

# 2SK1315(L)(S), 2SK1316(L)(S)

Silicon N-Channel MOS FET

## HITACHI

ADE-208-1267 (Z)

1st. Edition

Mar. 2001

### Application

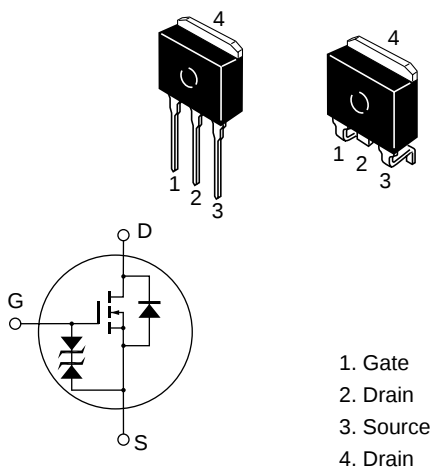
High speed power switching

### Features

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

### Outline

LDPAK



2SK1315(L)(S), 2SK1316(L)(S)

Absolute Maximum Ratings (Ta = 25°C)

| Item                                      |         | Symbol              | Ratings     | Unit |
|-------------------------------------------|---------|---------------------|-------------|------|
| Drain to source voltage                   | 2SK1315 | $V_{DS}$            | 450         | V    |
|                                           | 2SK1316 |                     | 500         |      |
| Gate to source voltage                    |         | $V_{GS}$            | ±30         | V    |
| Drain current                             |         | $I_D$               | 8           | A    |
| Drain peak current                        |         | $I_{D(pulse)}^{*1}$ | 32          | A    |
| Body to drain diode reverse drain current |         | $I_{DR}$            | 8           | A    |
| Channel dissipation                       |         | $P_{ch}^{*2}$       | 60          | W    |
| Channel temperature                       |         | Tch                 | 150         | °C   |
| Storage temperature                       |         | Tstg                | −55 to +150 | °C   |

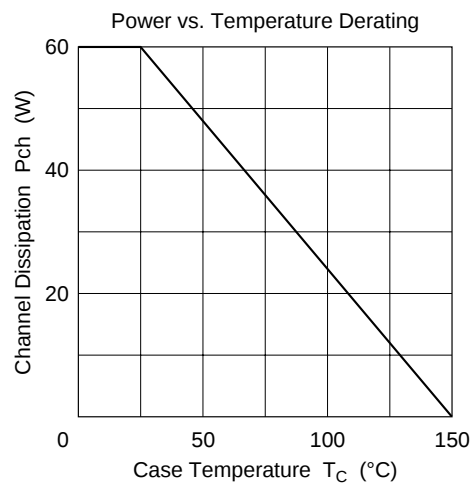
Notes: 1. PW 10 μs, duty cycle 1%  
2. Value at Tc = 25°C

# Electrical Characteristics (Ta = 25°C)

| Item                                       | Symbol                | Min      | Typ  | Max      | Unit          | Test conditions                                                               |
|--------------------------------------------|-----------------------|----------|------|----------|---------------|-------------------------------------------------------------------------------|
| Drain to source breakdown voltage          | 2SK1315 $V_{(BR)DSS}$ | 450      | —    | —        | V             | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$                                          |
|                                            | 2SK1316               | 500      |      |          |               |                                                                               |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$         | $\pm 30$ | —    | —        | V             | $I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$                            |
| Gate to source leak current                | $I_{GSS}$             | —        | —    | $\pm 10$ | $\mu\text{A}$ | $V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0$                                    |
| Zero gate voltage drain current            | 2SK1315 $I_{DSS}$     | —        | —    | 250      | $\mu\text{A}$ | $V_{DS} = 360 \text{ V}$ , $V_{GS} = 0$                                       |
|                                            | 2SK1316               |          |      |          |               | $V_{DS} = 400 \text{ V}$ , $V_{GS} = 0$                                       |
| Gate to source cutoff voltage              | $V_{GS(off)}$         | 2.0      | —    | 3.0      | V             | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$                                |
| Static Drain to source on state resistance | 2SK1315 $R_{DS(on)}$  | —        | 0.55 | 0.7      |               | $I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*1}$                            |
|                                            | 2SK1316               | —        | 0.60 | 0.8      |               |                                                                               |
| Forward transfer admittance                | $ y_{fs} $            | 4.5      | 7.5  | —        | S             | $I_D = 4 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*1}$                            |
| Input capacitance                          | $C_{iss}$             | —        | 1150 | —        | pF            | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,                                      |
| Output capacitance                         | $C_{oss}$             | —        | 340  | —        | pF            | $f = 1 \text{ MHz}$                                                           |
| Reverse transfer capacitance               | $C_{rss}$             | —        | 55   | —        | pF            |                                                                               |
| Turn-on delay time                         | $t_{d(on)}$           | —        | 17   | —        | ns            | $I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,                               |
| Rise time                                  | $t_r$                 | —        | 55   | —        | ns            | $R_L = 7.5$                                                                   |
| Turn-off delay time                        | $t_{d(off)}$          | —        | 100  | —        | ns            |                                                                               |
| Fall time                                  | $t_f$                 | —        | 45   | —        | ns            |                                                                               |
| Body to drain diode forward voltage        | $V_{DF}$              | —        | 0.9  | —        | V             | $I_F = 8 \text{ A}$ , $V_{GS} = 0$                                            |
| Body to drain diode reverse recovery time  | $t_{rr}$              | —        | 350  | —        | ns            | $I_F = 8 \text{ A}$ , $V_{GS} = 0$ ,<br>$di_F/dt = 100 \text{ A}/\mu\text{s}$ |

Note: 1. Pulse test

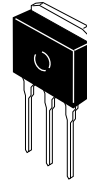
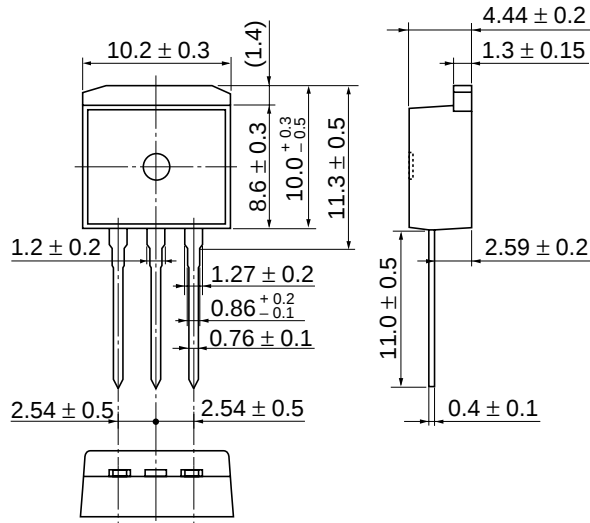
See characteristic curves of 2SK1159, 2SK1160.



# Package Dimensions

As of January, 2001

Unit: mm

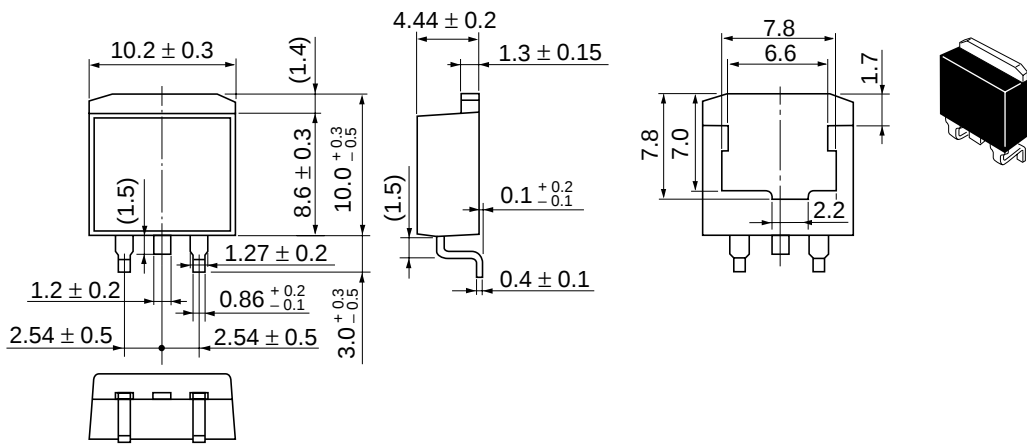


|                        |           |
|------------------------|-----------|
| Hitachi Code           | LDPAK (L) |
| JEDEC                  | —         |
| EIAJ                   | —         |
| Mass (reference value) | 1.4 g     |

**2SK1315(L)(S), 2SK1316(L)(S)**

As of January, 2001

Unit: mm

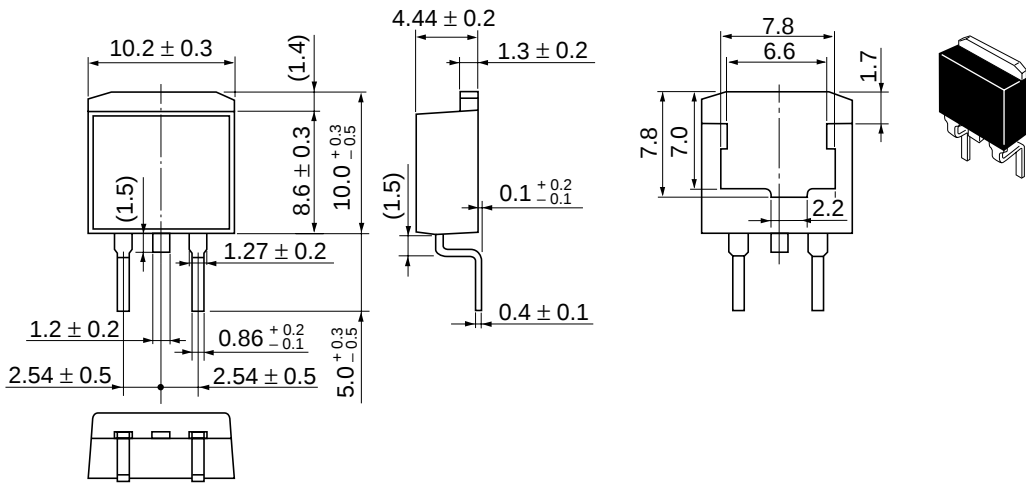


|                        |               |
|------------------------|---------------|
| Hitachi Code           | LDPAK (S)-(1) |
| JEDEC                  | —             |
| EIAJ                   | —             |
| Mass (reference value) | 1.3 g         |

# 2SK1315(L)(S), 2SK1316(L)(S)

As of January, 2001

Unit: mm



|                        |               |
|------------------------|---------------|
| Hitachi Code           | LDBAK (S)-(2) |
| JEDEC                  | —             |
| EIAJ                   | —             |
| Mass (reference value) | 1.35 g        |

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