

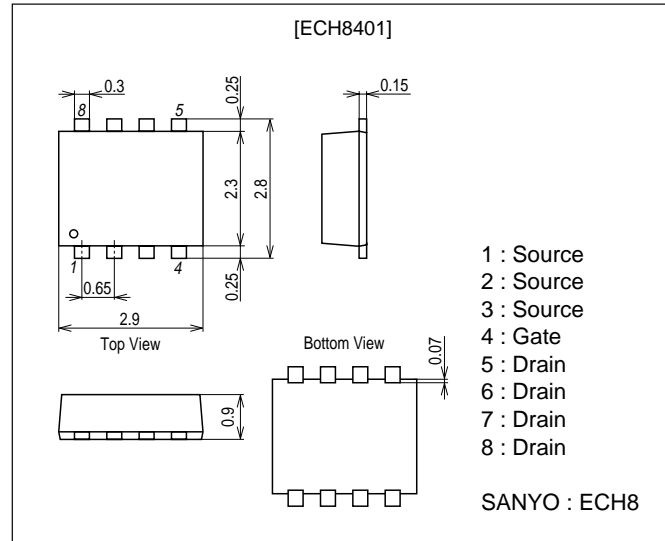
**ECH8401****Ultrahigh-Speed Switching Applications****Features**

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

Package Dimensions

unit : mm

2222

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|-----------|--|-------------|------------------|
| Drain-to-Source Voltage | V_{DSS} | | 20 | V |
| Gate-to-Source Voltage | V_{GSS} | | ± 12 | V |
| Drain Current (DC) | I_D | | 10 | A |
| Drain Current (Pulse) | I_{DP} | $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$ | 40 | A |
| Allowable Power Dissipation | P_D | Mounted on a ceramic board (900mm \times 90.8mm) | 1.6 | W |
| Channel Temperature | T_{ch} | | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | | -55 to +150 | $^\circ\text{C}$ |

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

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|-----------------------------------|---------------|--|---------|-----|----------|---------------|
| | | | min | typ | max | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D=1\text{mA}$, $V_{GS}=0$ | 20 | | | V |
| Zero-Gate Voltage Drain Current | I_{DSS} | $V_{DS}=20\text{V}$, $V_{GS}=0$ | | | 1 | μA |
| Gate-to-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 8\text{V}$, $V_{DS}=0$ | | | ± 10 | μA |
| Cutoff Voltage | $V_{GS(off)}$ | $V_{DS}=10\text{V}$, $I_D=1\text{mA}$ | 0.5 | | 1.3 | V |

Marking : KA

Continued on next page.

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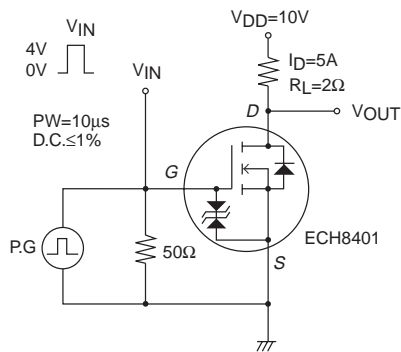
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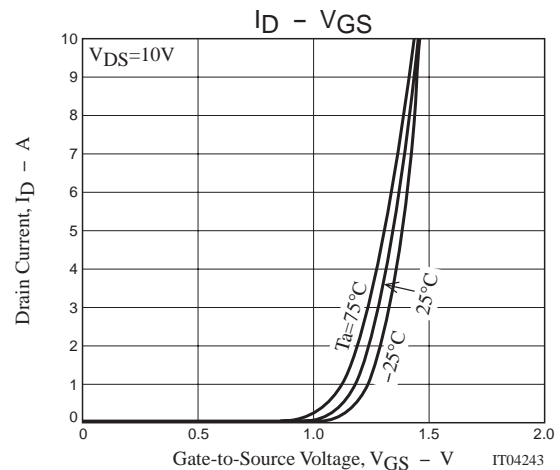
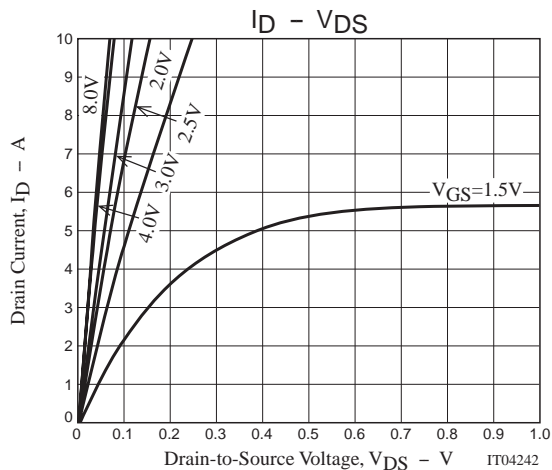
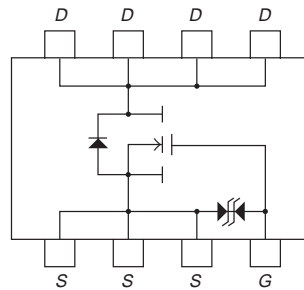
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| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|---------------|----------------------------------|---------|------|------|-----------|
| | | | min | typ | max | |
| Forward Transfer Admittance | $ y_{fs} $ | $V_{DS}=10V, I_D=5A$ | 14 | 20 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS(on)1}$ | $I_D=5A, V_{GS}=4V$ | | 9 | 14 | $m\Omega$ |
| | $R_{DS(on)2}$ | $I_D=5A, V_{GS}=3.1V$ | | 10 | 15.5 | $m\Omega$ |
| | $R_{DS(on)3}$ | $I_D=2A, V_{GS}=2.5V$ | | 12 | 19 | $m\Omega$ |
| Input Capacitance | C_{iss} | $V_{DS}=10V, f=1MHz$ | | 1700 | | pF |
| Output Capacitance | C_{oss} | $V_{DS}=10V, f=1MHz$ | | 330 | | pF |
| Reverse Transfer Capacitance | C_{rss} | $V_{DS}=10V, f=1MHz$ | | 270 | | pF |
| Turn-ON Delay Time | $t_d(on)$ | See specified Test Circuit | | 29 | | ns |
| Rise Time | t_r | See specified Test Circuit | | 150 | | ns |
| Turn-OFF Delay Time | $t_d(off)$ | See specified Test Circuit | | 220 | | ns |
| Fall Time | t_f | See specified Test Circuit | | 160 | | ns |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=10V, I_D=5A$ | | 52 | | nC |
| Gate-to-Source Charge | Q_{gs} | $V_{DS}=10V, V_{GS}=10V, I_D=5A$ | | 2.6 | | nC |
| Gate-to-Drain "Miller" Charge | Q_{gd} | $V_{DS}=10V, V_{GS}=10V, I_D=5A$ | | 7.4 | | nC |
| Diode Forward Voltage | V_{SD} | $I_S=10A, V_{GS}=0$ | | 0.82 | 1.2 | V |

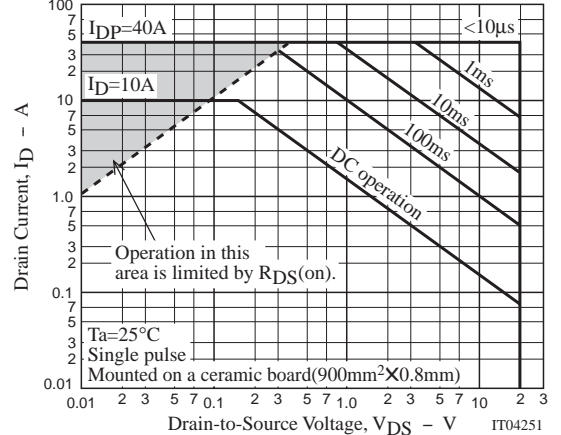
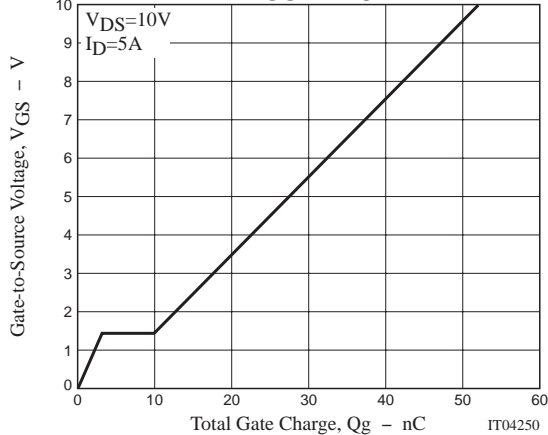
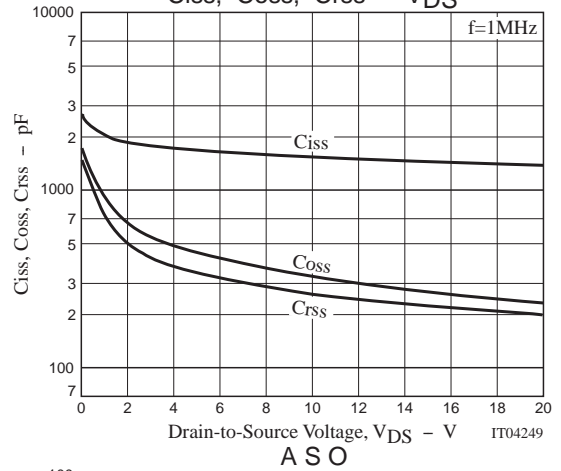
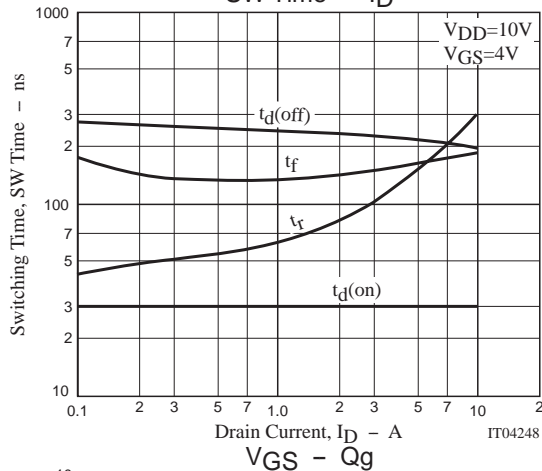
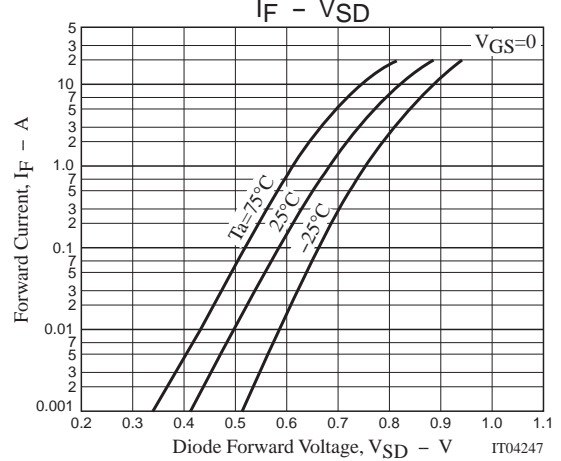
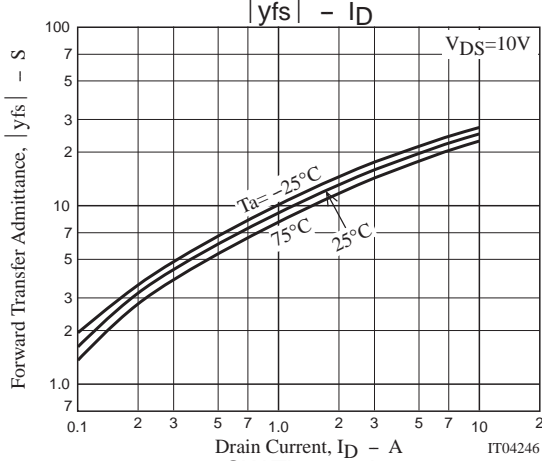
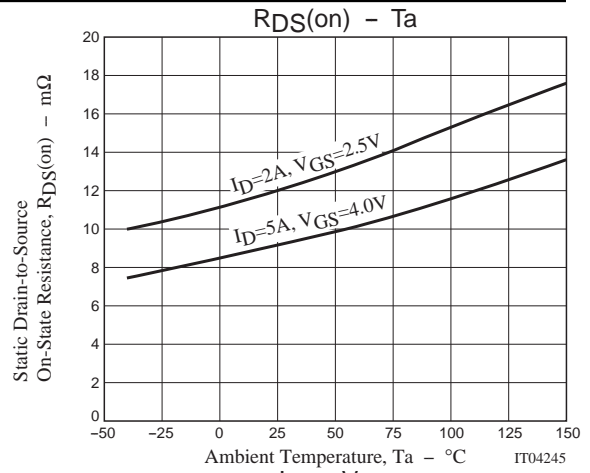
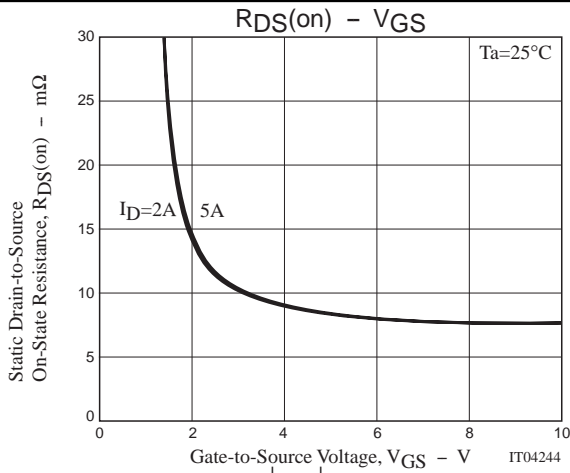
Switching Time Test Circuit



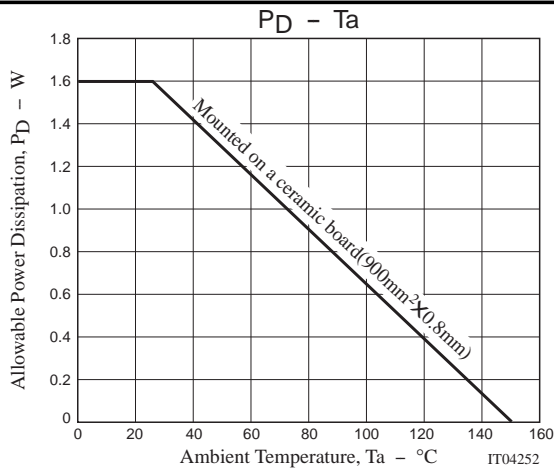
Electrical Connection



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