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# 2SK3211(L), 2SK3211(S)

Silicon N Channel MOS FET  
High Speed Power Switching

## HITACHI

ADE-208-761A (Z)  
2nd. Edition  
February 1999

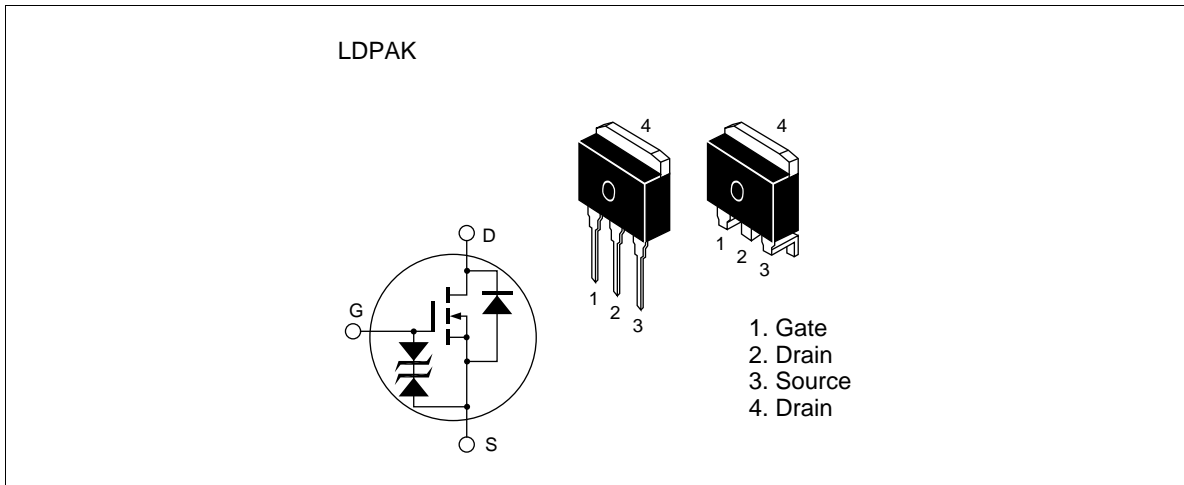
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### Features

- Low on-resistance  
 $R_{DS} = 60 \text{ m}\Omega$  typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

# 2SK3211

## Outline



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

| Item                                   | Symbol              | Ratings     | Unit |
|--|---------------------|-------------|------|
| Drain to source voltage                | $V_{DSS}$           | 200         | V    |
| Gate to source voltage                 | $V_{GSS}$           | $\pm 20$    | V    |
| Drain current                          | $I_D$               | 25          | A    |
| Drain peak current                     | $I_{D(pulse)}^{*1}$ | 100         | A    |
| Body-drain diode reverse drain current | $I_{DR}$            | 25          | A    |
| Avalanche current                      | $I_{AP}^{*3}$       | 25          | A    |
| Avalanche energy                       | $E_{AR}^{*3}$       | 41          | mJ   |
| Channel dissipation                    | $P_{ch}^{*2}$       | 100         | W    |
| Channel temperature                    | Tch                 | 150         | °C   |
| Storage temperature                    | Tstg                | -55 to +150 | °C   |

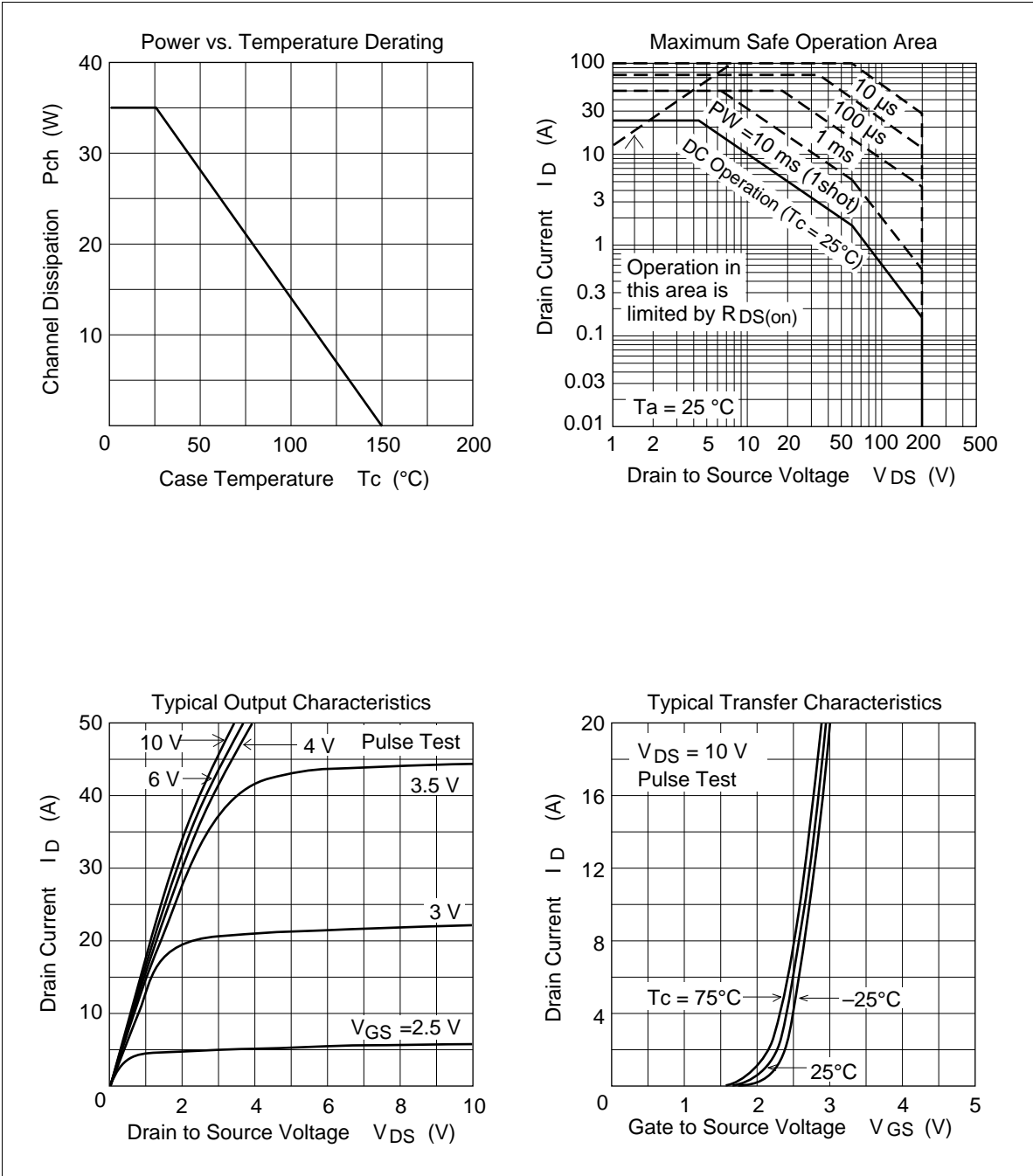
Note: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ C$   
3. Value at  $T_{ch} = 25^\circ C$ ,  $R_g \geq 50 \Omega$

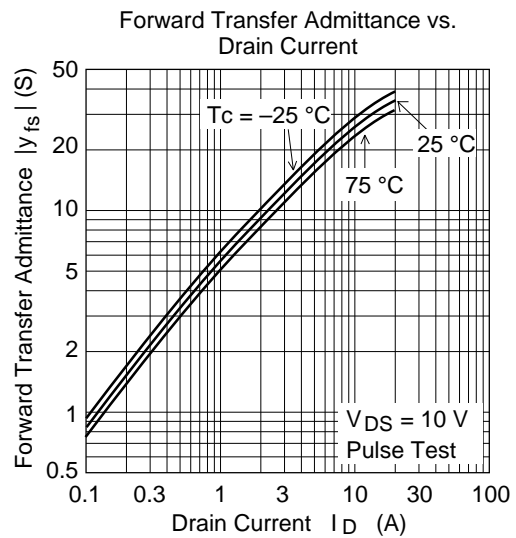
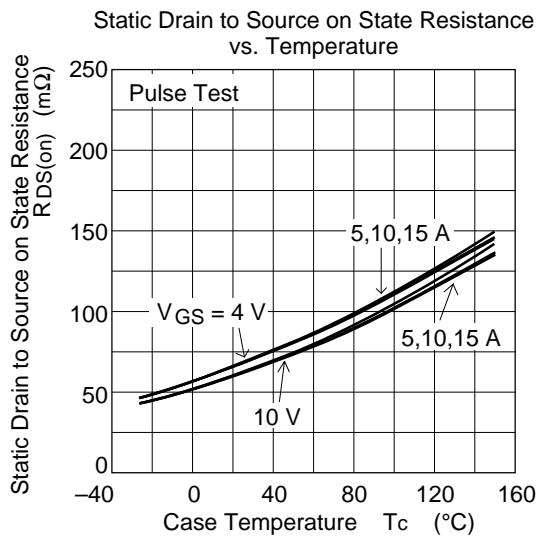
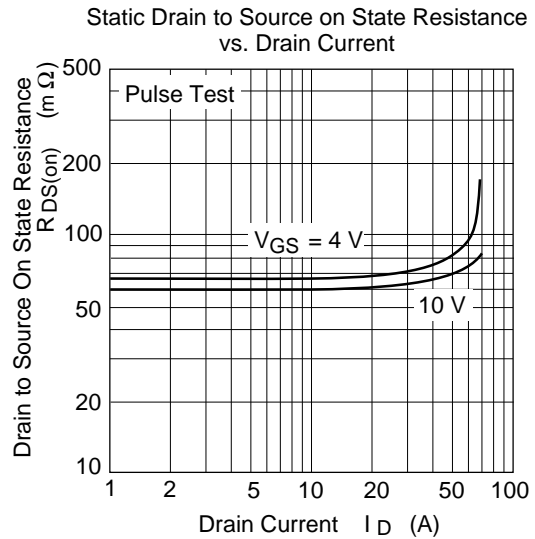
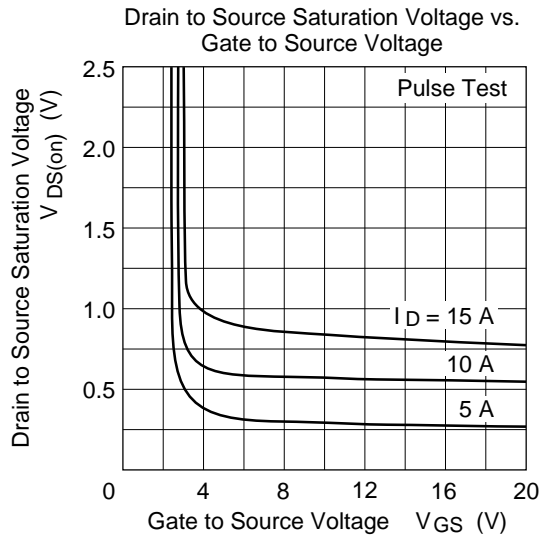
## Electrical Characteristics (Ta = 25°C)

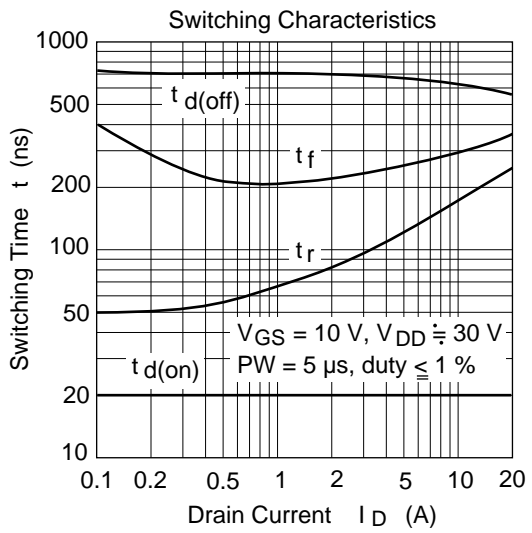
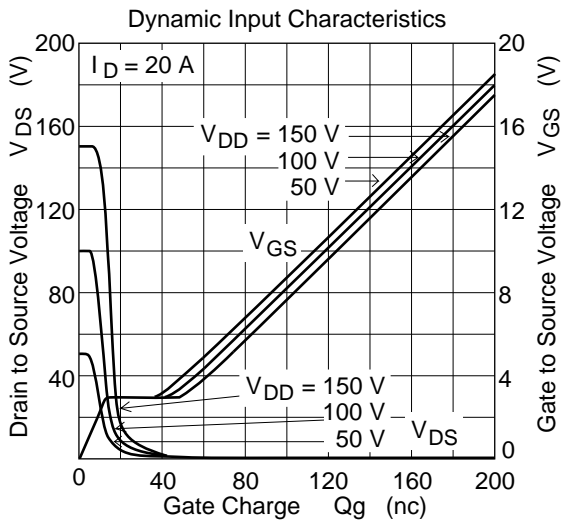
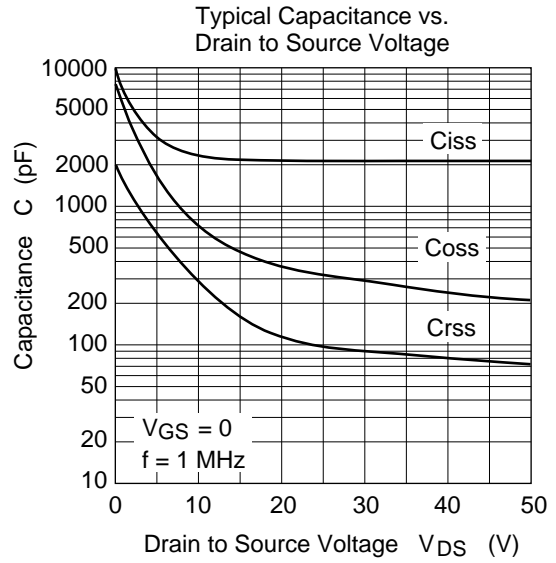
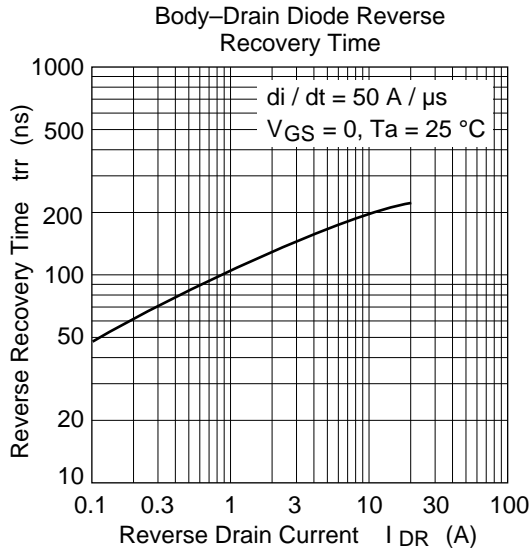
| Item                                       | Symbol        | Min      | Typ  | Max      | Unit          | Test Conditions  |
|--|---------------|----------|------|----------|---------------|--|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 200      | —    | —        | V             | $I_D = 10 \text{ mA}, V_{GS} = 0$  |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$ | $\pm 20$ | —    | —        | V             | $I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$                          |
| Gate to source leak current                | $I_{GSS}$     | —        | —    | $\pm 10$ | $\mu\text{A}$ | $V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$                                  |
| Zero gate voltage drain current            | $I_{DSS}$     | —        | —    | 10       | $\mu\text{A}$ | $V_{DS} = 200 \text{ V}, V_{GS} = 0$                                     |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 1.0      | —    | 2.5      | V             | $I_D = 1 \text{ mA}, V_{DS} = 10 \text{ V}$                              |
| Static drain to source on state resistance | $R_{DS(on)}$  | —        | 60   | 75       | m $\Omega$    | $I_D = 15 \text{ A}, V_{GS} = 10 \text{ V}^{*4}$                         |
|  | $R_{DS(on)}$  | —        | 65   | 85       | m $\Omega$    | $I_D = 15 \text{ A}, V_{GS} = 4 \text{ V}^{*4}$                          |
| Forward transfer admittance                | $ y_{fs} $    | 18       | 30   | —        | S             | $I_D = 15 \text{ A}, V_{DS} = 10 \text{ V}^{*4}$                         |
| Input capacitance                          | Ciss          | —        | 2420 | —        | pF            | $V_{DS} = 10 \text{ V}$  |
| Output capacitance                         | Coss          | —        | 790  | —        | pF            | $V_{GS} = 0$   |
| Reverse transfer capacitance               | Crss          | —        | 340  | —        | pF            | $f = 1 \text{ MHz}$  |
| Turn-on delay time                         | $t_{d(on)}$   | —        | 20   | —        | ns            | $I_D = 15 \text{ A}, V_{GS} = 10 \text{ V}$                              |
| Rise time                                  | $t_r$         | —        | 230  | —        | ns            | $R_L = 2 \text{ }\Omega$   |
| Turn-off delay time                        | $t_{d(off)}$  | —        | 590  | —        | ns            |  |
| Fall time                                  | $t_f$         | —        | 330  | —        | ns            |  |
| Body-drain diode forward voltage           | $V_{DF}$      | —        | 0.95 | —        | V             | $I_F = 25 \text{ A}, V_{GS} = 0$   |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —        | 230  | —        | ns            | $I_F = 25 \text{ A}, V_{GS} = 0$<br>$di_F/dt = 50 \text{ A}/\mu\text{s}$ |

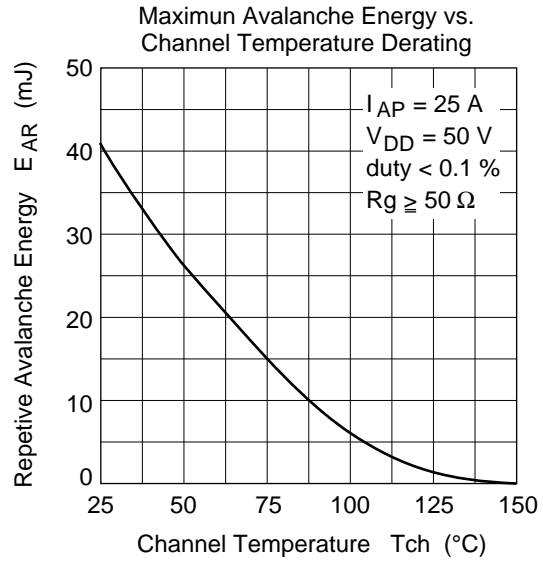
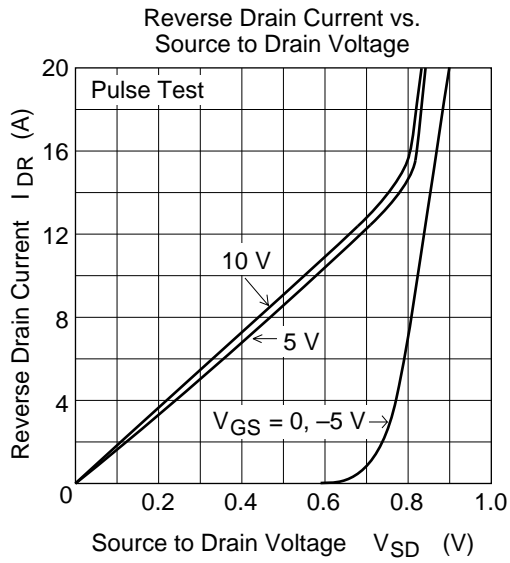
Note: 4. Pulse test

Main Characteristics

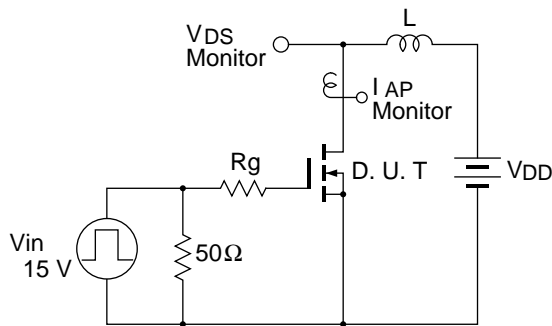




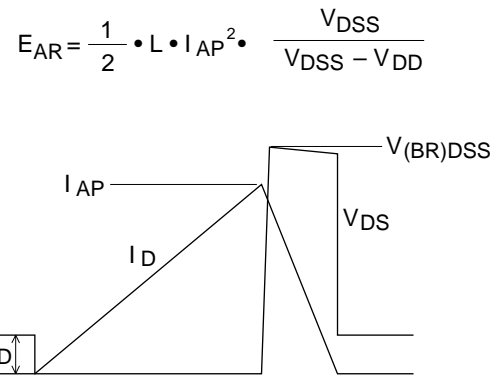


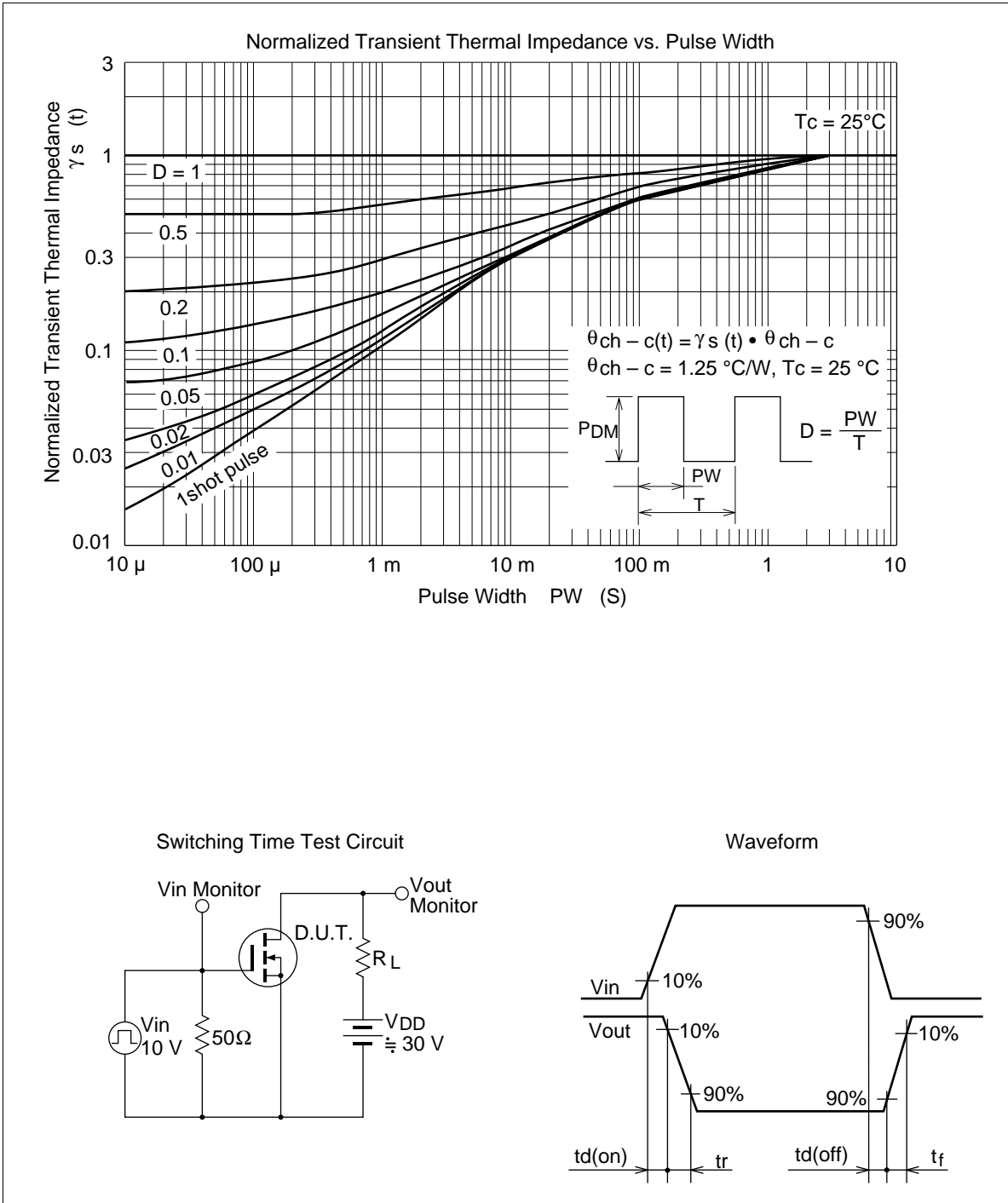


Avalanche Test Circuit



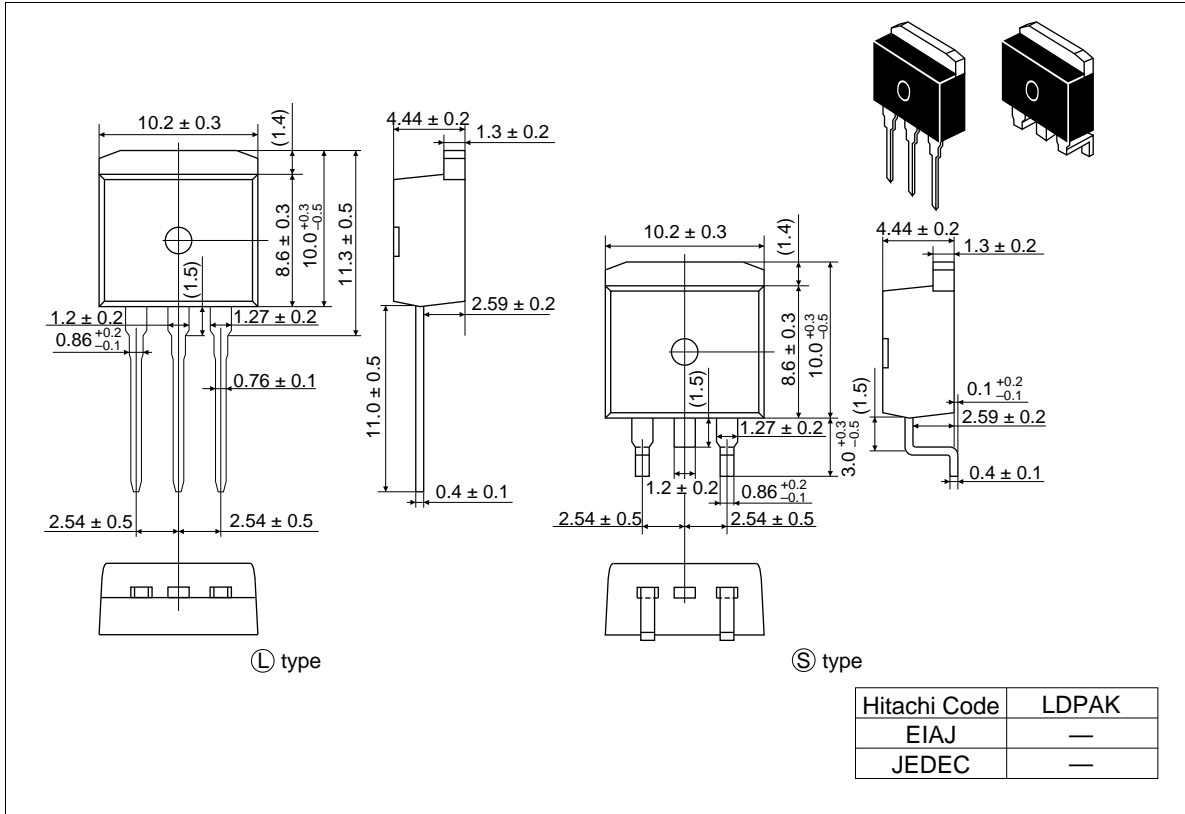
Avalanche Waveform





Package Dimensions

Unit: mm



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## 2SK3211

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