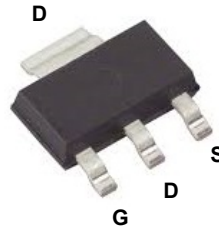
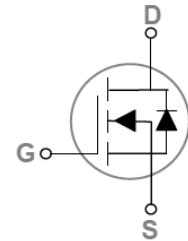


### Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	75m $\Omega$
$I_D$	5A



SOT-223



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 SSFL6912 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<sub>C</sub>=25°C unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current – Continuous (T <sub>C</sub> =25°C)	I <sub>D</sub>	5	A
Drain Current – Continuous (T <sub>C</sub> =100°C)		3.2	A
Drain Current – Pulsed <sup>1</sup>	I <sub>DM</sub>	20	A
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	25	mJ
Single Pulse Avalanche Current <sup>2</sup>	I <sub>AS</sub>	7	A
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	1.79	W
Power Dissipation – Derate above 25°C		0.014	W/°C
Storage Temperature Range	T <sub>STG</sub>	-50 to +150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-50 to +150	°C

### Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	---	70	°C/W
Thermal Resistance Junction to Case	R <sub>θJC</sub>	---	30	°C/W

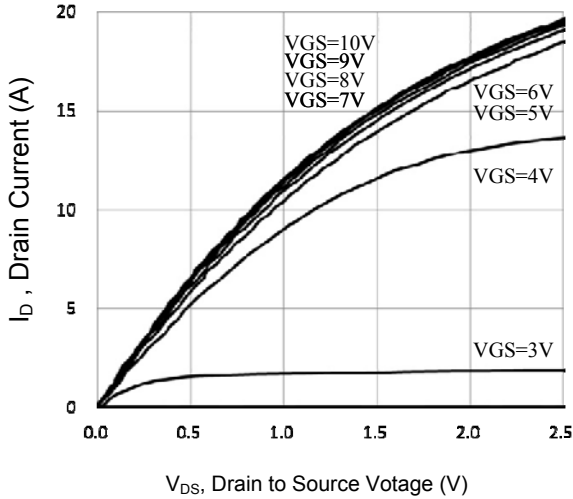
### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

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	60	---	---	V
BV <sub>DSS</sub> Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =1mA	---	0.05	---	V/°C
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =48V, 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	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =5A	---	60	75	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	---	70	90	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.2	1.8	2.5	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		---	-5	---	mV/°C
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =3A	---	7	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	Q <sub>g</sub>	V <sub>DS</sub> =48V, V <sub>GS</sub> =10V, I <sub>D</sub> =5A	---	9.3	14	nC
Gate-Source Charge <sup>2,3</sup>	Q <sub>gs</sub>		---	2.1	4	
Gate-Drain Charge <sup>2,3</sup>	Q <sub>gd</sub>		---	1.8	4	
Turn-On Delay Time <sup>2,3</sup>	T <sub>d(on)</sub>	V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω, I <sub>D</sub> =1A	---	2.9	6	nS
Rise Time <sup>2,3</sup>	T <sub>r</sub>		---	9.5	18	
Turn-Off Delay Time <sup>2,3</sup>	T <sub>d(off)</sub>		---	18.4	35	
Fall Time <sup>2,3</sup>	T <sub>f</sub>		---	5.3	10	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, F=1MHz	---	500	725	pF
Output Capacitance	C <sub>oss</sub>		---	45	65	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	16	30	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	---	2	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	---	---	5	A
Pulsed Source Current	I <sub>SM</sub>		---	---	20	A
Diode Forward Voltage	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	---	23.2	---	nS
Reverse Recovery Charge	Q <sub>rr</sub>		---	14.3	---	nC

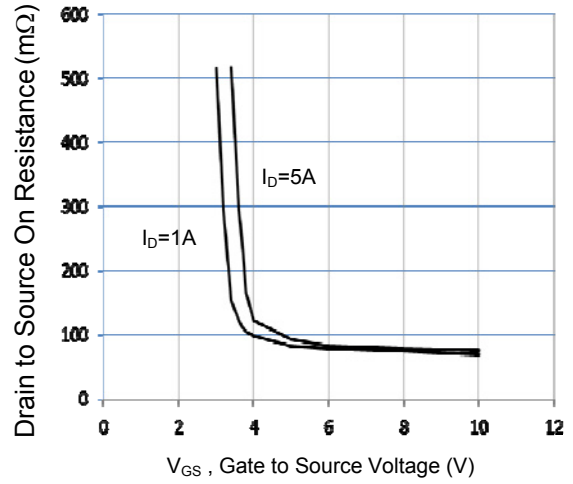
Note:

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>=7A, 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.

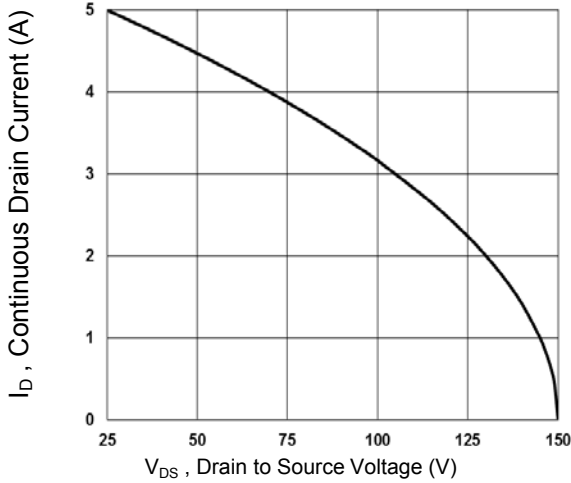
### Typical Electrical and Thermal Characteristic Curves



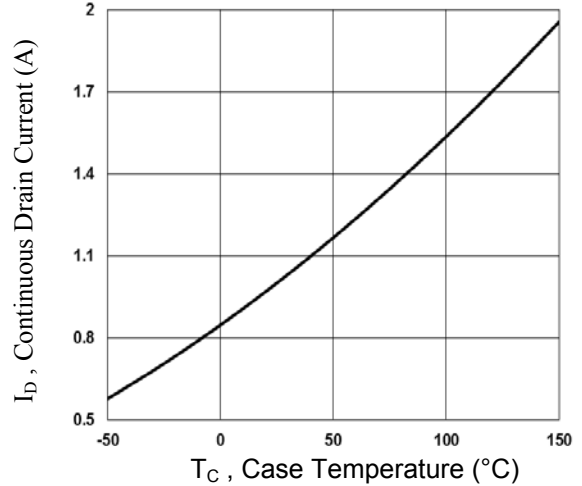
**Fig. 1 Typical Output Characteristics**



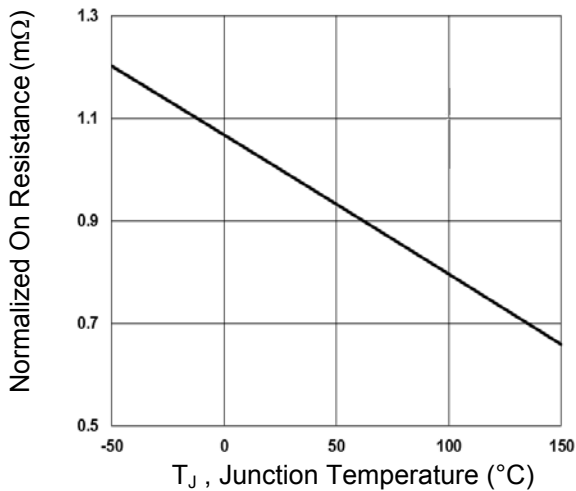
**Fig.2  $R_{DS(ON)}$  vs. Gate Voltage**



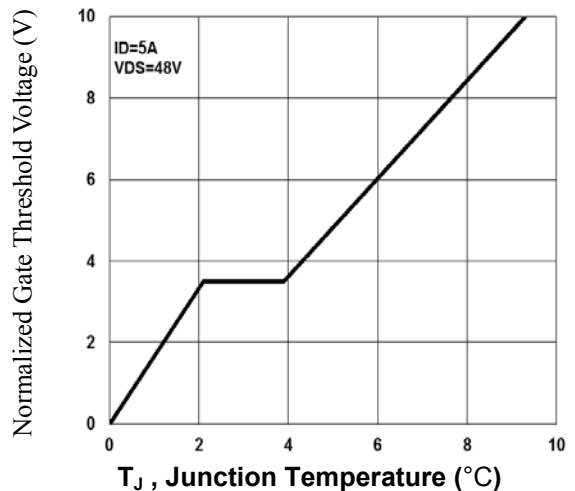
**Fig.3 Output Characteristics**



**Fig.4 Continuous Drain Current vs.  $T_C$**

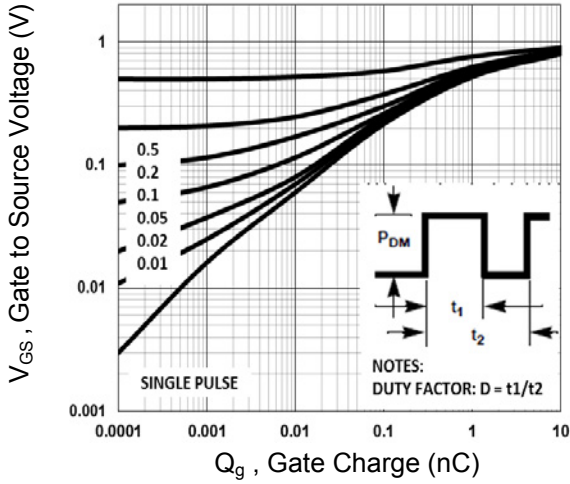


**Fig.5 Normalized  $R_{DS(ON)}$  vs.  $T_J$**

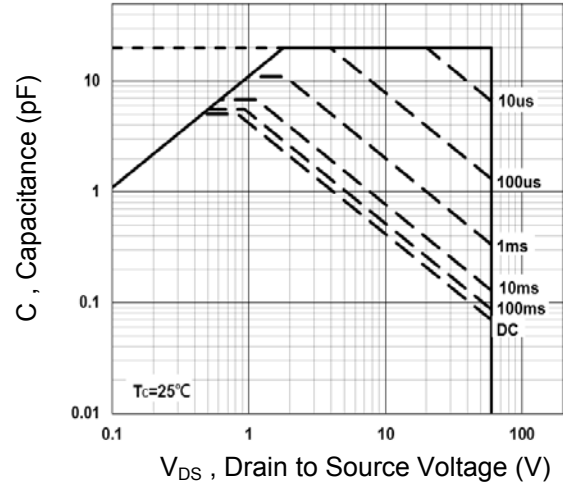


**Fig.6 Normalized  $V_{th}$  vs.  $T_J$**

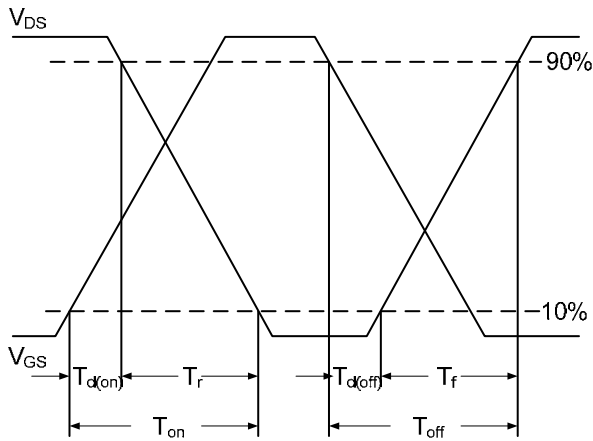
### Typical Electrical and Thermal Characteristic Curves



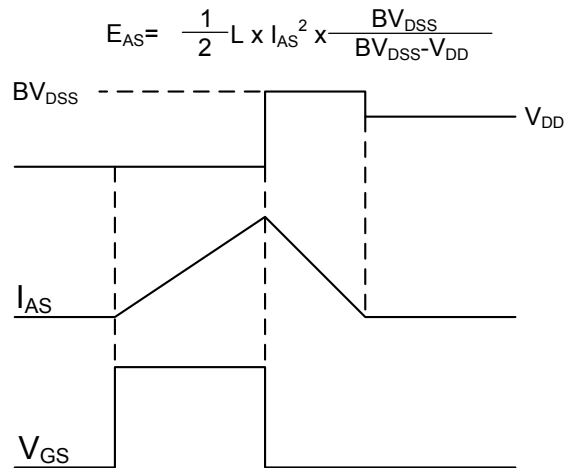
**Fig.7 Gate Charge Waveform**



**Fig.8 Capacitance Characteristics**

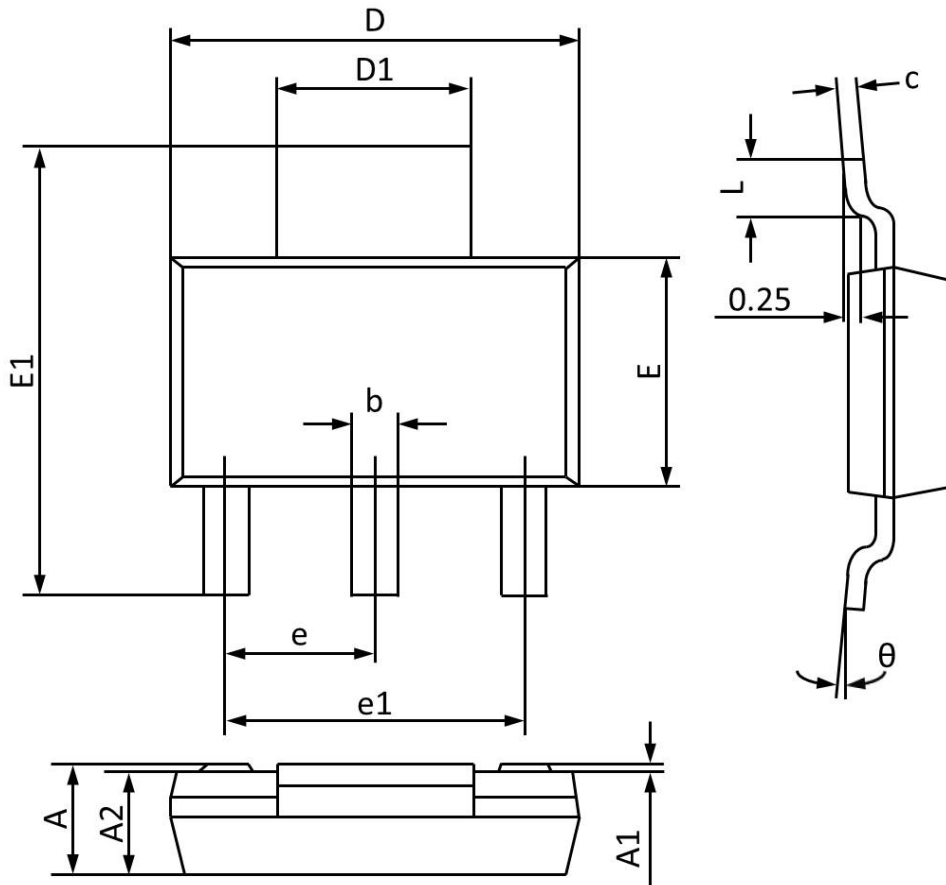


**Fig.9 Switching Time Waveform**



**Fig.10 E<sub>AS</sub> Waveform**

## Package Outline Dimensions SOT-223



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300 (BSC)		0.091 (BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°