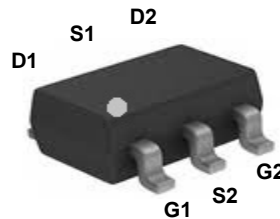
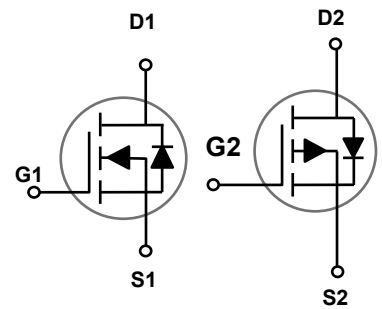


Main Product Characteristics

Polarity	N-Ch	P-Ch
V_{DSS}	20V	-20V
$R_{DS(ON)(Max.)}$	40m Ω	100m Ω
I_D	3.8A	-2.5A



SOT-23-6L



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for notebook, load switch, networking and hand-held devices
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The SSF2116 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)

Symbol	Parameter	N-Channel	P-Channel	Unit
V_{DS}	Drain-Source Voltage	20	-20	V
V_{GS}	Gate-Source Voltage	± 10	± 10	V
I_D	Drain Current – Continuous ($T_C=25^\circ\text{C}$)	3.8	-2.5	A
	Drain Current – Continuous ($T_C=100^\circ\text{C}$)	2.3	-1.5	A
I_{DM}	Drain Current – Pulsed ¹	15.2	-10	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	1.25	1.25	W
	Power Dissipation – Derate above 25°C	0.01	0.01	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to +150		$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to +150		$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	100	$^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=1\text{mA}$	---	0.02	---	$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	± 100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=3A$	---	30	40	m Ω
		$V_{GS}=2.5V, I_D=2A$	---	42	55	
		$V_{GS}=1.8V, I_D=1.5A$	---	55	70	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.3	0.6	1	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	-2	---	mV/ $^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=2A$	---	4.4	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2, 3}	Q_g	$V_{DS}=10V, V_{GS}=4.5V, I_D=3A$	---	5.8	10	nC
Gate-Source Charge ^{2, 3}	Q_{gs}		---	0.6	1.5	
Gate-Drain Charge ^{2, 3}	Q_{gd}		---	1.5	3	
Turn-On Delay Time ^{2, 3}	$T_{d(on)}$	$V_{DD}=10V, V_{GS}=4.5V, R_G=25\Omega, I_D=1A$	---	2.9	6	nS
Rise Time ^{2, 3}	T_r		---	8.4	16	
Turn-Off Delay Time ^{2, 3}	$T_{d(off)}$		---	19.2	38	
Fall Time ^{2, 3}	T_f		---	5.6	12	
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, F=1\text{MHz}$	---	315	600	pF
Output Capacitance	C_{oss}		---	50	80	
Reverse Transfer Capacitance	C_{rss}		---	40	60	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	---	---	3.8	A
Pulsed Source Current	I_{SM}		---	---	7.6	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V

Notes:

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.

P-Channel 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	---	-0.01	---	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 =-3A	---	82	100	mΩ
		V _{GS} =-2.5V , I _D =-2A	---	125	140	
		V _{GS} =-1.8V , I _D =-1A	---	197	230	
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-0.3	-0.6	-1.0	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		---	3	---	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =-10V , I _D =-1A	---	2.2	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2, 3}	Q _g	V _{DS} =-10V , V _{GS} =-4.5V , I _D =-2A	---	4.8	10	nC
Gate-Source Charge ^{2, 3}	Q _{gs}		---	0.5	1	
Gate-Drain Charge ^{2, 3}	Q _{gd}		---	1.9	4	
Turn-On Delay Time ^{2, 3}	T _{d(on)}	V _{DD} =-10V , V _{GS} =-4.5V , R _G =25Ω , I _D =-1A	---	3.5	7	nS
Rise Time ^{2, 3}	T _r		---	12.6	24	
Turn-Off Delay Time ^{2, 3}	T _{d(off)}		---	32.6	62	
Fall Time ^{2, 3}	T _f		---	8.4	16	
Input Capacitance	C _{iss}	V _{DS} =-15V , V _{GS} =0V , F=1MHz	---	350	510	pF
Output Capacitance	C _{oss}		---	65	95	
Reverse Transfer Capacitance	C _{rss}		---	50	75	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V , Force Current	---	---	-2.5	A
Pulsed Source Current	I _{SM}		---	---	-5	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =-1A , T _J =25°C	---	---	-1	V

Notes:

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.

N-Channel Typical Characteristic Curves

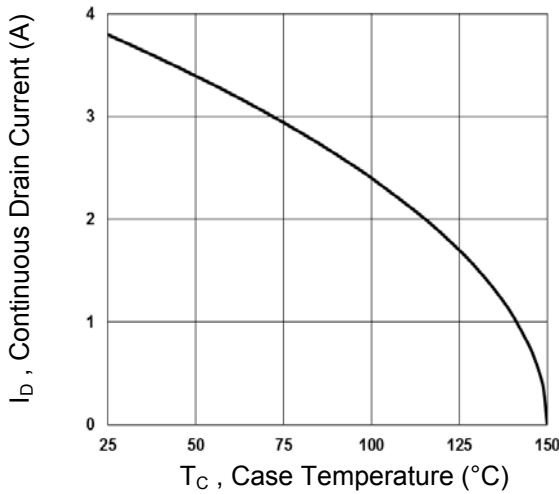


Fig.1 Continuous Drain Current vs. T_C

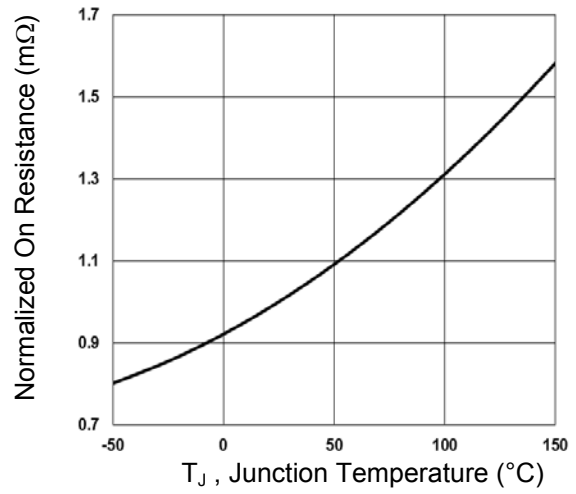


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

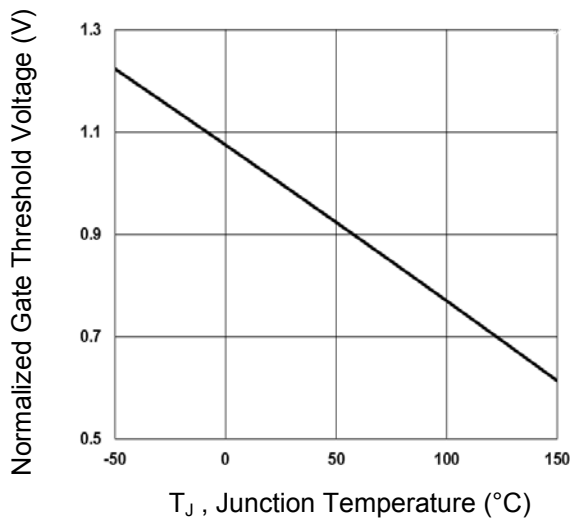


Fig.3 Normalized V_{th} vs. T_J

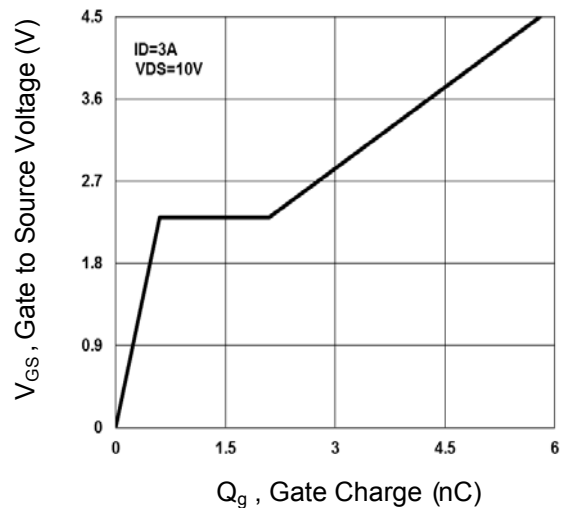


Fig.4 Gate Charge Waveform

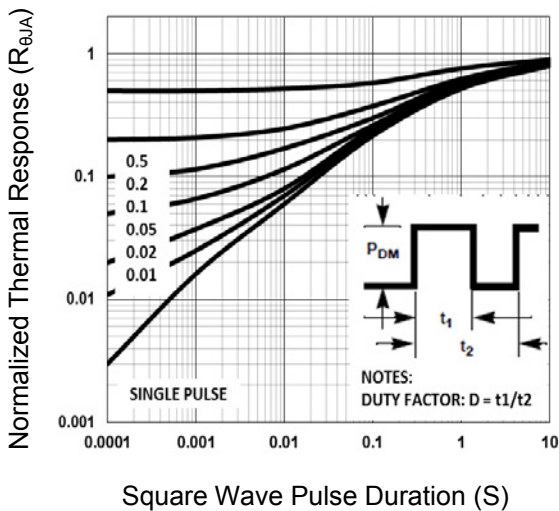


Fig.5 Normalized Transient Impedance

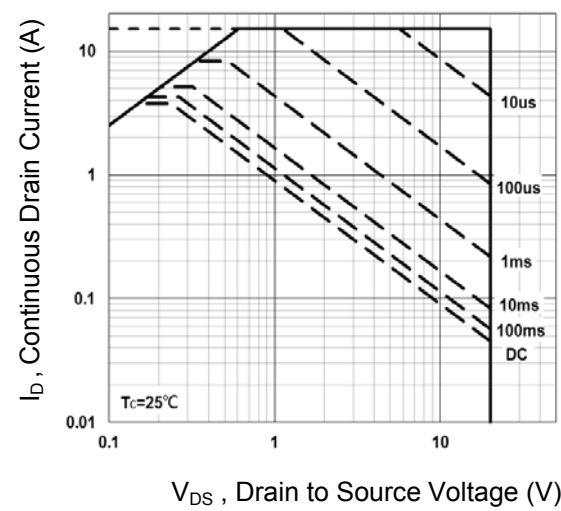


Fig.6 Maximum Safe Operation Area

P-Channel Typical Characteristic Curves

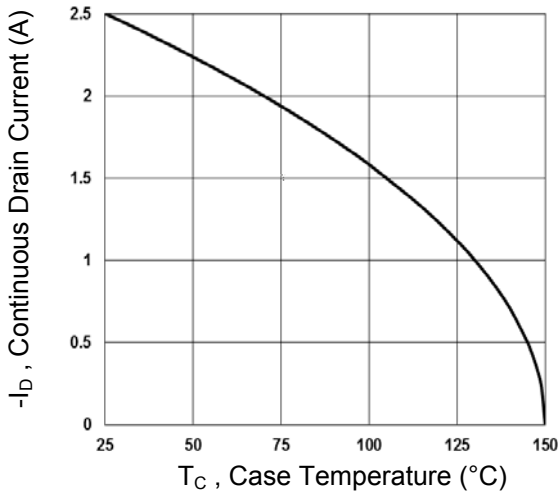


Fig.7 Continuous Drain Current vs. T_C

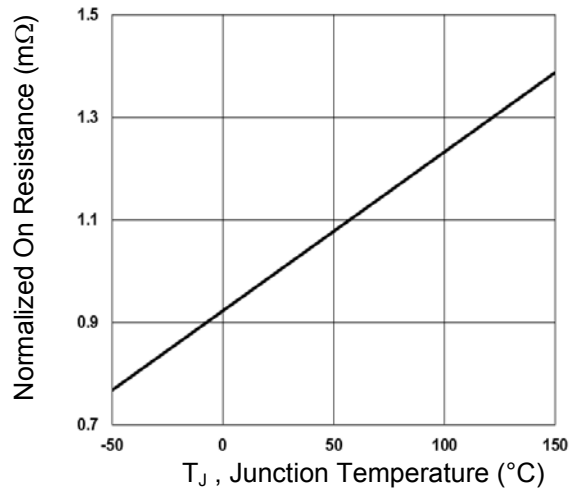


Fig.8 Normalized $R_{DS(ON)}$ vs. T_J

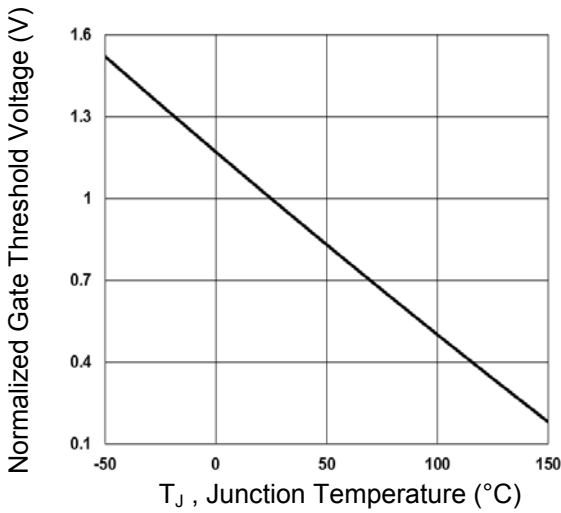


Fig.9 Normalized V_{th} vs. T_J

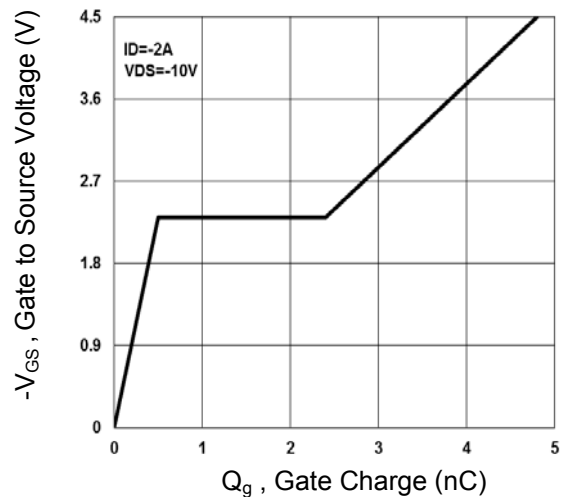


Fig.10 Gate Charge Waveform

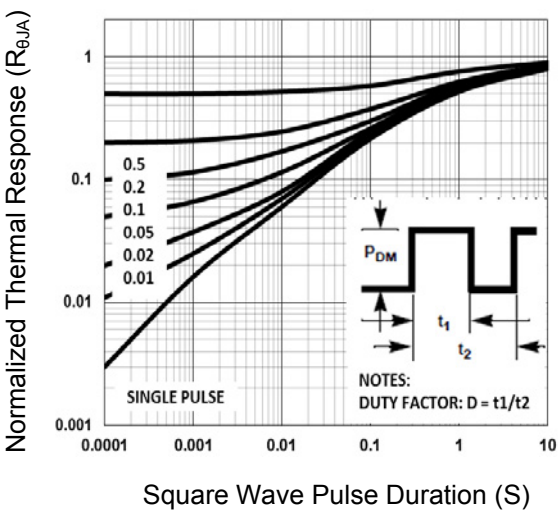


Fig.11 Normalized Transient Impedance

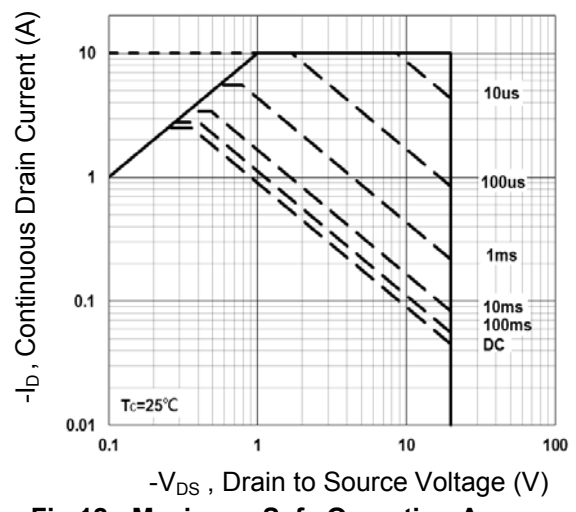
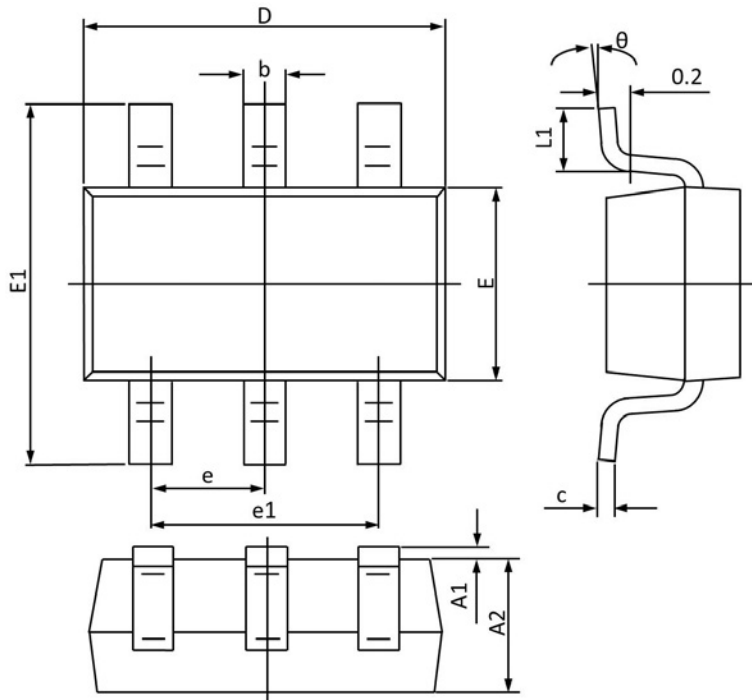


Fig.12 Maximum Safe Operation Area

Package Outline Dimensions

SOT-23-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.040	0.047
b	0.300	0.500	0.012	0.019
c	0.047	0.207	0.002	0.008
D	2.800	3.000	0.110	0.118
E	1.500	1.800	0.059	0.070
E1	2.600	3.000	0.103	0.118
e	0.950 TYP		0.037 TYP	
e1	1.900 TYP		0.075 TYP	
L1	0.250	0.550	0.010	0.021
theta	0°	8°	0°	8°

Order Information

Device	Package	Marking Code	Carrier	Quantity	HSF Status
SSF2116	SOT-23-6L	c	Tape & Reel	3000/Reel	RoHS Compliant