CMP20N50B/CMF20N50B

500V N-Channel MOSFET

General Description

These N-Channel enhancement mode power field effect transistors are produced using advanced technology which 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 efficient switched mode power supplies and active power factor correction.

Features

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

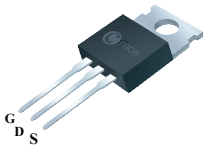
Product Summary

BVDSS	RDSON	ID
500V	0.32 Ω	20A

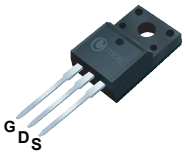
Applications

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

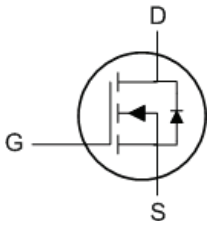
TO-220/220F Pin Configuration



TO-220
(CMP20N50B)



TO-220F
(CMF20N50B)



Absolute Maximum Ratings

Symbol	Parameter	CMP20N50B/CMF20N50B		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	20*	A
I_D@T_C=100°C	Continuous Drain Current	12	12*	A
I_{DM}	Pulsed Drain Current[1]	60	60*	A
EAS	Single Pulse Avalanche Energy[2]	512		mJ
I_{AS}	Avalanche Current	20		A
P_D@T_C=25°C	Total Power Dissipation	250	38.5	W
T_{STG}	Storage Temperature Range	-55 to 150		°C
T_J	Operating Junction Temperature Range	-55 to 150		°C

Thermal Data

Symbol	Parameter	CMP20N50B	CMF20N50B	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	62.5	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	0.5	3.3	°C/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	500	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=250uA	---	0.5	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=10A	---	---	0.32	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=500V, V_{GS}=0V	---	---	1	uA
		V_{DS}=400V , V_{GS}=0V , TC=125℃	---	---	10	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance [3]	V_{DS}=10V , I_D=20A	---	21	---	S
Q_g	Total Gate Charge	I_D=20A V_{DS}=400V V_{GS}=10V (Note 3, 4)	---	52	69	nC
Q_{gs}	Gate-Source Charge		---	18	---	
Q_{gd}	Gate-Drain Charge		---	26	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=250V I_D=20A R_G=25Ω (Note 3, 4)	---	80	---	ns
T_r	Rise Time		---	280	---	
$T_{d(off)}$	Turn-Off Delay Time		---	115	---	
T_f	Fall Time		---	117	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	4500	---	pF
C_{oss}	Output Capacitance		---	420	---	
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		---	---	60	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=20 A, T_J=25℃	---	---	1.4	V

Note :
1.Repetitive Rating: Pulse width limited by maximum junction temperature
2.L = 1mH, IAS = 32A, VDD = 50V, RG = 25Ω, Starting TJ = 25 ℃
3.Pulse Test: Pulse width≤300μs, Duty Cycle≤2%
4.Essentially Independent of Operating Temperature Typical Characteristics