

## Description

The ENP3411 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications.

## General Features

- VDS =-30V , ID =-9A  
RDS(ON)(Typ.)=22mΩ @VGS=-10V  
RDS(ON)(Typ.)=28mΩ @VGS=-4.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

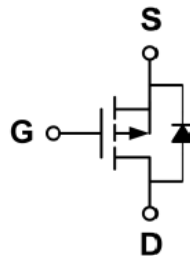
## Application

- PWM applications
- Load switch

## Package

- SOT-23-3L

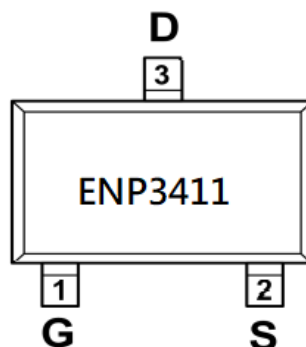
## Schematic diagram



## Marking and pin assignment

(Thickness 0.55mm)

SOT-23  
(TOP VIEW)





### Ordering Information

ENP3411 XX GR

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B1=SOT-23-3L

### Absolute Maximum Rating

(TA=25°C unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	V <sub>DS</sub>	-30	V
Gate-source voltage	V <sub>GS</sub>	±20	V
Drain current-continuous <sup>a</sup> @Tj=125°C -pulse <sup>d</sup>	I <sub>D</sub>	-9	A
	I <sub>DM</sub>	-36	A
Drain-source Diode forward current	I <sub>S</sub>	-9	A
Maximum power dissipation	P <sub>D</sub>	18	W
Operating junction Temperature range	T <sub>j</sub>	-55—150	°C



Electrical Characteristics (TA=25°C unless otherwise no

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-30	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V	-	-	-1	μA
Gate-body leakage	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
<b>ON Characteristics</b>						
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1	-1.7	-2.5	V
Drain-source on-state resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-9A	-	22	28	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A	-	28	36	
Forward transconductance	g <sub>fs</sub>	V <sub>GS</sub> =-5V, I <sub>D</sub> =-9A	-	5	-	S
<b>Dynamic Characteristics</b>						
Input capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V f=1.0MHz	-	1092	-	pF
Output capacitance	C <sub>OSS</sub>		-	124	-	
Reverse transfer capacitance	C <sub>RSS</sub>		-	99	-	
<b>Switching Characteristics</b>						
Turn-on delay time	t <sub>D(ON)</sub>	V <sub>DS</sub> =-15V V <sub>GS</sub> =-10V R <sub>L</sub> =2.3Ω R <sub>GEN</sub> =3Ω	-	8	-	ns
Rise time	t <sub>r</sub>		-	6	-	
Turn-off delay time	t <sub>D(OFF)</sub>		-	17	-	
Fall time	t <sub>f</sub>		-	5	-	
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =-15V, I <sub>D</sub> =-6A V <sub>GS</sub> =-10V	-	11.4	-	nC
Gate-source charge	Q <sub>gs</sub>		-	4.3	-	
Gate-drain charge	Q <sub>gd</sub>		-	3.5	-	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1.25A	-	-0.81	-1.2	V

Notes:

- surface mounted on FR4 board, t≤10sec
- pulse test: pulse width≤300μs, duty ≤2%
- guaranteed by design, not subject to production testing

## Thermal Characteristics

Thermal Resistance junction-to ambient	R <sub>th JA</sub>	100	°C/W
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Typical Performance Characteristics

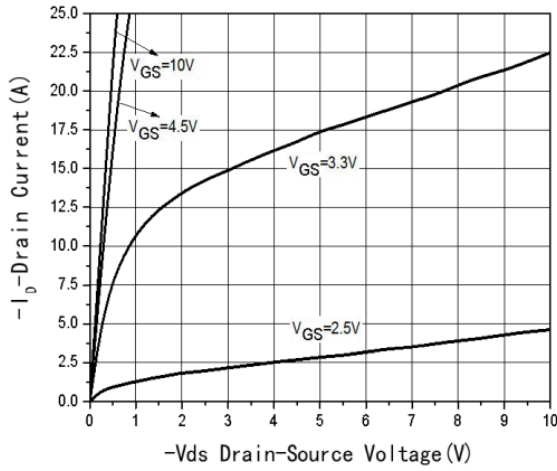


Fig1 Output Characteristics

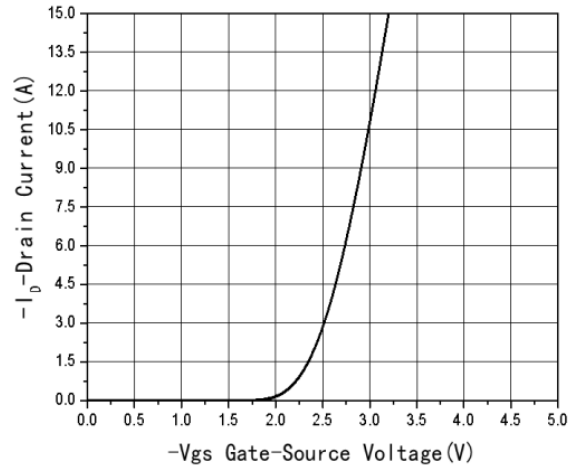


Fig2 Transfer Characteristics

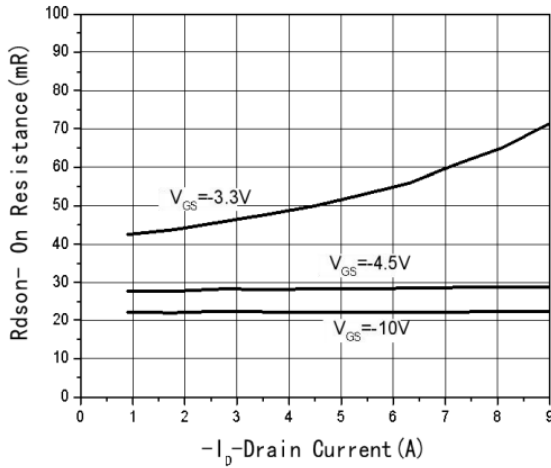


Fig3  $R_{dson}$ -Drain current

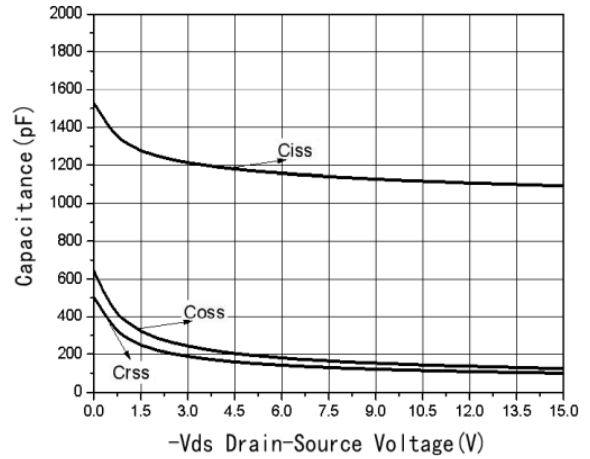


Fig4 Capacitance vs  $V_{DS}$

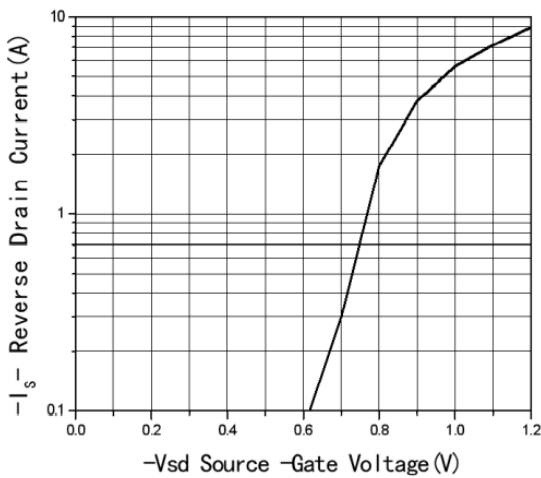


Fig5 Source-Drain Diode Forward

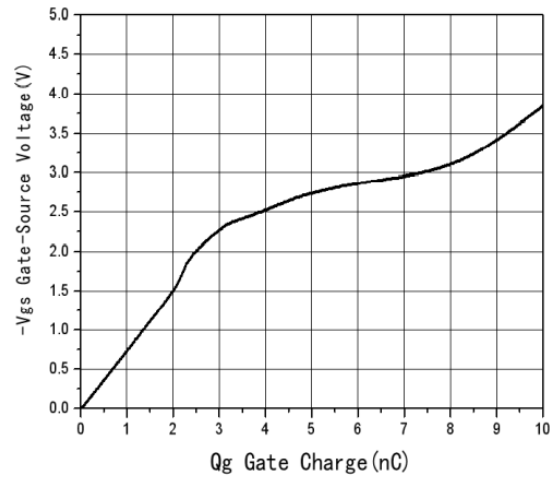
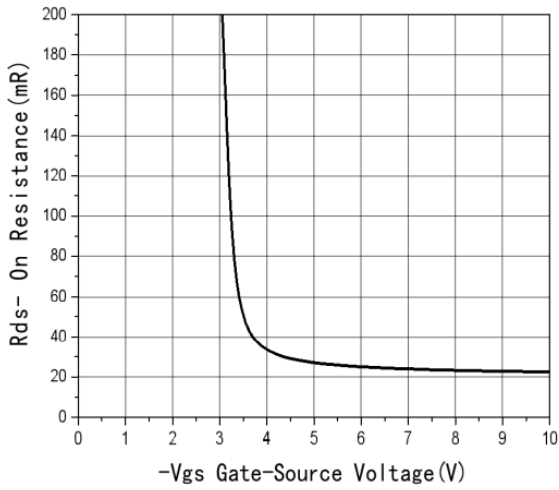
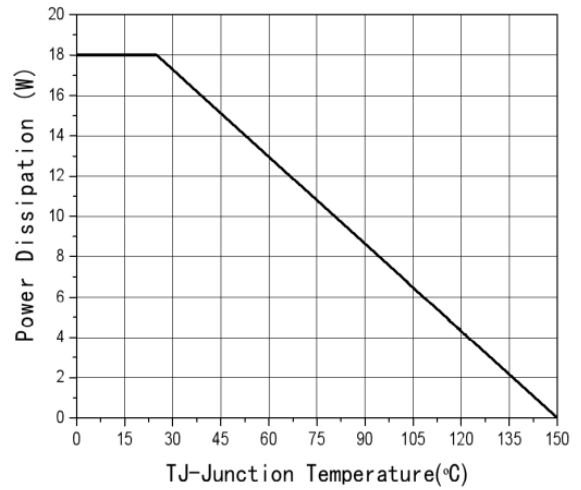


Fig6 Gate Charge

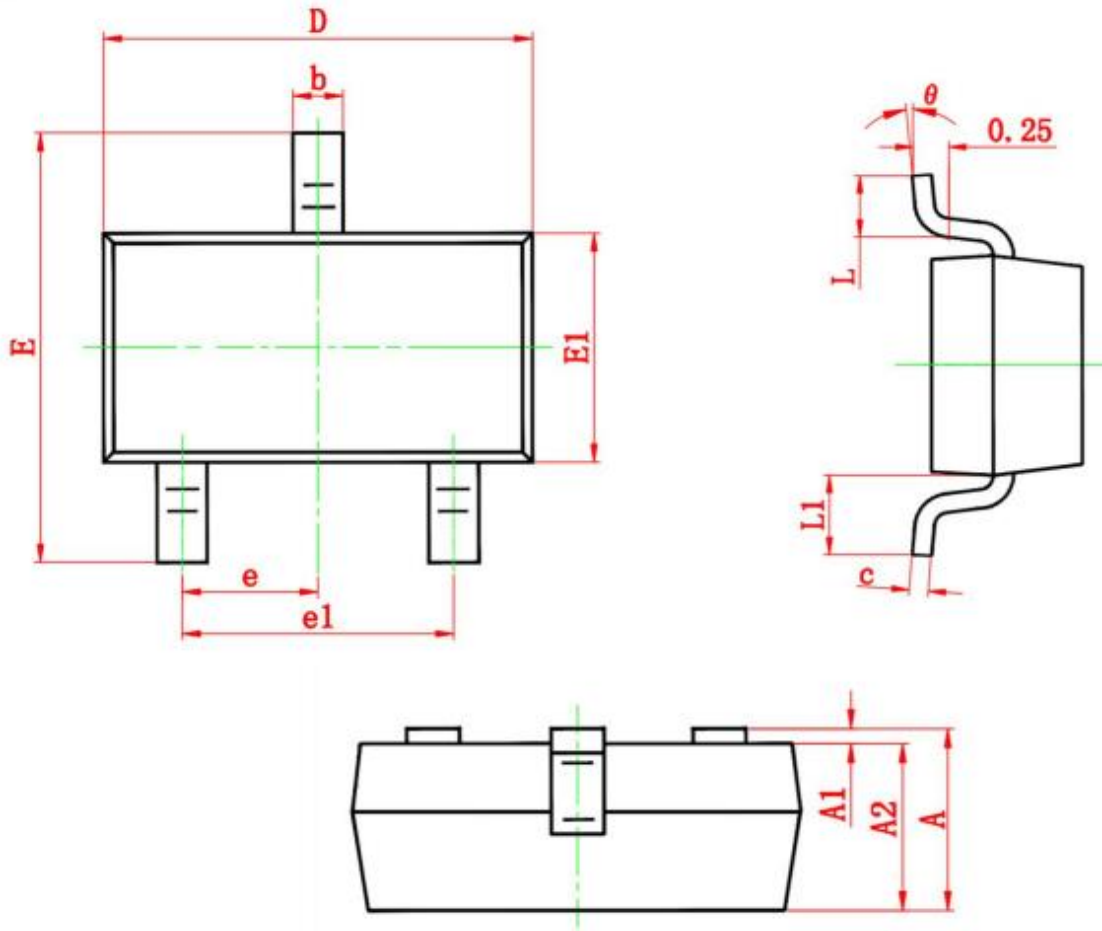


**Fig7 Rdson-Gate Drain voltage**



**Fig8 Power De-rating**

Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	2.250	2.550	0.089	0.100
E1	1.200	1.400	0.047	0.055
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.300	0.500	0.012	0.020
L1	0.550 REF.		0.022 REF.	
$\theta$	0°	8°	0°	8°