# 1.8V Drive Nch+Nch MOSFET

## EM6K6

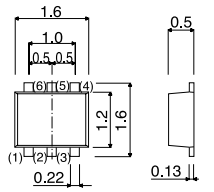
### ●Structure
Silicon N-channel
MOSFET

### ●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.

### ●Dimensions (Unit : mm)

**EMT6**



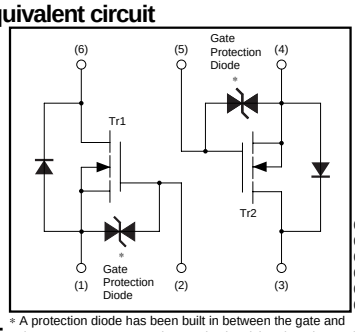

Each lead has same dimensions

Abbreviated symbol : K06

### ●Packaging specifications

| | | |
|---|---|---|
| Type | Package | Taping |
| | Code | T2R |
| | Basic ordering unit (pieces) | 8000 |
| EM6K6 | | ◯ |

### ●Equivalent circuit




(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.

### ●Absolute maximum ratings (Ta=25°C)
<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 | | Tch | 150 | °C |
| Storage temperature | | Tstg | −55 to +150 | °C |

∗1 Pw≤10µs, Duty cycle≤1%
∗2 Each terminal mounted on a recommended land.

### ●Thermal resistance

| 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

●**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 | $V_{GS}$=±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, $V_{DD}$ ≒10V |
| Rise time | $t_r$ * | – | 10 | – | ns | $V_{GS}$=4.0V |
| Turn-off delay time | $t_{d(off)}$ * | – | 15 | – | ns | $R_L$=67Ω |
| Fall time | $t_f$ * | – | 10 | – | ns | $R_G$=10Ω |

* 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**

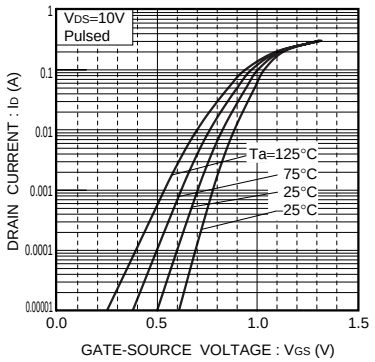



Fig.1 Typical transfer characteristics

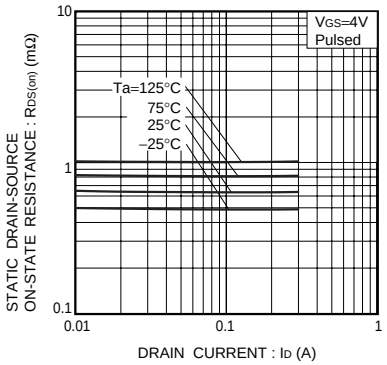



Fig.2 Static drain-source on-state resistance vs. drain current (I)

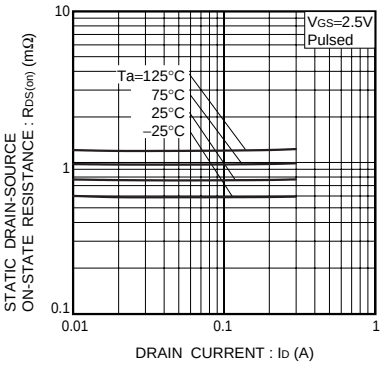



Fig.3 Static drain-source on-state resistance vs. drain current (II)

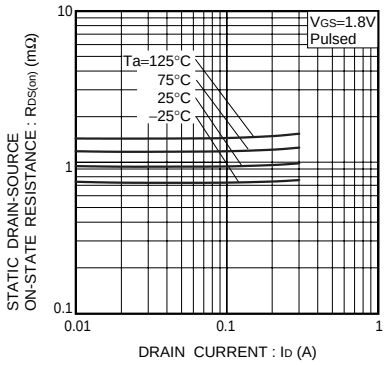



Fig.4 Static drain-source on-state resistance vs. drain current (III)

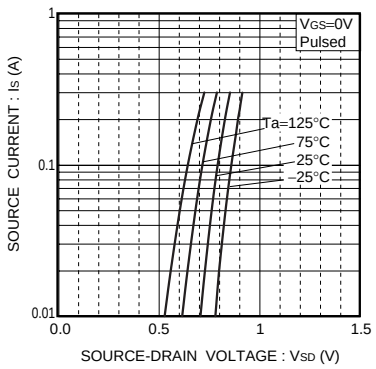



Fig.5 Source current vs. source-drain voltage

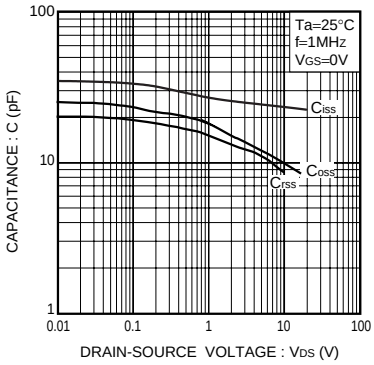



Fig.6 Typical capacitance vs. drain-source voltage

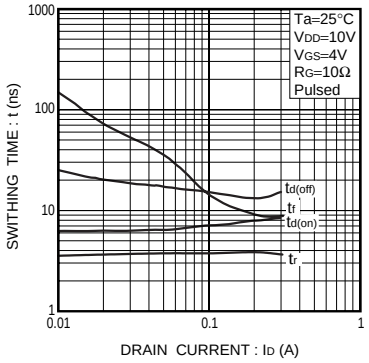



Fig.7 Switching characteristics

**●Switching characteristics measurement circuit**

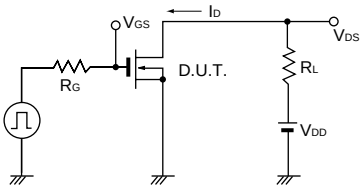



Fig.8 Switching time measurement circuit

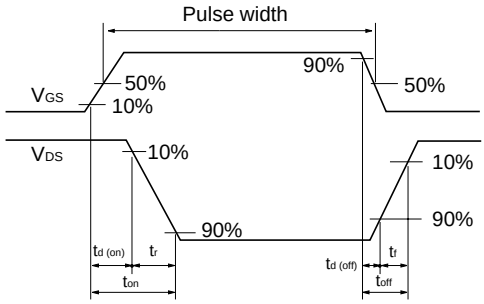



Fig.9 Switching time waveforms

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