



# CPH6438 — N-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- 1.5V drive.

### Specifications

Absolute Maximum Ratings at Ta=25°C

| Parameter                   | Symbol           | Conditions                                              | Ratings     | Unit |
|-----------------------------|------------------|---------------------------------------------------------|-------------|------|
| Drain-to-Source Voltage     | V <sub>DSS</sub> |                                                         | 60          | V    |
| Gate-to-Source Voltage      | V <sub>GSS</sub> |                                                         | ±10         | V    |
| Drain Current (DC)          | I <sub>D</sub>   |                                                         | 200         | mA   |
| Drain Current (Pulse)       | I <sub>DP</sub>  | PW≤10μs, duty cycle≤1%                                  | 800         | mA   |
| Allowable Power Dissipation | P <sub>D</sub>   | Mounted on a ceramic board (1200mm <sup>2</sup> ×0.8mm) | 1.3         | 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    | 60      |     |     | V    |
| Zero-Gate Voltage Drain Current            | I <sub>DSS</sub>     | V <sub>DS</sub> =60V, 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> =100μA | 0.4     |     | 1.3 | V    |
| Forward Transfer Admittance                | y <sub>fs</sub>      | V <sub>DS</sub> =10V, I <sub>D</sub> =100mA | 280     | 480 |     | mS   |
| Static Drain-to-Source On-State Resistance | R <sub>DS(on)1</sub> | I <sub>D</sub> =100mA, V <sub>GS</sub> =4V  |         | 2.2 | 2.9 | Ω    |
|                                            | R <sub>DS(on)2</sub> | I <sub>D</sub> =50mA, V <sub>GS</sub> =2.5V |         | 2.4 | 3.4 | Ω    |
|                                            | R <sub>DS(on)3</sub> | I <sub>D</sub> =10mA, V <sub>GS</sub> =1.8V |         | 3.5 | 7.0 | Ω    |
| Input Capacitance                          | C <sub>iss</sub>     | V <sub>DS</sub> =20V, f=1MHz                |         | 26  |     | pF   |
| Output Capacitance                         | C <sub>oss</sub>     | V <sub>DS</sub> =20V, f=1MHz                |         | 5.9 |     | pF   |
| Reverse Transfer Capacitance               | C <sub>rss</sub>     | V <sub>DS</sub> =20V, f=1MHz                |         | 3.2 |     | pF   |

Marking : ZQ

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# CPH6438

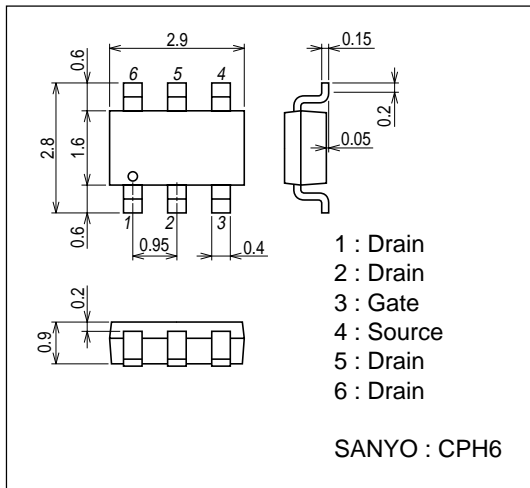
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| Parameter                     | Symbol       | Conditions                         | Ratings |      |     | Unit |
|-------------------------------|--------------|------------------------------------|---------|------|-----|------|
|                               |              |                                    | min     | typ  | max |      |
| Turn-ON Delay Time            | $t_{d(on)}$  | See specified Test Circuit.        |         | 18.5 |     | ns   |
| Rise Time                     | $t_r$        | See specified Test Circuit.        |         | 26   |     | ns   |
| Turn-OFF Delay Time           | $t_{d(off)}$ | See specified Test Circuit.        |         | 146  |     | ns   |
| Fall Time                     | $t_f$        | See specified Test Circuit.        |         | 69   |     | ns   |
| Total Gate Charge             | $Q_g$        | $V_{DS}=30V, V_{GS}=4V, I_D=200mA$ |         | 1.0  |     | nC   |
| Gate-to-Source Charge         | $Q_{gs}$     | $V_{DS}=30V, V_{GS}=4V, I_D=200mA$ |         | 0.20 |     | nC   |
| Gate-to-Drain "Miller" Charge | $Q_{gd}$     | $V_{DS}=30V, V_{GS}=4V, I_D=200mA$ |         | 0.20 |     | nC   |
| Diode Forward Voltage         | $V_{SD}$     | $I_S=200mA, V_{GS}=0V$             |         | 0.83 | 1.2 | V    |

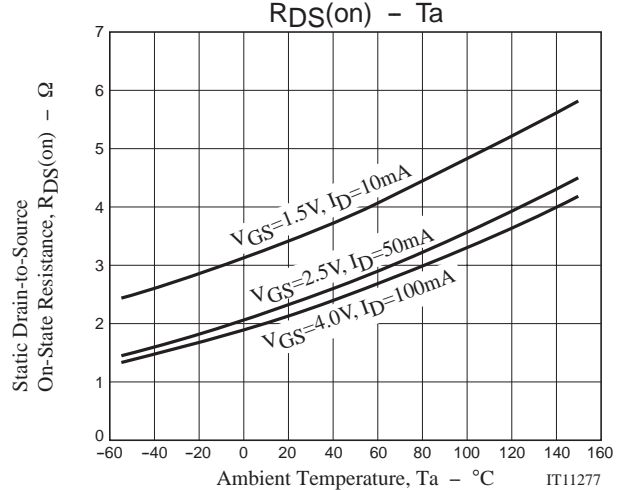
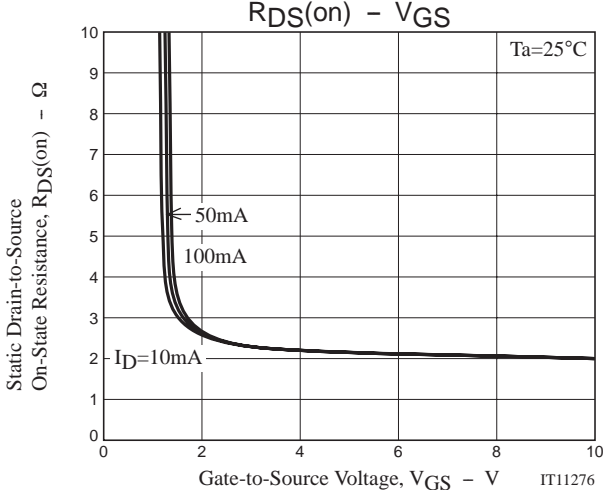
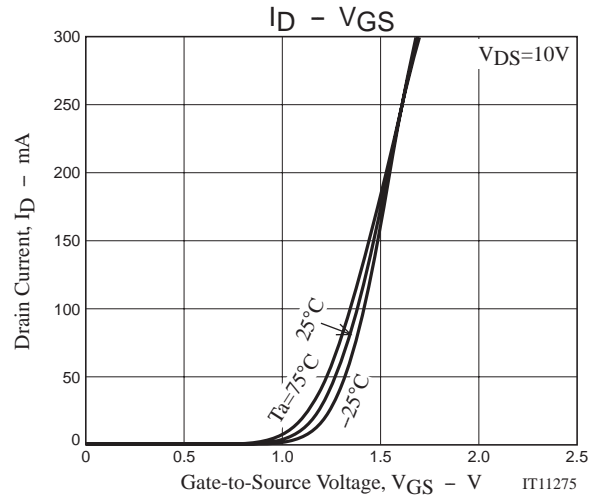
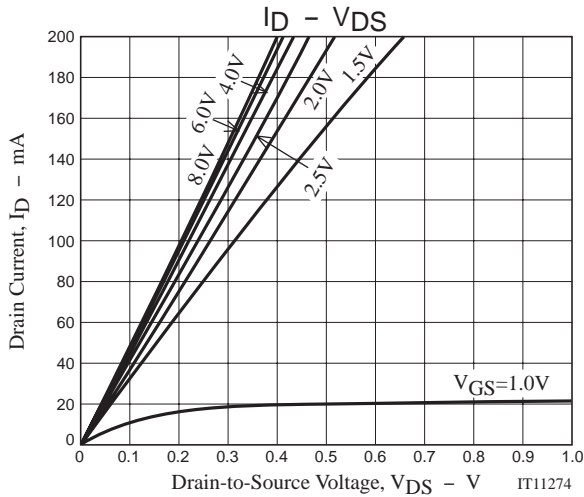
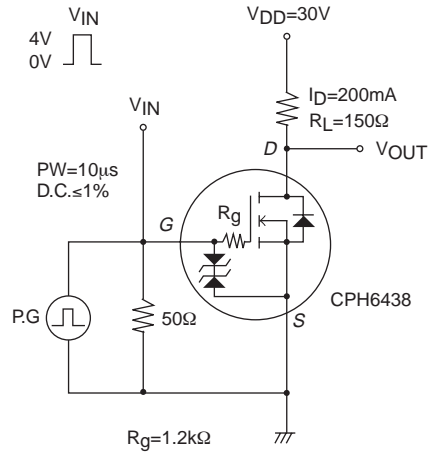
## Package Dimensions

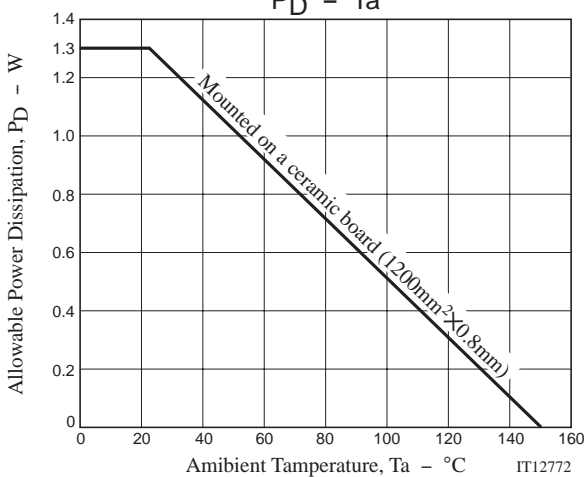
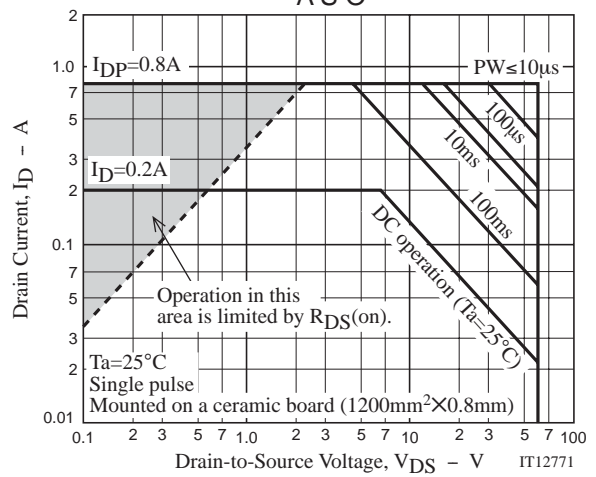
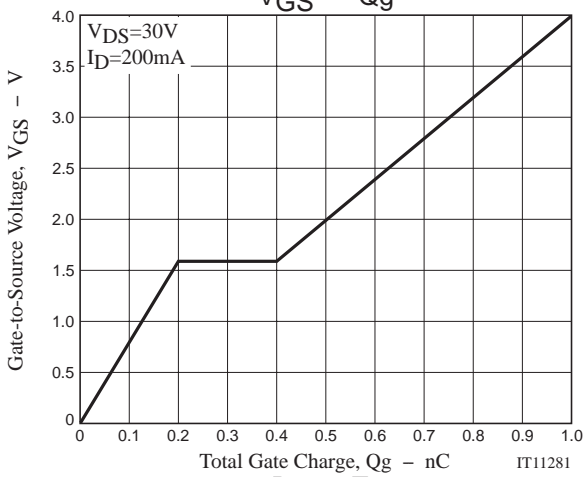
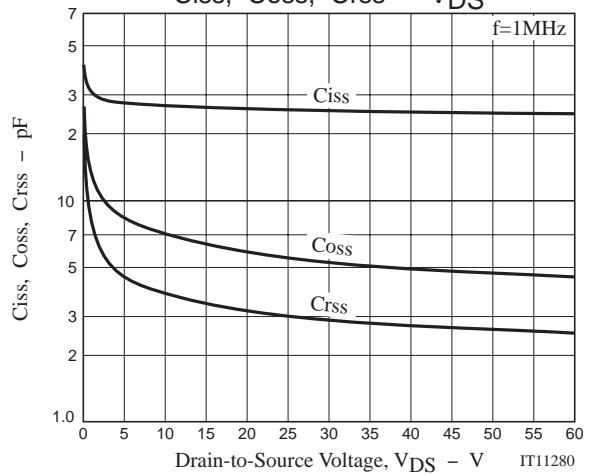
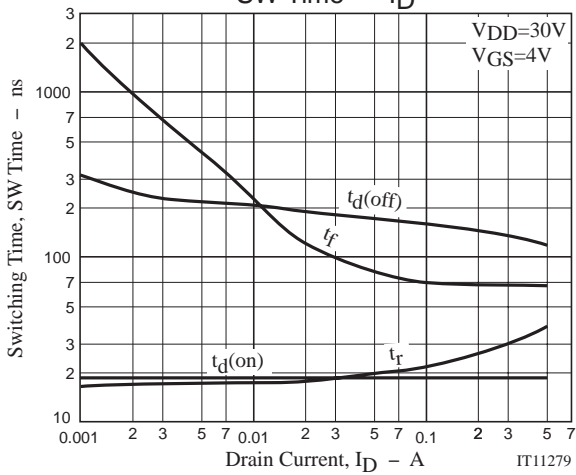
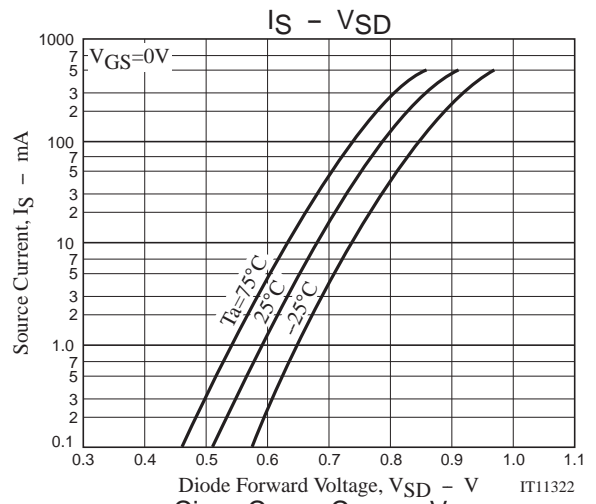
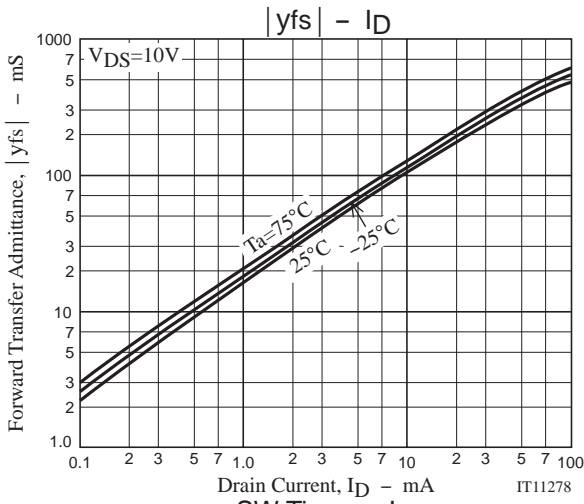
unit : mm (typ)

7018A-003



## Switching Time Test Circuit





Note on usage : Since the CPH6438 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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