

Transistors

2.5V Drive Nch+Nch MOSFET

QS5K2

●Structure

Silicon N-channel MOSFET

●Features

- 1) Low On-resistance.
- 3) Space saving, small surface mount package (TSMT5).

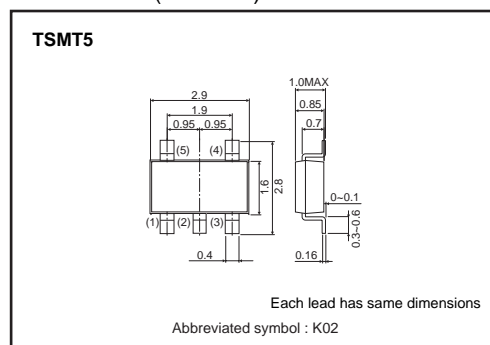
●Applications

Switching

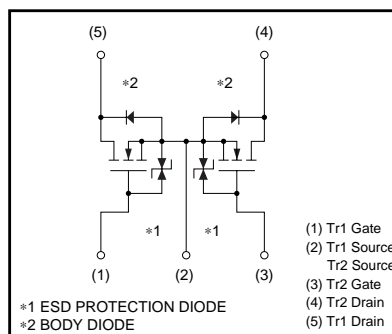
●Packaging specifications

| | | |
|-------|------------------------------|--------|
| Type | Package | Taping |
| | Code | TR |
| | Basic ordering unit (pieces) | 3000 |
| QS5K2 | | ○ |

●Dimensions (Unit : mm)



●Inner circuit



●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} | 30 | V |
| Gate-source voltage | V_{GSS} | 12 | V |
| Drain current | Continuous | I_D | ± 2.0 A |
| | Pulsed | I_{DP} *1 | ± 8.0 A |
| Source current (Body diode) | Continuous | I_S | 0.8 A |
| | Pulsed | I_{SP} *1 | 3.2 A |
| Total power dissipation | P_D *2 | 1.25 | W / TOTAL |
| | | 0.9 | W / ELEMENT |
| Channel temperature | T_{ch} | 150 | °C |
| Range of storage temperature | T_{stg} | -55 to +150 | °C |

*1 $P_w \leq 10\mu s$, Duty cycle $\leq 1\%$
 *2 Mounted on a ceramic board

●Thermal resistance

| Parameter | Symbol | Limits | Unit |
|--------------------|------------------|--------|------|
| Channel to ambient | $R_{th(ch-a)}$ * | 100 | °C/W |
| | | 139 | °C/W |

* Mounted on a ceramic board

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●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} =12V, V _{DS} =0V |
| Drain-source breakdown voltage | V _{(BR) DSS} | 30 | – | – | V | I _D = 1mA, V _{GS} =0V |
| Zero gate voltage drain current | I _{DSS} | – | – | 1 | μA | V _{DS} = 30V, V _{GS} =0V |
| Gate threshold voltage | V _{GS (th)} | 0.5 | – | 1.5 | V | V _{DS} = 10V, I _D = 1mA |
| Static drain-source on-state resistance | R _{DS (on)} * | – | 71 | 100 | mΩ | I _D = 2A, V _{GS} = 4.5V |
| | | – | 76 | 107 | mΩ | I _D = 2A, V _{GS} = 4.0V |
| | | – | 110 | 154 | mΩ | I _D = 2A, V _{GS} = 2.5V |
| Forward transfer admittance | Y _{fs} * | 1.5 | – | – | S | V _{DS} = 10V, I _D = 2A |
| Input capacitance | C _{iss} | – | 175 | – | pF | V _{DS} = 10V |
| Output capacitance | C _{oss} | – | 50 | – | pF | V _{GS} =0V |
| Reverse transfer capacitance | C _{rss} | – | 25 | – | pF | f=1MHz |
| Turn-on delay time | t _{d (on)} * | – | 8 | – | ns | V _{DD} ≐ 15V I _D = 1A |
| Rise time | t _r * | – | 10 | – | ns | V _{GS} = 4.5V |
| Turn-off delay time | t _{d (off)} * | – | 21 | – | ns | R _L = 15Ω |
| Fall time | t _f * | – | 8 | – | ns | R _E =10Ω |
| Total gate charge | Q _g * | – | 2.8 | 3.9 | nC | V _{DD} ≐ 15V |
| Gate-source charge | Q _{gs} * | – | 0.6 | – | nC | V _{GS} = 4.5V |
| Gate-drain charge | Q _{gd} * | – | 0.8 | – | nC | I _D = 2A |

*Pulsed

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

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|-----------------|-------------------|------|------|------|------|--|
| Forward voltage | V _{SD} * | – | – | 1.2 | V | I _S = 3.2A, V _{GS} =0V |

* Pulsed

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●Electrical characteristics curves

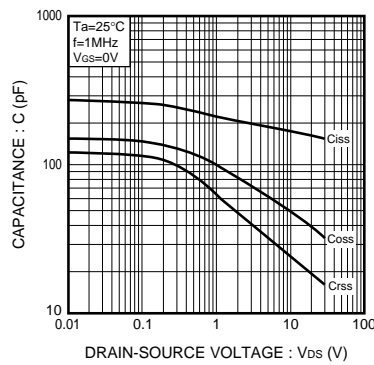


Fig.1 Typical Capacitance vs. Drain-Source Voltage

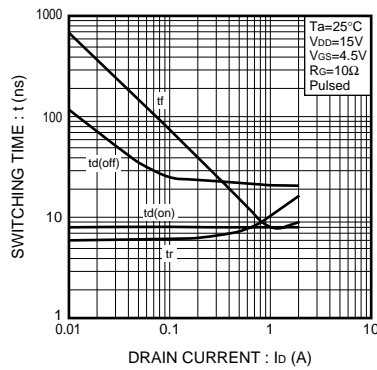


Fig.2 Switching Characteristics

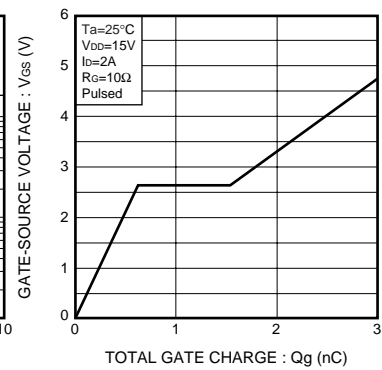


Fig.3 Dynamic Input Characteristics

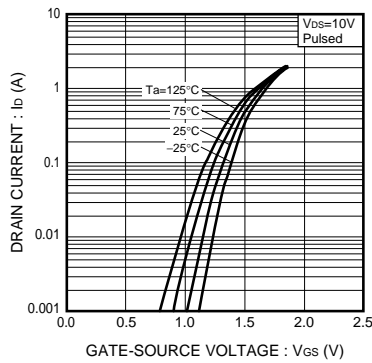


Fig.4 Typical Transfer Characteristics

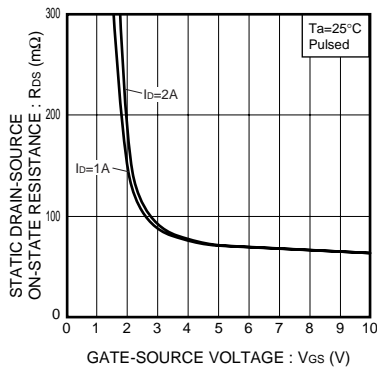


Fig.5 Static Drain-Source On-State Resistance vs. Gate source Voltage

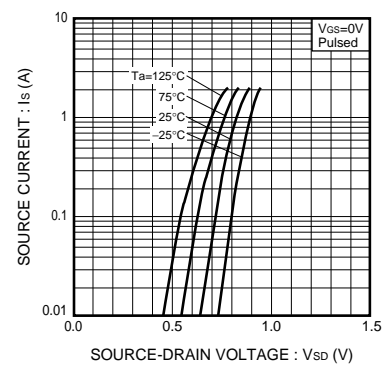


Fig.6 Source Current vs. Source-Drain Voltage

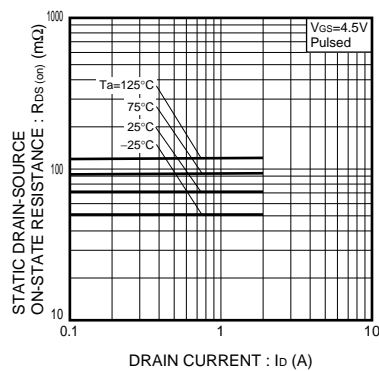


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (I)

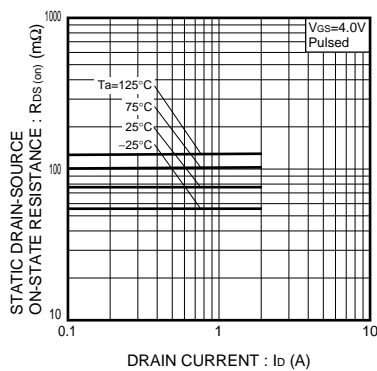


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (II)

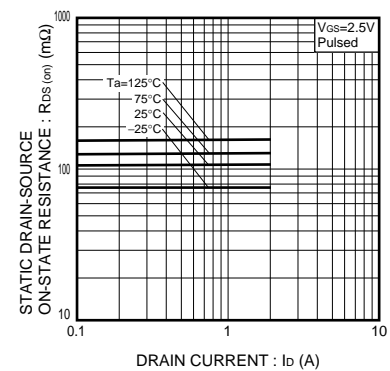


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (III)

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