

**2SK1413**

## Ultrahigh-Speed Switching Applications

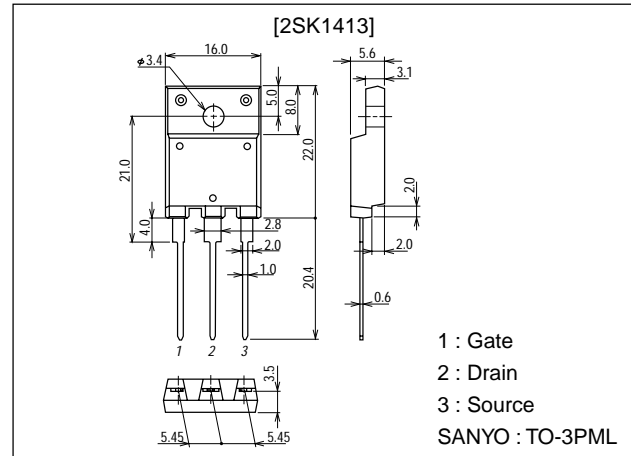
### Features

- Low ON resistance, low input capacitance, Ultrahigh-speed switching.
- High reliability (Adoption of HVP process).
- 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     | $V_{DS}$  |   | 1500        | V          |
| Gate-to-Source Voltage      | $V_{GS}$  |   | $\pm 20$    | V          |
| Drain Current (DC)          | $I_D$     |   | 2           | A          |
| Drain Current (Pulse)       | $I_{DP}$  | $PW \leq 10\mu s$ , duty cycle $\leq 1\%$ | 4           | A          |
| Allowable Power Dissipation | $P_D$     |   | 3.0         | W          |
|                             |           | $T_c = 25^\circ C$                        | 60          | 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          | $V_{(BR)DSS}$ | $I_D = 1mA$ , $V_{GS} = 0$        | 1500    |     |           | V        |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS} = 1200V$ , $V_{GS} = 0$   |         |     | 100       | $\mu A$  |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS} = \pm 20V$ , $V_{DS} = 0$ |         |     | $\pm 100$ | nA       |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS} = 10V$ , $I_D = 1mA$      | 1.5     |     | 3.5       | V        |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS} = 20V$ , $I_D = 1A$       | 1.0     | 1.5 |           | S        |
| Static Drain-to-Source ON-State Resistance | $R_{DS(on)}$  | $I_D = 1A$ , $V_{GS} = 10V$       |         | 8.0 | 11.0      | $\Omega$ |

(Note) Be careful in handling the 2SK1413 because it has no protection diode between gate and source.

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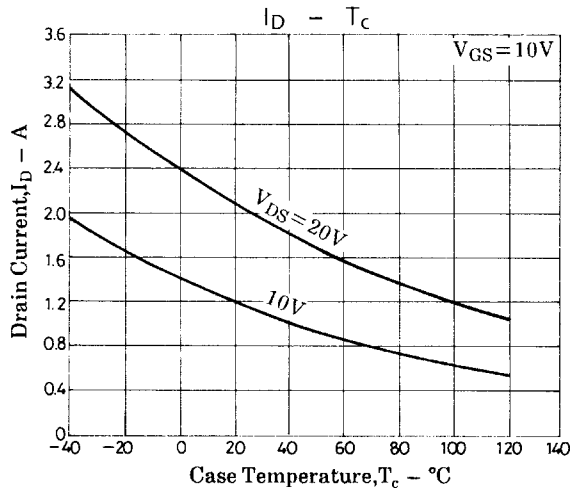
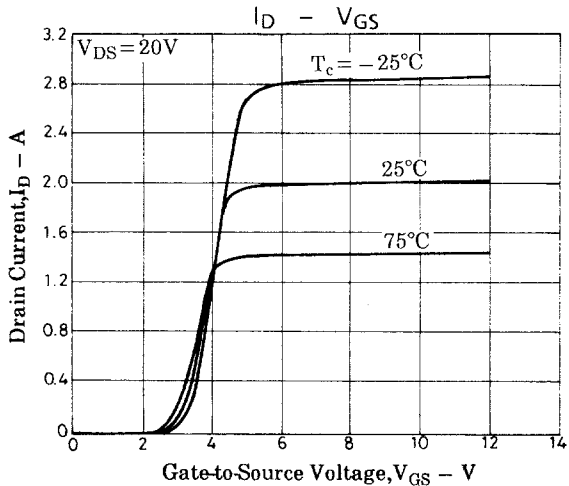
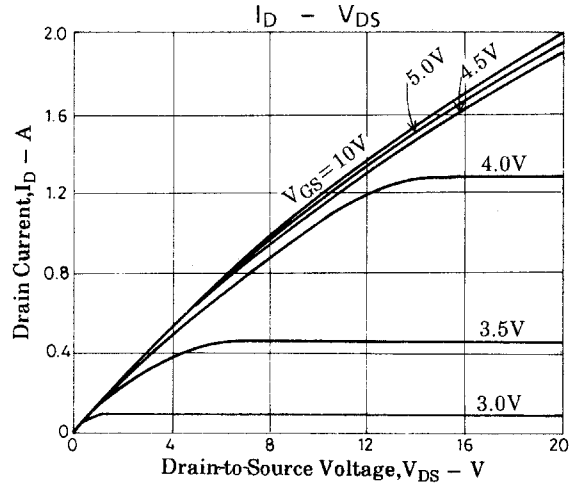
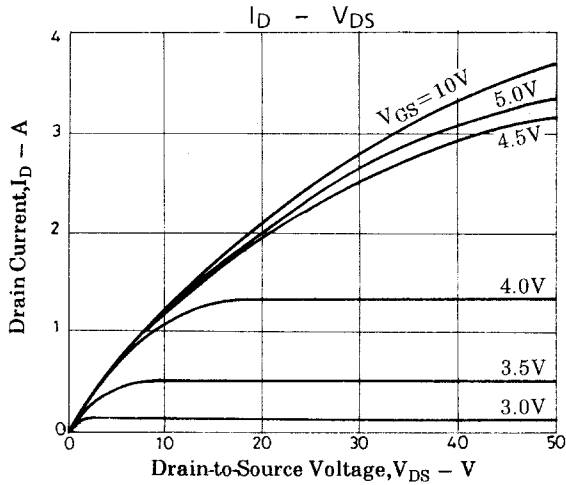
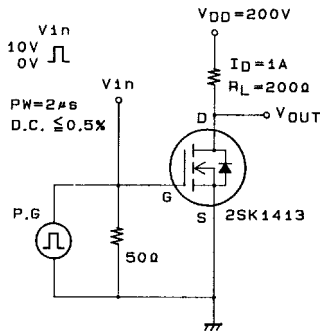
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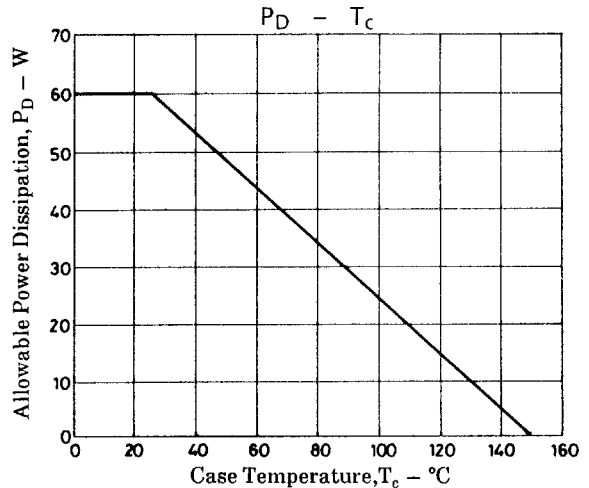
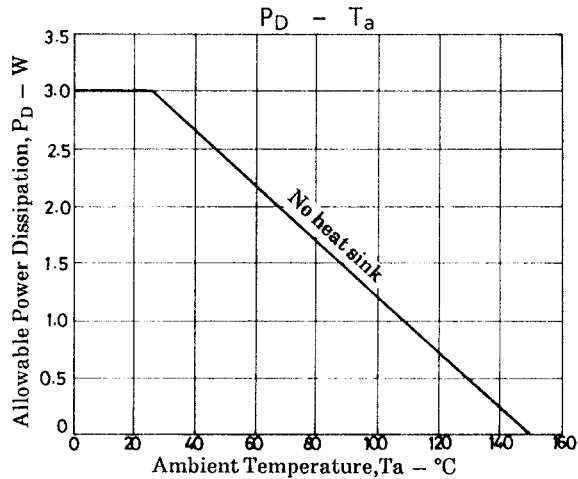
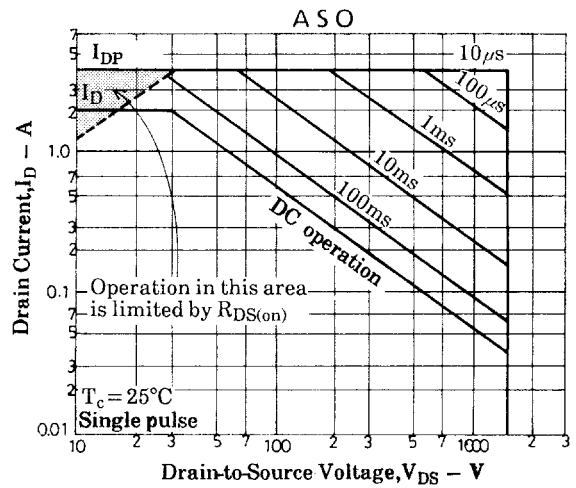
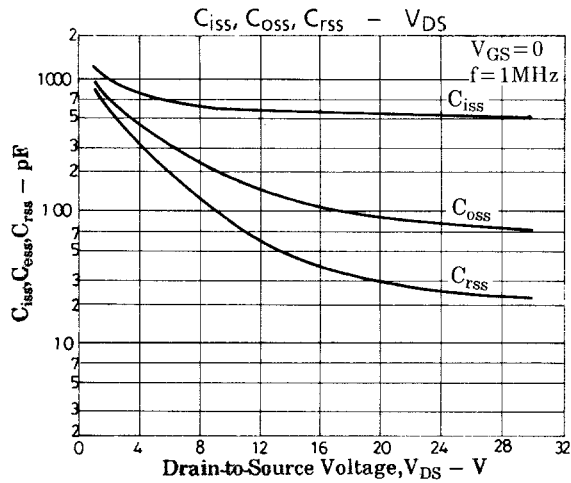
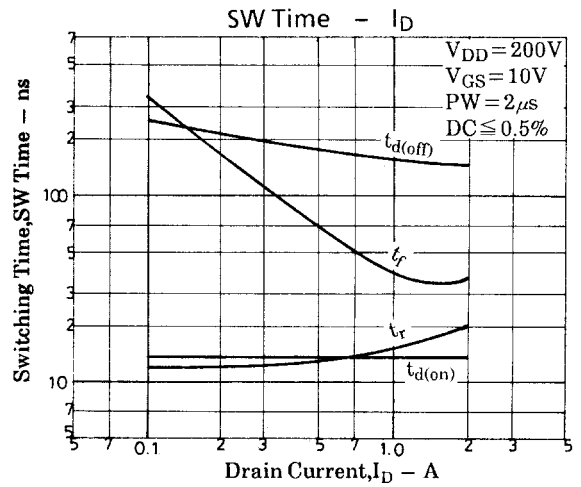
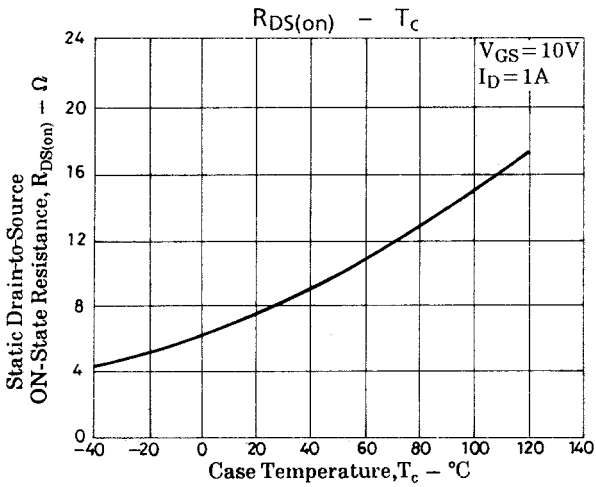
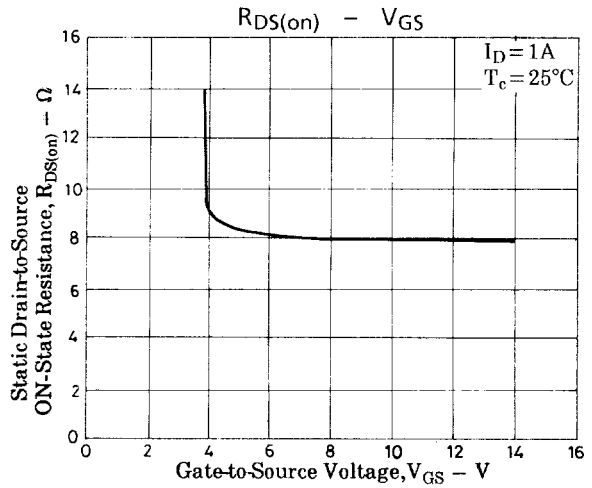
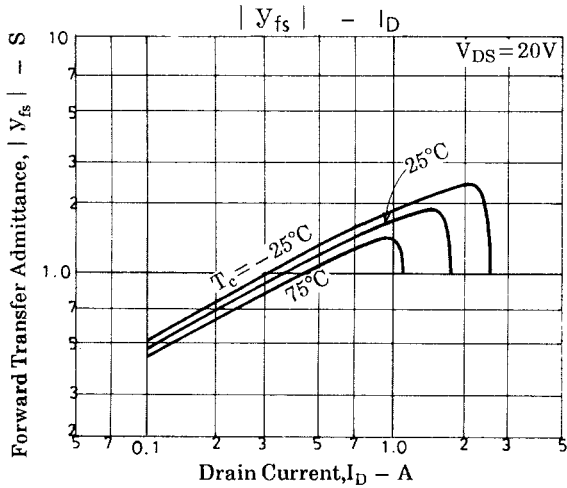
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| Parameter                    | Symbol       | Conditions                 | Ratings |     |     | Unit |
|------------------------------|--------------|----------------------------|---------|-----|-----|------|
|                              |              |                            | min     | typ | max |      |
| Input Capacitance            | $C_{iss}$    | $V_{DS}=20V, f=1MHz$       |         | 550 |     | pF   |
| Output Capacitance           | $C_{oss}$    | $V_{DS}=20V, f=1MHz$       |         | 90  |     | pF   |
| Reverse Transfer Capacitance | $C_{rss}$    | $V_{DS}=20V, f=1MHz$       |         | 30  |     | pF   |
| Turn-ON Delay Time           | $t_{d(on)}$  | See specified Test Circuit |         | 14  |     | ns   |
| Rise Time                    | $t_r$        | See specified Test Circuit |         | 16  |     | ns   |
| Turn-OFF Delay Time          | $t_{d(off)}$ | See specified Test Circuit |         | 160 |     | ns   |
| Fall Time                    | $t_f$        | See specified Test Circuit |         | 40  |     | ns   |
| Diode Forward Voltage        | $V_{SD}$     | $I_S=2A, V_{GS}=0$         |         | 1.0 | 1.5 | V    |

## Switching Time Test Circuit



# 2SK1413



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