

2SK2940(L),2SK2940(S)

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

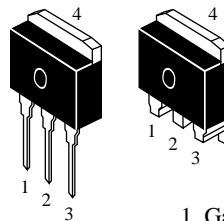
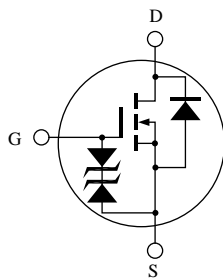
ADE-208-563B (Z)
3rd. Edition
Jun 1998

Features

- Low on-resistance
 $R_{DS} = 0.010 \Omega$ typ.
- High speed switching
- 4V gate drive device can be driven from 5V source

Outline

LDBPAK



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

2SK2940(L),2SK2940(S)

Absolute Maximum Ratings (Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|--|------------------------|-------------|------|
| Drain to source voltage | V_{DSS} | 60 | V |
| Gate to source voltage | V_{GSS} | ±20 | V |
| Drain current | I_D | 45 | A |
| Drain peak current | $I_{D(pulse)}^{Note1}$ | 180 | A |
| Body-drain diode reverse drain current | I_{DR} | 45 | A |
| Avalanche current | I_{AP}^{Note3} | 45 | A |
| Avalanche energy | E_{AR}^{Note3} | 173 | mJ |
| Channel dissipation | P_{ch}^{Note2} | 75 | W |
| Channel temperature | Tch | 150 | °C |
| Storage temperature | Tstg | -55 to +150 | °C |

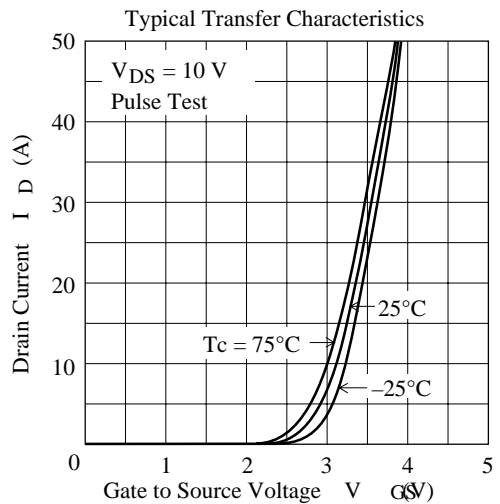
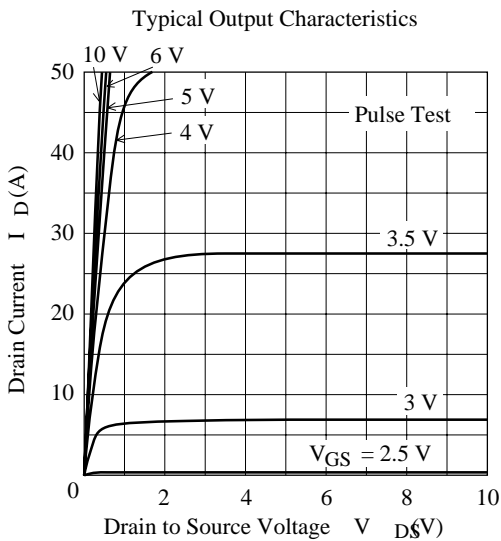
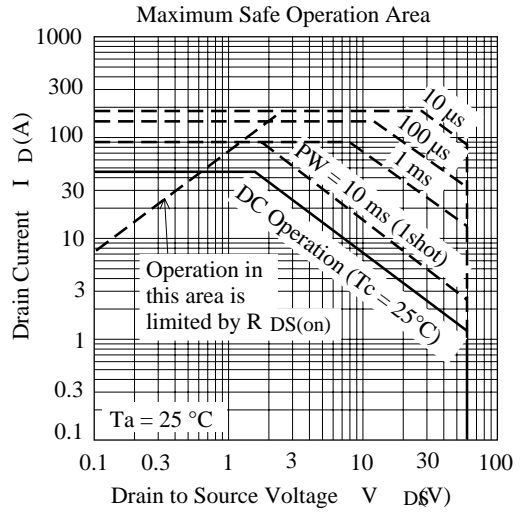
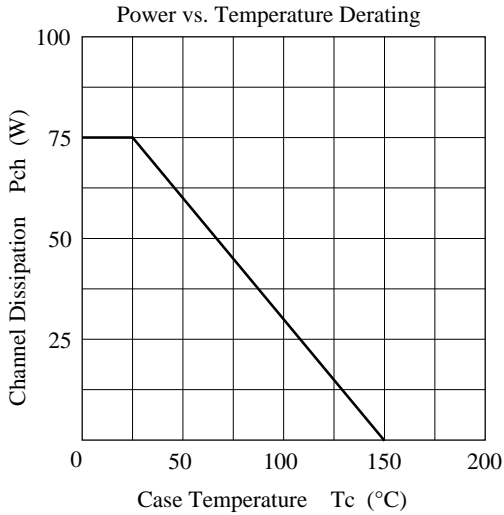
- Note: 1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$
2. Value at $T_c = 25^\circ C$
3. Value at $T_{ch} = 25^\circ C$, $R_g \geq 50\Omega$

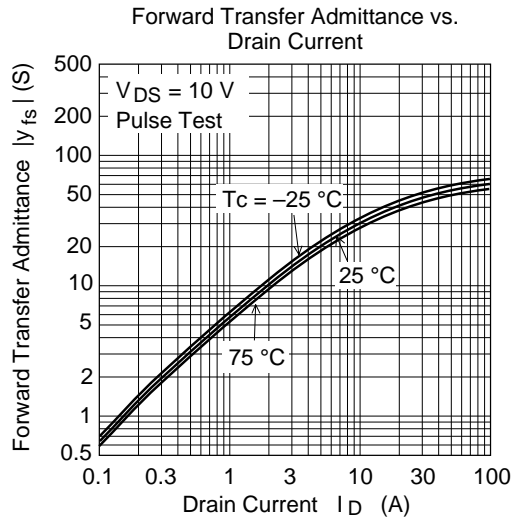
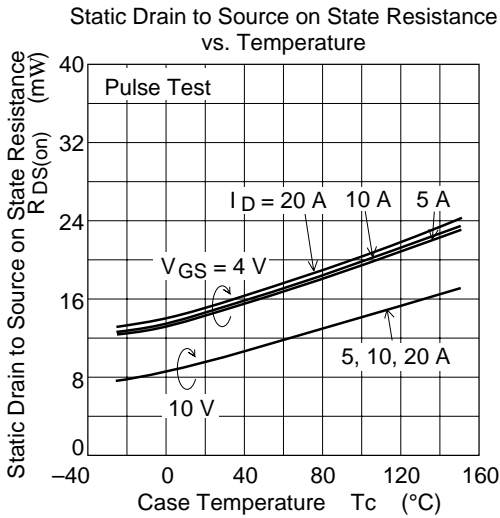
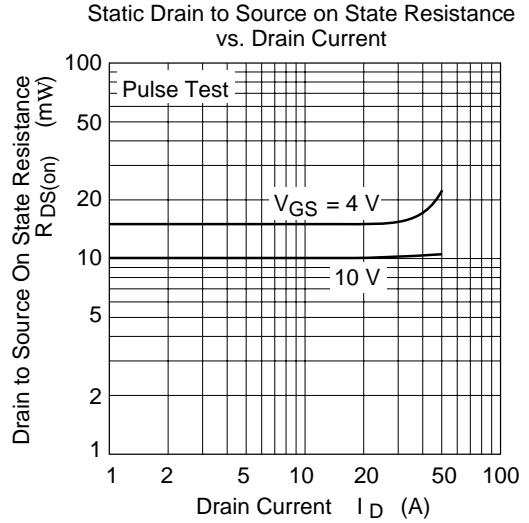
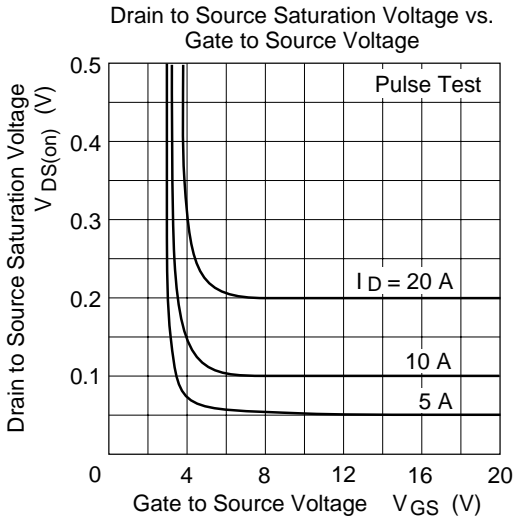
Electrical Characteristics (Ta = 25°C)

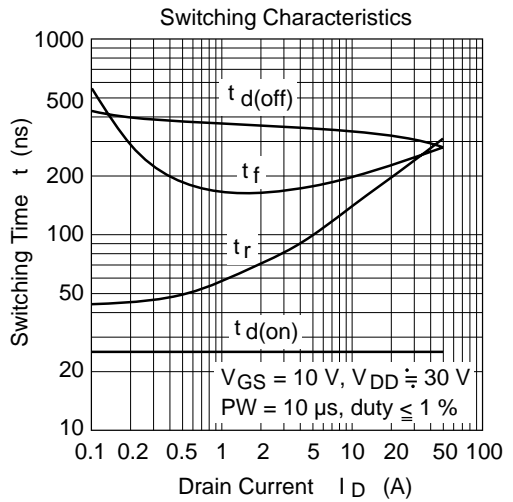
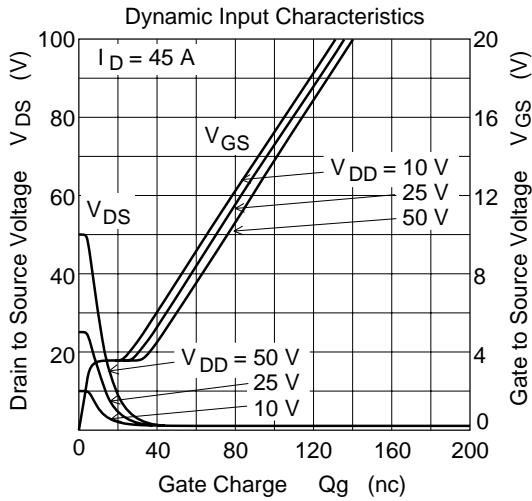
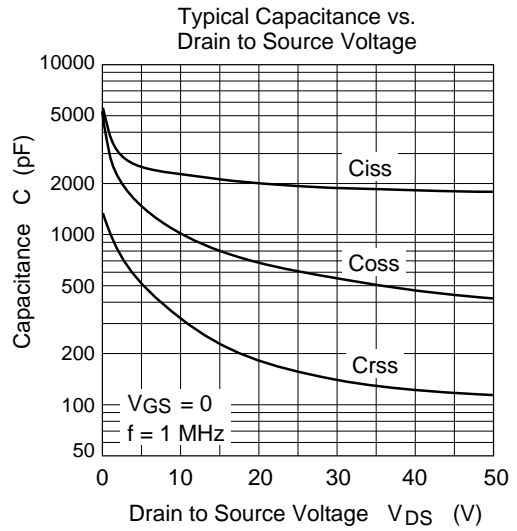
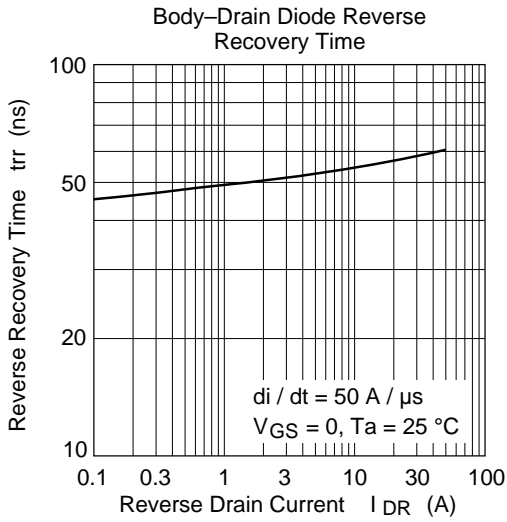
| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|---------------|----------|-------|----------|---------------|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 60 | — | — | V | $I_D = 10\text{mA}, V_{GS} = 0$ |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ± 20 | — | — | V | $I_G = \pm 100\mu\text{A}, V_{DS} = 0$ |
| Gate to source leak current | I_{GSS} | — | — | ± 10 | μA | $V_{GS} = \pm 16\text{V}, V_{DS} = 0$ |
| Zero gate voltage drain current | I_{DSS} | — | — | 10 | μA | $V_{DS} = 60\text{V}, V_{GS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 1.5 | — | 2.5 | V | $I_D = 1\text{mA}, V_{DS} = 10\text{V}$ |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 0.010 | 0.013 | Ω | $I_D = 20\text{A}, V_{GS} = 10\text{V}^{\text{Note4}}$ |
| | $R_{DS(on)}$ | — | 0.015 | 0.025 | Ω | $I_D = 20\text{A}, V_{GS} = 4\text{V}^{\text{Note4}}$ |
| Forward transfer admittance | $ y_{fs} $ | 24 | 40 | — | S | $I_D = 20\text{A}, V_{DS} = 10\text{V}^{\text{Note4}}$ |
| Input capacitance | C_{iss} | — | 2200 | — | pF | $V_{DS} = 10\text{V}$ |
| Output capacitance | C_{oss} | — | 1050 | — | pF | $V_{GS} = 0$ |
| Reverse transfer capacitance | C_{rss} | — | 320 | — | pF | $f = 1\text{MHz}$ |
| Turn-on delay time | $t_{d(on)}$ | — | 25 | — | ns | $I_D = 20\text{A}, V_{GS} = 10\text{V}$ |
| Rise time | t_r | — | 200 | — | ns | $R_L = 1.5\Omega$ |
| Turn-off delay time | $t_{d(off)}$ | — | 320 | — | ns | |
| Fall time | t_f | — | 240 | — | ns | |
| Body-drain diode forward voltage | V_{DF} | — | 0.95 | — | V | $I_F = 45\text{A}, V_{GS} = 0$ |
| Body-drain diode reverse recovery time | t_{rr} | — | 60 | — | ns | $I_F = 45\text{A}, V_{GS} = 0$ $diF/dt = 50\text{A}/\mu\text{s}$ |

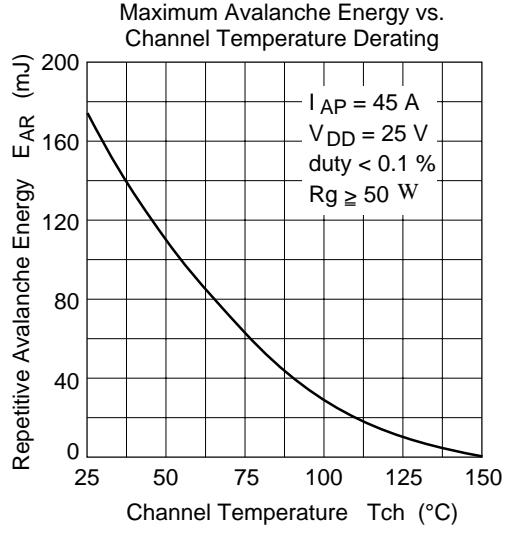
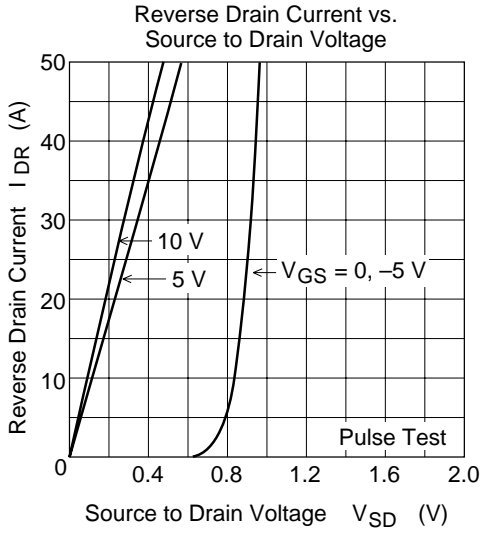
Note: 4. Pulse test

Main Characteristics

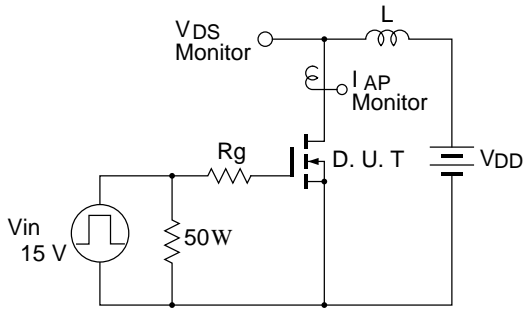






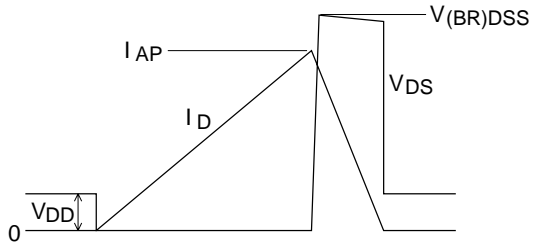


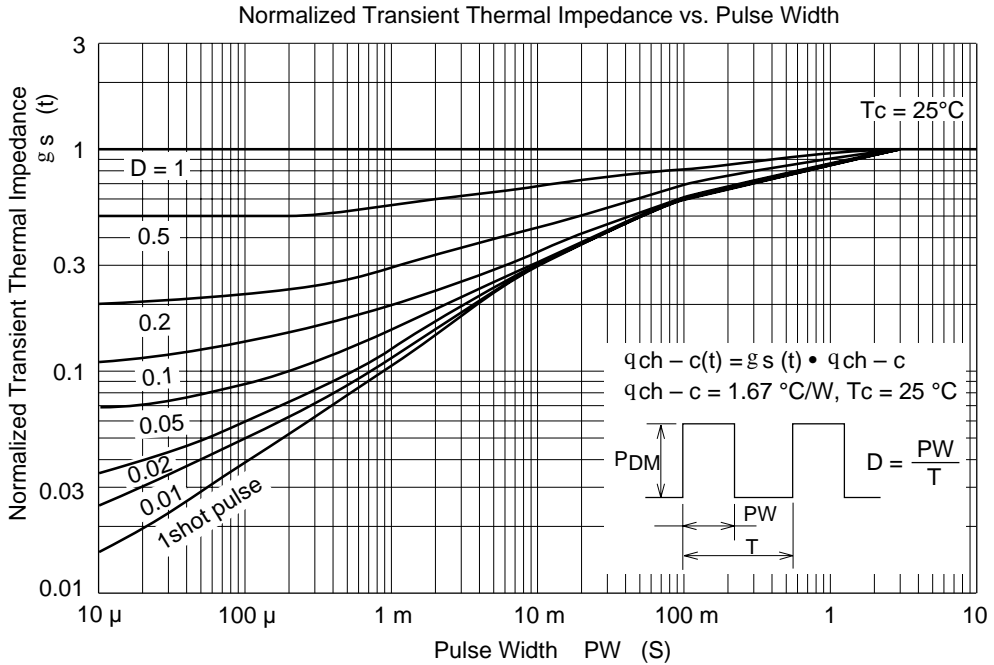
Avalanche Test Circuit



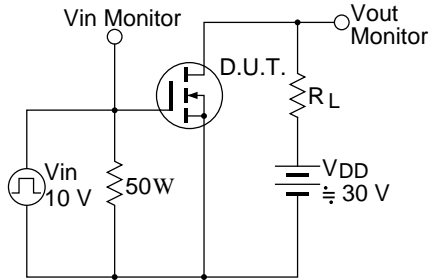
Avalanche Waveform

$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$

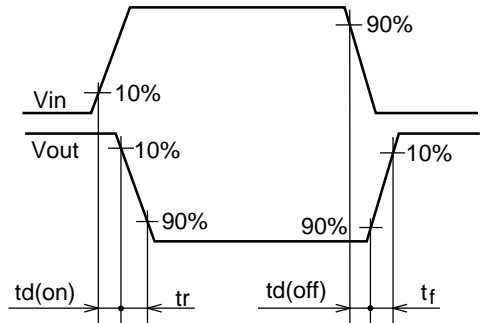




Switching Time Test Circuit

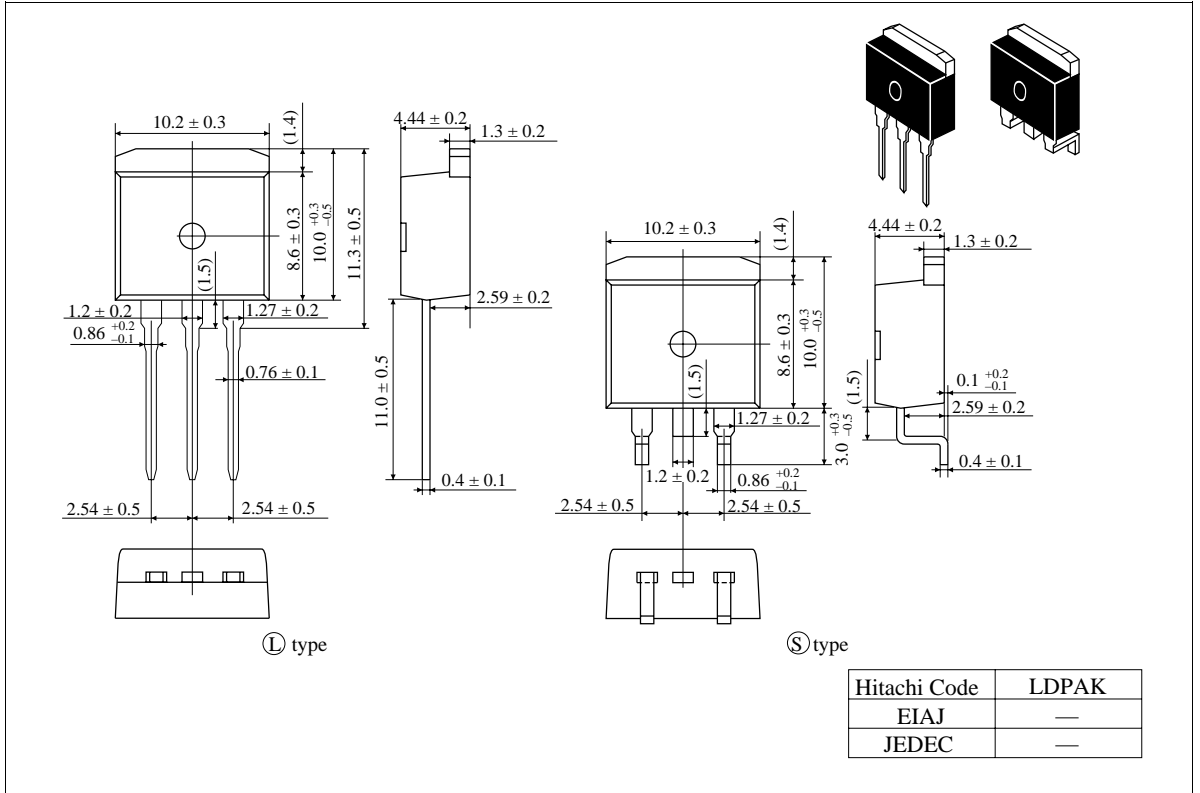


Waveform



Package Dimensions

Unit: mm



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