

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

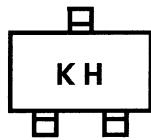
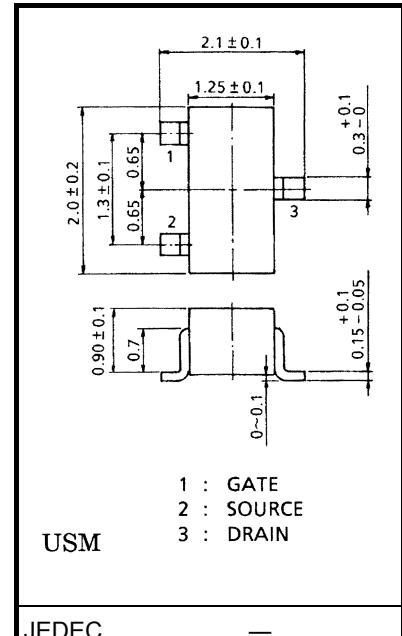
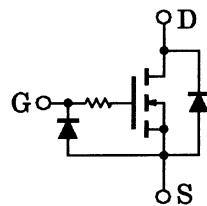
**2SK1827**

High Speed Switching Applications

Analog Switch Applications

Unit: mm

- 4 V gate drive
- Low threshold voltage:  $V_{th} = 0.8\sim2.5$  V
- High speed
- Enhancement-mode
- Small package

**Marking****Equivalent Circuit****Absolute Maximum Ratings (Ta = 25°C)**

| Characteristics           | Symbol    | Rating  | Unit |
|---------------------------|-----------|---------|------|
| Drain-source voltage      | $V_{DS}$  | 50      | V    |
| Gate-source voltage       | $V_{GSS}$ | 10      | V    |
| DC drain current          | $I_D$     | 50      | mA   |
| Drain power dissipation   | $P_D$     | 100     | mW   |
| Channel temperature       | $T_{ch}$  | 150     | °C   |
| Storage temperature range | $T_{stg}$ | -55~150 | °C   |

JEDEC —

JEITA SC-70

TOSHIBA 2-2E1E

Weight: 0.006 g (typ.)

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

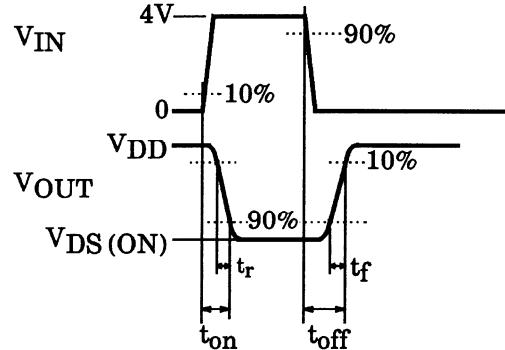
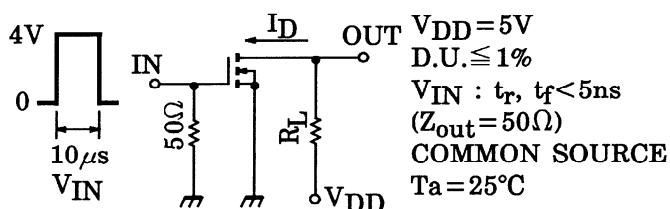
Note: This transistor is electrostatic sensitive device.

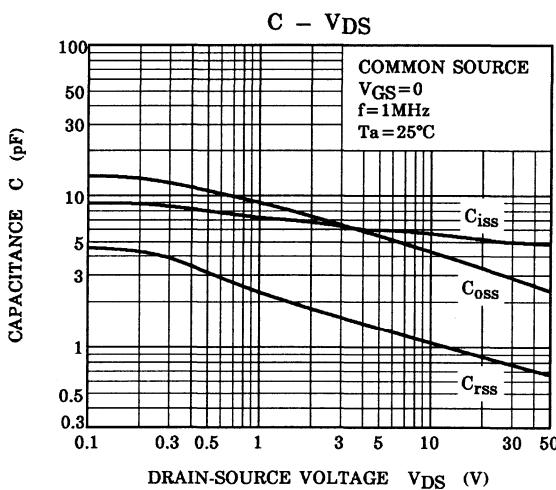
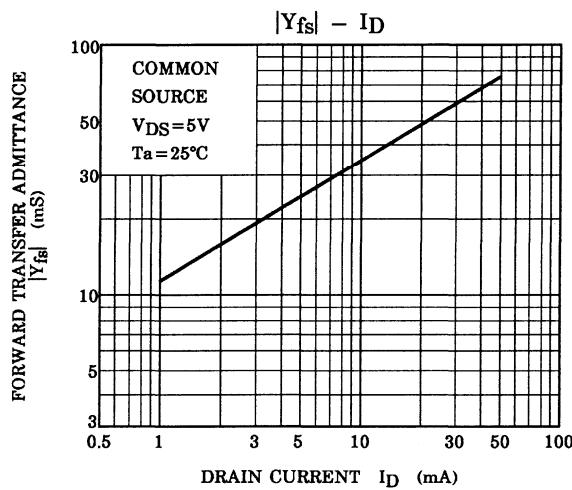
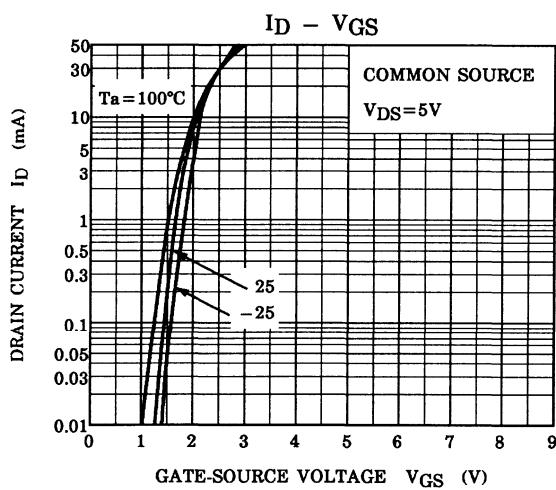
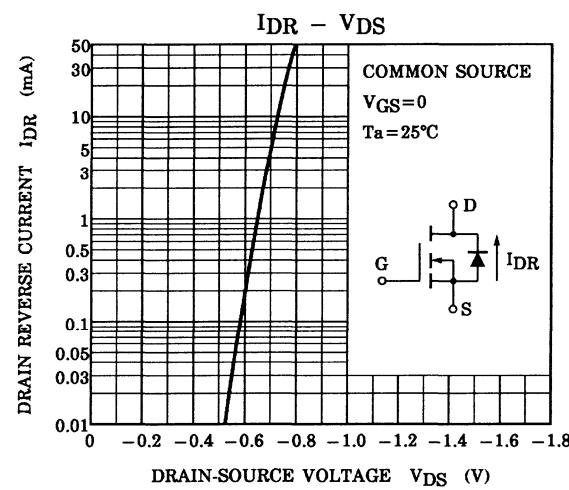
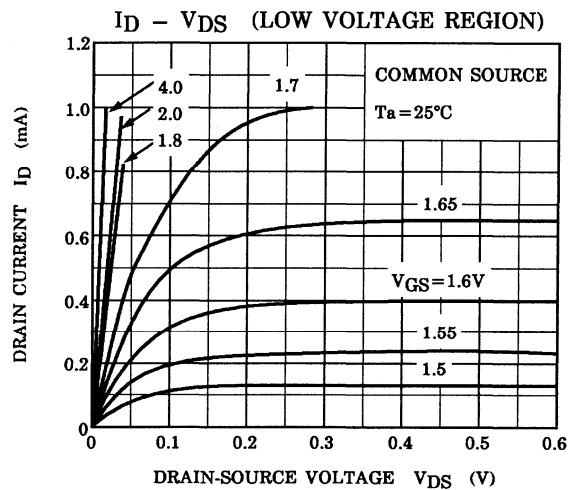
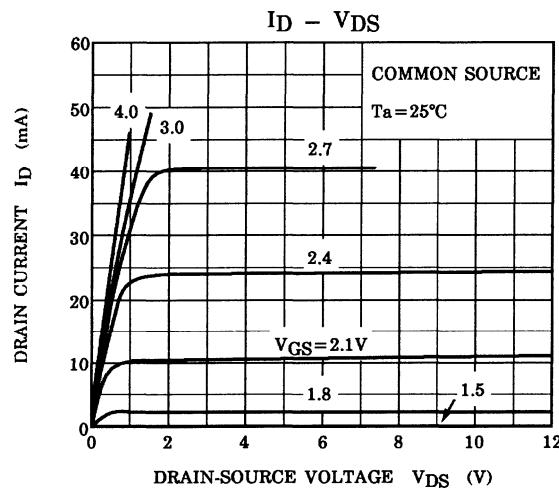
Please handle with caution.

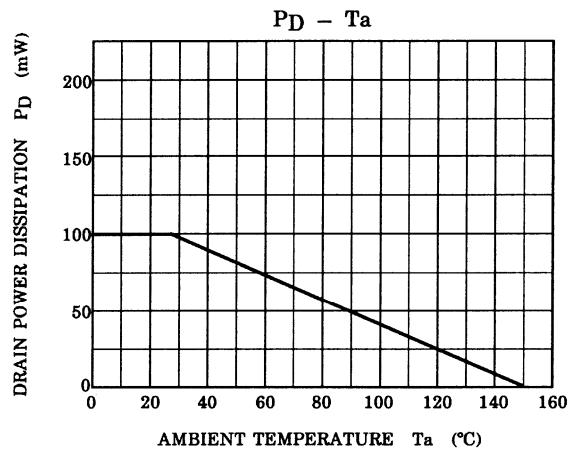
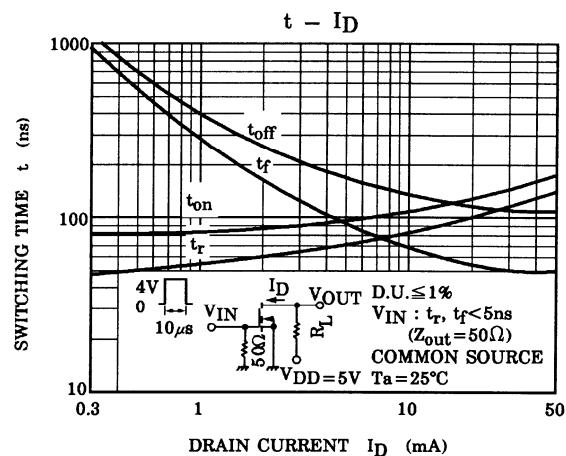
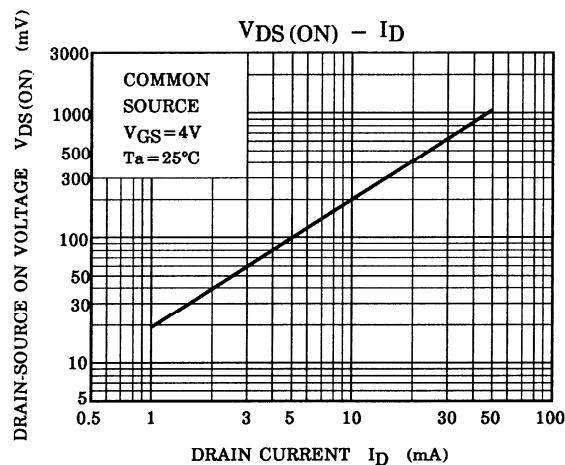
## Electrical Characteristics (Ta = 25°C)

| Characteristics                | Symbol                | Test Condition  | Min  | Typ. | Max  | Unit |
|--------------------------------|-----------------------|---|--|------|------|------|
| Gate leakage current           | I <sub>GSS</sub>      | V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0           | —  | —    | 1    | μA   |
| Drain-source breakdown voltage | V <sub>(BR)</sub> DSS | I <sub>D</sub> = 100 μA, V <sub>GS</sub> = 0          | 50   | —    | —    | V    |
| Drain cut-off current          | I <sub>DSS</sub>      | V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 0           | —  | —    | 1    | μA   |
| Gate threshold voltage         | V <sub>th</sub>       | V <sub>DS</sub> = 5 V, I <sub>D</sub> = 0.1 mA        | 0.8  | —    | 2.5  | V    |
| Forward transfer admittance    | Y <sub>fs</sub>       | V <sub>DS</sub> = 5 V, I <sub>D</sub> = 10 mA         | 20   | —    | —    | mS   |
| Drain-source ON resistance     | R <sub>DS</sub> (ON)  | I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 4.0 V       | —  | 20   | 50   | Ω    |
| Input capacitance              | C <sub>iss</sub>      | V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 0, f = 1 MHz | —  | 6.3  | —    | pF   |
| Reverse transfer capacitance   | C <sub>rss</sub>      | V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 0, f = 1 MHz | —  | 1.3  | —    | pF   |
| Output capacitance             | C <sub>oss</sub>      | V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 0, f = 1 MHz | —  | 5.7  | —    | pF   |
| Switching time                 | Turn-on time          | t <sub>on</sub>                                       | V <sub>DD</sub> = 5 V, I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0~4.0 V | —    | 0.11 | —    |
|                                | Turn-off time         | t <sub>off</sub>                                      | V <sub>DD</sub> = 5 V, I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0~4.0 V | —    | 0.15 | —    |
|                                |                       |   |  |      |      | μs   |

## Switching Time Test Circuit







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