

General Description

The 13N50A is produced using advanced high voltage MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology.

Features

- 100% avalanche tested
- Fast Switching
- RoHS Compliant

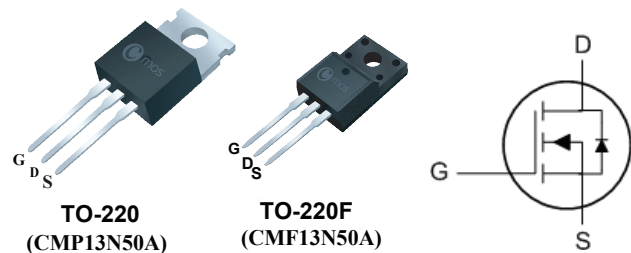
Product Summary

BVDSS	R _{DS(on)} max.	ID
500V	0.41Ω	13A

Applications

- Switching regulators
- UPS (Uninterruptible Power Supply)
- DC-DC converters

TO-220/220F Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	CMP13N50A/CMF13N50A		Units
V _{DS}	Drain-Source Voltage	500		V
V _{GS}	Gate-Source Voltage	±30		V
I _D @T _C =25°C	Continuous Drain Current	13	13*	A
I _D @T _C =100°C	Continuous Drain Current	8	8*	A
I _{DM}	Pulsed Drain Current ¹	52	52*	A
EAS	Single Pulse Avalanche Energy ²	722		mJ
P _D @T _C =25°C	Total Power Dissipation	200	50	W
T _{STG}	Storage Temperature Range	-55 to 150		°C
T _J	Operating Junction Temperature Range	-55 to 150		°C

Thermal Data

Symbol	Parameter	CMP13N50A	CMF13N50A	Unit
R _{θJA}	Thermal Resistance Junction-ambient	62.5	62.5	°C/W
R _{θJC}	Thermal Resistance Junction-case	0.63	2.5	°C/W

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	500	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=6.5A$	---	---	0.41	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=500V$, $V_{GS}=0V$	---	---	1	μA
		$V_{DS}=400V$, $V_{GS}=0V$, $TC=125^{\circ}\text{C}$	---	---	10	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 30V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=15V$, $I_D=6.5A$	---	12	---	S
Q_g	Total Gate Charge	$I_D=13A$	---	45	---	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=400V$	---	8	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$ (Note 3, 4)	---	20	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=250V$ $I_D=13A$ $R_G=25\Omega$ (Note 3, 4)	---	25	---	ns
T_r	Rise Time		---	100	---	
$T_{d(off)}$	Turn-Off Delay Time		---	130	---	
T_f	Fall Time		---	100	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1900	---	pF
C_{oss}	Output Capacitance		---	180	---	
C_{rss}	Reverse Transfer Capacitance		---	9	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	13	A
I_{SM}	Pulsed Source Current		---	---	52	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=13A$, $T_J=25^{\circ}\text{C}$	---	---	1.5	V

Note :

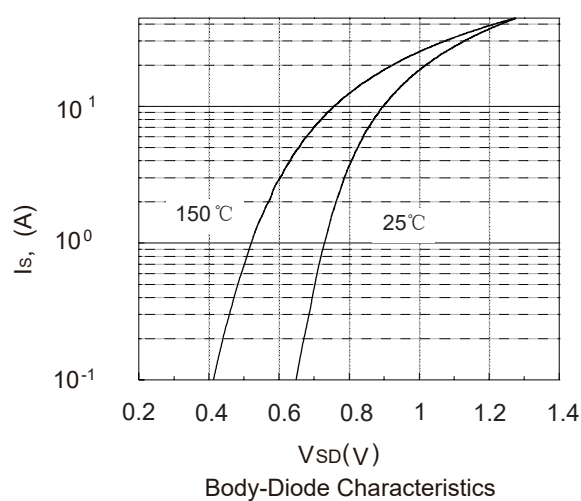
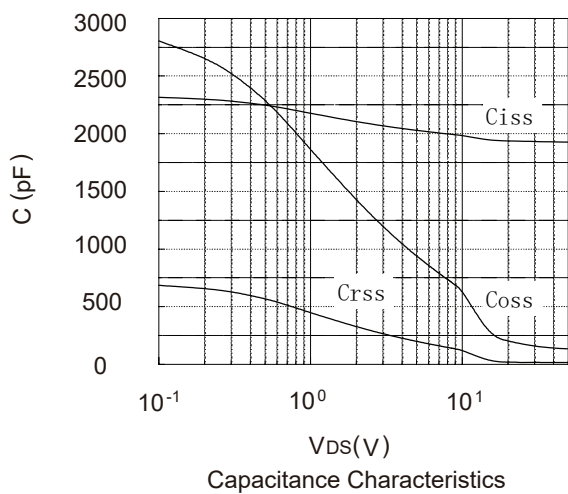
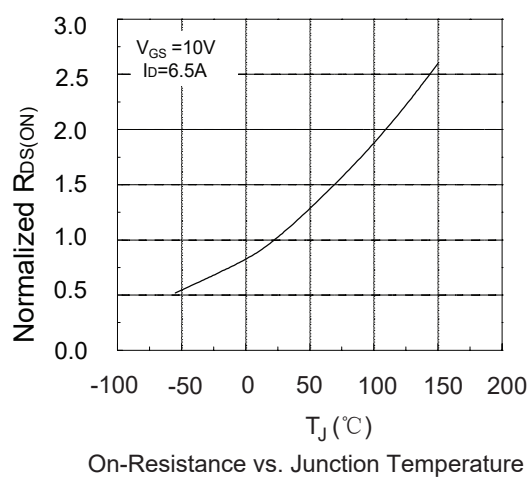
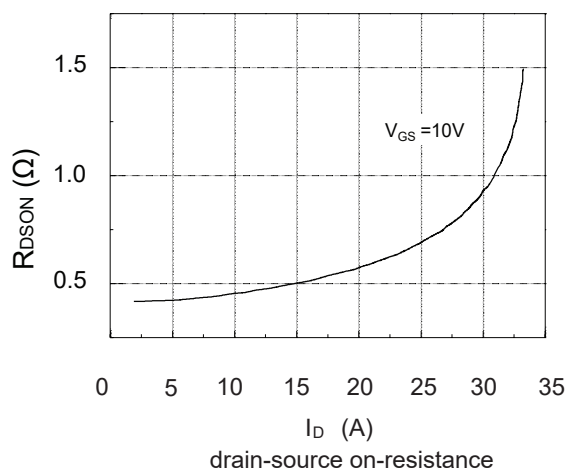
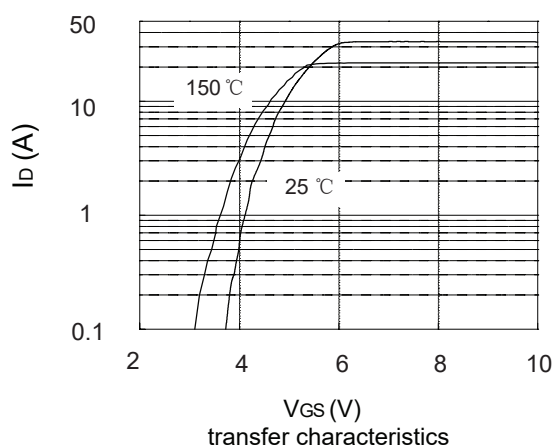
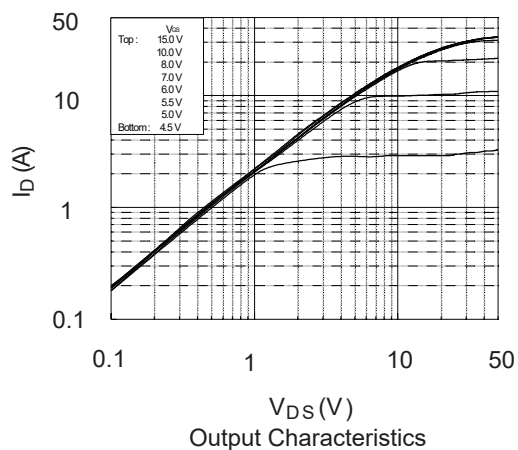
- 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2.1.The EAS data shows Max. rating .The test condition is $V_{DS}=80V$, $V_{GS}=10V$, $L=5\text{mH}$, $I_{AS}=17A$.
- 3.Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 4.Essentially Independent of Operating 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.Please refer to the latest version of specification.

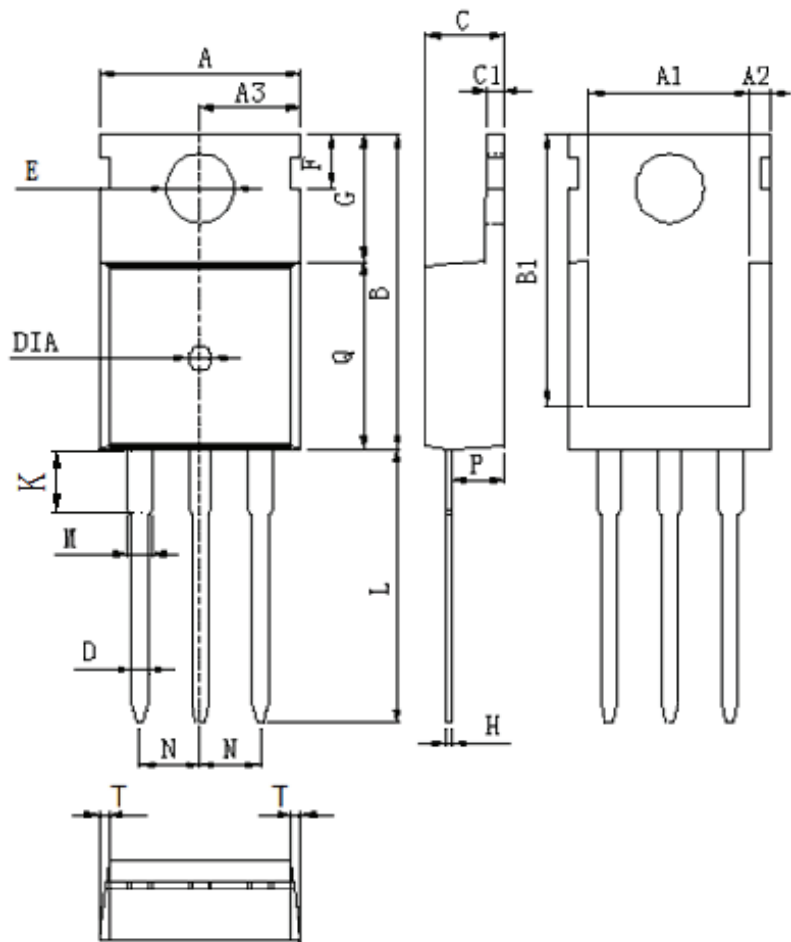
Typical Characteristics



Package Dimension

TO-220

Unit :mm

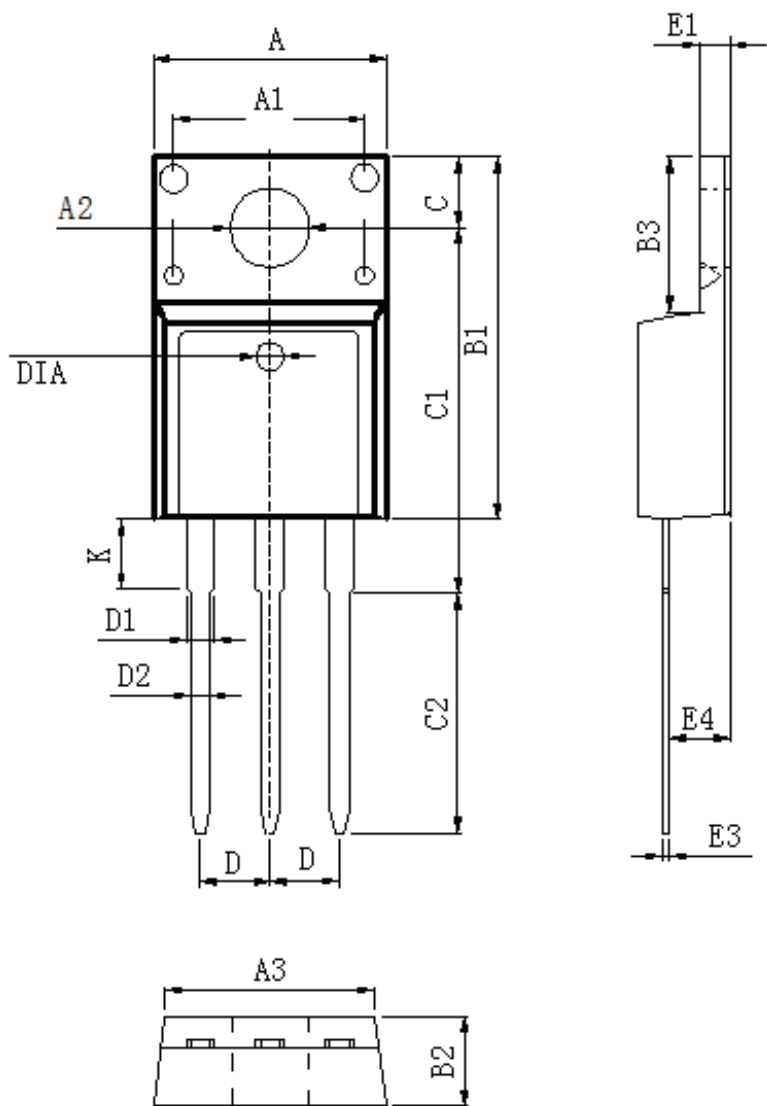


DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⊙1.5 (deep 0.2)

Package Dimension

TO-220F

Unit :mm



DIM	MILLIMETERS
A	10.16±0.3
A1	7.00±0.1
A2	3.3±0.2
A3	9.5±0.2
B1	15.87±0.3
B2	4.7±0.2
B3	6.68±0.4
C	3.3±0.2
C1	12.57±0.3
C2	10.02±0.5
D	2.54±0.05
D1	1.28±0.2
D2	0.8±0.1
K	3.1±0.3
E1	2.54±0.1
E3	0.5±0.1
E4	2.76±0.2
DIA	⌀1.5 (deep 0.2)