

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

# SSM6N04FU

## High Speed Switch Applications

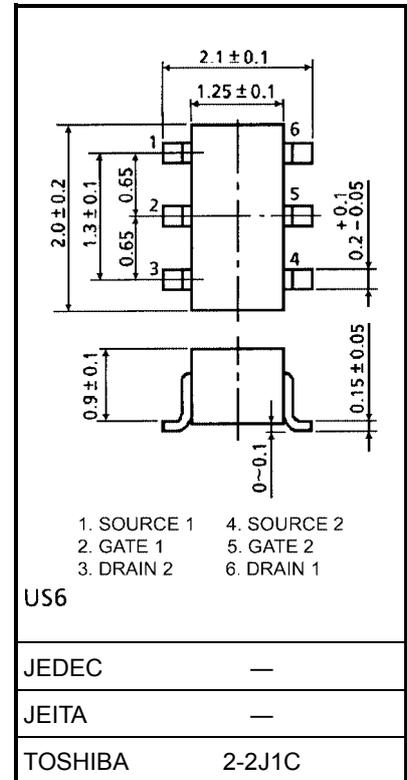
- With built-in gate-source resistor:  $R_{GS} = 1\text{ M}\Omega$  (typ.)
- 2.5 V gate drive
- Low gate threshold voltage:  $V_{th} = 0.7\sim 1.3\text{ V}$
- Small package

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

Characteristics	Symbol	Rating	Unit
Drain-source voltage	$V_{DS}$	20	V
Gate-source voltage	$V_{GSS}$	10	V
DC drain current	$I_D$	100	mA
Drain power dissipation	$P_D$ (Note)	200	mW
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55~150	$^\circ\text{C}$

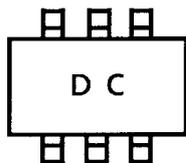
Note: Total rating

Unit: mm

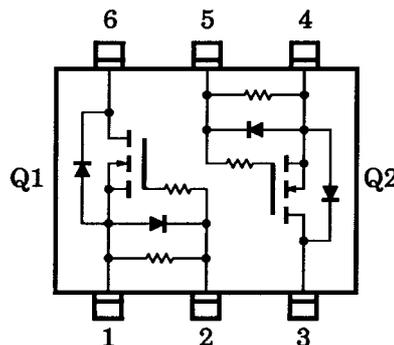


Weight: 6.8 mg (typ.)

## Marking

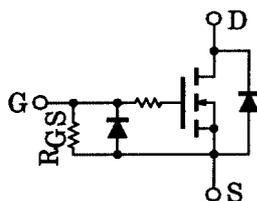


## Pin Assignment (top view)



(Q1, Q2 common)

## Equivalent Circuit

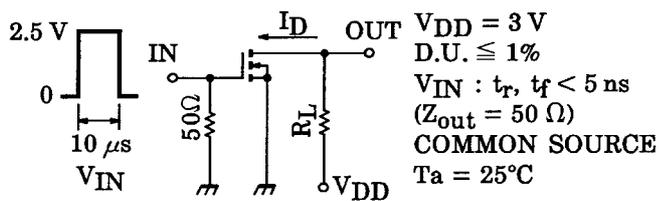


## Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

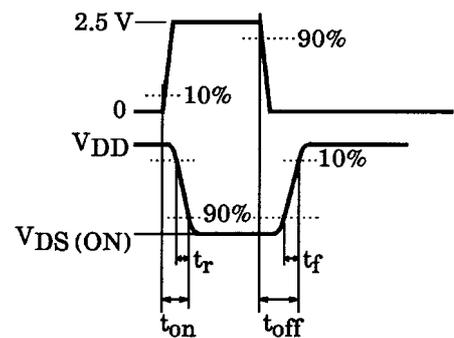
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	$I_{GSS}$	$V_{GS} = 10\text{ V}, V_{DS} = 0$	—	—	15	$\mu\text{A}$	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 100\ \mu\text{A}, V_{GS} = 0$	20	—	—	V	
Drain cut-off current	$I_{DSS}$	$V_{DS} = 20\text{ V}, V_{GS} = 0$	—	—	1	$\mu\text{A}$	
Gate threshold voltage	$V_{th}$	$V_{DS} = 3\text{ V}, I_D = 0.1\text{ mA}$	0.7	—	1.3	V	
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 3\text{ V}, I_D = 10\text{ mA}$	25	50	—	mS	
Drain-source ON resistance	$R_{DS(ON)}$	$I_D = 10\text{ mA}, V_{GS} = 2.5\text{ V}$	—	4	12	$\Omega$	
Input capacitance	$C_{iss}$	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	11.0	—	pF	
Reverse transfer capacitance	$C_{rss}$	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	3.3	—	pF	
Output capacitance	$C_{oss}$	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	9.3	—	pF	
Switching time	Turn-on time	$t_{on}$	$V_{DD} = 3\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\sim 2.5\text{ V}$	—	0.16	—	$\mu\text{s}$
	Turn-off time	$t_{off}$	$V_{DD} = 3\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\sim 2.5\text{ V}$	—	0.19	—	
Gate-source resistor	$R_{GS}$	$V_{GS} = 0\sim 10\text{ V}$	0.7	1.0	1.3	M $\Omega$	

## Switching Time Test Circuit

(a) Test circuit

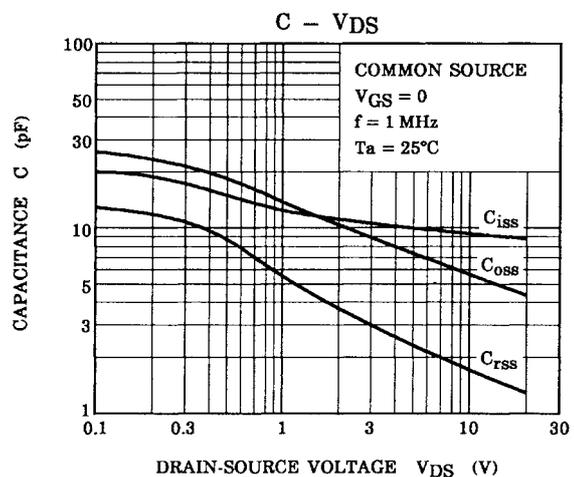
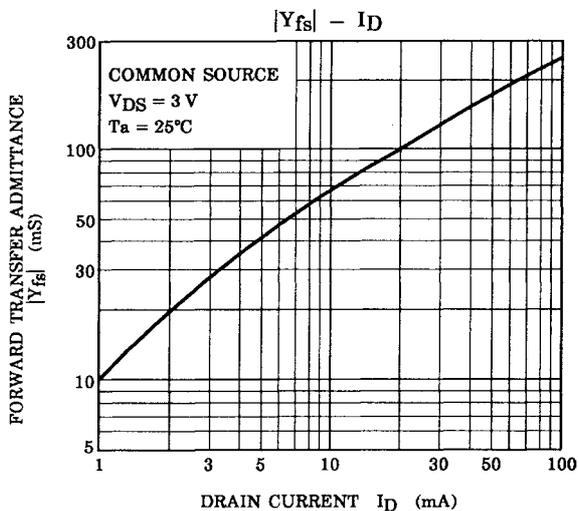
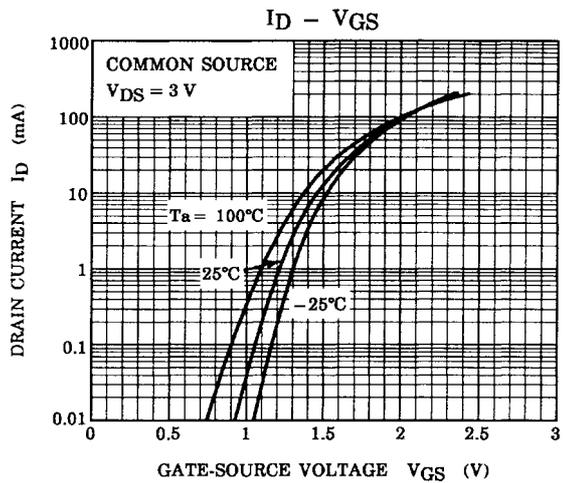
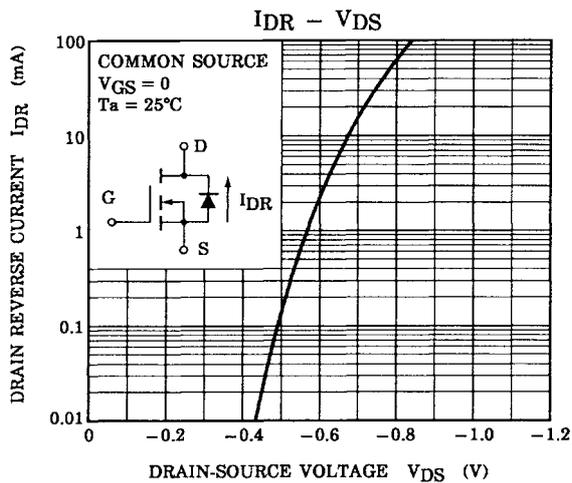
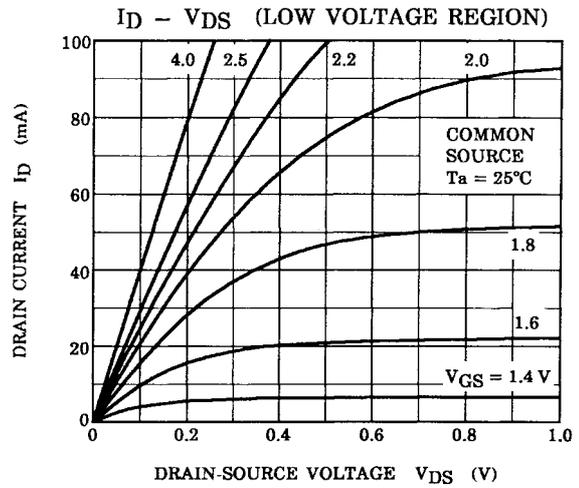
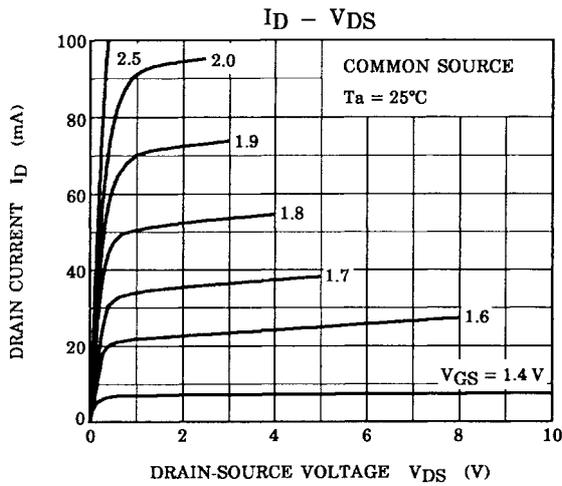


(b)  $V_{IN}$   
 $V_{GS}$

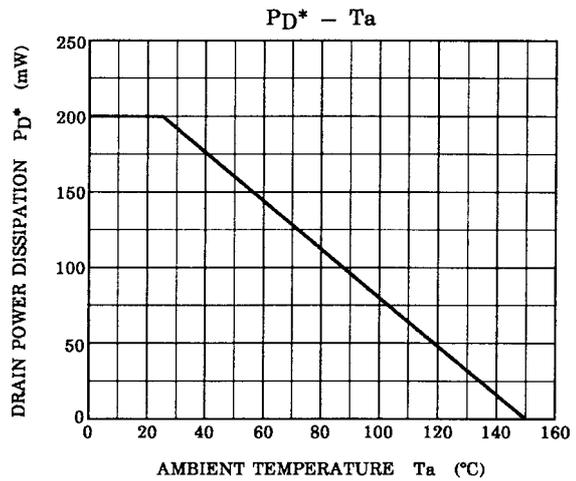
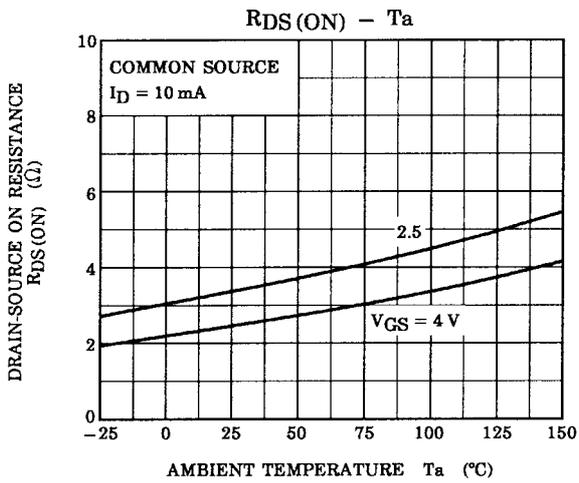
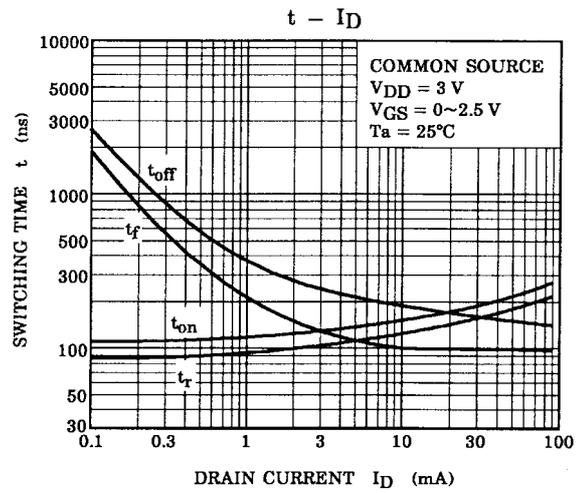
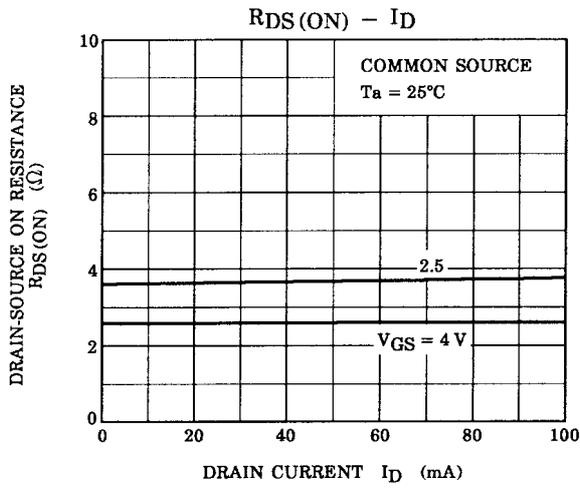


(c)  $V_{OUT}$   
 $V_{DS}$

(Q1, Q2 common)



(Q1, Q2 common)



\*: Total rating

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