

30V N-Channel Enhancement Mode MOSFET

Description

The CP100N03G 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

- ◆ $V_{DS} = 30V$, $I_D = 100A$
 $R_{DS(ON)}(Typ.) = 3.5m\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)}(Typ.) = 5.2m\Omega$ @ $V_{GS} = 4.5V$
 High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

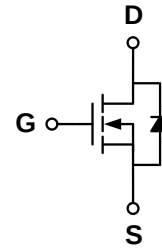
Application

- ◆ Load switch

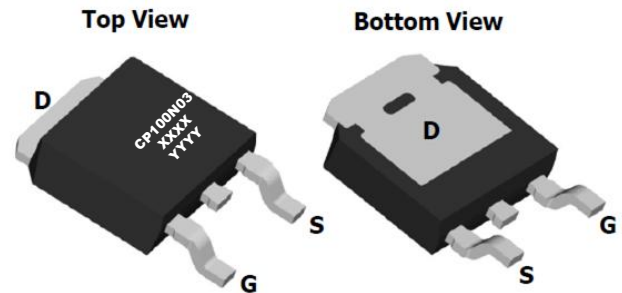
Package

- ◆ TO-252-2L

Schematic diagram



Marking and pin assignment



XXXX—Wafer Information
 YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP100N03G-G	-55°C to +150°C	TO-252-2L	2500

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	TC=25°C	I_D	100	A
	TC=100°C		80	
Pulsed Drain Current		I_{DP}	200	A
Avalanche Current		I_{AS}	40	A
Avalanche energy(L=0.5mH) ^(note1)		EAS	112	mJ
Maximum power dissipation	TC=25°C	P_D	85	W
	TC=100°C		44	

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
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	1.7	2.5	V
Drain-source on-state resistance ¹	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	3.5	4.5	mΩ
		V _{GS} =4.5V, I _D =20A	-	5.2	8	
On Status Drain Current	I _{D(ON)}	V _{DS} =10V, V _{GS} =10V	100	-	-	A
Diode Characteristics						
Diode Forward Voltage ¹	V _{SD}	I _{SD} =50A, V _{GS} =0V	-	0.8	1.1	V
Diode Continuous Forward Current	I _S		-	90	-	A
Reverse Recovery Time	t _{rr}	I _F =20A, dI/dt=100A/us	-	34	-	ns
Reverse Recovery Charge	Q _{rr}		-	30	-	nC
Dynamic Characteristics ²						
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =0V,f=1MHz	-	0.65	-	Ω
Input capacitance	C _{ISS}	V _{GS} =0V ,V _{DS} =15V f=1.0MHz	-	2122	-	pF
Output capacitance	C _{OSS}		-	303	-	
Reverse transfer capacitance	C _{RSS}		-	250	-	
Turn-on delay time	t _{D(ON)}	V _{GS} =10V, V _{DS} =15V, R _L =20Ω, I _D =1A, R _G =6Ω	-	12	-	ns
Turn-on Rise time	t _r		-	14.5	-	
Turn-off delay time	t _{D(OFF)}		-	40	-	
Turn-off Fall time	t _f		-	15	-	
Total gate charge	Q _g	V _{GS} =10V,I _D =20A V _{DS} =15V	-	40.5		nC
Gate-source charge	Q _{gs}			6.8		
Gate-drain charge	Q _{gd}		-	7.9	-	
Drain-Source Diode Characteristics						
Diode forward voltage	V _{SD}	I _{SD} =90A, V _{GS} =0V	-	0.8	1.2	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	Rθ _{jc}	1.7	°C/W
Thermal Resistance junction-to ambient	Rθ _{ja}	62.5	

Typical Performance Characteristics

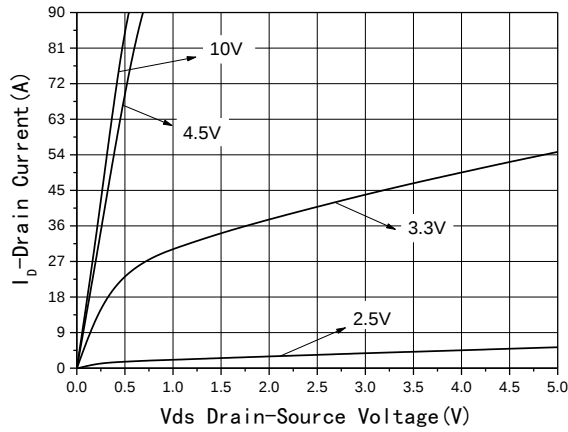


Fig1 Output Characteristics

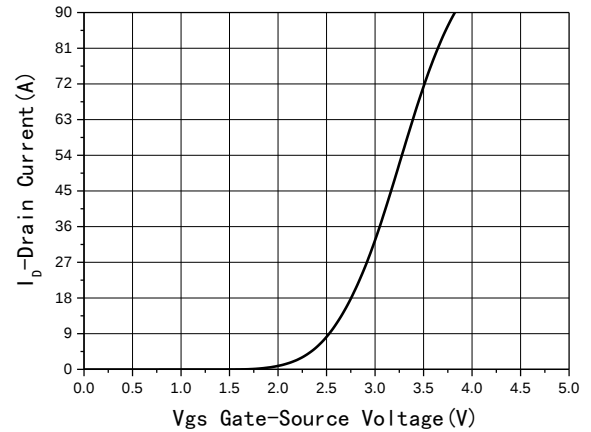


Fig2 Transfer Characteristics

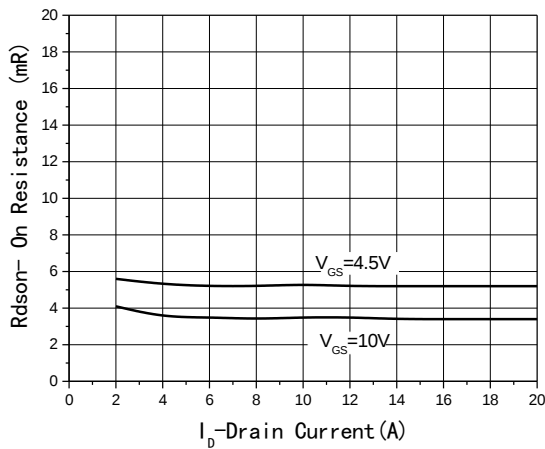


Fig3 Rdson-Drain current

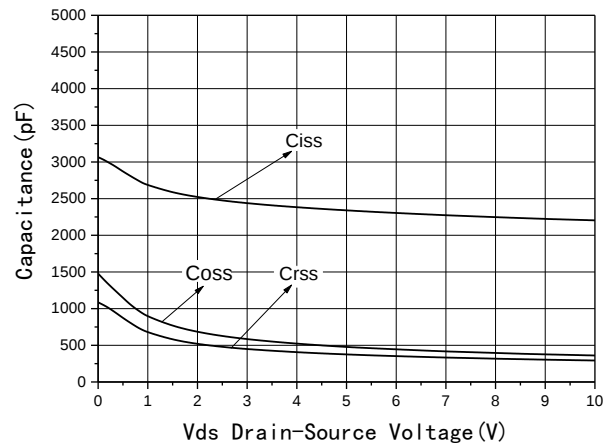


Fig4 Capacitance vs V_{DS}

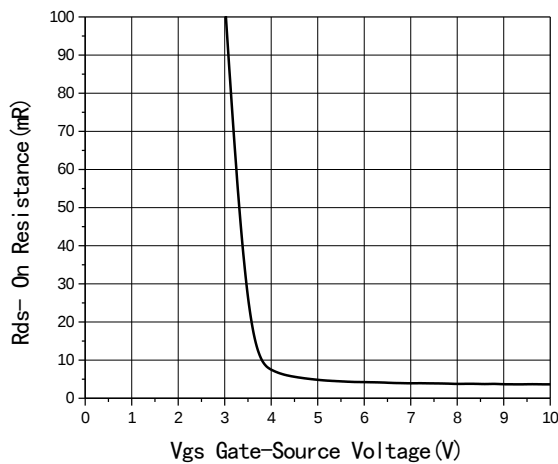


Fig5 Rdson-Gate Drain voltage

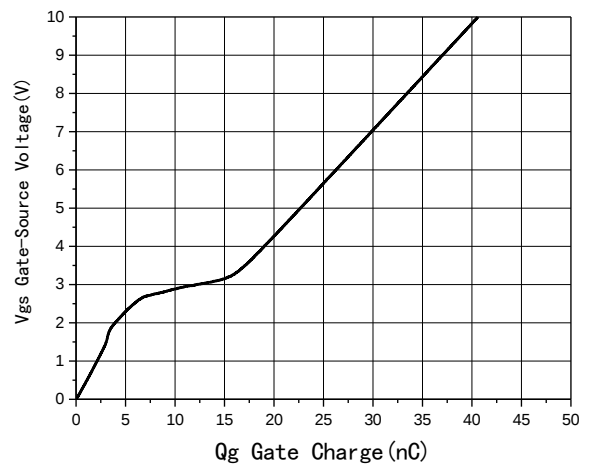
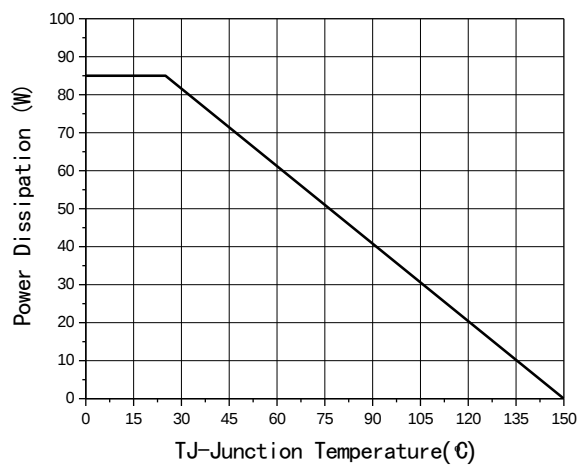
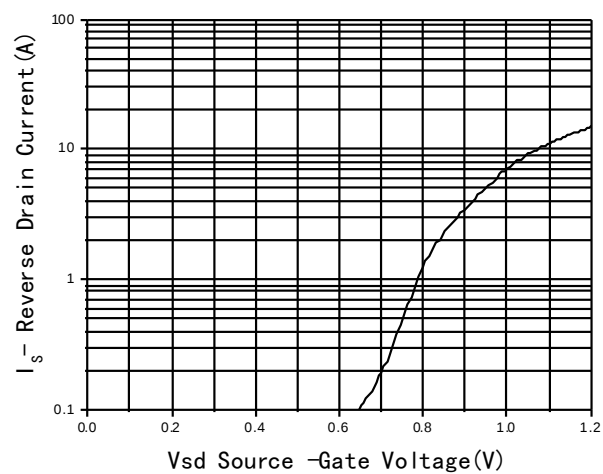
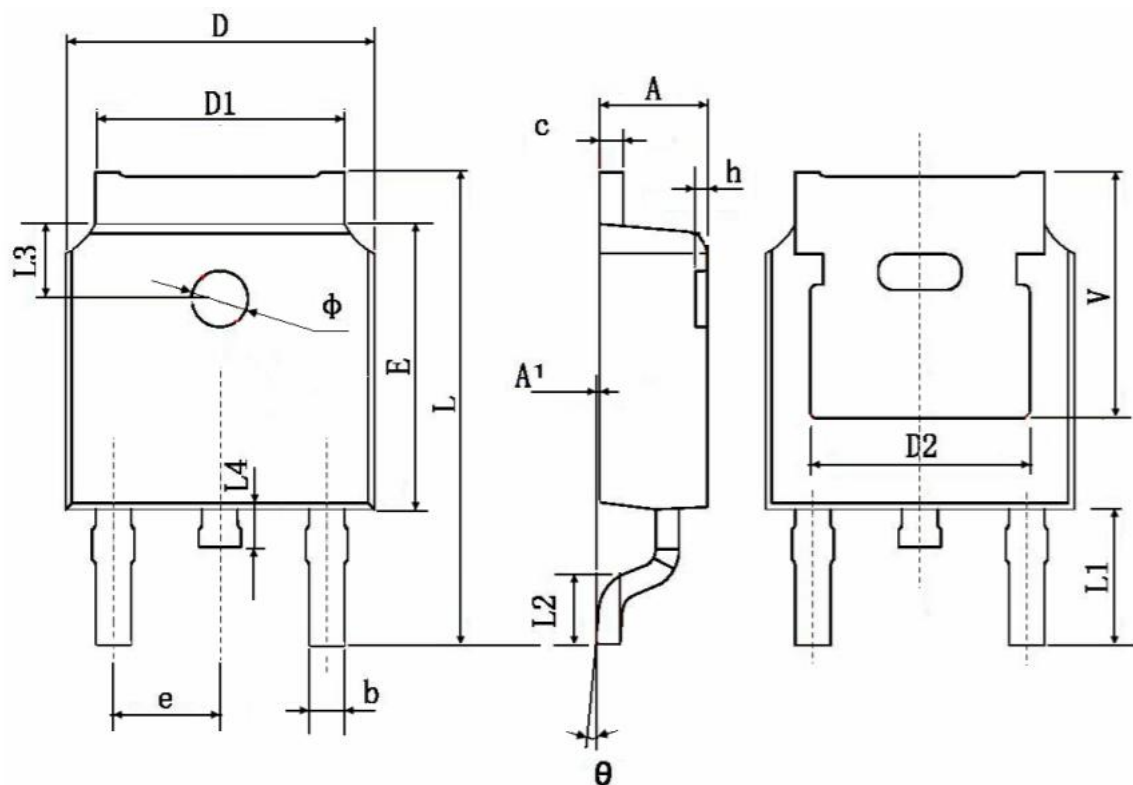


Fig6 Gate Charge


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.	