



# SLS20NP04 N-MOSFET and P-MOSFET

## 主要特征/Features

- ◇ Surface Mount T0-252-4L Package ;
- ◇ TrenchFET Power MOSFET;
- ◇ High Power and current handing capability;
- ◇ RoHS compliant / Green EMC;
- ◇ This device is suitable for use as a Battery protection or in other Switching application.

## N-MOSFET

$$V_{DS} = 40V$$

$$I_D = 20A$$

$$R_{DS(ON)} < 32m\Omega @ V_{GS}=10V \quad (\text{Type: } 24m\Omega)$$

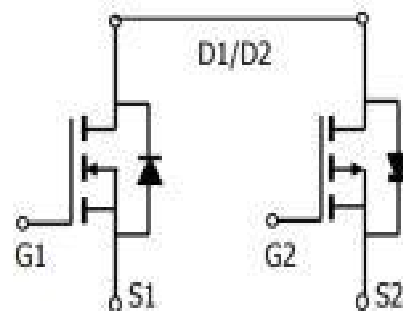
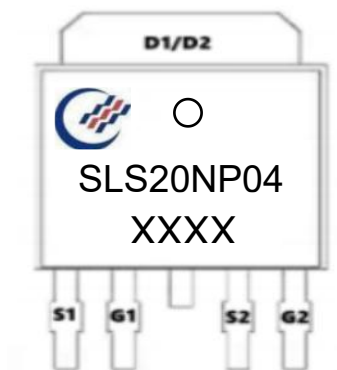
## P-MOSFET

$$V_{DS} = -40V$$

$$I_D = -18A$$

$$R_{DS(ON)} < 48m\Omega @ V_{GS} = -10V \quad (\text{Type: } 42m\Omega)$$

## 印字/MARKING 等效电路/Equivalent Circuit





极限参数/N-MOSFET Absolute Maximum Ratings(TA=25°C unless otherwise noted)

Symbol	Parameter	Rating		Units
		N-Ch	P-Ch	
V <sub>DS</sub>	Drain-Source Voltage	40	-40	V
V <sub>GS</sub>	Gate-Source Voltage	±20	±20	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	20	-18	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	15	-16	A
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	35	-36	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	15	45	mJ
I <sub>AS</sub>	Avalanche Current	10	-10	A
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation <sup>4</sup>	20	25	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	-55 to 150	°C
R <sub>θJA</sub>	Thermal Resistance Junction-Ambient <sup>1</sup>	62		°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-Case <sup>1</sup>	5		°C/W

电性能参数/Electrical Characteristics (T<sub>C</sub>=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	40	44	---	V
ΔBVDSS/ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	0.032	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =4A	---	24	32	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	---	38	48	
VGS(th)	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.0	1.5	2.5	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	-4.5	---	mV/°C
IDSS	Drain-Source Leakage Current	V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C	---	---	5	
IGSS	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
gfs	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =4A	---	8	---	S
R <sub>G</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	2.4	4.8	Ω
Q <sub>G</sub>	Total Gate Charge (4.5V)	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	---	5	---	nC
Q <sub>GS</sub>	Gate-Source Charge		---	1.54	---	
Q <sub>GD</sub>	Gate-Drain Charge		---	1.84	---	
Td(on)	Turn-On Delay Time		---	7.8	---	
T <sub>r</sub>	Rise Time	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω I <sub>D</sub> =1A	---	2.1	---	ns
Td(off)	Turn-Off Delay Time		---	29	---	
T <sub>f</sub>	Fall Time		---	2.1	---	



深圳市三联盛科技股份有限公司

SHENZHEN SLS TECHNOLOGY CO.,LTD.

股票代码 871699

Ciss	Input Capacitance	V <sub>DS</sub> =15V , V <sub>GS</sub> =0V , f=1MHz	---	452	---	pF
Coss	Output Capacitance		---	51	---	
Crss	Reverse Transfer Capacitance		---	38	---	
IS	Continuous Source Current <sup>1,4</sup>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	4.5	A
ISM	Pulsed Source Current <sup>2,4</sup>		---	---	14	A
VSD	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V , I <sub>S</sub> =1A , T <sub>J</sub> =25°C	---	---	1.2	V

**Note :**

- 1、The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width  $\cong$  300us , duty cycle  $\cong$  2%
- 3、The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=25V,V<sub>GS</sub>=10V,L=0.1mH,I<sub>AS</sub>=10A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.

**电性能参数/Electrical Characteristics (T<sub>c</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =-250uA	-40	---	---	V
ΔBVDSS/ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C , I <sub>D</sub> =-1mA	---	-0.02	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-10V , I <sub>D</sub> =-5A	---	42	48	mΩ
		V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-3A	---	48	60	
VGS(th)	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1.0	-1.6	-2.5	V
ΔVGS(th)	V <sub>GS(th)</sub> Temperature Coefficient		---	3.72	---	mV/°C
IDSS	Drain-Source Leakage Current	V <sub>DS</sub> =-32V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =-32V , V <sub>GS</sub> =0V , T <sub>J</sub> =55°C	---	---	5	
IGSS	Gate-Source Leakage Current	V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V	---	---	±100	nA
Q <sub>g</sub>	Total Gate Charge (-4.5V)	V <sub>DS</sub> =-20V , V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-6A	---	15.8	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	3.5	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	3.2	---	
Td(on)	Turn-On Delay Time	V <sub>DD</sub> =-15V , V <sub>GS</sub> =-10V , R <sub>G</sub> =3.3Ω, I <sub>D</sub> =-1A	---	5.2	---	ns
T <sub>r</sub>	Rise Time		---	7	---	
Td(off)	Turn-Off Delay Time		---	23	---	
T <sub>f</sub>	Fall Time		---	8	---	



深圳市三联盛科技股份有限公司

SHENZHEN SLS TECHNOLOGY CO.,LTD.

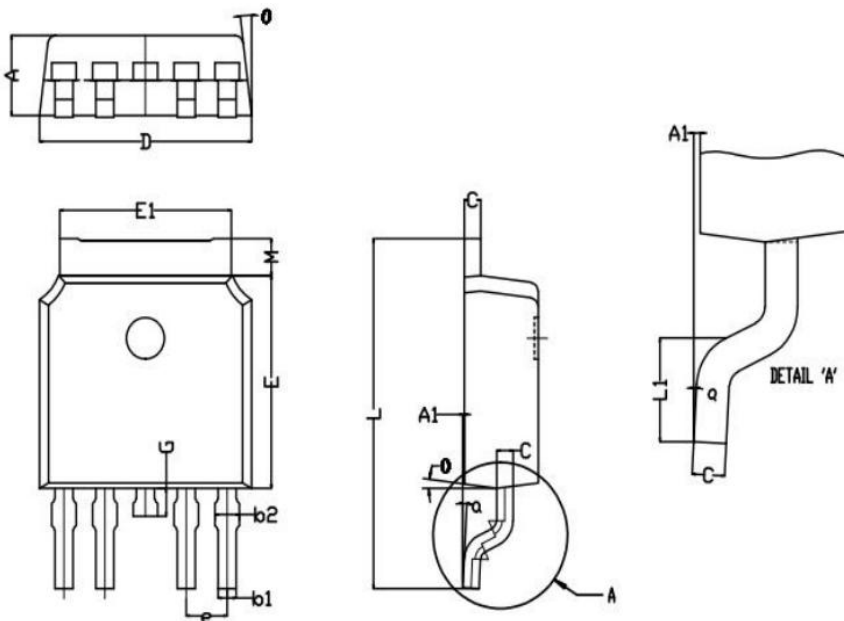
股票代码 871699

C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V , V <sub>GS</sub> =0V , f=1MHz	---	1000	---	pF
C <sub>oss</sub>	Output Capacitance		---	160	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	100	---	
I <sub>s</sub>	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	-5.7	A
VSD	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V , I <sub>s</sub> =-1A , T <sub>J</sub> =25°C	---	---	-1.2	V

**Note :**

- 1、 The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3、 The EAS data shows Max. rating . The test condition is VDD=-25V,VGS=-10V,L=0.1mH,IAS=-15A
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

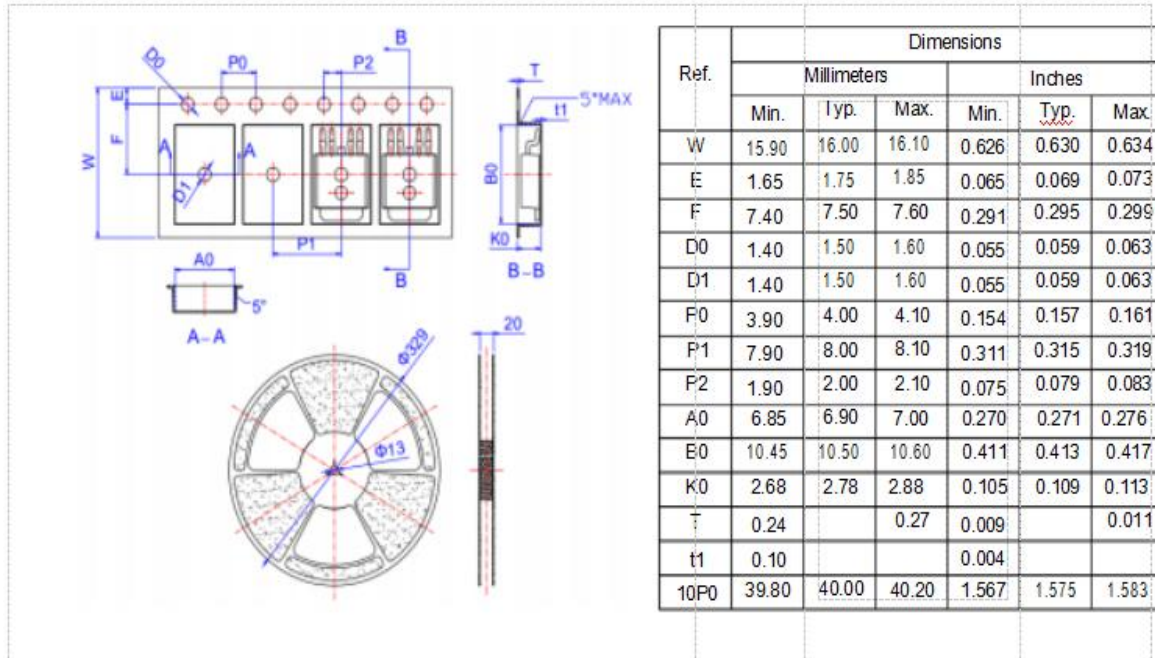
**成品外观尺寸/Package Mechanical Data:TO-252-4L**



Symbol	Dim in mm		
	Min	Nor	Max
A	2.25	2.30	2.35
L1	2.90	3.00	3.10
b1	0.51	0.56	0.61
b2	0.71	0.76	0.81
C	0.46	0.51	0.56
D	6.55	6.60	6.65
e	1.27 (BSC)		
E	6.05	6.10	6.15
E1	5.23	5.33	5.43
L	9.84	10.04	10.24
A1	0.00	0.05	0.10
M	1.01	1.06	1.11
G	0.70	0.80	0.90
O	0°	5°	10°
Q	0°	3°	6°



出货规范/Reel Spectification-TO-252-4



Reel	Reel Size	Box	Box Size(mm)	Carton	Carton size(mm)
2500 Pcs	13 inch	2500 Pcs	340×336×29	25 KPcs	353×345×365