

4V Drive Nch MOS FET

2SK2094

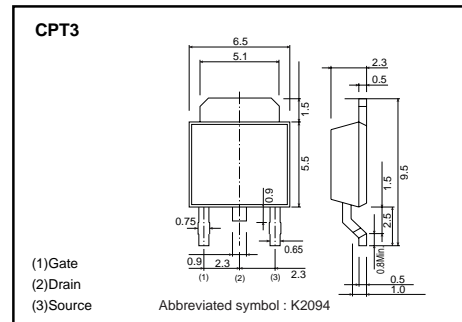
●Structure

Silicon N-channel MOS FET

●Features

- 1) Low On-resistance.
- 2) Fast switching speed.
- 3) Wide SOA (safe operating area).
- 4) 4V drive.
- 5) Drive circuits can be simple.
- 6) Parallel use is easy.

●External dimensions (Unit : mm)



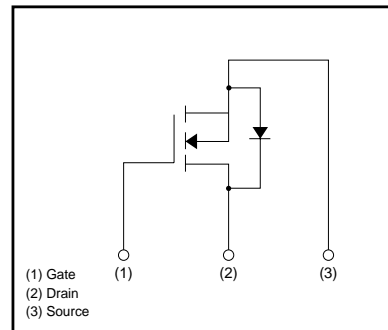
●Applications

Switching

●Packaging specifications

| Type | Package | Taping |
|---------|------------------------------|--------|
| | Code | TL |
| | Basic ordering unit (pieces) | 2500 |
| 2SK2094 | | ○ |

●Inner circuit



●Absolute maximum ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit | |
|----------------------------------|------------------|--------------------|------|---|
| Drain-source voltage | V _{DSS} | 60 | V | |
| Gate-source voltage | V _{GSS} | ±20 | V | |
| Drain current | Continuous | I _D | 2 | A |
| | Pulsed | I _{DP} * | 8 | A |
| Reverse drain current | Continuous | I _{DR} | 2 | A |
| | Pulsed | I _{DRP} * | 8 | A |
| Total power dissipation(Tc=25°C) | P _D | 10 | W | |
| Channel temperature | T _{ch} | 150 | °C | |
| Storage temperature | T _{stg} | -55 to +150 | °C | |

* P_w ≤ 300μs, Duty cycle ≤ 2%

Transistors

●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|----------------------|------|------|------|------|--|
| Gate-source leakage | I _{GSS} | – | – | ±100 | nA | V _{GS} = ±20V, V _{DS} =0V |
| Drain-source breakdown voltage | V _{(BR)DSS} | 60 | – | – | V | I _D =1mA, V _{GS} =0V |
| Zero gate voltage drain current | I _{DSS} | – | – | 100 | μA | V _{DS} =60V, 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)} | – | 0.3 | 0.35 | Ω | I _D =1A, V _{GS} =10V |
| | | – | 0.4 | 0.5 | | I _D =1A, V _{GS} =4V |
| Forward transfer admittance | Y _{fs} | 1.0 | – | – | S | V _{DS} =10V, I _D =1A |
| Input capacitance | C _{iss} | – | 400 | – | pF | V _{DS} =10V |
| Output capacitance | C _{oss} | – | 150 | – | pF | V _{GS} =0V |
| Reverse transfer capacitance | C _{rss} | – | 50 | – | pF | f=1MHz |
| Turn-on delay time | t _{d(on)} | – | 10 | – | ns | I _D =1A, V _{DD} =30V |
| Rise time | t _r | – | 20 | – | ns | V _{GS} =10V |
| Turn-off delay time | t _{d(off)} | – | 100 | – | ns | R _L =30Ω |
| Fall time | t _f | – | 40 | – | ns | R _G =10Ω |
| Reverse recovery time (Body Diode) | t _{rr} | – | 100 | – | ns | I _{DR} =2A, V _{GS} =0V, di/dt=50A/μs |

Transistors

●Electrical characteristics curve

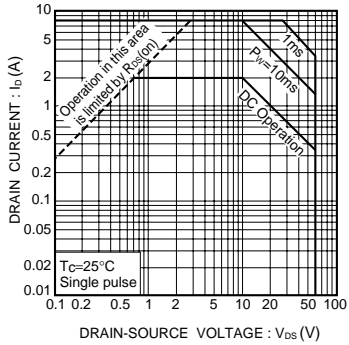


Fig.1 Maximum Safe Operating Area

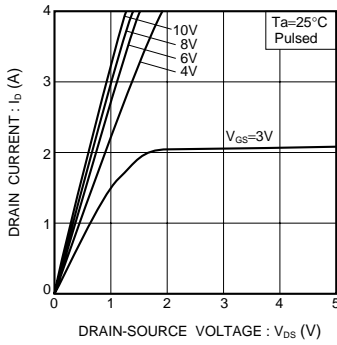


Fig.2 Typical Output Characteristics

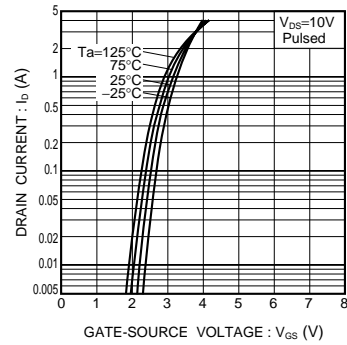


Fig.3 Typical Transfer Characteristics

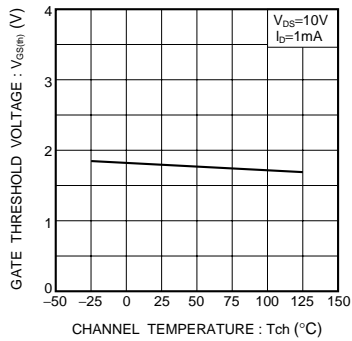


Fig.4 Gate Threshold Voltage vs. Channel Temperature

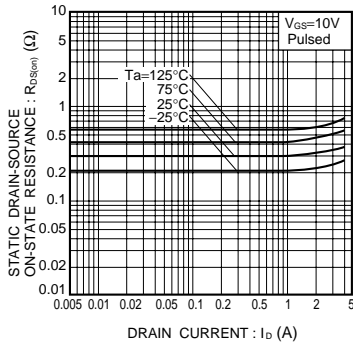


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (I)

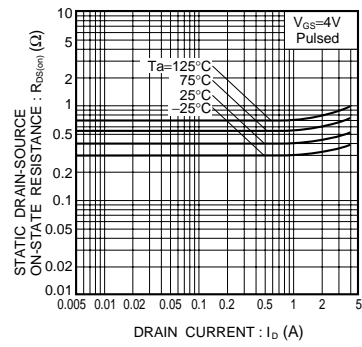


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (II)

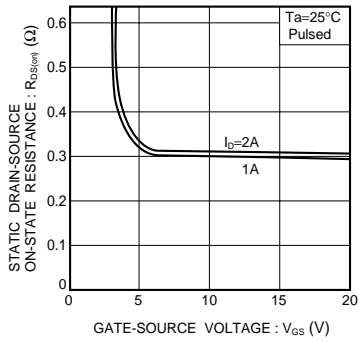


Fig.7 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

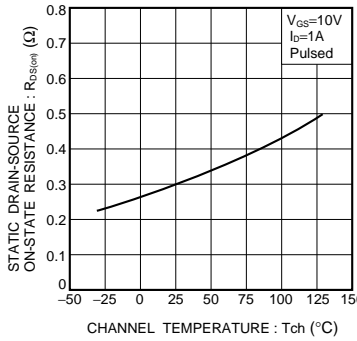


Fig.8 Static Drain-Source On-State Resistance vs. Channel Temperature

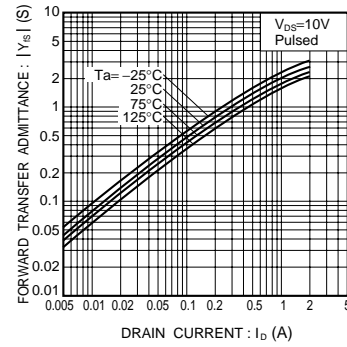


Fig.9 Forward Transfer Admittance vs. Drain Current

Transistors

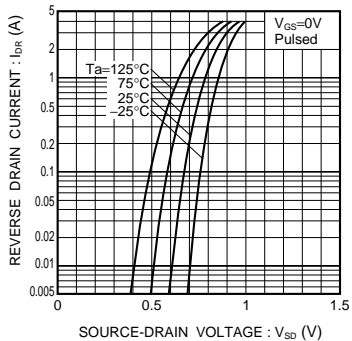


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (I)

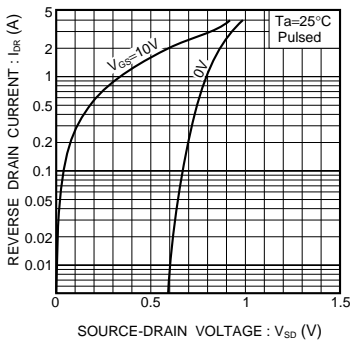


Fig.11 Reverse Drain Current vs. Source-Drain Voltage (II)

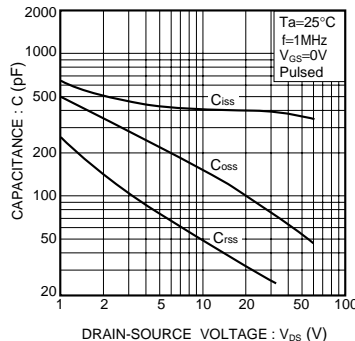


Fig.12 Typical Capacitance vs. Drain-Source Voltage

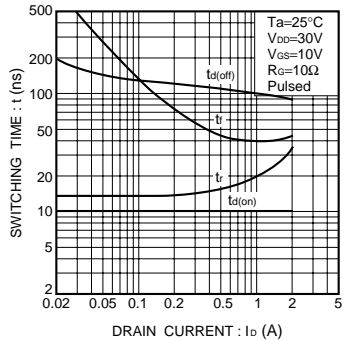


Fig.13 Switching characteristics (See Figure. 15 and 16 for the measurement circuit and resultant waveforms)

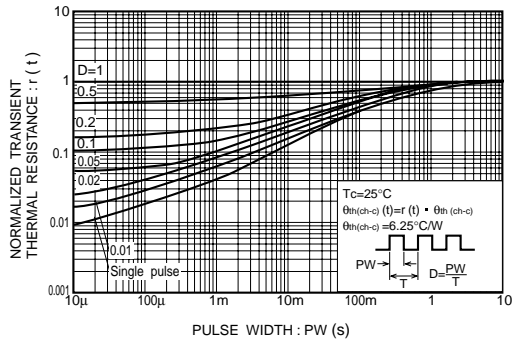


Fig.14 Normalized Transient Thermal Resistance vs. Pulse Width

● Switching characteristics measurement circuit

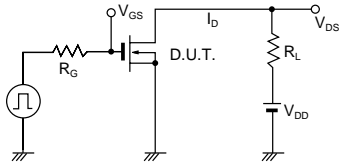


Fig.15 Switching Time Test Circuit

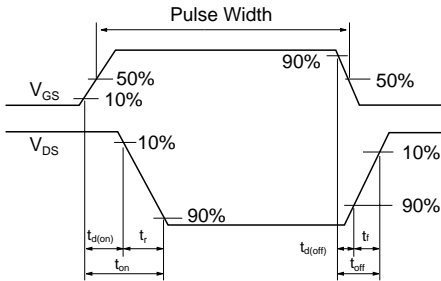


Fig.16 Switching Time Waveforms

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