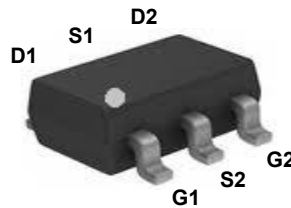
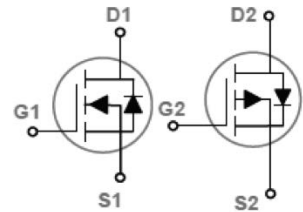


### Main Product Characteristics

Channel	N-Channel	P-Channel
$B_{VDSS}$	30V	-30V
$R_{DS(ON)}$	30m $\Omega$	65m $\Omega$
$I_D$	4A	-3A



SOT-23-6L



Schematic Diagram

### 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 SSF3714 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 ( $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating		Unit
Drain-Source Voltage	$V_{DS}$	30	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	$\pm 20$	V
Drain Current – Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	4	-3	A
Drain Current – Continuous ( $T_C=70^\circ\text{C}$ )		2.5	-1.8	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	16	-12	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	2		W
Power Dissipation – Derate above 25 $^\circ\text{C}$		0.016		W/ $^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150		$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to +150		$^\circ\text{C}$

### Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	100	$^\circ\text{C}/\text{W}$

### N-Channel 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	30	---	---	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>Ds</sub> =30V, V <sub>Gs</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>Ds</sub> =24V, 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> =4A	---	22	30	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =2A	---	35	46	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>Ds</sub> , I <sub>D</sub> =250uA	1.2	1.6	2.5	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		---	-4	---	mV/°C
Forward Transconductance	g <sub>fs</sub>	V <sub>Ds</sub> =10V, I <sub>D</sub> =3A	---	6.5	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	Q <sub>g</sub>	V <sub>Ds</sub> =15V, V <sub>Gs</sub> =4.5V, I <sub>D</sub> =6A	---	4.1	8	nC
Gate-Source Charge <sup>2,3</sup>	Q <sub>gs</sub>		---	1	2	
Gate-Drain Charge <sup>2,3</sup>	Q <sub>gd</sub>		---	2.1	4	
Turn-On Delay Time <sup>2,3</sup>	T <sub>d(on)</sub>	V <sub>Ds</sub> =15V, V <sub>Gs</sub> =10V, R <sub>θ</sub> =6Ω I <sub>D</sub> =1A	---	2.8	5	nS
Rise Time <sup>2,3</sup>	T <sub>r</sub>		---	7.2	14	
Turn-Off Delay Time <sup>2,3</sup>	T <sub>d(off)</sub>		---	15.8	30	
Fall Time <sup>2,3</sup>	T <sub>f</sub>		---	4.6	9	
Input Capacitance	C <sub>iss</sub>	V <sub>Ds</sub> =25V, V <sub>Gs</sub> =0V, F=1MHz	---	345	500	pF
Output Capacitance	C <sub>oss</sub>		---	55	80	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	32	45	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>Ds</sub> =0V, F=1MHz	---	3.2	6.4	Ω
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	4	A
Pulsed Source Current	I <sub>SM</sub>		---	---	8	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

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300uS, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

### Typical Electrical and Thermal Characteristics

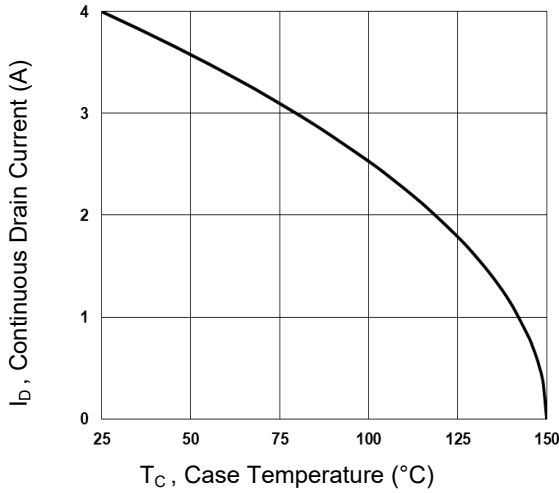


Figure 1. Continuous Drain Current vs.  $T_C$

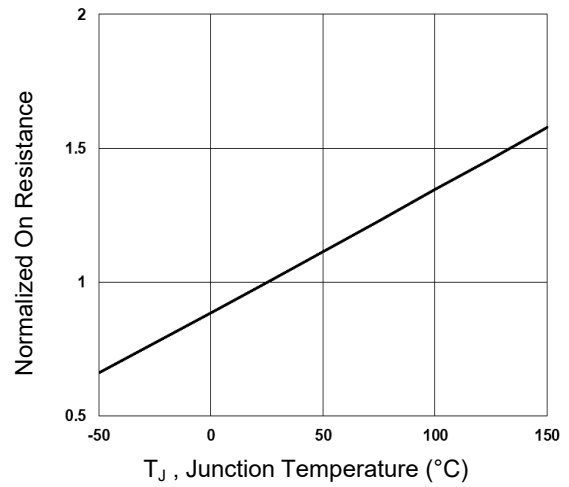


Figure 2. Normalized  $R_{DS(ON)}$  vs.  $T_J$

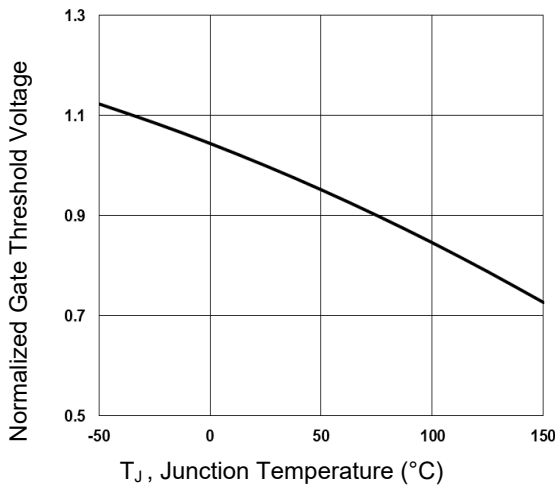


Figure 3. Normalized  $V_{th}$  vs.  $T_J$

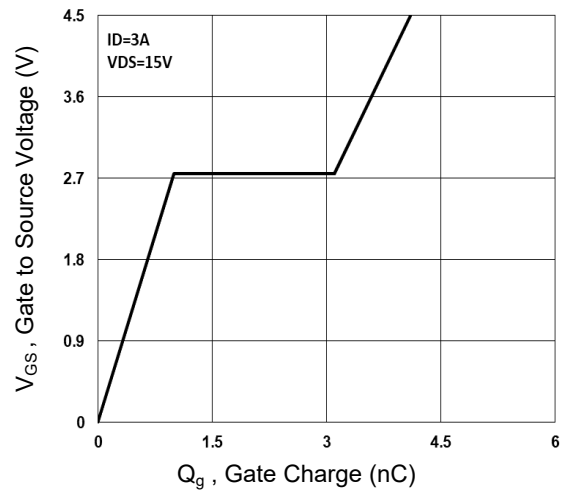


Figure 4. Gate Charge Waveform

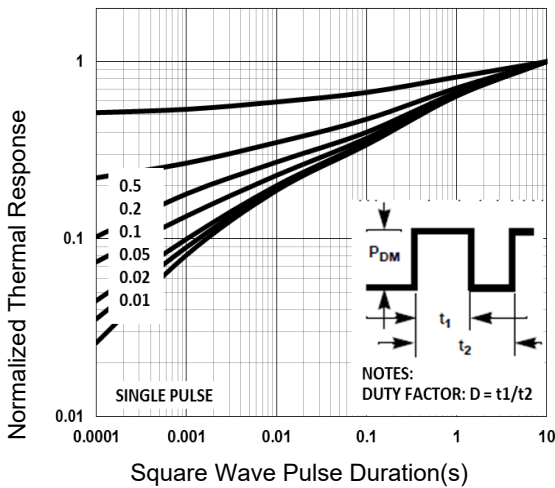


Figure 5. Normalized Transient Response

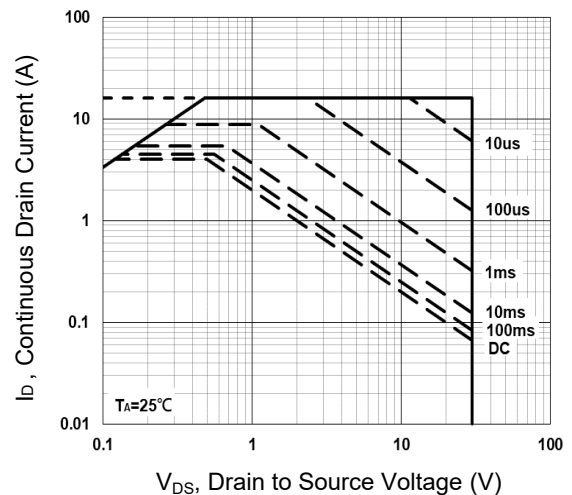


Figure 6. Maximum Safe Operation Area

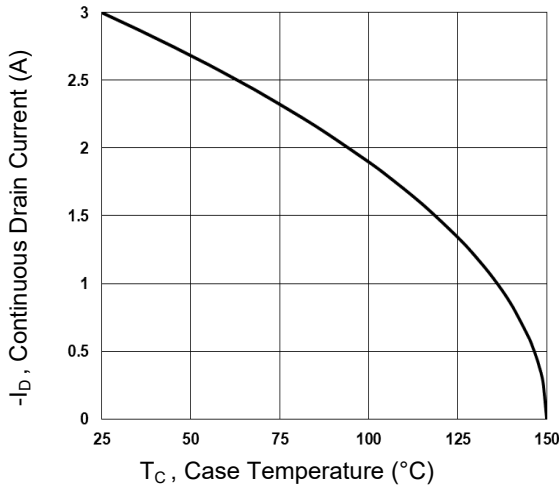
### P-Channel Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_b=-250\mu A$	-30	---	---	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^{\circ}\text{C}$ , $I_b=-1\text{mA}$	---	-0.03	---	$V/^{\circ}\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	-1	$\mu A$
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	---	---	-10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_b=-3A$	---	45	65	m $\Omega$
		$V_{GS}=-4.5V, I_b=-2A$	---	65	90	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.2	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	4	---	$\text{mV}/^{\circ}\text{C}$
Forward Transconductance	$g_{fs}$	$V_{DS}=-10V, I_b=-3A$	---	3.7	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=-30V, V_{GS}=-4.5V, I_b=-2A$	---	5	8	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		---	1.4	3	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		---	1.7	4	
Turn-On Delay Time <sup>2,3</sup>	$T_{d(on)}$	$V_{DD}=-30V, V_{GS}=-10V, R_G=6\Omega, I_b=-1A$	---	3.4	6	nS
Rise Time <sup>2,3</sup>	$T_r$		---	10.8	21	
Turn-Off Delay Time <sup>2,3</sup>	$T_{d(off)}$		---	26.9	51	
Fall Time <sup>2,3</sup>	$T_f$		---	6.9	13	
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V, F=1\text{MHz}$	---	420	810	pF
Output Capacitance	$C_{oss}$		---	50	80	
Reverse Transfer Capacitance	$C_{rss}$		---	35	60	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	---	---	-3	A
Pulsed Source Current	$I_{SM}$		---	---	-6	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	-1	V

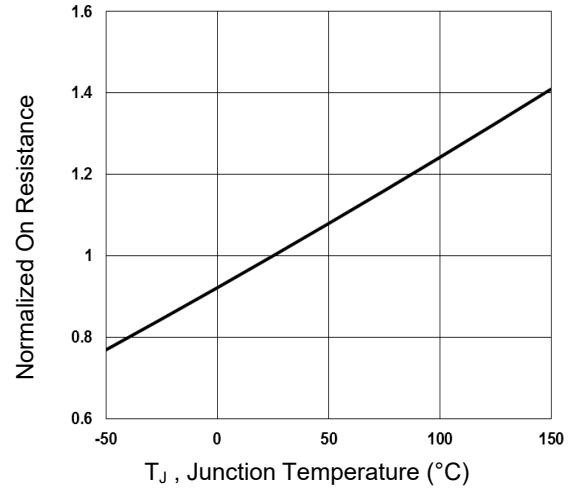
Note:

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.

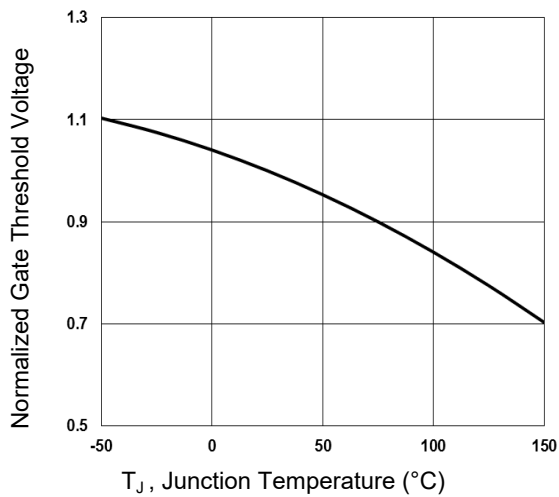
### Typical Electrical and Thermal Characteristics



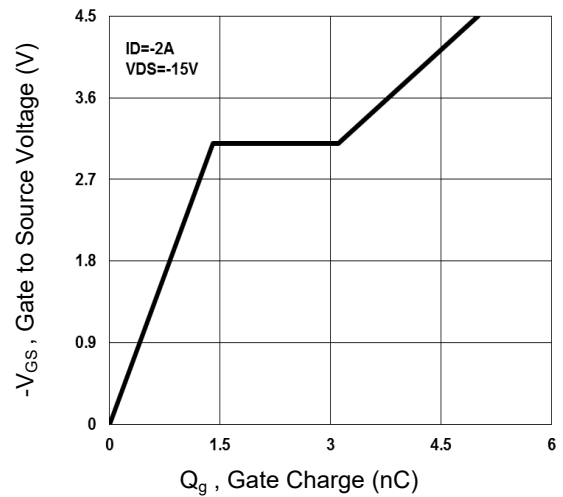
**Figure 1. Continuous Drain Current vs.  $T_C$**



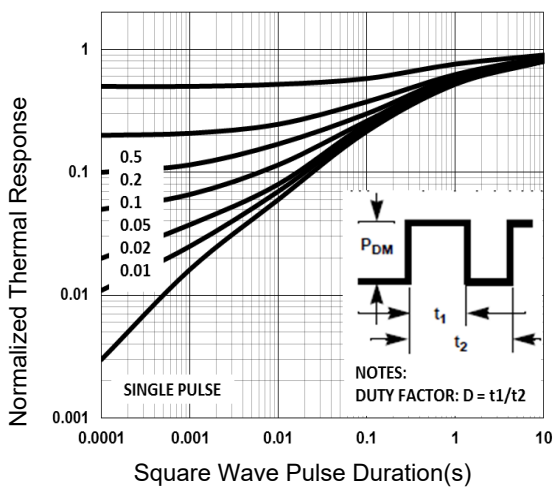
**Figure 2. Normalized  $R_{DS(on)}$  vs.  $T_J$**



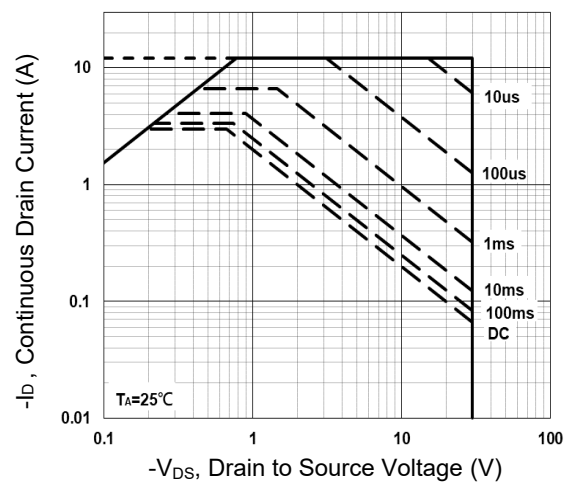
**Figure 3. Normalized  $V_{th}$  vs.  $T_J$**



**Figure 4. Gate Charge Waveform**

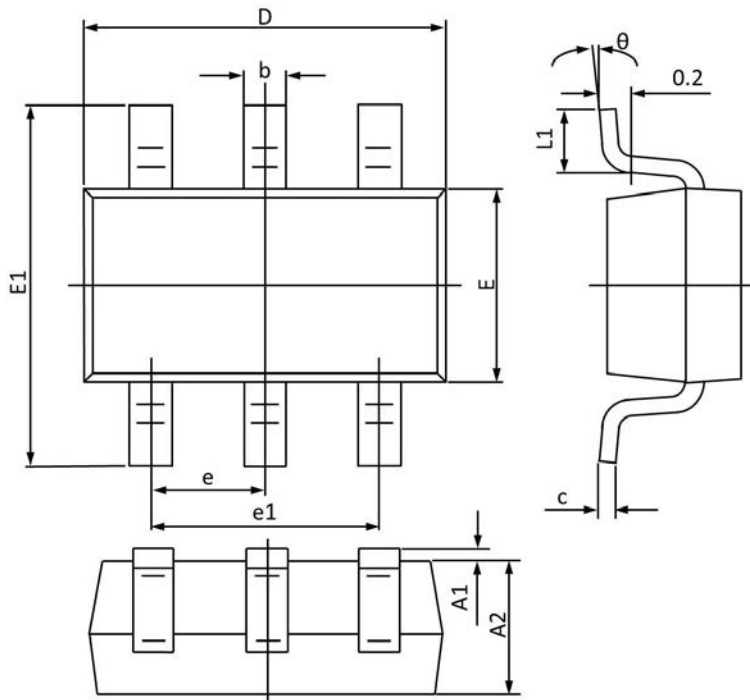


**Figure 5. Normalized Transient Impedance**



**Figure 6. Maximum Safe Operation Area**

### Package Outline Dimensions SOT-23-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
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
E	1.500	1.800	0.059	0.070
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°

### Order Information

Device	Package	Marking Code	Carrier	Quantity	HSF Status
SSF3714	SOT-23-6L	k	Tape & Reel	3000/Reel	RoHS Compliant