

EM6K6

Silicon N-channel
MOSFET

Switching

- 1) The MOSFET elements are independent, eliminating mutual interference.
- 2) Mounting cost and area can be cut in half.
- 3) Low on-resistance.
- 4) Low voltage drive (1.8V) makes this device ideal for portable equipment.

Type	Package	Taping
	Code	T2R
	Basic ordering unit (pieces)	8000
EM6K6		○

<It is the same ratings for the Tr1 and Tr2>

Parameter		Symbol	Limits	Unit
Drain–source voltage		V _{DSS}	20	V
Gate–source voltage		V _{GSS}	±8	V
Drain current	Continuous	I _D	±300	mA
	Pulsed	I _{DP} ^{*1}	±600	mA
Total power dissipation		P _D ^{*2}	150	mW / TOTAL
			120	mW / ELEMENT
Channel temperature		T _{ch}	150	°C
Storage temperature		T _{stg}	–55 to +150	°C

*2 Each terminal mounted on a recommended land.

Parameter	Symbol	Limits	Unit
Channel to ambient	Rth(ch-a) *	833	°C/W / TOTAL
		1042	°C/W / ELEMENT

* Each terminal mounted on a recommended land

EMT6

1.6

1.0

0.5

0.5

(6) (5) (4)

1.2

1.6

(1) (2) (3)

0.22

0.5

0.13

Each lead has same dimensions

Abbreviated symbol : K06

The diagram shows a two-transistor MOSFET driver circuit. It includes two N-channel MOSFETs, Tr1 and Tr2, and two PNP protection diodes. Tr1's source is connected to the negative supply (pin 1), its gate to the positive supply (pin 6), and its drain to the load (pin 2). Tr2's source is connected to the load (pin 3), its gate to the positive supply (pin 5), and its drain to the positive supply (pin 4). The protection diodes are connected from the gates to the drains of the MOSFETs, with their cathodes to the gates and anodes to the drains. A legend on the right identifies the pins: (1)Tr1 Source, (2)Tr1 Gate, (3)Tr2 Drain, (4)Tr2 Source, (5)Tr2 Gate, and (6)Tr1 Drain.

(1)Tr1 Source
(2)Tr1 Gate
(3)Tr2 Drain
(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.

Transistor

●Electrical characteristics (Ta=25°C)

<It is the same characteristics for the Tr1 and Tr2>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	—	—	± 10	μA	$V_{GS}=\pm 8V$, $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	20	—	—	V	$I_D=1mA$, $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	—	—	1.0	μA	$V_{DS}=20V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	0.3	—	1.0	V	$V_{DS}=10V$, $I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	—	0.7	1.0	Ω	$I_D=300mA$, $V_{GS}=4.0V$
		—	0.8	1.2	Ω	$I_D=300mA$, $V_{GS}=2.5V$
		—	1.0	1.4	Ω	$I_D=300mA$, $V_{GS}=1.8V$
Forward transfer admittance	$ Y_{fs} ^*$	400	—	—	ms	$I_D=300mA$, $V_{DS}=10V$
Input capacitance	C_{iss}	—	25	—	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	—	10	—	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	—	10	—	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^*$	—	5	—	ns	$I_D=150mA$, $V_{DD} \doteq 10V$
Rise time	t_r^*	—	10	—	ns	$V_{GS}=4.0V$
Turn-off delay time	$t_{d(off)}^*$	—	15	—	ns	$R_L=67\Omega$
Fall time	t_f^*	—	10	—	ns	$R_G=10\Omega$

* Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}^*	—	—	1.2	V	$I_S=100mA$, $V_{GS}=0V$

* Pulsed

●Electrical characteristic curves

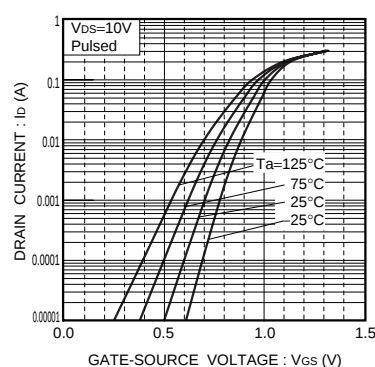


Fig.1 Typical transfer characteristics

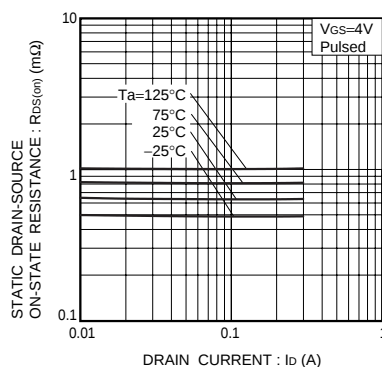


Fig.2 Static drain-source on-state resistance vs. drain current (I)

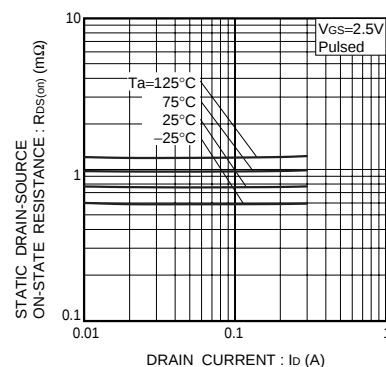


Fig.3 Static drain-source on-state resistance vs. drain current (II)

Transistor

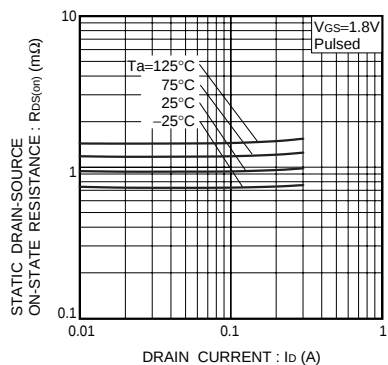


Fig.4 Static drain-source on-state resistance vs. drain current (III)

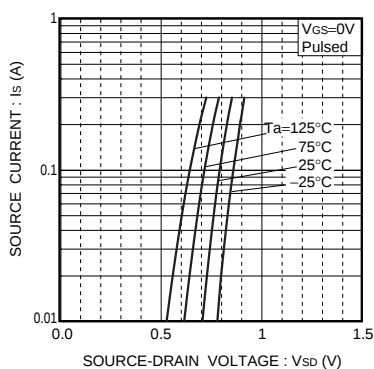


Fig.5 Source current vs. source-drain voltage

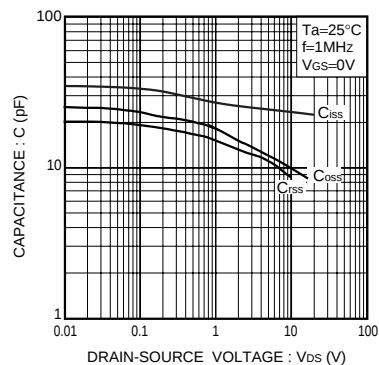


Fig.6 Typical capacitance vs. drain-source voltage

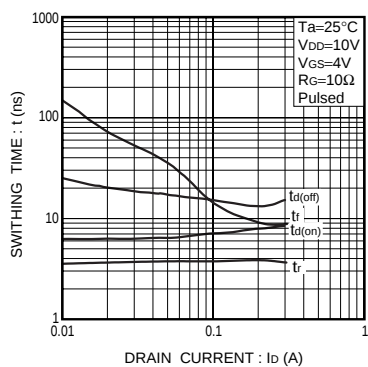


Fig.7 Switching characteristics

●Switching characteristics measurement circuit

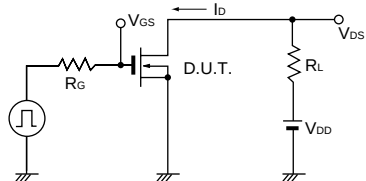


Fig.8 Switching time measurement circuit

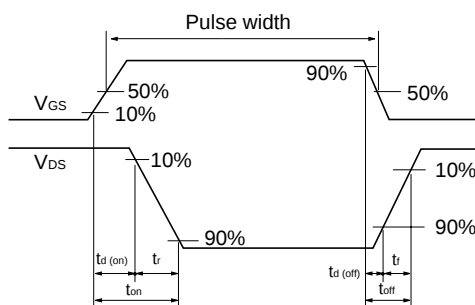


Fig.9 Switching time waveforms

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