

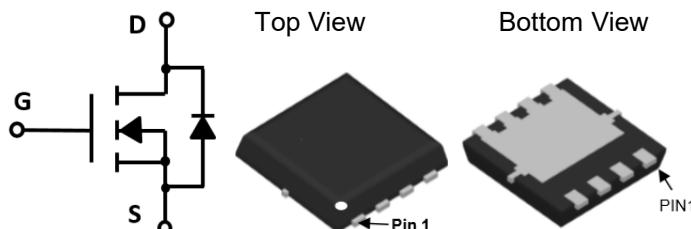
Description

The CMN3002GPF3 is the N-Channel enhancement mode power field effect transistors with high cell density, trench technology. This high density process and design have been optimized switching performance and especially tailored to minimize on-state resistance.

Features

- V_{DS}: 30V
- I_D: 107A
- R_{DS(on)} (@V_{GS}=10V) : < 2.9mΩ
- R_{DS(on)} (@V_{GS}=4.5V) : < 3.9mΩ
- High density cell design for extremely low R_{DS(on)}
- Excellent on-resistance and DC current capability

Equivalent Circuit and Pin Configuration



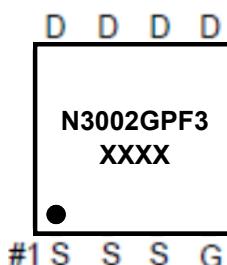
Absolute Maximum Ratings (TA=25 °C unless otherwise noted)

Parameter	Symbol	Maximum	Unit
Drain-source Voltage	V _{DS}	30	V
Gate-source Voltage	V _{GS}	±20	V
Drain Current ⁽¹⁾⁽⁶⁾	T _C =25°C	107	A
		63	A
	T _A =25°C	27	A
		16	A
Pulsed Drain Current ⁽³⁾	I _{DM}	214	A
Total Power Dissipation ⁽⁴⁾	T _C =25°C	50	W
		3.1	W
Thermal Resistance Junction-to-Ambient ⁽²⁾⁽⁵⁾	R _{θJA}	40	°C/W
Thermal Resistance Junction-to-Case	R _{θJC}	2.5	°C/W
Junction and Storage Temperature Range	T _{J,TSTG}	-55 to +150	°C

Applications

- Battery management
- Power management
- Load switch

Marking Information



Marking Code = N3002GPF3

Date Code = XXXX

Ordering Information

Part Number	Packaging	Reel Size
CMN3002GPF3	5000/Tape & Reel	13 inch

Electrical Characteristics (T_J=25 °C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BVDSS	V _{GS} =0V, I _D =250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V, T _C =25°C			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0		2.5	V
Static Drain-Source on-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		2.4	2.9	mΩ
		V _{GS} =4.5V, I _D =20A		3.4	3.9	
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.8	1.2	V
Maximum Body-Diode Continuous Current	I _S				107	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz		2480		pF
Output Capacitance	C _{oss}			996		
Reverse Transfer Capacitance	C _{rss}			116		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =15V, I _D =30A		21.5		nC
Gate Source Charge	Q _{gs}			6.45		
Gate Drain Charge	Q _{gd}			10.3		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =15V, I _D =30A, R _{GEN} =3.3Ω		26		ns
Turn-on Rise Time	t _r			12.8		
Turn-off Delay Time	t _{D(off)}			74.8		
Turn-off Fall Time	t _f			24.4		

Noted: (1) Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

- (2) The value of R_{θJA} is measured with the device mounted on lin2 FR-4 board with 2oz.Copper,in a still air environment with T_A =25°C.The Power dissipation PDSM is based on R_{θJA} t≤10s and the maximum allowed junction temperature of 150°C.The value in any given application depends on the user's specific board design.
- (3) Single pulse width limited by junction temperature T_{J(MAX)} = 150°C.
- (4) The power dissipation PD is based on T_{J(MAX)} = 150°C,using junction-to-case thermal resistance, and is more useful in setting the upper Dissipation limit for cases where additional heatsinking is used.
- (5) The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJA} and case to ambient.
- (6) The maximum current rating is package limited.

Typical Performance Characteristics

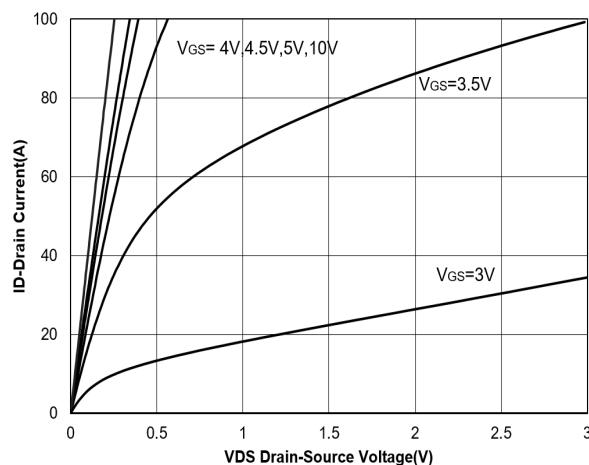


Figure 1. Output Characteristics

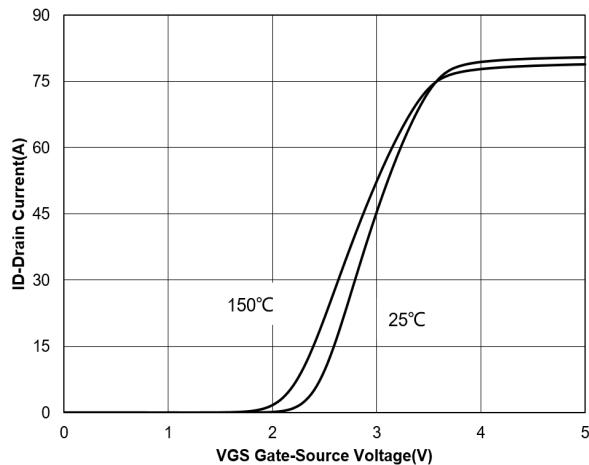


Figure 2. Transfer Characteristics

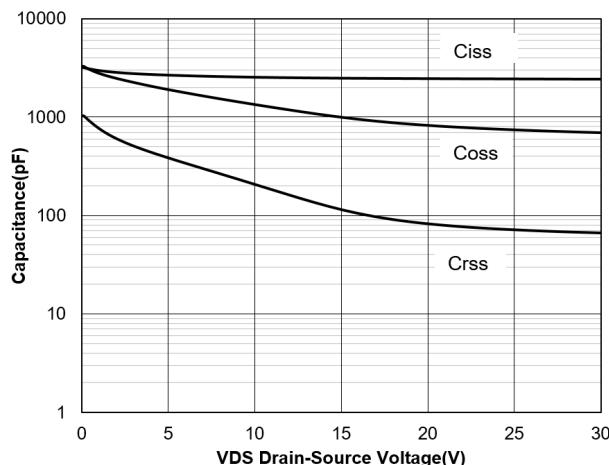


Figure 3. Capacitance Characteristics

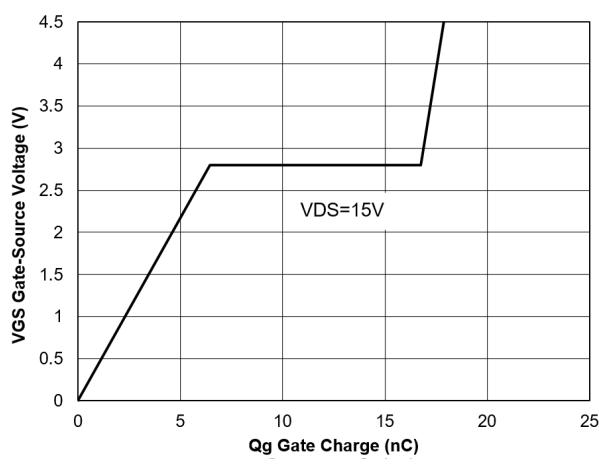


Figure 4. Gate Charge

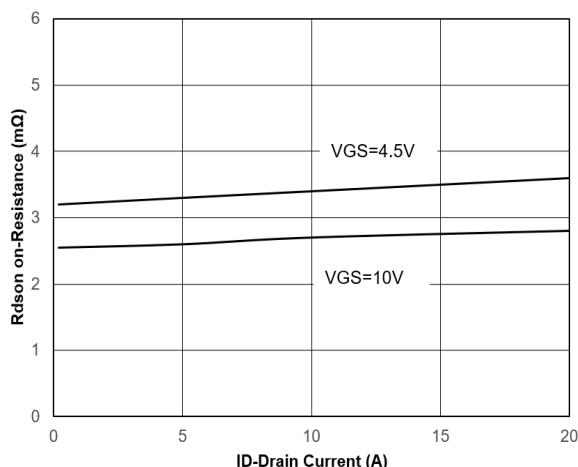


Figure 5. Drain-Source on Resistance

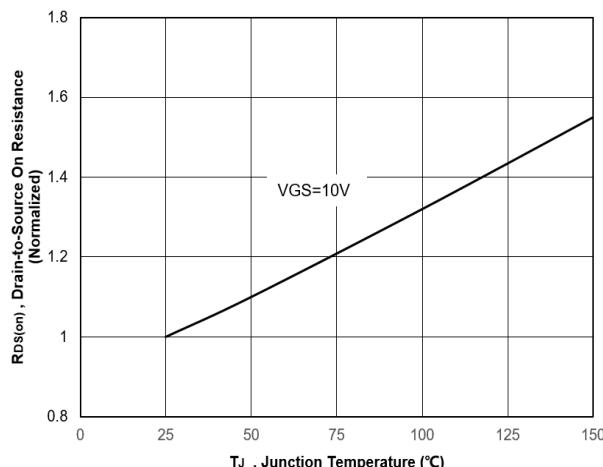


Figure 6. Normalized On-Resistance Vs. Temperature

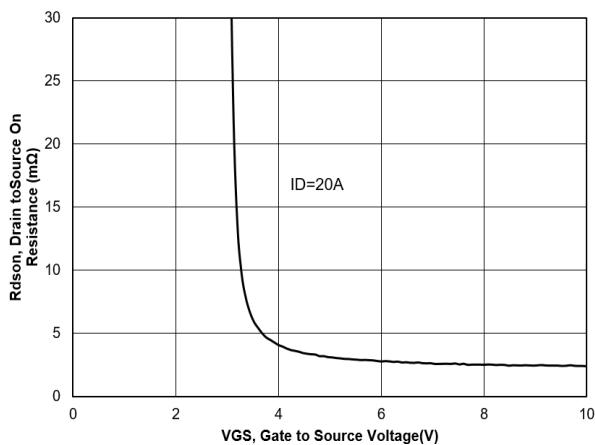


Figure 7. Typical Drain to Source ON Resistance

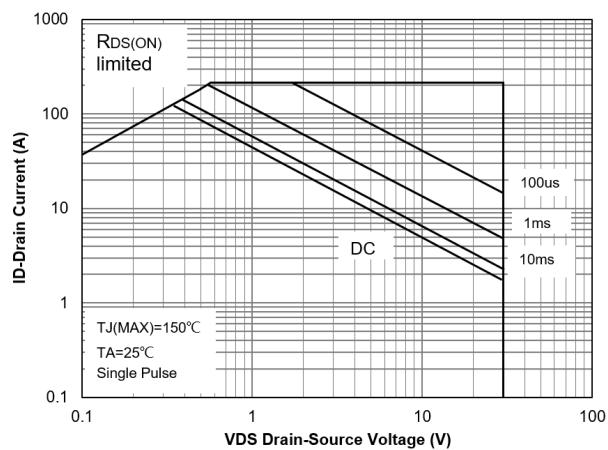


Figure 8. Safe Operation Area

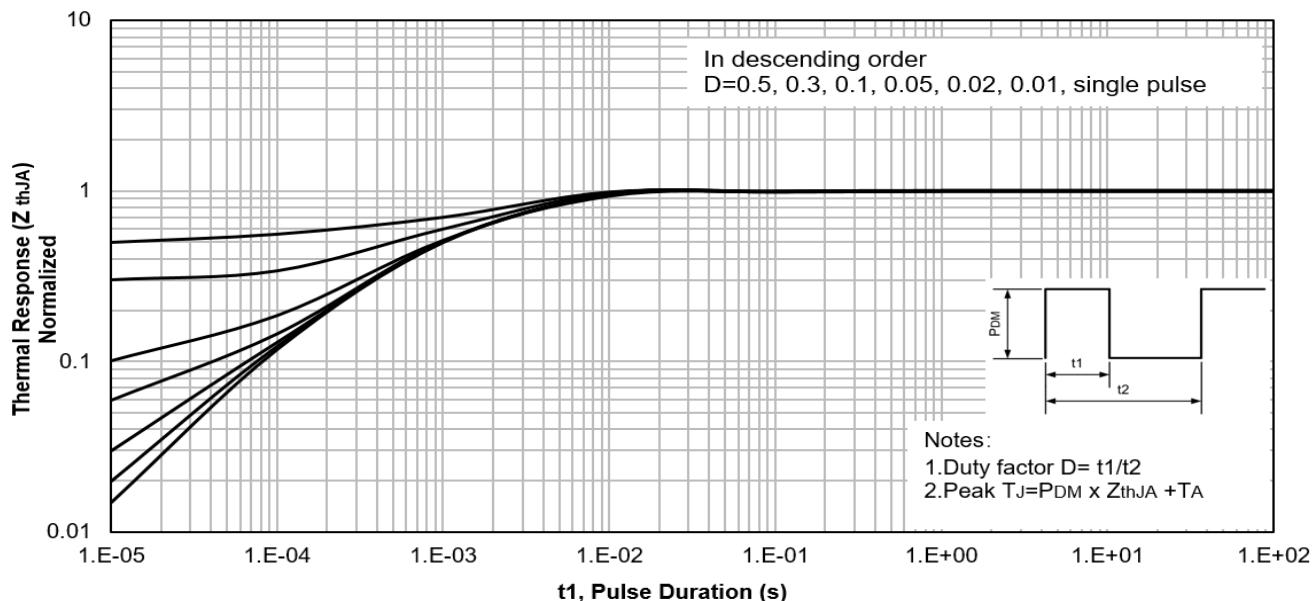


Figure 9. Maximum Effective Transient Thermal Impedance, Junction-to-Case

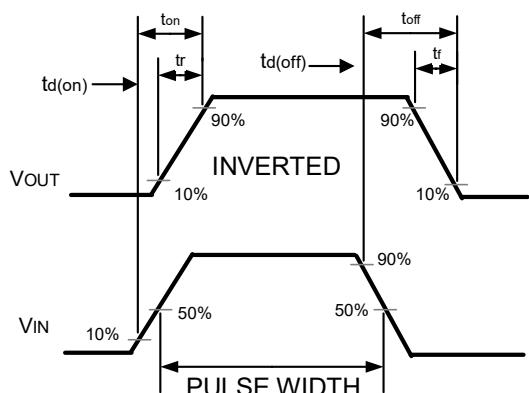
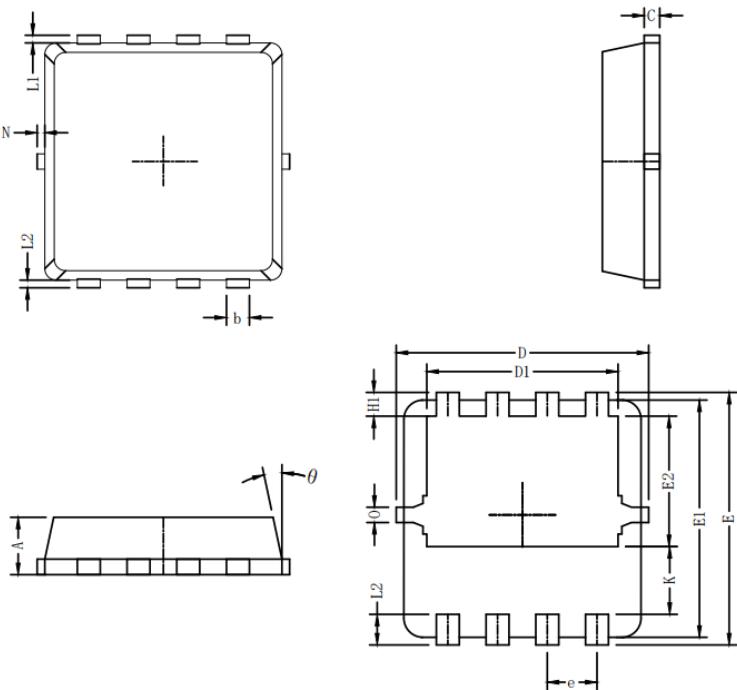


Figure 10. Switching wave

PDFN 3.3x3.3 Package Outline Drawing



Symbol	Millimeters		
	Min.	Nom.	Max.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
c	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.60	1.70	1.80
e	0.65 BSC		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.78	0.88	0.98
L1/L2	0.10 REF		
θ	11°	12°	13°
N	0	—	0.15
O	0.20 REF		

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