# CMP40P03

P-Ch -30V Fast Switching MOSFETs

## General Description

The CMP40P03 is a P-channel Power MOSFET. It has specifically been designed to minimize input capacitance and gate charge. The device is therefore suitable in advanced high-efficiency switching applications.

## Features

- Advanced Process Technology
- Ultra Low On-Resistance
- Dynamic dv/dt Rating
- Fast Switching
- Fully Avalanche Rated
- Lead-Free

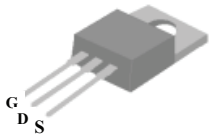
## Product Summery

| BVDSS | RDSON | ID |
|---|---|---|
| -30V | 14mΩ | -40A |

## Applications

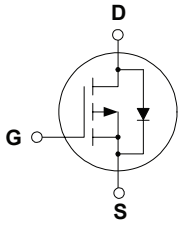
- LED POWER CONTROLLER
- DC-DC & DC-AC CONVERTERS
- HIGH CURRENT, HIGH SPEED SWITCHING
- SOLENOID AND RELAY DRIVERS
- MOTOR CONTROL, AUDIO AMPLIFIERS

## TO220 Pin Configuration




TO-220

(CMP40P03)




## Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | -30 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25°C | Continuous Drain Current[1] | -40 | A |
| $I_D$@$T_C$=100°C | Continuous Drain Current[1] | -20 | A |
| $I_{DM}$ | Pulsed Drain Current[2] | -120 | A |
| $P_D$@$T_C$=25°C | Total Power Dissipation | 80 | 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 |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient[1] | --- | 65 | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-case | --- | 3.72 | °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 | -30 | --- | --- | V |
| $\triangle BV_{DSS}/\triangle T_J$ | BVDSS Temperature Coefficient | Reference to 25℃ , $I_D$=-1mA | --- | -0.01 | --- | V/℃ |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance[2] | $V_{GS}$=-10V, $I_D$=-24A | --- | --- | 14 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =-250 uA | -1 | --- | -3 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=-30V, $V_{GS}$=0V | --- | --- | -1 | uA |
| | | $V_{DS}$=-24V, $V_{GS}$=0V @125℃ | --- | --- | -25 | |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance | $V_{DS}$=-10V, $I_D$=-24A | --- | 35 | --- | S |
| $Q_g$ | Total Gate Charge | $I_D$=-24A<br>$V_{DS}$=-24V<br>$V_{GS}$=-4.5V | --- | 30 | 55 | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 6 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 25 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DS}$=-15V<br>$I_D$=-24A<br>$R_G$=3.3Ω,$V_{GS}$=-10V<br>$R_D$=0.63Ω | --- | 10 | --- | ns |
| $T_r$ | Rise Time | | --- | 65 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 60 | --- | |
| $T_f$ | Fall Time | | --- | 100 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-25V, $V_{GS}$=0V , f=1MHz | --- | 2200 | 3395 | pF |
| $C_{oss}$ | Output Capacitance | | --- | 635 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 560 | --- | |

## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $t_{rr}$ | Reverse Recovery Time[2] | $V_{GS}$=0V , $I_S$=-24A<br>dI/dt=-100A/μs | --- | 39 | --- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | --- | 38 | --- | nC |
| $V_{SD}$ | Diode Forward Voltage[2] | $V_{GS}$=0V , $I_S$=-24A, $T_J$=25℃ | --- | --- | -1.2 | V |

Note :
1.The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%