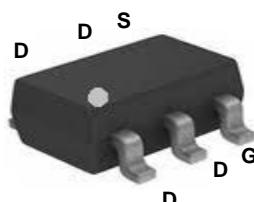
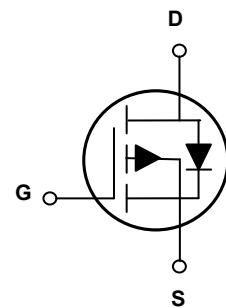


## Main Product Characteristics

$V_{(BR)DSS}$	-20V
$R_{DS(ON)}$	26mΩ
$I_D$	-6.5A



SOT-23-6L



Schematic Diagram

## Features and Benefits

- Advanced MOSFET process technology
- Ideal for notebook, load switch and networking
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



## Description

The SSF2307 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 ( $T_C=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Drain Current – Continuous ( $T_C=25^\circ C$ )	$I_D$	-6.5	A
Drain Current – Continuous ( $T_C=100^\circ C$ )		-4.1	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	-26	A
Power Dissipation ( $T_C=25^\circ C$ )	$P_D$	1.56	W
Power Dissipation – Derate above $25^\circ C$	$P_D$	0.012	W/ $^\circ C$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ C$
Operating Junction Temperature Range	$T_J$	-55 to +150	$^\circ C$

## Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	80	$^\circ C/W$

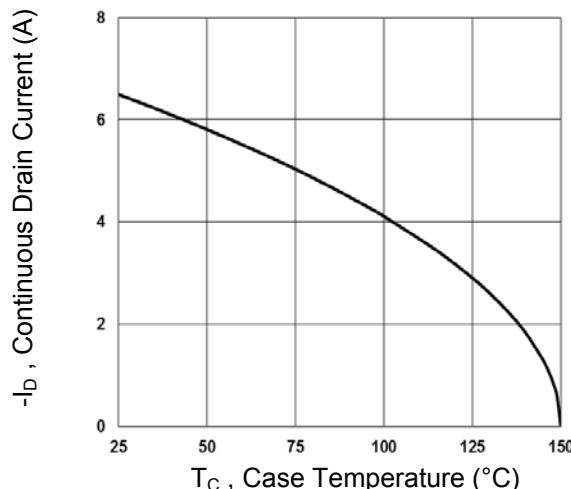
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}$ , $I_D=-250\mu\text{A}$	-20	---	---	V
BV <sub>DSS</sub> Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=-1\text{mA}$	---	-0.01	---	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=-20\text{V}$ , $V_{\text{GS}}=0\text{V}$ , $T_J=25^\circ\text{C}$	---	---	-1	$\mu\text{A}$
		$V_{\text{DS}}=-16\text{V}$ , $V_{\text{GS}}=0\text{V}$ , $T_J=125^\circ\text{C}$	---	---	-10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=\pm 10\text{V}$ , $V_{\text{DS}}=0\text{V}$	---	---	$\pm 100$	$\mu\text{A}$
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=-4.5\text{V}$ , $I_D=-5\text{A}$	---	19	23	$\text{m}\Omega$
		$V_{\text{GS}}=-2.5\text{V}$ , $I_D=-4\text{A}$	---	24	30	
		$V_{\text{GS}}=-1.8\text{V}$ , $I_D=-3\text{A}$	---	30	39	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}$ , $I_D=-250\mu\text{A}$	-0.3	-0.6	-1.0	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta V_{\text{GS}(\text{th})}$		---	3	---	$\text{mV}/^\circ\text{C}$
Forward Transconductance	$g_{\text{fs}}$	$V_{\text{DS}}=-10\text{V}$ , $I_s=-5\text{A}$	---	15	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2, 3</sup>	$Q_g$	$V_{\text{DS}}=-10\text{V}$ , $V_{\text{GS}}=-4.5\text{V}$ , $I_D=-5\text{A}$	---	19.5	29	$\text{nC}$
Gate-Source Charge <sup>2, 3</sup>	$Q_{gs}$		---	2	4	
Gate-Drain Charge <sup>2, 3</sup>	$Q_{gd}$		---	3.6	7	
Turn-On Delay Time <sup>2, 3</sup>	$T_{\text{d}(\text{on})}$	$V_{\text{DD}}=-10\text{V}$ , $V_{\text{GS}}=-4.5\text{V}$ , $R_G=25\Omega$ $I_D=-1\text{A}$	---	10.4	20	$\text{nS}$
Rise Time <sup>2, 3</sup>	$T_r$		---	37.5	71	
Turn-Off Delay Time <sup>2, 3</sup>	$T_{\text{d}(\text{off})}$		---	89.1	129	
Fall Time <sup>2, 3</sup>	$T_f$		---	24.6	47	
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=-15\text{V}$ , $V_{\text{GS}}=0\text{V}$ , $F=1\text{MHz}$	---	1670	2430	$\text{pF}$
Output Capacitance	$C_{\text{oss}}$		---	220	320	
Reverse Transfer Capacitance	$C_{\text{rss}}$		---	120	180	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_s$	$V_G=V_D=0\text{V}$ , Force Current	---	---	-6.5	A
Pulsed Source Current	$I_{\text{sm}}$		---	---	-26	A
Diode Forward Voltage	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}$ , $I_s=-1\text{A}$ , $T_J=25^\circ\text{C}$	---	---	-1	V

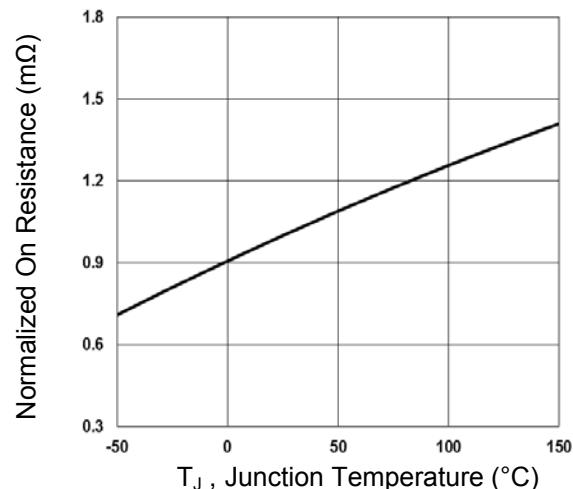
**Notes:**

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

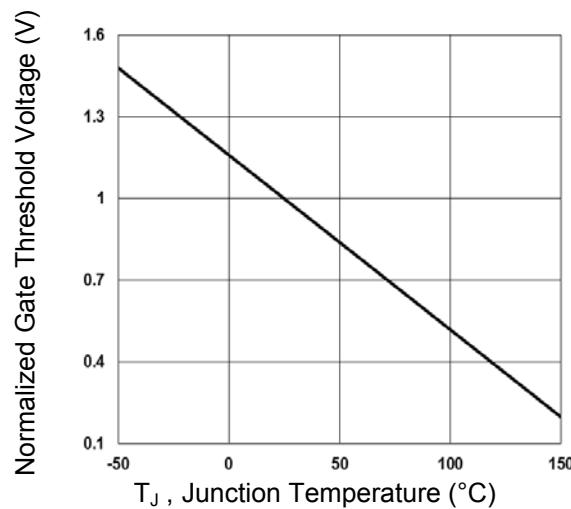
## Typical Electrical and Thermal Characteristic Curves



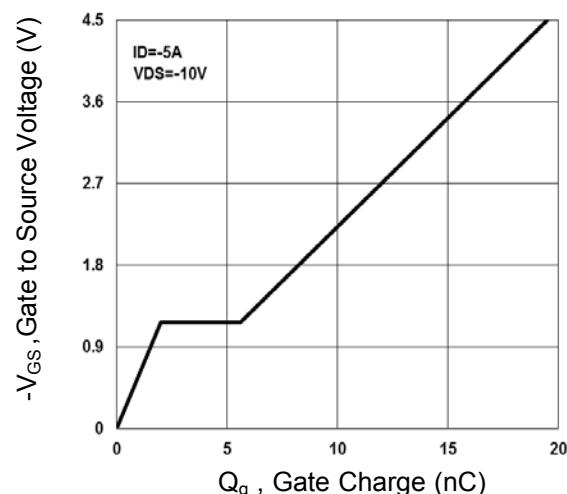
**Fig.1 Continuous Drain Current vs.  $T_c$**



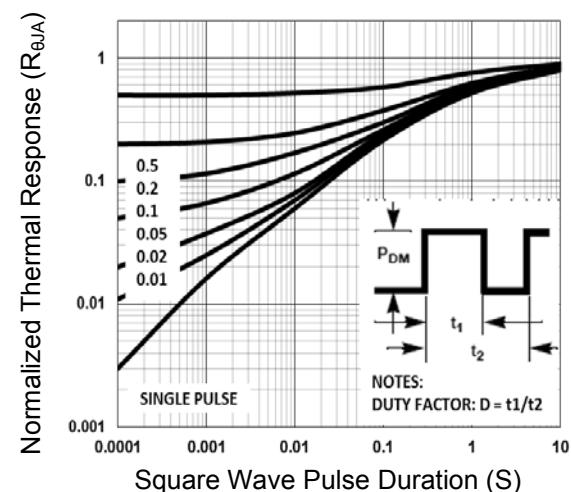
**Fig.2 Normalized  $R_{DS(ON)}$  vs.  $T_J$**



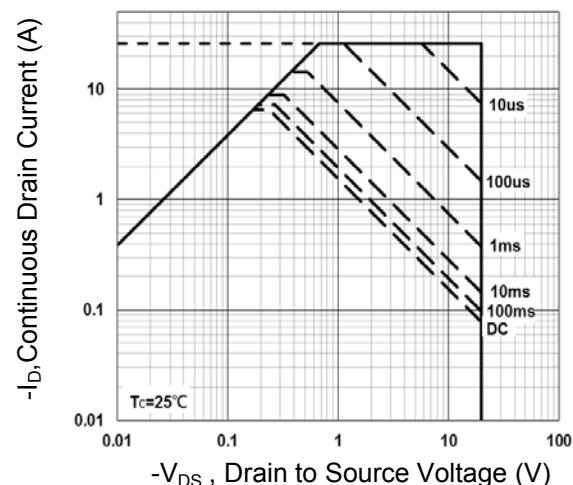
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Waveform**

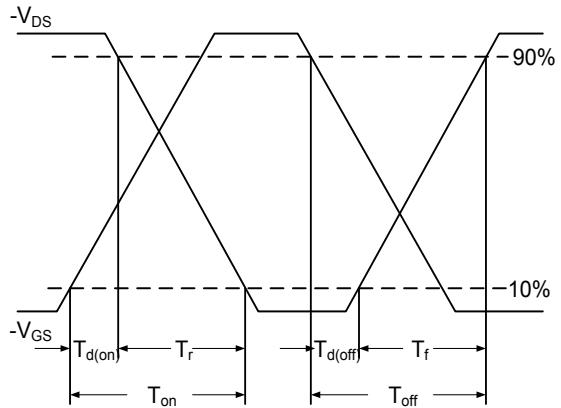


**Fig.5 Normalized Transient Impedance**

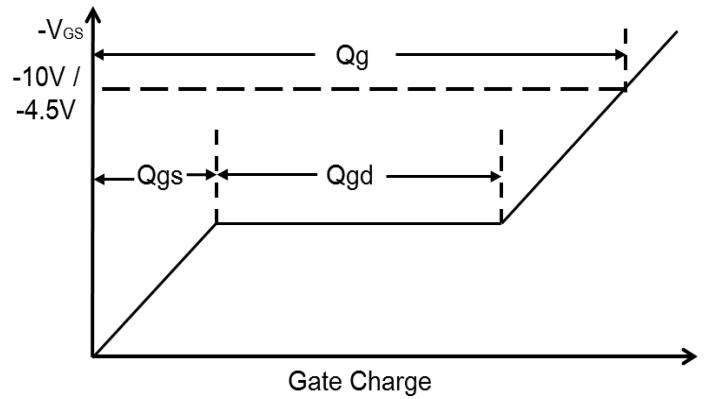


**Fig.6 Maximum Safe Operation Area**

## Typical Electrical and Thermal Characteristic Curves



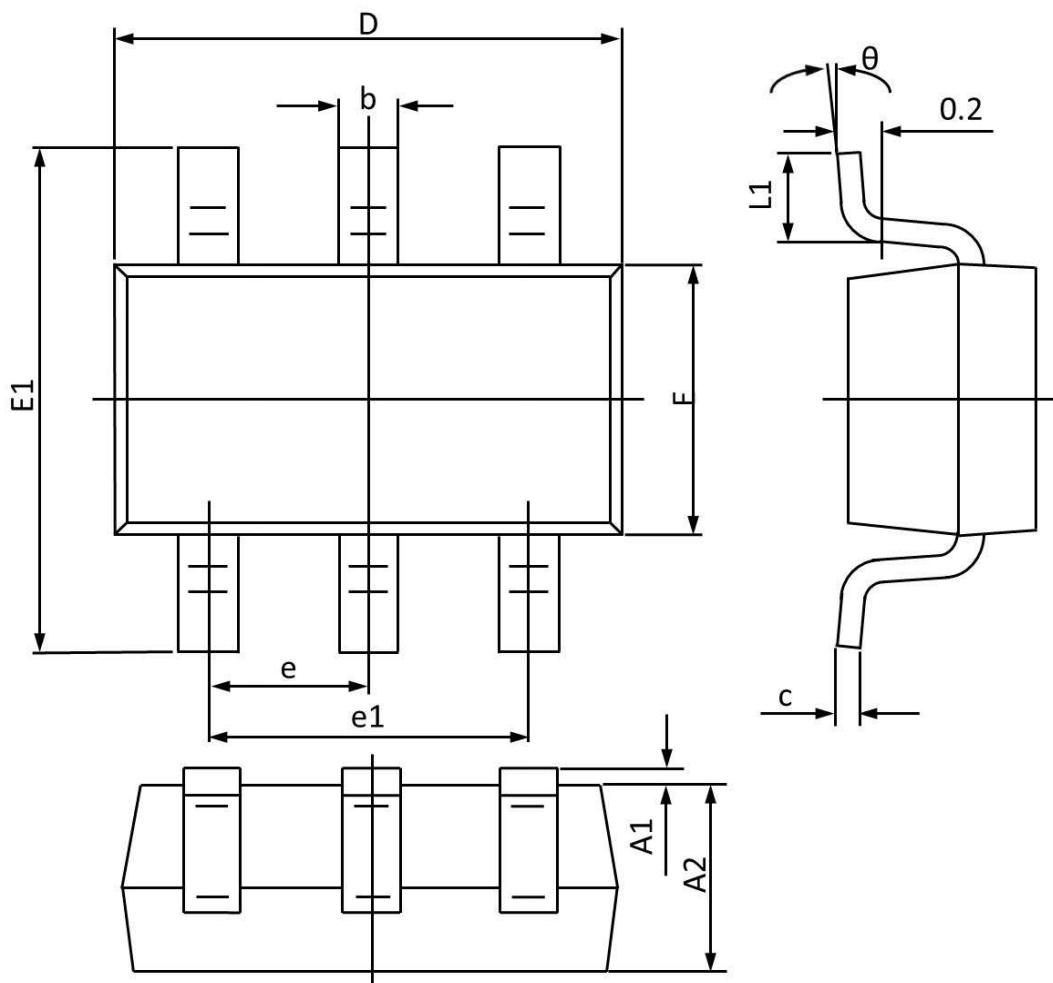
**Fig.7** Switching Time Waveform



**Fig.8** Gate Charge Waveform

**Package Outline Dimensions**

**SOT-23-6L**



<b>Symbol</b>	<b>Dimensions In Millimeters</b>		<b>Dimensions In Inches</b>	
	<b>Min</b>	<b>Max</b>	<b>Min</b>	<b>Max</b>
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.040	0.047
b	0.300	0.500	0.012	0.019
c	0.047	0.207	0.002	0.008
D	2.800	3.000	0.110	0.118
E1	2.600	3.000	0.103	0.118
e	0.950 TYP		0.037 TYP	
e1	1.900 TYP		0.075 TYP	
L1	0.250	0.550	0.010	0.021
$\theta$	0°	8°	0°	8°