

### General Description

The 031N03L uses advanced technology and design to provide excellent RDS(ON) .

This device is ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

### Features

- Low On-Resistance
- Fast Switching
- RoHS Compliant

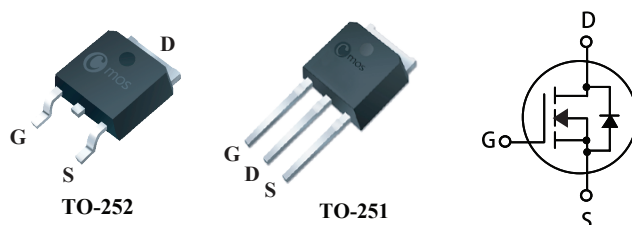
### Product Summary

| BVDSS | RDSON | ID   |
|-------|-------|------|
| 30V   | 3.1mΩ | 120A |

### Applications

- Inverters
- Power Supplies

### TO-252/251 Pin Configuration



| Type       | Package | Marking    |
|------------|---------|------------|
| CMD031N03L | TO-252  | CMD031N03L |
| CMU031N03L | TO-251  | CMU031N03L |

### Absolute Maximum Ratings

| Symbol                 | Parameter                                  | Rating     | Units |
|------------------------|--------------------------------------------|------------|-------|
| $V_{DS}$               | Drain-Source Voltage                       | 30         | V     |
| $V_{GS}$               | Gate-Source Voltage                        | ±20        | V     |
| $I_D@T_C=25^{\circ}C$  | Continuous Drain Current                   | 120        | A     |
| $I_D@T_C=100^{\circ}C$ |                                            | 84         | A     |
| $I_{DM}$               | Pulsed Drain Current                       | 480        | A     |
| $E_{AS}$               | Drain-Source Avalanche Energy <sup>1</sup> | 176        | mJ    |
| $P_D@T_C=25^{\circ}C$  | Total Power Dissipation                    | 100        | W     |
| $T_{STG}$              | Storage Temperature Range                  | -55 to 175 | °C    |
| $T_J$                  | Operating Junction Temperature Range       | -55 to 175 | °C    |

### Thermal Data

| Symbol          | Parameter                                              | Typ. | Max. | Unit |
|-----------------|--------------------------------------------------------|------|------|------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient(minimal footprint) | ---  | 75   | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-case                       | ---  | 1.6  | °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    | $V_{GS}=0V$ , $I_D=250\mu A$          | 30   | ---  | ---       | V         |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V$ , $I_D=30A$              | ---  | 2.7  | 3.1       | $m\Omega$ |
|              |                                   | $V_{GS}=4.5V$ , $I_D=25A$             | ---  | 3.5  | 4.4       |           |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}$ , $I_D=250\mu A$      | 0.8  | ---  | 2         | V         |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=30V$ , $V_{GS}=0V$            | ---  | ---  | 1         | $\mu A$   |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS}=\pm 20V$ , $V_{DS}=0V$        | ---  | ---  | $\pm 100$ | nA        |
| $g_{fs}$     | Forward Transconductance          | $V_{DS}=5V$ , $I_D=30A$               | ---  | 40   | ---       | S         |
| $R_g$        | Gate Resistance                   | $V_{DS}=0V$ , $V_{GS}=0V$ , $f=1MHz$  | ---  | 3.3  | ---       | $\Omega$  |
| $Q_g$        | Total Gate Charge                 | $I_D=30A$                             | ---  | 25   | ---       | nC        |
| $Q_{gs}$     | Gate-Source Charge                | $V_{DS}=15V$                          | ---  | 12   | ---       |           |
| $Q_{gd}$     | Gate-Drain Charge                 | $V_{GS}=0$ to $4.5V$                  | ---  | 6    | ---       |           |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DD}=15V$                          | ---  | 10   | ---       | ns        |
| $T_r$        | Rise Time                         | $I_D=30A$                             | ---  | 6    | ---       |           |
| $T_{d(off)}$ | Turn-Off Delay Time               | $R_{GEN}=1.6\Omega$                   | ---  | 35   | ---       |           |
| $T_f$        | Fall Time                         | $V_{GS}=10V$                          | ---  | 5    | ---       |           |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=25V$ , $V_{GS}=0V$ , $f=1MHz$ | ---  | 2500 | ---       | pF        |
| $C_{oss}$    | Output Capacitance                |                                       | ---  | 710  | ---       |           |
| $C_{rss}$    | Reverse Transfer Capacitance      |                                       | ---  | 80   | ---       |           |

### Diode Characteristics

| Symbol   | Parameter                 | Conditions                   | Min. | Typ. | Max. | Unit |
|----------|---------------------------|------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current | $V_G=V_D=0V$ , Force Current | ---  | ---  | 120  | A    |
| $I_{SM}$ | Pulsed Source Current     |                              | ---  | ---  | 480  | A    |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V$ , $I_S=30A$      | ---  | 0.84 | 1.2  | V    |

Notes:

1.The EAS data shows Max. rating .The test condition is  $V_{DS}=25V$  ,  $V_{GS}=10V$  ,  $L=0.5mH$  ,  $I_{AS}=26.6A$ .

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.

Typical Characteristics

