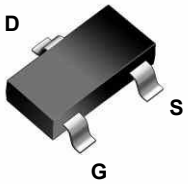
GOOD-ARK SEMICONDUCTOR

SSF2319CJ1

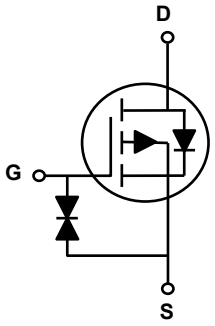
20V P-Channel MOSFET

Main Product Characteristics

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



SOT-523



Schematic Diagram

Features and Benefits

- Advanced trench MOSFET process technology
- Special designed for buttery 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°C unless otherwise specified)

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

Electrical Characteristics (T_A=25°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	-20	-	-	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}$ / $\triangle TJ$	Reference to 25°C, I_D=-1mA	-	-0.01	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V	-	-	-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±6V, V_{DS}=0V	-	-	±20	μA
		V_{GS}=±4.5V, V_{DS}=0V	-	-	±2	μA
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-0.3A	-	440	600	mΩ
		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[3]	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-0.3	-0.6	-1	V
$V_{GS(th)}$ Temperature Coefficient[3]	$\Delta V_{GS(th)}$		-	3	-	mV/°C
Dynamic and Switching Characteristics						
Total Gate Charge[4]	Q_g	V_{DS}=-10V, I_D=-0.2A V_{GS}=-4.5V	-	1	2	nC
Gate-Source Charge[4]	Q_{gs}		-	0.28	0.5	
Gate-Drain Charge[4]	Q_{gd}		-	0.18	0.4	
Turn-On Delay Time[4]	$t_{d(on)}$	V_{DD}=-10V, R_G=10Ω V_{GS}=-4.5V, I_D=0.2A	-	8	16	nS
Rise Time[4]	t_r		-	5.2	10	
Turn-Off Delay Time[4]	$t_{d(off)}$		-	30	60	
Fall Time[4]	t_f		-	18	36	
Input Capacitance[4]	C_{lss}	V_{DS}=-10V, V_{GS}=0V, F=1MHz	-	40	78	pF
Output Capacitance[4]	C_{oss}		-	15	30	
Reverse Transfer Capacitance[4]	C_{rss}		-	6.5	13	
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Current[2]	I_S	V_G=V_D=0V, Force Current	-	-	-400	mA
Diode Forward Voltage[3]	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 ≤ 10sec.
3. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

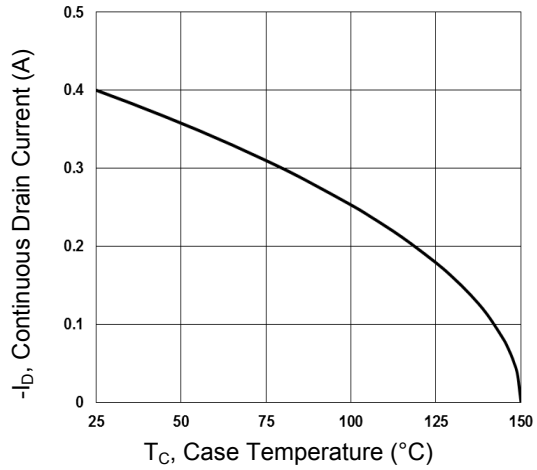


Figure 1. Drain Current vs. T_c

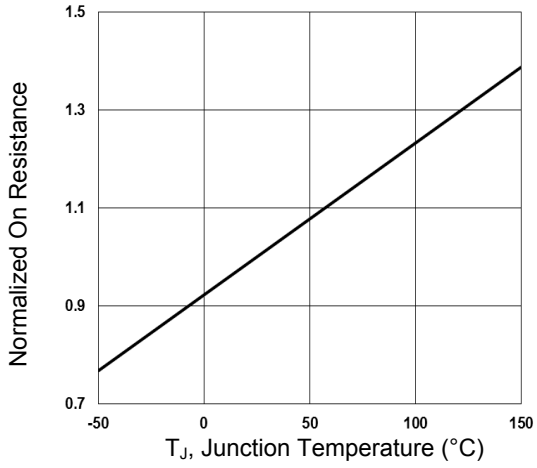


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

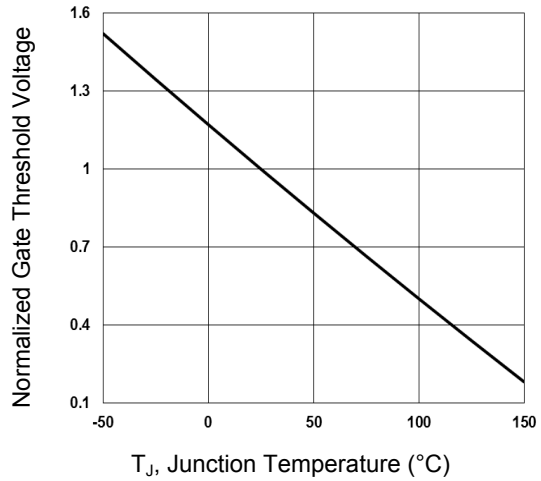


Figure 3. Normalized V_{th} vs. T_J

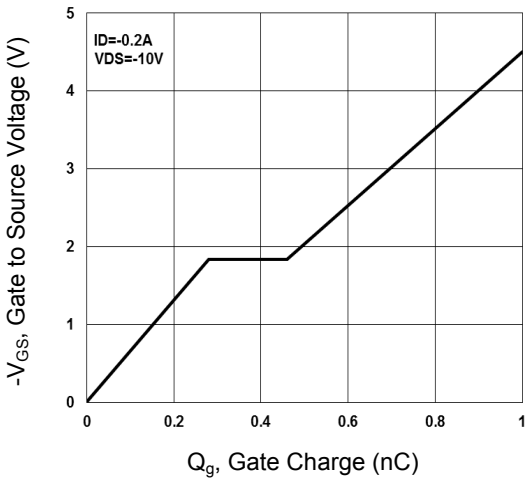


Figure 4. Gate Charge Waveform

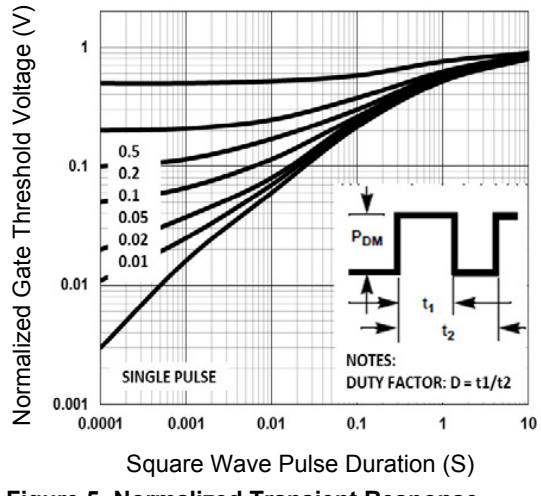


Figure 5. Normalized Transient Response

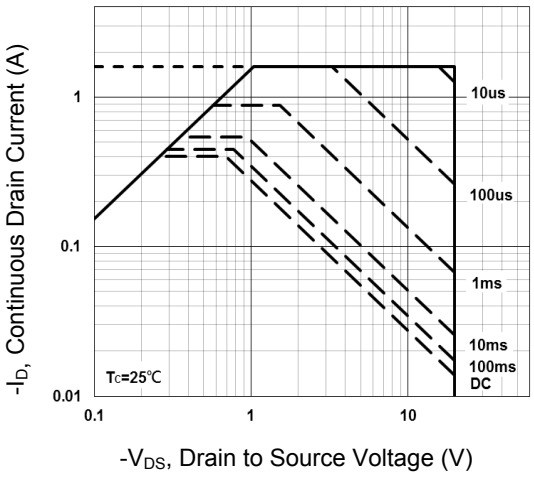
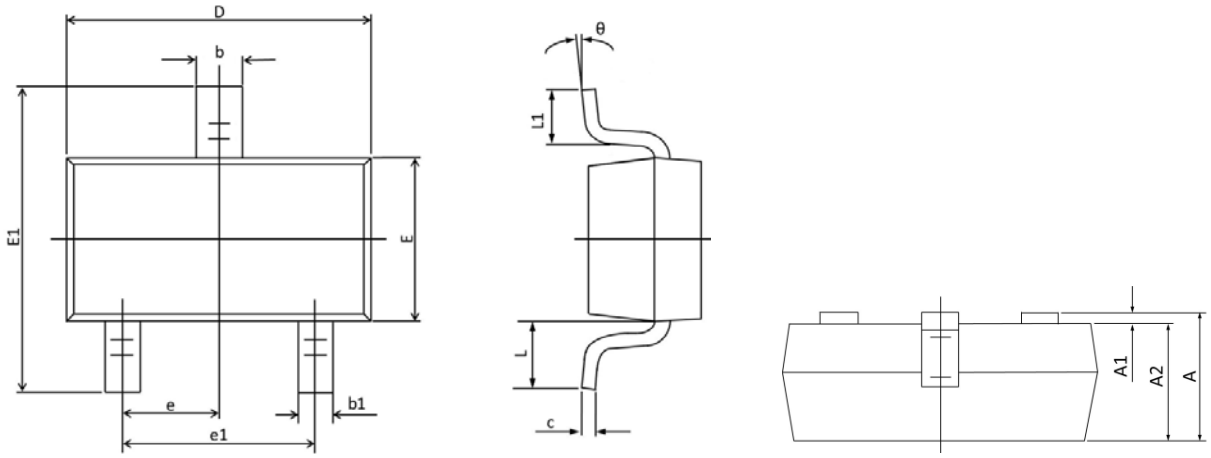


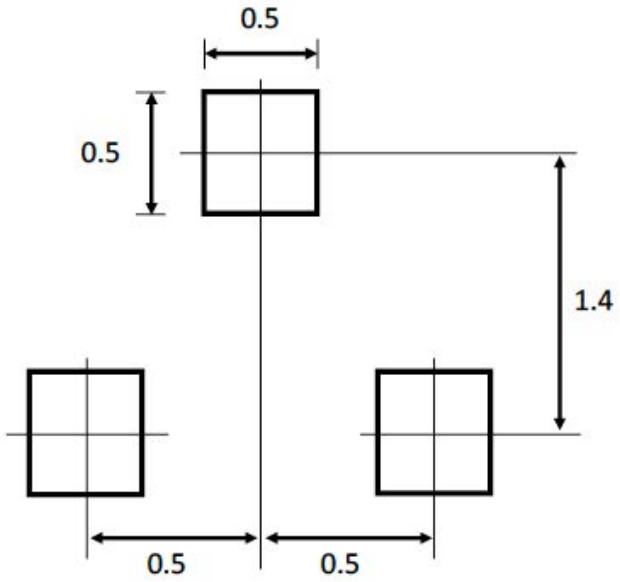
Figure 6. Safe Operation Area

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



Unit:mm

Order Information

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