

CMP8N50/CMI8N50/CMF8N50

500V N-Channel MOSFET

General Description

The 8N50 uses advanced Manufacturing of high pressure 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

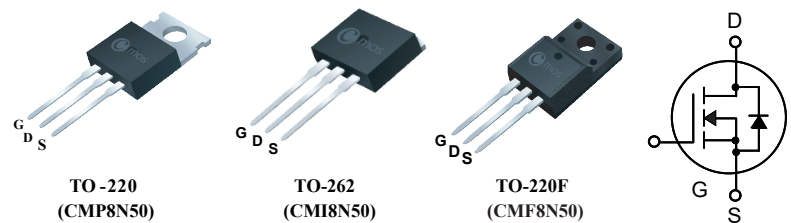
Product Summary

BVDSS	RDSON	ID
500V	0.85Ω	8A

Applications

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

TO-220/262/220F Pin Configuration



Absolute Maximum Ratings

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

Symbol	Parameter	220/262	220F	Units
V_{DSS}	Drain-Source Voltage	500		V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$)	8	8*	A
	- Continuous ($T_C = 100^\circ\text{C}$)	5	5*	A
I_{DM}	Drain Current - Pulsed (Note 1)	32	32*	A
V_{GSS}	Gate-Source Voltage	± 30		V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	200		mJ
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	130	38	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		$^\circ\text{C}$

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	220/262	220F	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case Max.	0.9	2.75	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient Max.	62.5	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
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Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	500	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 500\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
		$V_{DS} = 500\text{ V}, T_C = 125^\circ\text{C}$	--	--	200	
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	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 4\text{ A}$	--	0.71	0.85	Ω
g_{FS}	Forward Transconductance	$V_{DS} = 10\text{ V}, I_D = 8\text{ A}$	--	12	--	S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}$	--	1900	--	pF
C_{oss}	Output Capacitance	$V_{GS} = 0\text{ V}$	--	210	--	pF
C_{rss}	Reverse Transfer Capacitance	$f = 1.0\text{ MHz}$	--	80	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 250\text{ V}$	--	18	--	ns
t_r	Turn-On Rise Time	$I_D = 8\text{ A}$	--	65	--	ns
$t_{d(off)}$	Turn-Off Delay Time	$R_G = 25\Omega$	--	93	--	ns
t_f	Turn-Off Fall Time		--	64	--	ns
Q_g	Total Gate Charge	$V_{DS} = 200\text{ V}$	--	26	--	nC
Q_{gs}	Gate-Source Charge	$I_D = 8\text{ A}$	--	8	--	nC
Q_{gd}	Gate-Drain Charge	$V_{GS} = 10\text{ V}$	--	6.5	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

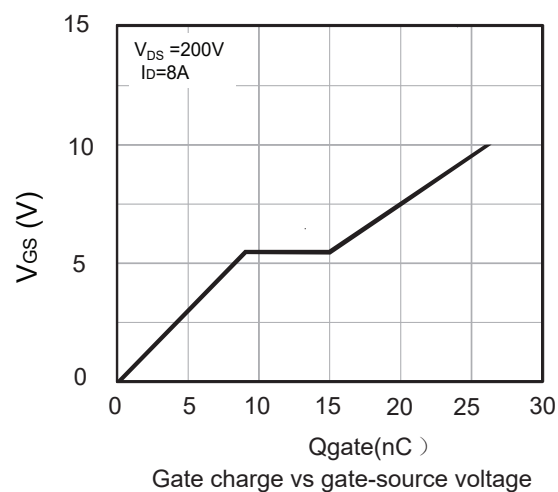
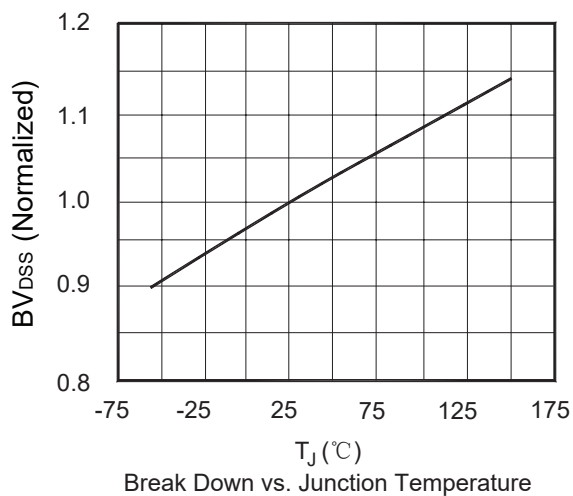
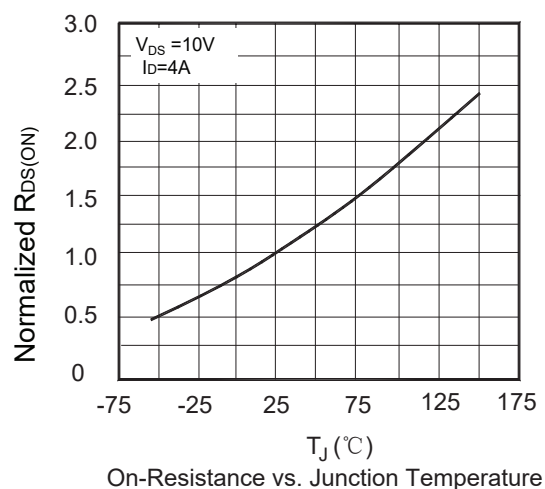
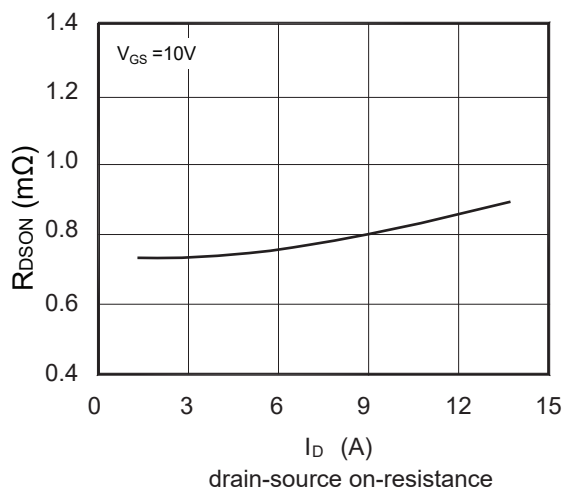
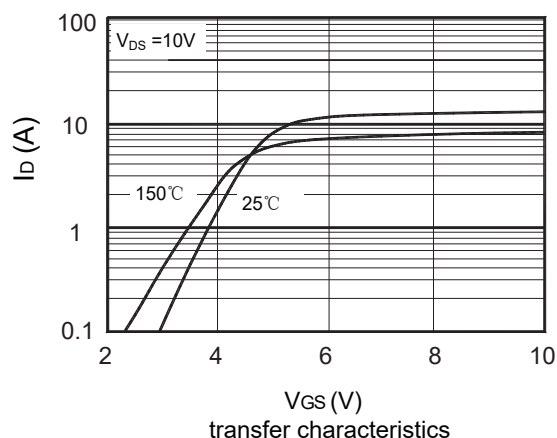
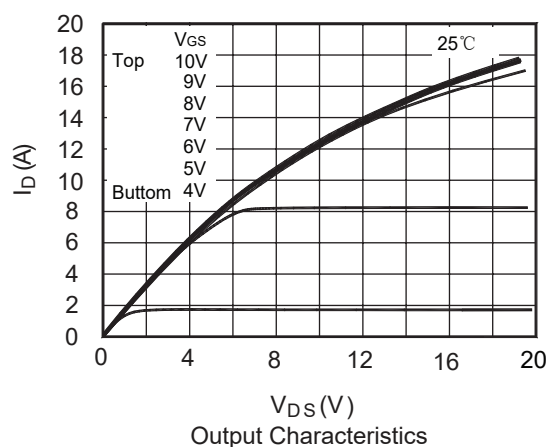
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	8	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	32	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 8\text{ A}$	--	--	1.4	V
t_{rr}	Reverse Recovery Time	$V_{GS} = 0\text{ V}, I_S = 8\text{ A}$	--	340	--	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt = 100\text{ A}/\mu\text{s}$	--	3	--	μC

Notes:

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature
- 2.L=1mH, $I_{AS}=20\text{ A}$, $V_{DD}=50\text{ V}$, $V_G=10\text{ V}$, Starting $T_J=25^\circ\text{C}$
- 3.Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
- 4.Essentially Independent of Operating Temperature Typical Characteristics

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Typical Characteristics



Typical Characteristics

