112		
Reverse Transfer Capacitance	C_{rss}			11		
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	1		3.5	Ω
Total Gate Charge (10V)	Q_g	V_{GS}=10V, V_{DS}=20V, I_D=8A		6.5	12	nC
Total Gate Charge (4.5V)				3	6	
Gate Source Charge	Q_{gs}			1.2		
Gate Drain Charge	Q_{gd}			1.1		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=10V, V_{DS}=20V, R_L=2.5Ω, R_{GEN}=3Ω		4		ns
Turn-On Rise Time	t_r			3		
Turn-Off DelayTime	$t_{d(off)}$			15		
Turn-Off Fall Time	t_f			2		
Body Diode Reverse Recovery Time	t_{rr}	I_F= 8A, dI/dt= 100A/us		12.5		
Body Diode Reverse Recovery Charge	Q_{rr}			3.5		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 us pulses, duty cycle 0.5% max.

■ Marking

Marking	4618 KA****

Complementary Trench MOSFET

AO4618 (KO4618)

■ P-Channel Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-250uA, V_{GS}=0V	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-40V, V_{GS}=0V			-1	uA
		V_{DS}=-40V, V_{GS}=0V, T_J=55℃			-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=-250μA	-1.7		-3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-7A			23	mΩ
		V_{GS}=-10V, I_D=-7A T_J=125℃			35	
		V_{GS}=-4.5V, I_D=-4A			30	
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-7A		26		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-20V, f=1MHz		1870		pF
Output Capacitance	C_{oss}			185		
Reverse Transfer Capacitance	C_{rss}			155		
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz		4.5	9	Ω
Total Gate Charge (10V)	Q_g	V_{GS}=-10V, V_{DS}=-20V, I_D=-7A		32	45	nC
Total Gate Charge (4.5V)				8	12	
Gate Source Charge	Q_{gs}			7.6		
Gate Drain Charge	Q_{gd}			6.2		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-20V, R_L=2.8Ω, R_{GEN}=3Ω		10		ns
Turn-On Rise Time	t_r			18		
Turn-Off DelayTime	$t_{d(off)}$			38		
Turn-Off Fall Time	t_f			24		
Body Diode Reverse Recovery Time	t_{rr}	I_F=-7A, di/dt=500A/us		13		
Body Diode Reverse Recovery Charge	Q_{rr}			33		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 us pulses, duty cycle 0.5% max.

Complementary Trench MOSFET

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■ N-Channel Typical Characterisitics

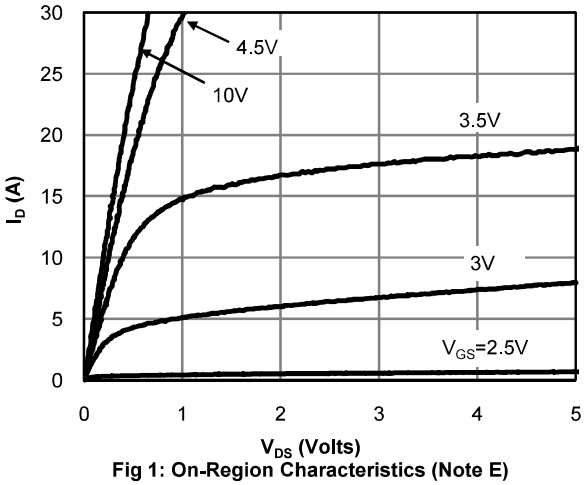

Fig 1: On-Region Characteristics (Note E)

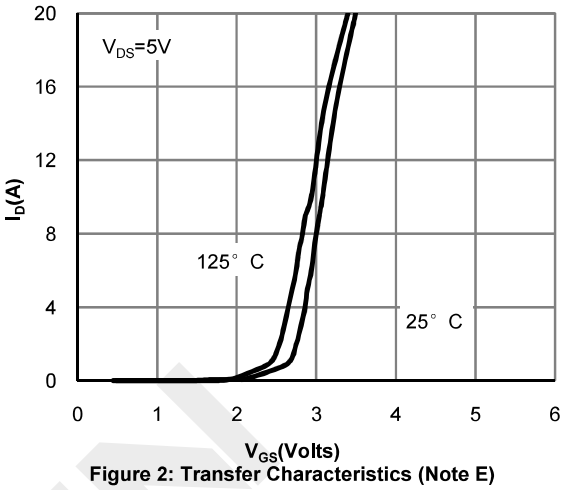

Figure 2: Transfer Characteristics (Note E)

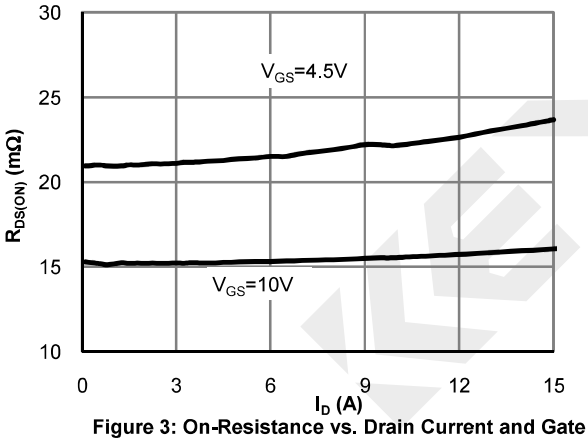

Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

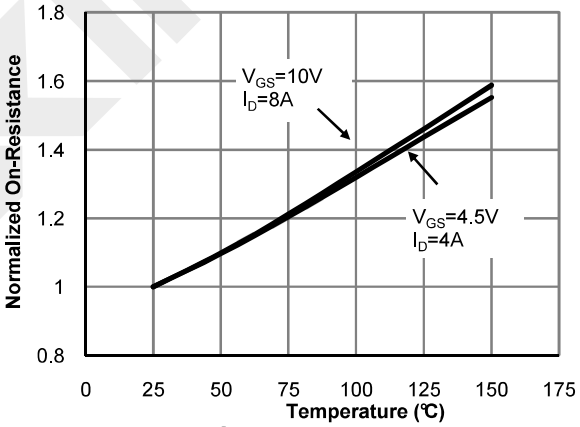

Figure 4: On-Resistance vs. Junction Temperature (Note E)

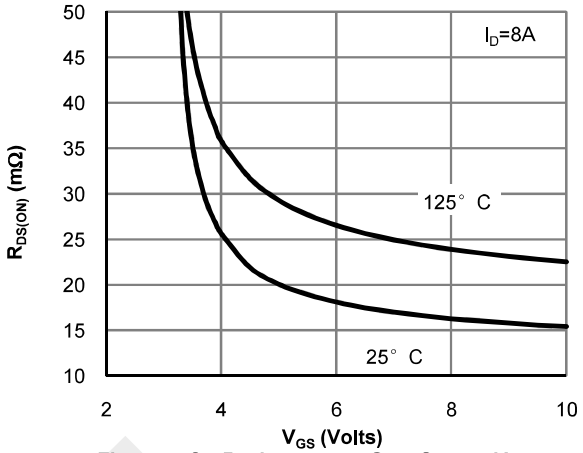

Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

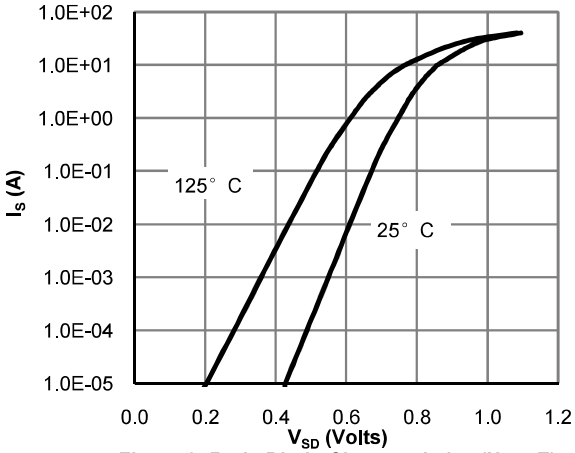

Figure 6: Body-Diode Characteristics (Note E)

Complementary Trench MOSFET

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■ N-Channel Typical Characterisitics

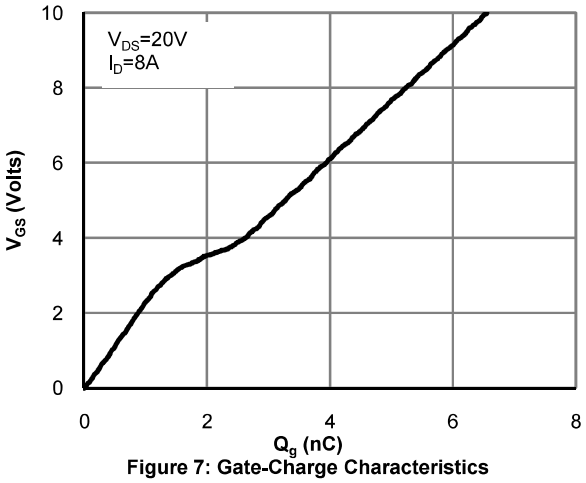

Figure 7: Gate-Charge Characteristics

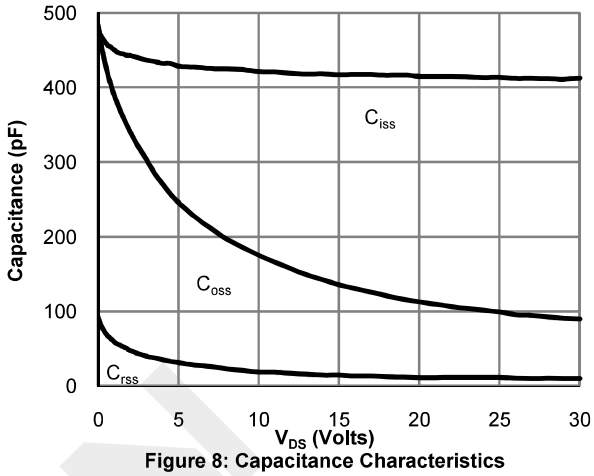

Figure 8: Capacitance Characteristics

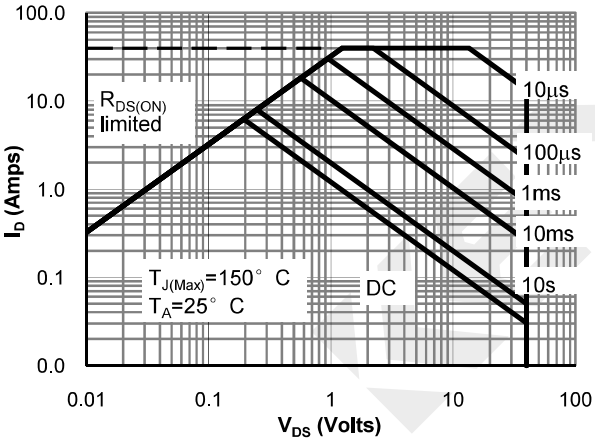

Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

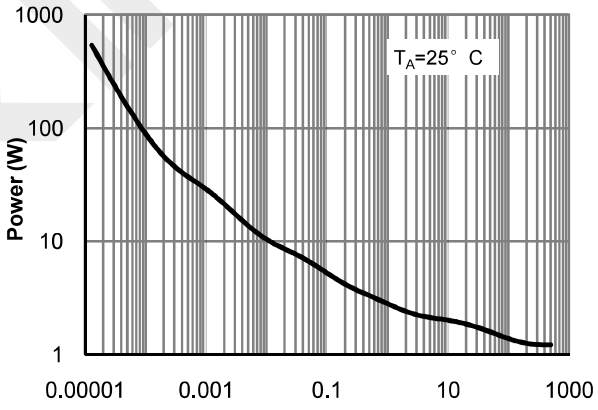

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

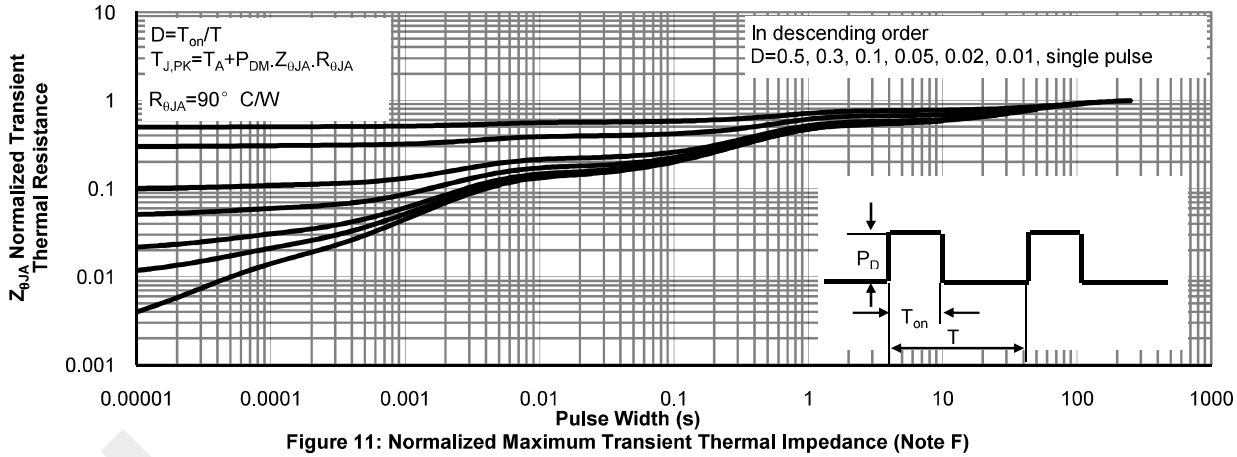

Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Complementary Trench MOSFET

AO4618 (KO4618)

■ P-Channel Typical Characterisitics

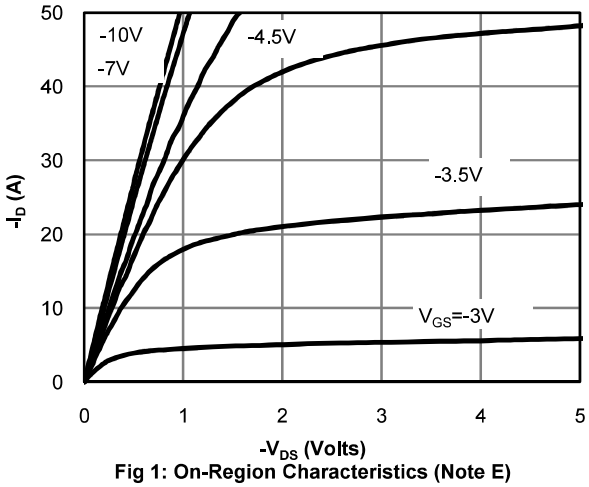

Fig 1: On-Region Characteristics (Note E)

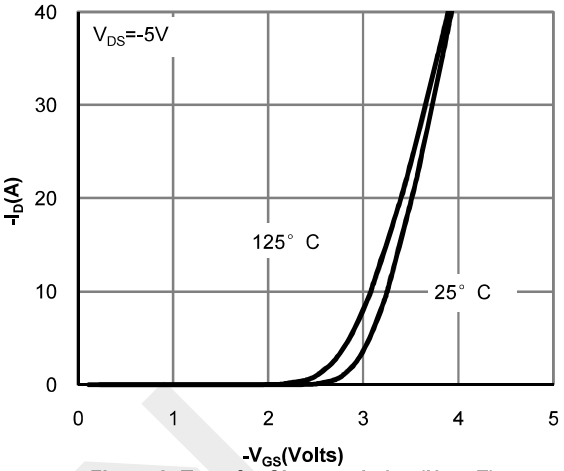

Figure 2: Transfer Characteristics (Note E)

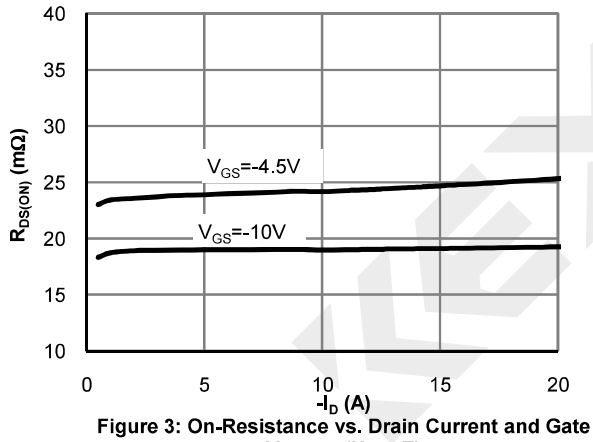

Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

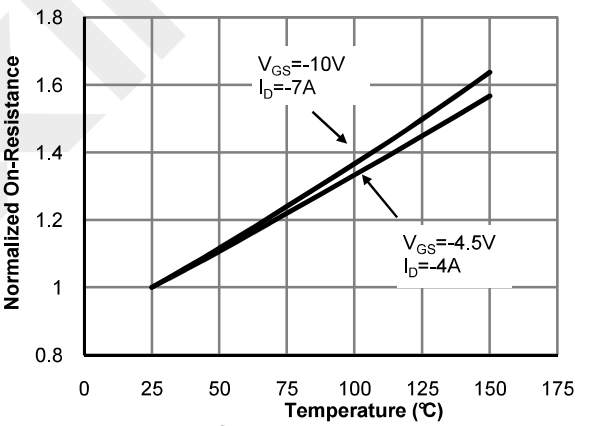

Figure 4: On-Resistance vs. Junction Temperature (Note E)

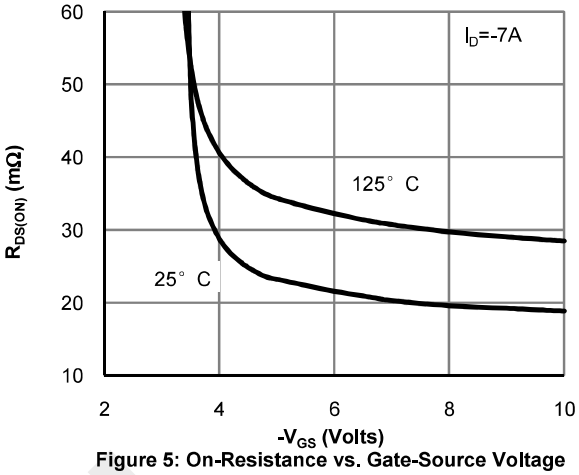

Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

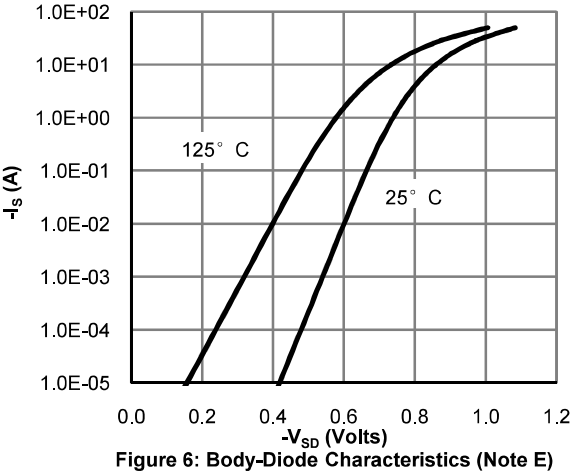

Figure 6: Body-Diode Characteristics (Note E)

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■ P-Channel Typical Characterisitics

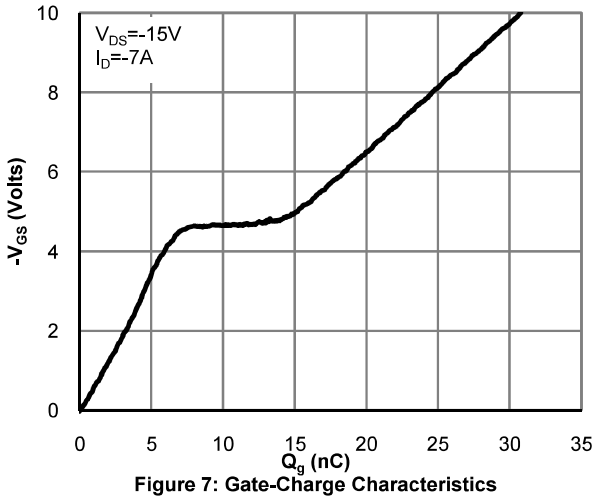

Figure 7: Gate-Charge Characteristics

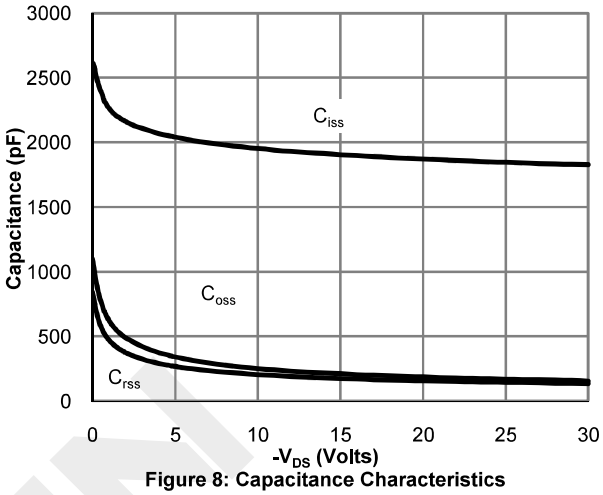

Figure 8: Capacitance Characteristics

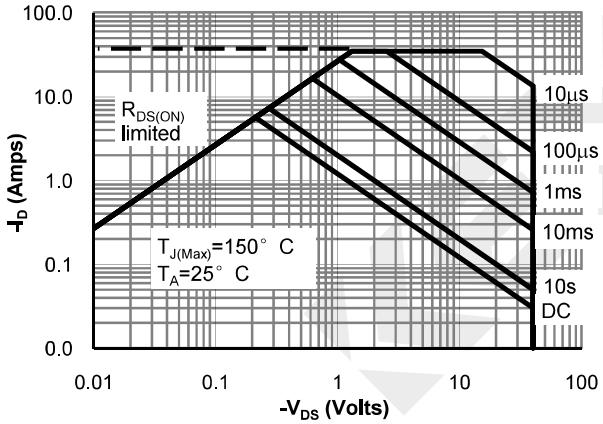

Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

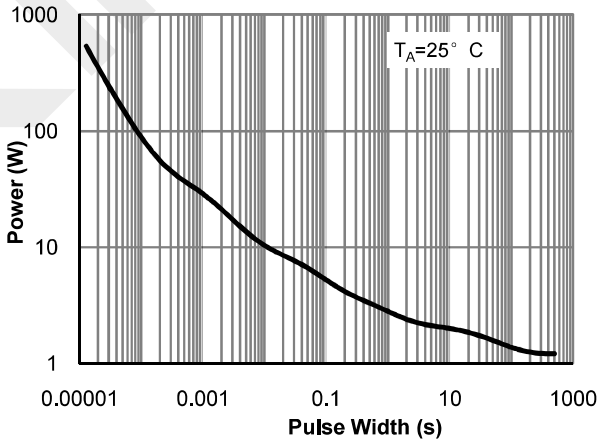

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

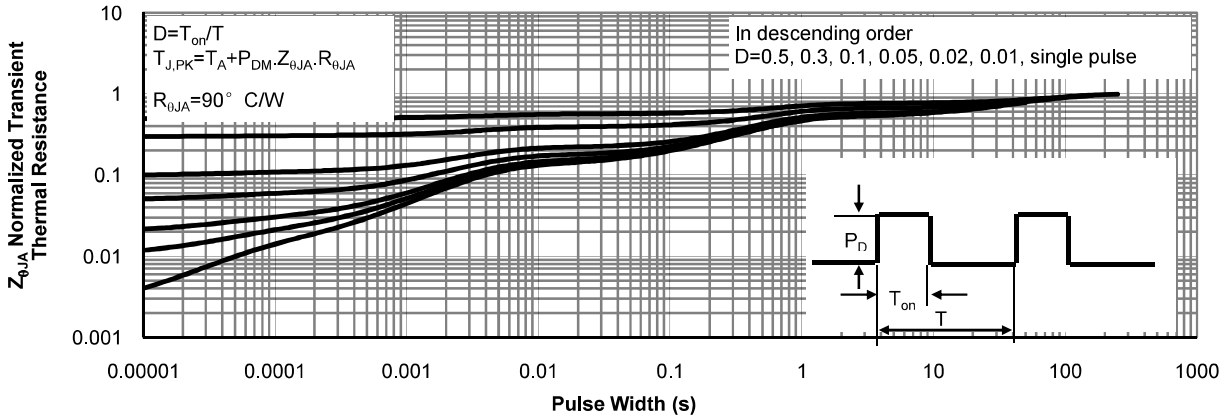

Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)