

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE

# SSM6N04FU

HIGH SPEED SWITCH APPLICATIONS

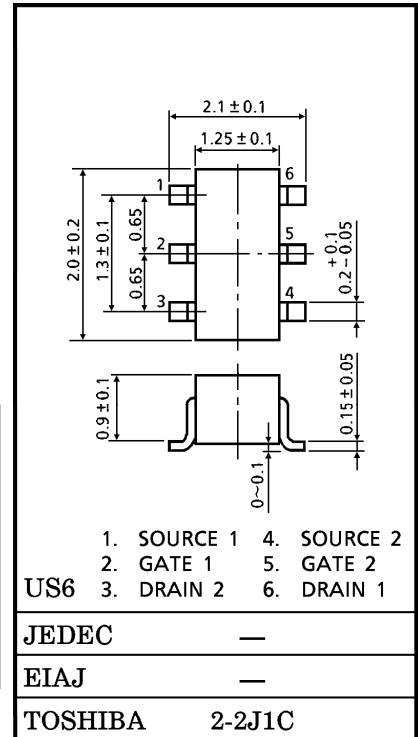
Unit in mm

- 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

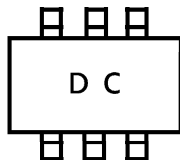
MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ ) (Q1, Q2 COMMON)

CHARACTERISTIC	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	$P_D^*$	200	mW
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55~150	$^\circ\text{C}$

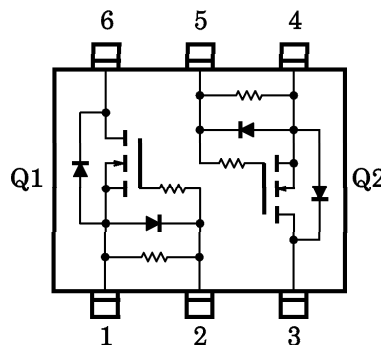
\* Total Rating



MARKING



PIN ASSIGNMENT (TOP VIEW)



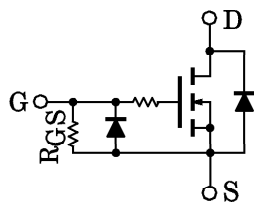
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ELECTRICAL CHARACTERISTICS (Ta = 25°C) (Q1, Q2 COMMON)

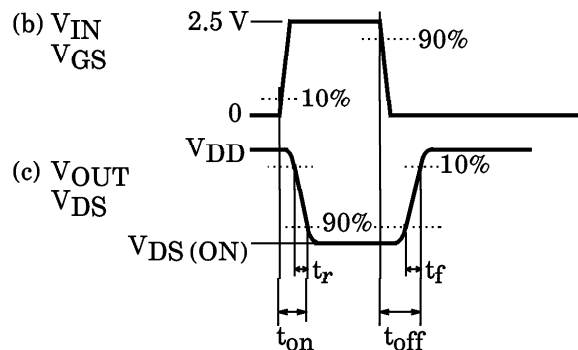
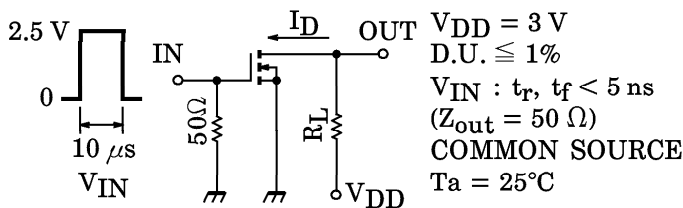
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	$I_{GSS}$	$V_{GS} = 10\text{ V}, V_{DS} = 0$	—	—	15	$\mu\text{A}$	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 100\ \mu\text{A}, V_{GS} = 0$	20	—	—	V	
Drain Cut-off Current	$I_{DSS}$	$V_{DS} = 20\text{ V}, V_{GS} = 0$	—	—	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 $\Omega$	

(Q1, Q2 COMMON)  
EQUIVALENT CIRCUIT

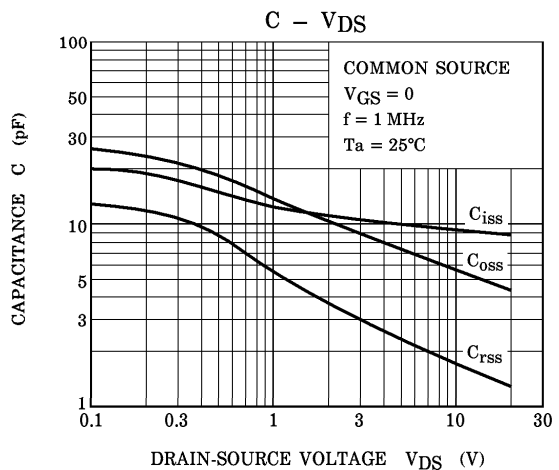
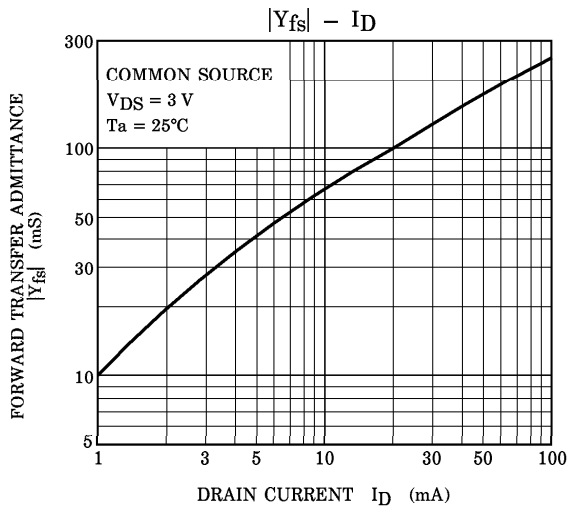
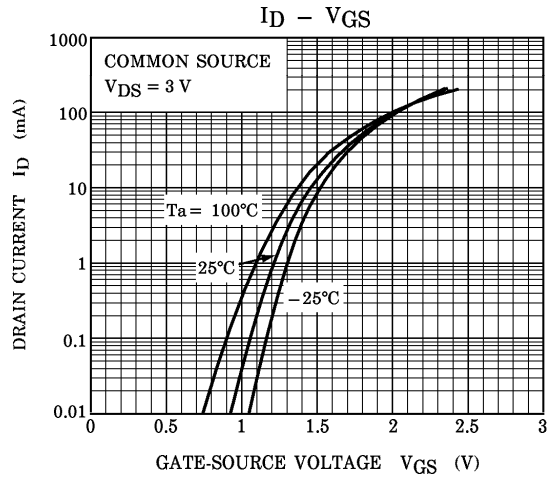
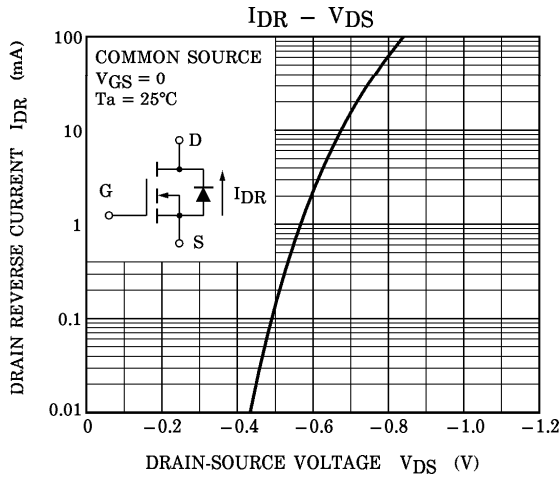
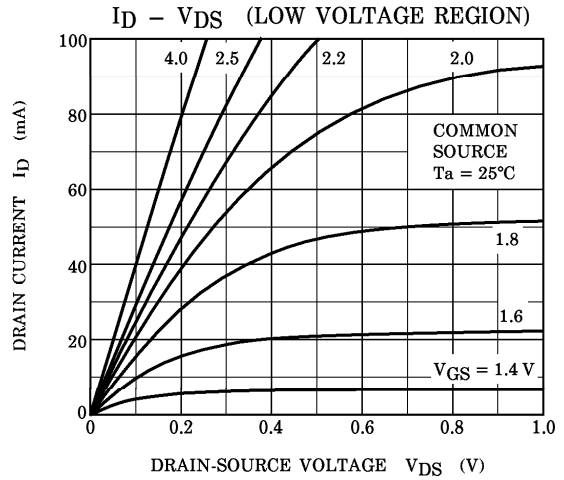
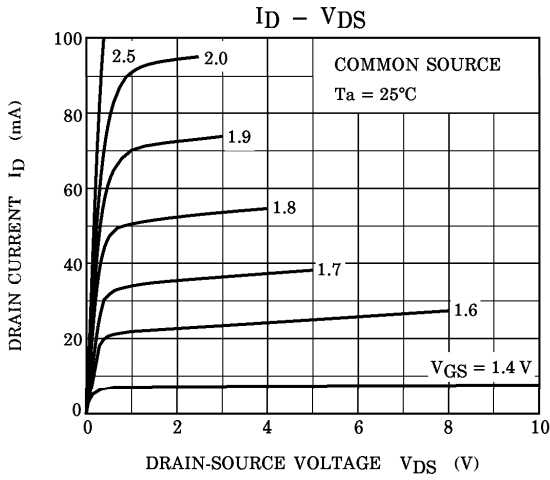


SWITCHING TIME TEST CIRCUIT

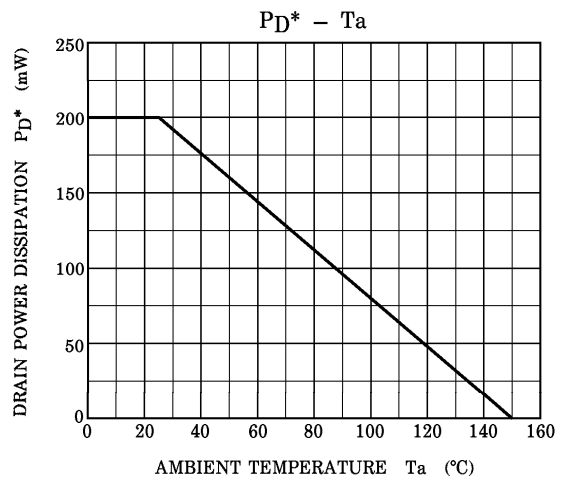
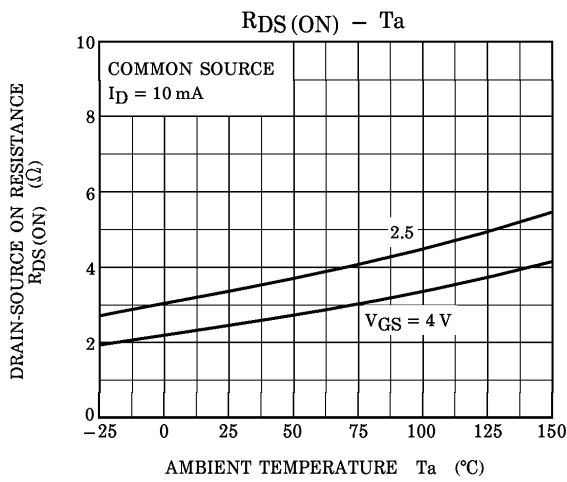
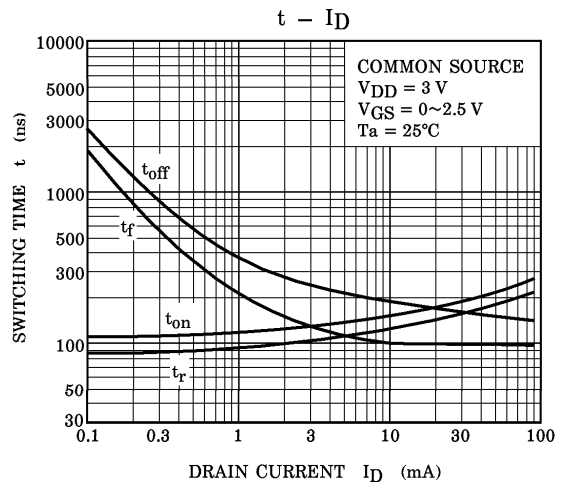
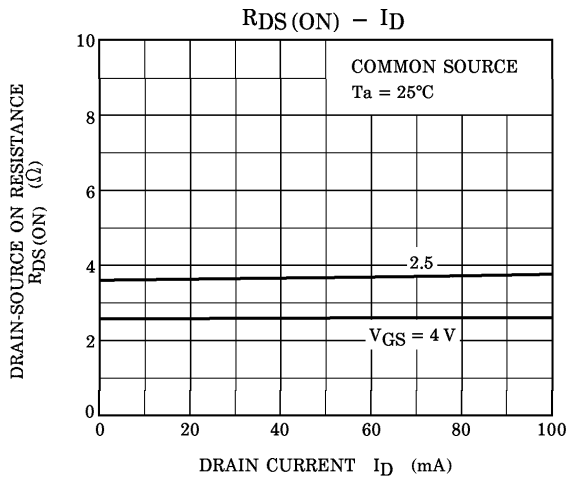
(a) TEST CIRCUIT



(Q1, Q2 COMMON)



(Q1, Q2 COMMON)



\*: Total Rating