

### General Description

The CMS25DN02 uses advanced trench technology to provide excellent RDS(ON).

These devices are well suited for low voltage and battery powered applications where low in-line power loss and fast switching are required.

### Features

- Low On-Resistance
- Surface mount package.
- RoHS Compliant

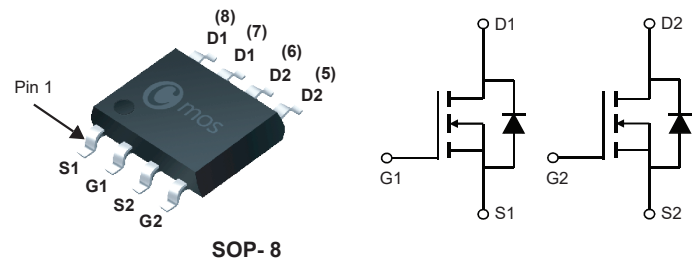
### Product Summary

| BVDSS | R <sub>DS(on)</sub> max. | ID  |
|-------|--------------------------|-----|
| 20V   | 7mΩ                      | 22A |

### Applications

- DC/DC Converter
- Notebook PC

### SOP-8 Pin Configuration



| Type      | Package | Marking   |
|-----------|---------|-----------|
| CMS25DN02 | SOP-8   | CMS25DN02 |

### Absolute Maximum Ratings

| Symbol                               | Parameter                                  | Rating     | Units |
|--------------------------------------|--------------------------------------------|------------|-------|
| V <sub>DS</sub>                      | Drain-Source Voltage                       | 20         | V     |
| V <sub>GS</sub>                      | Gate-Source Voltage                        | ±12        | V     |
| I <sub>D</sub> @T <sub>A</sub> =25°C | Continuous Drain Current                   | 22         | A     |
| I <sub>D</sub> @T <sub>A</sub> =70°C | Continuous Drain Current                   | 16         | A     |
| I <sub>DM</sub>                      | Pulsed Drain Current                       | 88         | A     |
| EAS                                  | Single Pulse Avalanche Energy <sup>1</sup> | 120        | mJ    |
| P <sub>D</sub> @T <sub>A</sub> =25°C | Total Power Dissipation                    | 3.1        | W     |
| T <sub>STG</sub>                     | Storage Temperature Range                  | -55 to 150 | °C    |
| T <sub>J</sub>                       | Operating Junction Temperature Range       | -55 to 150 | °C    |

### Thermal Data

| Symbol           | Parameter                                      | Typ. | Max. | Unit |
|------------------|------------------------------------------------|------|------|------|
| R <sub>θJA</sub> | Thermal Resistance Junction-ambient(t ≤ 10s)   | ---  | 40   | °C/W |
| R <sub>θJL</sub> | Thermal Resistance Junction-Lead(Steady-State) | ---  | 24   | °C/W |

Electrical Characteristics(T<sub>J</sub>=25°C, unless otherwise noted)

| Symbol              | Parameter                         | Conditions                                                                           | Min. | Typ. | Max. | Unit |
|---------------------|-----------------------------------|--------------------------------------------------------------------------------------|------|------|------|------|
| BV <sub>DSS</sub>   | Drain-Source Breakdown Voltage    | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                           | 20   | ---  | ---  | V    |
| R <sub>DS(ON)</sub> | Static Drain-Source On-Resistance | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A                                            | ---  | 6.1  | 7    | mΩ   |
|                     |                                   | V <sub>GS</sub> =2.5V, I <sub>D</sub> =3A                                            | ---  | 6.9  | 8    |      |
| V <sub>GS(th)</sub> | Gate Threshold Voltage            | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                             | 0.5  | ---  | 1.5  | V    |
| I <sub>DSS</sub>    | Drain-Source Leakage Current      | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C                      | ---  | ---  | 1    | uA   |
|                     |                                   | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C                      | ---  | ---  | 10   |      |
| I <sub>GSS</sub>    | Gate-Source Leakage Current       | V <sub>GS</sub> = ±12V, V <sub>DS</sub> =0V                                          | ---  | ---  | ±100 | nA   |
| g <sub>fs</sub>     | Forward Transconductance          | V <sub>DS</sub> =5V, I <sub>D</sub> =5A                                              | ---  | 20   | ---  | S    |
| R <sub>g</sub>      | Gate Resistance                   | V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz                                     | ---  | 1.9  | ---  | Ω    |
| Q <sub>g</sub>      | Total Gate Charge                 | V <sub>DD</sub> =10V, V <sub>GS</sub> =10V<br>I <sub>D</sub> =5A                     | ---  | 46.7 | ---  | nC   |
| Q <sub>gs</sub>     | Gate-Source Charge                |                                                                                      | ---  | 3    | ---  |      |
| Q <sub>gd</sub>     | Gate-Drain Charge                 |                                                                                      | ---  | 9.6  | ---  |      |
| T <sub>d(on)</sub>  | Turn-On Delay Time                | V <sub>DD</sub> =10V, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω<br>I <sub>D</sub> =5A | ---  | 3.7  | ---  | ns   |
| T <sub>r</sub>      | Rise Time                         |                                                                                      | ---  | 7.2  | ---  |      |
| T <sub>d(off)</sub> | Turn-Off Delay Time               |                                                                                      | ---  | 37.5 | ---  |      |
| T <sub>f</sub>      | Fall Time                         |                                                                                      | ---  | 23.3 | ---  |      |
| C <sub>iss</sub>    | Input Capacitance                 | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz                                    | ---  | 2000 | ---  | pF   |
| C <sub>oss</sub>    | Output Capacitance                |                                                                                      | ---  | 210  | ---  |      |
| C <sub>rss</sub>    | Reverse Transfer Capacitance      |                                                                                      | ---  | 200  | ---  |      |

## Diode Characteristics

| Symbol          | Parameter                 | Conditions                                                    | Min. | Typ. | Max. | Unit |
|-----------------|---------------------------|---------------------------------------------------------------|------|------|------|------|
| I <sub>S</sub>  | Continuous Source Current | V <sub>G</sub> =V <sub>D</sub> =0V, Force Current             | ---  | ---  | 22   | A    |
| I <sub>SM</sub> | Pulsed Source Current     |                                                               | ---  | ---  | 88   | A    |
| V <sub>SD</sub> | Diode Forward Voltage     | V <sub>GS</sub> =0V, I <sub>S</sub> =5A, T <sub>J</sub> =25°C | ---  | 0.69 | 1.2  | V    |

Note :

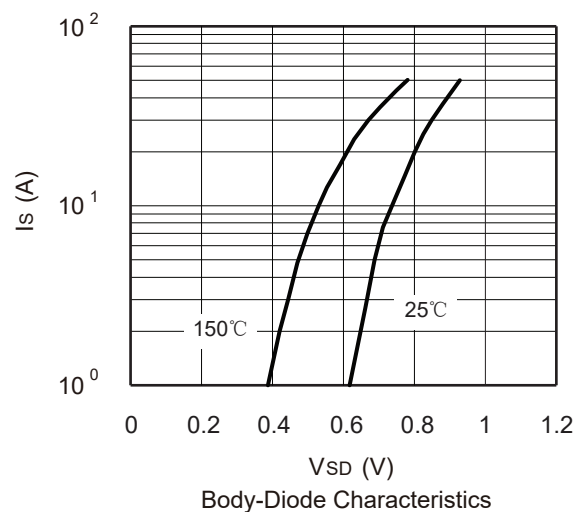
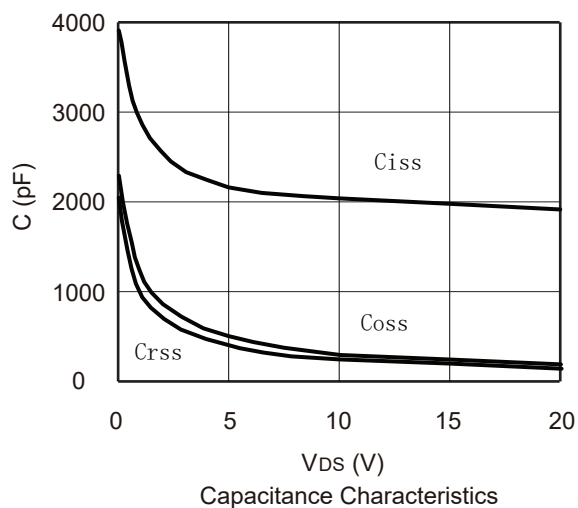
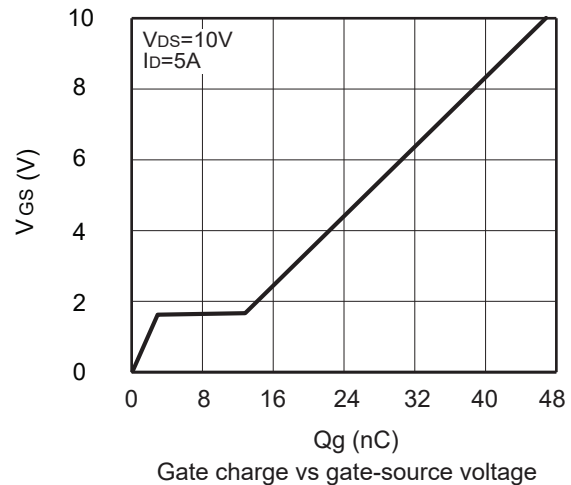
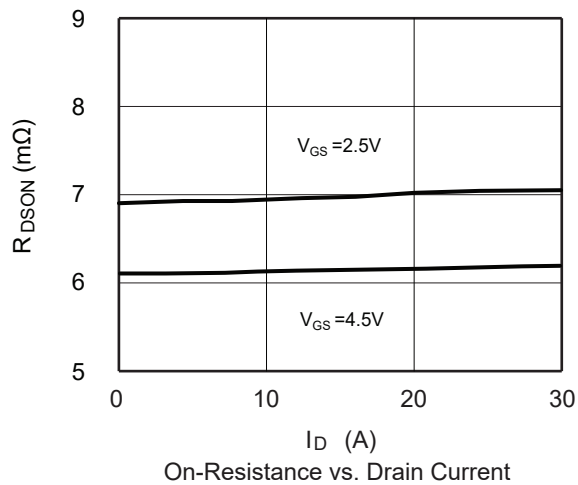
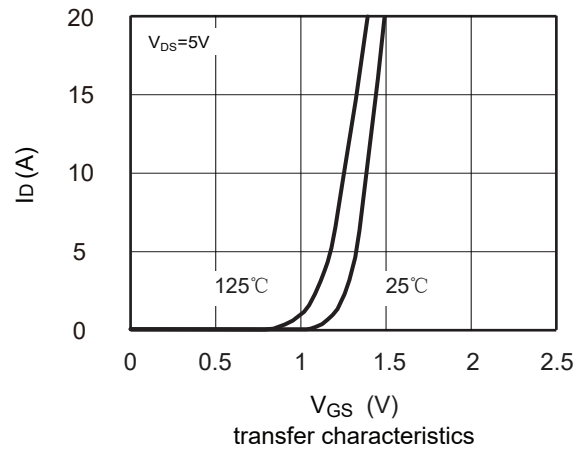
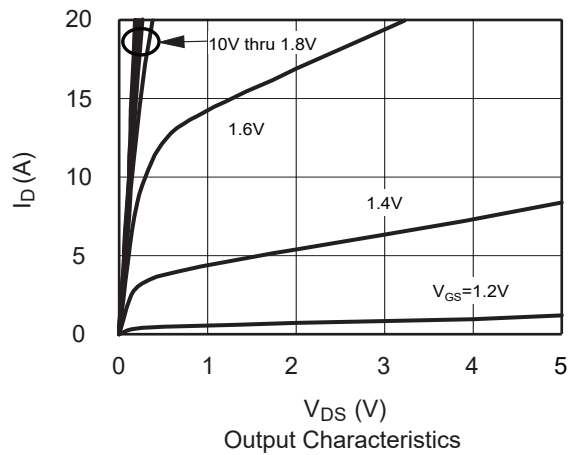
1.The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=20V, V<sub>GS</sub>=10V, L=1mH, I<sub>AS</sub>=15.5A.

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.

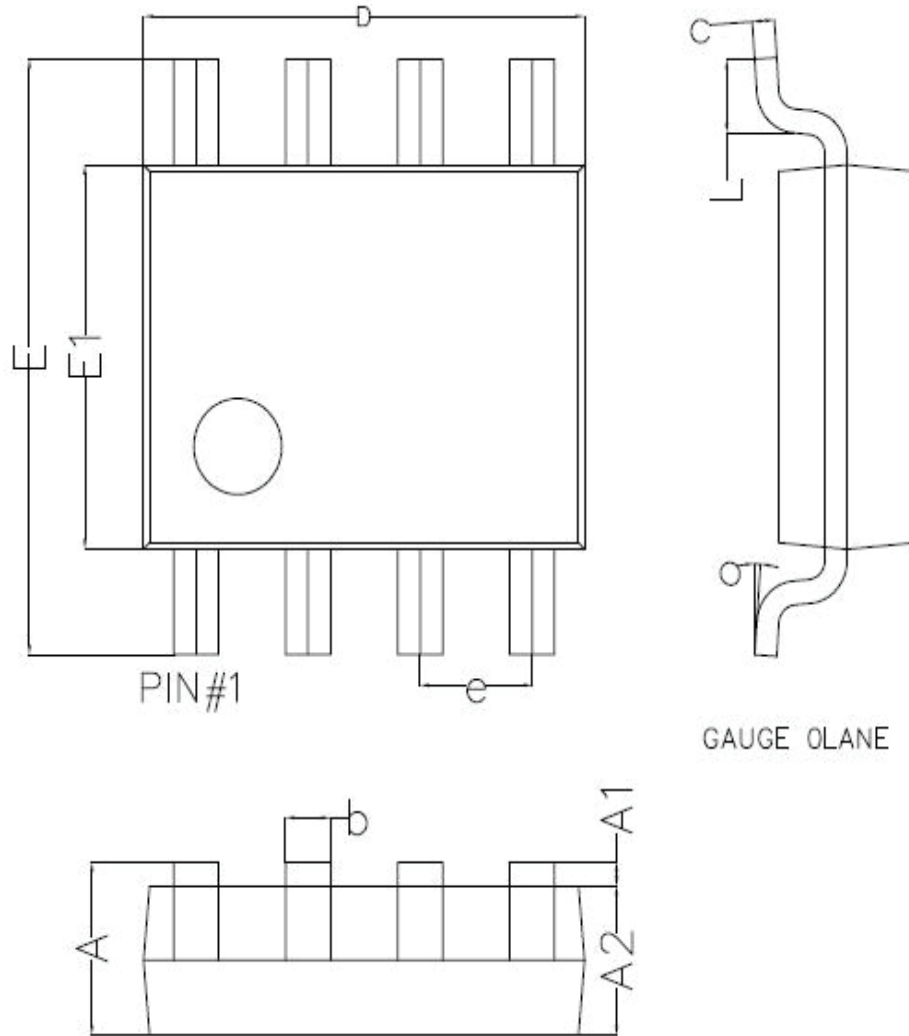
Typical Characteristics



Package Dimension

SOP-8

Unit :mm



| Symbol | Dim in mm   |       |      |
|--------|-------------|-------|------|
|        | Min         | Nor   | Max  |
| A      | 1.35        | 1.55  | 1.75 |
| A1     | 0.02        | 0.065 | 0.10 |
| A2     | 1.35        | 1.45  | 1.55 |
| b      | 0.33        | 0.42  | 0.51 |
| c      | 0.17        | 0.21  | 0.25 |
| D      | 4.80        | 4.90  | 5.00 |
| e      | 1.270 (BSC) |       |      |
| E      | 5.80        | 6.00  | 6.20 |
| E1     | 3.80        | 3.90  | 4.00 |
| L      | 0.4         | 0.835 | 1.27 |
| θ      | 0°          | 4°    | 8°   |