



# MCH6421

N-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 1.8V drive.

### Specifications

#### Absolute Maximum Ratings at Ta=25°C

| Parameter                   | Symbol           | Conditions   | Ratings     | Unit |
|-----------------------------|------------------|--|-------------|------|
| Drain-to-Source Voltage     | V <sub>DSS</sub> |  | 20          | V    |
| Gate-to-Source Voltage      | V <sub>GSS</sub> |  | ±12         | V    |
| Drain Current (DC)          | I <sub>D</sub>   |  | 5.5         | A    |
| Drain Current (Pulse)       | I <sub>DP</sub>  | PW≤10μs, duty cycle≤1%   | 22          | A    |
| Allowable Power Dissipation | P <sub>D</sub>   | When mounted on ceramic substrate (1200mm <sup>2</sup> ×0.8mm) | 1.5         | W    |
| Channel Temperature         | T <sub>ch</sub>  |  | 150         | °C   |
| Storage Temperature         | T <sub>stg</sub> |  | -55 to +150 | °C   |

#### Electrical Characteristics at Ta=25°C

| Parameter                                  | Symbol               | Conditions                                  | Ratings |     |     | Unit |
|--|----------------------|---|---------|-----|-----|------|
|  |                      |   | min     | typ | max |      |
| Drain-to-Source Breakdown Voltage          | V(BR)DSS             | I <sub>D</sub> =1mA, V <sub>GS</sub> =0V    | 20      |     |     | V    |
| Zero-Gate Voltage Drain Current            | I <sub>DSS</sub>     | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V   |         |     | 1   | μA   |
| Gate-to-Source Leakage Current             | I <sub>GSS</sub>     | V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V   |         |     | ±10 | μA   |
| Cutoff Voltage                             | V <sub>GS(off)</sub> | V <sub>DS</sub> =10V, I <sub>D</sub> =1mA   | 0.4     |     | 1.3 | V    |
| Forward Transfer Admittance                | y <sub>fs</sub>      | V <sub>DS</sub> =10V, I <sub>D</sub> =2A    | 2.0     | 3.8 |     | S    |
| Static Drain-to-Source On-State Resistance | R <sub>DS(on)1</sub> | I <sub>D</sub> =2A, V <sub>GS</sub> =4.5V   |         | 29  | 38  | mΩ   |
|  | R <sub>DS(on)2</sub> | I <sub>D</sub> =1A, V <sub>GS</sub> =2.5V   |         | 43  | 61  | mΩ   |
|  | R <sub>DS(on)3</sub> | I <sub>D</sub> =0.5A, V <sub>GS</sub> =1.8V |         | 69  | 99  | mΩ   |

Marking : KV

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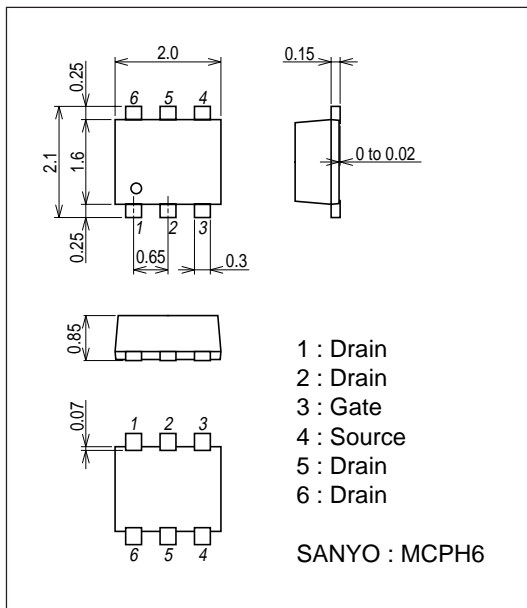
# MCH6421

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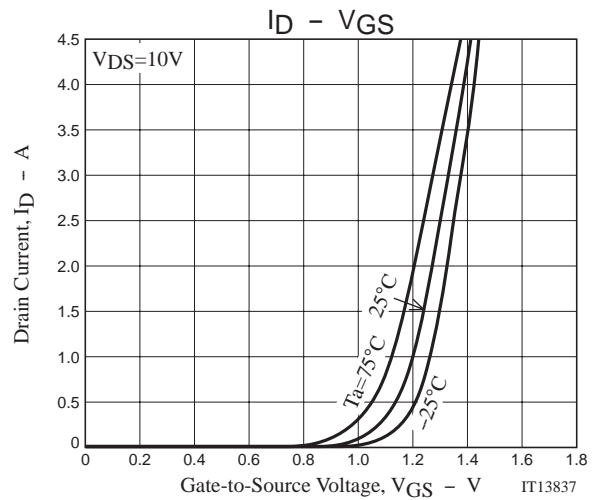
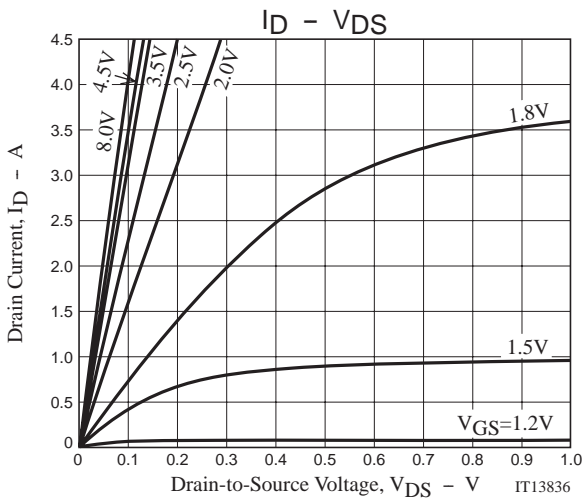
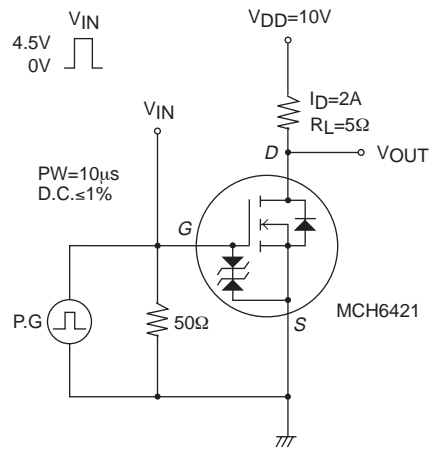
| Parameter                     | Symbol              | Conditions  | Ratings |     |     | Unit |
|-------------------------------|---------------------|---|---------|-----|-----|------|
|                               |                     |   | min     | typ | max |      |
| Input Capacitance             | Ciss                | V <sub>DS</sub> =10V, f=1MHz                                      |         | 410 |     | pF   |
| Output Capacitance            | Coss                | V <sub>DS</sub> =10V, f=1MHz                                      |         | 84  |     | pF   |
| Reverse Transfer Capacitance  | Crss                | V <sub>DS</sub> =10V, f=1MHz                                      |         | 59  |     | pF   |
| Turn-ON Delay Time            | t <sub>d(on)</sub>  | See specified Test Circuit.                                       |         | 7.5 |     | ns   |
| Rise Time                     | t <sub>r</sub>      | See specified Test Circuit.                                       |         | 26  |     | ns   |
| Turn-OFF Delay Time           | t <sub>d(off)</sub> | See specified Test Circuit.                                       |         | 38  |     | ns   |
| Fall Time                     | t <sub>f</sub>      | See specified Test Circuit.                                       |         | 32  |     | ns   |
| Total Gate Charge             | Qg                  | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.5A |         | 5.1 |     | nC   |
| Gate-to-Source Charge         | Qgs                 | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.5A |         | 0.7 |     | nC   |
| Gate-to-Drain "Miller" Charge | Qgd                 | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.5A |         | 1.7 |     | nC   |
| Diode Forward Voltage         | V <sub>SD</sub>     | I <sub>S</sub> =5.5A, V <sub>GS</sub> =0V                         |         | 0.8 | 1.2 | V    |

## Package Dimensions

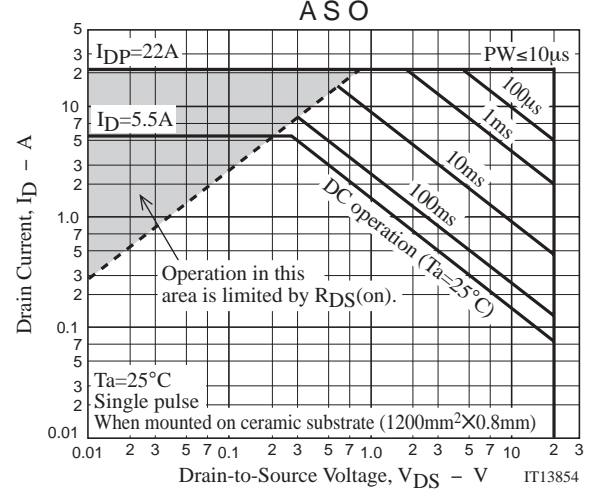
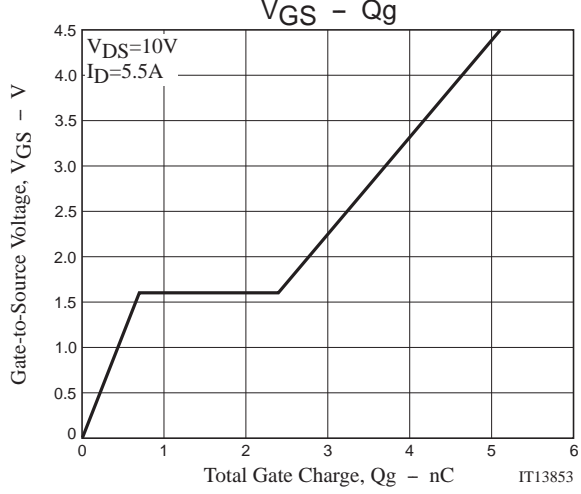
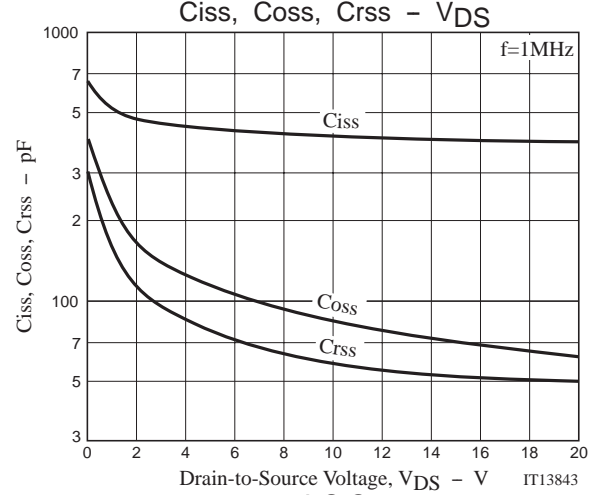
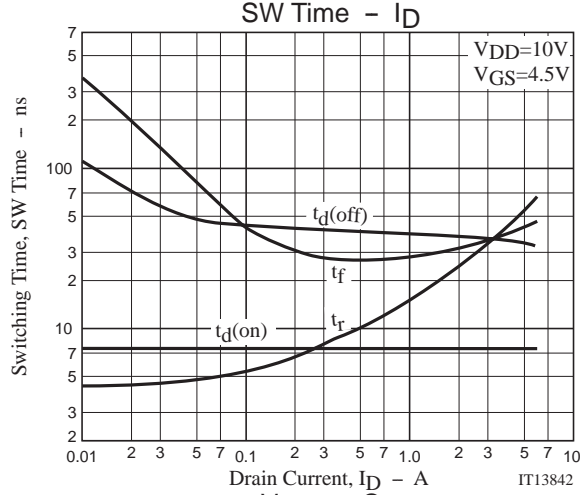
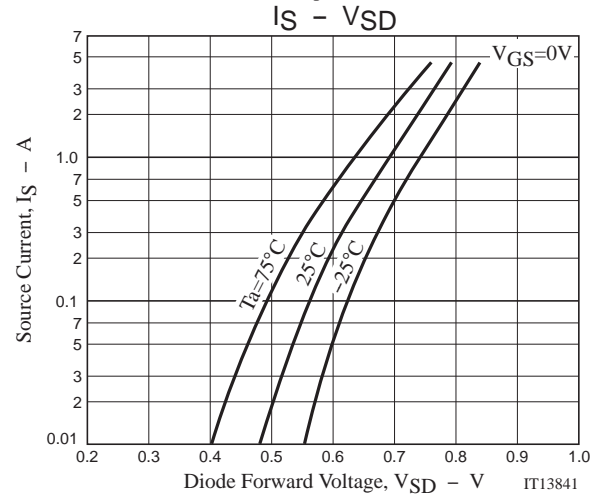
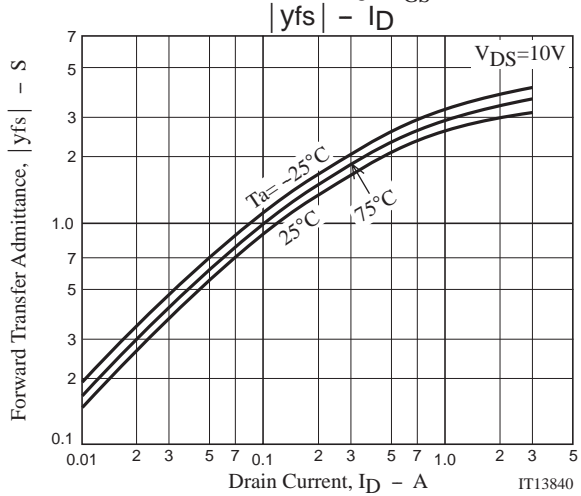
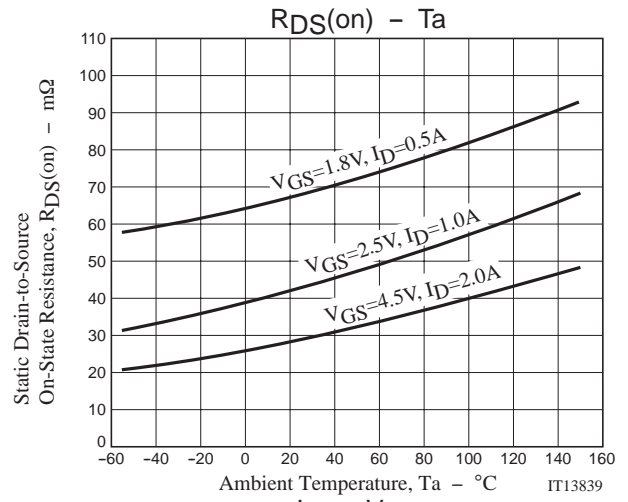
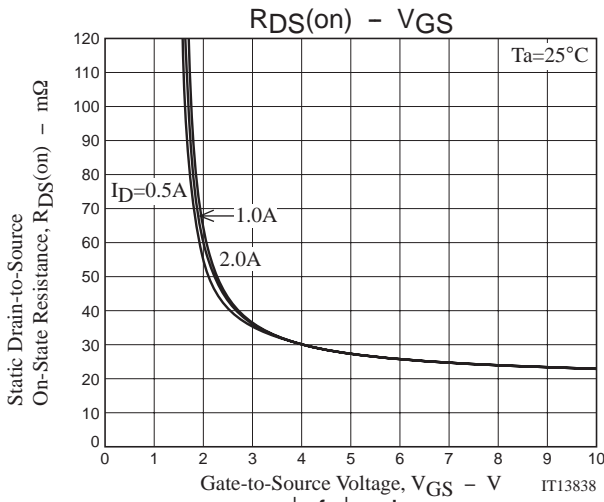
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7022A-009



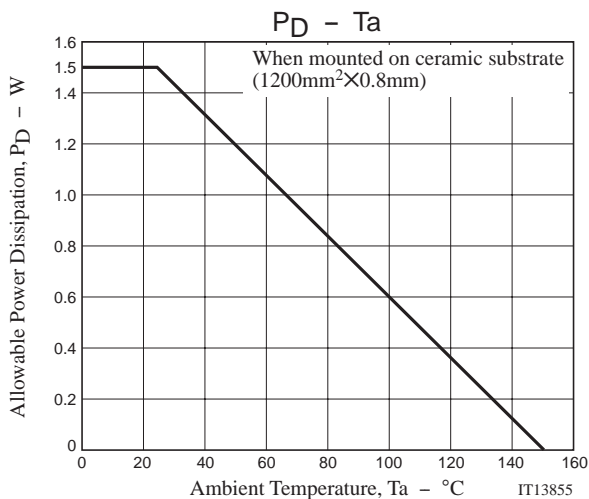
## Switching Time Test Circuit



# MCH6421



## MCH6421



Note on usage : Since the MCH6421 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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