20V N-Channel MOSFET

Features

- High-Side Switching
- Low On-Resistance
- Low Threshold
- Fast Switching Speed
- ESD protected

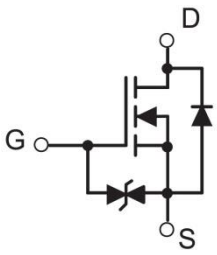
Applications

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers

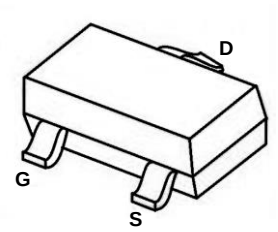
MOSFET Product Summary

V_{DSS}	$R_{DS(ON)}$ @V_{GS}=4.5V	$R_{DS(ON)}$ @V_{GS}=2.5V	I_D
20V	700mΩ	850mΩ	500mA

Package and Pin Configuration

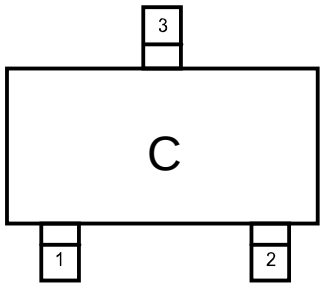


Circuit diagram



SOT-523

Marking Information



C= device marking code

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GS}	±12	
Drain Current-Continuous	$I_{D(DC)}$	500	mA
Drain Current -Pulsed(note1)	$I_{DM(pulse)}$	1000	
Power Dissipation (note 2 , Ta=25℃)	P_D	150	mW
Maximum Power Dissipation (note 3 , Tc=25℃)		275	
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	833	℃/W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	455	
Storage Temperature	Tj	150	℃
Junction Temperature	Tstg	-55 ~+150	

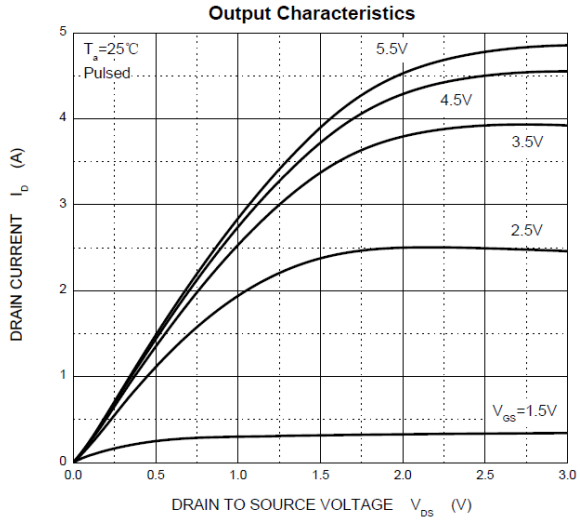
Electrical characteristics (T_A=25 ℃, unless otherwise noted)

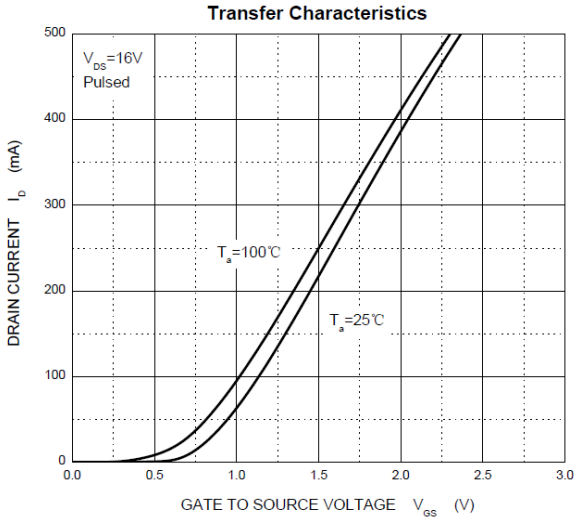
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
On/Off States						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.45	0.8	1.2	
Gate-Body Leakage Current	I_{GSS}	V_{DS} =0V, V_{GS} =±4.5V			±1	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =16V, V_{GS} =0V			100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$)	V_{GS} =4.5V, I_D =600mA		250	700	mΩ
		V_{GS} =2.5V, I_D =500mA		330	850	
Forward Transconductance	g_{FS}	VD_S =10V, I_D =400mA		1		S
Dynamic Characteristics						
Input Capacitance (note 4)	Ciss	V_{DS} =16V,V_{GS} =0V, f =1MHz		100		pF
Output Capacitance (note 4)	Coss			16		
Reverse Transfer Capacitance (note 4)	Crss			12		
Total Gate Charge	Qg	V_{DS} =10V,V_{GS} =4.5V, I_D =250mA		750		nC
Gate-Source Charge	Qgs			75		
Gate-Drain Charge	Qgd			225		
Switching Times (note 4)						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=10V, R_L=47Ω, I_D=200mA, V_{GS}=4.5V,R_G=10Ω		5		nS
Rise Time	tr			5		
Turn-Off Delay Time	$t_{d(off)}$			25		
Fall Time	tf			11		
Drain-Source Diode Characteristics						
Drain-Source Diode Forward Voltage (note 5)	V_{SD}	I_S=0.15A, V_{GS} = 0V			1.2	V

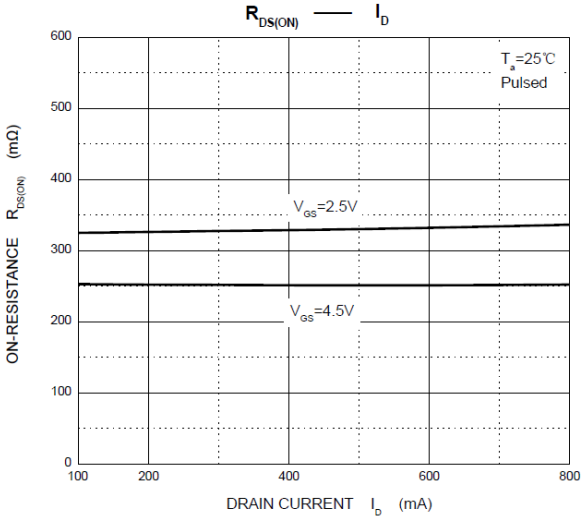
Notes:

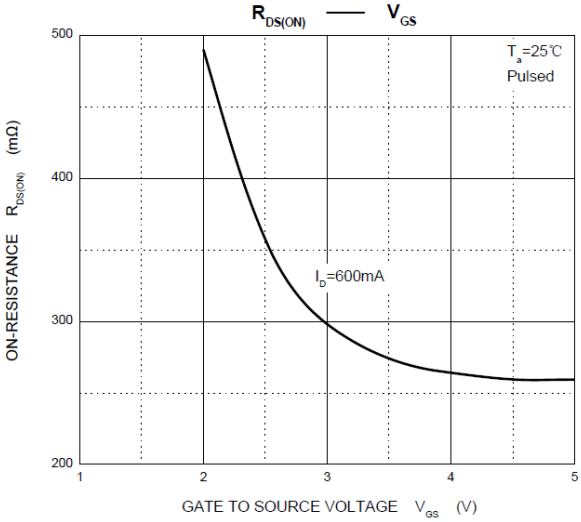
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. This test is performed with no heat sink at Ta=25℃.
3. This test is performed with infinite heat sink at Tc=25℃.
4. These parameters have no way to verify.
5. Pulse Test : Pulse Width≤300μs, Duty Cycle≤0.5%.

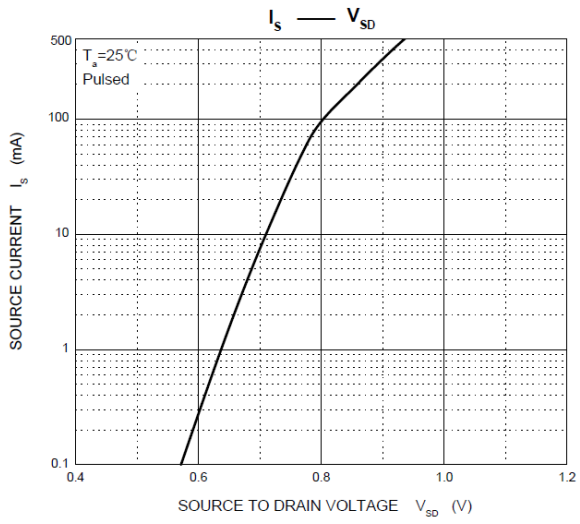
Typical Electrical and Thermal Characteristics

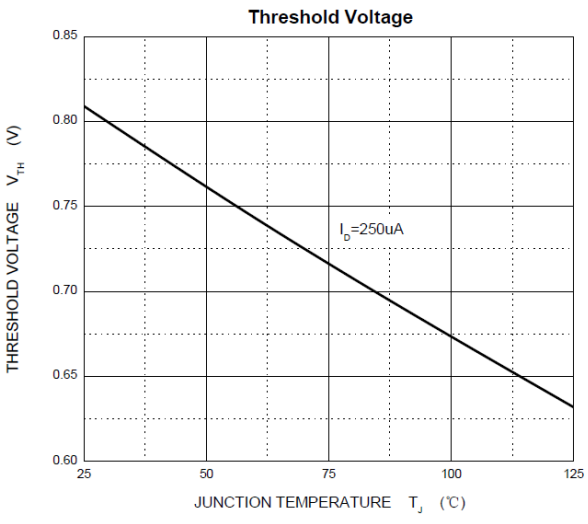




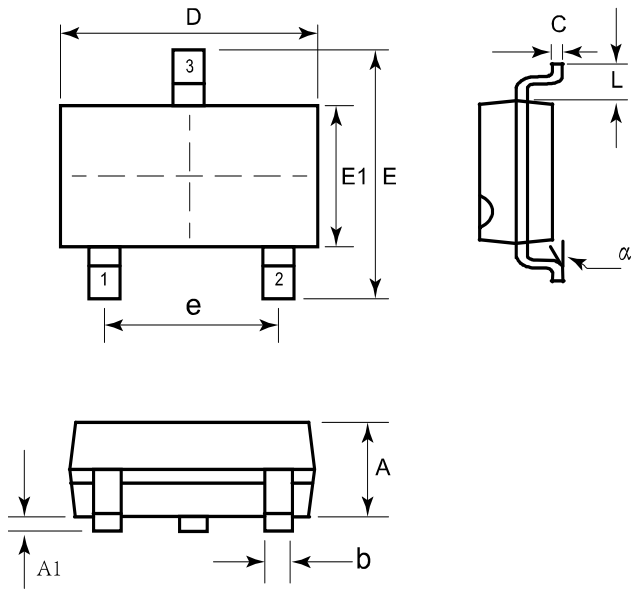






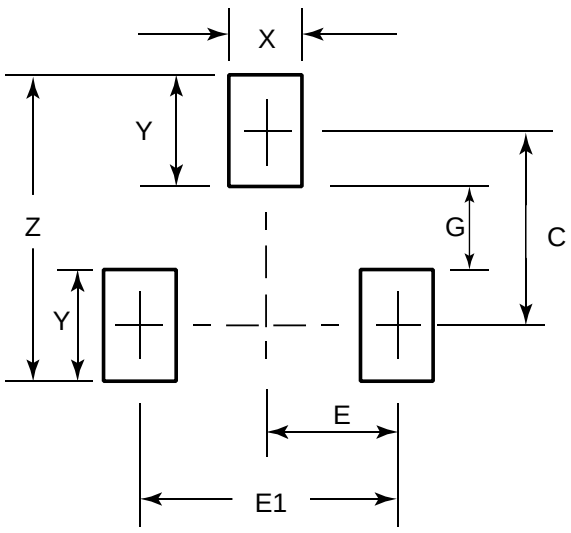


SOT-523 Package Outline Drawing



SYM	DIMENSIONS					
	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.023	0.030	0.031	0.60	0.75	0.80
A1	0.00		0.004	0.00		0.10
b	0.005		0.012	0.15		0.30
C	0.003		0.008	0.10		0.20
D	0.059	0.063	0.067	1.50	1.60	1.70
E	0.057	0.063	0.069	1.45	1.60	1.75
E1	0.029	0.031	0.033	0.75	0.80	0.85
e	0.039 BSC			1.00 BSC		
L	0.009 BSC			0.22 BSC		
α	0°		8°	0°		8°

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	1.40	0.055
E	0.50	0.020
E1	1.00	0.039
G	0.60	0.024
X	0.40	0.016
Y	0.80	0.031
Z	2.20	0.087