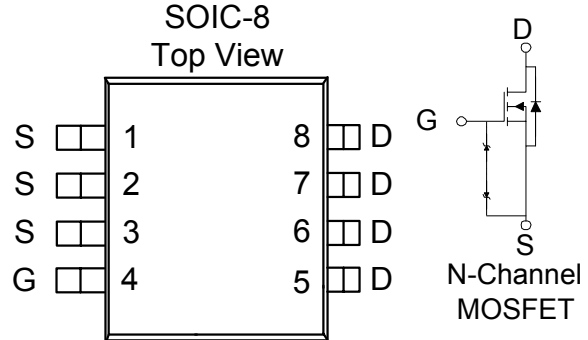


### N-Channel 30-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low  $r_{DS(on)}$  and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

| PRODUCT SUMMARY |                            |           |
|-----------------|----------------------------|-----------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ m( $\Omega$ ) | $I_D$ (A) |
| 30              | 22 @ $V_{GS} = 10V$        | 9.4       |
|                 | 30 @ $V_{GS} = 4.5V$       | 7.0       |

- Low  $r_{DS(on)}$  provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SOIC-8 saves board space
- Fast switching speed
- High performance trench technology



#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)

| Parameter   | Symbol         | Maximum            | Units      |
|---|----------------|--------------------|------------|
| Drain-Source Voltage                                      | $V_{DS}$       | 30                 | V          |
| Gate-Source Voltage                                       | $V_{GS}$       | $\pm 20$           |            |
| Continuous Drain Current <sup>a</sup>                     | $I_D$          | $T_A = 25^\circ C$ | 9.4        |
|   |                | $T_A = 70^\circ C$ | 7.4        |
| Pulsed Drain Current <sup>b</sup>                         | $I_{DM}$       | $\pm 30$           | A          |
| Continuous Source Current (Diode Conduction) <sup>a</sup> | $I_S$          | 1.6                | A          |
| Power Dissipation <sup>a</sup>                            | $P_D$          | $T_A = 25^\circ C$ | 3.1        |
|   |                | $T_A = 70^\circ C$ | 2          |
| Operating Junction and Storage Temperature Range          | $T_J, T_{stg}$ | -55 to 150         | $^\circ C$ |

#### THERMAL RESISTANCE RATINGS

| Parameter                                | Symbol          | Maximum         | Units |
|--|-----------------|-----------------|-------|
| Maximum Junction-to-Ambient <sup>a</sup> | $R_{\theta JA}$ | t $\leq$ 10 sec | 50    |
|  |                 | Steady State    | 92    |

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
- b. Pulse width limited by maximum junction temperature

| SPECIFICATIONS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |              |   |        |     |           |      |
|---|--------------|---|--------|-----|-----------|------|
| Parameter   | Symbol       | Test Conditions   | Limits |     |           | Unit |
|   |              |   | Min    | Typ | Max       |      |
| <b>Static</b>   |              |   |        |     |           |      |
| Gate-Threshold Voltage  | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$  | 1      |     |           | V    |
| Gate-Body Leakage   | $I_{GSS}$    | $V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$                                       |        |     | $\pm 100$ | nA   |
| Zero Gate Voltage Drain Current                                   | $I_{DSS}$    | $V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}$   |        |     | 1         | uA   |
|   |              | $V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$                   |        |     | 25        |      |
| On-State Drain Current <sup>A</sup>                               | $I_{D(on)}$  | $V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$   | 20     |     |           | A    |
| Drain-Source On-Resistance <sup>A</sup>                           | $r_{DS(on)}$ | $V_{GS} = 10 \text{ V}, I_D = 9.2 \text{ A}$  |        |     | 22        | mΩ   |
|   |              | $V_{GS} = 4.5 \text{ V}, I_D = 7 \text{ A}$   |        |     | 30        |      |
| Forward Transconductance <sup>A</sup>                             | $g_{fs}$     | $V_{DS} = 15 \text{ V}, I_D = 9.2 \text{ A}$  |        | 40  |           | S    |
| Diode Forward Voltage   | $V_{SD}$     | $I_S = 2.3 \text{ A}, V_{GS} = 0 \text{ V}$   |        | 0.7 |           | V    |
| <b>Dynamic<sup>b</sup></b>  |              |   |        |     |           |      |
| Total Gate Charge   | $Q_g$        | $V_{DS} = 10 \text{ V}, V_{GS} = 4.5 \text{ V},$<br>$I_D = 7 \text{ A}$                 |        | 4.0 |           | nC   |
| Gate-Source Charge  | $Q_{gs}$     |   |        | 1.1 |           |      |
| Gate-Drain Charge   | $Q_{gd}$     |   |        | 1.4 |           |      |
| Turn-On Delay Time  | $t_{d(on)}$  | $V_{DD} = 10 \text{ V}, R_L = 6 \Omega, I_D = 1 \text{ A},$<br>$V_{GEN} = 10 \text{ V}$ |        | 16  |           | nS   |
| Rise Time   | $t_r$        |   |        | 5   |           |      |
| Turn-Off Delay Time   | $t_{d(off)}$ |   |        | 23  |           |      |
| Fall-Time   | $t_f$        |   |        | 3   |           |      |

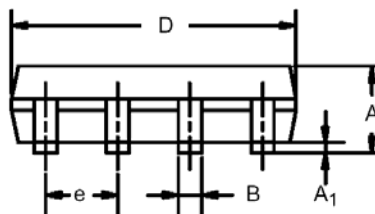
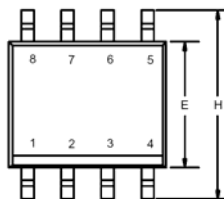
## Notes

- Pulse test:  $PW \leq 300\mu\text{s}$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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# Package Information

## SO-8: 8LEAD



| Dim            | MILLIMETERS |      | INCHES    |       |
|----------------|-------------|------|-----------|-------|
|                | Min         | Max  | Min       | Max   |
| A              | 1.35        | 1.75 | 0.053     | 0.069 |
| A <sub>1</sub> | 0.10        | 0.20 | 0.004     | 0.008 |
| B              | 0.35        | 0.51 | 0.014     | 0.020 |
| C              | 0.19        | 0.25 | 0.0075    | 0.010 |
| D              | 4.80        | 5.00 | 0.189     | 0.196 |
| E              | 3.80        | 4.00 | 0.150     | 0.157 |
| e              | 1.27 BSC    |      | 0.050 BSC |       |
| H              | 5.80        | 6.20 | 0.228     | 0.244 |
| h              | 0.25        | 0.50 | 0.010     | 0.020 |
| L              | 0.50        | 0.93 | 0.020     | 0.037 |
| q              | 0°          | 8°   | 0°        | 8°    |

