

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

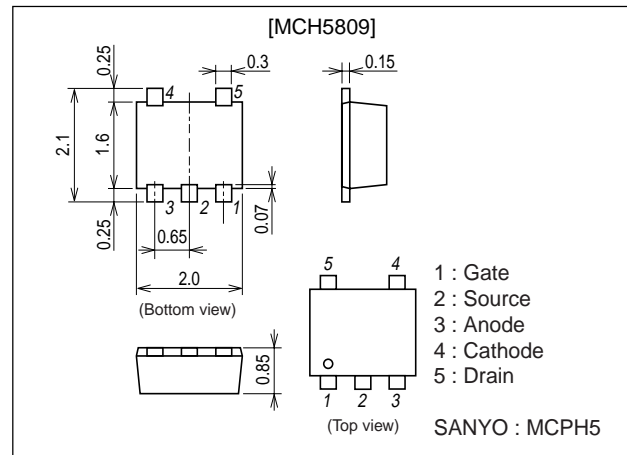
- Composite type with an N-Channel Silicon MOSFET (MCH3443) and a Schottky Barrier Diode (SBS006M) contained in one package facilitating high-density mounting.

[MOSFET]

- Low ON-resistance.
- Ultrahigh-speed switching.
- 2.5V drive.

[SBD]

- Short reverse recovery time.
- Low forward voltage.

Package Dimensionsunit : mm
2195**Specifications****Absolute Maximum Ratings** at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|--|-------------------|--|-------------|------|
| [MOSFET] | | | | |
| Drain-to-Source Voltage | V _{DSS} | | 30 | V |
| Gate-to-Source Voltage | V _{GS} | | ±12 | V |
| Drain Current (DC) | I _D | | 1.5 | A |
| Drain Current (Pulse) | I _{DP} | PW≤10μs, duty cycle≤1% | 6 | A |
| Allowable Power Dissipation | P _D | Mounted on a ceramic board (900mm ² X0.8mm) 1unit | 0.8 | W |
| Channel Temperature | T _{ch} | | 150 | °C |
| Storage Temperature | T _{stg} | | -55 to +125 | °C |
| [SBD] | | | | |
| Repetitive Peak Reverse Voltage | V _R RM | | 30 | V |
| Nonrepetitive Peak Reverse Surge Voltage | V _R SM | | 30 | V |
| Average Output Current | I _O | | 0.5 | A |
| Surge Forward Current | I _{FSM} | 50Hz sine wave, 1 cycle | 3 | A |
| Junction Temperature | T _J | | -55 to +125 | °C |
| Storage Temperature | T _{stg} | | -55 to +125 | °C |

Marking : QJ

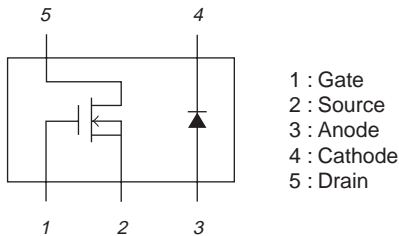
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MCH5809

Electrical Characteristics at Ta=25°C

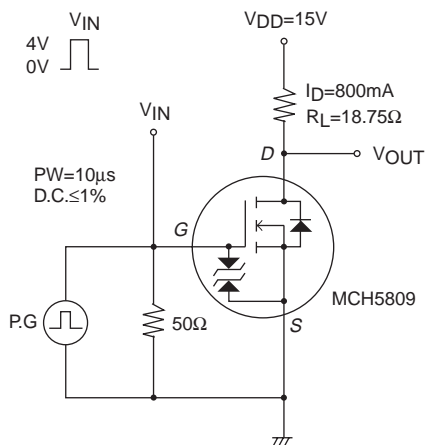
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|---------------|---|---------|------|----------|-----------|
| | | | min | typ | max | |
| [MOSFET] | | | | | | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D=1mA, V_{GS}=0$ | 30 | | | V |
| Zero-Gate Voltage Drain Current | I_{DSS} | $V_{DS}=30V, V_{GS}=0$ | | | 1 | μA |
| Gate-to-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 8V, V_{DS}=0$ | | | ± 10 | μA |
| Cutoff Voltage | $V_{GS(off)}$ | $V_{DS}=10V, I_D=1mA$ | 0.4 | | 1.3 | V |
| Forward Transfer Admittance | $ y_{fs} $ | $V_{DS}=10V, I_D=800mA$ | 1.3 | 2.2 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=800mA, V_{GS}=4V$ | | 165 | 215 | $m\Omega$ |
| | $R_{DS(on)2}$ | $I_D=400mA, V_{GS}=2.5V$ | | 210 | 295 | $m\Omega$ |
| Input Capacitance | C_{iss} | $V_{DS}=10V, f=1MHz$ | | 130 | | pF |
| Output Capacitance | C_{oss} | $V_{DS}=10V, f=1MHz$ | | 22 | | pF |
| Reverse Transfer Capacitance | C_{rss} | $V_{DS}=10V, f=1MHz$ | | 16 | | pF |
| Turn-ON Delay Time | $t_d(on)$ | See specified Test Circuit | | 9 | | ns |
| Rise Time | t_r | See specified Test Circuit | | 20 | | ns |
| Turn-OFF Delay Time | $t_d(off)$ | See specified Test Circuit | | 23 | | ns |
| Fall Time | t_f | See specified Test Circuit | | 29 | | ns |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=4V, I_D=1.5A$ | | 2.2 | | nC |
| Gate-to-Source Charge | Q_{gs} | $V_{DS}=10V, V_{GS}=4V, I_D=1.5A$ | | 0.52 | | nC |
| Gate-to-Drain "Miller" Charge | Q_{gd} | $V_{DS}=10V, V_{GS}=4V, I_D=1.5A$ | | 0.52 | | nC |
| Diode Forward Voltage | V_{SD} | $I_S=1.5A, V_{GS}=0$ | | 0.9 | 1.2 | V |
| [SBD] | | | | | | |
| Reverse Voltage | V_R | $I_R=0.5mA$ | 30 | | | V |
| Forward Voltage | V_{F1} | $I_F=0.3A$ | | 0.35 | 0.40 | V |
| | V_{F2} | $I_F=0.5A$ | | 0.42 | 0.47 | V |
| Reverse Current | I_R | $V_R=10V$ | | | 200 | μA |
| Interterminal Capacitance | C | $V_R=10V, f=1MHz$ | | 20 | | pF |
| Reverse Recovery Time | t_{rr} | $I_F=I_R=100mA$, See specified Test Circuit. | | | 10 | ns |

Electrical Connection (Top view)



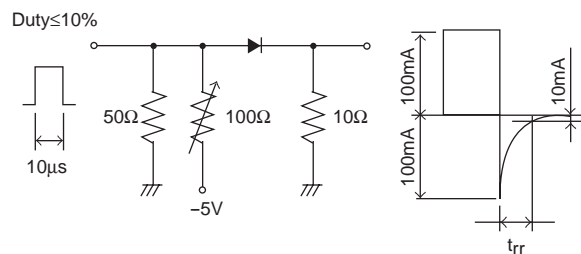
Switching Time Test Circuit

[MOSFET]

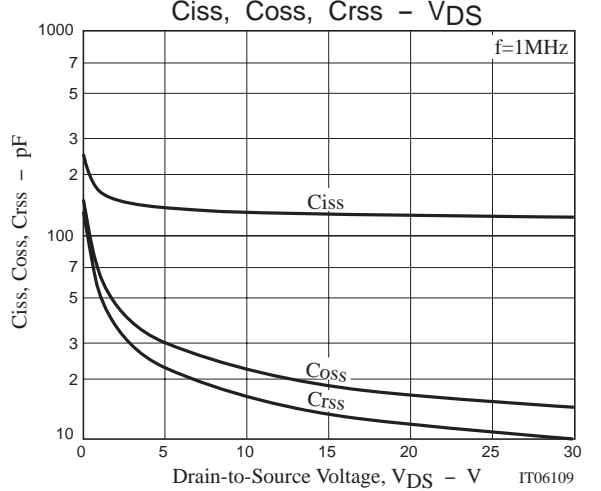
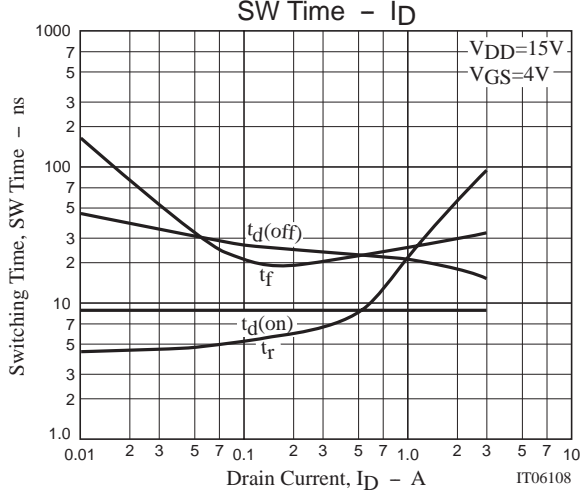
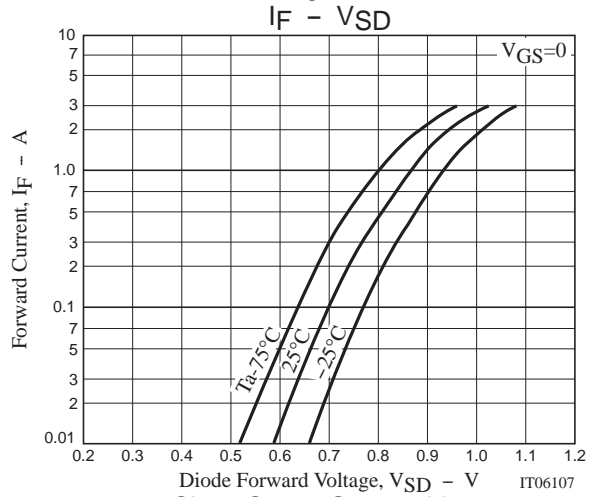
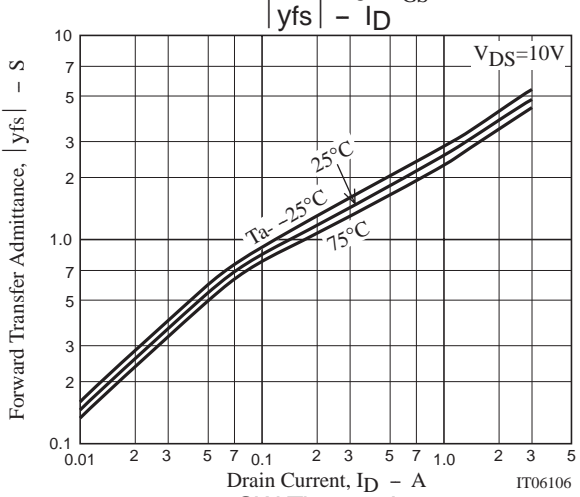
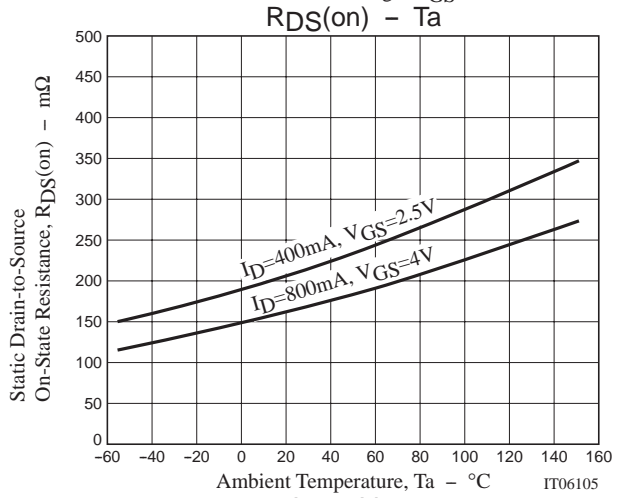
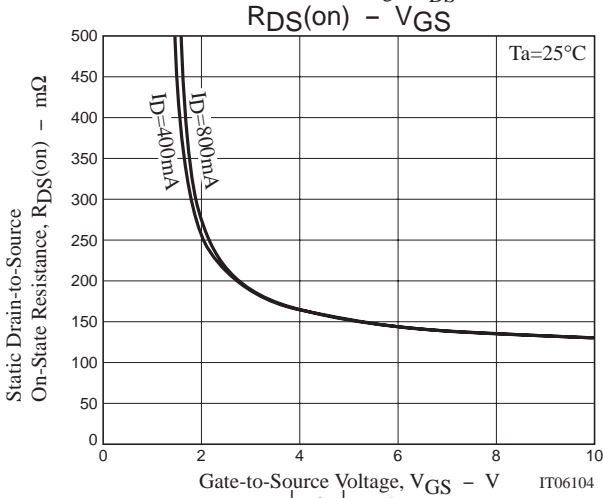
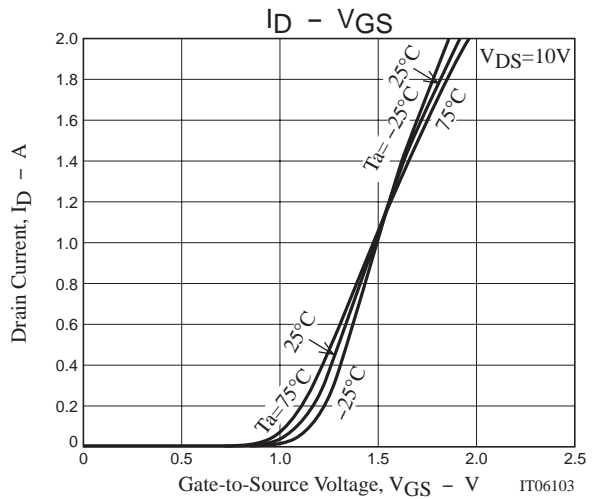
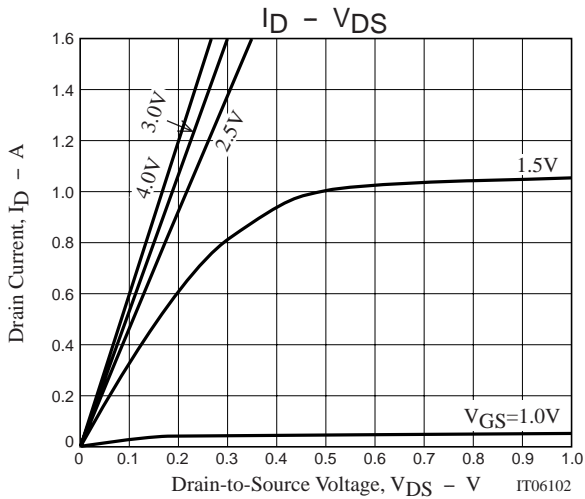


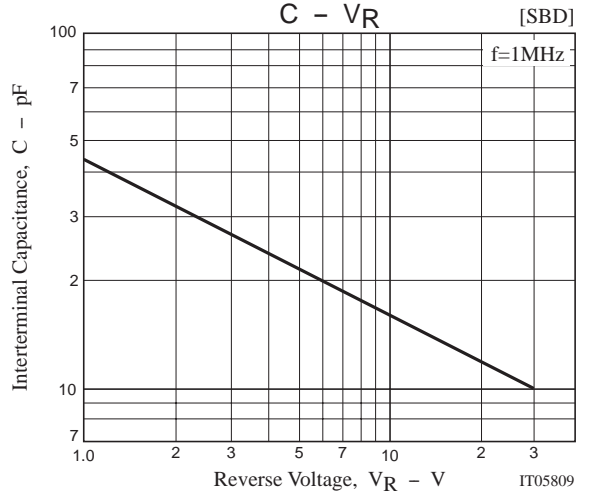
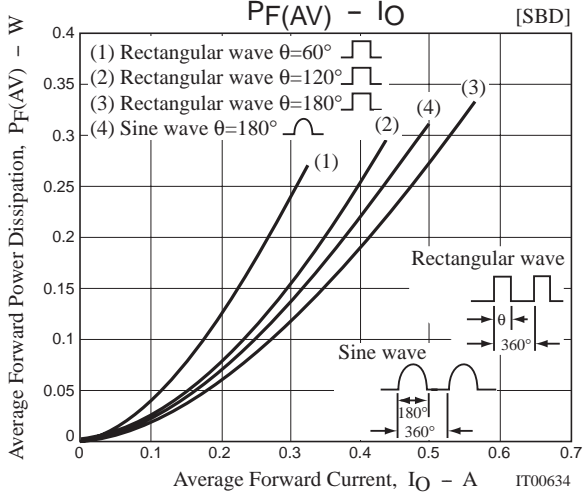
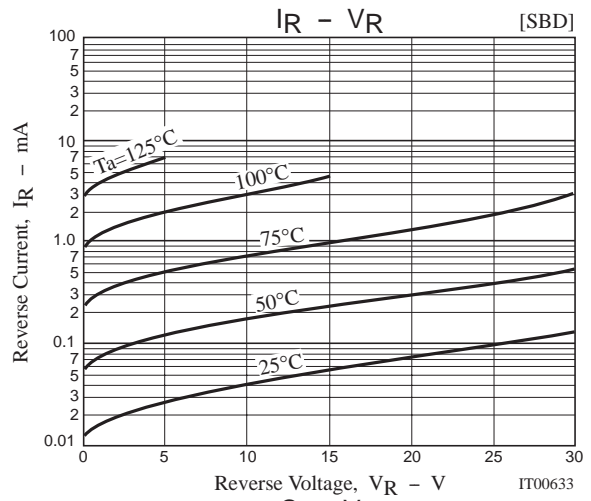
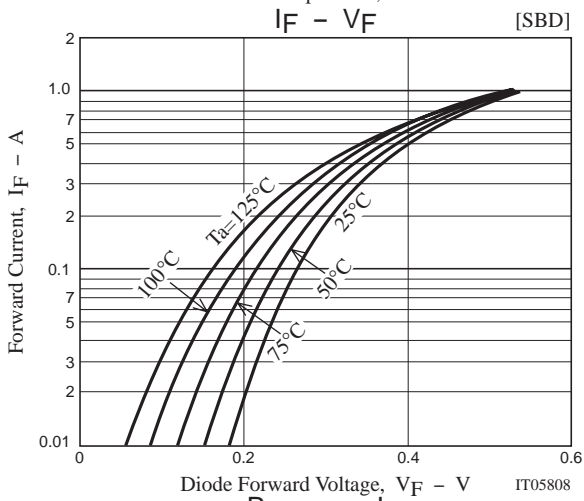
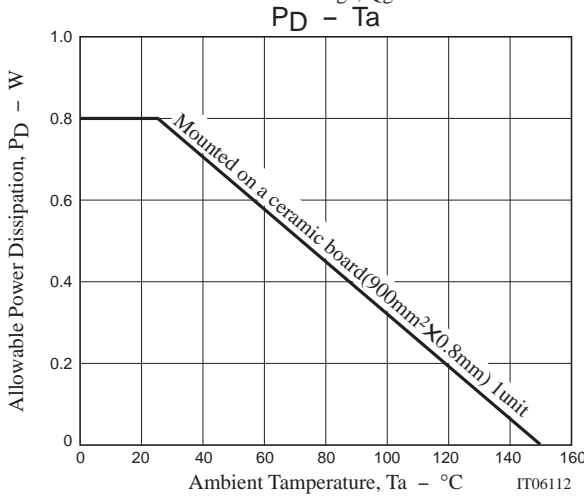
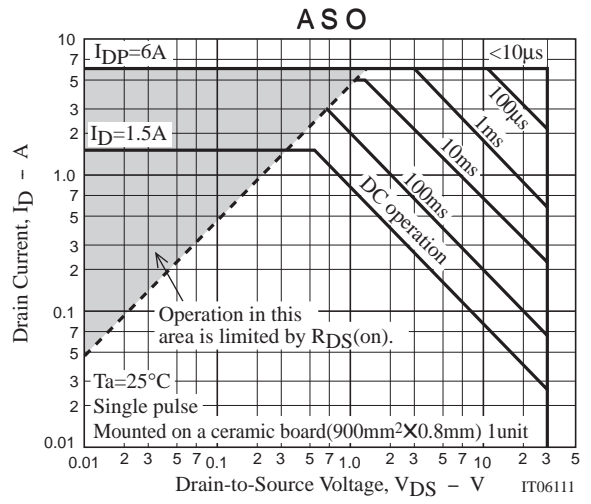
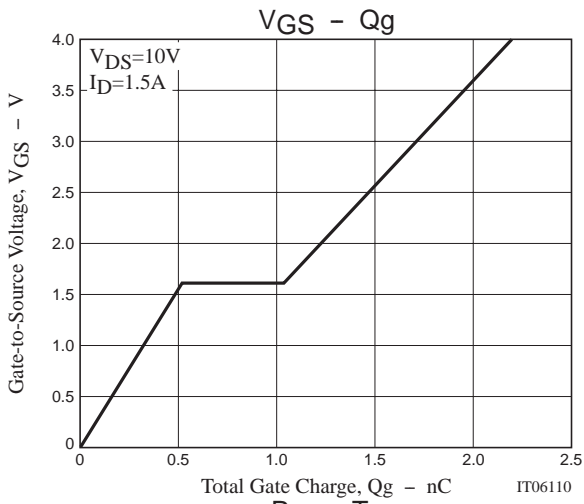
t_{rr} Test Circuit

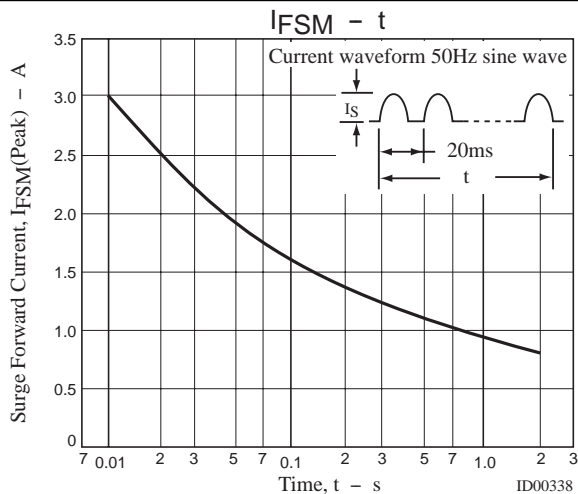
[SBD]



MCH5809







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