

CMD3N50M/CMU3N50M

500V N-Channel MOSFET

General Description

The 3N50M 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

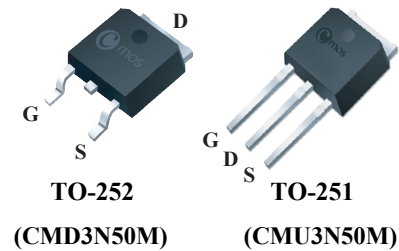
Product Summary

BVDSS	RDSON	ID
500V	3Ω	3A

Applications

- Power factor correction(PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible power supply(UPS)

TO-252/251 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	500	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$) - Continuous ($T_C = 100^\circ\text{C}$)	3	A
		1.8	A
I_{DM}	Drain Current - Pulsed	12	A
V_{GSS}	Gate-Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy ¹	81	mJ
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	60	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C

Thermal Characteristics

Symbol	Parameter	Rating	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case Max.	1.25	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient Max.	110	°C/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 uA	500	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 500 V, V _{GS} = 0 V	--	--	1	uA
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 uA	2	--	4	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 1A	--	2.6	3	Ω
g _{FS}	Forward Transconductance	V _{DS} = 20 V, I _D = 1A	--	2.3	--	S

Dynamic Characteristics

C _{iss}	Input Capacitance	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz	--	280	--	pF
C _{oss}	Output Capacitance		--	25	--	pF
C _{rss}	Reverse Transfer Capacitance		--	0.5	--	pF

Switching Characteristics

t _{d(on)}	Turn-On Delay Time	V _{DD} = 250 V, I _D = 3A, R _G = 25Ω, V _{GS} = 10 V	--	11	--	ns
t _r	Turn-On Rise Time		--	20	--	ns
t _{d(off)}	Turn-Off Delay Time		--	21	--	ns
t _f	Turn-Off Fall Time		--	15	--	ns
Q _g	Total Gate Charge	V _{DS} = 480 V, I _D = 1A, V _{GS} = 10 V	--	5	--	nC
Q _{gs}	Gate-Source Charge		--	1	--	nC
Q _{gd}	Gate-Drain Charge		--	3	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

I _S	Maximum Continuous Drain-Source Diode Forward Current	--	--	3	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	12	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 3A	--	--	1.4 V
t _{rr}	Reverse Recovery Time	V _{GS} = 0 V, I _S = 3A, di _F / dt = 100 A/us	--	190	ns
Q _{rr}	Reverse Recovery Charge		--	0.53	uC

Notes:

1. The EAS data shows Max. rating . The test condition is V_{DS}=50V , V_{GS}=10V , L=8mH , I_{AS}=4.5A.

This product has been designed and qualified for the consumer market.

Cmos assumes no liability for customers' product design or applications.

Cmos reserves the right to improve product design ,functions and reliability without notice.

Typical Characteristics

