

# 2SK2729

Silicon N Channel MOS FET  
High Speed Power Switching

# HITACHI

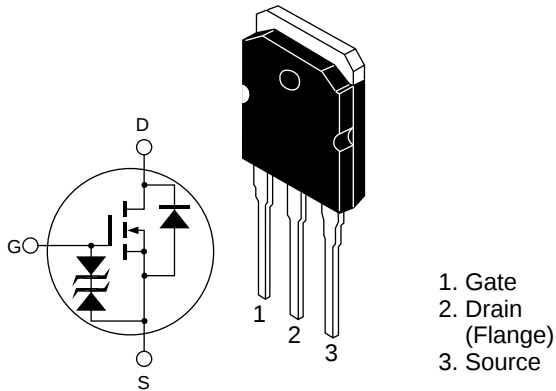
ADE-208-455 A  
2nd. Edition

## Features

- Low on-resistance
- High speed switching
- Low drive current
- Avalanche ratings

## Outline

TO-3P



Absolute Maximum Ratings (Ta = 25°C)

| Item                                      | Symbol                              | Ratings     | Unit |
|-------------------------------------------|-------------------------------------|-------------|------|
| Drain to source voltage                   | V <sub>DSS</sub>                    | 500         | V    |
| Gate to source voltage                    | V <sub>GSS</sub>                    | ±30         | V    |
| Drain current                             | I <sub>D</sub>                      | 20          | A    |
| Drain peak current                        | I <sub>D(pulse)</sub> <sup>*1</sup> | 80          | A    |
| Body to drain diode reverse drain current | I <sub>DR</sub>                     | 20          | A    |
| Avalanche current                         | I <sub>AP</sub> <sup>*3</sup>       | 20          | A    |
| Avalanche energy                          | E <sub>AR</sub> <sup>*3</sup>       | 22          | mJ   |
| Channel dissipation                       | Pch <sup>*2</sup>                   | 150         | W    |
| Channel temperature                       | Tch                                 | 150         | °C   |
| Storage temperature                       | Tstg                                | −55 to +150 | °C   |

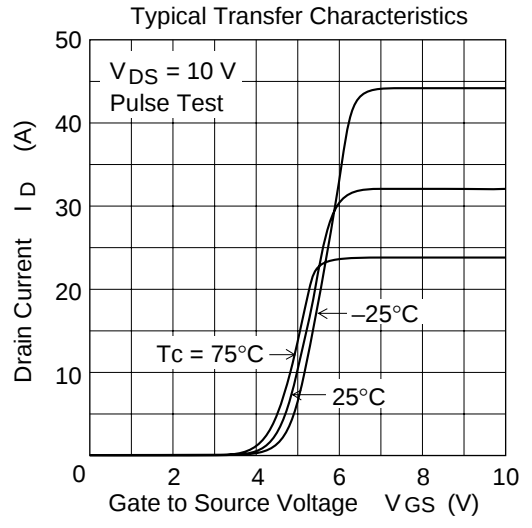
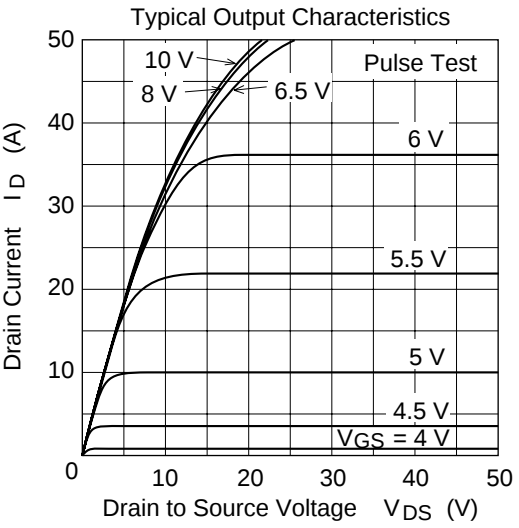
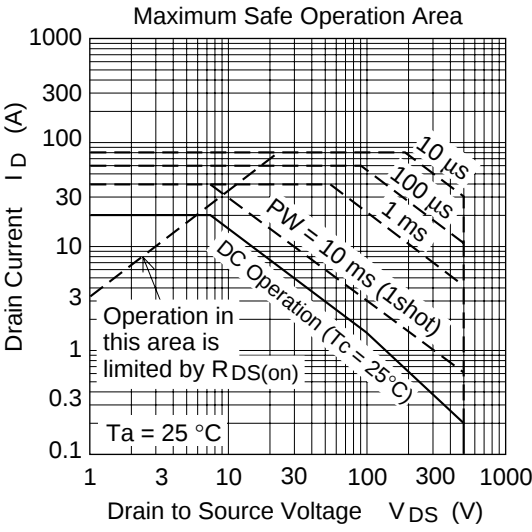
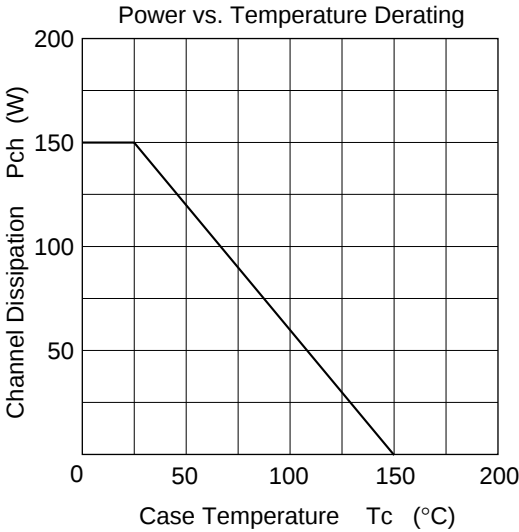
Notes: 1. PW ≤ 10μs, duty cycle ≤ 1 %  
2. Value at Tc = 25°C  
3. Value at Tch = 25°C, Rg ≥ 50Ω

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

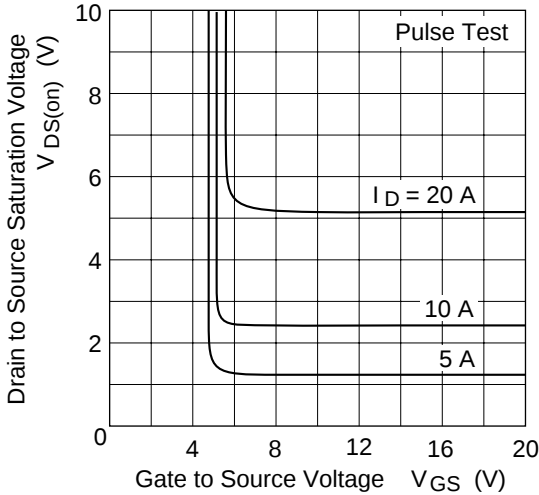
| Item                                       | Symbol        | Min | Typ  | Max  | Unit | Test Conditions                                                          |
|--------------------------------------------|---------------|-----|------|------|------|--------------------------------------------------------------------------|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 500 | —    | —    | V    | $I_D = 10\text{mA}$ , $V_{GS} = 0$                                       |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$ | ±30 | —    | —    | V    | $I_G = \pm 100\mu\text{A}$ , $V_{DS} = 0$                                |
| Gate to source leak current                | $I_{GSS}$     | —   | —    | ±10  | μA   | $V_{GS} = \pm 25\text{V}$ , $V_{DS} = 0$                                 |
| Zero gate voltage drain current            | $I_{DSS}$     | —   | —    | 10   | μA   | $V_{DS} = 500\text{V}$ , $V_{GS} = 0$                                    |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 2.5 | —    | 3.5  | V    | $I_D = 1\text{mA}$ , $V_{DS} = 10\text{V}^{*1}$                          |
| Static drain to source on state resistance | $R_{DS(on)}$  | —   | 0.24 | 0.29 | Ω    | $I_D = 10\text{A}$ , $V_{GS} = 10\text{V}^{*1}$                          |
| Forward transfer admittance                | $ y_{fs} $    | 9   | 15   | —    | S    | $I_D = 10\text{A}$ , $V_{DS} = 10\text{V}^{*1}$                          |
| Input capacitance                          | $C_{iss}$     | —   | 3300 | —    | pF   | $V_{DS} = 10\text{V}$                                                    |
| Output capacitance                         | $C_{oss}$     | —   | 900  | —    | pF   | $V_{GS} = 0$                                                             |
| Reverse transfer capacitance               | $C_{rss}$     | —   | 120  | —    | pF   | $f = 1\text{MHz}$                                                        |
| Total gate charge                          | $Q_g$         | —   | 55   | —    | nc   | $V_{DD} = 400\text{V}$                                                   |
| Gate to source charge                      | $Q_{gs}$      | —   | 14   | —    | nc   | $V_{GS} = 10\text{V}$                                                    |
| Gate to drain charge                       | $Q_{gd}$      | —   | 17   | —    | nc   | $I_D = 20\text{A}$                                                       |
| Turn-on delay time                         | $t_{d(on)}$   | —   | 45   | —    | ns   | $V_{GS} = 10\text{V}$ , $I_D = 10\text{A}$                               |
| Rise time                                  | $t_r$         | —   | 140  | —    | ns   | $R_L = 3\Omega$                                                          |
| Turn-off delay time                        | $t_{d(off)}$  | —   | 150  | —    | ns   |                                                                          |
| Fall time                                  | $t_f$         | —   | 85   | —    | ns   |                                                                          |
| Body to drain diode forward voltage        | $V_{DF}$      | —   | 1.0  | —    | V    | $I_D = 20\text{A}$ , $V_{GS} = 0$                                        |
| Body to drain diode reverse recovery time  | $t_{rr}$      | —   | 400  | —    | ns   | $I_F = 20\text{A}$ , $V_{GS} = 0$<br>$di_F/dt = 100\text{A}/\mu\text{s}$ |

Note: 1. Pulse test

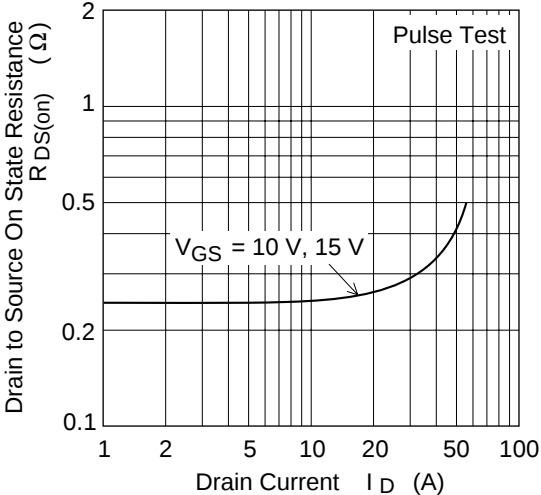
Main Characteristics



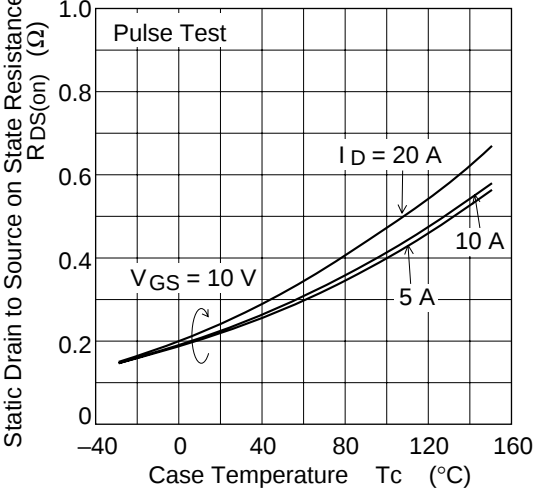
Drain to Source Saturation Voltage vs.  
Gate to Source Voltage



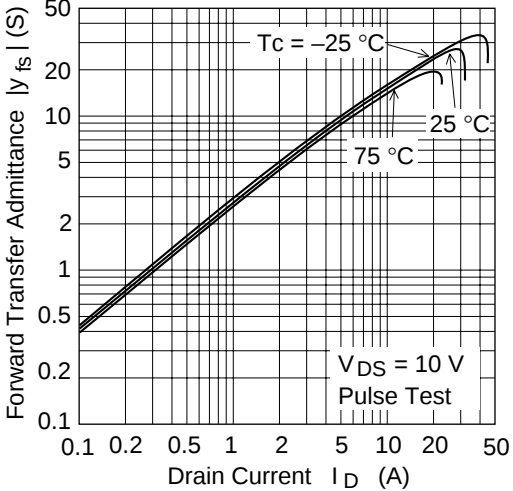
Static Drain to Source on State Resistance  
vs. Drain Current



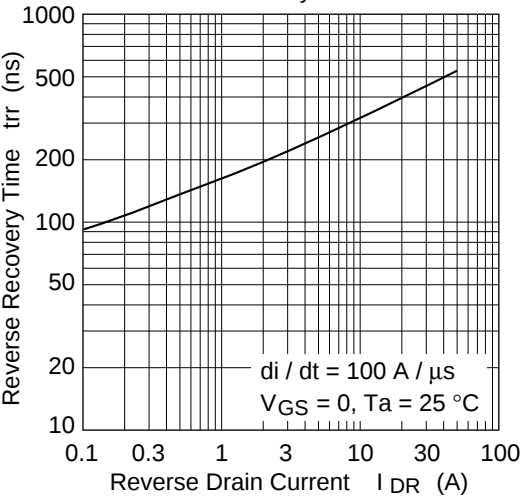
Static Drain to Source on State Resistance  
vs. Temperature



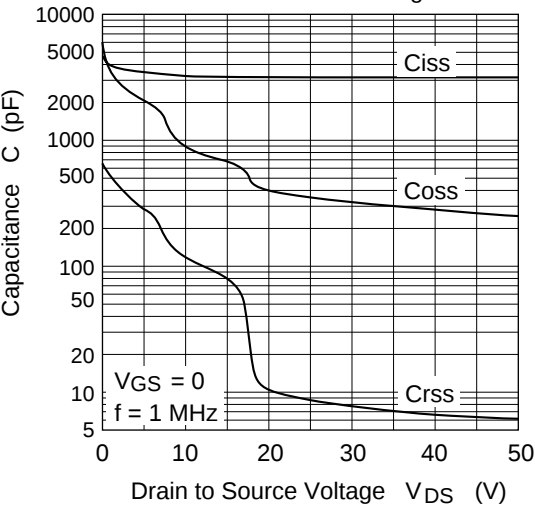
Forward Transfer Admittance vs.  
Drain Current



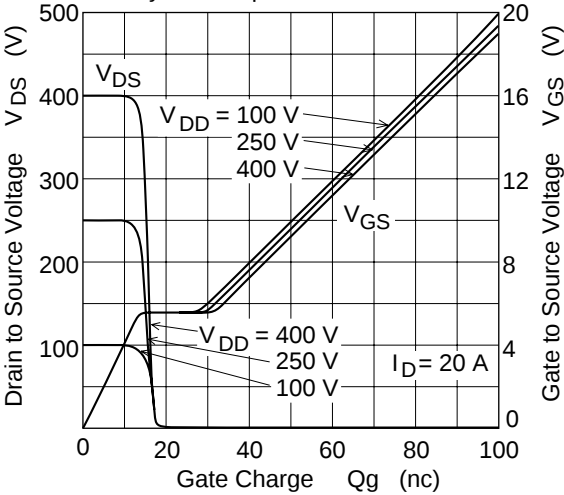
Body to Drain Diode Reverse Recovery Time



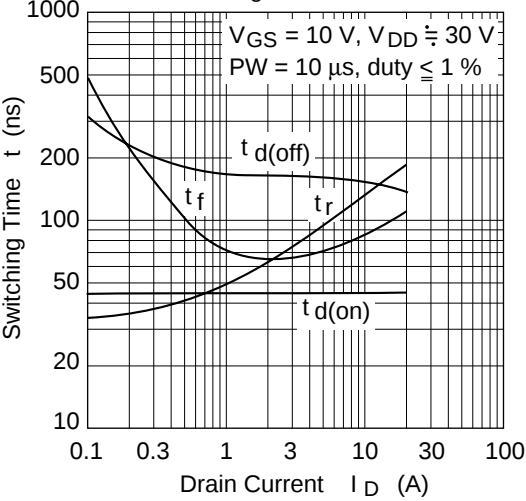
Typical Capacitance vs. Drain to Source Voltage

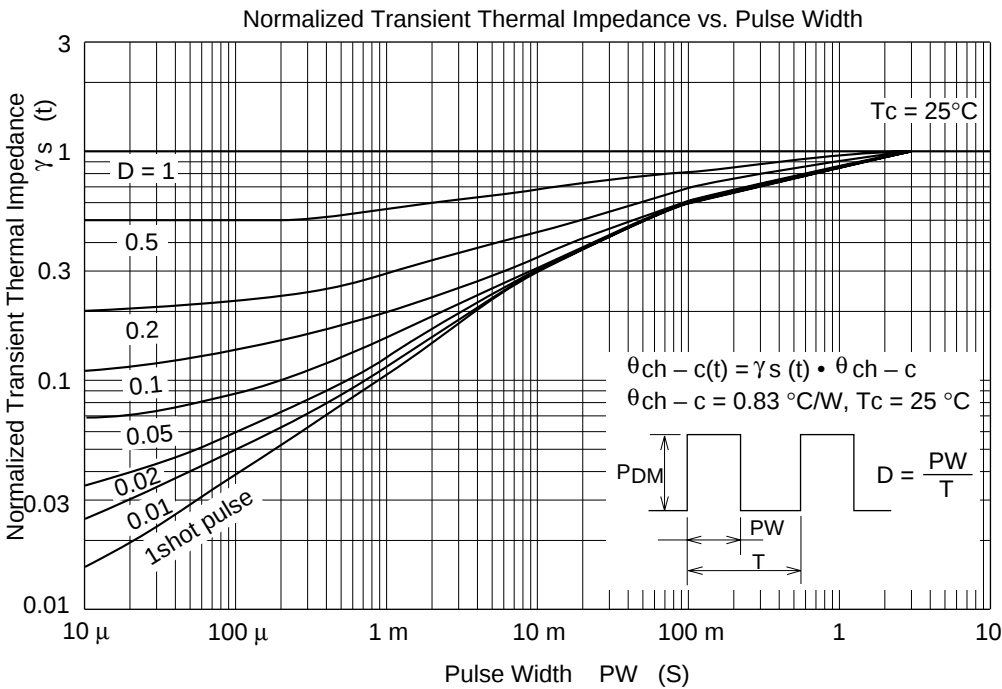
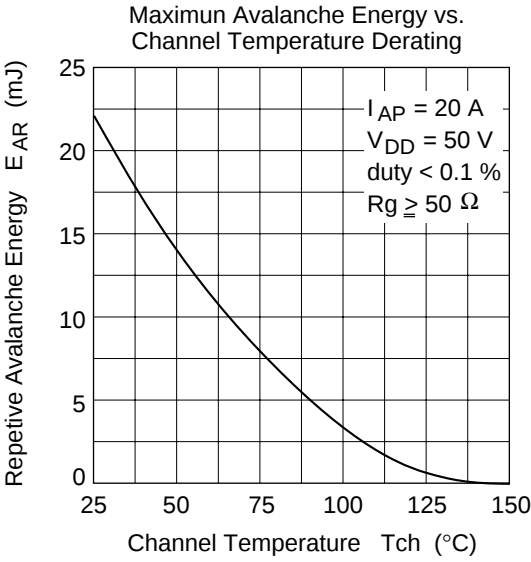
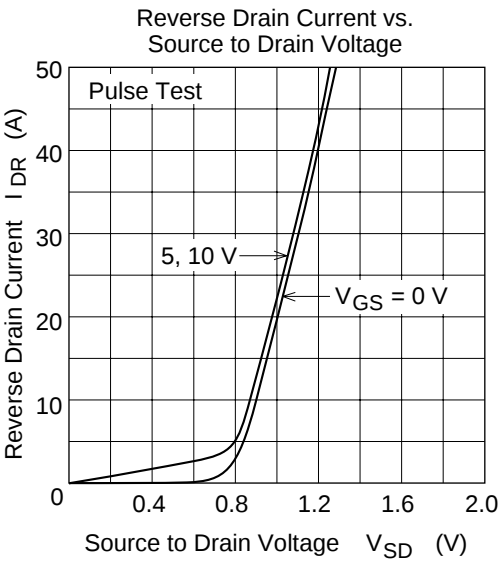


Dynamic Input Characteristics

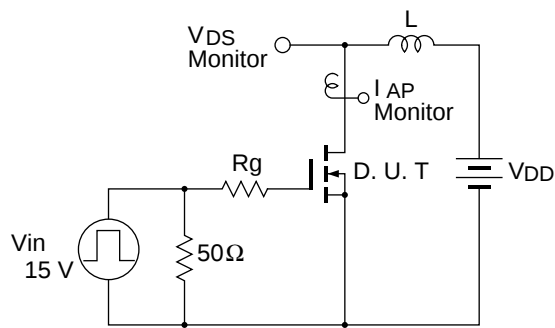


Switching Characteristics

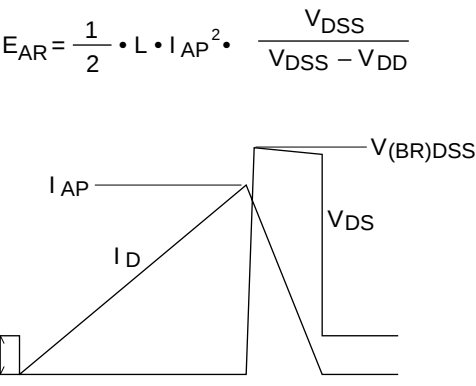




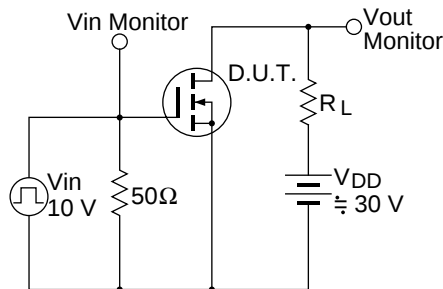
Avalanche Test Circuit



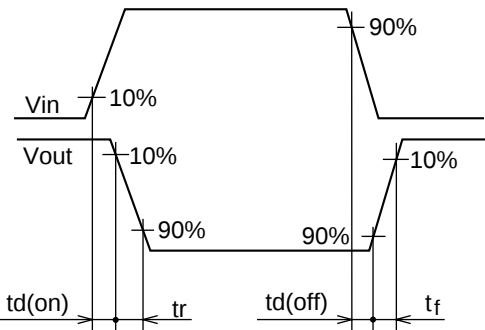
Avalanche Waveform



Switching Time Test Circuit

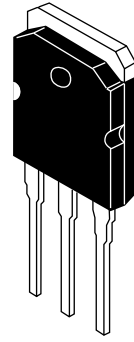
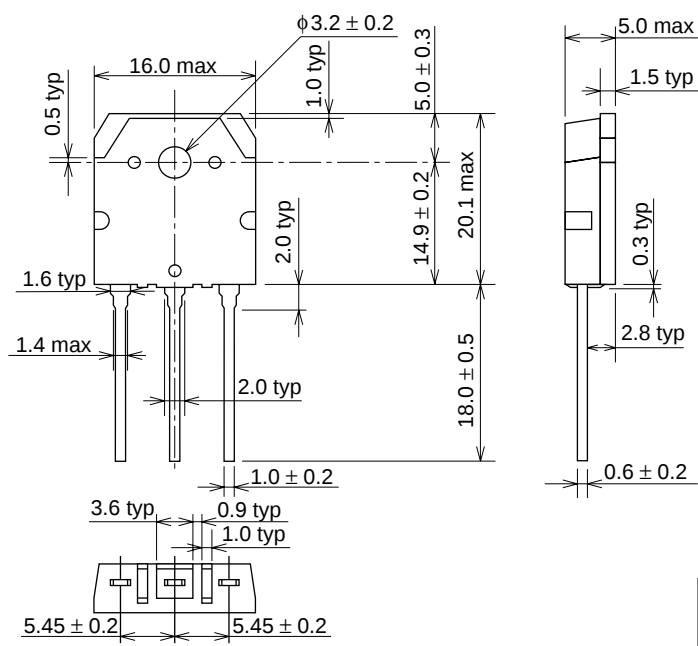


Switching Time Waveform



Package Dimentions

Unit: mm



|              |       |
|--------------|-------|
| Hitachi Code | TO-3P |
| EIAJ         | SC-65 |
| JEDEC        | —     |

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## Hitachi, Ltd.

Semiconductor & Integrated Circuits.  
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan  
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

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Hitachi Asia (Hong Kong) Ltd.  
Group III (Electronic Components)  
7/F., North Tower, World Finance Centre,  
Harbour City, Canton Road, Tsim Sha Tsui,  
Kowloon, Hong Kong  
Tel: <852> (2) 735 9218  
Fax: <852> (2) 730 0281  
Telex: 40815 HITEC HX

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