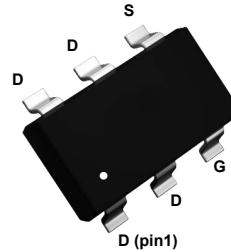
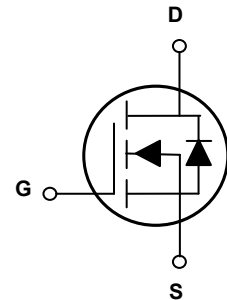


### Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	24mΩ
$I_D$	6.5A



SOT-23-6L



Schematic Diagram

### Features and Benefits

- Advanced MOSFET process technology
- Ideal for MB/VGA/Vcore and load switch
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



### Description

The SSF3912 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	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current – Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	6.5	A
Drain Current – Continuous ( $T_C=100^\circ\text{C}$ )		4.1	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	26	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	32	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	8	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	1.56	W
Power Dissipation – Derate above $25^\circ\text{C}$	$P_D$	0.012	W/ $^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to +150	$^\circ\text{C}$

### Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	80	$^\circ\text{C/W}$

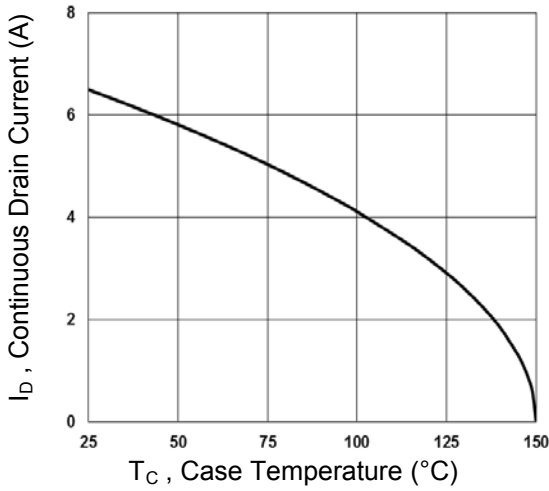
### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	---	---	V
BV <sub>DSS</sub> Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =1mA	---	0.04	---	V/°C
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>Ds</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>Ds</sub> =24V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	---	---	10	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>Ds</sub> =0V	---	---	±100	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance <sup>3</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =6A	---	19	24	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A	---	25	34	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>Ds</sub> , I <sub>D</sub> =250uA	1.2	1.6	2.5	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		---	-4	---	mV/°C
Forward Transconductance	g <sub>fs</sub>	V <sub>Ds</sub> =10V, I <sub>D</sub> =4A	---	6.5	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3, 4</sup>	Q <sub>g</sub>	V <sub>Ds</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A	---	4.1	8	nC
Gate-Source Charge <sup>3, 4</sup>	Q <sub>gs</sub>		---	1	2	
Gate-Drain Charge <sup>3, 4</sup>	Q <sub>gd</sub>		---	2.1	4	
Turn-On Delay Time <sup>3, 4</sup>	T <sub>d(on)</sub>	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω, I <sub>D</sub> =1A	---	2.8	5	nS
Rise Time <sup>3, 4</sup>	T <sub>r</sub>		---	7.2	14	
Turn-Off Delay Time <sup>3, 4</sup>	T <sub>d(off)</sub>		---	15.8	30	
Fall Time <sup>3, 4</sup>	T <sub>f</sub>		---	4.6	9	
Input Capacitance	C <sub>iss</sub>	V <sub>Ds</sub> =25V, V <sub>GS</sub> =0V, F=1MHz	---	345	500	pF
Output Capacitance	C <sub>oss</sub>		---	55	80	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	32	45	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>Ds</sub> =0V, F=1MHz	---	3.2	6.4	Ω
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	6.5	A
Pulsed Source Current <sup>3</sup>	I <sub>SM</sub>		---	---	26	A
Diode Forward Voltage <sup>3</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1	V
Reverse Recovery Time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, di/dt=100A/μS, T <sub>J</sub> =25°C	---	---	---	nS
Reverse Recovery Charge	Q <sub>rr</sub>		---	---	---	nC

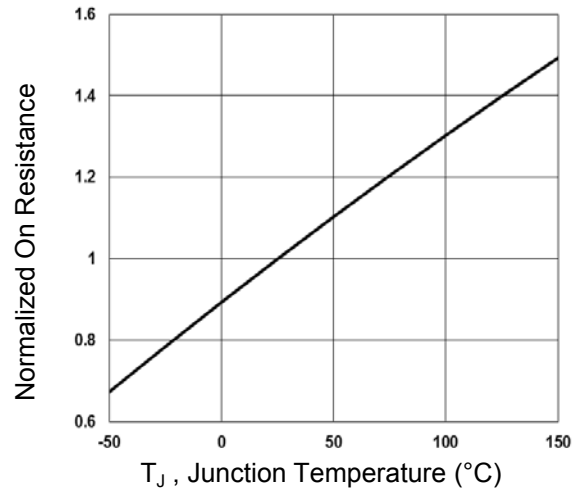
Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=1mH, I<sub>AS</sub>=8A, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
3. The data tested by pulsed, pulse width ≤ 300uS, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

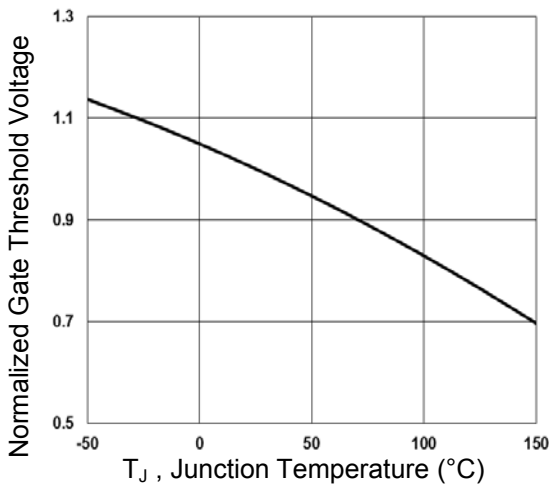
### Typical Electrical and Thermal Characteristics



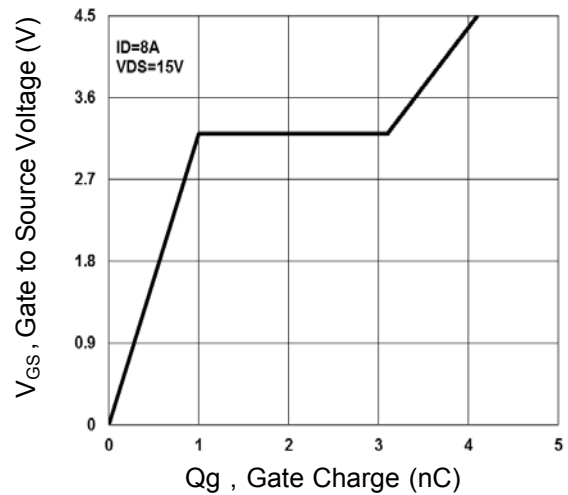
**Fig.1 Continuous Drain Current vs.  $T_C$**



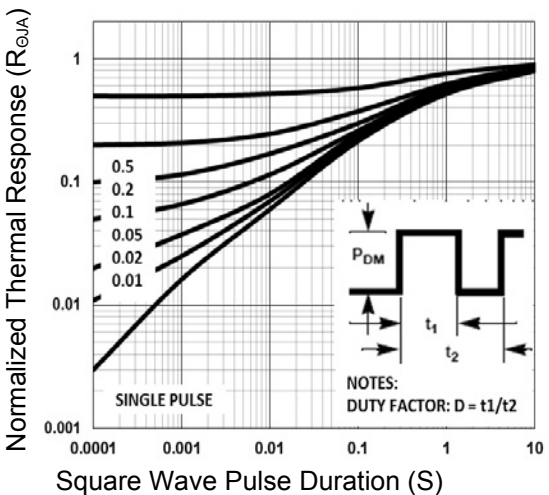
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$**



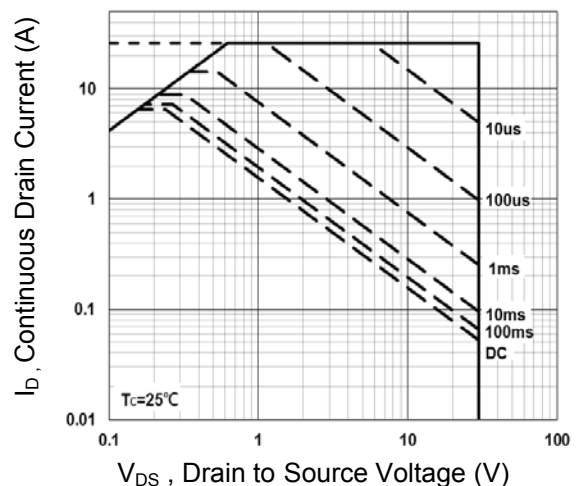
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Waveform**

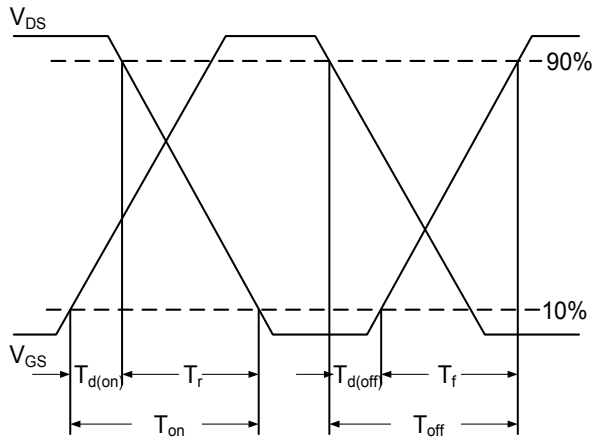


**Fig.5 Normalized Transient Response**

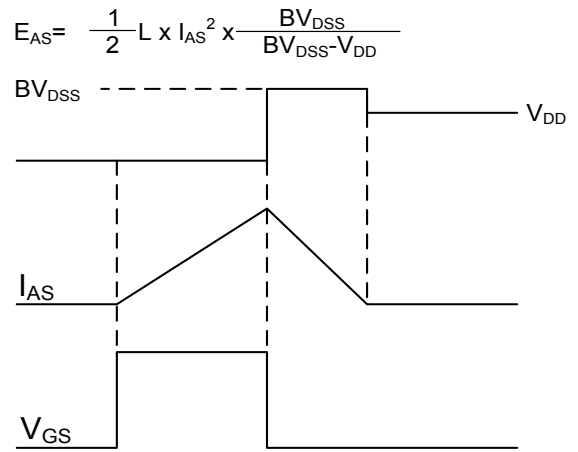


**Fig.6 Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristics**



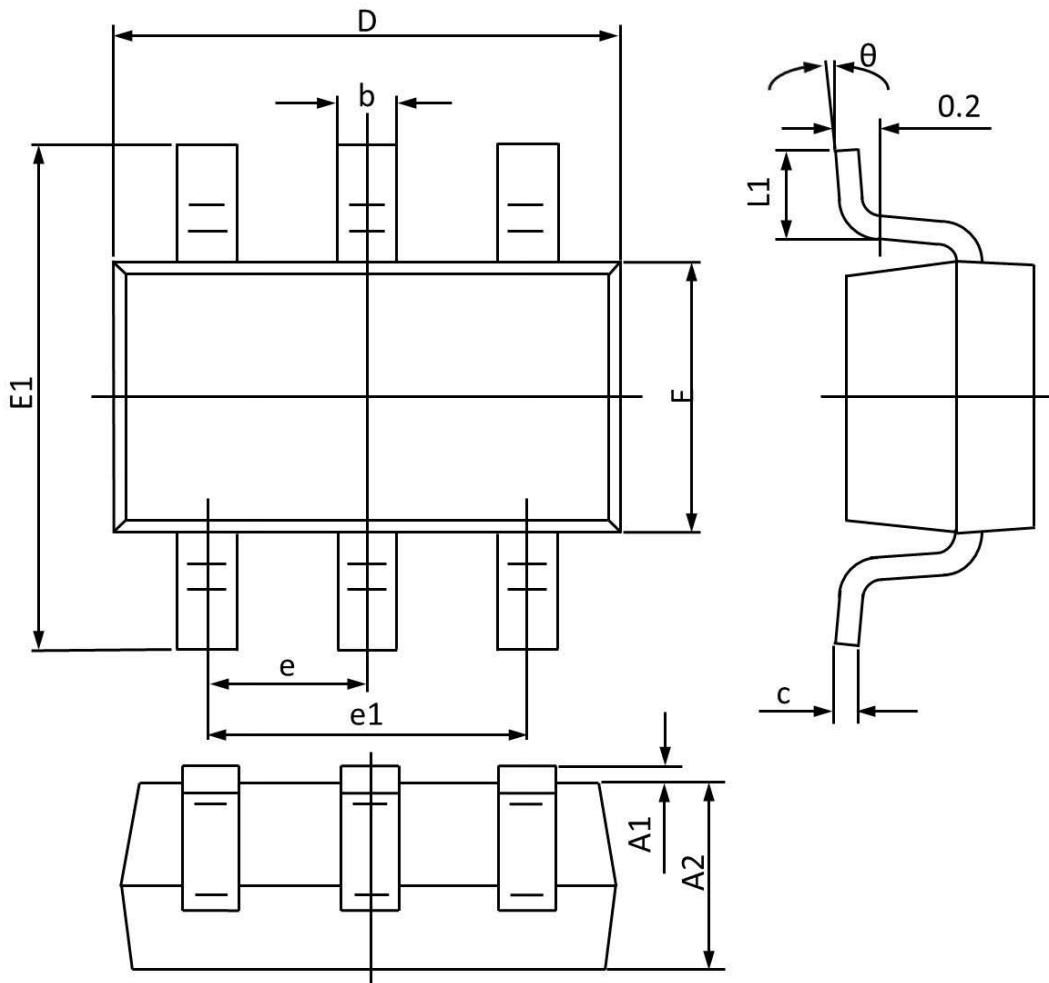
**Fig.7 Switching Time Waveform**



**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
theta	0°	8°	0°	8°