

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE

**SSM6J06FU**

POWER MANAGEMENT SWITCH

HIGH SPEED SWITCHING APPLICATIONS

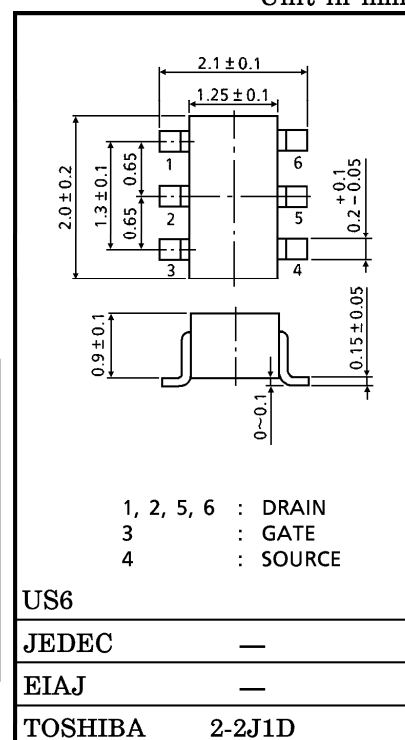
Unit in mm

- Small Package
- Low on Resistance :  $R_{on} = 0.5 \Omega$  Max. ( $V_{GS} = -4 V$ )  
:  $R_{on} = 0.7 \Omega$  Max. ( $V_{GS} = -2.5 V$ )
- Low Gate Threshold Voltage

MAXIMUM RATINGS ( $T_a = 25^\circ C$ )

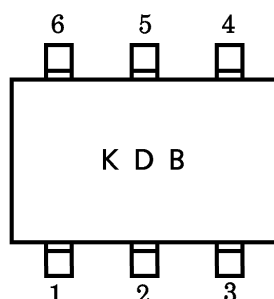
CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DS}$	-20	V
Gate-Source Voltage		$V_{GSS}$	$\pm 12$	V
Drain Current	DC	$I_D$	-650	mA
	Pulse	$I_{DP}$	-1300	
Drain Power Dissipation ( $T_a = 25^\circ C$ )		$P_D^*$	300	mW
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	-55~150	$^\circ C$

\* Mounted on FR4 board.

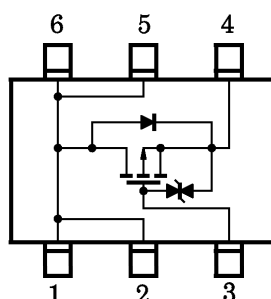
(25.4 mm  $\times$  25.4 mm  $\times$  1.6 t, Cu Pad : 0.32 mm<sup>2</sup>  $\times$  6) Fig.1.

Weight : 6.8 mg

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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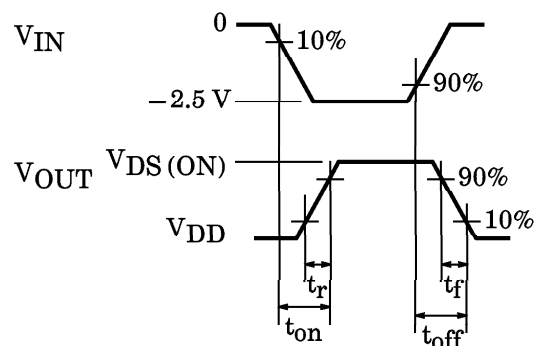
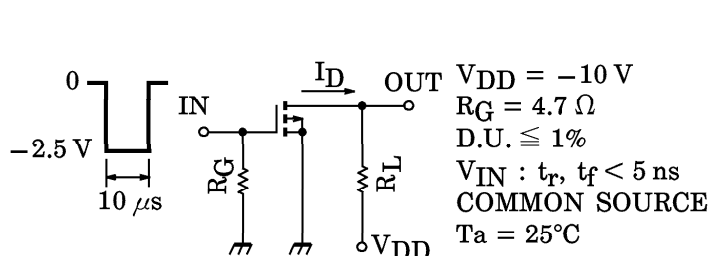
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## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I <sub>GSS</sub>	V <sub>GS</sub> = ±12 V, V <sub>DS</sub> = 0	—	—	±1	μA
Drain-Source Breakdown Voltage		V <sub>(BR) DSS</sub>	I <sub>D</sub> = −1 mA, V <sub>GS</sub> = 0	−20	—	—	V
Drain Cut-off Current		I <sub>DSS</sub>	V <sub>DS</sub> = −20 V, V <sub>GS</sub> = 0	—	—	−1	μA
Gate Threshold Voltage		V <sub>th</sub>	V <sub>DS</sub> = −3 V, I <sub>D</sub> = −0.1 mA	−0.6	—	−1.1	V
Forward Transfer Admittance		Y <sub>fs</sub>	V <sub>DS</sub> = −3 V, I <sub>D</sub> = −0.3 A (Note)	0.6	—	—	S
Drain-Source ON Resistance		R <sub>DS (ON)</sub>	I <sub>D</sub> = −0.3 A, V <sub>GS</sub> = −4 V (Note)	—	0.4	0.5	Ω
			I <sub>D</sub> = −0.3 A, V <sub>GS</sub> = −2.5 V (Note)	—	0.55	0.7	
Input Capacitance		C <sub>iss</sub>	V <sub>DS</sub> = −10 V, V <sub>GS</sub> = 0, f = 1 MHz	—	160	—	pF
Reverse Transfer Capacitance		C <sub>rss</sub>	V <sub>DS</sub> = −10 V, V <sub>GS</sub> = 0, f = 1 MHz	—	25	—	pF
Output Capacitance		C <sub>oss</sub>	V <sub>DS</sub> = −10 V, V <sub>GS</sub> = 0, f = 1 MHz	—	90	—	pF
Switching Time	Turn-on Time	t <sub>on</sub>	V <sub>DD</sub> = −10 V, I <sub>D</sub> = −0.3 A,	—	27	—	ns
	Turn-off Time	t <sub>off</sub>	V <sub>GS</sub> = 0~−2.5 V, R <sub>G</sub> = 4.7 Ω	—	43	—	

(Note) : Pulse test

## SWITCHING TIME TEST CIRCUIT



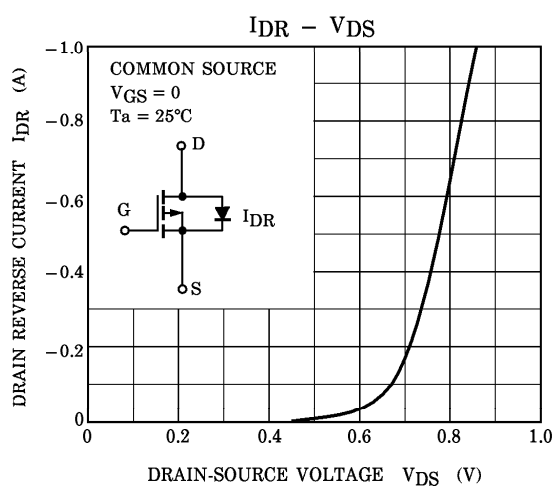
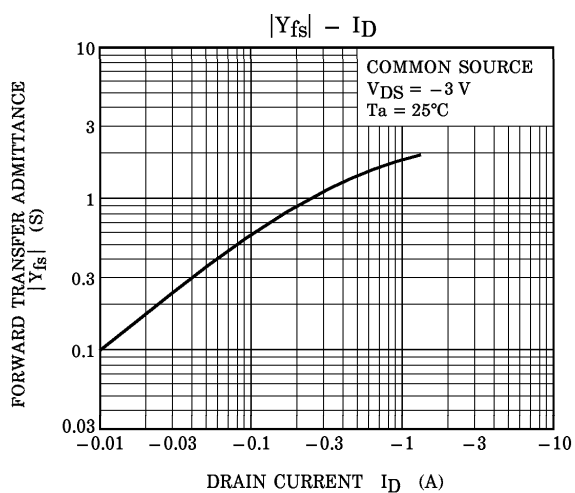
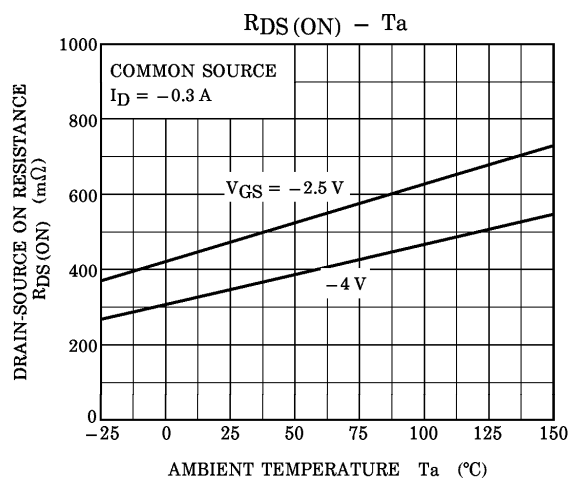
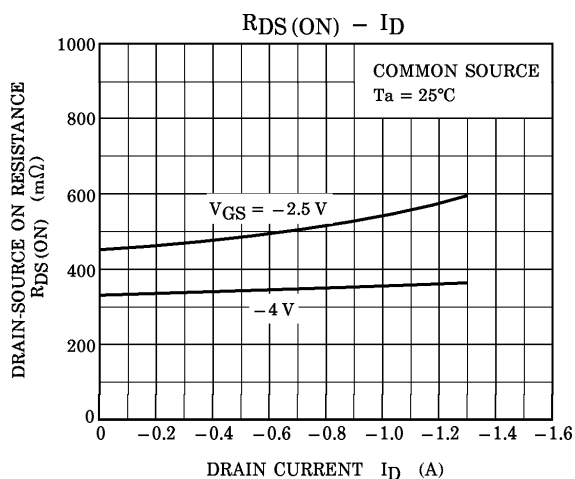
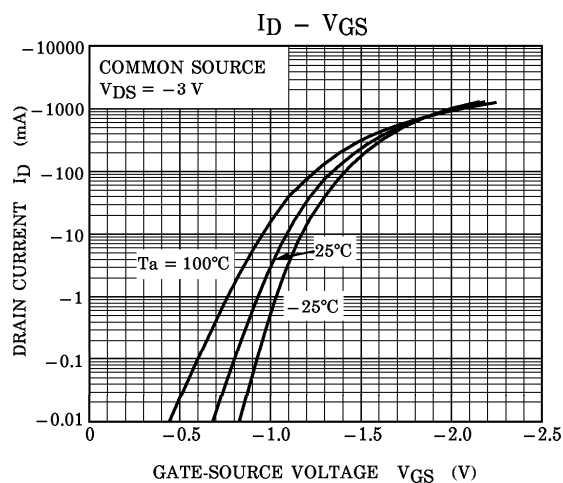
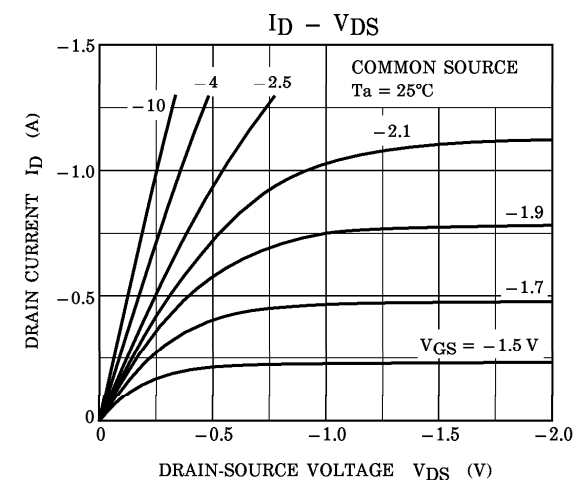
## PRECAUTION

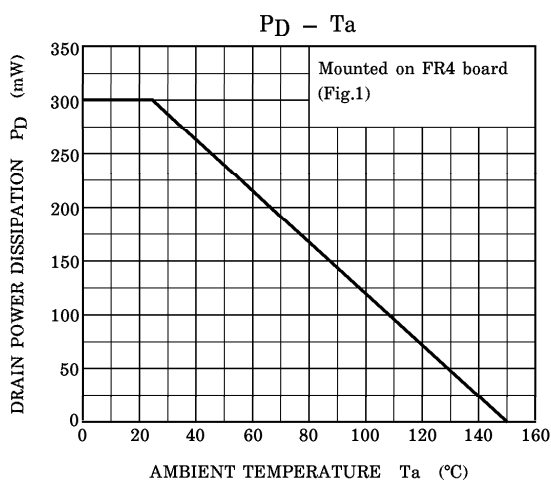
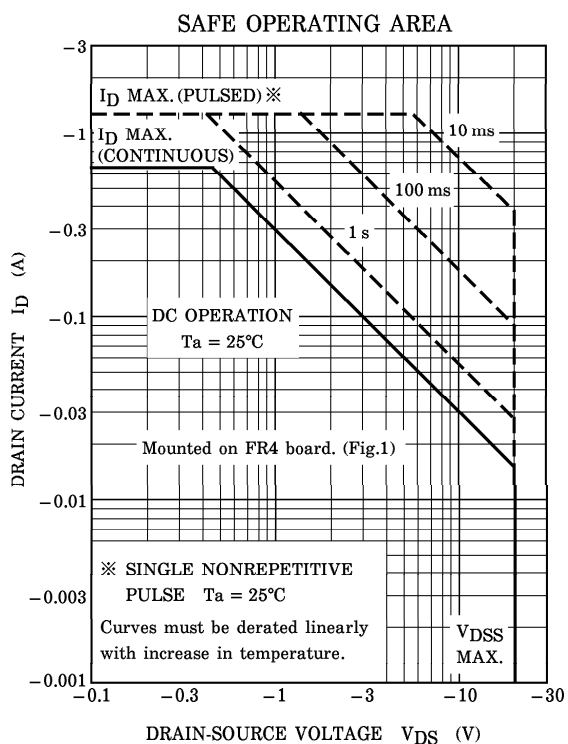
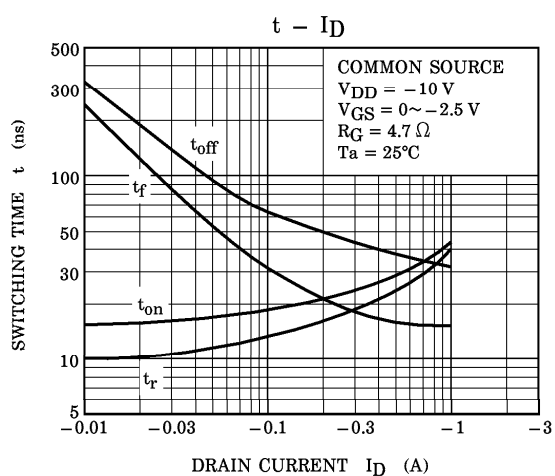
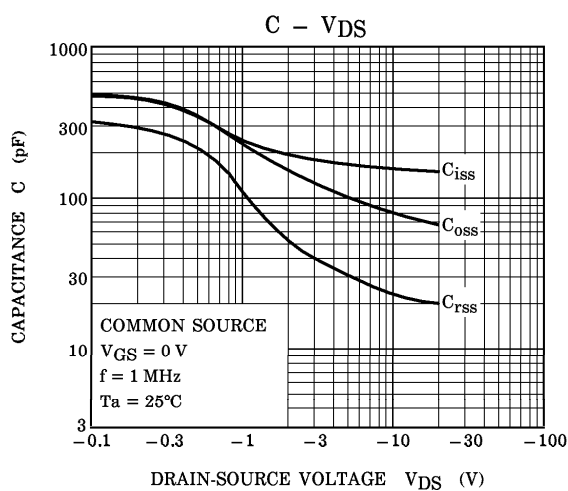
$V_{th}$  can be expressed as voltage between gate and source when low operating current value is  $I_D = -100\text{ }\mu\text{A}$  for this product. For normal switching operation,  $V_{GS(ON)}$  requires higher voltage than  $V_{th}$  and  $V_{GS(off)}$  requires lower voltage than  $V_{th}$ .

(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.





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

