N-Channel Enhancement MOSFET

Features

- Trench Power LV MOSFET technology
- Voltage Controlled Small Signal Switch
- High Power and current handing capability
- ESD Protected Gate

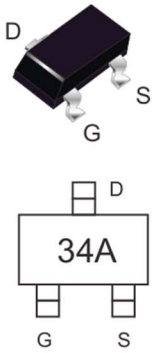
Product Summary		
V_{DS}	$R_{DS(on)}$ (mΩ) Typ	I_D (A)
20V	220@ 4.5V, 0. 5A	0. 5
	290@ 2. 5V, 0. 4A	

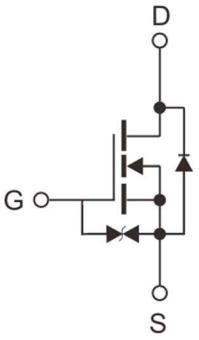
Application

- Load Switch for Portable Devices
- Solid-state relays

Marking information

SOT-523





N-channel MOSFET

Absolute Maximum Ratings (at T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous drain current (T_A=25 °C)	I_D	0.5	A
Continuous drain current (T_A=70 °C)	I_D	0.4	A
Pulsed Drain Current [1)]	I_{DM}	3.3	A
Power Dissipation	P_D	0.18	W
Operating Junction	T_J	-55~150	℃
Storage Temperature Range	T_{stg}	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	694	℃/W

Note: 1. Pulse test: 300μs pulse width, 1% duty cycle.

Characteristics at T_J = 25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at V_{GS}=0V, I_D=250μA	BV_{DSS}	20			V
Drain-Source Leakage Current at V_{DS}=20V, V_{GS}=0V	I_{DSS}			1	μA
Gate Leakage Current at V_{GS}=±10V, V_{DS}=0V	I_{GSS}			±10	μA
Gate-Source Threshold Voltage at V_{DS}=V_{GS}, I_D=250μA	$V_{GS(th)}$	0.35	0.75	1.1	V
Drain-Source On-State Resistance at V_{GS}=4.5V, I_D=0.5A at V_{GS}=2.5V, I_D=0.4A at V_{GS}=1.8V, I_D=0.2A	$R_{DS(on)}$		220 290 420	300 400 700	mΩ
DYNAMIC PARAMETERS					
Input Capacitance at V_{DS}=10V, V_{GS}=0V, f=1MHz	C_{iss}		56		pF
Output Capacitance at V_{DS}=10V, V_{GS}=0V, f=1MHz	C_{oss}		20		pF
Reverse Transfer Capacitance at V_{DS}=10V, V_{GS}=0V, f=1MHz	C_{rss}		2.5		pF
Gate charge total at V_{DS}=10V, V_{GS}=4.5V, I_D=0.5A	Q_g		1.0		nc
Gate to Source Charge at V_{DS}=10V, V_{GS}=4.5V, I_D=0.5A	Q_{gs}		0.28		nc
Gate to Drain Charge at V_{DS}=10V, V_{GS}=4.5V, I_D=0.5A	Q_{gd}		0.22		nc
Turn-On Delay Time at V_{DD}=10V, I_D=0.5A, R_{GEN}=10Ω, V_{GS}=4.5V	$t_{d(on)}$		2		ns
Turn-On Rise Time at V_{DD}=10V, I_D=0.5A, R_{GEN}=10Ω, V_{GS}=4.5V	t_r		18.8		ns
Turn-Off Delay Time at V_{DD}=10V, I_D=0.5A, R_{GEN}=10Ω, V_{GS}=4.5V	$t_{d(off)}$		10		ns
Turn-On Fall Time at V_{DD}=10V, I_D=0.5A, R_{GEN}=10Ω, V_{GS}=4.5V	t_f		23		ns
Reverse Recovery Time I_F=0.5A, di/dt=20A/μs	trr		14.4		ns
Reverse Recovery Charge I_F=0.5A, di/dt=20A/μs	Qrr		0.4		nc
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I_S=0.5A, V_{GS}=0V	V_{SD}			1.2	V
Maximum Body-Diode Continuous Current	I_S			0.5	A

Electrical Characteristics Curves

Figure1. Output Characteristics

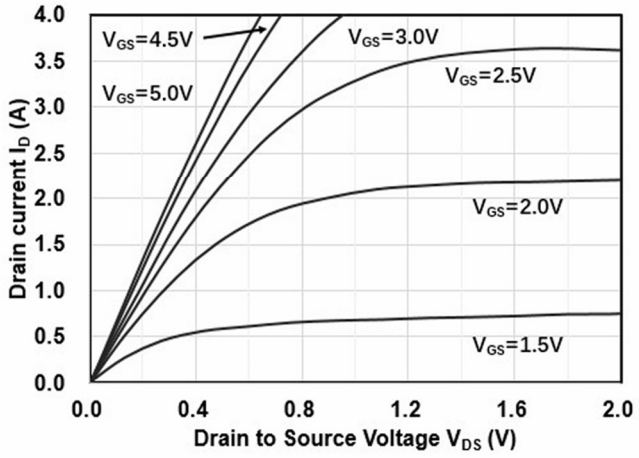


Figure2. Transfer Characteristics

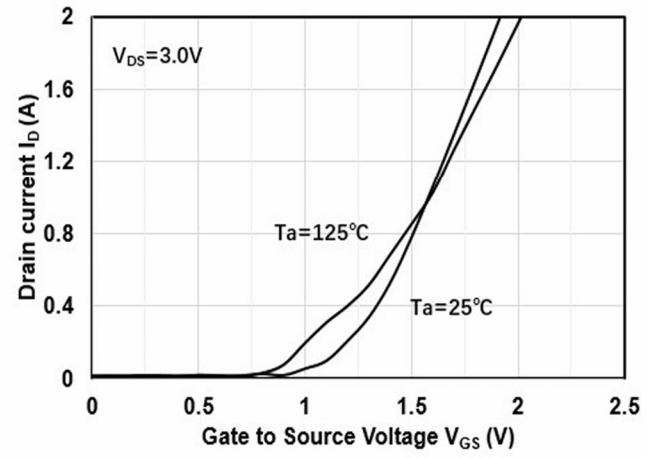


Figure3. Capacitance Characteristics

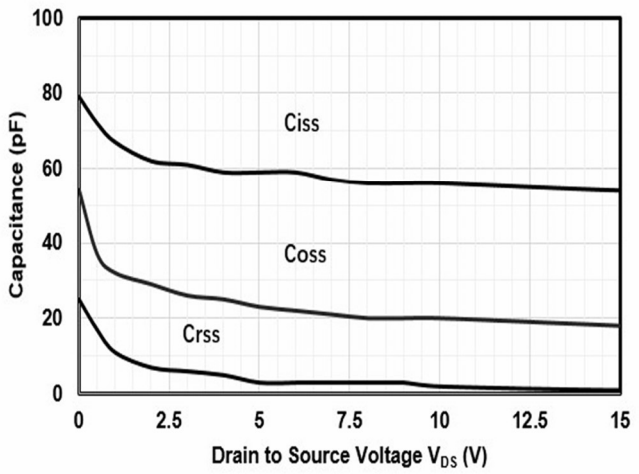


Figure4. Gate Charge

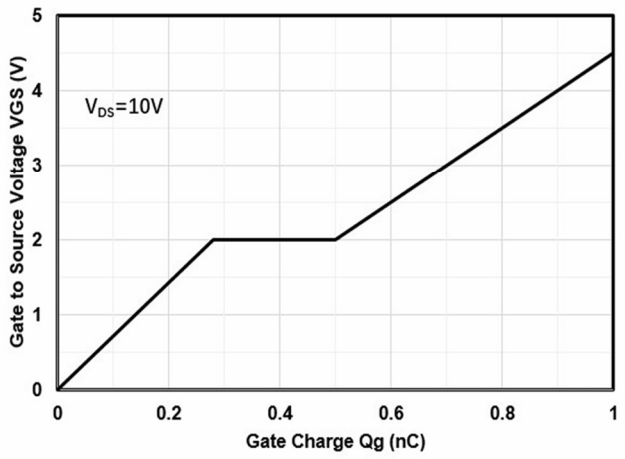


Figure5. Drain-Source on Resistance

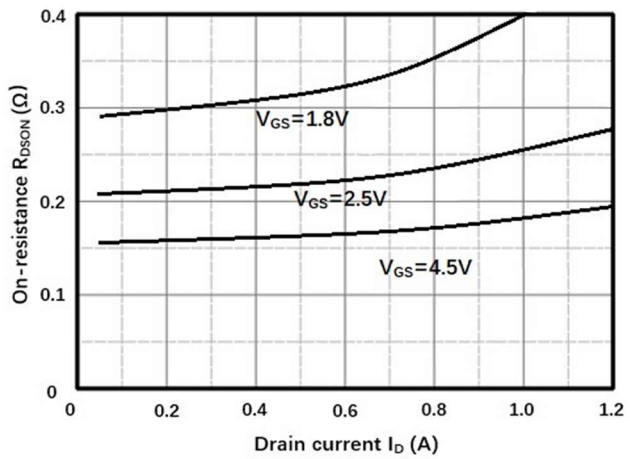


Figure6. Drain-Source on Resistance

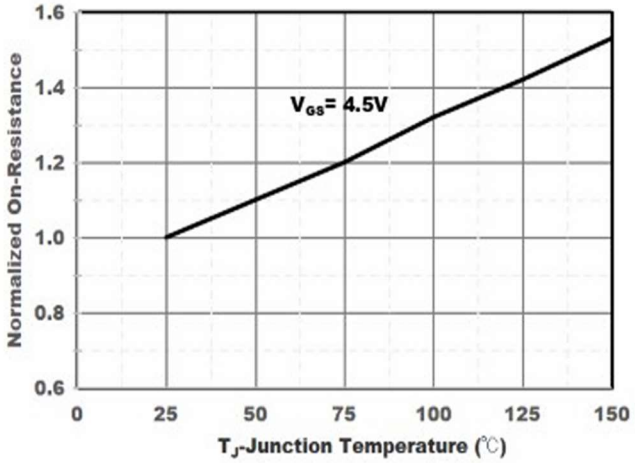


Figure7. Safe Operation Area

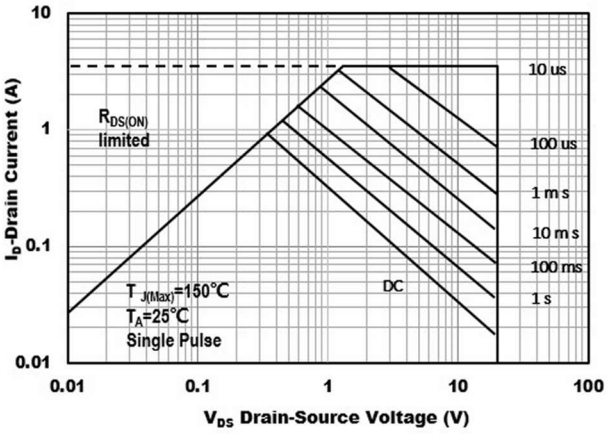
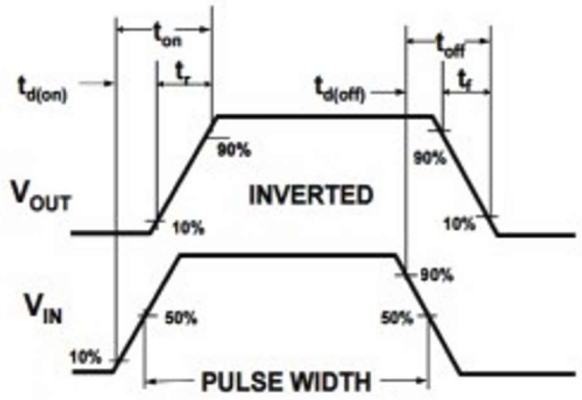
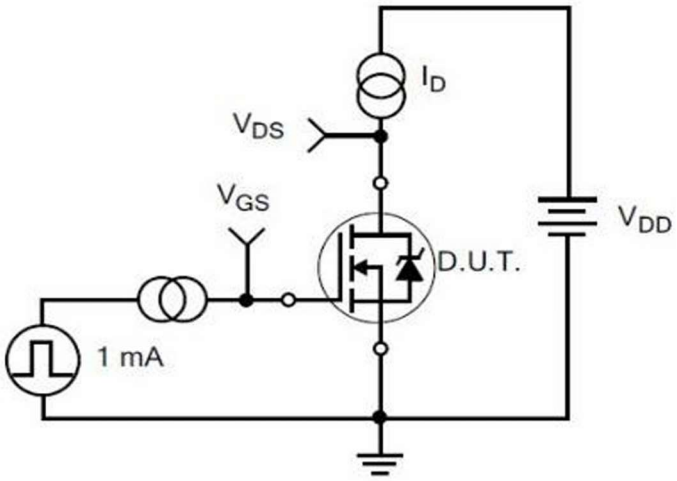


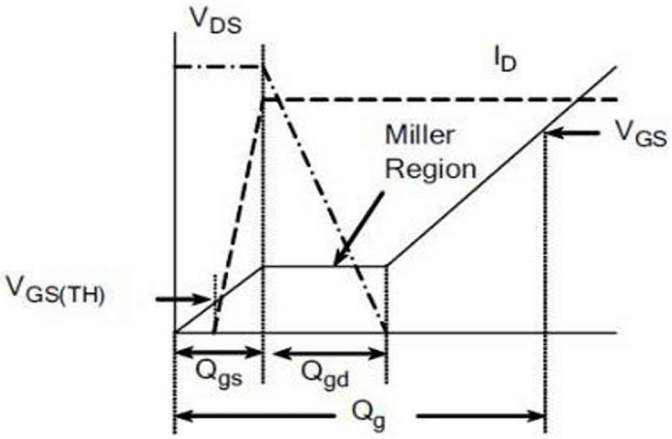
Figure8. Switching wave



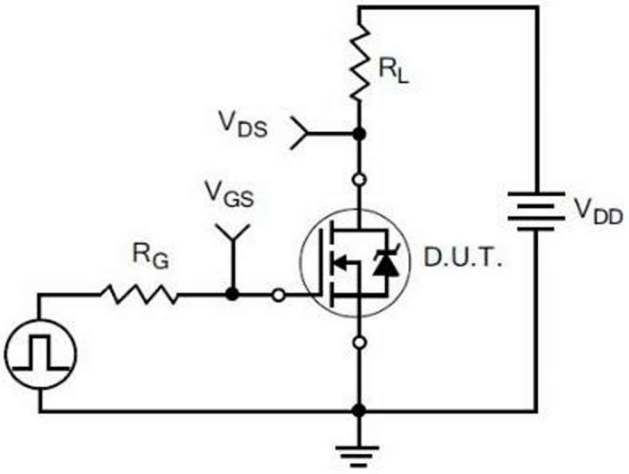
Test Circuits & Waveforms



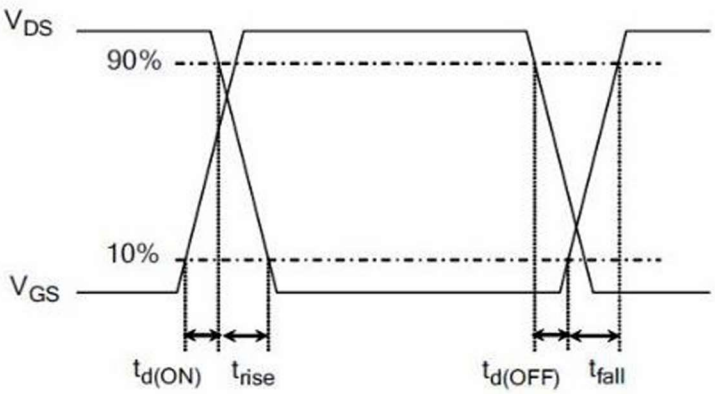
1) Gate Charge Test Circuit



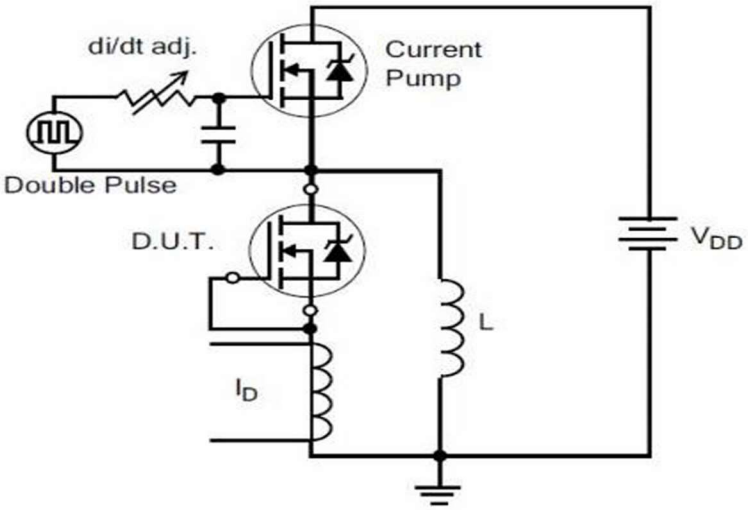
2) . Gate Charge Waveform



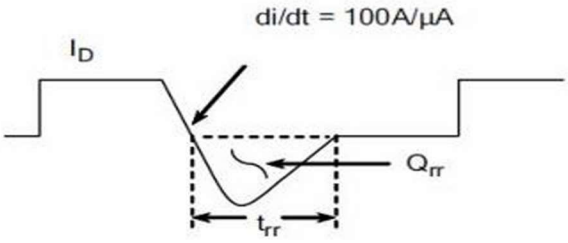
3) Resistive Switching Test Circuit



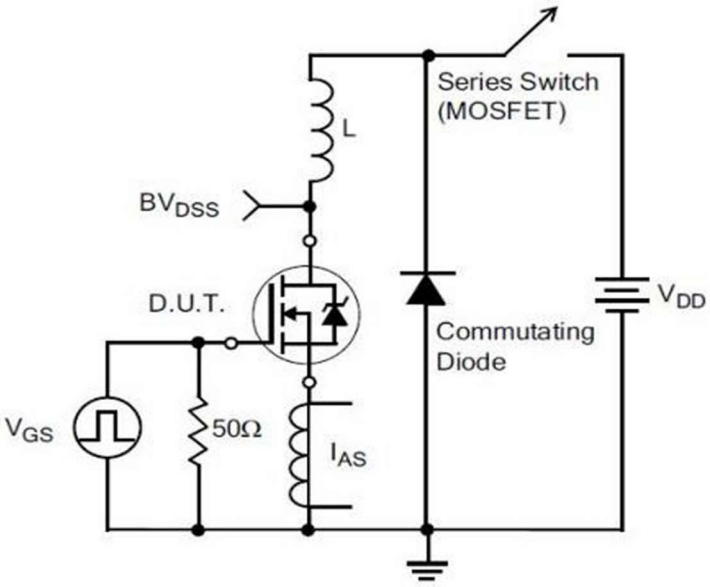
4) Resistive Switching Waveforms



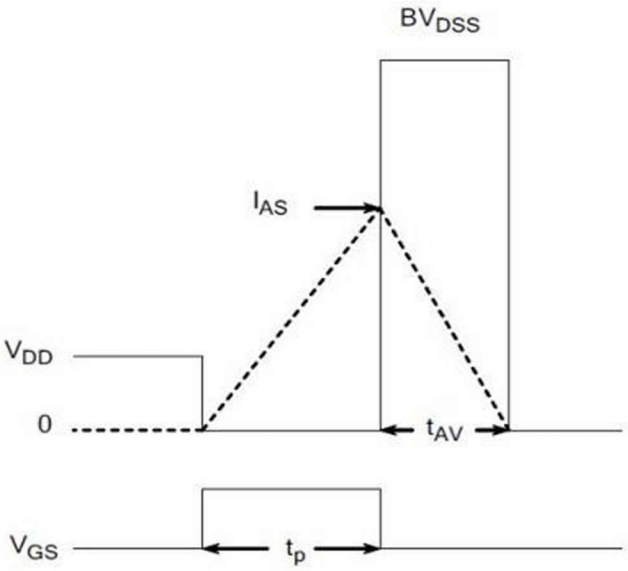
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform



7) . Unclamped Inductive Switching Test Circuit



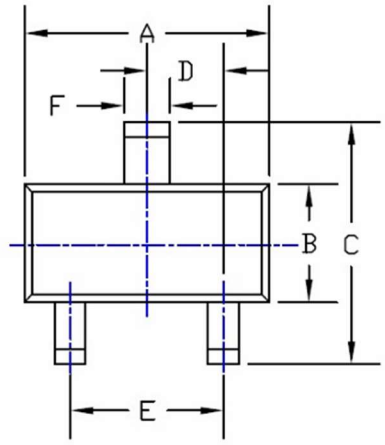
$$E_{AS} = \frac{I_{AS}^2 L}{2}$$

8) Unclamped Inductive Switching Waveforms

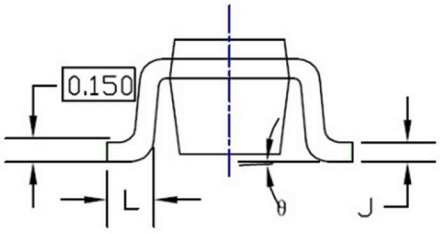
Order Information

Part Number	Package	Quantity
Sh3134KAE	SOT-523	3000

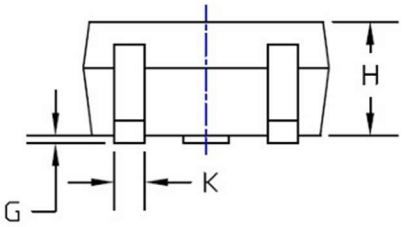
Package Outline Dimensions (Units: mm) SOT-523



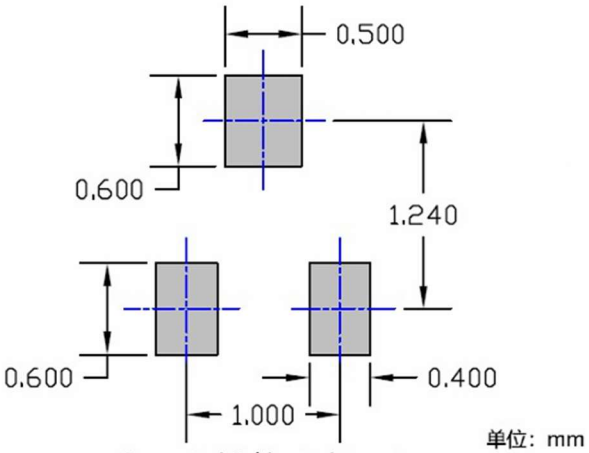
TOP VIEW



SIDE VIEW



SIDE VIEW



Suggested Solder Pad Layout

单位：mm

DIMENSIONS						
SYMBOL	INCHES			Millmeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.059	0.063	0.067	1.500	1.600	1.700
B	0.030	0.031	0.033	0.750	0.800	0.850
C	0.057	0.063	0.069	1.450	1.600	1.750
D	0.020TYP			0.500TYP		
E	0.035	0.039	0.043	0.900	1.000	1.100
F	0.010	0.014	0.018	0.250	0.350	0.450
G	0.000	---	0.004	0.000	---	0.100
H	0.024	0.028	0.031	0.600	0.700	0.800
J	0.004	---	0.008	0.100	---	0.200
K	0.006	0.010	0.014	0.150	0.250	0.350
L	0.010	---	0.018	0.260	---	0.460
θ	0°	---	8°	0°	---	8°

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.