

# 2SK1620(L), 2SK1620(S)

Silicon N Channel MOS FET

REJ03G0957-0200  
(Previous: ADE-208-1298)  
Rev.2.00  
Sep 07, 2005

## Application

High speed power switching

## Features

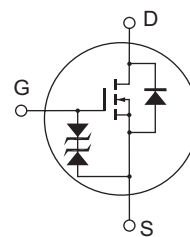
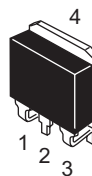
- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator, DC-DC converter and motor driver

## 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                   | $V_{DSS}$           | 150         | V    |
| Gate to source voltage                    | $V_{GSS}$           | $\pm 20$    | V    |
| Drain current                             | $I_D$               | 10          | A    |
| Drain peak current                        | $I_{D(pulse)}^{*1}$ | 40          | A    |
| Body to drain diode reverse drain current | $I_{DR}$            | 10          | 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  $T_C = 25^\circ C$ 

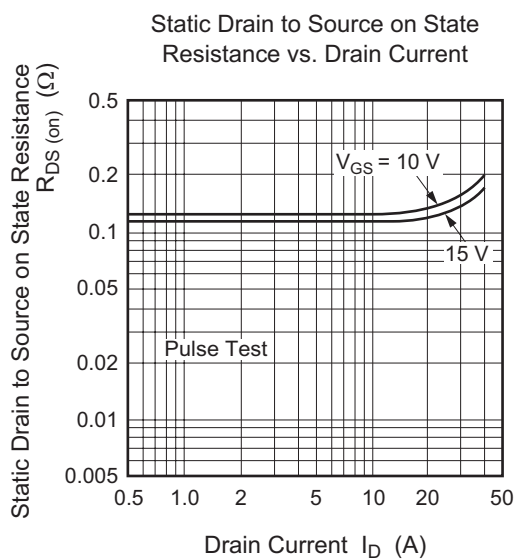
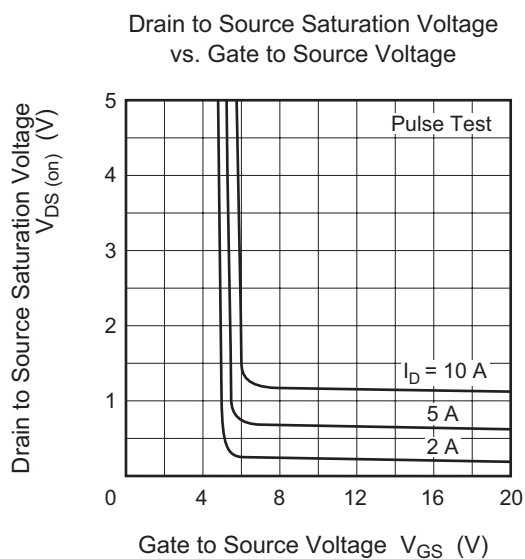
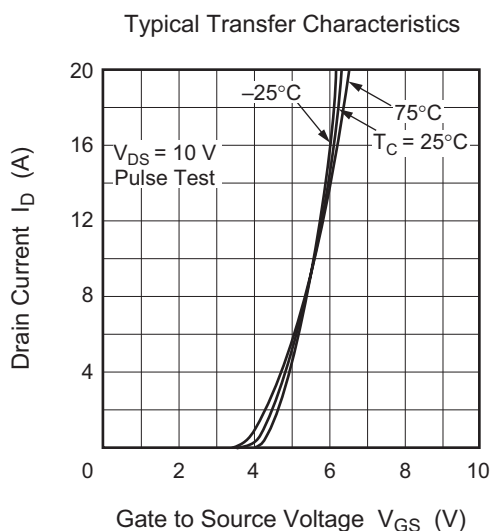
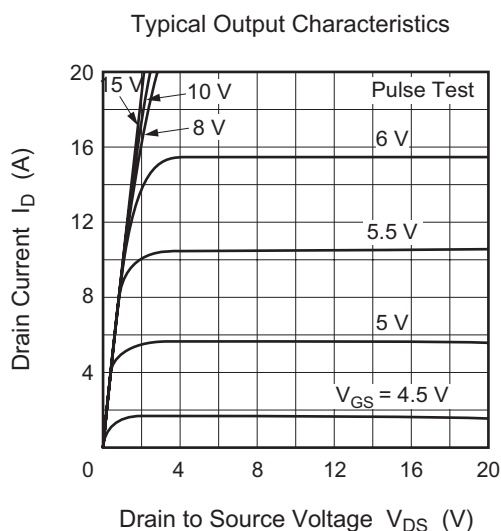
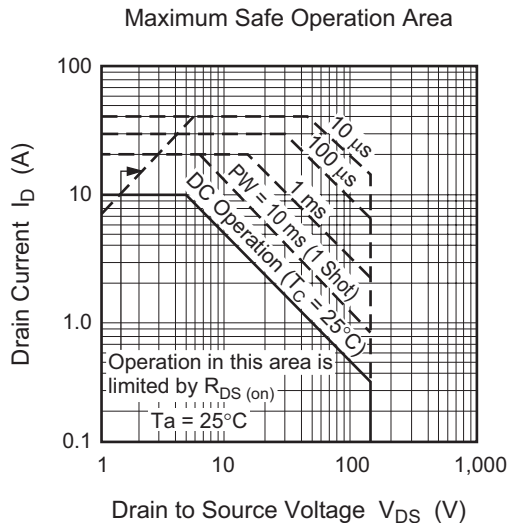
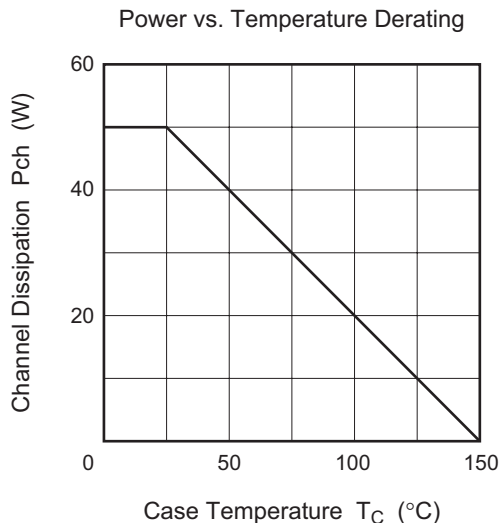
## Electrical Characteristics

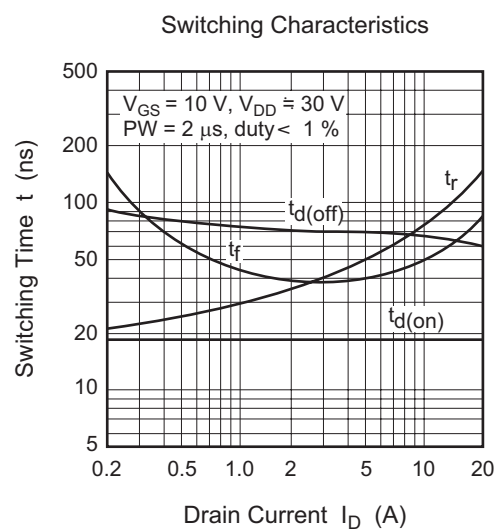
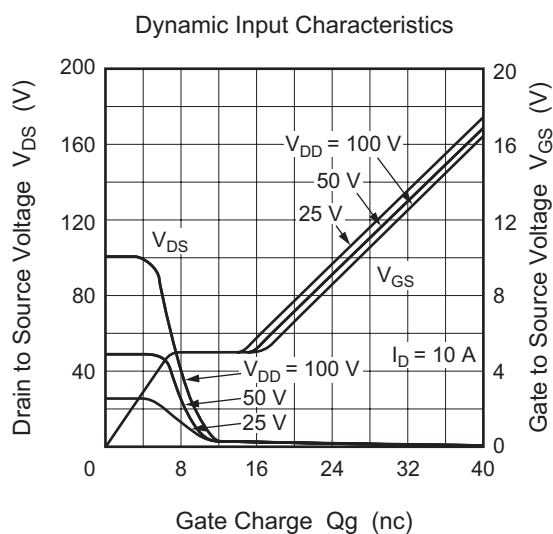
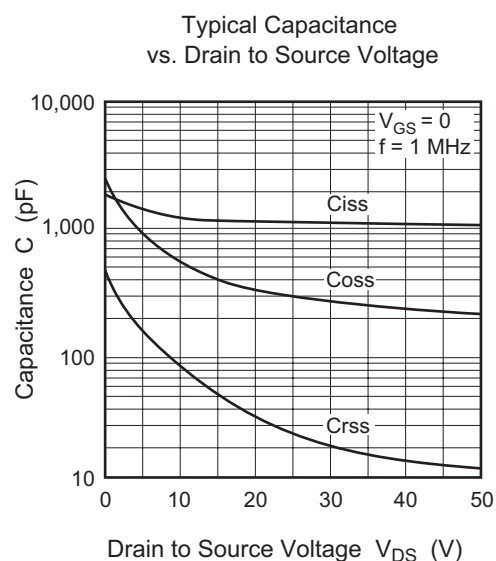
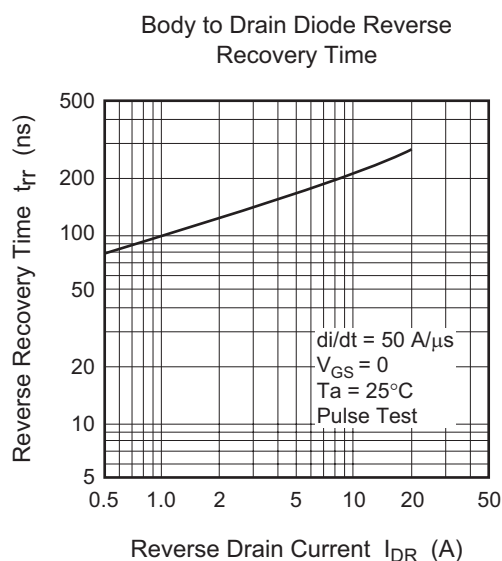
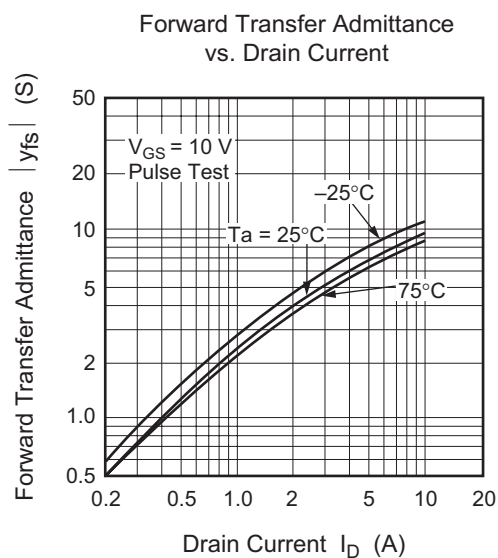
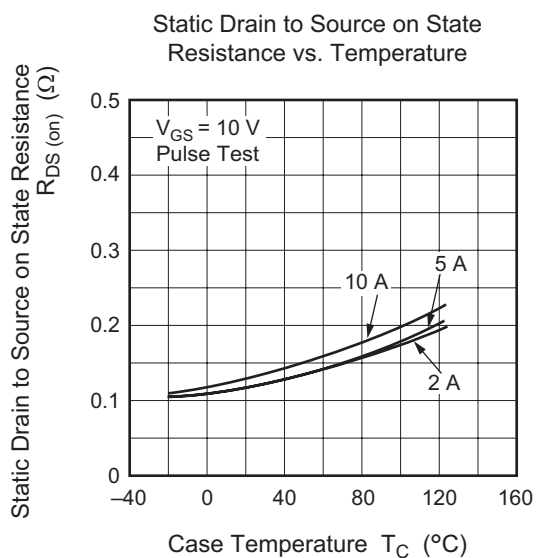
(Ta = 25°C)

| Item                                       | Symbol        | Min      | Typ  | Max      | Unit     | Test conditions                                                         |
|--------------------------------------------|---------------|----------|------|----------|----------|-------------------------------------------------------------------------|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 150      | —    | —        | V        | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$                                    |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$ | $\pm 20$ | —    | —        | V        | $I_G = \pm 100 \mu A$ , $V_{DS} = 0$                                    |
| Gate to source leak current                | $I_{GSS}$     | —        | —    | $\pm 10$ | $\mu A$  | $V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$                              |
| Zero gate voltage drain current            | $I_{DSS}$     | —        | —    | 250      | $\mu A$  | $V_{DS} = 120 \text{ V}$ , $V_{GS} = 0$                                 |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 2.0      | —    | 4.0      | V        | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$                          |
| Static drain to source on state resistance | $R_{DS(on)}$  | —        | 0.12 | 0.15     | $\Omega$ | $I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*3}$                      |
| Forward transfer admittance                | $ y_{fs} $    | 4.0      | 7.0  | —        | S        | $I_D = 5 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*3}$                      |
| Input capacitance                          | $C_{iss}$     | —        | 1200 | —        | pF       | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,<br>$f = 1 \text{ MHz}$         |
| Output capacitance                         | $C_{oss}$     | —        | 550  | —        | pF       |                                                                         |
| Reverse transfer capacitance               | $C_{rss}$     | —        | 85   | —        | pF       |                                                                         |
| Turn-on delay time                         | $t_{d(on)}$   | —        | 20   | —        | ns       | $I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,<br>$R_L = 6 \Omega$     |
| Rise time                                  | $t_r$         | —        | 50   | —        | ns       |                                                                         |
| Turn-off delay time                        | $t_{d(off)}$  | —        | 70   | —        | ns       |                                                                         |
| Fall time                                  | $t_f$         | —        | 40   | —        | ns       |                                                                         |
| Body to drain diode forward voltage        | $V_{DF}$      | —        | 1.2  | —        | V        | $I_F = 10 \text{ A}$ , $V_{GS} = 0$                                     |
| Body to drain diode reverse recovery time  | $t_{rr}$      | —        | 220  | —        | ns       | $I_F = 10 \text{ A}$ , $V_{GS} = 0$ ,<br>$di_F/dt = 50 \text{ A}/\mu s$ |

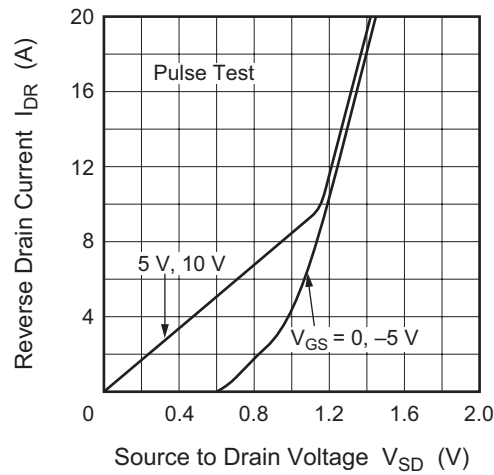
Note: 3. Pulse test

## Main Characteristics

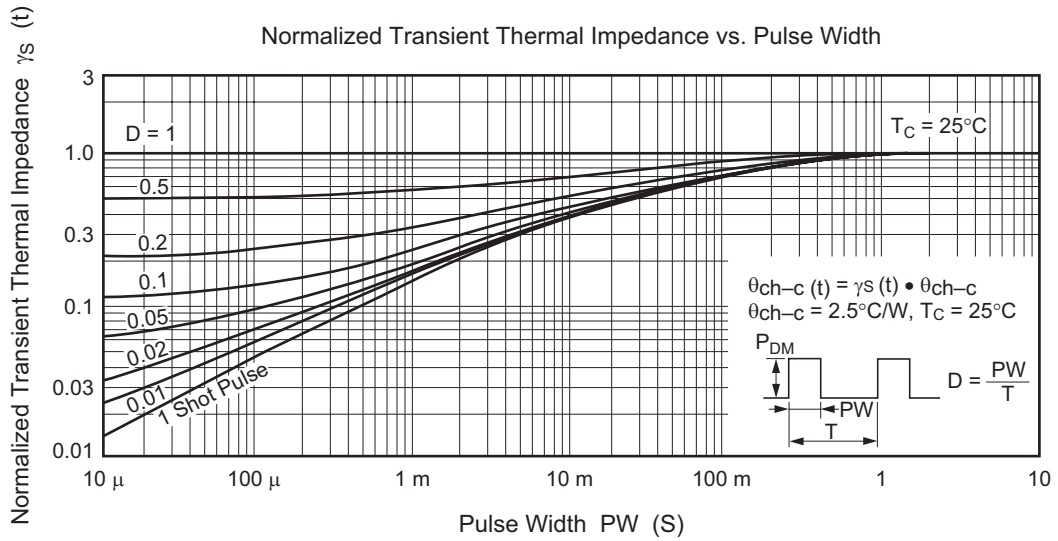




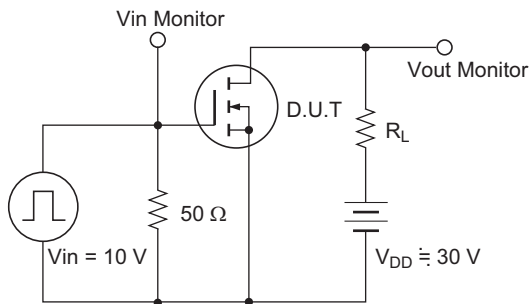
Reverse Drain Current vs.  
Source to Drain Voltage



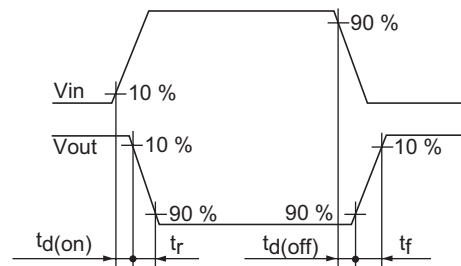
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



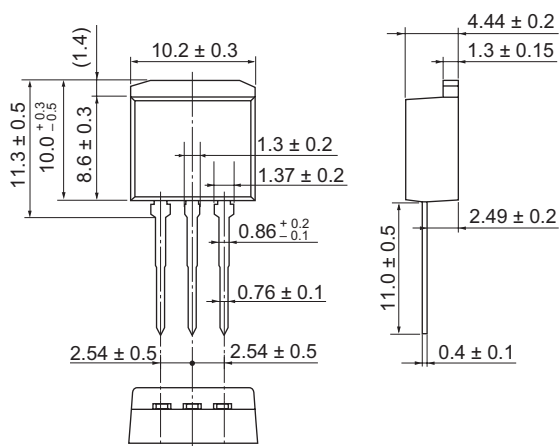
Waveforms



## Package Dimensions

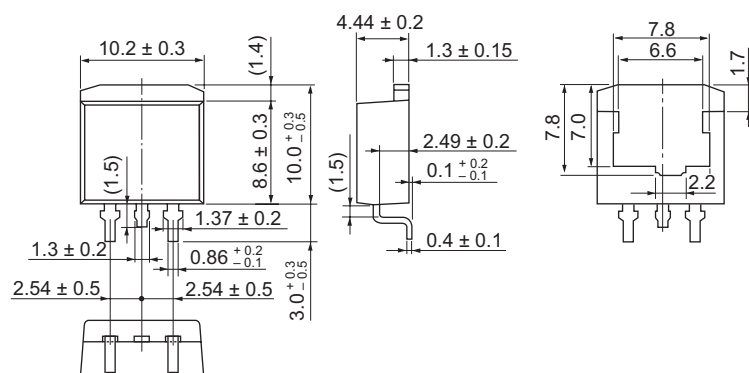
|                    |              |                      |            |
|--------------------|--------------|----------------------|------------|
| JEITA Package Code | RENESAS Code | Package Name         | MASS[Typ.] |
| —                  | PRSS0004AE-A | LDBAK(L) / LDBAK(L)V | 1.40g      |

Unit: mm



| JEITA Package Code | RENESAS Code | Package Name               | MASS[Typ.] |
|--------------------|--------------|----------------------------|------------|
| SC-83              | PRSS0004E-B  | LDBAK(S)-1) / LDBAK(S)-1)V | 1.30g      |

Unit: mm



## Ordering Information

| Part Name    | Quantity | Shipping Container |
|--------------|----------|--------------------|
| 2SK1620L-E   | 500 pcs  | Box (Sack)         |
| 2SK1620STL-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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