



## Ultrahigh-Speed Switching Applications

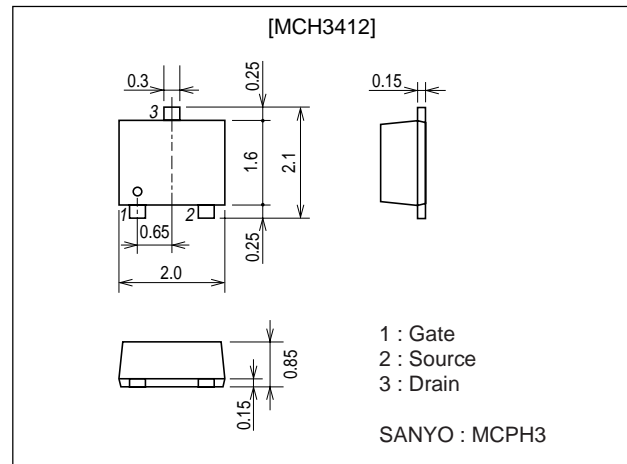
### Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.

### Package Dimensions

unit : mm

2167



### Specifications

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

| Parameter                   | Symbol    | Conditions   | Ratings     | Unit             |
|-----------------------------|-----------|--|-------------|------------------|
| Drain-to-Source Voltage     | $V_{DS}$  |  | 30          | V                |
| Gate-to-Source Voltage      | $V_{GS}$  |  | $\pm 20$    | V                |
| Drain Current (DC)          | $I_D$     |  | 3           | A                |
| Drain Current (Pulse)       | $I_{DP}$  | $PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$        | 12          | A                |
| Allowable Power Dissipation | $P_D$     | Mounted on a ceramic board (900mm <sup>2</sup> X0.8mm) | 1           | W                |
| Channel Temperature         | $T_{ch}$  |  | 150         | $^\circ\text{C}$ |
| Storage Temperature         | $T_{stg}$ |  | -55 to +125 | $^\circ\text{C}$ |

Electrical Characteristics at  $T_a=25^\circ\text{C}$ 

| Parameter                         | Symbol        | Conditions                              | Ratings |     |          | Unit          |
|-----------------------------------|---------------|---|---------|-----|----------|---------------|
|                                   |               |   | min     | typ | max      |               |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D=1\text{mA}$ , $V_{GS}=0$           | 30      |     |          | V             |
| Zero-Gate Voltage Drain Current   | $I_{DSS}$     | $V_{DS}=30\text{V}$ , $V_{GS}=0$        |         |     | 1        | $\mu\text{A}$ |
| Gate-to-Source Leakage Current    | $I_{GSS}$     | $V_{GS}=\pm 16\text{V}$ , $V_{DS}=0$    |         |     | $\pm 10$ | $\mu\text{A}$ |
| Cutoff Voltage                    | $V_{GS(off)}$ | $V_{DS}=10\text{V}$ , $I_D=1\text{mA}$  | 1.2     |     | 2.6      | V             |
| Forward Transfer Admittance       | $ y_{fs} $    | $V_{DS}=10\text{V}$ , $I_D=1.5\text{A}$ | 2.1     | 3   |          | S             |

Marking : KM

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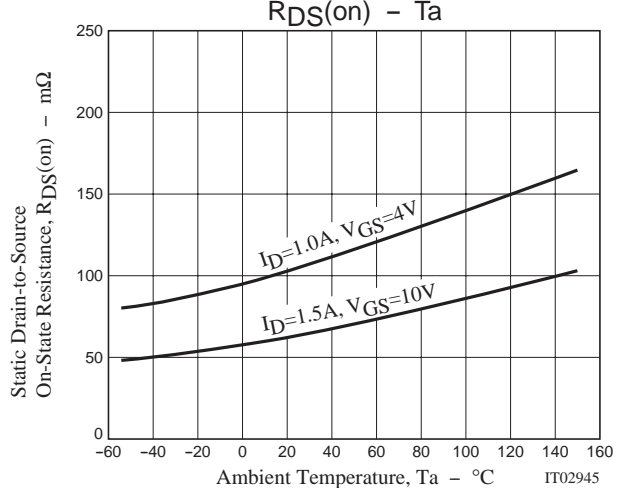
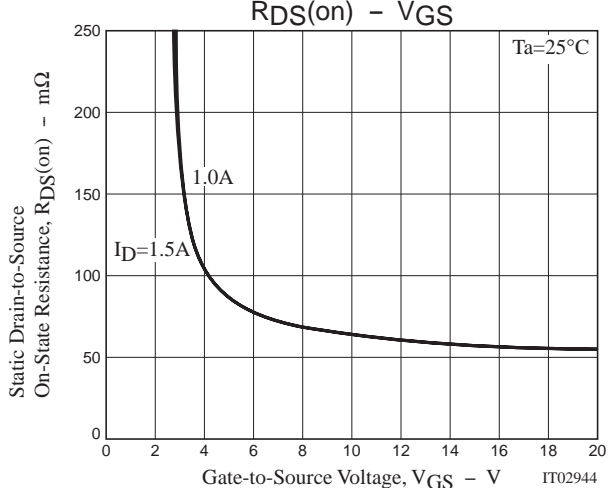
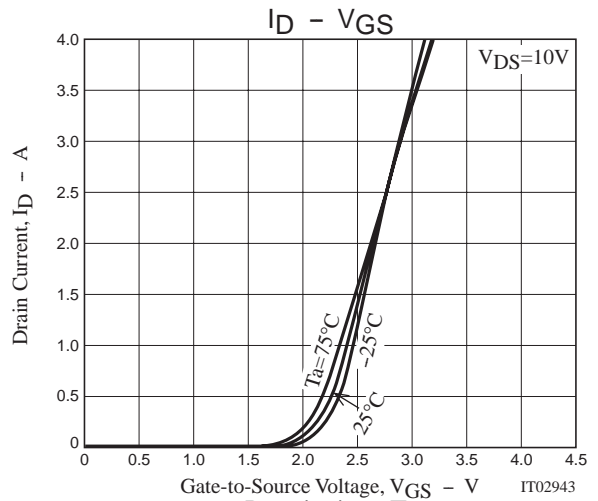
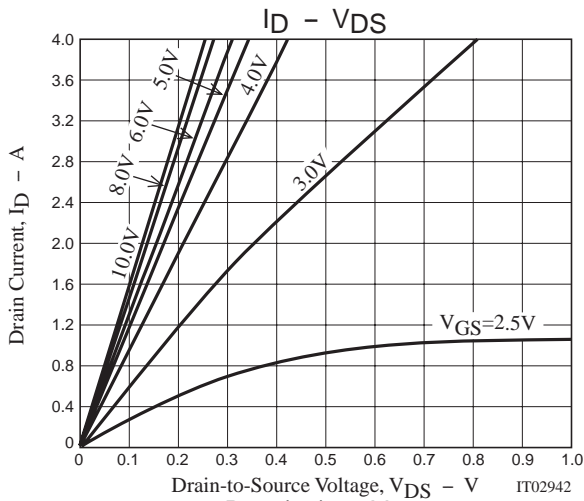
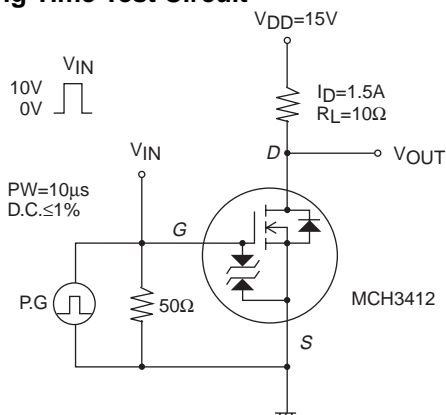
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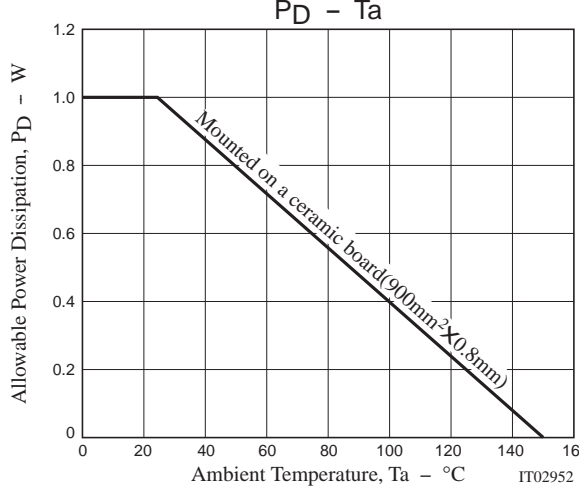
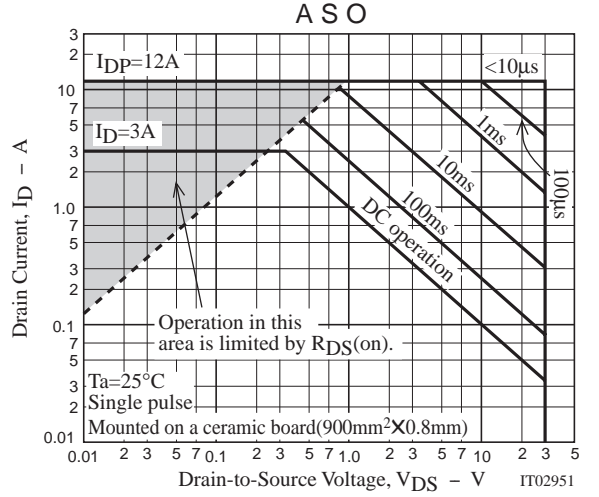
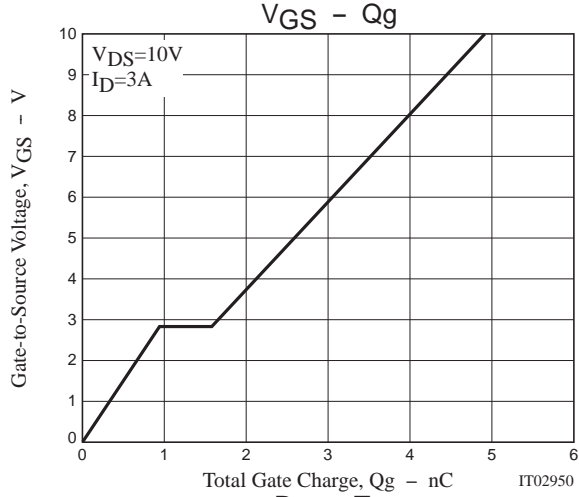
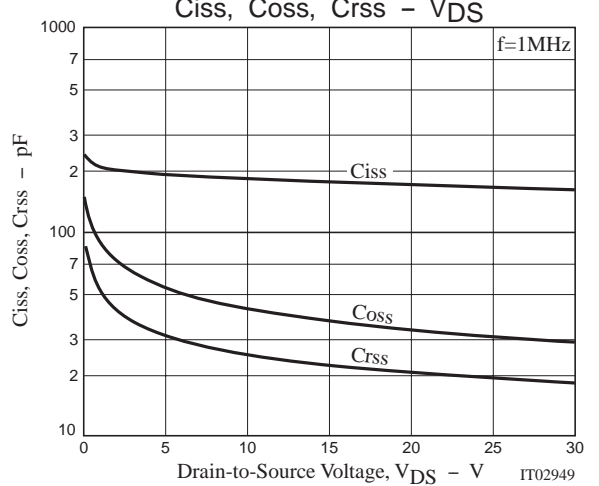
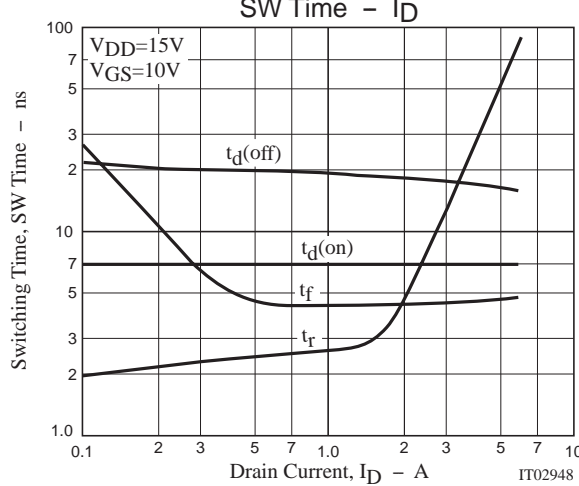
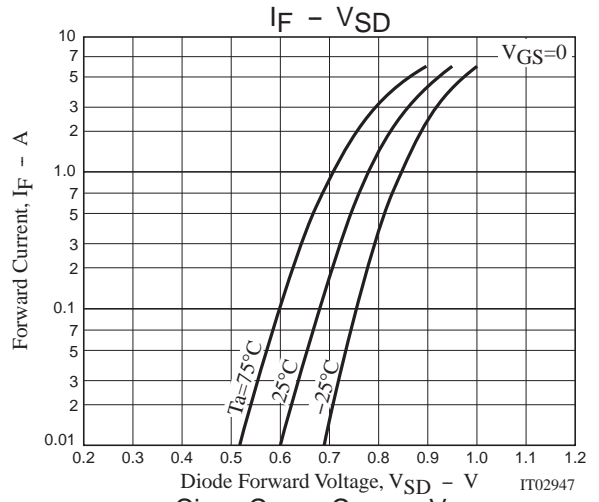
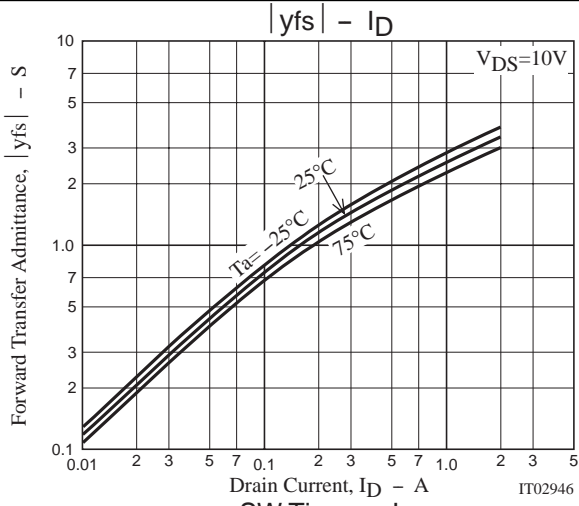
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| Parameter                                  | Symbol        | Conditions                       | Ratings |      |     | Unit      |
|--|---------------|----------------------------------|---------|------|-----|-----------|
|  |               |                                  | min     | typ  | max |           |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=1.5A, V_{GS}=10V$           |         | 64   | 84  | $m\Omega$ |
|  | $R_{DS(on)2}$ | $I_D=1A, V_{GS}=4V$              |         | 105  | 150 | $m\Omega$ |
| Input Capacitance                          | $C_{iss}$     | $V_{DS}=10V, f=1MHz$             |         | 180  |     | $pF$      |
| Output Capacitance                         | $C_{oss}$     | $V_{DS}=10V, f=1MHz$             |         | 42   |     | $pF$      |
| Reverse Transfer Capacitance               | $C_{rss}$     | $V_{DS}=10V, f=1MHz$             |         | 25   |     | $pF$      |
| Turn-ON Delay Time                         | $t_d(on)$     | See specified Test Circuit       |         | 7    |     | ns        |
| Rise Time                                  | $t_r$         | See specified Test Circuit       |         | 2.8  |     | ns        |
| Turn-OFF Delay Time                        | $t_d(off)$    | See specified Test Circuit       |         | 18.5 |     | ns        |
| Fall Time                                  | $t_f$         | See specified Test Circuit       |         | 4.4  |     | ns        |
| Total Gate Charge                          | $Q_g$         | $V_{DS}=10V, V_{GS}=10V, I_D=3A$ |         | 4.9  |     | nC        |
| Gate-to-Source Charge                      | $Q_{gs}$      | $V_{DS}=10V, V_{GS}=10V, I_D=3A$ |         | 0.93 |     | nC        |
| Gate-to-Drain "Miller" Charge              | $Q_{gd}$      | $V_{DS}=10V, V_{GS}=10V, I_D=3A$ |         | 0.63 |     | nC        |
| Diode Forward Voltage                      | $V_{SD}$      | $I_S=3A, V_{GS}=0$               |         | 0.85 | 1.2 | V         |

## Switching Time Test Circuit



# MCH3412



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