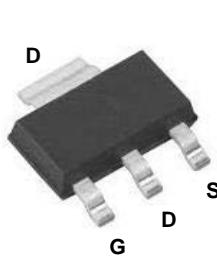
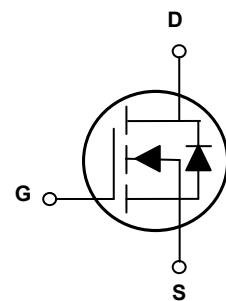


Main Product Characteristics

$V_{(BR)DSS}$	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 ($T_c=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_c=25^\circ\text{C}$)	I_D	6.8	A
Drain Current-Continuous ($T_c=100^\circ\text{C}$)		4.3	
Drain Current-Pulsed ¹	I_{DM}	27.2	A
Single Pulse Avalanche Energy ²	E_{AS}	11	mJ
Single Pulse Avalanche Current ²	I_{AS}	15	A
Power Dissipation ($T_c=25^\circ\text{C}$)	P_D	5.4	W
Power Dissipation-Derate above 25°C		0.043	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	85	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	23	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_D=250\mu\text{A}$	60	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to 25°C , $\text{I}_D=1\text{mA}$	-	0.05	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$\text{V}_{\text{DS}}=60\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	μA
		$\text{V}_{\text{DS}}=48\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$\text{V}_{\text{GS}}=\pm 20\text{V}, \text{V}_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Static Drain-Source On-Resistance	$\text{R}_{\text{DS}(\text{ON})}$	$\text{V}_{\text{GS}}=10\text{V}, \text{I}_D=6\text{A}$	-	50	60	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=4.5\text{V}, \text{I}_D=3\text{A}$	-	56	70	$\text{m}\Omega$
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}, \text{I}_D=250\mu\text{A}$	1.2	1.8	2.5	V
$\text{V}_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta \text{V}_{\text{GS}(\text{th})}$		-	-4.2	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{fs}	$\text{V}_{\text{DS}}=10\text{V}, \text{I}_D=4\text{A}$	-	10	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$\text{V}_{\text{DS}}=48\text{V}, \text{I}_D=8\text{A}, \text{V}_{\text{GS}}=10\text{V}$	-	14	21	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	2.9	5	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	2.4	4	
Turn-On Delay Time ^{2,3}	$\text{t}_{\text{d}(\text{on})}$	$\text{V}_{\text{DD}}=30\text{V}, \text{R}_G=6\Omega, \text{V}_{\text{GS}}=10\text{V}, \text{I}_D=8\text{A}$	-	14	27	nS
Rise Time ^{2,3}	t_r		-	4	8	
Turn-Off Delay Time ^{2,3}	$\text{t}_{\text{d}(\text{off})}$		-	32	60	
Fall Time ^{2,3}	t_f		-	2	4	
Input Capacitance	C_{iss}	$\text{V}_{\text{DS}}=25\text{V}, \text{V}_{\text{GS}}=0\text{V}, \text{F}=1\text{MHz}$	-	835	1300	pF
Output Capacitance	C_{oss}		-	69	130	
Reverse Transfer Capacitance	C_{rss}		-	40	80	
Gate Resistance	R_g	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=0\text{V}, \text{F}=1\text{MHz}$	-	1.7	3.4	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_s	VG=VD=0V, Force Current	-	-	6.8	A
Pulsed Source Current	I_{SM}		-	-	13.6	A
Diode Forward Voltage	V_{SD}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time ²	t_{rr}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_s=-8\text{A}, \text{di/dt}=100\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	-	14.6	-	nS
Reverse Recovery Charge ²	Q_{rr}		-	6.6	-	nC

Note:

- Repetitive rating: Pulsed width limited by maximum junction temperature.
- $\text{V}_{\text{DD}}=25\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{L}=0.1\text{mH}, \text{I}_{\text{AS}}=15\text{A}$, starting $T_J=25^\circ\text{C}$.
- Pulse test: pulse width $\leq 300\text{us}$, duty cycle $\leq 2\%$.
- Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristics

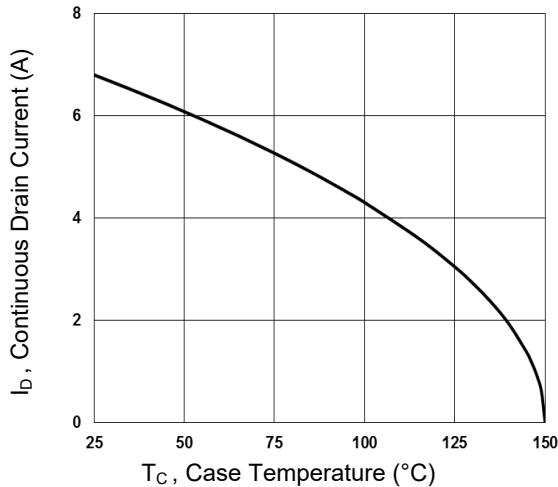


Figure 1. Continuous Drain Current vs. T_c

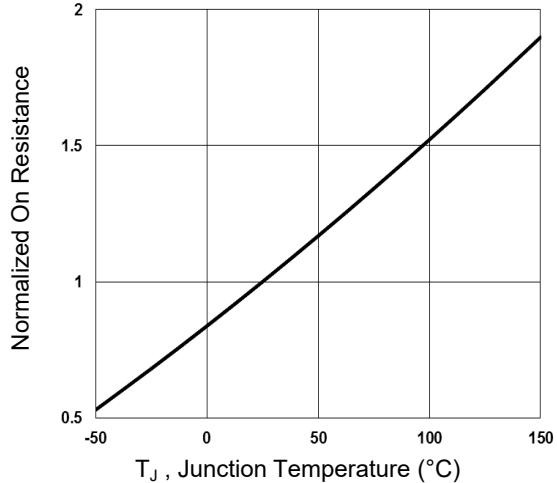


Figure 2. Normalized R_{DSON} vs. T_j

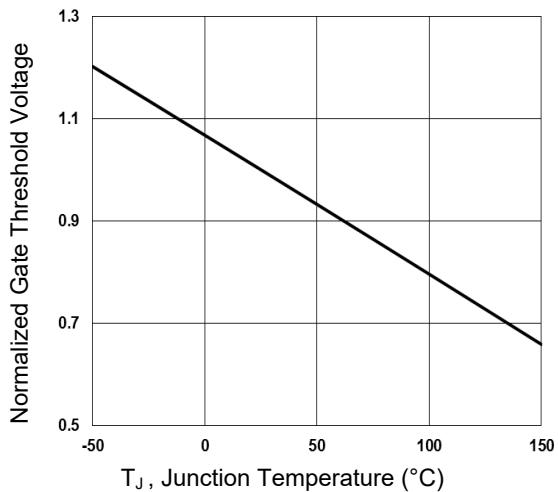


Figure 3. Normalized V_{th} vs. T_j

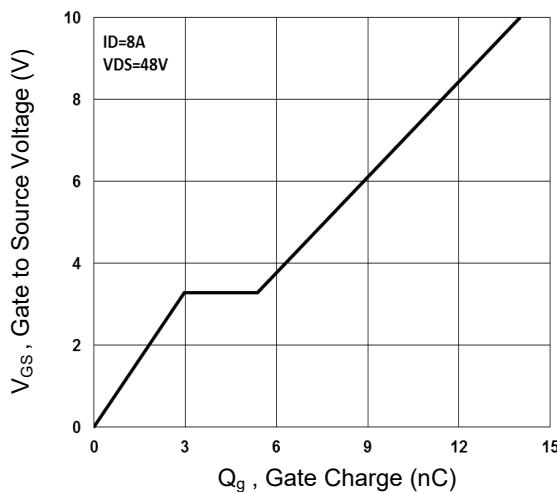


Figure 4. Gate Charge Waveform

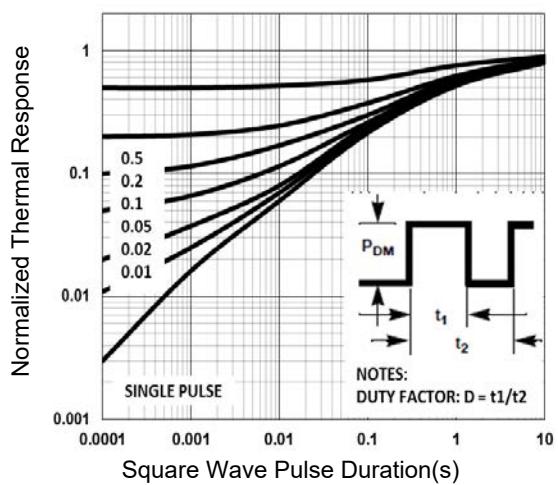


Figure 5. Normalized Transient Impedance

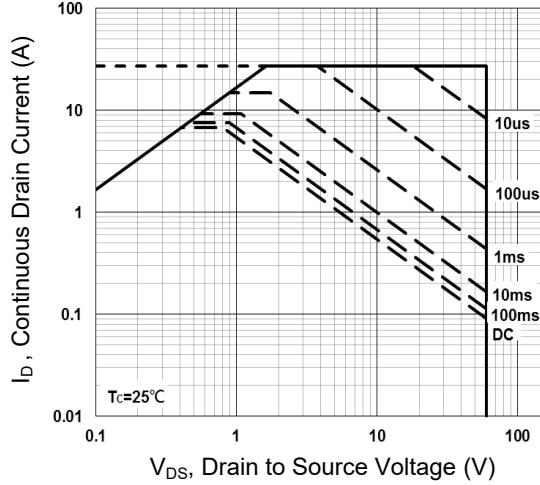


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

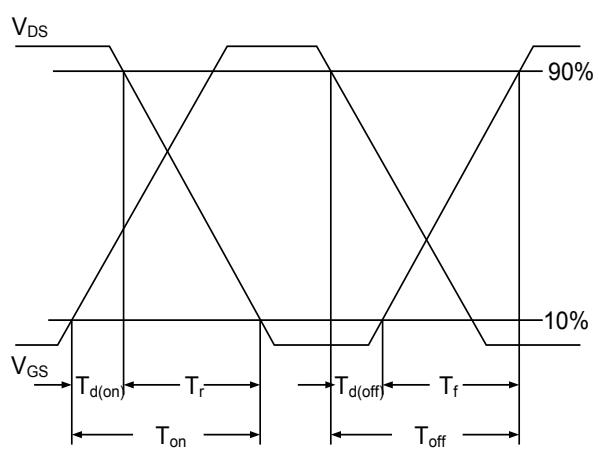


Figure 7. Switching Time Waveform

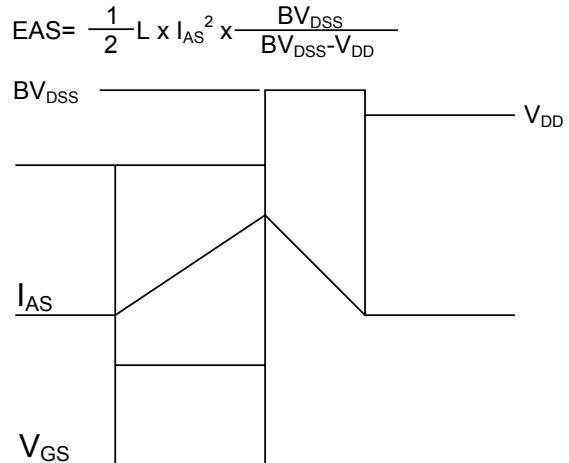
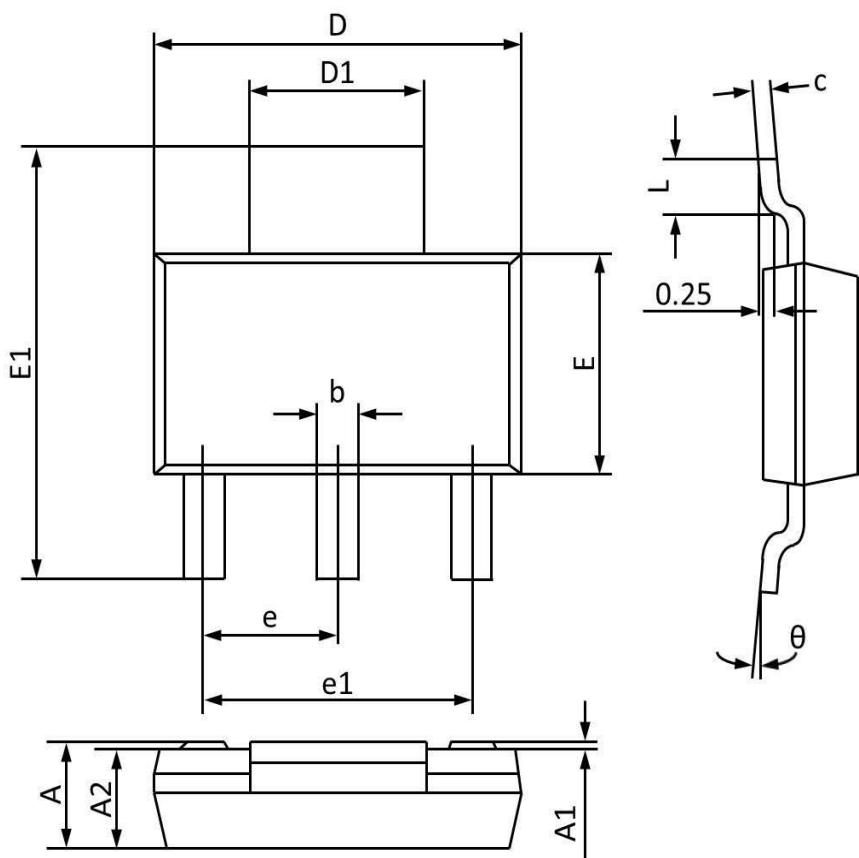


Figure 8. EAS Waveform

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°