

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

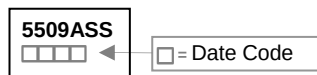
DESCRIPTION

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.

FEATURES

- Lower Gate Charge
- RoHS Compliant

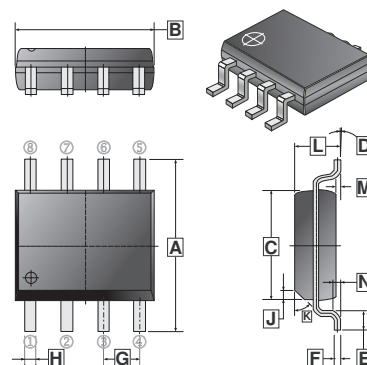
MARKING CODE



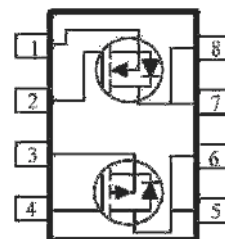
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	3K	13 inch

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.				



MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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		℃
Linear Derating Factor			0.016		W / ℃
Thermal Resistance Ratings					
Maximum Thermal Resistance Junction-ambient ³		R _{θJA}	62.5		℃ / W

N-CHANNEL ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	$V_{GS}=0$, $I_D=250\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.2	V	$V_{DS}=V_{GS}$, $I_D=250\mu A$
Forward Transconductance	g_{fs}	-	15	-	S	$V_{DS}=5V$, $I_D=5A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}= \pm 12V$
Drain-Source Leakage Current($T_J = 25^{\circ}C$)	I_{DSS}	-	-	1	μA	$V_{DS}=24V$, $V_{GS}=0$
Drain-Source Leakage Current($T_J = 70^{\circ}C$)		-	-	25	μA	$V_{DS}=24V$, $V_{GS}=0$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	30	m Ω	$V_{GS}=10V$, $I_D=5.8A$
		-	-	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	$V_{DS}=15V$ $V_{GS}=10V$ $R_G=3\Omega$ $R_L=2.7\Omega$
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	$V_{GS}=0$ $V_{DS}=15V$ $f=1.0\text{ MHz}$
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	$I_S=5A$, $V_{GS}=0$, $di/dt = 100A/\mu s$
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 $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Surface mounted on 1 in² copper pad of FR4 board; 135 °C/W when mounted on Min. copper pad.

P-CHANNEL ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	-30	-	-	V	$V_{GS}=0$, $I_D= -250\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	-	-1.2	V	$V_{DS}=V_{GS}$, $I_D= -250\mu A$
Forward Transconductance	g_{fs}	-	11	-	S	$V_{DS}= -5V$, $I_D= -5A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}= \pm 12V$
Drain-Source Leakage Current($T_J = 25^{\circ}C$)	I_{DSS}	-	-	-1	μA	$V_{DS}= -24V$, $V_{GS}=0$
Drain-Source Leakage Current($T_J = 70^{\circ}C$)		-	-	-25	μA	$V_{DS}= -24V$, $V_{GS}=0$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	55	m Ω	$V_{GS}= -10V$, $I_D= -4.2A$
		-	-	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	$V_{DS}= -15V$ $V_{GS}= -10V$ $R_G=6\Omega$ $R_L=3.6\Omega$
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	$I_S= -4A$, $V_{GS}=0$, $di/dt=100A/\mu s$
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 $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Surface mounted on 1 in² copper pad of FR4 board; 135 °C/W when mounted on Min. copper pad.

CHARACTERISTIC CURVE (N-Ch)

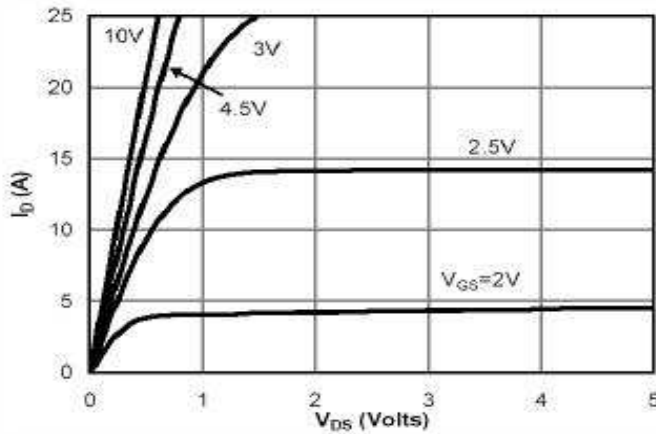


Fig 1. Typical Output Characteristics

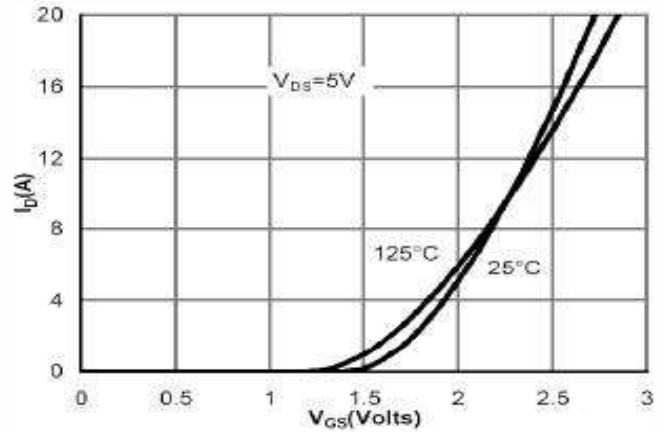


Fig 2. Transfer Characteristics

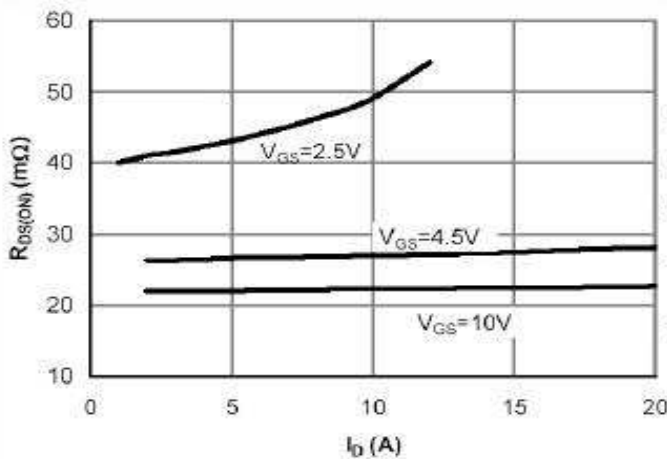


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

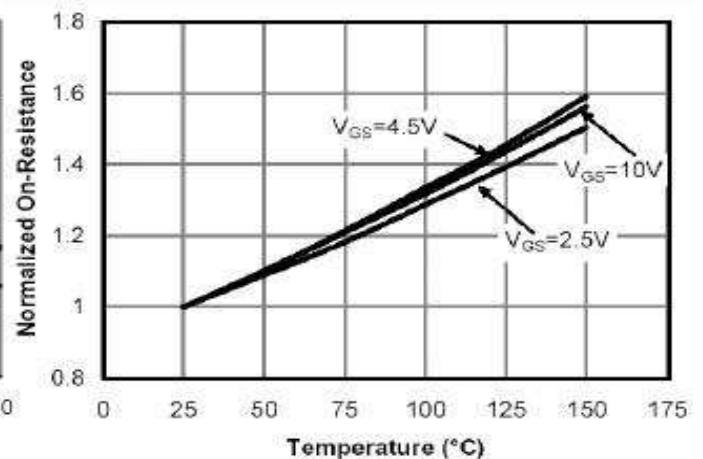


Fig 4. On-Resistance vs. Junction Temperature

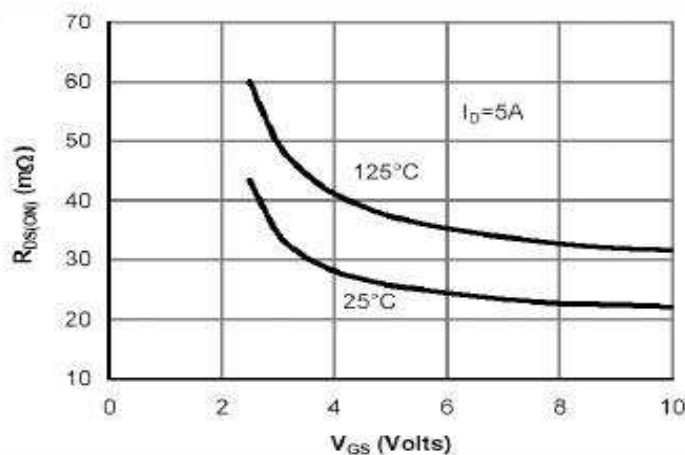


Fig 5. On-Resistance vs. Gate-Source Voltage

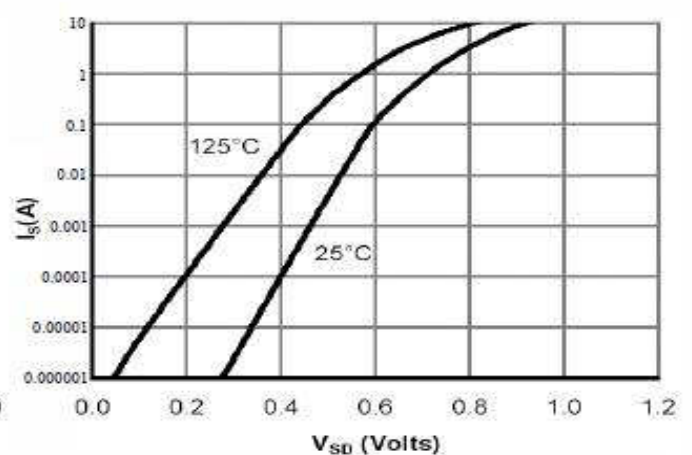


Fig 6. Body Diode Characteristics

CHARACTERISTIC CURVE (N-Ch)

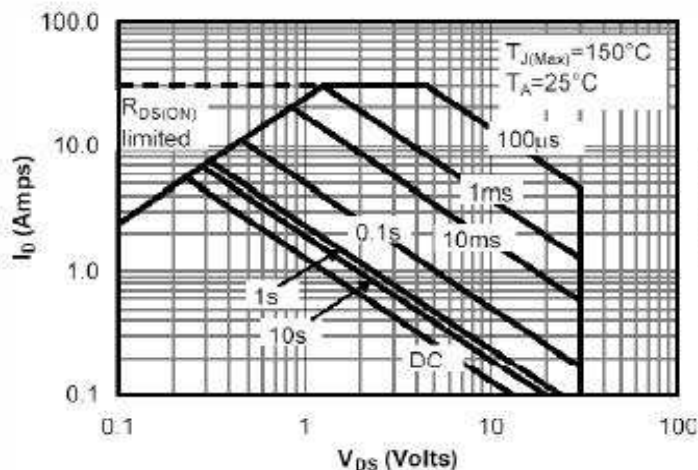


Fig 7. Maximum Safe Operating Area

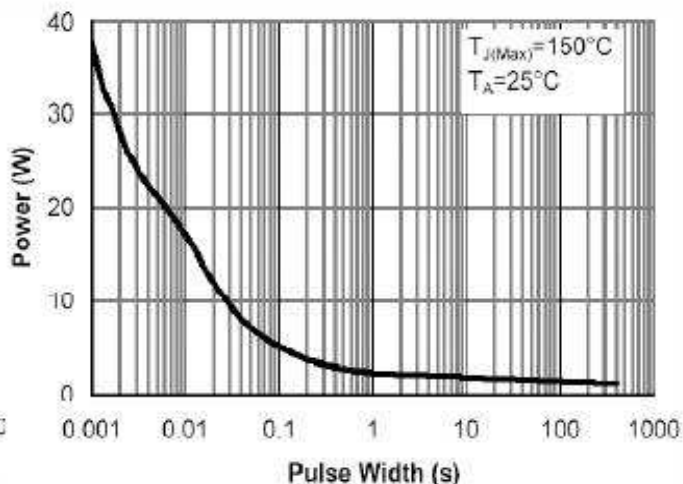


Fig 8. Single Pulse Power Rating
Junction-to-Ambient

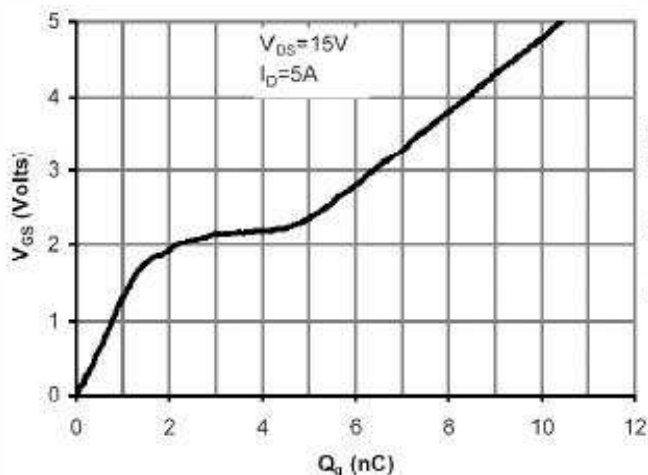


Fig 9. Gate Charge Characteristics

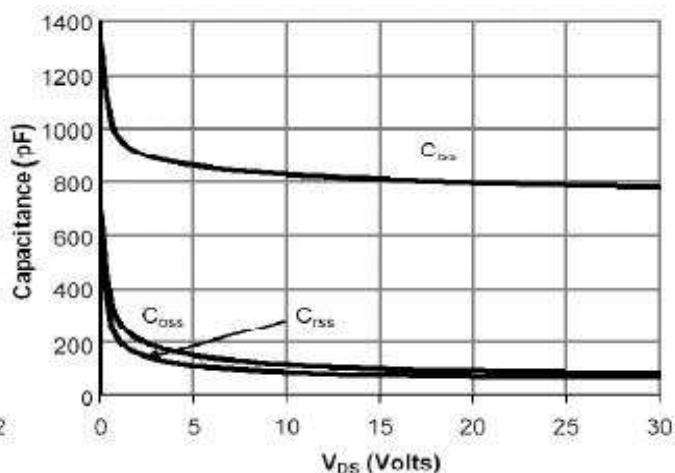


Fig 10. Typical Capacitance Characteristics

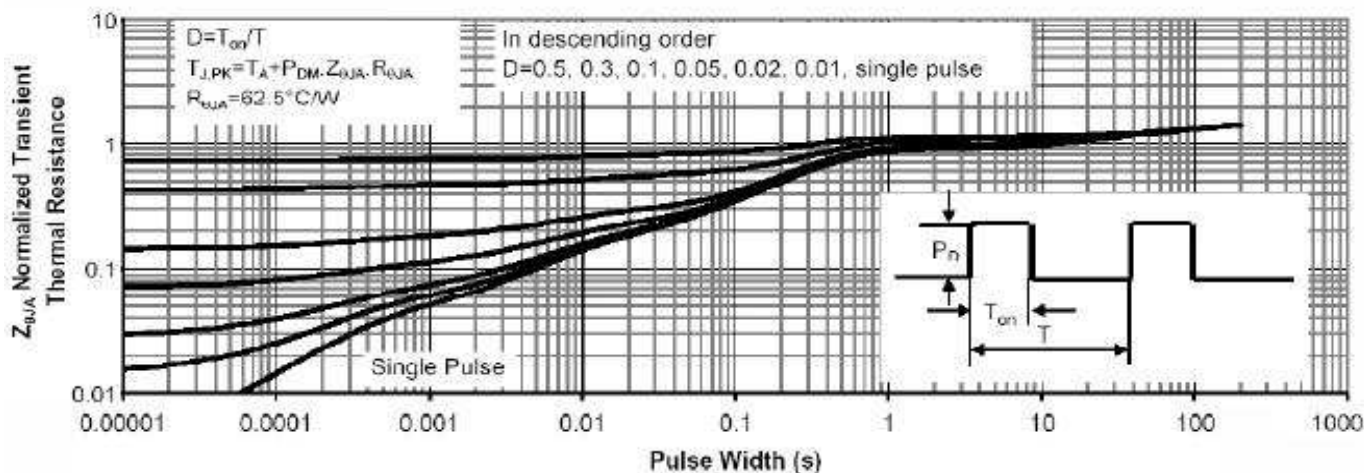


Fig 11. Normalized Maximum Transient Thermal Impedance

CHARACTERISTIC CURVE (P-Ch)

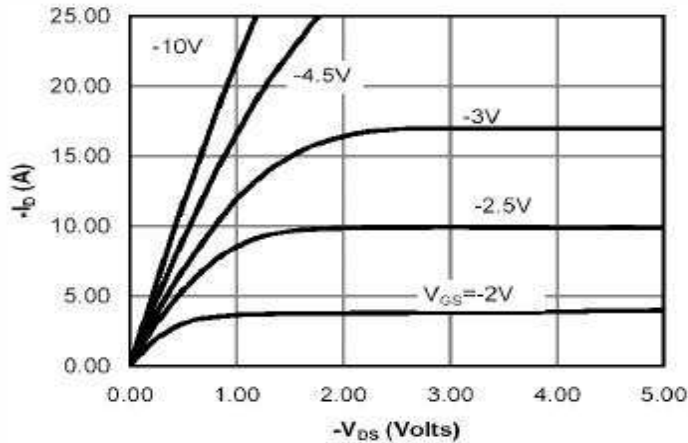


Fig 1. Typical Output Characteristics

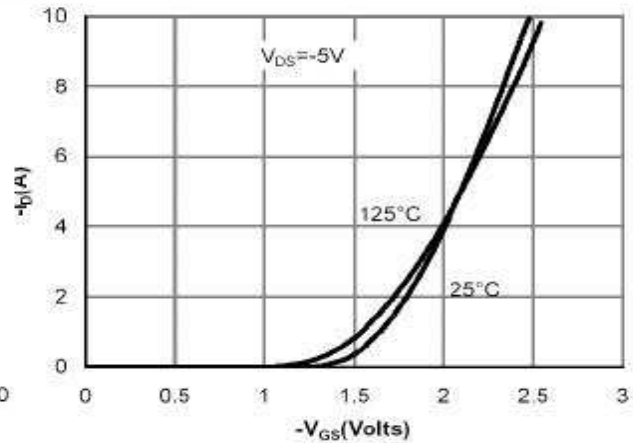


Fig 2. Transfer Characteristics

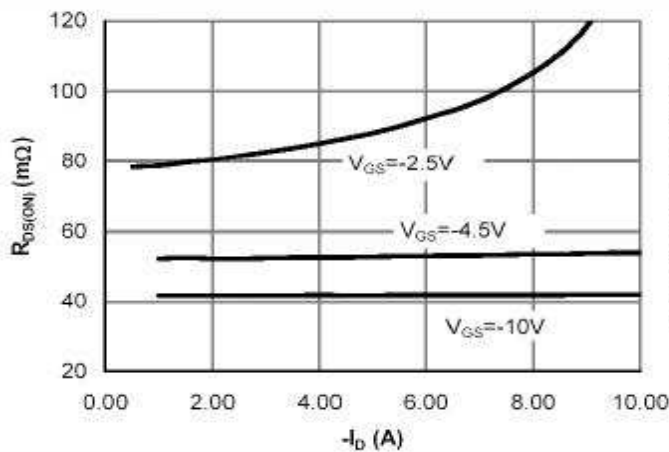


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

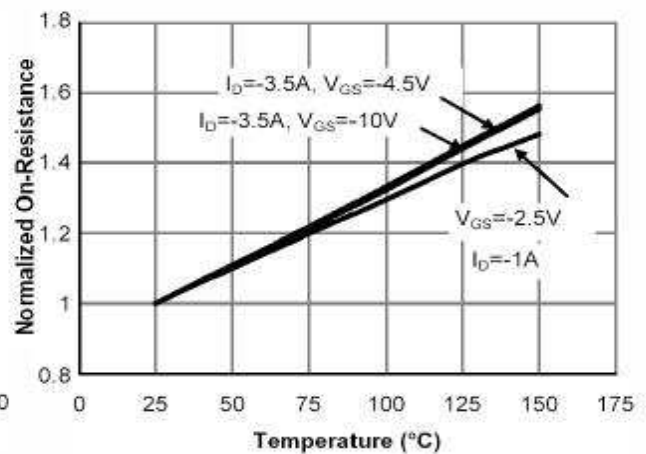


Fig 4. On-Resistance vs. Junction Temperature

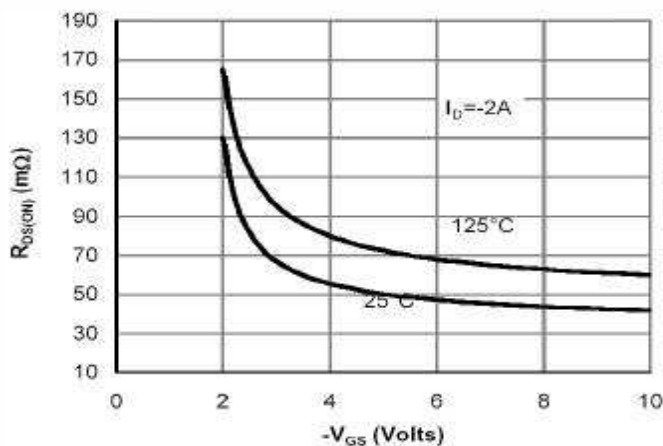


Fig 5. On-Resistance vs. Gate-Source Voltage

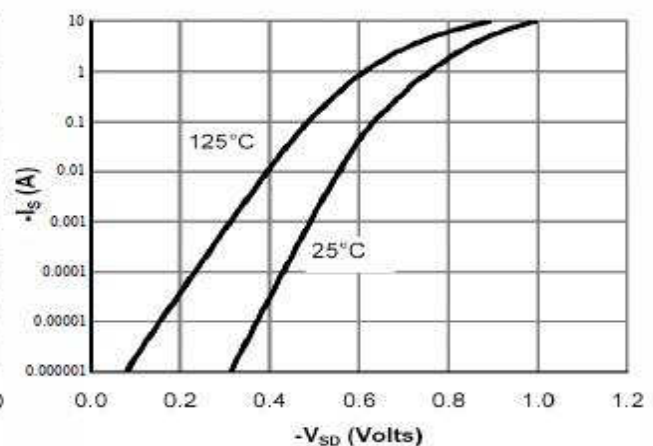


Fig 6. Body Diode Characteristics

CHARACTERISTIC CURVE (P-Ch)

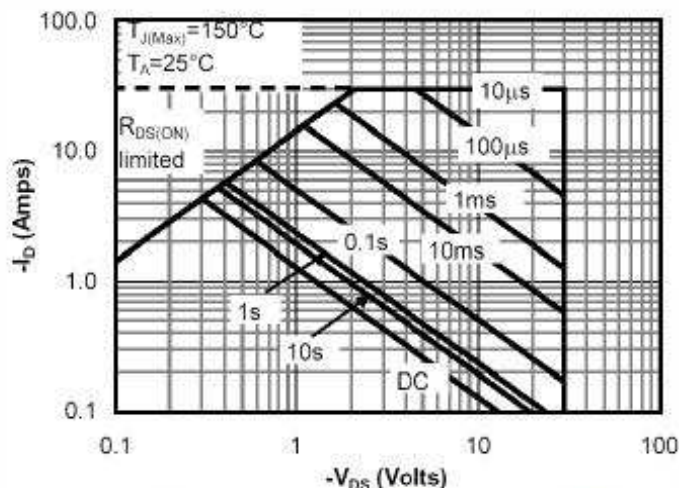


Fig 7. Maximum Safe Operating Area

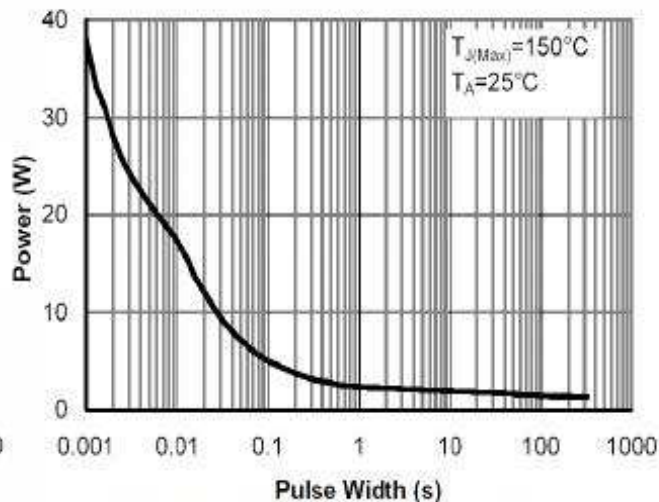


Fig 8. Single Pulse Power Rating
Junction-to-Ambient

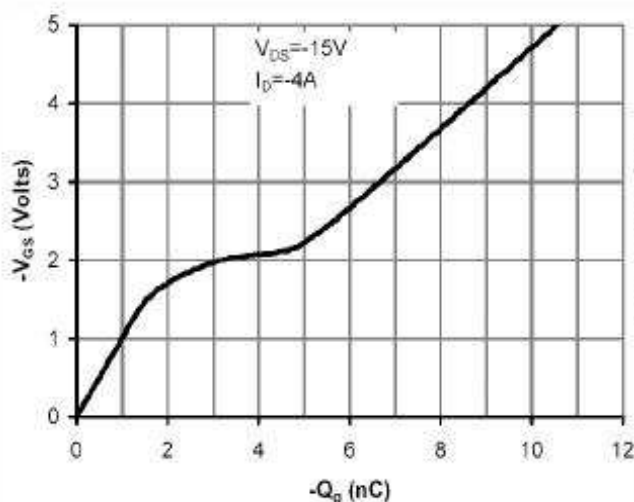


Fig 9. Gate Charge Characteristics

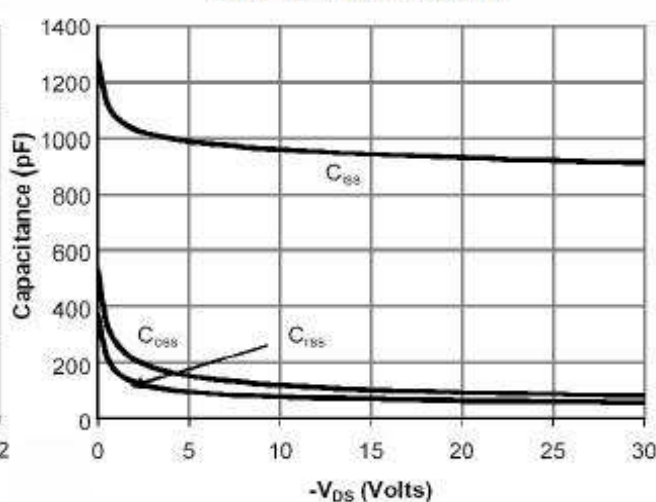


Fig 10. Typical Capacitance Characteristics

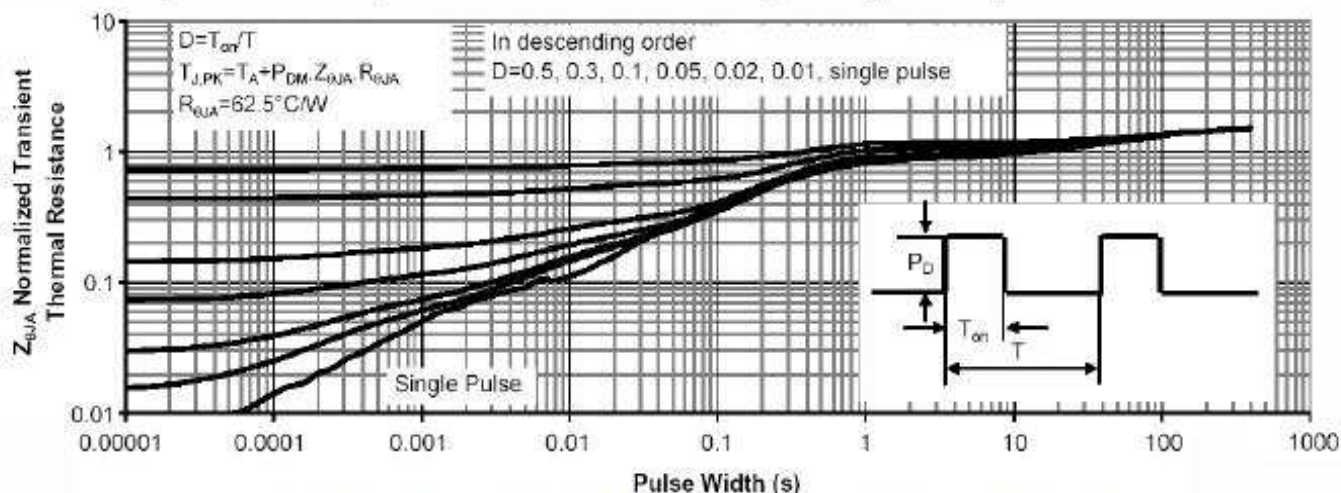


Fig 11. Normalized Maximum Transient Thermal Impedance