

Silicon P Channel MOS Type (Π-MOSⅦ)

TENTATIVE

SSM6K31FE

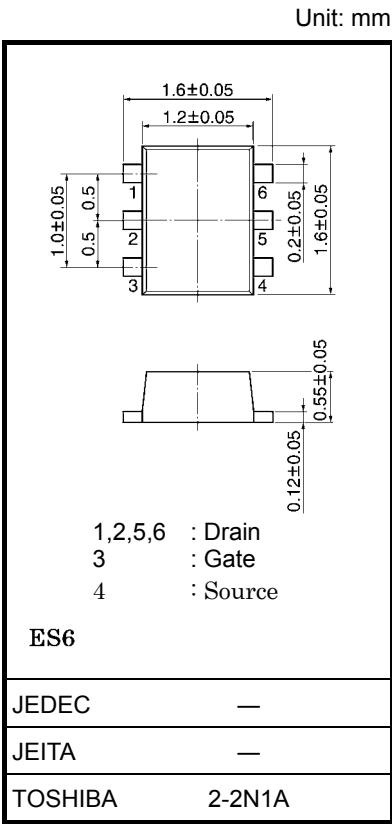
- High speed switching
- DC-DC Converter

- small package
- Low RDS (ON)
 - : Ron = 240 mΩ (typ) (@VGS = 10 V)
 - : Ron = 400 mΩ (typ) (@VGS = 4 V)

Maximum Ratings (Ta = 25°C) MOSFET

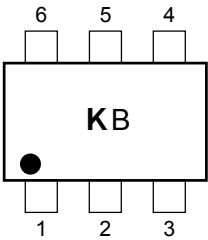
Characteristics		Symbol	Rating	Unit
Drain-Source voltage		VDS	20	V
Gate-Source voltage		VGSS	±20	V
Drain current	DC	ID	1.2	A
	Pulse	IDP	2.4	
Drain power dissipation		PD (Note 1)	500	mW
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55~150	°C

Note 1: Mounted on FR4 board
(25.4 mm × 25.4 mm × 1.6 t, Cu pad: 645 mm²)

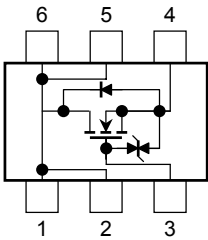


Weight: 3 mg (typ.)

Marking
Circuit (top view)



Equivalent



Handling Precaution

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

The Channel-to-Ambient thermal resistance Rth (ch-a) and the drain power dissipation PD vary according to the board material, board area, board thickness and pad area. When using this device, please take heat dissipation fully into account.

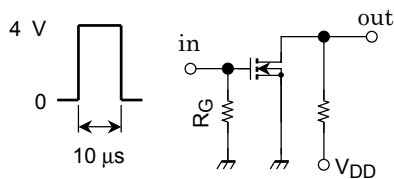
Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$	—	—	± 1	μA
Drain-Source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1 \text{ mA}, V_{GS} = 0$	20	—	—	V
	I_{DSS}	$V_{DS} = 20 \text{ V}, V_{GS} = 0$	—	—	1	μA
Drain Cut-off current	V_{th}	$V_{DS} = 5 \text{ V}, I_D = 0.1 \text{ mA}$	1.1	—	2.3	V
Gate threshold voltage	$ Y_{fs} $	$V_{DS} = 5 \text{ V}, I_D = 0.6 \text{ A}$ (Note 2)	0.58	—	—	S
Forward transfer admittance	$R_{DS(ON)}$	$I_D = 0.6 \text{ A}, V_{GS} = 10 \text{ V}$ (Note 2)	—	240	320	$\text{m}\Omega$
Drain-Source ON resistance		$I_D = 0.6 \text{ A}, V_{GS} = 4 \text{ V}$ (Note 2)	—	400	540	
	C_{iss}	$V_{DS} = 10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	36	—	pF
Input capacitance	C_{rss}	$V_{DS} = 10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	10	—	pF
Reverse transfer capacitance	C_{oss}	$V_{DS} = 10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	30	—	pF
Switching time	Turn-on time	t_{on}	$V_{DD} = 10 \text{ V}, I_D = 0.6 \text{ A},$ $V_{GS} = 0 \sim 4 \text{ V}, R_G = 10 \Omega$		—	ns
	Turn-off time	t_{off}			—	

Note 2: Pulse measurement

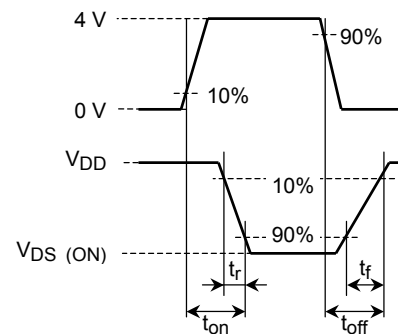
Switching Time Test Circuit

(a) Test circuit

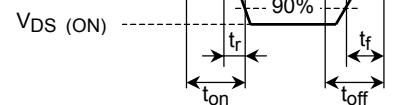


$V_{DD} = 10 \text{ V}$
 $R_G = 10 \Omega$
 Duty $\leq 1\%$
 V_{IN} : $t_r, t_f < 5 \text{ ns}$
 Common source
 $T_a = 25^\circ\text{C}$

(b) V_{IN}



(c) V_{OUT}



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 4.0 V or higher to turn on this product.

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