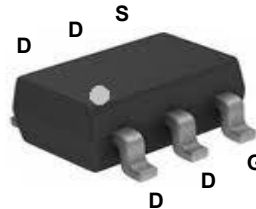
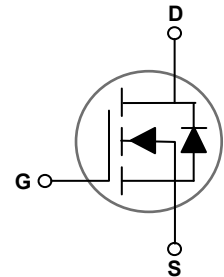


## Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	75mΩ
$I_D$	2.9A



SOT-23-6L



Schematic Diagram

## Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



## Description

The SSF6912 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	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current – Continuous ( $T_A=25^\circ\text{C}$ )	$I_D$	2.9	A
Drain Current – Continuous ( $T_A=70^\circ\text{C}$ )		2.3	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	11.6	A
Power Dissipation ( $T_A=25^\circ\text{C}$ )	$P_D$	1	W
Power Dissipation – Derate above $25^\circ\text{C}$		0.008	W/°C
Storage Temperature Range	$T_{STG}$	-50 to +150	°C
Operating Junction Temperature Range	$T_J$	-50 to +150	°C

## Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	125	°C/W

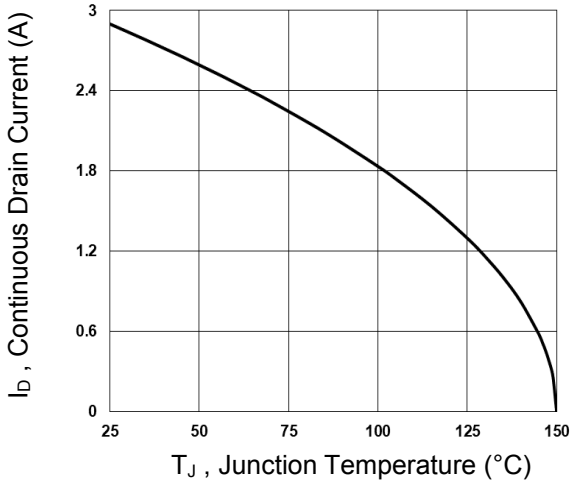
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
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 $25^{\circ}\text{C}$ , $I_D=1\text{mA}$	---	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	$\mu A$
		$V_{DS}=48V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	---	---	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2A$	---	60	75	m $\Omega$
		$V_{GS}=4.5V, I_D=1.5A$	---	70	90	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	-5	---	mV/ $^{\circ}\text{C}$
Forward Transconductance	gfs	$V_{DS}=10V, I_D=1A$	---	7	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2, 3</sup>	$Q_g$	$V_{DS}=48V, V_{GS}=10V, I_D=2A$	---	9.3	14	nC
Gate-Source Charge <sup>2, 3</sup>	$Q_{gs}$		---	2.1	4	
Gate-Drain Charge <sup>2, 3</sup>	$Q_{gd}$		---	1.8	4	
Turn-On Delay Time <sup>2, 3</sup>	$T_{d(on)}$	$V_{DD}=30V, V_{GS}=10V, R_G=3.3\Omega, I_D=1A$	---	2.9	6	nS
Rise Time <sup>2, 3</sup>	$T_r$		---	9.5	18	
Turn-Off Delay Time <sup>2, 3</sup>	$T_{d(off)}$		---	18.4	35	
Fall Time <sup>2, 3</sup>	$T_f$		---	5.3	10	
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, F=1\text{MHz}$	---	500	725	pF
Output Capacitance	$C_{oss}$		---	45	65	
Reverse Transfer Capacitance	$C_{rss}$		---	16	30	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	2	4	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V$ , Force Current	---	---	2.9	A
Pulsed Source Current	$I_{SM}$		---	---	5.8	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	1	V
Reverse Recovery Time <sup>2</sup>	$t_{rr}$	$V_{GS}=30V, I_S=1A,$ $dI/dt=100A/\mu S, T_J=25^{\circ}\text{C}$	---	23.2	---	nS
Reverse Recovery Charge <sup>2</sup>	$Q_{rr}$		---	14.3	---	nC

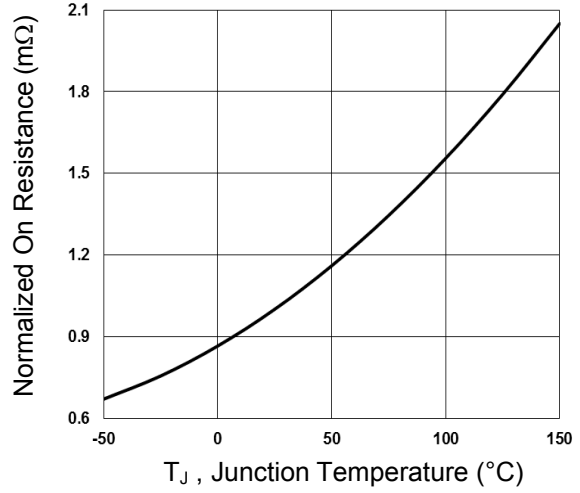
Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width  $\leq 300\mu S$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

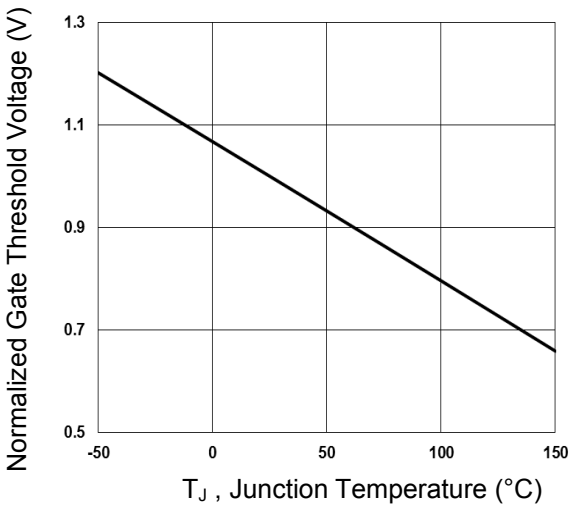
**Typical Electrical and Thermal Characteristic Curves**



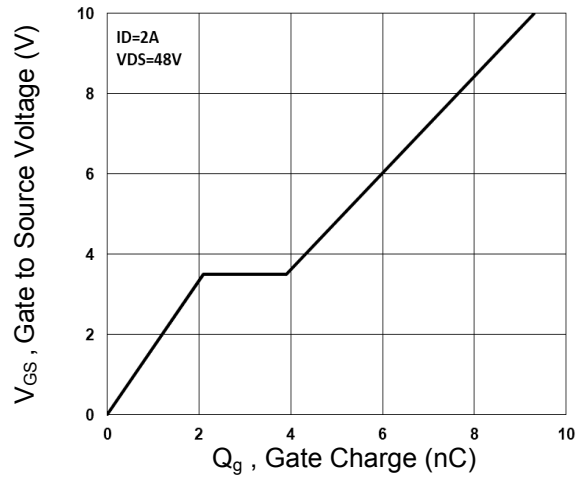
**Fig.1 Continuous Drain Current vs. T<sub>J</sub>**



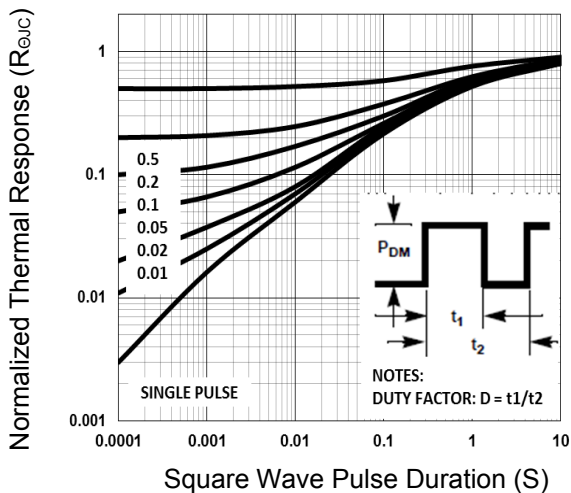
**Fig.2 Normalized R<sub>DS(on)</sub> vs. T<sub>J</sub>**



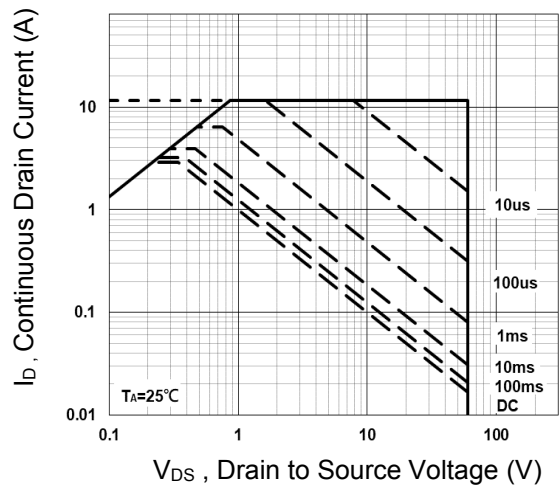
**Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>**



**Fig.4 Gate Charge Waveform**

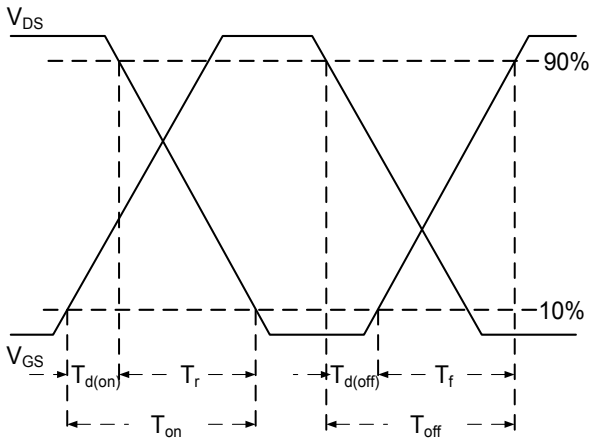


**Fig.5 Normalized Transient Response**

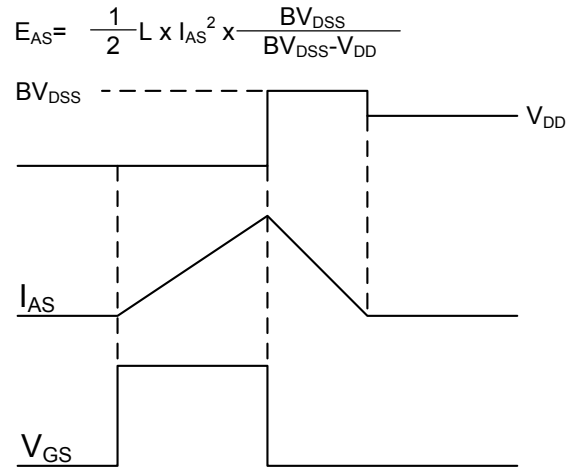


**Fig.6 Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**



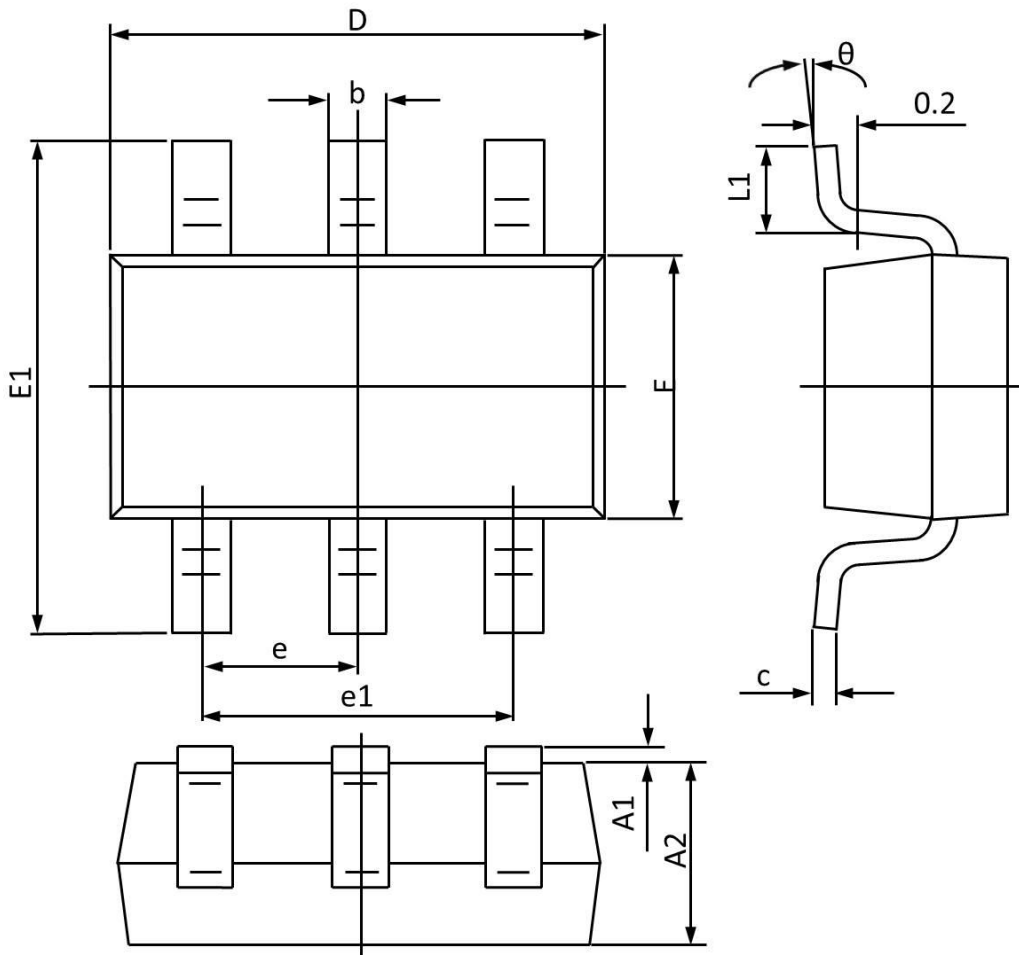
**Fig.7 Switching Time Waveform**



**Fig.8  $E_{AS}$  Waveform**

**Package Outline Dimensions**

**SOT-23-6L**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.040	0.047
b	0.300	0.500	0.012	0.019
c	0.047	0.207	0.002	0.008
D	2.800	3.000	0.110	0.118
E1	2.600	3.000	0.103	0.118
e	0.950 TYP		0.037 TYP	
e1	1.900 TYP		0.075 TYP	
L1	0.250	0.550	0.010	0.021
θ	0°	8°	0°	8°