N-Channel Enhancement Mode MOSFET

Description

The CP100N04G uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS} =40V，I_D=100A
  $R_{DS(ON)}$(Typ.)=3.8mΩ @V_{GS}=10V
  $R_{DS(ON)}$(Typ.)=5.1mΩ @V_{GS}=4.5V
- High power and current handing capability
- Lead free product is acquired
- Surfacemountpackage

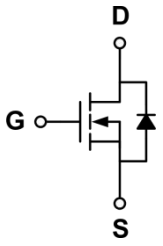
Application

- PWM applications
- Load switch

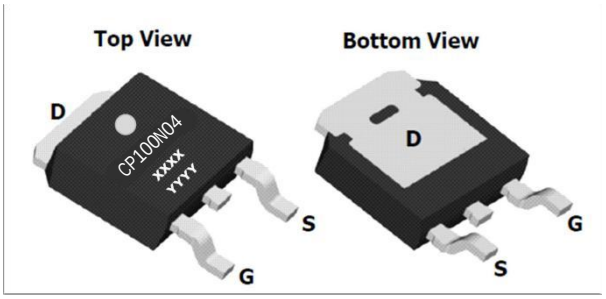
Package

- TO-252-2L

Schematic diagram



Marking and pin assignment



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP100N04G-G	-55°C to +150°C	TO-252-2L	2500

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	100	A
	TC=70°C		70	
Pulsed Drain Current		I_{DM}	400	A
Avalanche energy(V_{DD}=20V,V_G=10V,L=0.5mH,Rg=25Ω)		E_{AS}	299	mJ
power dissipation	TC=25°C	P_D	220	W
	TC=70°C		100	
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	T_J=25°C	-	-	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		1.1	1.6	2.1	V
Drain-source on-state resistance[1]	$R_{DS(ON)}$	V_{GS}=10V, I_D=3A			3.8	4.6	mΩ
		V_{GS}=4.5V, I_D=2A		-	5.1	6.2	
Diode Characteristics							
Diode Continuous Forward Current	I_S			-	-	100	A
Reverse Recovery Time	t_{rr}	IF=20A, V_{GS}=0V dI/dt=100A/us		-	44	-	ns
Reverse Recovery Charge	I_S			-	30	-	nC
Dynamic Characteristics[2]							
Intrinsic gate resistance	R_G	V_{GS}=0V, V_{DS}=0V,f=1MHz		-	1.6	-	Ω
Input capacitance	C_{ISS}	V_{DS}=20V ,V_{GS}=0V f=1.0MHz		-	3987	-	pF
Output capacitance	C_{OSS}			-	285	-	
Reverse transfer capacitance	C_{RSS}			-	226	-	
Turn-on delay time	$t_{D(ON)}$	V_{DS}=20V,V_{GS}=10V R_L=2.6Ω,R_{GEN}=3Ω		-	11	-	ns
Turn-on Rise time	tr			-	15	-	
Turn-off delay time	$t_{D(OFF)}$			-	42	-	
Turn-off Fall time	tf			-	16	-	
Total gate charge	Qg	V_{DS}=20V I_D=3A V_{GS}=10V		-	68	-	nC
Gate-source charge	Qgs			-	9	-	
Gate-drain charge	Qgd			-	11	-	
Drain-Source Diode Characteristics							
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=3A		-	0.72	1.4	V

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

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

Typical Performance Characteristics

Fig1 Output Characteristics

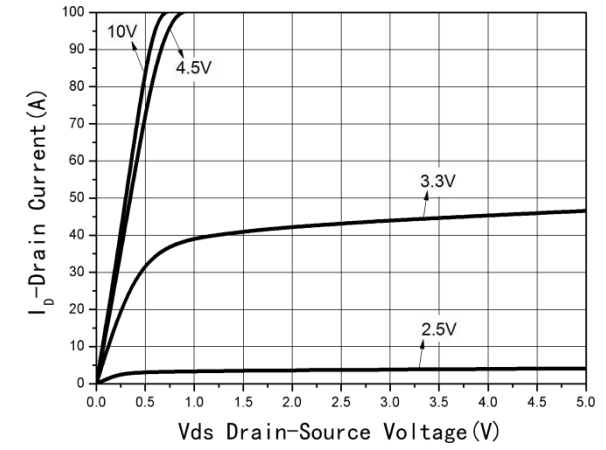


Fig2 Transfer Characteristics

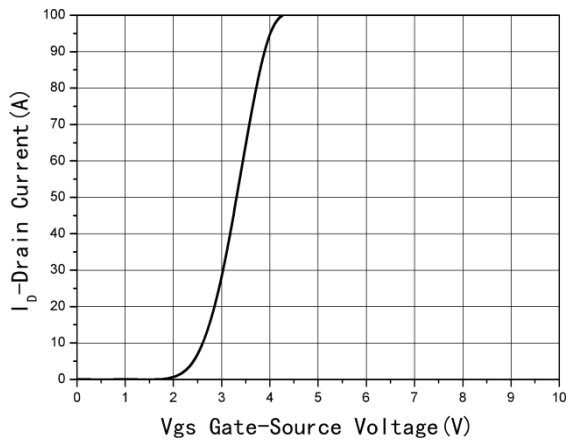


Fig3 Rdson-Drain current

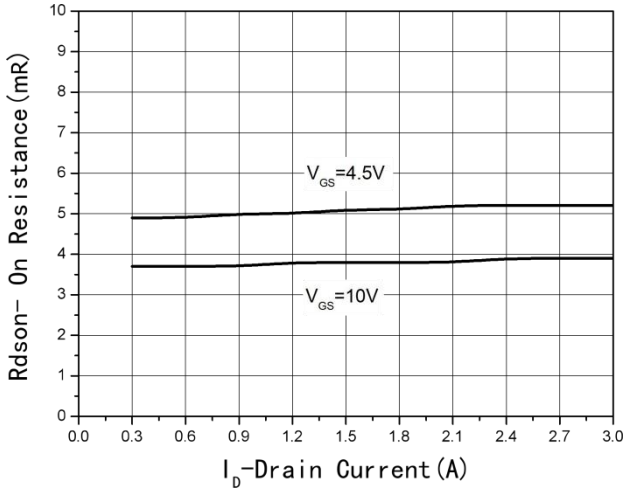


Fig4 Capacitance vs Vds

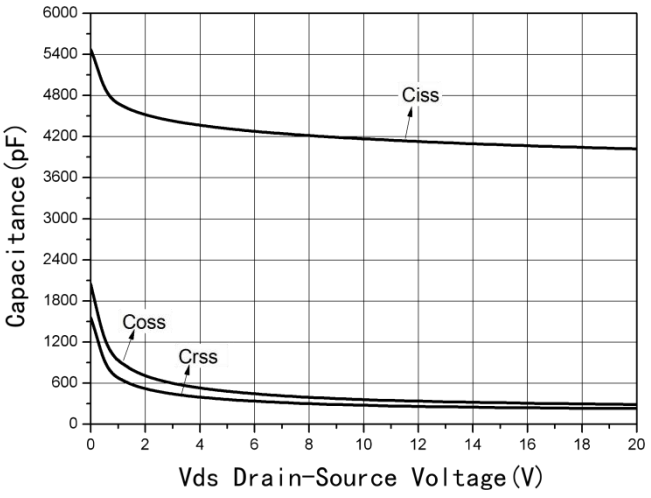


Fig5 Rdson-Gate Drain voltage

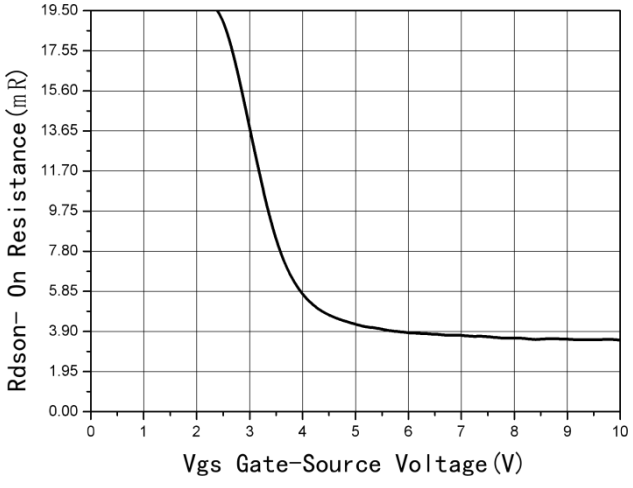


Fig6 Gate Charge

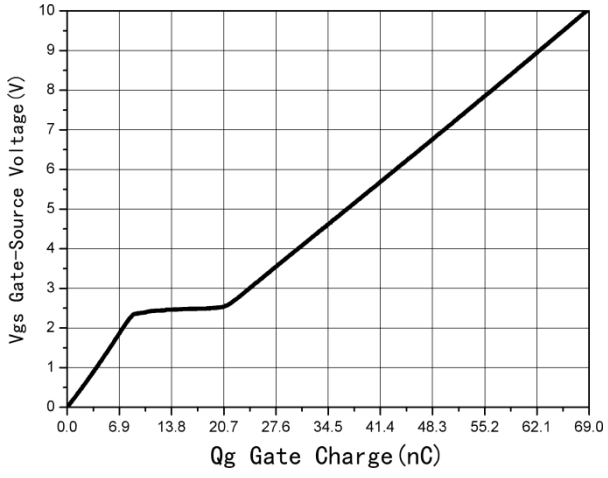


Fig7 Power De-rating

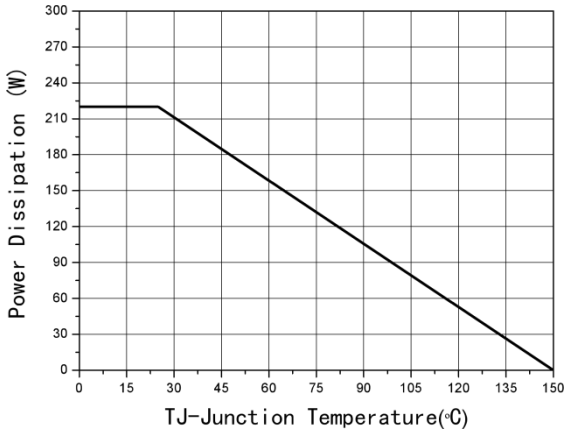
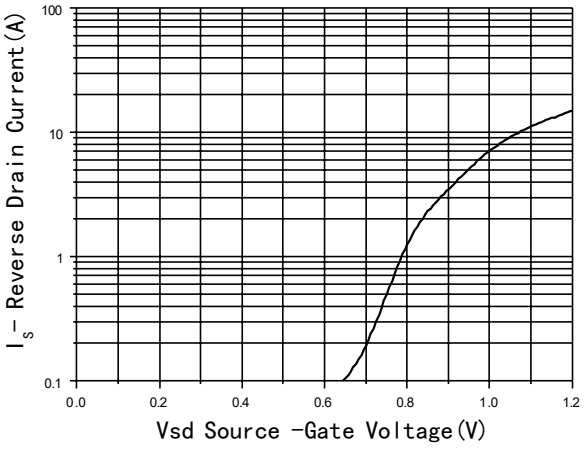
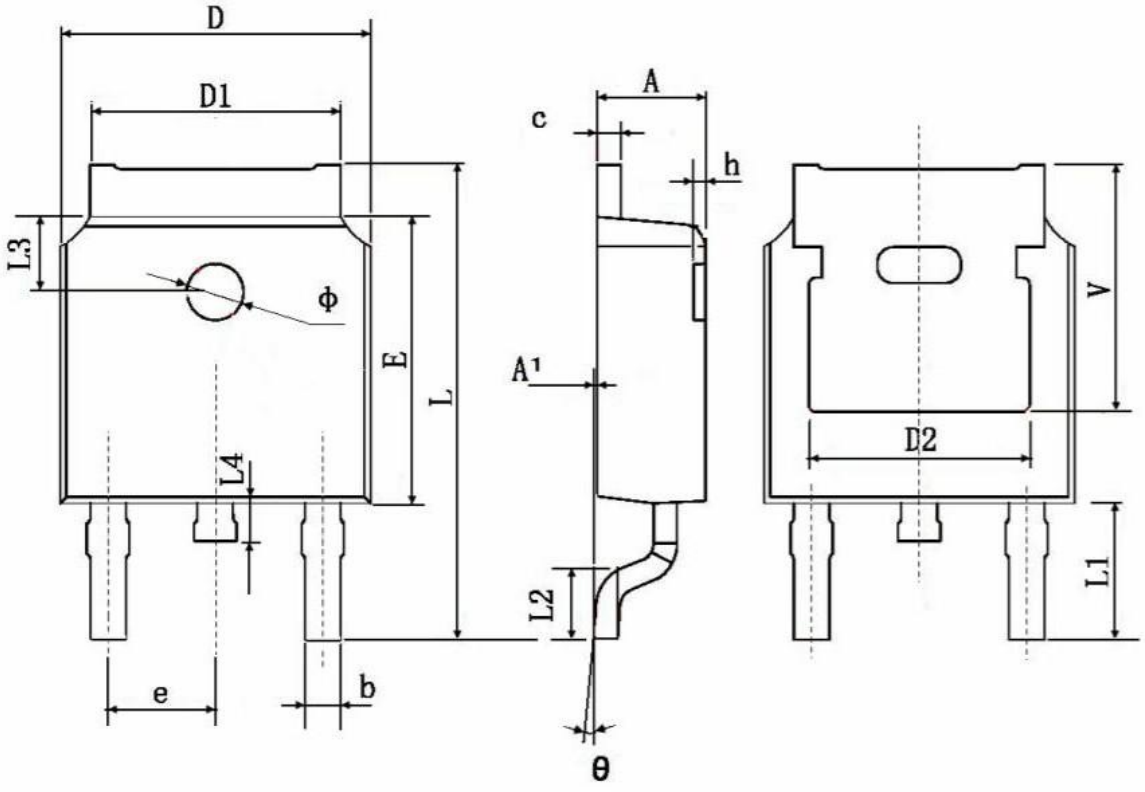


Fig8 Source-Drain Diode Forward



Package Information

- **TO-252-2L**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	