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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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2SK1151(L)(S), 2SK1152(L)(S)

Silicon N-Channel MOS FET

RENESAS

ADE-208-1245 (Z)
1st. Edition
Mar. 2001

Application

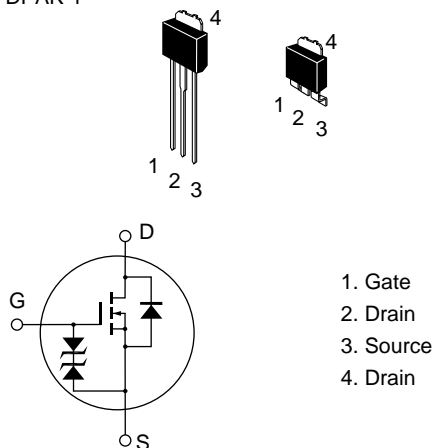
High speed power switching

Features

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

Outline

DPAK-1



1. Gate
2. Drain
3. Source
4. Drain

2SK1151(L)(S), 2SK1152(L)(S)

Absolute Maximum Ratings (Ta = 25°C)

| Item | | Symbol | Ratings | Unit |
|---|---------|---------------------|-------------|------|
| Drain to source voltage | 2SK1151 | V_{DSS} | 450 | V |
| | 2SK1152 | | 500 | |
| Gate to source voltage | | V_{GSS} | ±30 | V |
| Drain current | | I_D | 1.5 | A |
| Drain peak current | | $I_{D(pulse)}^{*1}$ | 6 | A |
| Body to drain diode reverse drain current | | I_{DR} | 1.5 | A |
| Channel dissipation | | Pch^{*2} | 20 | W |
| Channel temperature | | Tch | 150 | °C |
| Storage temperature | | Tstg | -55 to +150 | °C |

Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$

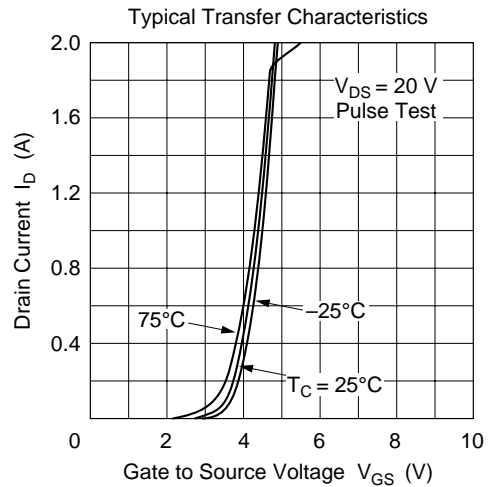
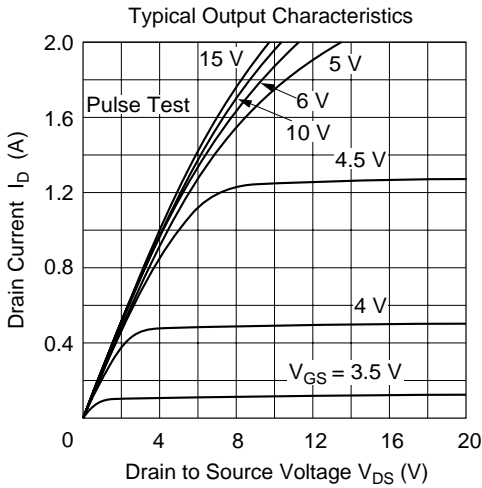
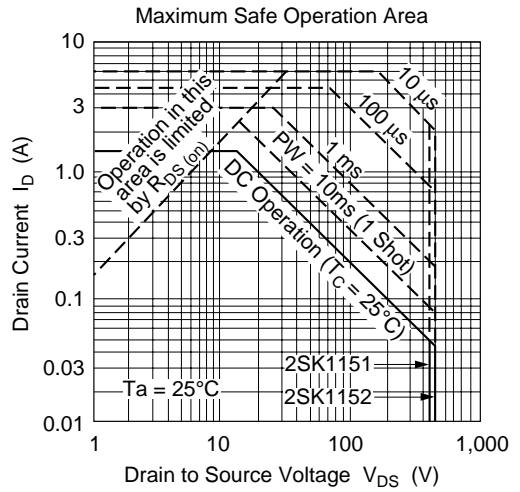
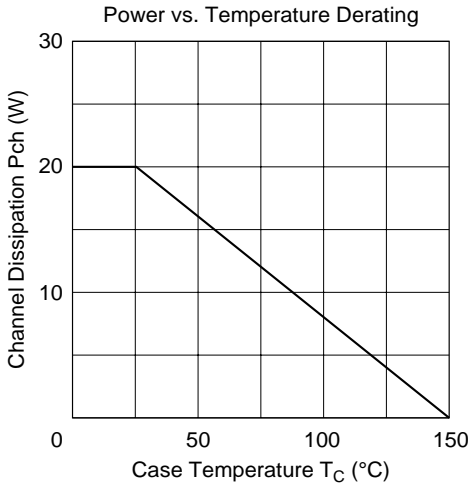
2. Value at $T_C = 25^\circ C$

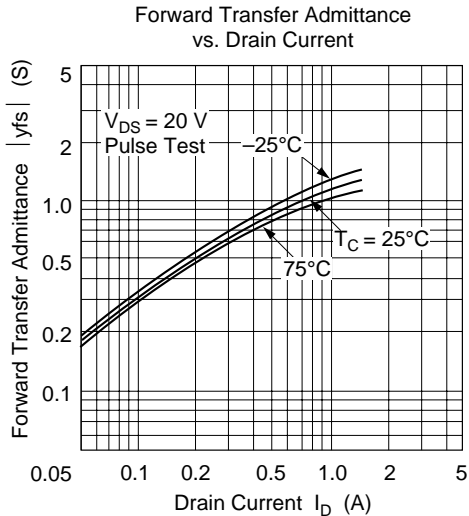
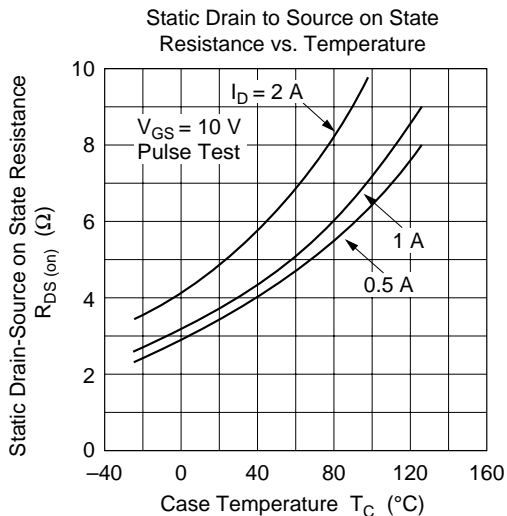
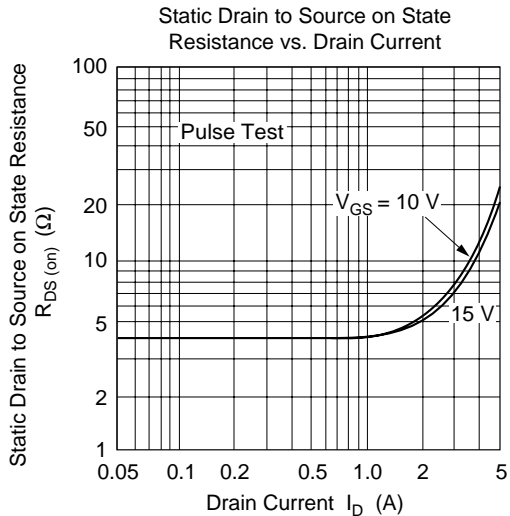
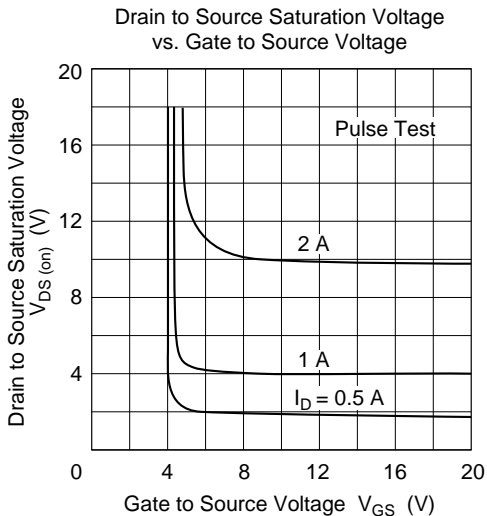
Electrical Characteristics (Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|-----------------------|-----|-----|-----|------|---|
| Drain to source breakdown voltage | 2SK1151 $V_{(BR)DSS}$ | 450 | — | — | V | $I_D = 10 \text{ mA}, V_{GS} = 0$ |
| | 2SK1152 | 500 | | | | |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ±30 | — | — | V | $I_G = \pm 100 \mu\text{A}, V_{DS} = 0$ |
| Gate to source leak current | I_{GSS} | — | — | ±10 | μA | $V_{GS} = \pm 25 \text{ V}, V_{DS} = 0$ |
| Zero gate voltage drain current | 2SK1151 I_{DSS} | — | — | 100 | μA | $V_{DS} = 360 \text{ V}, V_{GS} = 0$ |
| | 2SK1152 | | | | | $V_{DS} = 400 \text{ V}, V_{GS} = 0$ |
| 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 statesresistance | 2SK1151 $R_{DS(on)}$ | — | 3.5 | 5.5 | Ω | $I_D = 1 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$ |
| | 2SK1152 | — | 4.0 | 6.0 | | |
| Forward transfer admittance | yfs | 0.6 | 1.1 | — | S | $I_D = 1 \text{ A}, V_{DS} = 20 \text{ V}^{*1}$ |
| Input capacitance | Ciss | — | 160 | — | pF | $V_{DS} = 10 \text{ V}, V_{GS} = 0,$ |
| Output capacitance | Coss | — | 45 | — | pF | $f = 1 \text{ MHz}$ |
| Reverse transfer capacitance | Crss | — | 5 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 5 | — | ns | $I_D = 1 \text{ A}, V_{GS} = 10 \text{ V},$ |
| Rise time | t_r | — | 10 | — | ns | $R_L = 30 \Omega$ |
| Turn-off delay time | $t_{d(off)}$ | — | 20 | — | ns | |
| Fall time | t_f | — | 10 | — | ns | |
| Body to drain diode forward voltage | V_{DF} | — | 1.0 | — | V | $I_F = 1.5 \text{ A}, V_{GS} = 0$ |
| Body to drain diode reverse recovery time | t_{rr} | — | 220 | — | ns | $I_F = 1.5 \text{ A}, V_{GS} = 0,$ $di_F/dt = 100 \text{ A}/\mu\text{s}$ |

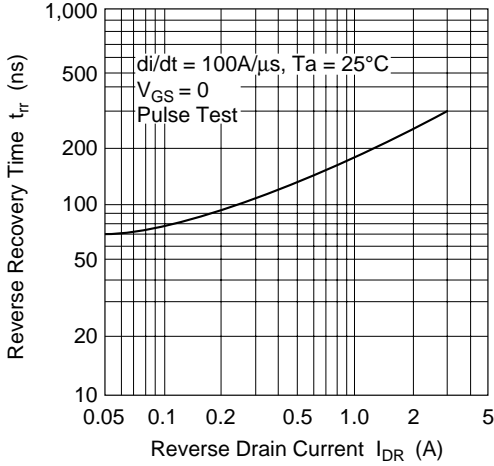
Note: 1. Pulse test

2SK1151(L)(S), 2SK1152(L)(S)

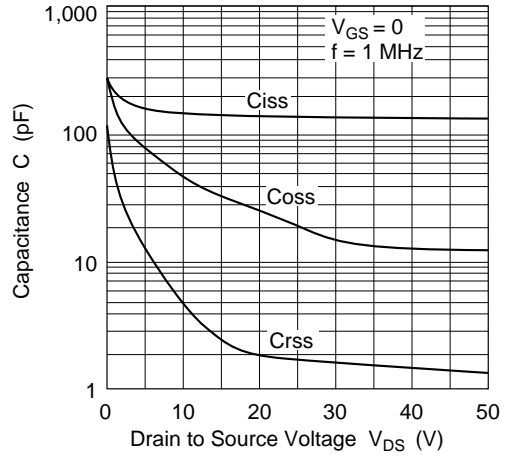




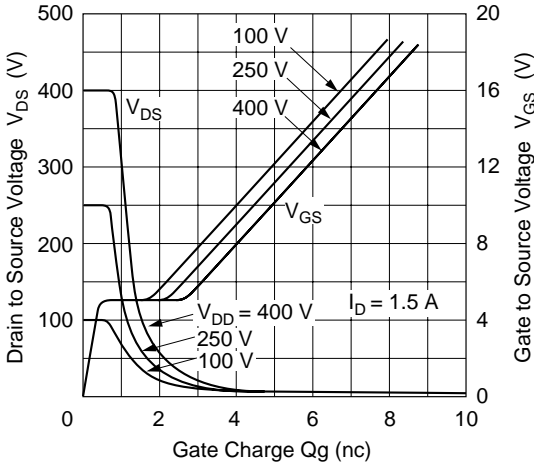
Body to Drain Diode Reverse Recovery Time



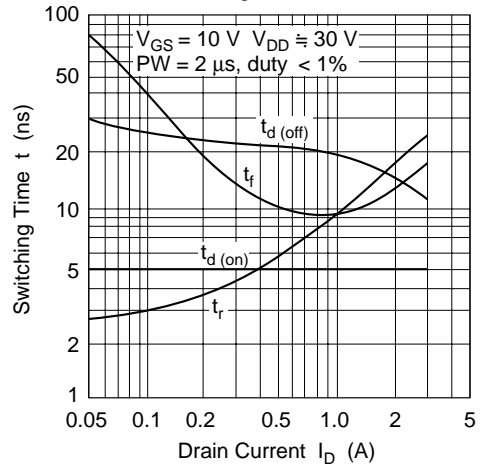
Typical Capacitance vs. Drain to Source Voltage

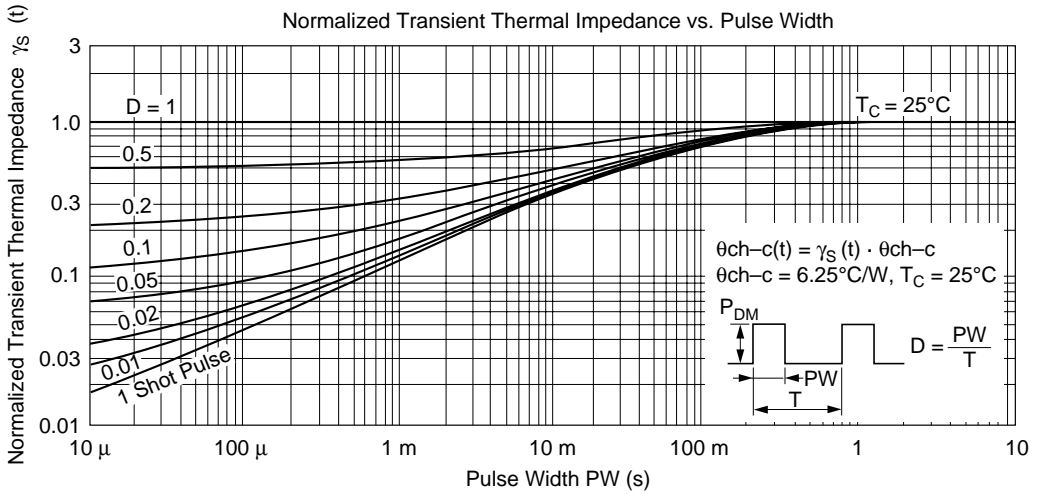
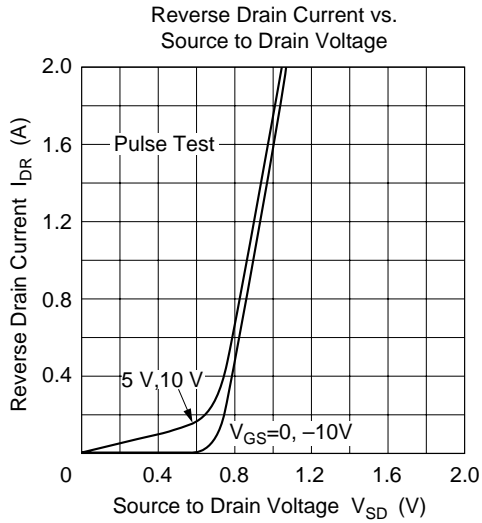


Dynamic Input Characteristics

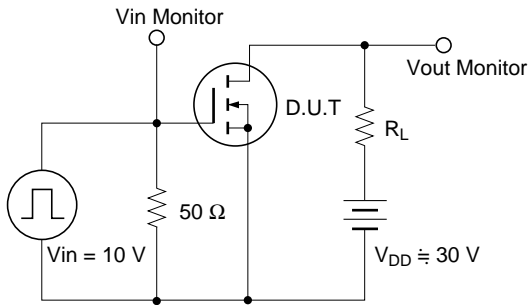


Switching Characteristics

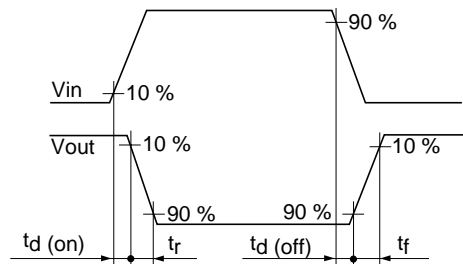




Switching Time Test Circuit

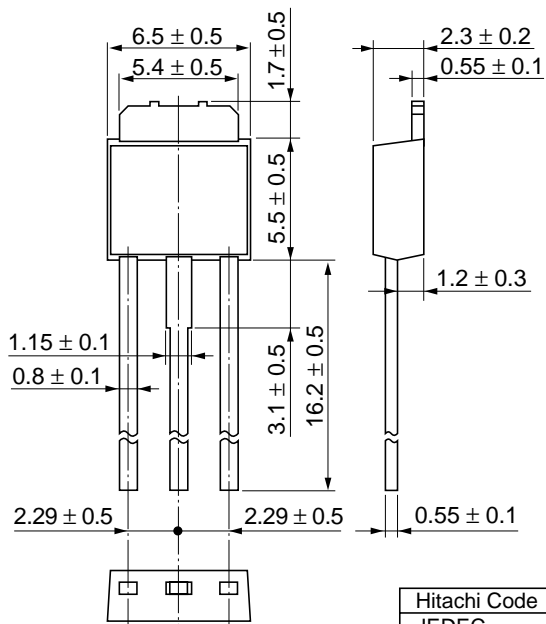


Waveforms



Package Dimensions

As of January, 2001
Unit: mm

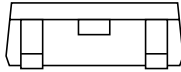
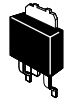
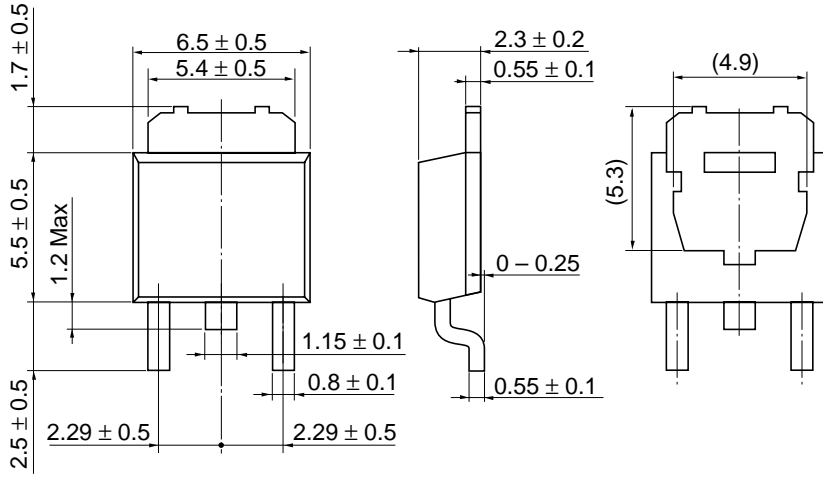


| | |
|------------------------|--------------|
| Hitachi Code | DPAK (L)-(1) |
| JEDEC | — |
| EIAJ | Conforms |
| Mass (reference value) | 0.42 g |

2SK1151(L)(S), 2SK1152(L)(S)

As of January, 2001

Unit: mm

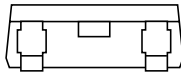
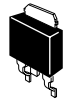
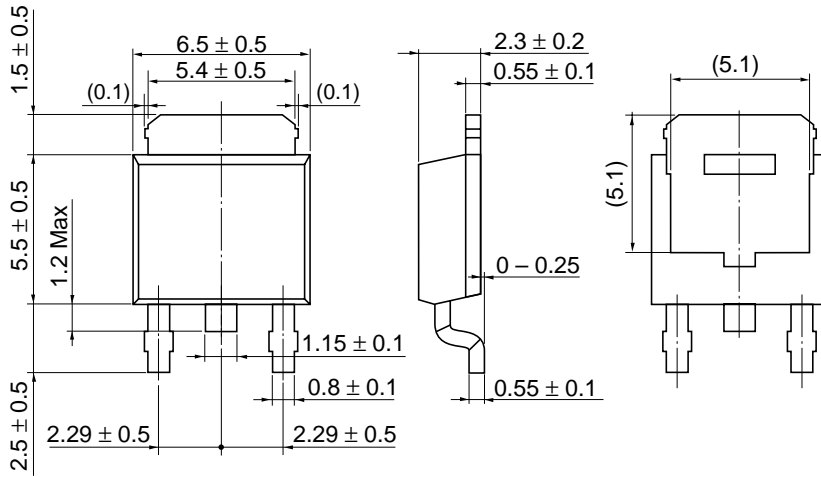


| | |
|------------------------|------------------|
| Hitachi Code | DPAK (S)-(1),(2) |
| JEDEC | — |
| EIAJ | Conforms |
| Mass (reference value) | 0.28 g |

2SK1151(L)(S), 2SK1152(L)(S)

As of January, 2001

Unit: mm



| | |
|------------------------|--------------|
| Hitachi Code | DPAK (S)-(3) |
| JEDEC | — |
| EIAJ | Conforms |
| Mass (reference value) | 0.28 g |

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