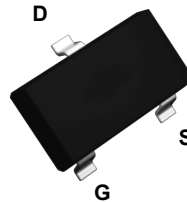
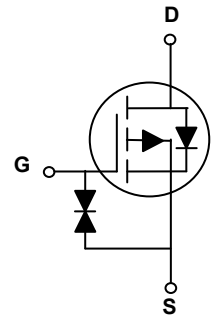


Main Product Characteristics

BV_{DSS}	-30V
$R_{DS(ON)}$	75mΩ (Max.)
I_D	-3.8A



SOT-23



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 SSF8309S 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	Value	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 25	V
Drain Current Continuous ($T_A=25^\circ\text{C}$)	I_D	-3.8	A
Drain Current Continuous ($T_A=70^\circ\text{C}$)		-3.0	A
Drain Current Pulsed ¹	I_{DM}	-15.2	A
Power Dissipation ($T_A=25^\circ\text{C}$)	P_D	1.56	W
Power Dissipation Derate above 25°C		0.012	W/ $^\circ\text{C}$
Max. Thermal Resistance Junction to Ambient	$R_{\theta JA}$	80	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-30	-	-	V
BV _{DSS} Temperature Coefficient	△BV _{DSS} / △T _J	Reference to 25°C, I _D =-1mA	-	-0.03	-	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V, T _J =25°C	-	-	-1	uA
		V _{DS} =-24V, V _{GS} =0V, T _J =125°C	-	-	-10	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±20	uA
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-3A	-	64	75	mΩ
		V _{GS} =-4.5V, I _D =-2A	-	105	130	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-1.6	-2.2	V
V _{GS(th)} Temperature Coefficient	△V _{GS(th)}		-	4	-	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =-10V, I _D =-3A	-	3.5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q _g	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-3A	-	4.2	6	nC
Gate-Source Charge ^{2,3}	Q _{gs}		-	1.9	2.5	
Gate-Drain Charge ^{2,3}	Q _{gd}		-	1.4	2	
Turn-On Delay Time ^{2,3}	t _{d(on)}	V _{DD} =-15V, V _{GS} =-10V, R _G =6Ω, I _D =-1A	-	2.8	5	nS
Rise Time ^{2,3}	t _r		-	8.7	17	
Turn-Off Delay Time ^{2,3}	t _{d(off)}		-	21.4	41	
Fall Time ^{2,3}	t _f		-	5.7	11	
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1MHz	-	460	665	pF
Output Capacitance	C _{oss}		-	45	65	
Reverse Transfer Capacitance	C _{rss}		-	30	45	
Drain-Source Ratings and Characteristics						
Continuous Source Current	I _s	V _G =V _D =0V, Force Current	-	-	-3.8	A
Pulsed Source Current	I _{SM}		-	-	-15.2	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _s =-1A, T _J =25°C	-	-	-1	V

Note:

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

Typical Electrical and Thermal Characteristic Curves

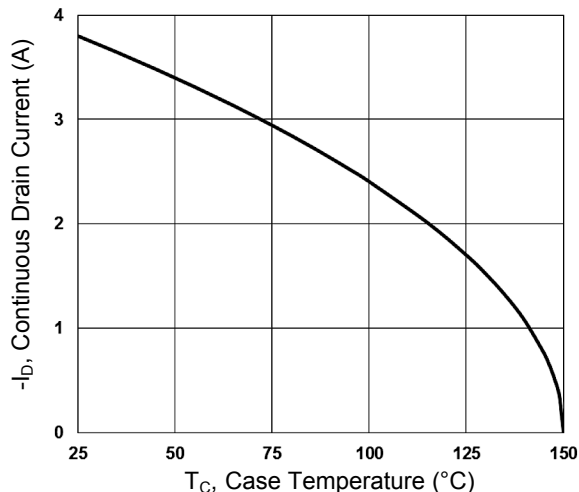


Figure 1. Continuous Drain Current vs. T_c

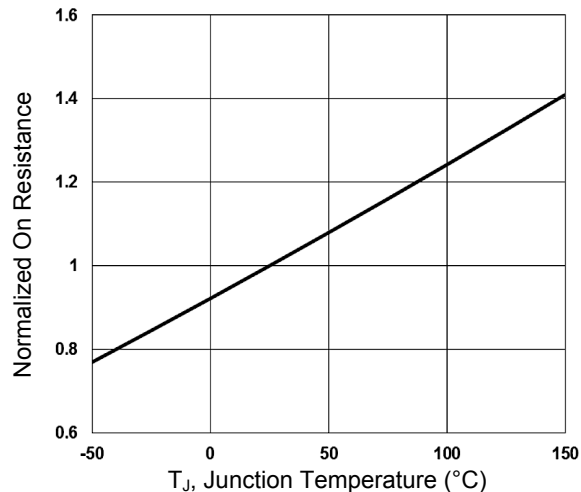


Figure 2. Normalized $R_{DS(ON)}$ vs. T_j

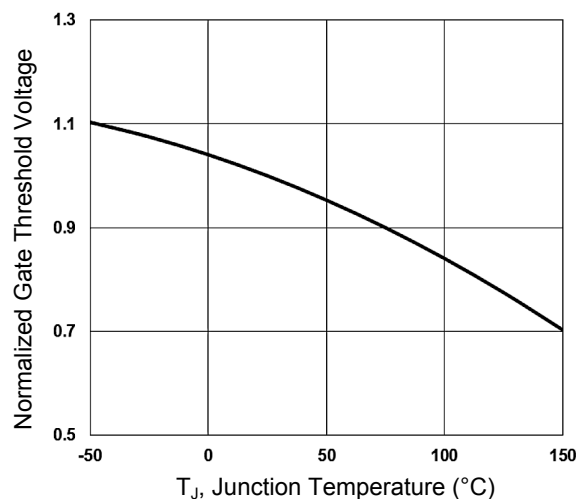


Figure 3. Normalized V_{th} vs. T_j

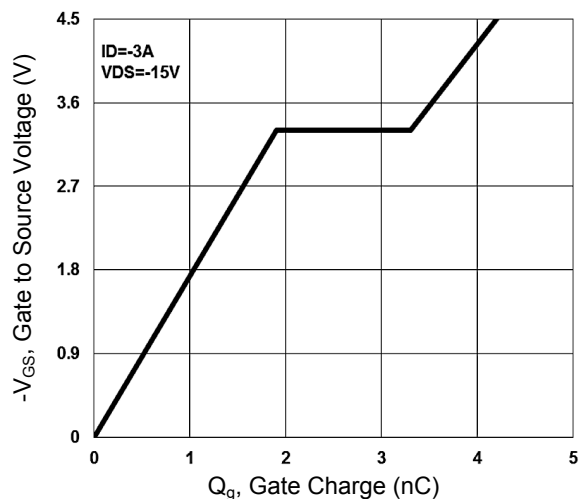


Figure 4. Gate Charge Waveform

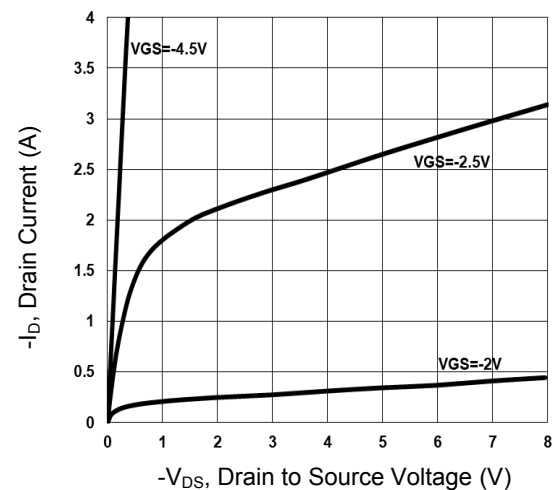


Figure 5. Typical Output Characteristics

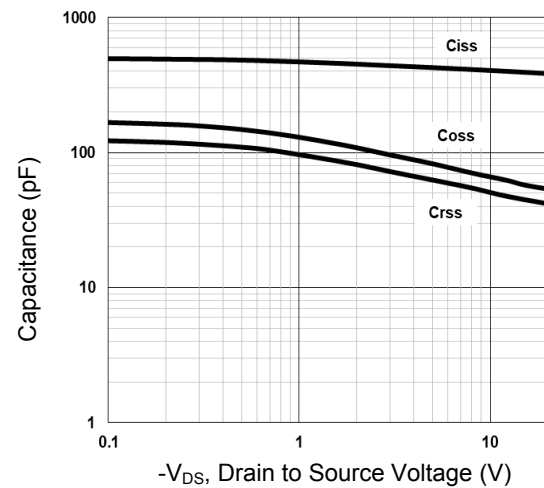


Figure 6. Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

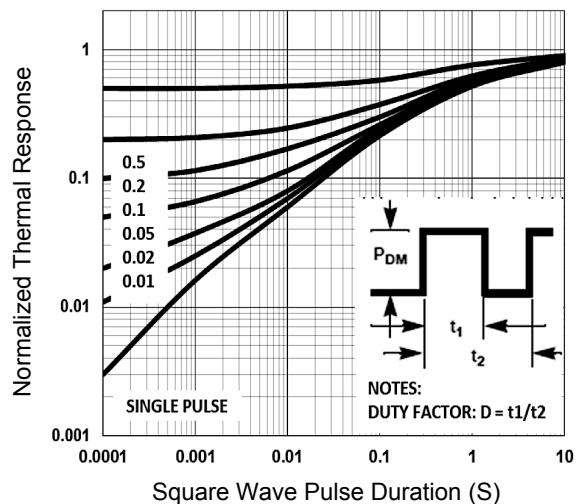


Figure 7. Normalized Transient Impedance

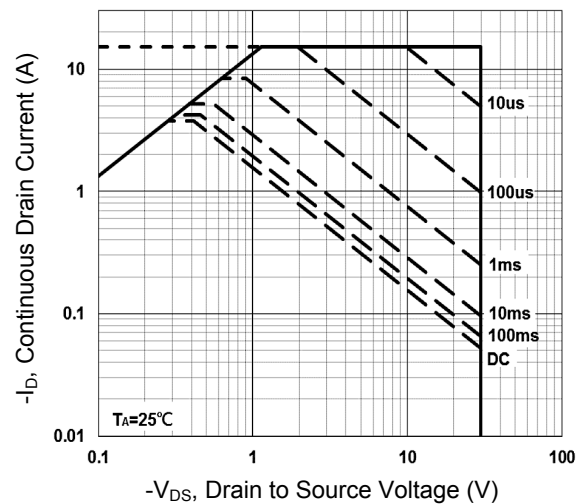
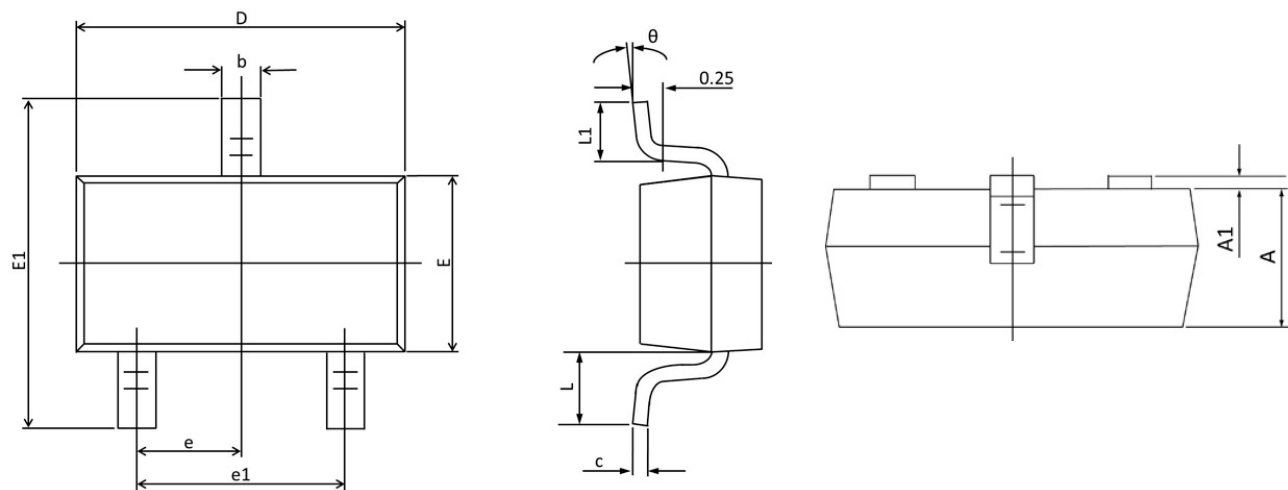


Figure 8. Maximum Safe Operation Area

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.001	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.080	0.180	0.003	0.007
D	2.700	3.100	0.106	0.122
E	1.100	1.500	0.043	0.059
E1	2.100	2.640	0.083	0.104
e	0.950 TYP.		0.037 TYP.	
e1	1.780	2.040	0.070	0.080
L	0.550 REF.		0.022 REF.	
L1	0.100	0.500	0.004	0.020
θ	1°	10°	1°	10°

Order Information

Device	Package	Marking	Packaging	SPQ
SSF8309S	SOT-23	J>(* varied by lots)	Tape & Reel	3,000 Pcs / Reel