# CMP18N20/CMF18N20

**200V N-Channel MOSFET**

## General Description

The 18N20 uses advanced planar stripe DMOS technology to provide excellent $R_{DS(ON)}$ and 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

- Fast switching
- 100% avalanche tested
- RoHS Compliant

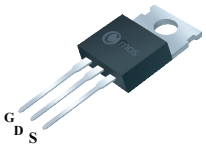
## Product Summary

| BVDSS | RDSON | ID |
|---|---|---|
| 200V | 170mΩ | 18A |

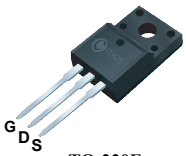
## Applications

- DC-DC Converters
- UPS
- Motor control

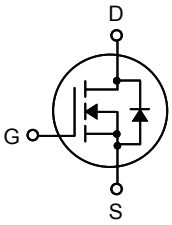
## TO-220/220F Pin Configuration




TO-220
(CMP18N20)




TO-220F
(CMF18N20)




## Absolute Maximum Ratings

| Symbol | Parameter | 220 | 220F | Units |
|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 200 | | V |
| $V_{GS}$ | Gate-Source Voltage | ±30 | | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current | 18 | 18* | A |
| $I_D$@$T_C$=100℃ | Continuous Drain Current | 9.1 | 9.1* | A |
| $I_{DM}$ | Pulsed Drain Current | 72 | 72* | A |
| EAS | Single Pulse Avalanche Energy[1] | 324 | | mJ |
| $P_D$@$T_C$=25℃ | Total Power Dissipation | 100 | 35 | 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 | 220 | 220F | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient | 62.5 | 62.5 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-case | 1.2 | 3.6 | ℃/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 | 200 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}$=10V , $I_D$=9A | --- | 140 | 170 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250uA | 2 | --- | 4 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=200V , $V_{GS}$ =0V | --- | --- | 1 | uA |
| | | $V_{DS}$=160V, $V_{GS}$=0V , $T_C$=125℃ | --- | --- | 100 | |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$ = ±30V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance [2] | $V_{DS}$=10V , $I_D$ =10A | --- | 11 | --- | S |
| $Q_g$ | Total Gate Charge [2 3] | $I_D$=18 A<br>$V_{DD}$=160 V<br>$V_{GS}$=10 V | --- | 22 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge [2 3] | | --- | 6.6 | --- | |
| $Q_{gd}$ | Gate-Drain Charge [2 3] | | --- | 7.2 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time [2 3] | $V_{DD}$=125 V<br>$I_D$=18A<br>$R_G$=25Ω | --- | 15 | --- | ns |
| $T_r$ | Rise Time [2 3] | | --- | 130 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time [2 3] | | --- | 140 | --- | |
| $T_f$ | Fall Time [2 3] | | --- | 100 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=25V , $V_{GS}$=0V , f=1MHz | --- | 1000 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 220 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 40 | --- | |

## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current | $V_G$=$V_D$=0V , Force Current | --- | --- | 18 | A |
| $I_{SM}$ | Pulsed Source Current | | --- | --- | 72 | A |
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V , $I_S$=18 A, $T_J$=25℃ | --- | --- | 1.4 | V |

Note :

1.The test condition is $V_{DD}$=50V , $V_{GS}$=10V , L=2mH , $I_{AS}$=18A.

2.Pulse test: Pulse width≤300us, Duty cycle≤2%.

3.Essentially independent of operating temperature.