

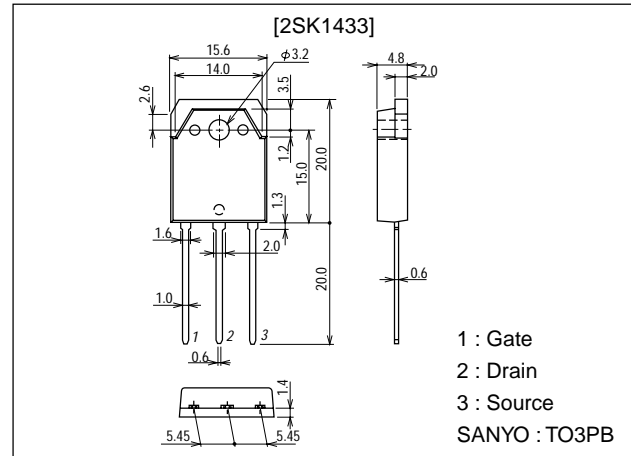
**2SK1433****Ultrahigh-Speed Switching Applications****Features**

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

**Package Dimensions**

unit:mm

2056A

**Specifications****Absolute Maximum Ratings at Ta = 25°C**

| Parameter                   | Symbol    | Conditions                                 | Ratings     | Unit       |
|-----------------------------|-----------|--|-------------|------------|
| Drain-to-Source Voltage     | $V_{DSS}$ |  | 100         | V          |
| Gate-to-Source Voltage      | $V_{GSS}$ |  | $\pm 20$    | V          |
| Drain Current (DC)          | $I_D$     |  | 30          | A          |
| Drain Current (Pulse)       | $I_{DP}$  | $PW \leq 10 \mu s$ , duty cycle $\leq 1\%$ | 120         | A          |
| Allowable Power Dissipation | $P_D$     | $T_c = 25^\circ C$                         | 100         | W          |
|                             |           |  | 2.5         | 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          | $V_{(BR)DSS}$ | $I_D = 1mA$ , $V_{GS} = 0$        | 100     |       |           | V        |
| Zero-Gate Voltage Drain Current            | $I_{DSS}$     | $V_{DS} = 100V$ , $V_{GS} = 0$    |         |       | 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     |       | 2.5       | V        |
| Forward Transfer Admittance                | $ y_{fs} $    | $V_{DS} = 10V$ , $I_D = 20A$      | 13      | 22    |           | S        |
| Static Drain-to-Source ON-State Resistance | $R_{DS(on)}$  | $I_D = 20A$ , $V_{GS} = 10V$      |         | 0.040 | 0.055     | $\Omega$ |

(Note) Be careful in handling the 2SK1433 because it has no protection diode between gate and source.

Continued on next page.

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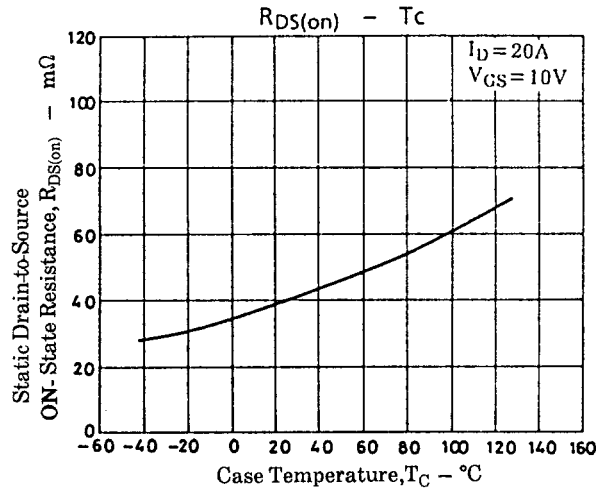
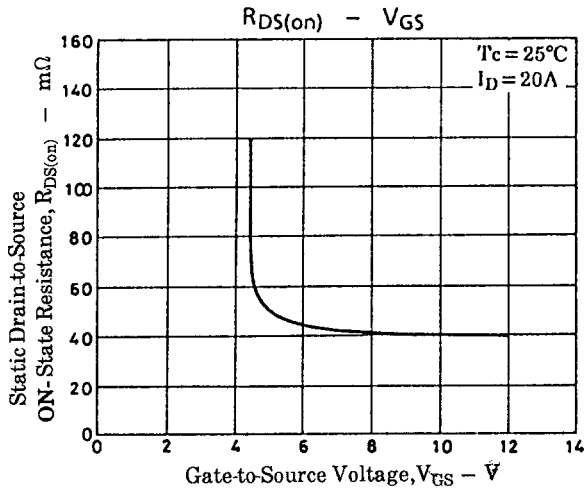
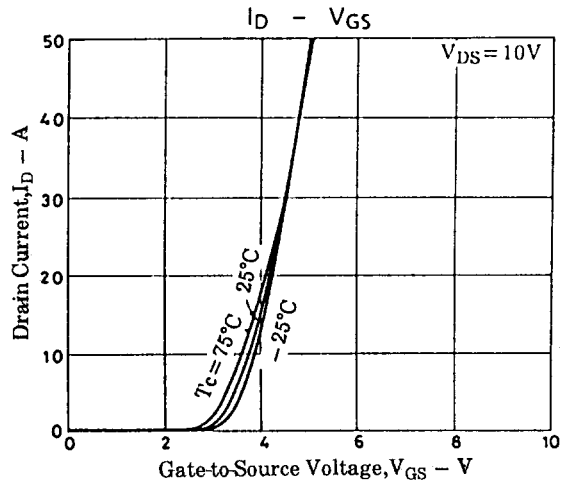
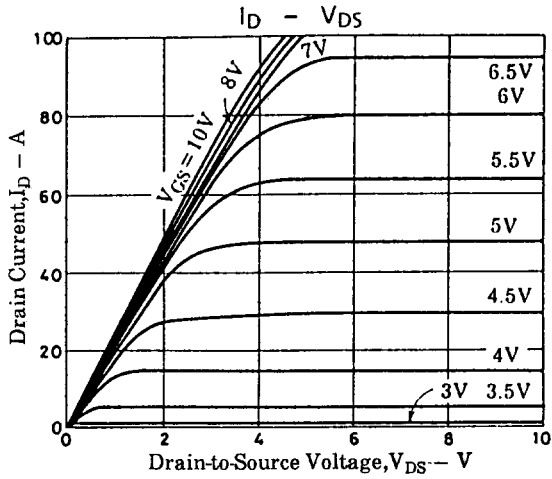
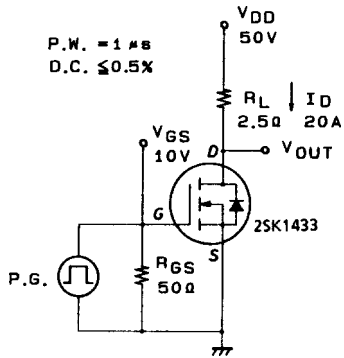
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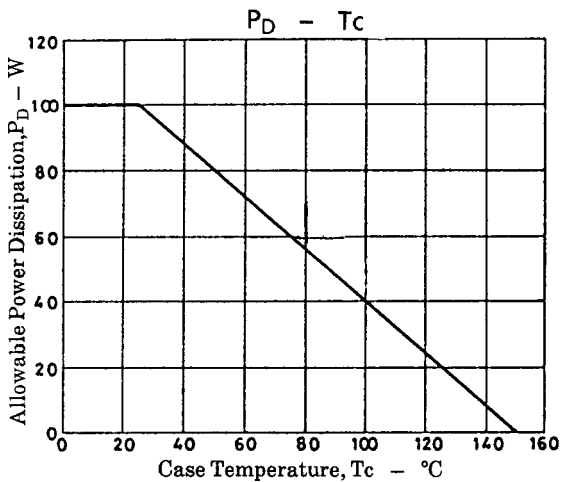
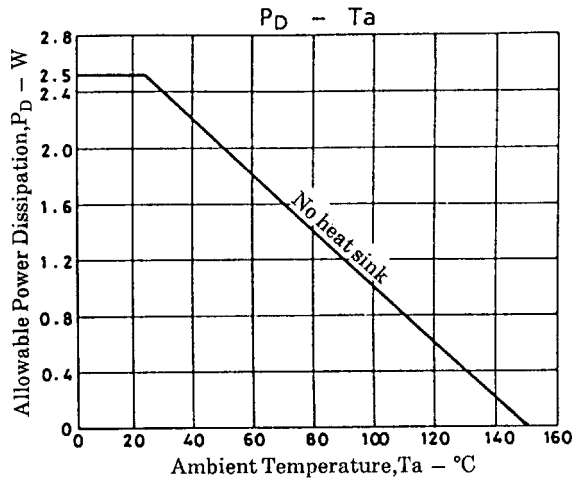
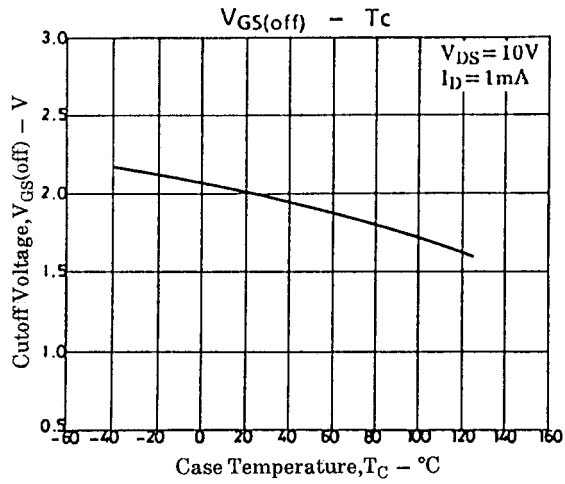
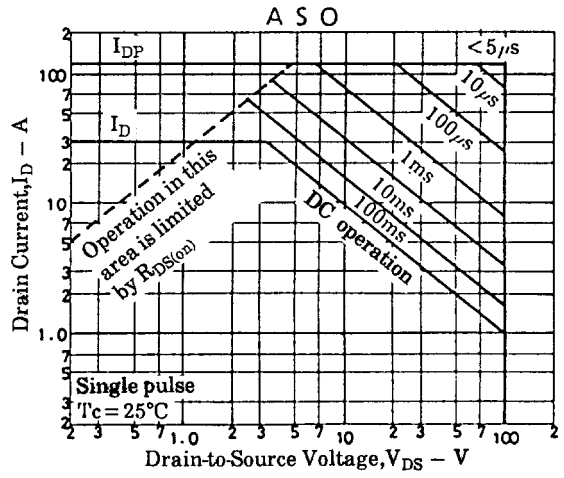
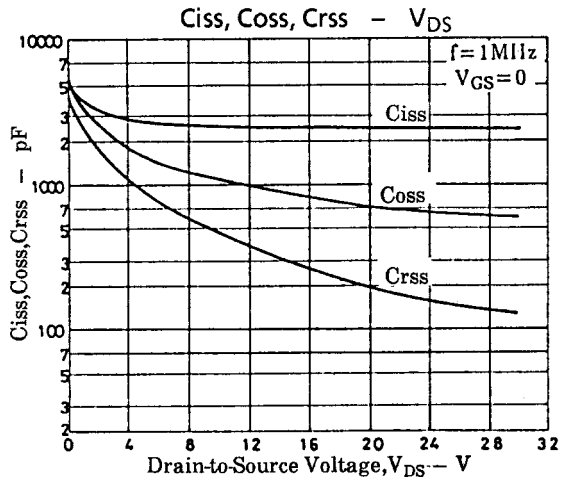
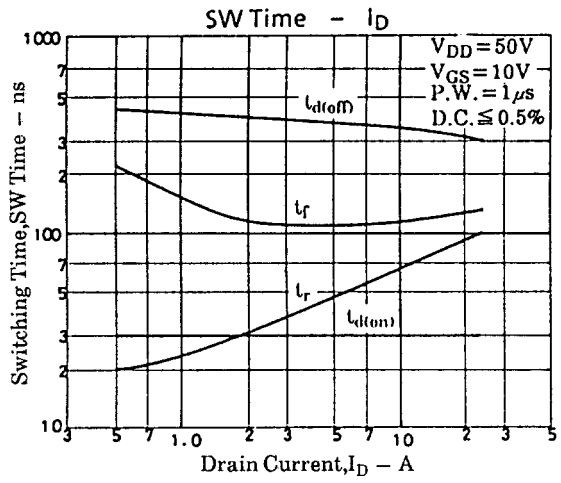
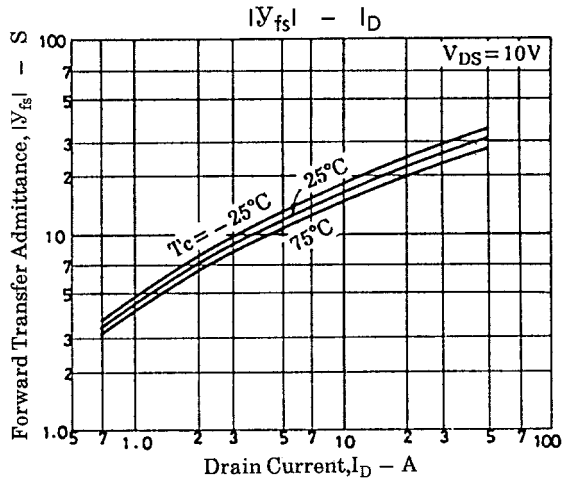
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| Parameter                    | Symbol       | Conditions   | Ratings |      |     | Unit |
|------------------------------|--------------|--|---------|------|-----|------|
|                              |              |  | min     | typ  | max |      |
| Input Capacitance            | $C_{iss}$    | $V_{DS}=20V, f=1MHz$                               |         | 2400 |     | pF   |
| Output Capacitance           | $C_{oss}$    | $V_{DS}=20V, f=1MHz$                               |         | 700  |     | pF   |
| Reverse Transfer Capacitance | $C_{rss}$    | $V_{DS}=20V, f=1MHz$                               |         | 200  |     | pF   |
| Turn-ON Delay Time           | $t_{d(on)}$  | $I_D=20A, V_{GS}=10V, V_{DD}=50V, R_{GS}=50\Omega$ |         | 30   |     | ns   |
| Rise Time                    | $t_r$        | $I_D=20A, V_{GS}=10V, V_{DD}=50V, R_{GS}=50\Omega$ |         | 90   |     | ns   |
| Turn-OFF Delay Time          | $t_{d(off)}$ | $I_D=20A, V_{GS}=10V, V_{DD}=50V, R_{GS}=50\Omega$ |         | 320  |     | ns   |
| Fall Time                    | $t_f$        | $I_D=20A, V_{GS}=10V, V_{DD}=50V, R_{GS}=50\Omega$ |         | 130  |     | ns   |
| Diode Forward Voltage        | $V_{SD}$     | $I_S=30A, V_{GS}=0$                                |         |      | 1.8 | V    |

## Switching Time Test Circuit



# 2SK1433



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