

20V, 14mΩ typ., 10A N-Channel MOSFET

**General Description**

The CMS2054L uses advanced trench technology to provide excellent  $R_{DS(on)}$ .

These devices have been designed to offer exceptional power dissipation in a very small footprint package.

**Features**

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

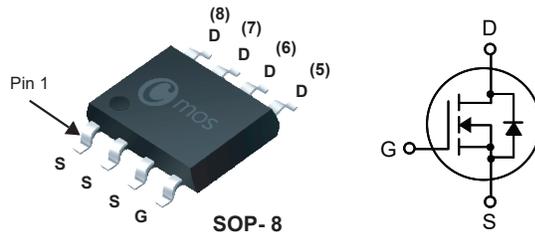
**Product Summary**

| BVDSS | $R_{DS(on)}$ max. | ID  |
|-------|-------------------|-----|
| 20V   | 17mΩ              | 10A |

**Applications**

- DC/DC converter
- Load switch

**SOP-8 Pin Configuration**



| Type     | Package | Marking  |
|----------|---------|----------|
| CMS2054L | SOP-8   | CMS2054L |

**Absolute Maximum Ratings**

| Symbol               | Parameter                                  | Rating     | Units |
|----------------------|--|------------|-------|
| $V_{DS}$             | Drain-Source Voltage                       | 20         | V     |
| $V_{GS}$             | Gate-Source Voltage                        | ±12        | V     |
| $I_D@T_A=25^\circ C$ | Continuous Drain Current                   | 10         | A     |
| $I_D@T_A=70^\circ C$ | Continuous Drain Current                   | 8          | A     |
| $I_{DM}$             | Pulsed Drain Current                       | 40         | A     |
| EAS                  | Single Pulse Avalanche Energy <sup>1</sup> | 10         | mJ    |
| $P_D@T_A=25^\circ C$ | Total Power Dissipation                    | 2.5        | W     |
| $T_{STG}$            | Storage Temperature Range                  | -55 to 150 | °C    |
| $T_J$                | Operating Junction Temperature Range       | -55 to 150 | °C    |

**Thermal Data**

| Symbol          | Parameter                           | Typ. | Max. | Unit |
|-----------------|-------------------------------------|------|------|------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient | ---  | 50   | °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> =6A   | ---  | 14   | 17   | mΩ   |
|                     |                                   | V <sub>GS</sub> =2.5V , I <sub>D</sub> =5A   | ---  | 20   | 26   |      |
| V <sub>GS(th)</sub> | Gate Threshold Voltage            | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA   | 0.4  | ---  | 1.0  | V    |
| I <sub>DSS</sub>    | Drain-Source Leakage Current      | V <sub>DS</sub> =16V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C  | ---  | ---  | 1    | uA   |
| I <sub>GSS</sub>    | Gate-Source Leakage Current       | V <sub>GS</sub> = ±12V , V <sub>DS</sub> =0V   | ---  | ---  | ±100 | nA   |
| R <sub>g</sub>      | Gate Resistance                   | V <sub>DS</sub> =0V , V <sub>GS</sub> =0V , f=1MHz   | ---  | 1.2  | ---  | Ω    |
| Q <sub>g</sub>      | Total Gate Charge                 | V <sub>DD</sub> =10V , V <sub>GS</sub> =4.5V<br>I <sub>D</sub> =10A  | ---  | 15   | ---  | nC   |
| Q <sub>gs</sub>     | Gate-Source Charge                |  | ---  | 5.4  | ---  |      |
| Q <sub>gd</sub>     | Gate-Drain Charge                 |  | ---  | 3    | ---  |      |
| T <sub>d(on)</sub>  | Turn-On Delay Time                | V <sub>DD</sub> =10V , V <sub>GEN</sub> =4.5V , R <sub>G</sub> =6Ω<br>I <sub>D</sub> =1A , R <sub>L</sub> =10Ω | ---  | 25   | ---  | ns   |
| T <sub>r</sub>      | Rise Time                         |  | ---  | 21   | ---  |      |
| T <sub>d(off)</sub> | Turn-Off Delay Time               |  | ---  | 65   | ---  |      |
| T <sub>f</sub>      | Fall Time                         |  | ---  | 35   | ---  |      |
| C <sub>iss</sub>    | Input Capacitance                 | V <sub>DS</sub> =10V , V <sub>GS</sub> =0V , f=1MHz  | ---  | 450  | ---  | pF   |
| C <sub>oss</sub>    | Output Capacitance                |  | ---  | 70   | ---  |      |
| C <sub>rss</sub>    | Reverse Transfer Capacitance      |  | ---  | 65   | ---  |      |

**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              | ---  | ---  | 20   | A    |
| I <sub>SM</sub> | Pulsed Source Current     |   | ---  | ---  | 80   | A    |
| V <sub>SD</sub> | Diode Forward Voltage     | V <sub>GS</sub> =0V , I <sub>S</sub> =5A , T <sub>J</sub> =25°C | ---  | 0.87 | 1.2  | V    |

Note :

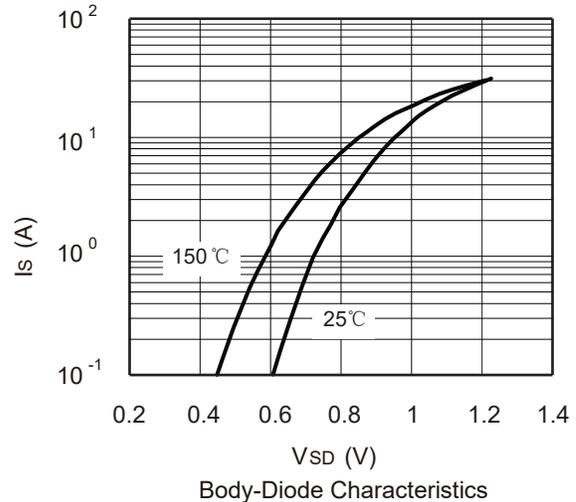
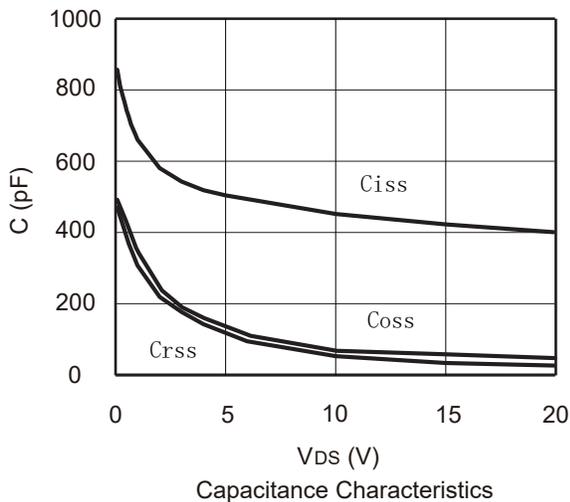
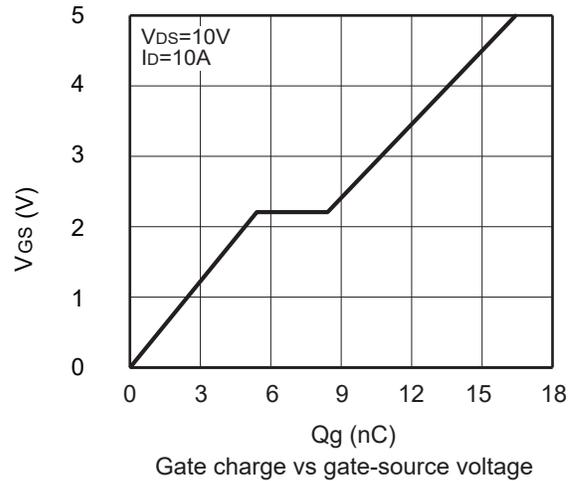
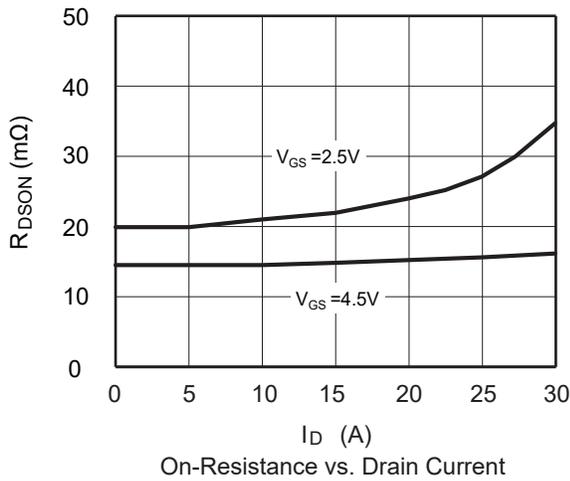
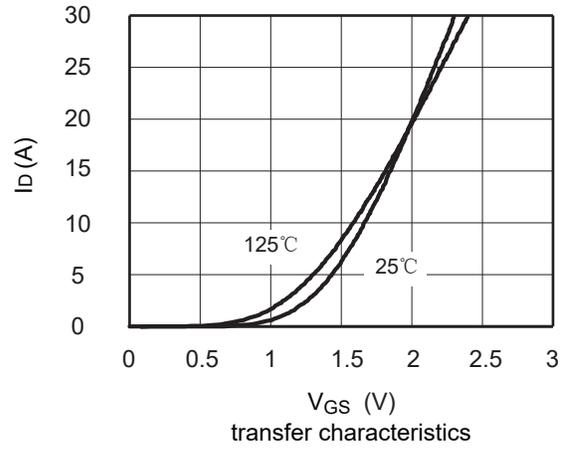
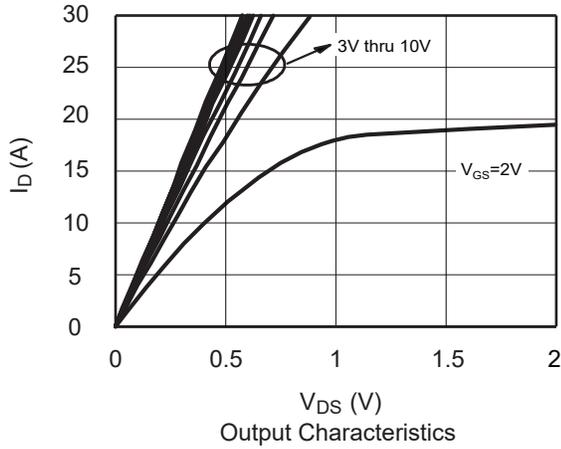
1.The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=20V , V<sub>GS</sub>=10V , L=1mH , I<sub>AS</sub>=4.5A.

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

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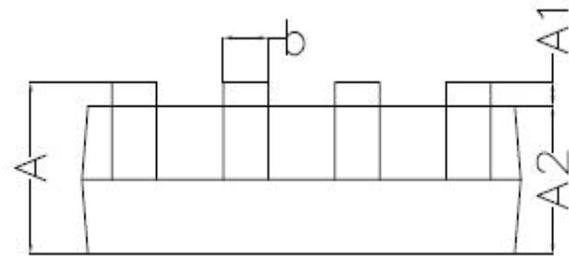
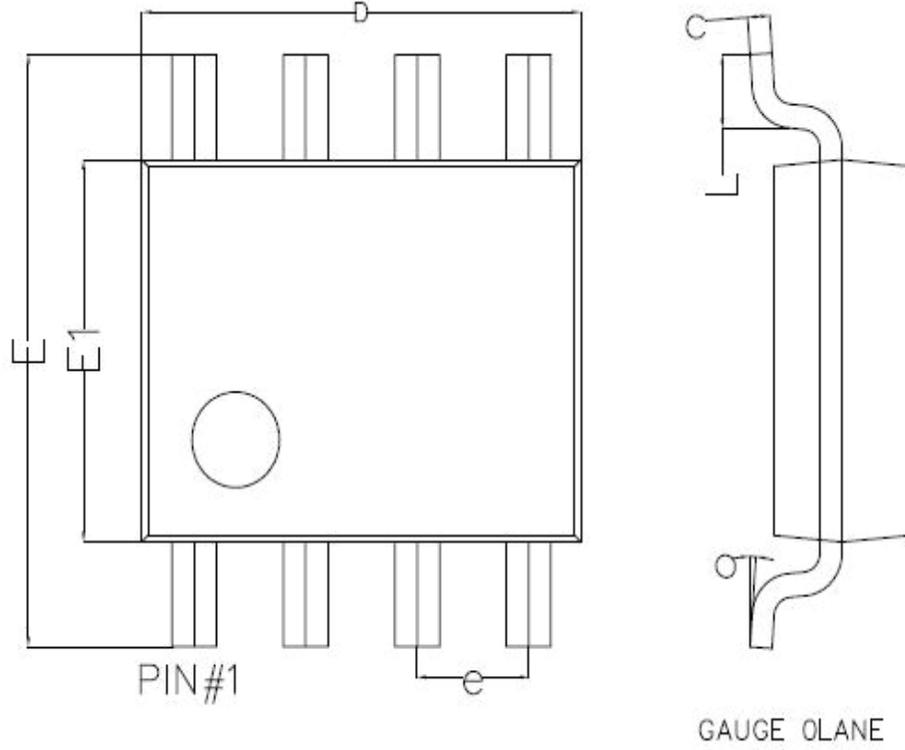
Cmos reserves the right to improve product design ,functions and reliability without notice.Please refer to the latest version of specification.

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°   |