

### General Description

The CMD607A uses advanced trench technology MOSFETs to provide excellent  $R_{DS(ON)}$  and low gate charge.

The complementary MOSFETs may be used in H-bridge, Inverters and other applications.

### Features

- 30V 20A  $R_{DS(ON)} \leq 20m\Omega$  @  $V_{GS}=10V$   
 $R_{DS(ON)} \leq 40m\Omega$  @  $V_{GS}=4.5V$
- -30V -12A  $R_{DS(ON)} \leq 48m\Omega$  @  $V_{GS}=-10V$   
 $R_{DS(ON)} \leq 65m\Omega$  @  $V_{GS}=-4.5V$
- High Density Cell Design For Ultra Low On Resistance

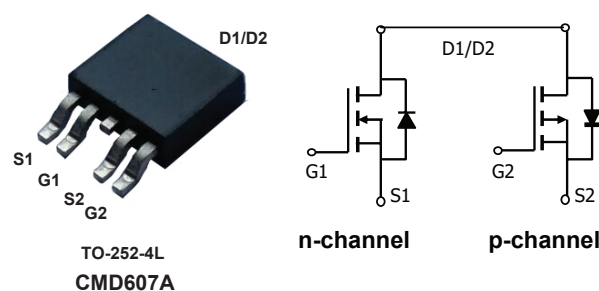
### Product Summary

|           | BVDSS | RDSON        | ID   |
|-----------|-------|--------------|------|
| N-Channel | 30V   | 20m $\Omega$ | 20A  |
| P-Channel | -30V  | 48m $\Omega$ | -12A |

### Applications

- Power Management
- Load Switch
- DC/DC Converter

### TO-252-4L Pin Configuration



### Absolute Maximum Ratings

| Symbol                   | Parameter                            | Max n-channel | Max p-channel | Units      |
|--------------------------|--------------------------------------|---------------|---------------|------------|
| $V_{DS}$                 | Drain-Source Voltage                 | 30            | -30           | V          |
| $V_{GS}$                 | Gate-Source Voltage                  | $\pm 20$      | $\pm 20$      | V          |
| $I_D @ T_C = 25^\circ C$ | Continuous Drain Current             | 20            | -12           | A          |
| $I_D @ T_C = 70^\circ C$ | Continuous Drain Current             | 15            | -9.4          | A          |
| $I_{DM}$                 | Pulsed Drain Current                 | 60            | -36           | A          |
| $P_D @ T_C = 25^\circ C$ | Power Dissipation                    | 25            | 25            | W          |
| $T_{STG}$                | Storage Temperature Range            | -55 to 150    | -55 to 150    | $^\circ C$ |
| $T_J$                    | Operating Junction Temperature Range | -55 to 150    | -55 to 150    | $^\circ C$ |

### Thermal Characteristics: n-channel

| Symbol          | Parameter                                  | Typ. | Max. | Unit         |
|-----------------|--------------------------------------------|------|------|--------------|
| $R_{\theta JA}$ | Maximum Junction-to-Ambient (Steady-State) | ---  | 50   | $^\circ C/W$ |
| $R_{\theta JC}$ | Maximum Junction-to-Case (Steady-State)    | ---  | 6.5  | $^\circ C/W$ |

**N- and P-Channel Enhancement Mode MOSFET**
**Thermal Characteristics: p-channel**

| Symbol          | Parameter                                  | Typ. | Max. | Unit                 |
|-----------------|--------------------------------------------|------|------|----------------------|
| $R_{\theta JA}$ | Maximum Junction-to-Ambient (Steady-State) | ---  | 50   | $^{\circ}\text{C/W}$ |
| $R_{\theta JC}$ | Maximum Junction-to-Case (Steady-State)    | ---  | 4.2  | $^{\circ}\text{C/W}$ |

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

| Symbol       | Parameter                         | Conditions                                                    | Min. | Typ. | Max.      | Unit       |
|--------------|-----------------------------------|---------------------------------------------------------------|------|------|-----------|------------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage    | $V_{GS}=0V, I_D=250\mu A$                                     | 30   | ---  | ---       | V          |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V, I_D=12A$                                         | ---  | ---  | 20        | m $\Omega$ |
|              |                                   | $V_{GS}=4.5V, I_D=10A$                                        | ---  | ---  | 40        |            |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}, I_D=250\mu A$                                 | 1    | ---  | 3         | V          |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=24V, V_{GS}=0V$                                       | ---  | ---  | 1         | $\mu A$    |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS}=\pm 20V, V_{DS}=0V$                                   | ---  | ---  | $\pm 100$ | nA         |
| $g_{fs}$     | Forward Transconductance          | $V_{DS}=5V, I_D=12A$                                          | ---  | 10   | ---       | S          |
| $Q_g$        | Total Gate Charge                 | $V_{DS}=15V, V_{GS}=10V, I_D=8A$                              | ---  | 7.5  | ---       | nC         |
| $Q_{gs}$     | Gate-Source Charge                |                                                               | ---  | 1.3  | ---       |            |
| $Q_{gd}$     | Gate-Drain Charge                 |                                                               | ---  | 1.7  | ---       |            |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DS}=15V, V_{GS}=10V, R_L=1.87\Omega$<br>$R_{GEN}=3\Omega$ | ---  | 4.5  | ---       | ns         |
| $T_r$        | Rise Time                         |                                                               | ---  | 2.7  | ---       |            |
| $T_{d(off)}$ | Turn-Off Delay Time               |                                                               | ---  | 15   | ---       |            |
| $T_f$        | Fall Time                         |                                                               | ---  | 3    | ---       |            |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$                        | ---  | 650  | ---       | pF         |
| $C_{oss}$    | Output Capacitance                |                                                               | ---  | 65   | ---       |            |
| $C_{rss}$    | Reverse Transfer Capacitance      |                                                               | ---  | 40   | ---       |            |

**Diode Characteristics**

| Symbol   | Parameter                 | Conditions                                  | Min. | Typ. | Max. | Unit |
|----------|---------------------------|---------------------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current | $V_G=V_D=0V$ , Force Current                | ---  | ---  | 20   | A    |
| $I_{SM}$ | Pulsed Source Current     |                                             | ---  | ---  | 60   | A    |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V, I_F=1A, T_J=25^{\circ}\text{C}$ | ---  | ---  | 1    | V    |

### P Channel 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> =-250μA                                                  | -30  | ---  | ---  | V    |
| R <sub>DS(ON)</sub> | Static Drain-Source On-Resistance | V <sub>GS</sub> =-10V , I <sub>D</sub> =-10A                                                  | ---  | ---  | 48   | mΩ   |
|                     |                                   | V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-8A                                                  | ---  | ---  | 65   |      |
| V <sub>GS(th)</sub> | Gate Threshold Voltage            | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250μA                                     | -1   | ---  | -3   | V    |
| I <sub>DSS</sub>    | Drain-Source Leakage Current      | V <sub>DS</sub> =-24V , V <sub>GS</sub> =0V                                                   | ---  | ---  | -1   | uA   |
| I <sub>GSS</sub>    | Gate-Source Leakage Current       | V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V                                                  | ---  | ---  | ±100 | nA   |
| g <sub>fs</sub>     | Forward Transconductance          | V <sub>DS</sub> =-5V , I <sub>D</sub> =-10A                                                   | ---  | 10   | ---  | S    |
| Q <sub>g</sub>      | Total Gate Charge                 | V <sub>DS</sub> =-15V , V <sub>GS</sub> =-10V , I <sub>D</sub> =-12A                          | ---  | 14   | ---  | nC   |
| Q <sub>gs</sub>     | Gate-Source Charge                |                                                                                               | ---  | 2.5  | ---  |      |
| Q <sub>gd</sub>     | Gate-Drain Charge                 |                                                                                               | ---  | 3.2  | ---  |      |
| T <sub>d(on)</sub>  | Turn-On Delay Time                | V <sub>DS</sub> =-15V , V <sub>GS</sub> =-10V , R <sub>L</sub> =1.25Ω<br>R <sub>GEN</sub> =3Ω | ---  | 8    | ---  | ns   |
| T <sub>r</sub>      | Rise Time                         |                                                                                               | ---  | 6    | ---  |      |
| T <sub>d(off)</sub> | Turn-Off Delay Time               |                                                                                               | ---  | 18   | ---  |      |
| T <sub>f</sub>      | Fall Time                         |                                                                                               | ---  | 5    | ---  |      |
| C <sub>iss</sub>    | Input Capacitance                 | V <sub>DS</sub> =-15V , V <sub>GS</sub> =0V , f=1MHz                                          | ---  | 1300 | ---  | pF   |
| C <sub>oss</sub>    | Output Capacitance                |                                                                                               | ---  | 140  | ---  |      |
| C <sub>rss</sub>    | Reverse Transfer Capacitance      |                                                                                               | ---  | 95   | ---  |      |

### 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               | ---  | ---  | -12  | A    |
| I <sub>SM</sub> | Pulsed Source Current     |                                                                  | ---  | ---  | -36  | A    |
| V <sub>SD</sub> | Diode Forward Voltage     | V <sub>GS</sub> =0V , I <sub>F</sub> =-1A , T <sub>J</sub> =25°C | ---  | ---  | -1   | V    |

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