

**2SK1451**

## Ultrahigh-Speed Switching Applications

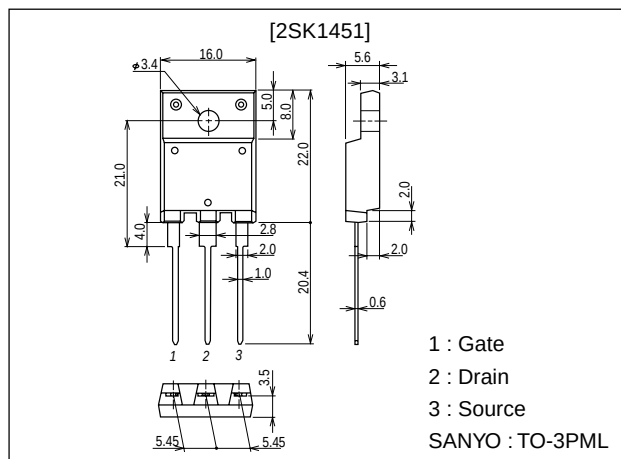
### Features

- Low ON-state resistance.
- Ultrahigh-speed switching.
- Converters.
- Micaless package facilitating mounting.

### Package Dimensions

unit:mm

2076B



### Specifications

#### Absolute Maximum Ratings at Ta = 25°C

| Parameter                   | Symbol    | Conditions                                | Ratings     | Unit       |
|-----------------------------|-----------|-------------------------------------------|-------------|------------|
| Drain-to-Source Voltage     | $V_{DS}$  |                                           | 450         | V          |
| Gate-to-Source Voltage      | $V_{GS}$  |                                           | $\pm 30$    | V          |
| Drain Current (DC)          | $I_D$     |                                           | 8           | A          |
| Drain Current (Pulse)       | $I_{DP}$  | $PW \leq 10\mu s$ , duty cycle $\leq 1\%$ | 32          | A          |
| Allowable Power Dissipation | $P_D$     | $T_c = 25^\circ C$                        | 50          | W          |
|                             |           |                                           | 3.0         | W          |
| Channel Temperature         | $T_{ch}$  |                                           | 150         | $^\circ C$ |
| Storage Temperature         | $T_{stg}$ |                                           | -55 to +150 | $^\circ C$ |

#### Electrical Characteristics at Ta = 25°C

| Parameter                                  | Symbol        | Conditions                        | Ratings |     |           | Unit     |
|--------------------------------------------|---------------|-----------------------------------|---------|-----|-----------|----------|
|                                            |               |                                   | min     | typ | max       |          |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D = 1mA$ , $V_{GS} = 0$        | 450     |     |           | V        |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS} = 450V$ , $V_{GS} = 0$    |         |     | 1.0       | mA       |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS} = \pm 30V$ , $V_{DS} = 0$ |         |     | $\pm 100$ | nA       |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS} = 10V$ , $I_D = 1mA$      | 2.0     |     | 3.0       | V        |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS} = 10V$ , $I_D = 4A$       | 3.0     | 6.0 |           | S        |
| Static Drain-to-Source ON-State Resistance | $R_{DS(on)}$  | $I_D = 4A$ , $V_{GS} = 10V$       |         | 0.6 | 0.8       | $\Omega$ |

(Note) Be careful in handling the 2SK1451 because it has no protection diode between gate and source.

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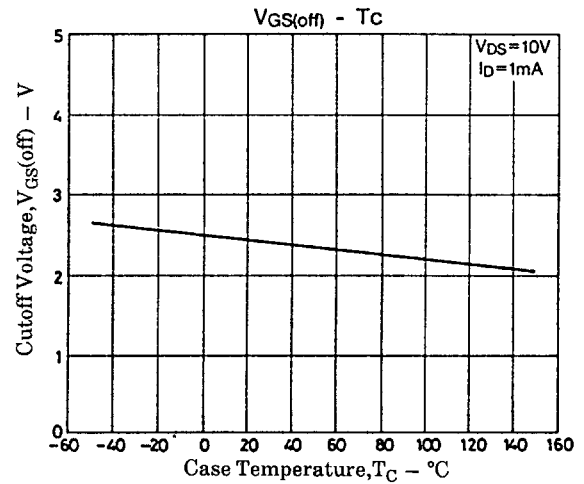
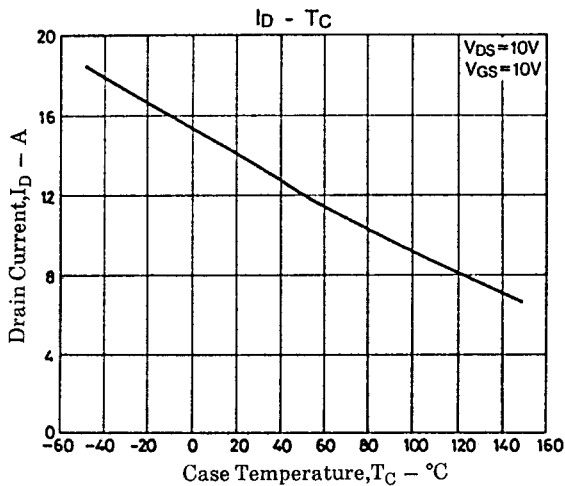
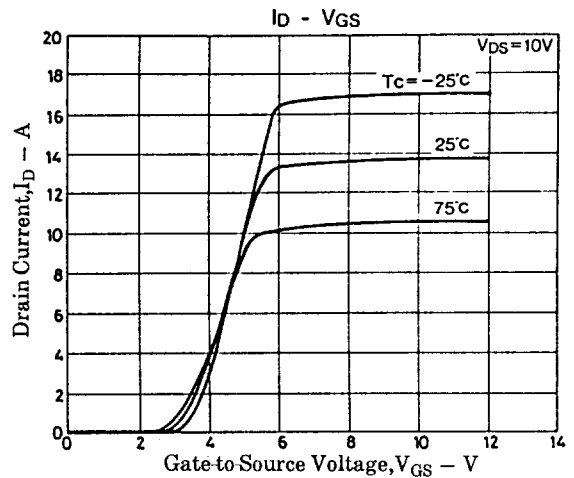
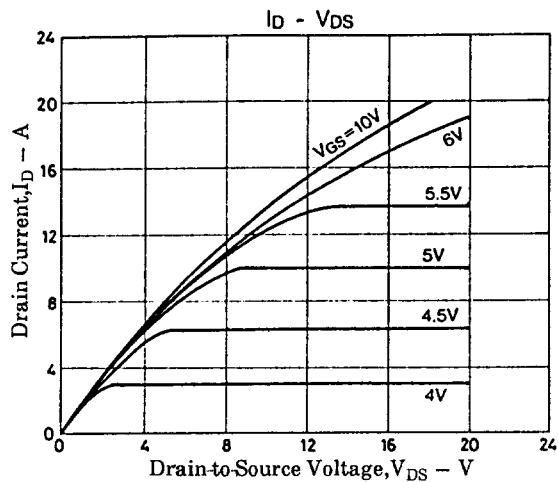
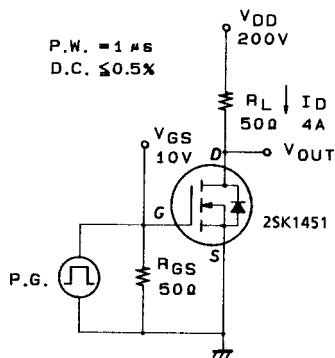
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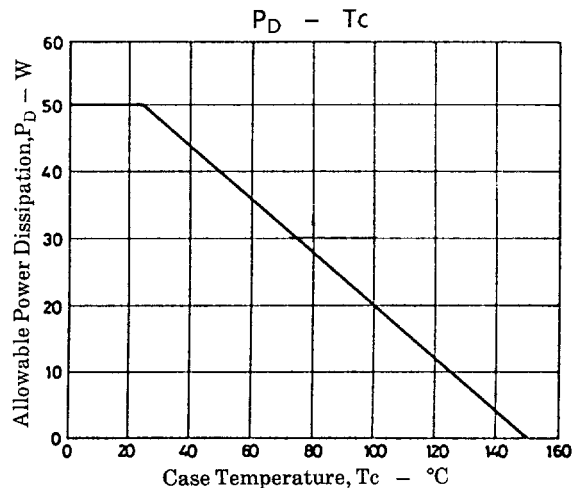
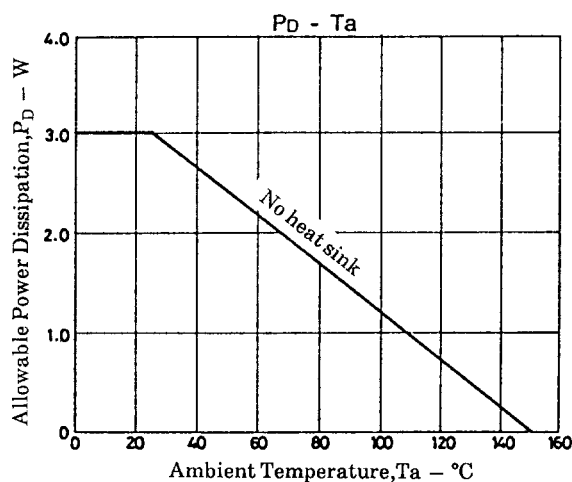
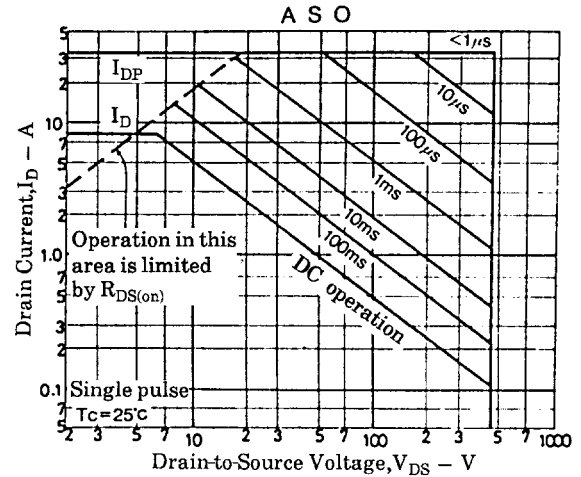
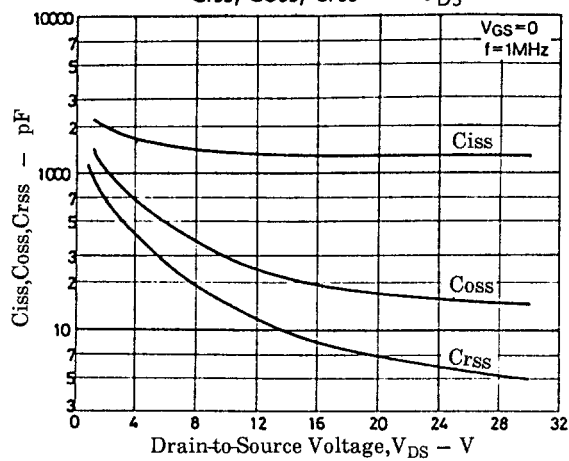
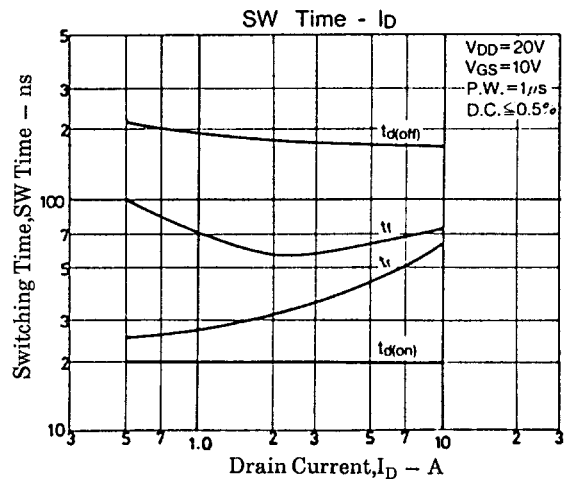
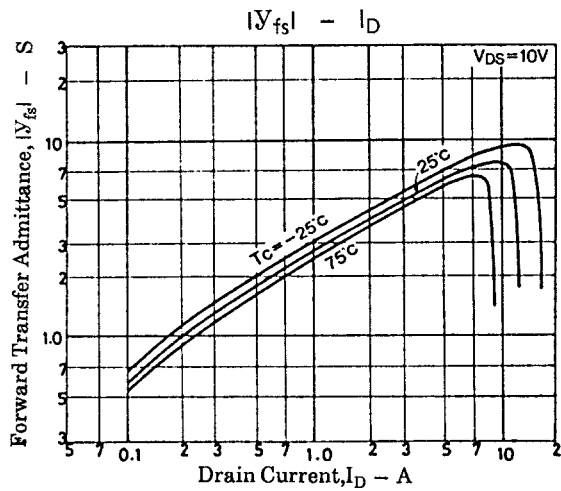
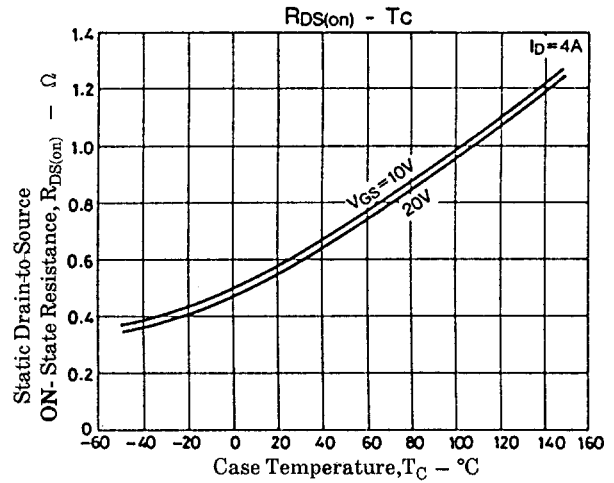
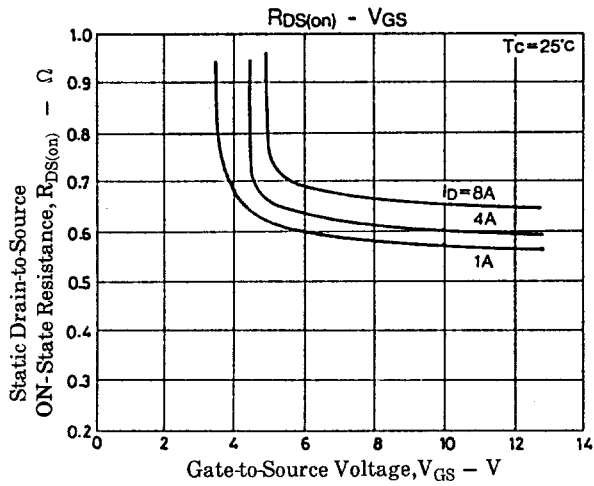
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| Parameter                    | Symbol              | Conditions                                                                            | Ratings |      |     | Unit |
|------------------------------|---------------------|---------------------------------------------------------------------------------------|---------|------|-----|------|
|                              |                     |                                                                                       | min     | typ  | max |      |
| Input Capacitance            | Ciss                | V <sub>DS</sub> =20V, f=1MHz                                                          |         | 1200 |     | pF   |
| Output Capacitance           | Coss                | V <sub>DS</sub> =20V, f=1MHz                                                          |         | 180  |     | pF   |
| Reverse Transfer Capacitance | Crss                | V <sub>DS</sub> =20V, f=1MHz                                                          |         | 70   |     | pF   |
| Turn-ON Delay Time           | t <sub>d(on)</sub>  | I <sub>D</sub> =4A, V <sub>GS</sub> =10V, V <sub>DD</sub> =200V, R <sub>GS</sub> =50Ω |         | 20   |     | ns   |
| Rise Time                    | t <sub>r</sub>      | I <sub>D</sub> =4A, V <sub>GS</sub> =10V, V <sub>DD</sub> =200V, R <sub>GS</sub> =50Ω |         | 40   |     | ns   |
| Turn-OFF Delay Time          | t <sub>d(off)</sub> | I <sub>D</sub> =4A, V <sub>GS</sub> =10V, V <sub>DD</sub> =200V, R <sub>GS</sub> =50Ω |         | 160  |     | ns   |
| Fall Time                    | t <sub>f</sub>      | I <sub>D</sub> =4A, V <sub>GS</sub> =10V, V <sub>DD</sub> =200V, R <sub>GS</sub> =50Ω |         | 60   |     | ns   |
| Diode Forward Voltage        | V <sub>SD</sub>     | I <sub>S</sub> =8A, V <sub>GS</sub> =0                                                |         |      | 1.8 | V    |

Switching Time Test Circuit



# 2SK1451



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