# 2SK1163, 2SK1164

Silicon N-Channel MOS FET

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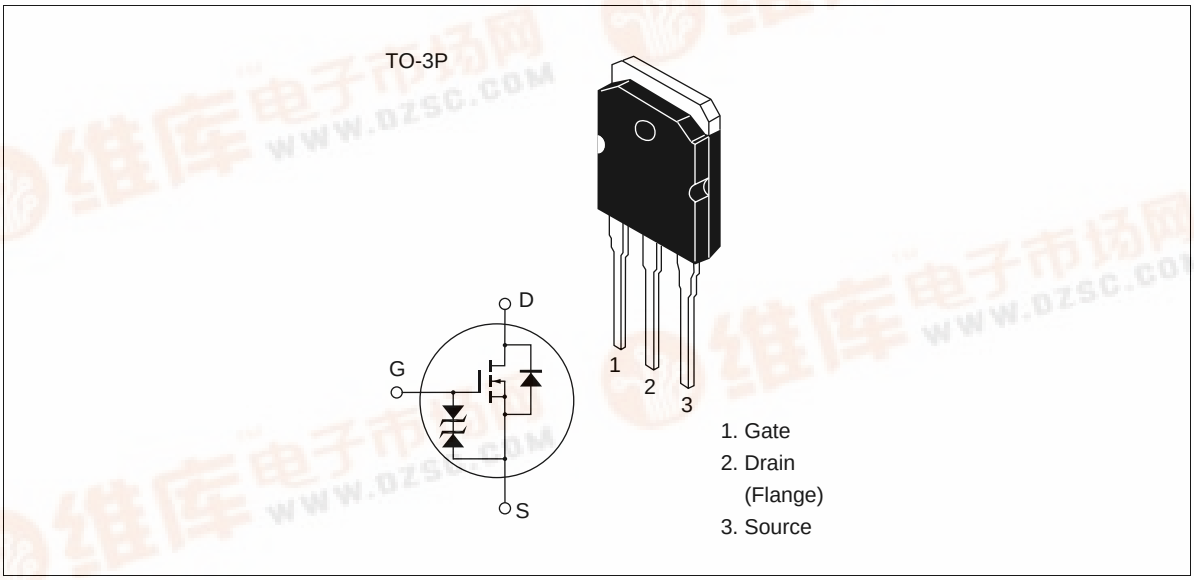
## Application

High speed power switching

## Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator and DC-DC converter

## Outline



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## Absolute Maximum Ratings (Ta = 25°C)

| Item | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Drain to source voltage | 2SK1163 | $V_{DSS}$ | 450 | V |
| | 2SK1164 | | 500 | |
| Gate to source voltage | | $V_{GSS}$ | ±30 | V |
| Drain current | | $I_D$ | 11 | A |
| Drain peak current | | $I_{D(pulse)}$*[1] | 40 | A |
| Body to drain diode reverse drain current | | $I_{DR}$ | 11 | A |
| Channel dissipation | | Pch*[2] | 100 | W |
| Channel temperature | | Tch | 150 | °C |
| Storage temperature | | Tstg | –55 to +150 | °C |

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at $T_C$ = 25°C

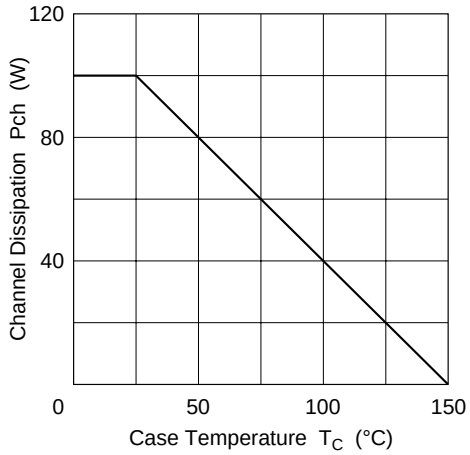
## Electrical Characteristics (Ta = 25°C)

| Item | | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | 2SK1163 | $V_{(BR)DSS}$ | 450 | — | — | V | $I_D$ = 10 mA, $V_{GS}$ = 0 |
| | 2SK1164 | | 500 | | | | |
| Gate to source breakdown voltage | | $V_{(BR)GSS}$ | ±30 | — | — | V | $I_G$ = ±100 µA, $V_{DS}$ = 0 |
| Gate to source leak current | | $I_{GSS}$ | — | — | ±10 | µA | $V_{GS}$ = ±25 V, $V_{DS}$ = 0 |
| Zero gate voltage drain current | 2SK1163 | $I_{DSS}$ | — | — | 250 | µA | $V_{DS}$ = 360 V, $V_{GS}$ = 0 |
| | 2SK1164 | | | | | | $V_{DS}$ = 400 V, $V_{GS}$ = 0 |
| Gate to source cutoff voltage | | $V_{GS(off)}$ | 2.0 | — | 3.0 | V | $I_D$ = 1 mA, $V_{DS}$ = 10 V |
| Static Drain to source on state resistance | 2SK1163 | $R_{DS(on)}$ | — | 0.55 | 0.7 | Ω | $I_D$ = 5 A, $V_{GS}$ = 10 V *[1] |
| | 2SK1164 | | — | 0.60 | 0.8 | | |
| Forward transfer admittance | | \|yfs\| | 5.0 | 8.0 | — | S | $I_D$ = 5 A, $V_{DS}$ = 10 V *[1] |
| Input capacitance | | Ciss | — | 1150 | — | pF | $V_{DS}$ = 10 V, $V_{GS}$ = 0, f = 1 MHz |
| Output capacitance | | Coss | — | 340 | — | pF | |
| Reverse transfer capacitance | | Crss | — | 55 | — | pF | |
| Turn-on delay time | | $t_{d(on)}$ | — | 17 | — | ns | $I_D$ = 5 A, $V_{GS}$ = 10 V, $R_L$ = 6 Ω |
| Rise time | | $t_r$ | — | 60 | — | ns | |
| Turn-off delay time | | $t_{d(off)}$ | — | 95 | — | ns | |
| Fall time | | $t_f$ | — | 50 | — | ns | |
| Body to drain diode forward voltage | | $V_{DF}$ | — | 1.0 | — | V | $I_F$ = 11 A, $V_{GS}$ = 0 |
| Body to drain diode reverse recovery time | | $t_{rr}$ | — | 400 | — | ns | $I_F$ = 11 A, $V_{GS}$ = 0, $di_F/dt$ = 100 A/µs |

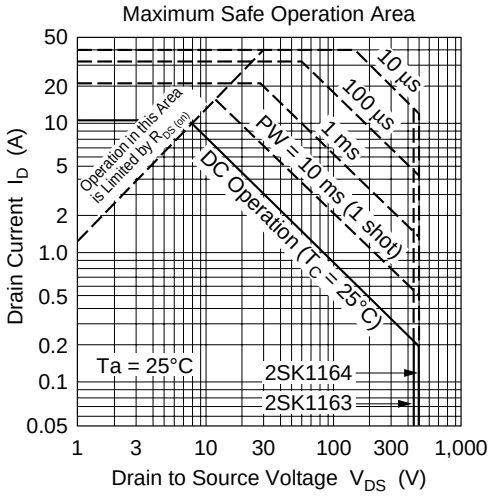
Note: 1. Pulse test

See characteristic curves of 2SK1159, 2SK1160.

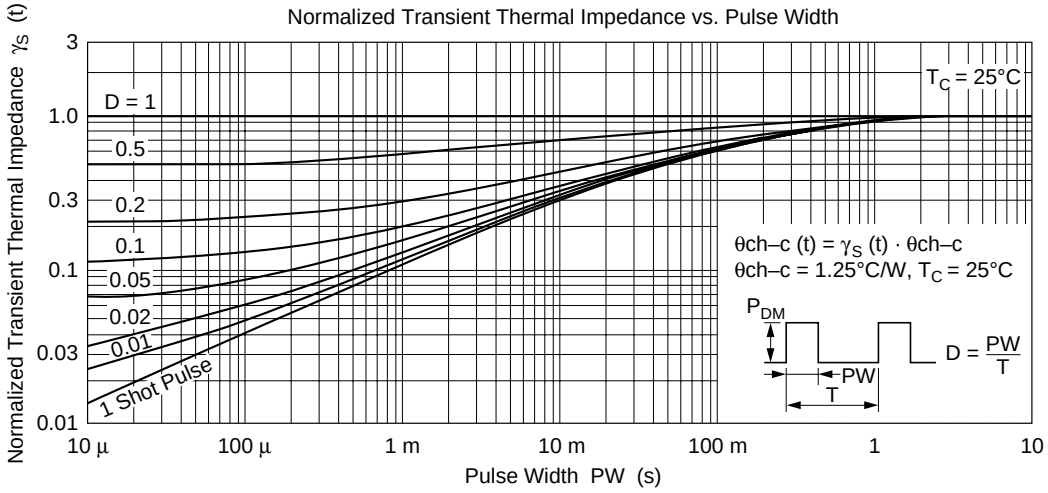
Power vs. Temperature Derating



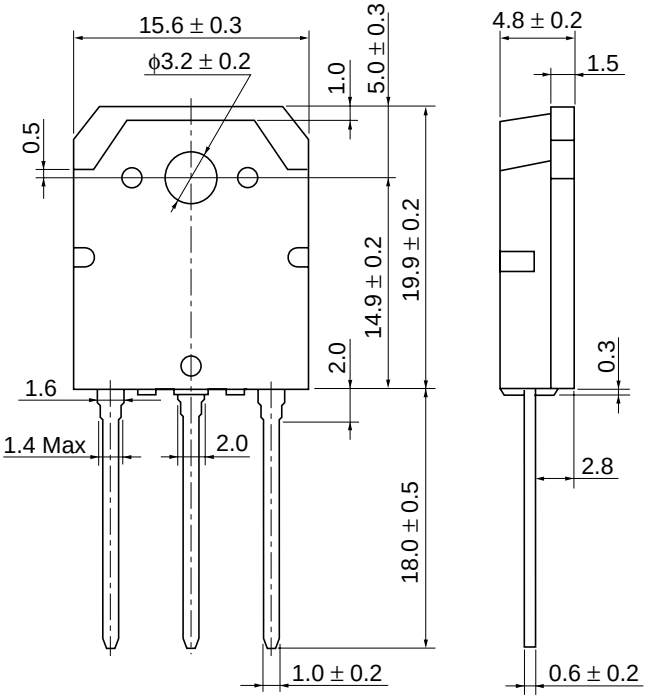

Maximum Safe Operation Area

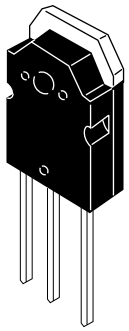


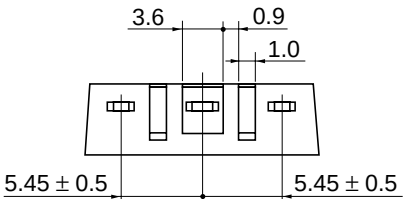

Normalized Transient Thermal Impedance vs. Pulse Width



Unit: mm


15.6 ± 0.3
ϕ3.2 ± 0.2
1.0
5.0 ± 0.3
0.5
14.9 ± 0.2
19.9 ± 0.2
2.0
1.6
1.4 Max
2.0
18.0 ± 0.5
1.0 ± 0.2
4.8 ± 0.2
1.5
0.3
2.8
0.6 ± 0.2




3.6
0.9
1.0
5.45 ± 0.5
5.45 ± 0.5

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