

Description

The ENP60N03 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge.

General Description

- ◆ $V_{DS} = 30V$, $I_D = 60A$ $R_{DS(ON)}(Typ.) = 4\ m\Omega$ @ $V_{GS} = 10V$ $R_{DS(ON)}(Typ.) = 6.3\ m\Omega$ @ $V_{GS} = 4.5V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

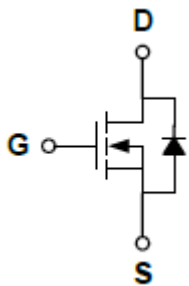
Applications

- ◆ High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- ◆ Networking DC-DC Power System
- ◆ Load switch

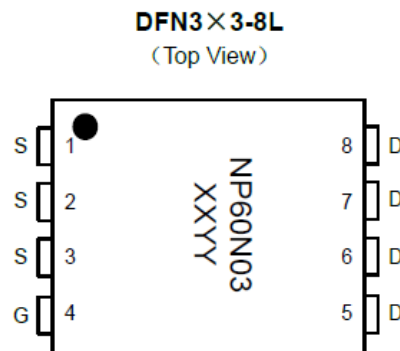
Package

- ◆ DFN3x3-8L

Schematic diagram



Marking and pin assignment



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
ENP60N03FGR	-55°C to +150°C	DFN3×3-8L	5000

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}	±20	V
Continuous Drain Current	I_D	TC=25°C	60
		TC=100°C	45
Pulsed Drain Current	I_{DP}	180	A
Avalanche Current	I_{AS}	48	A
Avalanche energy(L=0.5mH)	EAS	120	mJ
Maximum power dissipation	P_D	TC=25°C	28
Power Dissipation – Derate above 25°C		TC=25°C	1.67
Operating junction Temperature range	T_J	-55—150	°C

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30	-	-	V
BVDSS Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =1mA	-	27	-	mV/°C
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	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	1.0	1.6	2.5	V
Drain-source on-state resistance ¹	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	4	4.5	mΩ
		V _{GS} =4.5V, I _D =20A	-	6.3	8	
On Status Drain Current	I _{D(ON)}	V _{DS} =10V, V _{GS} =10V	40	-	-	A
Diode Characteristics						
Diode Forward Voltage ¹	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.8	1.1	V
Diode Continuous Forward Current	I _S		-	-	60	A
Reverse Recovery Time	t _{rr}	I _F =30A, dI/dt=100A/μs	-	9.2	-	ns
Reverse Recovery Charge	Q _{rr}		-	2	-	nC
Dynamic Characteristics²						
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	1.7	-	Ω
Input capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =20V f=1.0MHz	-	2161	-	pF
Output capacitance	C _{OSS}		-	308	-	
Reverse transfer capacitance	C _{RSS}		-	261	-	
Turn-on delay time	t _{D(ON)}	V _{GS} =10V, V _{DS} =15V, R _L =20Ω, I _D =20A, R _G =3.3Ω	-	4.6	-	ns
Turn-on Rise time	t _r		-	12.2	-	
Turn-off delay time	t _{D(OFF)}		-	26.6	-	
Turn-off Fall time	t _f		-	8	-	
Total gate charge	Q _g	V _{GS} =4.5V, I _D =2A V _{DS} =15V	-	42.3	-	nC
Gate-source charge	Q _{gs}		-	6.7	-	
Gate-drain charge	Q _{gd}		-	8.6	-	
Drain-Source Diode Characteristics						
Diode forward voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.8	1.1	V

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

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

Thermal Characteristics

Parameter	Symbol	Typical	Unit
Thermal Resistance-Junction to Case	$R\theta_{jc}$	1.7	°C/W
Thermal Resistance junction-to ambient	$R\theta_{ja}$	62.5	

Typical Performance Characteristics

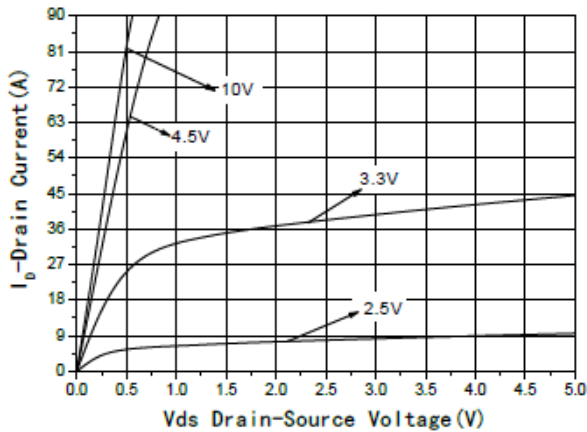


Fig1 Output Characteristics

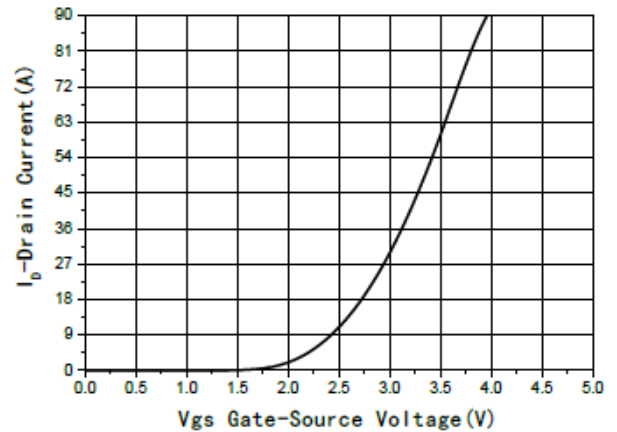


Fig2 Transfer Characteristics

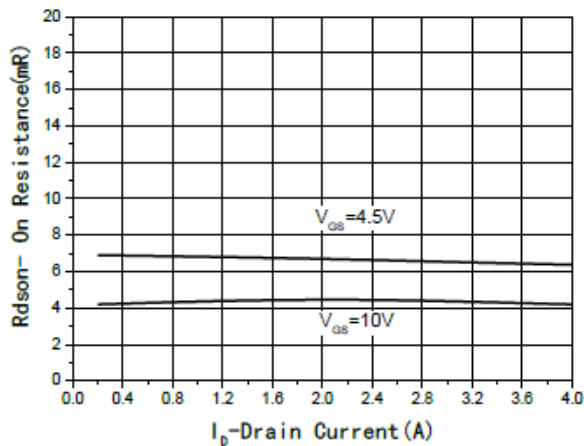


Fig3 Rds(on)-Drain current

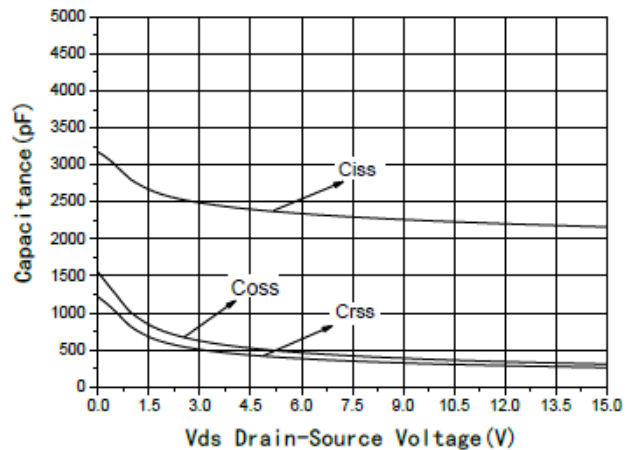


Fig4 Capacitance vs Vds

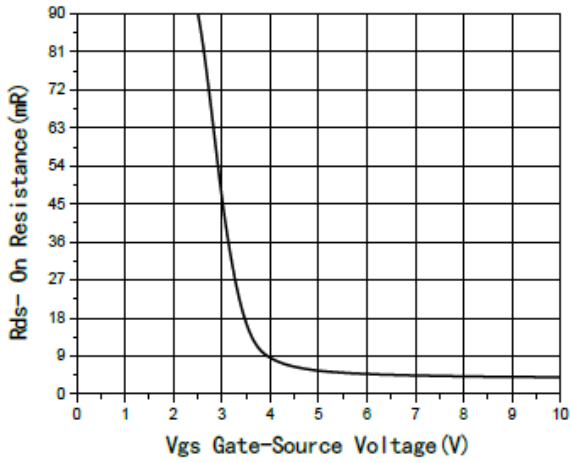


Fig5 Rdson-Gate Drain voltage

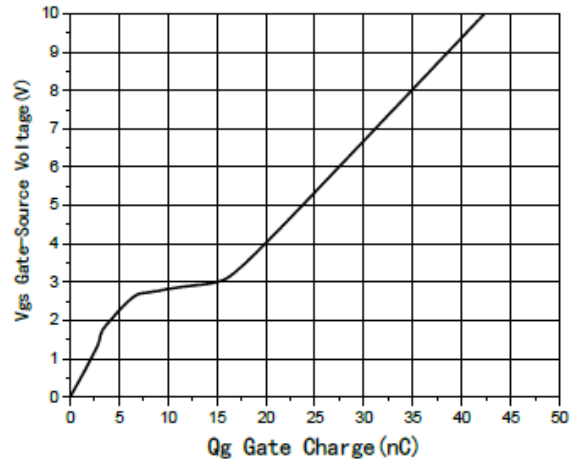


Fig6 Gate Charge

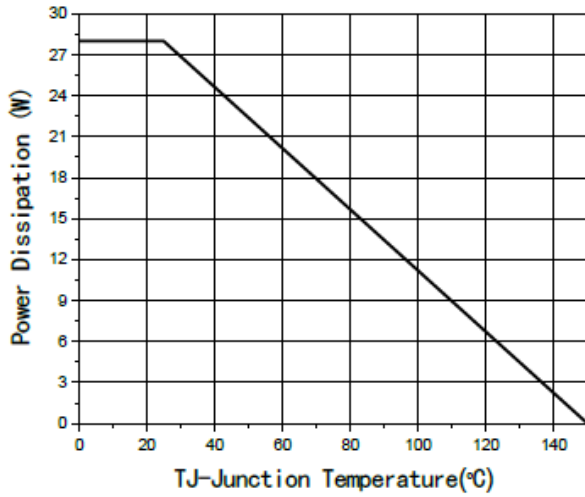


Fig7 Power De-rating

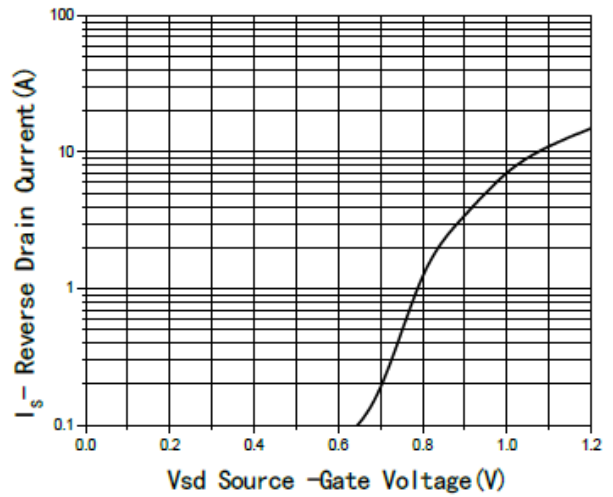
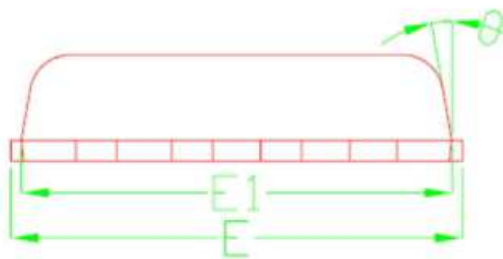
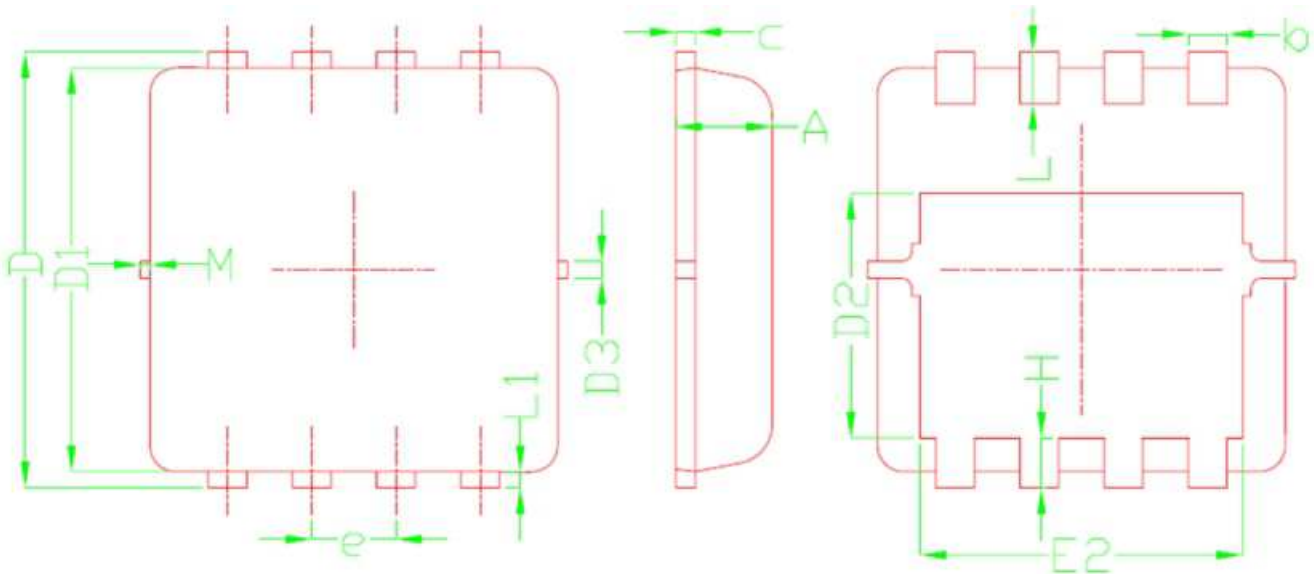


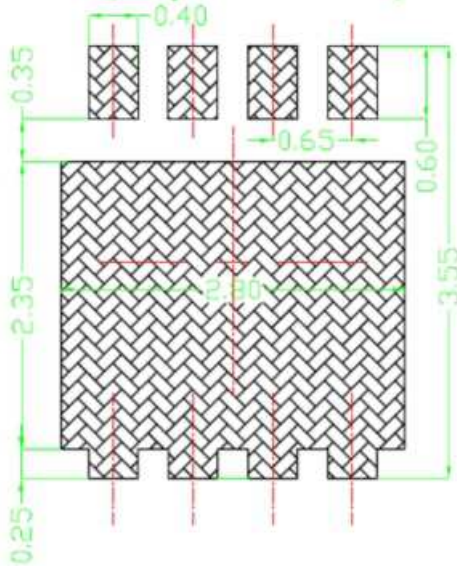
Fig8 Source-Drain Diode Forward

Package Information

DFN3x3-8L



Land Pattern
(Only for Reference)



SYMBOL	DIMENSIONAL REQOMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			