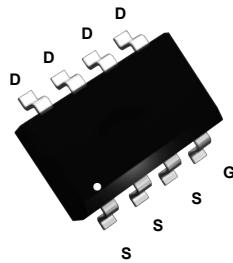
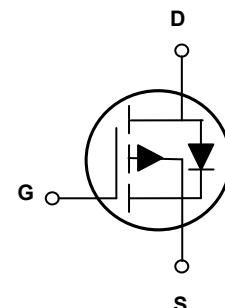


## Main Product Characteristics

$V_{(BR)DSS}$	-30V
$R_{DS(ON)}$	5.8mΩ
$I_D$	-18A



SOP-8



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 SSFQ3983 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 ( $T_C=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current – Continuous ( $T_A=25^\circ C$ )	$I_D$	-18	A
Drain Current – Continuous ( $T_A=70^\circ C$ )		-14.4	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	-72	A
Power Dissipation ( $T_A=25^\circ C$ )	$P_D$	1.47	W
Power Dissipation – Derate above 25°C		0.011	W/°C
Storage Temperature Range	$T_{STG}$	-55 to +150	°C
Operating Junction Temperature Range	$T_J$	-55 to +150	°C

## Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	40	°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	$\text{BV}_{\text{DSS}}$	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_\text{D}=-250\mu\text{A}$	-30	---	---	V
Drain-Source Leakage Current	$\text{I}_{\text{DSS}}$	$\text{V}_{\text{DS}}=-30\text{V}, \text{V}_{\text{GS}}=0\text{V}, \text{T}_J=25^\circ\text{C}$	---	---	-1	$\mu\text{A}$
		$\text{V}_{\text{DS}}=-24\text{V}, \text{V}_{\text{GS}}=0\text{V}, \text{T}_J=125^\circ\text{C}$	---	---	-10	$\mu\text{A}$
Gate-Source Leakage Current	$\text{I}_{\text{GSS}}$	$\text{V}_{\text{GS}}=\pm20\text{V}, \text{V}_{\text{DS}}=0\text{V}$	---	---	$\pm100$	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$\text{R}_{\text{DS(ON)}}$	$\text{V}_{\text{GS}}=-10\text{V}, \text{I}_\text{D}=-6\text{A}$	---	4.8	5.8	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=-4.5\text{V}, \text{I}_\text{D}=-5\text{A}$	---	6.8	8.8	$\text{m}\Omega$
Gate Threshold Voltage	$\text{V}_{\text{GS(th)}}$	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}, \text{I}_\text{D}=-250\mu\text{A}$	-1	-1.6	-2.5	V
Forward Transconductance	$\text{g}_{\text{fs}}$	$\text{V}_{\text{DS}}=-10\text{V}, \text{I}_\text{D}=-3\text{A}$	---	13	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2, 3</sup>	$\text{Q}_\text{g}$	$\text{V}_{\text{DS}}=-15\text{V}, \text{V}_{\text{GS}}=-4.5\text{V}, \text{I}_\text{D}=-6\text{A}$	---	80	---	nC
Gate-Source Charge <sup>2, 3</sup>	$\text{Q}_{\text{gs}}$		---	35	---	
Gate-Drain Charge <sup>2, 3</sup>	$\text{Q}_{\text{gd}}$		---	5	---	
Turn-On Delay Time <sup>2, 3</sup>	$\text{T}_{\text{d(on)}}$	$\text{V}_{\text{DD}}=-15\text{V}, \text{V}_{\text{GS}}=-10\text{V}, \text{R}_\text{G}=6\Omega, \text{A}$ $\text{I}_\text{D}=-1\text{A}$	---	35	---	nS
Rise Time <sup>2, 3</sup>	$\text{T}_\text{r}$		---	14	---	
Turn-Off Delay Time <sup>2, 3</sup>	$\text{T}_{\text{d(off)}}$		---	235	---	
Fall Time <sup>2, 3</sup>	$\text{T}_\text{f}$		---	85	---	
Input Capacitance	$\text{C}_{\text{iss}}$	$\text{V}_{\text{DS}}=-15\text{V}, \text{V}_{\text{GS}}=0\text{V}, \text{F}=1\text{MHz}$	---	5500	---	pF
Output Capacitance	$\text{C}_{\text{oss}}$		---	820	---	
Reverse Transfer Capacitance	$\text{C}_{\text{rss}}$		---	500	---	
Gate Resistance	$\text{R}_\text{g}$	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=0\text{V}, \text{F}=1\text{MHz}$	---	9	---	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$\text{I}_\text{s}$	$\text{V}_\text{G}=\text{V}_\text{D}=0\text{V}$ , Force Current	---	---	-18	A
Pulsed Source Current	$\text{I}_{\text{sm}}$		---	---	-72	A
Diode Forward Voltage	$\text{V}_{\text{SD}}$	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_\text{s}=-1\text{A}, \text{T}_J=25^\circ\text{C}$	---	---	-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 Characteristic Curves

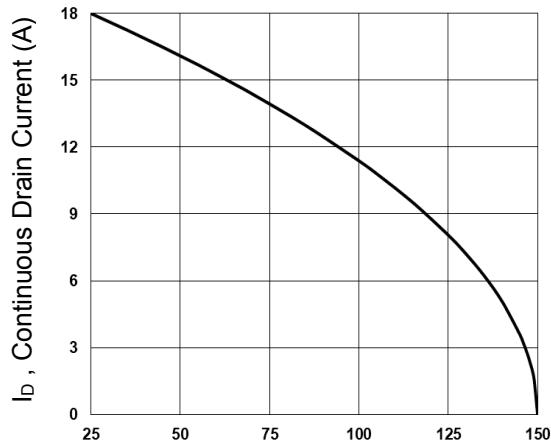


Fig.1 **Continuous Drain Current vs.  $T_J$**

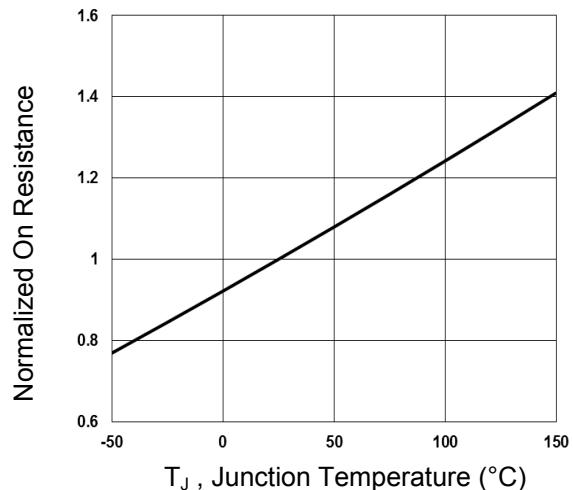


Fig.2 **Normalized  $R_{DS(ON)}$  vs.  $T_J$**

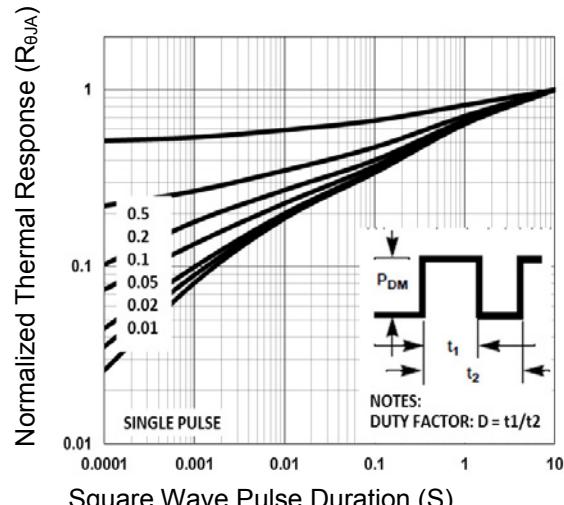


Fig.3 **Normalized Transient Impedance**

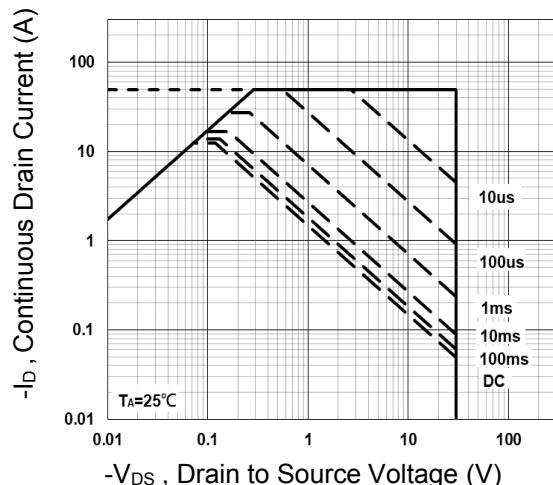


Fig.4 **Maximum Safe Operation Area**

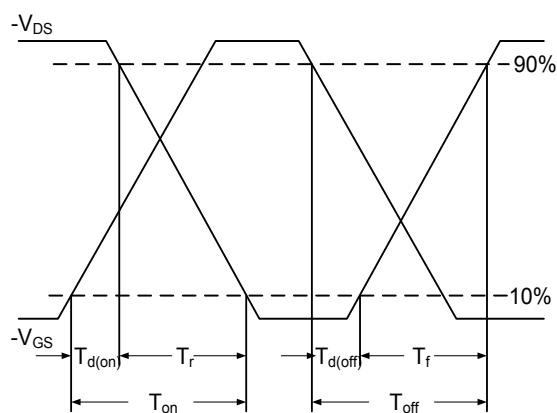


Fig.5 **Switching Time Waveform**

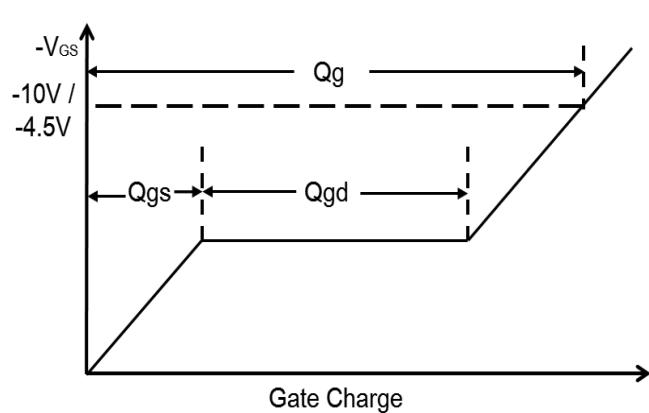
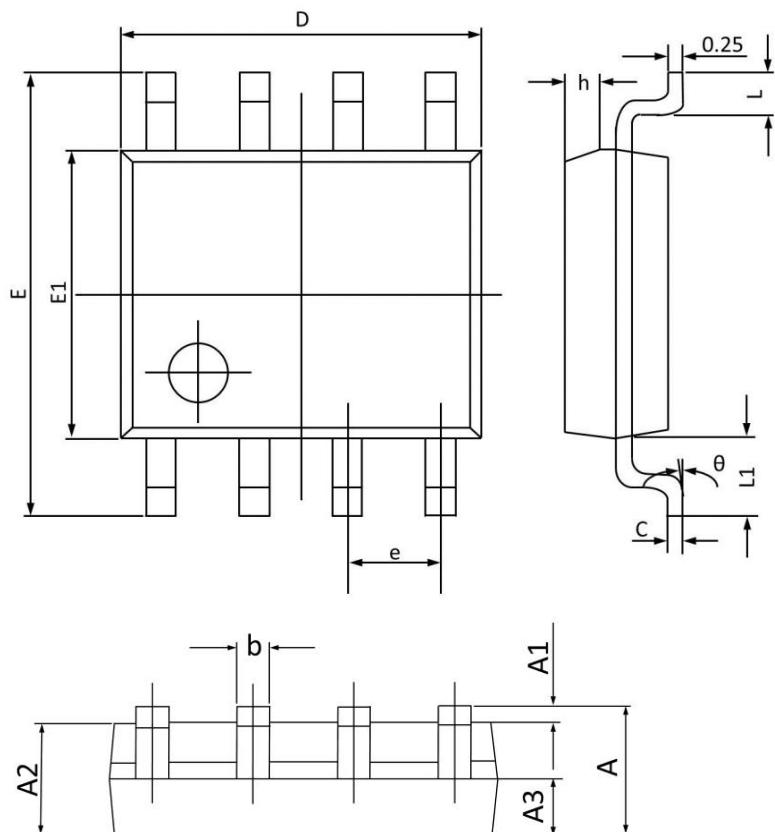


Fig.6 **Gate Charge Waveform**

### Package Outline Dimensions

**SOP-8**



<b>Symbol</b>	<b>Dimensions In Millimeters</b>		<b>Dimensions In Inches</b>	
	<b>Min</b>	<b>Max</b>	<b>Min</b>	<b>Max</b>
A	1.350	1.750	0.053	0.068
A1	0.100	0.250	0.004	0.009
A2	1.300	1.500	0.052	0.059
A3	0.600	0.700	0.024	0.027
b	0.390	0.480	0.016	0.018
c	0.210	0.260	0.009	0.010
D	4.700	5.100	0.186	0.200
E	5.800	6.200	0.229	0.244
E1	3.700	4.100	0.146	0.161
e	1.270(BSC)		0.050(BSC)	
h	0.250	0.500	0.010	0.019
L	0.500	0.800	0.019	0.031
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°