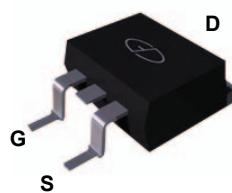
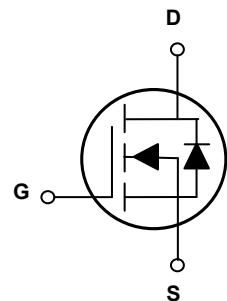


## Main Product Characteristics

$V_{DS}$	250V
$R_{DS(ON)}$	18.5mΩ
$I_D$	80A



TO-263-2L



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 SSFT25N80 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 supplies and a wide variety of other applications.

## Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	250	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	80	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		56.6	A
Drain Current-Pulsed	$I_{DM}$	320	A
Maximum Power Dissipation	$P_D$	300	W
Derating Factor		2	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	1200	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.5	$^\circ\text{C}/\text{W}$
Storage Temperature Range	$T_{STG}$	-55 To +175	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 To +175	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	250	-	-	V
Zero Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{\text{DS}}=250\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=\pm20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	$\pm100$	nA
<b>On Characteristics</b>						
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=250\mu\text{A}$	2.5	3.5	4.5	V
Drain-Source On-State Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=40\text{A}$	-	16	18.5	$\text{m}\Omega$
Forward Transconductance	$g_{\text{FS}}$	$V_{\text{DS}}=10\text{V}, I_{\text{D}}=40\text{A}$	70	-	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=125\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	5400	-	pF
Output Capacitance	$C_{\text{oss}}$		-	329	-	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	12	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time <sup>2</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=125\text{V}, R_{\text{G}}=4.7\Omega$ $V_{\text{GS}}=10\text{V}, I_{\text{D}}=40\text{A}$	-	18	-	nS
Turn-On Rise Time <sup>2</sup>	$t_{\text{r}}$		-	26	-	
Turn-Off Delay Time <sup>2</sup>	$t_{\text{d}(\text{off})}$		-	41	-	
Turn-Off Fall Time <sup>2</sup>	$t_{\text{f}}$		-	11	-	
Total Gate Charge <sup>2</sup>	$Q_{\text{g}}$	$V_{\text{DS}}=125\text{V}, I_{\text{D}}=40\text{A}, V_{\text{GS}}=10\text{V}$	-	76.7	-	nC
Gate-Source Charge <sup>2</sup>	$Q_{\text{gs}}$		-	22.7	-	
Gate-Drain Charge <sup>2</sup>	$Q_{\text{gd}}$		-	20	-	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}, I_{\text{s}}=80\text{A}$	-	-	1.2	V
Diode Forward Current	$I_{\text{s}}$	-	-	-	80	A
Reverse Recovery Time	$t_{\text{rr}}$	$T_{\text{j}}=25^\circ\text{C}, I_{\text{F}}=40\text{A}, \text{di/dt}=100\text{A}/\mu\text{s}$	-	140	-	nS
Reverse Recovery Charge	$Q_{\text{rr}}$		-	600	-	nC

Notes:

1. EAS condition:  $T_j=25^\circ\text{C}, V_{\text{DD}}=50\text{V}, V_{\text{G}}=10\text{V}, L=0.5\text{mH}, R_{\text{G}}=25\Omega$ .
2. Guaranteed by design, not subject to production.
3. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of  $T_{\text{j}(\text{MAX})}=175^\circ\text{C}$ . The SOA curve provides a single pulse rating.

### Typical Electrical and Thermal Characteristic Curves

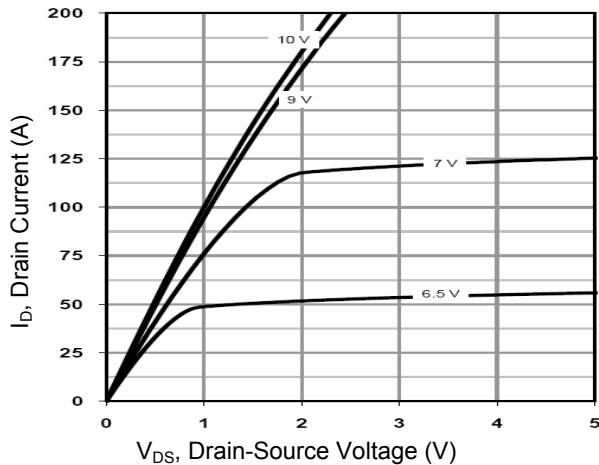


Figure 1. Output Characteristics

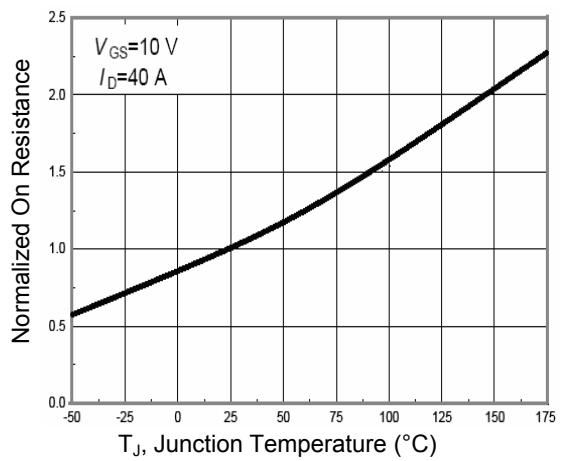


Figure 2.  $R_{DSON}$ -Junction Temperature

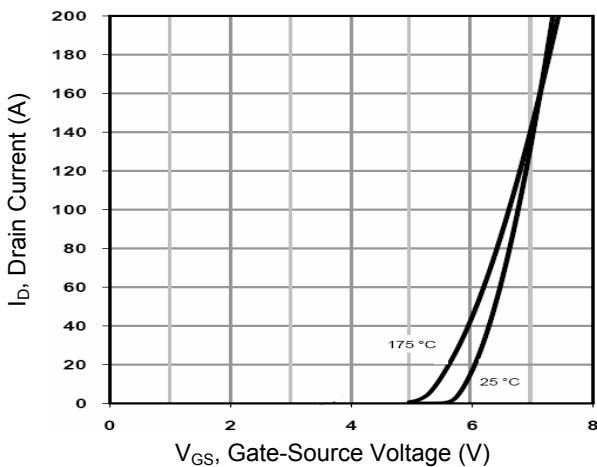


Figure 3. Transfer Characteristics

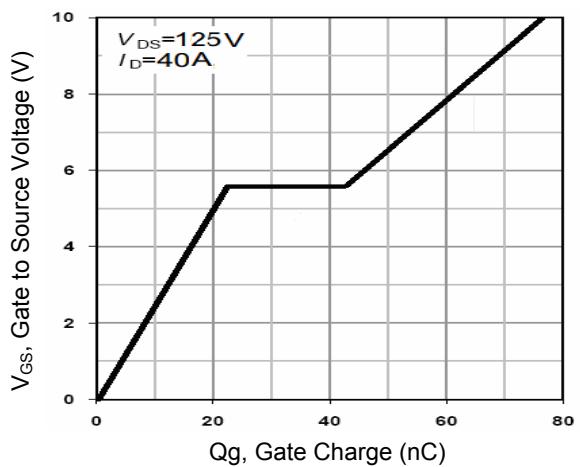


Figure 4. Gate Charge

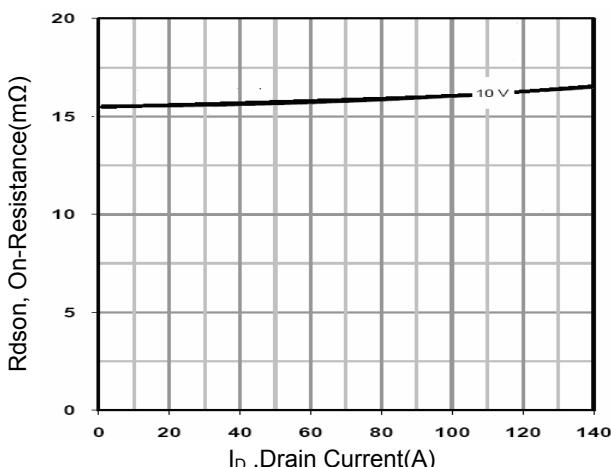


Figure 5.  $R_{DSON}$ -Drain Current

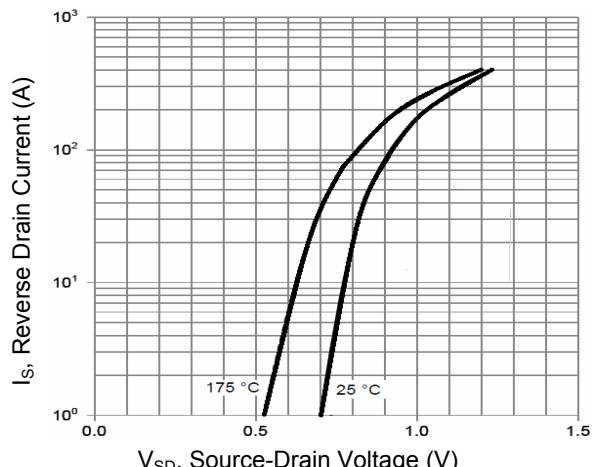


Figure 6. Source-Drain Diode Forward

### Typical Electrical and Thermal Characteristic Curves

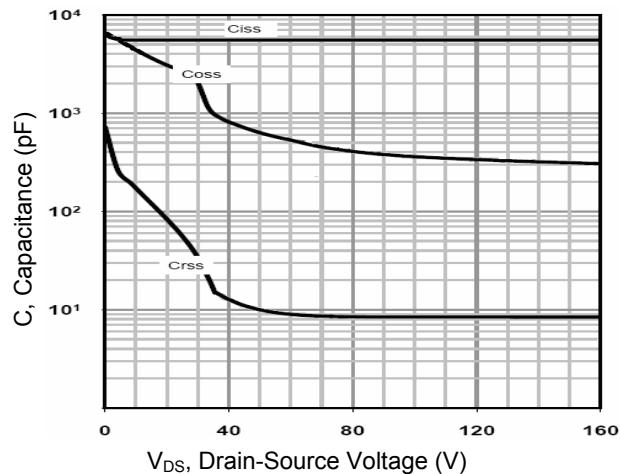


Figure 7. Capacitance vs.  $V_{DS}$

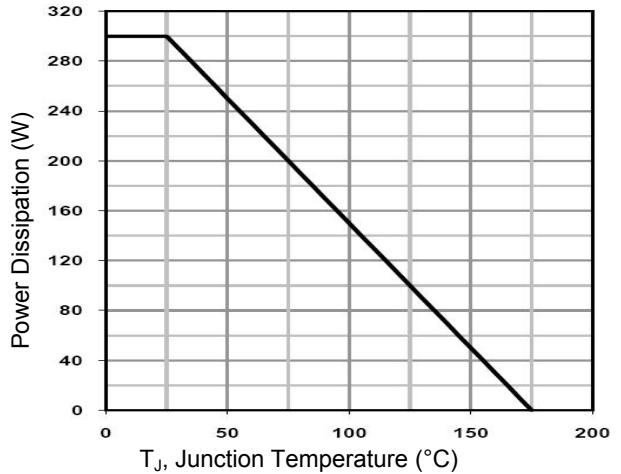


Figure 8. Power De-rating

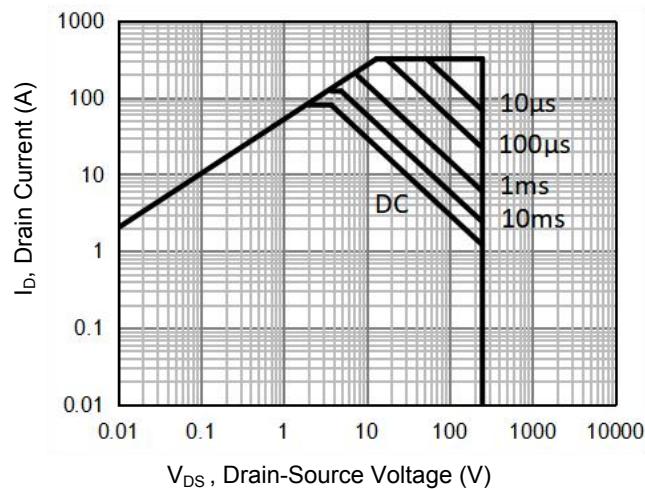


Figure 9. Safe Operation Area

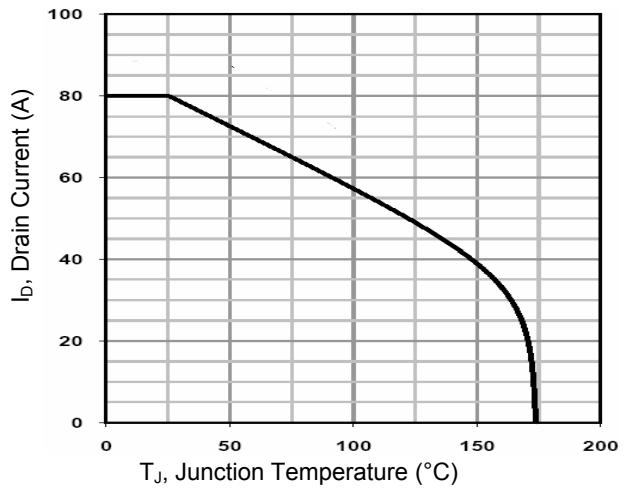


Figure 10. Current De-rating

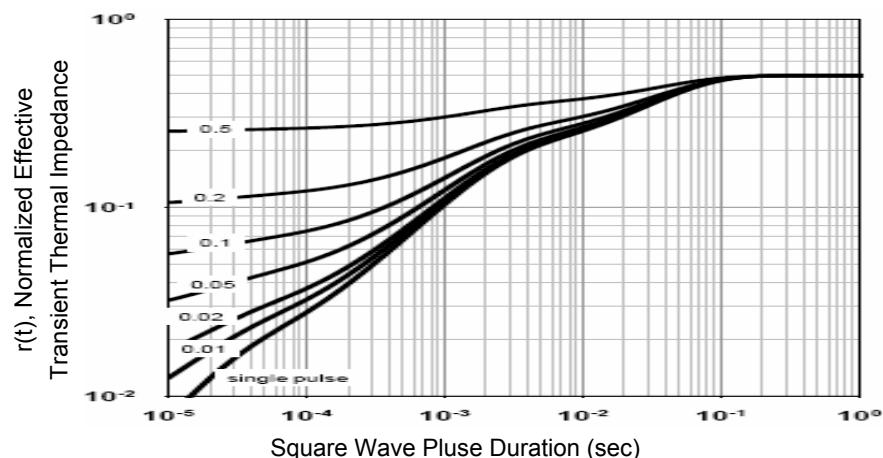
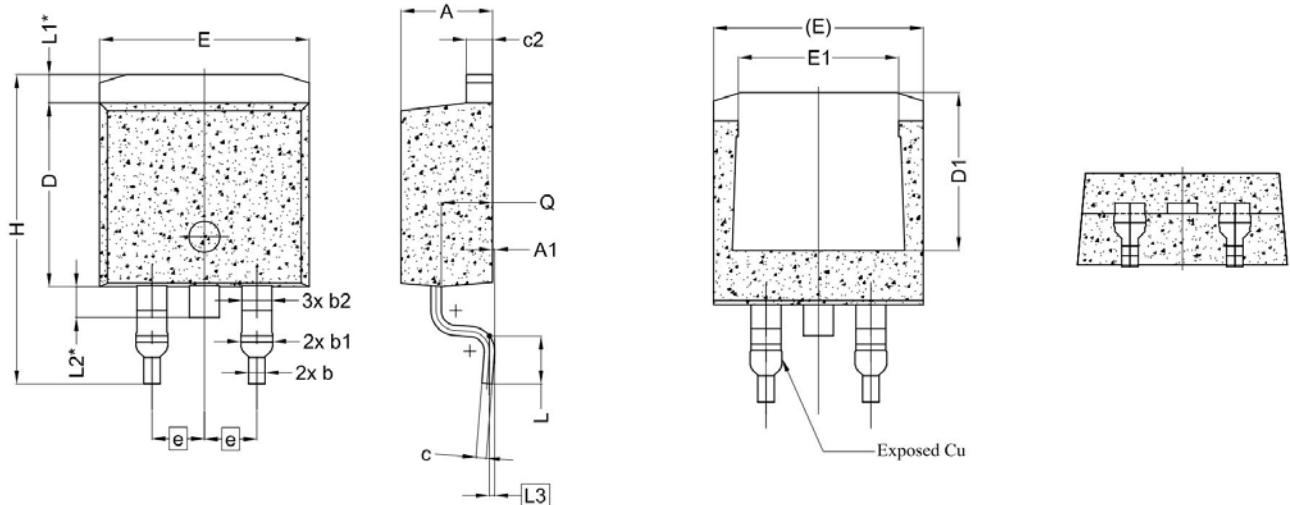


Figure 11. Normalized Maximum Transient Thermal Impedance

**Package Outline Dimensions (TO-263-2L)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.240	4.640	0.167	0.183
A1	0.000	0.250	0.000	0.010
b	0.700	0.900	0.028	0.035
b1	1.200	1.750	0.047	0.069
b2	1.200	1.700	0.047	0.067
c	0.400	0.600	0.016	0.024
c2	1.150	1.400	0.045	0.055
D	8.820	9.020	0.347	0.355
D1	6.860	-	0.270	-
E	9.960	10.360	0.392	0.408
E1	6.890	7.890	0.271	0.311
e	2.540 BSC		0.100 BSC	
H	14.610	15.880	0.575	0.625
L	1.780	2.790	0.070	0.110
L1	1.360 REF		0.054 REF	
L2	1.500 REF		0.059 REF	
L3	0.250 BSC		0.010 BSC	
Q	2.300	2.700	0.091	0.106