# CMP063N15A/CMB063N15A/CMI063N15A/CMF063N15A

**150V, 5.7mΩ typ., 157A N-Channel MOSFET**

## General Description

The 063N15A uses advanced SGT technology to provide excellent RDS(ON).This device is suitable for use as a Battery protection or in other Switching application.

## Product Summary

| BVDSS | $R_{DS(on)}$ max. | ID |
|---|---|---|
| 150V | 6.5mΩ | 157A |

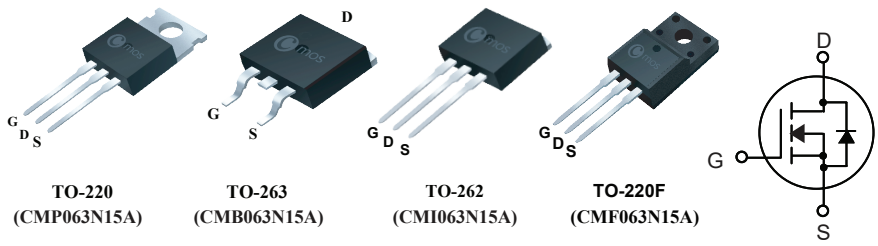
## Applications

- Motor control and drive
- Battery management
- Uninterrupible Power Supplies

## Features

- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

## TO-220/263/262/220F Pin Configuration




TO-220 (CMP063N15A) | TO-263 (CMB063N15A) | TO-262 (CMI063N15A) | TO-220F (CMF063N15A)

## Absolute Maximum Ratings

| Symbol | Parameter | 220/263/262 | 220F | Units |
|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 150 | | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current | 157 | 157* | A |
| $I_D$@$T_C$=100℃ | Continuous Drain Current | 110 | 110* | A |
| $I_{DM}$ | Pulsed Drain Current | 628 | 628* | A |
| EAS | Single Pulse Avalanche Energy (Note 1) | 2030 | | mJ |
| $P_D$@$T_C$=25℃ | Total Power Dissipation | 375 | 45 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 175 | | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 175 | | ℃ |

* Drain current limited by maximum junction temperature.

## Thermal Data

| Symbol | Parameter | 220/263/262 | 220F | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient Max. (Note 2) | 33 | 33 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-case Max. | 0.40 | 3.33 | ℃/W |

150V, 5.7mΩ typ., 157A N-Channel MOSFET

## 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 | 150 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}$=10V , $I_D$=20A | --- | 5.7 | 6.5 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250μA | 2.5 | --- | 4.5 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=150V , $V_{GS}$=0V | --- | --- | 1 | uA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$= ±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance | $V_{DS}$=10V, $I_D$ =20A | --- | 45 | --- | S |
| $R_g$ | Gate Resistance | $V_{DS}$=0V , $V_{GS}$=0V , f=1MHz | --- | 1.7 | --- | Ω |
| $Q_g$ | Total Gate Charge | $V_{DS}$=75V , $I_D$=20A<br>$V_{GS}$=10V<br>(Note 3) | --- | 61 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 18.3 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 15.3 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DS}$=75V , $V_{GS}$=10V , $I_D$=20A<br>$R_G$ =3Ω<br>(Note 3) | --- | 6 | --- | ns |
| $T_r$ | Rise Time | | --- | 28 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 38 | --- | |
| $T_f$ | Fall Time | | --- | 20 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=25V , $V_{GS}$=0V , f=1MHz | --- | 4250 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 2800 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 170 | --- | |

## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current | $V_G$=$V_D$=0V , Force Current | --- | --- | 157 | A |
| $I_{SM}$ | Pulsed Source Current | | --- | --- | 628 | A |
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V , $I_S$=20A ,$T_J$=25℃ | --- | 0.79 | 1.2 | V |
| $t_{rr}$ | Reverse Recovery Time | di/dt = 100A/μs<br>$T_J$ =25℃ , $I_F$ =20A (Note 3) | --- | 92 | --- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | --- | 337 | --- | nC |

Note :

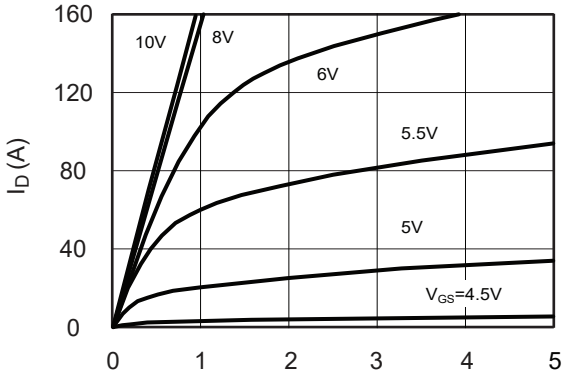
1.The EAS data shows Max. rating .The test condition is $V_{DS}$=80V , $V_{GS}$=10V , L=5mH , $I_{AS}$=28.5A.

2.Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.

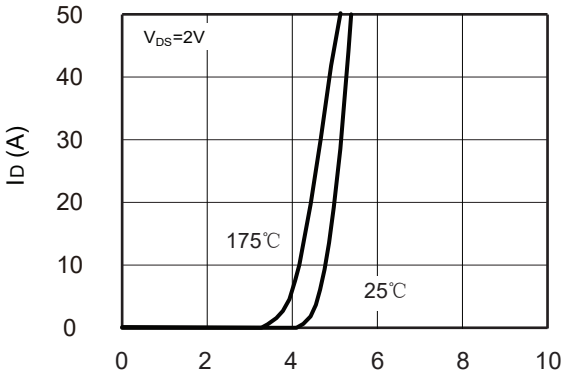
3. Defined by design, not subject to production.

This product has been designed and qualified for the counsumer market.
Cmos assumes no liability for customers' product design or applications.
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.Please refer to the latest version of specification.

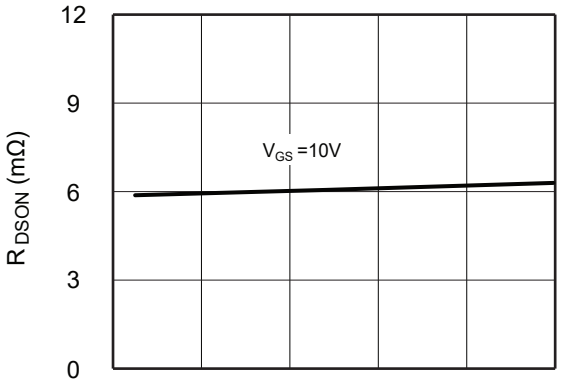
## Typical Characteristics



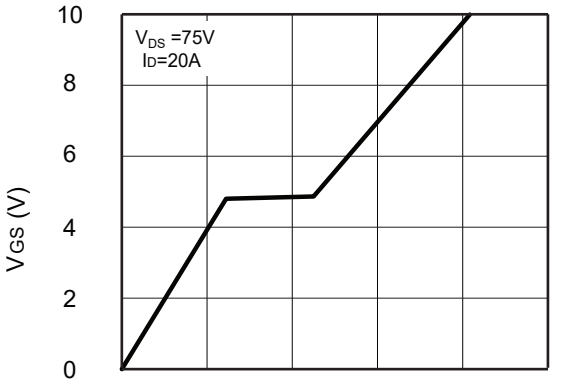

Output Characteristics



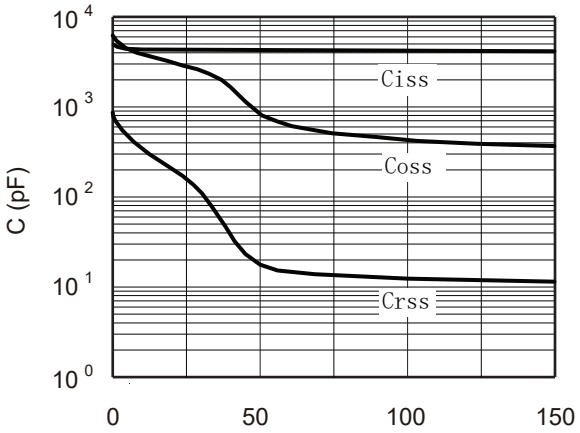

transfer characteristics



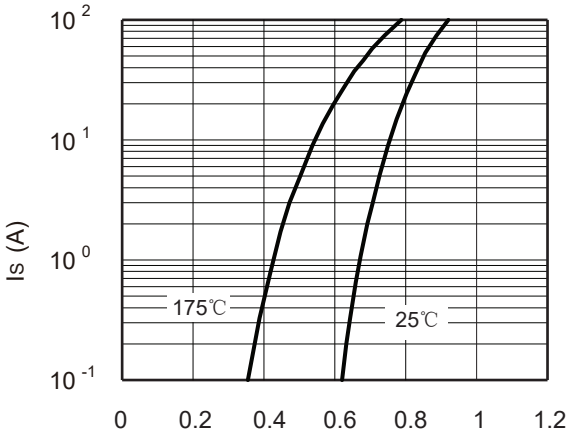

drain-source on-resistance




Gate charge vs gate-source voltage



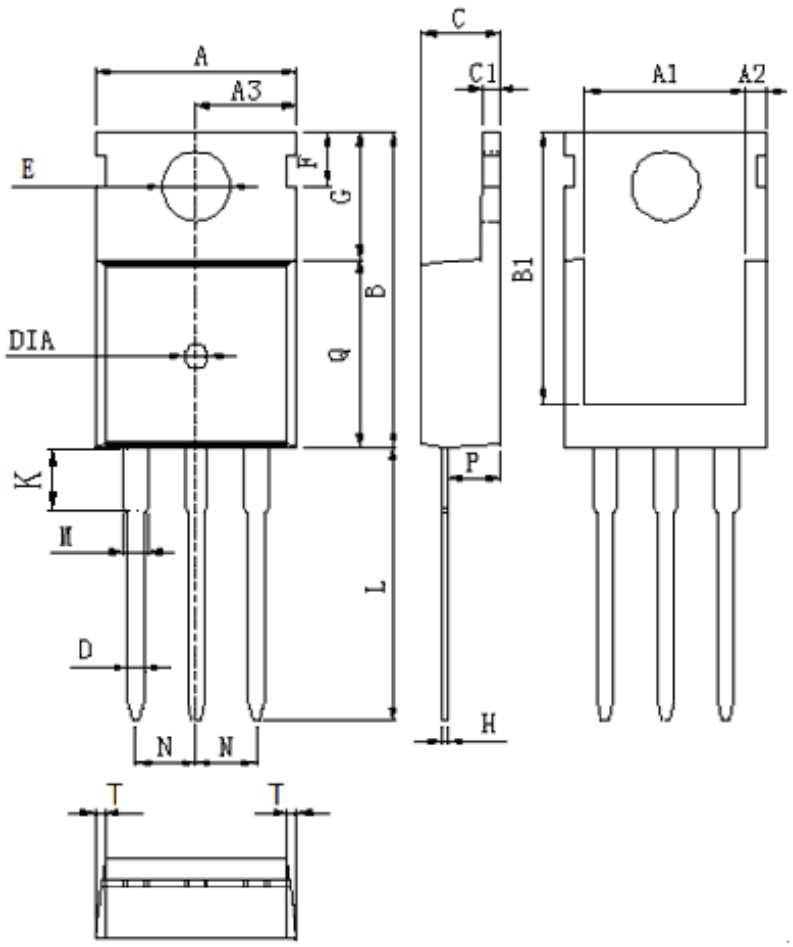

Capacitance Characteristics




Body-Diode Characteristics

## Package Dimension

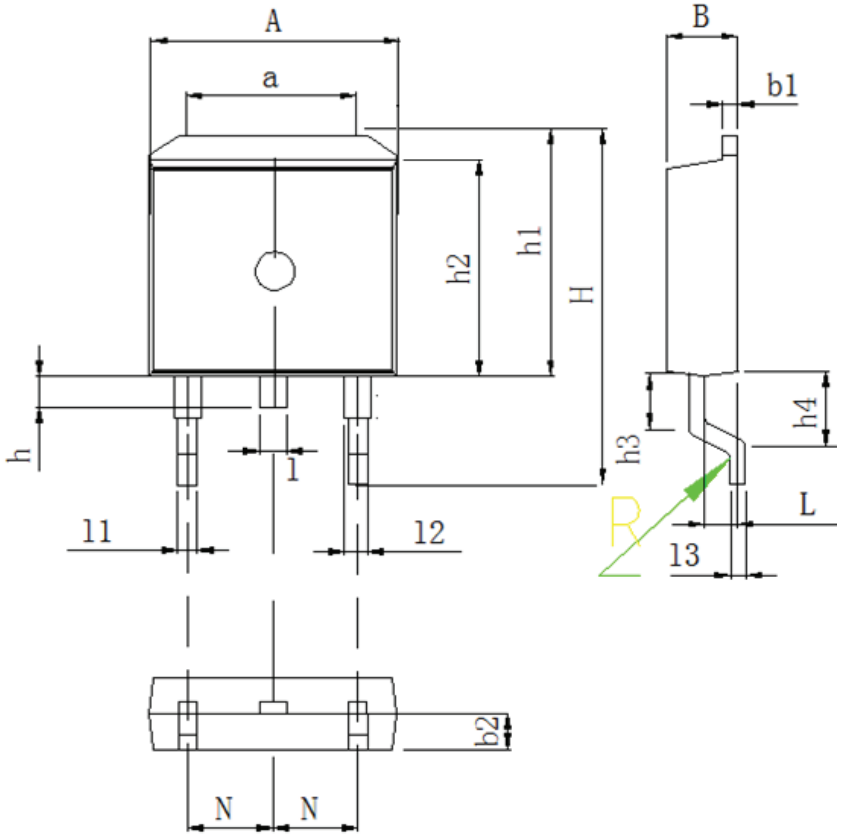
TO-220 Unit :mm




| DIM | MILLIMETERS |
|---|---|
| A | 10.0±0.3 |
| A1 | 8.64±0.2 |
| A2 | 1.15±0.1 |
| A3 | 5.0±0.2 |
| B | 15.8±0.4 |
| B1 | 13.2±0.3 |
| C | 4.56±0.1 |
| C1 | 1.3±0.2 |
| D | 0.8±0.2 |
| E | 3.6±0.2 |
| F | 2.95±0.3 |
| G | 6.5±0.3 |
| H | 0.5±0.1 |
| K | 3.1±0.2 |
| L | 13.2±0.4 |
| M | 1.25±0.1 |
| N | 2.54±0.1 |
| P | 2.4±0.3 |
| Q | 9.0±0.3 |
| T | W:0.35 |
| DIA | ⊙1.5(deep 0.2) |

## Package Dimension

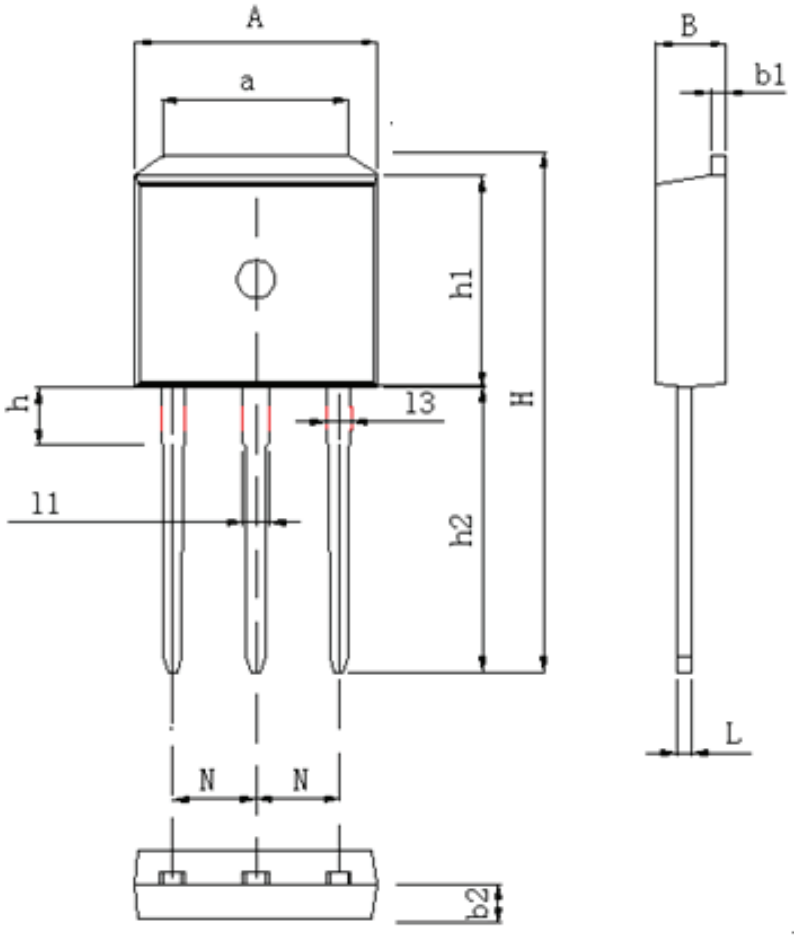
TO-263 Unit :mm




| DIM | MILLIMETERS |
|---|---|
| A | 9.8±0.2 |
| a | 7.4±0.4 |
| B | 4.5±0.2 |
| b1 | 1.3±0.05 |
| b2 | 2.4±0.2 |
| H | 15.5±0.3 |
| h | 1.54±0.2 |
| h1 | 10.5±0.2 |
| h2 | 9.2±0.1 |
| h3 | 1.54±0.2 |
| h4 | 2.7±0.2 |
| L | 2.4±0.2 |
| l | 1.3±0.1 |
| l1 | 0.8±0.1 |
| l2 | 1.3±0.1 |
| l3 | 0.5±0.1 |
| N | 2.54±0.1 |
| R | 0.5R±0.05 |

## Package Dimension

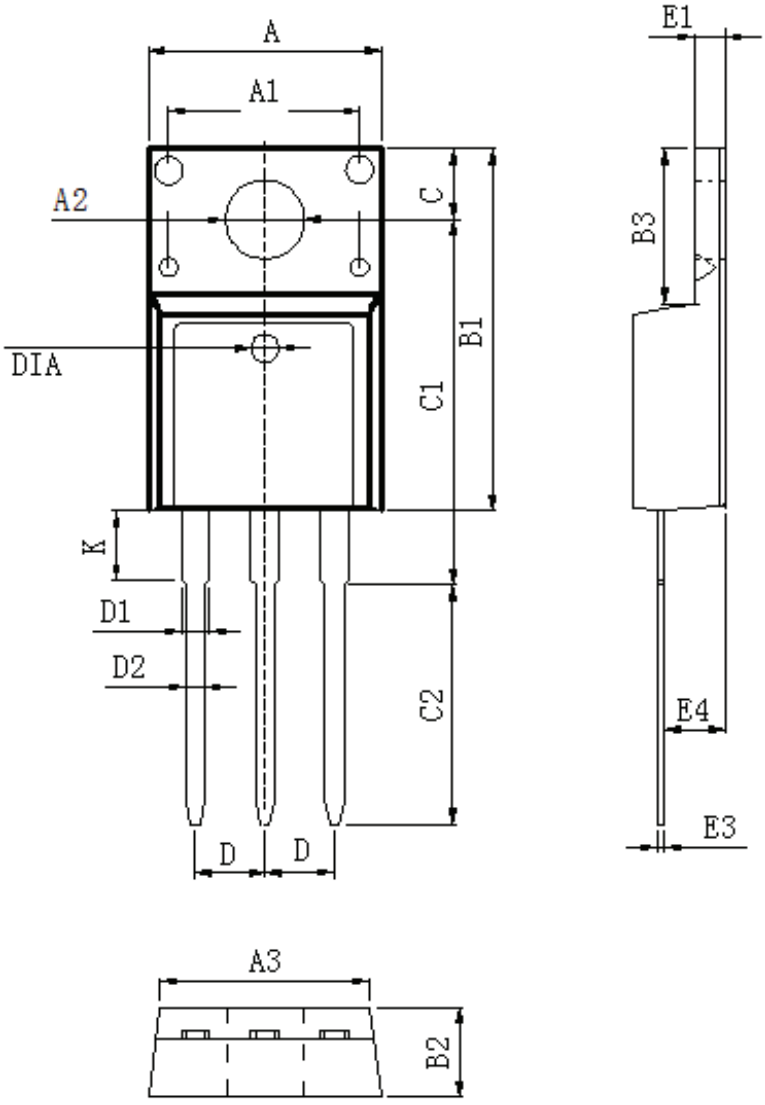
TO-262 Unit :mm




| DIM | MILLIMETERS |
|---|---|
| A | 9.98±0.2 |
| a | 7.4±0.4 |
| B | 4.5±0.2 |
| b1 | 1.3±0.05 |
| b2 | 2.4±0.2 |
| H | 23.9±0.3 |
| h | 3.1±0.2 |
| h1 | 9.16±0.2 |
| h2 | 13.2±0.2 |
| L | 0.5±0.1 |
| l1 | 1.3±0.1 |
| l2 | 0.8±0.1 |
| N | 2.45±0.1 |

## Package Dimension

TO-220F Unit :mm




| DIM | MILLIMETERS |
|---|---|
| A | 10.16±0.3 |
| A1 | 7.00±0.1 |
| A2 | 3.3±0.2 |
| A3 | 9.5±0.2 |
| B1 | 15.87±0.3 |
| B2 | 4.7±0.2 |
| B3 | 6.68±0.4 |
| C | 3.3±0.2 |
| C1 | 12.57±0.3 |
| C2 | 10.02±0.5 |
| D | 2.54±0.05 |
| D1 | 1.28±0.2 |
| D2 | 0.8±0.1 |
| K | 3.1±0.3 |
| E1 | 2.54±0.1 |
| E3 | 0.5±0.1 |
| E4 | 2.76±0.2 |
| DIA | ⊙1.5(deep 0.2) |