300V N-Channel Enhancement Mode MOSFET

Description

The NP12N30G uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge.It can be used in a wide variety of applications.

General Features

- V_{DS} =300V，I_D =12A
  $R_{DS(ON)}$(Typ.)= 250mΩ @V_{GS}=10V
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

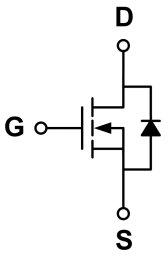
Application

- Automotive applications
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

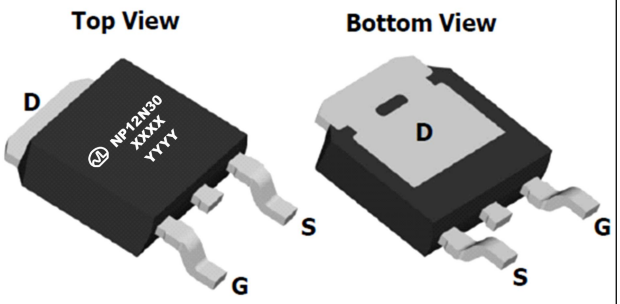
- TO-252-2L

Schematic diagram



Marking and pin assignment

TO-252-2L
（Top View）



XXXX—Wafer Information
YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
NP12N30G-G	-55°C to +150°C	TO-252-2L	2500

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	300	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current	TC=25°C	I_D	12	A
	TC=100°C		10.8	
Pulsed Drain Current		I_{DM}	48	A
Avalanche energy(L=0.5mH)		E_{AS}	85	mJ
Maximum power dissipation	TC=25°C	P_D	123	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		300	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=300V, V_{GS}=0V	T_J=25°C	-	-	10	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	2.8	4	V
Drain-source on-state resistance[1]	$R_{DS(ON)}$	V_{GS}=10V, I_D=7.5A		-	250	300	mΩ
On Status Drain Current	$I_{D(ON)}$	V_{DS}=300V, V_{GS}=10V		12	-	-	A
Gate resistance	R_G			-	2	-	Ω
Diode Characteristics							
Diode Continuous Forward Current	I_S			-	-	12	A
Reverse Recovery Time	t_{rr}	I_F=7.5A,V_{DS}=100V, dI/dt=100A/us		-	32	-	ns
Reverse Recovery Charge	Q_{rr}			-	200	-	nC
Dynamic Characteristics[2]							
Input capacitance	C_{ISS}	V_{GS}=0V ,V_{DS}=100V f=1.0MHz		-	870	-	pF
Output capacitance	C_{OSS}			-	56	-	
Reverse transfer capacitance	C_{RSS}			-	5.3	-	
Turn-on delay time	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=100V, R_L=5Ω, R_{GEN}=3Ω		-	7	-	ns
Turn-on Rise time	tr			-	7	-	
Turn-off delay time	$t_{D(OFF)}$			-	29	-	
Turn-off Fall time	tf			-	7	-	
Total gate charge	Q_g	V_{GS}=10V,I_D=7.5A V_{DS}=100V		-	16.4	-	nC
Gate-source charge	Q_{gs}			-	5.1	-	
Gate-drain charge	Q_{gd}			-	1.3	-	
Drain-Source Diode Characteristics							
Diode forward voltage	V_{SD}	I_{SD}=7.5A,V_{GS}=0V			0.83	1.4	V

Note: 1：Eas test：VDD=50V，RG=25ohm，L=0.5mH

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

Typical Performance Characteristics

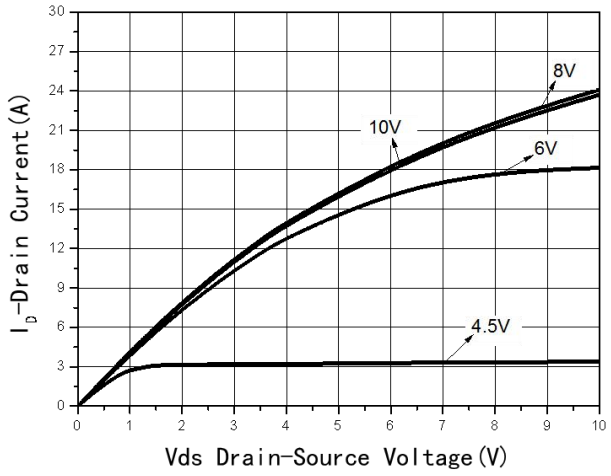


Fig1 Output Characteristics

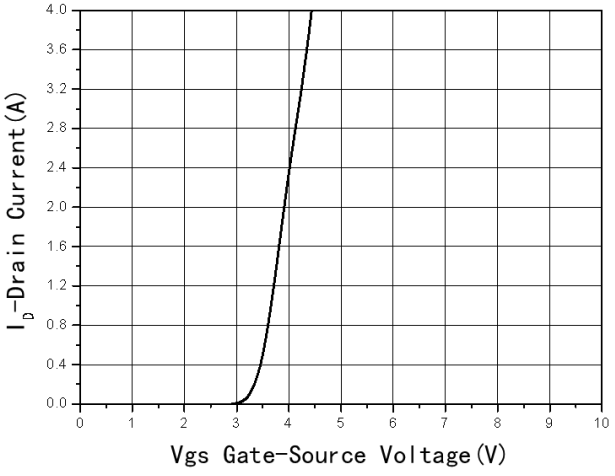


Fig2 Transfer Characteristics

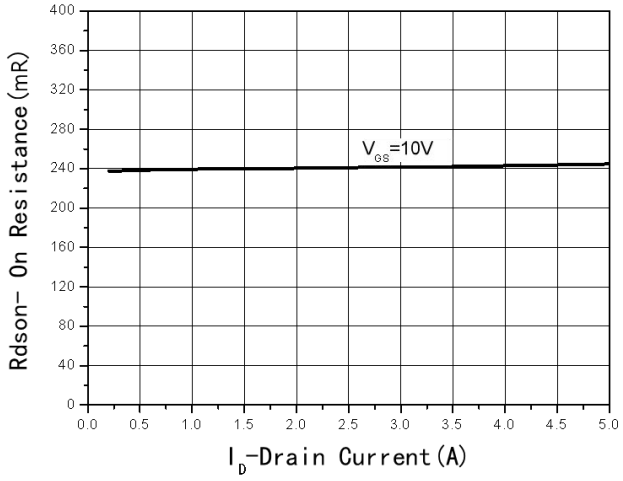


Fig3 Rdson-Drain current

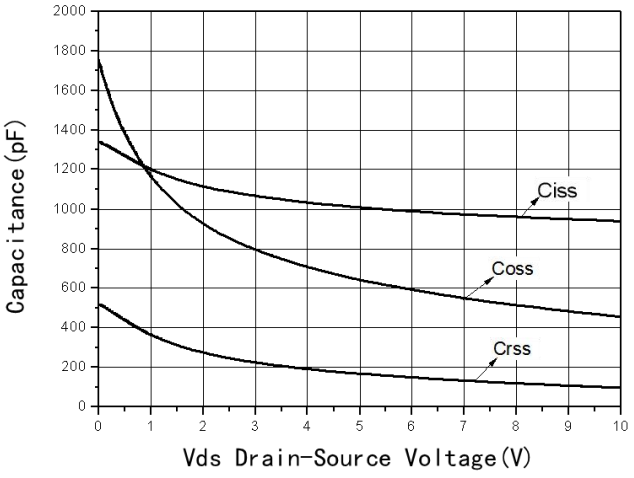


Fig4 Capacitance vs Vds

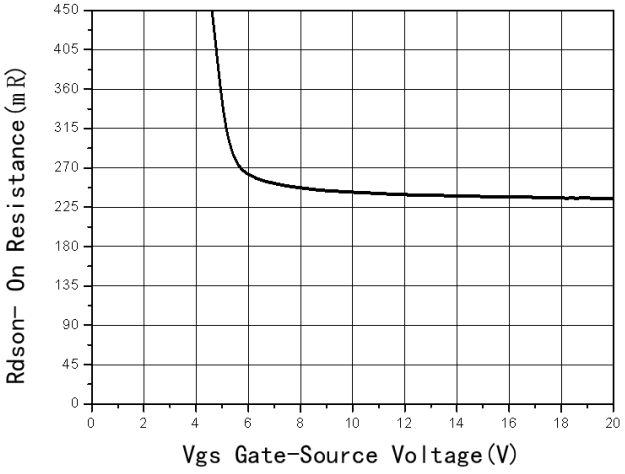


Fig5 Rdson-Gate Drain voltage

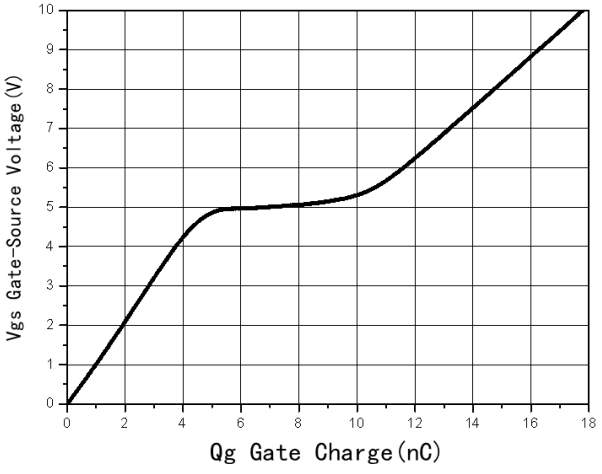


Fig6 Gate Charge

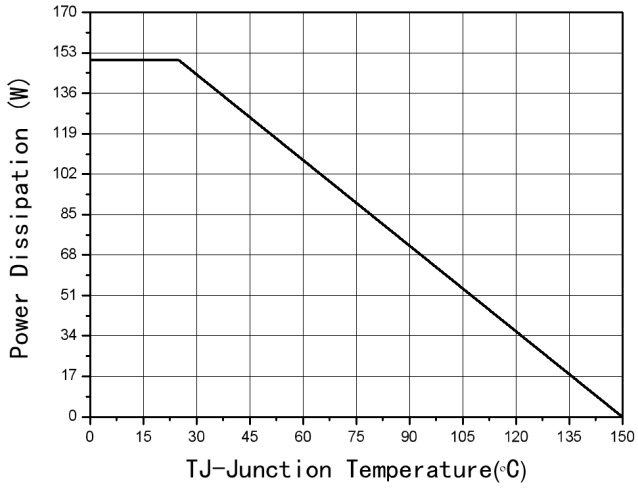


Fig7 Power De-rating

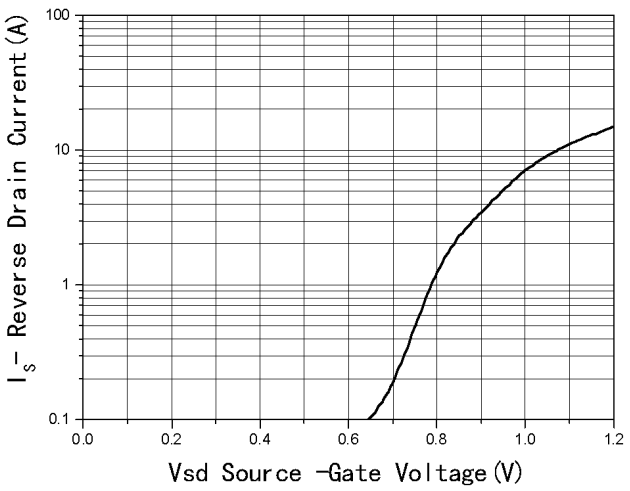
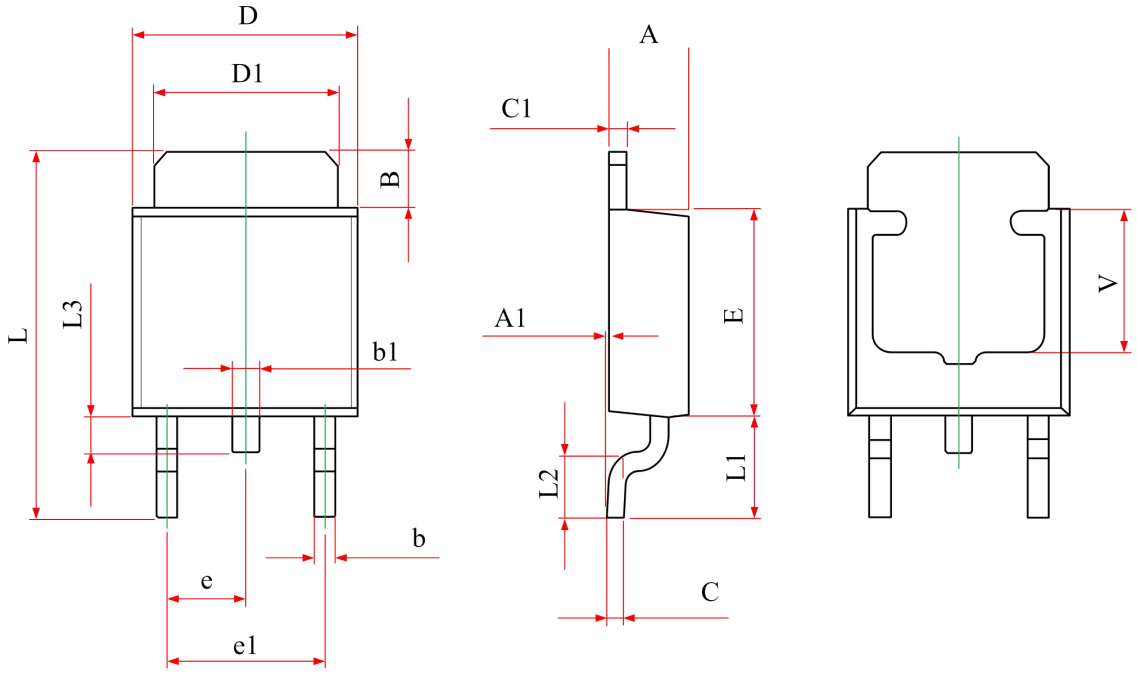


Fig8 Source-Drain Diode Forward

Package Information

- **TO-252-2L**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300TYP		0.091TYP	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800REF		0.150REF	