

2SK2096

Silicon N Channel MOS FET

Application

High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device can be driven from 5 V source
- Suitable for switching regulator, DC-DC converter
- Avalanche ratings

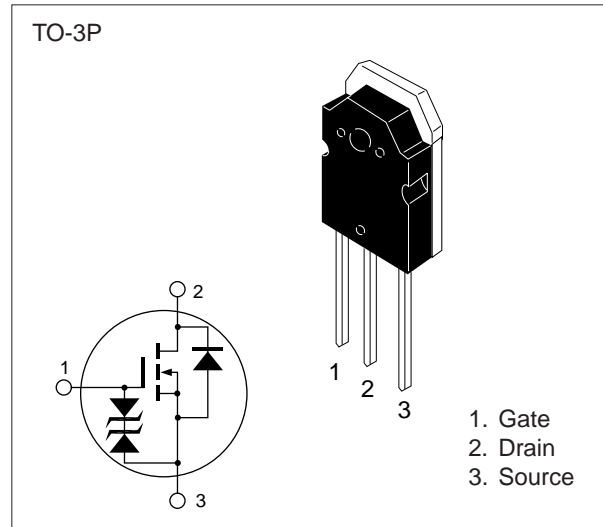


Table 1 Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Item | Symbol | Ratings | Unit |
|--|-------------------------|-------------|------------------|
| Drain to source voltage | V_{DSS} | 60 | V |
| Gate to source voltage | V_{GSS} | ± 20 | V |
| Drain current | I_D | 45 | A |
| Drain peak current | $I_{D(\text{pulse})}^*$ | 180 | A |
| Body-drain diode reverse drain current | I_{DR} | 45 | A |
| Avalanche current | I_{AP}^{***} | 45 | A |
| Avalanche energy | E_{AR}^{***} | 173 | mJ |
| Channel dissipation | P_{ch}^{**} | 100 | W |
| Channel temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

* $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$

** Value at $T_c = 25^\circ\text{C}$

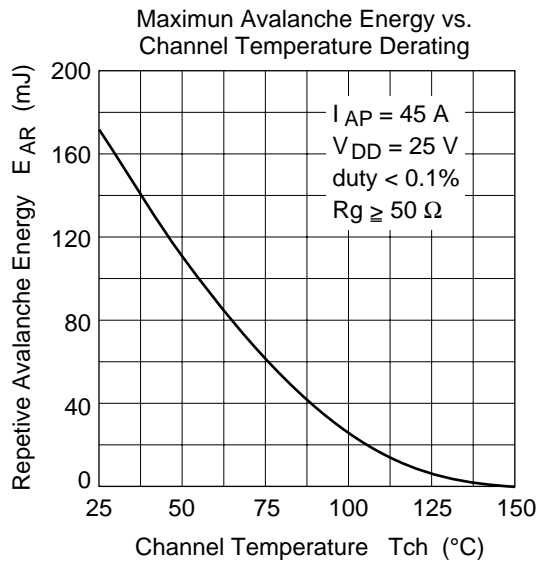
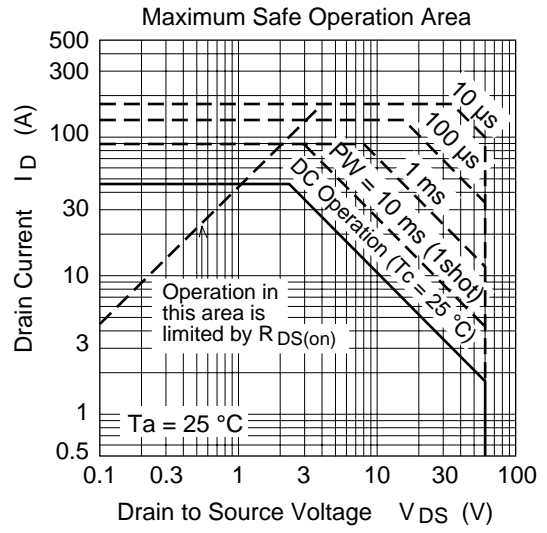
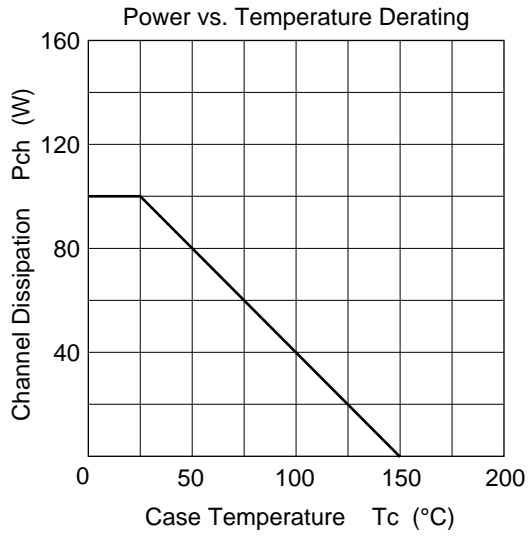
*** Value at $T_{ch} = 25^\circ\text{C}$, $R_g \geq 50 \Omega$

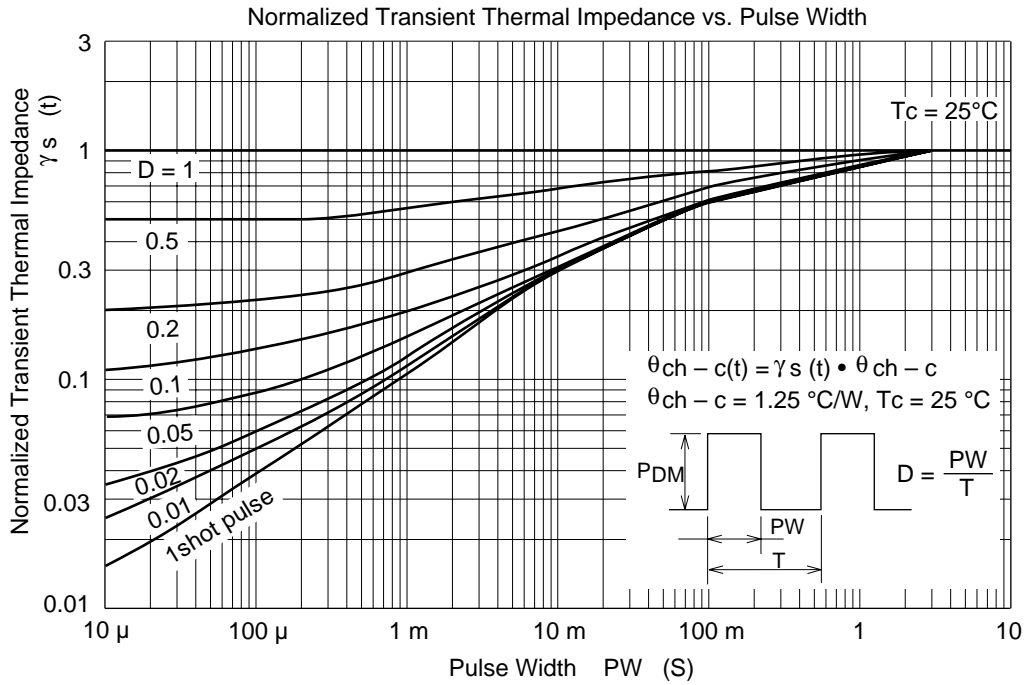
Table 2 Electrical Characteristics ($T_a = 25^\circ\text{C}$)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|---------------|----------|-------|----------|---------------|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 60 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ± 20 | — | — | V | $I_G = \pm 100 \mu\text{A}$, $V_{DS} = 0$ |
| Gate to source leak current | I_{GSS} | — | — | ± 10 | μA | $V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$ |
| Zero gate voltage drain current | I_{DSS} | — | — | 250 | μA | $V_{DS} = 50 \text{ V}$, $V_{GS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 1.0 | — | 2.25 | V | $I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$ |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 0.018 | 0.022 | Ω | $I_D = 25 \text{ A}$ $V_{GS} = 10 \text{ V}^*$ |
| | | — | 0.023 | 0.028 | Ω | $I_D = 25 \text{ A}$ $V_{GS} = 4 \text{ V}^*$ |
| Forward transfer admittance | $ y_{fs} $ | 25 | 37 | — | S | $I_D = 25 \text{ A}$ $V_{DS} = 10 \text{ V}^*$ |
| Input capacitance | C_{iss} | — | 3530 | — | pF | $V_{DS} = 10 \text{ V}$ |
| Output capacitance | C_{oss} | — | 1480 | — | pF | $V_{GS} = 0$ |
| Reverse transfer capacitance | C_{rss} | — | 300 | — | pF | $f = 1 \text{ MHz}$ |
| Turn-on delay time | $t_{d(on)}$ | — | 33 | — | ns | $I_D = 25 \text{ A}$ |
| Rise time | t_r | — | 160 | — | ns | $V_{GS} = 10 \text{ V}$ |
| Turn-off delay time | $t_{d(off)}$ | — | 450 | — | ns | $R_L = 1.5 \Omega$ |
| Fall time | t_f | — | 230 | — | ns | |
| Body-drain diode forward voltage | V_{DF} | — | 1.3 | — | V | $I_F = 45 \text{ A}$, $V_{GS} = 0$ |
| Body-drain diode reverse recovery time | t_{rr} | — | 130 | — | ns | $I_F = 45 \text{ A}$, $V_{GS} = 0$, $di_F / dt = 50 \text{ A} / \mu\text{s}$ |

* Pulse Test

■ See characteristic curve of 2SK1911.





Avalanche Test Circuit and Waveform

