20V N-Channel Enhancement Mode MOSFET

Description

The CP80N02QR uses advanced trench technology and design to provide excellent $R_{DS(ON)}$.This device is ideal for high-frequency switching and synchronous rectification.

General Features

- V_{DS} =20V，ID =80A
  $R_{DS(ON)}$=3.6mΩ (typical)　@ VGS=4.5V
  $R_{DS(ON)}$=4.7 mΩ (typical)　@ VGS=2.5V
- Excellent gate charge x $R_{DS(ON)}$ product(FOM)
- Very low on-resistance $R_{DS(ON)}$
- 150 °C operating temperature
- Pb-free lead plating
- 100% UIS tested

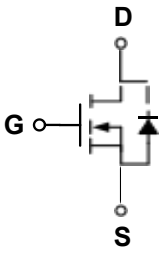
Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

- PDFN3X3-8L

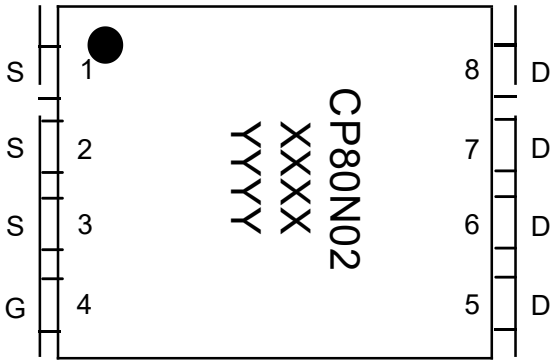
Schematic diagram



Marking and pin assignment

PDFN3×3-8L

（Top View）



XXXX—Wafer Information

YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP80N02QR-G	-55°C to +150°C	PDFN3X3-8L	5000

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

parameter	symbol	limit	unit
Drain-source voltage	V_{DS}	20	V
Gate-source voltage	V_{GS}	±12	V
Drain Current-Continuous (Silicon Limited)	I_D	80	A
Pulsed Drain Current (Package Limited)	I_{DM}	320	A
Single pulse avalanche energy	E_{AS}	125	mJ
Maximum power dissipation	P_D	60	W
Operating junction Temperature range	Tj	-55—150	℃

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	20	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.4	0.6	1.0	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=10A	-	3.6	4.5	mΩ
		V_{GS}=2.5V, I_D=10A	-	4.7	6.5	
Forward transconductance	gfs	V_{DS}=5V, I_D=5A	-	35	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=10V ,V_{GS}=0V f=1.0MHz	-	2344	-	pF
Output capacitance	C_{OSS}		-	425	-	
Reverse transfer capacitance	C_{RSS}		-	407	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DS}=10V I_D=2.8A V_{GEN}=4.5V R_L=10ohm R_{GEN}=60ohm	-	20	-	ns
Rise time	tr		-	31	-	
Turn-off delay time	$t_{D(OFF)}$		-	40	-	
Fall time	tf		-	21	-	
Total gate charge	Qg	V_{DS}=10V,I_D=3A V_{GS}=5V	-	36.3	-	nC
Gate-source charge	Qgs		-	3.6	-	
Gate-drain charge	Qgd		-	9.7	-	

Thermal Characteristics

Thermal Resistance junction-to ambient	Rth JA	62	℃/W

Typical Performance Characteristics

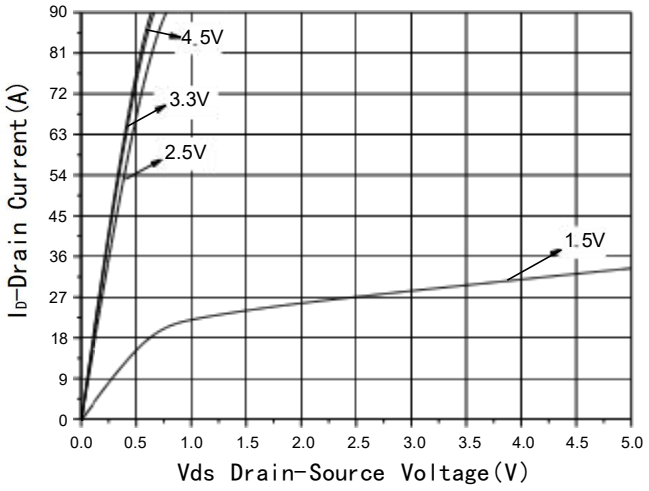


Fig1 Output Characteristics

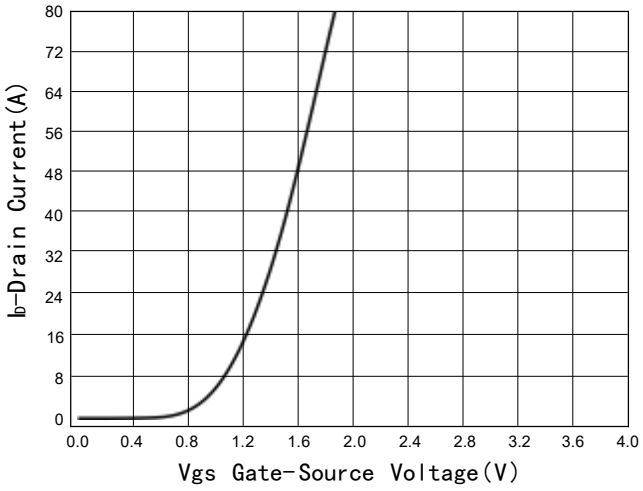


Fig2 Transfer Characteristics

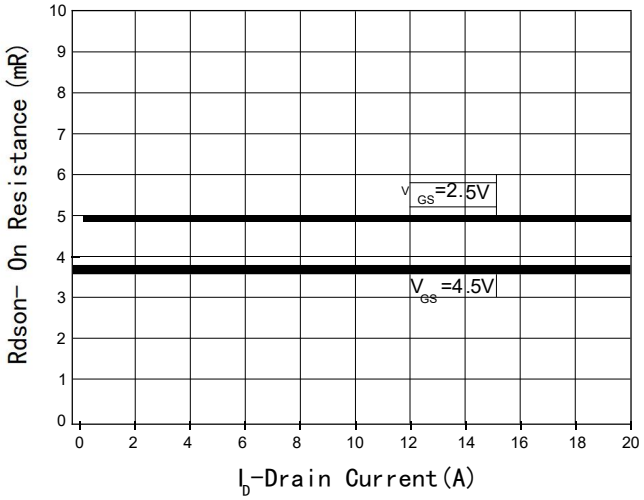


Fig3 Rdson-Drain current

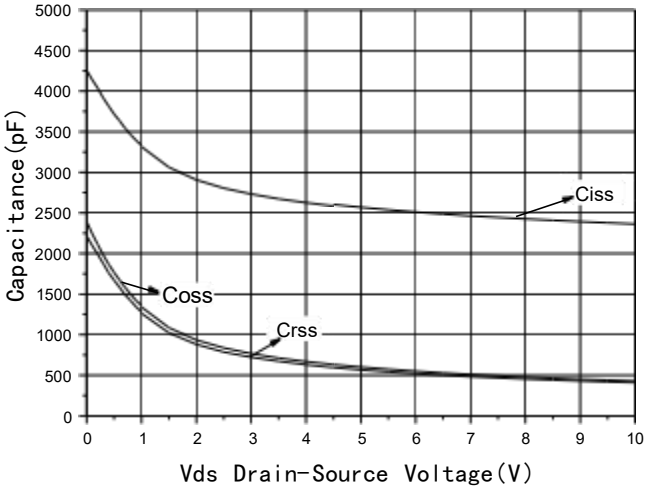


Fig4 Capacitance vs Vds

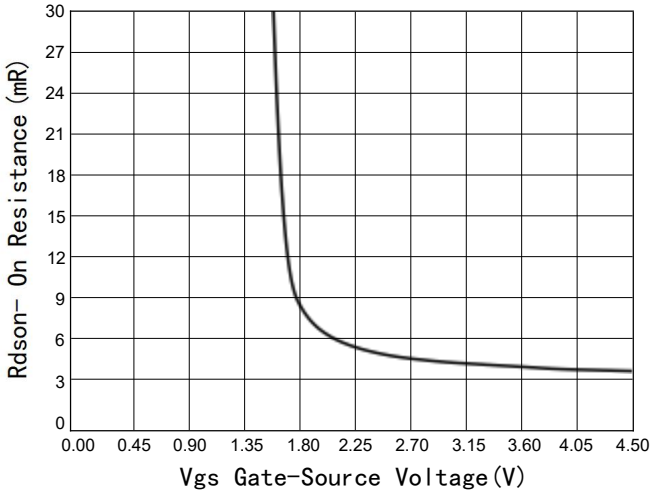


Fig5 Rdson-Gate Drain voltage

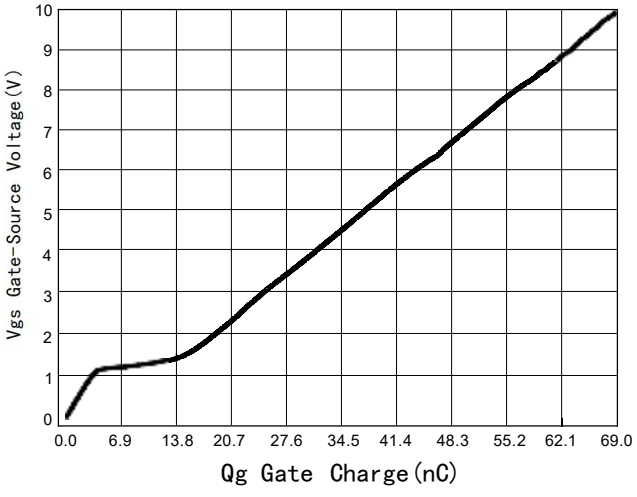


Fig6 Gate Charge

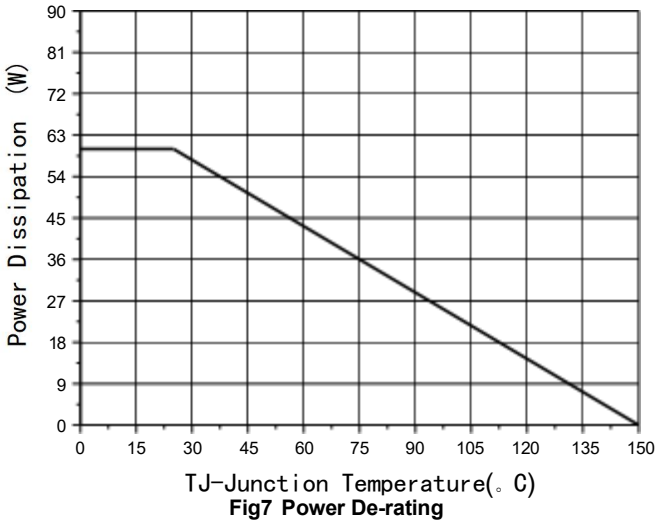


Fig7 Power De-rating

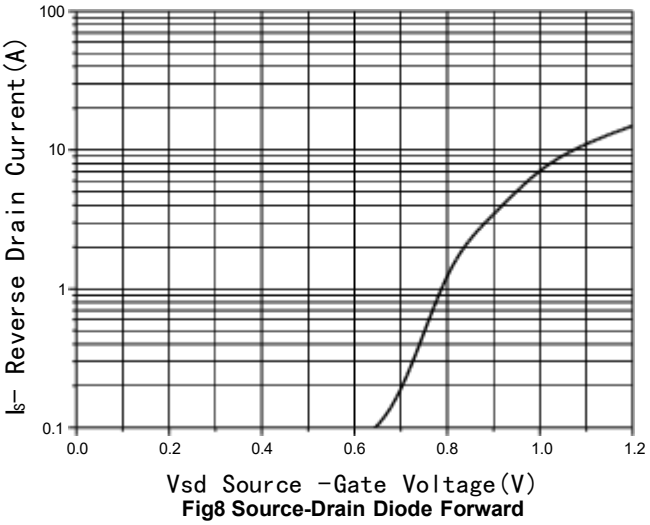
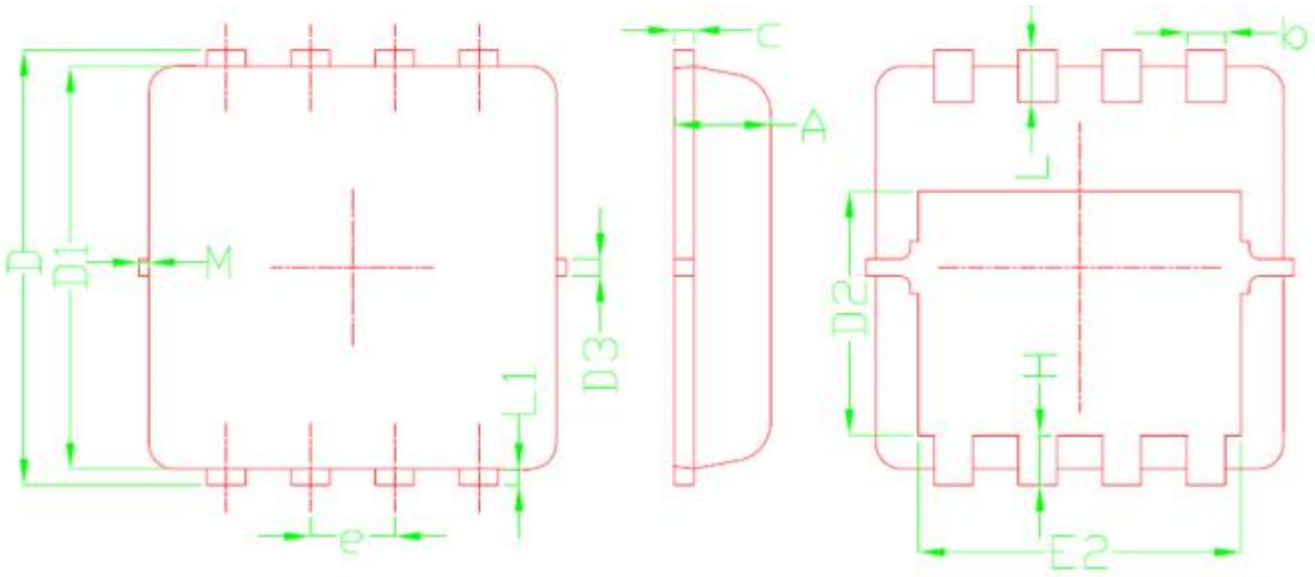


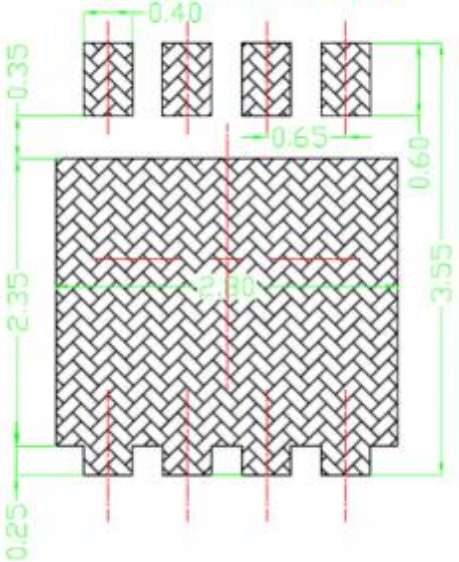
Fig8 Source-Drain Diode Forward

Package Information

PDFN3*3-8L



Land Pattern
(Only for Reference)



SYMBOL	DIMENSIONAL REQMTS		
	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			