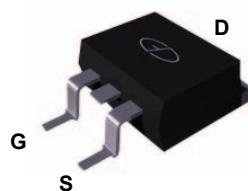
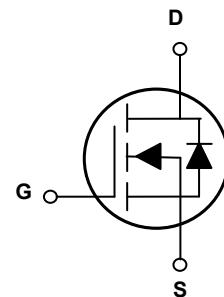


## Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	4.2mΩ
$I_D$	150A



TO-263 (D<sup>2</sup>PAK)



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 SSFT0980 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	Max.	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	+20/-12	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	150	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		95	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	600	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	378	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	87	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	275	W
Power Dissipation-Derate above 25°C		2.22	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.45	°C/W
Operating Junction Temperature Range	$T_J$	-50 To +150	°C
Storage Temperature Range	$T_{STG}$	-50 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	100	-	-	V
Drain-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=100\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$V_{\text{DS}}=80\text{V}, V_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	100	nA
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=20\text{A}$	-	3.5	4.2	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=15\text{A}$	-	4.5	6	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	1.2	1.8	2.5	V
Forward Transconductance	$g_{\text{fs}}$	$V_{\text{DS}}=10\text{V}, I_{\text{D}}=3\text{A}$	-	20	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{\text{DS}}=80\text{V}, I_{\text{D}}=10\text{A}$ $V_{\text{GS}}=10\text{V}$	-	110	165	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{\text{gs}}$		-	11.5	18	
Gate-Drain Charge <sup>3,4</sup>	$Q_{\text{gd}}$		-	28	42	
Turn-On Delay Time <sup>3,4</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=50\text{V}, R_{\text{G}}=6\Omega$ $V_{\text{GS}}=10\text{V}, I_{\text{D}}=1\text{A}$	-	23	46	nS
Rise Time <sup>3,4</sup>	$t_r$		-	32	64	
Turn-Off Delay Time <sup>3,4</sup>	$t_{\text{d}(\text{off})}$		-	157	320	
Fall Time <sup>3,4</sup>	$t_f$		-	115	230	
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=25\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	6680	13300	pF
Output Capacitance	$C_{\text{oss}}$		-	1690	3380	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	78	156	
Gate Resistance	$R_g$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	1.9	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_s$	$V_G=V_D=0\text{V}, \text{Force Current}$	-	-	150	A
Pulsed Source Current	$I_{\text{SM}}$		-	-	300	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
Reverse Recovery Time	$t_{\text{rr}}$	$V_{\text{GS}}=0\text{V}, I_s=10\text{A}, \frac{di}{dt}=100\text{A}/\mu\text{s}$ $T_J=25^\circ\text{C}$	-	72	-	nS
Reverse Recovery Charge	$Q_{\text{rr}}$		-	162	-	nC

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2.  $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=87\text{A}, R_{\text{G}}=25\Omega$ , Starting  $T_J=25^\circ\text{C}$ .
3. Pulse test: pulse width  $\leq 300\text{us}$ , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.

## Typical Electrical and Thermal Characteristic Curves

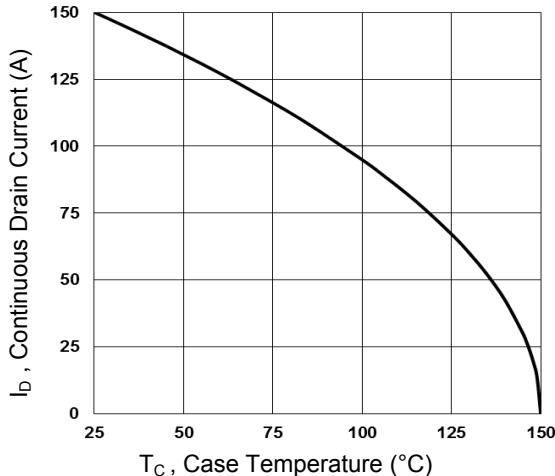


Figure 1. Continuous Drain Current vs.  $T_c$

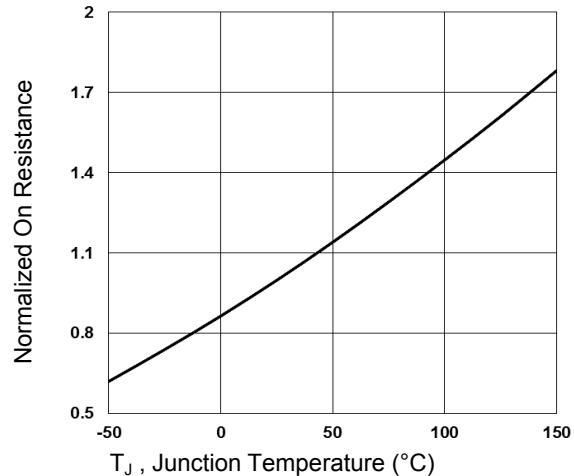


Figure 2. Normalized  $R_{DSON}$  vs.  $T_j$

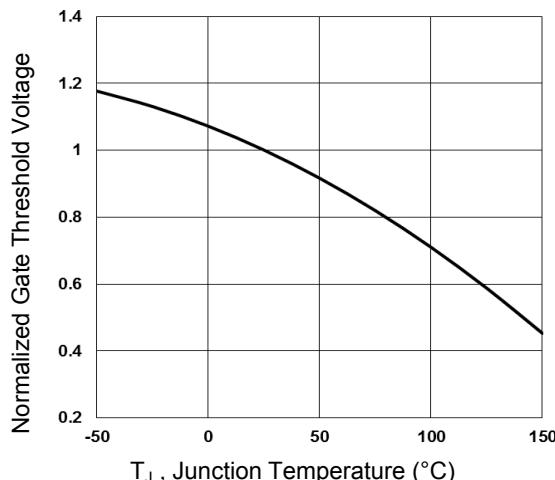


Figure 3. Normalized  $V_{th}$  vs.  $T_j$

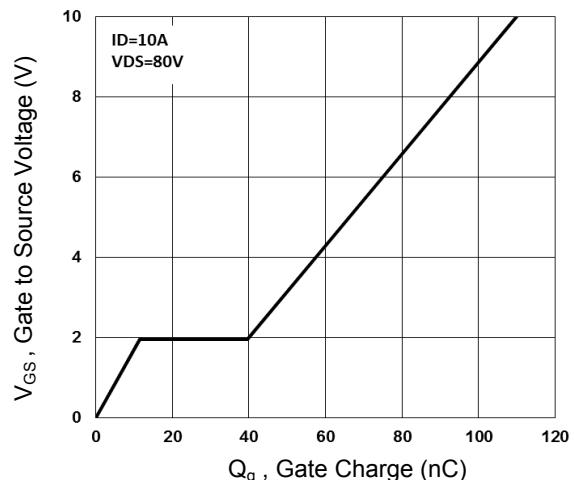


Figure 4. Gate Charge Waveform

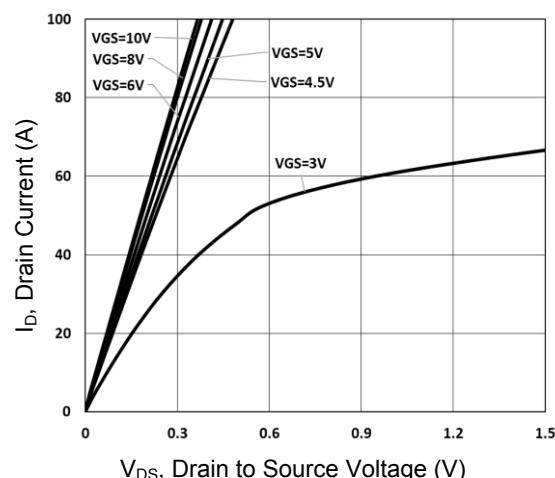


Figure 5. Typical Output Characteristics

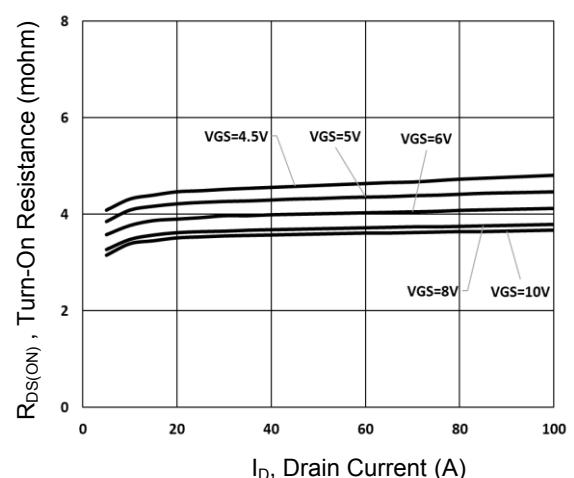


Figure 6. Turn-on Resistance  $R_{DSON}$  vs  $I_D$

## Typical Electrical and Thermal Characteristic Curves

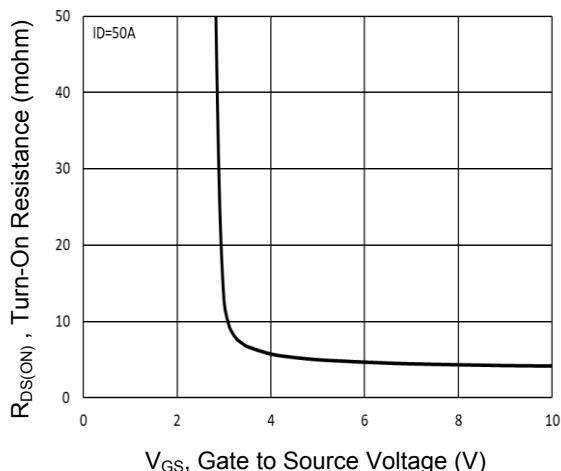


Figure 7. Turn-on Resistance  $R_{DS(on)}$  vs  $V_{GS}$

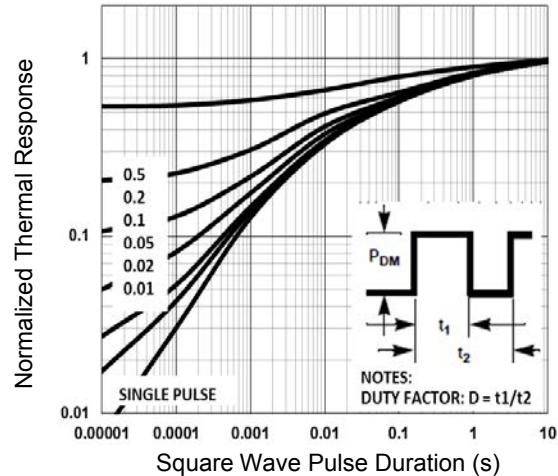


Figure 8. Normalized Transient Impedance

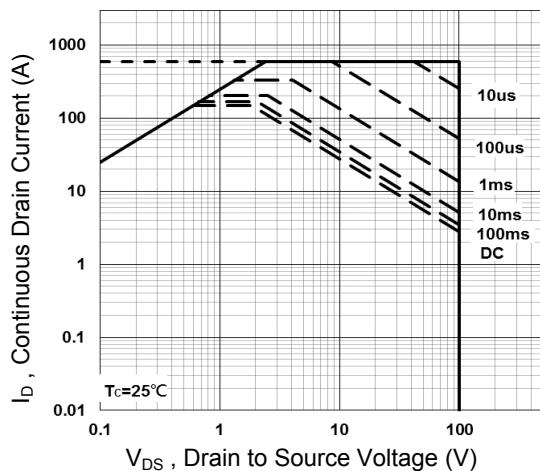


Figure 9. Maximum Safe Operation Area

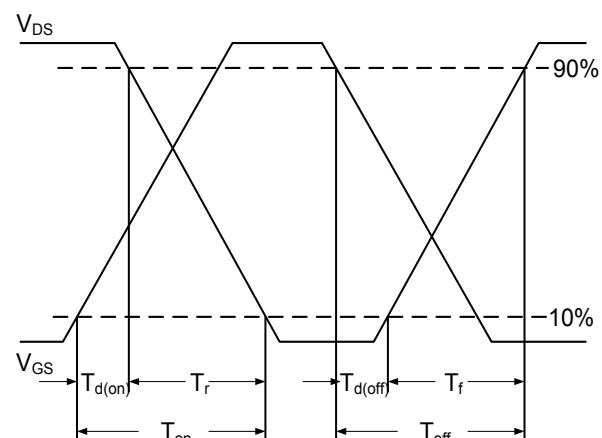


Figure 10. Switching Time Waveform

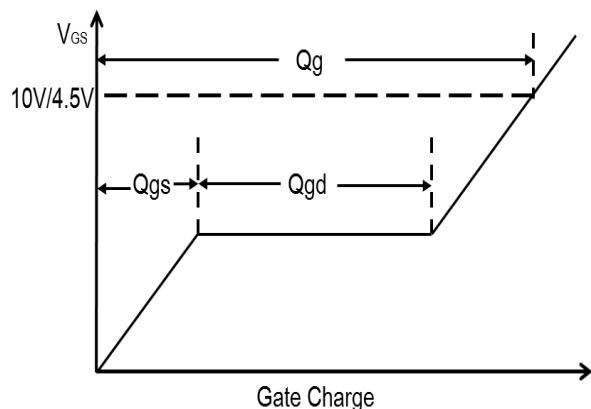


Figure 11. Gate Charge Waveform

**Package Outline Dimensions**

**TO-263 (D<sup>2</sup>PAK)**

Unit: mm

