

# N4501L

## S-N4501L

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

### 1. FEATURES

- Leading planar technology for low gate charge / fast switching
- 2.5 V rated for low voltage gate drive
- SOT-23 surface mount for small footprint
- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.

### 2. APPLICATIONS

- Load/Power switch for portables
- Load/Power switch for computing
- DC-DC conversion

### 3. DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
N4501L	N45	3000/Tape&Reel

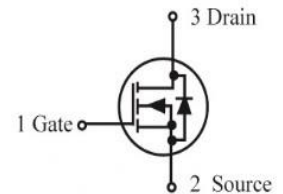
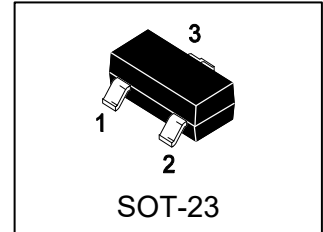
### 4. MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	VDSS	20	V
Gate-to-Source Voltage – Continuous	VGS	±12	V
Drain Current			A
– Continuous TA = 25°C	ID	3.2	
– Pulsed	IDM	10	

### 5. THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Maximum Power Dissipation(Note 1)	PD	1.25	W
Thermal Resistance, Junction-to-Ambient(Note 1)	RθJA	100	°C/W
Junction and Storage temperature	TJ, Tstg	-55~+150	°C

1. Surface-mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces).

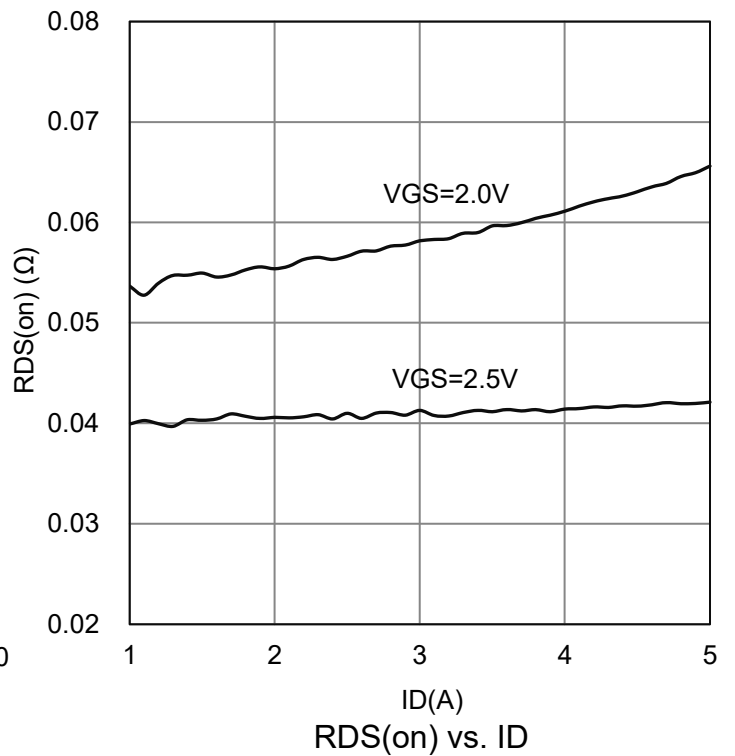
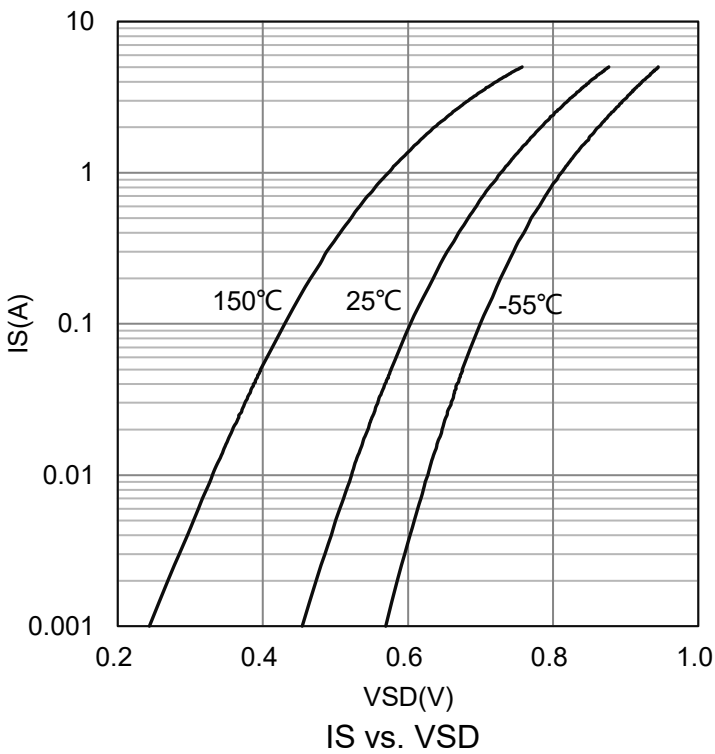
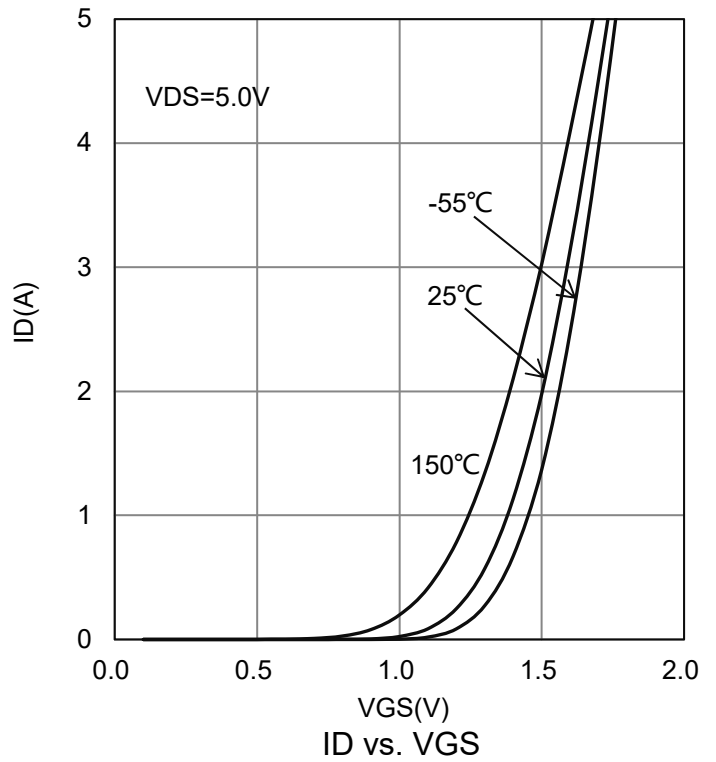
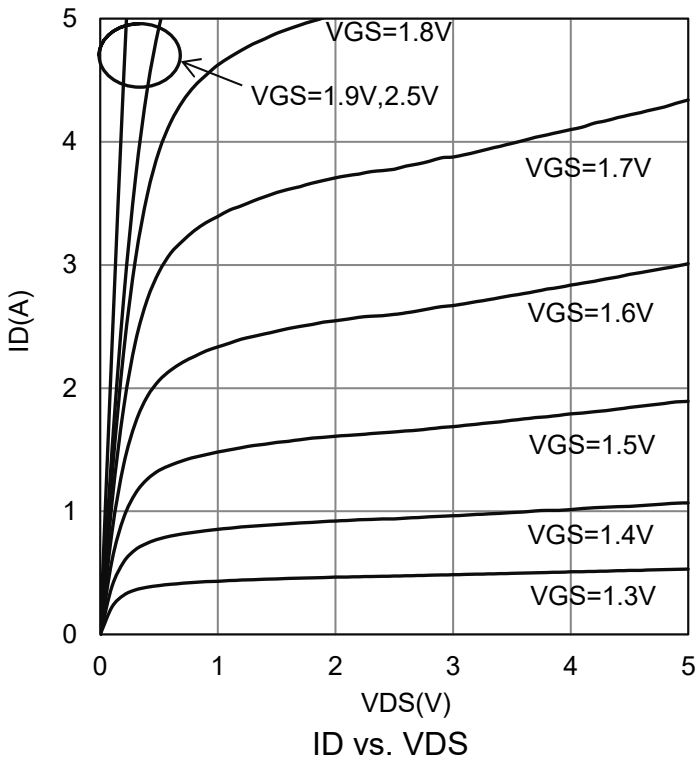


**6. ELECTRICAL CHARACTERISTICS (Ta= 25°C )**

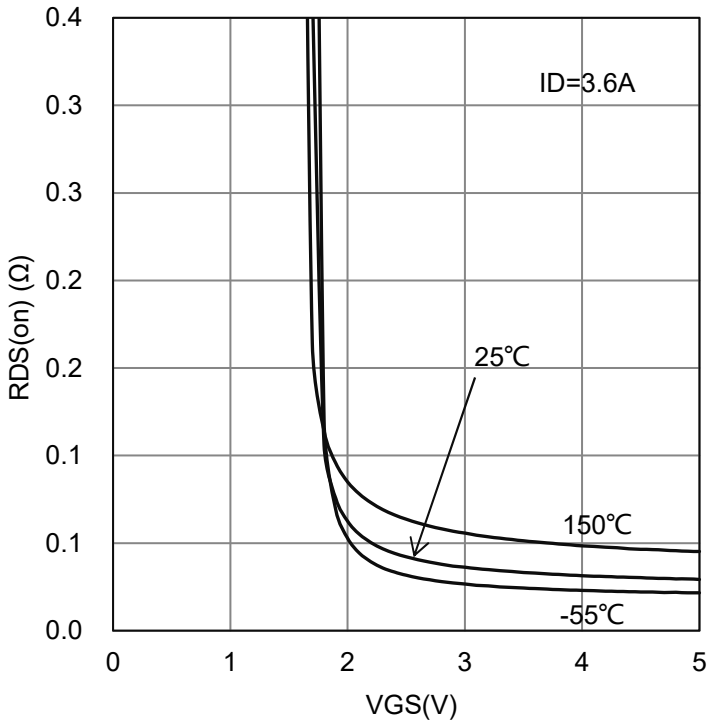
Characteristic	Symbol	Min.	Typ.	Max.	Unit	
<b>Static</b>						
Drain-Source Breakdown Voltage (VGS = 0, ID = 250μA)	V(BR)DSS	20	-	-	V	
Zero Gate Voltage Drain Current (VDS=16V, VGS=0V)	IDSS	-	-	1.5	μA	
Gate-Body Leakage Current, Forward (VDS = 0 V, VGS = 12 V)	IGSSF	-	-	100	nA	
Gate-Body Leakage Current, Reverse (VDS = 0 V, VGS = -12 V)	IGSSR	-	-	-100	nA	
Gate Threshold Voltage (VDS = VGS, ID = 250μA)	VGS(th)	0.6	-	1.2	V	
Static Drain-Source On-State Resistance (VGS = 4.5 V, ID = 3.6 A) (VGS = 2.5 V, ID = 3.1 A)	RDS(on)	- -	70 85	80 105	mΩ	
Forward Transconductance (VDS = 5.0 V, ID = 3.6 A)	gfs	-	9	-	S	
Forward Voltage (VGS = 0 V, ISD = 1.6 A)	VSD	-	0.8	1.2	V	
<b>Dynamic</b>						
Input Capacitance (VGS = 0 V, f = 1.0MHz, VDS= 10 V)	Ciss	-	388	-	pF	
Output Capacitance (VGS = 0 V, f = 1.0MHz, VDS= 10 V)	Coss	-	53	-	pF	
Reverse Transfer Capacitance (VGS = 0 V, f = 1.0MHz, VDS= 10 V)	Crss	-	45	-	pF	
Total Gate Charge	(VDS = 10V, VGS = 4.5V, ID = 3.6A)	Qg	-	4	6	nC
Gate-Source Charge		Qgs	-	0.6	-	
Gate-Drain Charge		Qgd	-	1.3	-	
Turn-On Delay Time	(VGS = 4.5 V, VDS =10V, ID = 3.6 A, RG = 6.0Ω)	td(on)	-	6.5	-	ns
Rise Time		tr	-	12	-	
Turn-Off Delay Time		td(off)	-	12	-	
Fall Time		tf	-	3	-	



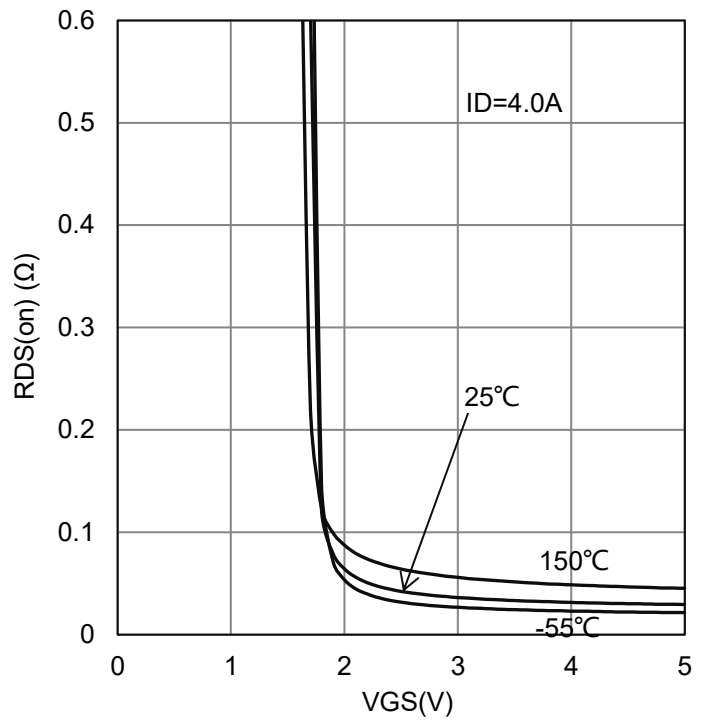
**7. ELECTRICAL CHARACTERISTICS CURVES**



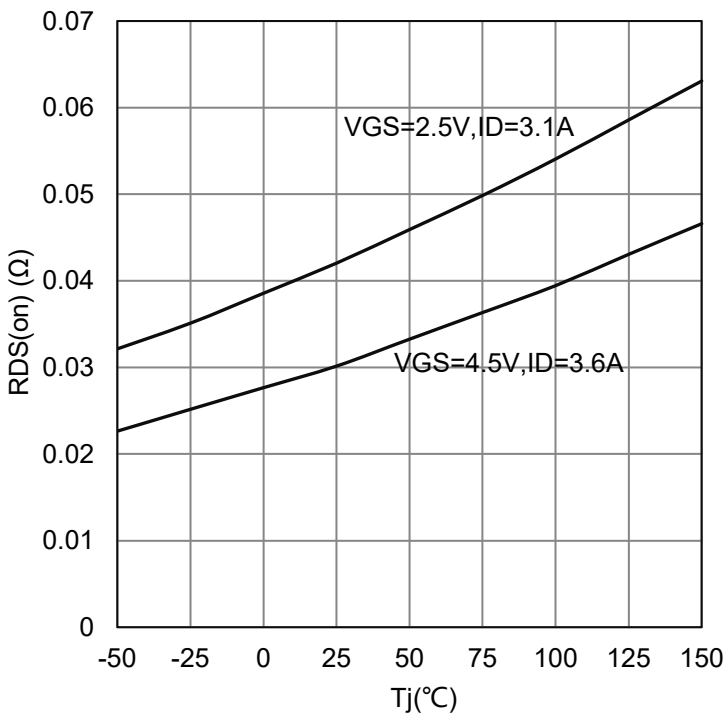
**7. ELECTRICAL CHARACTERISTICS CURVES(Con.)**



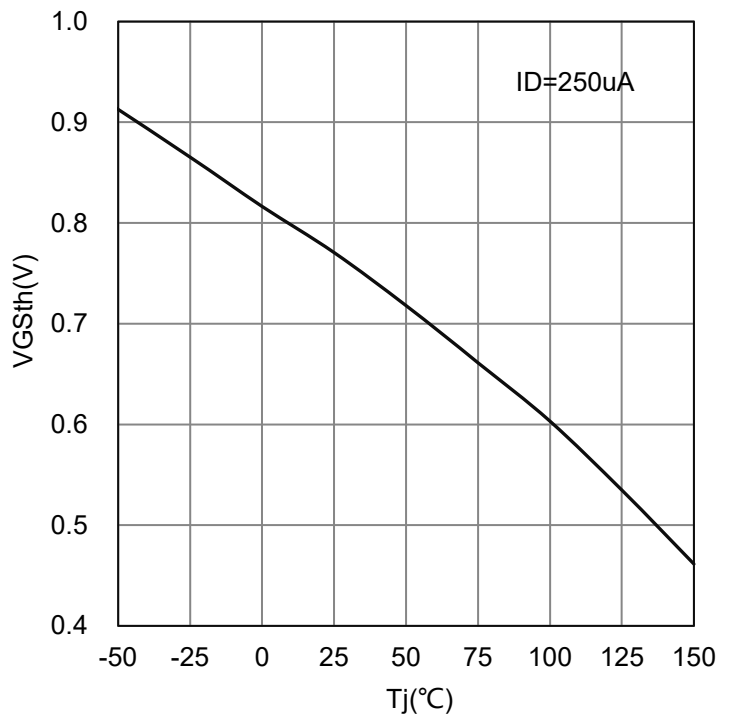
RDS(on) vs. VGS( $I_D=3.6A$ )



RDS(on) vs. VGS( $I_D=4.0A$ )



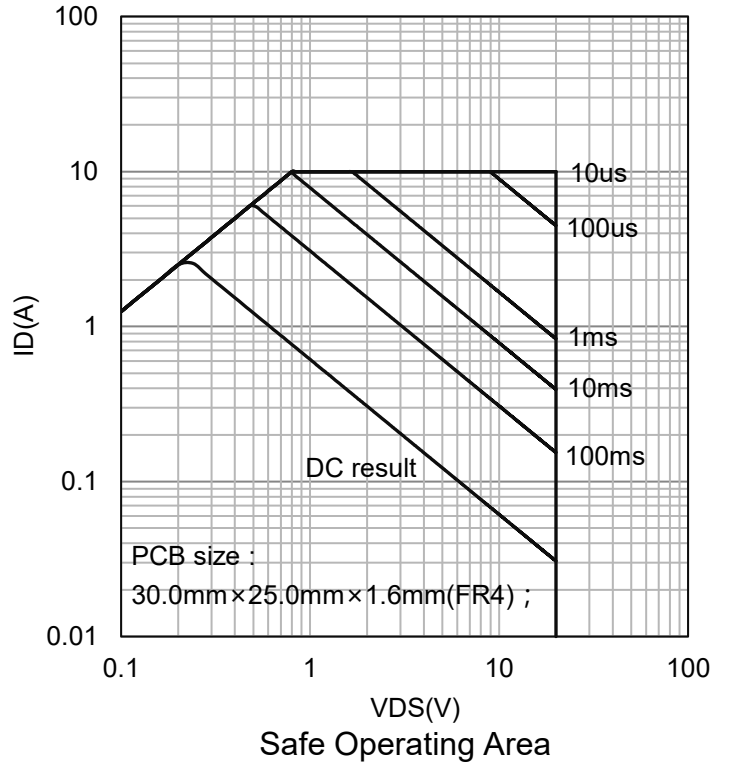
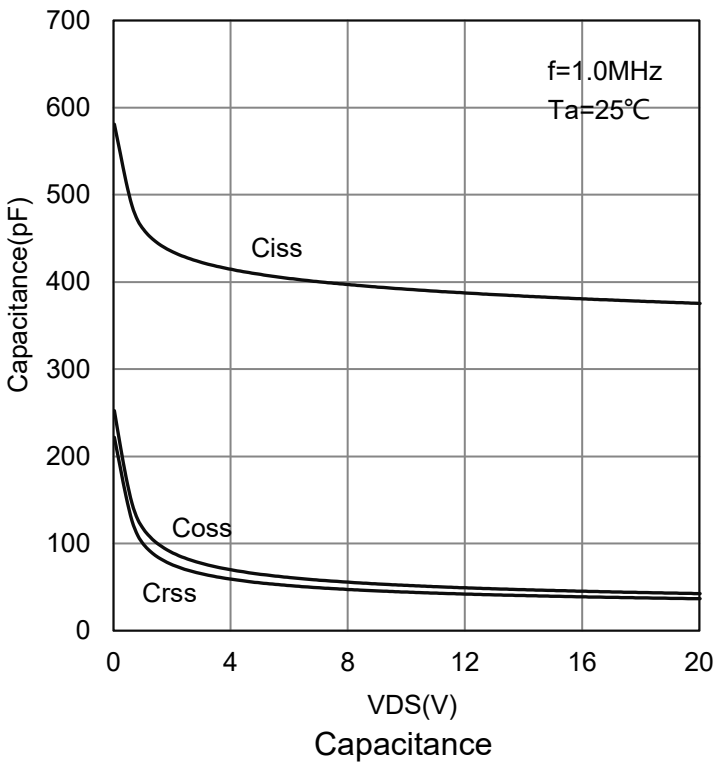
RDS(on) vs.  $T_j$



$V_{GSth}$  vs.  $T_j$



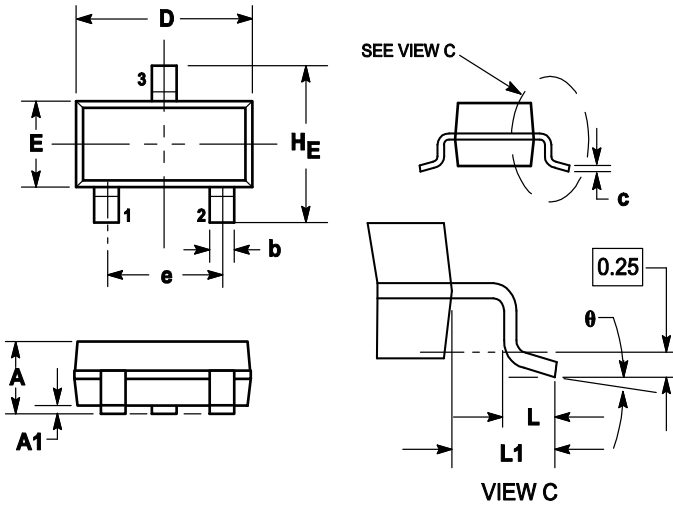
**7. ELECTRICAL CHARACTERISTICS CURVES(Con.)**



### 8. OUTLINE AND DIMENSIONS

Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.



DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1	1.11	0.035	0.04	0.044
A1	0.01	0.06	0.1	0.001	0.002	0.004
b	0.37	0.44	0.5	0.015	0.018	0.02
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.9	3.04	0.11	0.114	0.12
E	1.20	1.3	1.4	0.047	0.051	0.055
e	1.78	1.9	2.04	0.07	0.075	0.081
L	0.10	0.2	0.3	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.4	2.64	0.083	0.094	0.104
$\theta$	0°	---	10°	0°	---	10°

### 9. SOLDERING FOOTPRINT

