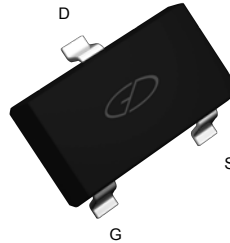
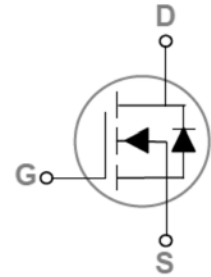


Main Product Characteristics

$V_{(BR)DSS}$	20V
$R_{DS(ON)}$	19mΩ
I_D	6.7A



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 SSF2312S 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	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current – Continuous ($T_c=25^\circ\text{C}$)	I_D	6.7	A
Drain Current – Continuous ($T_c=100^\circ\text{C}$)		4.2	A
Drain Current – Pulsed ¹	I_{DM}	26.8	A
Power Dissipation ($T_c=25^\circ\text{C}$)	P_D	1.56	W
Power Dissipation – Derate above 25°C		0.012	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	$R_{\theta JA}$	---	80	°C/W

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	20	---	---	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =1mA	---	0.02	---	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =125°C	---	---	10	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =4A	---	15	19	mΩ
		V _{GS} =2.5V, I _D =3A	---	18	24	
		V _{GS} =1.8V, I _D =2A	---	23	32	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	0.3	0.6	0.8	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		---	2	---	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =4A	---	9.5	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =4A	---	5.8	8	nC
Gate-Source Charge ^{2,3}	Q _{gs}		---	0.6	1	
Gate-Drain Charge ^{2,3}	Q _{gd}		---	2	4	
Turn-On Delay Time ^{2,3}	T _{d(on)}	V _{DD} =10V, V _{GS} =4.5V, R _G =25Ω, I _D =1A	---	5	9	nS
Rise Time ^{2,3}	T _r		---	14.4	27	
Turn-Off Delay Time ^{2,3}	T _{d(off)}		---	30	55	
Fall Time ^{2,3}	T _f		---	9.2	17	
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, F=1MHz	---	600	870	pF
Output Capacitance	C _{oss}		---	70	100	
Reverse Transfer Capacitance	C _{rss}		---	45	65	
Drain-Source Diode Characteristics and Maximum Ratings						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	---	---	6.7	A
Pulsed Source Current	I _{SM}		---	---	26.8	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 ≤300uS, duty cycle ≤2%.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

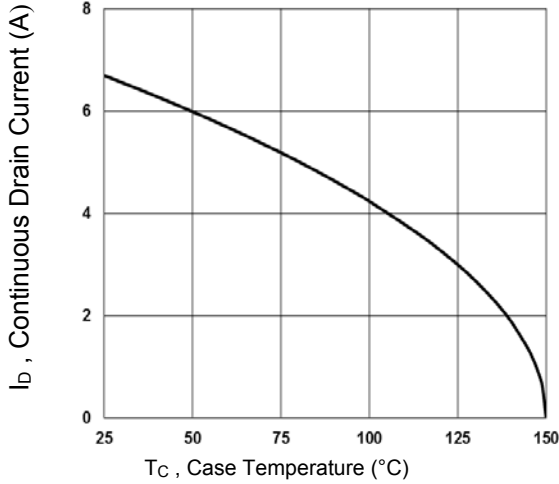


Fig.1 Continuous Drain Current vs. T_C

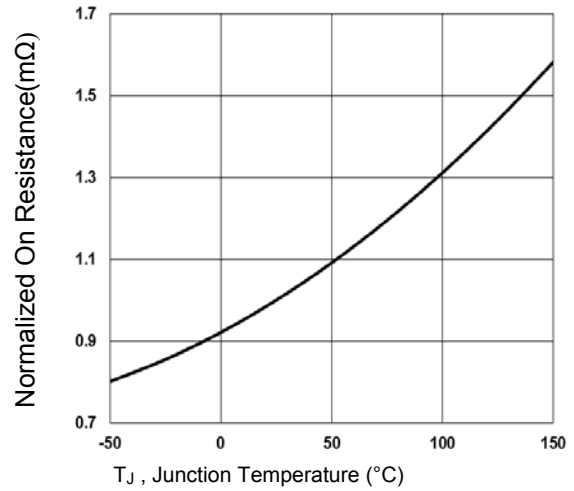


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

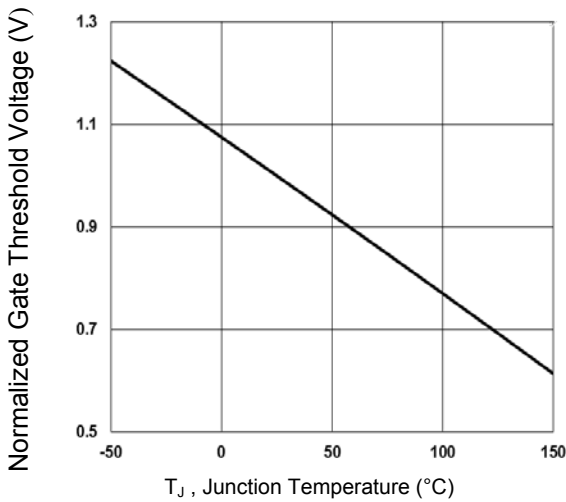


Fig.3 Normalized V_{th} vs. T_J

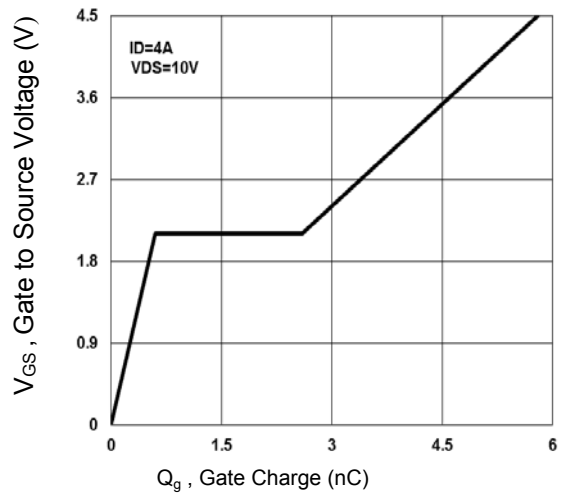


Fig.4 Gate Charge Waveform

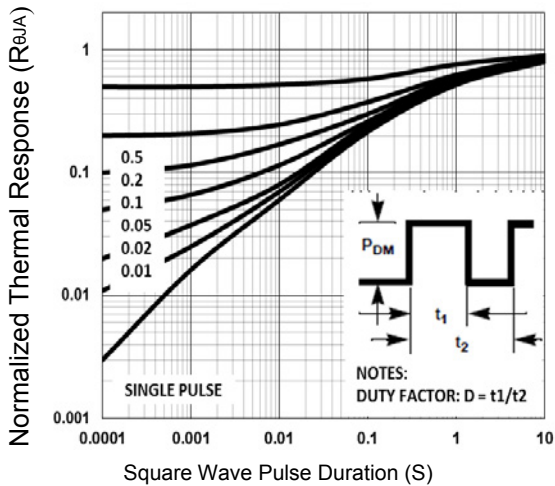


Fig.5 Normalized Transient Impedance

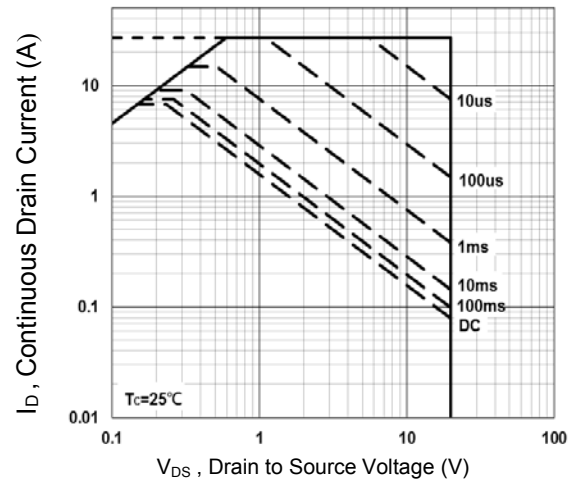


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

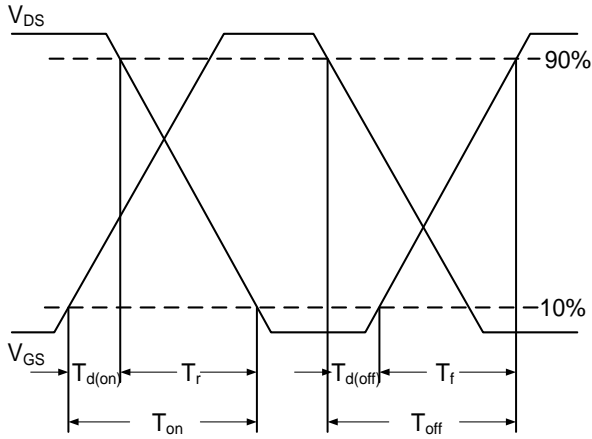


Fig.7 Switching Time Waveform

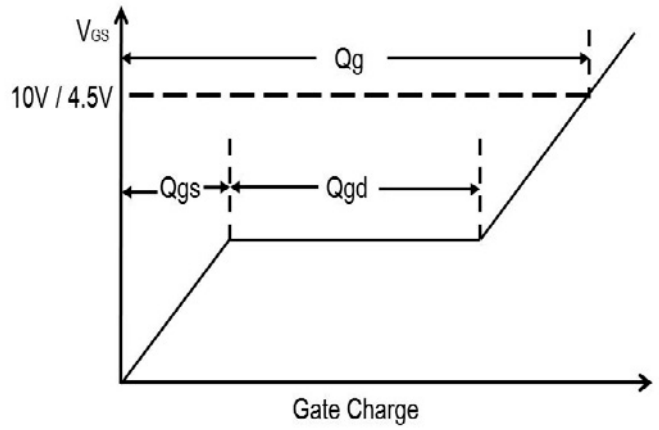
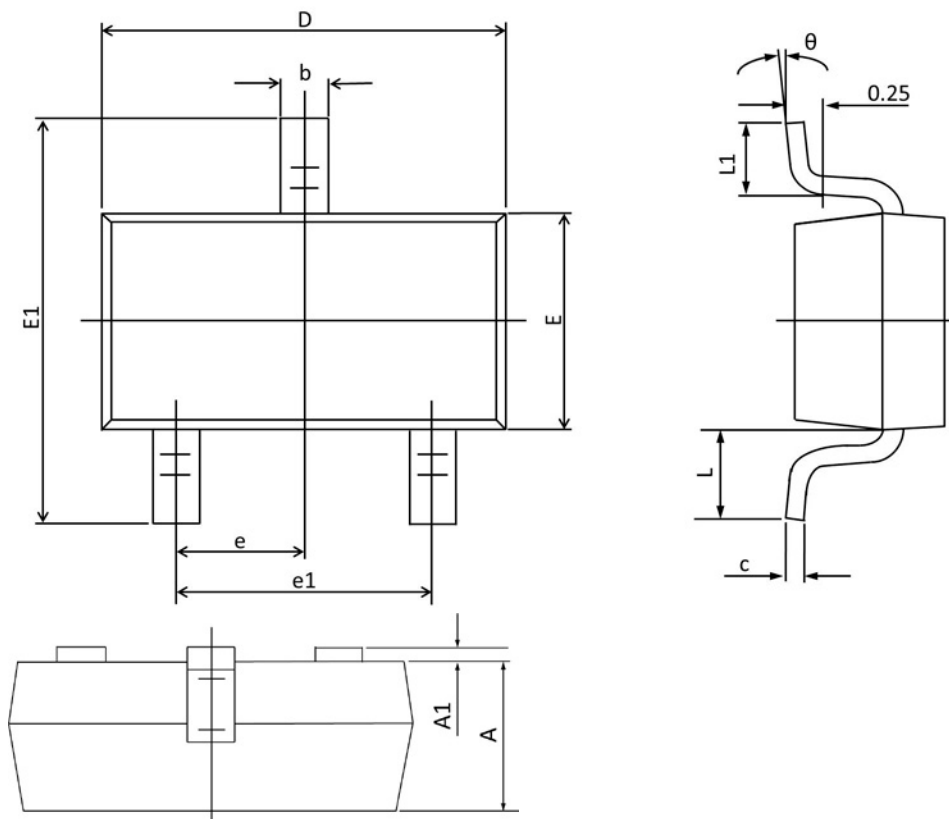


Fig.8 Gate Charge Waveform

Package Outline Dimensions SOT-23



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°