2SK3541

2.5V Drive Nch MOS FET

- **Structure**
  Silicon N-channel MOSFET

- **Applications**
  Interfacing, switching (30V, 100mA)

- **Features**
  1) Low on-resistance.
  2) Fast switching speed.
  3) Low voltage drive (2.5V) makes this device ideal for portable equipment.
  4) Drive circuits can be simple.
  5) Parallel use is easy.

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- **Absolute maximum ratings (Ta=25 °C)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Limits</th>
<th>Unit</th>
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<tbody>
<tr>
<td>Drain-source voltage</td>
<td>Voss</td>
<td>±30</td>
<td>V</td>
</tr>
<tr>
<td>Gate-source voltage</td>
<td>Voss</td>
<td>±20</td>
<td>V</td>
</tr>
<tr>
<td>Drain current Continuous</td>
<td>Io</td>
<td>±100</td>
<td>mA</td>
</tr>
<tr>
<td>Pulsed</td>
<td>Idr*1</td>
<td>±400</td>
<td>mA</td>
</tr>
<tr>
<td>Total power dissipation</td>
<td>Pd*2</td>
<td>150</td>
<td>mW</td>
</tr>
<tr>
<td>Channel temperature</td>
<td>Tch</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tstg</td>
<td>−55 to +150</td>
<td>°C</td>
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Electrical characteristics (Ta=25°C)

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<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gate-source leakage</td>
<td>IGSS</td>
<td>–</td>
<td>–</td>
<td>±1</td>
<td>μA</td>
<td>VGS=±20V, VDS=0V</td>
</tr>
<tr>
<td>Drain-source breakdown voltage</td>
<td>VBRDSS</td>
<td>30</td>
<td>–</td>
<td>–</td>
<td>V</td>
<td>Ib=10μA, VDS=0V</td>
</tr>
<tr>
<td>Zero gate voltage drain current</td>
<td>IDSS</td>
<td>–</td>
<td>–</td>
<td>1.0</td>
<td>μA</td>
<td>VGS=30V, VDS=0V</td>
</tr>
<tr>
<td>Gate threshold voltage</td>
<td>VGS(th)</td>
<td>0.8</td>
<td>–</td>
<td>1.5</td>
<td>V</td>
<td>VGS=3V, Ib=100μA</td>
</tr>
<tr>
<td>Static drain-source on-state</td>
<td>RDS(on)</td>
<td>5</td>
<td>8</td>
<td>13</td>
<td>Ω</td>
<td>Ib=10mA, VDS=2.5V</td>
</tr>
<tr>
<td>resistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input capacitance</td>
<td>Cin</td>
<td>–</td>
<td>13</td>
<td>–</td>
<td>pF</td>
<td>VDS=5V</td>
</tr>
<tr>
<td>Output capacitance</td>
<td>Coss</td>
<td>–</td>
<td>9</td>
<td>–</td>
<td>pF</td>
<td>VDS=0V</td>
</tr>
<tr>
<td>Reverse transfer capacitance</td>
<td>Cros</td>
<td>–</td>
<td>4</td>
<td>–</td>
<td>pF</td>
<td>f=1MHz</td>
</tr>
<tr>
<td>Turn-on delay time</td>
<td>td(on)</td>
<td>–</td>
<td>15</td>
<td>–</td>
<td>ns</td>
<td>VDS=3V</td>
</tr>
<tr>
<td>Rise time</td>
<td>trr</td>
<td>–</td>
<td>35</td>
<td>–</td>
<td>ns</td>
<td>VDS=5V</td>
</tr>
<tr>
<td>Turn-off delay time</td>
<td>td(off)</td>
<td>–</td>
<td>80</td>
<td>–</td>
<td>ns</td>
<td>RL=500Ω</td>
</tr>
<tr>
<td>Fall time</td>
<td>tf</td>
<td>–</td>
<td>80</td>
<td>–</td>
<td>ns</td>
<td>R=1kΩ</td>
</tr>
</tbody>
</table>

Electrical characteristic curves

- Fig.1 Typical output characteristics
- Fig.2 Typical transfer characteristics
- Fig.3 Gate threshold voltage vs. channel temperature
- Fig.4 Static drain-source on-state resistance vs. drain current (I)
- Fig.5 Static drain-source on-state resistance vs. drain current (II)
- Fig.6 Static drain-source on-state vs. gate-source voltage
2SK3541

Transistor

Fig. 7 Static drain-source on-state resistance vs. channel temperature

Fig. 8 Forward transfer admittance vs. drain current

Fig. 9 Reverse drain current vs. source-drain voltage (I)

Fig. 10 Reverse drain current vs. source-drain voltage (II)

Fig. 11 Typical capacitance vs. drain-source voltage

Fig. 12 Switching characteristics

(See Figures 13 and 14 for the measurement circuit and resultant waveforms)

Switching characteristics measurement circuit

Fig. 13 Switching time measurement circuit

Fig. 14 Switching time waveforms

Not Recommended for New Designs
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