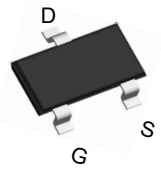
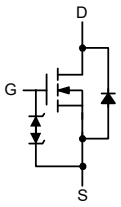
N-Channel Enhancement Mode MOSFET

Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Pin Description

SOT-523	Symbol
	

Applications

- Power Management in Desktop Computer
- DC/DC Converters

V_{DSS}	20	V
$R_{DS(ON)-Typ}$	190	mΩ
I_D	0.5	A

Absolute Maximum Ratings(T_C=25℃, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	20	V
V_{GSS}	Gate-Source Voltage	±12	V
T_J	Maximum Junction Temperature	-55 to 150	℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
I_{DM} ①	Pulse Drain Current Tested	3	A
I_D	Continuous Drain Current	0.5	A
P_D	Maximum Power Dissipation	0.2	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	633	℃/W

Note ①: Max. current is limited by bonding wire.

Note ②: UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③: Surface Mounted on 1in^2 FR-4 board with 1oz.

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Electrical Characteristics (T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V	---	---	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	0.35	---	1.1	V
I_{GSS}	Gate Leakage Current	V_{GS}=±30V, V_{DS}=0V	---	---	±100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=4.5V, I_D=0.65A	---	190	380	mΩ
		V_{GS}=2.5V, I_D=0.55A	---	260	450	mΩ
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{DS}=16V, V_{GS}=0V, Freq.=1MHz	---	79	---	pF
C_{oss}	Output Capacitance		---	13	---	
C_{rss}	Reverse Transfer Capacitance		---	9	---	
$T_{d(on)}$	Turn-on Delay Time	V_{DS}=10V,V_{GS}=4.5V, I_D=0.5A,R_G=10Ω	---	6.7	---	nS
T_r	Turn-on Rise Time		---	4.8	---	
$T_{d(off)}$	Turn-off Delay Time		---	17.3	---	
T_f	Turn-off Fall Time		---	7.4	---	
Q_g	Total Gate Charge	V_{DS}=10V,V_{GS}=4.5V, I_D=0.9A	---	1	---	nC
Q_{gs}	Gate-Source Charge		---	0.28	---	
Q_{gd}	Gate-Drain Charge		---	0.22	---	
Source-Drain Characteristics						
V_{SD}	Diode Forward Voltage	If=150mA, V_{GS}=0V	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I_F=3.6A,dI_F/dt=100A/us	---	7.5	---	nS
Q_{rr}	Reverse Recovery Charge		---	2.5	---	nC

Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤：Guaranteed by design, not subject to production testing.

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Typical Characteristics

Fig. 1 - Output Charact eristics

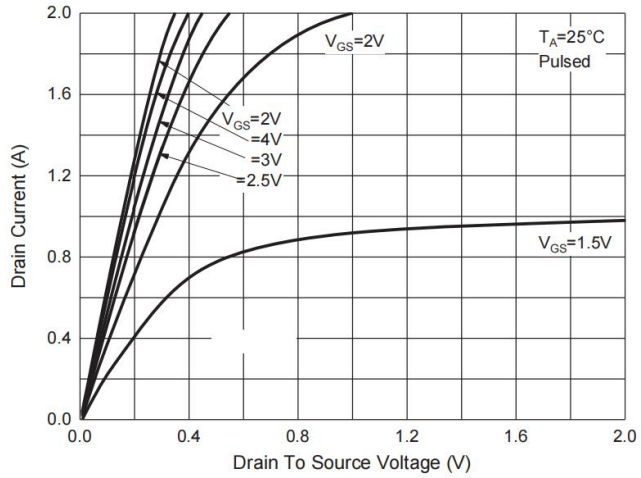

Fig. 2 - Transfer Characteristics

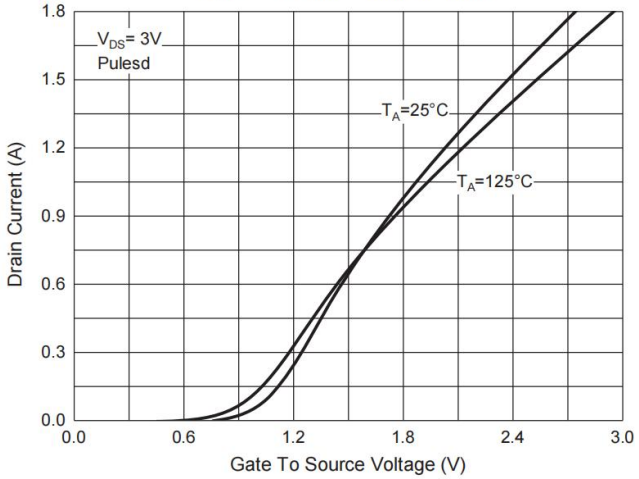

Fig. 3 - $R_{DS(ON)}$—I_D

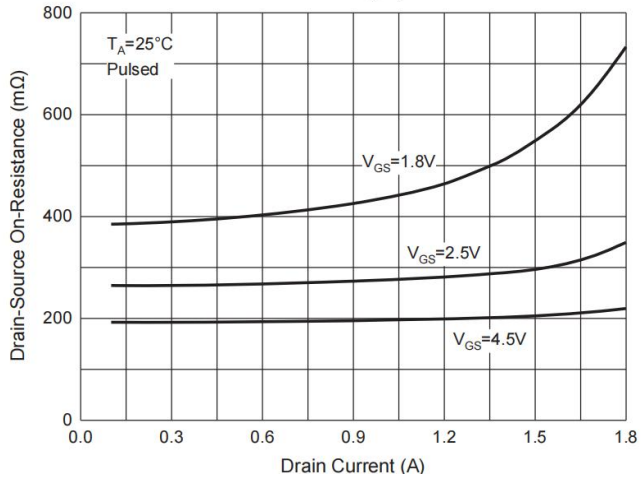

Fig. 4 - $R_{DS(ON)}$—V_{GS}

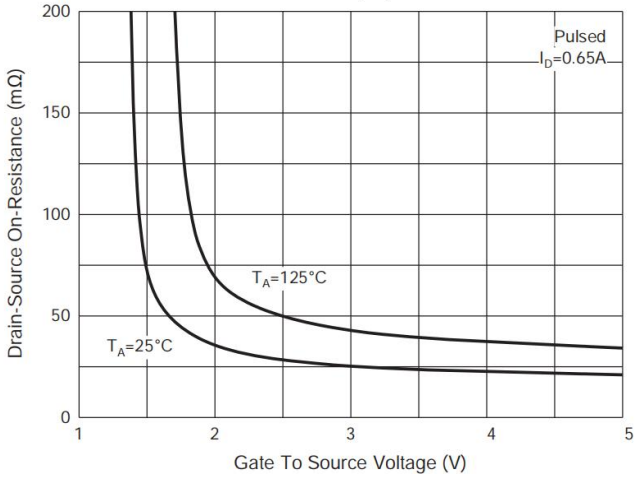

Fig. 3 - I_S—V_{SD}

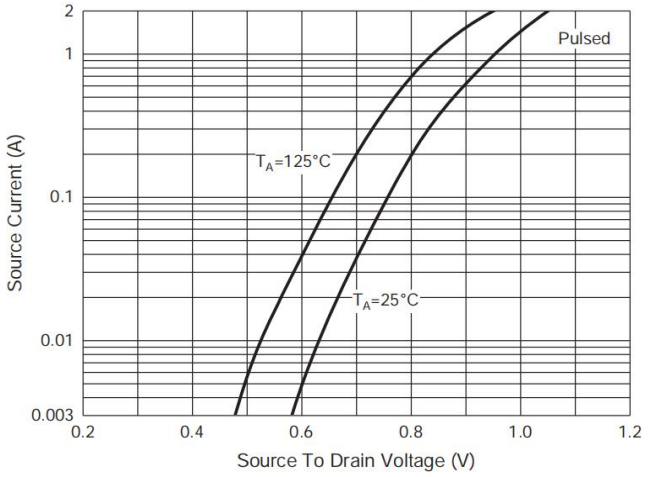

Fig. 6 - T res old Voltage

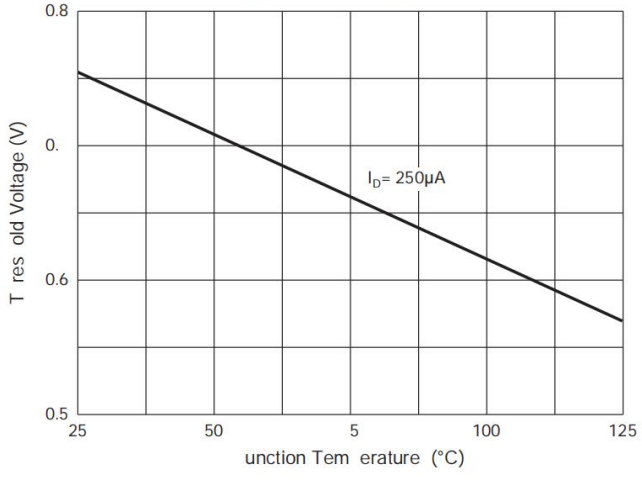

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Fig.1-1 Switching times test circuit

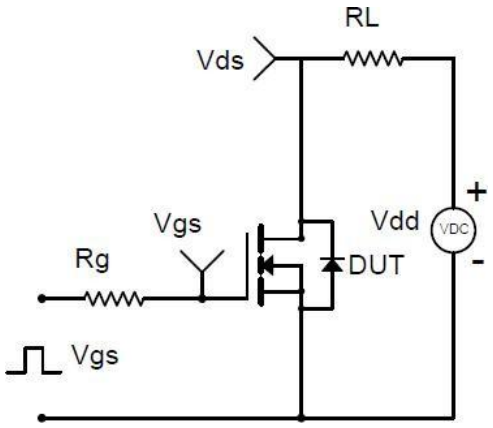


Fig.1-2 Switching Waveform

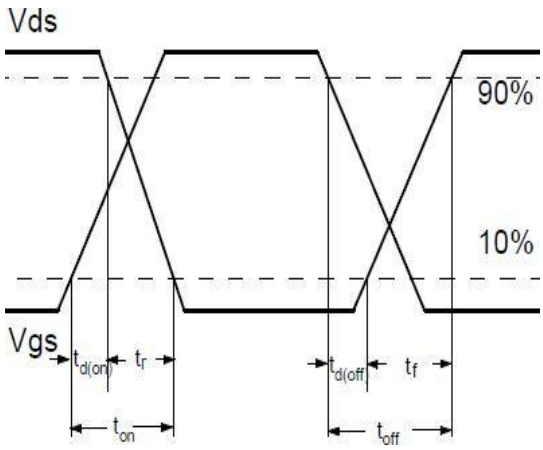


Fig.2-1 Gate charge test circuit

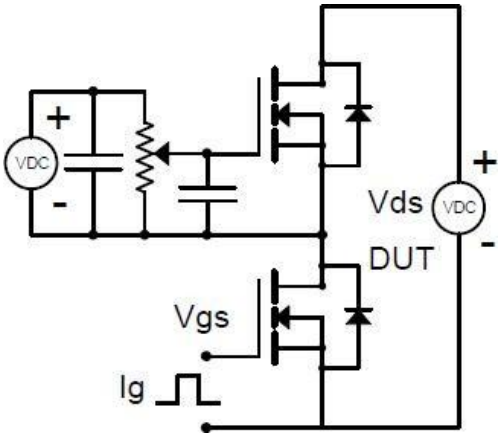


Fig.2-2 Gate charge waveform

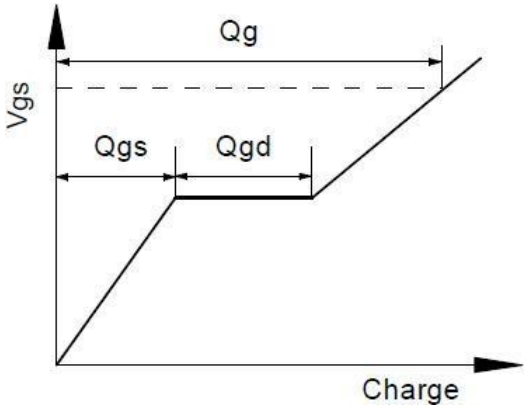


Fig.3-1 Avalanche test circuit

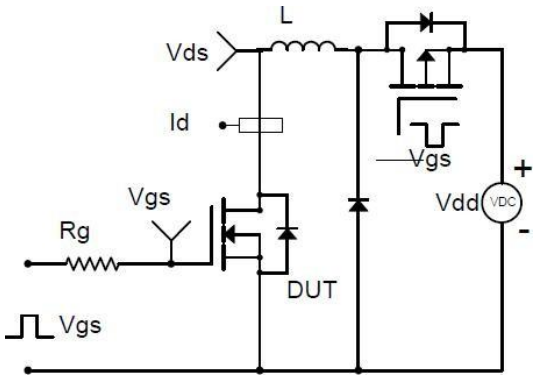
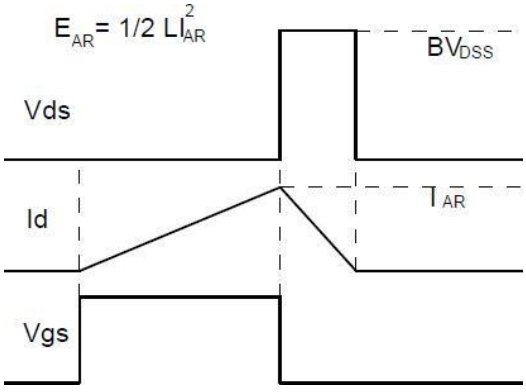
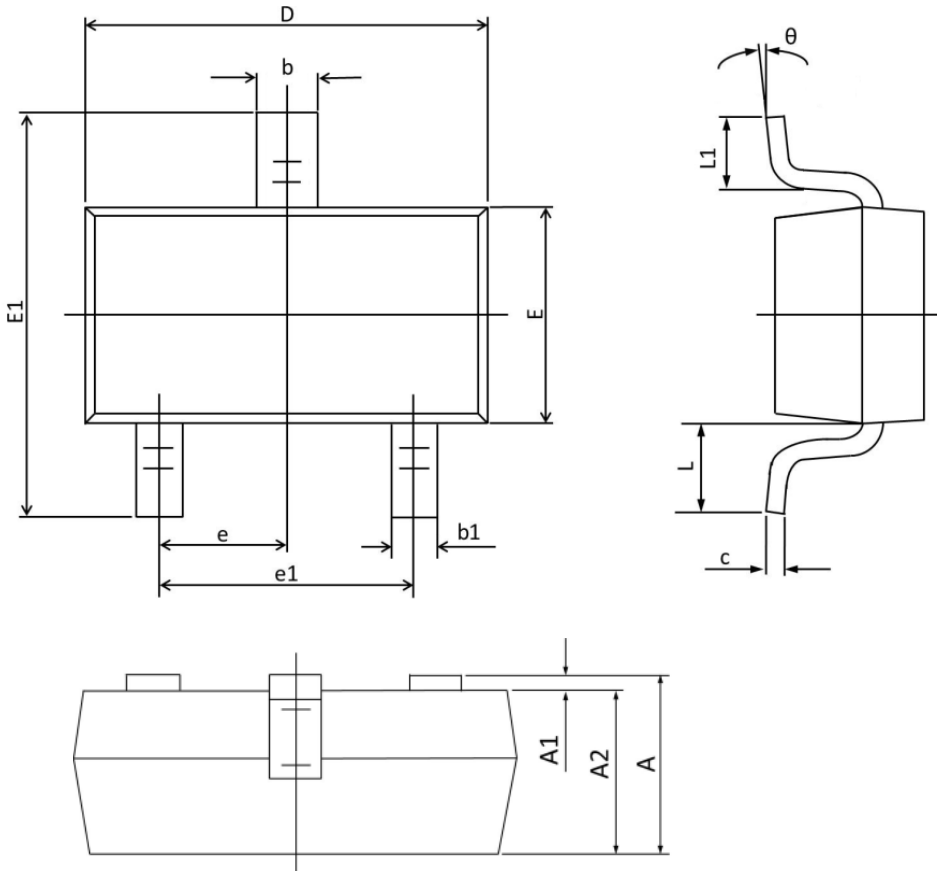


Fig.3-2 Avalanche waveform



SOT523 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.70	0.80	0.90	**E**	0.70	0.80	0.90
A1	0.00	---	0.10	**E1**	1.40	1.60	1.75
A2	0.70	0.75	0.80	**e**	0.50 REF		
b	0.25	0.30	0.35	**e1**	0.90	1.00	1.10
b1	0.15	0.20	0.25	**L**	0.30	0.36	0.48
c	0.10	0.15	0.20	**L1**	0.26	0.36	0.46
D	1.50	1.60	1.75	**θ**	0°		8°