

### General Description

The CMSA80N02 uses advanced trench technology to provide excellent RDS(ON). This device is suitable for use in PWM, load switching and general purpose applications.

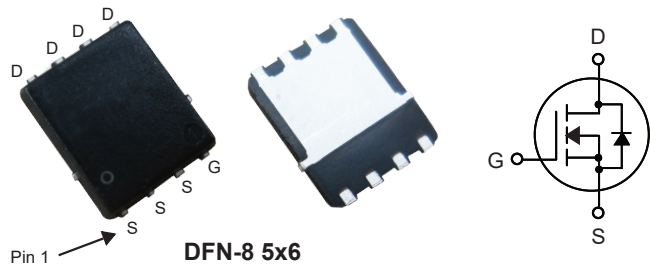
### Product Summary

| BVDSS | RDS(on) max. | ID  |
|-------|--------------|-----|
| 20V   | 6.5mΩ        | 80A |

### Applications

- DC-DC Converters

### DFN-8 5x6 Pin Configuration



| Type      | Package   | Marking   |
|-----------|-----------|-----------|
| CMSA80N02 | DFN-8 5x6 | CMSA80N02 |

### Features

- Low On-Resistance
- 100% avalanche tested
- Small Footprint (5x6 mm) for Compact Design
- RoHS Compliant

### Absolute Maximum Ratings

| Symbol                      | Parameter                                  | Rating     | Units            |
|-----------------------------|--------------------------------------------|------------|------------------|
| $V_{DS}$                    | Drain-Source Voltage                       | 20         | V                |
| $V_{GS}$                    | Gate-Source Voltage                        | $\pm 12$   | V                |
| $I_D@T_C=25^\circ\text{C}$  | Continuous Drain Current                   | 80         | A                |
| $I_D@T_C=100^\circ\text{C}$ | Continuous Drain Current                   | 55         | A                |
| $I_{DM}$                    | Pulsed Drain Current                       | 320        | A                |
| EAS                         | Single Pulse Avalanche Energy <sup>1</sup> | 45         | mJ               |
| $P_D@T_C=25^\circ\text{C}$  | Total Power Dissipation                    | 60         | W                |
| $T_{STG}$                   | Storage Temperature Range                  | -55 to 150 | $^\circ\text{C}$ |
| $T_J$                       | Operating Junction Temperature Range       | -55 to 150 | $^\circ\text{C}$ |

### Thermal Data

| Symbol          | Parameter                                         | Typ. | Max. | Unit                      |
|-----------------|---------------------------------------------------|------|------|---------------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient(Steady-State) | ---  | 43   | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-case                  | ---  | 2.08 | $^\circ\text{C}/\text{W}$ |

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

| Symbol       | Parameter                         | Conditions                                                                   | Min. | Typ. | Max. | Unit |
|--------------|-----------------------------------|------------------------------------------------------------------------------|------|------|------|------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage    | $V_{GS}=0V$ , $I_D=250\mu A$                                                 | 20   | ---  | ---  | V    |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V$ , $I_D=20A$                                                     | ---  | 5.5  | 6.5  | mΩ   |
|              |                                   | $V_{GS}=4.5V$ , $I_D=20A$                                                    | ---  | 6    | 6.8  |      |
|              |                                   | $V_{GS}=2.5V$ , $I_D=10A$                                                    | ---  | 7.2  | 8.5  |      |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}$ , $I_D=250\mu A$                                             | 0.5  | ---  | 1.5  | V    |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=20V$ , $V_{GS}=0V$                                                   | ---  | ---  | 1    | μA   |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS}=\pm 12V$ , $V_{DS}=0V$                                               | ---  | ---  | ±100 | nA   |
| $g_{fs}$     | Forward Transconductance          | $V_{DS}=5V$ , $I_D=20A$                                                      | ---  | 23   | ---  | S    |
| $R_g$        | Gate Resistance                   | $V_{DS}=0V$ , $V_{GS}=0V$ , $f=1\text{MHz}$                                  | ---  | 1.9  | ---  | Ω    |
| $Q_g$        | Total Gate Charge                 | $I_D=20A$                                                                    | ---  | 26   | ---  | nC   |
| $Q_{gs}$     | Gate-Source Charge                | $V_{DD}=10V$                                                                 | ---  | 6    | ---  |      |
| $Q_{gd}$     | Gate-Drain Charge                 | $V_{GS}=5V$                                                                  | ---  | 11   | ---  |      |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DD}=10V$<br>$V_{GS}=5V$ , $R_L=0.5\Omega$<br>$R_G=3.3\Omega$ , $I_D=18A$ | ---  | 23   | ---  | ns   |
| $T_r$        | Rise Time                         |                                                                              | ---  | 56   | ---  |      |
| $T_{d(off)}$ | Turn-Off Delay Time               |                                                                              | ---  | 70   | ---  |      |
| $T_f$        | Fall Time                         |                                                                              | ---  | 16   | ---  |      |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=15V$ , $V_{GS}=0V$ , $f=1\text{MHz}$                                 | ---  | 1300 | ---  | pF   |
| $C_{oss}$    | Output Capacitance                |                                                                              | ---  | 150  | ---  |      |
| $C_{rss}$    | Reverse Transfer Capacitance      |                                                                              | ---  | 130  | ---  |      |

## Diode Characteristics

| Symbol   | Parameter                 | Conditions                                         | Min. | Typ. | Max. | Unit |
|----------|---------------------------|----------------------------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current | $V_G=V_D=0V$ , Force Current                       | ---  | ---  | 80   | A    |
| $I_{SM}$ | Pulsed Source Current     |                                                    | ---  | ---  | 320  | A    |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V$ , $I_S=20A$ , $T_J=25^{\circ}\text{C}$ | ---  | 0.88 | 1.2  | V    |

Note :

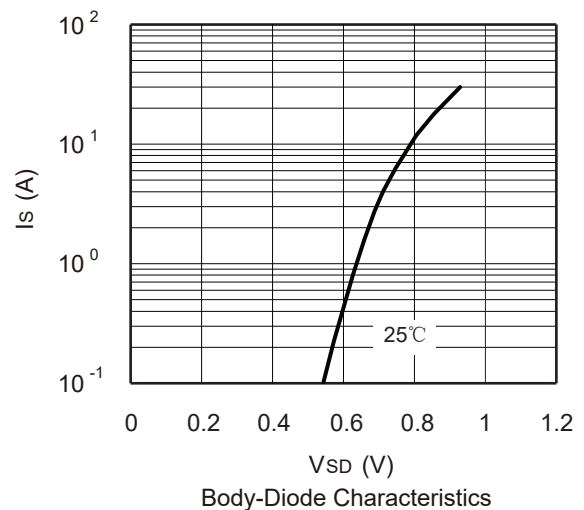
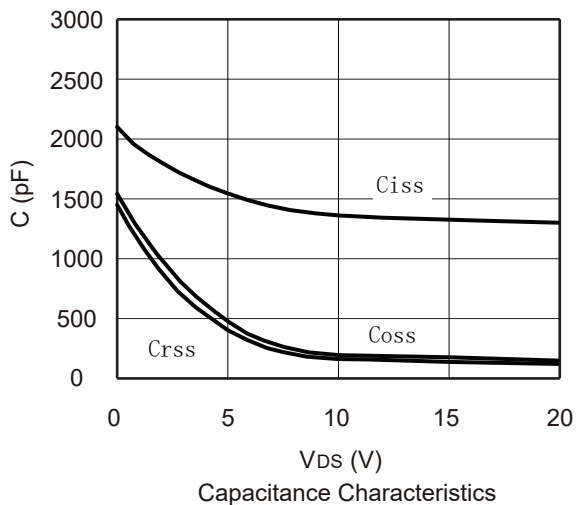
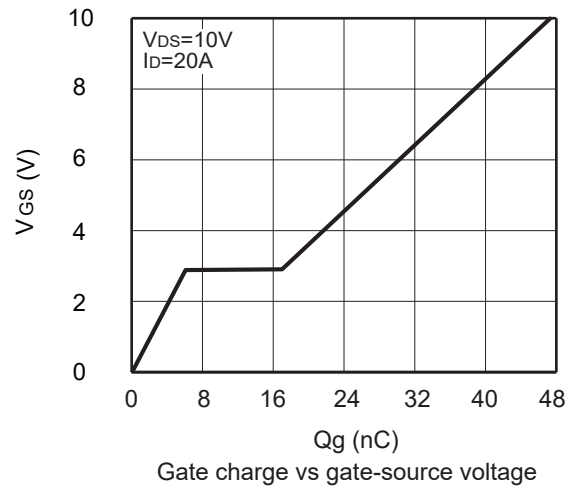
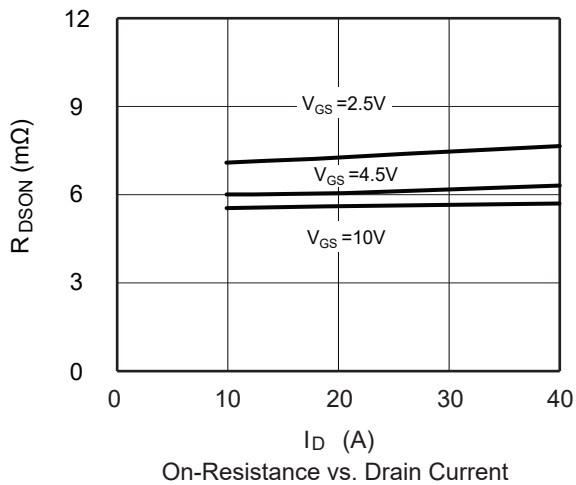
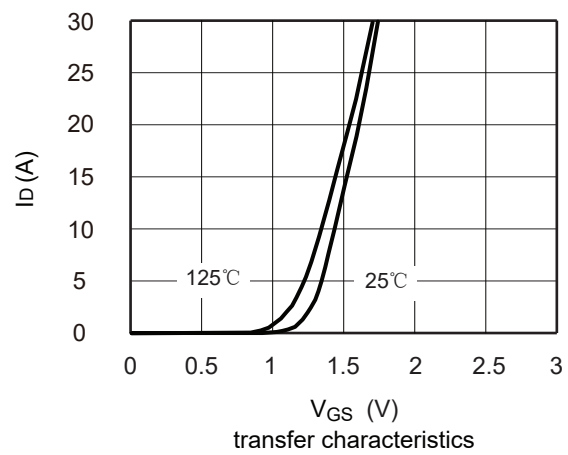
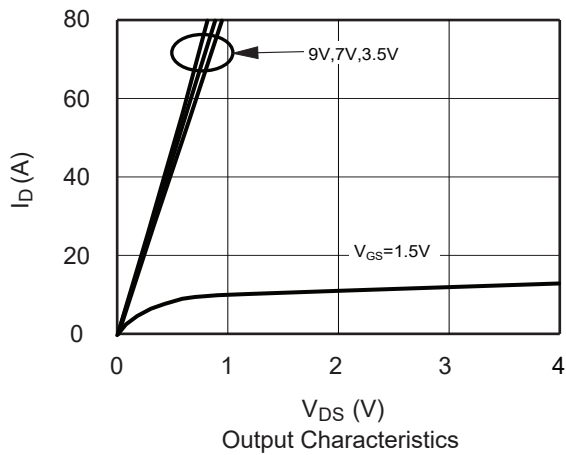
1.The EAS data shows Max. rating . The test condition is  $V_{DD}=20V$ ,  $V_{GS}=10V$ ,  $L=0.5\text{mH}$ ,  $I_{AS}=13.5A$ .

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

Cmos assumes no liability for customers' product design or applications.

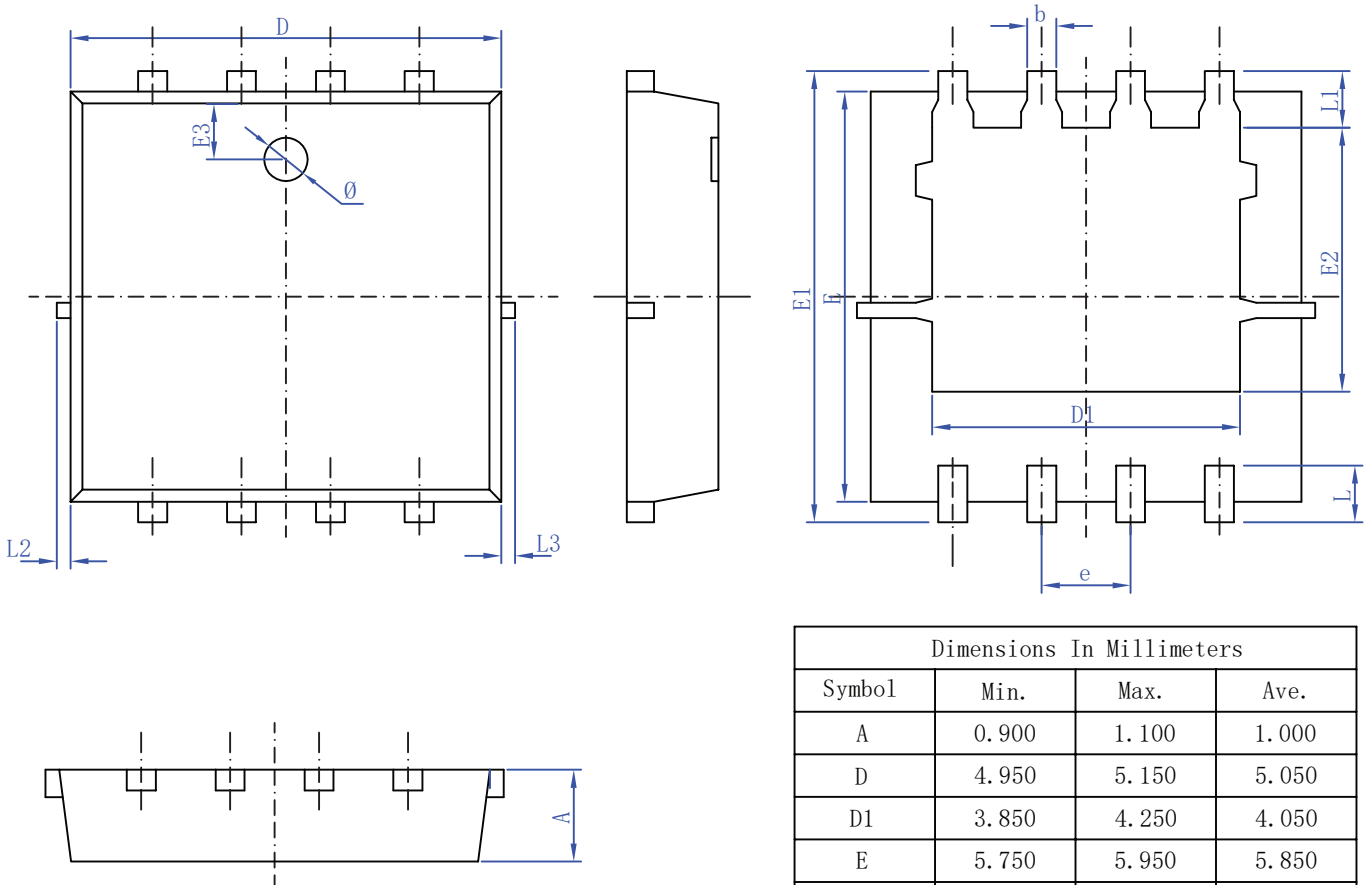
Cmos reserves the right to improve product design, functions and reliability without notice. Please refer to the latest version of specification.

## Typical Characteristics



Package Dimension

DFN-8 5x6 Unit :mm



注：  
1. 未注公差±0.05未标注圆角R max=0.25

| Dimensions In Millimeters |         |       |       |
|---------------------------|---------|-------|-------|
| Symbol                    | Min.    | Max.  | Ave.  |
| A                         | 0.900   | 1.100 | 1.000 |
| D                         | 4.950   | 5.150 | 5.050 |
| D1                        | 3.850   | 4.250 | 4.050 |
| E                         | 5.750   | 5.950 | 5.850 |
| E1                        | 5.950   | 6.350 | 6.150 |
| E2                        | 3.300   | 3.700 | 3.500 |
| E3                        | 0.900   | 1.300 | 1.100 |
| b                         | 0.250   | 0.350 | 0.300 |
| e                         | 1.220   | 1.320 | 1.270 |
| L                         | 0.585   | 0.785 | 0.685 |
| L1                        | 0.525   | 0.725 | 0.625 |
| Ø                         | 1.000   | 1.400 | 1.200 |
| L2                        | 0~0.100 |       |       |
| L3                        | 0~0.100 |       |       |