CP20P04QR

40V P-Channel Enhancement Mode MOSFET

Description

The CP20P04QR uses advanced trench technology to provide excellent $R_{DS(ON)}$, This device is suitable for use as a load switch or in PWM applications.

General Features

- V_{DS} =-40V，I_D =-20A
  $R_{DS(ON)}$(Typ.)=21mΩ @V_{GS}=-10V
  $R_{DS(ON)}$(Typ.)=26mΩ @V_{GS}=-4.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package
- 150 °C operating temperature
- 100% UIS tested

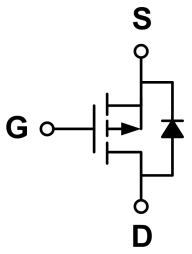
Application

- PWM applications
- Load switch
- Uninterruptible power supply

Package

- PDFN3*3-8L

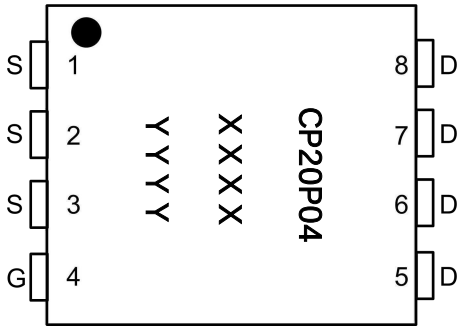
Schematic diagram



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
CP20P04QR-G	-55°C to +150°C	PDFN3*3-8L	5000

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	-40	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current	TC=25°C	I_D	-20	A
	TC=70°C		-16	
Pulsed Drain Current		I_{DM}	-80	A
Avalanche energy(T_j=25℃ ,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=50Ω)		E_{AS}	100	mJ
Power Dissipation	TC=25°C	P_D	30	W
	TC=70°C		20	
Operating junction Temperature range		Tj	-55—150	℃

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-40	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-40V, V_{GS}=0V	-	-	-1	μA
		T_J=85°C	-	-	-10	
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	-1.5	-2.5	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-20A	-	21	25	mΩ
		V_{GS}=-4.5V, I_D=-15A	-	26	32	
On Status Drain Current	$I_{D(ON)}$	V_{DS}=-20V, V_{GS}=-10V	-20	-	-	A
Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_{SD}=-20A,V_{GS}=0V	-	-0.7	-1.5	V
Diode Continuous Forward Current	I_S		-	-20	-	A
Reverse Recovery Time	t_{rr}	I_F=-20A, dI/dt=-100A/us	-	26	-	ns
Reverse Recovery Charge	Q_{rr}		-	19	-	nC
Dynamic Characteristics						
Gate Resistance	R_G	V_{GS}=0V, V_{DS}=0V,f=1MHz	-	5.3	-	Ω
Input capacitance	C_{ISS}	V_{GS}=0V ,V_{DS}=-10V f=1.0MHz	-	1908	-	pF
Output capacitance	C_{OSS}		-	124	-	
Reverse transfer capacitance	C_{RSS}		-	112	-	
Turn-on delay time	$t_{D(ON)}$	V_{GS}=-10V, V_{DS}=-10V, R_L=3Ω, I_D=-20A, R_G=2.5Ω	-	17	-	ns
Turn-on Rise time	tr		-	10.5	-	
Turn-off delay time	$t_{D(OFF)}$		-	27	-	
Turn-off Fall time	tf		-	14	-	
Total gate charge	Q_g	V_{GS}=-10V,I_D=-20A V_{DS}=-20V	-	37.8	-	nC
Gate-source charge	Q_{gs}		-	8.7	-	
Gate-drain charge	Q_{gd}		-	4	-	

Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient	≤ 10s	$R_{\theta JA}$	67	85	℃/W
Maximum Junction-to-Ambient	Steady-State		90	100	
Maximum Junction-to-Case	Steady-State	$R_{\theta JC}$	4.2	6	

Typical Performance Characteristics

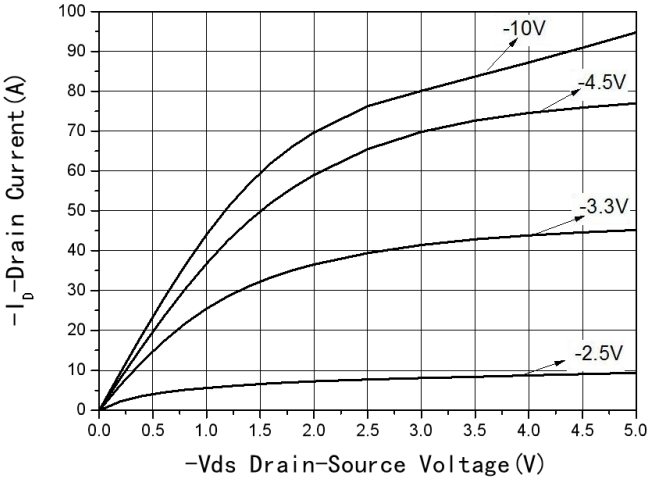


Fig1 Output Characteristics

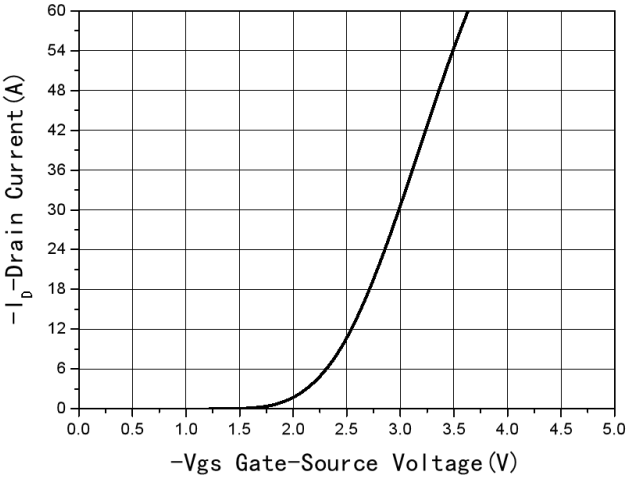


Fig2 Transfer Characteristics

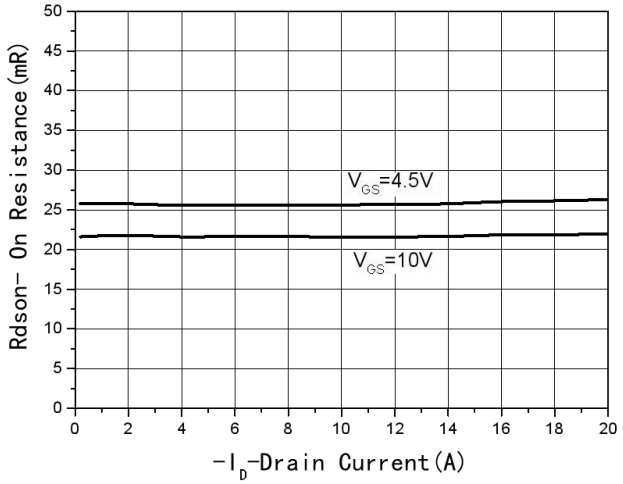


Fig3 Rdson-Drain current

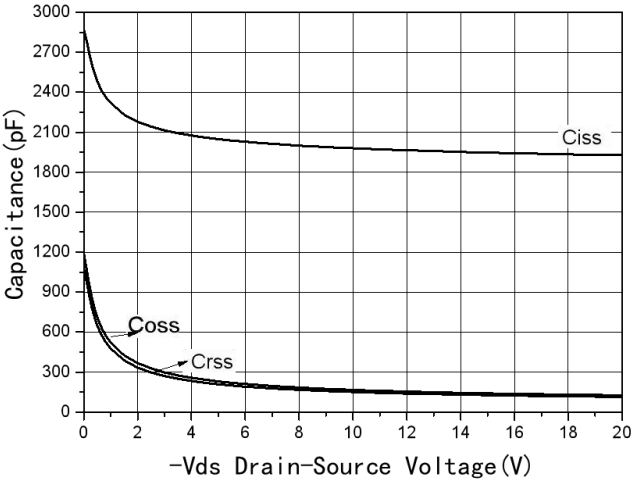


Fig4 Capacitance vs Vds

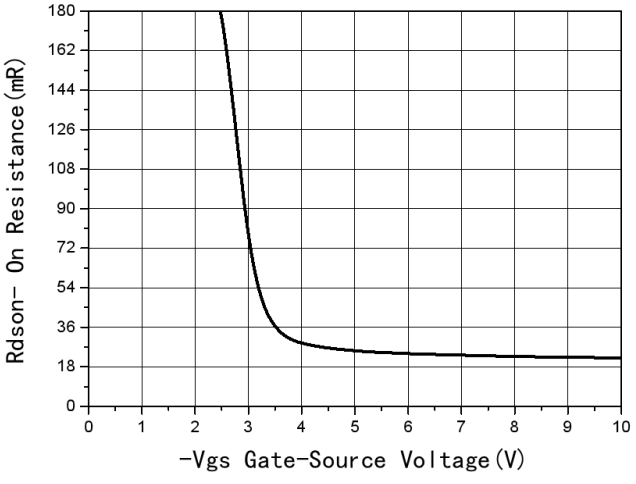


Fig5 Rdson-Gate Drain voltage

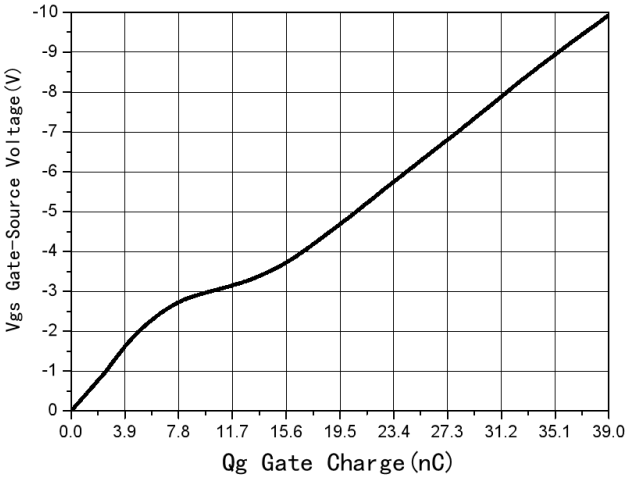


Fig6 Gate Charge

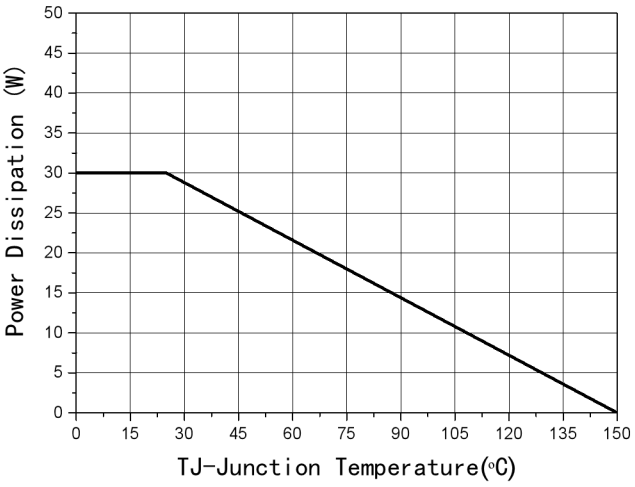


Fig7 Power De-rating

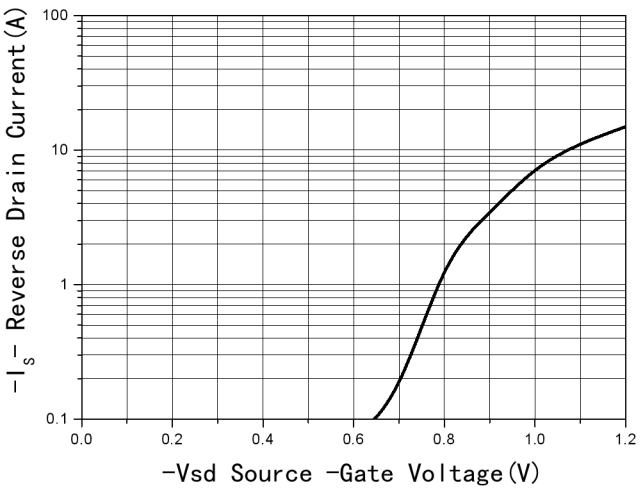
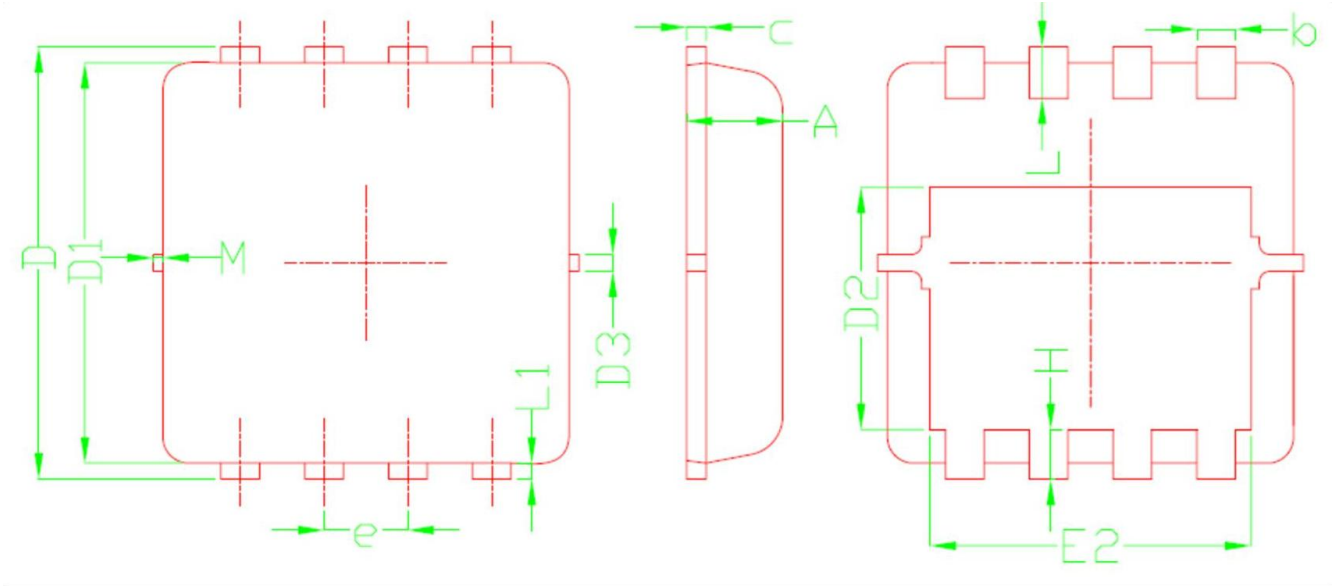
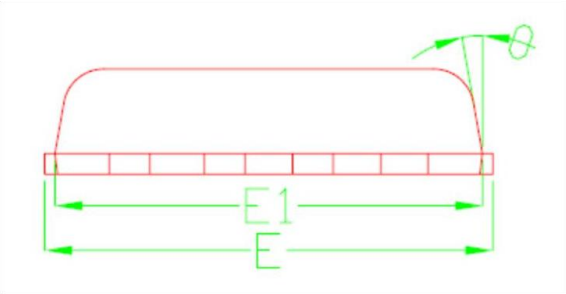


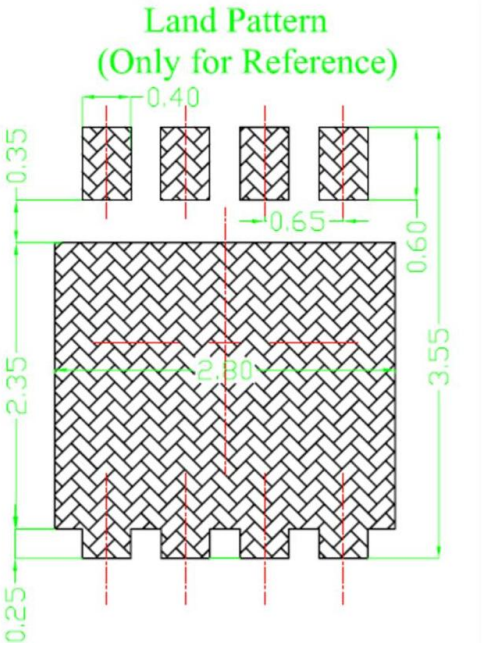
Fig8 Source-Drain Diode Forward

Package Information

- **PDFN3*3-8L**







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			