

### General Description

The 4010 is a N-channel MOS Field Effect Transistors .These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching.

### Features

- Low On-Resistance
- 100% avalanche tested
- Simple Drive Requirements
- RoHS Compliant

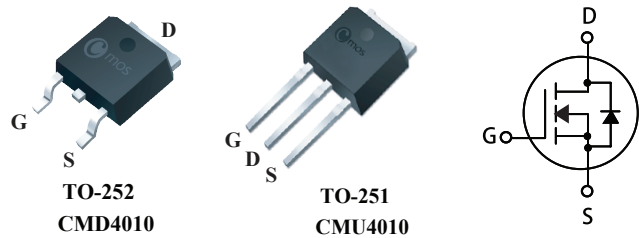
### Product Summary

| BVDSS | RDSON | ID  |
|-------|-------|-----|
| 40V   | 14mΩ  | 60A |

### Applications

- Power Management in Note book
- LCD Display inverter
- DC/DC converter
- Load Switch

### TO252 / TO251 Pin Configuration



### Absolute Maximum Ratings

| Symbol                 | Parameter                                  | Rating     | Units |
|------------------------|--|------------|-------|
| $V_{DS}$               | Drain-Source Voltage                       | 40         | V     |
| $V_{GS}$               | Gate-Source Voltage                        | ±20        | V     |
| $I_D@T_C=25^{\circ}C$  | Continuous Drain Current                   | 60         | A     |
| $I_D@T_C=100^{\circ}C$ | Continuous Drain Current                   | 35         | A     |
| $I_{DM}$               | Pulsed Drain Current                       | 240        | A     |
| EAS                    | Single Pulse Avalanche Energy <sup>1</sup> | 144        | mJ    |
| $P_D@T_C=25^{\circ}C$  | Total Power Dissipation                    | 50         | W     |
| $T_{STG}$              | Storage Temperature Range                  | -55 to 150 | °C    |
| $T_J$                  | Operating Junction Temperature Range       | 150        | °C    |

### Thermal Data

| Symbol          | Parameter                           | Typ. | Max. | Unit |
|-----------------|-------------------------------------|------|------|------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient | ---  | 50   | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction -Case   | ---  | 2.5  | °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  | 40   | ---  | ---  | V    |
| R <sub>DS(ON)</sub> | Static Drain-Source On-Resistance | V <sub>GS</sub> =10V, I <sub>D</sub> =15A   | ---  | ---  | 14   | mΩ   |
|                     |                                   | V <sub>GS</sub> =5V, I <sub>D</sub> =8A   | ---  | ---  | 17   |      |
| V <sub>GS(th)</sub> | Gate Threshold Voltage            | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA                                | 1    | ---  | 3    | V    |
| I <sub>DSS</sub>    | Drain-Source Leakage Current      | V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =25 °C                        | ---  | ---  | 1    | uA   |
|                     |                                   | V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =85 °C                        | ---  | ---  | 30   |      |
| I <sub>GSS</sub>    | Gate-Source Leakage Current       | V <sub>GS</sub> =±20V, 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  | ---  | 4    | ---  | Ω    |
| Q <sub>g</sub>      | Total Gate Charge                 | V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =15A                         | ---  | 30   | ---  | nC   |
| Q <sub>gs</sub>     | Gate-Source Charge                |   | ---  | 4.5  | ---  |      |
| Q <sub>gd</sub>     | Gate-Drain Charge                 |   | ---  | 10.2 | ---  |      |
| T <sub>d(on)</sub>  | Turn-On Delay Time                | V <sub>DD</sub> =20V, V <sub>GEN</sub> =10V, R <sub>G</sub> =6 Ω<br>I <sub>DS</sub> =1A | ---  | 18   | ---  | ns   |
| T <sub>r</sub>      | Rise Time                         |   | ---  | 12   | ---  |      |
| T <sub>d(off)</sub> | Turn-Off Delay Time               |   | ---  | 45   | ---  |      |
| T <sub>f</sub>      | Fall Time                         |   | ---  | 11   | ---  |      |
| C <sub>iss</sub>    | Input Capacitance                 | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz                                       | ---  | 1900 | ---  | pF   |
| C <sub>oss</sub>    | Output Capacitance                |   | ---  | 150  | ---  |      |
| C <sub>rss</sub>    | Reverse Transfer Capacitance      |   | ---  | 100  | ---  |      |

**Diode Characteristics**

| Symbol          | Parameter             | Conditions                                | Min. | Typ. | Max. | Unit |
|-----------------|-----------------------|---|------|------|------|------|
| V <sub>SD</sub> | Diode Forward Voltage | V <sub>GS</sub> =0V, I <sub>SD</sub> =15A | ---  | ---  | 1.1  | V    |

Notes:

1.The EAS data shows Max. rating .The test condition is V<sub>DS</sub>=30V, V<sub>GS</sub>=10V, L=1mH, I<sub>AS</sub>=17A.

This product has been designed and qualified for the counsumer market.  
Cmos assumes no liability for customers' product design or applications.  
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.

N-Channel Enhancement Mode MOSFET

Typical Characteristics

