

## General Description

The 8N50 uses advanced Manufacturing of high voltage MOSFET process , can provide excellent RDS(ON). These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology.

## Features

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

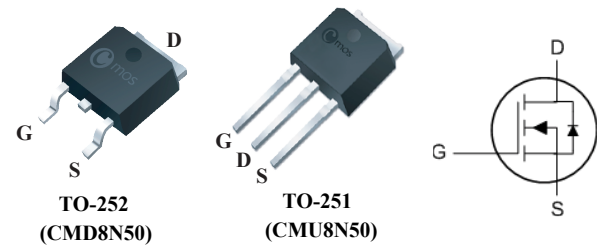
## Product Summary

BVDSS	RDS(ON)	ID
500V	0.85Ω	8A

## Applications

- Adapter
- Switched Mode Power Supplies (SMPS)
- Uninterruptible Power Supply (UPS)

## TO-252/251 Pin Configuration



## Absolute Maximum Ratings

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

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain-Source Voltage	500	V
$I_D$	Drain Current - Continuous ( $T_C = 25^\circ\text{C}$ )	8	A
	- Continuous ( $T_C = 100^\circ\text{C}$ )	5	A
$I_{DM}$	Drain Current - Pulsed <sup>a</sup>	24	A
$V_{GSS}$	Gate-Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulsed Avalanche Energy <sup>b</sup>	64	mJ
dv/dt	Peak Diode Recovery dv/dt <sup>c</sup>	4.5	V/ns
$P_D$	Power Dissipation ( $T_C = 25^\circ\text{C}$ )	130	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	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case Max.	0.9	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient Max.	62.5	$^\circ\text{C}/\text{W}$

## Electrical Characteristic

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
--------	-----------	-----------------	-----	-----	-----	-------

### Off Characteristics

$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	500	--	--	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 500\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	$\mu\text{A}$
		$V_{DS} = 400\text{ V}, T_C = 125^\circ\text{C}$	--	--	10	
$I_{GSSF}$	Gate-Body Leakage Current, Forward	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
$I_{GSSR}$	Gate-Body Leakage Current, Reverse	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

### On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 3\text{ A}$	--	--	0.85	$\Omega$
$g_{FS}$	Forward Transconductance	$V_{DS} = 10\text{ V}, I_D = 5\text{ A}$	--	10	--	S

### Dynamic Characteristics

$C_{iss}$	Input Capacitance	$V_{DS} = 25\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1.0\text{ MHz}$	--	1500	--	$\mu\text{F}$
$C_{oss}$	Output Capacitance		--	210	--	$\mu\text{F}$
$C_{riss}$	Reverse Transfer Capacitance		--	80	--	$\mu\text{F}$

### Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 250\text{ V}$ $I_D = 8\text{ A}$ $R_G = 25\ \Omega$	--	15	--	ns
$t_r$	Turn-On Rise Time		--	62	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	93	--	ns
$t_f$	Turn-Off Fall Time		--	48	--	ns
$Q_g$	Total Gate Charge	$V_{DS} = 400\text{ V}$ $I_D = 8\text{ A}$ $V_{GS} = 10\text{ V}$	--	26	--	nC
$Q_{gs}$	Gate-Source Charge		--	4	--	nC
$Q_{gd}$	Gate-Drain Charge		--	13	--	nC

### Drain-Source Diode Characteristics and Maximum Ratings

$I_S$	Maximum Continuous Drain-Source Diode Forward Current	--	--	8	A	
$I_{SM}$	Maximum Pulsed Drain-Source Diode Forward Current	--	--	24	A	
$V_{SD}$	Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 8\text{ A}$	--	--	1.4	V
$t_{rr}$	Reverse Recovery Time	$V_{GS} = 0\text{ V}, I_S = 8\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$	--	340	--	ns
$Q_{rr}$	Reverse Recovery Charge		--	3	--	$\mu\text{C}$

#### Notes:

- Repetitive Rating: Pulse width limited by maximum junction temperature
- $L=0.5\text{ mH}, I_{AS}=16\text{ A}, V_{DD}=50\text{ V}, V_G=10\text{ V}, \text{Starting } T_J=25^\circ\text{C}$
- $I_{SD} \leq 8.0\text{ A}, di/dt \leq 200\text{ A}/\mu\text{s}, V_{DD} \leq BV_{DSS}, \text{Starting } T_J = 25^\circ\text{C}$
- Pulse Test: Pulse width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$
- Essentially Independent of Operating Temperature Typical Characteristics

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.