

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE

SSM3K05FU

HIGH SPEED SWITCHING APPLICATIONS

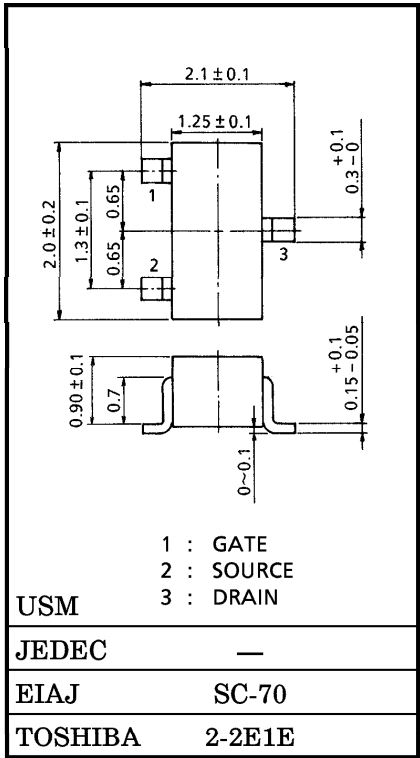
Unit in mm

- Small Package
- Low on Resistance : $R_{on} = 0.8 \Omega$ Max. (@ $V_{GS} = 4 V$)
: $R_{on} = 1.2 \Omega$ Max. (@ $V_{GS} = 2.5 V$)
- Low Gate Threshold Voltage

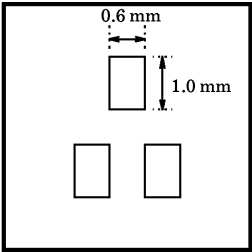
MAXIMUM RATINGS ($T_a = 25^\circ C$)

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

* Mounted on FR4 board.
($25.4 \text{ mm} \times 25.4 \text{ mm} \times 1.6 \text{ t}$, Cu Pad : $0.6 \text{ mm}^2 \times 3$)



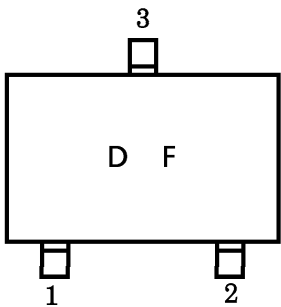
Weight : 0.006 g (Typ.)



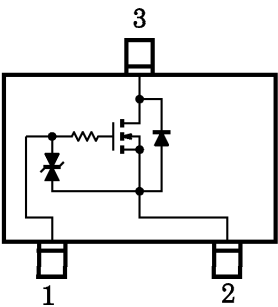
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MARKING



EQUIVALENT CIRCUIT (TOP VIEW)



HANDLING PRECAUTION

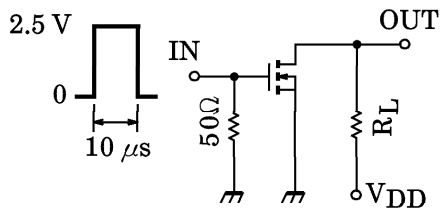
When handling individual devices (which are not yet mounting on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

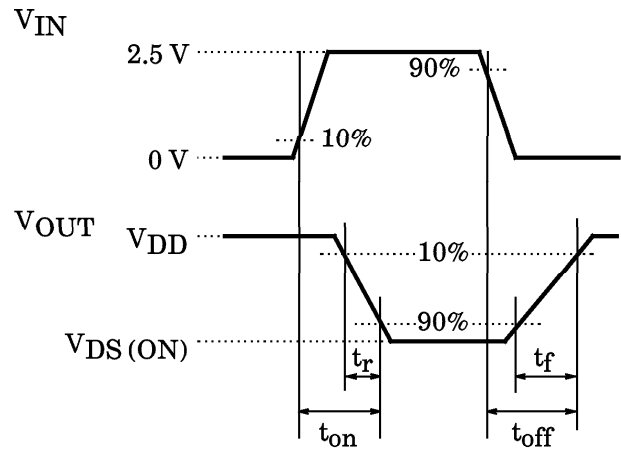
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±12 V, VDS = 0	—	—	±1	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 1 mA, VGS = 0	20	—	—	V
Drain Cut-off Current		IDSS	VDS = 20 V, VGS = 0	—	—	1	μA
Gate Threshold Voltage		Vth	VDS = 3 V, ID = 0.1 mA	0.6	—	1.1	V
Forward Transfer Admittance		Yfs	VDS = 3 V, ID = 200 mA (Note)	350	—	—	mS
Drain-Source ON Resistance		RDS(ON)	ID = 200 mA, VGS = 4 V (Note)	—	0.6	0.8	Ω
			ID = 200 mA, VGS = 2.5 V (Note)	—	0.85	1.2	
Input Capacitance		Ciss	VDS = 3 V, VGS = 0, f = 1 MHz	—	22	—	pF
Reverse Transfer Capacitance		Crss	VDS = 3 V, VGS = 0, f = 1 MHz	—	9	—	pF
Output Capacitance		Coss	VDS = 3 V, VGS = 0, f = 1 MHz	—	21	—	pF
Switching Time	Turn-on Time	ton	VDD = 3 V, ID = 100 mA, VGS = 0~2.5 V	—	60	—	ns
	Turn-off Time	toff		—	70	—	

(Note) : Pulse test

SWITCHING TIME TEST CIRCUIT



$V_{DD} = 3\text{ V}$
 $\text{D.U.} \leq 1\%$
 $V_{IN} : t_r, t_f < 5\text{ ns}$
 $(Z_{OUT} = 50\ \Omega)$
 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.

