

2SK1254(L), 2SK1254(S)

Silicon N-Channel MOS FET

HITACHI

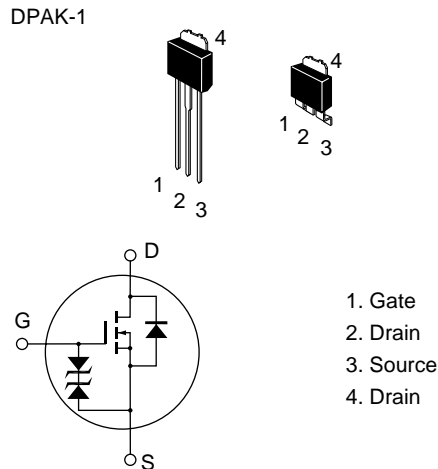
Application

High speed power switching

Features

- Low on-resistance
- High speed switching
- 4 V gate drive device
 - Can be driven from 5 V source
- Suitable for motor drive, DC-DC converter, power switch and solenoid drive

Outline



2SK1254(L), 2SK1254(S)

Absolute Maximum Ratings (T_a = 25°C)

| Item | Symbol | Ratings | Unit |
|---|-------------------------------------|-------------|------|
| Drain to source voltage | V _{DSS} | 120 | V |
| Gate to source voltage | V _{GSS} | ±20 | V |
| Drain current | I _D | 3 | A |
| Drain peak current | I _{D(pulse)} ^{*1} | 12 | A |
| Body to drain diode reverse drain current | I _{DR} | 3 | A |
| Channel dissipation | P _{ch} ^{*2} | 20 | W |
| Channel temperature | T _{ch} | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

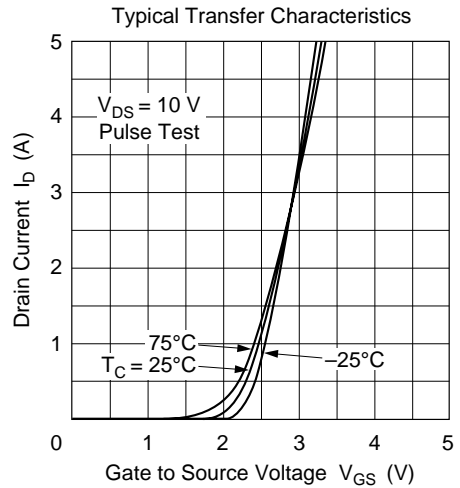
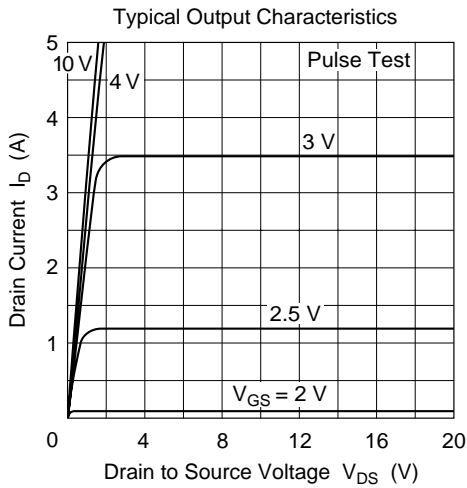
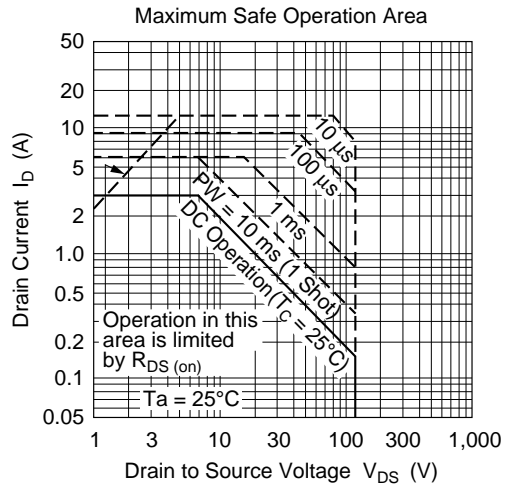
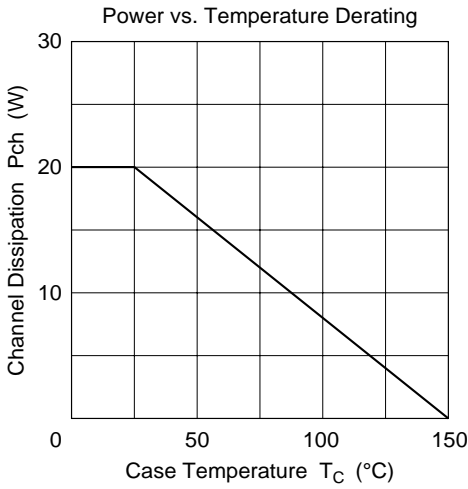
Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at T_c = 25°C

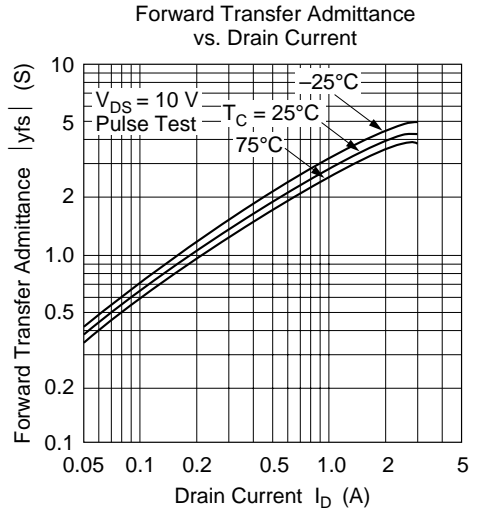
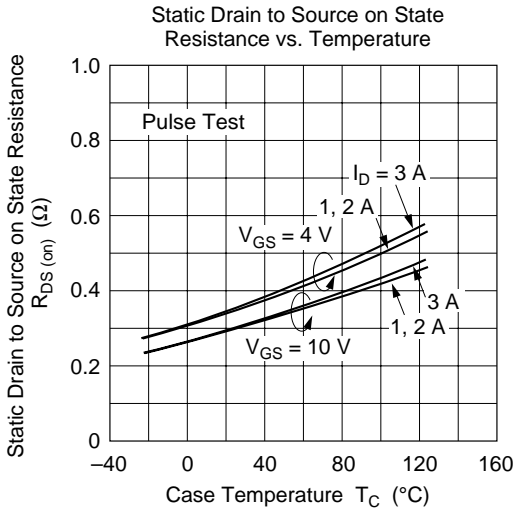
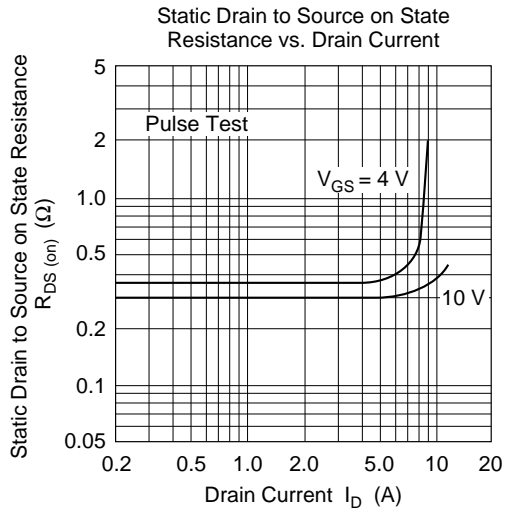
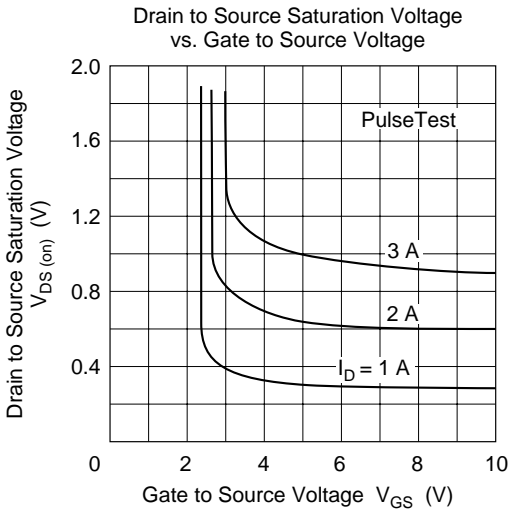
Electrical Characteristics (Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|---------------|----------|------|----------|---------------|--|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 120 | — | — | V | $I_D = 10 \text{ mA}, V_{GS} = 0$ |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ± 20 | — | — | V | $I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$ |
| 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} | — | — | 100 | μA | $V_{DS} = 100 \text{ V}, V_{GS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 1.0 | — | 2.0 | V | $I_D = 1 \text{ mA}, V_{DS} = 10 \text{ V}$ |
| Static Drain to source on state resistance | $R_{DS(on)}$ | — | 0.30 | 0.40 | Ω | $I_D = 2 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$ |
| | | — | 0.35 | 0.55 | Ω | $I_D = 2 \text{ A}, V_{GS} = 4 \text{ V}^{*1}$ |
| Forward transfer admittance | $ y_{fs} $ | 2.4 | 4.0 | — | S | $I_D = 2 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$ |
| Input capacitance | C_{iss} | — | 420 | — | pF | $V_{DS} = 10 \text{ V}, V_{GS} = 0,$ |
| Output capacitance | C_{oss} | — | 190 | — | pF | $f = 1 \text{ MHz}$ |
| Reverse transfer capacitance | C_{rss} | — | 25 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 5 | — | ns | $I_D = 2 \text{ A}, V_{GS} = 10 \text{ V},$ |
| Rise time | t_r | — | 20 | — | ns | $R_L = 15 \text{ }\Omega$ |
| Turn-off delay time | $t_{d(off)}$ | — | 150 | — | ns | |
| Fall time | t_f | — | 45 | — | ns | |
| Body to drain diode forward voltage | V_{DF} | — | 0.95 | — | V | $I_F = 3 \text{ A}, V_{GS} = 0$ |
| Body to drain diode reverse recovery time | t_{rr} | — | 160 | — | ns | $I_F = 3 \text{ A}, V_{GS} = 0,$ $di_F/dt = 50 \text{ A}/\mu\text{s}$ |

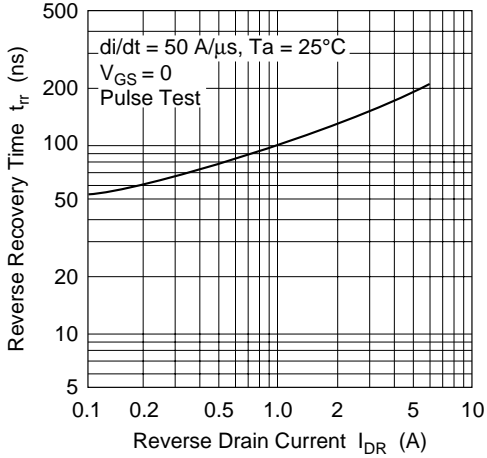
Note: 1. Pulse test

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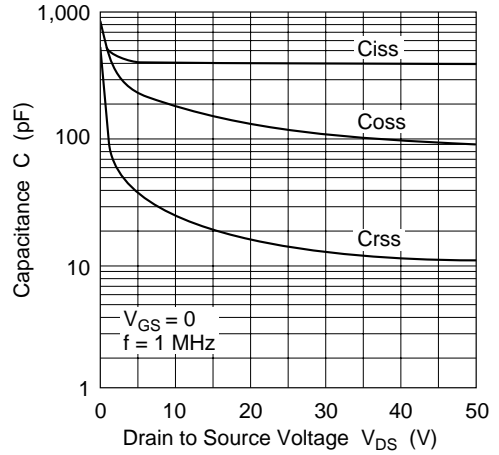




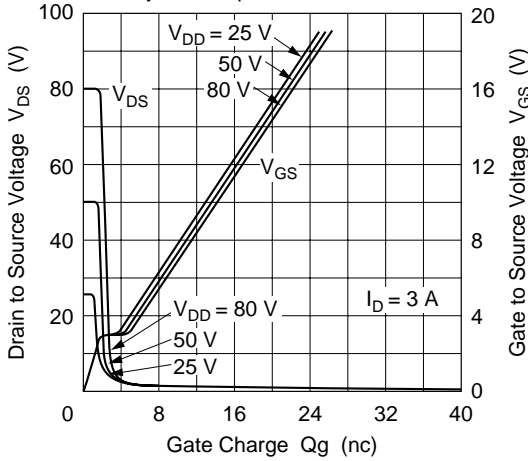
Body to Drain Diode Reverse Recovery Time



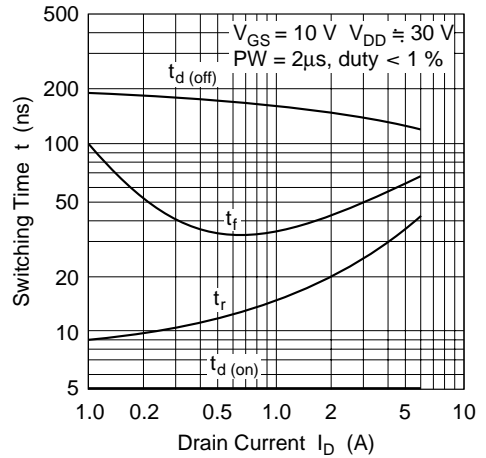
Typical Capacitance vs. Drain to Source Voltage

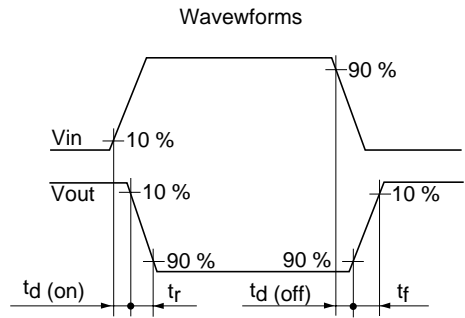
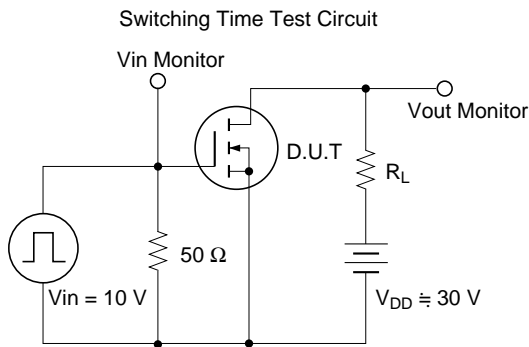
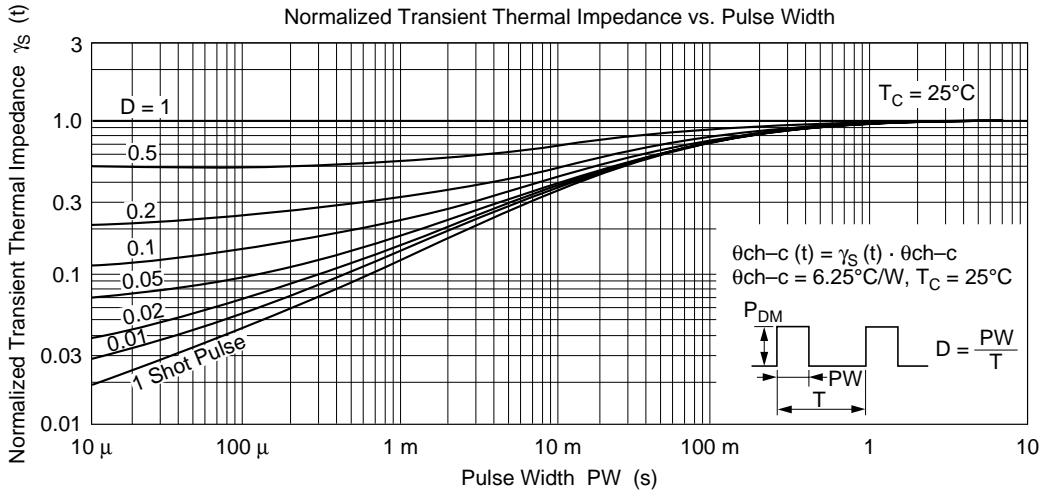
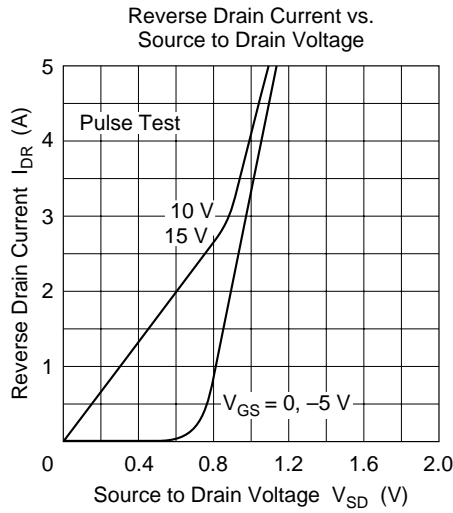


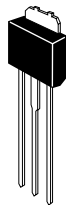
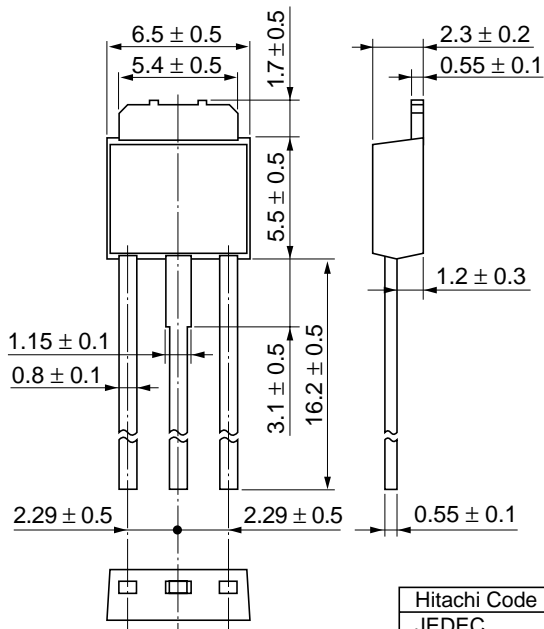
Dynamic Input Characteristics



Switching Characteristics







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

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