

TOSHIBA Transistor Silicon P Channel MOS Type

SSM6J07FU

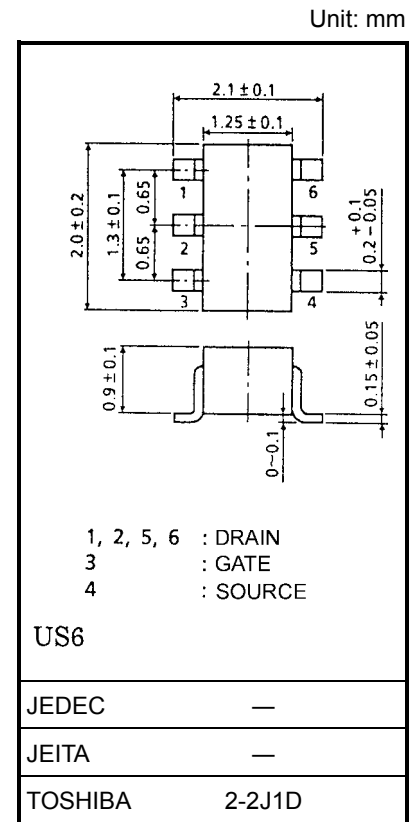
Power Management Switch
High Speed Switching Applications

- Small package
- Low on resistance
 - : $R_{on} = 450 \text{ m}\Omega$ (max) ($V_{GS} = -10 \text{ V}$)
 - : $R_{on} = 800 \text{ m}\Omega$ (max) ($V_{GS} = -4 \text{ V}$)

Maximum Ratings ($T_a = 25^\circ\text{C}$)

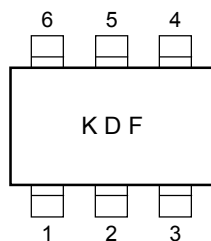
Characteristics	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	-30	V
Gate-source voltage	V_{GSS}	± 20	V
Drain current	DC	I_D	-0.8
	Pulse	I_{DP}	-1.6
Drain power dissipation	P_D (Note1)	300	mW
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55~150	$^\circ\text{C}$

Note 1: Mounted on FR4 board
(25.4 mm × 25.4 mm × 1.6 t, Cu Pad: $0.32 \text{ mm}^2 \times 6$)

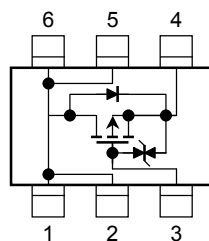


Weight: 6.8 mg (typ.)

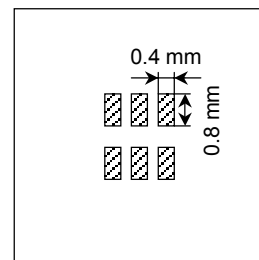
Marking



Equivalent Circuit Figure 1: (top view)



**25.4 mm × 25.4 mm × 1.6 t,
Cu Pad: $0.32 \text{ mm}^2 \times 6$**



Handling Precaution

When handling individual devices (which are not yet mounting 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.

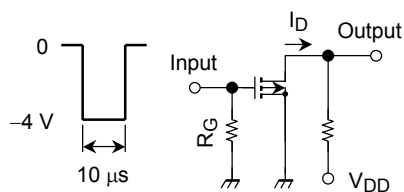
Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	I_{GSS}	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$	—	—	± 1	μA	
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	μA	
Gate threshold voltage	V_{th}	$V_{DS} = -5 \text{ V}, I_D = -0.1 \text{ mA}$	-1.1	—	-1.8	V	
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = -5 \text{ V}, I_D = -0.4 \text{ A}$ (Note2)	0.7	—	—	S	
Drain-source ON resistance	$R_{DS(ON)}$	$I_D = -0.4 \text{ A}, V_{GS} = -10 \text{ V}$ (Note2)	—	350	450	m Ω	
		$I_D = -0.4 \text{ A}, V_{GS} = -4 \text{ V}$ (Note2)	—	570	800		
		$I_D = -0.4 \text{ A}, V_{GS} = -3.3 \text{ V}$ (Note2)	—	0.7	1.6	Ω	
Input capacitance	C_{iss}	$V_{DS} = -15 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	130	—	pF	
Reverse transfer capacitance	C_{rss}	$V_{DS} = -15 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	16	—	pF	
Output capacitance	C_{oss}	$V_{DS} = -15 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	52	—	pF	
Switching time	Turn-on time	t_{on}	$V_{DD} = -15 \text{ V}, I_D = -0.4 \text{ A},$ $V_{GS} = 0 \sim -4 \text{ V}, R_G = 10 \Omega$	—	28	—	ns
	Turn-off time	t_{off}		—	38	—	ns

Note 2: Pulse test

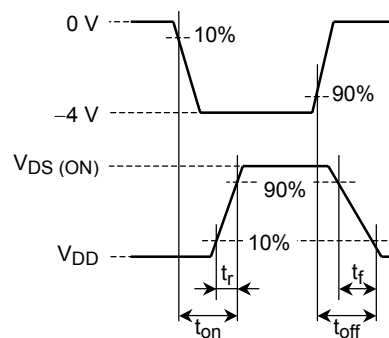
Switching Time Test Circuit

(a) Test circuit



$V_{DD} = -15 \text{ V}$
 $R_G = 10 \Omega$
 D.U. $\leq 1\%$
 Input: $t_r, t_f < 5 \text{ ns}$
 Common source
 $T_a = 25^\circ\text{C}$

(b) V_{IN}



(c) V_{OUT}

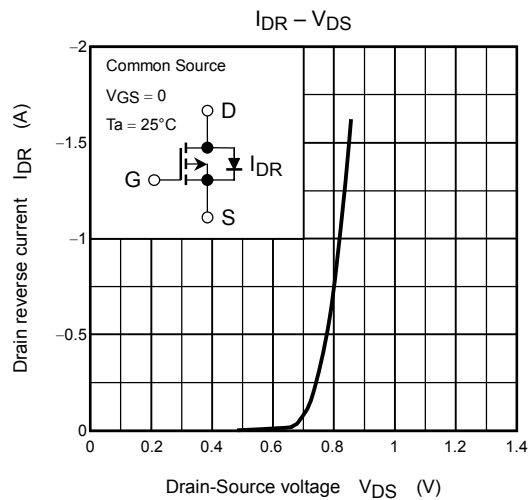
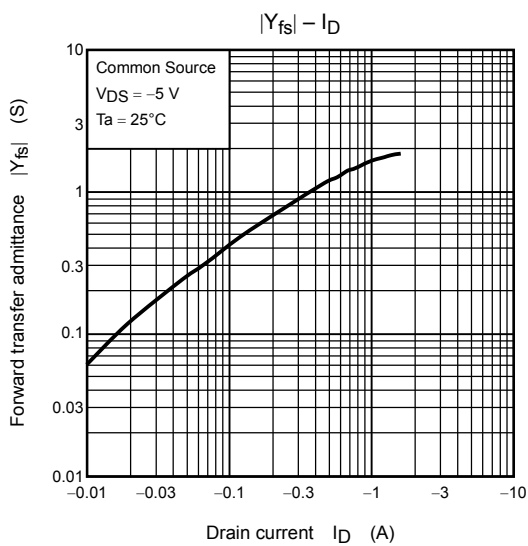
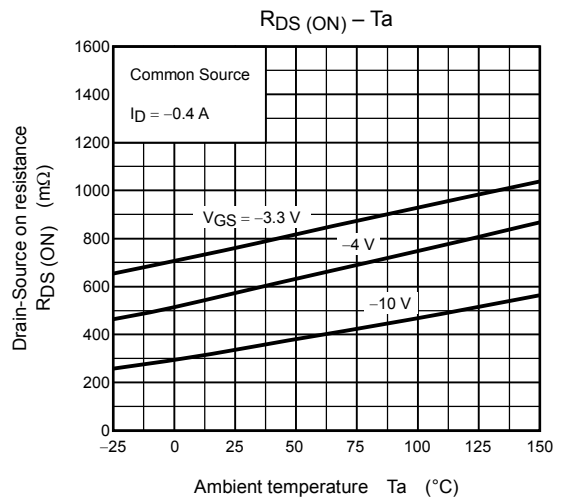
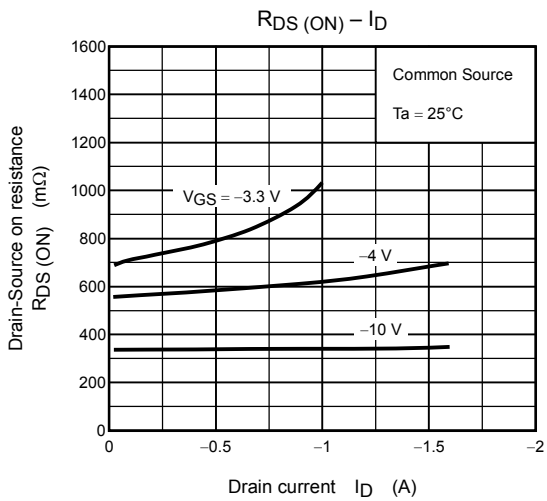
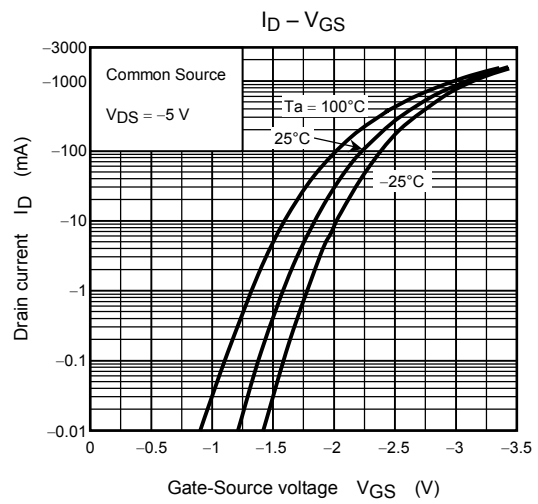
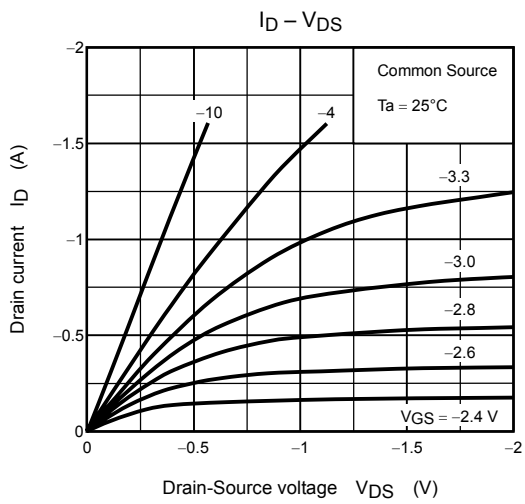
Precaution

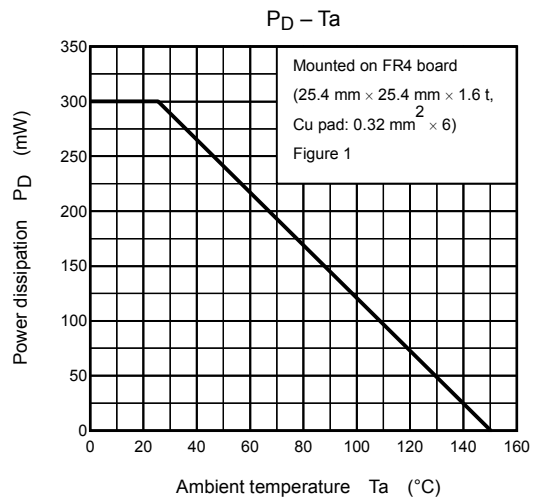
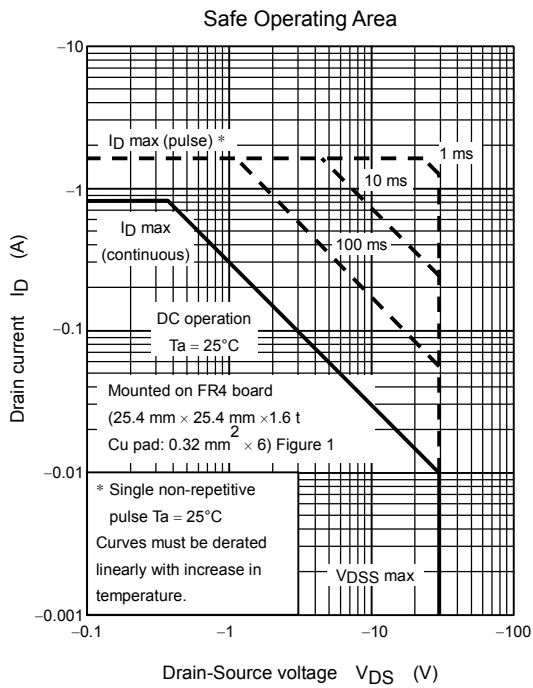
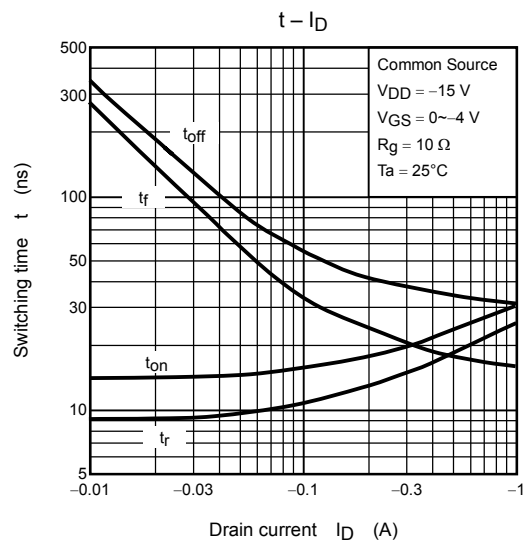
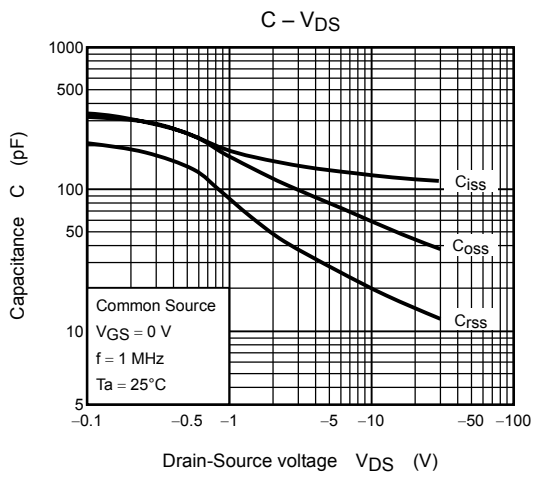
V_{th} can be expressed as voltage between gate and source when low operating current value is $I_D = -100 \mu\text{A}$ for this product. For normal switching operation, $V_{GS(on)}$ requires higher voltage than V_{th} and $V_{GS(off)}$ requires lower voltage than V_{th} .

(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 -4.0 V or higher to turn on this product.





RESTRICTIONS ON PRODUCT USE

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