

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

## SSM3K17FU

High Speed Switching Applications

Analog Switch Applications

- Suitable for high-density mounting due to compact package
- High drain-source voltage
- High speed switching

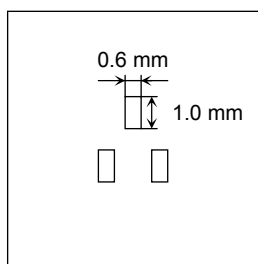
### Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Drain-Source voltage	$V_{DS}$	50	V
Gate-Source voltage	$V_{GSS}$	$\pm 7$	V
Drain current	DC	$I_D$	100
	Pulse	$I_{DP}$	200
Drain power dissipation (Ta = 25°C)	$P_D$ (Note 1)	150	mW
Channel temperature	$T_{ch}$	150	°C
Storage temperature range	$T_{stg}$	-55~150	°C

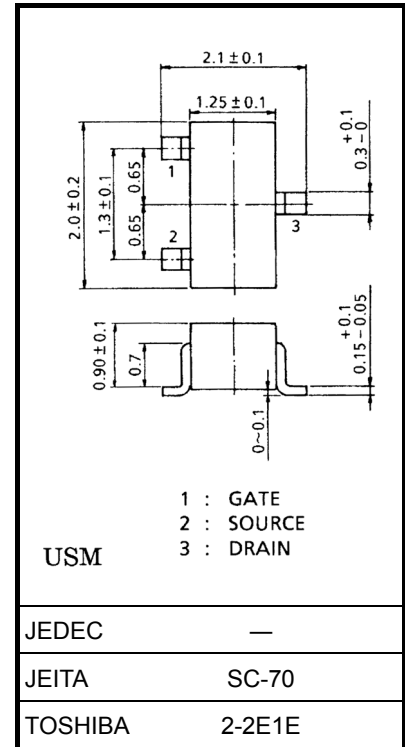
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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: Mounted on FR4 board  
(25.4 mm × 25.4 mm × 1.6 t, Cu Pad: 0.6 mm<sup>2</sup> × 3)

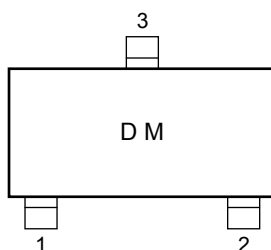


Unit: mm

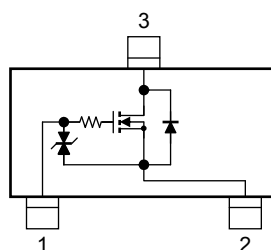


Weight: 6 mg (typ.)

### Marking



### Equivalent Circuit



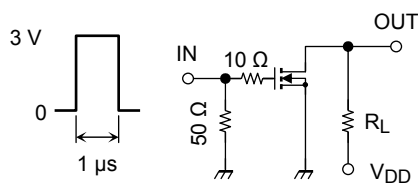
This transistor is an electrostatic sensitive device. Please handle with caution.

## Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	$I_{GSS}$	$V_{GS} = \pm 7\text{ V}, V_{DS} = 0$	—	—	$\pm 5$	$\mu\text{A}$
Drain-Source breakdown voltage	$V_{(BR)DSS}$	$I_D = 0.1\text{ mA}, V_{GS} = 0$	50	—	—	V
Drain cut-off current	$I_{DSS}$	$V_{DS} = 50\text{ V}, V_{GS} = 0$	—	—	1	$\mu\text{A}$
Gate threshold voltage	$V_{th}$	$V_{DS} = 3\text{ V}, I_D = 1\text{ }\mu\text{A}$	0.9	—	1.5	V
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 3\text{ V}, I_D = 10\text{ mA}$	20	40	—	mS
Drain-Source ON resistance	$R_{DS(ON)}$	$I_D = 10\text{ mA}, V_{GS} = 4\text{ V}$	—	12	20	$\Omega$
		$I_D = 10\text{ mA}, V_{GS} = 2.5\text{ V}$	—	22	40	
Input capacitance	$C_{iss}$	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	7	—	pF
Reverse transfer capacitance	$C_{rss}$	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	3	—	pF
Output capacitance	$C_{oss}$	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	7	—	pF
Switching time	Turn-on time	$V_{DD} = 3\text{ V}, I_D = 20\text{ mA}, V_{GS} = 0\sim 3\text{ V}, R_G = 10\text{ }\Omega, R_L = 150\text{ }\Omega$	—	100	—	ns
	Turn-off time		—	40	—	

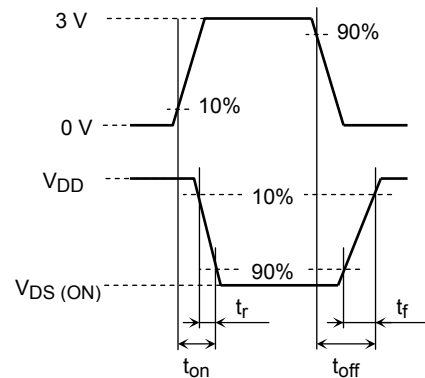
## Switching Time Test Circuit

(a) Test circuit

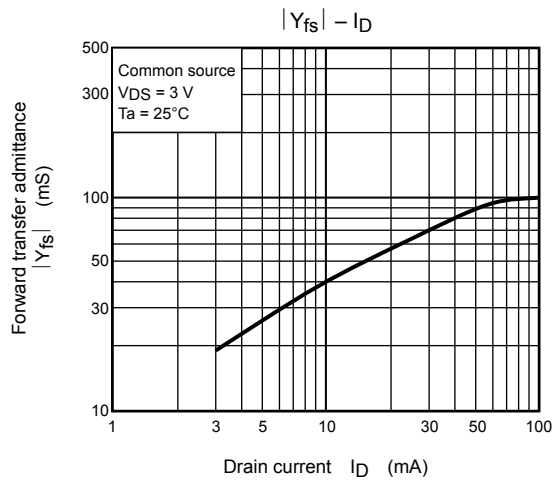
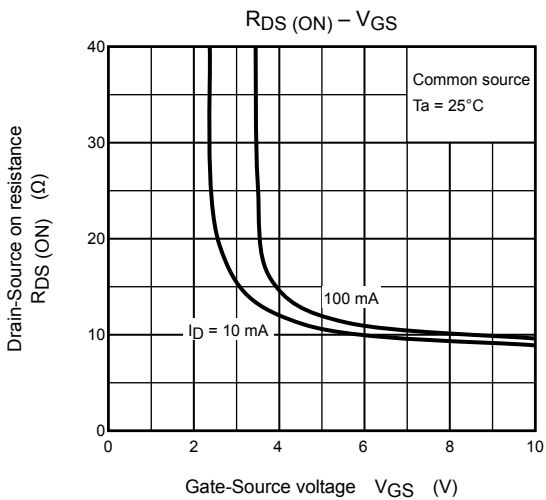
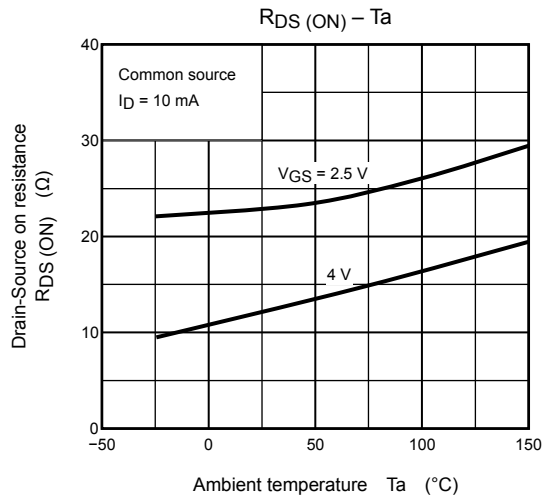
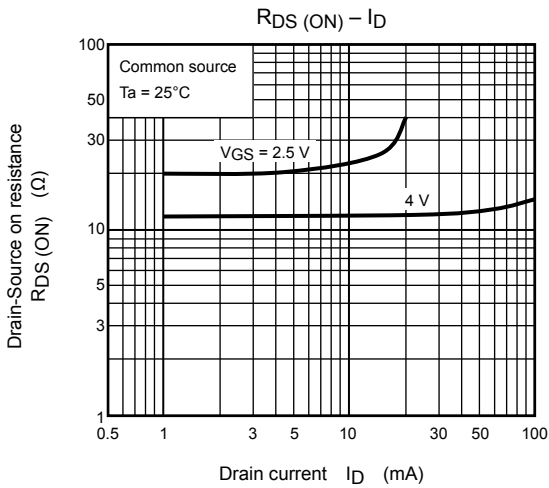
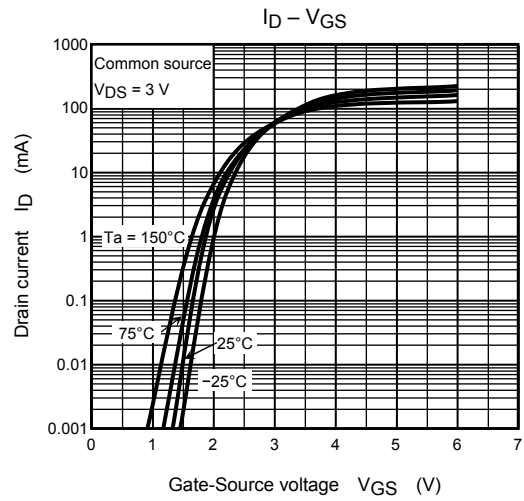
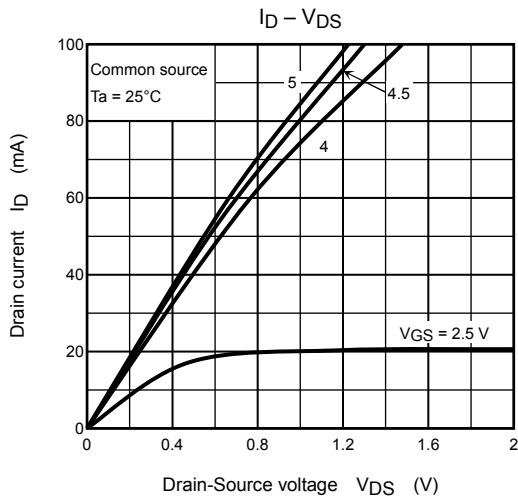


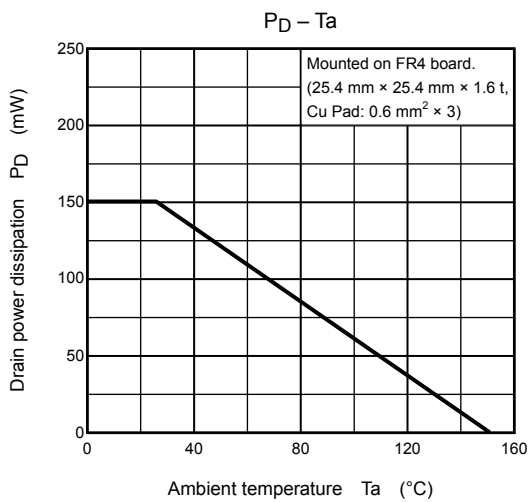
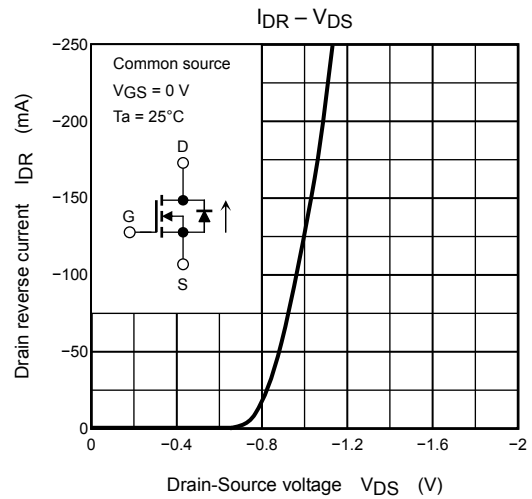
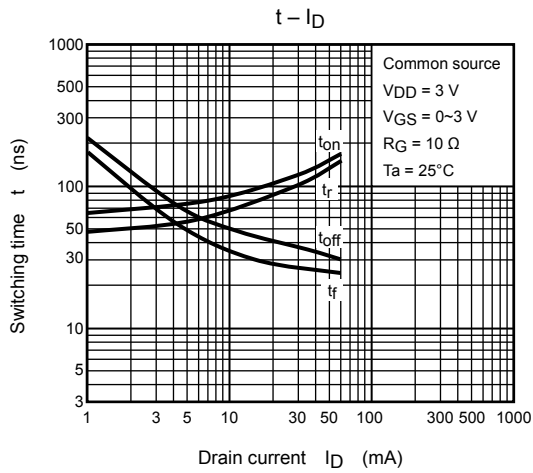
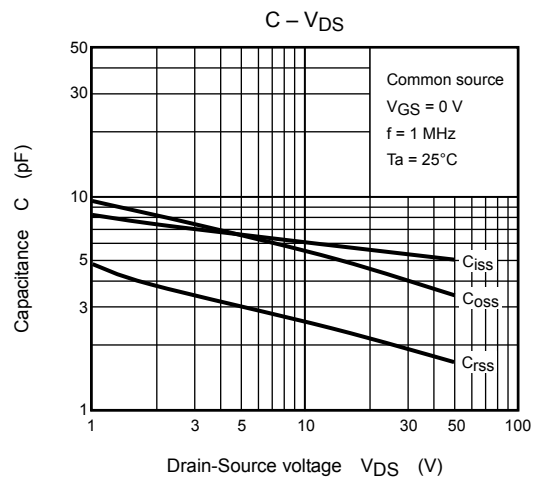
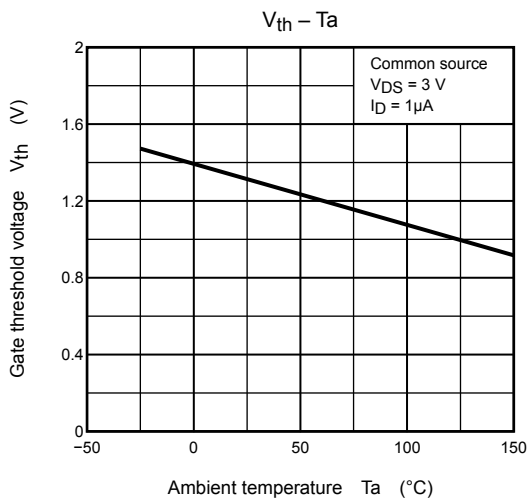
$V_{DD} = 3\text{ V}$   
 Duty  $\leq 1\%$   
 $V_{IN}$ :  $t_r, t_f < 5\text{ ns}$   
 $(Z_{out} = 50\text{ }\Omega)$   
 Common source  
 $T_a = 25^\circ\text{C}$

(b)  $V_{IN}$



(c)  $V_{OUT}$





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20070701-EN GENERAL

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