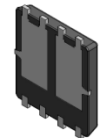
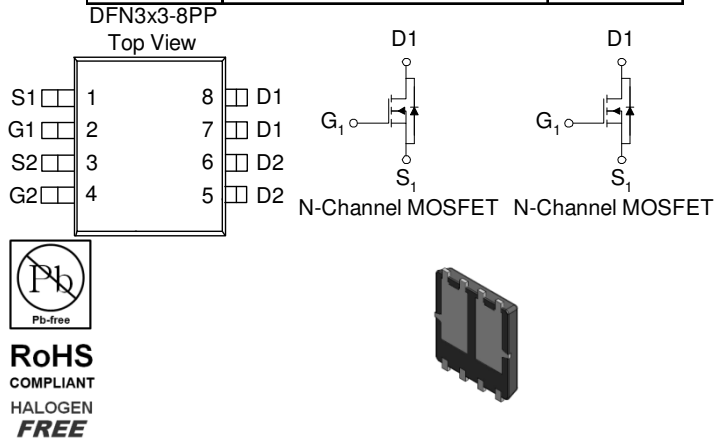


### Dual N-Channel 40-V (D-S) MOSFET

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 DFN3x3-8PP saves board space
- Fast switching speed
- High performance trench technology

| PRODUCT SUMMARY |                            |           |
|-----------------|----------------------------|-----------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ m( $\Omega$ ) | $I_D$ (A) |
| 40              | 35 @ $V_{GS} = 10V$        | 7.0       |
|                 | 46 @ $V_{GS} = 4.5V$       | 6.1       |



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED) |                |                  |            |
|---|----------------|------------------|------------|
| Parameter   | Symbol         | Limit            | Units      |
| Drain-Source Voltage  | $V_{DS}$       | 40               | V          |
| Gate-Source Voltage   | $V_{GS}$       | 20               |            |
| Continuous Drain Current <sup>a</sup>                                 | $I_D$          | $T_A=25^\circ C$ | 7          |
|   |                | $T_A=70^\circ C$ | 5.7        |
| Pulsed Drain Current <sup>b</sup>                                     | $I_{DM}$       | $\pm 20$         | A          |
| Continuous Source Current (Diode Conduction) <sup>a</sup>             | $I_S$          | 7                | A          |
| Power Dissipation <sup>a</sup>  | $P_D$          | $T_A=25^\circ C$ | 2.5        |
|   |                | $T_A=70^\circ C$ | 1.3        |
| 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> | $t \leq 10$ sec | $R_{\theta JA}$ | 50    |
|  | Steady State    | $R_{\theta JC}$ | 7     |

Notes

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

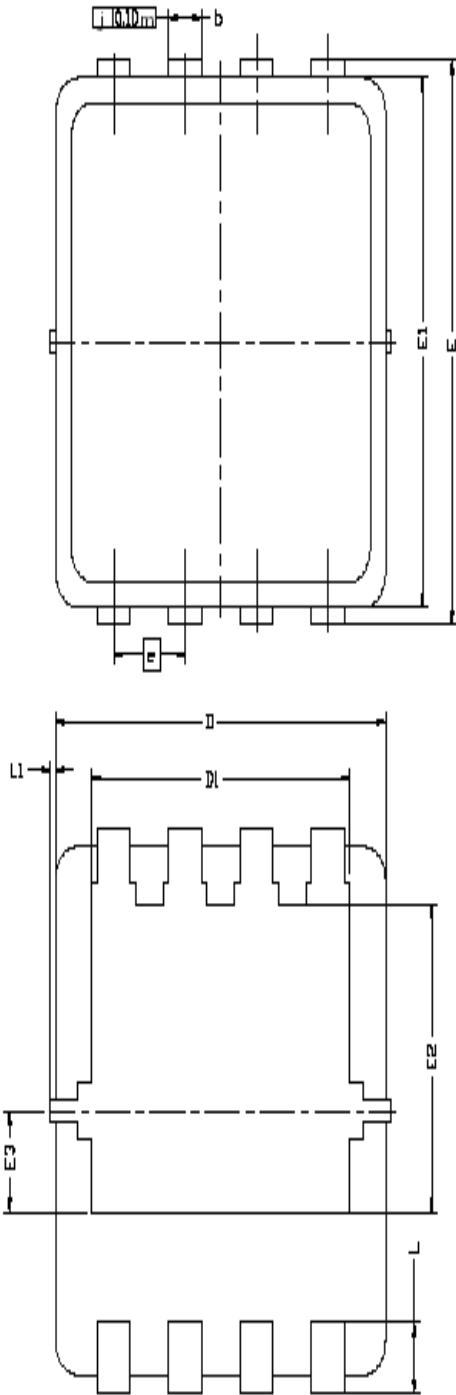
| SPECIFICATIONS (T <sub>A</sub> = 25 <sup>o</sup> C UNLESS OTHERWISE NOTED) |                     |  |        |     |           |            |
|--|---------------------|--|--------|-----|-----------|------------|
| Parameter  | Symbol              | Test Conditions  | Limits |     |           | Unit       |
|  |                     |  | Min    | Typ | Max       |            |
| <b>Static</b>  |                     |  |        |     |           |            |
| Gate-Threshold Voltage   | V <sub>GS(th)</sub> | V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250 $\mu$ A   | 1      |     |           | V          |
| Gate-Body Leakage  | I <sub>GSS</sub>    | V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0 V  |        |     | $\pm$ 100 | nA         |
| Zero Gate Voltage Drain Current  | I <sub>DSS</sub>    | V <sub>DS</sub> = 32 V, V <sub>GS</sub> = 0 V  |        |     | 1         | $\mu$ A    |
| 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   |        |     | 35        | m $\Omega$ |
|  |                     | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 1 A  |        |     | 46        |            |
| Forward Transconductance <sup>A</sup>                                      | g <sub>fs</sub>     | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 1 A   |        | 26  |           | S          |
| <b>Dynamic</b>   |                     |  |        |     |           |            |
| 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                                   |        | 7   |           | 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   |        | 400 |           | pF         |
| Output Capacitance   | C <sub>oss</sub>    |  |        | 80  |           |            |
| Reverse Transfer Capacitance   | C <sub>rss</sub>    |  |        | 40  |           |            |
| Turn-On Delay Time   | t <sub>d(on)</sub>  | N-Channel<br>V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =1A ,<br>R <sub>GEN</sub> =25 $\Omega$ |        | 2   |           | nS         |
| Rise Time  | t <sub>r</sub>      |  |        | 3   |           |            |
| Turn-Off Delay Time  | t <sub>d(off)</sub> |  |        | 12  |           |            |
| Fall-Time  | t <sub>f</sub>      |  |        | 4   |           |            |

## Notes

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

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Package Information



| DIM | MILLIMETERS |       |       | INCHES    |        |        |
|-----|-------------|-------|-------|-----------|--------|--------|
|     | MIN         | NOM   | MAX   | MIN       | NOM    | MAX    |
| A   | 0.700       | 0.80  | 0.900 | 0.0276    | 0.0315 | 0.0354 |
| A1  | 0.00        | ---   | 0.05  | 0.000     | ---    | 0.002  |
| b   | 0.24        | 0.30  | 0.35  | 0.009     | 0.012  | 0.014  |
| c   | 0.10        | 0.152 | 0.25  | 0.004     | 0.006  | 0.010  |
| D   | 3.00 BSC    |       |       | 0.118 BSC |        |        |
| D1  | 2.35 BSC    |       |       | 0.093 BSC |        |        |
| E   | 3.20 BSC    |       |       | 0.126 BSC |        |        |
| E1  | 3.00 BSC    |       |       | 0.118 BSC |        |        |
| E2  | 1.75 BSC    |       |       | 0.069 BSC |        |        |
| E3  | 0.575 BSC   |       |       | 0.023 BSC |        |        |
| e   | 0.65 BSC    |       |       | 0.026 BSC |        |        |
| L   | 0.30        | 0.40  | 0.50  | 0.0118    | 0.0157 | 0.0197 |
| LL  | D           | ---   | 0.100 | D         | ---    | 0.004  |
| B1  | 0°          | 10°   | 12°   | 0°        | 10°    | 12°    |