

# SSM6K06FU

## High Speed Switching Applications

- Small package
- Low on resistance:  $R_{on} = 160 \text{ m}\Omega \text{ max (@}V_{GS} = 4 \text{ V)}$   
 $R_{on} = 210 \text{ m}\Omega \text{ max (@}V_{GS} = 2.5 \text{ V)}$
- Low gate threshold voltage

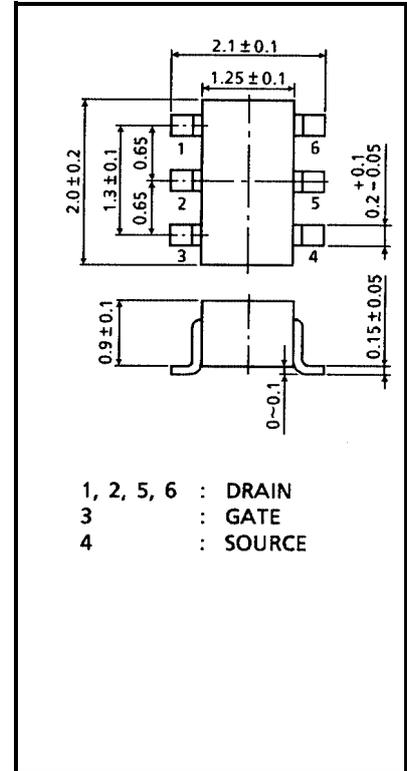
## Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristics		Symbol	Rating	Unit
Drain-source voltage		$V_{DS}$	20	V
Gate-source voltage		$V_{GSS}$	$\pm 12$	V
Drain current	DC	$I_D$	1.1	A
	Pulse	$I_{DP}$	2.2	
Drain power dissipation ( $T_a = 25^\circ\text{C}$ )		$P_D$ (Note 1)	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.

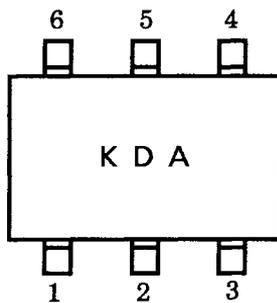
(25.4 mm × 25.4 mm × 1.6 t, Cu pad: 0.32 mm<sup>2</sup> × 6) Figure 1.

Unit: mm

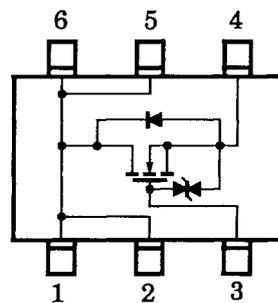


Weight: 6.8 mg (typ.)

## Marking



## Equivalent Circuit (top view)



## 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.

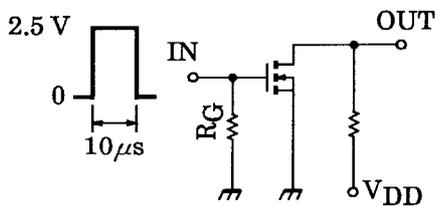
# SSM6K06FU

## Electrical Characteristics (Ta = 25°C)

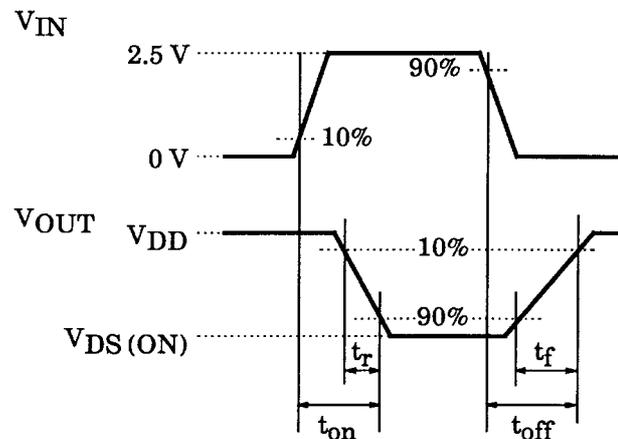
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	$I_{GSS}$	$V_{GS} = \pm 12\text{ V}, V_{DS} = 0$	—	—	$\pm 1$	$\mu\text{A}$
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1\text{ mA}, V_{GS} = 0$	20	—	—	V
Drain cut-off current	$I_{DSS}$	$V_{DS} = 20\text{ V}, V_{GS} = 0$	—	—	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} $	$V_{DS} = 3\text{ V}, I_D = 0.5\text{ A}$ (Note 2)	1.2	—	—	S
Drain-source ON resistance	$R_{DS(ON)}$	$I_D = 0.5\text{ A}, V_{GS} = 4\text{ V}$ (Note 2)	—	120	160	m $\Omega$
		$I_D = 0.5\text{ A}, V_{GS} = 2.5\text{ V}$ (Note 2)	—	160	210	
Input capacitance	$C_{iss}$	$V_{DS} = 10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	125	—	pF
Reverse transfer capacitance	$C_{rss}$	$V_{DS} = 10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	30	—	pF
Output capacitance	$C_{oss}$	$V_{DS} = 10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	75	—	pF
Switching time	Turn-on time	$V_{DD} = 10\text{ V}, I_D = 0.5\text{ A}, V_{GS} = 0\sim 2.5\text{ V}, R_G = 4.7\ \Omega$	—	42	—	ns
	Turn-off time		—	100	—	

Note 2: Pulse test

## Switching Time Test Circuit



$V_{DD} = 10\text{ V}$   
 $R_G = 4.7\ \Omega$   
 D.U.  $\leq 1\%$   
 $V_{IN} : t_r, t_f < 5\text{ ns}$   
**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 V or higher to turn on this product.