

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

Preliminary

#### FEATURES

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

#### Application

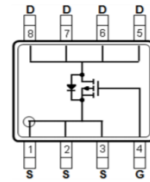
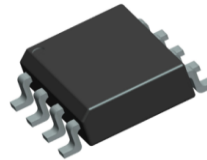
- Portable Devices
- Consumer Electronics

#### Mechanical

- Case: SOP-8-Single Package

| PRODUCTY SUMMARY |                            |              |           |
|------------------|----------------------------|--------------|-----------|
| $V_{DS}$         | $R_{DS(on)}$ m( $\Omega$ ) |              | $I_D$ (A) |
| -30              | 15                         | Rdson @-10V  | -8.1      |
|                  | 18                         | Rdson @-4.5V | -7.4      |

#### SOP-8-Single



#### Packing Information

| Package      | Packing        |
|--------------|----------------|
| SOP-8-Single | 2.5K /13" Reel |

#### Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter  | Symbol         | Limit      | Unit             |
|--|----------------|------------|------------------|
| Drain-Source Voltage                             | $V_{DS}$       | -30        | V                |
| Gate-Source Voltage                              | $V_{GS}$       | $\pm 20$   | V                |
| Continuous Drain Current <sup>1)</sup>           | $I_D$          | -15        | A                |
| Maximum Power Dissipation                        | $P_D$          | 1.1        | W                |
| Pulsed Drain Current <sup>2)</sup>               | $I_{DM}$       | -60        | A                |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$ | -55 to 150 | $^\circ\text{C}$ |

#### Typical Thermal Resistance

| Parameter                              | Symbol          | Limit | Unit               |
|--|-----------------|-------|--------------------|
| Junction-to-Ambient Thermal Resistance | $R_{\theta JA}$ | 110   | $^\circ\text{C/W}$ |

Note:

1. Fused current that based on wire numbers and diameter
2. Repetitive Rating: Pulse width limited by the maximum junction temperature
3. 1in2 2oz Cu PCB board

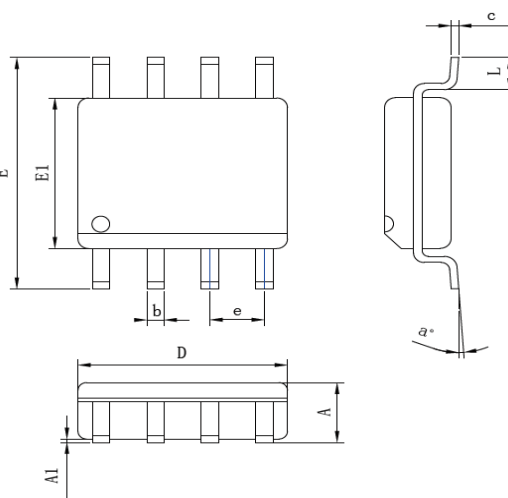
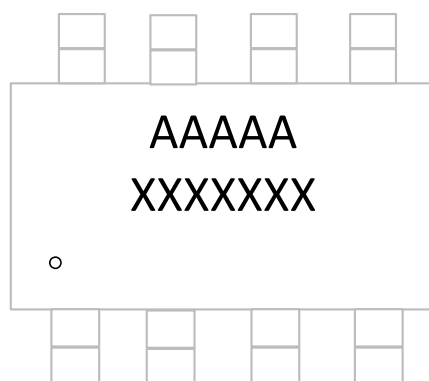
| Electrical Characteristics (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED) |                     |   |        |       |       |      |
|---|---------------------|---|--------|-------|-------|------|
| Characteristics   | Symbol              | Test Condition  | Limits |       |       | Unit |
|   |                     |   | Min    | Typ   | Max   |      |
| Static  |                     |   |        |       |       |      |
| Drain-Source Breakdown Voltage  | B <sub>VDSS</sub>   | V <sub>GS</sub> = 0V, I <sub>D</sub> =-250uA  | -30    |       |       | V    |
| Gate Threshold Voltage  | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA                               | -1.00  | -1.50 | -3.00 | V    |
| Drain-Source On-State Resistance  | R <sub>DS(on)</sub> | V <sub>GS</sub> =-10.0V, I <sub>D</sub> =-8.1A  | -      | 12.0  | 15.0  | mΩ   |
|   |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-7.4A   | -      | 15.0  | 18.0  | mΩ   |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>    | V <sub>DS</sub> =-30V, V <sub>G</sub> S=0V  |        |       | 1.0   | uA   |
| Gate-Source Leakage Current   | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V  |        |       | ±100  | nA   |
|   |                     |   |        |       |       |      |
| Dynamic <sup>3)</sup>   |                     |   |        |       |       |      |
| Total Gate Charge   | Q <sub>g</sub>      | V <sub>DS</sub> =-15V, I <sub>D</sub> =-10A,<br>V <sub>GS</sub> =-4.5V                  | -      | 26    | -     | nC   |
| Gate-Source Charge  | Q <sub>gs</sub>     |   | -      | 8.7   | -     | nC   |
| Gate-Drain Charge   | Q <sub>gd</sub>     |   | -      | 8.6   | -     | nC   |
| Input Capacitance   | C <sub>iSS</sub>    | V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V,<br>f=1.0MHZ                                 | -      | 3168  | -     | pF   |
| Output Capacitance  | C <sub>oSS</sub>    |   | -      | 393   | -     | pF   |
| Reverse Transfer Capacitance  | C <sub>rSS</sub>    |   | -      | 258   | -     | pF   |
|   |                     |   |        |       |       |      |
| Switching   |                     |   |        |       |       |      |
| Turn-On Delay Time  | t <sub>d(on)</sub>  | V <sub>DD</sub> =-15V, I <sub>D</sub> =-1A,<br>V <sub>GS</sub> =-10V,R <sub>G</sub> =6Ω | -      | 11    | -     | ns   |
| Turn-On Rise Time   | t <sub>r</sub>      |   | -      | 14    | -     | ns   |
| Turn-Off Delay Time   | t <sub>d(off)</sub> |   | -      | 102   | -     | ns   |
| Turn-Off Fall Time  | t <sub>f</sub>      |   | -      | 47    | -     | ns   |
|   |                     |   |        |       |       |      |
| Drain-Source Diode  |                     |   |        |       |       |      |
| Maximum Continuous Drain-Source   | I <sub>S</sub>      | -   | -      | -     | -12   | A    |
| Diode Forward Voltage   | V <sub>SD</sub>     | I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V  | -      | -     | -1.2  | V    |

**NOTES :**

1. Pulse width<300us, Duty cycle<2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature T<sub>J</sub>(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub> =25°C.
4. The maximum current rating is package limited.
5. R<sub>QJA</sub> is the sum of the junction to case and case to ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch<sup>2</sup> with 2oz square pad of copper.
6. Guaranteed by design, not subject to production testing.

**Package Outline Dimensions ( inches and millimeters)**

| <b>SOP-8</b> |             |      |        |       |
|--------------|-------------|------|--------|-------|
| SYMBOL       | Dimensions  |      |        |       |
|              | Millimeters |      | Inches |       |
|              | Min         | Max  | Min    | Max   |
| A            | -           | 1.75 |        | 0.069 |
| A1           | 0.10        | 0.23 | 0.004  | 0.009 |
| b            | 0.35        | 0.48 | 0.014  | 0.019 |
| c            | 0.19        | 0.25 | 0.007  | 0.010 |
| D            | 4.70        | 5.10 | 0.185  | 0.201 |
| E            | 5.80        | 6.20 | 0.228  | 0.244 |
| E1           | 3.70        | 4.10 | 0.146  | 0.161 |
| e            | 1.27bsc     |      |        |       |
| L            | 0.50        | 0.80 | 0.020  | 0.031 |
| a°           | 0°          | 8°   | 0°     | 8°    |


**Marking Information**


First line:

AAAAAA = Product number

XXXXXXX = Tracking number

Third line: Gate Pin Point

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