

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

SSM3K44MFV

High Speed Switching Applications

Analog Switch Applications

- AEC-Q101 qualified (Note 1)
- Compact package suitable for high-density mounting
- Low ON-resistance : $R_{DS(ON)} = 4.0 \Omega$ (max) (@ $V_{GS} = 4 V$)
: $R_{DS(ON)} = 7.0 \Omega$ (max) (@ $V_{GS} = 2.5 V$)

Note 1: For detail information, please contact to our sales.

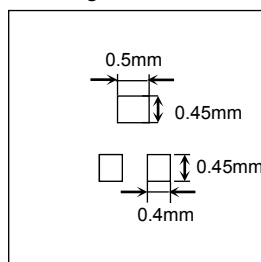
Absolute Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|-------------------------------------|-------|----------------|------------|------|
| Drain-source voltage | | V_{DSS} | 30 | V |
| Gate-source voltage | | V_{GSS} | ± 20 | V |
| Drain current | DC | I_D | 100 | mA |
| | Pulse | I_{DP} | 200 | |
| Drain power dissipation (Ta = 25°C) | | P_D (Note 1) | 150 | mW |
| Channel temperature | | T_{ch} | 150 | °C |
| Storage temperature | | T_{stg} | -55 to 150 | °C |

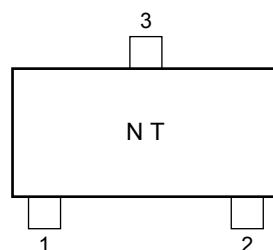
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

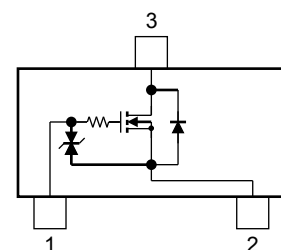
Note 1: Total rating, mounted on FR4 board (25.4 mm × 25.4 mm × 1.6 mm)



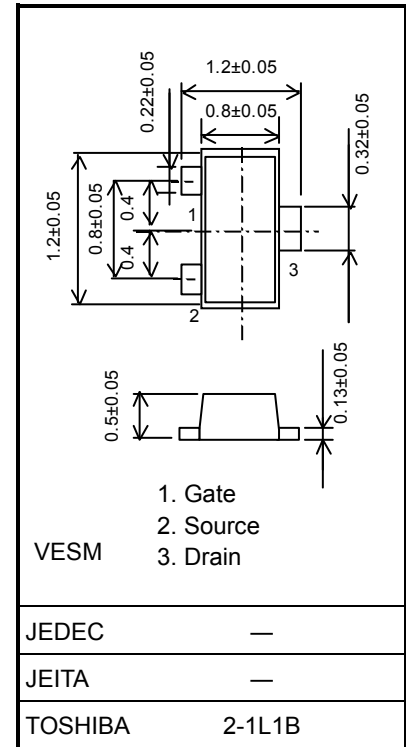
Marking



Equivalent Circuit



Unit: mm



Weight: 1.5 mg (typ.)

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.

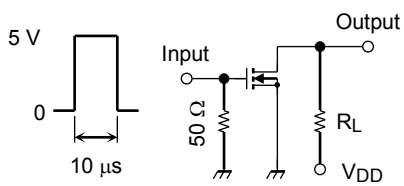
Start of commercial production
2009-12

Electrical Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit | |
|--------------------------------|---------------|---------------------------------|--|------|-----|------|----|
| Gate leakage current | IGSS | VGS = ±14 V, VDS = 0 V | — | — | ±1 | μA | |
| Drain-source breakdown voltage | V (BR) DSS | ID = 0.1 mA, VGS = 0 V | 30 | — | — | V | |
| Drain cut-off current | IDSS | VDS = 30 V, VGS = 0 V | — | — | 1 | μA | |
| Gate threshold voltage | Vth | VDS = 3 V, ID = 0.1 mA | 0.8 | — | 1.5 | V | |
| Forward transfer admittance | Yfs | VDS = 3 V, ID = 10 mA | 25 | — | — | mS | |
| Drain-Source on-resistance | RDS (ON) | ID = 10 mA, VGS = 4 V | — | 2.2 | 4.0 | Ω | |
| | | ID = 10 mA, VGS = 2.5 V | — | 4.0 | 7.0 | | |
| Input capacitance | Ciss | VDS = 3 V, VGS = 0 V, f = 1 MHz | — | 8.5 | — | pF | |
| Reverse transfer capacitance | Crss | | — | 5.3 | — | | |
| Output capacitance | Coss | | — | 9.4 | — | | |
| Switching time | Turn-on time | t _{on} | VDD = 5 V, ID = 10 mA, VGS = 0 to 5 V | — | 50 | — | ns |
| | Turn-off time | t _{off} | | — | 200 | — | |

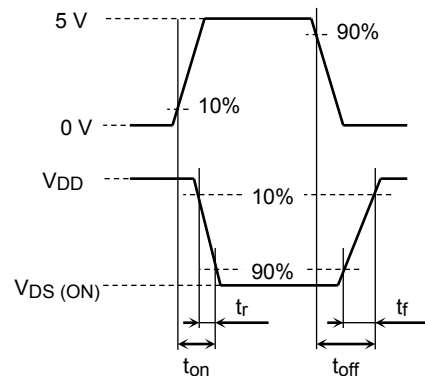
Switching Time Test Circuit

(a) Test circuit



V_{DD} = 5 V
 Duty ≤ 1%
 Input: t_r, t_f < 5 ns
 (Z_{out} = 50 Ω)
 Common Source
 Ta = 25°C

(b) VIN



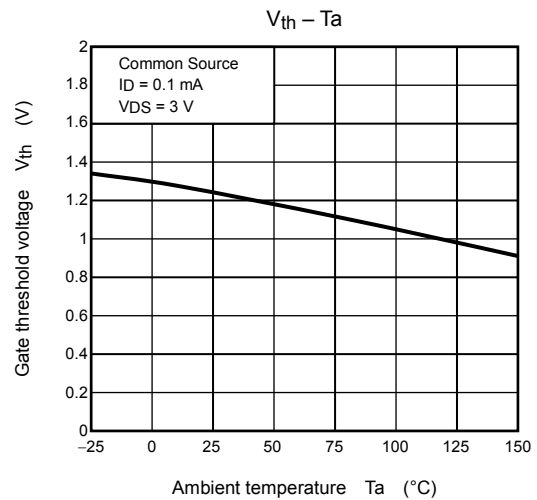
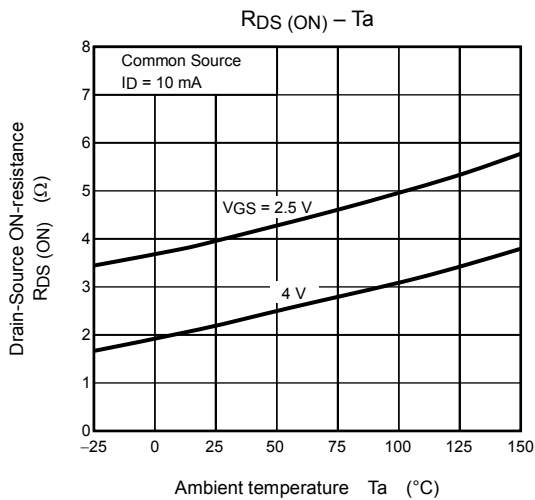
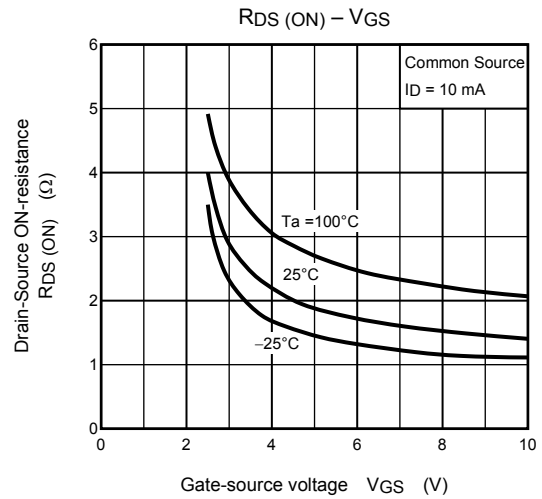
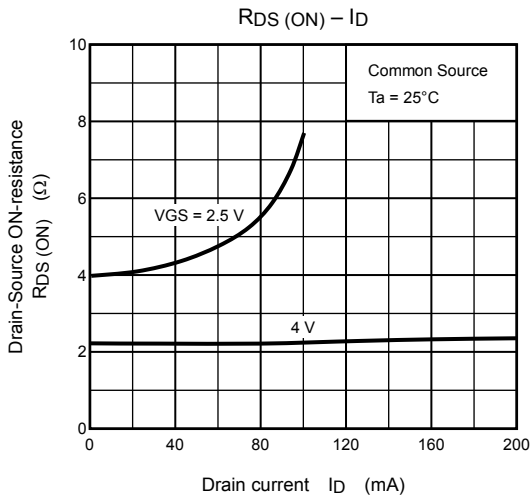
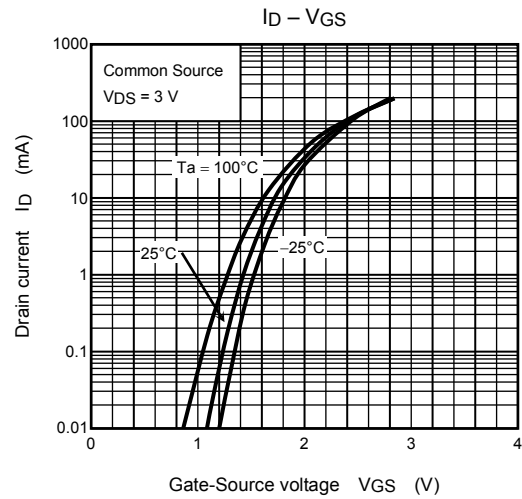
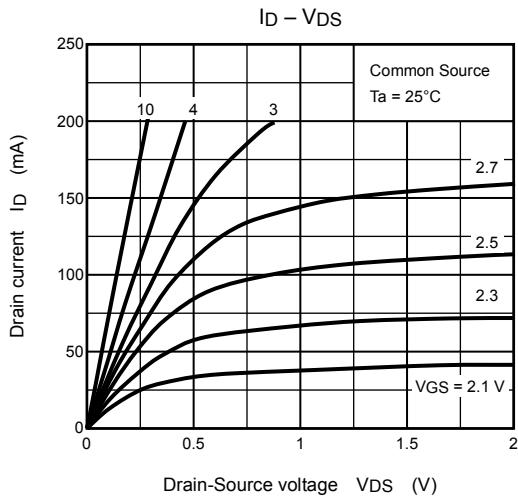
(c) VOUT

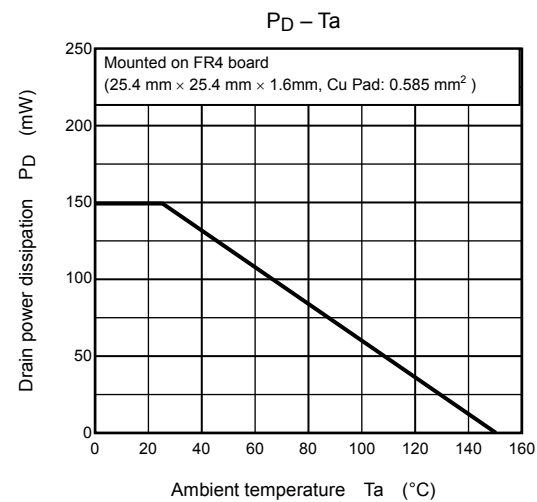
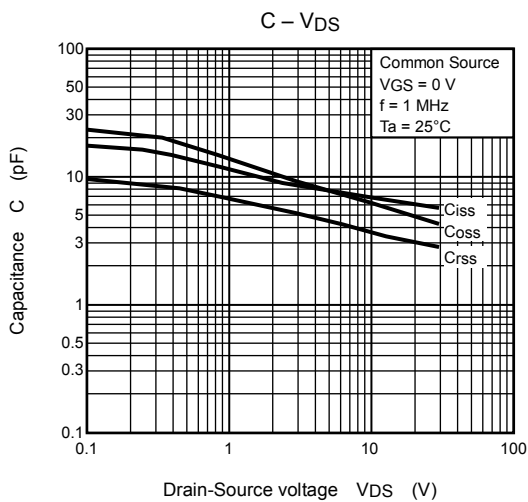
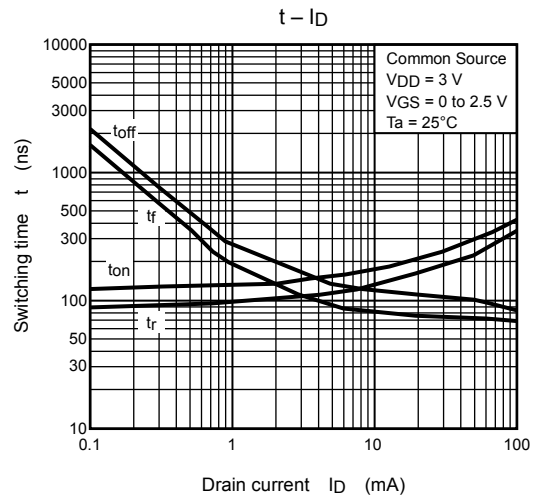
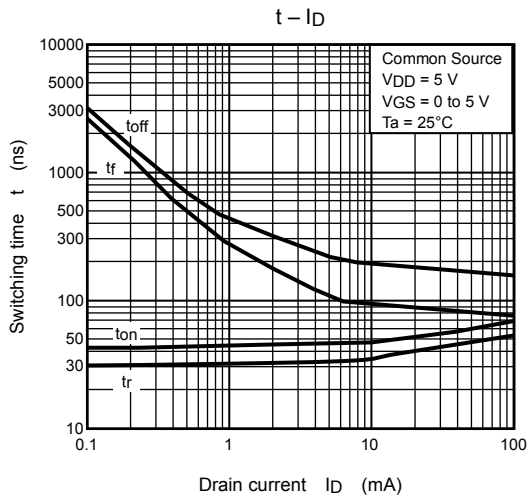
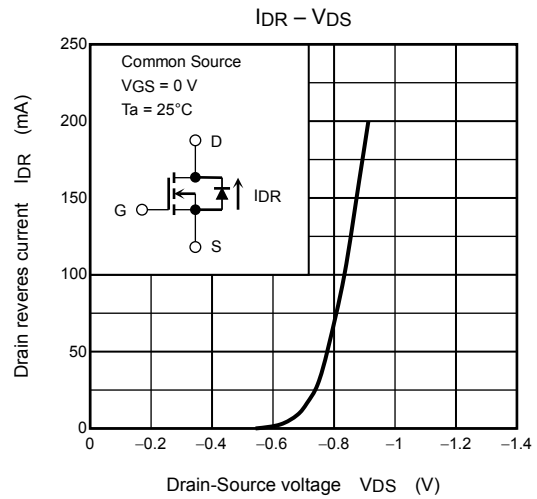
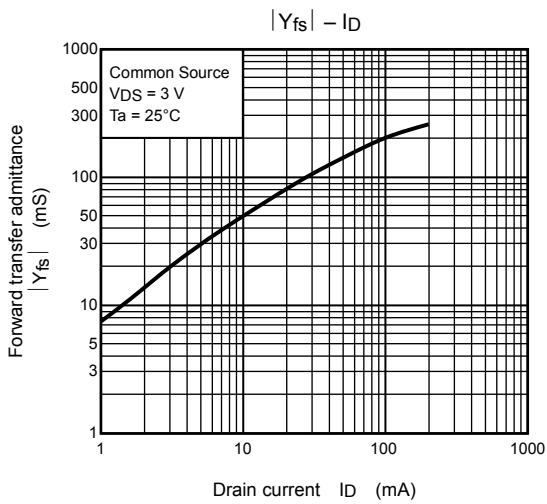
Precaution

V_{th} can be expressed as the voltage between gate and source when the low operating current value is ID = 100 μA for this product. For normal switching operation, VGS (on) requires a higher voltage than V_{th} and VGS (off) requires a lower voltage than V_{th}.

(The relationship can be established as follows: VGS (off) < V_{th} < VGS (on))

Please take this into consideration when using the device.





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