

General Description

The CMA20N50 uses advanced planar stripe DMOS technology and design to provide excellent RDS(ON).

These devices are well suited for high efficient switched mode power supplies and active power factor correction.

Features

- 100% avalanche tested
- Fast Switching
- Improved dv/dt capability
- RoHS Compliant

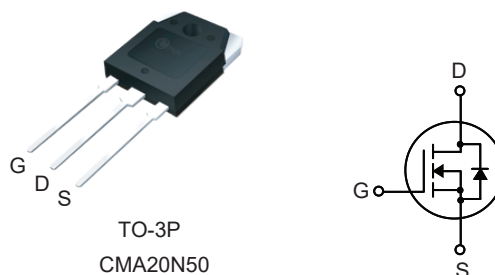
Product Summary

BVDSS	R _{DS(on)} max.	ID
500V	0.26Ω	20A

Applications

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

TO-3P Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	500	V
V _{GS}	Gate-Source Voltage	±30	V
I _D @T _C =25°C	Continuous Drain Current	20	A
I _D @T _C =100°C	Continuous Drain Current	12	A
I _{DM}	Pulsed Drain Current ¹	80	A
EAS	Single Pulse Avalanche Energy ²	860	mJ
P _D @T _C =25°C	Total Power Dissipation	280	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient	---	40	°C/W
R _{θJC}	Thermal Resistance Junction-case	---	0.44	°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
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=250\mu A$	---	0.5	---	V/ $^{\circ}\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=10A$	---	---	0.26	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 ³	$V_{DS}=40V$, $I_D=10A$	---	24	---	S
Q_g	Total Gate Charge	$I_D=20A$	---	70	---	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=400V$	---	18	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$ (Note 3, 4)	---	35	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=250V$	---	100	---	ns
T_r	Rise Time	$I_D=20A$	---	400	---	
$T_{d(off)}$	Turn-Off Delay Time	$R_G=25\Omega$	---	100	---	
T_f	Fall Time	(Note 3, 4)	---	100	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	4000	---	pF
C_{oss}	Output Capacitance		---	380	---	
C_{rss}	Reverse Transfer Capacitance		---	35	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	20	A
I_{SM}	Pulsed Source Current		---	---	80	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=20A$	---	---	1.5	V
t_{rr}	Reverse Recovery Time	$V_{GS}=0V$, $I_S=20A$	---	500	---	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$	---	7.2	---	μC

Note :

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature
- 2.L = 4.1mH, $I_{AS}=20A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$
- 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.

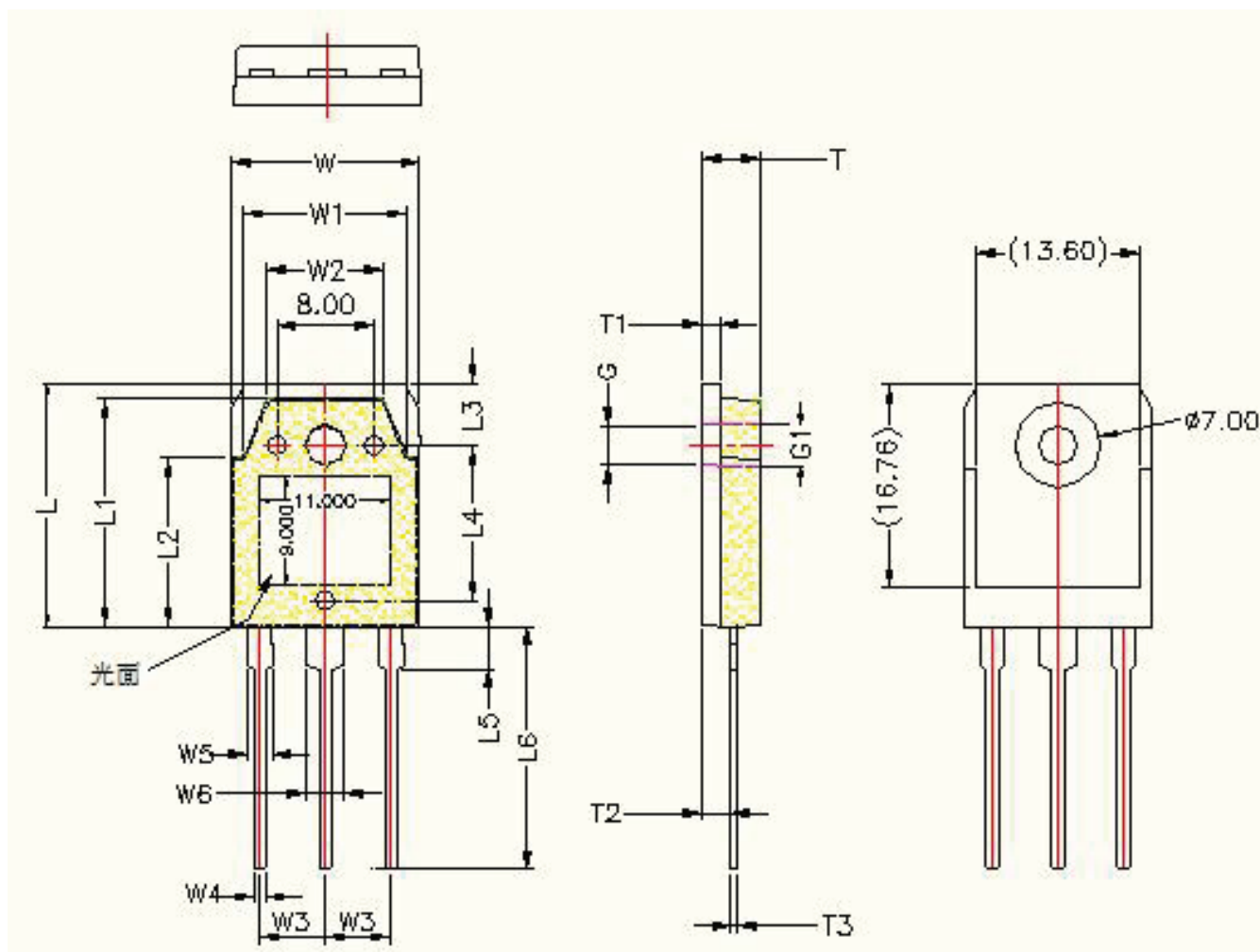
Cmos assumes no liability for customers' product design or applications.

Cmos reserves the right to improve product design ,functions and reliability without notice.Please refer to the latest version of specification.

Package Dimension

TO-3P

Unit :mm



Symbol	Dimensions	Symbol	Dimensions	Symbol	Dimensions
W	15.60±0.3	L	19.90±0.3	T	4.80±0.3
W1	13.60±0.3	L1	18.70±0.3	T1	1.50±0.3
W2	9.60±0.3	L2	13.90±0.3	T2	2.40±0.3
W3	5.45(TYP)	L3	5.00±0.3	T3	0.60±0.3
W4	1.00±0.3	L4	12.76±0.3	G	Ø3.25±0.3
W5	2.10±0.2	L5	3.50±0.3	G1	Ø3.58±0.3
W6	3.10±0.2	L6	20.00±0.3		