

# 2.5V Drive Nch+Nch MOS FET

## US6K1

●Structure

Silicon N-channel MOS FET

●Features

- 1) Low On-resistance.
- 2) Space saving, small surface mount package (TUMT6).
- 3) Low voltage drive (2.5V drive).

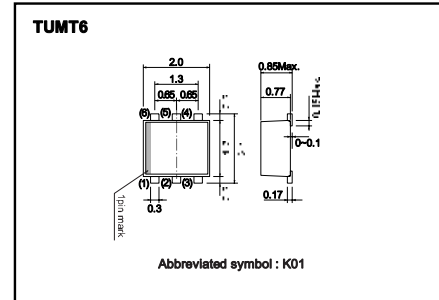
●Applications

Switching

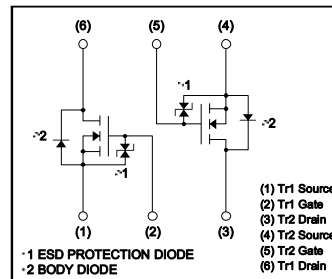
●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
US6K1		○

●External dimensions (Unit : mm)



●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-source voltage	V <sub>DSS</sub>	30	V
Gate-source voltage	V <sub>GSS</sub>	12	V
Drain current	Continuous	I <sub>D</sub>	±1.5 A
	Pulsed	I <sub>DP</sub> <sup>∗1</sup>	±6 A
Source current (Body diode)	Continuous	I <sub>S</sub>	0.6 A
	Pulsed	I <sub>SP</sub> <sup>∗1</sup>	6 A
Total power dissipation	P <sub>D</sub> <sup>∗2</sup>	1.0	W / TOTAL
		0.7	W / ELEMENT
Channel temperature	T <sub>ch</sub>	150	°C
Range of storage temperature	T <sub>stg</sub>	-55 to +150	°C

<sup>∗1</sup> Pw≤10μs, Duty cycle≤1%  
<sup>∗2</sup> Mounted on a ceramic board

●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	R <sub>th(ch-a)</sub> <sup>*</sup>	125	°C/W / TOTAL
		179	°C/W / ELEMENT

<sup>\*</sup> Mounted on a ceramic board

## Transistors

## ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I <sub>oss</sub>	–	–	10	μA	V <sub>GS</sub> =12V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	30	–	–	V	I <sub>D</sub> = 1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	–	–	1	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	0.5	–	1.5	V	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1mA
Static drain-source on-state resistance	R <sub>DS(on)</sub> <sup>*)</sup>	–	170	240	mΩ	I <sub>D</sub> = 1.5A, V <sub>GS</sub> = 4.5V
		–	180	250	mΩ	I <sub>D</sub> = 1.5A, V <sub>GS</sub> = 4.0V
		–	240	340	mΩ	I <sub>D</sub> = 1.5A, V <sub>GS</sub> = 2.5V
Forward transfer admittance	Y <sub>fs</sub>	1.5	–	–	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1.5A
Input capacitance	C <sub>iss</sub>	–	80	–	pF	V <sub>DS</sub> = 10V
Output capacitance	C <sub>oss</sub>	–	13	–	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	–	12	–	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub> <sup>*)</sup>	–	7	–	ns	V <sub>DD</sub> ≐ 15V I <sub>D</sub> = 0.75A
Rise time	t <sub>r</sub> <sup>*)</sup>	–	9	–	ns	V <sub>GS</sub> = 4.5V
Turn-off delay time	t <sub>d(off)</sub> <sup>*)</sup>	–	15	–	ns	R <sub>L</sub> = 20Ω
Fall time	t <sub>f</sub> <sup>*)</sup>	–	6	–	ns	R <sub>G</sub> =10Ω
Total gate charge	Q <sub>g</sub> <sup>*)</sup>	–	1.6	2.2	nC	V <sub>DD</sub> ≐ 15V
Gate-source charge	Q <sub>gs</sub> <sup>*)</sup>	–	0.5	–	nC	V <sub>GS</sub> = 4.5V
Gate-drain charge	Q <sub>gd</sub> <sup>*)</sup>	–	0.3	–	nC	I <sub>D</sub> = 1.5A

\*) Pulsed

## ●Body diode characteristics (Source-drain) (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub>	–	–	1.2	V	I <sub>S</sub> = 0.6A, V <sub>GS</sub> =0V

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