

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE

SSM3J05FU

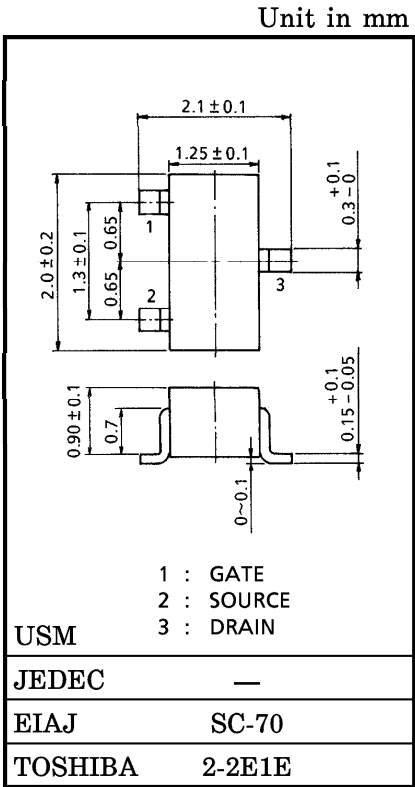
POWER MANAGEMENT SWITCH

HIGH SPEED SWITCHING APPLICATIONS

- Small Package
- Low on Resistance : $R_{on} = 3.3 \Omega$ Max. (@ $V_{GS} = -4 V$)
: $R_{on} = 4.0 \Omega$ Max. (@ $V_{GS} = -2.5 V$)
- Low Gate Threshold Voltage

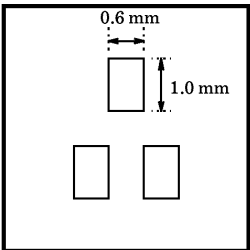
MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GSS}	± 12	V
Drain Current	DC	I_D	-200	mA
	Pulse	I_{DP}	-400	
Drain Power Dissipation ($T_a = 25^\circ C$)		P_D^*	150	mW
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55~150	$^\circ C$



Weight : 0.006 g (Typ.)

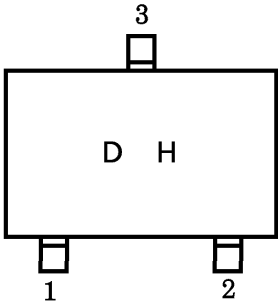
* Mounted on FR4 board.
(25.4 mm × 25.4 mm × 1.6 t, Cu Pad : 0.6 mm² × 3)



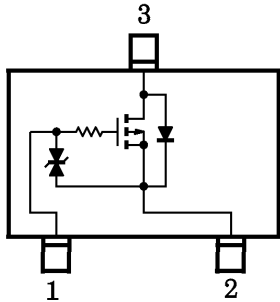
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MARKING



EQUIVALENT CIRCUIT (TOP VIEW)



HANDLING PRECAUTION

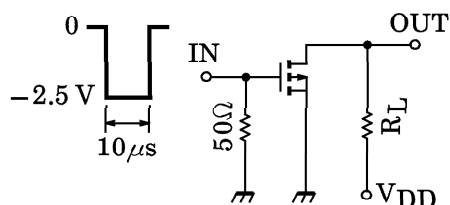
When handling individual devices (which are not yet mounting on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static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

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 12\text{ V}, V_{DS} = 0$	—	—	± 1	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = -1\text{ mA}, V_{GS} = 0$	-20	—	—	V
Drain Cut-off Current		I_{DSS}	$V_{DS} = -20\text{ V}, V_{GS} = 0$	—	—	-1	μA
Gate Threshold Voltage		V_{th}	$V_{DS} = -3\text{ V}, I_D = -0.1\text{ mA}$	-0.6	—	-1.1	V
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = -3\text{ V}, I_D = -50\text{ mA}$ (Note)	100	—	—	mS
Drain-Source ON Resistance		$R_{DS(ON)}$	$I_D = -100\text{ mA}, V_{GS} = -4\text{ V}$ (Note)	—	2.1	3.3	Ω
			$I_D = -50\text{ mA}, V_{GS} = -2.5\text{ V}$ (Note)	—	3.2	4.0	
Input Capacitance		C_{iss}	$V_{DS} = -3\text{ V}, V_{GS} = 0,$ $f = 1\text{ MHz}$	—	27	—	pF
Reverse Transfer Capacitance		C_{rss}	$V_{DS} = -3\text{ V}, V_{GS} = 0,$ $f = 1\text{ MHz}$	—	7	—	pF
Output Capacitance		C_{oss}	$V_{DS} = -3\text{ V}, V_{GS} = 0,$ $f = 1\text{ MHz}$	—	21	—	pF
Switching Time	Turn-on Time	t_{on}	$V_{DD} = -3\text{ V}, I_D = -50\text{ mA},$ $V_{GS} = 0 \sim -2.5\text{ V}$	—	70	—	ns
	Turn-off Time	t_{off}		—	70	—	

(Note) : Pulse test

SWITCHING TIME TEST CIRCUIT



$V_{DD} = -3\text{ V}$

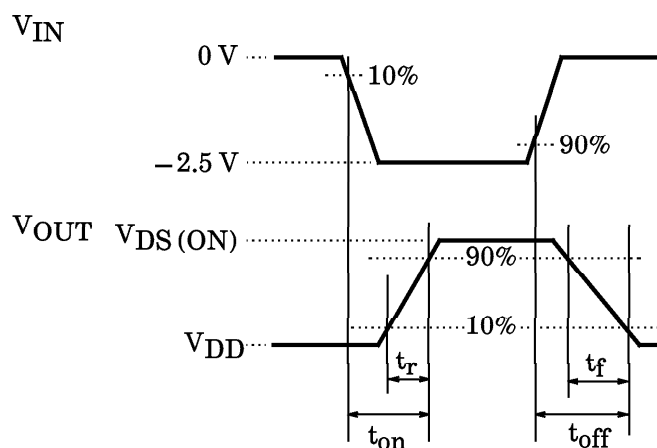
D.U. $\leq 1\%$

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.

