CP45P03QR

30V P-Channel Enhancement Mode MOSFET

Description

The CP45P03QR 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} =-30V，I_D =-45A
  $R_{DS(ON)}$(Typ.)= 8.7mΩ @V_{GS}=-10V
  $R_{DS(ON)}$(Typ.)=10.8mΩ @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

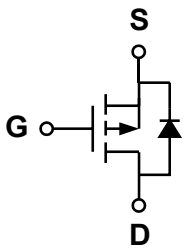
Application

- PWM applications
- Load switch
- Uninterruptible power supply

Package

- PDFN3*3-8L

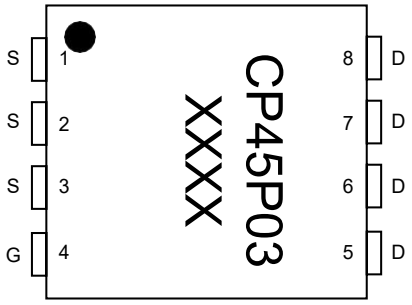
Schematic diagram



Marking and pin assignment

PDFN3×3-8L

（Top View）



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP45P03QR-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}	-30	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current	TC=25°C	I_D	-45	A
	TC=70°C		-30	
Pulsed Drain Current		I_{DP}	-120	A
Avalanche energy(T_j=25℃ ,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω)		E_{AS}	45	mJ
Power Dissipation	TC=25°C	P_D	29	W
	TC=70°C		12	
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	-30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V	-	-	-1	μA
		T_J=55°C	-	-	-5	
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	-1.4	-2.5	V
Drain-source on-state resistance[1]	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-20A	-	8.7	13	mΩ
		V_{GS}=-4.5V, I_D=-20A	-	10.8	16	
On Status Drain Current	$I_{D(ON)}$	V_{DS}=-5V, V_{GS}=-10V	-45	-	-	A
Diode Characteristics						
Diode Forward Voltage[1]	V_{SD}	I_{SD}=-20A,V_{GS}=0V	-	-0.72	-1.3	V
Diode Continuous Forward Current	I_S		-	-45	-	A
Reverse Recovery Time	t_{rr}	I_F=-20A, dI/dt=-100A/us	-	24	-	ns
Reverse Recovery Charge	Q_{rr}		-	16	-	nC
Dynamic Characteristics[2]						
Gate Resistance	R_G	V_{GS}=0V, V_{DS}=0V,f=1MHz	-	4.0	-	Ω
Input capacitance	C_{ISS}	V_{GS}=0V ,V_{DS}=-15V f=1.0MHz	-	3473	-	pF
Output capacitance	C_{OSS}		-	341	-	
Reverse transfer capacitance	C_{RSS}		-	313	-	
Turn-on delay time	$t_{D(ON)}$	V_{GS}=-10V, V_{DS}=-15V, R_L=1.6Ω, I_D=20A, R_G=3Ω	-	11	-	ns
Turn-on Rise time	tr		-	9.4	-	
Turn-off delay time	$t_{D(OFF)}$		-	24	-	
Turn-off Fall time	tf		-	12	-	
Total gate charge	Q_g	V_{GS}=-10V,I_D=-10A V_{DS}=-15V	-	69.1	-	nC
Gate-source charge	Q_{gs}		-	9.3	-	
Gate-drain charge	Q_{gd}		-	12.9	-	

Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient[A]	≤ 10s	$R_{\theta JA}$	29	34	℃/W
Maximum Junction-to-Ambient[A]	Steady-State		56	66	
Maximum Junction-to-Lead[B]	Steady-State	$R_{\theta JC}$	3.5	4.2	

A:The value of R qJA is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T A=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

B: The R qJA is the sum of the thermal impedence from junction to lead R qJL and lead to ambient.

Typical Performance Characteristics

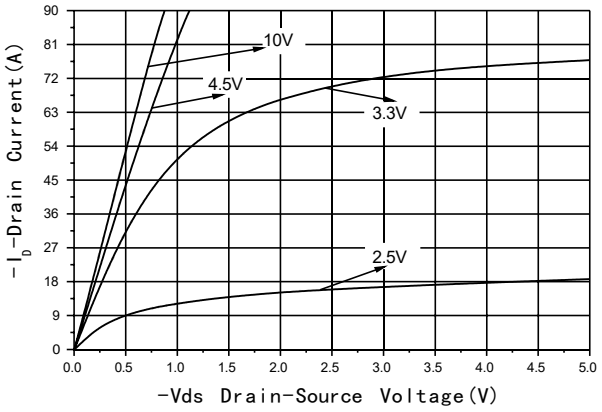


Fig1 Output Characteristics

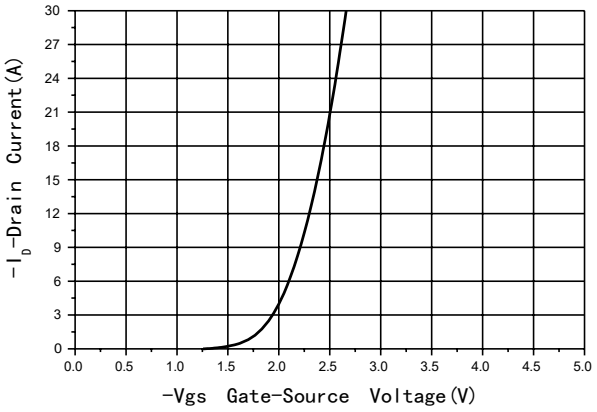


Fig2 Transfer Characteristics

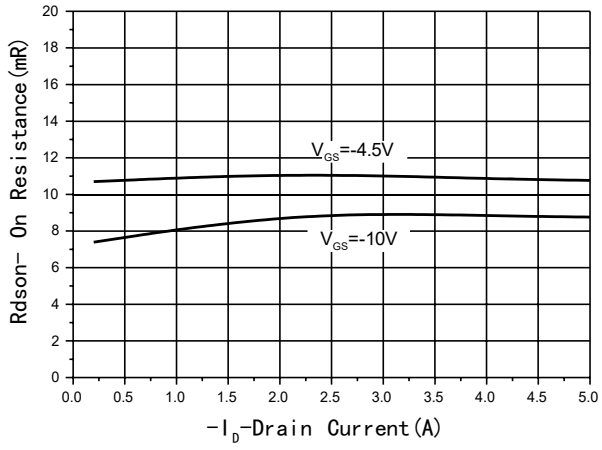


Fig3 Rdson-Drain current

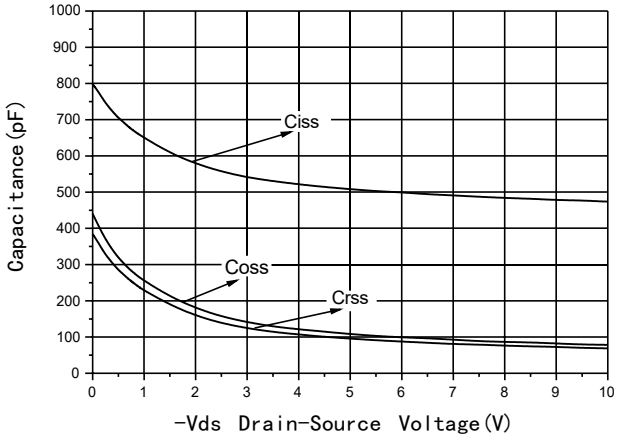


Fig4 Capacitance vs Vds

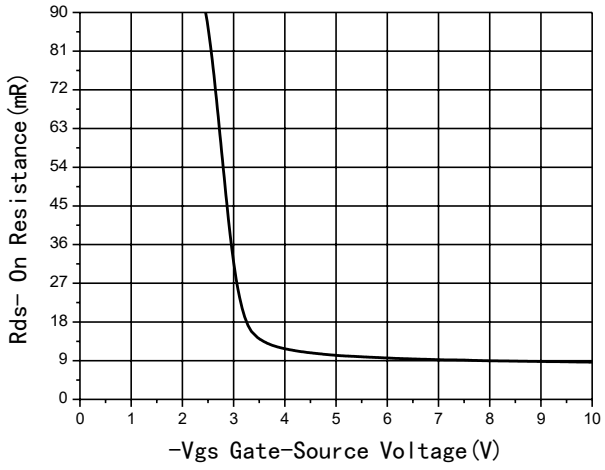


Fig5 Rdson-Gate Drain voltage

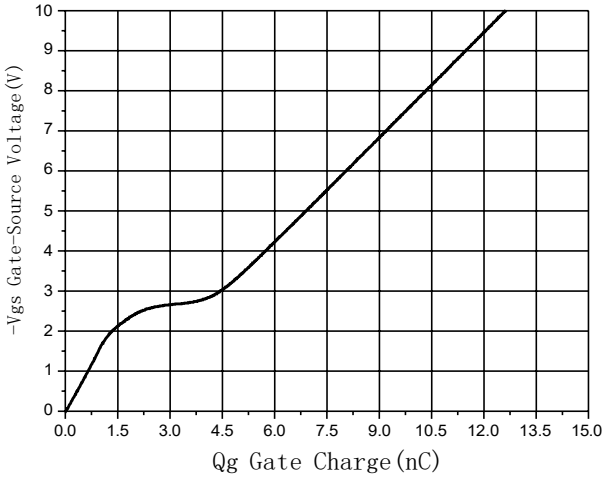


Fig6 Gate Charge

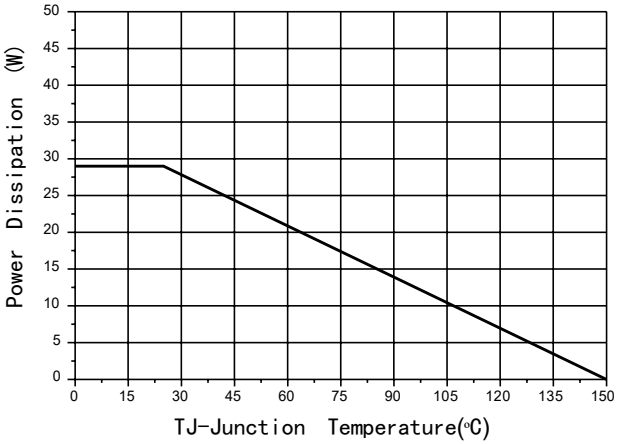


Fig7 Power De-rating

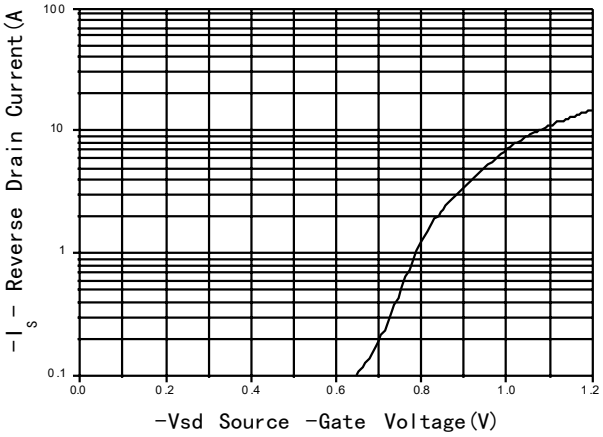
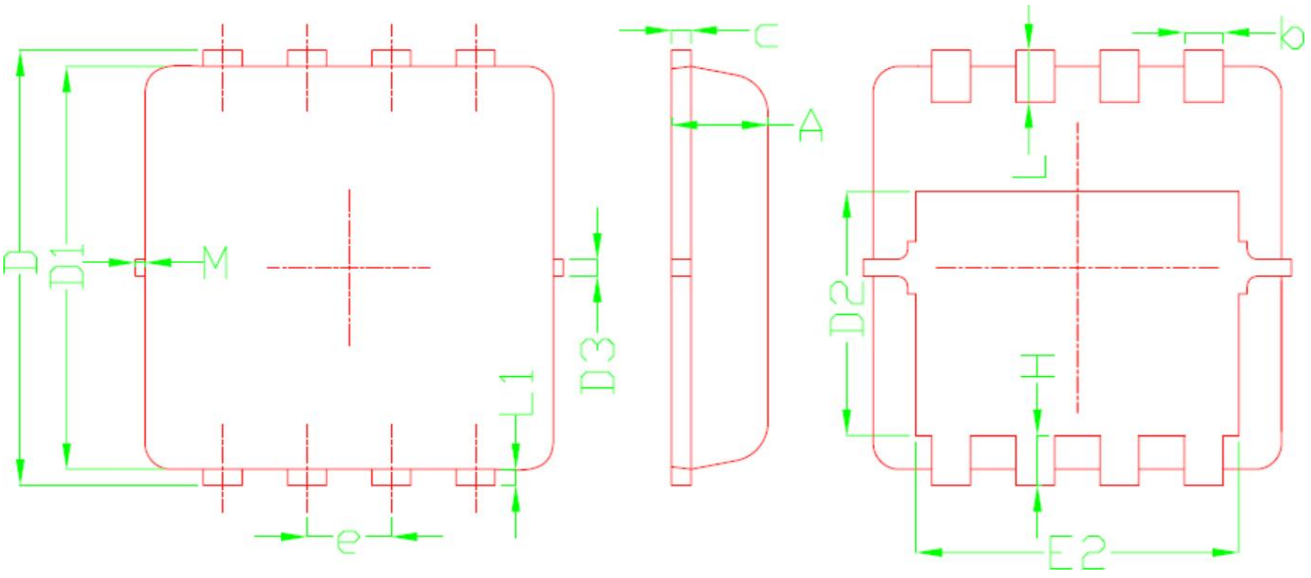
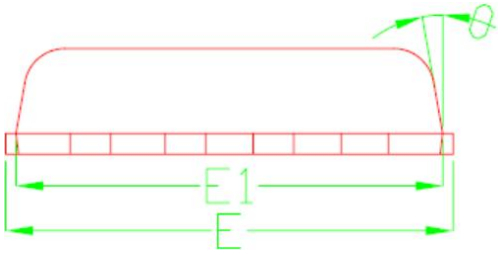


Fig8 Source-Drain Diode Forward

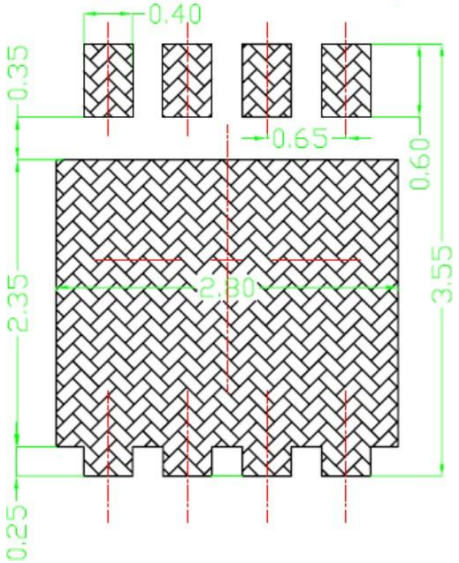
Package Information

- **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			