

# 2SK3229

Silicon N Channel MOS FET  
High Speed Power Switching

# HITACHI

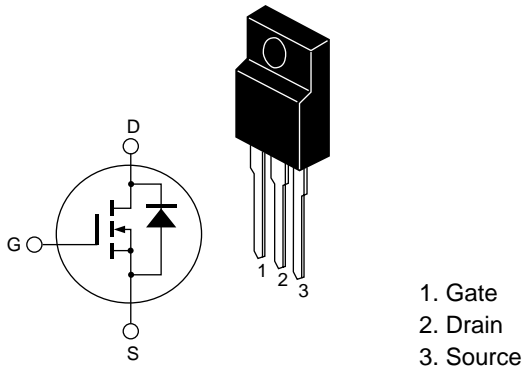
ADE-208-766(Z)  
Target specification  
1st. Edition  
December 1998

## Features

- Low on-resistance  
 $R_{DS(on)} = 6m\Omega$  typ.
- Low drive current
- 4V gate drive device can be driven from 5V source

## Outline

TO-220CFM



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

| <b>Item</b>                            | <b>Symbol</b>       | <b>Ratings</b> | <b>Unit</b>      |
|--|---------------------|----------------|------------------|
| Drain to source voltage                | $V_{DSS}$           | 80             | V                |
| Gate to source voltage                 | $V_{GSS}$           | $\pm 20$       | V                |
| Drain current                          | $I_D$               | 60             | A                |
| Drain peak current                     | $I_{D(pulse)}^{*1}$ | 240            | A                |
| Body-drain diode reverse drain current | $I_{DR}$            | 60             | A                |
| Avalanche current                      | $I_{AP}^{*3}$       | 50             | A                |
| Avalanche energy                       | $E_{AR}^{*3}$       | 181            | mJ               |
| Channel dissipation                    | $P_{ch}^{*2}$       | 35             | 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  $T_{ch} = 25^\circ\text{C}$ ,  $R_g \geq 50\Omega$

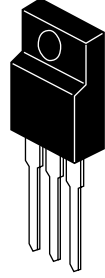
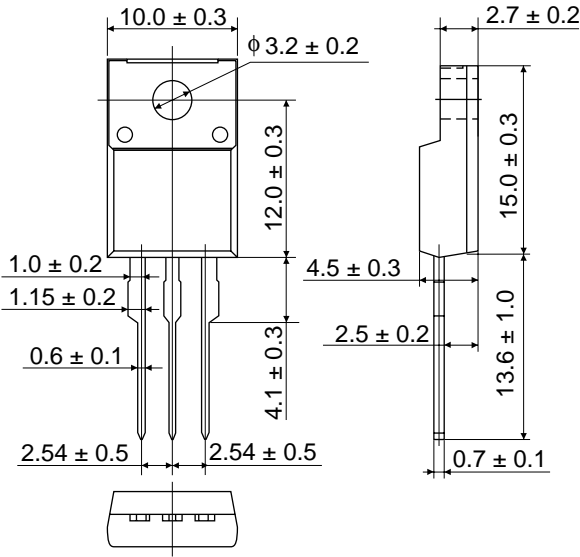
## Electrical Characteristics (Ta = 25°C)

| Item                                       | Symbol        | Min | Typ  | Max       | Unit             | Test Conditions   |
|--|---------------|-----|------|-----------|------------------|---|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 80  | —    | —         | V                | $I_D = 10\text{mA}, V_{GS} = 0$                                     |
| Gate to source leak current                | $I_{GSS}$     | —   | —    | $\pm 0.1$ | $\mu\text{A}$    | $V_{GS} = \pm 20\text{V}, V_{DS} = 0$                               |
| Zero gate voltage drain current            | $I_{DSS}$     | —   | —    | 10        | $\mu\text{A}$    | $V_{DS} = 80\text{V}, V_{GS} = 0$                                   |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 1.0 | —    | 2.5       | V                | $I_D = 1\text{mA}, V_{DS} = 10\text{V}^{*1}$                        |
| Static drain to source on state resistance | $R_{DS(on)}$  | —   | 6.0  | 7.5       | $\text{m}\Omega$ | $I_D = 30\text{A}, V_{GS} = 10\text{V}^{*1}$                        |
|  |               | —   | 8.0  | 12        | $\text{m}\Omega$ | $I_D = 30\text{A}, V_{GS} = 4\text{V}^{*1}$                         |
| Forward transfer admittance                | $ y_{fs} $    | 50  | 85   | —         | S                | $I_D = 30\text{A}, V_{DS} = 10\text{V}^{*1}$                        |
| Input capacitance                          | $C_{iss}$     | —   | 9700 | —         | pF               | $V_{DS} = 10\text{V}$   |
| Output capacitance                         | $C_{oss}$     | —   | 1250 | —         | pF               | $V_{GS} = 0$  |
| Reverse transfer capacitance               | $C_{rss}$     | —   | 290  | —         | pF               | $f = 1\text{MHz}$   |
| Total gate charge                          | $Q_g$         | —   | 150  | —         | nc               | $V_{DD} = 25\text{V}$   |
| Gate to source charge                      | $Q_{gs}$      | —   | 30   | —         | nc               | $V_{GS} = 25\text{V}$   |
| Gate to drain charge                       | $Q_{gd}$      | —   | 30   | —         | nc               | $I_D = 60\text{A}$  |
| Turn-on delay time                         | $t_{d(on)}$   | —   | 80   | —         | ns               | $V_{GS} = 10\text{V}, I_D = 30\text{A}$                             |
| Rise time                                  | $t_r$         | —   | 280  | —         | ns               | $R_L = 1\Omega$   |
| Turn-off delay time                        | $t_{d(off)}$  | —   | 780  | —         | ns               |   |
| Fall time                                  | $t_f$         | —   | 340  | —         | ns               |   |
| Body-drain diode forward voltage           | $V_{DF}$      | —   | 1.0  | —         | V                | $I_F = 60\text{A}, V_{GS} = 0$                                      |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —   | 80   | —         | ns               | $I_F = 60\text{A}, V_{GS} = 0$<br>$diF/dt = 50\text{A}/\mu\text{s}$ |

Note: 1. Pulse test

Package Dimensions

Unit: mm



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

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