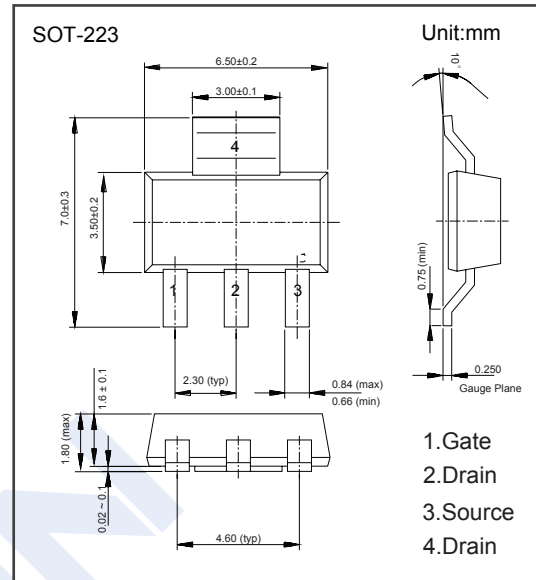
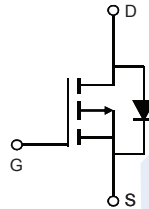


## P-channel MOSFET

## 2KJ6054

## ■ Features

- $V_{DS} (V) = -20V$
- $I_D = -6.0A$
- $R_{DS(ON)} < 50m\Omega @ V_{GS} = -4.5V$
- $R_{DS(ON)} < 65m\Omega @ V_{GS} = -2.5V$
- $R_{DS(ON)} < 85m\Omega @ V_{GS} = -1.8V$

■ Absolute Maximum Ratings (T<sub>c</sub> = 25°C Unless otherwise noted)

| Parameter   | Symbol          | Rating     | Unit |
|---|-----------------|------------|------|
| Drain-Source Voltage                              | $V_{DS}$        | -20        | V    |
| Gate-Source Voltage                               | $V_{GS}$        | ±12        |      |
| Continuous Drain Current                          | $I_D$           | -6.0       | A    |
| Pulsed Drain Current ( $t_p \leq 10\mu s$ )       | $I_{DM}$        | -20        |      |
| Power Dissipation                                 | $P_D$           | 2.8        | W    |
| Thermal Resistance, Junction- to-Ambient (Note 1) | $R_{\theta JA}$ | 62.5       | °C/W |
| Junction Temperature                              | $T_J$           | 150        | °C   |
| Junction Storage Temperature Range                | $T_{stg}$       | -55 to 150 |      |

Note 1. Surface mounted on FR4 board.

## P-channel MOSFET

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■ Electrical Characteristics (T<sub>A</sub> = 25°C Unless otherwise noted)

| Parameter   | Symbol              | Test Conditions  | Min  | Typ   | Max  | Unit |
|---|---------------------|--|------|-------|------|------|
| <b>Off Characteristics</b>                                    |                     |  |      |       |      |      |
| Drain-Source Breakdown Voltage                                | V <sub>DSS</sub>    | I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V  | -20  |       |      | V    |
| Zero Gate Voltage Drain Current                               | I <sub>DSS</sub>    | V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V  |      |       | -1   | μA   |
| Gate-Body Leakage Current                                     | I <sub>GSS</sub>    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±12V   |      |       | ±100 | nA   |
| <b>On Characteristics</b>                                     |                     |  |      |       |      |      |
| Gate Threshold Voltage  | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                  | -0.5 |       | -1.0 | V    |
| Static Drain-Source On-Resistance (Note 2)                    | R <sub>DS(on)</sub> | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -6A  |      | 35    | 50   | mΩ   |
|   |                     | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -4A  |      | 43    | 65   |      |
|   |                     | V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -2A  |      | 55    | 85   |      |
| Forward Transconductance (Note 2)                             | g <sub>FS</sub>     | V <sub>DS</sub> = -5V, I <sub>D</sub> = -5A  |      | 5     |      | S    |
| <b>Dynamic Characteristics</b>                                |                     |  |      |       |      |      |
| Input Capacitance   | C <sub>iss</sub>    | V <sub>GS</sub> = 0V, V <sub>DS</sub> = -10V, f = 1MHz                                       |      | 1185  |      | pF   |
| Output Capacitance  | C <sub>oss</sub>    |  |      | 235   |      |      |
| Reverse Transfer Capacitance                                  | C <sub>rss</sub>    |  |      | 100   |      |      |
| Total Gate Charge   | Q <sub>g</sub>      | V <sub>DS</sub> = -10V, I <sub>D</sub> = -6A, V <sub>GS</sub> = -4.5V                        |      | 12    | 20   | nC   |
| Gate Source Charge  | Q <sub>gs</sub>     |  |      | 1.9   |      |      |
| Gate Drain Charge   | Q <sub>gd</sub>     |  |      | 3.2   |      |      |
| <b>Switching Characteristics</b>                              |                     |  |      |       |      |      |
| Turn-On Delay Time  | t <sub>d(on)</sub>  | V <sub>GS</sub> = -4.5V, V <sub>DD</sub> = -5V,<br>I <sub>D</sub> = -1A, R <sub>G</sub> = 6Ω |      | 10    | 20   | ns   |
| Turn-On Rise Time   | t <sub>r</sub>      |  |      | 15    |      |      |
| Turn-Off Delay Time   | t <sub>d(off)</sub> |  |      | 45    |      |      |
| Turn-Off Fall Time  | t <sub>f</sub>      |  |      | 25    |      |      |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |                     |  |      |       |      |      |
| Maximum Body-Diode Continuous Current                         | I <sub>S</sub>      |  |      |       | -6   | A    |
| Maximum Body-Diode Pulse Current                              | I <sub>SM</sub>     |  |      |       | -20  |      |
| Diode Forward Voltage   | V <sub>SD</sub>     | I <sub>SD</sub> = -1.25 A, V <sub>GS</sub> = 0V  |      | -0.81 | -1.2 | V    |

Note 2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycles ≤ 2%

## ■ Marking

|         |               |
|---------|---------------|
| Marking | J6054<br>K*** |
|---------|---------------|

P-channel MOSFET

2KJ6054

Typical Characteristics

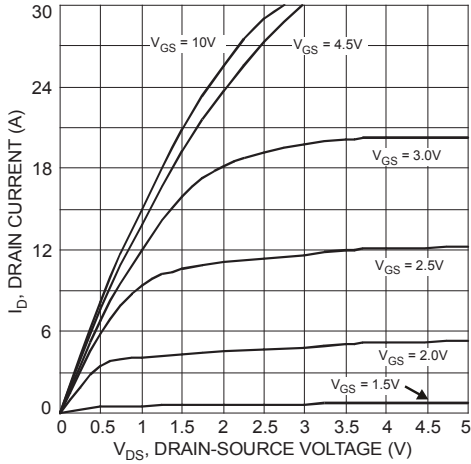


Fig. 1 Typical Output Characteristic

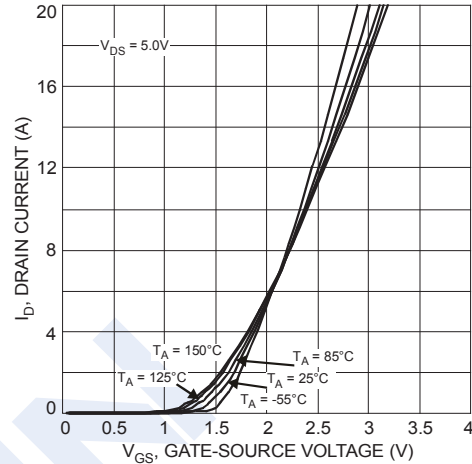


Fig. 2 Typical Transfer Characteristic

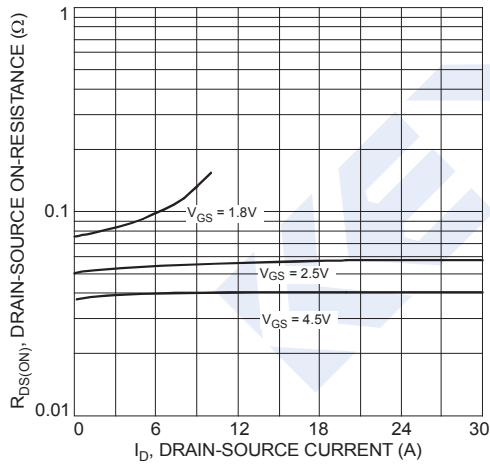


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

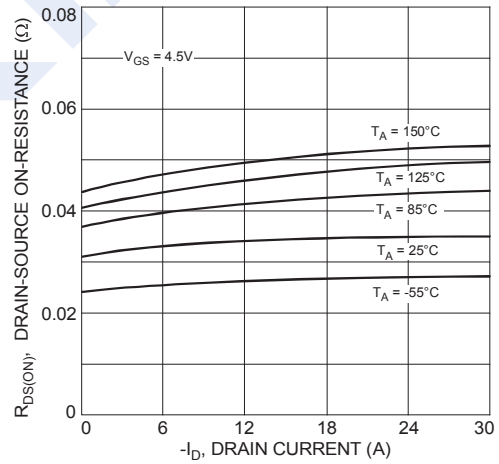


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

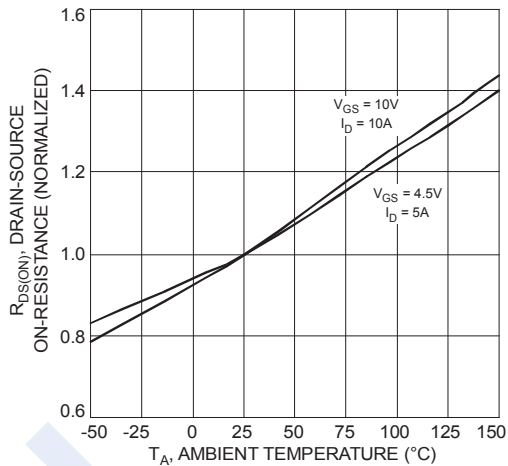


Fig. 5 Normalized On-Resistance vs. Ambient Temperature

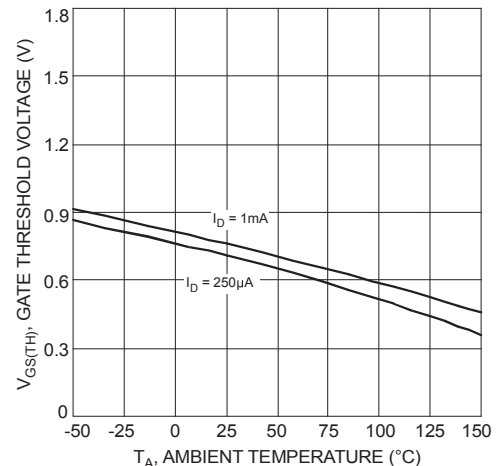


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

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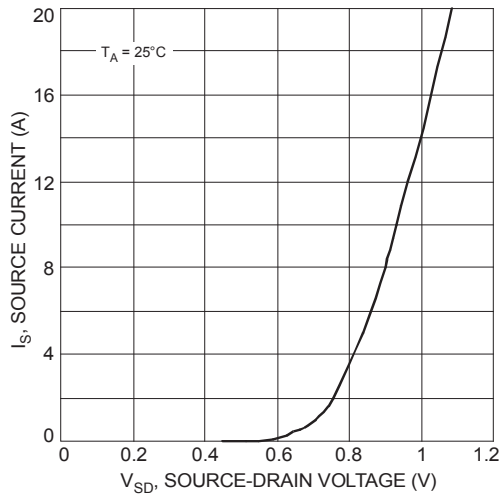


Fig. 7 Diode Forward Voltage vs. Current

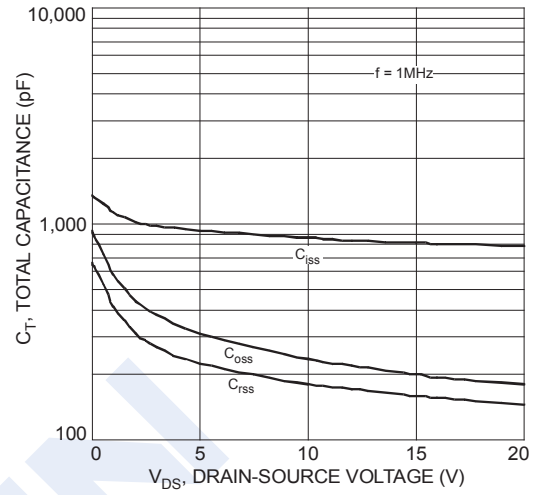


Fig. 8 Typical Total Capacitance

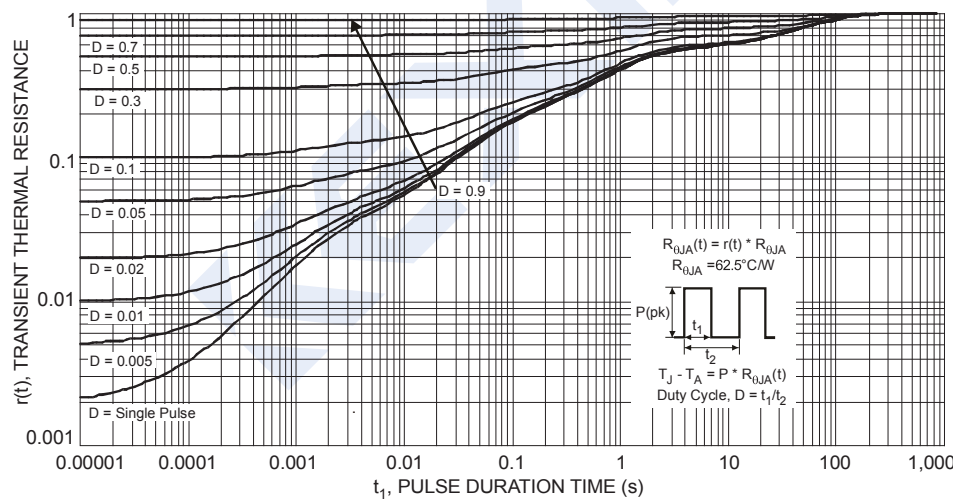


Fig. 9 Transient Thermal Response