

Ordering number : ENN6620

P-Channel Silicon MOSFET

**5LP01N**

## Ultrahigh-Speed Switching Applications

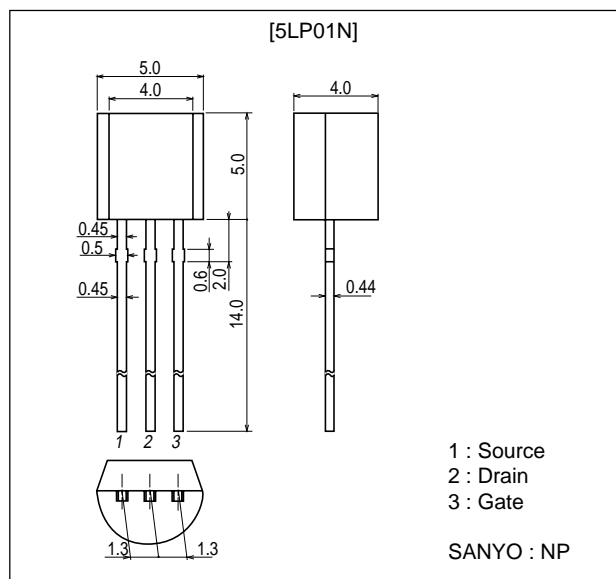
### Features

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

### Package Dimensions

unit : mm

2178



### 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>   |                        | -0.07       | A    |
| Drain Current (Pulse)       | I <sub>DP</sub>  | PW≤10μs, duty cycle≤1% | -0.28       | A    |
| Allowable Power Dissipation | P <sub>D</sub>   |                        | 0.4         | 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(BR)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    |     | -1.4 | V    |

Marking : XB

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TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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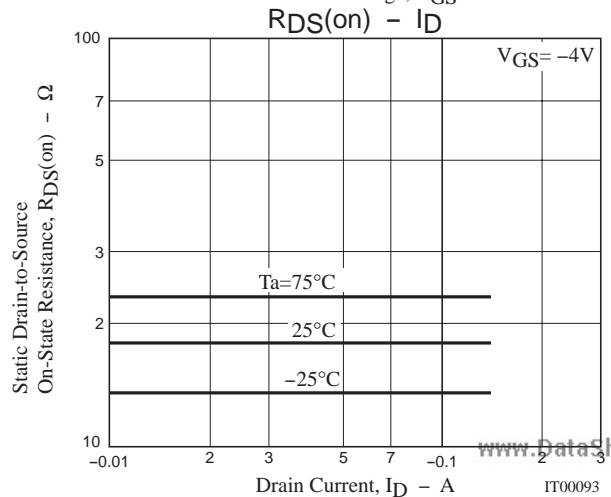
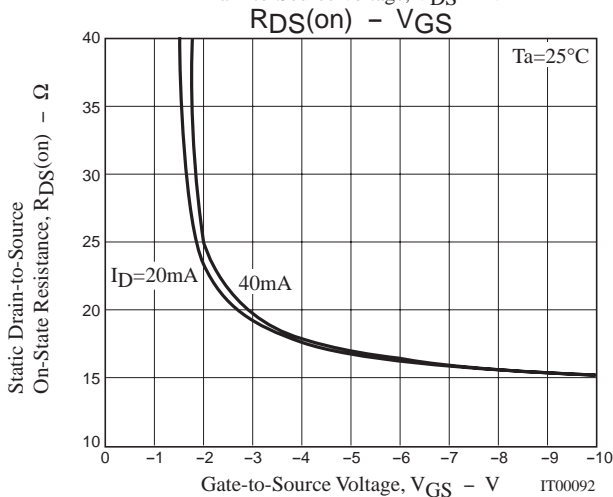
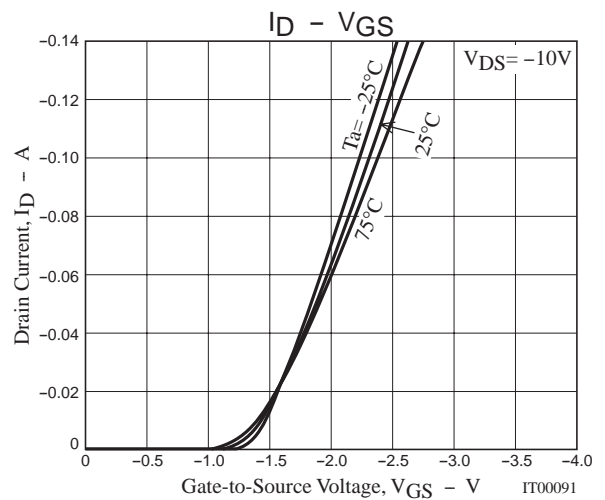
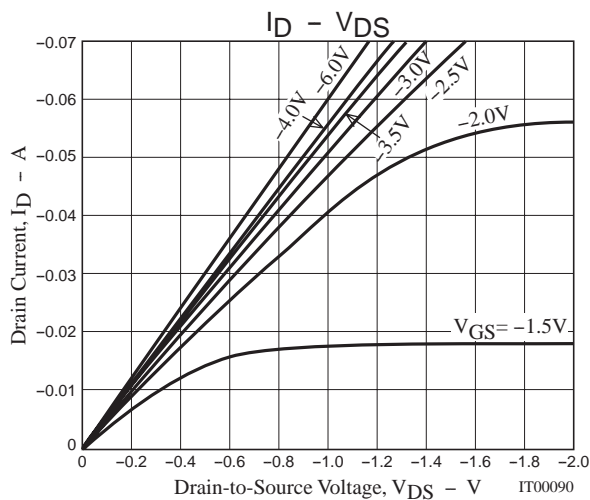
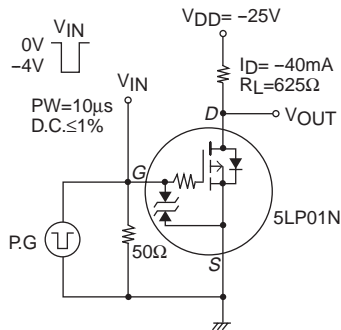
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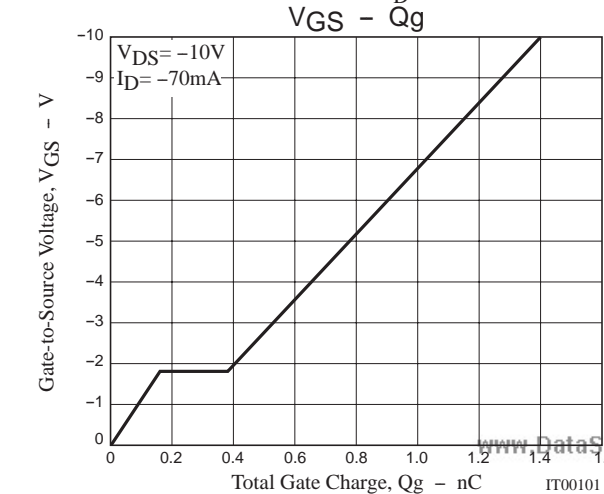
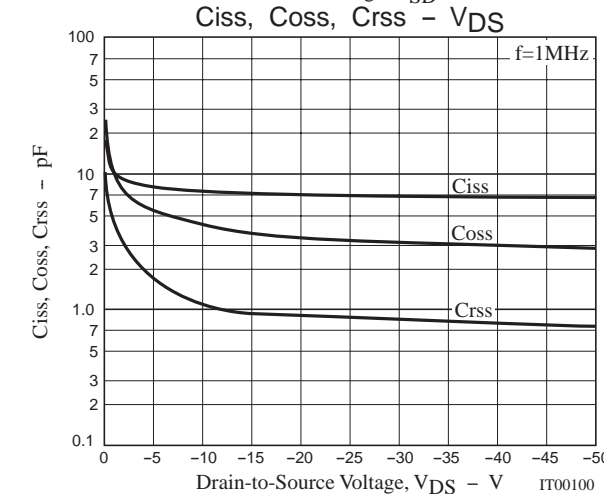
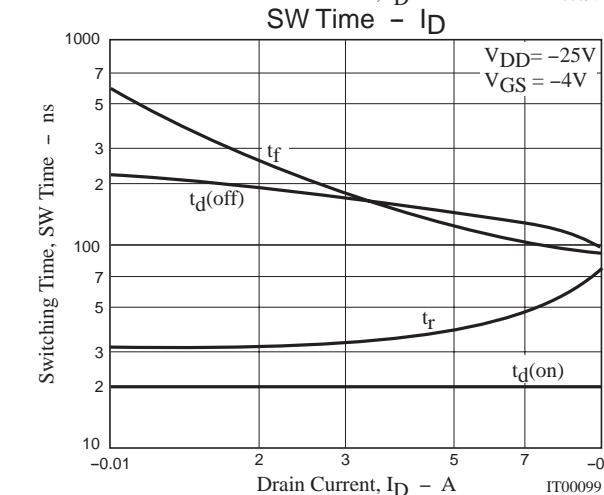
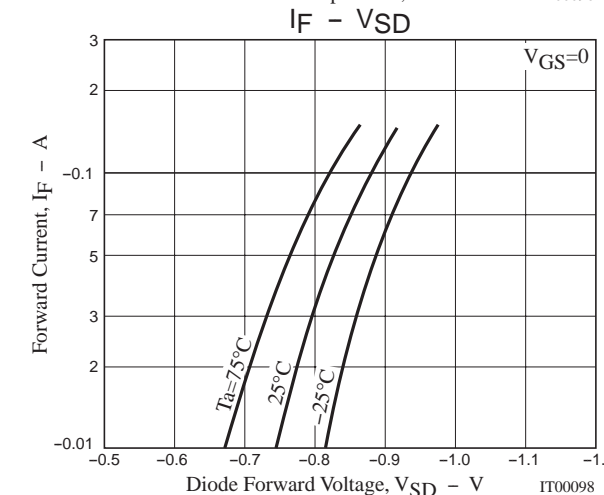
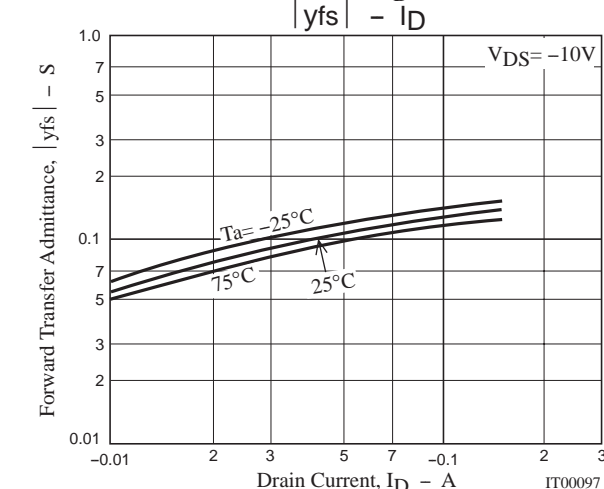
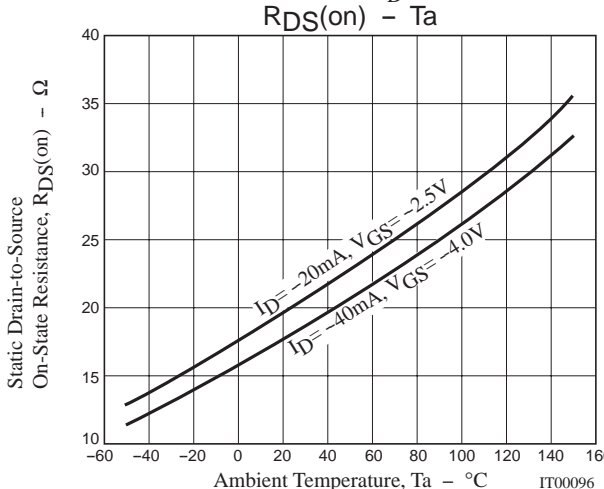
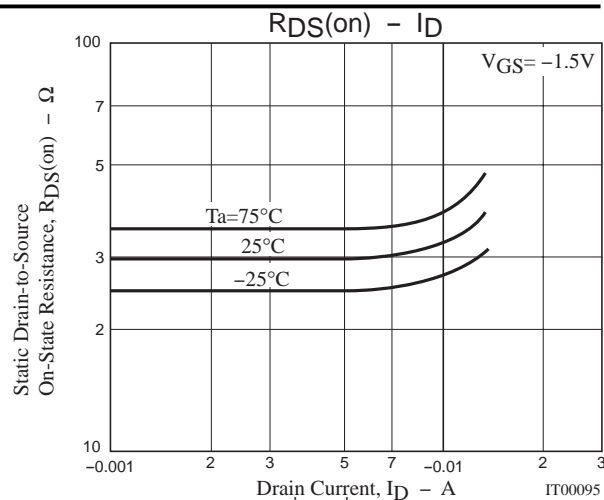
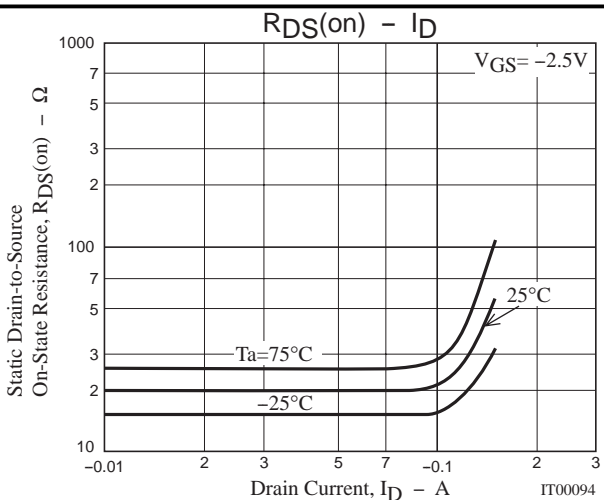
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| Parameter                                  | Symbol        | Conditions                            | Ratings |      |     | Unit     |
|--|---------------|---------------------------------------|---------|------|-----|----------|
|  |               |                                       | min     | typ  | max |          |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS}=-10V, I_D=-40mA$              | 70      | 100  |     | mS       |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=-40mA, V_{GS}=-4V$               |         | 18   | 23  | $\Omega$ |
|  | $R_{DS(on)2}$ | $I_D=-20mA, V_{GS}=-2.5V$             |         | 20   | 28  | $\Omega$ |
|  | $R_{DS(on)3}$ | $I_D=-5mA, V_{GS}=-1.5V$              |         | 30   | 60  | $\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=-10V, f=1MHz$                 |         | 7.4  |     | pF       |
| Output Capacitance                         | $C_{oss}$     | $V_{DS}=-10V, f=1MHz$                 |         | 4.2  |     | pF       |
| Reverse Transfer Capacitance               | $C_{rss}$     | $V_{DS}=-10V, f=1MHz$                 |         | 1.3  |     | pF       |
| Turn-ON Delay Time                         | $t_d(on)$     | See specified Test Circuit            |         | 20   |     | ns       |
| Rise Time                                  | $t_r$         | See specified Test Circuit            |         | 35   |     | ns       |
| Turn-OFF Delay Time                        | $t_d(off)$    | See specified Test Circuit            |         | 160  |     | ns       |
| Fall Time                                  | $t_f$         | See specified Test Circuit            |         | 150  |     | ns       |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=-10V, V_{GS}=-10V, I_D=-70mA$ |         | 1.40 |     | nC       |
| Gate-to-Source Charge                      | $Q_{gs}$      | $V_{DS}=-10V, V_{GS}=-10V, I_D=-70mA$ |         | 0.16 |     | nC       |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      | $V_{DS}=-10V, V_{GS}=-10V, I_D=-70mA$ |         | 0.23 |     | nC       |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=-70mA, V_{GS}=0$                 |         | 0.85 | 1.2 | V        |

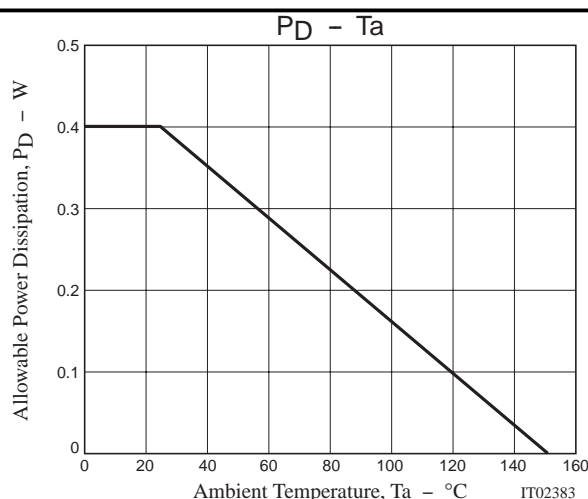
## Switching Time Test Circuit



### 5LP01N



## 5LP01N



Note on usage : Since the 5LP01N is designed for high-speed switching applications, please avoid using this device in the vicinity of highly charged objects.

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