GOOD-ARK
SEMICONDUCTOR

SSFL6912
60V N-Channel MOSFET

Main Product Characteristics

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

D

S

D

G

SOT-223

D

G

S

Schematic Diagram

RoHS
Compliant

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_C=25°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_A=25°C)	I_D	5	A
Drain Current-Continuous (T_A=70°C)		4	
Drain Current-Pulsed[1]	I_{DM}	20	A
Single Pulse Avalanche Energy[2]	E_{AS}	8	mJ
Single Pulse Avalanche Current[2]	I_{AS}	12.8	A
Power Dissipation (T_A=25°C)	P_D	1.79	W
Power Dissipation-Derate above 25°C		0.014	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{θJA}$	70	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

GOOD-ARK

SEMICONDUCTOR

SSFL6912
60V N-Channel MOSFET

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250µA	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	µA
		V_{DS}=48V, V_{GS}=0V, T_J=125°C	-	-	10	µA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5A	-	60	75	mΩ
		V_{GS}=4.5V, I_D=3A	-	70	90	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250µA	1.2	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		-	-5	-	mV/°C
Forward Transconductance	g_{fs}	V_{DS}=10V, I_D=3A	-	7	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=30V, I_D=3A, V_{GS}=10V	-	4.6	8	nC
Gate-Source Charge[2,3]	Q_{gs}		-	0.4	3	
Gate-Drain Charge[2,3]	Q_{gd}		-	2	4	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=30V, R_G=6Ω, V_{GS}=10V, I_D=3A	-	2.9	*6*	nS
Rise Time[2,3]	t_r		-	9.5	18	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	18.4	35	
Fall Time[2,3]	t_f		-	5.3	10	
Input Capacitance	C_{Iss}	V_{DS}=30V, V_{GS}=0V, F=1MHz	-	360	540	pF
Output Capacitance	C_{oss}		-	30	45	
Reverse Transfer Capacitance	C_{rss}		-	20	30	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	2	4	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	5	A
Pulsed Source Current	I_{SM}		-	-	20	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_R=50V, I_S=3A, di/dt=100A/µs, T_J=25°C	-	25	-	nS
Reverse Recovery Charge[2]	Q_{rr}		-	15	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=12.8A, R_G=25Ω, starting T_J=25°C.
3. Pulse test: pulse width ≤300us, duty cycle≤2%.
4. Essentially independent of operation temperature.

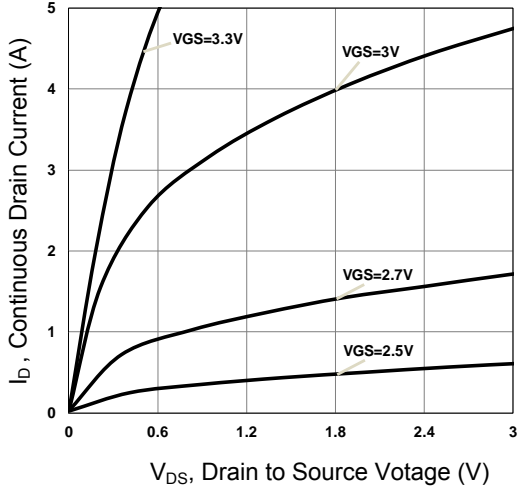# Typical Electrical and Thermal Characteristic Curves
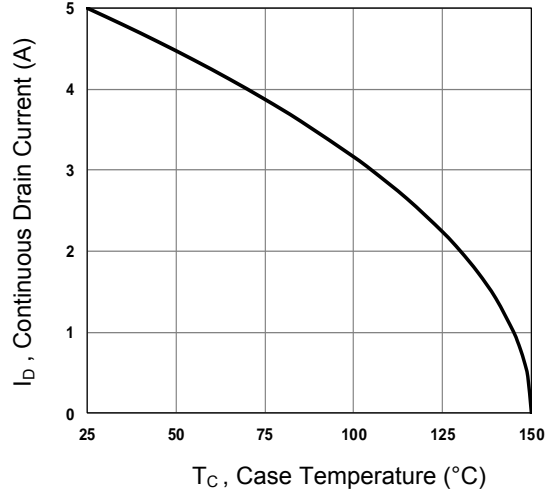

Figure 1. Typical Output Characteristics

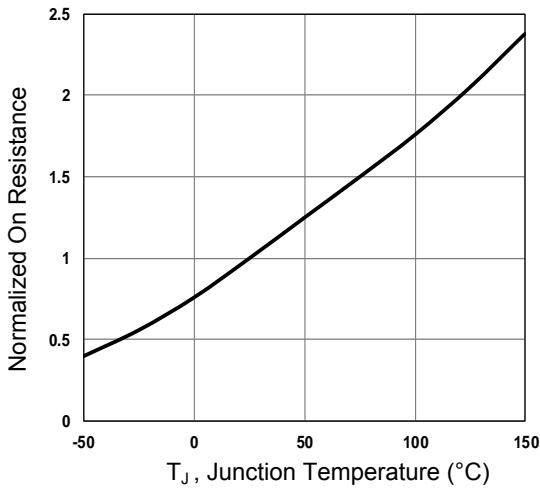Figure 2. Continuous Drain Current vs. T_C

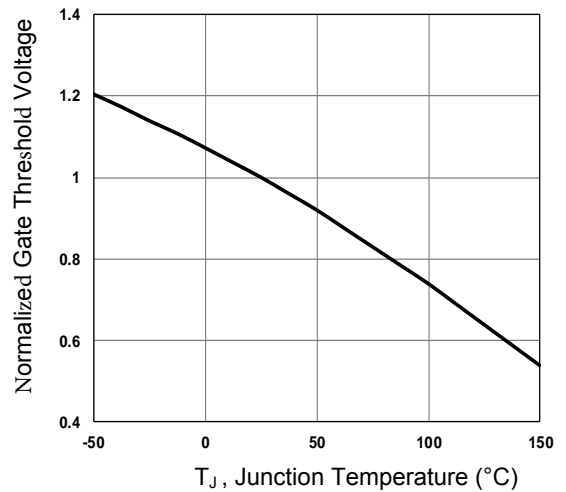Figure 3. Normalized R_{DSON} vs. T_J

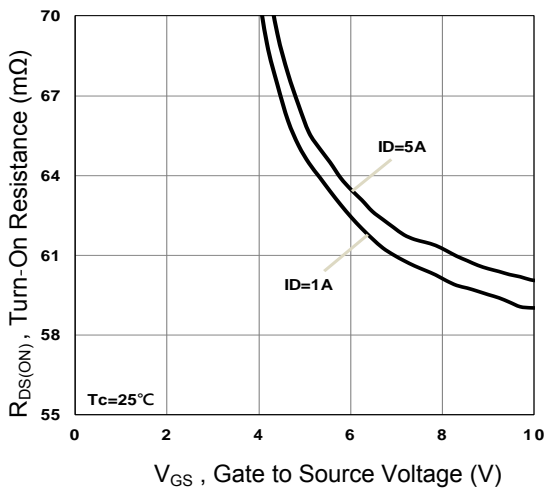
Figure 4. Normalized V_{th} vs. T_J
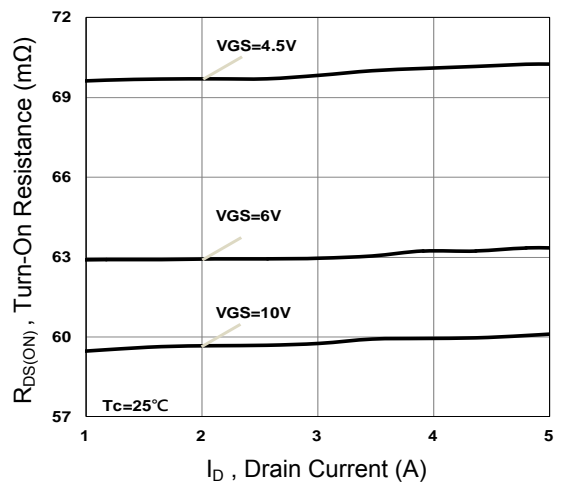

Figure 5. Turn-On Resistance vs. V_{GS}

Figure 6. Turn-On Resistance vs. I_D

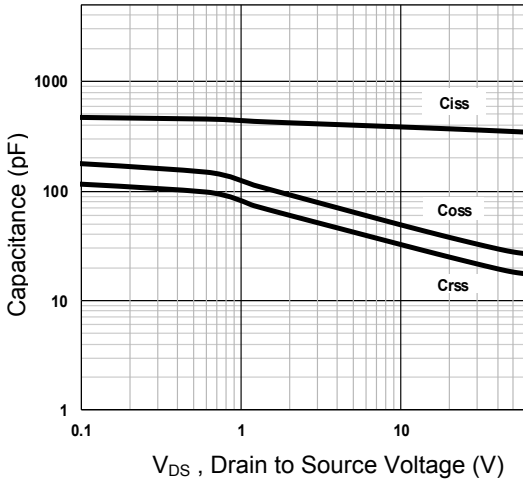# Typical Electrical and Thermal Characteristic Curves

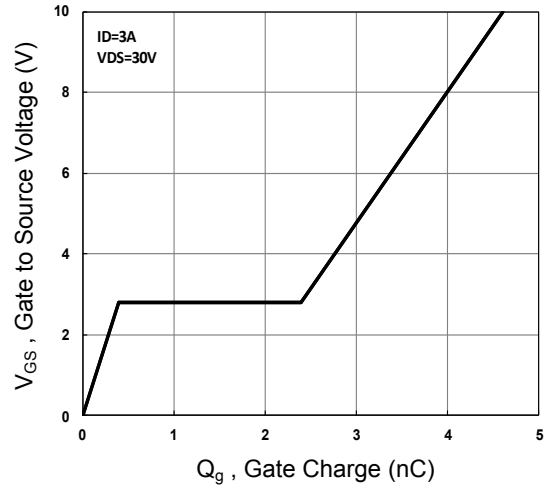**Figure 7. Capacitance Characteristics**
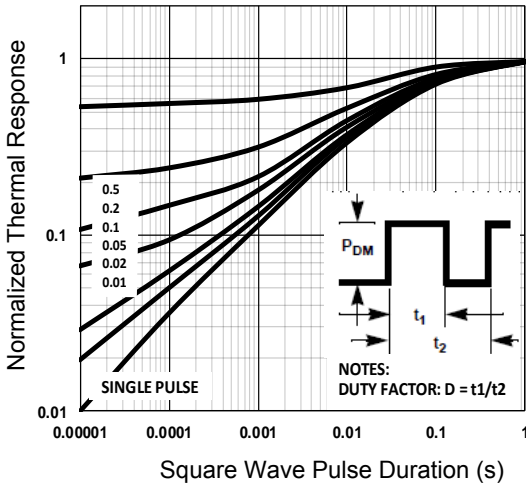

Figure 8. Gate Charge Characteristics

Figure 9. Normalized Transient Impedance

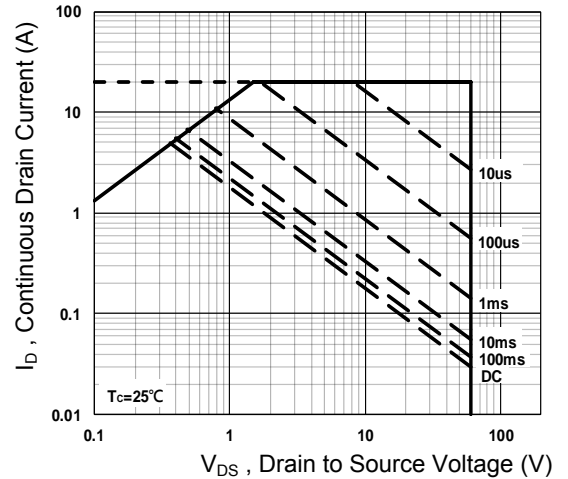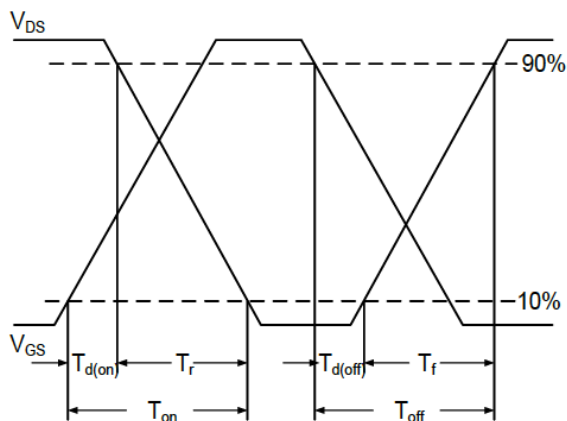**Figure 10. Maximum Safe Operation Area**

Figure 11. Switching Time Waveform

Figure 12. EAS Waveform
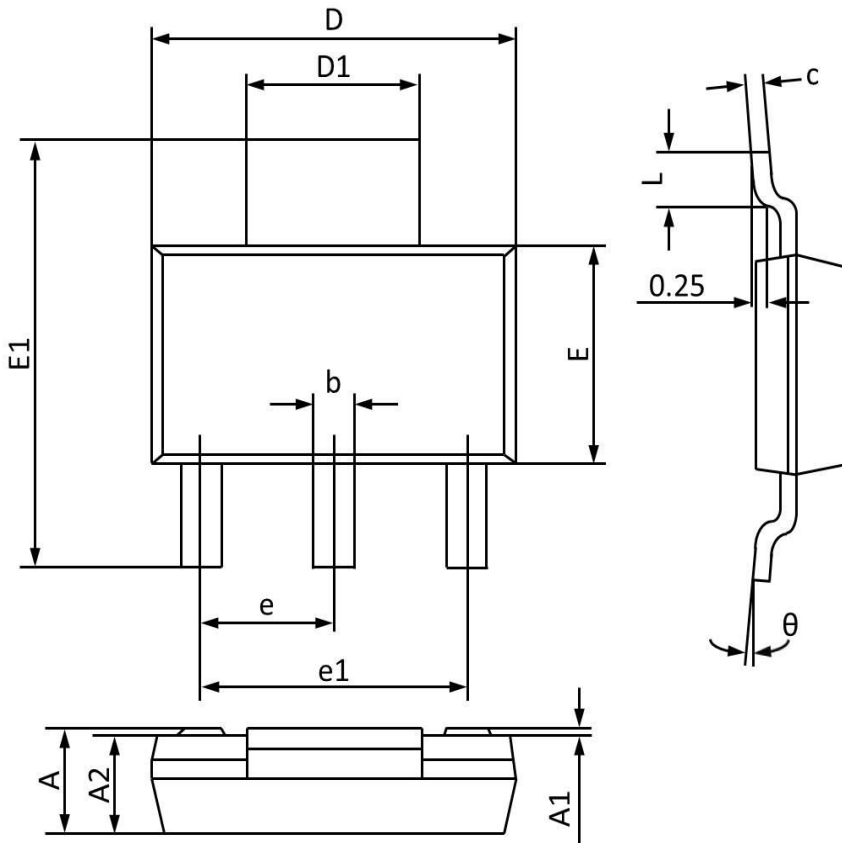
Package Outline Dimensions SOT-223

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	**MIN**	**MAX**	**MIN**
A	1.800	1.500	0.071	0.060
A1	0.120	0.000	0.005	0.000
A2	1.750	1.450	0.069	0.057
b	0.820	0.600	0.032	0.024
c	0.350	0.200	0.014	0.008
D	6.700	6.200	0.264	0.244
D1	3.100	2.900	0.122	0.114
E	3.700	3.300	0.146	0.130
E1	7.300	6.700	0.287	0.264
e	2.30(BSC)		0.091(BSC)	
e1	4.700	4.400	0.185	0.173
L	1.150	0.900	0.045	0.035
θ	10°	0°	10°	0°