# Small switching (60V, 2A)

## 2SK2094

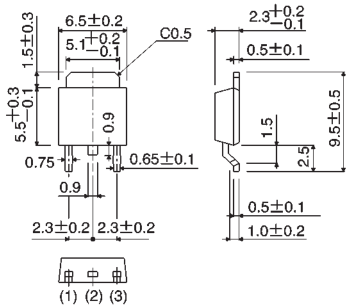
●Features

1) Low on-resistance.
2) Fast switchig speed.
3) Wide SOA (safe operating area).
4) Low-voltage drive (4V).
5) Easily designed drive circuits.
6) Easy to parallel.

●Structure

Silicon N-channel
MOSFET

●External dimensions (Units: mm)



ROHM : CPT3
EIAJ : SC-63

(1) Gate
(2) Drain
(3) Source

●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℃) | | $P_D$ | 20 | W |
| Channel temperature | | Tch | 150 | ℃ |
| Storage temperature | | Tstg | −55～+150 | ℃ |

∗ Pw≦300 μs, Duty cycle≦2%

●Packaging specifications

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

●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 | $\lvert Y_{fs} \rvert$ | 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 | $t_{rr}$ | — | 100 | — | ns | $I_{DR}$=2A, $V_{GS}$=0V, di/dt=50A/μs |

●Electrical characteristic curves

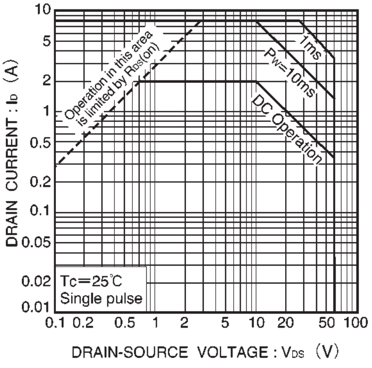


Fig.1 Maximum safe operating area

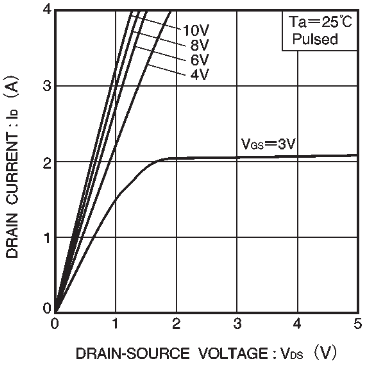


Fig.2 Typical output characteristics

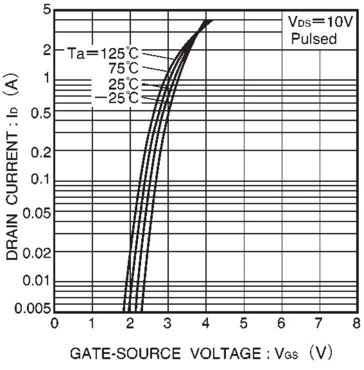


Fig.3 Typical transfer characteristics

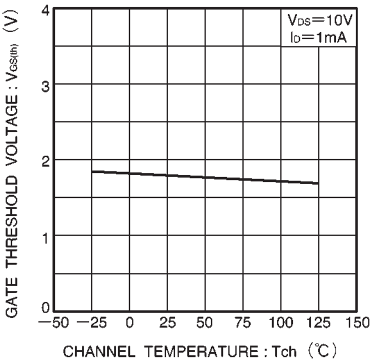


Fig.4 Gate threshold voltage vs. channel temperature

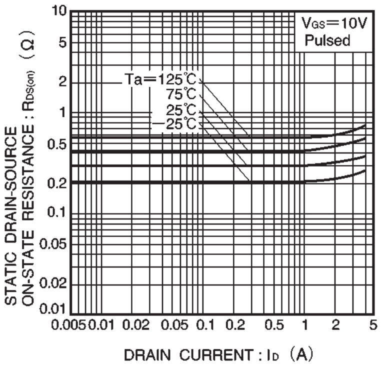


Fig.5 Static drain-source on-state resistance vs. drain current (Ⅰ)

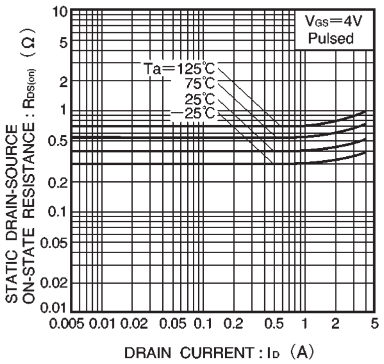


Fig.6 Static drain-source on-state resistance vs. drain current (Ⅱ)

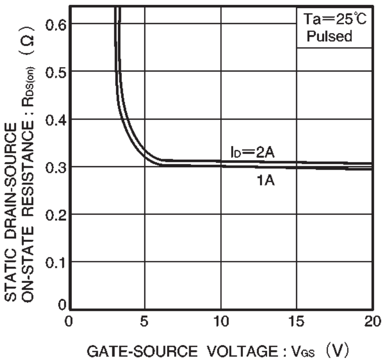


Fig.7 Static drain-source on-state resistance vs. gate-source voltage

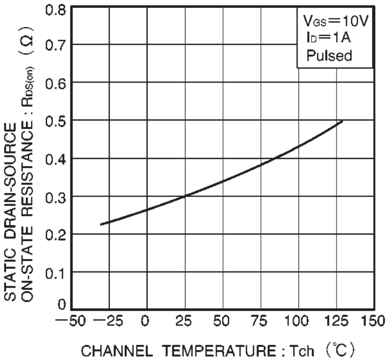


Fig.8 Static drain-source on-state resistance vs. channel temperature

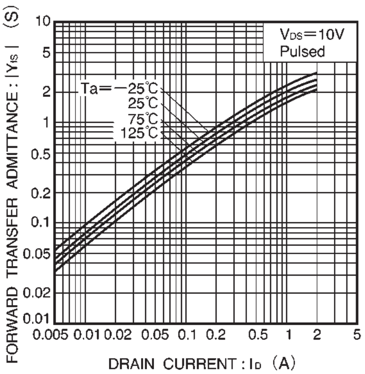


Fig.9 Forward transfer admittance vs. drain current

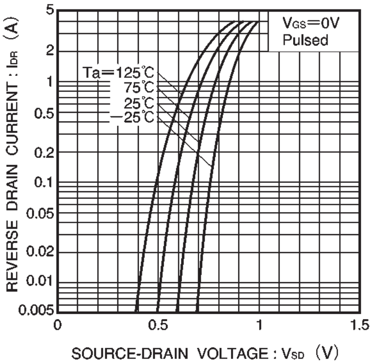


Fig.10 Reverse drain current vs. source-drain voltage (Ⅰ)

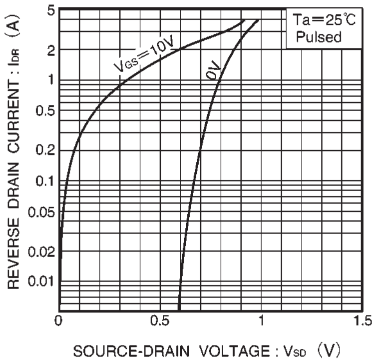


Fig.11 Reverse drain current vs. source-drain voltage (Ⅱ)

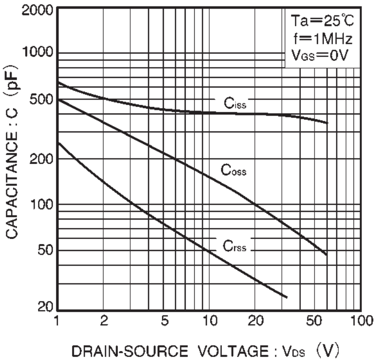


Fig.12 Typical capacitance vs. drain-source voltage

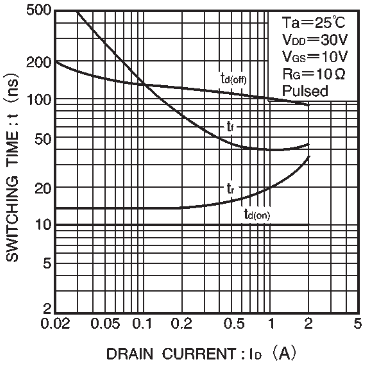


Fig.13 Switching characteristics (See Figure. 15 and 16 for the measurement circuit and resultant waveforms)

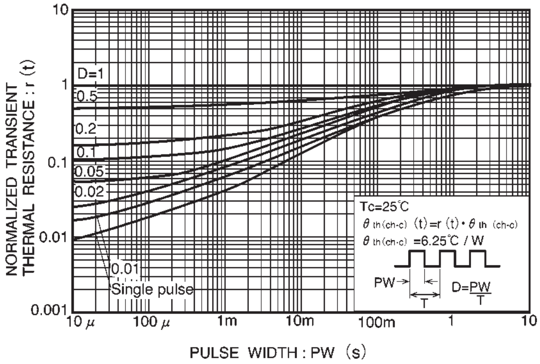
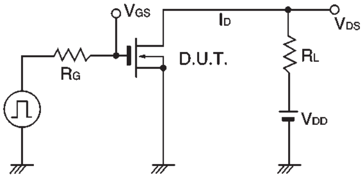


Fig.14 Normalized transient thermal resistance vs. pulse width

●Switching characteristics measurement circuit



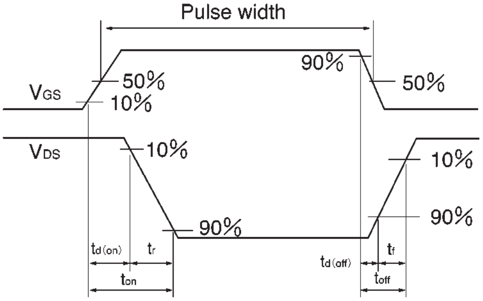


Fig.15 Switching time measurement circuit

Fig.16 Switching time waveforms