

### General Description

These P-Channel enhancement mode power field effect transistors use advanced trench technology and design to provide excellent RDS(ON) . This device is suitable for use as a load switch or in PWM applications.

### Features

- Fast switching speed
- Lower On-resistance
- 100% EAS Guaranteed
- Simple Drive Requirement

### Absolute Maximum Ratings

| Symbol               | Parameter                            | Rating     | Units      |
|----------------------|--------------------------------------|------------|------------|
| $V_{DS}$             | Drain-Source Voltage                 | -100       | V          |
| $V_{GS}$             | Gate-Source Voltage                  | $\pm 20$   | V          |
| $I_D@T_C=25^\circ C$ | Continuous Drain Current             | -18        | A          |
| $I_{DM}$             | Pulsed Drain Current                 | -54        | A          |
| EAS                  | Single Pulse Avalanche Energy        | 17         | mJ         |
| $P_D@T_C=25^\circ C$ | Total Power Dissipation              | 40         | W          |
| $T_{STG}$            | Storage Temperature Range            | -55 to 175 | $^\circ C$ |
| $T_J$                | Operating Junction Temperature Range | -55 to 175 | $^\circ C$ |

### Thermal Data

| Symbol          | Parameter                | Typ. | Max. | Unit         |
|-----------------|--------------------------|------|------|--------------|
| $R_{\theta JA}$ | Junction-to-Ambient      | ---  | 62   | $^\circ C/W$ |
| $R_{\theta JC}$ | Junction-to-Case (Drain) | ---  | 3.5  | $^\circ C/W$ |

### Product Summary

| BVDSS | RDSON         | ID   |
|-------|---------------|------|
| -100V | 175m $\Omega$ | -18A |

### Applications

- DC-DC Converters
- LCD Display inverter
- Power Management in Note book

### TO-252/251 Pin Configuration



| Type    | Package | Marking |
|---------|---------|---------|
| CMD5931 | TO-252  | CMD5931 |
| CMU5931 | TO-251  | CMU5931 |

### Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)

| Symbol       | Parameter                         | Conditions   | Min. | Typ. | Max.      | Unit       |
|--------------|-----------------------------------|--|------|------|-----------|------------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage    | $V_{GS}=0V, I_D=-250\mu A$                             | -100 | ---  | ---       | V          |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=-10V, I_D=-6A$                                 | ---  | ---  | 175       | m $\Omega$ |
|              |                                   | $V_{GS}=-4.5V, I_D=-3A$                                | ---  | ---  | 185       |            |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}, I_D=-250\mu A$                         | -1   | ---  | -3        | V          |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=-24V, V_{GS}=0V, T_J=25^{\circ}\text{C}$       | ---  | ---  | -1        | $\mu A$    |
|              |                                   | $V_{DS}=-24V, V_{GS}=0V, T_J=125^{\circ}\text{C}$      | ---  | ---  | -100      |            |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS}=\pm 20V, V_{DS}=0V$                            | ---  | ---  | $\pm 100$ | nA         |
| $g_{fs}$     | Forward Transconductance          | $V_{DS}=-5V, I_D=-6A$                                  | ---  | 14   | ---       | S          |
| $Q_g$        | Total Gate Charge                 | $V_{DS}=-80V, I_D=-8A$<br>$V_{GS}=4.5V$                | ---  | 17   | ---       | nC         |
| $Q_{gs}$     | Gate-Source Charge                |  | ---  | 5    | ---       |            |
| $Q_{gd}$     | Gate-Drain Charge                 |  | ---  | 9    | ---       |            |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DS}=-50V, V_{GS}=-10V, R_G=3.3\Omega$<br>$I_D=-8A$ | ---  | 10   | ---       | ns         |
| $T_r$        | Rise Time                         |  | ---  | 15   | ---       |            |
| $T_{d(off)}$ | Turn-Off Delay Time               |  | ---  | 46   | ---       |            |
| $T_f$        | Fall Time                         |  | ---  | 42   | ---       |            |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=-25V, V_{GS}=0V, f=1\text{MHz}$                | ---  | 1450 | ---       | pF         |
| $C_{oss}$    | Output Capacitance                |  | ---  | 110  | ---       |            |
| $C_{rss}$    | Reverse Transfer Capacitance      |  | ---  | 70   | ---       |            |

### Diode Characteristics

| Symbol   | Parameter                 | Conditions                   | Min. | Typ. | Max. | Unit |
|----------|---------------------------|------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current | $V_G=V_D=0V$ , Force Current | ---  | ---  | -18  | A    |
| $I_{SM}$ | Pulsed Source Current     |                              | ---  | ---  | -54  | A    |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V, I_S=-12A$        | ---  | ---  | -1.2 | V    |

Note :

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