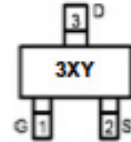


Main Product Characteristics

V_{DSS}	- 20V
$R_{DS(on)}$	440m Ω (typ.)
I_D	- 400mA

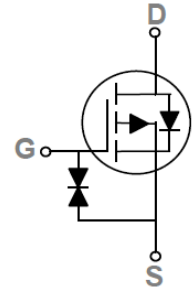


SOT-723



3: Part Marking
X: Year
Y: Lot

Marking and Pin Assignment



Schematic Diagram

Features and Benefits

- Advanced trench MOSFET process technology
- Ideal for PWM, load switching and general power management
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature
- Main applications: notebooks, load switching, battery protection, hand-held instruments.



Description

The SSF2319GE utilizes the latest processing techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable for use in battery protection, power switching and a wide variety of other applications.

Absolute Max Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Drain Current-Continuous($T_C=25^\circ\text{C}$)	I_D	-400	mA
Drain Current-Continuous($T_C=100^\circ\text{C}$)	I_D	-250	mA
Drain Current-Pulsed (Note 1)	I_{DM}	-1.6	A
Maximum Power Dissipation	P_D	275	mW
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To +150	$^\circ\text{C}$

Thermal Resistance

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	450	$^\circ\text{C/W}$
--	-----------------	-----	--------------------

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

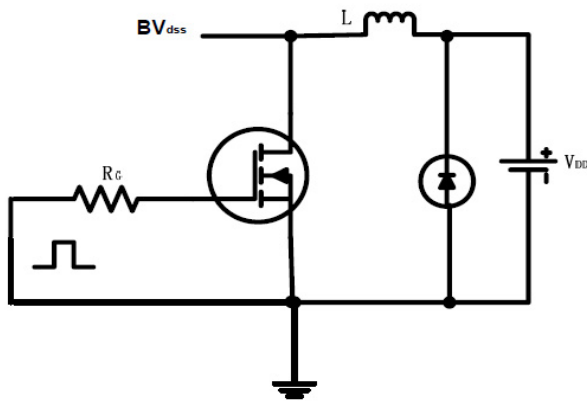
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	-20			V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	Reference to 25°C , $I_D = -1\text{mA}$		-0.01		$\text{V}/^{\circ}\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 6V, V_{DS} = 0V$			± 20	μA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.3	-0.6	-1.0	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$		3		$\text{mV}/^{\circ}\text{C}$
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -0.3A$		440	600	m Ω
		$V_{GS} = -2.5V, I_D = -0.2A$		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	
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{iss}	$V_{DS} = -10V, V_{GS} = 0V,$ $F = 1.0\text{MHz}$		40	78	PF
Output Capacitance	C_{oss}			15	30	PF
Reverse Transfer Capacitance	C_{rss}			6.5	13	PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -10V, I_D = 0.2A$ $V_{GS} = -4.5V, R_{GEN} = 10\Omega$		8	16	nS
Turn-on Rise Time	t_r			5.2	10	nS
Turn-Off Delay Time	$t_{d(off)}$			30	60	nS
Turn-Off Fall Time	t_f			18	36	nS
Total Gate Charge	Q_g	$V_{DS} = -10V, I_D = -0.2A,$ $V_{GS} = -4.5V$		1	2	nC
Gate-Source Charge	Q_{gs}			0.28	0.5	nC
Gate-Drain Charge	Q_{gd}			0.18	0.4	nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS} = 0V, I_S = -0.2A$		-0.8	-1.0	V
Diode Forward Current (Note 2)	I_S	$V_G = V_b = 0V$, Force Current			-400	mA

Note :

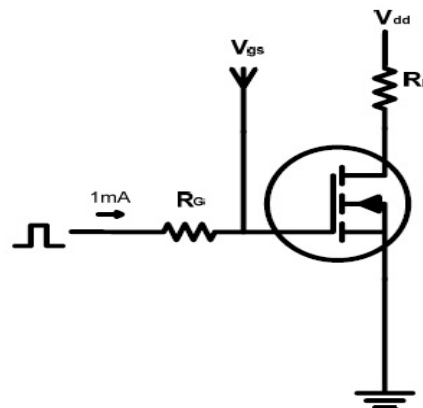
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Test Circuits and Waveforms

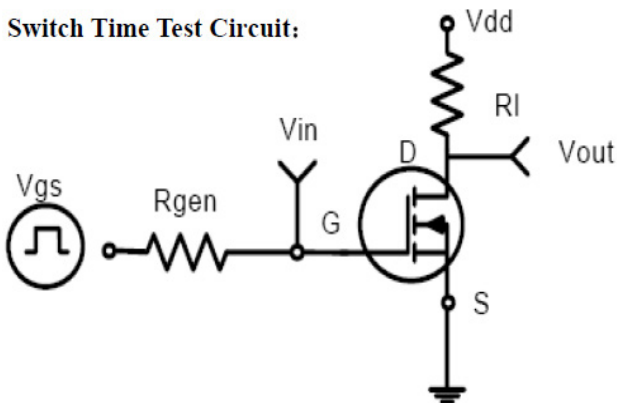
EAS test circuits:



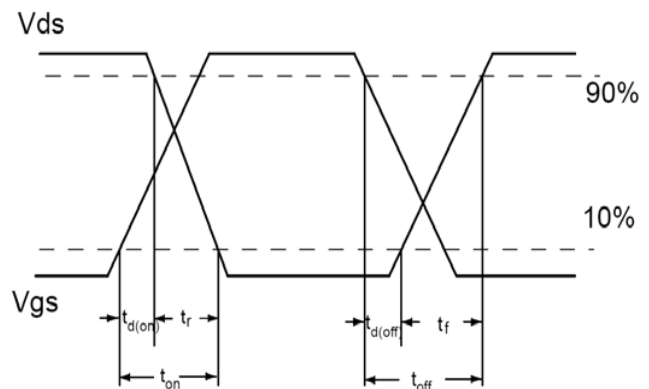
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

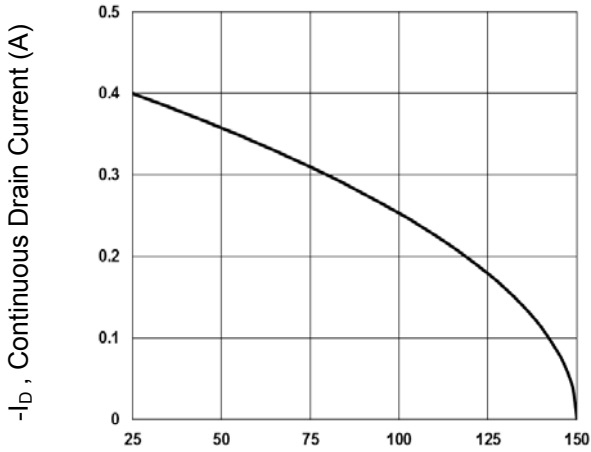


Figure 1. Drain Current vs. Tc

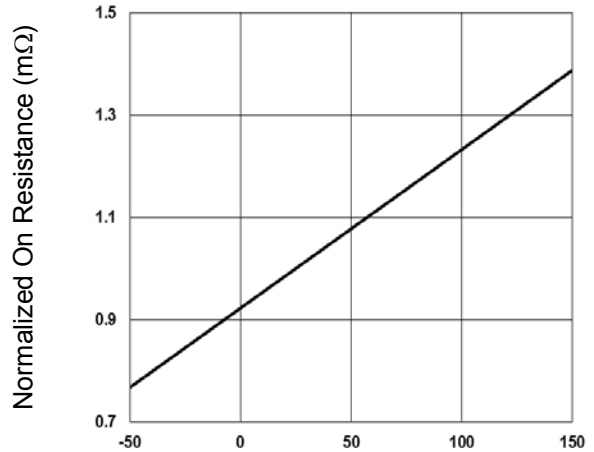


Figure 2. Normalized RDSon vs. Tj

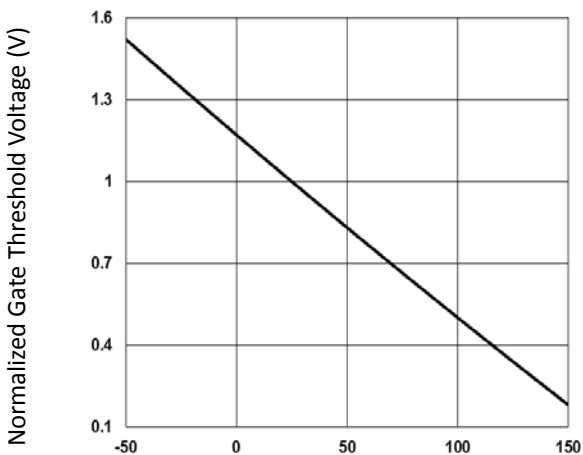


Figure 3. Normalized Vth vs. Tj

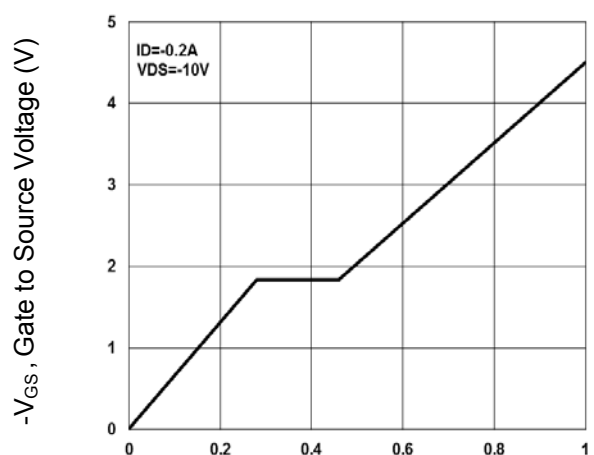


Figure 4. Gate Charge Waveform

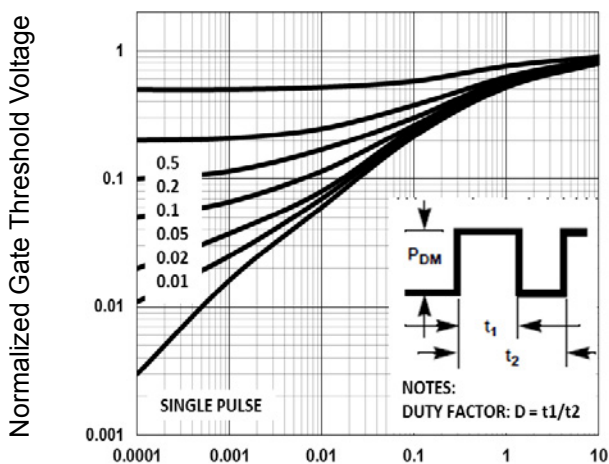


Figure 5. Normalized Transient Response

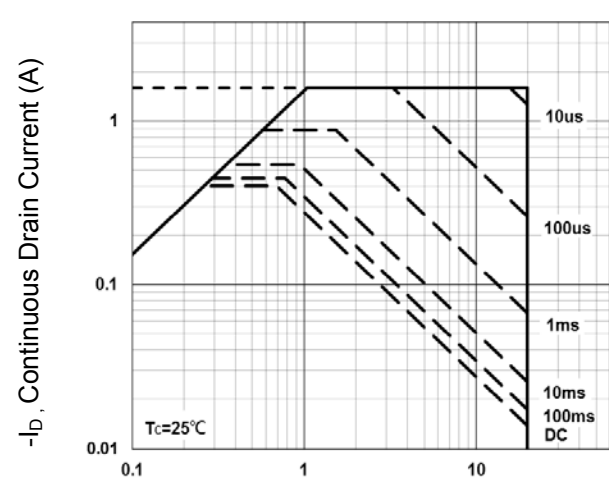
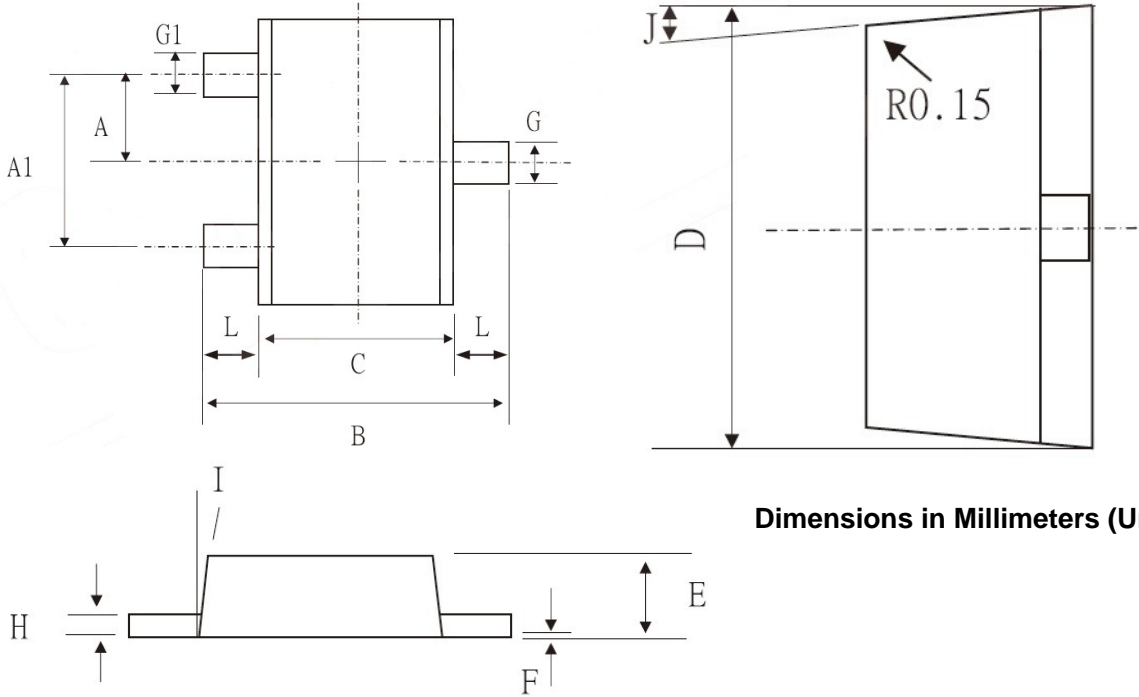


Figure 6. Safe Operation Area

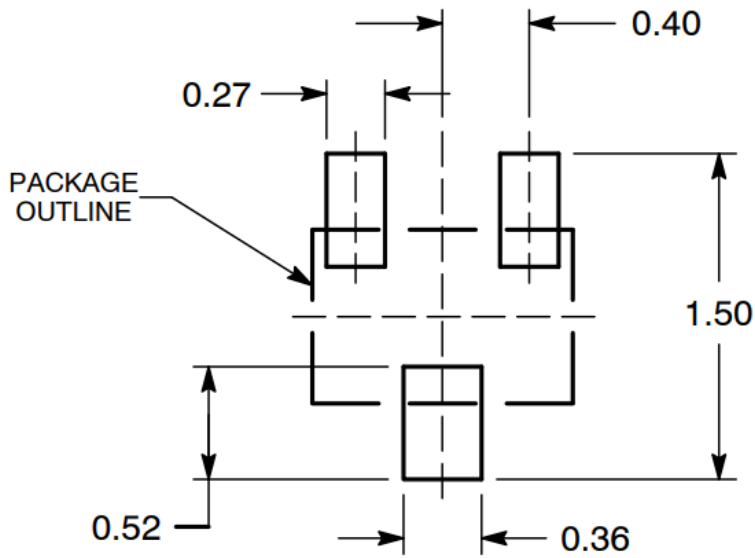
Package Outline Dimensions (SOT-723)



Dimensions in Millimeters (Unit:mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.4BSC		0.016BSC	
A1	0.8BSC		0.031BSC	
B	1.250	1.150	0.049	0.045
C	0.850	0.750	0.033	0.030
D	1.250	1.150	0.049	0.045
E	0.390	0.370	0.015	0.015
F	0.050	0.000	0.002	0.000
G	0.270	0.220	0.011	0.009
G1	0.220	0.170	0.009	0.007
H	0.110	0.009	0.004	0.000
I	13°	9°	13°	9°
L	0.250	0.150	0.010	0.006
J	11°	7°	11°	7°

Recommended Pad Layout



unit : mm