

Power MOSFET

20 V, 3.2 A, Single N-Channel, SOT-23

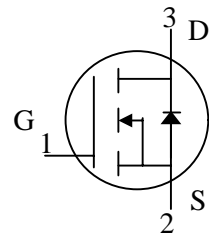
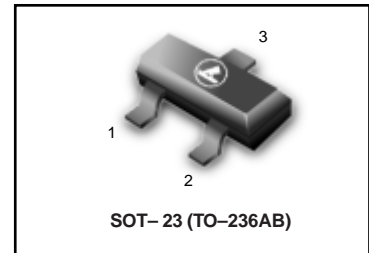
● APPLICATIONS

- 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.

LN4501LT1G



● DEVICE MARKING AND ORDERING INFORMATION

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

● MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	Unit	
Drain-to-Source Voltage	VDSS	20	V	
Gate-to-Source Voltage	VGS	±12	V	
Continuous Drain Current (Note 1) Steady State	ID	TA = 25°C	3.2	A
		TA = 85°C	2.4	A
Steady State Power Dissipation (Note 1) Steady State	PD	1.25	W	
Pulsed Drain Current (tp = 10 μs)	IDM	10	A	
Continuous Source Current (Body Diode)	IS	1.6	A	
Operating and Storage Temperature Range	TJ, Tstg	-55 to +150	°C	
Maximum Temperature for Soldering Purposes (1/8" from case for 10 s)	TL	260	°C	

● THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Junction-to-Ambient (Note 1)	RθJA	100	°C/W
Junction-to-Ambient (Note 2)	RθJA	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.

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● ELECTRICAL CHARACTERISTICS (Ta= 25°C)
OFF CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Drain-to-Source Breakdown Voltage (Note 3)	V(BR)DSS	20	24.5	–	V	VGS = 0 V, ID = 250 μA
Drain-to-Source Breakdown Voltage Temperature Coefficient	V(BR)DSS/TJ	–	22	–	mV/°C	
Zero Gate Voltage Drain Current	IDSS	–	–	1.5	μA	VGS = 0 V, VDS = 16 V, TJ = 25°C
		–	–	10	μA	VGS = 0 V, VDS = 16 V, TJ = 85°C
Gate-to-Source Leakage Current	IGSS	–	–	±100	nA	VDS = 0 V, VGS = ±12V

ON CHARACTERISTICS

Gate Threshold Voltage (Note 3)	VGS(TH)	0.6	–	1.2	V	VGS = VDS, ID = 250 μA
Temperature Coefficient	VGS(TH)/TJ	–	–2.3	–	mV/°C	
Drain-to-Source On Resistance	RDS(on)	–	70	80	mΩ	VGS = 4.5 V, ID = 3.6 A
		–	85	105	mΩ	VGS = 2.5 V, ID = 3.1 A
Forward Transconductance	gFS	–	9	–	S	VDS = 5.0 V, ID = 3.6 A

CAPACITANCES

Input Capacitance	Ciss	–	200	–	pF	VGS = 0 V, f = 1.0 MHz, VDS = 10 V
Output Capacitance	Coss	–	80	–		
Reverse Transfer Capacitance	Crss	–	50	–		
Total Gate Charge	QG(TOT)	–	2.4	6	nC	VGS = 4.5 V, VDS = 10 V, ID = 3.6 A
Gate-to-Source Gate Charge	QGS	–	0.5	–		
Gate-to-Drain Charge	QGD	–	0.6	–		

SWITCHING CHARACTERISTICS (Note 4)

Turn-On Delay Time	td(on)	–	6.5	–	ns	VGS = 4.5 V, VDS = 10 V, ID = 3.6 A, RG = 6.0Ω
Rise Time	tr	–	12	–		
Turn-Off Delay Time	td(off)	–	12	–		
Fall Time	tf	–	3	–		

SOURCE-DRAIN DIODE CHARACTERISTICS

Forward Diode Voltage	VSD		0.8	1.2	V	VGS = 0 V, ISD = 1.6 A
Reverse Recovery Time	tRR		7.1		ns	VGS = 0 V, dIS/dt = 100A/μs, IS = 1.6 A
Charge Time	ta		5			
Discharge Time	tb		1.9			
Reverse Recovery Charge	QRR		3		nC	

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

4. Switching characteristics are independent of operating junction temperatures

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ELECTRICAL CHARACTERISTIC CURVES

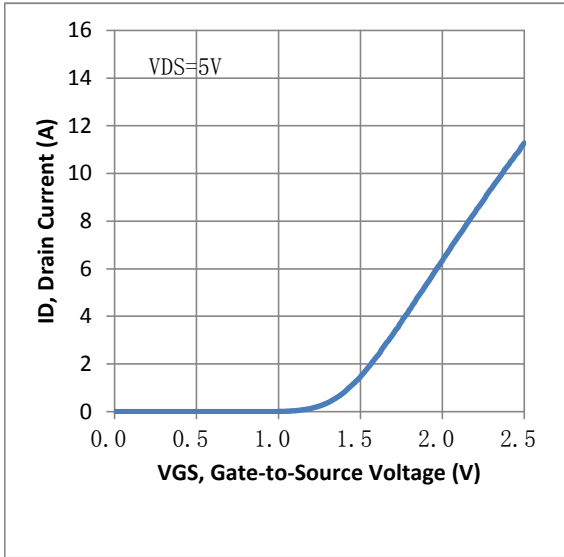


FIG.1 Transfer Characteristics

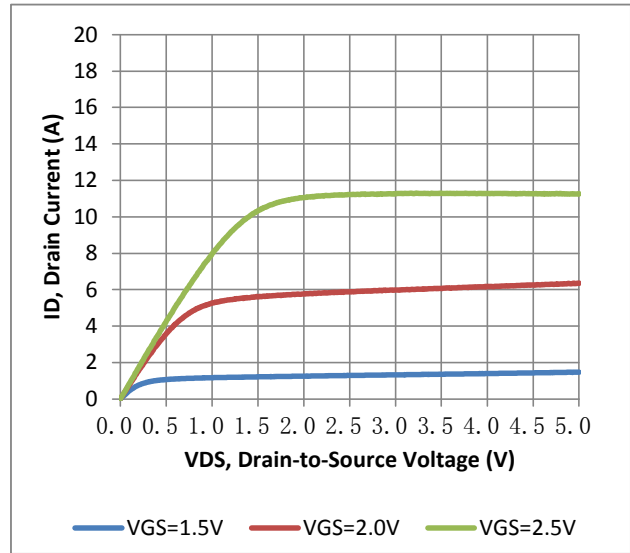


FIG.2 On-Region Characteristics

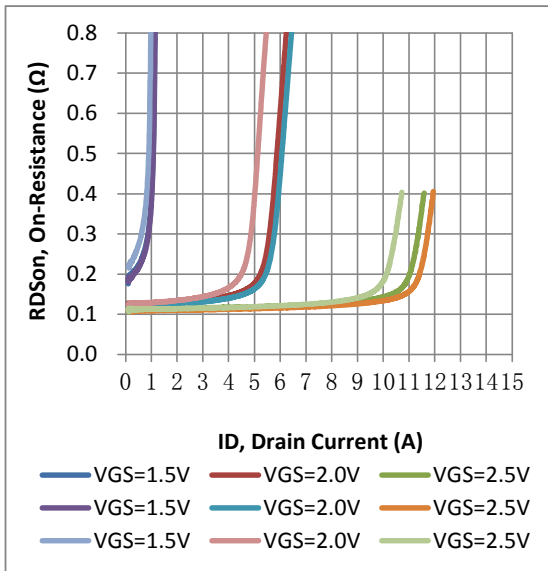


FIG.3 On-Resistance versus Drain Current

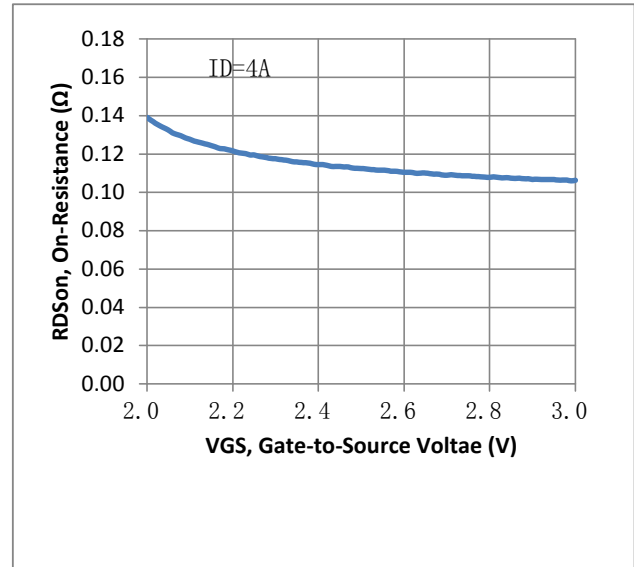


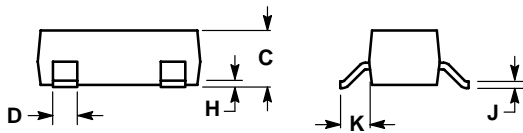
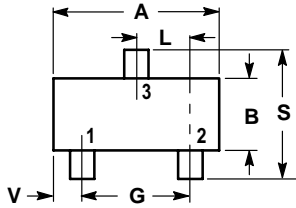
FIG.4 On-Resistance vs. Gate-to-Source Voltage

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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

