

**MCH5804****DC / DC Converter Applications****Features**

- Composite type with an N-Channel Silicon MOSFET (MCH3408) and a Schottky Barrier Diode (SBS007M) contained in one package facilitating high-density mounting.

**[MOSFET]**

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

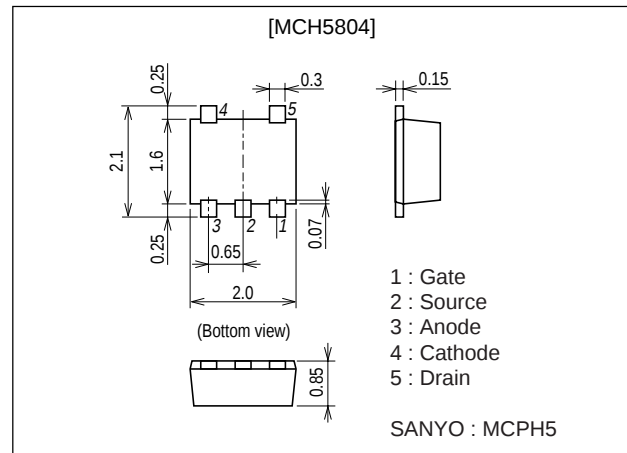
**[SBD]**

- Short reverse recovery time.
- Low forward voltage.

**Package Dimensions**

unit : mm

2195

**Specifications****Absolute Maximum Ratings** at Ta=25°C

| Parameter                                | Symbol           | Conditions                                      | Ratings     | Unit |
|------------------------------------------|------------------|-------------------------------------------------|-------------|------|
| <b>[MOSFET]</b>                          |                  |                                                 |             |      |
| Drain-to-Source Voltage                  | V <sub>DSS</sub> |                                                 | 30          | V    |
| Gate-to-Source Voltage                   | V <sub>GSS</sub> |                                                 | ±20         | V    |
| Drain Current (DC)                       | I <sub>D</sub>   |                                                 | 1.4         | A    |
| Drain Current (Pulse)                    | I <sub>DP</sub>  | PW≤10μs, duty cycle≤1%                          | 5.6         | A    |
| Allowable Power Dissipation              | P <sub>D</sub>   | Mounted on a ceramic board (600mm²×0.8mm) 1unit | 0.8         | W    |
| Channel Temperature                      | T <sub>ch</sub>  |                                                 | 150         | °C   |
| Storage Temperature                      | T <sub>stg</sub> |                                                 | -55 to +125 | °C   |
| <b>[SBD]</b>                             |                  |                                                 |             |      |
| Repetitive Peak Reverse Voltage          | V <sub>RRM</sub> |                                                 | 15          | V    |
| Nonrepetitive Peak Reverse Surge Voltage | V <sub>RSM</sub> |                                                 | 15          | V    |
| Average Output Current                   | I <sub>O</sub>   |                                                 | 0.5         | A    |
| Surge Forward Current                    | I <sub>FSM</sub> | 50Hz sine wave, 1 cycle                         | 10          | A    |
| Junction Temperature                     | T <sub>J</sub>   |                                                 | -55 to +125 | °C   |
| Storage Temperature                      | T <sub>stg</sub> |                                                 | -55 to +125 | °C   |

Marking : QD

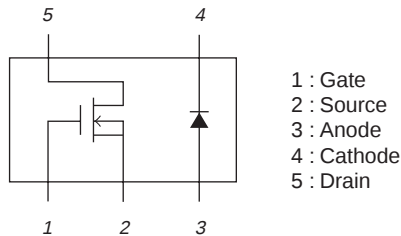
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# MCH5804

## Electrical Characteristics at Ta=25°C

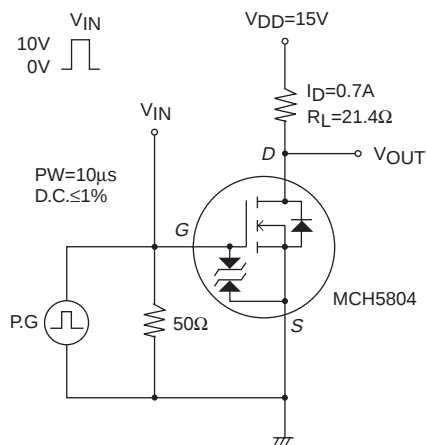
| Parameter                                  | Symbol   | Conditions                               | Ratings |      |      | Unit |
|--------------------------------------------|----------|------------------------------------------|---------|------|------|------|
|                                            |          |                                          | min     | typ  | max  |      |
| [MOSFET]                                   |          |                                          |         |      |      |      |
| Drain-to-Source Breakdown Voltage          | V(BR)DSS | ID=1mA, VGS=0                            | 30      |      |      | V    |
| Zero-Gate Voltage Drain Current            | IDSS     | VDS=30V, VGS=0                           |         |      | 1    | μA   |
| Gate-to-Source Leakage Current             | IGSS     | VGS=±16V, VDS=0                          |         |      | ±10  | μA   |
| Cutoff Voltage                             | VGS(off) | VDS=10V, ID=1mA                          | 1.2     |      | 2.6  | V    |
| Forward Transfer Admittance                | yfs      | VDS=10V, ID=700mA                        | 0.85    | 1.2  |      | S    |
| Static Drain-to-Source On-State Resistance | RDS(on)1 | ID=700mA, VGS=10V                        |         | 230  | 300  | mΩ   |
|                                            | RDS(on)2 | ID=400mA, VGS=4V                         |         | 370  | 520  | mΩ   |
| Input Capacitance                          | Ciss     | VDS=10V, f=1MHz                          |         | 70   |      | pF   |
| Output Capacitance                         | Coss     | VDS=10V, f=1MHz                          |         | 15   |      | pF   |
| Reverse Transfer Capacitance               | Crss     | VDS=10V, f=1MHz                          |         | 10   |      | pF   |
| Turn-ON Delay Time                         | td(on)   | See specified Test Circuit               |         | 6    |      | ns   |
| Rise Time                                  | tr       | See specified Test Circuit               |         | 3    |      | ns   |
| Turn-OFF Delay Time                        | td(off)  | See specified Test Circuit               |         | 10   |      | ns   |
| Fall Time                                  | tf       | See specified Test Circuit               |         | 4    |      | ns   |
| Total Gate Charge                          | Qg       | VDS=10V, VGS=10V, ID=1.4A                |         | 2.6  |      | nC   |
| Gate-to-Source Charge                      | Qgs      | VDS=10V, VGS=10V, ID=1.4A                |         | 0.6  |      | nC   |
| Gate-to-Drain "Miller" Charge              | Qgd      | VDS=10V, VGS=10V, ID=1.4A                |         | 0.5  |      | nC   |
| Diode Forward Voltage                      | VSD      | IS=1.4A, VGS=0                           |         | 0.9  | 1.2  | V    |
| [SBD]                                      |          |                                          |         |      |      |      |
| Reverse Voltage                            | VR       | IR=0.5mA                                 | 15      |      |      | V    |
| Forward Voltage                            | VF1      | IF=0.3A                                  |         | 0.35 | 0.40 | V    |
|                                            | VF2      | IF=0.5A                                  |         | 0.40 | 0.45 | V    |
| Reverse Current                            | IR       | VR=6V                                    |         |      | 200  | μA   |
| Interterminal Capacitance                  | C        | VR=10V, f=1MHz                           |         | 20   |      | pF   |
| Reverse Recovery Time                      | trr      | IF=IR=100mA, See specified Test Circuit. |         |      | 10   | ns   |

## Electrical Connection (Top view)



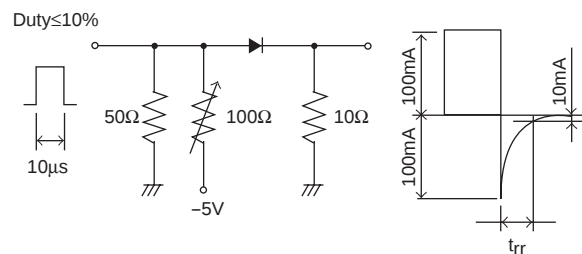
## Switching Time Test Circuit

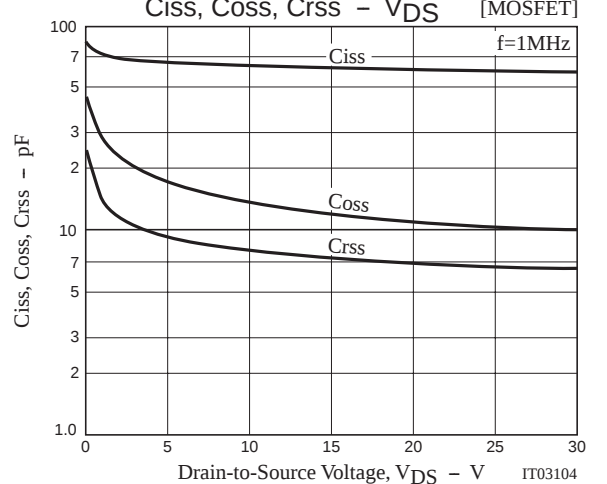
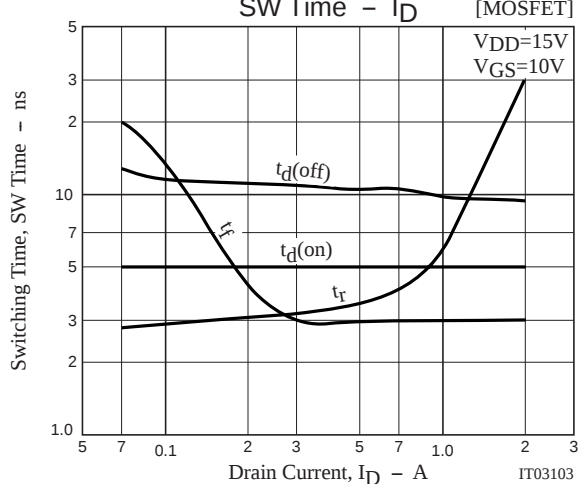
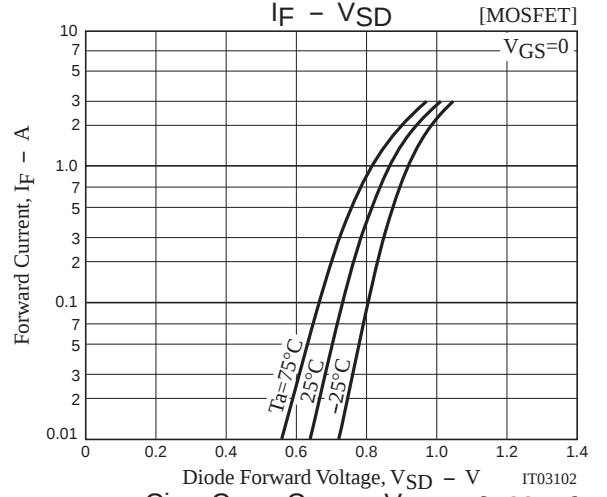
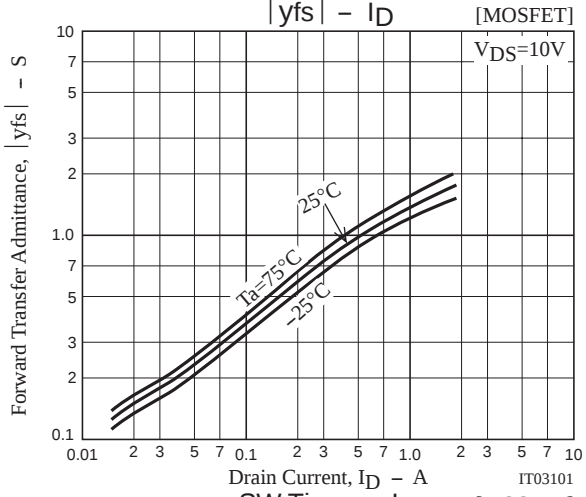
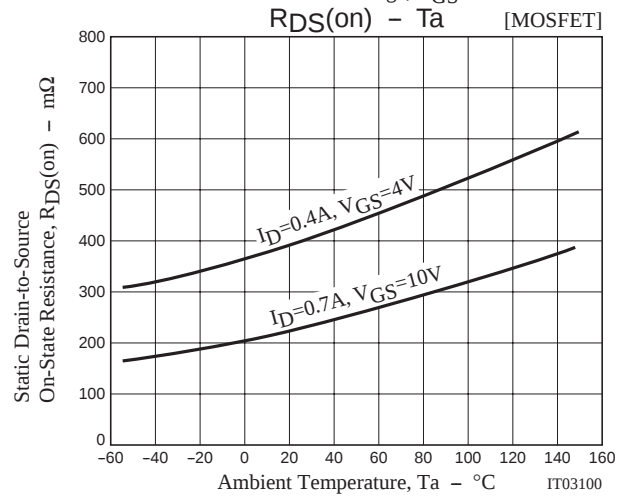
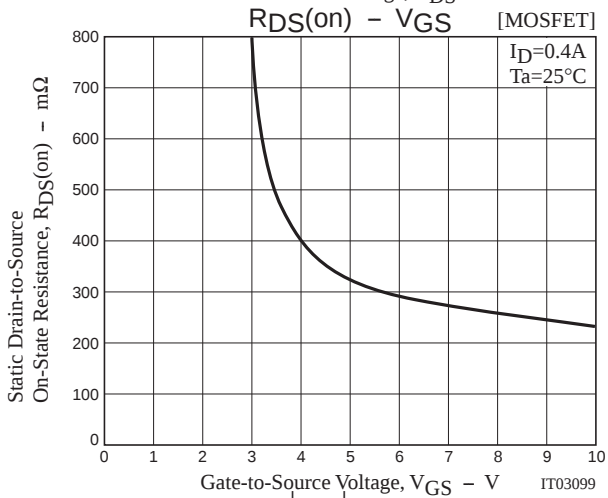
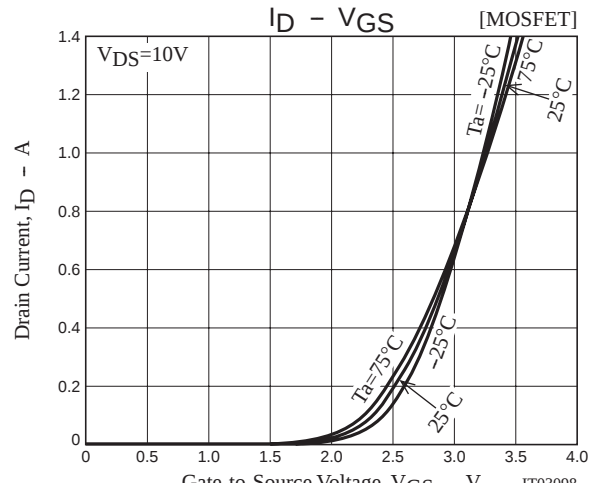
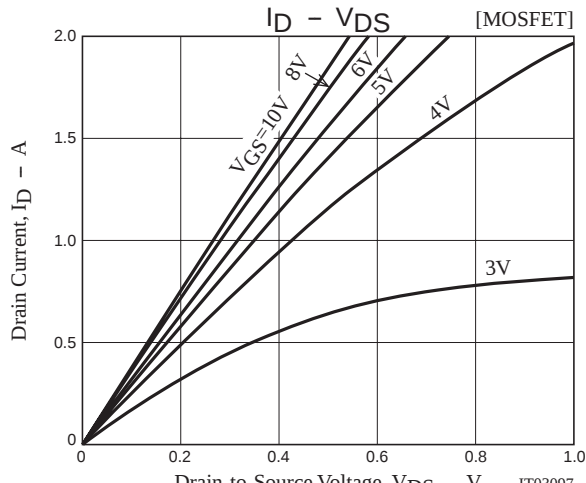
[MOSFET]

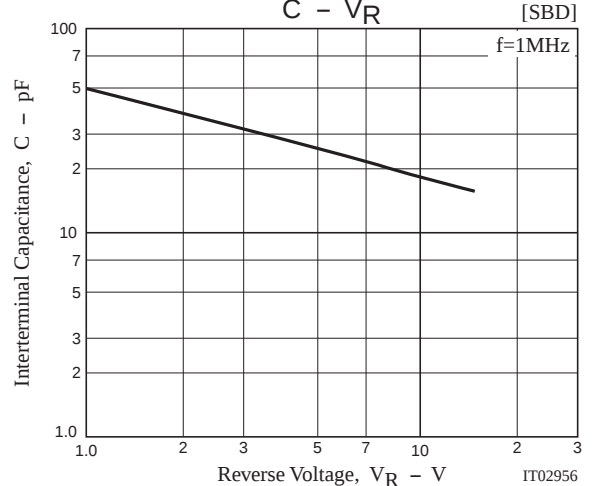
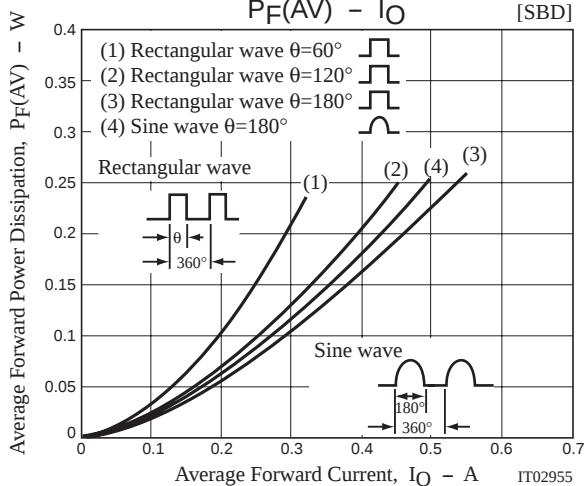
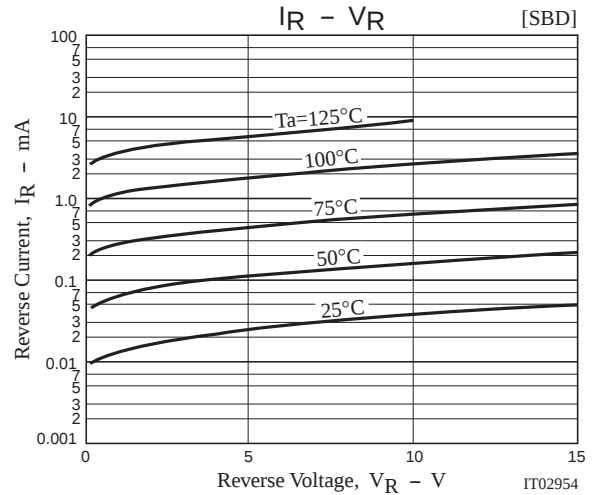
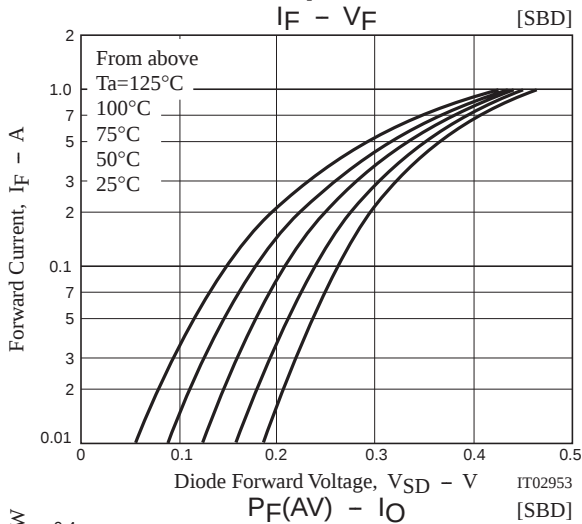
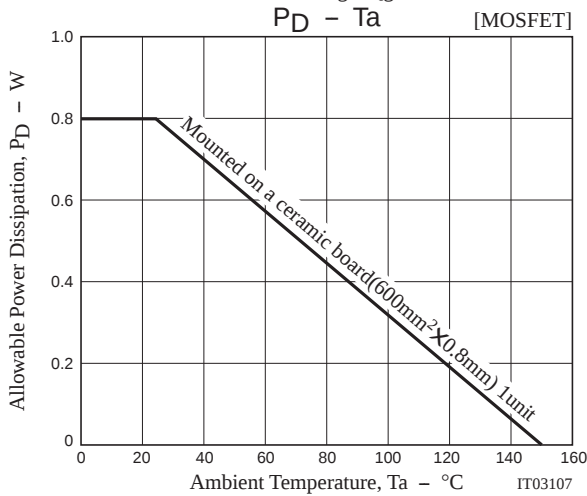
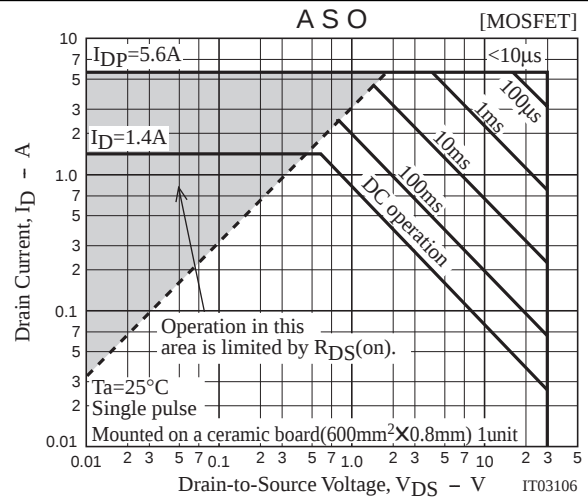
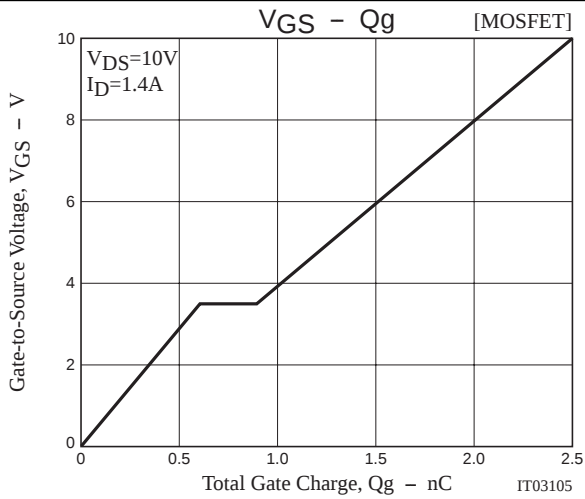


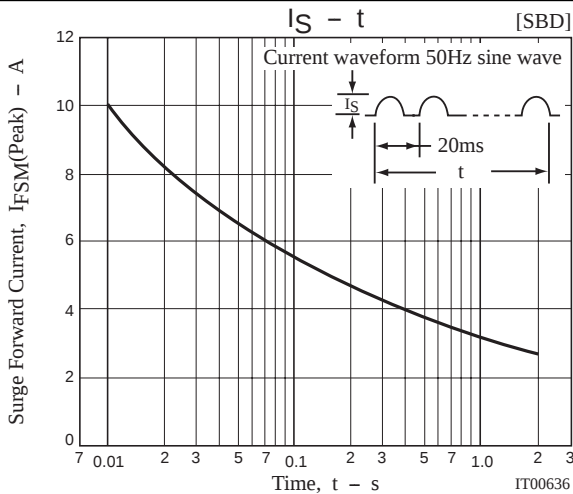
## trr Test Circuit

[SBD]









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