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TOSHIBA Field Effect Transistor Silicon P Channel MOS Type

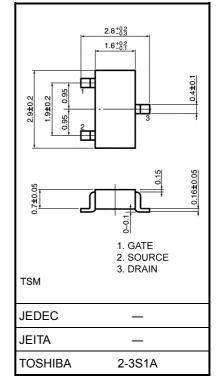
SSM3J01T

Power Management Switch High Speed Switching Applications

- Small Package
- Low on Resistance: $R_{on} = 0.4 \Omega (max) (@V_{GS} = -4 V)$
 - $R_{on} = 0.6 \Omega (max) (@V_{GS} = -2.5 V)$
- Low Gate Threshold Voltage

Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit	
Drain-Source voltage		V _{DS}	-30	V	
Gate-Source voltage		V _{GSS}	±10	V	
Drain current	DC	I _D	-1.7	А	
	Pulse	I _{DP} (Note2)	-3.4		
Drain power dissipation (Ta = 25° C)		P _D (Note1)	1250	mW	
Channel temperature		T _{ch}	150	°C	
Storage temperature range		T _{stg}	-55~150	°C	



Note 1: Mounted on FR4 board

 $(25.4 \text{ mm} \times 25.4 \text{ mm} \times 1.6 \text{ t}, \text{ Cu pad: } 645 \text{ mm}^2, \text{ t} = 10 \text{ s})$

Note 2: The pulse width limited by max channel temperature.

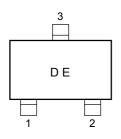
Handling Precaution

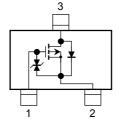
When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static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

The Channel-to-Ambient thermal resistance R_{th} (ch-a) and the drain power dissipation PD vary according to the board material, board area, board thickness and pad area, and are also affected by the environment in which the product is used. When using this device, please take heat dissipation fully into account.

Marking

Equivalent Circuit





Unit: mm

Weight: 10 mg (typ.)

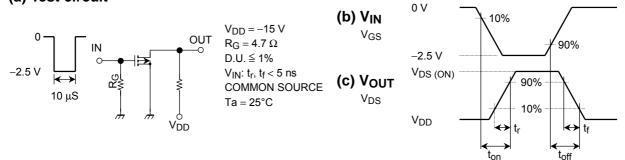
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage current		I _{GSS}	$V_{GS}=\pm 10~V,~V_{DS}=0$	_		±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}	$V_{DS} = -30 \text{ V}, \text{ V}_{GS} = 0$	_	_	-1	μA
Gate threshold voltage		V _{th}	$V_{DS} = -3 \text{ V}, \text{ I}_{D} = -0.1 \text{ mA}$	-0.6		-1.1	V
Forward transfer admittance		Y _{fs}	$V_{DS} = -3 V, I_D = -0.85 A$ (Note3)	1.2	2.3		S
Drain-Source ON resistance		R _{DS (ON)}	$I_D = -0.85 \text{ A}, V_{GS} = -4 \text{ V}$ (Note3)	_	0.3	0.4	Ω
Drain-Source ON resistance		R _{DS (ON)}	$I_D = -0.85 \text{ A}, V_{GS} = -2.5 \text{ V}$ (Note3)	_	0.4	0.6	Ω
Input capacitance		C _{iss}	$V_{DS} = -10 \text{ V}, \text{ V}_{GS} = 0, \text{ f} = 1 \text{ MHz}$	_	240		pF
Reverse transfer capacitance		C _{rss}	$V_{DS} = -10 \text{ V}, \text{ V}_{GS} = 0, \text{ f} = 1 \text{ MHz}$	_	24		pF
Output capacitance		C _{oss}	$V_{DS} = -10 \text{ V}, \text{ V}_{GS} = 0, \text{ f} = 1 \text{ MHz}$	_	94		pF
Switching time	Turn-on time	t _{on}	$V_{DD} = -15 \text{ V}, \text{ I}_{D} = -0.3 \text{ A}$	_	36		ns
	Turn-off time	t _{off}	V_{GS} = 0~–2.5 V, R_{G} = 4.7 Ω	_	37		

Note3: Pulse test

Switching Time Test Circuit

(a) Test circuit



Precaution

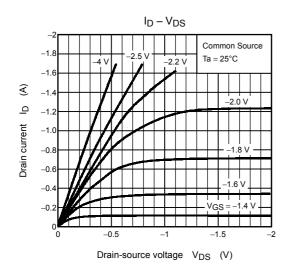
 V_{th} can be expressed as voltage between gate and source when low operating current value is I_D = $-100~\mu A$ for this product. For normal switching operation, V_{GS} (on) requires higher voltage than V_{th} and V_{GS} (off) requires lower voltage than V_{th} .

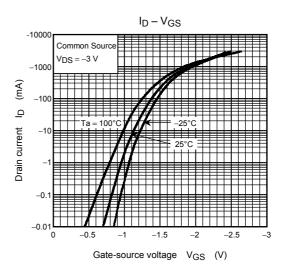
(relationship can be established as follows: $V_{\rm GS}~_{\rm (off)} < V_{th} < V_{\rm GS}~_{\rm (on)})$

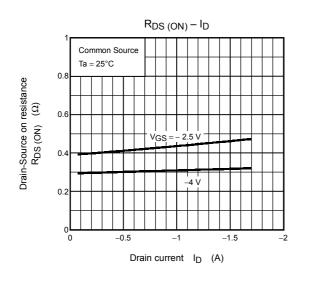
Please take this into consideration for using the device.

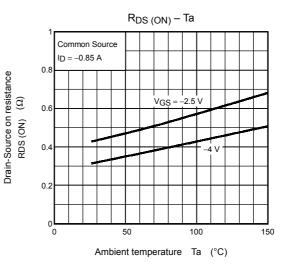
 V_{GS} recommended voltage of –2.5 V or higher to turn on this product.

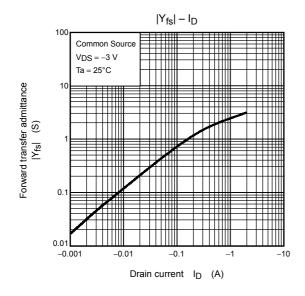
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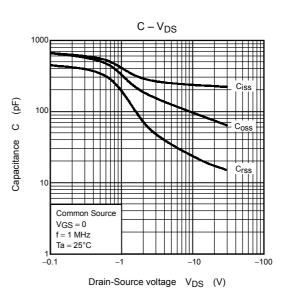




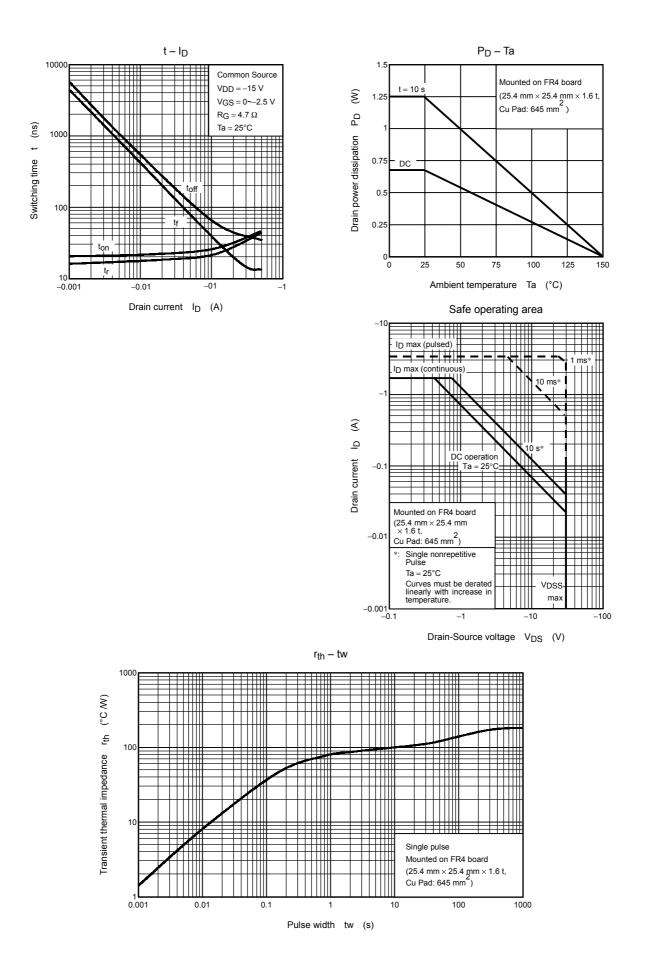








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