Unit: mm

TOSHIBA Field Effect Transistor Silicon P Channel MOS Type

SSM3J05FU

Power Management Switch **High Speed Switching Applications**

Small package

Low on resistance: $R_{on} = 3.3 \Omega \text{ (max) } (@V_{GS} = -4 \text{ V})$

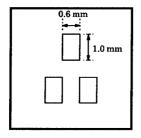
: $R_{on} = 4.0 \Omega \text{ (max) } (@V_{GS} = -2.5 \text{ V})$

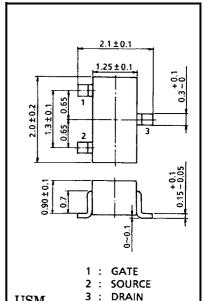
Low gate threshold voltage

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit	
Drain-source voltage		V_{DS}	-20	V	
Gate-source voltage		V_{GSS}	±12	V	
Drain current	DC	ID	-200	mA	
	Pulse	I _{DP}	-400		
Drain power dissipation (Ta = 25°C)		P _D (Note 1)	150	mW	
Channel temperature		T _{ch}	150	°C	
Storage temperature range		T _{stg}	−55~150	°C	

Note 1: Mounted on FR4 board. $(25.4 \text{ mm} \times 25.4 \text{ mm} \times 1.6 \text{ t}, \text{ Cu pad: } 0.6 \text{ mm}^2 \times 3)$





SC-70

2-2E1E

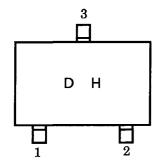
Weight: 0.006 g (typ.)

USM

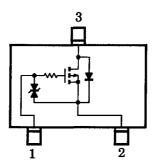
JEDEC JEITA

TOSHIBA

Marking



Equivalent Circuit



Handling Precaution

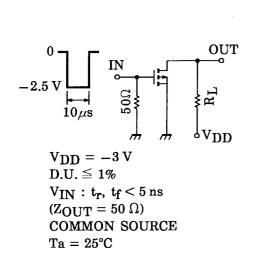
When handling individual devices (which are not yet mounting on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static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

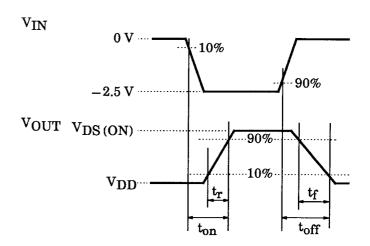
Electrical Characteristics (Ta = 25°C)

Chara	Characteristics Symbol Test Condition		Test Condition	Min	Тур.	Max	Unit
Gate leakage current		I _{GSS}	$V_{GS} = \pm 12 \text{ V}, V_{DS} = 0$	_	_	±1	μА
Drain-source brea	n-source breakdown voltage $V_{(BR)DSS}$ $I_D = -1$ mA, $V_{GS} = 0$		-20	_	_	V	
Drain cut-off curre	n cut-off current I_{DSS} $V_{DS} = -20 \text{ V}, V_{GS} = 0$		_	_	-1	μА	
Gate threshold vo	oltage	V _{th}	$V_{DS} = -3 \text{ V}, I_D = -0.1 \text{ mA}$	-0.6	_	-1.1	V
Forward transfer	admittance	Y _{fs}	$V_{DS} = -3 \text{ V}, I_D = -50 \text{ mA}$ (Note 2)	100	_	_	mS
Drain-source ON resistance		R _{DS (ON)}	$I_D = -100 \text{ mA}, V_{GS} = -4 \text{ V}$ (Note 2)	_	2.1	3.3	Ω
			$I_D = -50 \text{ mA}, V_{GS} = -2.5 \text{ V}$ (Note 2)	_	3.2	4.0	
Input capacitance		C _{iss}	$V_{DS} = -3 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	_	27	_	pF
Reverse transfer capacitance		C _{rss}	$V_{DS} = -3 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	_	7	_	pF
Output capacitance		Coss	$V_{DS} = -3 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	_	21	_	pF
Switching time	Turn-on time	t _{on}	$V_{DD} = -3 \text{ V}, I_D = -50 \text{ mA},$	_	70	_	ns
	Turn-off time	t _{off}	V _{GS} = 0~-2.5 V	_	70	_	

Note 2: Pulse test

Switching Time Test Circuit





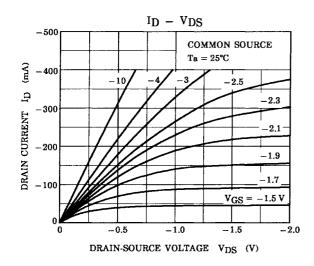
Precaution

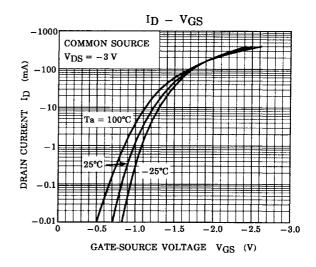
 V_{th} can be expressed as voltage between gate and source when low operating current value is ID = $-100~\mu A$ for this product. For normal switching operation, V_{GS} (ON) requires higher voltage than V_{th} and V_{GS} (off) requires lower voltage than V_{th} .

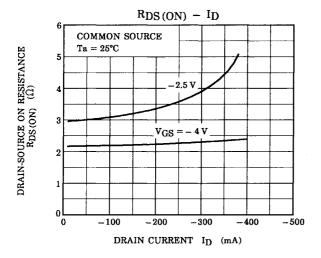
(Relationship can be established as follows: VGS (off) < Vth < VGS (ON))

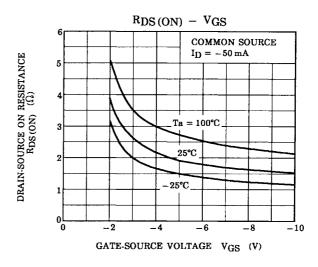
Please take this into consideration for using the device.

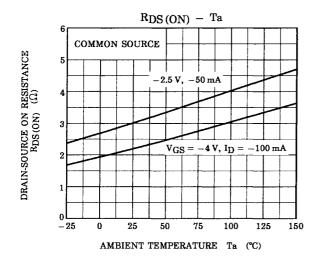
 $V_{\rm GS}$ recommended voltage of $-2.5~{\rm V}$ or higher to turn on this product.

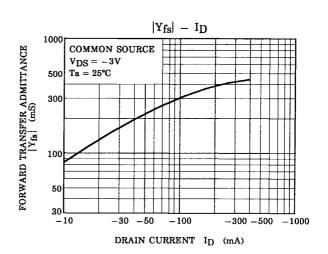


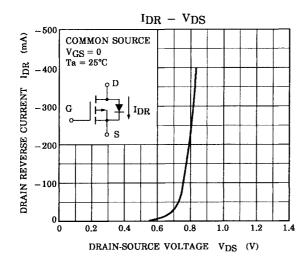


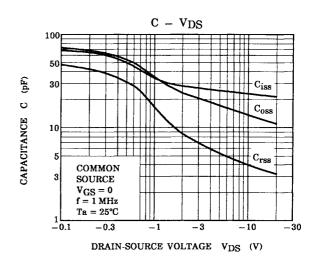


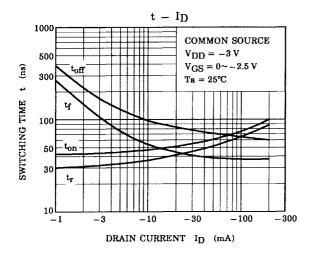


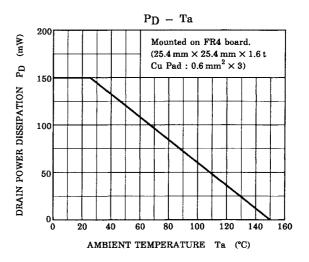












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