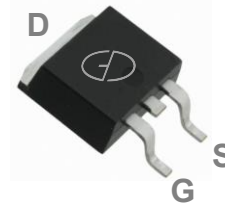
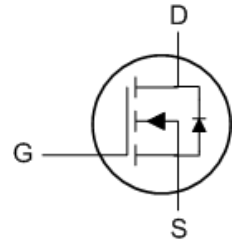


### Main Product Characteristics

$V_{BDSS}$	800V
$R_{DS(on)}$	4.2Ω
$I_D$	3A



TO-252



Schematic Diagram

### Features and Benefits

- Advanced MOSFET process technology
- Ideal for battery operated systems, load switching, power converters and other general purpose applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



### Description

The SSF03N80R utilizes the latest techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. 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	Units
Drain-Source Voltage	$V_{DS}$	800	V
Gate-Source Voltage	$V_{GS}$	±30	V
Drain Current – Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	3	A
Drain Current – Continuous ( $T_C=100^\circ\text{C}$ )		1.9	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	12	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	283	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	3	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	94	W
Power Dissipation – Derate above $25^\circ\text{C}$	$P_D$	0.75	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	$R_{\theta JA}$	---	62	$^\circ\text{C/W}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	1.33	$^\circ\text{C/W}$

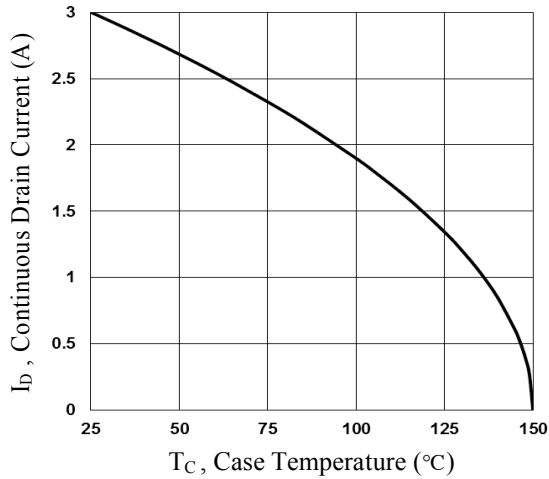
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	800	---	---	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=800V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	10	$\mu A$
		$V_{DS}=640V, V_{GS}=0V, T_J=100^{\circ}\text{C}$	---	---	100	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1.5A$	---	3.36	4.2	$\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	---	4	V
Forward Transconductance	$g_{fs}$	$V_{DS}=30V, I_D=1.5A$	---	3.7	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{DS}=640V, V_{GS}=10V, I_D=3A$	---	19	---	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{gs}$		---	4	---	
Gate-Drain Charge <sup>3,4</sup>	$Q_{gd}$		---	7.6	---	
Turn-On Delay Time <sup>3,4</sup>	$T_{d(on)}$	$V_{DD}=400V, V_{GS}=10V, R_G=25\Omega, I_D=3A$	---	48	---	ns
Rise Time <sup>3,4</sup>	$T_r$		---	36	---	
Turn-Off Delay Time <sup>3,4</sup>	$T_{d(off)}$		---	106	---	
Fall Time <sup>3,4</sup>	$T_f$		---	41	---	
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, F=1\text{MHz}$	---	696	---	pF
Output Capacitance	$C_{oss}$		---	65	---	
Reverse Transfer Capacitance	$C_{rss}$		---	10.2	---	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
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	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	1.5	V
Reverse Recovery Times	$t_{rr}$	$V_{GS}=0V, I_S=3A, di/dt=100A/\mu s$	---	372	---	ns
Reverse Recovery Charge <sup>3</sup>	$Q_{rr}$	$T_J=25^{\circ}\text{C}$	---	1.8	---	$\mu C$

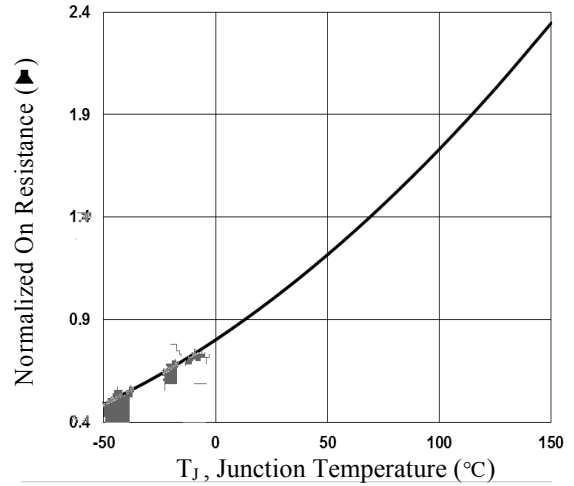
**Notes :**

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=50V, V_{GS}=10V, L=59mH, I_{AS}=3A, R_G=25\Omega, \text{Starting } T_J=25^{\circ}\text{C}$ .
3. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.

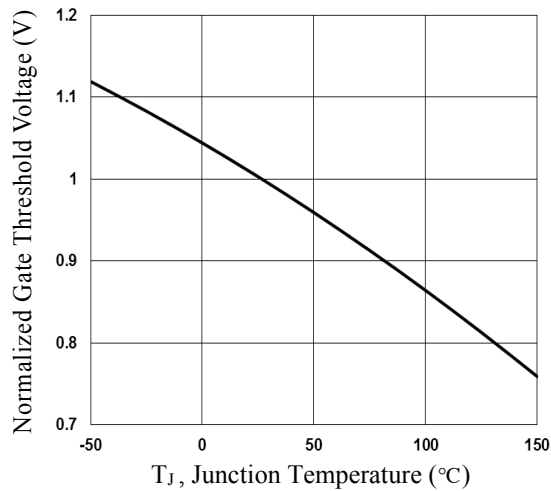
### Typical Electrical and Thermal Characteristics



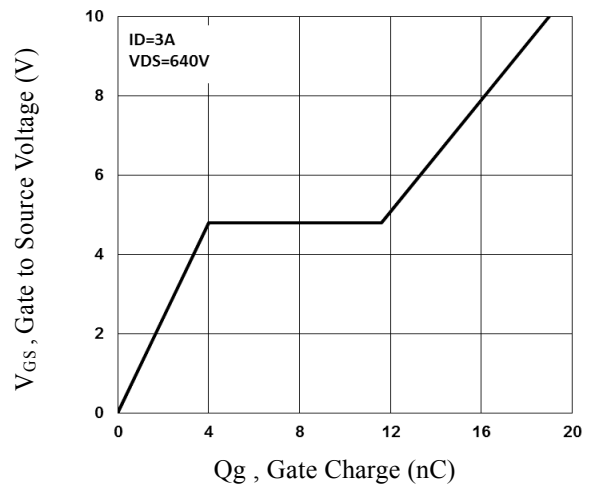
**Fig.1 Continuous Drain Current vs. T<sub>c</sub>**



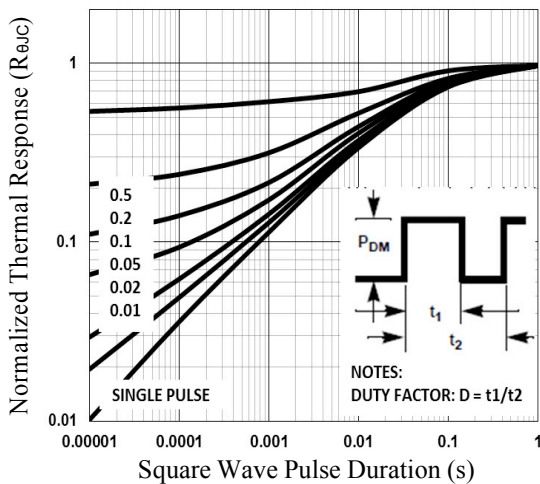
**Fig.2 Normalized RD<sub>SON</sub> vs. T<sub>j</sub>**



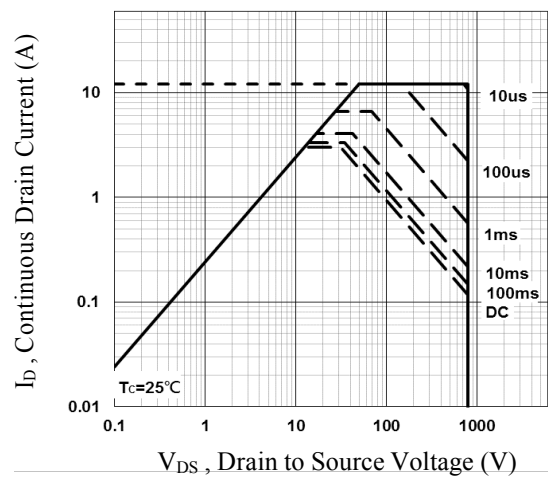
**Fig.3 Normalized V<sub>th</sub> vs. T<sub>j</sub>**



**Fig.4 Gate Charge Waveform**

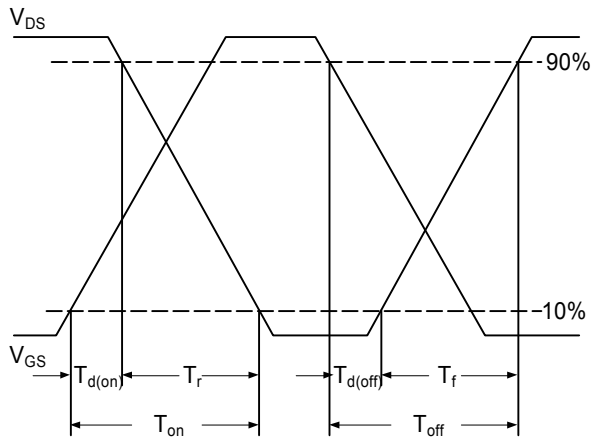


**Fig.5 Normalized Transient Impedance**

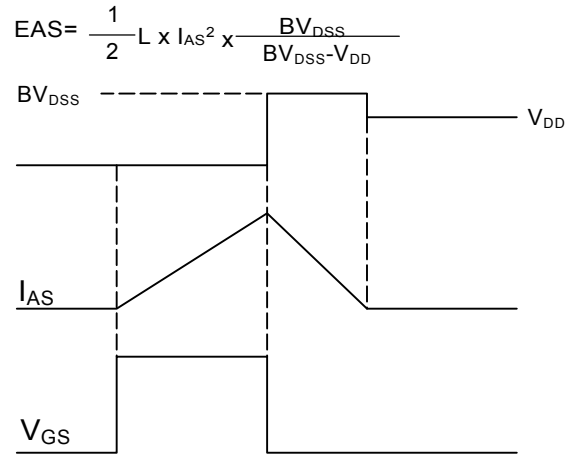


**Fig.6 Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristics**



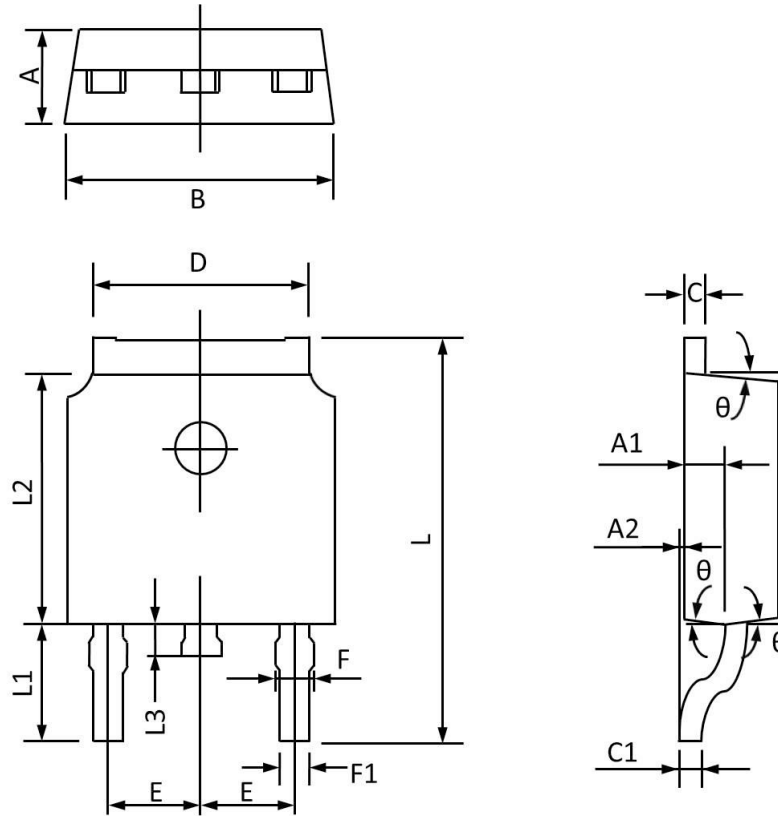
**Fig.7 Switching Time Waveform**



**Fig.8 EAS Waveform**

### Package Outline Dimensions

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
A1	0.91	1.11	0.036	0.044
A2	0.00	0.15	0.000	0.006
B	6.50	6.70	0.256	0.264
C	0.46	0.580	0.018	0.230
C1	0.46	0.580	0.018	0.030
D	5.10	5.46	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.74	0.94	0.029	0.037
F1	0.660	0.860	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9REF		0.114REF	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
θ	3°	9°	3°	9°