To our customers,

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Old Company Name in Catalogs and Other Documents

On April 1\textsuperscript{st}, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

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April 1\textsuperscript{st}, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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JUNCTION FIELD EFFECT TRANSISTOR

2SK515

AUDIO FREQUENCY AMPLIFIER

N-CHANNEL SILICON JUNCTION FIELD EFFECT TRANSISTOR

MINI MOLD

FEATURES

- High Voltage \( V_{DSX} = 50 \text{ V} \)
- High \( |V_T| \) \( |V_T| = 4.1 \text{ mS TYP.} \)

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents \( (T_A = 25^\circ \text{C}) \)

- Gate to Drain Voltage \( V_{GDO} \) \(-50\) \text{ V} \)
- Gate to Source Voltage \( V_{GSO} \) \(-50\) \text{ V} \)
- Drain to Source Voltage \( V_{DSX} \) \(50\) \text{ V} \)
- Drain Current (DC) \( I_D \) 20 \text{ mA} \)
- Gate Current (DC) \( I_G \) 10 \text{ mA} \)

Maximum Power Dissipation

- Total Power Dissipation at 25 \(^\circ\text{C} \) Ambient Temperature \( P_T \) 150 \text{ mW} \)

Maximum Temperatures

- Junction Temperature \( T_J \) 125 \(^\circ\text{C} \)
- Storage Temperature Range \( T_{STG} \) \(-55 \text{ to } +125 \) \(^\circ\text{C} \)

ELECTRICAL CHARACTERISTICS \( (T_A = 25^\circ \text{C}) \)

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>SYMBOL</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
<th>TEST CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gate Cutoff Current</td>
<td>( I_{GS} )</td>
<td>-1.0</td>
<td></td>
<td></td>
<td>\text{mA}</td>
<td>( V_{GS} = -30 \text{ V}, V_{DS} = 0 )</td>
</tr>
<tr>
<td>Zero-Gate Voltage Drain Current</td>
<td>( I_{DSS} )</td>
<td>1.0</td>
<td>3.5</td>
<td>12</td>
<td>\text{mA}</td>
<td>( V_{DS} = 5.0 \text{ V}, V_{GS} = 0 )</td>
</tr>
<tr>
<td>Gate to Source Cutoff Voltage ( V_{GSO} ) (off)</td>
<td>( V_{DSS} )</td>
<td>-0.5</td>
<td>-1.7</td>
<td>-4.5</td>
<td>\text{V}</td>
<td>( V_{DS} = 5.0 \text{ V}, I_D = 0.1 \text{ \mu A} )</td>
</tr>
<tr>
<td>Forward Transfer Admittance</td>
<td>( V_T )</td>
<td>1.2</td>
<td>1.2</td>
<td>2</td>
<td>\text{mS}</td>
<td>( V_{DS} = 5.0 \text{ V}, I_D = 0.5 \text{ mA}, f = 1.0 \text{ kHz} )</td>
</tr>
<tr>
<td>Feedback Capacitance ( C_{FB} )</td>
<td>( C_{FB} )</td>
<td>1.5</td>
<td></td>
<td></td>
<td>\text{pF}</td>
<td>( V_{DS} = 10 \text{ V}, V_{GS} = 0, f = 1.0 \text{ MHz} )</td>
</tr>
<tr>
<td>Input Capacitance ( C_{IS} )</td>
<td>( C_{IS} )</td>
<td>6.0</td>
<td></td>
<td></td>
<td>\text{pF}</td>
<td>( V_{DS} = 10 \text{ V}, V_{GS} = 0, f = 1.0 \text{ MHz} )</td>
</tr>
</tbody>
</table>

\( I_{DSS} \) Classification

<table>
<thead>
<tr>
<th>Marking</th>
<th>X31</th>
<th>X32</th>
<th>X33</th>
<th>X34</th>
<th>X36</th>
</tr>
</thead>
<tbody>
<tr>
<td>( I_{DSS} ) (mA)</td>
<td>1.0 to 2.0</td>
<td>1.5 to 3.0</td>
<td>2.5 to 5.0</td>
<td>4.0 to 8.0</td>
<td>6.0 to 12</td>
</tr>
</tbody>
</table>

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TYPICAL CHARACTERISTICS ($T_a = 25^\circ C$)

**TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE**

![Graph showing total power dissipation vs. ambient temperature.](image)

**DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE**

![Graph showing drain current vs. drain to source voltage.](image)

**DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE**

![Graph showing drain current vs. drain to source voltage.](image)

**DRAIN CURRENT vs. GATE TO SOURCE VOLTAGE**

![Graph showing drain current vs. gate to source voltage.](image)

**FORWARD TRANSFER ADMITTANCE ($Y_{fs}$) vs. GATE TO SOURCE VOLTAGE**

![Graph showing forward transfer admittance vs. gate to source voltage.](image)