To our customers,

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April 1st, 2010
Renesas Electronics Corporation

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DESCRIPTION
The 2SK3482 is N-channel MOS Field Effect Transistor designed for high current switching applications.

FEATURES
- Low on-state resistance
  \[ R_{DS(on)} = 33 \, \text{m}\Omega \, \text{MAX. (VGS = 10 V, Id = 18 A)} \]
  \[ R_{DS(on)} = 39 \, \text{m}\Omega \, \text{MAX. (VGS = 4.5 V, Id = 18 A)} \]
- Low \( C_{iss} \): \( C_{iss} = 3600 \, \text{pF TYP.} \)
- Built-in gate protection diode
- TO-251/TO-252 package

ABSOLUTE MAXIMUM RATINGS (\( TA = 25^\circ \text{C} \))

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain to Source Voltage (( V_{DS} = 0 , \text{V} ))</td>
<td>( V_{DSS} ) 100 V</td>
</tr>
<tr>
<td>Gate to Source Voltage (( V_{DS} = 0 , \text{V} ))</td>
<td>( V_{GSS} ) ±20 V</td>
</tr>
<tr>
<td>Drain Current (DC)</td>
<td>( I_{D(DC)} ) ±36 A</td>
</tr>
<tr>
<td>Drain Current (Pulse) Note1</td>
<td>( I_{D(pulse)} ) ±100 A</td>
</tr>
<tr>
<td>Total Power Dissipation (( T_{C} = 25^\circ \text{C} ))</td>
<td>( P_{T} ) 50 W</td>
</tr>
<tr>
<td>Total Power Dissipation (( T_{A} = 25^\circ \text{C} ))</td>
<td>( P_{T} ) 1.0 W</td>
</tr>
<tr>
<td>Channel Temperature</td>
<td>( T_{ch} ) 150 °C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{stg} ) −55 to +150 °C</td>
</tr>
<tr>
<td>Single Avalanche Current Note2</td>
<td>( I_{AS} ) 30 A</td>
</tr>
<tr>
<td>Single Avalanche Energy Note2</td>
<td>( E_{AS} ) 90 mJ</td>
</tr>
</tbody>
</table>

Notes 1. \( PW \leq 10 \, \mu\text{s, Duty Cycle} \leq 1\% \)

2. Starting \( T_{ch} = 25^\circ \text{C}, \, R_{G} = 25 \, \Omega, \, V_{GB} = 20 \rightarrow 0 \, \text{V} \)

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>PACKAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2SK3482</td>
<td>TO-251 (MP-3)</td>
</tr>
<tr>
<td>2SK3482-Z</td>
<td>TO-252 (MP-3Z)</td>
</tr>
</tbody>
</table>
## ELECTRICAL CHARACTERISTICS (TA = 25°C)

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>SYMBOL</th>
<th>TEST CONDITIONS</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
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<tr>
<td>Zero Gate Voltage Drain Current</td>
<td>IDSS</td>
<td>VGS = 100 V, VDS = 0 V</td>
<td>10</td>
<td>μA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leakage Current</td>
<td>ISGSS</td>
<td>VGS = ±20 V, VDS = 0 V</td>
<td>±10</td>
<td>μA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gate Cut-off Voltage</td>
<td>VGS(off)</td>
<td>VGS = 10 V, ID = 1 mA</td>
<td>1.5</td>
<td>2.0</td>
<td>2.5</td>
<td>V</td>
</tr>
<tr>
<td>Forward Transfer Admittance</td>
<td></td>
<td>VGS = 10 V, ID = 18 A</td>
<td>12</td>
<td>23</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>Drain to Source On-state Resistance</td>
<td>RDS(on)</td>
<td>VGS = 10 V, ID = 18 A</td>
<td>27</td>
<td>33</td>
<td>mΩ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RDS(on)2</td>
<td>VGS = 4.5 V, ID = 18 A</td>
<td>29</td>
<td>39</td>
<td>mΩ</td>
<td></td>
</tr>
<tr>
<td>Input Capacitance</td>
<td>Ciss</td>
<td>VDS = 10 V</td>
<td>3600</td>
<td>pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Capacitance</td>
<td>Coss</td>
<td>VGS = 0 V</td>
<td>360</td>
<td>pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse Transfer Capacitance</td>
<td>Crss</td>
<td>f = 1 MHz</td>
<td>190</td>
<td>pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn-on Delay Time</td>
<td>tδ(on)</td>
<td>VDD = 50 V, ID = 18 A</td>
<td>15</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rise Time</td>
<td>τr</td>
<td>VGS = 10 V</td>
<td>10</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn-off Delay Time</td>
<td>tδ(off)</td>
<td>RG = 0 Ω</td>
<td>68</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Time</td>
<td>τf</td>
<td></td>
<td>6</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Gate Charge</td>
<td>QG</td>
<td>VDD = 80 V</td>
<td>72</td>
<td>nC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gate to Source Charge</td>
<td>QSs</td>
<td>VGS = 10 V</td>
<td>10</td>
<td>nC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gate to Drain Charge</td>
<td>QGD</td>
<td>ID = 36 A</td>
<td>19</td>
<td>nC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Diode Forward Voltage</td>
<td>VFS(DS)</td>
<td>IF = 36 A, VGS = 0 V</td>
<td>1.0</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse Recovery Time</td>
<td>trr</td>
<td>IF = 36 A, VGS = 0 V</td>
<td>70</td>
<td>ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse Recovery Charge</td>
<td>Qrr</td>
<td>dIdt = 100 A/μs</td>
<td>180</td>
<td>nC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note** Pulsed

### TEST CIRCUIT 1  AVALANCHE CAPABILITY

- **D.U.T.**
- **RG = 25 Ω**
- **50 Ω**
- **VGS = 20 → 0 V**

### TEST CIRCUIT 2  SWITCHING TIME

- **D.U.T.**
- **RG**
- **RL**
- **VDS Wave Form**
- **VGS Wave Form**

- **VDS**
- **0**
- **10%**
- **90%**

- **VGS**
- **0**
- **10%**
- **90%**

- **t**
- **1 μs**
- **Duty Cycle ≤ 1%**

### TEST CIRCUIT 3  GATE CHARGE

- **D.U.T.**
- **RG = 2 m Ω**
- **50 Ω**
- **VDD**

---

Data Sheet D15064EJ3V0DS
TYPICAL CHARACTERISTICS (TA = 25°C)

DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA

TOTAL POWER DISSIPATION vs. CASE TEMPERATURE

FORWARD BIAS SAFE OPERATING AREA

TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH

Data Sheet D15064EJ3V0DS
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE

CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE

SWITCHING CHARACTERISTICS

DYNAMIC INPUT/OUTPUT CHARACTERISTICS

SOURCE TO DRAIN DIODE FORWARD VOLTAGE

REVERSE RECOVERY TIME vs. DRAIN CURRENT
SINGLE AVALANCHE CURRENT vs. INDUCTIVE LOAD

![Graph showing single avalanche current vs. inductive load with specific values:]

- **L** - Inductive Load - mH
- **I_{AS}** - Single Avalanche Current - A
- **V_{DD} = 50 V**
- **V_{GS} = 20 → 0 V**
- **R_G = 25 Ω**
- **I_{AS} ≤ 30 A**
- **E_{AS} = 90 mJ**

SINGLE AVALANCHE ENERGY DERATING FACTOR

![Graph showing energy derating factor with specific values:]

- **Energy Derating Factor - %**
- **Starting T_{ch} - Starting Channel Temperature - °C**
- **V_{DD} = 50 V**
- **V_{GS} = 20 → 0 V**
- **R_G = 25 Ω**
- **I_{AS} ≤ 30 A**

---

Data Sheet D15064EJ3V0DS
EQUIVALENT CIRCUIT

Remark  The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.
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