



# 2SK1920

## Ultrahigh-Speed Switching Applications

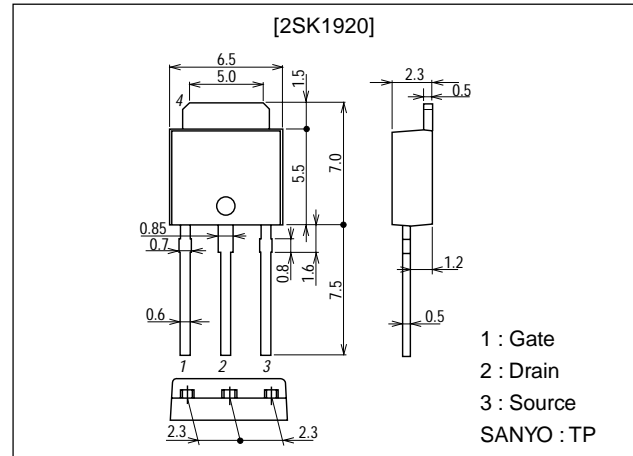
### Features

- Low ON resistance.
- Ultrahigh-speed switching.
- Low-voltage drive.

### Package Dimensions

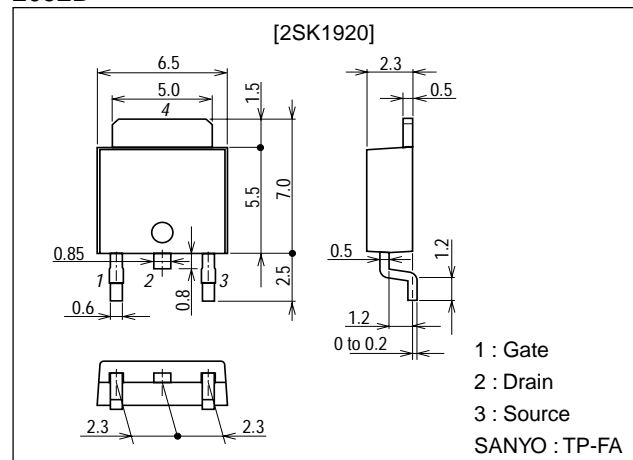
unit:mm

2083B



unit:mm

2092B



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## Specifications

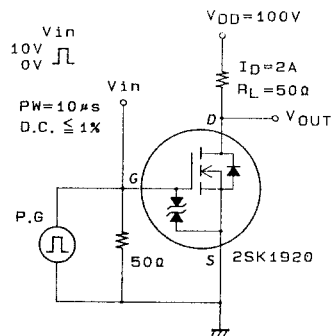
### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

| Parameter                   | Symbol    | Conditions                                      | Ratings     | Unit             |
|-----------------------------|-----------|---|-------------|------------------|
| Drain-to-Source Voltage     | $V_{DSS}$ |   | 250         | V                |
| Gate-to-Source Voltage      | $V_{GSS}$ |   | $\pm 30$    | V                |
| Drain Current (DC)          | $I_D$     |   | 4           | A                |
| Drain Current (pulse)       | $I_{DP}$  | $PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$ | 16          | A                |
| Allowable Power Dissipation | $P_D$     |   | 1.0         | W                |
|                             |           | $T_c = 25^\circ\text{C}$                        | 30          | W                |
| Channel Temperature         | $T_{ch}$  |   | 150         | $^\circ\text{C}$ |
| Storage Temperature         | $T_{stg}$ |   | -55 to +150 | $^\circ\text{C}$ |

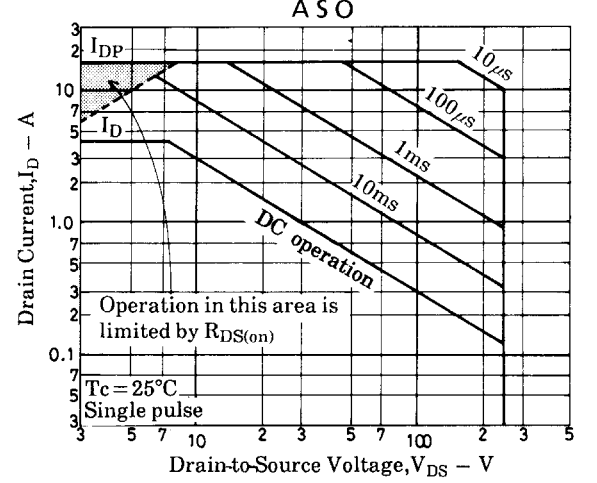
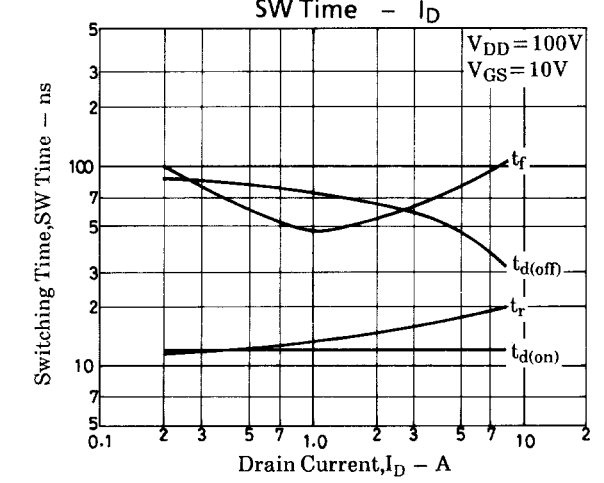
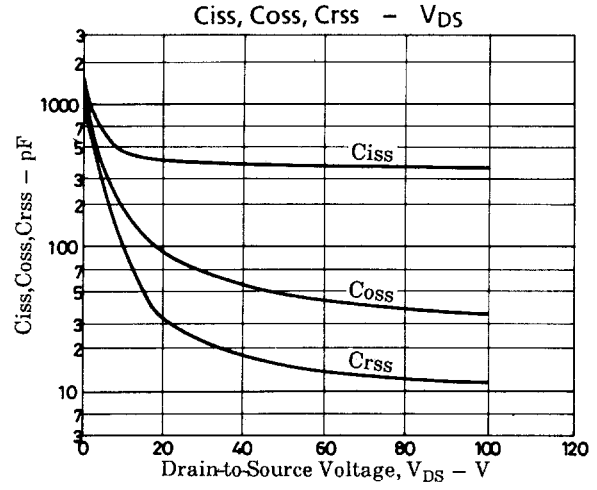
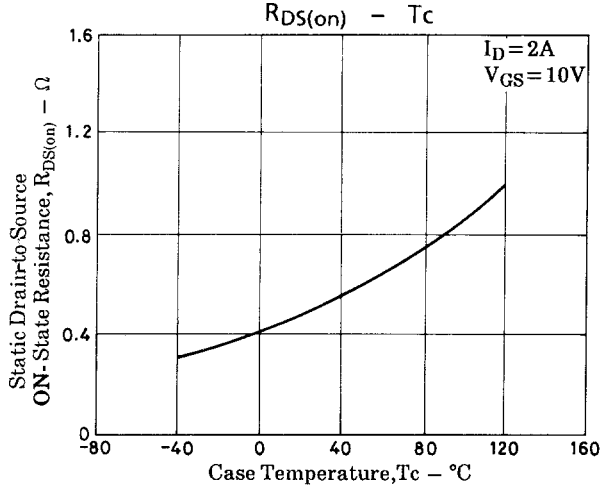
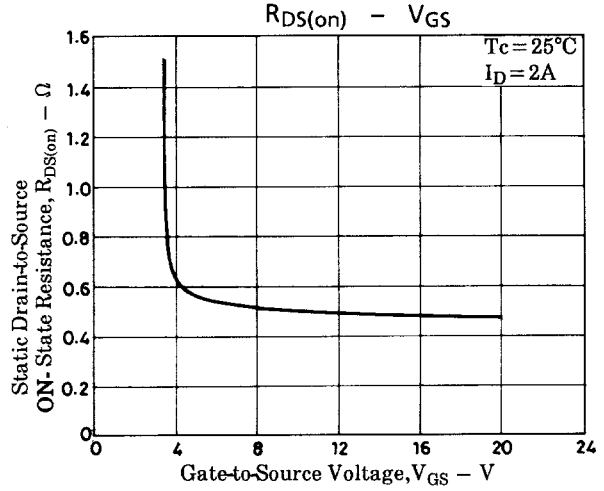
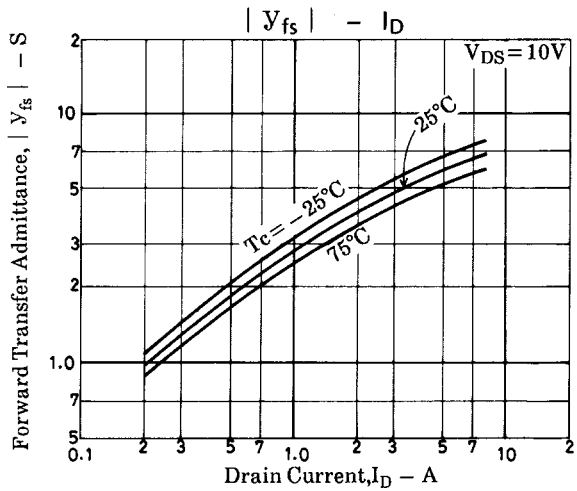
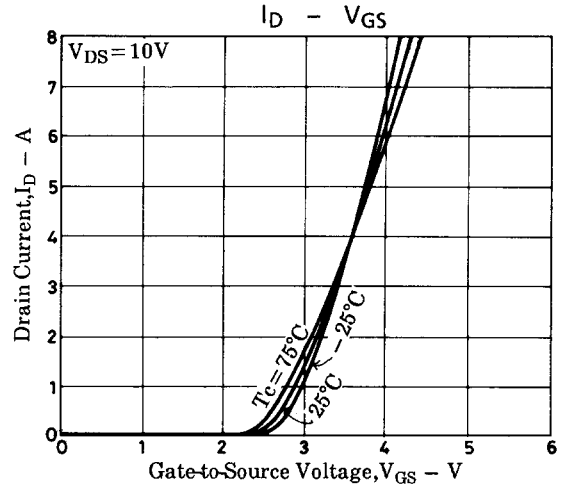
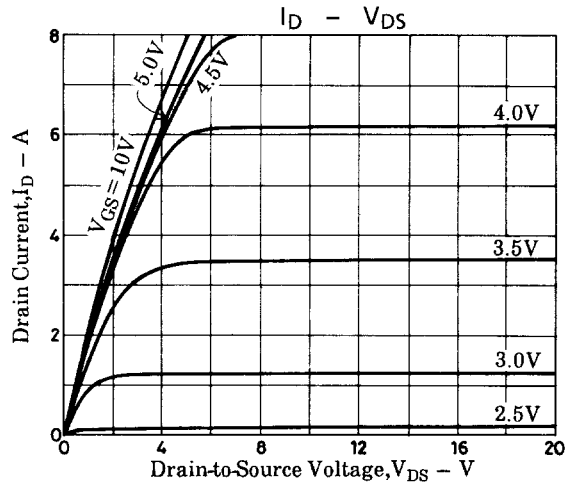
### Electrical Characteristics at $T_a = 25^\circ\text{C}$

| Parameter                                  | Symbol        | Conditions                                 | Ratings  |     |          | Unit             |
|--|---------------|--|----------|-----|----------|------------------|
|  |               |  | min      | typ | max      |                  |
| Drain-to-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D = 1\text{mA}$ , $V_{GS} = 0$          | 250      |     |          | V                |
| Gate-to-Source Breakdown Voltage           | $V_{(BR)GSS}$ | $I_G = \pm 100\mu\text{A}$ , $V_{DS} = 0$  | $\pm 30$ |     |          | V                |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS} = 250\text{V}$ , $V_{GS} = 0$      |          |     | 100      | $\mu\text{A}$    |
| Gate-to-Source Leakage Current             | $I_{GSS}$     | $V_{GS} = \pm 25\text{V}$ , $V_{DS} = 0$   |          |     | $\pm 10$ | $\mu\text{A}$    |
| Cutoff Voltage                             | $V_{GS(off)}$ | $V_{DS} = 10\text{V}$ , $I_D = 1\text{mA}$ | 1.5      |     | 2.5      | V                |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS} = 10\text{V}$ , $I_D = 2\text{A}$  | 2.5      | 4   |          | S                |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)}$  | $I_D = 2\text{A}$ , $V_{GS} = 10\text{V}$  |          | 500 | 700      | $\text{m}\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS} = 20\text{V}$ , $f = 1\text{MHz}$  |          | 420 |          | pF               |
| Output Capacitance                         | $C_{oss}$     | $V_{DS} = 20\text{V}$ , $f = 1\text{MHz}$  |          | 95  |          | pF               |
| Reverse Transfer Capacitance               | $C_{rss}$     | $V_{DS} = 20\text{V}$ , $f = 1\text{MHz}$  |          | 30  |          | pF               |
| Turn-ON Delay Time                         | $t_{d(on)}$   | See specified Test Circuit                 |          | 12  |          | ns               |
| Rise Time                                  | $t_r$         | See specified Test Circuit                 |          | 15  |          | ns               |
| Turn-OFF Delay Time                        | $t_{d(off)}$  | See specified Test Circuit                 |          | 65  |          | ns               |
| Fall Time                                  | $t_f$         | See specified Test Circuit                 |          | 55  |          | ns               |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S = 4\text{A}$ , $V_{GS} = 0$           |          | 1.0 | 1.5      | V                |

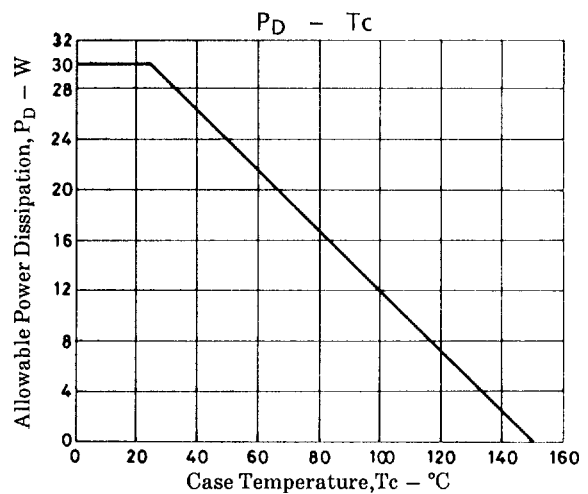
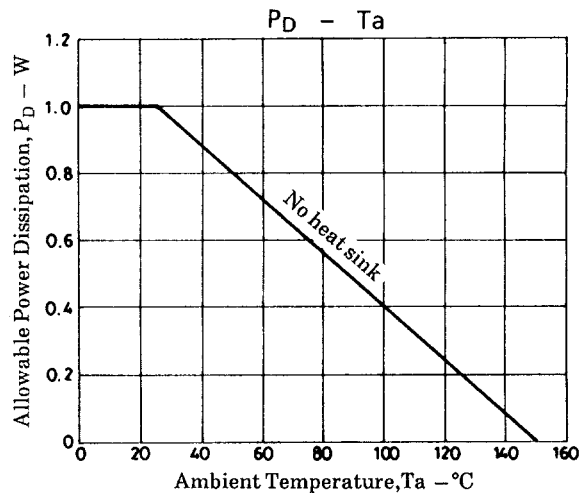
### Switching Time Test Circuit



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