

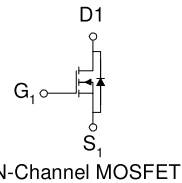
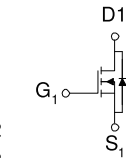
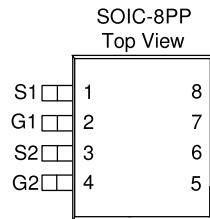
## Dual N-Channel 40-V (D-S) MOSFET

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.

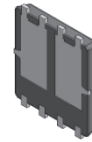
- Low  $r_{DS(on)}$  provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SOIC-8PP saves board space
- Fast switching speed
- High performance trench technology

### PRODUCT SUMMARY

| $V_{DS}$ (V) | $r_{DS(on)}$ m( $\Omega$ ) | $I_D$ (A) |
|--------------|----------------------------|-----------|
| 40           | 19 @ $V_{GS} = 10V$        | 24        |
|              | 22 @ $V_{GS} = 4.5V$       | 22        |



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**



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

| Parameter                                                 |                      | Symbol                            | Limit      | Units |
|-----------------------------------------------------------|----------------------|-----------------------------------|------------|-------|
| Drain-Source Voltage                                      |                      | V <sub>DS</sub>                   | 40         | V     |
| Gate-Source Voltage                                       |                      | V <sub>GS</sub>                   | 20         |       |
| Continuous Drain Current <sup>a</sup>                     | T <sub>A</sub> =25°C | I <sub>D</sub>                    | 24         | A     |
|                                                           | T <sub>A</sub> =70°C |                                   | 20         |       |
| Pulsed Drain Current <sup>b</sup>                         |                      | I <sub>DM</sub>                   | ±50        |       |
| Continuous Source Current (Diode Conduction) <sup>a</sup> |                      | I <sub>S</sub>                    | 13         | A     |
| Power Dissipation <sup>a</sup>                            | T <sub>A</sub> =25°C | P <sub>D</sub>                    | 16         | W     |
|                                                           | T <sub>A</sub> =70°C |                                   | 10         |       |
| Operating Junction and Storage Temperature Range          |                      | T <sub>J</sub> , T <sub>stg</sub> | -55 to 150 | °C    |

### THERMAL RESISTANCE RATINGS

| Parameter                                |              | Symbol           | Maximum | Units |
|------------------------------------------|--------------|------------------|---------|-------|
| Maximum Junction-to-Ambient <sup>a</sup> | t <= 10 sec  | R <sub>θJA</sub> | 35      | °C/W  |
|                                          | Steady State | R <sub>θJC</sub> | 8       |       |

Notes

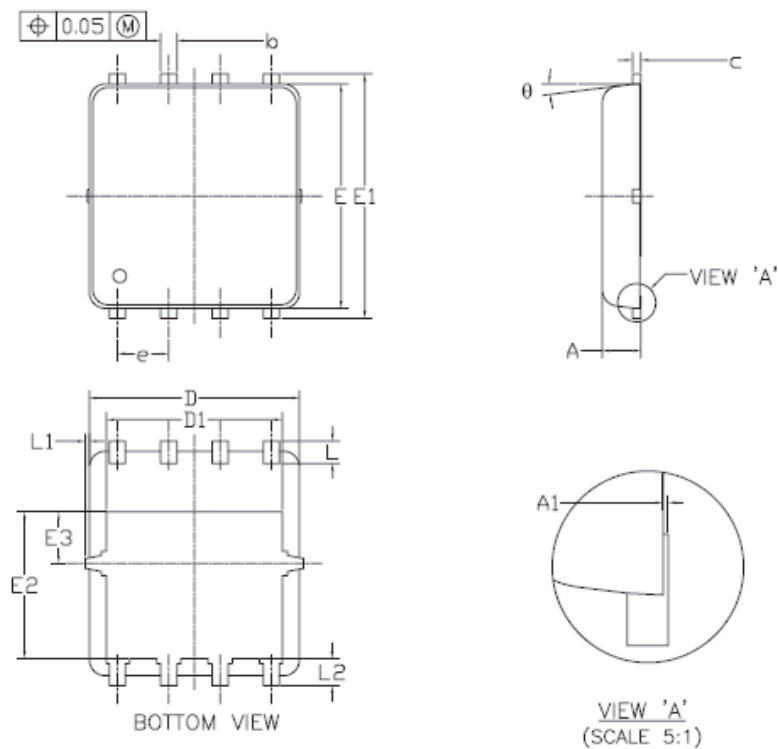
- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

| SPECIFICATIONS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED) |                     |                                                                              |        |     |      |      |
|---------------------------------------------------------------|---------------------|------------------------------------------------------------------------------|--------|-----|------|------|
| Parameter                                                     | Symbol              | Test Conditions                                                              | Limits |     |      | Unit |
|                                                               |                     |                                                                              | Min    | Typ | Max  |      |
| Static                                                        |                     |                                                                              |        |     |      |      |
| Gate-Threshold Voltage                                        | V <sub>GS(th)</sub> | V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250 uA                  | 1      |     |      | V    |
| Gate-Body Leakage                                             | I <sub>GSS</sub>    | V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0 V                                |        |     | ±100 | nA   |
| Zero Gate Voltage Drain Current                               | I <sub>DSS</sub>    | V <sub>DS</sub> = 80 V, V <sub>GS</sub> = 0 V                                |        |     | 1    | uA   |
| 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> = 10 V, I <sub>D</sub> = 1 A                                 |        |     | 19   | mΩ   |
|                                                               |                     | V <sub>GS</sub> = 4.5 V, ID = 1 A                                            |        |     | 22   |      |
| Forward Tranconductance <sup>A</sup>                          | g <sub>fs</sub>     | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 1 A                                 |        | 40  |      | S    |
| Dynamic                                                       |                     |                                                                              |        |     |      |      |
| Total Gate Charge                                             | Q <sub>g</sub>      | N-Channel<br>V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =1A |        | 10  |      | nC   |
| Gate-Source Charge                                            | Q <sub>gs</sub>     |                                                                              |        | 2   |      |      |
| Gate-Drain Charge                                             | Q <sub>gd</sub>     |                                                                              |        | 2   |      |      |
| Input Capacitance                                             | C <sub>iss</sub>    | N-Channel<br>V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz               |        | 600 |      | pF   |
| Output Capacitance                                            | C <sub>oss</sub>    |                                                                              |        | 100 |      |      |
| Reverse Transfer Capacitance                                  | C <sub>rss</sub>    |                                                                              |        | 50  |      |      |
| Turn-On Delay Time                                            | t <sub>d(on)</sub>  | N-Chaneel<br>V <sub>DD</sub> =15V, VGS=10V, ID=1A ,<br>R <sub>GEN</sub> =25Ω |        | 12  |      | nS   |
| Rise Time                                                     | t <sub>r</sub>      |                                                                              |        | 14  |      |      |
| Turn-Off Delay Time                                           | t <sub>d(off)</sub> |                                                                              |        | 20  |      |      |
| Fall-Time                                                     | t <sub>f</sub>      |                                                                              |        | 10  |      |      |

## Notes

- Pulse test: PW ≤ 300us duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

# 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            |       |       |
| $\theta$ | 0°                        | —    | 10°  | 0°                   | —     | 10°   |