

## Description

The CMN6002HGP is the N-Channel enhancement mode power field effect transistors with high cell density, high voltage planar technology. This high density process and design have been optimized switching performance and especially tailored to minimize on-state resistance.

## Features

- $V_{DS}$ : 60V
- $I_D$  (@ $V_{GS}=10V$ ): 133A
- $R_{DS(ON)}$  (@ $V_{GS}=10V$ ): < 4.7m $\Omega$
- High density cell design for extremely low  $R_{DS(ON)}$
- Excellent on-resistance and DC current capability

## Applications

- AC/DC load switch
- SMPS
- Notebooks and Handhelds adapter
- UPS Power

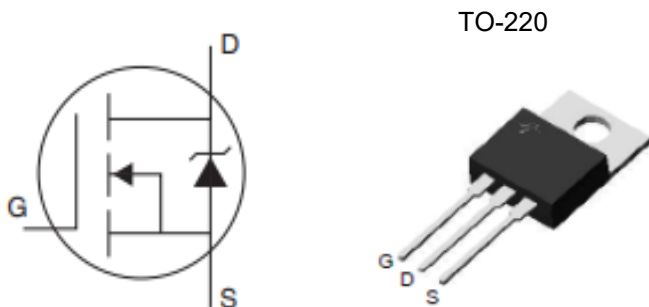
## Marking Information



Marking Code = CMN6002HGP

Date Code = XXXX

## Equivalent Circuit and Pin Configuration



## Ordering Information

P/N	Package Type	Packaging
CMN6002HGP	TO-220	Tube

## Absolute Maximum Ratings ( $T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Maximum	Unit	
Drain-source Voltage	$V_{DS}$	60	V	
Gate-source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current <sup>(1)</sup>	$I_D$	$T_c=25^\circ\text{C}$	133	A
		$T_c=100^\circ\text{C}$	95	A
Pulsed Drain Current <sup>(2)</sup>	$I_{DM}$	533	A	
Total Power Dissipation <sup>(3)</sup>	$P_D @ T_c=25^\circ\text{C}$	167	W	
	Derating Factor above $25^\circ\text{C}$	1.3	W/ $^\circ\text{C}$	
Thermal Resistance Junction-to-Case <sup>(3)</sup>	$R_{\theta JC}$	0.75	$^\circ\text{C/W}$	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$	

**Electrical Characteristics (T<sub>c</sub>=25 °C unless otherwise noted)**

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BVDSS	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
Static Drain-Source on-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A		3.5	4.7	mΩ
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =30A, V <sub>GS</sub> =0V		0.9	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				133	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=100KHz		4200		pF
Output Capacitance	C <sub>oss</sub>			1210		
Reverse Transfer Capacitance	C <sub>rss</sub>			30		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, I <sub>D</sub> =50A, V <sub>GS</sub> =10V		58		nC
Gate Source Charge	Q <sub>gs</sub>			16		
Gate Drain Charge	Q <sub>gd</sub>			9		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =30V, I <sub>D</sub> =10A, R <sub>GEN</sub> =2Ω		37		ns
Turn-on Rise Time	t <sub>r</sub>			22.2		
Turn-off Delay Time	t <sub>D(off)</sub>			52		
Turn-off Fall Time	t <sub>f</sub>			26.1		

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

(2) Pulse width limited by maximum junction temperature.

(3) Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. With 2oz Copper, t ≤ 10s.

**Typical Performance Characteristics**

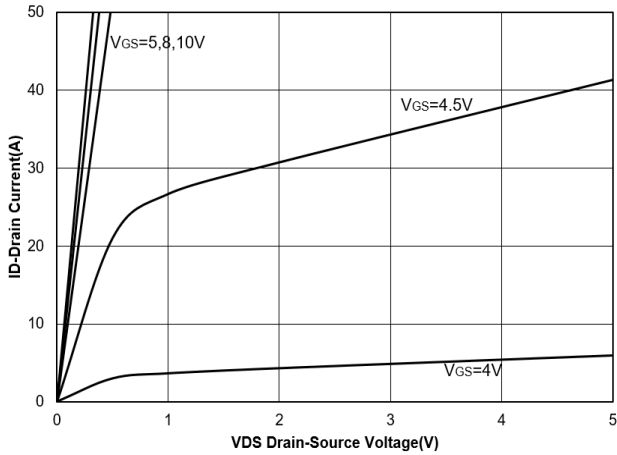


Figure 1. Output Characteristics

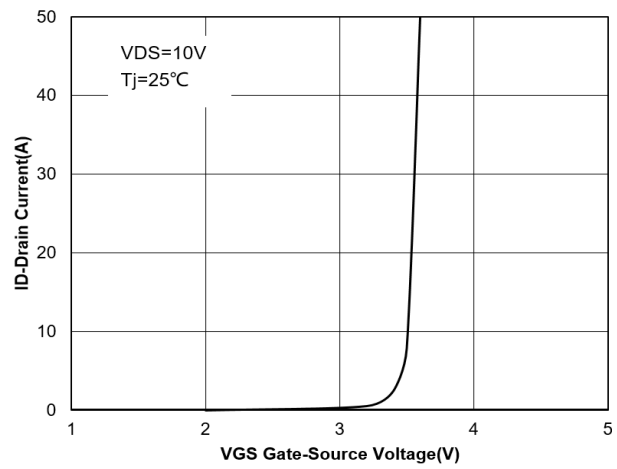


Figure 2. Transfer Characteristics

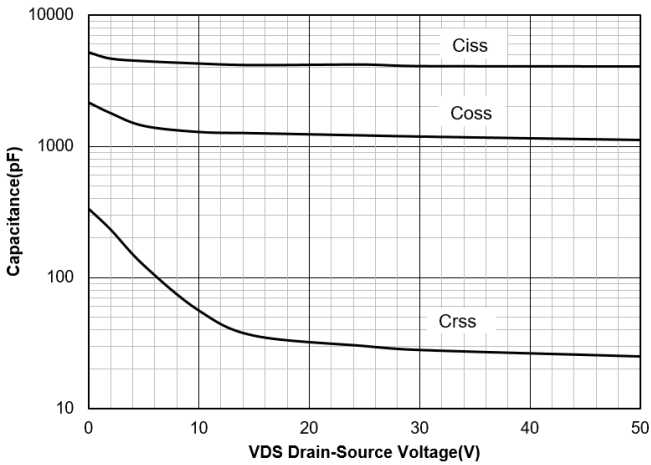


Figure 3. Capacitance Characteristics

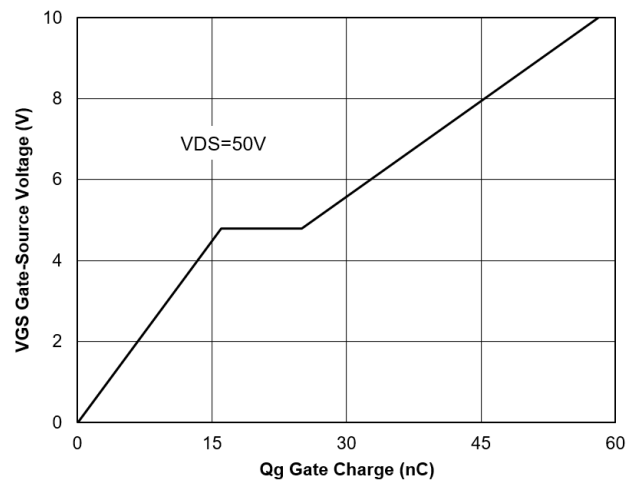


Figure 4. Gate Charge

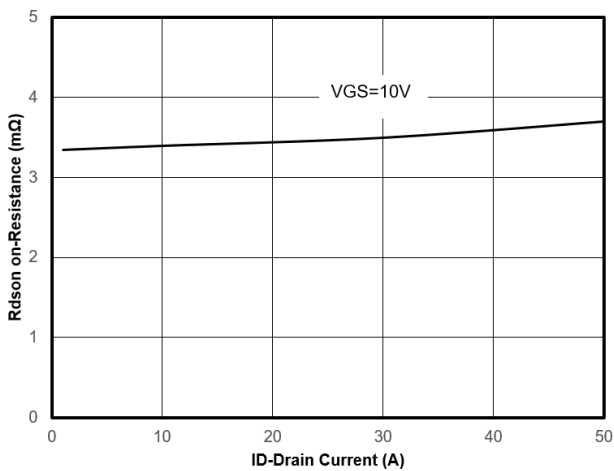


Figure 5. Drain-Source on Resistance

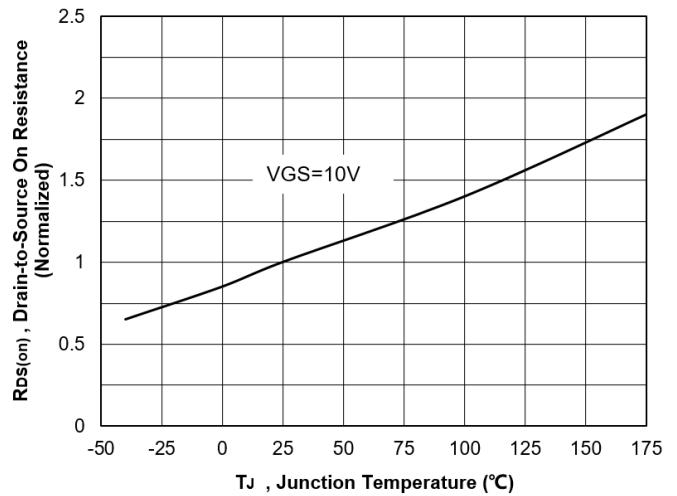


Figure 6. Normalized On-Resistance Vs. Temperature

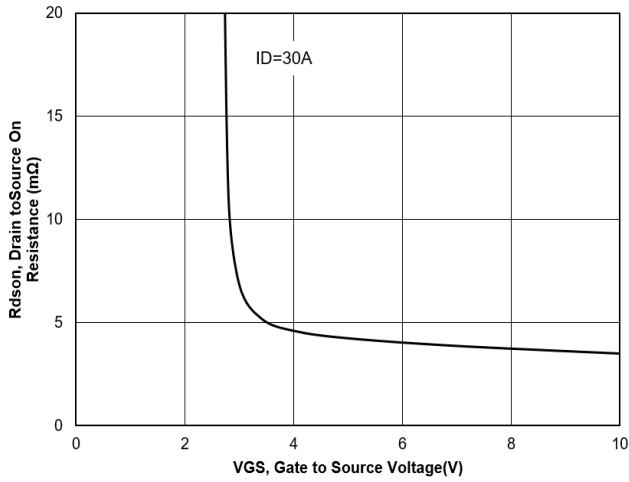


Figure 7. Typical Drain to Source ON Resistance VS Gate Voltage and Drain Current

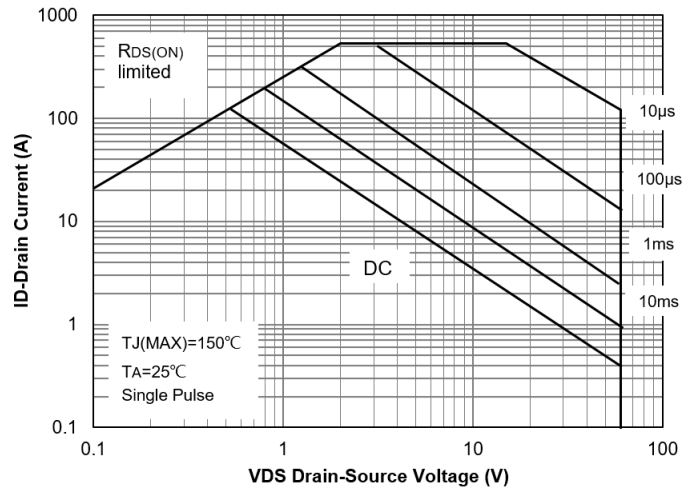


Figure 8. Safe Operation Area

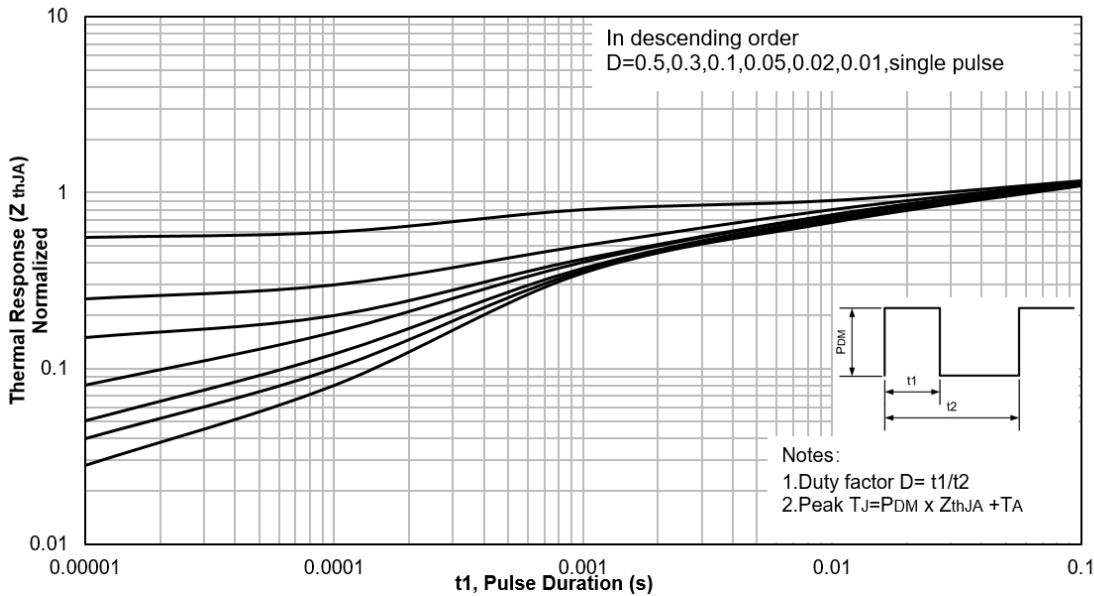


Figure 9. Maximum Effective Transient Thermal Impedance ,Junction-to-Case

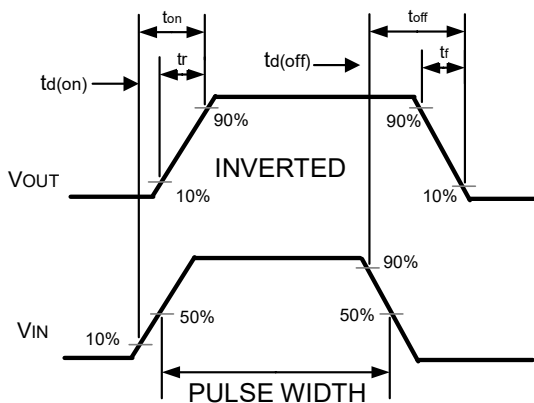
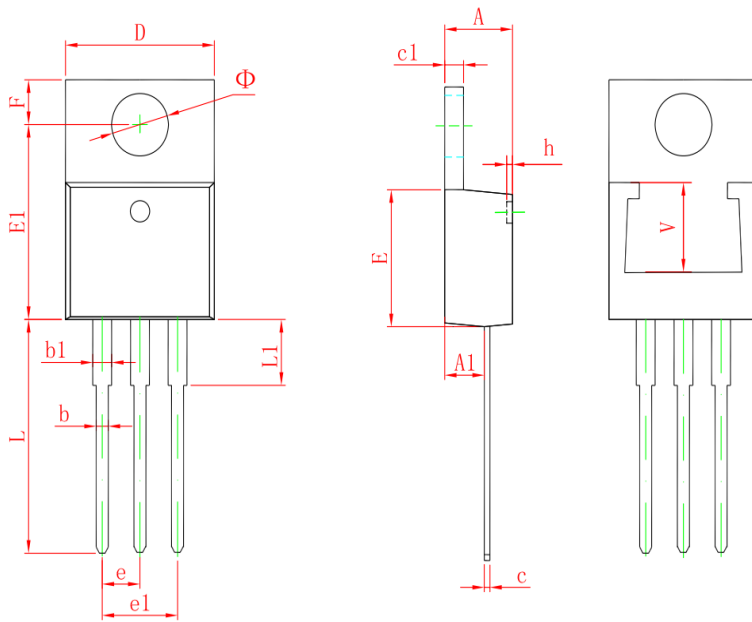


Figure 10. Switching wave

### TO-220 Package Outline Drawing



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155
V	5.600 REF.		0.220 REF.	

### Contact Information

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