

# SSM3J02T

Power Management Switch  
High Speed Switching Applications

- Component package suitable for high-density mounting
- Small Package
- Low ON Resistance :  $R_{on} = 0.5 \Omega$  (max) (@ $V_{GS} = -4 V$ )  
                              :  $R_{on} = 0.7 \Omega$  (max) (@ $V_{GS} = -2.5 V$ )
- Low-voltage operation possible

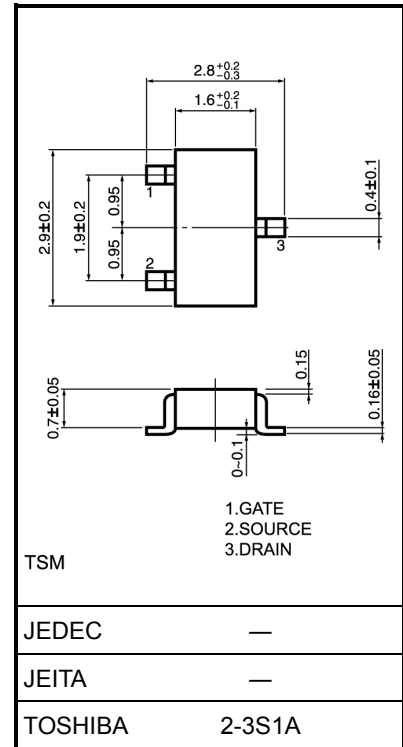
### Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Drain-Source voltage		$V_{DS}$	-30	V
Gate-Source voltage		$V_{GSS}$	$\pm 10$	V
Drain current	DC	$I_D$	-1.5	A
	Pulse	$I_{DP}$ (Note2)	-3.0	
Drain power dissipation (Ta = 25°C)		$P_D$ (Note1)	1250	mW
Channel temperature		$T_{ch}$	150	°C
Storage temperature range		$T_{stg}$	-55 to 150	°C

Note1: Mounted on FR4 board  
(25.4 mm × 25.4 mm × 1.6 t, Cu pad: 645 mm<sup>2</sup>, t = 10 s)

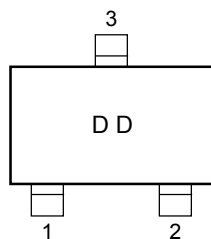
Note2: The pulse width limited by max channel temperature.

Unit: mm

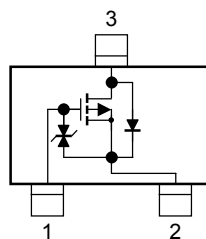


Weight: 10 mg (typ.)

### Marking



### Equivalent Circuit



### 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.

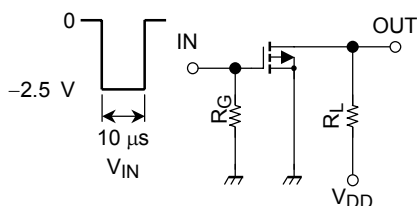
## Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GSS}$	$V_{GS} = \pm 10\text{ V}, V_{DS} = 0$	—	—	$\pm 1$	$\mu\text{A}$
Drain-Source breakdown voltage		$V_{(BR)DSS}$	$I_D = -1\text{ mA}, V_{GS} = 0$	-30	—	—	V
Drain Cut-off current		$I_{DSS}$	$V_{DS} = -30\text{ V}, V_{GS} = 0$	—	—	-1	$\mu\text{A}$
Gate threshold voltage		$V_{th}$	$V_{DS} = -3\text{ V}, I_D = -0.1\text{ mA}$	-0.6	—	-1.1	V
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = -3\text{ V}, I_D = -0.3\text{ A}$ (Note3)	0.6	—	—	S
Drain-Source ON resistance		$R_{DS(ON)}$	$I_D = -0.3\text{ A}, V_{GS} = -4\text{ V}$ (Note3)	—	0.4	0.5	$\Omega$
			$I_D = -0.3\text{ A}, V_{GS} = -2.5\text{ V}$ (Note3)	—	0.55	0.7	
Input capacitance		$C_{iss}$	$V_{DS} = -10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	150	—	pF
Reverse transfer capacitance		$C_{rss}$	$V_{DS} = -10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	21	—	pF
Output capacitance		$C_{oss}$	$V_{DS} = -10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	61	—	pF
Switching time	Turn-on time	$t_{on}$	$V_{DD} = -15\text{ V}, I_D = -0.3\text{ A},$ $V_{GS} = 0\text{ to }-2.5\text{ V}, R_G = 4.7\ \Omega$	—	55	—	ns
	Turn-off time	$t_{off}$		—	52	—	

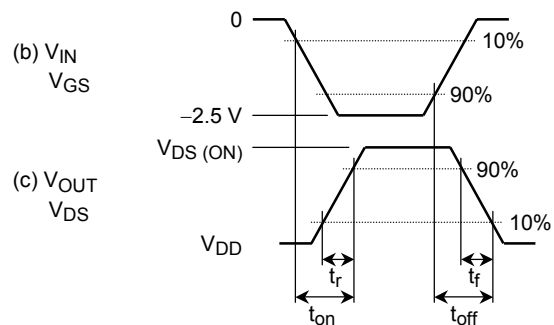
Note3: Pulse test

## Switching Time Test Circuit

(a) Test circuit



$V_{DD} = -15\text{ V}$   
 $R_G = 4.7\ \Omega$   
 D.U.  $\leq 1\%$   
 $V_{IN}$ :  $t_r, t_f < 5\text{ ns}$   
 COMMON SOURCE  
 $T_a = 25^\circ\text{C}$



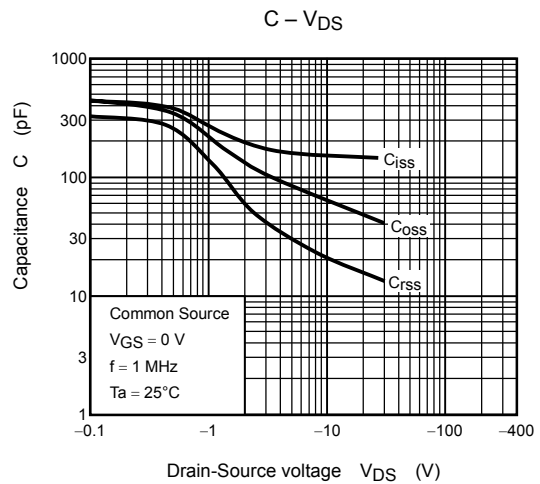
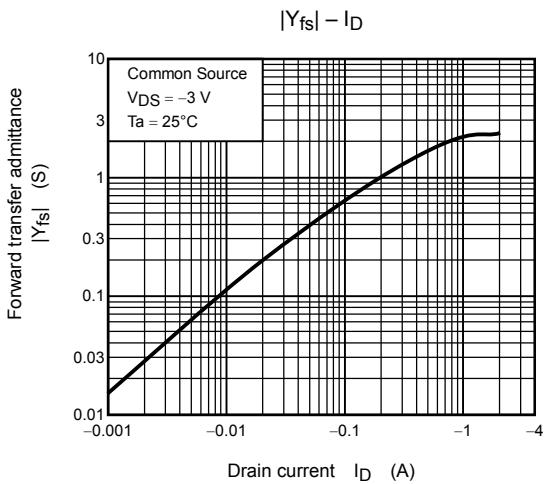
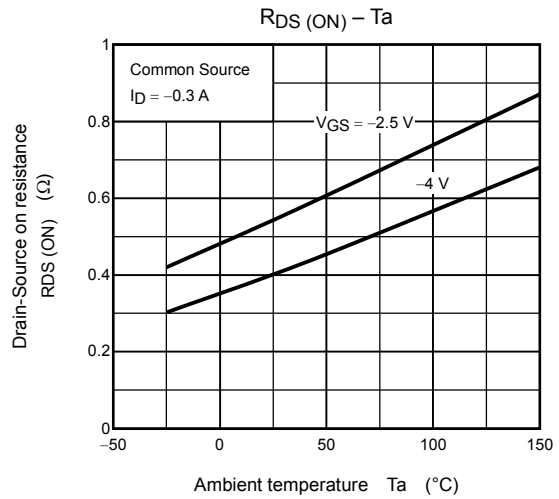
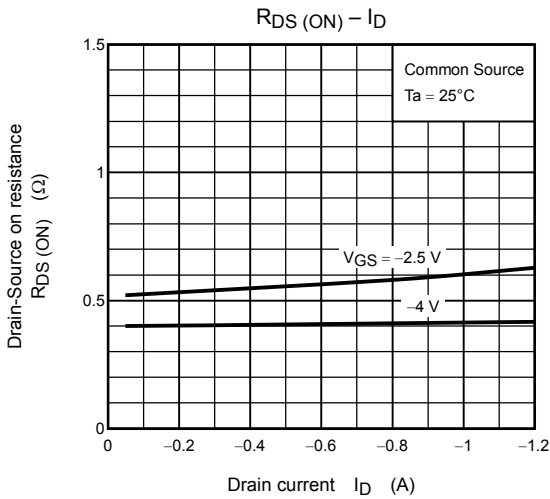
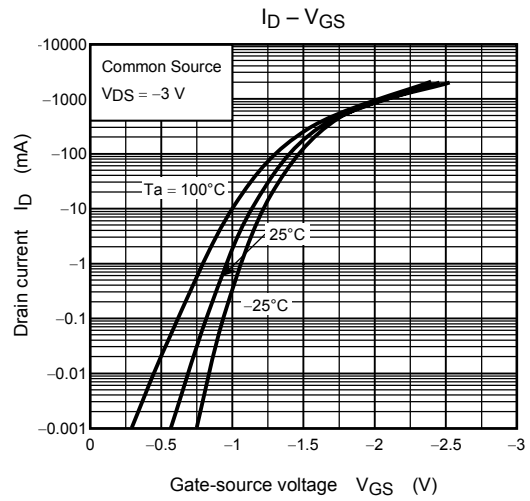
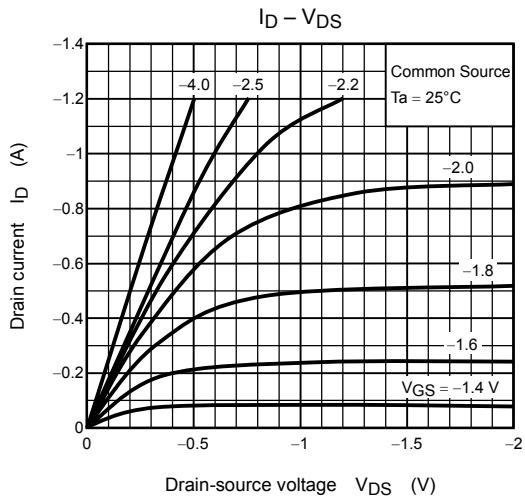
## Precaution

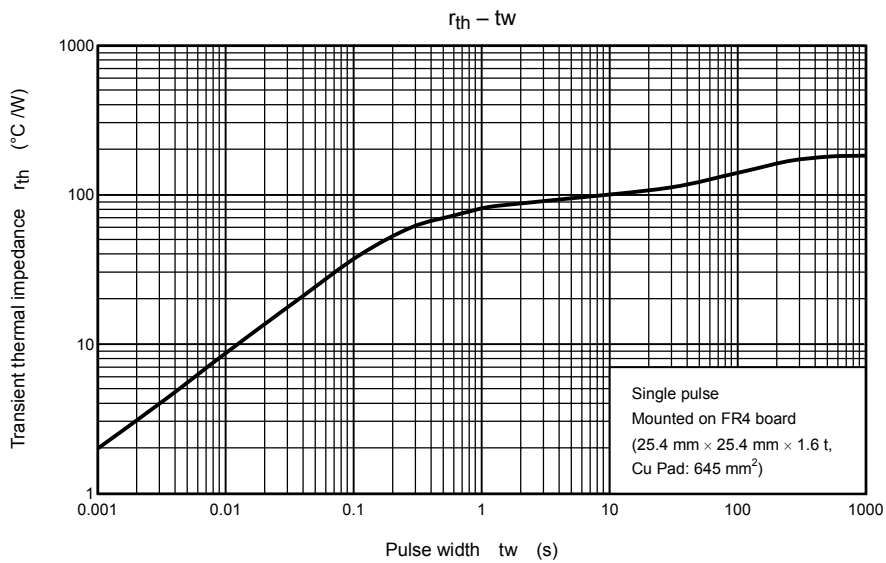
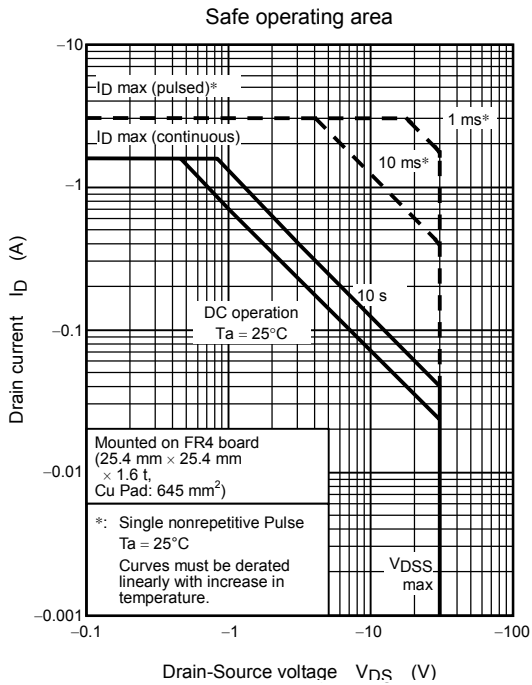
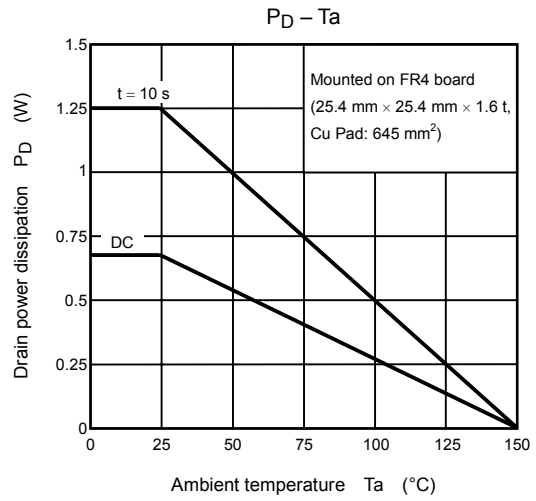
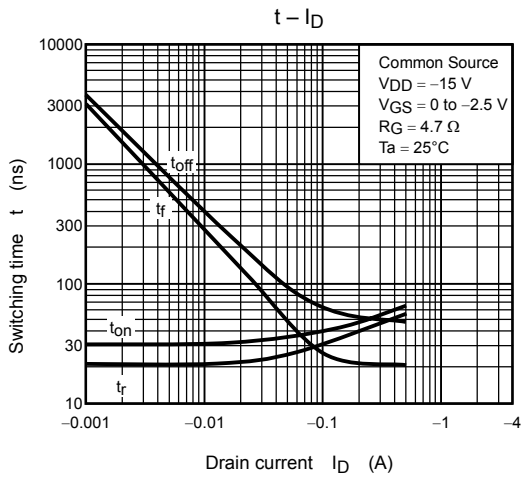
$V_{th}$  can be expressed as voltage between gate and source when low operating current value is  $I_D = -100\ \mu\text{A}$  for this product. For normal switching operation,  $V_{GS(ON)}$  requires higher voltage than  $V_{th}$  and  $V_{GS(OFF)}$  requires lower voltage than  $V_{th}$ .

(relationship can be established as follows:  $V_{GS(OFF)} < V_{th} < V_{GS(ON)}$ )

Please take this into consideration for using the device.

$V_{GS}$  recommended voltage of  $-2.5\text{ V}$  or higher to turn on this product.





**RESTRICTIONS ON PRODUCT USE**

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