

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE

SSM3K01F

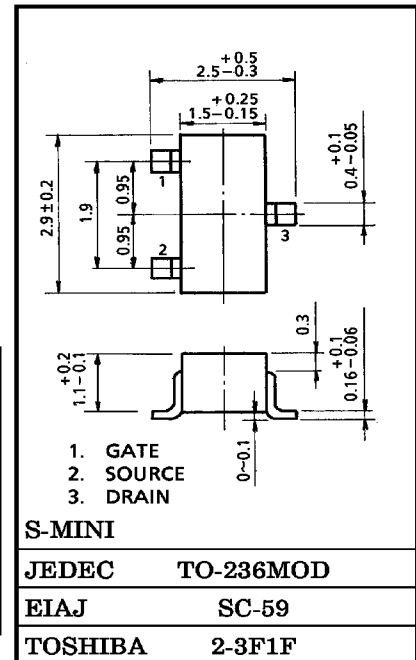
HIGH SPEED SWITCHING APPLICATIONS

Unit in mm

- Small Package
- Low on Resistance : $R_{on} = 120\text{ m}\Omega$ (Max) ($V_{GS} = 4\text{ V}$)
: $R_{on} = 150\text{ m}\Omega$ (Max) ($V_{GS} = 2.5\text{ V}$)
- Low Gate Threshold Voltage : $V_{th} = 0.6\sim 1.1\text{ V}$
($V_{DS} = 3\text{ V}$, $I_D = 0.1\text{ mA}$)

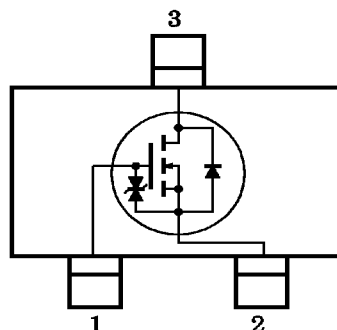
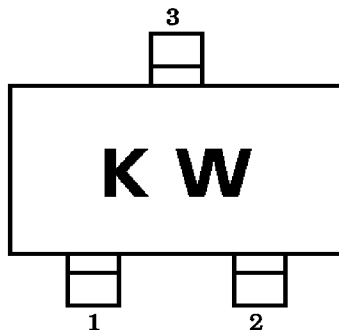
MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---------------------------|-------|-----------|---------------|------------------|
| Drain-Source Voltage | | V_{DS} | 30 | V |
| Gate-Source Voltage | | V_{GSS} | ± 10 | V |
| Drain Current | DC | I_D | 1.3 | A |
| | Pulse | I_{DP} | 2.6 | |
| Drain Power Dissipation | | P_D | 200 | mW |
| Channel Temperature | | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage Temperature Range | | T_{stg} | $-55\sim 150$ | $^\circ\text{C}$ |



MARKING

EQUIVALENT CIRCUIT



HANDLING PRECAUTION

When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

961001EAA1

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

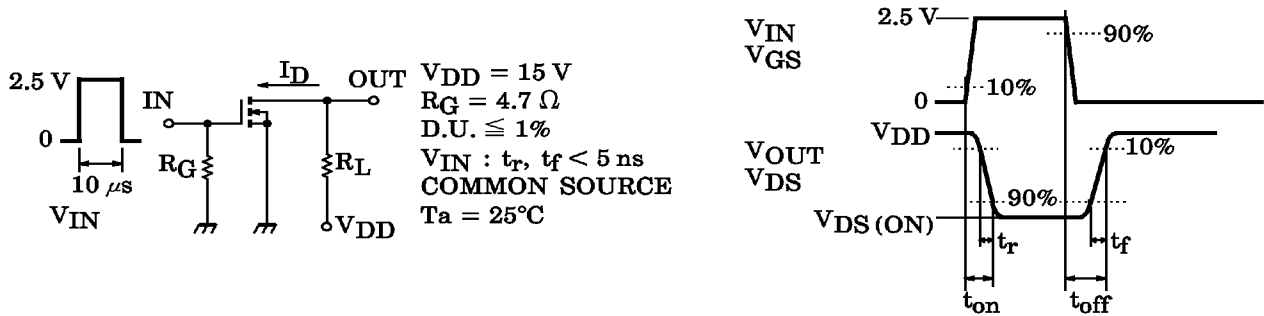
1999-06-17 1/4

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--------------------------------|---------------|------------|--|------|------|------|------|
| Gate Leakage Current | | IGSS | VGS = ±10 V, VDS = 0 | — | — | ±5 | μA |
| Drain-Source Breakdown Voltage | | V (BR) DSS | ID = 1 mA, VGS = 0 | 30 | — | — | V |
| Drain Cut-off Current | | IDSS | VDS = 30 V, VGS = 0 | — | — | 1 | μA |
| Gate Threshold Voltage | | Vth | VDS = 3 V, ID = 0.1 mA | 0.6 | — | 1.1 | V |
| Forward Transfer Admittance | | Yfs | VDS = 3 V, ID = 0.65 A (Note 1) | 2.0 | — | — | S |
| Drain-Source ON Resistance | | RDS (ON) | ID = 0.65 A, VGS = 4V (Note 1) | — | 85 | 120 | mΩ |
| | | | ID = 0.65 A, VGS = 2.5 V (Note 1) | — | 115 | 150 | |
| Input Capacitance | | Ciss | VDS = 10 V, VGS = 0, f = 1 MHz | — | 152 | — | pF |
| Reverse Transfer Capacitance | | Crss | VDS = 10 V, VGS = 0, f = 1 MHz | — | 41 | — | pF |
| Output Capacitance | | Coss | VDS = 10 V, VGS = 0, f = 1 MHz | — | 102 | — | pF |
| Switching Time | Turn-on Time | ton | VDD = 15 V, ID = 0.5 A, VGS = 0~2.5 V, RG = 4.7 Ω | — | 45 | — | ns |
| | Turn-off Time | toff | | — | 69 | — | |

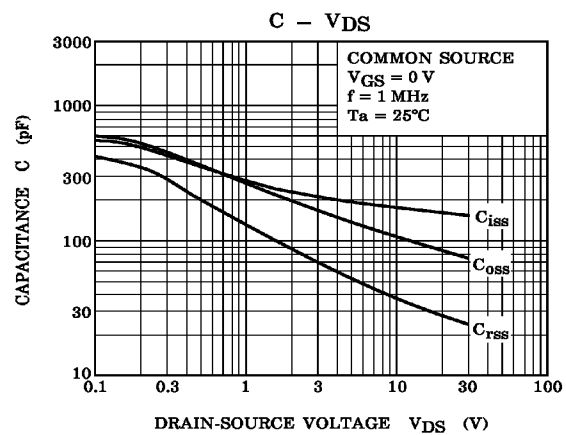
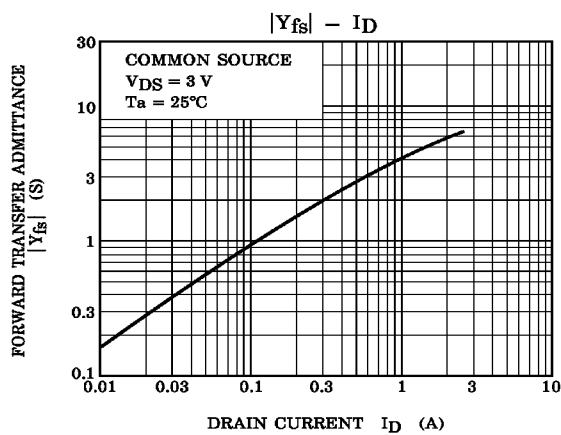
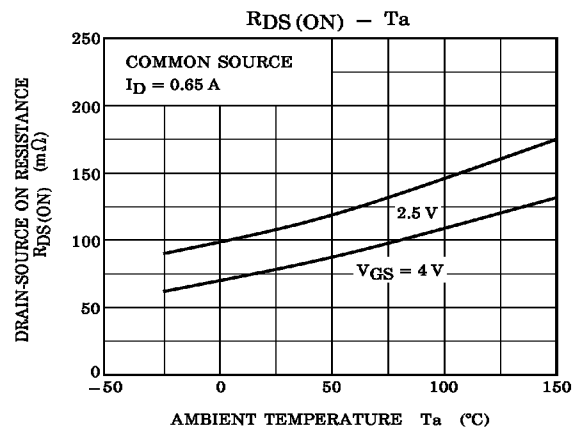
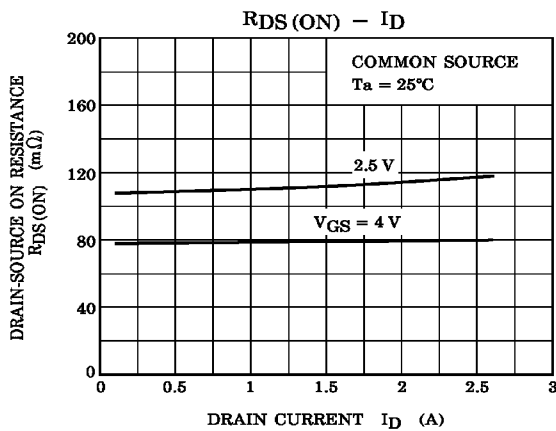
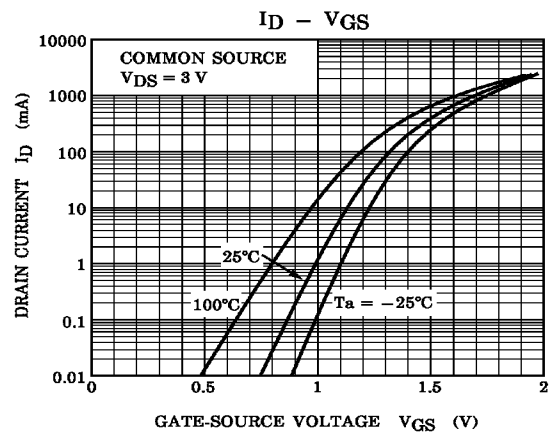
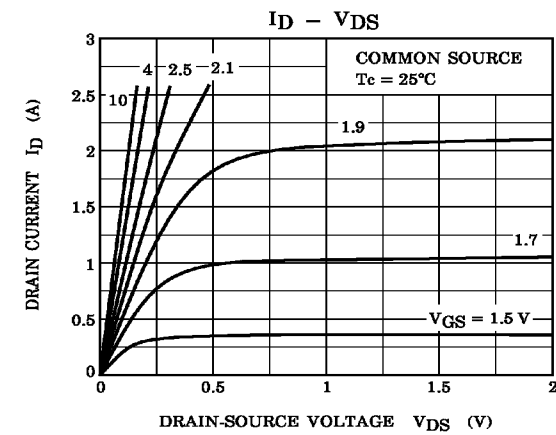
(Note 1) : Pulse test

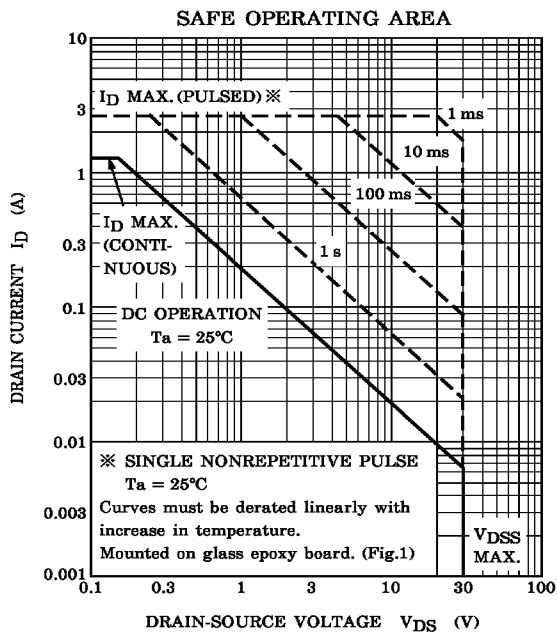
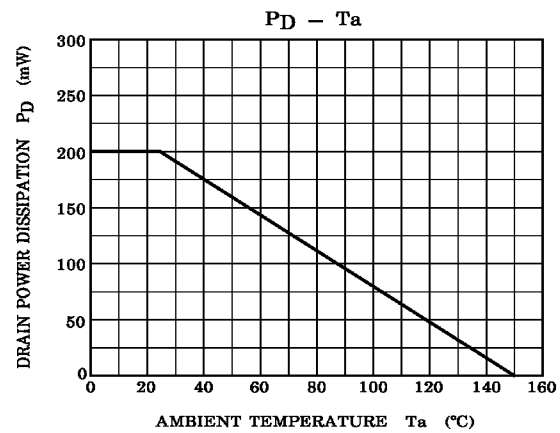
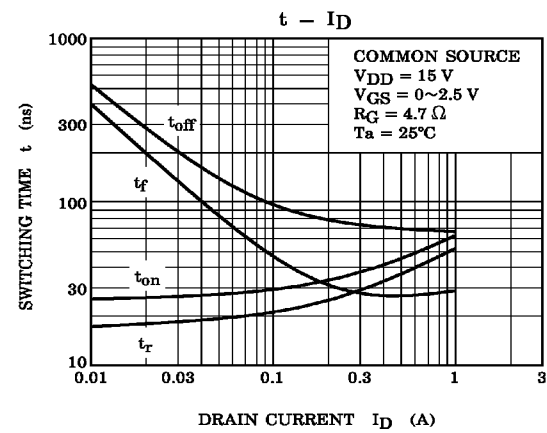
SWITCHING TIME TEST CIRCUIT



PRECAUTION

Vth can be expressed as voltage between gate and source when low operating current value is ID = 100 μA for this product. For normal switching operation, VGS(ON) requires higher voltage than Vth and VGS(off) requires lower voltage than Vth.
(Relationship can be established as follows : VGS(off) < Vth < VGS(ON))
Please take this into consideration for using the device.
VGS recommended voltage of 2.5 V or higher to turn on this product.





(Fig.1) : 25.4 mm × 25.4 mm × 1.6 t (a Cu pad of 0.8 mm² area)

