

## N-Channel Enhancement Mode MOSFET

### Description

The NP3008DR 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

- ◆  $V_{DS} = 30V$ ,  $I_D = 8A$   
 $R_{DS(ON)}(Typ.) = 17.5m\Omega$  @  $V_{GS} = 4.5V$   
 $R_{DS(ON)}(Typ.) = 33m\Omega$  @  $V_{GS} = 2.5V$
- ◆ High power and current handing capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

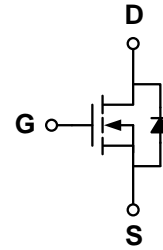
### Application

- ◆ PWM applications
- ◆ Load switch

### Package

- ◆ DFN2\*2-6L-B

### Schematic diagram

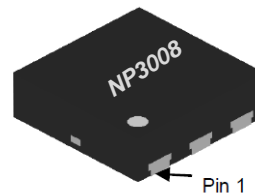


### Marking and pin assignment

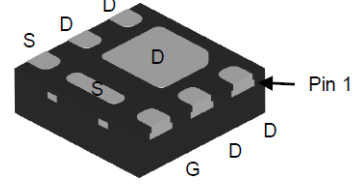
#### DFN2\*2-6L-B

(Thickness 0.55mm)

Top View



Bottom View



NP----Natlinear Power  
 3008----NP3008



### Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
NP3008DR-G	-55°C to +150°C	DFN2*2-6L-B	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> @ $T_j = 125^\circ C$ -pulse <sup>b</sup>	$I_D$	8	A
	$I_{DM}$	32	A
Drain-source Diode forward current	$I_S$	8	A
Maximum power dissipation	$T_A = 25^\circ C$	$P_D$	2.8 W
	$T_C = 25^\circ C$	$P_D$	18 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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6	1.1	1.4	V
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=8A$	-	14.5	18	m $\Omega$
		$V_{GS}=4.5V, I_D=6A$	-	17.5	21	
		$V_{GS}=2.5V, I_D=4A$	-	33	45	
Forward transconductance	gfs	$V_{GS}=5V, I_D=8A$	-	33	-	S
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{ISS}$	$V_{DS}=15V, V_{GS}=0V$ $f=1.0MHz$	-	464	-	pF
Output capacitance	$C_{OSS}$		-	60	-	
Reverse transfer capacitance	$C_{RSS}$		-	51	-	
<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	tr		-	3	-	
Turn-off delay time	$t_{D(OFF)}$		-	26	-	
Fall time	tf		-	3.6	-	
Total gate charge	Qg	$V_{DS}=15V, I_D=8A$ $V_{GS}=4.5V$	-	6.8	-	nC
Gate-source charge	Qgs		-	1.4	-	
Gate-drain charge	Qgd		-	2	-	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A$	-	0.76	1.16	V

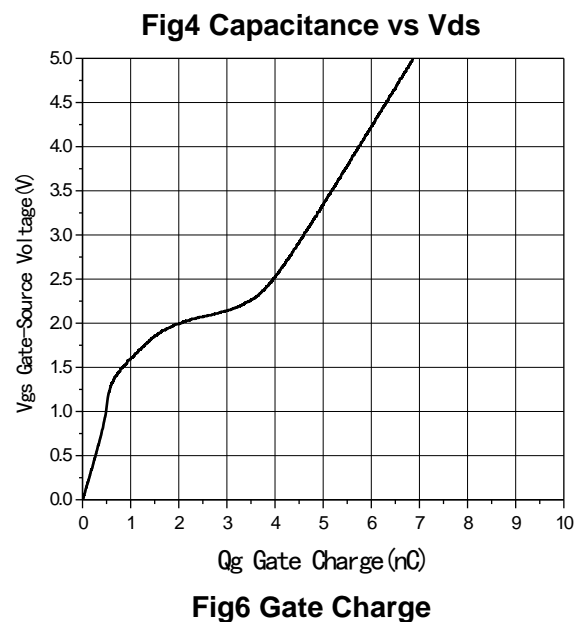
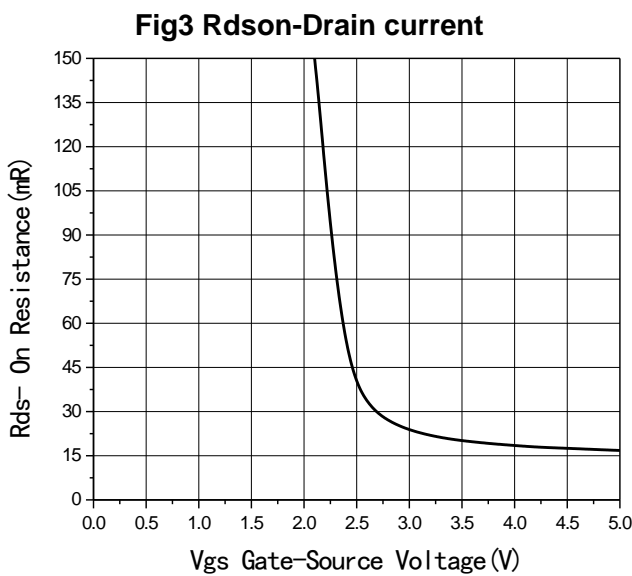
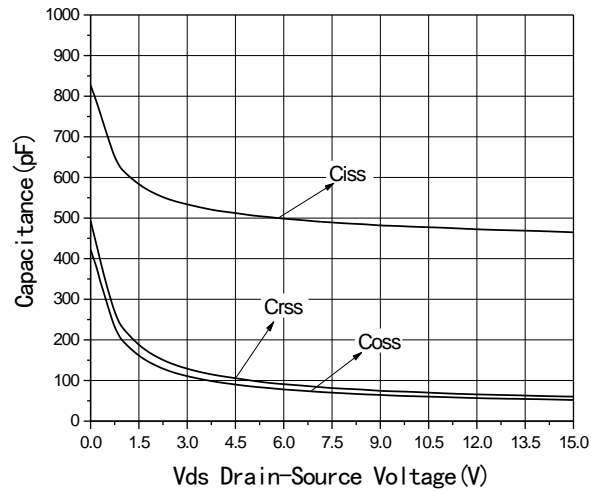
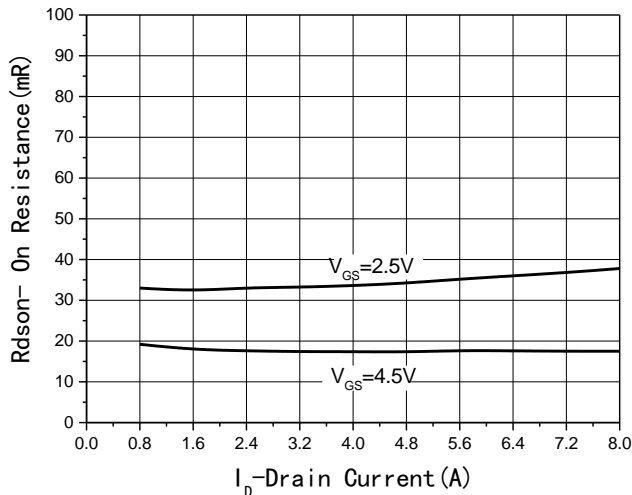
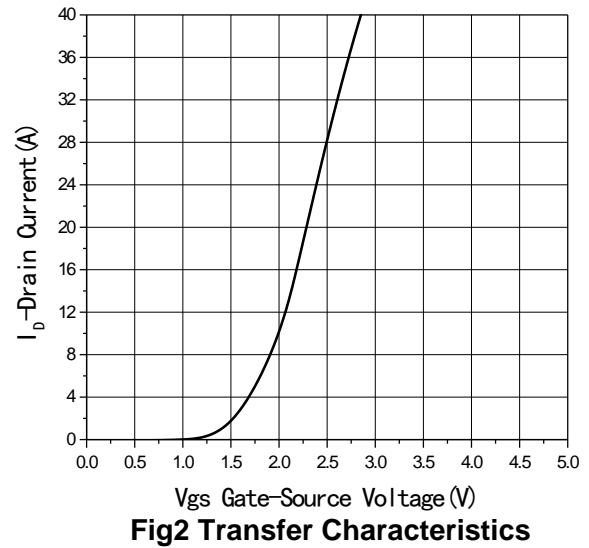
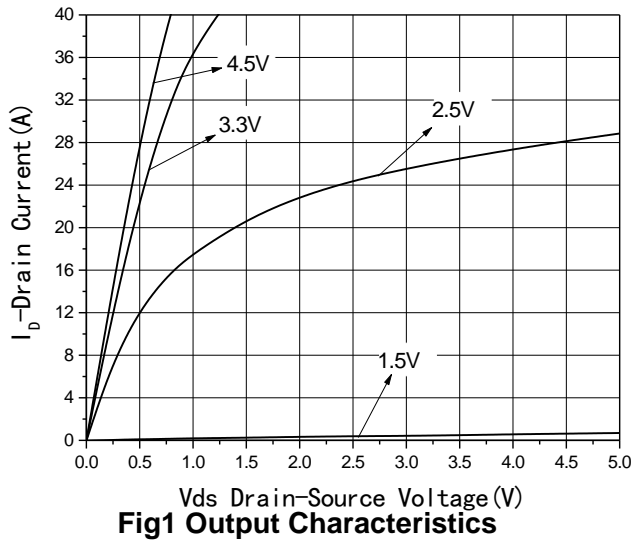
**Notes:**

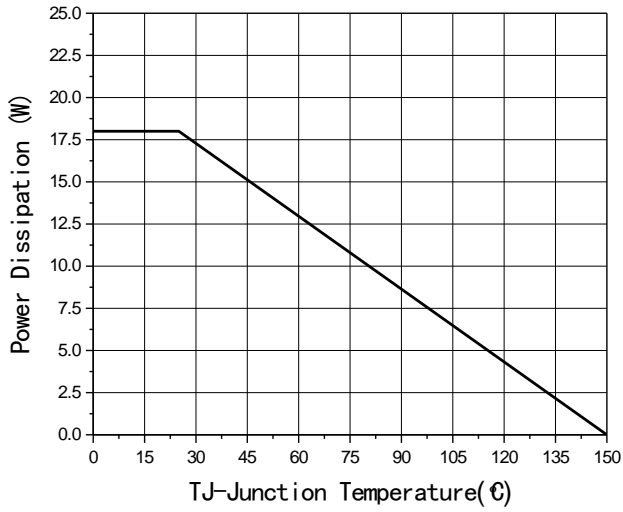
- surface mounted on FR4 board,  $t \leq 10sec$
- pulse test: pulse width  $\leq 300\mu s$ , duty  $\leq 2\%$
- guaranteed by design, not subject to production testing

**Thermal Characteristics**

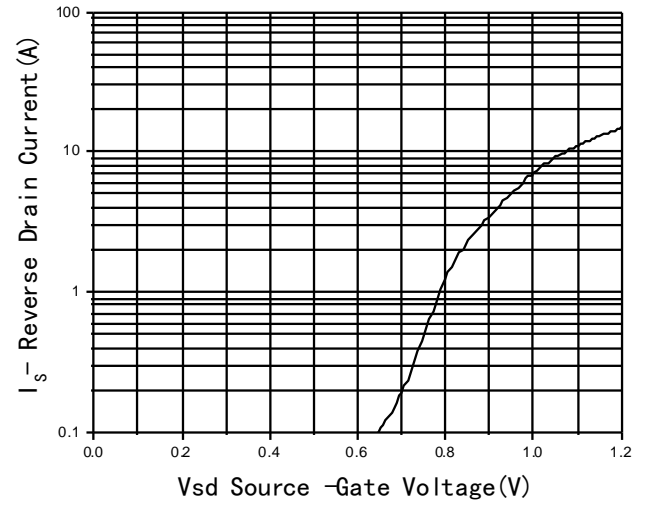
Thermal Resistance junction-to ambient	Rth JA	80	$^{\circ}C/W$
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## Typical Performance Characteristics





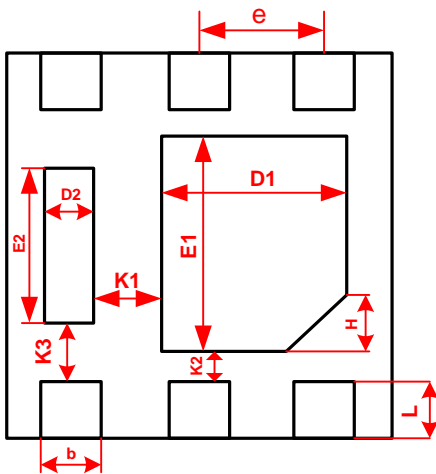
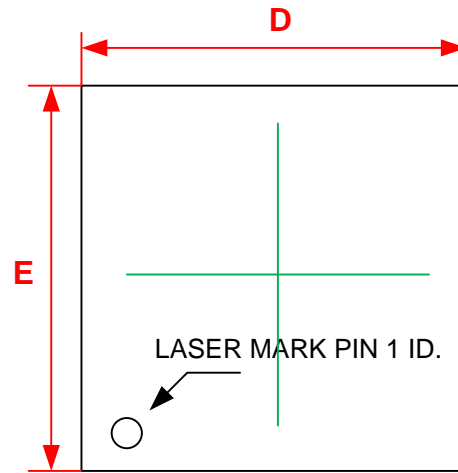
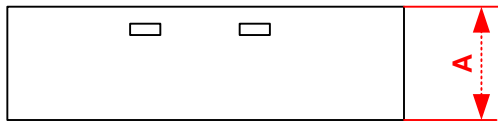
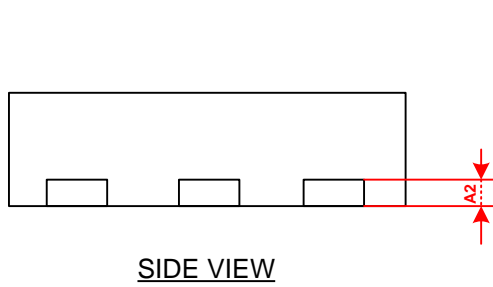
**Fig7 Power De-rating**



**Fig8 Source-Drain Diode Forward**

## Package Information

- DFN2\*2-6L-B



Common Dimension (mm)			
PKG	DFN2020-6L-B		
SYMBOL	MIN.	MON.	MAX.
A	0.527	0.552	0.577
A2		0.127REF	
b	0.25	0.30	0.35
D	1.90	2.00	2.10
E	1.90	2.00	2.10
D1	0.85	0.95	1.05
E1	1.05	1.15	1.25
D2	0.20	0.25	0.30
E2	0.69	0.79	0.89
e	0.55	0.65	0.75
H	0.25	0.30	0.35
K1	0.25MIN		
K2	0.15MIN		
K3	0.20MIN		
L	0.20	0.25	0.30