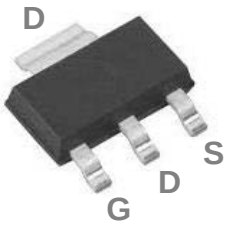
GOOD-ARK SEMICONDUCTOR

SSF6910

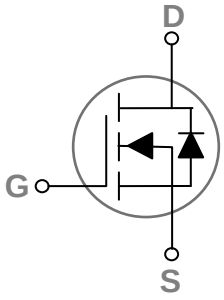
60V N-Channel MOSFET

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°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current – Continuous (T_C=25°C)	I_D	6.8	A
Drain Current – Continuous (T_C=100°C)		4.3	A
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°C)	P_D	5.4	W
Power Dissipation – Derate above 25°C	P_D	0.043	W/°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	85	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	23	°C/W

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	60	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C , I_D=1mA	---	0.05	---	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=48V , V_{GS}=0V , T_J=125°C	---	---	10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=6A	---	50	60	mΩ
		V_{GS}=4.5V , I_D=3A	---	56	70	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.2	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	-4.2	---	mV/°C
Forward Transconductance	gfs	V_{DS}=10V , I_D=4A	---	10	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=48V , V_{GS}=10V , I_D=8A	---	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]	$T_{d(on)}$	V_{DD}=30V , V_{GS}=10V , R_G=6Ω I_D=8A	---	14	27	ns
Rise Time[2,3]	T_r		---	4	8	
Turn-Off Delay Time[2,3]	$T_{d(off)}$		---	32	60	
Fall Time[2,3]	T_f		---	2	4	
Input Capacitance	C_{iss}	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	835	1300	pF
Output Capacitance	C_{oss}		---	69	130	
Reverse Transfer Capacitance	C_{rss}		---	40	80	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	1.7	3.4	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V , Force Current	---	---	6.8	A
Pulsed Source Current	I_{SM}		---	---	13.6	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25°C	---	---	1	V
Reverse Recovery Time[2]	t_{rr}	V_{GS}=0V,I_S=-8A , dI/dt=100A/μs, T_J=25°C	---	14.6	---	ns
Reverse Recovery Charge[2]	Q_{rr}		---	6.6	---	nC

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=15A., Starting T_J=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

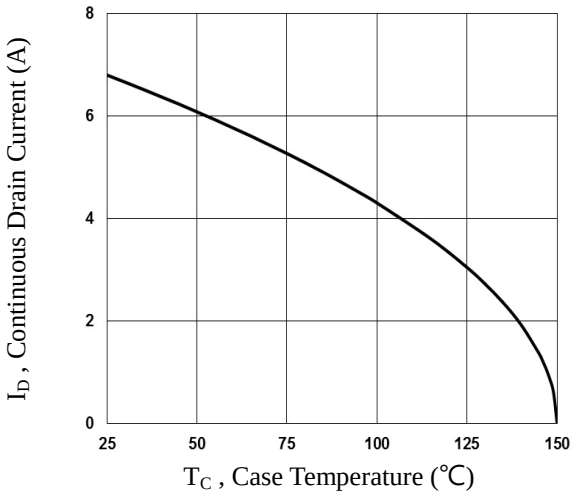


Fig.1 Continuous Drain Current vs. T_C

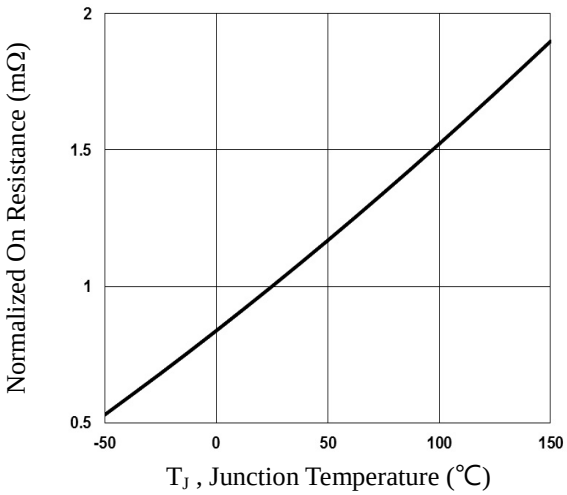


Fig.2 Normalized RDSON vs. T_J

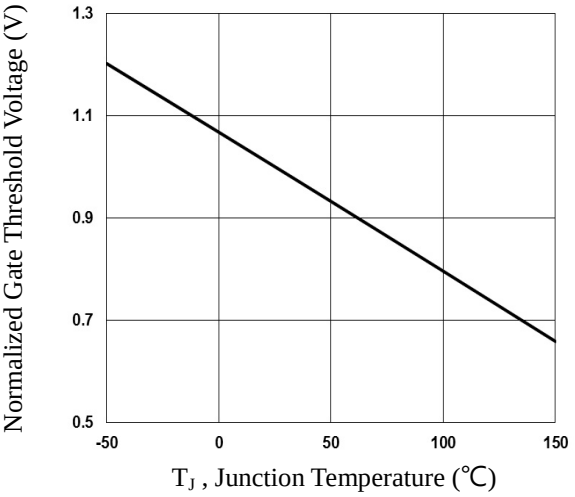


Fig.3 Normalized V_{th} vs. T_J

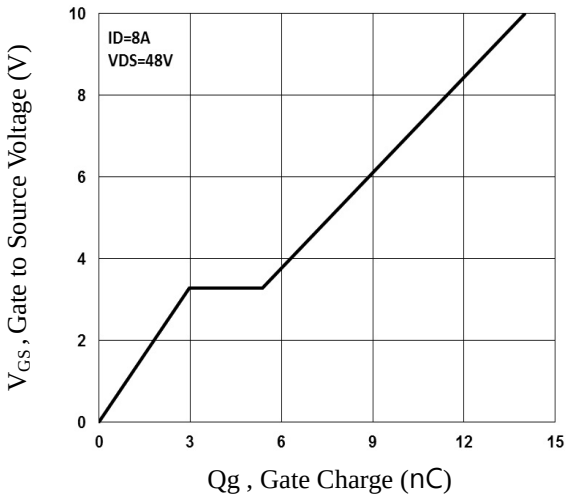


Fig.4 Gate Charge Waveform

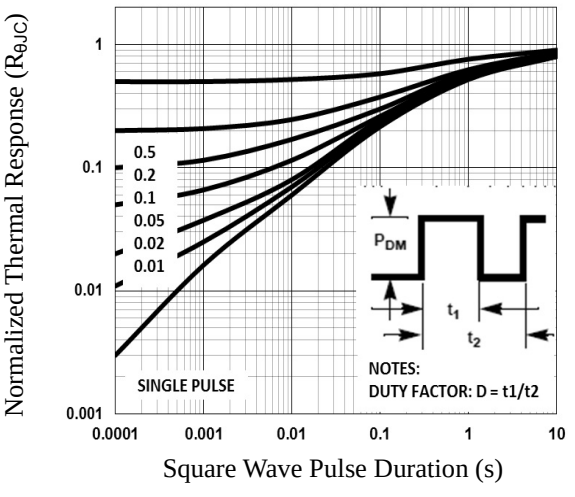


Fig.5 Normalized Transient Impedance

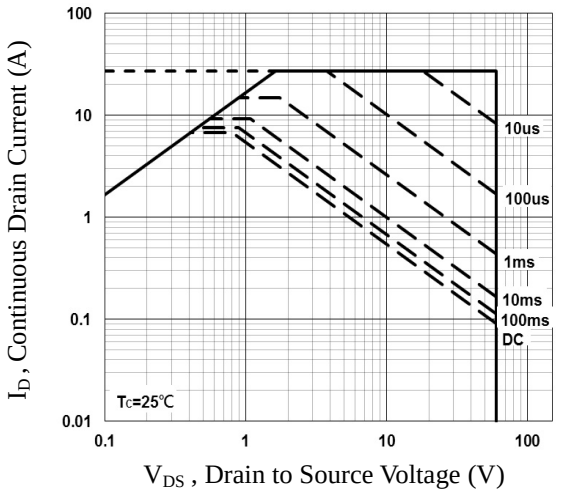


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

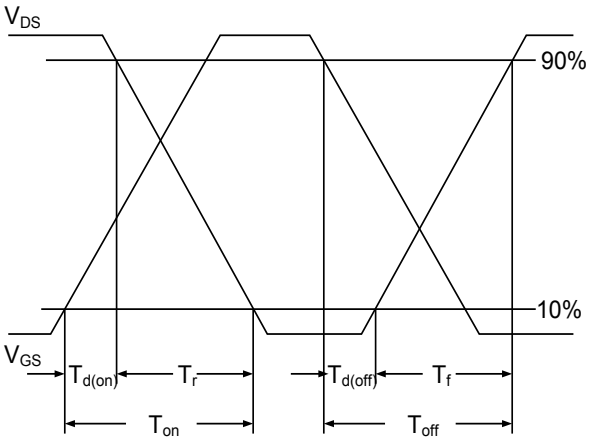


Fig.7 Switching Time Waveform

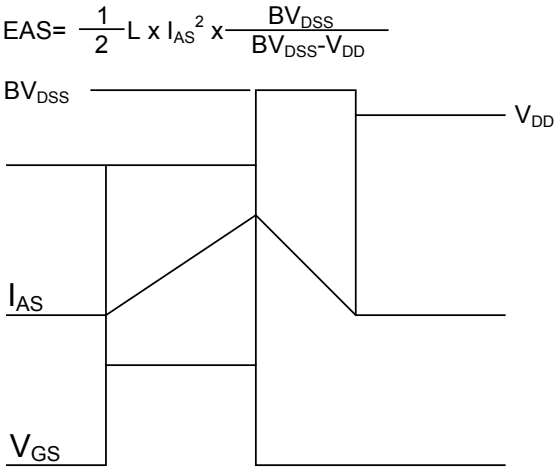
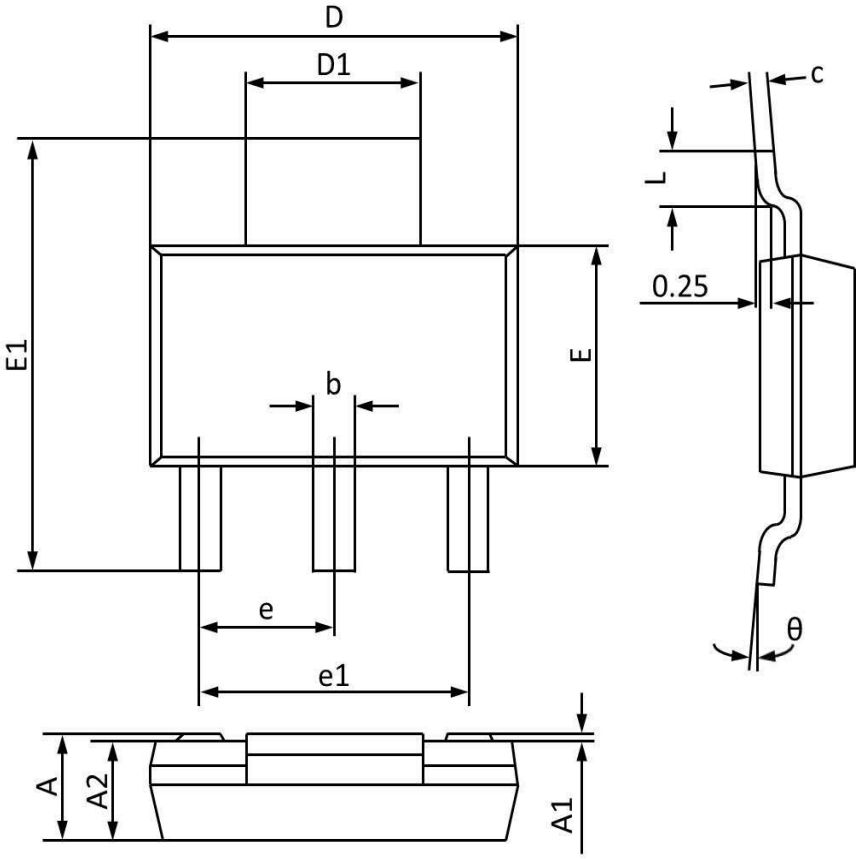


Fig.8 EAS Waveform

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°