

## 2SK1647(L), 2SK1647(S)

Silicon N Channel MOS FET

REJ03G0963-0200  
(Previous: ADE-208-1306)  
Rev.2.00  
Sep 07, 2005

### Application

High speed power switching

### Features

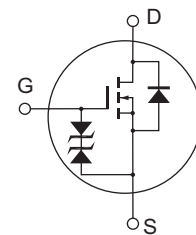
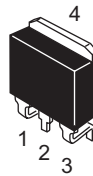
- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator and DC-DC converter

### Outline

RENESAS Package code: PRSS0004AE-A  
(Package name: LDKPAK(L))



RENESAS Package code: PRSS0004AE-B  
(Package name: LDKPAK(S)-(1))



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

## Absolute Maximum Ratings

(Ta = 25°C)

| Item                                      | Symbol              | Ratings     | Unit |
|---|---------------------|-------------|------|
| Drain to source voltage                   | $V_{DSS}$           | 900         | V    |
| Gate to source voltage                    | $V_{GSS}$           | $\pm 30$    | V    |
| Drain current                             | $I_D$               | 2           | A    |
| Drain peak current                        | $I_{D(pulse)}^{*1}$ | 6           | A    |
| Body to drain diode reverse drain current | $I_{DR}$            | 2           | A    |
| Channel dissipation                       | $P_{ch}^{*2}$       | 50          | W    |
| Channel temperature                       | $T_{ch}$            | 150         | °C   |
| Storage temperature                       | $T_{stg}$           | -55 to +150 | °C   |

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$   
 2. Value at  $T_C = 25^\circ C$

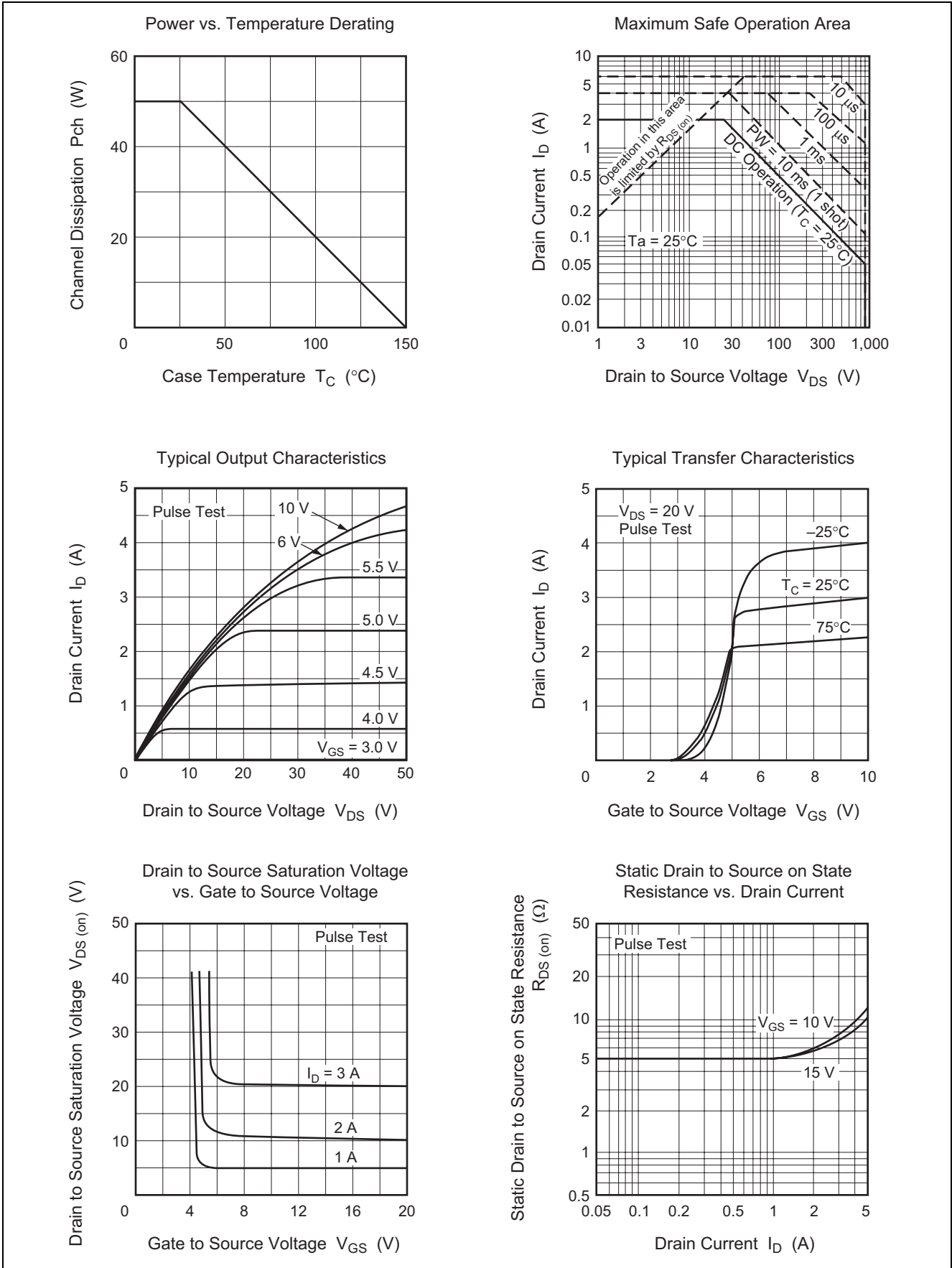
## Electrical Characteristics

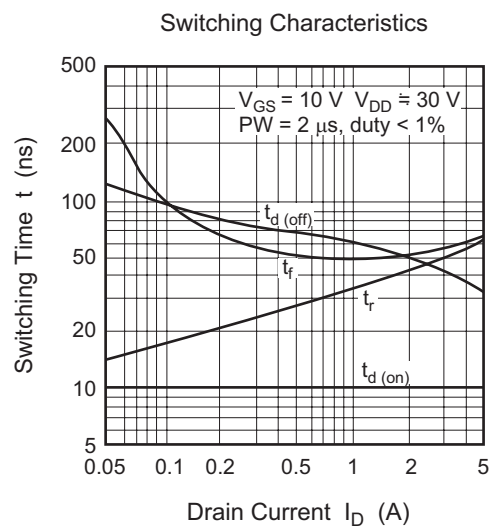
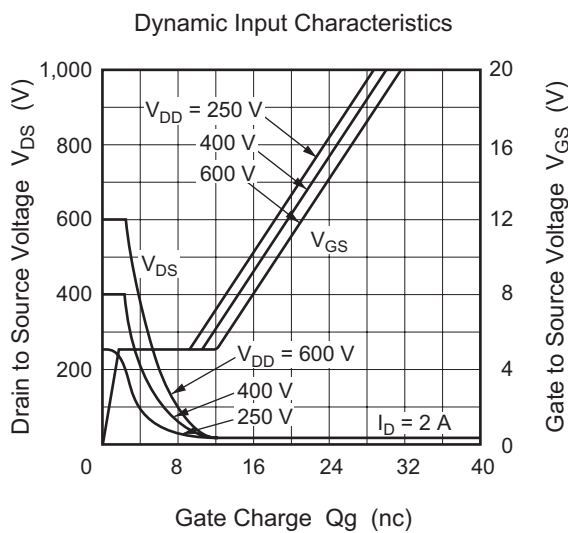
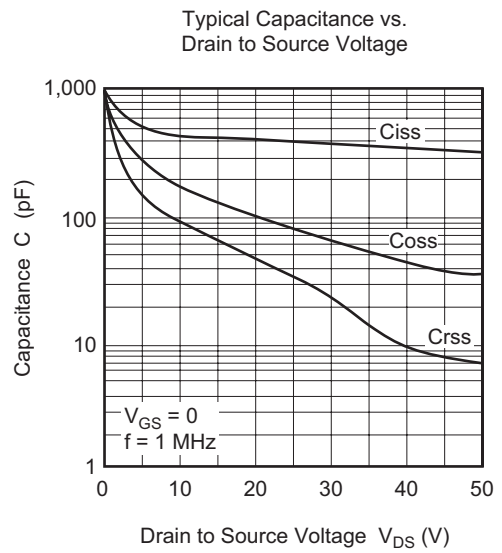
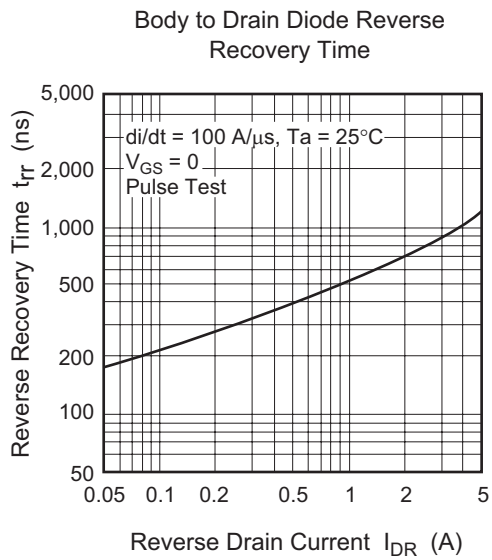
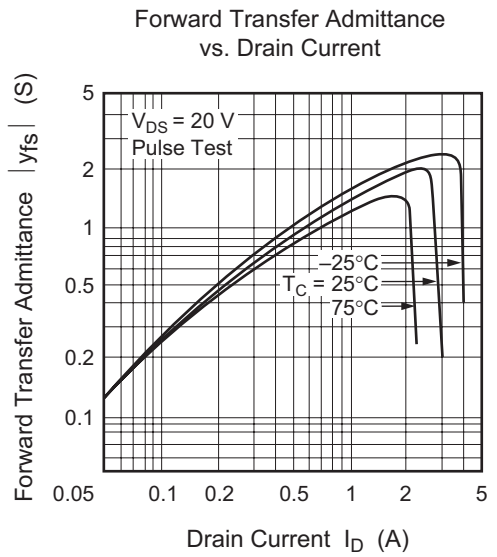
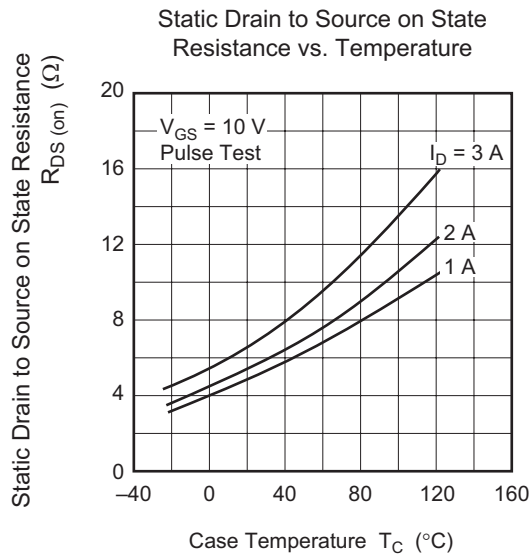
(Ta = 25°C)

| Item                                       | Symbol        | Min      | Typ | Max      | Unit     | Test conditions   |
|--|---------------|----------|-----|----------|----------|---|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 900      | —   | —        | V        | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$                                    |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$ | $\pm 30$ | —   | —        | V        | $I_G = \pm 100 \mu A$ , $V_{DS} = 0$                                    |
| Gate to source leak current                | $I_{GSS}$     | —        | —   | $\pm 10$ | $\mu A$  | $V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0$                              |
| Zero gate voltage drain current            | $I_{DSS}$     | —        | —   | 250      | $\mu A$  | $V_{DS} = 720 \text{ V}$ , $V_{GS} = 0$                                 |
| 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 | $R_{DS(on)}$  | —        | 5.0 | 7.0      | $\Omega$ | $I_D = 1 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*3}$                      |
| Forward transfer admittance                | $ y_{fs} $    | 0.9      | 1.5 | —        | S        | $I_D = 1 \text{ A}$ , $V_{DS} = 20 \text{ V}^{*3}$                      |
| Input capacitance                          | $C_{iss}$     | —        | 425 | —        | pF       | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,<br>$f = 1 \text{ MHz}$         |
| Output capacitance                         | $C_{oss}$     | —        | 175 | —        | pF       |   |
| Reverse transfer capacitance               | $C_{rss}$     | —        | 85  | —        | pF       |   |
| Turn-on delay time                         | $t_{d(on)}$   | —        | 10  | —        | ns       | $I_D = 1 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,<br>$R_L = 30 \Omega$    |
| Rise time                                  | $t_r$         | —        | 35  | —        | ns       |   |
| Turn-off delay time                        | $t_{d(off)}$  | —        | 60  | —        | ns       |   |
| Fall time                                  | $t_f$         | —        | 50  | —        | ns       |   |
| Body to drain diode forward voltage        | $V_{DF}$      | —        | 0.9 | —        | V        | $I_F = 2 \text{ A}$ , $V_{GS} = 0$                                      |
| Body to drain diode reverse recovery time  | $t_{rr}$      | —        | 700 | —        | ns       | $I_F = 2 \text{ A}$ , $V_{GS} = 0$ ,<br>$di_F/dt = 100 \text{ A}/\mu s$ |

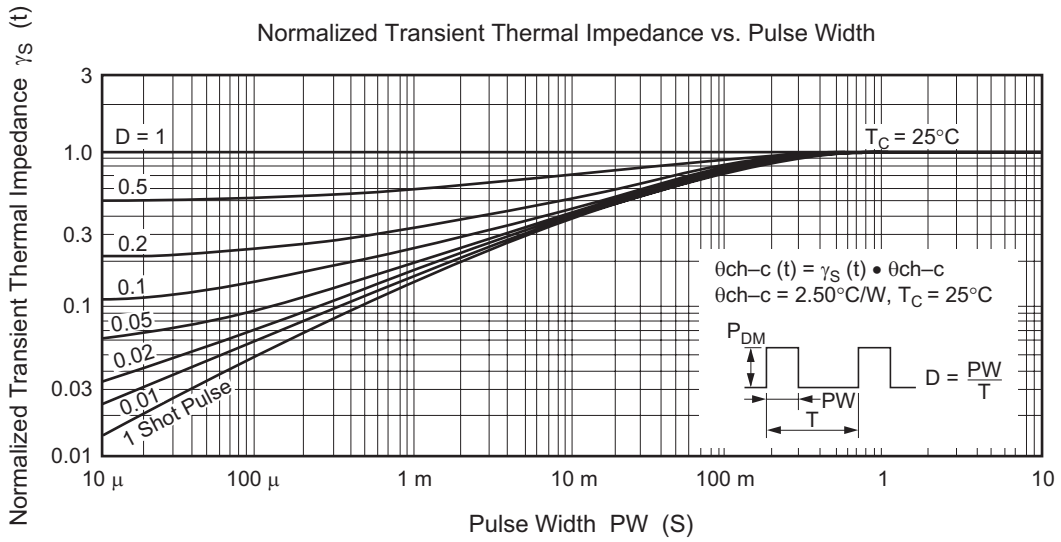
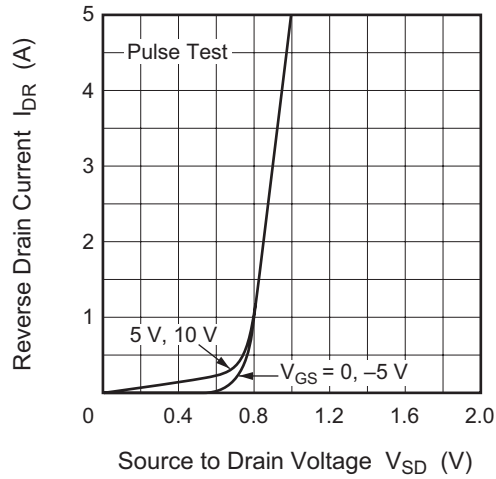
Note: 3. Pulse test

### Main Characteristics

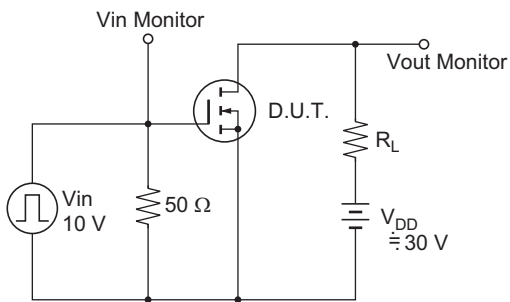




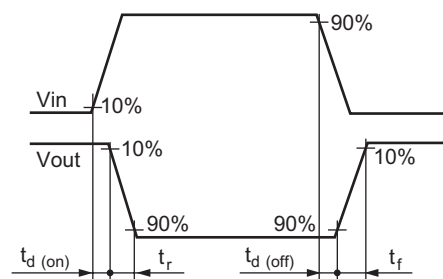
Reverse Drain Current vs. Source to Drain Voltage



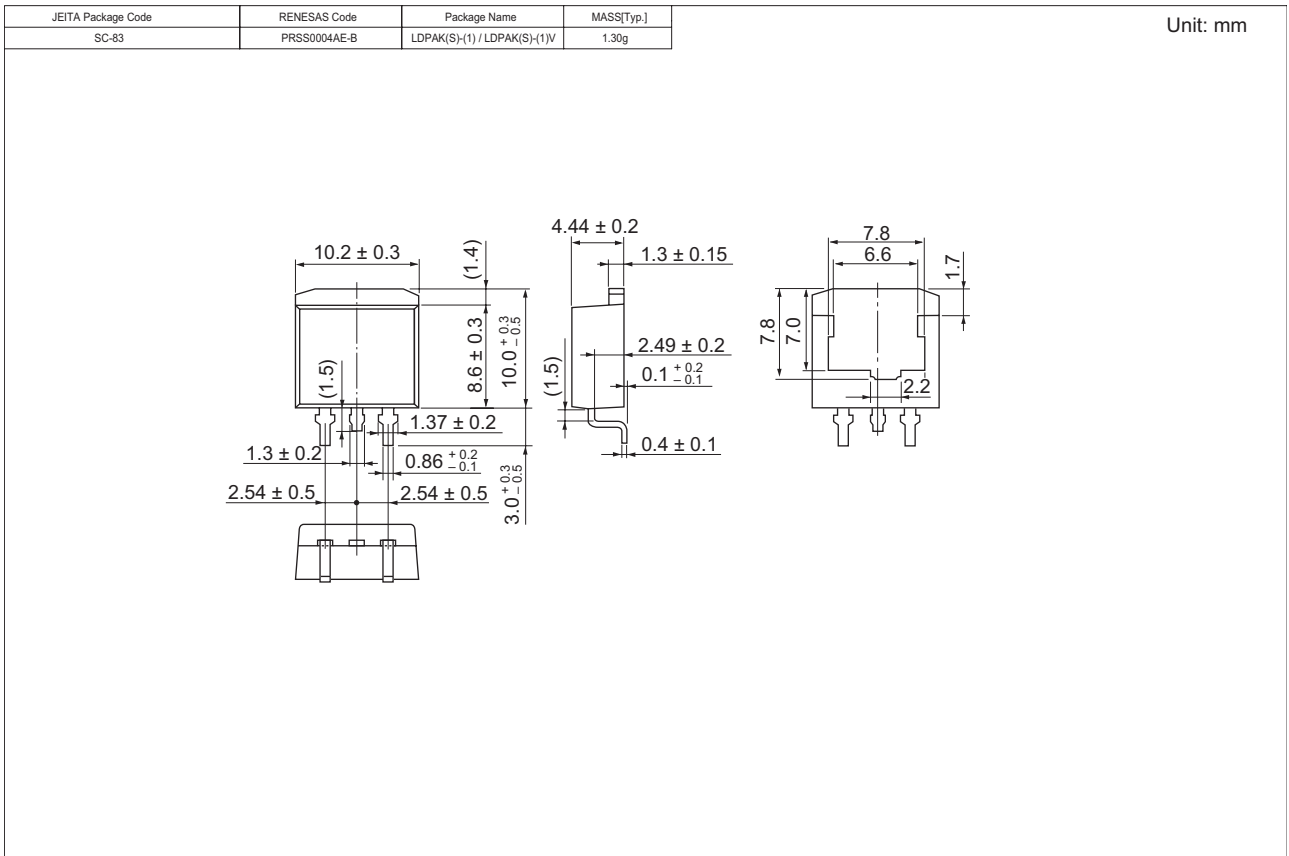
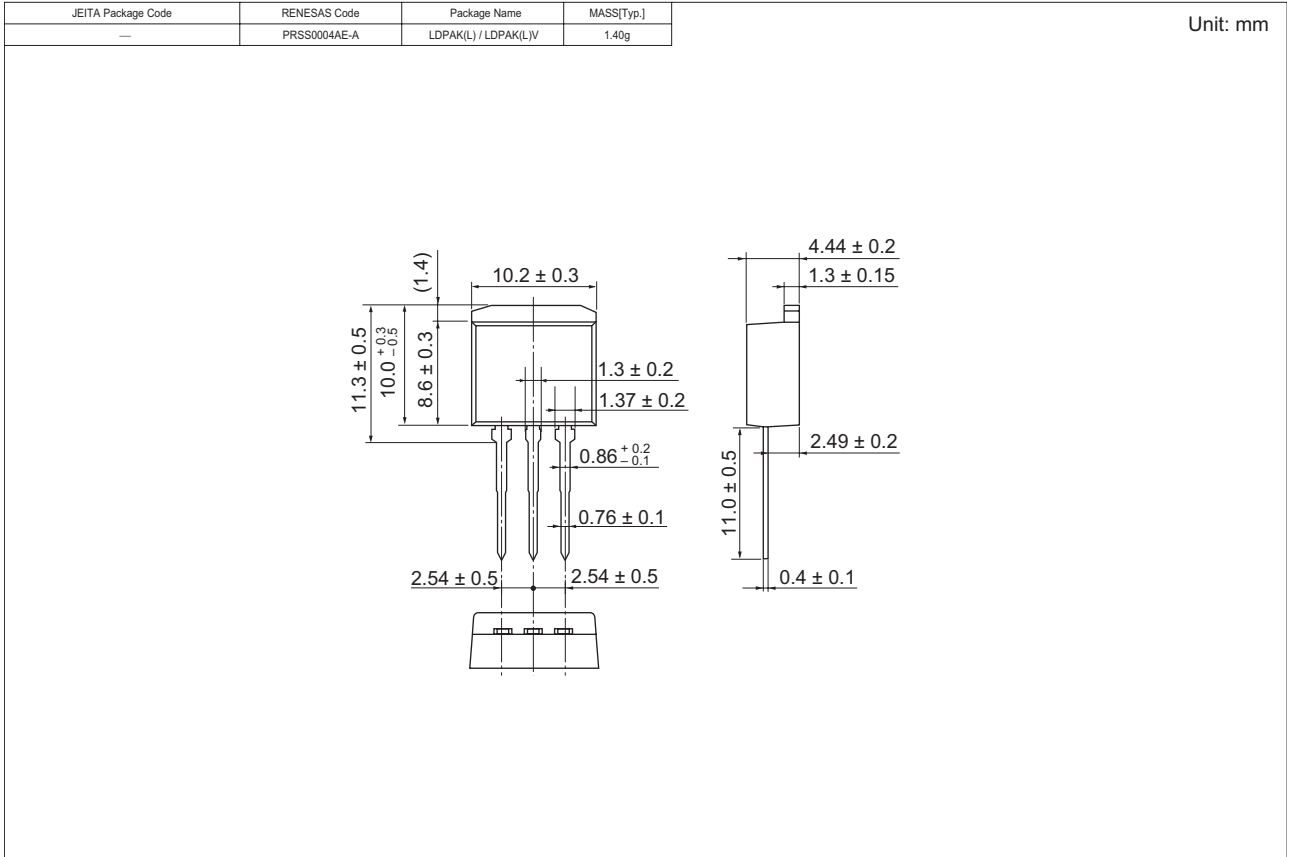
Switching Time Test Circuit



Waveforms



Package Dimensions



### Ordering Information

| Part Name    | Quantity | Shipping Container |
|--------------|----------|--------------------|
| 2SK1647L-E   | 500 pcs  | Box (Sack)         |
| 2SK1647STL-E | 1000 pcs | Taping             |

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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