

2SK2932

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

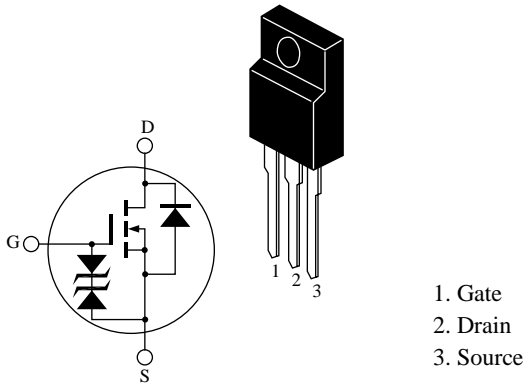
ADE-208-555B (Z)
3rd. Edition
Jun 1998

Features

- Low on-resistance
 $R_{DS} = 0.055 \Omega$ typ.
- High speed switching
- 4V gate drive device can be driven from 5V source

Outline

TO-220CFM



Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Item | Symbol | Ratings | Unit |
|--|------------------------|----------------|------------------|
| Drain to source voltage | V_{DSS} | 60 | V |
| Gate to source voltage | V_{GSS} | ± 20 | V |
| Drain current | I_D | 10 | A |
| Drain peak current | $I_{D(pulse)}^{Note1}$ | 40 | A |
| Body-drain diode reverse drain current | I_{DR} | 10 | A |
| Avalanche current | I_{AP}^{Note3} | 10 | A |
| Avalanche energy | E_{AR}^{Note3} | 8.5 | mJ |
| Channel dissipation | P_{ch}^{Note2} | 20 | W |
| Channel temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

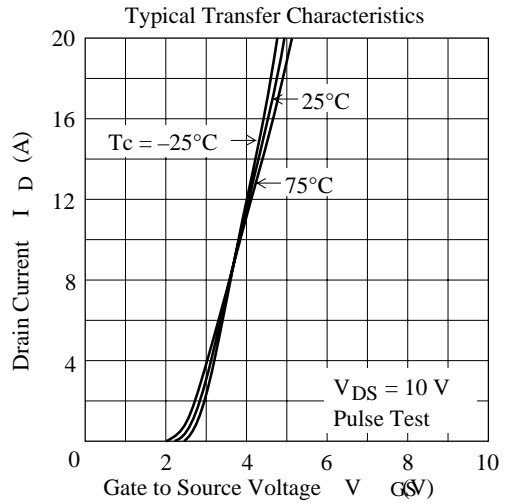
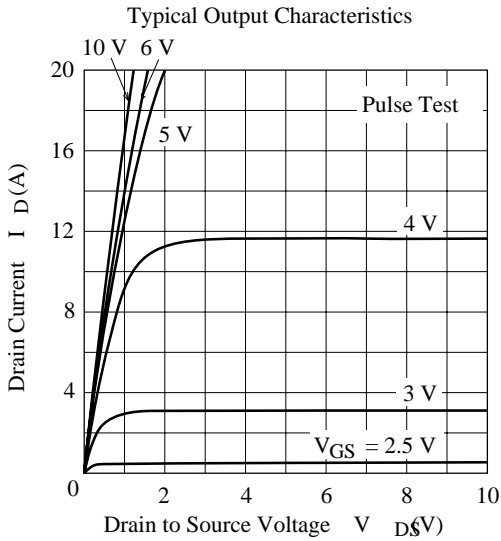
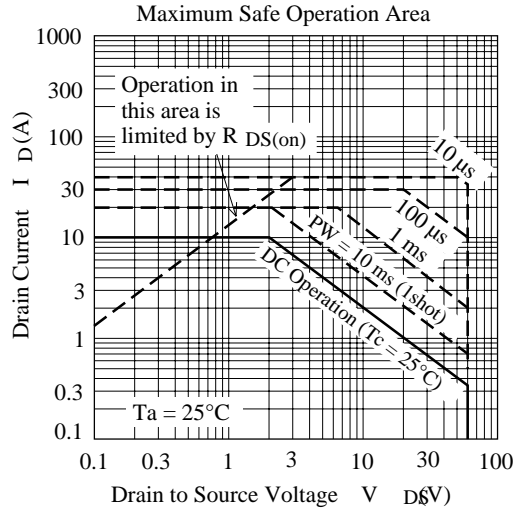
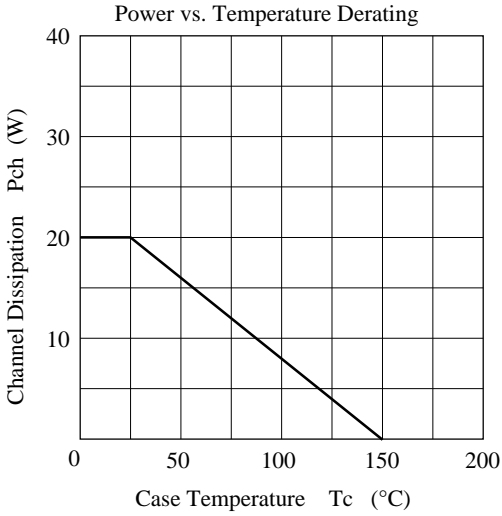
- Note: 1. $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$
2. Value at $T_c = 25^\circ\text{C}$
3. Value at $T_{ch} = 25^\circ\text{C}$, $R_g \geq 50\Omega$

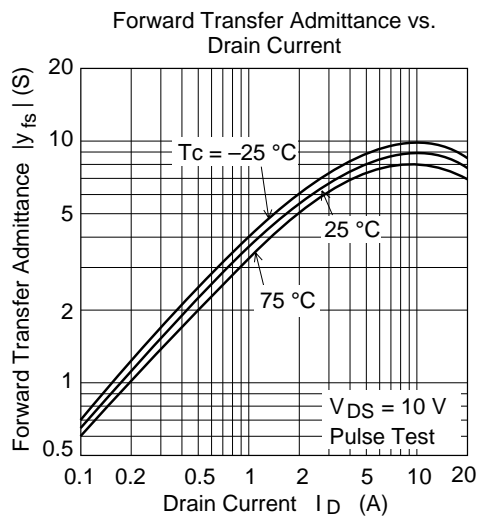
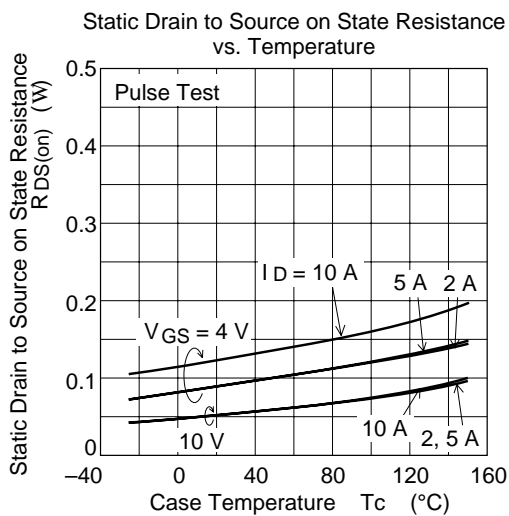
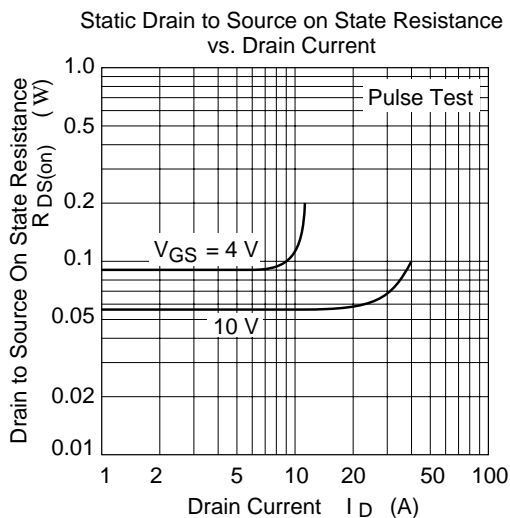
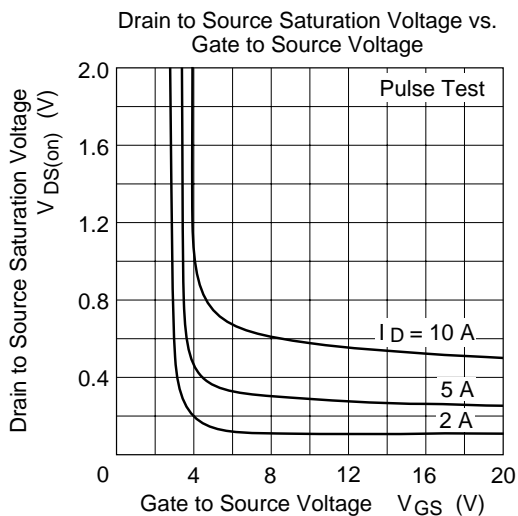
Electrical Characteristics (Ta = 25°C)

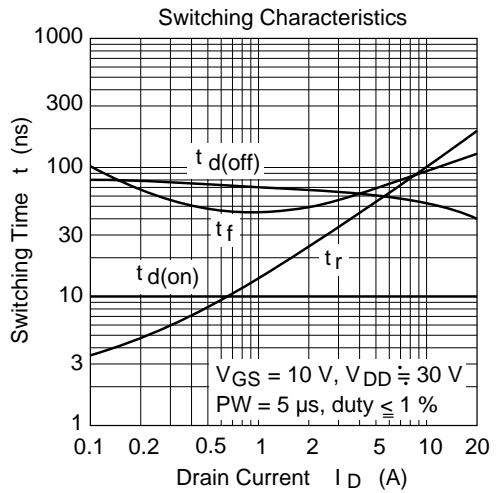
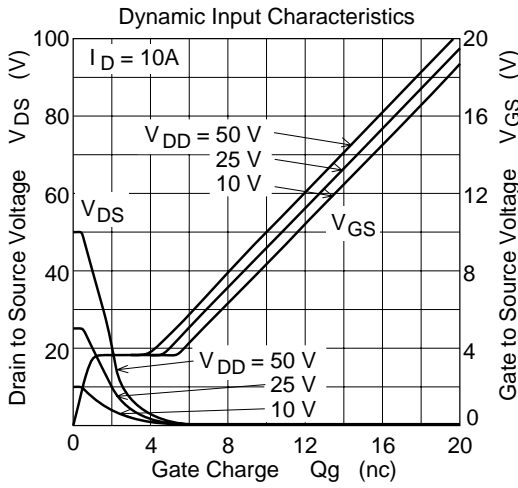
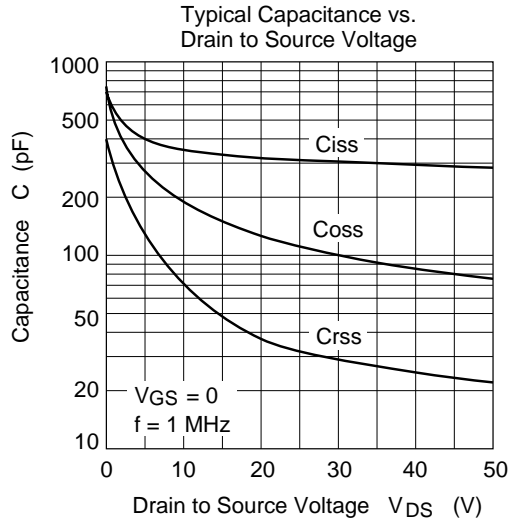
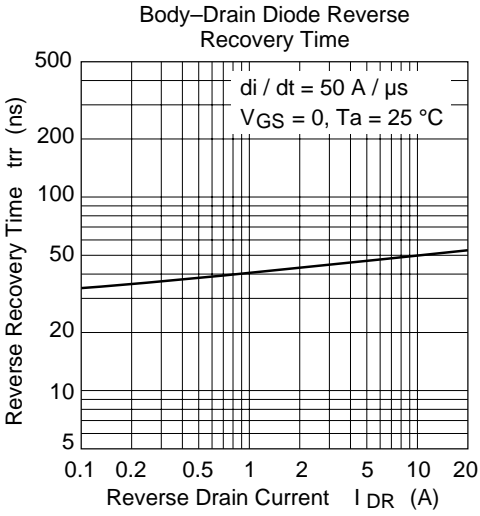
| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|---------------|----------|-------|----------|---------------|--|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 60 | — | — | V | $I_D = 10\text{mA}$, $V_{GS} = 0$ |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ± 20 | — | — | 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 | $R_{DS(on)}$ | — | 0.055 | 0.075 | Ω | $I_D = 5\text{A}$, $V_{GS} = 10\text{V}$ ^{Note4} |
| | $R_{DS(on)}$ | — | 0.090 | 0.150 | Ω | $I_D = 5\text{A}$, $V_{GS} = 4\text{V}$ ^{Note4} |
| Forward transfer admittance | $ y_{fs} $ | 5 | 8 | — | S | $I_D = 5\text{A}$, $V_{DS} = 10\text{V}$ ^{Note4} |
| Input capacitance | C_{iss} | — | 350 | — | pF | $V_{DS} = 10\text{V}$ |
| Output capacitance | C_{oss} | — | 190 | — | pF | $V_{GS} = 0$ |
| Reverse transfer capacitance | C_{rss} | — | 70 | — | pF | $f = 1\text{MHz}$ |
| Turn-on delay time | $t_{d(on)}$ | — | 10 | — | ns | $I_D = 5\text{A}$, $V_{GS} = 10\text{V}$ |
| Rise time | t_r | — | 55 | — | ns | $R_L = 6\Omega$ |
| Turn-off delay time | $t_{d(off)}$ | — | 60 | — | ns | |
| Fall time | t_f | — | 70 | — | ns | |
| Body-drain diode forward voltage | V_{DF} | — | 0.9 | — | V | $I_F = 10\text{A}$, $V_{GS} = 0$ |
| Body-drain diode reverse recovery time | t_{rr} | — | 50 | — | ns | $I_F = 10\text{A}$, $V_{GS} = 0$ $diF/dt = 50\text{A}/\mu\text{s}$ |

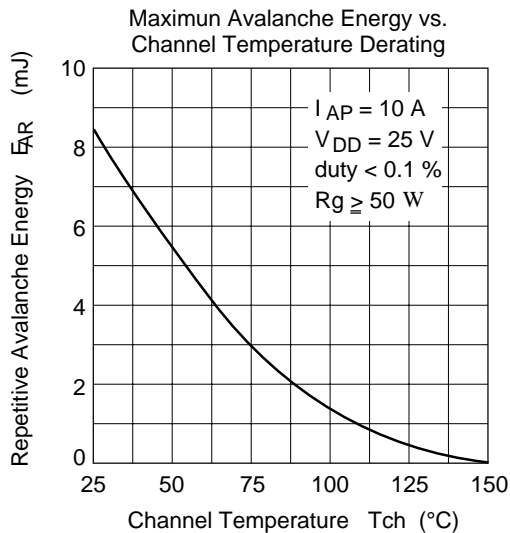
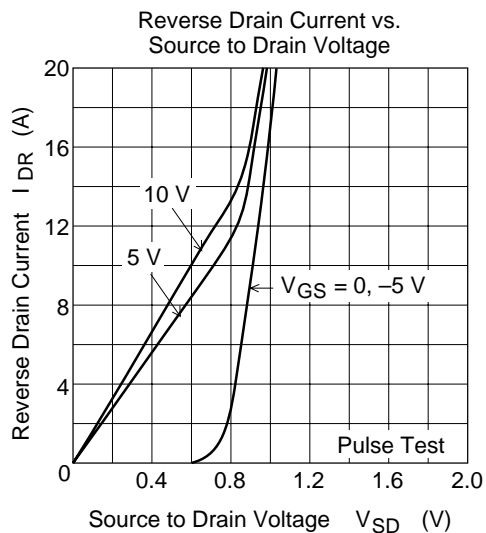
Note: 4. Pulse test

Main Characteristics

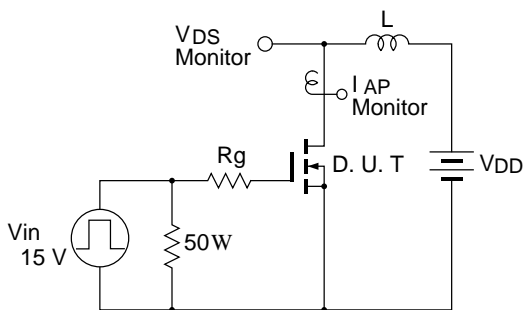






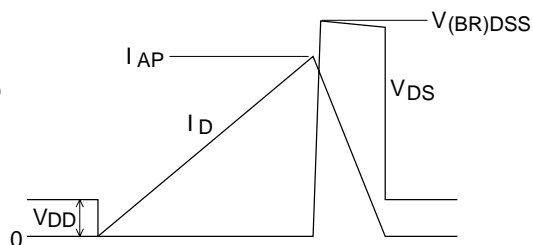


Avalanche Test Circuit

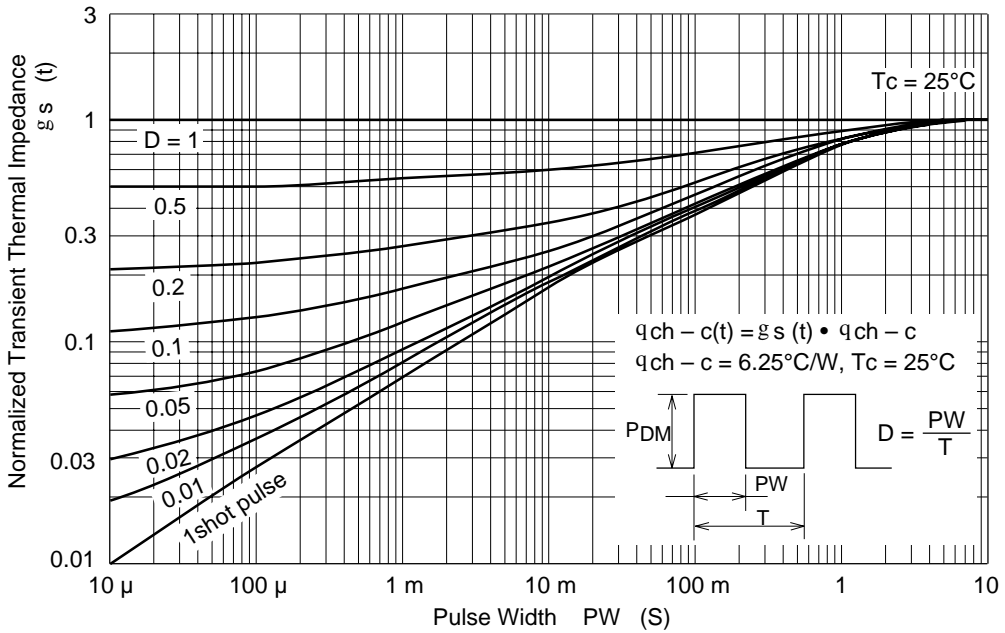


Avalanche Waveform

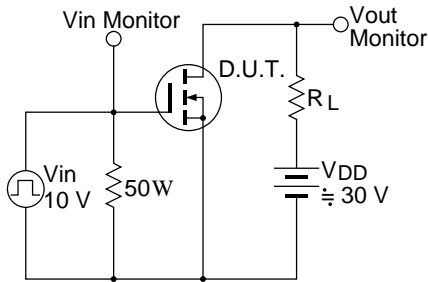
$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



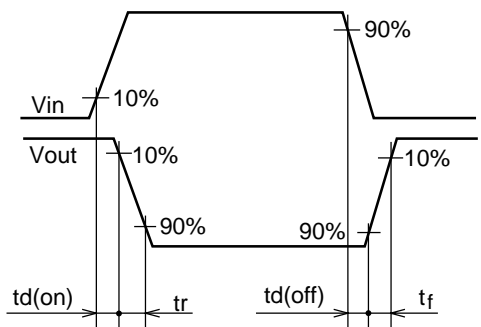
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

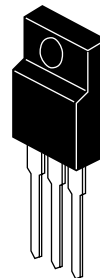
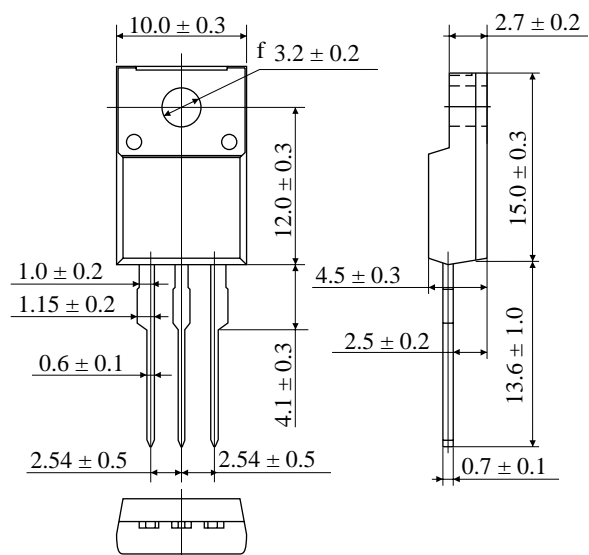


Waveform



Package Dimensions

Unit: mm



| | |
|--------------|-----------|
| Hitachi Code | TO-220CFM |
| EIAJ | — |
| JEDEC | — |

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