# 2SJ506(L), 2SJ506(S)

Silicon P Channel MOS FET
High Speed Power Switching

HITACHI

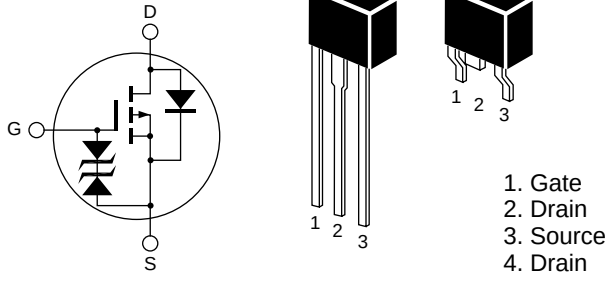
ADE-208-548
Target Specification 1st. Edition

## Features

- Low on-resistance
  $R_{DS(on)}$ = 0.065 Ω typ. (at $V_{GS}$ = –10V, $I_D$ = –5A)
- Low drive current
- High speed switching
- 4V gate drive devices.

## Outline

DPAK–2




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

Hitachi semiconductor

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

| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain to source voltage | $V_{DSS}$ | –30 | V |
| Gate to source voltage | $V_{GSS}$ | ±20 | V |
| Drain current | $I_D$ | –10 | A |
| Drain peak current | $I_{D(pulse)}$ Note1 | –40 | A |
| Body to drain diode reverse drain current | $I_{DR}$ | –10 | A |
| Channel dissipation | Pch Note2 | 20 | W |
| Channel temperature | Tch | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

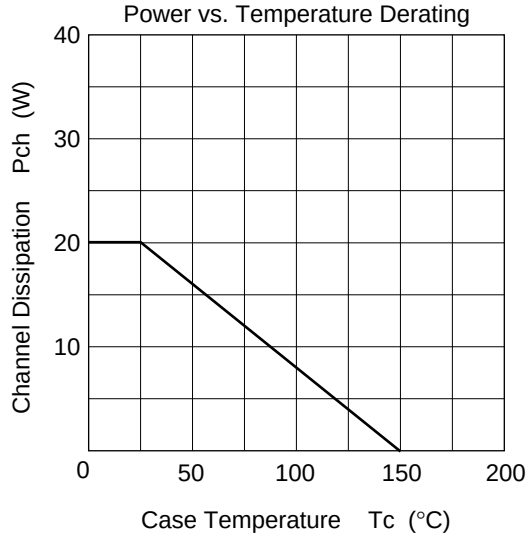
Notes: 1. PW ≤ 10µs, duty cycle ≤ 1 %
2. Value at Tc = 25°C

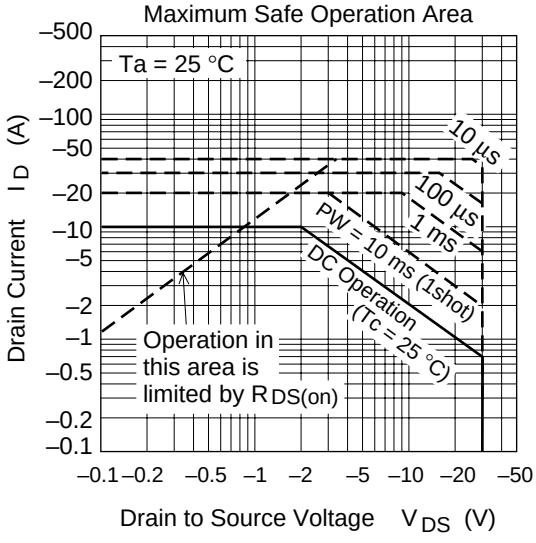
## Electrical Characteristics (Ta = 25°C)

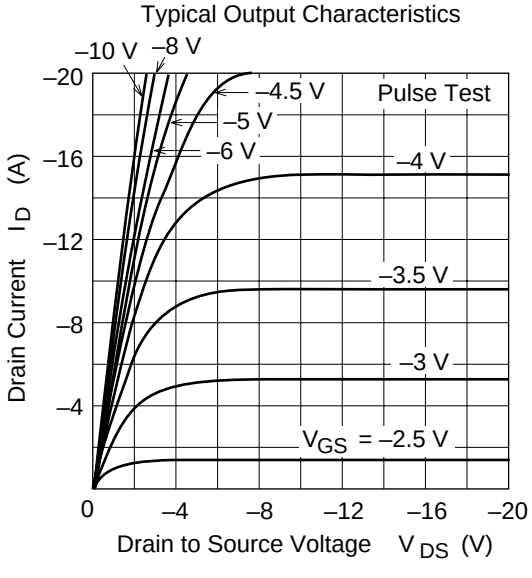
| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | –30 | — | — | V | $I_D$ = –10mA, $V_{GS}$ = 0 |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ±20 | — | — | V | $I_G$ = ±100µA, $V_{DS}$ = 0 |
| Zero gate voltege drain current | $I_{DSS}$ | — | — | –10 | µA | $V_{DS}$ = –30 V, $V_{GS}$ = 0 |
| Gate to source leak current | $I_{GSS}$ | — | — | ±10 | µA | $V_{GS}$ = ±16V, $V_{DS}$ = 0 |
| Gate to source cutoff voltage | $V_{GS(off)}$ | –1.0 | — | –2.0 | V | $I_D$ = –1mA, $V_{DS}$ = –10V |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 65 | 85 | mΩ | $I_D$ = –5A, $V_{GS}$ = –10V Note3 |
| | $R_{DS(on)}$ | — | 110 | 180 | mΩ | $I_D$ = –5A, $V_{GS}$ = –4V Note3 |
| Forward transfer admittance | $\|y_{fs}\|$ | 10 | 16 | — | S | $I_D$ = –5A, $V_{DS}$ = –10V Note3 |
| Input capacitance | Ciss | — | 660 | — | pF | $V_{DS}$ = –10V |
| Output capacitance | Coss | — | 440 | — | pF | $V_{GS}$ = 0 |
| Reverse transfer capacitance | Crss | — | 140 | — | pF | f = 1MHz |
| Turn-on delay time | $t_{d(on)}$ | — | 12 | — | ns | $I_D$ = –5A, $R_L$ = 2Ω |
| Rise time | $t_r$ | — | 65 | — | ns | $V_{GS}$ = –10V |
| Turn-off delay time | $t_{d(off)}$ | — | 85 | — | ns | |
| Fall time | $t_f$ | — | 65 | — | ns | |
| Body to drain diode forward voltage | $V_{DF}$ | — | –1.05 | — | V | $I_F$ = –10A, $V_{GS}$ = 0 |
| Body to drain diode reverse recovery time | $t_{rr}$ | — | 65 | — | ns | $I_F$ = –10A, $V_{GS}$ = 0<br>diF/ dt = 50A/µs |

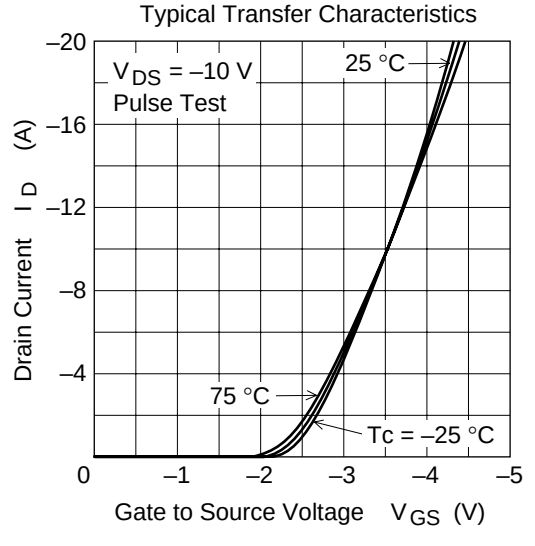
Note: 3. Pulse test

## Main Characteristics

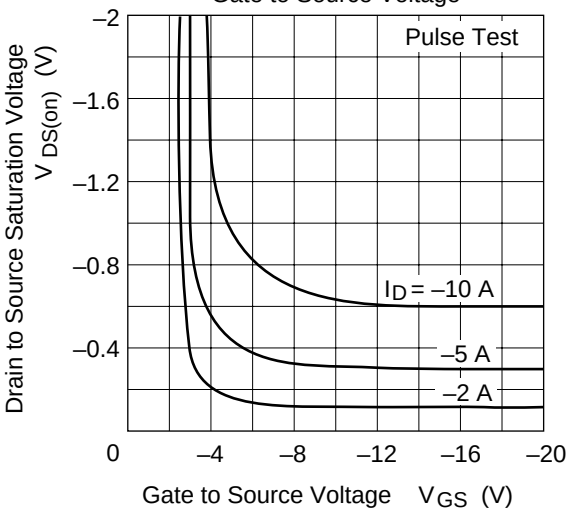


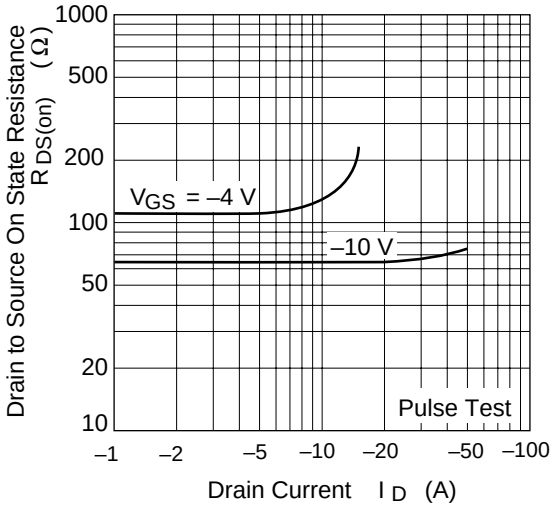



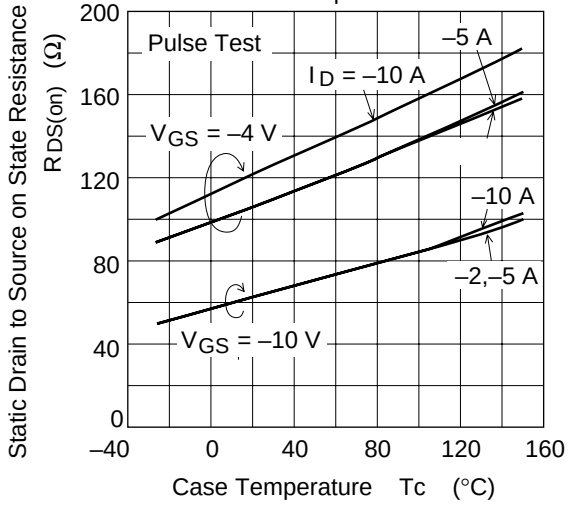
Drain to Source Saturation Voltage vs. Gate to Source Voltage



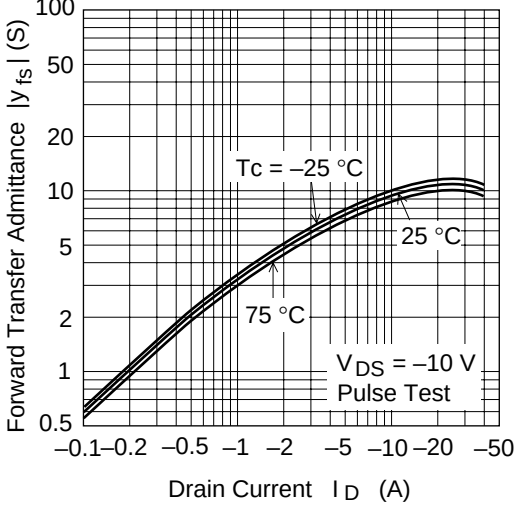

Static Drain to Source on State Resistance vs. Drain Current



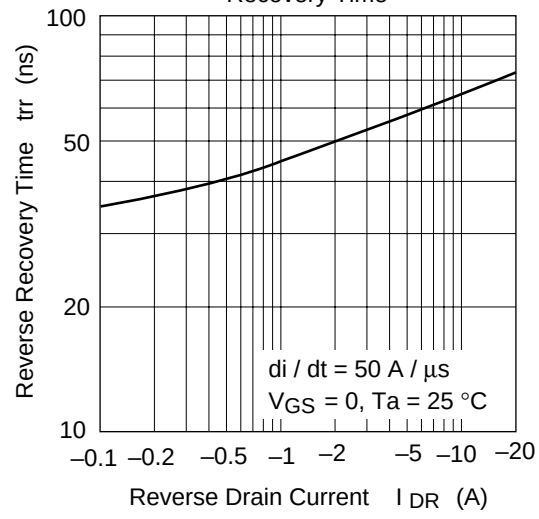

Static Drain to Source on State Resistance vs. Temperature



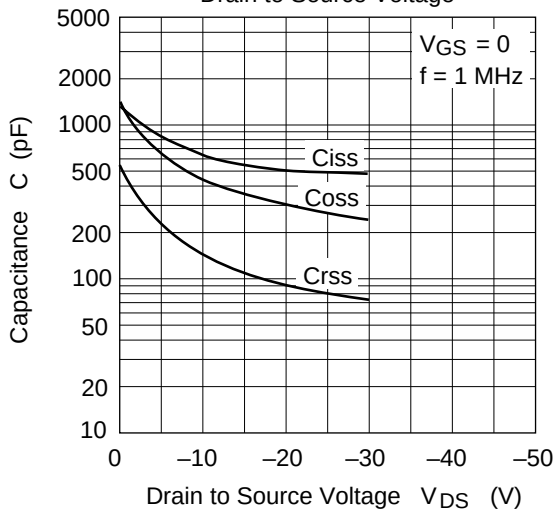

Forward Transfer Admittance vs. Drain Current



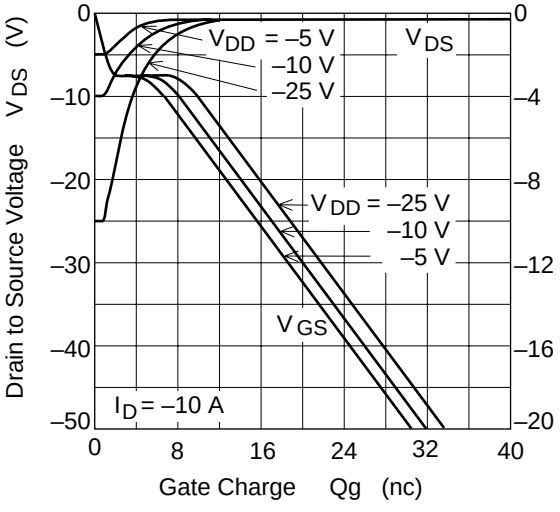
Body to Drain Diode Reverse Recovery Time



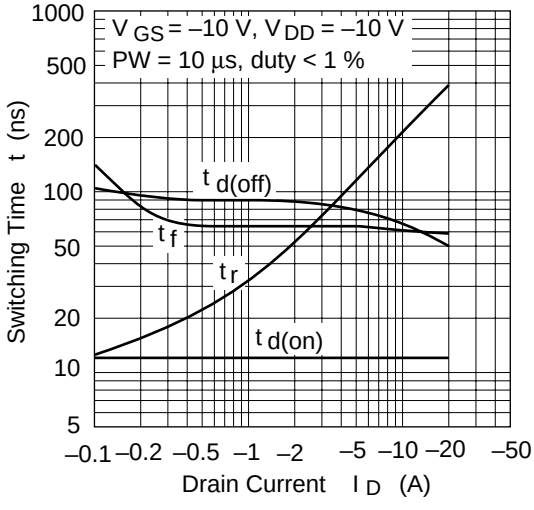

Typical Capacitance vs. Drain to Source Voltage



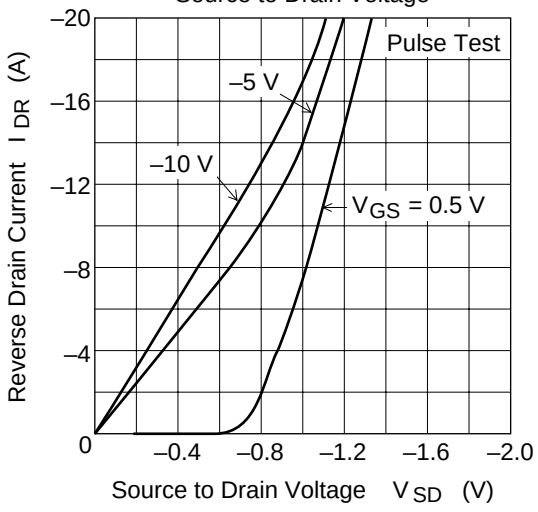

Dynamic Input Characteristics



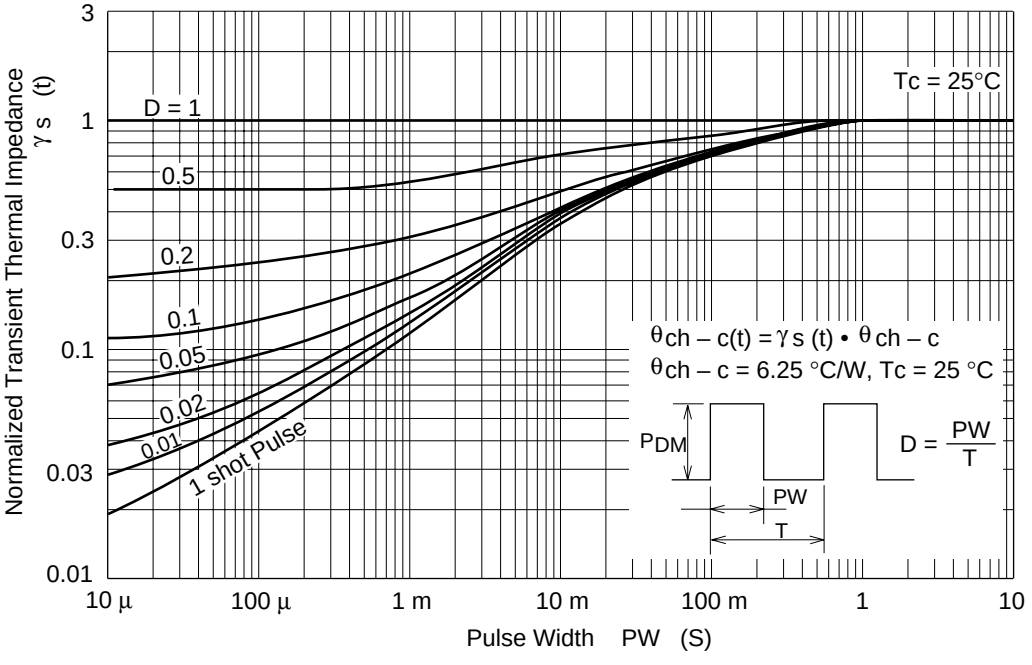

Switching Characteristics



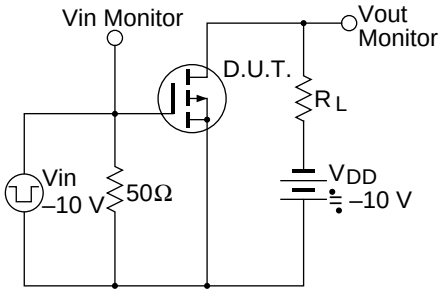
Reverse Drain Current vs.
Source to Drain Voltage



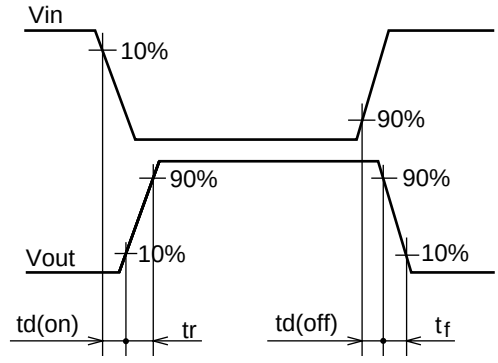

Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

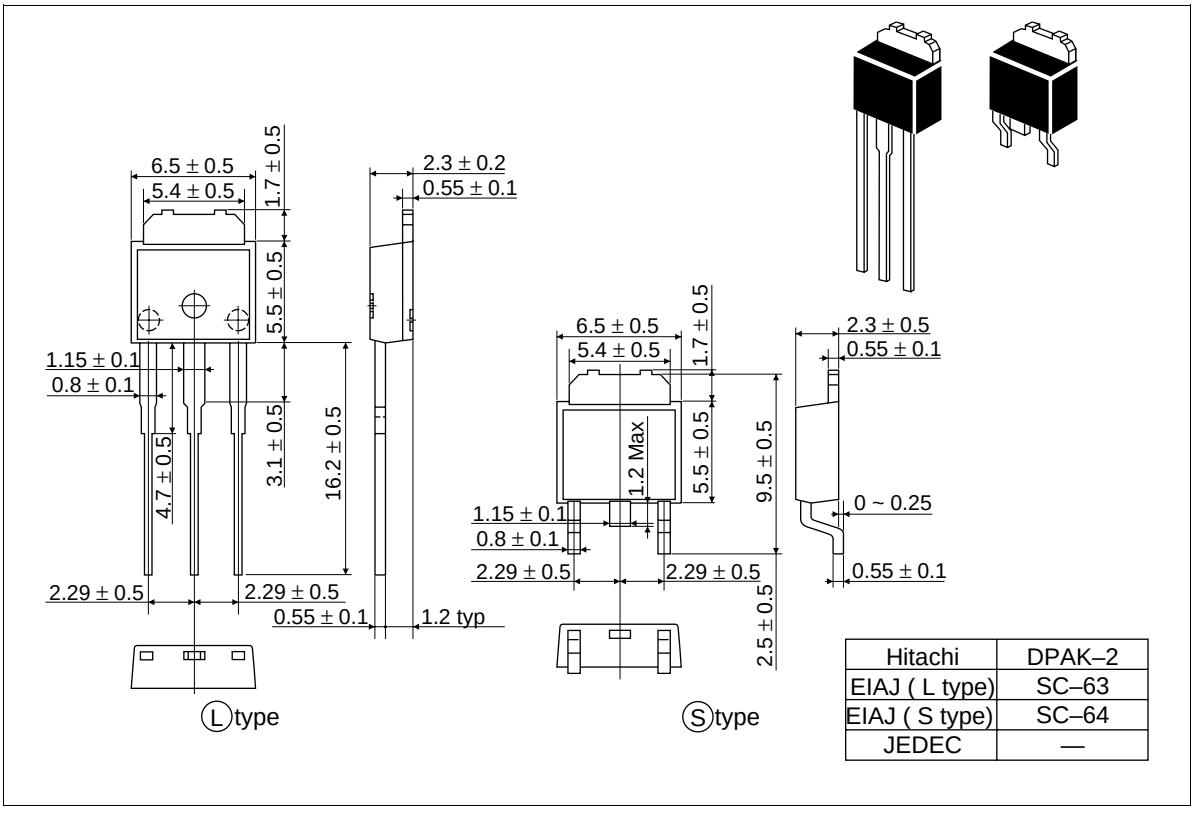



Waveforms



## Package Dimensions

**Unit: mm**




| | |
|---|---|
| Hitachi | DPAK–2 |
| EIAJ ( L type) | SC–63 |
| EIAJ ( S type) | SC–64 |
| JEDEC | — |

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