

## N-Channel Enhancement Mode Field Effect Transistor

## General Description

The 130N07 is N-Channel 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

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

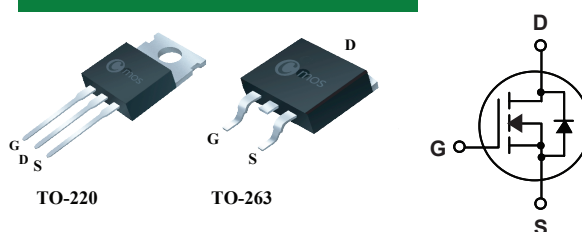
## Product Summary

| BVDSS | R <sub>DS(on)</sub> max. | ID   |
|-------|--------------------------|------|
| 70V   | 6.0mΩ                    | 130A |

## Applications

- Motor Control
- DC-DC converters
- Switching applications

## TO-220/263 Pin Configuration



| Type      | Package | Marking   |
|-----------|---------|-----------|
| CMP130N07 | TO-220  | CMP130N07 |
| CMB130N07 | TO-263  | CMB130N07 |

## Absolute Maximum Ratings

| Symbol                                | Parameter                                  | Rating     | Units |
|---------------------------------------|--------------------------------------------|------------|-------|
| V <sub>DS</sub>                       | Drain-Source Voltage                       | 70         | V     |
| V <sub>GS</sub>                       | Gate-Source Voltage                        | ±20        | V     |
| I <sub>D</sub> @T <sub>C</sub> =25°C  | Continuous Drain Current                   | 130        | A     |
| I <sub>D</sub> @T <sub>C</sub> =100°C | Continuous Drain Current                   | 100        | A     |
| I <sub>DM</sub>                       | Pulsed Drain Current                       | 520        | A     |
| EAS                                   | Single Pulse Avalanche Energy <sup>1</sup> | 722        | mJ    |
| P <sub>D</sub> @T <sub>C</sub> =25°C  | Total Power Dissipation                    | 200        | W     |
| T <sub>STG</sub>                      | Storage Temperature Range                  | -55 to 175 | °C    |
| T <sub>J</sub>                        | Operating Junction Temperature Range       | -55 to 175 | °C    |

## Thermal Data

| Symbol           | Parameter                           | Typ. | Max. | Unit |
|------------------|-------------------------------------|------|------|------|
| R <sub>θJA</sub> | Thermal Resistance Junction-ambient | ---  | 62   | °C/W |
| R <sub>θJC</sub> | Thermal Resistance Junction-case    | ---  | 0.75 | °C/W |

## N-Channel Enhancement Mode Field Effect Transistor

Electrical Characteristics ( $T_J=25^{\circ}\text{C}$  , unless otherwise noted)

| Symbol       | Parameter                         | Conditions                                   | Min. | Typ. | Max.      | Unit       |
|--------------|-----------------------------------|----------------------------------------------|------|------|-----------|------------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage    | $V_{GS}=0V$ , $I_D=250\mu A$                 | 70   | ---  | ---       | V          |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V$ , $I_D=30A$                     | ---  | ---  | 6         | m $\Omega$ |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}$ , $I_D=250\mu A$             | 2    | ---  | 4         | V          |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=70V$ , $V_{GS}=0V$                   | ---  | ---  | 1         | $\mu A$    |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS}=\pm 20V$ , $V_{DS}=0V$               | ---  | ---  | $\pm 100$ | nA         |
| $g_{fs}$     | Forward Transconductance          | $V_{DS}=10V$ , $I_D=32A$                     | ---  | 28   | ---       | S          |
| $R_g$        | Gate Resistance                   | $V_{DS}=0V$ , $V_{GS}=0V$ , $f=1\text{MHz}$  | ---  | 2.2  | ---       | $\Omega$   |
| $Q_g$        | Total Gate Charge                 | $I_D=30A$                                    | ---  | 126  | ---       | nC         |
| $Q_{gs}$     | Gate-Source Charge                | $V_{DD}=35V$                                 | ---  | 25   | ---       |            |
| $Q_{gd}$     | Gate-Drain Charge                 | $V_{GS}=10V$                                 | ---  | 50   | ---       |            |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DD}=35V$                                 | ---  | 21   | ---       | ns         |
| $T_r$        | Rise Time                         | $I_D=2A$                                     | ---  | 20   | ---       |            |
| $T_{d(off)}$ | Turn-Off Delay Time               | $R_G=2.5\Omega$                              | ---  | 71   | ---       |            |
| $T_f$        | Fall Time                         | $V_{GS}=10V$                                 | ---  | 50   | ---       |            |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=25V$ , $V_{GS}=0V$ , $f=1\text{MHz}$ | ---  | 5900 | ---       | pF         |
| $C_{oss}$    | Output Capacitance                |                                              | ---  | 411  | ---       |            |
| $C_{rss}$    | Reverse Transfer Capacitance      |                                              | ---  | 316  | ---       |            |

## Diode Characteristics

| Symbol   | Parameter                 | Conditions                                         | Min. | Typ. | Max. | Unit |
|----------|---------------------------|----------------------------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current | $V_G=V_D=0V$ , Force Current                       | ---  | ---  | 130  | A    |
| $I_{SM}$ | Pulsed Source Current     |                                                    | ---  | ---  | 520  | A    |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V$ , $I_S=50A$ , $T_J=25^{\circ}\text{C}$ | ---  | ---  | 1.2  | V    |

Note :

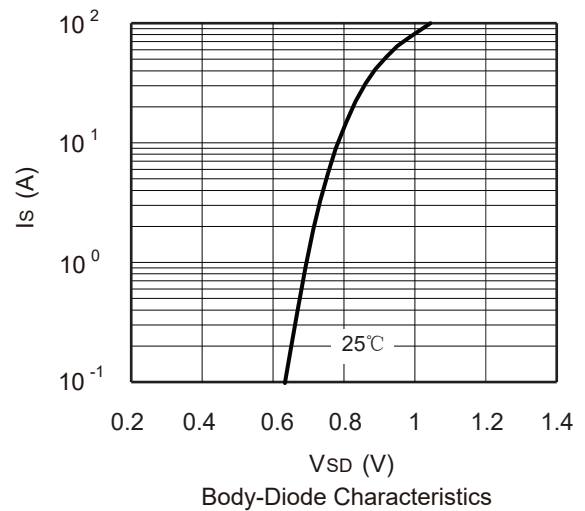
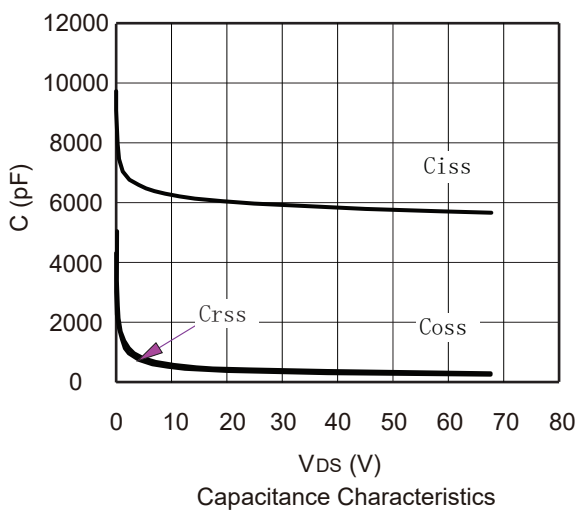
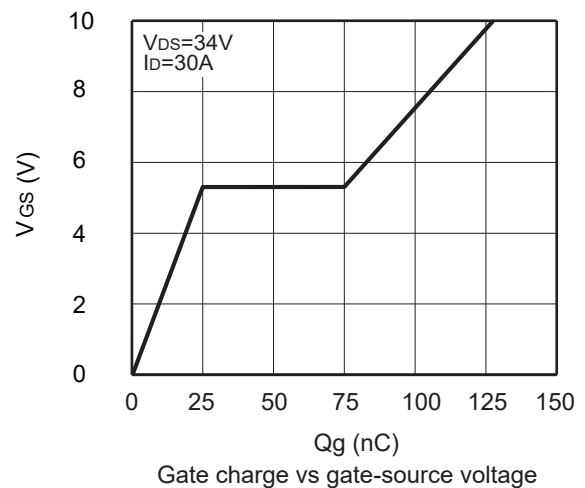
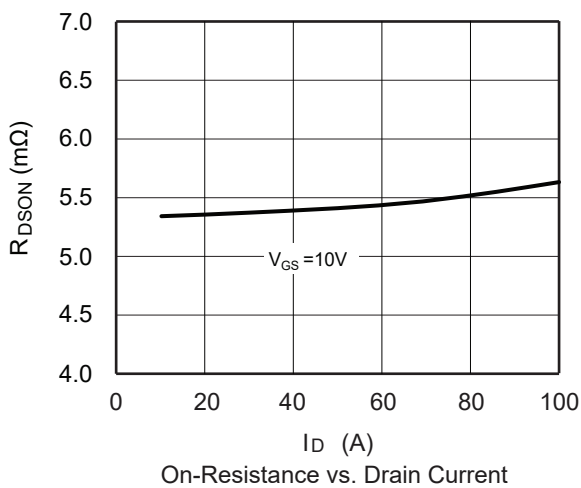
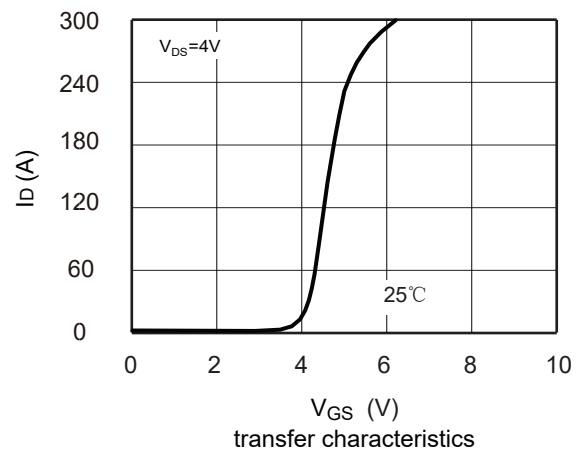
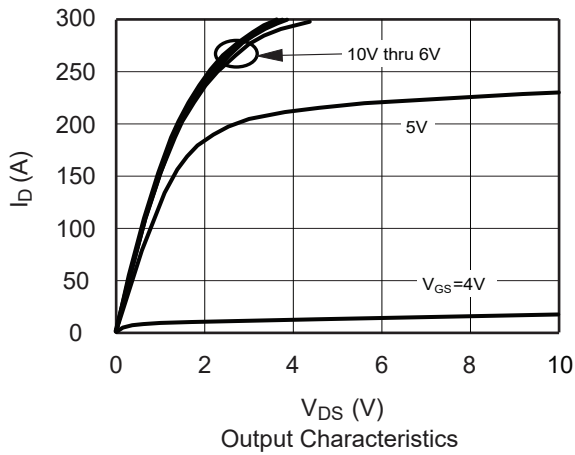
1.The EAS data shows Max. rating . The test condition is  $V_{DD}=40V$  ,  $V_{GS}=10V$  ,  $L=1\text{mH}$  ,  $I_{AS}=38A$ .

This product has been designed and qualified for the consumer market.

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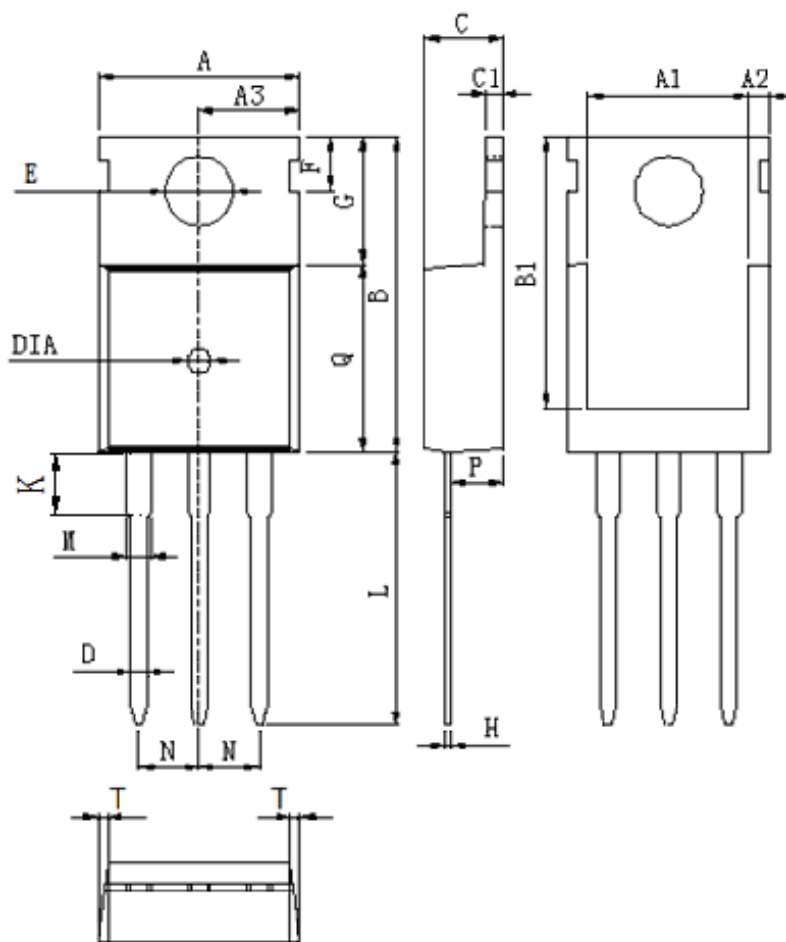
Typical Characteristics



## Package Dimension

TO-220

Unit :mm

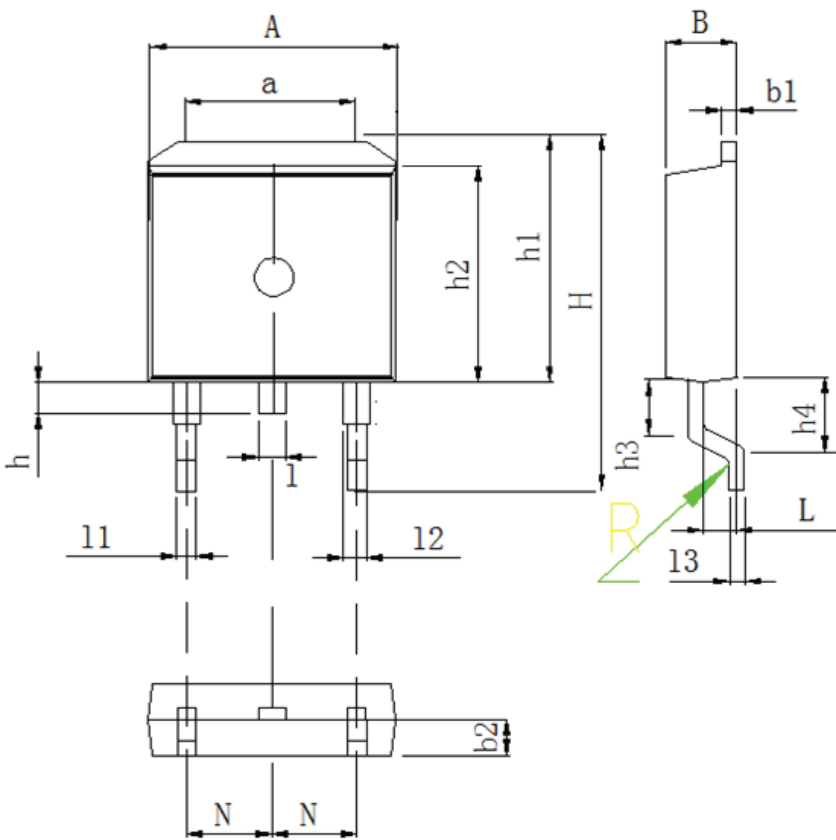


| DIM | MILLIMETERS            |
|-----|------------------------|
| A   | $10.0 \pm 0.3$         |
| A1  | $8.64 \pm 0.2$         |
| A2  | $1.15 \pm 0.1$         |
| A3  | $5.0 \pm 0.2$          |
| B   | $15.8 \pm 0.4$         |
| B1  | $13.2 \pm 0.3$         |
| C   | $4.56 \pm 0.1$         |
| C1  | $1.3 \pm 0.2$          |
| D   | $0.8 \pm 0.2$          |
| E   | $3.6 \pm 0.2$          |
| F   | $2.95 \pm 0.3$         |
| G   | $6.5 \pm 0.3$          |
| H   | $0.5 \pm 0.1$          |
| K   | $3.1 \pm 0.2$          |
| L   | $13.2 \pm 0.4$         |
| M   | $1.25 \pm 0.1$         |
| N   | $2.54 \pm 0.1$         |
| P   | $2.4 \pm 0.3$          |
| Q   | $9.0 \pm 0.3$          |
| T   | W:0.35                 |
| DIA | $\odot 1.5$ (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     |
| 1   | 1.3±0.1     |
| 11  | 0.8±0.1     |
| 12  | 1.3±0.1     |
| 13  | 0.5±0.1     |
| N   | 2.54±0.1    |
| R   | 0.5R±0.05   |