

SSM3J15F

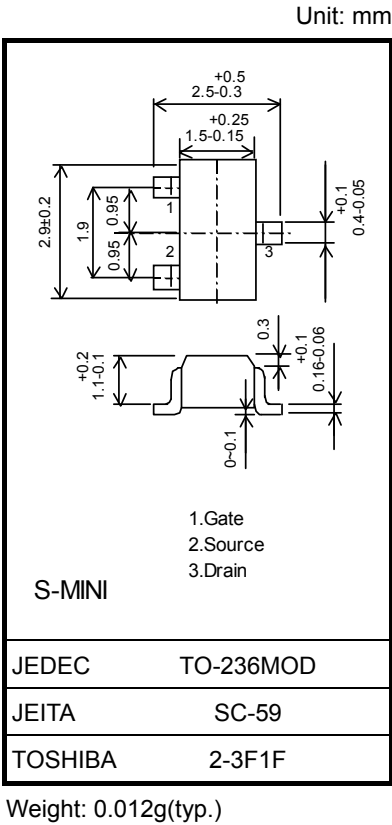
High Speed Switching Applications
Analog Switch Applications

- Small package
- Low ON resistance : $R_{on} = 12\ \Omega$ (max) (@ $V_{GS} = -4\text{ V}$)
: $R_{on} = 32\ \Omega$ (max) (@ $V_{GS} = -2.5\text{ V}$)

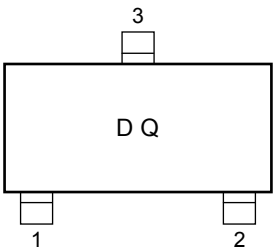
Absolute Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|-------------------------------------|-------|-----------|------------|------|
| Drain-Source voltage | | V_{DS} | -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 | 200 | mW |
| Channel temperature | | T_{ch} | 150 | °C |
| Storage temperature range | | T_{stg} | -55 to 150 | °C |

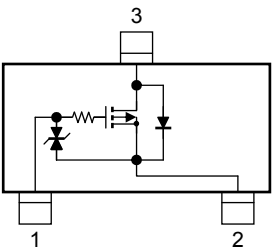
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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



Marking



Equivalent Circuit (top view)



Handling Precaution

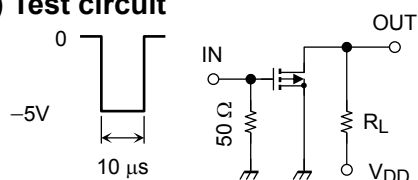
When handling individual devices (which are not yet mounting on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static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

Electrical Characteristics (Ta = 25°C)

| Characteristic | Symbol | Test Condition | MIN. | TYP. | MAX. | UNIT |
|--------------------------------|---------------|---|------|------|---------|---------------|
| Gate leakage current | I_{GSS} | $V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$ | — | — | ± 1 | μA |
| Drain-Source breakdown voltage | $V_{(BR)DSS}$ | $I_D = -0.1 \text{ mA}, V_{GS} = 0$ | -30 | — | — | V |
| Drain cut-off current | I_{DSS} | $V_{DS} = -30 \text{ V}, V_{GS} = 0$ | — | — | -1 | μA |
| Gate threshold voltage | V_{th} | $V_{DS} = -3 \text{ V}, I_D = -0.1 \text{ mA}$ | -1.1 | — | -1.7 | V |
| Forward transfer admittance | $ Y_{fs} $ | $V_{DS} = -3 \text{ V}, I_D = -10 \text{ mA}$ | 20 | — | — | mS |
| Drain-Source ON resistance | $R_{DS(ON)}$ | $I_D = -10 \text{ mA}, V_{GS} = -4 \text{ V}$ | — | 8 | 12 | Ω |
| | | $I_D = -1 \text{ mA}, V_{GS} = -2.5 \text{ V}$ | — | 14 | 32 | |
| Input capacitance | C_{iss} | $V_{DS} = -3 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$ | — | 9.1 | — | pF |
| Reverse transfer capacitance | C_{rss} | | — | 3.5 | — | pF |
| Output capacitance | C_{oss} | | — | 8.6 | — | pF |
| Switching time | Turn-on time | $V_{DD} = -5 \text{ V}, I_D = -10 \text{ mA},$ $V_{GS} = 0 \text{ to } -5 \text{ V}$ | — | 65 | — | ns |
| | Turn-off time | | — | 175 | — | |

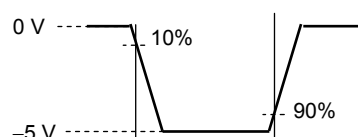
Switching Time Test Circuit

(a) Test circuit

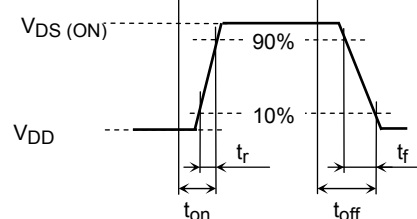


$V_{DD} = -5 \text{ V}$
 Duty $\leq 1\%$
 V_{IN} : $t_r, t_f < 5 \text{ ns}$
 $(Z_{out} = 50 \Omega)$
 Common Source
 $T_a = 25^\circ\text{C}$

(b) V_{IN}



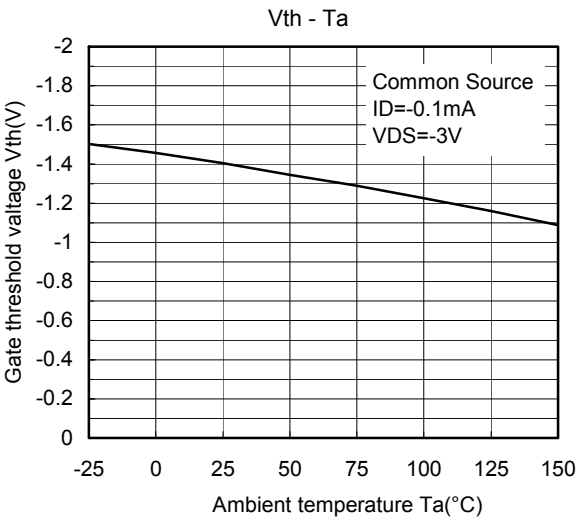
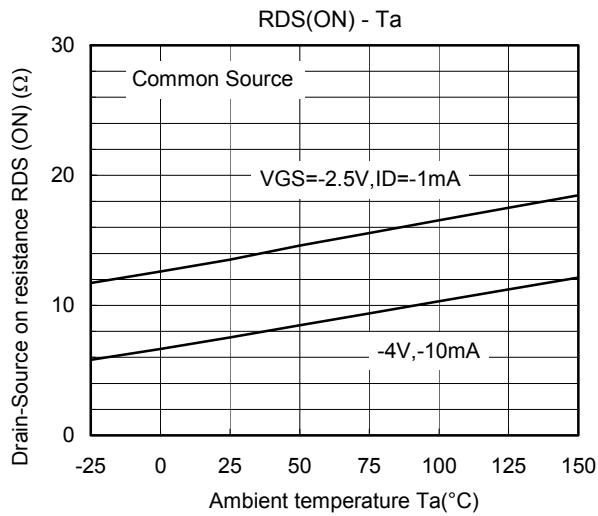
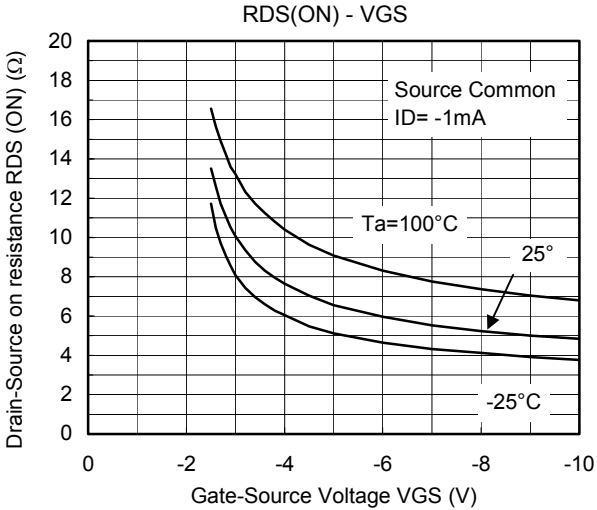
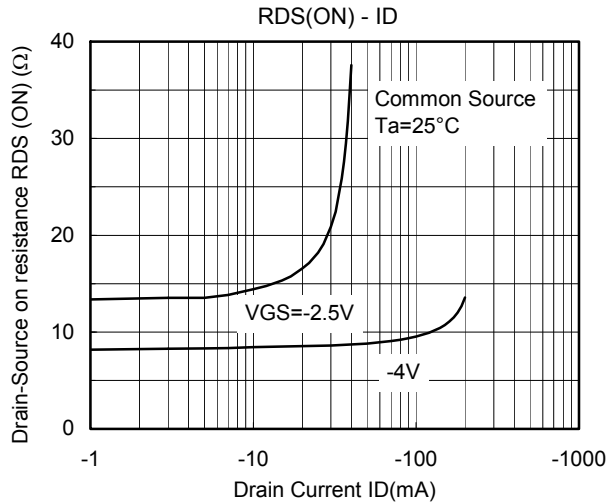
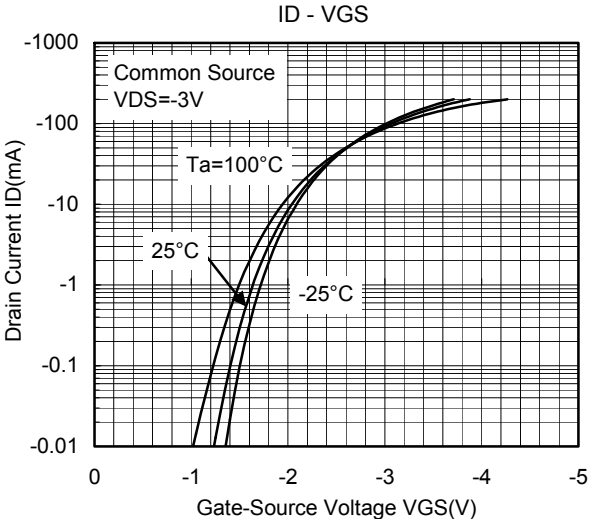
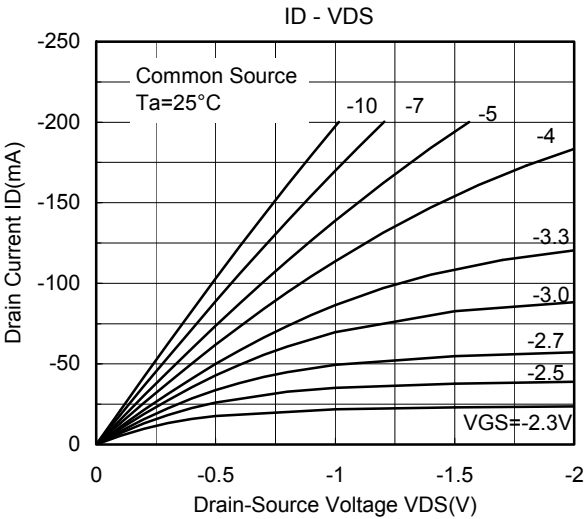
(c) V_{OUT}

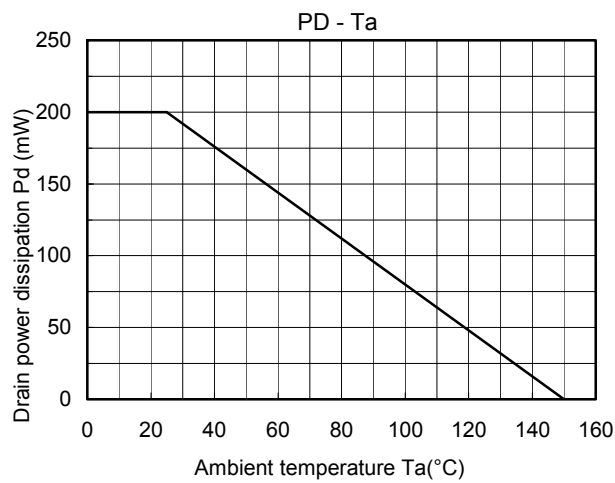
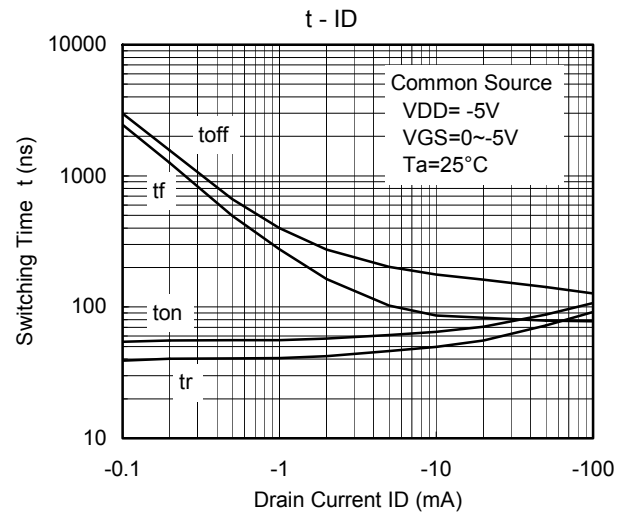
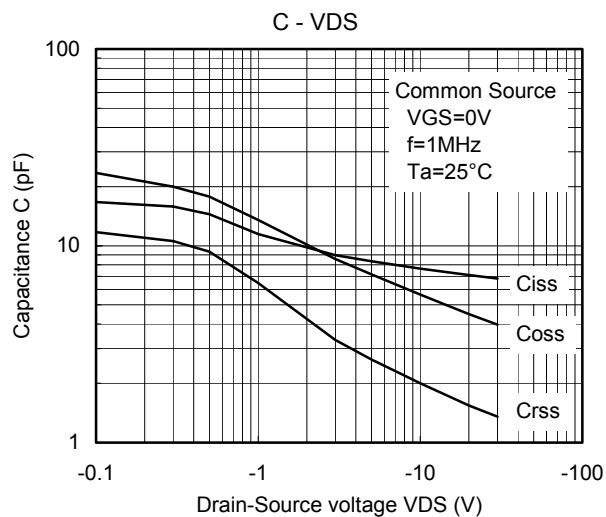
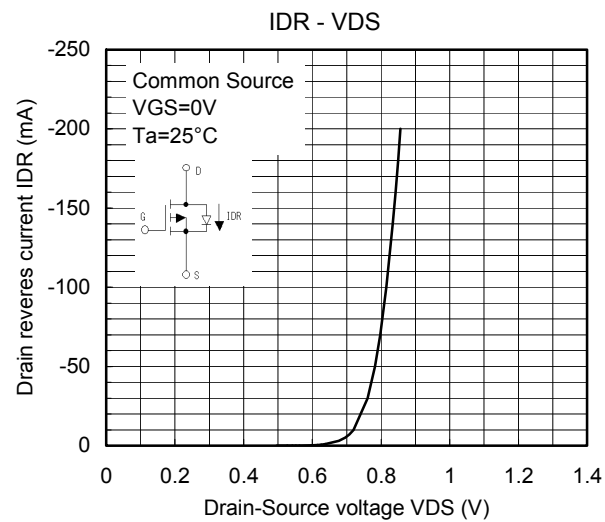
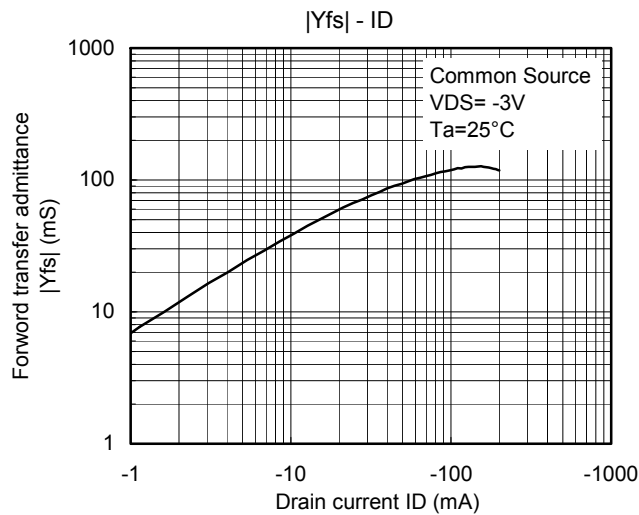


Precaution

V_{th} can be expressed as voltage between gate and source when low operating current value is $I_D = -100 \mu\text{A}$ for this product. For normal switching operation, $V_{GS(on)}$ requires higher voltage than V_{th} and $V_{GS(off)}$ requires lower voltage than V_{th} . (Relationship can be established as follows: $V_{GS(off)} < V_{th} < V_{GS(on)}$)

Please take this into consideration for using the device.





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