Slope Adjustable Triangular Wave Generator Design for Improving Dynamic Performance of Buck Converter

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DC-DC Buck converter is widely used in portable device

Research Objective

A Slope Adjustable triangular wave generator

◆ Improve dynamic performance for Buck converter

◆ Simple

---Without current sensor or slope compensation

Line transient response

Load transient response

\[ V_g: \ 5V \leftrightarrow 8V \]

\[ I_{out}: \ 100mA \leftrightarrow 420mA \]

**SATWG**

<table>
<thead>
<tr>
<th>Without proposed TWG</th>
<th>With proposed TWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over-shoot</td>
<td>5mV</td>
</tr>
<tr>
<td></td>
<td>55mV</td>
</tr>
<tr>
<td>Response time</td>
<td>5μs</td>
</tr>
<tr>
<td></td>
<td>400μs</td>
</tr>
</tbody>
</table>

**Line feed-forward control**

● Slope proportional to input voltage

● Slope inversely proportional to variation in output voltage

Wideband, fast modulation

Principle

**DC-DC Buck converter**

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