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# ON Semiconductor DATA SHEET

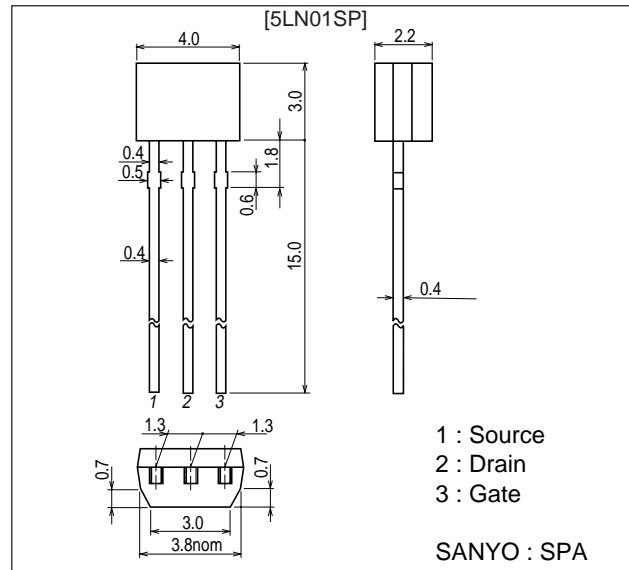
## 5LN01SP — N-Channel Silicon MOSFET — Ultrahigh-Speed Switching Applications

### Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 2.5V drive.

### Package Dimensions

unit : mm  
2180



### Specifications

Absolute Maximum Ratings at Ta=25°C

| Parameter                   | Symbol           | Conditions             | Ratings     | Unit |
|-----------------------------|------------------|------------------------|-------------|------|
| Drain-to-Source Voltage     | V <sub>DSS</sub> |                        | 50          | V    |
| Gate-to-Source Voltage      | V <sub>GSS</sub> |                        | ±10         | V    |
| Drain Current (DC)          | I <sub>D</sub>   |                        | 0.1         | A    |
| Drain Current (Pulse)       | I <sub>DP</sub>  | PW≤10μs, duty cycle≤1% | 0.4         | A    |
| Allowable Power Dissipation | P <sub>D</sub>   |                        | 0.25        | W    |
| Channel Temperature         | T <sub>ch</sub>  |                        | 150         | °C   |
| Storage Temperature         | T <sub>stg</sub> |                        | -55 to +150 | °C   |

### Electrical Characteristics at Ta=25°C

| Parameter                         | Symbol                | Conditions                                  | Ratings |      |     | Unit |
|-----------------------------------|-----------------------|---|---------|------|-----|------|
|                                   |                       |   | min     | typ  | max |      |
| Drain-to-Source Breakdown Voltage | V <sub>(BR)</sub> DSS | I <sub>D</sub> =1mA, V <sub>GS</sub> =0     | 50      |      |     | V    |
| Zero-Gate Voltage Drain Current   | I <sub>DSS</sub>      | V <sub>DS</sub> =50V, V <sub>GS</sub> =0    |         |      | 10  | μA   |
| Gate-to-Source Leakage Current    | I <sub>GSS</sub>      | V <sub>GS</sub> =±8V, V <sub>DS</sub> =0    |         |      | ±10 | μA   |
| Cutoff Voltage                    | V <sub>GS(off)</sub>  | V <sub>DS</sub> =10V, I <sub>D</sub> =100μA | 0.4     |      | 1.3 | V    |
| Forward Transfer Admittance       | y <sub>fs</sub>       | V <sub>DS</sub> =10V, I <sub>D</sub> =50mA  | 0.13    | 0.18 |     | S    |

Marking : YB

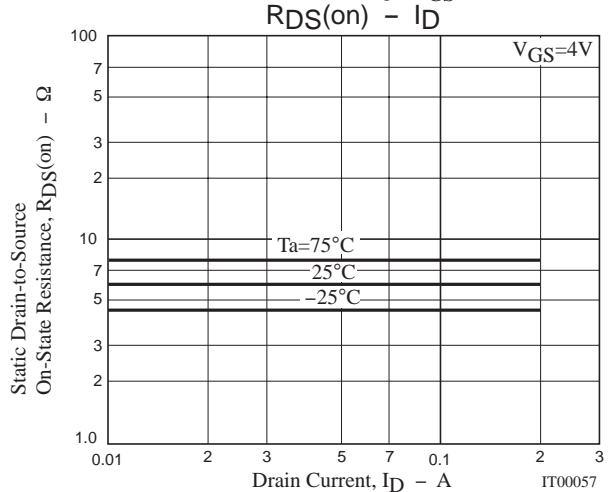
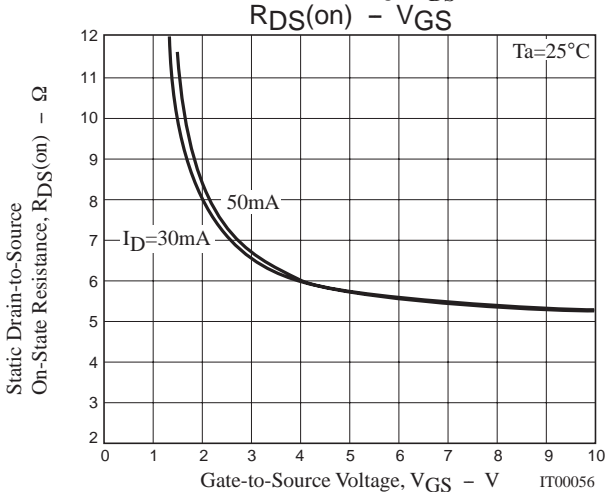
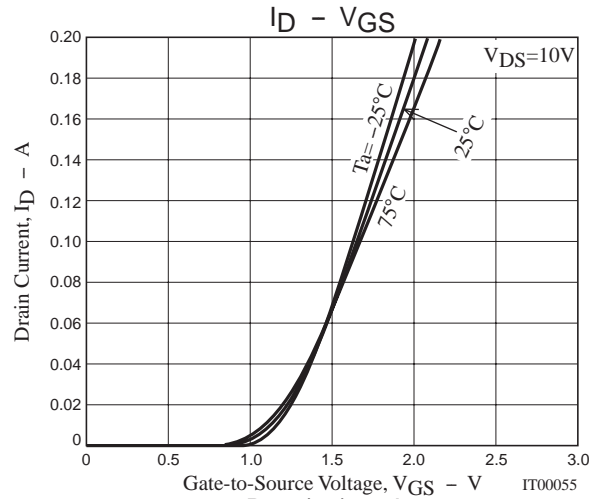
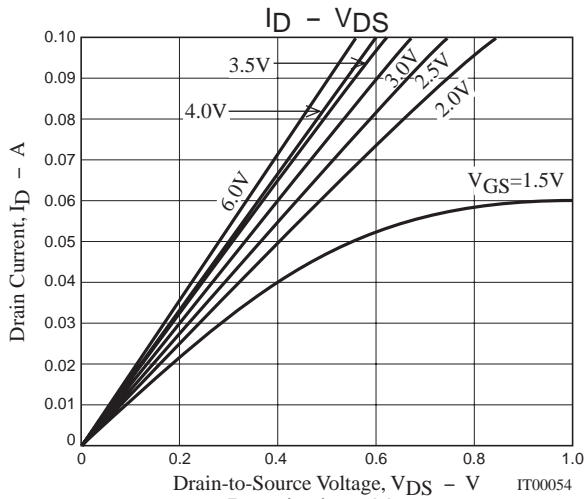
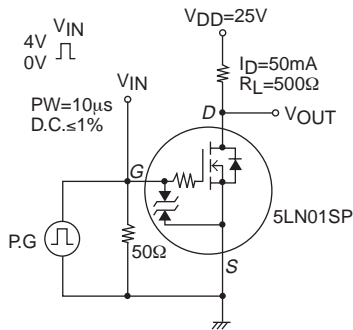
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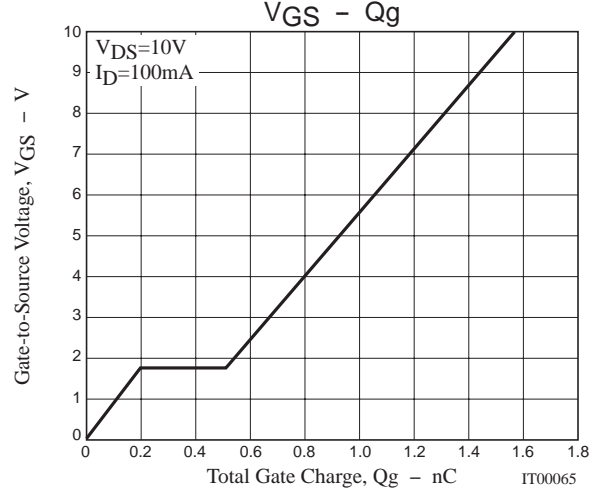
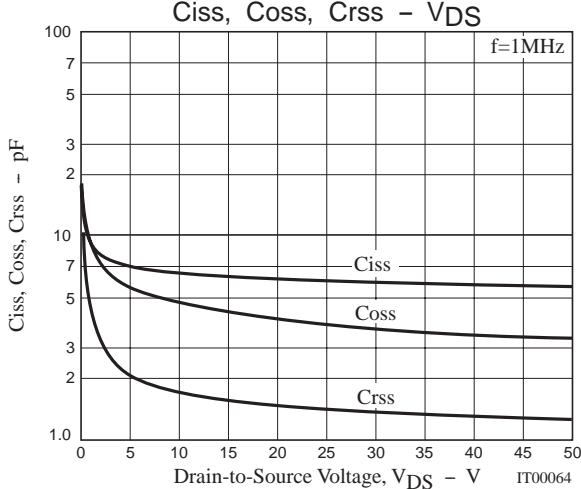
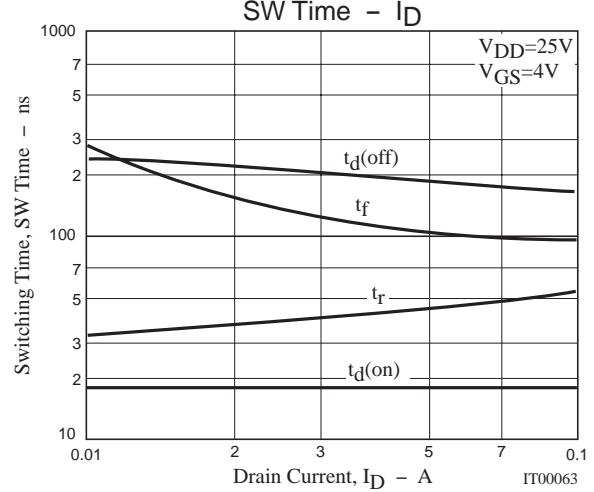
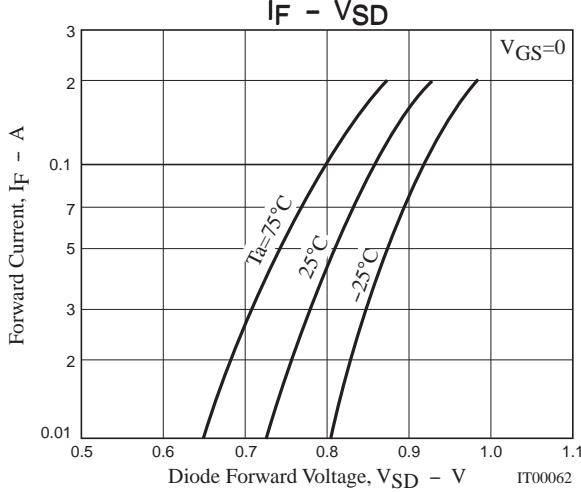
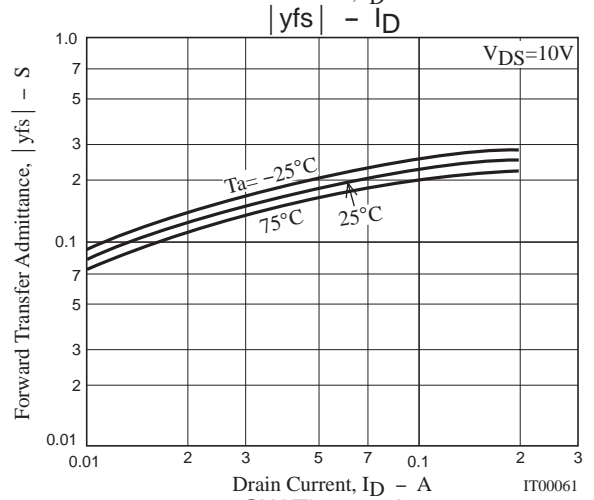
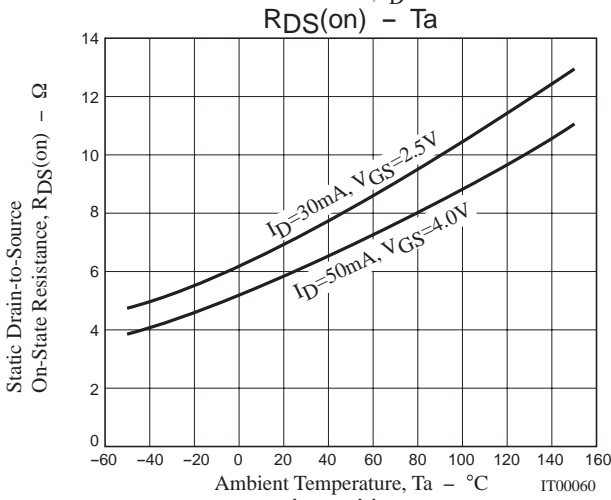
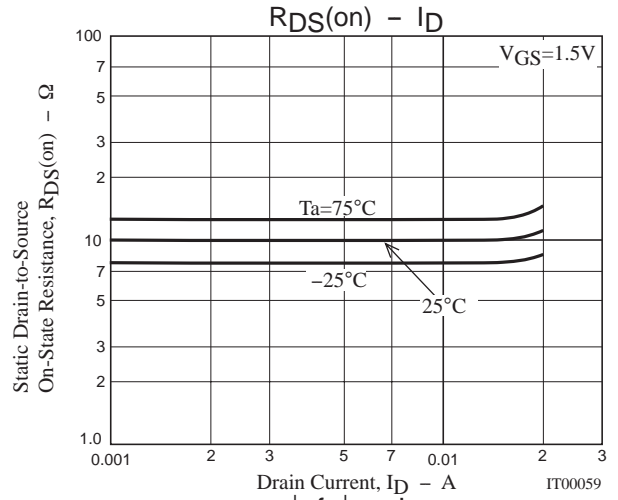
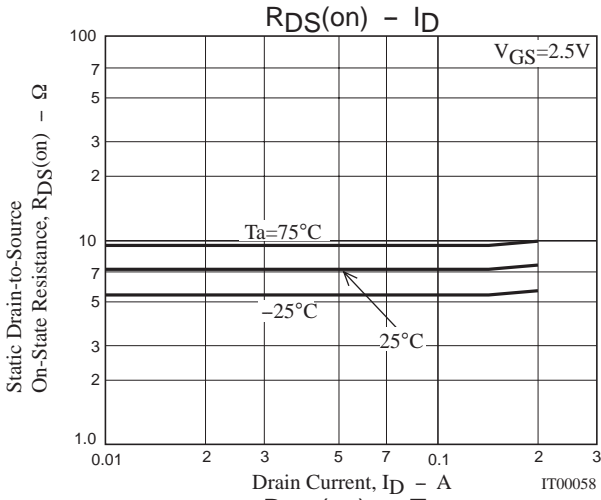
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| Parameter                                  | Symbol        | Conditions   | Ratings |      |     | Unit     |
|--|---------------|--|---------|------|-----|----------|
|  |               |  | min     | typ  | max |          |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=50\text{mA}, V_{GS}=4\text{V}$                      |         | 6    | 7.8 | $\Omega$ |
|  | $R_{DS(on)2}$ | $I_D=30\text{mA}, V_{GS}=2.5\text{V}$                    |         | 7.1  | 9.9 | $\Omega$ |
|  | $R_{DS(on)3}$ | $I_D=10\text{mA}, V_{GS}=1.5\text{V}$                    |         | 10   | 20  | $\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=10\text{V}, f=1\text{MHz}$                       |         | 6.6  |     | pF       |
| Output Capacitance                         | $C_{oss}$     | $V_{DS}=10\text{V}, f=1\text{MHz}$                       |         | 4.7  |     | pF       |
| Reverse Transfer Capacitance               | $C_{rss}$     | $V_{DS}=10\text{V}, f=1\text{MHz}$                       |         | 1.7  |     | pF       |
| Turn-ON Delay Time                         | $t_{d(on)}$   | See specified Test Circuit                               |         | 18   |     | ns       |
| Rise Time                                  | $t_r$         | See specified Test Circuit                               |         | 42   |     | ns       |
| Turn-OFF Delay Time                        | $t_{d(off)}$  | See specified Test Circuit                               |         | 190  |     | ns       |
| Fall Time                                  | $t_f$         | See specified Test Circuit                               |         | 105  |     | ns       |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=10\text{V}, V_{GS}=10\text{V}, I_D=100\text{mA}$ |         | 1.57 |     | nC       |
| Gate-to-Source Charge                      | $Q_{gs}$      | $V_{DS}=10\text{V}, V_{GS}=10\text{V}, I_D=100\text{mA}$ |         | 0.20 |     | nC       |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      | $V_{DS}=10\text{V}, V_{GS}=10\text{V}, I_D=100\text{mA}$ |         | 0.32 |     | nC       |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=100\text{mA}, V_{GS}=0$                             |         | 0.85 | 1.2 | V        |

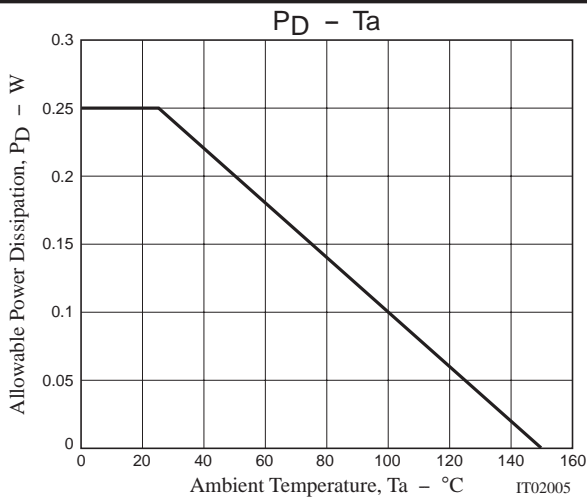
## Switching Time Test Circuit



# 5LN01SP



## 5LN01SP



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