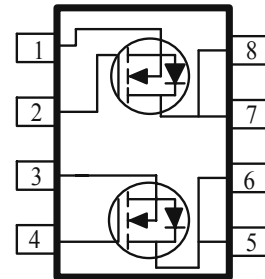
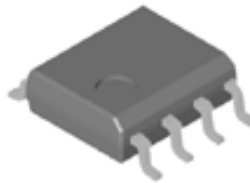


### Dual N-Channel 30-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize High Cell Density process. Low  $r_{DS(on)}$  assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are PWMDC-DC converters, power management in portable and battery-powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

- Low  $r_{DS(on)}$  Provides Higher Efficiency and Extends Battery Life
- Miniature SO-8 Surface Mount Package Saves Board Space
- High power and current handling capability
- Low side high current DC-DC Converter applications

| PRODUCT SUMMARY |                            |           |
|-----------------|----------------------------|-----------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ m( $\Omega$ ) | $I_D$ (A) |
| 30              | 34 @ $V_{GS} = 10V$        | 6.9       |
|                 | 41 @ $V_{GS} = 4.5V$       | 6.0       |



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED) |                |                  |            |
|---|----------------|------------------|------------|
| Parameter   | Symbol         | Limit            | Units      |
| Drain-Source Voltage  | $V_{DS}$       | 30               | V          |
| Gate-Source Voltage   | $V_{GS}$       | $\pm 20$         |            |
| Continuous Drain Current <sup>a</sup>                                 | $I_D$          | $T_A=25^\circ C$ | $\pm 6.9$  |
|   |                | $T_A=70^\circ C$ | $\pm 5.6$  |
| Pulsed Drain Current <sup>b</sup>                                     | $I_{DM}$       | $\pm 40$         | A          |
| Continuous Source Current (Diode Conduction) <sup>a</sup>             | $I_S$          | 1.7              | A          |
| Power Dissipation <sup>a</sup>  | $P_D$          | $T_A=25^\circ C$ | 2.1        |
|   |                | $T_A=70^\circ C$ | 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> | $R_{\theta JA}$ | t $\leq$ 10 sec | 62.5  |
|  |                 | Steady-State    | 110   |

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
- b. 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  |      |
| <b>Static</b>   |                     |  |        |      |      |      |
| Gate-Threshold Voltage  | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 uA                                      | 1      |      |      |      |
| 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> = 24 V, V <sub>GS</sub> = 0 V  |        |      | 1    | uA   |
|   |                     | V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C                             |        |      | 10   |      |
| 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> = 6.9 A   |        |      | 34   | mΩ   |
|   |                     | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 6.0 A  |        |      | 41   |      |
| Forward Transconductance <sup>A</sup>                         | g <sub>fs</sub>     | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 6.9 A   |        | 25   |      | S    |
| Diode Forward Voltage   | V <sub>SD</sub>     | I <sub>S</sub> = 1.7 A, V <sub>GS</sub> = 0 V  |        | 0.77 |      | V    |
| <b>Dynamic<sup>b</sup></b>                                    |                     |  |        |      |      |      |
| 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> = 6.9 A                       |        | 4.0  |      | nC   |
| Gate-Source Charge  | Q <sub>gs</sub>     |  |        | 1.1  |      |      |
| Gate-Drain Charge   | Q <sub>gd</sub>     |  |        | 1.4  |      |      |
| Turn-On Delay Time  | t <sub>d(on)</sub>  | V <sub>DD</sub> = 15 V, R <sub>L</sub> = 15 Ω , I <sub>D</sub> = 1 A,<br>V <sub>GEN</sub> = 10 V |        | 12   |      | nS   |
| Rise Time   | t <sub>r</sub>      |  |        | 10   |      |      |
| Turn-Off Delay Time   | t <sub>d(off)</sub> |  |        | 60   |      |      |
| Fall-Time   | t <sub>f</sub>      |  |        | 15   |      |      |
| Source-Drain Reverse Recovery Time                            | t <sub>rr</sub>     | I <sub>F</sub> = 1.7 A, Di/Dt = 100 A/uS   |        | 50   |      |      |

Notes

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

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### Typical Electrical Characteristics (N-Channel)

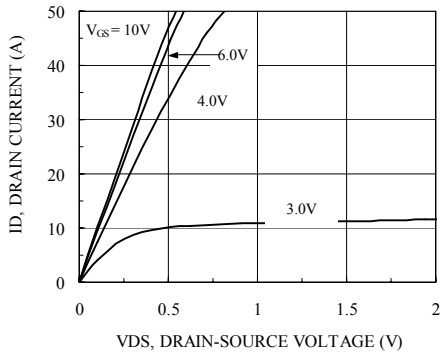


Figure 1. On-Region Characteristics

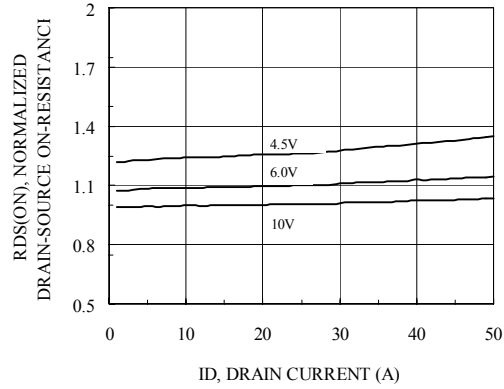


Figure 2. On-Resistance with Drain Current

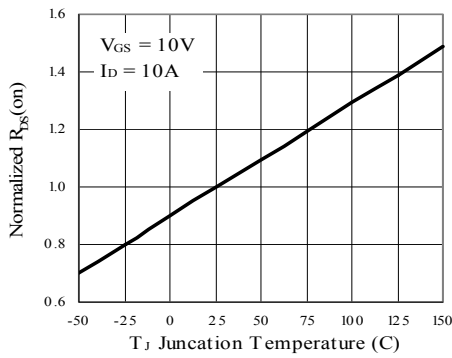


Figure 3. On-Resistance Variation with Temperature

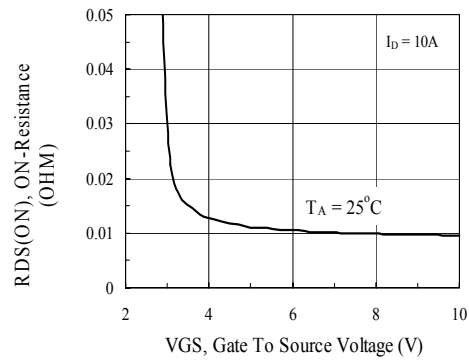


Figure 4. On-Resistance Variation with Gate to Source Voltage

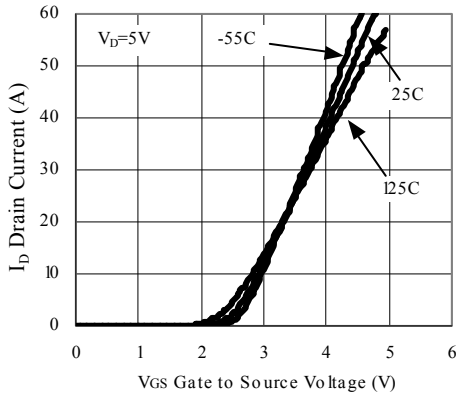


Figure 5. Transfer Characteristics

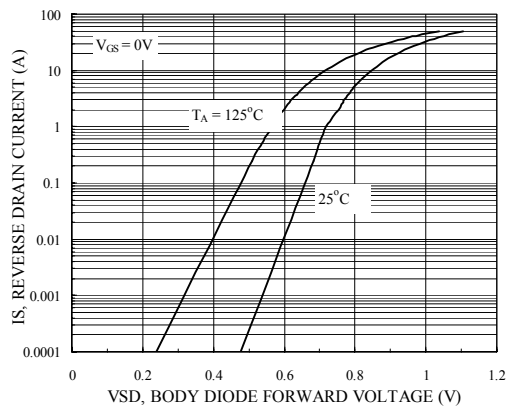


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

### Typical Electrical Characteristics (N-Channel)

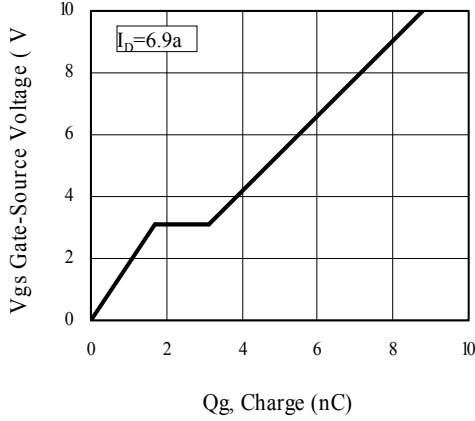


Figure 7. Gate Charge Characteristics

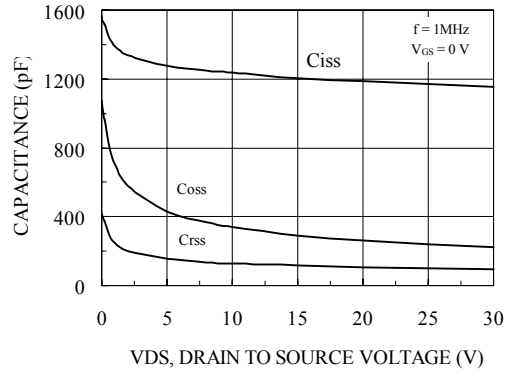


Figure 8. Capacitance Characteristics

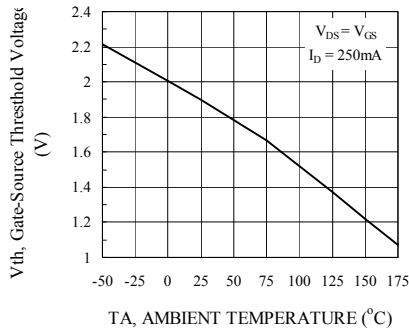


Figure 9. Threshold Vs Ambient Temperature

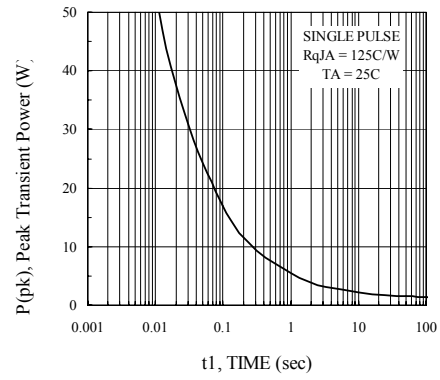


Figure 10. Single Pulse Maximum Power Dissipation

### Normalized Thermal Transient Junction to Ambient

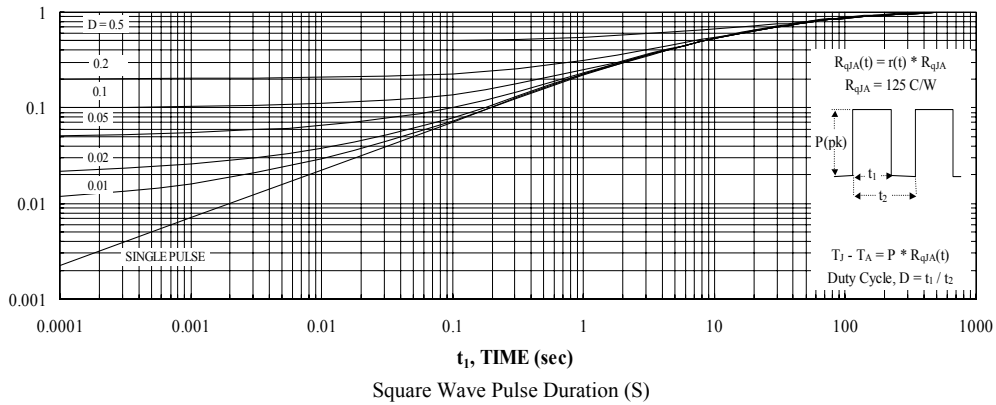
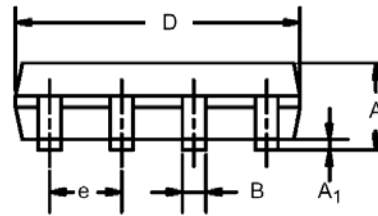
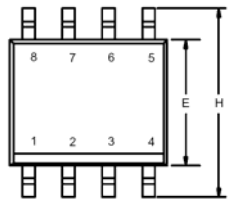


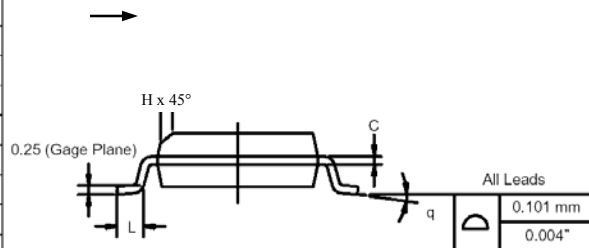
Figure 11. Transient Thermal Response Curve

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°    |



# Ordering information

- AM4920N-T1-XX
  - A: Analog Power
  - M: MOSFET
  - 4920: Part number
  - N: N-Channel
  - T1: Tape & reel
  - XX: Blank: Standard  
PF: Leadfree