Elektronische Bauelemente

SSG5509A

N & P-Ch Enhancement Mode Power MOSFET

N-Ch: 6.1 A, 30 V, $R_{DS(ON)}$ 30 mΩ

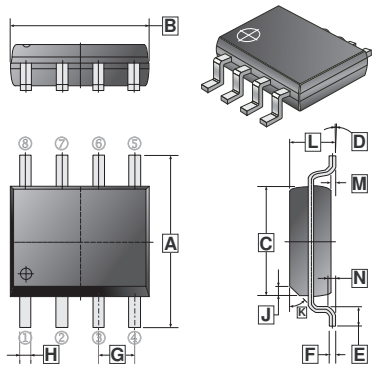
P-Ch: -4.8 A, -30 V, $R_{DS(ON)}$ 55 mΩ

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

The SSG5509A uses advanced trench technology to provide excellent on-resistance extremely efficient and cost-effectiveness device. The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

SOP-8

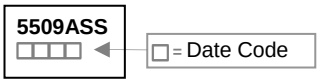


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	H	0.35	0.49
B	4.80	5.00	J	0.375 REF.	
C	3.80	4.00	K	45°	
D	0°	8°	L	1.35	1.75
E	0.40	0.90	M	0.10	0.25
F	0.19	0.25	N	0.25 REF.	
G	1.27 TYP.				

FEATURES

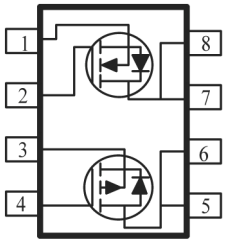
- Lower Gate Charge
- RoHS Compliant

MARKING CODE



PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	3K	13 inch



MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter		Symbol	Ratings		Unit
			N-Ch	P-Ch	
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±12	±12	V
Continuous Drain Current[3]	T_A=25℃	I_D	6.1	-4.8	A
	T_A=70℃		4.9	-3.8	A
Pulsed Drain Current[1]		I_{DM}	30	-30	A
Total Power Dissipation		P_D	2		W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150		°C
Linear Derating Factor			0.016		W / °C
Thermal Resistance Ratings					
Maximum Thermal Resistance Junction-ambient[3]		$R_{\theta JA}$	62.5		°C / W

N-CHANNEL ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250μA
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.2	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transconductance	g_{fs}	-	15	-	S	V_{DS}=5V, I_D=5A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±12V
Drain-Source Leakage Current(T_J =25℃)	I_{DSS}	-	-	1	μA	V_{DS}=24V, V_{GS}=0
Drain-Source Leakage Current(T_J =70℃)		-	-	25	μA	V_{DS}=24V, V_{GS}=0
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	30	mΩ	V_{GS}=10V, I_D=5.8A
		-	-	35		V_{GS}=4.5V, I_D=5A
				55		V_{GS}=2.5V, I_D=4A
Total Gate Charge[2]	Q_g	-	9.7		nC	I_D=5.8A V_{DS}=15V V_{GS}=4.5V
Gate-Source Charge	Q_{gs}	-	1.6	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	3.1	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	3.3	-	nS	V_{DS}=15V V_{GS}=10V R_G=3Ω R_L=2.7Ω
Rise Time	T_r	-	4.8	-		
Turn-off Delay Time	$T_{d(off)}$	-	26.3	-		
Fall Time	T_f	-	4.1	-		
Input Capacitance	C_{iss}	-	823	-	pF	V_{GS}=0 V_{DS}=15V f=1.0 MHz
Output Capacitance	C_{oss}	-	99	-		
Reverse Transfer Capacitance	C_{rss}	-	77	-		
Source -Drain Diode						
Forward On Voltage[2]	V_{SD}	-	-	1.0	V	I_S=1A, V_{GS}=0
Reverse Recovery Time[2]	T_{rr}	-	16	-	nS	I_S=5A, V_{GS}=0, dI/dt =100A/μs
Reverse Recovery Charge	Q_{rr}	-	8.9	-	nC	
Continuous Source Current (Body Diode)	I_S	-	-	2.5	A	V_D=V_G=0, V_S=1.0V

Notes:
1. Pulse width limited by Max. junction temperature.
2. Pulse width≦300us, duty cycle≦2%.
3. Surface mounted on 1 in^2 copper pad of FR4 board; 135 °C/W when mounted on Min. copper pad.

P-CHANNEL ELECTRICAL CHARACTERISTICS (T_J=25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	-30	-	-	V	V_{GS}=0, I_D= -250μA
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	-	-1.2	V	V_{DS}=V_{GS}, I_D= -250μA
Forward Transconductance	g_{fs}	-	11	-	S	V_{DS}= -5V, I_D= -5A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±12V
Drain-Source Leakage Current(T_J =25℃)	I_{DSS}	-	-	-1	μA	V_{DS}= -24V, V_{GS}=0
Drain-Source Leakage Current(T_J =70℃)		-	-	-25	μA	V_{DS}= -24V, V_{GS}=0
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	55	mΩ	V_{GS}= -10V, I_D= -4.2A
		-	-	70		V_{GS}= -4.5V, I_D= -4A
		-	-	120		V_{GS}= -2.5V, I_D= -1A
Total Gate Charge[2]	Q_g	-	9.4	-	nC	I_D= -4 A V_{DS}= -15V V_{GS}= -4.5V
Gate-Source Charge	Q_{gs}	-	2	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	3	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	6.3	-	nS	V_{DS}= -15V V_{GS}= -10V R_G=6Ω R_L=3.6Ω
Rise Time	T_r	-	3.2	-		
Turn-off Delay Time	$T_{d(off)}$	-	38.2	-		
Fall Time	T_f	-	12	-		
Input Capacitance	C_{iss}	-	954	-	pF	V_{GS}=0 V_{DS}= -15V f=1.0 MHz
Output Capacitance	C_{oss}	-	115	-		
Reverse Transfer Capacitance	C_{rss}	-	77	-		
Source -Drain Diode						
Forward On Voltage[2]	V_{SD}	-	-	-1.0	V	I_S= -1A, V_{GS}=0
Reverse Recovery Time[2]	T_{rr}	-	20.2	-	nS	I_S= -4A, V_{GS}=0, dI/dt=100A/μs
Reverse Recovery Charge	Q_{rr}	-	11.2	-	nC	
Continuous Source Current (Body Diode)	I_S	-	-	-2.2	A	V_D=V_G=0, V_S= -1V

Notes:
1. Pulse width limited by Max. junction temperature.
2. Pulse width≦300us, duty cycle≦2%.
3. Surface mounted on 1 in^2 copper pad of FR4 board; 135 °C/W when mounted on Min. copper pad.

CHARACTERISTIC CURVE (N-Ch)

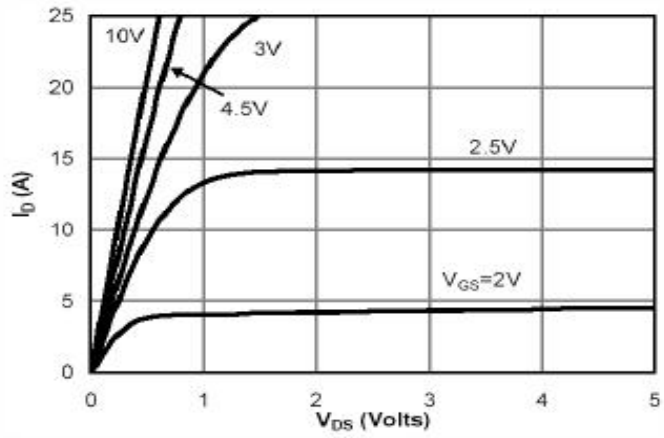


Fig 1. Typical Output Characteristics

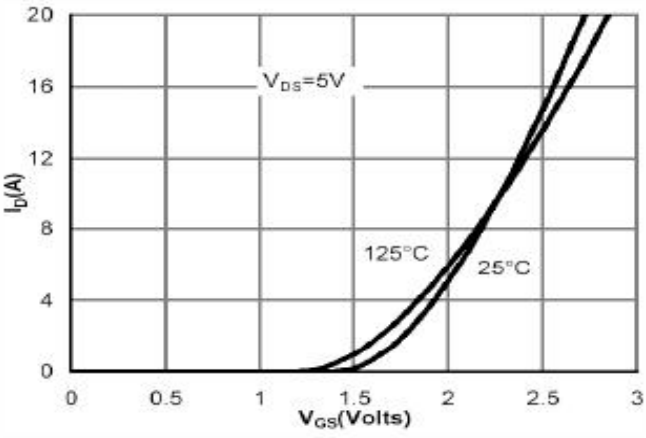


Fig 2. Transfer Characteristics

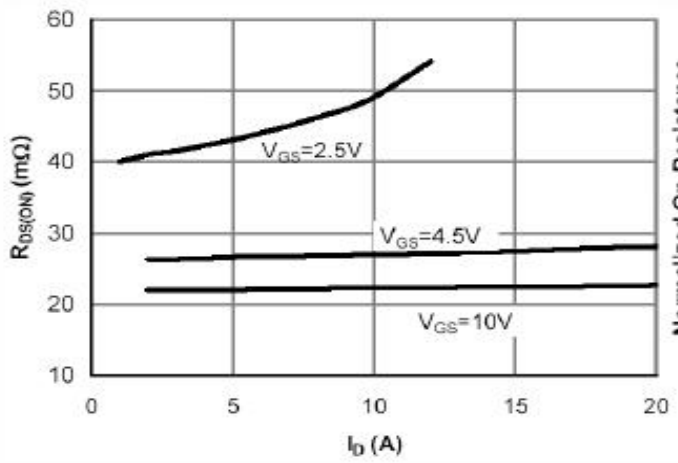


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

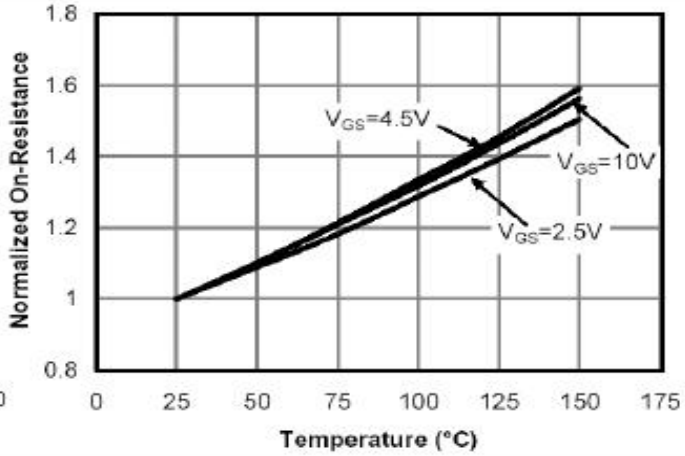


Fig 4. On-Resistance vs. Junction Temperature

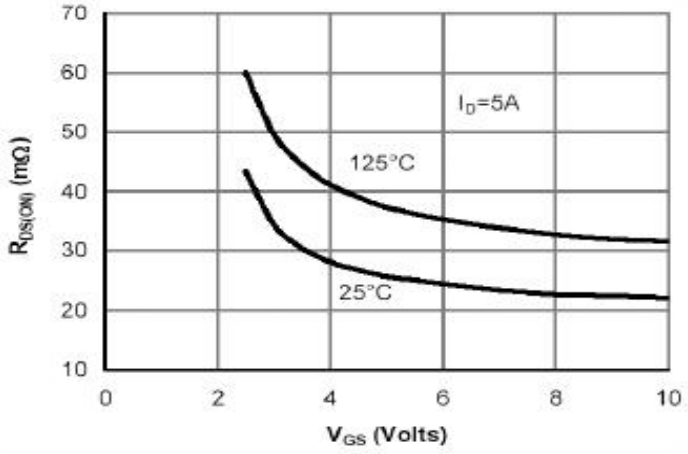


Fig 5. On-Resistance vs. Gate-Source Voltage

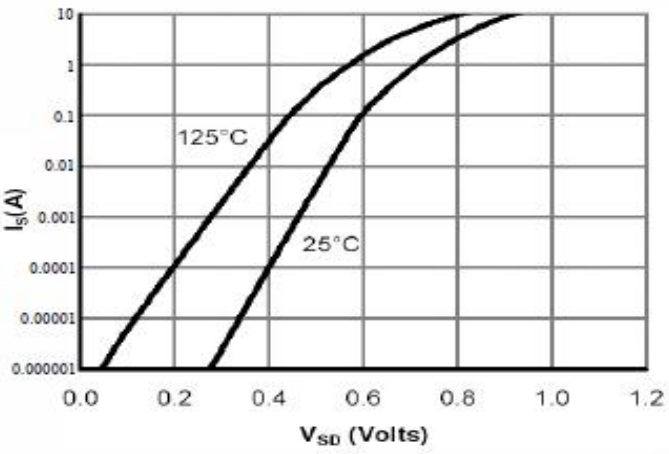


Fig 6. Body Diode Characteristics

CHARACTERISTIC CURVE (N-Ch)

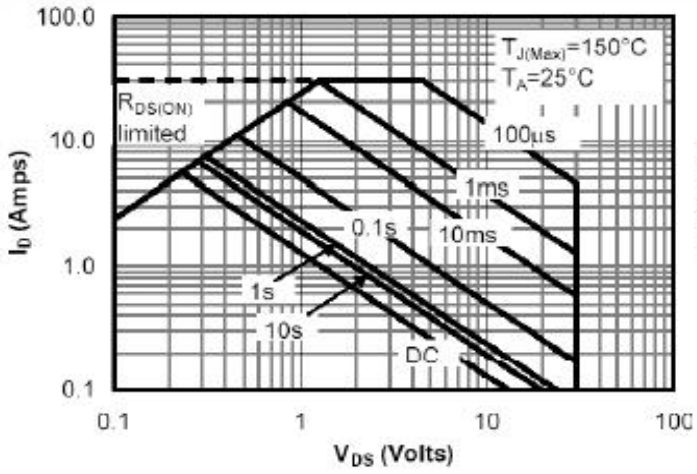


Fig 7. Maximum Safe Operating Area

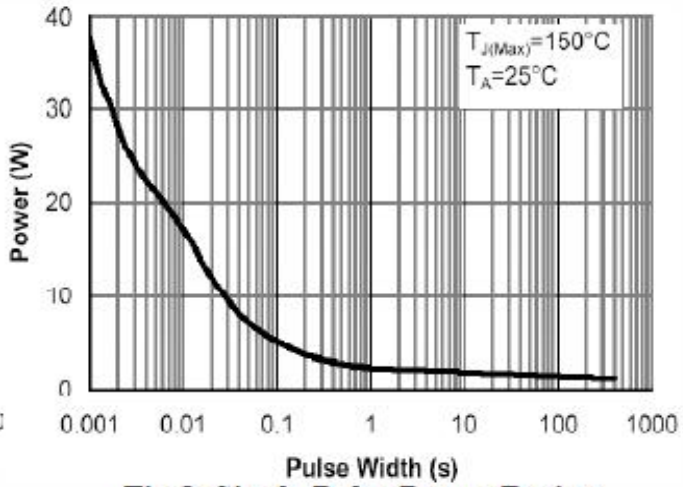


Fig 8. Single Pulse Power Rating Junction-to-Ambient

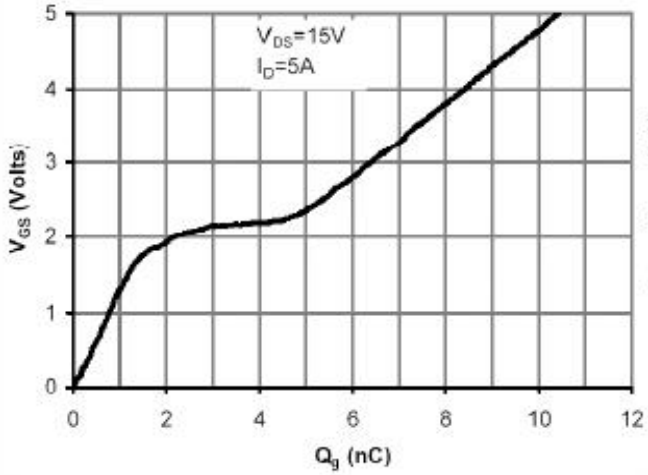


Fig 9. Gate Charge Characteristics

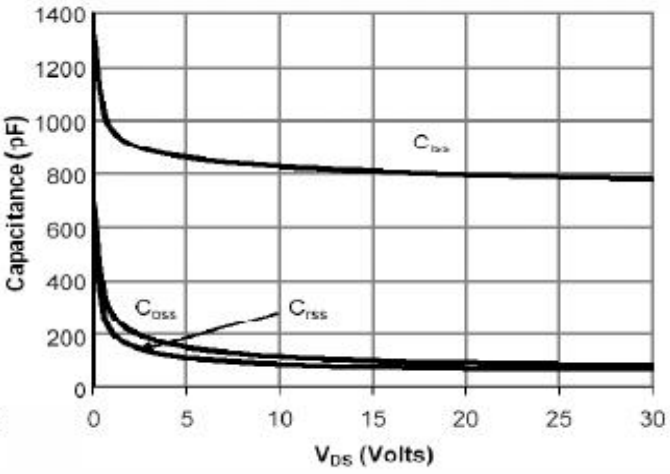


Fig 10. Typical Capacitance Characteristics

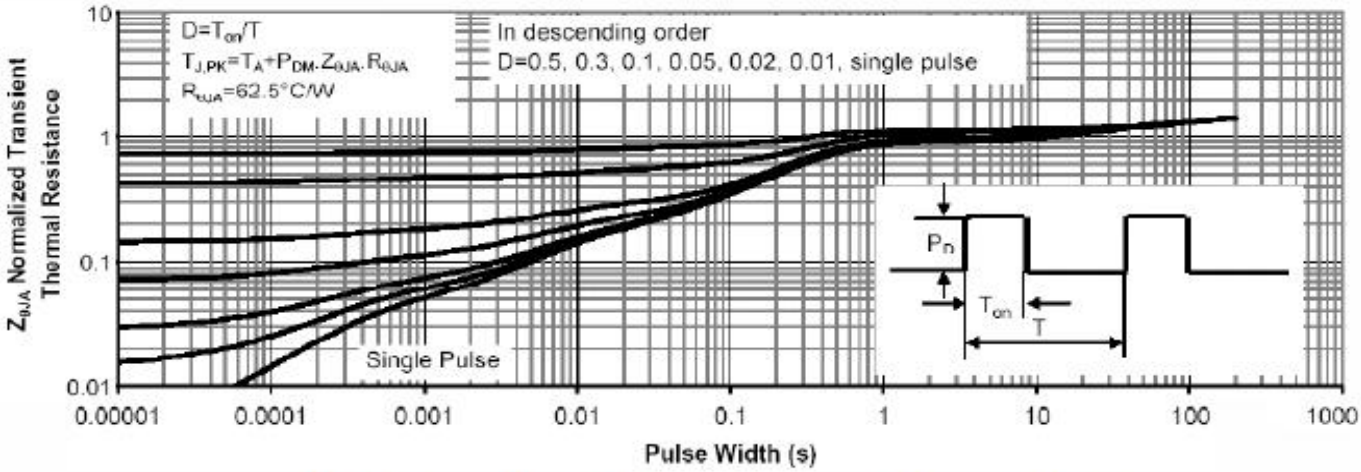


Fig 11. Normalized Maximum Transient Thermal Impedance

CHARACTERISTIC CURVE (P-Ch)

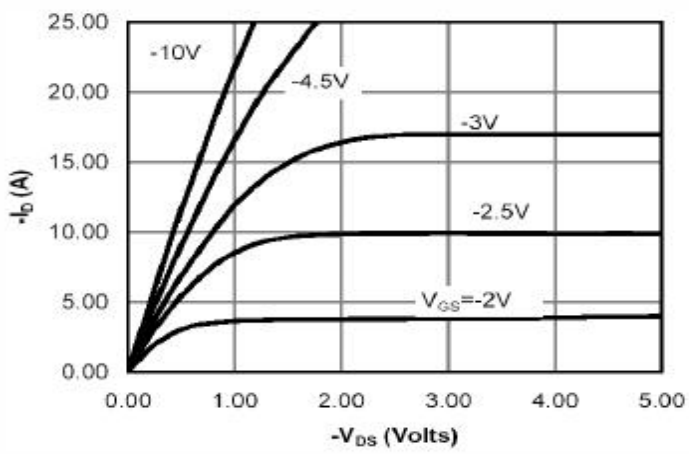


Fig 1. Typical Output Characteristics

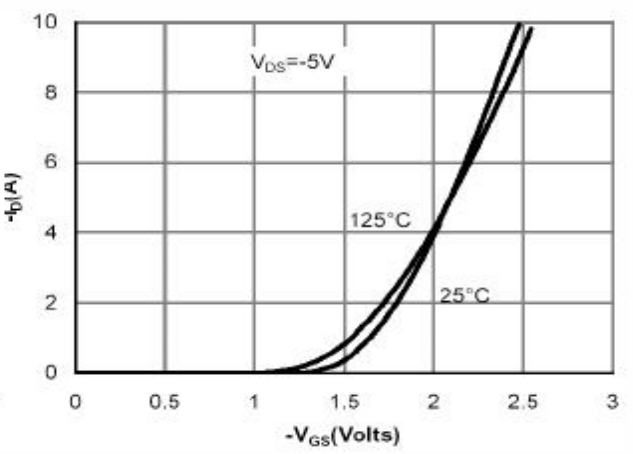


Fig 2. Transfer Characteristics

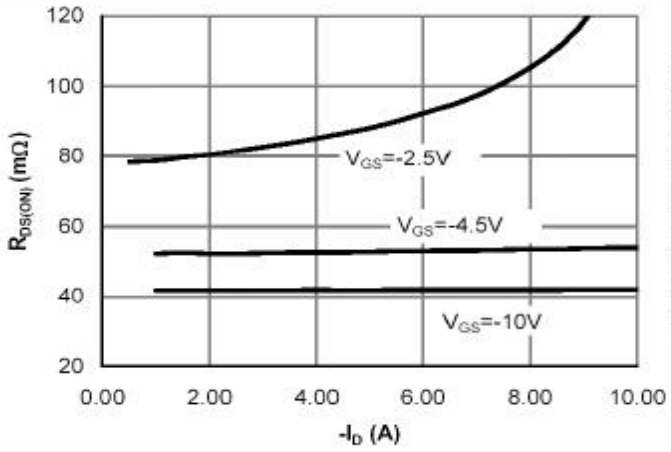


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

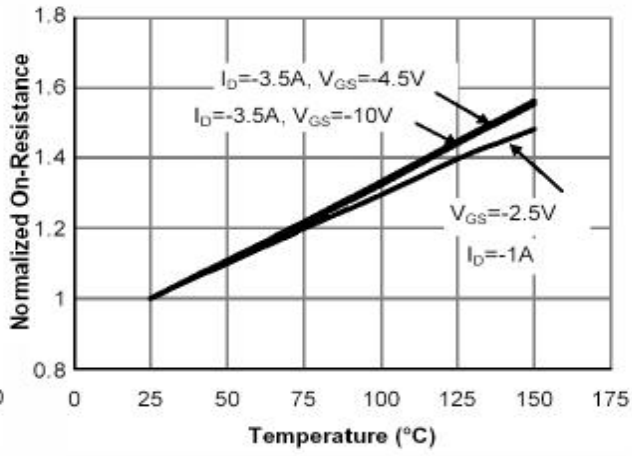


Fig 4. On-Resistance vs. Junction Temperature

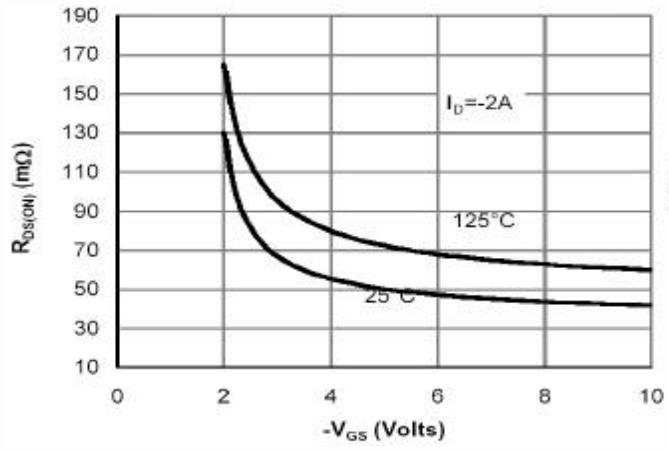


Fig 5. On-Resistance vs. Gate-Source Voltage

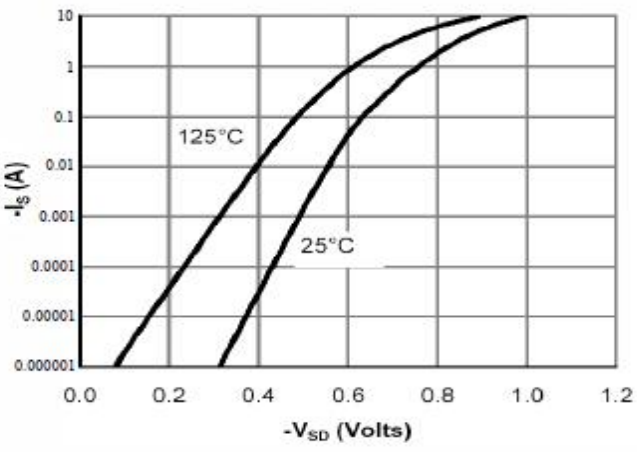


Fig 6. Body Diode Characteristics

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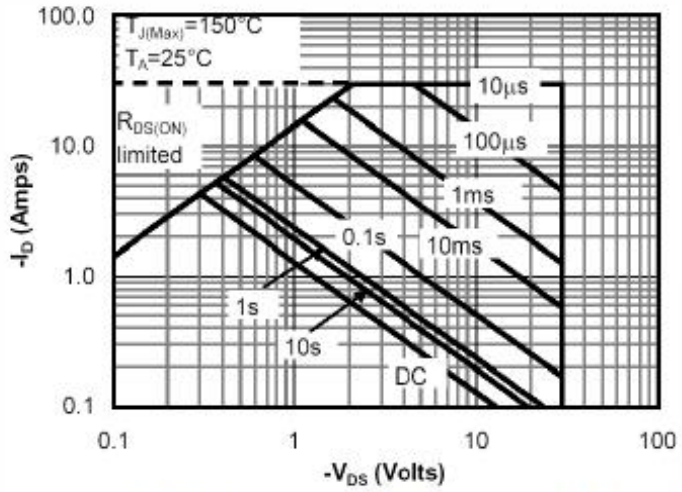

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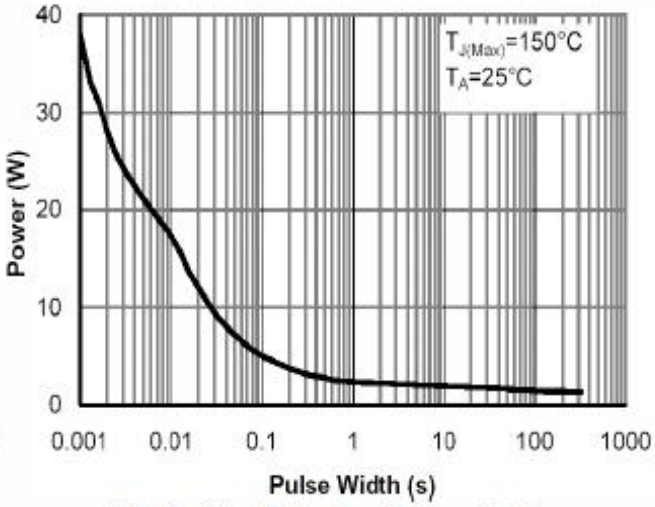

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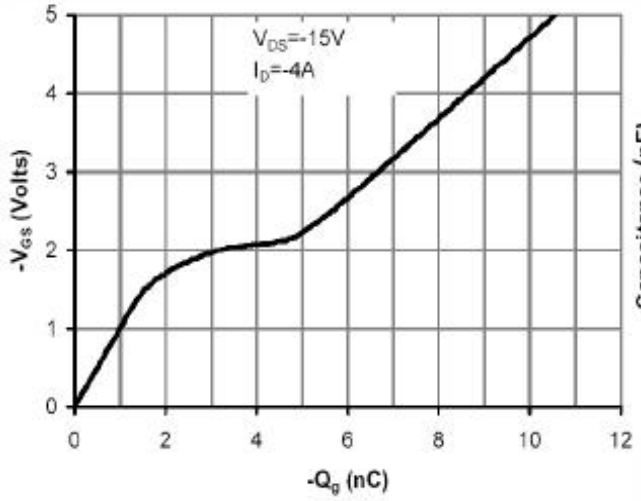

Fig 9. Gate Charge Characteristics

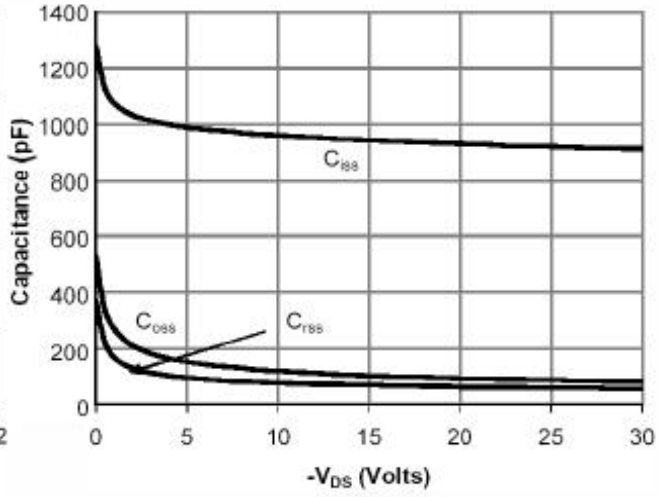

Fig 10. Typical Capacitance Characteristics

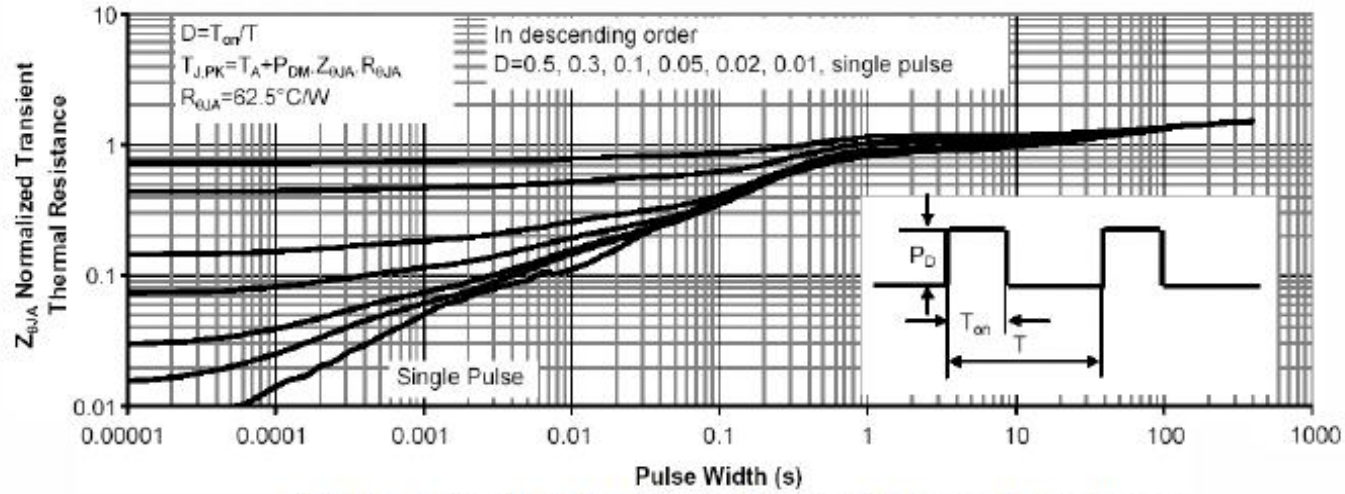

Fig 11. Normalized Maximum Transient Thermal Impedance