

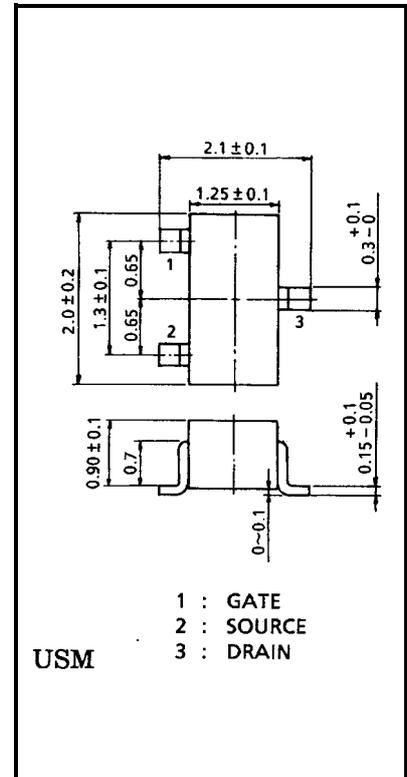
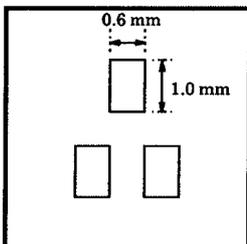
# SSM3J05FU

- Small package
- Low on resistance :  $R_{on} = 3.3 \Omega$  (max) (@ $V_{GS} = -4 V$ )  
:  $R_{on} = 4.0 \Omega$  (max) (@ $V_{GS} = -2.5 V$ )
- Low gate threshold voltage

## Maximum Ratings (Ta = 25°C)

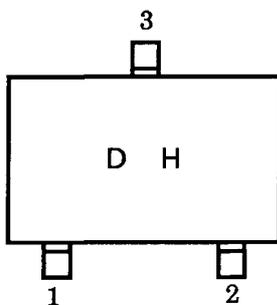
Characteristics		Symbol	Rating	Unit
Drain-source voltage		$V_{DS}$	-20	V
Gate-source voltage		$V_{GSS}$	$\pm 12$	V
Drain current	DC	$I_D$	-200	mA
	Pulse	$I_{DP}$	-400	
Drain power dissipation (Ta = 25°C)		$P_D$ (Note 1)	150	mW
Channel temperature		$T_{ch}$	150	°C
Storage temperature range		$T_{stg}$	-55~150	°C

Note 1: Mounted on FR4 board.  
(25.4 mm × 25.4 mm × 1.6 t, Cu pad: 0.6 mm<sup>2</sup> × 3)

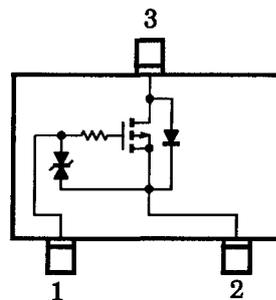


Weight: 0.006 g (typ.)

## 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.

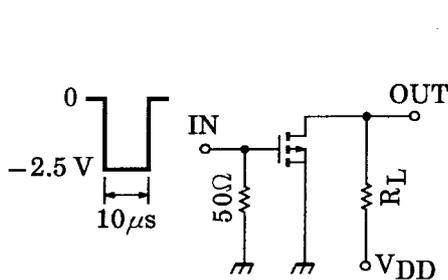
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## Electrical Characteristics (Ta = 25°C)

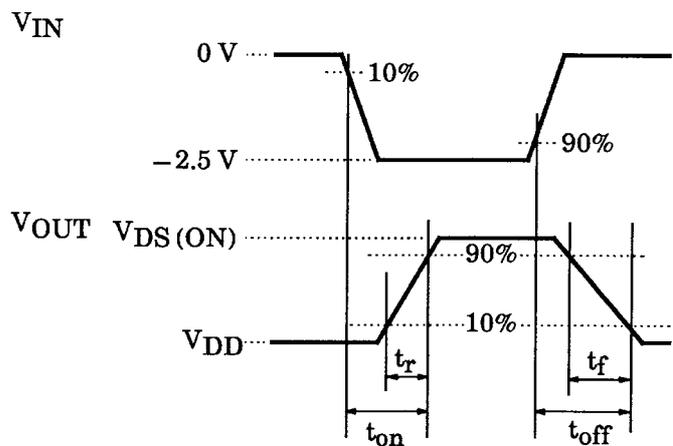
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	$I_{GSS}$	$V_{GS} = \pm 12\text{ V}, V_{DS} = 0$	—	—	$\pm 1$	$\mu\text{A}$
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = -1\text{ mA}, V_{GS} = 0$	-20	—	—	V
Drain cut-off current	$I_{DSS}$	$V_{DS} = -20\text{ V}, V_{GS} = 0$	—	—	-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} $	$V_{DS} = -3\text{ V}, I_D = -50\text{ mA}$ (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	$\Omega$
		$I_D = -50\text{ mA}, V_{GS} = -2.5\text{ V}$ (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	$C_{oss}$	$V_{DS} = -3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	21	—	pF
Switching time	Turn-on time	$t_{on}$	—	70	—	ns
	Turn-off time					
		$V_{DD} = -3\text{ V}, I_D = -50\text{ mA}, V_{GS} = 0 \sim -2.5\text{ V}$				

Note 2: Pulse test

## Switching Time Test Circuit



$V_{DD} = -3\text{ V}$   
 D.U.  $\leq 1\%$   
 $V_{IN}$  :  $t_r, t_f < 5\text{ ns}$   
 $(Z_{OUT} = 50\ \Omega)$   
**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.