150V N-Channel Enhancement Mode MOSFET

Description

The NP200S15LL uses advanced trench technology to provide excellent RDS(ON), This device is suitable for use as a load switch or in PWM applications.

General Features

- V_{DS} =150V，I_D =200A
  $R_{DS(ON)}$(Typ.)=4.9mΩ @V_{GS}=10V
  $R_{DS(ON)}$(Typ.)=5.4mΩ @V_{GS}=4.5V
- High power and current handing capability
- Lead free product is a acquired
- Surface mount package
- 150°C operating temperature
- 100% UIS tested

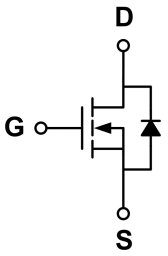
Application

- PWM applications
- Load switch
- Uninterruptible power supply

Package

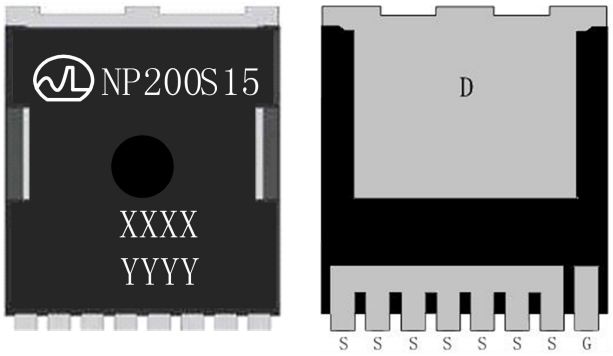
- TOLL-8L

Schematic diagram



Marking and pin assignment

TOLL-8L
（Top View）



XXXX—Wafer Information
YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
NP200S15LL-G	-55°C to +150°C	TOLL-8L	2000

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	150	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current	TC=25°C	I_D	200	A
	TC=100°C		150	
Pulsed Drain Current		I_{DM}	800	A
Avalanche energy(L=60mH)		E_{AS}	1.45	J
Maximum power dissipation	TC=25°C	P_D	440	W
Operating junction Temperature range		Tj	-55—150	℃

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition		Min	Typ	Max	Unit
Static Characteristics							
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA		150	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=150V, V_{GS}=0V	T_J=25°C	-	-	1	μA
			T_J=85°C	-	-	30	
Gate Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V		-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA		2.0	3.2	4.0	V
Drain-source on-state resistance[1]	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		-	4.9	7.5	mΩ
		V_{GS}=8V, I_D=20A			5.4	7.7	
Diode Characteristics							
Diode Continuous ForwardCurrent	I_S			-	-	200	A
Reverse Recovery Time	t_{rr}	IF=100A, V_{GS}=0V, V_{DS}=100V,dI/dt=100A/us		-	268	-	ns
Reverse Recovery Charge	Q_{rr}			-	22	-	nC
Dynamic Characteristics[2]							
Intrinsic gate resistance	R_G	V_{GS}=0V, V_{DS}=0V,f=1MHz		-	3.8	-	Ω
Input capacitance	C_{ISS}	V_{GS}=0V ,V_{DS}=50V f=1.0MHz		-	4754	-	pF
Output capacitance	C_{OSS}			-	1009	-	
Reverse transfer capacitance	C_{RSS}			-	175	-	
Turn-on delay time	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=100V, R_G=25Ω , I_D=20A		-	20	-	ns
Turn-on Rise time	tr			-	34	-	
Turn-off delay time	$t_{D(OFF)}$			-	37	-	
Turn-off Fall time	tf			-	25	-	
Total gate charge	Q_g	V_{GS}=10V,I_D=20A V_{DS}=100V		-	73.4	-	nC
Gate-source charge	Q_{gs}			-	65.5	-	
Gate-drain charge	Q_{gd}			-	6.8	-	
Drain-Source Diode Characteristics							
Diode forward voltage	V_{SD}	I_{SD}=20A,V_{GS}=0V		-	0.77	1.4	V

Note: 1：Pulse test; pulse width ≦ 300ns, duty cycle ≦ 2%.

2：Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

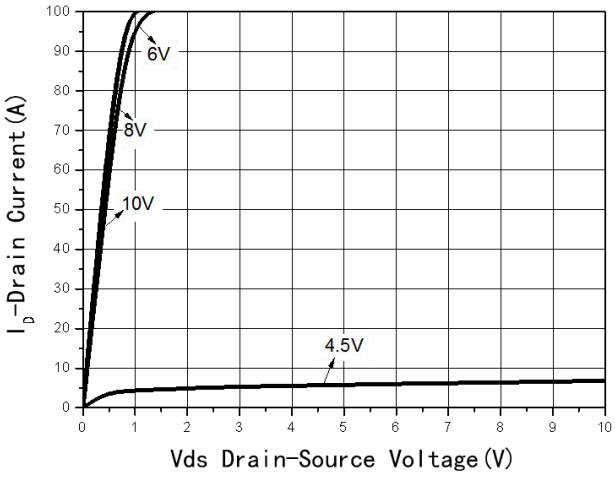


Fig1 Output Characteristics

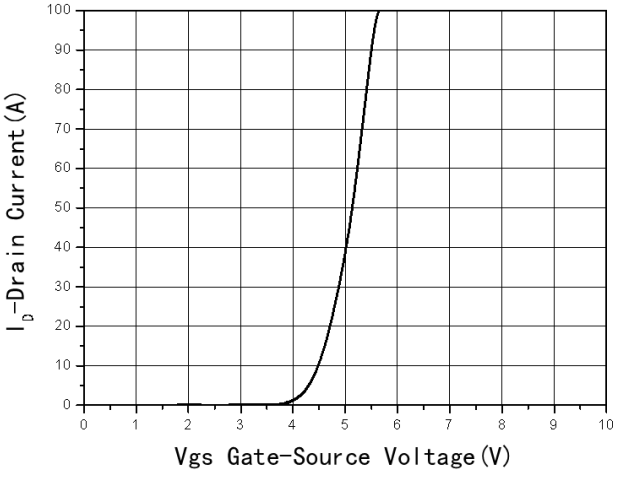


Fig2 Transfer Characteristics

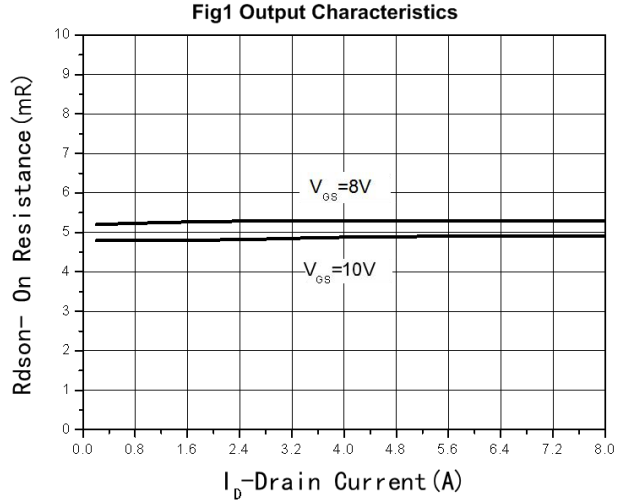


Fig3 Rdson-Drain current

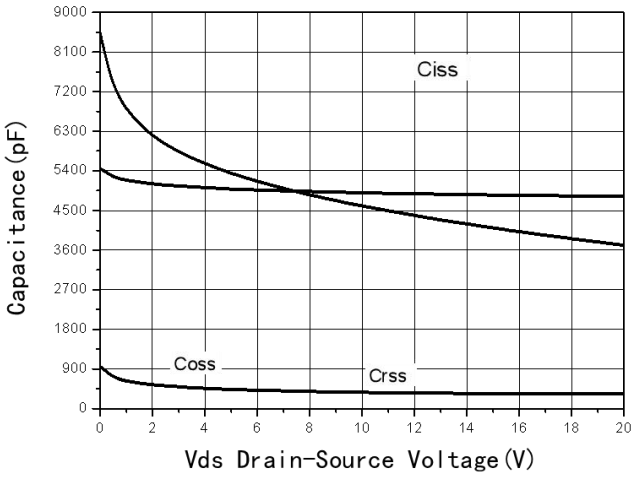


Fig4 Capacitance vs Vds

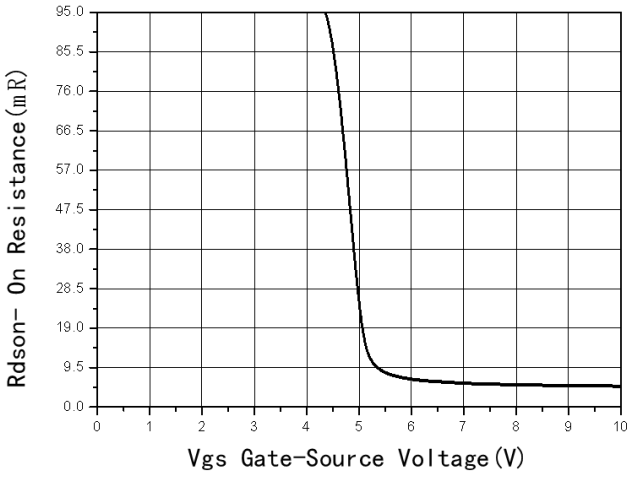


Fig5 Rdson-Gate Drain voltage

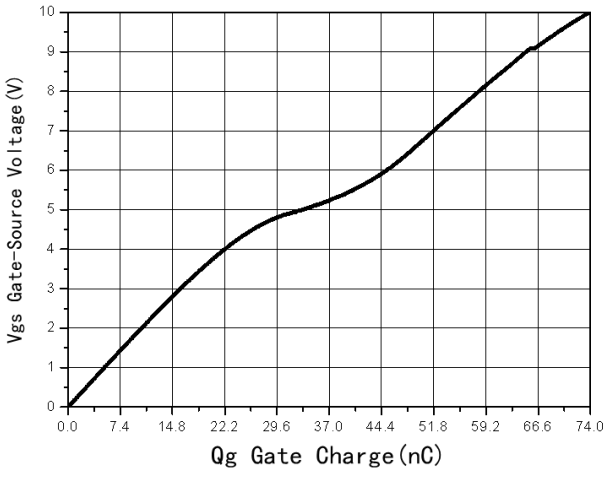


Fig6 Gate Charge

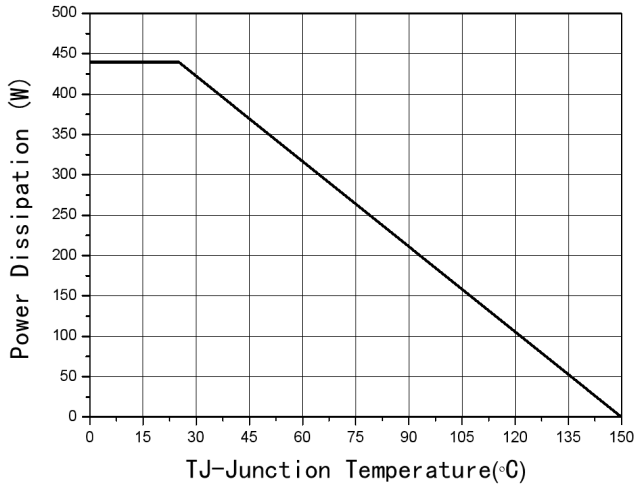


Fig7 Power De-rating

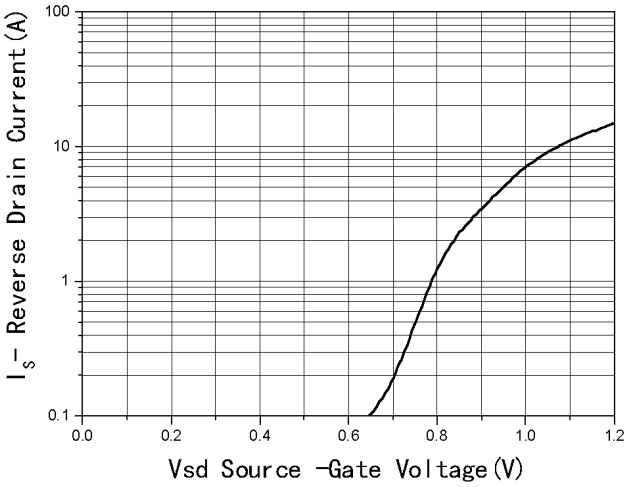
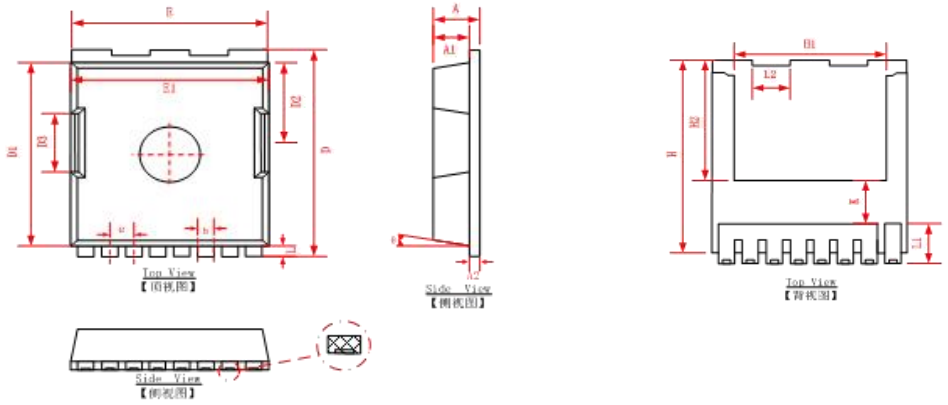


Fig8 Source-Drain Diode Forward

Package Information

- **TOLL-8L**



Symbol	Dimensions In Millimeters		
	Min	Ref	Max
A	2.100	2.300	2.500
A1	1.700	1.800	1.900
A2	0.400	0.500	0.600
θ		10°Ref	
D	11.500	11.600	11.700
E	9.700	9.800	9.900
D1	10.300	10.400	10.500
E1	9.800	9.900	10.000
D2	4.450	4.550	4.650
D3	3.200	3.300	3.400
e		1.200BSC	
b	0.600	0.700	0.800
L	0.500	0.600	0.700
H	10.000	11.000	12.000
H1	8.700	8.800	8.900
H2		7.250Ref	
L1	1.630	1.680	1.720
L2	2.900	3.000	3.100
K		2.650Ref	