CMP13N50T/CMF13N50T

500V N-Channel MOSFET

General Description

The 13N50T 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
- Improved dv/dt capability

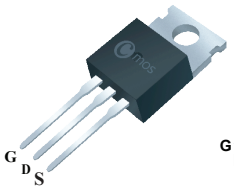
Product Summary

BVDSS	RDSON	ID
500V	0.48Ω	13A

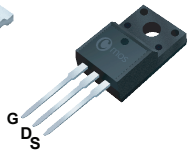
Applications

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

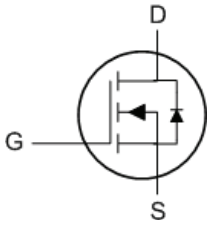
TO-220/220F Pin Configuration



TO-220
(CMP13N50T)



TO-220F
(CMF13N50T)



Absolute Maximum Ratings

Symbol	Parameter	CMP13N50T/CMF13N50T		Units
V_{DS}	Drain-Source Voltage	500		V
V_{GS}	Gate-Source Voltage	±30		V
I_D@T_C=25℃	Continuous Drain Current	13	13*	A
I_D@T_C=100℃	Continuous Drain Current	8	8*	A
I_{DM}	Pulsed Drain Current[1]	52	52*	A
EAS	Single Pulse Avalanche Energy[2]	860		mJ
P_D@T_C=25℃	Total Power Dissipation	200	50	W
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

* Drain current limited by maximum junction temperature.

Thermal Data

Symbol	Parameter	CMP13N50T	CMF13N50T	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	62.5	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	0.64	2.58	℃/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
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=6.5A	---	---	0.48	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	V_{DS}=10V , I_D=7A	---	12	---	S
Q_g	Total Gate Charge	I_D=13A V_{DS} =400V V_{GS} =10V (Note 3, 4)	---	45	---	nC
Q_{gs}	Gate-Source Charge		---	8	---	
Q_{gd}	Gate-Drain Charge		---	20	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS} =250V I_D=13A R_G=25Ω (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=1MHz	---	2800	---	pF
C_{oss}	Output Capacitance		---	200	---	
C_{rss}	Reverse Transfer Capacitance		---	20	---	

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=13 A, T_J=25℃	---	---	1.5	V

Note :
1.Repetitive Rating: Pulse width limited by maximum junction temperature
2.L = 6mH , I_{AS} = 17A, V_{DD} = 80V, Starting T_J = 25 ℃
3.Pulse Test: Pulse width≤300μs, Duty Cycle≤2%
4.Essentially Independent of Operating Temperature Typical Characteristics