

# SSM6P09FU

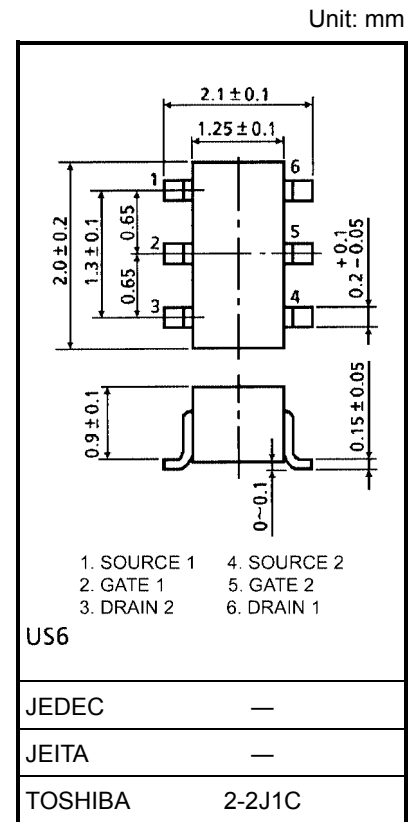
## High Speed Switching Applications

- Small package
- Low Drain-Source ON resistance.  
 :  $R_{on} = 2.7 \Omega$  (max) (@ $V_{GS} = -10$  V)  
 :  $R_{on} = 4.2 \Omega$  (max) (@ $V_{GS} = -4$  V)

## Maximum Ratings ( $T_a = 25^\circ\text{C}$ ) (Q1, Q2 Common)

Characteristics		Symbol	Rating	Unit
Drain-Source voltage		$V_{DS}$	-30	V
Gate-Source voltage		$V_{GSS}$	$\pm 20$	V
Drain current	DC	$I_D$	-200	mA
	Pulse	$I_{DP}$	-800	
Drain power dissipation ( $T_a = 25^\circ\text{C}$ )		$P_D$ (Note1)	300	mW
Channel temperature		$T_{ch}$	150	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55~150	$^\circ\text{C}$

Note1: Total rating, mounted on FR4 board  
 (25.4 mm  $\times$  25.4 mm  $\times$  1.6 t, Cu Pad:  $0.32 \text{ mm}^2 \times 6$ ) Figure 1.

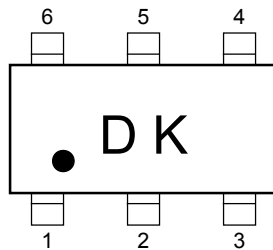


Weight: 6.8 mg (typ.)

## 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.

## Marking



## Equivalent Circuit (top view)

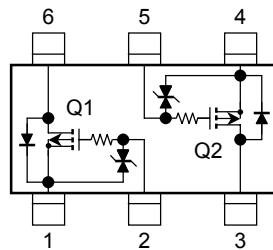
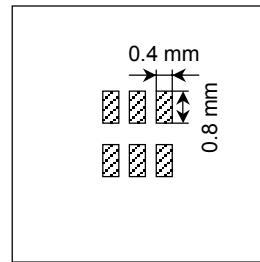


Figure 1: 25.4 mm × 25.4 mm × 1.6 t,  
Cu Pad: 0.32 mm<sup>2</sup> × 6



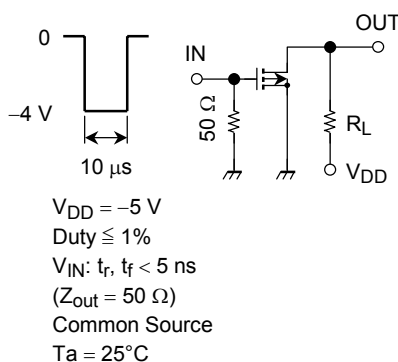
## Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	$I_{GSS}$	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$	—	—	$\pm 1$	$\mu\text{A}$
Drain-Source breakdown voltage	$V_{(BR)DSS}$	$I_D = -1 \text{ mA}, V_{GS} = 0$	-30	—	—	V
Drain cut-off current	$I_{DSS}$	$V_{DS} = -30 \text{ V}, V_{GS} = 0$	—	—	-1	$\mu\text{A}$
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} $	$V_{DS} = -5 \text{ V}, I_D = -100 \text{ mA}$ (Note2)	115	—	—	mS
Drain-Source ON resistance	$R_{DS(ON)}$	$I_D = -100 \text{ mA}, V_{GS} = -10 \text{ V}$ (Note2)	—	2.1	2.7	$\Omega$
		$I_D = -100 \text{ mA}, V_{GS} = -4 \text{ V}$ (Note2)	—	3.3	4.2	
		$I_D = -100 \text{ mA}, V_{GS} = -3.3 \text{ V}$ (Note2)	—	4.0	6.0	
Input capacitance	$C_{iss}$	$V_{DS} = -5 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	22	—	pF
Reverse transfer capacitance	$C_{rss}$	$V_{DS} = -5 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	5	—	pF
Output capacitance	$C_{oss}$	$V_{DS} = -5 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	14	—	pF
Switching time	Turn-on time	$V_{DD} = -5 \text{ V}, I_D = -100 \text{ mA},$ $V_{GS} = 0 \sim -4 \text{ V}$	—	85	—	ns
	Turn-off time		—	85	—	

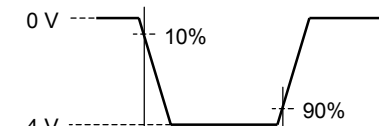
Note2: Pulse test

## Switching Time Test Circuit (Q1, Q2 Common)

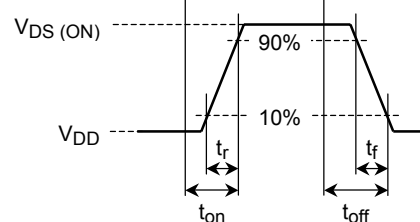
### (a) Test circuit



### (b) $V_{IN}$



### (c) $V_{OUT}$

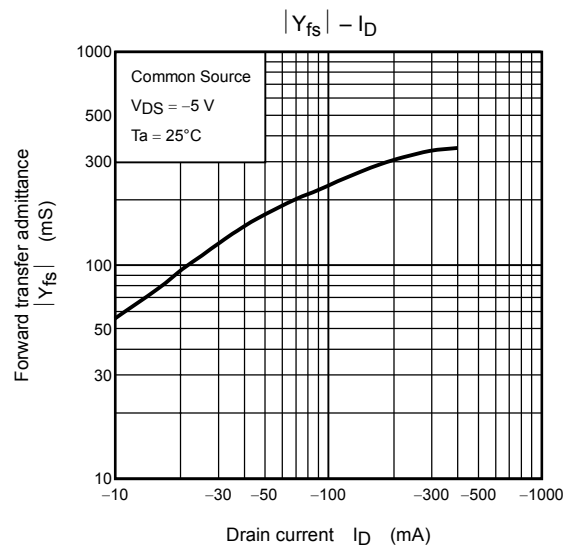
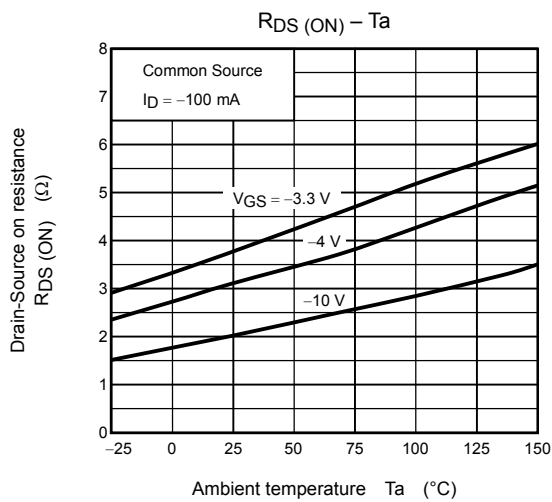
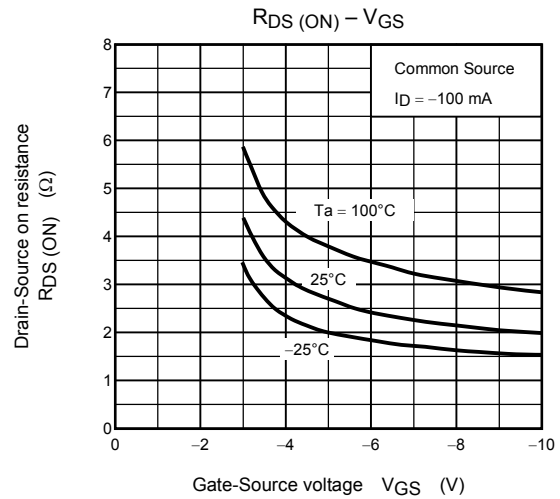
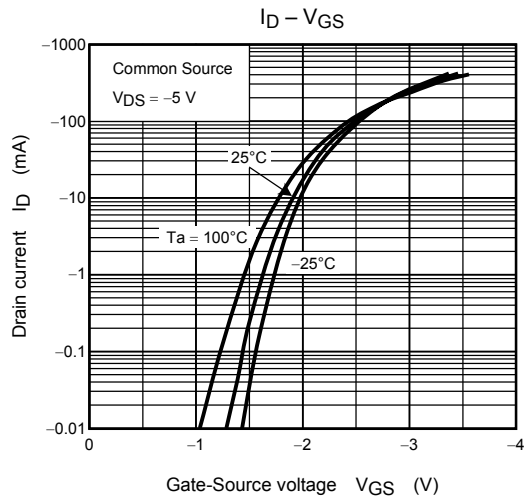
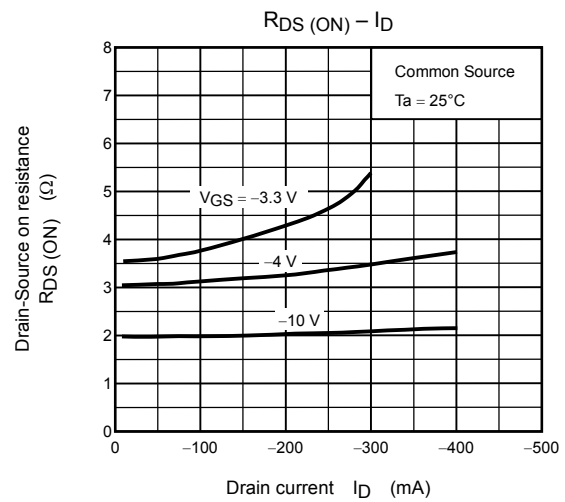
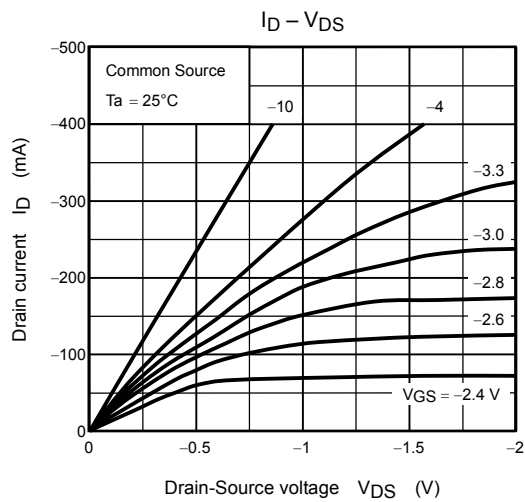


## Precaution

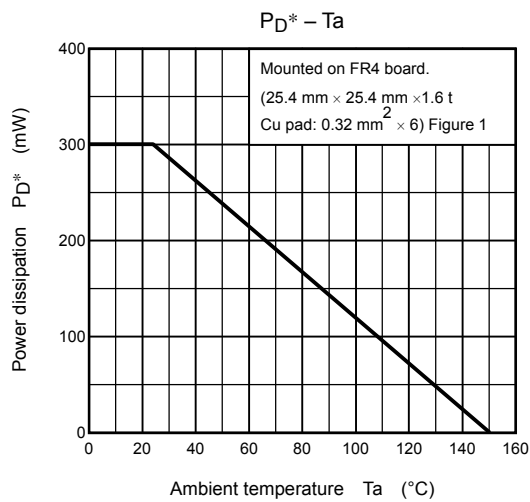
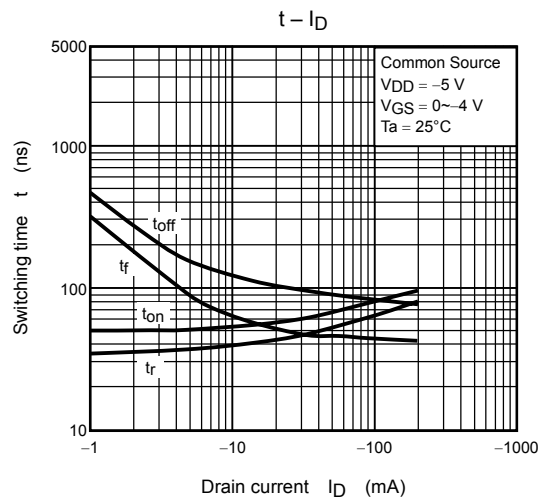
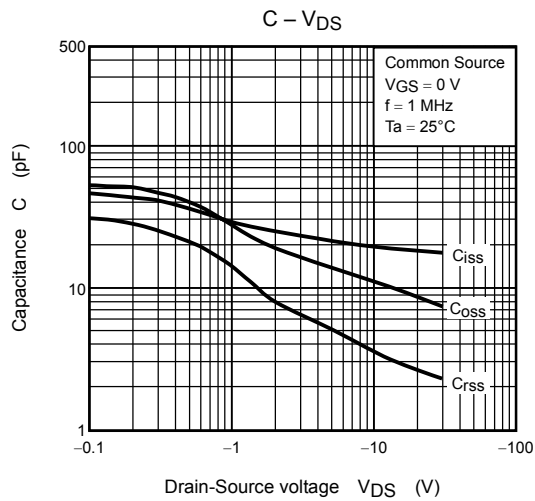
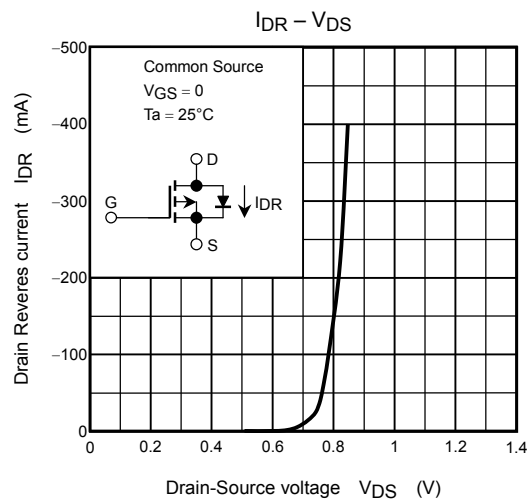
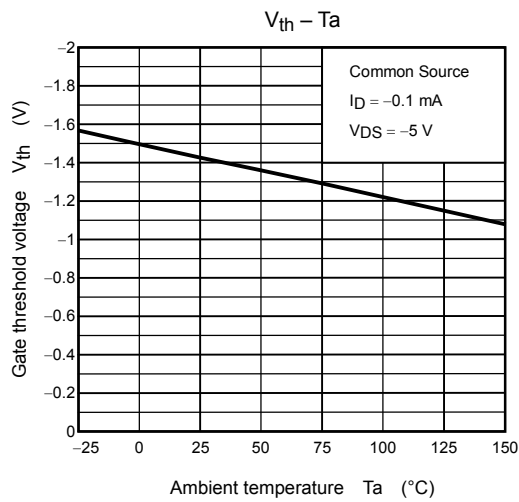
$V_{th}$  can be expressed as voltage between gate and source when low operating current value is  $I_D = -100 \mu\text{A}$  for this product. For normal switching operation,  $V_{GS(ON)}$  requires higher voltage than  $V_{th}$  and  $V_{GS(OFF)}$  requires lower voltage than  $V_{th}$ . (Relationship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

(Q1, Q2 common)



(Q1, Q2 common)



\*: Total rating

**RESTRICTIONS ON PRODUCT USE**

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