

CMD5N50/CMU5N50

500V N-Channel MOSFET

General Description

The 5N50 have been fabricated using an advanced high voltage MOSFET process that is designed to deliver high levels of performance and robustness in popular AC-DC applications.

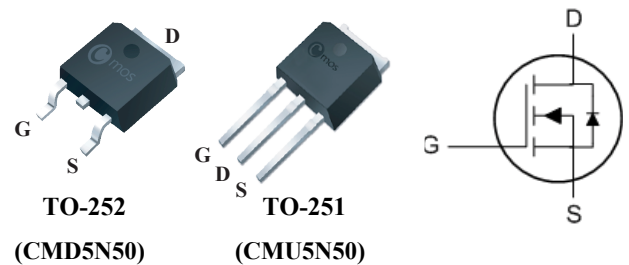
Features

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Product Summary

BVDSS	RDSON	ID
500V	1.5Ω	4.5A

TO-252/251 Pin Configuration



Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	CMD5N50/CMU5N50	Units
V_{DSS}	Drain-Source Voltage	500	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$) - Continuous ($T_C = 100^\circ\text{C}$)	4.5	A
		2.9	A
I_{DM}	Drain Current - Pulsed (Note 1)	15	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	202	mJ
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	50	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	CMD5N50/CMU5N50	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case Max.	2.6	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient Max.	62.5	$^\circ\text{C}/\text{W}$

Electrical Characteristic (T_C=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	500	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 500 V, V _{GS} = 0 V	--	--	1	μA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 30 V, V _{DS} = 0 V	--	--	100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} = -30 V, V _{DS} = 0 V	--	--	-100	nA

On Characteristics

V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μA	2.0	--	4.5	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 2.2A	--	--	1.5	Ω
g _{FS}	Forward Transconductance	V _{DS} = 40 V, I _D = 1.5A	--	3.5	--	S

Dynamic Characteristics

C _{iss}	Input Capacitance	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz	--	750	--	pF
C _{oss}	Output Capacitance		--	80	--	pF
C _{rss}	Reverse Transfer Capacitance		--	15	--	pF

Switching Characteristics

t _{d(on)}	Turn-On Delay Time	V _{DD} = 250 V, I _D = 4.5 A, R _G = 25Ω	--	15	--	ns
t _r	Turn-On Rise Time		--	40	--	ns
t _{d(off)}	Turn-Off Delay Time		--	85	--	ns
t _f	Turn-Off Fall Time		--	45	--	ns
Q _g	Total Gate Charge	V _{DS} = 400 V, I _D = 4.5 A, V _{GS} = 10 V	--	18	30	nC
Q _{gs}	Gate-Source Charge		--	3	--	nC
Q _{gd}	Gate-Drain Charge		--	8	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

I _S	Maximum Continuous Drain-Source Diode Forward Current	--	--	4.5	A	
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	15	A	
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 1A	--	--	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0 V, I _S = 4.5 A, dI _F / dt = 100 A/μs	--	270	--	ns
Q _{rr}	Reverse Recovery Charge		--	2	--	μC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 5 mH, I_{AS} = 9 A, V_{DD} = 50V, Starting T_J = 25°C

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