

## Features

- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"

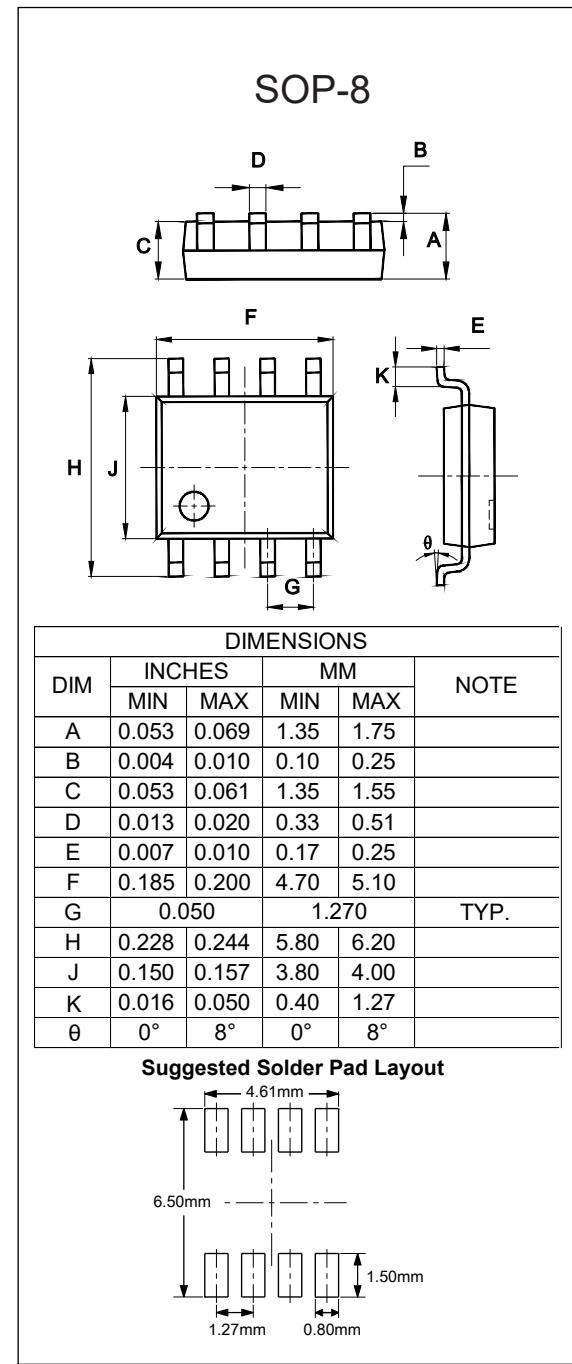
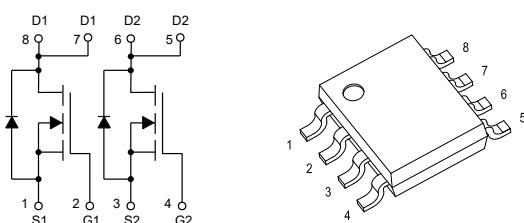
## Dual N-Channel Power MOSFET

## Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 100°C/W Junction to Ambient

| Parameter  | Symbol                            | Rating | Unit |
|--|-----------------------------------|--------|------|
| Drain-Source Voltage                                 | V <sub>DS</sub>                   | 60     | V    |
| Gate-Source Voltage                                  | V <sub>GS</sub>                   | ±20    | V    |
| Drain Current (t ≤10s) <sup>(Note1)</sup>            | I <sub>D</sub>                    | 4.5    | A    |
| Pulsed Drain Current <sup>(Note2)</sup>              | I <sub>DM</sub>                   | 20     | A    |
| Repetitive Avalanche Energy 0.1mH <sup>(Note2)</sup> | E <sub>AR</sub> , E <sub>AS</sub> | 18     | mJ   |
| Total Power Dissipation                              | P <sub>D</sub>                    | 1.25   | W    |

## Internal Structure:



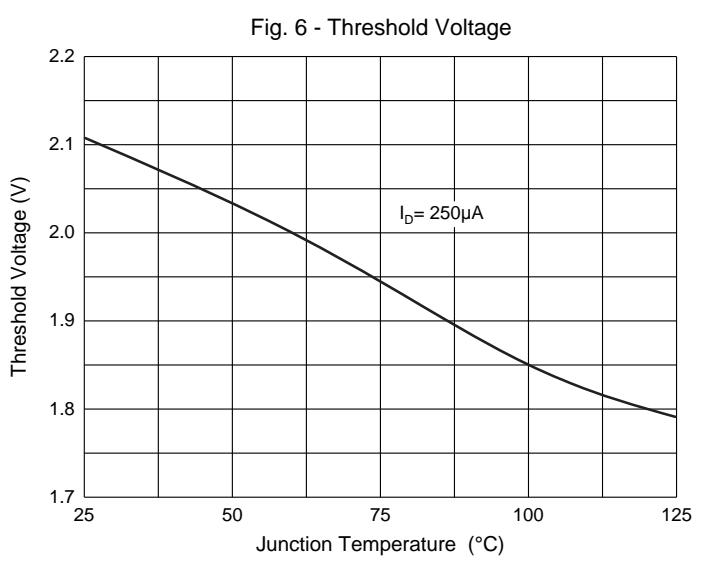
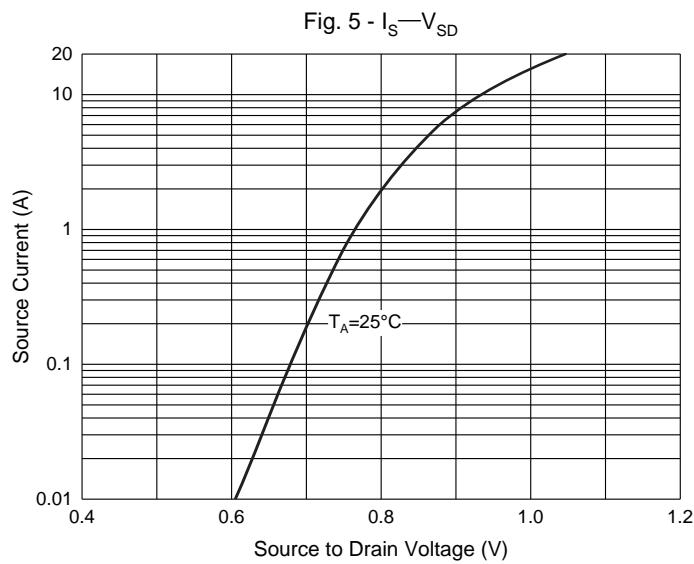
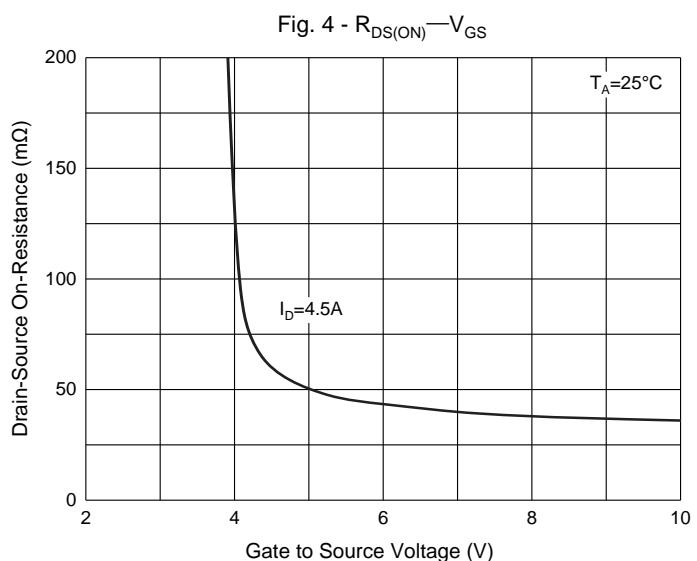
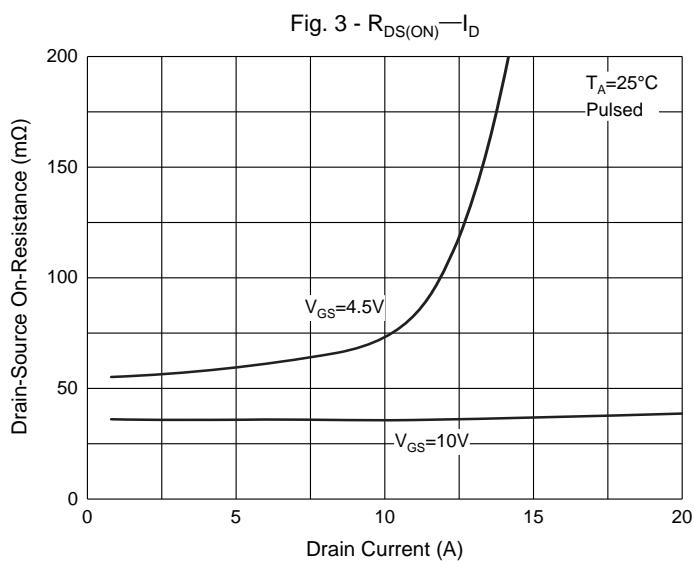
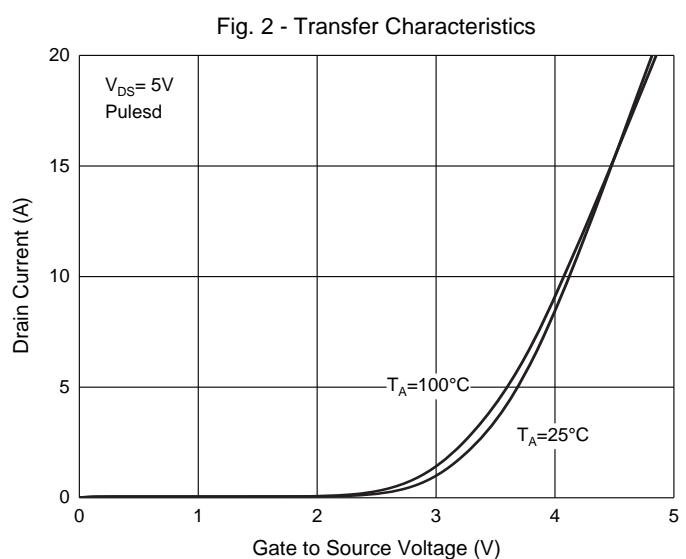
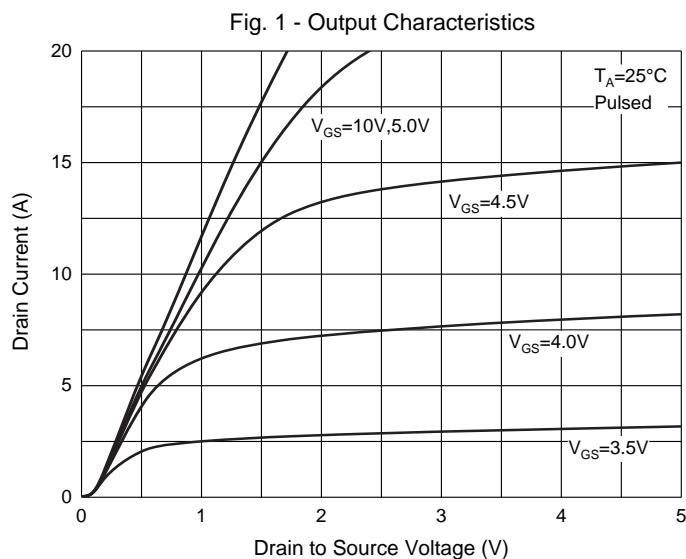
**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

| Parameter   | Symbol        | Test Conditions  | Min | Typ  | Max       | Unit      |
|---|---------------|--|-----|------|-----------|-----------|
| <b>Static Characteristics</b>                       |               |  |     |      |           |           |
| Drain-Source Breakdown Voltage                      | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                                    | 60  |      |           | V         |
| Gate-Source Leakage Current                         | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 20V$                                  |     |      | $\pm 100$ | nA        |
| Zero Gate Voltage Drain Current                     | $I_{DSS}$     | $V_{DS}=60V, V_{GS}=0V$                                      |     |      | 1         | $\mu A$   |
| Gate-Threshold Voltage <sup>(Note 3)</sup>          | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                                | 1   | 2.1  | 3         | V         |
| Drain-Source On-Resistance <sup>(Note 3)</sup>      | $R_{DS(on)}$  | $V_{GS}=10V, I_D=4.5A$                                       |     | 40   | 56        | $m\Omega$ |
|   |               | $V_{GS}=4.5V, I_D=3A$  |     | 55   | 77        |           |
| Forward Tranconductance <sup>(Note 3)</sup>         | $g_{FS}$      | $V_{DS}=5V, I_D=4.5A$  | 6   |      |           | S         |
| Diode Forward Voltage <sup>(Note 3)</sup>           | $V_{SD}$      | $V_{GS}=0V, I_S=1A$  |     |      | 1         | V         |
| <b>Dynamic Characteristics<sup>(Note 4)</sup></b>   |               |  |     |      |           |           |
| Input Capacitance                                   | $C_{iss}$     | $V_{DS}=30V, V_{GS}=0V, f=1MHz$                              |     |      | 540       | $pF$      |
| Output Capacitance                                  | $C_{oss}$     |  |     | 60   |           |           |
| Reverse Transfer Capacitance                        | $C_{rss}$     |  |     | 25   |           |           |
| <b>Switching Characteristics<sup>(Note 4)</sup></b> |               |  |     |      |           |           |
| Turn-On Delay Time                                  | $t_{d(on)}$   | $V_{GS}=10V, V_{DS}=30V$<br>$R_{GEN}=3\Omega, R_L=6.7\Omega$ |     | 4.7  |           | $ns$      |
| Turn-On Rise Time                                   | $t_r$         |  |     | 2.3  |           |           |
| Turn-Off Delay Time                                 | $t_{d(off)}$  |  |     | 15.7 |           |           |
| Turn-Off Fall Time                                  | $t_f$         |  |     | 1.9  |           |           |
| Total Gate Charge (10V)                             | $Q_g$         | $V_{GS}=10V, V_{DS}=30V$<br>$I_D=4.5A$                       |     |      | 10.5      | $nC$      |
| Total Gate Charge (4.5V)                            |               |  |     |      | 5.5       |           |
| Gate-Source Charge                                  | $Q_{gs}$      |  |     | 1.6  |           |           |
| Gate-Drain Charge                                   | $Q_{gd}$      |  |     | 2.2  |           |           |

Notes :

1. The Value In Any Given Application Depends On The User's Specific Board Design.
2. Repetitive Rating : Pulse Width Limited by Junction Temperature.
3. Pulse Test : Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$ .
4. These Parameters Have No Way to Verify.

## Curve Characteristics



## Ordering Information

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 4Kpcs/Reel |

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-TP-HF

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