

## P-Channel Enhancement Mode Field Effect Transistor

### General Description

The CMSA120P03A uses advanced trench technology to provide excellent RDS(ON).

This device is ideal for load switch and battery protection applications.

### Features

- Low On-Resistance
- Simple Drive Requirements
- 100% EAS Guaranteed
- RoHS Compliant

### Absolute Maximum Ratings

| Symbol                | Parameter                                  | Rating     | Units      |
|-----------------------|--|------------|------------|
| $V_{DS}$              | Drain-Source Voltage                       | -30        | V          |
| $V_{GS}$              | Gate-Source Voltage                        | $\pm 20$   | V          |
| $I_D@T_C=25^\circ C$  | Continuous Drain Current                   | -150       | A          |
| $I_D@T_C=100^\circ C$ | Continuous Drain Current                   | -105       | A          |
| $I_{DM}$              | Pulsed Drain Current                       | -600       | A          |
| EAS                   | Single Pulse Avalanche Energy <sup>1</sup> | 200        | mJ         |
| $P_D@T_C=25^\circ C$  | Total Power Dissipation                    | 78         | W          |
| $T_{STG}$             | Storage Temperature Range                  | -55 to 150 | $^\circ C$ |
| $T_J$                 | Operating Junction Temperature Range       | 150        | $^\circ C$ |

### Thermal Data

| Symbol          | Parameter                         | Typ. | Max. | Unit         |
|-----------------|-----------------------------------|------|------|--------------|
| $R_{\theta JA}$ | Junction-to-Ambient(Steady-State) | ---  | 55   | $^\circ C/W$ |
| $R_{\theta JC}$ | Junction-to-Case                  | ---  | 1.6  | $^\circ C/W$ |

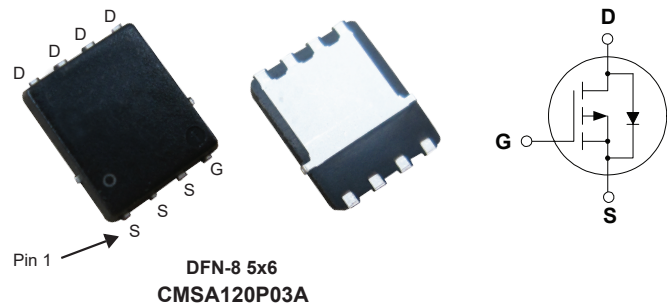
### Product Summary

| BVDSS | RDSON         | ID    |
|-------|---------------|-------|
| -30V  | 3.6m $\Omega$ | -150A |

### Applications

- Load Switch
- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

### DFN-8 5x6 Pin Configuration



**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   | -30  | ---  | ---  | V    |
| R <sub>DS(ON)</sub> | Static Drain-Source On-Resistance | V <sub>GS</sub> =-10V, I <sub>D</sub> =-28A  | ---  | 3.1  | 3.6  | mΩ   |
|                     |                                   | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-25A   | ---  | 4.2  | 5    |      |
| V <sub>GS(th)</sub> | Gate Threshold Voltage            | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA  | -1   | ---  | -2   | V    |
| I <sub>DSS</sub>    | Drain-Source Leakage Current      | V <sub>DS</sub> =-24V , 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> =±20V , V <sub>DS</sub> =0V  | ---  | ---  | ±100 | nA   |
| g <sub>fs</sub>     | Forward Transconductance          | V <sub>DS</sub> =-10V , I <sub>D</sub> =-20A   | ---  | 41   | ---  | S    |
| R <sub>g</sub>      | Gate Resistance                   | V <sub>DS</sub> =0V , V <sub>GS</sub> =0V , f=1MHz   | ---  | 22   | ---  | Ω    |
| Q <sub>g</sub>      | Total Gate Charge                 | V <sub>DS</sub> =-15V, I <sub>D</sub> =-30A<br>V <sub>GS</sub> =-10V   | ---  | 135  | ---  | nC   |
| Q <sub>gs</sub>     | Gate-Source Charge                |  | ---  | 12   | ---  |      |
| Q <sub>gd</sub>     | Gate-Drain Charge                 |  | ---  | 36   | ---  |      |
| T <sub>d(on)</sub>  | Turn-On Delay Time                | V <sub>DD</sub> =-15V, V <sub>GEN</sub> =-10V<br>I <sub>D</sub> =-1A, R <sub>G</sub> =6Ω , R <sub>L</sub> =15Ω | ---  | 22   | ---  | ns   |
| T <sub>r</sub>      | Rise Time                         |  | ---  | 25   | ---  |      |
| T <sub>d(off)</sub> | Turn-Off Delay Time               |  | ---  | 163  | ---  |      |
| T <sub>f</sub>      | Fall Time                         |  | ---  | 104  | ---  |      |
| C <sub>iss</sub>    | Input Capacitance                 | V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V , f=1MHz  | ---  | 5000 | ---  | pF   |
| C <sub>oss</sub>    | Output Capacitance                |  | ---  | 600  | ---  |      |
| C <sub>rss</sub>    | Reverse Transfer Capacitance      |  | ---  | 380  | ---  |      |

**Diode Characteristics**

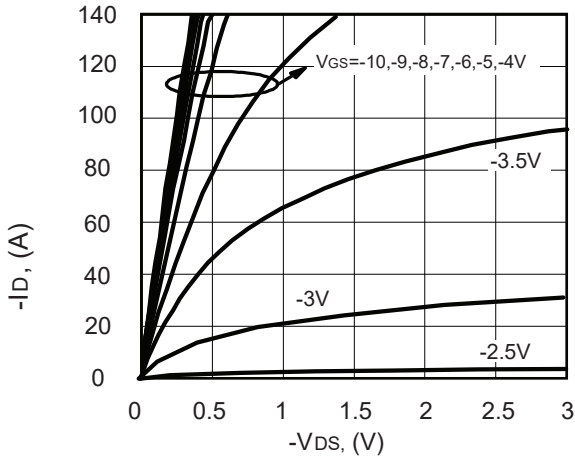
| Symbol          | Parameter                 | Conditions   | Min. | Typ.  | Max. | Unit |
|-----------------|---------------------------|--|------|-------|------|------|
| I <sub>S</sub>  | Continuous Source Current | V <sub>G</sub> =V <sub>D</sub> =0V , Force Current | ---  | ---   | -150 | A    |
| I <sub>SM</sub> | Pulsed Source Current     |  | ---  | ---   | -600 | A    |
| V <sub>SD</sub> | Diode Forward Voltage     | V <sub>GS</sub> =0V , I <sub>F</sub> =-25A         | ---  | -0.82 | -1.2 | V    |

Note :

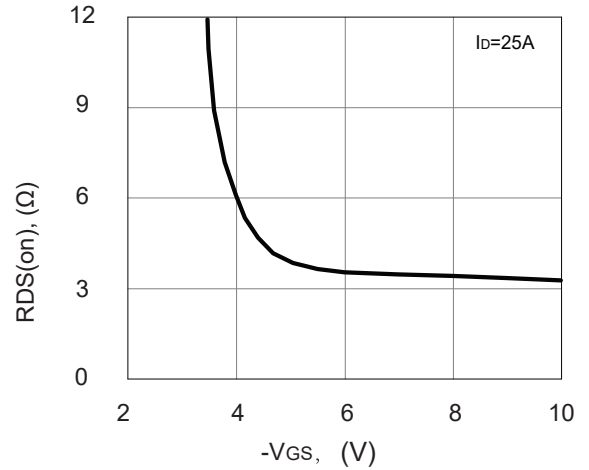
1.The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=-25V,V<sub>GS</sub>=-10V,L=0.5mH,I<sub>D</sub>=-28.3A

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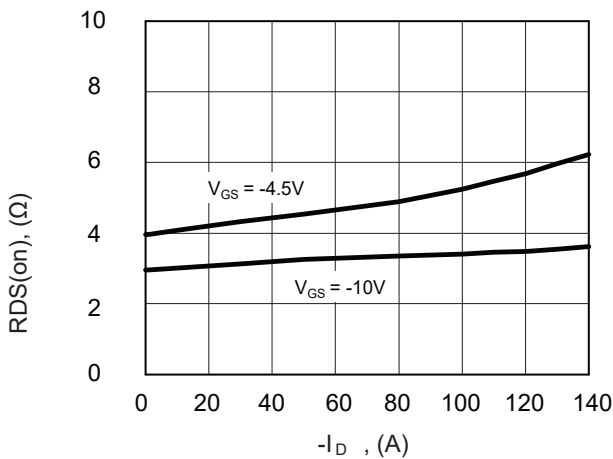
Typical Characteristics



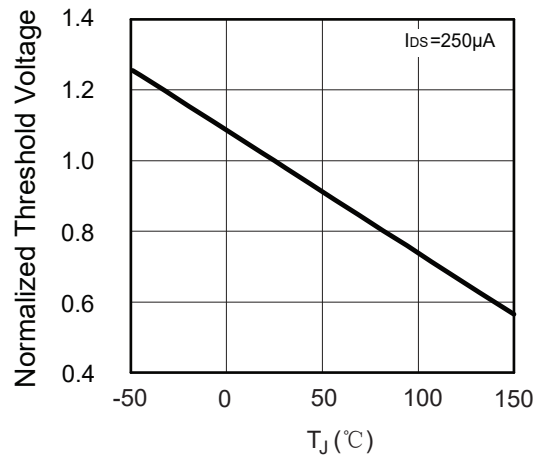
Typical Output Characteristics



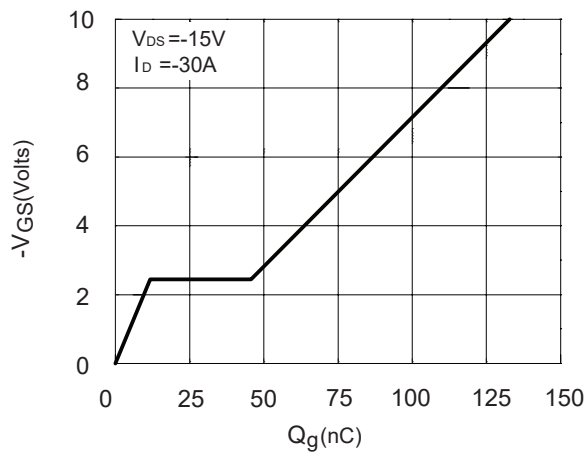
On-Resistance vs. Gate-Source Voltage



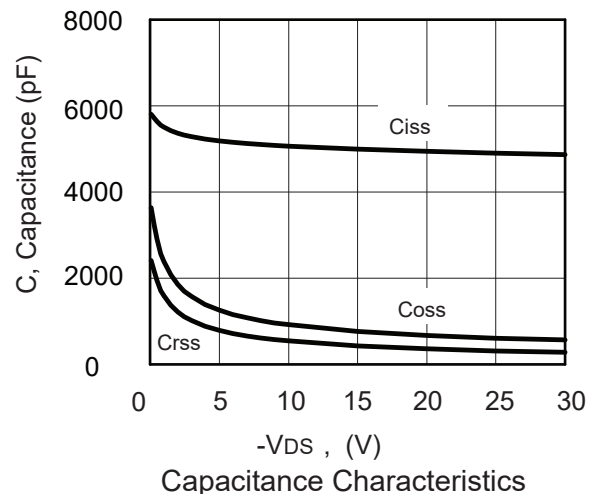
On-Resistance vs. Drain Current



Gate-Source Voltage vs. Junction Temperature



Gate Charge Characteristics



Capacitance Characteristics