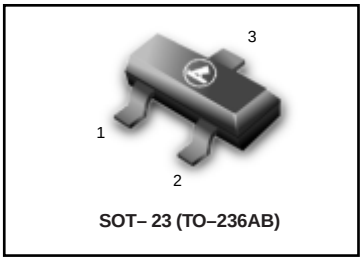
Power MOSFET
20 V, 3.2 A, Single N−Channel,SOT−23

LN4501LT1G



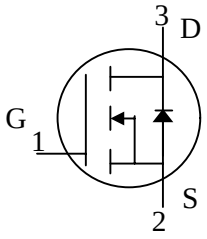
SOT− 23 (TO−236AB)

●APPLICATIONS

1) Load/Power Switch for Portables
2) Load/Power Switch for Computing
3) DC−DC Conversion

●FEATURES

1)Leading Planar Technology for Low Gate Charge / Fast Switching
2)2.5 V Rated for Low Voltage Gate Drive
3)SOT−23 Surface Mount for Small Footprint
4) We declare that the material of product compliant with RoHS requirements and Halogen Free.



●DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
LN4501LT1G	N45	3000/Tape&Reel
LN4501LT3G	N45	10000/Tape&Reel

●MAXIMUM RATINGS(Ta = 25℃)

Parameter		Symbol	Limits	Unit
Drain−to−Source Voltage		V_{DSS}	20	V
Gate−to−Source Voltage		V_{GS}	±12	V
Continuous Drain Current (Note 1) Steady State	T_A = 25°C	I_D	3.2	A
	T_A = 85°C		2.4	A
Steady State Power Dissipation (Note 1) Steady State		P_D	1.25	W
Pulsed Drain Current (tp = 10 μs)		I_{DM}	10	A
Continuous Source Current (Body Diode)		I_S	1.6	A
Operating and Storage Temperature Range		T_J, Tstg	−55 to +150	°C
Maximum Temperature for Soldering Purposes (1/8” from case for 10 s)		T_L	260	°C

●THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Junction−to−Ambient (Note 1)	$R_{\theta JA}$	100	°C/W
Junction−to−Ambient (Note 2)	$R_{\theta JA}$	300	°C/W

1. Surface−mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces).
2. Surface−mounted on FR4 board using the minimum recommended pad size.

LN4501LT1G

●ELECTRICAL CHARACTERISTICS (Ta= 25℃)

OFF CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Drain−to−Source Breakdown Voltage (Note 3)	$V_{(BR)DSS}$	20	24.5	–	V	V_{GS} = 0 V, I_D = 250 μA
Drain−to−Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	–	22	–	mV/°C	
Zero Gate Voltage Drain Current	I_{DSS}	–	–	1.5	μA	V_{GS} = 0 V,V_{DS} = 16 V, T_J = 25°C
		–	–	10	μA	VGS = 0 V,V_{DS} = 16 V, T_J = 85°C
Gate−to−Source Leakage Current	I_{GSS}	–	–	±100	nA	V_{DS} = 0 V, V_{GS} = ±12V

ON CHARACTERISTICS

Gate Threshold Voltage (Note 3)	$V_{GS(TH)}$	0.6	–	1.2	V	V_{GS} = V_{DS}, I_D = 250 μA
Temperature Coefficient	$V_{GS(TH)}/T_J$	–	−2.3	–	mV/°C	
Drain−to−Source On Resistance	$R_{DS(on)}$	–	70	80	mΩ	V_{GS} = 4.5 V, I_D = 3.6 A
		–	85	105	mΩ	V_{GS} = 2.5 V, I_D = 3.1 A
Forward Transconductance	gFS	–	9	–	S	V_{DS} = 5.0 V, I_D = 3.6 A

CAPACITANCES

Input Capacitance	Ciss	–	200	–	pF	V_{GS} = 0 V, f = 1.0 MHz, V_{DS}= 10 V
Output Capacitance	Coss	–	80	–		
Reverse Transfer Capacitance	Crss	–	50	–		
Total Gate Charge	$Q_{G(TOT)}$	–	2.4	6	nC	V_{GS} = 4.5 V,V_{DS} = 10 V I_D = 3.6 A
Gate−to−Source Gate Charge	Q_{GS}	–	0.5	–		
Gate−to−Drain Charge	Q_{GD}	–	0.6	–		

SWITCHING CHARACTERISTICS (Note 4)

Turn−On Delay Time	td(on)	–	6.5	–	ns	V_{GS} = 4.5 V, V_{DS} =10 V I_D = 3.6 A, R_G = 6.0Ω
Rise Time	tr	–	12	–		
Turn−Off Delay Time	td(off)	–	12	–		
Fall Time	tf	–	3	–		

SOURCE−DRAIN DIODE CHARACTERISTICS

Forward Diode Voltage	V_{SD}		0.8	1.2	V	V_{GS} = 0 V, I_{SD} = 1.6 A
Reverse Recovery Time	t_{RR}		7.1		ns	V_{GS} = 0 V, d_{IS}/d_t = 100A/μs I_S = 1.6 A
Charge Time	t_a		5			
Discharge Time	t_b		1.9			
Reverse Recovery Charge	Q_{RR}		3		nC	

3. Pulse Test: Pulse width≤300μs, duty cycle ≤2%.

4. Switching characteristics are independent of operating junction temperatures

ELECTRICAL CHARACTERISTIC CURVES

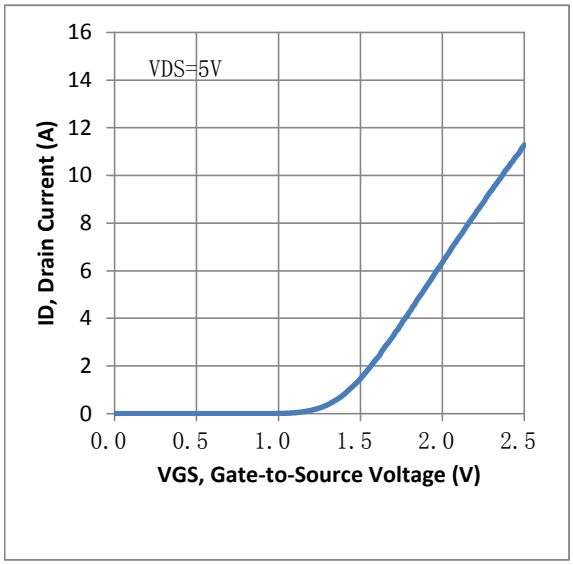


FIG. 1 Transfer Characteristics

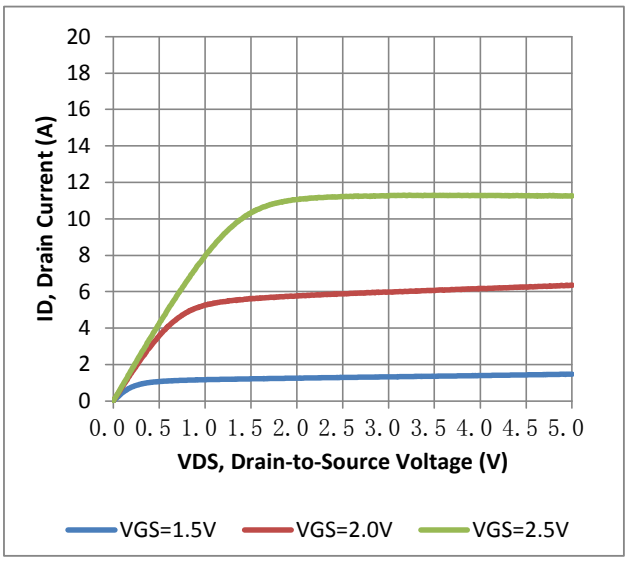


FIG. 2 On-Region Characteristics

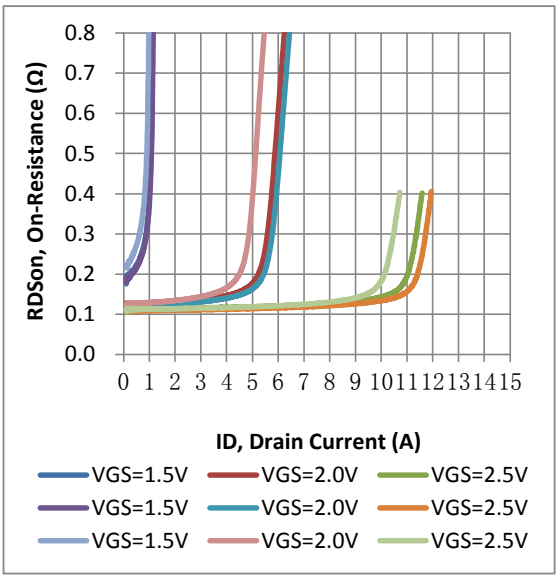


FIG. 3 On-Resistance versus Drain Current

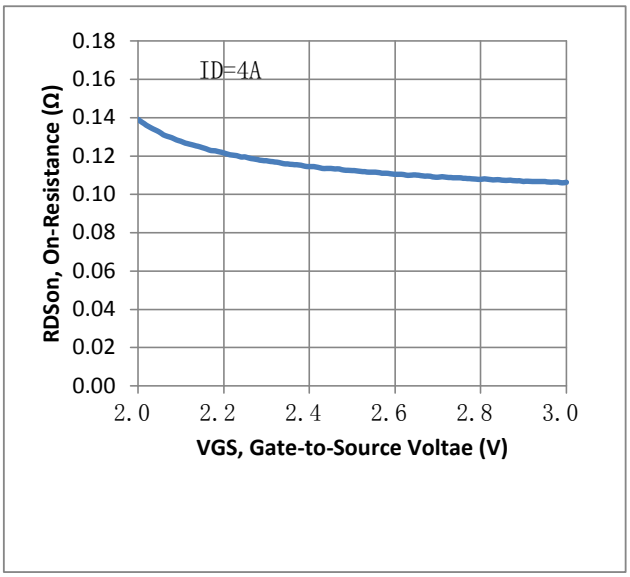
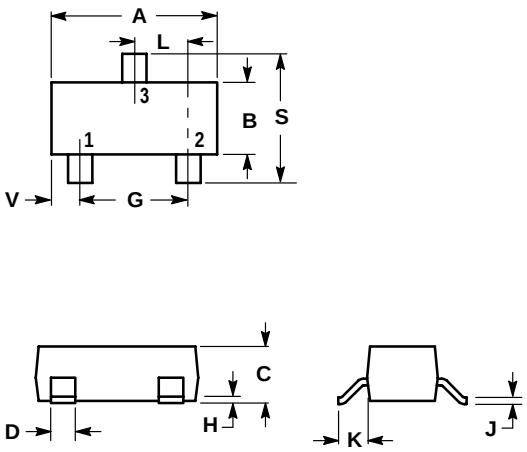


FIG. 4 On-Resistance vs. Gate-to-Source Voltage

LN4501LT1G

SOT-23



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60