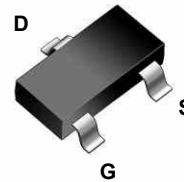
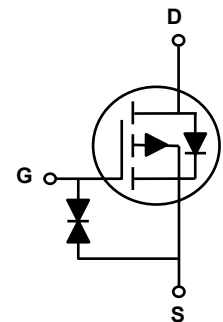


## Main Product Characteristics

$V_{DSS}$	-20V
$R_{DS(ON)}$	600m $\Omega$ (typ.)
$I_D$	-450mA



SOT-523



Schematic Diagram

## Features and Benefits

- Advanced trench MOSFET process technology
- Special designed for battery protection, load switching and general power management
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature
- ESD protection up to 2KV



## Description

The SSF2319CJ1 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 ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	-450	mA
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		-280	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-1.7	A
Power Dissipation	$P_D$	312	mW
Thermal Resistance, Junction-to-Ambient <sup>2</sup>	$R_{\theta JA}$	450	$^\circ\text{C/W}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$

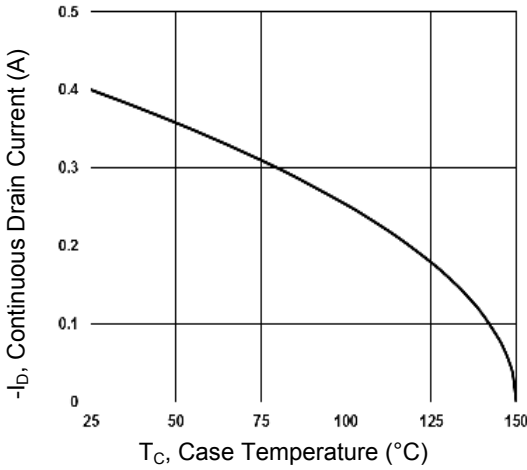
**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
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 $25^\circ\text{C}$ , $I_D=-1\text{mA}$	-	-0.01	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 6V, V_{DS}=0V$	-	-	$\pm 20$	$\mu A$
		$V_{GS}=\pm 4.5V, V_{DS}=0V$	-	-	$\pm 2$	$\mu A$
Static Drain-Source On-Resistance <sup>3</sup>	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-0.3A$	-	440	600	m $\Omega$
		$V_{GS}=-2.5V, I_D=-0.2A$	-	610	850	
		$V_{GS}=-1.8V, I_D=-0.1A$	-	810	1200	
		$V_{GS}=-1.5V, I_D=-0.1A$	-	1020	1600	
		$V_{GS}=-1.2V, I_D=-0.1A$	-	1800	3000	
Gate Threshold Voltage <sup>3</sup>	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.3	-0.6	-1	V
$V_{GS(th)}$ Temperature Coefficient <sup>3</sup>	$\Delta V_{GS(th)}$		-	3	-	$\text{mV}/^\circ\text{C}$
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>4</sup>	$Q_g$	$V_{DS}=-10V, I_D=-0.2A$ $V_{GS}=-4.5V$	-	1	2	nC
Gate-Source Charge <sup>4</sup>	$Q_{gs}$		-	0.28	0.5	
Gate-Drain Charge <sup>4</sup>	$Q_{gd}$		-	0.18	0.4	
Turn-On Delay Time <sup>4</sup>	$t_{d(on)}$	$V_{DD}=-10V, R_G=10\Omega$ $V_{GS}=-4.5V, I_D=0.2A$	-	8	16	nS
Rise Time <sup>4</sup>	$t_r$		-	5.2	10	
Turn-Off Delay Time <sup>4</sup>	$t_{d(off)}$		-	30	60	
Fall Time <sup>4</sup>	$t_f$		-	18	36	
Input Capacitance <sup>4</sup>	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V,$ $F=1\text{MHz}$	-	40	78	pF
Output Capacitance <sup>4</sup>	$C_{oss}$		-	15	30	
Reverse Transfer Capacitance <sup>4</sup>	$C_{rss}$		-	6.5	13	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Diode Forward Current <sup>2</sup>	$I_S$	$V_G=V_D=0V$ , Force Current	-	-	-400	mA
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$V_{GS}=0V, I_S=-0.2A$	-	-0.8	-1	V

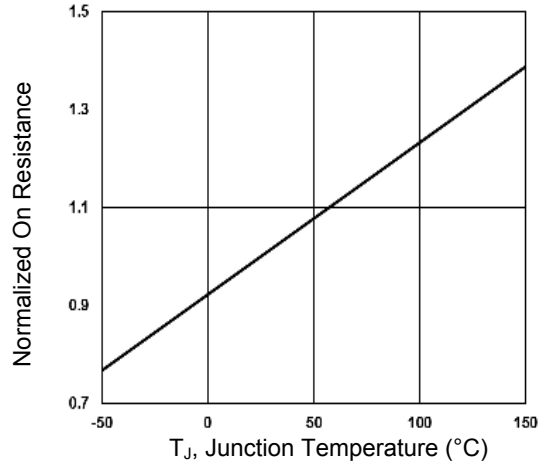
Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10\text{sec}$ .
3. Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

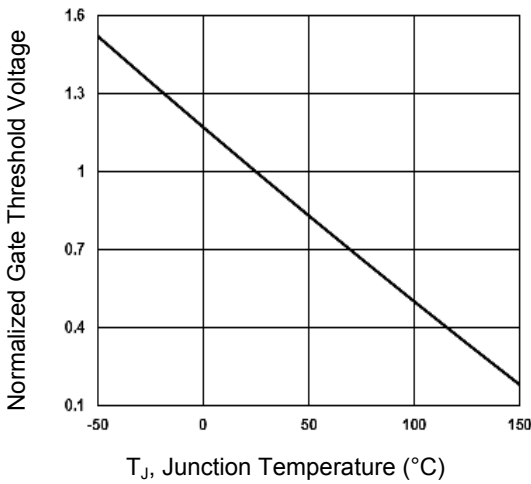
**Typical Electrical and Thermal Characteristics**



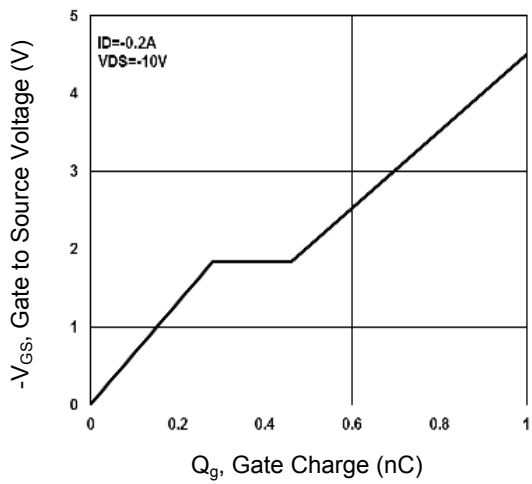
**Figure 1. Drain Current vs.  $T_c$**



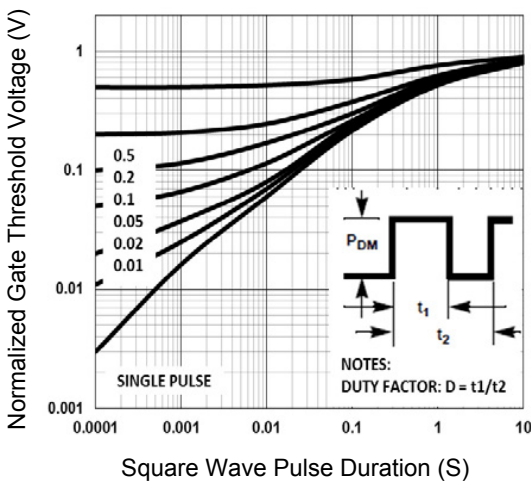
**Figure 2. Normalized  $R_{DS(on)}$  vs.  $T_j$**



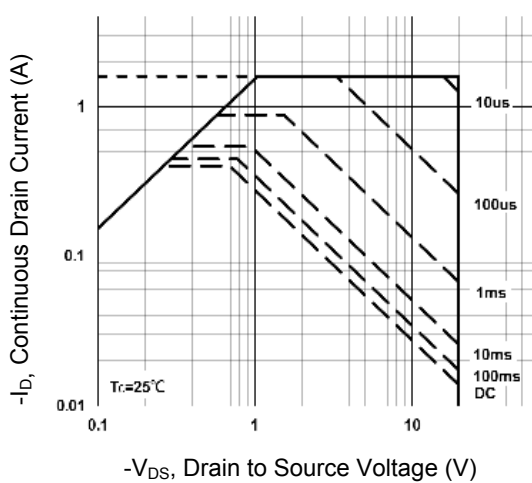
**Figure 3. Normalized  $V_{th}$  vs.  $T_j$**



**Figure 4. Gate Charge Waveform**

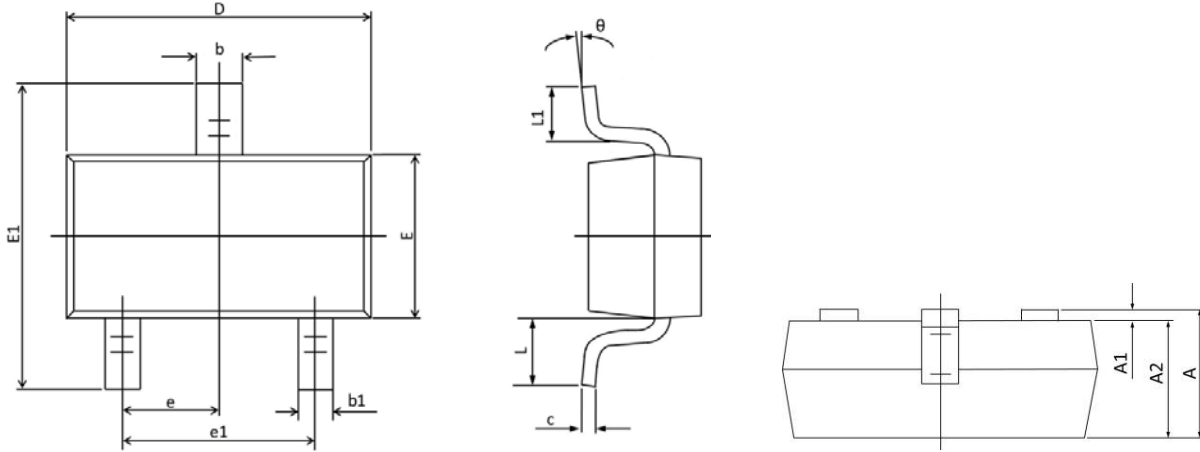


**Figure 5. Normalized Transient Response**



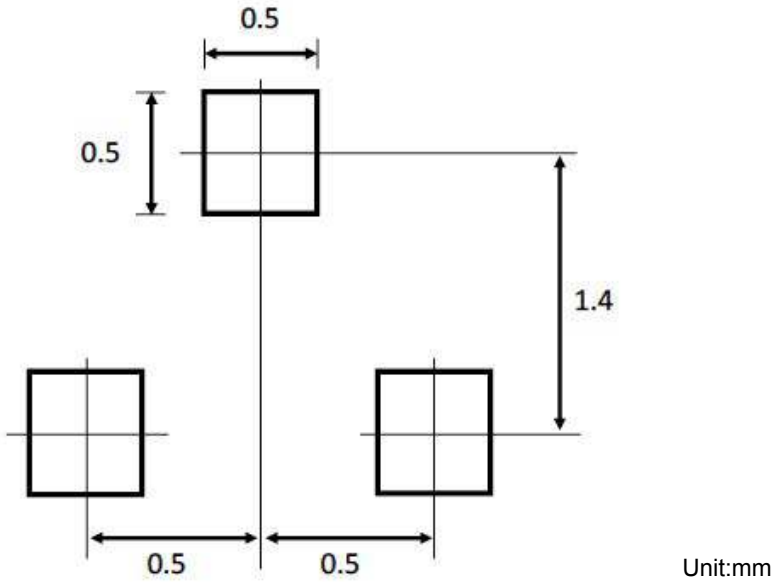
**Figure 6. Safe Operation Area**

**Package Outline Dimensions (SOT-523)**



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.014
b1	0.150	0.250	0.006	0.010
c	0.100	0.200	0.004	0.008
D	1.500	1.750	0.059	0.069
E	0.700	0.900	0.028	0.035
E1	1.400	1.750	0.055	0.069
e	0.500 TYP		0.020 TYP	
e1	0.900	1.100	0.035	0.043
L	0.300	0.460	0.012	0.018
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

**Recommended Pad Layout**



**Order Information**

Device	Package	Marking	Carrier	Quantity
SSF2319CJ1	SOT-523	F	Tape & Reel	3,000 pcs / Reel