

2SK3105

DESCRIPTION

The 2SK3105 is a switching device which can be driven directly by a 4 V power source.

The 2SK3105 features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as power switch of portable machine and so on.

FEATURES

- Can be driven by a 4 V power source
- Low on-state resistance

$R_{DS(on)1} = 95 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 1.5 \text{ A)}$

$R_{DS(on)2} = 135 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 1.5 \text{ A)}$

$R_{DS(on)3} = 150 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 1.5 \text{ A)}$

ORDERING INFORMATION

| PART NUMBER | PACKAGE |
|-------------|-----------------------------|
| 2SK3105 | 3-pin Mini Mold (Thin Type) |

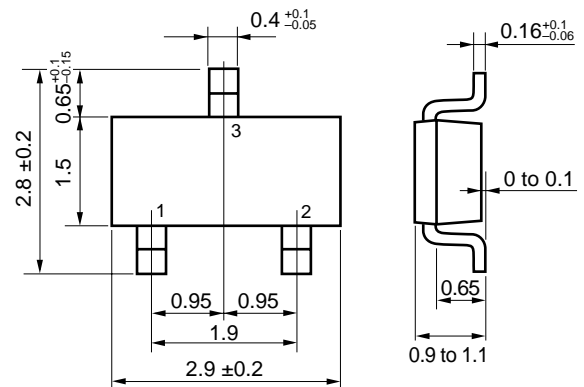
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

| | | | |
|--|-----------------------|-------------|----|
| Drain to Source Voltage | V _{DSS} | 30 | V |
| Gate to Source Voltage | V _{GSS} | ±20 | V |
| Drain Current (DC) | I _{D(DC)} | ±2.5 | A |
| Drain Current (pulse) ^{Note1} | I _{D(pulse)} | ±10 | A |
| Total Power Dissipation | P _{T1} | 0.2 | W |
| Total Power Dissipation ^{Note2} | P _{T2} | 1.25 | W |
| Channel Temperature | T _{ch} | 150 | °C |
| Storage Temperature | T _{stg} | -55 to +150 | °C |

- Notes**
1. $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1 \%$
 2. Mounted on FR4 Board, $t \leq 5 \text{ sec.}$

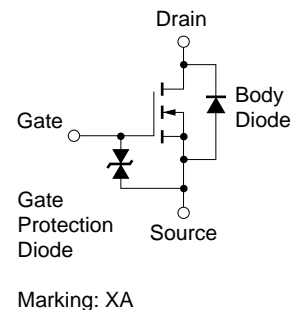
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

PACKAGE DRAWING (Unit : mm)



- 1 : Gate
2 : Source
3 : Drain

EQUIVALENT CIRCUIT



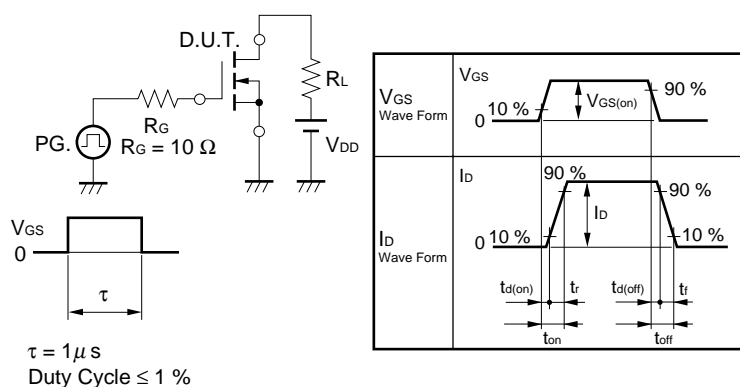
Marking: XA

2SK3105

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

| CHARACTERISTICS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------|----------------------|---|------|------|------|------|
| Drain Cut-off Current | I _{DSS} | V _{DS} = 30 V, V _{GS} = 0 V | | | -10 | μA |
| Gate Leakage Current | I _{GSS} | V _{GS} = ±16 V, V _{DS} = 0 V | | | ±10 | μA |
| Gate Cut-off Voltage | V _{GS(off)} | V _{DS} = 10 V, I _D = 1 mA | 1.0 | 1.6 | 2.5 | V |
| Forward Transfer Admittance | y _{fs} | V _{DS} = 10 V, I _D = 1.5 A | 1 | 3.5 | | S |
| Drain to Source On-state Resistance | R _{DS(on)1} | V _{GS} = 10 V, I _D = 1.5 A | | 56 | 95 | mΩ |
| | R _{DS(on)2} | V _{GS} = 4.5 V, I _D = 1.5 A | | 82 | 135 | mΩ |
| | R _{DS(on)3} | V _{GS} = 4.0 V, I _D = 1.5 A | | 91 | 150 | mΩ |
| Input Capacitance | C _{iss} | V _{DS} = 10 V | | 211 | | pF |
| Output Capacitance | C _{oss} | V _{GS} = 0 V | | 95 | | pF |
| Reverse Transfer Capacitance | C _{rss} | f = 1 MHz | | 42 | | pF |
| Turn-on Delay Time | t _{d(on)} | V _{DD} = 10 V | | 12 | | ns |
| Rise Time | t _r | I _D = 1.0 A | | 44 | | ns |
| Turn-off Delay Time | t _{d(off)} | V _{GS(on)} = 10 V | | 28 | | ns |
| Fall Time | t _f | R _G = 10 Ω | | 15 | | ns |
| Total Gate Charge | Q _G | V _{DS} = 10 V | | 2.1 | | nC |
| Gate to Source Charge | Q _{GS} | I _D = 2.5 A | | 0.61 | | nC |
| Gate to Drain Charge | Q _{GD} | V _{GS} = 4.0 V | | 0.84 | | nC |
| Diode Forward Voltage | V _{F(S-D)} | I _F = 2.5 A, V _{GS} = 0 V | | 0.81 | | V |
| Reverse Recovery Time | t _{rr} | I _F = 2.5 A, V _{GS} = 0 V | | 15 | | ns |
| Reverse Recovery Charge | Q _{rr} | di/dt = 90 A/μs | | 3.7 | | nC |

TEST CIRCUIT 1 SWITCHING TIME



TEST CIRCUIT 2 GATE CHARGE

