

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

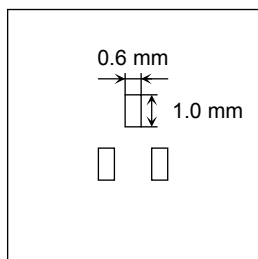
Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Drain-Source voltage		V_{DS}	50	V
Gate-Source voltage		V_{GSS}	± 7	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 range		T_{stg}	-55 to 150	°C

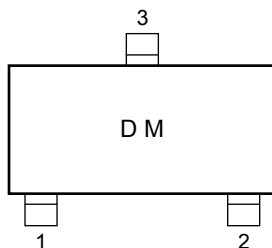
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

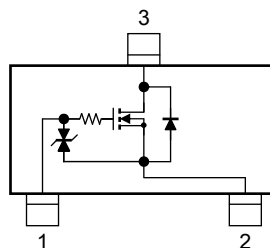
Note 1: Mounted on FR4 board
(25.4 mm × 25.4 mm × 1.6 t, Cu Pad: 0.6 mm² × 3)



Marking



Equivalent Circuit



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

Unit: mm

JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1E

Weight: 6 mg (typ.)

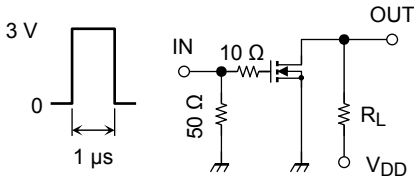
Start of commercial production
2001-09

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	$V_{GS} = \pm 7 \text{ V}, V_{DS} = 0$	—	—	± 5	μA
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	μA
Gate threshold voltage	V_{th}	$V_{DS} = 3 \text{ V}, I_D = 1 \mu\text{A}$	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	Ω
		$I_D = 10 \text{ mA}, V_{GS} = 2.5 \text{ V}$	—	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	$V_{DD} = 3 \text{ V}, I_D = 20 \text{ mA}, V_{GS} = 0 \text{ to } 3 \text{ V},$ $R_G = 10 \Omega, R_L = 150 \Omega$	—	100	—	ns
	Turn-off time		—	40	—	

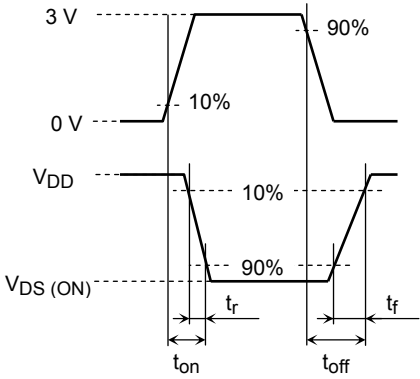
Switching Time Test Circuit

(a) Test circuit

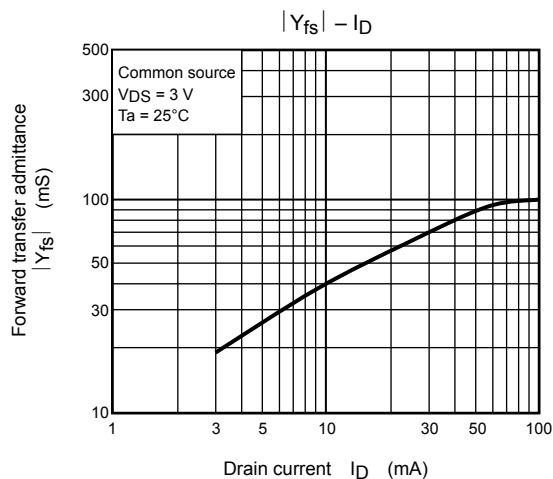
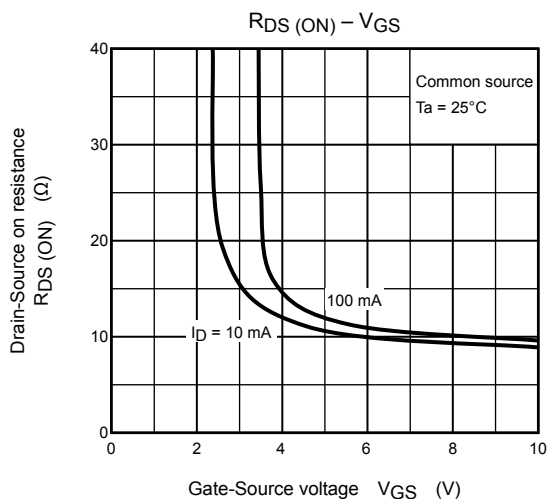
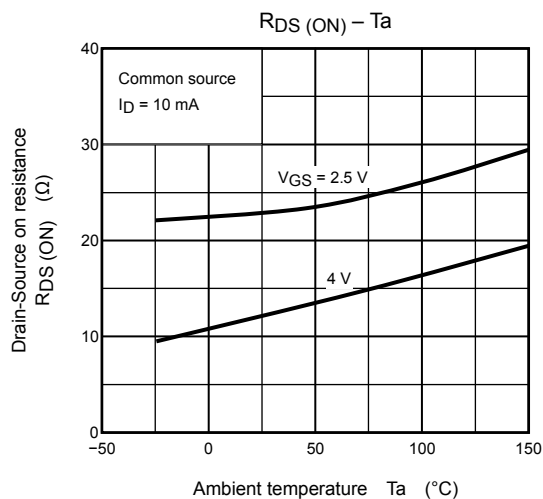
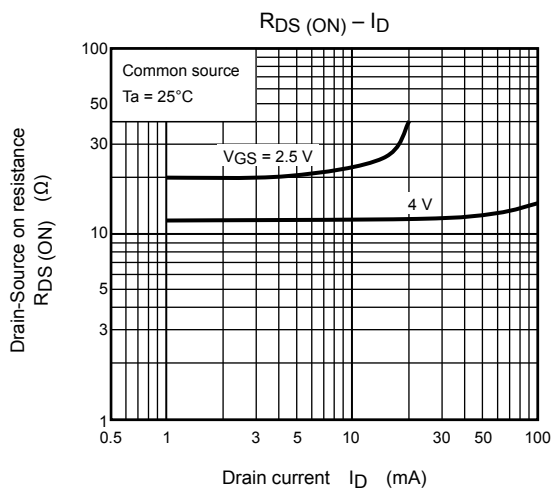
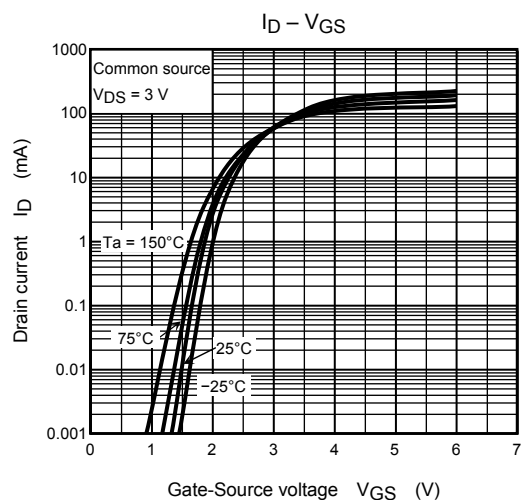
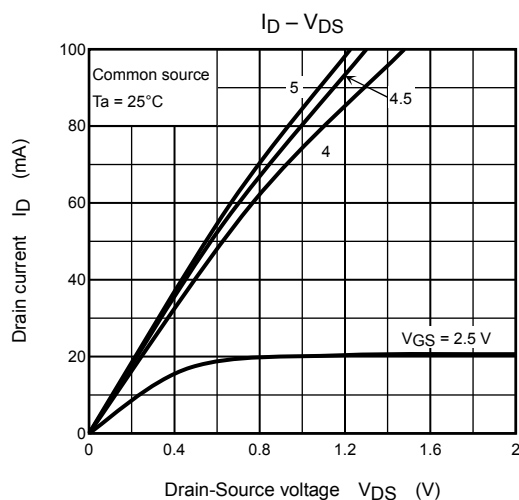


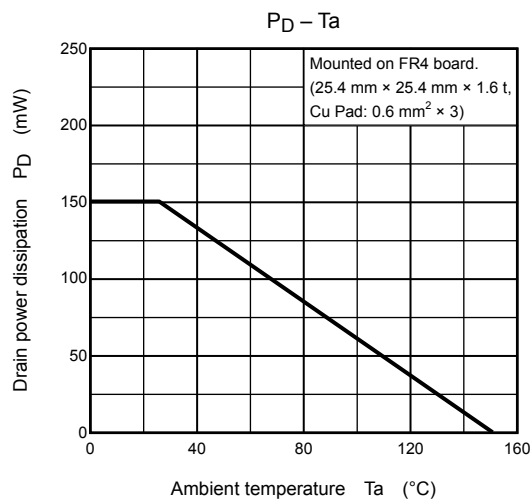
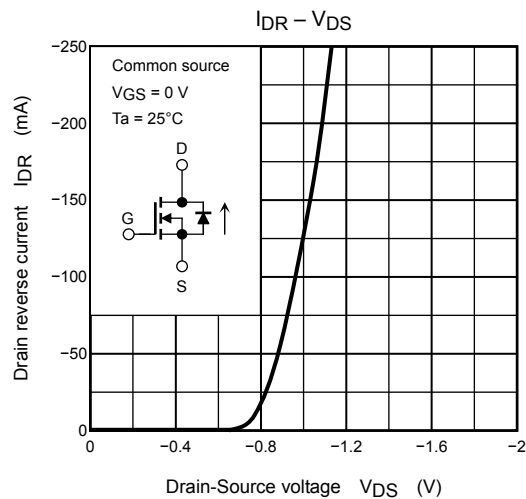
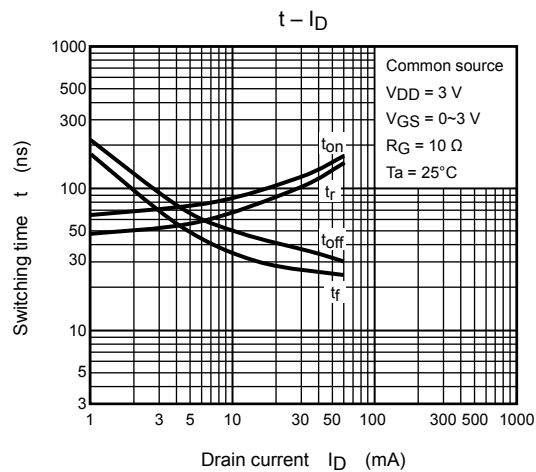
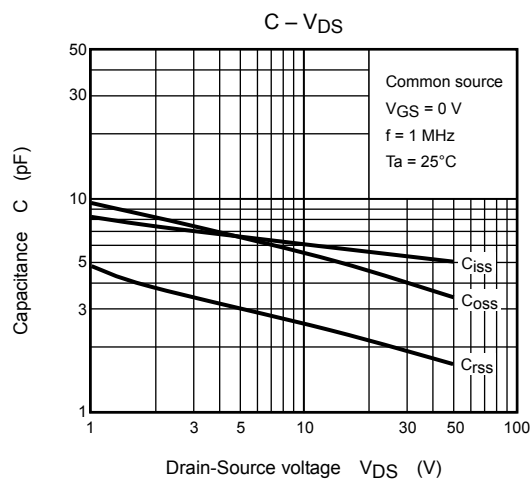
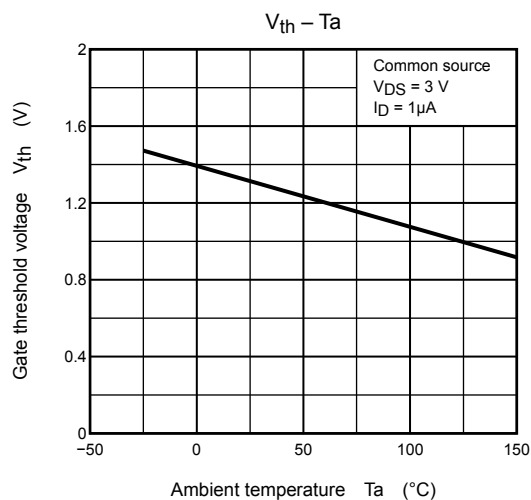
$V_{DD} = 3 \text{ V}$
 Duty $\leq 1\%$
 V_{IN} : $t_r, t_f < 5 \text{ ns}$
 $(Z_{out} = 50 \Omega)$
 Common source
 $T_a = 25^\circ\text{C}$

(b) V_{IN}



(c) V_{OUT}





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