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# 2SK1957

Silicon N-Channel MOS FET

# HITACHI

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## Application

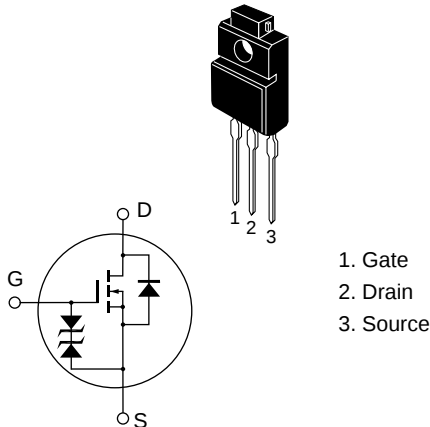
High speed power switching

## Features

- Low on-resistance
- High speed switching
- Low drive current
- No Secondary Breakdown
- Suitable for Switching regulator, DC - DC converter, Motor Control

## Outline

TO-220FM



Absolute Maximum Ratings (Ta = 25°C)

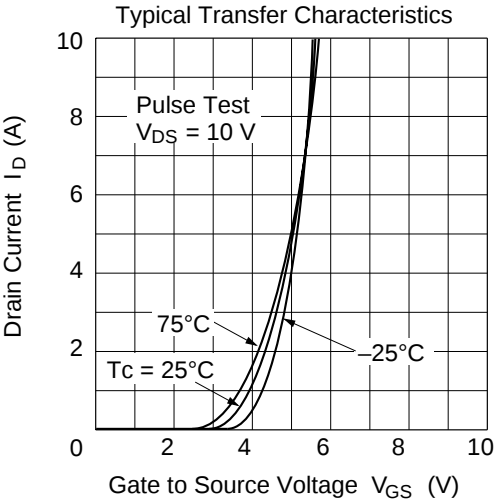
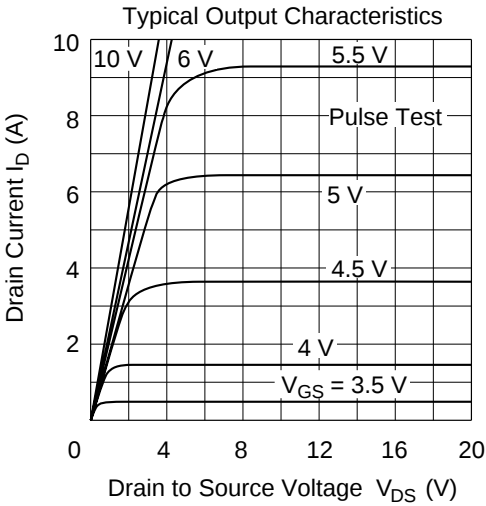
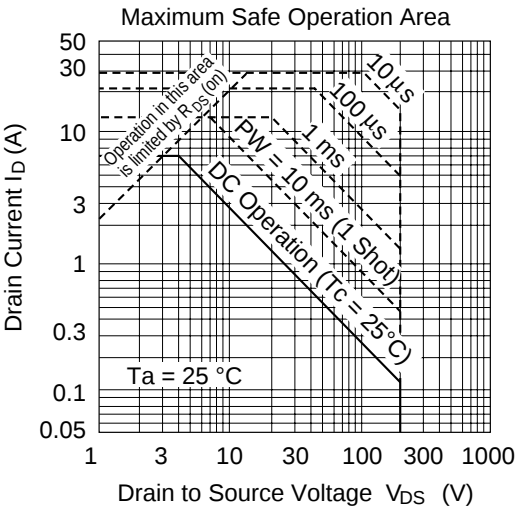
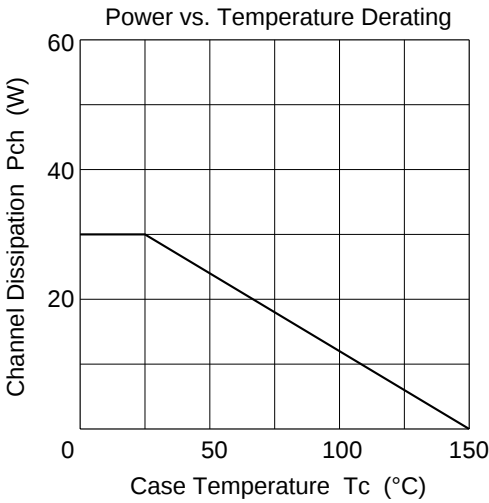
| Item                                      | Symbol                              | Ratings     | Unit |
|-------------------------------------------|-------------------------------------|-------------|------|
| Drain to source voltage                   | V <sub>DSS</sub>                    | 200         | V    |
| Gate to source voltage                    | V <sub>GSS</sub>                    | ±20         | V    |
| Drain current                             | I <sub>D</sub>                      | 7           | A    |
| Drain peak current                        | I <sub>D(pulse)</sub> <sup>*1</sup> | 28          | A    |
| Body to drain diode reverse drain current | I <sub>DR</sub>                     | 7           | A    |
| Channel dissipation                       | Pch <sup>*2</sup>                   | 30          | W    |
| Channel temperature                       | Tch                                 | 150         | °C   |
| Storage temperature                       | Tstg                                | −55 to +150 | °C   |

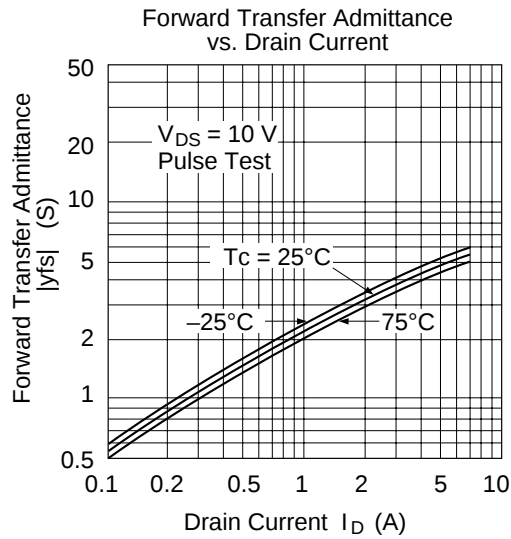
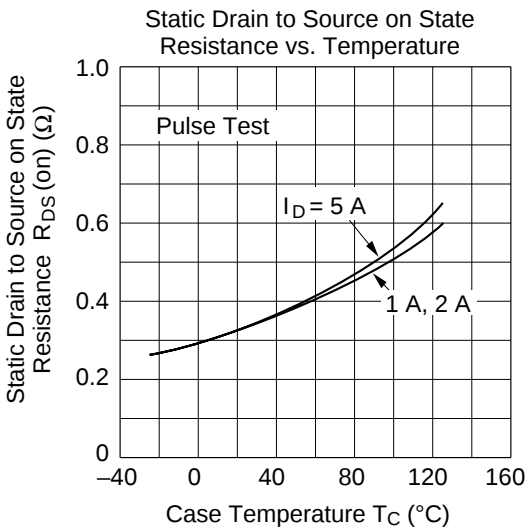
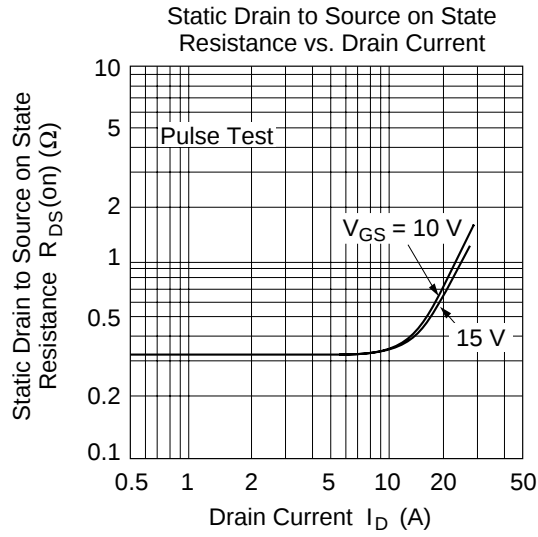
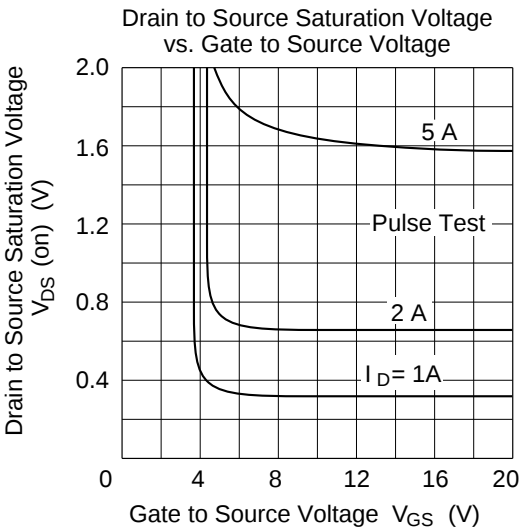
Notes    1. PW ≤ 10 μs, duty cycle ≤ 1 %  
          2. Value at Tc = 25°C

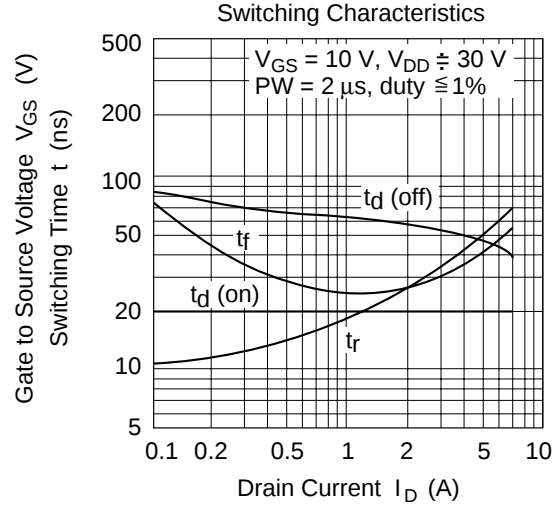
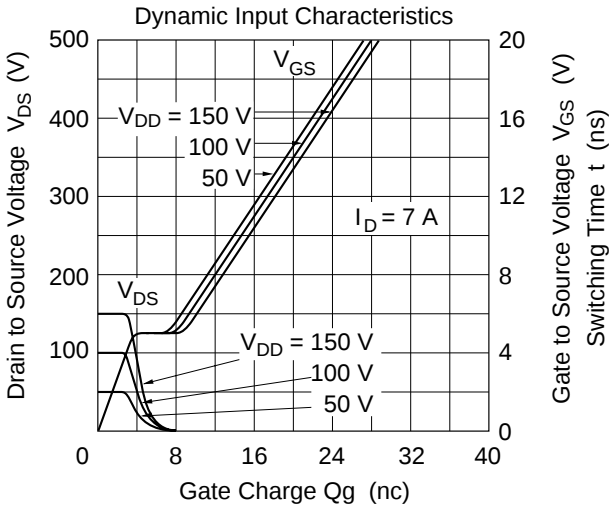
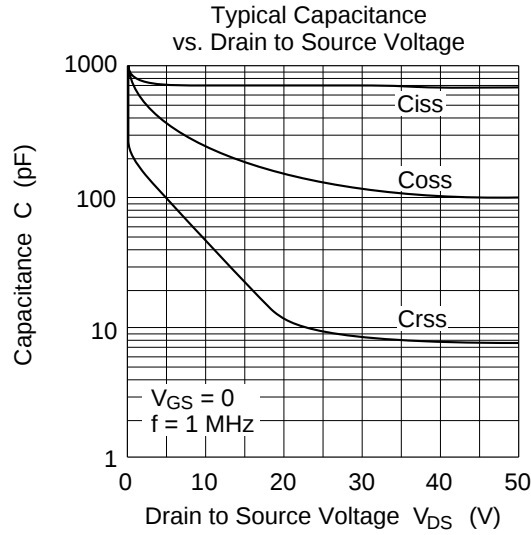
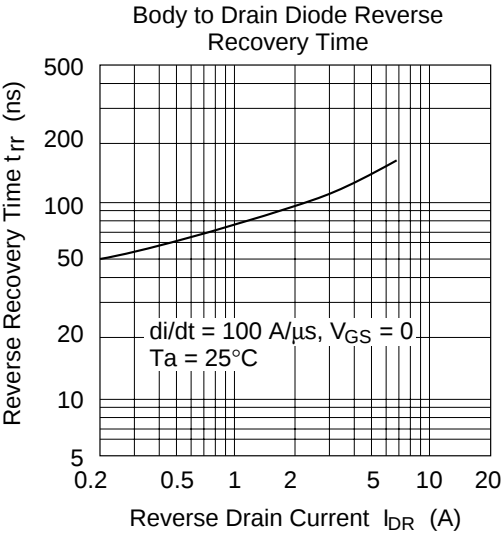
**Electrical Characteristics** (Ta = 25°C)

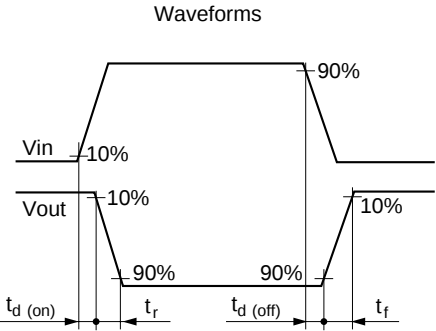
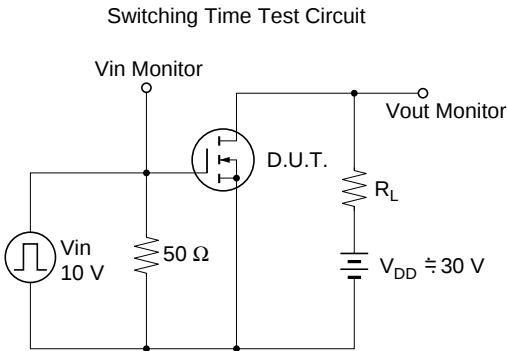
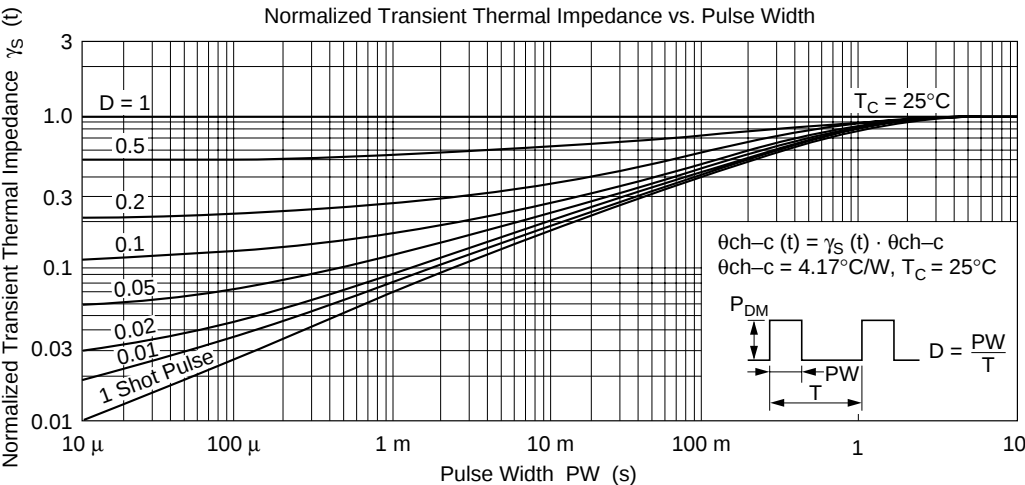
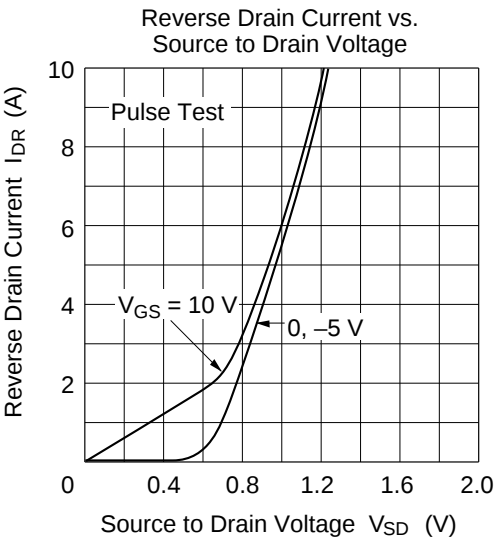
| Item                                       | Symbol        | Min      | Typ  | Max      | Unit          | Test conditions                                                                   |
|--------------------------------------------|---------------|----------|------|----------|---------------|-----------------------------------------------------------------------------------|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 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            | $I_{DSS}$     | —        | —    | 250      | $\mu\text{A}$ | $V_{DS} = 160 \text{ V}$ , $V_{GS} = 0$                                           |
| 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 | $R_{DS(on)}$  | —        | 0.33 | 0.45     | $\Omega$      | $I_D = 4 \text{ A}$<br>$V_{GS} = 10 \text{ V}^{*1}$                               |
| Forward transfer admittance                | $ y_{fs} $    | 3.0      | 4.5  | —        | S             | $I_D = 4 \text{ A}$<br>$V_{DS} = 10 \text{ V}^{*1}$                               |
| Input capacitance                          | $C_{iss}$     | —        | 700  | —        | pF            | $V_{DS} = 10 \text{ V}$                                                           |
| Output capacitance                         | $C_{oss}$     | —        | 260  | —        | pF            | $V_{GS} = 0$                                                                      |
| Reverse transfer capacitance               | $C_{rss}$     | —        | 45   | —        | pF            | $f = 1 \text{ MHz}$                                                               |
| Turn-on delay time                         | $t_{d(on)}$   | —        | 20   | —        | ns            | $I_D = 4 \text{ A}$                                                               |
| Rise time                                  | $t_r$         | —        | 45   | —        | ns            | $V_{GS} = 10 \text{ V}$                                                           |
| Turn-off delay time                        | $t_{d(off)}$  | —        | 50   | —        | ns            | $R_L = 7.5 \Omega$                                                                |
| Fall time                                  | $t_f$         | —        | 35   | —        | ns            |                                                                                   |
| Body to drain diode forward voltage        | $V_{DF}$      | —        | 1.1  | —        | V             | $I_F = 7 \text{ A}$ , $V_{GS} = 0$                                                |
| Body to drain diode reverse recovery time  | $t_{rr}$      | —        | 150  | —        | ns            | $I_F = 7 \text{ A}$ , $V_{GS} = 0$ ,<br>$di_F / dt = 100 \text{ A} / \mu\text{s}$ |

Note 1. Pulse Test

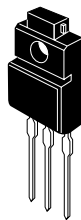
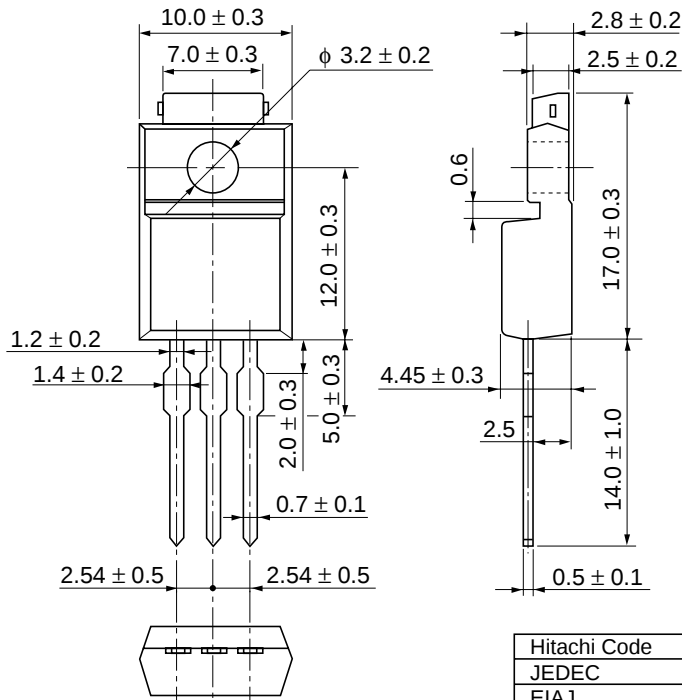








Unit: mm



|                          |          |
|--------------------------|----------|
| Hitachi Code             | TO-220FM |
| JEDEC                    | —        |
| EIAJ                     | Conforms |
| Weight (reference value) | 1.8 g    |

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