

# SSM6N17FU

High Speed Switching Applications

Analog Switch Applications

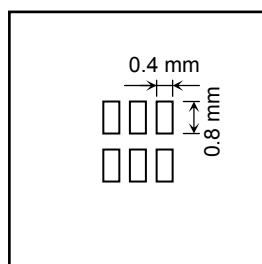
- Suitable for high-density mounting due to compact package
- High drain-source voltage
- High speed switching

## Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

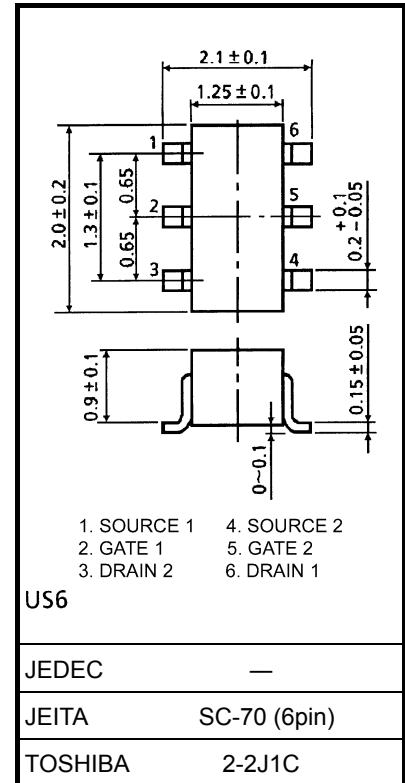
Characteristics	Symbol	Rating	Unit
Drain-Source voltage	V <sub>DS</sub>	50	V
Gate-Source voltage	V <sub>GSS</sub>	±7	V
Drain current	DC	I <sub>D</sub>	100
	Pulse	I <sub>DP</sub>	200
Drain power dissipation (Ta = 25°C)	P <sub>D</sub> (Note 1)	200	mW
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-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: Total rating, Mounted on FR4 board  
(25.4 mm × 25.4 mm × 1.6 t, Cu Pad: 0.32 mm<sup>2</sup> × 6)

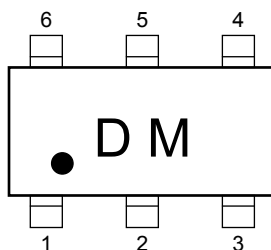


Unit: mm

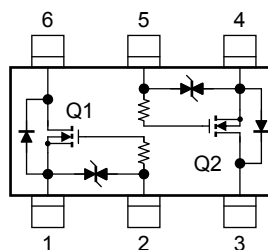


Weight: 6.8 mg (typ.)

## Marking



## Equivalent Circuit



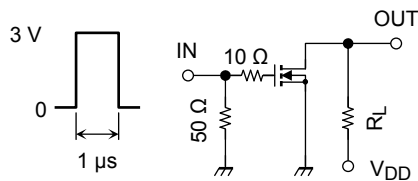
This transistor is an electrostatic sensitive device. Please handle with caution.

## Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

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	$V_{th}$	$V_{DS} = 3 \text{ V}, I_D = 1 \mu\text{A}$	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	$C_{rss}$		—	3	—	pF	
Output capacitance	$C_{oss}$		—	7	—	pF	
Switching time	Turn-on time	$t_{on}$	$V_{DD} = 3 \text{ V}, I_D = 20 \text{ mA},$ $V_{GS} = 0 \sim 3 \text{ V}, R_G = 10 \Omega,$ $R_L = 150 \Omega$		—	100	ns
	Turn-off time	$t_{off}$			—	40	

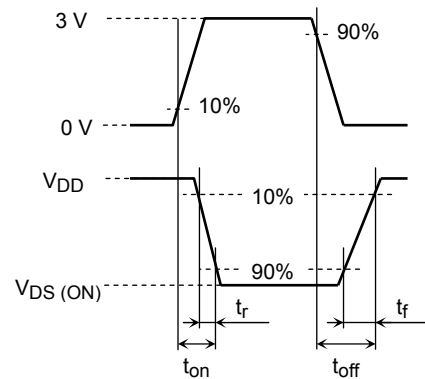
## Switching Time Test Circuit

(a) Test circuit



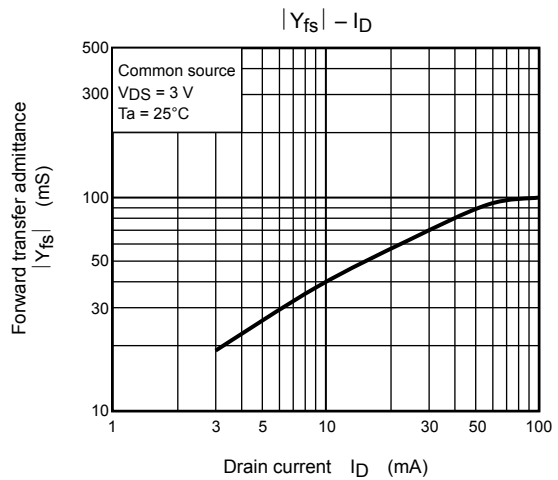
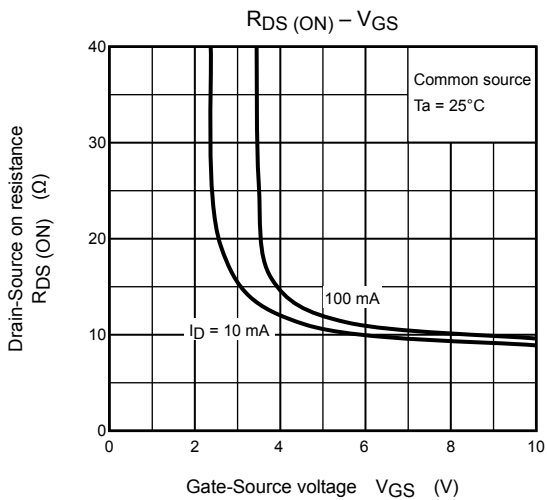
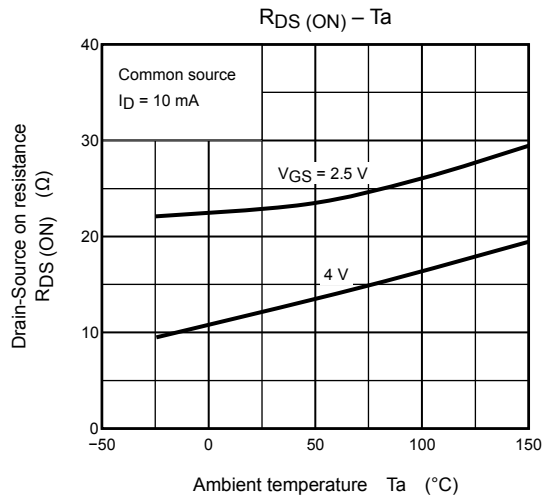
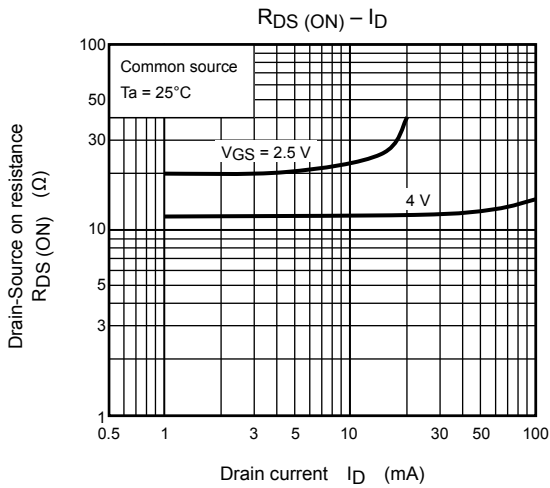
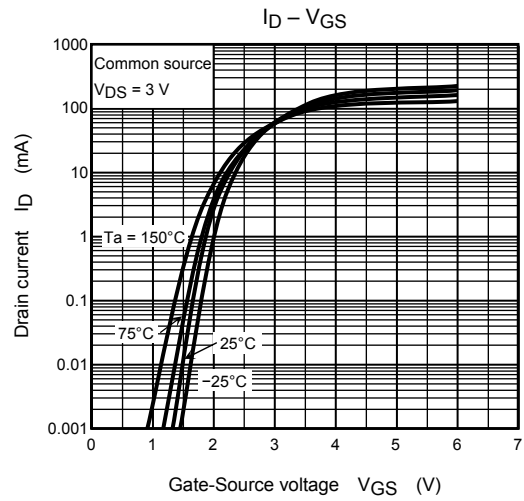
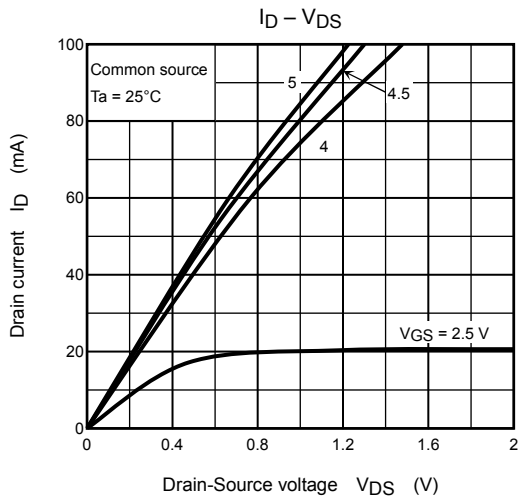
$V_{DD} = 3 \text{ V}$   
 Duty  $\leq 1\%$   
 $V_{IN}$ :  $t_r, t_f < 5 \text{ ns}$   
 $(Z_{out} = 50 \Omega)$   
 Common source  
 $T_a = 25^\circ\text{C}$

(b)  $V_{IN}$

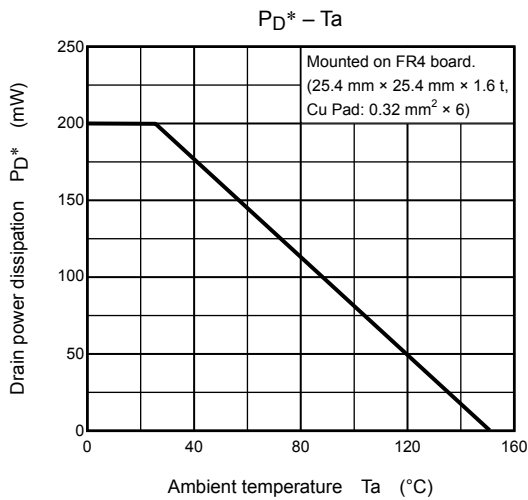
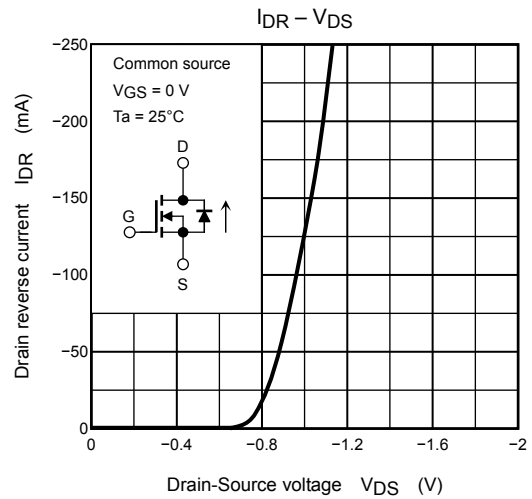
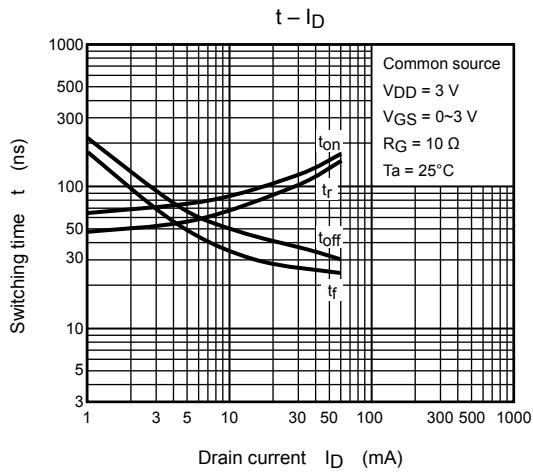
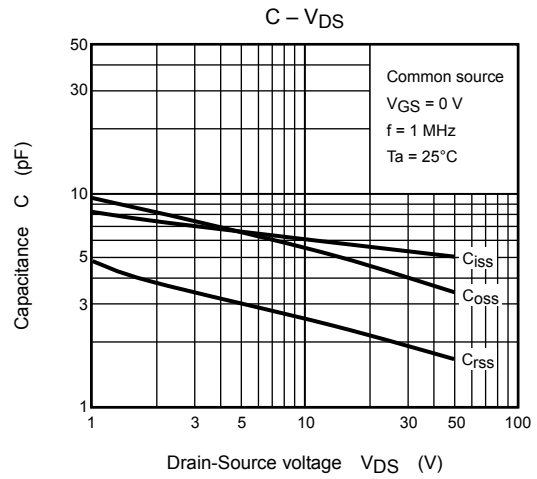
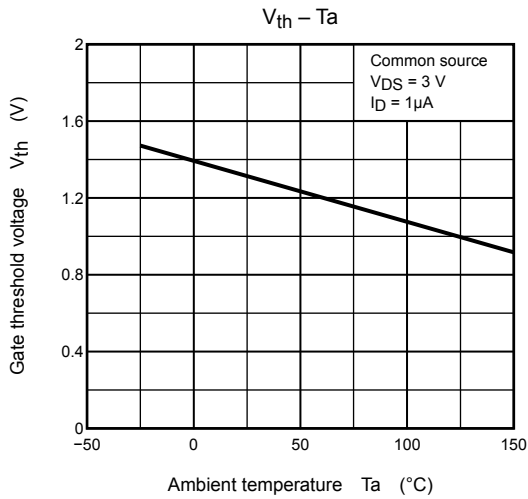


(c)  $V_{OUT}$

(Q1, Q2 Common)



## (Q1, Q2 Common)



\*: Total rating

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20070701-EN GENERAL

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