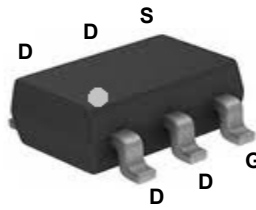
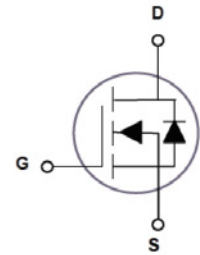


### Main Product Characteristics

$BV_{(BR)DSS}$	150V
$R_{DS(ON)}$	480mΩ
$I_D$	1.4A



SOT-23-6L



Schematic Diagram

### Features and Benefits

- Advanced MOSFET process technology
- Ideal for hand-held devices, battery protection and load switch
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



### Description

The SSF02N15 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	Rating	Unit
Drain-Source Voltage	$V_{DS}$	150	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current – Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	1.4	A
Drain Current – Continuous ( $T_C=100^\circ\text{C}$ )		0.88	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	5.6	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	1.56	W
Power Dissipation – Derate above $25^\circ\text{C}$		0.012	W/ $^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-50 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-50 to +150	$^\circ\text{C}$

### Thermal Characteristics

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

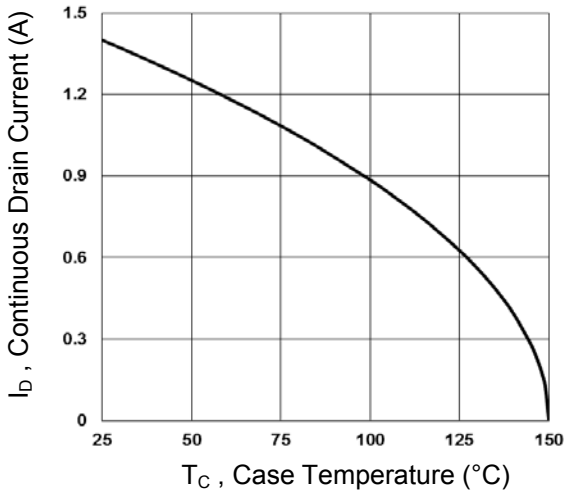
### Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_b=250\mu A$	150	---	---	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=150V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	$\mu A$
		$V_{DS}=120V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	---	---	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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1A$	---	380	480	m $\Omega$
		$V_{GS}=6V, I_D=0.5A$	---	410	520	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	3	4	V
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=1A$	---	1.7	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=75V, V_{GS}=10V, I_D=1A$	---	8.1	16	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{GS}$		---	2	4	
Gate-Drain Charge <sup>2,3</sup>	$Q_{GD}$		---	2.7	5.4	
Turn-On Delay Time <sup>2,3</sup>	$T_{d(on)}$	$V_{DD}=75V, V_{GS}=10V, R_G=10\Omega, I_D=1A$	---	8.2	16	nS
Rise Time <sup>2,3</sup>	$T_r$		---	5.8	12	
Turn-Off Delay Time <sup>2,3</sup>	$T_{d(off)}$		---	14.8	28	
Fall Time <sup>2,3</sup>	$T_f$		---	8	16	
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, F=1\text{MHz}$	---	350	700	pF
Output Capacitance	$C_{oss}$		---	34	68	
Reverse Transfer Capacitance	$C_{rss}$		---	26	52	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	2	4	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	---	---	1.4	A
Pulsed Source Current	$I_{SM}$		---	---	2.8	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	1	V
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V, I_S=1A,$	---	43	---	nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt=100A/\mu S, T_J=25^{\circ}\text{C}$	---	37	---	nC

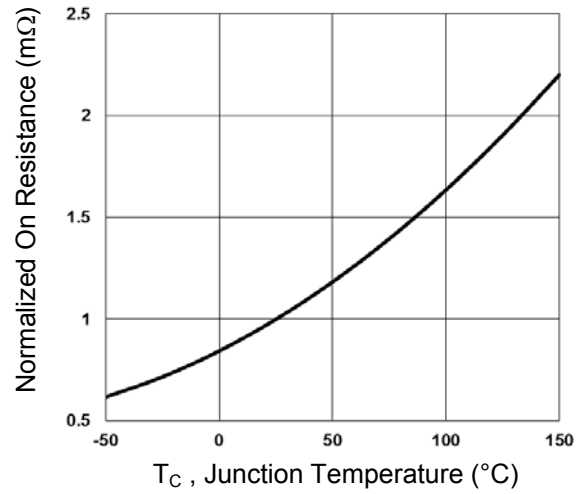
Note:

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

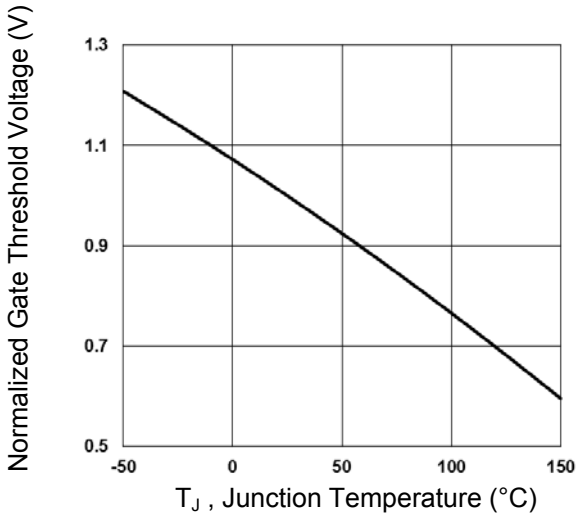
## Typical Electrical and Thermal Characteristic Curves



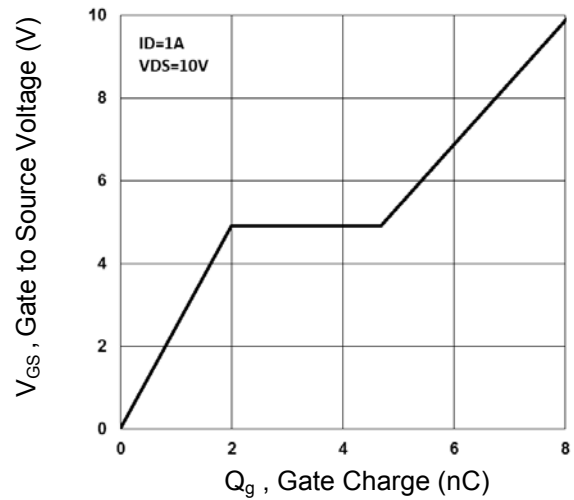
**Fig.1 Continuous Drain Current vs.  $T_c$**



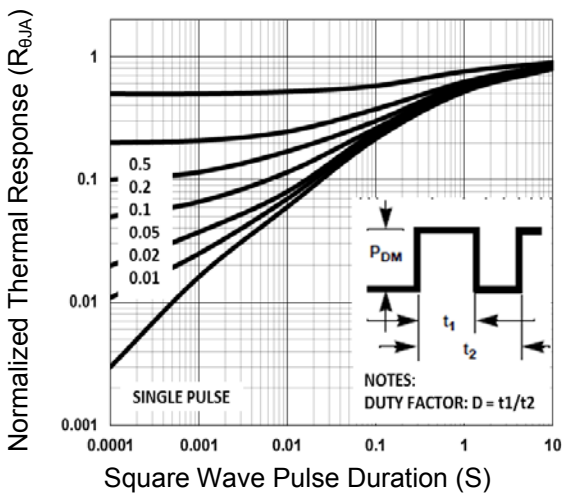
**Fig.2 Continuous Drain Current vs.  $T_c$**



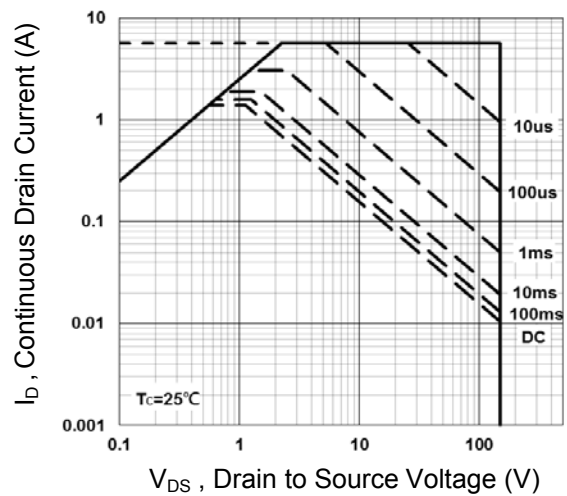
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**

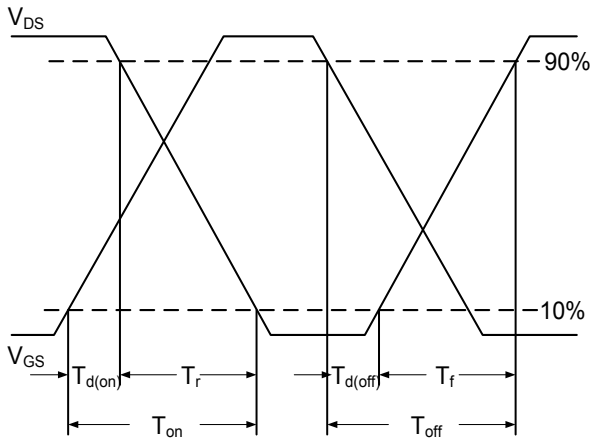


**Fig.5 Normalized Transient Impedance**

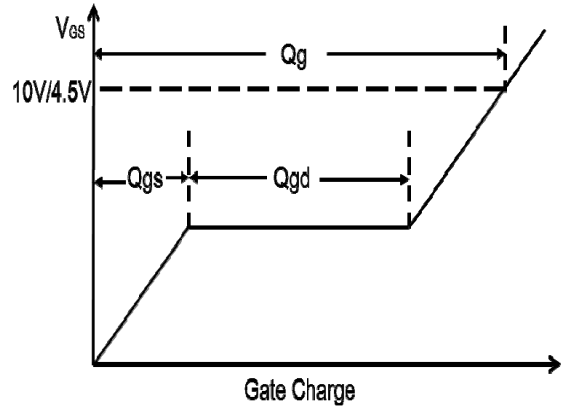


**Fig.6 Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**

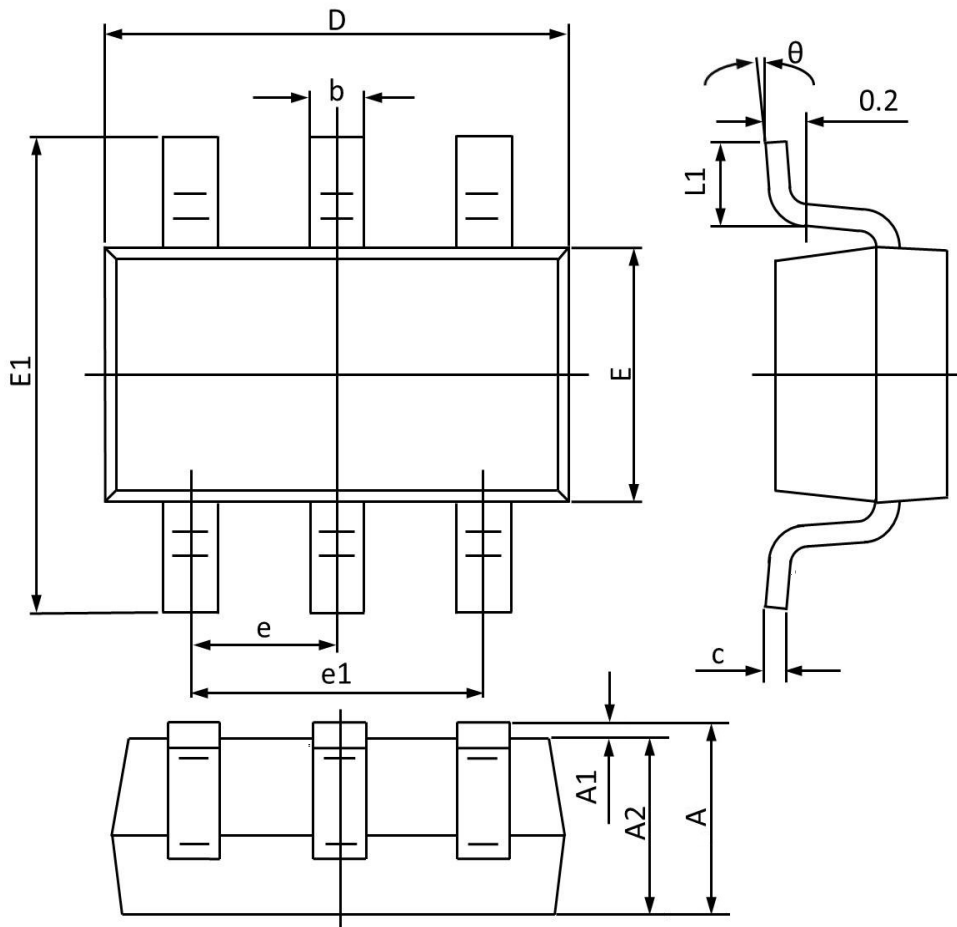


**Fig.7 Switching Time Waveform**



**Fig.8  $E_{AS}$  Waveform**

## SOT23-6 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.450	-	0.057	-
A1	0.100	0.000	0.004	0.000
A2	1.300	1.050	0.051	0.041
b	0.500	0.300	0.020	0.012
c	0.200	0.100	0.008	0.004
D	3.100	2.700	0.122	0.106
E	1.800	1.400	0.071	0.055
E1	3.000	2.600	0.118	0.102
e	0.95 BSC		0.037 BSC	
e1	2.000	1.800	0.079	0.071
L1	0.600	0.300	0.024	0.012
theta	10°	0°	10°	0°