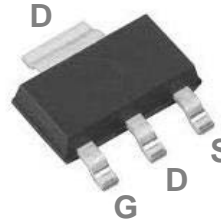
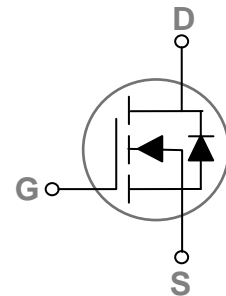


### Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(on)}$	60mΩ
$I_D$	6.8A



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 SSF6910 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	Value	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>	6.8	A
Drain Current – Continuous (T <sub>C</sub> =100°C)		4.3	A
Drain Current – Pulsed <sup>1</sup>	I <sub>DM</sub>	27.2	A
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	11	mJ
Single Pulse Avalanche Current <sup>2</sup>	I <sub>AS</sub>	15	A
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	5.4	W
Power Dissipation – Derate above 25°C	P <sub>D</sub>	0.043	W/°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to +150	°C

### Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	---	85	°C/W
Thermal Resistance Junction to Case	R <sub>θJC</sub>	---	23	°C/W

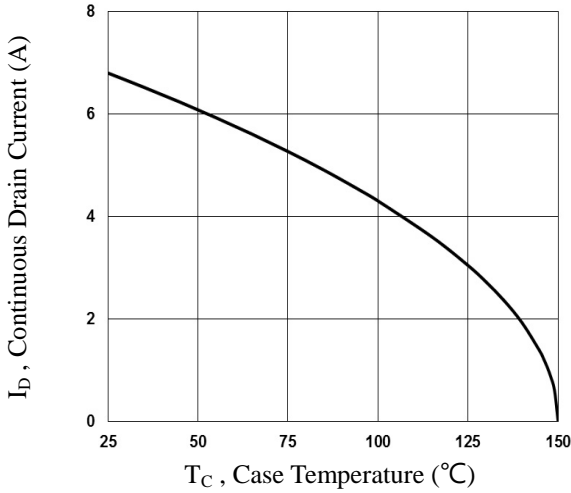
### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

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> =6A	---	50	60	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	---	56	70	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.2	1.8	2.5	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		---	-4.2	---	mV/°C
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =4A	---	10	---	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> =8A	---	14	21	nC
Gate-Source Charge <sup>2, 3</sup>	Q <sub>gs</sub>		---	2.9	5	
Gate-Drain Charge <sup>2, 3</sup>	Q <sub>gd</sub>		---	2.4	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> =6Ω I <sub>D</sub> =8A	---	14	27	ns
Rise Time <sup>2, 3</sup>	T <sub>r</sub>		---	4	8	
Turn-Off Delay Time <sup>2, 3</sup>	T <sub>d(off)</sub>		---	32	60	
Fall Time <sup>2, 3</sup>	T <sub>f</sub>		---	2	4	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, F=1MHz	---	835	1300	pF
Output Capacitance	C <sub>oss</sub>		---	69	130	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	40	80	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	---	1.7	3.4	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	---	---	6.8	A
Pulsed Source Current	I <sub>SM</sub>		---	---	13.6	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 <sup>2</sup>	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-8A, dI/dt=100A/μs, T <sub>J</sub> =25°C	---	14.6	---	ns
Reverse Recovery Charge <sup>2</sup>	Q <sub>rr</sub>		---	6.6	---	nC

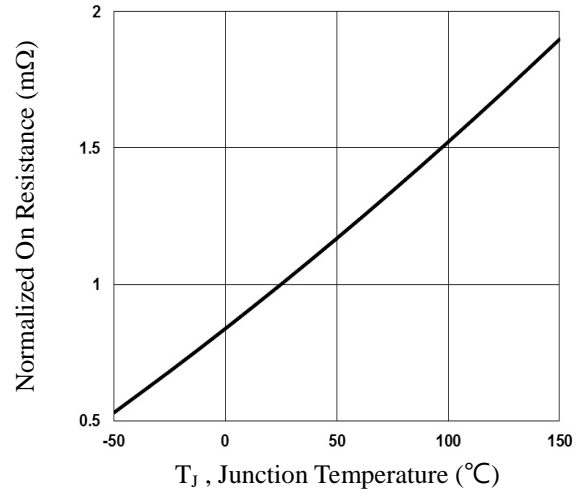
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=15A., 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.

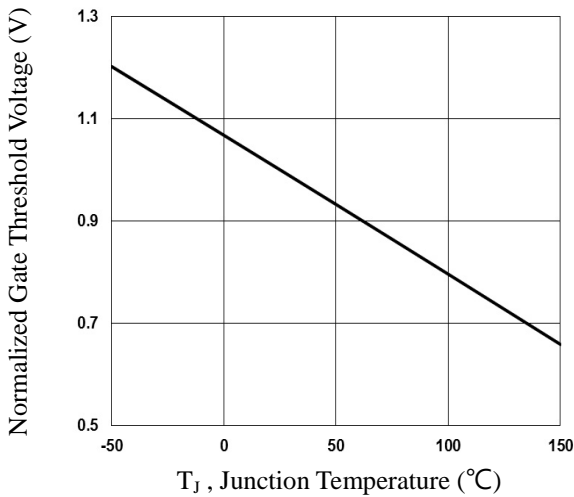
**Typical Electrical and Thermal Characteristics**



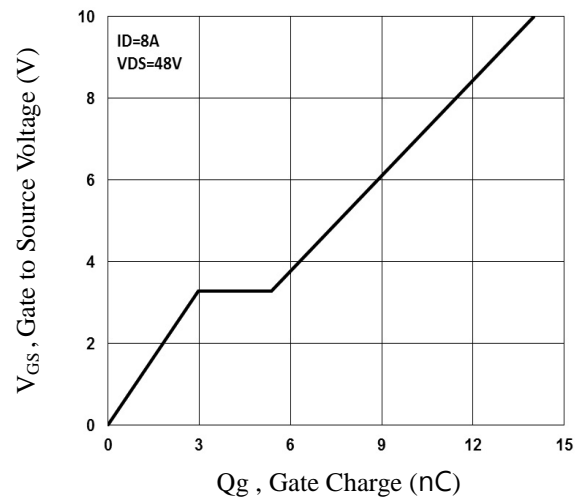
**Fig.1 Continuous Drain Current vs.  $T_c$**



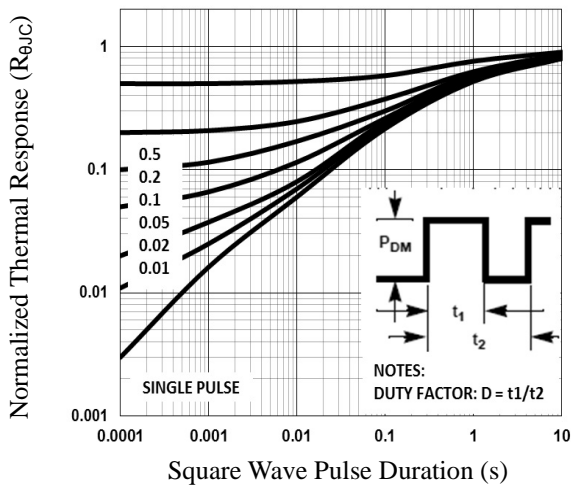
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



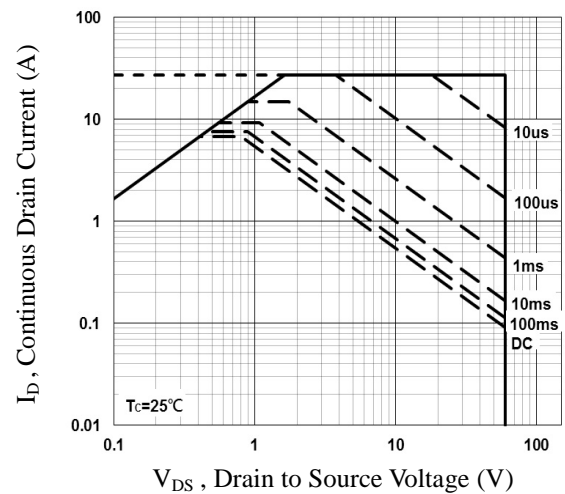
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**

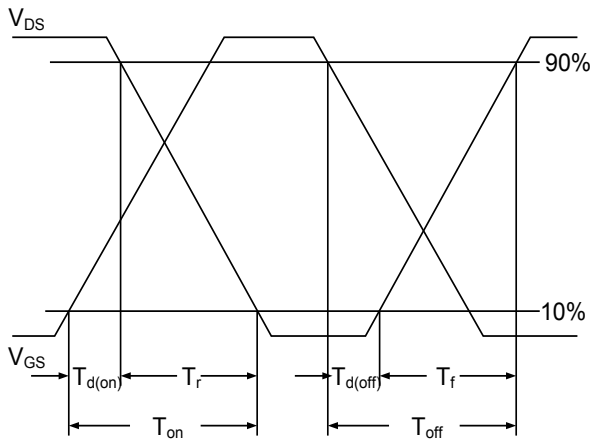


**Fig.5 Normalized Transient Impedance**

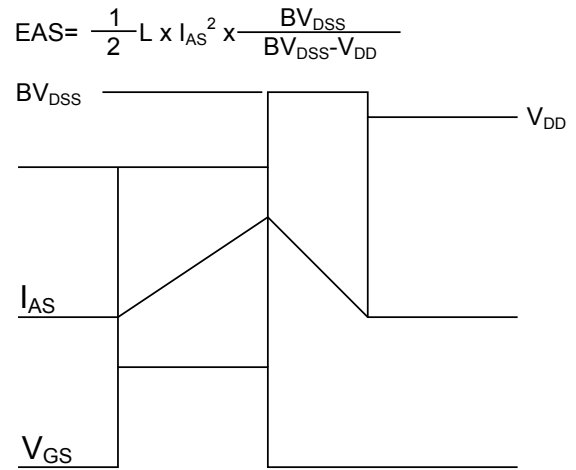


**Fig.6 Maximum Safe Operation Area**

## Typical Electrical and Thermal Characteristics



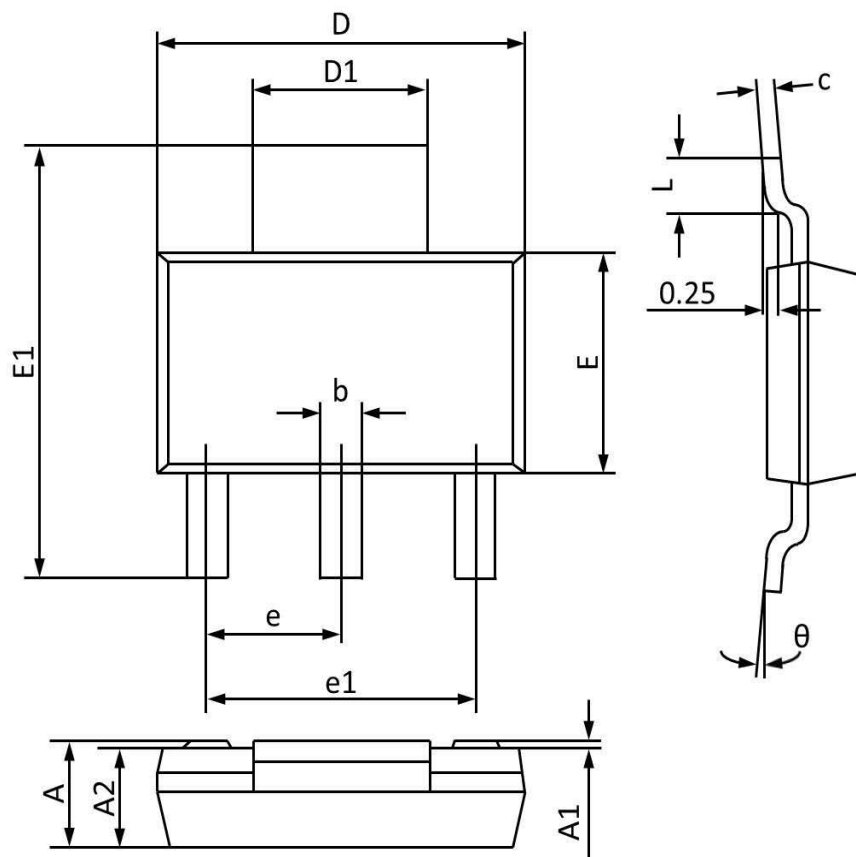
**Fig.7 Switching Time Waveform**



**Fig.8 EAS 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°