Small switching (30V, 0.1A) UM6K1N

Features

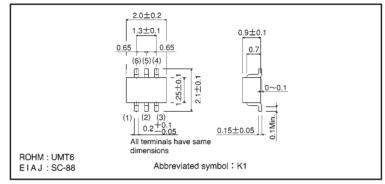
- Two 2SK3018 transistors in a single UMT package.
- 2) The MOSFET elements are independent, eliminating interference.
- Mounting cost and area can be cut in half.
- 4) Low on-resistance.
- 5) Low voltage drive (2.5V) makes this device ideal for portable equipment.

Applications

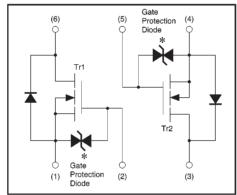
Interfacing, switching (30V, 100mA)

●Structure Silicon N-channel MOSFET

External dimensions (Units: mm)



Equivalent circuit



- (1) Tr1 Source
- (2) Tr1 Gate
- (4) Tr2 Source
- (5) Tr2 Gate
- (6) Tr1 Drain
- * A protection diode has been built in between the gate and the source to protect against static electricity when the product is in use. Use the protection circuit when rated voltages are exceeded.

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		Voss	30	٧
Gate-source voltage		Vgss	±20	٧
Drain current	Continuous	lο	100	mA
	Pulsed	IDP*1	200	mA
Reverse drain current	Continuous	IDR	100	mA
	Pulsed	IDRP*1	200	mA
Total power dissipation (Tc=25℃)		P D*2	150	mW
Channel temperature		Tch	150	Ĉ
Storage temperature		Tstg	−55~ +150	Ĉ

^{*1} Pw \leq 10 μ s, Duty cycle \leq 50%

Packaging specifications

Туре	Package	Taping
	Code	TN
	Basic ordering unit (pieces)	3000
UM6K1N		0

^{*2} With each pin mounted on the recommended lands.

Transistor UM6K1N

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Test Conditions
Gate-source leakage	lgss	_	_	±1	μΑ	V _{GS} =±20V, V _{DS} =0V
Drain-source breakdown voltage	V(BR)DSS	30	_	_	٧	I _D =10 μA, V _{GS} =0V
Zero gate voltage drain current	loss		_	1.0	μΑ	V _{DS} =30V, V _{GS} =0V
Gate threshold voltage	VGS(th)	0.8	_	1.5	٧	V _{DS} =3V, I _D =100 μA
Static drain-source on-starte resistance	RDS(on)		5	8	Ω	ID=10mA, VGS=4V
	RDS(on)	_	7	13	Ω	ID=1mA, VGS=2.5V
Forward transfer admittance	Yfs	20	_	_	mS	ID=10mA, VDS=3V
Input capacitance	Ciss	_	13	_	рF	V _{DS} =5V
Output capacitance	Coss	_	9	_	рF	V _{GS} =0V
Reverse transfer capacitance	Crss	_	4	_	pF	f=1MHz
Turn-on delay time	td(on)	_	15	_	ns	I _D =10mA, V _{DD} ≒5V
Rise time	tr	_	35	_	ns	V _{GS} =5V
Turn-off delay time	td(off)	_	80	_	ns	RL=500 Ω
Fall time	tr	_	80	_	ns	R _{GS} =10Ω

Electrical characteristic curves

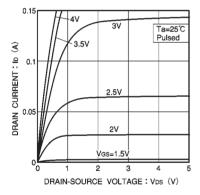


Fig.1 Typical output characteristics

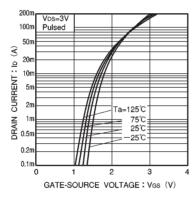


Fig.2 Typical transfer characteristics

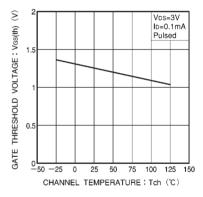
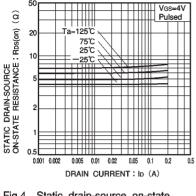


Fig.3 Gate threshold voltage vs. channel temperature

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Vgs=2.5V a Pulsed Ta=125℃ 75°C STATIC DRAIN-SOURCE ON-STATE RESISTANCE: Rps(on) 20 25℃ 10 0.001 0.002 0.005 0.01 0.02 0.05 DRAIN CURRENT: ID (A)

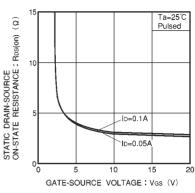
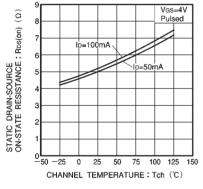


Fig.4 Static drain-source on-state resistance vs. drain current (I)

Static drain-source on-state Fig.5 resistance vs. drain current (II)

Fia.6 Static drain-source on-state resistance vs. gate-source voltage



0. Vps=3V Pulsed 0.2 8 Ta=-25°C FORWARD TRANSFER ADMITTANCE: | Yfs | 0.1 25°C 75℃ 0.05 25°C 0.02 0.01 0.005 0.002 0.001 0.002 0,005 0.02 0.05 0.1 DRAIN CURRENT: ID (A)

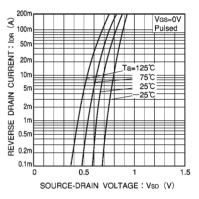


Fig.7 Static drain-source on-state resistance vs. channel temperature

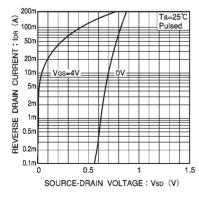
Fig.8 Forward transfer admittance vs. drain current

50

Reverse drain current vs. source-drain voltage (I)

1000

Ta=25℃



f=1MHz Vgs=0V (PF) CAPACITANCE: C Crss 0.5 0.2 DRAIN-SOURCE VOLTAGE: VDS

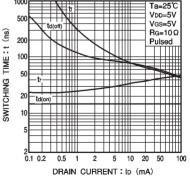


Fig.10 Reverse drain current vs. source-drain voltage (I)

Typical capacitance vs. Fig.11 drain-source voltage

Switching characteristics Fig.12 (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

Transistor UM6K1N

Switching characteristics measurement circuit

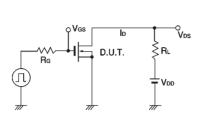


Fig.13 Switching time measurement circuit

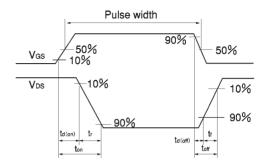


Fig.14 Switching time waveforms