

Description

The CMN6003GSB 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} : 60V
- I_D (@ $V_{GS}=10V$): 120A
- $R_{DS(ON)}$ (@ $V_{GS}=10V$): < 3m Ω
- 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

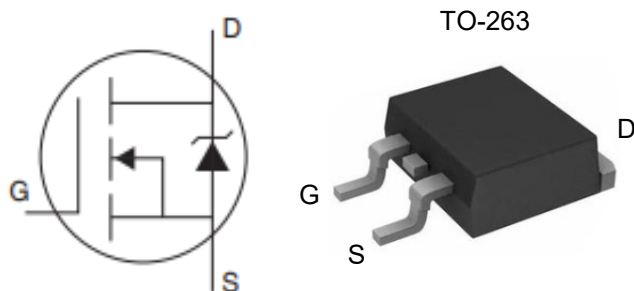
Marking Information



Marking Code = N6003GSB

Date Code = XXXX

Equivalent Circuit and Pin Configuration



Ordering Information

P/N	Package Type	Packaging
CMN6003GSB	TO-263	Tape and reel

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}	± 20	V
Continuous Drain Current ⁽¹⁾	$T_c=25^\circ\text{C}$	222	A
	$T_c=100^\circ\text{C}$	157	
	$T_c=25^\circ\text{C}$ (Package Limit)	120	
Pulsed Drain Current ⁽²⁾	I_{DM}	444	A
Total Power Dissipation ⁽³⁾	$PD @ T_c=25^\circ\text{C}$	259	W
	Derating Factor above 25°C	1.7	W/ $^\circ\text{C}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.58	$^\circ\text{C/W}$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, 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	2		4	V
Static Drain-Source on-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =30A		2.5	3.0	mΩ
Diode Forward Voltage	V _{SD}	I _S =30A, V _{GS} =0V		0.85	1.2	V
Maximum Body-Diode Continuous Current	I _S				120	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		4460		pF
Output Capacitance	C _{oss}			2280		
Reverse Transfer Capacitance	C _{rss}			78		
Switching Parameters						
Total Gate Charge	Q _g	V _{DS} =48V, I _D =30A, V _{GS} =10V		63.8		nC
Gate Source Charge	Q _{gs}			19.2		
Gate Drain Charge	Q _{gd}			13.2		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =48V, R _L =1Ω, R _{GEN} =6Ω		75		ns
Turn-on Rise Time	t _r			43		
Turn-off Delay Time	t _{D(off)}			102		
Turn-off Fall Time	t _f			47		

Noted: (1) Pulse Test: Pulse Width ≤ 300μs, 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

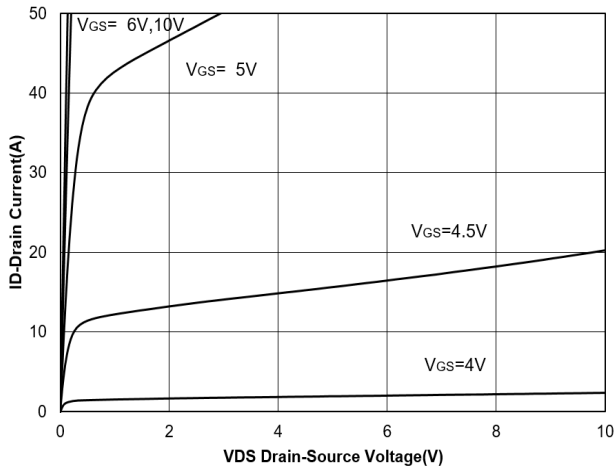


Figure 1. Output Characteristics

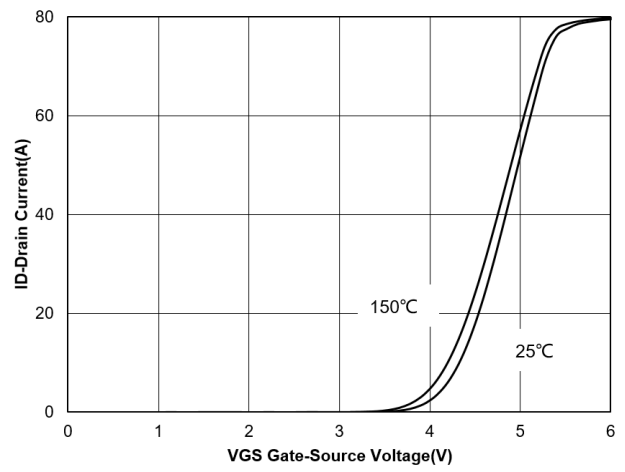


Figure 2. Transfer Characteristics

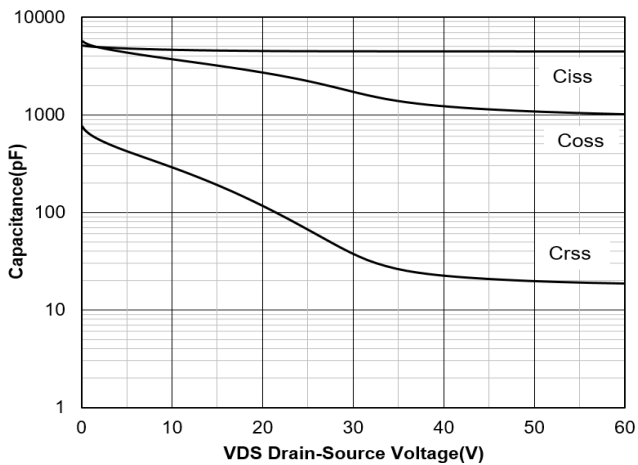


Figure 3. Capacitance Characteristics

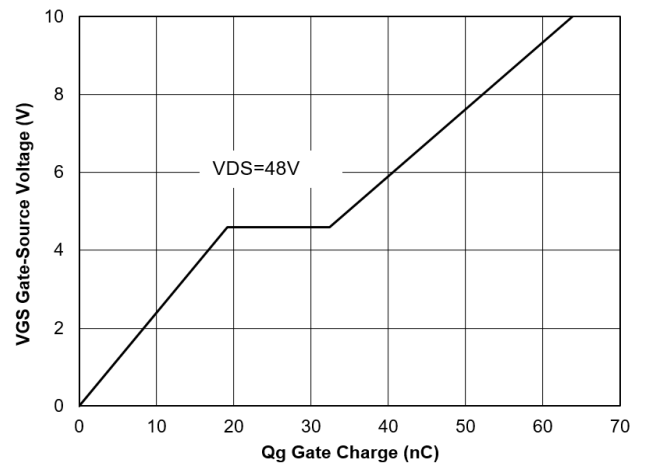


Figure 4. Gate Charge

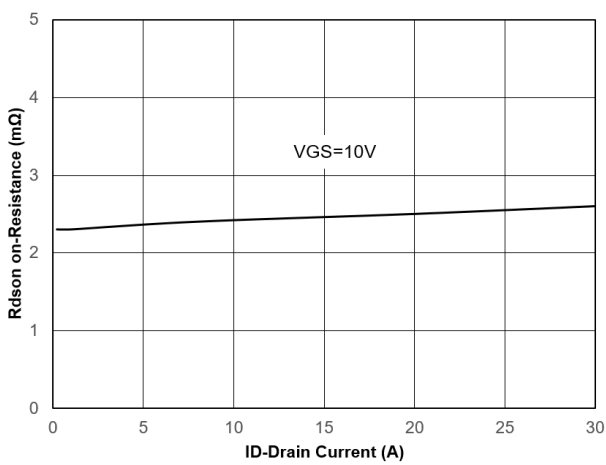


Figure 5. Drain-Source on Resistance

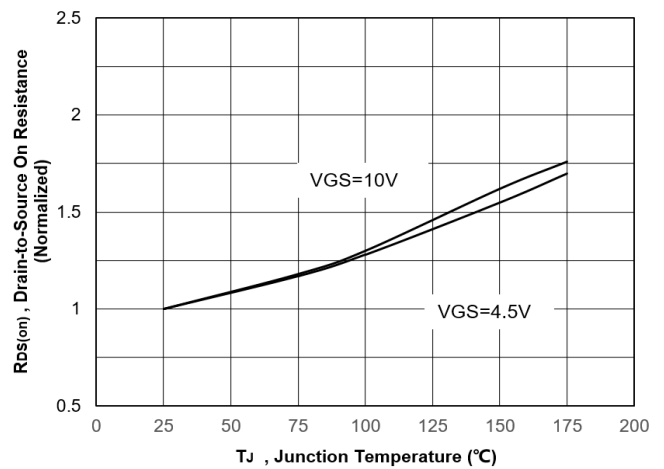


Figure 6. Normalized On-Resistance Vs. Temperature

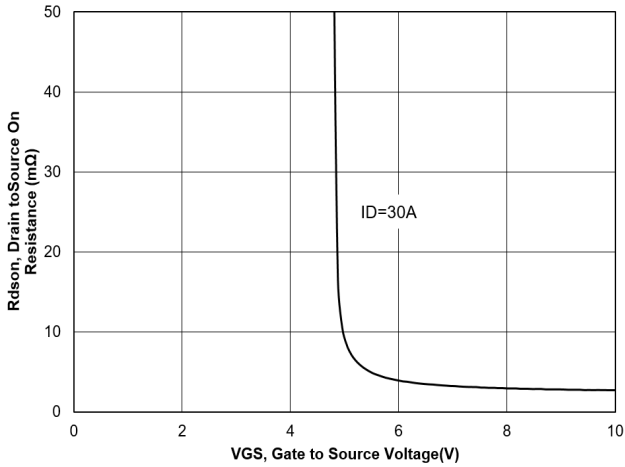


Figure 7. Typical Drain to Source ON Resistance VS Gate Voltage and Drain Current

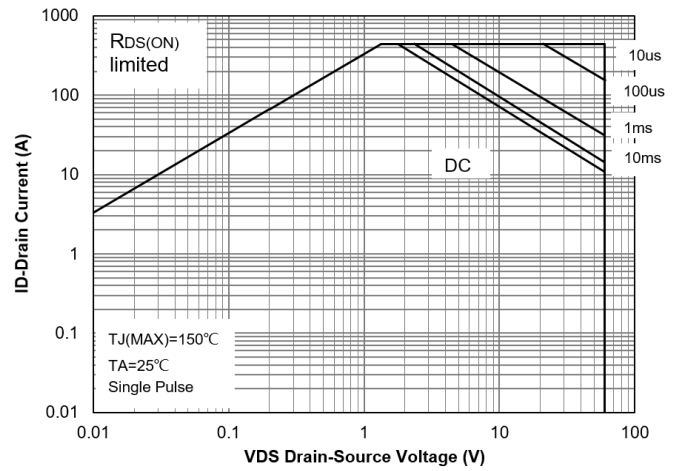


Figure 8. Safe Operation Area

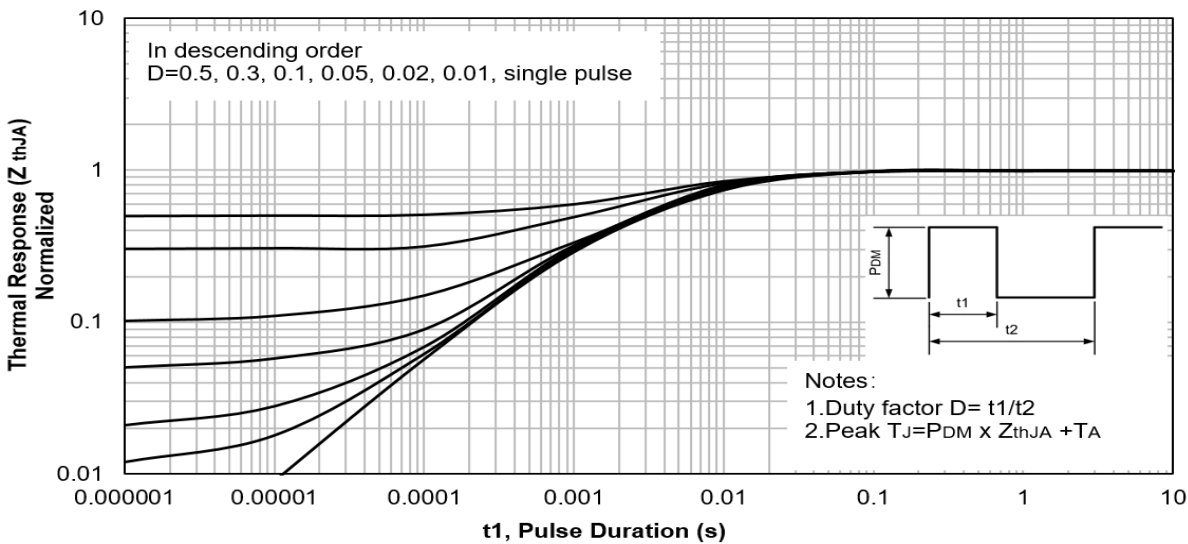


Figure 9. Maximum Effective Transient Thermal Impedance ,Junction-to-Case

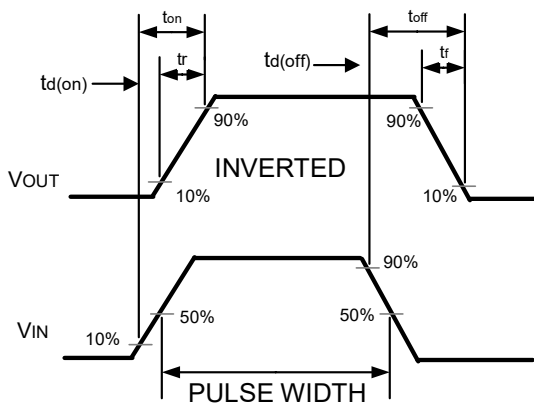
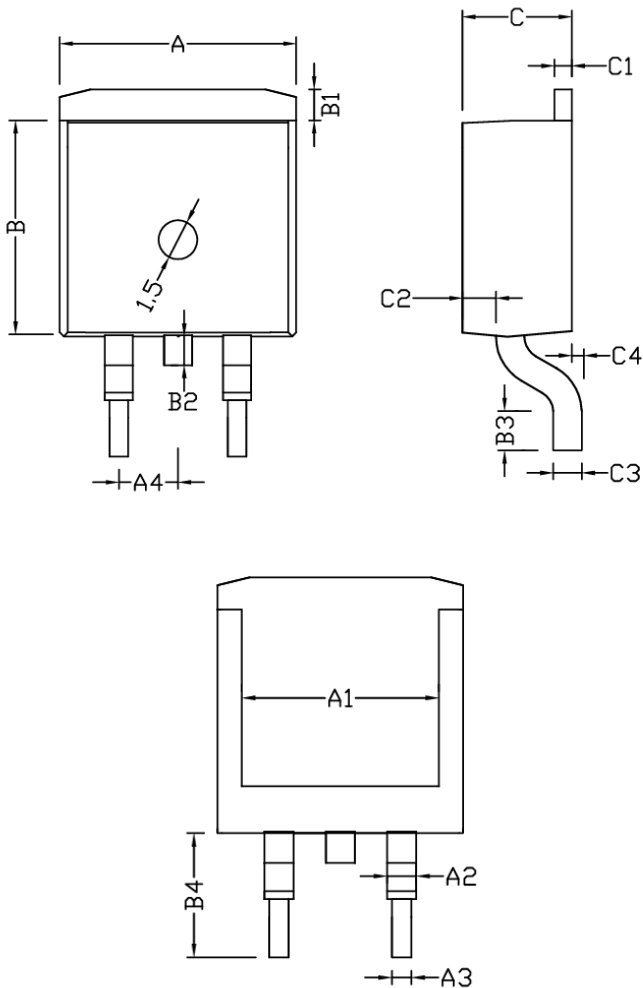


Figure 10. Switching wave

TO-263 Package Outline Drawing



Symbol	Millimeters		
	Min.	Nom.	Max.
A	9.78	9.88	9.98
A1	7.02	7.16	7.3
A2	1.22	1.27	1.35
A3	0.77	0.8	0.83
A4	2.5	2.54	2.58
B	8.7	9.2	9.7
B1	1.07	1.27	1.47
B2	1.4	1.55	1.7
B3	2.0	2.3	2.6
B4	5.03	5.13	5.23
C	4.42	4.5	4.58
C1	1.27	1.3	1.33
C2	1.55	1.6	1.65
C3	0.48	0.5	0.52
C4	0.01	0.06	0.12

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