Unit: mm

TOSHIBA Field Effect Transistor Silicon P Channel MOS Type (U-MOSII)

## SSM6J08FU

# Power Management Switch DC-DC Converter

• Small Package

• Low on Resistance :  $R_{on} = 0.18 \Omega \text{ (max) } (@V_{GS} = -4 \text{ V})$ 

 $: R_{on} = 0.26 \Omega \text{ (max) (@VGS} = -2.5 \text{ V)}$ 

• Low Gate Threshold Voltage

#### Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit	
Drain-Source voltage		$V_{DS}$	-20	V	
Gate-Source voltage		V <sub>GSS</sub>	±12	V	
Drain current	DC	I <sub>D</sub>	-1.3	А	
	Pulse	I <sub>DP</sub> (Note 2)	-2.6		
Drain power dissipation		P <sub>D</sub> (Note 1)	300	mW	
Channel temperature		T <sub>ch</sub>	150	°C	
Storage temperature range		T <sub>stg</sub>	-55~150	°C	

Note1: Mounted on FR4 board

 $(25.4 \text{ mm} \times 25.4 \text{ mm} \times 1.6 \text{ t}, \text{ Cu Pad: } 0.32 \text{ mm}^2 \times 6) \text{ Fig: } 1.$ 

Note2: The pulse width limited by max channel temperature.

1, 2, 5, 6 : DRAIN 3 : GATE 4 : SOURCE

2-2J1D

Weight: 6.8 mg (typ.)

US<sub>6</sub>

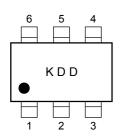
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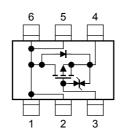
**TOSHIBA** 

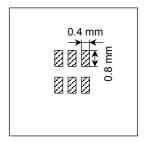
## Marking

## **Equivalent Circuit**

Fig 1: 25.4 mm  $\times$  25.4 mm  $\times$  1.6 t, Cu Pad: 0.32 mm<sup>2</sup>  $\times$  6







## **Handling Precaution**

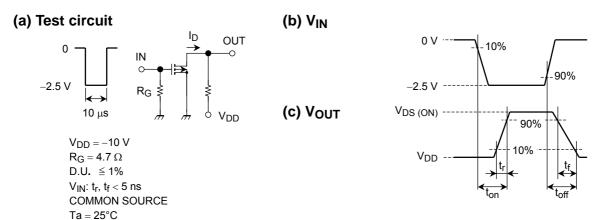
When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static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

## **Electrical Characteristics (Ta = 25°C)**

Chara	acteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage current $I_{GSS}$ $V_{GS} = \pm 12 \text{ V}, V_{DS} = 0$		$V_{GS} = \pm 12 \text{ V}, V_{DS} = 0$	_	_	±1	μА	
Drain-Source breakdown voltage	V (BR) DSS	$I_D = -1 \text{ mA}, V_{GS} = 0$	-20	_	_	V	
	V (BR) DSX	$I_D = -1$ mA, $V_{GS} = 12$ V	-8	_	_		
Drain Cut-off curre	ent	I <sub>DSS</sub>	$V_{DS} = -20 \text{ V}, V_{GS} = 0$	_	_	-1	μА
Gate threshold vo	Itage	V <sub>th</sub>	$V_{DS} = -3 \text{ V}, I_D = -0.1 \text{ mA}$	-0.5	_	-1.1	V
Forward transfer a	admittance	Y <sub>fs</sub>	$V_{DS} = -3 \text{ V}, I_D = -0.65 \text{ A}$ (Note 3)	1.3	2.7	_	S
Drain-Source ON resistance		R <sub>DS</sub> (ON)	$I_D = -0.65 \text{ A}, V_{GS} = -4 \text{ V}$ (Note 3)	_	140	180	mΩ
			$I_D = -0.65 \text{ A}, V_{GS} = -2.5 \text{ V}$ (Note 3)	_	200	260	
			$I_D = -0.65 \text{ A}, V_{GS} = -2.0 \text{ V}$ (Note 3)	_	260	460	
Input capacitance		C <sub>iss</sub>	$V_{DS} = -10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	_	370	_	pF
Reverse transfer capacitance		C <sub>rss</sub>	$V_{DS} = -10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	_	73	_	pF
Output capacitance		C <sub>oss</sub>	$V_{DS} = -10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	_	116	_	pF
Switching time	Turn-on time	t <sub>on</sub>	$V_{DD} = -10 \text{ V}, I_D = -0.65 \text{ A},$	_	33	_	ns
	Turn-off time	t <sub>off</sub>	$V_{GS} = 0 \sim -2.5 \text{ V}, R_G = 4.7 \Omega$	—	47		ns

Note 3: Pulse test

## **Switching Time Test Circuit**



#### **Precaution**

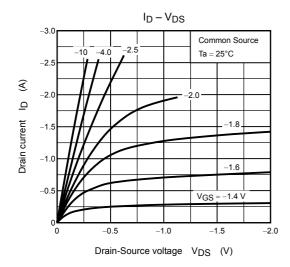
 $V_{th} \ can \ be \ expressed \ as \ voltage \ between \ gate \ and \ source \ when \ low \ operating \ current \ value \ is \ ID = -100 \ \mu A$  for this product. For normal switching operation,  $V_{GS}$  (on) requires higher voltage than  $V_{th}$  and  $V_{GS}$  (off) requires lower voltage than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

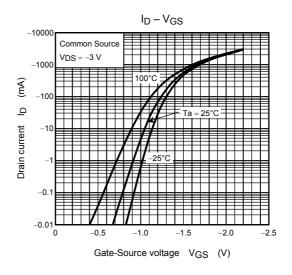
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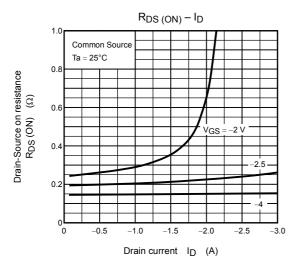
(relationship can be established as follows:  $V_{GS}$  (off) <  $V_{th}$  <  $V_{GS}$  (on))

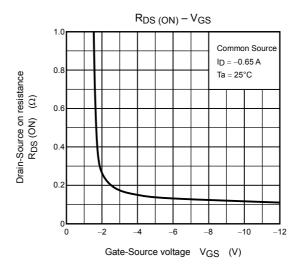
Please take this into consideration for using the device.

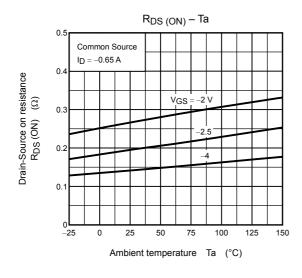
VGS recommended voltage of –2.5  $\ensuremath{V}$  or higher to turn on this product.

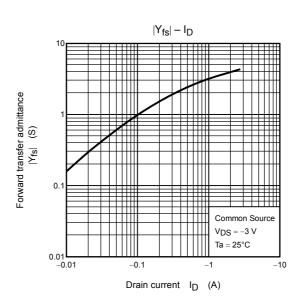




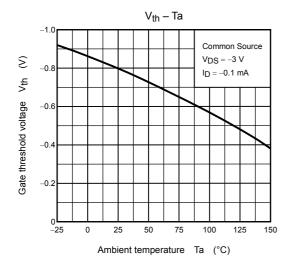


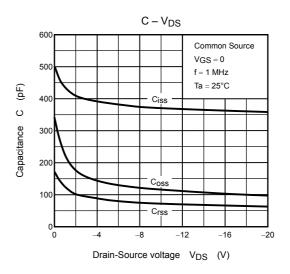


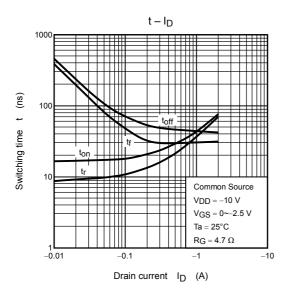


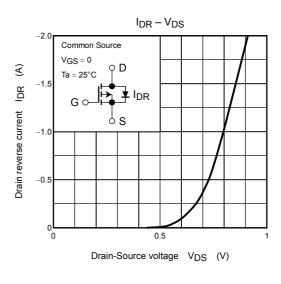


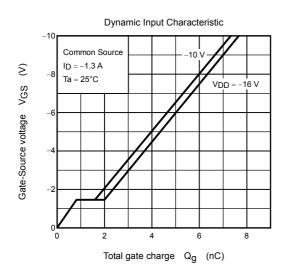
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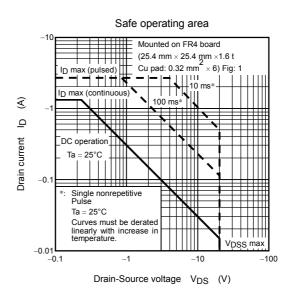


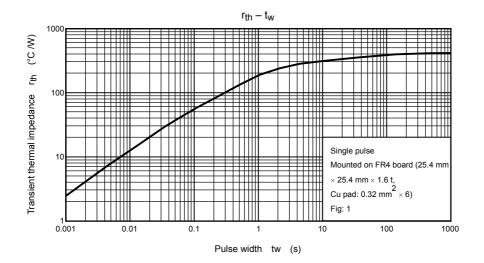


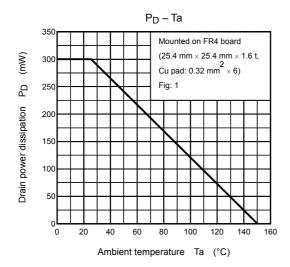












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