

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

### FEATURES

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

### Application

- Portable Devices
- Consumer Electronics

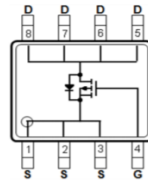
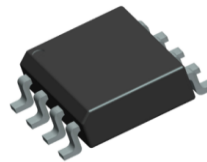
### Mechanical

- Case: SOP-8-Single Package

### PRODUCTY SUMMARY

| $V_{DS}$ | $R_{DS(on)}$ m( $\Omega$ ) |              | $I_D$ (A) |
|----------|----------------------------|--------------|-----------|
| -30      | 13                         | Rdson @-10V  | -8.7      |
|          | 15                         | Rdson @-4.5V | -8.1      |

### 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

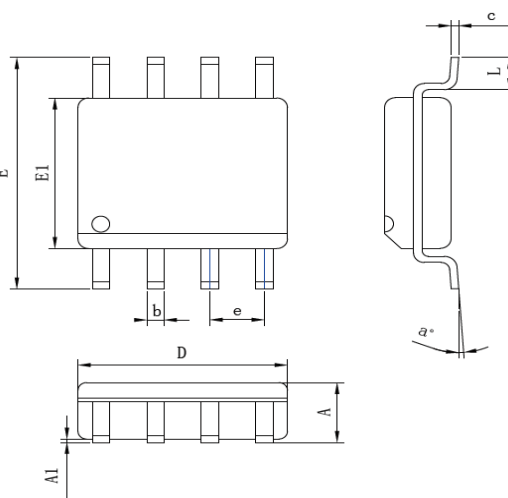
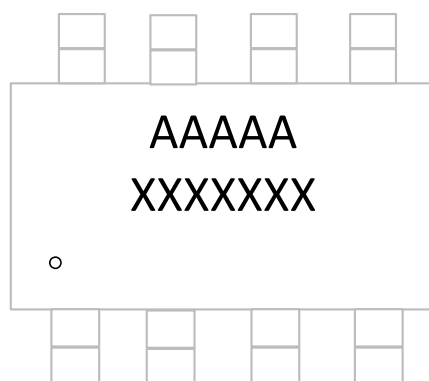
| Electrical Characteristics (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED) |                     |   |        |       |       |      |
|---|---------------------|---|--------|-------|-------|------|
| Characteristics   | Symbol              | Test Condition  | Limits |       |       | Unit |
|   |                     |   | 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> =-8.7A  | -      | 9     | 13    | mΩ   |
|   |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-8.1A   | -      | 12    | 15    | mΩ   |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>    | V <sub>DS</sub> =-30V, V <sub>GS</sub> =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

Motive reserves the right to make changes without further notice to any products herein. Motive makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motive assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in Motive data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motive does not convey any license under its patent rights nor the rights of others. Motive products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motive product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motive products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motive and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motive was negligent regarding the design or manufacture of the part.