

General Description

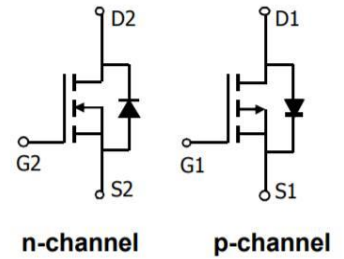
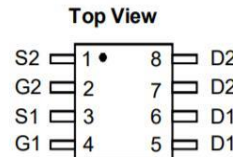
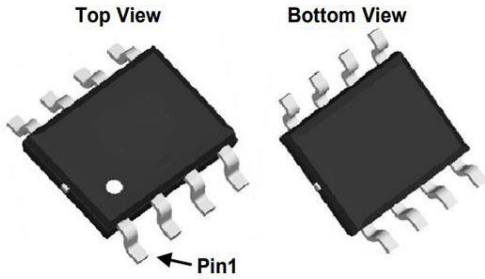
N+P Complementary Power MOSFET

 Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5\text{ V}$

Pb-free lead plating; RoHS compliant

N channel P channel

V_{DS}	30	-30	V
$R_{DS(on),TYP@V_{GS}=10V}$	29.4	37.8	m Ω
$R_{DS(on),TYP@V_{GS}=4.5}$	46.2	37.8	m Ω
I_D	6	-7	A



Part ID	Package Type	Marking	Tape and reel information
AC4606	SOP8	7N03C	3000



100% UIS Tested

Parameter	Symbol	Max N-channel	Max P-channel	Units	
Drain-Source Voltage	V_{DS}	30	-30	V	
Gate-Source Voltage	V_{GS}	20	20	$\pm V$	
Continuous Drain Current ^A	I_D	$T_A=25^\circ C$	6	-7	A
		$T_A=70^\circ C$	5	-5.5	
Pulsed Drain Current ^B	I_{DM}	9.6	-11.2		
Avalanche Current ^G	I_{AR}	1.92	-2.2		
Repetitive avalanche energy $L=0.1mH$ ^G	E_{AR}	4.416	-5.2	mJ	
Power Dissipation ^A	P_D	$T_A=25^\circ C$	2	3.1	W
		$T_A=70^\circ C$	1.3	2	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	-55 to 150	$^\circ C$	

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	105	157	$t \leq 10s$
Maximum Junction-to-Ambient ^A				Steady State
Maximum Junction-to-Lead ^c	$R_{\theta JL}$	63	100	$^\circ C/W$

STATIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D = -250\mu A, V_{GS} = 0V$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$			1 5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.8	2.4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	#REF!		29.4	42.0	m Ω
		$V_{GS}=4.5V, I_D=6A$		46.2	60.1	
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=6A$		83		S
V_{SD}	Diode Forward Voltage	$I_S=1A, V_{GS}=18V$		0.72	1	V
I_S	Maximum Body-Diode Continuous Current				6	A

DYNAMIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=15V, f=1MHz$		255	311	pF
C_{oss}	Output Capacitance			45	55	pF
C_{rss}	Reverse Transfer Capacitance				35	41
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$			0.65	Ω

SWITCHING PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$Q_g(10V)$	Total Gate Charge	$V_{GS}=10V, V_{DS}=15V, I_D=6A$		2.55		nC
$Q_g(4.5V)$	Total Gate Charge			1.275		
Q_{gs}	Gate Source Charge			0.91		
Q_{gd}	Gate Drain Charge			1.3		
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10V, V_{DS}=15V, R_L=0.75\Omega, R_{GEN}=3\Omega$		4.25		ns
t_r	Turn-On Rise Time			3.4		
$t_{D(off)}$	Turn-Off Delay Time			11.9		
t_f	Turn-Off Fall Time			3.825		
t_{rr}	Body Diode Reverse Recovery Time	$I_F=-8A, dI/dt=500A/\mu s$		8.5		ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=18A, dI/dt=500A/\mu s$		2.2		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

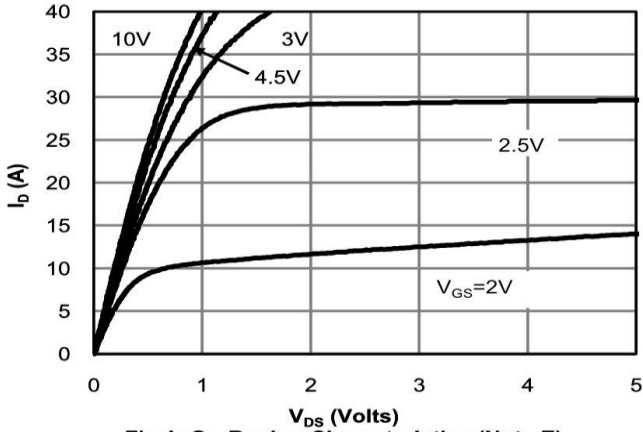


Fig 1: On-Region Characteristics (Note E)

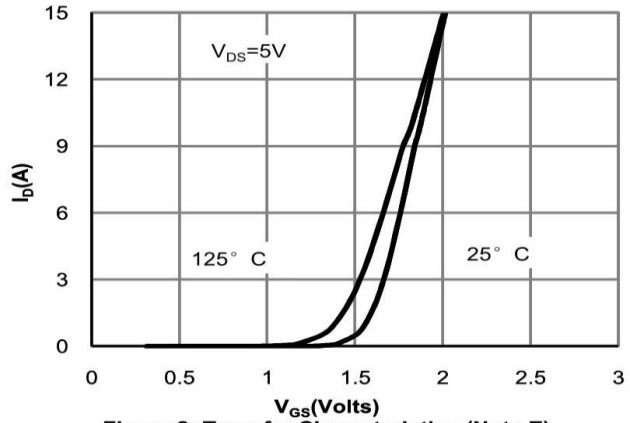


Figure 2: Transfer Characteristics (Note E)

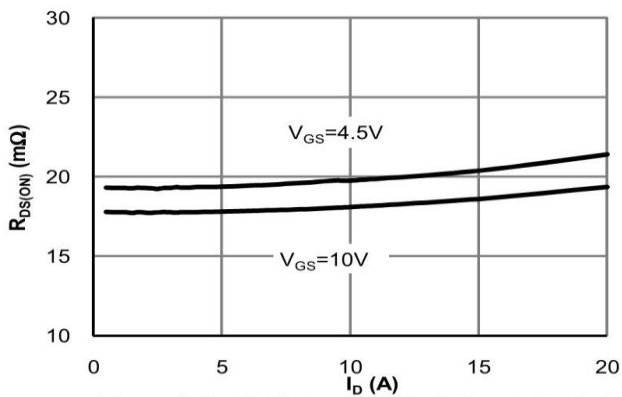


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

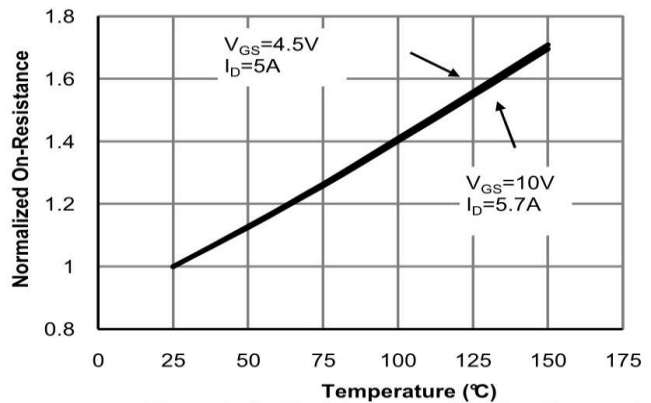


Figure 4: On-Resistance vs. Junction Temperature (Note E)

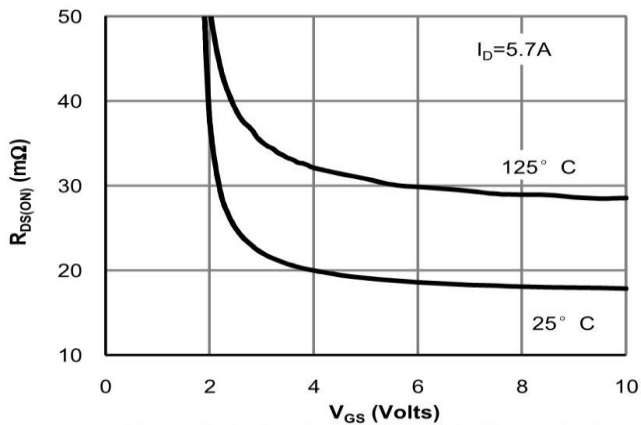


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

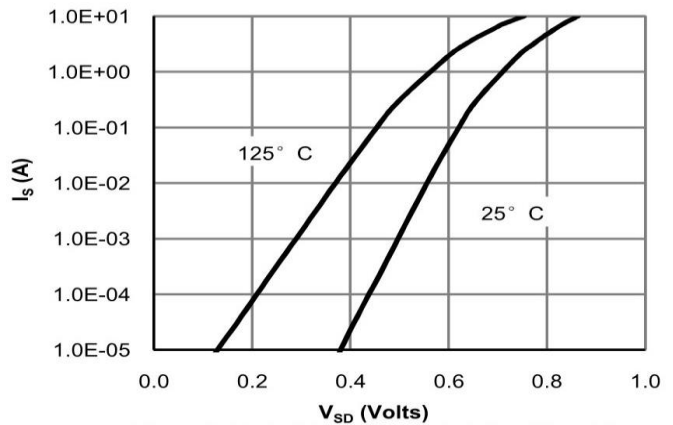


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

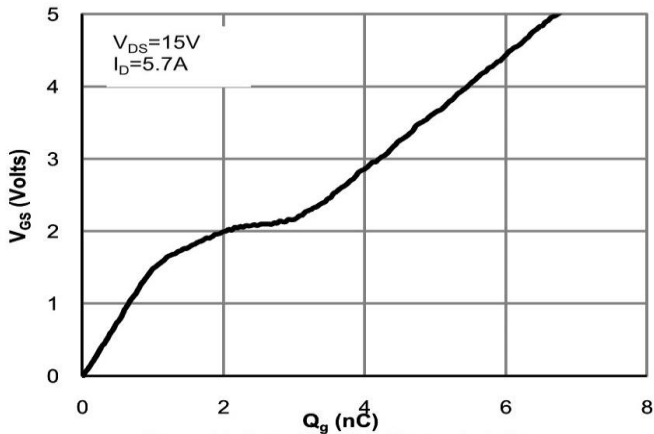


Figure 7: Gate-Charge Characteristics

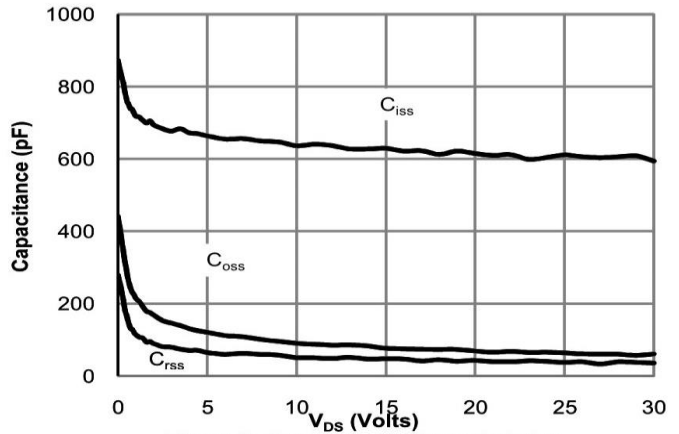


Figure 8: Capacitance Characteristics

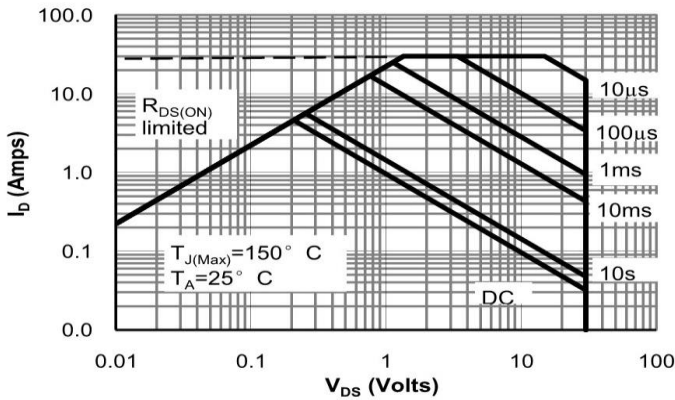


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

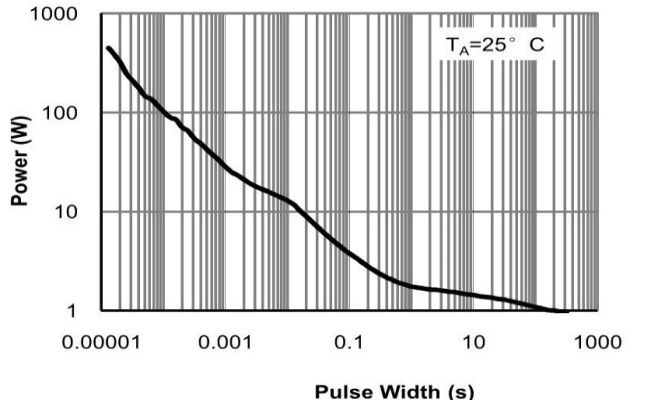


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

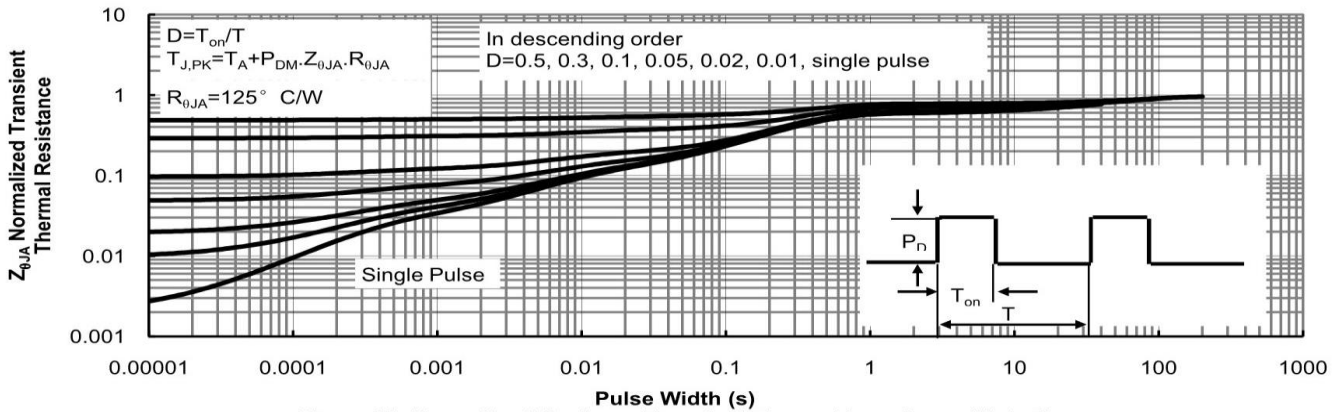


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

STATIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D = -250\mu A, V_{GS} = 0V$	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -30V, V_{GS} = 0V$			-1 -5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	-1.2	-1.8	-2.4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = -10V, I_D = -7A$		54.0	54.0	m Ω
		$V_{GS} = -4.5V, I_D = -7A$		59.4	77.2	
g_{FS}	Forward Transconductance	$V_{DS} = -5V, I_D = -7A$		43		S
V_{SD}	Diode Forward Voltage	$I_S = -1A, V_{GS} = 0V$		-0.72	-1	V
I_S	Maximum Body-Diode Continuous Current				-7	A

DYNAMIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
C_{iss}	Input Capacitance	$V_{GS} = 0V, V_{DS} = -15V, f = 1MHz$		760	927	pF
C_{oss}	Output Capacitance			140	172	pF
C_{rss}	Reverse Transfer Capacitance				95	113
R_g	Gate resistance	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$			1.6	Ω

SWITCHING PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$Q_g(10V)$	Total Gate Charge	$V_{GS} = -10V, V_{DS} = -15V, I_D = -7A$		6.7		nC
$Q_g(4.5V)$	Total Gate Charge			3.35		
Q_{gs}	Gate Source Charge			2.24		
Q_{gd}	Gate Drain Charge			3.2		
$t_{D(on)}$	Turn-On Delay Time	$V_{GS} = -10V, V_{DS} = -15V, R_L = 0.75\Omega, R_{GEN} = 3\Omega$		7.5		ns
t_r	Turn-On Rise Time			6		
$t_{D(off)}$	Turn-Off Delay Time			21		
t_f	Turn-Off Fall Time			6.75		
t_{rr}	Body Diode Reverse Recovery Time	$I_F = -8A, di/dt = 500A/\mu s$		15		ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F = 18A, di/dt = 500A/\mu s$		9.7		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

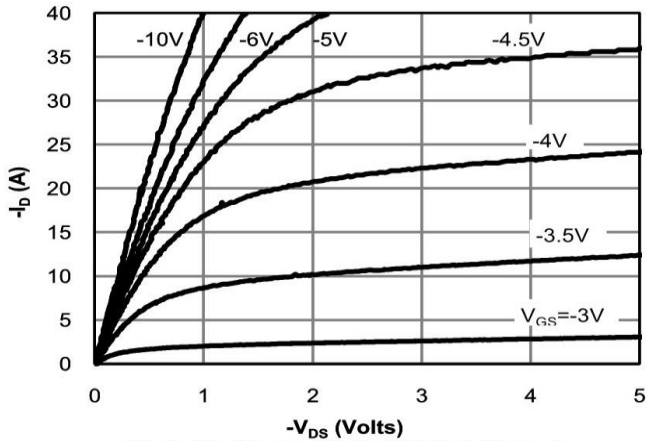


Fig 1: On-Region Characteristics (Note E)

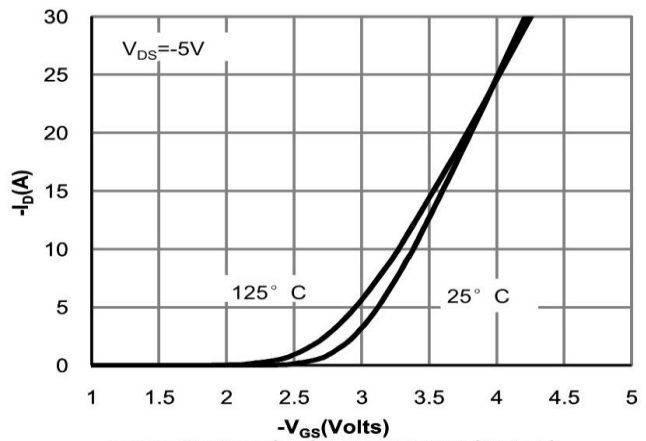


Figure 2: Transfer Characteristics (Note E)

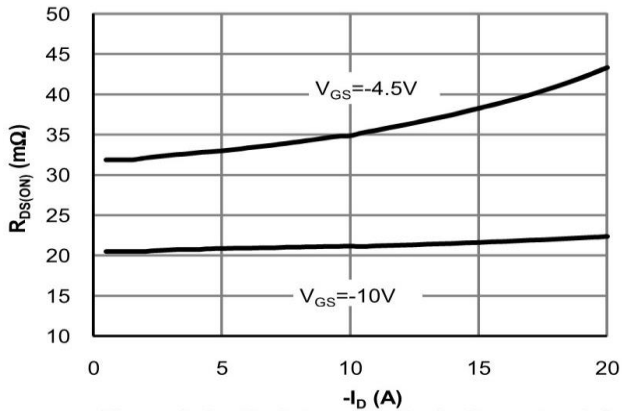


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

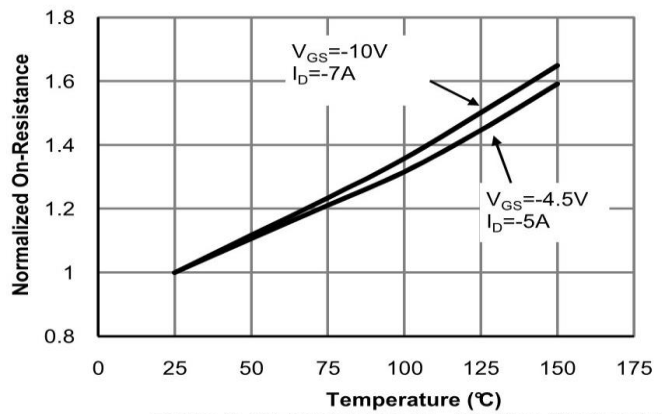


Figure 4: On-Resistance vs. Junction Temperature (Note E)

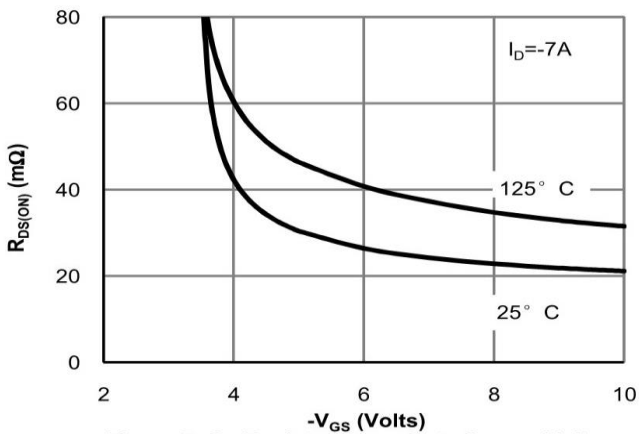


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

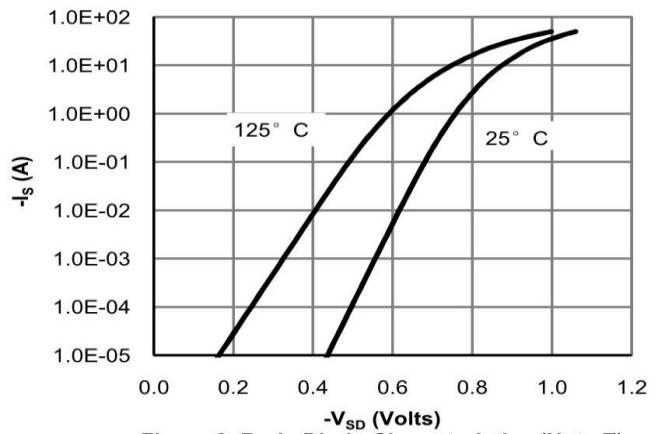


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

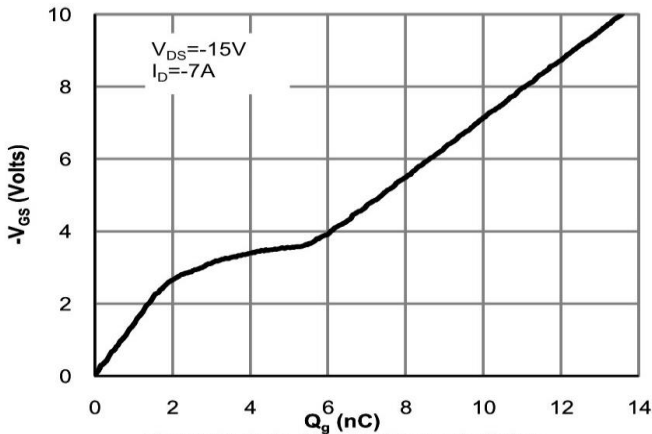


Figure 7: Gate-Charge Characteristics

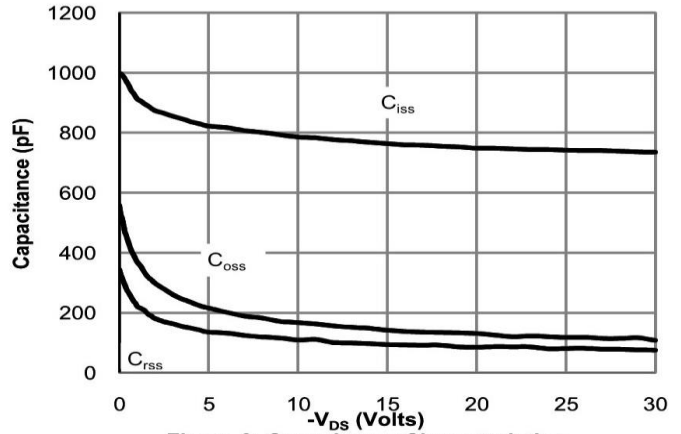


Figure 8: Capacitance Characteristics

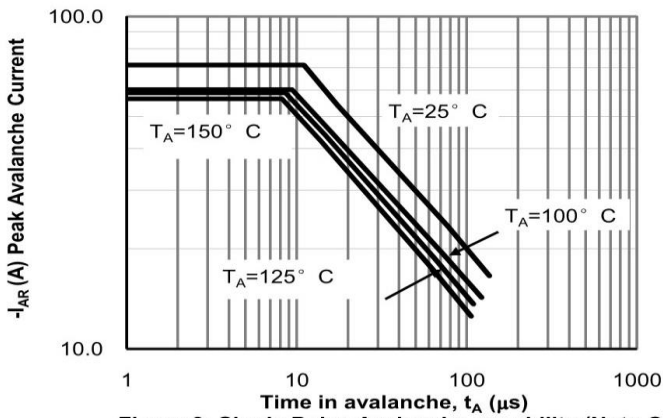


Figure 9: Single Pulse Avalanche capability (Note C)

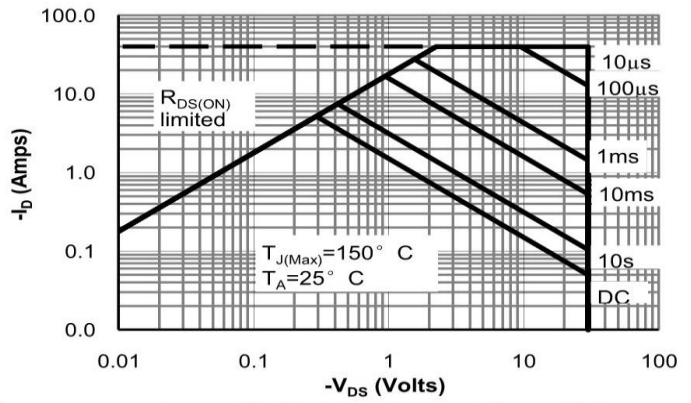


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

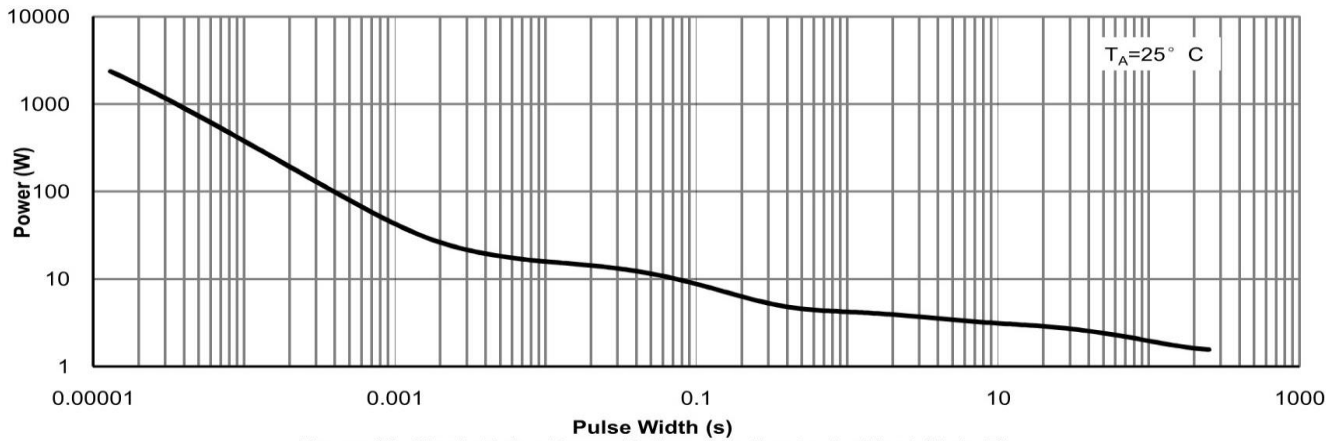


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)