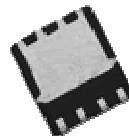


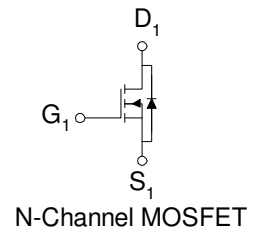
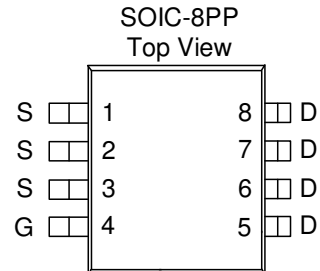
## N-Channel 20-V (D-S) MOSFET

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.

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



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COMPLIANT  
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**FREE**  
Available



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |                          |                |            |                  |
|-----------------------------------------------------------------------------|--------------------------|----------------|------------|------------------|
| Parameter                                                                   |                          | Symbol         | Limit      | Units            |
| Drain-Source Voltage                                                        |                          | $V_{DS}$       | 20         | V                |
| Gate-Source Voltage                                                         |                          | $V_{GS}$       | $\pm 8$    |                  |
| Continuous Drain Current <sup>a</sup>                                       | $T_A = 25^\circ\text{C}$ | $I_D$          | $\pm 37$   | A                |
|                                                                             | $T_A = 70^\circ\text{C}$ |                | $\pm 30$   |                  |
| Pulsed Drain Current <sup>b</sup>                                           |                          | $I_{DM}$       | $\pm 50$   |                  |
| Continuous Source Current (Diode Conduction) <sup>a</sup>                   |                          | $I_S$          | 2.3        | A                |
| Power Dissipation <sup>a</sup>                                              | $T_A = 25^\circ\text{C}$ | $P_D$          | 5.0        | W                |
|                                                                             | $T_A = 70^\circ\text{C}$ |                | 3.2        |                  |
| Operating Junction and Storage Temperature Range                            |                          | $T_J, T_{stg}$ | -55 to 150 | $^\circ\text{C}$ |

| THERMAL RESISTANCE RATINGS               |                         |                 |         |                    |
|------------------------------------------|-------------------------|-----------------|---------|--------------------|
| Parameter                                |                         | Symbol          | Maximum | Units              |
| Maximum Junction-to-Ambient <sup>a</sup> | $t \leq 10 \text{ sec}$ | $R_{\theta JA}$ | 25      | $^\circ\text{C/W}$ |
|                                          | Steady State            |                 | 65      | $^\circ\text{C/W}$ |

### Notes

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

**SPECIFICATIONS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

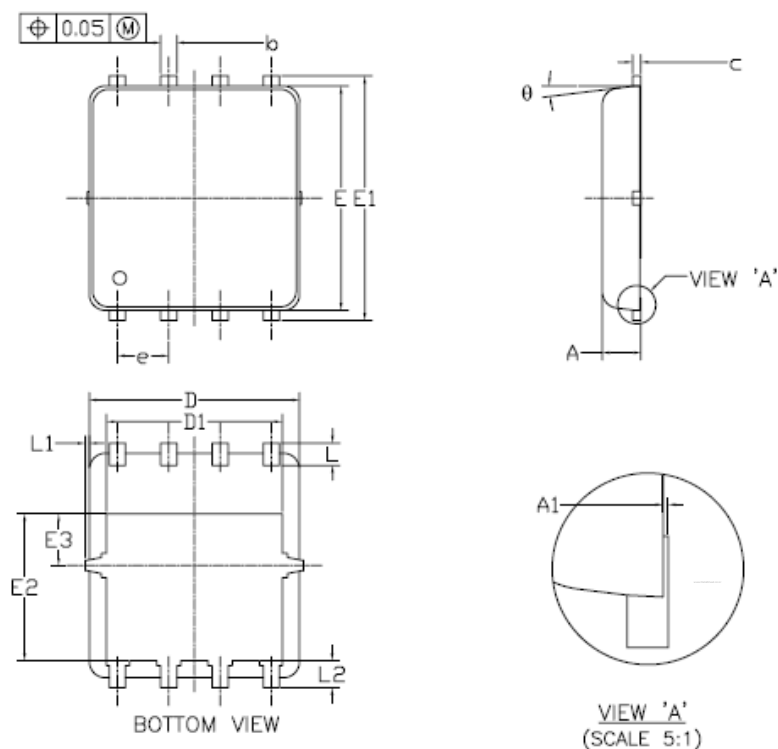
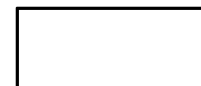
| Parameter                               | Symbol              | Test Conditions                                                                                  | Limits |     |      | Unit |
|-----------------------------------------|---------------------|--------------------------------------------------------------------------------------------------|--------|-----|------|------|
|                                         |                     |                                                                                                  | Min    | Typ | Max  |      |
| Static                                  |                     |                                                                                                  |        |     |      |      |
| Gate-Threshold Voltage                  | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 uA                                      | 0.7    |     |      | V    |
| Gate-Body Leakage                       | I <sub>GSS</sub>    | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = 20 V                                                    |        |     | ±100 | nA   |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V                                                    |        |     | 1    | uA   |
|                                         |                     | V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C                             |        |     | 25   |      |
| On-State Drain Current <sup>A</sup>     | I <sub>D(on)</sub>  | V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V                                                    | 20     |     |      | A    |
| Drain-Source On-Resistance <sup>A</sup> | r <sub>DS(on)</sub> | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 1 A                                                    |        |     | 2.5  | mΩ   |
|                                         |                     | V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 1 A                                                    |        |     | 4    |      |
| Forward Tranconductance <sup>A</sup>    | g <sub>fs</sub>     | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 1 A                                                     |        | 40  |      | S    |
| Diode Forward Voltage                   | V <sub>SD</sub>     | I <sub>S</sub> = 1 A, V <sub>GS</sub> = 0 V                                                      |        | 0.7 |      | V    |
| Dynamic <sup>b</sup>                    |                     |                                                                                                  |        |     |      |      |
| Total Gate Charge                       | Q <sub>g</sub>      | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 4.5 V,<br>I <sub>D</sub> = 1 A                         |        | 100 |      | nC   |
| Gate-Source Charge                      | Q <sub>gs</sub>     |                                                                                                  |        | 20  |      |      |
| Gate-Drain Charge                       | Q <sub>gd</sub>     |                                                                                                  |        | 20  |      |      |
| Turn-On Delay Time                      | t <sub>d(on)</sub>  | V <sub>DD</sub> = 25 V, R <sub>L</sub> = 25 Ω , I <sub>D</sub> = 1 A,<br>V <sub>GEN</sub> = 10 V |        | 50  |      | nS   |
| Rise Time                               | t <sub>r</sub>      |                                                                                                  |        | 90  |      |      |
| Turn-Off Delay Time                     | t <sub>d(off)</sub> |                                                                                                  |        | 300 |      |      |
| Fall-Time                               | t <sub>f</sub>      |                                                                                                  |        | 100 |      |      |

## 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



| SYMBOLS | DIMENSIONS IN MILLIMETERS |      |      | DIMENSIONS IN INCHES |       |       |
|---------|---------------------------|------|------|----------------------|-------|-------|
|         | MIN                       | NOM  | MAX  | MIN                  | NOM   | MAX   |
| A       | 0.85                      | 0.95 | 1.00 | 0.033                | 0.037 | 0.039 |
| A1      | 0.00                      | —    | 0.05 | 0.000                | —     | 0.002 |
| b       | 0.30                      | 0.40 | 0.50 | 0.012                | 0.016 | 0.020 |
| c       | 0.15                      | 0.20 | 0.25 | 0.006                | 0.008 | 0.010 |
| D       | 5.20 BSC                  |      |      | 0.205 BSC            |       |       |
| D1      | 4.35 BSC                  |      |      | 0.171 BSC            |       |       |
| E       | 5.55 BSC                  |      |      | 0.219 BSC            |       |       |
| E1      | 6.05 BSC                  |      |      | 0.238 BSC            |       |       |
| E2      | 3.625 BSC                 |      |      | 0.143 BSC            |       |       |
| E3      | 1.275 BSC                 |      |      | 0.050 BSC            |       |       |
| e       | 1.27 BSC                  |      |      | 0.050 BSC            |       |       |
| L       | 0.45                      | 0.55 | 0.65 | 0.018                | 0.022 | 0.026 |
| L1      | 0                         | —    | 0.15 | 0                    | —     | 0.006 |
| L2      | 0.68 REF                  |      |      | 0.027 REF            |       |       |
| θ       | 0°                        | —    | 10°  | 0°                   | —     | 10°   |