

### General Description

The 200N06A uses advanced trench technology to provide excellent RDS(ON). This device is ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

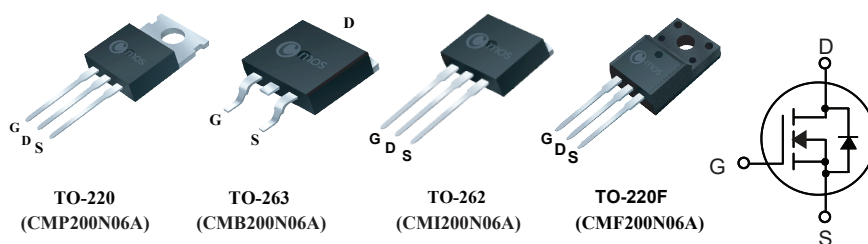
### Product Summary

| BVDSS | R <sub>DS(on)</sub> max. | ID   |
|-------|--------------------------|------|
| 60V   | 2.3mΩ                    | 180A |

### Applications

- Motor control and drive
- Battery management

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



### Features

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

### Absolute Maximum Ratings

| Symbol                                | Parameter                              | 220/263/262 | 220F | Units |
|---------------------------------------|----------------------------------------|-------------|------|-------|
| V <sub>DS</sub>                       | Drain-Source Voltage                   | 60          |      | V     |
| V <sub>GS</sub>                       | Gate-Source Voltage                    | ±20         |      | V     |
| I <sub>D</sub> @T <sub>C</sub> =25°C  | Continuous Drain Current               | 180         | 180* | A     |
| I <sub>D</sub> @T <sub>C</sub> =100°C | Continuous Drain Current               | 125         | 125* | A     |
| I <sub>DM</sub>                       | Pulsed Drain Current                   | 720         | 720* | A     |
| EAS                                   | Single Pulse Avalanche Energy (Note 1) | 2888        |      | mJ    |
| P <sub>D</sub> @T <sub>C</sub> =25°C  | Total Power Dissipation                | 330         | 50   | W     |
| T <sub>STG</sub>                      | Storage Temperature Range              | -55 to 150  |      | °C    |
| T <sub>J</sub>                        | Operating Junction Temperature Range   | -55 to 150  |      | °C    |

\* Drain current limited by maximum junction temperature.

### Thermal Data

| Symbol           | Parameter                                                | 220/263/262 | 220F | Unit |
|------------------|----------------------------------------------------------|-------------|------|------|
| R <sub>θJA</sub> | Thermal Resistance Junction-ambient Max.(min. footprint) | 84          | 84   | °C/W |
| R <sub>θJC</sub> | Thermal Resistance Junction-case Max.                    | 0.38        | 2.5  | °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    | $V_{GS}=0V$ , $I_D=250\mu A$                                    | 60   | ---  | ---  | V    |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V$ , $I_D=80A$                                        | ---  | 2.0  | 2.3  | mΩ   |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}$ , $I_D=250\mu A$                                | 2    | ---  | 4    | V    |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=60V$ , $V_{GS}=0V$                                      | ---  | ---  | 1    | μA   |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS}=\pm 20V$ , $V_{DS}=0V$                                  | ---  | ---  | ±100 | nA   |
| $g_{fs}$     | Forward Transconductance          | $V_{DS}=10V$ , $I_D=20A$                                        | ---  | 48   | ---  | S    |
| $R_g$        | Gate Resistance                   | $V_{DS}=0V$ , $V_{GS}=0V$ , $f=1\text{MHz}$                     | ---  | 1.2  | ---  | Ω    |
| $Q_g$        | Total Gate Charge                 | $V_{DS}=30V$ , $I_D=80A$<br>$V_{GS}=10V$                        | ---  | 183  | ---  | nC   |
| $Q_{gs}$     | Gate-Source Charge                |                                                                 | ---  | 45   | ---  |      |
| $Q_{gd}$     | Gate-Drain Charge                 |                                                                 | ---  | 75   | ---  |      |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DD}=30V$ , $I_D=80A$<br>$R_{G\_ext}=3\Omega$ , $V_{GS}=10V$ | ---  | 31   | ---  | ns   |
| $T_r$        | Rise Time                         |                                                                 | ---  | 118  | ---  |      |
| $T_{d(off)}$ | Turn-Off Delay Time               |                                                                 | ---  | 71   | ---  |      |
| $T_f$        | Fall Time                         |                                                                 | ---  | 149  | ---  |      |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=25V$ , $V_{GS}=0V$ , $f=1\text{MHz}$                    | ---  | 8050 | ---  | pF   |
| $C_{oss}$    | Output Capacitance                |                                                                 | ---  | 1400 | ---  |      |
| $C_{rss}$    | Reverse Transfer Capacitance      |                                                                 | ---  | 1000 | ---  |      |

**Diode Characteristics**

| Symbol        | Parameter                        | Conditions                                         | Min. | Typ. | Max. | Unit |
|---------------|----------------------------------|----------------------------------------------------|------|------|------|------|
| $I_S$         | Diode continuous forward current | $V_G=V_D=0V$ , Force Current                       | ---  | ---  | 180  | A    |
| $I_{S,pulse}$ | Diode pulse current              |                                                    | ---  | ---  | 720  | A    |
| $V_{SD}$      | Diode Forward Voltage            | $V_{GS}=0V$ , $I_F=80A$ , $T_J=25^{\circ}\text{C}$ | ---  | 0.82 | 1.2  | V    |

Note :

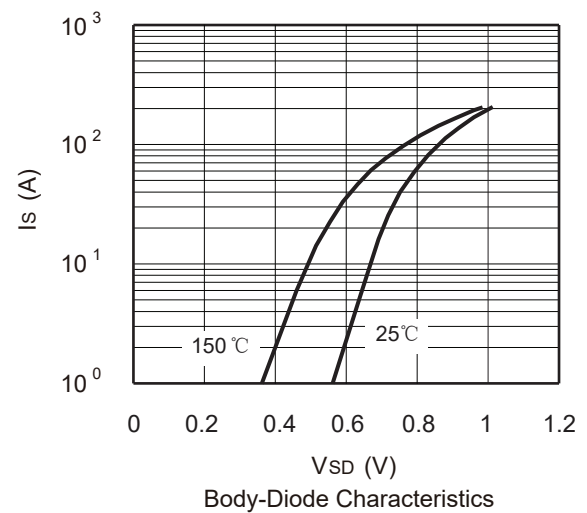
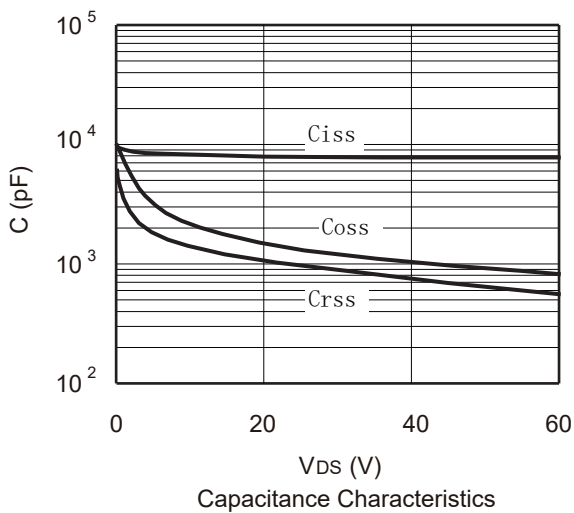
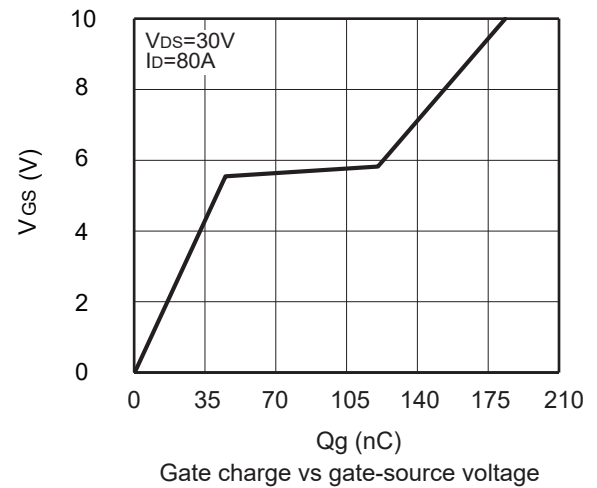
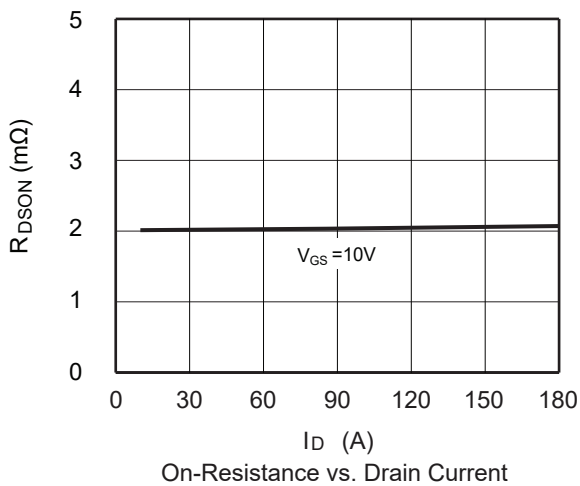
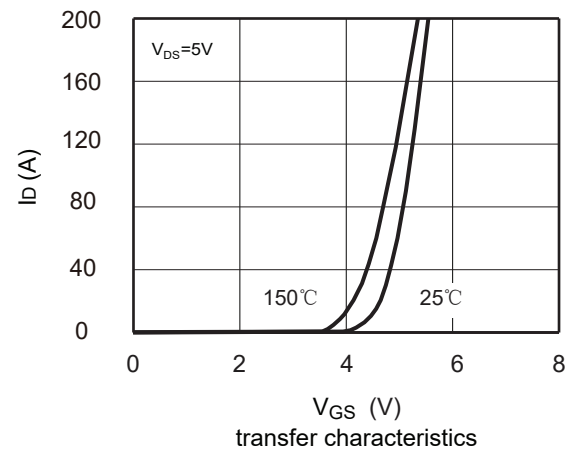
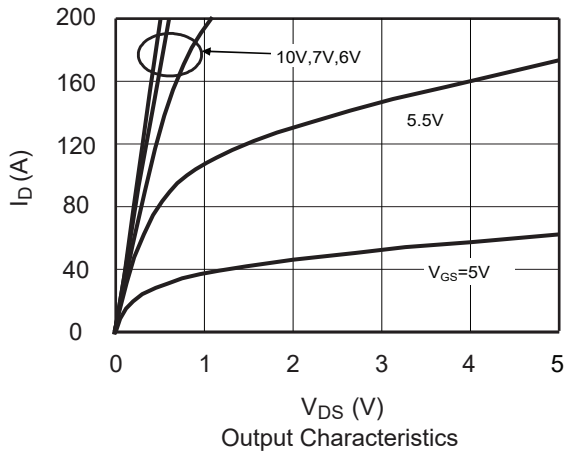
1.The EAS data shows Max. rating .The test condition is  $V_{DS}=55V$  ,  $V_{GS}=10V$  ,  $L=1\text{mH}$  ,  $I_{AS}=76A$ .

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.Please refer to the latest version of specification.

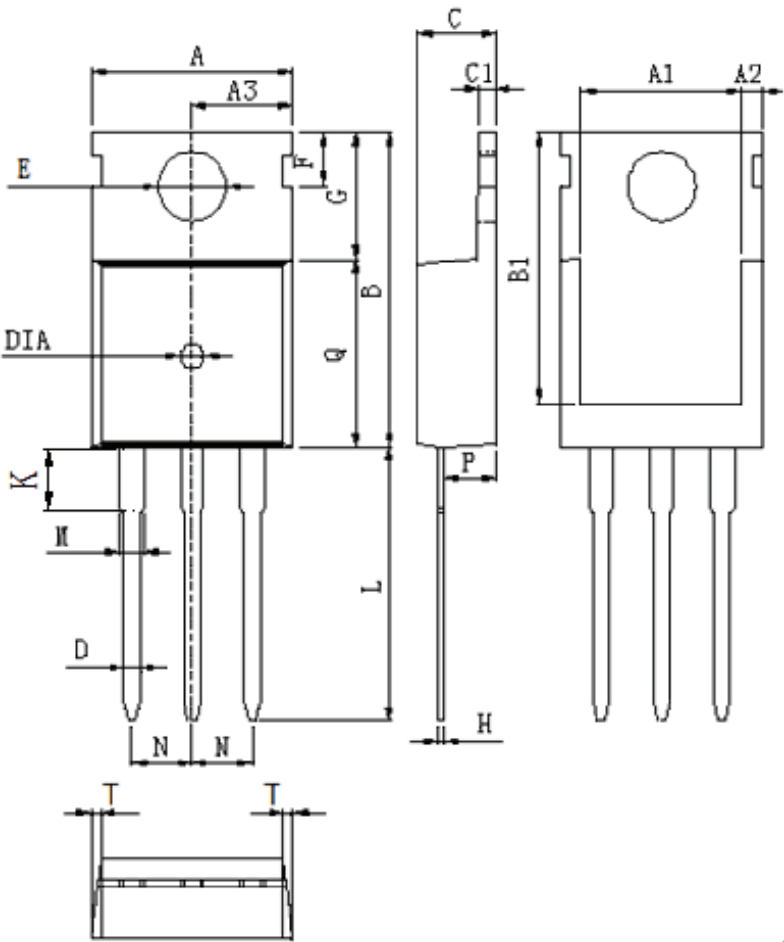
Typical Characteristics



Package Dimension

TO-220

Unit :mm

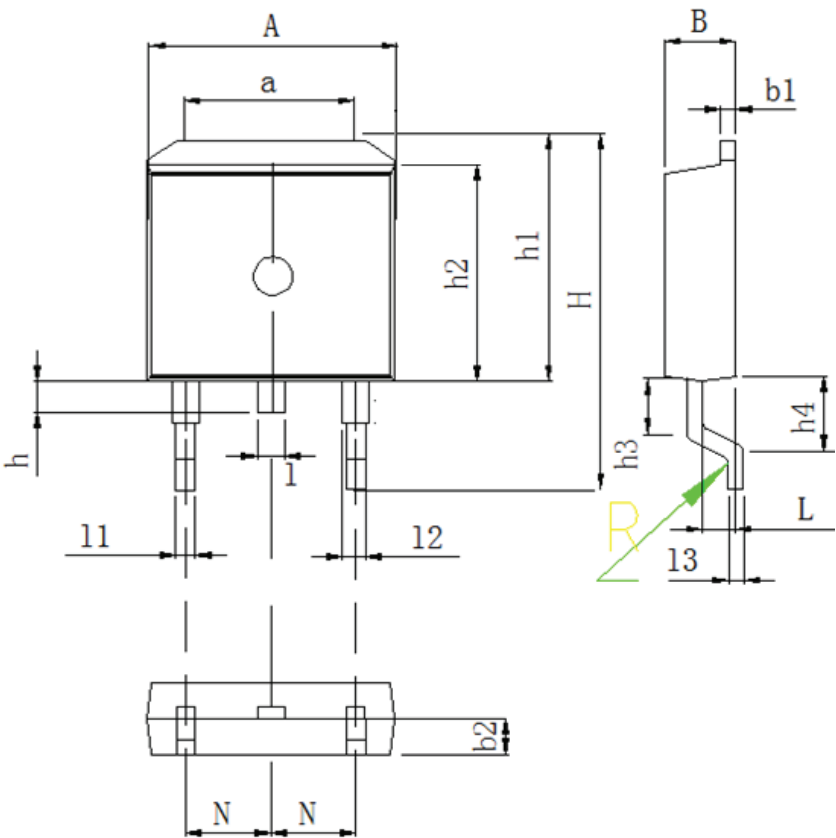


| DIM | MILLIMETERS    |
|-----|----------------|
| A   | 10.0±0.3       |
| A1  | 8.64±0.2       |
| A2  | 1.15±0.1       |
| A3  | 5.0±0.2        |
| B   | 15.8±0.4       |
| B1  | 13.2±0.3       |
| C   | 4.56±0.1       |
| C1  | 1.3±0.2        |
| D   | 0.8±0.2        |
| E   | 3.6±0.2        |
| 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

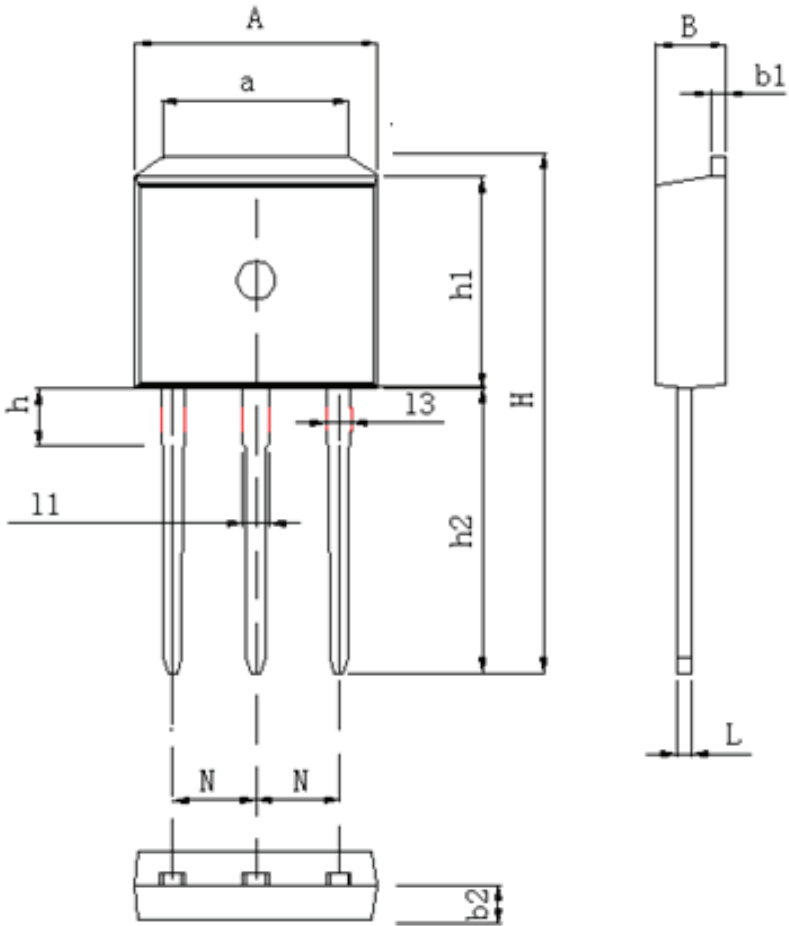


| DIM | MILLIMETERS     |
|-----|-----------------|
| A   | $9.8 \pm 0.2$   |
| a   | $7.4 \pm 0.4$   |
| B   | $4.5 \pm 0.2$   |
| b1  | $1.3 \pm 0.05$  |
| b2  | $2.4 \pm 0.2$   |
| H   | $15.5 \pm 0.3$  |
| h   | $1.54 \pm 0.2$  |
| h1  | $10.5 \pm 0.2$  |
| h2  | $9.2 \pm 0.1$   |
| h3  | $1.54 \pm 0.2$  |
| h4  | $2.7 \pm 0.2$   |
| L   | $2.4 \pm 0.2$   |
| 1   | $1.3 \pm 0.1$   |
| 11  | $0.8 \pm 0.1$   |
| 12  | $1.3 \pm 0.1$   |
| 13  | $0.5 \pm 0.1$   |
| N   | $2.54 \pm 0.1$  |
| R   | $0.5R \pm 0.05$ |

Package Dimension

TO-262

Unit :mm

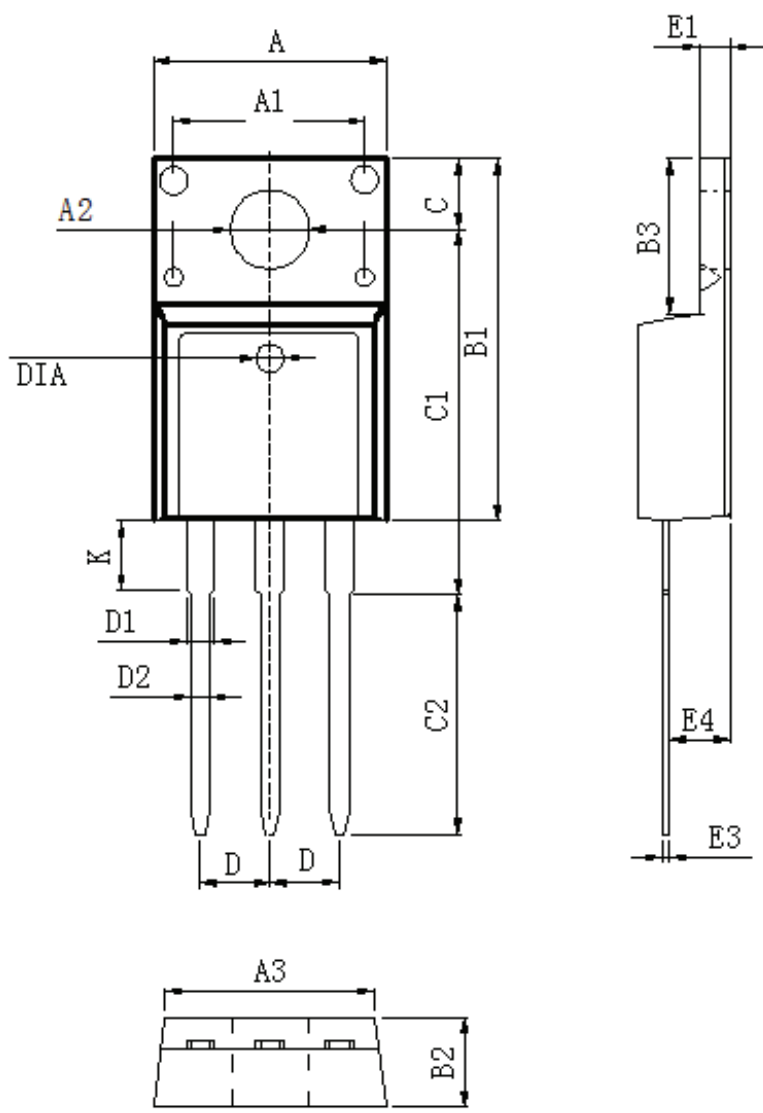


| DIM | MILLIMETERS    |
|-----|----------------|
| A   | $9.98 \pm 0.2$ |
| a   | $7.4 \pm 0.4$  |
| B   | $4.5 \pm 0.2$  |
| b1  | $1.3 \pm 0.05$ |
| b2  | $2.4 \pm 0.2$  |
| H   | $23.9 \pm 0.3$ |
| h   | $3.1 \pm 0.2$  |
| h1  | $9.16 \pm 0.2$ |
| h2  | $13.2 \pm 0.2$ |
| L   | $0.5 \pm 0.1$  |
|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

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) |