

# 1.8V Drive Nch+Nch MOSFET

## EM6K6

### ●Structure

Silicon N-channel  
MOSFET

### ●Applications

Switching

### ●Features

- 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.

### ●Packaging specifications

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

### ●Absolute maximum ratings (Ta=25°C)

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

Parameter	Symbol	Limits	Unit
Drain-source voltage	$V_{DS}$	20	V
Gate-source voltage	$V_{GS}$	$\pm 8$	V
Drain current	Continuous	$I_D$	$\pm 300$ mA
	Pulsed	$I_{DP}^{*1}$	$\pm 600$ 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

\*1  $P_w \leq 10 \mu s$ , Duty cycle  $\leq 1\%$

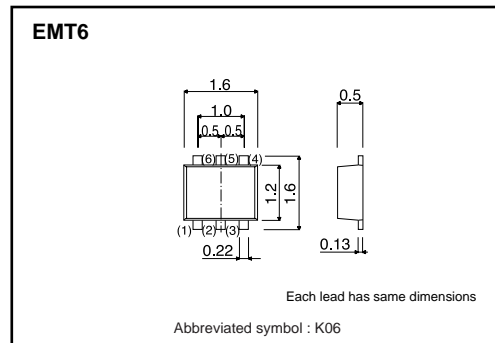
\*2 Each terminal mounted on a recommended land.

### ●Thermal resistance

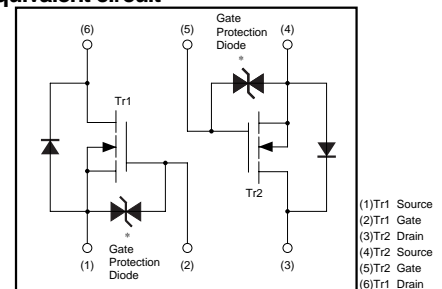
Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}^*$	833	°C/W / TOTAL
		1042	°C/W / ELEMENT

\* Each terminal mounted on a recommended land

### ●Dimensions (Unit : mm)



### ●Equivalent circuit



\* 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)

&lt;It is the same characteristics for the Tr1 and Tr2&gt;

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I <sub>GSS</sub>	–	–	±10	μA	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	20	–	–	V	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	–	–	1.0	μA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS(th)</sub>	0.3	–	1.0	V	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA
Static drain-source on-state resistance	R <sub>DS(on)</sub> *	–	0.7	1.0	Ω	I <sub>D</sub> =300mA, V <sub>GS</sub> =4.0V
		–	0.8	1.2	Ω	I <sub>D</sub> =300mA, V <sub>GS</sub> =2.5V
		–	1.0	1.4	Ω	I <sub>D</sub> =300mA, V <sub>GS</sub> =1.8V
Forward transfer admittance	Y <sub>fs</sub>  *	400	–	–	ms	I <sub>D</sub> =300mA, V <sub>DS</sub> =10V
Input capacitance	C <sub>iss</sub>	–	25	–	pF	V <sub>DS</sub> =10V
Output capacitance	C <sub>oss</sub>	–	10	–	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	–	10	–	pF	f=1MHz
Turn-on delay time	t <sub>d(on)</sub> *	–	5	–	ns	I <sub>D</sub> =150mA, V <sub>DD</sub> ≐ 10V
Rise time	t <sub>r</sub> *	–	10	–	ns	V <sub>GS</sub> =4.0V
Turn-off delay time	t <sub>d(off)</sub> *	–	15	–	ns	R <sub>L</sub> =67Ω
Fall time	t <sub>f</sub> *	–	10	–	ns	R <sub>G</sub> =10Ω

\* 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> = 100mA, V <sub>GS</sub> =0V

\* Pulsed

## ●Electrical characteristic curves

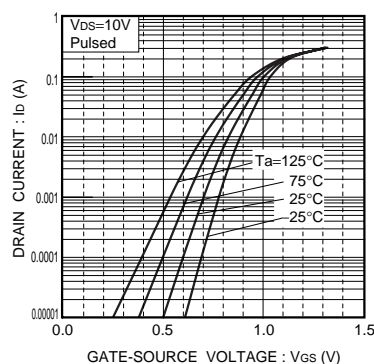


Fig.1 Typical transfer characteristics

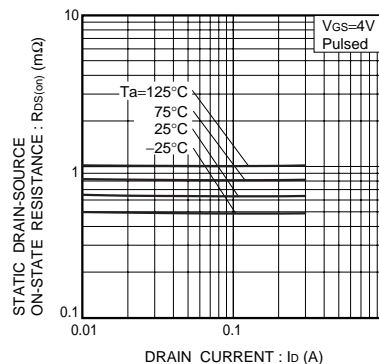


Fig.2 Static drain-source on-state resistance vs. drain current (I)

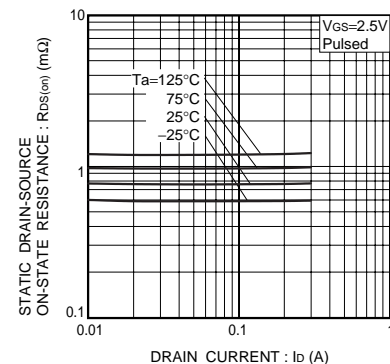


Fig.3 Static drain-source on-state resistance vs. drain current (II)

Transistor

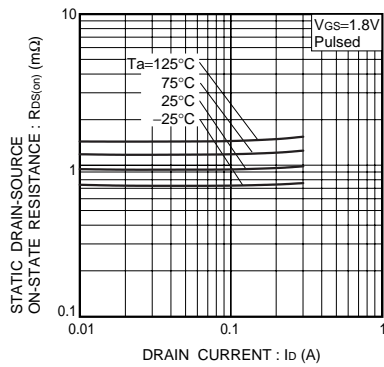


Fig.4 Static drain-source on-state resistance vs. drain current (III)

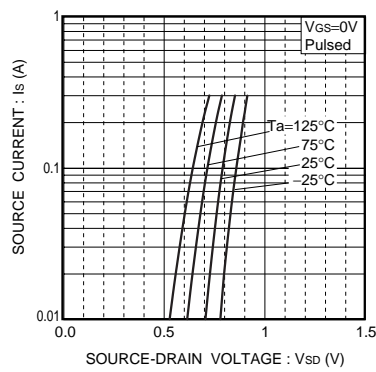


Fig.5 Source current vs. source-drain voltage

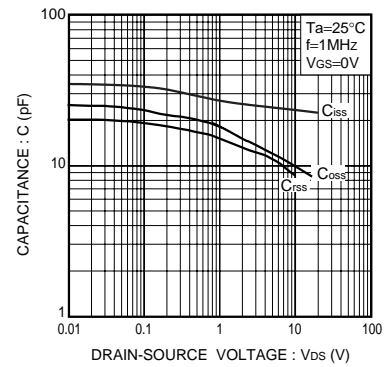


Fig.6 Typical capacitance vs. drain-source voltage

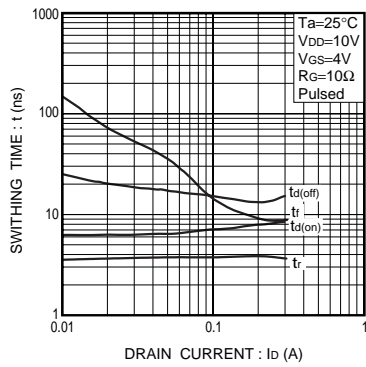


Fig.7 Switching characteristics

● Switching characteristics measurement circuit

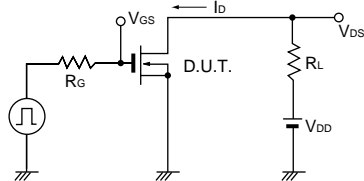


Fig.8 Switching time measurement circuit

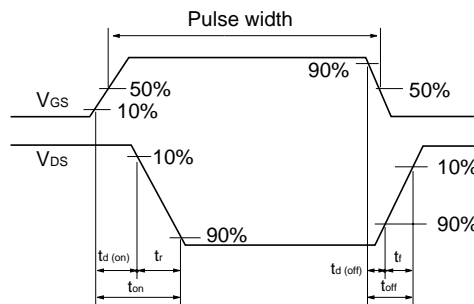


Fig.9 Switching time waveforms

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