

Interface and switching (30V, 200mA)

2SK2731

●Structure

Silicon N-channel
MOSFET

●Features

- 1) Low on-resistance.
- 2) High-speed switching.
- 3) Low-voltage drive(4V).

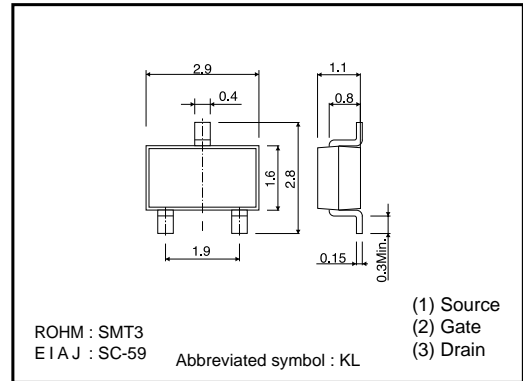
●Application

Switching

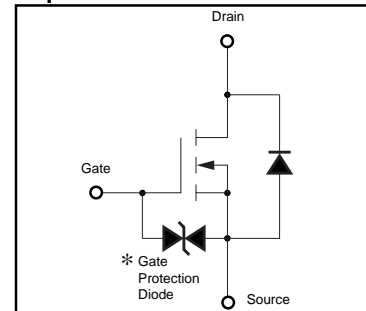
●Packaging specifications

| Type | Package | Taping |
|---------|------------------------------|--------|
| | Code | T146 |
| | Basic ordering unit (pieces) | 3000 |
| 2SK2731 | | ○ |

●Dimensions (Unit : mm)



●Equivalent circuit



* A protection diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use a protection circuit when the fixed voltage are exceeded.

●Absolute maximum ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit | |
|-------------------------|------------|-------------|------|----|
| Drain-source voltage | V_{DS} | 30 | V | |
| Gate-source voltage | V_{GS} | ± 20 | V | |
| Drain current | Continuous | I_D | 200 | mA |
| | Pulsed | I_{DP}^* | 800 | mA |
| Total power dissipation | P_D | 200 | mW | |
| Channel temperature | T_{ch} | 150 | °C | |
| Storage temperature | T_{stg} | -55 to +150 | °C | |

* $P_w \leq 10\mu s$, Duty cycle $\leq 1\%$

Transistors

●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|----------------|------|------|------|------|----------------------------------|
| Gate-source leakage | I_{GSS} | - | - | ±10 | μA | $V_{GS} = \pm 20V, V_{DS} = 0V$ |
| Drain-source breakdown voltage | $V_{(BR) DSS}$ | 30 | - | - | V | $I_D = 1mA, V_{GS} = 0V$ |
| Zero gate voltage drain current | I_{DSS} | - | - | 10 | μA | $V_{DS} = 30V, V_{GS} = 0V$ |
| Gate threshold voltage | $V_{GS(th)}$ | 1.0 | - | 2.5 | V | $V_{DS} = 10V, I_D = 1mA$ |
| Static drain-source on-state resistance | $R_{DS(on)}$ | - | 1.5 | 2.8 | Ω | $I_D = 0.1A, V_{GS} = 10V$ |
| | | - | 2.8 | 4.5 | | $I_D = 0.1A, V_{GS} = 4V$ |
| Forward transfer admittance | $ Y_{fs} ^*$ | 100 | - | - | mS | $I_D = 0.1A, V_{DS} = 10V$ |
| Input capacitance | C_{iss} | - | 25 | - | pF | $V_{DS} = 10V$ |
| Output capacitance | C_{oss} | - | 15 | - | pF | $V_{GS} = 0V$ |
| Reverse transfer capacitance | C_{rss} | - | 10 | - | pF | $f = 1MHz$ |
| Turn-on delay time | $t_d(on)$ | - | 15 | - | ns | $I_D = 0.1A, V_{DD} \approx 15V$ |
| Rise time | t_r | - | 20 | - | ns | $V_{GS} = 10V$ |
| Turn-off delay time | $t_d(off)$ | - | 90 | - | ns | $R_L = 150\Omega$ |
| Fall time | t_f | - | 100 | - | ns | $R_G = 10\Omega$ |

* $P_w \leq 300ms$, Duty cycle $\leq 1\%$

●Electrical characteristic curves

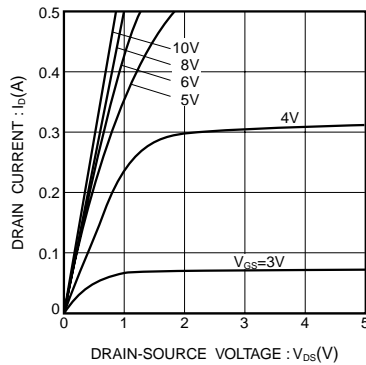


Fig.1 Typical Output Characteristics

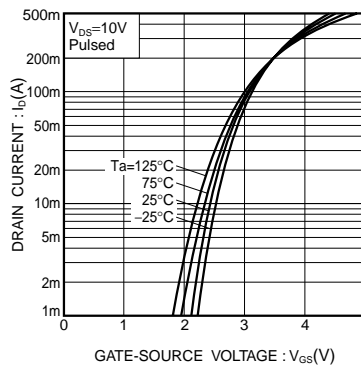


Fig.2 Typical Transfer Characteristics

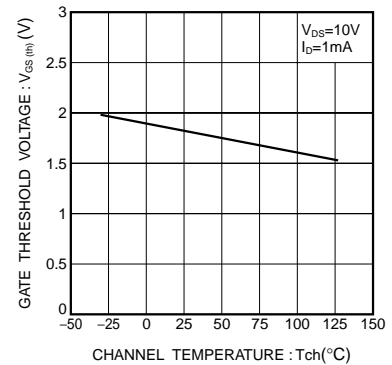


Fig.3 Gate Threshold Voltage vs. Channel Temperature

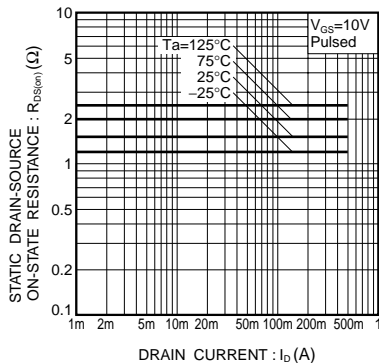


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (I)

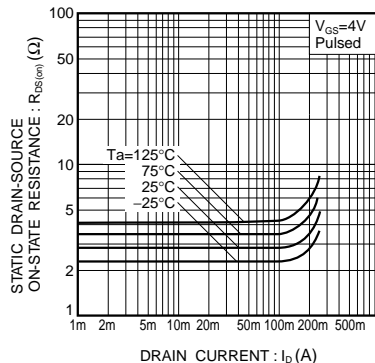


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (II)

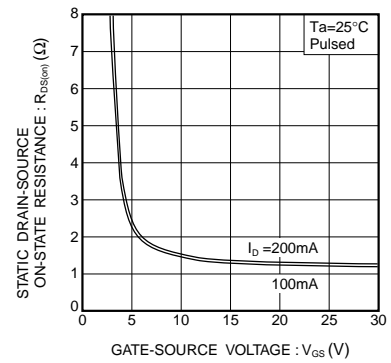


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

Transistors

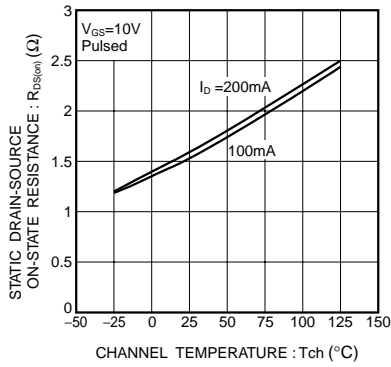


Fig.7 Static Drain-Source On-State Resistance vs. Channel Temperature

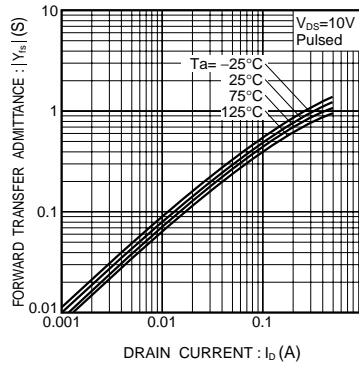


Fig.8 Forward Transfer Admittance vs. Drain Current

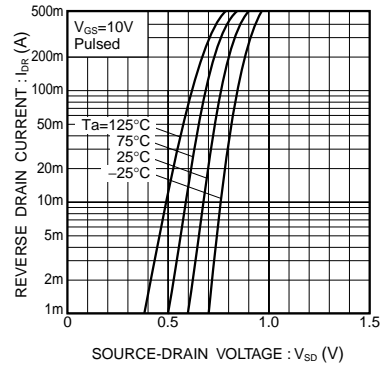


Fig.9 Reverse Drain Current vs. Source-Drain Voltage (I)

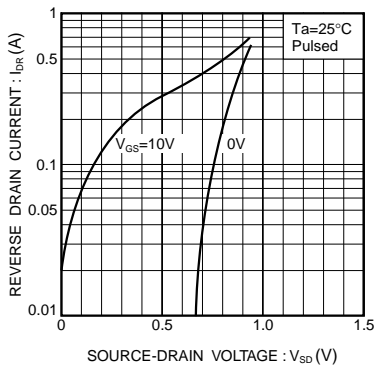


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (II)

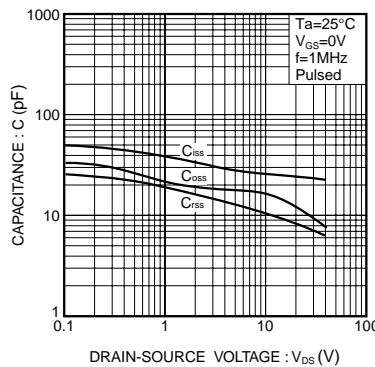


Fig.11 Typical Capacitance vs. Drain-Source Voltage

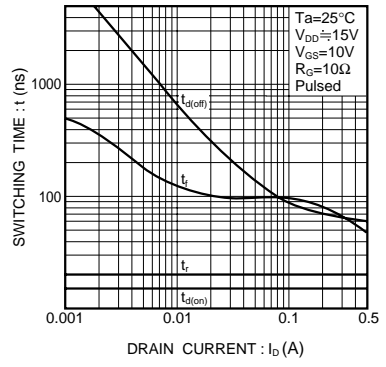


Fig.12 Switching Characteristics (See Figure. 13 and 14 for measurement circuit)

●Measurement circuit

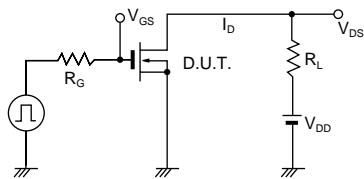


Fig.13 Switching Time Test Circuit

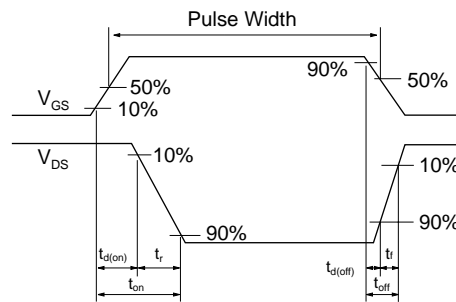


Fig.14 Switching Time Waveforms

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