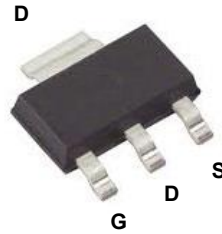
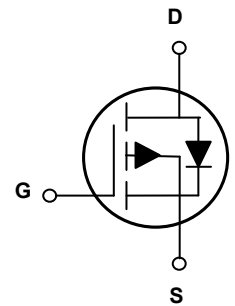


Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	105mΩ
I_D	-3.2A



SOT-223



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for motor drive, power tools and LED lighting
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The SSF6909 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous($T_A=25^\circ\text{C}$)	I_D	-3.2	A
Drain Current-Continuous($T_C=70^\circ\text{C}$)		-5	A
Drain Current-Pulsed($T_A=25^\circ\text{C}$) ¹	I_{DM}	-12.8	A
Single Pulse Avalanche Energy ²	E_{AS}	25	mJ
Single Pulse Avalanched Current ²	I_{AS}	-18	A
Power Dissipation($T_A=25^\circ\text{C}$)	P_D	2	W
Power Dissipation($T_C=25^\circ\text{C}$)		5.4	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient ⁵	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	23	$^\circ\text{C}/\text{W}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=-1mA$	-	-0.05	-	$V/^{\circ}\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	-	-	-1	μA
		$V_{DS}=-48V, V_{GS}=0V$, $T_J=125^{\circ}\text{C}$	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-3A$	-	87	105	m Ω
		$V_{GS}=-4.5V, I_D=-2A$	-	107	140	
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.6	-2.5	V
Gate Threshold Voltage	$V_{GS(th)}$		-	3	-	mV/ $^{\circ}\text{C}$
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-3A$	-	5.5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=-30V, I_D=-2A$, $V_{GS}=-10V$	-	10	15	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	1.6	3.2	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	3	6	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=-30V, R_G=6\Omega$ $V_{GS}=-10V, I_D=-1A$	-	8	16	nS
Rise Time ^{3,4}	t_r		-	15.4	30	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	42.8	80	
Fall Time ^{3,4}	t_f		-	8.4	16	
Input Capacitance	C_{iss}	$V_{DS}=-30V, V_{GS}=0V$, $F=1MHz$	-	785	1300	pF
Output Capacitance	C_{oss}		-	175	300	
Reverse Transfer Capacitance	C_{rss}		-	112	220	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V$, $F=1MHz$	-	36	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V$, Force Current	-	-	-3.2	A
Pulsed Source Current	I_{SM}		-	-	-6.4	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A$, $T_J=25^{\circ}\text{C}$	-	-	-1	V

Notes:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-18A, R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.
3. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.
5. Thermal resistance, Junction-to-Ambient measured in board size of 1inch x 1inch, 1oz copper.

Typical Electrical and Thermal Characteristic Curves

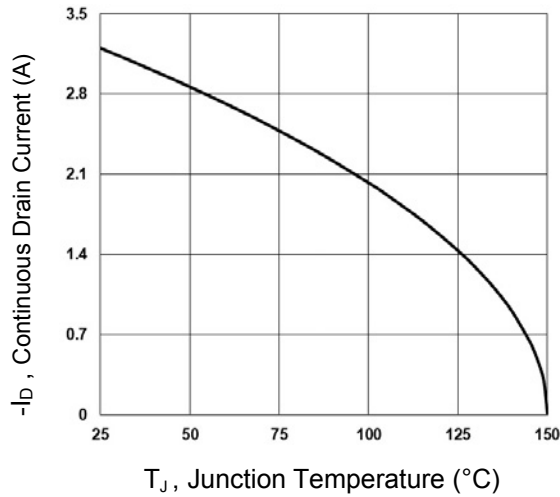


Fig.1 Continuous Drain Current vs. T_J

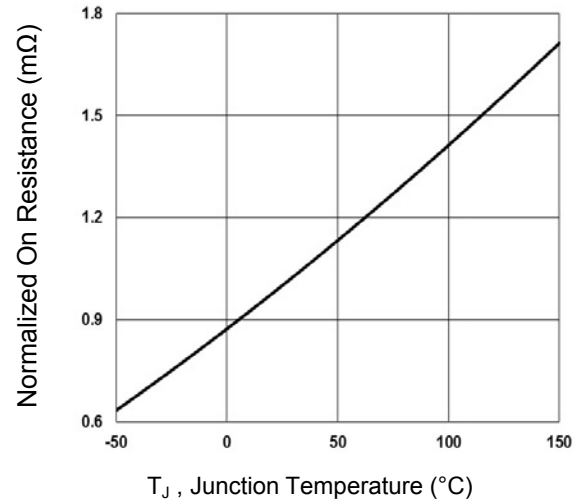


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

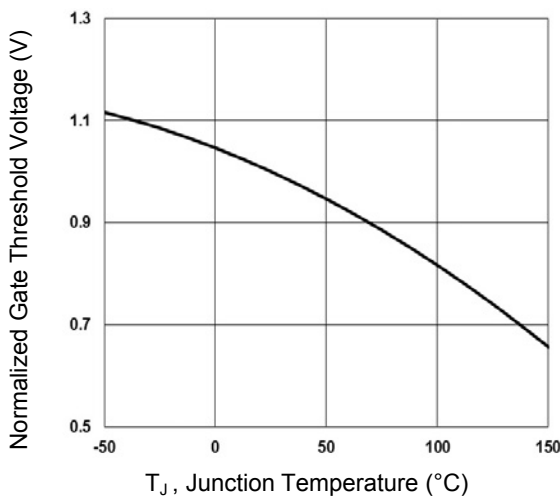


Fig.3 Normalized V_{th} vs. T_J

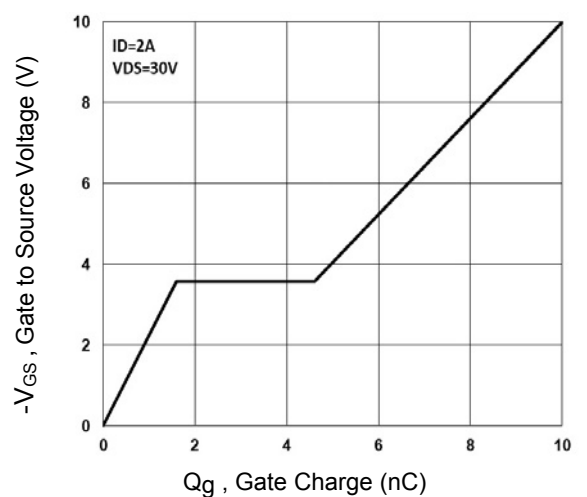


Fig.4 Gate Charge Waveform

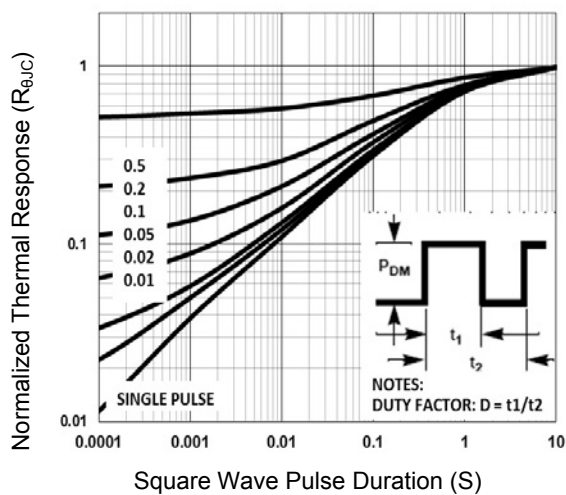


Fig.5 Normalized Transient Impedance

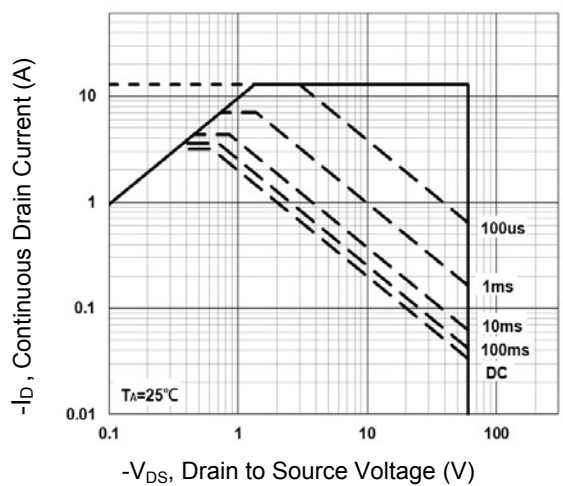


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

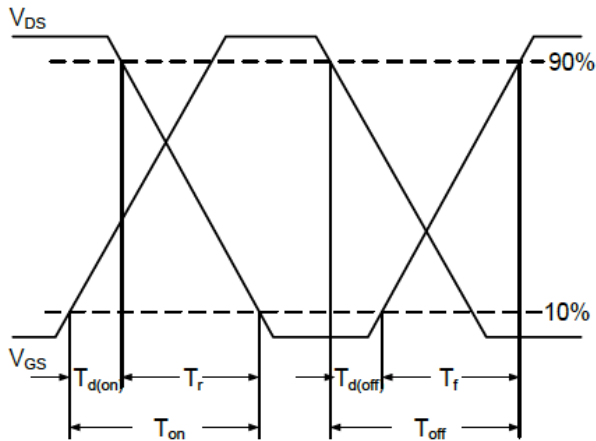


Fig.7 Switching Time Waveform

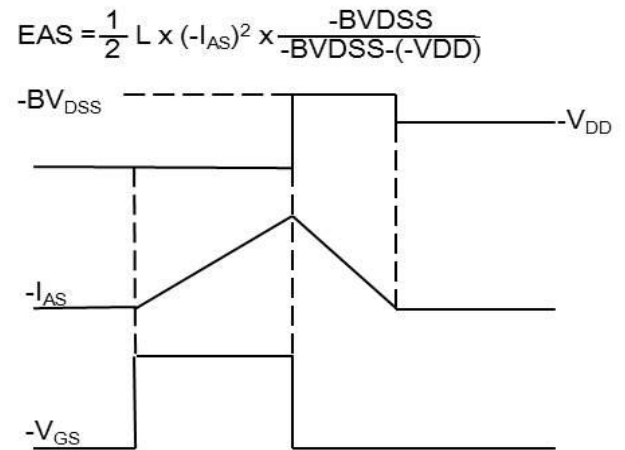
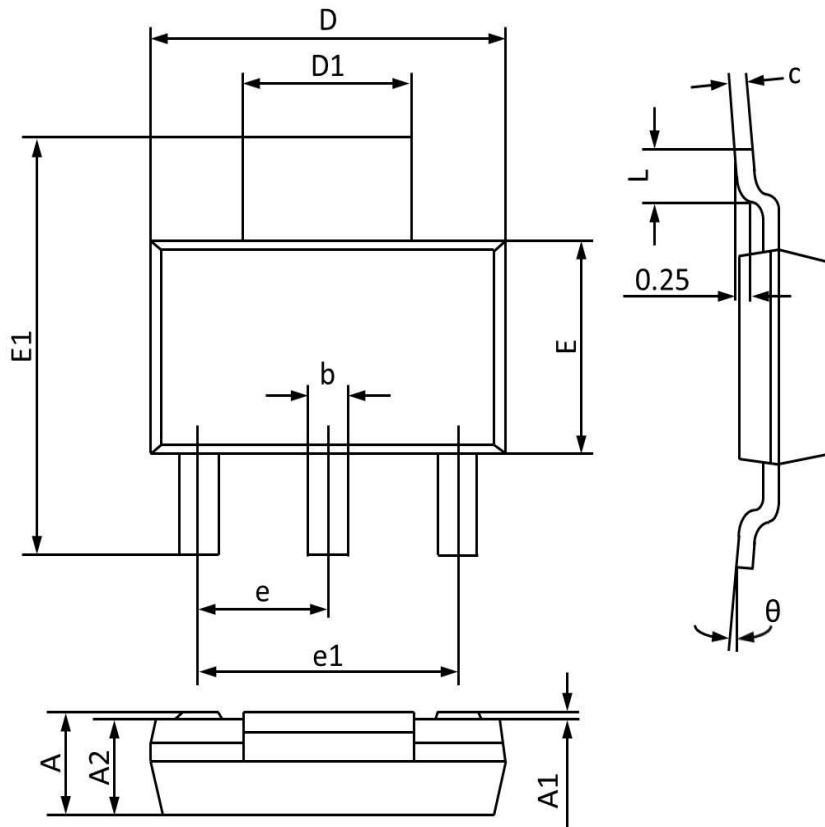


Fig.8 E_{AS} Waveform

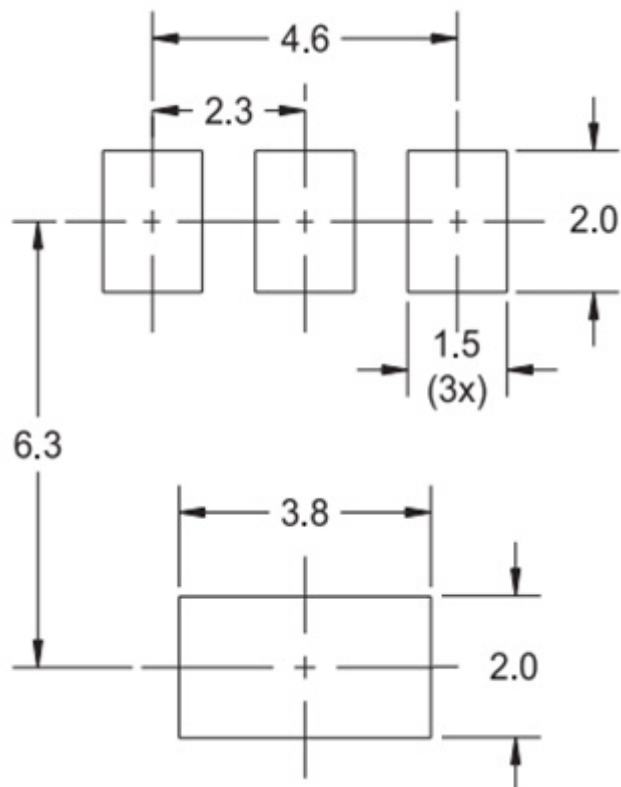
Package Outline Dimensions

SOT-223



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.800	1.520	0.071	0.060
A1	0.100	0.000	0.004	0.000
A2	1.700	1.500	0.067	0.059
b	0.820	0.660	0.032	0.026
c	0.350	0.250	0.014	0.010
D	6.400	6.200	0.252	0.244
D1	3.100	2.900	0.122	0.114
E	3.700	3.300	0.146	0.130
E1	7.070	6.830	0.278	0.269
e	2.30(BSC)		0.091(BSC)	
e1	4.700	4.500	0.185	0.177
L	1.150	0.900	0.045	0.035
θ	10°	0°	10°	0°

Recommended Pad Layout



unit: mm