

## N-Channel Enhancement Mode MOSFET

### Description

The NP3008SR uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and high density cell Design for ultra low on-resistance. This device is suitable for use as a load switch or in PWM applications.

### General Features

- ◆  $V_{DS} = 30V$ ,  $I_D = 8A$   
 $R_{DS(ON)}(Typ.) = 24.5m\Omega$  @  $V_{GS} = 10V$   
 $R_{DS(ON)}(Typ.) = 29.2m\Omega$  @  $V_{GS} = 4.5V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

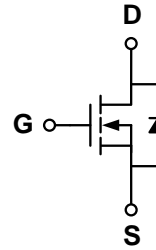
### Application

- ◆ PWM applications
- ◆ Load switch

### Package

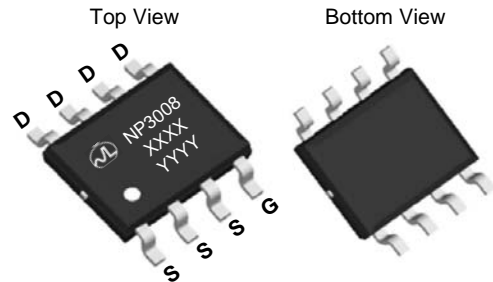
- ◆ SOP-8

### Schematic diagram



### Marking and pin assignment

#### SOP-8



XXXX—Wafer Information

YYYY—Quality Code

### Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
NP3008SR-G	-55°C to +150°C	SOP-8	4000

### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	$V_{DS}$	30	V
Gate-source voltage	$V_{GS}$	±12	V
Drain current-continuous <sup>a</sup> @Tj=125°C -pulse <sup>b</sup>	$I_D$	8	A
	$I_{DM}$	32	A
Drain-source Diode forward current	$I_S$	8	A
Maximum power dissipation	$P_D$	3.1	W
Operating junction Temperature range	$T_j$	-55—150	°C

**Electrical Characteristics** (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-body leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$	-	-	$\pm 100$	nA
<b>ON Characteristics</b>						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.9	1.3	V
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8A$	-	24.5		m $\Omega$
		$V_{GS}=4.5V, I_D=6A$	-	29.2		
Forward transconductance	gfs	$V_{GS}=5V, I_D=8A$	-	33	-	S
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{ISS}$	$V_{DS}=15V, V_{GS}=0V$ $f=1.0MHz$	-	838	-	pF
Output capacitance	$C_{OSS}$		-	51	-	
Reverse transfer capacitance	$C_{RSS}$		-	43	-	
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{D(ON)}$	$V_{DS}=15V$ $V_{GS}=10V$ $R_L=2.6\ ohm$ $R_{GEN}=3ohm$	-	3	-	ns
Rise time	$t_r$		-	3	-	
Turn-off delay time	$t_{D(OFF)}$		-	26	-	
Fall time	$t_f$		-	3.6	-	
Total gate charge	Qg	$V_{DS}=15V, I_D=8A$ $V_{GS}=4.5V$	-	11	-	nC
Gate-source charge	Qgs		-	1.4	-	
Gate-drain charge	Qgd		-	2.3	-	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A$	-	0.76	1.16	V

**Notes:**

- surface mounted on FR4 board,  $t \leq 10sec$
- pulse test: pulse width  $\leq 300\mu s$ , duty  $\leq 2\%$
- guaranteed by design, not subject to production testing

**Thermal Characteristics**

Thermal Resistance junction-to ambient	Rth JA	75	$^{\circ}C/W$
--	--------	----	---------------

## Typical Performance Characteristics

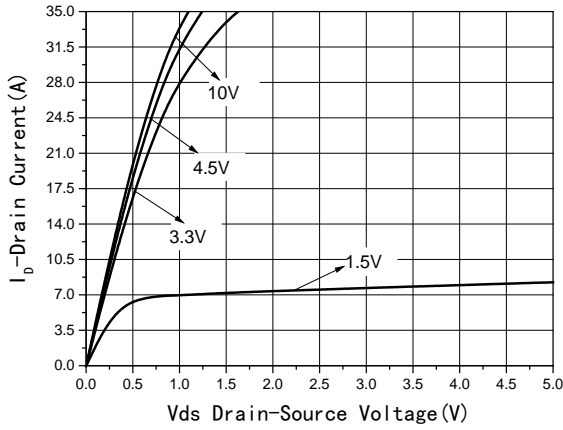


Fig1 Output Characteristics

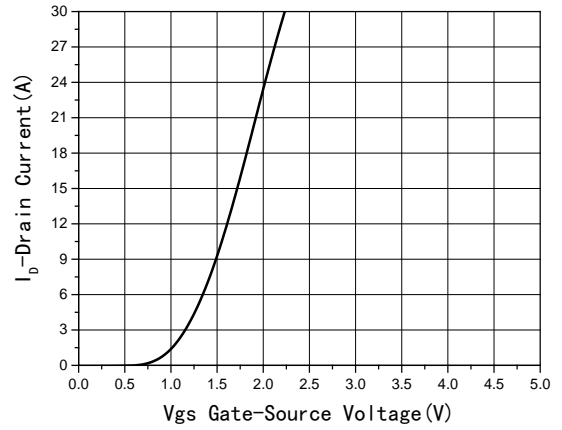


Fig2 Transfer Characteristics

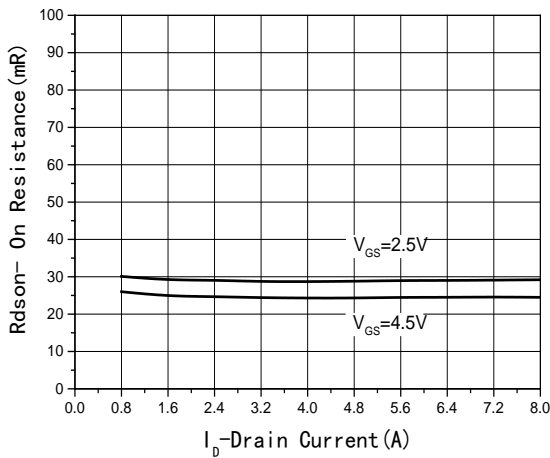


Fig3  $R_{DS(on)}$ -Drain current

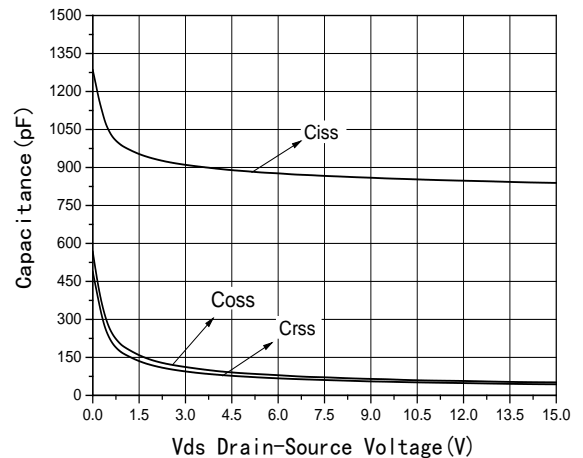


Fig4 Capacitance vs  $V_{DS}$

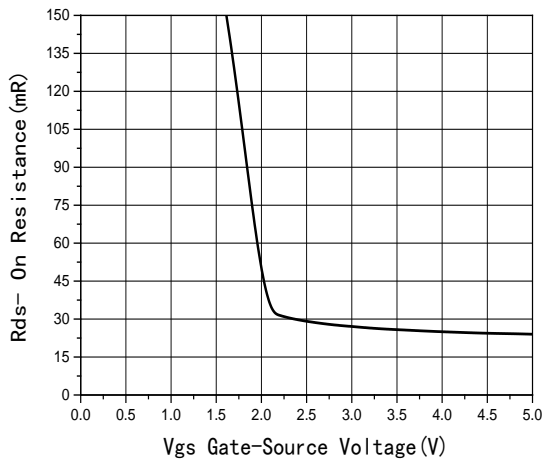


Fig5  $R_{DS(on)}$ -Gate Drain voltage

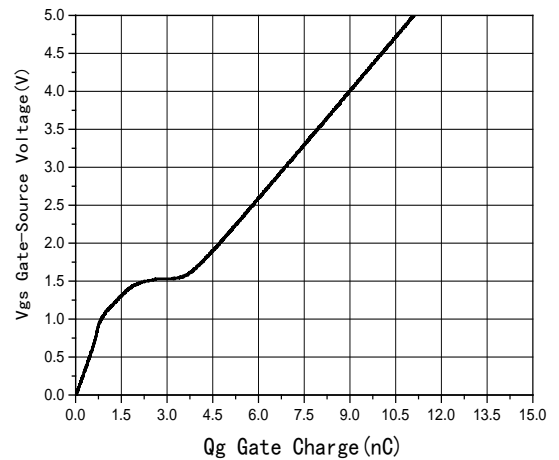
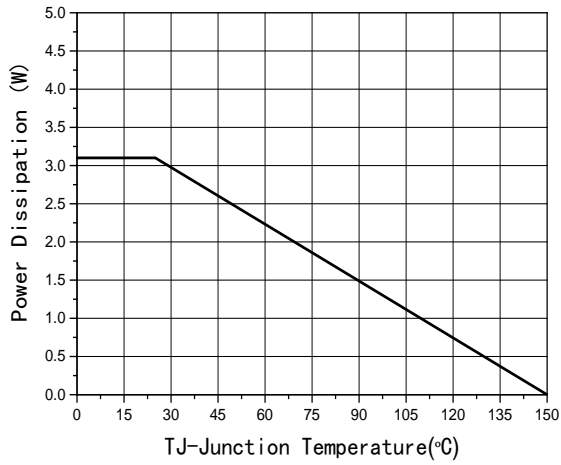
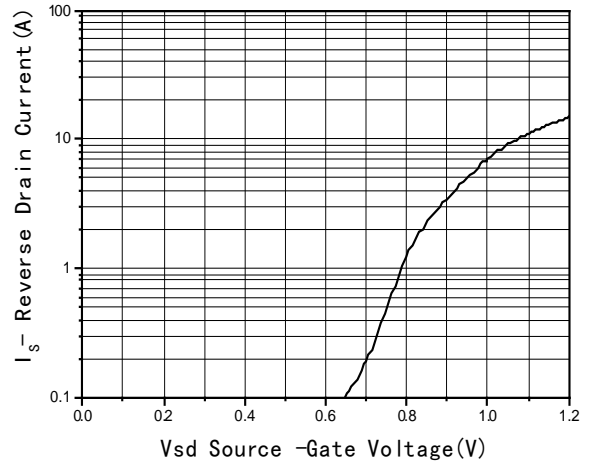


Fig6 Gate Charge



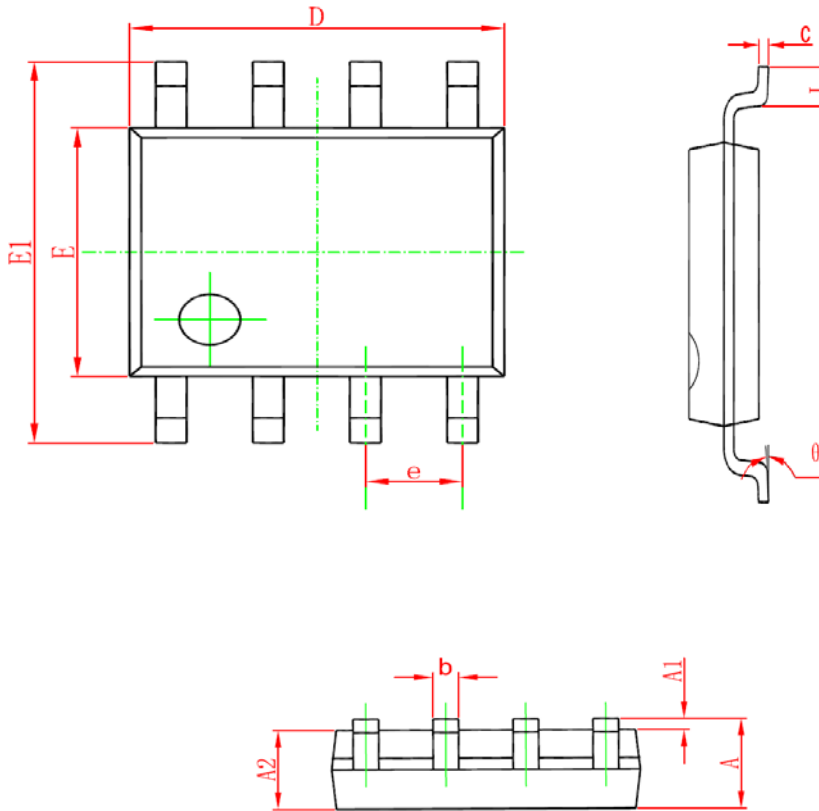
**Fig7 Power De-rating**



**Fig8 Source-Drain Diode Forward**

## Package Information

- SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°