Silicon P Channel MOS Type (Π-MOSⅦ)

TENTATIVE

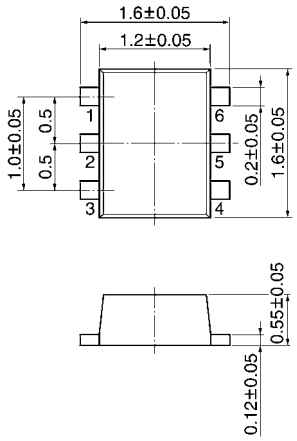
SSM6K31FE

○ High speed switching

○ DC-DC Converter

- small package
- Low $R_{DS\ (ON)}$: R_{on} = 240 mΩ (typ) (@V_{GS} = 10 V)
  : R_{on} = 400 mΩ (typ) (@V_{GS} = 4 V)

Unit: mm



1,2,5,6 : Drain
3 : Gate
4 : Source

ES6

JEDEC	—
JEITA	—
TOSHIBA	2-2N1A

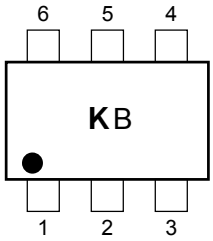
Weight: 3 mg (typ.)

Maximum Ratings (Ta = 25°C) MOSFET

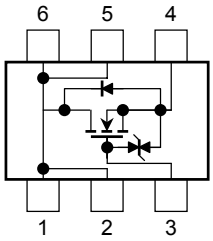
Characteristics		Symbol	Rating	Unit
Drain-Source voltage		V_{DS}	20	V
Gate-Source voltage		V_{GSS}	±20	V
Drain current	DC	I_D	1.2	A
	Pulse	I_{DP}	2.4	
Drain power dissipation		P_D (Note 1)	500	mW
Channel temperature		T_{ch}	150	°C
Storage temperature		T_{stg}	−55~150	°C

Note 1:Mounted on FR4 board
(25.4 mm × 25.4 mm × 1.6 t, Cu pad: 645 mm^2)

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 $R_{th\ (ch\text{-}a)}$ and the drain power dissipation P_D vary according to the board material, board area, board thickness and pad area. When using this device, please take heat dissipation fully into account.

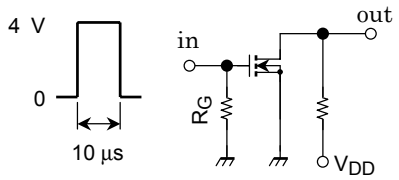
Electrical Characteristics (Ta = 25°C)

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

Note 2:Pulse measurement

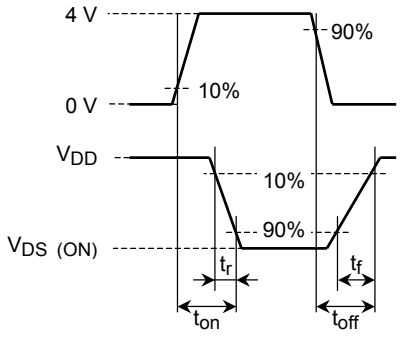
Switching Time Test Circuit

(a) Test circuit



V_{DD} = 10 V
R_G = 10Ω
Duty ≦ 1%
V_{IN}: t_r, t_f < 5 ns
Common source
Ta = 25°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 μA 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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