N-Channel 20V (D-S) Power MOSFET

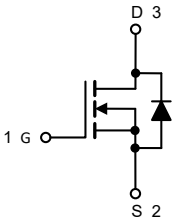
Features

- 150°C operating temperature
- Halogen Free, Pb-Free
- RoHS Compliant

SOT-23

Applications

- Relay driver
- Switching circuits
- High-side load switch
- High-speed line driver



Absolute Maximum Ratings (T_A=25°C unless otherwise noted)				
Parameter		**Symbol**	**Value**	**Unit**
Drain Source Voltage		V_{DS}	20	V
Gate Source Voltage		V_{GS}	±20	V
Drain Current, Continuous V_{GS}=10V	T_C=25°C	I_D	3	A
Drain Current, Pulsed *(Note 1)*		I_{DM}	11	A
Power Dissipation	T_C=25°C	P_D	1.4	W
Operating Junction/ Storage Temperature Range		T_J/ T_{STG}	-55 to +150	°C

Note 1: Single pulse; $t_p \leq 1us$.

Thermal Characteristics			
Parameter	**Symbol**	**Max**	**Unit**
Thermal Resistance Junction to Ambient *(Note 2)*	R_{thJA}	140	°C/W

Note 2: Device mounted on 1 square inch FR4 PCB board, with 2oz single-sided copper, in a 25°C still air environment.

Electrical Characteristics (T_A =25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	--	--	1	uA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_{DS}=250uA	0.4	--	1	V
Gate Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	--	--	±100	nA
Drain-Source On-state Resistance *(Note 3)*	$R_{DS(on)}$	V_{GS}=4.5V, I_D=2A	--	44	55	mΩ
		V_{GS}=2.5V, I_D=1A	--	52	80	
Total Gate Charge	Q_g	$V_{GS(off)}$=0V, $V_{GS(on)}$=4.5V, V_{Ds}=10V, I_D=4.2A	--	10	--	nC
Gate-Source Charge	Q_{gs}		--	2.3	--	
Gate-Drain Charge	Q_{gd}		--	2.9	--	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=4.5V, V_{DD}=20V, R_L=10Ω, R_G=3Ω	--	3.6	--	ns
Turn-on Rise Time	t_r		--	10.6	--	
Turn-off Delay Time	$t_{d(off)}$		--	7.2	--	
Turn-off Fall Time	t_f		--	4	--	
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, f=1MHz	--	133	--	pF
Output Capacitance	C_{oss}		--	24	--	
Reverse Transfer Capacitance	C_{rss}		--	17	--	

Reverse Diode Characteristics (T_A =25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Forward Current, Continuous	I_{SD}	T_C=25°C	--	--	3	A
Diode Forward Voltage *(Note 3)*	V_{SD}	I_F=1A, V_{GS}=0V	--	--	1.2	V

Note 3: Pulse test; pulse width ≤ 380μs, duty cycle ≤ 1%.

Typical Characteristics Curves (T_A = 25℃ unless otherwise noted)

Fig.1 - Output Characteristics

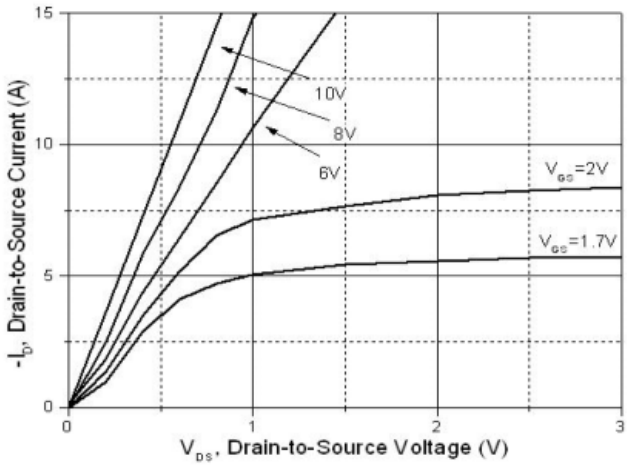


Fig.2 - $R_{DS(on)}$ vs. Junction Temperature

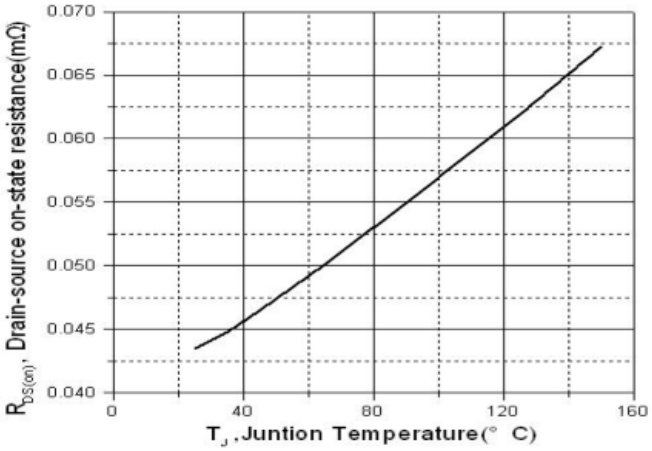


Fig.3 - Vth vs. Junction Temperature

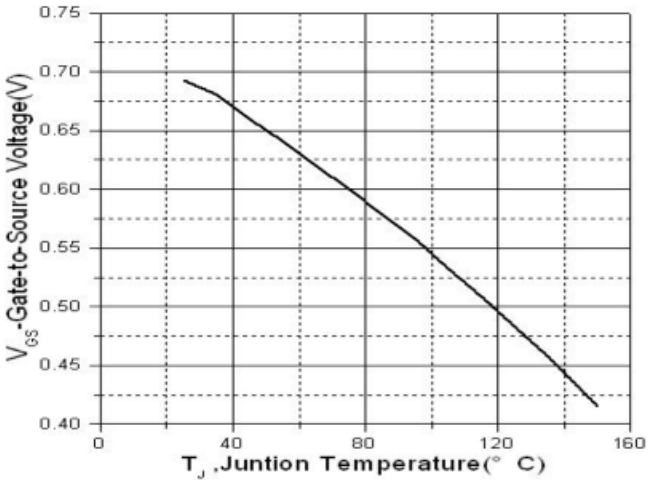


Fig.4 - Capacitance

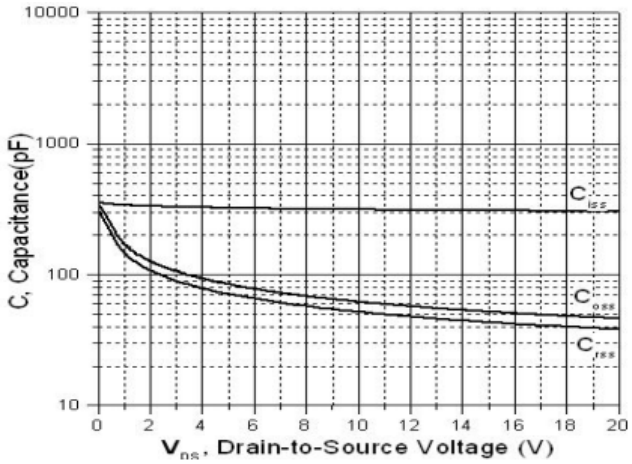


Fig.5 - Drain Current vs. Case Temperature

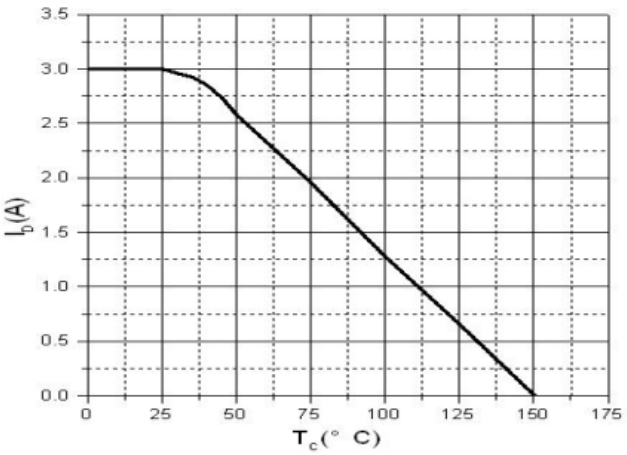
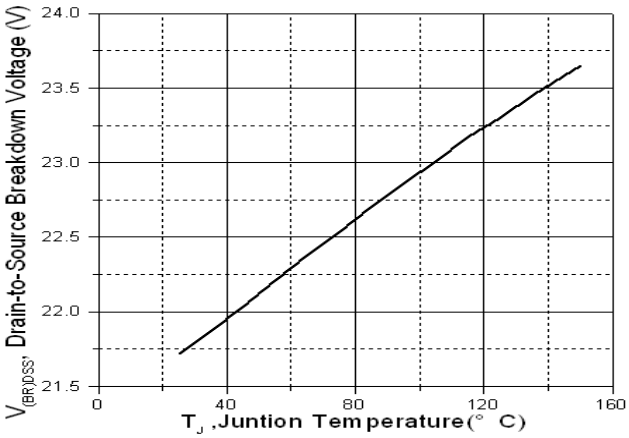


Fig.6 - Drain-to-Source Breakdown Voltage vs. Junction Temperature



Package Outline Dimensions (Unit: millimeters)

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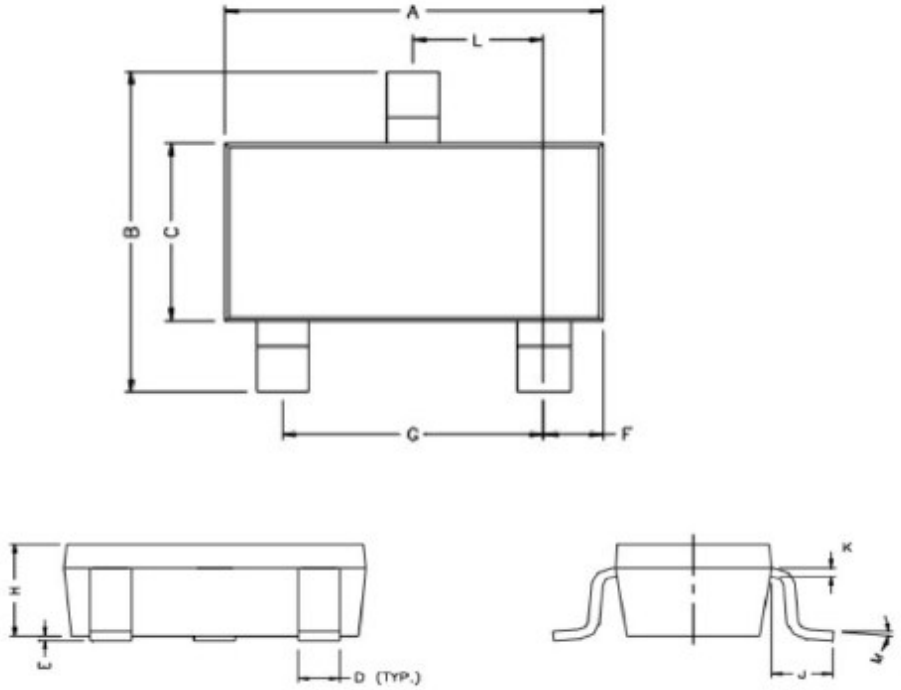
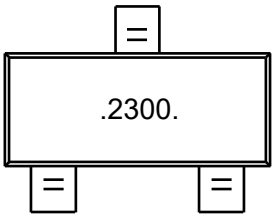


REF.	Millimeter		REF.	Millimete	
	Min.	Max.		Min.	Max.
A	2.80	3.00	G	1.80	2.00
B	2.30	2.50	H	0.90	1.1
C	1.20	1.40	K	0.10	0.20
D	0.30	0.50	J	0.35	0.70
E	0	0.10	L	0.92	0.98
F	0.45	0.55	M	0°	10°

Marking Outline



Part Name: SSF2300P

1. P/N Mark: .2300.

Revision History

Version	Date	Major Changes
Rev.A	2025.07.08	Official Release

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