

**2SK1053**

## Ultrahigh-Speed Switching Applications

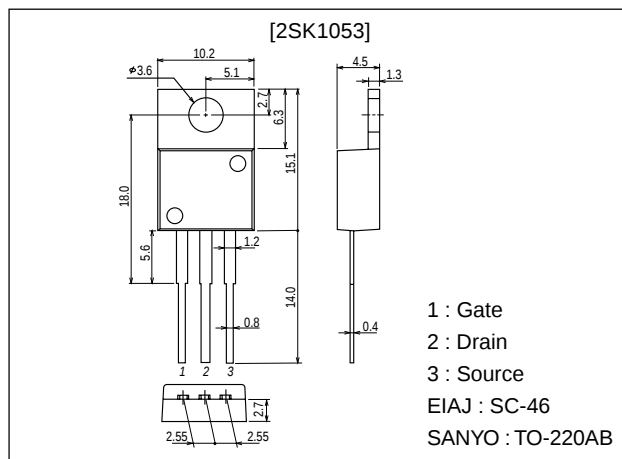
### Features

- Low ON-state resistance.
- Ultrahigh-speed switching.

### Package Dimensions

unit:mm

2052C



### 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      | $V_{GS}$  |                                           | ±30         | V    |
| Drain Current (DC)          | $I_D$     |                                           | 1.0         | A    |
| Drain Current (Pulse)       | $I_{DP}$  | $PW \leq 10\mu s$ , duty cycle $\leq 1\%$ | 4.0         | A    |
| Allowable Power Dissipation | $P_D$     | $T_c = 25^\circ C$                        | 40          | W    |
|                             |           |                                           | 1.75        | W    |
| Channel Temperature         | $T_{ch}$  |                                           | 150         | °C   |
| Storage Temperature         | $T_{stg}$ |                                           | -55 to +150 | °C   |

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

| Parameter                                  | Symbol        | Conditions                        | Ratings |     |      | Unit     |
|--------------------------------------------|---------------|-----------------------------------|---------|-----|------|----------|
|                                            |               |                                   | min     | typ | max  |          |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D = 1mA$ , $V_{GS} = 0$        | 450     |     |      | V        |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS} = 450V$ , $V_{GS} = 0$    |         |     | 1.0  | mA       |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS} = \pm 30V$ , $V_{DS} = 0$ |         |     | ±100 | nA       |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS} = 10V$ , $I_D = 1mA$      | 2.0     |     | 3.0  | V        |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS} = 10V$ , $I_D = 0.5A$     | 0.6     | 1.2 |      | S        |
| Static Drain-to-Source ON-State Resistance | $R_{DS(on)}$  | $I_D = 0.5A$ , $V_{GS} = 10V$     |         | 3.5 | 4.5  | $\Omega$ |

(Note) Be careful in handling the 2SK1053 because it has no protection diode between gate and source.

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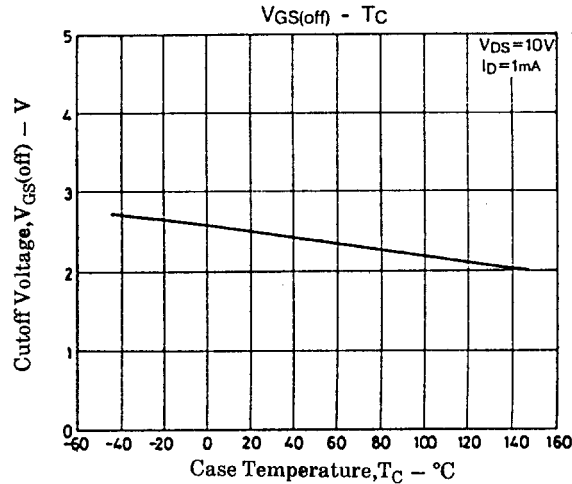
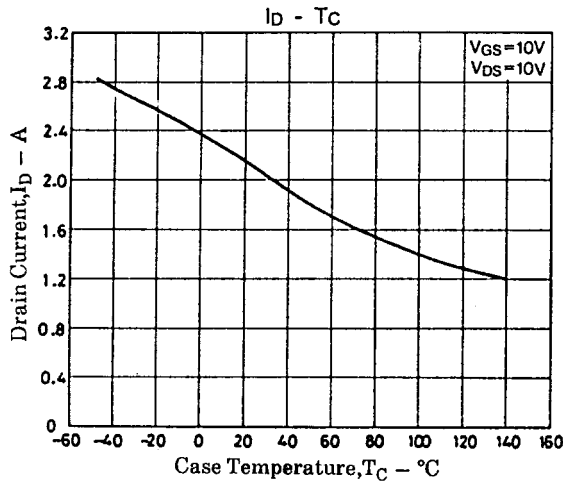
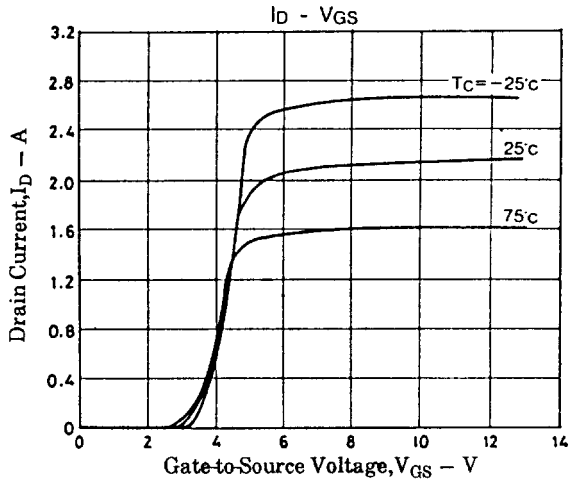
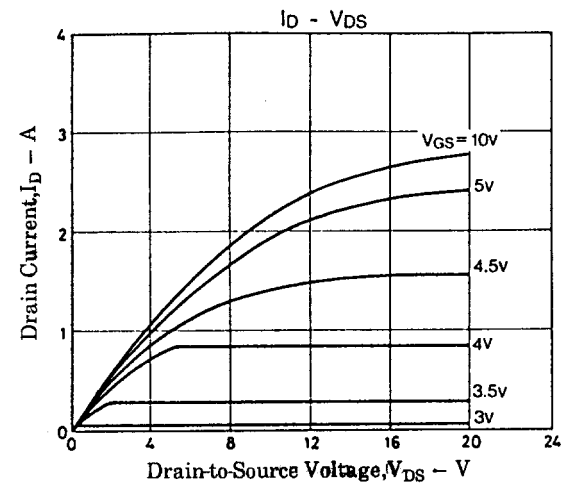
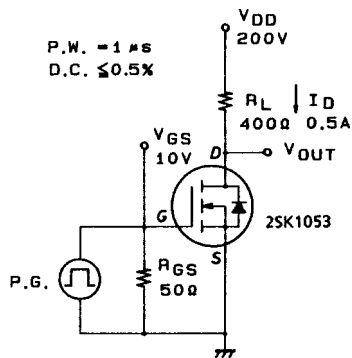
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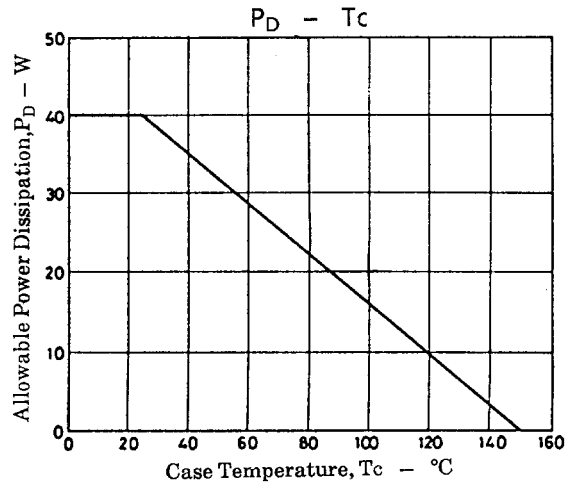
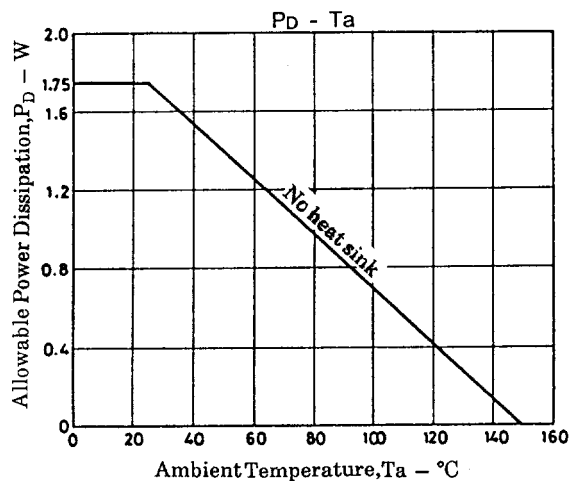
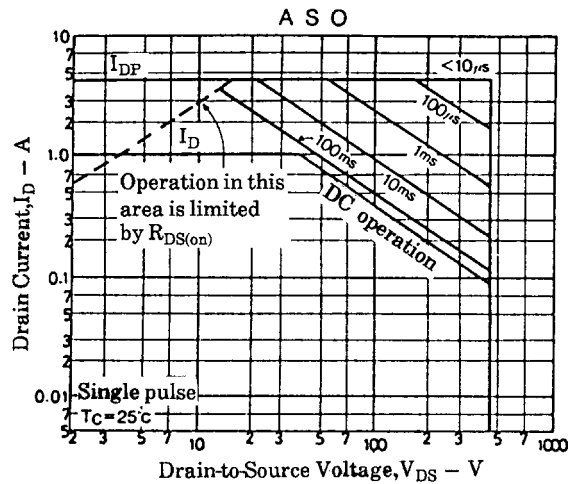
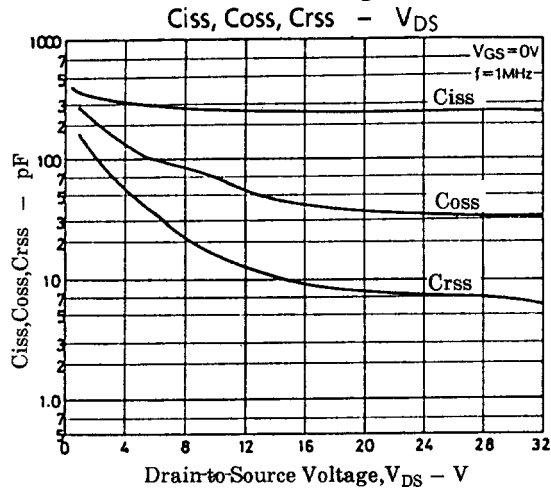
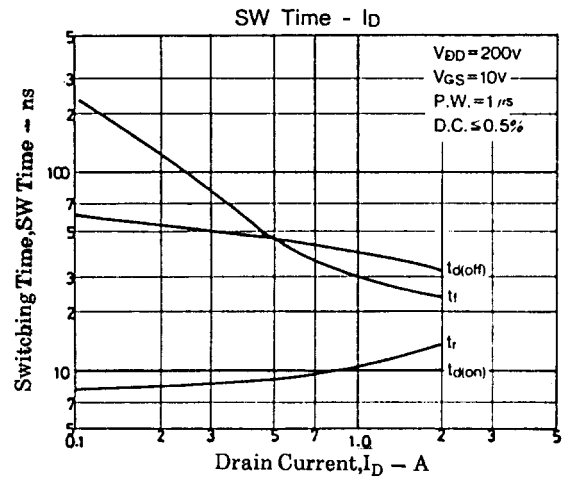
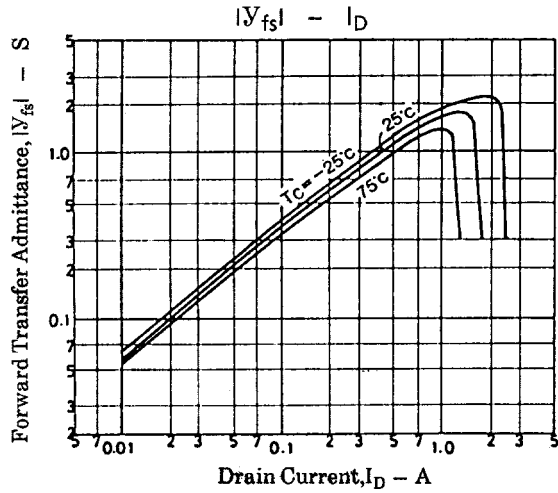
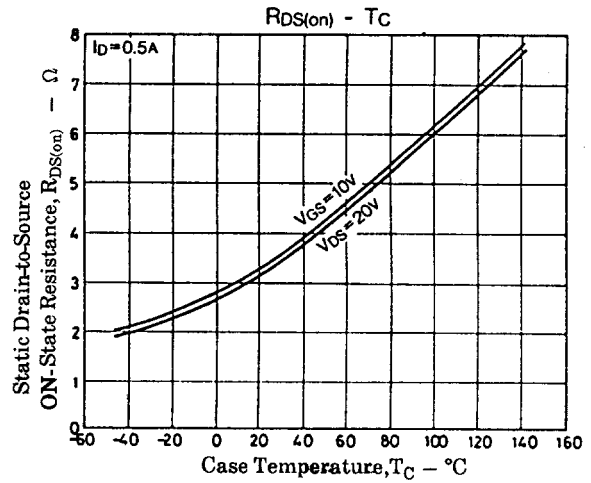
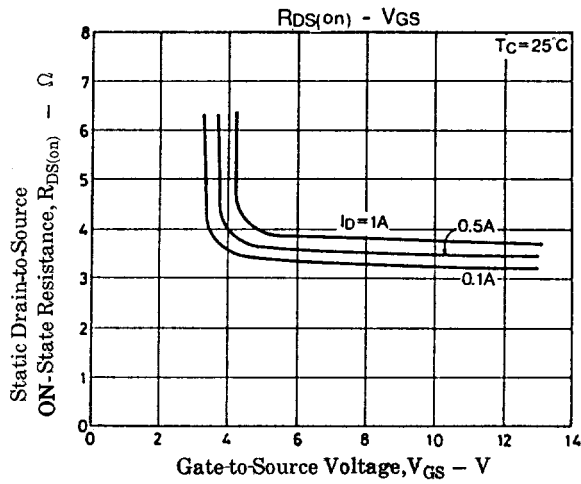
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| Parameter                    | Symbol       | Conditions                                           | Ratings |     |     | Unit |
|------------------------------|--------------|------------------------------------------------------|---------|-----|-----|------|
|                              |              |                                                      | min     | typ | max |      |
| Input Capacitance            | Ciss         | $V_{DS}=20V, f=1MHz$                                 |         | 250 |     | pF   |
| Output Capacitance           | Coss         | $V_{DS}=20V, f=1MHz$                                 |         | 40  |     | pF   |
| Reverse Transfer Capacitance | Crss         | $V_{DS}=20V, f=1MHz$                                 |         | 8.0 |     | pF   |
| Turn-ON Delay Time           | $t_{d(on)}$  | $I_D=0.5A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50\Omega$ |         | 10  |     | ns   |
| Rise Time                    | $t_r$        | $I_D=0.5A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50\Omega$ |         | 9   |     | ns   |
| Turn-OFF Delay Time          | $t_{d(off)}$ | $I_D=0.5A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50\Omega$ |         | 45  |     | ns   |
| Fall Time                    | $t_f$        | $I_D=0.5A, V_{GS}=10V, V_{DD}=200V, R_{GS}=50\Omega$ |         | 50  |     | ns   |
| Diode Forward Voltage        | $V_{SD}$     | $I_S=1.0A, V_{GS}=0$                                 |         |     | 1.8 | V    |

Switching Time Test Circuit





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